Installation manual
Wood chip boiler
Eco-HK 70-120

HARGASSNER
HEIZTECHNIK DER ZUKUNFT

Follow and store this manual

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Contents

1 General

This installation manual is part of the Operation manual of the boiler.

D A N G E R

Risk of death, injuries, damage from improper operation

- Observe safety instructions on the boiler and in the manual
- The accomplishment of the activities, described in this manual are only allowed to be carried out by Hargassner - trained installation personnel.

D A N G E R

Death, injuries, damage through wrong execution of the boiler room and fuel storage room

Boiler room

- Design according to local fire protection regulations
- Ensure fire-safe, level and firm floor condition
- Create air inlet openings according to local regulations
- Ensure weatherproof and frost-proof execution
- carrying capacity of the foundation (weight of the boiler)

Fuel storage room

- Structure must be able to bear the weight of the quantity of fuel stored here
- Ensure weatherproof and frost-proof execution
- must be dust-proof
- Ensure easy access and easy refill of the fuel storage room
- Install safety devices in accordance with local regulations
- Attach safety instructions near the access

2 Transport

2.1 Transport weight

The delivery of the heating system is in individually packaged units on pallets.

Designation	Weight	
	Eco-HK 70 - 90	Eco-HK 100 - 120
Boiler pallet depending on execution	Approx. 865 kg	Approx. 890 kg
Pallet with stoker unit and agitator system	Max. of 300 kg depending on version	

Unloading, inspection and damage report

❒ Unload boiler
❒ Remove transport packaging
❒ Dispose packaging waste in accordance with law
☞ Recycling materials can be recycled in a separated and cleaned state
❒ Check all pallets for transport damage
❒ Check delivery for completeness
⇨ See "Scope of delivery" on page 10.
↳ Record any incompleteness of the delivery immediately in writing and send a report to Hargassner Ges mbH
↳ Record any transport damage immediately in writing, take photographs, and send a report to Hargassner Ges mbH
☞ If the transport company is at fault, then the complaint must also be noted on the shipping documents

2.2 Place of installation

⇨ See "Construction of boiler room" on page 32.

Conditions

- sufficient light
- Ensure fireproof, level and solid floor and ceiling construction
- free of disturbing electrical installations and tubes

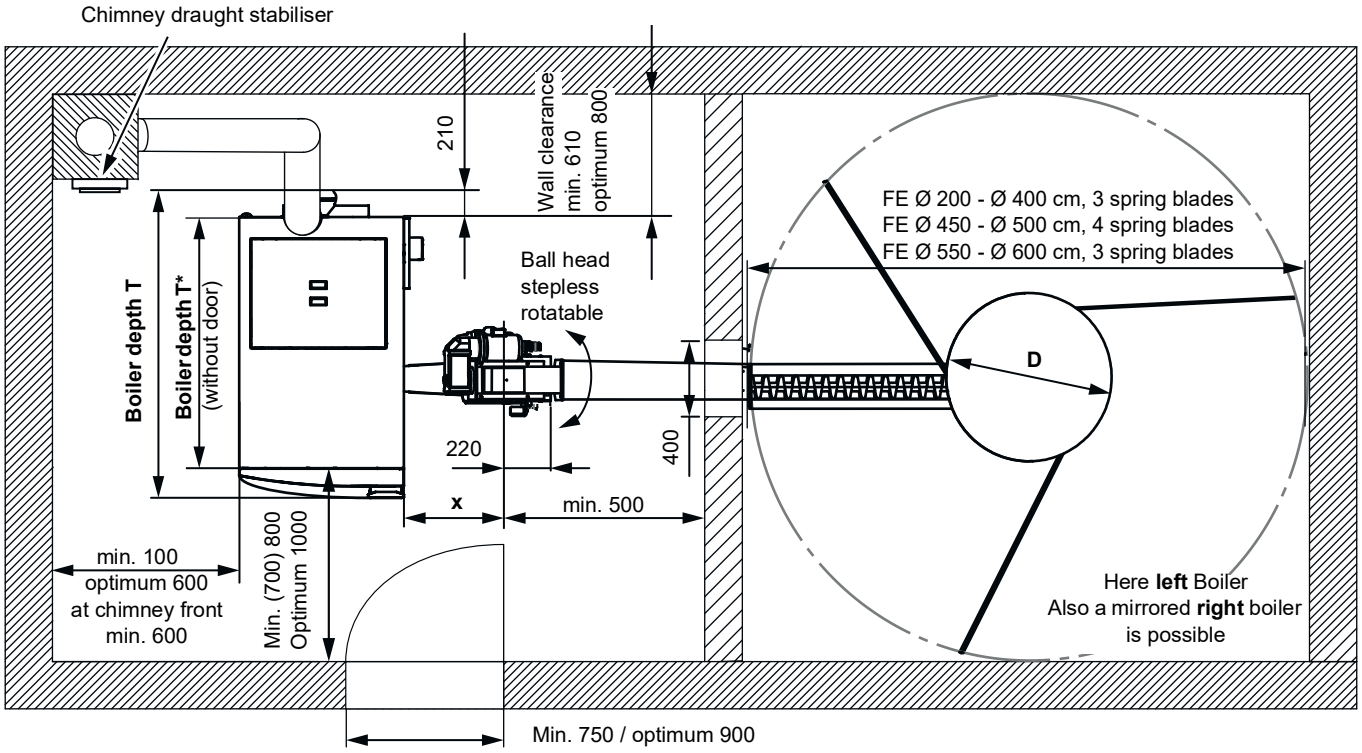
2.3 Space requirements of the system

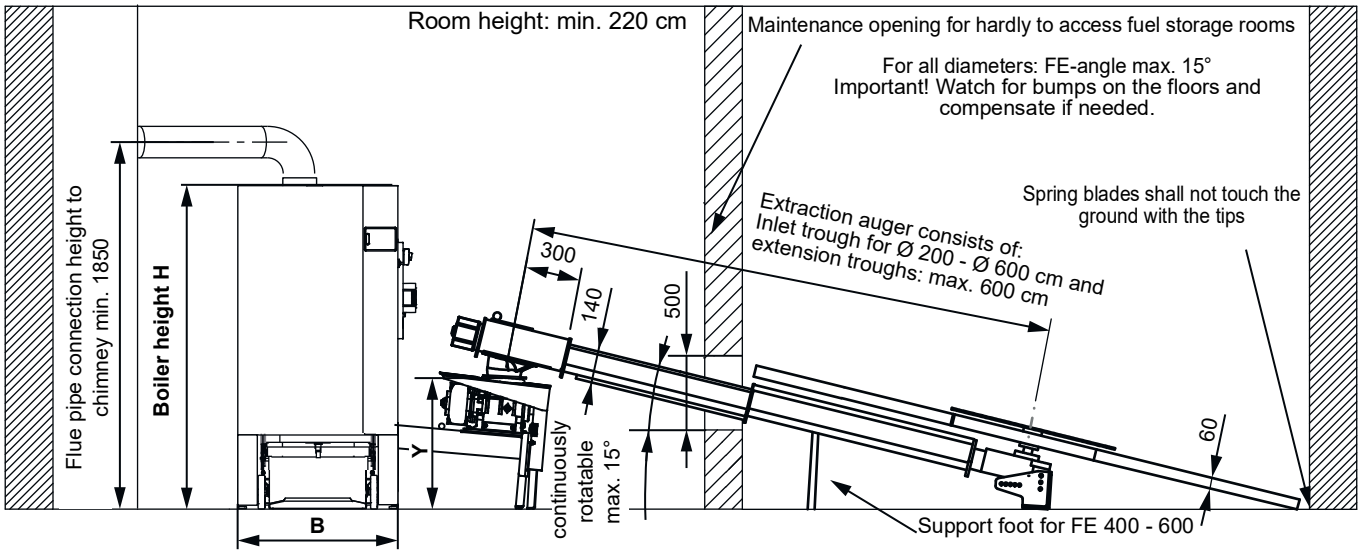
- See data sheet or individual customer drawing
- Observe minimum space requirements
- Drawing of the dimensions required

Designation	Eco-HK 70 - 90	Eco-HK 100 - 120
Room height	Min. 220 cm	

3 Dimensions for

3.1 Eco-HK 70-120 with fuel extraction system ECO-RA





	Stoker unit length X			
	500 mm	**1000 mm**	**1500 mm**	**2000 mm**
Stoker unit height Y	655 mm	610 mm	570 mm	525 mm

Execution FE	**FE 200**	**FE 250**	**FE 300**	**FE 350**	**FE 400**	**FE 450**	**FE 500**	**FE 550**	**FE 600**
Ø fuel extraction	Ø 200 cm	Ø 250 cm	Ø 300 cm	Ø 350 cm	Ø 400 cm	Ø 450 cm	Ø 500 cm	Ø 550 cm	Ø 600 cm
Ø cover disc (D)	Ø 84 cm	Ø 99 cm				Ø 130 cm		Ø 140 cm	
Spring blades	3 Pcs.					4 Pcs.		3 Pcs.	

Extension	**RAV300**	**RAV400**	**RAV600**	**RAV800**	**RAV1000**	**RAV1200**	**RAV1400**	**RAV1600**	**RAV1800**	**RAV2000**
Trough	300	400	600	800	1000	1200	1400	1600	1800	2000
Lid	300	400	600	600+200	600+400	600+600	600+800	600+1000	600+1200	600+1400
all dimension in [mm]								Extension up to 6000 mm possible		

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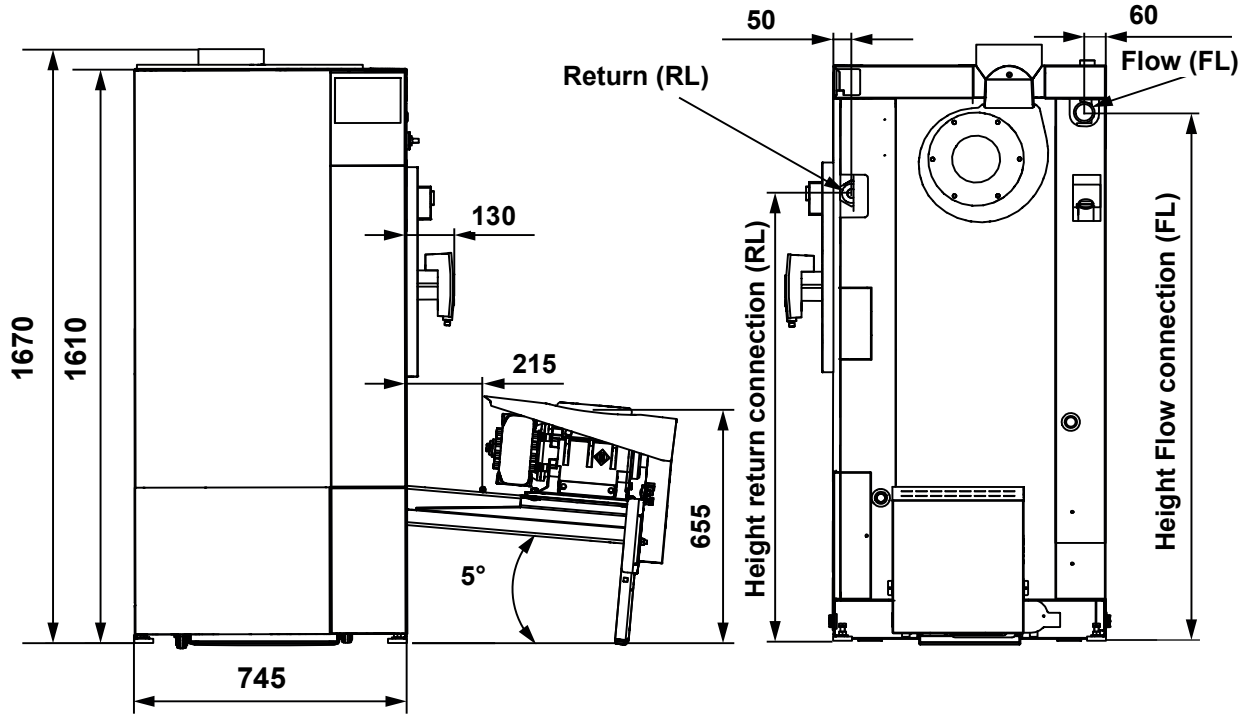
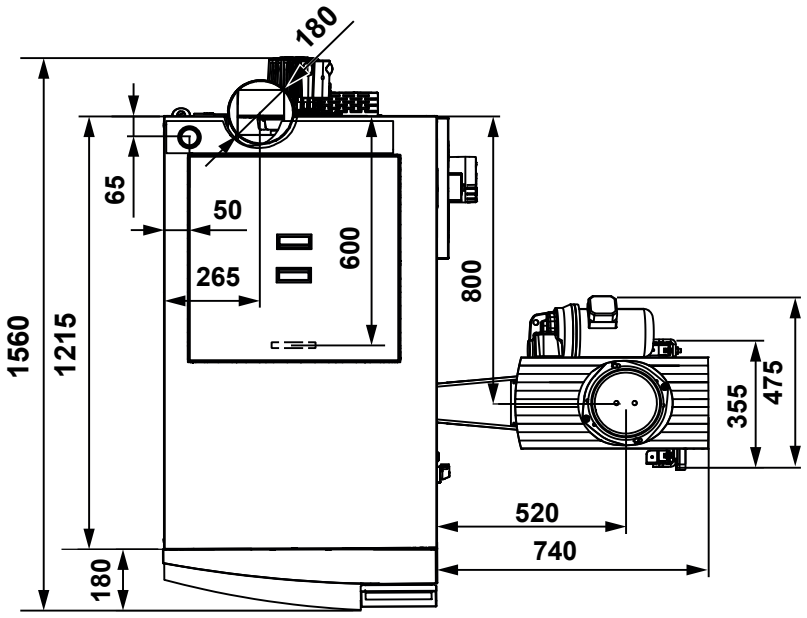
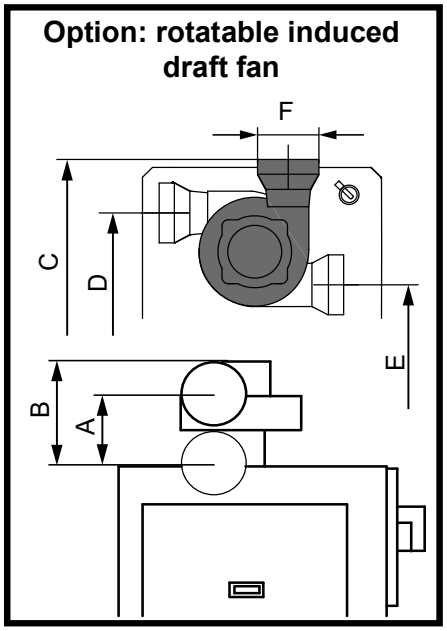
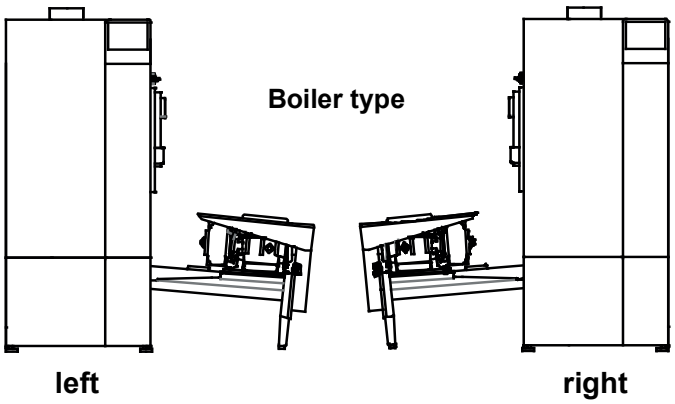
3.2 Dimensioning







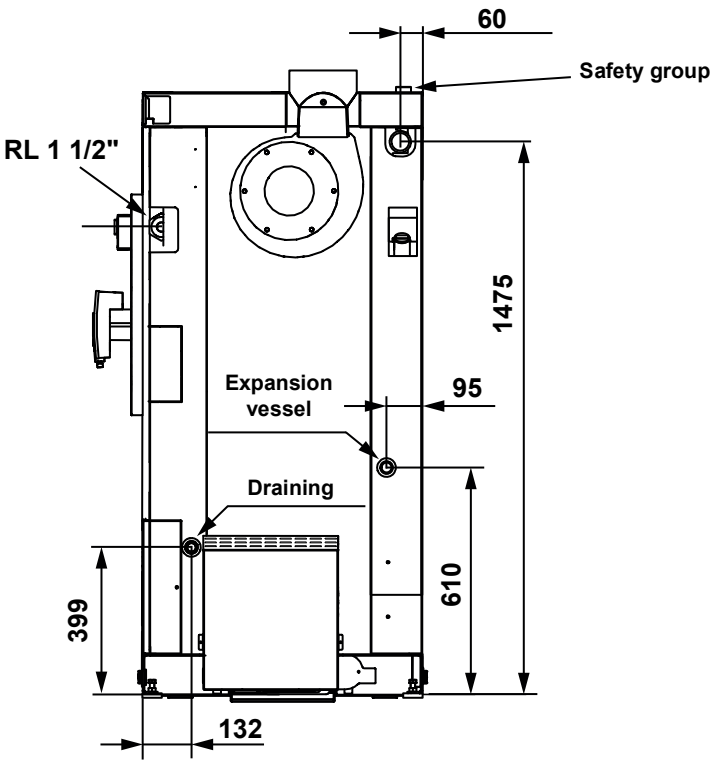


	A	B	C	D	E	F
Eco 70-120	205	295	1655	1425	1260	Ø180

Position D is not possible with a left-type boiler, because the flue pipe would cover the flow.
Position E is not possible with a right-type boiler, because the flue pipe would cover the return.

Image Eco-HK 70-120 with standard stoker L = 500 mm

Eco-HK 70 - 120



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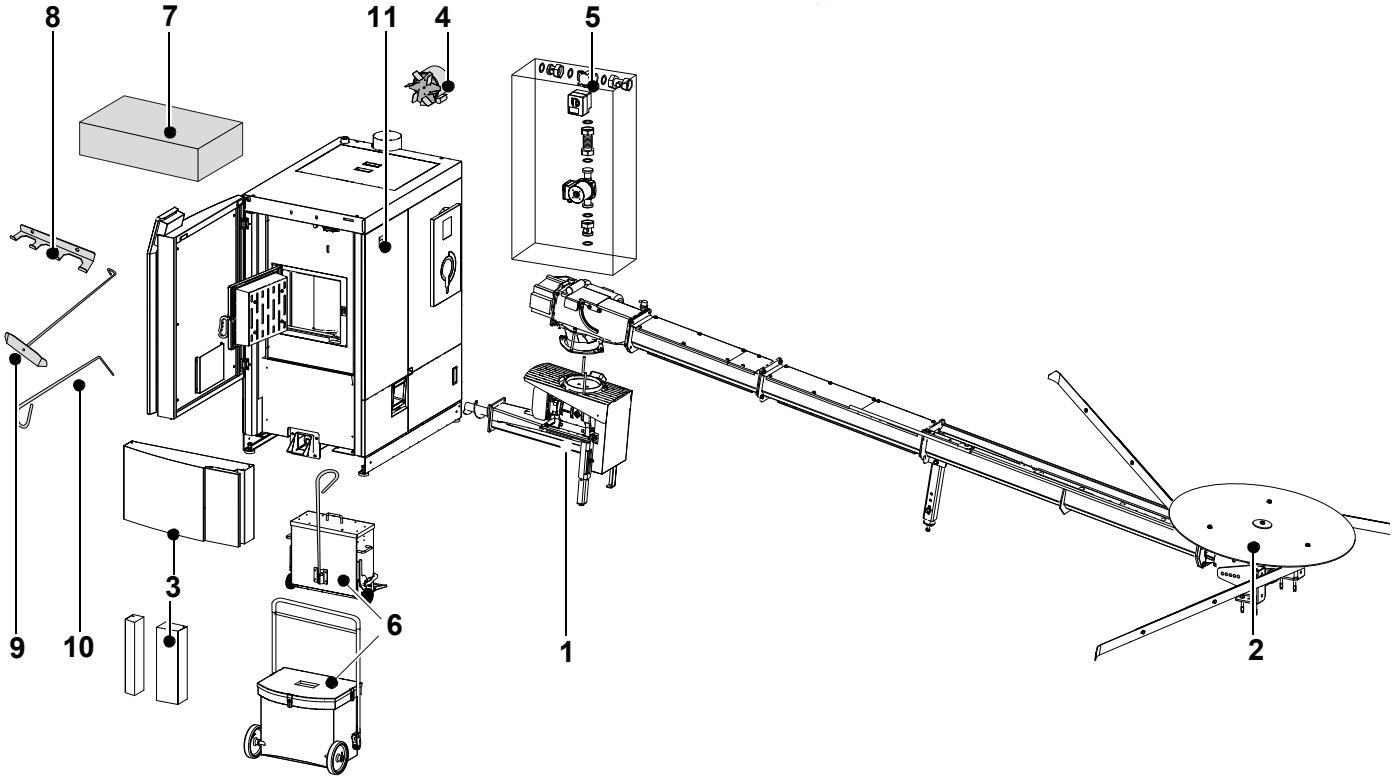
3.3 Technical Data

Designation	Unit	Eco-HK 70	Eco-HK 90	Eco-HK 100	Eco-HK 110	Eco-HK 120
Power range	KW	21-70	27-90	29.7-99	33-110	36-120
Fuel power	KW	73.2	94.4	104.0	115.8	126.6
Boiler class (according to EN 303-5:2012)		5				
Fuel classification (EN ISO 17225)		Wood chips (A1) / wood pellets (A1)				
Boiler height H	mm	1610				
Boiler width B	mm	745				
Boiler depth T / without door T*	mm	1560 / 1215				
Transport dimensions (HxWxD)		1670x745x1320				
Height flow FL	mm	1475				
Height return RL	mm	1250				
Draining	Inches	3/4 IT				
Flow	Inches	1 1/2 IT				
Return	Inches	1 1/2 IT				
Connection expansion vessel	Inches	3/4 IT				
Safety group (safety valve) connection point	Inches	Valve 1 IT				
Maximum operating pressure	bar	3				
Max. operating temperature	°C	85				
Water content	Litre	180				
Weight	kg	865		890		
Req. delivery pressure	Pa	2				
Flue draft max. limit	Pa	10				
Flue pipe diameter FPD	mm	180				
Flue gas temperature	°C	140	150	140	150	160
CO_2	%	14				
Mass flow rate	kg/sec	0.0402	0.0519	0.0571	0.0636	0.0696
Water resistance dT 10°	mbar	57.1	94.4	112.4	138.7	165.1
Water resistance dT 20°	mbar	14.6	24.1	28.7	35.4	42.1
Power consumption	W	222		232		
Power supply		400 V AC, 50 Hz, 13 A				
Acoustic emission (normal operation)*	dBA	55.4				

*Emission of airborne acoustical noise from the wood chip boiler in the boiler room; no significance for acoustic emissions at the chimney mouth or in the surroundings

4 Scope of delivery

The add-on parts are individually packed and can be found inside the boiler or on the pallets.



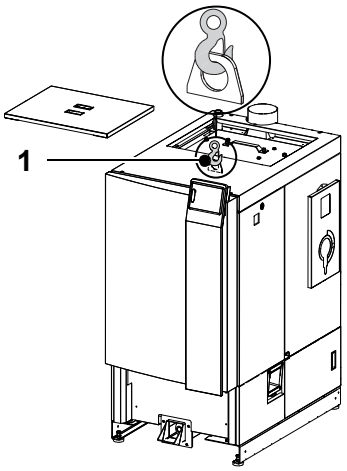
Pos.	Description	Function
1	Stoker unit	Carries the fuel into the combustion chamber ⇨ See "Fitting the Stoker Unit" on page 16.
2	Fuel extraction	Carries the fuel from the fuel storage room into the stoker auger ⇨ See "Assembling and adjusting the agitator" on page 18.
3	Door panel (depending on version)	Lower part of the front cover door ⇨ See "Mounting the trim panel" on page 14.
4	Exhaust fan motor	Transports the flue gas from the boiler into the chimney ⇨ See "Fitting the Induced Draft Fan Motor" on page 14.
5	Back end protection (Optional)	Adjusts a stable return temperature (packed loose in cardboard) ⇨ See "Back end protection" on page 40.
6	Ash box (depending on version)	To collect the ash from the combustion process ⇨ See "Ash box" on page 29.
7	Sensor package	Flow sensor, return sensor, safety temperature breaker (STB), thermostat, flue gas sensor, lambda sensor, etc., according to sensor pack list
8	Socket for companion set	Wall socket for the chimney companion set
9	Ash slider	For cleaning the boiler
10	Poker	For removing combustion residues in the combustion chamber
11	Main switch	On/Off switch for providing electrical power to the boiler ⇨ See "Installing the main power switch" on page 44.

5 Unloading the boiler

D A N G E R

Risk of death, injuries, damage due to falling or toppling loads

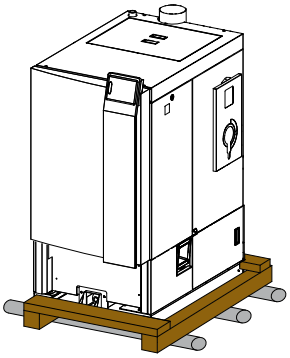
- This boiler may be installed by trained staff only
- Only use tested lifting gear with sufficient load-bearing capacity and in perfect condition
- Do not exceed the maximum permissible load (carrying capacity) of the forklift or lift truck (note type plate)
- Do not hang the plant or plant parts on screws, shaft ends or moving parts
- Never stand under suspended loads
- At first, lift the plant slowly from the ground
  - ☞ Check that the load attaching points are chosen correctly and sit tight
  - ☞ Only when the load has been correctly picked up may it be transported over longer distances
- Pay attention to the balance point
  - ☞ Pick-up point at the boiler is not the balance point
  - ☞ Secure against tipping
- Lift the plant during transport with a forklift only as far from the ground that it can be transported safely
- Set up the boiler on a horizontal, even place



❒ Remove the cover lid from the boiler
❒ Hook the hoist (hook) into the eyebolt **(1)**
  ☞ When lifting focus on balance point
  ☞ Pick-up point at the boiler is not the balance point

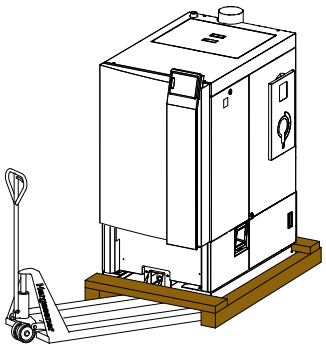
6 Installation

	N O T E
	To transport the boiler safely when moving it to its position Do not dismantle transport timbers

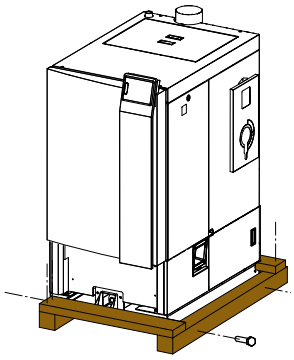


❒ Transport the boiler on rollers

☞ For better rolling, use tubes of at least 1" or equivalent



❒ Transport the boiler with a lift truck or forklift



❒ Position the boiler at the place provided for this purpose

❒ Remove the transport timbers from the boiler

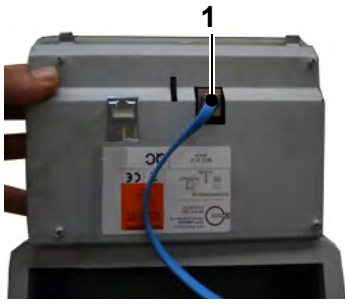
	N O T E
	Tight space conditions when transporting the boiler (e.g.: narrow doors, stairwell) ❒ Remove the cover door.

6.1 Removing the cover door

6.1.1 Dismount Touch display (BCE)

❒ Slide the control panel upwards until it disengages from the bottom of the cover

❒ Tip the control panel out and pull it downwards out of the boiler cover



❒ Disconnect the BUS connection **(1)** from the back of the control panel

❒ Pull the blue ribbon cable out of the cover door

❒ Put the control panel safely aside

6.1.2 Detaching the cover door

❒ Pull the bottom hinge pin first and then the top hinge pin **(2)** up and out of the hinge

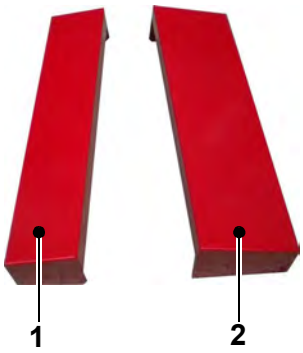
☞ Secure the door against tipping

❒ Remove the cover door and put it aside

❒ After having positioned the boiler, assemble the cover door in reverse order
- ❒ Hang in door
- ❒ Pull in BUS-cable
- ❒ Mount touch display

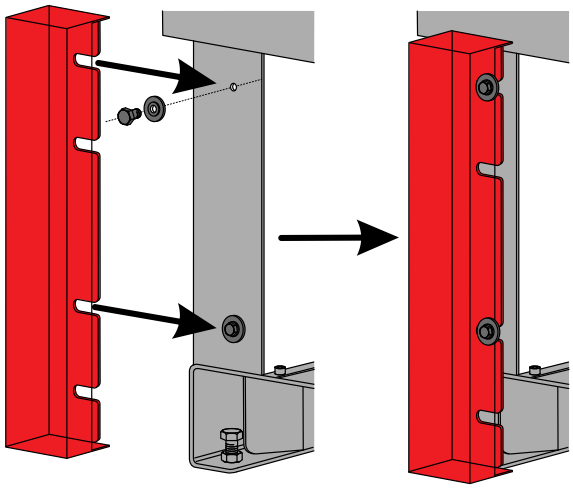
	N O T E
☞	Recommendation: Also dismount the cover door to mount the trim panel

7 Mounting the trim panel



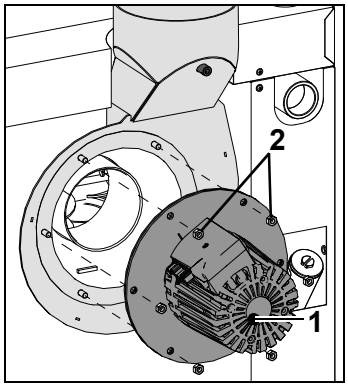
Trim panels for 60 litre ash box

❒ Position the trim panels **(1** and **2)** flush with the cover door
- Left boiler: Narrow trim panel **(1)** left, wide trim panel **(2)** right
- Right boiler: Wide trim panel **(2)** left, narrow trim panel **(1)** right



❒ Put the trim panels on from the side
❒ Use M6x16 screws and plastic washers to fix them in place

8 Fitting the Induced Draft Fan Motor



❒ Fasten the induced draft fan motor **(1)** to the induced draft fan housing
❒ Fasten the motor with M8 copper nuts **(2)**

☞ Do not damage the seals on the motor and housing

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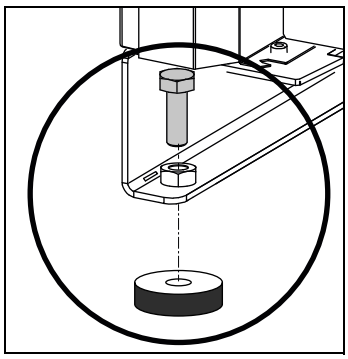
9 Insulating the recirculation hose

	N O T E
☞	**If the exhaust fan can rotate, the recirculation hose must be insulated.** The insulation will prevent or reduce condensation in the hose

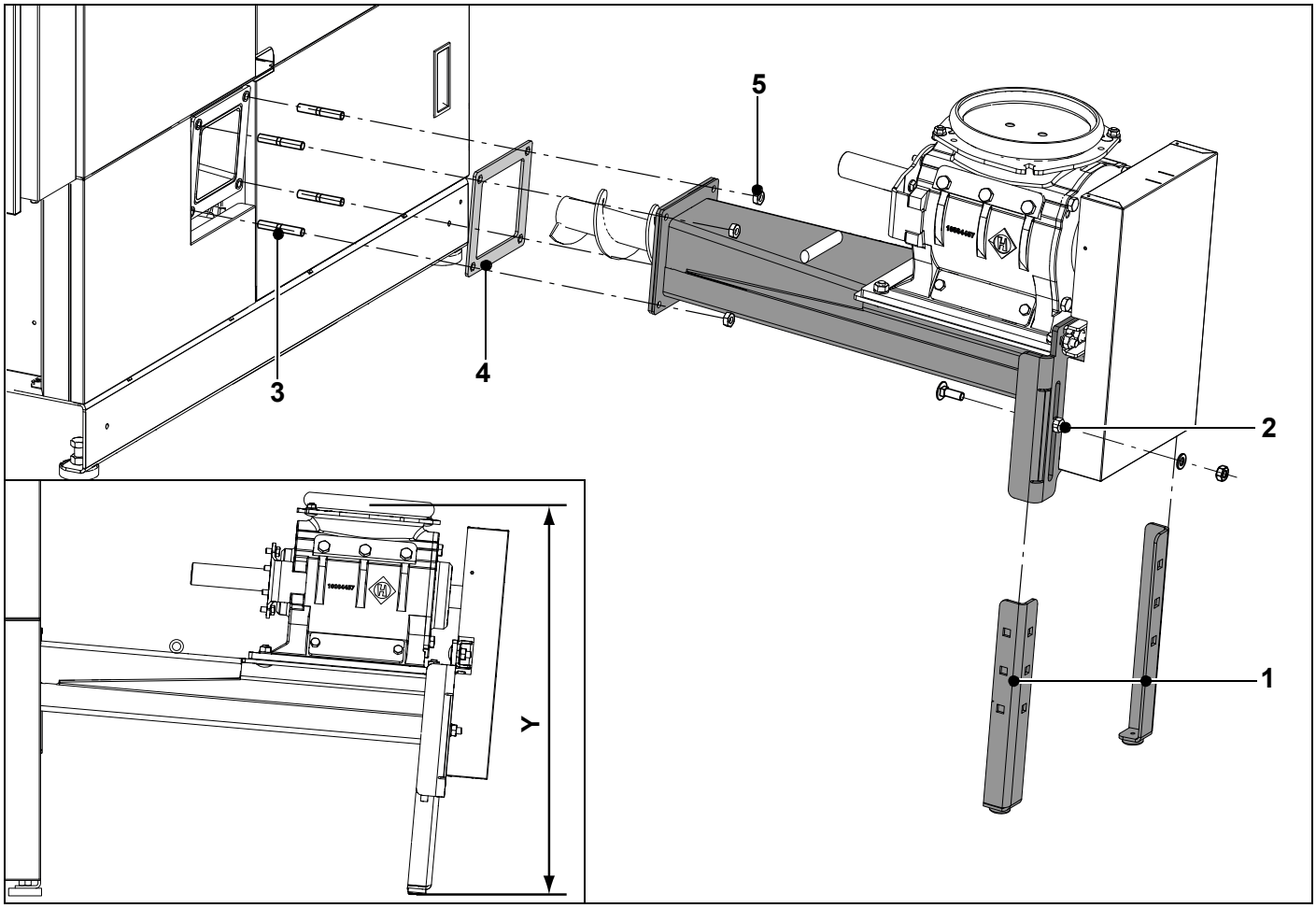
10 Attaching the Levelling Feet



Once the boiler is in its final position, it has to be levelled with the levelling feet.

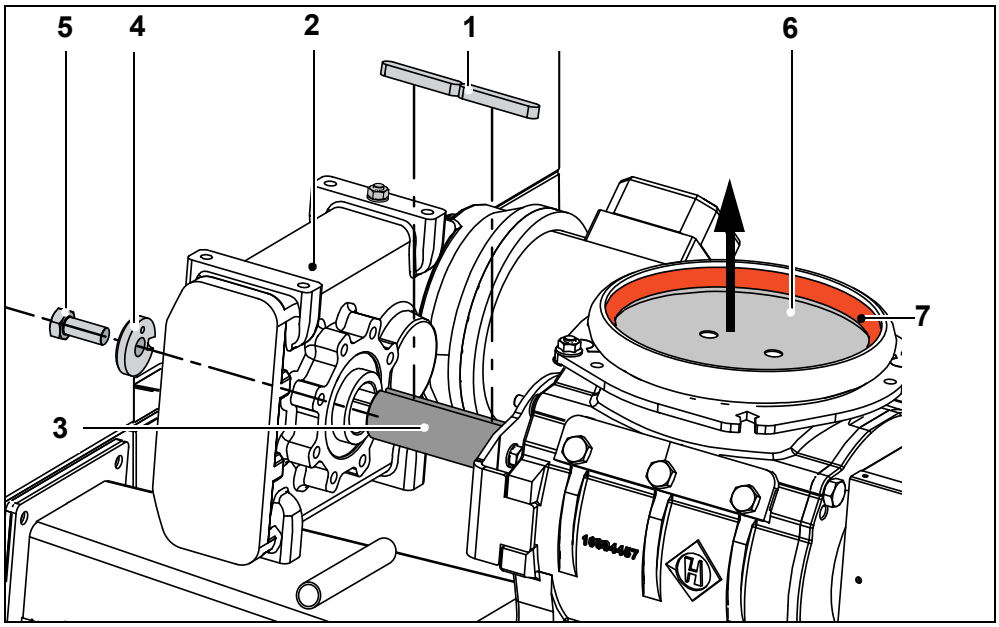
- ❒ Screw the M12x30 screws from top into the boiler body
- ❒ Place levelling feet under screws
- ❒ Lower the boiler onto the levelling feet
- ❒ Align the boiler horizontally using the screws

11 Fitting the Stoker Unit

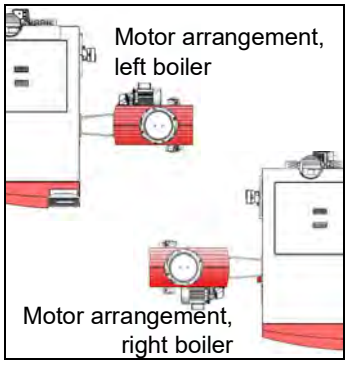


- ❒ Push in the two levelling feet **(1)** and fix them using a M10x30 mushroom head bolt and M10 collar nut **(2)**
- ☞ Set the height to **Y** depending on the length of the stoker unit (according to customer plan / installation dimensions)
- ❒ Screw the **short** thread side (thread length 10 mm) of 4 M8x25 stud screws (total length 30 mm) **(3)** into the boiler flange
- ❒ Insert **(4)** seal
- ❒ Fasten the stoker unit to the boiler flange with M8 nuts **(5)**

11.1 Mounting the gear motor of the stoker unit

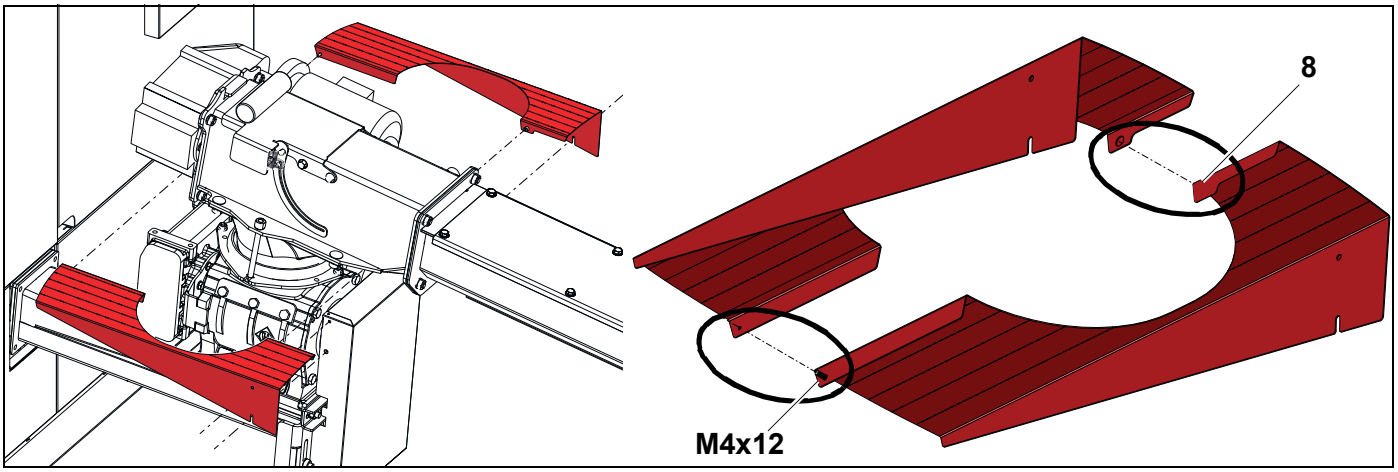


Power
0.25 kW



- ❒ Place 2 10x8x60 feather keys **(1)** on the rotor shaft of the rotary valve
- ❒ Plug the gear motor **(2)** onto the rotor shaft **(3)**
- ☞ Do not mount the motor onto the wrong side of the rotary valve
- ❒ Fix the gear motor onto the shaft using a large washer **(4)** and an M12x30 hex screw **(5)**
- ❒ Remove the ring seal **(7)** from the ball socket
- ❒ Remove the transport protection **(6)** from the rotary valve
- ❒ Reinstate ring-seal again

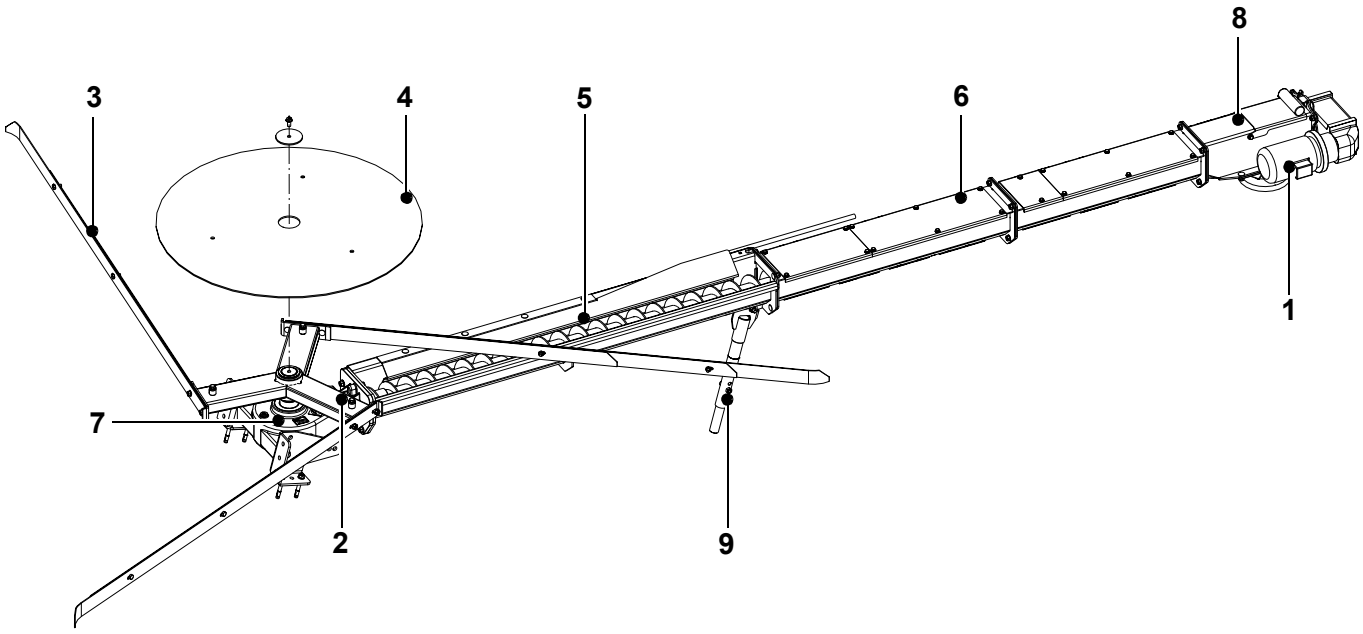
11.2 Mounting the rotary valve cover



- ❒ Loosen 2 fastening screws from the motor's protection plate
- ❒ Position the covers using the guide pin **(8)**
- ❒ Screw the covers together with the self-tapping screw **(M4x12)**
- ❒ Mount the cover to the protection plate using 2 fastening screws
- ❒ Tighten the 2 fastening screws on the protection plate again

12 Assembling and adjusting the agitator

12.1 Overview of fuel extraction system (ECO-RA 140)

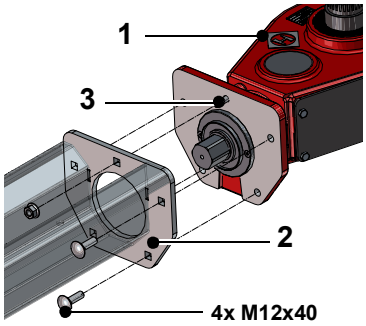


Pos.	Description	Function
1	Fuel extraction motor	Drives the spring blades and the extraction auger
2	Turnstile	Attaches the springs
3	Spring blades	Moves the fuel into the inlet trough
4	Cover plate	Hides spring blades underneath
5	Inlet trough auger extensions	Carries the fuel
6	Auger extensions (delivery channel with auger)	Carries the fuel
7	Fuel extraction gearbox with stabilizers	Drivers spring blades
8	Fuel extraction head with auger	Carries the fuel into the stoker auger
9	Support leg	Stabilizes the gearbox

12.2 Assembling the auger channel

☞ Before assembling the troughs, remove the lids and trough augers

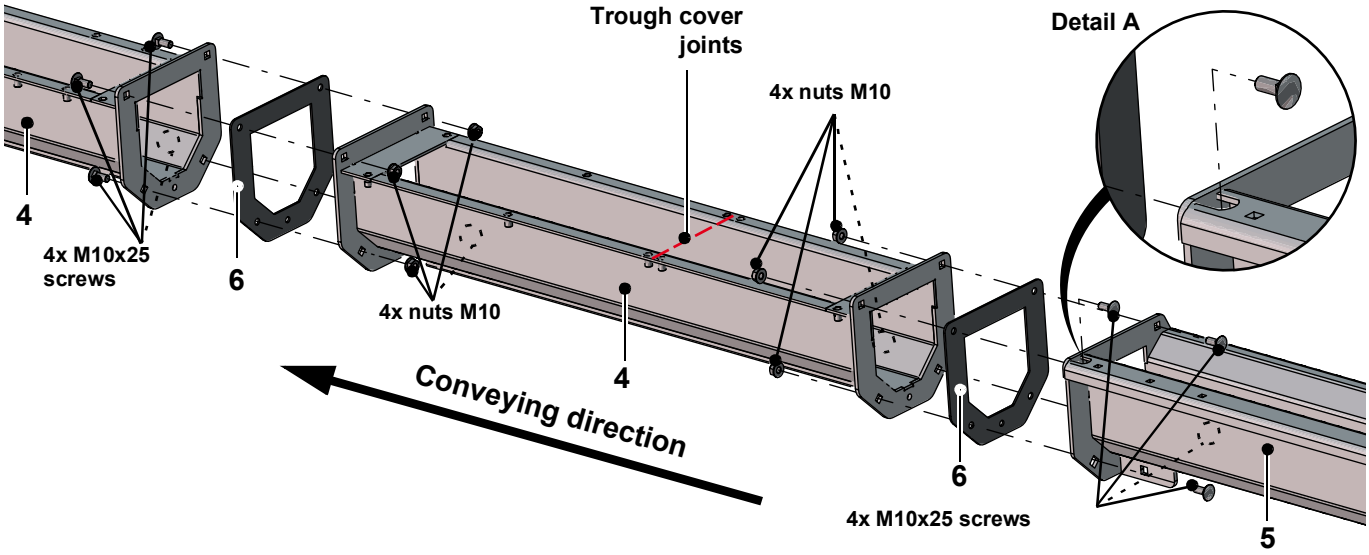
12.2.1 Assembling the gearbox and trough



❒ Screw the gearbox **(1)** to the inlet trough **(2)**
  ❒ Place inlet trough with M12 nut on the threaded bolt **(3)**
  ❒ 4 M12 mushroom head bolts and 4 M12 nuts

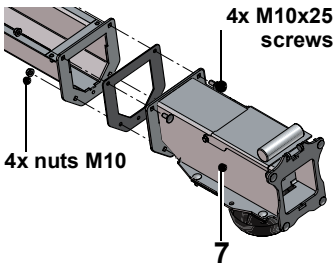
12.2.2 Assembling the troughs

❒ Place the troughs on the floor in the correct order (see customer plan)



❒ Position the extension trough **(4)** correctly on the inlet trough **(5)**
  ☞ The trough cover joints should not be placed in the wall opening
❒ Place the seal **(6)** between the troughs
❒ Screw the troughs
  ☞ 4 M10x25 mushroom head bolts
    4 M10 flange nuts
  ☞ Screw direction, see **Detail A**

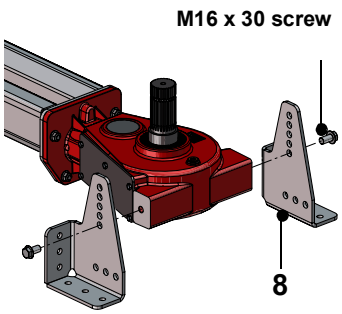
12.2.3 Mounting the fuel extraction head



❒ Mount the head **(7)** onto the last trough
  ☞ 4 M10x25 mushroom head bolts
    4 M10 flange nuts

☞ Use a second worker to facilitate assembly

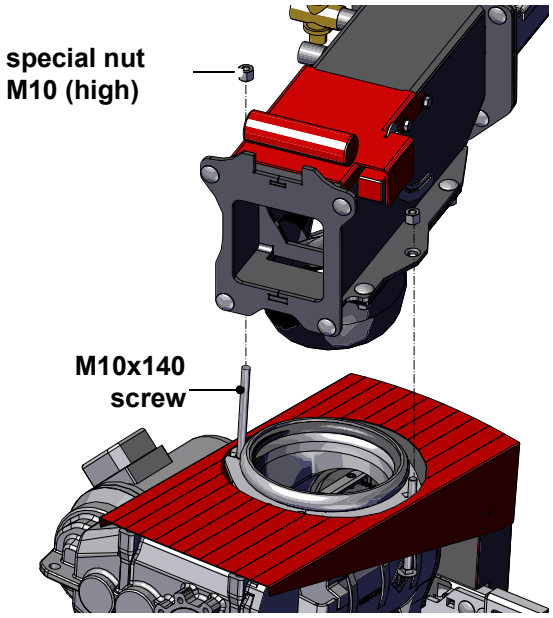
12.2.4 Mounting the floor stabilizers



❒ Mount floor stabilizers **(8)** on the fuel extraction gearbox

☞ Position the floor stabilisers on the lower hole using an M16x30 screw and then tighten them slightly

12.2.5 Positioning the agitator on the stoker unit



☞ Second worker needed

❒ Mount head part onto ball socket

☞ A downpipe or a connection auger can be mounted in between

❒ Place M10x130 mushroom head bolts into the clamp from below

❒ Place ball head into the ball pan of the stoker unit and fix slightly

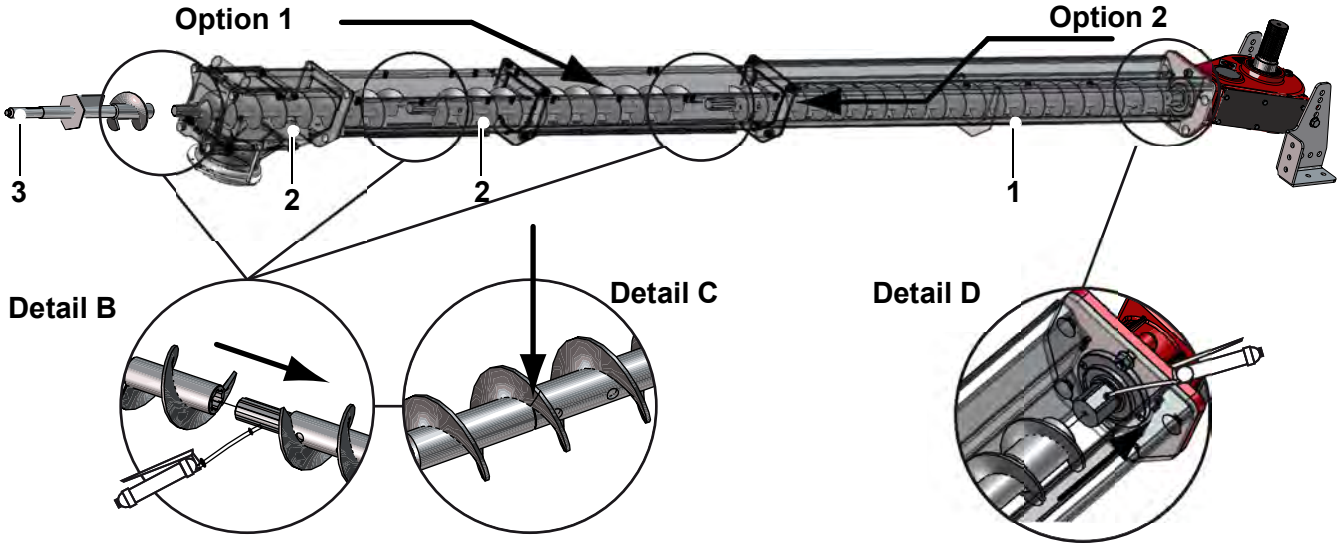
☞ Using M10x130 screws and M10 special nut (high; rounded side downwards)

☞ The fuel extraction can also be positioned on the stoker unit after the agitators have been installed (not recommended!)

⇨ See "Installing the augers into the auger channel" on page 21.

↳ Positioning the fuel extraction is made more difficult by the additional weight of the agitators

12.2.6 Installing the augers into the auger channel



Hint:
Align the winding end of the augers upwards when inserting them so that their level position can be checked more easily after pushing them together.

Option 1

❒ Insert the augers into the auger channel from above

☞ Sequence for the insertion:

- Inlet trough auger **(1)**
- Extension trough auger (depending on version) **(2)**
- Head end auger **(3)**

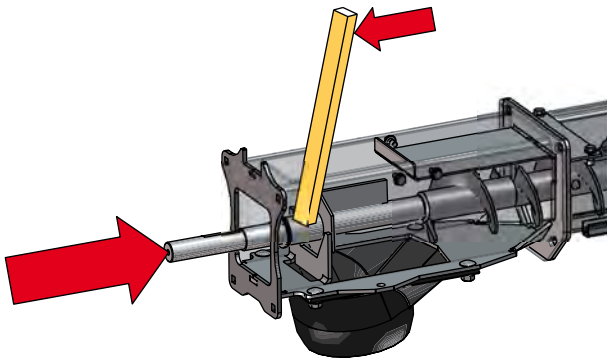
Option 2

❒ Thread the augers from the back into the auger channel

☞ Sequence for the insertion:

- Extension trough auger (depending on version) **(2)**
- Inlet trough auger **(1)**
- Insert the head end auger **(3)** from the front

	N O T E
☜	Prior assembly of the different auger parts, **all** auger connections have to be lubricated with grease. ⇨ See Detail B and Detail D Turns of the auger must be flush. ⇨ See Detail C



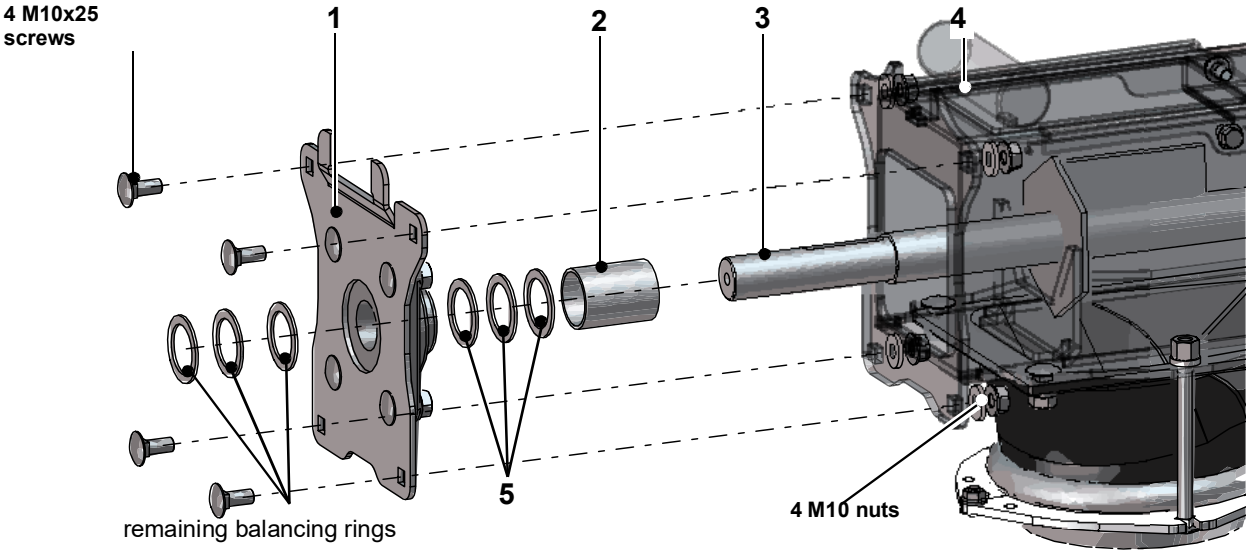
Push the auger parts completely together by pressing the end auger of the head

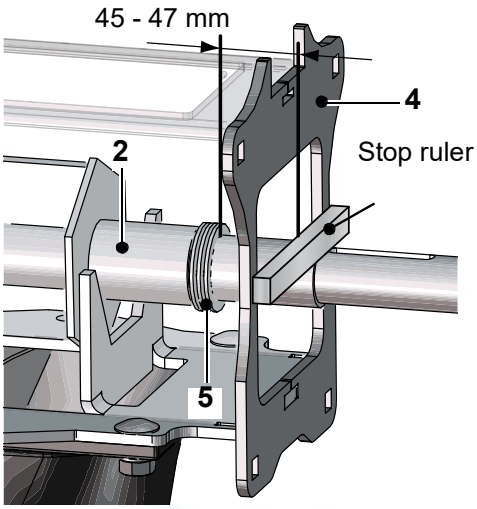
Hint:
Press the auger parts backwards with a wooden lath

❒ Check the connection points of the auger parts

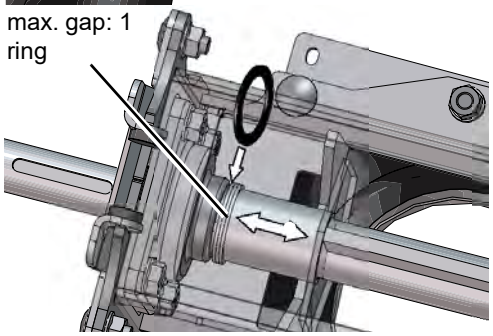
⇨ See Detail C and Detail D

12.2.7 Mounting the bearing plate



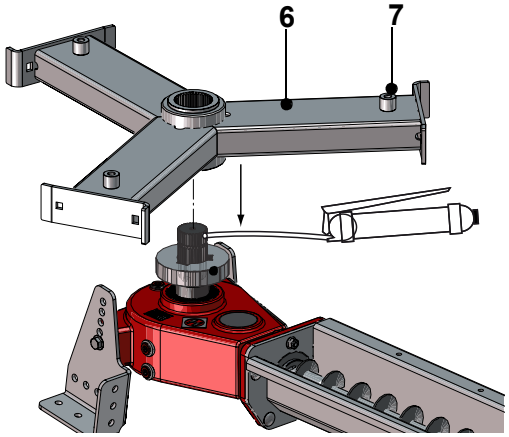


- ❒ Move the test sleeve **(2)** and balance rings **(5)** onto the shaft **(3)**
  - ☞ Take 3 pcs. balance rings
- ❒ Check the distance to the balance rings (45 - 47 mm)
  - ☞ Adjust distance with the number of balance rings
- ❒ Mount the bearing plate **(1)** onto the head **(4)** using 4 M10x25 mushroom head bolts and 4 M10 nuts



- ❒ Check the free movement of the test sleeve **(2)**
  - ☞ The test sleeve must be easy to move (max. of 1 balance ring with 2 mm of clearance)
- ❒ Push the remaining balancing rings onto the outside of the shaft so that they are not lost

12.2.8 Mounting the turnstile



- ❒ Push the three-arm turnstile **(6)** onto the output shaft of the gear-box with the threaded sleeves **(7)** pointing upwards
- ❒ Attach the four-arm turnstile with the sliding jaws pointing upwards

- ☞ Lubricate the output shaft before putting the gearbox on

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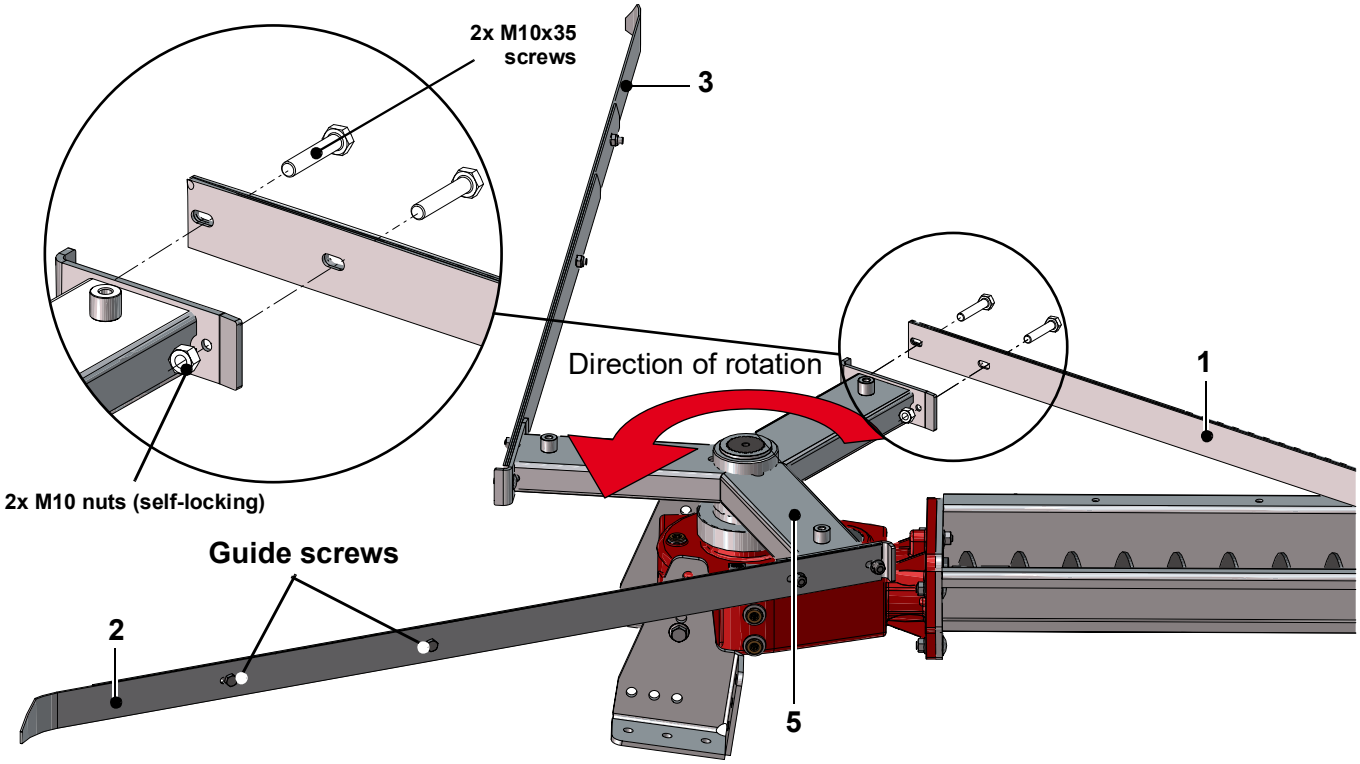
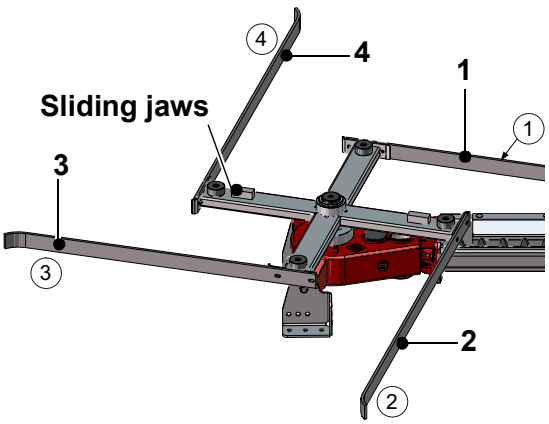
12.3 Mounting the spring blades

	N O T E
☞	**Position the spring blades correctly** **Do not tighten the guide screws** **Place the spring blades at the correct position** • The diameter of the fuel extraction defines the lengths, the position and the heights of the individual spring blades during assembly ☞ Thanks to the varying lengths of the spring blades (FE 350 - 500), fuel is discharged from the fuel storage room as efficiently as possible **Do not tighten main screws of the spring blades** ☞ The individual spring blade parts are easy to move in themselves



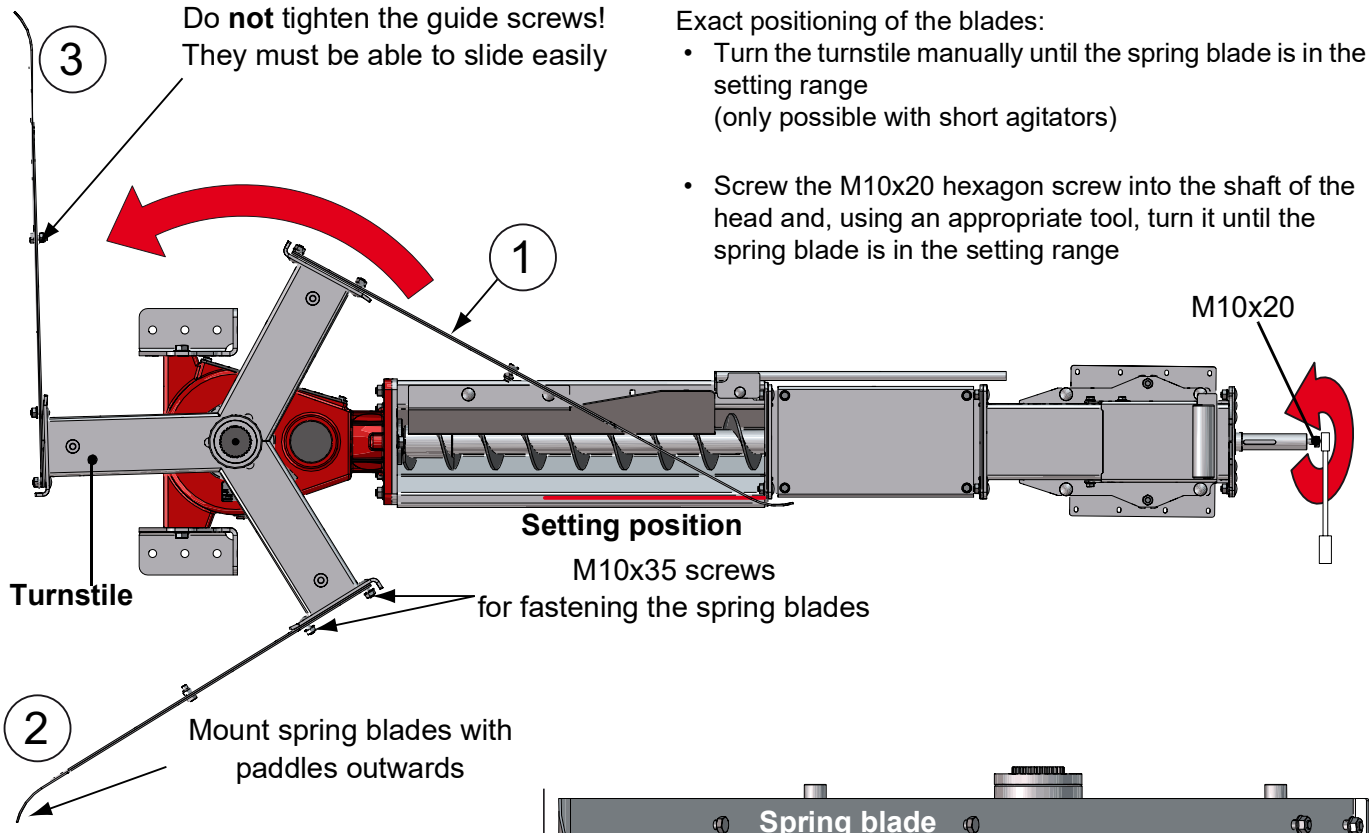


❒ Screw the spring blades **(1-4)** onto the turnstile **(5)**
☞ FE 150 - 400 **3 spring blades (1 - 3)**
☞ FE 450 - 500 **4 spring blades (1 - 4)**
☞ Put in 2 M10x35 hex screws and 2 M10 self-locking hex nuts
☞ Make sure the lengths and positions of the spring blades on the turnstile are correct
⇨ See "Setting the spring blades" on page 24.
☞ Mount spring blades with paddles outwards
↳ Spring blade paddles show in direction of rotation

Setting the spring blades

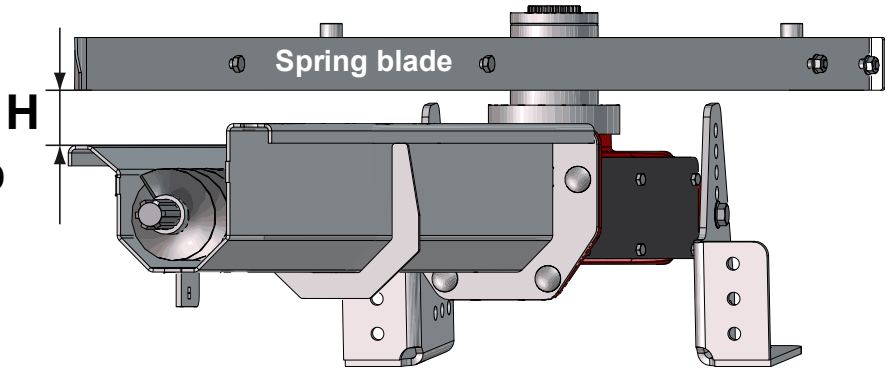
Exact positioning of the blades:

- Turn the turnstile manually until the spring blade is in the setting range
  (only possible with short agitators)
- Screw the M10x20 hexagon screw into the shaft of the head and, using an appropriate tool, turn it until the spring blade is in the setting range



ATTENTION:
Observe the "H" gap

- Mount short blades low
- and long blades high



FE 150 - 200			
Ø	**Spring blade**	**Length**	**Gap H**
150	1 - 2 - 3	770 mm	65 mm
200	1 - 2 - 3	1040 mm	65 mm

Cover disc: Ø 840 mm

Turnstile: Ø 610 [mm] - 3-arm

FE 250 - 400			
Ø	**Spring blade**	**Length**	**Gap H**
250	1 - 2 - 3	1280 mm	65 mm
300	1 - 2 - 3	1550 mm	65 mm
350	1	1550 mm	40 mm
	2 - 3	1800 mm	65 mm
400	1	1800 mm	40 mm
	2 - 3	2050 mm	65 mm

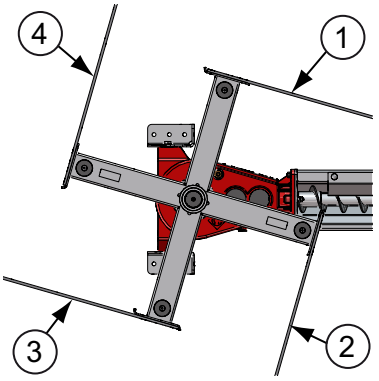
Cover disc: Ø 990 mm

Turnstile: Ø 710 mm - 3-arm

FE 450 - 500			
Ø	**Spring blade**	**Length**	**Gap H**
450	1 - 3	2050 mm	30 mm
	2 - 4	2280 mm	85 mm
500	1 - 3	2280 mm	30 mm
	2 - 4	2560 mm	85 mm

Cover disc: Ø 1300 mm

Turnstile: Ø 992 mm - 4-arm



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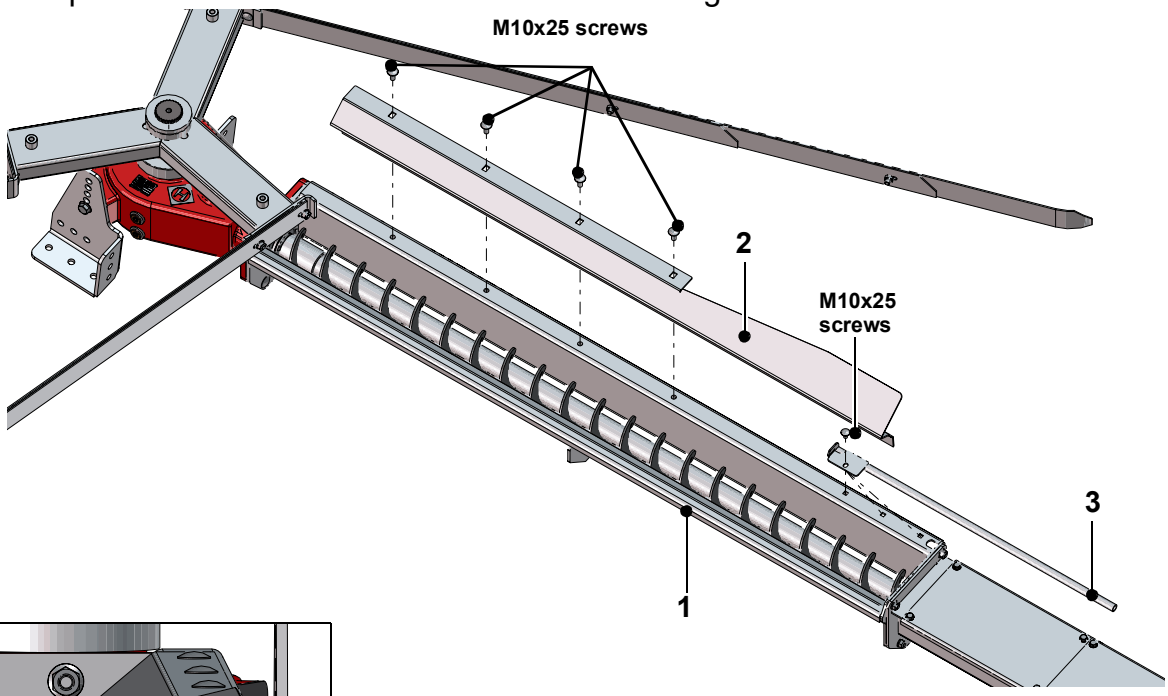
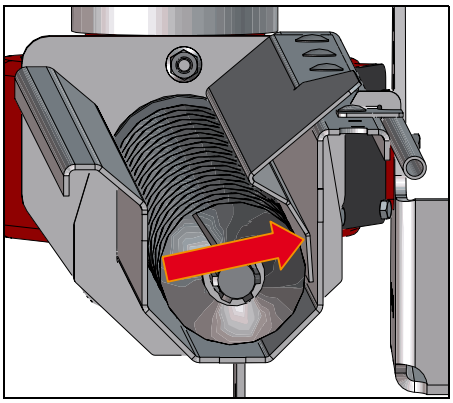
12.4 Mounting the add-on parts onto the troughs

12.4.1 Inlet plate and TMFR sensor tube on the inlet trough

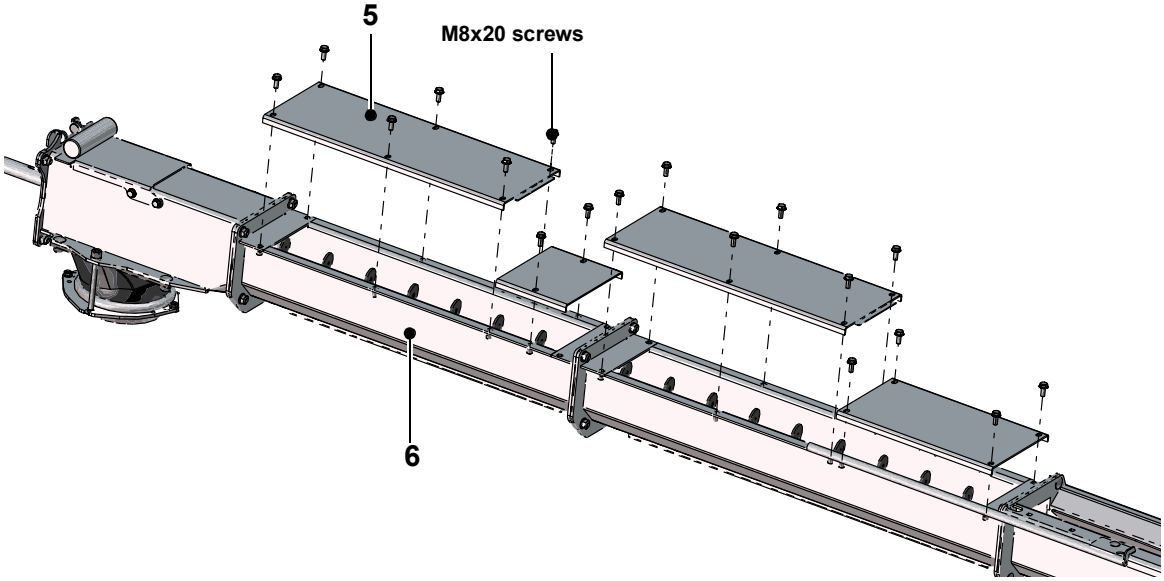




❒ Mount the TMF sensor tube **(3)** onto the inlet trough **(1)**
- ☞ M10x25 mushroom head bolts and M10 nut
- ☞ Select the mounting position based on the thickness of the wall

❒Mount the wood chip inlet plate **(2)** onto the inlet trough **(1)**
- ☞ M10x25 mushroom head bolts and M10 nuts
- ☞ Take care that the inlet plate touches the lateral wall of the inlet auger trough

12.4.2 Mounting the trough cover

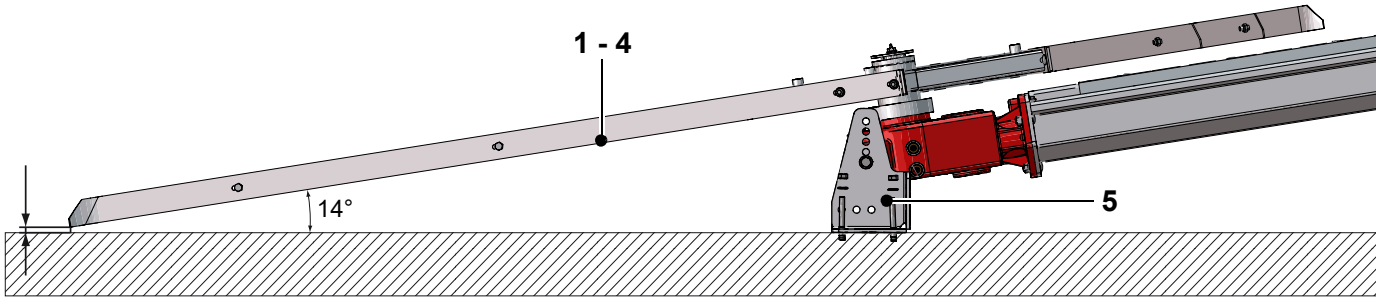


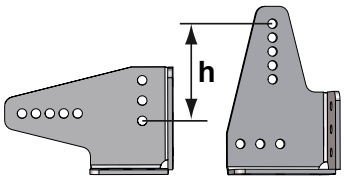
❒ Mount trough covers (5) onto the extension troughs **(6)**
- ☞ M8x20 screw (number depends on the cover)

☞ The joint of the trough covers should not be placed in the wall opening

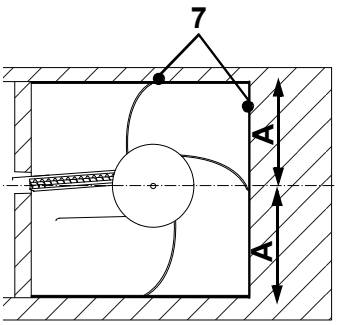
12.5 Fastening the fuel extraction gearbox to the floor

	N O T E
☞	Before fastening the agitator to the storage room floor, check the height adjustment and the position of the fuel extraction gearbox first.

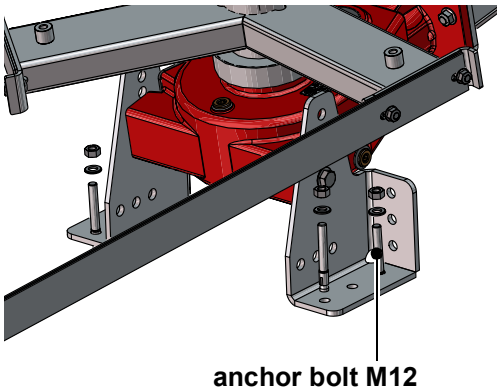




- ☞ Spring blades **(1-4)** may not touch the floor with their tips
  - ☞ If the spring blades touch the floor, the height **(h)** of the stabilizers **(5)** must be adjusted
- ☞ Do not exceed the maximum 14° inclination angle of the agitator
  - ☞ Adjust the height if necessary (stabilizers can be mounted horizontally or vertically)

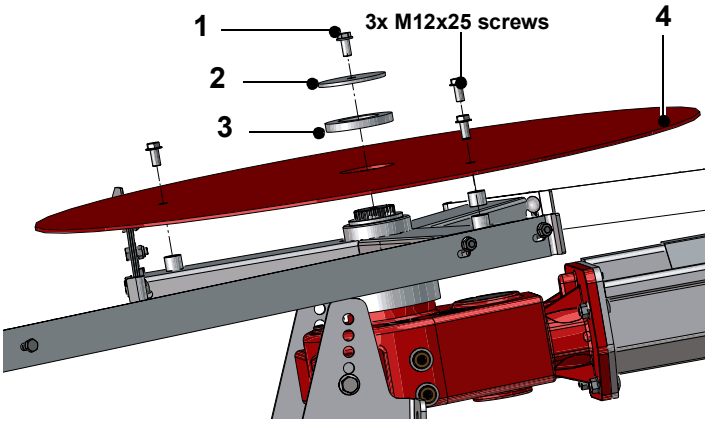


- ❒ Make sure that the spring blades do not touch the wall
- ☞ If any "brushing" on the wall cannot be prevented
  - ↳ Centre the fuel extraction system in the fuel storage room **(layout A-A)**, so that the bending of the spring blades on the wall takes place uniformly
  - ☞ No spring blade should touch the wall with a wall opening
  - ☞ To protect the wall, install a wooden board or a metal sheet **(Z)** between the spring blade and the masonry
- ❒ After positioning the agitator correctly in the fuel storage room, screw the stabilizers of the fuel extraction gearbox onto the floor



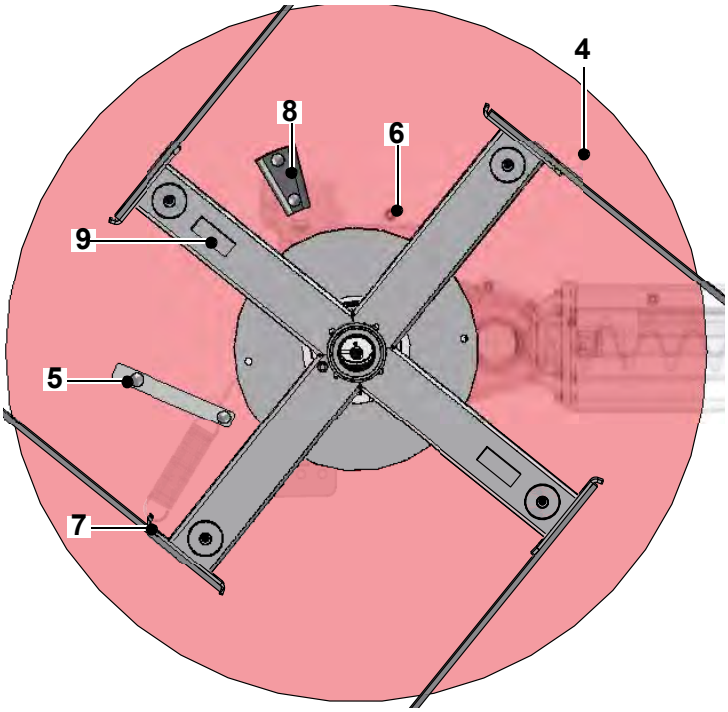
- ❒ Anchor the fuel extraction system on the floor in the fuel storage room with the floor stabilisers **(7)**
  - ☞ 2 M12 anchor bolts per stabiliser

12.6 Mounting the three-pod cover disc



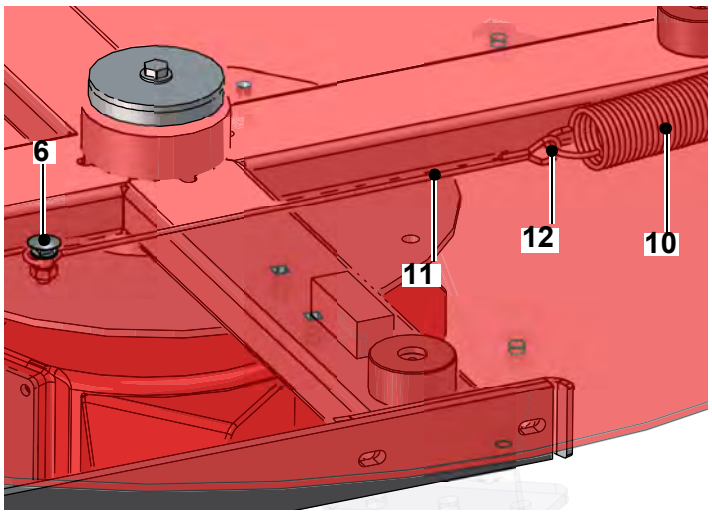
- ❒ Push the cover disc **(4)** onto the shaft of the fuel extraction gearbox
  - ☞ Align the cover disc to the turnstile and fasten it to the turnstile using M12x25 hex screws
- ❒ Push the balancing disc **(3)** onto the output shaft of the FE gearbox
- ❒ Clamp the cover disc onto the shaft using a **12.9** strength class screw **(1)** and a collar disc **(2)**

12.7 Mounting the 4-pod cover disc



- ❒ Push the cover disc **(4)** onto the shaft of the fuel extraction gearbox
  - ☞ Align the cover disc to the turnstile with the brake shoes **(5)** towards the top
  - ☞ Position the fastening point **(6)** of the spring return of the cover disc **opposite** the turnstile pod with the suspension position **(7)** of the spring
  - ☞ The cover disc's stop point **(8)** is behind the turnstile's stop point **(9)**
- ❒ Push the balancing disc **(3)** onto the output shaft of the FE gearbox
- ❒ Clamp the cover disc onto the shaft using a **12.9** strength class screw **(1)** and a collar disc **(2)**

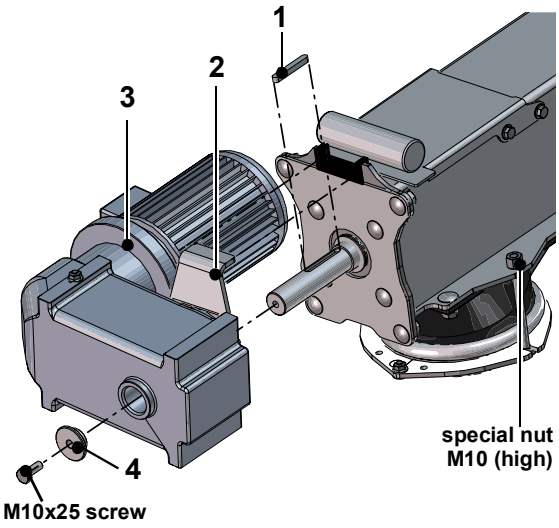
12.7.1 Mounting the spring return



- ❒ Hook the spring **(10)** into the turnstile pod **(7)**
- ❒ Mount the steel cable **(11)** on the cover disc onto the attachment point **(6)**
  - ☞ M10x30 mushroom head bolt, flange sleeve and M10 nut
  - ☞ Mount the bushing with the flange pointing towards the cover disc

- ❒ Attach the other end of the steel cable **(11)** to the spring **(12)**

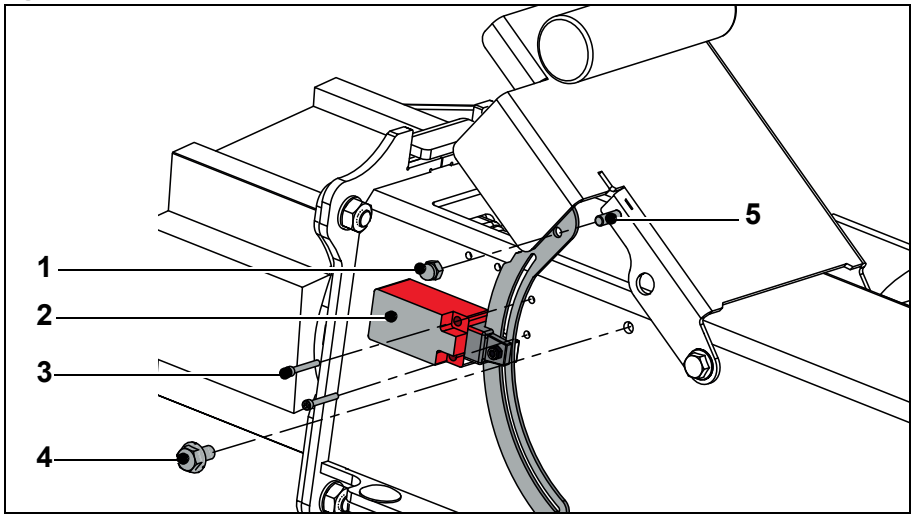
12.8 Installation of the FE Motor



- ❒ Insert the feather key **(1)** into the shaft end
- ❒ grease shaft end
- ❒ Push the fuel extraction motor **(3)** onto the shaft end
  - ☞ The torque support **(2)** must engage with the bearing plate gap
- ❒ Fasten the fuel extraction motor using the washer disc **(4)** and M10x25 hexagon screw
- ❒ tighten ball head with clamp manually by hand

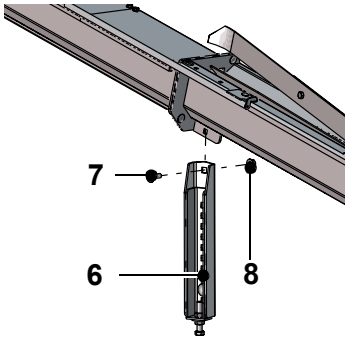
auger length	
Less than 5 m	**5 m or above**
0.37 kW / 10.7 rpm	

12.9 Mounting the limit switch on the FE head



- ❒ Undo M6 cap-nut **(1)** and M6 flange screw **(4)**
- ❒ Push the bracket with the anchor point onto the threaded bolt **(5)** and fasten using the M6 cap nut **(1)**
- ❒ Fix the switch to the head horizontally using 2 M5x25 Allen screws
- ❒ Completely close the fuel extraction cover and screw in the M6 screw **(4)** again

12.10 Mounting the stabilizer onto the trough (only for FE 400 - 500)



- ❒ Mount the stabilizer **(6)** onto the inlet trough
- ☞ M12x35 mushroom head bolt **(7)** and M12 nut **(8)**

Recommendation: Create an additional support foot on-site for fuel extraction systems with long augers or lots of extension troughs.

13 Ash box

13.1 Mounting the ash box flange

1. Open the cover door

2. Position flange correctly on boiler

3. Fasten the flange using 4 M6x16 hexagon socket screws (in the screw package)

13.2 Installing the ash box (60 litres)

13.2.1 Transport handle position

❒ To change the position of the transport handle, pull the unlocking rod upwards

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13.2.2 Adjusting the ash box wheels

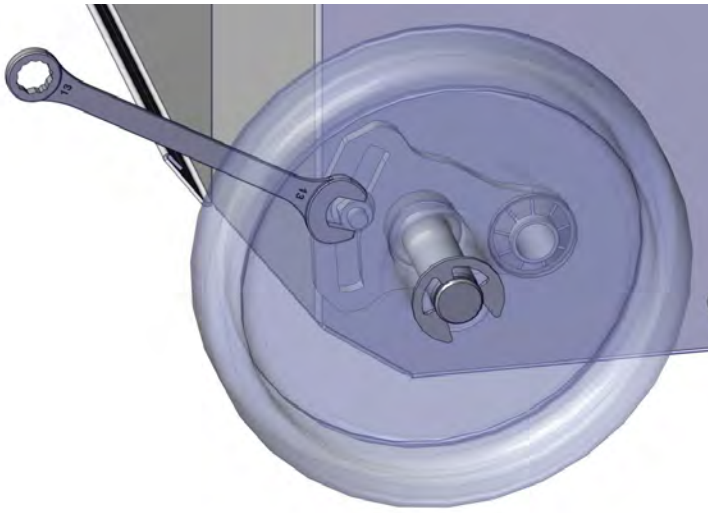
❒ Place ash box onto boiler correctly

☞ Both sides must snap into place

❒ Remove the cover of the ash box

❒ Align the ash box using a spirit level

❒ Loosen M8 nut



❒ Press wheel tight onto the floor and refix nuts

❒ Repeat on the other side

14 Facilities on site

14.1 Country-specific regulations

A T T E N T I O N

Observe country-specific safety regulations

The regulations and safety regulations on the operation of heating systems and the storage of fuels vary from country to country

- Check country-specific regulations prior to commissioning the heating system
  - ☞ Fire protection
  - ☞ Operation of heating systems
  - ☞ Storage of heating fuels
  - ☞ Construction requirements for boiler rooms and fuel storage rooms
  - ☞ Requirements from chimney sweep

14.2 Qualification of installation staff

W A R N I N G

Risk of death, injuries, damage from inappropriate installation

- Work on the electrics, hydraulics, components of the flue gas system, structural measures and fire protection must be carried out by authorised staff only
- The boiler operator is obliged to have the flue gas system and fire protection checked by licensed authorised bodies

In addition to the operation manual and the mandatory regulations for accident prevention in the country, where the system is installed also the technical rules for safety and proper installation has to be considered.

14.3 Construction of boiler room

- Boiler room must be executed according to legislation in your country
- Ensure fireproof, level and solid floor and ceiling construction
- Weatherproof and frost-proof (ambient temp. up to + 40°C)
- free of disturbing electrical installations and tubes

☞ A boiler room is required for heating systems starting from a nominal heating output of 50 kW

14.3.1 Austrian regulations

- Country-specific boiler room regulation
- Ö-Norm M7510 (Inspections of heating systems of solid fuels)
- TRVB 118 H (wood chip storage)
- TRVB 124 F (first and extended extinguishing help)
- TRVB 105 H (fireplaces for solid fuels)
- Ö-Norm H5170 (Heating systems - requirements for buildings and safety technology as well as fire- and environmental protection)
  - Walls and ceilings REI 90 (F90)
  - Doors $EI_2$30-C (F30)
    - ☞ Width: ≥ 0.8 m; height: ≥ 2 m
  - Protect fuel storage room against water

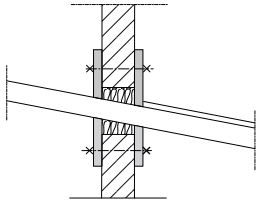
14.3.2 German regulations

- FeuVO (Fire regulation of provinces)

14.3.3 Swiss regulations

- VKF (Association of Cantonal Fire Insurances); important points from the VKF **Fire protection guidelines** 2017 version
- Doors and rooms with fire resistance EI (not flammable)
- Walls behind heating systems must be made of fire-resistant material and need to be at least 0.12 m thick
- Highly flammable materials like wood insulation wool, straw, paper or similar materials must not be stored in the boiler room

14.3.4 Fire resistance of the wall breakthrough



Ensure fire resistance of the wall breakthrough EI 90 (F90)

❒ Cover with steel sheets (thickness at least 1.5 [mm])

❒ Cover with fire-resistant plates (thickness at least 8 [mm])

☞ Use at least 10 screws for fixing the cover and position them around the circumference

❒ Ensure that there is a gap between the fuel extraction system's trough and the wall

☞ This also prevents sound transmission

❒ Filling: with rock wool EI 90 (F90)

14.4 Ventilation of the boiler room

An air supply and exhaust opening must be installed in the boiler room for the combustion process.

	N O T E
☞	**Please find the size of air ventilation openings in your local regulations** Hargassner Minimum requirements: Provide an air ventilation opening of 5 cm² per kW boiler nominal heating output, but at least a total square of 200 cm². It must be ensured that no impairment is caused by air currents or climatic influences. If there are gratings installed, the cross-section-area has at least to be the minimum of 200 [cm²].

14.5 Decreasing acoustic emissions

The following measures can be taken for decreasing acoustic emissions:

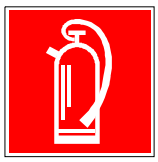
❒ Sound insulating doors for the boiler room and the fuel storage room

❒ Limit the air intakes to a minimum

❒ Footfall sound insulation in the floors of the rooms above

❒ Acoustic insulation on the chimney

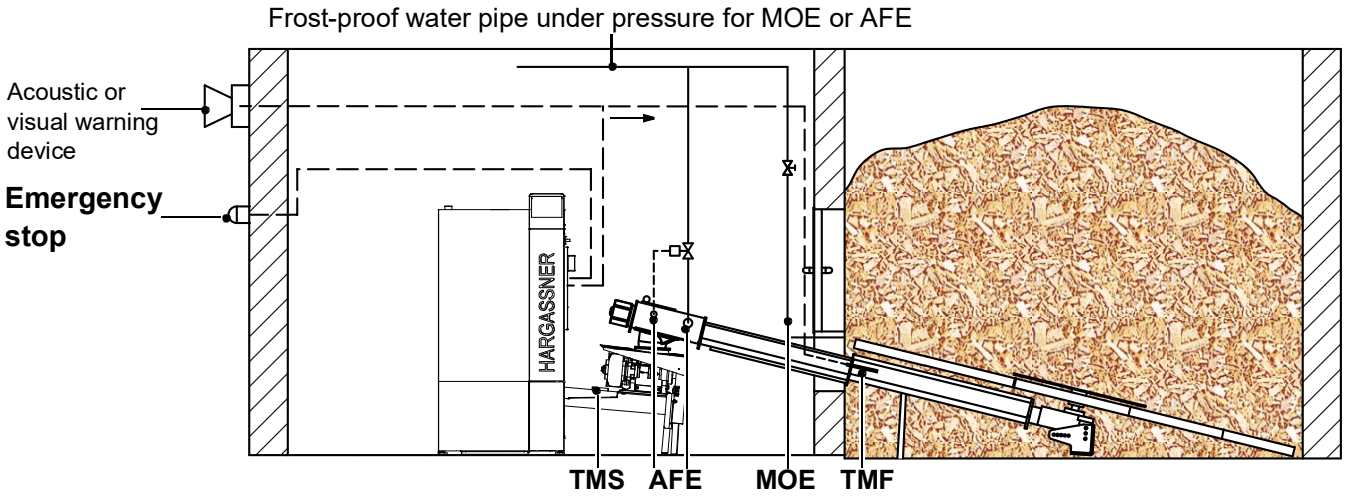
14.6 Fire extinguisher



Install verified fire extinguisher (every 2 years) easily accessible outside of the boiler room right next to the boiler room door:

Boiler room size	Amount of extinguishing powder	Certification
< 20 m²	6 kg	EN3
20 - 50 m²	12 kg	EN3

14.7 Safety equipment on site



Designation	Description
Main heating switch (emergency stop)	Main heating switch for switching off the boiler at all poles For outside installation please check federal regulations. Used to switch off the biomass boiler only in the event of a fire.
TMF	TÜB (Temperature monitor in fuel storage room) An acoustic or visual signal will be emitted if 70 °C is exceeded in the fuel storage room.
MOE	Manual extinguishing device with water in the fuel storage room. MOE = pressurised water pipe (min. 3/4") with a stop valve in the boiler room. The pipe ends about 15 [cm] above the extraction auger
AFE	Automatic fire-extinguishing device Regulation applicable in Switzerland only. SLE = At a temperature of 50 [°C], measured at the extraction auger head, the valve of the extinguishing device opens and floods the extraction auger.
TMS	Temperature monitoring at stoker unit TMS = At a temperature of 60 °C, measured on top of the stoker auger, an error message appears on the control panel.
Fire extinguisher	Install the fire extinguisher easily accessible and in accordance with local laws

	N O T E
☞	**Installation of MOE and TMFR** Install **MOE and TMFR prior filling** the storage room. ☞ Ensure accessibility to the fuel storage room ☞ To commission the boiler, only fill the fuel storage room to the extent that fuel can be transported in the auger

14.7.1 Austrian regulations

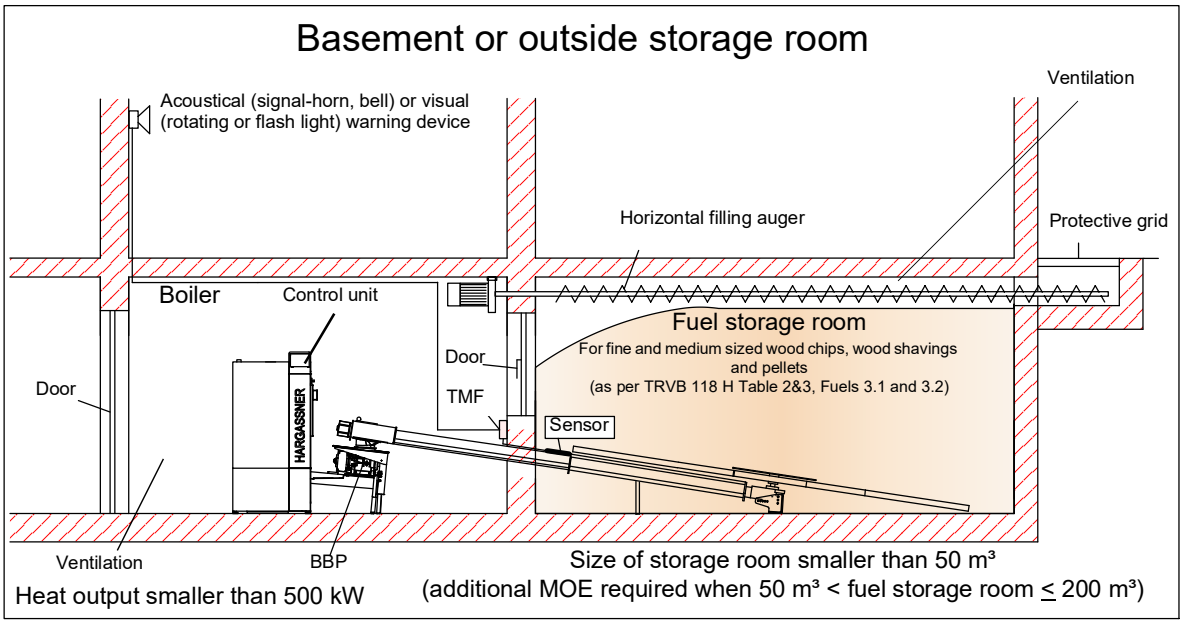
TRVB 118 H

The certified burn-back protection **(BBP)** is integrated in the boiler by a rotary valve.

The temperature monitoring of the fuel storage room **(TMF)** is mandatory and therefore required in each case.

Depending on the construction of the fuel storage room, several combinations are possible when using the manually operated extinguishing device **(MOE)**.

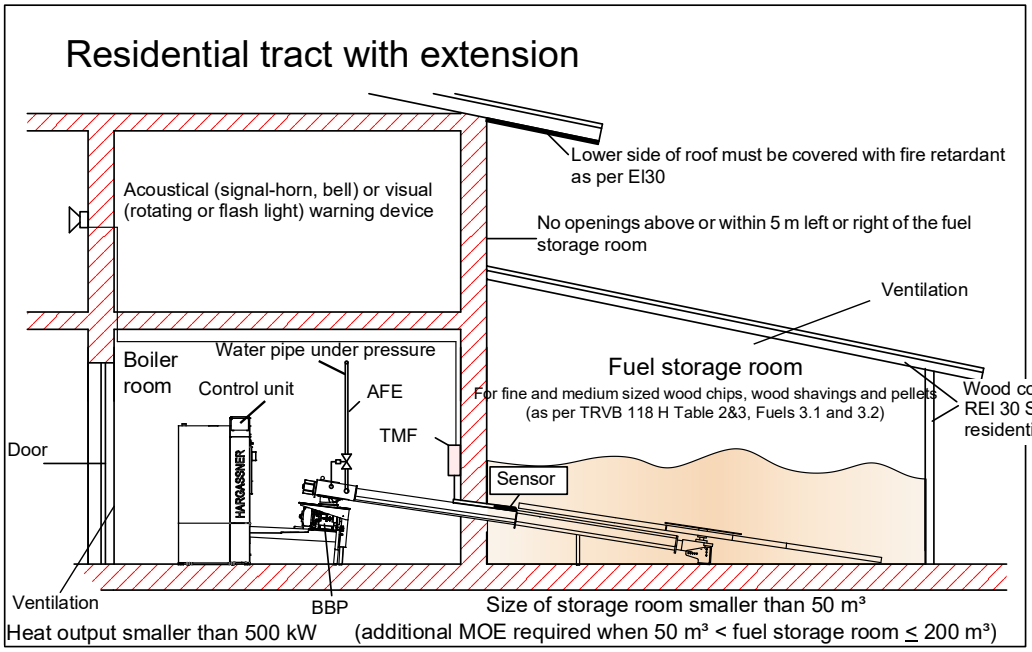
Closed fuel storage room



- ☞ REI 90 (F90) for outside walls, floor and ceiling
- ☞ REI 90 (F90) for intermediate walls between boiler room and fuel storage room
- ☞ EI 30 (T30) for the boiler room door and the fuel storage room door
- ☞ When the exhaust air from the boiler room is routed outside, a fire damper with EI 30-S must be installed. It must close automatically in the event of a fire and when the fan is switched off.
- ☞ The fuel storage room must be integrated if the building is equipped with a fire alarm system

Size of the enclosed storage area	Additional safety requirements
≤ 50 m³	**no additional requirements**
> 50 m³	**MOE**
> 200 m³	**MOE (+ AFE for Switzerland)**

Extension of the fuel storage room to a residential building

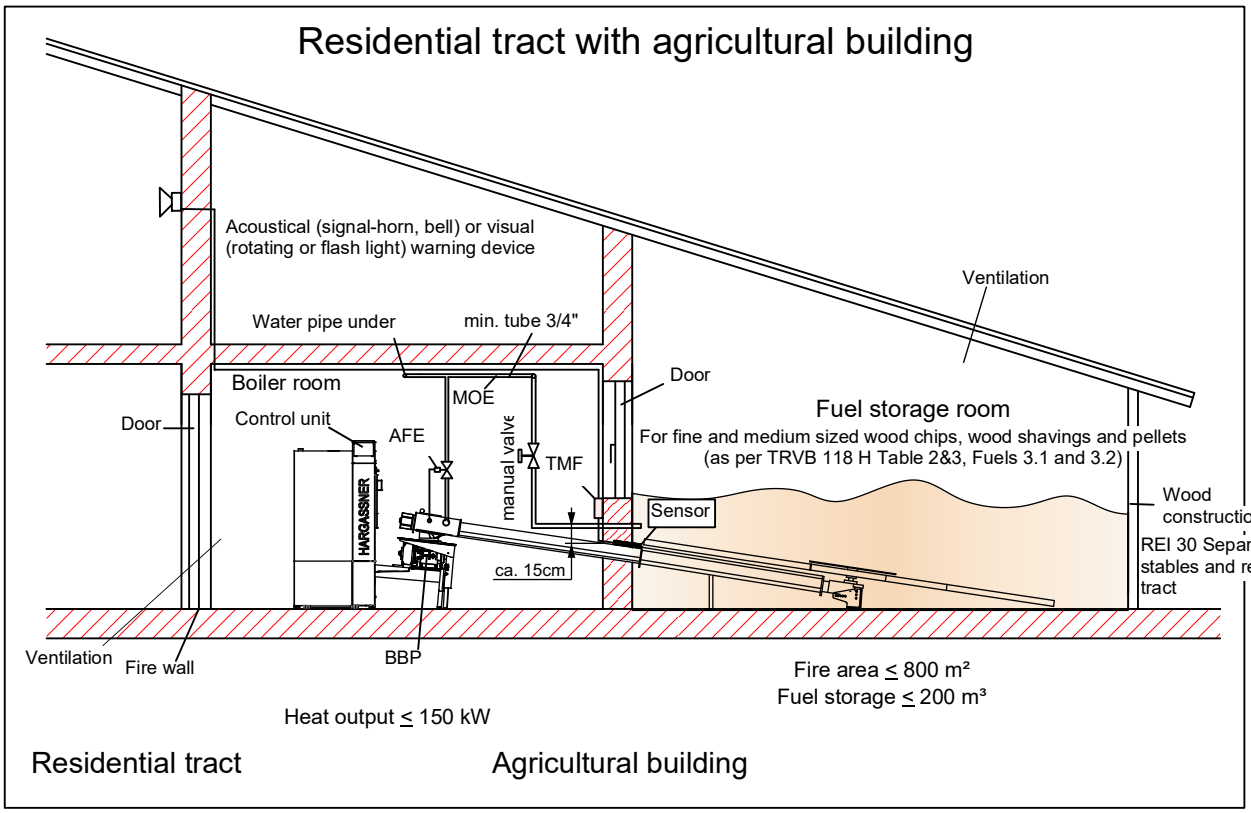


Size of the enclosed storage area	Additional safety requirements
≤ 50 m³	**(AFE for Switzerland)**
> 50 m³ - 200 m³	**MOE (+ AFE for Switzerland)**

Agricultural building

If the fuel storage room is a **agricultural used building** (of a farm)

- MOE (independent of the fuel storage room size)
- + AFE (in Switzerland)



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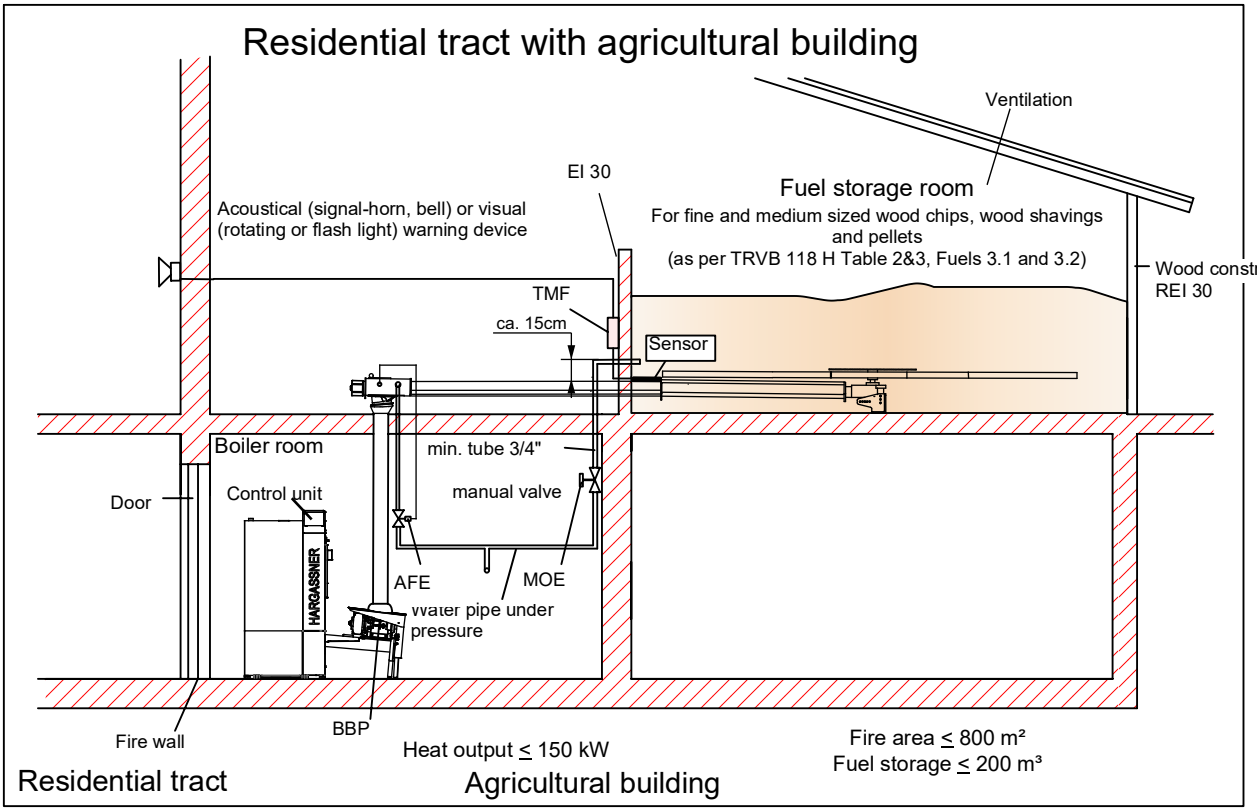

Residential tract with agricultural building
Ventilation
EI 30
Fuel storage room
For fine and medium sized wood chips, wood shavings and pellets
(as per TRVB 118 H Table 2&3, Fuels 3.1 and 3.2)
Acoustical (signal-horn, bell) or visual (rotating or flash light) warning device
Wood construction REI 30
TMF
ca. 15cm
Sensor
Boiler room
min. tube 3/4"
Door
Control unit
manual valve
AFE
MOE
water pipe under pressure
HARGASSNER
Fire wall
BBP
Heat output ≤ 150 kW
Fire area ≤ 800 m²
Fuel storage ≤ 200 m³
Residential tract
Agricultural building

14.8 Adhesive label for the fuel storage

- ❒ Explain the contents of the sticker to the operator in detail
- ❒ Apply the sticker in the access area to the fuel storage room (storage room door, etc.) so that it is clearly visible and is read again before (re)filling the fuel storage room
- ❒ Apply the sticker to a flat, well adhering surface

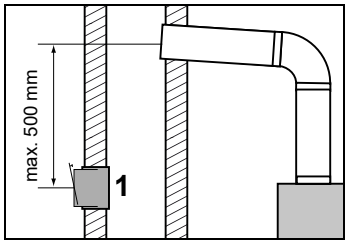
14.9 Chimney connection, flue pipe

	Unit	Eco-HK 70	Eco-HK 90	Eco-HK 100	Eco-HK 110	Eco-HK 120
Power	**KW**	70	90	99	110	120
Flue gas temperature	**°C**	140	150	140	150	160
CO_2	**%**	14				
Flue gas mass flow rate	**kg/sec**	0.0402	0.0519	0.0571	0.0636	0.0696
Req. delivery pressure	**Pa**	2				
Flue draught max.	**Pa**	10				
Flue pipe diameter	**mm**	180				

The flue gas system must be designed in accordance with local regulations or ÖNORM EN 13384-1.

- ❒ The flue pipe is rising towards the chimney and should be as short as possible
- ❒ Install appropriate openings for cleaning
- ❒ Installing a chimney draught stabiliser is mandatory
- ❒ Insulate the flue pipe
  - ☞ Protection of a hot surface (Risk of burn)
  - ☞ Protection of flammable parts and materials (e.g. electrical wiring)
  - ☞ To reduce condensation
  - ☞ Insulation (Rockwool foil-laminated) 30mm, optionally > 50 mm
  - ☞ Tape joints
- ❒ No flammable materials within 20 cm of an insulated flue pipe

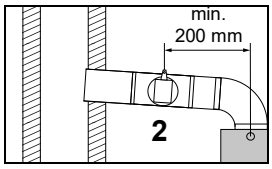
14.9.1 Chimney draught stabiliser



- ❒ The chimney draught stabiliser has to be installed in the chimney on-site
- ❒ Set the chimney draught stabiliser to 10 Pa using the gas meter
- ❒ Install the flue pipe rising towards the chimney

A draught stabiliser with an explosion flap **(1)** must be installed in the chimney beneath the junction of the flue connection.

- ☞ Maximum distance to the flue pipe junction in the chimney 500 mm
- ☞ A chimney draught stabiliser installed in the chimney is beneficial in overpressure situations and when the chimney draught is poor



If an installation in the chimney is not possible, a chimney draught stabiliser with an explosion flap **(2)** must be installed in the pipe connecting to the chimney.

- ☞ Minimum distance to the flue gas sensor 200 mm

15 Hydraulic Installation

- ❒ Install the hydraulics according to enclosed hydraulic scheme
  - ☞ Design criteria according to EN 12828
  - ☞ Piping and seals must withstand a maximum temperature of 110°C
- ❒ Note description on boiler
- ❒ Use an accumulator with sufficient volume
  - ☞ For an accumulator with integrated domestic hot water coil, a DHW mixer is mandatory
- ❒ Connect all safety devices
  - MOE, AFE, thermal safety circuit
- ❒ Check opening direction of mixing valve
- ❒ Install the hydraulic control valves according to scheme
- ❒ Install sensors according to hydraulic scheme
  - ☞ See enclosed information "Sensor installation“
- ❒ The chemical and physical properties of heating water must comply with country-specific standards (EN 12828, ÖNORM H 5195-1, VDI 2035, SWKI BT 102-01 and/or SIA 384)
- ❒ The electrical conductivity of the heating water should be between 20 and 200 µS
- ❒ When filling the heating system with heating water, do not allow air to enter the heating system - vent the filling tube before connecting it
- ❒ Only use approved heating filling devices for filling with heating water

15.1 Back end protection

A T T E N T I O N

Corrosion due to condensation in the boiler

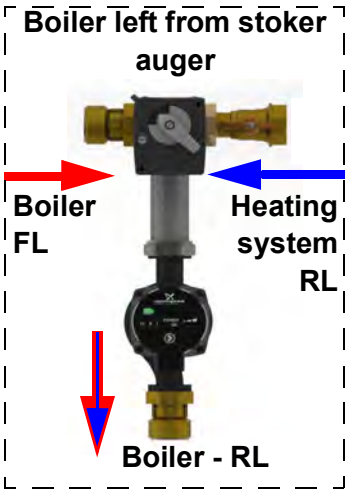
Damage to the plant due to aggressive condensate

- Back-end protection must be installed properly and according to hydraulic schematic

If the plant drops under the dewpoint, condensing water is produced. This, in combination with residual pieces of the combustion leads to the production of aggressive condensate in the boiler.

- ☞ As long as the temperature of the heating-water return to the boiler is below the minimum return temperature for the boiler, the boiler's flow heating water is added
  - ☞ Regulation to constant return temperature
  - ☞ An admixture is almost always used

15.1.1 Hargassner back end protection



The accompanying images show the back-end protection of a **left** and a **right** boiler.

Note the following:

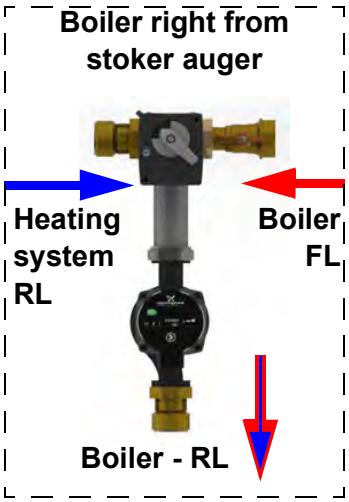
☞ Mount BEP laterally on boiler

☞ Pay attention to the mixer direction

The mixer is **Closed** when the boiler circuit is closed or the mixer is **Open** when the boiler circuit is open. During operation, the return temperature increases when the mixer **Closes** and decreases when the mixer **Opens**!

❒ Install a degassing device

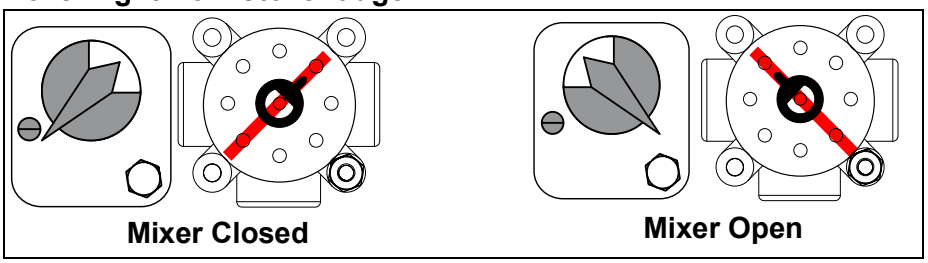
❒ De aerate the pump



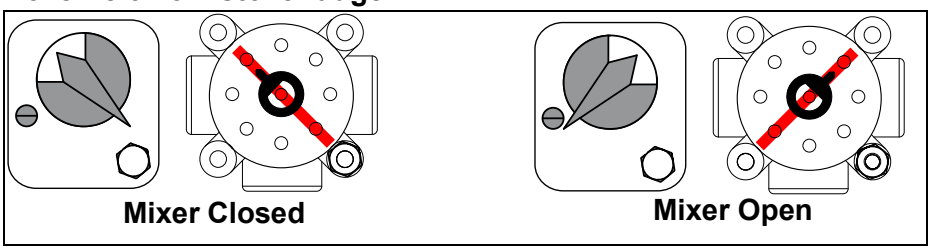
15.1.2 Position of the cock plug

Position of the cock plug

Boiler right from stoker auger



Boiler left from stoker auger



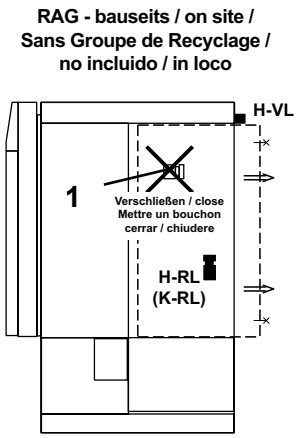
☞ The mixing valve is **Closed** when the boiler circuit is closed

↳ Maximum back-end protection, no energy for heating

☞ The mixing valve is **Open** when the boiler circuit is open

↳ Minimal back-end protection, maximum energy for heating. During the heating-up phase, the mixer moves to the **Closed** position in order to reach the return temperature as quickly as possible. Once the return temperature has been reached, the boiler adjusts to a constant return temperature by opening the mixer

15.1.3 Back-end protection on site



The adjacent image shows the on-site back-end protection connections of a **left-type** boiler.

↳ The image is mirrored for the right boiler

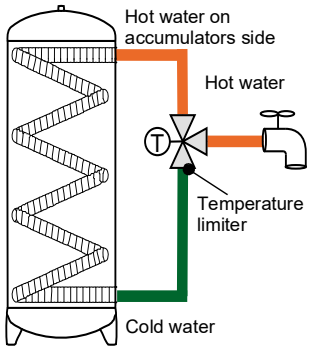
Note the following:

- ❒ Remove the lateral boiler cover
- ❒ Close not used pipes **(1)**
- ☞ Pay attention to the mixer direction

❒ Install a degassing device

❒ De aerate the pump

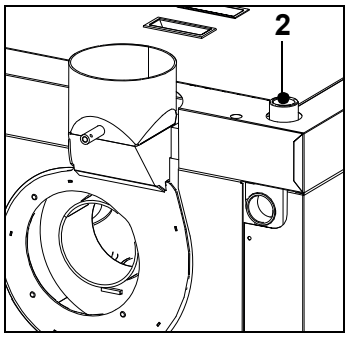
15.2 HWT-mixer



Hot water heating with accumulator and integrated HWT coil or integrated HWT

↳ To protect against scalding, it is imperative to install a temperature limiter

15.3 Safety group

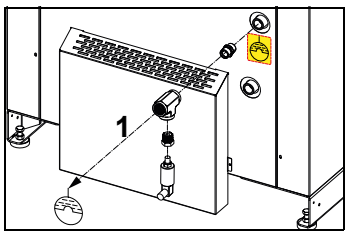


❒ Install safety group at the top on the boiler **(2)**

❒ Check tightness

	N O T E
☞	**Connect drain to over pressure valve** To ensure a proper drain after the overpressure valve triggered, a hose or tube must be installed between the over pressure valve and the drain. The drain with cone must be free to inspect, to easily see any leakage of the valve.

16 Safety components



- System pressure limiter (system pressure sensor) **(1)** optional

17 Electrical installations

For electrical installation, a detailed electrical manual is included.

- Wiring diagram
- Electrical scheme of the sensor, motors, pumps, mixers, initiators
- Instructions for connecting the main switch next to the boiler room door
- Information for lengthening of cables

Work on electrical equipment may only be carried out through

- Authorized specialists
- According to the electrical standards (as per VDE or ÖVE)

W A R N I N G

Fire hazard

During the electrical installation process, pay attention to the position of the exhaust fan and the flue pipe!

- The insulation for the cables and cable shafts is flammable
- Distance of electrical wires to bare flue pipe at least 40 cm

Ensure minimum distance of electrical wires from parts outside of the boiler to the hot flue gas pipe and the exhaust fan. (Main power supply, sensors, pumps, mixer-control)

- Main power supply to the control
- Protection of the supply line with fuse according to electrical scheme
  ☞ Note instructions in wiring diagram
- Main heating switch (emergency stop) in front of the boiler room door
  ☞ Complete disconnection of electrical supply to the control
- Connection of necessary safety equipment
  ☞ TMS (temperature monitor stoker auger)
  ☞ TMF (Temperature monitoring at fuel storage room)
  ☞ Install warning light or horn so that it can be noticed easily
  ☞ All sensors for safe operation of the boiler (according to wiring diagram)
- Connections of heat circuits (pumps, mixers, sensors)
- Install outside temperature sensor
  ☞ Do not mount in direct sunlight

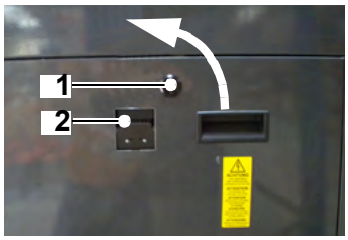
17.1 Fault lamp

To display errors, a fault lamp has to be installed.

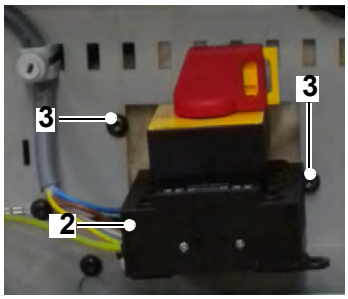
⇨ Wiring diagrams of the boards in the cabinet

- Acoustical (horn) or visual warning device (rotating light)

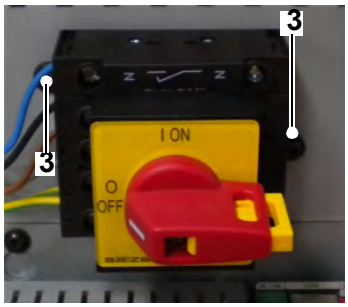
17.2 Installing the main power switch



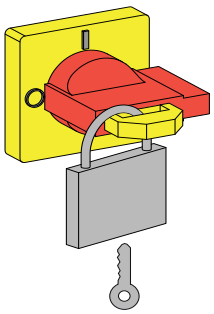
❒ Open turn-type lock **(1)** using the plastic key (on combustion chamber door handle)
❒ Open and remove covers from the control box



❒ Loosen two self-tapping screws **(3)** on the control board plate



❒ Remove the main power switch **(2)** and position it correctly
☞ Position **On** must be on top
❒ Fix main power supply on the two fixing points of the board ground plate
☞ 2 self-tapping screws **(3)**
❒ Refit covers from the control box
❒ Lock again using the turn-type lock



❒ Turn the main power switch **(2)** to position **0**
❒ Lock the main power switch with a padlock for maintenance and repair work
❒ During installation, keep the machine locked to prevent any unexpected movements
☞ Keep key safe

17.3 Cable assembly

❒ Connect the cable and sensor according to the enclosed electrical manual
☞ Note the numbers on the connectors

18 Sensor mounting

18.1 Outside sensor

Position:

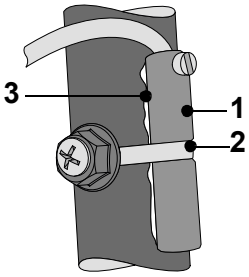
- Non-sunny side of building, coldest side of building (North; North-East)
- Installation height min. 2 m
- On insulated external walls
- Check for external heat sources (falsification)
  - ☞ Chimney, warm air ducts, windows and doors
- Cable outlet from sensor on bottom
  - ☞ Prevent sensor from moisture
- Electrical installation with 2-pole cable
  - ☞ Min. profile see wiring diagram

18.2 Flow, Accumulator and External Heat Sensors

According to hydraulic scheme

- Temperature sensors (except the flue gas sensor) designed as a PT 1000 immersion sensor with a pre-connected sensor cable
  - ☞ Do not damage or break sensor cable
  - ☞ When extending the cable, ensure a minimum cross section

18.2.1 Flow sensor for heat circuits



Position

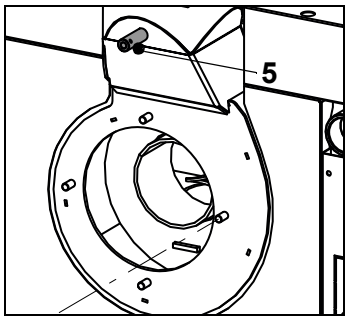
- Approx. 50 cm after heat circuit pump
- Metallic blank tube surface

❒ Fasten with enclosed mounting material

- Brass housing **(1)** and tightening strap **(2)** or
- clamp **(4)**

❒ Prior to mounting the sensor, apply heat conducting paste **(3)** to the point of contact for better heat transfer.

18.2.2 Flue gas sensor



Designed as a thermocouple (type K) with a pre-connected sensor cable

- ☞ Do not damage or break sensor cable
- ☞ When extending the cable, ensure a minimum cross section

❒ Insert the sensor tip into the opening **(5)** on the exhaust fan and secure with the spring

18.2.3 Boiler, HWT, accumulator and external heat sensors

- ❒ Mount the sensor using the immersion sleeve
- ❒ Positioning of accumulator- and HWT sensor

A T T E N T I O N

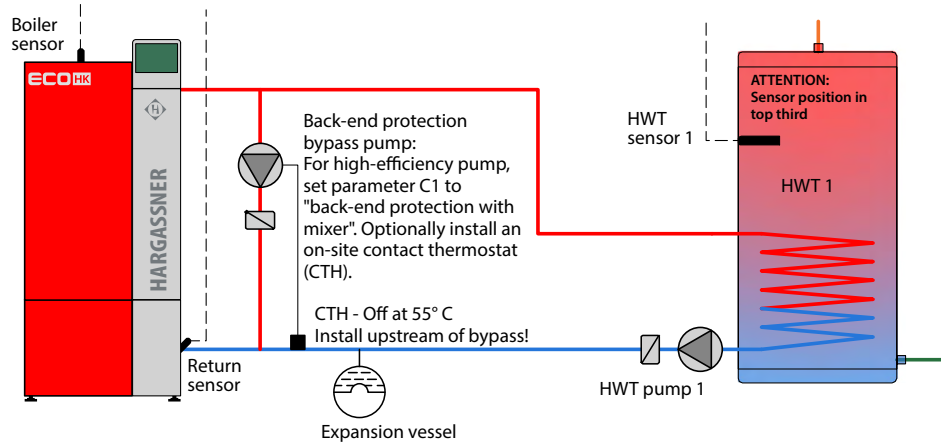
Correct sensor position

- To control the HWT and accumulator loading processes, position the sensors correctly

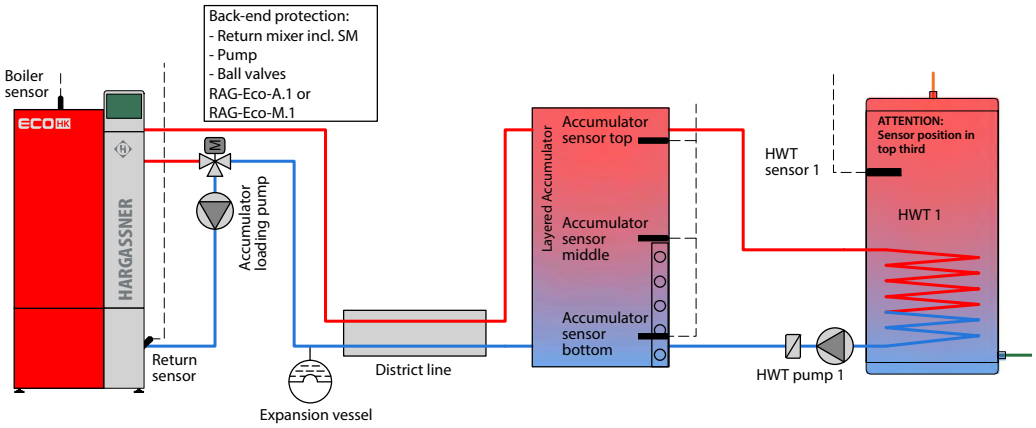
Sensor resistance

Boiler, HWT, Accumulator, Flow, Return, Outside and External Heat Sensors	
in °C	in Ohm
-20	922
-10	960
0	1000
10	1039
15	1058
20	1077
25	1097
30	1116
35	1136
40	1155
45	1174
50	1193
55	1213
60	1232
65	1252
70	1270
75	1290
80	1309
85	1328
90	1347
95	1366
100	1385
Room temperature sensor (Remote control FR25) Switch position AUTOMATIC (clock) and central position of the remote adjuster (independent of room temperature)	
3340 - 3650 Ω	

External HWT



Accumulator with external HWT



19 Remote control FR25 / FR35 / FR40

☞ For a professional installation and operation of the remote control, see the user manual of the respective remote control

Attention: In the installer settings, the corresponding remote control must be parametrised to the assigned heat circuit.

❒ Install the remote control at an easily accessible position

Place of installation

- No direct sunlight, draught, radiators, chimney, etc.
  - ☞ Measurement of the real room temperature
- In most appropriate room (e.g. living room or dining room)
  - ☞ No stove (e.g. a tiled stove) may be heated in this room
  - ☞ Set the radiator thermostat to a temperature higher than the room temperature on the control
    - ↳ Influences the room sensor
    - ↳ Heat circuit flow is adjusted, causing other rooms to become too cold or too warm

19.1 Remote control FR25 (analogue)

Can be used for heat circuits connected to the HKM or HKR
(not for heat circuits of heat circuit board A).

Remote control with room sensor

❒ Connect clamp 1 and 2 (to FR 25)

Remote control without room sensor

❒ Connect clamp 1 and 3 (to FR 25)

Fault lamp

The remote control is equipped with a red LED, which can be connected to the boiler. This LED lights up on the control panel when a warning or an error is displayed.

❒ Connect clamp 4 (+) and 5 (-) - to FR 25

19.2 Remote control FR35 (digital)

Can be used for all heat circuits (HKM, HKR and HC A).
BUS cable 2x2x0.5 mm² shielded and pair-twisted (e.g. LiYCY)

☞ For cable lengths from 100 m, a cross-section of 0.75 mm²

19.3 Remote control FR40 (digital)

Can be used for all heat circuits (HKM, HKR and HC A)
BUS cable 2x2x0.5 mm² shielded and pair-twisted (e.g. LiYCY)

☞ For cable lengths from 100 m, a cross-section of 0.75 mm²

20 Heat circuit - extension module, -board or -controller

20.1 Heat circuit extension module (HKM) 0, 1, 2

A maximum of three HKM's may be connected. The connection to the boiler control board is formed by a BUS cable (to the CAN BUS plug).

❒ Set address selection switch on the extension module (default:**0**)

- **0** for HKM 0 = Heat circuit 1+2 and HWT 1
- **1** for HKM 1 = Heat circuit 3+4 and HWT 2
- **2** for HKM 2 = Heat circuit 5+6 and HWT 3

20.2 Additional control board I/O 36 (HC AB/F, 5-sensor accumulator or differential controller)

The additional control board I/O 36 is for extending the HWT and heat circuits on the boiler. The connection to the boiler control board is formed by a BUS cable.

❒ Default address switch of the additional control board

- **A** for HC A = Heat circuit A and HWT circuit A
- **B** for HC B = Heat circuit B and HWT circuit B
- **F** for CDL = controlled district line
- **C** for AS board= 5-sensor accumulator
- **D** for D board = Differential controller

20.3 Heat circuit controller HKR

Up to 16 HKRs can be connected to extend the heating and HWT circuits, as well as accumulators and external heat boilers. The connection to the boiler control board is made by a BUS cable
(on the CAN BUS plug).

❒ Set address selection switch on the HKR (default:1)

- **0** for HKR 0
- **1** for HKR 1 etc..

21 Permits and reporting requirements

Attention: Have the installation or conversion of a biomass boiler approved by the relevant regulatory authority.

- Report reconstruction to the supervising office
  - ☞ Austria: Responsible building authority
  - ☞ Germany: chimney sweep or building authority
  - ☞ Other countries: Observe the regulations of the local authorities

22 Commissioning of the heating system

D A N G E R

Unauthorised commissioning!

The boiler may only be commissioned by personnel authorised by Hargassner.

- Prevent unauthorised commissioning
- Perform no work on the boiler
- Only operate the boiler independently after a commissioning report has been signed

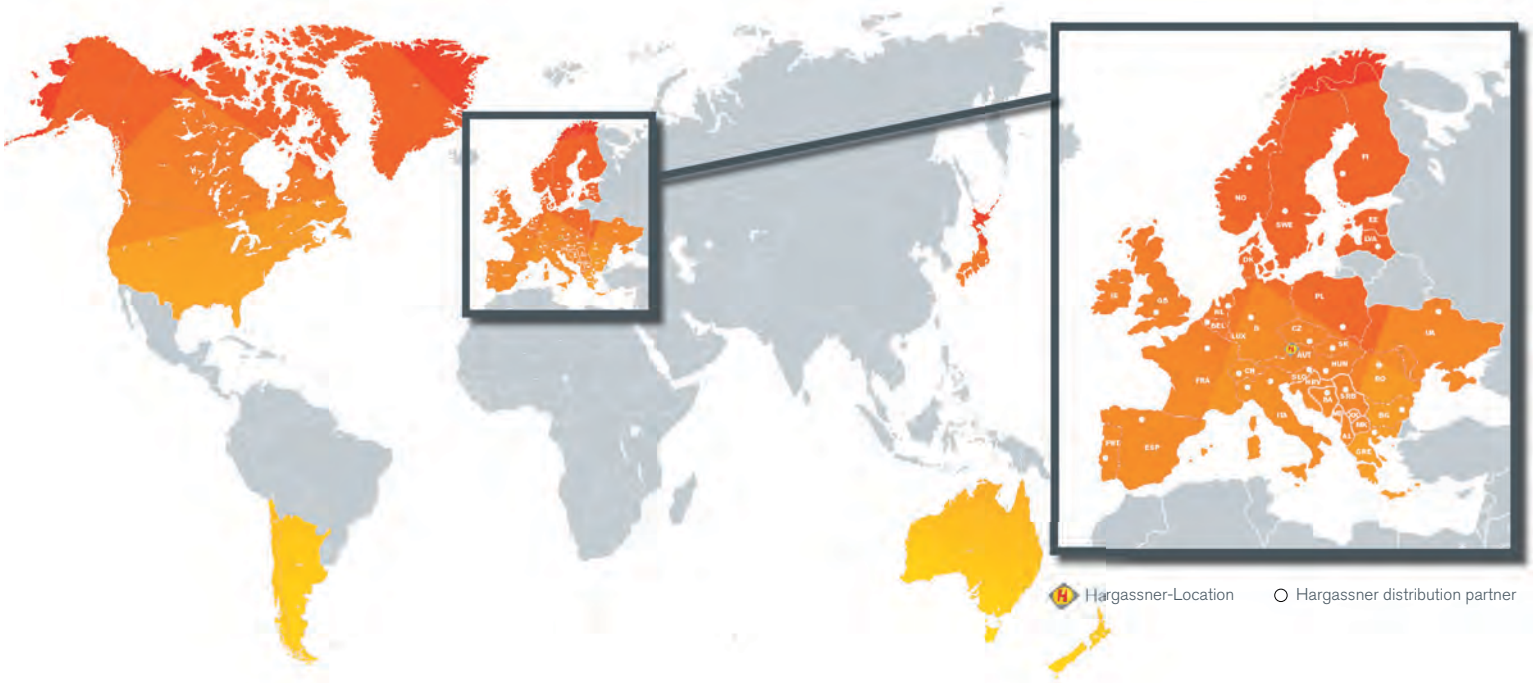
notes

notes

notes

HARGASSNER

Your expert for **PELLET | WOOD LOG | WOOD CHIP** HEATING



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