Maintenance Manual
Pellet Boiler
Eco-PK 70-120

HARGASSNER
HEIZTECHNIK DER ZUKUNFT

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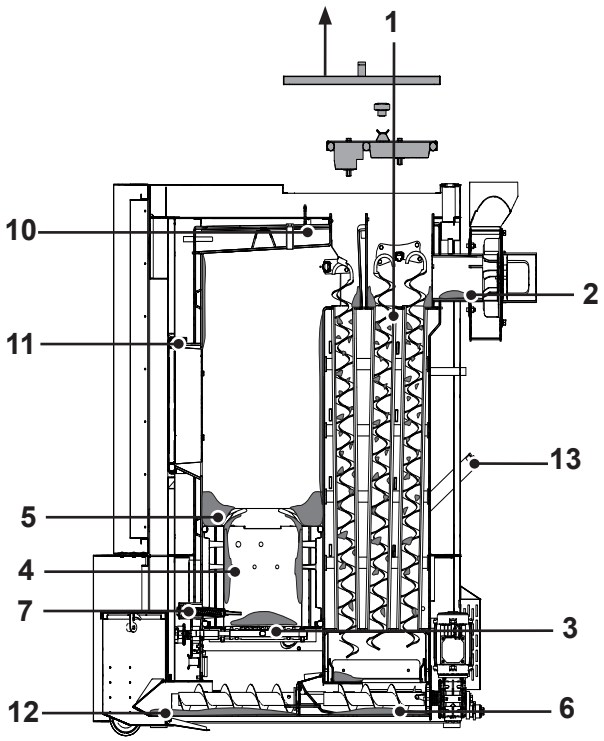
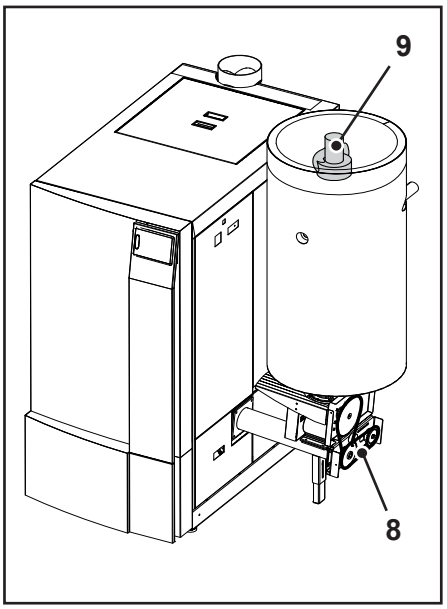
Chapter I: Service and Maintenance

1 Maintenance overview





Pos.	Tasks of maintenance[1]	Frequency (a = annually)
1	Tap off the turbulators and clean the turbulator space	1x a
2	Clean the exhaust fan and flue pipe with a vacuum cleaner	1x a
3	Clean the grate	1x a
4	Clean combustion chamber with ash cleaner	1x a
5	Remove and clean flame concentration plate	1x a
6	Remove maintenance opening and clean fly ash space	1x a
7	Clean ignition	1x a
8	Lubricate the stoker chains and check the chain tension	1x a
9	Clean the filter of the pellet vacuum turbine	1x a
10	Clean the lambda sensor and combustion chamber sensor.	1x a
11	Check sealings	1x a
12	Remove ash under the grate (especially at ash grate)	1x a
13	Vacuum recirculation	1x a
14	Check the safety devices (main power switch, TMS, MOE/AFE, TMF and warning device)	1x a

1 Frequency: at least once annually and no later than after 4000 full-load hrs, 8000 partial-load hrs or after a message has appeared on the control unit

2 Preparation for cleaning and maintenance

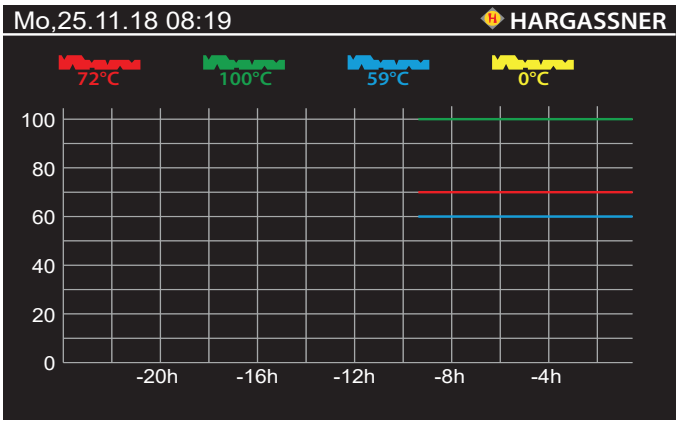
❒ Switch off the boiler on the control unit (BCE) (operating mode **F. Off**)
❒ Let boiler cool down

→ Talk to the customer before beginning the maintenance process
→ Take any problems and wishes the customer expresses into consideration when performing the maintenance tasks

2.1 Reading the error memory

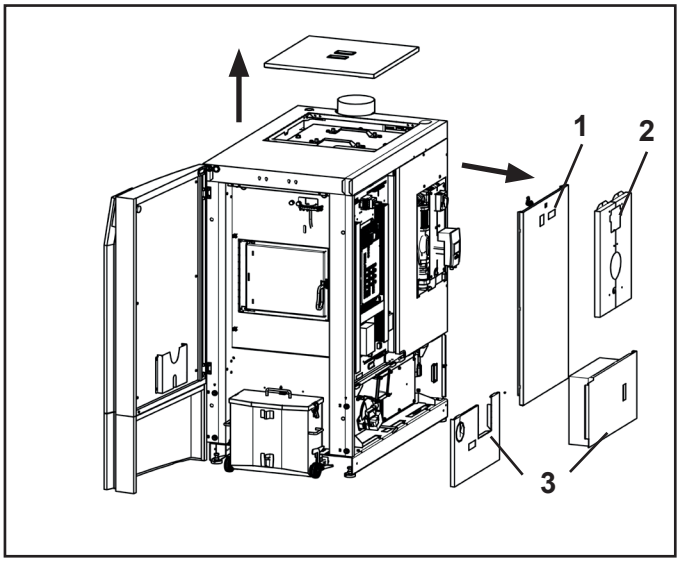
❒ Call up the error memory in the service level
→ Rectify new errors during the maintenance process if possible

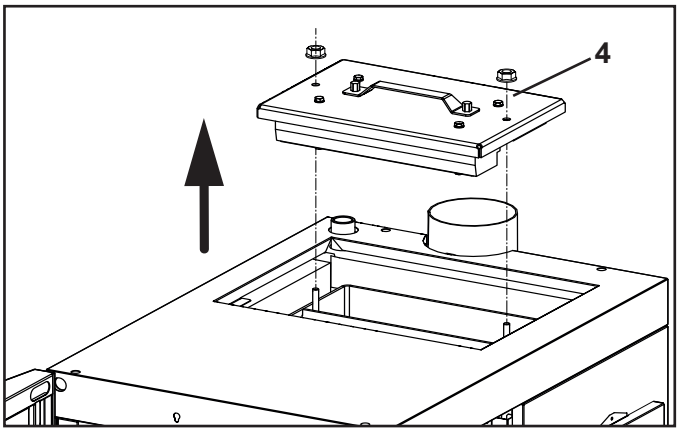
2.2 Checking the operating behaviour



❒ Call up the graph in the info level using an active service code
❒ Check the operating behaviour

2.3 Removing the casing





❒ Remove cover lid and maintenance lid
❒ Remove the casing panel covering the control box **(1)**
❒ Remove the casing panel covering the back-end protection **(2)**
❒ Remove the lower casing panels on the side **(3)**
  ❒ Loosen screw at the back cover of the fly ash space
  ❒ Pull cover backwards and remove
  ❒ Remove insulation
  ❒ Lift cover from the stoker and remove
❒ Clean the maintenance lid **(4)** covering the heat exchanger
❒ Select manual mode

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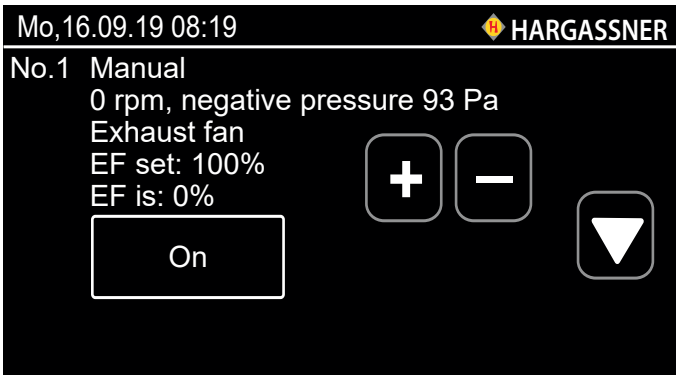
3 Service manual mode (function test)

→ Used to check all the electrical functions
→ Manually operate the drives to check them or if there is an error

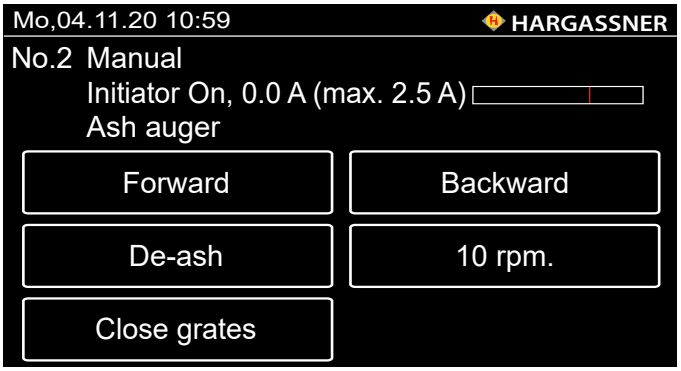
❒ Activate manual mode and service
→ A code has to be entered to activate them

❒ To activate the function, press or press and hold the button.
❒ To deactivate the function, press again or release the button
→ To activate continuous operation (max. 2 minutes), double-click the button when the service settings are activated.

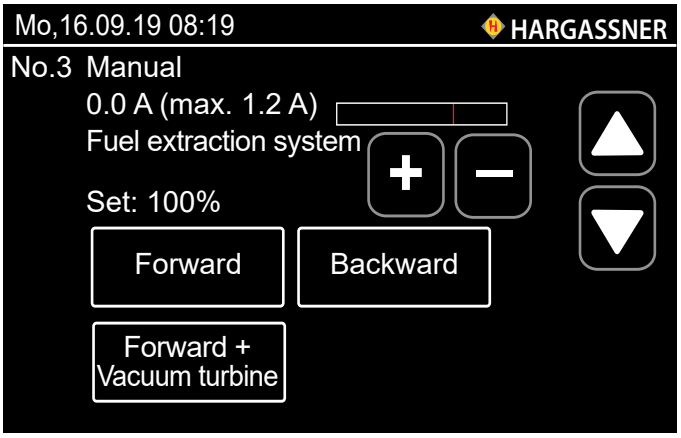
Only the selected function is activated. All other functions are inactive.



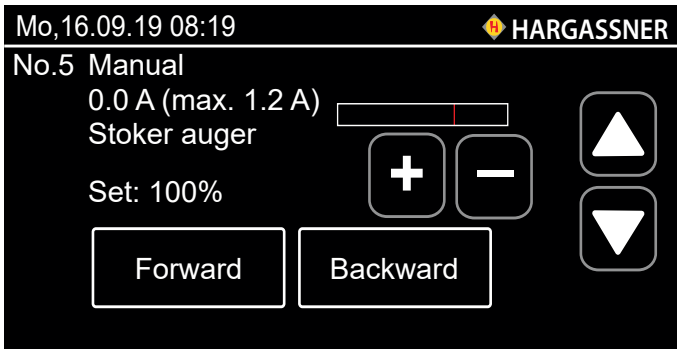
No.1 Function check on the exhaust fan's motor
→ Negative pressure reached with recirculation closed: 300 Pa



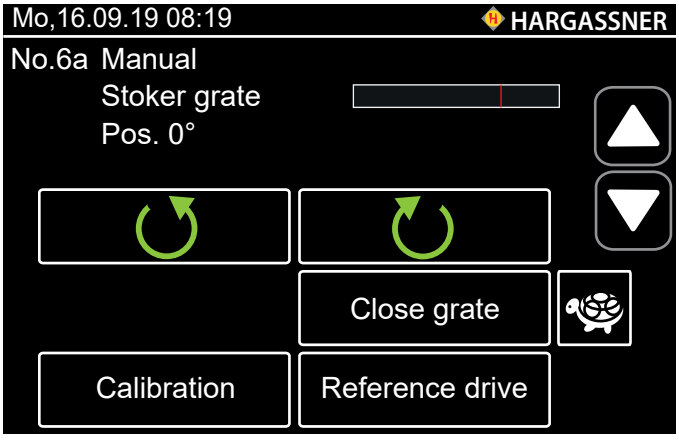
No.2 Function and rotation check of ash extraction motor
→ Forward
→ Backward
→ De-ash
→ Close grates
→ Only press the Backward button briefly



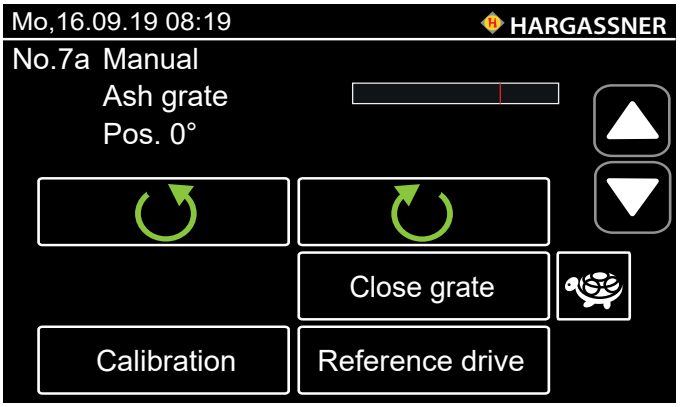
No.3 Function and rotation check of fuel extraction motor
→ Manual Forward and Backward of the motor to clear any blockages
→ Press Backward button only briefly
→ For double agitator, the additional parameter No. 3a is shown



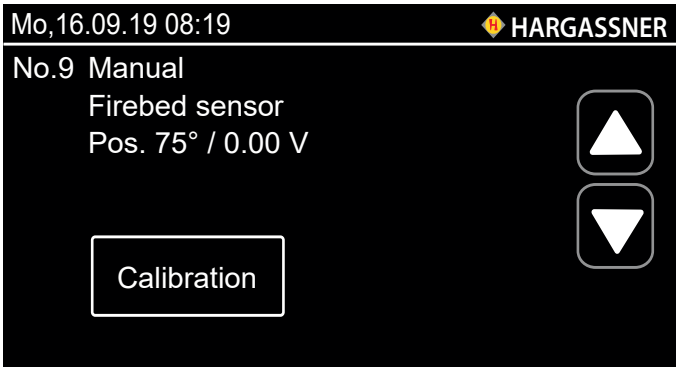
No.5 Function and rotation check of stoker auger motor
→ Manual Forward and Backward to fill the stoker auger
→ Press Backward button only briefly
→ For double rotary valve, the additional display No. 5a is shown



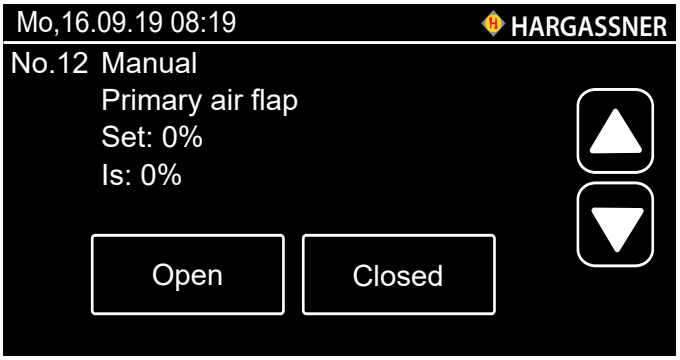
No.6a Function and rotation check of stoker grate motor
→ Manual Forward or Backward of the motor
→ Close and check the grate
⇨ See „Calibrating the stoker grate and ash grate“ on page 13
→ Tortoise mode: a slow mode with more power for more precise calibration



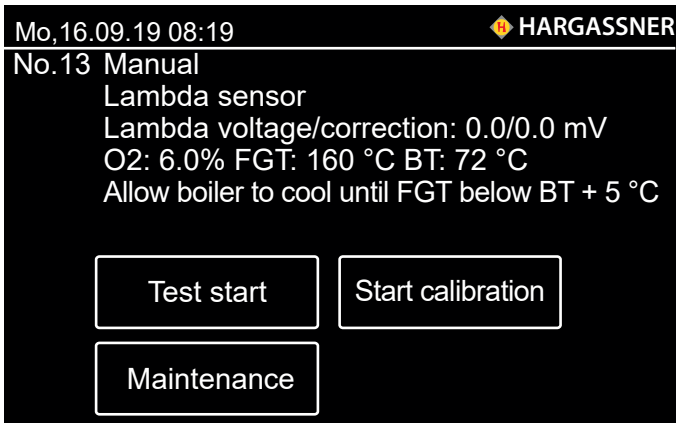
No.7a Function and rotation check of ash grate motor
→ Manual Forward or Backward of the motor
→ Close and check the grate
⇨ See „Calibrating the stoker grate and ash grate“ on page 13
→ Tortoise mode: a slow mode with more power for more precise calibration



No.9 Calibration of the firebed sensor
⇨ See „Calibrating the firebed sensor“ on page 13



No.12 Function and position check of the primary air flap (set/actual)
→ 100% - Open; 0% - Closed
❒ Position at both extremes 0% and 100%
→ Press Open or Closed and monitor the actual value as it changes

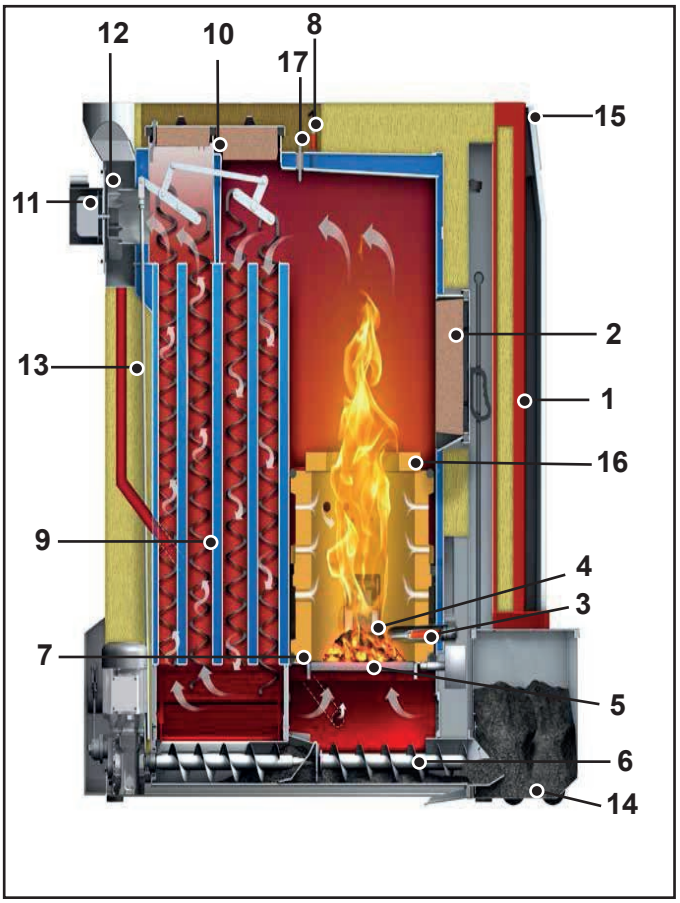


No.13 Calibration of the lambda sensor
⇨ See „Calibrating the lambda sensor“ on page 13
→ When a correction value is displayed, the calibration has been completed
→ If the value is not reached, the message “Lambda sensor defective” will be displayed
→ Calibrate the lambda sensor at the end of the maintenance process
→ If the maintenance process is activated in service mode, the maintenance process has to be reset after the calibration
→ Service manual mode no. 59

4 Cleaning

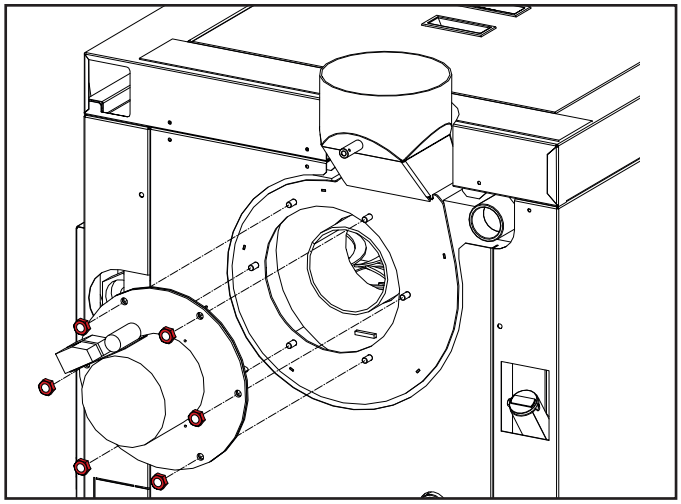
→ Disconnect the boiler's power supply before cleaning or performing maintenance tasks on any moving parts

4.1 Overview of components



Pos.	Description
1	Boiler cover door
2	Combustion door
3	Ignition
4	Firebed monitoring
5	Double rotary step grate
6	Ash-auger
7	Refractory
8	Lambda sensor
9	Turbulators
10	Cleaning lid
11	Exhaust fan
12	Flue gas sensor
13	Recirculation
14	Ashbox (Suction cleaning optionally)
15	Control unit
16	Flame concentration jet
17	Combustion chamber sensor

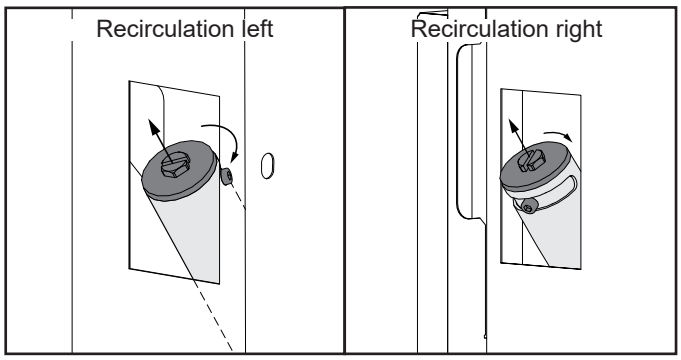
4.2 Cleaning the flue pipe



❒ Disconnect the electrical connections from the motor
❒ Loosen copper nuts and remove exhaust fan backwards
→ The anti-adhesive seal on the exhaust fan housing prevents the exhaust fan seal from sticking to the housing
→ If the fan seal gets stuck, replace the anti-adhesive
→ Clean flue pipe, housing and impeller of the exhaust fan
→ Do not damage the impeller

4.3 Cleaning the recirculation

→ Factory setting: 50%



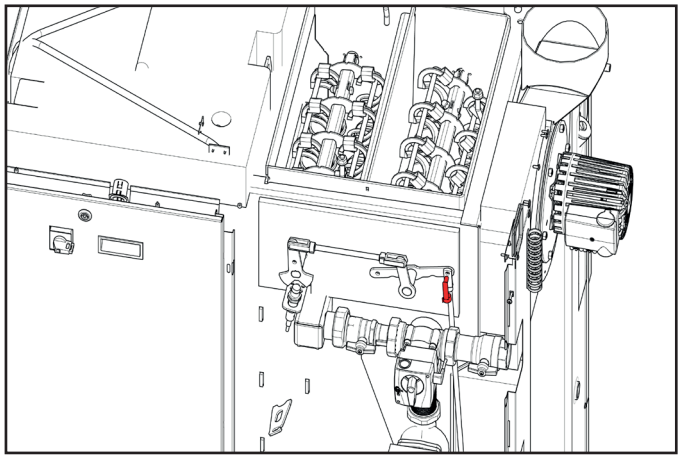
❒ Mark recirculation settings
❒ Plug a vacuum cleaner into the recirculation's connection point and turn the vacuum cleaner on
❒ **Close** the recirculation
→ The vacuum cleaner is loud (no air is being suctioned)
❒ **Open** the recirculation
→ The vacuum cleaner is quiet
❒ Put the recirculation back in its starting position

4.4 Cleaning and checking the heat exchanger

4.4.1 Checking the maintenance lid

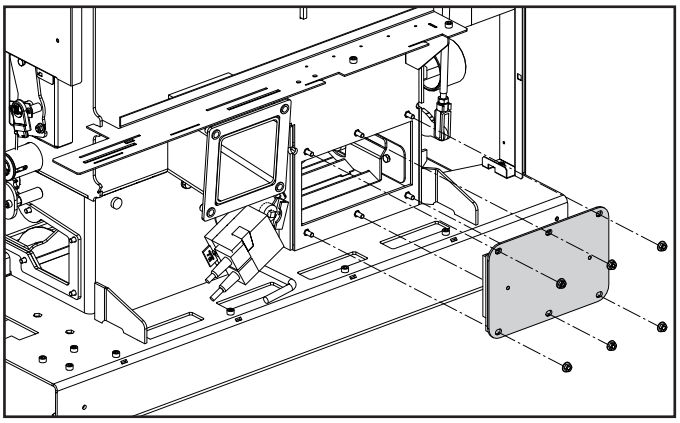
❒ Remove the cover and vacuum the seal
❒ Check the seal
  ❒ Spray the seal with graphite spray
  ❒ Press the cover on and take it off again
→ You will be able to tell from the seal whether the cover is on properly
  → If necessary, replace the seal

4.4.2 Cleaning the turbulators and the turbulator chamber

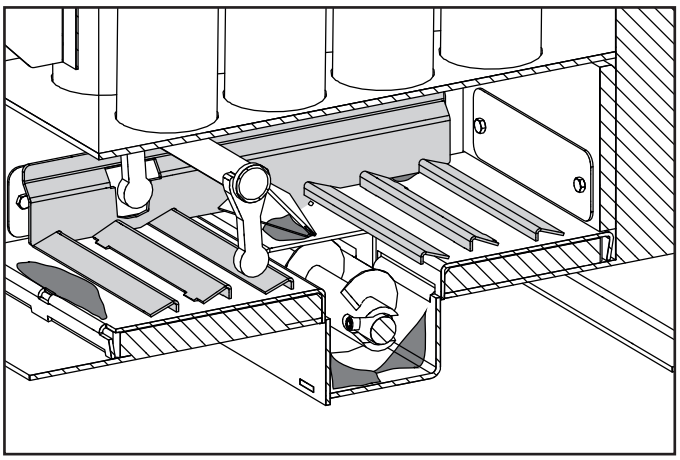


❒ Loosen the turbulators' fixing points
→ Remove the clevis pin
  → Spray with lubricant spray before putting it back in place
❒ Knock any residue off the turbulators and check they can move freely
❒ Clean the turbulator chamber
❒ Check the rods and rubber pads
❒ Check the cleaning device's initiator
  → Gap of 2 mm

4.5 Cleaning the fly ash area

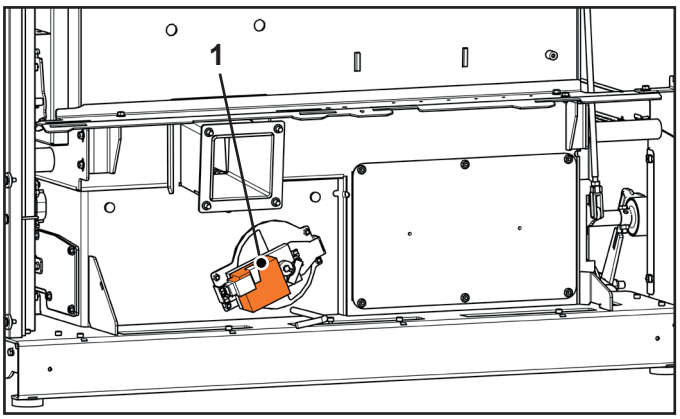


❒ Loosen the fastenings of the fly ash area's cover and remove it
❒ Check the cover's seal



❒ Remove any accumulated ash from the ash area

4.6 Checking the primary air flap

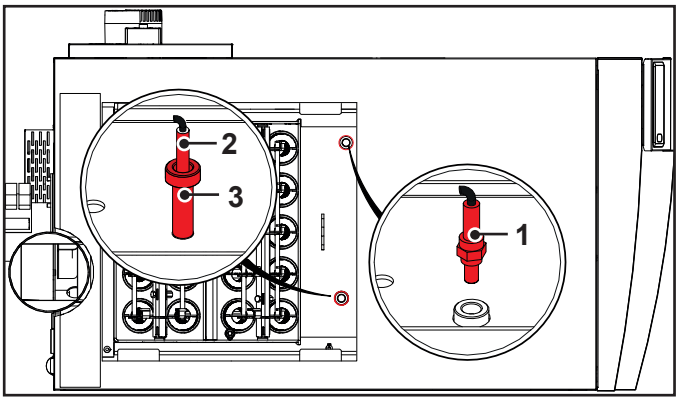


❒ Unlock the air flap motor **(1)**
  ❒ Press the black button and run the motor to open and close the air flap with the button pressed
❒ Check it can move freely
→ If any contact problems occur, the contacts have to be set (read the error memory)
⇨ See „Resolving air flap servomotor errors“ on page 21

4.7 Cleaning the lambda sensor

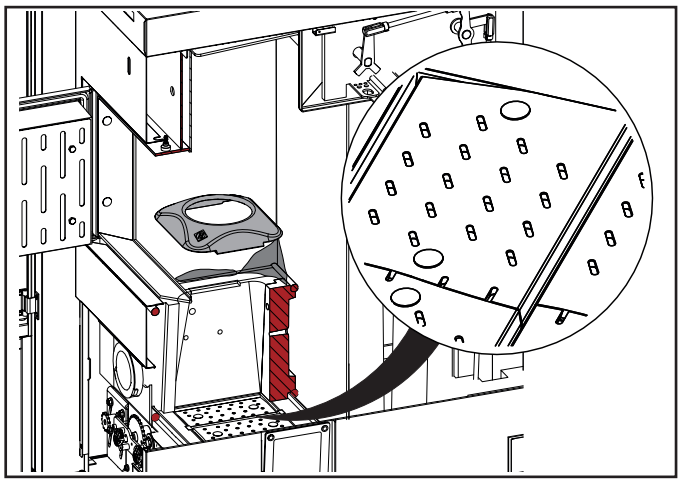
N O T E

Do not tap the lambda sensor
- Do not blow it with compressed air
- Do not use sharp objects or chemical cleaning agents (brake cleaner, etc.)



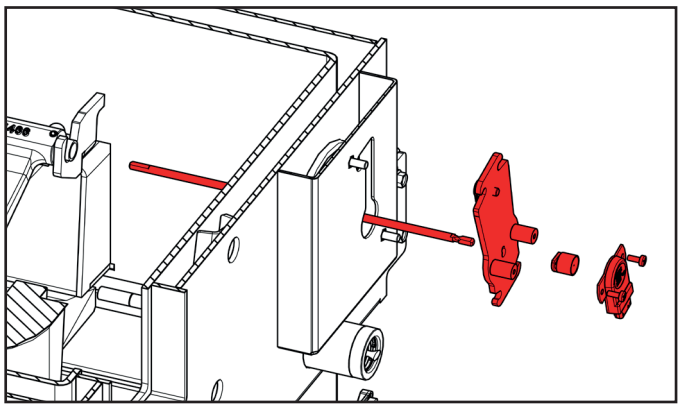
❒ Disconnect and unscrew the lambda sensor **(1)**
❒ Place sensor head down
→ Debris falls down
❒ Vacuum the sensor
❒ Calibrate the lambda sensor and then put it back in place once the maintenance process is complete
⇨ See „Calibrating the lambda sensor“ on page 13
→ Pull out the combustion chamber sensor **(2)** and the ceramic protective pipe **(3)** and wipe them with a soft cloth

4.8 Cleaning the combustion chamber and post combustion chamber



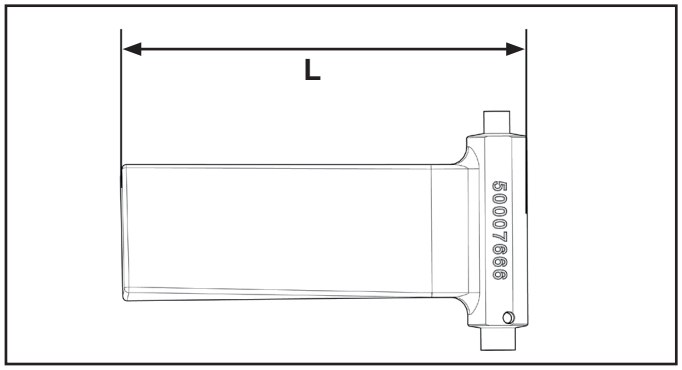
❒ Open the combustion chamber door and check the ash cone
❒ Check the seal and, if necessary, adjust the combustion chamber door
❒ Clean flame concentration plate in the combustion chamber
❒ Remove flame concentration plate from combustion chamber
❒ Clean the combustion chamber and post-combustion chamber with a cleaning stick
❒ Check the refractory stones for damage
→ Replace any stones with pieces broken off or major cracks or fissures
⇨ See „Replacing the refractory stones“ on page 15
❒ Extract the ash in manual mode
❒ Turn all the grates to 90° and all the ash to drop down
❒ Ash area cleaning
❒ Check the ash hasp
❒ Clean the rotating grates and ensure the holes are free of any dirt
❒ Remove the lower front casing door and the ash box

4.8.1 Checking the firebed sensor unit

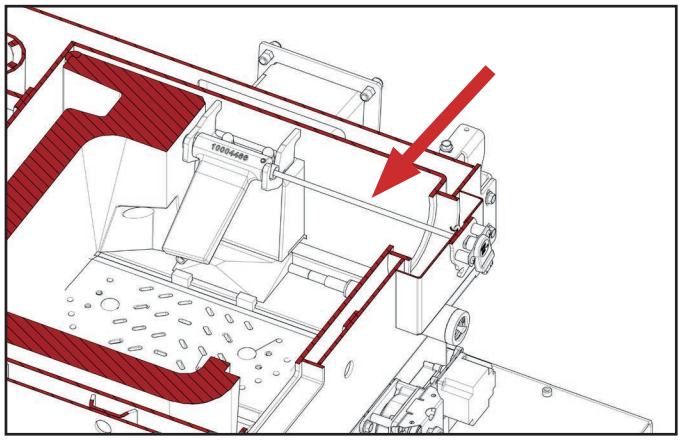


❒ Unscrew the magnetic sensor and remove the magnet
❒ Hold the shaft with a pair of pliers and pull the tongue of the firebed sensor up

→ **If there has been too much erosion, replace the firebed sensor's tongue**



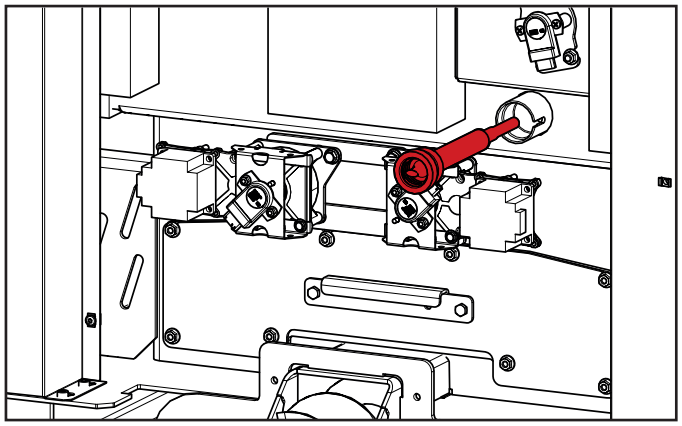
- Length when new 139 mm
- Length after the maximum amount of erosion 99 mm



- Idle run between the shaft and firebed sensor tongue maximum 10°

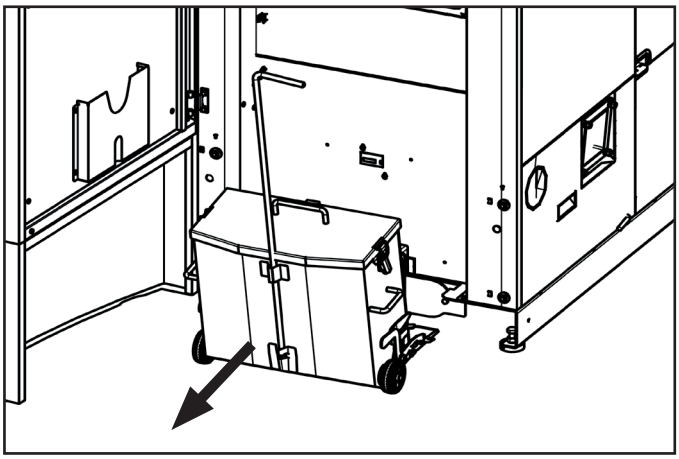
❒ Check the spring
→ The spring should rebound back into its original position after being pressed down

4.9 Cleaning the ignition



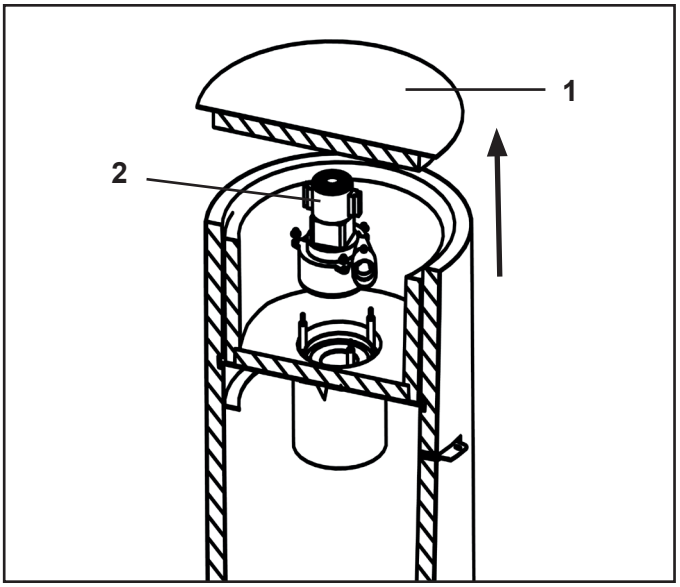
❒ Unscrew the ignition
→ Do not damage the ignition (ceramic component)
❒ Clean ignition and ignition sleeve (on the boiler) with vacuum cleaner
→ Mount ignition hand-tight only

4.10 Emptying the ash box



❒ Open the cover door
❒ Push the release levers on both sides of the ash box down
❒ Remove ash box from the boiler
❒ Secure the transport handle
→ Now the ash box can easily be transported to the emptying point
→ Remove the transport handle
❒ Undo the lid's fasteners and remove the lid
❒ Empty the ash box
❒ Put the lid back on and secure it with the fasteners
❒ Attach the transport handle
❒ Reattach the ash box to the boiler
→ It will automatically lock into place on both sides when it is pressed against the boiler

4.11 Cleaning the vacuum turbine



- ❒ Remove the day hopper's cover **(1)**
- ❒ Remove the insulation at the top
- ❒ Disconnect plug of the vacuum turbine
- ❒ Loosen the clamp of the return air hose and remove the hose from the vacuum turbine
- ❒ Remove the vacuum turbine **(2)** by pulling it upwards
- ❒ Remove dust and deposits from the sieve, vacuum turbine and return air hose
  → Use a vacuum cleaner
- ❒ Re-assemble the boiler after cleaning

→ Replace the carbon brushes after 400 operating hours

⇨ See „Replacing the pellet vacuum turbine"s carbon brushes" on page 19

5 Cleaning and checking the suction system

- ❒ Check the hoses for wear and holes
- ❒ Check them by inspecting and feeling them

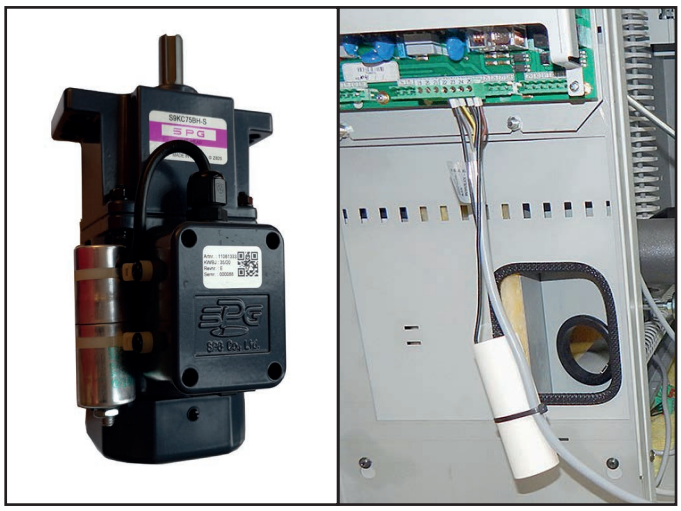
→ White patches of discolouration on the red coating indicate wear

→ Replace the hose or add a metal bracket

6 Checking the capacitor

- ❒ Check the stoker motor's capacitor
  - ❒ Check the direction of rotation
    → Replace the capacitor if necessary and at least every 10 years
- ❒ Check the RAS motor's capacitor (if present)

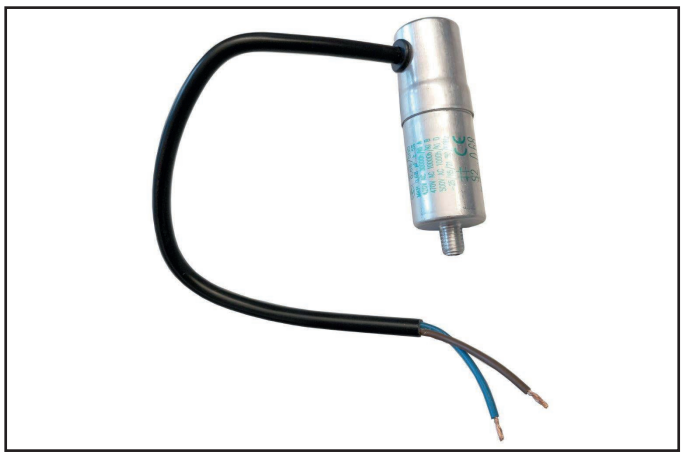
→ The capacitor can be attached to the motor or to the board



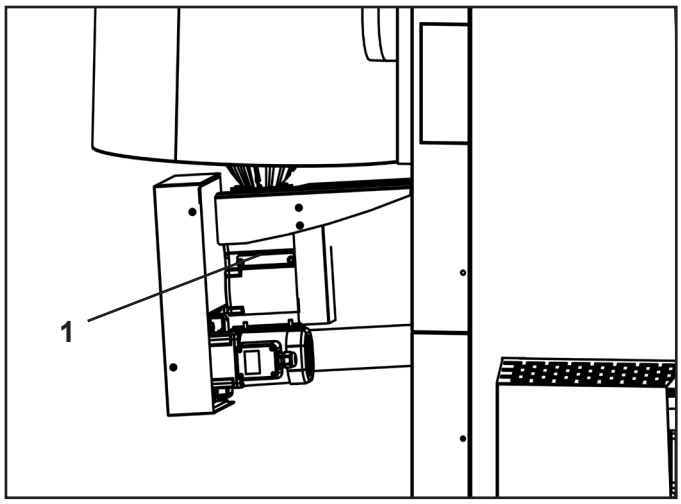
- ❒ Make a note of when (day and year) and the number of operating hours after which the capacitor has been changed

→ **If a capacitor with white housing is currently installed, it needs to be replaced by the latest version (metal housing)**

⇨ See „Changing the stoker motor capacitor" on page 22



7 Checking the double rotary valve

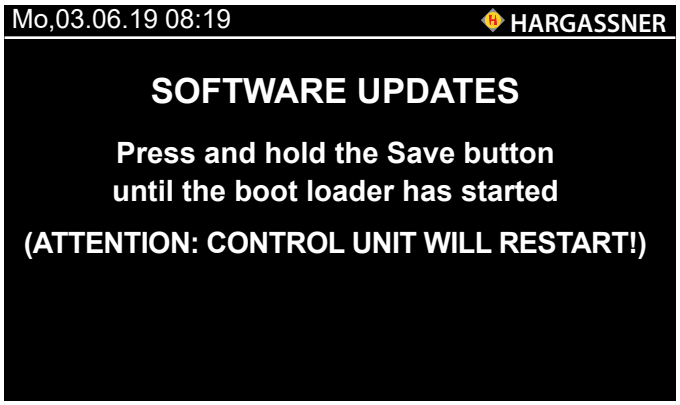


❒ Check the chain tension and, if necessary, adjust the tension
❒ Lubricate the chain
⇨ See „Lubrication points“ on page 14
❒ Check the air slot **(1)**

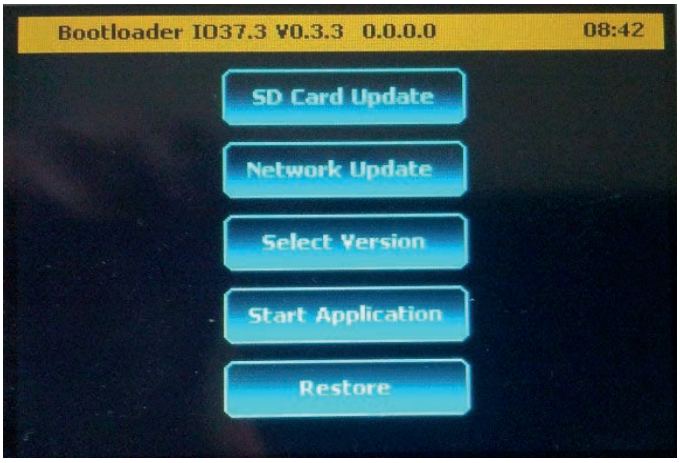
8 Software updates

→ To ensure the warranty extension is granted, the boiler's software must be up to date

❒ Check the software version in the info level (Hargassner symbol) before updating
❒ Tap on **Settings**
❒ Select Service mode and enter the code
❒ Select the **Update** button and use the arrow button to move all the way to the bottom



❒ Tap and hold the Save button
→ The bootloader will start
❒ Insert a storage card into the card slot

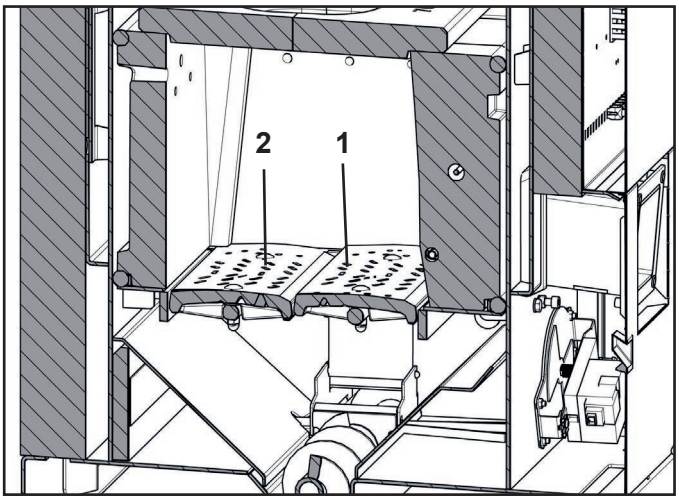


❒ Tap on “SD card update”
❒ Use the “Down” or “Up” button to select the correct software version
❒ Confirm your selection with “Enter”
❒ Start the software by tapping on the “Start application” button
→ The version you have selected will be loaded onto the control unit
❒ Remove the storage card

9 Calibrating the lambda sensor

❒ Connect the lambda sensor and put it in a safe place
→ The lambda sensor will get hot when it is connected
❒ Select Lambda sensor in service manual mode
❒ Tap on Start calibration
→ The calibration process will take 8 minutes
→ If an error message appears, clean and calibrate the lambda sensor again
→ If the error message is still displayed, replace the lambda sensor and then calibrate the replacement
→ Reset the maintenance process when the calibration process has been completed
→ Service manual mode no. 59

10 Calibrating the stoker grate and ash grate



❒ Close both grates in manual mode
❒ Check the horizontal position of the stoker grate **(1)** and ash grate **(2)**
→ If necessary, set the grates manually
→ Both grates have to be positioned horizontally
❒ Tap on “Calibrate”

11 Calibrating the firebed sensor

❒ Put the firebed sensor in position
❒ Check the vertical position by hand without wood chips
→ If 0° is displayed, the sensor is OK
→ If necessary, calibrate it

12 Test run

❒ Repeat the function test
⇨ See „Service manual mode (function test)“ on page 5
→ All the moving parts should be checked before and after the maintenance process
❒ Switch on the boiler
❒ Start the flue gas measurement process
❒ Wait for your desired boiler temperature
❒ Tap on the boiler symbol and read the O2 level on the BCE
❒ Compare the O2 level with the value on the meter

If no heat is required from the boiler, it can be heated using the test mode function.
❒ Select Full load or Partial load
→ A message will appear when the boiler is ready for measurement

❒ Check the hydraulics
❒ Check the water pressure and pump settings
❒ Check the back-end protection

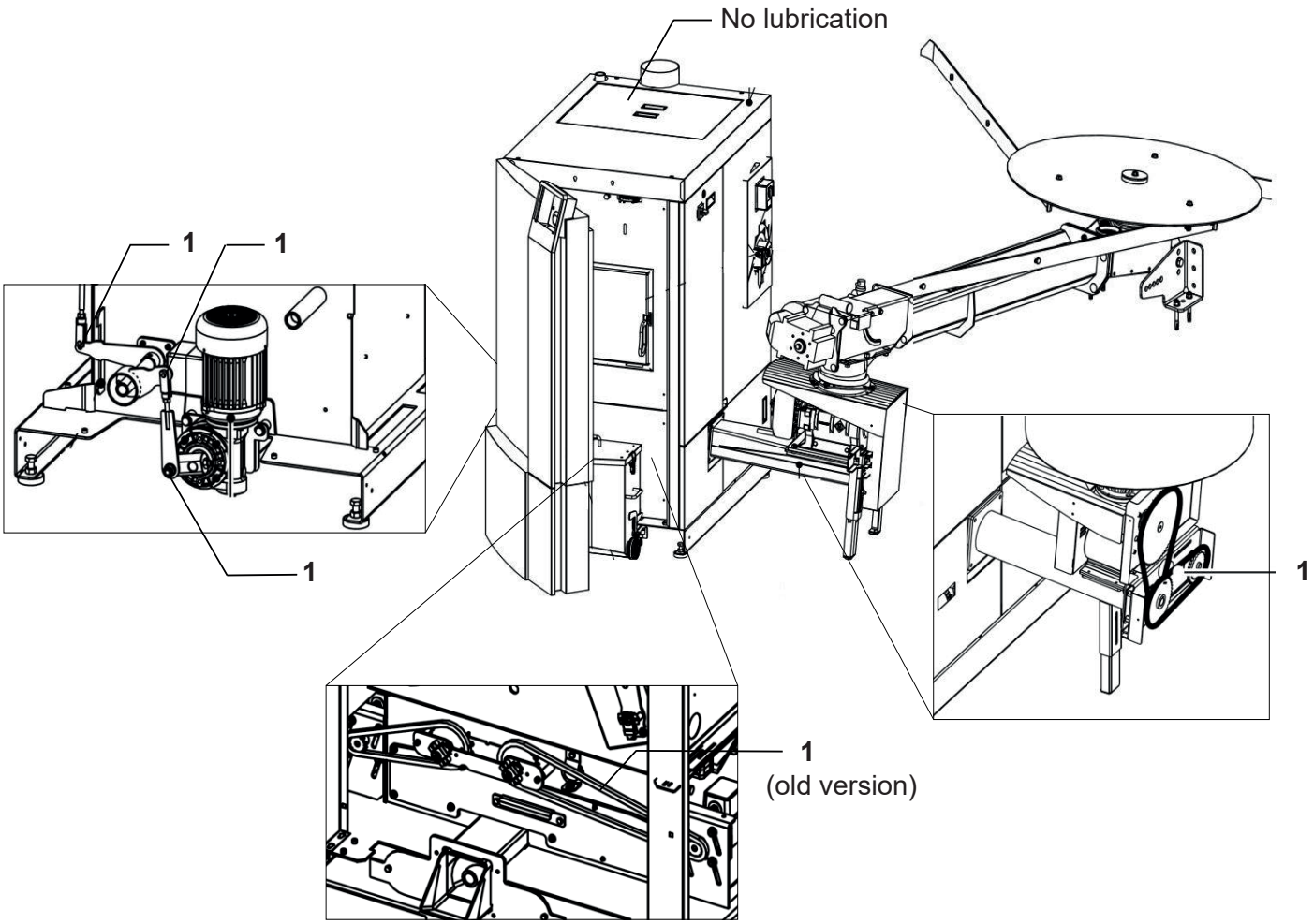
❒ Talk to the customer again at the end of the maintenance process and issue a maintenance report and/or a test report
- Make a note of the flue gas values and any present defects
- Make a note of any technical safety defects depending on the respective country’s regulations
- Check the flue pipe insulation
- Check the air supply openings

Chapter II: Lubrication plan

1 Lubricants

No.	Designation	Properties	Article number
1	High-performance lubricant	Mechanical joints and screws that are not exposed to heat	11052895

2 Lubrication points



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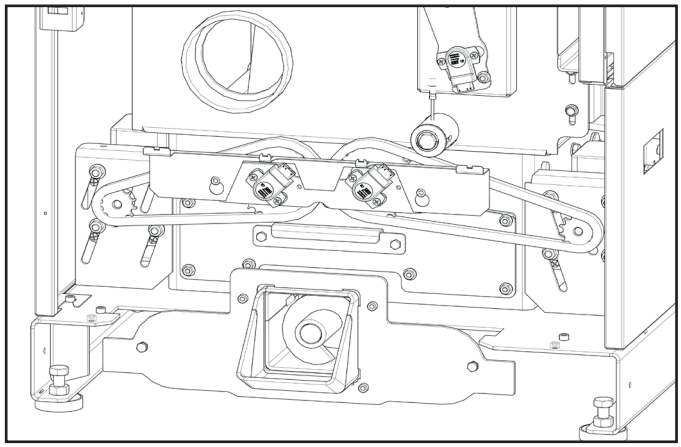
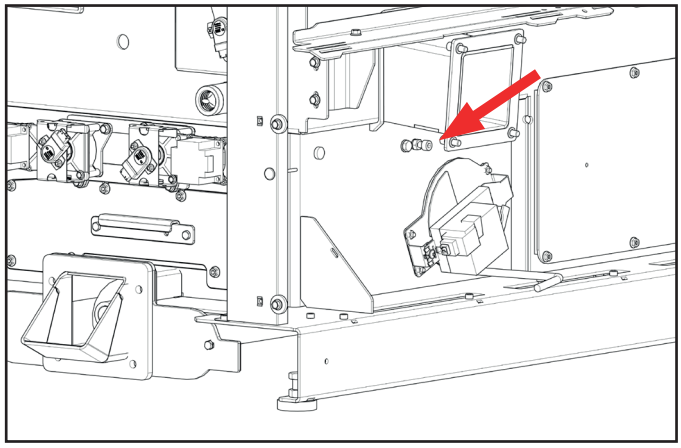
Chapter III: Advanced service tasks

1 Replacing the refractory stones

1.1 Eco-PK 70-90

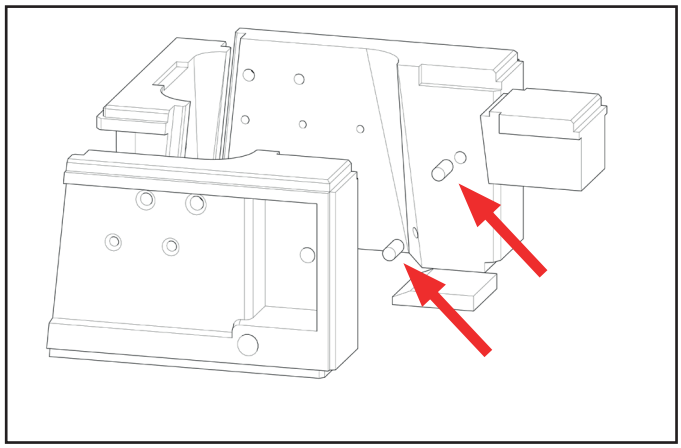


❒ Undo the two gear unit motors and loosen the drive chains on the rotary grate shafts (if present)



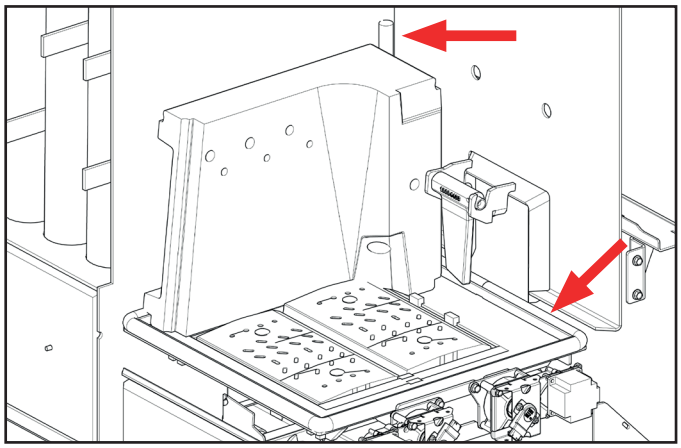
❒ Loosen the screw in the middle plate and push the plate to the opposite side of the boiler

→ The stop screw (with the nut) must not be changed



❒ Close the back refractory stone"s openings with a fibreglass sealing cord (Ø 18 mm, length 40 mm)

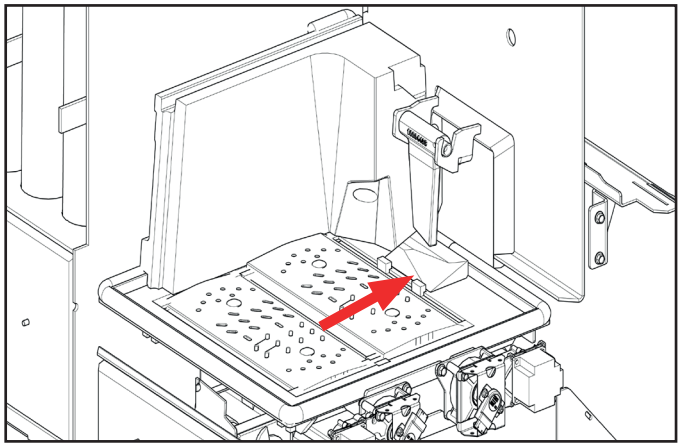
→ All the other openings must be clear



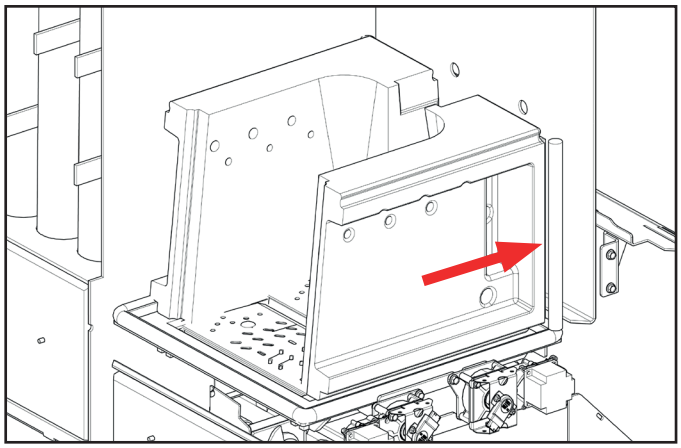
❒ Insert a fibreglass sealing cord (Ø 20 mm, length 1850 mm) into the gap between the middle plate and boiler wall

❒ Apply "KS Fiberfrax 140" mastic in the corners

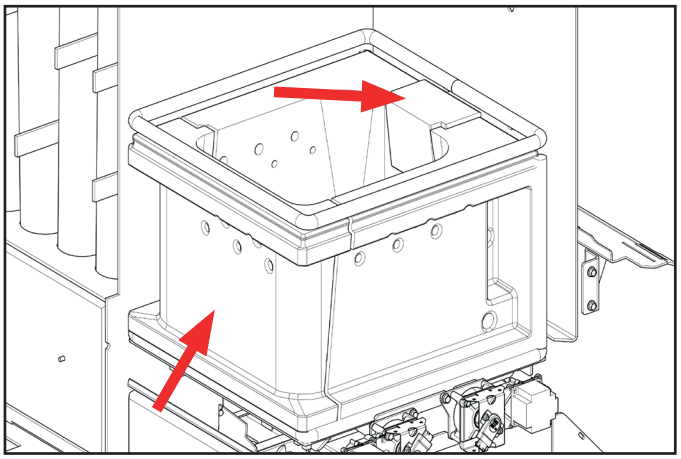
❒ Place a fibreglass sealing cord (Ø 20 mm, length 1850 mm) in the corner behind the stoker and set it in place with the refractory stone



❒ Put the refractory stone in position under the stoker

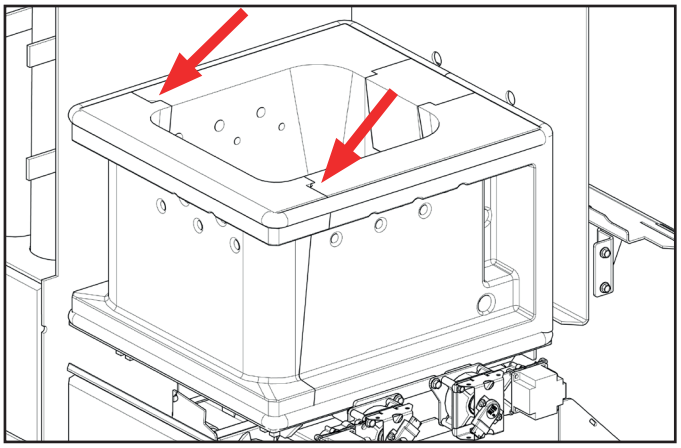


❒ Place a fibreglass sealing cord (Ø 20 mm, length 280 mm) in the corner in front of the stoker and set it in place with the refractory stone

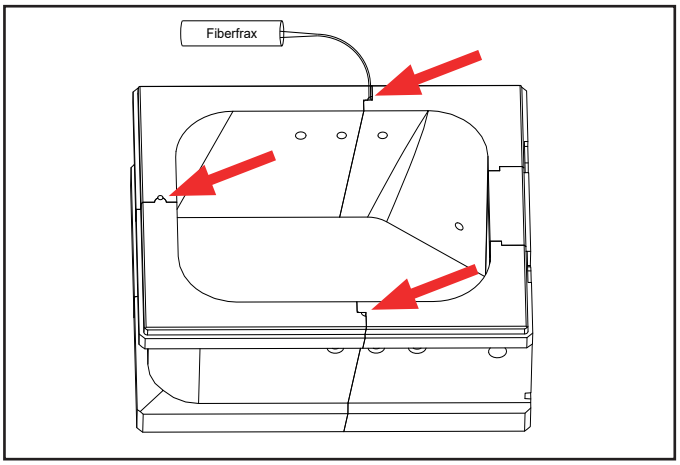


❒ Put the refractory stones in position opposite and above the stoker
❒ Check that the firebed sensor tongue can move freely
❒ Insert a fibreglass sealing cord (Ø 20 mm, length 1850 mm) into the gap between the refractory stones and the boiler wall
❒ Apply “KS Fiberfrax 140” mastic in the corners

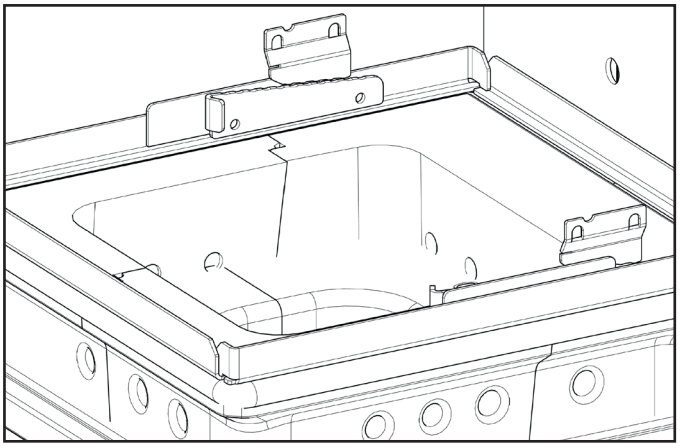
→ **“KS Fiberfrax 140” should be used as the sealant between the refractory stones**
→ **Use a hose to insert the mastic straight from the cartridge into the gaps between the stones**



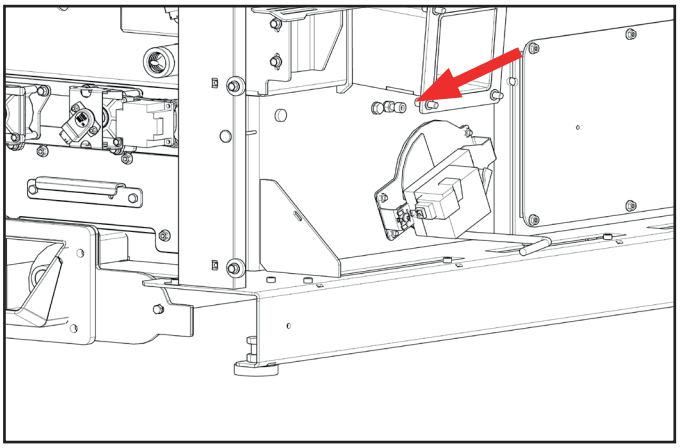
❒ Attach the hose to the nozzle
❒ Push the hose right to the bottom of the gap for the sealant



❒ Insert the sealant into the gap while slowly pulling the hose out at the same time



❒ Mount and pre-tension the stone holders
→ The refractory stones should be pressed down (if present)
❒ Put the two-part flame concentration plate in position



❒ Retighten the screw in the middle plate
→ The middle plate should be pulled to the stoker

→ The stop screw (with the nut) must not be changed
❒ Tension the two drive chains on the rotary grate shafts (if present)

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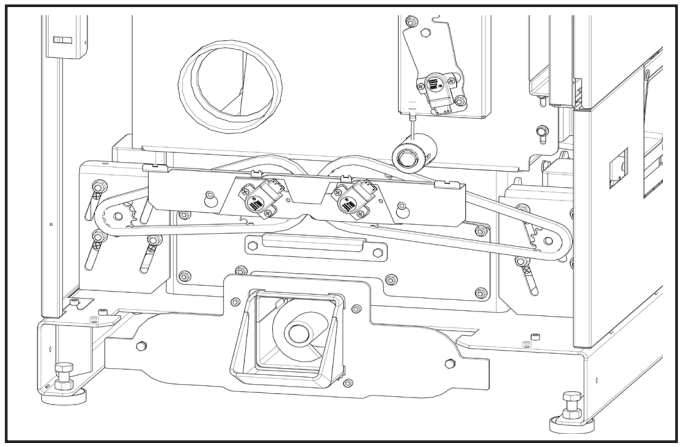
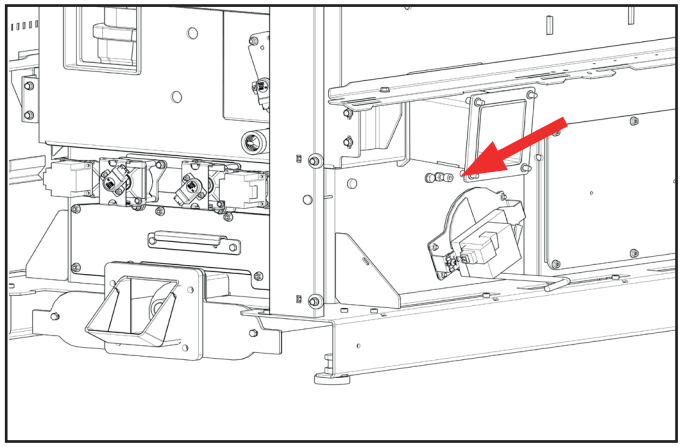
1.2 Eco-PK 100-120

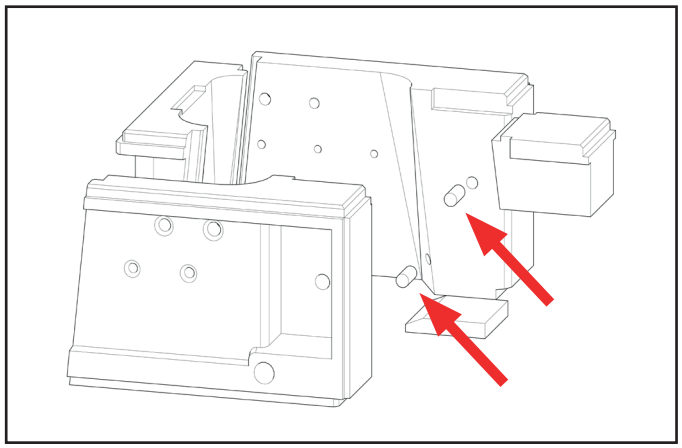


❒ Undo the two gear unit motors and loosen the drive chains on the rotary grate shafts (if present)



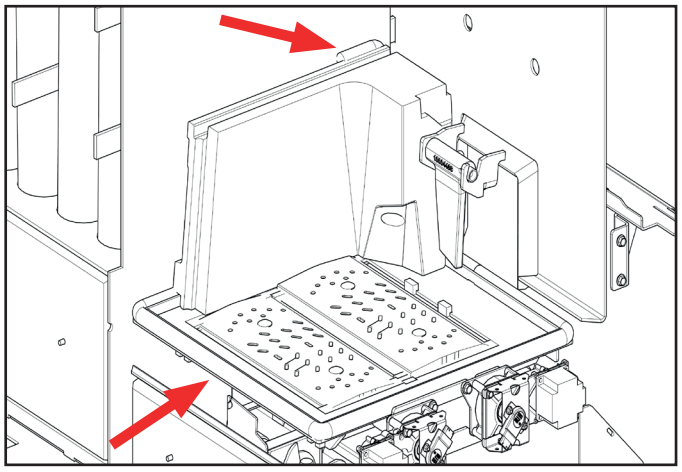
❒ Loosen the screw in the middle plate and push the plate to the opposite side of the boiler

→ The stop screw (with the nut) must not be changed



❒ Close the back refractory stone"s openings with a fibreglass sealing cord (Ø 18 mm, length 40 mm)

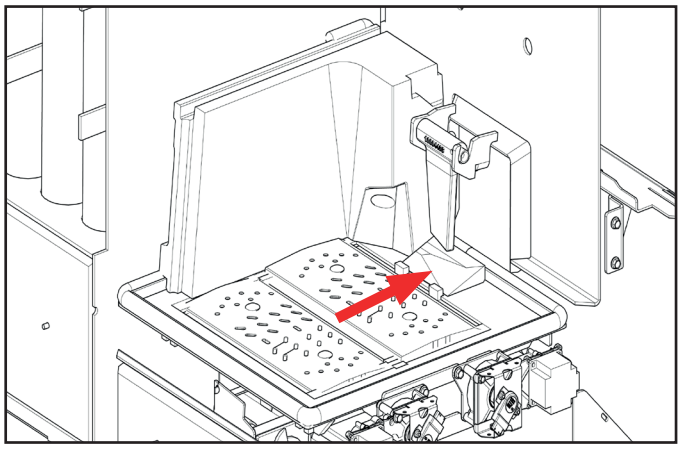
→ All the other openings must be clear



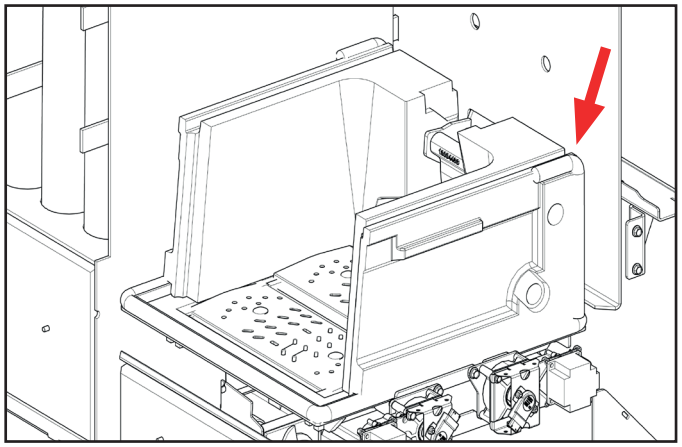
❒ Insert a fibreglass sealing cord (Ø 20 mm, length 1850 mm) into the gap between the middle plate and boiler wall

❒ Apply "KS Fiberfrax 140" mastic in the corners

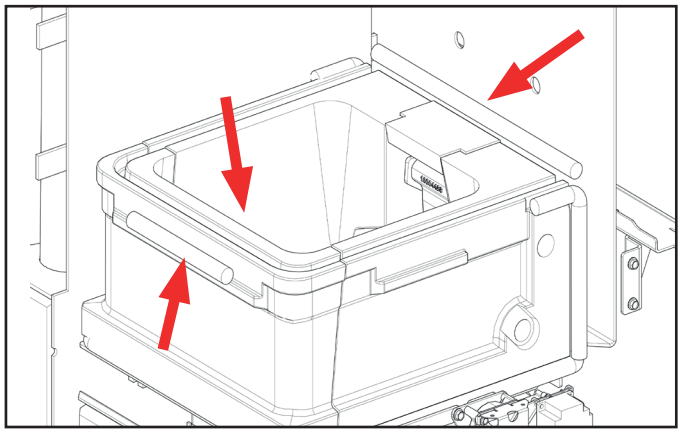
❒ Place a fibreglass sealing cord (Ø 20 mm, length 280 mm) in the corner behind the stoker and set it in place with the refractory stone



❒ Put the refractory stone in position under the stoker

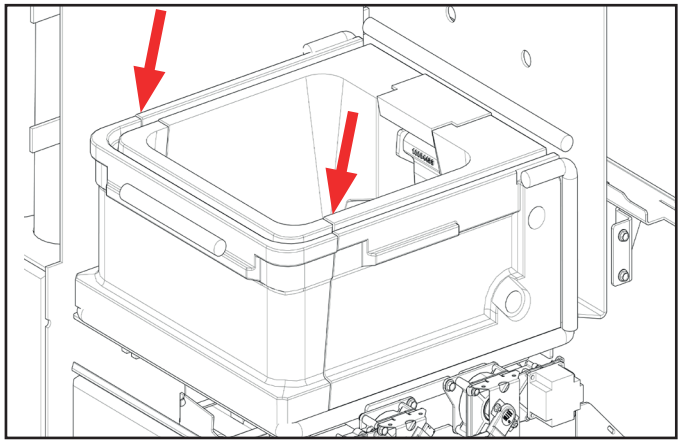


❒ Place a fibreglass sealing cord (Ø 20 mm, length 280 mm) in the corner in front of the stoker and set it in place with the refractory stone

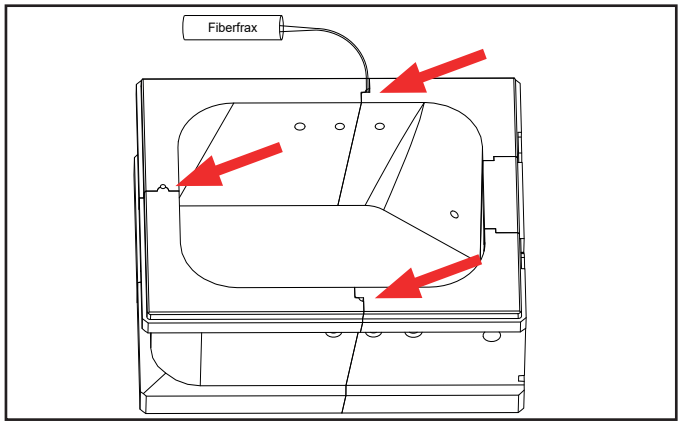


❒ Put the refractory stones in position opposite and above the stoker
❒ Check that the firebed sensor tongue can move freely
❒ Insert a fibreglass sealing cord (Ø 20 mm, length 200 mm) into the gap between the refractory stone and boiler wall opposite the stoker
❒ Insert a fibreglass sealing cord (Ø 20 mm, length 440 mm) into the gap between the refractory stones and the boiler wall above the stoker

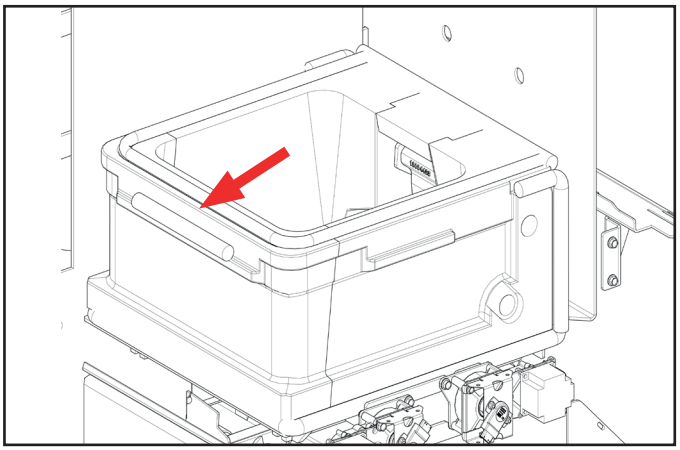
→ **“KS Fiberfrax 140” should be used as the sealant between the refractory stones**
→ **Use a hose to insert the mastic straight from the cartridge into the gaps between the stones**



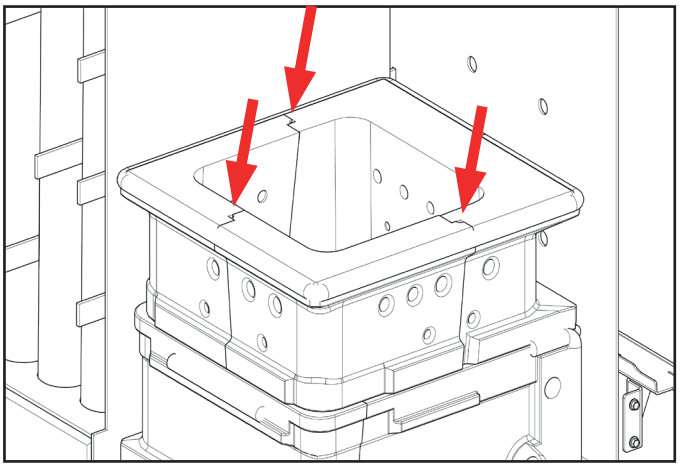
❒ Attach the hose to the nozzle
❒ Push the hose right to the bottom of the gap for the sealant



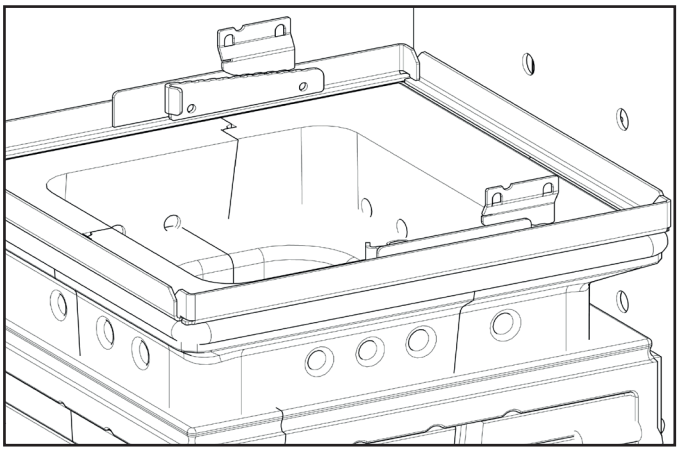
❒ Insert the sealant into the gap while slowly pulling the hose out at the same time



❒ Place a fibreglass sealing cord (Ø 15 mm, length 1230 mm) in the groove



❒ Put the top row of refractory stones in position
❒ Insert a fibreglass sealing cord (Ø 20 mm, length 1850 mm) into the gap between the refractory stones and the boiler wall
❒ Apply “KS Fiberfrax 140” mastic in the corners



❒ Mount and pre-tension the stone holders
→ The refractory stones should be pressed down (if present)
❒ Put the two-part flame concentration plate in position

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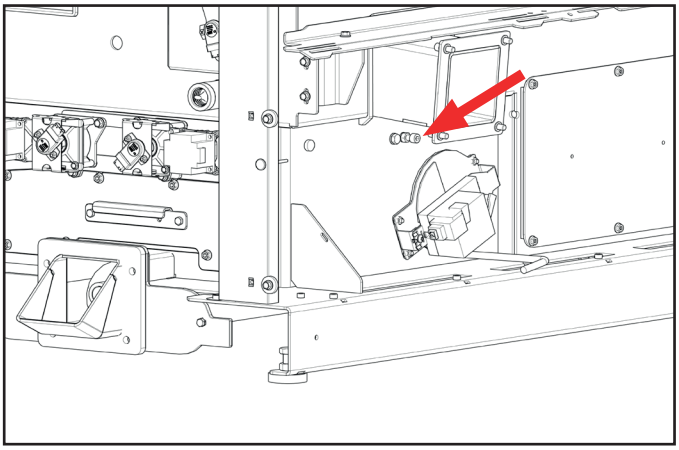


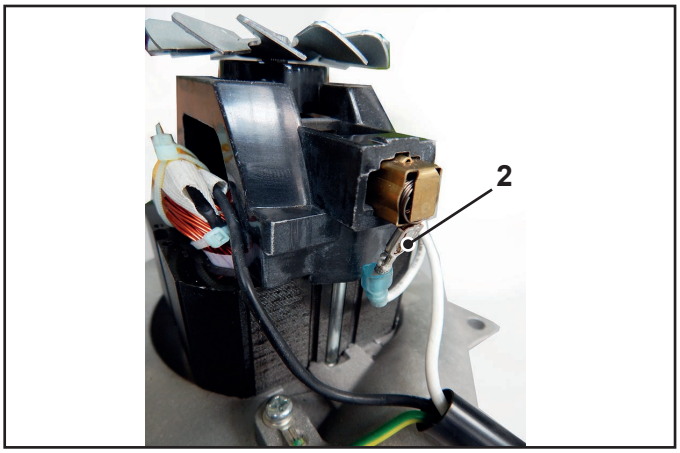
❒ Retighten the screw in the middle plate
→ The middle plate should be pulled to the stoker

→ The stop screw (with the nut) must not be changed
❒ Tension the two drive chains on the rotary grate shafts (if present)

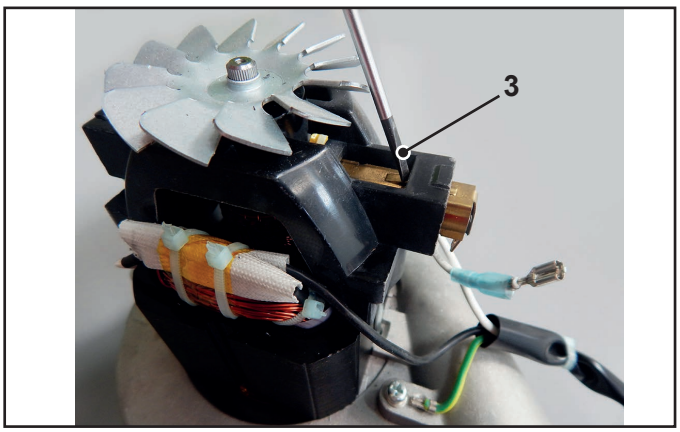
2 Replacing the pellet vacuum turbine's carbon brushes

2.1 Cinderson vacuum turbine

❒ Remove the **(1)** housing cover

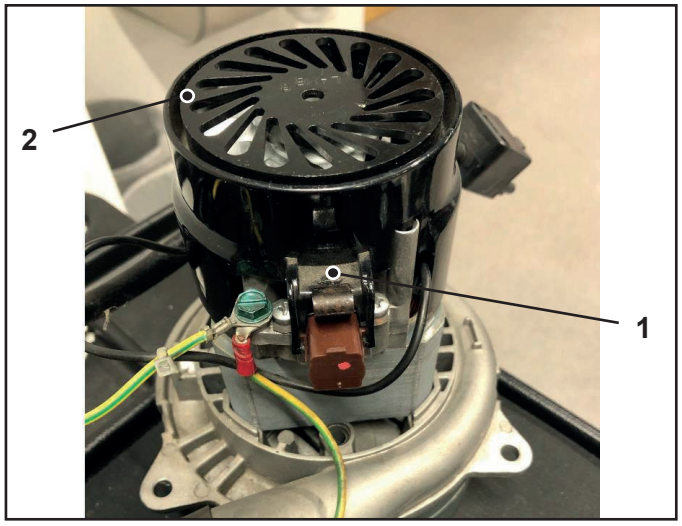


❒ Take off the flat receptacle **(2)**

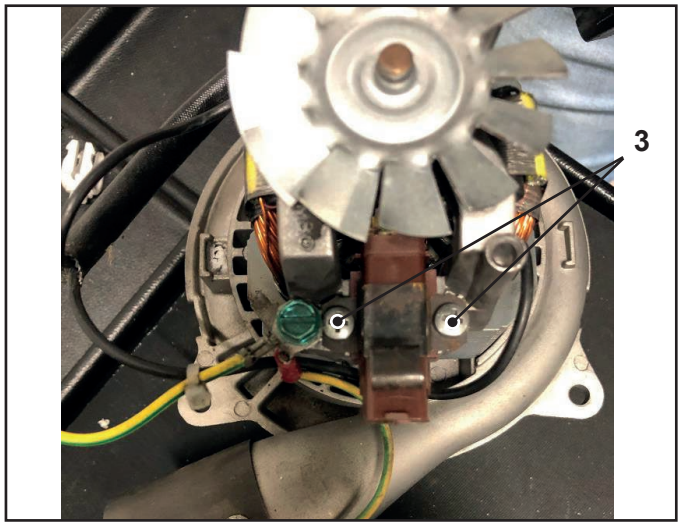


❒ Push in the leaf spring **(3)** on the housing of the carbon brush
❒ Pull out the carbon brush
❒ Replace the two carbon brushes with new ones
❒ Put the components you have detached back together in reverse order
❒ Clean and check the housing
→ Reset the vacuum turbine"s meter after replacing the carbon brushes
→ Service manual mode no. 59

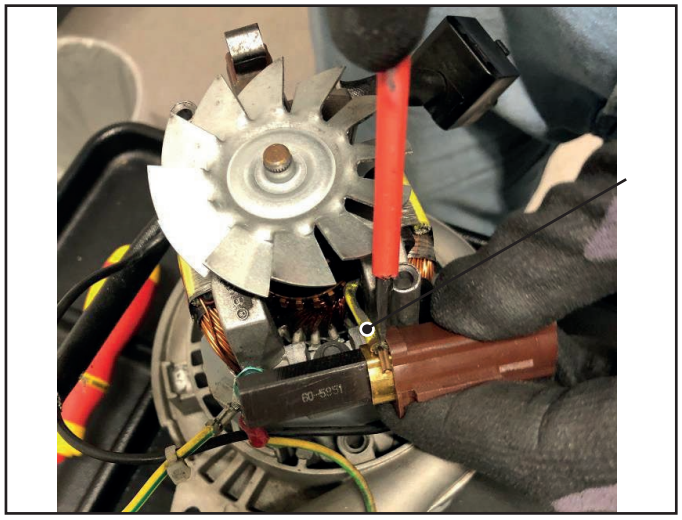
2.2 Ametek vacuum turbine



❒ Bend the flap **(1)** upwards and remove the housing cover **(2)**

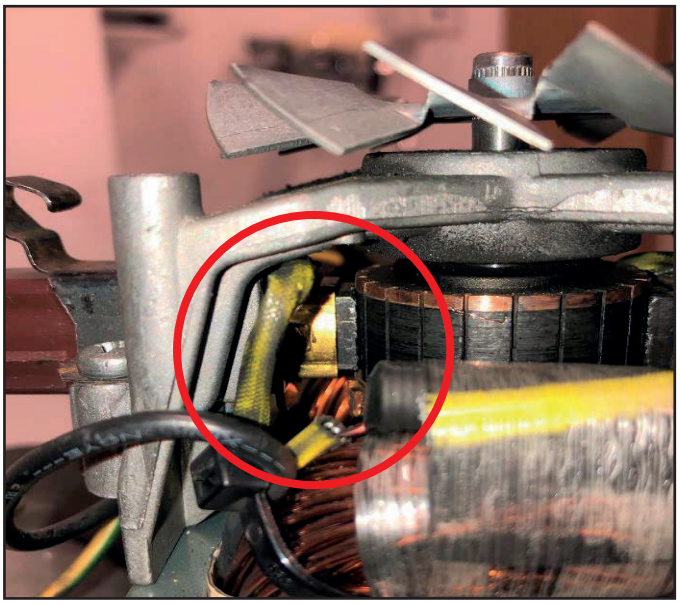


❒ Loosen the screws **(3)** on the carbon brush bracket and remove the brush



❒ Remove the cable **(4)** and check the length of the carbon brush

→ If the brush is less than 1 cm, replace it



→ Make sure the cable is in the correct position when installing the carbon brush

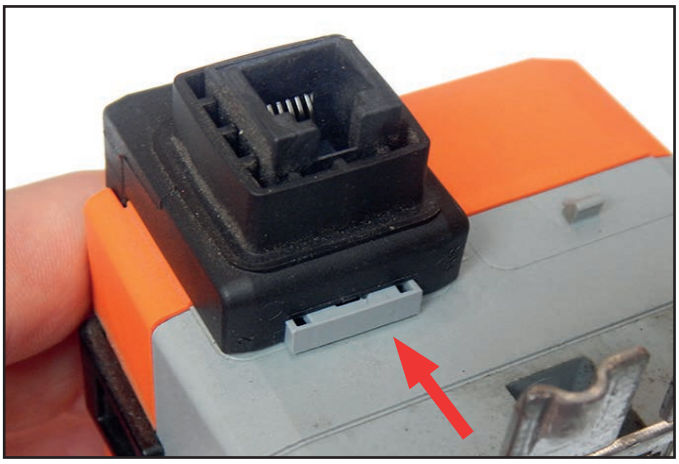
❒ Put the components you have detached back together in reverse order

❒ Clean and check the housing

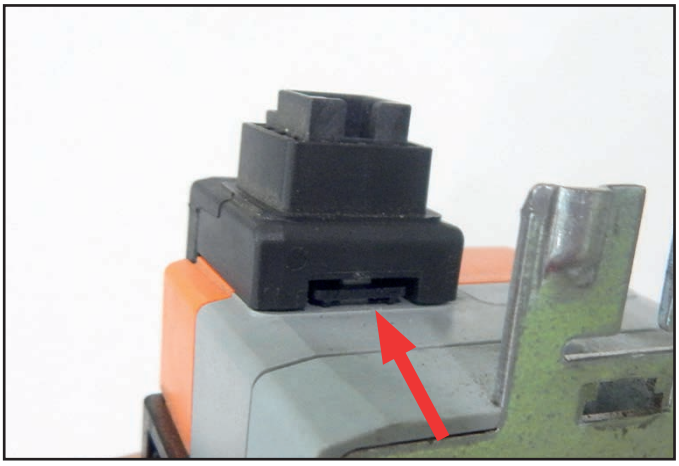
→ Reset the vacuum turbine"s meter after replacing the carbon brush

→ Service manual mode no. 59

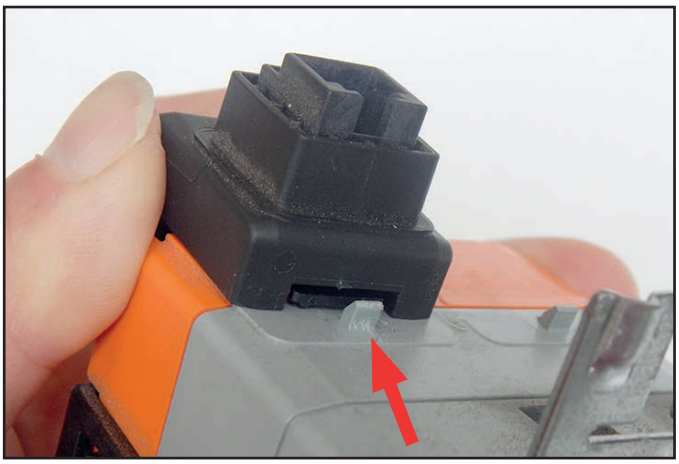
3 Resolving air flap servomotor errors



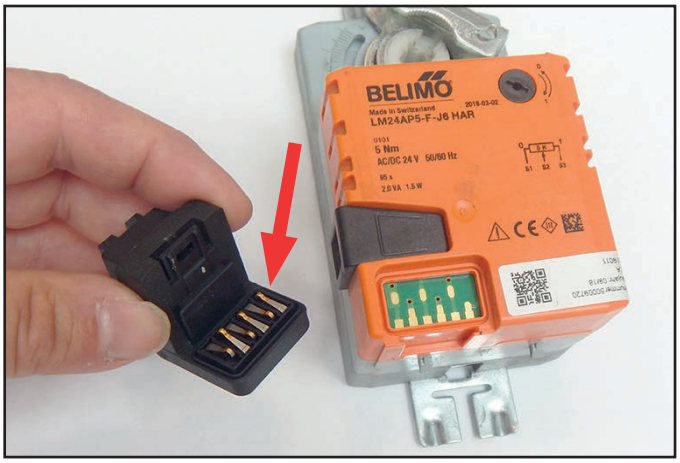
❒ Remove the plug lock



❒ Lift up the tab



❒ Remove the plug

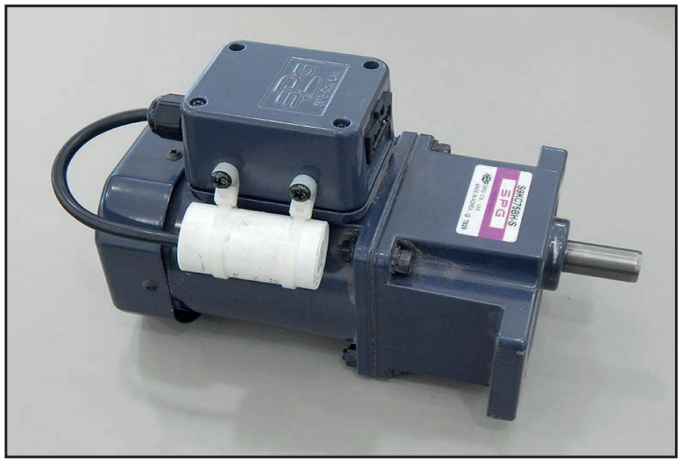


❒ Bend the plug"s contact blades up slightly (max. of 1-2 mm)

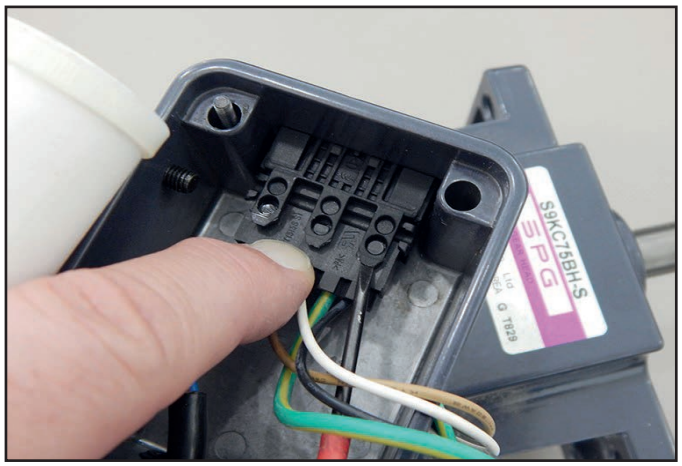
❒ Spray the tips of the contact blades with a thin layer of contact spray

❒ Re-assemble the unit in reverse order

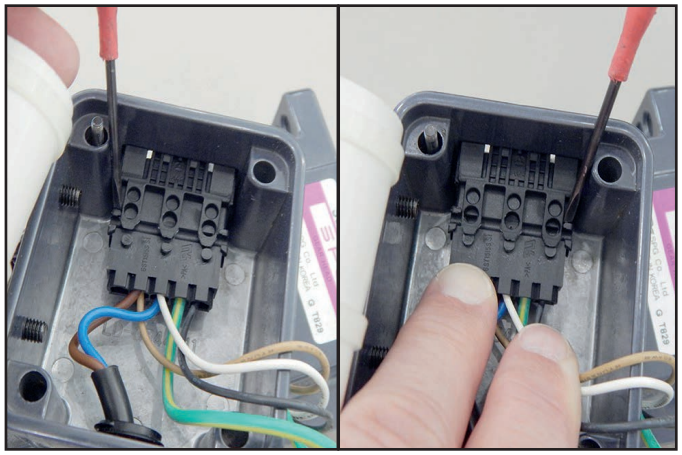
4 Changing the stoker motor capacitor



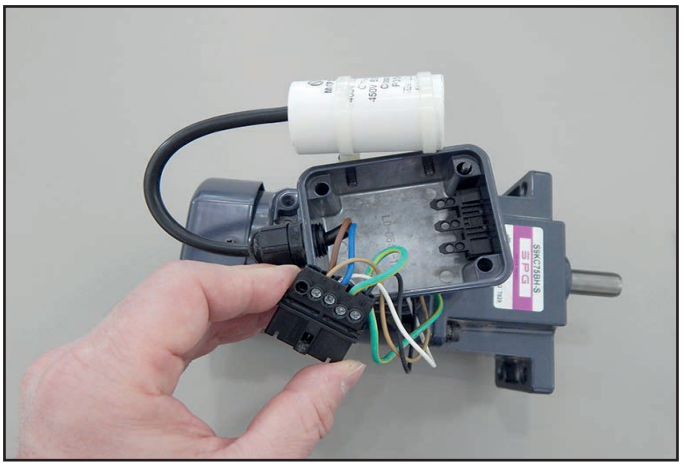
❒ Remove the cover and turn it over



❒ Press the plug down and carefully bend all three retaining brackets upwards
→ If the plug is not pressed down, the retaining brackets will immediately click into place again
→ There are no retaining brackets on the other side of the plug



❒ Carefully lever out the plug using the projections at the side



❒ Loosen the terminals and remove the capacitor

❒ Connect the new capacitor and click the plug back into place
❒ Put on the cover
❒ Turn the capacitor”s holder so it is pointing upwards

❒ Install the new capacitor
❒ Check the motor”s direction of rotation

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Chapter IV: Parameters

1 Parameter list - Service

Menu	Description	Default
	J - GSM	
J1	Waiting time - SMS alert	5 Min
J2	GSM module - alarm - reset	No
J3	Time to clear	10 Min
J4	Auto Reset GSM	Auto Reset YES
J5	Send notices via SMS	Yes
	K - Boiler	
K1	Combustion - minimum output	30 %
K2	Combustion - maximum heat output	100 %
K3s	Controller Exhaust fan speed - 100% output	**See end of chart**
K10	Minimum temperature with bypass	78 °C
K10a	Minimum temperature	78 °C
K10a_HT	Minimum temperature	78 °C
K11	Maximum temperature	85 °C
K11_HT	Maximum temperature	95 °C
K12	Temperature - hysteresis	15 °C
K12_HT	Temperature - hysteresis	5 °C
K13	Set temperature - superelevation	4 °C
K13_HT	Set temperature - superelevation	1 °C
K14	Flue gas temperature - error below	70 °C
K15	Time - flue gas temperature - error	15 Min
K20	TMF maximum temperature fuel storage room	60 °C
K21	TMS Temperature Note Stoker channel	65 °C
K21a	TMS temperature - error Stoker channel	70 °C
K21b	TMS temperature OK after notice/error	55 °C
K29	Max. board temperature exceeded	60 °C
K30	Test mode Set temperature	78 °C
K31	Test mode runtime	120 Min
K32	Test mode maximum power Full load	100 %
K32a	Boiler test mode maximum power Partial load	50 %
K40	Output limit during error	60 %
K51	PAF set in slumber mode	10 %
K51a	Exhaust fan set in slumber mode	10 %
K51b	PAF set off while lambda heating active	10 %
K51c	Exhaust fan set off while lambda heating active	10 %
K52	Boiler locked at 2x slumber mode within	30 Min
K52a	Duration - boiler locked at 2x slumber mode	60 Min
K54	Signal - water pressure at 0 bar	0 V
K55	Signal - water pressure at 10 bar	10 V
K56	Maximum demand HKR	75 °C
K57	Number of boiler starts within 24h below minimum runtime before info	10 x
K60	Boiler burnout exhaust fan ramp when O2 at least	10 %

Menu	Description	Default
K60a	Boiler burnout exhaust fan ramp duration	5 min
K60b	Boiler burnout exhaust after ramp	50 %
	L - Pumps	
L1	District line pump 1 Release temperature	58 °C
L2	District line pump 2 Release temperature	59 °C
L2a	Controlled district line pump Release temperature	59 °C
L3	Heat circuit pump 1 Release temperature	60 °C
L4	Heat circuit pump 2 Release temperature	61 °C
L4a	Heat circuit pump 3 Release temperature	62 °C
L4b	Heat circuit pump 4 Release temperature	63 °C
L4c	Heat circuit pump 5 Release temperature	62 °C
L4d	Heat circuit pump 6 Release temperature	63 °C
L4e	Heat circuit pump A Release temperature	62 °C
L4f	Heat circuit pump B Release temperature	62 °C
L4i	Heat circuit pump 1 release temperature	30 °C
L4j	Heat circuit pump 2 Release temperature	31 °C
L4k	Heat circuit pump 3 Release temperature	32 °C
L4l	Heat circuit pump 4 Release temperature	33 °C
L4m	Heat circuit pump 5 Release temperature	32 °C
L4n	Heat circuit pump 6 Release temperature	33 °C
L4o	Heat circuit pump A Release temperature	32 °C
L4p	Heat circuit pump B Release temperature	32 °C
L5	External heat circuits Release temperature	64 °C
L6	HWT pump 1 release temperature	62 °C
L7	HWT pump 2 release temperature	63 °C
L7a	HWT pump 3 release temperature	62 °C
L7b	HWT pump A release temperature	63 °C
L7c	HWT pump B release temperature	63 °C
L10	Return minimum	58 °C
L10a	Return - heat differential	**See end of chart**
L10b	Return Heat differential - auto setting range	5
L10c	Return pump release temperature	52 °C
L10d	Return Minimum heat differential	3 °C
L10e	Info pump setting due to heat differential Autoadapt after	0 h
L11	Back-end protection error below	50 °C
L11e	Open return mixer at first startup	40 %
L12	Time for error back-end protection	60 Min
L12a	Return mixer interval	10 sec
L12b	Return mixer Kp	1 sec
L12b_PB	Return Return mixer Tn	1.5 Sec
L12c	Return mixer Tn	20 sec
L12d	Return minimum mixer runtime	0.5 sec
L12e	Return maximum mixer runtime per interval	50 %
L13	Return pump - type	HE-pump
L23	Return return mixer for STB	Auto
L30	Return mixer at BTM Kp	3 sec

Menu	Description	Default
L30_PB	Return mixer at BTM Kp	0 sec
L31	Return mixer at BTM Tn	45 sec
L40	Output limit at return increase over	0.07 °C/s
L41	Return Output limit - controller Kp	2.5
L42	Return Output limit - controller Tn	10 sec
L43	Return Controller off at BT diff. higher than	10 °C
L51	Return Controller - accumulator 3F/5F Kp	0.7
L52	Return Controller - accumulator 3F/5F Tn	300 sec
L53	Return -controller - accumulator 3F/5F Tv	125 sec
L54	Return Controller accumulator 3F/5F T1	125
L55	Return Controller - output minimum	30 %
L60	PHE differential temperature for mixer	1 °C
L61	PHE minimum mixer runtime	0.3 Sec
L62	PHE Mixers open at first start-up	40 %
M - Heat circuits		
M1	All heat circuits Heat circuit pumps on above boiler temperature	92 °C
M1_HT	All heat circuits Heat circuit pumps on above boiler temperature	98 °C
M1a	All heat circuits Outside temperature for safety circuit	-10 °C
M2	All heat circuits Residual heat until boiler below	40 °C
M2a	All heat circuits	Residual heat several times
M3	All heat circuits Boiler superelevation according to flow temperature	10 °C
M4	Heat circuit 1 Factor - room influence Remote control	1
M5	Heat circuit 2 Factor - room influence Remote control	1
M5a	Heat circuit 3 Factor - room influence Remote control	1
M5b	Heat circuit 4 Factor - room influence Remote control	1
M5c	Heat circuit 5 Factor - room influence Remote control	1
M5d	Heat circuit 6 Factor - room influence Remote control	1
M5e	Heat circuit A Factor - room influence Remote control	1
M5f	Heat circuit B Factor - room influence Remote control	1
M6	All heat circuits Superelevation room temperature Room controller	1 °C
M6a	All heat circuits Hysteresis room temperature Room controller	0 °C
M7	All heat circuits Reduction delay	15 Min
M8	Heat circuit 1 Minimum mixer runtime	0.3 sec
M9	Heat circuit 2 Minimum mixer runtime	0.3 sec
M9a	Heat circuit 3 Minimum mixer runtime	0.3 sec
M9b	Heat circuit 4 Minimum mixer runtime	0.3 sec
M9c	Heat circuit 5 Minimum mixer runtime	0.3 sec
M9d	Heat circuit 6 Minimum mixer runtime	0.3 sec
M9e	Heat circuit A Minimum mixer runtime	0.3 sec
M9f	Heat circuit B Minimum mixer runtime	0.3 sec
M10	External HC	without outside temperature
M11	All heat circuits Proportional coefficient	100 %
M12	All heat circuits Differential temperature for mixer	1 °C
M14	Controlled district line Differential temperature for mixer	1 °C

Menu	Description	Default
M15	Controlled district line minimum mixer runtime	0.3 sec
M16	Error detection - mixer/pump	not activated
	N - HWT	
N1	HWT pump on when boiler temperature above	90 °C
N1_HT	HWT pump on when boiler temperature above	98 °C
N2	Differential temperature for HWT pump	1 °C
N3	HWT priority - factor	1
N4	HWT pump - post-run - residual heat	5 °C
N5	Boiler superelevation Legionella protection	5 °C
N6	All HWTs Residual heat	Residual heat several times
N7	Boiler superelevation during HWT loading	10 °C
N15	All HWTs - info "HWT is not reaching accumulator temperature" after (0 = inactive)	2 h
	O - Accumulator / External heat	
O1-Set	Superelevation - heat circuit set temperature	5 °C
O2	Hysteresis - heat circuit set temperature	5 °C
O3-Set	Superelevation - HWT temperature	5 °C
O4	Hysteresis - HWT temperature	1 °C
O5	Base temperature boiler - accumulator	58 °C
O6	Differential temperature	5 °C
O6_HT	Differential temperature	1 °C
O9	HWT difference control	ON
O10	External heat Switch-on temperature	60 °C
O11	External heat Heat differential	2 °C
O12	External heat Lock time	15 Min
O13	Accumulator Residual heat until boiler temperature below	65 °C
O14_HT	Accumulator Accumulator loading until TAT	90 °C
O30	Outlet temperature - superelevation - shutdown - pump	12 °C
O31	Outlet temperature - hysteresis	6 °C
O32-Set	Control - PWM pump - minimum	18 %
O33	Control - PWM pump - maximum	95 %
O33a	Control - PWM pump - maximum	90 %
O33b	Pump-cycle duration at minimum output	5 sec
O34	Accumulator loading - superelevation - demand FWS	5 °C
O35-Set	Accumulator loading - hysteresis FWS	5 °C
O36	Interpolation factor	3
O36a	Pump starting output scaling	1
O36b	Pump starting output scaling	0.85
O43-Set	I_AntiWindUp	2.5
O43a	I_AntiWindUp	2.5
O44	D_MaxFilterFrame	8
O46-Set	FWS primary circulation	No
O46a	Primary circulation - runtime	10 sec
O46b	Primary circulation - downtime	30 min

Menu	Description	Default
O46c	FWS primary circulation	ON 06:00 11:00 OFF 08:00 13:00
O47-Set	FWS primary circulation	No
O47a	Primary circulation - runtime	10 sec
O47b	Primary circulation - downtime	30 min
O47c	FWS primary circulation	ON 06:00 11:00 OFF 08:00 13:00
O48-Set	FWS primary circulation	No
O48a	Primary circulation - runtime	10 sec
O48b	Primary circulation - downtime	30 min
O48c	FWS primary circulation	ON 06:00 11:00 OFF 08:00 13:00
O49-Set	FWS primary circulation	No
O49a	Primary circulation - runtime	10 sec
O49b	Primary circulation - downtime	30 min
O49c	FWS primary circulation	ON 06:00 11:00 OFF 08:00 13:00
P - Ignition		
P1	Ignition timeout	25 min
P2s	Ignition Firebed-set at ignition wood chips / pellets / loose miscanthus / wood shavings	35 °C
P3	Exhaust fan maximum upon ignition ON	75 %
P4	Negative pressure set for ignition	105 Pa
P5	Hysteresis firebed level	1 °C
P6	Exhaust fan when kindling	90 %
P6a	Ignition exhaust fan until combustion chamber filling completed	30 %
P7	Heat-up time	0 sec
P10	Second ignition attempt after	7 Min
P11	FBS superelevation	5 °C
P12	Negative pressure superelevation	10 Pa
P14	Number of ignition attempts	4
P15	Stoker - backwards before reinsertion	2 sec
P16	Minimum delivery rate from second ignition attempt	40 %
P20	Ignition connection monitoring for ignition	Yes
P30	Ignition on at O2 >	20.00 %
P31	Delta O2 ignition off	1.00%
P40	FGT - transition - combustion	100 °C
P41	Flue gas temperature increase	20 °C
P42	O2 maximum for transition to combustion	16.00 %
P43	Time O2 maximum for transition to combustion	10 sec
P44	Primary air at transition to combustion	100 %
P45	Ramp - transition - combustion	120 sec
P46	TCC transition combustion	250 °C
P50	Delivery rate ignition at defective FBS	40 %
P51	Stoker runtime ignition with defective FBS	180 sec
P60	Max. O2 decrease for PAF closed	-0.22 %
P61	PAF CLOSED for	10 sec

Menu	Description	Default
P62	Interval for max. O2 decrease	10 sec
P63	Stoker delay during ignition by	7 sec
P64	Exhaust fan and PAF delay during ignition by	0 sec
Q - Ash extraction		
Q1	Minimum runtime - combustion	60 min
Q2s	Maximum runtime combustion pellets	300 min
Q3s	Minimum burnout time pellets	20 min
Q3s	Maximum burnout time pellets	20 min
Q3as	Maximum burnout time pellets	60 min
Q3b	Mean value O2-burnout finished	20 %
Q3c	Number of burnouts with maximum time before warning	0
Q4s	Exhaust fan maximum for burnout	90 %
Q5	Firebed reduction prior to burnout	10°
Q6	Grate - motor type	SPG
Q7	Initiator ash impulses forward	6
Q7a	Initiator ash impulses	2
Q8	Initiator ash impulses return	3
Q8a	Break time of ash auger during suction	2.5 Sec
Q10s	Initiator ash auger impulses for pellets	14
Q11	Max. motor current - de-ash	2.5 A
Q11a	Maximum motor current - de-ash single-phase	3.2 A
Q12	Nominal motor current - de-ash	1.2 A
Q12a	Nominal motor current - de-ash single-phase	2.2 A
Q12z	AE connection monitoring	Yes
Q13a	Maximum motor current ash auger system 0.18kW	0.9 A
Q13aa	Maximum motor current ash auger system 0.25kW	2.5 A
Q13b	Nominal motor current ash auger system 0.18 kW	0.75 A
Q13ba	Nominal motor current ash auger system 025 kW	1.2 A
Q13c	De-ash number of revolutions for ash auger system pre-run	5 R
Q13d	De-ash number of revolutions for ash auger system post-run	5 R
Q13e	Ash auger system - number of return runs	3 x
Q13f	Number of revolutions for return runs	9 R
Q13g	Duration overcurrent at motor	1 sec
Q15	Ash motor number - return runs	3 x
Q19	Tolerance FBSset - major de-ash	10°
Q20s	Delay - grate turn pellets	20 Sec
Q21s	Grate rounds pellets	1
Q22	Downtime for major de-ash	60 min
Q23s	Number before a forced de-ash for pellets	2
Q24c	Grate motor - runtime 1 revolution	23 sec
Q25	Maximum motor current - rotary grate	160 mA
Q26	Grate motor - return time	10 sec
Q28	Poke at burnout every	0 sec
Q30	Grate opening	0°
Q31	Primary air de-ash	0 %
Q32	Controller - tertiary air - burnout	0 %

Menu	Description	Default
Q33	Controller - tertiary air - de-ash	0 %
Q35	Repeated grate blockage removal attempts	1 x
Q35a	Interval between repeated grate blockage removal attempts	5 Min
Q37	Max. number of grate blockages during a de-ash	8x
Q49	De-ash during "Ash suction lock time" in ash box	Yes
Q49a	Issue warning after number of de-ash cycles in ash box	25x
Q50	Ash suction - number de-ash cycles	1 x
Q51s	Time ash suction wood chips / pellets / loose miscanthus / wood shavings	90 Sec
Q52s	Exhaust fan during de-ash	0 %
Q52a	Pre-/post-run time ash suction turbine	5 Sec
Q53	Number of ash suction cycles per de-ash	2
Q54	Version - ash suction	Version 3
Q55	Ash auger active after error	No
Q56	Rotate grates sequentially	No
Q56a	SG opening during minor de-ash	10°
Q56b	SG opening during major de-ash	120°
Q57	Angle of grate open for blockage removal without blockage detection	10°
Q58	Attempts to open grates during blockage removal without blockage detection	6
Q68	Holding torque of grates for a blockage	36 Nm
Q69	Torque - rotary grates	55 Nm
Q70	Torque - rotary grates - blockage removal	56 Nm
Q70a	Holding torque rotary grates	20 Nm
Q70b	Tolerance - position - rotary grates	2°
Q76	Minimum speed - grates - regular run	6 °C/s
Q76a	Minimum speed - grates - blockage removal	0.5 °C/s
Q76b	Minimum speed - grates @60Nm	0.2 °C/s
Q77	De-ash blockage check tolerance	10°
Q80	De-ash ABS function - boiler	active
Q82 - Q98a	Parameters for boiler eCleaner	See eCleaner operating manual
R - Stoker unit / Fuel extraction		
R0	Stoker - motor	ABM
R1s	Firebed set value pellets	60°
R2	Delivery rate warning period	45 min
R3	Break for blockage removal	3 pulses
R4	Ramp firebed set level during combustion transition	15 Min
R9	Stoker - delivery rate [kg/h]	**See end of chart**
R9a	Info when storage level reached	1000 kg
R9b	Info when storage level reached	15 m³
R9c	Fuel consumption per hour - runtime FE	0.3 m³
R10	Maximum motor current - stoker	0.8 A
R10a	Maximum motor current - stoker	0.8 A
R11	Nominal motor current - stoker	0.5 A
R11a	Nominal motor current - stoker	0.5 A

Menu	Description	Default
R13	Maximum return time - stoker	15 sec
R15	Rotary valve motor	0.37 kW
R16	Maximum motor current rotary valve (0.18kW)	1.1 A
R16a	Maximum motor current rotary valve (0.25kW)	1.6 A
R16b	Maximum motor current rotary valve (0.37kW)	1.7 A
R16c	Maximum motor current rotary valve (0.55kW)	2.5 A
R16d	Maximum motor current rotary valve (0.75kW)	3 A
R16e	Maximum motor current rotary valve (special motor)	1.1 A
R17	Nominal motor current rotary valve (0.18kW)	0.7 A
R17a	Nominal motor current rotary valve (0.25kW)	1.2 A
R17b	Nominal motor current rotary valve (0.37kW)	1.4 A
R17c	Nominal motor current rotary valve (0.55kW)	1.7 A
R17d	Nominal motor current rotary valve (0.75kW)	2 A
R17e	Nominal motor current rotary valve (special motor)	0.7 A
R20	Maximum interval duration when trigger time is not reached	30 Sec
R20s	Stoker cycle pellets	30 Sec
R21	Automatic filling - min. stoker auger runtime for suction	90 min
R22	Fill RAS - max. fill time	25 Min
R22a	Fill RAD - max. fill time	10 min
R22b	RAS filling - maximum filling time Schellinger	45 min
R23	Extraction auger delay at suction	5 Sec
R24	Fill RAS - follow up time vacuum turbine	10 Sec
R24a	RAS filling - backward running after suction - activation only in combination with freewheel clutch RAS	0.0 Sec
R24b	RAS filling Schellinger Classic suction turbine follow-up time	10 Sec
R24c	RAS filling Schellinger E3 suction turbine follow-up time	20 Sec
R25	Fill RAS - delay indication limiter	5 Sec
R25a	Fill RAD - follow up time extraction auger	20 Sec
R26	Auto change unit - max. suction time	20 min
R26a	AUP changeover unit limit for blockage detection	60 %
R27	Auto change unit - min. speed	0.3
R27a	Changeover unit Pos.1 Set	2.5 mm
R27b	Changeover unit Pos.2 Set	67.5 mm
R27c	Changeover unit Pos.3 Set	132.5 mm
R27d	Changeover unit Pos.4 Set	197.5 mm
R27e	Changeover unit Pos.5 Set	262.5 mm
R27f	Changeover unit Pos.6 Set	327.5 mm
R27g	Changeover unit Pos.7 Set	392.5 mm
R27h	Changeover unit Pos.8 Set	457.5 mm
R28a	Changeover unit Pos.1 Set	6
R28b	Changeover unit Pos.2 Set	71
R28c	Changeover unit Pos.3 Set	136
R28d	Changeover unit Pos.4 Set	198
R29a	Changeover unit length of AUP 2 positions	135.0 mm
R29b	Changeover unit length of AUP 3 positions	135.0 mm
R29c	Changeover unit length of AUP 4 positions	200.0 mm

Menu	Description	Default
R29d	Changeover unit length of AUP 6 positions	330.0 mm
R29e	Changeover unit length of AUP 8 positions	460.0 mm
R30	Agitator factor FE-delivery rate pellets	100 %
R31	Auto Adapt - FE-delivery rate	Available
R32	Factor - FE-delivery rate - auto setting range	30%
R33	Current factor - FE delivery rate	70 %
R35	Connection monitoring FE	Yes
R35a	Fuel extraction system Connection monitoring FE2	Yes
R40	Maximum motor current FE (0.18kW)	3.2 A
R40a	Maximum motor current FE (0.25kW)	1.6 A
R40b	Maximum motor current FE (0.37kW)	1.7 A
R40c	Maximum motor current FE (0.55kW)	2.5 A
R40c1	Maximum motor current FE (0.75kW)	3 A
R40c2	Maximum motor current FE (special motor)	3.2 A
R40d	Maximum motor current FE-2 (0.18kW)	3.2 A
R40e	Maximum motor current FE-2 (0.25kW)	1.6 A
R40f	Maximum motor current FE-2 (0.37kW)	1.7 A
R40g	Maximum motor current FE-2 (0.55kW)	2.5 A
R40g1	Maximum motor current FE-2 (0.75kW)	3 A
R40g2	Maximum motor current FE-2 (special motor)	3.2 A
R40h	RAS extraction auger Maximum motor current FE (RAS)	3.2 A
R40i	Extrac. auger RAD max. motor current FE (RAD)	1.6 A
R40j	RAS extraction auger Maximum motor current FE (RAS 3~)	2.5 A
R41	Nominal motor current FE (0.18kW)	2 A
R41a	Nominal motor current FE (0.25kW)	1.2 A
R41b	Nominal motor current FE (0.37kW)	1.4 A
R41c	Nominal motor current FE (0.55kW)	1.7 A
R41c1	Nominal motor current FE (0.75kW)	2 A
R41c2	Nominal motor current FE (special motor)	2 A
R41d	Nominal motor current FE-2 (0.18kW)	0.7 A
R41e	Nominal motor current FE-2 (0.25kW)	1.2 A
R41f	Nominal motor current FE-2 (0.37kW)	1.4 A
R41g	Nominal motor current FE-2 (0.55kW)	1.7 A
R41g1	Nominal motor current FE-2 (0.75kW)	2 A
R41g2	Nominal motor current FE-2 (special motor)	0.7 A
R41h	RAS nominal motor current FE (RAS)	2 A
R41i	RAD nominal motor current FE (RAD)	0.75 A
R41j	RAS nominal motor current FE (RAS 3)	1.2 A
R42	Return time fuel extraction system FE	1 sec
R49	Connection auger Tno.10/11/12 option 1 Motor	0.55 kW
R49a	Connection auger Tno.10/11/12 Connection monitoring VBS	Yes
R50	Connection auger Maximum motor current (0.18kW)	1.1 A
R50a	Connection auger Maximum motor current (0.25kW)	1.6 A
R50b	Connection auger Maximum motor current (0.37kW)	1.7 A
R50c	Connection auger Maximum motor current (0.55kW)	2.5 A
R50d	Connection auger Maximum motor current (0.75kW)	3 A

Menu	Description	Default
R50e	Connection auger Maximum motor current (special motor)	1.1 A
R51	Connection auger Nominal motor current connection auger	0.7 A
R51a	Connection auger Nominal motor current (0.25kW)	1.2 A
R51b	Connection auger Nominal motor current (0.37kW)	1.4 A
R51c	Connection auger Nominal motor current (0.55kW)	1.7 A
R51d	Connection auger Nominal motor current (0.75kW)	2 A
R51e	Connection auger Nominal motor current (special motor)	0.7 A
R52	Connection auger connection auger return time	10 Sec
R52a	Connection auger Tno.10/11/12 Minimum runtime motor option 1	1 Sec
R53r/s/t/u	Connection auger Factor connection auger delivery rate wood chips / pellets / miscanthus / wood shavings	100 %
R54	Vertical connection auger CAN address 6 2 motor	0.55 kW
R54aa	Vertical Connection-Auger CAN-Adr.6 S-VBS connection monitoring	Yes
R54a	Vertical connection auger CAN address 6 Maximum motor current (0.18kW)	1.1 A
R54b	Vertical connection auger CAN address 6 Maximum motor current (0.25kW)	1.6 A
R54c	Vertical connection auger CAN address 6 Maximum motor current (0.37kW)	1.7A
R54d	Vertical connection auger CAN address 6 Maximum motor current (0.55kW)	2.5 A
R54e	Vertical connection auger CAN address 6 Maximum motor current (0.75kW)	3 A
R54f	Vertical connection auger CAN address 6 Maximum motor current (special motor)	1.1 A
R55	Vertical connection auger CAN address 6 nominal Motor current (0.18kW)	0.7 A
R55a	Vertical connection auger CAN address 6 Nominal motor current (0.25kW)	1.2 A
R55b	Vertical connection auger CAN address 6 Nominal motor current (0.37kW)	1.4 A
R55c	Vertical connection auger CAN address 6 Nominal motor current (0.55kW)	1.7 A
R55d	Vertical connection auger CAN address 6 Nominal motor current (0.75kW)	2 A
R55e	Vertical connection auger CAN address 6 Nominal motor current (special motor)	0.7A
R56	Vertical connection auger CAN address 6 Return time	10 Sec
R57s	Vertical connection auger CAN address 6 Factor delivery rate	100%
R58	Vertical connection auger CAN address 6 Maximum duration - over-current	1 sec
R58a	Vertical connection auger CAN address 6 Return at overcurrent	3 sec
R58b	Vertical connection auger CAN address 6 Motor maximum number of attempts at overcurrent	3
R60	Stoker reduction for the FBS	15°
R60a	Stoker empty run during burnout (0 = deactivated)	10°
R60b	Stoker delivery rate during slumber mode (0 = deactivated)	10 %

Menu	Description	Default
R61	Time - overfill	30 sec
R62	Delivery rate when overfilled	70 %
R63	Overfill-stop off if below FBS set	0°
R64	Delivery rate reduction after overfilling	90 %
R65	Delivery rate at TMS	10 %
R70	Distribution box / common agitator Agitator motor	0.18 kW
R70a	Distribution box / common agitator Maximum motor current agitator (0.18kW)	1.1 A
R70b	Distribution box / common agitator Maximum motor current agitator (0.25kW)	1.6 A
R70c	Distribution box / common agitator Maximum motor current agitator (0.37kW)	1.7 A
R70d	Distribution box / common agitator max. motor current agitator (0.55 kW)	2.5 A
R70e	Distribution box / common agitator Maximum motor current agitator (0.75kW)	3 A
R70e1	Distribution box / common agitator Maximum motor current agitator (special motor)	1.1 A
R70f	Distribution box / common agitator nominal Motor current agitator (0.18kW)	0.7 A
R70g	Distribution box / common agitator nominal Motor current agitator (0.25kW)	1.2 A
R70h	Distribution box / common agitator nominal Motor current agitator (0.37kW)	1.4 A
R70i	Distribution box / common agitator nominal Motor current agitator (0.55kW)	1.7 A
R70j	Distribution box / common agitator nominal Motor current agitator (0.75kW)	2.0 A
R70j1	Distribution box / common agitator nominal motor current for agitator (special motor)	0.7 A
R71b	Distribution box / common agitator Motor - duration overcurrent	1 sec
R71c	Distribution box / common agitator Motor - duration - return run at overcurrent	3 sec
R71d	Distribution box / common agitator Motor maximum number of attempts at overcurrent	3
R71e	Distribution box / common agitator Motor runtime	100%
R71f	Distribution box / common agitator Motor pulsing	10 sec
R71g	Distribution box Motor - runtime - filling	50 %
R71h	Distribution box Post-run time - agitator - emptying	40 sec
R71i	Distribution box - initiator top - detection time	15 sec
R71j	Distribution box - initiator bottom - detection time	30 sec
R71k	Distribution box filling time exceeded, warning after (0 = deactivated)	2 h
R71l	Distribution box Rotation after one hour at a standstill for (0 = deactivated)	15 sec
R71m	Distribution box start filling at	400 mm
R71n	Distribution box stop filling at	200 mm

Menu	Description	Default
R71o	Distribution box - initiator - emergency programme after (0 = deactivated)	2 h
R71p	Distribution box Container depth	55cm
R71q	Distribution box Info - change in value - ultrasonic sensor	5 sec
R72a	Distribution box Number of filling cycles before an empty run is performed	10
R72b	Distribution box duration empty run before filling cycle	5 min
R72s	Distribution box Motor - runtime - agitation	15 5
R73	Distribution box connection monitoring VTB	Yes
R73a	Distribution box Measuring range minimum	0 V
R73b	Distribution box Measuring range minimum	12cm
R73c	Distribution box Measuring range maximum	10 V
R73d	Distribution box Measuring range maximum	100cm
R79	Mole Schellinger Mole - trigger time	120 Sec
R79a	Mole Schellinger Mole - break time	5 Sec
R79b	Mole Schellinger E3 - trigger time	60 Sec
R79c	Mole Schellinger E3 - break time	15 Sec
S - Lambda sensor		
S1s	O2-set pellets	8 %
S2	Test mode - O2-set Full load	7 %
S3	O2-stop difference	3 %
S4	O2 increase partial load	1.40 %
S5	TCC max.	650 °C
S6	TCC - exceedance - O2 increase Kp	1
S7	TCC exceedance - O2 increase Tn	250 sec
S9	Exhaust fan during lambda calibration	60%
S10	Exhaust fan post-run until O2 over	18 %
S12	Lambda Default voltage lambda heating	8 W
S20	Lambda sensor	0.0 mV
S30	O2 warning when set level has not been reached after (0 = deactivated)	60 min
T - Control		
T1	Flue gas temperature - minimum	100 °C
T2	Flue gas temperature - maximum	200 °C
T3	Flue gas temperature - limiter Kp	1
T4	Flue gas temperature - limiter Tn	250 sec
T5	Correction - flue gas temperature at 150 C	-10°C
T10	Boiler temperature - controller Kp	2
T10_HT	Boiler temperature - controller Kp	7
T11	Boiler temperature - controller Tn	600 sec
T12	Boiler temperature - controller Tv	100 sec
T13	Boiler temperature - controller T1	100
T14	Boiler temperature - controller xw_exp	1.5
T20	Delivery rate - firebed Kp	3
T21	Delivery rate - firebed Tn	140 sec
T22	Delivery rate - firebed z	0

Menu	Description	Default
T23	Delivery rate - firebed minimum	0
T24	Delivery rate - firebed maximum	150
T25	Delivery rate at defective FBS Kp	4
T26	Delivery rate at defective FBS Tn	120 sec
T27	Delivery rate at defective FBS minimum	0
T28	Delivery rate at defective FBS maximum	105
T30	Primary air (O2) Kp	4.5
T31	Primary air (O2) Tn	20
T32	Primary air (O2) Tv	5
T33	Primary air - factor - D-filter	2
T34	Primary air - negative boost	1
T35s	Primary air maximum pellets	100 %
T36	Primary air - defective lambda sensor	25 %
T36a	PAF maximum Kp (0 = deactivated)	1.5
T36b	PAF maximum Tn	80 sec
T36c	PAF maximum firebed set reduction	5 °C
T36d	PAF maximum controller active after	20 Min
T40	Negative pressure controller Kp	0.1
T41	Negative pressure controller Tn	4 sec
T42	Negative pressure controller Tv	0 sec
T50	Exhaust fan Kp	30
T51	Exhaust fan Tn	30 sec
T59a	Service sensor Minimum value - sensor SG	100
T59b	Service sensor Maximum value - sensor SG	920
T59c	Service sensor Minimum value - sensor AG	100
T59d	Service sensor Maximum value - sensor SG	920
T60	Stoker grate offset (L)	-45
T60a	Stoker grate offset (R)	45
T60d	Service sensor Step motor stoker grate offset (L)	45°
T60e	Service sensor Step motor stoker grate offset (R)	-45°
T61	Ash grate offset (L)	45
T61a	Ash grate offset (R)	-45
T61d	Service sensor Step motor ash grate offset (L)	135°
T61e	Service sensor Step motor ash grate offset (R)	-135°
T62	FBS offset (L)	190
T62a	FBS offset (R)	190
T63	0% TAF set at PAF	100 %
T64	100% TAF set at PAF	20 %
T65	0% TAF max. at output	30 %
T66	100% TAF max. at output	100 %
T67	TAF maximum - closing speed	10 %
T67a	TAF maximum closing speed in burnout	1.5 %
T70	Error air flap	Enabled
T80	Power box Controller ventilator - minimum speed	25 %
T80a	Power box Controller ventilator Kp	100 %
T80b	Power box Controller ventilator Tn	1.5

Menu	Description	Default
T80c	Power box Controller ventilator Tv	250 Sec
T80d	Power box Controller ventilator Tv	0 Sec
T81	PowerBox Duration Ramp warm-air module start	100 Sec
U - Negative pressure / exhaust fan		
U1	Negative pressure set at 30% exhaust fan	30 Pa
U2	Negative pressure set at 80% exhaust fan	150 Pa
U3	Negative pressure Kp	0.5
U4	Negative pressure Tn	20
U9	Filter factor negative pressure sensor	95 %
U10	Negative pressure limit warning/error	50 %
U11	Time until error	30 sec
U20	Exhaust fan - motor type	EC motor
U21	Exhaust fan max. RPM	3400
U22	Exhaust fan - speed - tolerance	30 %
W - Service		
W1	Warning for service	No
W2	Reset service	No
W3	Service Warning for full-load hours (0=inactive)	2000 h
W4	Service Warning for heating hours (0=inactive)	4000 h
W5	Info from	01.01.2017 01:00
W7	Service from	01.02.2017 01:00
W8	Service until	30.11.2017 01:00
W9	Info for boiler starts	3000 x
X - Service sensors		
X01	Service sensor stoker grate X0	0.5 V
X02	Service sensor stoker grate X1	4.5 V
X04	Service sensor ash grate X0	0.5 V
X05	Service sensor ash grate X1	4.5 V
X07	Service sensor firebed sensor X0	0.5 V
X08	Service sensor firebed sensor X1	4.5 V
X10	Service sensor negative pressure X0	0.5 V
X11	Service sensor negative pressure X1	4.5 V
X12	Service sensor primary flap X0	0.5 V
X13	Service sensor primary flap X1	4.5 V
X14	Service sensor tertiary flap X0	0.5 V
X15	Service sensor tertiary flap X1	4.5 V
Z - Special functions		
Z1j	Ash auger system	Not available
Z1yes	Ash auger system - motor	0.25 kW
Z1k	Power converter	Not available
Z1l	Timeout Loxone	30 sec
Z1m	S (IO-X10-104) extension control board 1	Not available
Z1n	S (IO-X10-104) extension control board 2	Not available
Z1na	DAQ output - sensor board 2	No selection
Z1o	Distribution box / common agitator	Not available
Z1p	MBus addressing	Secondary address

Menu	Description	Default
Z1q	MBus baud rate	2400
Z1s	Bypass pump	Not available
Z1t	eCleaner	Not available
Z1u	MWZ03 DAQ channels	Not available
Z9a	Delete error list	No
Z9b	Clear infos	No
Z8	Commission no.	1
Z10	Error display - grate - sensor	No

Parameters for each boiler model		Eco-PK 70	Eco-PK 90	Eco-PK 100	Eco-PK 110	Eco-PK 120
K3s	Controller Exhaust fan speed - 100% output Pellets	75 %	85 %	90 %	95 %	100 %
L10a	Return - heat differential	16 °C	20 °C	17 °C	18 °C	20 °C
R9	Delivery rate [kg/h]	27.9	27.9	41.2	41.2	41.2

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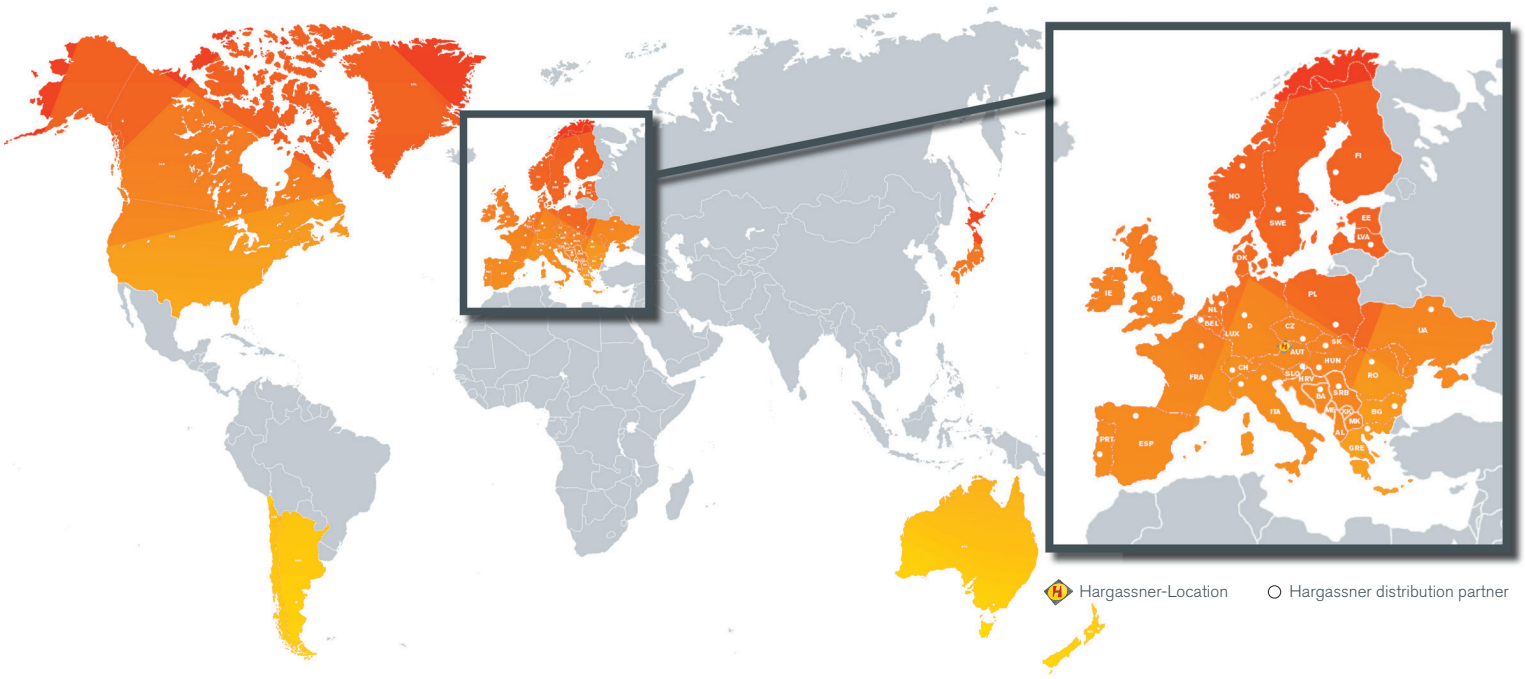

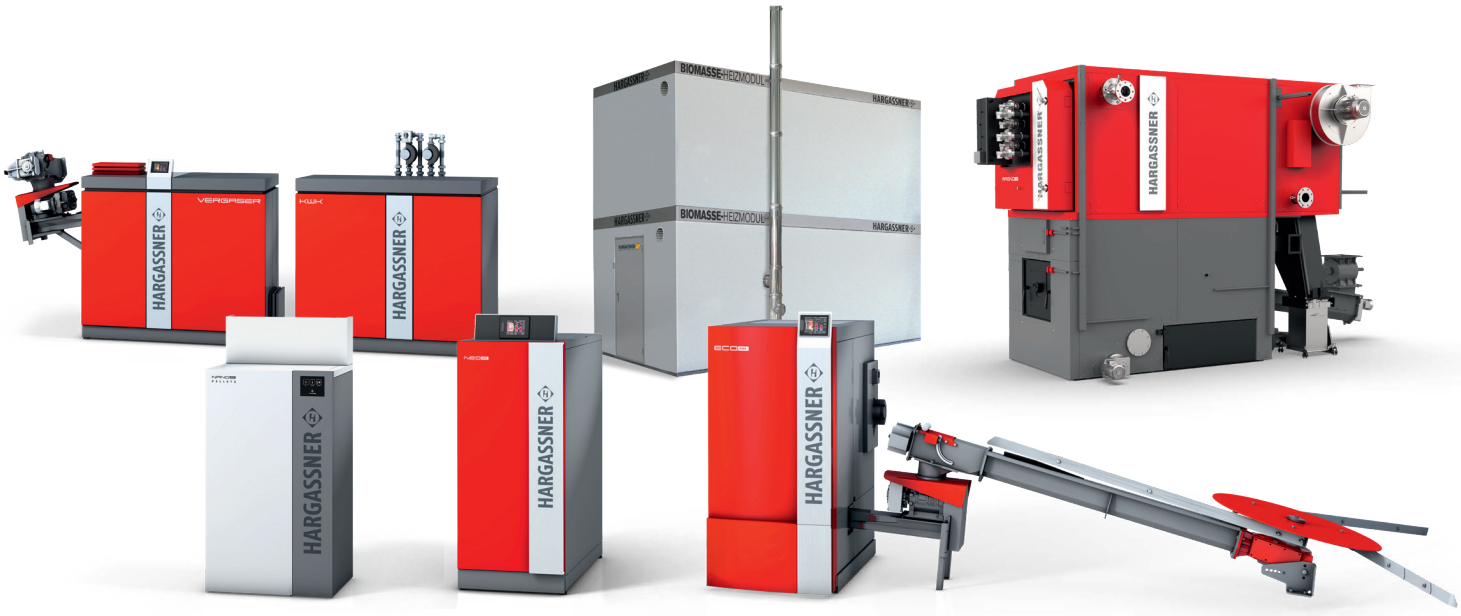

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