

## Operating Instructions



*Turbomat 320/500*

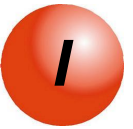


*Read and follow the operating instructions and safety information.*

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**Dear Customer,**

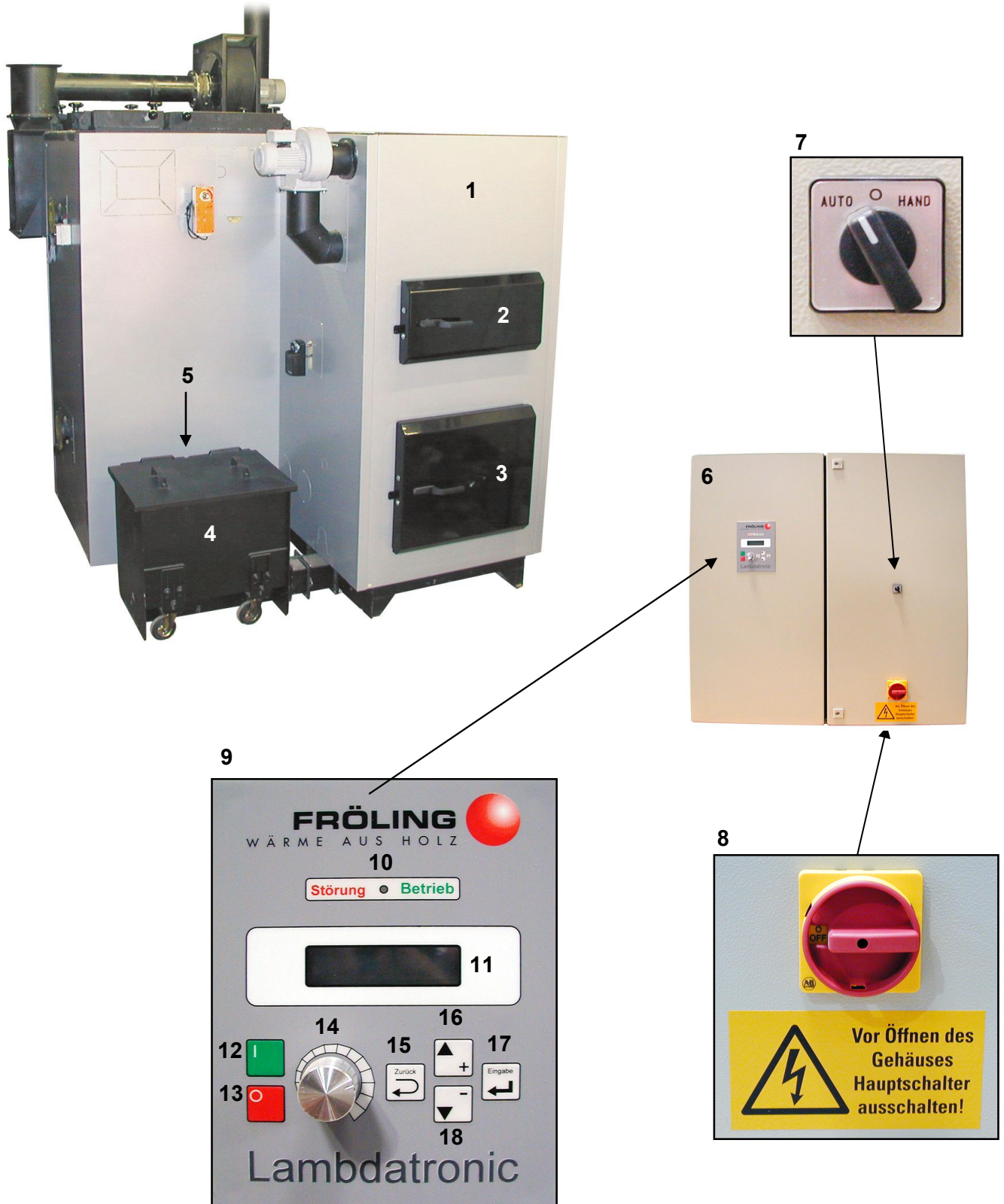
Congratulations on choosing a quality product from FRÖLING.

The FRÖLING Turbomat is a state-of-the-art design that conforms to all currently applicable standards and testing guidelines.

Please read and observe the operating instructions and always keep them available in close proximity to the boiler. They contain safety information and all the operation and maintenance specifications needed to operate the boiler safely, properly, and economically.

## 1 Product overview

Pos.	Description
1	Waste wood boiler – Fröling Turbomat 320 kW or 500 kW
2	Tunnel door
3	Combustion chamber door
4	Mobile ashcan; Automatic ash removal - combustion chamber
5	Two-piece ashcan; Automatic ash removal - heat exchanger
6	Switch gear cabinet with integrated controller
7	Selector switch for induced draught fan: AUTO: The induced draught fan is switched on and off by the controller. 0: The induced draught fan is switched off. MANUAL: The induced draught fan is switched on and off by the operator and not by the controller.
8	Main switch: switches the system on and off
9	Lambdatronic H 3000 controller
10	LED indicating operating status: Long green blinking: boiler activated Short green blinking: boiler deactivated Red blinking: Fault
11	Two-row display showing: operating mode, operating status, parameters, ...
12	START key: switches on boiler
13	STOP key: switches off boiler
14	Temperature selector: selects temperature setpoint
15	BACK key: returns you to a previous menu, undoes a data entry
16	PLUS key: moves the arrow up, increases or activates a parameter
17	MINUS key: moves the arrow down, decreases or deactivates a parameter
18	ENTER key: takes you to a submenu, calls up or confirms entries



## 2 General information

### 2.1 Permitted uses

The boiler should only be operated when it is fully efficient. The boiler should be operated in accordance with the instructions given in this manual. Implement all the necessary safety precautions. Before you start using the boiler, make sure that you are aware of the potential hazards involved. Ensure that any malfunctions, which might impact safety are traced any removed immediately.

**The Turbomat is designed exclusively for heating domestic water. Only use the fuels specified below 2.1.1.**

**The manufacturer or supplier are not liable for any damages resulting from non-permitted uses.**

#### 2.1.1 Permitted fuel

**For Germany:** waste-wood conforming to 1. BImSchV of 15 July 1988

**For Austria:** waste-wood conforming to ÖNORM M 7133

	Designation	Description
Water content	W20	air dried
	W30	requires storage
	W35	requires limited storage
	W40	damp
	W50	wet
Size	G30	Fine waste-wood (for screw feeders)
	G50	Medium waste-wood (for screw feeders)
	G100	Large waste-wood (for hydraulic feeders only)

#### IMPORTANT

Corrosive deposits. Do not burn non-approved fuels. Do not operate at low temperatures which cause condensation. Burning non-approved fuels will cause a build up of corrosive deposits. Condensation also corrodes.



**Operating under these conditions will void your guarantee. May cause damage or corrosion in the combustion chamber.**

#### 2.1.2 Who May Operate the Boiler

Only trained operators are permitted to operate the boiler.

#### IMPORTANT

No unauthorized access to the boiler room.



**Hazard: Personal injury and damage to property.**

It is the responsibility of the operator to ensure that unauthorized persons, especially children, are kept away from the boiler.



## 2.2 Design information

As a rule, the operator is not authorized to modify or disable the safety equipment.

In addition to the operating instructions and the applicable regulations for the country in which the boiler will be operated, all fire, police, and electrical regulations must be observed.

### 2.2.1 Official approval and reporting obligations

#### NOTE

☐ **Each heating system must be officially approved.**

*In Austria:*

- New installations must be reported to the local building or police authorities.

*In Germany:*

- Report new installations to an approved chimney sweep and to the building authorities.

### 2.2.2 Domestic hot water requirements

There are no special requirements for domestic hot water supplies.

Applicable standards:

Austria:                   ÖNORM H 5195, ÖNORM H 5195-2

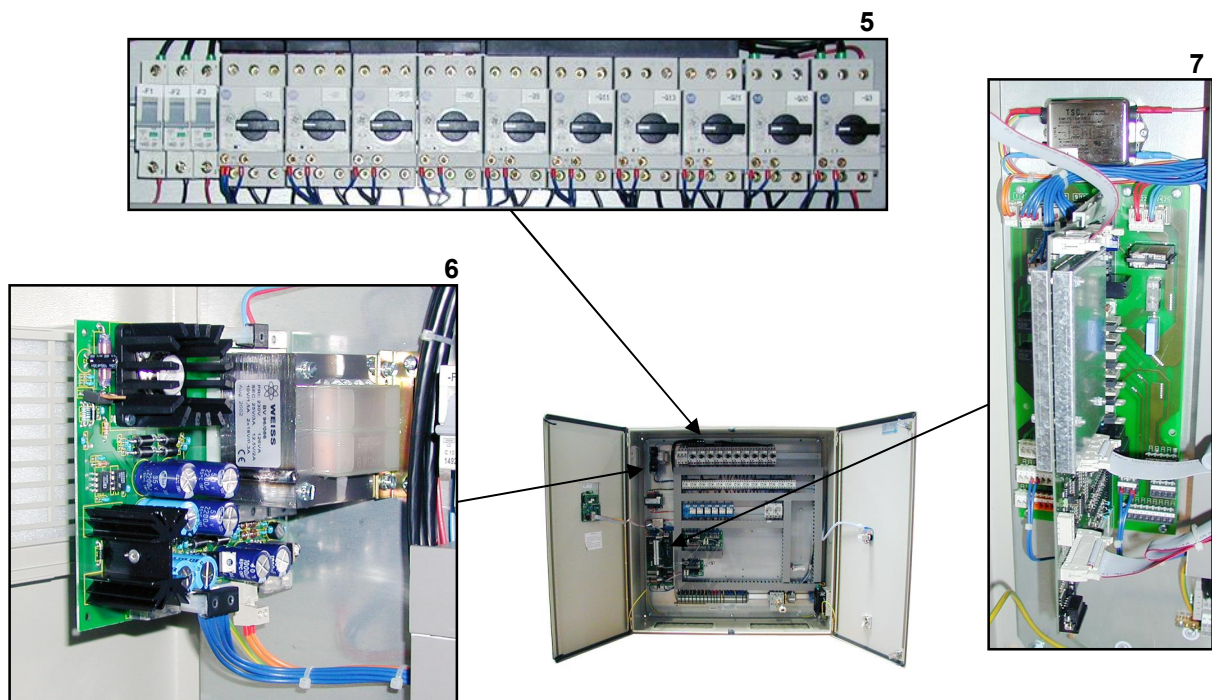
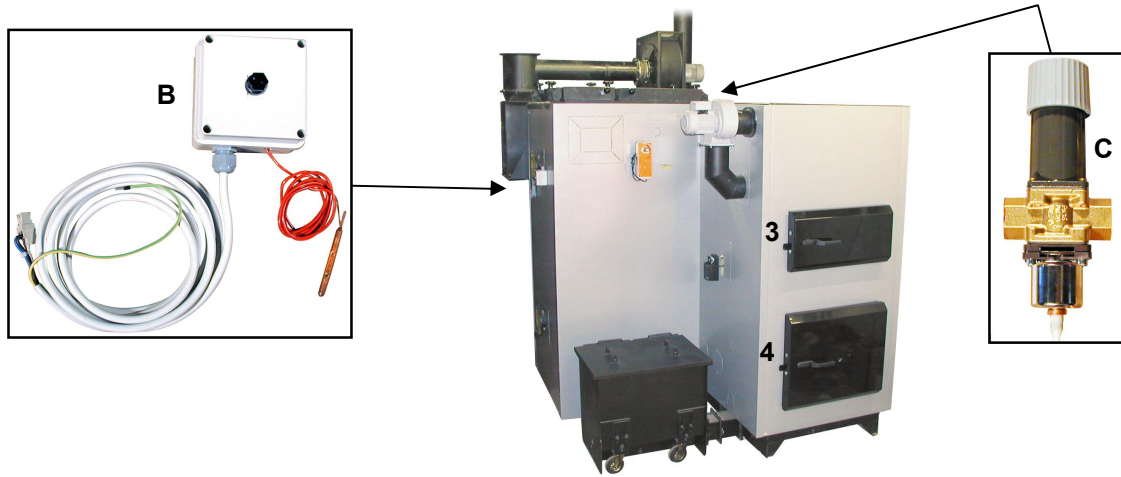
Germany:               VDI 2035

If the system is topped up or refilled:

Prepare (soften) the water to prevent boiler scaling.



## 2.3 Safety devices





Pos.	Component	Description
1	Main switch	Before maintenance: Switch off the entire system ⤴ All components are switched off and powered down
2	STOP key	In the event of over-heating, shuts down boiler ⤴ The pumps continue to run.  📄 <b>IMPORTANT: To stop heating operations, always use the STOP key only. Do not use the main switch.</b>
3	Door contact switch, tunnel door	If you open the door while the boiler is operating, switch the induced draught fan to full speed.
4	Door contact switch, combustion chamber door	
5	Safety overload switches, motor overload switch	Switch off the related component in the event of fault currents or overloads.
6	Power supply fuses	Properly fuse the control system and any electronic components  📄 When changing fuses, fit fuses with the rated current specified.
7	Motherboard fuses	
Devices for preventing the boiler from over-heating:		
A	Boiler controller	Switches the boiler off if the boiler temperature is set 5°C (standard) above the setpoint value.
B	Safety temperature limiter (STB)	Switches off the blower fan at the maximum boiler temperature of 100 °C. The pumps continue to run. Once the temperature falls to below 95 °C, the STB can be reset mechanically ⌚ Unscrew the cap on the safety temperature limiter ⌚ Using a screwdriver, press the reset button
C	Safety battery valve	Opens at a temperature of 105 °C and feeds cold water to the safety heat exchanger (safety battery).
D	Safety valve (not illustrated, provided by the customer)	When the boiler pressure is too high, the safety valve opens and vents off the hot water as steam.  📄 Before you start up the system again, top up the system to replace any water which has been lost through venting.

## 2.4 Residual risks

**IMPORTANT**

Do not touch hot surfaces and flue gas pipes.

**Burns hazard**

- ⑨ Only operate the boiler using the handles provided for this purpose.
- ⑨ Insulate the flue gas pipes or simply avoid touching them during operation.

**IMPORTANT**

Do not open the combustion chamber door during operation.

**Equipment damage hazard.**

Opening the door during operation will cause a loss of draught in the combustion chamber.

- ⚡ Flash fire hazard
- ⚡ Increase the speed of the induced draught fan to the maximum to compensate for any loss of draught. Dust can be sucked up by the chimney and expelled into the open air.

Take the following precautions:

- ⑨ Only open the door when a fault is present

Before starting any maintenance work:

- ⑨ Turn the induced draught selector switch to the "0" (OFF) position.
- ⑨ Switch off the boiler and allow it to cool down.

**IMPORTANT**

Do not use unauthorized fuel types.

**Equipment damage hazard.**

- ⑨ Only use permitted fuels.
- ✦ See 2.1.1 Permitted fuel

**IMPORTANT**

Failure to observe specified cleaning and maintenance intervals.

**Equipment damage hazard.  
This will void your guarantee.**

Failure to observe the specified cleaning and maintenance intervals can cause hazardous operating conditions (e.g. blow-back, flash fires).

- 📄 Your guarantee will not cover damage caused in these circumstances.



## 2.5 *Emergency actions*

If the system over-heats and the safety devices fail to operate, proceed as follows:

- ⑨ Close all the doors on the boiler.
- ⑨ Shut down the boiler by pressing the STOP key.

 **Do not use the main switch.**

- ⑨ Open all mixer taps. Switch on all pumps.
- ⑨ Leave the boiler room and close the door.
- ⑨ Try to increase heat consumption by turning on all radiators and other appliances.

If the temperature does not drop:

- ⑨ Contact an installer or Fröling Customer Service.
  - ✦ [See 6.3.1 Manufacturer's address](#)

## 3 Operating the system

### 3.1 Starting up for the first time

#### NOTE

- 📄 The initial start-up must be carried out by an authorized installer or by the Fröling Customer Service department.

#### 3.1.1 Checking the heating system

- ⑨ Check that there is sufficient water in the heating system.
- ⑨ Check that the heating system has been completely vented.
- ⑨ Check that all the safety devices are correctly fitted and are fully efficient.
  - ✦ See 2.3 Safety devices
- ⑨ Check that there is sufficient ventilation and venting.
  - ✦ See the set-up instructions for the Turbomat 320/500.

### 3.2 Heating up the boiler

#### 3.2.1 Switching on the system

- ⑨ Turn the mains switch (1) on the switch gear cabinet to ON.
  - ✦ When the controller has completed the self-test and system check, the boiler is ready for operation.



#### 3.2.2 Switching on the boiler

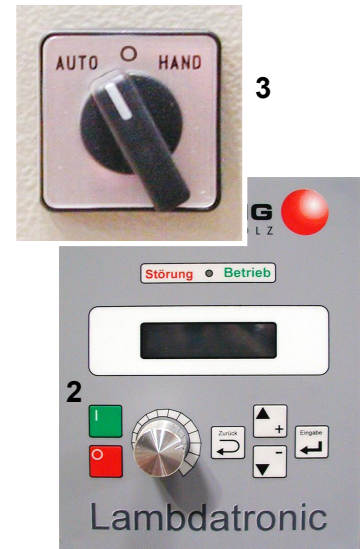
##### Heating with the automatic igniter

- ⑨ Press the START key (2).
- ✦ Fuel will be fed into the combustion chamber and heated by the igniter fan.
- ✦ The heating system is controlled via the control system according to the selected mode.



### Heating without the automatic igniter

- ⑨ Turn the induced draught selector switch (3) to the "0" position.
- ⑨ Open the combustion chamber door.
- ⑨ Place paper, cardboard or wood on the grate and ignite this.
- ⑨ Close the combustion chamber door.
- ⑨ Turn the induced draught selector switch (3) to the "AUTO" position.
- ⑨ Press the START key (2).
  - ⤴ The heating system is controlled via the control system according to the selected mode.



### 3.2.3 Controlling the boiler

Necessary control steps. Displaying or modifying parameters:

- ✦ See the instruction manual for the Lambdatronic H 3000.

### 3.2.4 Switching off the boiler

- ⑨ Press the STOP key (4).
  - ⤴ The boiler follows the shut-down program and switches to the "OFF" status.
  - ⤴ The heating system is no longer controlled via the control system.
- 📄 **Always stop the boiler using the STOP switch. The pumps must continue to run for 6 hours.**



### 3.2.5 Switching off the system

- 📄 **IMPORTANT! Only switch off when the boiler has cooled down.**
- ⑨ Switch off the main switch (1) on the controller.
  - ⤴ The controller is switched off.
  - ⤴ All the system components (drive, induced draught fan, pumps,...) are powered down.





## 4 Boiler maintenance

### IMPORTANT

Maintenance when the boiler is hot.



**Burns hazard. Hot components.**

Before starting maintenance on the boiler:

- ⑨ Shut down the boiler using the STOP key and allow it to cool down.
- ⑨ Turn the induced draught selector switch to the "0" position.

### IMPORTANT

Working on electrical components.



**Hazard - Risk of electric shock**

- ⑨ Shut down the boiler using the STOP key and allow it to cool down.
- ⑨ Switch off the main switch and take precautions to prevent accidental switching on.

 **Work on electrical components must only be carried out by authorized skilled electricians.**


### IMPORTANT

Failure to observe specified cleaning and maintenance intervals.



**Equipment damage hazard.  
This will void your guarantee.**

Failure to observe the specified cleaning and maintenance intervals can cause hazardous operating conditions (e.g. blow-back, flash fires).

 Your guarantee will not cover damage caused in these circumstances.

**IMPORTANT**

Cleaning the combustion chamber with the combustion chamber temperature sensor already mounted.



**Hazard. Risk of damage to thermocouple.**

Before you start to clean the combustion chamber:

- ⑨ Mark the position of the thermocouple.
- ⑨ Loosen the clamps and pull out the thermocouple.

After maintenance:


- ⑨ Carefully clean any tar or soot deposits from the thermocouple.
- ⑨ Re-insert the thermocouple to the position marked previously and fix in place with the clamps.

#### **4.1 Inspection, cleaning, and maintenance**



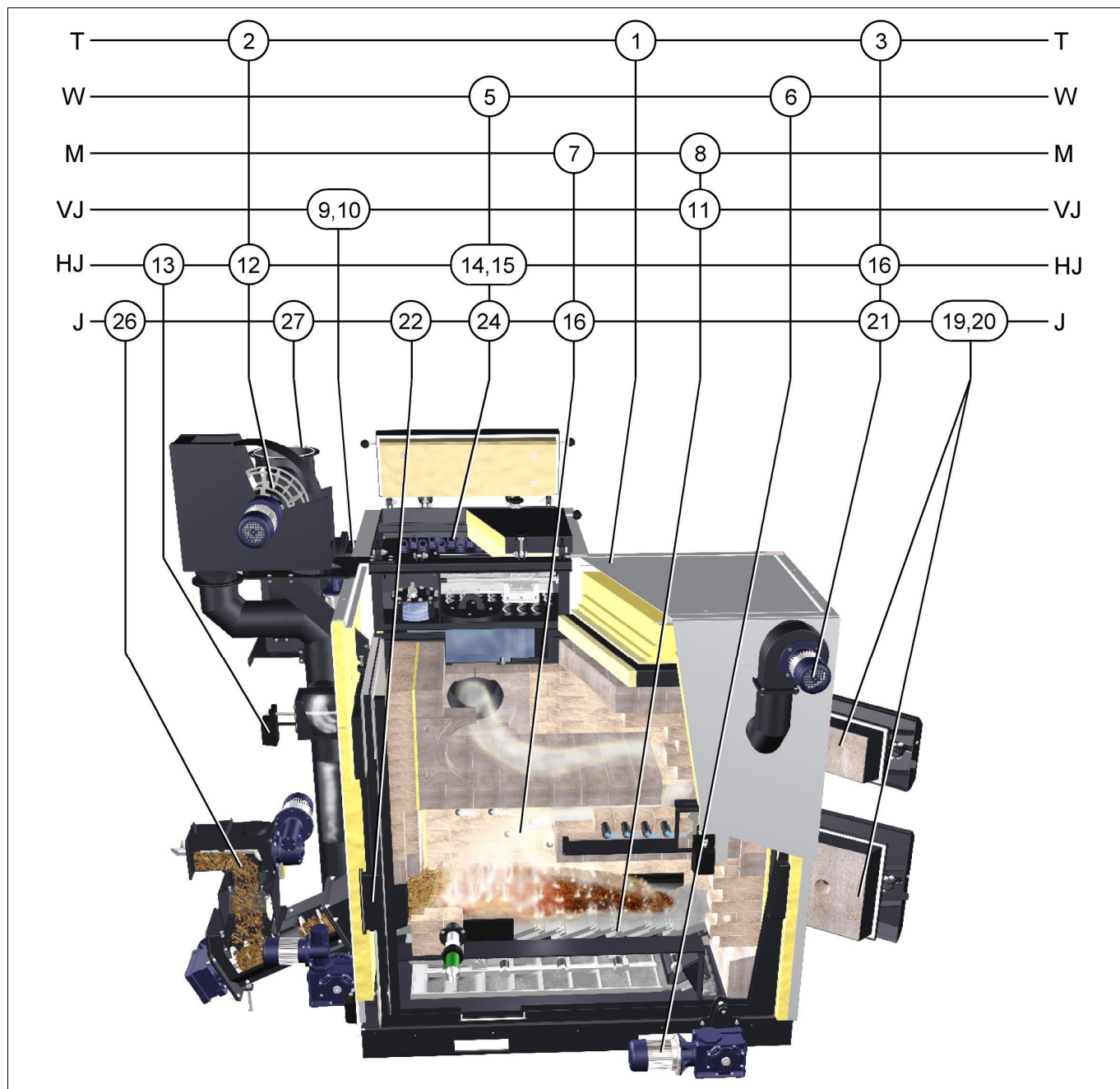
For cleaning and maintenance use the cleaning kit provided. The cleaning kit consists of:

- Chamber plate (triangular plate)
- Flat scraper
- Large brush (Ø 81 mm)
- Small brush (Ø 53 mm)

 We recommend that you also use an industrial vacuum cleaner.



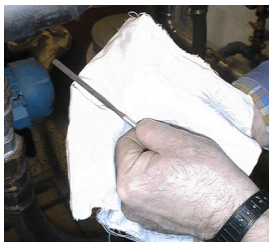




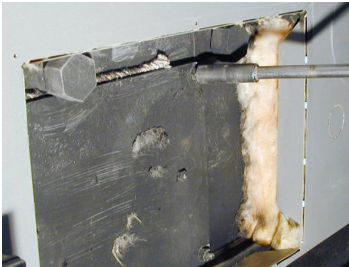


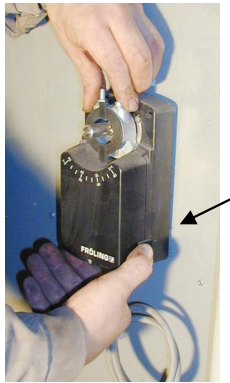
#### 4.1.1 Maintenance schedule for Turbomat 320



T(D) = Daily, W = Weekly, M = Monthly, VJ(3-M) = Every 3 months, HJ(6-M) = Every six months, J(Y) = Annually

No.	Component / Maintenance Operation		Interval
1	Chamber + heat exchanger	⑨ Overall visual inspection	D
2	Induced draught fan + flue gas return (FGR)	⑨ Clean all components where necessary	
3	Combustion air blower fan	📄 Change defective components immediately.	
4	Gear motors	⑨ Check all gear motors for oil leaks.	W
5	Heat-exchanger ash removal	⑨ Check the ash level.	
6	Ash removal chamber	⑨ Empty the ashcan where necessary. ✦ See page 23, Emptying the ash can	

No.	Component / Maintenance Operation	Interval
7	<p><b>Combustion chamber</b></p>  <ul style="list-style-type: none"> <li>⑨ Using the flat scraper and working from the tunnel door, pull the ash on the upper side of middle vault towards you.</li> <li>⑨ Using the flat scraper and working from the tunnel door, push the ash on the upper side of the lower vault towards the rear.</li> <li>⑨ Using the flat scraper, pull the ash on the combustion chamber grate towards you.</li> </ul> <ul style="list-style-type: none"> <li>⑨ On the "Test Mode" menu, switch on the ash removal screws so that the ash which has fallen into the ashcan is fed out. If your system is not fitted with automatic ash removal, you must shovel the ash out of the chamber by hand.</li> <li>☐ The ash removal screws of the heat exchanger ash removal system will also operate at the same time.</li> <li>⑨ Empty the ashcans.</li> <li>✦ See page 23, Emptying the ash can</li> </ul>	M
8	<p><b>Conveyor grate</b></p> <ul style="list-style-type: none"> <li>⑨ Check the conveyor grate for dirt and obstructions (nails, stones, slag,...). Clean where necessary.</li> <li>☐ The primary air slots must be free and unobstructed.</li> <li>⑨ Check the grate, grate shafts and grate bearings for wear and deformation</li> <li>✦ Change any worn or deformed components.</li> <li>⑨ Check the grate drive for dirt and deposits.</li> </ul> 	
9	<p><b>Flue gas sensor</b></p> <ul style="list-style-type: none"> <li>⑨ Loosen the retaining screw and pull out the flue gas sensor.</li> <li>⑨ Using a clean cloth, wipe off the sensor.</li> <li>⑨ Insert the flue gas sensor back into the flue gas pipe and finger-tighten the retaining screw</li> </ul> 	3-M






No.	Component / Maintenance Operation	Interval
10	<b>Lambda probe</b> <ul style="list-style-type: none"> <li>⑨ Unscrew and remove the lambda probe and clean with a clean cloth.</li> <li>⑨ Refit and finger-tighten the lambda probe.</li> </ul> 	3-M
11	<b>Conveyor grate</b> <div style="display: flex; justify-content: space-around;">    </div> <p>In the chamber opposite the heat exchanger:</p> <ul style="list-style-type: none"> <li>⑨ Remove the cover from the cleaning hatch.</li> <li>⑨ Remove the cleaning cover.</li> <li>⑨ Check the grate and ash rakes for dirt and deposits. Clean where necessary.</li> </ul>	
12	<b>Flue gas return (FGR) (optional)</b> <ul style="list-style-type: none"> <li>⑨ Remove the pipe insulation from the inspection cover.</li> <li>⑨ Unscrew the wing nuts from the inspection cover and remove the cover.</li> <li>⑨ Check the pipe for dirt and deposits. Clean where necessary.</li> </ul> 	6-M
13	<b>Servomotors, drives, door contact switch</b> <ul style="list-style-type: none"> <li>⑨ Visually inspect operation of the drives of the feed and ash removal screws and the grate.</li> <li>⑨ Check the efficiency of the door contact switch.               <ul style="list-style-type: none"> <li>⤴ When the door is opened, the induced draught unit must operate at full speed.</li> </ul> </li> </ul> <p>Check the efficiency of the air flap servo motors:</p> <ul style="list-style-type: none"> <li>⑨ Press the reset button on the servo motor to release the air flap.               <ul style="list-style-type: none"> <li>☐ Hold the reset button pressed down.</li> </ul> </li> <li>⑨ Turn the air flap to the left-hand endstop.</li> <li>⑨ Release the test knob.               <ul style="list-style-type: none"> <li>⤴ The air flap must return automatically to its original position.</li> </ul> </li> </ul> 	





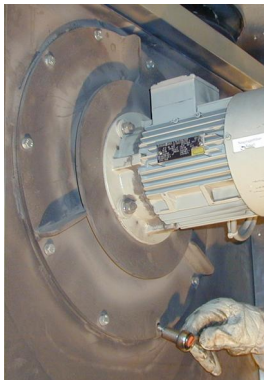




No.	Component / Maintenance Operation	Interval
14	<p data-bbox="245 271 448 304"><b>Heat exchanger</b></p> <ul style="list-style-type: none"> <li>⑨ Open the two heat exchanger covers.</li> <li>⑨ Remove all dirt and deposits for the flue gas chamber.</li> </ul> <p data-bbox="284 506 558 566">☐ Use a vacuum cleaner for this job.</p> <div data-bbox="609 461 1031 707" data-label="Image"> </div> <div data-bbox="1043 293 1362 707" data-label="Image"> </div> <p data-bbox="245 685 328 719"><b>1. flue:</b></p> <div data-bbox="252 741 552 1043" data-label="Image"> </div> <ul style="list-style-type: none"> <li>⑨ Remove the cover from the combustion pipe.</li> <li>⑨ Clean the cover, the pipe and the burn-out opening (1) between the chamber and the heat exchanger.</li> <li>⑨ Refit the cover.</li> </ul> <p data-bbox="245 1066 328 1099"><b>2. flue:</b></p> <ul style="list-style-type: none"> <li>⑨ Check that the automatic heat exchanger cleaning system operates smoothly.</li> <li>⑨ Check the area for dirt and deposits.</li> <li>⑨ If necessary, pull the entire system out of the heat exchanger pipes and then clean the pipes and the Wirbulators with a brush.</li> </ul> <div data-bbox="1203 887 1362 1335" data-label="Image"> </div> <p data-bbox="245 1323 328 1357"><b>3. flue:</b></p> <div data-bbox="245 1364 632 1655" data-label="Image"> </div> <ul style="list-style-type: none"> <li>⑨ Clean the inside of the dust separator pipe with the small brush.</li> <li>⑨ Pull out the dust separator pipe and clean it.</li> <li>☐ Refit the pipe after you have cleaned the fourth flue.</li> </ul> <div data-bbox="1155 1364 1362 1655" data-label="Image"> </div> <p data-bbox="245 1682 344 1715"><b>4th flue:</b></p> <div data-bbox="229 1733 429 2036" data-label="Image"> </div> <ul style="list-style-type: none"> <li>⑨ Dismantle the pipe retaining plate.</li> <li>⑨ Under the plate, clean the flue gas chamber and the connecting pipe to the induced draught fan.</li> <li>⑨ Clean the heat exchanger pipes with the large brush.</li> </ul> <div data-bbox="1123 1733 1362 2036" data-label="Image"> </div>	6-M

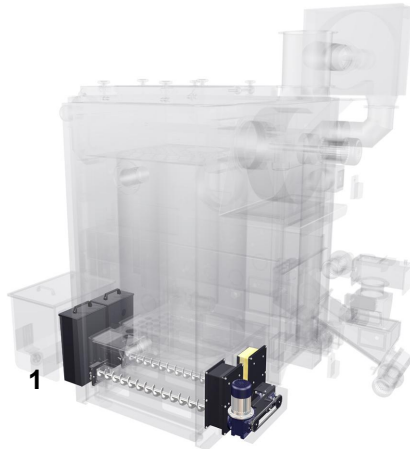
No.	Component / Maintenance Operation	Interval
15	<b>Heat exchanger ash removal</b> <div data-bbox="172 376 480 741"> </div> <div data-bbox="584 376 999 725"> </div> <div data-bbox="1091 376 1310 752"> </div> <p>           ⑨ Remove the ashcan of the heat exchanger ash removal unit.            ⑨ Dismantle the two-piece ash removal flange.            ⑨ Remove dirt and deposits from the sloping plates and from the ash screws.         </p>	6-M
16	<b>Combustion chamber</b> <div data-bbox="161 976 572 1352"> </div> <div data-bbox="574 976 866 1151"> </div> <div data-bbox="574 1182 866 1375"> </div> <div data-bbox="574 1406 866 1621"> </div> <p>           ⑨ Working from tunnel door, carefully clean the upper vault with the cleaning brush.            ⑨ Working from the tunnel door, carefully clean the underside of the middle vault with the cleaning brush.            ⑨ Working from the combustion chamber door, carefully clean the lower vault with the cleaning brush.         </p> <p>           ⑨ Carefully clean the side walls of the combustion chamber with the flat scraper.            ⑨ Check the firebrick and refractory material for wear.            ⑨ Remove any ash which has fallen down.         </p> <p>           ✦ For combustion chamber cleaning, see maintenance schedule no. 6.         </p> <div data-bbox="903 1706 1289 1975"> </div>	Y

No.	Component / Maintenance Operation		Interval
17	<b>Underpressure controller.</b>  ⑨ Unplug the silicon tube from the differential pressure transducer. ⑨ Using compressed air, blow out the line in the direction of the combustion chamber to remove any deposits. ⑨ Reconnect the silicon tube to the Minus nipple.		Y
18	<b>Combustion chamber overpressure sensor</b>    ⑨ Loosen the retaining screw. ⑨ Pull the combustion chamber overpressure sensor out of the spacer pipe. ⑨ Clean any deposits from the sensor with a soft cloth. ⑨ Check that the spacer pipe is free.		
19	<b>Heat exchanger cover</b>	⑨ Check the fibre-glass seal fits perfectly on the door frame. ⤴ Check the imprint on the fibre-glass seal. If the seal is coloured black at several points or the imprint is interrupted: ⤴ The seal is no longer efficient. ⤴ Tighten the door latches or change the fibre-glass seal. 📄 When you adjust the tunnel and combustion chamber doors, also check the efficiency of the door contact switches. Substitute inefficient switches.	
20	<b>Tunnel door + combustion chamber door</b>		
21	<b>Combustion air blower fan</b>    ⑨ Clean any dust and deposits from the protective grating. ⑨ Dismantle the protective grating and clean the fan with a soft brush where necessary.    ⑨ Remove the insulating cover from the chamber. ⑨ Check the suction side grill for dirt and deposits and clean where necessary.		



No.	Component / Maintenance Operation		Interval
22	<b>Secondary air ducts</b>  <p>On the rear of the chamber:</p> <ul style="list-style-type: none"> <li>⑨ Remove the insulation to the right and to the left of the slide-in duct.</li> <li>⑨ Dismantle the cleaning cover for the secondary air channels.</li> <li>⑨ Remove any dirt or deposits with a cleaning brush or with a vacuum cleaner.</li> </ul> 		Y
23	<b>Induced draught fan + flue gas return (FGR) blower</b>    <ul style="list-style-type: none"> <li>⑨ Loosen the blower fan screws.</li> <li>⑨ Mark the position of the flange.</li> <li>⑨ Take out the blower and clean the blower wheel with a brush.</li> <li>📋 When you refit the unit, use the marks made previously.</li> </ul>		
24	<b>Heat exchanger ash removal</b>	<ul style="list-style-type: none"> <li>⑨ Grease the chain drive. Check the chain for wear.</li> <li>⑨ Check the chain tension and adjust where necessary.</li> </ul>	
25	<b>Bearings</b>	<ul style="list-style-type: none"> <li>⑨ Grease the bearings of the screws and the drives.</li> </ul>	
26	<b>Slide-in unit</b>	<ul style="list-style-type: none"> <li>⑨ Test the efficiency of the slide-in unit sprinkler system.</li> </ul>	
27	<b>Flue gas pipe</b>	<ul style="list-style-type: none"> <li>⑨ Check the flue gas pipe and chimney and clean with the flue brush where necessary.</li> <li>📋 Only use stainless steel brushes when cleaning stainless steel flue pipes, chimney pipes and connections.</li> </ul>	

### ***Emptying the ash can***



*Heat exchanger ash removal*



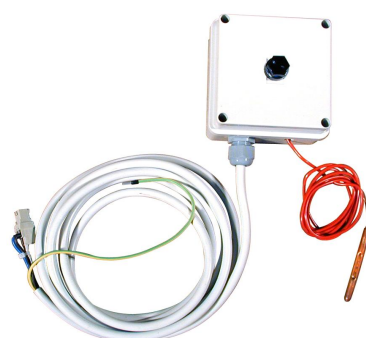
*Combustion chamber ash removal*

- ⑨ Unscrew the wing nuts on the flange of the ashcan (1) or the mobile ashcan (2).
- ⑨ Separate the ashcan from the flange and take the ashcan to the ash disposal point.



## 4.1.2 Maintenance schedule for safety devices

No.	Component / Maintenance Operation		Interval
1	<b>System pressure</b> <ul style="list-style-type: none"> <li>⑨ Read off the system pressure on the pressure gauge.</li> <li>✦ The value must be over the pre-stressed pressure of the expansion tank by 20%</li> <li>✦ See the expansion tank operating instructions</li> </ul> <p>If the system pressure is less:</p> <ul style="list-style-type: none"> <li>⑨ Top up the water</li> <li>☐ If this occurs frequently it indicates that the heating system is not sealed correctly. Call a service engineer.</li> </ul> <p>If large pressure fluctuations are observed:</p> <ul style="list-style-type: none"> <li>☐ Have the expansion tank checked.</li> </ul>		D
2	<b>Back-fire flap</b>	⑨ Check the seal and the efficiency of the back-fire flap.	W
3	<b>Safety valve</b> (provided by the customer)	⑨ Check the safety valve as per the manufacturer's instructions. ✦ See the expansion tank operating instructions.	M
4	<b>Safety battery valve</b> <ul style="list-style-type: none"> <li>⑨ Pull the safety valve sensor out of its immersion sleeve.</li> <li>⑨ Hold the sensor in a heated water tank fitted with a temperature display.</li> <li>⑨ Heat the water until the temperature reaches the setpoint value for the valve.</li> <li>✦ At this temperature the valve must open and allow cold water to flow into the safety battery.</li> <li>⑨ After the test, push the valve sensor back into its immersion sleeve.</li> <li>⑨ Check that water is flowing out of the safety battery drain pipe.</li> <li>✦ Clean or change the valve if it leaks.</li> <li>☐ Risk of scaling in the safety heat exchanger.</li> <li>⑨ If the heat exchanger is badly scaled, the flow-through will be very small. In this case the heat-exchanger must be descaled by a specialist company.</li> </ul>		3-M
5	<b>Safety temperature limiter (STB)</b> <ul style="list-style-type: none"> <li>⑨ Pull the STB capillary sensor out of its immersion sleeve.</li> <li>⑨ Hold the sensor in a heated water tank fitted with a temperature display.</li> <li>⑨ Heat the water until the temperature reaches the setpoint value (approx. 100 °C) for the STB.</li> <li>✦ The system will shutdown and a fault message will be displayed.</li> <li>☐ If the system does not shutdown, the STB is defective and must be changed immediately.</li> </ul> <p>Resetting the STB by hand:</p> <ul style="list-style-type: none"> <li>⑨ Allow the sensor to cool down and then screw the cap off the STB.</li> <li>⑨ Reset the safety temperature limiter by pressing with a screw-driver.</li> </ul>		Y
6	<b>Heating EMERGENCY STOP switch</b>	⑨ Test the efficiency of the emergency stop switch for the heating.	



## **4.2 Summer service**

- ☞ Guarantee a long service life with a summer service.

Regular maintenance and servicing by a heating specialist will ensure a long, trouble-free service life for your heating system. Regular servicing will ensure that your system stays environment-friendly and operates efficiently and cost-effectively.

This is why FRÖLING offers a maintenance contract. A maintenance contract is our way of ensuring that the boiler and its safety devices will continue to give long, efficient service.

## 5 Troubleshooting

There are two main types of fault: internal and external.

### 5.1 External faults

- ⑨ The heating EMERGENCY STOP switch has been pressed.
- ⑨ A household fuse (FI protective circuit breaker), a fuse or a motor overload switch has tripped.
- ⑨ The safety temperature limiter has triggered.

### 5.2 Internal boiler faults

If a fault has occurred and has not yet been cleared:

- Red status LED 1 blinks.
- A fault message is displayed on the display 2.



Internally, a distinction is made between a fault and a warning. A fault has the same effect as an "EMERGENCY STOP" and shuts down the system immediately. A warning, on the other hand, shuts down the system in a controlled manner.

Fault message list:

- ✦ [See the instruction manual for the Lambdatronic H 3000.](#)

#### 5.2.1 Resetting the safety temperature limiter (STB)

The STB shuts down the boiler at a temperature of 100°C (approx.). After the STB has cooled down it must be reset by hand. Proceed as follows:

- ⑨ Unscrew the cap on the safety temperature limiter
- ⑨ Reset the safety temperature limiter by pressing with a screw-driver

#### 5.2.2 Acknowledging a fault message

Trace and remove the fault and then:

- ⑨ Press the ENTER key 1
- ⑨ Press the START key 2



## 6 Appendix

### 6.1 *Preparing to test emissions*

- ⑨ According to the stipulations of Austrian standard ÖNORM M 5861-1, The flue gas piping must have a built-in DN 100 test flange.
- ⑨ The entire system must be thoroughly cleaned 2 to 3 days before emission tests are performed. (The entire system in this case means: the ashcans, the combustion chamber, the vaults, the heat exchanger, the smoke flue pipe connection between the boiler and the induced draught unit, the container under the induced draught unit, the flue gas piping and the chimney).
- ⑨ System performance must be measured at full load and at partial load.
- ⑨ In the last two days before the test, system output must be increased to approximately the rated output of the boiler. This is to prevent the release during testing of any old deposits (e.g. tar) in the flue gas piping.
- ⑨ The system operator must provide waste wood in conformity with Austrian Standard ÖNORM M 7133 with a water content of not more than 30%.

Waste wood size:

- for screw feed systems: G 50 max.
- for hydraulic feed systems: G 100 max.
- ⑨ One or two days before the test, the efficiency and settings of the system should be checked by our service technician.  
The system must be set up for the fuel to be used during the emission tests.  
(Test measurements by our service technician).
- ⑨ Our service technician will be present at the tests. Emission tests should be carried out by an accredited test institute or, in Germany, a chimney sweep.

**6.2 Maintenance instructions for hydraulic equipment****IMPORTANT**

Do not use unskilled personnel for hydraulic system maintenance.



**Hazard: Personal injury and damage to property.**



**Only skilled, specialist technicians should be allowed to work on hydraulic equipment.**

**Do not allow the oil temperature to exceed +50 °C or fall below -30 °C.**

The interval at which oil should be changed depends on a variety of factors including the age of the oil and the amount of dirt contained in it. As a general rule, the oil should be changed at the following intervals:

Interval [service hours]	Component / Maintenance Operation
<b>50 - 100</b>	First maintenance service after installation. (This does not apply to subsequent maintenance services): ⑨ Change the oil and the filter
<b>50</b>	⑨ Check the oil level The oil must show no visible signs of foaming. ⑨ Check the tightness of screw connectors.
<b>200</b>	⑨ Check the return filter for dirt. Clean where necessary. ⑨ Change the filter cartridge where necessary.
<b>5000 (or annually)</b>	⑨ Change the oil. ⑨ Change the return filter and the vent filter sets.

To change the oil, proceed as follows:

- ⑨ Move the hydraulic cylinder to its end stop.
  - ⤴ This will expel all the oil.
- ⑨ Drain off or pump off the oil from the hydraulic unit.
- ⑨ Remove the unit cover or open the inspection cover.
- ⑨ Thoroughly clean the oil tank. (Make sure that you remove all oil sludge).
- ⑨ Change the return filter and the vent filter sets.
- ⑨ Refit the unit cover or close the inspection cover.
- ⑨ Fill the tank with hydraulic oil to the level mark shown on the inspection glass.
  - See the oil manufacturer's specifications.
- ⑨ At the other end of the cylinder (relative to its current position), disconnect the hose of the hydraulic cylinder on the fixed piping side. Place a container under the disconnected hose.
- ⑨ Move the cylinder to its other end stop.
  - ⤴ The remaining old oil will be pushed out of the hose into the container prepared previously.
- ⑨ Refit the hydraulic hose and check its seal.
- ⑨ Bleed the hydraulic system and check the oil level. Top up where necessary.



## **6.3     *Addresses***

### **6.3.1   Manufacturer's address**

**Fröling:**  
**Heizkessel- und Behälterbau GesmbH**

**Industriestraße 12**  
**A-4710 Grieskirchen**  
**AUSTRIA**

TEL 0043 (0)7248 606 0  
FAX 0043 (0)7248 606 600  
E-MAIL [info@froeling.com](mailto:info@froeling.com)  
INTERNET [www.froeling.com](http://www.froeling.com)

### **6.3.2   Your Installer's Address**

Stamp

**6.4 Declaration of Conformity****EC - DECLARATION OF CONFORMITY**

Product: **Waste-wood burner with automatic infeed**  
Type: **Turbomat**  
Rated power: **320 and 500 kW**

EU Directives:

89/392/EC                      The Machinery Directive  
73/23/EC                      Electrical Equipment:  
                                      **Low Voltage Directive**  
89/336/EC                      **Electromagnetic Compatibility (EMC) Directive**


Reference Standards and Guidelines:

ÖNORM – EN 729-2              Welding **Quality Specifications**  
ÖNORM – EN 303-5              Sections 4.2.1 and 4.2.6 in accordance with point A.1 - "Variations  
    for Austria".

FAV (Heating Plant Regulations) BGBL 331/1997

We hereby certify that the series production version of the product designated above meets the directives, guidelines and standards specified.

Grieskirchen, dated 02.06.2005

  
\_\_\_\_\_  
Quality Assurance Office

  
\_\_\_\_\_  
Management



## 6.5 *Your notes*