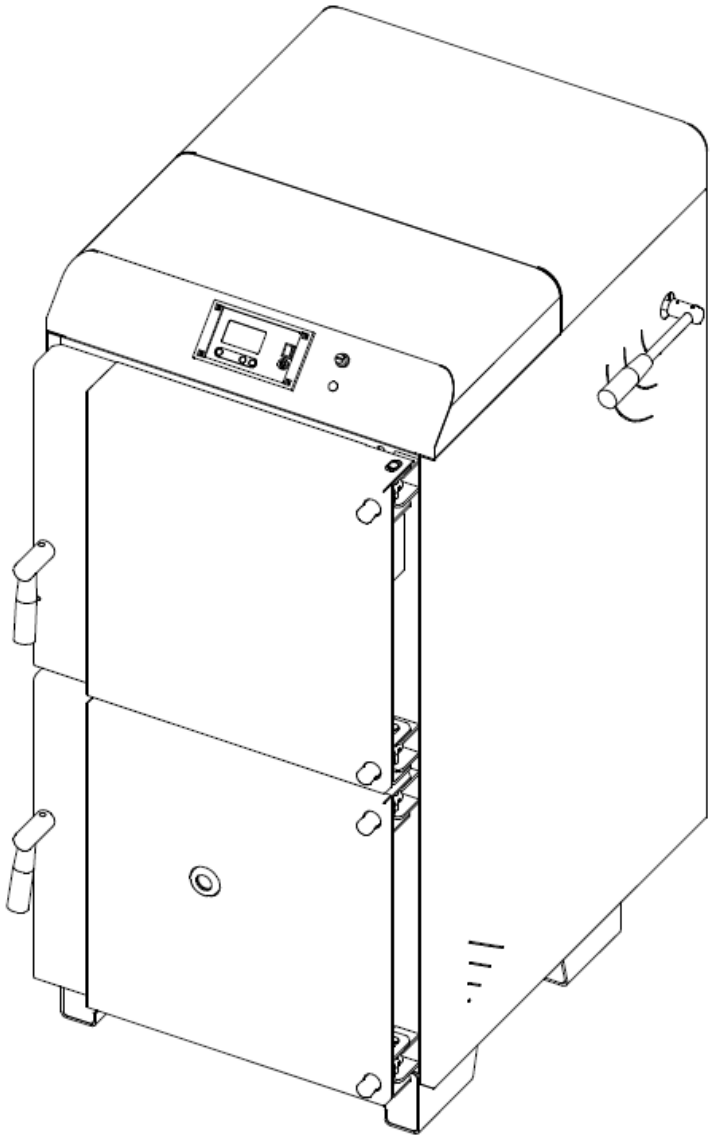
INSTALLATION AND OPERATING INSTRUCTIONS

↪ LIGNUM NG



AENOR
Gestión Ambiental
CGM-04/392

AENOR
Empresa Registrada
ER-0170/1996

DOMUSA TEKNIK

Thank you for choosing a DOMUSA TEKNIK heating boiler. From the range of **DOMUSA TEKNIK** products you have chosen the **Lignum NG** model. With a suitable hydraulic installation and with firewood for fuel, this high-efficiency wood boiler will provide the ideal level of comfort for your home.

This manual forms an essential part of the product and it must be given to the user. We recommend you read the warnings and recommendations in the manual carefully, as they contain important information on the safety, use and maintenance of the installation.

These boilers must be installed by qualified personnel only, in accordance with the legislation in force and following the manufacturer's instructions.

Incorrect installation of these boilers could result in damage to people, animals or property, and the manufacturer will hold no liability in such cases.

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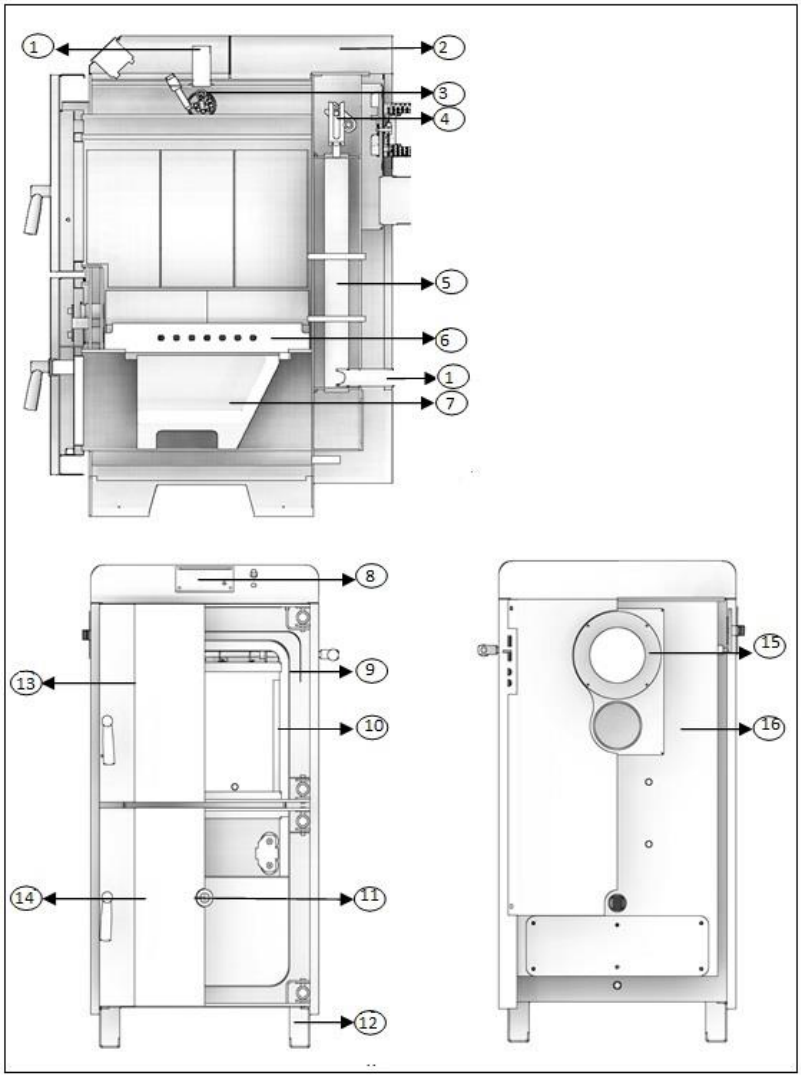
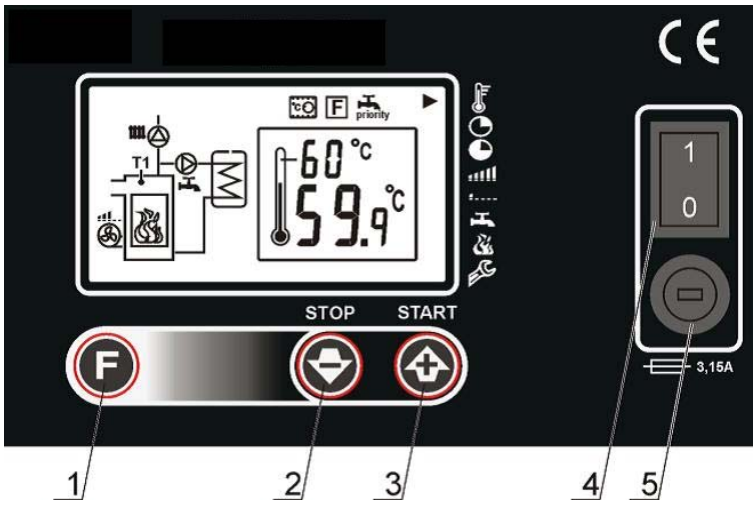


1. Water inlet/outlet
2. Top cover
3. Safety heat exchanger
4. Pipe cleaning mechanism
5. Fume pipes
6. Top refractory element
7. Bottom refractory element
8. Control panel
9. Heat exchanger
10. Wood housing
11. Peep-hole
12. Base
13. Top door
14. Bottom door
15. Extractor fan
16. Fume chamber

2 CONTROL COMPONENTS



1. Button for changing Menu settings:

Used for selecting the adjustable Menu settings.

2. STOP button (and reduce value):

Used to stop the fan and, as a result, the combustion adjustment. Also used to reduce the values of the selected Menu settings.

3. START button (and increase value):

Activates the fan and the combustion adjustment. Also used to increase the values of the selected Menu settings.

4. Main switch:

Turn on the controller.

5. Fuse carrier:

It protects the controller and the elements dependent on the controller. It is recommended that a porcelain, slow-blow, 5x20mm, 3.15A nominal current fuse be used.

3 INSTALLATION INSTRUCTIONS

The boiler must be installed by personnel authorised by the Ministry of Industry, in compliance with the applicable laws and regulations.

This boiler is suitable for heating water to a temperature below boiling point at atmospheric pressure. It must be connected to a heating buffer tank, which must always be compatible with its performance and power.

This appliance must only be used for the purpose for which it has been expressly designed. Any other use is considered unsuitable and therefore hazardous. The manufacturer shall not be considered liable under any circumstances for damage caused by unsuitable, erroneous or irrational use.

Remove all the packaging and check the contents are complete. In case of doubt, do not use the boiler. Contact your supplier. Keep the packaging elements out of reach of children, as they can be dangerous.

When you no longer wish to use the boiler, disable the parts that could represent a potential hazard.

3.1 Location

The boiler must be installed in a sufficiently ventilated site, away from humidity. It must be located so that the air grilles on the premises are not obstructed and normal boiler maintenance is possible. It must be kept a minimum distance of 1 m from the fuel tank or install a radiation protection plate. The boilers must not operate on flammable surfaces. The boiler must have an external combustion air supply (minimum opening 300 cm^2).

Generally, it is not recommended to install boilers of up to 50 kW in stairways, living areas, corridors or garages. Similarly, installing boilers in locations with ventilation, fans, extractor fans, air extraction systems, etc. should be avoided (e.g. tumble dryer extraction). It must be kept a minimum distance of 0.4 m from flammable building materials so as to not reach surfaces temperatures above 85°C.

3.2 Hydraulic installation

The hydraulic installation must be made by qualified personnel. The applicable installation legislation (RITE) must be complied with, and the following recommendations should also be taken into account:

- **It is obligatory and essential to install a heating water buffer tank** (see "*Example of installation with buffer tank*"*).* The minimum volume of the buffer tank must be calculated based on Standard EN 303-5.
- **It is obligatory and essential to install a device for raising the return temperature**, to prevent any water condensation in the heat exchanger. If this requirement is not complied with, **DOMUSA TEKNIK**'s guarantee of the appliance will automatically be null and void.
- **It is obligatory and essential to install the temperature relief valve supplied with the boiler.** To correctly install the boiler, carefully follow the instructions given in the section "Installing the temperature relief valve" . If this requirement is not complied with, **DOMUSA TEKNIK**'s guarantee of the appliance will automatically be null and void.
- The inside of the installation piping should be thoroughly cleaned before switching on the boiler.
- We recommend inserting cut-off valves between the installation piping and the boiler to simplify maintenance tasks.

- Leave a free space around the boiler for carrying out any maintenance and repair operations.
- Drain valves and suitable devices for correctly bleeding the air from the circuit during the boiler filling stage should be fitted.
- Install all the necessary safety elements (expansion vessel, safety valve, etc.) to comply with the applicable regulations for the installation.

3.3 Fuel: preparing the firewood

Firewood is the fuel which must be used for the **Lignum NG** boiler. If this requirement is not complied with, **DOMUSA TEKNIK**'s guarantee of the appliance will automatically be null and void.

The quality of the fuel plays an important part in the performance and useful life of the boiler. The firewood must have less than 20% water content (humidity). If the percentage of water is too high, the corrosion inside the boiler increases and the boiler performance is drastically reduced.

"Green" wood (recently cut) may contain over 50% humidity. Its caloric power is approximately half of that of "seasoned" wood with 15% humidity. The greater the humidity of the wood, the slower the combustion and the lower the flame temperature. This abruptly increases the amount of soot and tar in the fumes.

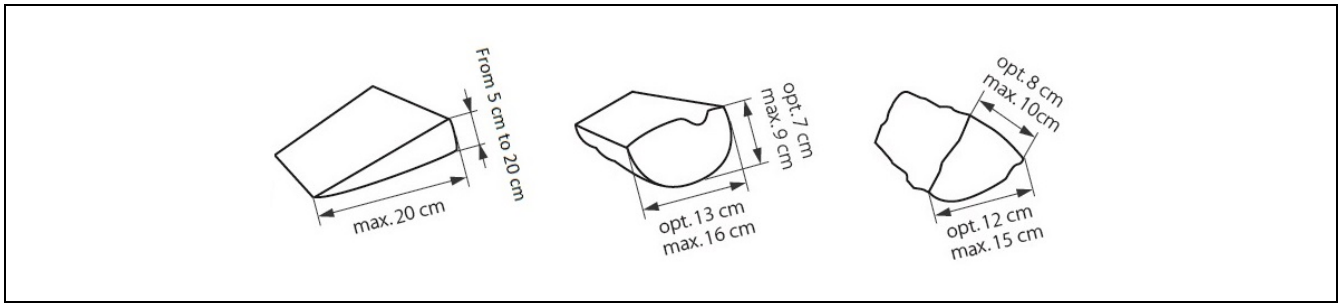
To reach dry levels in the air (<20%), the following drying times are recommended:

- Oak: 2.5 years
- Beech, ash, fruit trees: 2 years
- Linden, alder, birch: 1.5 years
- Pine, poplar, spruce: 1 year

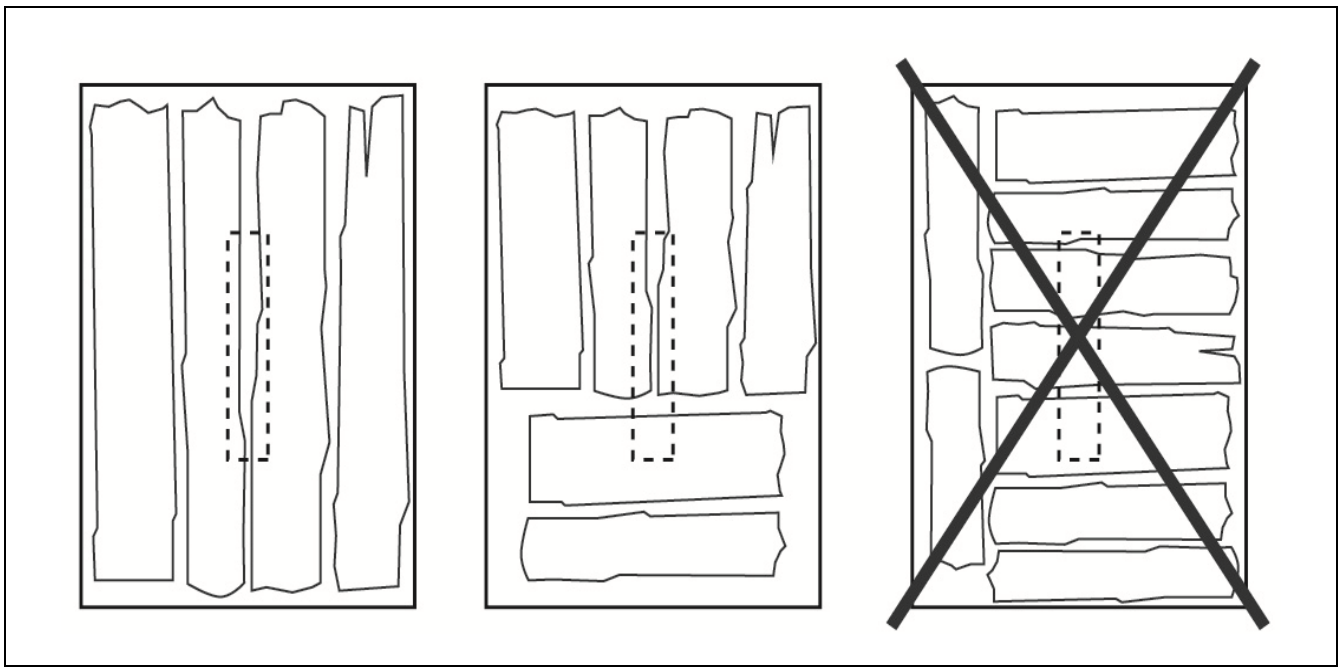
If the wood is not cut (round wood), a minimum of 2 extra months are required.

In addition to the cutting, another important factor is the physical size of the firewood. In relation to its mass, smaller firewood has a greater surface than larger pieces of wood. It is easier to ignite and its combustion is quicker. Large firewood may slow down combustion due to an unfavourable volume/surface area ratio. This, unavoidably, implies a lower flame temperature and greater contaminant emissions.

The following sizes of firewood are those recommended for a perfect and homogeneous service in the combustion chamber:

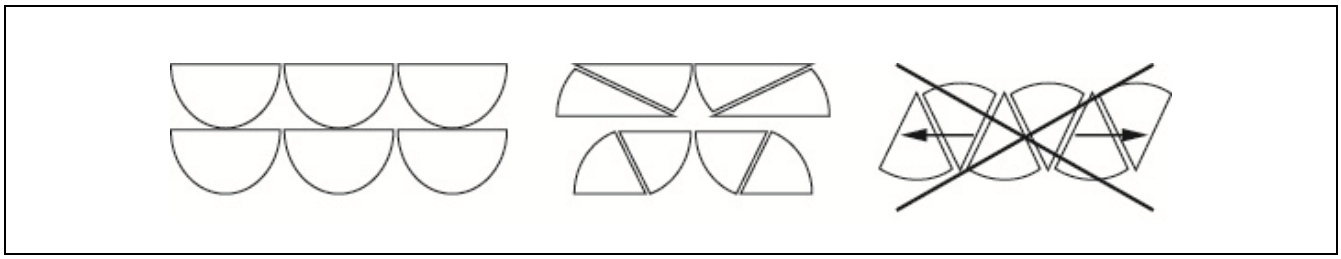


For Lignum NG 20, Lignum NG 30 and Lignum NG 40 boilers, the recommended log length is 50 cm. If the logs are short, it is recommended that they be placed lengthwise in the back part and that the free space at the front be filled with logs placed obliquely.



Make sure the logs in the fuel loading compartment do not get stuck (avoid logs which are too long). If the logs are too long, they do not fall properly and can cause gaps, causing a drop in the boiler power. In order to avoid this, it may be necessary to cut the total length in half.

Place the rounded part of the logs facing down, to avoid any wedging effect.

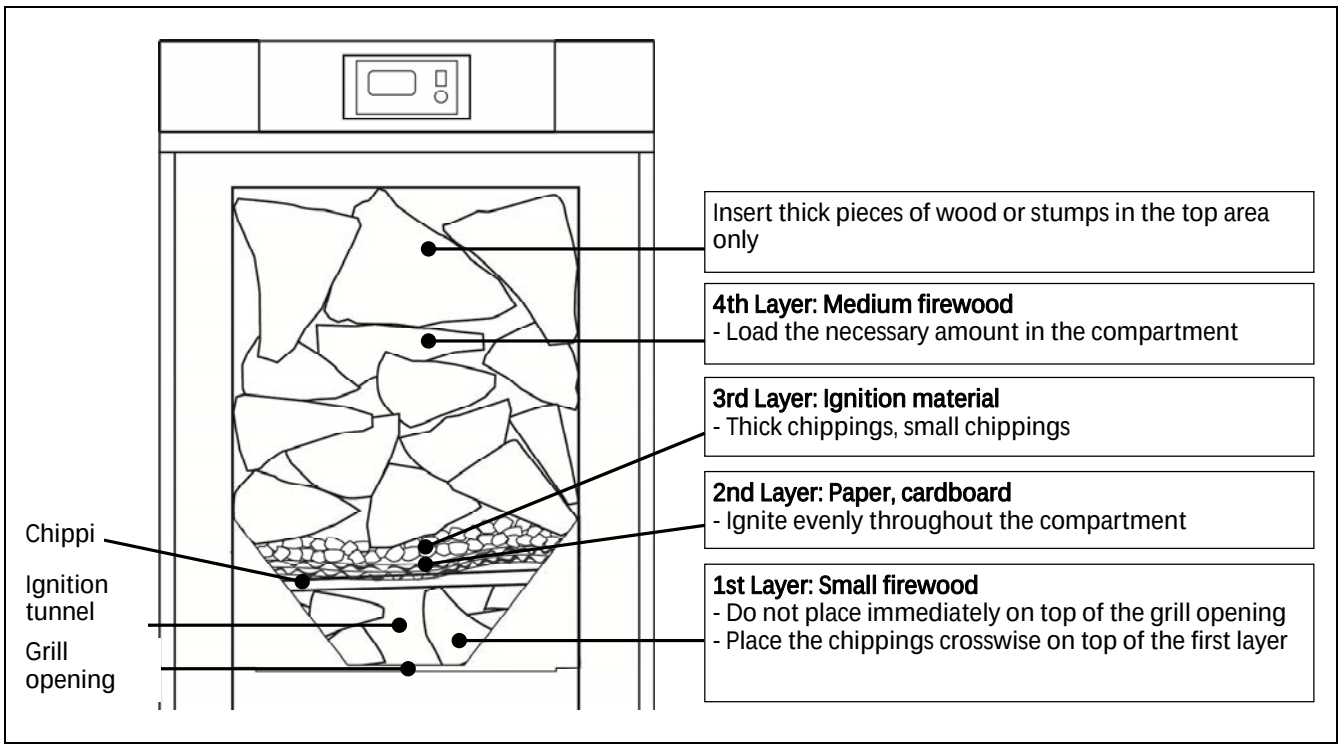


If using briquettes, they must have a diameter of 6 to 10 cm. Their use is only recommended in combination with firewood.

Pay special attention to the energy density of the firewood, as a full load of pine wood is equivalent to 2/3 of a load of beech wood and to ½ a load of briquettes.

3.4 Ignition and positioning of the firewood

How the firewood is loaded into the housing is very important for an optimised combustion process. It is recommended that the firewood be inserted into the loading compartment as follows:



IMPORTANT: If there is no charcoal from a previous firewood load, put the first layer (at the bottom of the fireplace) with abundant wood, as dry as possible, to obtain the proper amount of charcoal (approximately 10 zm).

3.4.1 Ignition tunnel

The ignition tunnel allows the combustion air to flow during ignition. Therefore, do not place any combustion material on top of the opening of the grill during the ignition, leaving the ignition tunnel free of obstacles.

3.4.2 Paper, cardboard and kindling

The fire should be lit with paper, cardboard and/or kindling. The cardboard should be placed evenly on top of the ignition tunnel, across the entire surface of the first layer of small logs. If the cardboard used is small, distribute it in paper ball shapes. The kindling must be placed crossways under the cardboard.

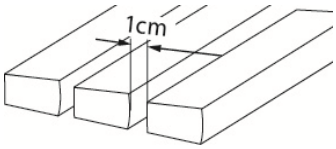
The ignition process is manual and must be performed as follows:

- Partially load the combustion chamber with small dry logs and paper, cardboard or wood chips.
- Turn the boiler on and press START to start up the induced draught fan.
- Light a paper ball using a match or a lighter.
- The lit paper is placed with the paper/cardboard on top of the ignition tunnel. The door can be kept slightly open to ease ignition.

- Once the fire has spread and embers have formed, distribute them evenly, add the rest of the load on top and fully close the doors.
- The control automatically regulates the combustion process.

3.4.3 Sawn wood (planks)

Sawn wood can be used in a similar way to kindling to ease ignition above the tunnel. The planks should not be placed too close to each other, so that air circulates during ignition. It is recommended that at least 1 cm be left between planks.



3.4.4 Thick wood or stumps

Thick wood or tree stumps (part of the trunk joined to the root) can be placed on the top layer, on top of several layers of firewood. Do not use more than one oversized piece of firewood or stump in the same load.

3.4.5 Thick kindling and woodworking waste

Thick kindling (G100, > 100mm), small material, woodworking waste, etc. must only be placed in the loading compartment on top of at least three layers of firewood (approximately half of the combustion chamber).

3.5 Unsuitable fuel

- Wood with >20% humidity.
- Waste, plastics
- Paper and cardboard (only for ignition).
- Sawdust, wood shavings.
- Small kindling.
- Coal.
- Material generally forbidden by legislation regarding atmospheric contamination and air quality, such as treated wood, beams, etc.

3.6 Combustion product removal

The Lignum NG boiler is a biomass boiler and it is essential for it to be connected to a flue, i.e. a smoke duct able to create a pressure drop (which in this case should be between 0.10 and 0.20 mbar), in compliance with the applicable laws in this regard.

The combustion product exhaustion ducts must be installed by qualified personnel and must comply with the regulations in force. For the flue to create a pressure drop, the following recommendations should be taken into account:

- It should be suitably insulated.
- It should be independently located, with a separate flue for each boiler.
- It should be vertical, avoiding any angles greater than 45º.

- It should always have the same diameter. It is recommended that it be circular, and never any narrower than the boiler outlet.
- **It is obligatory to install a fume inspection plate with condensation collection, to remove the condensation generated in the flue.** Otherwise, the condensation may reach the inside of the boiler and cause irreparable damage, **which would not be covered** by DOMUSA TEKNIK's guarantee. **The condensation pipe should lead to a drain outlet**, as a large amount of water may be generated. This connection must be made in compliance with the regulations for draining off condensation water to the drain system.
- **It is recommended that a draught stabiliser be installed** to prevent any pressure drop variations in the flue due to atmospheric conditions, which could affect correct boiler combustion. **This draught stabiliser must be installed below the fume inspection plate to prevent any leakage of combustion gases.**

3.7 Electrical Connection

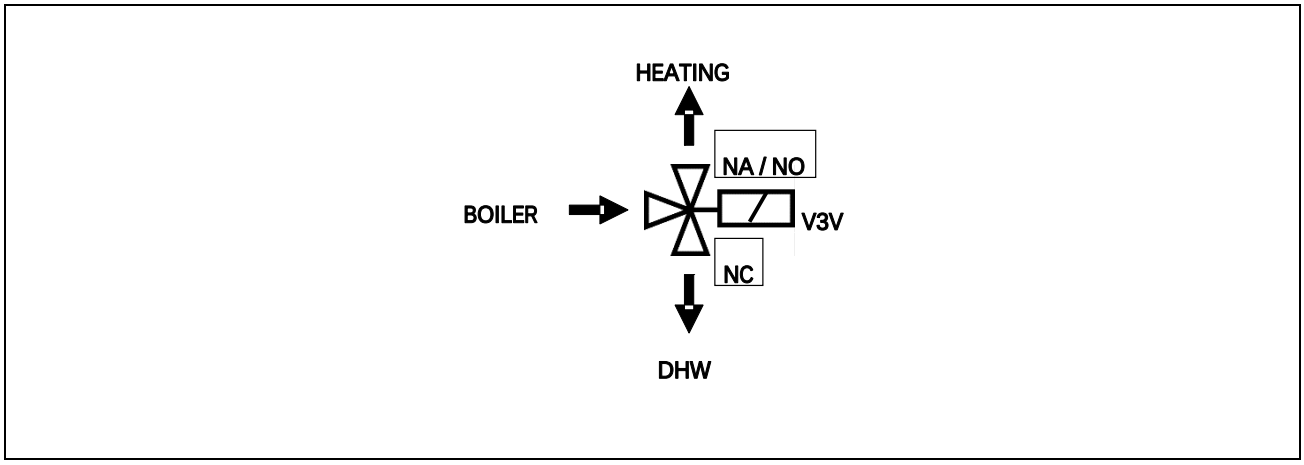
The **Lignum NG** boiler must be connected to 230 V~ ac 50 Hz by the connector labelled "**220V AC**" on the back of the boiler. **The socket should have an appropriate earth connection.**

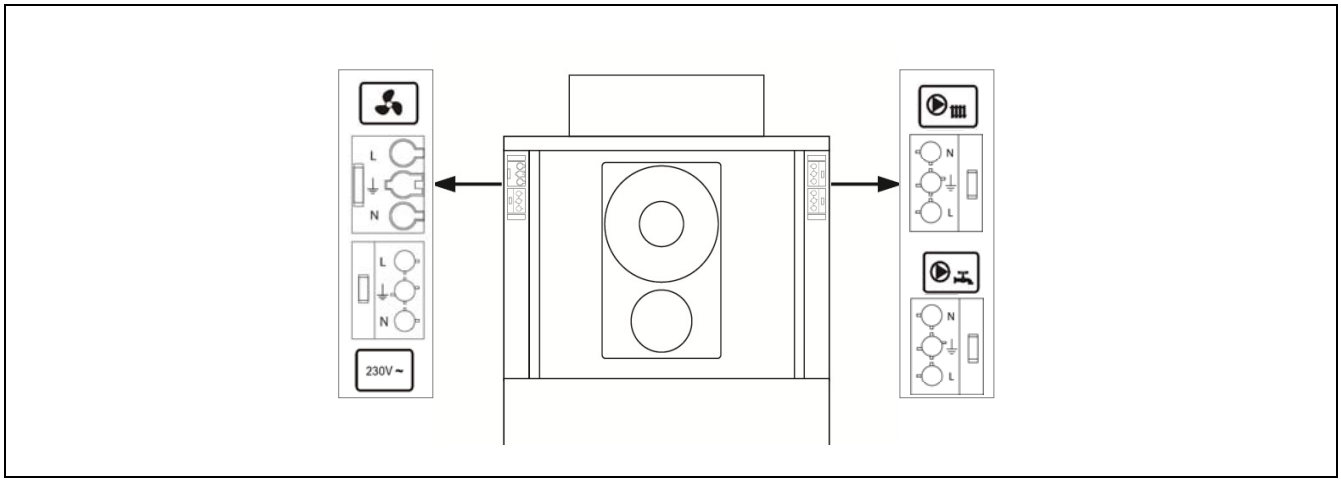
The circulating pump must be connected to the 3-pin connector "  " on the back of the boiler, on the side opposite the connection to the mains electrical supply.

3.7.1 DHW tank electrical connection (optional).

If there is an optional DHW tank, connect the DHW 3-way diverter valve in the 3-pin connector "  ". Connect the DHW temperature sensor in the controller, as indicated in the *"Electrical Diagram"*.

The hydraulic installation for the 3-way DHW diverter valve should be made so that the heating circuit (buffer tank) can flow through the valve when it is idle (not powered):





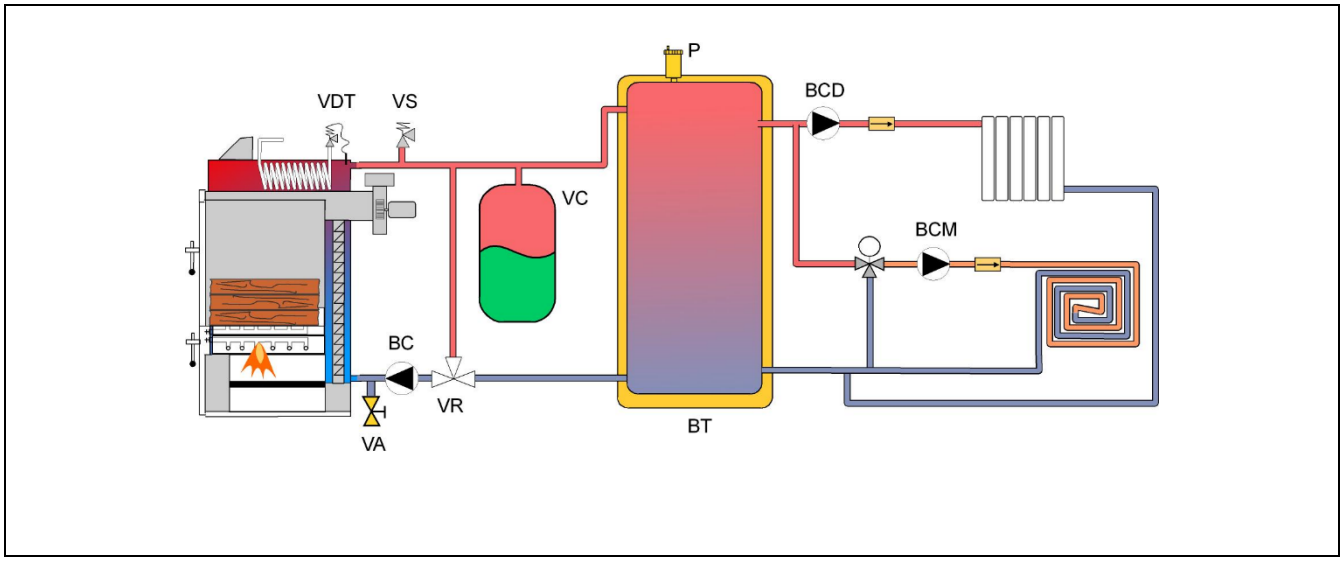
IMPORTANT: Before carrying out any work on the boiler's electrical installation, always ensure it is disconnected from the mains.

IMPORTANT: Make sure that none of the mains cables come into contact with a hot surface (e.g. flue).

3.8 Example of an installation with a buffer tank

The Lignum NG boiler is equipped with an electronic control that can govern a circuit with buffer tank, with an external circulation kit to prevent condensation in the heat exchanger. The heating circuit must be regulated and controlled with an external regulator (not included in the boiler control).

The figure below shows an example of a hydraulic diagram of a buffer tank heating installation:



VS: Heating safety valve
VR: Anti-condensation thermostatic valve
VA: Drain valve
BC: Heating pump
BT: Buffer tank
VDT: Temperature relief valve
VC: Heating expansion vessel
BCD: Direct circuit pump
BCM: Mixed circuit pump
P: Automatic air bleed valve

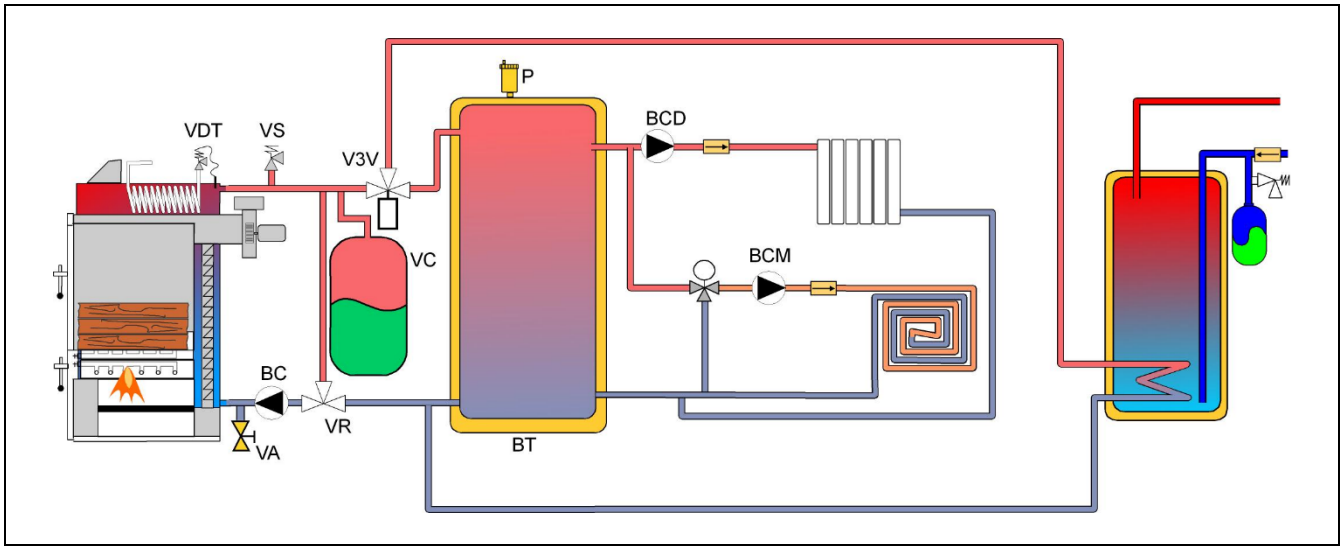
IMPORTANT: It is obligatory and essential to install a heating water buffer tank.

3.9 Example of an installation with a buffer tank and DHW tank

The Lignum NG boiler is equipped with an electronic control that can govern a buffer tank circuit, with an external circulation kit to prevent condensation in the heat exchanger and, optionally, a DHW tank loading circuit.

To control a DHW circuit, connect a DHW sensor from the hot water tank to the boiler (optionally supplied by DOMUSA TEKNIK) and a 3-way diverter valve (see *"Electrical Diagram"*).

The figure below shows an example of a hydraulic diagram for a heating installation with radiators and a DHW tank:



VS: Heating safety valve
VR: Anti-condensation thermostatic valve
VA: Drain valve
BC: Heating pump
BT: Buffer tank

V3V: 3-way valve
VC: Heating expansion vessel
BCD: Direct circuit pump
BCM: Mixed circuit pump
P: Automatic air bleed valve

IMPORTANT: It is obligatory and essential to install a heating water buffer tank.

4 ADJUSTING THE COMBUSTION AIR

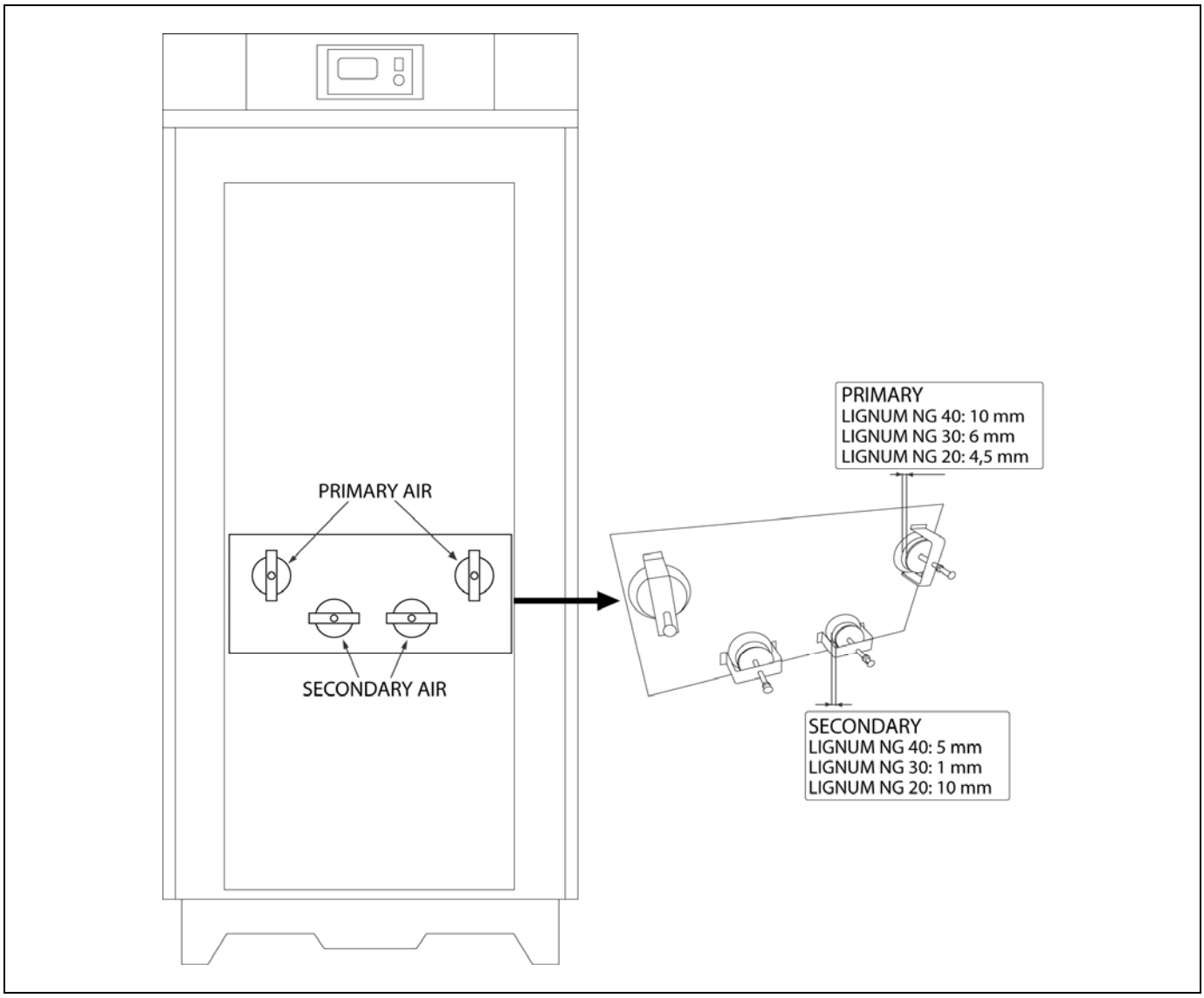
The various stages of combustion (drying, pyrolysis, gasification and combustion) of the Lignum NG wood boiler take place in a controlled manner in different parts of the boiler.

The wood dries and decomposes in the loading compartment via the technique known as "inverted draught", generating a combustible gas. The heat required for the decomposition reactions (pyrolysis and gasification) is provided by the partial combustion of the firewood. The air necessary for the gasification is called primary air.

The gas produced in the housing is mixed with the preheated secondary air and generates an extremely high temperature combustion in the refractory chamber, reducing emissions and increasing the boiler efficiency.

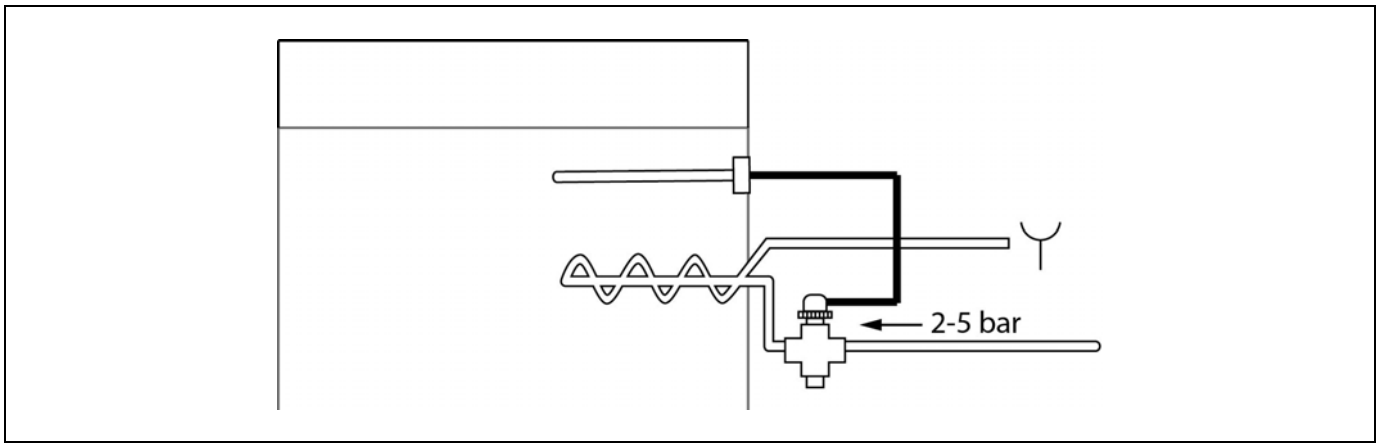
The induced draught fan supplies the primary and secondary air to the boiler by suction.

The air regulators or the boilers are set by default to optimal conditions for obtaining suitable fume temperatures and emissions. Therefore, the initial air setting of the boiler should not be modified.



5 TEMPERATURE RELIEF SAFETY VALVE

In order to avoid the temperature inside the boiler reaching damaging levels, this valve opens and lets the mains water supply pass into the interior coil, thereby dispelling the heat in a fully reliable manner. This occurs when, for hydraulic reasons or due to lack of electric current, the boiler cannot dispel the heat it is generating. **This valve is obligatory in Lignum NG boiler installations.**



5.1 Operating principle

The valve is regulated by the hot water from the boiler. If the water temperature is greater than 95ºC, the valve opens and lets the mains water through. This water moving in the coil absorbs the boiler temperature and this prevents overheating and any damage to the boiler. The boiler protection system corresponds with Standard EN 303-5.

5.2 Valve assembly

The temperature relief valve must be connected with free discharge to the safety heat exchanger (in accordance with Standard EN 12828). The connection must not be blocked manually. Furthermore, access must be granted to the heat protection mechanism and to the cleaning inspection, once assembled. The minimum connection pressure for the safety heat exchanger is 2 bars. The nominal pressure of the valve is 5 bars.

The temperature relief valve is installed up-current of the coil (placed respecting the flow direction according to the arrow on the coil). The mains water supply must be connected directly to the temperature relief valve. The connection is threaded, type Rp 3/4" (DIN EN 10226).

IMPORTANT: It should not be possible to close the supply pipe so as to avoid any accidental blockage.

IMPORTANT: The cold water pressure should not depend on the electricity supply.

IMPORTANT: The pipe must be thoroughly washed before installation.

6 STARTING UP THE BOILER

6.1 Prior warnings

Repair and maintenance of the boiler must be carried out by a qualified professional, authorised by **DOMUSA TEKNIK**. For optimum functioning and conservation of the boiler, it should be serviced annually.

Carefully read this instruction manual and keep it in a safe, easily-accessible place. **DOMUSA TEKNIK** will not be liable for any damages caused by failure to follow these instructions.

During some of the operating phases, a forced noise may be heard for a few minutes. This is normal and does not affect the boiler's integrity in any way.

Before any servicing, **disconnect the boiler from the mains**.

6.2 Filling the installation

The hydraulic installation must include a fill valve, a manometer, a safety valve, drain valves and the necessary hydraulic components for correctly filling the installation.

To fill the installation, open the fill valve until the installation manometer shows a pressure of 1 - 1.5 bars. The installation must be filled slowly, bleeding the air from the water circuit using the drain valves provided for this purpose. Close the fill valve after filling.

IMPORTANT: Switching on the boiler with no water inside could result in serious damage.

6.3 Start-up

Before beginning the start-up process, the following must be complied with:

- The boiler must be connected to the mains.
- The installation must be filled with water (the pressure must be between 1 and 1.5 bar).

The following steps are obligatory in the start-up sequence:

- Remove the cleaning brush and the rake supplied with the boiler.
- Check the flue is correctly installed using the condensation inspection plate and a draught stabiliser
- Check the external hydraulic anti-condensation kit is correctly installed.
- Check that the temperature relief valve is properly installed.
- If the installation has flow and return valves, check they are open.
- Set the installation type parameter (see "*Digital display and selecting parameters*"):

The value is 04 if there is a buffer tank without a DHW tank.

The value is 02 if there is a buffer tank and a DHW tank.

- Set the boiler adjustment mode parameter (see "*Digital display and selecting parameters*"):

The recommended value is 02.

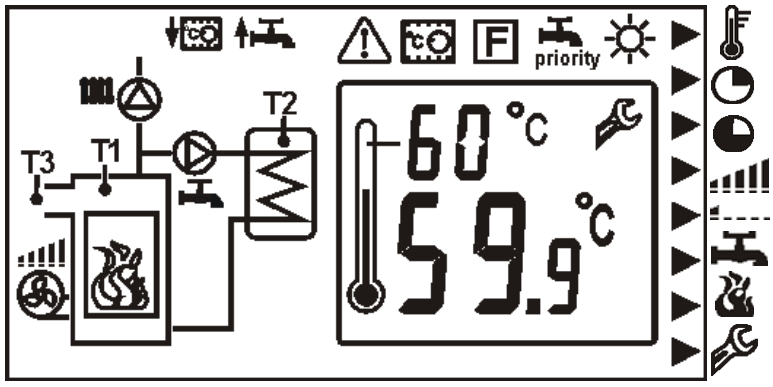
6.4 Installation hand over

After the initial start-up, the installation engineer will explain to the user how the boiler works, making any observations they consider relevant.

The installer is responsible for clearly explaining to the user the functioning of any control or regulation device forming part of the installation but not supplied with the boiler.

7 DIGITAL DISPLAY AND SELECTING PARAMETERS

The **Lignum NG** boiler is equipped with a digital touch display for viewing and adjusting the different boiler settings. The various parameters displayed on the main screen are described below.



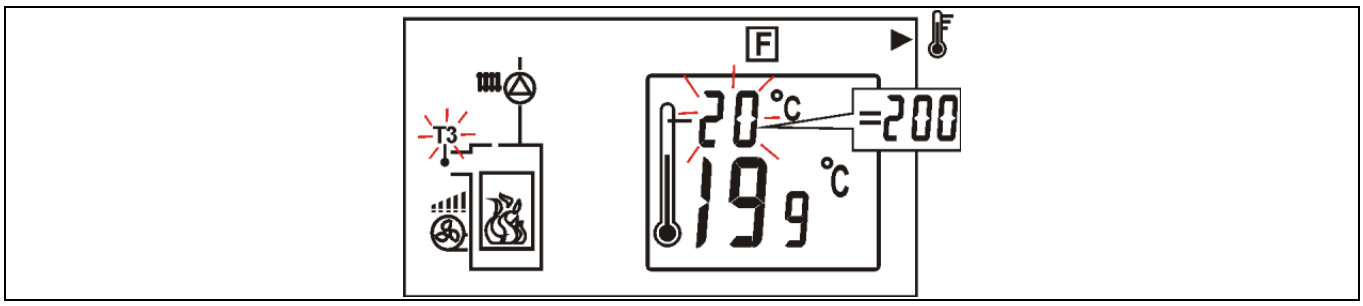
The various parameters displayed on the screen are described in the table below. You can browse through the parameters by pressing the "F" button:

	Selecting the boiler set-point temperature, T1. Default value (recommended): **80**ºC If the DHW sensor is connected and the hydraulic installation type selected includes a DHW tank, after selecting the boiler temperature and pressing the F button, the DHW set-point temperature must be selected, T2 (only valid for installation with DHW tank). Default value: **55**ºC After pressing the F button again, select the fume set-point temperature, T3 (only valid for Adjustment Mode 03). Recommended value: **180**ºC
	Ventilation time during periods with no heat demand. Default value (recommended): **10** s
	Ventilation interval during periods with no heat demand. Default value (recommended): **5** min
	Maximum fan speed. Default value (recommended): **99**%
	Minimum fan speed. Recommended value: **50**%
	Settings for hydraulic installation type. When the Lignum NG boiler is installed with a buffer tank (see *Example of installation with buffer tank*), the value of this parameter must be **04**.

	If there is a buffer tank and a DHW tank (see *Example of installation with buffer tank and DHW tank*), the selected parameter is **02**. In order to work with a DHW tank, a domestic hot water temperature sensor (see *Electrical Diagram*) and a 3-way valve must be connected in the "" connector (see *Electrical Connection*). **IMPORTANT: Hydraulic installation types 01 and 03 are not operational in Lignum NG boilers.**
	Boiler adjustment mode. There are 3 options: - Classic Adjustment. **01** - PID adjustment based on the boiler temperature adjustment. **02** - PID adjustment based on the fume temperature adjustment. **03**. Recommended parameter: **02** (PID adjustment based on boiler temperature)
	Service menu symbol.

To select the parameters, press "F". Use the "+" and "-" buttons to increase or reduce the value of the selected parameter (the value will be flashing). Check that the value shown on the boiler temperature set-point indicator is the one desired.

IMPORTANT: If the fume temperature is selected as an adjustment parameter, it must be taken into account that the real value is 10 times greater than that selected. For example 20ºC means 200ºC.



8 BOILER MAINTENANCE AND CLEANING

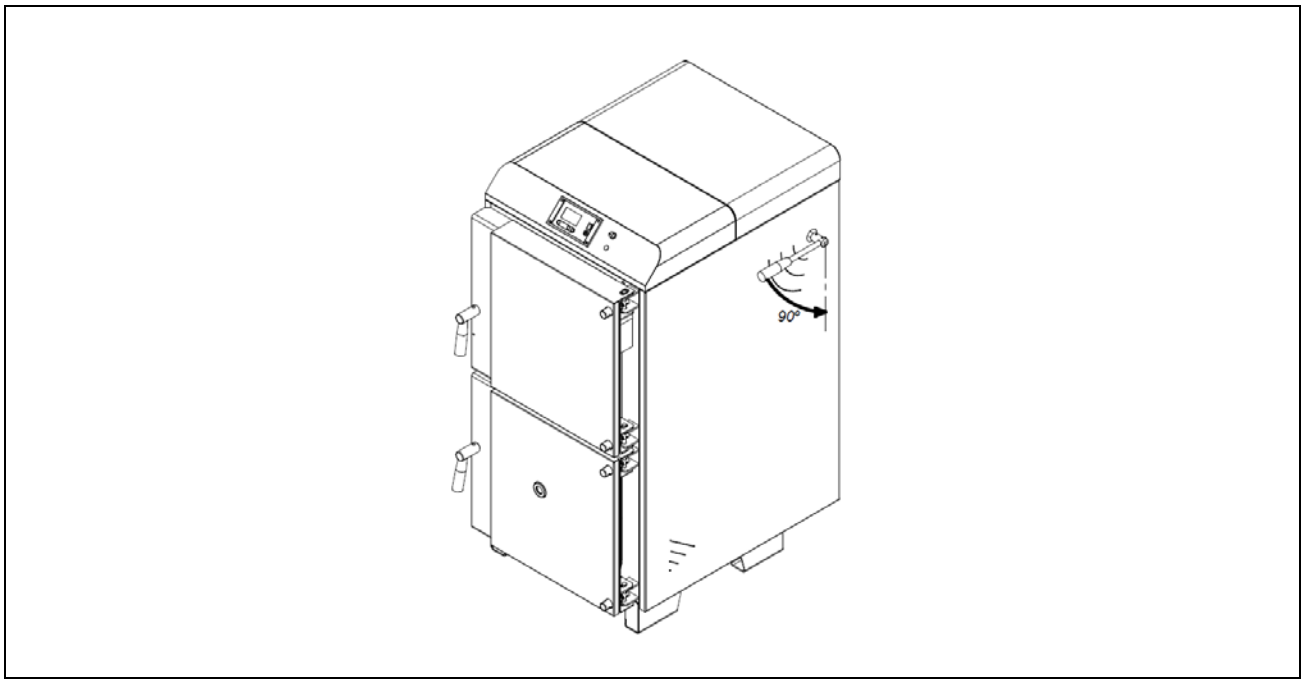
8.1 Cleaning the boiler

8.1.1 Ashes

The ashes must be cleaned out regularly and properly after every 3 or 5 loads of firewood, depending on the type of wood. The ashes accumulate in both the loading compartment and the refractory combustion chamber and in the flue. The ash could be deposited in the ash box.

To clean the boiler, follow these steps:

- The boiler must be cold before cleaning. Wait 2-3 hours after all the fuel has been finished.
- Open the top loading door, clean the ashes through the hole in the refractory burner using the cleaning rake provided with the boiler. We recommend that you save part of the ashes and carbonised wood to make it easier to light the next time. Avoid scraping the rake on the middle refractory part in order to avoid abrasion of the part.
- Close the top loading door and open the bottom front door. Remove the ashes that have built up inside the combustion chamber and surrounding areas.
- Clean the flue by moving the lever towards the boiler approximately 10 times. Perform full 90º cycles.



NOTE: The flue cleaning lever can be placed on the opposite side of the boiler. To do so, remove the sides, the back part of the roof and the flue lid, loosen the lever and the arm of the cleaning axle, remove the axle and place it in the reverse position.

8.1.2 Tar

Clean the tar from the metal surface of the fuel loading chamber using the scraper. The gasification process produces tar and the amount will depend on the type of wood, its humidity and the water inlet and outlet temperatures. It is recommended that it be cleaned once a month, although the frequency may vary depending on the type of wood used.

8.2 Boiler maintenance:

Various maintenance operations should be carried out at different intervals to keep the boiler in perfect working order.

The most important aspects to be checked are as follows:

No.	Operation	Frequency
1.	Clean ashes from the loading compartment, combustion chamber and flue.	3-5 loads of firewood
2.	Check the boiler visually.	weekly
3.	Clean tar from the loading compartment	monthly
4.	Clean the windows of the peep-holes with alcohol	visual control
5.	Clean all exchange surfaces: flue, fume chamber, etc. You can use the cleaning brush for scraping and descaling any embedded tar or ashes.	yearly
6.	Check and clean the flue. The flue must be free of any obstacles and have no leaks.	yearly
7.	Check the expansion vessel. It must be full, according to its reference plate.	yearly
8.	Check the air-tightness of the housing doors.	yearly
9.	Check the water pressure in the heating installation. **In cool mode**, it should be between 1 - 1.5 bars.	yearly

8.2.1 Draining the condensation water

Draining of condensation water from the flue should not be altered in any way and it must be kept free of obstructions.

8.2.2 Boiler water characteristics

In areas with water hardness exceeding 25-30ºfH, treated water must be used in the heating installation to avoid any scale deposits on the boiler. It should be noted that even a few millimetres of lime-scale will greatly reduce the boiler's heat conductivity, causing a significant decrease in its performance.

Treated water must be used in the heating circuit in the following cases:

- Very large circuits (containing a large amount of water).
- Frequent filling of the installation.

If repeated partial or total draining of the installation is necessary, we recommend filling it with treated water.

8.3 Safety warnings:

8.3.1 Safe handling of ashes

For **safe handling** of the ashes, you should take the necessary safety precautions and wear suitable clothing to protect against possible injury. The following advice should be particularly taken into account:

- **Shut down the boiler operation** before removing the ashes.
- It is recommended to wear heatproof **"thermal gloves"** to protect your hands from any burns from hot parts of the drawer.
- It is recommended you wear a **"protective mask"** to avoid breathing in any ash particles, particularly in the case of people with allergies or any type of respiratory trouble, who should always wear a mask when carrying out ashes.
- As the ash to be removed may be burning or glowing, special precautions should be taken with regard to the type of container it is emptied into. A **metal** container is recommended, or **the ash should be totally put out** at the time of handling, using water or another extinguishing agent.

DOMUSA TEKNIK shall not be liable for any damage caused to people, animals or property as a result of incorrect handling of the ash drawer or the ash itself.

IMPORTANT: The ash clearance must only be undertaken when the boiler is switched off.

8.3.2 Hazards related to the door of the fuel loading chamber.

To avoid hazards related to the door of the fuel loading chamber, take the following advice into account:

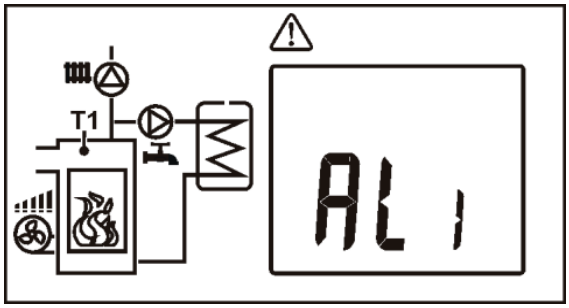
- If opening the fuel loading door when there is combustion in the housing, do so carefully. First open very slightly. Keep your body and face away from the fuel loading door.
- Close the door of the fuel loading chamber immediately after performing the control of the fuel load amounts or after having reloaded fuel.
- The danger of deflagration increases after uncontrolled conditions in the installation (power cut).
- Let the installation cool down before opening it.
- Do not open the door of the combustion chamber during/after a power cut.
- The flames can cause damage to the control unit.
- Inspect the doors and joints of the installation in search of possible leaks.

9 SHUTTING DOWN THE BOILER

To stop the boiler, press the "STOP" button. In **shut-down mode**, the fan stops working. To shut down boiler operation completely, unplug it from the mains.

9.1 Detection of lack of fuel

The controller automatically detects the lack of fuel. When the fuel runs out, the message AL1 appears on the screen.



After detecting the lack of fuel, the circulating pump and the fan are deactivated so as to avoid any heat loss in the buffer tank. In this case, if no additional load of wood is desired, the controller can be turned off. The "AL1" alarm can be cancelled by pressing the "START" button or after turning the controller on and off.

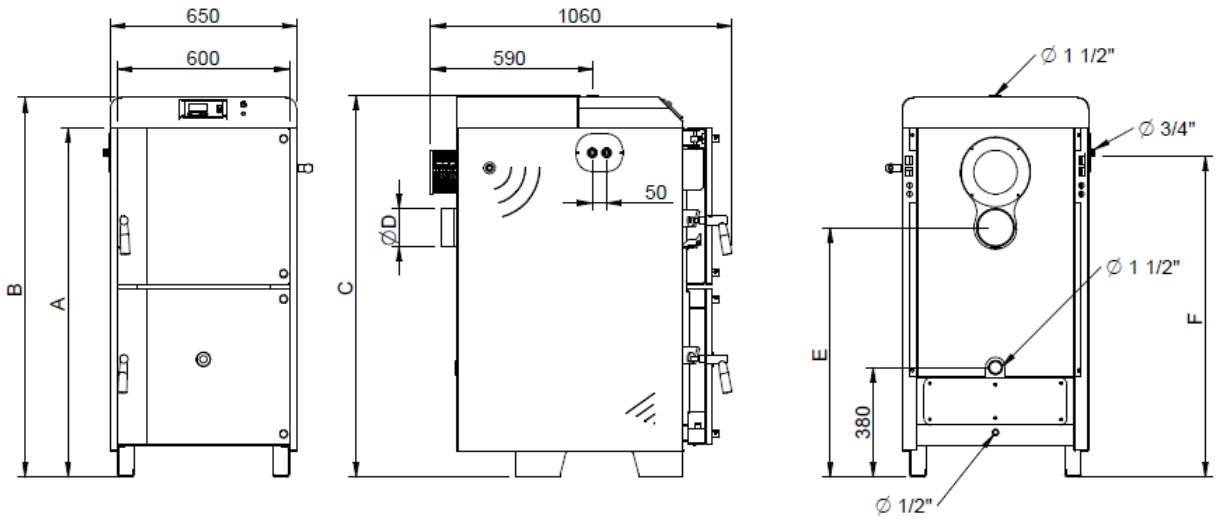
NOTE: If the lack of fuel is detected too quickly or too slowly, call the Technical Support Service to check and modify the controller values.

10 TECHNICAL CHARACTERISTICS

MODEL		Lignum NG 20	Lignum NG 30	Lignum NG 40
Maximum output power	kW	20	30	40
Performance (indirect method)	%	90,1	90,4	91,2
Fuel load volume	lt	89	113	137
CO at maximum power (10% of O_2)	mg/m^3	< 700		
Classification (as per EN 303-5)	-	Class 5	Class 5	Class 5
Maximum operating pressure	bar	3		
Fume temperature	ºC	150 - 200		
Control temperature range	ºC	65 - 80		
Minimum return temperature	ºC	55		
Safety thermostat temperature	ºC	97		
Boiler water volume	litres	90	104	114
Water pressure drop (ΔT=10ºC)	mbar	39	22	44
Water pressure drop (ΔT=20ºC)	mbar	11	6	11
Minimum flue draught	mbar	0.01		
	Pa	10		
Electrical supply	-	230 V~, 50 Hz		
Average electrical consumption in nominal power	W	57	64	70
Average electrical consumption in Standby	W	3		
Fume outlet diameter	mm	125 -130		146-150
Weight (net)	Kg	385	425	450

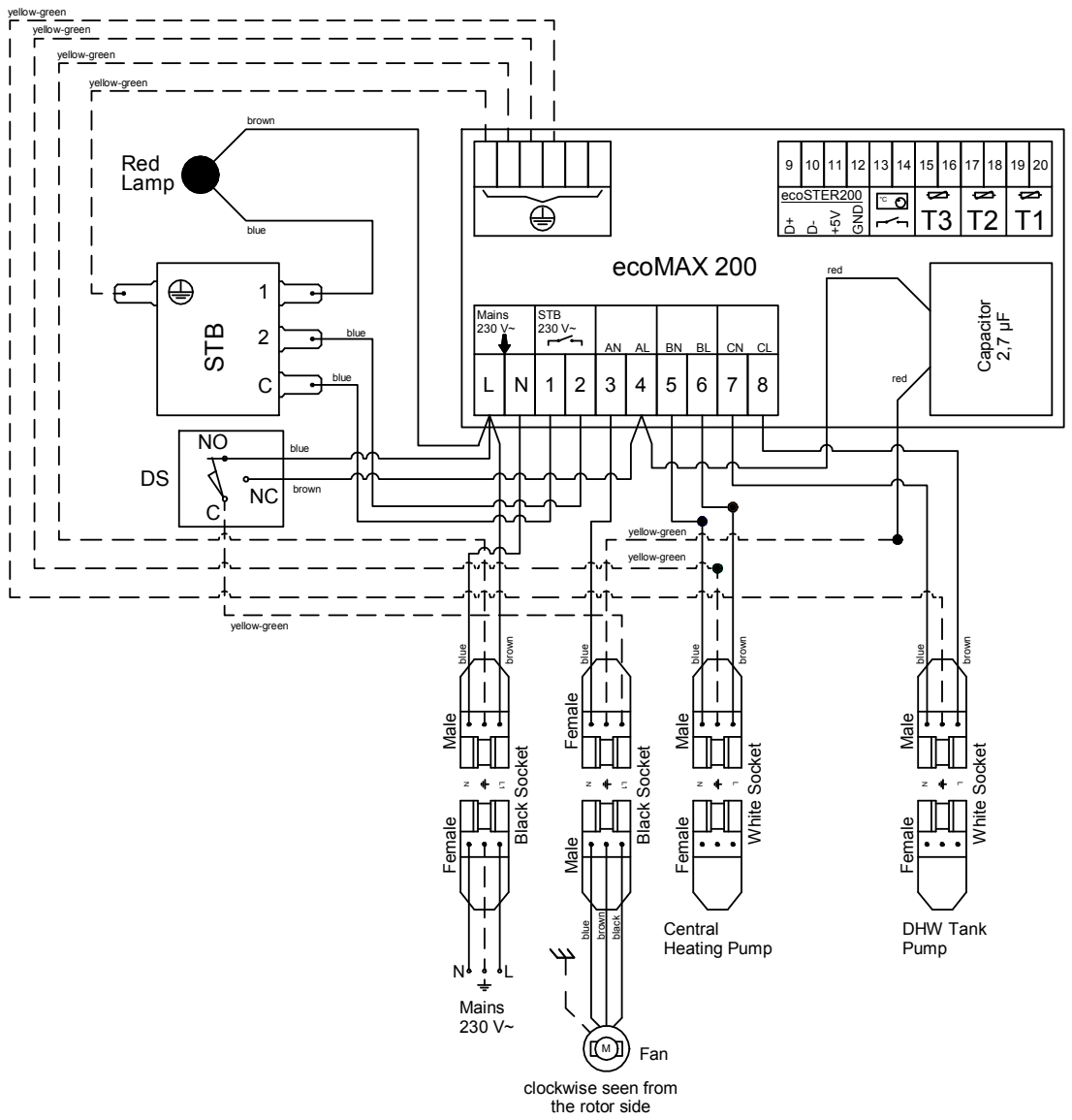
11 DIAGRAMS AND MEASUREMENTS

Lignum NG



MODEL		Lignum NG 20	Lignum NG 30	Lignum NG 40
Boiler height (A)	mm	1060	1210	1310
Total height (B)	mm	1165	1315	1415
Feeder connection height (C)	mm	1137	1287	1387
Fumes outlet connection (D)	mm	125-130		146-150
Chimney connection height (E)	mm	715	865	955
Height of the Safety Heat Exchanger (F)	mm	975	1125	1225

12 ELECTRICAL DIAGRAM



L: Phase.
N: Neutral.
C: Common.
GND: Earth.
T1: Boiler sensor.
T2: DHW sensor.
T3: Fume temperature sensor.
: Room thermostat (not operative in the Lignum NG boilers).
STB: Safety thermostat (100ºC).
DS: Door switch.
NO: Normally open port.
NC: Normally closed port.

13 SENSOR VALUES

The table below shows the electrical resistance values for each temperature on the sensors connected to the boiler. To correctly measure these values, the sensors must be electrically disconnected from their corresponding terminal block:

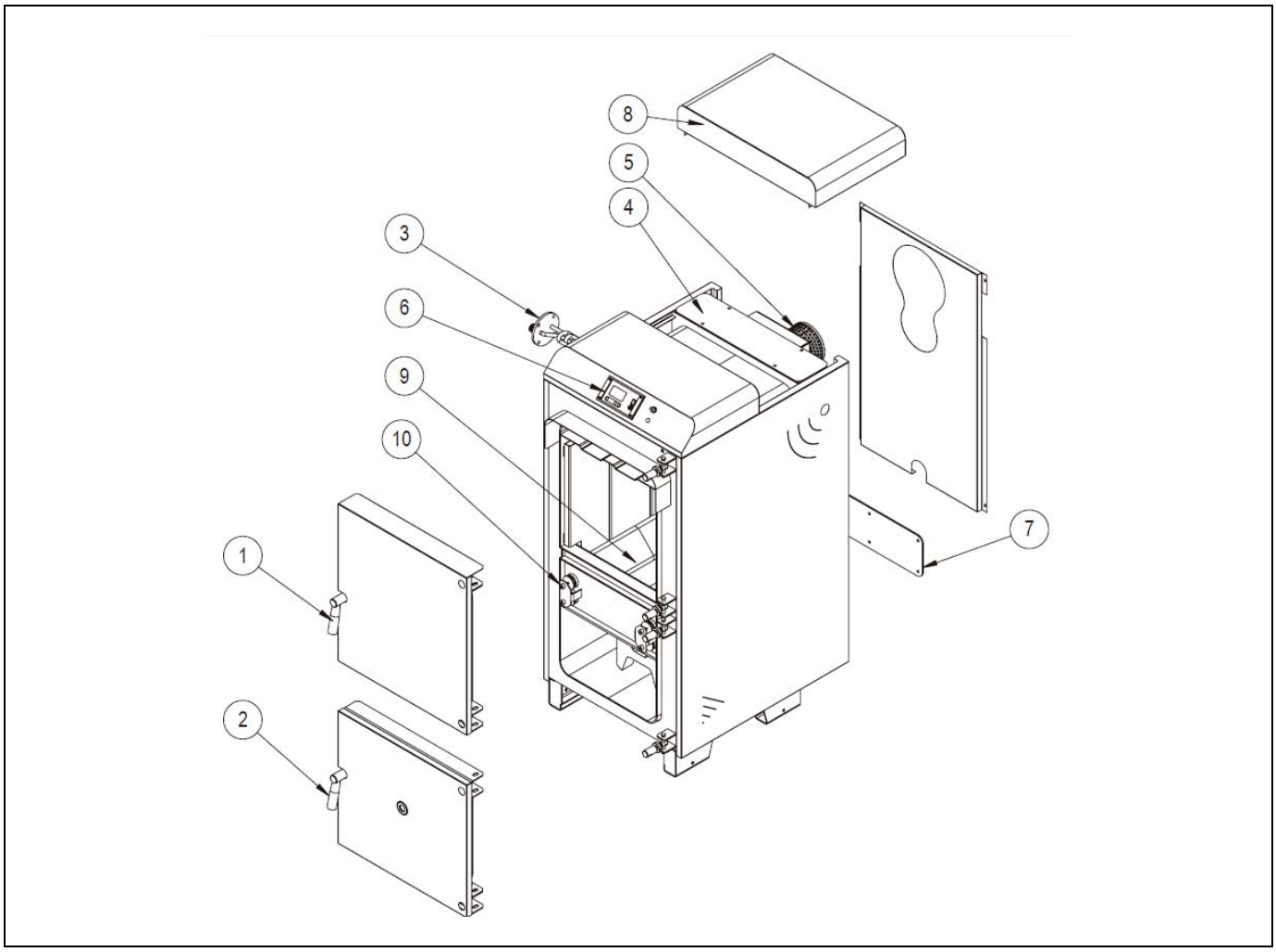
DHW/BOILER SENSOR PTC (1 kΩ at 25ºC)			
R (ohms)	**Temp.** (ºC)	**R** (ohms)	**Temp.** (ºC)
815	0	1209	50
886	10	1299	60
961	20	1392	70
1000	25	1490	80
1040	30	1591	90
1122	40		

FUMES SENSOR PT1000 (1 kΩ at 0ºC)			
R (ohms)	**Temp.** (ºC)	**R** (ohms)	**Temp.** (ºC)
1000	0	1385	100
1097	25	1479	125
1194	50	1573	150

If there are significant differences with regard to the values in the table, the sensor must be changed.

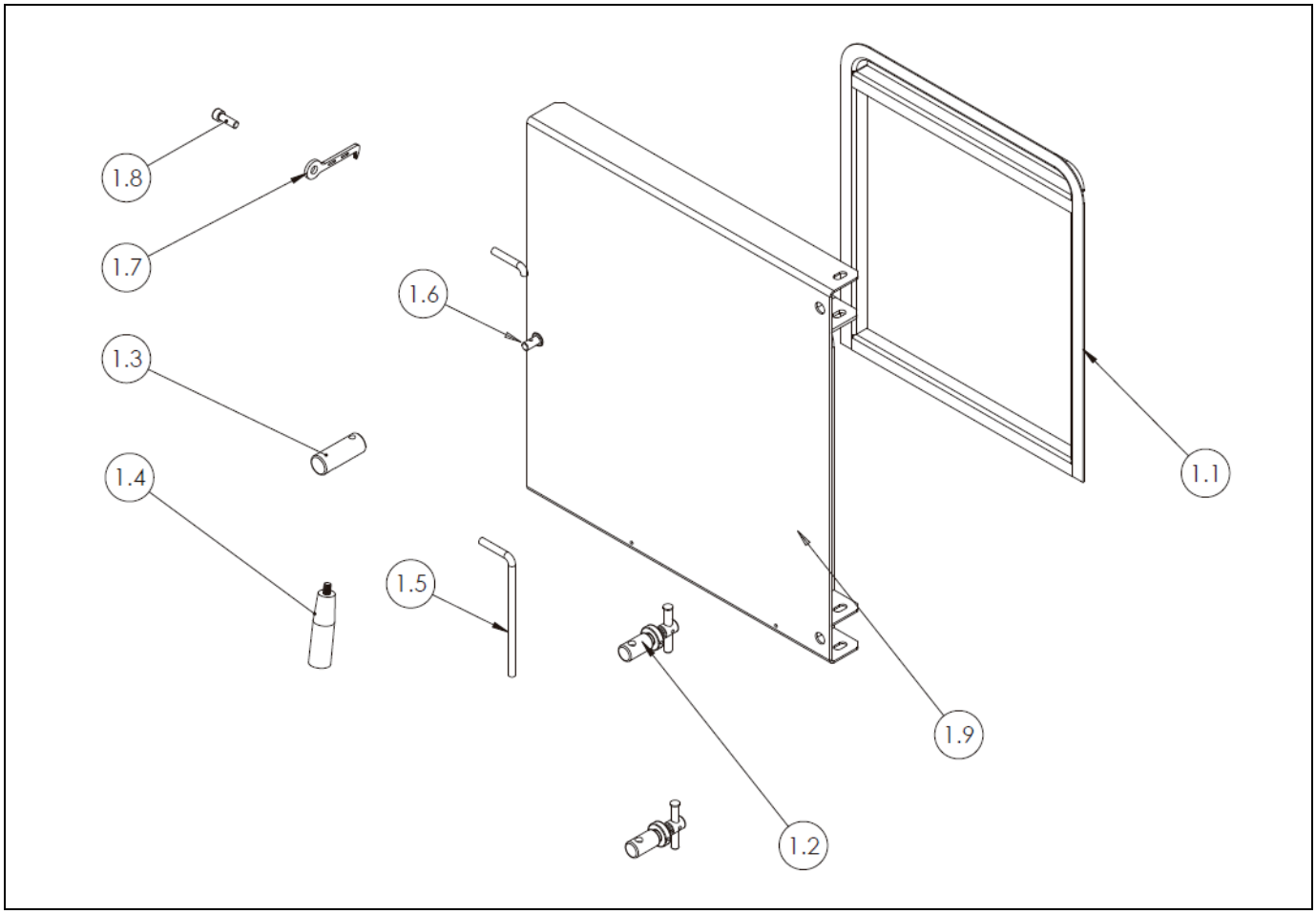
14 SPARES LIST

Boiler



No.	Code	Description
1		Top door
2		Bottom door
3		LIGNUM NG coil
4		Gas flue cleaning system
5		Fan
6		Controller
7		Bottom back part
8		Outside
9		Refractory parts
10	CLIG000163	Air adjustment LIGNUM NG 20/30
	CLIG000111	Air adjustment LIGNUM NG 40

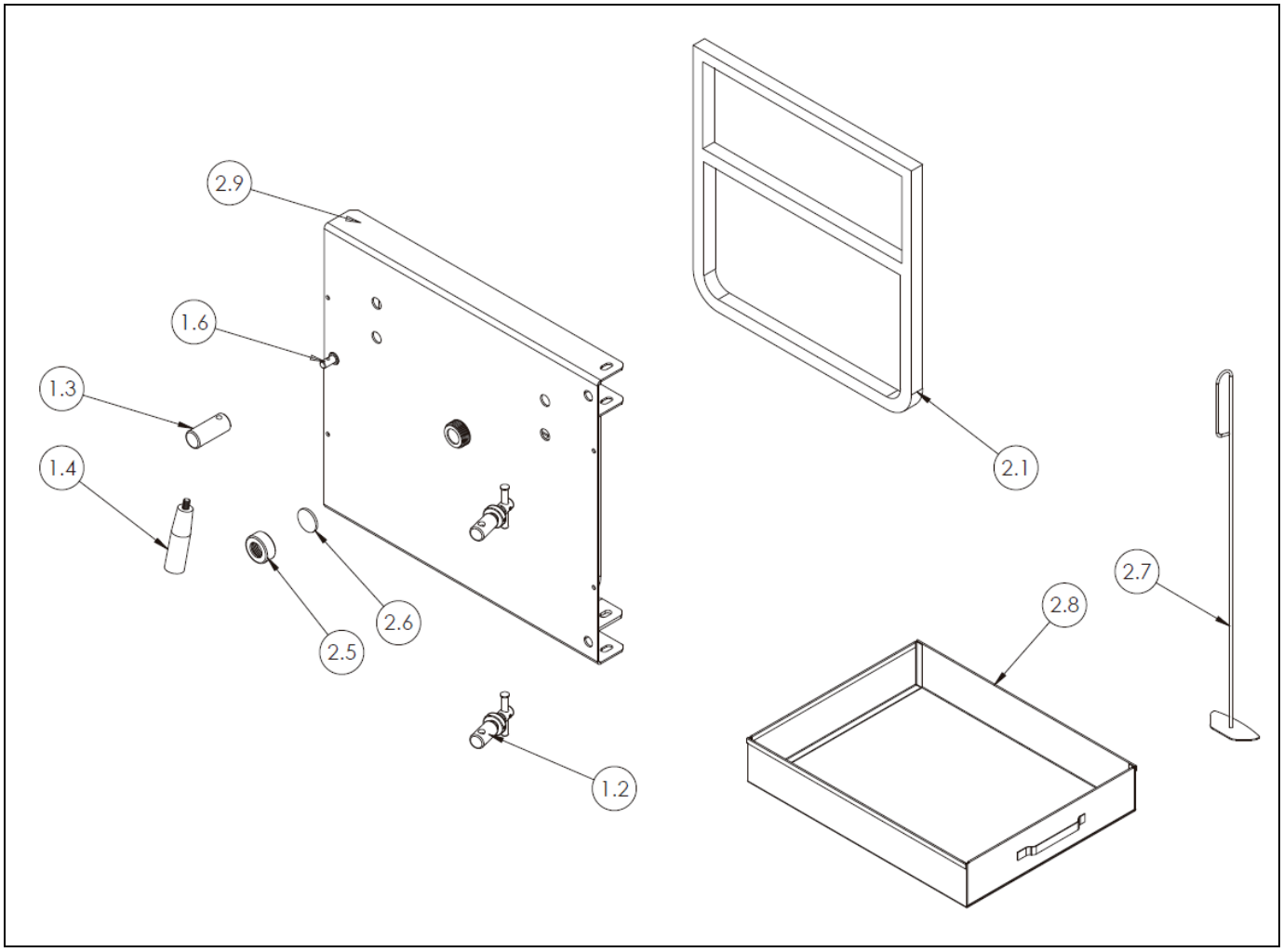
Top door



No.	Code	Description
1.1	CLIG000116	LIGNUM NG 20 top door seal
	CLIG000117	LIGNUM NG 30 top door seal
	CLIG000118	LIGNUM NG 40 top door seal
1.2	CLIG000003	LIGNUM NG door hinge
1.3	CLIG000004	LIGNUM NG door handle assembly
1.4	CLIG000005	LIGNUM NG Bakelite arm
1.5	CLIG000006	LIGNUM NG door fixing
1.6	CLIG000113	LIGNUM NG handle shaft
1,7	CLIG000119	LIGNUM NG Door lock
1,8	CLIG000120	LIGNUM NG door lock pin
1,9	CLIG000121	LIGNUM NG upper front door with refractory LIGNUM NG 20
	CLIG000122	LIGNUM NG upper front door with refractory LIGNUM NG 30
	CLIG000123	LIGNUM NG upper front door with refractory LIGNUM NG 40

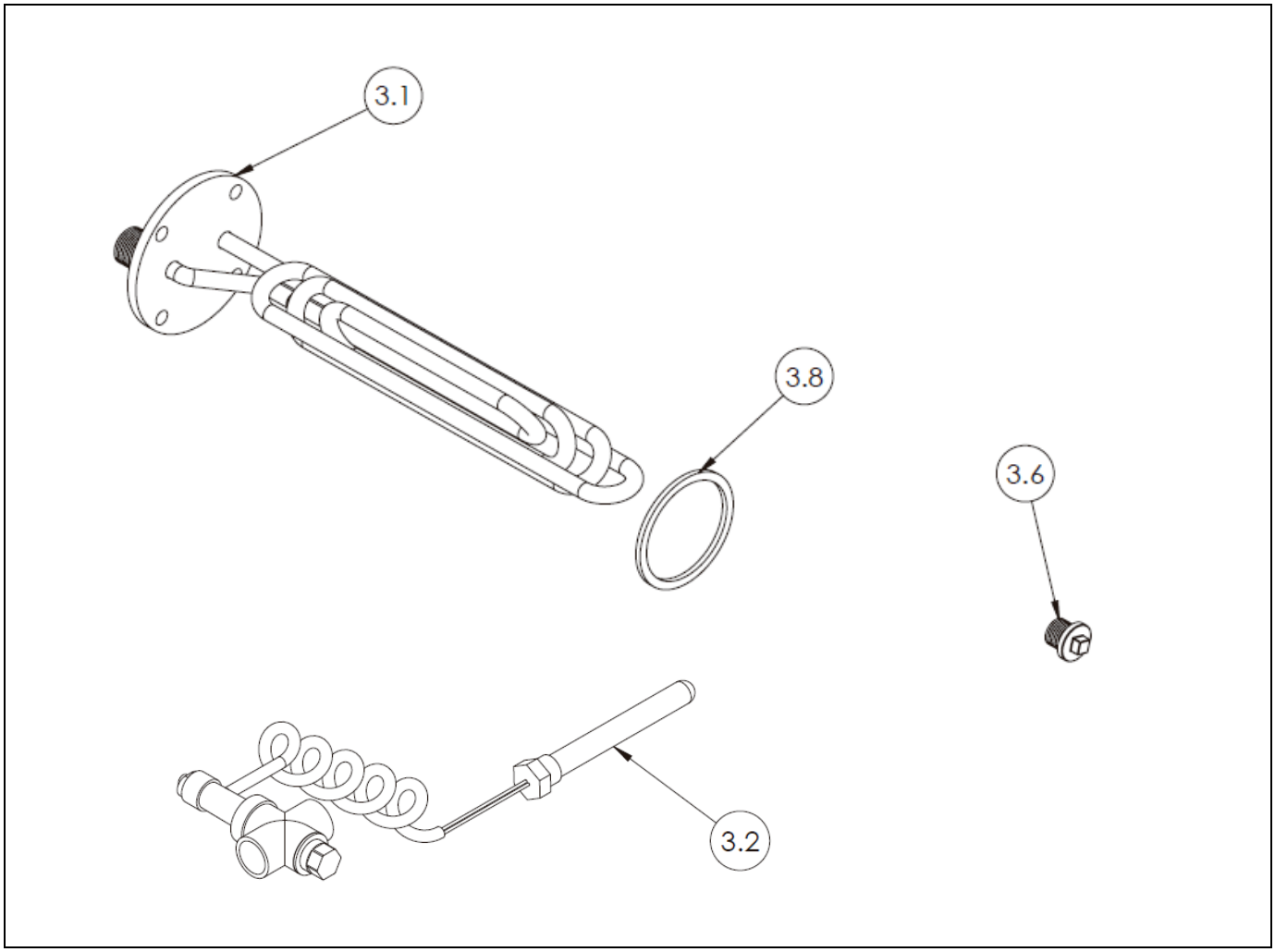
Lignum NG

Bottom door



No.	Code	Description
2.1	CLIG000126	LIGNUM NG 20 bottom door seal
	CLIG000127	LIGNUM NG 30/40 bottom door seal
2.5	CLIG000011	LIGNUM NG peep-hole
2.6	CLIG000012	LIGNUM NG peep-hole casing
2.7	CLIG000013	LIGNUM NG rake
2.8	CLIG000128	LIGNUM NG ash box
2,9	CLIG000129	LIGNUM NG 20 bottom front door with refractory
	CLIG000130	LIGNUM NG 30/40 bottom front door with refractory

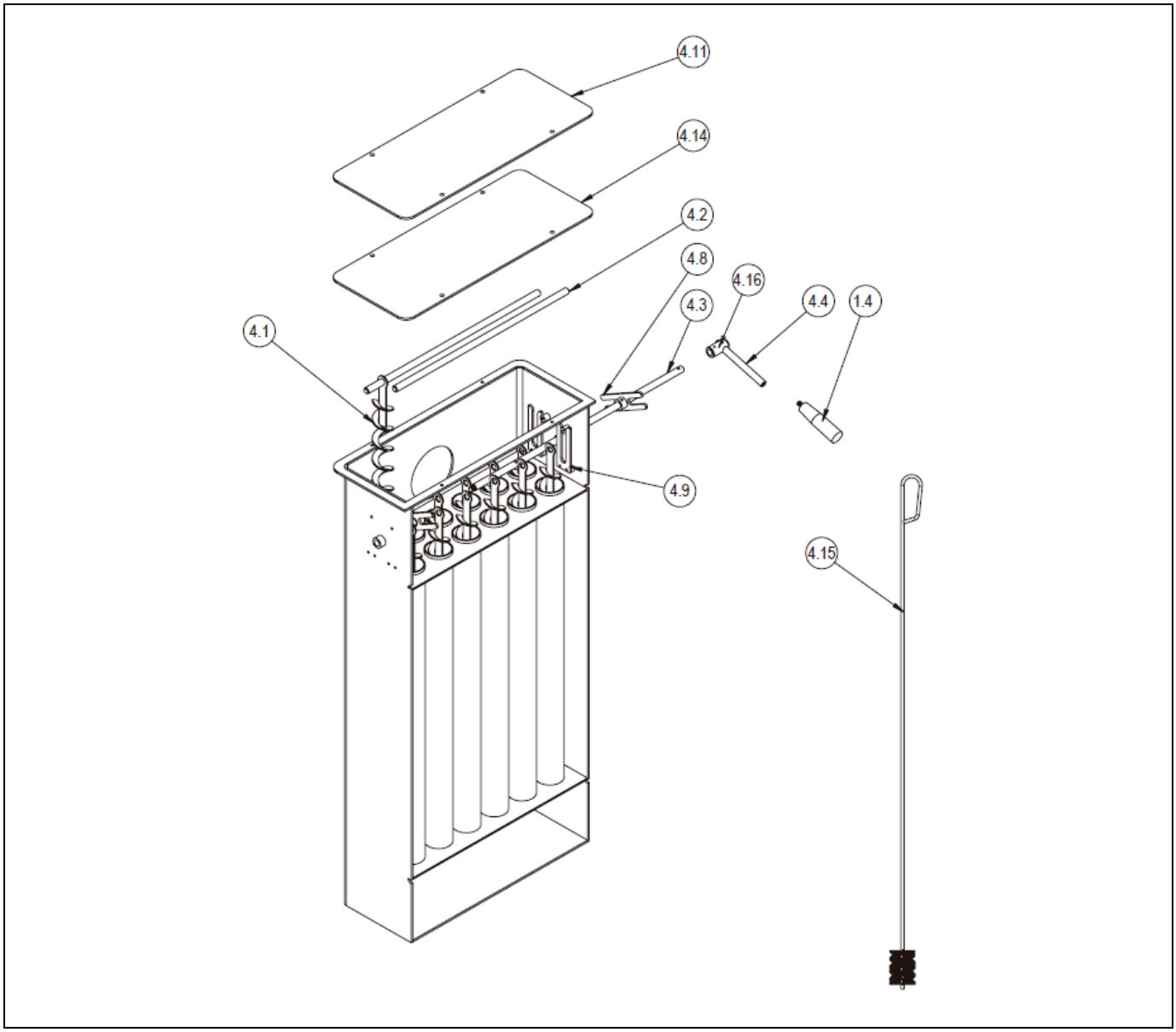
Coil



No.	Code	Description
3.1	CLIG000016	LIGNUM NG cooling heat exchanger
3.2	CLIG000017	LIGNUM NG Temperature relief valve
3.6	CLIG000019	LIGNUM NG Temperature relief valve casing
3.8	CLIG000131	LIGNUM NG Temperature relief valve seal

Lignum NG

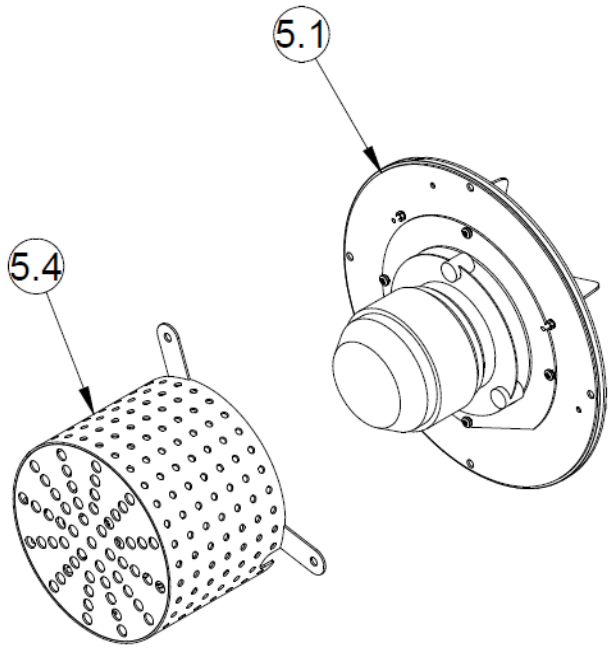
Gas flue cleaning system



No.	Code	Description
4.1	CLIG000132	LIGNUM NG 20 turbulator
	CLIG000133	LIGNUM NG 30 turbulator
	CLIG000134	LIGNUM NG 40 turbulator
4.2	CLIG000026	LIGNUM NG turbulator axle
4.3	CLIG000135	LIGNUM NG cleaning axle
4.4	CLIG000030	LIGNUM NG cleaning arm
4.5	CLIG000031	LIGNUM NG cleaning handle

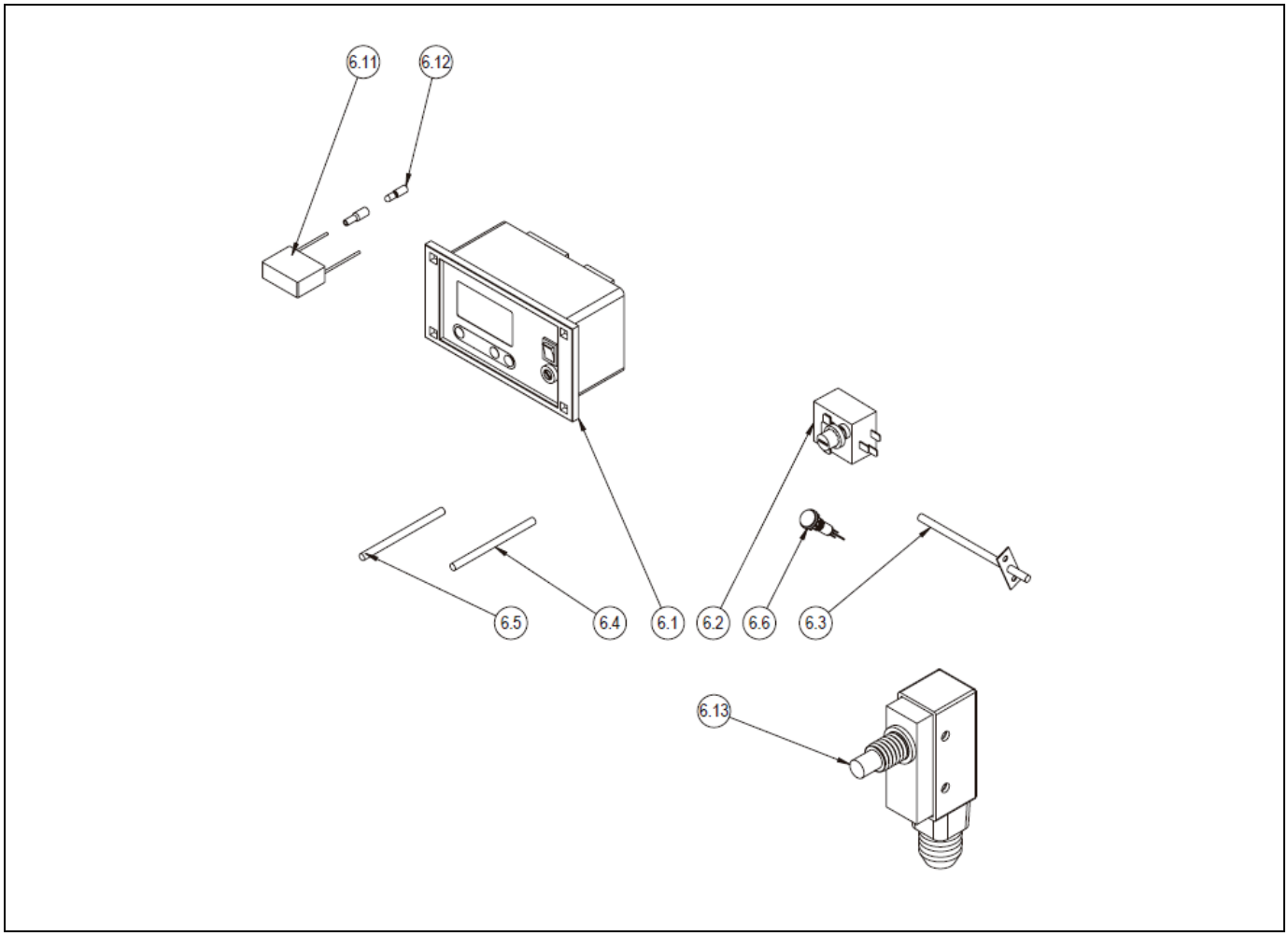
No.	Code	Description
4.8	CLIG000032	LIGNUM NG cleaning axle arm
4.9	CLIG000034	LIGNUM NG cleaning axle support
4.11	CLIG000136	LIGNUM NG flue lid
4.14	CLIG000137	LIGNUM NG flue lid insulation
4.15	CLIG000042	LIGNUM NG cleaning brush

Fan



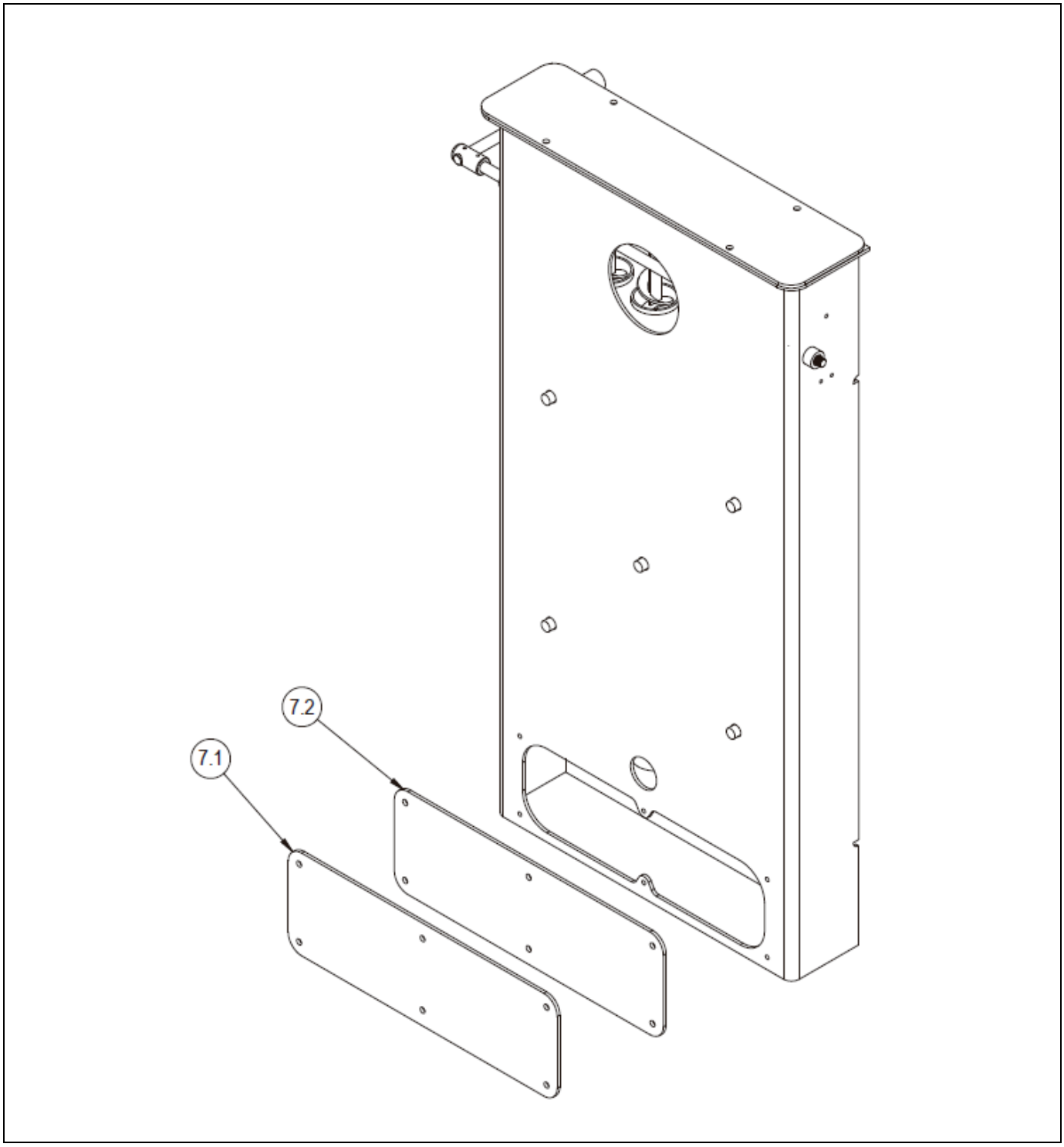
No.	Code	Description
5.1	RLIG000113	LIGNUM NG fan
5.4	RLIG000114	LIGNUM NG fan cover box
	CLIG000046	LIGNUM NG fan gasket

Controller



No.	Code	Description
6.1	CLIG000048	LIGNUM NG controller
6.2	CLIG000049	LIGNUM NG safety thermostat
6.3	CLIG000050	LIGNUM NG fumes sensor
6.4	CLIG000051	LIGNUM NG boiler sensor
6.5	CLIG000052	LIGNUM NG DHW sensor
6.6	CLIG000053	LIGNUM NG controller light
6.7	CLIG000138	LIGNUM NG controller housing
6.11	CFOV000151	LIGNUM NG capacitor
6.12		LIGNUM NG capacitor terminal
6.13	CLIG000114	LIGNUM NG door switch

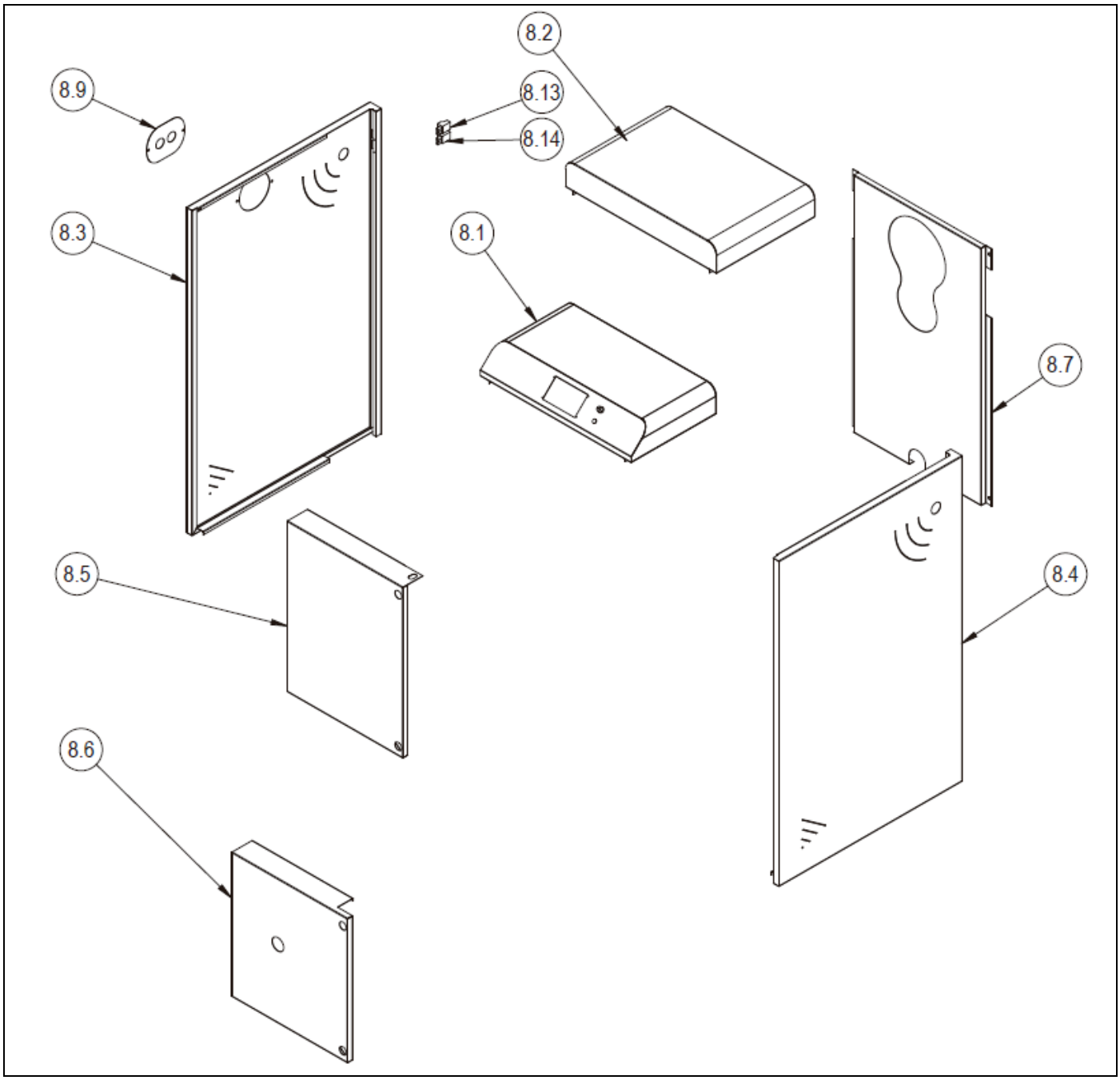
Bottom back part



No.	Code	Description
7.1	CLIG000139	LIGNUM NG back part
7.2	CLIG000140	LIGNUM NG back door insulation

Lignum NG

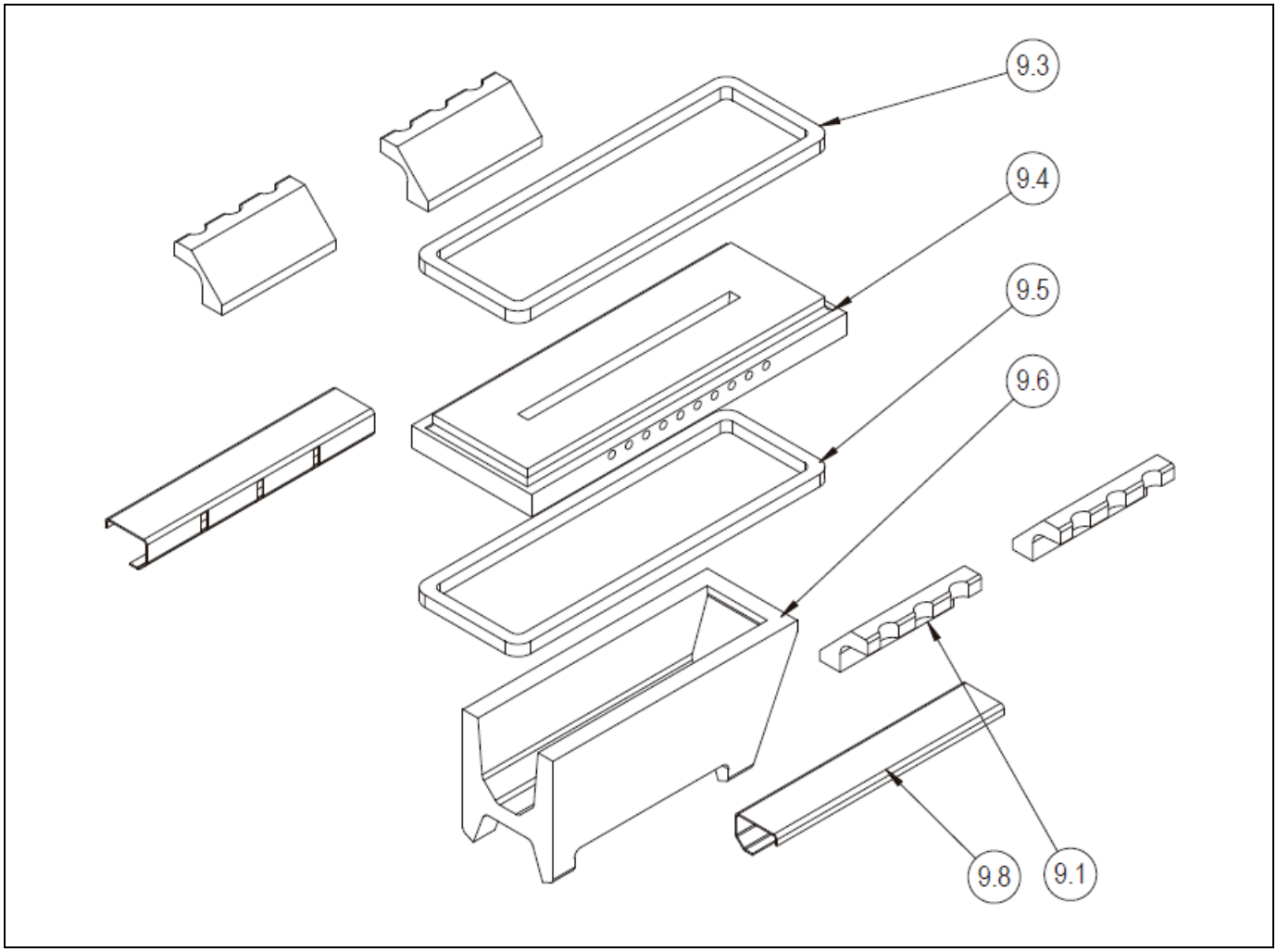
Outside



No.	Code	Description
8.1	CLIG000141	LIGNUM NG front roof
8.2	CLIG000142	LIGNUM NG back roof
8.3-a	CLIG000143	LIGNUM NG 20 left side
	CLIG000144	LIGNUM NG 30 left side
	CLIG000145	LIGNUM NG 40 left side
8.4	CLIG000146	LIGNUM NG right side
	CLIG000147	LIGNUM NG right side
	CLIG000148	LIGNUM NG right side
8.5	CLIG000149	LIGNUM NG top door
	CLIG000150	LIGNUM NG top door
	CLIG000151	LIGNUM NG top door
8.6	CLIG000152	LIGNUM NG 20 bottom door
	CLIG000153	LIGNUM NG 30/40 bottom door
8.7	CLIG000154	LIGNUM NG 20 bottom back
	CLIG000155	LIGNUM NG 30 bottom back
	CLIG000156	LIGNUM NG 40 bottom back
8.9	CLIG000157	LIGNUM NG coil cover
8.13	CLIG000090	3-pin socket connector LIGNUM NG
8.14	CLIG000091	3-pin plug connector LIGNUM NG

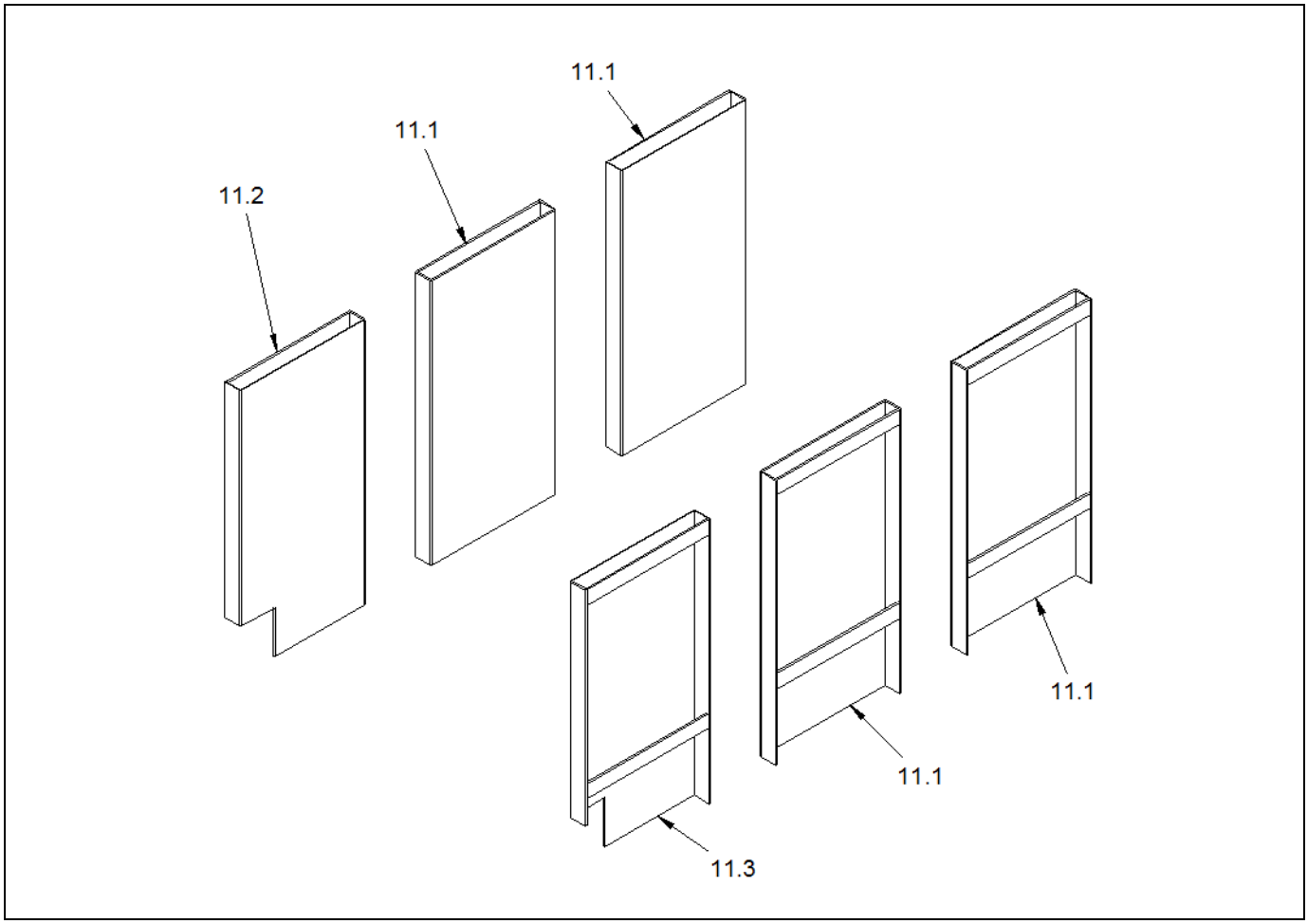
Lignum NG

Refractory parts



No.	Code	Description
9.1	CLIG000158	LIGNUM NG top refractory element
9.3	CLIG000159	LIGNUM NG top fibre seal
9.4	CLIG000160	LIGNUM NG middle refractory element
9.5	CLIG000161	LIGNUM NG bottom fibre seal
9.6	CLIG000108	LIGNUM NG 20 bottom refractory element
	CLIG000109	LIGNUM NG 30/40 bottom refractory element
9.8	RLIG000124	LIGNUM NG primary air duct

Anti-condensates



No.	Code	Description
11.1	RLIG000118	Rear anti-condensates sheet LIGNUM NG 20
	RLIG000121	Rear anti-condensates sheet LIGNUM NG 30
	RLIG000115	Rear anti-condensates sheet LIGNUM NG 40
11.2	RLIG000119	Front left anti-condensates sheet LIGNUM NG 20
	RLIG000122	Front left anti-condensates sheet LIGNUM NG 30
	RLIG000116	Front left anti-condensates sheet LIGNUM NG 40
11.3	RLIG000120	Front right anti-condensates sheet LIGNUM NG 20
	RLIG000123	Front right anti-condensates sheet LIGNUM NG 30
	RLIG000117	Front right anti-condensates sheet LIGNUM NG 40

15 ALARM CODES

The **Lignum NG** boiler has an electronic control able to detect overheating or lack of fuel in the boiler. When the electronic control detects an operating error, this is indicated by an alarm code on the display. The table below shows a list of the alarm codes that may appear:

CODE	ALARM	CAUSE / ACTION
AL1	Lack of fuel alarm	When the fuel runs out, this message appears on the screen. It does not emit an acoustic signal.
AL2	Damage to the boiler sensor alarm	This alarm occurs when the boiler temperature sensor does not function properly or after it has exceeded its measuring range. The alarm activates the heating pump and an acoustic signal. The alarm is deactivated once the temperature returns to its measurement range and after the general switch on the controller is turned off and on. The Technical Support Service must be called to check and replace the sensor.
AL3	Boiler overheating alarm	This alarm occurs when the boiler temperature exceeds 90ºC. If this happens, the fan switches off and the pumps are activated. In addition, an acoustic signal is emitted. When the boiler temperature drops, the regulator which controls the boiler will operate normally.
AL4	Fume temperature sensor alarm	This alarm occurs when the electronic control detects a failure in the fume temperature sensor.
⚠	Maximum fume temperature overrun	The regulator warns the user that the fume temperature is too high when it exceeds 450ºC. This temperature can be reached if the housing door is left open or due to a malfunction of the fume temperature sensor. The alarm is displayed visually and emits a short, acoustic signal.
	Safety thermostat alarm	When the boiler temperature exceeds 100ºC, the safety thermostat (manual reset) deactivates the fan and the red light on the control panel turns on.

16 GUARANTEE CONDITIONS

DOMUSA TEKNIK's commercial guarantee covers normal operation of the products manufactured by DOMUSA TEKNIK Calefacción S.Coop., in accordance with the following conditions and time periods:

1. This **commercial guarantee** is valid for the following periods, as from the **start-up** date:

   2 Years for electric and hydraulic elements, pumps, valves, etc.

   5 Years for heat exchangers.

   During the 2-year period following the date of first start-up, DOMUSA TEKNIK will carry out any repairs of original flaws or defects totally free of charge.

   After these 2 years have elapsed and until the end of the guarantee period, labour costs and call-out charges will be payable by the user.

2. The annual service is not included in the terms of this guarantee.

3. The **commissioning** and **annual service** are to be carried out by personnel authorised by DOMUSA TEKNIK.

4. The **commercial guarantee** will be null and void in the following cases:

   - If the **annual service** has not been carried out by personnel authorised by DOMUSA TEKNIK.
   - If the boiler has not been installed in accordance with the applicable laws and regulations for this type of appliance.
   - If the boiler has not been commissioned immediately after its installation, by personnel authorised by DOMUSA TEKNIK.

Failures due to misuse or incorrect installation, use of non-suitable power or fuel, water supply with physical or chemical properties causing lime-scale or corrosion, incorrect handling of the appliance and, in general, for any reason beyond DOMUSA TEKNIK's control, are excluded from this guarantee.

This guarantee does not affect the consumer's rights as stipulated by law.

NOTES:

NOTES:

DOMUSA TEKNIK

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