GROUPE ATLANTIC

INSTALLATION, USE AND MAINTENANCE

LRB Boilers

LRB 12 000, 14 000, 16 500, 18 000, 20 000, 23 000 kW to be fitted with a burner

Uxxxxxxx-A
28.01.2020

For professionals.
To be kept by the user for future reference

For Belgium:

Die Montage-, Wartungs- und Bedienungsanleitungen sind auf deutsch erhältlich. Nehmen Sie bitte Kontakt mit uns.

CONTENTS

1. WARNINGS AND RECOMMENDATIONS

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLING, MAINTAINING AND USING THE BOILER. IT CONTAINS IMPORTANT SAFETY INFORMATION.

1.1. Transport and storage

The boiler:

- must be arranged horizontally in a place where the temperature is between 0 °C and +50 °C and whose relative humidity is between 5% and 95%.
- must be protected from humidity.

1.2. Symbols used in this document

INFORMATION:	This symbol draws attention to comments.
CAUTION :	Failure to comply with these instructions may cause damage to the installation or to other objects.
DANGER:	Failure to comply with these instructions may cause injury and serious material damage.
DANGER:	Failure to comply with these instructions may cause electrocution.

1.3. Qualification of personnel for installation, adjustment, use and maintenance

The operations to install, adjust and maintain the boiler must be carried out by qualified and approved professionals in accordance with current local and national regulations. These operations may required intervention under voltage, for an intervention on the burner or the control panel.

1.3.1. Installation and settings

- The installation and calibration of the unit must be performed exclusively by qualified personnel in conformity with existing regulations and the indications provided in this Manual.

1.3.2. Electrical Installation

- Electrical connections must be made exclusively by qualified personnel and all prevailing electrical regulations must be scrupulously observed.
- Make sure that the electrical power supply used for connection conforms to the specifications indicated on the rating plate and in this manual.
- The unit must be correctly connected to an efficient ground system in conformity to the prevailing norms checked and controlled for efficiency by qualified personnel when in doubt.
- Never confuse neutral wires with phase wires.
- The unit must be hooked up to the electrical network with a plug-socket

connection that is such as to prevent inversion of phase and neutral. Install a master switch for the heating plant as requested by existing legislation.
- The entire electrical system, and all cable sections in particular, must be adequate to deliver the maximum absorbed power value indicated on the equipment's rating plate and in this manual.
- If the mains power cable is found to be defective, it must be replaced only by qualified personnel.
- Never stretch power supply cables and keep them well away from sources of heat.

1.4. Safety instructions

- Always disconnect the power supply to the boiler and shut off the main gas or oilsupply before carrying out any work on it.
- Check that there are no gas leaks on the installation after any intervention on the boiler (maintenance or repair).

DANGER:

If you smell gas:
- **Do not use any naked flames, smoke or activate any contacts or electric switches.**
- **Switch off the gas supply.**
- **Ventilate the premises.**
- **Look for the leak and correct it.**

DANGER:

If any smoke is released:
- **Switch off the boiler.**
- **Ventilate the premises.**
- **Look for the leak and correct it.**

DANGER:

This boiler's earth continuity is provided by link cables (green/yellow) and specific holding screws. During any disassembly operations, make sure that the cables in question are reconnected; you MUST also reuse the original holding screws.

1.5. Unit

- Smooth boiler performance and manufacturer's guarantee are dependant upon adherence to the boiler installation, operation and maintenance instructions contained in this booklet.
- Never permit children or unauthorized persons to tamper with the equipment.
- The unit must be used only for its expressed application. All other uses are considered to be dangerous.
- The burner's minumum and maximum delivery settings, all pressures and temperatures must all be contained in the range stipulated in this manual.
- Modification of the equipment in order to alter its performance or applications prohibited.
- Do not open or tamper with components of the unit other than those parts of the unit that are subject to maintenance operations.
- Never touch the hot parts of the unit; these parts (flue gas conduit, sight

glass, burner parts, etc) may remain hot for quite some time after the burner has switched off.

- Never touch the unit with wet parts of the body or without wearing shoes.
- When the unit is not to be used for a longer period, the main power switch on the electrical control panel must be switched off and the manual valve on the unit fuel supply line must be closed.
- The device contains components made of synthetic silicon mineral fibres (ceramic and glass fibres, insulation wool). These components must be disposed of appropriately at the end of their life cycle. Local regulations must be observed.

1.6. Water characteristics

The following rules apply once the boiler is put into service and remain valid until the end of life of the product.

DANGER: **The use of glycol water if forbidden.**

1.7. Water quality

- The following rules apply once the boiler is put into service and remain valid until the end of life of the product.

1.7.1. Preparing the water system before putting the boiler into service

For any installation (new or renovation), the water system pipes must be thoroughly cleaned. The purpose of this initial cleaning is to eliminate germs and residue that can cause deposits to form. **In new installations** in particular, residue from grease, oxidised metal, and even copper microdeposits must be removed. **In renovated installations**, cleaning should focus on removing sludge and the products of corrosion formed when the unit was last in operation. There are two types of methods for cleaning and removing sludge: a high intensity approach that takes a few hours and a slower, more gradual approach that takes several weeks. The first type of cleaning must be done **before connecting the new boiler**, and with the second type, a filter should be installed on the back of the boiler to capture loosened deposits. **The cleaning performed prior to installation improves performance, reduces energy consumption, and resists scaling and corrosion on the unit. A professional (water treatment) should carry out the cleaning.**

1.7.2. Protecting the unit against scaling

Water naturally contains dissolved calcium ions and carbonates that cause scaling (calcium carbonate) to form. To prevent excessive deposits, take precautions with regard to **the water used to fill the unit: TH < 5 ° f.**

Adding a large amount of untreated water always contributes a significant

amount of scaling. To monitor this and to detect problems, **a system water meter must be installed.**

Failure to comply with these quidelines (such that the fill water plus the make-up water is more than three times the water capacity of the heating system) requires a full cleaning (to remove sludge and scaling) to be performed.

Additional precautions are required for operation:

- When the unit has a water softener, the equipment must be inspected on a regular basis in order to ensure that it is not outputting chloride-rich water into the system. The connection of chlorides must always remain below 50 mg/l.

– To prevent the build-up of calcium deposits (such as on exchange surfaces), the unit should be brought into service slowly, starting by operating at a low power with high primary water flow.

– When the tap water lacks the desired qualities, **water treatment is required.** The fill water must be treated, and whenever new water is added, the make-up water must also be treated.

– Installations with multiple boilers require all of the boilers to be brought up simultaneously at minimal power. Doing this prevents the calcium in the water from depositing on the exchange surfaces of the first boiler.

– When working on the unit, avoid draining it completely, only the required parts of the system are to be drained.
The rules listed above are designed to minimise scaling on the exchange surfaces and thus to increase the life of the boilers. To optimise how the equipment operates, plan to remove its calcium deposits. This must be done by a specialized company. Also, before putting the unit into service, verify that the heating system is not damaged (ex.leaks). If it has excessive scaling, the unit's settings for operation and for water treatment must be adjusted.

After the heating season is over, the water must not be drained from the boiler. For long term stops, water analysis of the heating system must be done so that the TH value will not go under the limit value where corrosive effect occurs.

It is more appropriate to make a general definition to precipitate material instead of calcium. (Because except of calcium, there could also be magnesium and silicon materials.)

Due to the use of different materials in the heating system (such as carbon steel, copper, plastic, brass etc.), battery reaction occurs. In order to prevent this, grounding line must be installed in hot water boilers.
During maintenance activities, the burner and the equipment connected to it must be 40 degrees or less.

1.8. Protecting the unit against scaling

Water naturally contains dissolved calcium ions and carbonates that cause scaling (calcium carbonate) to form. To prevent excessive deposits, take precautions with regard to the water used to fill the unit: **TH < 10°f**

Water must be added during the life of the boiler. The new water adds scaling to the water system. The amount of fill water plus the amount of make-up

water added during the life of the unit should not be more than three times the water capacity of the heating system. Also, the hardness of the make-up water must be controlled. Make-up water: **TH < 5°f**
Adding a large amount of untreated water always contributes a significant amount of scaling. To monitor this and to detect problems, a system water meter must be installed.
Failure to comply with these guidelines (such that the fill water plus the make-up water is more than three times the water capacity of the heating system) requires a full cleaning (to remove sludge and scaling) to be performed.

Additional precautions are required for operation:

- When a softener is present in the installation, frequent inspection of the equipment is required to check that it does not discharge water with a rich chloride content into the network: the chloride concentration must always remain below 50 mg/litre.
- To prevent the build-up of calcium deposits (such as on exchange surfaces), the unit should be brought into service slowly, starting by operating at a low power with high primary water flow.
- When the tap water lacks the desired qualities, water treatment is required. The fill water must be treated, and whenever new water is added, the make-up water must also be treated.
- Installations with multiple boilers require all of the boilers to be brought up simultaneously at minimal power. Doing this prevents the calcium in the water from depositing on the exchange surfaces of the first boiler.
- When working on the unit, avoid draining it completely; only the required parts of the system are to be drained.

The rules listed above are designed to minimise scaling on the exchange surfaces and thus to increase the life of the boilers.
To optimise how the equipment operates, plan to remove its calcium deposits. This must be done by a specialized company. Also, before putting the unit into service, verify that the heating system is not damaged (ex. leaks). If it has excessive scaling, the unit's settings for operation and for water treatment must be adjusted.

1.9. Protecting steel and stainless steel boilers against corrosion

Corrosion can affect the iron components used in boilers and heating systems, which is directly related to the presence of oxygen in the water of the water heater. The dissolved oxygen which enters the unit when it is first filled reacts with the materials of the equipment and quickly disappears. Without refreshing the oxygen thanks to significant water contributions, the device could not suffer any damage. This damage can occur from corrosion when oxygen continuously enters the heating water through open installations, expansion tanks too small, underfloor heaters with pipe material which is not waterproof. oxygen, etc. If this cannot be avoided, additional measures are required in the form of oxygen binding agents or properly used chemicals. If it is not possible to carry out an installation without oxygen inlet, a system separation must be implemented using heat exchangers. However, it is important to follow the design rules and installation guidelines in order to prevent oxygen from continuously flowing into the heating water. From these rules we have:

- Preferably an expansion vessel with a membrane rather than an open expansion vessel that allows direct passage.

– Internal pressure with the unit of more than 1 bar cold.

– Remove leaky (permeable) components that are letting out more gas than as if they were sealed.

If the guidelines above are followed, the unit's system water has the proper characteristics to last a long time: **8.2 < Ph < 9.5 with a water concentration of < 0.1 mg/l.**

If there is a chance that oxygen could enter the unit, you must take additional precautions. Adding an oxygen scavenger (ex. Sodium sulphite) is highly recommended. We recommend directing any water treatment questions to specialists, which can provide:

- The appropriate treatment based on the characterstics of the unit,
- A monitoring agreement with a guarantee as to the results.

For units in which **the water comes into contact with heterogeneous materials**, such as copper or aluminum, **appropriate treatment is recommended** in order to ensure that the unit will last. In most cases, this consists of adding corrosion inhibitors (in the form of chemical solutions) to the unit. Referring to a water treatment specialist is recommended.

1.10. Choice of burner / boiler

We recommend adopting modulating burners to prevent thermal shocks.

1.11. Hydraulics

- Position an effective degasser as close as possible to the boiler output to evacuate the network air which entered when filling and making up with water in order to maintain a good convection coefficient.
- Add an extra expansion vessel if the pressure maintenance unit characteristics do not enable the pressure variations to be limited to 0.5 bars in order to limit the hydraulic pressure variations.
- Respect the minimum recommended flow values. (chapter 3.5 p.15)

1.12. Use

- The cold start frequency must be as low as possible; we recommend that you do not exceed one cold start per week.
- Do not switch the boiler off at full load in order to prevent temperature shocks.
- Whenever you need to, add buffer volumes to the installation's hydraulic network to prevent operating short circuits, in particular when the boiler is protected by a hydraulic separation plate exchanger. Concerning the regulation of the installation, we recommend burner modulation parameters (PID) that are slow enough to guarantee stability and low variations in temperature. The start and stop differentials / hysteresis must be reasonable in order to give the burner enough of an operating range and ensure its modulation (value +/- 4°C). All of the strategies must enable the burner to start up for an average operating time equal to 30 min or else operate at minimum power.

- The boiler's temperature variations must be as low as possible to guarantee the longest lifetime.
- The first time the boiler is switched on, run it at 25-30% of its capacity for around 2 hours to correctly eliminate all humidity from the refractory part of the door by evaporation.
- Please use the burner floor attachment accessories proposed by the burner's manufacturer to minimise the structural vibrations on the burner support assembly.

1.13. Setting up a plate exchanger

If the recommendations listed above cannot be met, you can set up a plate exchanger to separate the primary system from the secondary system, which protects the boiler from undesirable effects.

2. APPROVALS

2.1. Compliance with European Directives

- Gas appliances (2009/142/CE)

- Eco-design (2009/125/EC):

In application of the directive and according to the requirements of the EU regulation No. 813/2013 of 02 August 2013, the technical parameters of condensation boilers with a power of less than or equal to 400 kW are available in appendix A.

2.2. Regulatory installation conditions for France

The appliance must be installed by an approved professional in accordance with the prevailing regulations and code of practice, in particular:

- Order of 2 August 1977: Règles techniques et de sécurité applicables aux installations de gaz combustible et d'hydrocarbures liquéfiés situés à l'intérieur des bâtiments d'habitation et de leurs dépendances.(~Technical and safety rules applicable to combustible gas and liquefied hydrocarbon installations located inside dwellings and their outbuildings.) The air flow rates needed for combustion are given in the table in page 6 (chapter 2.3) applicable until 31/12/2019.

Order of 23 February 2018: Règles techniques et de sécurité applicables aux installations de gaz combustible des bâtiments d'habitation individuelle ou collective, y compris les parties communes abrogent le texte actuellement en vigueur : arrêté du 02/08/1977, (~Technical and safety rules applicable to combustible gas for individual or collective dwellings, including common areas, which repeal the text which currently applies: order of 02/08/1997), applicable on 01/01/2020.

- DTU 65.4 cheminée (~chimney) and DTU 24.1 fumisterie (~exhaust system), and national and prefectoral regulations.

- Standard NF DTU 61.1: Gas installations in residential premises.

- Departmental Health Regulations.

- Standards NF C 15-100 (version 2002):

Low voltage electrical installations - Rules.

- Fire Safety regulations:

a) General requirements:

- GZ articles: Combustible gas and liquefied hydrocarbon installations.
- CH articles: Heating, ventilation, cooling, air conditioning and vapour and domestic hot water production.

b) Special requirements for each type of establishment receiving the public (hospitals, shops, etc.).

2.3. Regulatory installation conditions for other countries

The appliance must be installed and maintained by a qualified professional, in accordance with the regulations and current regulatory practices in the country where the boiler is installed.

3. TECHNICAL SPECIFICATIONS

3.1. General information

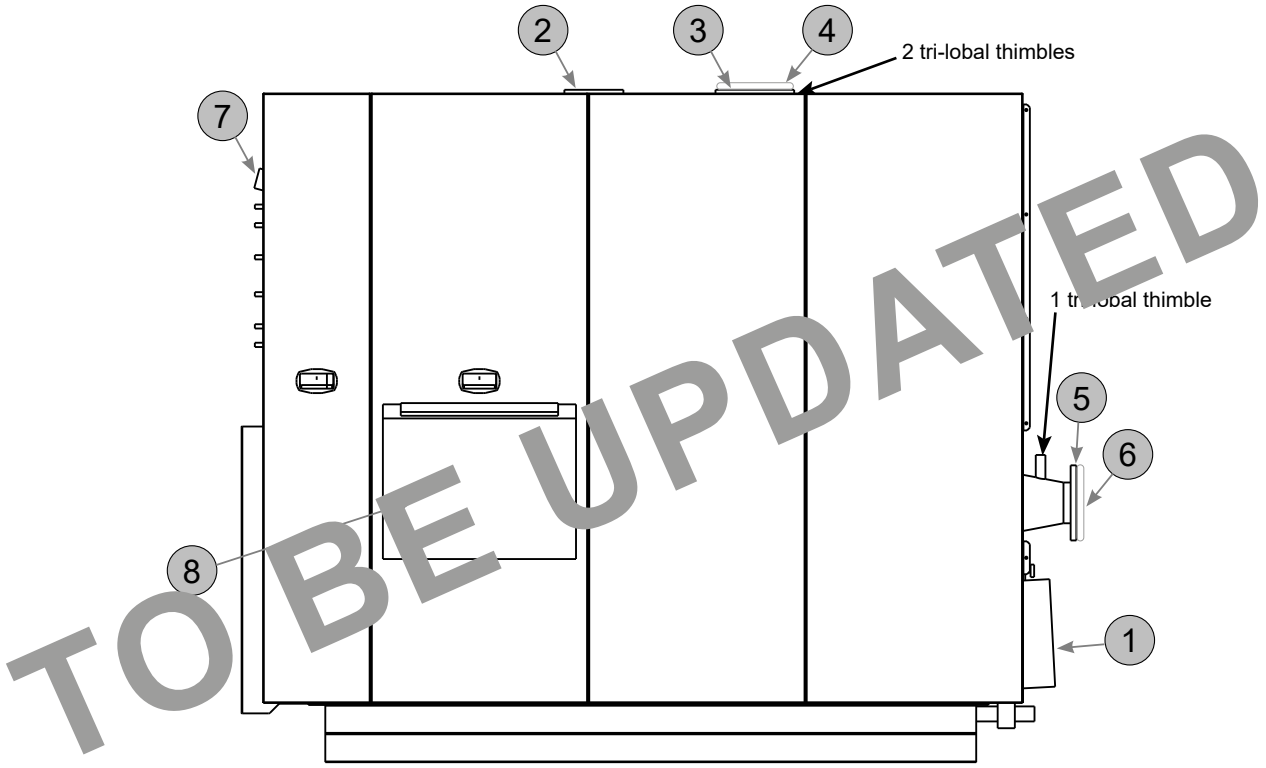
LRB boilers are high efficiency, power-saving and high capacity boilers ranging from 12 to 23 MW with operating pressures of 8,10,14 and 16 bars. They can be operated in combination with oil and gas burners. The LRB boiler range are three pass, smoke tube boilers with combustion chamber and flue way using the low-NOx technology. Models LRB 12-23 are adapted for use with light fuel at a maximum output corresponding to the low-NOx applications. The boiler's thermal insulation is made of glass fiber insulation wool that adheres to the boiler shell, guaranteeing minimal loss in stand-by mode. In addition, the front part of the LRB 12-23 boiler is provided with superior quality of glass fiber insulation wool . The outstanding characteristics of the material are the low thermal conductivity and the low specific thermal capacity.

This leads to a further reduction of the stand-by losses. On the larger boilers a special concrete with similar characteristics is used as thermal insulation of the boiler door. The revolving door gives easy access to parts of the boiler that are in contact with combustion gases. This allows cleaning of combustion chamber and passage ways to be easily performed from the front. The flue gas collector on the rear of the boiler is provided with an opening for easy cleaning.

3.2. Scope of supply

- Boiler body, flue gas collector and flue gas tube
- Gas-tight boiler door with insulation and burner connection (and flue gas fan connection if ordered for LRB 12-23)
- Furnace sight glass integrated in the boiler door.
- 1 explosion-proof valve door
- Supply and return tubes as well as safety valve connection with flanges, counterflanges, gaskets and screws.
- Filling and discharge tube.
- Flue gas turbulators
- Boiler insulation
- Catwalk over the boiler
- 4 lifting rings
- 1 inlet , 1 outlet nozzle
- Burner pipe insulation material, supplied separetely (not mounted)
- Cleaning set
- Manual of installation and maintenance and operating instructions
- 2 minimum safety nozzles (depending on the pressure).

3.3. Boiler components



1	Chimney connection
2	Valve tube
3	Outlet flange
4	Counter-flange (option)

5	Return flange
6	Counter-flange (option)
7	Flame viewer
8	Control panel (option)

figure 1 - Varmega 465 to 1250 kW

3.4. DimensionsTechnical characteristics (GAS)

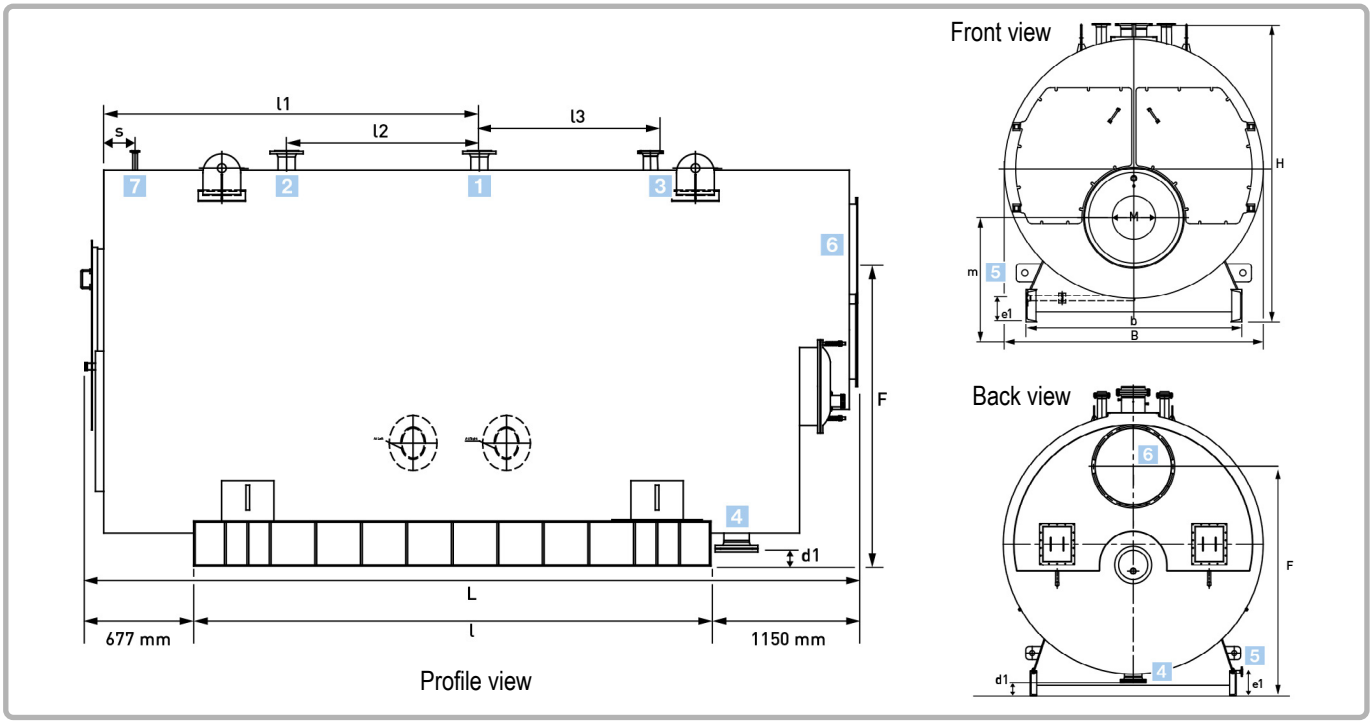


figure 2 - Boiler dimensional characteristics

			MODELS					
			LRB 12	**LRB 14**	**LRB 16,5**	**LRB 18**	**LRB 20**	**LRB 23**
Boiler								
L	Overall depth	(mm)	8130	8230	8430	8830	9530	10130
B	Overall width	(mm)	3420	3614	3789	4068	4068	4862
H	Overall height	(mm)	4040	4223	4470	4751	4751	4988
Boiler base								
l	Base length	(mm)	6290	6390	6590	6990	7690	8290
b	Base width	(mm)	2723	2923	3023	3223	3223	3423
Hydraulic								
1 / 2	Diameter Start 1 / Return 2 PN 16	--	DN300	DN300	DN350	DN350	DN400	DN400
l1	Center-to-center distance / Start 1	(mm)	4070	4220	4775	4275	5220	5745
l2	Center distance Departure 1 / Return 2	(mm)	2000	2000	2000	2030	2850	3000
3	Valve sleeve diameter 3 PN16		2(1)xDN100	2(1)xDN125	2(1)xDN150	2(1)xDN150	2(1)xDN150	4(1)xDN100
l3	Flow distance 1 / Valve sleeve 3	(mm)	1980	1830	1775	3005	2750	2750
4	Drain diameter 4 PN16	--	DN250	DN250	DN250	DN250	DN250	DN250
d1	Drain height 4 / Floor	(mm)	235	235	235	235	235	235
5	Drain diameter 5 PN16	--	DN40	DN40	DN40	DN40	DN40	DN40
e1	Drain height 5 / Floor	(mm)	376	376	376	376	376	376
Door / burner								
M	Burner head passage	--	Ø 500	Ø 500	Ø 500	Ø 500	Ø 500	Ø 500
m	Burner / Floor height	(mm)	1432	1474	1532	1561	1561	1586
Fumes								
6	Outer diameter of the smoke nozzle	(mm)	1150	1200	1250	1300	1350	1450
6	Inside diameter of the smoke nozzle	(mm)	1050	1100	1150	1200	1250	1350
F	Height of smoke nozzle / ground axis	(mm)	3012	3179	3342	3991	3556	3666

The values are given as an indication for operating pressures 8 bar.
These data are subject to change. Please contact us systematically.
Please contact us if you require data for higher operating pressures.
(1) number of valve sleeves.

3.5. Technical characteristics (GAS)

		MODELS					
		LRB 12	**LRB 14**	**LRB 16,5**	**LRB 18**	**LRB 20**	**LRB 23**
Max power	kW	12 000	14 000	16 500	18 000	19 900	23 000
Unloaded weight	kg	31 035	35 468	40 256	47 431	50 450	57 674
Water volume	L	31 380	35 860	39 870	49 260	53 520	61 510
Pressure drop on the smoke side (1)	daPa	125	130	137	100	100	105
Water side pressure drop (2)	daPa	550	400	300	350	400	550

(1) For 20% excess air
(2) For a Δt of 20K

CAUTION : **The power indicated is the maximum power that the corresponding heating body model can deliver. The selected burner and the output or polluting emissions (NOx) constraints may require the burner to be set at a lower calorific flow value. For more information, please contact the after or before sales department.**

3.6. Main characteristics

LRB		**1200, 1400, 1650, 1800, 2000, 2300**			
MAX.OPERATING PRESSURE		8 bar	10 bar	14 bar	16 bar
MIN. SERVICE PRESSURE		2 bar			
TEST PRESSURE		12,5 bar	15,6 bar	21,9 bar	25,7 bar
MAX. SERVICE TEMPERATURE		105 °C			
MAX.OPERATING TEMPERATURE (SAFETY CUT-OUT)		110 °C			
MIN. OPERATING TEMPERATURE	WITH LIGHT OIL	80 °C			
	WITH NATURAL GAS	80 °C			
MIN. RETURN TEMPERATURE	WITH LIGHT OIL	60 °C			
	WITH NATURAL GAS	60 °C			
CO2 - CONTENT (DRY FLUE GAS)	WITH LIGHT OIL	13,93%			
	WITH NATURAL GAS	10,59%			

3.7. Technical characteristics

			MODELS					
			1200	**1400**	**1650**	**1800**	**2000**	**2300**
POWER								
NOMINAL POWER PN (80/60°C)		KW	12000	14000	16500	18000	20000	23000
POWER AT 25% NOMINAL POWER		KW	3000	3500	4125	4500	5000	5750
NOMINAL HEAT INPUT QN		KW	12980	15140	17850	19470	21630	24880
EFFICIENCIES								
MINIMUM MODULATION RATE (80/60°C)		%	25	25	25	25	25	25
OVERALL EFFICIENCY (105/85°C)	100%	%	92.2	92.2	92.2	92.2	92.2	92.2
	25%	%	96.3	96.3	96.3	96.3	96.3	96.3
OVERALL EFFICIENCY (80/60°C)	100%	%	92.4	92.4	92.4	92.4	92.4	92.4
	25%	%	96.5	96.5	96.5	96.5	96.5	96.5
FLOWS								
GAS FLOW RATE AT PN (15°C)		NM3/H	1353	1578	1860	2029	2255	2593
MAX FLUE-GAS MASS FLOW RATE (105/85°C)		NM3/H	16275.6	18988.2	22379	24413	27126.1	31195
MAX FLUE-GAS MASS FLOW RATE (80/60°C)		NM3/H	16235.3	18941.1	22323.5	24352.9	27058.8	31117.6
SMOKE CHARACTERISTICS, LOSSES								
HEAT LOSS OF THE BOILER BODY	ΔT20	KW	24	28	33	36	40	46
COUNTER PRESSURE ON THE FLUE GAS SIDE		MBAR	6.5	6.5	7.5	6.5	6.5	6.5
MAX FLUE-GAS TEMPERATURE (105/85°C)		°C	185	185	185	185	185	185
MIN FLUE-GAS TEMPERATURE (105/85°C) AT MINIMUM MODULATION RATE		°C	105	105	105	105	105	105
MAX FLUE-GAS TEMPERATURE (80/60°C)		°C	180	180	180	180	180	180
MIN FLUE-GAS TEMPERATURE (80/60°C) AT MINIMUM MODULATION RATE		°C	100	100	100	100	100	100
HYDRAULIC CHARACTERISTICS								
HYDRAULIC PRESSURE LOSS AT MAXIMUM FLOW	ΔT20	DAPA	550	400	300	350	400	550
WATER FLOW RATE	ΔT20	M3/H	516	602	710	774	860	989

"EXCESS AIR= 10 %, CO2 = 10,59 %, LAMBDA = 1,10
ROOM TEMPERATURE = 20 C°, RELATIVE HUMIDITY = 60 %, ATMOSPHERIC PRESSURE = 100 KPA
LOWER CALORIFIC VALUE NATURAL GAS = 9,6 MW/NM3"

			MODELS					
			1200	**1400**	**1650**	**1800**	**2000**	**2300**
POWER								
NOMINAL POWER PN (80/60°C)		KW	12000	14000	16500	18000	20000	23000
POWER AT 40% NOMINAL POWER		KW	3000	3500	4125	4500	5000	5750
NOMINAL HEAT INPUT QN		KW	12980	15140	17850	19470	21630	24880
EFFICIENCIES								
MINIMUM MODULATION RATE (80/60°C)		%	40	40	40	40	40	40
OVERALL EFFICIENCY (105/85°C)	100%	%	92.6	92.6	92.6	92.6	92.6	92.6
	40%	%	96.2	96.2	96.2	96.2	96.2	96.2
OVERALL EFFICIENCY (80/60°C)	100%	%	92.8	92.8	92.8	92.8	92.8	92.8
	40%	%	96.4	96.4	96.4	96.4	96.4	96.4
FLOWS								
GAS FLOW RATE AT PN (15°C)		NM3/H	1094.4	1274.5	1502	1638.5	1820.6	2093.7
MAX FLUE-GAS MASS FLOW RATE (105/85°C)		NM3/H	14201	16567.8	19526.3	21301.5	23668.3	27218.5
MAX FLUE-GAS MASS FLOW RATE (80/60°C)		NM3/H	14173.4	16535.8	19488.5	21260.1	23622.4	27165.7
SMOKE CHARACTERISTICS, LOSSES								
HEAT LOSS OF THE BOILER BODY	ΔT20	KW	24	28	33	36	40	46
COUNTER PRESSURE ON THE FLUE GAS SIDE		MBAR	6.5	6.5	7.5	6.5	6.5	6.5
MAX FLUE-GAS TEMPERATURE (105/85°C)		°C	182	182	182	182	182	182
MIN FLUE-GAS TEMPERATURE (105/85°C) AT MINIMUM MODULATION RATE		°C	115	115	115	115	115	115
MAX FLUE-GAS TEMPERATURE (80/60°C)		°C	178	178	178	178	178	178
MIN FLUE-GAS TEMPERATURE (80/60°C) AT MINIMUM MODULATION RATE		°C	113	113	113	113	113	113
HYDRAULIC CHARACTERISTICS								
HYDRAULIC PRESSURE LOSS AT MAXIMUM FLOW	ΔT20	DAPA	550	400	300	350	400	550
WATER FLOW RATE	ΔT20	M3/H	516	602	710	774	860	989

"EXCESS AIR= 12 %, CO2 = 13,93 %, LAMBDA = 1,12
ROOM TEMPERATURE = 20 C°, RELATIVE HUMIDITY = 60 %, ATMOSPHERIC PRESSURE = 100 KPA
LOWER CALORIFIC VALUE LIGHT OIL = 11,9 MW/KG"

4. INSTALLATION

4.1. The boiler room

- The boiler room must be fitted in accordance with local regulations and installation specifications, it must be lockable and its air openings compliant. Particular attention must be paid to the ventilation of the boiler room. The combustion air supply must be guaranteed (opening not closed). The minimum air requirement is 1.6 m3 / h for each kW of boiler power. The minimum free section of the combustion air opening is 6 cm2 for each kW of boiler power. If in doubt about the air circulation, measure the number of CO2 with the burner operating at its maximum flow rate and the room ventilated only by the burner ventilation openings and a second time with the door open. The CO2 count measured in the two cases must not differ. If there is more than one unit in the same room, this test should be performed with all equipment operating simultaneously.
- Never obstruct the air openings in the boiler room, the intake opening of the burner fan, the air ducts and the ventilation.
- The equipment must always be protected against rain, snow and frost.
- The boiler room must be kept clean and free from volatile substances which can be drawn into the fan and obstruct the internal burners of the burner or the combustion head.
- The combustion air must be free of halogens (chlorinated and fluorinated compounds). In case of doubt, the quality of the combustion air must be ensured by an external air inlet.

CAUTION :

The combustion air must not have high dust concentrations. Furthermore, it must be free of halogens (chlorine and fluorine compounds). An excessive presence of halogen in the combustion air leads to great corrosion damage. The maximum permitted amount of halogen in the combustion air is 5 ppm. Halogen compounds are found in spray cans, thinners, cleaning agents, degreasing agents and solvents, among others. In addition, halogen emissions are strongly suspected in the vicinity of dry cleaners', hair dressing salons, swimming pools, printing offices and washing machines installed in the same room. In the case of doubt, the perfect quality of the combustion air must be ensured with an external air intake. Make sure that there is a minimum loss of pressure, since this could impair the performance of the burner.

4.2. Handling and moving the boiler

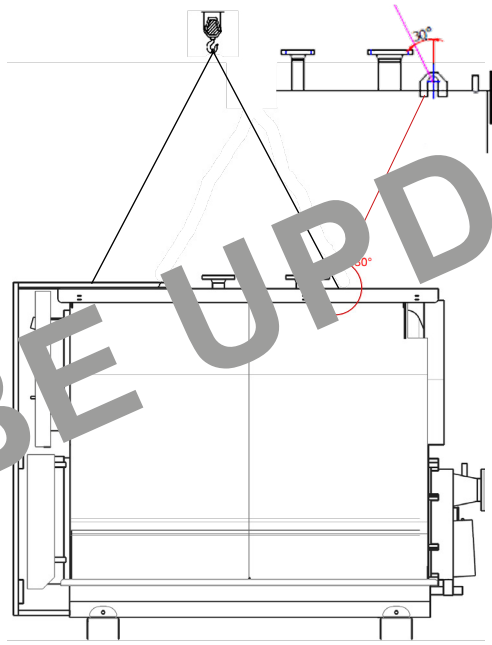
CAUTION :

- **The boiler must be protected against all mechanical impacts during loading, unloading and transport.**
- **It must be protected against all damage due humidity and the external mechanical factors that may arise during temporary storage, before transport and definitive installation.**

4.2.1. Movement by crane or bridge

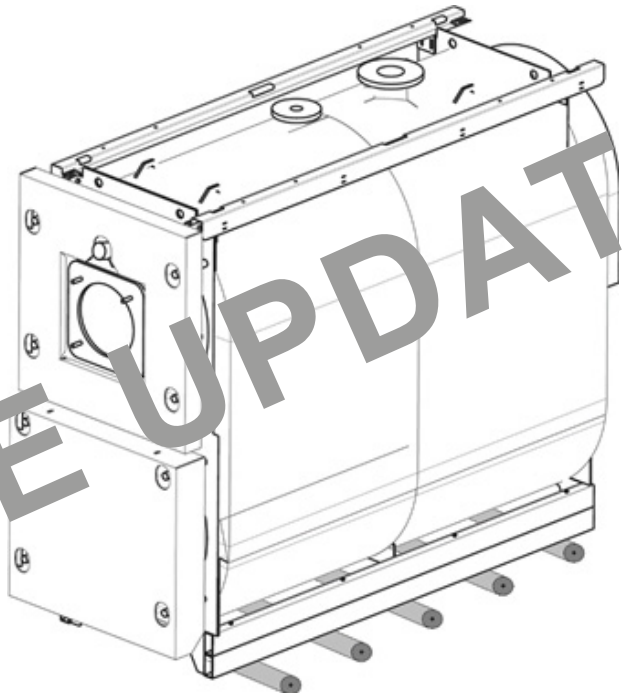
The boiler must be transported using the necessary equipment and the lifting and transport points for the appliance.

Given the dimensional characteristics of the boiler, its centre of gravity is high and slightly shifted to the front (as the doors are heavier). It is located mid-distance from the lifting rings. This comment must be taken into account for all boiler movement.



4.2.2. Movement by forklift truck

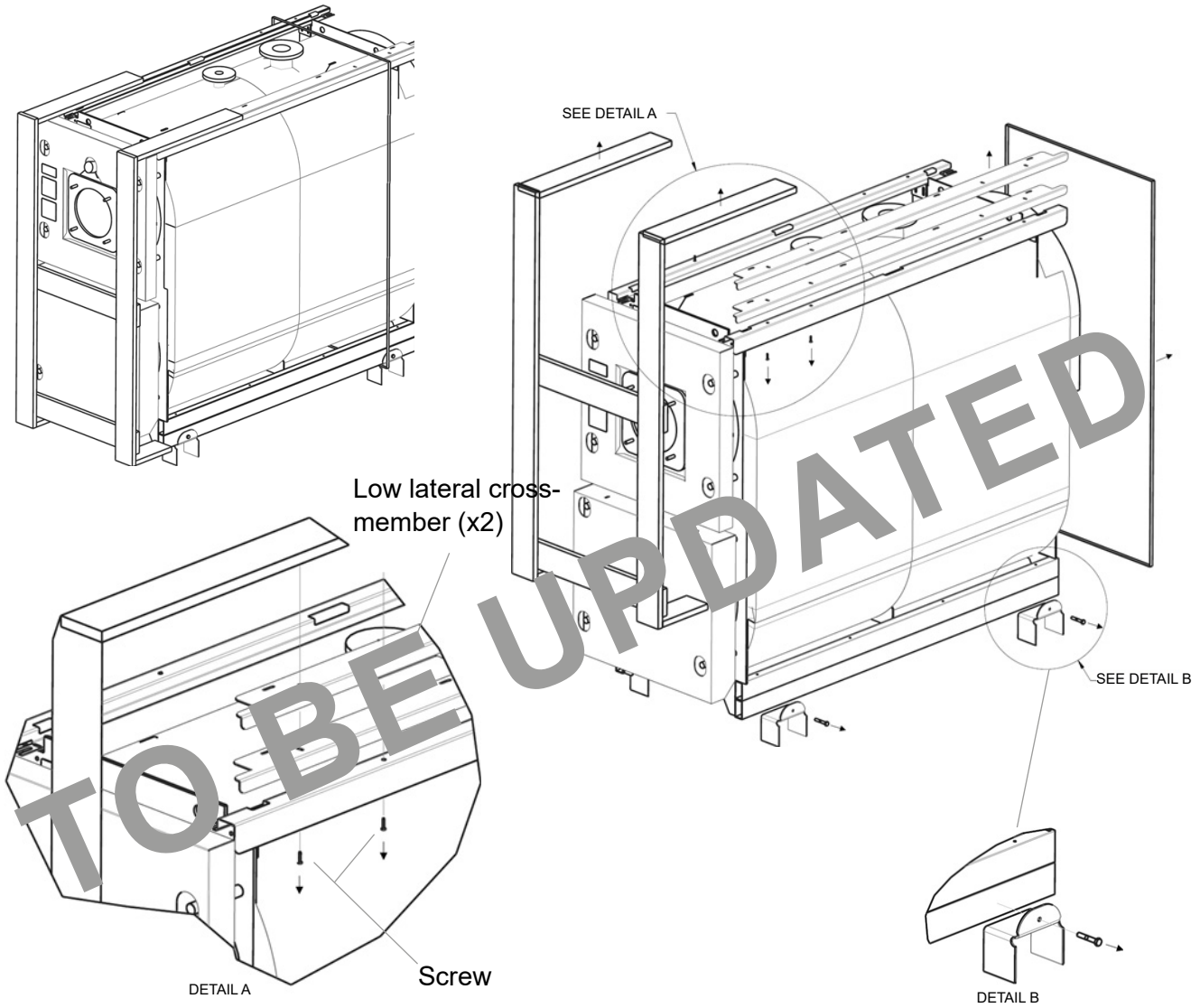
DANGER: **As the product's centre of gravity is high for a reduced floor surace, we recommend that you do not move the boiler with a pallet truck or forklift truck.**



4.3. Boiler packaging removal

After removing all packaging materials, check the contents to make sure that no damage has occured during shipping. When in doubt, do not use the apparatus and contact the supplier. The packaging materials are to be disposed of properly

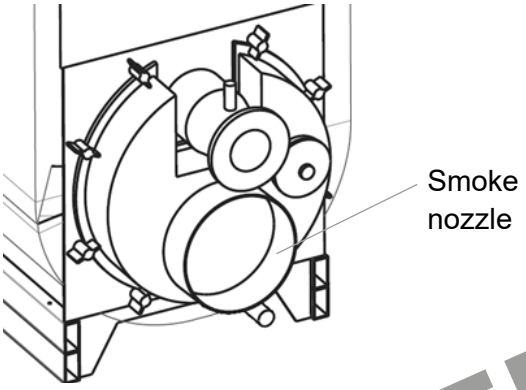
4.4. Disassembly of the boiler packaging



CAUTION : **The boiler must never be used with the transport boosters in place.**

- Remove the 4 transport boosters.
- Remove the strapping which holds the low lateral cross-members in place.
- Unscrew from underneath the screws holding the heating body - cross-member - wooden panel assemblies.
- Remove the protective armaflex from around the smoke nozzle at the rear of the boiler.

INFORMATION: **The elastomer foam used as protection around the smoke nozzle during transport may also be used to insulate the smoke outlet.**



4.5. Location

The chamber door, including the burner, must be able to open to 90°. Please consult us if you wa to change a door or opening direction

	MODELS				
	465	[illegible]	[illegible]	1000	1250
D1	2[illegible]00	2[illegible]	2500	2200	2600
D2	1000				
D3	1000				

(in mm)

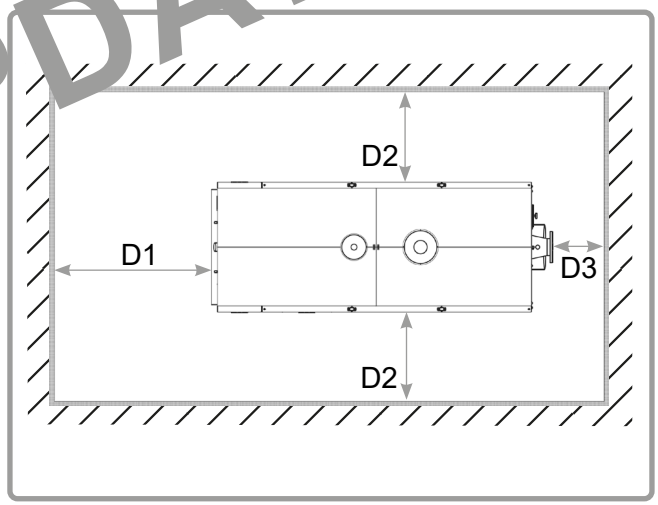


figure 3 - Installation spaces

4.6. Installation

- Install the boiler in the site's boiler room on a foundation which is raised up from the ground. This foundation must be inflammable (no wooden floor, plastic floor covering, etc.).

CAUTION : **The front of the boiler must not be lower than the rear. We even advise that it should be 2-3 mm higher.**

4.7. Fuel

- The unit must be fed with the type of fuel for which it has been preset as indicated on the rating plate.
- The fuel pressure must be according to the values listed in the burner manual.
- The fuel line that feeds the unit must be sized according to the requirements of local regulations and the prescriptions in the burner manual. The line must be perfectly sealed. The fuel supply line must also be equipped with all the control and safety mechanisms required by local regulations in force. The

line must be free from all impurities, take particular care that foreign matter does not enter the line during installation.

- Oil:
- The light oil storage tank must be adequately protected against penetration of impurities and water. The fuel tank must be kept full of fuel during the summer in order to avoid the condensation of humidity. Clean the tank carefully before filling. Beware not to overfill the tank.
- Both the tank and the unit fuel supply line must be protected from frost.
- Oil consumption and tank unit must be checked regularly, in order for leaks to be detected in good time.
- Gas:
- The gas line must be checked for leakage during commissioning and after each disconnection.

DANGER: **Do not raise the boiler to position the runners beyond 50 mm (dmax). As the centre of gravity is quite high, too much of a tilt could push the boiler over.**

INFORMATION: **Once the boiler is full of water it may lower in height by 2-3 mm.**

4.8. Hydraulic connection

For the hydraulic connection of the heating system – in particular with regards to technical safety devices such as safety valves, expansion tanks, etc. – refer to generally accepted engineering rules as well as locally applicable standards, specifications and regulations.

If boilers are installed in garret-based heating plants or at the highest point of the heating system, then boilers will have to be provided with additional safety devices (such as protections against water shortage). Observe the minimum operating pressure as specified in chapter 2.2, page 10. Act in compliance with local safety regulations in force at all times.

Before connecting the boiler to an old installation, it is necessary to flush the whole heating system. It is also recommended to provide for a sludge separator.

To protect the boiler from return temperatures below the limits as specified in chapter 2.1, page 10, the boiler should be provided with an automatic return temperature regulation.

Boiler's maximum operating pressure and the maximum operating temperature are given in chapter 2.1, page 10. No minimum level of the amount of circulating water is required.

4.9. Smoke outlet connection

4.9.1. Section determination

The sections must be calculated for B23 type pressurised chamber boilers. To define the dimensions, the key elements are the type of fuel, the appliance's power, the temperature and quantity of the gas burnt and the construction and height of the chimney.

4.9.2. Flue

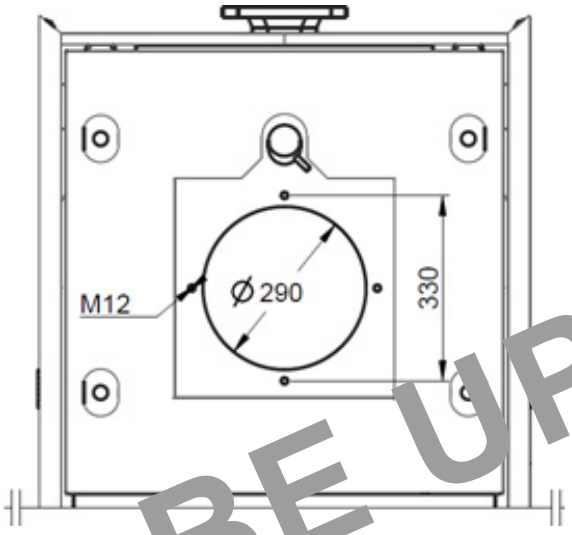
The cross-section of the connection pipe must not be less than the device's outlet nozzle (see § 3.3, page 14).

The connection pipe must be laid and inserted into the chimney with an inclination of 30-45 ° in order to favor the updraft. It must be removable. Check that the chimney is equipped with a condensate trap. The exhaust nozzle will be tightly connected to the duct. Provide collars or any other suitable material to avoid the transmission of vibrations, the weight of the chimney must in no case be supported by the boiler. Inspection pads, flanges and cleaning openings must always be accessible.

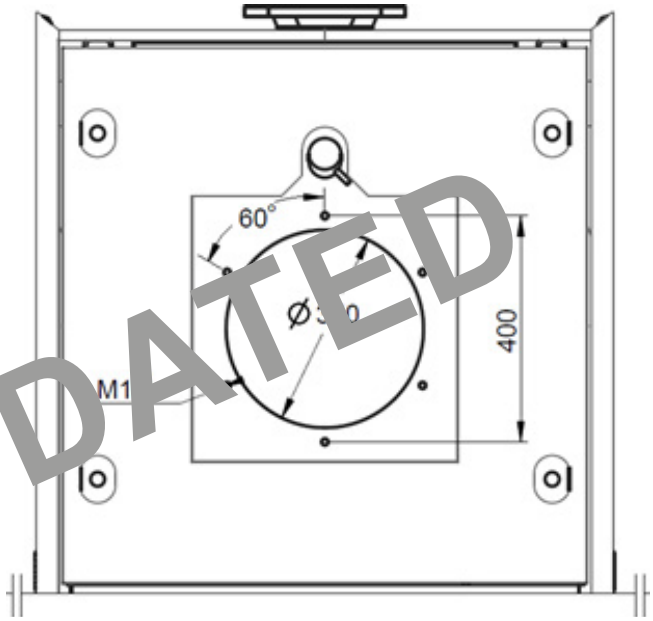
The flue housing must be resistant to smoke and overpressure. In addition, it must be resistant to humidity and acids.

4.10. Installing the burner flange and burner

4.10.1. Burner connection



VARMEGA 465



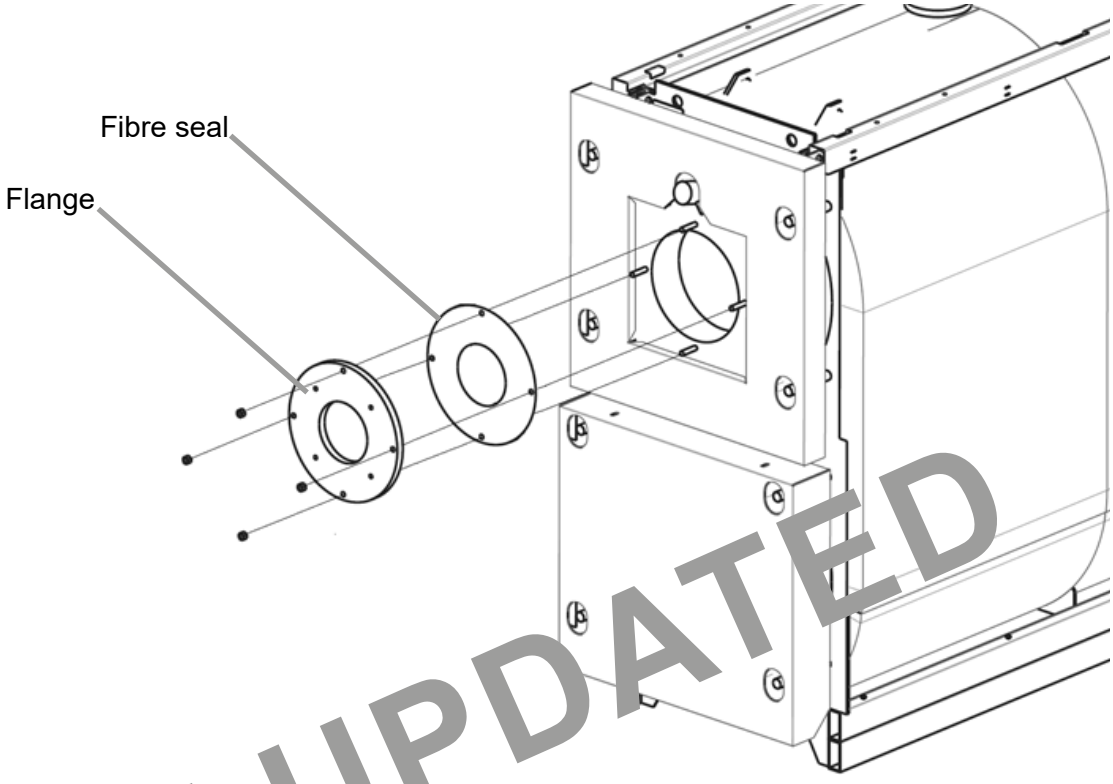
VARMEGA 625 / 810 / 1000 and 1250

An intermediate flange may be necessary to attach the burner. This flange with nits must be ordered specifically or be provided by the burner supplier. A 26 pin is provided for this purpose. Contact is if you want to reverse the door direction.

Max burner weight:

	MODELS				
	465	**625**	**810**	**1000**	**1250**
kg	100	120			125

4.10.2. Mounting the burner flange



E.g.: VARMEGA 465

4.11. Installing the cowling

Equipment required:

- 4 mm BTR key
- 10 mm flat spanner

Package composition:

- Package A (x1):

Reference	Designation	Quantity
A01	Front/rear junction cross-member	2
A02	Central junction cross-member	1
A03	Left rear upper panel	1
A04	Right rear upper panel	1
A05	Right front upper panel	1
A06	Left front upper panel	1
A07	Curved wide head M6 BHC screw	30
A08	Narrow head M6 screw	4
A09	M6 flat washer	8

- Package B (x1):

Reference	Designation	Quantity
B01	Control panel support side panel	1
B02	Side panel (identical to C01)	1

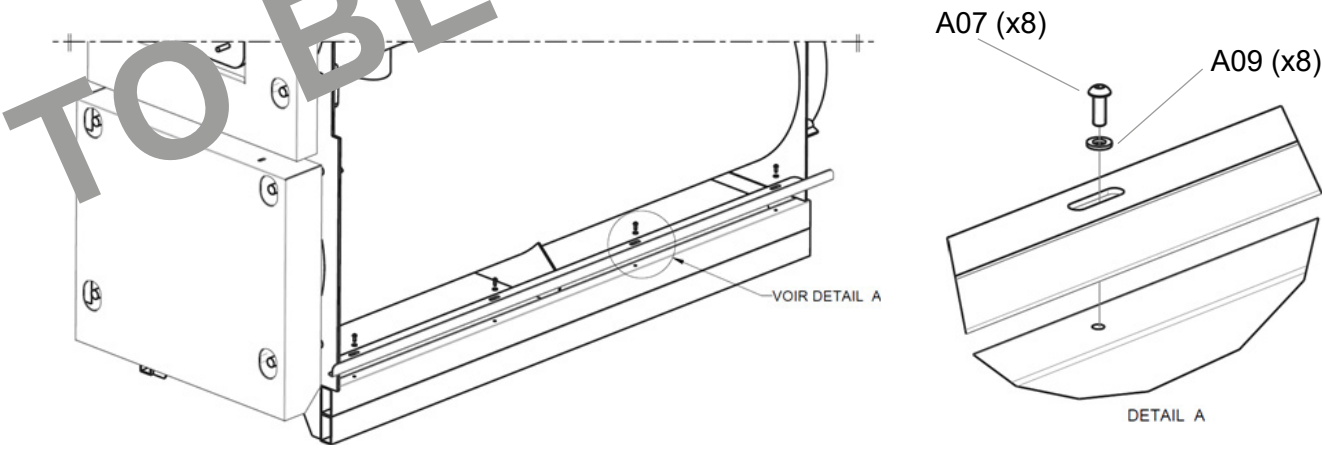
- Package C (x2):

Reference	Designation	Quantity
C01	Side panel (identical to B02)	2

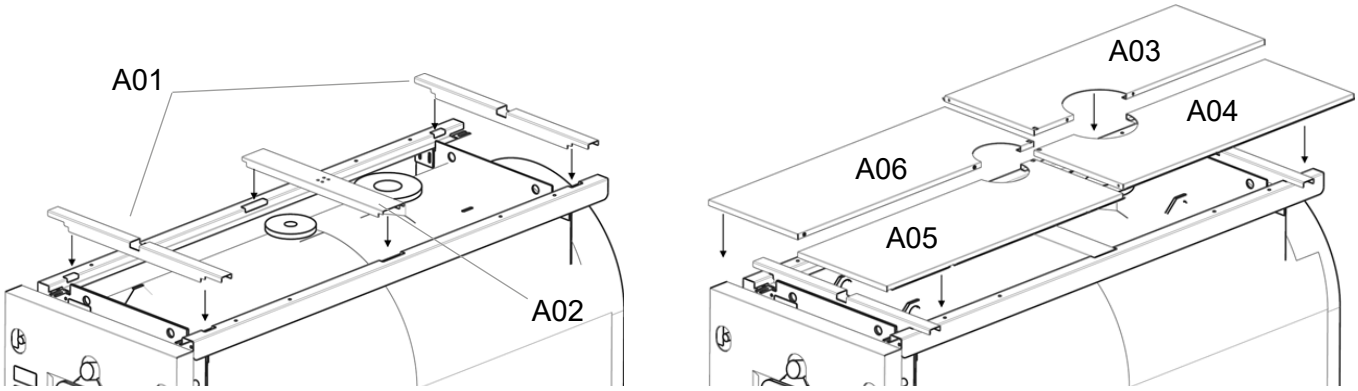
- Package D (x1):

Reference	Designation	Quantity
D01	Right / left removable front panel	2
D02	Right rear panel	1
D03	Left rear panel	1
D04	Rear reinforcement cross-member	1
D05	Cowling holding part	8
D06	Curved wide head M6 BHC screw	9
D07	M6 flat washer	[illegible]
D08	M6 Grower washer	[illegible]
D09	M6 cap nut	5
D10	Nylon clip	14

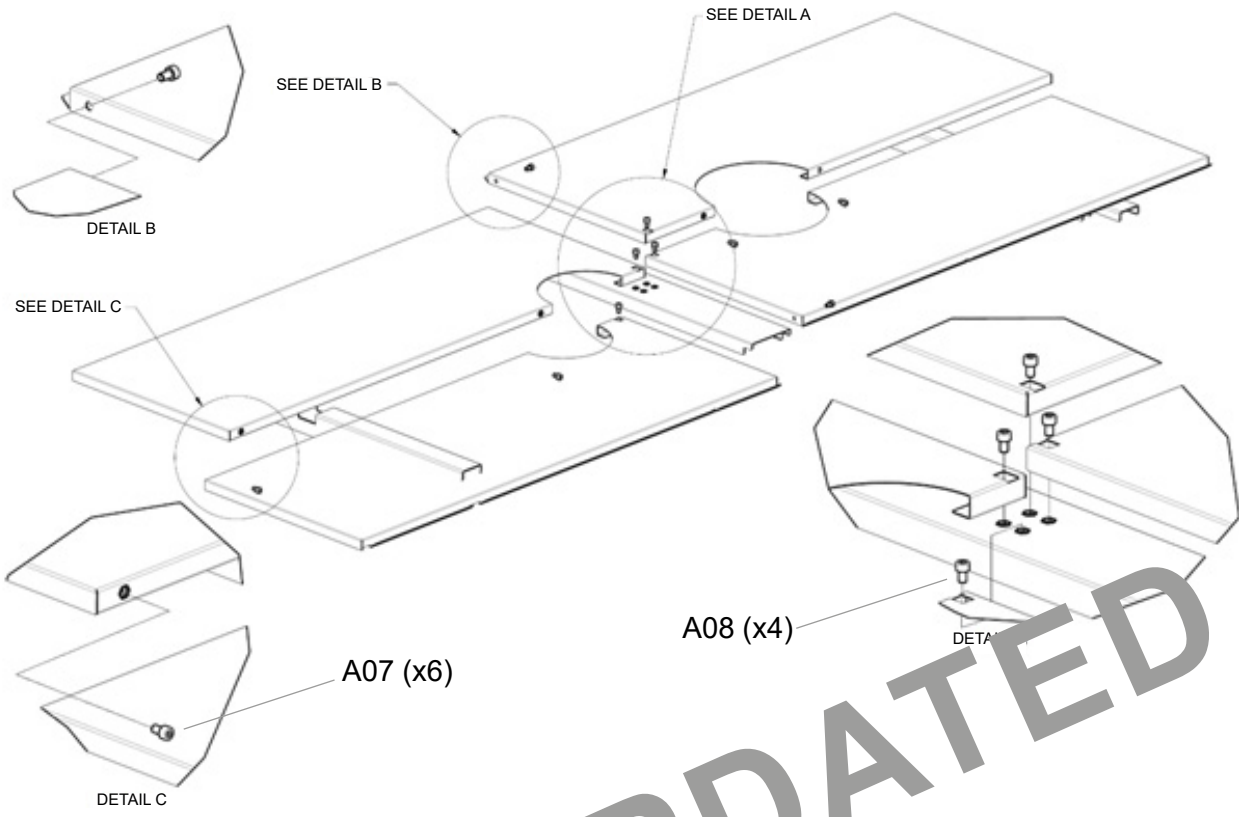
- Position and attach the low side cross-members (previously removed from the boiler packaging) to the heating body:



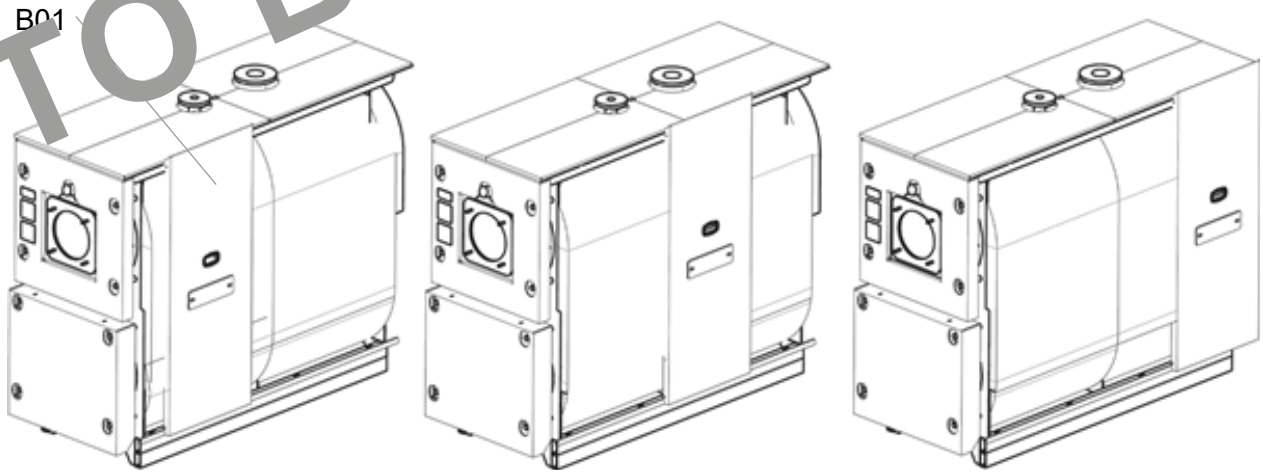
- Position the front / rear (A01) and central (A02) cross-members, then position the 4 upper panels (A03, A04, A05 and A06):



• Secure the upper panels with the M6 screws (A07 and A08):



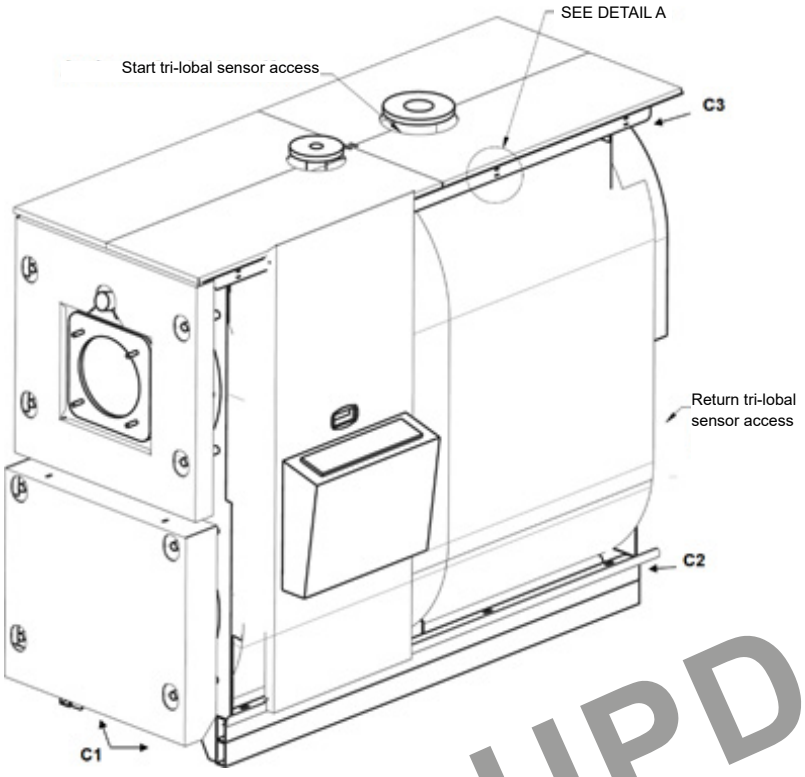
• The optional control may be be installed in any of the 6 possible positions (below are the positions possible next to the boiler). We recommend positioning it close to the front door to facilitate connection to the burner.

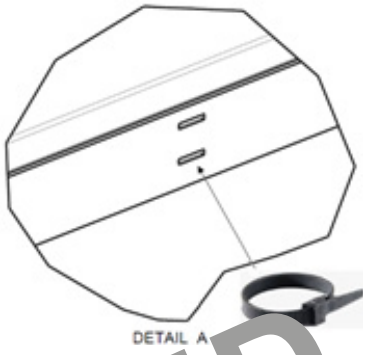


INFORMATION:

We recommend attaching the control panel at this step:

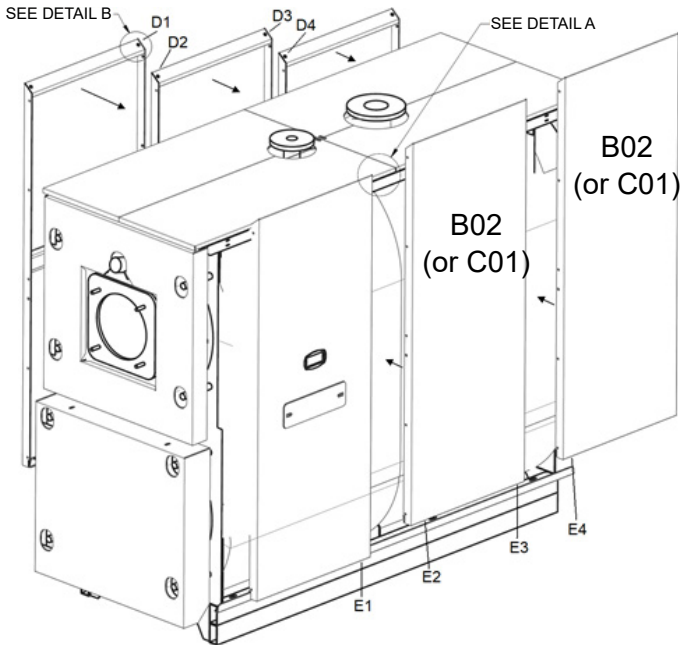
- **The sensor connectors are accessible**
- **The power supply cables may be positioned easily**
- **Notches in the upper cross-member may be used to hold the cables with nylon clamps (see detail A in the figure below)**

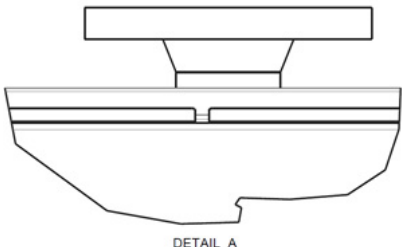


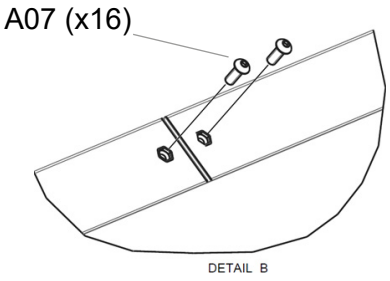


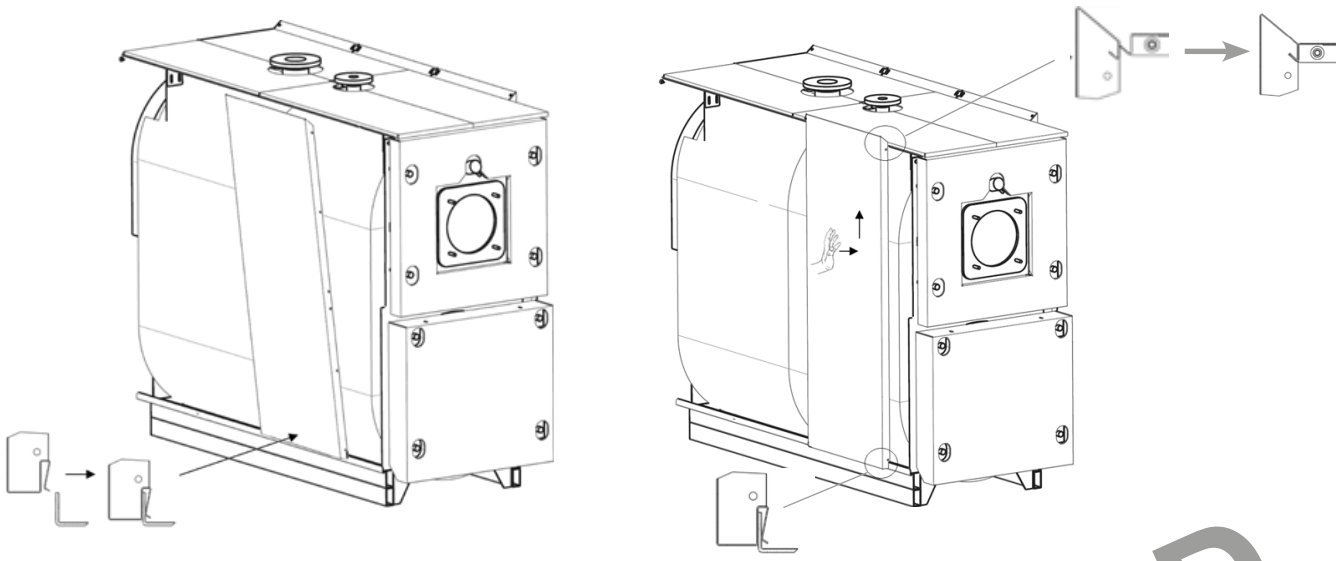
- Please refer to the control panel's manual for its assembly.
- Mount the side panels:

INFORMATION: **We recommend pushing a few A07 screw threads into each side panel at the D1, D2, D3, D4, E1, E2, E3 and E4 markers (see below) to make it easier to attach these panels to each other when they are installed.**



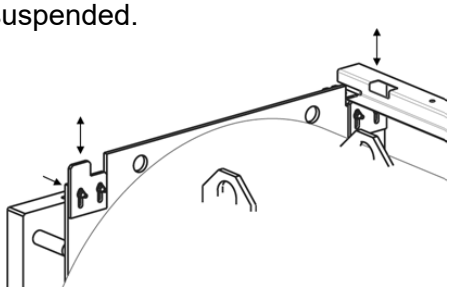




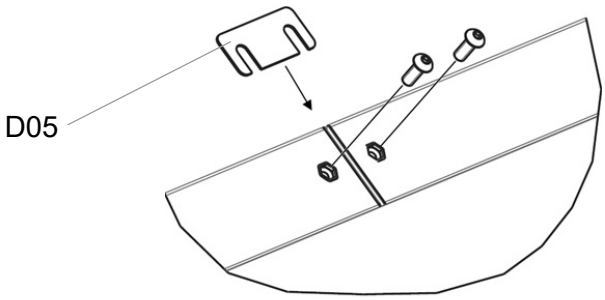


CAUTION: **The side panels must be suspended and not placed on the low cross-members.**

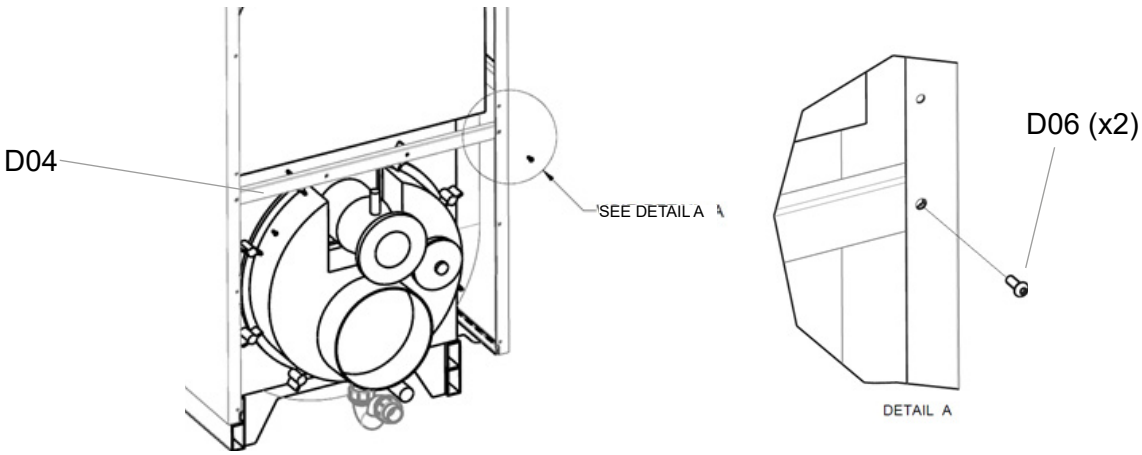
- 4 adjustment parts are used to adjust the height of the high cross-members on the roof so that the side panels are suspended.



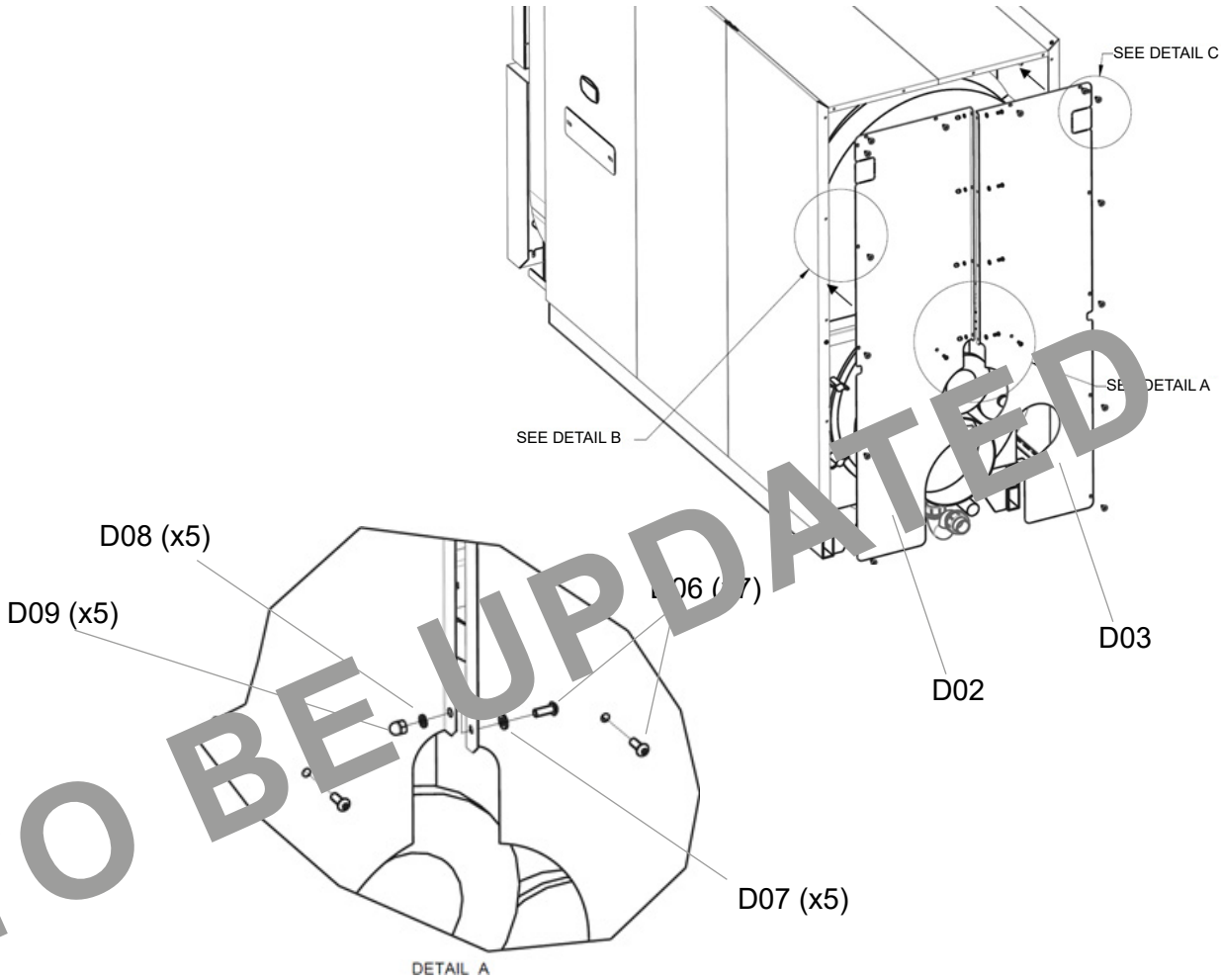
- Position the 8 D05 cowling holding parts and tighten the screws (2 per holding part).

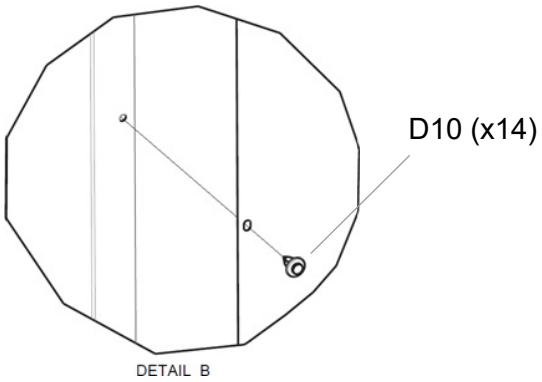


- Place the D04 rear reinforcement cross-member and attach it with 2 wide head M6 BHC screws (D06).

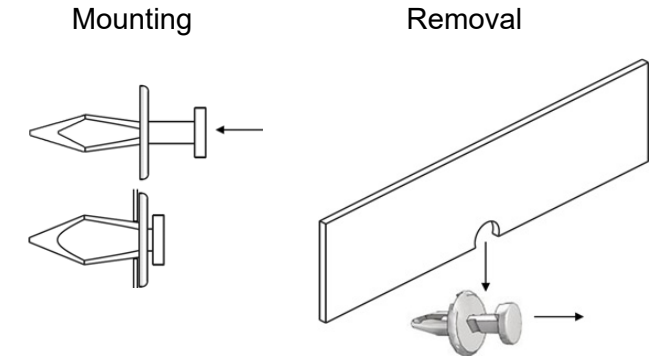


• Place the D02 right and D03 left rear panels and secure them:

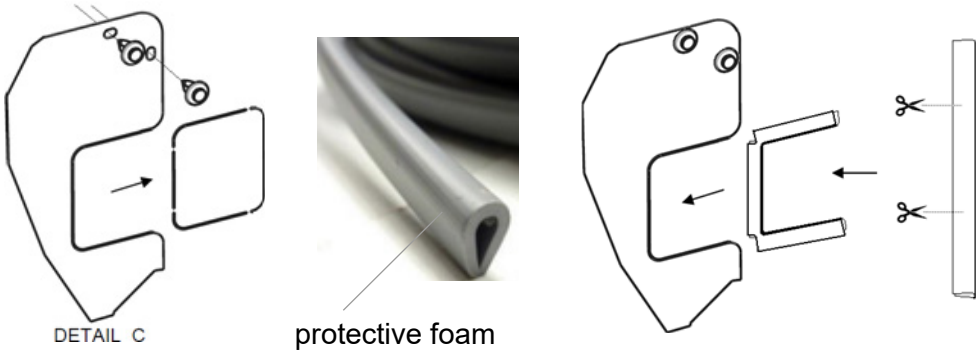




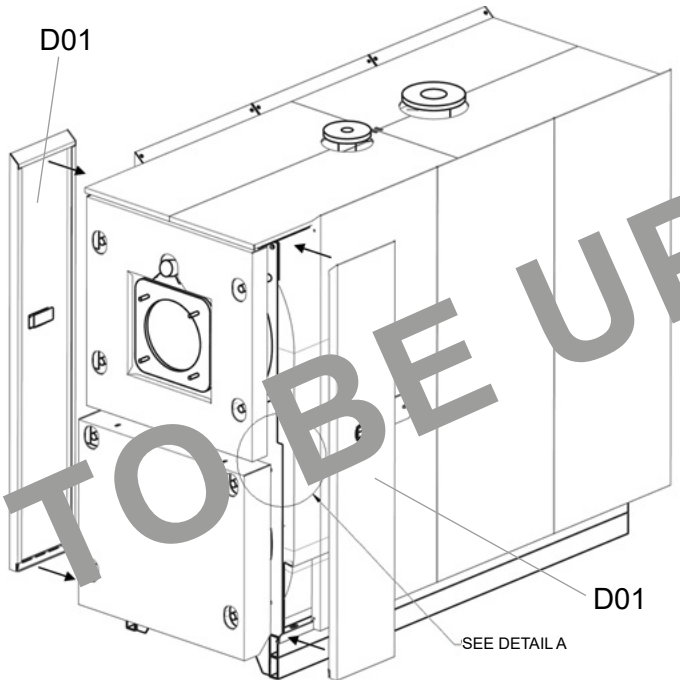
Principle of the D10 clips on the rear panels:

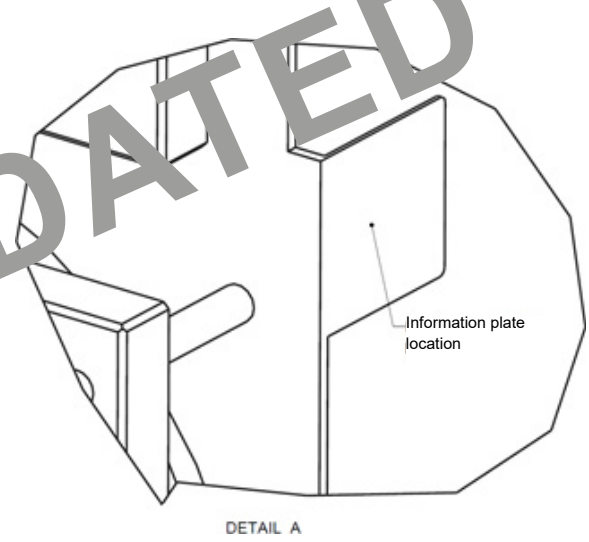


• If the access hatch to access the electrical cable passage on the rear panel is used, we recommend using protective foam to prevent damaging the cable sheath.



• Position the 2 D01 front side panels.





The identification plate is located behind the side panel on the left or right depending on your boiler's opening direction.

INFORMATION: **These panels must be removed at all times when the burner and condenser doors are opened.**

4.12. Electrical installation

4.12.1. General warnings

The electrical installation must be carried out by an authorised electrician from beginning to end. In carrying out the electrical installation, local regulations as well as any standards and specifications in force must be complied with. The mounting instructions for the control panel and its support can be found in the separate assembly guide. The wiring diagram is joined with the control panel. In the event of maintenance or breakdown, due to safety reasons, the power supply must be cut-off.

CAUTION: **Electrical connections, especially the connection to the mains, should only be made after all other assembly and installation work has been completed.**
Locally made installations (raceways, etc.) must not be clamped to the boiler's cladding!

4.12.2. Connecting to the supply mains

The external power supply is single-phase in alternating current 230VAC, 50 Hz or three-phase in alternating current 400VAC, 50Hz, both at 16A max. The control panel is protected inside by a 6.3 A delayed action fuse (burner / boiler) and by a 6.3 A delayed action fuse for each regulator or additional module.

The network connection cable and all external boiler control connections must be made properly on site.

A circuit breaker conforming to standard NF C 15-100 must be supplied on site.

The quality of the power supply must comply with standard EN50160 (voltage ± 10% max, frequency ± 1%). All connection cables external to the boiler must be correctly laid on site. A disconnection device in accordance with DIN VDE 0116 must be supplied on site.

4.12.3. Connecting the burner

The burner's electrical connections (electrical supply and command) are made by the customer according to the burner's requirements.

4.13. Burner choice

For effective combustion, the burner to be installed on the boiler must be selected with a flame appropriate to the combustion chamber defined in the boiler's technical specifications section.

While installing the burner, make sure that the burner head axis matches up to the combustion chamber's.

The combustion gas used for operation will comply with the burner manufacturer's recommendations.

The following formula will apply:

Burner combustion power = Burner capacity / Burner effectiveness.

Contact the pre-sales department for the selection of the burner.

Select a burner for which the capacity corresponds to the boiler's counter pressure. To order the burner, inform the seller of the manufacturer of the burner you have selected to ensure that the boiler door and connection flange are compatible.

Use a burner for which the combustion head length corresponds to the boiler.

The burner combustion head must enter the combustion chamber over around 30 mm.

The operation of the burner and the safety system must be compatible with the boiler's control panel.

The boiler may be used with a one speed or two speed burner or a modulating burner.

The burner / heating body assembly must respect the criteria in appendix E in EN303-3 using the burner's characteristics and the characteristics of the heating body indicated in paragraph 3.5, page 15.

4.13.1. Connection of the gas supply

The whole installation may only be carried out by a licensed installation company. The installation must be performed in accordance with local regulations.Particular care is to be taken that measures are foreseen to prevent any burner start when the boiler door is open. Good practice is to connect the fuel supply to the burner in such a way that the supply line has to be disconnected in order to be able to open the boiler door. Another possibility is to attach the burner cables with glands in such a way that the connectors on the burner have to be pulled to open the door.

CAUTION: **Customer installations (oil tubes, etc.) must not be attached to the boiler cladding!**

The whole system must be installed by an approved specialist only. The connection must comply with the regulations in force.

In particular, you must make sure that measures are taken to prevent the burner starting up when the boiler door is open. Standard practice is to connect the fuel supply to the burner so that it must be disconnected to be able to open the boiler door. Another method is to attach the burner cables with packing glands so that the connectors must be disconnected from the burner to be able to open the door.

Gas Burner

Observe the seperate instructions of the supplied burner. The gas installation must be dimensioned in accordance with the gas flow rate and the available gas pressure. A shut-off valve must be installed in the gas supply line to the burner.

INFORMATION: **Before the gas burner is connected to the gas line, it must be ensured that the line has been blown through and is free from particles and chips. The gas line must be checked for leakage during commissioning and after each disconnection (leak detector spray). The installation may only be operated using gas of the intended quality – observe additional panel on boiler!**

Oil Burner

Observe the seperate instructions of the supplied burner.

4.13.2. Part load operation

Stick to the minumum power of the supply heat according to the technical data

	**IMPORTANT:**	**The installations created on site (gas pipes, etc.) must not be attached to the boiler's insulation.**

pressure.

Place a gas tap near the burner.

	**INFORMATION:**	**Before connecting the gas pipe, make sure that it has been bled and is free of particles and shavings.** **On commissioning and each time the gas line is opened, the line's seal must be examined with a leak detector.** **The installation must only be used with the quality of gas intended - Respect the information plate on the burner.**

To prevent any premature damage to the equipment, you must ensure the compatibility at all times of the flame and the heat release with the heating body.

4.14. Flue gas system

LRB boilers have been developed using the latest technologies. The perfect balance existing between boiler and chimney ensures optimal fuel use and economical system operation as a result. The pertinent rules of technology and good practice as well as the country-specific regulations and valid standards must be observed.

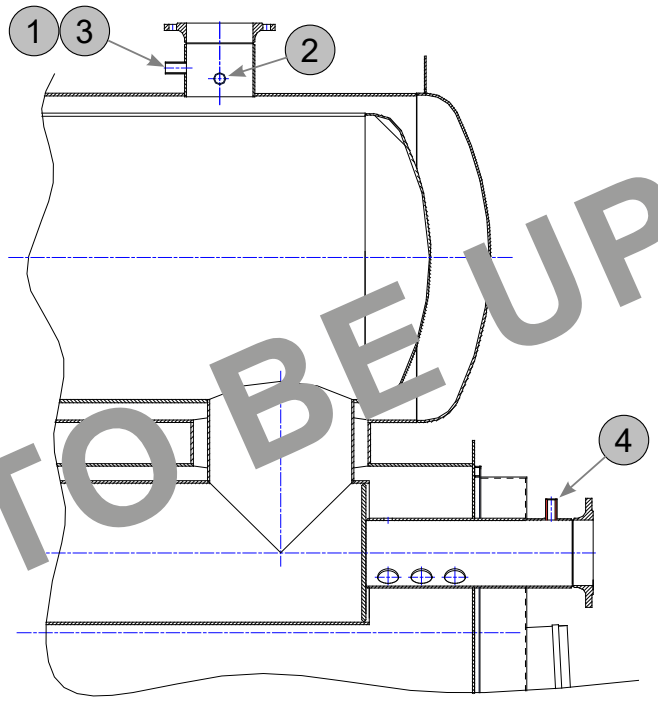
4.14.1. Section determination

Sections must be calculated for boilers without draught. Fuel type, power output, combustion gas temperature and quantity, chimney construction and height are all important elements in determining sizes.

4.14.2. Flue gas tubes

We recommend the use of flue gas tubes made from acid-resistant, non-corrosive materials. The tube must be laid and introduced in the chimney to an inclination of 30-45° to minimize pressure loss. The tube will have to be inserted in such a way as to prevent any condensation reversal from the chimney down into the boiler. To avoid vibration transmission, combustion gas tubes must be fitted with adequate sleeve tubes or clamps. Connections exceeding 1 m in length should be insulated. At the same time, ensure that the measuring pipes extend beyond the insulation and that flanges and cleaning covers remain accessible. The chimney must be designed so that it is gas and pressure- tight as well as moisture-insensitive and acid-resistant.

5. TEMPERATURE SENSOR POSITION



1. Regulation thermostat
2. Safety thermostat
3. Water thermometer
4. B7 return sensor (optional)

6. OPERATION

Read the section of the manual with great care and get an installer to explain the heat producing system in all its different aspects: regulation and control.

If you suspect that the boiler or other part of the system is frozen, do not start the system.

Note for LRB 12-23 : The boiler door screws on the side of the axis of rotation must NOT be loosened!

Please read this part of the manual carefully and ask your installer to explain the heat production installation to you with all its regulation and control elements.

Do not connect the installation if you think that the boiler or part of the system is frozen.

6.1. Start-up Commission

Before commissioning the system, please check:

- Whether the burner and the fuel system have been checked and the settings of the burner correspond to the required performance of the unit. Observe the instructions for putting the burner into operation,
- Whether any foreign matter has been removed from the boiler furnace,
- **Whether the clearance space around the burner tube has been filled with insulation material,**
- Whether the boiler door is closed properly,
- Whether the heating system has been filled up with water and completely vented,
- Whether the thermostats are properly regulated and whether the heating system governor has been set according to the necessary parameters by the support service or by the installer,
- Whether the regulation and safety devices work properly,
- Whether all shut-off valves (of both water and burner) have been opened,
- Whether the circulation pumps work,
- Whether the air supply is ensured and the flue outlet is free,
- During first commissioning of the boiler or renewal of the boiler cover, the burner should be operated in manual position at minimum capacity for 2 - 3 hours to ensure that the moisture in the door’s refractory material’s humid is slowly thrown out of the system and that the fire concrete is not damaged.

The unit is put in operation by actuating the ON/OFF switch of the control panel (position I) or possibly, depending on the installation, by actuating a switch on the burner or within the central control cabinet.

INFORMATION:

Pre-heating may result in the appearance of cracks. Small shrinkage splits and cracks do not hinder operation and do not represent a defect; they are unavoidable.

Whether the clearance space around the burner tube has been filled with insulation material

6.2. Decommission

The unit is put out of operation by actuating the ON/OFF switch of the control panel (position O) or possibly, depending on the installation, by actuating a switch on the burner or within the central control cabinet. Should the heat producing system remain off for several weeks, we recommend that the following measures be taken:

- Close the fuel supply,
- Clean and protect the heating surface of the boiler. Your installation contractor will be pleased to give you some advice.
- In case of frost warnings, drain the system or add an anti-freeze product and follow the instructions given in chapter 4.4.

Ethylene glycol or propylene glycol, defined as antifreeze, is an organic-based material and should not be used as there is a risk of corrosive effect and degradation of PH over time! Instead, a non-corrosive hydromx or similar non-corrosive material should be used.

6.3. First intervention in the event of a breakdown

In the event of system operational failure, perform the checks in the table below. Also check the governor set-up. If the failure can not be eliminated, call a reliable engineer or your support service.

Problem	Possible cause	Solution
Burner not functioning	No power	Check fuse, switch on main or safety switch. Connect supply and burner plug.
	Burner LED is on	Press burner rest button
	No oil	Add oil
	Gas pressure insufficient	Call the gas board
	Overheat temperature LED is on. Safety thermostat has come into operation	Fix the cause, wait until temperature has dropped below overheat setpoint then reset the safety thermostat by pushing the pin
	External default LED is on	Fix the cause
No heat release to consumers	Incorrect operation type setting on governor	Setup type of operation and heating programme
	Circulation pump blocked	Remove locking screw, turn shaft until no more resistance is left
	Water level or system pressure	Top up and ventilate
	Shutt-off elements on supply and return lines closed	Open them
No ignition	Burner malfunction	Respect the burner manufacturer's recommendations
Knocking noise in the hydraulic part of the boiler	Air present in the system	Bleed the air
	Installation failure	Check that the connections comply with the installation's wiring diagram

For the faults above, intervention by the boiler operator is sufficient. For other faults, contact the approved services.

Fault	Possible causes	Solution
The output water temperature does not increase	Water flow too high	Contact the approved service for them to check your burner
	Wrong burner chosen, not adapted to the boiler's capacity Burner at low speed	
Coloured smoke, temperature increase, deformation of the refractory glass or a turbulator,	Wrong burner selected, excessive setting	Replacement of the burner, repair required, with adequate measures and correct setting of the burner
	Installation failure	Check that the connections comply with the installation's wiring diagram
Elevation in combustion temperature	Operation without turbulator or not enough of them, wrong burner selection and setting	The turbulators must be in place and in good condition. The burner must be set correctly. The burner must be adapted to the boiler.
Water temperature too high	Manual mode in progress Programming error Insufficient irrigation	To be checked

6.4. Malfunction

- If the unit stops working and goes into lock-out and does not resume operation after two or three manual lock-out reset attempts, disconnect the power supply, do not attempt to repair and contact a qualified specialist.
- All repairs required must be performed exclusively at a technical servicing and/or technician centre authorized by the manufacturer using original spare parts only. Failure to observe the above may compromise the reliability and safety of the equipment.
- Any failure or damage resulting from improper use or intentional damage will relieve the manufacturer from any guarantee obligation.

6.5. Switching off

Refer to the control panel's manual to switch the boiler off.

The following measures must be observed if the unit is to be shut down for several weeks:

- Activate the general switch in the boiler premises,
- Switch off the fuel supply.
- If there is a risk of freezing, drain the installation,
- Clean the boiler's heating surfaces and protect them. Call on the professional on who monitors the installation.
- At the end of the season, a protective chemical may be added to the system's water to prevent the effects of oxygen in the water and similar corrosive elements on the metal surfaces.

- Check the surfaces which are in contact with the combustion gas and the smoke and clean them if necessary.
  The cleaned surfaces must be inspected under powerful light to detect any leaks, seepage, cracks, etc.. If this is the case, alert the approved service for them to make the necessary repairs.

7. MAINTENANCE

DANGER: **Prior to performing any maintenance operations, switch off the power supply by using the main switch and cut off the fuel supply as well.**

The boiler and installation maintenance must be carried out regularly to maintain the appliance's high efficiency. Depending on the operating conditions, the servicing operation is to be carried out once or twice a year for operation with natural gas.

The boiler and supply must be checked according to local provisions by a qualified professional.

Before carrying out any work, switch off the general electrical power supply and close the fuel supply valve.

DANGER: **The appliance contains components made of silica mineral synthetic fibres (ceramic and glass fibres, insulating wool). When carrying out any work on these components, the operator must wear suitable clothing and a breathing protection make to prevent any risk specific to these products.**

DANGER: **The device contains components made of synthetic silicon mineral fibres (ceramic and glass fibres, insulation wool). In order to avoid all types of health hazards, suitable clothing and protective mask must be worn for work on or with these components**

7.1. Periodic checks and servicing work

- Check the pressure gauge, with the circulation pump off. If it indicates a low water or pressure level, fill the heating system with water.
- Check that the expansion chambers are operating correctly.
- Check the safety valves.
- 2 manholes present for inspection
- Service the burner according to the specific recommendations described in the boiler manual.
- Clean the boiler and the chimney.
- Check the door and smoke box seals.
- 2 inspection hatches on the smoke box
- Read the make-up water meter and check that it changes normally.

7.2. Cleaning the boiler

CAUTION: **On LRB 12-23 do NOT loosen screws on the side of the axis of rotation!**

The boiler must be cleaned by a qualified technician.

- Switch the burner off,
- Disconnect the burner cables,
- Loosen the boiler door screws and turn it with the burner. A 26 pin is provided for this purpose.
- Remove the turbulators,
- Clean the chamber and the smoke tubes,
- Remove the rear cleaning hatch and clean the smoke collector,
- Check that all the turbulators are present,
- Put the clean turbulators back,
- Close the cleaning hatch and close the chamber door,
- Tighten the 4 screws to guarantee the seal,
- Start the burner up again.

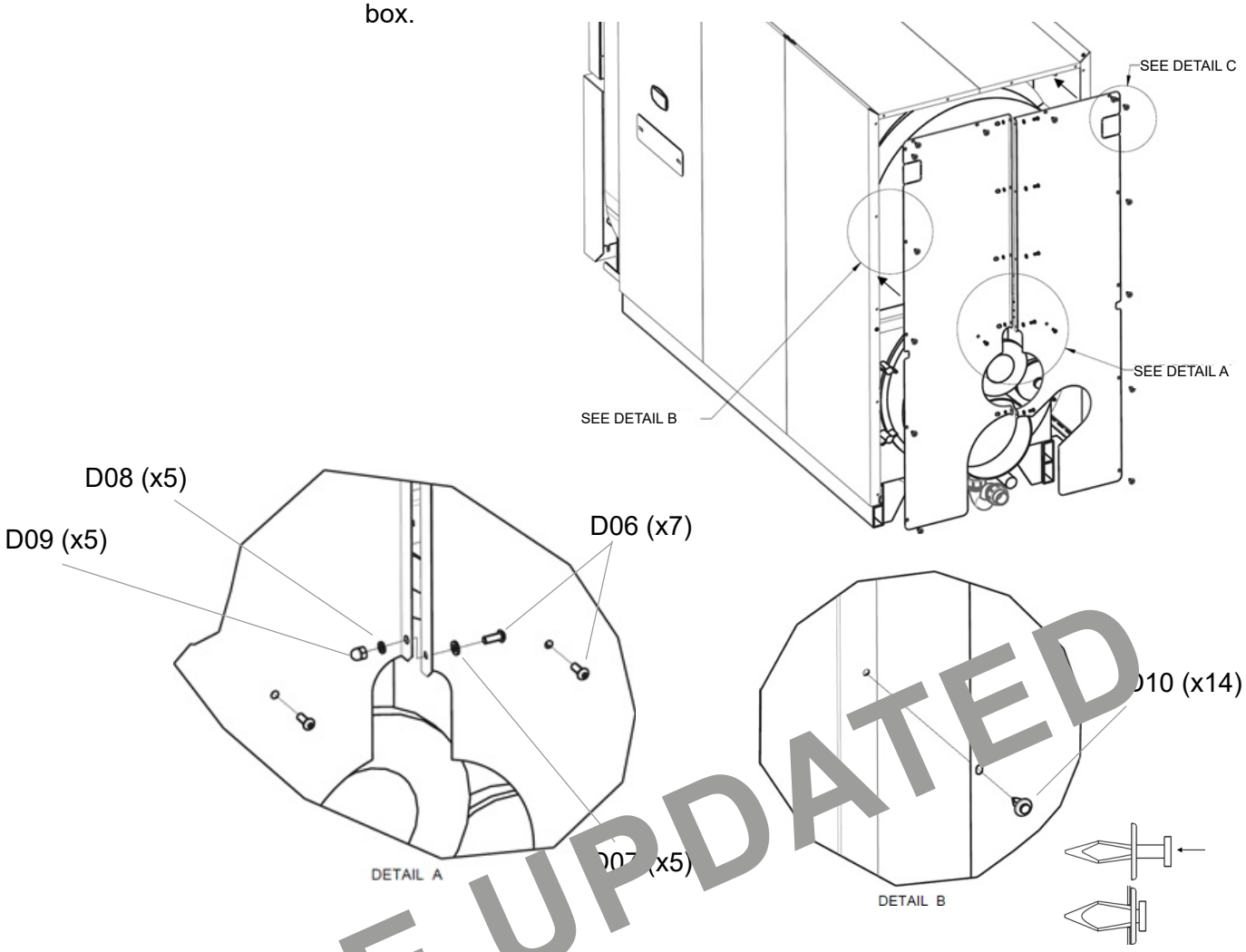
7.3. Burner maintenance

The burner (electrodes) must be maintained by a specialist according to the directives in the burner's technical manual.

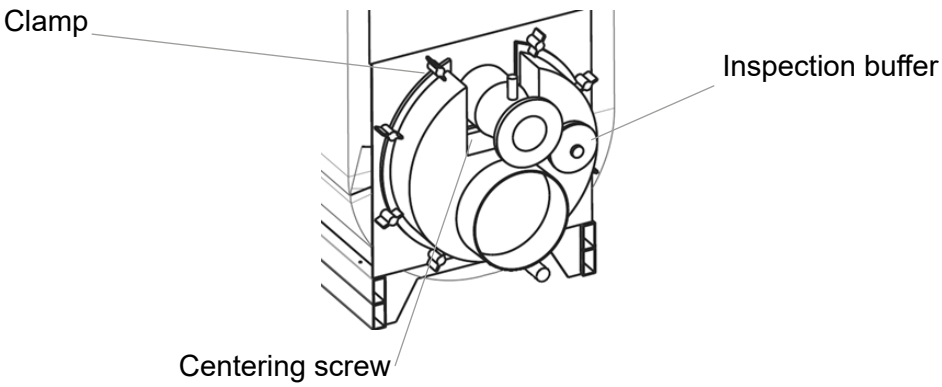
After the replacement, a check of the burner must be made to ensure that the adjustments have not been changed and correspond to the desired power of the boiler.

7.4. Removing the smoke box

- Remove the 2 rear panels.
- Unscrew the clamps and turn them 90° around the whole edge of the smoke box.



- Unscrew and remove the 2 smoke box centering screws located under the return flange.



CAUTION: **When putting everything back, check the silicon seal around the edge of the smoke box and the access hatch.**

8. SPARE PARTS

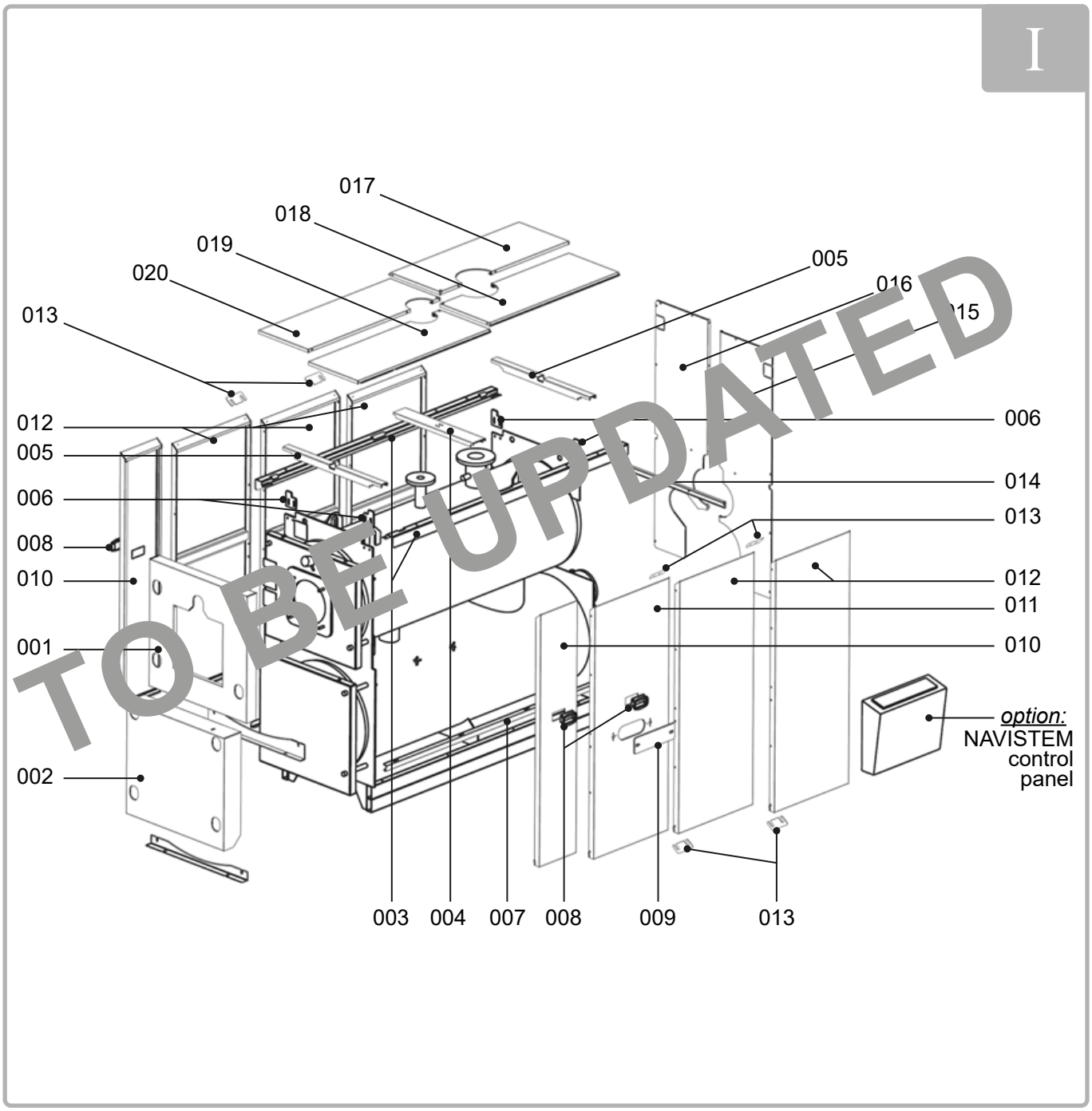


figure 4 - Cowling spare parts

ITEM	DESIGNATION	REF. FOR MODELS				
		465	625	810	1000	1250
001	Atlantic burner top front cowling	555005	555007		555008	
	Ygnis burner top front cowling	555009	555011		555012	
002	Consenser front cowling	555013	555014		555016	
003	Roof left / right high cross-member	555026		555027	555028	555029
004	Roof centering middle cross-member	555021	555023		555025	
005	Roof front / rear cross-member	555017	555018		555019	
006	High cross-member adjustment part	555037				
007	Low cross-member	555030		555032	555033	555035
008	Handle	555076				
009	Control panel cover	555038				
010	Right / left removable front panel	555073	555074		555075	
011	Control panel support side panel	555067	555069	555070	555071	555072
012	Side panel	555077	555078	555079	555080	555081
013	Cowling hooking part	555151				
014	Rear reinforcement cross-member	555088	555089		555090	
015	Right rear panel	555082	555083		555084	
016	Left rear panel	555085	555086		555087	
017	Left rear roof cowling	555060	555061	555062	555063	555065
018	Right rear roof cowling	555054	555055	555056	555057	555058
019	Right front roof cowling	555039	555040	555042	555044	555045
020	Left front roof cowling	555046	555047	555048	555051	555053
---	Complete cowling attachment fittings (excluding door)	555091				
---	Door cowling fittings	555092				
---	Rear panel attachment fittings	555093				

II

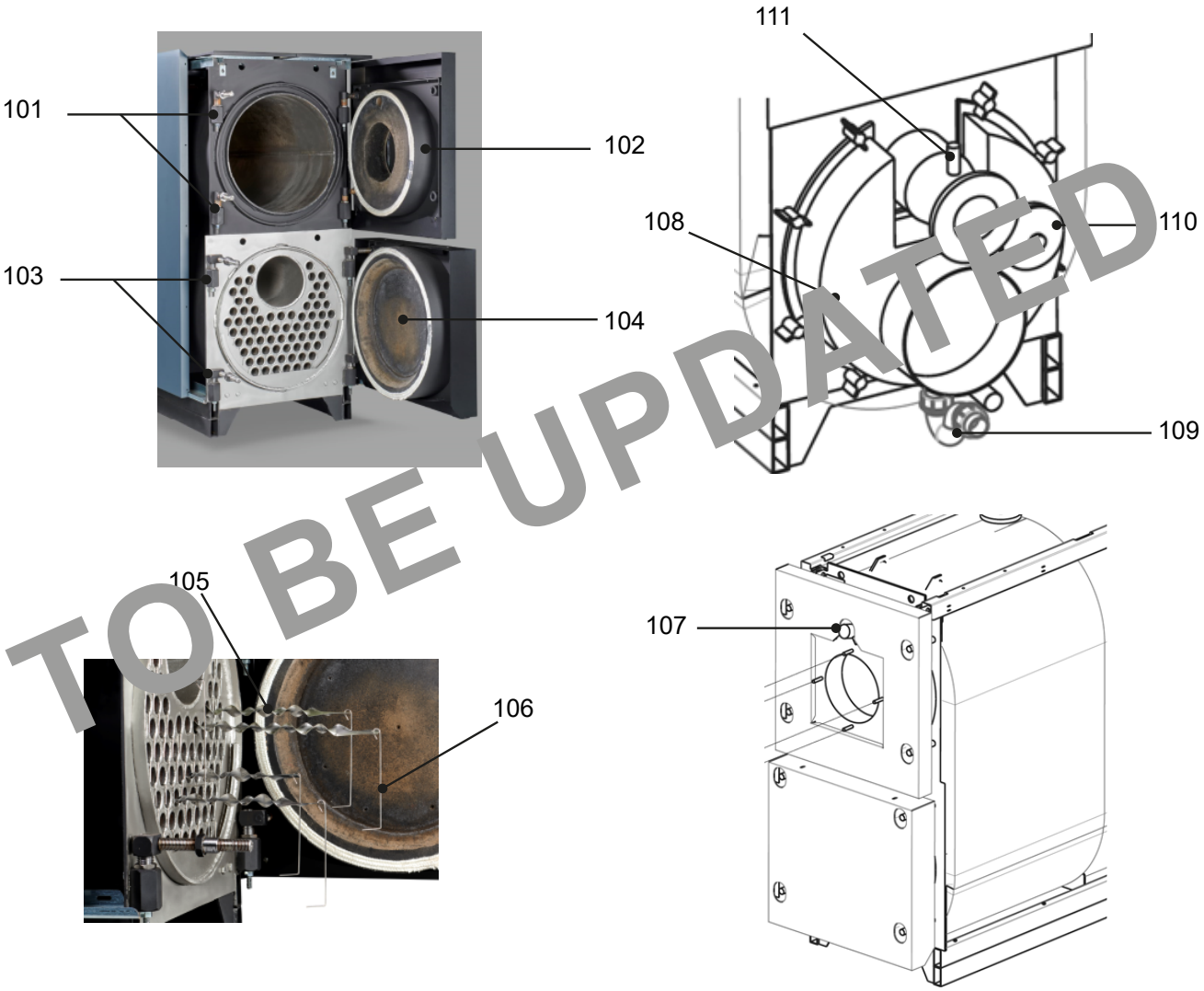


figure 5 - Heating body spare parts

ITEM	DESIGNATION	REF. FOR MODELS				
		465	625	810	1000	1250
101	Door burner attachment (x4)	555117	555118		555119	
102	Complete burner door	555102	555103		555104	
103	Condenser door attachment (x4)	555121	555122		555123	
104	Complete condenser door	555109	555111		555112	
105	Complete turbulators (set)	555124	555125	555126	555127	555128
	Complete turbulator (individual)	555129	555130	555131	555132	555133
106	Turbulator handle	555135				
107	Complete flame viewer	011300				
108	Complete smoke box	555141	555142		555143	
109	Siphon	555094				
110	Complete inspection hatch with seal	555140				
111	Complete thimble	551243				
	Thimble seal	551843				
--	Heating body insulation	552992	555001	555002	555003	555004
--	Burner door braid	555106	555107		555108	
--	Condenser door braid	555113	555114		555116	
--	Smoke outlet seal (red)	555144	555145		555146	
--	Smoke box / body seal (white)	555147			555148	
--	Smoke box fittings (set of 12)	060003				
--	Stuffing sack	510131				

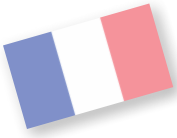
9. OPTIONAL ACCESSORIES

Valve, isolation valve, safety thermostat, pressure switch, temp return safety kit sup plateform, start cuff...

GROUPE ATLANTIC

Date of commissioning:

Address of your heating installer or customer service.



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