

# L.H.E.M.M.

Condensing heat generator for installation in a heating plant



INSTALLATION, COMMISSIONING, USE AND MAINTENANCE MANUAL

ITALIAN DESIGN





## CONTENTS

<b>General requirements</b>	<b>1</b>	Connecting the condensate outlet	14	Main menu	25	General maintenance operations	35
Manufacturer's declaration	1	Connection to the mains gas supply	15	Page 2-operation-temperature regulation	26	Cleaning the Mixer filter	37
General information	1	Connection to the mains electrical system	15	Information menu	27	Service function	37
<b>Technical specifications</b>	<b>2</b>	Flue system: important information	17	Special functions	28	Data plate	38
Description of the generator	2	Flue system: main characteristics	18	Faults	28	Testing the gas supply dynamic pressure:	39
Main characteristics	2	Flue system: installation	19	Fault codes table (all models)	29	Heating power adjustment module 65 kw	39
Technical data	3	Hydraulic separator and plate exchanger	20	Operating diagram	30	Analysis - checking and regulating combustion	40
Dimensions	4	Cascade connected heating unit control unit	21	Heating unit wiring diagram	31	Changing gas type:	41
Main generator components	7	Installation examples	22	Generator wiring diagram	32	Accessing the configuration menu	41
<b>Installation</b>	<b>8</b>	<b>Operation</b>	<b>24</b>	<b>Adjustment and maintenance</b>	<b>33</b>	Main parameters	43
Regulatory references	8	Interface description	24	Preliminary maintenance operations	33	Special functions	43
L.H.E.M.M. Model assembly	8			Access to the devices	33	<b>Accessories</b>	<b>44</b>
480 kw	8			Single heating unit maintenance	34		
Packaging	9						
Installation location	10						
Plumbing the boiler in	11						
Safety devices	12						
Filling the system	13						

## GENERAL REQUIREMENTS

### DICHIARAZIONE CE DI CONFORMITÀ (SECONDO ISO/IEC 17050-1)

G20 Engineering srl con sede in Loc. Campogrande, 13 - Carpaneto Piacentino i cui processi di progettazione, fabbricazione ed assistenza post vendita sono conformi ai requisiti della norma UNI EN ISO 9001:2008 - DICHIARA CHE Le caldaie modello THEA sono conformi alle Direttive Europee e ai Regolamenti Delegati Europei di seguito elencati: 1 - Direttiva "Eco-design" 2009/125/CE; 2 - Direttiva "Etichettatura Energetica" 2010/30/CE; 3 - Regolamento UE 811/2013; 4 - Regolamento UE 813/2013; 5 - Direttiva "Apparecchi a Gas" 2009/142/CE; 6 - Direttiva "Compatibilità Elettromagnetica" 2004/108/CE; 7 - Direttiva "Rendimenti" 92/42/CE; 8 - Direttiva "Bassa Tensione" 2006/95/CE

Amministratore Unico Marco Rapaccioli



CE CERTIFICATES ARE AVAILABLE ON OUR WEBSITE [www.produzionecaldaie.it](http://www.produzionecaldaie.it)

## GENERAL INFORMATION

This manual, supplied with every generator, should be considered as an integral component as it contains instructions for the correct, safe and appropriate installation, use and maintenance of the system.

The manual must always be kept by the user of the equipment and made available for the installation and/or maintenance technicians to consult. It must also accompany the generator if it should be moved or otherwise transferred.

The "Plant book" (specified by Pres. Decree 412/93), must be filled out by the installer (when installing the generator) and then by the maintenance technician, who will update it as necessary when the periodic operations required by law are carried out. The manufacturer shall not be held responsible for any damage caused by failure to follow the instructions contained in this manual, nor:

If the boiler is used for purposes other than those for which it was built

If any part or circuit of the boiler is modified

If accessories or kits not approved by the manufacturer are installed

If ordinary and extraordinary maintenance is not performed by qualified personnel

If applicable technical and legal requirements have not been observed during installation and maintenance of the generator.

### WARNING!

If the boiler should cease to function or not function correctly, deactivate it immediately by turning it off and then shutting off the gas supply. Do not attempt any repairs or direct work on the boiler.

Only personnel with the necessary qualifications and licenses (regulated by law 46 /90 in Italy) must perform maintenance on the boiler. Any repairs must be performed using only original parts and accessories.



**SYMBOLS USED IN THE MANUAL:**

Advice, suggestion, note



Important information, indications of methods and operations which could compromise correct operation of the boiler and create a hazard



### DESCRIPTION OF THE GENERATOR

**L.H.E.M.M.** is a condensing heat generator for installation in a thermal power station, consisting of multiple pre-assembled, independent elements. This constructive philosophy makes it possible to obtain very high power modulation ratios and therefore maximum functional versatility together with maximum logistics versatility, making it possible to perform complete maintenance cycles without stopping operation, which makes **L.H.E.M.M.** a real continuous duty system. Therefore the **L.H.E.M.M.** condensing generator is irreplaceable where high and continuous performance is required with a maximum degree of reliability.

The system includes manifolds that transport the heat carrying fluid and the gas, making installation quick and easy and fully maximising the use of space available at the plant.

The **L.H.E.M.M. heat generator** has been designed and built to make it easier to install and manage medium power installations. It relieves the operators from problems of design, assembly and adjustment, drastically reducing the possibility of errors and unexpected compromises.

### MAIN CHARACTERISTICS

#### THE L.H.E.M.M. IS ARRANGED FOR:

- Control of primary ring pumps
- Control of heating adjustment loads
- INAIL (ex ISPEL)

#### SOME FEATURES:

- 4 star Efficiency Class, according to directive EEC 92/42
- Every heating element consists of: bimetallic cast iron-aluminium heat exchanger with reverse flame ceramic burner, modulating fan, gas valve, high pressure head circulator, ignition and flame control device, NTC sensor for delivery temperature control, safety thermostat, water circuit pressure switch, safety control and management program
- Premix system in the fan with anti-reflux valve integrated in every flue duct
- Comburent air intake/supply system from the boiler room

#### THE SYSTEM IS EQUIPPED WITH:

- Delivery/return manifolds arranged with mounting flanges
- Gas manifold with shut-off valves
- Reversible hydraulic and gas connections
- Integrated heating adjustment program
- System load management for up to 3 mixed circuits and boiler load
- Supplied with: external probe, delivery probe and boiler probe, area control probes

#### OPERATING LOGIC:

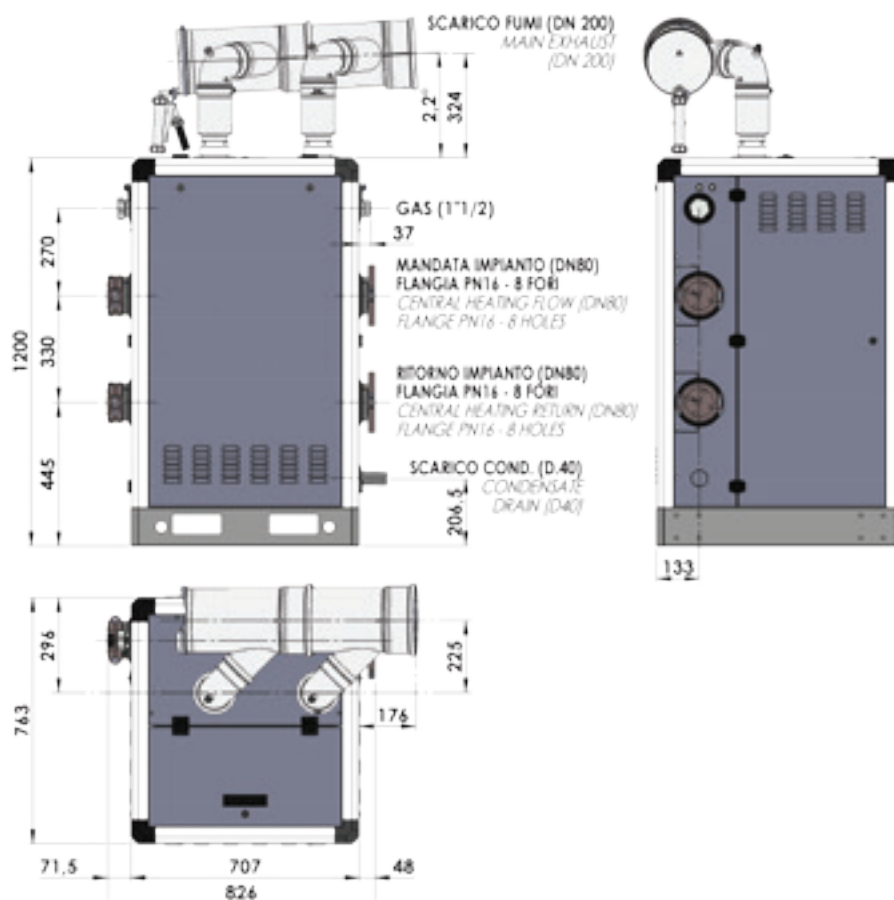
- Power distribution for obtaining the highest efficiency
- System for automatically distributing the working hours among the heating elements, guaranteeing their optimal homogeneous use
- Production of DHW by means of a priority probe, boiler load pump control, 3-way diverting valve
- Possibility of power control to each heating element
- Automatic control of power output, the system temperature setpoint
- Monitoring of the working status and temperatures
- Alarm management
- Parameter setting

## TECHNICAL DATA FOR A SINGLE THERMAL MODULE

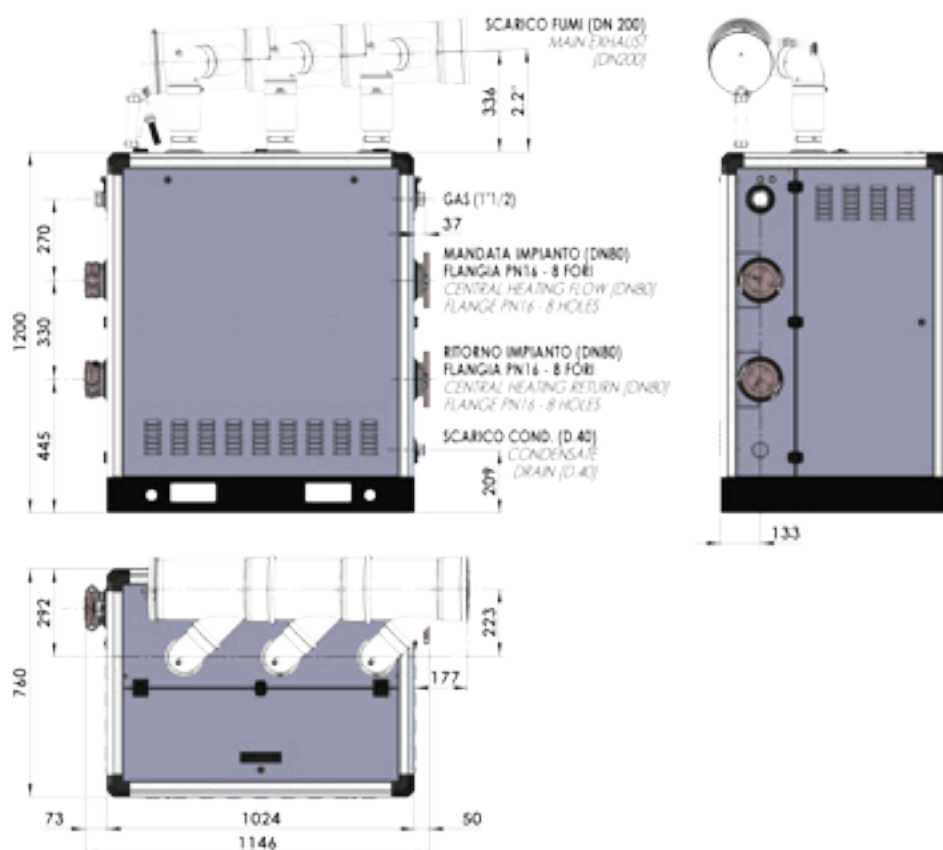
CATEGORY	II2H3P	
PIN	CE-1299CS0038	
Gas type	G20	G31
Maximum gas consumption m <sup>3</sup> /h (kg/h)	6,3 [m <sup>3</sup> /h]	4,8 [kg/h]
Rated heat input for heat generator (60 - 80 °C)	121-486 [kw]	
Minimum heat input for heat generator (60 - 80 °C)	14,1 [kw]	
Rated heat input (60 - 80 °C)	60,7 [kw]	
Maximum heat output P <sub>n</sub> 100% (60 - 80 °C) kW	58,6 [kw]	
Minimum heat output (60 - 80 °C) kW	13,4 [kw]	
Useful efficiency P <sub>n</sub> 100% (60 - 80 °C)	96,5 [%]	
Useful efficiency P <sub>n</sub> 100% (50 - 30 °C)	105,7 [%]	
Useful efficiency P <sub>n</sub> 30% (50 - 30 °C)	113,3 [%]	
NO <sub>x</sub> Class	5	
N° of generator modules	2 - 8	
CO <sub>2</sub> level - Rated output (G20 - G31)	9 [%] - 10,5 [%]	
CO <sub>2</sub> level - Minimum output (G20 - G31)	8,8[%] - 9,9[%]	
CO <sub>2</sub> level P <sub>n</sub> 100%	87 [p.p.m.]	
Net flue temperature - Rated output (60 - 80 °C)	60,3 [°C]	
Max available pressure at the chimney base	220 [Pa]	
Available hydraulic head in module circuit	6 [m.c.a.]	
IP rating	40	
Power consumption	270 [Watt]	

## DIMENSIONS

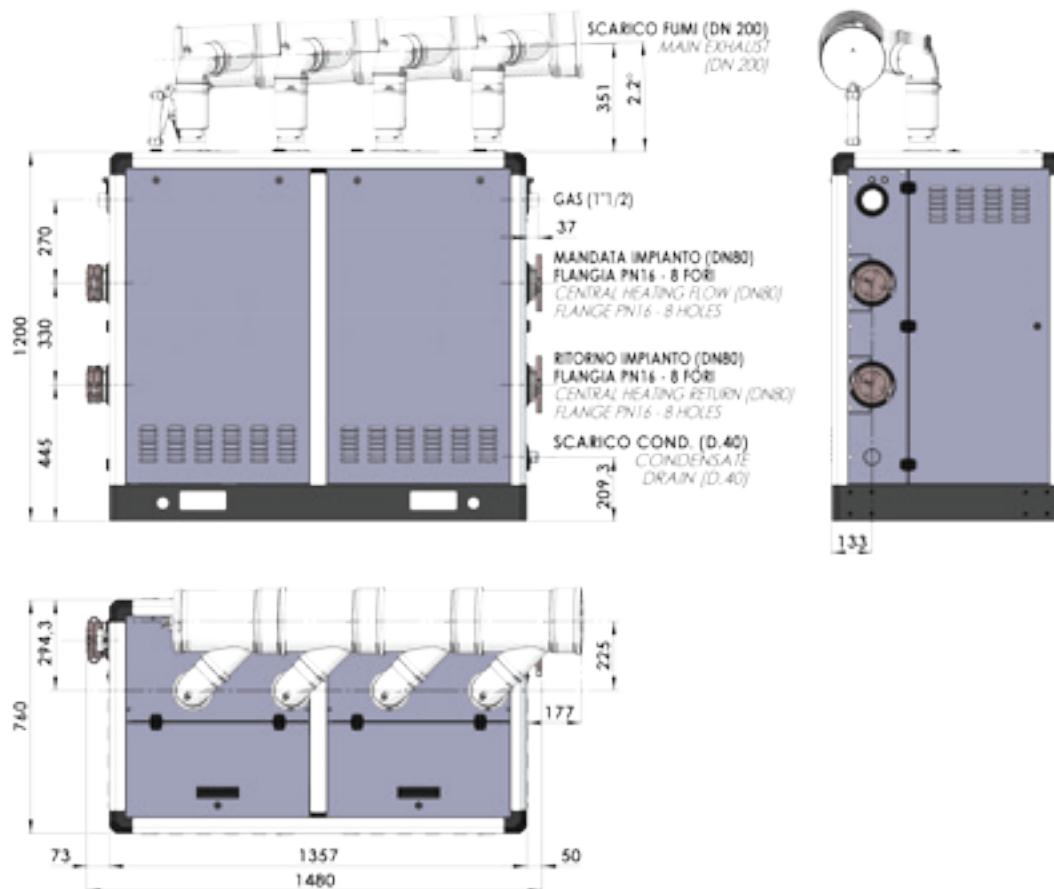
Pict.1 - M65 114-130 KW SERIES GENERATOR DIMENSIONS



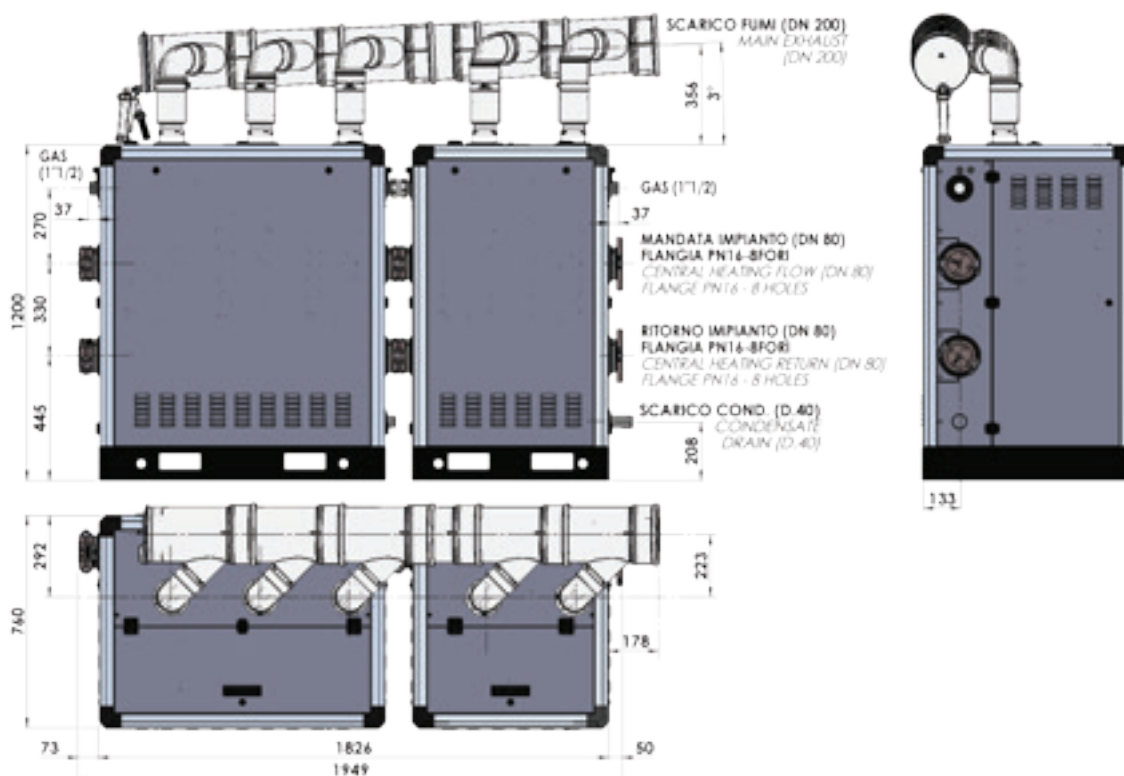
Pict.2 - M65 195 KW SERIES GENERATOR DIMENSIONS



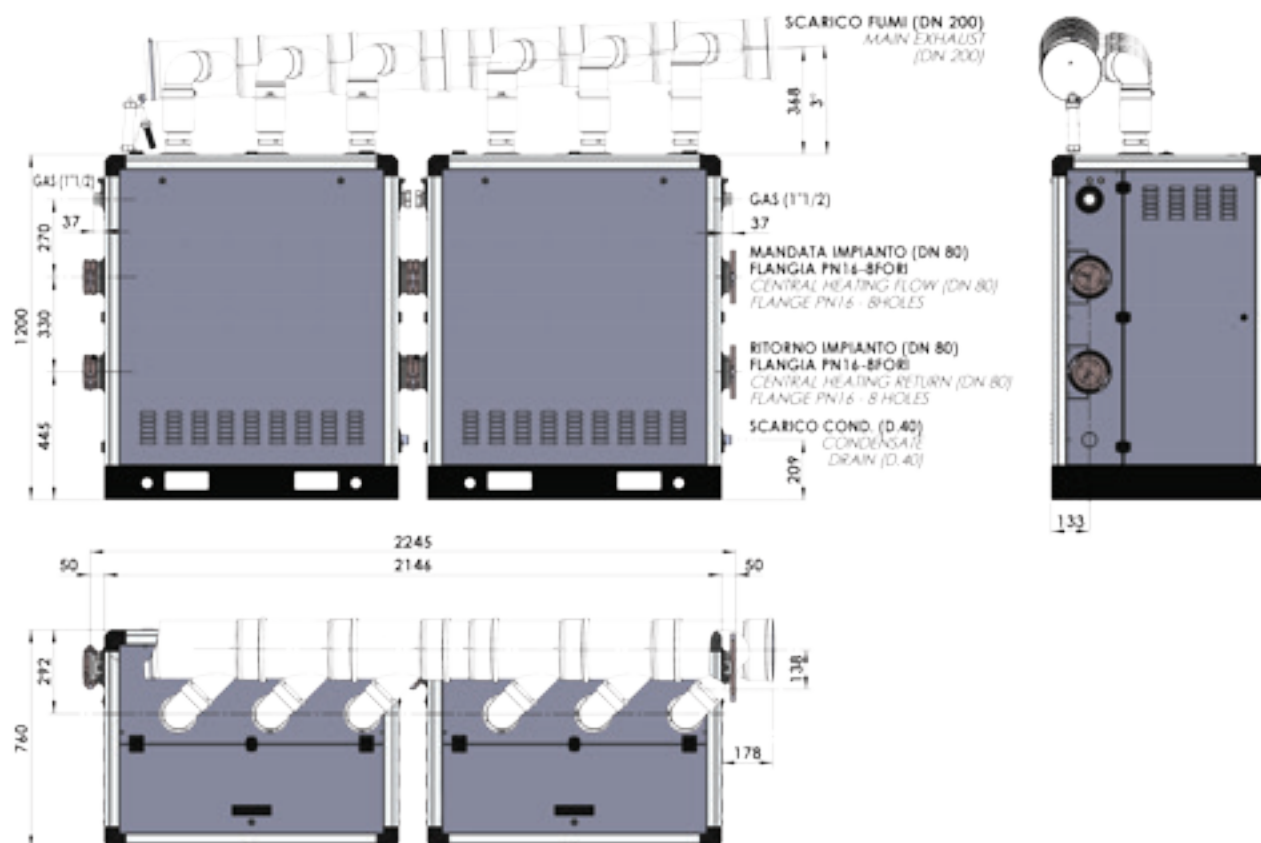
Pict.3 - M65 260 KW SERIES GENERATOR DIMENSIONS



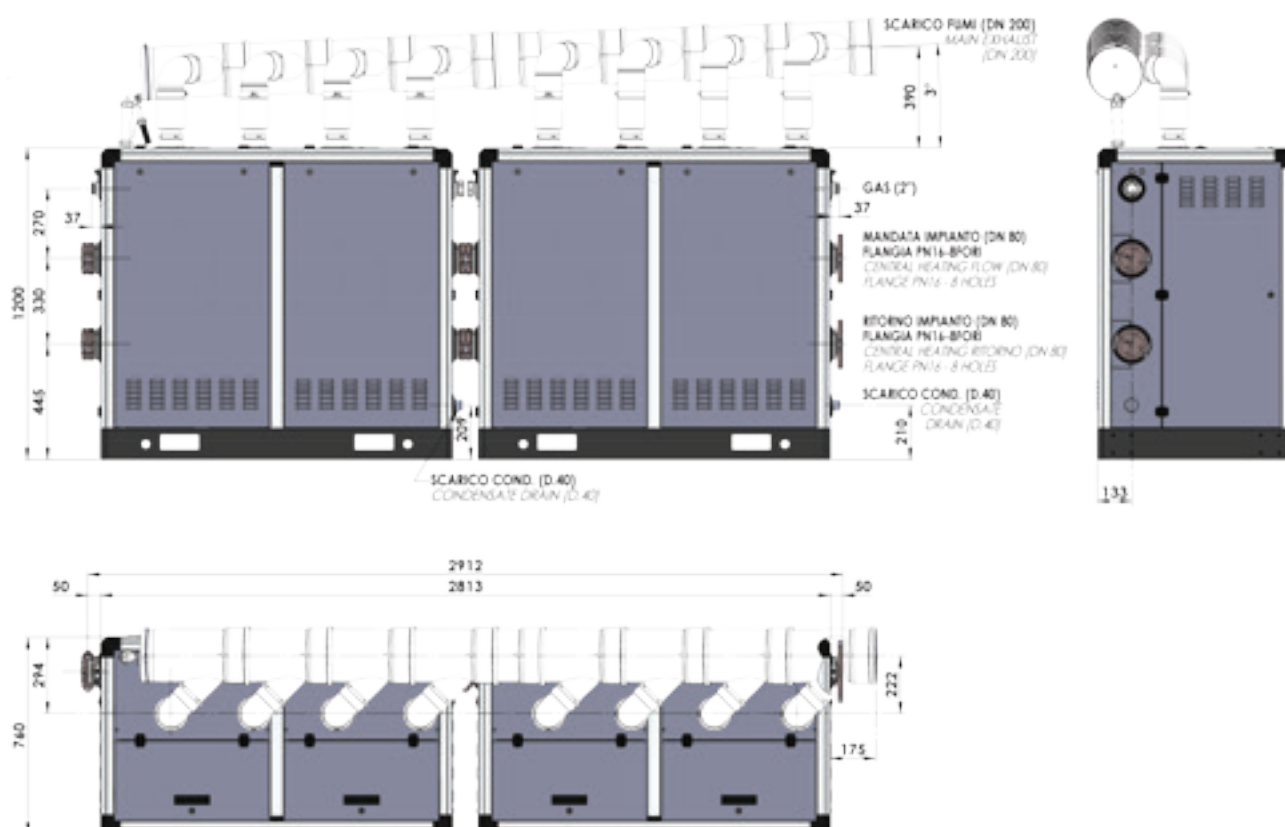
Pict.4 - M65 325 KW SERIES GENERATOR DIMENSIONS



Pict.5 - M65 390 KW SERIES GENERATOR DIMENSIONS



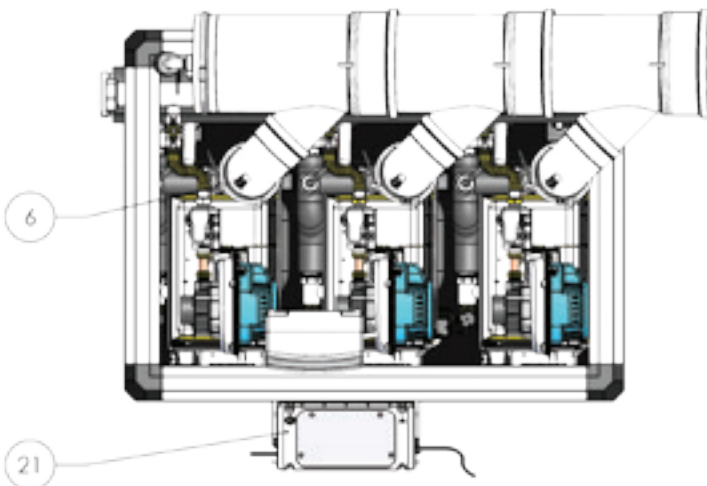
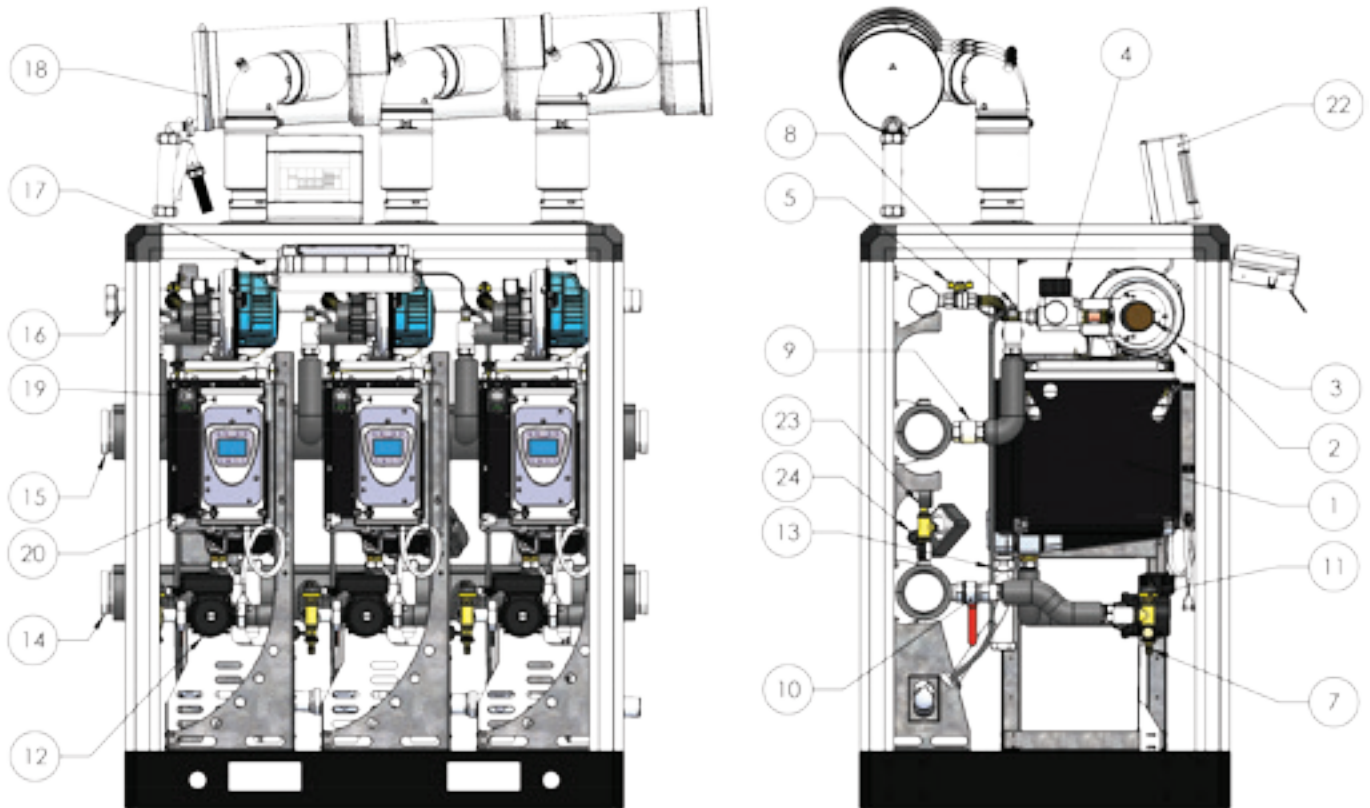
Pict.6 - M65 520 KW SERIES GENERATOR DIMENSIONS





## MAIN GENERATOR COMPONENTS

Pict.7



### Legend:

- 1) HEAT EXCHANGER
- 2) FAN
- 3) AIR-GAS MIXER
- 4) GAS VALVE
- 5) GAS SHUT-OFF VALVE
- 6) SAFETY THERMOSTAT/ TEMPERATURE SENSOR
- 7) EMPTYING VALVE
- 8) MANUAL BLEED VALVE
- 9) CHECK VALVE
- 10) VALVE
- 11) PRESSURE SWITCH
- 12) CIRCULATOR UNIT
- 13) CONDENSATE OUTLET SIPHON
- 14) SYSTEM RETURN MANIFOLD
- 15) SYSTEM DELIVERY MANIFOLD
- 16) GAS MANIFOLD
- 17) FLUE SENSOR
- 18) FLUE KIT
- 19) IGNITER
- 20) PANEL
- 21) MODULE CONTROL ELECTRICAL BOX
- 22) SWITCH PANEL
- 23) PRESSURE GAUGE
- 24) MINIMUM PRESSURE SWITCH

## REGULATORY REFERENCES

The installation must comply with the requirements of the most recent standards and laws concerning central heating plants, heating system and hot water production installations, ventilation, chimneys suitable for releasing condensing boiler combustion products, and anything else applicable.

In terms of safety, protection and control of the systems, refer to the INAIL requirements and relative specifications of "COLLECTION R".

With regard to the gas, electrical, flue and condensate outlet connections as well as measures for saving energy and preventing atmospheric pollution, refer to the local and national laws and regulations in force.



The equipment must be installed in compliance with the instructions provided in this manual.

The installation must be performed by a professionally qualified technician who shall be responsible for complying with all the local and/or national laws published in the gazzetta ufficiale (Official Gazette) as well as all applicable technical standards.

The installation technician is responsible for any regulatory updates

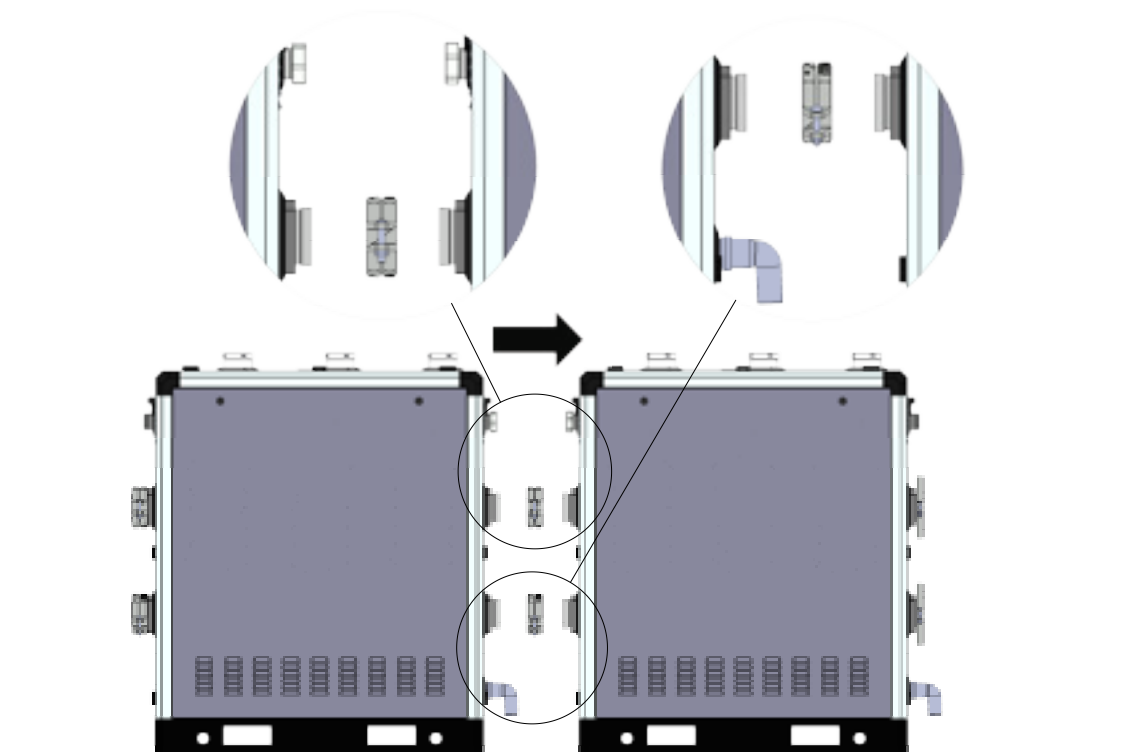
## L.H.E.M.M. MODEL ASSEMBLY 325-390-520 KW

For installation of Generator model 480 Kw. it is necessary to connect two modules that are supplied separately. Once the hydraulic and gas connections are completed for the first module, as described on pages 11 and 15, proceed as follows:

- Place the second module on the side opposite the connections, making sure to align the return and delivery manifold. Ensure the joining of the two modules using the supplied Joints according to the instructions supplied with the machine.

Mount the joints and caps provided on the opposite side of the second module. To seal the plug on the gas manifold, use the sealant for threads suitable for use, while for the Joints with caps refer to the instructions supplied.

Pict. 8



## PACKAGING

The L.H.E.M.M. generator is supplied assembled in a robust cardboard box.



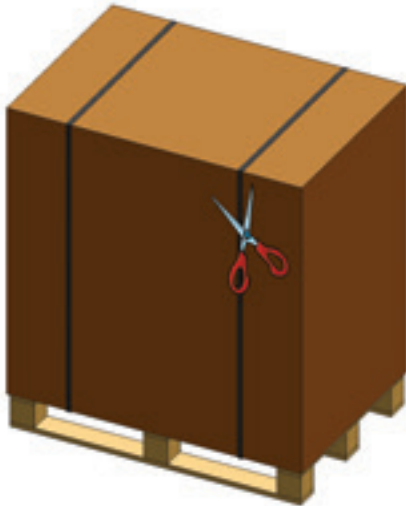
After removing the straps (Pict. 9a), pull off the box from the top (Pict. 9b) and make sure that the contents are in a good condition.



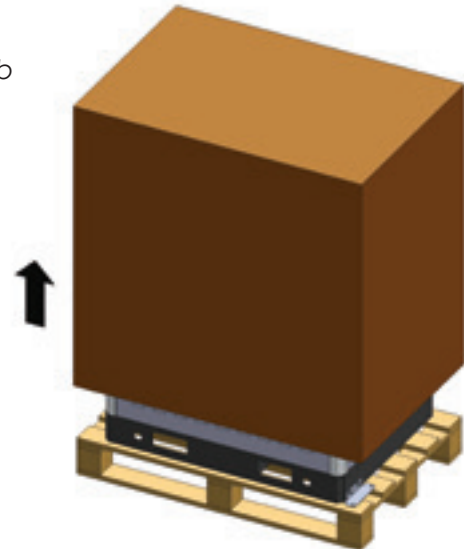
The packaging (cardboard box, straps, plastic bags, etc.) must not be left within the reach of children as they could be dangerous.

Air Control shall not be held responsible in the case of damage caused to people, animals or property due to the failure to observe what was stated above

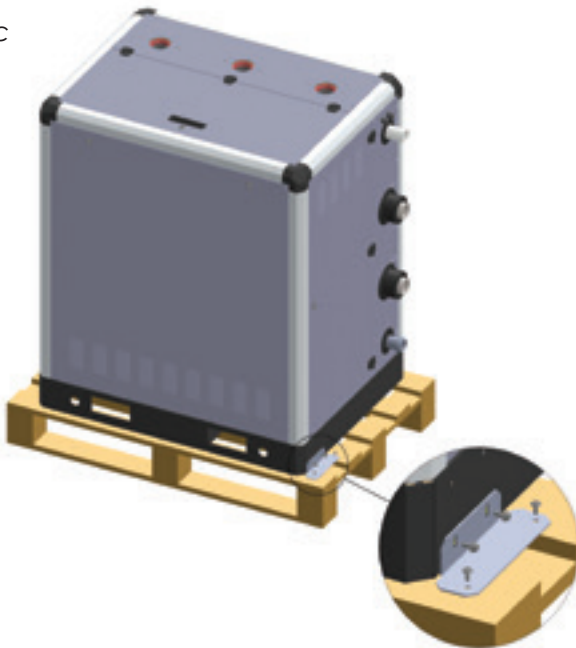
Pict. 9a



Pict. 9b



Pict. 9c



Pict. 9d



After removing the cardboard box, remove the two brackets (see Pict. 9c) that fasten the generator on the pallet.

The generator has holes in its base for inserting steel bars to be used for lifting it (see Pict. 9d). This must be done using suitable equipment based on the weight of the model being handled (see Table).

Model	A	B	C	Gross weight (kg)
Lhemm 114-130	830	810	1380	180
Lhemm 195	1150	810	1380	250
Lhemm 260	1470	810	1380	330

## INSTALLATION LOCATION

The L.H.E.M.M. is a condensing heat generator for installation in a heating plant. Particular importance must be placed on the local standards and laws concerning this particular area, specifically regarding the minimum distances (see Pict. 10) that must be kept free around the equipment and ventilation openings to the outside.

For positioning, leave sufficient space around the modules for normal maintenance operations. Make sure in particular that the front door and the two side doors can be opened without obstacles.



Once installation is complete, the generator must be perfectly horizontal and stable (to reduce vibrations and noise). If the same room also contains burners or extractors that could operate together, the ventilation openings must be sized for the planned operation of all the equipment. The place of installation must be free of inflammable objects or materials, corrosive gas, dust or volatile substances.



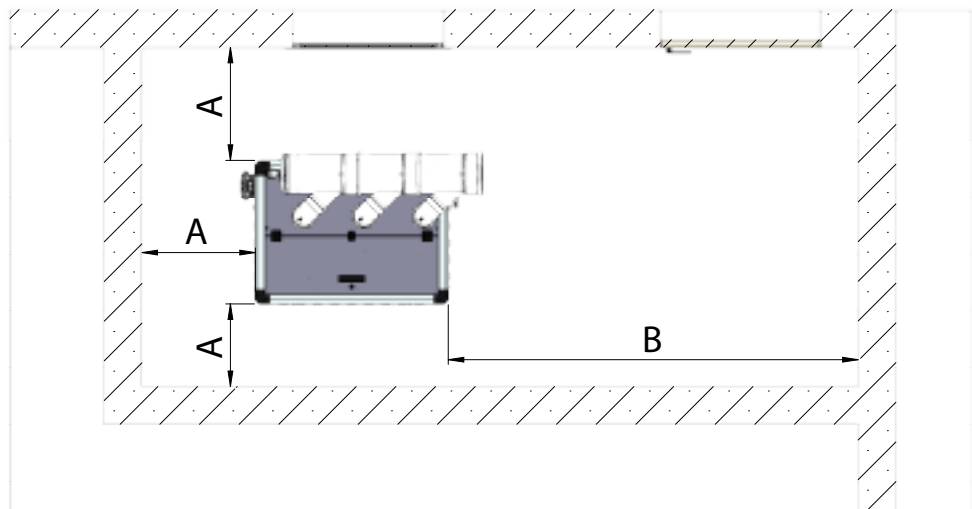
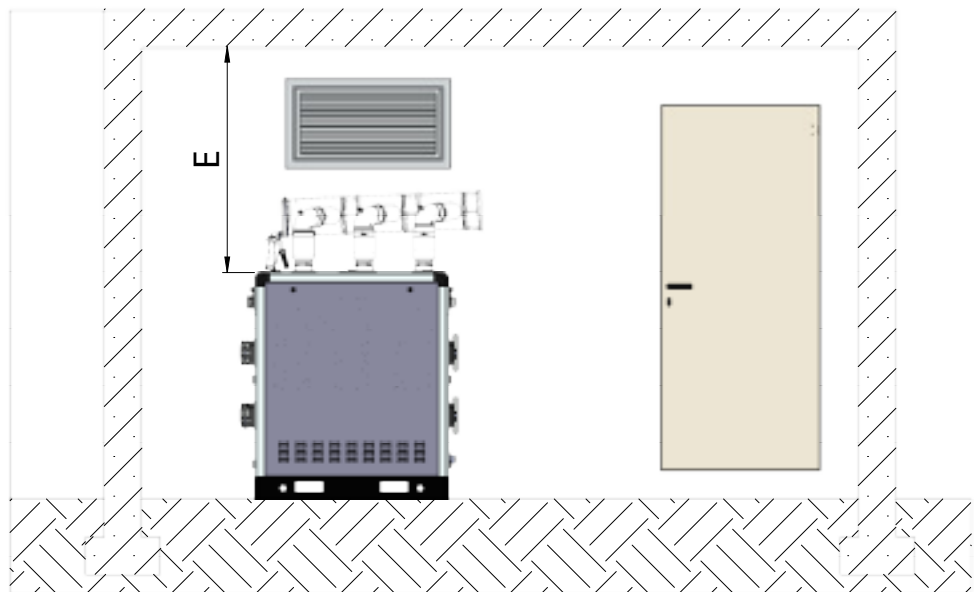
The air intake required for combustion takes place through slots in the lower and upper parts of the casing. Make sure nothing is blocking these air passages.

The generator must be installed in order to prevent, under the foreseen operating conditions, the liquid it contains from freezing and prevent the command and control devices from being exposed to temperatures below  $-15^{\circ}\text{C}$  and above  $+40^{\circ}\text{C}$ .

The generator must be protected by climatic/ environmental variations by using specific antifreeze products in the hydraulic system. These products must be compatible with the materials used in the entire system and tolerable for aluminium alloys.

Pict. 10

	Minimum distances
A	0.60 m
B	1.30 m
E	1.00 m



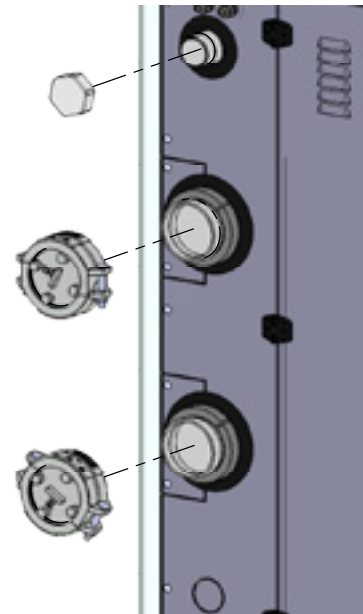


## PLUMBING THE BOILER IN

The delivery, return and gas manifolds must be closed from the opposite side using the supplied plugs and Joints with caps (Pict. 12).

To seal the plug on the gas manifold, use the sealant for threads suitable for use, while for the Joints with caps refer to the instructions supplied.

Pict. 12



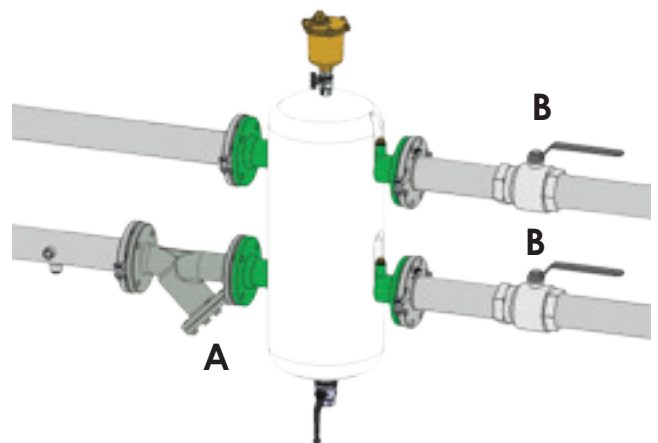
**It is recommended to always install a Y-filter on the return pipe to the generator (Part A Pict. 13).**

This filter protects the heating units from dirt coming from the heating system. The L.H.E.M.M. generators can be supplied with a separate kit (accessory) that includes a Y-filter.

Pict. 13



**It is recommended to install the ball shut-off valve (Part B Pict. 13) on the system delivery and return pipes (secondary).** This makes it possible to disconnect or empty the generator in the case of scheduled/non-scheduled maintenance without having to empty the entire system.



**Be particularly careful when installing the hydraulic connections so they are not tensioned, thereby avoiding problems with system tightness. Use appropriate tools and procedures for tightening.**

Flush the pipes thoroughly before making the hydraulic connection and make sure that any impurities are completely removed.

Size the pipes taking the loss of load caused by system components and its configuration into account.



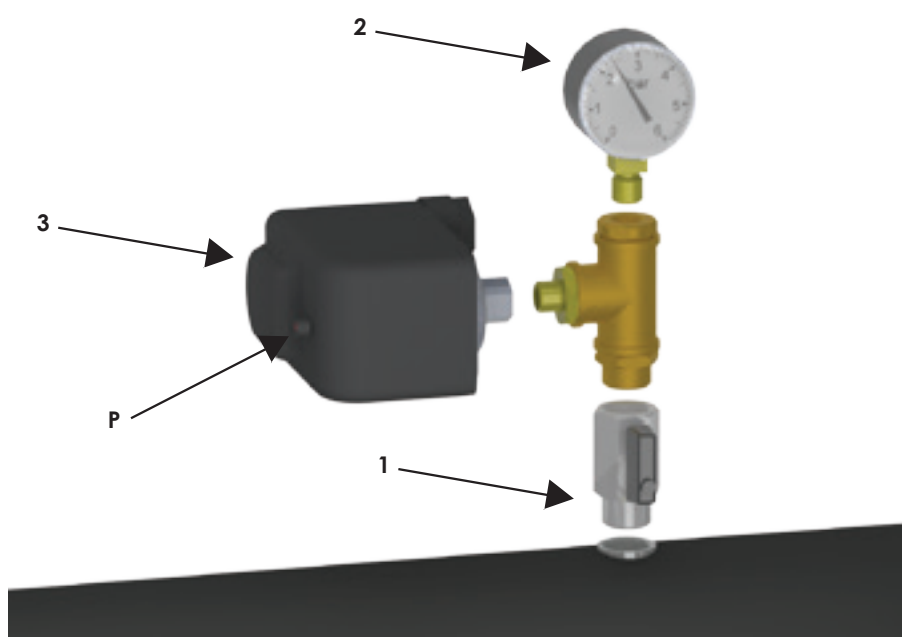
**Do not use the hydraulic connection pipes as earthing points for electrical equipment.**

## SAFETY DEVICES

The L.H.E.M.M. generator is provided standard with a minimum pressure switch (3), a ball valve (1) to permit eventually the replacement, and a manometer (2) to measure the pressure (see Pict. 14). Minimum pressure switch acts by stopping the electrical power of the generator when the hydraulic system pressure goes down the value of setting. If the pressure switch acts, this can be restarted after having setted the pressure to a value between 1.3 and 1.6 Bar, pushing the small button (P) on the back.

The device is not supplied with an expansion tank, therefore it must be connected by the installer. The dimensions of the expansion tank to be installed depend on the data relative to the heating system and vary from system to system.

Pict. 14



## FILLING THE SYSTEM

Arrange an appropriate filling unit.

When all of the generator's hydraulic connections have been made, it is possible to start filling the system. Perform the operation slowly to help all air bleed out of the system. When filling, check all the internal and external parts of the system to make sure they are perfectly tight.

The L.H.E.M.M. generator leaves the factory with the valves in the individual heating units closed.

Starting from the heating unit closest to the side with the connections, proceed as follows:

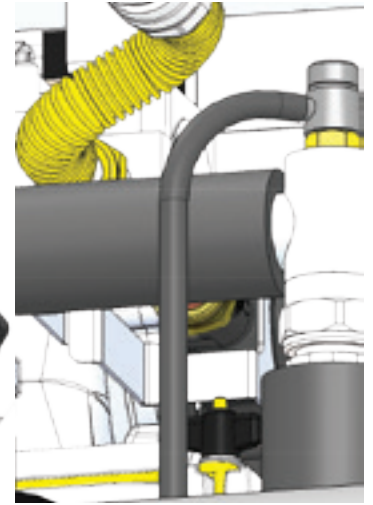
- Open the valve on the individual heating unit (see Pict. 18);
- Open the air bleed valve on the individual heating unit (see Pict. 17);
- Slowly open the system filling tap, making sure that the air bleed valve is working properly.
- Close the air bleed valves as soon as water starts to come out;
- Check the pressure gauge (Pict. 16) located on the generator return stub pipe, making sure the pressure reaches a value between 1.3 and 1.6 bar;
- Close the filling tap.

Repeat the operations described above for all of the generator's heating units.

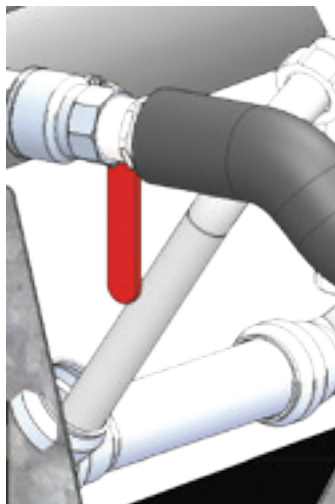
Pict. 16



Pict. 17



Pict. 18



**Do not mix heating water with antifreeze or anticorrosion substances in incorrect concentrations! This could damage the gaskets and create noise during operation.**

**Air Control shall not be held responsible in the case of damage caused to people, animals or property due to the failure to observe what was stated above.**

**Each individual heating unit has a drain tap. Its position is indicated in Pict. 19. This tap can only be used to empty the individual heating unit. Therefore the system must be equipped with its own drain tap, which must be sized according to system capacity.**



**Perform the filling and topping up of the system with the generator completely off and all parts at ambient temperature.**

**Always close the filling loop cock once you have finished the operation**

## CONNECTING THE CONDENSATE OUTLET

Each heating unit is equipped with a siphon for the condensate outlet, which prevents combustion products from escaping to the room in which it is installed. All of the siphons are connected to a condensate outlet manifold in the generator. The installer is responsible for connecting a Ø40 pipe to the condensate outlet manifold for the evacuation of the condensate produced during operation and shall provide a condensate neutralisation system if necessary.

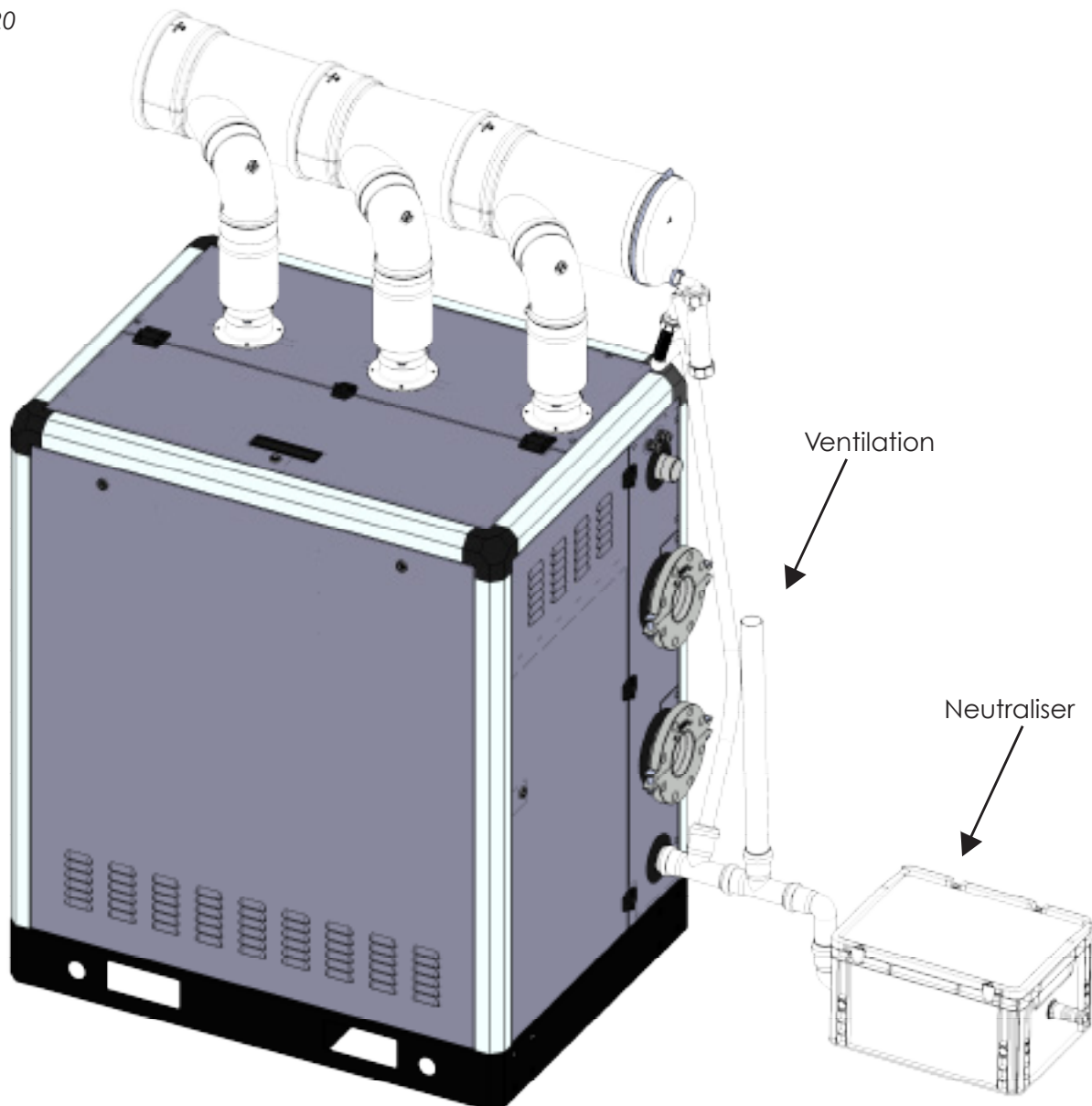
The L.H.E.M.M. generators can be supplied with a separate condensate neutralisation device (accessory). The produced condensate is drained and treated in the neutralisation device.

As specified by applicable standards, an open type connection must be made to avoid ice from

forming in the evacuation system, which would prevent the condensate from draining. Furthermore a ventilation device must be inserted between the siphon and neutralisation device (see Pict. 20). The condensate water outlet towards the drain channel must be visible. It must be installed with a slope and be equipped with a siphon from the side of the drainage system and sample collection devices.

Pict. 20 shows how to connect the generator's condensate outlet manifold to a neutraliser.

Pict. 20





## CONNECTION TO THE MAINS GAS SUPPLY

Before making the connection, check that the device is designed to function with the available type of gas. Thoroughly flush all the gas pipes to remove any residues which could compromise correct operation of the generator.

The gas must be connected to the relative coupling in accordance with applicable regulations.

Check that the flow rate from the line from the gas meter is sufficient to support the simultaneous use of all equipment connected to it. Check that there is no significant drop in pressure along the distribution line from the gas meter; pipes of sufficient diameter must therefore be used to satisfy this requirement.



**Check that all connections are perfectly tight before opening the gas connection.**  
**Check that all devices necessary for creating and limiting the maximum permissible pressure of the relative gas are installed in the system before opening the boiler's gas connection.**  
**Do not use the gas supply pipework connections as earth points for electrical equipment.**  
**Always install a shut-off valve upstream of the device. This must have a YELLOW valve handle and must be placed in a visible position without any obstacles that could jeopardise the manoeuvre, even partially.**  
**Do not install shut-off valves between the generator and the safety devices.**  
**Install a gas shut-off valve outside of the modules in order to directly shut-off the gas supply if the water temperature limit value is reached**

## CONNECTION TO THE MAINS ELECTRICAL SYSTEM

For safe installation of the boiler it must also be correctly connected to the mains electrical supply in accordance with all applicable regulations, and in particular it must be connected to a suitable protective earthing system.

The generator is supplied with a supply cable of a suitable length. Proceed as described below if it must be replaced.

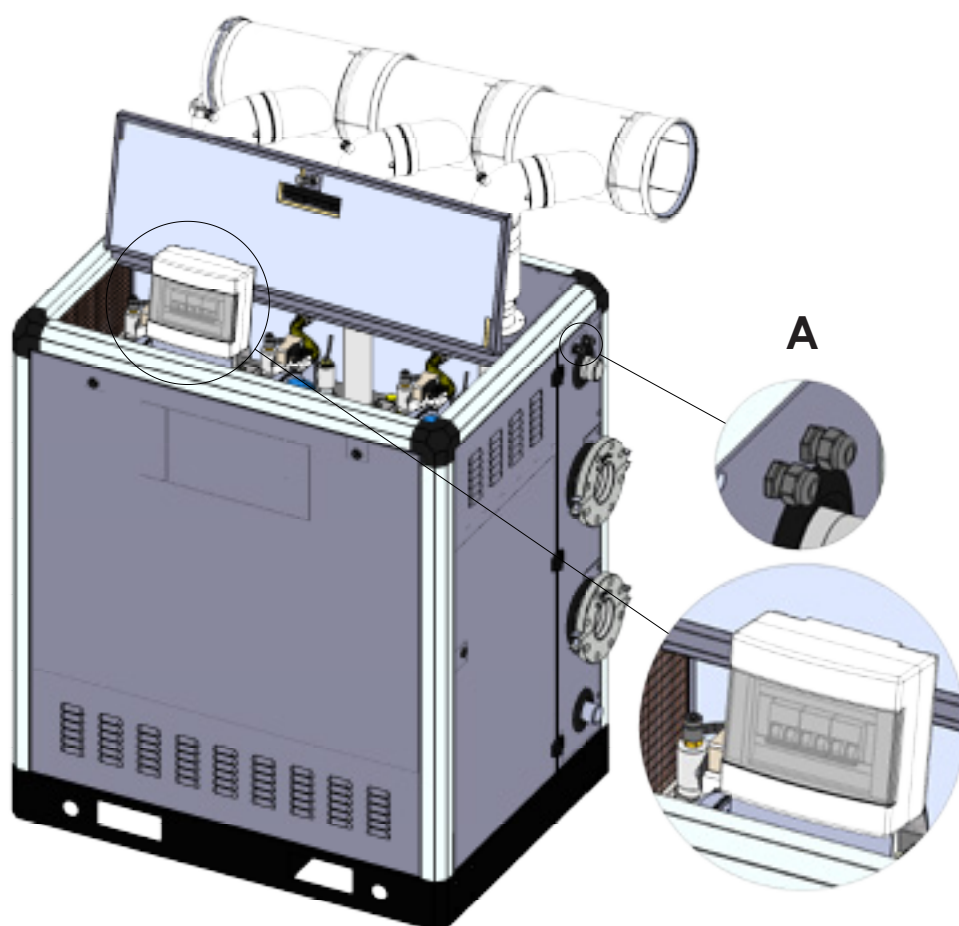
Use a three-core cable for the connection to the electrical line. It must be connected to the mains with a dedicated connection via a dual-pole switch whose contacts have an opening of at least 3 mm. It is important to respect the correct polarity (LIVE: brown cable / NEUTRAL: blue cable / EARTH: yellow-green cable) when wiring in the boiler. Proceed as follows to connect the supply cable:

- cut power to the equipment using the power switch installed upstream,
- open the upper door of the generator,
- turn the electrical panel to a vertical position (see Pict. 21 on page 16),
- remove the front cover of the panel by unscrewing the 4 fixing screws on the back,

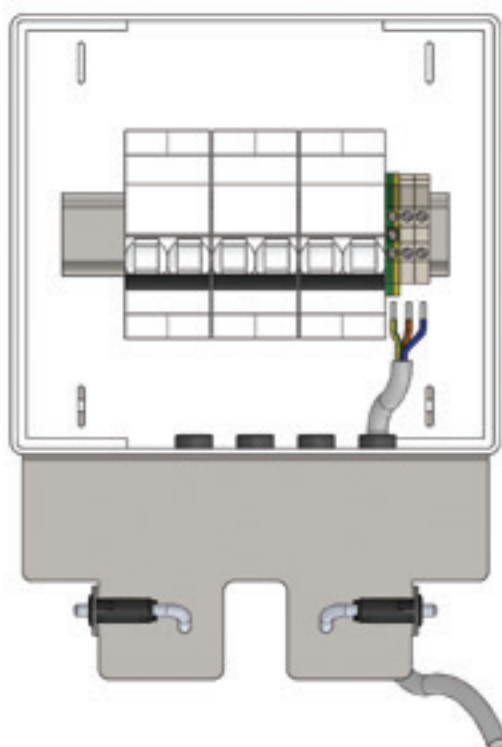
- use a free cable gland in the lower part of the panel to insert the cable,
- identify the terminals located on one side of the switches (Pict. 22 on page 16) and connect the live, neutral and earth poles of the cable, respecting the positions,
- close the front cover and screw it closed,
- return the electrical panel to the operating position.
- cable glands are provided on the sides of the generator for passing the cable; use a free one on the side selected for making the electrical connections.

**For connecting or replacing conductors, use H05VV-F, H05VVH2-F (CEI EN 60228) or better rated cable.**

Pict. 21



Pict. 22



A qualified electrician should check the suitability of the protective earth system. The manufacturer is not responsible for any damage caused by the lack of a suitable system earth.

Check that the electrical connection is sufficient to satisfy the generator's maximum power consumption, indicated on the generator plate. Extensions, adaptors or gang sockets must not be used when connecting the device to the mains electrical system.

## FLUE SYSTEM: IMPORTANT INFORMATION



**FOLLOW APPLICABLE LEGISLATION AND REGULATIONS TO THE LETTER.**

**INSTALL THE EVACUATION SYSTEMS CONFORMING TO THE SPECIFICATIONS GIVEN ON THE TECHNICAL DATA PLATE AND SCRUPULOUSLY OBSERVE ANY LIMITATIONS ARISING FROM APPLICABLE LEGISLATION AND REGULATIONS.**

**ONLY USE APPROVED COMPONENTS FOR FLUE EVACUATION SYSTEMS WHICH ARE OF THE CORRECT DIMENSIONS AND PURPOSELY DESIGNED AND MANUFACTURED FOR THE PURPOSE.**

**FOLLOW INSTALLATION INSTRUCTIONS TO THE LETTER.**

**INSULATE ANY FLUE SECTIONS WHICH WILL BE EXPOSED TO LOW TEMPERATURES.**

**WHENEVER NECESSARY, PLACE APPROPRIATE CONDENSATE TRAPS ON THE EVACUATION LINE.**

**Ensure the following before commissioning the boiler:**

- **THE PERFECT SEAL OF THE FLUE LINE**
- **THAT IT IS CORRECTLY POSITIONED AND FASTENED**
- **THAT THERE ARE NO MECHANICAL, THERMAL OR UNFORESEEN CHEMICAL STRESSES ON THE LINES WHICH COULD EVEN MOMENTARILY COMPROMISE THEIR INTEGRITY.**

**ALWAYS PROVIDE SYSTEMS FOR ABSORBING THERMAL EXPANSION IF THE FLUE LINE SEGMENTS ARE LONGER THAN THE MINIMUM REQUIRED.**

## FLUE SYSTEM: MAIN CHARACTERISTICS

As the fumes of a condensing generator are released at a very low temperature, the FLUE must be perfectly impermeable to the condensate produced by combustion and be constructed with suitable materials that are corrosion resistant. It must run vertically and not have any narrow sections along its full length. It must be placed at a suitable distance from flammable materials using air spaces or suitable insulation. There must be a chamber for collecting solid materials and any condensate under the first funnel. Access must be guaranteed to this chamber by an air-tight metal door. A chimney cap must be placed on top in compliance with current regulations. There may not be any intake devices positioned on the end of the line. If it passes through or up against residential rooms, there must not be any overpressure inside it. With regard to the cross-section and height of the chimney, reference must be made to applicable national and local regulations. The various socket joints must be well sealed and have suitable gaskets in order to prevent condensate from escaping and air from entering.

The FUNNEL (the channel that connects the heating units and the flues together) must be constructed in materials able to resist normal mechanical stress, heat and the action of the products of combustion

and any condensate over time. Corrugated pipe may not be used. The connection must be airtight. The connection must be in view and easy to disassemble and permit normal thermal expansion. The maximum lengths must be respected. It must be fixed airtight to the chimney opening. It may not have any shut-off valves. It must be positioned at least 500 mm from combustible and/or flammable materials. A suitable condensate outlet must be provided at every change in direction (e.g. a 90° curve).



Take proper precautions so the condensate does not freeze in the outlet.



The supplier excludes all contractual and non-contractual responsibility for damage caused by errors regarding installation and use and in any case due to failure to comply with the instructions provided by the manufacturer.

Refer to the data in the table for the maximum diameters and length of the flue.

L.H.E.M.M model	Flue (DN)	Equivalent length (m)
114	200	10
195	200	10
260	200	10
325	200	10
390	200	10
520	200	10



## FLUE SYSTEM: INSTALLATION

Before starting with installation, check and scrupulously comply with the local standards and regulations.

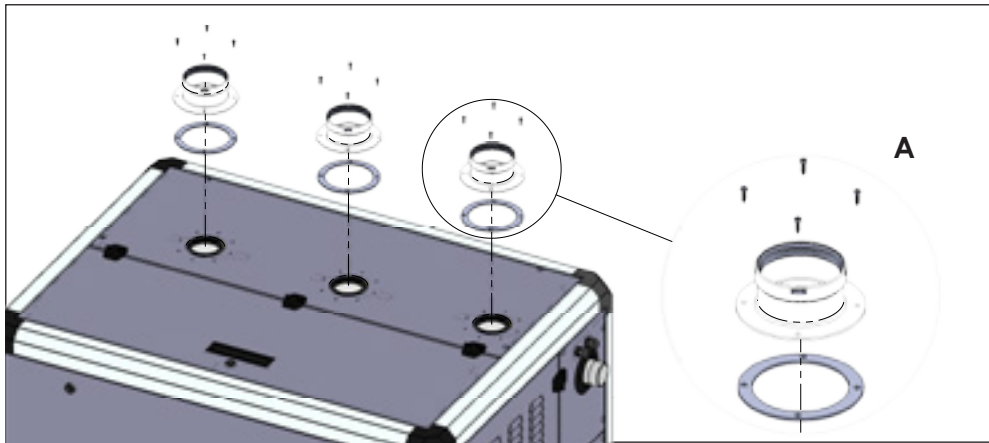
The L.H.E.M.M. generator is provided standard with flue manifolds for evacuation to the flues, equipped with non-return devices (valves) to prevent the product of combustion from a heating unit from interfering with the combustion circuit of other thermal units that are turned off.

The kits are made out of plastic in order to guarantee high corrosion resistance and quick and easy installation, also thanks to the coupling system and the sealing gaskets. A siphon at the end of the manifold drains the condensate and must be connected to a collection network.

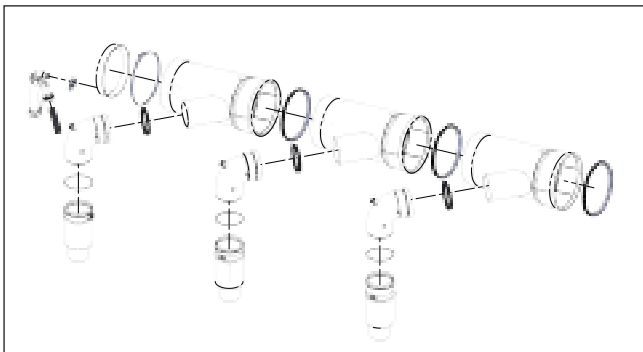
Install the drain stub pipes (part A in Pict. 23a) on the

fixed generator cover near the holes for the flues of the various heating units, inserting the relative gaskets in the middle and tightening with the provided screws. Proceed by preassembling the various modules of the flue manifold, placing gaskets between them (Pict. 23b) provided in the kit, meanwhile considering the side where the connections to the flue pipe are to be done and keeping in mind that the duct must protrude from the heat generator side (Pict. 23c). Install the flue manifold on the generator (Pict. 23d), making sure to correctly insert all the ends in the stub pipes that were previously fixed on the cover and check that the gaskets are correctly positioned in their seats. The duct must be positioned with a gradient of 3° at least; if necessary, act on the telescopic stub pipes (part B in Pict. 23d)

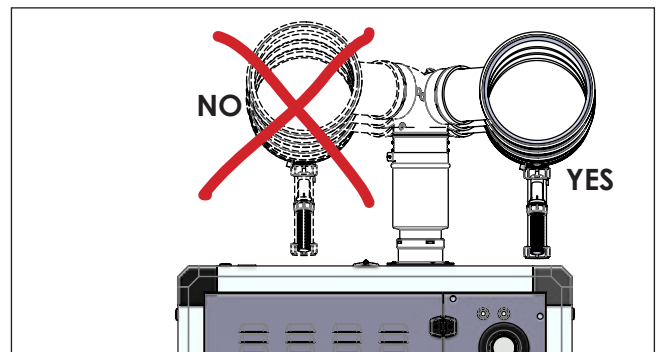
Pict. 23a



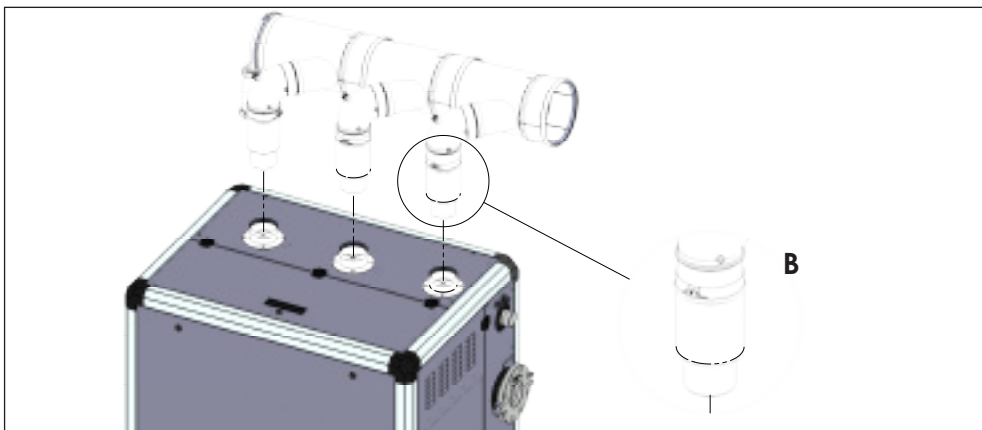
23b



Pict. 23c



Pict. 23d

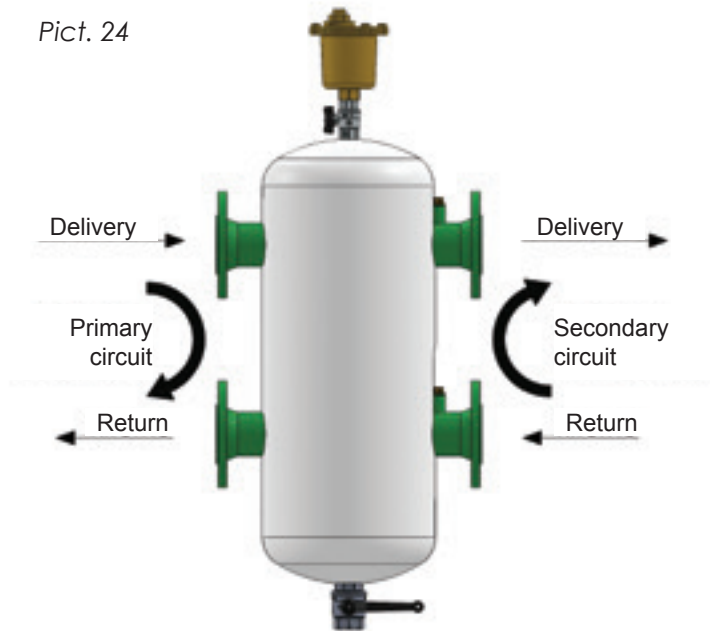


## HYDRAULIC SEPARATOR AND PLATE EXCHANGER

The L.H.E.M.M. generator leaves the factory prepared for the installation of a hydraulic separator (accessory) complete with an air bleed valve, drain tap and thermal insulation, or a plate exchanger (accessory), based on system requirements.

The hydraulic separator make it possible to make the hydraulic units of the LHEMM (primary circuit) independent of the hydraulic circuit of the heating system that is served (secondary circuit).

Pict. 24

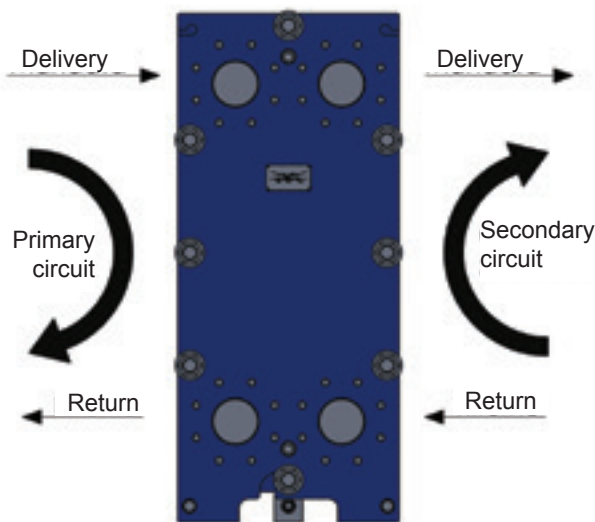


The plate exchanger (accessory) has the advantage of keeping the two circuits (primary and secondary) hydraulically separate, making it possible to use the L.H.E.M.M. generator in an industrial process, for example.



See page 45 to identify the hydraulic separator or plate exchanger designed by Manufacturer.

Pict. 26



## CASCADE CONNECTED HEATING UNIT CONTROL UNIT

Every L.H.E.M.M. generator is equipped standard with a control unit for management of cascade connected heating units.

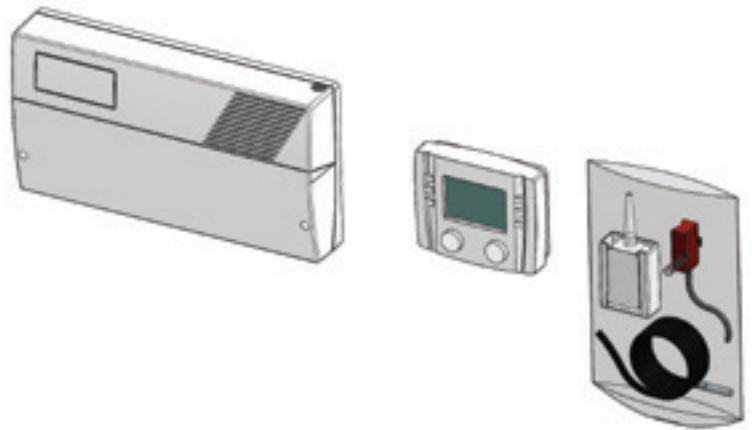
The control unit is supplied with: remote control, external sensor, boiler sensor, delivery sensor. If the system requirements make it necessary to use additional sensors, they are available as accessories (see page 48).

Refer to the provided instruction manual for their installation and use.

The generator is supplied with an E-BUS cable of a suitable length for connection between the control unit and module control panel. Proceed as described below if it must be replaced. Use a bipolar cable (max. 50 m. and min. 0.5 mm.<sup>2</sup>) and proceed as follows:

- cut power to the equipment using the power switch installed upstream,
- open the front door of the generator,
- remove the front cover of the panel, unscrewing the 4 fixing screws (see Pict. 28),
- connect the live and neutral poles of the cable to the terminal board, as in Pict. 29,
- house the cable in the slots on the side of the panel to so it can exit,
- close the front cover of the panel and screw it closed,
- cable glands are provided on the sides of the generator for passing the cables; use a free one on the side selected for positioning the control unit,
- make the connection to the control unit as described in the supplied instruction manual.

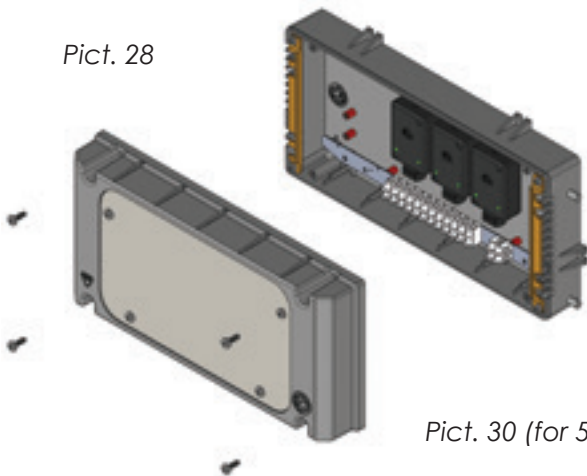
Pict. 27



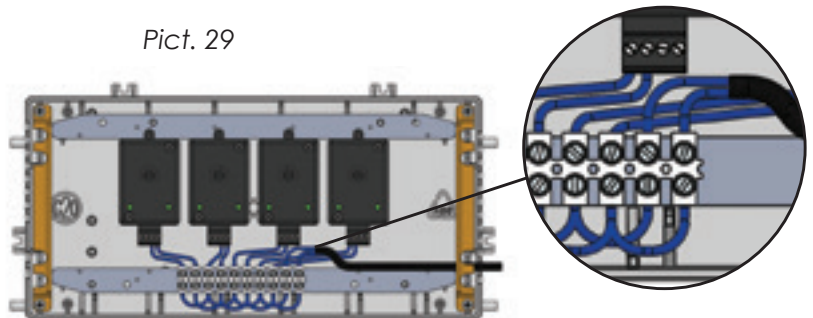
### FOR 520 kW L.H.E.M.M ONLY:

- Make sure the unit is powered off;
- Open the front doors of the two generators;
- Remove the front covers of the two control panels by unscrewing the 4 visible screws (see Pict. 28);
- Connect the "A" bipolar cable which hangs out of the first generator side, to the "B" terminal board inside the second generator control panel (see Pict 29), carefully introduce it in one of the two cable-press located on the generator left side and lodge it in the proper openings on the control panel side;
- Close the control panels front covers by screwing up the relevant screws;
- Effect the connection to the Control Unit according to the instruction book.

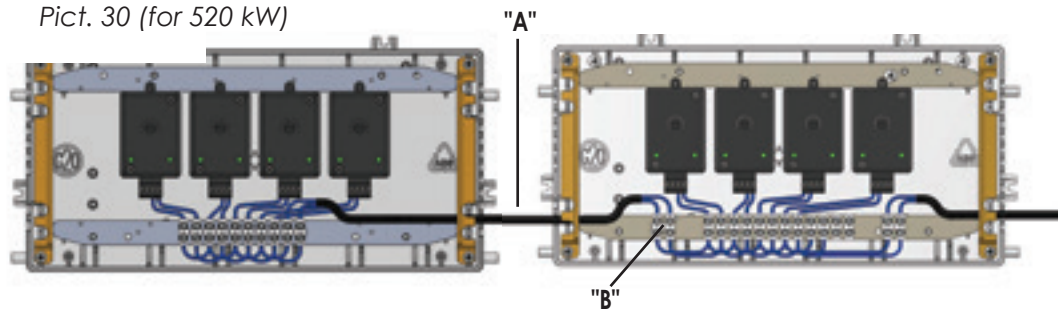
Pict. 28



Pict. 29



Pict. 30 (for 520 kW)










**For connecting or replacing conductors, use H05VV -F, H05VVH2-F (CEI EN 60228) or better rated cable.**

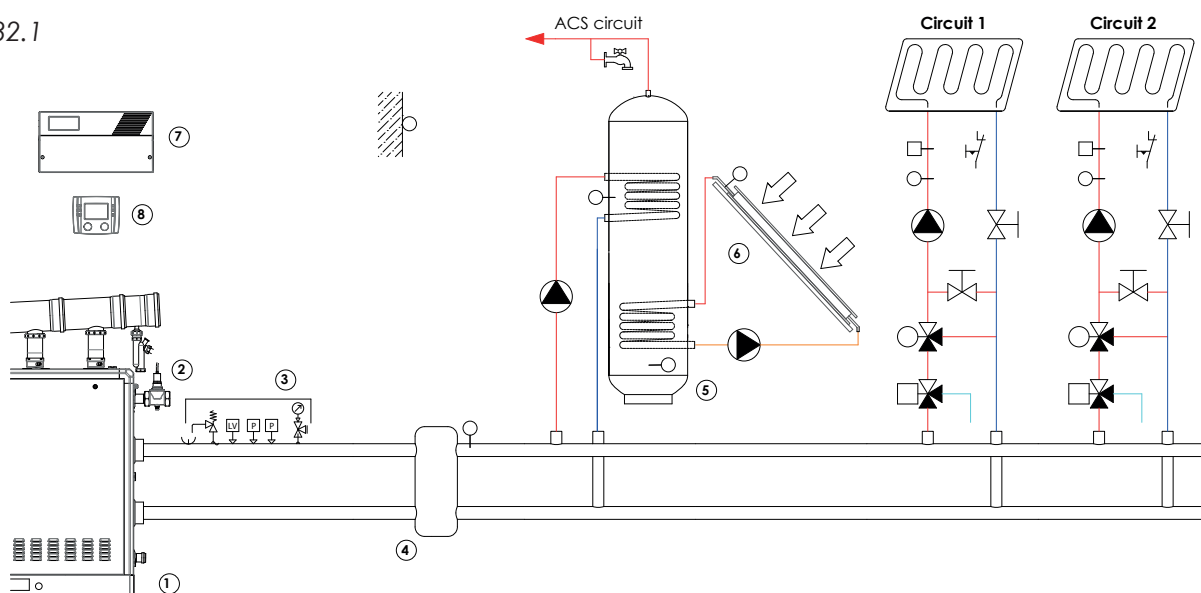
## INSTALLATION EXAMPLES

### LEGEND

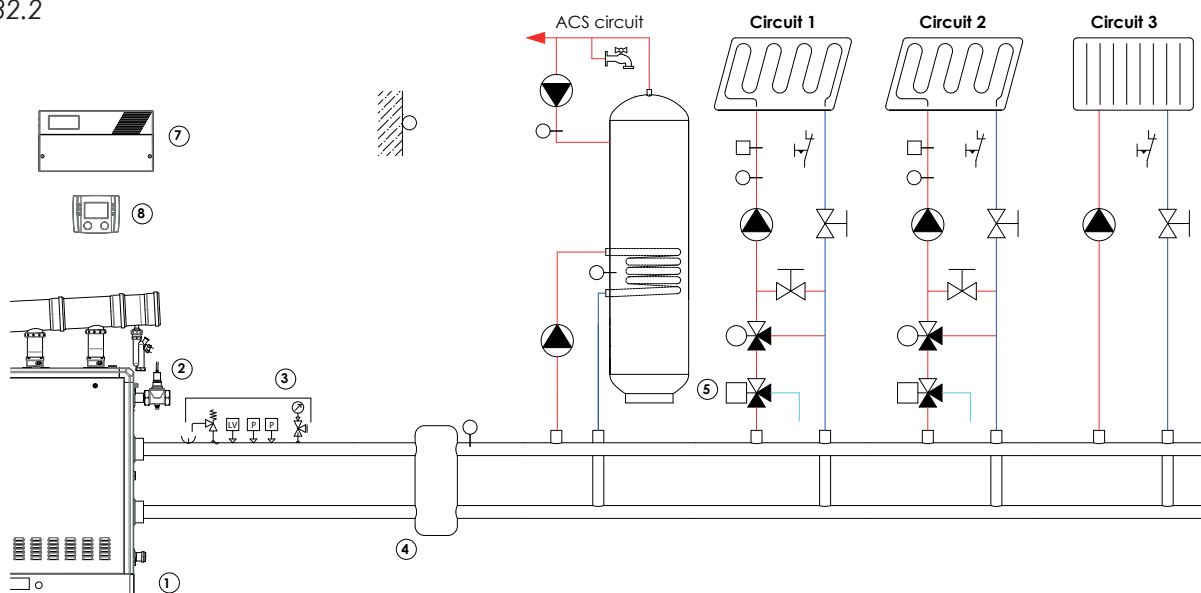
- 1- Lhemm generator
- 2- Fuel shut-off valve
- 3- I.S.P.S.E.L components
- 4- Hydraulic separator/plate exchanger
- 5- Dual coil boiler
- 6- Solar panel
- 7- Control unit
- 8- Remote control

-  Mixer
-  3-way valve
-  Pump
-  Domestic hot water circuit
-  Thermostat
-  Sensor
-  External enabling contact

Pict. 32.1

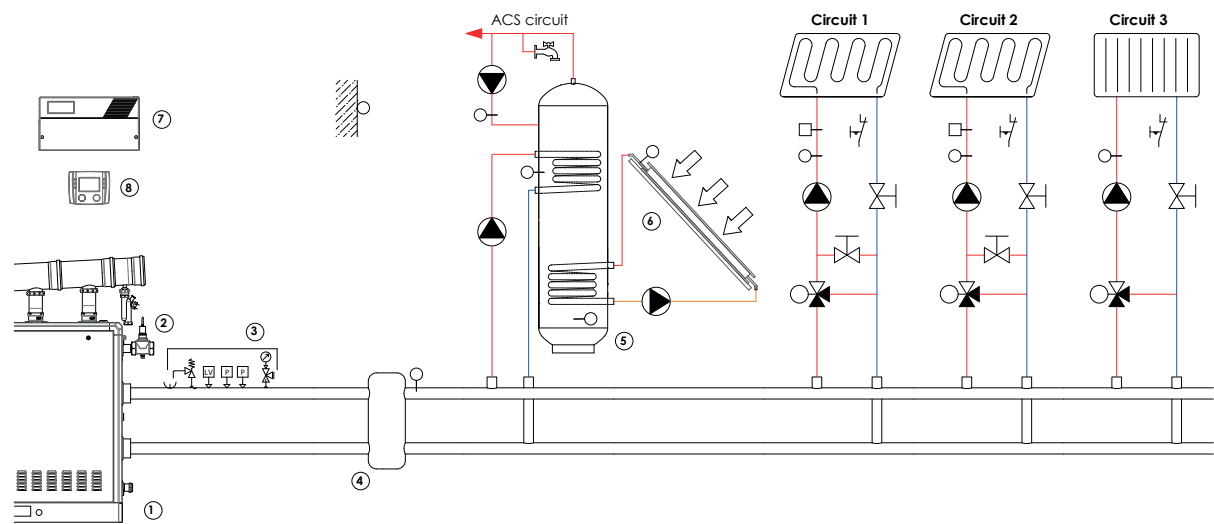


Pict. 32.2

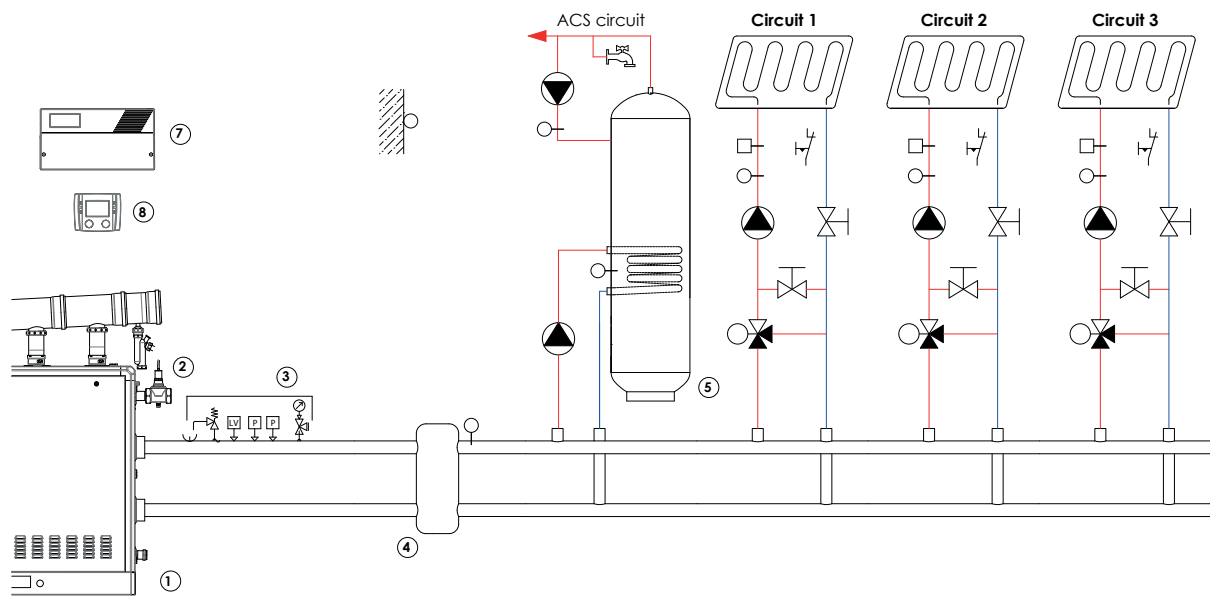




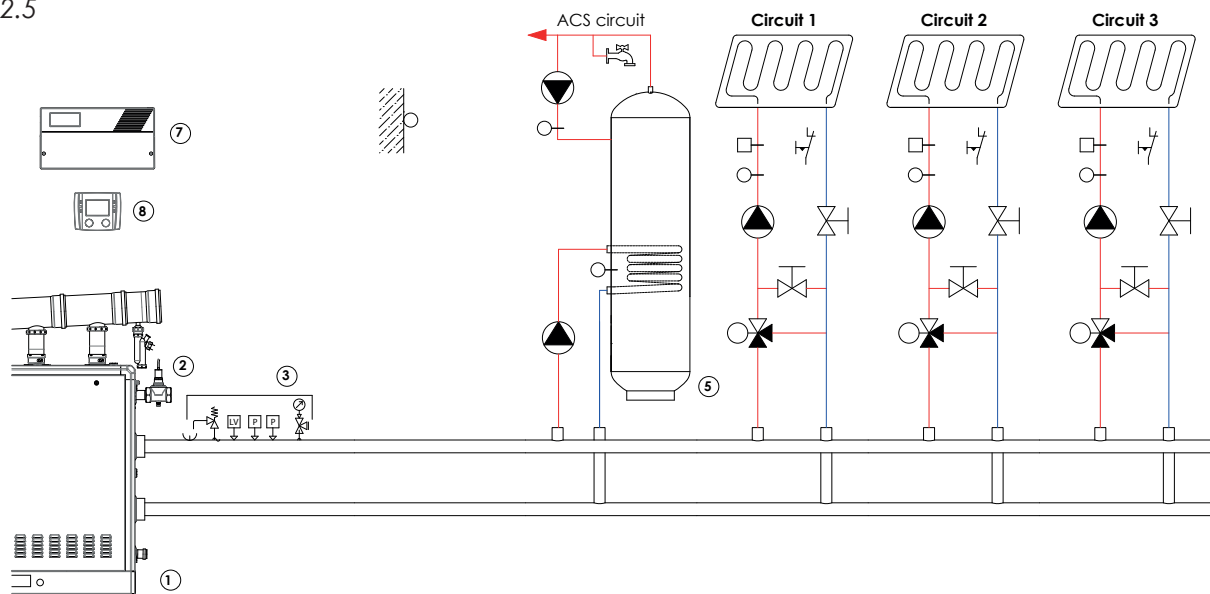
Pict. 32.3



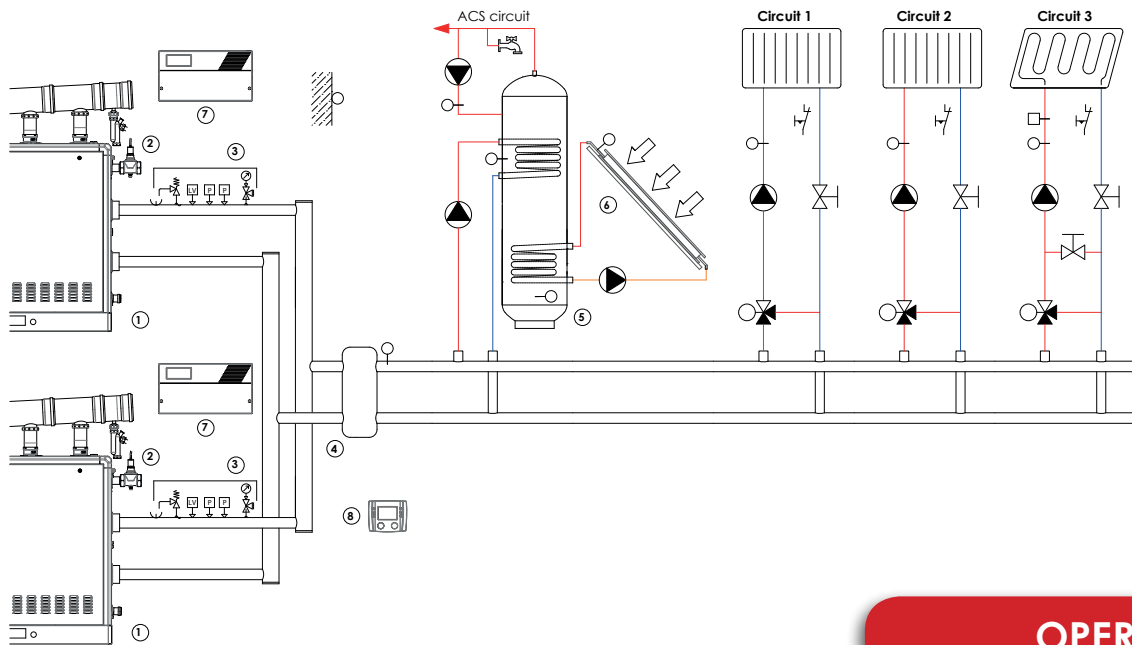
Pict. 32.4



Pict. 32.5



Pict. 32.6



## OPERATION

Turn on the boiler's electrical supply at the switch, which must be installed on the power supply line to the boiler. The LCD display (with blue backlight) will turn on immediately, showing the two-digit software version number loaded on the microprocessor for a few seconds, while an automatic check is performed on the conditions of the system and installed devices. When this stage has finished, if no faults are detected, the last page of the MAIN menu to be stored is displayed on the LCD (the one being displayed when the power was turned off).

Pict. 33



1. ON/OFF BUTTON
2. SUMMER/WINTER BUTTON
3. RESET BUTTON
4. INFO/CONFIGURATION BUTTON
5. DHW TEMPERATURE DECREASE
6. DHW TEMPERATURE INCREASE
7. CH TEMPERATURE DECREASE
8. CH TEMPERATURE INCREASE

## INTERFACE DESCRIPTION

The interface allowing all operating parameters to be selected and modified as well as their relative values to be displayed is extremely simple. It is composed of a large backlit LCD which displays all symbols necessary for communicating the boiler's status in a simple and

immediate way, together with a series of BUTTONS each one having a specific function shown on the display. Read the relevant chapters for more information about the symbols and the available operation modes.

## “STAND-BY” MAIN MENU

When the boiler is turned on, two operating modes are possible. These constitute the MAIN MENU from which it is possible to set any operating mode required or view the boiler status at any time. The characteristics of the possible options for each page of the MAIN MENU are here listed:

### Page 1 – STAND-BY (Pic. 34.1)

In this mode the device is powered but all functions regarding the supply of domestic hot water or central heating are inactive. In this mode the central heating system pressure is displayed (in boilers with transducer) and it is possible to turn the boiler on by pressing BUTTON 1, at the MAIN MENU page :

In order to go back to the first page (stand-by), press again BUTTON 1. (Pic. 34.2)

By pressing BUTTON 4, the INFORMATION MENU can be accessed; by pressing BUTTON 4 again, the first page is displayed (Pict. 34.3).

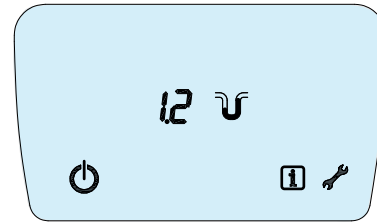
Read the relevant chapters for more information about the functions in each menu: “FUNCTION, PARAMETERS MENU”

**While in the stand-by mode, all fault indication modes remain active as do the main maintenance functions for the diverter valve (when fitted) and the circulator unit together with the ANTI-FROST function.**

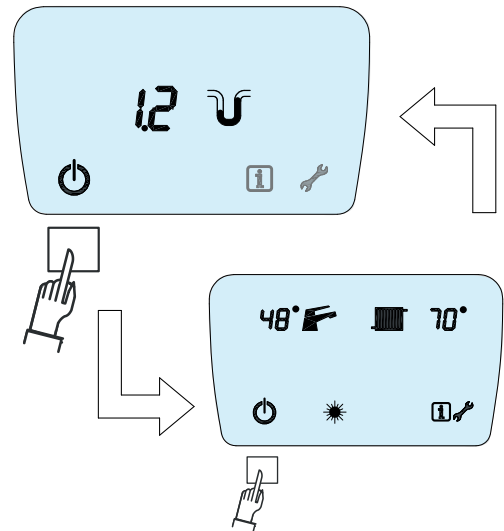


**WARNING:** In standby/off mode the boiler is inactive but its electricity supply is still connected!

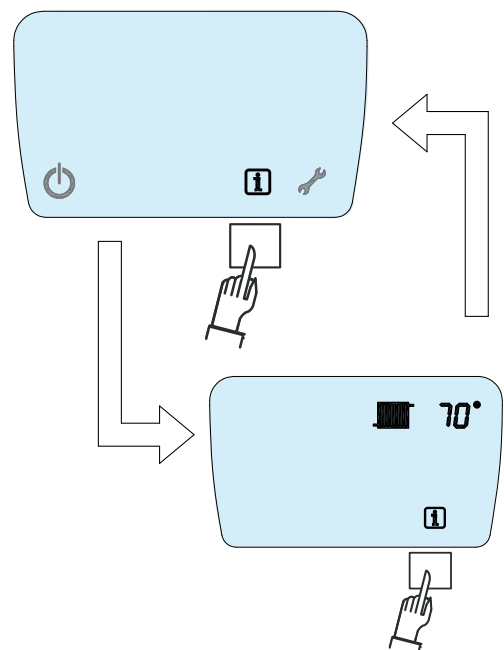
Pic. 34.1



Pic. 34.2



Pic. 34.3



## OPERATION MAIN MENÙ

The FUNCTION page is always displayed during the normal operation of the boiler. Symbols regarding the following items are always displayed:

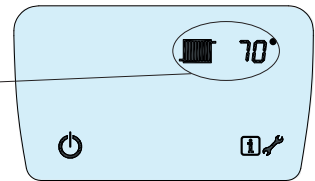
### Central-heating only boilers

- The temperature of the water in the CH circuit
- The INFORMATION menu access symbol
- The standby/off menu access symbol (Pic. 35.1).

When the burner is operating the flame signal is displayed, with the radiator symbol flashing (Pict. 35.2). Based on whether devices such as the pressure sensor, external temperature sensor and OT timer thermostat are installed, the following are displayed respectively: the pressure of the central heating circuit with relative symbol and the OT timer thermostat present symbol. (Pic. 35.3).

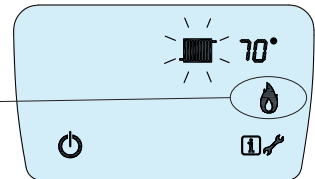
Pict. 35.1

Heating temperature



Pict. 35.2

Burner on

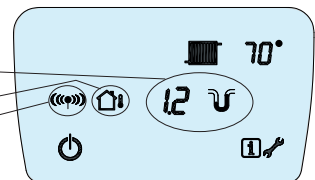


Pict. 35.3

Pressure sensor

External temperature sensor

OT timer thermostat



## PAGE 2-OPERATION-TEMPERATURE REGULATION

### Setting CH temperature

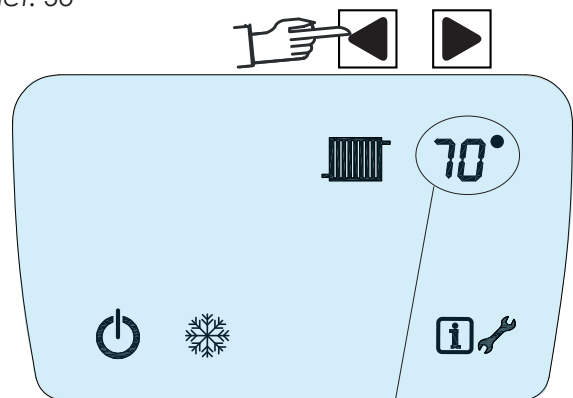
Press one of the two buttons upon the tap symbol (7-8). The numbers indicating the temperature flash, then press the ► button (8) to increase the temperature of CH. Each time this button is pressed, an increase by 1°C is obtained. In order to decrease the CH temperature, press the ◀ button (7). Each time this button is pressed, a decrease by 1°C is obtained.

Once the needed temperature value is set, do not press the (7-8) buttons anymore. The new CH temperature value will flash for 5 seconds, then it will be stored and displayed.

The CH temperature values depend on the type of installation.

For boilers used for high temperature systems, the temperature range is 50°C – 80°C, while for the ones used for low temperature systems, the temperature range is 27°C – 55°C.

Pict. 36



CH temperature





**ASK YOUR AREA INSTALLER FOR  
INFORMATION ON THE TYPE OF  
SYSTEM CONNECTED AND RESPECTIVE  
ADJUSTMENTS**

## INFORMATION MENU

Accessing the INFORMATION MENU allows various important parameters regarding the boiler adjustments and status to be viewed, allowing the state determining its operation to be known at any time. The displayed parameters cannot be modified.

To access the menu pages, press BUTTON 4. The menu can be accessed both when the boiler is in stand-by and when it is operating.

Selecting the menu pages

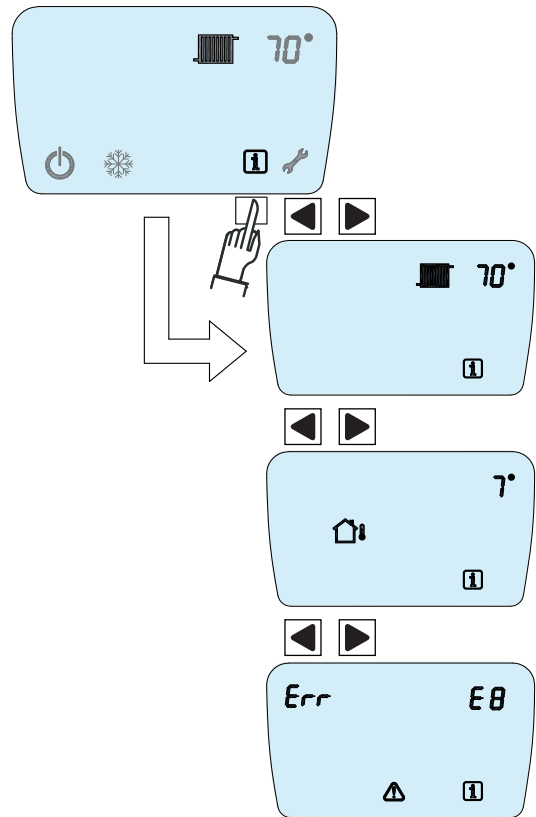
In order to visualize the values of all the INFORMATION MENU parameters, after activating the initial page which immediately displays the central heating temperature, press the  button (6) to scroll forward the pages and press the  button (5) to scroll backward the pages. The pages which can be displayed are:

1. CH temperature
2. DHW temperature
3. Temperature measured by external temperature sensor (if present\*)
4. Last error code
5. Second to last error code

The automatic exit from the menu happens after 60 seconds of device inactivity, or by pressing any button.

The display will return to last menu page active when the INFORMATION MENU was accessed.

Pict. 37



**REQUEST INFORMATION ON CONNECTED  
DEVICES FROM AREA AUTHORISED  
INSTALLER**



## FAULTS

All functions supported by the boiler are managed by a microprocessor-based system which, aside from allowing the system to run perfectly in order to maintain the greatest level of comfort possible, constantly monitors the functional parameters, ensuring they fall within the necessary safety interval by a wide margin, and therefore that all devices present are functioning perfectly.

Whenever the malfunction of any component or conditions which could compromise safe operation of the system are detected, the microprocessor system places the device into a limited operation mode or even completely prevents it from operating. The microprocessor system is able to detect and issue warnings for the main fault conditions to allow the system to be brought back to normal conditions as soon as possible. Fault warnings are given on the LCD display. The malfunction is detected and an intermittent warning displayed immediately, consisting of a number preceded by the error symbol E (Pict. 38). Faults are displayed on any screen of the main menu.

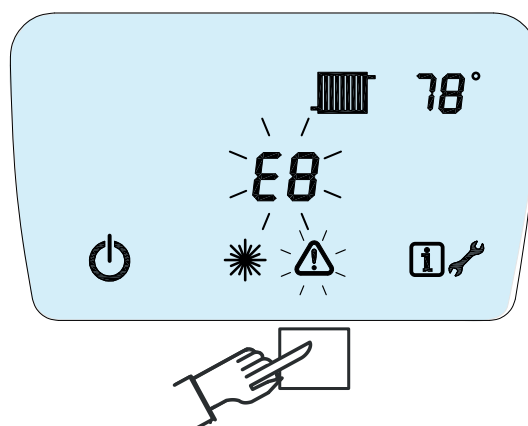
Conditions causing transitory faults are possible. Many of these are recognized and cause a temporary block which is automatically reset once the condition causing the fault has stopped. Some

of these provide for the possibility to attempt to restore operation manually.

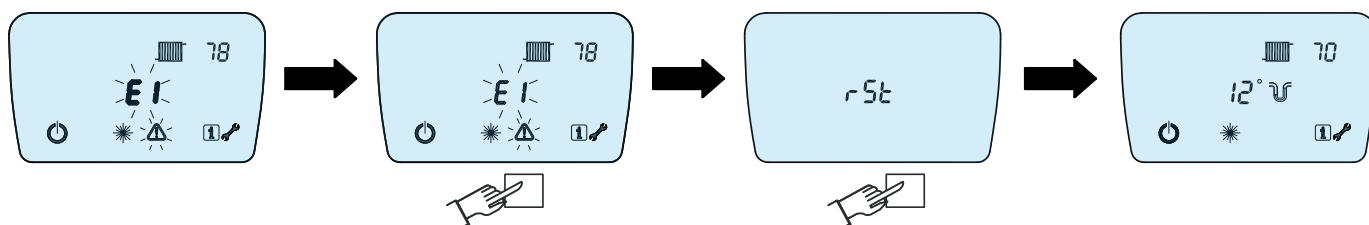
### Manual error reset, recovery attempt

To manually reset the system following a fault condition, press **BUTTON 3**: the symbol **RST** (reset) will be displayed on the LCD display. Then press **BUTTON 3** again (Pict. 39). The microprocessor will attempt to recover the system by resetting all the conditions presumed to have caused the fault. If the operation is successful the boiler will return to normal operation; if not, the error code causing the malfunction will be displayed.

Pict. 38



Pict. 39



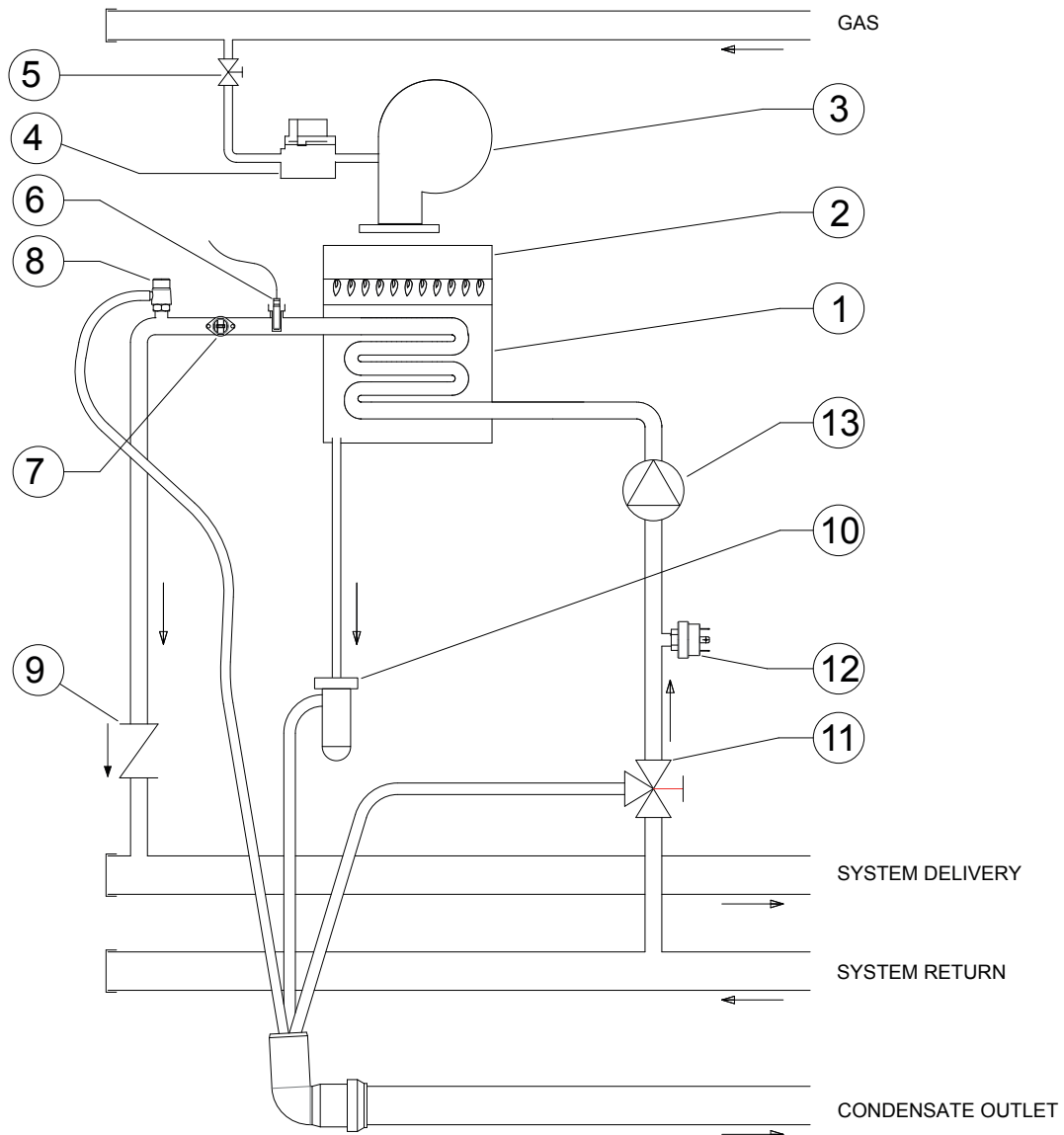
**IF A FAULT IS NOT SOLVED AFTER 2 MANUAL RESET ATTEMPTS THEN THE AUTHORISED TECHNICAL ASSISTANCE CENTRE MUST BE CALLED.**

## FAULT CODES TABLE

Code	Possible cause	Behaviour	Possible actions
<b>E0*</b>	No communication with ECHOCHRONO timer thermostat	Operation in provisional mode	Check the transmission line. Replace the "ECHOCHRONO"
<b>E1</b>	Ignition failed	Heating unit block	Check for the presence of gas Check gas line pressure Check the ignition/detection electrodes Check the electronic cable Check the igniter
<b>E3</b>	Heating system temperature sensor fault	Heating unit block	Replace the heating sensor
<b>E5</b>	Fan fault	Heating unit block	Check fan connections Replace the fan
<b>E6</b>	High temperature detected by heating system sensor	Device in stand-by Normal DHW supply	Wait for automatic unlocking Check system pressure
<b>E8</b>	Central heating system pressure too low	Heating unit block	Check system pressure
<b>E9</b>	Central heating system water temperature too high	Heating unit block	Perform system degassing Check system pressure Check system circulation Check combustion regulation
<b>E10</b>	Central heating system pressure too HIGH (> 2.7 bar)	Heating unit block	Check circulator operation
<b>E12</b>	Reset from depleted remote control	Heating unit block	Reset the system Disconnect the supply
<b>E13</b>	EEPROM error	Heating unit block	Reset the system Disconnect the supply Replace the board
<b>E14</b>	Fan speed fault	Heating unit block	Check fan connections Replace the fan
<b>E16</b>	Flue temperature sensor activation	Heating unit block	Check system degassing Check system circulation Check circulator operation Check burner Check heating unit regulation
<b>E25</b>	Too low CH water temperature (danger of freezing)	Boiler locked	Wait for automatic unlocking
<b>E26</b>	Valve board anomaly	Heating unit block	Replace the board
<b>E30</b>	Parameter configuration error	Heating unit block	Check and reconfigure the parameters

## OPERATING DIAGRAM

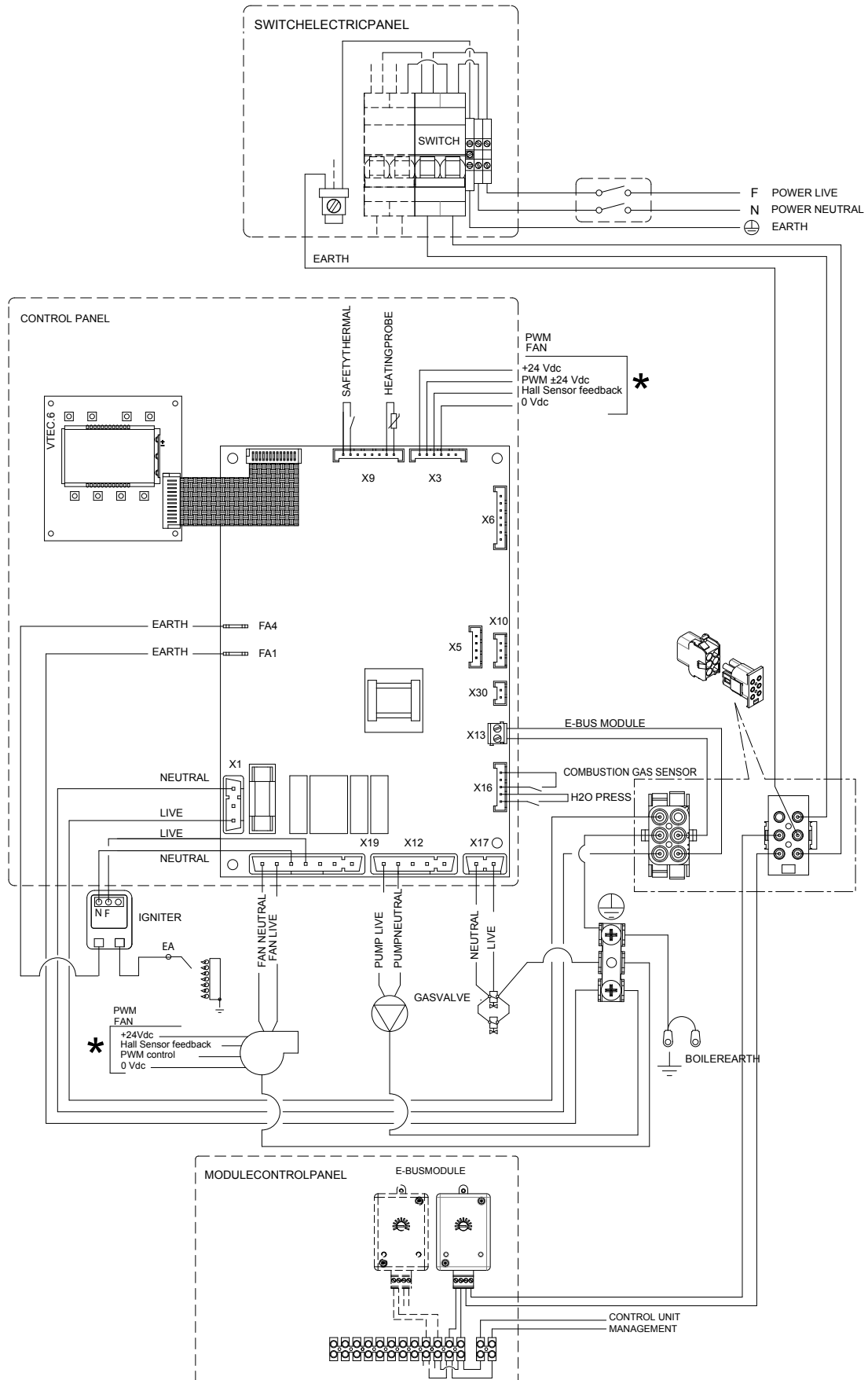
Pict. 40



- 1) PRIMARY HEAT EXCHANGER
- 2) BURNER
- 3) FAN
- 4) GAS VALVE
- 5) GAS SHUT-OFF VALVE
- 6) TEMPERATURE SENSOR
- 7) SAFETY THERMOSTAT
- 8) MANUAL BLEED VALVE
- 9) CHECK VALVE
- 10) CONDENSATE OUTLET SIPHON
- 11) THREE-WAY VALVE
- 12) PRESSURE SWITCH
- 13) CIRCULATOR UNIT

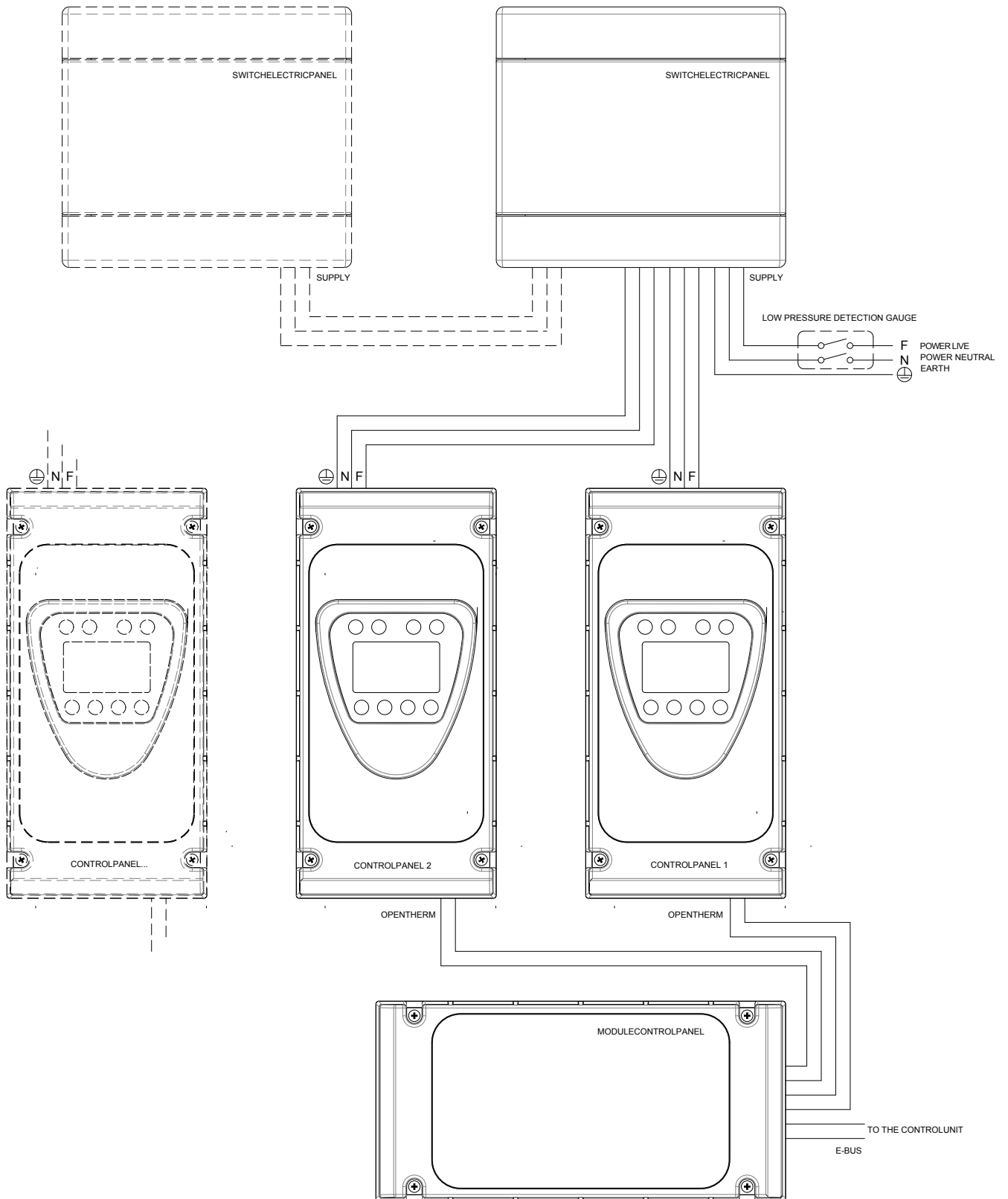
## HEATING UNIT WIRING DIAGRAM

Pict. 41



## GENERATOR WIRING DIAGRAM

Pict. 42





**All maintenance operations MUST BE PERFORMED BY PERSONNEL QUALIFIED according to law no. 46 dated 5 March 1990 and in compliance with the applicable technical standards.**

These operations must also be performed in full compliance with all applicable legislation and regulations. The boiler should be inspected by a qualified technician at the end of every heating season (winter) and whenever else it is considered necessary in order to keep it in optimum operating condition.

### PRELIMINARY MAINTENANCE OPERATIONS

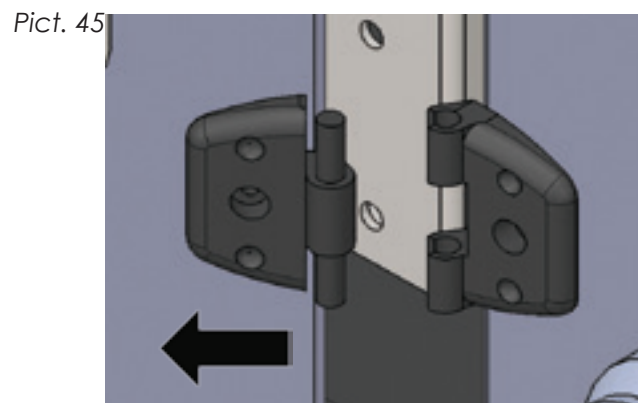
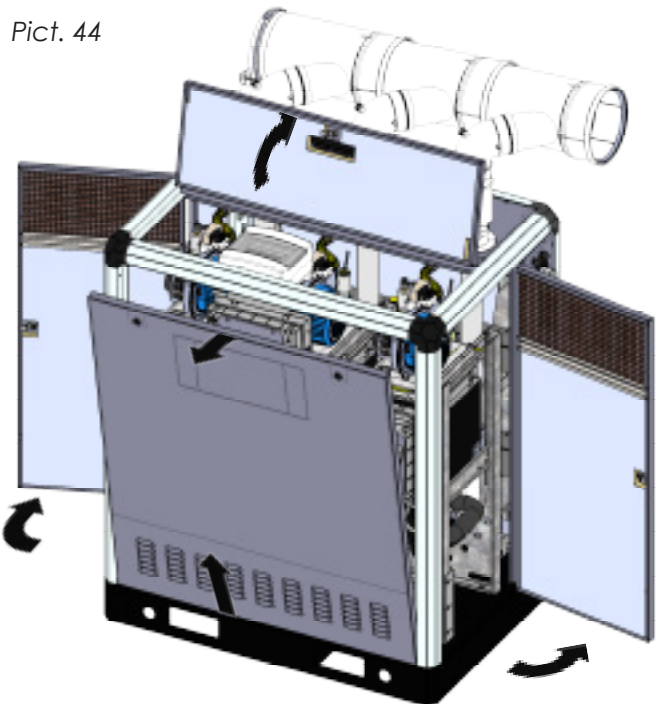
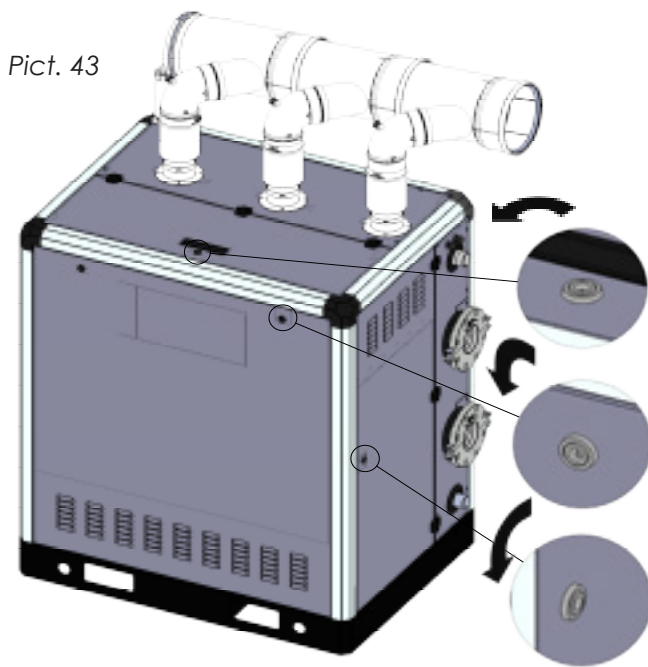
- Declaration of conformity check.
- Check the log book.
- Check that the INSTRUCTION MANUAL IS PRESENT
- Visual check of the installation (in conformity with applicable regulations).

- Visual check of the flue system.
- Check that combustion gases are being properly evacuated

### ACCESS TO THE DEVICES

To access the devices inside the generator, turn the locks (see Pict. 43) positioned on the front/rear panels and on the side/upper doors counter-clockwise using a suitable tool. This makes it possible to remove the generator's front/rear panels and

open the doors located on its sides and on the top (see Pict. 44). If necessary, the side doors can be removed easily due to their interlocking hinge system (see Pict. 45).



## SINGLE HEATING UNIT MAINTENANCE

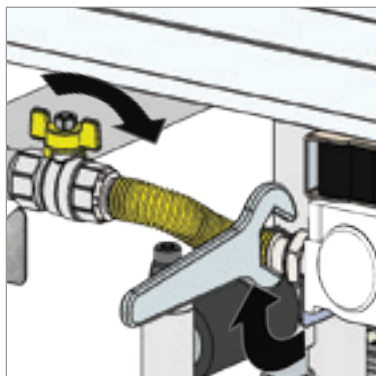
The LHEMM heating units are shut-off individually to make sectioning easier in the case of a fault or maintenance operations. Every heating unit has a shut-off valve on the gas line, an anti-reflux valve on the flue, a non-return valve on the delivery line, a ball valve on the return line and an emptying valve connected with the atmosphere (condensate outlet network) as required by safety standards. Thanks to this design detail, the maintenance operations can be carried out on the individual heating units without having to stop generator operation.

If necessary, the LHEMM generator was designed to permit certain maintenance operations on an individual heating unit by removing it from the generator. To perform this operation, the heating unit must be disconnected hydraulically and electrically from the rest of the system, as described below:

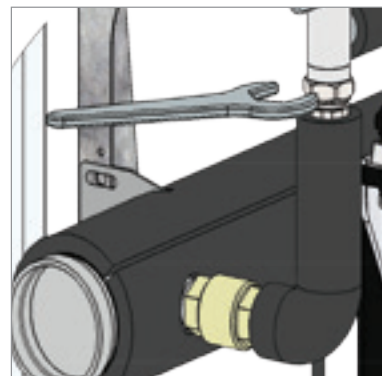
- electrically disconnect the unit using the switch on the electric panel,
- close the shut-off valve located on the gas manifold at the entrance to the unit and disconnect the supply pipe using the swivel union that connects it to the valve (Pict. 46),
- close the ball valve (Pict. 48) located on the return manifold at the entrance to the unit; open the emptying valve to allow the heating unit to be emptied, then disconnect the return pipe using the swivel union (Pict. 49) that connects it to the ball valve,
- disconnect the delivery pipe from the swivel union (Pict. 47) that connects it to the non-return valve on the delivery manifold at the heating unit outlet,
- disconnect the electrical connector (Pict. 50) located under the control panel,
- remove the screws that fasten the flue stub pipe and the internal evacuation line to the upper generator cover (Pict. 50/a); before removing the unit, the stub pipe must be lifted in order to remove it from the socket gasket located on the internal evacuation line. Then apply the supplied condensate outlet stub pipe (Optionals kit pag. 47) to the flue line that is still free (Pict. 50/b) and connect it to the main condensate outlet line using a rubber pipe (supplied with the kit),
- remove the bolts that fasten the heating unit frame to the base (Pict. 51),
- then remove the module (see Pict. 52 on page 36).

Once the maintenance operations are complete, reinsert the heating unit inside the generator, repeating the operations described above in reverse order. The unit will then have to be filled as described on page 13.

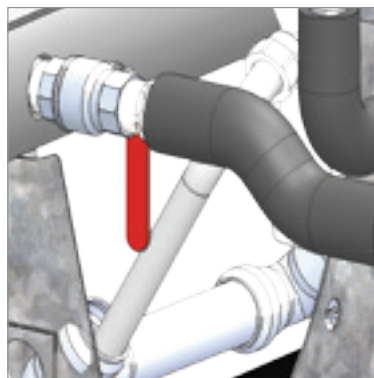
Pict. 46



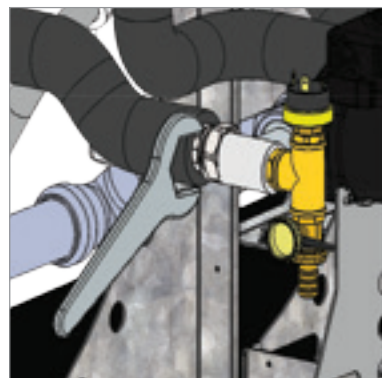
Pict. 47



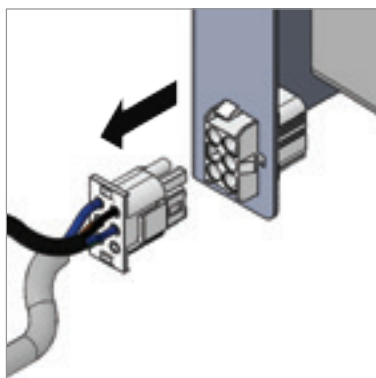
Pict. 48



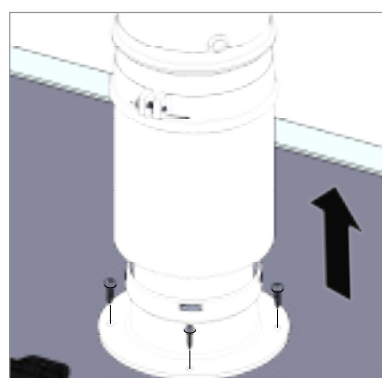
Pict. 49



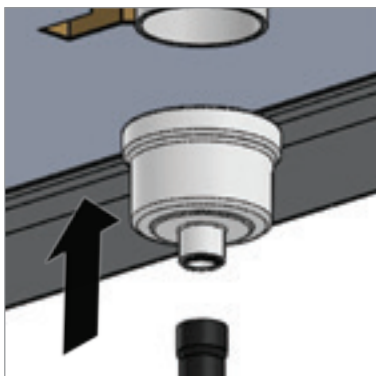
Pict. 50



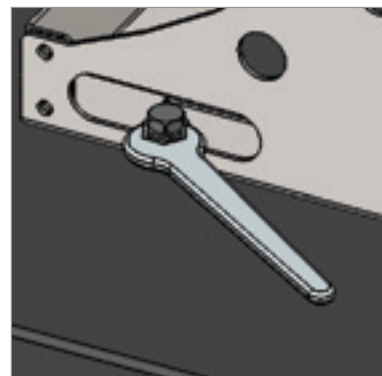
Pict. 50/a



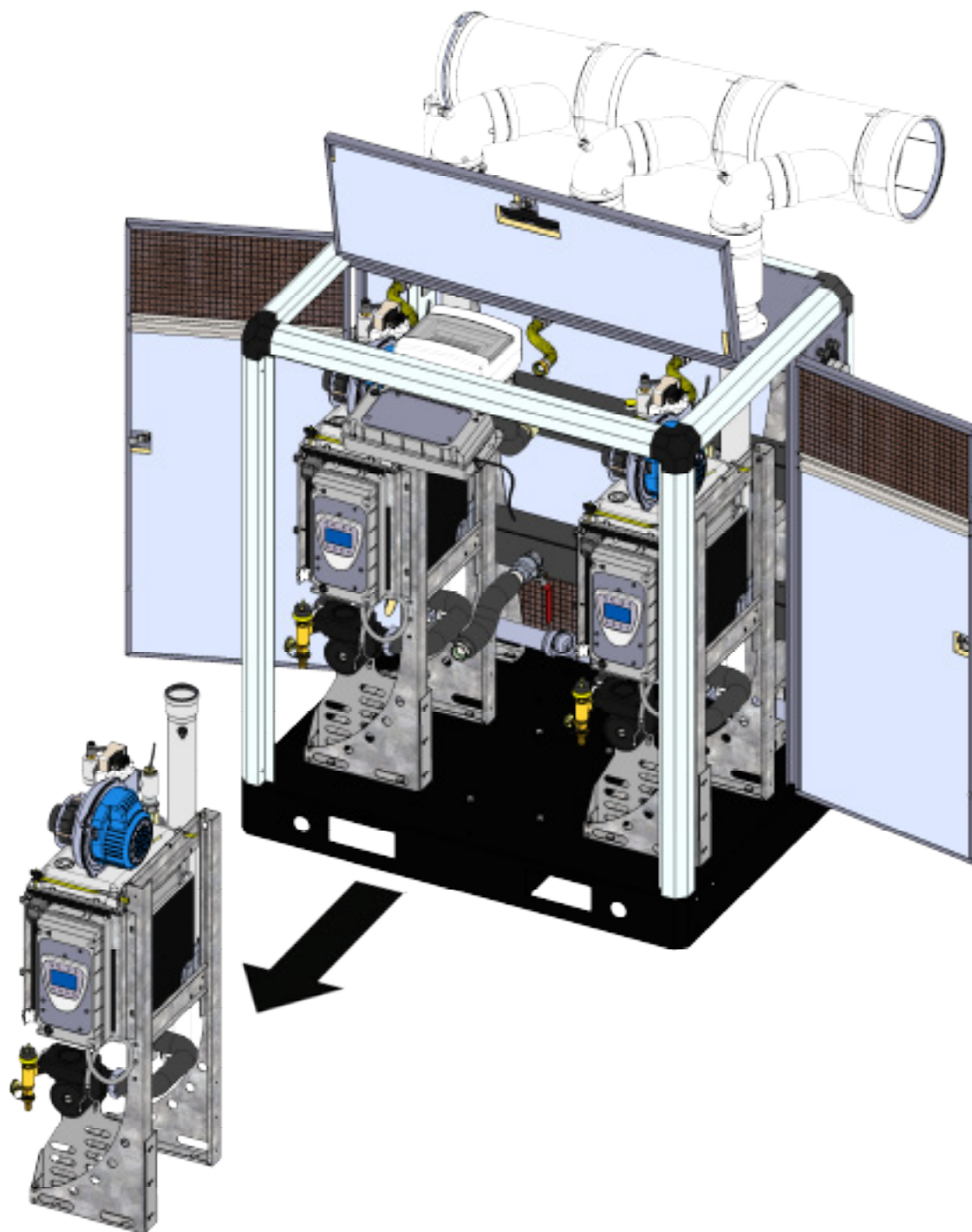
Pict. 50/b



Pict. 51



Pict. 52



## GENERAL MAINTENANCE OPERATIONS

- Clean any deposits on the heat-exchanger fins
- Remove any oxidation on the burner
- Check that the boiler ignites, turns off and functions correctly
- Visual check for leaks in gas and water pipes and unions
- Check that the safety devices are operational
- Check that the boiler's control and regulation

- devices are functioning correctly
- Check that the combustion gas evacuation device and/or duct is in good condition and operating correctly
- Perform a visual check that the safety valve outlet is not blocked
- Check hydraulic system static pressure
- Check the condensate traps



**If any components of the generator require replacement, original spare parts supplied by the manufacturer must be used. Use of other components could compromise correct operation of the device. The manufacturer declines any responsibility for consequences linked to the use of non-original spare parts.**



Pict. 53

## FAN

If the fan must be replaced, proceed as follows:

1. Disconnect the supply
  2. Close the gas
  3. Completely loosen the swivel nut on the gas supply union
  4. Disconnect the supply cables
  5. Release the two fan fastening pins from the burner plate, turning them 90°
  6. Remove the front pin and take the fan out of its seat
- Refit the fan, inserting it between the rear pin and the gaskets, repeating the operations in reverse order.

## BURNER

If the burner must be accessed, proceed as follows:

1. Disconnect the supply
2. Close the gas
3. Loosen the swivel nut on the gas supply union
4. Remove the gas valve and fan supply cables
5. Remove the fan as explained in the "fan" section
6. Loosen the two knobs without loosening them completely and, pushing them downwards, release the spring system from the engagement hubs
7. Remove the burner support plate

## To reinstall the burner

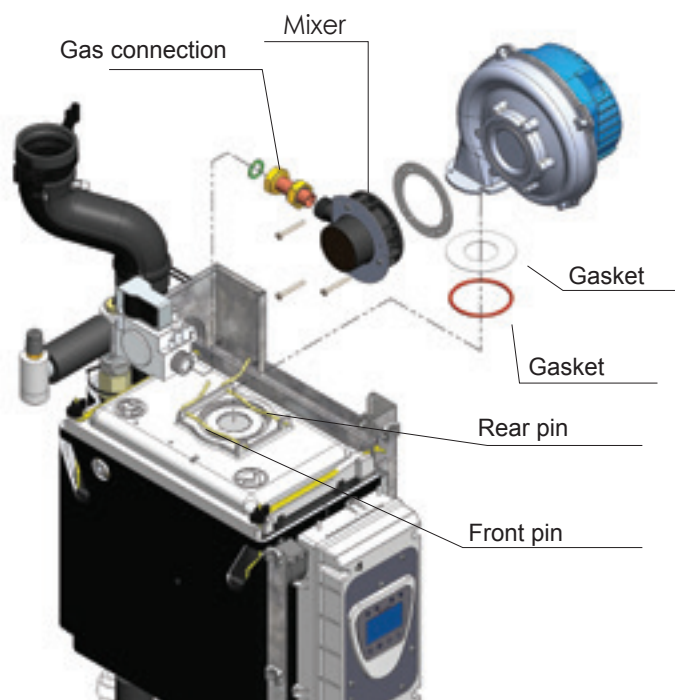
1. Insert it in the seat of the hood, being careful to correctly reposition the gaskets and check the seal.
2. Refit the hood, making it fit perfectly to the body.
3. Insert the engagement system in the slots near the back of the heating unit, engage the remaining part in the front seats and tightening the two knobs again so that the hood moves up against the locators of the cast iron burner support element.

## FLAME WINDOW AND IGNITION AND DETECTION ELECTRODE

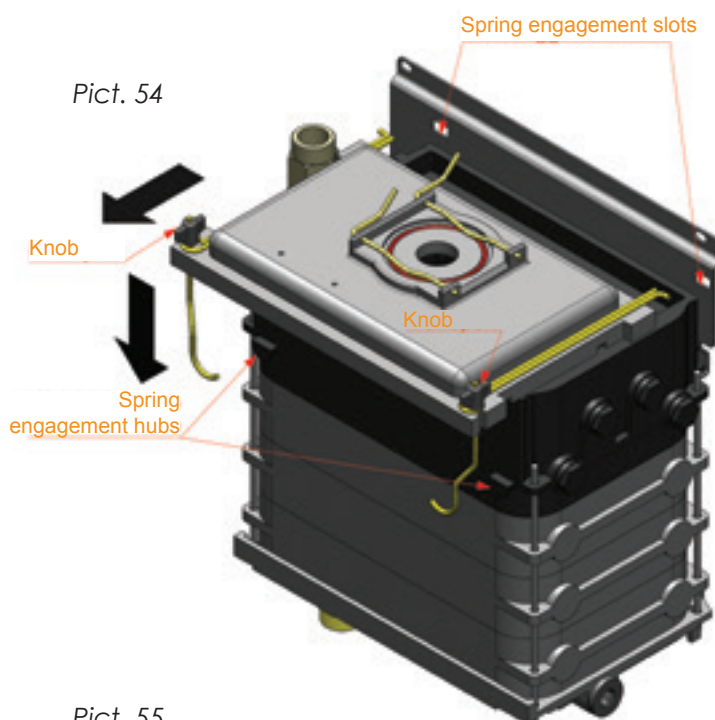
If the flame window must be replaced, proceed as follows:

1. Unscrew the flame window from its seat using a 24 spanner
2. After refitting it, make sure that the inner wire is in a vertical position and check the correct distance between the electrode and the flame window.

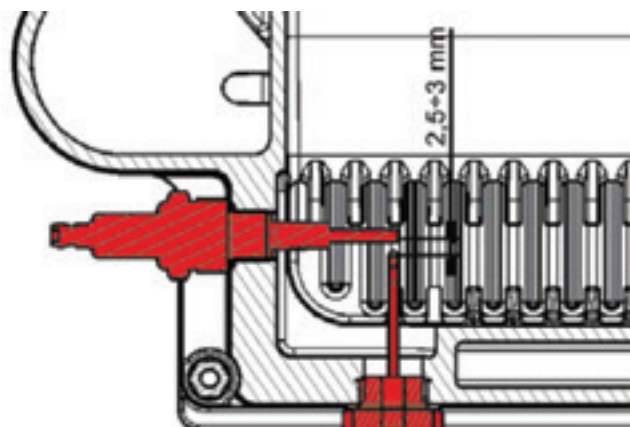
If replacing and checking the ignition and detection electrodes, it is necessary to check their correct positioning and their distance.



Pict. 54



Pict. 55

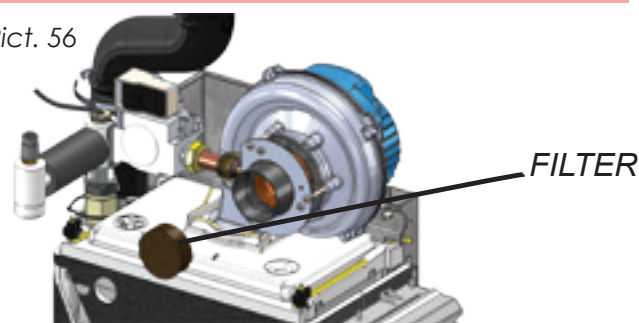


## CLEANING THE MIXER FILTER

The air intake filter positioned on the gas mixer must be cleaned at least once a year.

Remove the filter from the mixer and clean it by a slight jet of compressed air.

Pict. 56



## FLUE CLEANING FUNCTION

This function allows the boiler to be run at minimum and maximum power conditions during maintenance and adjustment operations, independently of the room thermostat signals.

The boiler installation must be completed before activating the "SERVICE" function. Before activating this function check that all conditions specified in the "Commissioning" chapter have been satisfied.

**Activating the function:**

To activate the function it is necessary to access the MENU and activate the relative modes from the dedicated page. Refer to the procedures indicated in the relative chapter (page 28) to access the installer MENU.

Enter the "PARAMETER MENU" and select page "P6" by using the buttons 5-6. Press one of the two buttons upon the digits displayed next to the relevant page. The value will begin to flash. Press button 8 to increase the displayed value and button 7 to decrease it.

### POSSIBLE VALUES FOR PARAMETER P6

0 - NORMAL OPERATION (default)

1 - MINIMUM POWER

2 - MAXIMUM POWER

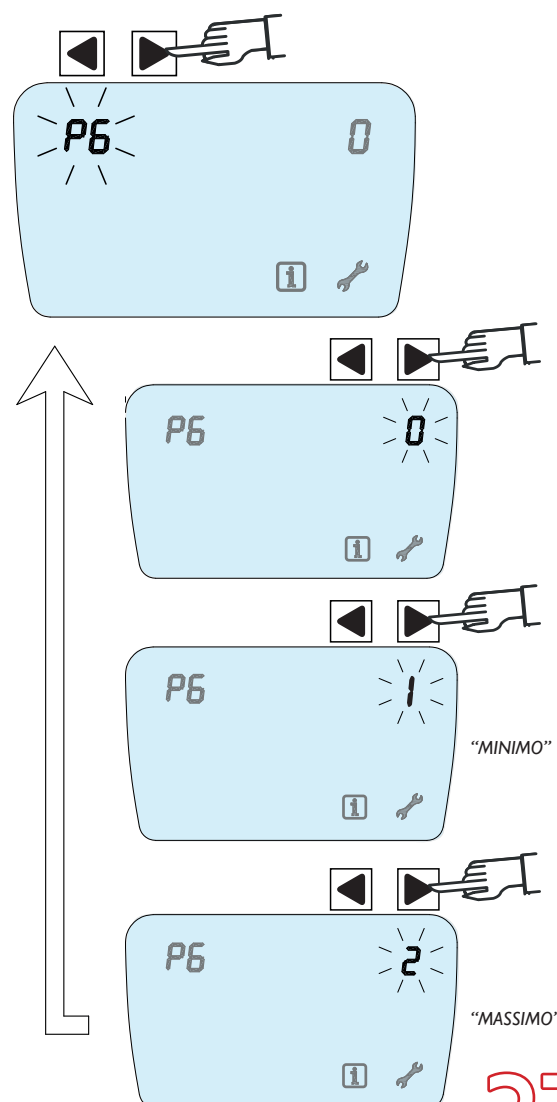
In "SERVICE" mode the diverter valve sets the device to run in central heating mode.

If the function remains activated for long periods of time an increase in pressure may occur in correspondence with the system's terminals.

All safety measures are active when in FLUE CLEANING mode, in particular those for the control of the maximum temperature in the central heating circuit via the flow temperature sensor; on reaching 80°C the function is suspended.

The boiler exits the function automatically after 15 minutes of operation each time the mode is set, or else when the relative page of the PARAMETER MENU is selected and the current value which returns the boiler to normal operation is assigned.

Pict. 57



**ENSURE THAT:**  
THE CENTRAL HEATING SYSTEM IS CHARGED AND PRESSURISED  
ANY SHUT-OFF VALVES FITTED TO THE PLANT FLOW AND RETURN AND ON THE GAS LINE ARE OPEN AND THAT THE GAS SUPPLY IS AVAILABLE.  
ANY CONTROL VALVES ARE TURNED TOWARDS THE SYSTEM.  
THE SPECIFICATIONS FOR CORRECT INSTALLATION AND COMMISSIONING OF THE BOILER HAVE BEEN OBSERVED.



## DATA PLATE

### TECHNICAL DATA PLATE

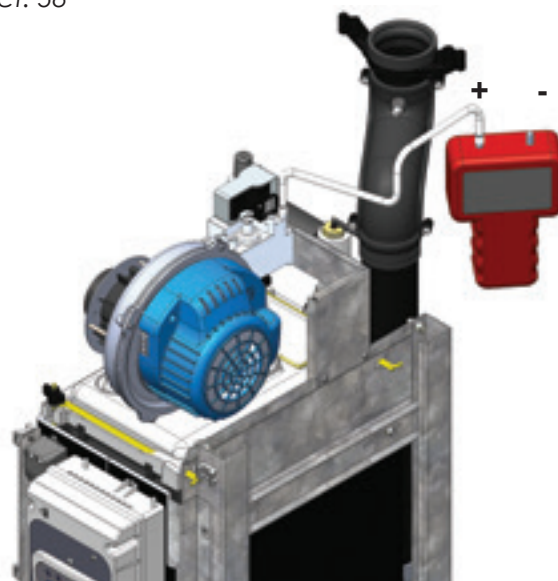
Type:	A	Cat.:	0
Serial number	B	Type:	G
Code:	C	Date:	H
Country of destination:	D	PIN Code:	I
Manufacturer:	E	Class NOx	J
Gas:	F		K
..... Natural gas G20	Flow	Pressure	
..... LPG G31	L/a (m <sup>3</sup> /h)	L/b (mbar)	
C.H. Circuit	L/a (kg/h)	L/b (mbar)	
Thermal load: 60/80°	MIN.	MAX.	
Thermal power: 60/80°	M kW (min.)	M/a (kW max)	
Thermal power: 30/50°	N kW (min.)	N/a (kW max)	
Work Pressure:	O kW (min.)	O/a (kW max)	
	P (bar)	Work Temperature: Q(C°)	
This heat generator can be adjusted according to the power required by the installation at p. 28 of the enclosed user b			
Power curves are available depending on the number of fan rotations.			
D.H.W. Circuit:	R (kW min.)	R/a (kW max)	
Thermal load:	S (l/min.)		
Specific flow Δt25:	T (bar)	Work Temperature: U(C°)	
Work Pressure:			
D.H.W. ErP η <sub>wh</sub> :	V(%)	C.H. ErP η <sub>wh</sub> :	V/a(%)
IP protection rate:	W	Electric power:	X(W)
Work Temperature:	Y(C°)	Power supply:	Z

0= Supervisory body  
 A= Type of boiler  
 B= **Boiler** model  
 C= Serial Number  
 D= Code  
 E= Country of destination  
 F= Manufacturer  
 G= Category  
 H= Approved types of exhaust exchange configuration  
 I= Date of production  
 J= P.I.N. product identification number  
 K= NOx Class  
 L= Set by gas type  
 L/a= Load  
 L/b= Supply pressure  
 M= Thermal load min 60/80  
 M/a= Thermal load max 60/80  
 N= Thermal power min 60/80  
 N/a= Thermal power max 60/80  
 O= Thermal power min 30/50  
 O/a= Thermal power max 30/50  
 P= C.H. work pressure  
 Q= C.H. work temperature  
 R= D.H.W thermal load if different from M min.  
 R/a= D.H.W thermal load if different from M/a max  
 S= A.C.S. specific flow rate according to EN625-EN13203-1  
 T= D.H.W work pressure  
 U= D.H.W work temperature  
 V= Seasonal energy efficiency ratio of water heating  
 V/a= Seasonal energy efficiency ratio of room heating  
 W= IP protection rate  
 X= Gas consumption  
 Y= Operating temperature  
 Z= Power supply

## TESTING THE GAS SUPPLY DYNAMIC PRESSURE:

When supplied, the boiler is already set up to function optimally with a specific type of gas, which can be identified by consulting the technical data plate present on the rear of the instrument panel.

Pict. 58



**However, in order to check the dynamic pressure, follow these procedures:**

- remove the generator casing
- loosen the screw "A" holding the pressure outlet upstream of the regulator and connect it with silicone tubing to the + input of a differential micro-pressure gauge with an appropriate range (at least 0 to -50 mbar), leaving the second input free if present
- Turn on the gas supply by opening the shut-off valve located on the meter and open the gas cock before the boiler.
- Use the FLUE CLEANING function to bring the boiler to maximum power.
- Measure the gas pressure before the regulator (dynamic mains supply pressure). Check that the value measured with the manometer falls within the max-min interval given in the "Dynamic mains supply pressure" table for the specific type of gas.

DYNAMIC PRESSURE mbar (MAINS)					
G20 (NATURAL GAS)		G30 (BUTANE)		G31 (PROPANE)	
min	max	min	max	min	max
17	25	-	-	25	37



**Whenever dynamic pressures below the specified minimum levels should be found:**

- Check that there are no kinks, blocks or other impediments to the normal gas flow in the gas supply line to the boiler. Check that the diameter of piping used for the gas supply line is sufficient and constant along the whole length.
- Check that there are no elements in the supply line which could lead to excessive pressure drops, e.g. too many bends, changes of direction, excessively long or countersloping sections etc.
- Consult the gas company on the specified minimum supply pressure values.

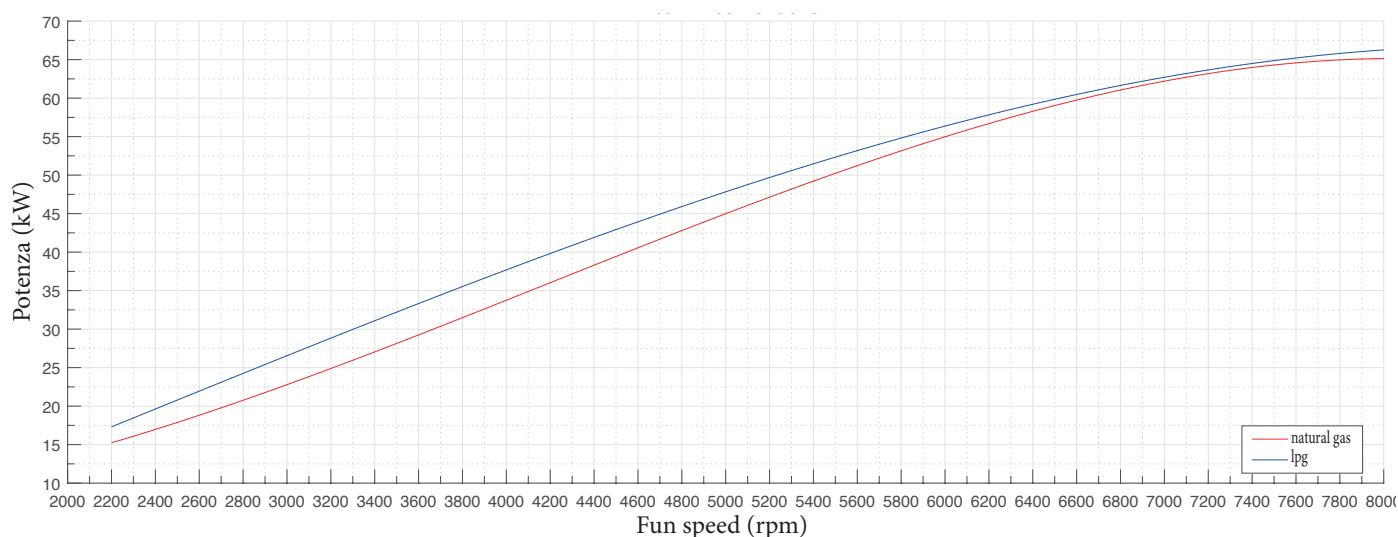


**Whenever dynamic pressures above the specified maximum values should be found:**

- Install a suitable pressure reducer/regulator on the gas supply line before the boiler.
- Adjust the dynamic pressure of the gas via the regulator, if already present.

## HEATING POWER ADJUSTMENT MODULE 65 KW

Pict. 59



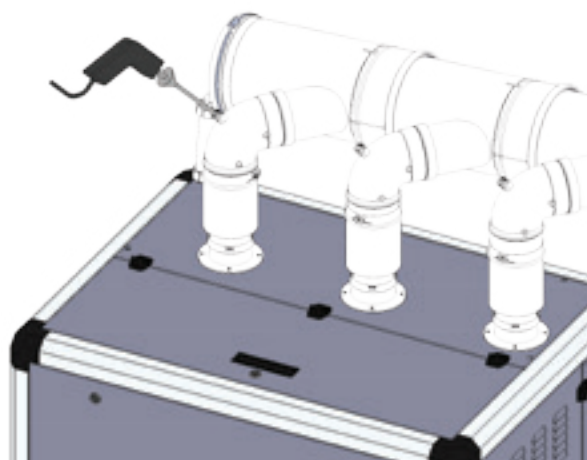
## ANALYSIS - CHECKING AND REGULATING COMBUSTION

Every single generator heating unit is supplied already calibrated and tested for the requested type of gas. However it is advisable to check that the type of gas and the relative pressures are correct. If this should not be the case, follow the procedures described in this section.

### MAXIMUM POWER\*:

- Use the Flue cleaning function to bring the boiler to maximum power.
- Insert the combustion analyser probe in the inspection outlet provided in the flue (Pict. 60). After the boiler has been running for 2-3 minutes, run the analysis and check that the CO<sub>2</sub> measured by the analyser corresponds to the value indicated in the table for maximum power.
- If the CO<sub>2</sub> does not correspond, regulate with screw "N" (Pict. 60) of the ratio adjuster until the specified CO<sub>2</sub> value is obtained. Turn clockwise to decrease the CO<sub>2</sub> value, anticlockwise to increase it.

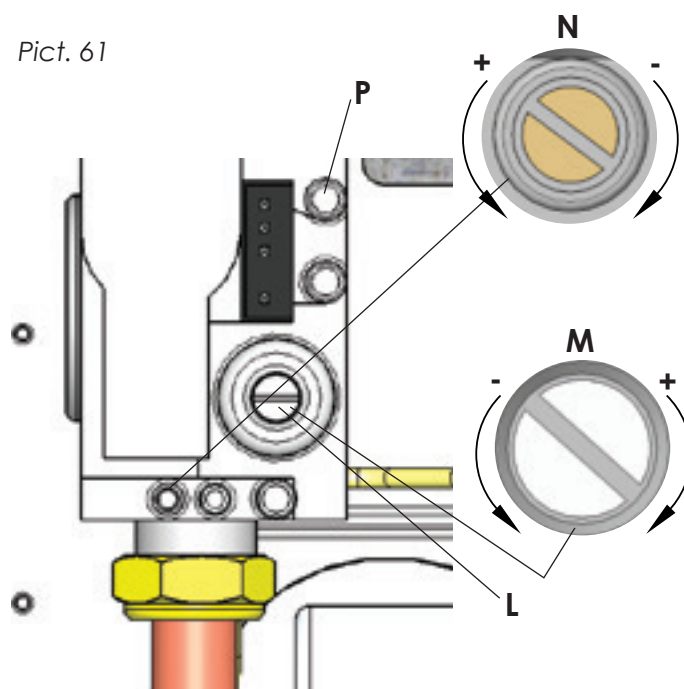
Pict. 60



### MINIMUM POWER\*:

- Use the Flue cleaning function to bring the boiler to minimum power.
- Wait a few seconds for the ignition phase to complete and the heating unit to bring itself to minimum power.
- After the boiler has been running for 2-3 minutes, run the analysis and check that the CO<sub>2</sub> measured by the analyser corresponds to the value indicated in the table for maximum power.
- If the CO<sub>2</sub> value does not correspond, regulate with screw "M" (Pict. 61) of the ratio adjuster after removing the protective cover "L" until the specified CO<sub>2</sub> value is obtained. Turn clockwise to increase the CO<sub>2</sub> value, anticlockwise to decrease it.

Pict. 61



It may be necessary to repeat the maximum and minimum adjustment twice to obtain correct regulation.

\* Operations to be repeated for every individual heating unit

### CO<sub>2</sub> VALUE TABLES

	U.M.	G20 (natural gas)	G31 (LPG)
CO <sub>2</sub> max power	%	9.3 +1 -0	10.6 +0.1 -0
CO <sub>2</sub> min power	%	8.7 +1 -0	9.9 +0.1 -0
Minimum mains pressure	mbar	17	29
Maximum mains pressure	mbar	25	37

### WARNING!

After finishing the gas supply pressure tests:



- Disable the FLUE CLEANING function
- Place the device in stand-by (off)
- Disconnect the micromanometer connected before the gas regulator. **TIGHTEN THE PRESSURE OUTLET SCREW UNTIL IT SEALS**
- Press the gas valve regulation screws cover closed

## CHANGING GAS TYPE:

When necessary, it is possible to modify the boiler to run on types of gas which are supported but which the boiler was not set up for in the factory. This modification concerns in particular the change from NATURAL GAS to LPG and LPG to NATURAL GAS.



THE CONVERSION OPERATIONS MUST ALWAYS BE CARRIED OUT BY QUALIFIED PERSONNEL AS SPECIFIED BY LAW 46/90 DECREE 37/08.

### FROM NG TO LPG:

- Perform the software adjustment to the new gas
- Repeat the adjustment at the maximum and minimum power

### FROM LPG TO NG:

- Perform the software adjustment to the new gas
- Repeat the adjustment at the maximum and minimum power

### CONFIGURE THE SOFTWARE FOR THE CHANGE IN GAS TYPE:

- to adapt the supply driver of the gas regulation valve modulator it is necessary to enter the "INSTALLER MENU" and view the value of parameter "A1"
- set the parameter according to the gas supply and the change performed, following the values given in the table:

Gas type	Parameter value
Natural gas	0
LPG	1



**BEFORE COMMISSIONING THE NEWLY CONFIGURED BOILER IT IS NECESSARY TO CHECK THE GAS SUPPLY PRESSURE BEFORE THE BOILER AND MEASURE AND ADJUST THE GAS PRESSURE AT THE BURNER. REFER TO THE PRESSURE VALUES AND PROCEDURES GIVEN FOR EACH SPECIFIC GAS IN THE "GAS PRESSURE CHECK" CHAPTER**

**Complete the change by attaching the label indicating the change to the new type of gas for which the equipment has now been configured near the technical data plate.**

## ACCESSING THE CONFIGURATION MENU

It is possible to view information or perform complete configuration of the boiler by accessing the different pages of the available menus:

- INFORMATION MENU
- INSTALLER MENU

The INFORMATION MENU is the only one which exclusively displays information on the state or presence of devices and does not allow any modifications to the operational parameters;

to access the pages of the information menu, proceed as described on page 28.

Accessing the INSTALLER MENU, aside from displaying information on the state or presence of most of the devices, also allows the configuration parameters to be altered, therefore substantially influencing the device's operation.



**ACCESS TO THE "CONFIGURATION MENU" IS EXCLUSIVELY RESERVED FOR TECHNICIANS WITH THE NECESSARY QUALIFICATIONS AND LICENSES. ARBITRARY MODIFICATION OF ANY PARAMETER CAN CAUSE MALFUNCTIONING OF AND DAMAGE TO THE BOILER, AS WELL AS CREATING A DANGEROUS SITUATION FOR PERSONS AND PROPERTY.**

From any page of the "MAIN MENU", press button "4" for more than 5 seconds. The access to the menu pages is indicated by a symbol and a page number flashing alternatively, while the value of the parameter referred to by that page is displayed normally.

In this mode it is possible to scroll through the pages

for all parameters and read the relative values, but without the possibility to make changes. To modify the value of any parameter it is necessary to activate "Edit" mode by entering the correct security code which corresponds to the value of menu parameter P10. (Pict. 63)

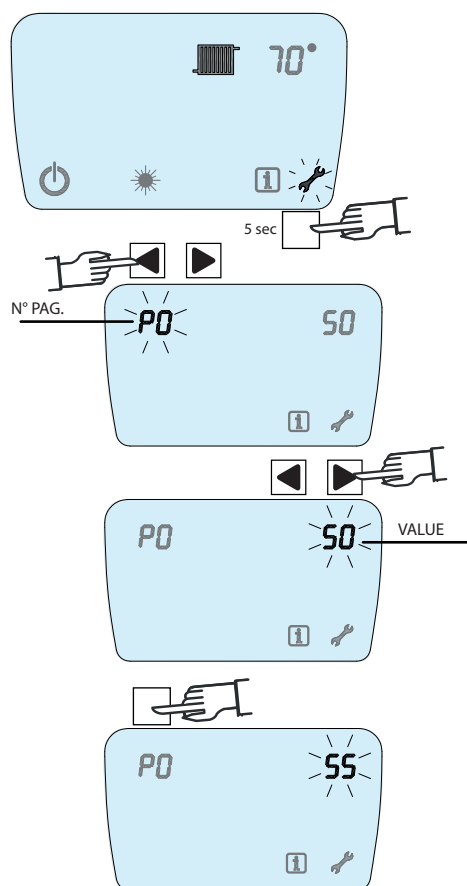
Selecting the menu/parameter modification page:  
By pressing buttons "5"- "6" the available pages in menu can be scrolled.

Once the required page has been identified, modify the associated parameter, press the buttons "7"- "8": the symbol and page number will be displayed normally while the value of the parameter flashes.

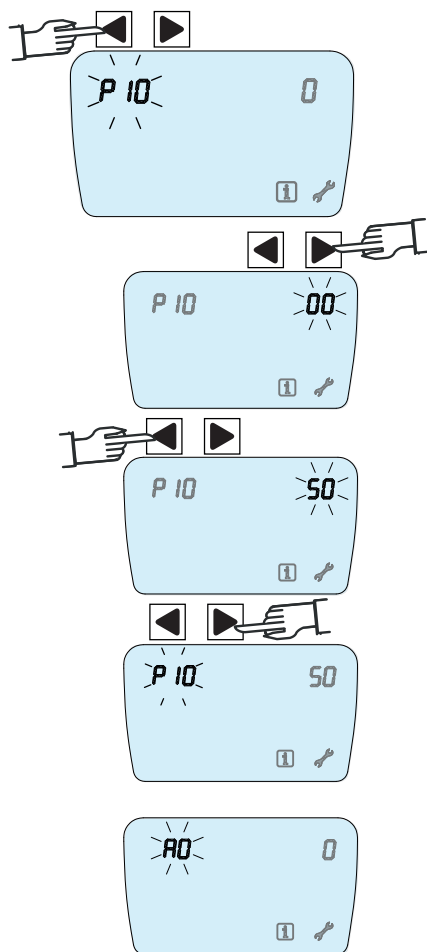
Modifying the parameter associated with a page:  
When the required value of the parameter is displayed, select it by pressing button "5". Once the parameter has been stored the boiler will return to the menu page selection condition.

The system will automatically exit the INSTALLER MENU after 30 seconds, or by pressing any button among "1"- "2"- "3"- "4", and return to normal display mode.

Pict. 62



Pict. 63



THE DESCRIPTIONS AND VALUES GIVEN IN ITALICS IN THE TABLE BELOW ARE ONLY TO BE USED WHEN IT IS NECESSARY TO CHECK THE CONFIGURATION.

MODIFICATION OF THE PARAMETERS IN ITALICS CAN CAUSE THE BOILER TO MALFUNCTION AND BE DAMAGED OR DESTROYED.



## MAIN PARAMETERS

Page	Description	Min	Max	Default
P0	Burner ignition power % with NG supply	0	99	20
P1	Burner ignition power % with LPG supply	0	99	17
P3	"Post circulation" time sec	0	99	60
P4	"Post ventilation" time sec	0	99	10
P6	Service function	0 = deactivated 1= minimum power 2= maximum power		
P10	<b>PARAMETER MODIFICATION ENABLE CODE</b>	0-99		

Page	Description	Min	Max	Default
A1	Gas type setting	0 Natural gas	1 LPG	0
A2	System type	1 High temperature	2 Low temperature	1
A4	Minimum fan RPM with NG (RPM/100) (if A1 = 0)	10	40	17
A5	Minimum fan RPM with LPG (RPM/100) (if A1 = 0)	10	40	20
A6	Maximum fan RPM with NG (RPM/100) (if A1 = 0)	Val A4	70	70
A7	Maximum fan RPM with LPG (RPM/100) (if A1=1)	Val A5	70	70
A99	Exit menu			

The parameters which are not indicated, do not refer to Lhemm configuration.

## SPECIAL FUNCTIONS

### ANTI-FROST:

This function is always active, whatever mode the boiler is in.

In order to allow this function to fulfil its purpose, the device must be:

- Turned on
- Connected to the mains gas supply
- The shut-off valves on the central heating circuit must be open
- the shut-off valves on the gas line must be open and must not have faults present

If the temperature measured by the sensor on

the heating system hot water delivery circuit is < 6°C, circulation is activated and the burner lit at minimum power.

When the temperature measured by the sensor reaches 8°C, the function is deactivated by turning off the burner and restoring the previous conditions.



**THIS FUNCTION DOES NOT GUARANTEE COMPLETE AND CERTAIN PROTECTION OF THE SYSTEM FROM TOTAL OR PARTIAL FREEZING!**



**WHEN CONSIDERED NECESSARY, AND WHEN THE SYSTEM IS CERTAIN TO BE EXPOSED TO LOW TEMPERATURES, IT IS POSSIBLE TO ADD ANTIFREEZE TO THE CENTRAL HEATING CIRCUIT.**



**ONLY USE ANTIFREEZE WHICH IS COMPATIBLE WITH THE CENTRAL HEATING SYSTEM DEVICES AND EQUIPMENT. CAREFULLY FOLLOW THE INSTRUCTIONS FOR USE.**

## HYDRAULIC ACCESSORIES



Hydraulic separator (flange DN 80)  
Caleffi brand



Plate exchanger for model 120 - 180 - 240  
- 300 - 360\*\*

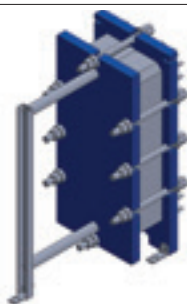


Plate exchanger for model 480\*\*



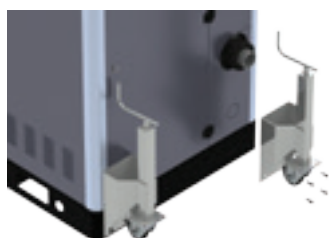
O-ring sensor 5K

TEM-2VF210






Boiler sensor 5K







TEM-801501







Drive-In system (four wheels)

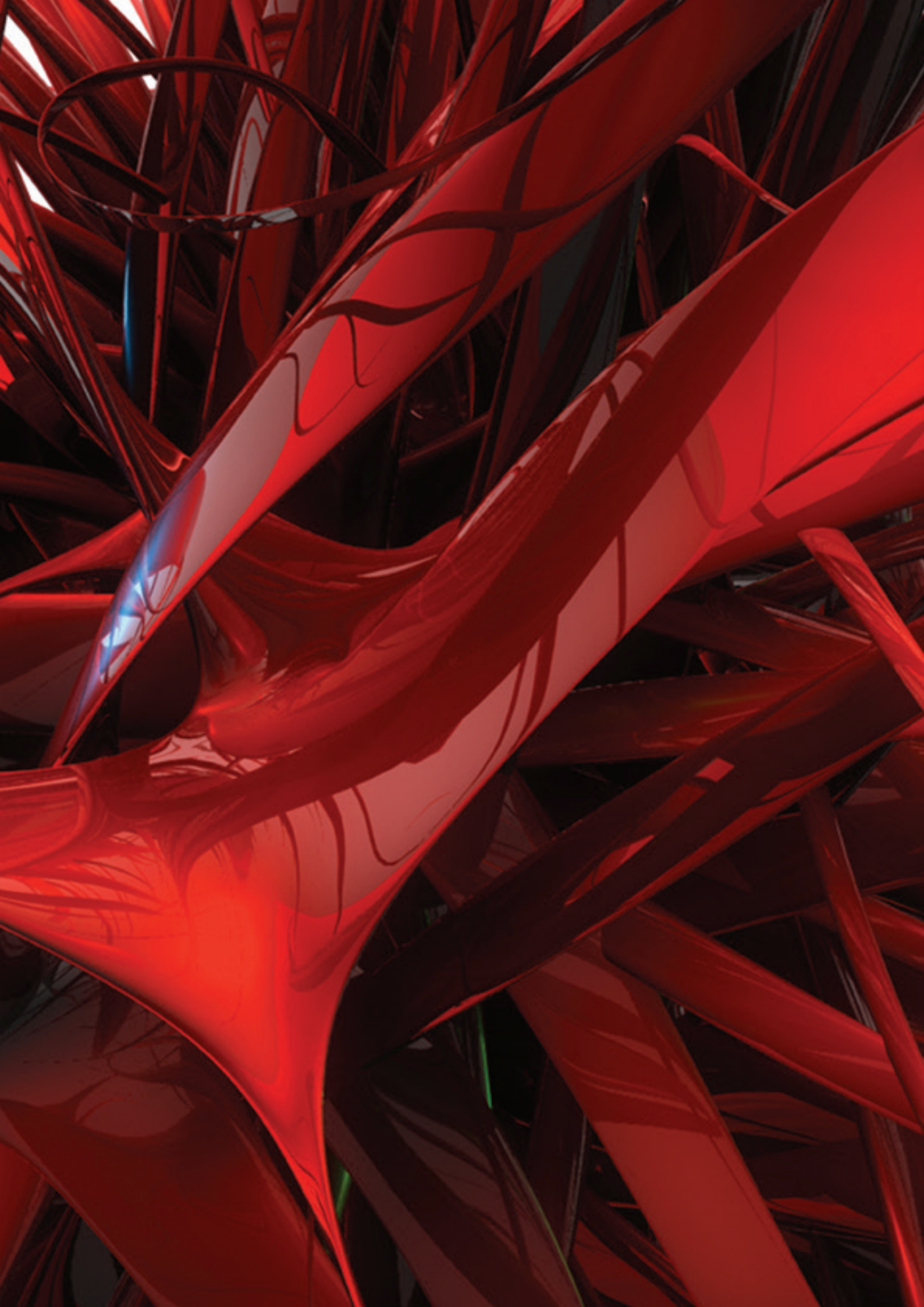
## FLUE ACCESSORIES

	Eccentric reduction 160/125	ALM-PPKX19
	Eccentric reduction 200/160	ALM-PPKX27
	Eccentric reduction 250/200	ALM-PPKXV4
	45° bend DN125	ALM-PPSB42
	45° bend DN160	ALM-PPSB46
	45° bend DN200	ALM-PPSB40
	90° bend DN125	ALM-PPSB92
	90° bend DN160	ALM-PPSB96
	90° bend DN200	ALM-PPSB90
	Extension DN125 500 mm	ALM-PPRM52
	Extension DN160 500 mm	ALM-PPRM56
	Extension DN200 500 mm	ALM-PPRM50
	Extension DN125 1000 mm	ALM-PPRM12
	Extension DN160 1000 mm	ALM-PPRM16
	Extension DN200 1000 mm	ALM-PPRM10
	Extension DN125 2000 mm	ALM-PPRM22
	Extension DN160 2000 mm	ALM-PPRM26
	Extension DN200 2000 mm	ALM-PPRM20

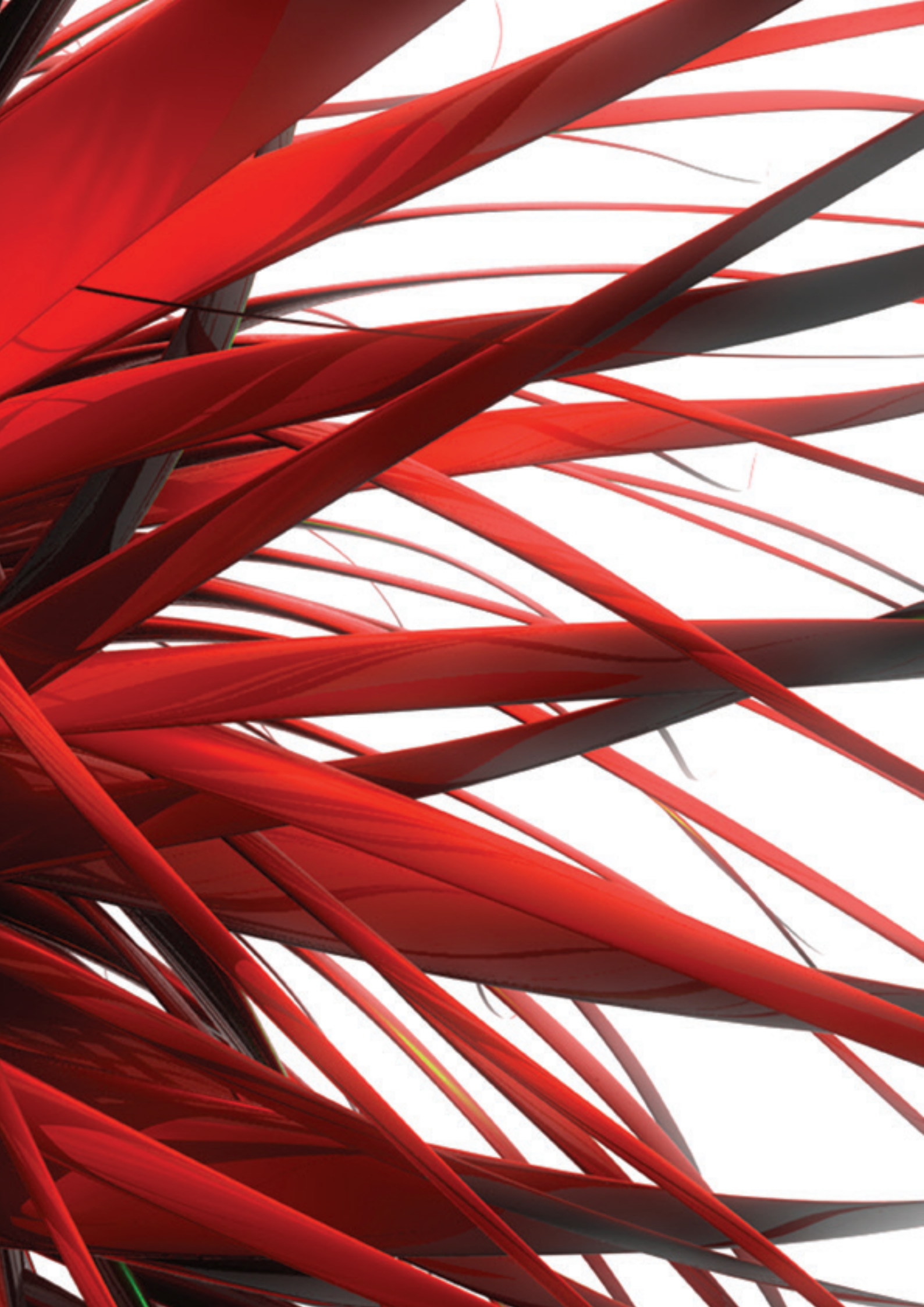
	Inspection pipe DN125	ALM-PPRTD2
	Inspection pipe DN160	ALM-PPRTD6
	Inspection pipe DN200	ALM-PPRTD0
	Inspection bend DN125	ALM-PPRB92
	Inspection bend DN160	ALM-PPRB96
	Inspection bend DN200	ALM-PPRB90
	T-union DN125	ALM-PPTE92
	T-union DN160	ALM-PPTE96
	T-union DN200	ALM-PPTE90
	Cond. outlet plug DN125	ALM-PPMA02
	Cond. outlet plug DN160	ALM-PPMA06
	Cond. outlet plug DN200	ALM-PPMA00
	Spacers DN125	ALM-PPRF02
	Spacers DN160	ALM-PPRF06
	Spacers DN200	ALM-PPRF00
	Chimney cover DN125	ALM-PPSAS2
	Chimney cover DN160	ALM-PPSAS6
	Chimney cover DN200	ALM-PPSAS0

	<p>Neutraliser</p>	<p>LH_KITNC</p>
	<p>Granular neutralizer refill kit in bags (10 kgs)</p>	<p>LH_KITRNC</p>
	<p>Active carbon in bags</p>	<p>LH_KITRCA</p>
	<p>Condensate outlet stub pipe</p>	











MADE IN ITALY



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Brand of G20 ENGINEERING

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