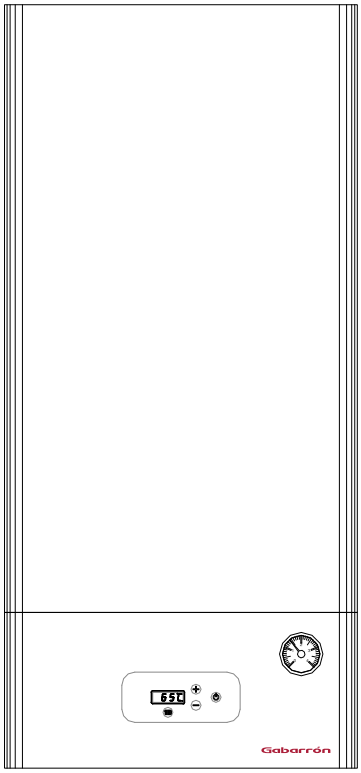
INSTRUCCIONES DE INSTALACIÓN Y USO
INSTALLATION INSTRUCTIONS AND USER GUIDE

Gabarrón



MATTIRA

CALDERAS ELÉCTRICAS MODULANTES DIGITALES
DIGITAL MODULATING ELECTRIC BOILERS

PARA CALEFACCIÓN / FOR CENTRAL HEATING

MAS18
MAS15

Por favor, lea estas instrucciones atentamente antes de instalar o utilizar el aparato por primera vez. Estas instrucciones deben ser seguidas para una instalación segura de la caldera. Cualquier problema, fallo o daño ocasionado por la no observancia de estas instrucciones no será cubierto por la garantía del fabricante. Este manual debe ser guardado con el aparato por el usuario para futuras consultas.

Please read these instructions before installing or using this appliance for the first time. These instructions must be followed for the safe installation of the boiler. Any problem, fault or damage caused by the non-observance of these instructions will not be covered under the manufacturer's warranty. This manual should be retained with the appliance by the user for future reference.

INDEX

1 IMPORTANT

The following installation instructions are intended to guide the competent person throughout the entire installation process.
The boiler's guarantee does not cover any damage caused by non-observance of any of these instructions.
These installation instructions and user's guide must be conserved and given to any new user.

The symbols used in the text are explained below:

 WARNING This indication shows the possibility of causing death from electric shock.

 WARNING This indication shows the possibility of causing death or serious injury.

 CAUTION This indication shows the possibility of causing injury or damage to properties only.

 Symbol for useful information.

2 SAFETY

- This appliance is not destined for use by anyone (including children) with reduced physical, sensorial or mental capacities or those who do not know how to use the appliance, unless they are supervised or instructed by a person responsible for their safety.
- Check that the voltage on the indicator plate of the boiler coincides with the voltage of the mains circuit to which it is going to be connected.
- The use of these boilers in the presence of gases, explosives or inflammable objects is prohibited.
- The air inputs and outputs of the boiler ensure its correct operation and protect it from over-heating. They must never be covered.
- This boiler must be disconnected from the mains electricity before carrying out any internal repairs.
- The boiler must be installed in such a manner that the switches or other controls cannot be touched by anyone who is using the bath or shower.
- The installation must be performed in accordance with current electricity regulations.
- This appliance is destined to be permanently connected to a fixed installation. The power circuit of the boiler must incorporate an omni-polar cut-off switch with a separation between the contacts of at least 3 mm.
- The electricity supply circuit must incorporate a Residual-Current Device.
- This boiler must be earthed.
- All the models incorporate different safety elements. If one or more of them are activated, consult the section 7 TROUBLE SHOOTING.
- In time, the presence in the air of smoke, dust and pollution may stain the walls and areas close to the appliance.
- Any improper use is forbidden.
- Do not install the boiler in rooms prone to frost.

3 INTRODUCTION

3.1 DESING & OPERATION

The Gabarrón MATTIRA MAS18 and MAS15 boilers are electrically heated appliances providing wet central heating through a standard radiator system (or underfloor system with special kit).

Outputs are from 2 to 18kW. Maximum output can be adjusted to match the heat requirement of the system or the limitations of the incoming available power supply. Operation is possible on three phase 3x400V+N or single phase 230V – (Standard configuration allows a maximum of 12kW in single phase mode).

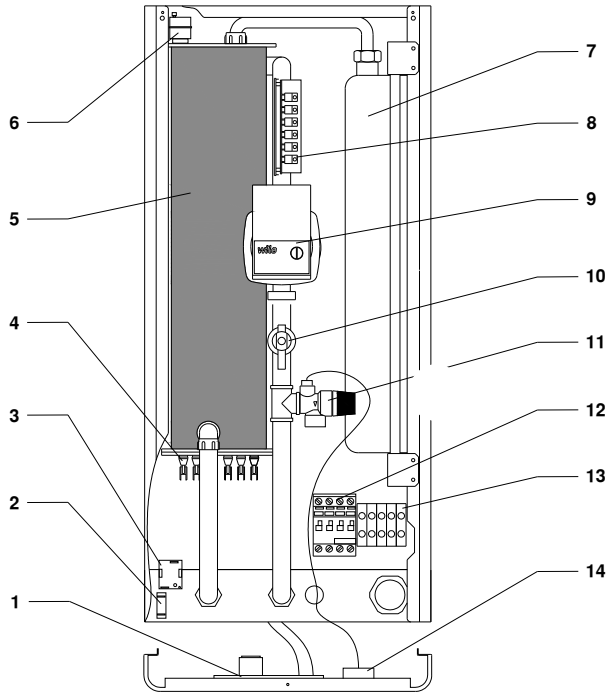
The boilers are designed for internal installation on a suitable wall with consideration for the total weight of the appliance when full.

A digital control panel provides user control to adjust the temperatures of heating. A power modulation feature automatically adjusts the heating output to the demand to ensure economic operation. A suitable external time clock/room thermostat should be fitted (not supplied). All components for sealed system central heating are built-in.

3.2 PRINCIPLE COMPONENTS

- Insulated steel boiler unit with immersed stainless steel elements INCOLOY800.
- Fully integrated electronic control boards featuring temperature control and modulation function, pump over-run, anti-seize and frost protection. Self-diagnostic fault information.
- Sealed system heating components: circulating pump, expansion vessel, auto air-vent, 3 bar relief valve, pressure gauge, water flow switch and temperature limit safety thermostat.
- Silent TRIAC power switches.
- Digital control board.

3.3 KEY TO COMPONENTS



1 Main electronic PCB.
2 ON / OFF switch.
3 Heating safety thermal limit switch.
4 Heating resistance.
5 Insulated heating header tank.
6 Automatic purge.
7 Heating expansion vessel 6L.
8 Heating power electronic PCB
9 Circulation pump.
10 Heating flow detector.
11 Heating 3 bar relief valve.
12 Main contactor.
13 Connection block.
14 Pressure gauge.

3.4 SAFETY DEVICES

Safe operation under various conditions is ensured by the following controls fitted inside the boiler:

- Water flow switch that monitors water flow in the heating system and will prevent operation in case of a blockage, if the system flow rate is below the permitted level, error E3 will appear. Installation of a system by-pass may be necessary (see 7.3 Heating system flow switch – E3 Error).
- Heating system high limit safety thermostat will prevent operation if the temperature exceeds 100°C. It requires re-setting manually.
- Heating system pressure relief valve will discharge to relieve excess pressure at 3 bar. (Requires piping to a safe external discharge point.)

4 INSTALATION

IMPORTANT PRE- INSTALLATION POINTS

In order to ensure the successful installation and operation of your Gabarron boiler, please consider the following points before commencing.

SITING THE BOILER

WARNING Wall and fixings must be suitable to support the total weight; MATTIRA MAS boiler when full is **50kg.**

Allow sufficient clearance and access for operating, maintenance and repair work.
Boiler must be protected from any water, moisture or dampness.
Where installations are in a bathroom, the installation must comply with the relevant electrical regulations.
Boiler electrical protection rating is IP20/IP2X. This boiler is not designed to be installed in the open air.
The boiler must be installed in the upright position.

ELECTRICAL POWER SUPPLY & WIRING

WARNING Before carrying out any work inside the boiler and obtaining access to terminals, all supply circuits must be disconnected.

WARNING Earth the appliance. If the appliance is not earthed, it may hold voltage if a defect occurs.

The cable, MCB and RCD must be of sufficient capacity to carry the required load.

Boiler is supplied set at maximum output and must be adjusted to suit the incoming supply before being switched on. (See 5.2 LIMITING BOILER MAXIMUM OUTPUT).

HEATING SYSTEM & CONTROLS

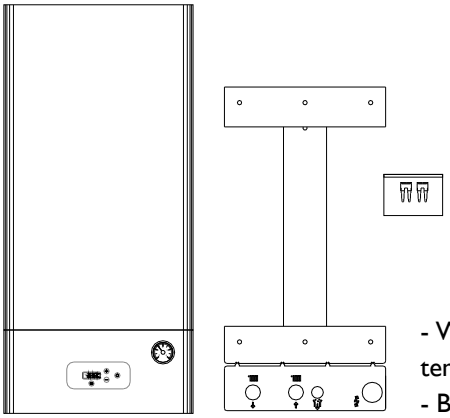
Any existing system must be suitable for sealed system operation at up to 3bar pressure and may require flushing/cleansing.
Isolation valves and drain point are required.
A time clock/room thermostat should be installed. (Necessary to activate automatic power modulation).
If the installation includes thermostatic radiator valves or automatic temperature zone controller, it is essential not to interrupt the flow rate trough the boiler in any case, it will cause E3 error or the action of safety thermostat.

4.1 GENERAL REQUIREMENTS

The installation should be carried out by a person certified as competent for the installation of unvented hot water systems in accordance with current building regulations.

Installation should also be in accordance with the relevant Standards and Codes of Practice.

4.2 UNPACKING & CONTENTS



- Wall bracket with template.
- Boiler.
- Documentation.
- Bag with connecting links.

Dispose of the cardboard packaging at a cardboard recycling site. Observe national regulations.

4.3 LOCATION

WARNING: INSTALL UPRIGHT ON A WALL SUITABLE TO SUPPORT THE TOTAL WEIGHT OF THE BOILER WHEN FULL OF WATER – 50 kg

The location should be clean and dry with no presence of gases, explosives or flammable objects.

It is not suitable for installation outside and should be protected from moisture and frost.

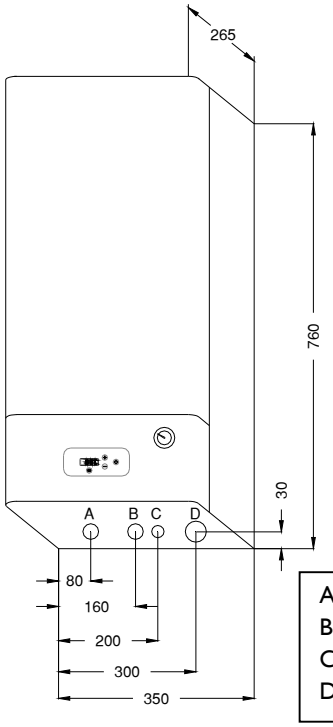
The boiler must be sited so that the boiler and controls are not accessible to any persons whilst using a bath or shower and there should be no possibility of water dripping or splashing onto the boiler or controls.

Electrical safety regulations for clearances must be followed if installed in a bathroom or shower area.

Where possible the boiler should be sited to minimize the pipe distance to hot water outlets.

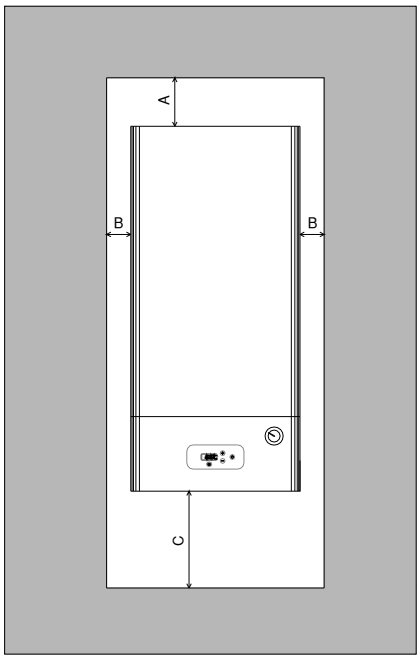
The power supply cable should be carefully routed and secured and provision made for a suitable isolation switch and MCB/RCD.

4.4 DIMENSIONS & CONNECTIONS



A Heating FLOW ¾"
B Heating RETURN ¾"
C Safety valve drain
D Electrical connection

4.5 CLEARANCES



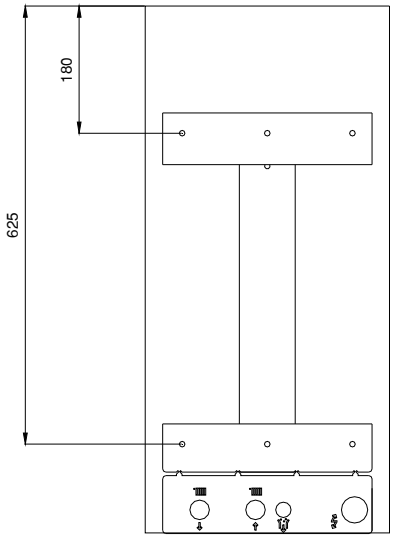
A: 50 mm B: 10 mm C: 200 mm

The clearances around the boiler as shown above must be observed for correct operation.

A minimum of 200mm clearance must be maintained underneath the boiler to allow replacement of the heating elements if required. A minimum of 500 mm clearance must be maintained in front of the boiler to enable easy access for servicing.

Ensure sufficient space to make all water connections including the outlet pipes for the heating safety valve which should be routed to a suitable discharge point.

4.6 MOUNTING BRACKET



Mark the hole positions using the wall bracket as a template per the diagram.

Fit bracket securely onto wall before lifting appliance into position. Drill the holes and fit the bracket ensuring it is level using suitable high strength screws, with appropriate plugs or fixings, minimum M10 size.

Always use assistance if required. Wear suitable cut resistant gloves when handling the appliance. Ensure safe lifting techniques are used. Do not lift the appliance by attached pipe-work or components. When lifting the boiler ensure that the fixing elements and the wall have a sufficient load-bearing capacity. Check the quality of the wall.

4.7 WATER CONNECTIONS

CAUTION: The hydraulic connections must be carried out respecting the flow and return marked on the boiler.

CAUTION: When tightening or loosening threaded connections, always use suitable tools as open-end spanners. Do not use pipe wrenches, extensions or unsuitable tools that may cause damage or water leaks.

Install purges in the radiators and high points of the installation.

Heating Flow & Return

These connections are ¾ " for connection to 22mm pipe. Service valves should be installed at this position to allow the boiler to be isolated for maintenance without the need to drain the entire system. The valves should be of sufficiently large bore so not to restrict the heating circulation.

Single pipe heating systems are not recommended only a twin-pipe heating system should be used.

Drain Point

A drain point should be fitted at the lowest point of the system. It is not acceptable to drain the boiler through the safety valve as debris and deposits will prevent correct operation of the valve.

Heating System By-pass

The heating water flow switch requires a minimum flow rate through the boiler of 7 L per minute for correct operation. Systems fitted throughout with Thermostatic Radiator Valves will require provision of a System By-pass to maintain sufficient flow should all the valves be closed. (see 7.3 HEATING SYSTEM FLOW SWITCH – E3 ERROR).

System Expansion

An integral 6 L expansion vessel provides for expansion of the heated system water under normal conditions however a system with larger volumes of water may require extra expansion capacity to be provided.

4.8 SAFETY VALVE CONNECTIONS

The 3 bar pressure relief valve may discharge boiling water and should be piped with a continuous fall to a safe yet visible point where any discharge cannot cause damage or injury.

 CAUTION: The discharge pipe-work from the T&P relief valve must be installed by a competent person. The discharge pipe material must be capable of conveying water / steam at 100°C.

All installations must be fitted in accordance with all local regulations in force at that time. Failure to comply with these regulations will invalidate the manufacturers' warranty.

4.9 PUMP DUTY

Boiler equipped with a high efficiency circulation pump, with a maximum impulsion height of 6.2 m and a maximum flow of 3.3 m^3 / h.

There are selectable operation modes with the built-in knob. You can select constant operating speeds I, II and III.

A LED indicator informs about the operating status of the pump:

- Green: correct operation.
- Green / red flashing: Lower voltage U<180V; overvoltage U>253V; Module overheating
- Red flashing: pump blocked.

4.10 ELECTRICAL CONNECTIONS

Connection to Mains Supply

The MAS15 and MAS18 boilers must be installed in premises having a system impedance of not more than 0.25 + j0.25Ω.
The MAS15 and MAS18 boilers comply with the technical requirements of EN 61000-3-3.
The MAS15 and MAS18 boilers must be installed in premises having a service capacity ≥100 A per phase.

Complete all the pipe-work before connecting the boiler to the electricity supply.
Any re-installation must be performed by qualified electricians.
Ensure that the mains voltage available coincides with that shown on the rating label.

 **WARNING:** THE SUPPLY CABLE TO THE BOILER SHOULD BE OF SUFFICIENT SIZE TO CARRY THE LOAD CAPACITY REQUIRED. IT SHOULD BE WIRED THROUGH A LINKED ISOLATOR SWITCH WITH MINIMUM CONTACT GAPS OF 3mm IN EVERY POLE AND PROTECTED BY A SUITABLY RATED CIRCUIT BREAKER MCB/RCD
Install the necessary electrical protections as indicated in the current regulations. In the event of these regulations not being complied with, the manufacturer will not be liable for any bodily injury or material damage that may occur.

 **WARNING:** IT IS ESSENTIAL THAT THE BOILER IS PROPERLY EARTHED and the wiring tested to current IEE regulations.

Electrical Supply Sizing

The following table shows the specification for a boiler installed on three phase single phase 3x400V+N~.

Rated output of boiler	4kW	5kW	6kW	7kW	8kW	9kW	10kW	11kW	12kW	13kW	15kW	18kW
Supply current	13.0A	13.0A	13.0A	13.0A	13.0A	13.0A	21.7A	21.7A	21.7A	21.7	21.7A	26.0A
RCD rating	16A	16A	16A	16A	16A	16A	25A	25A	25A	25A	25A	32A
Minimum cable size	4mm	4mm	4mm	4mm	4mm	4mm	6mm	6mm	6mm	6mm	6mm	10mm

The following table shows the specification for a boiler installed on single phase 230V~ supply.

Rated output of boiler	4kW	5kW	6kW	7kW	8kW	9kW	10kW	11kW	12kW	13kW	15kW	18kW
Supply current	17.4A	21.7A	26.1A	30.4A	34.8A	39.1A	43.5A	47.8A	52.2A	56.5A*	65.2A*	78.3A*
RCD rating	20A	25A	32A	32A	40A	50A	50A	50A	63A	63A*	80A*	80A*
Minimum cable size	4mm	6mm	10mm	10mm	10mm	16mm	16mm	16mm	16mm	25mm	25mm	35mm

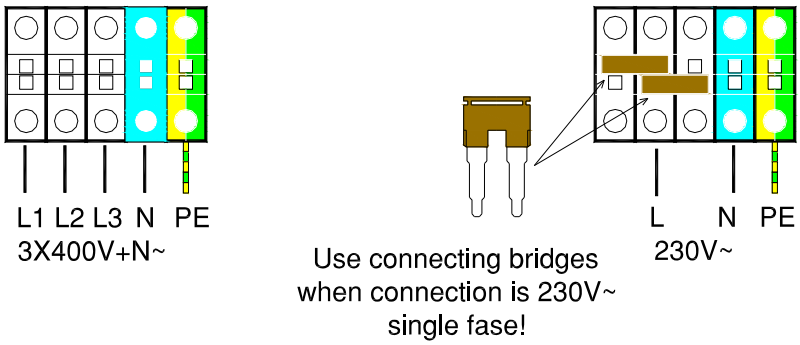
*** The standard configuration of the boiler only allows a maximum of 12kW when connected SINGLE-PHASE 230V~.**

Connection to Boiler

WARNING: Touching live connections can cause serious personal injury.

Before establishing a mains connection switch off the power supply. Secure the power supply against being switched on again. Mains connection terminals remain live even if the on/off switch is turned off.

The boiler is delivered ready for operation on 3x400V three phase supply. For operation on 230V single phase the bridging connection supplied must be connected across the terminals of the connection block as shown.



The terminal connection block is accessed after removing the boiler front panel . The supply cable should be safely routed to this point through the cable entry point on the right hand bottom of the boiler.

CAUTION: A mains voltage at the incorrect plug terminal can destroy the electronics.

Make sure the connectin cables are securely fastened to the plug terminals.

Wiring External Controls

It is recommended that the boiler is controlled by an external control such as a time clock or room thermostat or a combined programmable room thermostat such as the Gabarrónmodel CTP-10.

CAUTION: The switching connection of this control should be VOLT FREE and connected to the terminals indicated **'TA'** on the PCB. The factory fitted link across these terminals must be removed.

The boiler's automatic power modulation feature is activated by the initial interruption of this switching link.

4.11 ROOM THERMOSTAT CONNECTION

A **'volt free'** room thermostat can be connected to regulate heating installation. To take advantage of the modulation feature of MAS Boiler, the use of a room thermostat is required.

Connect the room thermostat across the terminals marked 'TA' on the PCB. See "12 WIRING DIAGRAMS".

4.12 OUTDOOR NTC TEMPERATURE SENSOR CONNECTION

An outdoor temperature sensor must be fitted to the boiler to activate the auto heating regulation depending on the outdoors temperature.

Connect a NTC sensor (10kΩ - 25°C) across the terminals marked T.EXT on the PDC. See "12 WIRING DIAGRAMS".

5 COMISSIONING

5.1 INSTALLATION PARAMETERS

These parameters must be adjusted by the installer to match the requirements of the installation.

To access to installation parameters menu – with front display OFF, press and hold the ⏻ and ⊖ buttons together for at least 5 seconds.

To move forward or backward through the menu use the ⊕ and ⊖ buttons respectively.

To modify a parameter, press the ▥ button to display the current setting, modify the setting as required using the ⊕ and ⊖ buttons. To confirm the new setting, press the ▥ button once.

After setting the various parameters it is necessary to validate by pressing the ⏻ button for 3 seconds. If none of the buttons are pressed for 30 seconds, the installation parameter menu will be automatically closed without validating/saving any changes.

P00 **Boiler type.** For MAS18 and MAS15 boilers, this parameter is 0.

P01 **Model.** 18 corresponds to model MAS18, 15 corresponds to model MAS15.

P03 **Boiler maximum output limit.**
Model MAS18 can be limited to 18 - 15 - 12 - 9 - 6 - 3 kW.
Model MAS15 can be limited to 15 - 13 - 12 - 11 - 10 - 9 - 8 - 7 - 6 - 5 - 4 - 3 - 2 kW.

P04 **Underfloor heating.** If the boiler is underfloor heating ready this parameter will be 1 (an especial limiter is required), otherwise it will be 0.

P05 **Outdoor temperature probe.** An outdoor temperature probe (not provided) can be installed. In this case the parameter value will be 1.

P06 **Heating temperature differential.** The heating temperature differential can be selected from 2°C to 10°C. The default value is 2°C.

P08 **Modulation.** Possible values: 1 (modulation ON), 0 (modulation OFF).

P09 **Units.** It is possible to change temperature units (°C Celsius, °F Fahrenheit). Default value: °C.

P11 **AUTO heating regulation**. If a fan outdoor temperature probe is installed it is possible to activate the auto heating regulation by shifting this parameter value to 1.

P12 **TIMAX.** Maximum water flow temperature in AUTO heating mode.

P13 **TIMIN.** Minimum water flow temperature in AUTO heating mode.

P14 **TEMAX.** Outdoor temperature from which the water flow temperature will be TIMIN.

P15 **TEMIN.** Outdoor temperature below which the water flow temperature will be TIMAX.

5.2 LIMITING BOILER MAXIMUM OUTPUT

The boiler is supplied for operation on maximum heat output of 15kW or 18 kW depending of the model. The output can be rated below this maximum to match the heat load required. The setting is realized modifying P03 parameter. See "5.1. INSTALLATIONS PARAMETERS".

WARNING: ON INSTALLATIONS WHERE THE INCOMING POWER SUPPLY IS NOT CAPABLE OF MAXIMUM LOAD THE BOILER CONTROL MUST BE RE-CONFIGURED TO LIMIT THE OUTPUT BEFORE SWITCHING ON.

The boiler will not exceed this pre-set maximum but will still modulate in heating mode up to this level, adapting to demand and ensuring economic operation.

Correct configuration for the selected output can be checked on the boiler display panel following the procedure shown in "7.4 CHECKING RATED HEAT OUTPUT".

CAUTION: It is essential to confirm the power output with the use of a clamp meter

LIMITATION OF OUTPUT ON MODELS MATTIRA SYSTEM MAS18

Maximum output limited to:	MAXIMUM CURRENT **L1**	MAXIMUM CURRENT **L2**	MAXIMUM CURRENT **L3**
18kW	26.0A	26.0A	26.0A
15kW	26.0A	26.0A	13.0A
12kW	26.0A	13.0A	13.0A
9kW	13.0A	13.0A	13.0A
6kW	13.0A	13.0A	-
3kW	13.0A	-	-

CONNECTION THREE-PHASE 3x400V~+N

Maximum output limited to:	MAXIMUM CURRENT
18kW*	78.3A*
15kW*	65.2A*
12kW	52.2A
9kW	39.1A
6kW	26.1A
3kW	13.0A

CONNECTION SINGLE PHASE 230V~

LIMITATION OF OUTPUT ON MODELS MATTIRA SYSTEM MAS15

Maximum output limited to:	MAXIMUM CURRENT **L1**	MAXIMUM CURRENT **L2**	MAXIMUM CURRENT **L3**
15kW	21.7A	21.7A	21.7A
13kW	21.7A	21.7A	13.0A
12kW	8.7A	21.7A	21.7A
11kW	21.7A	13.0A	13.0A
10kW	13.0A	8.7A	21.7A
9kW	13.0A	13.0A	13.0A
8kW	13.0A	8.7A	13.0A
7kW	8.7A	13.0A	8.7A
6kW	8.7A	8.7A	8.7A
5kW	8.7A	13.0A	-
4kW	-	8.7A	8.7A
3kW	13.0A	-	-
2kW	-	-	8.7A

CONNECTION THREE-PHASE 3x400V~+N

Maximum output limited to:	MAXIMUM CURRENT
15kW*	65.2A*
13kW*	56.5A*
12kW	52.2A
11kW	47.8A
10kW	43.5A
9kW	39.1A
8kW	34.8A
7kW	30.4A
6kW	26.1A
5kW	21.7A
4kW	17.4A
3kW	13.0A
2kW	8.7A

CONNECTION SINGLE PHASE 230V~

*** The standard configuration of the boiler only allows a maximum of 12kW when connected SINGLE-PHASE 230V~.**

5.3 HEATING SYSTEM FLUSHING

CAUTION: Flush the heating installation thoroughly prior to installation.

The heating system should be flushed which will remove any debris or contaminants detrimental to the operation and life of the boiler. Any cleanser or additives used should comply with current standards and the manufacturer's instructions carefully followed.

NOTE: IT IS IMPORTANT NOT TO USE THE BOILER PRESSURE RELIEF VALVE TO DRAIN OR FLUSH THE SYSTEM AS TRAPPED DEBRIS WILL CAUSE INCORRECT OPERATION. A PURPOSE PROVIDED DRAIN POINT SHOULD BE USED.

5.4 HEATING SYSTEM INITIAL FILLING

Ensure both flow and return isolation valves are open. Identify the boiler automatic air release valve at the top right hand side of boiler and loosen the cap. Close any manual air vents fitted on the system.

Be careful not to splash any of the electrical components.

Fill slowly until the pressure gauge indicates between 1 and 1.5 bar.

Proceed to vent all the manual release valves until all air is purged from the system. It will be necessary to top-up through the filling during this operation, filling the installation until the pressure gauge indicates between 1 and 1.5 bar.

5.5 PUMP CHECKING & VENTING

Sometimes (i.e. if display fault E3) it is necessary to check that the pump is properly vented and spinning freely.

To purge the pump, turn on the boiler and with the pump selector, alternate between positions III and Min every fifteen seconds. Keep this operation for 5 minutes.

If excess air remains in the system or there is insufficient pressure or flow rate the boiler will fail to operate and display fault E3.

A LED indicator informs about the operating status of the pump:

- Green: correct operation.
- Green / red flashing: Lower voltage U<180V; overvoltage U>253V; Module overheating
- Red flashing: pump blocked.

5.6 MORE INSTALLATION DATA

It is possible to display more installation data by pressing  for a few seconds and then  or  .

 Heating return temperature.

 Maximum output limitation in kW.

 Modulated output in kW.

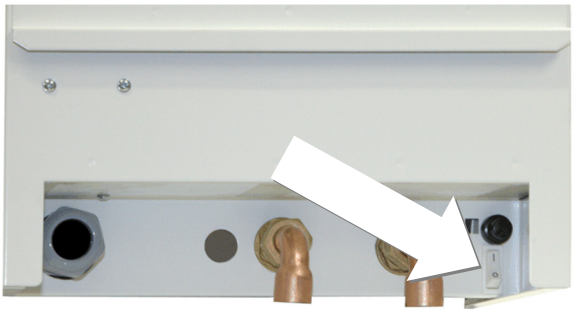
 Outdoors temperature. (Only if the sensor is connected and P005 is activated).

6 OPERATING THE BOILER

6.1 INITIAL SWITCHING ON

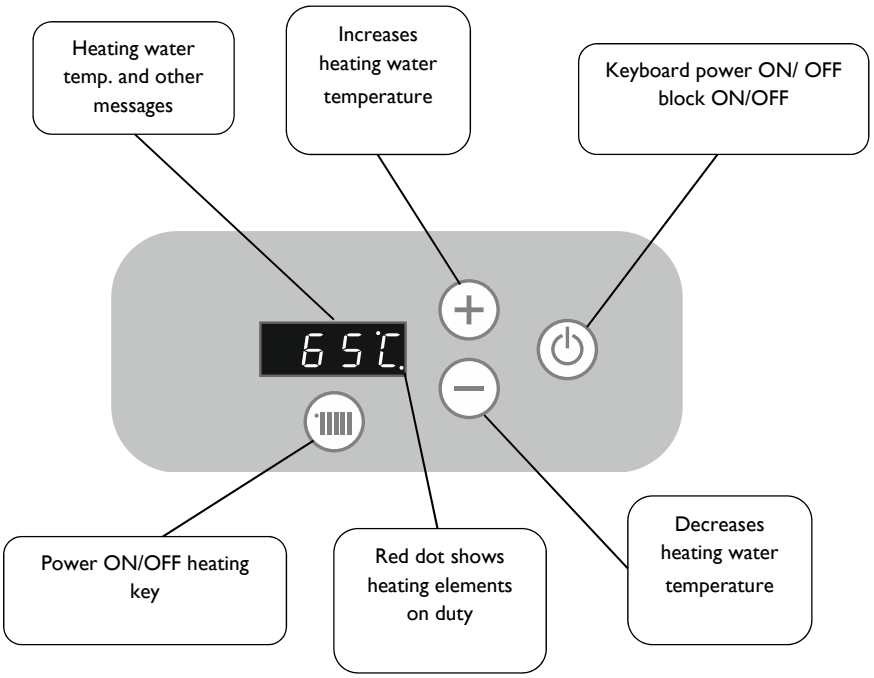
CAUTION: THE MAXIMUM HEAT OUTPUT MUST BE ADJUSTED BEFORE SWITCHING ON. THE BOILER SHOULD NEVER BE SWITCHED ON WITH THE HEATING SYSTEM TANK EMPTY. DAMAGE COULD OCCUR.

When the boiler is first connected it will perform a general self-check and if a fault is detected it will be indicated on the display.



Turn on the boiler with the on/off switch located at the back of the boiler as shown.

6.2 CONTROL PANEL DESCRIPTION



Push the button to start the boiler up. The same button will turn the boiler off when pushed again.

If the heating function is not selected the screen will not display a value but just a red dot.

6.3 CENTRAL HEATING OPERATION

First ensure that any external controls such as room thermostat or time clock are demanding heat.

To select the heating function, push the button. Pushing again will switch the function off and return display to just a red dot.

When the heating mode is selected the display will show the temperature of the heating water.

We can modify the setting of the temperature of the water by pushing either the button or the button and using the same buttons to adjust the value that flashes on the display. The modified setting will be stored after a few seconds or instantly by pushing the button.

The heating setting can be varied between 8°C and 85°C.
The symbol H appears after the 85 value or before the 8 value. If this value is selected, the heating will function in anti-freeze mode.

If the setting is higher than the actual temperature of the heating water, the heating will connect and a small red indicator of the consumption of heating resistances will light up.

6.4 ANTI-FREEZE MODE (Frost Protection)

It is possible to select an anti-freeze mode for frost protection during periods of inactivity. The power supply to the boiler must be maintained.
By attempting to set a central heating temperature below the 8°C value or above the 85°C value the symbol H will appear on the display. By selecting this value, the heating will only work in anti-freeze mode i.e. if the boiler temperature falls to 7°C the heating will activate automatically.

6.5 USER PARAMETERS.

The user can change a number of parameters to set some functions of the boiler to the needs of each customer.

To access the user parameters menu – with front display OFF, press and hold the and buttons for at least 5 seconds.

To move forward or backward through the menu use the and buttons respectively.

To modify a parameter, press the button and the current value will be displayed. It can be modified with the and buttons. Press the button to validate.

Modulation. Possible values: 1 (modulation ON), 0 (modulation OFF).

Units. It is possible to change temperature units (°C Celsius, °F Fahrenheit). Default value: °C.

AUTO heating regulation. If a fan outdoor temperature probe is installed it is possible to activate the auto heating regulation by shifting this parameter value to 1. Only shown when P05 is activated.

TIMAX. Maximum water flow temperature in AUTO heating mode. Only shown when P05 is activated.

TIMIN. Minimum water flow temperature in AUTO heating mode. Only shown when P05 is activated.

TEMAX. Outdoor temperature from which the water flow temperature will be TIMIN. Only shown when P05 is activated.

TEMIN. Outdoor temperature below which the water flow temperature will be TIMAX. Only shown when P05 is activated.

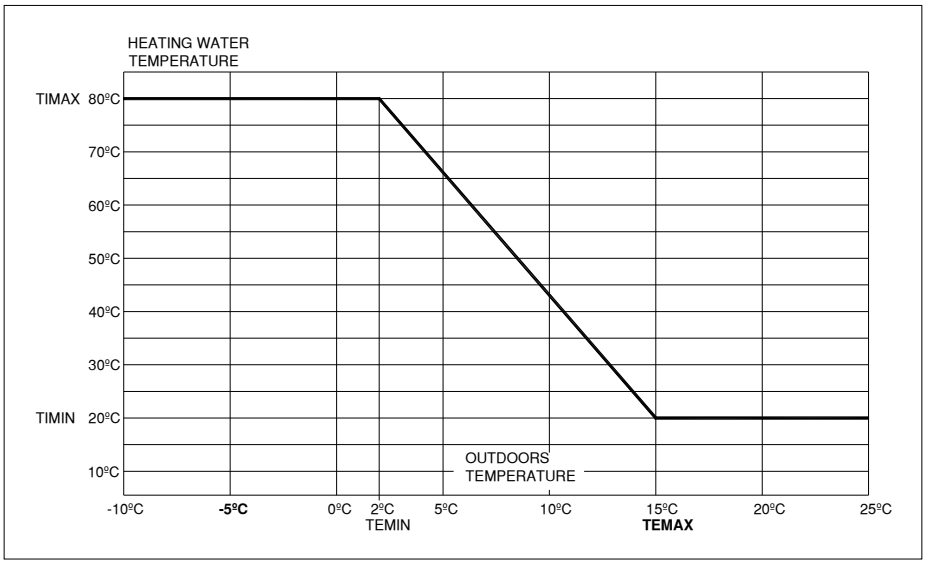
6.6 HEATING MODULATION FEATURE

The advanced control board on the boiler will automatically modulate the heating output to the demand required to save energy.
This function works by the boiler 'learning' and anticipating the time taken to reach the temperature level demanded by the external thermostatic control. The power output is automatically adjusted therefore reducing power consumption on warmer days or when another heat source is present.
An external 'volt free' control must be fitted across the terminals marked 'TA' on the PCB and the 'bridge' removed for this function to be activated.
This feature can be disabled using parameter P08. See "6.5 USER PARAMETERS".

6.7 AUTO HEATING REGULATION.

It is possible to regulate the temperature at which the boiler drives the water heating circuit depending on the outdoors temperature. This method of regulation provides maximum comfort as it anticipates changes in the thermal needs of the house. The room thermostat continues to regulate the temperature inside the house.

To activate this mode of heating, the installer will need to connect an external temperature sensor (not supplied) and activate the P05 and P11 parameters.



There are four parameters that define this function.

TIMAX. Maximum water flow temperature in AUTO heating mode.
In the above example TIMAX=80°C.

TIMIN. Minimum water flow temperature in AUTO heating mode.
In the above example TIMIN=20°C.

TEMAX. Outdoor temperature from which the water flow temperature will be TIMIN.
In the above example TEMAX=15°C.

TEMIN. Outdoor temperature below which the water flow temperature will be TIMAX.
In the above example TEMIN=2°C.

On the coldest days the water will be driven at higher temperatures and vice versa on the hottest days-less water will be driven at a lower temperature. In the example we see how, if the outdoors temperature is of 5°C the water flow temperature heating circuit would be about 66 °C.

You can temporarily override the automatically calculated set point. If, for example, you want to use the boiler to the maximum for a few hours even when automatic control mode, you would proceed as follows:

When pressing the ⊕ or ⊖ button, the display will alternatively show the calculated set point and the indication AUTO. By holding down either of these two keys for at least 5 seconds, the calculated set point will start flashing and the set point can now be modified with the same keys. Validate the selection by pressing the button. The time that the set point is going to be overridden is shown: 1H. It can be modified from 1 to 24h.

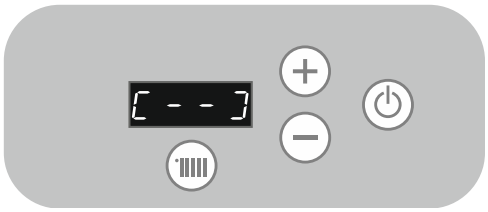
Validate the selection by pressing the button. The override set point and the time remaining are displayed alternatively every 10 seconds. At any time, it is possible to cancel this state just by turning off and restarting the boiler

6.8 BLOCKING THE CONTROLS

It is possible to lock the buttons of the control panel to prevent any adjustment.

By keeping the button pressed down for a few seconds, the control panel will be locked.

The control buttons of the boiler will be locked and no button will respond when pressed. Internally all the settings remain the same and the boiler will function normally.



To unlock the buttons, press the same button down for a few seconds until the above displayed symbol goes off. If the boiler is disconnected from the mains or there is a failure in the house's electricity supply, the buttons will also be unlocked.

6.9 PUMP ANTI-SEIZE FUNCTION

The advanced boiler control will automatically energize the pump for 10 seconds each month to protect it from seizing during long periods of inactivity. The power supply must be maintained for this function to operate.

7 TROUBLESHOOTING

7.1 POSSIBLE FAULTS & SOLUTIONS

Problem	Possible cause	Solution
Boiler will not start	No power to boiler.	Check incoming power supply.
	No power.	Check boiler control switch is on. (See Section 6.1.)
	Heating overheat. Switch tripped.	Locate switch and reset. (See Section 7.2)
Fault E1 displayed Heating flow temperature sensor	Heating water out temperature probe defective.	Contact Technical Service
Fault E2 displayed Heating return temperature sensor	Heating water return temperature probe defective.	Contact Technical Service
Fault E3 displayed Heating system water flow switch	Low heating system pressure.	Check for leaks. Refill heating system to 1.5 bar.
	Pump not turning.	Check rotating freely (sect 5.5) Replace pump if necessary.
	Air in system.	Purge thoroughly. Check automatic air valve open. Vent pump (sect 5.5)
	System resistance too high or blockage.	Check pump speed 3. Check pump duty (sect 4.9) Open all radiator valves. Install system by-pass.
Fault E8 displayed Outdoor temperature sensor	Defective outdoor temperature sensor or not present.	This sensor is optional. Check connections. Replace sensor if necessary.
Heating system water discharging from 3 bar safety valve	Excessive heating system pressure.	Check filling loop not passing and remove. Check expansion vessel is charged to correct level with air. Check system expansion volume.
The buttons do not respond	Control panel blocked	See Section 6.8 BLOCKING THE CONTROLS
Low heating temperature	Settings too low.	Check temperature & output selected.
	Failure of heating elements	Check and replace.
	Heat requirements miscalculated.	Re-calculate & configure.

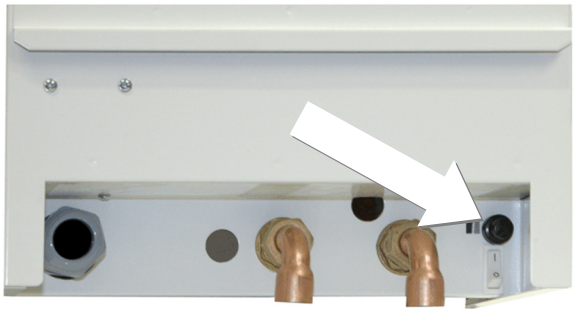
If the suggested action fails to resolve a problem, please contact ELNUR technical service for further advice.

7.2 OVERHEAT LOCK-OUT & RE-SETTING

Central heating overheat.

If the boiler detects an overheat condition of 100°C (80°C if adapted floor heating) in the central heating circuit a safety thermal limit switch will operate and switch the boiler off disabling all functions.

The cause of the overheat should be investigated.
The safety limit switch is on the right underside of the boiler and will require re-setting manually by following the procedure shown:



Unscrew & remove the black cap and push the small pin behind it until you hear a click.

The limiter will not re-set until the temperature in the heating header drops below 100°C or 80°C if the boiler is adapted for radiant floor heating.

7.3 HEATING SYSTEM FLOW SWITCH – E3 ERROR & SYSTEM BY-PASS REQUIREMENTS

If the error E3 appears on the display, the flow switch has detected insufficient water flow in the heating circuit and heat production is disabled to protect the boiler from overheating.

A 7l/min flow rate is required. The possible causes for this condition are:

- Insufficient water pressure in the heating system requiring re-filling to 1.5bar
- Pump not circulating or seized. Check as shown (Sect 5.5)
- Blockage in heating circuit from debris or a foreign object in the boiler or pipe-work.
- Insufficient flow rate caused by restrictions such as insufficient size pipe-work, too many bends or isolation valves with restricted bore.
- Closed radiator valves (Thermostatic). It may be sufficient to maintain one radiator with permanently open valves however it is recommended the fitting of an automatic by-pass valve. This type of valve modulates open when necessary to ensure that the appropriate minimum flow rate is maintained through the boiler, at all other times it is closed thus preventing unnecessary and wasteful circulation through the bypass and the boiler.

7.4 CHECKING RATED HEAT OUTPUT

It is possible to check the actual heat power output configuration that is set on the boiler and also the modulated operating output at that moment.

Press the button for three seconds.

The heating display will show 

followed by the temperature value of the return probe of the heating circuit.

On pushing button the display will show 

followed by the value of the limited maximum output according to the tables (see 5.1).

On pushing button again the display will show 

followed by the actual modulated output power at that moment.

8 MAIN COMPONENTS

Heating expansion vessel 6L	ref. 60091510	¾" heating flow detector	ref. 60100805
Insulated heating header tank	ref. 60101700	0-4 bar pressure gauge	ref. 60100820
Circulation pump RKC130	ref. 60190076	100°C thermal limiter	ref. 60101860
Power PCB MAC with support	ref. 60105595	Automatic purge	ref. 60091280
Main electronic PCB MAC	ref. 60105585	3 bar central heating relief valve	ref. 60100840
Temperature sensor white	ref. 60105600	Keyboard MAC	ref. 60105555
Temperature sensor black	ref. 60105605		
15 kW heating resistance & joint 140	ref. 60100750		
18 kW heating resistance & joint 140	ref. 60100760		

9 MAINTENANCE & CARE

Gabarrón electric boilers do not require any special maintenance for a prolonged and trouble-free life however the following points should be observed.

- Check and maintain the heating system pressure between 1 & 1.5 bar when cold. Frequent re-filling of the system could cause scaling and corrosion and should be avoided. Regular pressure loss could indicate a leak and should be investigated promptly.


CAUTION: Under no circumstances should the boiler be switched on when the system is dry.

- Keep the ventilation openings on the boiler clear to ensure correct operation and protect from overheating. Do not place or store objects on the boiler.

- Protect against freezing by ensuring power is maintained to the boiler at all times. In dwellings frequently un-occupied or at risk of freezing an appropriate anti-freeze can be added to the heating system at a concentration of not more than 30% by volume. Otherwise it is recommended to isolate the power and completely drain the heating and hot water systems.

- The outer case can be cleaned with a damp cloth having first isolated the boiler from the mains. Do not use solvents or abrasive cleaners.

10 ENVIRONMENTAL INFORMATION

Gabarrón boilers are manufactured within a certified environmental management system. From the design stage, all the production phases are performed taking into account the most rigorous environmental requirements. For example, the selection of materials involves guaranteeing their biodegradability, re-use and recycling.

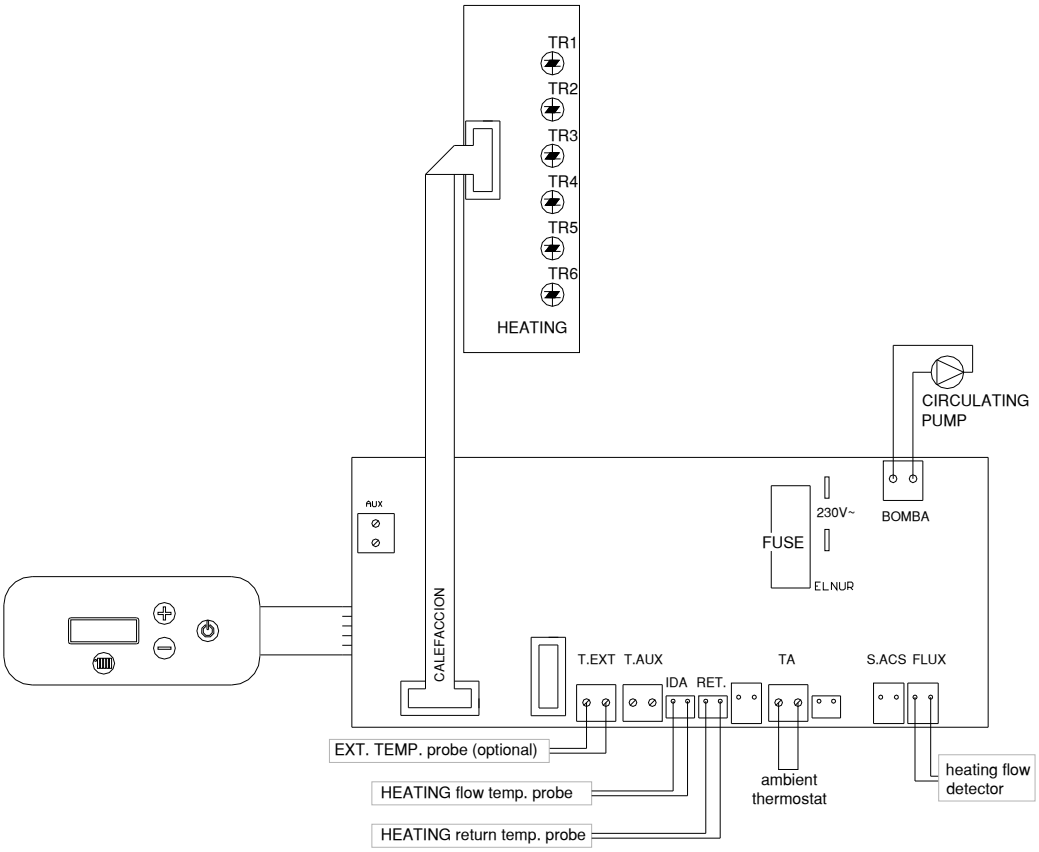
When this boiler's long, useful life is over; it must be handed in to an electrical equipment collection point for proper recycling. By ensuring that this product is correctly disposed of, you will help to avoid any possible negative effects on the environment and public health that could occur if this product is not properly handled. To obtain more detailed information on the recycling of this product, contact your local authority, your waste disposal service or the shop where you purchased the product.

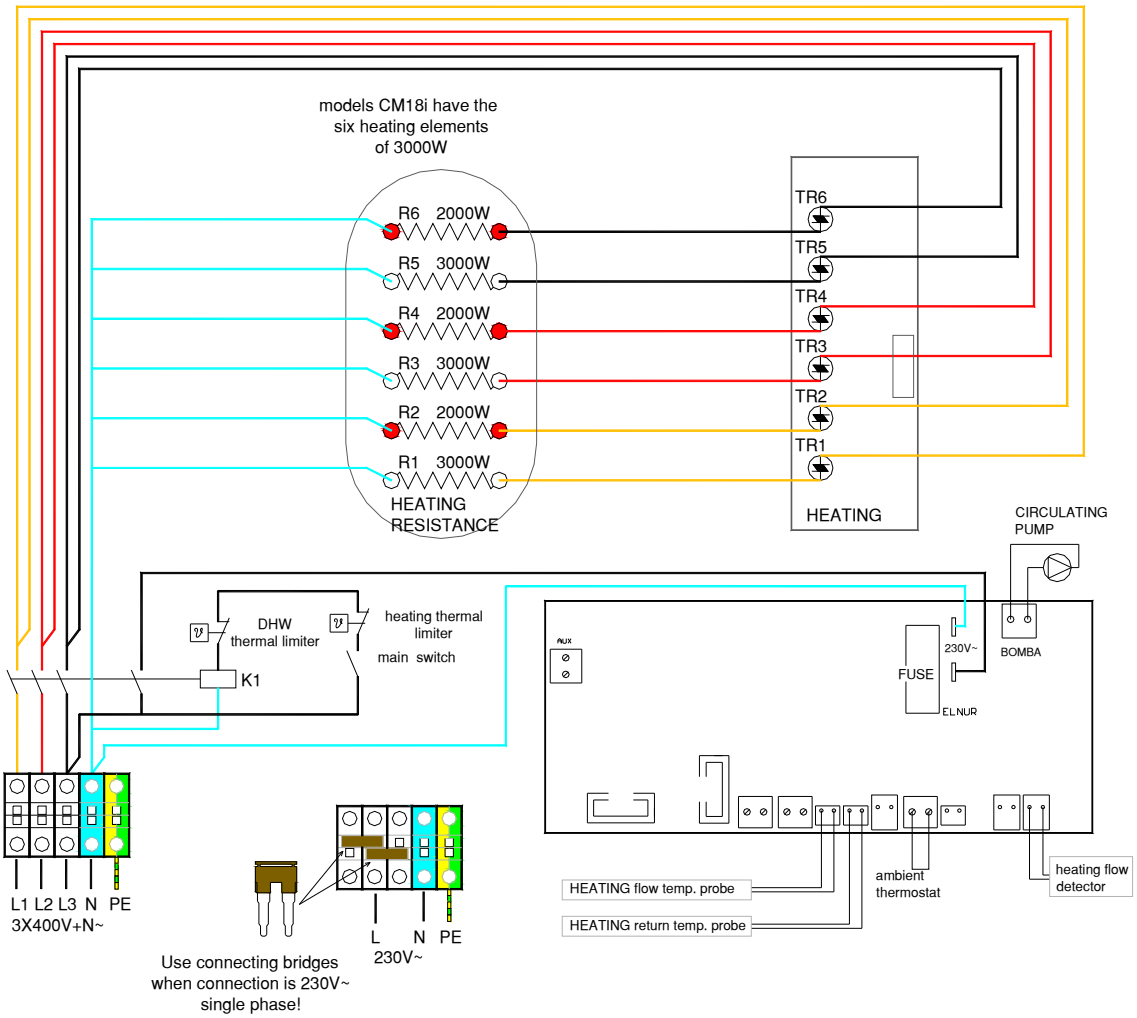
These regulations only apply in EU member countries.

11 TECHNICAL DATA		MAS15	MAS18
Frequency	Hz	50	50
Connection 3x400V+N~		◆	◆
Output limited to **18kW**; Maximum intensity	A	-	26.0
Output limited to **15kW**; Maximum intensity	A	21.7	26.0
Output limited to **13kW**; Maximum intensity	A	21.7	-
Output limited to **12kW**; Maximum intensity	A	21.7	26.0
Output limited to **11kW**; Maximum intensity	A	21.7	-
Output limited to **10kW**; Maximum intensity	A	21.7	-
Output limited to **9kW**; Maximum intensity	A	13.0	13.0
Output limited to **8kW**; Maximum intensity	A	13.0	-
Output limited to **7kW**; Maximum intensity	A	13.0	-
Output limited to **6kW**; Maximum intensity	A	13.0	13.0
Output limited to **5kW**; Maximum intensity	A	13.0	-
Output limited to **4kW**; Maximum intensity	A	13.0	-
Output limited to **3kW**; Maximum intensity	A	13.0	13.0
Connection 230V~ single phase		◆[1]	◆[1]
Nominal maximum intensity **18kW**	A	-	78.3[1]
Nominal maximum intensity **15kW**	A	65.2[1]	65.2[1]
Maximum converted intensity at **13kW**	A	56.5[1]	-
Maximum converted intensity at **12kW**	A	52.2	52.2
Maximum converted intensity at **11kW**	A	47.8	-
Maximum converted intensity at **10kW**	A	43.5	-
Maximum converted intensity at **9kW**	A	39.1	39.1
Maximum converted intensity at **8kW**	A	34.8	-
Maximum converted intensity at **7kW**	A	30.4	-
Maximum converted intensity at **6kW**	A	26.1	26.1
Maximum converted intensity at **5kW**	A	21.7	-
Maximum converted intensity at **4kW**	A	17.4	-
Maximum converted intensity at **3kW**	A	13.0	13.0
Weight	kg	32	32
Insulated steel heater header	No CFC	◆	◆
Stainless steel plated resistance elements INCOLOY800	Heating	◆	◆
6 L expansion vessel		◆	◆
Electronic regulation of heater modulation		◆	◆
Digital display		◆	◆
0-4 bar pressure gauge		◆	◆
Accelerator pump		◆	◆
Automatic purge		◆	◆
TRIACS silent power switches		◆	◆
Heating flow detector		◆	◆
100°C heating temperature limiter		◆	◆
3 bar heating relief valve		◆	◆
Ambient thermostat intake		◆	◆
Space heating energy efficiency class		D	D
Rated heat output	kW	15	18
Annual electricity consumption (AEC)	kWh	2806	2806
Space heating energy efficiency (η_s)	%	37	37
Sound power level (L_{WA})	dB	36	36

◆ included[1] using connecting bridge included. The standard configuration of the boiler only allows a maximum of 12kW when connected SINGLE-PHASE 230V~.

12 WIRING DIAGRAMS





NOTAS / NOTES

DECLARACION DE CONFORMIDAD

De acuerdo con la norma ISO / IEC 17050-1

DECLARATION OF CONFORMITY

According to the Standard ISO / IEC 17050-1

Nº 6610000

Nombre del fabricante : ELNUR, S.A.
Manufacturer's name :

Dirección del fabricante : ELNUR, S.A.
Manufacturer's address : Travesía de Villa Esther, 11
28110 Algete, Madrid, Spain

Declara que el producto : Caldera modulante digital sólo calefacción "MAS"

Declares, that the product : "MAS" *Heating digital modulating boiler*

Marca : GABARRÓN
Trade Mark :

Modelos : MAS15, MAS18
Models :

ha sido fabricado conforme a las especificaciones técnicas del producto y cumple en todo las Normas vigentes, en particular:

has been manufactured to the technical specifications of the product and conforms in all respects to the relevant standards and regulations in force and especially to :

Seguridad : EN 60335-1:2012+A11:2014
Safety : EN 60335-2-35:2002+A1:2007+A2:2011
EN 50106:2008

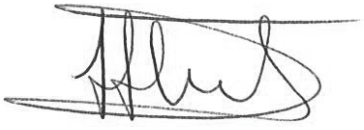
EMC : EN 55014-1:2006+A1:2009+A2:2011
EN 55014-2:1997+A1:2001+A2:2008
EN 61000-3-2:2006+A1:2009+A2:2009
EN 61000-3-3:2008

Información adicional :
Additional information :

El producto aquí citado se halla en conformidad con la Directiva de Baja Tensión 2014/35/UE y la Directiva de EMC 2014/30/UE y lleva el marcado CE.
Cualquier uso que no esté de acuerdo con las instrucciones y/o cualquier cambio al aparato invalidarán esta declaración de conformidad.

The product herewith complies with the requirements of the Low Voltage Directive 2014/35/UE and the EMC Directive 2014/30/UE and carries the CE mark.
Any use not according to the instructions and/or any change to the appliance will invalidate this declaration of conformity.

Algete, 21 de Julio de 2016
Place, Date



Alberto Fernández
Director Gerente
ELNUR, S.A.

El símbolo en el producto o en su embalaje indica que este producto no se puede tratar como desperdicios normales del hogar. Este producto se debe entregar al punto de recolección de equipos eléctricos y electrónicos para reciclaje. Al asegurarse de que este producto se deseche correctamente usted ayudará a evitar posibles consecuencias negativas para el ambiente y la salud pública, lo cual podría ocurrir si este producto no se manipula de forma adecuada. Para obtener información más detallada sobre el reciclaje de este producto, póngase en contacto con la administración de su ciudad, con su servicio de desechos del hogar o con la tienda donde compró el producto. Estas disposiciones solamente son válidas en los países miembros de la UE

The symbol on the product or in its packaging indicates that this product may not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product. These instructions are only valid in the EU member states.

Fabricado por / Manufactured by

ELNUR S.A.
Travesía de Villa Esther, 11
28110 Algete - Madrid

La Grand E.V.O

Sydneystraat 90
3047BP Rotterdam

www.lagrand-evo.nl

ISO 9001 ISO 14001

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