

ARES 440 TEC ERP

ARES 550 TEC ERP

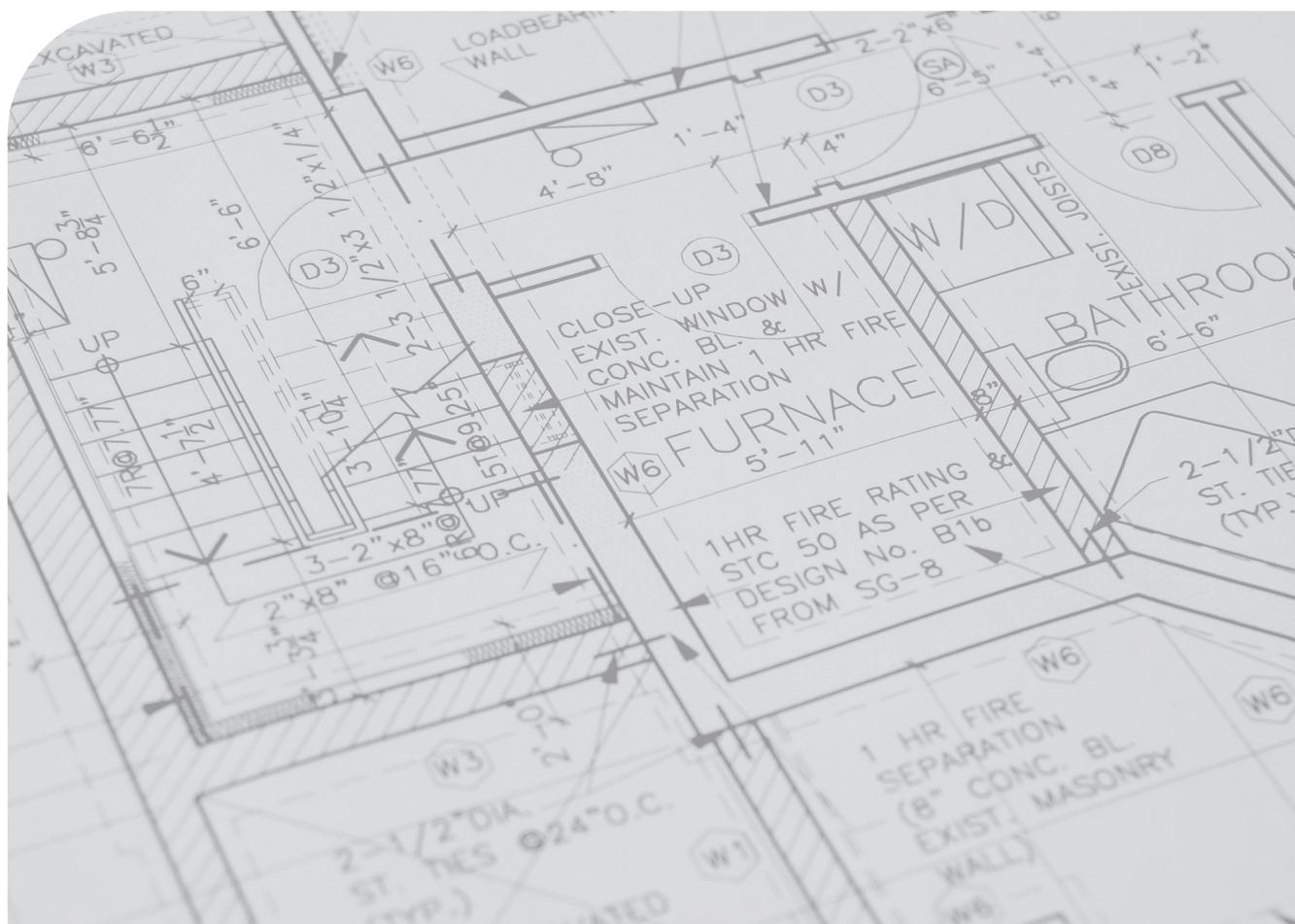
ARES 660 TEC ERP

ARES 770 TEC ERP

ARES 900 TEC ERP

IE**Instructions and
recommendations**

1.043689ENG



Warning this manual contains the exclusive instructions for use for professionally qualified installers and/or maintenance technicians, in compliance with laws in force.
The user in charge of the system is NOT authorised to work on the boiler.
The manufacturer will not be held liable in the case of damage to people, animals or property due to the failure to observe the instructions contained in the manuals supplied with the boiler.

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Instructions on how to correctly dispose of the product.

At the end of its life, this appliance must not be disposed of as mixed municipal waste.

It is mandatory to separate this type of waste so that the materials making up the appliance can be recycled and reused. Contact authorised operators for disposal of this type of appliance. Incorrect management of waste and its disposal has potential negative effects on the environment and on human health. The symbol on the appliance represents the prohibition of disposing of the product as mixed municipal waste.

The company **IMMERGAS S.p.A.**, with registered office in via Cisa Ligure 95 42041 Brescello (RE), declares that the design, manufacturing and after-sales assistance processes comply with the requirements of standard **UNI EN ISO 9001:2015**.

For further details on the product CE marking, request a copy of the Declaration of Conformity from the manufacturer, specifying the appliance model and the language of the country.

The manufacturer declines all liability due to printing or transcription errors, reserving the right to make any modifications to its technical and commercial documents without forewarning.



1 GENERAL INFORMATION

1.1 GENERAL WARNINGS

The instruction handbook is an integral and essential part of the product and must be kept safe by the user.

Read the warnings contained in the handbook carefully, as they provide important instructions regarding installation, user and maintenance safety.

Keep the handbook safe for future consultation.

The appliance must be installed and maintained in accordance with regulations in force, pursuant to the instructions of the manufacturer, the state of the art and by authorised and qualified personnel, in accordance with the law.

Domestic hot water production systems **MUST** be built entirely with compliant materials.

Professionally qualified personnel means staff with specific technical skills in the sector of heating system parts for civil use, hot water production for domestic use and maintenance. This personnel must have the authorisations required by legislation in force.

Incorrect installation or poor maintenance can cause injury to persons and animals and damage to objects, for which the manufacturer is not liable.

Before carrying out any cleaning or maintenance operations, cut the appliance off from the power mains by acting on the switch on the system and/or using the cut-off devices.

Do not obstruct the intake/exhaust pipe terminals.

In case of breakdown and/or poor operation of the appliance, switch it off, and do not attempt in any way to repair it or intervene directly. Only contact an authorised company that has been authorised in accordance with the law.

Any repairs to the products must be carried out by an authorised company only, using original spare parts only. Failure to observe the above can jeopardise the safety of the appliance and will void the warranty.

The guarantee the efficiency of the appliance and its correct operation it is essential for authorised company to carry out annual maintenance.

If the appliance is put out of use for downtime, any part that is susceptible to posing a potential source of danger must be made safe. Before re-commissioning an appliance that has been put out of use, proceed to washing the domestic hot water production system, making water flow through it for the amount of time required to change the water completely.

If the appliance is sold or transferred to another owner or if the owner moves, leaving the appliance behind, always ensure the handbook accompanies the appliance so that it may be consulted by the new owner and/or installer.

All appliances with optionals or kits (including electric) must only use original spare parts.

The appliance must only be employed for its expressly foreseen use. Any other use must be considered improper and therefore dangerous.



ATTENTION!

The heat unit must be installed so as to avoid, under the envisioned operating conditions, the liquid contained in it from freezing and avoid exposing the command and control parts to temperatures below -15°C and over +40°C.

The heat unit must be protected from climatic/environmental variations by:

- insulating the hydraulic and condensation exhaust pipes
- adopting specific anti-freeze products in the hydraulic system.

1.2 SYMBOLS USED IN THE MANUAL

When reading this manual, pay special attention to the parts marked with these symbols:



DANGER!
Serious danger to safety and life



ATTENTION!
Possibly dangerous situation for the product and environment



NOTE!
Tips for the user



DANGER!
Scalding hazard!



OBLIGATION!
Wear protective gloves

1.3 COMPLIANT USE OF THE APPLIANCE



The ARES Tec ErP appliance was built based on the current technical level and recognised technical safety rules. Nevertheless, following improper use the safety and life of the user or other people may be exposed to danger, i.e. damage to the appliance or other objects.

The appliance is designed for operation in hot water circulating heating systems.

Any other use is considered improper.

Immergas will not be held liable for any damage resulting from improper use.

Any use in accordance with the envisioned purposes includes the strict observance of the instructions in this manual.

1.4 INFORMATION FOR THE SYSTEM MANAGER



The user must be instructed in the use and operation of his/her heating system, in particular:

- Deliver these instructions to the user, as well as the other documents relative to the appliance contained in the packaging in an envelope. **The user must keep this documentation safe so that it is available for future consultation.**
- Inform the user of the importance of aeration vents and the flue exhaust system, highlighting how essential they are and how it is strictly forbidden to change them.
- Inform the user on how to control the water pressure in the system as well as the operations required to restore it.
- Inform the user on how to correctly regulate the temperature, control units/thermostats and radiators in order to save energy.
- Remember that in compliance with the laws in force, the equipment must be inspected and maintained according to the requirements and on the basis set down by the manufacturer.
- If the appliance is sold or transferred to another owner or if the owner moves, leaving the appliance behind, always ensure the manual accompanies the appliance so that it may be consulted by the new owner and/or installer.

The manufacturer will not be held liable in the case of damage to people, animals or property due to the failure to observe the instructions contained in this manual.



GENERAL INFORMATION

1.5 SAFETY WARNINGS



ATTENTION!

The appliance must not be used by children.

The appliance can be used only by adults who have read the instruction manual for the user / manager with care.

Children must be supervised to ensure they do not play or tamper with the appliance.



ATTENTION!

Installation, adjustment and maintenance of the appliance must be carried out by professionally authorised company, in compliance with regulations and provisions in force, as incorrect installation can cause damage to people, animals and property, for which the manufacturer will not be held liable.



DANGER!

NEVER attempt to carry out maintenance or repairs on the boiler of your own initiative.

Any work must be carried out by professionally qualified staff; we advise you to stipulate a maintenance contract.

Poor or irregular maintenance can compromise the operational safety of the appliance and cause damage to people, animals and property for which the manufacturer will not be held liable.



Changes to parts connected to the appliance (after installation of the appliance)

Do not make changes to the following elements:

- to the boiler
- to the gas, air, water and power supply lines
- to the flue pipe, safety valve and exhaust pipe
- to the constructive elements that affect the operational safety of the appliance.



ATTENTION!

To tighten or loosen the screw-attached fittings, use suitable wrenches only.

Improper use and/or unsuitable tools can cause damage (for ex. water and gas leaks).



ATTENTION!

Instructions for appliances running on propane gas

Make sure that the gas tank has been deaerated prior to installing the appliance.

For a thorough deaeration of the tank contact the liquid gas supplier and in any case authorised company, in accordance with the law. Ignition problems can arise if the tank is not thoroughly deaerated.

In this case contact the liquid gas tank supplier.



Smell of gas

In case of the smell of gas observe the following safety instructions:

- do not use electric switches
- do not smoke
- do not use the telephone
- shut off the gas cut-off valve
- aerate the room where the gas leak occurred
- notify the gas supply company or a company specialised in the installation and maintenance of heating systems.



Explosive and easily flammable substances

Do not use or deposit explosive or easily flammable materials (for ex. petrol, paints, paper) in the room where the appliance is installed.



ATTENTION!

Do not use the appliance as a base to support any object. Specifically, do not place receptacles containing liquids (Bottles, Glasses, Containers or Detergents) on top of the boiler. If the appliance is installed inside a box, do not insert or place other objects inside it



1.6 TECHNICAL DATA PLATE

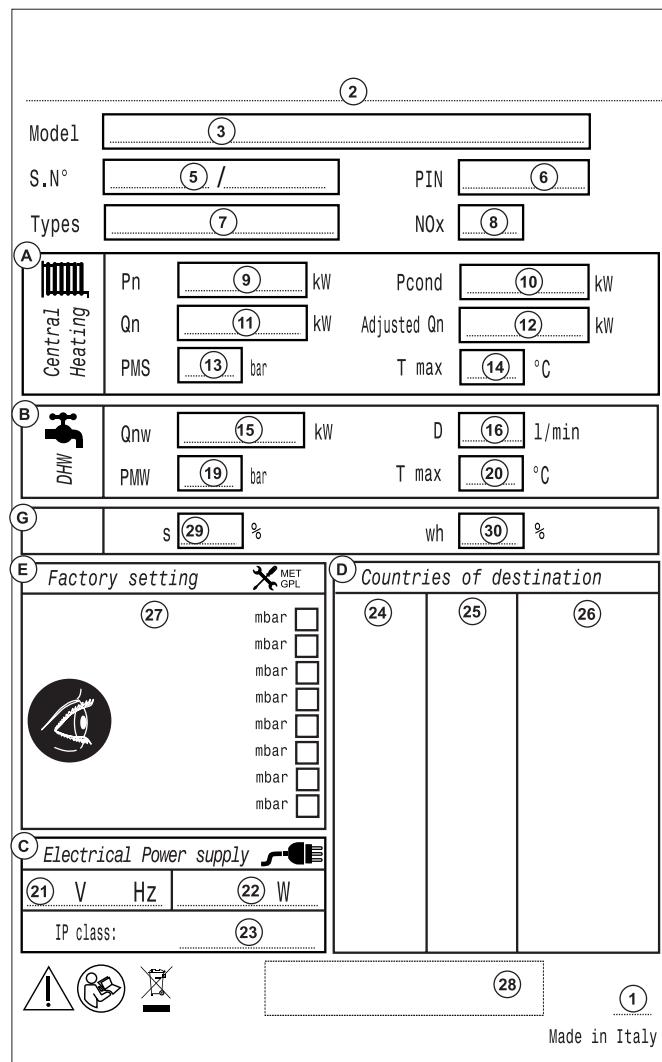
CE Marking

certifies conformity of the appliance with the essential safety requirements set down by the directive and applicable European regulations, and operation in compliance with the technical standards of reference.

The CE marking is applied on each appliance with a label.

The CE declaration of conformity, released by the Manufacturer in compliance with the international regulations in force, can be found in the documents enclosed with the product.

The technical data plate is located under the casing, on the front cross member. There is a DUPLICATE of the plate near the temperature control unit.



KEY:

- 1 = CE supervisory body
- 2 = Type of boiler
- 3 = Boiler model
- 5 = (S.N°) Serial Number
- 6 = P.I.N. Product Identification Number
- 7 = Types of approved flue exhaust configurations
- 8 = (NOx) NOx class

A = Characteristics of the heating circuit

9 = (Pn) Useful heat output

10 = (Pcond) Useful output in condensation

11 = (Qn) Maximum heat input

12 = (Adjusted Qn) Adjusted for useful heat input

13 = (PMS) Max. central heating operating pressure

14 = (T max) Max. central heating temperature

A = Characteristics of the DHW circuit

15 = (Qnw) Nominal heat input in DHW mode (if different from Qn)

16 = (D) Specific flow rate for DHW according to EN625-EN13203-1

19 = (PMW) Max. DHW operating pressure

20 = (T max) Max. DHW temperature

C = Electrical features

21 = Electric power supply

22 = Consumption

23 = Degree of protection

D = Countries of destination

24 = Direct and indirect countries of destination

25 = Gas category

26 = Supply pressure

E = Factory settings

27 = Adjusted for gas type X

28 = Space for national brands

G = ErP

29 = Seasonal central heating energy efficiency

30 = Seasonal water heating energy efficiency.



GENERAL INFORMATION

1.7 WATER TREATMENT



Treating the supply water allows you to prevent problems and maintain the functionality and efficiency of the generator over time.



The ideal pH value of the water in the central heating system must be:

VALUE	MIN	MAX
PH	6,5	8
HARDNESS (°fr)	9	15



To minimise corrosion, it is essential to use a corrosion inhibitor. In order for it to work efficiently, the metal surfaces must be clean.



ATTENTION!
Any damage caused to the boiler, due to the formation of build-up or corrosive water, will not be covered by the warranty.



ATTENTION!
The models only equipped with central heating are NOT suitable for hot water production for human consumption (M.D. 174/2004).

1.8 BOILER FROST PROTECTION

Activated by default

This protection only cuts in when the electric and gas supply are present. If the electric or gas supply are disconnected and 11 (SM) detects a temperature of between 2 and 5°C when the supply is restored, the appliance responds as indicated in the table below, in pos.2.



Antifreeze products with an inhibitor for central heating systems (specific for multmetal) can be used to ensure efficient protection of the central heating against freezing.



Do not use antifreeze products for car engines since these can damage the water gaskets.

POS	ANTIFREEZE FUNCTION				
	Supply		11 - SR (*)	Status of antifreeze function	Actions
	Electric	Gas			
1	ON	ON	< 7°C	ON	Burner and Pump ON until T > 15°C
2	ON	OFF	< 5 ÷ 5°C	OFF	INDICATION OF FAULT CODE 16 (see Par. 4.4 ERROR CODES). Ignition inhibited.
	OFF	ON		OFF	Ignition inhibited.
	OFF	OFF		OFF	Ignition inhibited.

(*) SR sensor, see Par. 2.2



2 TECHNICAL CHARACTERISTICS AND DIMENSIONS

2.1 TECHNICAL CHARACTERISTICS

- Heat generator, to heat Low Nox condensation gas
- Comprised of a heat module designed to operate on its own or in a set
- Can be set up directly outside (IP X5D)
- Low water content
- High response speed to load changes
- Single flue exhaust that can be positioned on 3 sides
- Unified flow and return hydraulic manifolds
- Comprised of 2 or more heating elements (between 2 and 7), aluminium/silicon/magnesium casting
- Including total irradiation premixing modulating burners
- None of the heating elements have hydraulic cut-off devices
- Single gas supply pipe
- Modulated power between 25 ÷ 108 kW/element.

TEMPERATURE CONTROL DEVICES:

- ROOM NTC sensor (every heating element)
- Room Limit Thermostat (every heating element)
- Flow NTC sensor (General)
- Return NTC sensor (General)
- Approved safety thermostat
- BCM global flow probe.

OTHER SAFETY DEVICES according to the R COLLECTION.

POP-UP control panel composed of:

- ON-OFF switch
- HSCP boiler thermoregulation/manager
- BCM (internal cascade management board)
- Protection fuses
- Fan air pressure switch
- Condensation water level sensor
- Gas pressure switch
- Exhaust pressure switch (anti-obstruction).

- The entire heating unit is equipped with global temperature control NTC sensors on the flow and return manifolds.

- Integral insulation with non-allergenic synthetic wool.
- Total premix burner, modulating, with "metal foam" radiation combustion chamber. Premixing in the fan. Automatic separating backflow diaphragm from the combustion chamber.
- Sound emissions at maximum power below 52 dBA for models 100-350, 54 dBA for models 440-770 and 56 dBA for 900.
- Operation during heating: determining the instantaneous power through a control microprocessor, with preset comparison parameters between requested temperature (or calculated by the outdoor thermoregulation) and global flow temperature.

- Logic of operation:
 - Possibility of controlling the power of the single heating elements for calibration and/or assistance with reserved access code.
 - Domestic hot water production using a priority NTC probe, for control by a storage tank loading pump or diverter valve, is done with an SHC module that is supplied with the boiler.
 - Possibility of controlling the power of the single heating elements.
 - Heat request control: temperature setpoint and modulation level.
 - Monitoring the state of operation and temperatures.
 - Alarm notification.
 - Parameter setting.
 - Control relay to switch on a pump at a fixed speed.
 - Analogue 0÷10V output to control a modulating pump.

- Emergency operation: this allows you to avoid the system from stopping due to an interruption in communication with the adjusting system or possible remote management of the control unit:
- Emergency temperature with maximum power 100%.
- Alarm management.
- Alarm reset input.
- Alarm notification Relay.
- Condensation collection tray with stainless steel exhaust trap.
- Easily removable integral paneling comprised of oven-painted steel panels suitable for outdoor installation.
- Condensation collection tray with stainless steel exhaust trap and flue chamber.
- Incorporated deaerator.

The request for heat can be generated by the HSCP thermoregulation/manager or alternatively by the BCM (Boiler controller).

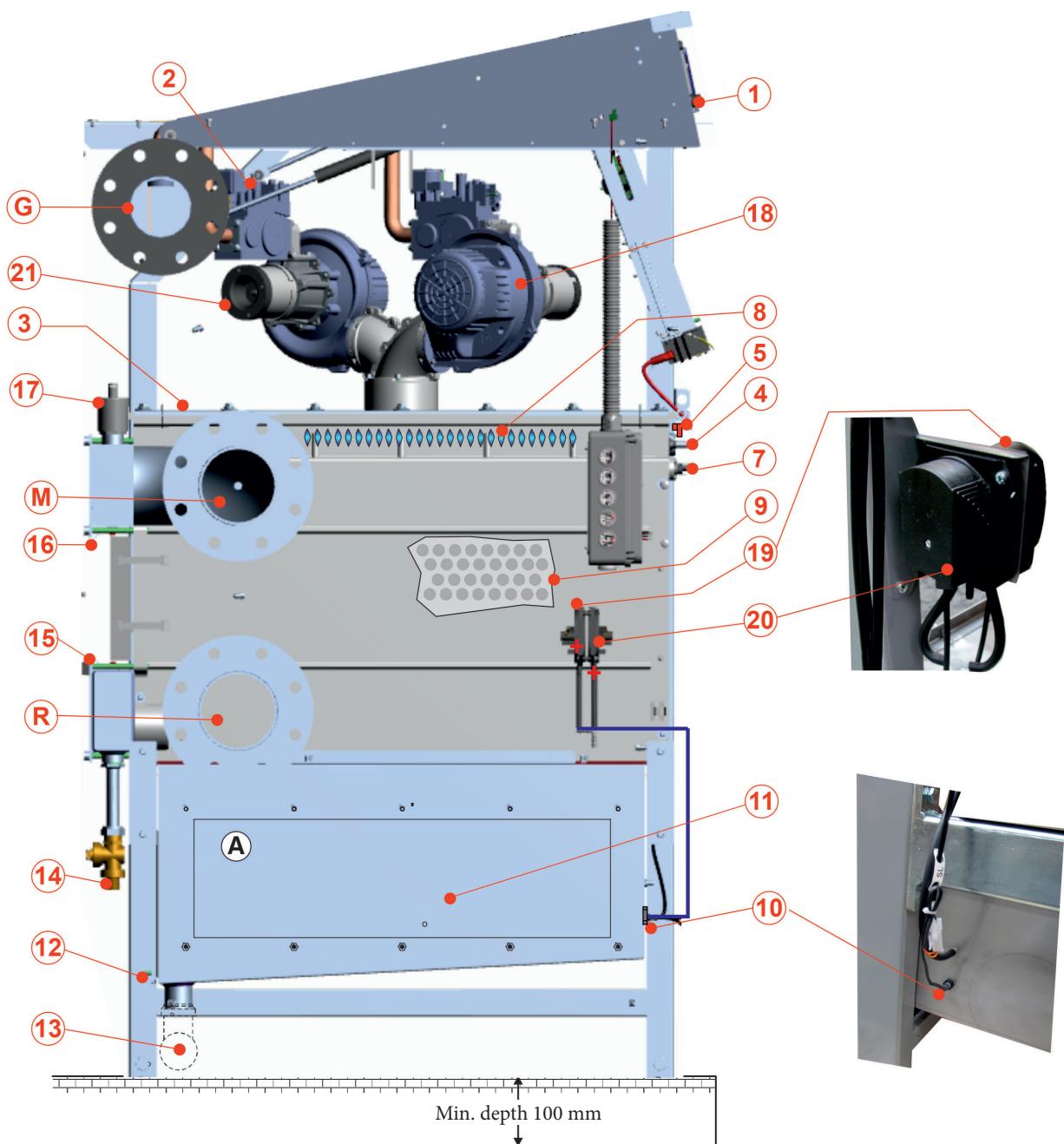
The management logic envisions simultaneous operation of the maximum number of heat elements, so as to always obtain the maximum efficiency. Since it guarantees the maximum exchange area based on the delivered power. The elements are made to operate so as to equally divide the operating time.

The hot water that is produced is pushed by the pump located on the return of the primary ring to the flow of the hydraulic separator. From here a second pump (system - see suggested diagrams) will distribute to the various utilities. From the system, return the cooled water is taken in by the pump on the return, through the hydraulic separator, to start the cycle towards the generator again.



TECHNICAL CHARACTERISTICS AND DIMENSIONS

2.2 VIEW OF MAIN PARTS



KEY			
N°	Error code	Wiring diagram	Description
1		HSCP	Control Panel
2		VG	Gas Valve
3			Burner Cover
4		E. ACC.	Ignition
5		E. RIL.	Ionisation
7		TL	Limit Thermostat
8			Burner
9			Silicon Aluminium Exchanger
10		SL	Level Sensor
11			Condensation Collection Pan / Flue Fitting
12			Frame

13			Condensate Drain Outlet
14			Draining Valve
15		SRR	Return Global Ntc
16		SMG	Probe Flow Global Ntc
17			Automatic Air Bleed Valve
18			Fan
19		PF min	Minimum Flue Pressure Switch
20		PF	Flue Pressure Switch
21			Fan Filter



flue outlet LEFT, RIGHT, REAR side

flow LEFT side

return LEFT side

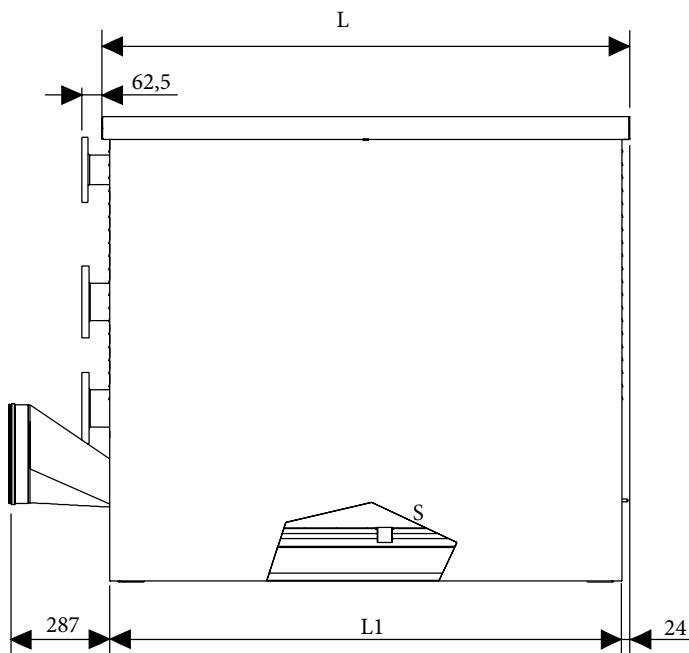
Gas inlet LEFT side

BCM: under the front casing

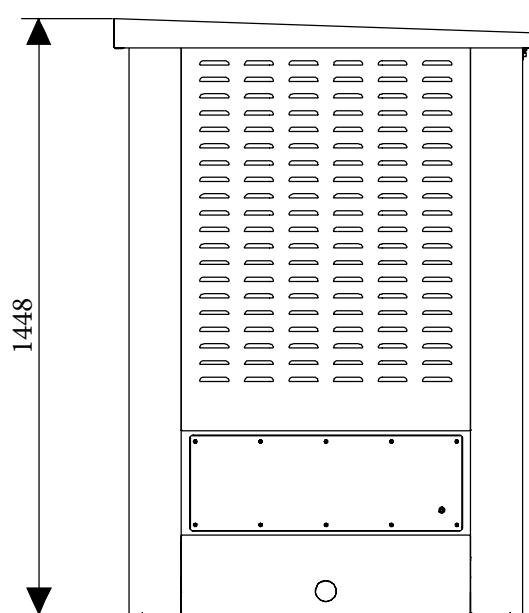
TECHNICAL CHARACTERISTICS AND DIMENSIONS

2.3 DIMENSIONS

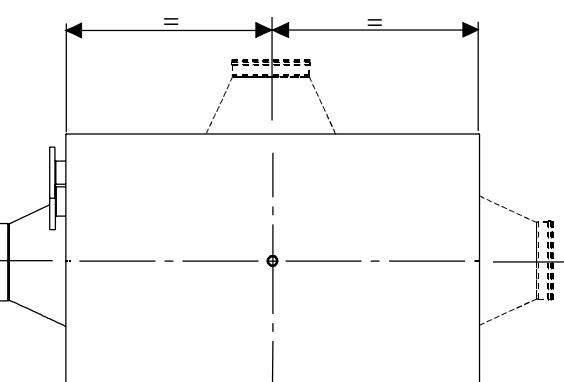
FRONT VIEW



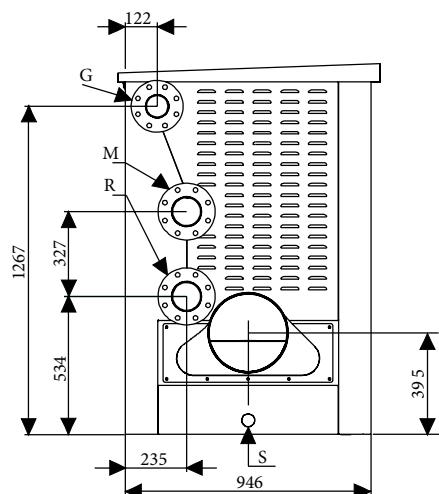
RIGHT SIDE VIEW



TOP VIEW



LEFT SIDE VIEW



Flue outlets:

Left side (supply condition)

Right side

Rear side

Dimensions	Unit	440	550	660	770	900
Heating elements	n°	4	5	6	7	8
Height	mm	1448	1448	1448	1448	1448
Width "L"	mm	1087	1355	1355	1623	1623
Width "L1"	mm	1039	1307	1307	1575	1575
Depth	mm	946	946	946	946	946
Attachment sizes						
G Gas fitting	mm (inch)	80 (3)	80 (3)	80 (3)	80 (3)	80 (3)
F System flow	mm (inch)	100 (4)	100 (4)	100 (4)	100 (4)	100 (4)
R System return	mm (inch)	100 (4)	100 (4)	100 (4)	100 (4)	100 (4)
Flue fitting	mm	250	250	300	300	300
Condensate drain	mm	40	40	40	40	40



TECHNICAL CHARACTERISTICS AND DIMENSIONS

2.4 OPERATING DATA / GENERAL CHARACTERISTICS

For the adjustment data: NOZZLES - PRESSURES - DIAPHRAGMS - FLOW RATES refer to the paragraph ADAPTATION FOR USE WITH OTHER GASES.



Our appliances are built to work with natural gas (G20), LPG and mixtures of methane and hydrogen up to 20% in volume (20% H₂NG). Power supply pipes must be the same as or larger than the appliance fitting.

ARES Tec ErP		440	550	660	770	900
Boiler category		II _{2H3P}				
Modulation ratio		1 : 19.6	1 : 24.5	1 : 29.4	1 : 34.3	1 : 39.2
Nominal heat input on L.C.V. Qn	kW	432	540	648	756	864
Minimum heat input on L.C.V. Qmin	kW			22		
Nominal heat input on L.V.C. Qn with gas 20% H ₂ NG	kW	392.8	491	589.2	687.4	785.6
Minimum heat input on L.V.C. Qmin with gas 20% H ₂ NG	kW			20.4		
Nominal effective power (Tr 60 / Tf 80 °C) Pn	kW	424.3	530.4	636.5	742.6	849.0
Minimum effective power (Tr 60 / Tf 80 °C) Pn min	kW			20.6		
Nominal effective power (Tr 30 / Tf 50 °C) Pcond	kW	445.0	557.8	670.1	783.2	900.3
Minimum effective power (Tr 30 / Tf 50 °C) Pcond min	kW			23.9		
Efficiency at nominal power (Tr 60 / Tf 80°C)	%			98.2		
Efficiency at minimum power (Tr 60 / Tf 80°C)	%			93.5		
Efficiency at nominal power (Tr 30 / Tm 50°C)	%			104.0		
Efficiency at minimum power (Tr 30 / Tm 50°C)	%			109.0		
Efficiency at 30% of the load (Tr 30°C)	%	107.3	107.5	108.3	107.8	107.6
Combustion efficiency at nominal load	%			97.8		
Combustion efficiency at a reduced load	%			98.5		
Losses from operating burner casing (Qmin)	%			5.04		
Losses from operating burner casing (Qn)	%			0.1		
Flue temperature at net of Tf-Ta (min)(*)	°C			31.0		
Flue temperature at net of Tf-Ta (max)(*)	°C	46.7	46.7	46.7	46.7	45.8
Maximum permitted temperature	°C			100		
Maximum operating temperature:	°C			90		
Mass flue flow rate (min)	kg/h			37		
Mass flue flow rate (max)	kg/h	740	925	1111	1296	1515
Air excess	%			28.2		
Chimney losses with burner in operation (min)	%			1.5		
Flue losses with burner in operation (max)	%	2.58	2.53	2.51	2.58	2.58
Minimum pressure of heating circuit	bar			0.5		
Maximum pressure of heating circuit	bar			6.0		
Water content	l	67	80	94	108	122
Methane gas consumption G20 (supp.press, 20 mbar) at Qn	m ³ /h	45.68	57.10	68.52	79.94	91.36
Methane gas consumption G20 (supp.press, 20 mbar) at Qn	m ³ /h			2.33		
Gas consumption G25 (supp.press, 20/25 mbar) at Qn	m ³ /h	53.13	66.41	79.69	92.97	106.25
Gas consumption G25 (supp.press, 20/25 mbar) at Qn	m ³ /h			2.71		
Propane gas consumption (supp.press, 37/50 mbar) at Qn	kg/h	33.53	41.92	50.30	58.68	67.01
Propane gas consumption (supp.press, 37/50 mbar) at Qn	kg/h			1.71		
Maximum pressure available at flue base	Pa			100		
Max condensate production	kg/h	73.4	91.7	110	128.4	146.7
Emissions						
CO at maximum heat input with 0% O ₂	mg/kWh	58	58	56	61	58
NOx at maximum heat input with 0% O ₂	mg/kWh	40	40	38	36	37
NOx class				6		
(***) Sound pressure level	dBA	54	54	54	54	56
Electrical data						
Frequency/Power supply voltage:	V/Hz			230/50		
Absorbed power in normal operation	kW	0.626	0.783	0.940	1.096	1.252
(****) Absorbed power after Limit Thermostat trip	kW - A	0.968-4.4	1.210-5.5	1.452-6.6	1.692-7.7	1.936-8.8
Supply fuse	A (R)			6.3/10		
(**) Degree of protection	IP			X5D		



Room Temperature = 20°C

(*) Temperatures read with the device operating with flow 80°C / ret. 60°C

CO₂(min/max) See "NOZZLES - PRESSURES" table

Seasonal Energy Efficiency according to 2009/125 EEC (<=400Kw) ηs - see Table ErP

Losses at shutdown at ΔT 30°C - Pstb - see Table ErP

Electrical consumption in standby - Pstb - see Table ErP

(**) The IP X5D degree of protection is obtained with the lid lowered

(***) at a distance of 1 m in a free field.



(****) ATTENTION!

Dedicate a residual current device protection C16 only to the boiler without further loads
(see Par. 3.12 Electrical supply connection).



2.4.1 TECHNICAL DATA

ARES TEC ErP			440	550	660	770	900
Element	Symbol	Unit					
Useful heat output	Nominal output	kW	424	530	636	743	849
Room central heating seasonal energy efficiency	η_s	%	92	92	92	92	92
For boilers for central heating and combination boilers: useful heat output							
Useful heat output in high temperature mode (Tr 60 °C / Tm 80 °C)	P_4	kW	424.3	530.4	636.5	742.6	848.7
Efficiency at nominal heat output in high temperature mode (Tr 60 °C / Tm 80 °C)	η_4	%	88.5	88.5	88.5	88.5	88.5
Useful heat output at 30% nominal heat output in low temperature mode (Tr 30 °C)	P_1	kW	139.1	174.2	210.5	244.5	278.9
Efficiency at 30% nominal heat output in low temperature mode (Tr 30 °C)	η_1	%	96.7	96.9	97.6	97.1	96.9
Boiler with power range adjustment: YES / NO			NO	NO	NO	NO	NO
Auxiliary electricity consumption							
At full load	elmax	kW	0.626	0.783	0.940	1.096	1.252
At partial load	elmin	kW			0.054		
In standby mode	PSB	kW			0.020		
Other items							
Heat loss in standby	P_{std}	kW	0.2114	0.2114	0.2114	0.2114	0.2114
Emissions of nitrogen oxides ref. PCS	NOx	Mg/kWh			27		
Annual electrical consumption	QHE	GJ	1303	1633	1959	2286	2612
For mixed central heating appliances							
Stated load profile			-	-	-	-	-
Water central heating energy efficiency	η_{wh}	%	-	-	-	-	-
Daily electrical power consumption	Qelec	kWh	-	-	-	-	-
Daily fuel consumption	Qfuel	kWh	-	-	-	-	-
Sound power level indoors	Lwa	dB (A)	-	-	-	-	-
Annual electrical consumption	AEC	kWh	-	-	-	-	-
Annual fuel consumption	AFC	GJ	-	-	-	-	-
DHW seasonal efficiency class			-	-	-	-	-



TECHNICAL CHARACTERISTICS AND DIMENSIONS

2.4.2 DETERMINING THE PRIMARY CIRCUIT PUMP OR BOILER PUMP

The boiler pump must have head that can ensure circulator flow rates according to the circuit's Δt .

The pump is not an integral part of the boiler. It is advisable to choose a pump with a flow rate and head of approximately 2/3 of its typical curve.



The pumps must be determined by the installer or designer based on the data for the boiler and system.

ARES TEC 440 ErP

Maximum flow rate in l/h ($\Delta t = 15$ K)	24.326
Nominal requested flow rate in l/h ($\Delta t = 20$ K)	18.243

ARES TEC 770 ErP

Maximum flow rate in l/h ($\Delta t = 15$ K)	42.570
Nominal requested flow rate in l/h ($\Delta t = 20$ K)	31.926

ARES TEC 550 ErP

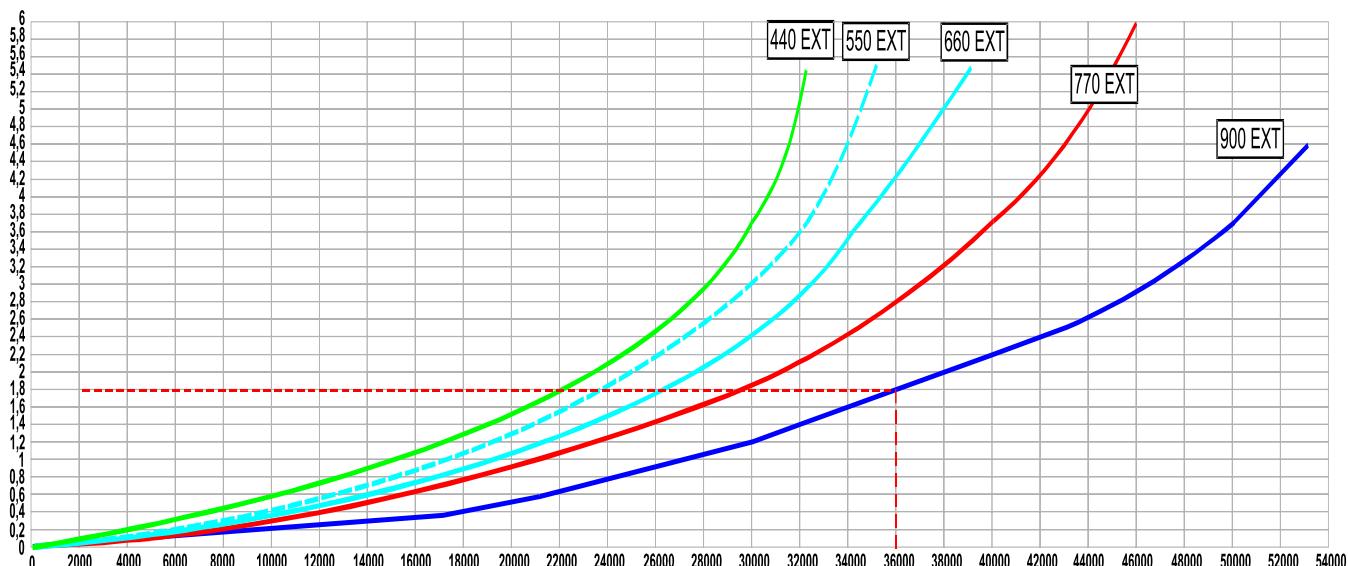
Maximum flow rate in l/h ($\Delta t = 15$ K)	30.404
Nominal requested flow rate in l/h ($\Delta t = 20$ K)	22.804

ARES TEC 900 ErP

Maximum flow rate in l/h ($\Delta t = 15$ K)	48.647
Nominal requested flow rate in l/h ($\Delta t = 20$ K)	36.487

ARES TEC 660 ErP

Maximum flow rate in l/h ($\Delta t = 15$ K)	36.487
Nominal requested flow rate in l/h ($\Delta t = 20$ K)	27.365



EXAMPLE:

For a Δt 20K, of an ARES Tec ErP 900 the maximum required flow rate is 10514 l/h.
From the head loss graph it is possible to deduce that the pump must ensure a head of at least 1.6 m/ H_2O .



NOTE:

It is always advisable to set up a hydraulic compensator between the boiler circuit and the system circuit. It becomes ESSENTIAL if the system requires greater flow rates than the maximum allowed by the boiler, i.e. Δt below 15K.



3 INSTRUCTIONS FOR INSTALLATION

3.1 GENERAL RECOMMENDATIONS



ATTENTION!

This boiler must only be employed for its explicitly intended use. Any other use must be considered improper and therefore dangerous.

This boiler is used to heat water to below boiling temperature in atmospheric pressure.



ATTENTION!

The appliances are designed to be installed inside buildings only in suitable technical compartments, and also outdoors in a completely open place.



Before connecting the boiler, have professionally authorised company:

- Accurately washing all of the pipes in the system to remove any residues or sediments could stop the boiler from running efficiently, even in terms of health and hygiene.
- Making sure the boiler is set up to operate with the available type of fuel. The type of fuel is stated on the packaging and technical characteristics plate.
- Make sure that the chimney/flue has an adequate draught, that it is not choked, and that there are no other exhausts for other appliances, unless the flue is designed for multiple utilities, in accordance with standard specifications and requirements in force. Only once this check has been carried out can the fitting between boiler and chimney/flue be set up.



ATTENTION!

In rooms with aggressive vapour or dust, the appliance must operate independently of the air in the room of installation!



ATTENTION!

The appliance must be installed by an authorised company possessing professional-technical qualifications in accordance with the law, who, under his/her own responsibility, enforces the observance of regulations according to the rules of good practice.



ATTENTION!

Assemble the appliance in observance of the minimum required distances for installation and maintenance.



The boiler must be connected to a heating system compatibly with its specifications and power.

3.2 REGULATIONS FOR INSTALLATION

Installation must be carried out by a professionally authorised company, who is in charge of enforcing observance of all local and/or national laws published in the Official Gazette, as well as all applicable technical regulations.

3.3 PREVENTATIVE CHECKS AND ADAPTATION OF THE SYSTEM

when the appliance is installed on existing systems, make sure that:

- The flue is suitable for condensation appliances, for the temperatures of the combustion products, calculated and built in accordance with regulations in force. That is it a straight as possible, water-tight and insulated and does not have any obstructions or constrictions.
- The flue is equipped with an attachment to evacuate the condensation. The boiler room is equipped with a pipe for the evacuation of the condensation produced by the boiler.
- The electrical system is built in accordance with specific regulations and by professionally authorised company.
- The flow rate, head and direction of flow of the circulation pumps is appropriate.
- The fuel feed line and any existing tanks are set up in accordance with regulations in force.
- The expansion vessels ensure complete absorption of the dilation of the fluid contained in the system.
- Slurry and build-up have been cleaned out of the system.



INSTRUCTIONS FOR THE INSTALLER

3.4 PACKAGING

The ARES Tec ErP boiler is supplied assembled in a sturdy cardboard box.



Once the two straps have been removed, slide the box off from the top and make sure the contents are intact.



Packaging materials (cardboard box, straps, plastic bags, etc.) **constitute a potential hazard and must be kept out of the reach of children.**

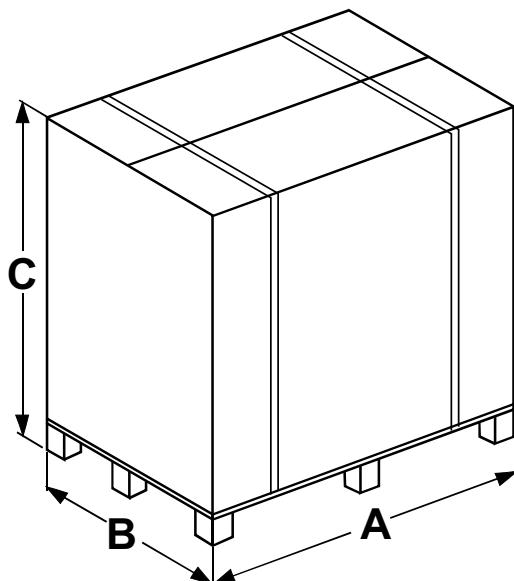
The manufacturer will not be held liable in case of damage caused to people, animals or property due to failure to observe the above.



OBLIGATION!

Wear protective gloves

- Only transport the boiler using appropriate transport means, for example a trolley with fixing strap.
- When the boiler is shipped, it must be secured to the transport equipment.
- Protect all parts against impacts, if they must be transported.
- Follow the transport instructions on the package.
- The boilers must always be lifted and carried with a trolley or suitable transport equipment.



Model	A (mm)	B (mm)	C (mm)	Gross Weight (kg)
440	1263	1120	1515	585
550	1531	1120	1515	643
660	1531	1120	1515	707
770	1799	1120	1515	806
900	1799	1120	1515	858

To take the boiler off of the pallet it is necessary to use a jib crane, to avoid damaging it.

- Remove the casings and harness it using slings "A" fig. 3 being careful to pass the slings through the load bearing crossbeams of the frame
- Tie the slings to the jib "B". Perform these operations with caution.

Composition of packaging:

on the left side of the boiler:

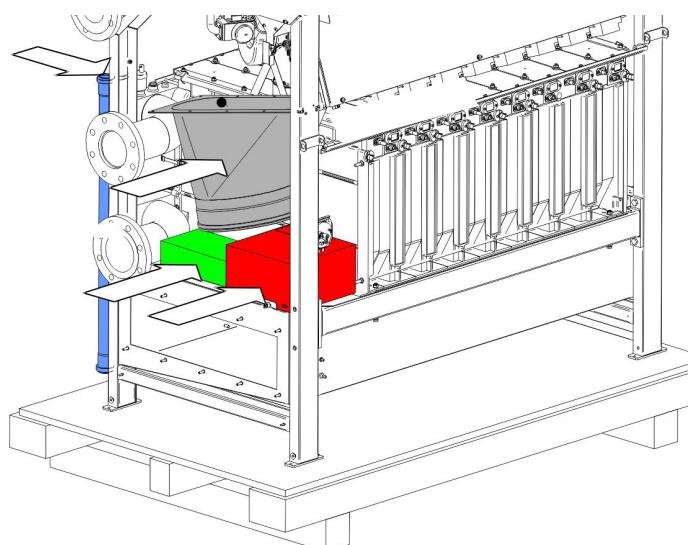
- The flue exhaust manifold.
- A cardboard box containing:
 - Gasket between pan and terminal
 - Collar gasket (\varnothing 250) \varnothing 300
 - Two bends + one T + plastic cap for condensate drain
 - Screws required to secure the flue terminal
- The probes: external, flow, storage tank.
- Flue inspection cap.
- Plate and fairlead for power output.
- A cardboard box containing:
 - Flanges

Inside the rear side of the casing:

- Condensate drain trap pipes (1 m).

Above the boiler cover:

- A plastic bag containing:
 - Installer and maintenance technician instructions handbook
 - HSCP control unit user handbook
 - BCM 2.0 user handbook
 - SHC book
 - Warranty certificate
 - Hydraulic test certificate
 - Pins to block the set of fans in raised position



3.5 OPERATION TO UNLOAD AND REMOVE THE PACKAGING


ATTENTION!

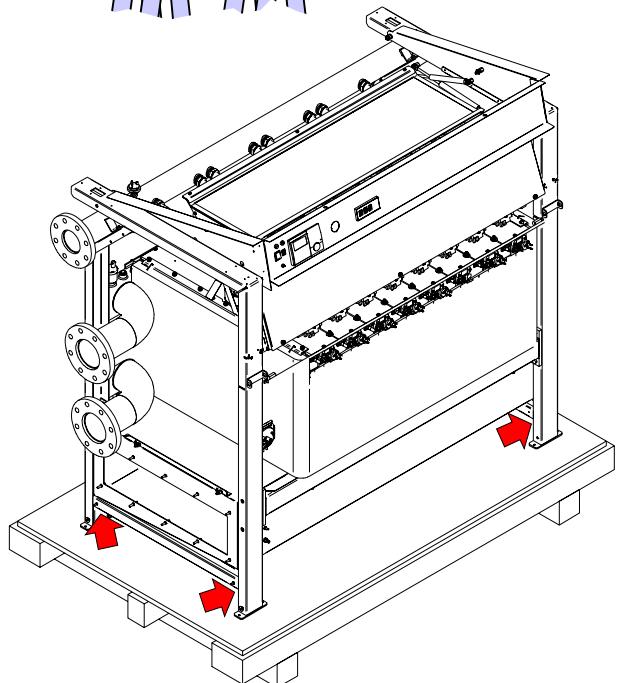
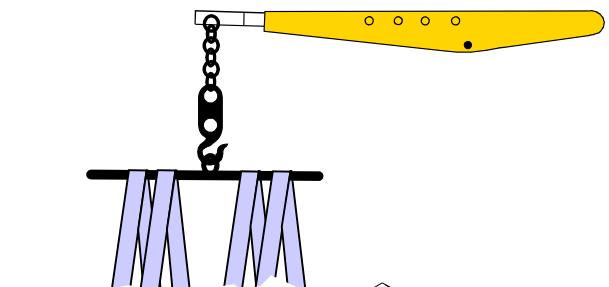
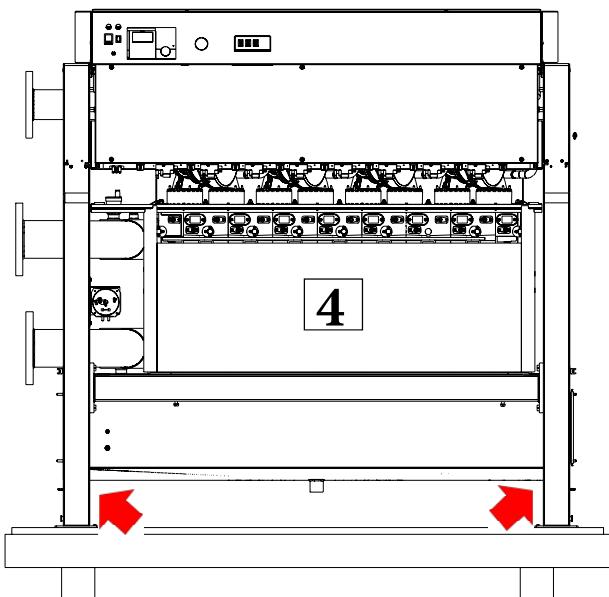
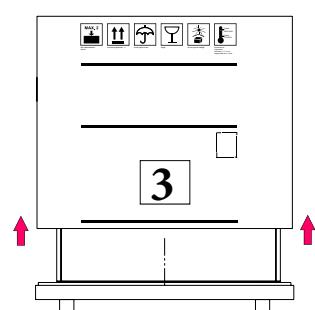
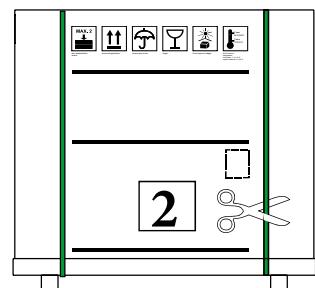
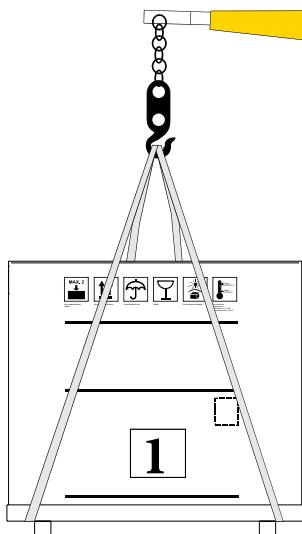
Handle using forklift or hoist and sling.


ATTENTION!

Sling slotting points for lifting. The slings must be assembled on the load bearing crossbeams.

To take the boiler off of the pallet it is necessary to use a jib crane, to avoid damaging it.

- Remove the casings and harness it using slings, being careful to pass the slings through the load bearing crossbeams of the frame.
- Tie the slings to the jib. Perform these operations with caution.



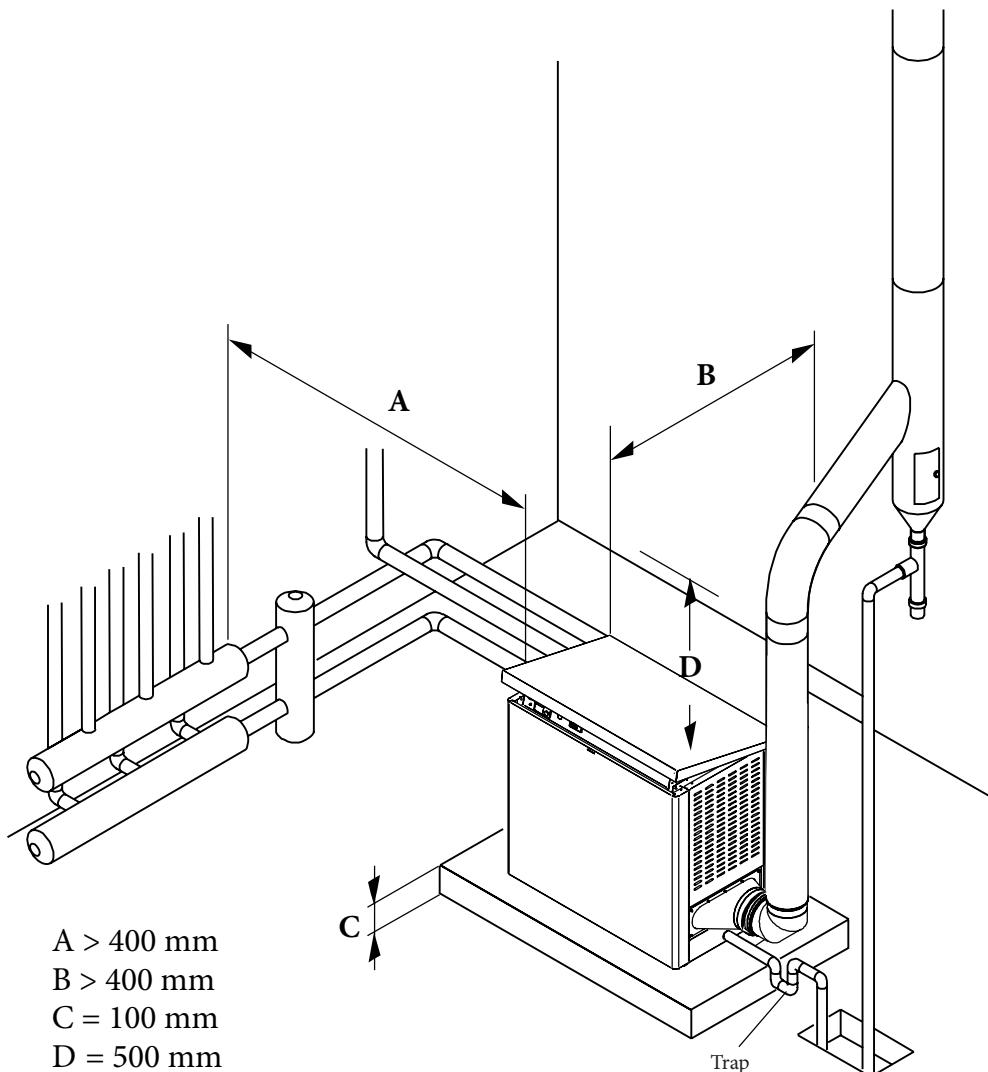
3.6 POSITIONING THE HEATING CONTROL UNIT

Special attention must be paid to local standards and regulations regarding heating control units, especially the minimum distances that must be observed.

Installation must be comply with the requirements contained in the most recent standards and legislation regarding heating control units, heating system installation and hot water production, ventilation, flues suitable for condensation boiler combustion product exhaust, and any other applicable regulation.

The boiler can be placed on a flat platform that is sufficiently sturdy in size, in plan, no smaller than the boiler measurements and with a minimum height of at least 100 mm so that the trap for condensate drainage can be installed. Alternatively, a trap can be built from this platform, next to the boiler, at a depth of 100 mm so that the trap can be placed in it (Parag. 3.16).

When installation is complete the boiler should be perfectly horizontal and firmly stable (to reduce vibrations and noise).



 Observe the minimum clearance distances required to perform normal maintenance and cleaning operations.

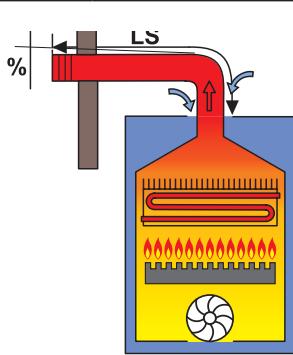
3.7 FLUE EXHAUST PIPE CONNECTION

The flue exhaust pipe must comply with local and national regulations.

B23P

ATTENTION

For this type of connection, the room follows the same installation regulations for boilers with natural draught



Connection to a combustion product evacuation pipe outside the room, the combustion air is taken directly from the room where the device is installed.

3.7.1 FLUE EXHAUST MANIFOLD CONNECTION

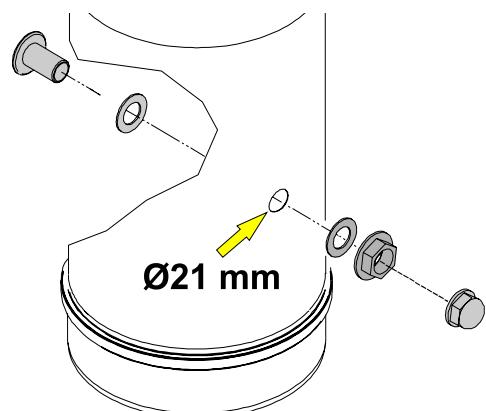


To secure the flue exhaust manifold use the nuts and washers contained in the bag.



The flue point must be positioned on the first straight section, within 1 meter of the boiler.

To set up the flue inspection point, cut a Ø 21 mm hole in the flue exhaust pipe, and install the inspection point following the sequence provided.



HEAD AVAILABLE AT THE BASE OF THE CHIMNEY

S (Exhaust) A (Intake)	A (Intake)
Dp = 100 Pa -	-

The maximum permitted length of the pipes is determined by the head (Dp) available at the base of the chimney.



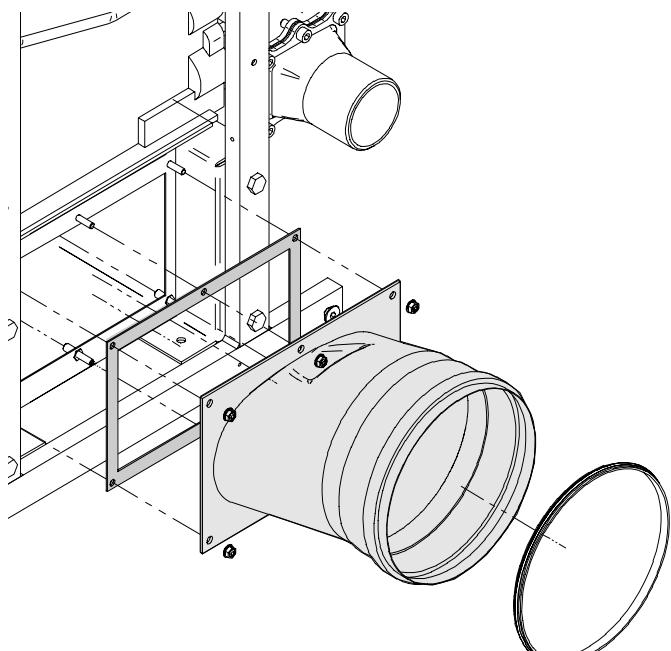
ATTENTION:

for the type of B23P connection, the room follows the same installation regulations for boilers with natural draught.



ATTENTION:

The flue must comply with the standards in force.



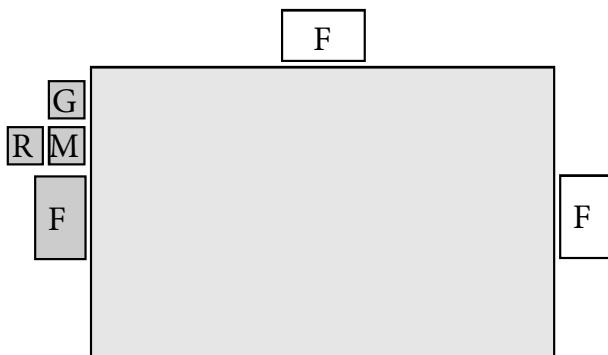
3.8 CONNECTING THE BOILER



The ARES Tec ErP boiler leaves the factory set up for the hydraulic (flow and return) and gas connections located on the left side of the boiler.

To fasten the flue exhaust manifold use the screws and gaskets contained in the accessory kit box and a 10 mm socket key.

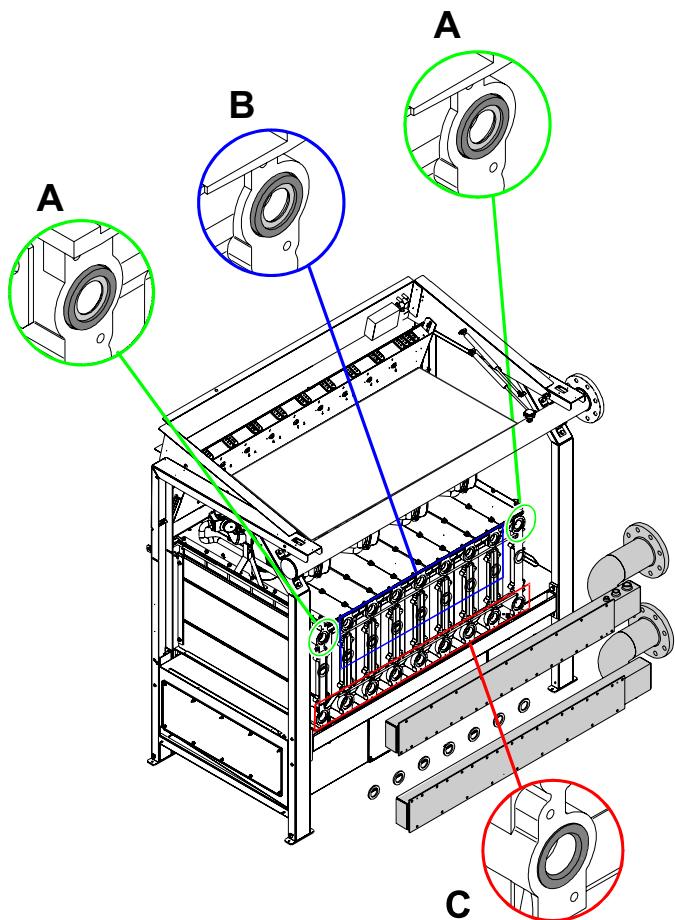
The flue exhaust manifold is set up on the LEFT SIDE. It is also possible to set up the outlet on the RIGHT and REAR SIDE.



Diaphragms and gaskets.

Diaphragm installed on the first and last element of the flow manifold Ø 18 (A), internal Ø 27 (B).

Gaskets installed on all of the other elements (C).



3.9 GAS CONNECTION

The gas intake pipe must be connected to the boiler using the respective G 3" fitting as indicated in parag. 2.3.

The supply pipe must have a section equal to or larger than the one used in the boiler and must nevertheless provide the correct gas pressure.

It is nevertheless advisable to adhere to the standard specifications and requirements in force, setting up a cut-off valve, gas filter, anti-vibration joint, etc.

Before commissioning an internal gas distribution system and therefore, before connecting it to the meter, it is necessary to thoroughly check the seal.

If any part of the system is not in view, the sealing test must be carried out before covering the pipe.



Danger!

The gas connection must be set up by an authorised installation technician who must observe and apply the contents of the legislation in force and the local requirements of the gas supply company, as incorrect installation can cause damage to people, animals and property, for which the manufacturer will not be held liable.



Before installation it is advisable to clean the inside of the fuel intake pipe thoroughly, in order to remove any residues that could stop the boiler from operating smoothly.



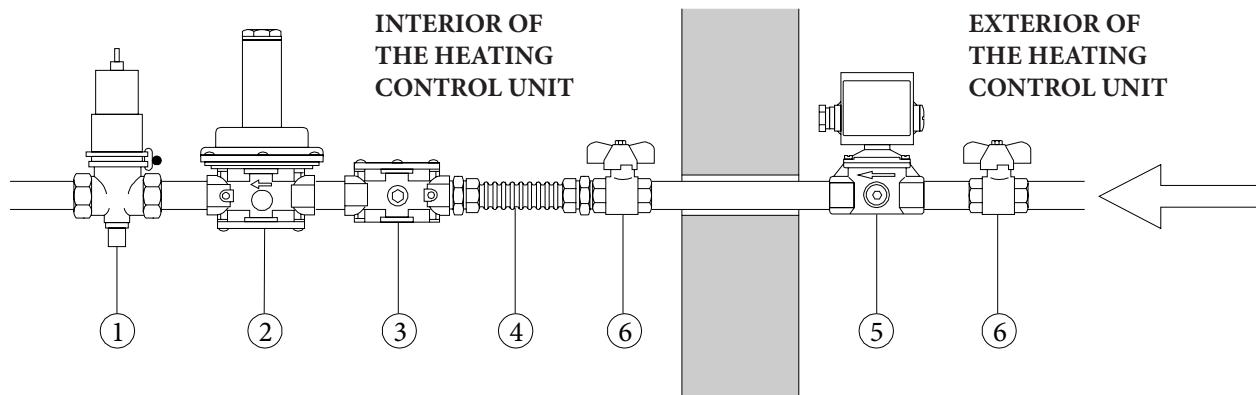
If you notice the smell of gas:

- Do not work the electrical switches, the telephone or any other object that can generate sparks;
- Immediately open doors and windows to create an air current that purifies the room;
- Close the gas valves;
- Seek the assistance of professionally qualified personnel.



In order to prevent any gas leaks it is advisable to install a surveillance and protection system composed of a gas leak detector combined with a cut-off electrovalve on the fuel supply line.

EXAMPLE OF GAS INTAKE SYSTEM



Key:

- 1 - Fuel shut-off valve
- 2 - Double membrane regulator
- 3 - Gas filter
- 4 - Anti-vibration joint
- 5 - Gas electrovalve
- 6 - Cut-off valve



3.10 CONNECTION

G	GAS	G 3"
---	-----	------



Danger!

The gas connection must be set up by an authorised installation technician who must observe and apply the contents of the legislation in force and the local requirements of the gas supply company, as incorrect installation can cause damage to people, animals and property, for which the manufacturer will not be held liable.



If you notice the smell of gas:

- Do not work the electrical switches, the telephone or any other object that can generate sparks;
- Immediately open doors and windows to create an air current that purifies the room;
- Close the gas valves;
- Seek the assistance of professionally qualified personnel.



In order to prevent any gas leaks it is advisable to install a surveillance and protection system composed of a gas leak detector combined with a cut-off electrovalve on the fuel supply line.

M	FLOW	G 4"
R	RETURN	G 4"

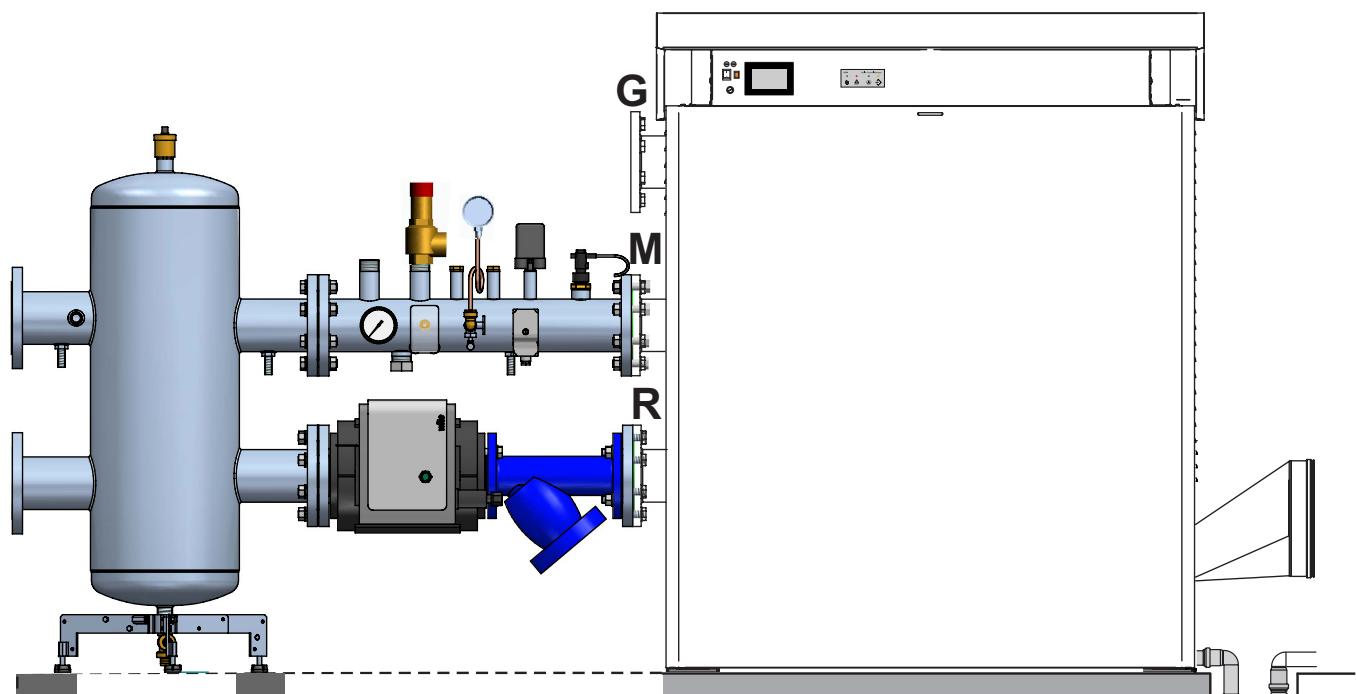


Make sure the pipes in the system are not used as earthing connections for the electrical or telephone system. They are absolutely not suitable for this purpose. Serious damage to pipes, boiler and radiators could occur in a short amount of time.



ATTENTION!

IT IS ABSOLUTELY FORBIDDEN TO SET UP CUT-OFF DEVICES ON THE GENERATOR BEFORE THE SAFETY DEVICES.



Condensate drain

During the combustion process, the boiler generates condensate that flows into the drain trap through pipe "A".

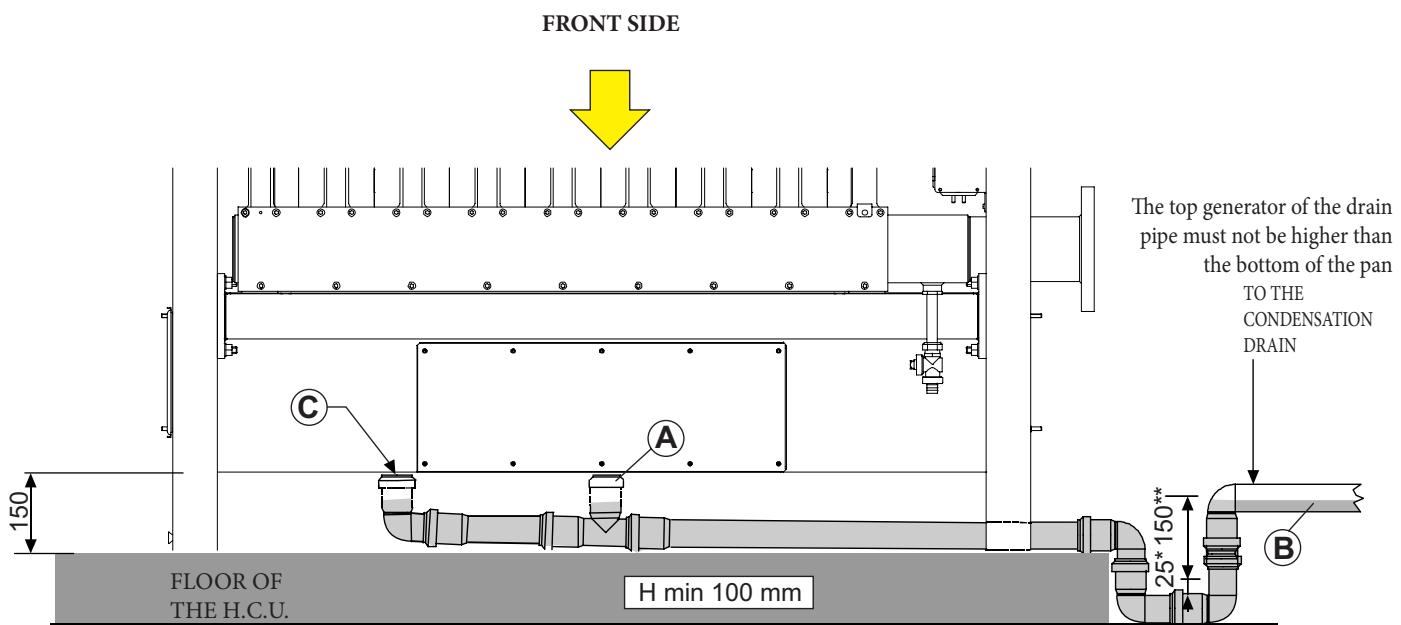
The condensate that forms inside the boiler must flow into a suitable drain from pipe "B".

**Danger!****Before commissioning the appliance:**

- check correct assembly of the drain trap
- fill the drain trap from the filler cap "C" and check the correct draining of condensate.

If the appliance is used with an empty condensate drain trap the danger of poisoning subsists following a flue gas leak.

The condensate drain pipe outlet is set up towards the connection side of the flue box manifold, removing the pre-sectioned part on the cover panel.



* Minimum safety trap enforced by regulation

** Minimum head with boiler operating at maximum power.



Connection between the appliance and the domestic wastewater disposal system must be carried out in compliance with the specific regulations of reference.



If you do not want to or are able to create a platform, it is possible to install the boiler on the floor and set up the trap at a depth of 100 mm.



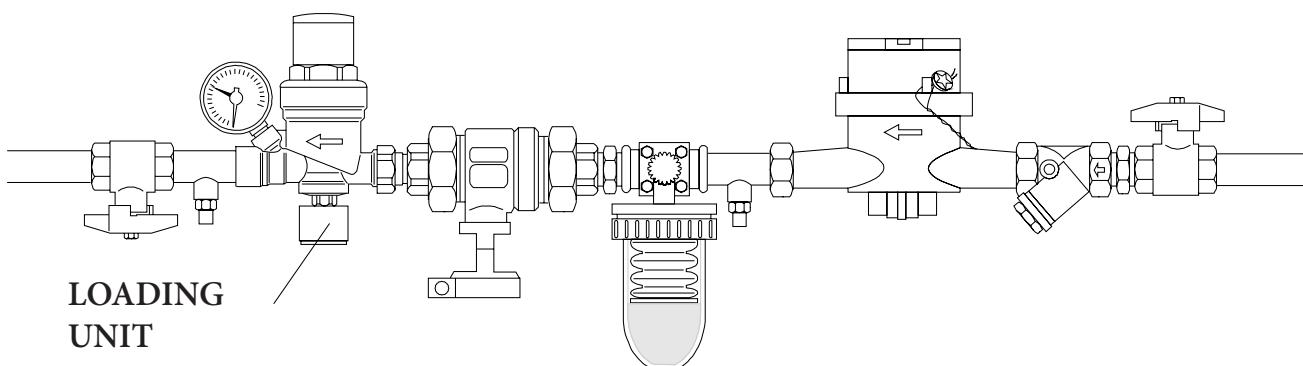
3.11 SYSTEM FILLING AND EMPTYING

Once all of the connections for the system have been set up, it is possible to fill the circuit.



To fill the system it is possible to set up a loading valve on the system's return pipe.

EXAMPLE OF SYSTEM LOADING UNIT



A load cock must be provided on the central heating circuit in order to fill the system, or use the optional accessories.

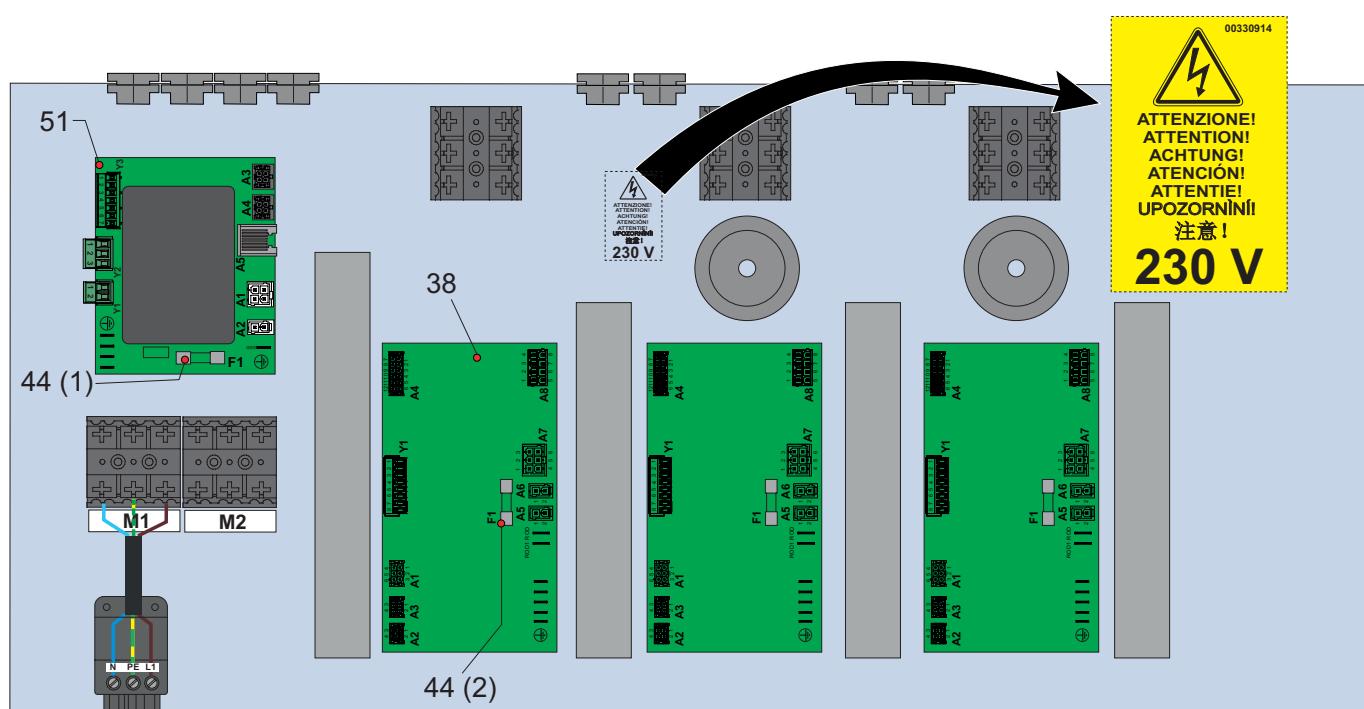
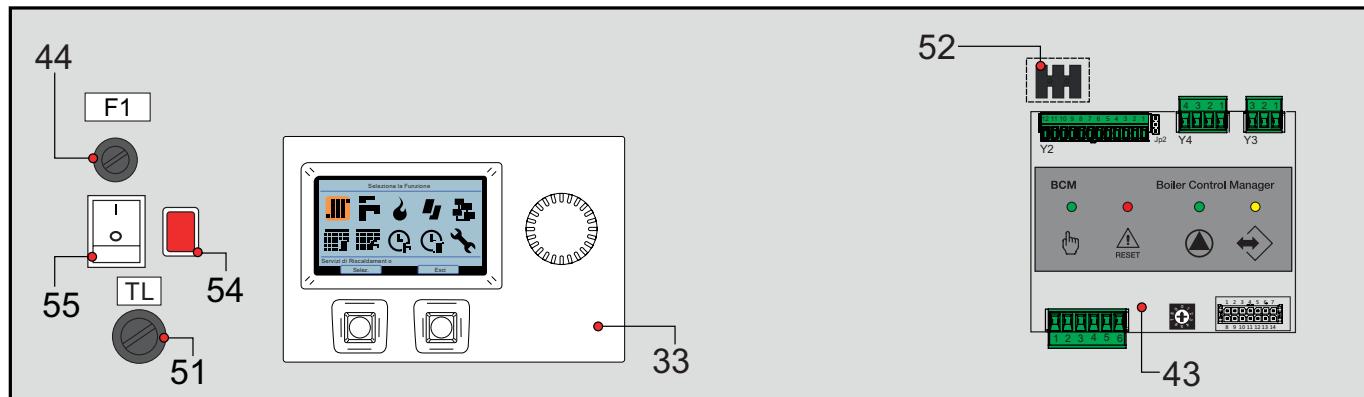


The boiler is equipped with its own draining valve, **14**. This valve must **never** be used to empty the system, since all of the dirt contained in the system may accumulate in the boiler, jeopardising smooth operation. Therefore, before using the draining valve, make sure that the system's interception cock situated under the pump has been closed. **The system must be equipped with its own emptying valve, of a suitable size for the flow rate of the system.**

3.12 ELECTRICAL CONNECTIONS



Danger! Before setting up the connections or any operation on the electrical parts, always cut-off the electrical supply and make sure it cannot be accidentally re-connected.



KEY

No.		Description
33		Temperature control HSCP
38	BMM	Burner management board
43	BCM	Boiler controller
44 (1)	F1	Power supply fuse 6.3 AF 250 V
44 (2)	F1	Board fuse BMM 6.3 AF 250 V
E		Power supply board
51	TLG	Manual resetting general limit thermostat
52	M2	Additional terminal board +24V BCM
54	LTGL	TLG intervention light
55		Boiler main switch
D		Wieland power plug 230V - 50Hz



INSTRUCTIONS FOR THE INSTALLER

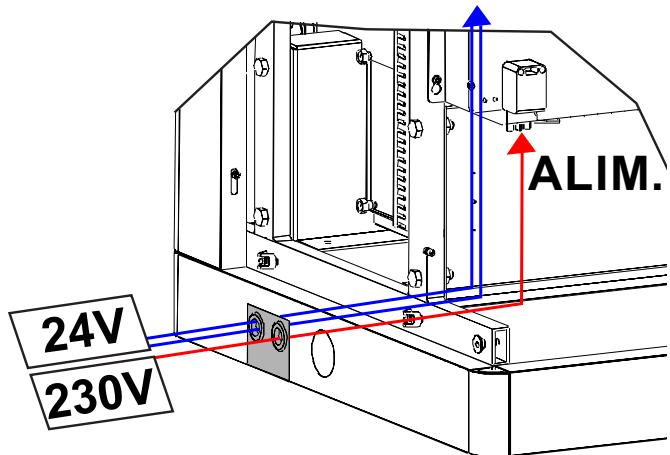


Danger!
Electrical installation must only be carried out by an authorised company.



Electrical connection to the mains power supply.
This connection must be set up by state of the art, as envisioned by regulations in force.

Electrical supply connection



Connect with the plug "D" supplied with the boiler.

N.B. The 24 V output is for any signal / services connections.



Remember that it is necessary to install a bipolar switch on the electrical supply to the boiler with a max distance between the contacts of 3 mm, easy to access, so that maintenance operations can be carried out quickly and safely.



The electrical supply to the boiler, 230 V - 50 Hz single-phase, must be carried out with a H05VV-F (PHASE - NEUTRAL - GROUND) three-pole cable with a section between 0.75 mm and 1.5 mm.

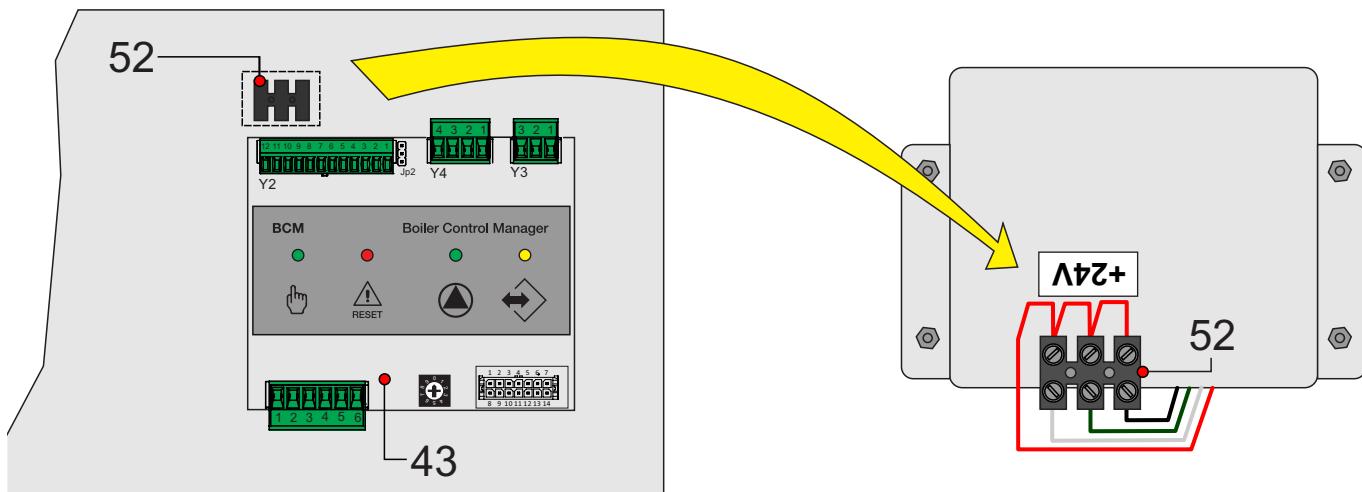


ATTENTION!
Respect the PHASE and NEUTRAL polarity since flame detection is Phase Sensitive.

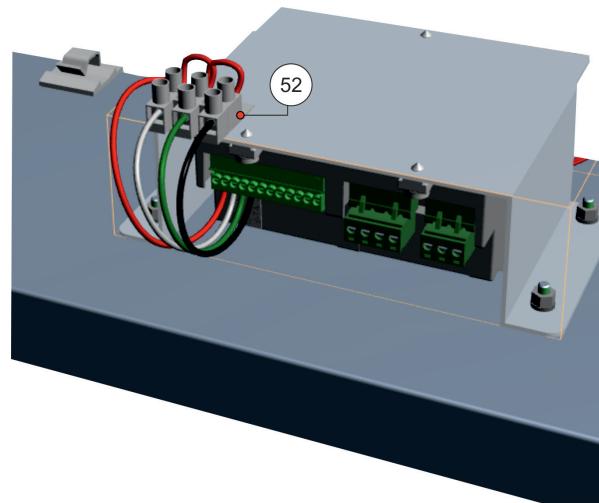


ATTENTION:
Cables carrying a voltage of 230 V must travel separately from cables carrying a voltage of 24 V.

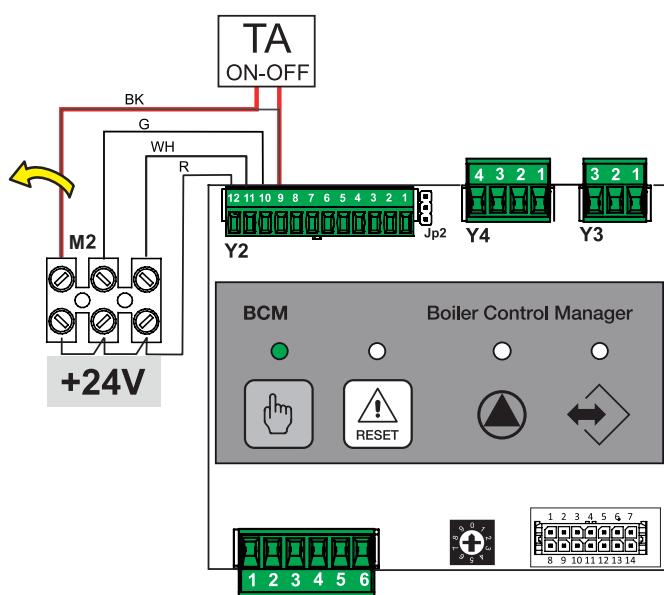
Connections to the additional BCM terminal board



52 M2 Additional terminal board +24V BCM



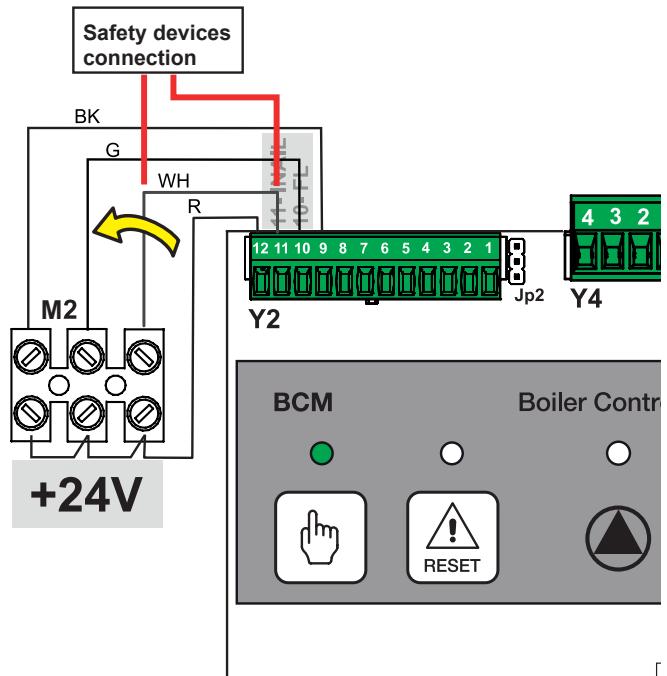
Connection TA (*)



(Y2 - 9 and terminal board M2) after removing the jumper.

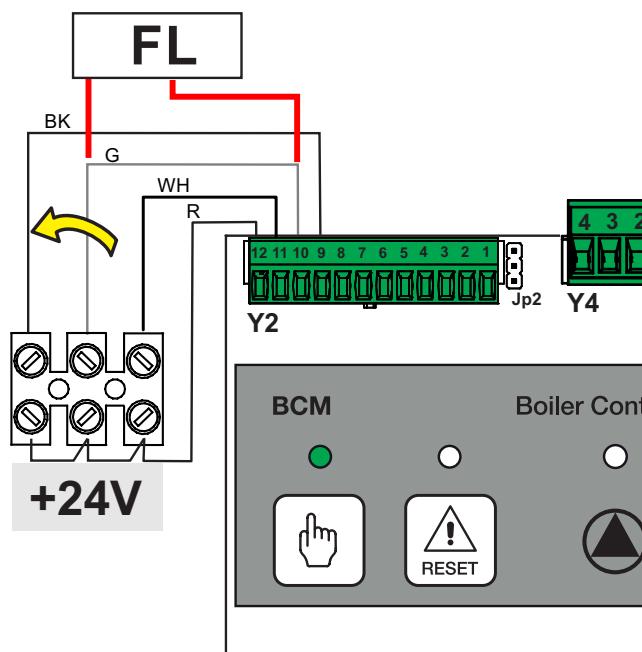
(*) Optional

INAIL safety connection



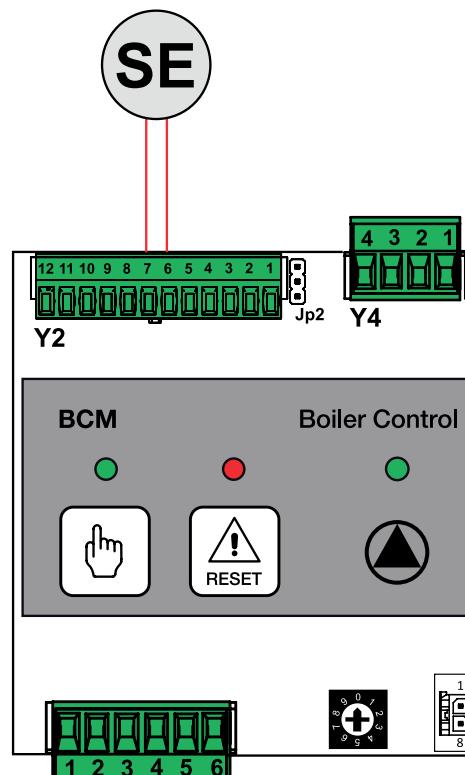
Remove the jumper and connect the cables, as indicated between (Y2 11 and terminal board M2).

FL Flow switch connection (*)



Remove the jumper and connect the cables, as indicated between (Y2 10 and terminal board M2).

External probe connection



Set up on the terminal board, BCM (Y2 6-7)



INSTRUCTIONS FOR THE INSTALLER

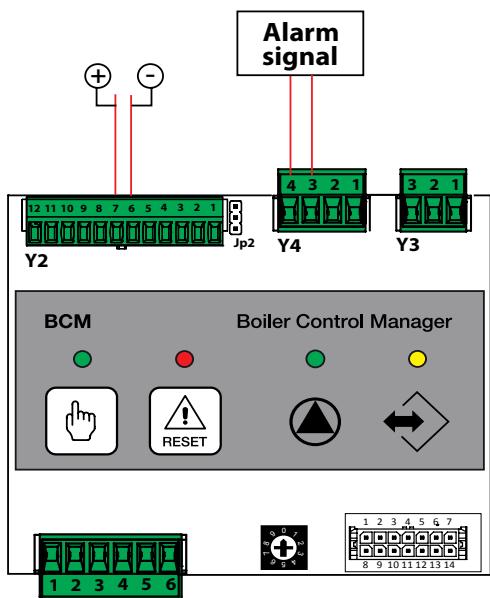


NOTE:

The boiler is provided with set-up to manage one direct flow and one storage tank.

If **Stemp. ACC** is connected automatically, the DHW service is enabled, which will be managed as a priority compared to direct flow through the pumps shown below.

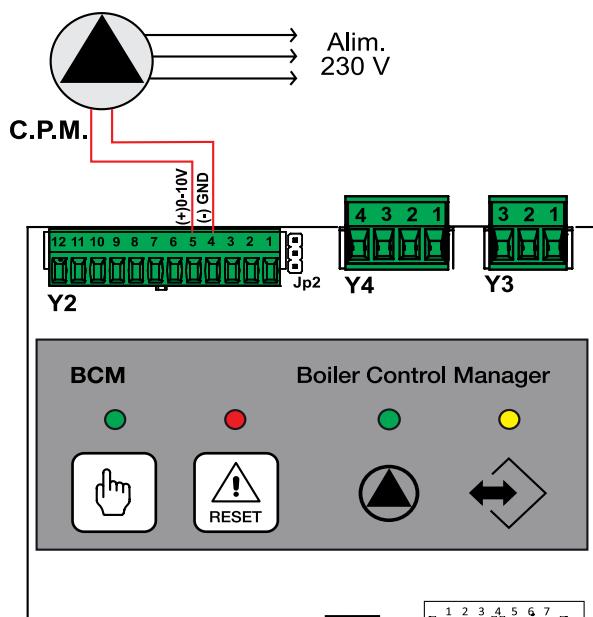
Alarm / signals contact (N.O. dry contact)
Ext signal contact 0 - 10 V



Connect the cables as indicated (Y4 3-4)
Connect the cables (Y4 7-8)

Connection Mod. P. Central Heating Modulating Pump (Optional)

P. Mod.



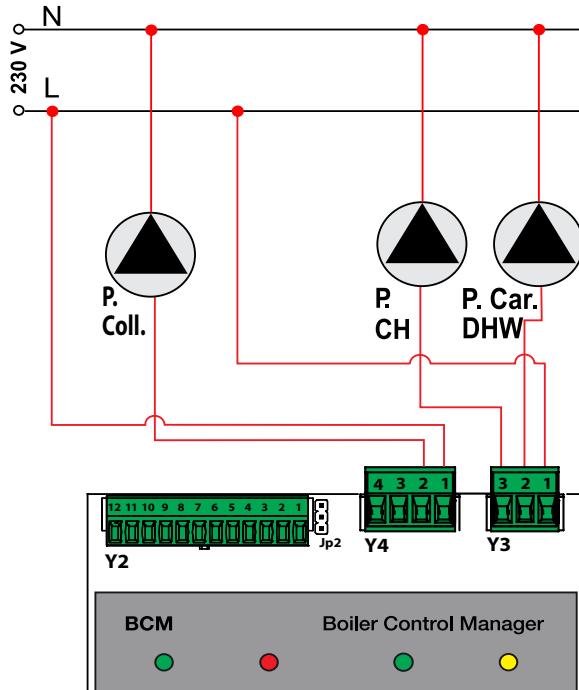
Connect the modulation control cables as indicated (Y2 4-5).
External power supply 230 V-50 Hz.

If other services (storage tanks, mixed zones, solar, etc.) are requested, it is necessary to purchase SHC multifunction modules to connect to the local bus for total temperature control management via HSCP (and UFLY).



The BCM relay contacts support pumps with max absorption of 4 A.

P. Coll - Pump Manifold (Primary ring) (Optional)
P CH - Heating circuit pump (central heating circuit)
P. Car DHW - Storage tank load pump

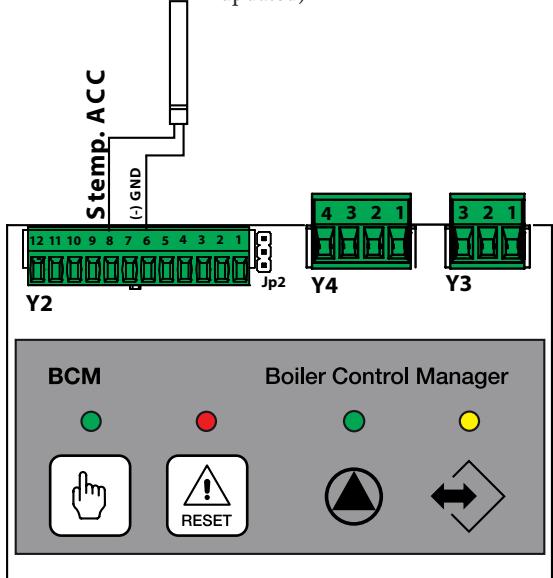


Connect the cables as indicated (Y4 1-2)
Connect the cables as indicated (Y3 1-2-3)

Stemp. ACC. Storage Tank Temperature Sensor



If the storage tank temperature sensor is connected, the DHW is automatically activated when the boiler is powered.
The code (803) **Srv** (it is automatically updated)

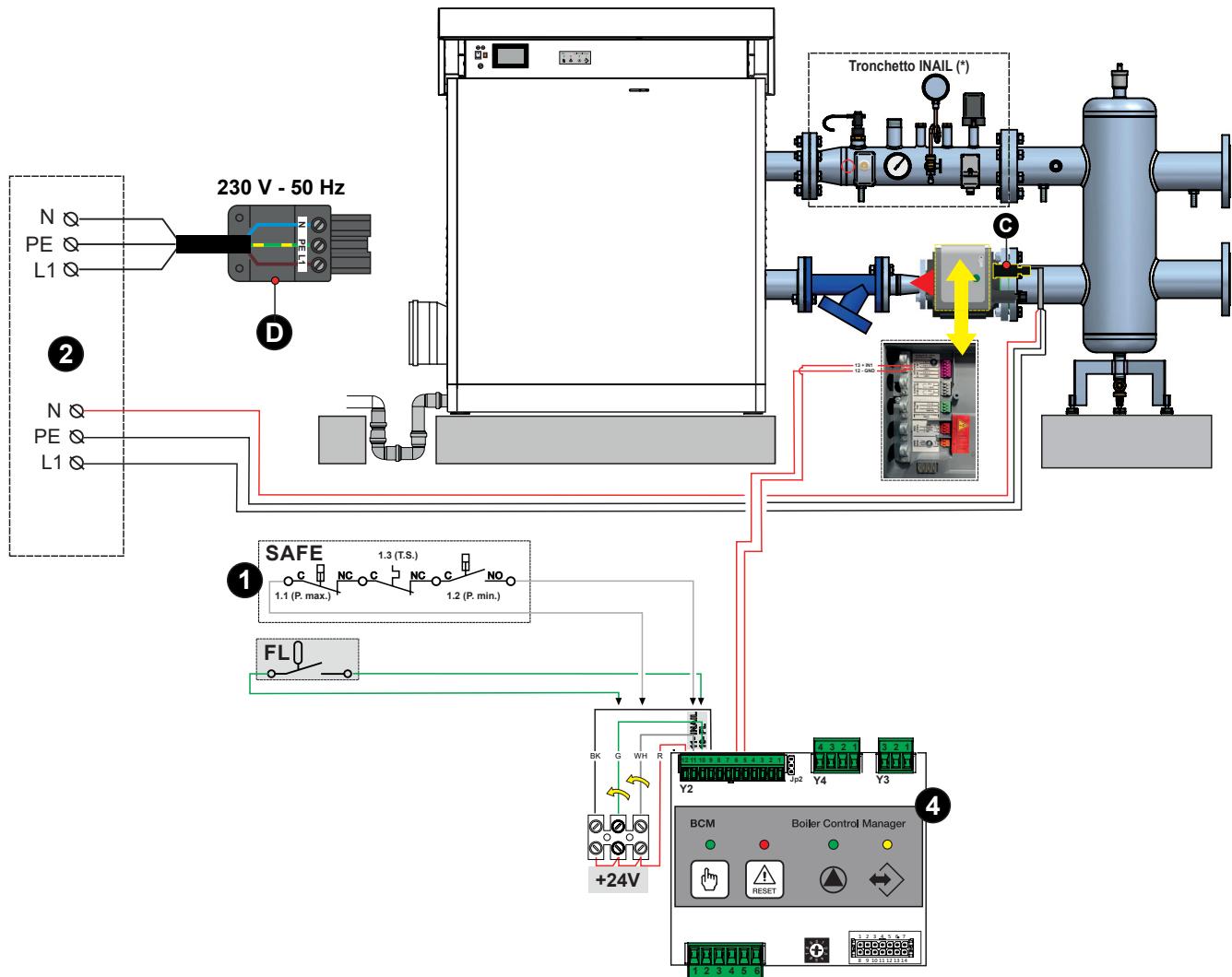


Connect the temperature sensor cables as indicated (Y2 6-8).



Example of connection diagram:

Power supply, INAIL, Modulation pump, external probe, Flow switch.



LEGENDA	
No.	Description
1	Safety components
2	Main electrical panel (Not supplied)
B	Services connection return terminal board
D	Wieland mobile 230 V - 50Hz power supply socket
FL	Terminals for flow switch
SE	Terminals for External probe
SMG	Global flow probe
C	Pump power supply connector
Pump terminal board	AI 1
0-10V connection	13 = + In 12 = - GND



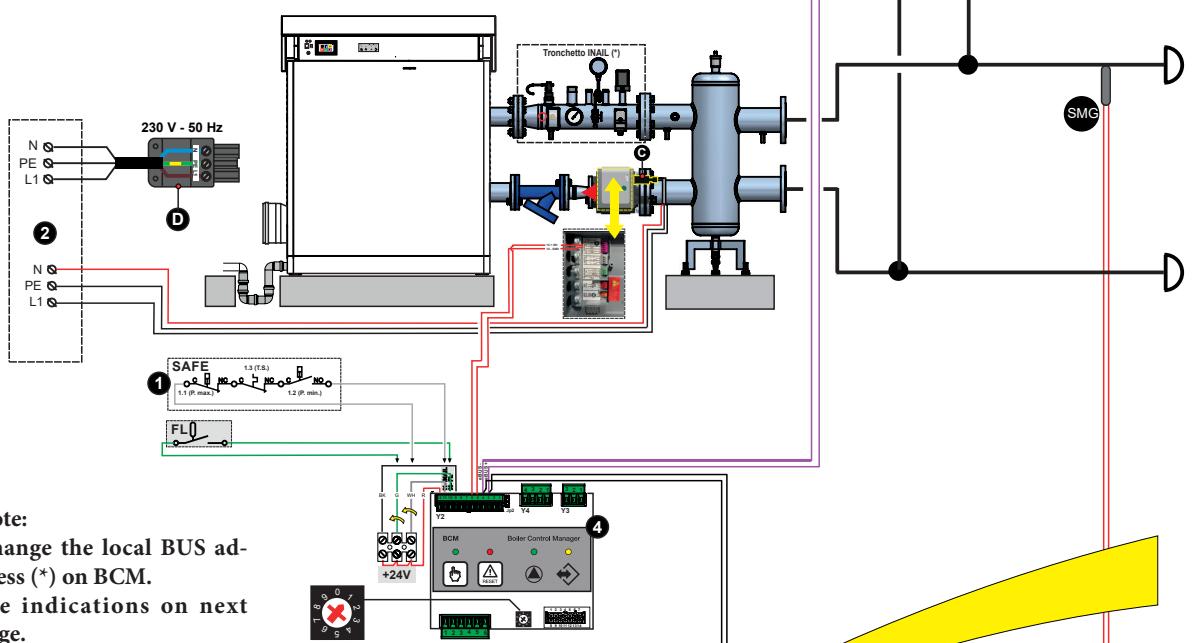
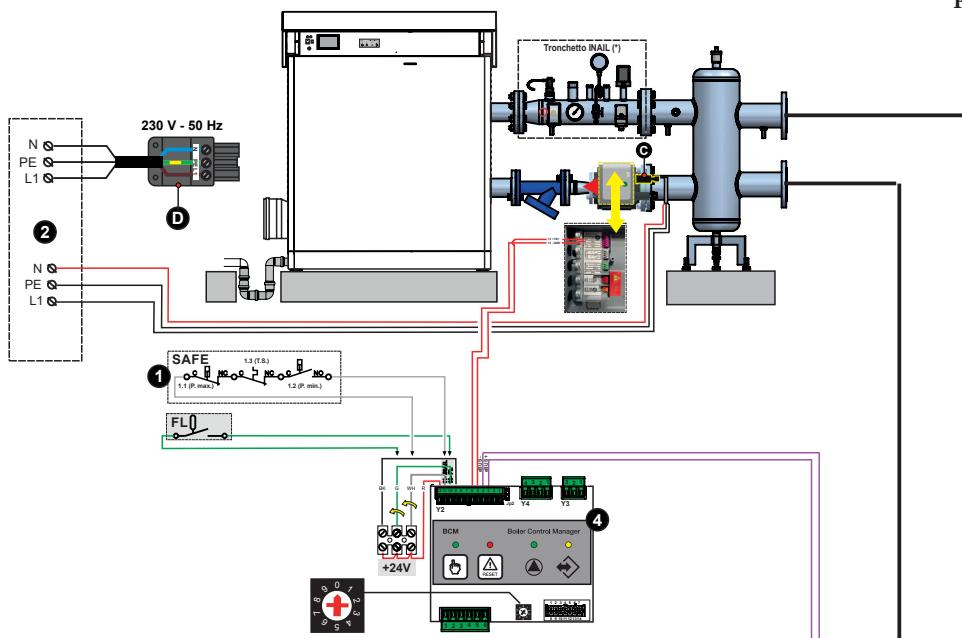
To activate the 0-10 V function, follow the instructions in the pump manual.
(main menu)



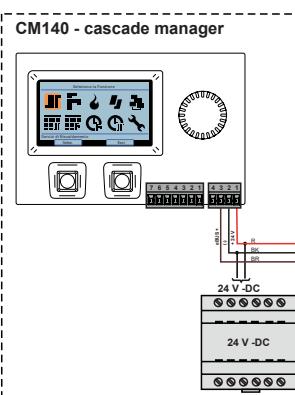
INSTRUCTIONS FOR THE INSTALLER

Example of connection diagram: 2 Ares Tec in battery controlled by Cascade Manager.

PRIMARY LOOP

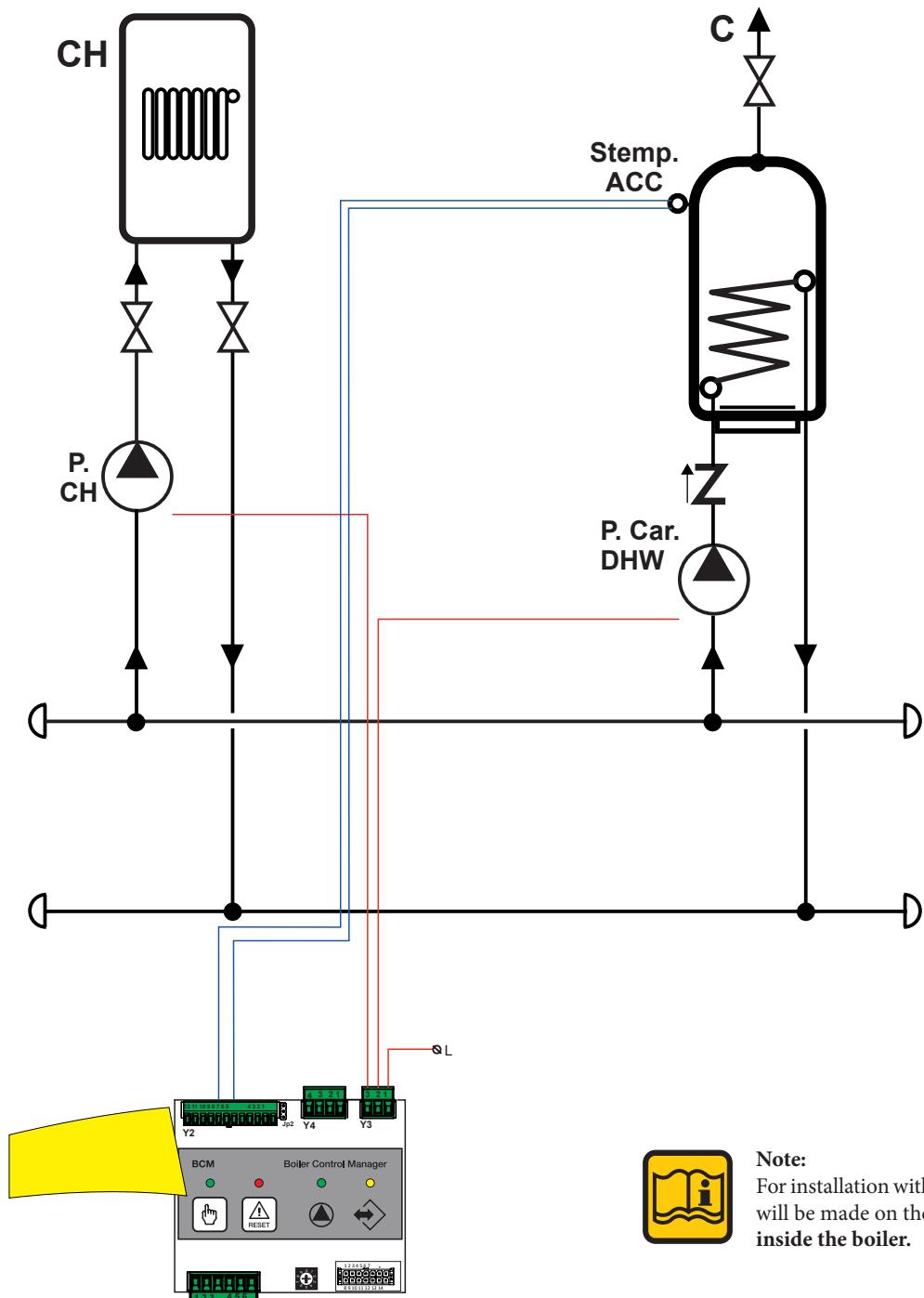


Note:
Change the local BUS address (*) on BCM.
See indications on next page.



Example of connection diagram: 2 Ares Tec in battery controlled by Cascade Manager with Direct Zone plus Production of Domestic Hot Water.

SECONDARY LOOP



Note:

For installation with a single boiler, the above connections will be made on the return terminal board (BCM board) **inside the boiler**.



Note:

When cascading 2 or more boilers, the local BUS address (*) must be changed on the BCM.



If the rotary selector (*) is positioned as default, namely at 0, to change the local BUS address = 1 - 2 - 3 etc. of each boiler, use Ufly: parameter 784 (from Device Management -> hcm -> parameter 784).

Note

Example diagram, consider the total nominal flow rate, any non-return valves (not supplied), moreover, the efficiency of the flow switches must be checked at each flow rate in modulation



Note

For configuration of boiler cascade management parameters, see the specific installation manual



3.13 FIRST IGNITION

Preliminary checks.



First ignition must be carried out by professionally authorised company. Immergas will not be held liable in case of damage caused to people, animals or property due to failure to observe the above.



Danger!

Prior to commissioning the appliance fill the trap through the filler hole and make sure the condensate is draining correctly.

If the appliance is used with an empty condensate drain trap the danger of poisoning subsists following a flue gas leak.

Prior to commissioning the boiler it is advisable to make sure that:

- installation fulfils the standard specifications and requirements in force for both the gas and electrical part;
- the supply of combustion air and the evacuation of flue exhaust are carried out correctly in accordance with standard specifications and requirements in force;
- the fuel supply system is sized for the boiler's flow rate and is equipped with all of the safety and control devices required by regulations in force;
- the power supply for the boiler is 230V - 50Hz;
- the system has been filled with water (pressure gauge 0.8/1 bar with the pump off);
- any cut-off dampers on the system are open;
- the required gas corresponds to the one used for boiler calibration: otherwise have the boiler converted for use with the available gas (see section: "ADAPTATION FOR USE WITH OTHER GASES"); this operation must be carried out by authorised company in accordance with regulations in force;
- the gas supply valve is open;
- there are no gas leaks;
- the external main switch is engaged;
- the system safety valve on the boiler responds to operation and is connected to the sewer drain;
- the condensate drain trap is filled with water;
- there are no water leaks;
- the conditions for aeration and minimum distances to carry out any maintenance operations are fulfilled.

Switching the boiler on and off

To turn the boiler on and off read the manual for the HSCP regulator.

Information for the system manager

The individual in charge of the system must be instructed in the use and operation of the heating system, in particular:

- Supply the system manager with the "THE SYSTEM MANAGER'S INSTRUCTIONS FOR USE", as well as all other documents attached the appliance contained in the envelope in the packaging. **The system manager must keep this documentation safe so that it is available for future consultation.**
- Inform the system manager of the importance of aeration vents and the flue exhaust system, highlighting how essential they are and how it is strictly forbidden to change them.
- Inform the system manager of the requirement to check the system's water pressure, as well as operations to restore it.
- Inform the system manager on how to correctly regulate the temperature, control units/thermostats and radiators in order to save energy.
- Remember that it is compulsory to carry out regular maintenance on the system and measure combustion output (as per national law).
- If the appliance is sold or transferred to another owner or if the owner moves, leaving the appliance behind, always ensure the manual accompanies the appliance so that it may be consulted by the new owner and/or installer.



3.14 ON-SITE MEASUREMENT OF THE COMBUSTION EFFICIENCY

3.14.1 ENABLE THE CALIBRATION FUNCTION



ATTENTION!

Function reserved exclusively to Authorised Service Centres.



ATTENTION!

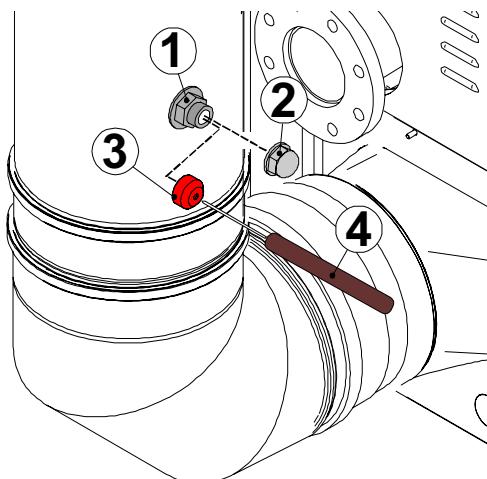
This function is explained in chapter 6 (Generator control) of the **HSCP installation and maintenance manual**.

3.14.2 POSITIONING THE PROBES

In order to determine the combustion efficiency, the following measurements must be taken:

- measure the combustion air temperature
- measure the flue gas temperature and content of CO₂ withdrawn from the hole 2.

Take the specific measurements with the generator at full speed (see Par. 3.14.1).



All boilers leave the factory calibrated and approved, nevertheless, if the calibration conditions need to be changed it is necessary to re-calibrate the gas valve.

ATTENTION!

Remove cap 2, attach the red cap 3 to the flue point 1. Place the CO₂ analysis probe 4 in the hole on the cap. Once the measurement has been made, take the cap out and use the relative cap 2 to close the flue exhaust point back up.

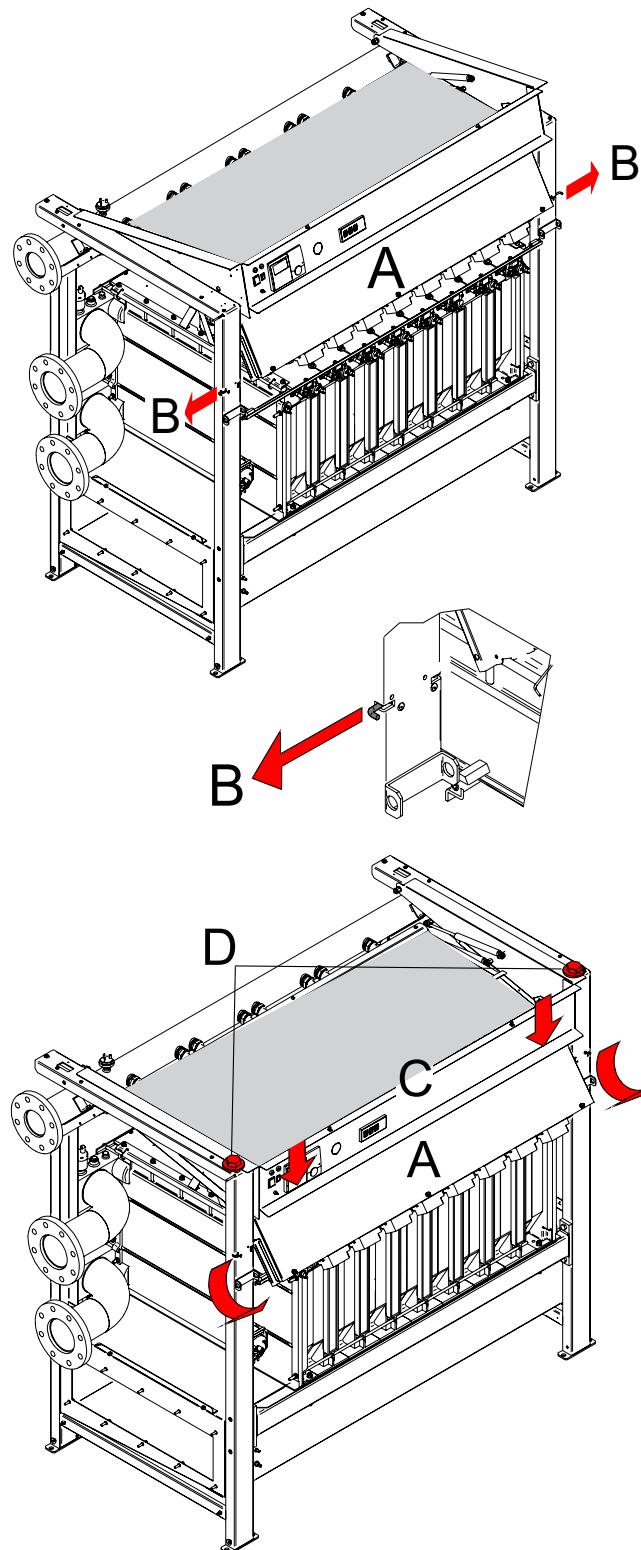
3.15 BURNER ADJUSTMENT



All boilers are factory calibrated and tested. If necessary, recalibrate the gas valves (MODULE1, MODULE 2, etc.)



All of the instructions below are provided for the exclusive use of **authorised assistance** personnel.



ATTENTION!

To access the gas valves more easily, unhook electric panel "A" by acting on spring "B" (right and left).

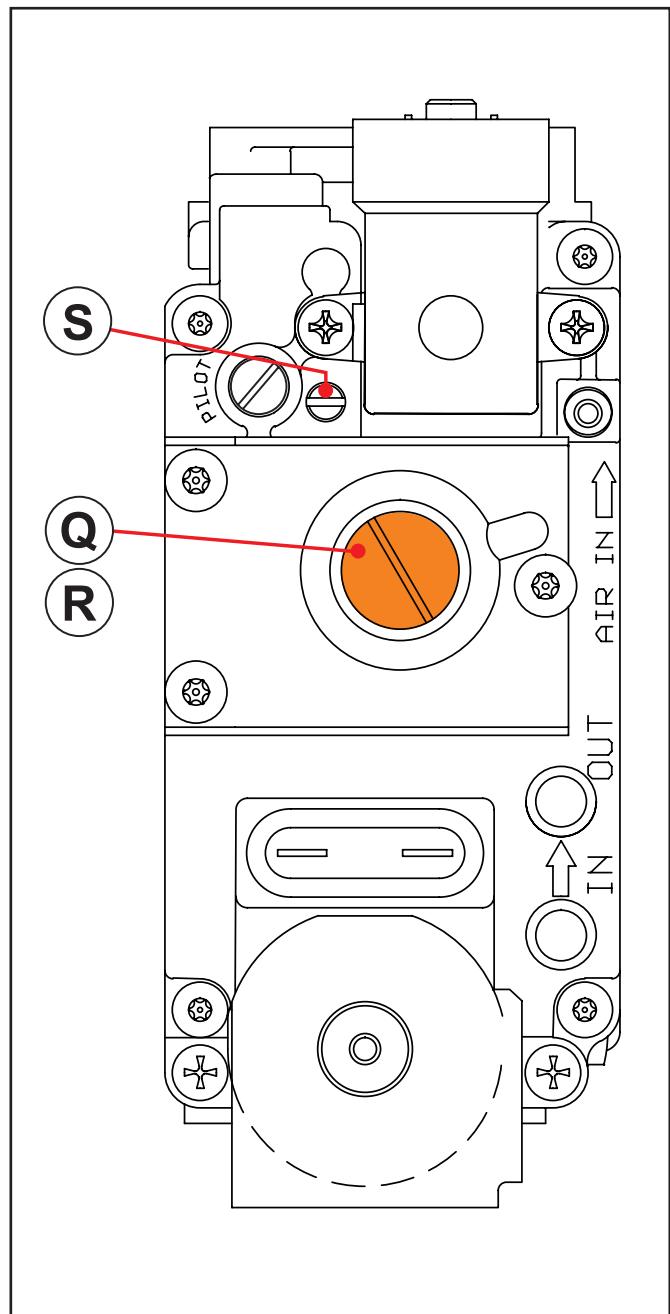
Turn electrical panel "A" slightly and lower tilting panel "C".

For the amount of time required for the adjusting operation, fix tilting panel "C" in place using 2 M4 screws + "D" washers (contained in the documentation bag).

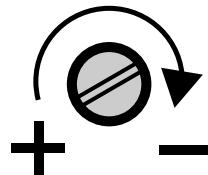
1) Adjustment at maximum power:

- Remove the cap and insert the CO2 analysis probe into the flue gas output of the intake/exhaust terminal, see chap. 3.14.2.

- Start the boiler in "calibration" mode at MAXIMUM POWER (see 3.14.1)
- Once the burner is on, check:
that the CO2 value at "MAXIMUM" power corresponds with what is indicated in the "NOZZLES - PRESSURES" table.
- If it does not correspond, correct it by turning screw "S" CLOCKWISE to decrease it, or ANTICLOCKWISE to increase it.
(see NOZZLES -FLOW RATES - PRESSURES table).



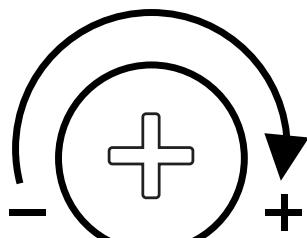
**(S)
MAXIMUM POWER
ADJUSTING SCREW**



2) Adjustment at minimum power:

- Start the boiler in "calibration" mode at MINIMUM POWER (see 3.14.1)
- Once the burner is on, check:
that the CO2 value at "MINIMUM" power corresponds with what is indicated in the "NOZZLES - PRESSURES" table.
- If necessary, correct the value by removing the screwing plug "Q" and turning the screw "R"; CLOCKWISE to increase or ANTI CLOCKWISE to decrease.
(see NOZZLES -FLOW RATES - PRESSURES table).

**(R)
MINIMUM POWER
ADJUSTING SCREW**

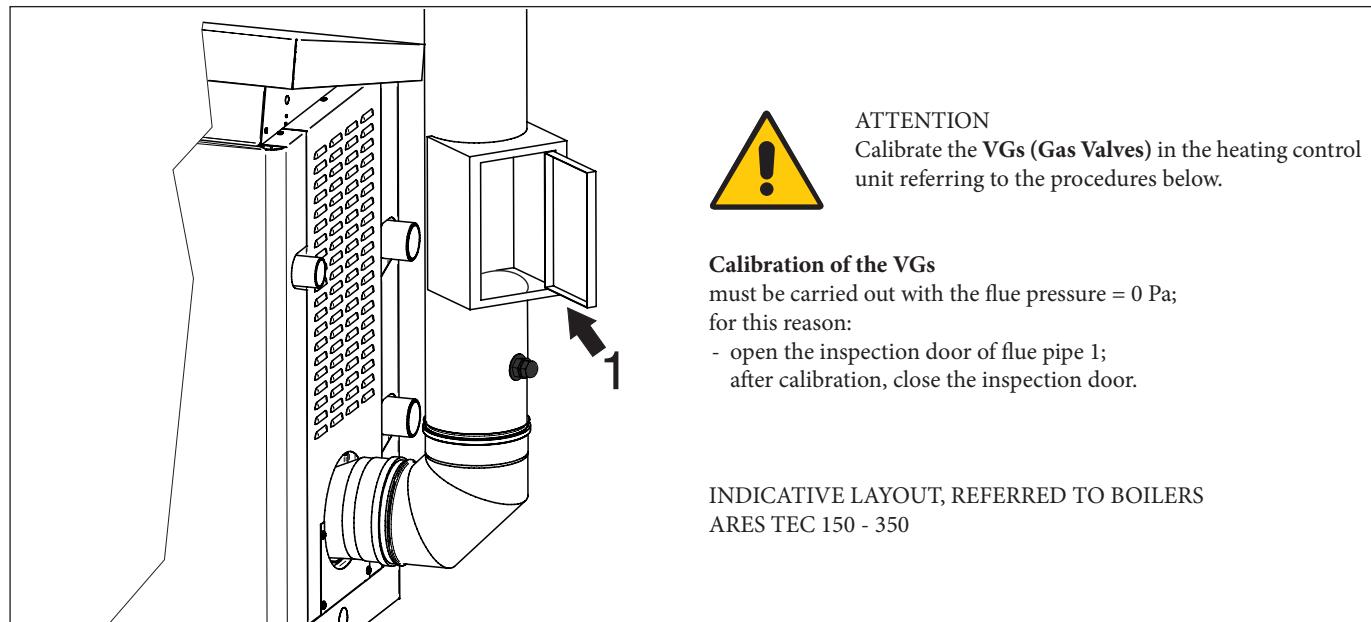


INSTRUCTIONS FOR THE INSTALLER

Follow this procedure to adjust the other modules as well.

If the measured flow rate is too low, make sure the supply and draining systems (the supply and draining pipes) are not obstructed.

If they are not obstructed, make sure the burner and/or exchanger are not dirty.



ATTENTION

Calibrate the **VGs (Gas Valves)** in the heating control unit referring to the procedures below.

Calibration of the VGs

must be carried out with the flue pressure = 0 Pa;
for this reason:

- open the inspection door of flue pipe 1;
after calibration, close the inspection door.

3) Completing basic calibration

- Check CO₂ values at the minimum and maximum flow rate.
- Touch up if necessary.
- Close the cap (2 - 3) for the flue inspection point back up (1)
- **Check there are no gas leaks.**



For smooth operation, calibrate the CO₂ values taking care to observe the values in the table.



NOTE: Do not force the adjusting screw limit switch limits.

NOZZLES - PRESSURES - FLOW RATES TABLE

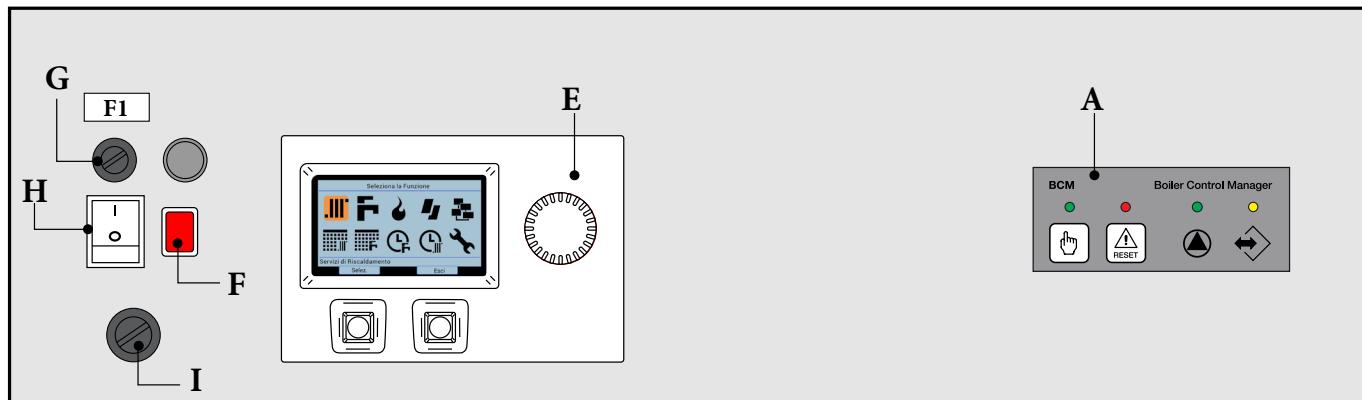
Type of Gas	ARES TEC ErP: 440 - 550 - 660 - 770 - 900									
	Supply pressure (mbar)	Ø Noz- zles (mm)	Diaphragm (mm)	Fan speed		CO ₂ levels (%)		(*) O ₂ levels (%)		Power at ignition (%)
Nat. gas (G20)	20	9	-	28	108	8.8	8.8	5.2	5.2	50
Nat. gas (G25)	25	9	-	28	113	9.1	8.5	-	-	50
Propane (G31)	37	9	-	28	101	10.8	10.6	-	-	50
±0.2 Acceptable CO ₂ range for G20/G25										
±0.4 Acceptable O ₂ range for 20%H ₂ NG										
±0.2 Acceptable CO ₂ range for G31										



(*) If a Hydrogen Ready installation is envisaged, refer to the table above for all calibration operations, with the O₂% content in the flue gas. O₂ values refer to gas 20%H₂NG



3.16 EMERGENCY AND SAFETY OPERATIONS



BCM

The BCM board prevents the system from shutting down if management of the HSCP system or main boiler system are out of service (see the BCM manual).

A YELLOW LED = flashing (communication between BMM and BCM) ok

GREEN LED = on (Pump On)

RED LED = on (Error Code detected)

E HSCP Control panel

F Starting from ARES 350 Tec ErP Intervention lamp TLG General Limit Thermostat

G Fuses:

1 = 6.3 A

H Main Switch

I Only for ARES 350 Tec ErP

When TLG General Limit Thermostat comes on it cuts off power to the boiler and light F comes on. To re-arm it, take off the cap and press

Condensate level sensor position



NOTE: the devices are positioned under the casing next to the control unit.



NOTE: the emergency function only switches the burners on in the boiler to 100% in flow. All system loads, including the manifold pump, must be controlled manually.



4 INSPECTIONS AND MAINTENANCE



Inspections and maintenance carried out to state of the art and at regular intervals, as well as the exclusive use of original spare parts, are of primary importance for smooth operation and to guarantee long boiler life. Annual maintenance of the appliance is compulsory, in accordance with Legislation in force.



Failure to carry out Inspections and Maintenance can cause material and personal damage.



OBLIGATION!
Wear protective gloves.



Scalding hazard!
Be careful during the maintenance operations.

4.1 INSTRUCTIONS FOR INSPECTION AND MAINTENANCE

Only original **IMMERGAS** spare parts must be used to ensure a long life for all of the functions of your appliance, and to avoid changing the conditions of the approved standard product. When a part needs to be replaced:

- Disconnect the appliance from the mains power supply and make sure it cannot be reconnected accidentally.
- Shut the gas cut-off valve upstream of the boiler.
- If necessary, and based on the work that needs to be carried out, close any cut-off valves on the heating flow and return, as well as the cold water inlet valve.

After completing all maintenance operations, restore the boiler's operation.

- Open the heating flow and return, as well as the cold water inlet valve (if it was previously closed).
- Relieve and, if necessary, restore the pressure in the heating system, until reaching pressure of 0.8/1.0 bar.
- Open the gas cut-off valve.
- Apply voltage to the boiler.
- Make sure the appliance is water-tight, on the gas side and the water side.

Table of resistance values based on the heating probe (SR) and the heating return probe (SRR) temperature

T°C	0	1	2	3	4	5	6	7	8	9
0	32755	31137	29607	28161	26795	25502	24278	23121	22025	20987
10	20003	19072	18189	17351	16557	15803	15088	14410	13765	13153
20	12571	12019	11493	10994	10519	10067	9636	9227	8837	8466
30	8112	7775	7454	7147	6855	6577	6311	6057	5815	5584
40	5363	5152	4951	4758	4574	4398	4230	4069	3915	3768
50	3627	3491	3362	3238	3119	3006	2897	2792	2692	2596
60	2504	2415	2330	2249	2171	2096	2023	1954	1888	1824
70	1762	1703	1646	1592	1539	1488	1440	1393	1348	1304
80	1263	1222	1183	1146	1110	1075	1042	1010	979	949
90	920	892	865	839	814	790	766	744	722	701

Relation between the temperature (°C) and nom. resistance (Ohm) of the heating probe SR and the heating return probe SRR.

Example: At 25°C, the nominal resistance is 10067 Ohm





We urge you to have authorised company fulfil requirements regarding periodic maintenance checks.

Since dust is extracted from the inside, the resistance on the flue side, through the boiler, will increase, leading to a decrease in the heat load (and, consequentially, in the power).

Prior to cleaning, check the heat load and the percentage of CO₂ (see Par. 3.13). If the measured load (with a correct CO₂ level) is within 5% of the value indicated, the boiler does not need to be cleaned.

The operation must therefore be limited to cleaning the trap.



ATTENTION!

A drop in the heat load can be caused by an obstruction in the exhaust channel or air intake pipe. First of all make sure that this is not the cause.

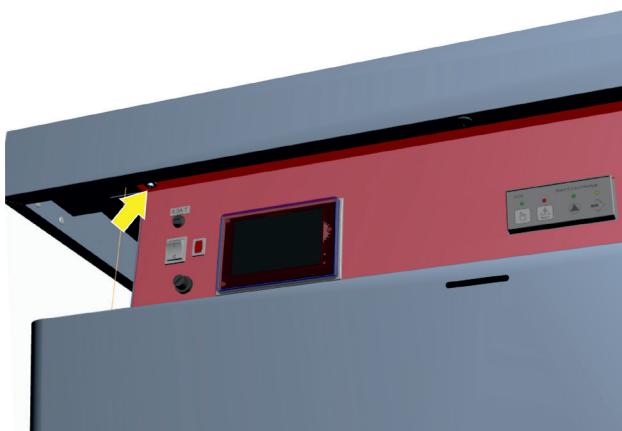
If there is a drop in the heat load greater than 5%, check how clean the burner condensate-collection pan is. Also clean the trap.

First phase – Disassembly.

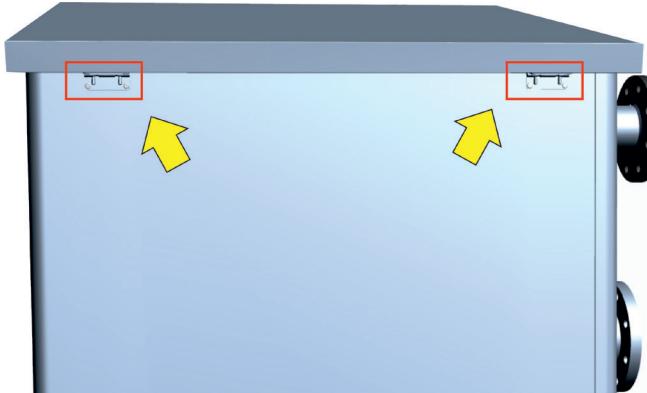
- Shut off the electrical and gas supplies **making sure the valve is firmly shut.**
- Remove:
 - all of the casings;



- turn the required screw to lift the cover;



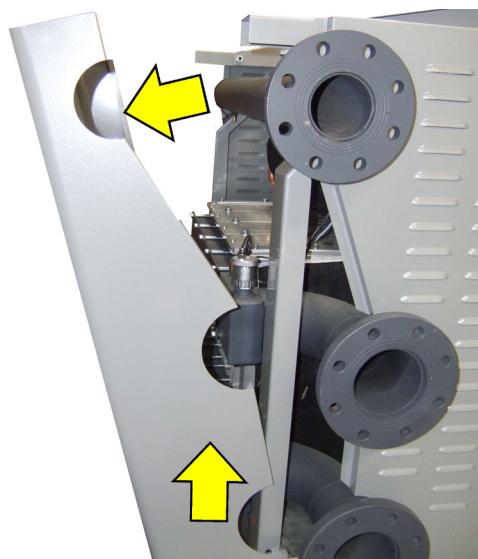
- take out the 2 cover clamping screws;



- act on the two rear closing hinges to take out the cover;



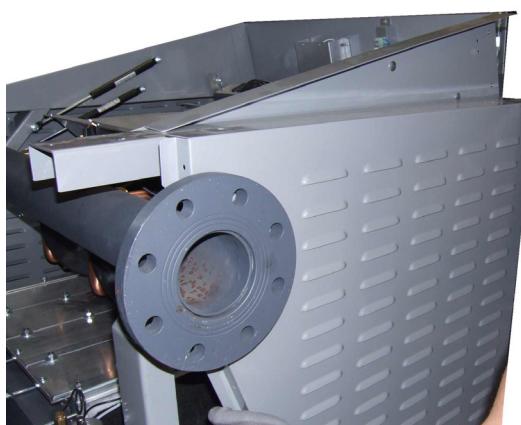
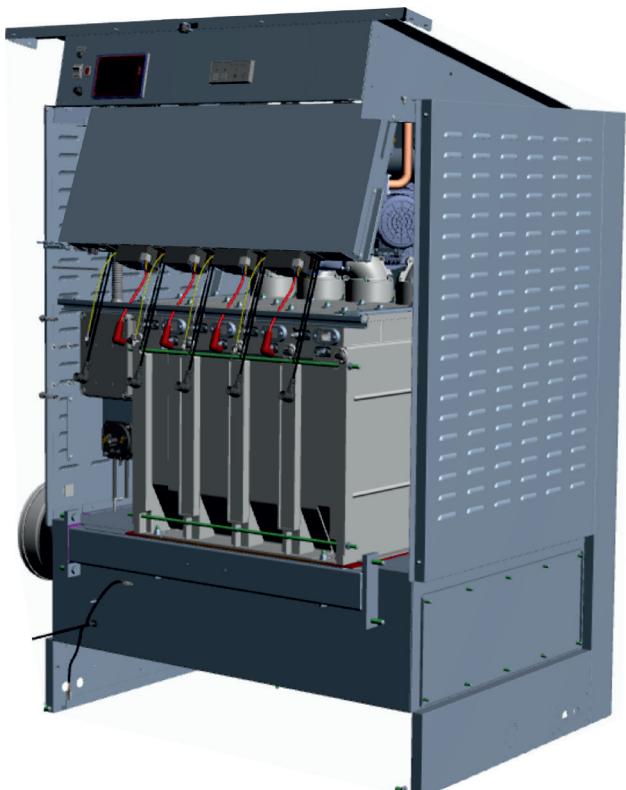
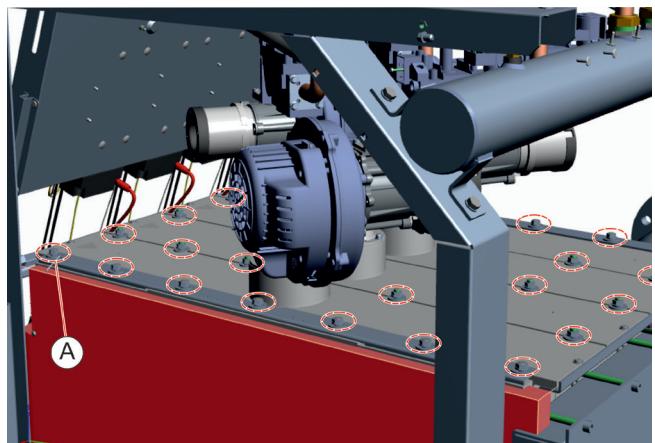
- take out the rear, front and side casing clamping screws;



INSPECTIONS AND MAINTENANCE

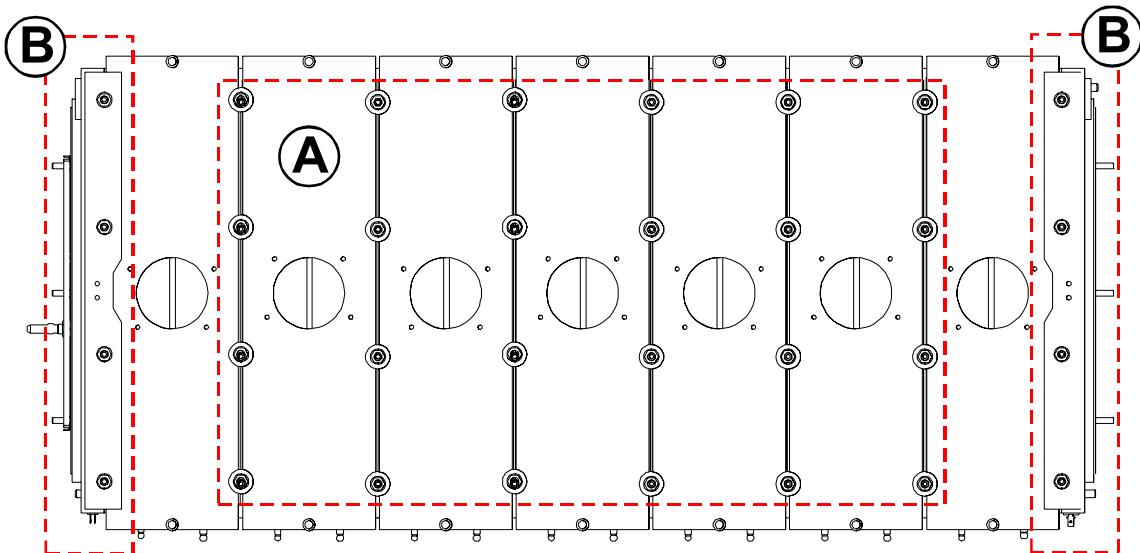


- Element screws

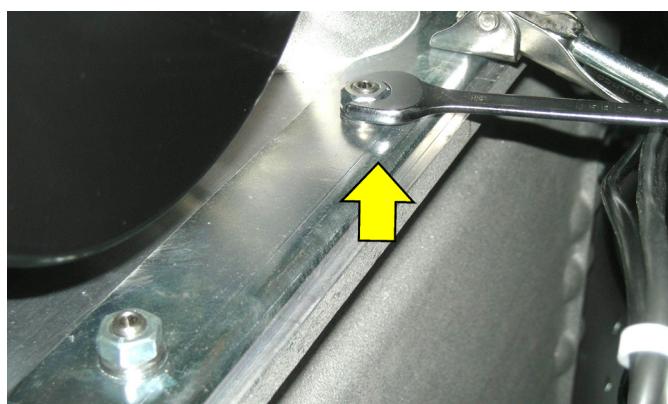


- take out screws "A" from each element
(with 13mm socket wrench and flat key);

- Element screws



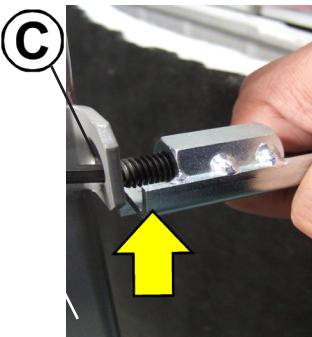
- take out screws "A" from each element (with 13 mm socket key);



- take out screws "B" (with 13 mm socket key / with 13 mm hex key) and take out the clamping plates;

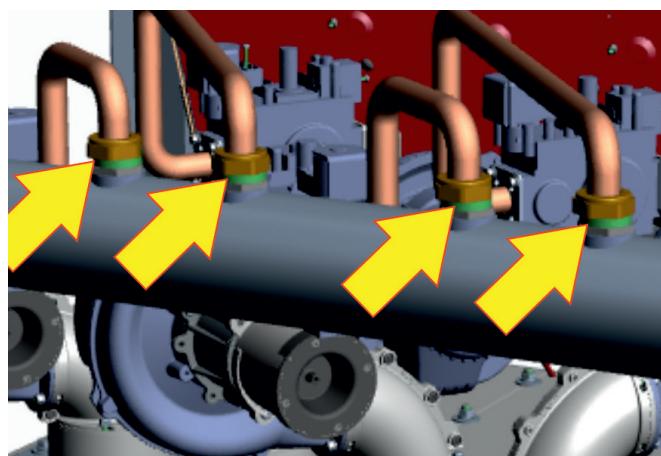
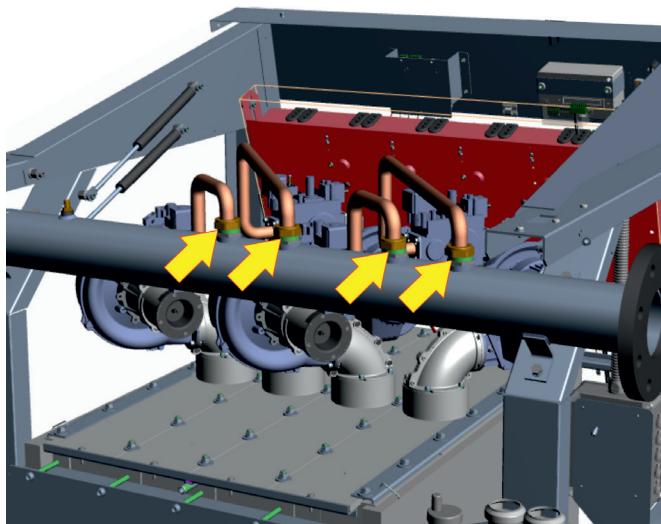


INSPECTIONS AND MAINTENANCE



- lift the **front** burner block slightly and take out 2 pins with a 5 mm hex key, until you reach holes "C" (left and right side);

- lift the burner block (rear part).



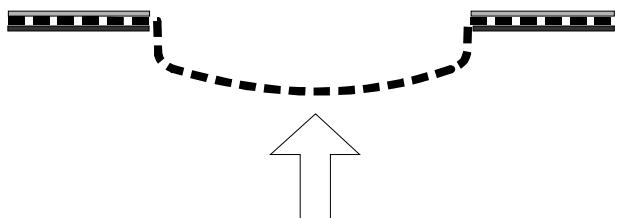
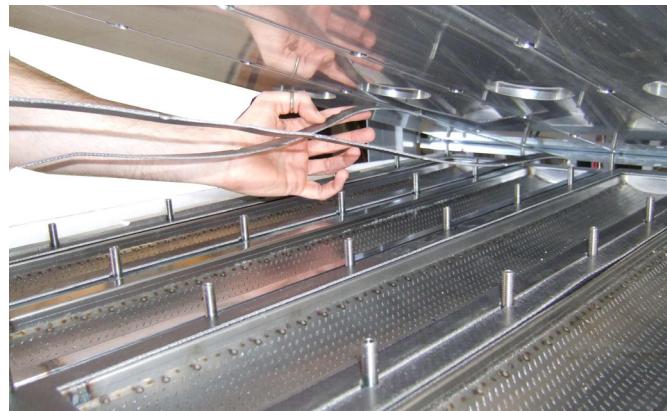
- take out the gas fittings from the gas manifold with a 36 mm flat key;

Second phase – Cleaning.

- Take out the gaskets and burners.
- Dry clean the burners using compressed air and operating from the "flame side".
- Visually check the state of the welding on the angulars and burner mesh.



The burner gaskets must be replaced every time cleaning operations are carried out.



- Wash the combustion chamber with water being careful not to get the electrical cables wet.
- During this operation is necessary to make sure that the condensate exhaust pipe is always unobstructed so that the wash water does not leak out from the inspection opening.
- Blow the combustion chamber with compressed air to remove any dirt that is still attached to the studs.
- When the elements have been washed make sure that the condensate drain trap is unobstructed: clean if necessary.
- Inspect the exhaust evacuation pipe and the flue.

Third phase - Reassembly.

- Once the body and/or burners have been cleaned, put the burners back in their places.
- Put the new graphite gaskets in place.



Proceed in the reverse order for reassembly, being careful to tighten the screws that clamp the mixer unit/fans to the body, at a torque of 13 Nm.



ATTENTION
IT IS NECESSARY TO CHANGE THE SEALING GASKETS ON EACH BURNER AT EVERY MAINTENANCE OPERATION.

- Before opening the gas supply valve make sure that the previously loosened gas fitting is firmly tightened. In order to do so open the valve and check the seal using soapy water.
- As a burner is being ignited, immediately check the seal between each single gas valve and relative premixing chamber.
- Perform a combustion analysis and check the parameters.
- Make sure that all of the previously opened gas pressure points are closed.



INSPECTIONS AND MAINTENANCE

4.2 PROGRAMMING THE OPERATION PARAMETERS



ATTENTION!

Function reserved exclusively to Authorised Service Centres.



ATTENTION!

This function is explained in chapter 8 (Device management) of the HSCP installation and maintenance manual.

BCM parameters						
Code	Symb.	PARAMETER DESCRIPTION	Unit	Min	Max	Factory settings
803	Srv	Services enabled		16	27	19
483	rP	Generator: Maximum Differential Temperature	°K	0,0	50,0	25
34	HY	Burner Hysteresis	°K	5,0	20,0	5,0
31	HL	CH#1: Minimum Setpoint	°C	20,0	40,0	30,0
39	HH	CH#1: Maximum Setpoint	°C	45,0	85,0	85,0
799	AC	Input 0/10V		0	3	1
376	DI1	Programmable Input #1		0	2	0
322	Po	Pump Post-circulation	min.	1	10	3
341	PL	Pump Minimum Control	Volt	0	10	3
313	Pr	Pump Maximum Control	Volt	0	10	10
792	CHP	CH (Central heating): Maximum Modulation.	%	0	100	100
611	POT	Generator: Maximum Parallel Error (simultaneous supply)	°K	0	30	5
612	POL	Generator: Maximum Parallel Modulation (simultaneous supply)	%	0	100	0
650	dL	Minimum D.H.W. Setpoint	°C	25,0	45,0	35,0
385	dH	Maximum D.H.W. Setpoint		50,0	65,0	65,0
360	dt	Storage tank adjustment		0	15	0
656	drT	Domestic Hot Water: Differential Temperature Requested	°K	-20	20	4
657	drH	Domestic Hot Water: Requested Temp. Hysteresis	°K	1	20	8
310	DpT	Domestic Hot Water Pump: Post-circulation	sec.	5	600	60
660	dbT	Domestic Hot Water: Maximum Boiler Temperature	°C	50,0	85,0	75,0
48	ChSet	CH#1: Setpoint	°C	20,0	85,0	84,0
64	ChPO1	CH#1: Parallel Supply		0	1	0
346	FL	Minimum Modulation	%	0	100,0	31,0
800	mB	Burners: minimum number of burners inserted		1	8	1
616	BSt	Generator: Insertion Time (generator cascade)	sec.	30	900	120
613	BRt	Generator: Removal Time (generator cascade)	sec.	30	900	120
336	HS	Temperature Gradient	°C/min	1	30	5
353	HP	CH PID: Proportional	°K	0	50	25
354	HI	CH PID: Integrative	°K	0	50	12
478	Hd	CH PID: Derivative	°K	0	50	0
816	MI	ModBus Address		1	127	1
817	MT	Timeout Modbus	sec.	0	240	30
896	TU	°Fahrenheit		0	1	0
309	St	Application Code		0	1	0
368	VA1	Programmable Relay #1		0	1	0
369	VA2	Programmable Relay #2		0	1	1
771	PS	Water Pressure Sensor		0	1	0
768	LG	Minimum Gas Pressure Sensor		0	1	1
793	COC	Chimney Obstruction Sensor		0	2	2
622	FS	Minimum Flow Sensor		0	7	1

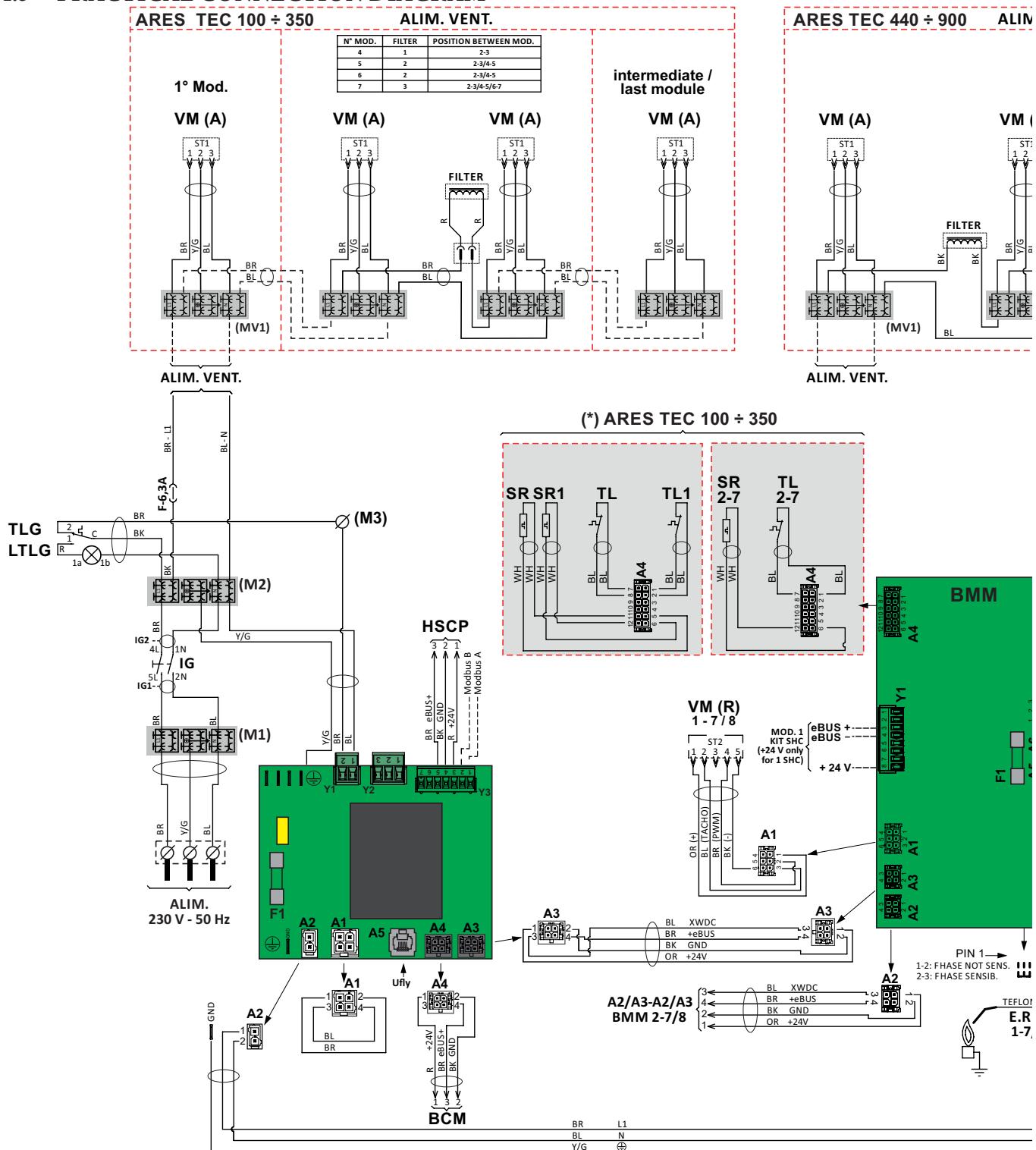


BMM parameters						
Code	Symb.	PARAMETER DESCRIPTION	Unit	Min	Max	Factory settings
803	Srv	Services enabled		0	1	1
48	ChSet	CH#1: Setpoint	°C	30	95	80
784	BC	Local BUS address		0	11	0
816	MI	ModBus Address		1	127	1
817	MT	Timeout Modbus	sec	0	240	30
896	0	Unknown Parameter		0	1	0
799	AC	Input 0/10V		0	2	0
376	DI1	Programmable Input #1		0	3	0
322	Po	Pump Post-circulation	min	1	30	3
341	PL	Pump Minimum Control	%	0	100	30
313	Pr	Pump Maximum Control	%	0	100	100
31	HL	CH#1: Minimum Setpoint	°C	20	105	30
39	HH	CH#1: Maximum Setpoint	°C	20	105	95
792	CHP	CH (Central heating): Maximum Modulation.	%	0	100	100
619	IG	Ignition Modulation	%	32	82	80
645	IDT	Generator: Flame Stabilisation Time	sec	0	30	0
783	Er	Generator: Ignition Attempts		0	10	0
646	0	Unknown Parameter		0	1	0
527	PU	Fan: Pulses/Rev		0	4	2
486	FP	Fan: Proportional gain adjustment		0	50	30
487	FI	Fan: Integral gain adjustment		0	50	9
489	Fpl	Fan: Minimum PWM (pulse width modulation)	%	5	15	8
337	Fr	Modulation gradient	%	1,0	100,0	2,0
526	FU	Fan: Maximum Speed	Hz	50	150	100
319	FH	Maximum Modulation	%	1,0	100,0	100,0
346	FL	Minimum Modulation	%	1,0	100,0	28,0
314	Sb	Standby Modulation	%	0	100	26
620	IP	Postpurge: Fan	%	0	100	26
617	IGL	Ignition: Minimum Modulation	%	10	100	32
618	IGH	Maximum Modulation Ignition	%	0	100	82
353	HP	CH PID: Proportional	°K	0	50	25
354	HI	CH PID: Integrative	°K	0	50	12
478	Hd	CH PID: Derivative	°K	0	50	0
34	HY	Burner Hysteresis	°K	5,0	20,0	5,0
336	HS	Temperature Gradient	°C/min	1	30	10
483	rP	Generator: Maximum Differential Temperature	°C	0,0	50,0	30,0
380	AI1	Programmable Sensor #1		0	3	1
777	AFC	APS Control (Burner air flow control)		0	3	0
623	TS	Temperature Sensors		0	1	0
626	TSE	Flue Sensor		0	3	0
805	LV	Mains Voltage	Volt	100	240	230
2590		Burner Power	kW	10	1000	108

(*) = Values for LPG



4.3 PRACTICAL CONNECTION DIAGRAM

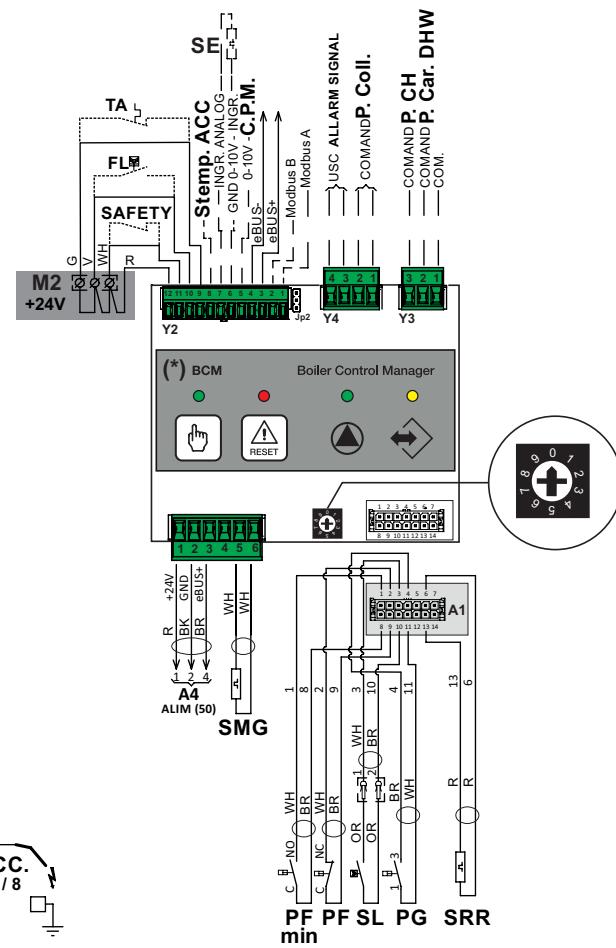
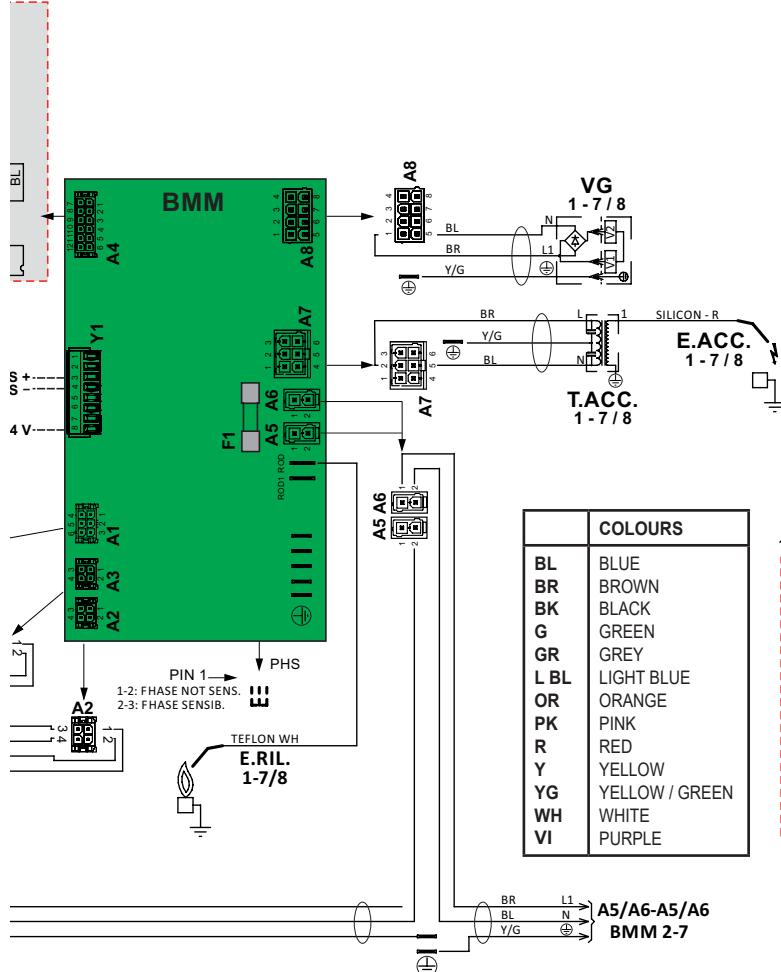
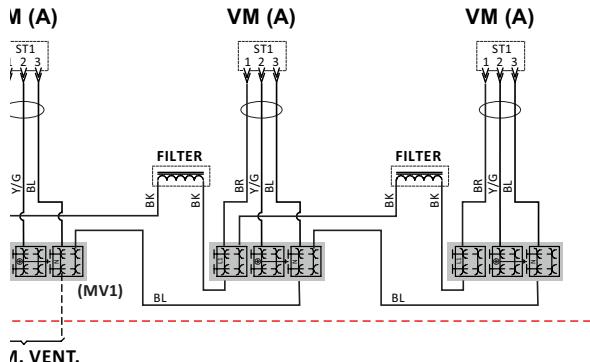


KEY	
E. ACC.	Ignition electrode
E. RIL.	Detection electrode
HSCP	Temperature control
SR	Heating sensor (only 1st mod.)
SR 1÷7	Local heating sensor
PF	Flue pressure switch (only 1st mod.)

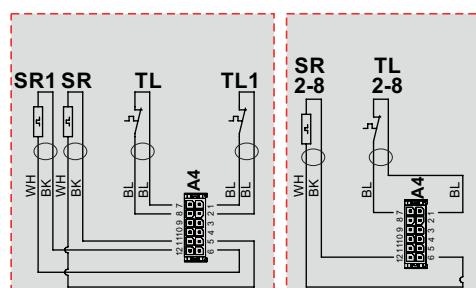
PF min	Minimum Flue pressure switch (only 1st mod.)
SL	Condensate level sensor (2nd mod.)
T. ACC.	Ignition Transformation
TL	Limit thermostat
TL 1÷7	Local limit thermostat
VG	Gas valve
VM (A)	Modulating fan power supply

VM (R)	Modulating fan adjustment/Det.
SRR	Global return sensor
PG	Gas pressure switch
IG	Main switch
TLG	General limit thermostat
LTLG	General limit thermostat light
F	Fuse

S TEC 440 ÷ 900 ALIM. VENT.



(*) ARES TEC 440 ÷ 900



BCM	
SMG	Global flow probe
S. temp. ACC.	Storage tank temperature sensor
SE	Outdoor temperature sensor
INGR. ANALOG.	Analogue input
GND 0-10V ING	0-10 V analogue input

0-10V C.P.M.	Modulating Pump Control
ALLARM SIGNAL	Alarm Outlet
Comm. P. COLL	Boiler manifold pump control
Comm. P. CH	Central heating pump control
P. car DHW	Storage tank load pump control
COM.	Common



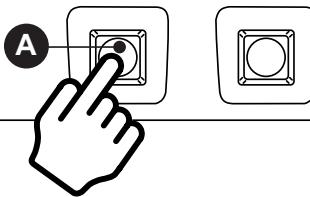
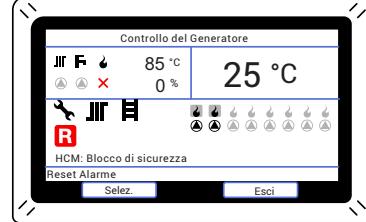
4.4 ERROR CODE



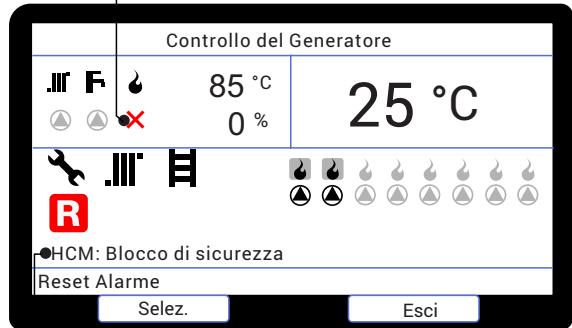
ATTENTION!
Function reserved exclusively to Authorised Service Centres.



ATTENTION!
This function is explained in chapter 9 (Error codes) of the HSCP installation and maintenance manual.



segnalazione guasto



descrizione errore

When the boiler detects a fault, the alarm symbol is displayed on the screen together with the relative error code and description.

It is possible to reset the boiler by pressing key "A".







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This instruction booklet is
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