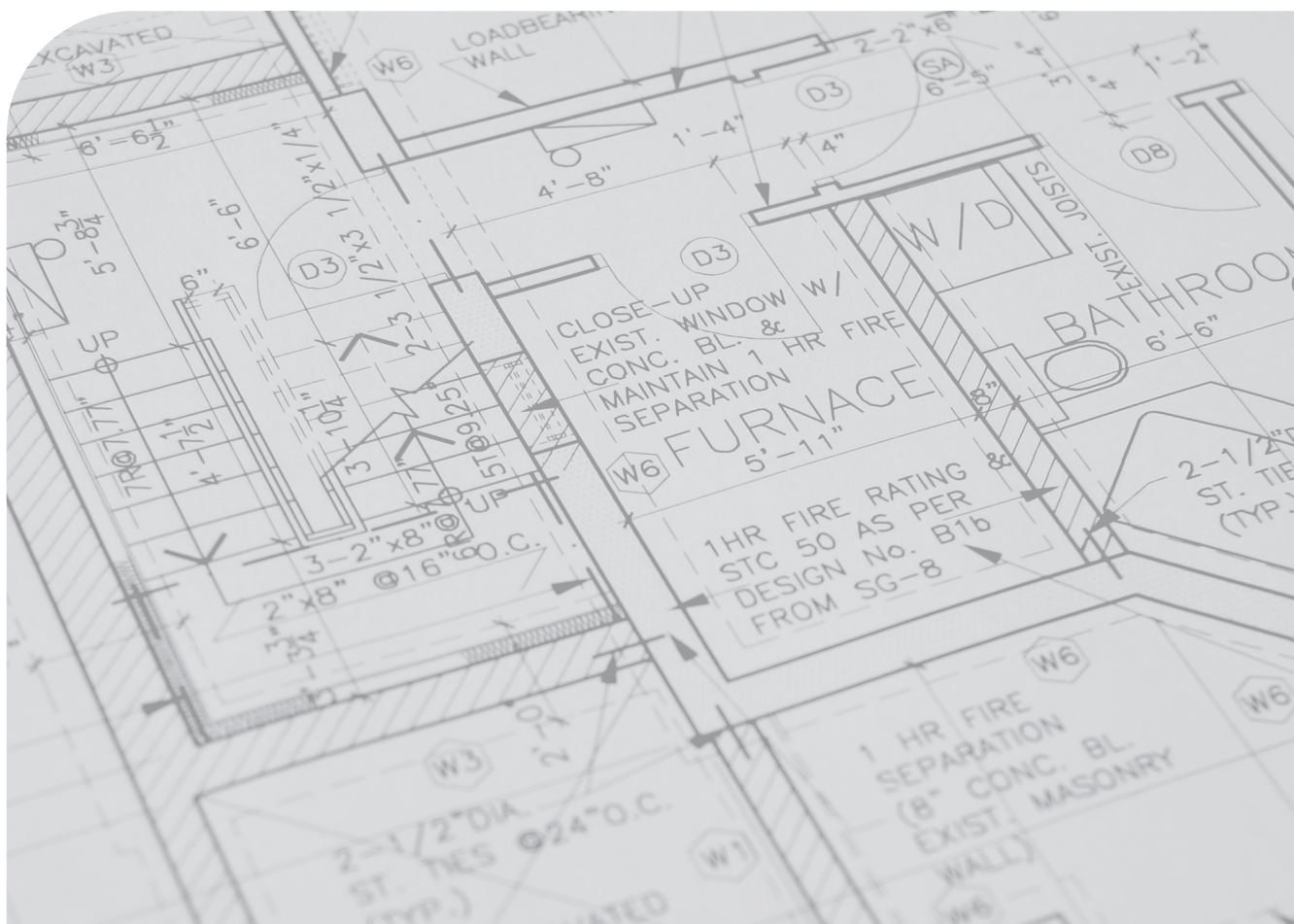


# ARES 150 TEC ERP ARES 200 TEC ERP ARES 250 TEC ERP ARES 300 TEC ERP ARES 350 TEC ERP

IE

Instructions and  
recommendations

\*1.043688ENG\*







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

## INDEX

<b>1</b>	<b>General information.....</b>	<b>5</b>	<b>3</b>	<b>Instructions for installation .....</b>	<b>17</b>
1.1	general warnings.....	5	3.1	General recommendations .....	17
1.2	Symbols used in the manual.....	6	3.2	Regulations for installation.....	17
1.3	Compliant use of the appliance.....	6	3.3	Preventative checks and adaptation of the system .....	17
1.4	Information for the system manager.....	6	3.4	Packaging.....	18
1.5	Safety warnings .....	7	3.5	Positioning the heating control unit.....	19
1.6	Technical data plate .....	8	3.6	Flue exhaust pipe connection.....	20
1.7	Water treatment .....	9	3.6.1	Flue exhaust manifold connection .....	20
1.8	Boiler frost protection .....	9	3.7	Reversing the connections.....	21
<b>2</b>	<b>Technical characteristics and dimensions.....</b>	<b>10</b>	3.8	Connection .....	22
2.1	Technical characteristics .....	10	3.9	System filling and emptying .....	24
2.2	Internal view with indications of main components .....	11	3.10	Electrical connections .....	25
2.3	Dimensions.....	13	3.11	First ignition.....	33
2.4	Operating data and general characteristics .....	14	3.12	On-site measurement of the combustion efficiency.....	34
2.4.1	Technical data according to the ErP directive .....	15	3.12.1	Enable the calibration function.....	34
2.4.2	Determining the primary circuit pump or boiler pump .....	16	3.12.2	Positioning the probes.....	34
			3.13	Burner adjustment .....	35
			3.14	Emergency and safety operations .....	37
			<b>4</b>	<b>Inspections and maintenance .....</b>	<b>38</b>
			4.1	Instructions for inspection and maintenance .....	38
			4.2	Programming the operation parameters .....	44
			4.3	Practical connection diagram .....	46
			4.4	Adapting for use with other gases .....	48
			4.5	Error code .....	50



### 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.**

## 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.**

		(2)		
Model	(3)			
S.N°	(5) /	PIN	(6)	
Types	(7)	NOx	(8)	
A Central Heating	Pn	(9) kW	Pcond	(10) kW
	Qn	(11) kW	Adjusted Qn	(12) kW
	PMS	(13) bar	T max	(14) °C
B DHW	Qnw	(15) kW	D	(16) l/min
	PMW	(19) bar	T max	(20) °C
G	s	(29) %	wh	(30) %
E Factory setting		D Countries of destination		
(27) mbar <input type="checkbox"/> mbar <input type="checkbox"/> mbar <input type="checkbox"/> mbar <input type="checkbox"/> mbar <input type="checkbox"/> mbar <input type="checkbox"/> mbar <input type="checkbox"/> mbar <input type="checkbox"/>		(24) (25) (26)		
C Electrical Power supply				
(21) V Hz (22) W				
IP class: (23)				
		(28) (1)		
Made in Italy				

### 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.

## 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 multimetal) 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  $12 \div 50$  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
- Any limit thermostats  $> 350$  kW
- 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  $0 \div 10$  V 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 panelling comprised of oven-painted steel panels suitable for outdoor installation.
- Condensation collection tray with stainless steel exhaust trap and flue chamber.
- Incorporated deaerator.

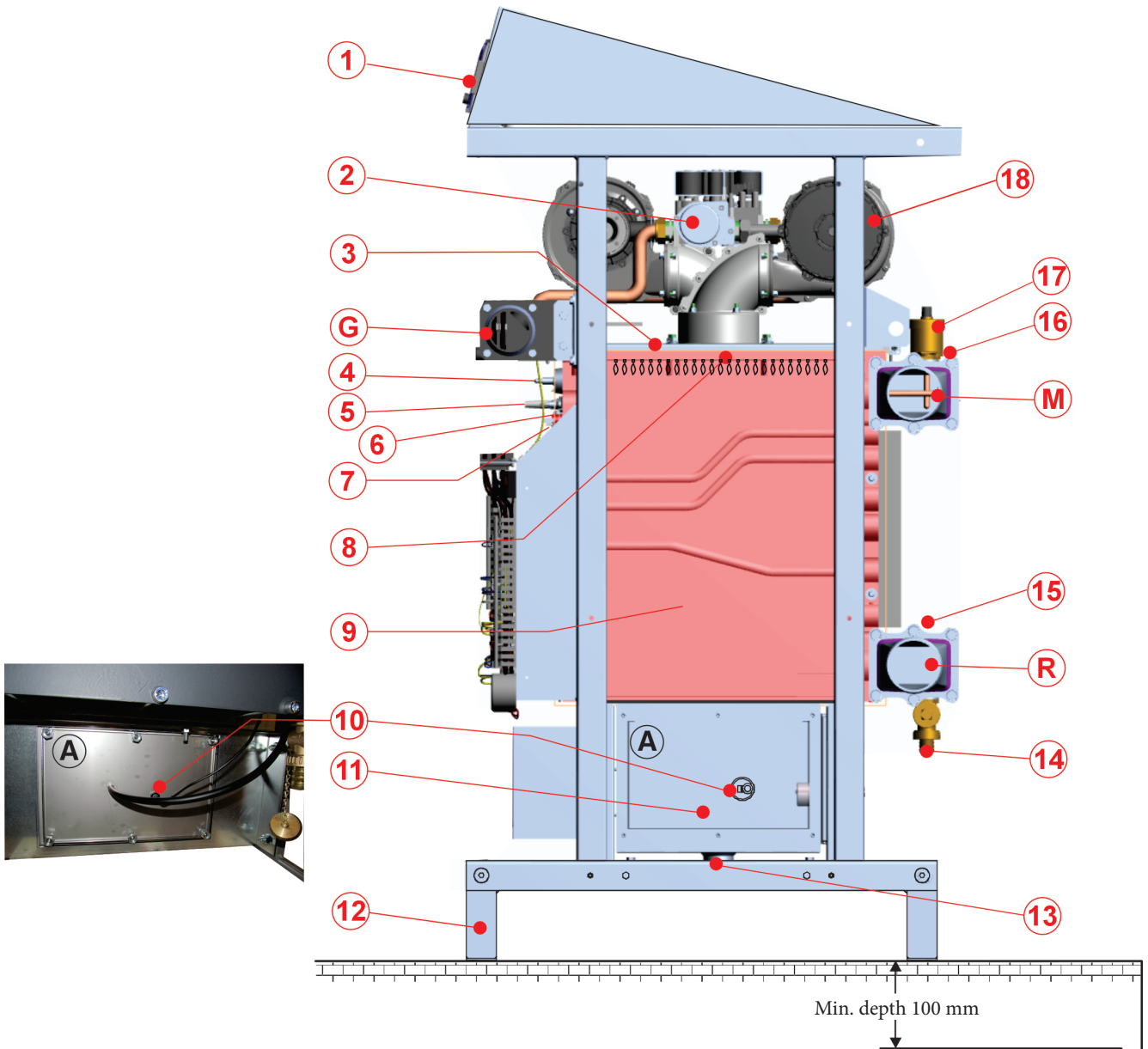
The request for heat can be generated by the HSCP thermoregulation/manager or alternatively by the BCM (Boiler controller).

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.



## 2.2 INTERNAL VIEW WITH INDICATIONS OF MAIN COMPONENTS



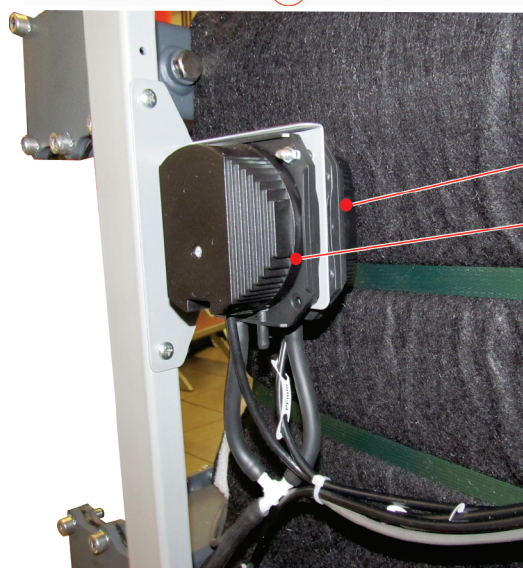
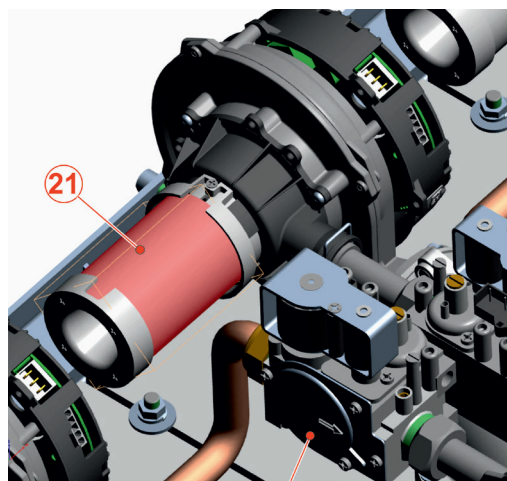
### KEY

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
6		SR	Room Ntc Probe
7		TL	Limit Thermostat
8			Burner
9			Silicon Aluminium Exchanger
10		SL	Level Sensor

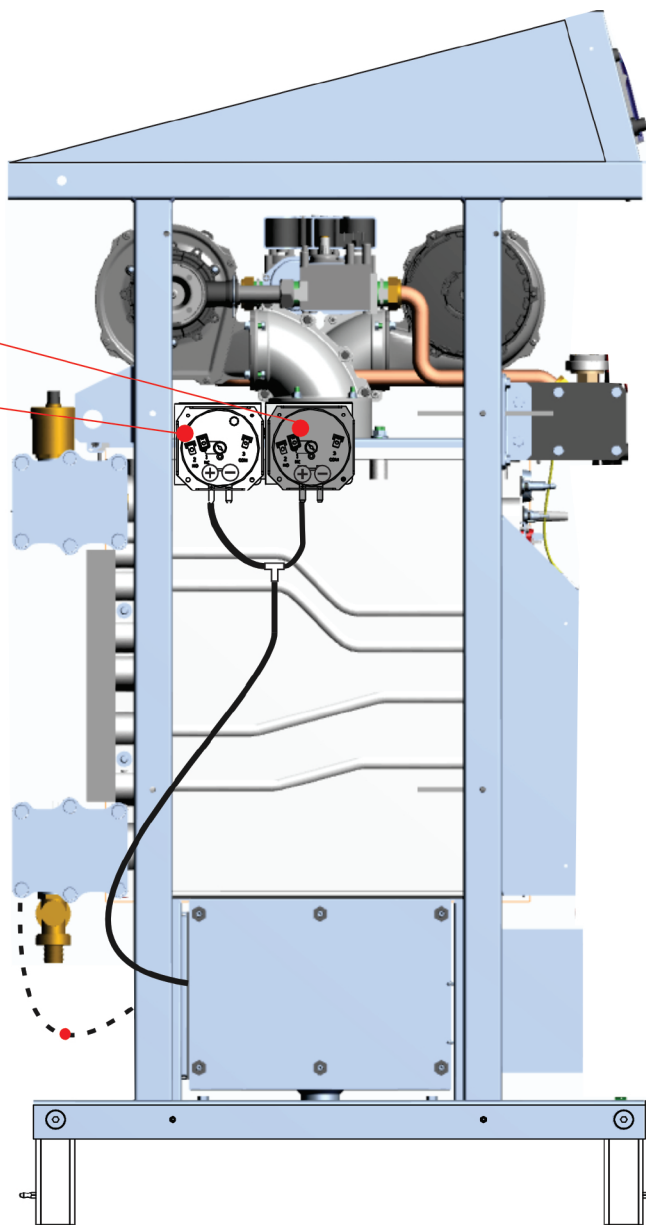
N°	Error code	Wiring diagram	Description
11			Condensation Collection Pan / Flue Fitting
12			Frame
13			Condensate Drain Outlet
14			Draining Valve
15		SRR	Return Global Ntc
16		SMG	Probe Flow Global Ntc
17			Automatic Air Bleed Valve
18			Fan







N°	Error code	Wiring diagram	Description
19		PF min	Minimum flue pressure switch
20		PF	Flue pressure switch
21			Fan filter



**Note:**  
PF (20) and PFmin. (19) they are opposite each other as shown in the photo, in the drawing they are shown side by side for clarity.



**flue gas outlet** RIGHT side (supply condition) - LEFT side and REAR side (order rear flue gas outlet kit)  
**flow** RIGHT side (supply condition) - LEFT side  
**return** RIGHT side (supply condition) - LEFT side  
**Gas intake** RIGHT side (supply condition) - LEFT side

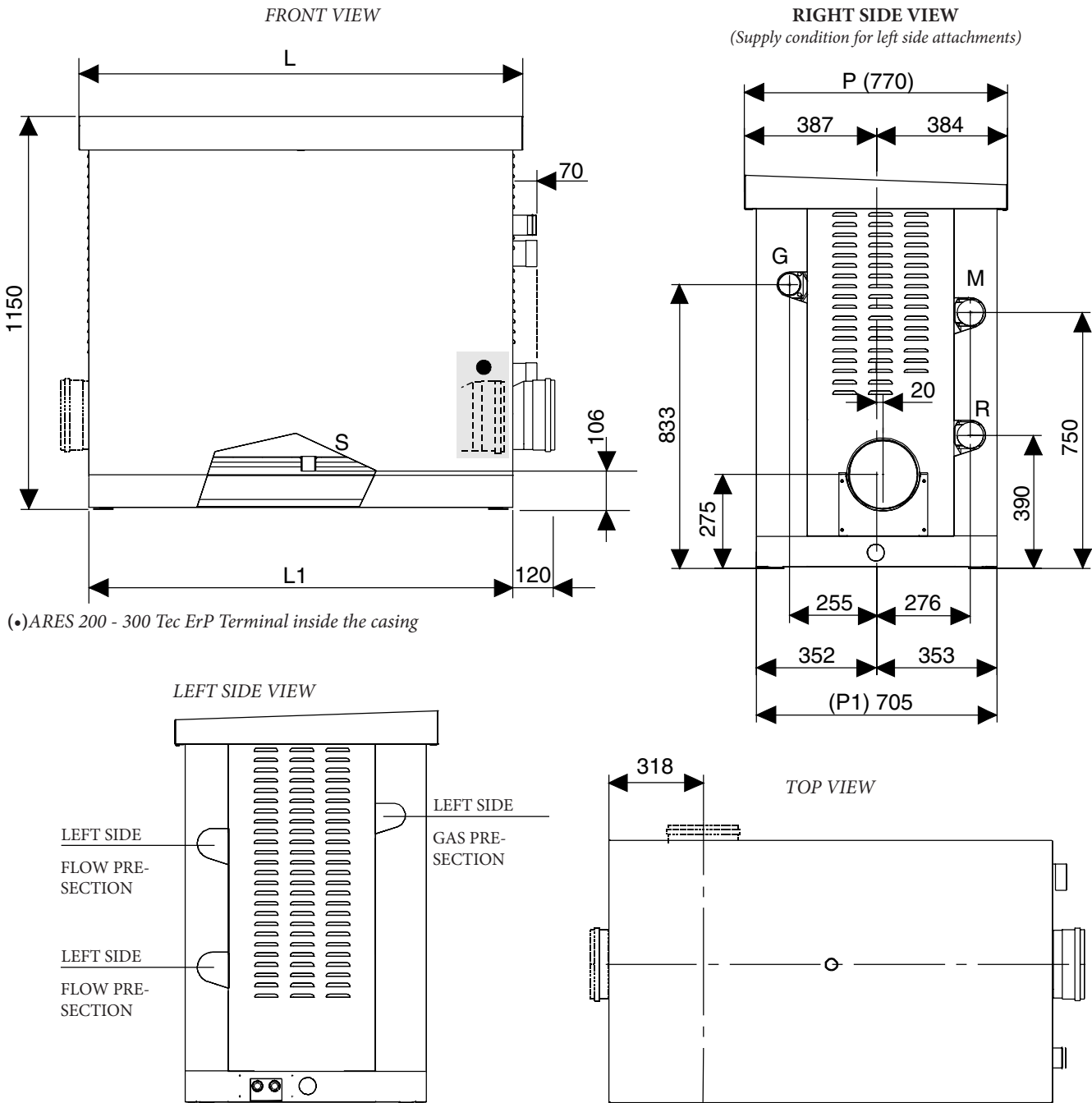


If it is necessary to position the flue exhaust, on the **left** side of the boiler, it is necessary to move cover "A" with relative cabling, level sensor and pressure switch pipe, on the rear side of the boiler.  
The rear cover (previously removed) must be put back on the right side of the boiler.





### 2.3 DIMENSIONS



(•)ARES 200 - 300 Tec ErP Terminal inside the casing

ARES Tec ErP		150	200	250	300	350
<b>Dimensions</b>	Unit					
Heating elements	n°	3	4	5	6	7
Height	mm	1150	1150	1150	1150	1150
Width "L"	mm	764	1032	1032	1300	1300
Width "L1"	mm	706	974	974	1242	1242
Depth "P"	mm	770	770	770	770	770
Depth "P1"	mm	705	705	705	705	705
<b>Attachment sizes</b>						
G Gas fitting	mm (inch)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)
F System flow	mm (inch)	64 (2½)	64 (2½)	64 (2½)	64 (2½)	64 (2½)
R System return	mm (inch)	64 (2½)	64 (2½)	64 (2½)	64 (2½)	64 (2½)
Flue fitting	mm	150	150	200	200	200
Condensate drain	mm	40	40	40	40	40



## 2.4 OPERATING DATA AND 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% H<sub>2</sub>NG). Power supply pipes must be the same as or larger than the appliance fitting.

ARES Tec ErP		150	200	250	300	350
Boiler category		II <sub>2H3P</sub>	II <sub>2H3P</sub>	II <sub>2H3P</sub>	II <sub>2H3P</sub>	II <sub>2H3P</sub>
Modulation ratio		1 : 12.5	1 : 16.7	1 : 20.8	1 : 25	1 : 29
Nominal heat input on L.V.C. Q <sub>n</sub>	kW	150	200	250	300	348
Minimum heat input on L.C.V. Q <sub>min</sub>	kW			12		
Nominal heat input on L.V.C. Q <sub>n</sub> with gas 20% H <sub>2</sub> NG	kW	137	182,6	228,3	273,9	319,6
Minimum heat input on L.V.C. Q <sub>min</sub> on gas 20% H <sub>2</sub> NG	kW			10,8		
Nominal effective power (Tr 60 / Tf 80 °C) P <sub>n</sub>	kW	146.1	195.2	244.5	294.0	341.7
Minimum effective power (Tr 60 / Tf 80 °C) P <sub>n</sub> min	kW			11.7		
Nominal effective power (Tr 30 / Tf 50 °C) P <sub>cond</sub>	kW	150	200.4	251.3	302.7	354.6
Minimum effective power (Tr 30 / Tf 50 °C) P <sub>cond</sub> min	kW			12.8		
Efficiency at nominal power (Tr 60 / Tf 80 °C)	%	97.4	97.6	97.8	98.0	98.2
Efficiency at minimum power (Tr 60 / Tf 80 °C)	%			97.16		
Efficiency at nominal power (Tr 30 / Tf 50 °C)	%	100.0	100.2	100.5	100.9	101.9
Efficiency at minimum power (Tr 30 / Tf 50 °C)	%			106.5		
Efficiency at 30% of the load (Tr 30 °C)	%			107.3		
Combustion efficiency at nominal load	%	97.8	97.8	98.0	98.1	98.3
Combustion efficiency at a reduced load	%			98.3		
Losses from operating burner casing (Q <sub>min</sub> )	%			1.2		
Losses from operating burner casing (Q <sub>n</sub> )	%	0.4	0.2	0.2	0.1	0.1
Flue temperature at net of Tf-Ta (min)(*)	°C			33.4		
Flue temperature at net of Tf-Ta (max)(*)	°C	45.1	46.5	47.3	48.2	49.1
Maximum permitted temperature	°C			100		
Maximum operating temperature:	°C			90		
Mass flue flow rate (min)	kg/h			19.6		
Mass flue flow rate (max)	kg/h	245	327	409	490	569
Air excess	%	28.2	28.2	28.2	28.2	28.2
Chimney losses with burner in operation (min)	%			1.7		
Flue losses with burner in operation (max)	%	2.2	2.2	2.2	1.9	1.7
Minimum pressure of heating circuit	bar			0.5		
Maximum pressure of heating circuit	bar			6.0		
Water content	l	14.2	18.3	22.4	26.5	30.6
Methane gas consumption G20 (supp.press. 20 mbar) at Q <sub>n</sub>	m <sup>3</sup> /h	15.9	21.1	26.4	31.7	36.8
Methane gas consumption G20 (supp.press. 20 mbar) at Q <sub>n</sub>	m <sup>3</sup> /h			1.3		
Gas consumption G25 (supp.press. 20/25 mbar) at Q <sub>n</sub>	m <sup>3</sup> /h	18.4	24.6	36.7	36.9	42.8
Gas consumption G25 (supp.press. 20/25 mbar) at Q <sub>n</sub>	m <sup>3</sup> /h			1.5		
Propane gas consumption (supp.press. 37/50 mbar) at Q <sub>n</sub>	kg/h	11.6	15.5	19.4	23.3	27
Propane gas consumption (supp.press. 37/50 mbar) at Q <sub>n</sub>	kg/h			0.9		
Maximum pressure available at flue base	Pa			100		
Max condensate production	kg/h	23	30.60	38.3	45.9	53.6
<b>Emissions</b>						
CO at maximum heat input with 0% O <sub>2</sub>	mg/kWh	54	62	71	55	58
NOx at maximum heat input with 0% O <sub>2</sub>	mg/kWh	38	36	44	42	40
NOx class				6		
(***) Sound pressure level	dBA			52		
<b>Electrical data</b>						
Frequency/Power supply voltage:	V/Hz			230/50		
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

CO<sub>2</sub> (min/max) See "NOZZLES - PRESSURES" table

Seasonal Energy Efficiency according to 2009/125 EEC (<=400Kw) η<sub>s</sub> - see Table ErP

Losses at shutdown at ΔT 30°C - P<sub>stb</sub> - see Table ErP



Electrical consumption in standby - P<sub>sb</sub> - 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.



**2.4.1 TECHNICAL DATA ACCORDING TO THE ERP DIRECTIVE**

ARES TEC ErP			150	200	250	300	350
Element	Symbol	Unit					
Useful heat output	Nominal output	kW	146	195	244	294	342
Room central heating seasonal energy efficiency	ηs	%	92				
Central heating seasonal efficiency class			A	A	A	A	A
For boilers for central heating and combination boilers: useful heat output							
Useful heat output in high temperature mode (Tr 60 °C / Tm 80 °C)	P4	kW	146.1	195.2	244.5	294.0	341.7
Efficiency at nominal heat output in high temperature mode (Tr 60 °C / Tm 80 °C)	η4	%	87.67	87.85	88.03	88.21	88.38
Useful heat output at 30% nominal heat output in low temperature mode (Tr 30 °C)	P1	kW	49.3	64.4	80.5	96.6	112
Efficiency at 30% nominal heat output in low temperature mode (Tr 30 °C)	η1	%	96.7				
Boiler with power range adjustment: YES / NO			NO	NO	NO	NO	NO
Auxiliary electricity consumption							
At full load	elmax	kW	0.360	0.451	0.542	0.633	0.724
At partial load	elmin	kW	0.040				
In standby mode	PSB	kW	0.019				
Other items							
Heat loss in standby	Pstb	kW	0.94	0.98	1.10	1.15	1.39
Emissions of nitrogen oxides ref. PCS	NOx	Mg/kWh	30				
Annual electrical consumption	QHE	GJ	459	612	766	920	1069
For mixed central heating appliances							
Stated load profile			-	-	-	-	-
Water central heating energy efficiency	ηwh	%	-	-	-	-	-
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			-	-	-	-	-



## 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  $\Delta t$ .

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 150 ErP

Maximum flow rate in l/h ( $\Delta t = 15$ K)	8.376
Nominal requested flow rate in l/h ( $\Delta t = 20$ K)	6.282

### ARES TEC 200 ErP

Maximum flow rate in l/h ( $\Delta t = 15$ K)	11.192
Nominal requested flow rate in l/h ( $\Delta t = 20$ K)	8.394

### ARES TEC 250 ErP

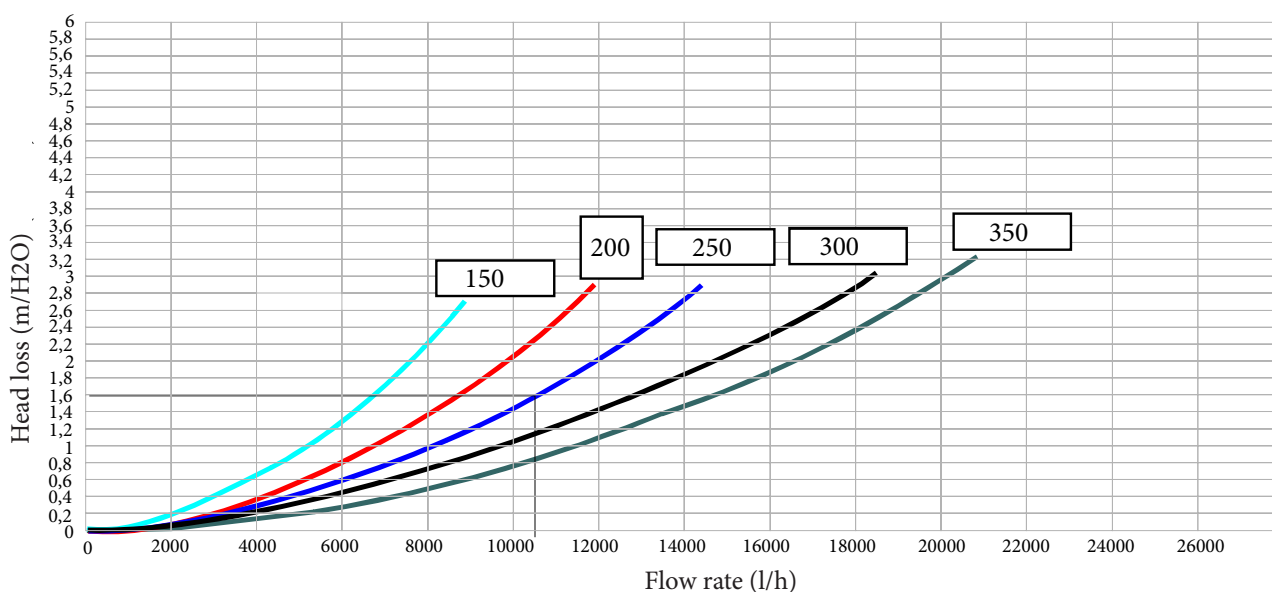
Maximum flow rate in l/h ( $\Delta t = 15$ K)	14.018
Nominal requested flow rate in l/h ( $\Delta t = 20$ K)	10.514

### ARES TEC 300 ErP

Maximum flow rate in l/h ( $\Delta t = 15$ K)	16.856
Nominal requested flow rate in l/h ( $\Delta t = 20$ K)	12.642

### ARES TEC 350 ErP

Maximum flow rate in l/h ( $\Delta t = 15$ K)	19.712
Nominal requested flow rate in l/h ( $\Delta t = 20$ K)	14.784



#### EXAMPLE:

For a  $\Delta T$  20K, of an ARES 250 Tec 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<sub>2</sub>O.



#### 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.  $\Delta t$  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:

- a) **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.**
- b) 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.
- c) 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.



## 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!

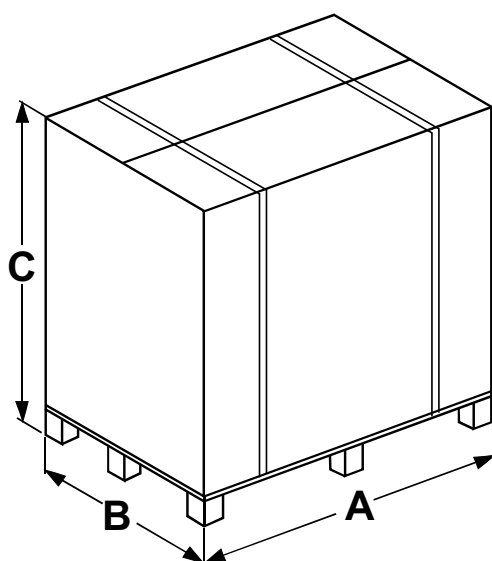
#### Wear protective gloves

- 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.

Composition of packaging:

#### On the front of the boiler there are:

- The flue exhaust manifold anchored to the front crossbeam with screws
- A box containing:
  - 4 supporting feet
  - 3 closing plugs to invert manifolds
  - 3 insulating gaskets for manifolds (outdoor boiler)
- A box containing:
  - Gasket between pan and terminal



Model	A (mm)	B (mm)	C (mm)	Gross Weight (kg)
150	840	890	1250	236
200	1110	890	1250	295
250	1110	890	1250	325
300	1375	890	1250	386
350	1375	890	1250	419

- Collar gasket
- 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
- Kit of resistances
- Plate and fairlead for power output

#### On the right side of the boiler:

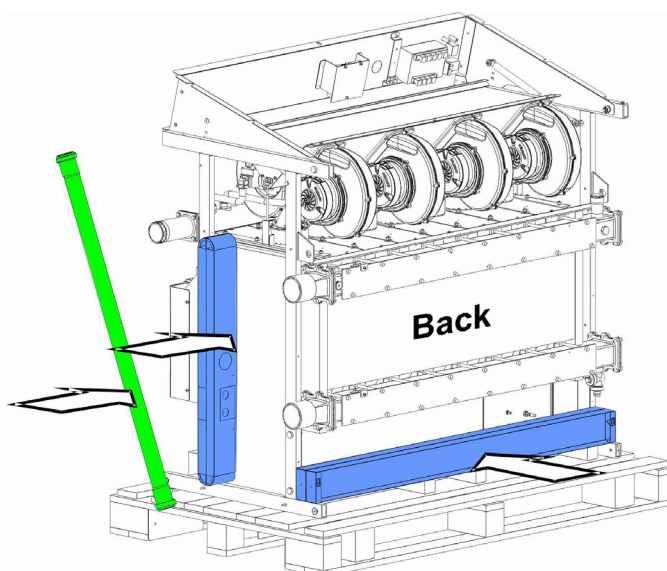
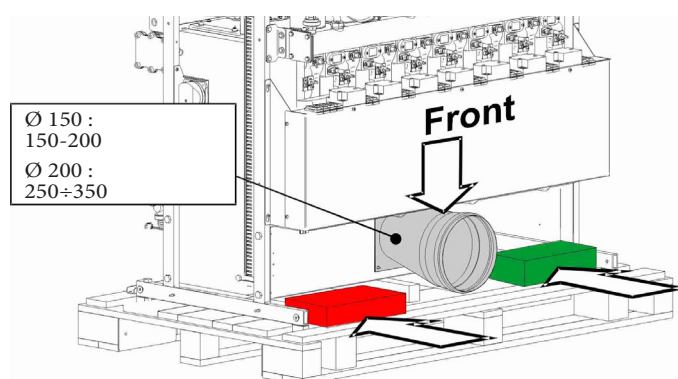
- Condensate drain trap pipe
- RT and LT side platform.

#### On the rear side of the boiler:

- Front and rear platform.

#### 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
  - Hydraulic test certificate
  - Warranty certificate
  - Pins to block the set of fans in raised position.



## 3.5 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.

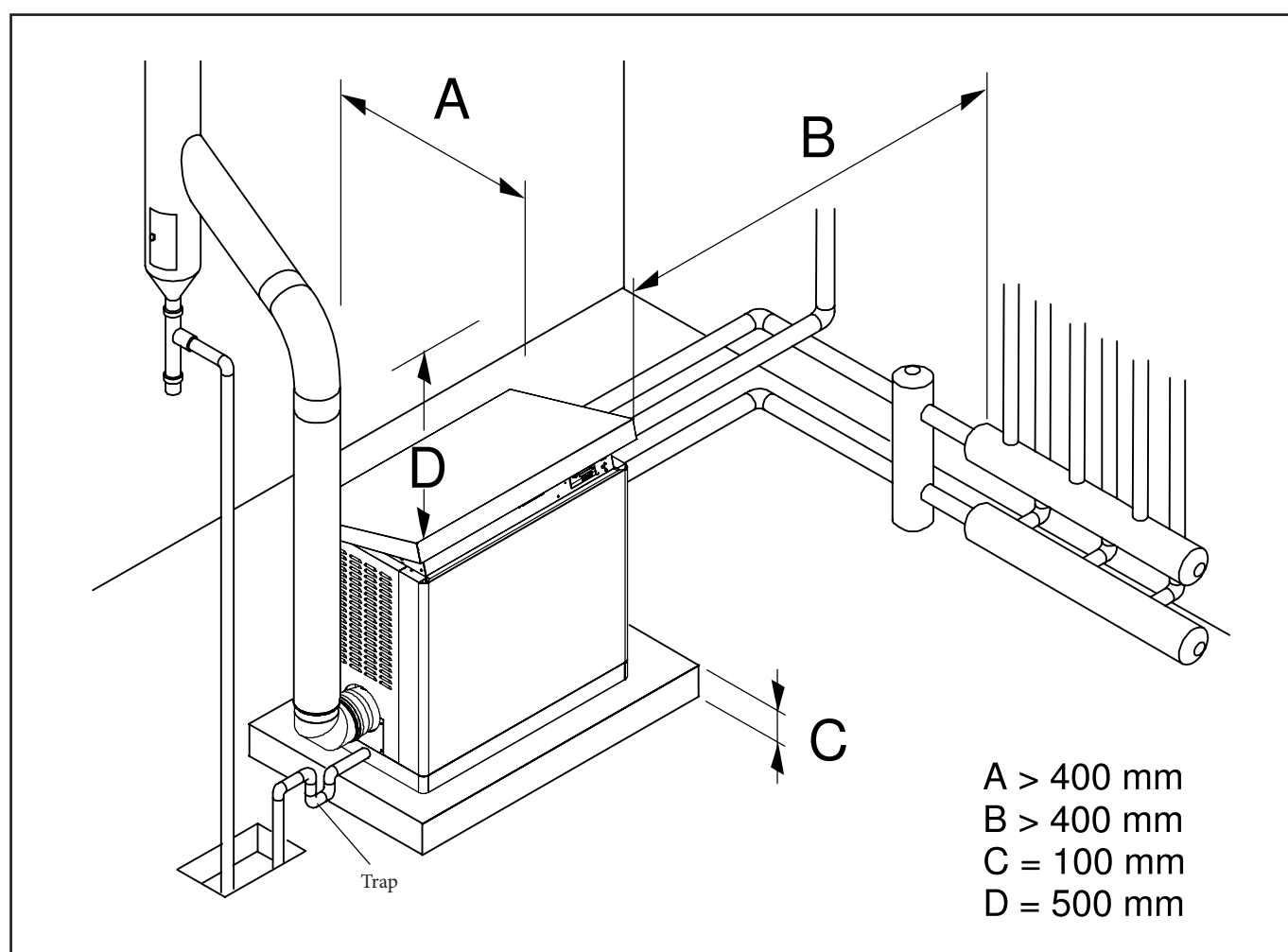
Installation must comply with the requirements contained in the most recent standards and legislation regarding heating control units, heating system installation and hot water production, ventilation, flues suitable for condensation boiler combustion product exhaust, and any other applicable regulation.

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.

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.





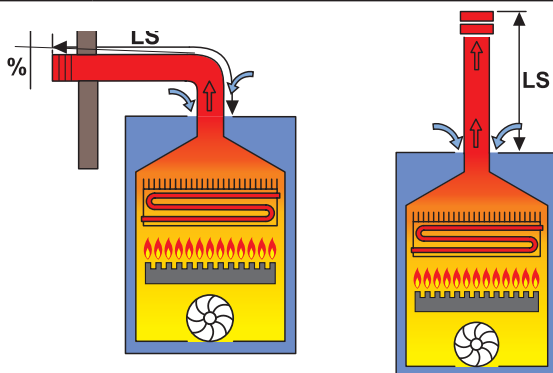
## 3.6 FLUE EXHAUST PIPE CONNECTION

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.

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



#### ATTENTION:

The flue must comply with the standards in force

## 3.6.1 FLUE EXHAUST MANIFOLD CONNECTION

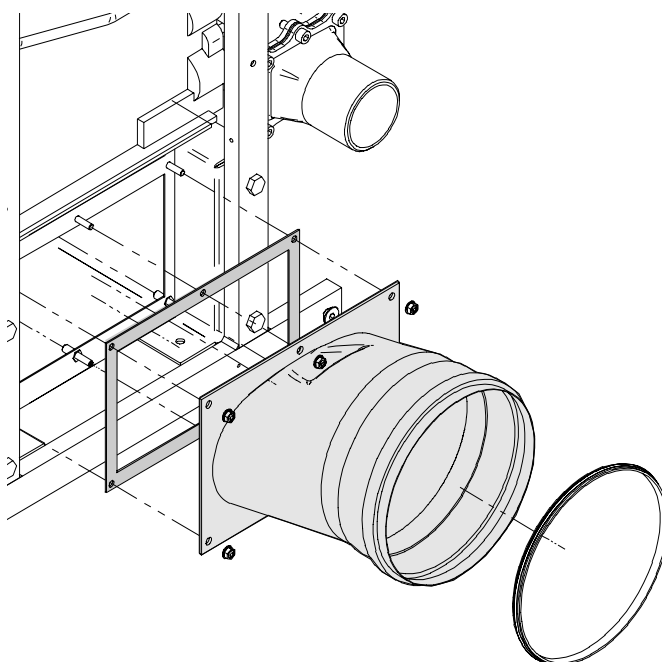
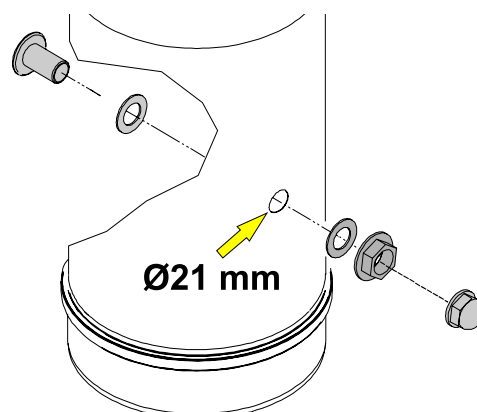


To secure the flue exhaust manifold use the nuts and washers contained in the bag.



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.





## 3.7 REVERSING THE CONNECTIONS

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

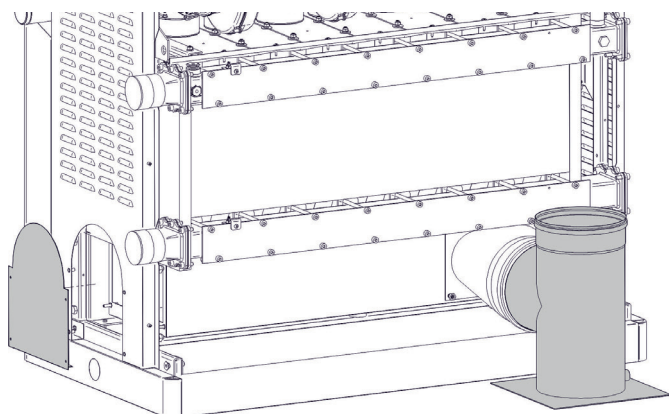
### Reversing FLUE GAS

To move the flue exhaust to LEFT simply switch the two sides of the casing around.



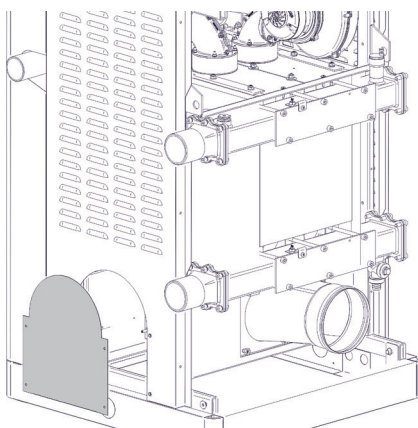
#### FOR MODELS 250 - 300 - 350

To move the flue exhaust from Right (standard position) to the rear position, you need to request the optional flue kit consisting of the Ti shown in the figure and a closing plate for the hole in the Rh side of the casing.



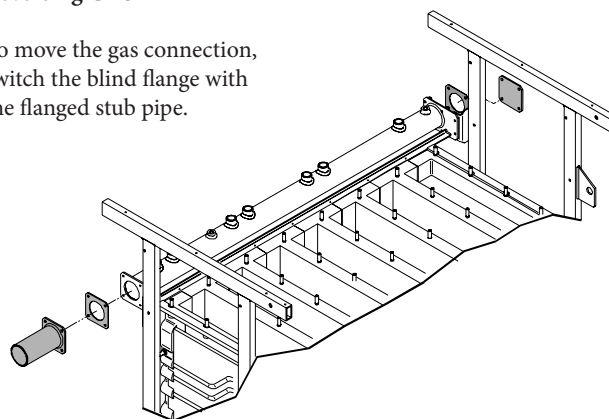
#### FOR MODELS 150 - 200

it is necessary to request the flue kit comprised of a closing plate over the hole on the Rt side of the casing.



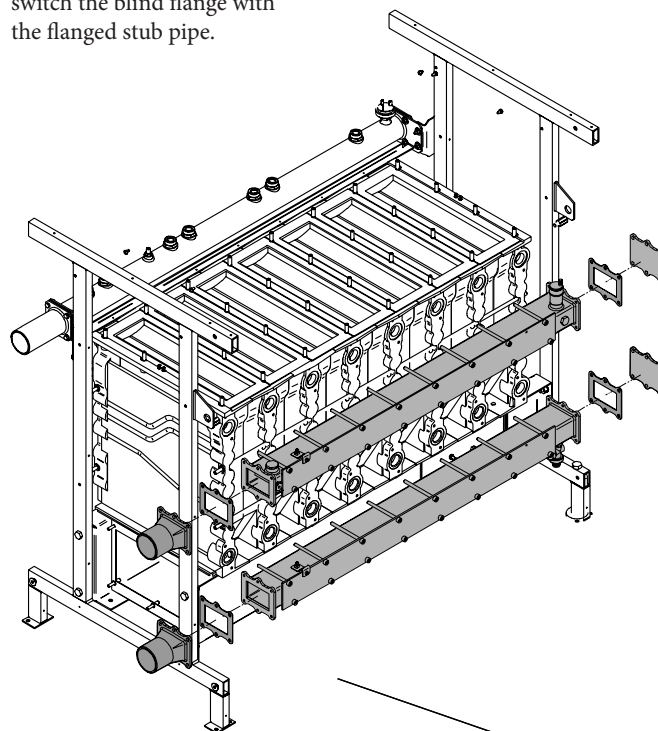
### Reversing GAS

To move the gas connection, switch the blind flange with the flanged stub pipe.

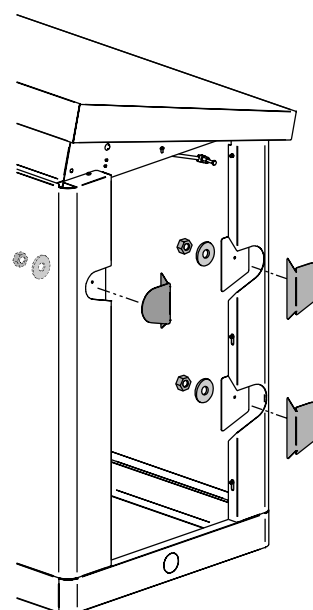


### Reversing SYSTEM FLOW AND RETURN

To move the Flow / Return connections to the opposite side, switch the blind flange with the flanged stub pipe.



To move the hydraulic connections (one or both) to the LEFT side, remove the pre-sectioned part on the attachments that you intend to move to the opposite side and close the RIGHT side of the casing with the caps supplied with the boiler.



## 3.8 CONNECTION

G	GAS	G 2"
---	-----	------

M	FLOW	G 2½"
R	RETURN	G 2½"



### 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.



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.

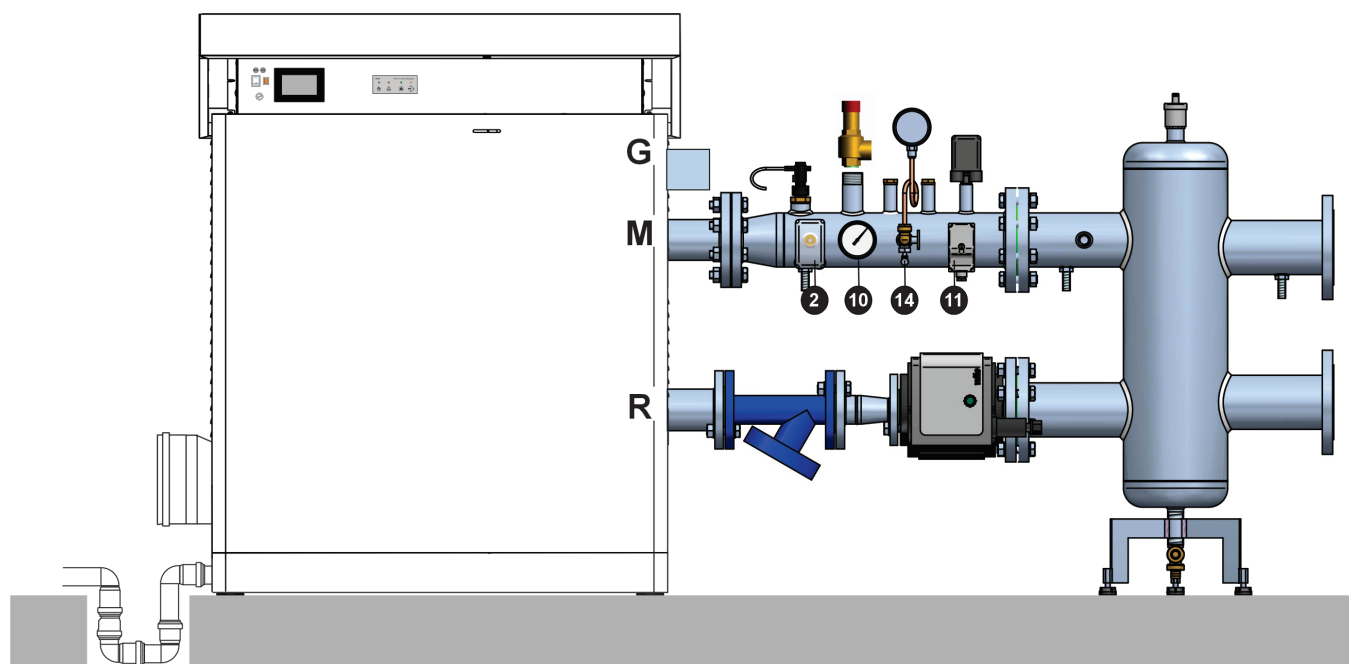


### If you notice the smell of gas:

- 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.



## 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".



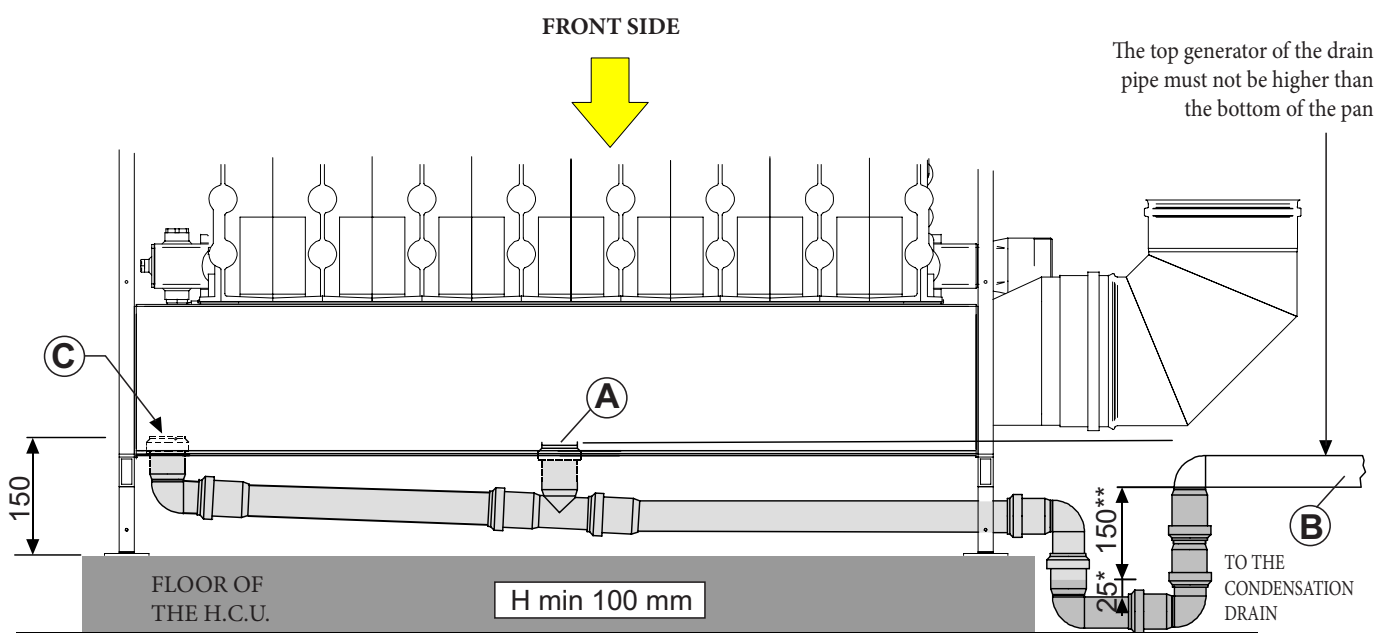
### **Danger!**

**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.



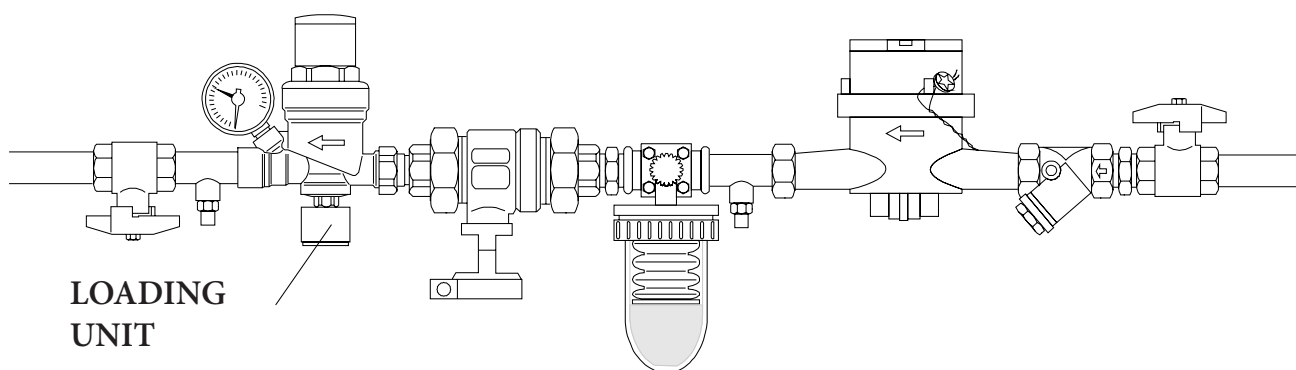
### 3.9 SYSTEM FILLING AND EMPTYING



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.

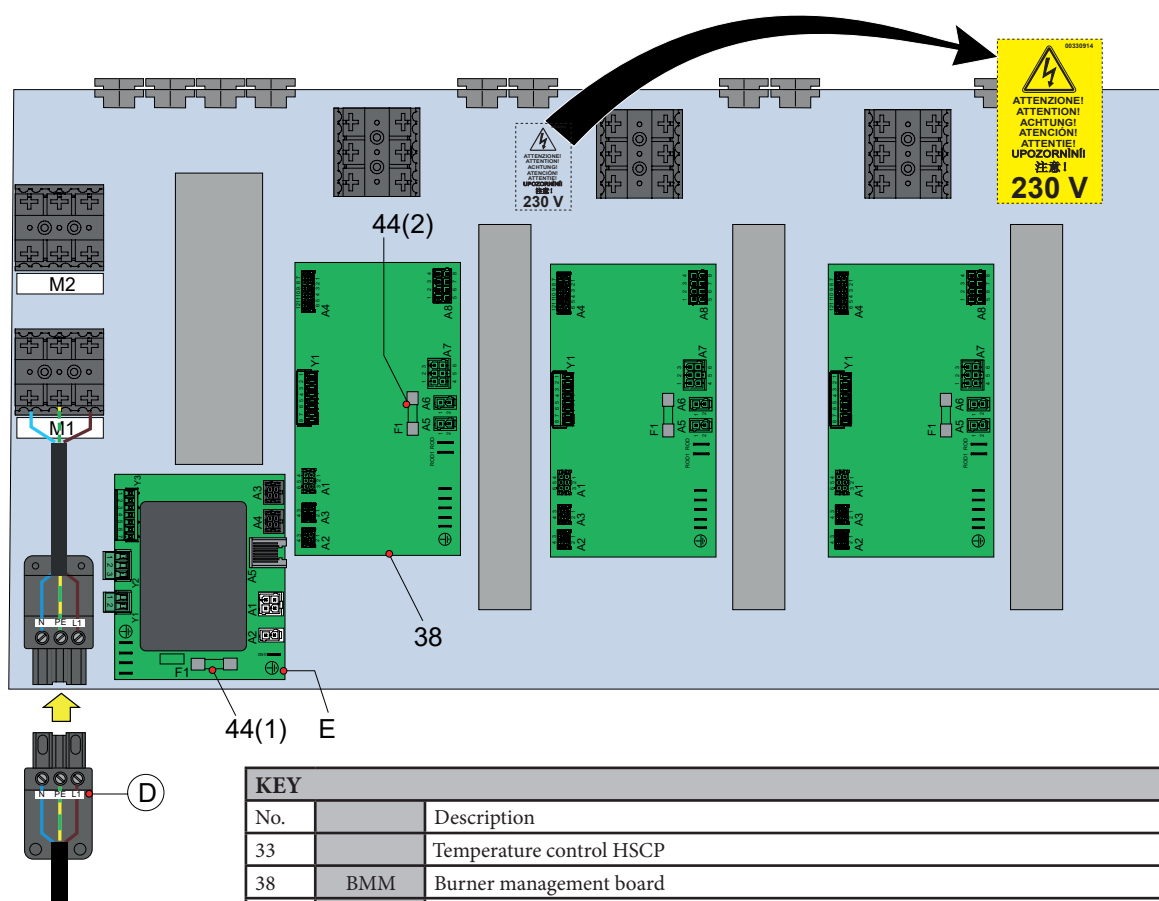
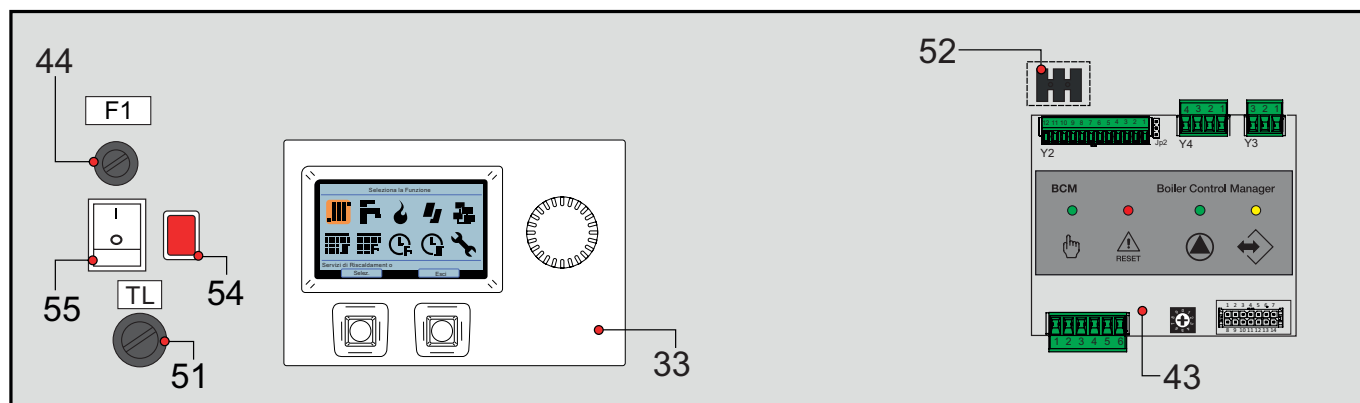


The boiler is equipped with its own draining valve, 14. This valve must **never** be used to empty the system, since all of the dirt contained in the system may accumulate in the boiler, jeopardising smooth operation. Therefore, before using the draining valve, make sure that the system's interception 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.**

### 3.10 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 (350 kW boilers)
52	M2	Additional terminal board +24V BCM
54	LTGL	TLG intervention light (350 kW boilers)
55		Boiler main switch
D		Wieland power plug 230V - 50Hz



## INSTRUCTIONS FOR THE INSTALLER

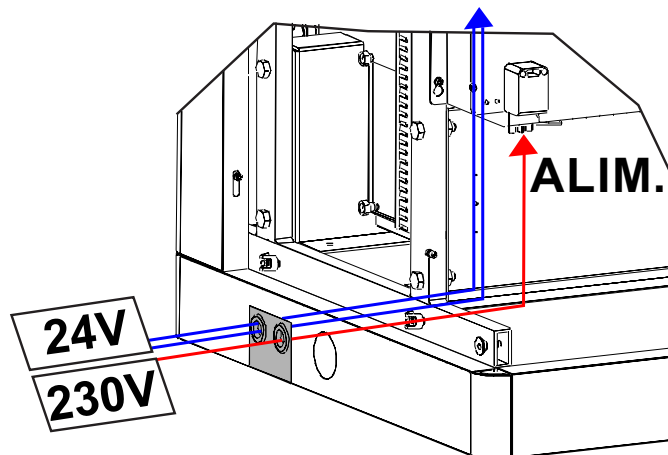


**Danger!**  
Electrical installation must only be carried out by an authorised company.



**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

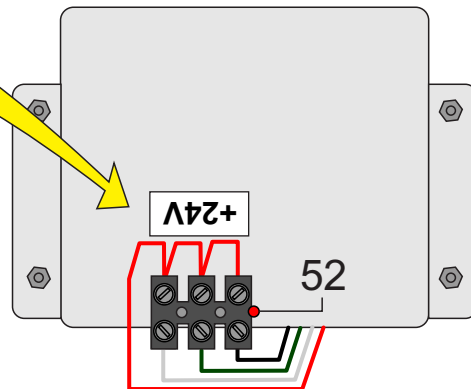
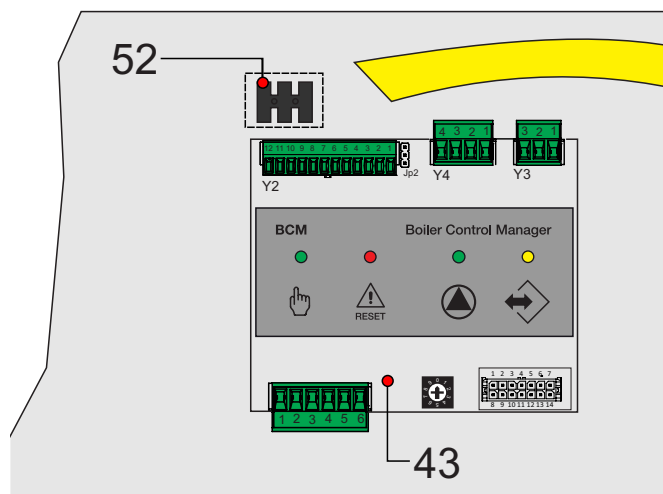


**ATTENTION!**  
Respect the PHASE and NEUTRAL polarity since flame detection is Phase Sensitive.

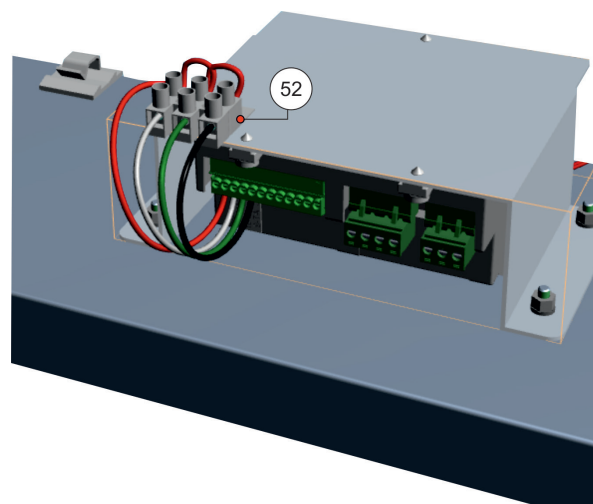


**ATTENTION:**  
Cables carrying a voltage of 230 V must travel separately from cables carrying a voltage of 24 V.

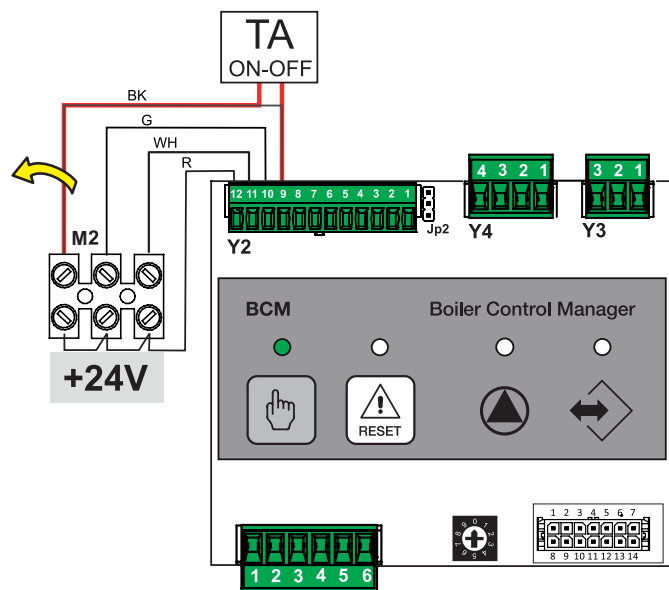
### Connections to the additional BCM terminal board



52	M2	Additional terminal board +24V BCM
----	----	------------------------------------

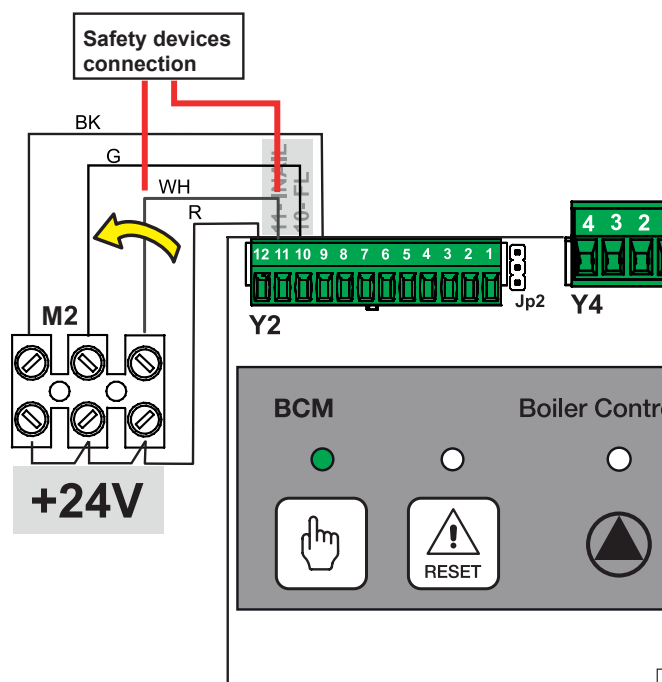


## Connection TA (\*)



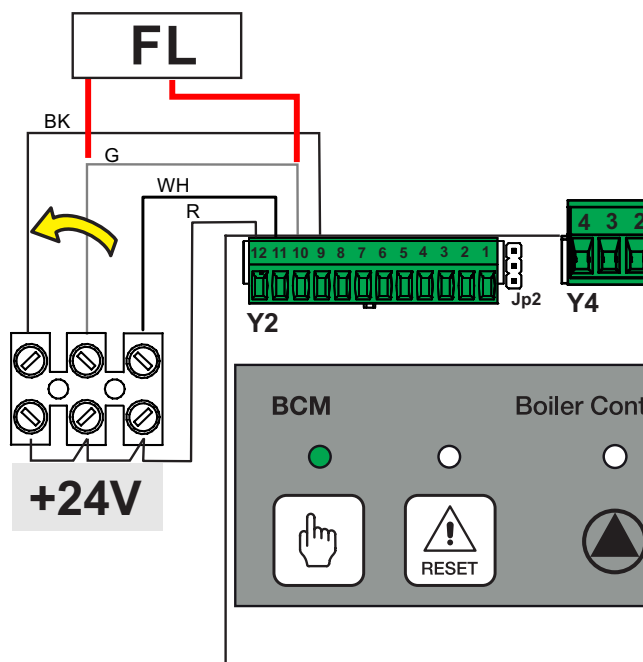
(Y2 - 9 and terminal board M2) after removing the jumper.  
(\*) Optional

## INAIL safety connection



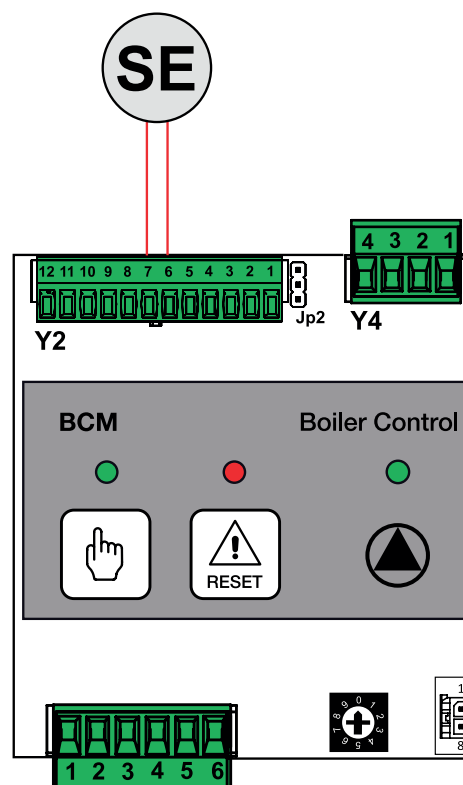
Remove the jumper and connect the cables, as indicated between (Y2 11 and terminal board M2).

## 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

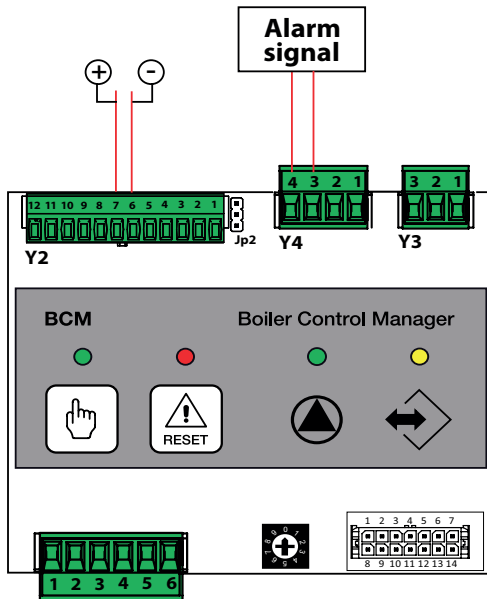


### NOTE:

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.

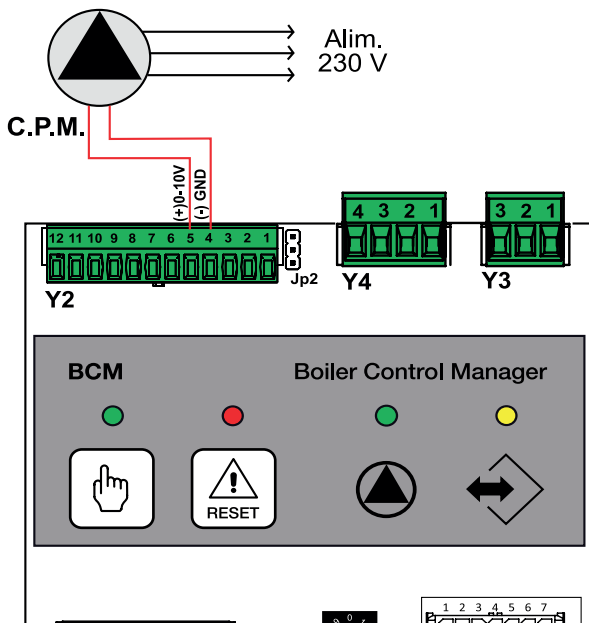
Alarm / signals contact (N.O. dry contact)  
Ext signal contact 0 - 10 V



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).

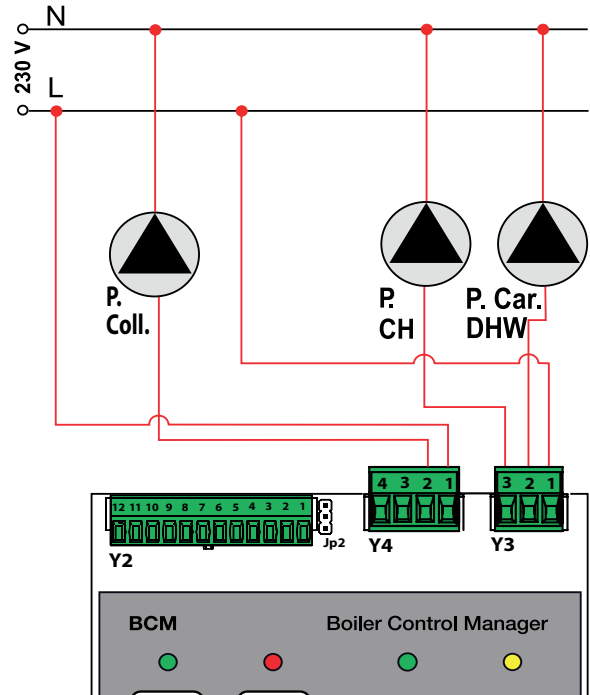


The BCM relay contacts support pumps with max absorption of 4 A.

P. Coll - Pump Manifold (Primary ring) (Optional)

P CH - Heating circuit pump (central heating circuit)

P. Car. DHW - Storage tank load pump

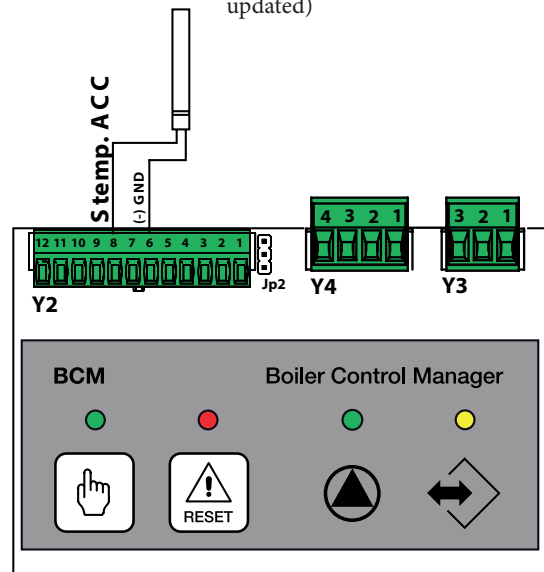


Connect the cables as indicated (Y4 1-2)  
Connect the cables as indicated (Y3 1-2-3)

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)



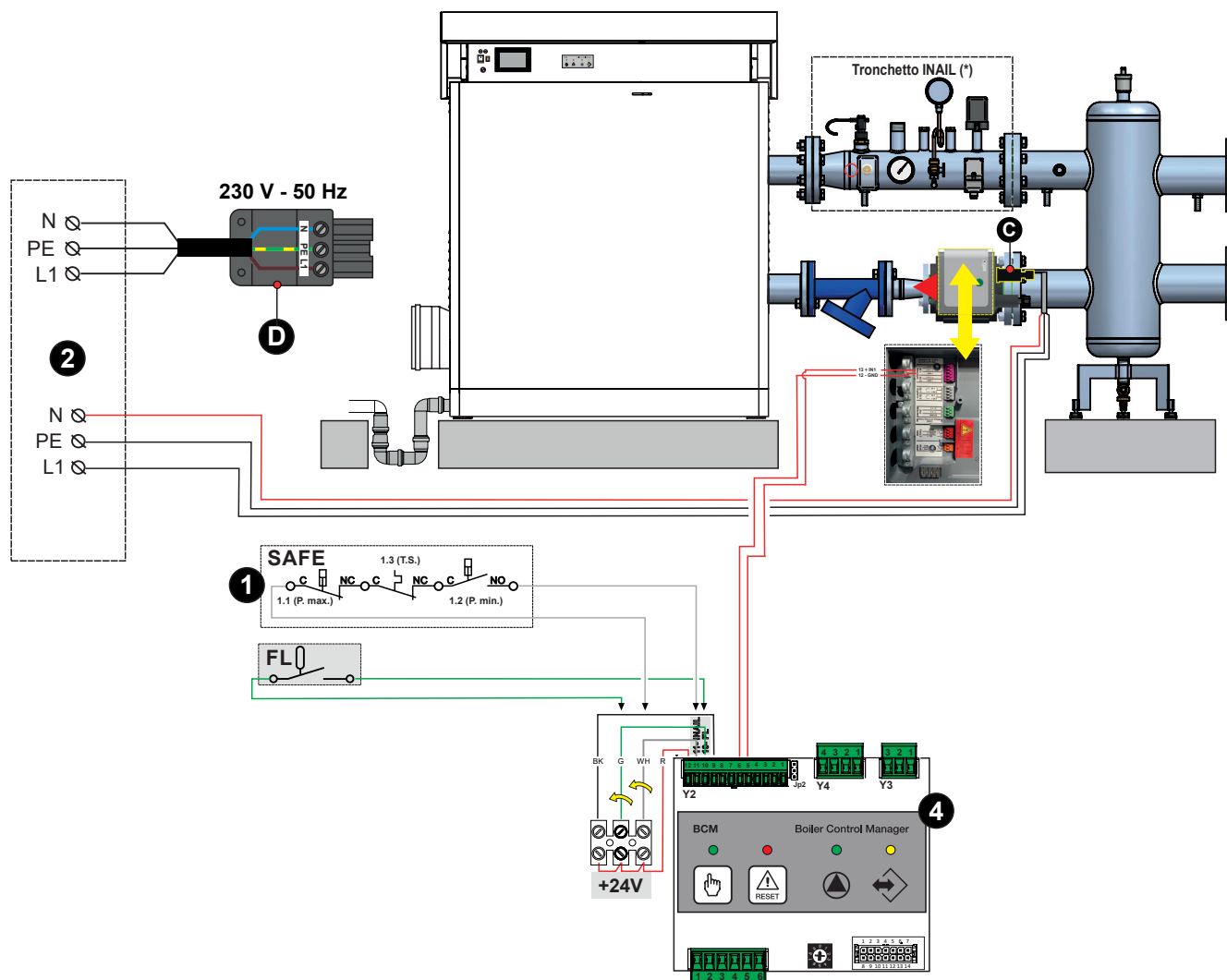
Connect the temperature sensor cables as indicated (Y2 6-8).





## 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 0-10V connection	AI 1 13 = + In 12 = - GND



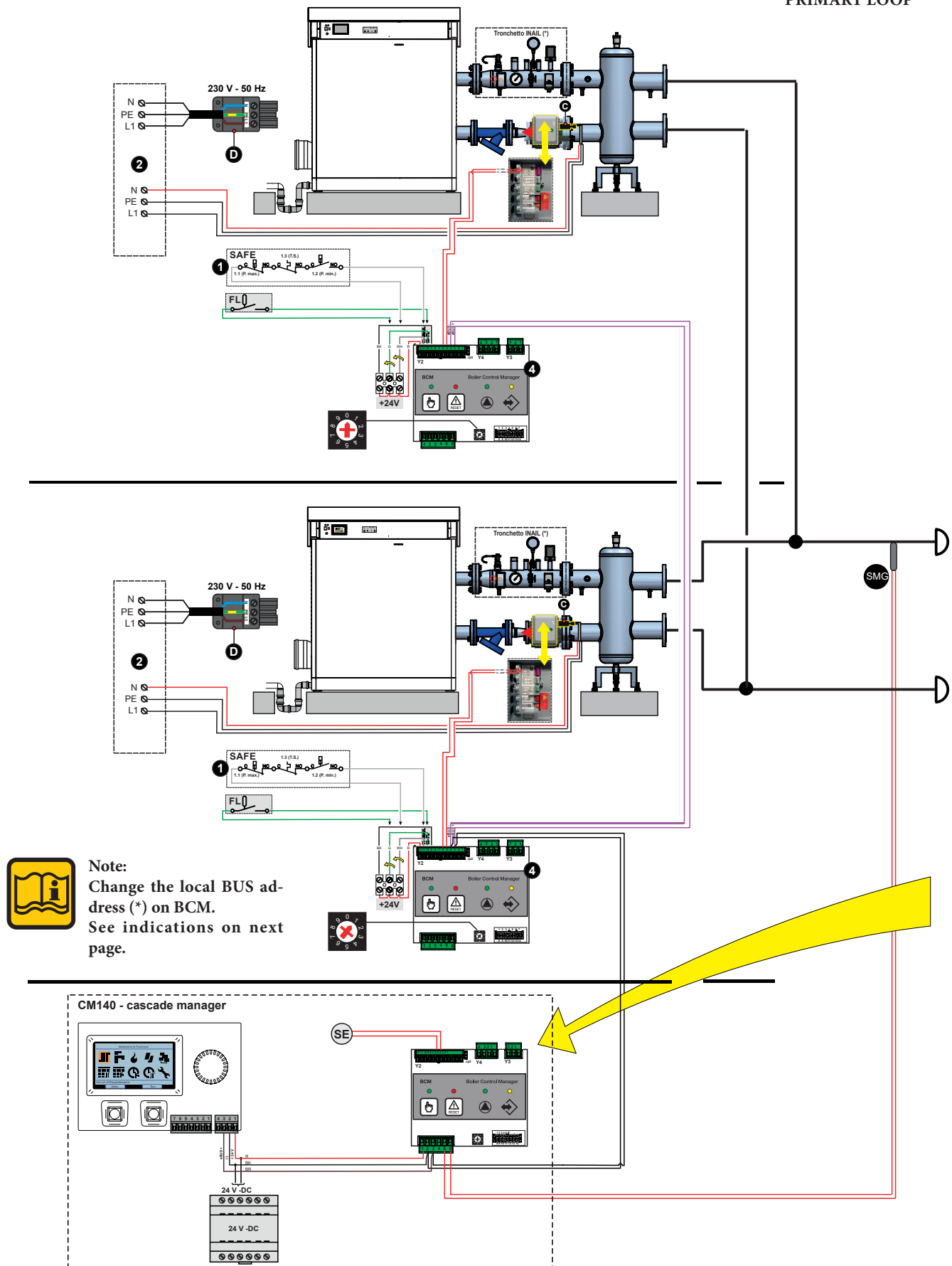
To activate the 0-10 V function, follow the instructions in the pump manual.  
(main menu)



## INSTRUCTIONS FOR THE INSTALLER

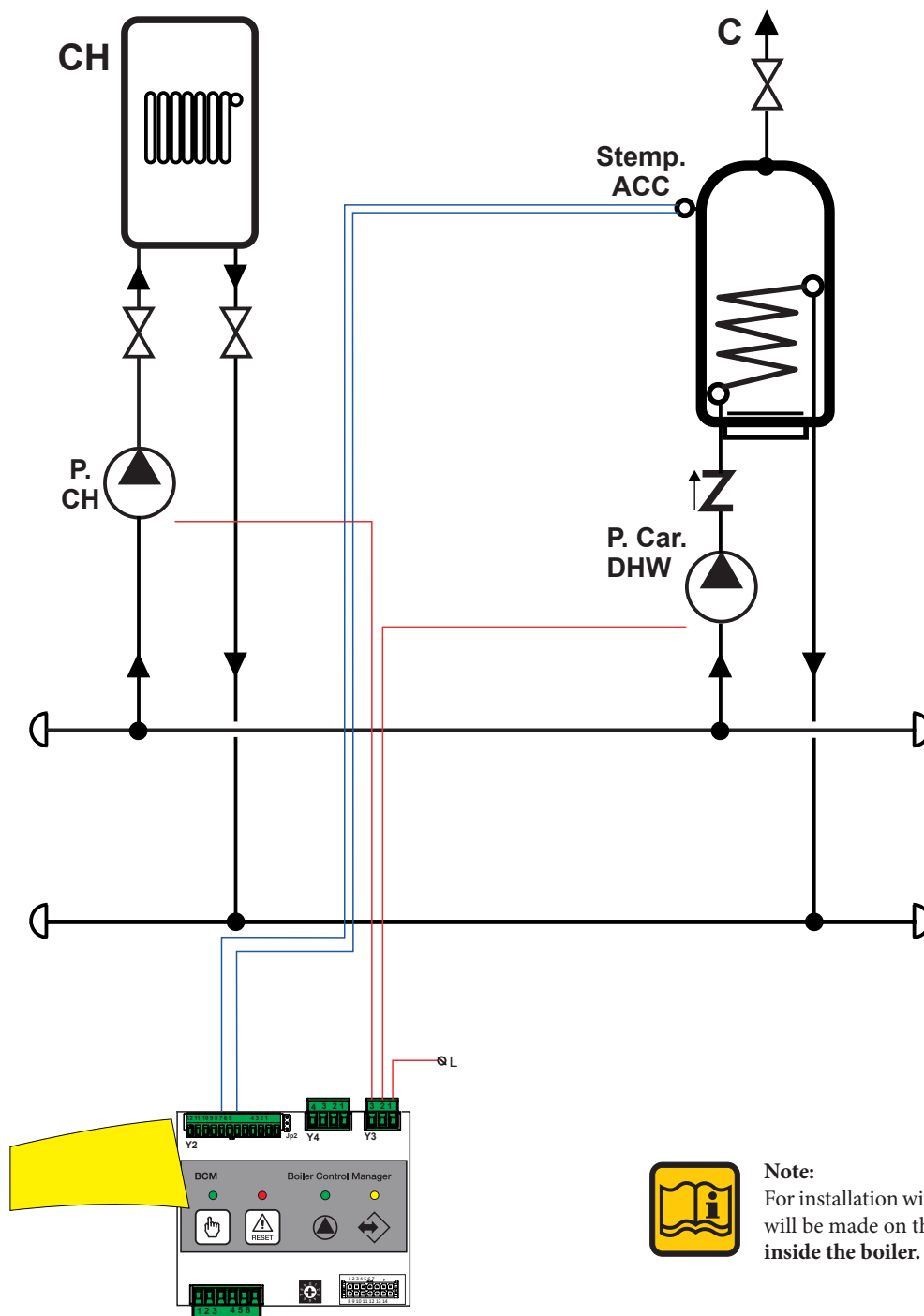
Example of connection diagram: 2 Ares Tec in battery controlled by Cascade Manager.

PRIMARY LOOP



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**

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



**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).





### 3.11 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 to 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.



### 3.12 ON-SITE MEASUREMENT OF THE COMBUSTION EFFICIENCY

#### 3.12.1 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.



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!**

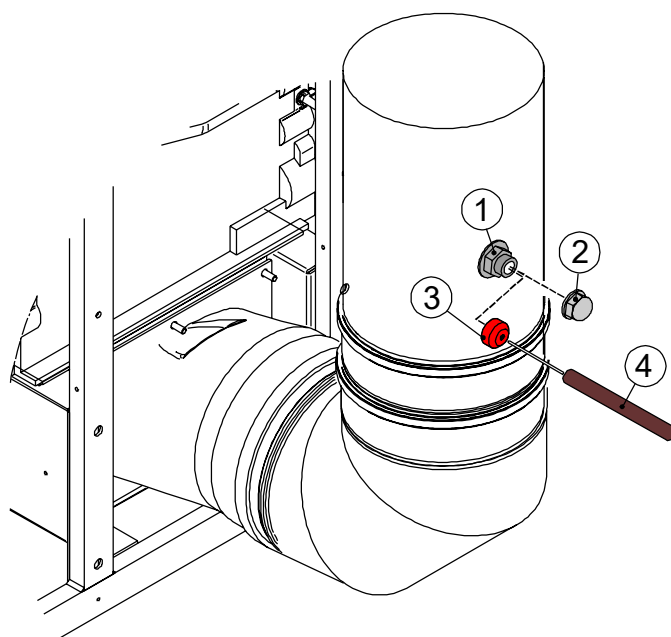
Remove cap 2, attach the red cap 3 to the flue point 1. Place the CO<sub>2</sub> analysis probe 4 in the hole on the cap. Once the measurement has been made, take the cap out and use the relative cap 2 to close the flue exhaust point back up.

#### 3.12.2 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 CO<sub>2</sub> withdrawn from the hole 2.

Take the specific measurements with the generator at full speed (see Par. 3.12.1).



### 3.13 BURNER ADJUSTMENT



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

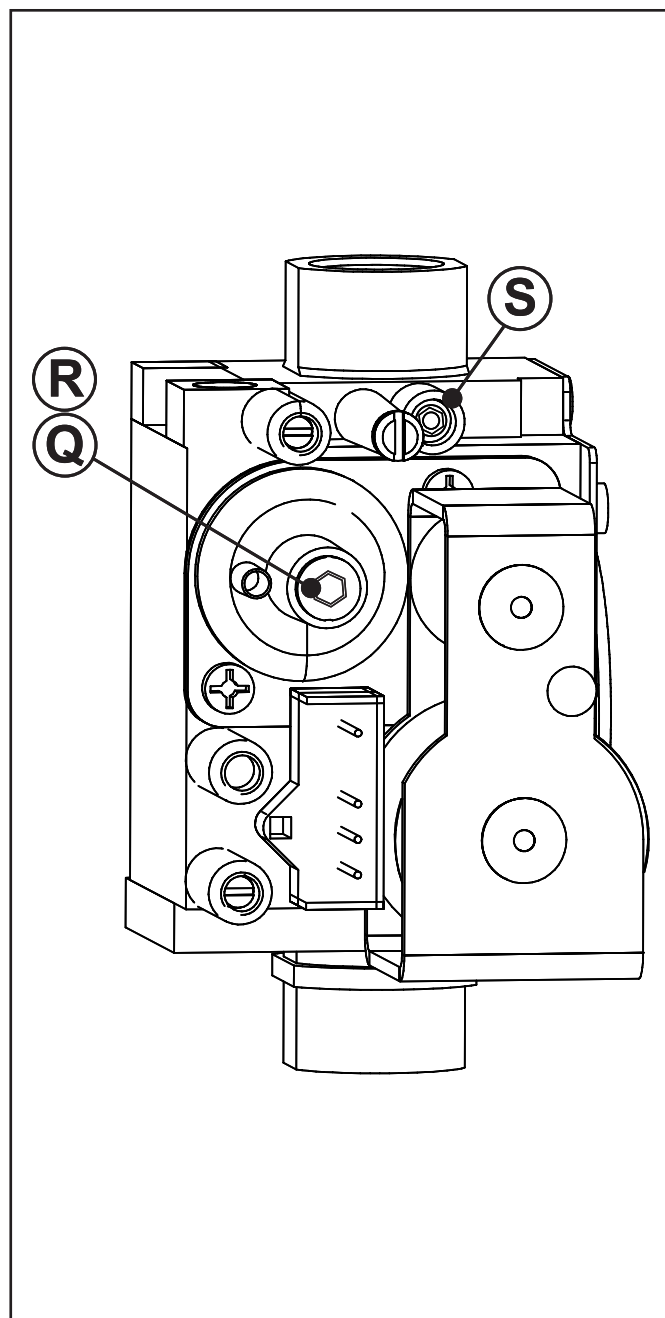


All of the instructions below are provided for the exclusive use of **authorised assistance** personnel.

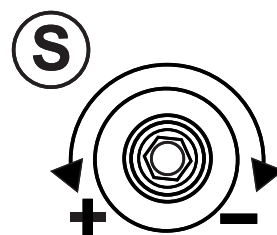
- Remove the cap and insert the CO<sub>2</sub> analysis probe into the flue gas output of the intake/exhaust terminal, see chap. 3.12.2.

#### 1) Adjustment at maximum power:

- Start the boiler in “calibration” mode at MAXIMUM POWER (see 3.12.1)
- Once the burner is on, check: that the CO<sub>2</sub> 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).



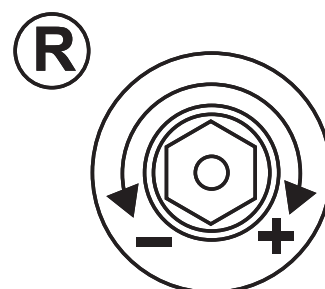
#### MAXIMUM POWER ADJUSTING SCREW



#### 2) Adjustment at minimum power:

- Start the boiler in “calibration” mode at MINIMUM POWER (see 3.12.1)
- Once the burner is on, check: that the CO<sub>2</sub> 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).

#### MINIMUM POWER ADJUSTING SCREW

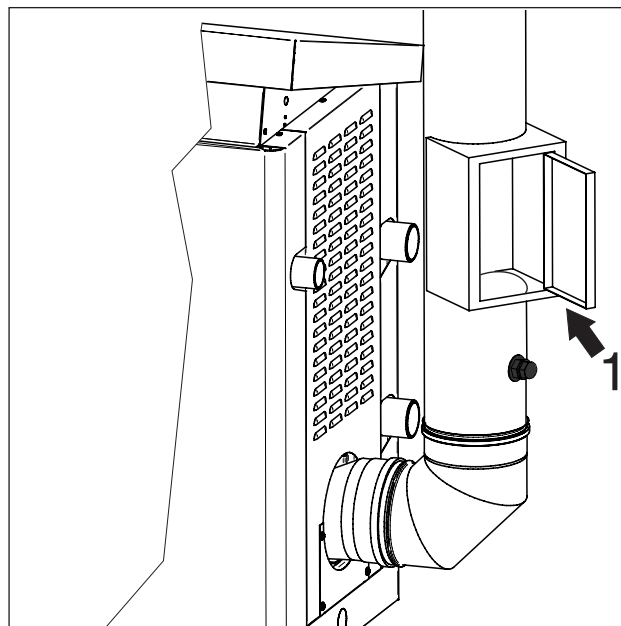


## INSTRUCTIONS FOR THE INSTALLER

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 CO<sub>2</sub> 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 CO<sub>2</sub> 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

ARES TEC ErP: 150 - 200 - 250 - 300 - 350										
Type of Gas	Supply pressure	Ø Nozzles	Diaphragm	Fan speed		CO <sub>2</sub> levels (%)		(*) O <sub>2</sub> levels (%)		Power at ignition (%)
	mbar	(mm)	(mm)	FL Min.	FU Max.	Min.	Max.	Min.	Max.	IG
Nat. gas (G20)	20	7	-	32	100	8.9	8.9	5.0	5.0	80
Nat. gas (G25)	25	9	-	32	100	8.9	8.9	-	-	80
Propane (G31)	37	7	-	31	93	10.8	10.8	-	-	80
±0.2 Acceptable CO <sub>2</sub> range for G20/G25										
±0.4 Acceptable O <sub>2</sub> range for 20%H <sub>2</sub> NG										
±0.2 Acceptable CO <sub>2</sub> range for G31										

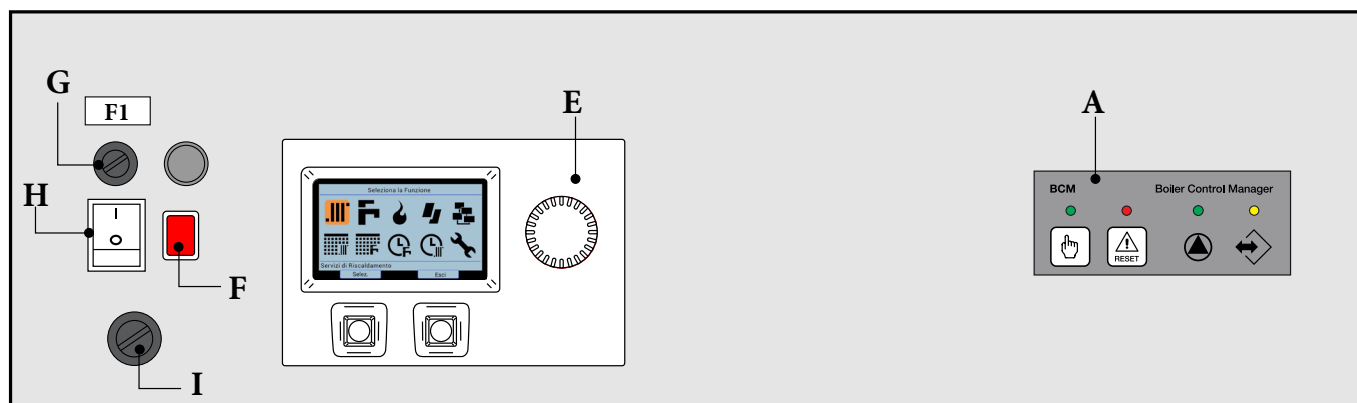


(\*) If a Hydrogen Ready installation is envisaged, refer to the table above for all calibration operations, with the O<sub>2</sub>% content in the flue gas. O<sub>2</sub> values refer to gas 20%H<sub>2</sub>NG





### 3.14 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).



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

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 Only for ARES 350 Tec Light indicating the General Limit Thermostat TLG is on

G Fuses:

I = 6.3 A

H Main Switch

I Only for ARES 350 Tec

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



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.

#### Condensate level sensor position



# 4 INSPECTIONS AND MAINTENANCE



**OBLIGATION!**  
Wear protective gloves.



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.



**Scalding hazard!**  
Be careful during the maintenance operations.



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

## 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 (see 3.13) and the percentage of CO<sub>2</sub> (see Par. 3.13). If the measured load (with a correct CO<sub>2</sub> 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.



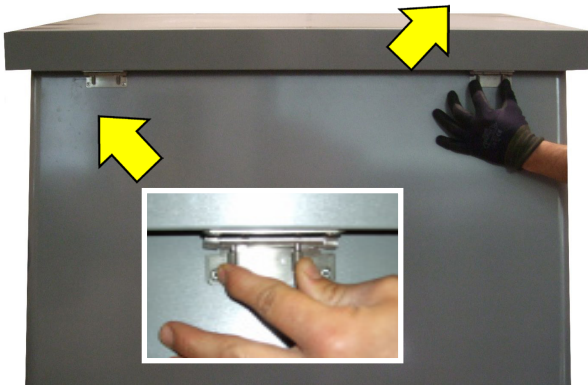
## ATTENTION!

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.

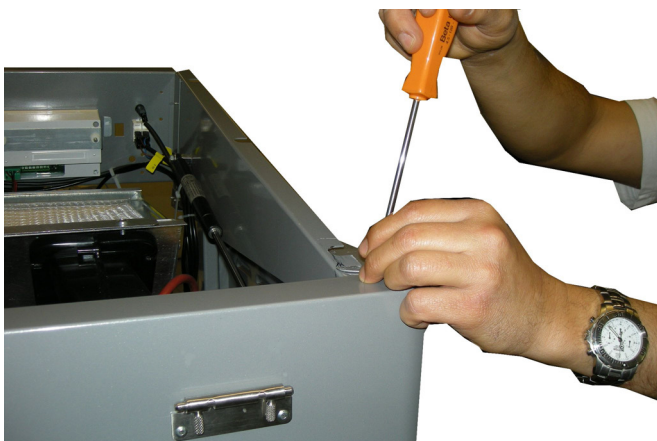
- Shut off the electrical and gas supplies **making sure the valve is firmly shut.**
- Remove:
  - all of the casings;



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



- take out the side clamping screws (right/left side);



- take out the rear casing clamping screw on the right and left side;

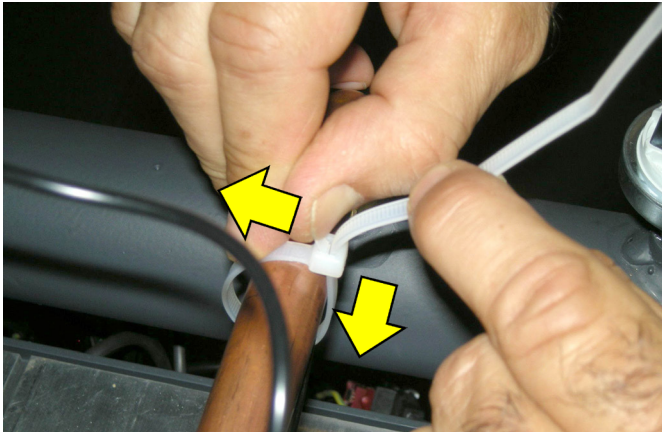


- take out the closing plate clamping screws (flue exhaust output side) and take off the casing;

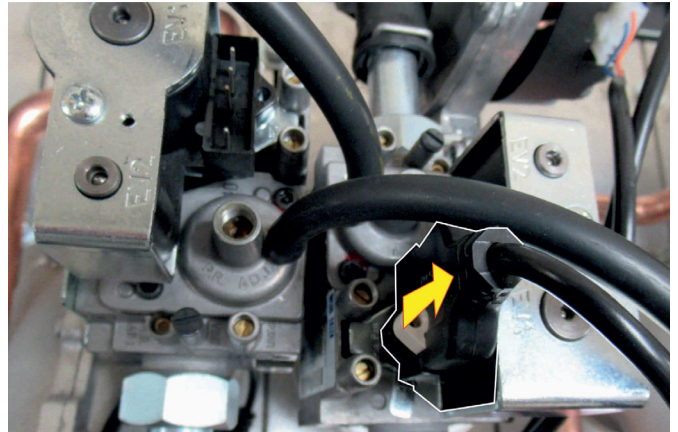




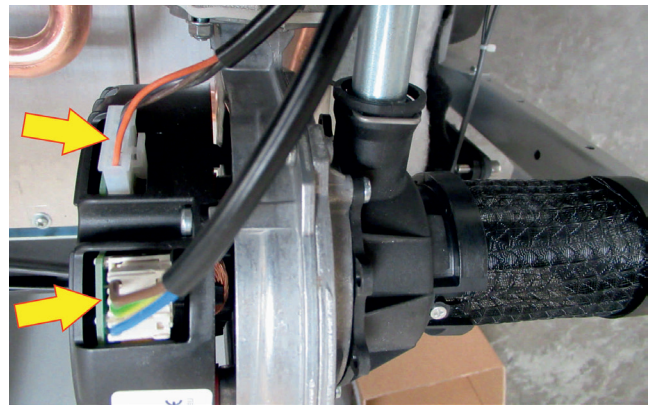
### • Cabling



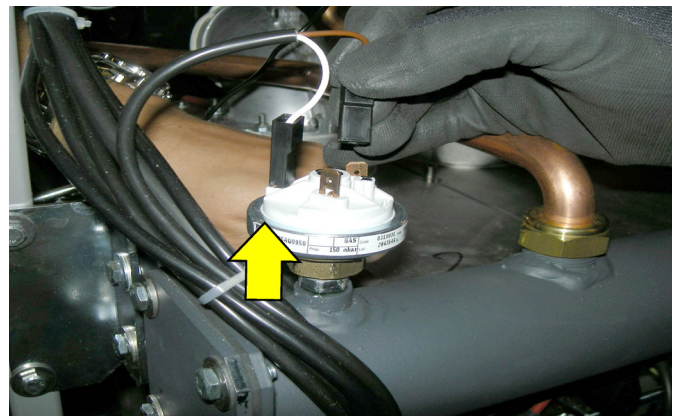
- unhook the cable clamps at the top of the boiler (DO NOT CUT);



- take out the gas valve connector;

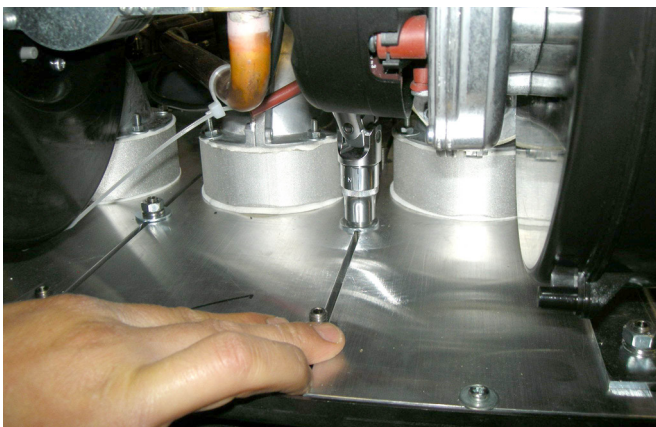
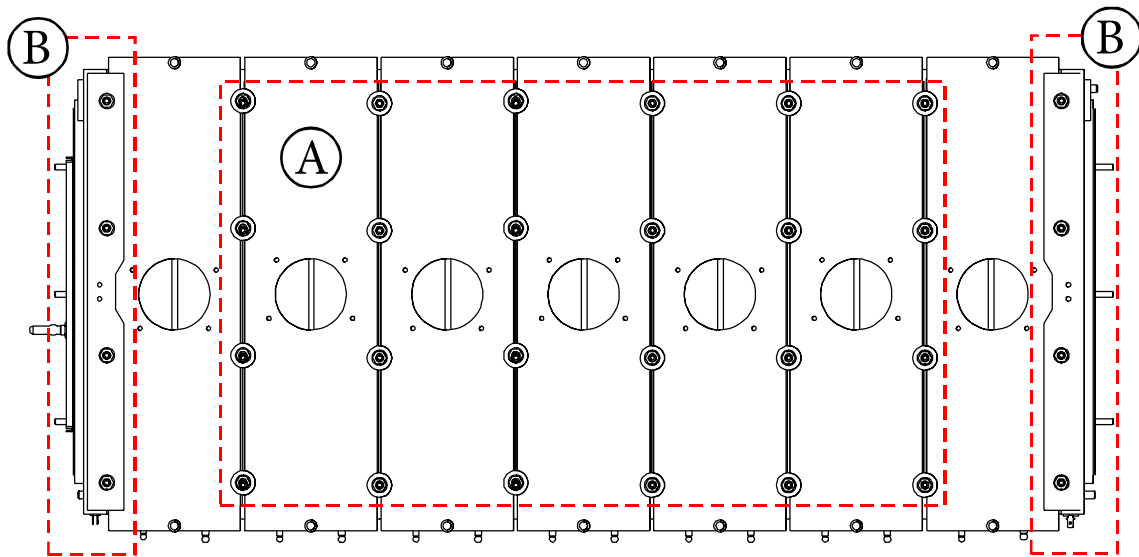


- take out the fan connector;

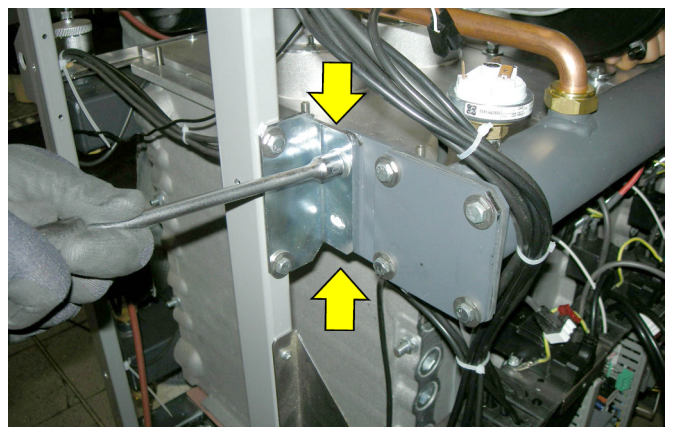


- take out the gas pressure switch connection;

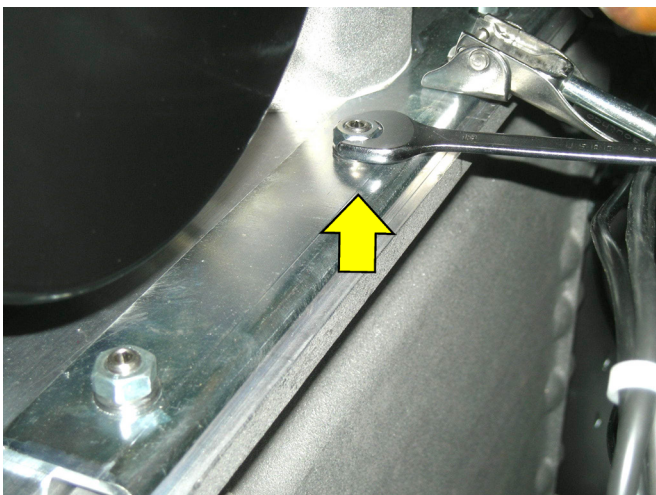
• Element screws.



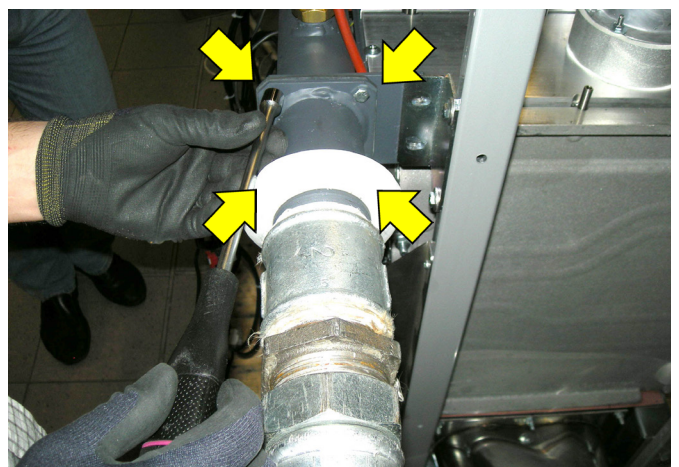
- take out screws "A" from each element (with 13 mm socket key);



- take out the gas pipe clamping screws (right and left side);

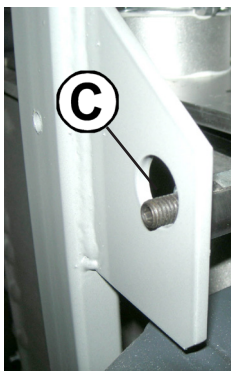
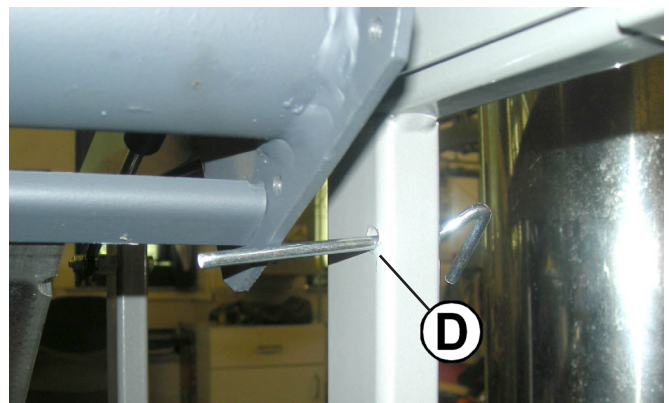
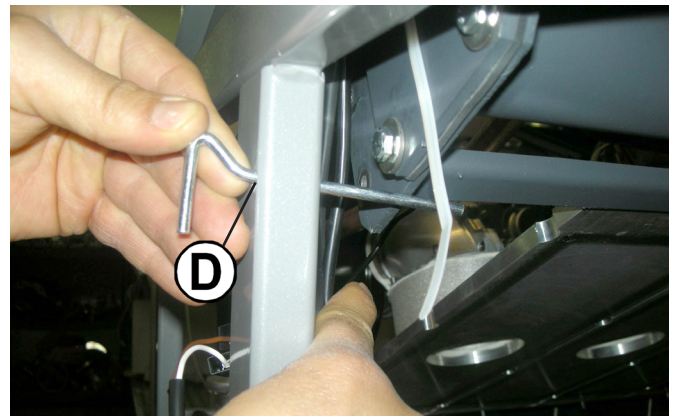
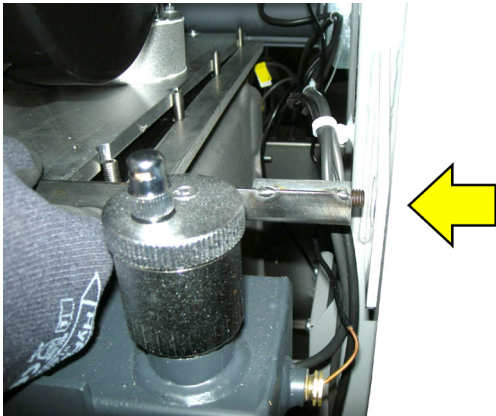


- take out screws "B" (with 13 mm socket key / with 13 mm hex key) and take out the clamping plates;



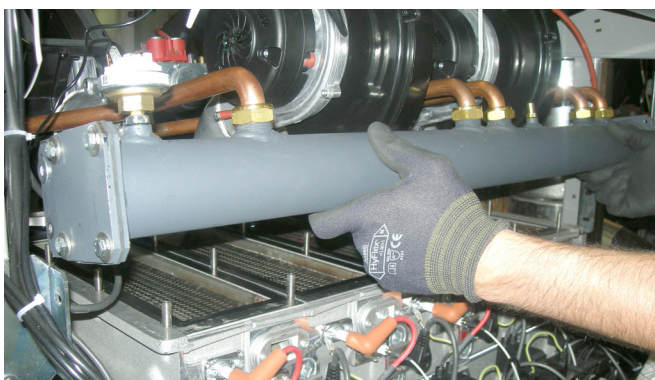
- take out the four screws, followed by the gas flange, using a 10 mm socket key;





- lift the **rear** burner block slightly and take out 2 pins with a 4 mm hex key, until you reach holes "C";

- place the pins in holes "D" to support the burner block.



- lift the burner block (front part);

### 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.



### 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**.

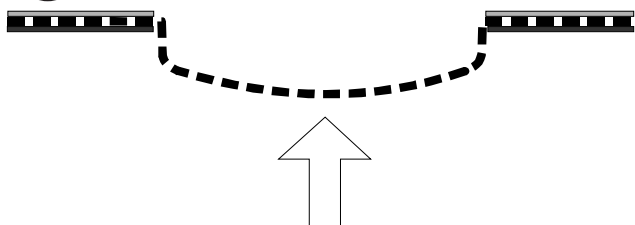


Proceed in the reverse order for reassembly, being careful to tighten the screws that clamp the mixer unit/fans to the body, at a torque of 13 Nm.



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

- Prior to ignition, make sure the condensate drain trap is full of water.
- 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.



Compressed air

- 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.

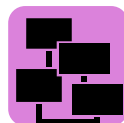




## 4.2 PROGRAMMING THE OPERATION PARAMETERS



**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

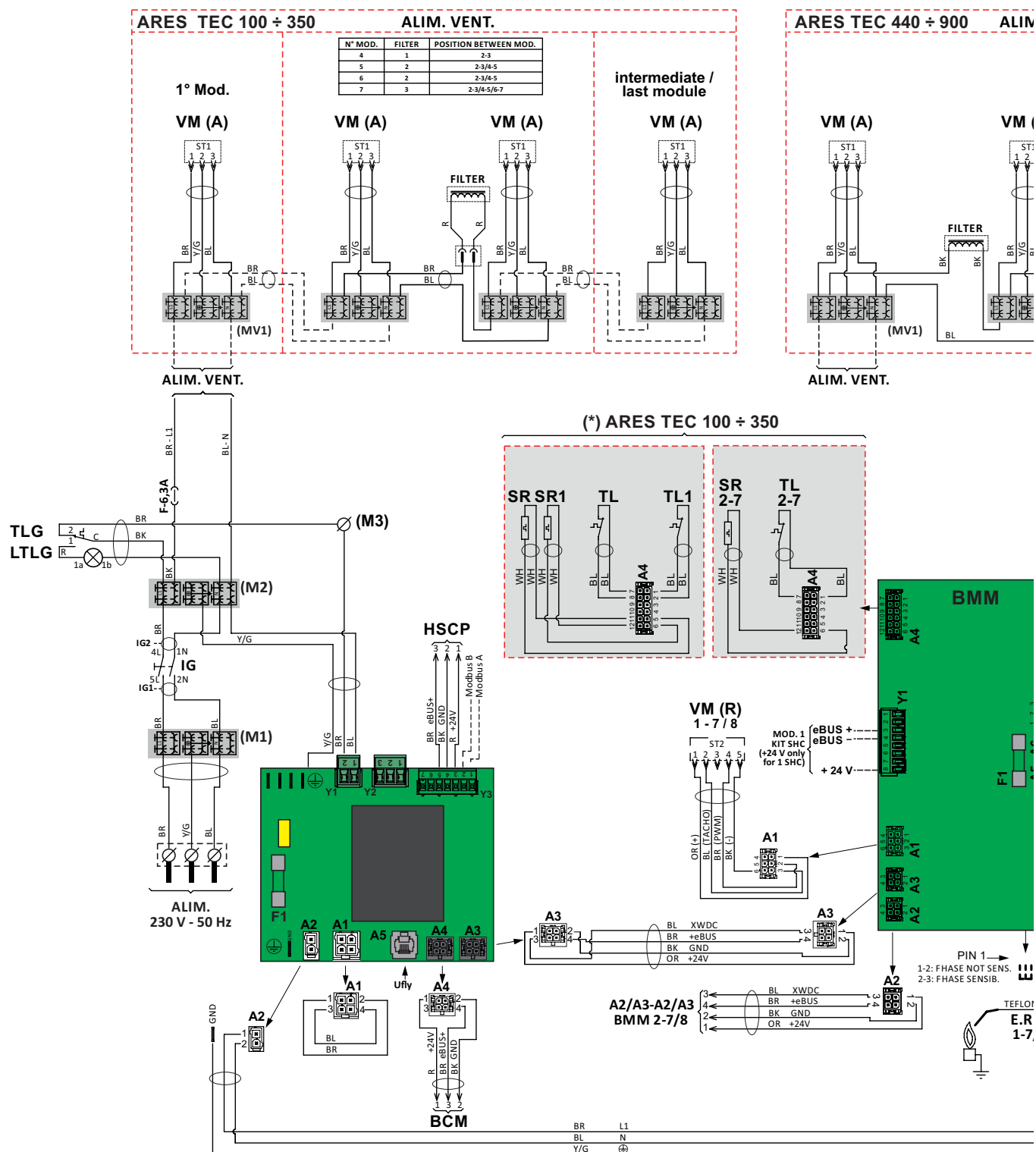


BMM parameters						
Code	Symb.	PARAMETER DESCRIPTION	Unit	Min	Max	Factory settings
803	Srv	Services enabled		0	1	1
48	ChSet	CH#1: Setpoint	°C	30	95	80
784	BC	Local BUS address		0	11	0
816	MI	ModBus Address		1	127	1
817	MT	Timeout Modbus	sec	0	240	30
896	0	Unknown Parameter		0	1	0
799	AC	Input 0/10V		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 (*93,0)
346	FL	Minimum Modulation	%	1,0	100,0	32,0 (*31,0)
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	50

(\*) = Values for LPG



### 4.3 PRACTICAL CONNECTION DIAGRAM

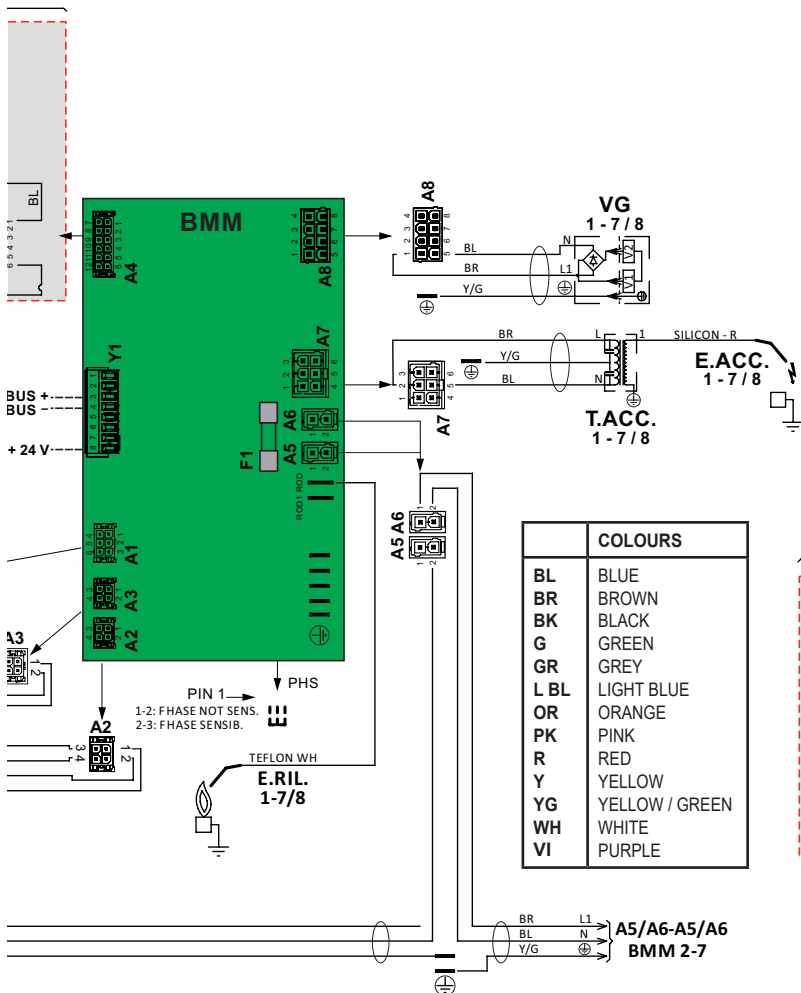
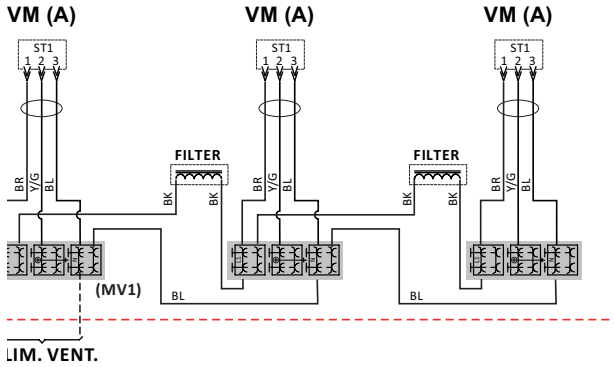


KEY	
E. ACC.	Ignition electrode
E. RIL.	Detection electrode
HSCP	Temperature control
SR	Heating sensor (only 1st mod.)
SR 1÷7	Local heating sensor
PF	Flue pressure switch (only 1st mod.)

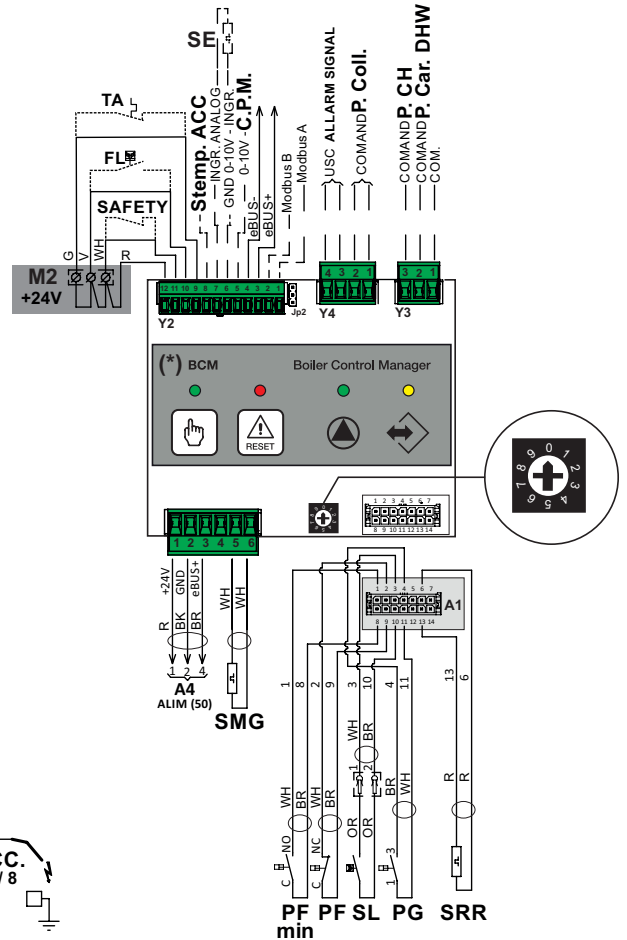
PF min	Minimum Flue pressure switch (only 1st mod.)
SL	Condensate level sensor (2nd mod.)
T. ACC.	Ignition Transformation
TL	Limit thermostat
TL 1÷7	Local limit thermostat
VG	Gas valve
VM (A)	Modulating fan power supply

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

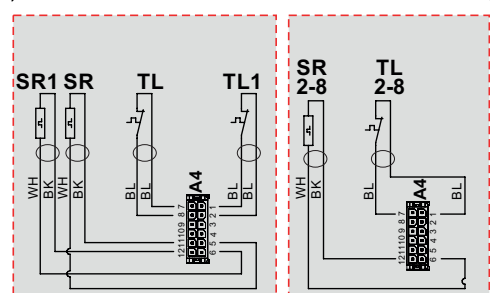
## ES TEC 440 ÷ 900 ALIM. VENT.



	COLOURS
BL	BLUE
BR	BROWN
BK	BLACK
G	GREEN
GR	GREY
L BL	LIGHT BLUE
OR	ORANGE
PK	PINK
R	RED
Y	YELLOW
YG	YELLOW / GREEN
WH	WHITE
VI	PURPLE



## (\*) 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 ADAPTING FOR USE WITH OTHER GASES

The boilers are produced for the type of gas specifically requested when placing the order.



#### **DANGER!**

Transformation of the boiler to operate with a different type of gas than the one specifically requested when ordering must be carried out by professionally qualified staff in compliance with the regulations in force.

The manufacturer shall not be held liable for any damage deriving from incorrect transformation operations or which were not carried out in compliance with current regulations and/or instructions given.



#### **ATTENTION!**

After transforming the boiler for operation with a different type of gas (for example, propane gas) than the one specifically requested when placing the order, the appliance can only operate with the said new type of gas.



#### **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 staff, in accordance with the law.

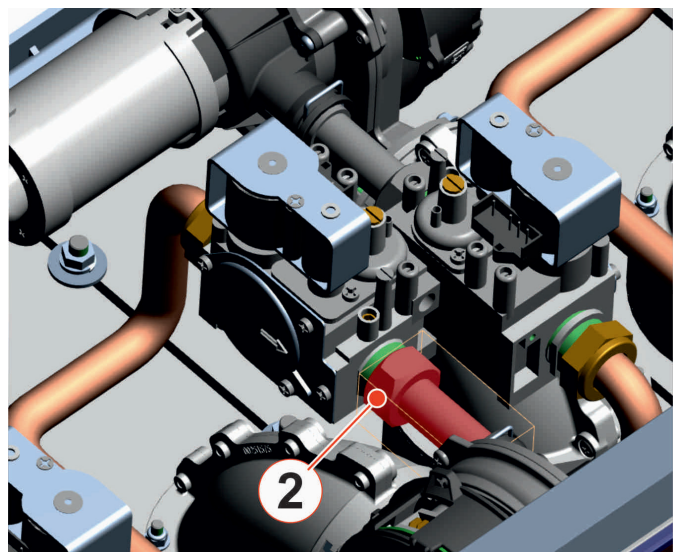
Ignition problems can arise if the tank is not thoroughly deaerated.

In this case contact the liquid gas tank supplier.

#### **Gas Transformation**

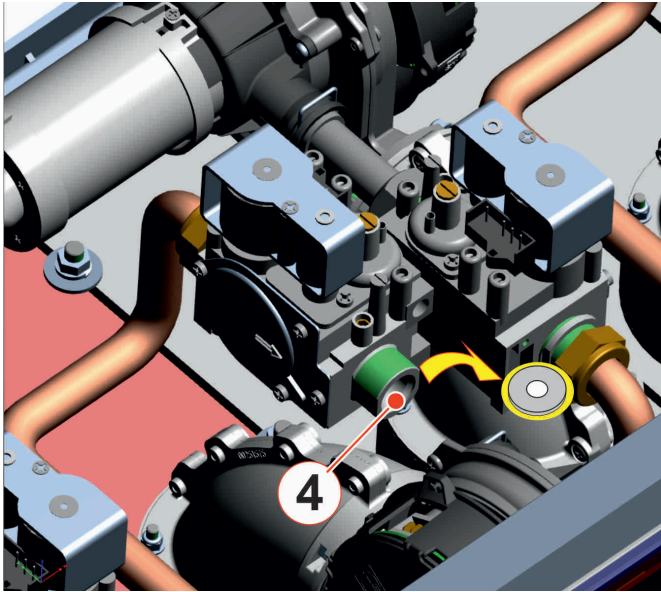
To convert the boiler from one type of gas to another, proceed as follows:

1. Remove the casings.
2. Disconnect power to the appliance.
3. Close the gas cock.
4. Remove gas fitting pipe (outlet gas valve unscrew fitting 2 flat key 30mm).
5. Remove the gas diaphragm 4.
6. Insert the new diaphragm 5.
7. Insert the gaskets 6.
8. Proceed with reassembly in reverse order.
9. Bring the maximum pressure adjustment screw (S) to about half stroke and tighten the minimum pressure adjustment screw (R) by one turn as indicated in paragraph 3.13.
10. Try to ignite the boiler; if it fails, unscrew the maximum pressure adjustment screw (S) by one turn and try ignition again. Repeat the operation several times until the boiler ignition is achieved.
11. Adjust the CO<sub>2</sub> value intended for the type of gas as described in paragraph "3.13- BURNER ADJUSTMENT".





## INSTRUCTIONS FOR THE INSTALLER



To change gas, you must edit/check the parameters FU / FL (max rpm and min rpm of Fan) and IG (Startup power).

(\*) for the values, refer to the NOZZLES - PRESSURES - FLOW RATES TABLE).

N A T U R A L  G A S	G P L	Symbol	Description	Value
		FU	Fan: Maximum revs	(*)
		FL	Fan: Minimum revs	(*)
		IG	Output Start up	(*)

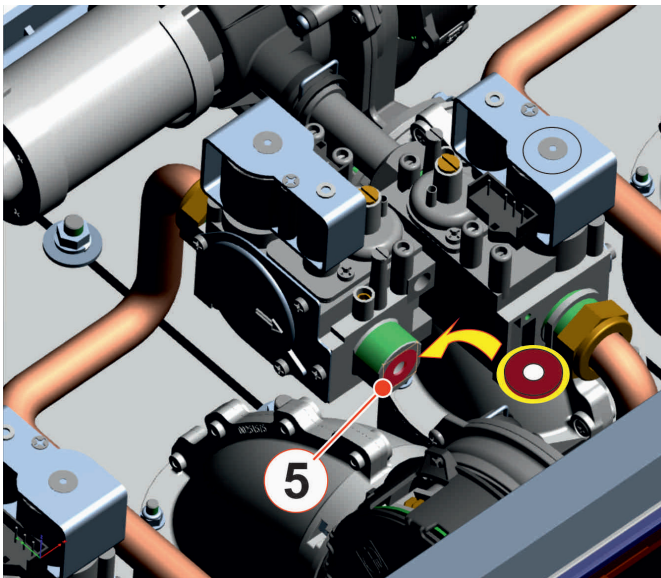
- once the transformation is completed, fill in the information provided on the label supplied in the documentation envelope and affix it to the side of the boiler's technical data label.



### Important

This appliance is suitable for the category containing up to 20% hydrogen (H<sub>2</sub>). Due to variations in the percentage of H<sub>2</sub>, the percentage of O<sub>2</sub> may vary over time depending on the quality of the gas supplied by the distributor.

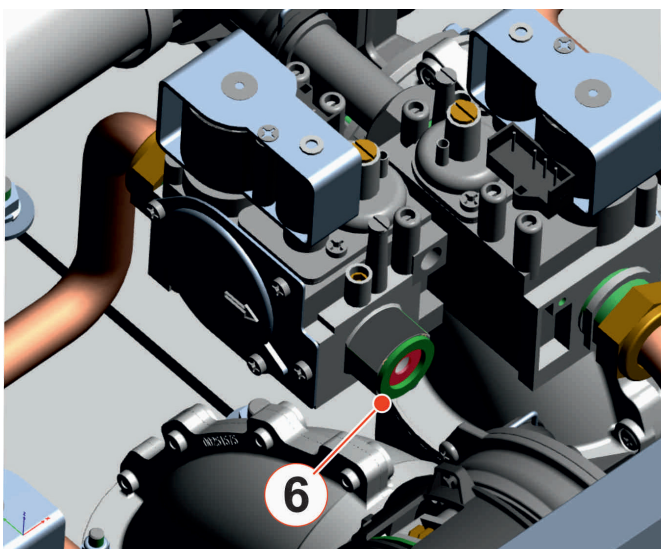
If a Hydrogen Ready installation is envisaged, refer only to the O<sub>2</sub> value given in the nozzles - pressures - flow rates table.



### EXAMPLE OF COMPILATION

	Data - Fecha Date - Datum	08 / 09 / 05
	Firma - Signature Unterschrift	
	- Regolata per	<input type="checkbox"/>
	- Réglée pour	<input type="checkbox"/>
- Adjusted for	G 20	<input type="checkbox"/>
- Reglada para	G 25	<input type="checkbox"/>
- Eingestellt für	G 30	<input checked="" type="checkbox"/>
	G 31	<input checked="" type="checkbox"/>

ETI 4530C



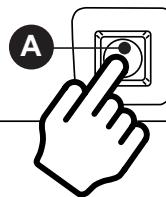
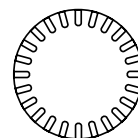
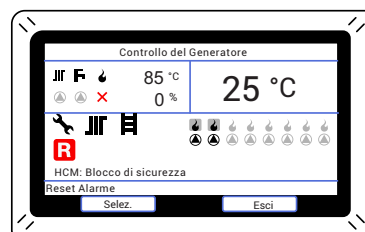
## 4.5 ERROR CODE



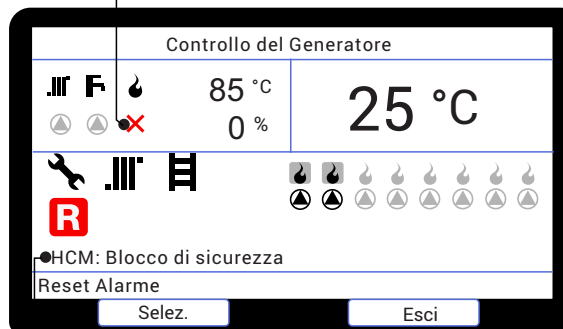
**ATTENTION!**  
Function reserved exclusively to Authorised Service Centres.



**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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Cod. 1.043688ENG - ST.004470/005 - 01/26



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