

# ALKON



100 EXT - 115 EXT - 140 EXT



## INSTALLATION AND SERVICING MANUAL





<http://www.unicalag.it/prodotti/professionale-300/light-commercial-alluminio/1639/alkon-140-ext>



**Provisions for proper disposal of the product**

At the end of its life cycle the product must not be disposed of as urban waste. It can be taken to a special recycling centre managed by the local authorities, or to a dealer who offers this service.

Separate disposal of a domestic appliance avoids possible negative consequences for the environment and human health deriving from inappropriate waste handling and allows the recovery of the materials of which it is made, in order to obtain significant energy and resource savings.



Attention: this manual contains instructions for the exclusive use of the professionally qualified installer and/or maintenance technician in compliance with current legislation.

The user is NOT qualified to intervene on the boiler.

The manufacturer will not be held liable in case of damage to persons, animals or objects resulting from failure to comply with the instructions contained in the manuals supplied with the boiler.

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## 1.1 - GENERAL WARNINGS

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

Read the warnings contained in this instruction booklet carefully as they provide important guidelines regarding installation, use and maintenance safety.

Keep the booklet with care for further consultation.

**Your appliance must be installed and serviced in compliance with the standards in force according to the manufacturer instructions, up to standard and by legally qualified and certified personnel.**

**Systems for the production of domestic hot water MUST be constructed entirely with compliant materials.**

**By professionally qualified personnel we mean: personnel with specific technical skill in the field of heating system components for civil use, domestic hot water production and maintenance. Personnel must have the qualifications provided for by current legislation.**

**Incorrect installation or improper maintenance can cause damage to persons, animals or objects for which the manufacturer is not responsible.**

Before performing any cleaning or maintenance, disconnect the appliance from the energy mains by acting on the switch of the system and/or through the specific cut-off devices.

Do not obstruct the terminals of the intake/exhaust ducts.

In the event of failure and/or malfunctioning of the appliance, switch it off and do not try to repair it or intervene on it directly. Contact only personnel qualified in compliance with law.

Any product repairs must be performed solely by personnel authorised by Unical, using original spare parts only. Failure to comply with the above can compromise the safety of the appliance and void the warranty.

To guarantee appliance efficiency and its correct operation, yearly maintenance must be performed by qualified personnel.

Should you decide not to use the appliance, parts entailing potential sources of hazard must be made safe.

Before commissioning an appliance that has not been used, wash the domestic hot water production system, making the water flow until it has been fully replaced.

Should the appliance be sold or transferred to a new owner or if you move and leave the appliance, always make sure that the instruction booklet accompanies it in order to be consulted by the new owner and/or installer.

Only original accessories must be used for all appliances with optionals or kits (including electric).

This appliance is intended solely for the use for which it was expressly designed.

Any other use is to be considered improper and therefore dangerous (\*).

## 1.2 - SYMBOLS USED IN THE MANUAL

Pay special attention when reading this manual to the parts marked by the symbols:



**DANGER!**  
Serious danger  
to safety  
and health



**ATTENTION!**  
Possible dangerous  
situation for the product  
and the environment



**NOTE!**  
Tips  
for the user



**NOTE!**  
For further details  
refer to the Technical Information:  
[http://www.unicalag.it/prodotti/  
professionale-300/light-  
commercial-alluminio/1639/alkon-140-ext](http://www.unicalag.it/prodotti/professionale-300/light-commercial-alluminio/1639/alkon-140-ext)



**DANGER!**  
Danger of burns!



**OBLIGATION!**  
wear gloves  
protective

## 1.3 - APPROPRIATE USE OF APPLIANCE



The heat generator has been built according to the current level of engineering and acknowledged technical safety rules.

Nonetheless, if improperly used, dangers could arise for the safety and life of the user and other persons or damage to the equipment or other objects.

The appliance is designed to work in heating systems, with hot water circulation, for the production of domestic hot water.

Any other use must be considered improper.

For any damage resulting from improper use, UNICAL AG S.p.A. assumes no responsibility.

Use according to the intended purposes also includes strict compliance with the instructions in this manual.

## 1.4 - INFORMATION FOR THE SYSTEM MANAGER



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

- Deliver these instructions to the user, as well as other documents concerning the appliance inserted in the envelope inside the packaging. **The user must keep this documentation safe for future consultation.**
- Inform the user about the importance of the air vents and the flue gas exhaust system, highlighting their essential features and the absolute prohibition of modifying them.
- Inform the user concerning controlling the system's water pressure as well as operations to restore it.
- Inform the user concerning correct temperature control, control units/thermostats and radiators for saving energy.
- Please note that, in compliance with the standards in force, the inspection and maintenance of the appliance must be carried out in compliance with the regulations and frequency indicated by the manufacturer.
- Should the appliance be sold or transferred to a new owner or if you move and leave the appliance, always make sure that the instruction manual accompanies it in order to be consulted by the new owner and/or installer.

**The manufacturer will not be held liable in the event of damage to persons, animals or objects resulting from failure to comply with the instructions contained in this manual.**

## 1.5 - SAFETY WARNINGS



### **ATTENTION!**

The boiler cannot be used by children.

The boiler can be used by adults and only after having carefully read the user's manual. Children should be supervised to ensure that they do not play or tamper with the device.



### **ATTENTION!**

The appliance must be installed, adjusted and maintained by professionally qualified personnel, in compliance with the standards and provisions in force. Incorrect installation can cause damage to persons, animals and objects for which the manufacturer cannot be held responsible.



### **DANGER!**

**NEVER** attempt performing maintenance or repairs on the boiler on your own initiative. Any work must be done by professionally qualified personnel. We recommend stipulating a maintenance contract.

Insufficient or irregular maintenance can jeopardise the operating safety of the appliance and cause damage to persons, animals and objects for which the manufacturer cannot be held responsible.



**Changes to the parts connected to the appliance (once the appliance installation is complete)**

Do not modify the following parts:

- the boiler
- the gas, air, water and electricity supply lines
- the flue gas pipe, the safety valve and the exhaust pipe
- the construction parts which affect the operating safety of the appliance



### **Attention!**

To tighten or loosen the screwed fittings, use only appropriate fixed spanners.

Incompliant use and/or inappropriate tools can cause damage (e.g. water or gas leakage).



### **ATTENTION!**

#### **Indications for propane gas-fired appliances**

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

For state-of-the-art tank venting, contact the LPG supplier or person qualified in compliance with the law requirement.

If the tank has not been professionally deaerated, ignition problems could arise.

In that case, contact the supplier of the LPG tank.



### **Smell of gas**

Should a smell of gas be perceived, follow these safety guidelines:

- do not turn electric switches on or off
- do not smoke
- do not use the telephone
- close the gas shut-off valve
- air out the area where the gas leakage has occurred
- inform the gas supplier or a company specialised in installation and maintenance of heating systems.



### **Explosive and easily flammable substances**

Do not use or store explosive or easily flammable materials (e.g. petrol, paints, paper) in the room where the appliance is installed.



### **DANGER!**

Do not use the appliance as a supporting base for objects.

In particular, do not place receptacles containing liquids (Bottles, Glasses, Jars or Detergents) on top of the appliance.

If the appliance is installed inside a housing, do not insert or rest other objects inside this housing.

# 1.6 - TECHNICAL DATA PLATE

## The CE marking

certifies the compliance of the equipment with the essential safety requirements defined in the directives and applicable European regulations and that its functioning satisfy applicable technical standards.

The CE marking is affixed to each piece of equipment with an appropriate label.

The CE declaration of conformity issued in accordance with international standards by the manufacturer, is placed in documentation envelope supplied with the product.



The technical data plate is located inside the boiler onto smoke chamber

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

### KEY:

- 1 = CE monitoring body
- 2 = Type of boiler
- 3 = Boiler model
- 4 = Number of stars (directive 92/42 EEC)
- 5 = (S.N°) Serial Number
- 6 = P.I.N. Product Identification Number
- 7 = Types of approved flue gas exhaust configurations
- 8 = (NOx) NOx Class

- A = Heating circuit characteristics
- 9 = (Pn) Effective nominal output
- 10 = (Pcond) Effective output in condensation
- 11 = (Qn) Maximum heat output
- 12 = (Adjusted Qn) Adjusted for rated heat output
- 13 = (PMS) Max. heating operating pressure
- 14 = (T max) Max. heating temperature

- B = Domestic hot water circuit characteristics
- 15 = (Qnw) Rated heat output in domestic hot water function (if different to Qn)
- 16 = (D) Specific D.H.W. flow rate according to EN 625 - EN 13203-1
- 17 = (R factor) No. of taps according to the declared amount of water (EN 13203-1)
- 18 = (F factor) No. of stars according to the declared quality of the water (EN 13203-1)
- 19 = (PMW) Max. domestic hot water operating pressure
- 20 = (T max) Max. domestic hot water temperature

- C = Electrical characteristics
- 21 = Electrical power supply
- 22 = Consumption
- 23 = Protection rating

- 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 space heating energy efficiency
- 30 = Energy efficiency in DHW production mode

## 1.7 - WATER TREATMENT



The treatment of the supply water allows to prevent inconveniences and maintain the functionality and efficiency of the generator over time.



**ATTENTION!**  
ANY DAMAGE TO THE BOILER CAUSED BY THE FORMATION OF FOULING OR BY CORROSIVE WATER WILL NOT BE COVERED BY THE WARRANTY.



The ideal water pH in heating systems must be within:

VALUE	MIN	MAX
PH	6,5	8
Hardness [°fr]	9	15



**ATTENTION (\*)** see general warnings 1.1  
The heating only models are NOT suitable for the production of water for human consumption according to Ministerial Decree D.M. 174/2004.



To minimise corrosion, it is crucial to use a corrosion inhibitor; in order for it to work properly, the metal surfaces must be clean. (see system protection ACCESSORIES sect. in domestic price list)

**NOTE!**  
Further details in the section “Technical Information” on the boiler indicated at page 2.



## 1.8 - BOILER ANTIFREEZE PROTECTION

### Enabled by default



This protection can intervene only if the electricity and gas supplies are connected. If one of the two is not available and upon reset **30 (SMG)** a temperature between  $2 \div 5^{\circ}\text{C}$  is detected, the appliance will behave as described in tab. **pos 2**.



The heating system can be protected effectively from frost by using antifreeze products with inhibitor for heating systems (specific for multidmetal)

Do not use car engine antifreeze products as they could damage the water gaskets.



For outdoor installations, in partially protected places, you must use the additional heater kit (optional) for antifreeze siphon cap.

P O S	ANTIFREEZE FUNCTION				
	Power supplies		30 - SMG (*)	Status function antifreeze	Actions
	Electric	Gas			
1	ON	ON	$< 7^{\circ}\text{C}$	ON	- Burner and Pump ON until $T > 15^{\circ}\text{C}$
2	ON	OFF	$< 2 \div 5^{\circ}\text{C}$	OFF	FAULT CODE 16 (see par. 4.6 ERROR CODES). Ignition disabled.
	OFF	ON		OFF	Ignition disabled.
	OFF	OFF		OFF	Ignition disabled.

(\*) Sensor 30 par. 2.2

# 2

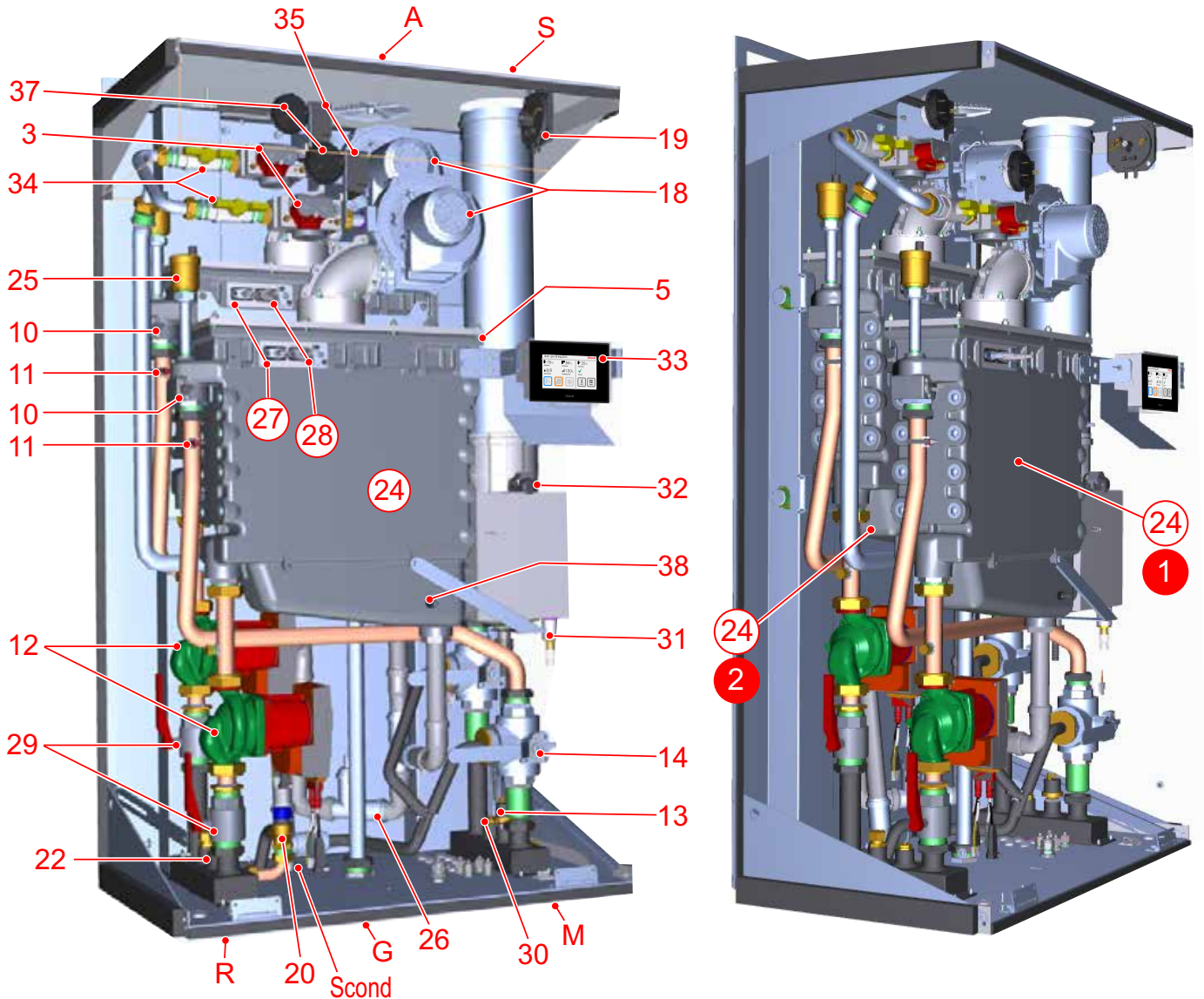
## TECHNICAL FEATURES AND DIMENSIONS

### 2.1 - TECHNICAL FEATURES



**NOTE!**  
Further details in the section  
"Technical Information" on the boiler  
page of the [www.unicalag.it](http://www.unicalag.it) website

### 2.2 - VIEW WITH THE INDICATION OF THE MAIN COMPONENTS

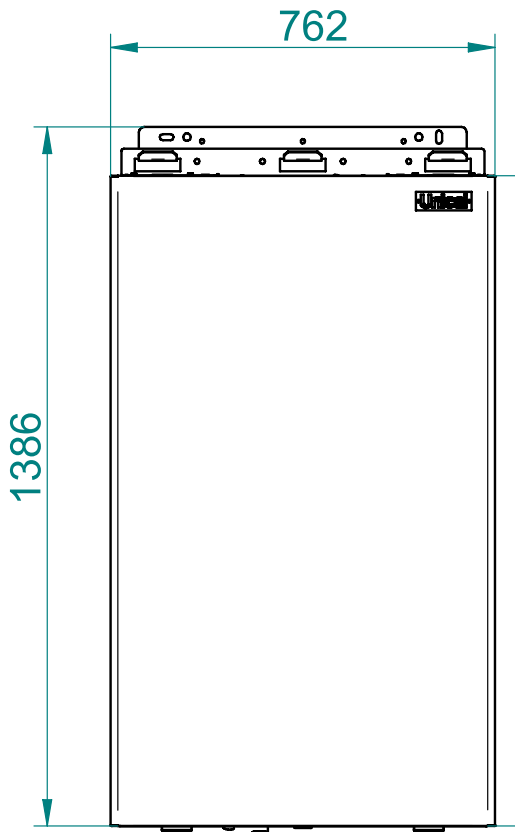


LEGENDA			
N°	C.E.	S.E.	Description
3		VG	Gas valve
5			Burner
10	HL	TL	Safety thermostat
11	Hb	SR	Heating temperature sensor (1) (2)
12	Ht	P	Modulating Pump
13	Lp	DK	Water deficiency pressure switch
14			Boiler drain valve
18	FL/ FH	VM	Fan

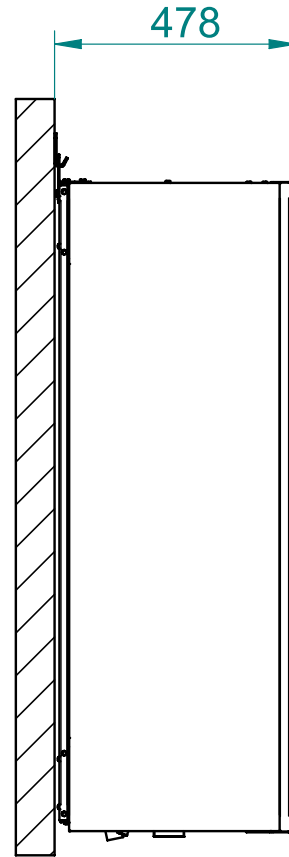
19	AF/AS	PV	Flue gas pressure switch
20			Safety valve drain system
22	rb	SRR	Return temperature sensor
24			Aluminium Heat Exchanger
25			Vent valve
26			Condensation drain trap
27		E. RIL.	Detection electrode
28		E. ACC.	Ignition electrode
29			Return shut-off valve
30		SMG	Sensor Flow General
31			Condensation drain trap

## 2.3 - DIMENSIONS

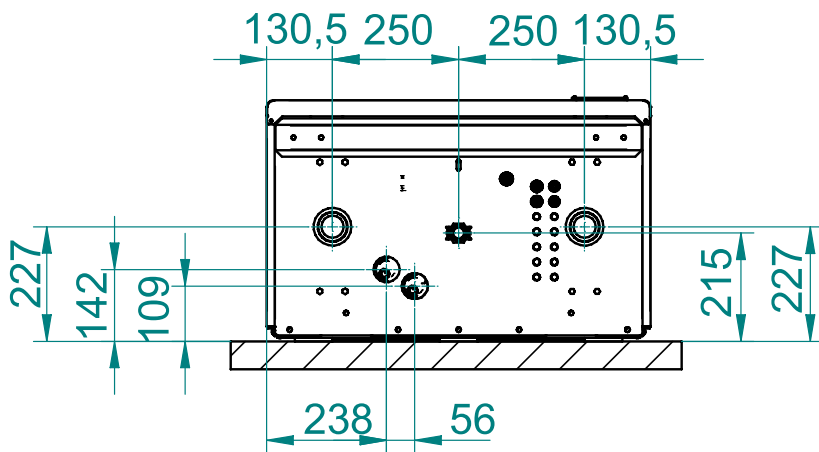
Front view



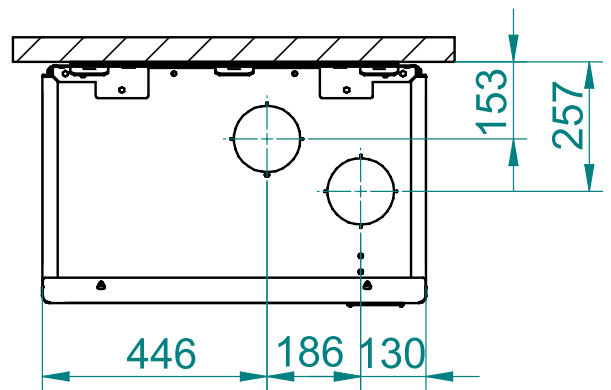
Side view



View from below



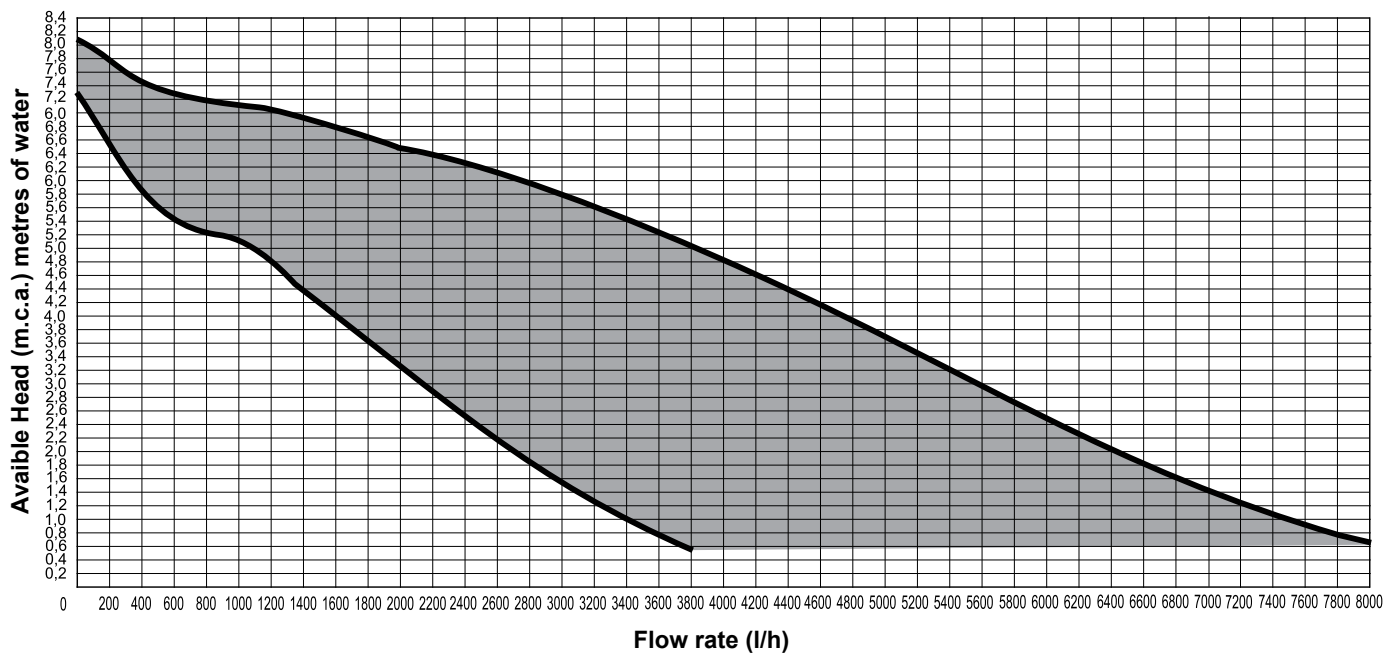
View from above



32			Outlet flue inspection
33			Heating Controller
34			Gas cock
35			Ignition Trasformer
37		PFmin	Gas min pressure switch
G			Gas inlet G 1"
M			Heating system flow G 2"

R			Heating system return G 2"
Scand			Condensation drain DN 32
	C.E.		= ERROR CODES see
		S.E.	= WIRING DIAGRAM

## 2.4 - DIAGRAM OF FLOW RATE/PRESSURE AVAILABLE FOR INSTALLATION



The table provides an indication the flow the pump in function of the  $\Delta t$  of the primary circuit.



	ALKON 100 EXT	ALKON 115 EXT	ALKON 140 EXT
Power supply in kW	100	115	135
Max flow rate demanded l/h ( $\Delta t$ 15 K)	5591	6422	7545
Nominal flow rate request ( $\Delta t$ 20 K)	4193	4816	5659

## 2.5 - OPERATING DATA ACCORDING TO UNI 10348 and GENERAL FEATURES

For the adjustment data: NOZZLES - PRESSURE - DIAGRAMS - FLOW RATES - CONSUMPTION refer to the paragraph ADAPTATION TO OTHER TYPES OF GAS.

		ALKON 100 EXT	ALKON 115 EXT	ALKON 140 EXT
Appliance category		II <sub>2H3P</sub>	II <sub>2H3P</sub>	II <sub>2H3P</sub>
Modulation Ratio		1:9,1	1:10,4	1:12,3
Nominal Heat Input on P.C.I. Qn	kW	100	115	135
Minimum Heat Input on P.C.I. Qmin	kW	11	11	11
Nominal Output (Tr 60 / Tm 80 °C) Pn	kW	98,8	112,01	131,60
Minimum Output (Tr 60 / Tm 80 °C) Pn min	kW	10,5	10,5	10,5
Nominal Output (Tr 30 / Tm 50 °C) Pcond	kW	102,4	117,1	136,1
Minimum Output (Tr 30 / Tm 50 °C) Pcond min	kW	11,5	11,5	11,5
Efficiency at max. output (Tr 60 / Tm 80°C)	%	98,83	97,4	97,48
Efficiency at min. output (Tr 60 / Tm 80°C)	%	95,1	95,1	95,1
Efficiency at max. output (Tr 30 / Tm 50°C)	%	102,4	101,85	100,8
Efficiency at min. output (Tr 30 / Tm 50°C)	%	104,5	104,3	104,3
Rendimento al 30% del carico (Tr 30°C)	%	108,2	108,3	108,3
Combustion efficiency with nominal load	%	97,5	97,4	97,5
Combustion efficiency with minimum load	%	98,35	98,35	98,35
Heat loss at casing with burner in operation (Qmin)	%	3,28	3,28	3,28
Heat loss at casing with burner in operation (Qn)	%	0,02	0,04	0,02
Flue gas temperature tf-ta (min)(*)	°C	33	33	33
Flue gas temperature tf-ta (max)(*)	°C	48,8	51,5	55
Maximum allowable temperature	°C	100	100	100
Maximum operating temperature	°C	85	85	85
Flue gas mass flow rate (min)	kg/h	12,58	12,58	18,2
Flue gas mass flow rate (max)	kg/h	114,39	129,20	220,8
Excess λ air	%	26,84	24,25	25,53
Flue losses with burner in operation (min)	%	1,65	1,65	1,65
Flue losses with burner in operation (max)	%	2,47	2,56	2,90
Minimum heating circuit pressure	bar	0,5	0,5	0,5
Maximum heating circuit pressure	bar	6	6	6
Max allowable pressure of the generator	bar	8	8	8
Water content	l	10	10	10
Gas Consumption Natural (20 mbar) gas G 20 a Qn	m <sup>3</sup> /h	10,57	12,16	14,27
Gas Consumption Natural gas (20 mbar) G 20 a Qmin	m <sup>3</sup> /h	1,16	1,16	1,16
Gas Consumption G25 (supply pressure 25 mbar) Qn	m <sup>3</sup> /h	12,30	14,14	16,60
Gas Consumption G25 (supply pressure 25 mbar) Qmin	m <sup>3</sup> /h	1,35	1,35	1,35
Gas Consumption G31 (supply pressure 37/50 mbar) Qn	kg/h	7,76	8,93	10,48
Gas Consumption G31 (supply pressure 37/50 mbar) Qmin	kg/h	0,85	0,85	0,85
Max. available pressure at the chimney base	Pa	70	70	70
Condensate production max	kg/h	13,7	18,5	21,8
<b>Emissioni</b>				
CO at Minimum Heat Input with 0% of O2	mg/kWh	83	131	139
NOx at Nominal Heat Input with 0% of O2	mg/kWh	48	56	58
NOx Class		6	6	6
<b>Electrical Data</b>				
Voltage/Frequency electric power supply	V/Hz	230/50	230/50	230/50
Fuse on main supply	A (R)	4	4	4
Insulation degree	IP	X5D	X5D	X5D
Room Temperature = 20°C				
(*) Temperatures detected with the unit in operation (Tr 60 / Tm 80°C)				
CO <sub>2</sub> (min/max) See table INJECTORS PRESSURES				
Seasonal space heating energy 2009/125 CEE (<=400Kw) η <sub>s</sub> - see ErP table				
Stand-by heat loss ΔT 30°C - P <sub>stb</sub> - see ErP table				
Consumption in stand-by - P <sub>sb</sub> - see ErP table				

## 2.5.1 - DATA ACCORDING TO ErP DIRECTIVE

			EXT 100	EXT 115	EXT 140
<b>Element</b>	<b>Symbol</b>	<b>Unit</b>			
Effective nominal output	P <sub>nominale</sub>	kW	99	112	132
Seasonal energy efficiency to heat the room	η <sub>s</sub>	%	93	93	93
<b>Season efficiency class to discharge</b>			<b>A</b>	<b>A</b>	<b>A</b>
<b>For CH only and combination boilers: useful heat output</b>					
Useful Heat Output in high-temperature regime (Tr 60 °C / Tm 80 °C)	P <sub>4</sub>	kW	55,0	61,4	71,2
Useful efficiency at nom. heat output in high-temperature regime (Tr 60 °C / Tm 80 °C)	η <sub>4</sub>	%	89	87,8	87,8
Useful heat output at 30% of nom. heat output in low-temperature regime (Tr 30 °C)	P <sub>1</sub>	kW	18	20,5	23,7
Useful efficiency at 30% of nom. heat output in low-temperature regime (Tr 30 °C)	η <sub>1</sub>	%	97,5	97,6	97,6
Range-rated boiler: YES / NO			YES	YES	YES
<b>Auxiliary electricity consumption</b>					
At full load	el <sub>max</sub>	kW	0,474	0,474	0,474
At part load	el <sub>min</sub>	kW	0,159	0,159	0,159
In stand-by mode	P <sub>SB</sub>	kW	0,007	0,007	0,007
<b>Other items</b>					
Heat loss in stand-by	P <sub>stb</sub>	kW	2,68	2,68	2,68
Emissions of nitrogen oxides ref. PCI (PCS)	NO <sub>x</sub>	Mg/kWh	48 (43)	56 (50)	58 (52)
Annual electricity consumption	Q <sub>HE</sub>	GJ	349	424	653
<b>For CH &amp; DHW production boilers</b>					
Declared load profile			-	-	-
Energy efficiency in DHW production mode	η <sub>wh</sub>	%	-	-	-
Daily electricity consumption	Q <sub>elec</sub>	kWh	-	-	-
Daily fuel consumption	Q <sub>fuel</sub>	kWh	-	-	-
Inside sound power level	L <sub>wa</sub>	dB (A)	-	-	-
Annual electricity consumption	AEC	kWh	-	-	-
Annual fuel consumption	AFC	GJ	-	-	-
<b>Seasonal efficiency class in DHW production mode</b>			-	-	-
<b>* Appliances not covered by Directive 2009/15 / EC</b>					

# 3

## INSTALLATION INSTRUCTIONS

### 3.1 - GENERAL WARNINGS



#### ATTENTION!

This boiler is intended solely for the use for which it was expressly designed. Any other use is to be considered improper and therefore dangerous.

This boiler heats water at a temperature lower than the atmospheric pressure boiling temperature.

Before connecting the boiler, have professionally qualified personnel:



a) **Thoroughly wash all the piping of the system to remove any residues or impurities which could jeopardise proper operation of the boiler, even from a hygienic point of view.**

b) Check that boiler is set up to operate with the available type of fuel. This can be seen written on the package and on the technical feature plate;

c) Check that the chimney/flue has an appropriate draught, without any bottlenecks, and that no exhausts from other appliances are inserted, unless the flue has been implemented to accommodate several utilities according to specific standards and regulations in force. Only after this check can the fitting between the boiler and chimney/flue be mounted;



#### ATTENTION!

If there is dust and/or if there are aggressive/corrosive vapours present in the installation room, the appliance must be protected suitably and must be able to operate independently from the air in the room.



#### ATTENTION!

Only mount the appliance on a closed wall, made of non-flammable material, flat, vertical so that the minimum distances required for installation and maintenance can be observed.



The boiler must be connected to a central heating system and/or domestic hot water supply network compatible with its efficiency and output.



**The boiler can be installed outdoors in a partially protected place or at least in a place where the boiler is not exposed to the direct action of the weather.**



**NOTE!**  
Further details in the section "Technical Information" on the boiler indicated at page 2.

### 3.2 - INSTALLATION STANDARDS

It must be installed by a professionally qualified technician, who shall take the responsibility of observing all local and/or national laws published in the official journal, as well as the applicable technical standards.



#### NOTE!

For further details relating to the standards, rules and regulations for safe installation of the thermal unit, refer to the section "Technical Information" on the boiler page of the [www.unicalag.it](http://www.unicalag.it) website

### 3.3 - PREVENTIVE VERIFICATION AND VERIFICATION AND ADJUSTMENT OPERATIONS



**NOTE!**  
Further details in the section "Technical Information" on the boiler indicated at page 2.

### 3.4 - IMBALLO

The boiler **ALKON 140** is delivered packaged in a cardboard boxes 1 (boiler)



After having removed the appliance from the packaging, make sure that the supply is complete and undamaged.



The packaging elements (cardboard box, straps, plastic bags, etc.) **must be kept out of the reach of children as they are potential sources of danger.**

**Unical AG S.p.A.** will not be held liable for damage to persons, animals or objects due to failure to comply with the instruction above. The packaging elements (cardboard box, straps, plastic bags, etc.) **must be kept out of the reach of children as they are potential sources of danger.**

As well as the appliance, the packaging contains:

#### A DOCUMENTATION ENVELOPE

- User operating instructions booklet
- Instruction booklet for the installer and maintenance engineer
- Certificate of conformity
- Gas conversion label
- Air inlet filter.
  
- Kit multifunction module SHC
- Outdoor sensor
- Sifone (\*)

**(\*) - For outdoor installations order the antifreeze kit (siphon trap), this is not included in the furniture.**



#### ATTENZIONE

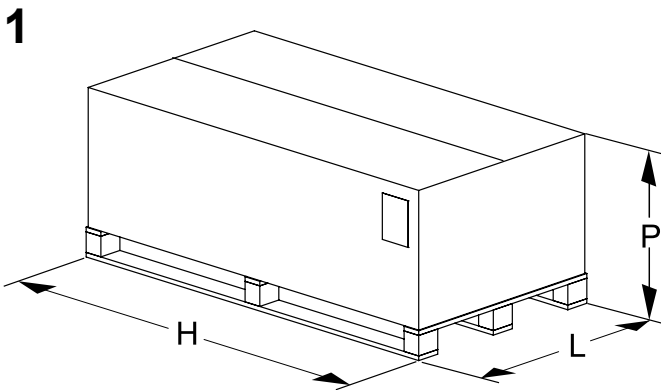
**La caldaia potrebbe essere danneggiata se non correttamente fissata.**



#### OBLIGATION!

**wear protective gloves**

- Only transport the boiler using appropriate transport equipment
- Follow the transport instructions on the packaging.



ALKON 100 EXT - 115 EXT - 140 EXT				
P depth	L width (mm)	H heigh (mm)	Net Weight (kg)	Gross Weight (kg)
619	840	1588	172	192



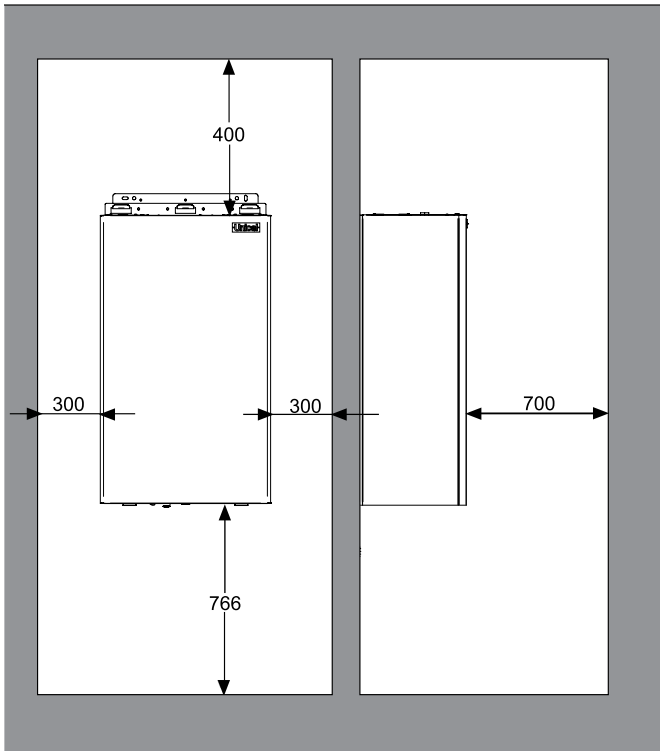
### 3.5 - POSITIONING IN BOILER ROOM

Particular importance should be given to local regulations and laws in terms of boiler room and especially the minimum distance that must be kept clear around the boiler.

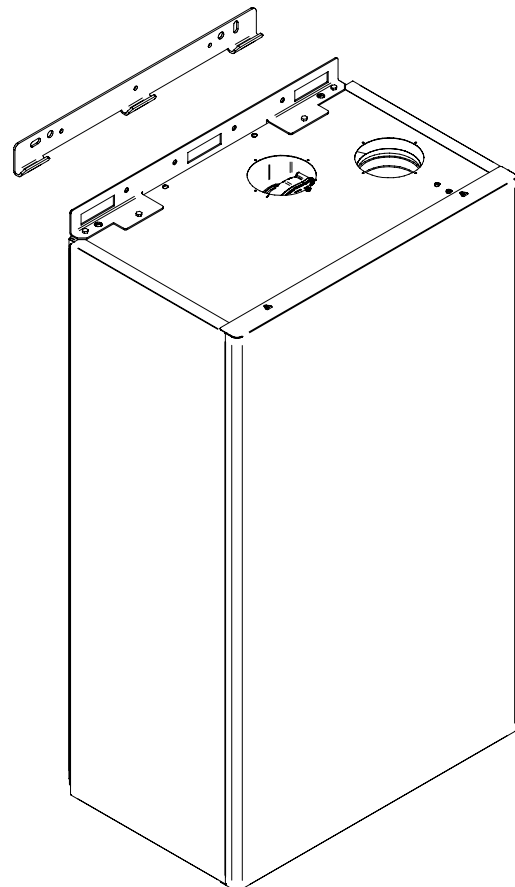
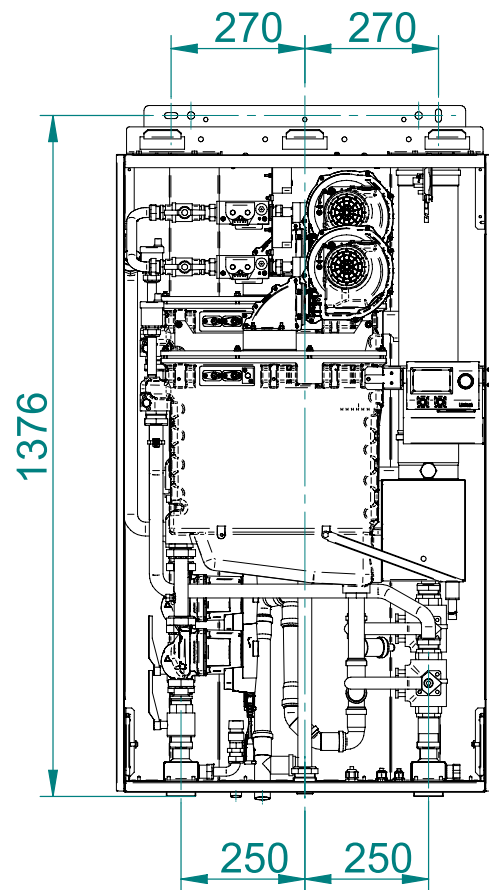
The installation must conform to the requirements contained in the most recent regulations and laws in terms of boiler room, installations of heating and production of hot water, ventilation, chimneys suitable to discharge the products of combustion of condensing boilers, and everything else applicable.

When choosing the place of the installation of the appliance, follow the safety instructions below:

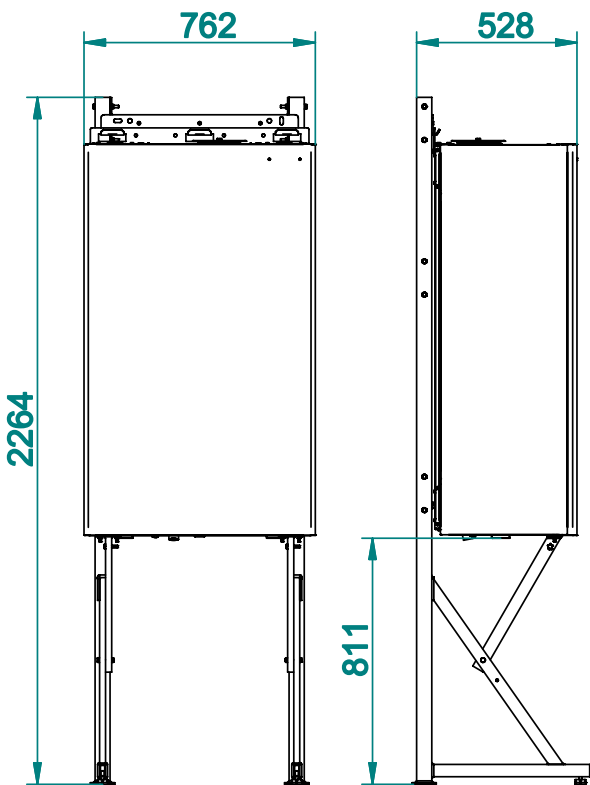
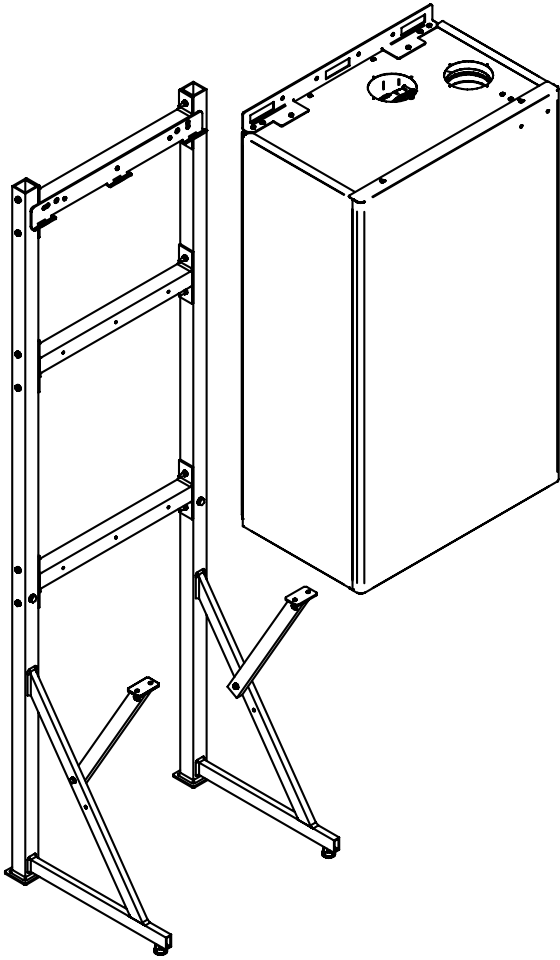
- **Place the boiler in a partially protected place and protect from frost.**
- Avoid installation in rooms with a corrosive or very dusty atmosphere.
- The appliance must only be installed on a vertical and solid wall which can support its weight or on a support kit optional.
- For outdoor installation, in a partially protect place, follow instruction in Par. 1.8.



Observe the minimum distances of encumbrance in order to perform the operations of normal maintenance and cleaning.



**2** SUPPORT FRAME (2) optional



### 3.6 - FLUE GAS EXHAUST PIPE CONNECTION

To connect the flue gas exhaust pipe, local and national standards must be observed

**In the event the boiler is replaced, ALWAYS replace the flue gas pipe as well.**

The boiler is type approved for the exhaust configurations listed below:

**B23P**

TOTAL LENGTH (LS)

SINGLE Ø120	
FROM [m]	TO [m]
1	20

Connection to a combustion products evacuation pipe outside the room; the combustion air is taken directly from the room where the appliance is installed.

C63x	C63
Boiler intended for connection to a combustion air intake and combustion products evacuation system, approved and sold separately	

	<b>ATTENTION:</b> The flue must comply with standards in force.
--	--



**NOTE!**  
For more information  
See Technical Info  
from site indicated at pag. 2

**Ø 120 optional adapters for twin flue systems**

ENGLISH

**Installation Instructions**

### 3.7 - CONNECTION

G	GAS	1"
---	-----	----



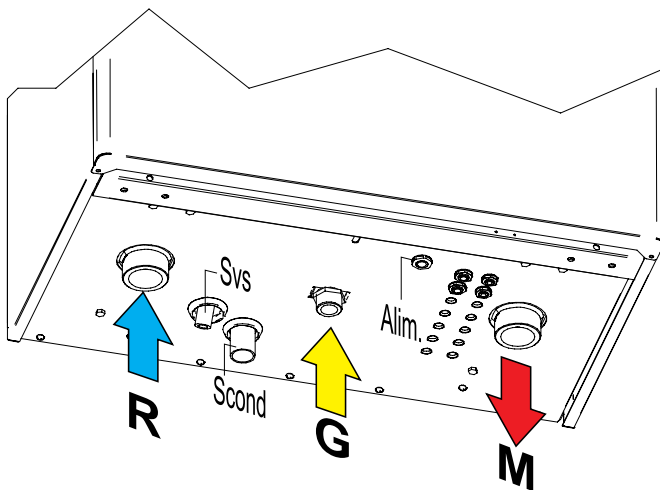
**Danger!**

The gas connection must be carried out only by a qualified installer who must respect and apply that foreseen by relevant laws in force in the local prescriptions of the supply company. Incorrect installation can cause damage to persons, animals and objects for which the manufacturer cannot be held responsible.



**If you smell gas:**

- Do not operate electric switches, the telephone or any other object that may cause sparks;
- Immediately open doors and windows to create air current to purify the room;
- Shut the gas cocks.



M	FLOW	2"
R	RETURN	2"

Sc	BOILER DRAIN
S.cond	CONDENSATION DRAIN
Rc	FILLING VALVE
Svs	SAFETY VALVE DRAIN Provide a drain pipe with funnel and a trap that lead to a suitable drain, in correspondence of Svs. This drainage must be controlled on sight. If this precaution is not taken, triggering of the safety valve can cause damage to persons, animals and objects, for which the manufacturer cannot be held responsible.

**Condensation drain**

The boiler, during the combustion process, produces condensation that, through pipe "A", flows into the trap. The condensation that forms inside the boiler flows into a suitable drain via pipe "B".

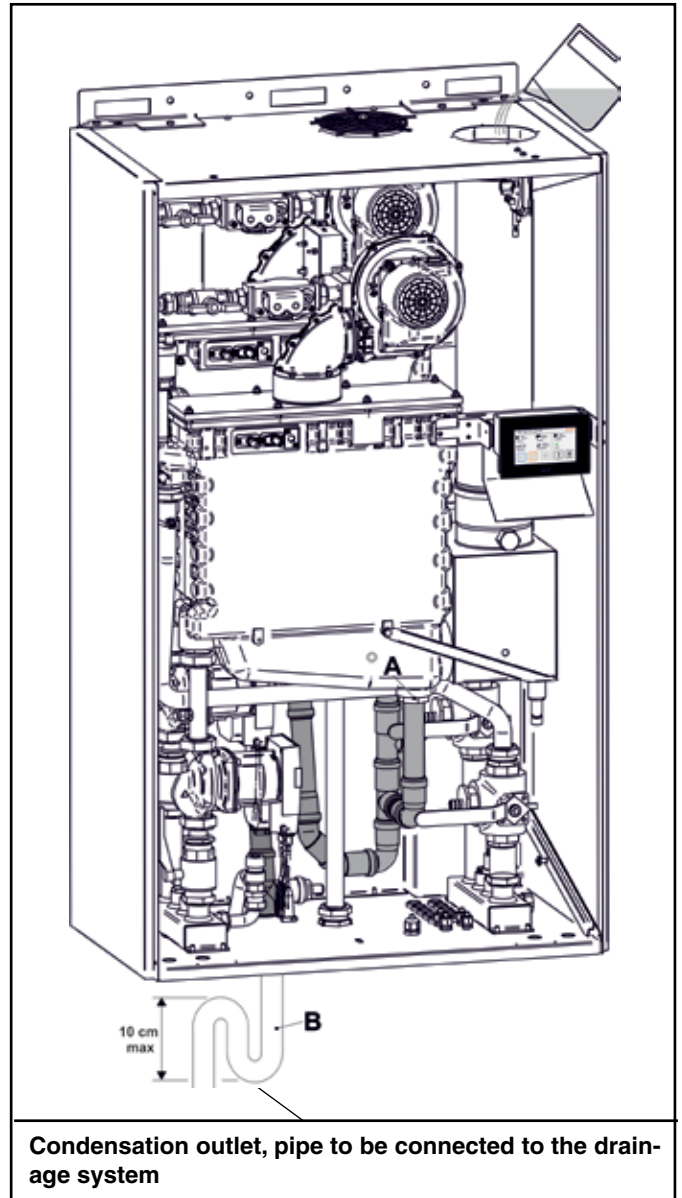


**Danger!**

Before commissioning the appliance:

- check that the trap is assembled properly
- fill the trap and check that the condensation is drained properly

If the appliance is used with an empty condensation drain trap, there is an intoxication hazard due to the release of exhaust gasses..



**Condensation outlet, pipe to be connected to the drainage system**



The connection between the appliance and the domestic waste system must be made in compliance with the specific reference standards.



**NOTE!**  
For more information  
See Technical Info  
from site indicated at pag. 2

### 3.8 - FILLING THE SYSTEM



**Attention!**

Do not mix the heating water with incorrect concentrations of antifreeze or anti-corrosion substances! This could damage the gaskets and cause noise during operation.

Unical will not be held liable for damage to persons, animals or objects due to failure to comply with the above instruction.



Pressure in the mains supply must be between 0.5 and 6 bar (In case of higher pressure a pressure reducer it must be installed)



To fill the system is necessary to provide a loading tap on the heating circuit, or use the optional accessories.



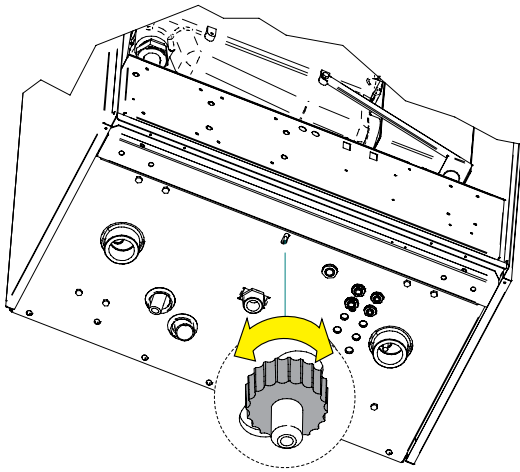
The boiler is equipped with its own drain valve, the position of which is indicated in the figure to par 2.2. This tap can never be used for emptying the system, since all the dirt present in the circuit could be accumulate in the boiler, compromising the proper functioning. Therefore, when using the drain valve, make sure that drain valve (29) it is closed. The system must be equipped with its own drain valve, with a size suitable to the capacity of the system.



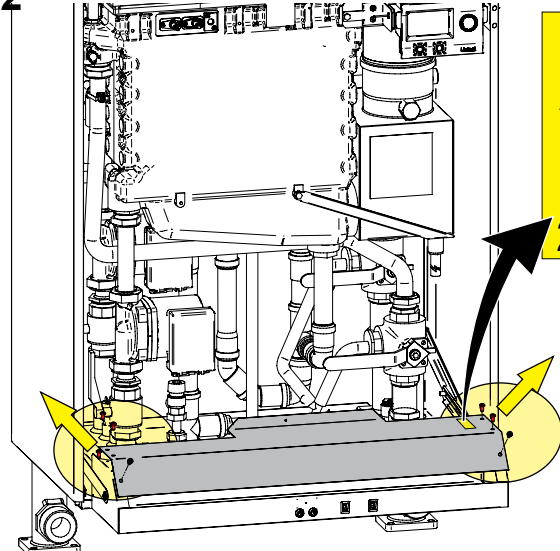
**NOTE!**  
For more information  
See Technical Info  
from site indicated at pag. 2

### 3.9 - ELECTRICAL CONNECTIONS

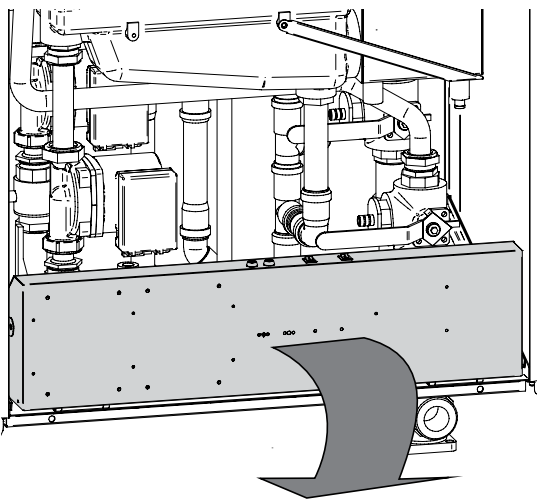
1



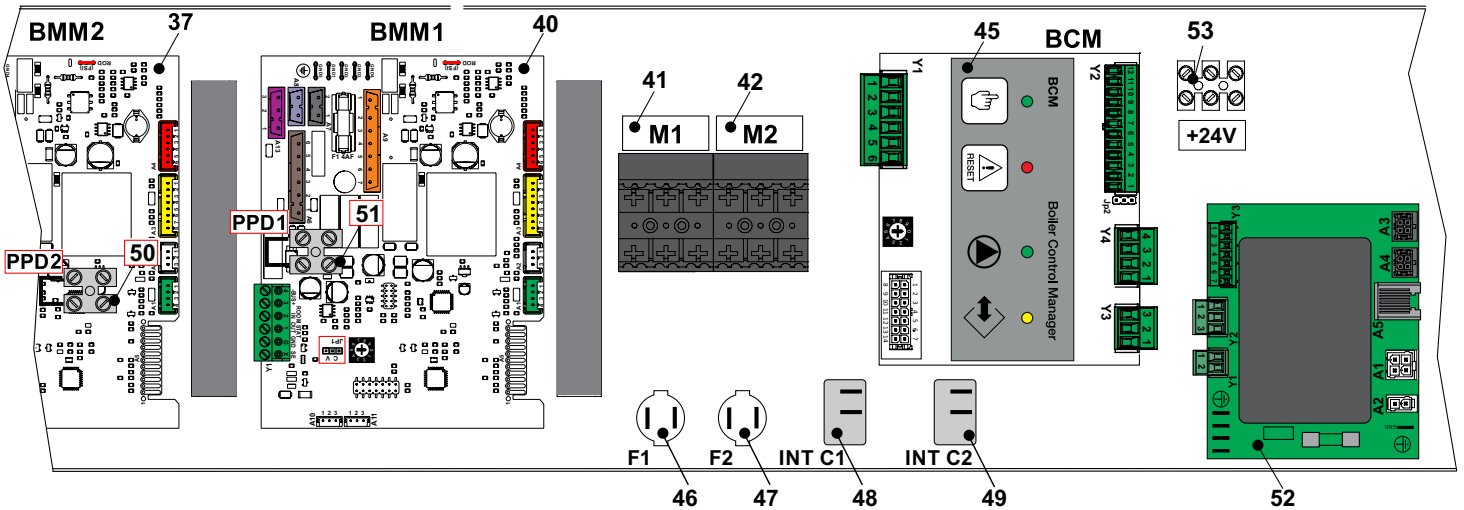
2



3



**Danger!**  
Only a qualified technician may perform the electrical installation.  
Before performing connections or any type of operation on electrical parts, always disconnect electrical power and make sure that it cannot be reconnected accidentally.



LEGENDA		
N°		Descrizione
37	BMM 2	Burner modul manager body 1
40	BMM 1	Burner modul manager body 2
41	M1	Power supply terminal 230 V
42	M2	Power Fans Terminal
45	BCM	Burner Control Manager / Cascade controller

46	F1	Power Fuse 6,3 A
47	F2	Power Fuse 6,3 A
48	INT. C1	Switch Inhibit Body 1
49	INT. C2	Switch Inhibit Body 2
50	PPD2	Connection pressure switch 2
51	PPD1	Connection pressure switch 1
52		Power supplier board
53		Supplementary terminal block +24V BCM



**Danger!**  
 Only a qualified technician may perform the electrical installation.  
 Before performing connections or any type of operation on electrical parts, always disconnect electrical power and make sure that it cannot be reconnected accidentally.

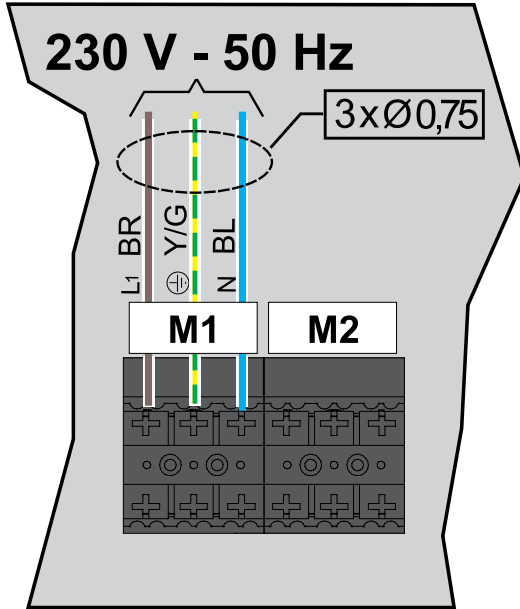


The boiler is equipped with a power cable, boiler installation requires electrical connection to the mains power supply. This connection must be made up to standard, as required the regulations in force.



Remember that a bipolar switch must be installed on the boiler power line with over 3 mm between contacts, easy to access, making maintenance quick and safe.

**Electric power supply connection**

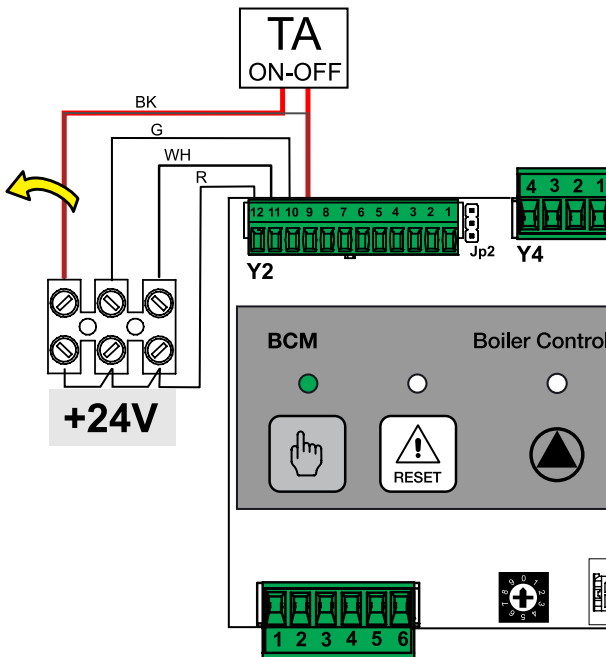


**ATTENTION!**  
 Size of power supply cables according to the boiler's power, thus of absorbed current, according to standards.



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

**TA connection (\*)**



**CAUTION:**  
 230 Volts cable must keep well separated by 24 Volts cable.

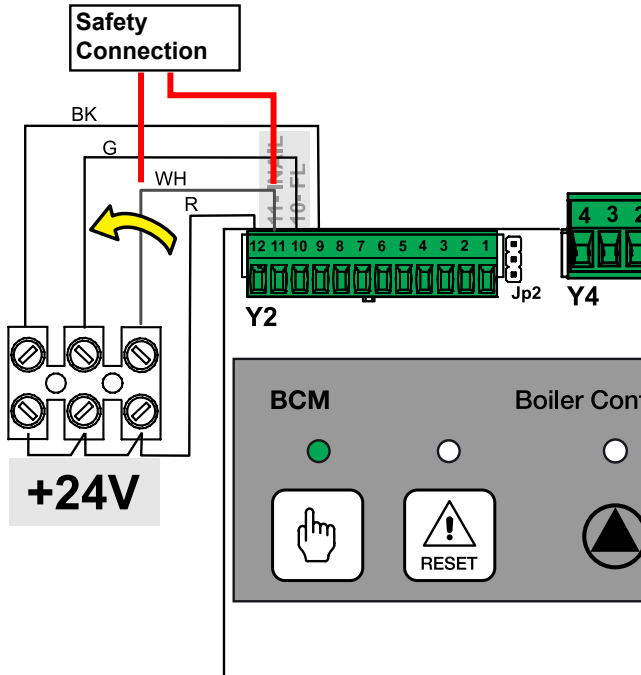


**NOTE!**  
 For more information  
 See Technical Info  
 from site indicated at pag. 2

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

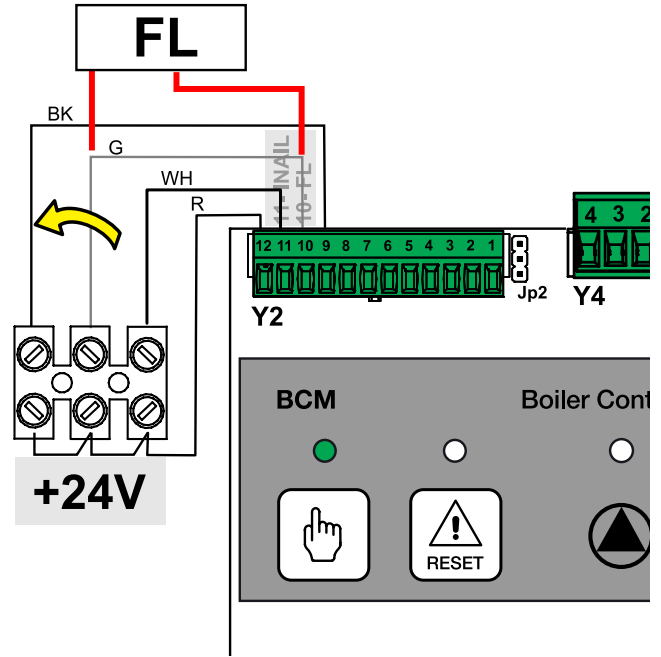
(\*) Optional

### INAIL safety connections



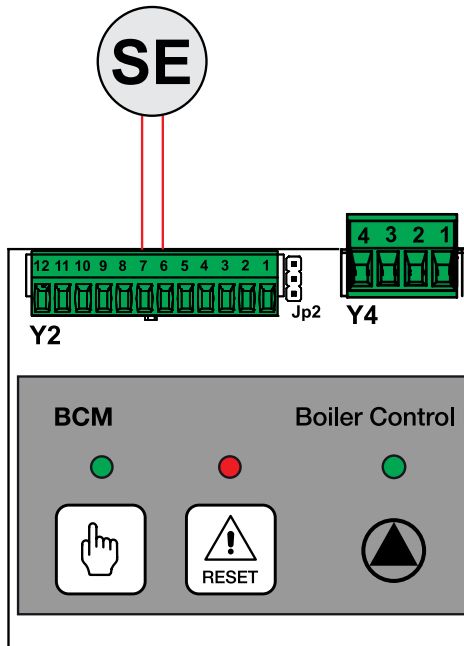
- Remove the jumper and connect the cables as indicated between (Y2 11 and terminal board M2).

### 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 terminal board, BCM (Y2 6-7).





**NOTE:**

The boiler is set up for direct flow and storage tank management.  
If **Stemp. ACC** is connected automatically, DHW is activated, which will have priority management with regard to direct flow through the pumps shown below.  
Should additional services be requested (storage

tanks, mixed areas, solar, etc), you must purchase **SHC** multi-function modules to connect to the local bus for total management through **HSCP** (and **UFLY**) heating controller.

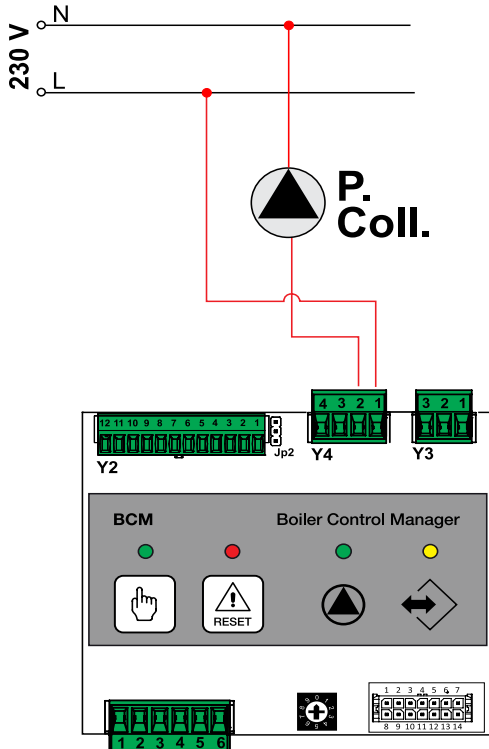


**BCM relay contacts support pumps with max. 4A absorption.**  
(\* Optional)

ENGLISH

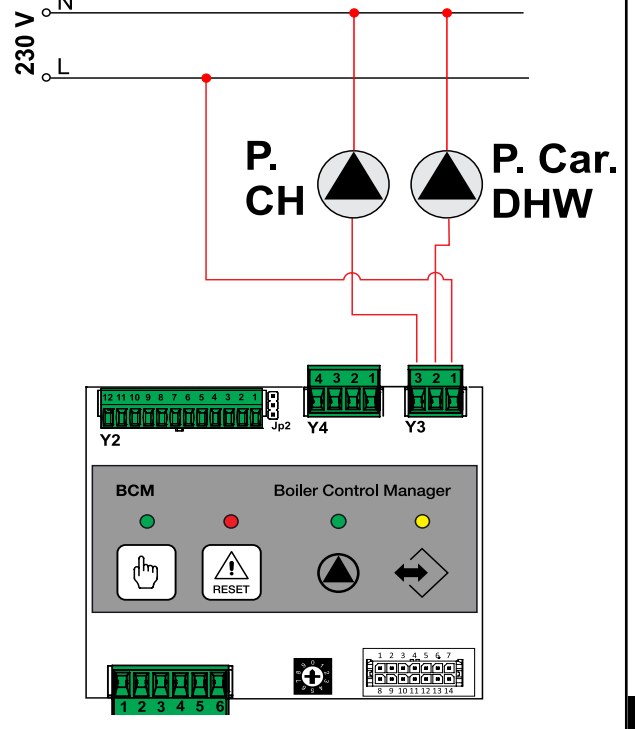
Installation Instructions

**P. Coll. - Collector Pump (\*) (Primary ring)**



- Connect the cables as indicated Y4.

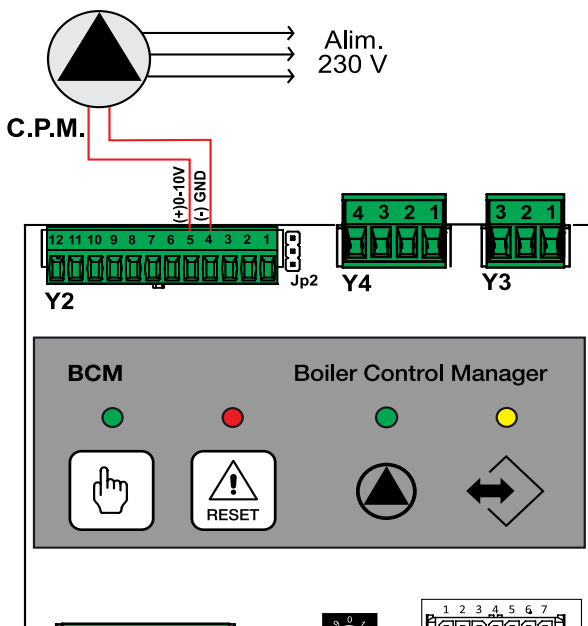
**P. CH - Heating Pump (heating circuit)  
P. Car DHW - Storage tank loading pump**



- Connect the cables as indicated Y3 1-2-3

**P. Mod. - Modulating Heating Pump (\*)**

**P. Mod.**

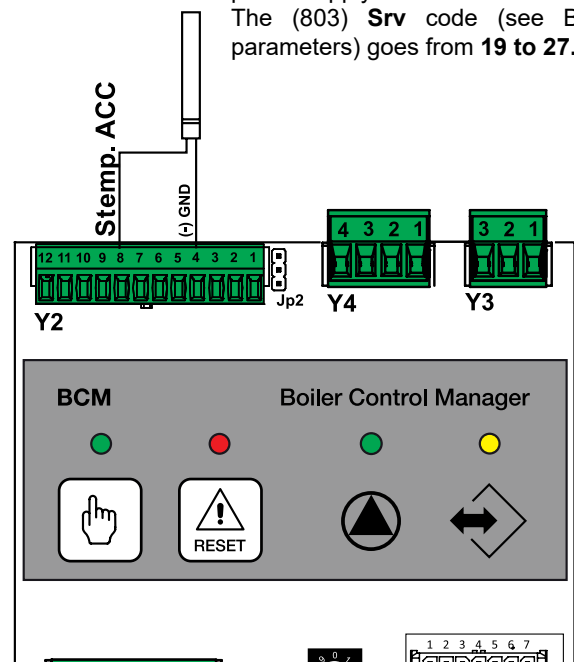


- Connect the modulation control cables as indicated (Y2 4-5).  
External 230 V-50 Hz power supply.

**Stemp. ACC. Storage Tank Temperature Sensor (\*)**

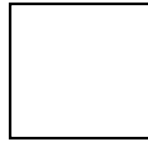


If the storage tank temperature sensor is connected, DHW service is automatically activated on boiler power supply.  
The (803) **Srv** code (see BCM parameters) goes from 19 to 27.

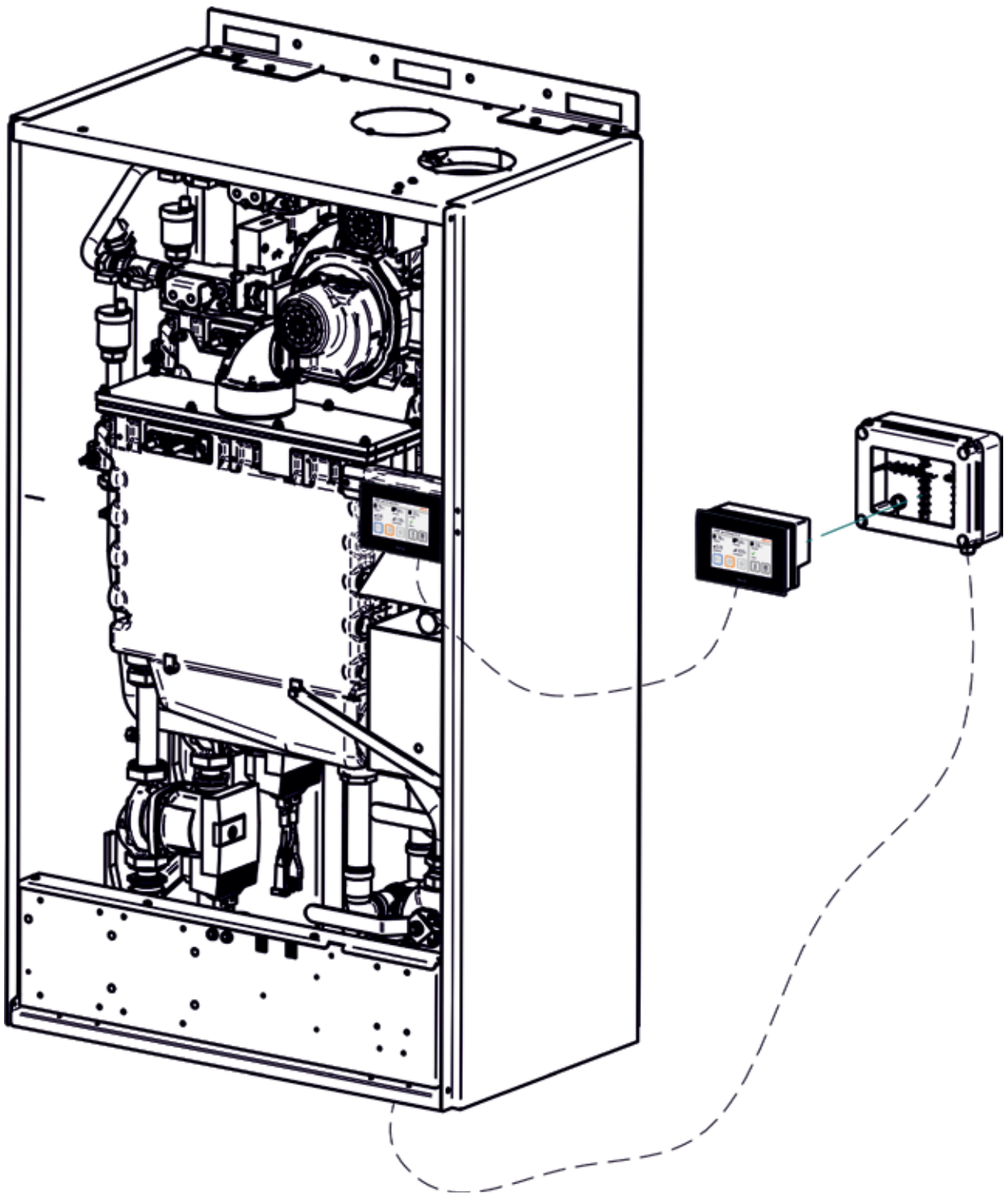


- Connect the temperature sensor cables as indicated (Y2 4-8).

Control panel remotely



**NOTE!**  
For more information  
See Technical Info  
from site indicated at pag. 2



### 3.10 - COMMISSIONING



Commissioning must be done by professionally qualified personnel. Unical AG S.p.A. will not be held liable for damage to persons, animals or objects due to failure to comply with the above

instruction.

Before commissioning the boiler, check that:

does the installation meet the specific standards and regulations in force, both relating to the gas part as well as the electrical part?	<input type="checkbox"/>
do the combustion air intake and flue gas exhaust take place properly according to what is defined by the specific rules and regulations in force?	<input type="checkbox"/>
is the fuel supply system sized according to the capacity required by the boiler? Is it equipped with all safety and control devices required by the standards in force?	<input type="checkbox"/>
is the power supply of the boiler 230V - 50Hz?	<input type="checkbox"/>
has the system been filled with water (approximately 0.8/1 bar pressure on the pressure gauge with the pump stopped)?	<input type="checkbox"/>
Has the condensation drain trap been filled with water as indicated in chapter 3.7?	<input type="checkbox"/>
are any system shut-off gate valves open?	<input type="checkbox"/>
does the gas to be used correspond to the boiler calibration gas?: otherwise, perform the boiler conversion in order to use the gas available (see section: 4.3"); this operation must be carried out by technical staff qualified in compliance with the standards in force;	<input type="checkbox"/>
is the gas supply valve open?	<input type="checkbox"/>
has the system been checked for gas leaks?	<input type="checkbox"/>
is the outside main switch ON?	<input type="checkbox"/>
is the system safety valve efficient and is it connected to the drains? is the condensation drain trap connected to the drains?	<input type="checkbox"/>
has the system been checked for water leaks?	<input type="checkbox"/>
are the ventilation conditions and minimum distances to perform any maintenance ensured?	<input type="checkbox"/>
have the GAS, HEATING and DOMESTIC HOT WATER pipes been cleaned thoroughly with products suitable for each circuit?	<input type="checkbox"/>
has a surveillance and protection system against gas leaks been installed? (Optional)	<input type="checkbox"/>
are the system pipes NOT used as the electrical system earthing?	<input type="checkbox"/>
has the system been sized properly bearing in mind the radiator pressure drops? thermostatic valves, radiator stop valves	<input type="checkbox"/>
has the operator been trained and has the documentation been supplied?	<input type="checkbox"/>
Please tick the operations performed	



#### Switching boiler on and off

#### NOTE!

For more information  
See Technical Info  
from site indicated at pag. 2

### 3.11 - MEASUREMENT OF THE COMBUSTION EFFICIENCY DURING INSTALLATION Generator Menu

#### 3.11.1 - CALIBRATION FUNCTION (CHIMNEY SWEEP)



**ATTENTION!**  
Function reserved for After Sale  
Service Centres only.



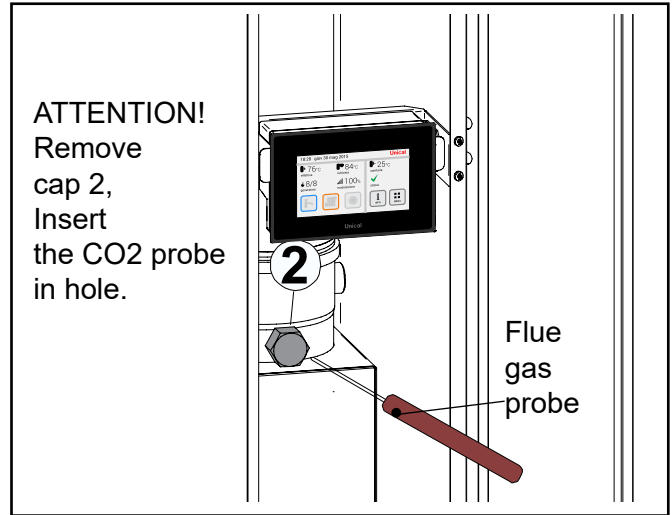
**ATTENTION!**  
These functions are explained in  
chapter 2.9 (Burner menu) of the  
Ufly P. TOUCH CONTROL instal-  
lation and maintenance manual.

### 3.11.2 - POSITIONING THE PROBES

To determine the combustion efficiency one must make the following measurements:

- measurement of the combustion air temperature
- measurement of the flue gas temperature and content of CO<sub>2</sub> taken in the relevant hole 2.

Take the measurements with the generator in steady state conditions (see par. 3.11.1).



ENGLISH

### 3.12 - ADJUSTING THE BURNER



All boilers leave the factory already calibrated and tested, however in the event the gas valve (BODY 1, BODY 2) recalibration are required:



The following instructions are intended exclusively for **authorised service personnel**.

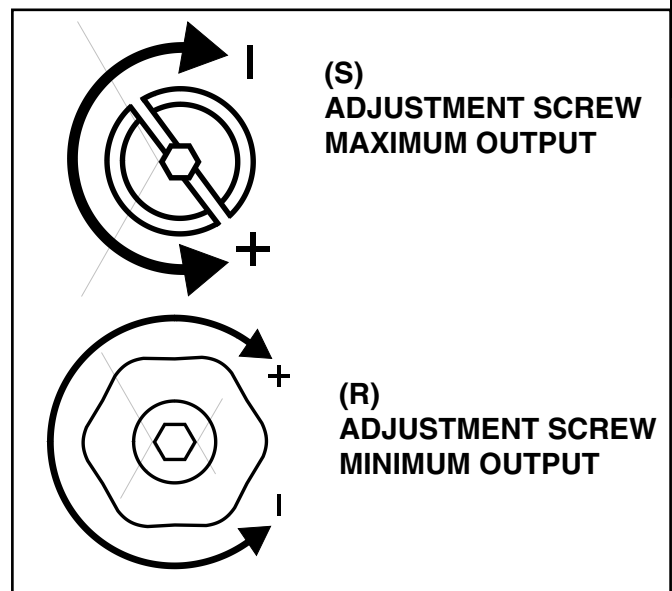
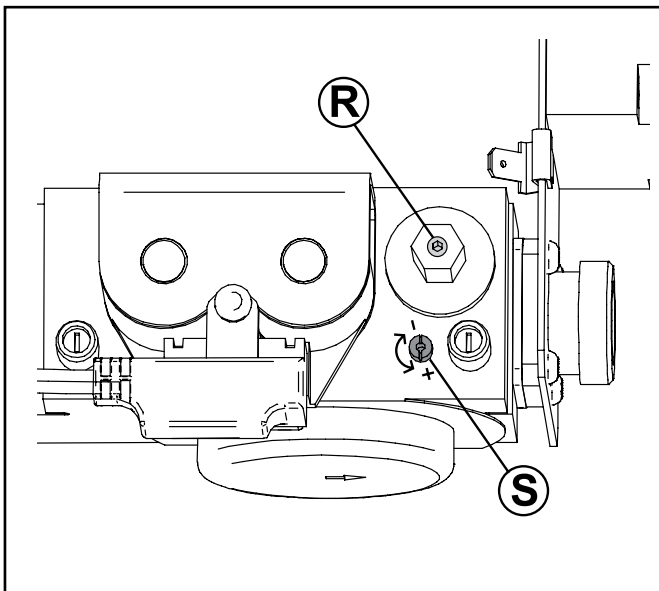
- Remove the cap and insert the CO<sub>2</sub> analysis probe in the flue gas sample point of the intake/exhaust terminal, see chap. 3.11.2.

#### 1) Maximum output adjustment

- Operate the boiler in "calibration" mode at MAXIMUM OUTPUT (see 3.11.1)
- Once the burner is on check that the CO<sub>2</sub> "MAXIMUM" value corresponds to that indicated in the table "NOZZLES - PRESSURE".
- if it does not correspond, correct it by turning the screw "S" CLOCKWISE to decrease it, ANTICLOCKWISE to increase it.

#### 2) Minimum output adjustment

- Operate the boiler in "calibration" mode at MINIMUM OUTPUT (see 3.11.1)
- Once the burner is on check that the CO<sub>2</sub> "MINIMUM" value corresponds to that indicated in the table "NOZZLES - PRESSURE".
- Correct it if needed by turning (with a screwdriver) the screw "R"; CLOCKWISE to increase it, ANTICLOCKWISE to decrease it



Installation Instructions

### 3) Conclusion of the basic calibrations

- once the CO<sub>2</sub> values at minimum and maximum output have been checked and any adjustments have been made (sections 1-2):
- disable the timed "calibration" function by switching off the main switch.
- close the flue gas inspection sample points of the intake and exhaust terminal
- **check that there are no gas leaks.**

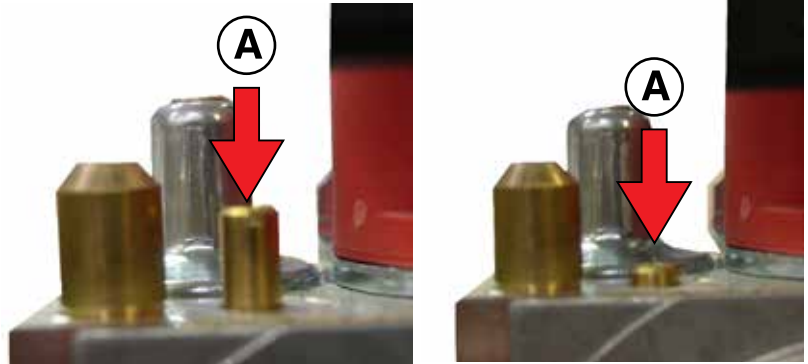


**For proper operation, the CO<sub>2</sub> values must be calibrated with particular attention, observing the values indicated in the table.**

In case of gas valve replacement or difficult ignition:

Tighten the maximum adjustment screw "A" in a clockwise direction until you arrive to the abutting end, than slacken for 7 turns. Verify the boiler ignition; if the boiler goes into lockout slacken the screw "A" again of one turn, than retry the ignition. If the boiler goes into lockout again, carry out the above indicated operations until the boiler is lighted.

At this point carry out the burner adjustment as previously indicated.



If the CO<sub>2</sub> percentage is too low, check if the air and smoke ducts are not obstructed.

If they are not obstructed, check if the burner and/or the exchanger (aluminium sections) are well cleaned.

### NOZZLES - PRESSURE - FLOW RATES TABLE

Check the levels of CO<sub>2</sub> often, especially with low flow rates. They refer to the boiler with a closed combustion chamber.

ALKON 100 EXT								
Type of Gas	Supply Press.	Ø Nozzles	Collector diaphragm	Fan speed		CO <sub>2</sub> levels		Start-up power.
	[mbar]	(mm)	[Ø/n.holes]	min	max	[%]		[%]
				FL [% FU]	FH [% FU]	min	max	IG
Nat gas (G20)	20	9	-	22	74	9,1	9,1	45
Nat gas (G25)	25	9	-	22	74	9,1	9,1	45
Propane (G31)	37	9	-	20	67	11	11	45

ALKON 115 EXT								
Type of Gas	Supply Press.	Ø Nozzles	Collector diaphragm	Fan speed		CO <sub>2</sub> levels		Start-up power.
	[mbar]	(mm)	[Ø/n.holes]	min	max	[%]		[%]
				FL [% FU]	FH [% FU]	min	max	IG
Nat gas (G20)	20	9	-	22	83	9,1	9,2	45
Nat gas (G25)	25	9	-	22	83	9,1	9,2	45
Propane (G31)	37	9	-	20	78	11	10,9	45

ALKON 140 EXT								
Type of Gas	Supply Press.	Ø Nozzles	Collector diaphragm	Fan speed		CO <sub>2</sub> levels		Start-up power.
	[mbar]	(mm)	[Ø/n.holes]	min	max	[%]		[%]
				FL [% FU]	FH [% FU]	min	max	IG
Nat gas (G20)	20	9	-	22	97	9,0	9,1	45
Nat gas (G25)	25	9	-	23	95	9,0	9,1	45
Propane (G31)	37	9	-	20	88	10,9	10,8	45

4

# INSPECTION AND MAINTENANCE



Inspections and maintenance performed professionally and according to a regular schedule, as well as the use of original spare parts, are of the utmost importance for fault-free operation of the boiler and to guarantee its long life.  
Yearly maintenance of the appliance is mandatory in compliance with Laws in force.



Failure to perform Inspections and Maintenance can entail material and personal damage.

## 4.1 - INSPECTION AND MAINTENANCE INSTRUCTIONS

To assure long-term functioning of your appliance and to avoid altering its approved status, only original Unical spare parts must be used.

If a component needs to be replaced:

- Disconnect the appliance from the electrical mains and make sure that it cannot be reconnected accidentally.
- Close the gas shut-off valve upstream the boiler.
- If needed, and depending on the intervention to be carried out, close any shut-off valves on the flow and return line of the heating system, as well as the cold water inlet valve.

Once all maintenance operations are complete resume boiler operation.

- Open the heating flow and return pipes, as well as the cold water inlet valve (if closed previously).
- Vent and, if necessary, restore the heating pressure until reaching a pressure of 0.8/1.0 bar.
- Open the gas shut-off valve.
- Switch the boiler on
- Make sure the appliance is gas tight and watertight.



**OBLIGATION!**  
wear gloves protective



**Danger of burns!**  
during maintenance operations.

**TABLE OF RESISTANCE VALUES, ACCORDING TO THE TEMPERATURE, TO THE HEATING PROBE 11 (SR) AND TO THE DOMESTIC HOT WATER PROBE 1 (SS) AND ANY HEATING RETURN PROBE 22 (SRR) see par. 4.5.**

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 the nom. resistance (Ohm) of the heating probe SR and of the domestic hot water probe SS

Example: At 25°C, the nominal resistance is 10067 Ohm At 90°C, the nominal resistance is 920 Ohm

<b>ROUTINE YEARLY VERIFICATION OPERATIONS</b>		
<b>COMPONENT:</b>	<b>VERIFY:</b>	<b>CONTROL/INTERVENTION METHOD:</b>
VG (Gas valve) ( 3 )	Does the valve modulate properly?	The verification is performed on the "Calibration" requiring 100%, in 50%, the minimum percentage of modulation. Make sure that the flame modulate.
SR (heating sensor)( 11 ) SS (domestic hot water sensor) ( 1 )	Do the sensors maintain the original characteristics?	12571 ohm at 20° C / 1762 ohm at 70° C. Measurement to be taken with the wires disconnected (see table Res/Temp).
E ACC/RIV. (ignition/detection electrode) ( 4 )	Does the discharge of sparks before putting the boiler in safe conditions last less than 10 sec.?	Detach the electrode ionisation wire and check the securing time.
TL (anti-overheating limit thermostat) ( 10 )	Does the TL put the boiler in safety conditions when overheating?	Heat the TL until it intervenes at 102°C and check that it intervenes at 102°.
DK (safety pressure switch against water deficiency) ( 13 )	Does the pressure switch block the boiler if the water pressure is below 0.4 bar?	Without request: close the shut-off valves of the heating circuit, open the drain valve to make the water pressure decrease. Before pressurising again, check the pressure of the expansion vessel.
Condensation drain trap (27)	Has the trap got deposits on the bottom?	Clean the trap with water.
Heat exchanger body ( 9 )	1) Measure the Thermal Capacity using a meter and compare the value with that contained in table 3.12. The data measured indicates if the exchanger needs cleaning.  2) Check that the space between the rungs of the exchanger are not clogged	It is recommended to use the products purposely created by Unical (see system protection ACCESSORIES sect. in the domestic price list), being careful to wash the area with most rungs first (lowest part visible from above) and then the upper part if necessary.
Burner ( 5 )	Check the state of cleanliness of the burner mesh	Remove any deposits using compressed air, blowing from the mesh side.
<b>( Num ) = see key Par. 2.2</b>		



## 4.3 - ADAPTATION TO THE USE OF OTHER GAS

The boilers are produced for the type of gas specifically requested upon ordering.



### DANGER!

The conversion for the operation of the boiler with a type of gas other than that specifically required in the order, must be performed by professionally qualified personnel, in compliance with the standards and regulations in force.

The manufacturer cannot be held liable for any damage resulting from a conversion operation that is incorrect or not performed in compliance with the laws in force and/or with the instructions given.



### ATTENTION!

After performing the conversion for the operation of the boiler with a type of gas (e.g. propane gas) other than that specifically requested when ordering, the appliance will only work with this new type of gas.



### ATTENTION!

Indications for propane gas-fired appliances Make sure that the gas tank has been deaerated before installing the appliance.

For state-of-the-art deaeration of the tank, contact the LPG supplier or a person qualified in compliance with law.

If the tank has not been professionally deaerated, ignition problems could arise.

In that case, contact the supplier of the LPG tank.

## Gas Conversion



**NOTE!**  
For more information  
See Technical Info  
from site indicated at pag. 2

In order to change the gas one must change the Factory parameter FH and FL.

(\*) for values, see TABLE NOZZLES - PRESSURE-FLOW

M	P	Code	Simb.	Description	Value
E	R	319	FH	Fan Speed: maximum	(*)
		346	FL	Ventilatore: minimum	(*)
A	P				
N	A				
E	N				
	E				

- when the conversion is complete, fill in the information required on the label supplied in the documentation envelope and apply it next to the technical data label of the boiler.

## EXAMPLE OF COMPILATION

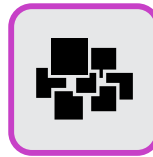
	Data - Fecha Date - Datum	08, 09, 05
	Firma - Signature Unterschrift	
- Regolata per	G 20	<input type="checkbox"/>
- Réglée pour	G 25	<input type="checkbox"/>
- Adjusted for	G 30	<input checked="" type="checkbox"/>
- Reglada para	G 31	<input checked="" type="checkbox"/>
- Eingestellt für		

ETI 4530C

## 4.4 - PROGRAMMING THE OPERATING PARAMETERS



**ATTENTION!**  
Function reserved for After Sale Service Centres only.

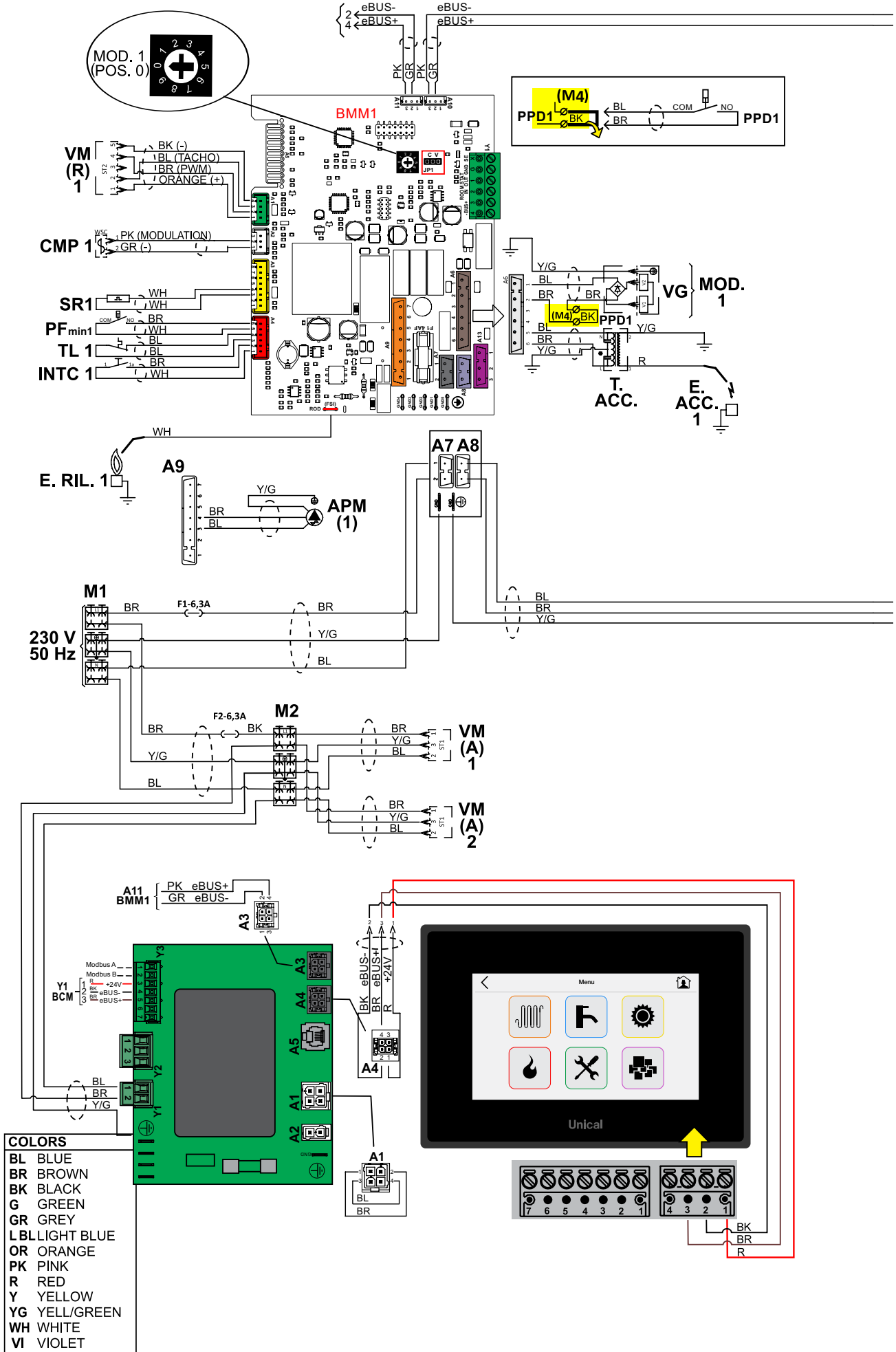


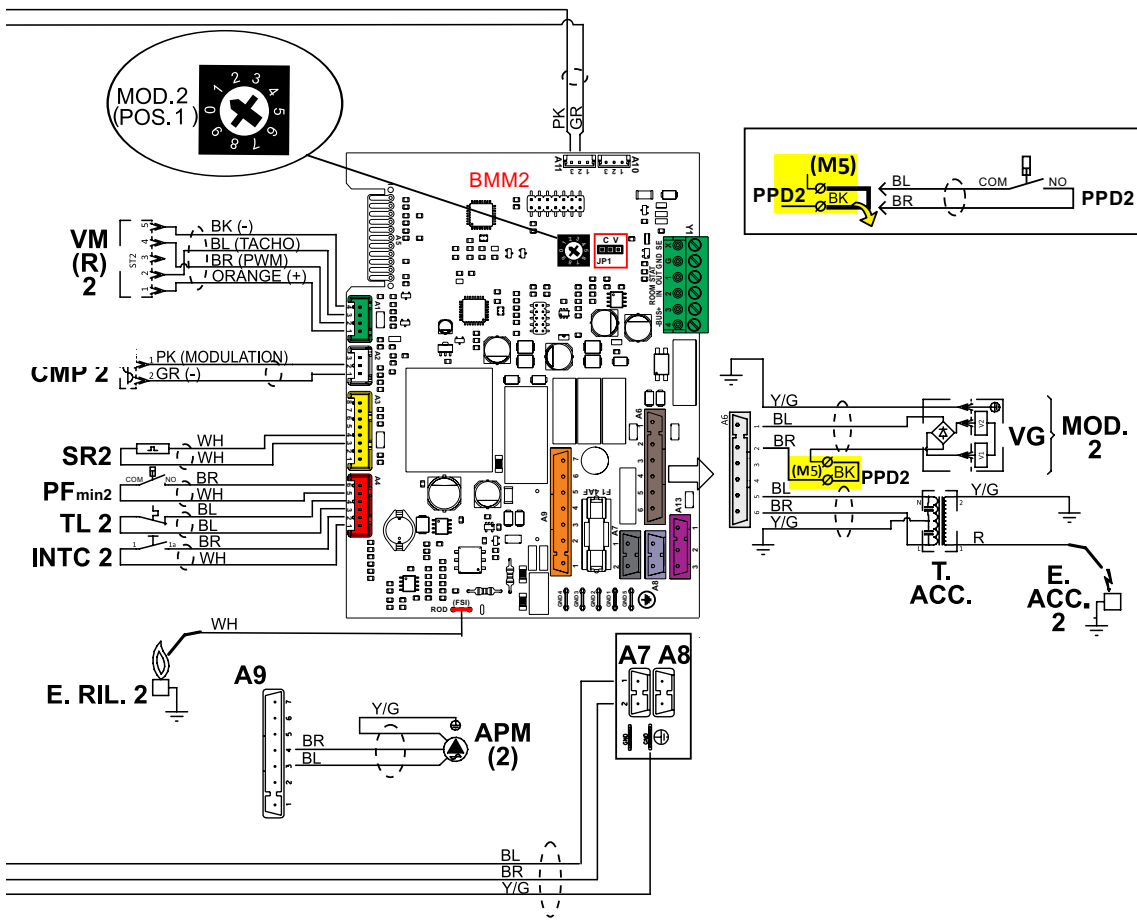
**ATTENTION!**  
These functions are explained in chapter 2.8 (DEVICES menu) of the Ufly P. TOUCH CONTROL installation and maintenance manual.

PARAMETER BMM MODULE						
CODE	SYMBOL	PARAMETER DESCRIPTION	U.M.	RANGE		SETTING FACTORY
				MIN	MAX	
803	Srv	Enabled services		0	3	0
31	HL	CH # 1: Minimum value of the CH setpoint adjustment	°C	20	45	30
39	HH	Maximum value of the CH setpoint adjustment	°C	50	90	85
322	Po	Pump overrun time	min	0	10	5
341	PL	Pump minimum modulation level	%	0	100	40
313	Pr	Pump maximum modulation level	%	20	100	100
368	VA1	Relay Programmabile #1		0	1	0
773	dr	Enable the DHW request by the temperature sensor		0	1	0
650	dL	Minimum value of the DHW setpoint adjustment	°C	25	45	40
385	dH	Maximum value of the DHW setpoint adjustment	°C	50	65	60
310	DpT	Pump overrun time after DHW operation	sec	0	600	30
360	dt	Storage tank regulation gain.		0	15	7
320	tH	Storage tank hysteresis	°C	0	30	0
309	St	Application code:	%	0	4	1
619	IG	Relative fan speed at burner pre-purge and ignition	%	0	100	45
314	Sb	Relative fan speed at burner standby	%	0	100	26
319	FH	Maximum relative fan speed	%	0	100	95
346	FL	Minimum relative fan speed	%	0	100	22
2590		Burner maximum capacity	kW	1	1000	70
483	rP	Water Δ-temperature protection:	°C	0	50	30
622	FS	Water minimum flow-rate protection		0	1	0
34	HY	Burner OFF hysteresis	°C	5	20	5
336	HS	Temperature control: slope limit.	°C/MIN	1	30	10
353	HP	Temperature control: proportional gain		0	50	25
354	HI	Temperature control: integrative gain		0	50	12
478	Hd	Temperature control: derivative gain		0	50	0
486	FP	Fan speed control: proportional gain		0	50	2
487	FI	Fan speed control: integrative gain		0	50	2
337	Fr	Fan speed slope (rpm/min)	rpm/min	0	30000	5000
526	FU	Maximum absolute fan speed	Hz	50	120	120
488	Fb	Fan PWM modulation at maximum fan speed		1	20	2
527	PU	Fan tachometer: pulse/revolution		2	3	2
777	AFC	Burner air-flow check		0	1	0
793	COC	Chimney obstruction check		0	1	1
783	0	unknown parameter		0	1	0
896	TU	Temperature unit:		0	1	0
768	LG	Low gas pressure protection		0	1	0
771	PS	LowWaterFlow		0	2	1
1056	Fc	Installation loading factor		1	10	3

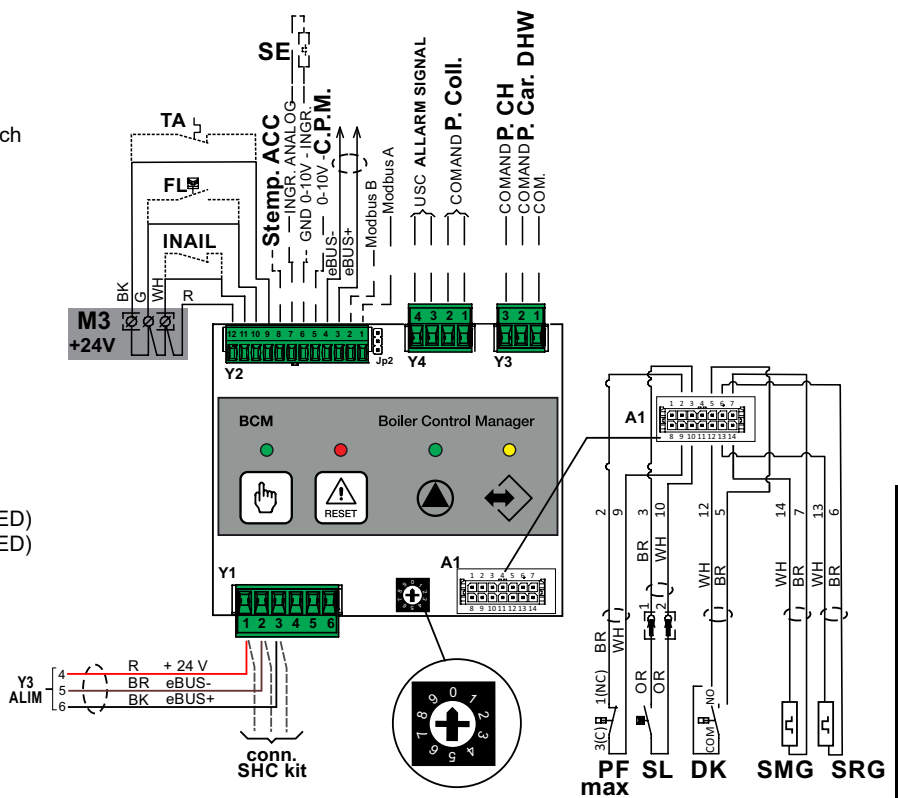
BCM Parameters						
Code	Symbol	Description	Unit	Min.	Max.	Imp. Fab.
803	Srv	Enabled Services		16	27	19
483	rP	Gen: Temp. Max Differential	°K	0,0	50,0	0
34	HY	Burner Hysteresis	°K	5,0	20,0	5,0
31	HL	CH#1: Minimum Set-point	°C	20,0	40,0	35,0
39	HH	CH#1: Maximum Set-point	°C	45,0	85,0	80,0
799	AC	Input 0/10V		0	3	1
376	DI1	Programmable Input #1		0	2	0
322	Po	Pump: Post-circulation	min.	1	10	5
341	PL	Pump: Minimum Control	V	0	10	3
313	Pr	Pump: Maximum Control	V	0	10	10
792	CHP	CH: Mx. Modulation	%	0	100	100
611	POT	Gen: Err. Max. Parallel	°K	0	30	5
612	POL	Gen: Mod. Max. Parallel	%	0	100	0
650	dL	DHW: Minimum Set-point	°C	25,0	45,0	35,0
385	dH	DHW: Maximum Set-point		50,0	65,0	65,0
360	dt	Storage Tank Adjustment		0	15	0
656	drT	DHW: Temp. Requested Differential	°K	-20	20	4
657	drH	DHW: Requested Temp. Hysteresis	°K	1	20	8
310	DpT	DHW Pump: Postcirc.	sec.	5	600	60
660	dbT	DHW: Temp. Maximum Boiler	°C	50,0	85,0	75,0
48	ChSet	CH#1: Set-point	°C	20,0	85,0	85,0
64	ChPO1	CH#1: Parallel Supply		0	1	0
346	FL	Minimum Modulation	%	0	100,0	25,0
600	mB	Burners: Min. Inserted		1	8	1
616	BSt	Gen: Insertion Time	sec.	30	900	120
613	BRt	Gen: Removal Time	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	Modbus Time-out	sec.	0	240	30
896	TU	°Fahrenheit		0	1	0
309	St	Application Code		0	1	1
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	Min. Gas Pressure Sensor		0	1	1
793	COC	Chimney Obstruction Sensor		0	2	1
622	FS	Minimum Flow Sensor		0	1	3

# 4.5 - WIRING DIAGRAM





- A1...A9 = Services Connector
- APM = Supply Modulating Pump
- CMP = Modulating pump control
- DK = Safety low water pressure switch
- E. ACC. = Ignition electrode
- E. RIL. = Detection Electrode
- IG = Insert BCM
- INTC (1) (2) = Switch inhibition body (1) (2)
- M1 = Power supply terminal 230 V
- M2 = Power Fans Terminal
- M3 = Terminal for safe conection
- M4 = Terminal for pressure switch 1 PPD1 (NOT USED)
- M5 = Terminal for pressure switch 2 PPD2 (NOT USED)
- PF = Flue gas pressure switch
- PPD1 (PV1) = Fan pressure switch (NOT USED)
- PPD2 (PV2) = Fan pressure switch (NOT USED)
- PR = Reset button
- SMG = Sensor Flow general
- SR (1) (2) = Heating temperature sensor module (1) (2)
- SRR = Return temperature sensor
- TL (1) (2) = Safety Thermostat module (1) (2)
- VG = Gas Valve (1) (2)
- VM (A) = Supply Modulating Fan



C.P.M.G = Modulation Pump Control (general / System)  
 eBUS = (outer cascade manager)  
 PLC / BMS = (supervisor PLC)  
 ALARM SIGNAL  
 Collector Pump Control

## 4.6 - ERROR CODES

18:28 lun 9 nov 2015 **Unical**

41 °C effettiva	0 °C richiesta	<b>HCM: 4</b> Accensione Fallita
0/1 generatore	100% modulazione	 status

18:28 lun 9 nov 2015 **Unical**

41 °C effettiva	0 °C richiesta	<b>HCM: 0</b> Funzionam OK
0/1 generatore	100% modulazione	 status

### Fault that causes the boiler to stop:

- The error code is displayed, the boiler has stopped running. After solving the failure, press Reset to restart the boiler.

### Fault that does NOT cause the boiler to stop:

- The error code is displayed, the boiler has a heating request, Reset icon (informing that a failure has been detected, even if the fault was temporary). Therefore, you must always carry out reset to cancel the word "Error" displayed.

( Num ) = see key Par. 2.2		
SYMBOL	DESCRIPTION OF FAULT DETECTED ON <b>BMM</b>	SOLUTION
<b>01</b>	<b>SAFETY THERMOSTAT</b> Intervention of the safety thermostat (10)	Press the unblock button on the panel and/or check that the thermostat or its connections are not interrupted, make sure the switches INTC are closed (position 1)
<b>04</b>	<b>BLOCK</b> No gas or failed burner ignition	Check the gas supply or that the ignition/detection electrode is working properly (4).
<b>05</b>	<b>PERDITA DI FIAMMA DURANTE IL FUNZIONAMENTO.</b>	Verificare elettrodo rilevazione
<b>06</b>	<b>HIGH TEMPERATURE</b> Boiler temperature too high	Check pump operation and if needed clean the exchanger (24)
<b>08</b>	<b>WATER DEFICIENCY</b> Insufficient water pressure and consequent intervention of the minimum water pressure - pressure switch (13).	
<b>10</b>	<b>INTERNAL FAULT</b>	
<b>11</b>	Flame detection before ignition (flame parasite)	
<b>12</b>	<b>HEATING SENSOR (11)</b> Heating sensor fault	Check the efficiency of the sensor (see table Res/Temp) (Par.4) or its connections.
<b>14</b>	<b>RETUR HEATING SENSOR</b> Auxiliary (SRR) sensor interrupted	Check the wiring, if needed replace the auxiliary sensor (22)
<b>15</b>	<b>WATER CIRCULATION INSUFFICIENT</b> Primary circuit water circulation insufficient ( $\Delta t > 40^\circ \text{C}$ )	Check pump operation and speed - remove any heating system obstructions.
<b>16</b>	<b>EXCHANGER FREEZING (24)</b> Exchanger freezing is detected If the heating sensor detects a temperature below $2^\circ \text{C}$ , burner ignition is inhibited until the sensor detects a temperature above $5^\circ \text{C}$ .	Disconnect the from the power supply, close the gas valve, defrost the exchanger carefully.
<b>24</b>	<b>SPEED OUT OF CONTROL</b> Alteration of the fan speed; the speed is not reached.	Check fan operation (18) and the connections

<b>26</b>	<b>SPEED OUT OF CONTROL</b> Alteration of the fan speed; the speed is above that requested	Check fan operation ( <b>18</b> ) and the connections
<b>28</b>	<b>OBSTRUCTION EXHAUST</b>	Check Chimney / Ceck siphon
<b>30</b>	<b>FACTORY PARAMETERS</b> Alteration of the factory parameters due to possible electromagnetic interferences.	Press the unblock key; if the anomaly persists, replace the board.
<b>32</b>	Line voltage under 80% of nominal value. The ignition procedure wait until the line voltage is > 85% of the nominal value.	Correction: if the line voltage <190Vac: the line voltage is really under the minimum limit, else errors line monitor fault: substitute the BMM
SYMBOL	DESCRIPTION OF FAULT DETECTED ON HCM (BCM)	SOLUTION
<b>17</b>	<b>EXCHANGER FREEZING ( 24 )</b>  Status stop	Push Reset: the system automatically activates the function of antifreeze and then it may be only a warning.
<b>18</b>	<b>MAXIMUM PROTECTION <math>\Delta T</math> FLOW AND RETURN</b> Status stop	Control of the circulation, verify installation
<b>19</b>	<b>OVERHEATING OF CH FLOW</b> Overheating of the outlet. It is activated when the flow temperature is > 95. It is reset automatically when the temperature is <80. Effect: Stop burner, pump on	Control of the circulation
<b>37</b>	<b>FAULTY PARAMETER MEMORY</b> Flame arrest	Contact Customer Service
<b>38</b>	<b>FACTORYPARAMETERSCORRUPTED</b> by electromagnetic interference Status stop	Contact Customer Service
<b>56</b>	<b>REMOTE CONTROL IS NOT DETECTED</b> Flame arrest	Check the electrical connections e-BUS1
<b>57</b>	<b>BMM BOARD NOT FOUND</b> Status stop	Check the electrical connections BMM e-BUS
<b>58</b>	<b>FLOW SENSOR</b> Status stop	Connect a new sensor. If the code disappears, replace the sensor, otherwise check the electrical connections
The error codes are displayed in info line of the display and persist even if the fault was temporary. Is necessary to push reset to clear the display of alarm code'.		

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