

KON^e

R 18 - C 18

R 24 - C 24

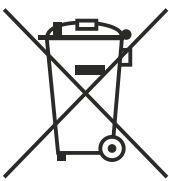
R 28 - C 28

R 35 - C 35

INSTALLATION AND SERVICING MANUAL



<http://www.unicalag.it/prodotti/domestico-50/condensazione-gas/776/kone>



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.

1 GENERAL INFORMATION	4
1.1 General warnings	4
1.2 Symbols used in the manual	5
1.3 Appropriate use of appliance.....	5
1.4 Information for system manager.....	5
1.5 Safety warnings.....	6
1.6 Technical data plate	7
1.7 Water treatment.....	8
1.8 Boiler antifreeze protection.....	8

2 TECHNICAL FEATURES AND DIMENSIONS	9
2.1 Technical features	9
2.2 Main components view and dimensions.....	9
2.3 Available flow rate / pressure diagram	12
2.4 Operation data.....	13
2.5 General features.....	14

3 INSTALLATION INSTRUCTIONS	15
3.1 General warnings	15
3.2 Installation standards	15
3.3 Preventive system verification and adjustment operations	15
3.4 Packaging.....	16
3.4 Positioning the boiler	17
3.6 Flue gas exhaust pipe connection.....	18
3.7 Connections	21
3.8 Filling the system.....	22
3.9 Electrical connections.....	23
3.10 Commissioning	25
3.11 Measurement of combustion efficiency during installation	26
3.11.1 Calibration function activation	26
3.11.2 Probes positioning	27
3.12 Burner adjustment.....	27
3.12.1 Combustion adjustment function activation	29
3.12.3 Adaptation of the power to the heating system.....	31

4 MAINTENANCE INSTRUCTIONS	31
4.1 Inspection and maintenance instructions	31
4.2 Parameters that can be edited from the control panel	33
4.3 Adaptation of the power to the heating system	37
4.3.1 GAC adjustment	38
4.4 Important notes	39
4.5 Wiring diagram	40
4.6 Error codes.....	41

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.

Installation and maintenance must be performed in compliance with the standards in force according to the instructions of the manufacturer, up to standard and by personnel qualified and certified in compliance with law.

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 case 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 repairs must be performed solely by personnel authorised by Unical AG S.p.A., 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:
at the web address
indicated
on page 2



DANGER!
Danger of burns!



OBLIGATION!
wear gloves
protective

1.3 - APPROPRIATE USE OF APPLIANCE



The boiler 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 is 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 PROVIDED TO THE USER



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 booklet 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 on the back at the bottom

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
- 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

Unical		(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			
<input checked="" type="checkbox"/> MET <input type="checkbox"/> GPL		[(27)] mbar	[(24)]	[(25)]	[(26)]
		[] 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					
C Electrical Power supply		[(21)] V	Hz	[(22)] W	
IP class:		[(23)]			
		[(28)]			[(1)]
Made in Italy					

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.



The ideal water pH in heating systems must be within:

VALUE	MIN	MAX
PH	6.5	8
Hardness [°fr]	9	15



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)



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



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.



NOTE!
Further details in the section "Technical Information" on the boiler

page of the www.unicalag.it website

1.8 - BOILER ANTIFREEZE PROTECTION (*)

 	<p>Make sure that E is lit up on the display (), select the mode using B / C.</p>
------	---

(*) The Antifreeze protection is always active. Even by disabling the heating and domestic hot water services, in this mode () only the antifreeze function is active.



This protection can intervene only if the electricity and gas supplies are connected.

If one of the two is not available and upon reset **11 (SR)** a temperature of < 2 °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 multimetals).

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

POS	ANTIFREEZE FUNCTION				
	Power supplies		11 - SR (*)	Status function antifreeze	Actions
	Electric	Gas			
1	ON	ON	< 6 °C	ON	- Burner and Pump ON until T > 14°C
	ON	ON	< 2 °C	ON	Only when both the power supplies are ON: - Burner and Pump OFF until T > 5°C - When T > 5°C then Burner and Pump ON until T > 14°C.
2	ON	OFF	< 7 °C	OFF	- Pump ON till T > 10°C
	OFF	ON		OFF	- Burner and Pump OFF
	OFF	OFF		OFF	- Burner and Pump OFF

(*) Sensor 11 par. 2.2

2

TECHNICAL FEATURES AND DIMENSIONS

2.1 - TECHNICAL FEATURES

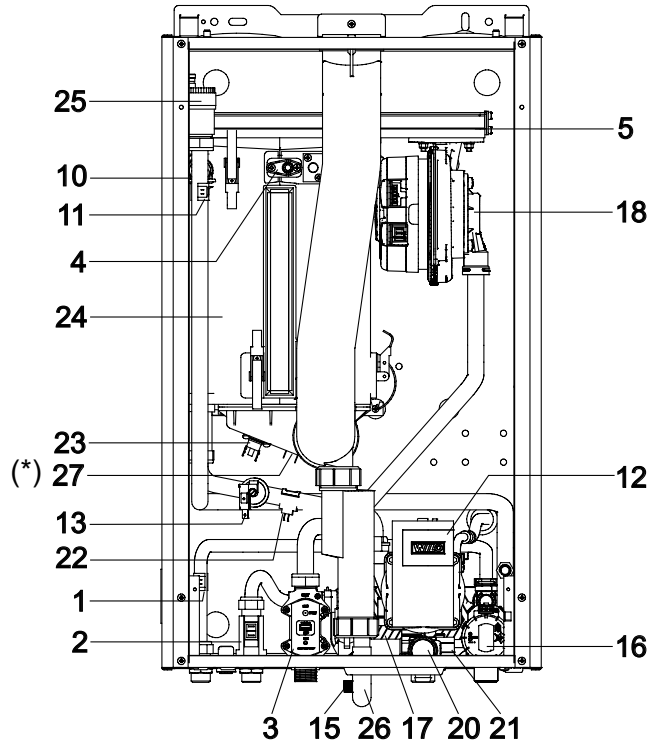
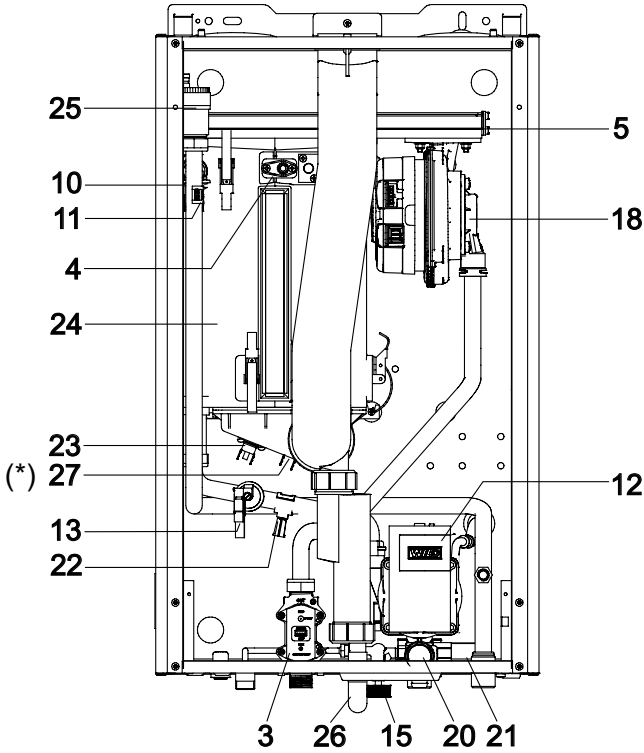
NOTE!

Further details in the section
 "Technical Information" on the boiler
 page of the www.unicalag.it website

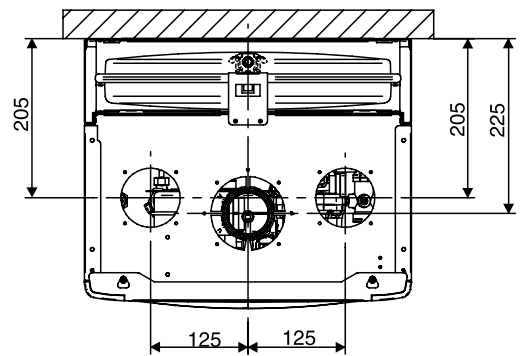
2.2 - VIEW WITH THE INDICATION OF THE MAIN COMPONENTS AND DIMENSIONS

KON^e 18 / 24 R

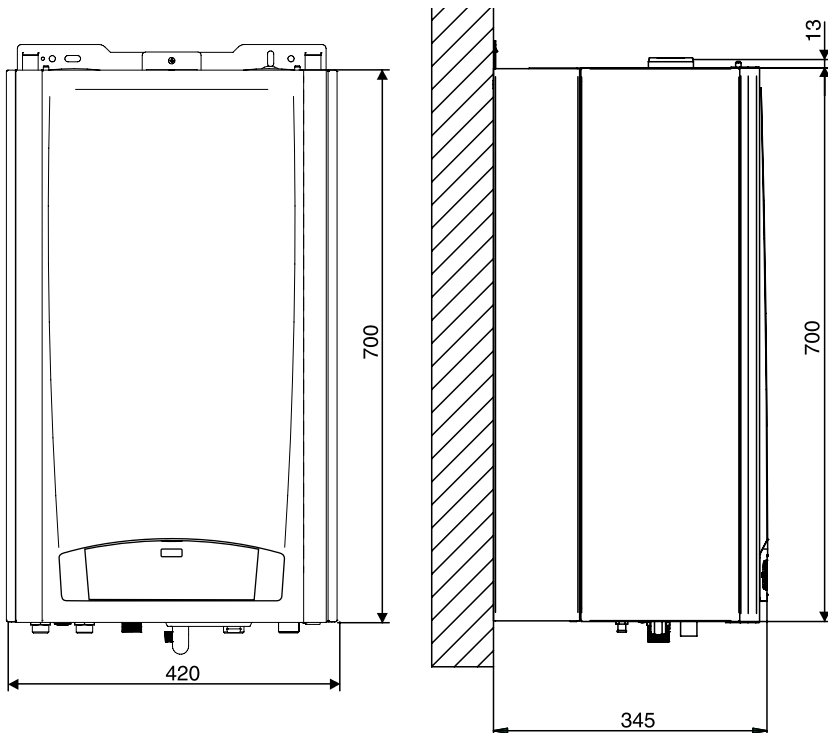
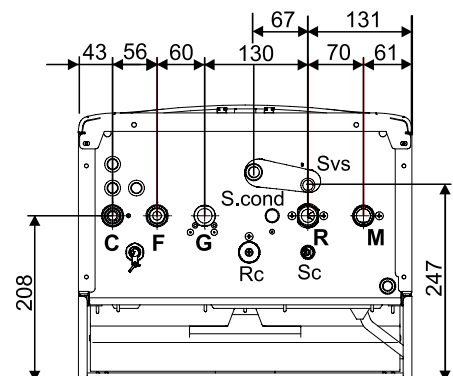
KON^e 18 / 24 C



View from above



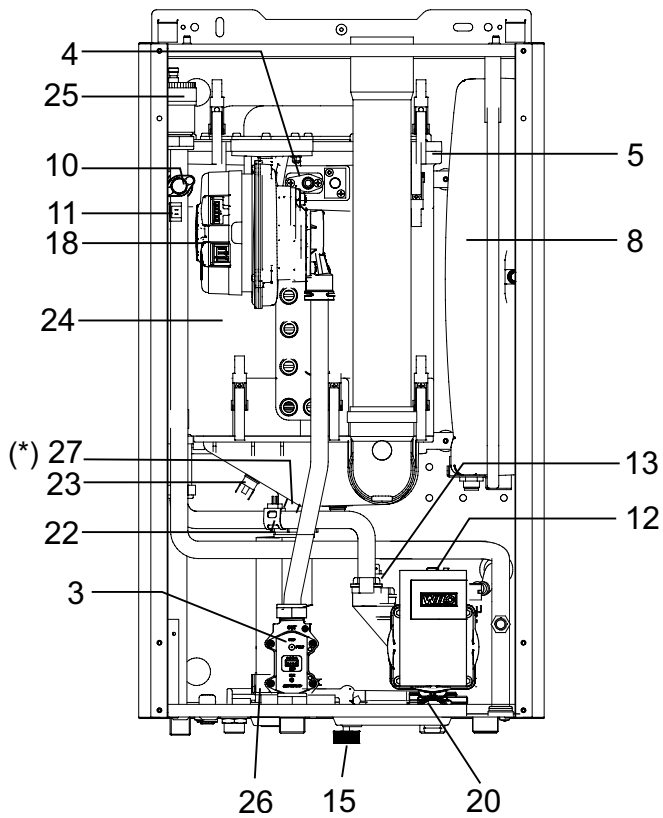
View from below



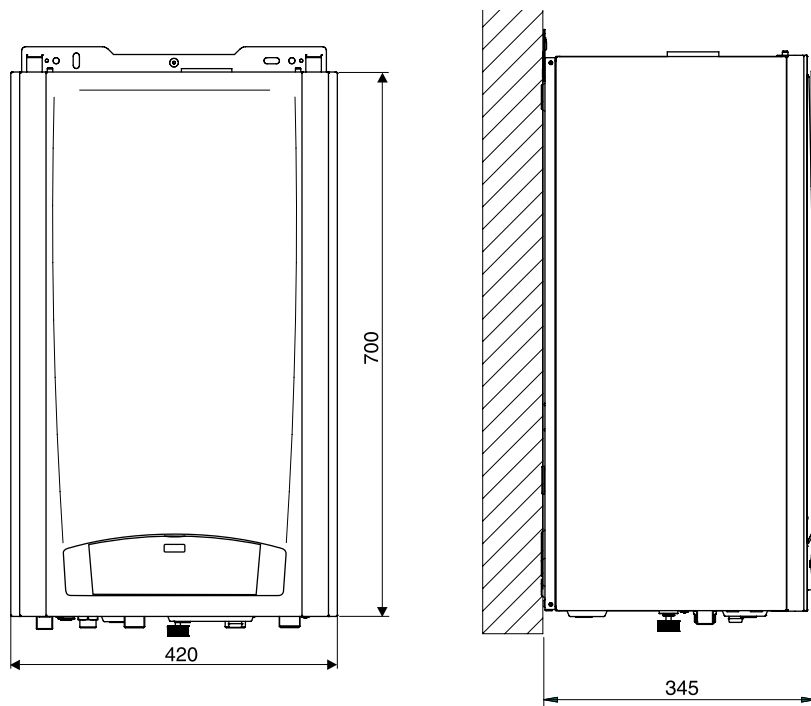
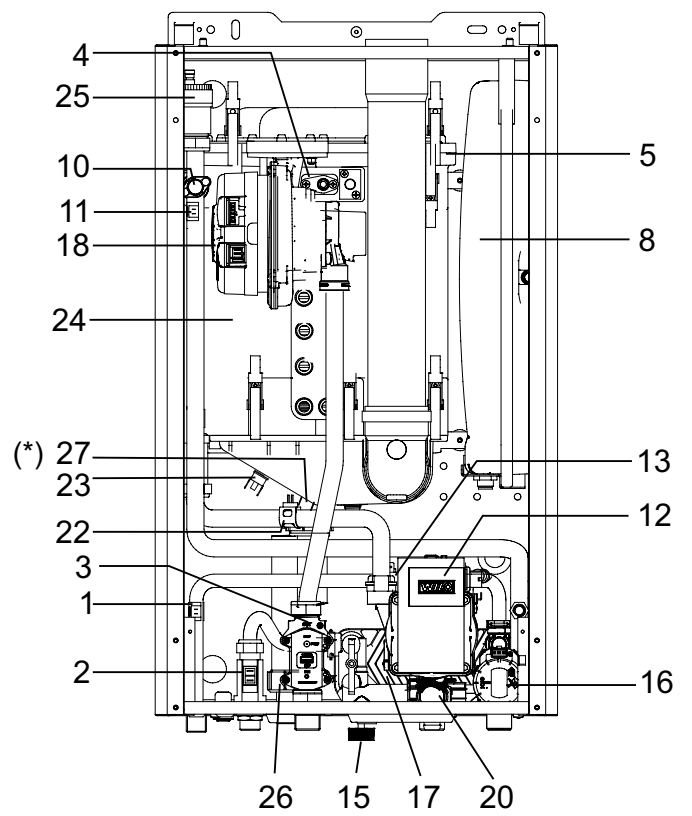
ENGLISH

Technical Features

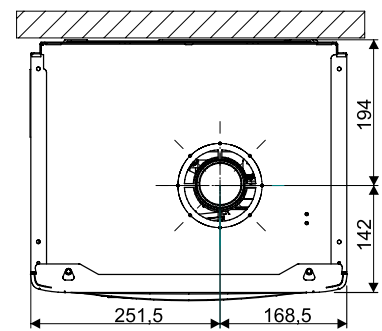
KON^e 28 / 35 R



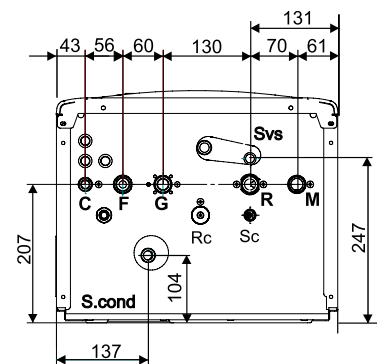
KON^e 28 / 35 C



View from above



View from below



KEY			
NO.	C.E.	S.E.	Description
1	db	SS	Domestic hot water temperature sensor
2		FLS	Flow switch with cold water filter
3		VG	Gas valve
4	Fd	E. ACC /RIL	Ignition/detection electrode
5			Burner
6			Combustion chamber
7	AF	TF	Flue gas anti-overflow thermostat
8			Expansion vessel
9	FR HT		Heat exchanger
10	HL	TL	Safety thermostat
11	Hb	SR	Heating temperature sensor
12	Ht	P	Pump
13	Lp	DK	Water deficiency pressure switch
14			Boiler drain valve
15			Filling valve
16			Diverter valve
17			Plate heat exchanger
18	FL FH	VM	Fan
19	AF AS	PV	Flue gas pressure switch

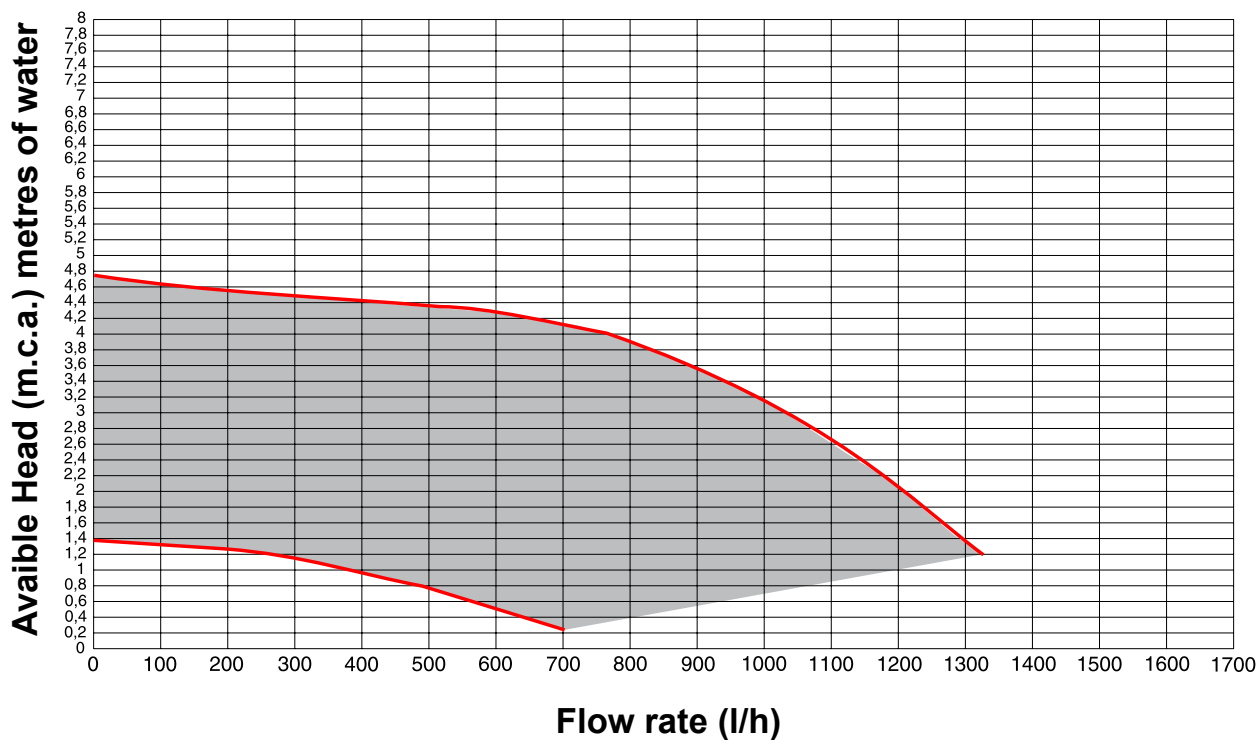
20			Safety valve
21			Automatic by-pass
22	rb	SRR	Return temperature sensor
23	tf	TLC	Flue gas collector safety thermostat
24			Aluminium Heat Exchanger/Capacitor
25			Vent valve
26			Condensation drain trap
27		SL	Arrangement for condensate sensor level
C			Domestic hot water outlet G ½
G			Gas inlet G ¾
F			Cold water inlet G ½
M			Heating system flow G ¾
R			Heating system return G ¾
Rc			Filling valve
Sc			Boiler drain
Svs			Safety valve drain
Scond			Condensation drain
	C.E.		= ERROR CODES see par. 4.6
		S.E.	= WIRING DIAGRAM KEY see par. 4.5

2.3 - DIAGRAM OF FLOW RATE/PRESSURE AVAILABLE FOR INSTALLATION

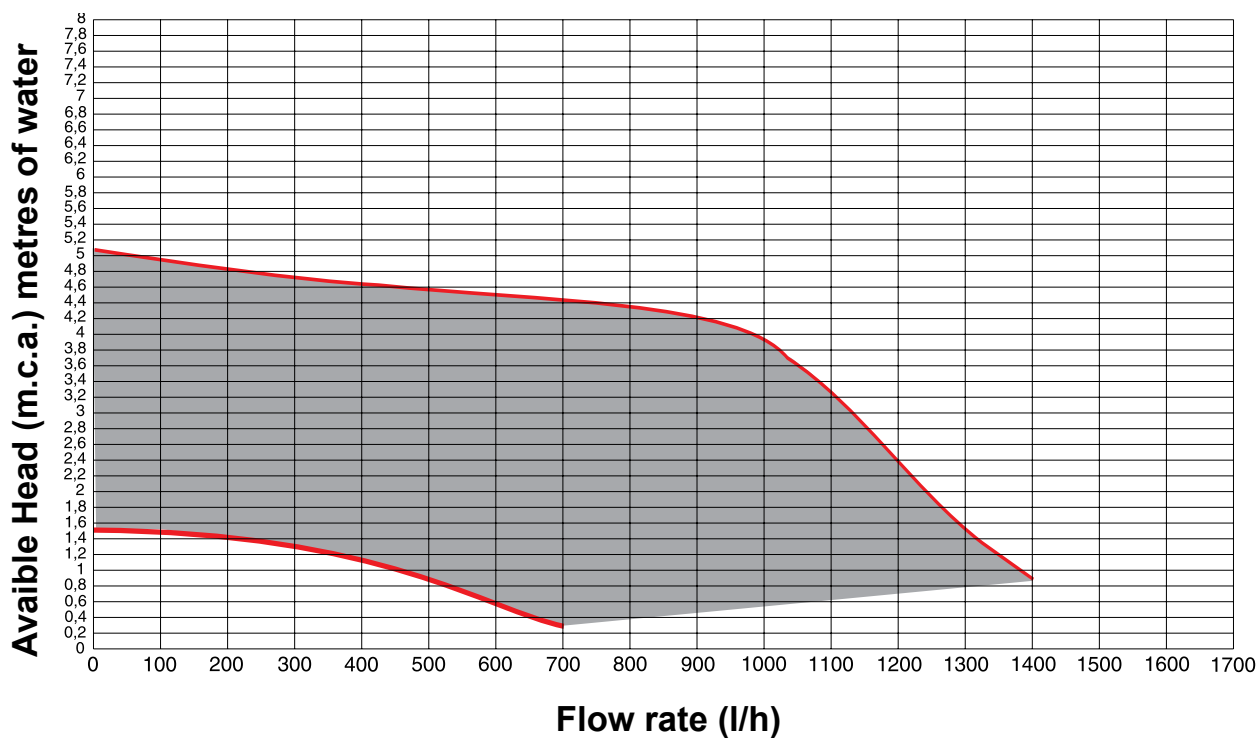
MODULATING PUMP

DIAGRAM OF FLOW RATE/PRESSURE AVAILABLE FOR INSTALLATION

KON° 18 - 24 = 6m



KON° 28 - 35 = 7m





2.4 - OPERATING DATA

For the adjustment data: NOZZLES - PRESSURES - DIAPHRAGMS - FLOW RATES - CONSUMPTIONS refer to the paragraph ADAPTATION TO OTHER TYPES OF GAS.





	KON ^m	R 18 / C 18	R 24 / C 24	R 28 / C 28	R 35 / C 35
Nominal heat input in CH / DHW mode	kW	18,0 / 23,4	23,4 / 23,4	28,0 / 28,0	33,0 / 33,0
Minimum heat input with Nat. Gas / Propane	kW	3,0 / 4,4	3,0 / 4,4	4,4 / 5,6	4,4 / 5,6
Nominal heat output	kW	17,4	22,6	27,2	32,0
Minimum heat output	kW	2,9	2,9	4,3	4,3
Nominal output in condensation 50/30 °C	kW	18,4	23,6	28,9	33,8
Minimum heat output in condensation 50/30 °C	kW	3,2	3,2	4,67	4,67
Combustion efficiency at full load	%	97,6	97,2	97,6	97,26
Combustion efficiency at part load	%	98,6	98,6	98,1	98,1
Heat losses through the casing (min.-max.)	%	2,0 - 0,67	2,0 - 0,6	1,47 - 0,43	1,47 - 0,2
(*) Net flue gas temperature tf-ta (max.)	°C	49,0	57,4	47,9	57,0
Flue gas mass flow rate (min.-max)	g/s	1,35 - 8,1	1,35 - 10,5	2 - 12,5	2 - 14,7
Air excess λ	%	24,3	24,3	23,0	23,0
CO ₂	%	9,2 - 9,2	9,2 - 9,2	9,3 - 9,3	9,3 - 9,3
CO at 0% of O ₂ (min. - max)	ppm	22 - 95	22 - 114	11 - 93	11 - 120
Maximum production of condensate	kg/h	2,9	3,8	4,5	5,3
NOx class		6	6	6	6
Chimney heat losses with burner ON (min. - max.)	%	1,4 - 2,4	1,4 - 2,9	1,9 - 2,4	1,9 - 2,8
Chimney heat losses with burner OFF	%	0,60	0,46	0,41	0,34
Prevalenza disponibile alla base del camino min. / max.	Pa	2 / 70	2 / 70	2 / 70	2 / 70

Notes: (*) Room Temperature = 20°C Data obtained with appliance operated with Nat Gas (G20)

2.4.1 - DATA ACCORDING TO ErP DIRECTIVE

Description	Symbol	Unit	KON ^e							
			R18	C18	R24	C24	R28	C28	R35	C35
Nominal Heat Output	P _{nominal}	kW	17		23		27		32	
Seasonal space heating energy efficiency	η _s	%	93		92		93		93	
Seasonal efficiency class in heating mode			A		A		A		A	
For CH only and combination boilers: useful heat output										
Useful Heat Output in high-temperature regime (Tr 60 °C / Tm 80 °C)	P ₄	kW	10,3		12,7		15,8		18,2	
Useful efficiency at nom. heat output in high-temperature regime (Tr 60 °C / Tm 80 °C)	η ₄	%	88,1		87,0		88,4		87,5	
Useful heat output at 30% of nom. heat output in low-temperature regime (Tr 30 °C)	P ₁	kW	3,4		4,2		5,3		6,1	
Useful efficiency at 30% of nom. heat output in low-temperature regime (Tr 30 °C)	η ₁	%	97,8		96,7		97,5		97,5	
Range-rated boiler: YES / NO			YES		YES		YES		YES	
Auxiliary electricity consumption										
At full load	el _{max}	kW	0,085		0,085		0,116		0,116	
At part load	el _{min}	kW	0,012		0,012		0,012		0,012	
In stand-by mode	P _{SB}	kW	0,003		0,003		0,003		0,003	
Other items										
Dispersione termica in stand-by	P _{stb}	kW	0,0824		0,0824		0,1136		0,1136	
Emissions of nitrogen oxides ref. PCI (PCS)	NO _x	Mg/kWh	37 (33)		50 (45)		55 (50)		43 (39)	
Annual electricity consumption	Q _{HE}	GJ	32		40		49		56	
For CH & DHW production boilers										
Declared load profile			-	XL	-	XL	-	XL	-	XL
Energy efficiency in DHW production mode	η _{wh}	%	-	86	-	86	-	85	-	85
Daily electricity consumption	Q _{elec}	kWh	-	0,09	-	0,09	-	0,09	-	0,09
Daily fuel consumption	Q _{fuel}	kWh	-	22,07	-	22,07	-	23,05	-	23,13
Inside sound power level	L _{wa}	dB (A)	-	50,7	-	51	-	55,2	-	55,2
Annual electricity consumption	AEC	kWh		400		400		402		402
Annual fuel consumption	AFC	GJ		17		17		17		18
Seasonal efficiency class in DHW production mode			-	A	-	A	-	A	-	A

2.5 - GENERAL FEATURES

	KON ^e	R 18	C 18	R 24	C 24	R 28	C 28	R 35	C 35
Appliance category		II _{2H3P}		II _{2H3P}		II _{2H3P}		II _{2H3P}	
Minimum heat. circuit output (Δt 20 °C)	l/min	1,2		1,2		1,7		1,7	
Minimum heating circuit pressure	bar	0,5		0,5		0,5		0,5	
Maximum heating circuit pressure	bar	3		3		3		3	
Primary circuit content	l	2,2		2,2		2,2		2,2	
Maximum operating temperature in heat.	°C	85		85		85		85	
Minimum operating temperature in heat.	°C	30		30		30		30	
Expansion vessel total capacity	l	8		8		10		10	
Expansion vessel pre-load	bar	1		1		1		1	
Maximum system capacity (max temp. calc.)	l	164		164		205		205	
Minimum domestic hot water circuit flow rate	l/min.	-	2	-	2	-	2	-	2
Minimum domestic hot water circuit pressure	bar	-	0,5	-	0,5	-	0,5	-	0,5
Maximum domestic hot water circuit pressure	bar	-	6	-	6	-	6	-	6
Domestic hot water specific flow rate (Δt 30 °C) "D"	l/min.	-	11,2	-	11,2	-	13	-	16
Production of D.H.W. in continuous operation with Δt 45 K	l/min.	-	7,4	-	7,4	-	8,6	-	10,1
Production of D.H.W. in continuous operation with Δt 40 K	l/min.	-	8,3	-	8,3	-	9,7	-	11,4
Production of D.H.W. in continuous operation with Δt 35 K	l/min.	-	9,5	-	9,5	-	11,1	-	13,0
Production of D.H.W. in continuous operation with Δt 30 K	l/min.	-	11,0	-	11,0	-	12,9	-	15,2
Production of D.H.W. in continuous operation with Δt 25 K (*)	l/min.	-	13,3	-	13,3	-	15,5	-	18,3
Adjustable DHW temperature	°C	-	35-60	-	35-60	-	35-60	-	35-60
Voltage/Frequency electric power supply	V-Hz	230/50		230/50		230/50		230/50	
Fuse on the power supply	A (F)	3,15		3,15		3,15		3,15	
Protection rating	IP	X5D		X5D		X5D		X5D	
Net weight	kg	32,5	34	32,5	34	35,5	37	35,5	37
Gross weight	kg	35,5	37	35,5	37	38,5	40	38,5	40
F Factor		-	1	-	1	-	2	-	2
R Factor		-		-		-		-	
(*) mixed									

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.

NOTE!

Further details in the section "Technical Information" on the boiler page of the www.unicalag.it website

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 website

3.3 - PREVENTIVE VERIFICATION AND VERIFICATION AND ADJUSTMENT OPERATIONS

NOTE!

Further details in the section "Technical Information" on the boiler page of the www.unicalag.it website

3.4 - PACKAGING

The boiler is supplied completely assembled in a sturdy cardboard box.



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.



OBLIGATION!
wear protective gloves

- The boilers must always be lifted and carried by two people, or a carrier carriage or special transport equipment must be used.

As well as the appliance, the packaging contains:

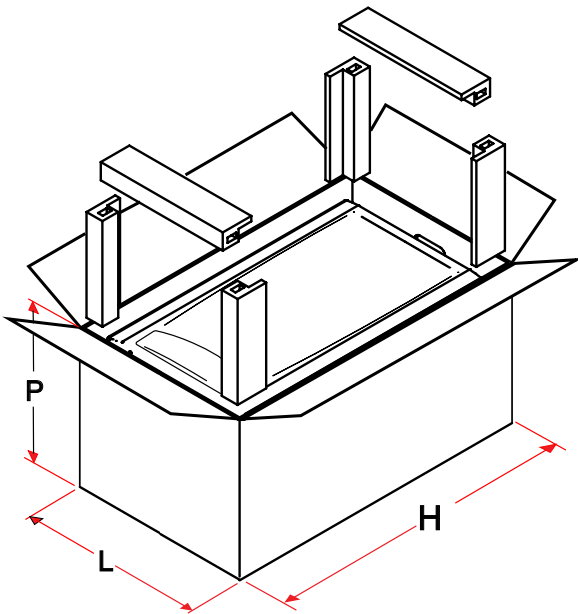
A DOCUMENTATION ENVELOPE

- System booklet
- User operating instructions booklet
- Instruction booklet for the installer and maintenance engineer
- Warranty
- 2 Spare parts form
- Certificate of conformity

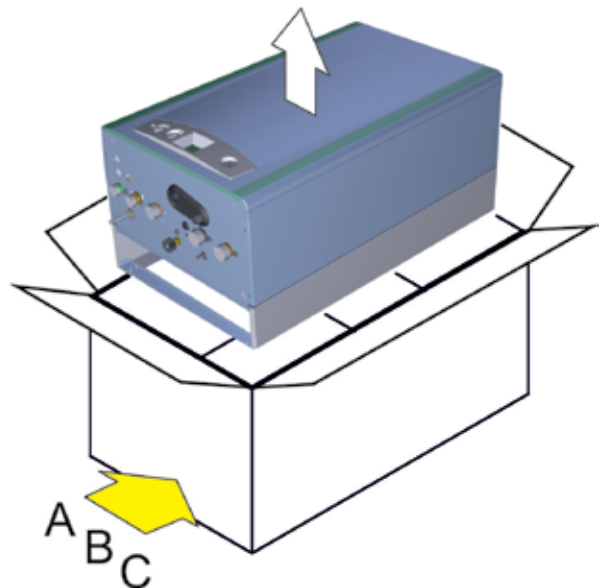
B - Connection predisposition paper template

C - Chimney spacer

1



2



P depth	L width	H height
380 mm	470 mm	810 mm

3.5 - POSITIONING THE BOILER

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

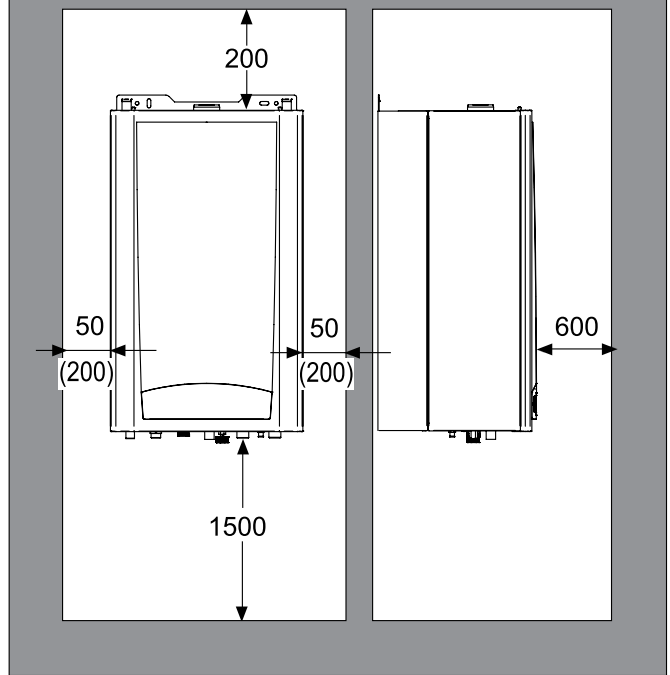
- Place the appliance in rooms protected from frost.
- Avoid installation in rooms with a corrosive or very dusty atmosphere.
- The appliance must only be installed on a vertical and solid wall which can support its weight.
- The wall must not be made of flammable material.

KON^e

Since the temperature of the wall on which the boiler is installed and the temperature of the coaxial exhaust pipe do not exceed, in normal operating conditions, a room temperature beyond 60 K, it is not necessary to observe the minimum distances from flammable walls.

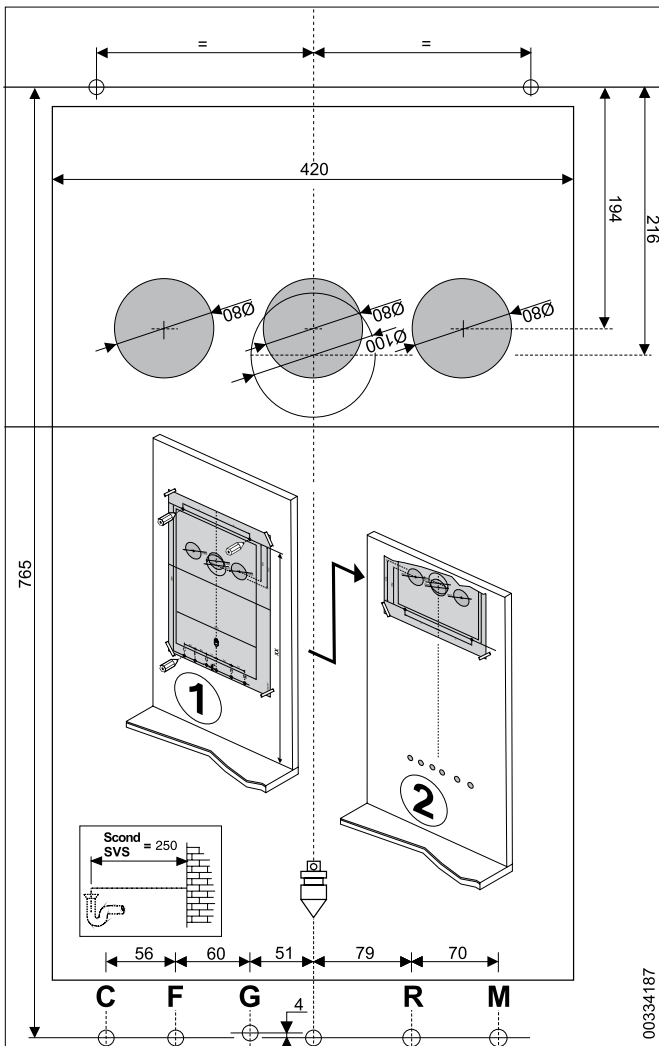
For boilers with double intake and exhaust pipes, in the event of crossing flammable walls, insert insulation between the wall and the flue gas exhaust pipe.

Clearance

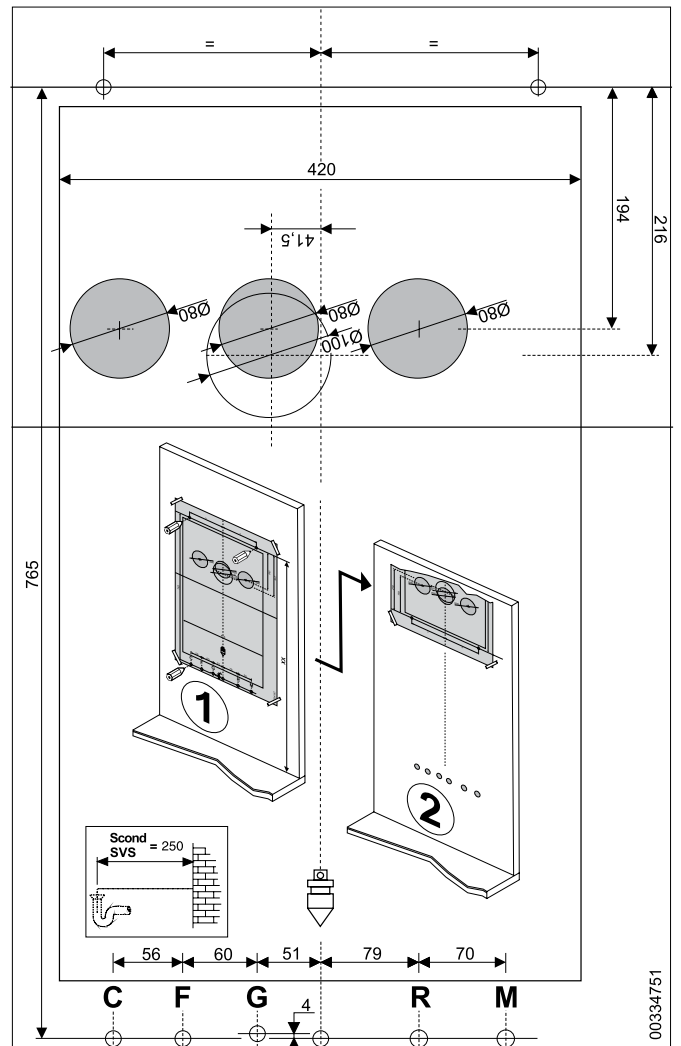


ENGLISH

KON^e 24 C



KON^e 35 C



Installation Instructions

3.6 - FLUE GAS EXHAUST PIPE CONNECTION FOR BOILERS WITH FORCED DRAUGHT

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

In the event the boiler is replaced, ALWAYS re-

place the flue gas pipe as well.

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

C13x		C13	
% Slope towards inlet = 3%			
TOTAL LENGTH (LA intake + L Exhaust)			
COAXIAL Ø60/100		DOUBLE Ø80	
FROM [m]	TO [m]	FROM [m]	TO [m]
1	5,5	1 + 1	40 (20A+20S)
COAXIAL Ø80/125		DOUBLE Ø60	
FROM [m]	TO [m]	FROM [m]	TO [m]
1	8	1 + 1	20 (10A+10S)
		Distance between air inlet pipe and flue gas exhaust pipe: min 250 mm - max 500	
Horizontal exhaust and intake terminals directed outside via coaxial or double pipes..			


C43x	C43
Collective chimney flue system, consisting of two pipes, one for combustion air intake and the other one for combustion products evacuation, coaxial or double.	

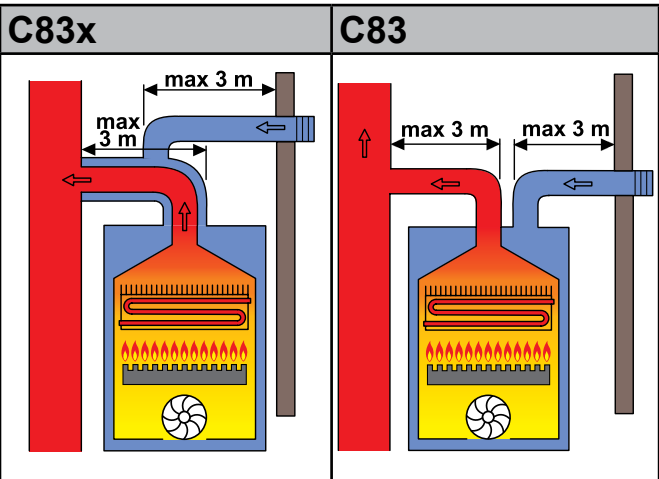
C53x	C53

C33x		C33	
TOTAL LENGTH (LA intake + L Exhaust)			
COAXIAL Ø60/100		DOUBLE Ø80	
FROM [m]	TO [m]	FROM [m]	TO [m]
1	7	0,5 + 0,5	40 (20A+20S)
COAXIAL Ø80/125		DOUBLE Ø60	
FROM [m]	TO [m]	FROM [m]	TO [m]
1	9	1 + 1	20 (10A+10S)
Vertical exhaust and intake terminals directed outside via coaxial or double pipes.			

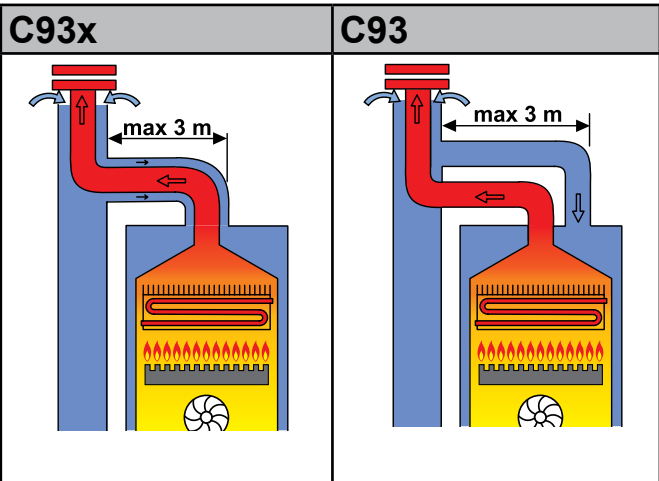
C53 NOT ALLOWED		C53	
TOTAL LENGTH (LA intake + L Exhaust)			
DOUBLE Ø80		DOUBLE Ø60	
FROM [m]	TO [m]	FROM [m]	TOA [m]
1 + 1	40 (max 30 S)	1 + 1	20 (max 15 S)
Separate combustion air intake and combustion products evacuation pipes. These pipes can discharge into areas with different pressure.			

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


 **ATTENTION:**
 The flue must comply with standards in force.




Connection to a terminal for combustion air intake and flue gas exhaust via a single or collective chimney.

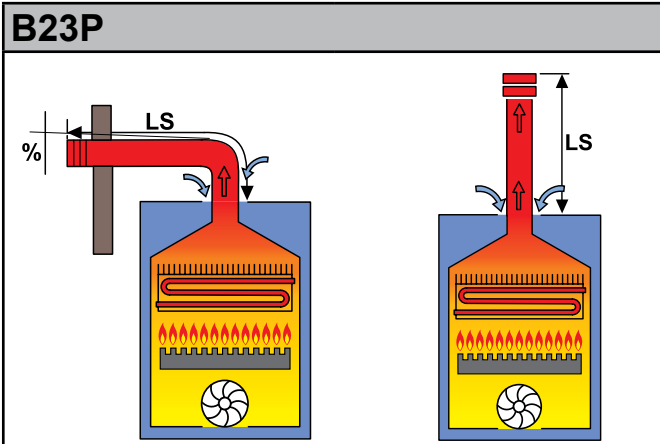


Air / flue gas through concentric pipes in the boiler room and single pipes in the chimney (combustion air with counterflow in the chimney)

 **CAUTION**
 LT total length is a reference value for the dimensioning of the ducts of **A** (intake) and **S** (Exhaust). Subtracting the values of LT reported, at values of bends* / terminals* / extensions* you get the value:
 if > 0 = OK - POSSIBLE configuration
 if < 0 = NO - WRONG configuration


(*) Values in the **MT018** available on the website.

 Please note: these values relate to exhausts/made by means of rigid pipes and smooth original UNICAL.



TOTAL LENGTH (LS)	
DOUBLE Ø80	
FROM [m]	TO [m]
1	30

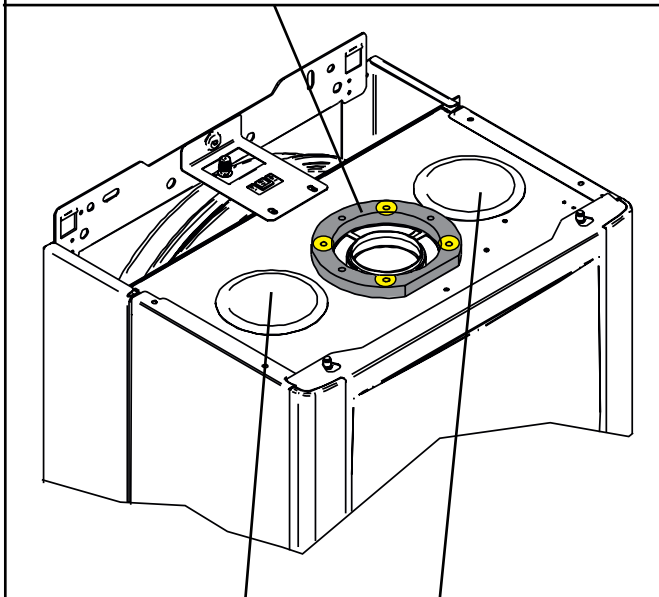
Connection to a combustion products evacuation pipe outside the room; the combustion air is taken directly from the room where the appliance is installed.

 **ATTENTION:**
 For the type of connection **B23P** the room follows the same installation rules for boilers with natural draught.

GENERAL INFORMATION ON THE FLUE GAS EXHAUST SYSTEM



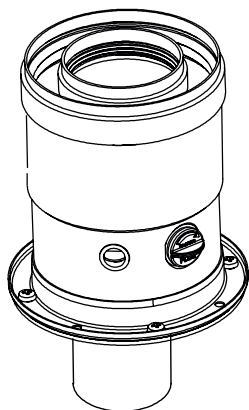
Attention:
For all drain configurations
mount the chimney
spacer supplied with the boiler



Rubber closure plugs
(DO NOT REMOVE)

NOTE!

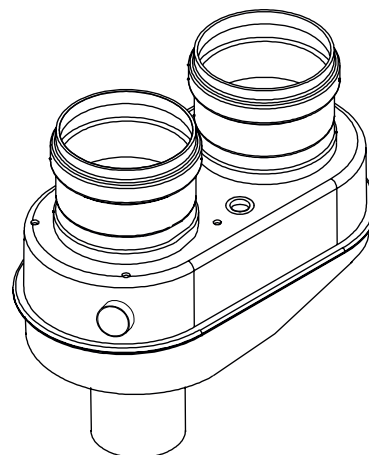
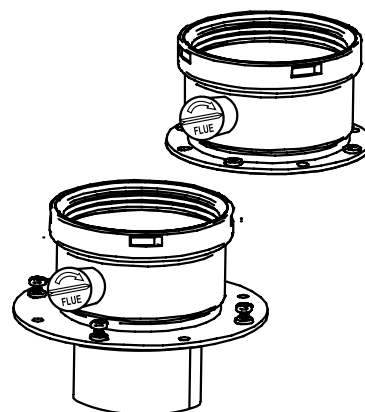
For further details relating to pressure drops of the individual components, for information on standards, rules and regulations for proper flue gas exhaust, refer to the "Technical Information" section on the boiler page of the www.unicalag.it website



Concentric start



It is recommended to only use original Unical exhaust pipes. The supplier will have no contractual or extra-contractual liability for damage caused due to incorrect installation and use and in any case failure to comply with the instructions provided by the manufacturer.



Adapter for double systems

3.7 - CONNECTION

G	GAS	3/4"
----------	------------	------



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	3/4"
R	RETURN	3/4"

C	HOT	1/2"
F	COLD	1/2"

Sc	BOILER DRAIN
S.cond	CONDENSATION DRAIN
Rc	FILLING VALVE
Svs	SAFETY VALVE DRAIN
	<p>Provide a drain pipe with funnel and a trap that lead to a suitable drain, in correspondence of Svs.</p> <p>This drainage must be controlled on sight.</p> <p>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.</p>



The mains pressure must be within 1 and 3 bar (in the event of greater pressure install a pressure reducer).

Condensation drain

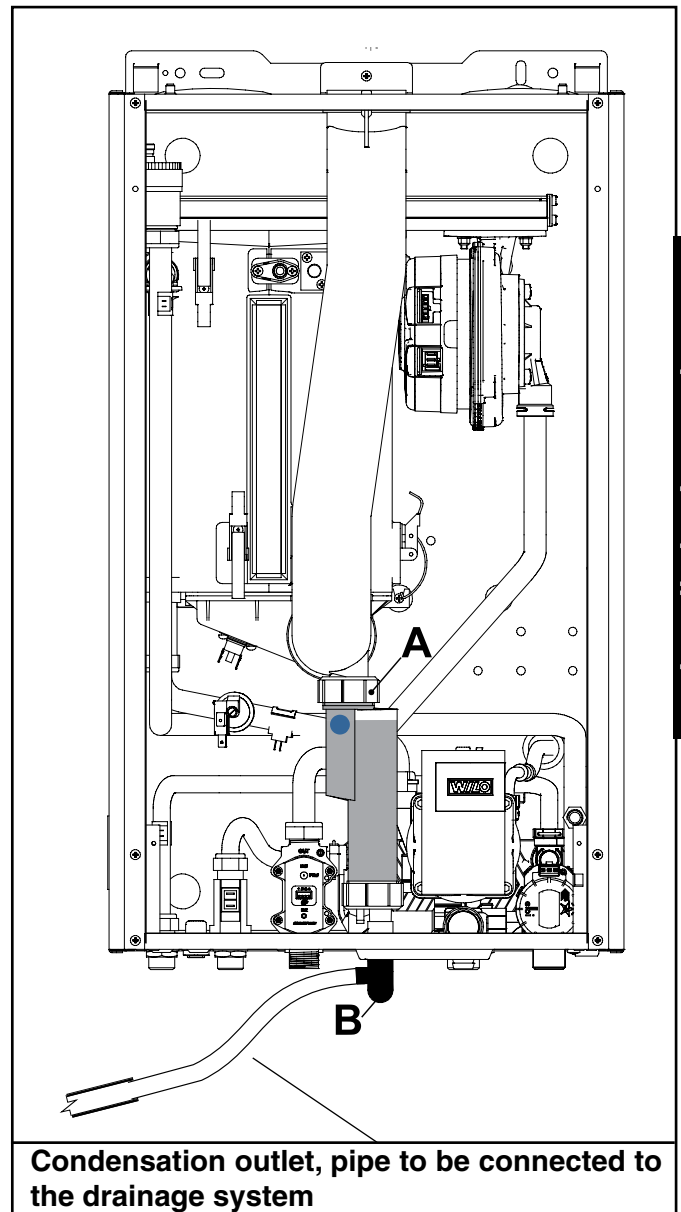
The boiler, during the combustion process, produces condensation that, through pipe "A", flows into the trap.

The condensation that forms inside the boiler flows into a suitable drain via pipe "B".



Danger!

- Before commissioning the boiler
- check that the trap is assembled properly
 - check the trap and 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!

Further details in the section “Technical Information” on the boiler page of the Unical AG S.p.A. website.

3.8 - FILLING THE SYSTEM



Attention!

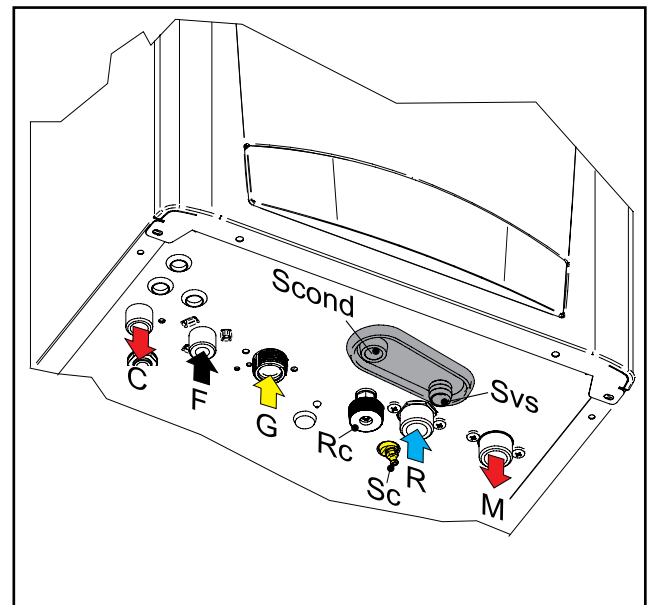
Do not mix the heating water with incorrect concentrations of antifreeze or anti-corrosion substances! This could damage the gaskets and cause noise during operation.

La 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.

When the system connections have been completed, the circuit can be filled.

This operation must be performed carefully, respecting the following phases:

- open the radiator vent valves and make sure the automatic valve is working properly in the boiler.
- open the filling tap gradually, making sure that the automatic air release valves installed on the system work properly.
- close the radiator air release valves as soon as water comes out.
- check the pressure gauge until pressure reaches approximately 0.8/1 bar.
- close the filling tap and bleed air once again through the radiator air release valves.



- make sure that all the connections are watertight.
- after commissioning the boiler (see par. 3.10) and bringing the system to the operating temperature, stop the boiler and repeat the air bleed operations.
- let the system cool down and, if necessary, return the water pressure to 0.8/1 bar. (See par. 4.4).



Danger of burns!

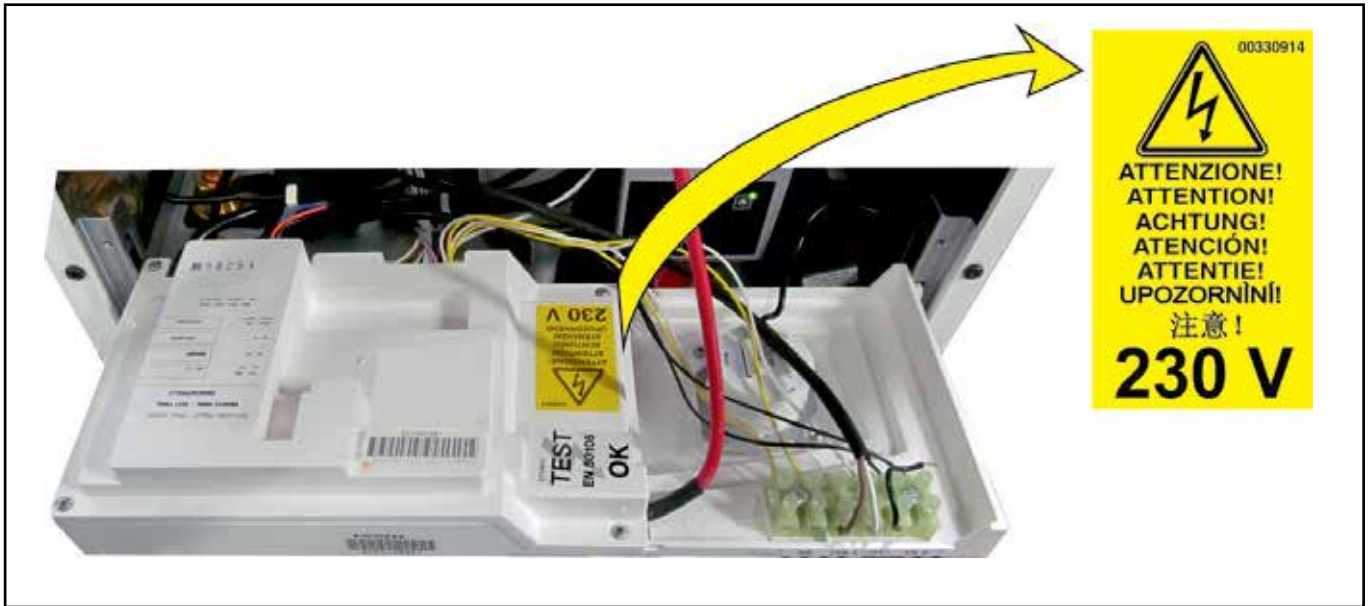
Attention to contact with flow pipe M and (if boiler combi) with hot water outlet pipe C.

3.9 - ELECTRICAL CONNECTIONS



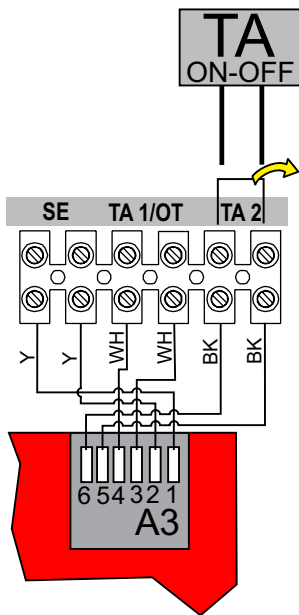
Danger!
 Only a qualified technician may perform the electrical installation.
 Before performing connections or

any type of operation on electrical parts, always disconnect electrical power and make sure that it cannot be reconnected accidentally.



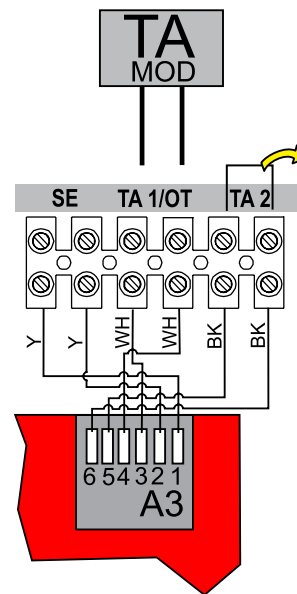
ENGLISH

ON/OFF room thermostat connection (*)



- Remove the jumper and connect the room thermostat wires between terminals TA 2.

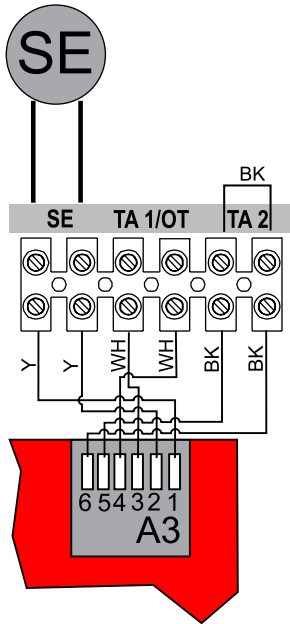
ON/OFF room thermostat connection RT/OT (*)



- Connect the modulating thermostat wire between terminals TA1/OT after having removed the jumper.

Installation Instructions

External probe connection (*)

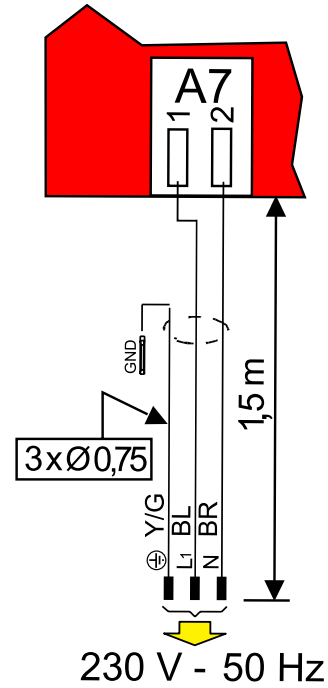


- Predisposed on the terminal board, terminals **SE**

See par. 4.5 positioning on the board

(*) **Optional**

Electric power supply connection



The boiler is equipped with a power cable, boiler installation requires electric al 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 nstalled on the boiler power line with over 3 mm between contacts, easy to access, making maintenance quick and safe.



The power cable must be replaced by technical personnel authorised by **UNI-CALAG S.p.A.**, using original spare parts only. Failure to comply with the above can jeopardise the safety of the appliance.

NOTE!

Further details in the section “Technical Information” on the boiler page of the www.unicalag.it website

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	

ENGLISH

Installation Instructions

Switching boiler on and off
NOTE!

Further details in the section
“Technical Information” on the boiler
page of the unicalag.ag website

3.11 - MEASUREMENT OF COMBUSTION EFFICIENCY DURING INSTALLATION

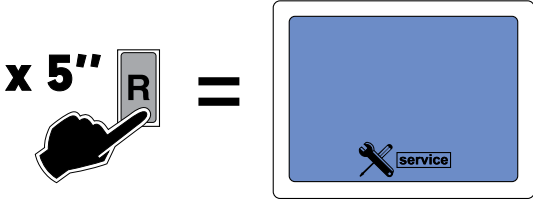
3.11.1- ACTIVATION OF THE CALIBRATION FUNCTION



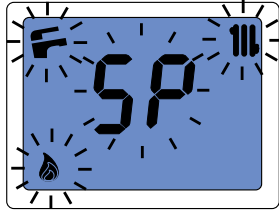
ATTENTION!
Function reserved for Authorised Assistance Centres only.

The user is **NOT** authorised to activate the function described below.

1 ACTIVATION

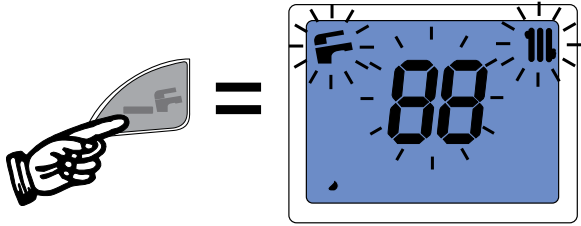


Press the key (**D**) for at least 5 seconds, until **S**ervice appears.

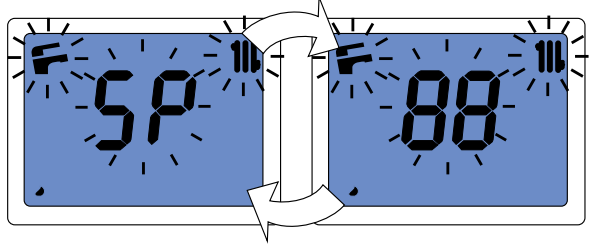


All the symbols flash on the display.

3 MINIMUM OUTPUT

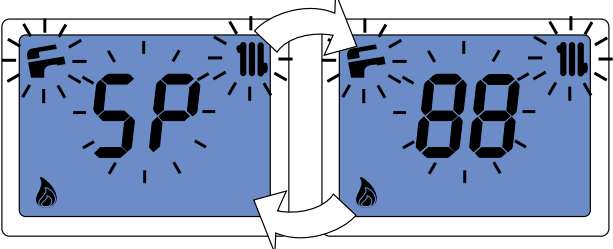


Press the key (**C-**), when the low flame symbol is fixed on the display.



and it alternates between **SP** and the flow temperature, the boiler operates at **minimum output**. Perform combustion analyses.

2 MAXIMUM OUTPUT



When the high flame symbol is fixed on the display and it alternates between **SP** and the flow temperature, the boiler operates at **maximum output**. Perform combustion analyses.

4 DISABLING

The "calibration" function stays active for 15 minutes.

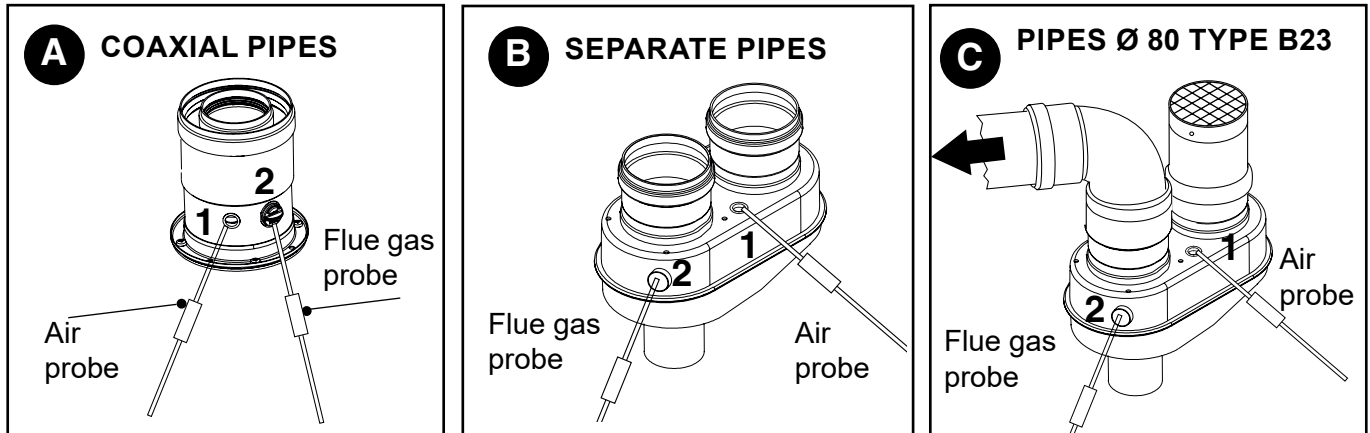
To disable the **CALIBRATION** function before the time elapses press the key (**D**) for 5 seconds, until **S**ervice disappears.

3.11.2 - POSITIONING THE PROBES

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

- measurement of the combustion air temperature taken in the relevant hole 1.
- measurement of the flue gas temperature and content of CO₂ taken in the relevant hole 2.

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



NOTE:

Do not insert the analyser probe in the sample point immediately, in order to prevent saturating the analyser.



It is important to perform the combustion analysis on the combustion air as well, (Making sure that the concentration of oxygen is within O₂ = 20.8% tolerance 0.2 - 0.4 %).

This is to prevent any flue gas recirculation.

3.12 - ADJUSTING THE BURNER



In order for the boiler to work properly the content of CO₂ must comply with the tolerance field of the table below.

PRESSURE - FLOW RATE TABLE

KON ^e R 18 - KON ^e C 18											
Type of Gas	Effective Output [kW]	Heating Thermal [kW] Capacity	Supply Press. [mbar]	Fan speed [rpm]		Collector diaphragm [Ø/n. holes]	CO ₂ levels [%]		Con- sumption		Start-up power IG [%]
				min	max		min	max	min	max	
Gas nat. (G20)	2,9 - 17,4	3,0 - 18	20	-	-	-	9,2	9,2	0,32 m ³ /h	1,9 m ³ /h	-
Gas nat. (G25)	2,9 - 17,4	3,0 - 18	25	-	-	-	9,2	9,2	0,37 m ³ /h	2,21 m ³ /h	-
Propane (G31)	2,9 - 17,4	3,0 - 18	37	-	-	-	10,5	10,5	0,23 kg/h	1,4 kg/h	-
A.P. (G230)	2,9 - 17,4	3,0 - 18	20	-	-	-	9,6	9,0	0,32 m ³ /h	1,78 m ³ /h	-
(*) ± 0,2 Acceptable range for G20 / G25				(+) ± 0,2 Acceptable range for G31 / G230							

KON ^e R 24 - KON ^e C 24											
Type of Gas	Effective Output [kW]	Heating Thermal [kW] Capacity	Supply Press. [mbar]	Fan speed [rpm]		Collector diaphragm [Ø/n. holes]	CO ₂ levels [%]		Con- sumption		Start-up power IG [%]
				min	max		min	max	min	max	
Gas nat. (G20)	2,9 - 22,6	3,0 - 23,4	20	-	-	-	9,2	9,2	0,32 m ³ /h	2,48 m ³ /h	-
Gas nat. (G25)	2,9 - 22,6	3,0 - 23,4	25	-	-	-	9,2	9,2	0,37 m ³ /h	2,88 m ³ /h	-
Propane (G31)	2,9 - 22,6	3,0 - 23,4	37	-	-	-	10,5	10,5	0,34 kg/h	1,82 kg/h	-
A.P. (G230)	2,9 - 22,6	3,0 - 23,4	20	-	-	-	9,6	9,0	0,32 m ³ /h	1,82 m ³ /h	-
(*) ± 0,2 Acceptable range for G20 / G25				(+) ± 0,2 Acceptable range for G31 / G230							

Installation Instructions

KON ^e R 28 - KON ^e C 28											
Type of Gas	Effective Output [kW]	Heating Thermal [kW] Capacity	Supply Press. [mbar]	Fan speed [rpm]		Collector diaphragm [Ø/n. holes]	CO ₂ levels [%]		Consumption min	Consumption max	Start-up power IG [%]
				min	max		min	max			
Gas nat. (G20)	4,3 - 27,2	4,4 - 28,0	20	-	-	-	9,3	9,3	0,47 m ³ /h	2,96 m ³ /h	-
Gas nat. (G25)	4,3 - 27,2	4,4 - 28,0	25	-	-	-	9,3	9,3	0,54 m ³ /h	4,06 m ³ /h	-
Propano (G31)	5,5 - 27,2	5,6 - 28,0	37	-	-	-	10,5	10,5	0,43 kg/h	2,17 kg/h	-
A.P. (G230)	4,3 - 27,2	4,4 - 28,0	20	-	-	-	9,6	9,0	0,34 m ³ /h	2,18 m ³ /h	-
(*) ± 0,2 Acceptable range for G20 / G25					(+) ± 0,2 R Acceptable range for G31 / G230						

KON ^e R 35 - KON ^e C 35											
Type of Gas	Effective Output [kW]	Heating Thermal [kW] Capacity	Supply Press. [mbar]	Fan speed [rpm]		Collector diaphragm [Ø/n. holes]	CO ₂ levels [%]		Consumption min	Consumption max	Start-up power IG [%]
				min	max		min	max			
Gas nat. (G20)	4,3 - 32,0	4,4 - 33,0	20	-	-	-	9,3	9,3	0,47 m ³ /h	3,49 m ³ /h	-
Gas nat. (G25)	4,3 - 32,0	4,4 - 33,0	25	-	-	-	9,3	9,3	0,54 m ³ /h	4,06 m ³ /h	-
Propano (G31)	5,5 - 32,0	5,6 - 33,0	37	-	-	-	10,5	10,5	0,43 kg/h	2,56 kg/h	-
A.P. (G230)	4,3 - 32,0	4,4 - 33,0	20	-	-	-	9,6	9,0	0,34 m ³ /h	2,57 m ³ /h	-
(*) ± 0,2 Acceptable range for G20 / G25					(+) ± 0,2 Acceptable range for G31 / G230						



Note: for operation with Propane air (A.P.) follow the procedure to adapt to another gas at Par. 4.3 setting the parameter for operation with Propane (1) and follow the GAC Automatic Calibration procedure in Par. 4.3.1.

If the CO₂ value detected is beyond the recommended range, check the integrity of the electrode. If needed, replace the electrode.

If the problem persists one can use the function described below.

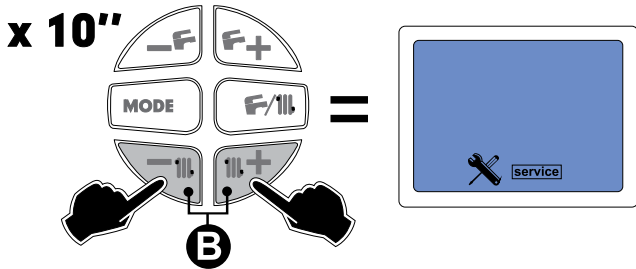
INCONVENIENCES	SOLUTIONS	
	KON^e 18 - 24 - 28 - 35	
Flame noisy in cold ignition	Act on parameter "IG" using the RCh section "TECHNICAL MENU" TSP parameters increasing the value by 5 ÷ 10 % max	
	KON^e 18 - 24	KON^e 28 - 35
Flame noisy in steady-state conditions	increase the CO ₂ value	increase the CO ₂ value
Flame noisy in modulation	<ul style="list-style-type: none"> - max value for methane gas = 9.4 % (min value > 9.0 %) - max value for propane = 10.7 % (min value > 10.3 %) - max value for A.P. = 9,2 % (min value > 9.4 %) 	<ul style="list-style-type: none"> - max value for methane gas = 9.5 % (min value > 9.1 %) - max value for propane = 10.7 % (min value > 10.3 %) - max value for A.P. = 9,2 % (min value > 9.4 %)

3.12.1 - COMBUSTION ADJUSTMENT FUNCTION ACTIVATION

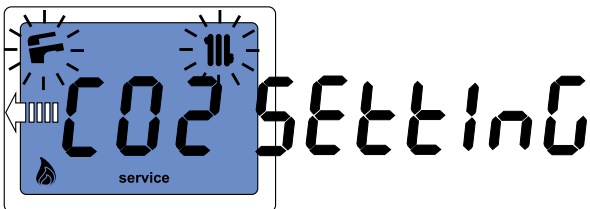
This function allows a partial adjustment of the CO₂ value on the following modulation points:

Maximum output	100	%
Start-up output	xx	%
Minimum output	0	%

1 ACTIVATION

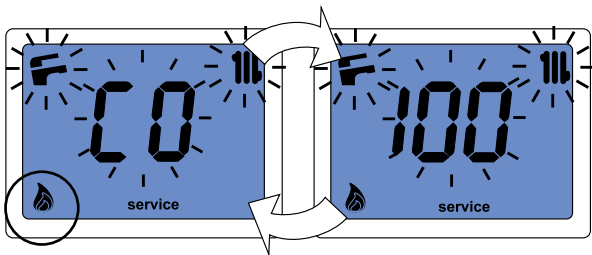


Press the keys (**B-** and **B+**) at the same time for at least 10 seconds, Service APPEARS.



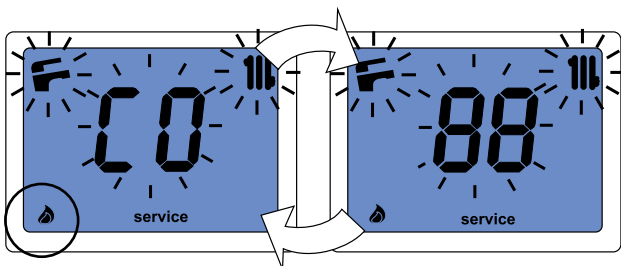
CO ...scrolls on the display

MAXIMUM OUTPUT



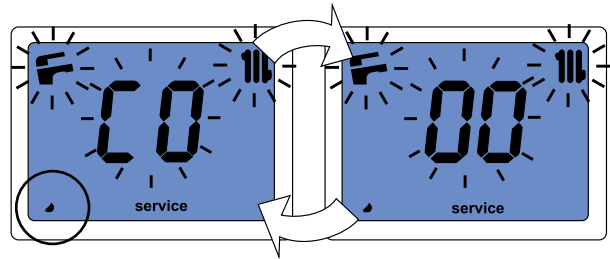
When the display alternates CO - 100

START-UP OUTPUT



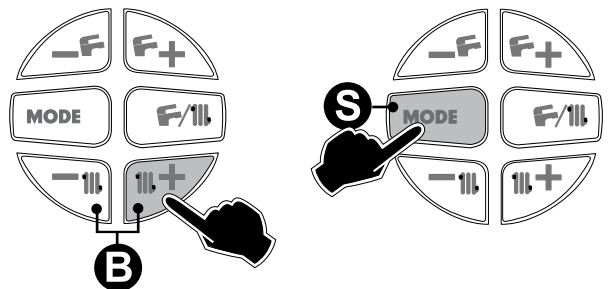
When the display alternates CO - with value XX.

MINIMUM OUTPUT



When the display alternates CO - 0

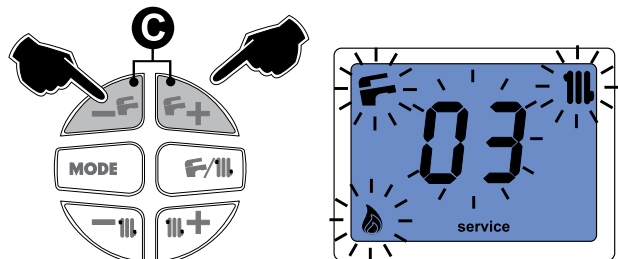
2 SELECTION



Select the modulation point on which to perform the adjustment, (max output / start-up output / min output) with key **B+**

Press key **S**

3 EDITING THE VALUE



When the flame flashes, correct the value with keys **C-** or **C+**

VALUES

FROM	TO	DEFAULT
-3 *	+3 *	0

(*) corresponds to about ± 0.5 points of CO₂

4 CONFIRM VALUE



Press key **D**

The flame is fixed again.

5 DISABLING

Press the keys (**B-** and **B+**) at the same time for at least 10 seconds, Service DISAPPEARS.

3.12.3 - ADAPTATION OF THE POWER TO THE HEATING SYSTEM



ATTENTION!
Function reserved for Authorised Assistance Centres only.

The user is **NOT** authorised to activate the function described below.

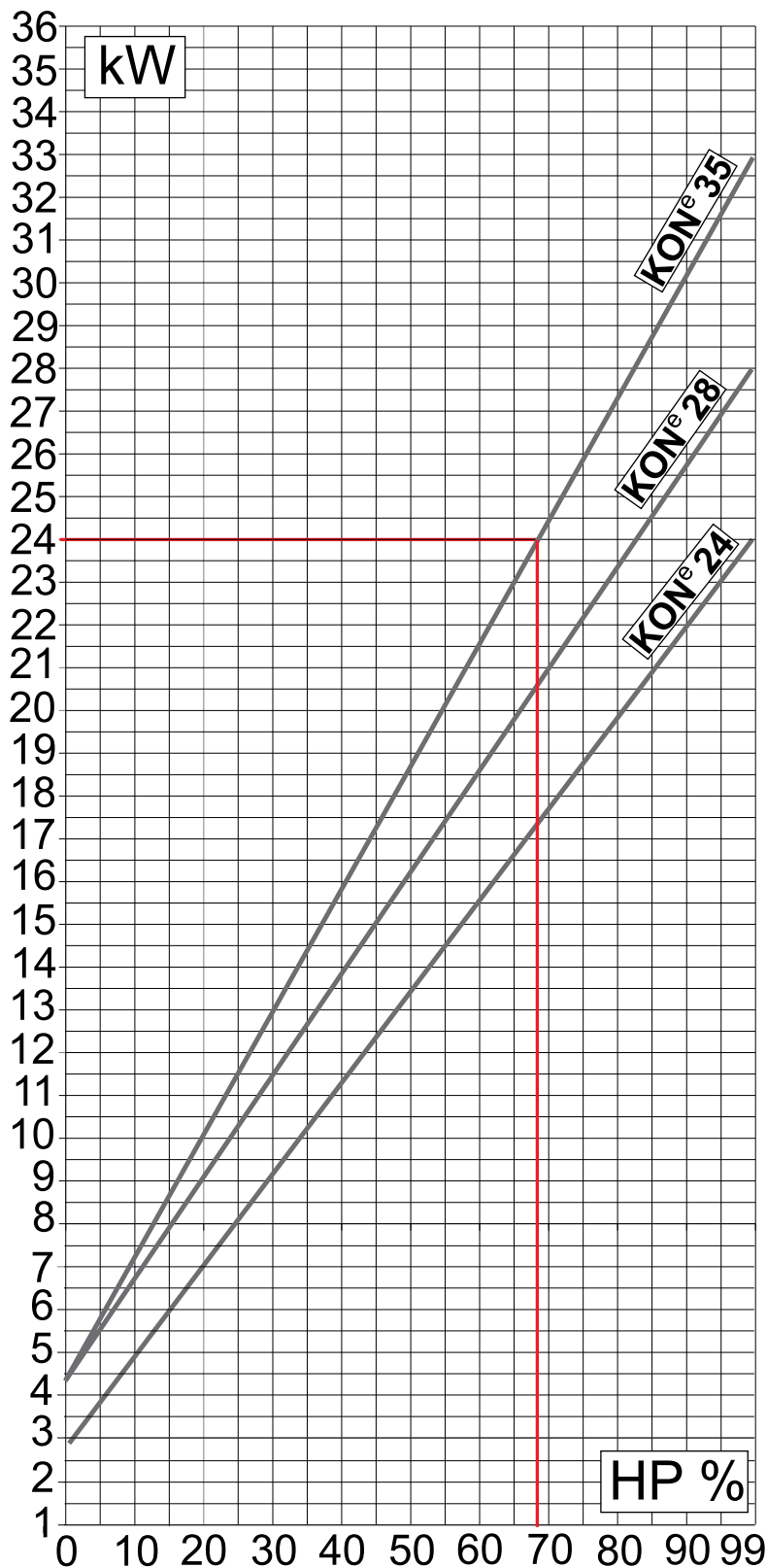
It is possible to adjust the maximum thermal capacity in heating mode, by decreasing the burner pressure value.

Act on parameter **HP** (par. 4.2 SE parameters list) to achieve the value corresponding to the desired output.

E.g.: **KON^e 24**
to decrease the output of the boiler to 18 kW, edit parameter HP (about 70).

E.g.: **KON^e 28**
to decrease the output of the boiler to 20 kW, edit parameter HP (about 65).

E.g.: **KON^e 35**
to decrease the output of the boiler to 24 kW, edit parameter HP (about 68).



4

INSPECTIONS 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 AG S.p.A. 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.
- Remove the front casing from the appliance.

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 back on.
- Make sure the appliance is gas tight and water-tight.
- Remount the front casing of the appliance.

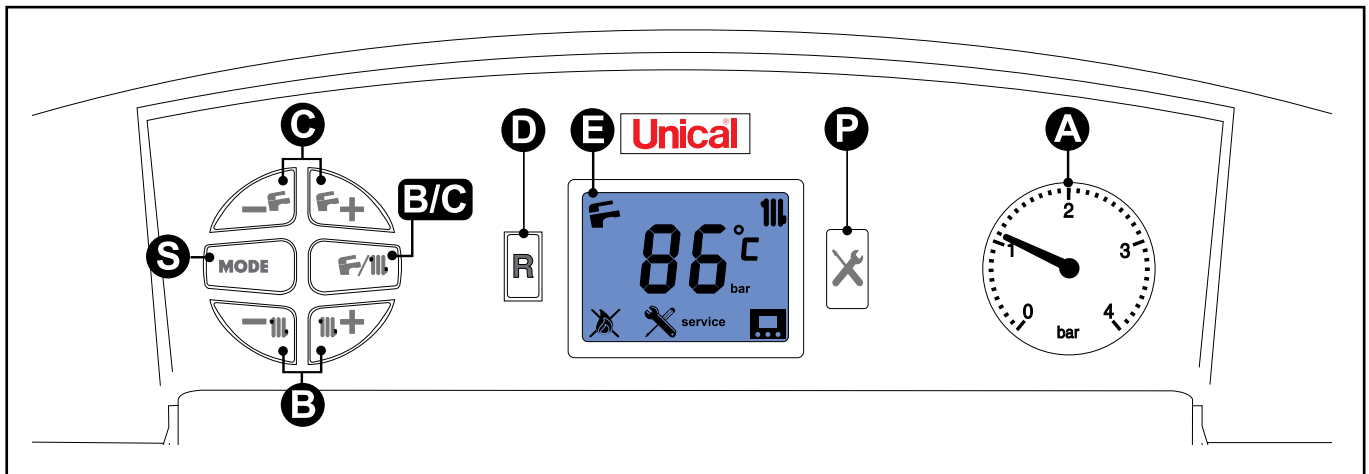


TABLE OF RESISTANCE VALUES, ACCORDING TO THE TEMPERATURE, TO THE HEATING PROBE 11 (SR) AND TO THE DOMESTIC HOT WATER PROBE 1 (SS) AND ANY HEATING RETURN PROBE 22 (SRR) see par. 4.5.

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

ROUTINE YEARLY VERIFICATION OPERATIONS

COMPONENT:	VERIFY:	CONTROL/INTERVENTION METHOD:
FL (domestic hot water priority flow switch) (2)	Is the minimum domestic hot water flow rate 3 l/min.?	The burner must ignite with an intake above or equal to: 3 l/min.
VG (Gas valve) (3)	Does the valve modulate properly?	Open a hot water tap at maximum flow rate and then at minimum. Make sure that the flame modulates.
SR (heating sensor)(11) SS (domestic hot water sensor) (1) SSR (return sensor) (22)	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 95°C and check that it intervenes at 95°.
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.
Expansion vessel (8)	Does the vessel contain the right amount of air?	Check the pressure in expansion vessel (1 bar when the boiler is empty). Pressurise the boiler (open the pump automatic vent valve). Open the heating circuit closing valves.
Condensation drain trap (27)	Has the trap got deposits on the bottom?	Clean the trap with water.
Domestic hot water flow rate	Filter in cold water inlet (2)	Clean the filter with limescale remover.
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 products purposely created by Unical AG S.p.A. (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.

(Num) = see key Par. 2.2

4.2 - PARAMETERS THAT CAN BE EDITED FROM THE CONTROL PANEL

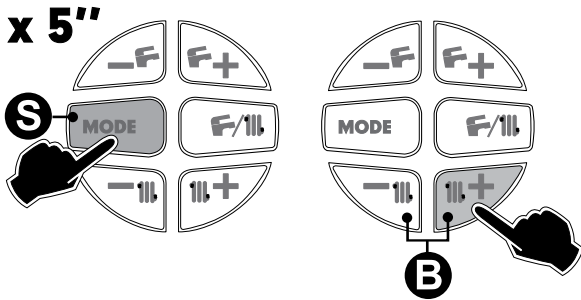


ATTENTION!
Function reserved for Authorised Assistance Centres only.

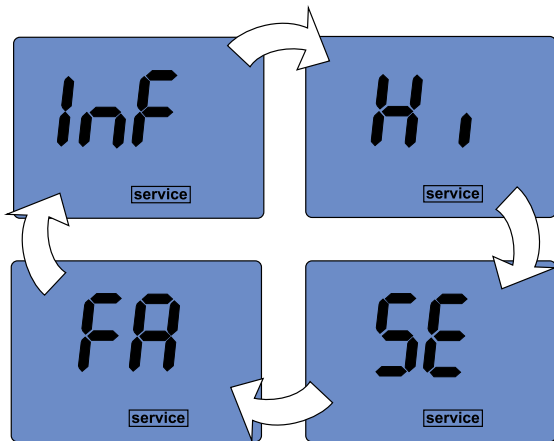
Menu access:

InF	InFormation
Hi	Errors Log
SE	SERvice
FA	Factory

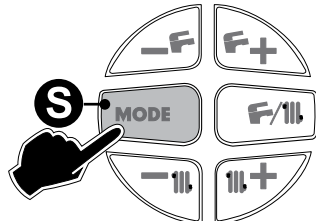
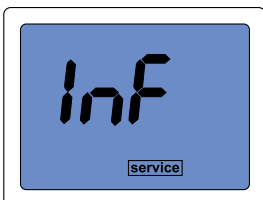
1 ACTIVATION - SELECTION



Press the key (S) for 5 seconds
Press the key (B+) to access the menus

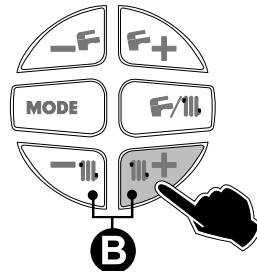


INFORMATION



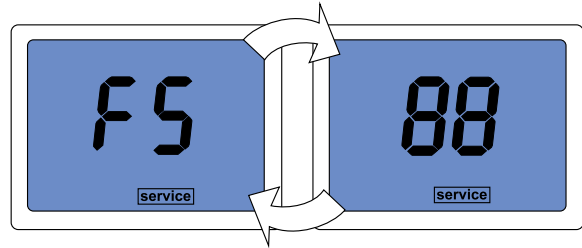
Press the key (S) to access the Inf parameters unit

2 DISPLAY



Press the key (B+) to display the parameters list InF

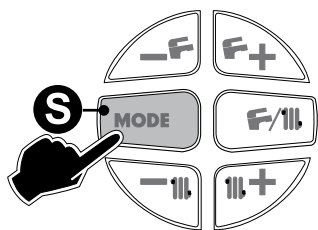
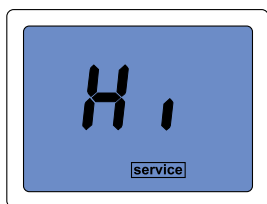
PARAMETERS LIST InF



The display alternates the Parameter and Value

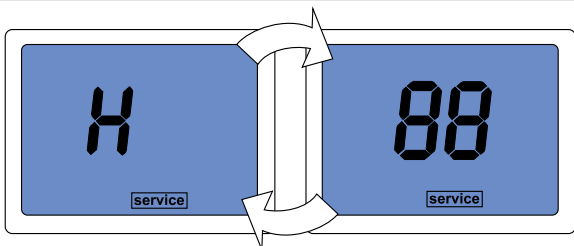
CODE	DESCRIPTION
$FS^{\circ}C$	Heating temperature, - - if the heating sensor is faulty
$o5^{\circ}C$	External temperature, - - if there is no external probe or if it is faulty
$d5^{\circ}C$	Domestic hot water temperature, - - if there is no sensor or if it is faulty
$r5^{\circ}C$	Return temperature, - - if there is no auxiliary sensor or if it is faulty
$dt^{\circ}C$	Differential Δt between flow and return.
$ICH^{\circ}C$	Heating temperature calculated, (been "room zone" ON-OFF and "remote zone" OT+.)
FS	Instantaneous fan speed __ rpm x 100
PH_{bar}	Water pressure, is there is not pressure sensor, - - is displayed
Sr	Firmware version (Factory)
Sd	Firmware version (Servicing)

(Hi) Errors Log



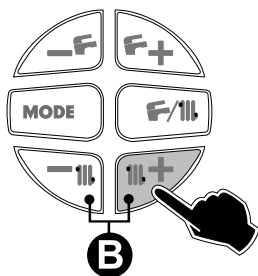
ACTIVATION - SELECTION See section 1 (4.2)

Press the key (S) to access the Hi parameters unit,



The display alternates H and the number of the position (01) in which the error is stored.

2 DISPLAY

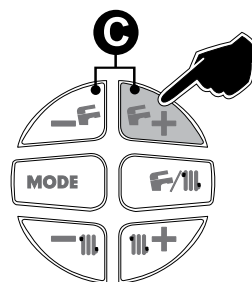


Press the key (B+) to display the sequence of faults between 01 ÷ 12

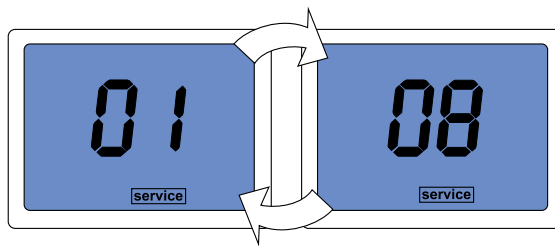
PARAMETERS LIST (Hi) Errors Log

Position	Description
01	last error displayed
02	penultimate error displayed
03	last but two error displayed
04error displayed
05error displayed.
06error displayed.
07error displayed.
08 error displayed
09 error displayed
10	third error displayed
11	second error displayed
12	first error displayed

3 DISPLAY - FAULT



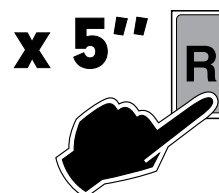
Press the key (C+) to display the fault code (see chap.5).



01 = last error displayed

08 = fault code (LP Water deficiency)
ref. chap. 4.6

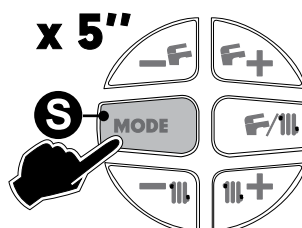
4 EDIT VALUE - RESET



Press the key (D) for over 5 seconds, to reset the whole errors log.

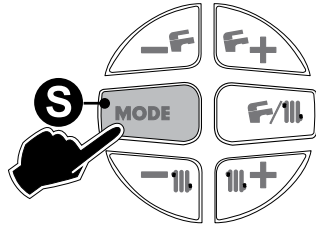
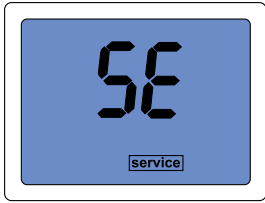
This operation must only be performed in the event one wants to delete the log completely (for example, if important updates are made it may therefore be useful to have a new chronological reference of events).

5 DISABLING



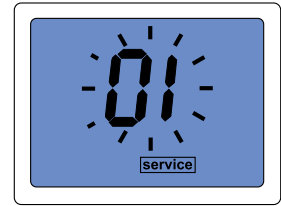
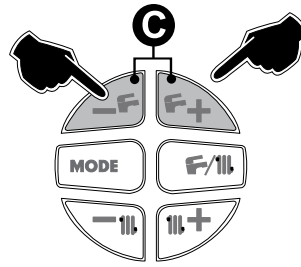
Briefly press the key (S) to go back to the main menu See section 1 (4.2), or press it for over 5 seconds to exit.

(SE) Service parameters



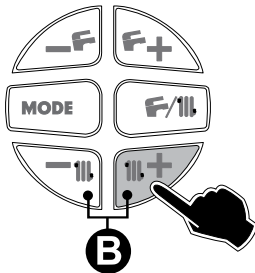
ACTIVATION - SELECTION See section 1 (4.2)
Press the key (S) to access the SE parameters unit. These parameters can be edited without restrictions, from the control panel.

3 EDITING THE VALUE



Press the key (C+) to access the parameter, the parameter value flashes.
Correct the value with the keys (C+ or C-)

2 DISPLAY



Press the key (B+) to display the parameters list

4 CONFIRM VALUE

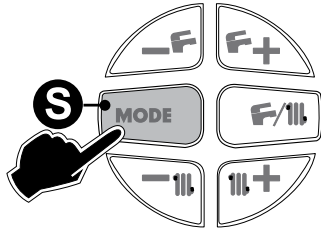
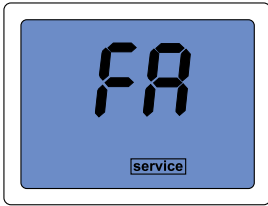


Press key D

PARAMETERS LIST SE

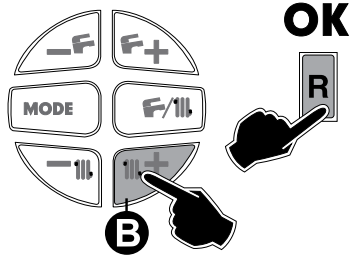
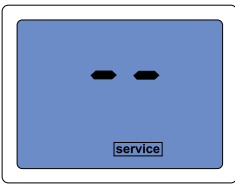
CODE	RANGE	DESCRIPTION
<i>Po</i>	0 1	Post circulation 0 = post 5" (default) 1 = continuous
<i>oL</i>	-20 10	External probe on panel - 20÷10 °C (default -10)
	0 30	External probe on Regolafacile 0 = - 20 °C 30 = +10 °C (default 10)
<i>nr</i>	0/5 30	Night reduction 0 = T.A. (default) 5 ÷ 30 = night reduction
<i>PH</i>	0 1	Domestic hot water pre-heat function 0 = Not active (default) 1 = Active
<i>HP</i>	0 100	Maximum heating modulation level (default 100)
<i>HL</i>	20 45	Minimum heating set point level (default 30)
<i>HH</i>	50 85	Maximum heating set point level (default 85)
<i>dL</i>	25 45	Minimum domestic hot water set point level (default 35)
<i>dH</i>	50 65	Maximum domestic hot water set point level (default 60)

(FA) Factory Parameters



ACTIVATION - SELECTION See section 1 (4.2)
Press the key (S) to access the FA parameters unit. These parameters can be edited by entering the ACCESS CODE.

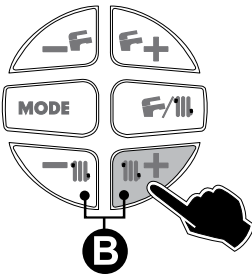
2 ACCESS CODE.



Press the key (B+) to enter the access code
Confirm with the key (D)

Once the access code has been entered, 1 or 2
Factory parameter units are displayed

3 DISPLAY



Press the key (B+) to scroll the parameters.

UNIT 1 - FA PARAMETERS LIST

CODE	RANGE	DESCRIPTION
<i>Gt</i>	0 1	Type of Gas 0 = methane (default) 1 = GPL
<i>PL</i>	0 100	Minimum pump modulation level *
<i>Pr</i>	20 100	Maximum pump modulation level
<i>dt</i>	5 20	Pump temperature differential
<i>SP</i>	0 6	Pump pause time during CH / DHW service change and vice-versa 0 = no pause 1÷6 = Time in seconds

<i>AP</i>	1	4	1: Instantaneous boiler 2: Instantaneous boilers with fixed hysteresis 3: Heat. only boiler / or storage tank (1 pump + 1 3-way val.) 4: Boiler with storage tank 2 pumps
<i>PS</i>	0	1	Heat. pressure sensor 0 = absent / 1 = present (default 0)
<i>Un</i>	0	1	Unit: 0 = °C - bar 1 = °F - PSI (default 0)
<i>nF</i>	0	1	Mains frequency 0 = 50 Hz / 1 = 60 Hz (default 0)
<i>rC</i>	0	1	DHW and CH setpoint: 0 = bidirectional 1 = from remote control only (default 0)
<i>rP</i>	0	1	Primary Δt protection 0 = disabled 1 = enabled (default 1)
<i>LL</i>	0	100	Minimum output value in CH and DHW (default 0)

(* Do not set values below 20!

UNIT 2 - FA PARAMETERS LIST

CODE	RANGE	DESCRIPTION
<i>bP</i>	0 9	Boiler Power
<i>IG</i>	10 70	Fan speed at start-up = rpmx100
<i>FL</i>	0 199	Minimum fan speed (* 10+750) = rpmx100
<i>FH</i>	0 199	Maximum fan speed (* 10+5000) = rpmx100
<i>hP</i>	1 20	Heating control: proportional
<i>hI</i>	1 20	Heating control: integrative
<i>hD</i>	1 20	Heating control: derivative
<i>dP</i>	1 20	Domestic hot water control: proportional
<i>dI</i>	1 50	Domestic hot water control: integrative
<i>dd</i>	1 20	Domestic hot water control: derivative
<i>SL</i>	3 90	Ramp time CH (Value *10) = sec
<i>AL</i>	0 1	Function antilegionella (storage tank boiler)

4 EDITING THE VALUE

Press the key (C+) to access the parameter, the parameter value flashes.
Correct the value with the keys (C+ or C-)

5 CONFIRM VALUE

Press key D

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 profession-

ally deaerated, ignition problems could arise. In that case, contact the supplier of the LPG tank.

Gas Conversion

NOTE!

Further details in the section "Technical Information" on the boiler page of the www.unicalag.it website

In order to change the gas one must change the Factory parameter:

FA PARAMETERS (UNIT 1) par 4.2		
CODE	METHANE	PROPANE
Gt	0	1



Once the Gt parameter has been edited one must perform the GAC automatic calibration (Gas Adaptive Calibration) Chapter 4.3.1

- 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 [Signature]

- Regolata per	<input type="checkbox"/>
- Réglée pour	<input checked="" type="checkbox"/> G 20
- Adjusted for	<input checked="" type="checkbox"/> G 25
- Reglada para	<input checked="" type="checkbox"/> G 30
- Eingestellt für	<input checked="" type="checkbox"/> G 31

ETI 4530C

Maintenance instructions

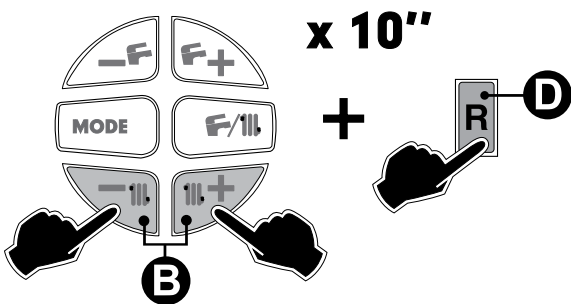
4.3.1 - GAC AUTOMATIC CALIBRATION

One can perform the GAC in domestic hot water mode as well.

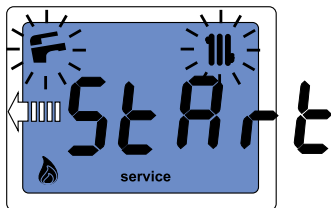
Make sure that there are no heating requests present and that all the valves of the heating system are open.

If during this stage one wishes to disperse the heat on the domestic hot water circuit, open at least 2 hot water taps (ONLY AFTER HAVING ACTIVATED THE GAC FUNCTION).

1 ACTIVATION



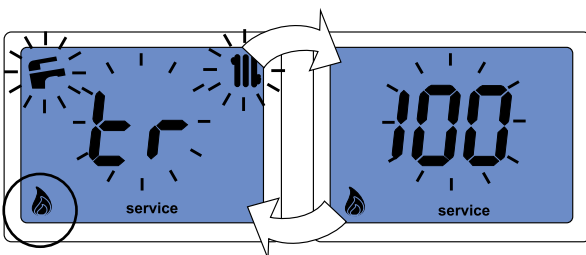
Press and hold the key (D) and press the keys (B- and B+) at the same time for at least 10 seconds, until service appears.



StArt scrolls on the display, the function is active when the symbols flash.

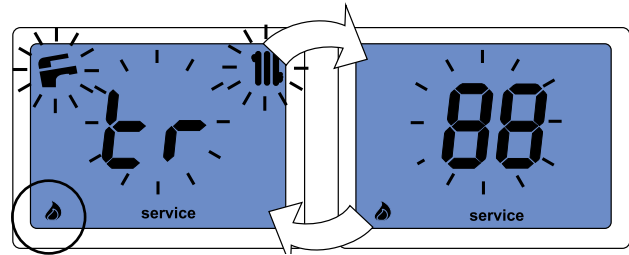
Note: After the ignition sequence, which can also take place after a few attempts, the boiler performs the calibration which consists of 3 stages:

Stage 1: MAXIMUM OUTPUT CALIBRATION



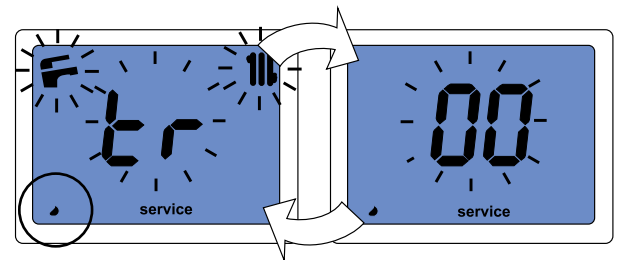
When the display alternates tr - 100 (about 1 min.)

Stage 2: START-UP OUTPUT CALIBRATION

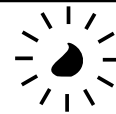


When the display alternates tr - with value XX. (1 min)

Stage 3: MINIMUM OUTPUT CALIBRATION



When the display alternates tr - 0



Calibration is complete when the small flame starts to flash.

2 DISABLING

See section 1 ACTIVATION

Note: If the display does not show errors it means that the system has been calibrated properly. Otherwise refer to chapter 4.6 "Error Codes".

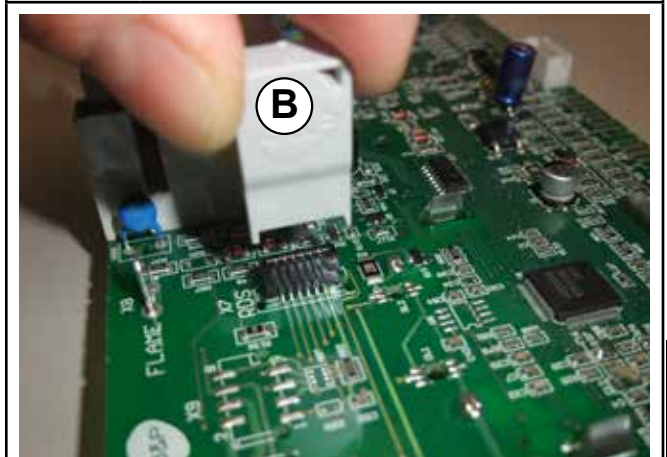
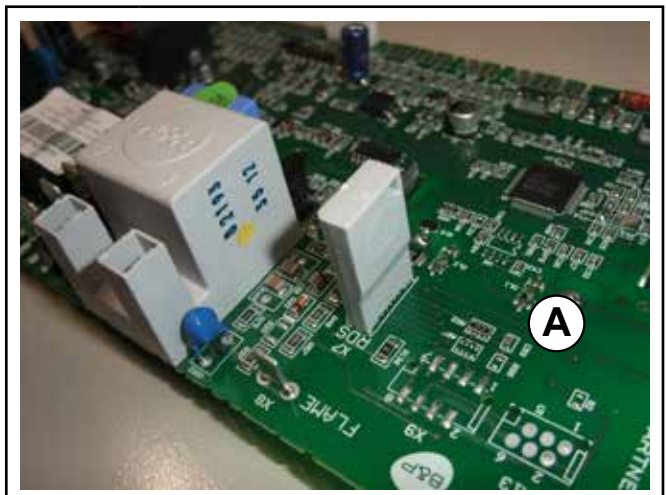
4.4 - IMPORTANT NOTES REPLACING COMPONENTS


Before replacing components one must follow the notes of chap. 4 "Inspections and maintenance".

To replace the components:
<ul style="list-style-type: none"> - GAS VALVE - FAN - BURNER, - IGNITION/DETECTION ELECTRODE, - MODULATION BOARD (in the event the memory board CANNOT be reused) (*),
GAC calibration is required

MODULATION BOARD		
A	universal board	
B	memory board (*)	The memory board is programmed by default for METHANE gas operation. In the event of LPG operation the GT parameter must be edited (Factory parameters), see (Chap. 4.2).
<p>(*) In the event the memory board can be re-used, there is no need to reprogram parameters, settings and automatic calibration.</p>		

ENGLISH

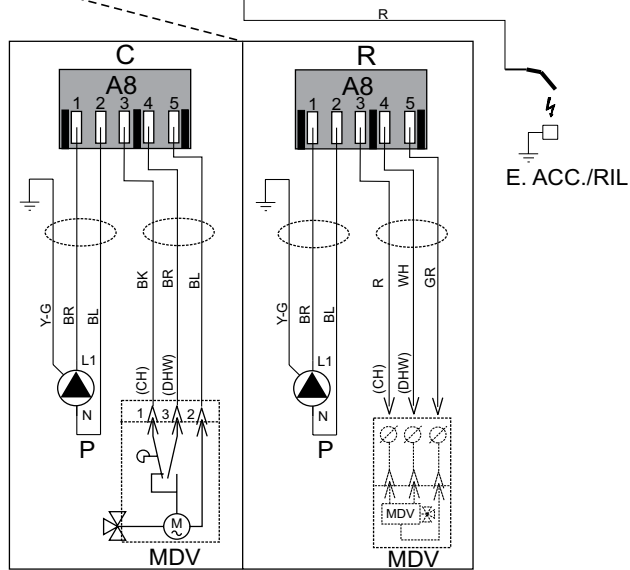
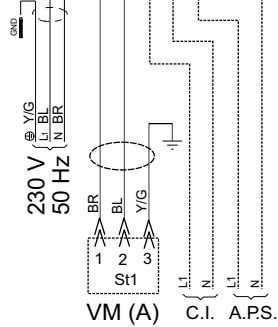
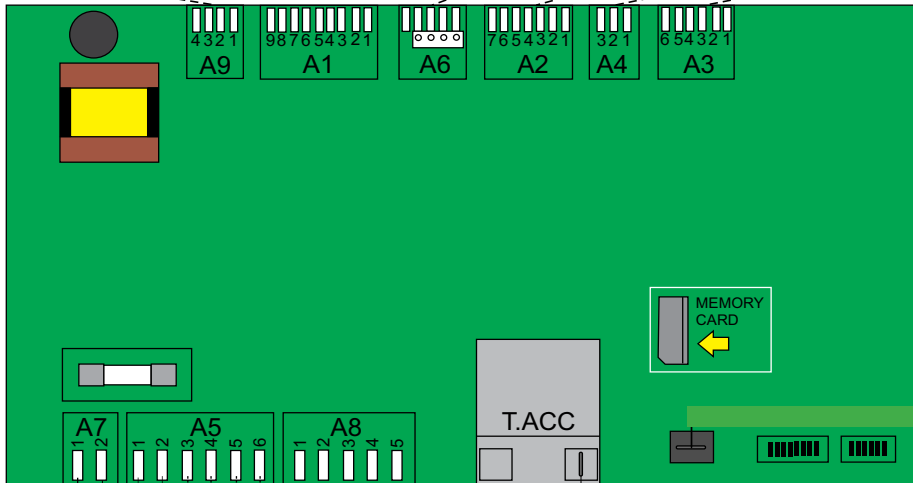
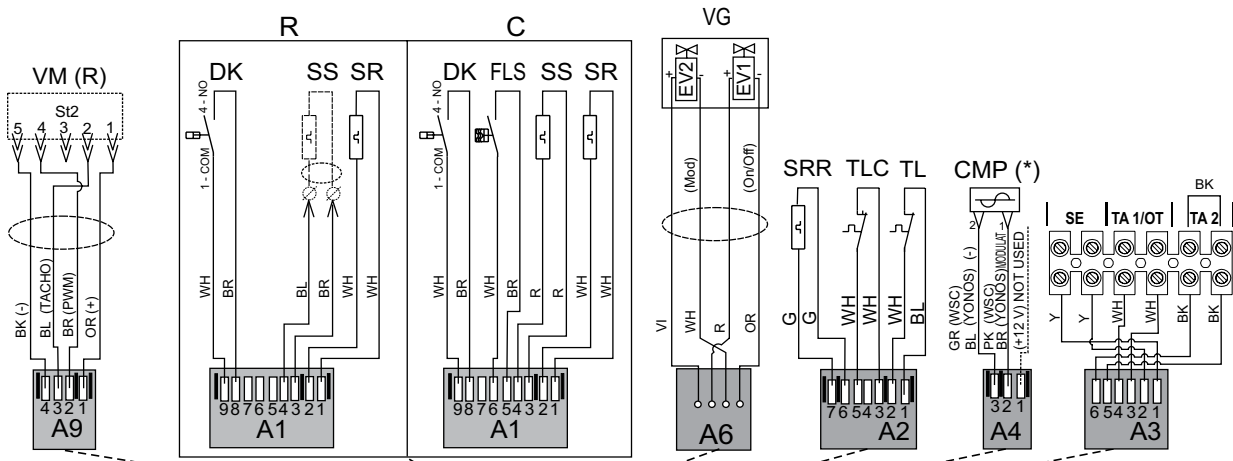


 Act carefully, pay attention to the insertion direction of the memory board.

Maintenance instructions

4.5 - WIRING DIAGRAM

Practical connection board




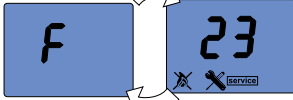


COLORS	
BL	BLUE
BR	BROWN
BK	BLACK
G	GREEN
GR	GREY
L BL	LIGHT BLUE
OR	ORANGE
PK	PINK
R	RED
Y	YELLOW
YG	YELL/GREEN
WH	WHITE
VI	VIOLET



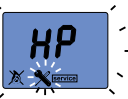





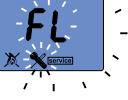
C.I.	System filling
A.P.S.	Additional Pump Supply


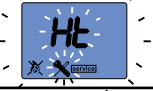











KEY	
A1.....A9	Services connectors
CMP	Modulating pump control
DK	Water deficiency safety pressure switch
E. ACC./RIL	Ignition/detection electrode
FLS	Domestic hot water request flow switch
MVD	Diverter valve motor
P	Pump
SR	Flow heating sensor
SRR	Return heating sensor







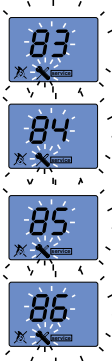



SS	Domestic hot water probe (Pred. for R models)
TL	Limit thermostat
TLC	Flue gas collector limit thermostat
VG	Gas valve
VM	Modulating fan
SE	External probe connection terminals
TA 1 / OT	Modulating TA connection terminals
TA 2	On/off TA connection terminals

 service	4.6 - ERROR CODES The symbol flashes on the display monitor when the boiler detects an anomaly.
	1) In the event of an anomaly that does not stop boiler operation, press key "D" to display the error code; in the event the boiler is in stand-by, the error code appears and remains fixed on the display.
	2) In the event of an anomaly that causes boiler down time, the error code flashes directly on the display. Each fault is characterised by a priority level: if two faults are detected at the same time, the code with the highest priority is displayed. The fault codes are listed below:
	F) Fault code displayed with code number: The display flashes alternating the F (FAULT - ANOMALY) with error code (eg 23).

(Num) = see key Par. 2.2

SYMBOL	COD. REGOLA FACILE/ FAULT HISTORY	PRIORITY	DESCRIPTION	SOLUTIONS
	09	0	EXTERNAL PROBE interrupted	Check the wiring, if needed replace the external probe
	14	1	RETURN PROBE Auxiliary (SRR) sensor interrupted	Check the wiring, if needed replace the auxiliary sensor (22)
	45	2	WATER OVERPRESSURE detected if the H ₂ O pressure Transducer is present with pressure > 2.5 bar; it is reset automatically when H ₂ O pressure < 2 bar	Wait for the values to return to default limits / Replace the Transducer
	30	3	SERVICE PARAMETERS Service parameters altered due to possible electromagnetic interferences.	Reset the altered parameters via the panel and/or regola-facile
	21	4	POOR WATER CIRCULATION Poor circulation in primary circuit	Check pump operation (12) and speed, if there are any obstructions or system closure.
	17	5	FLAME CONTROL FREQUENCY BEYOND LIMIT Depends on the power supply mains (Frequency and voltage beyond default limits)	Wait for the values to return to the default limits
	15	6	WATER CIRCULATION INSUFFICIENT Primary circuit water circulation insufficient ($\Delta t > 35^{\circ} \text{C}$)	Check pump operation (12) and speed - remove any heating system obstructions - clean the scaled domestic hot water exchanger
	22	7	INCORRECT SENSOR POSITIONING Flow and return sensors inverted	Check the wiring (21) (22)
	24	8	SPEED OUT OF CONTROL Alteration of the fan speed; the speed is not reached.	Check fan operation (18) and the connections

	26	9	SPEED OUT OF CONTROL Alteration of the fan speed; the speed is above that requested	Check fan operation (18) and the connections
	6	10	HIGH TEMPERATURE Boiler temperature too high	Check pump operation and if needed clean the exchanger (24)
	8 NO WATER	11	WATER DEFICIENCY Insufficient water pressure and consequent intervention of the minimum water pressure - pressure switch (13) .	Fill the heating circuit as described in chap. 3.8 and wait for the values to return within default limits. If needed, check the electrical connections and replace the minimum water pressure switch.
	44 NO WATER	12	WATER PRESSURE detected if the pressure Transducer is present	Wait for the values to return to default limits / Replace the Transducer
	16	13	EXCHANGER FREEZING (24) Exchanger freezing is detected If the heating sensor detects a temperature below 2° C, burner ignition is inhibited until the sensor detects a temperature above 5°C.	Disconnect the from the power supply, close the gas valve, defrost the exchanger carefully.
	13	14	DOMESTIC HOTWATER SENSOR Domestic hot water sensor fault (1)	Check the efficiency of the sensor (see table Res/Temp) (Par.4) or its connections.
	12	15	HEATING SENSOR (11) Heating sensor fault	Check the efficiency of the sensor (see table Res/Temp) (Par.4) or its connections.
	38	16	FACTORY PARAMETERS Alteration of the factory parameters due to possible electromagnetic interferences.	Press the unblock key; if the anomaly persists, replace the board.
	1 LIMIT THERM	17	SAFETY THERMOSTAT 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.
	4 BLOCK	18	BLOCK No gas or failed burner ignition	Check the gas supply or that the ignition/detection electrode is working properly (4) .
	11	19	PARASITE FLAME Flame detected upon ignition	Check the wiring of the Ign/Det. electrode and remove any oxidation. Check for humidity between drain wire and ceramic, if necessary, replace the electrode, press the unblock key, if the anomaly persists, replace the electrode (4) .
	20	20	PARASITE FLAME Flame detected after swtich-off	Check the wiring and for any leaks from the gas valve (3) , if needed replace the gas valve.
	5 CHIMNEY	21	FLUE GAS COLLECTOR SAFETY THERMOSTAT Intervention of the flue gas collector safety thermostat (23)	Rearm the thermostat manually and press the unblock button on the panel. Check the connections.

	(F) 27	22	ERROR Flow Gradient	Check if the pump switches off suddenly.
	(F) 23	23	Detected tab panel button pressed for longer than 30 "	Check keypad and reset the status of the buttons. Or replace the electronic board
	(F) 53	24	Clogged Outlets	Check the Chimneys / Check the trap.
	(F) 55	25	No Calibration	GAC Calibration 4.3.1
	(F) 18	26	Electrode earthed on the Burner or presence of moisture	Check the distance between the burner and the electrode, check for humidity between drain wire and ceramic, if necessary, replace the electrode.
	(F) 43	27	During the ignition stage, abnormal flame extinguishing has occurred 12 "consecutive" times in a period of about 50 sec.	Check the gas pressure / any flue gas recirculation in the chimney and obstructions / condensation drain / electrode electrical connection / electrode and burner earth / perform GAC calibration chap. 4.3.1 / replace the electrode and its connection / replace the electronic board
	BLOCK	28	Control circuit problems Gas Valve	Check the Gas Valve connections / Replace the Gas Valve (3) / Replace the Modulation Board
	BLOCK	32	Gas Valve opening time beyond limit time	Check the parts that generate the heat requests (thermostats, electrovalve limit switches, flow switch, etc.)
	BLOCK	33	Flame loss with max ignition value correction	Check the gas pressure / any flue gas recirculation in the chimney and obstructions / condensation drain / electrode electrical connection / electrode and burner earth / perform GAC calibration chap. 4.3.1 / replace the electrode and its connection / replace the electronic board
	BLOCK		General block for unclassified anomalies.	Replace Modulation Board.
ERRORS DISPLAYED ON REGOLAFACILE ONLY				
-	75	-	Regolafacile external sensor	Replace the external probe / Regolafacile
-	80	-	Regolafacile Internal Sensor	Replace Regolafacile
-	81	-	Eprom Error of Regolafacile	Replace Regolafacile
(*) if there is a condensation obstruction inside the flue gas manifold (before resetting) it is necessary to proceed to a drying operation inside of the tank especially of the level sensor electrodes.				

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ORIGINAL INSTRUCTION - 00334659/b - 1^a ed. 03/18

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