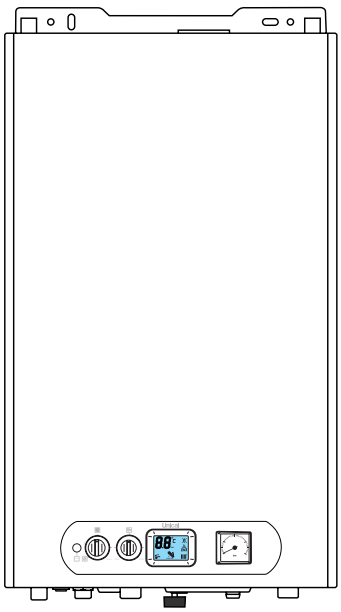
Библиотека СОК

Unical®



X

R 24 - C 24
R 32 - C 32

INSTALLATION AND SERVICING MANUAL

ENGLISH

https://www.unicalag.it/prodotti/domestico-50/condensazione-gas/2846/x



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 10
2.1 Technical features 10
2.2 Main components view and dimensions 10
2.3 Available flow rate / pressure diagram 13
2.4 Operation data 14
2.4.1 Data according to the directive ErP 14
2.5 General features 15

3 INSTALLATION INSTRUCTIONS 16
3.1 General warnings 16
3.2 Installation standards 16
3.3 Preventive system verification and adjustment operations 16
3.4 Packaging 17
3.5 Positioning the boiler 18
3.5.1 References and positioning 19
3.6 Flue gas exhaust pipe connection 21
3.6.1Installation on pressurized collective flues 24
3.7 Connections 29
3.8 Filling the system 31
3.9 Electrical connections 32
3.10 Commissioning 34
3.11 Measurement of combustion efficiency during installation 35
3.11.1 Calibration function activation 35
3.11.2 Probes positioning 35
3.12 Burner adjustment 37
3.12.1 Adaptation of the power to the heating system 39

4 MAINTENANCE INSTRUCTIONS 40
4.1 Inspection and maintenance instructions 40
4.2 Parameters that can be edited from the control panel 41
4.3 Adaptation to the use of other gas 43
4.4 Wiring diagram 45
4.5 Error codes 46

1 GENERAL INFORMATION

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.

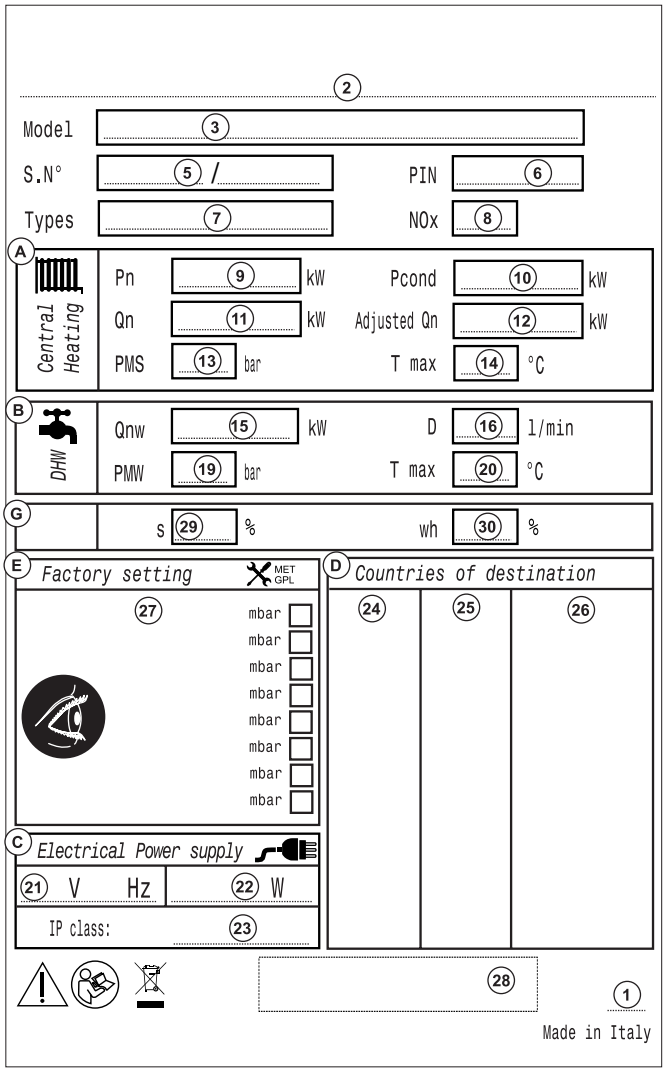
1.6 - TECHNICAL DATA PLATE

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

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

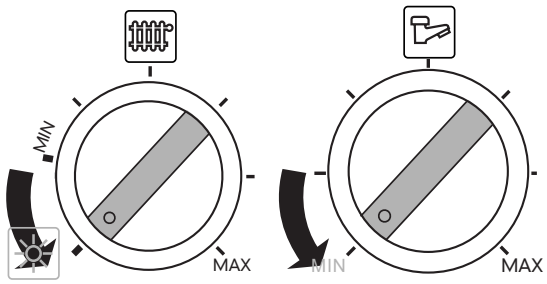
For outdoor installations, in partially protected places, it is necessary to use the additional resistance kit (optional) for the anti-freeze protection of the DHW and siphon fittings.

Declared room temperature, with use of the resistance kit = -15 ° C.

1.8 - BOILER ANTIFREEZE PROTECTION

To activate the antifreeze function only, position the two knobs as shown in the figure.

The Antifreeze protection is always active.
Even by disabling the heating and domestic hot water services.



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 multidmetal)

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

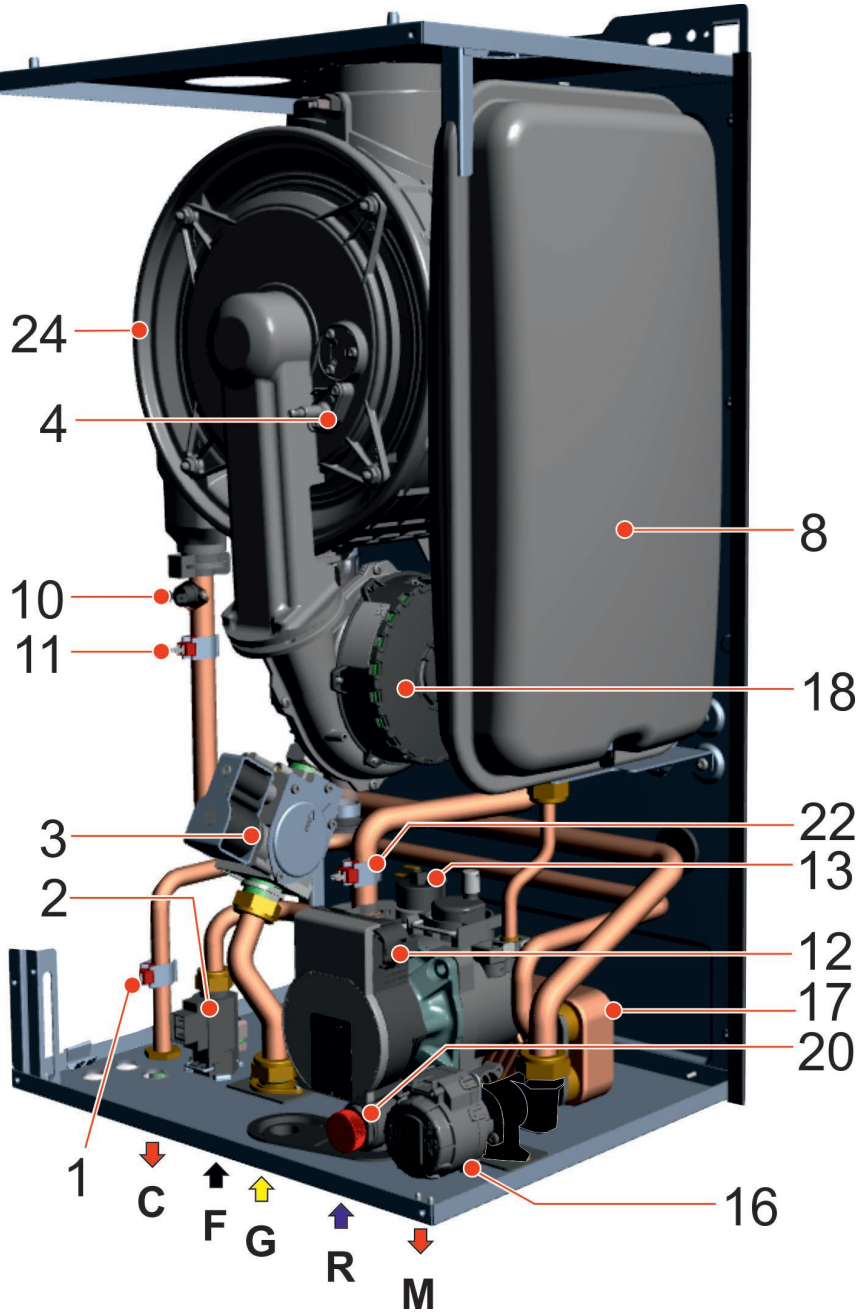
POS	ANTIFREEZE FUNCTION				
	Power supplies		**11 - SR** (*)	Status function antifreeze	Actions
	Electric	Gas			
1	ON	ON	< 6 °C	ON	- Burner and Pump ON until T > 14°C
	ON	ON	< 2 °C	ON	Only when both the power supplies are ON: - Burner and Pump OFF until T > 5°C - When T > 5°C then Burner and Pump ON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

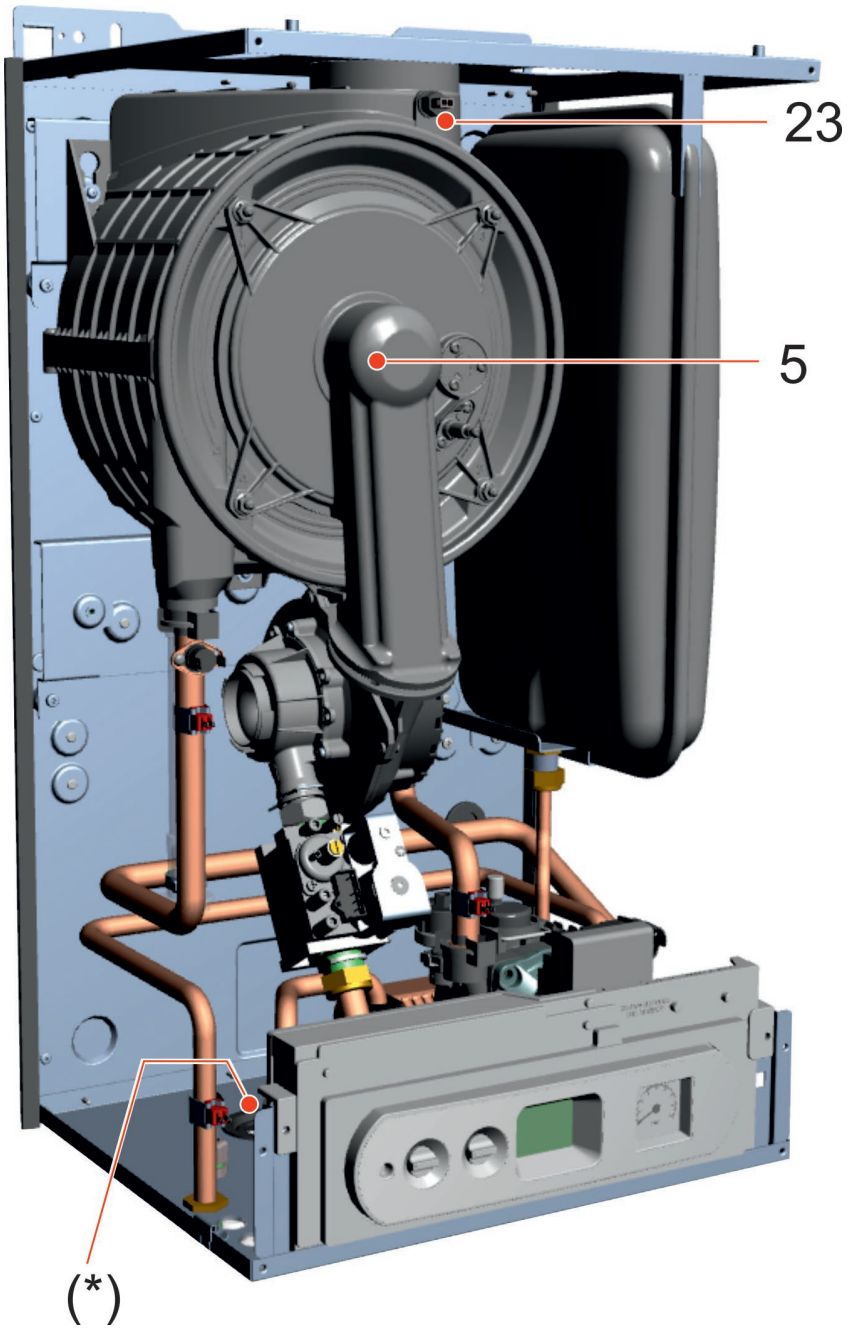
NOTE!
For further details refer to the Technical Information from the website (link at page 2)

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



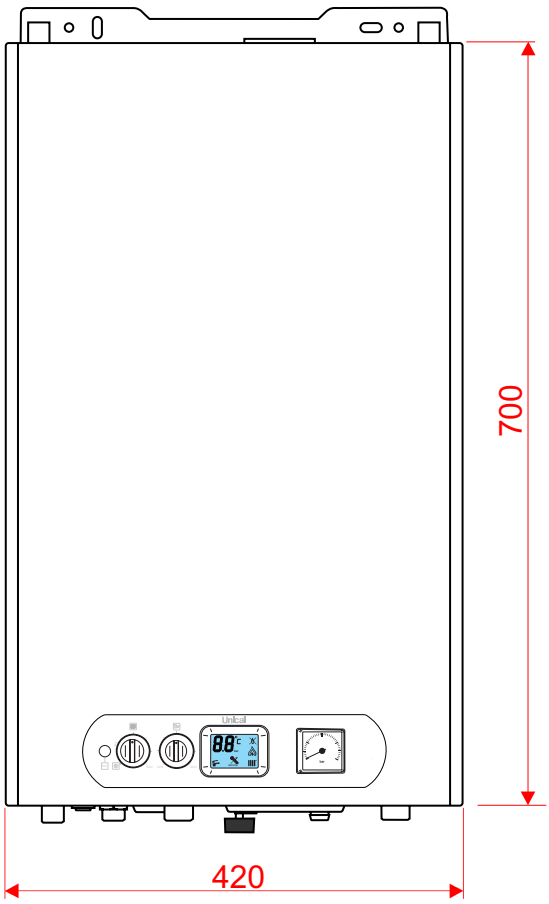
KEY			
N°	C.E.	S.E.	Description
1	db	SS	Domestic hot water temperature sensor
2		FLS	Flow switch with cold water filter
3		VG	Gas valve
4	Fd	E.ACC /RIL	Ignition/detection electrode

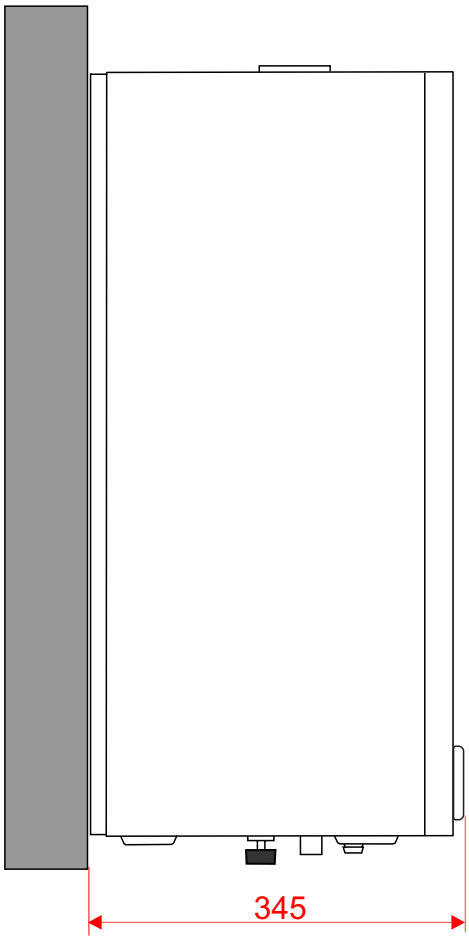
5			Burner
8			Expansion vessel
10	HL	TL	Safety thermostat
11	Hb	SR	Heating temperature sensor
12	Ht	P	Pump
13	Lp	DK	Water deficiency pressure switch
16			Diverting valve



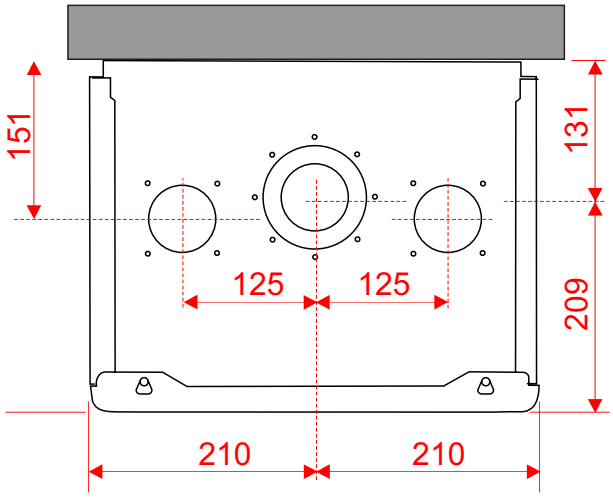
17			Plate heat exchanger	
18	FL FH	VM	Fan	
20			Safety valve	
22	rb	SRR	Return temperature sensor	
23	tf	TLC	Flue gas collector safety thermostat	
24			Aluminium Heat Exchanger/Capacitor	
(*)			Condensate drain siphon outlet position	
C			Domestic hot water outlet	G ½
G			Gas inlet	G ¾
F			Cold water 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	

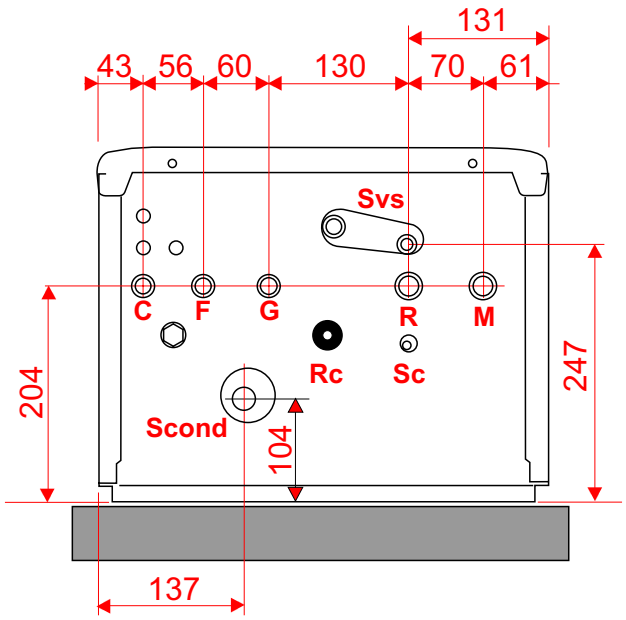




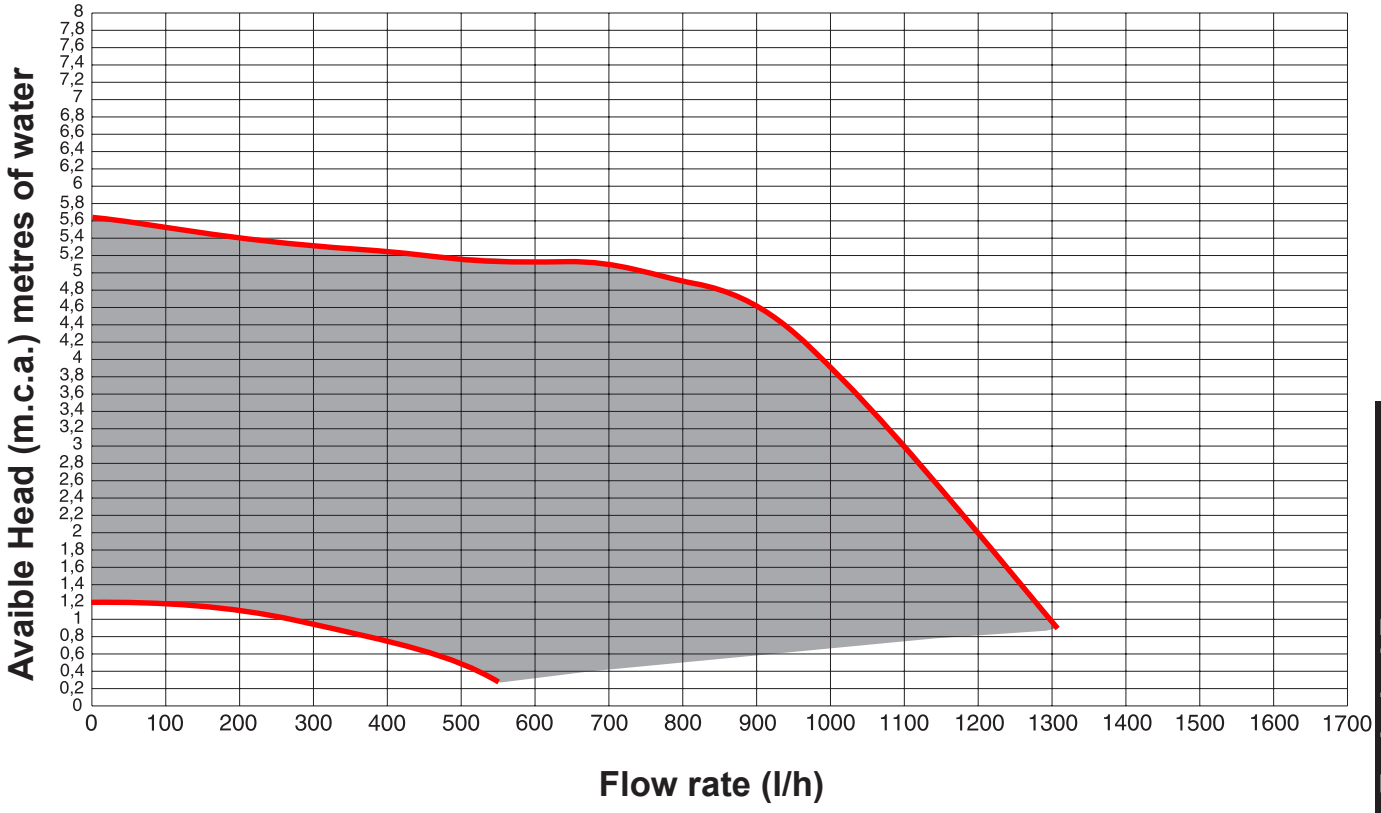
View from above



View from below



2.3 - DIAGRAM OF FLOW RATE/PRESSURE AVAILABLE FOR INSTALLATION



2.4 - OPERATING DATA

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

Our appliances are built to work with natural gas (G20), G.P.L. and mixtures of methane and hydrogen up to 20% by volume (20% H2NG). The supply pipe must be equal to or greater than the fitting of the appliance

		X R 24 / C 24	X R 32 / C 32
Nominal heat input in CH / DHW mode (***)	kW	24 / 28	32 / 32
Minimum heat input with Nat. Gas / Propane	kW	5 / 5	5 / 5
Nominal heat input on L.V.C. Qn **with gas 20%H2NG**	kW	22,5	30,1
Minimum heat input onu L.V.C. Qmin **with gas 20%H2NG**	kW	4,6	4,7
Nominal heat input DHW **with gas 20%H2NG**	kW	26,3	30,1
Nominal heat output / DHW (***)	kW	23,4 / 27,3	31,2 / 31,2
Minimum heat output / DHW (***)	kW	4,8 / 4,8	4,8 / 4,8
Nominal output in condensation 50/30	kW	25,2	33,6
Minimum heat output in condensation 50/30	kW	5,3	5,4
Combustion efficiency at full load	%	97,7	97,8
Combustion efficiency at part load	%	97,8	97,7
Heat losses through the casing (min.-max.)	%	1,3 - 0,2	1,3 - 0,4
(*) Net flue gas temperature tf-ta (max.)	°C	46,5	44,3
Flue gas mass flow rate (min.-max)	g/s	2,3 - 13,8	2,3 - 14,7
Air excess λ	%	26,8	26,8
CO_2	%	9,0 - 9,0	9,0 - 9,0
CO at 0% of O_2 (min. - max)	ppm	4 - 131	4 - 151
Maximum production of condensate	kg/h	3,9	5,2
Chimney heat losses with burner ON (min. - max.)	%	2,2 - 2,3	2,3 - 2,2
Chimney heat losses with burner OFF	%	0,5	0,3
Head available at the base of the chimney min. / max.	Pa	2 / 70	2 / 70
(**) Sound pressure level LpA at nominal operation	dB(A)	43	46
(**) Sound pressure level LpA at medium operation	dB(A)		
Notes: (*) Room Temperature = 20°C Data obtained with appliance operated with Nat Gas (G20)			
Note: (**) measured in free field at 1 m distance from the device			
ote: (***) DHW production power for domestic hot water only for C models (combined boilers)			

2.5 - GENERAL FEATURES

		X R 24	X C 24	X R 32	X C 32
Appliance category		II_{2H3P}		II_{2H3P}	
Minimum heat. circuit output (Δt 20 °C)	l/min	3,5		3,5	
Minimum heating circuit pressure	bar	0,5		0,5	
Maximum heating circuit pressure	bar	3		3	
Primary circuit content	l	2,5		2,8	
Maximum operating temperature in heat.	°C	85		85	
Minimum operating temperature in heat.	°C	30		30	
Expansion vessel total capacity	l	10		10	
Expansion vessel pre-load	bar	1		1	
Maximum system capacity (max temp. calc.)	l	205		205	
Minimum domestic hot water circuit flow rate	l/min.	-	2,0	-	2,0
Minimum domestic hot water circuit pressure	bar	-	0,5	-	0,5
Maximum domestic hot water circuit pressure	bar	-	6	-	6
Domestic hot water specific flow rate (Δt 30 °C) "**D**"	l/min.	-	13,5	-	15,5
Production of D.H.W. in continuous operation with Δt 45 K	l/min.	-	9	-	10,1
Production of D.H.W. in continuous operation with Δt 40 K	l/min.	-	10,1	-	11,4
Production of D.H.W. in continuous operation with Δt 35 K	l/min.	-	11,6	-	13
Production of D.H.W. in continuous operation with Δt 30 K	l/min.	-	13,5	-	15,2
Production of D.H.W. in continuous operation with Δt 25 K (*)	l/min.	-	16,2	-	18,2
Adjustable DHW temperature	°C	-	38-60	-	38-60
Voltage/Frequency electric power supply	V-Hz	230/50		230/50	
Fuse on the power supply	A (F)	3,15		3,15	
Power consumption max	kW	0,095	0,095	0,115	0,115
Protection rating	IP	X5D		X5D	
Net weight	kg	38,5	40	39,5	41
Gross weight	kg	41,5	43	42,5	44
F Factor		-	2	-	3
R Factor		-		-	
(*) mixed					

2.6 - DATA ACCORDING TO ErP DIRECTIVE

Description	Symbol	Unit	Model: X			
			R24	C24	R32	C32
Nominal Heat Output	Pnominal	kW	23		31	
Seasonal space heating energy efficiency	η_s	%	93		93	
Seasonal efficiency class in heating mode			**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	23,4		31,2	
Useful efficiency at nom. heat output in high-temperature regime (Tr 60 °C / Tm 80 °C	η_4	%	87,8		87,7	
Useful heat output at 30% of nom. heat output in low-temperature regime (Tr 30 °C)	P_1	kW	7,8		10,4	
Useful efficiency at 30% of nom. heat output in low-temperature regime (Tr 30 °C)	η_1	%	97,9		97,8	
Range-rated boiler: YES / NO			NO		NO	
Auxiliary electricity consumption						
At full load	elmax	kW	0,035		0,064	
At part load	elmin	kW	0,013		0,012	
In stand-by mode	P_{SB}	kW	0,003		0,003	
Other items						
Heat loss in stand-by	P_{stb}	kW	0,118		0,100	
Emissions of nitrogen oxides ref. PCS	NOx	mg/kWh	45		49	
NOx Class			6		6	
Annual electricity consumption	Q_{HE}	GJ	73		97	
Inside sound power level	Lwa	dB (A)	-		-	
For CH & DHW production boilers						
Declared load profile			-	**XL**	-	**XL**
Energy efficiency in DHW production mode	η_{wh}	%	-	87	-	89
Daily electricity consumption	Qelec	kWh	-	0,10	-	0,09
Daily fuel consumptionl	Qfuel	kWh	-	22,45	-	21,9
Annual electricity consumption	AEC	kWh	-	404	-	403
Annual fuel consumption	AFC	GJ	-	17	-	17
Seasonal efficiency class in DHW production mode			**-**	**A**	**-**	**A**

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 outside in a partially protected place or in any case in a place where the boiler is not exposed to the direct action of atmospheric agents.

NOTE!
Further details in the section "Technical Information" at the address indicated on 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 website

3.3 - PREVENTIVE VERIFICATION AND VERIFICATION AND ADJUSTMENT OPERATIONS

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

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.

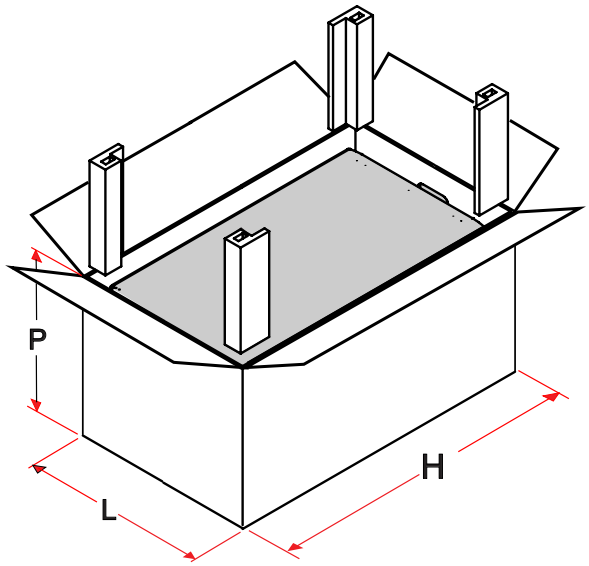
As well as the appliance, the packaging contains:

A DOCUMENTATION ENVELOPE
- User operating instructions booklet
- Instruction booklet for the installer and maintenance
- Certificate of conformity
- Gas conversion kit LPG conversion (diaphragm output VG)

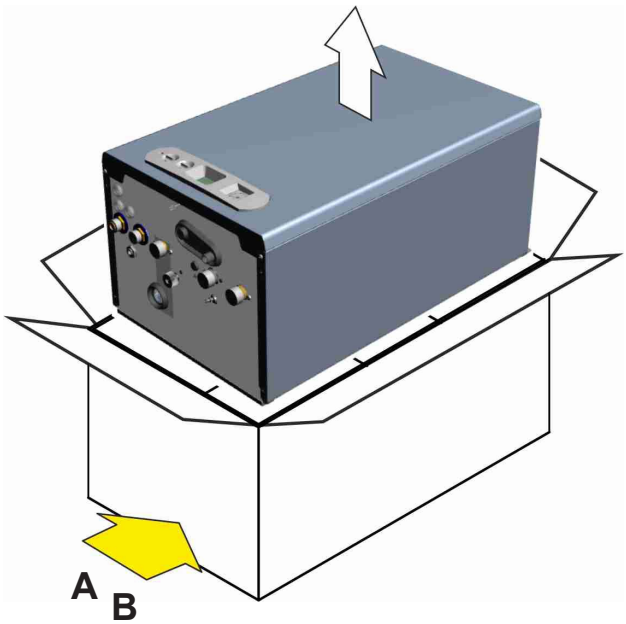
B CHIMNEY ADAPTER for coaxial intake / exhaust systems.

Siphon, (with corrugated tube and fixing strap) inside the boiler.

1



2



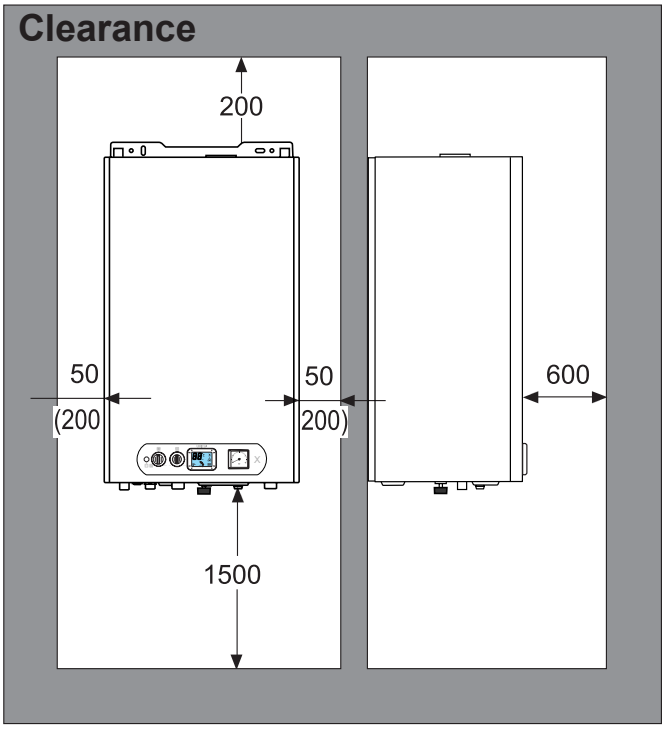
P depth	L width	H height
380 mm	470 mm	810 mm

3.5 - POSITIONING THE BOILER

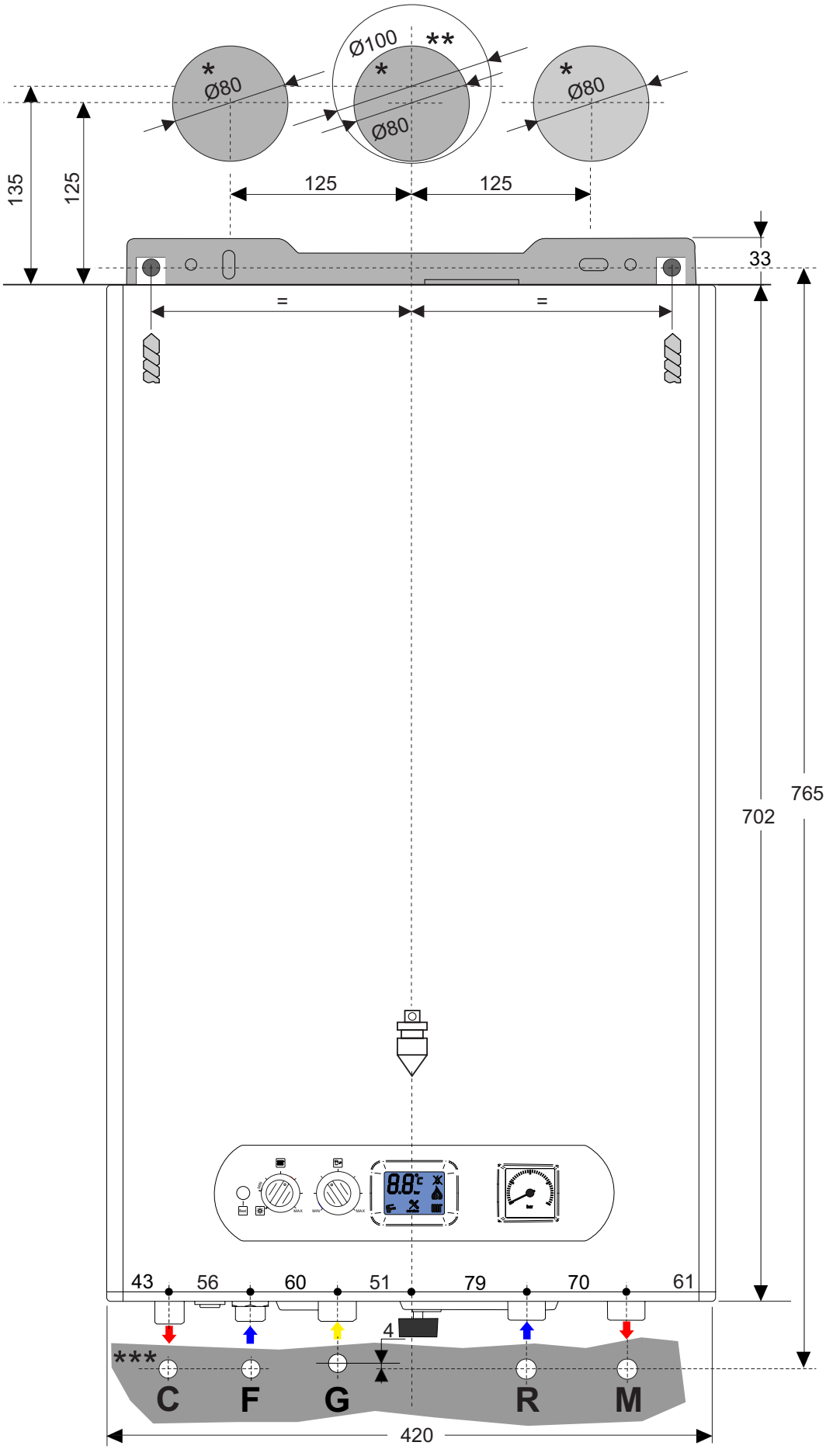
When choosing the place of the installation of the appliance, follow the safety instructions below:

- 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.

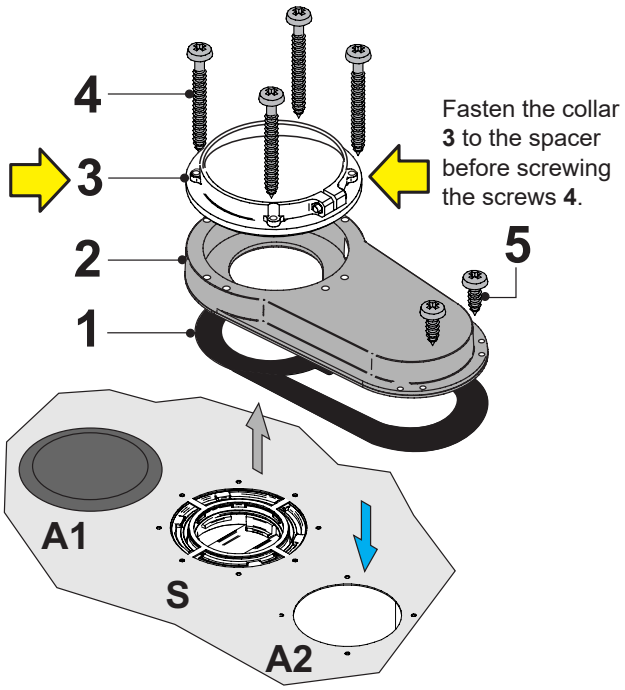
Since the temperature of the wall on which the boiler is installed and the temperature of the coaxial exhaust pipe do not exceed, in normal operating conditions, a room temperature beyond 60 K, it is not necessary to observe the minimum distances from flammable walls.
For boilers with double intake and exhaust pipes, in the event of crossing flammable walls, insert insulation between the wall and the flue gas exhaust pipe.



3.5.1 - REFERENCES FOR BOILER POSITIONING

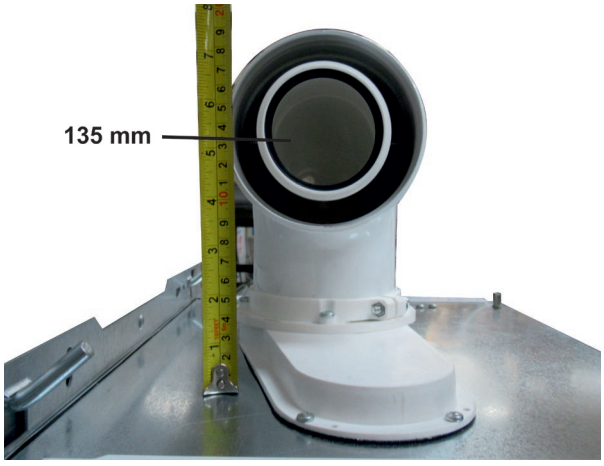


WARNING!
Fit gasket **1,** secure with screws **4** and **5.**

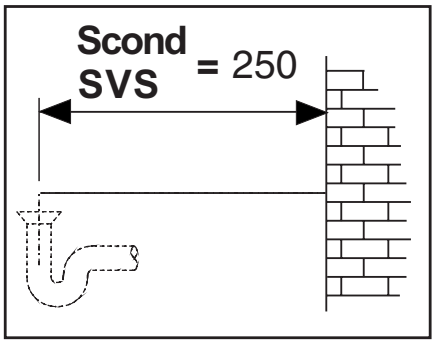


Fasten the collar **3** to the spacer before screwing the screws **4**.

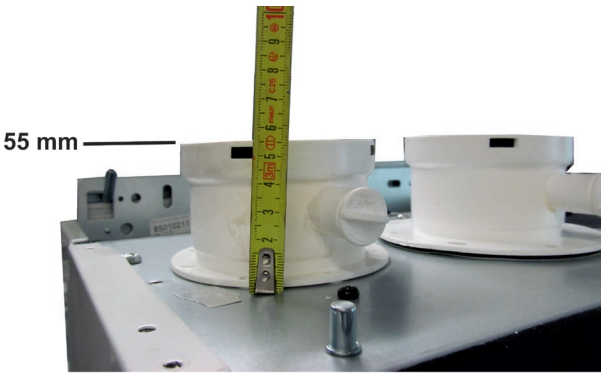
** references for coaxial outputs, **(kit a)**



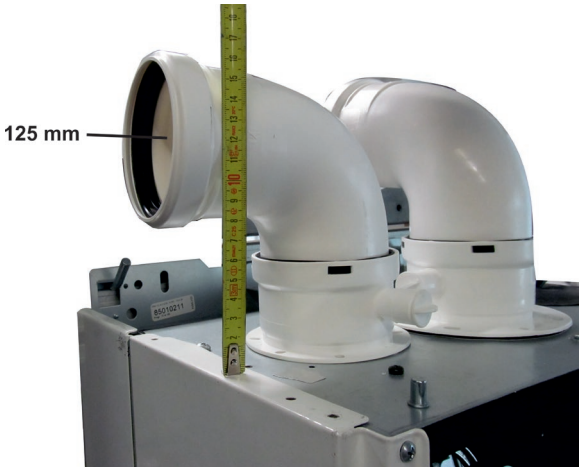
distance from safety relief valve wall / condensate drain



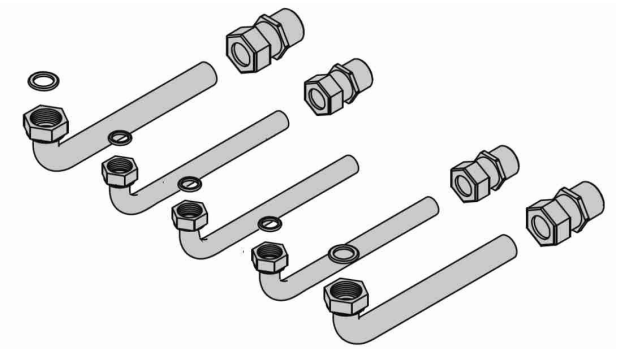
* references for twin output Ø 80.



* references for twin outputs Ø 80 **(kit b)**



*** hydraulic outlets reference for installation with horizontal pipe kit 00362527



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 replace the flue gas pipe as well.
The boiler is type approved for the exhaust configurations listed below:

(*) 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.

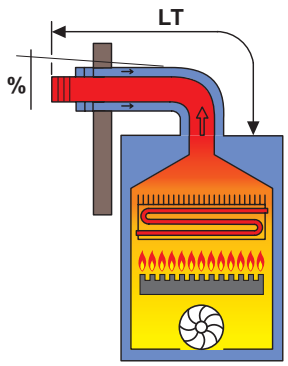
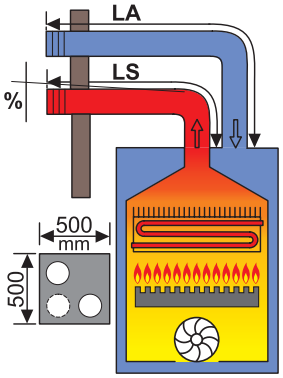
Calculation to determine the lengths of the exhaust configurations

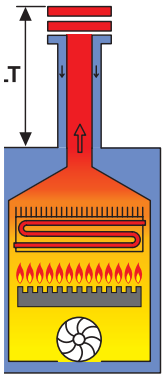
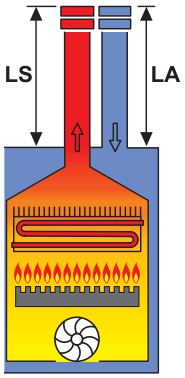
CAUTION
LT** total length is a reference value for the dimensioning of the ducts of **A** (intake) and **S** (Exhaust).

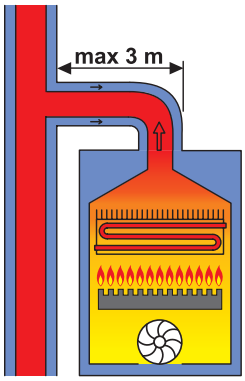
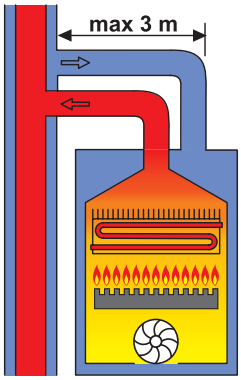
Subtracting the values of **LT** reported, at values of bends* / terminals* / extensions* you get the value:
if > 0 = OK
POSSIBLE configuration

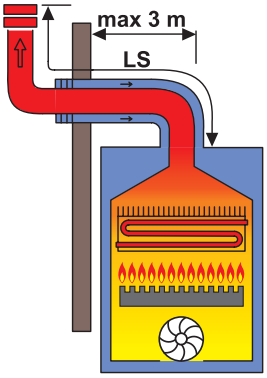
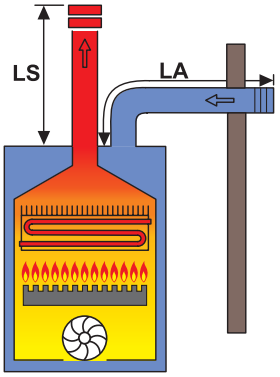
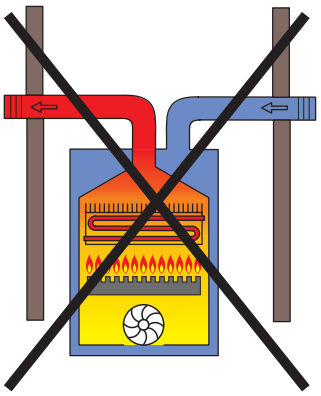
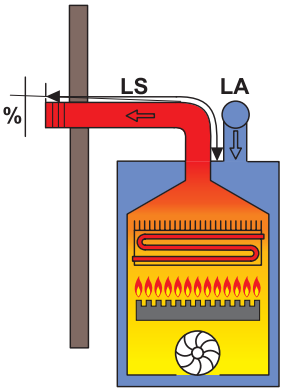
if < 0 = NO
WRONG configuration

ATTENTION
[m] = equivalent meters
(*) Values in the **MT018** available on the website (technical info section)

C(13) 3 x		C(13) 3	
			
% Slope towards inlet = 3%			
LT** (TOTAL LENGTH or 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..			

C(33) 3 x		C(33) 3	
			
LT** (TOTAL LENGTH or 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.			

C(43) 3 x	C(43) 3
	
<u>Collective chimney flue</u> system, consisting of two pipes, one for combustion air intake and the other one for combustion products evacuation, coaxial or double.	

C(53) 3 x	C(53) 3
	
C(53) 3 NOT ALLOWED	**C(53) 3**
	

LT** (LUNGHEZZA TOTALE o LAspirazione + LScarico)

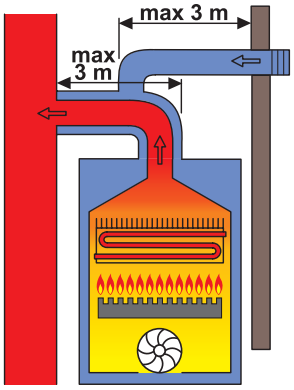
DOUBLE Ø80		DOUBLE Ø60	
FROM [m]	TO [m]	FROM [m]	TOA [m]
1 + 1	**40 (max 30 S)**	**1 + 1**	**20 (max 15 S)**

Separate combustion air intake and combustion products evacuation pipes.
These pipes can discharge into areas with different pressure.

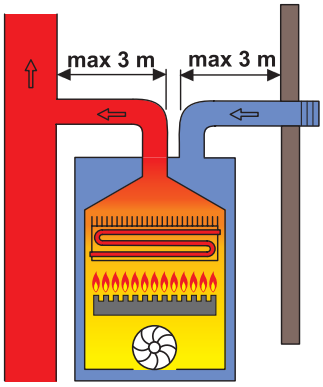
C63x	C63
Boiler intended for connection to a combustion air intake and combustion products evacuation system, approved and sold separately	

ATTENTION:
The flue must comply with standards in force.

C(83) 3 x

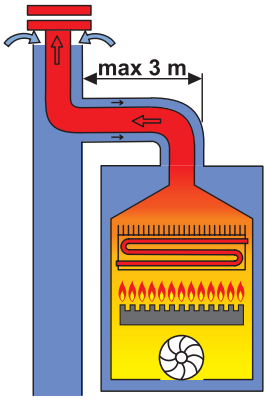


C(83) 3

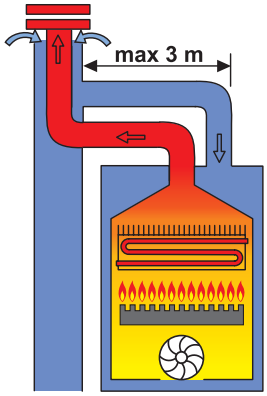


Connection to a terminal for combustion air intake and flue gas exhaust via a single or collective chimney.

C(93) 3 x

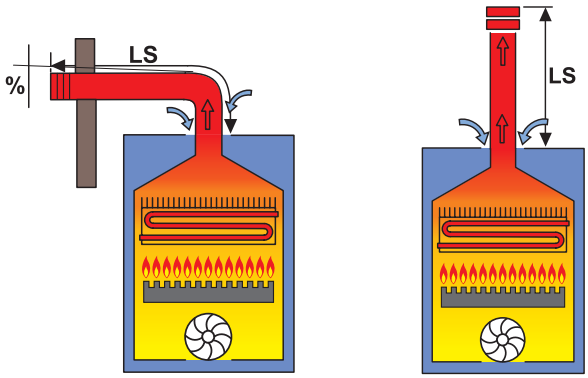


C(93) x



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

B(23) 3 P



TOTAL LENGTH (LS)	
DOUBLE Ø80	
FROM [m]	TO [m]
1	**30**
DOUBLE Ø60	
FROM [m]	TO [m]
1	**15**
DOUBLE Ø50	
FROM [m]	TO [m]
1	**10**

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
Ø 50 smoke exhaust, only for type B23P type and C53.

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

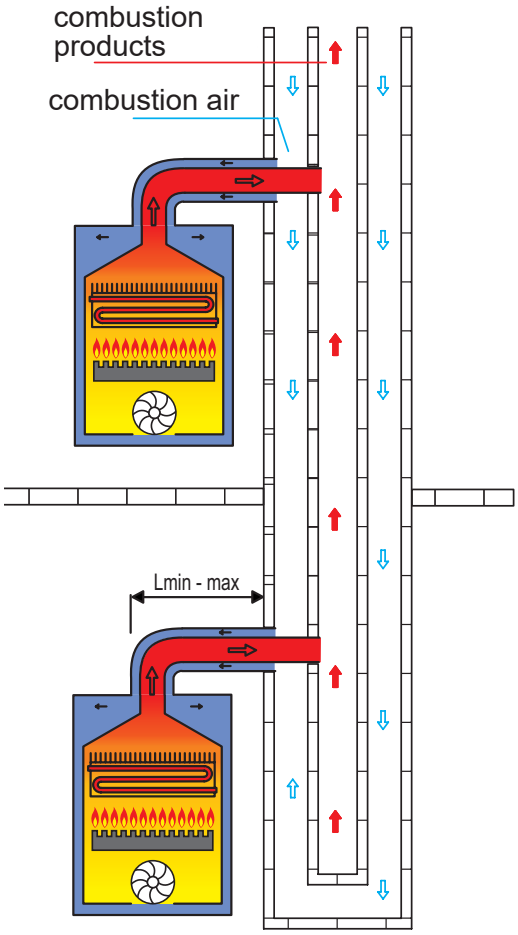
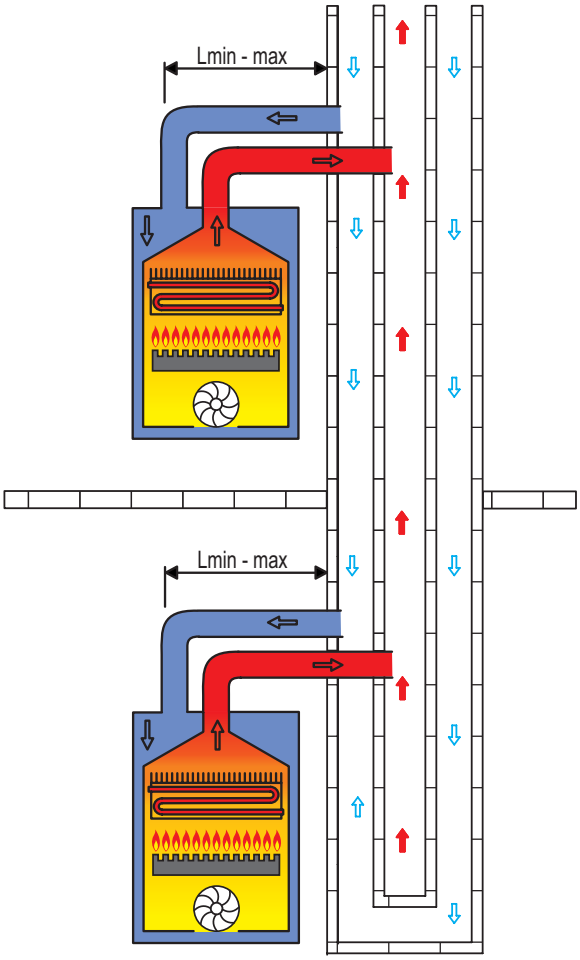
3.6.1 - Installation on collective flues in positive pressure

The collective flue is a smoke exhaust system suitable for collecting and expelling the combustion products of multiple appliances installed on multiple floors of a building.
Positive pressure collective flues can only be used for type C condensing appliances. Consequently, the B53P / B23P configuration is prohibited.
The installation of boilers on pressurized collective flues is permitted exclusively to
G20.
The boiler is sized to function correctly up to a maximum internal pressure of the flue not exceeding 25 Pa.
Make sure that the air intake and combustion product exhaust ducts are watertight.

Note:
for use in configuration **C (10)**
with optional clapét
(only for G20 methane).

It is possible to install the appliance in configuration **C (10)** only with the optional accessory. “clapét” provided by Unical.
Use of clapét as an accessory and requires a dedicated set of parameters to compensate the pressure drop introduced.

Note: Parameters are released by after-sales service upon request of installer / reserved technical area site.

C(10) 3 x	C(10) 3
	

Slope towards the entrance = 3%

Lmin-Lmax (Minimum and maximum LENGTH at the flue entrance)

COAXIAL Ø60/100		DOUBLE Ø80	
FROM [m]	TO [m]	FROM [m]	TO [m]
-	**-**	**0,5+0,5**	**4,5+4,5**
COAXIAL Ø80/125			
FROM [m]	TO [m]		
0,5	**4,5**		

Horizontal exhaust and intake terminals directed externally via coaxial or split type ducts.

FOLLOWS: Installation on collective flues in positive pressure

WARNINGS:



- The appliances connected to a collective flue, must all be of the same type and have equivalent combustion characteristics.

- The number of devices that can be connected to a collective flue in positive pressure is defined by the designer of the flue.
The boiler is designed to be connected to a collective flue sized to operate in conditions in which the static pressure of the collective flue duct can exceed the static pressure of the collective air duct by 25 Pa in the condition in which n-1 boilers work at maximum flow rate nominal heat and 1 boiler at the minimum heat input allowed by the controls.

- The assembly of the ducts must be carried out in such a way as to avoid condensation which would prevent the correct evacuation of the combustion products.

- A data plate must be present at the connection point with the collective smoke duct. Data plate must contained the following information:
- the collective flue is sized for type C (10) boilers
- the maximum mass flow rate allowed of combustion products in Kg/h.
- size of the connection to common ducts
- a warning regarding openings for air outlet and product inlet of the combustion of the smokes collective air under pressure; such openings they must be closed and it must be verified their tightness when the boiler is disconnected
- name of duct manufacturer collective smoke or its identification symbol
- Refer to the regulations in force for the discharge of combustion products and local provisions

- The fume and intake duct must be appropriately chosen based on the parameters reported below



- Terminal of collective duct must generate a draft.

- Before carrying out any operation, disconnect the electrical power supply to the appliance.

- Before assembly, lubricate seals with non-corrosive grease.

- The exhaust duct must be inclined, in the case of a horizontal duct, by 3° towards the boiler.

- Number and characteristics of appliances connected to the collective flue, must be adequate to the characteristics of the collective flue.

- Condensation can flow inside the boiler.
The maximum recirculation value allowed in windy conditions is 10%.

- The maximum pressure difference allowed (25 Pa) between the inlet of the combustion products and the air outlet of a collective flue cannot be exceeded when n-1 boilers work at the maximum nominal heat output and 1 boiler at the output minimum temperature allowed by the controls

- The collective flue duct must be adequate for an overpressure of at least 200 Pa

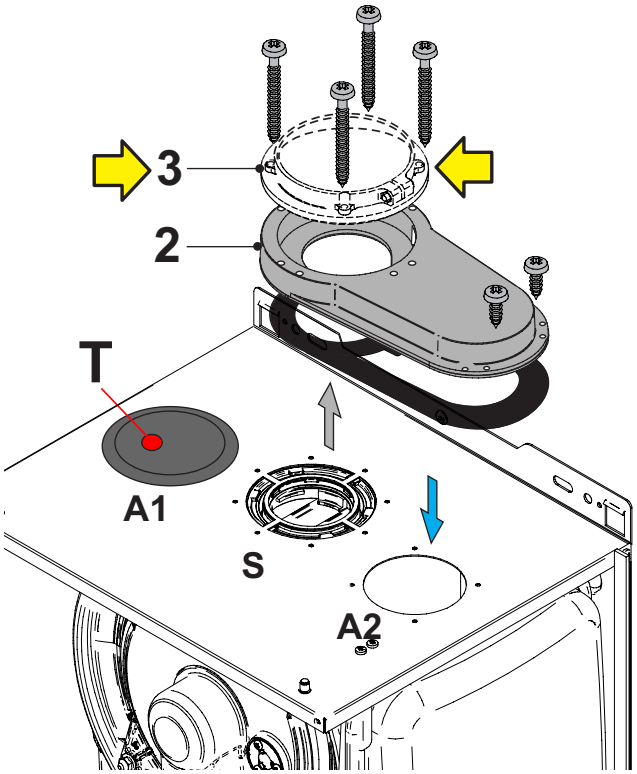
- The collective flue must not be equipped with a draft-breaking-windproof device.

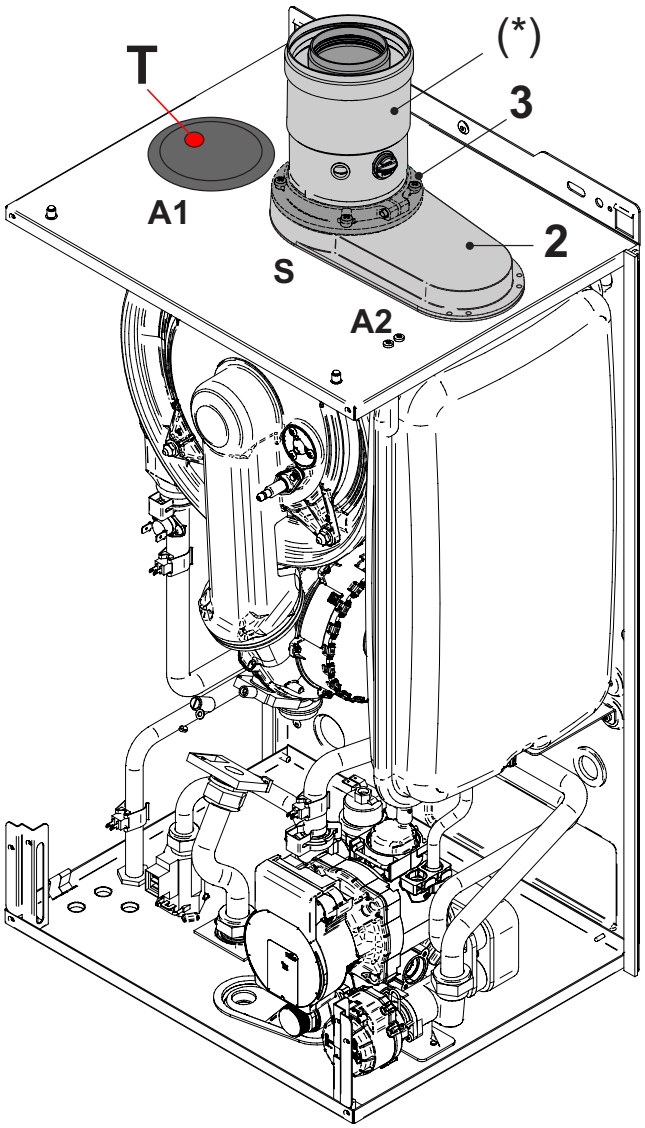
N.B.: The non-return valve (clapet) is a mandatory device in case of installations in positive pressure collective flue systems. **This is an optional kit not present inside the boiler.**

GENERAL INFORMATION ON THE FLUE GAS EXHAUST SYSTEM

For coaxial systems, mount always the suction adapter / exhaust **2** supplied with the boiler and **collar 3** (contained in coaxial fumes kit) as indicated.

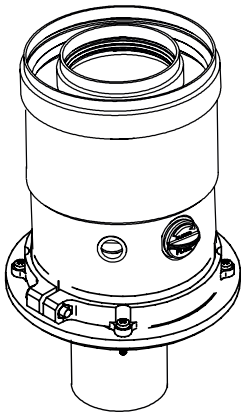
Attention: The air closure cap T must always be mounted on the air inlet hole Ø 80 **A1** or **A2.**



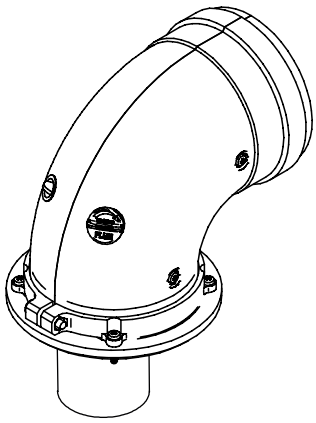


KIT A coax. Ø 100/60 = 00363010

00364867 (*)



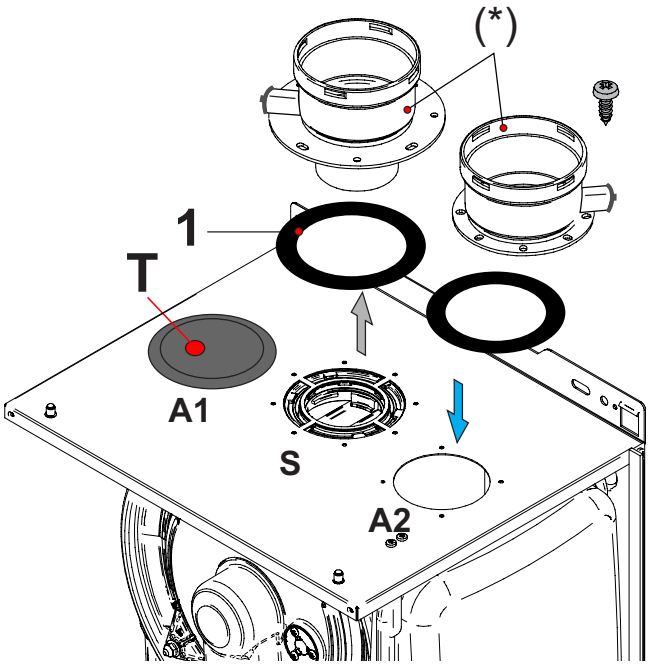
00363011 (*)

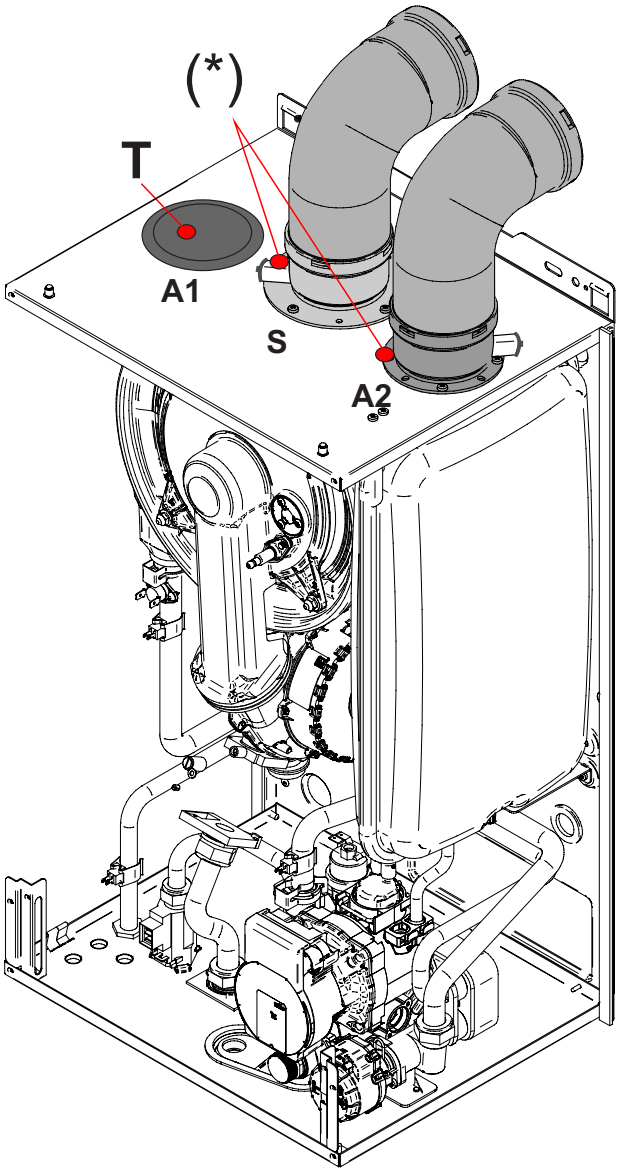


Concentric start

For split systems DO NOT USE THE INTAKE EXHAUST ADAPTER **2** supplied with the boiler. Use split system adapters (*) as indicated.

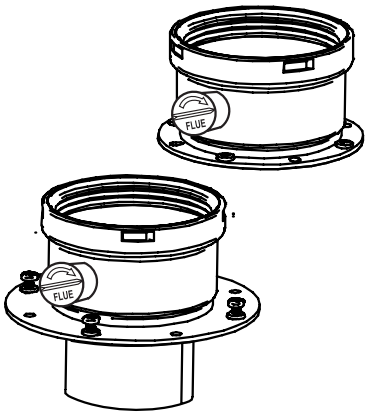
Attention: The air closure cap **T** d must always be mounted on the air inlet hole Ø 80 **A1** or **A2**. (the unused one)





KIT B double Ø 80 = 00364891

00364817 (*)



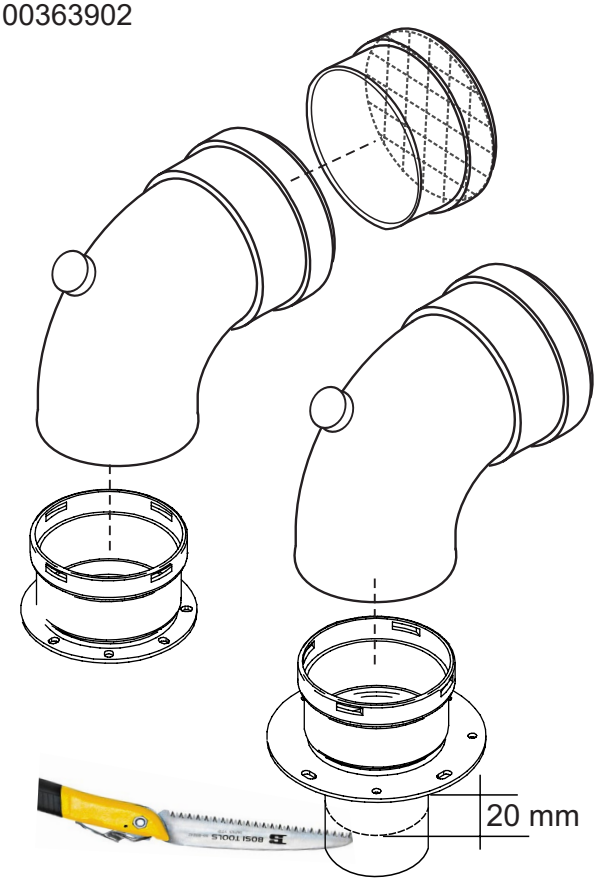
Adapter for double systems

For split systems DO NOT USE THE INTAKE EXHAUST ADAPTER **2** supplied with the boiler. Use split system adapters (*) as indicated.

Attention: The air closure cap **T** d must always be mounted on the air inlet hole Ø 80 **A1** or **A2**. (the unused one)

Type B22 for oudoor installation

00363902



Note: Cut a to the indicated measure

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

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.

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:
a) Do not operate electric switches, the telephone or any other object that may cause sparks;
b) Immediately open doors and windows to create air current to purify the room;
c) 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 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.**

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

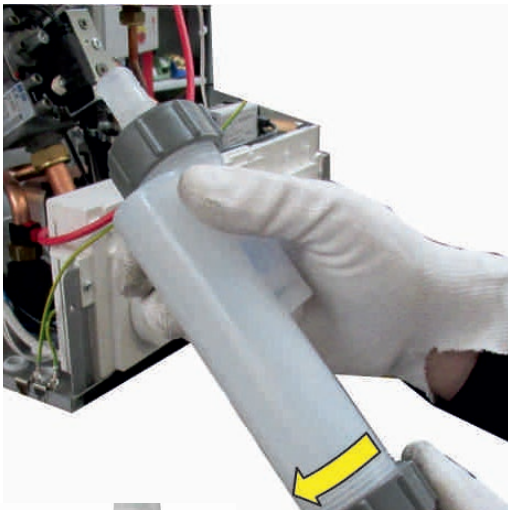
Condensation drain
The boiler, during the combustion process, produces condensation that, through pipe “A”, flows into the trap.
The condensation that forms inside the boiler flows into a suitable drain via pipe “B”.

Danger!
Before commissioning the appliance:
- check that the trap is assembled properly
- check that the condensation is drained properly

Check after few minutes of operation there are no combustion fumes from the condensate drain.

Assembly siphon

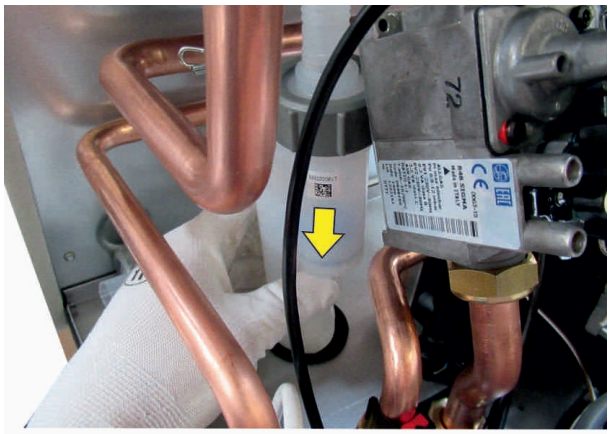
1

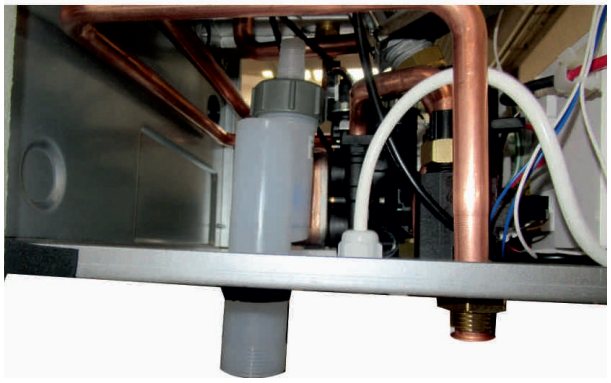


2



3

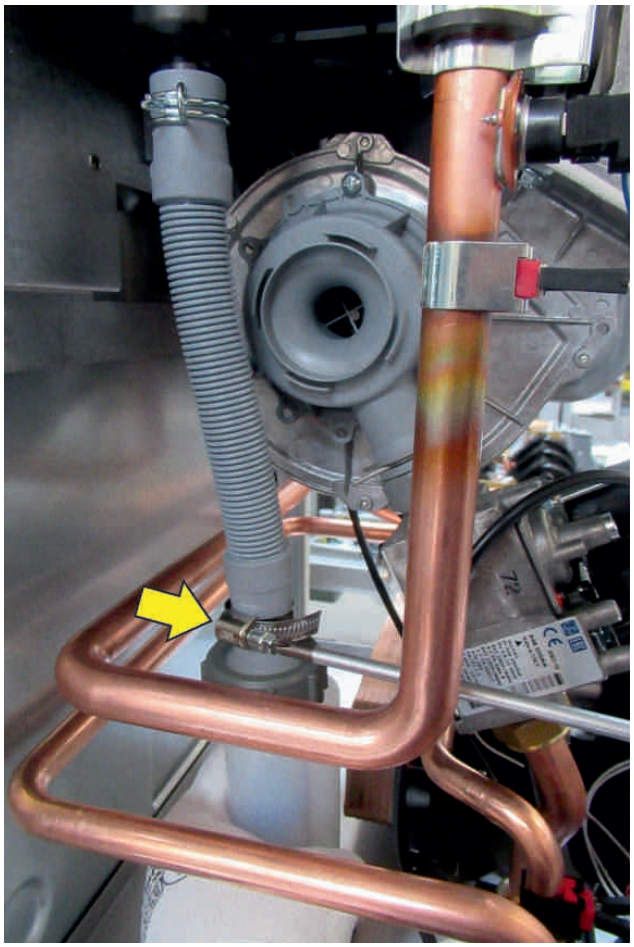


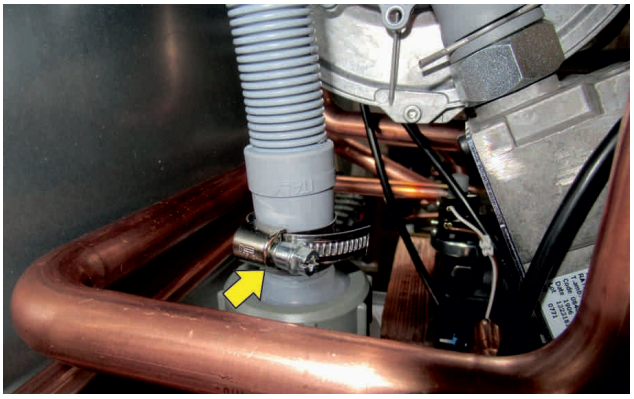


4



5





6



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.

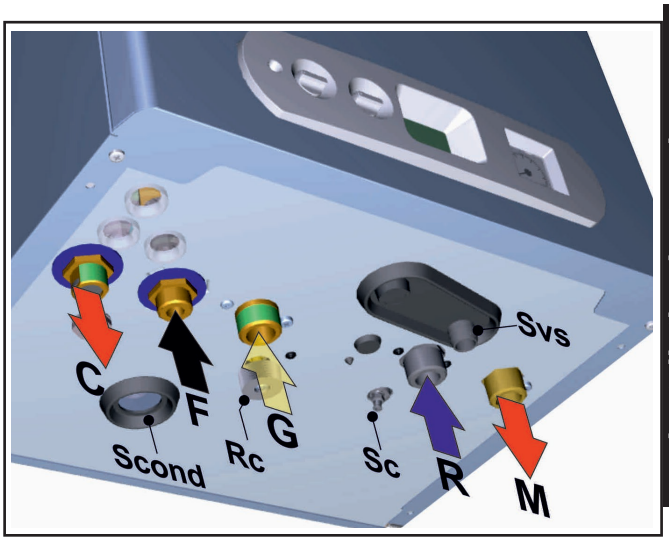
NOTE!
Further details in the section "Technical Information" on the boiler page of the www.unicalag.it website

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.
Unical 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.

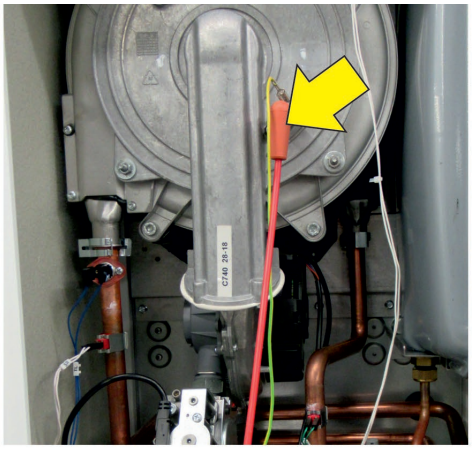


- make sure that all the connections are watertight.
- after commissioning the boiler (see par. 3.10) and bringing the system to the operating temperature, stop the boiler and repeat the air bleed operations.
- let the system cool down and, if necessary, return the water pressure to 0.8/1 bar.
  (See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

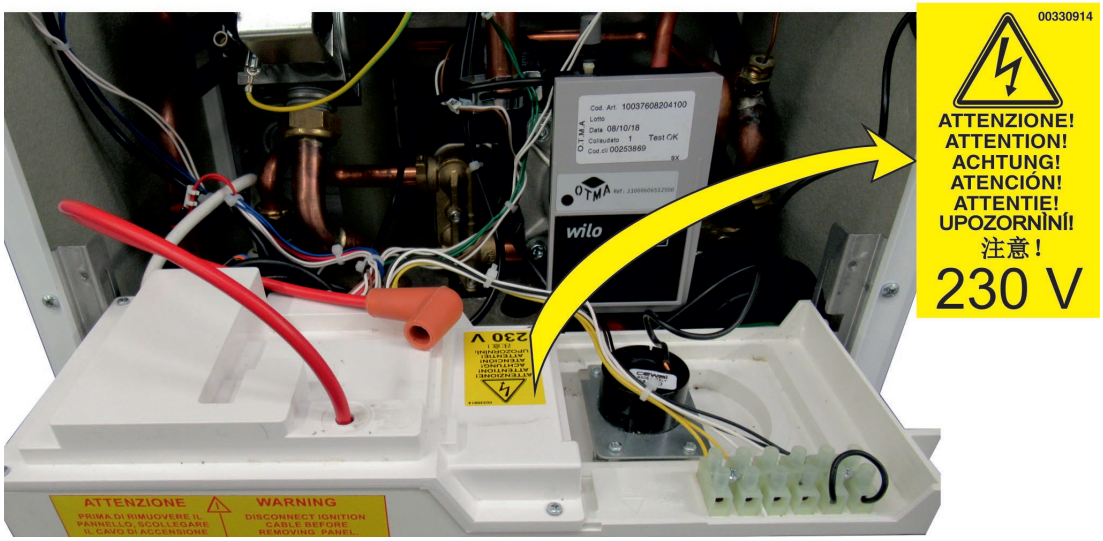
Danger of burns!
Attention to contact with flow pipe M and (if boiler combi) with hot water outlet pipe C.

3.9 - ELECTRICAL CONNECTIONS

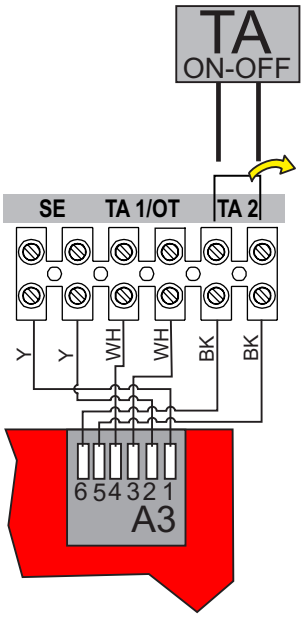
Danger!
Only a qualified technician may perform the electrical installation.
Before performing connections or any type of operation on electrical parts, always disconnect electrical power and make sure that it cannot be reconnected accidentally.



Attention, before rotate or removing panel.
Disconnect the indicated red ignition cable.

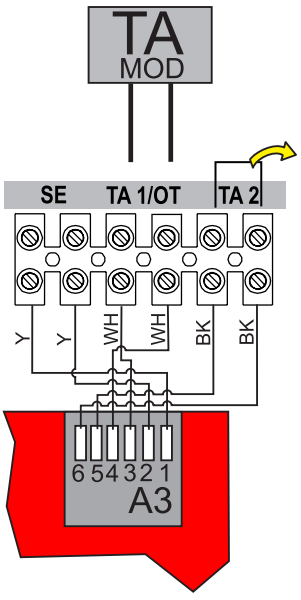


ON/OFF room thermostat connection (*)



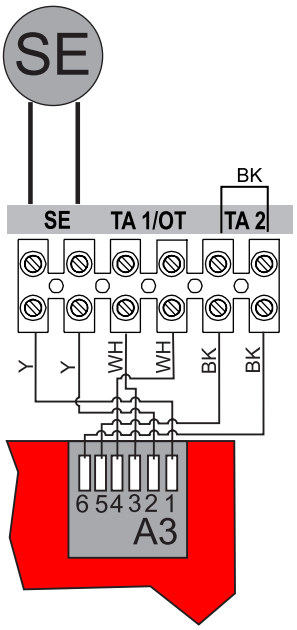
- Remove the jumper and connect the room thermostat wires between terminals TA 2.

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



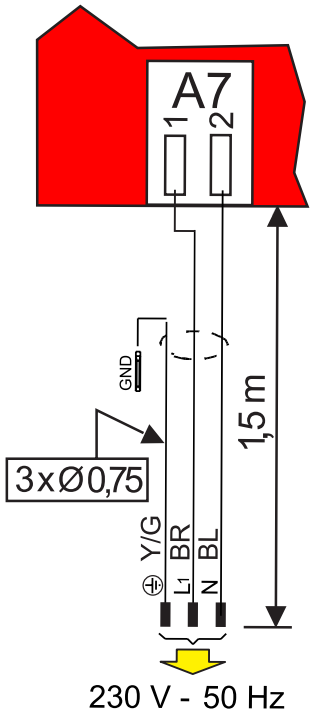
- Connect the modulating thermostat wire between terminals **TA1/OT** after having removed the jumper

External probe connection (*)



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

Electric power supply connection



See par. 4.5 positioning on the board
(*) Optional

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 **UNICAL AG S.p.A.**, using original spare parts only. Failure to comply with the above can jeopardise the safety of the appliance.

NOTE!
For further details refer to the Technical Information from the website (link at page 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?	☐
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?	☐
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?	☐
is the power supply of the boiler 230V - 50Hz?	☐
has the system been filled with water (approximately 0.8/1 bar pressure on the pressure gauge with the pump stopped)?	☐
Has the condensate drain trap been installed correctly as indicated in chapter 3.7?	☐
are any system shut-off gate valves open?	☐
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;	☐
is the gas supply valve open?	☐
has the system been checked for gas leaks?	☐
is the outside main switch ON?	☐
is the system safety valve efficient and is it connected to the drains? is the condensation drain trap connected to the drains?	☐
has the system been checked for water leaks?	☐
are the ventilation conditions and minimum distances to perform any maintenance ensured?	☐
have the GAS, HEATING and DOMESTIC HOT WATER pipes been cleaned thoroughly with products suitable for each circuit?	☐
has a surveillance and protection system against gas leaks been installed? (Optional)	☐
are the system pipes NOT used as the electrical system earthing?	☐
has the system been sized properly bearing in mind the radiator pressure drops? thermostatic valves, radiator stop valves	☐
has the operator been trained and has the documentation been supplied?	☐
Please tick the operations performed	

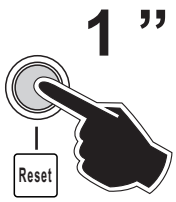
Switching boiler on and off

NOTE!
For further details refer to the Technical Information from the website (link at page 2).

3.10.1 - AIR BLEED FUNCTION OF BOILER / SYSTEM (AP)

The air bleed function is activated every time the boiler is powered electrically
(Power ON).
The procedure has a duration of 10 minutes and for the entire time of the procedure the display shows **AP** flashing.





Note.
The procedure can be forced to interrupt by pressing the release button for 1 s.

- In case of DHW request, the procedure is interrupted and at the end of the request is restarted.

ENGLISH

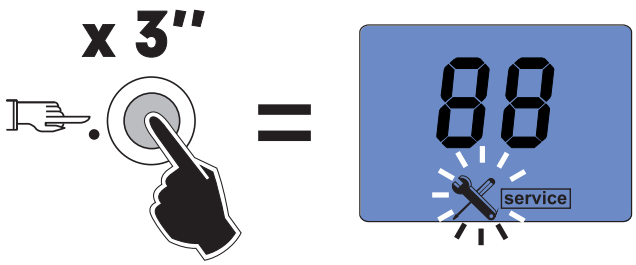
3.11 - MEASUREMENT OF COMBUSTION EFFICIENCY DURING INSTALLATION

3.11.1- ACTIVATION OF THE CALIBRATION FUNCTION

ATTENTION!
Function reserved for Authorised Assistance Centres only.

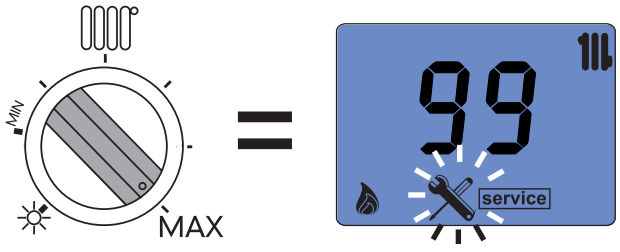
The user is NOT authorised to activate the function described below.

1 ACTIVATION



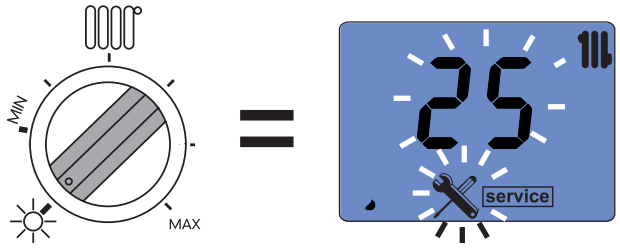
By pressing the button (**D**) for 3 seconds, the calibration function is activated. Release it when the SERVICE symbol appears, **Do not press it for more than 9” (par. 4.2)** This function is not activated if there is a block or domestic hot water request.

2 MAXIMUM OUTPUT



By turning the knob (B) onto MAX, the boiler will operate at **maximum output:**
- 2 illuminated symbols:
- 1 flashing service

3 MINIMUM OUTPUT



By turning the knob (B) in position , the boiler will operate at **minimum output**:
- 2 illuminated symbols
- 2 flashing service and indication Value.

4 DISABLING

The “calibration” function stays active for 15 minutes.

To disable the **CALIBRATION** function before the time elapses, switch the boiler on and off again by acting on the main switch.

Installation Instructions

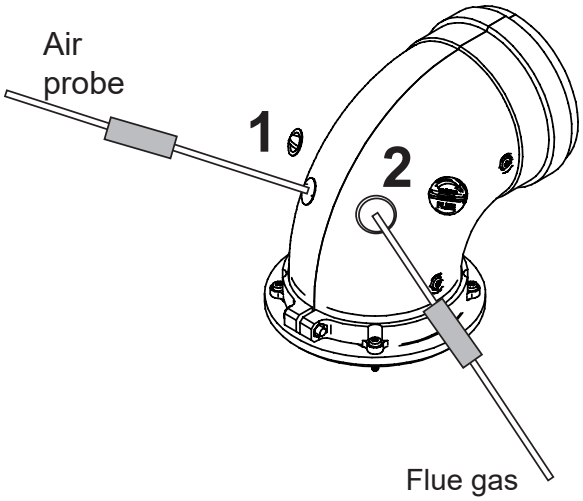
3.11.2 - POSITIONING THE PROBES

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 CO_2 taken in the relevant hole **2**.

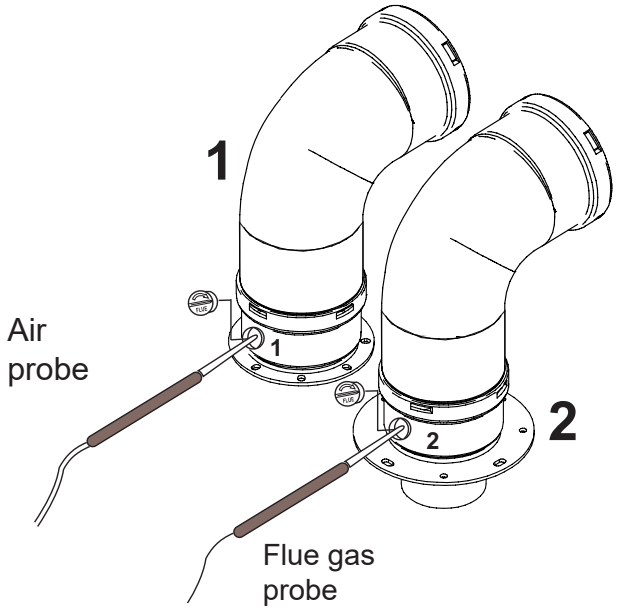
Take the measurements with the generator in steady state conditions (see par. 3.11.1).

N.B.: Insert the smoke probe only afterwards ignition of the burner, this in order to avoid saturation of the analyzer cells.

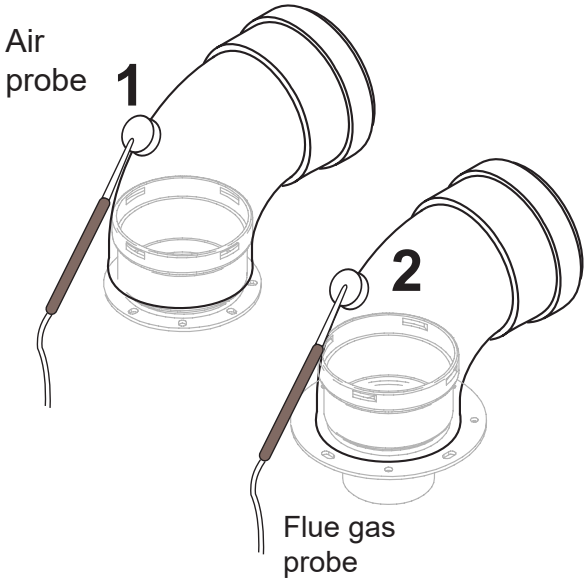
A **COAXIAL PIPES**



B **SEPARATE PIPES**



C **PIPES Ø 80 TYPE B23**



3.12 - ADJUSTING THE BURNER

Attention, during these operations do not take any samples in DHW mode.

All boilers leave the factory already calibrated and tested, however in the event the gas valve recalibration is required:

- Remove the cap and insert the CO2 analysis probe in the flue gas sample point of the intake/ exhaust terminal, see chap. 3.11.2.

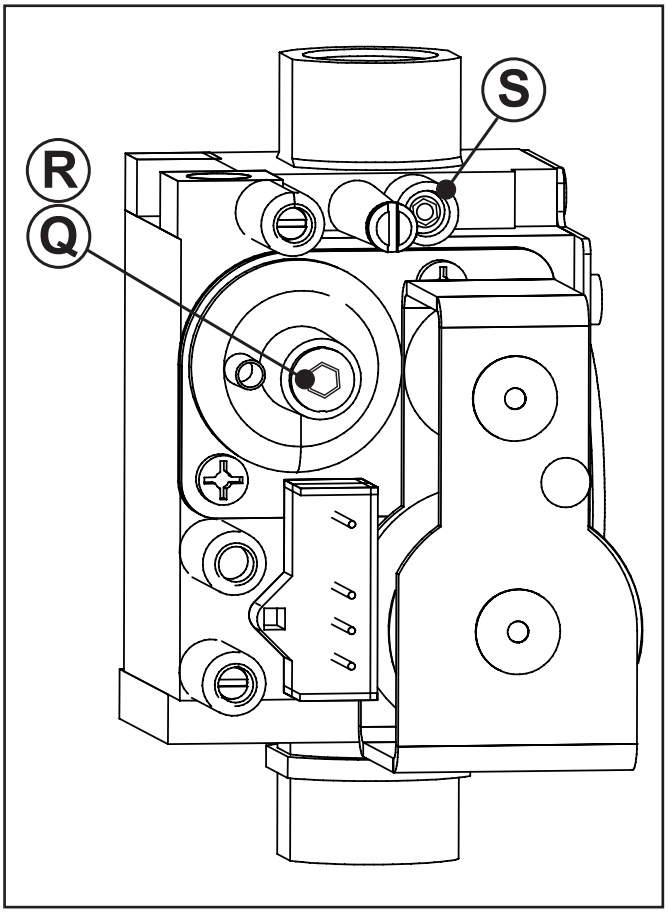
The following instructions are intended exclusively for **authorised service personnel**.

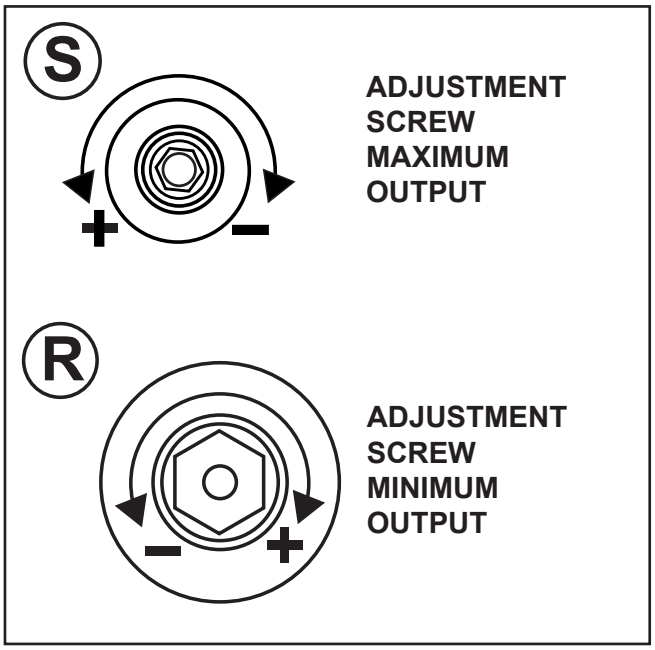
1) Maximum output adjustment

- Operate the boiler in “calibration” mode at MAXIMUM OUTPUT (see 3.11.1)
- Once the burner is on check that the CO_2 “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_2 “MINIMUM” value corresponds to that indicated in the table “NOZZLES - PRESSURE”.
- Correct it if needed (removing the screw cap Q) by turning (with a screwdriver) the screw **“R”;** CLOCKWISE to increase it, ANTICLOCKWISE to decrease it





3) Conclusion of the basic calibrations

- once the CO_2 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_2 values must be calibrated with particular attention, observing the values indicated in the table.

NOZZLES - PRESSURE - FLOW RATES TABLE

Check the levels of CO2 often, especially with low flow rates. They refer to the boiler with a closed combustion chamber.

X R 24 - X C 24 (referring data to CH mode)

Type of Gas	Effective Output [kW]	Heating Thermal Capacity [kW]	Supply Press. [mbar]	Fan speed [rpm]		Collector diaphragm [Ø/n. holes]	Dia-phragm VG [Ø]	CO_2 levels [%]		(*) - Levels O_2 [%]		Con-sumpt. [m³/h] [kg/h]	Con-sumpt. [m³/h] [kg/h]	Start-up power **IG** [%]
				min	max			min	max	min	max	min	max	
Nat. gas (G20)	4,8 - 23,4	5 - 24	20	1300	5000	-	5,8	9	9	4,8%	4,8%	0,53	2,54	40
Nat. gas (G25)	4,8 - 23,4	5 - 24	25	1300	5000	-	6,5	9	9	-	-	0,61	2,95	40
Propane (G31)	4,8 - 23,4	5 - 24	37	1300	4800	-	4,7	10,2	10,2	-		0,39	1,86	40
± 0,2 Acceptable range of CO_2 for G20 / G25						± 0,2 Acceptable range of CO_2 for G31								
± 0,4 Acceptable range of O_2 for 20%H_2NG														

X R 32 - X C 32 (referring data to CH mode)

Type of Gas	Effective Output [kW]	Heating Thermal Capacity [kW]	Supply Press. [mbar]	Fan speed [rpm]		Collector diaphragm [Ø/n. holes]	Dia-phragm VG [Ø]	CO_2 levels [%]		(*) - Levels O_2 [%]		Con-sumpt. [m³/h] [kg/h]	Con-sumpt. [m³/h] [kg/h]	Start-up power **IG** [%]
				min	max			min	max	min	max	min	max	
Nat. gas (G20)	4,8 - 31,2	5 - 32	20	1300	6600	-	5,8	9	9	4,8%	4,8%	0,53	3,38	40
Nat. gas (G25)	4,8 - 31,2	5 - 32	20	1300	6600	-	6,5	9	9	-	-	0,61	3,94	40
Propane (G31)	4,8 - 31,2	5 - 32	37	1300	6300	-	4,7	10,2	10,2	-		0,39	2,48	40
± 0,2 Acceptable range of CO_2 for G20 / G25						± 0,2 Acceptable range of CO_2 for G31								
± 0,4 Acceptable range of O_2 for 20%H_2NG														

(*) If a Hydrogen Ready installation is envisaged, for all calibration operations refer to the table overlying with the O_2 % content in the fumes.
The O_2 values refer to the 20%H NG gas.

Important
This appliance is suitable for the category containing up to 20% hydrogen (H2). Due to variations in the H2 percentage, the O2 percentage may vary over time depending on the quality of the gas supplied by the distributor.
If a Hydrogen Ready installation is envisaged, refer exclusively to the O2 value shown in the nozzles - pressures - flow rates table.

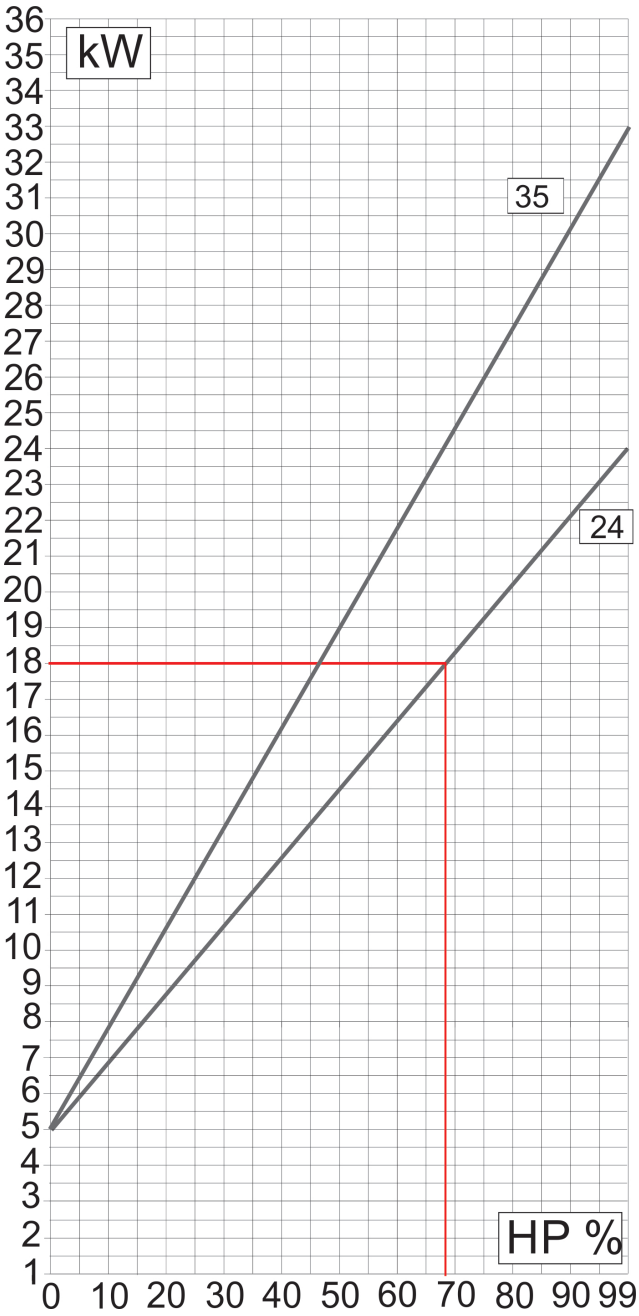
3.12.1 - ADAPTATION OF THE POWER TO THE HEATING SYSTEM

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 output value.

Act on parameter **HP** (par. 4.2 parameters that can be edited from control panel) to achieve the value corresponding to the desired output.

E.g.: **X 24**
to decrease the output of the boiler to 18 kW, edit parameter HP (about 68).



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.
- 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 on
- Make sure the appliance is gas tight and watertight.
- 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 **(26)**	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 **(24)**	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.
(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.
Some service parameters can be edited from the control panel:

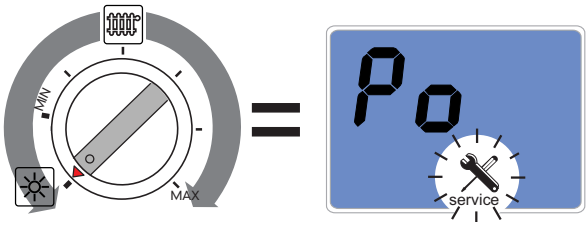
1 ACTIVATION



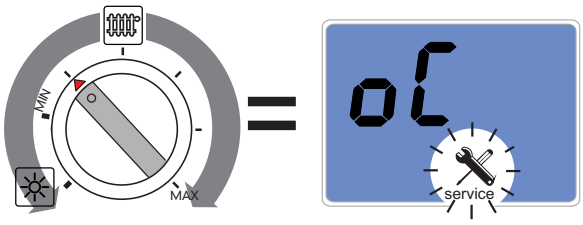
By pressing the button (**D**) for 10 seconds, the function is activated when the key flashes on the display

2 SELECTION

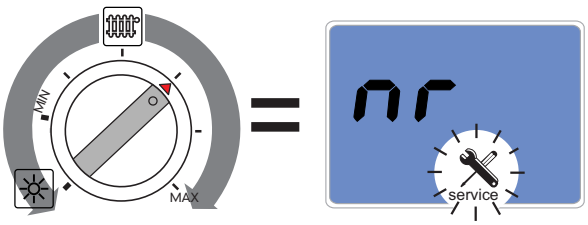
Turn the HEATING knob ''B''



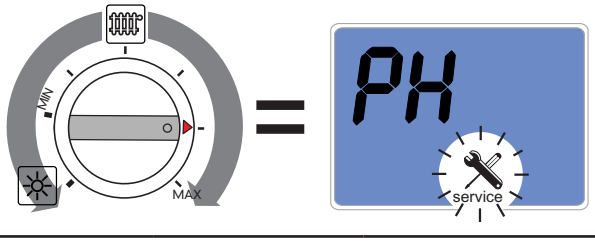
PUMP POST CIRCULATION		
VALUES		
FROM	TO	DEFAULT
0 (5 min)	**1** (ALWAYS)	**0** (5 min)



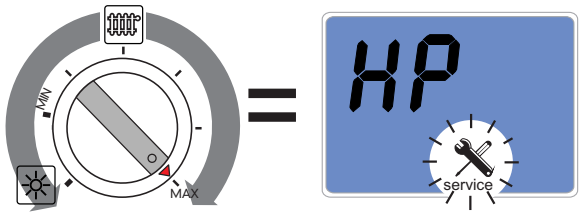
EXTERNAL PROBE TEMPERATURE		
VALUES		
FROM	TO	DEFAULT
0 (- 20°C)	**30** (+ 10°C)	**20** (0°C)



NIGHT REDUCTION			
VALUES			
FROM	TO	TO	DEFAULT
0 (TA -0°)	**5** (TA -5°)	**30** (TA -30°)	**0** (TA -0°)



PREHEATING		
VALUES		
FROM	TO	DEFAULT
0	**1**	**0**



MAXIMUM HEATING OUTPUT		
VALUES		
FROM	TO	DEFAULT
0 (Min)	**99** (Max)	**99**

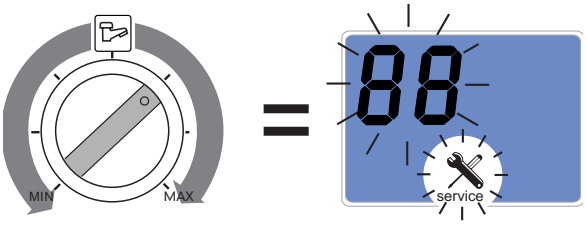
3 CONFIRM SELECTION



Confirm the parameter to be edited by pressing the unblock key

4 EDITING THE VALUE

Turn the DOMESTIC HOT WATER knob ''C''



Il valore lampeggia sul display.

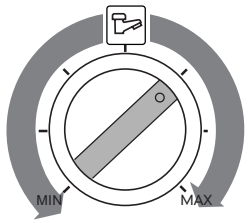
5 CONFIRM VALUE



Confirm the value by pressing the unblock key

6 PARAMETER SELECTION

Go back to section **2**.

7	DISATTIVAZIONE
	To exit the parameters list wait for 20” or quickly turn the domestic hot water knob **“C”**.

4.3 - ADAPTATION TO THE USE OF OTHER GAS

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

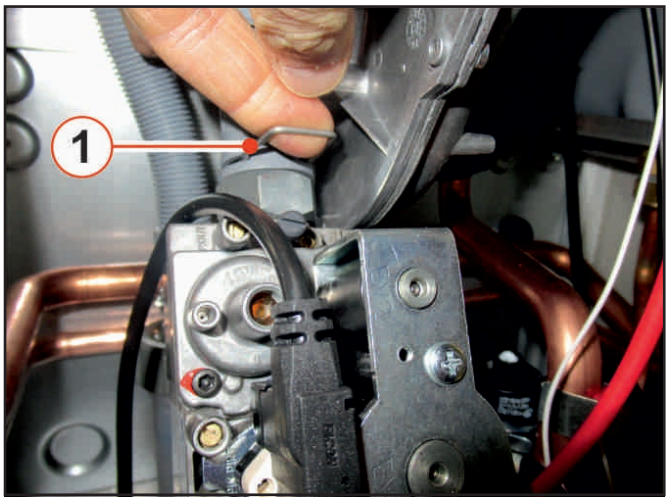
DANGER!
The conversion for the operation of the boiler with a type of gas other than that specifically required in the order, must be performed by professionally qualified personnel, in compliance with the standards and regulations in force.
The manufacturer cannot be held liable for any damage resulting 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.

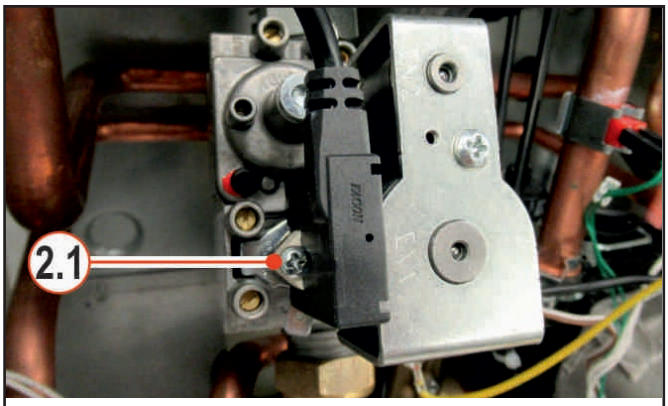
ATTENTION!
Indications for propane gas-fired appliances. Make sure that the gas tank has been deaerated before installing the appliance.
For state-of-the-art deaeration of the tank, contact the LPG supplier or a person qualified in compliance with law.
If the tank has not been professionally deaerated, ignition problems could arise.
In that case, contact the supplier of the LPG tank.

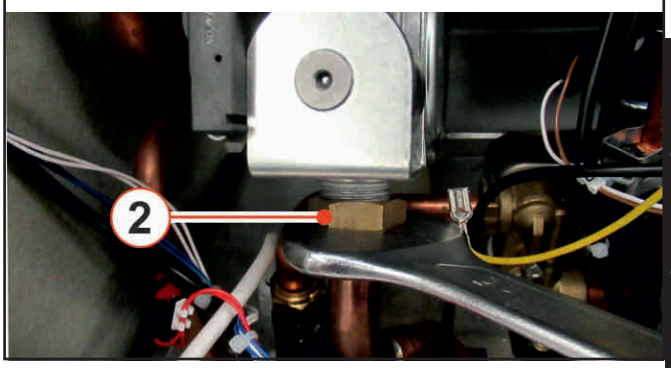
To convert the boiler from one type of gas to another, proceed as follows:

- Disconnect the appliance from the elctrical power supply
- Close the gas inlet tap

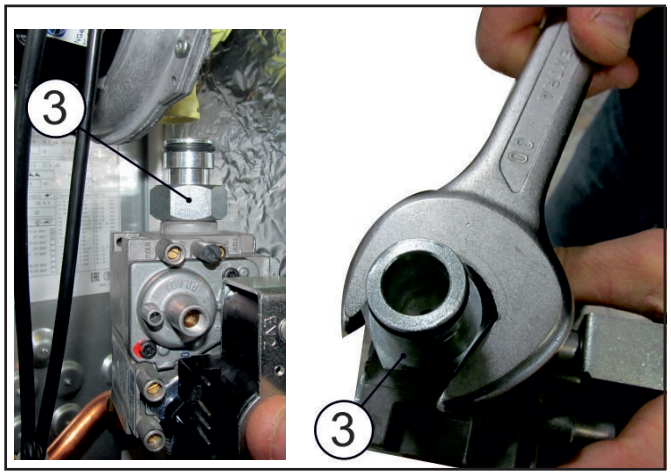


- Remove gas valve (remove fixing clip 1)

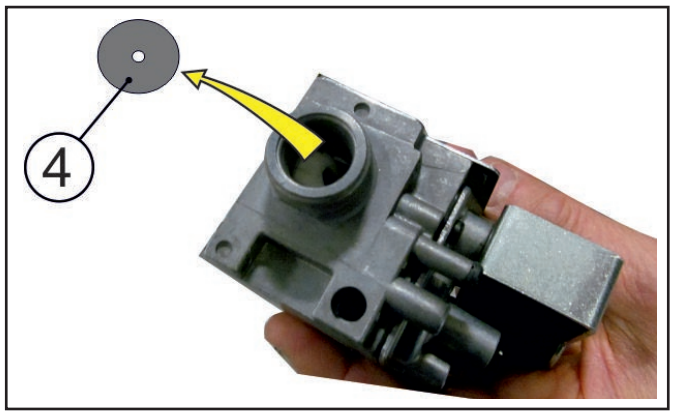




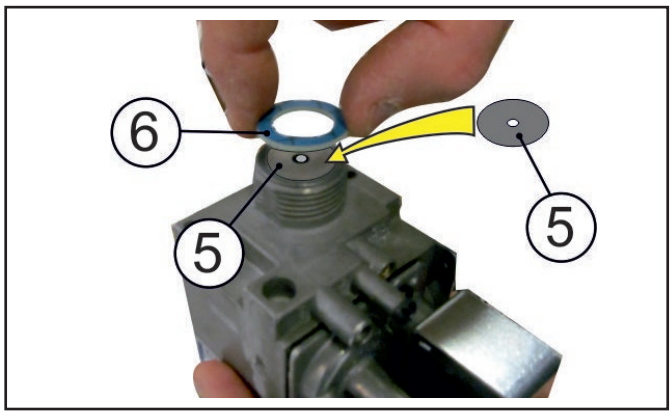
- remove the gas valve connector **2.1**
- disconnect the earth cable by pressing on the blade spring faston connected on the VG body.
- disconnect the red ignition cable
- unscrew fitting 2 (flat key 30mm).



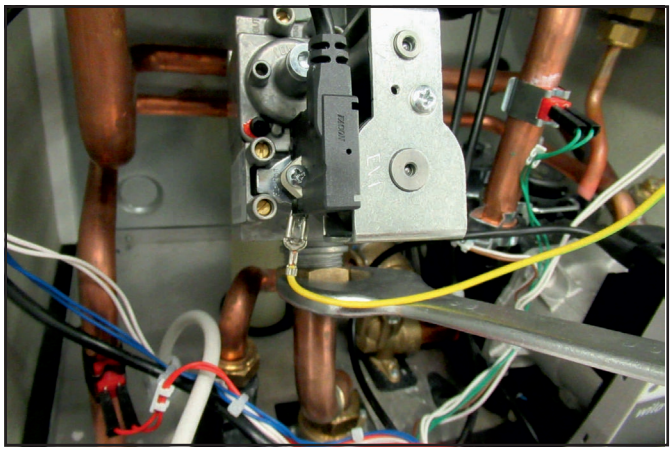
- Remove fitting **3** on gas valve (flat key 30 mm)



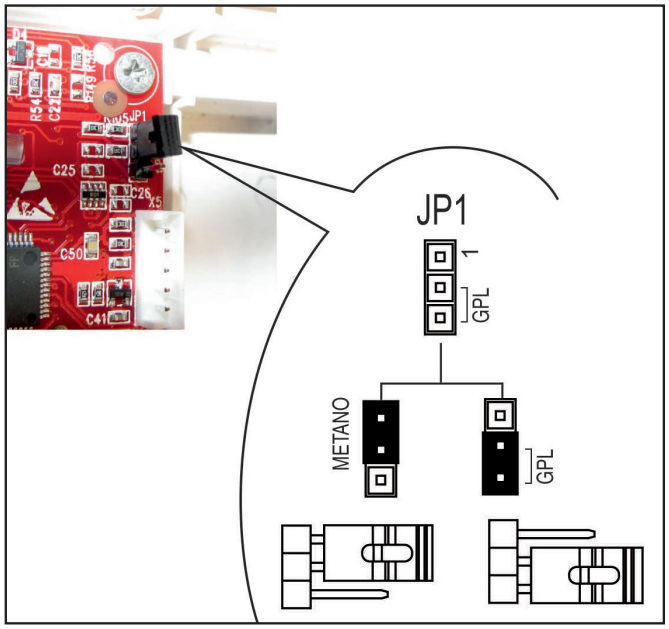
- Remove Diaphragm VG **4**



- Insert new diaphragm **5 (**contained in the gas conversion kit supplied with the boiler)
- Insert gasket **6**



- Proceed with assembly in reverse order.

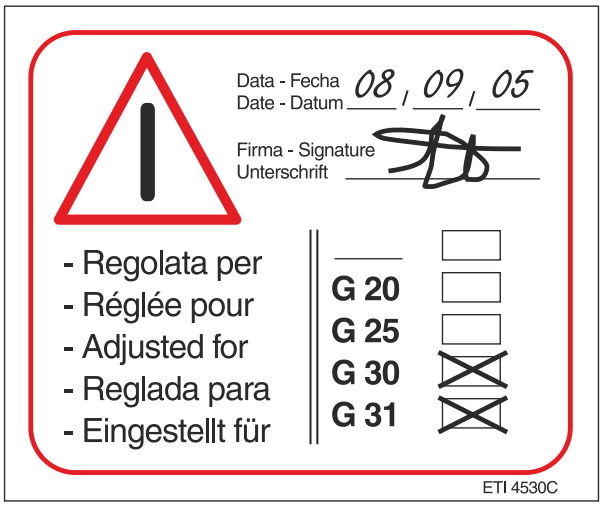


- Access the modulation board contained in the electric panel and position the jumper in the position corresponding to the new type of gas indicated in the figure;

4.3.1 - Ending of gas transformation

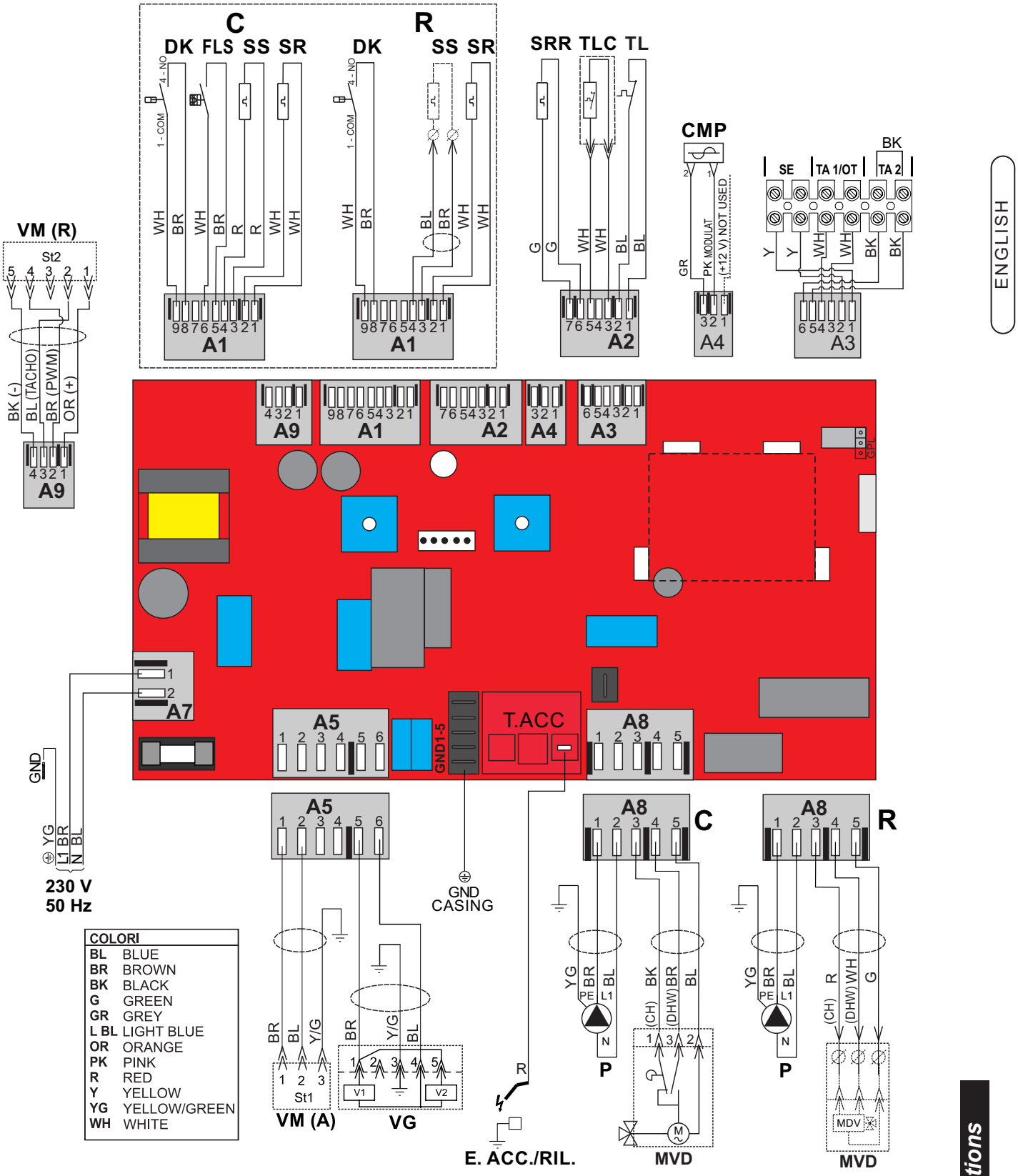
- Close the electric panel and restore the appliance's electric power supply;
- Check the pressure value upstream of the gas valve (see table "NOZZLES - PRESSURE") and adjust the CO_2 as indicated in paragraph "3.12";
- Check that the burner is working properly;
- **Check that there are no gas leaks.**
- **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



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

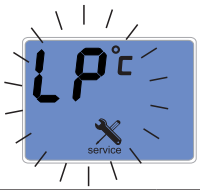
Practical connection board



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

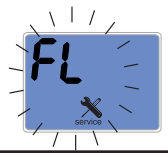
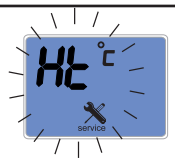
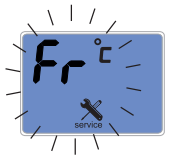
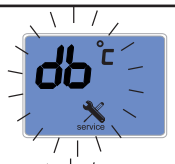
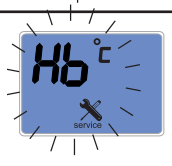
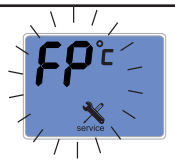
SRR	Return heating sensor
SS	Domestic hot water probe (Pred. for R models)
TL	Limit thermostat
TLC	Flue gas collector limit thermostat
VG	Gas valve
VM	Modulating fan
SE	External probe connection terminals
TA1 / OT	Modulating TA connection terminals
TA2	On/off TA connection terminals

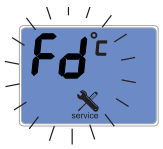
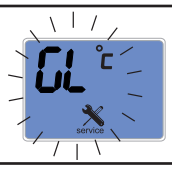
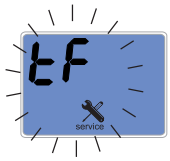
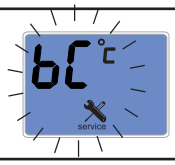
4.6 - ERROR CODES

	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 the unblock key 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:

(Num) = see key Par. 2.2

SYMBOL	CODE REGOLA-FACILE	PRIO-RITY	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)**
	**30**	2	**SERVICE PARAMETERS** Service parameters altered due to possible electromagnetic interferences	Reset the altered parameters via the panel and/or regola-facile
	**21**	3	**POOR WATER CIRCULATION** Poor circulation in primary circuit	Check pump operation **(12)** and speed, if there are any obstructions or system closure.
	**17**	4	**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**	5	**WATER CIRCULATION INSUFFICIENT** Primary circuit water circulation insufficient ($\Delta t > 35°$ C)	Check pump operation **(12)** and speed - remove any heating system obstructions - clean the scaled domestic hot water exchanger
	**22**	6	**INCORRECT SENSOR POSITIONING** Flow and return sensors inverted	Check the wiring **(11) (22)**

	**24**	7	**SPEED OUT OF CONTROL** Alteration of the fan speed; the speed is not reached.	Check fan operation **(18)** and the connections.
	**26**	8	**SPEED OUT OF CONTROL** Alteration of the fan speed; the speed is above that requested.	Check fan operation **(18)** and the connections.
	**6**	8	**HIGH TEMPERATURE** Boiler temperature too high.	Check pump operation and if needed clean the exchanger **(24)**
	**8** NO WATER	9	**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.
	**16**	10	**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.
	LIMIT THERM.	11	**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.
	**13**	12	**DOMESTIC HOT WATER SENSOR** Domestic hot water sensor fault **(1).**	Check the efficiency of the sensor (see table Res/Temp) (Par.4) and its connections.
	**12**	13	**HEATING SENSOR (11)** Heating sensor fault.	Check the efficiency of the sensor (see table Res/Temp) (Par.4) and its connections.
	**38**	14	**FACTORY PARAMETERS** Alteration of the factory parameters due to possible electromagnetic interferences.	Press the unblock key; if the anomaly persists, replace the board.

	**4**	15	**BLOCK** No gas or failed burner ignition	Check the gas supply or that the ignition/detection electrode is working properly **(4)**
	**11**	16	**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, press the unblock key, if the anomaly persists, replace the electrode (4).
	**20**	17	**PARASITE FLAME** Flame detected after swtich-off.	Check the wiring and for any leaks from the gas valve (3) **(3)** if needed replace the gas valve.
	**46** CHIMNEY	18	**FLUE GAS COLLECTOR SAFETY THERMOSTAT** Intervention of the flue gas collector safety thermostat (23).	Check the wiring
	**19**	22	**FLAME CONTROL** Flame control damaged	Replace the board.

INCONVENIENCES	SOLUTIONS
Flame noisy in cold ignition	Act on parameter **‘’IG”** using the **RCh** section ‘’TECHNICAL MENU” TSP parameters increasing the value by 5 ÷ 10 % max
Flame noisy in steady-state conditions	increase the CO_2 value - max value for methane gas = 9.7 % - max value for propane = 11.4 %
Flame noisy in modulation	

Unical®

www.unical.eu

ORIGINAL INSTRUCTION - 00338718EN - 1st ed. 04/2024

Unical AG S.p.A. 46033 casteldario - mantova - italia - tel. +39 0376 57001 - fax +39 0376 660556
info@unical-ag.com - export@unical-ag.com - www.unical.eu

Unical declines every responsibility for the possible inaccuracies if owed to errors of transcript or press.
Also reserves the right to bring those changes that it will hold necessary to it own products or profits, without jeopardizing its essential characteristics.