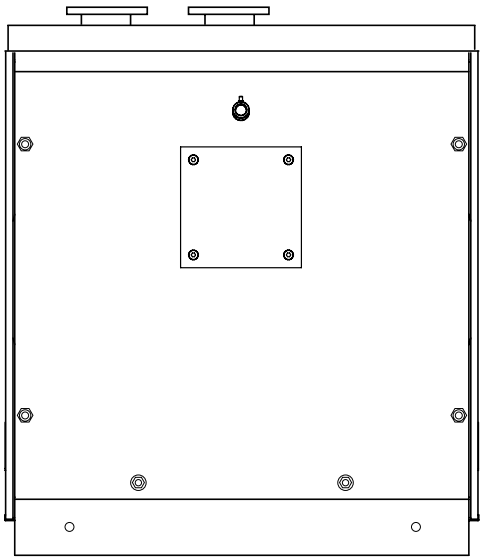
Unical®

ENGLISH



XC-K3

116 125 200
300 348 400

INSTALLATION AND MAINTENANCE INSTRUCTIONS

UK CA

Note:
Control panel is not included, therefore for schemes connection and programming refer to instruction booklet supplied with the panel (optional)

https://www.unicalag.it/catalogo-prodotti/caldaie-professionali-300/6242/controlli-e-pannelli-comando

https://www.unicalag.it/prodotti/professionale-300/commercial-condensazione-inox/341/xc-k 3

Provisions for proper disposal of the product

After decommissioning, this appliance must not be disposed of as mixed urban waste.

Separate waste collection is mandatory for this type of waste, in order to allow the recovery and reuse of the materials making up the appliance.

Please contact operators authorised for the disposal of this type of appliances

Incorrect management of waste and of its disposal has potential negative effects on the environment and human health

The  symbol on the appliance, represents the prohibition to dispose of the product as mixed urban waste.

Attention: this manual contains instructions for the exclusive use of the professionally qualified installer and/or maintenance technician in compliance with current legislation.
The user is NOT qualified to intervene on the boiler.
The manufacturer will not be held liable in case of damage to persons, animals or objects resulting from failure to comply with the instructions contained in the manuals supplied with the boiler.

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1.2 - SYMBOLS USED IN THE MANUAL

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

DANGER!
Serious danger to safety and health

ATTENTION!
Possible dangerous situation for the product and the environment

NOTE!
Tips for the user

NOTE!
For further details refer to the Technical Information: http://www.unicalag.it/catalogo-prodotti/professionale-300/334/commercial-condensazione-inox

DANGER!
Danger of burns!

OBLIGATION!
wear gloves protective

1.3 - APPROPRIATE USE OF APPLIANCE

The heat generator has been built according to the current level of engineering and acknowledged technical safety rules.
Nonetheless, if improperly used, dangers could arise for the safety and life of the user and other persons or damage to the equipment or other objects.
The appliance is designed to work in heating systems, with hot water circulation, for the production of domestic hot water.
Any other use must be considered improper.
For any damage resulting from improper use, UNICAL AG S.p.A. assumes no responsibility.
Use according to the intended purposes also includes strict compliance with the instructions in this manual.

1.4 - INFORMATION FOR THE SYSTEM MANAGER

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

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

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

1.5 - SAFETY WARNINGS

ATTENTION!
The appliance must not be used by children.
The appliance may be used by adults and only after carefully reading the operating instructions manual for the user.
Children must be supervised so they do not play or tamper with the appliance.

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.

ATTENTION!
Do not use the appliance to support any object.
Specifically, do not place any liquid containers (Bottles, Glasses, Containers or Detergents) on top of the boiler.

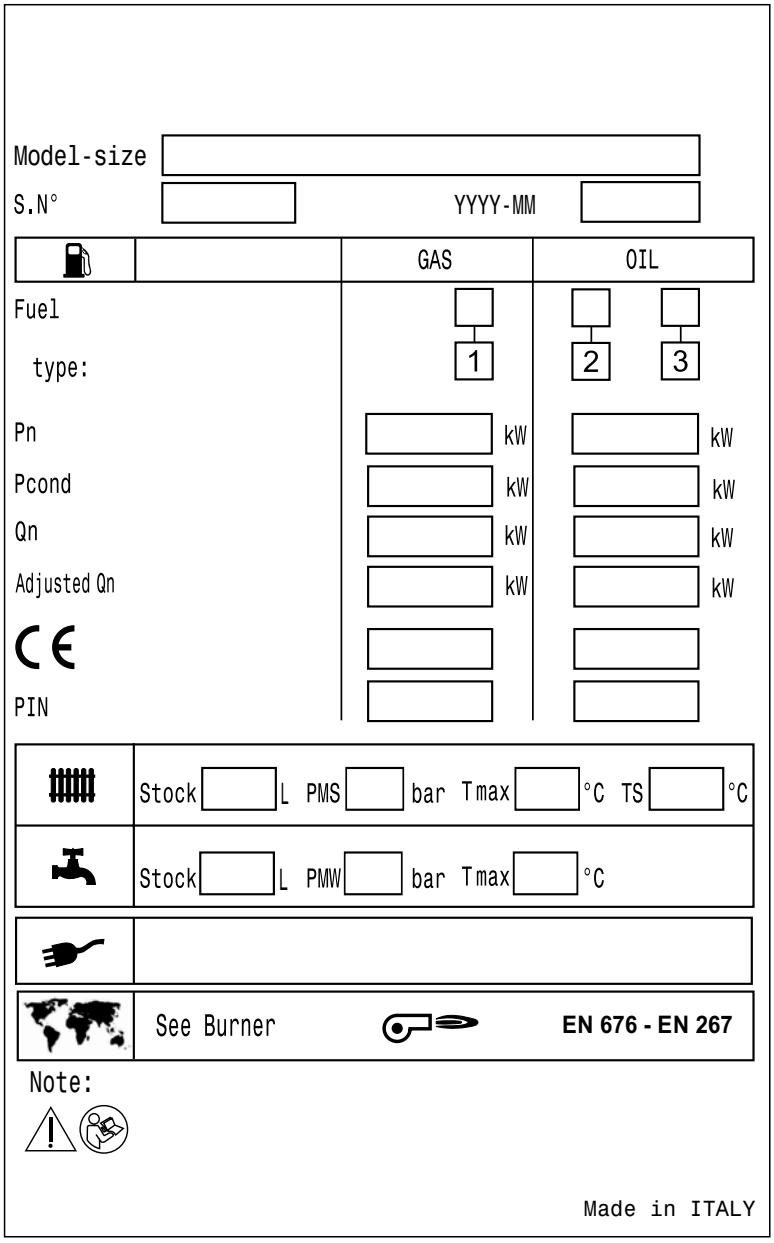
1.6 -TECHNICAL DATA PLATE

The technical data plate is adhesive and is included in the document case; it must be applied by the installer on the outside of the casing. The serial number of the boiler is on the riveted plaque on the front plate of the body (front right bottom side).

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.



Legenda

Symbol	EN
Model	Boiler Model
S.N° (*)	Serial Number: see on boiler body
Year	Year of manufacturing
Fuel type:	Fuel 1 - Gas 2 - Oil 3 - Heavy Oil
Pn	Nominal OUTPUT
Pcond	Condensing nom. output
Qn	Nominal heat INPUT
Adjusted Qn	Adj. for nom. heat input
CE	Surveillance notified body
PIN	P.I.N. code
	BOILER heating circuit:
Stock	Water content
PMS	Max. Working Pressure
T.max	Max. Working Temperature
	D.H.W. TANK:
Stock	Water content
PMW	Max. Working Pressure
T.max	Max. Working Temperature
	Electrical power supply
	Destination Countries: (SEE BURNER)
Note	(Condensing boiler)

1.7 - GENERAL WARNINGS

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

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 standards in force according to the instructions of the manufacturer and by qualified and certified personnel in compliance with law.

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 foreseen 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.

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 using original spare parts only. Failure to comply with the above can jeopardise the safety of the appliance.

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.

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.

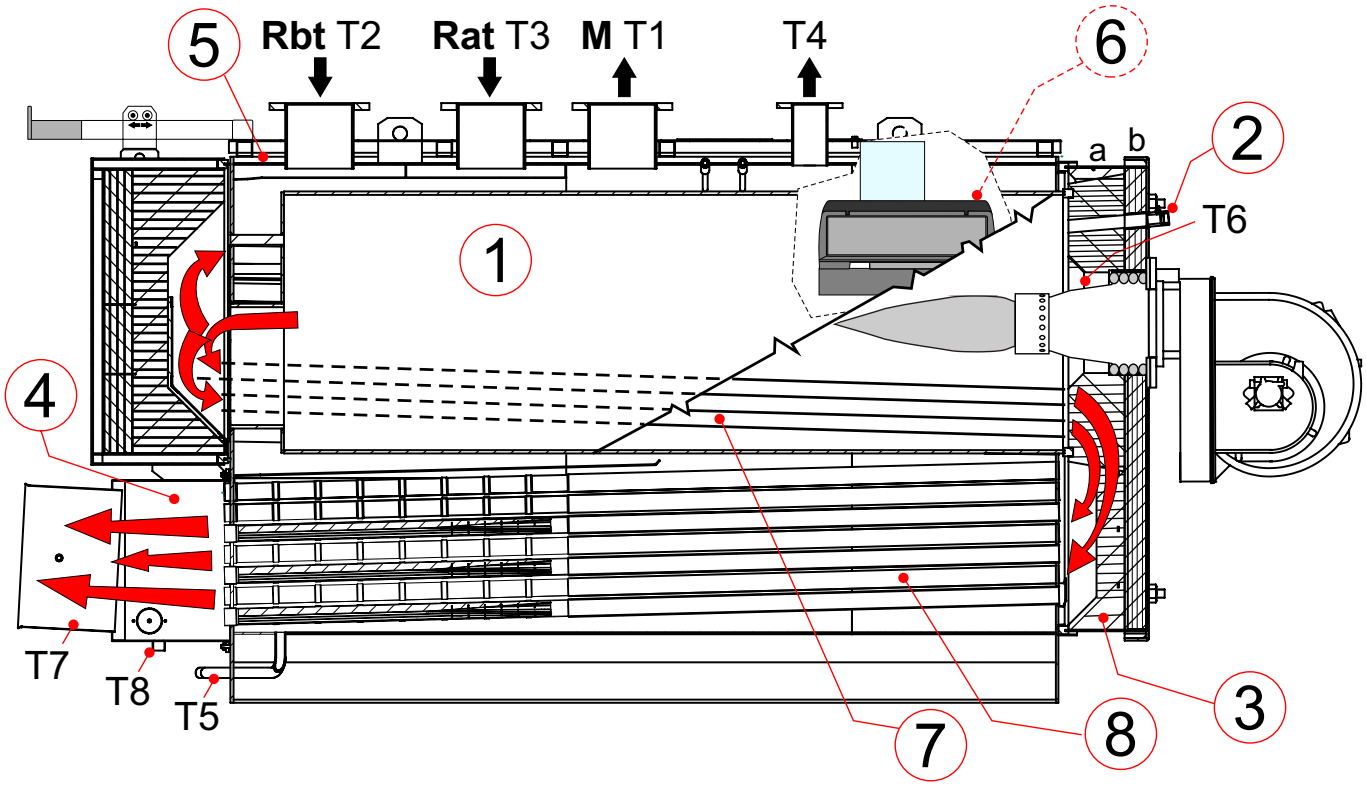
Only original accessories must be used for all appliances with optionals or kits (including electric).

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.

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



Smoking section tubes

Note:
For operation with oil burner, when ordering specify it (for OIL burner). So as to foresee on the smoke tubes the treatment with Nanoprom coating.

2.2 - MAIN COMPONENTS

The XC-K3 boilers are equipped with a cylindrical furnace in witch the combusted gases that reach the bottom take the smoke pipes of the second turn, having reached the front, the burnt gases are conveyed through the door into the pipes of the third turn to reach the chamber smoke back and then to the fireplace.
During burner operation, within the boiler's power range, the combustion chamber is always under pressure.
For the value of this pressure see the tables of cap. 2.4, in the column "Load losses smoke side ".
The chimney must be calculated in such a way that at its base is not detected any positive pressure.

KEY		
N°		Description
1		Furnace
2		flame sight glass
3		Door with flame sight glass
4		Smoke chamber
5		Body insulation
6		Panel board (optional - note: position of panel, depends on the type of panel and model of boiler)
7		Smoke tubes 2 Turn
8		Smoke tubes 3 Turn
M	T1	Flow
Rbt	T2	Low temperature return
Rat	T3	High temperature return
	T4	Expansion vessel
	T5	Boiler drain
	T6	Burner connection
	T7	Chimney connection
	T8	Condensation drain

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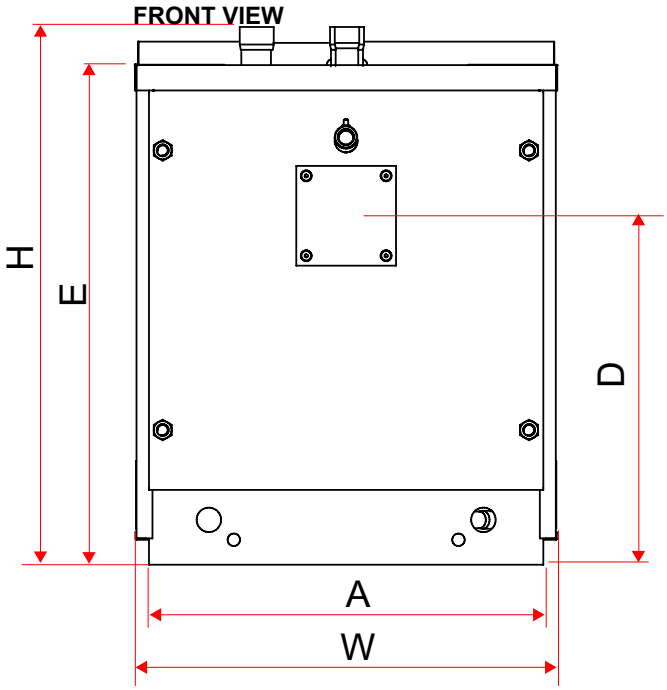
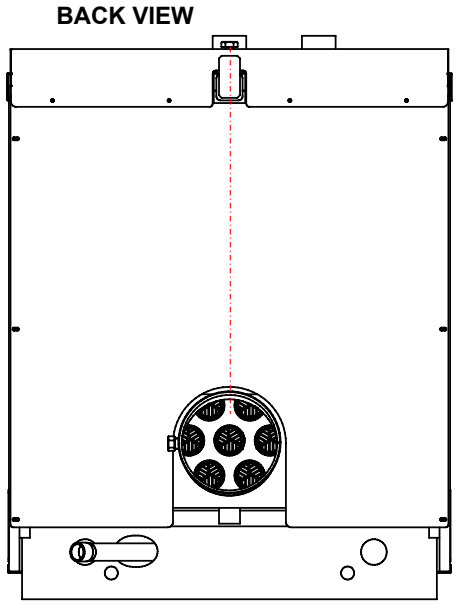
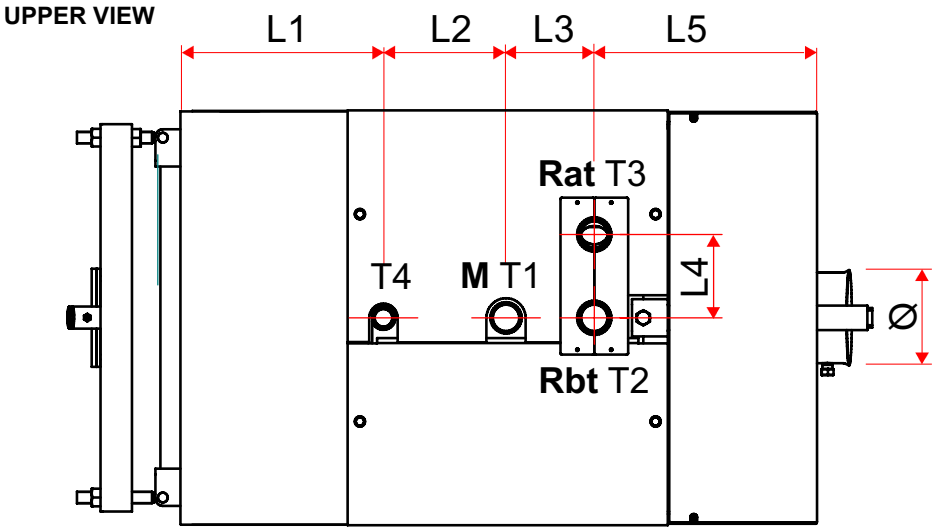
2.3 - DIMENSIONS

XC-K3 116 - 125

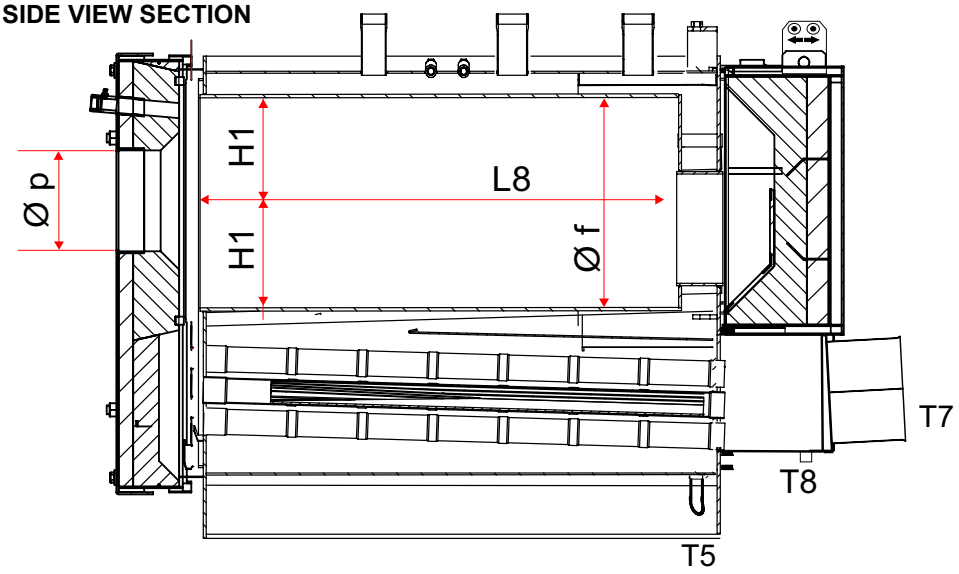




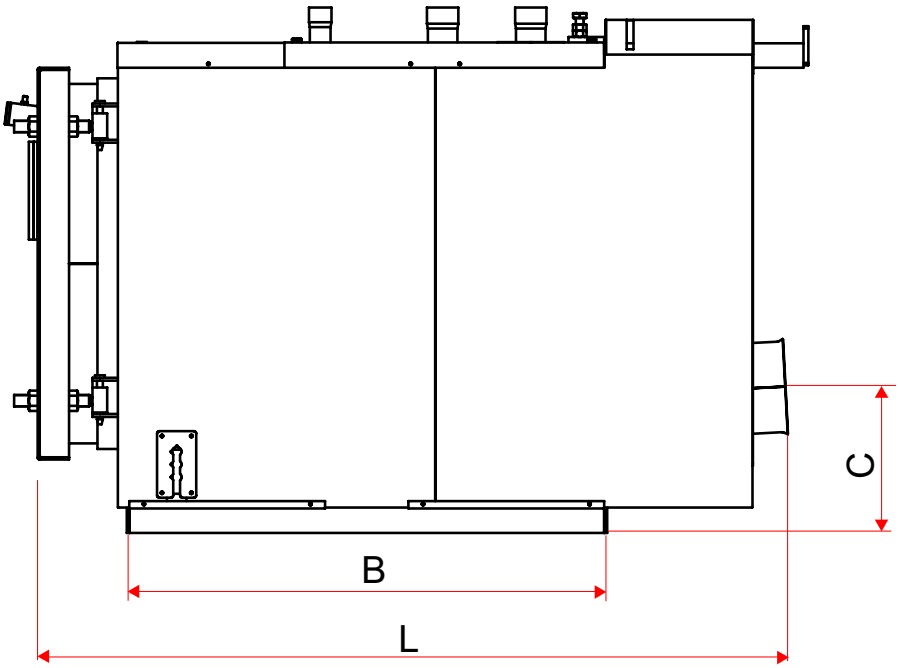


XC-K 3	DIMENSIONS [mm]																		
	Depth										Width		Height					Chim ney connection	Furnace
	L	B	L1	L2	L3	L4	L5	L6	L7	L8	W	A	H	H1	C	D	E	Ø	Ø f
116	1532	981	414	250	180	170	454	-	-	920	840	790	1073	180	299	699	1002	180	360
125	1532	981	414	250	180	170	454	-	-	920	840	790	1073	180	299	699	1002	180	360

SIDE VIEW SECTION



SIDE VIEW WITH CASING

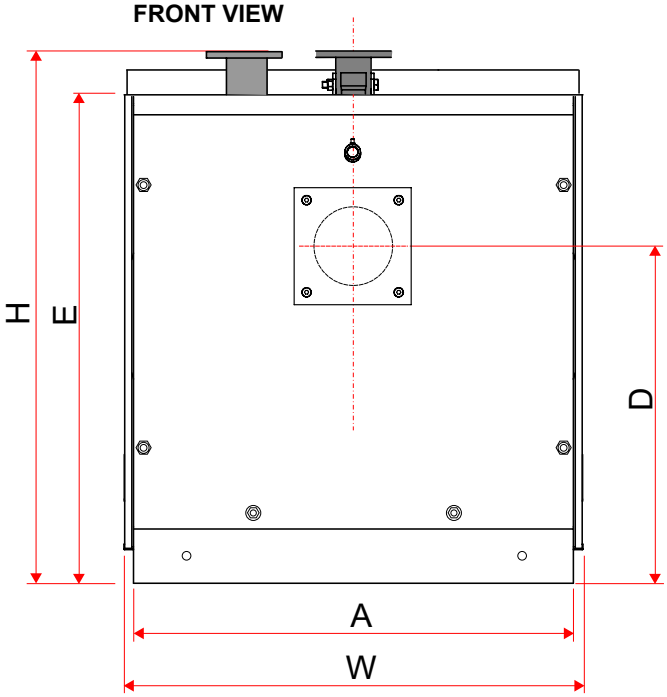


XC-K 3	CONNECTIONS									Weight
	T1 (M)	T2 (R)	T3 (R)	T4	T5 (Sc)	T6 (Ø p)	T7 (S)	T8 (Scond)	G	kG
	inch			inch	inch	[mm]	[mm]	[mm]	inch	
116	G 2"	G 2"	G 2"	G1 ¼"	G 1"	**(*)**	180	40	-	
125	G 2"	G 2"	G 2"	G1 ¼"	G 1"	**(*)**	180	40	-	

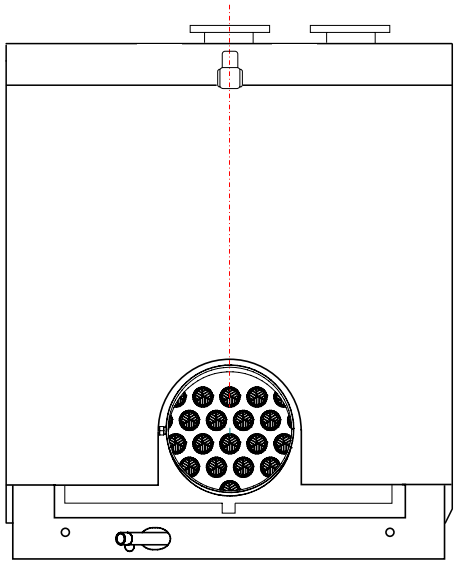
(*) See Table (Chapter 3.5.1 - Burner Choice)

XC-K3 300

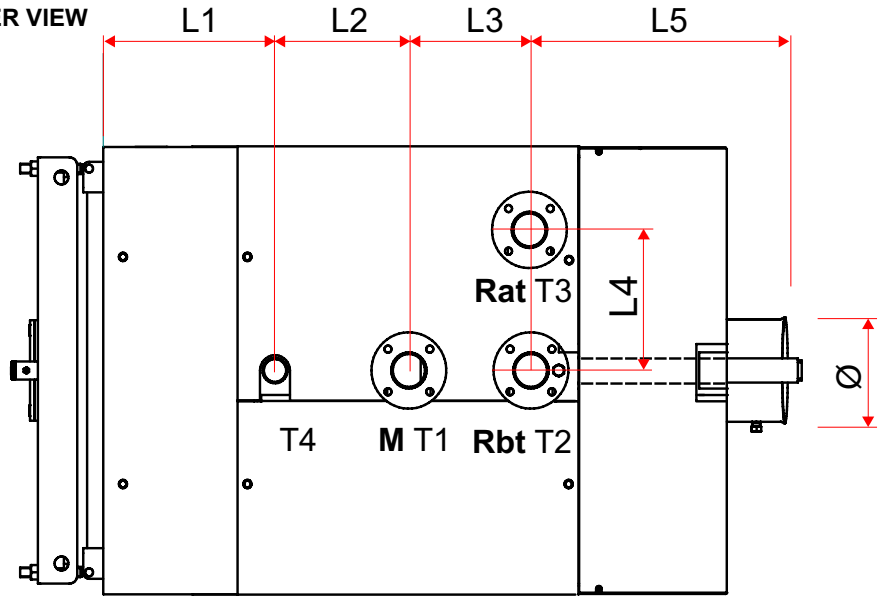
FRONT VIEW



BACK VIEW

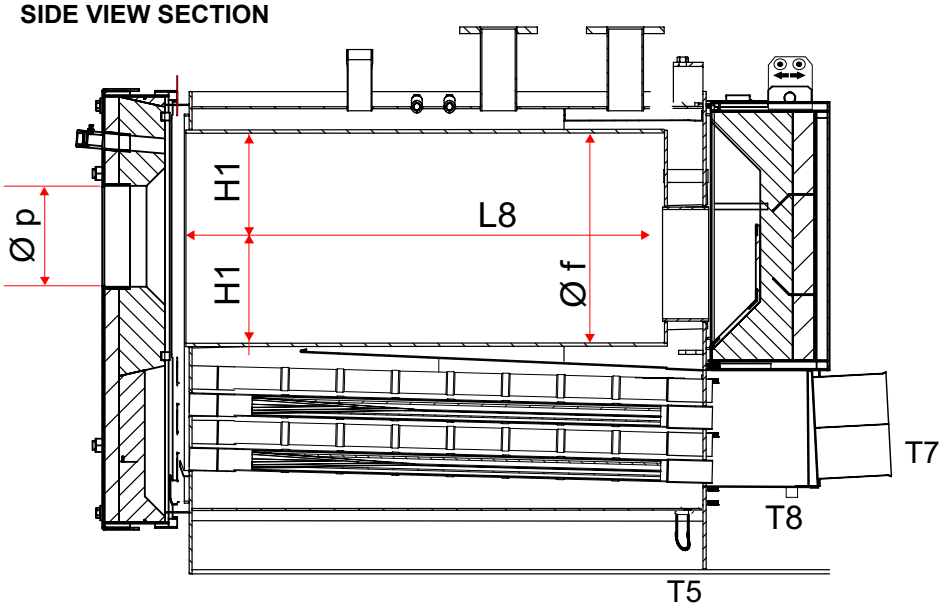


UPPER VIEW

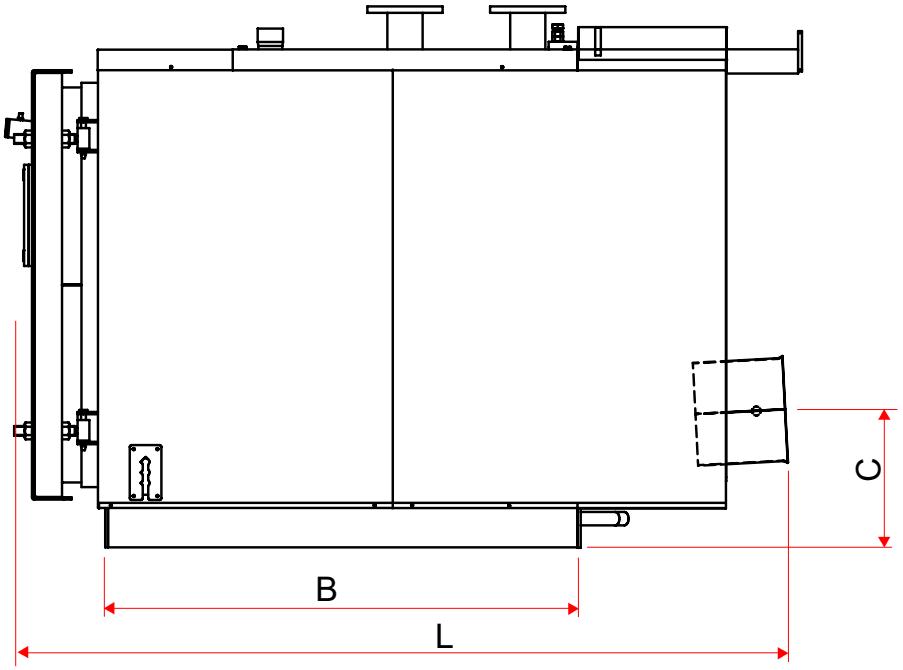


XC-K 3	DIMENSIONS [mm]																		
	Depth										Width		Height					Chimney connection	Furnace
	L	B	L1	L2	L3	L4	L5	L6	L7	L8	W	A	H	H1	C	D	E	Ø	Ø f
200	1758	1174	435	300	270	255	435	-	-	1080	1000	950	1243	214	329	778	1132	200	428
300	1922	1214	470	300	320	275	590	-	-	1120	1110	1060	1338	259	324	821	1230	250	518

SIDE VIEW SECTION



SIDE VIEW WITH CASING

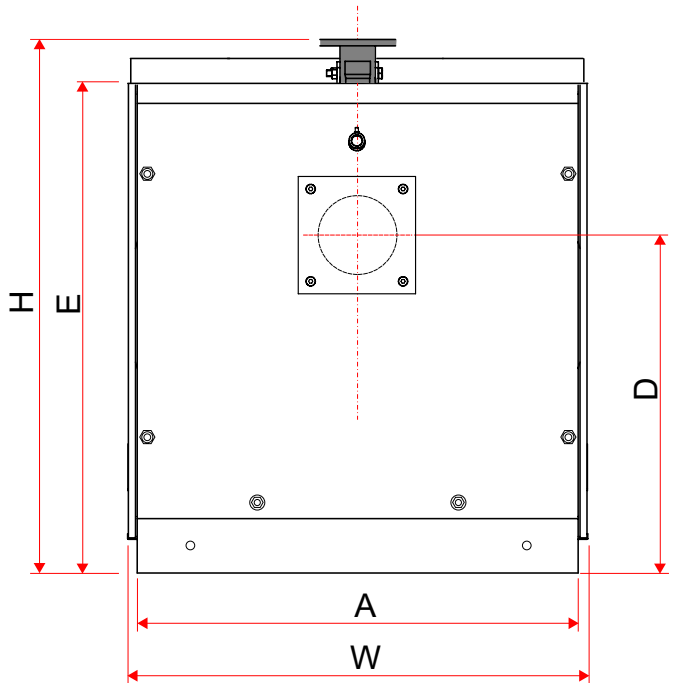


XC-K 3	CONNECTIONS									Weight
	T1 (M)	T2 (R)	T3 (R)	T4	T5 (Sc)	Ø p	T7 (S)	T8 (Scond)	G	kG
	PN6			inch	inch	[mm]	[mm]	[mm]	inch	
200	DN 65	DN 65	DN 65	G1 ½"	G 1"	**(*)**	200	40	-	
300	DN 80	DN 80	DN 80	G2"	G 1"	**(*)**	250	40	-	

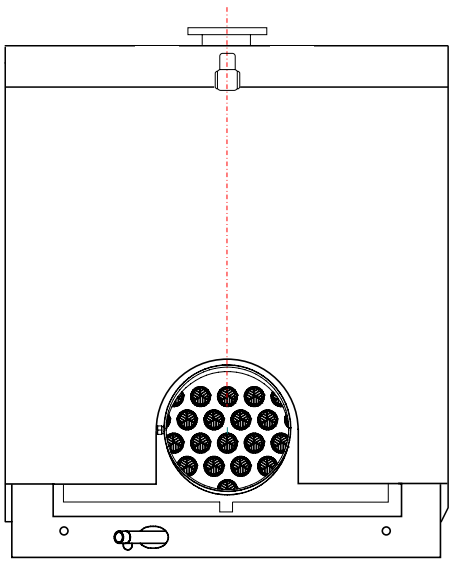
(*) See Table (Chapter 3.5.1 - Burner Choice)

XC-K3 348 - 400

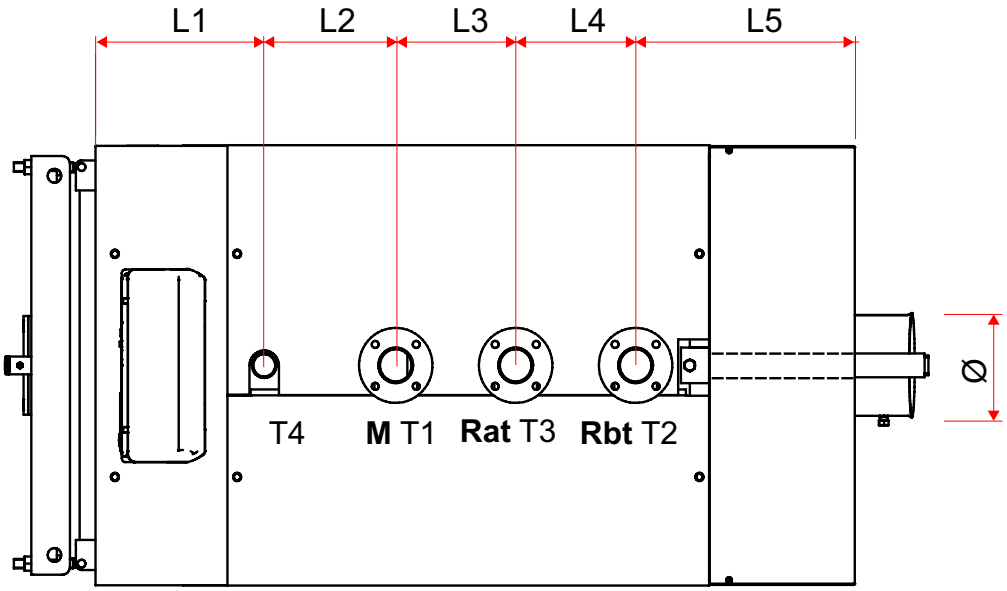
FRONT VIEW



BACK VIEW

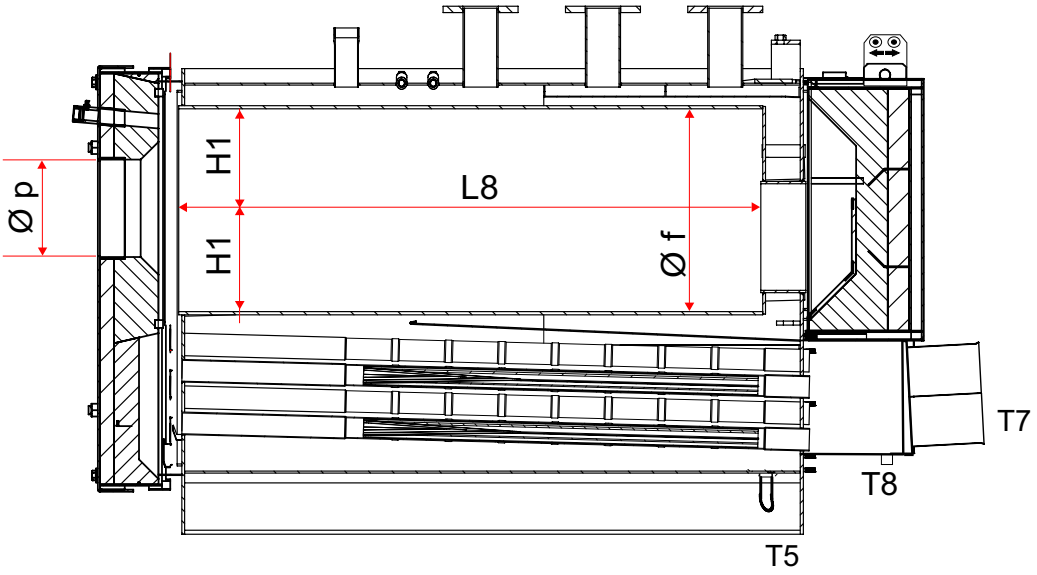


UPPER VIEW

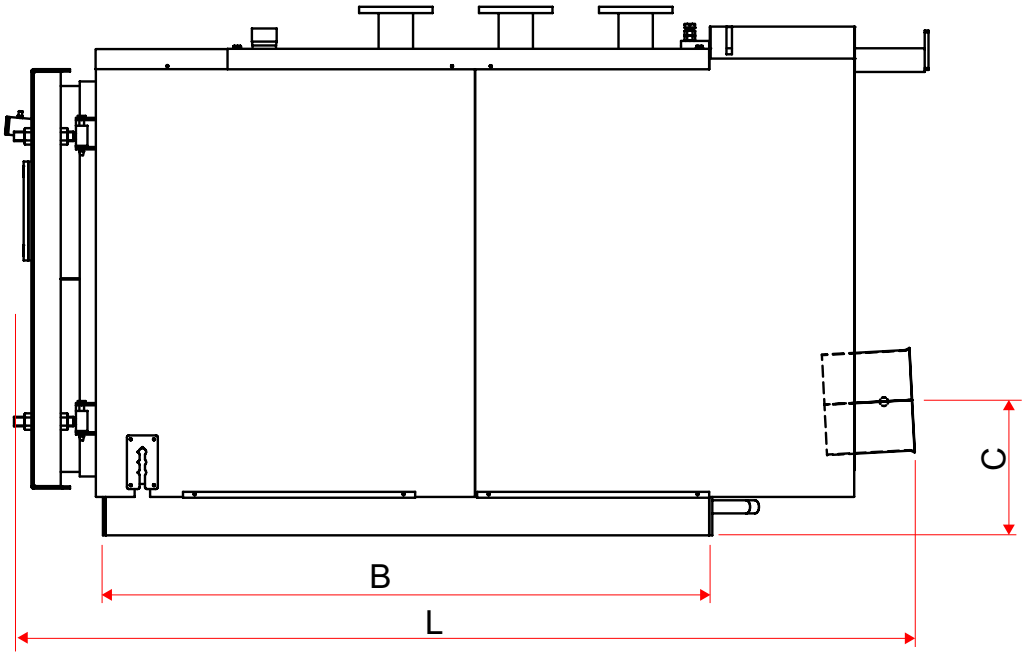


XC-K 3	DIMENSIONS [mm]																		
	Depth										Width		Height					Chimney con-nection	Furnace
	L	B	L1	L2	L3	L4	L5	L6	L7	L8	W	A	H	H1	C	D	E	Ø	Ø f
348	2283	1575	435	340	310	310	567	-	-	1480	1110	1060	1338	257	342	821	1232	250	530
400	2283	1575	435	340	310	310	567	-	-	1480	1110	1060	1338	257	342	821	1232	250	530

SIDE VIEW SECTION



SIDE VIEW WITH CASING



XC-K 3	CONNECTIONS									Weight
	T1 (M)	T2 (R)	T3 (R)	T4	T5 (Sc)	Ø p	T7 (S)	T8 (Scond)	G	kG
	PN6				inch	[mm]	[mm]	[mm]	inch	
348	DN 80	DN 80	DN 80	G2"	G 1"	**(*)**	250	40	-	
400	DN 80	DN 80	DN 80	G2"	G 1"	**(*)**	250	40	-	

(*) See Table (Chapter 3.5.1 - Burner Choice)

2.4 - OPERATING DATA

Data relating to gas operation.
In case of operation with diesel or bio-gas, contact our technical services.

Modelli: XC-K 3		116	125	200	300	348	400
Nominal heat output (80-60°C) (80-60°C)	[kW]	112,1	114,1	182,5	276,4	340,8	368,3
Nominal heat output (80-60°C) (50-30°C)	[kW]	122,8	125,0	199,7	299,8	370,6	400,5
Nominal Heat input	[kW]	115	117	187	282	347	375
Combustion Efficiency full load 80°C-60°C	[%]	97,5	97,5	97,6	98,0	98,2	98,2
Heat efficiency full load 50°C - 30°C	[%]	106,8	106,8	106,8	106.3	106.8	106,8
Heat efficiency partial load 30% del 30%: (retourn 30°C)	[%]	108,7	108,7	108,7	108,4	108,7	108,7
Flue gas temperature 80°C-60°C (Tflue - Tamb.)	[°C]	52	52	52	50	52	52
Flue gas temperature 50°C-30°C (Tflue - Tamb.)	[°C]	33	33	33	29	33	33
CO_2 content	[%]	9,8	9,8	9,8	9,8	9,8	9,8
Flue gas mass	[kg/h]	172,9	175,9	281,1	423,9	521,6	563,7
Heat loss at shell 80°C-60°C	[%]:	0,30	0,30	0,30	0,30	0,30	0,30
Heat loss at shell 50°C-30°C	[%]	0,24	0,24	0,24	0,24	0,24	0,24
Heat loss at chimney with burner ON 80°C-60°C	[%]	2,5	2,5	2,5	2,4	2,5	2,5
Heat loss at chimney with burner ON 50°C-30°C	[%]	1,6	1,6	1,6	1,4	1,6	1,6
Heat loss at chimney with burner OFF	[%]:	0,50	0,50	0,50	0,70	0,50	0,50
Maximum condensation production	[l/h]	19,5	19,8	31,6	47,7	58,7	63,4
Boiler back pressure (Smoke side pressure lost)	[mm/H_2O]	9,7	10,0	19,2	18,0	25,7	30,0
Head losses H_2O Δt 15	[kPa]	2,3	2,3	2,5	2,8	3,2	3,7
Water boiler content	[l]	258	258	395	508	633	633
Max working pressure	[bar]	6	6	6	6	6	6
Max operating temperature	[C°]	100	100	100	100	100	100
Available chimney base pressure	[Pa]	0	0	0	0	0	0

Model: XC-K3			116	125	200	300	348	400
Element	**Symbol**	**Unit**						
Effective nominal output	Prated	kW	112	114	183	276	341	368
Seasonal energy efficiency of central heating	ηs	%	92	92	92	92	92	92
Season efficiency class for heating			**A**	**A**	**A**	**A**	**A**	**A**
For space heating boilers and combination boilers: useful heat output								
Effective heat output with high temperature capacity (Tr 60 °C / Tm 80 °C)	P4	kW	112,1	114,1	182,5	276,4	340,8	368,3
Rated heat output efficiency with high temperature capacity (Tr 60 °C / Tm 80 °C)	η4	%	87,8	87,8	87,9	88,2	88,4	88,4
Effective output at 30% of the rated heat output with low temperature capacity (Tr 30 °C)	P1	kW	37,5	38,2	61,0	91,7	113,1	122,3
Performance at 30% of the rated heat output with low temperature capacity (Tr 30 °C)	η1	%	97,9	97.9	97,9	97,6	97,9	97,9
Boiler with output range adjustment: YES / NO								
Auxiliary electricity consumption								
With a full load	elmax	kW	0,358	0,358	0,302	0,583	0,606	0,606
With a partial load	elmin	kW	0,239	0,289	0,267	0,583	0,569	0,569
Standby mode	PSB	kW	0,004	0,004	0,004	0,004	0,004	0,004
Other eelements								
Heat dispersion on standby	Pstb	kW	0,5889	0,5889	0,9149	2,0806	2,007	2,007
Nitrogen oxides emissions ref. PCS	NOx	Mg/kWh	51	51	54	54	56	56
Annual electricity consumption	QHE	GJ	352	358	369	869	1064	1149
Internal sound power level	Lwa	dB (A)	-	-	-	-	-	-
For mixed heating appliances								
Declared load profile			-	-	-	-	-	-
Water heating energy efficiency	ηwh	%	-	-	-	-	-	-
Daily consumption of electricity	Qelec	kWh	-	-	-	-	-	-
Daily consumption of fuel	Qfuel	kWh	-	-	-	-	-	-
Annual electricity consumption	AEC	kWh	-	-	-	-	-	-
Annual fuel consumption	AFC	GJ	-	-	-	-	-	-
Seasonal DHW efficiency class			-	-	-	-	-	-
(*) (Equipment not covered by the directive 2009/125/CE)								

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.

ATTENTION!
The appliances are designed to be installed inside suitable rooms or technical spaces only. The appliances cannot be installed or operate outdoors. Outdoor installation can cause malfunctioning and be dangerous. Choose specifically designed appliances for outdoor installation.

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.**

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 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!
The appliance must be installed by a qualified technician with the technical-professional requirements according to law which, under his own responsibility, guarantees compliance with standards according to good practice rules.

ATTENTION!
Mount the appliance respecting the minimum distances required for installation and maintenance.

The boiler must be connected to a central heating system.

3.2 - STANDARDS FOR INSTALLATION

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 - PACKAGING

XC-K 3 boilers are supplied complete with the door and smoke chamber assembled, while the casing and insulation are included in separate cardboard packs.

Before starting installation, make sure that the length and width of the boiler body received correspond respectively to the dimensions L and W of the boiler you have ordered

The casing of boilers complete with insulation mattresses, is contained in boxes.

Boxes
n.3 XC-K 3 (116_125_200_300_348_400)

The control panel is optional and if required it is packed with its own cardboard and placed inside the furnace,

as accessories positioned inside thefurnace you will also find:
1 box containing hydraulic connection flanges, with relative gaskets and bolts (where included).
- ceramic fibre cord to insulate between burner blast tube and door.

Keep the packaging material (plastic bags, etc.) out of the reach of children as they are potential sources of danger.

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

Inside the furnace is contained:

Pouch with the following documentation:
- Manager operating instructions booklet
- Instruction booklet for the installer and maintenance engineer
- Certificate of conformity
- Testing certificate

Accessories box containing:
- 5 bends + a T + a plastic condensate draining cap

- Condensate drain siphon pipe 1 m.

3.3.1 - HANDLING

The boiler must be handled by lifting by the upper hooks, or by translation with rollers placed under the sturdy base side.

OBLIGATION!
wear protective gloves

- Protect all parts against impacts if they are to be transported.

3.4 - POSITIONING IN THE BOILER ROOM

Boielr must be installed in a room that complies with the safety regulations in force in the country of destination, with adequately sized air vents.
In the absence of specific provisions of the country of destination, you must observe the following guidelines:

1) The room must be set up exclusively for use as a boiler room: access to unauthorised personnel must be denied (with clearly visible signs).
   The doors, the horizontal and vertical walls (roofing) of the room must be made of Italian fire reaction zero class material or European fire reaction class A1 material.
2) Provide adequate space for the operation and maintenance of all system components (pumps, valves, filters, water treatment system, heat exchangers, etc.).
3) The support base must be raised by 5-10 cm, in concrete, horizontal, and able to withstand the weight of the generator and its water content.
   For the dimensions of the basement, see section DIMENSIONS. Where not possible, the support surface must be suitably reinforced in order to withstand the weight of the generator with its water content, and all its accessories.
4) The rooms must be sized to provide the following minimum distances, less any obstacles:
   a) On front of the generator: To facilitate cleaning of the smoke circuit, a free space must be left no less than the length of the boiler body (see DIMENSIONS) and, in any case, never less than 1300 mm.
      If this is not possible, on the front of the generator, it will still be necessary to guarantee the minimum space that allows the door to be opened to 90° and the burner to be removed if necessary;
   b) On both sides of the generator: **W** 0.80 m, which can be reduced to 0.05 m if the generator is adjacent to a wall or another generator and no accessories or controls are provided in the passage and this space does not constitute a passage .
      If it is not possible, provide a removable wall or door that allow the operation, making sure that the same can be carried out in safe conditions.
   c) On the back of the generator: **L9** 0.80 m.
      If it is not possible, provide a removable wall or door that allows access to the back, making sure that the operation can be carried out in safe conditions.

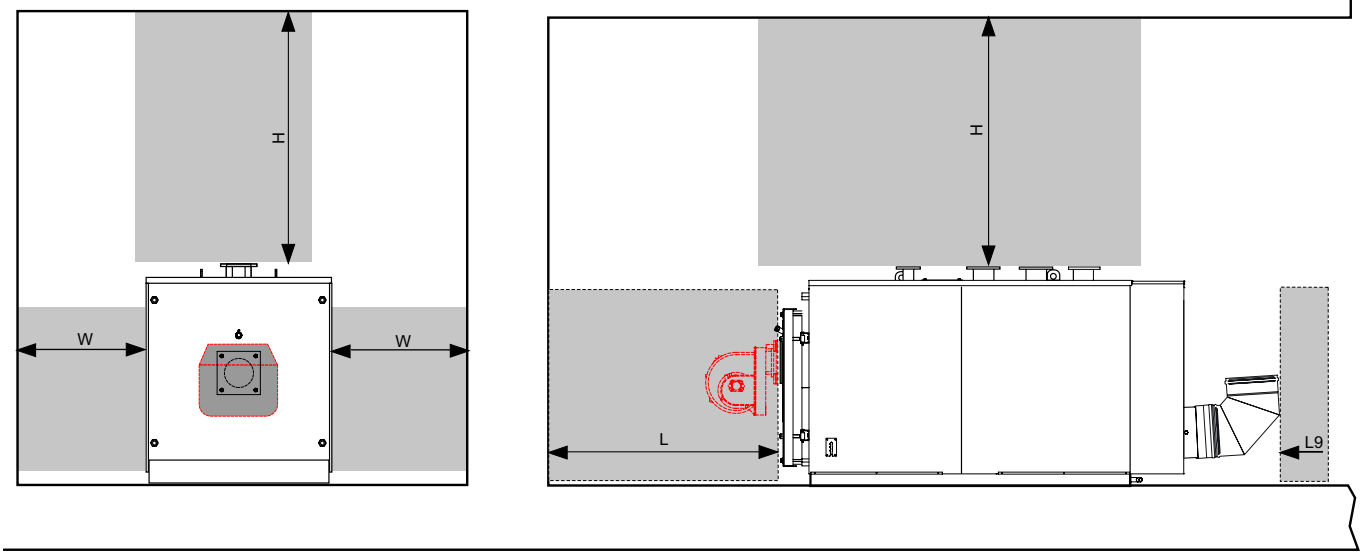
Rispettare le minime distanze di ingombro per poter eseguire le operazioni di normale manutenzione e pulizia.

	QCLEARANCE m			
XC-K 3	**W**	**L**	**L9**	**H**
	0,80	min. 1,3	0,80	1,8

   d) From the upper part of the generator: **H** 1.80 m between the highest walkway and the lowest obstacle of the room's roof and 1 metre between the highest point of the generator and the lowest obstacle between the generator and the roof itself. We recommend a space that is at least the same length as the generator coil; this will allow it to be replaced, if necessary.
      If it is not possible, provide appropriate hatches on the roof of the room to access the inspection openings and the protection and control devices located above.
   e) The pipes and the existing transmissions above the generator must be arranged so as not to obstruct the work, nor hinder the operator's movements in accessing the upper part of the generator to view or repair the accessories.

ATTENTION:
If the burner is fed with fuel gas with a greater specific weight than that of air, the electrical parts must be placed higher than 0.5 metres from the ground.

IT IS FORBIDDEN TO INSTALL THE BOILER OUTDOORS AS IT IS NOT DESIGNED FOR THIS PURPOSE AND IS NOT FITTED WITH AUTOMATIC FROST PROTECTION SYSTEMS.



3.5 - BURNER

The burners operating with the XC-K3 boilers must have the EC certification comply with the local and / or national regulations in force published in the official journal.

3.5.1 - CHOOSING THE BURNER

he correct choice and adjustment of the burner are fundamental for optimal operation of the boiler and therefore must be done carefully and not underestimated.
The burner must be chosen verifying that its firing rate (fuel capacity - combustion chamber pressure) is compatible with the same features declared for the boiler.
Remember that pressure drops on the flue side of the boiler, namely combustion chamber backpressure, refer to zero pressure at the base of the chimney.
It is also appropriate to ensure correct calibration of the min. and max. of the burner.
The flame to be developed must be suitable for the characteristics of our combustion chamber.
In order to take advantage of the whole heat exchange surface of the blind bottom furnaces, use burners capable of providing a “long and narrow” flame in any operating condition, namely even at the minimum output when controlling two or more stages or modulating.

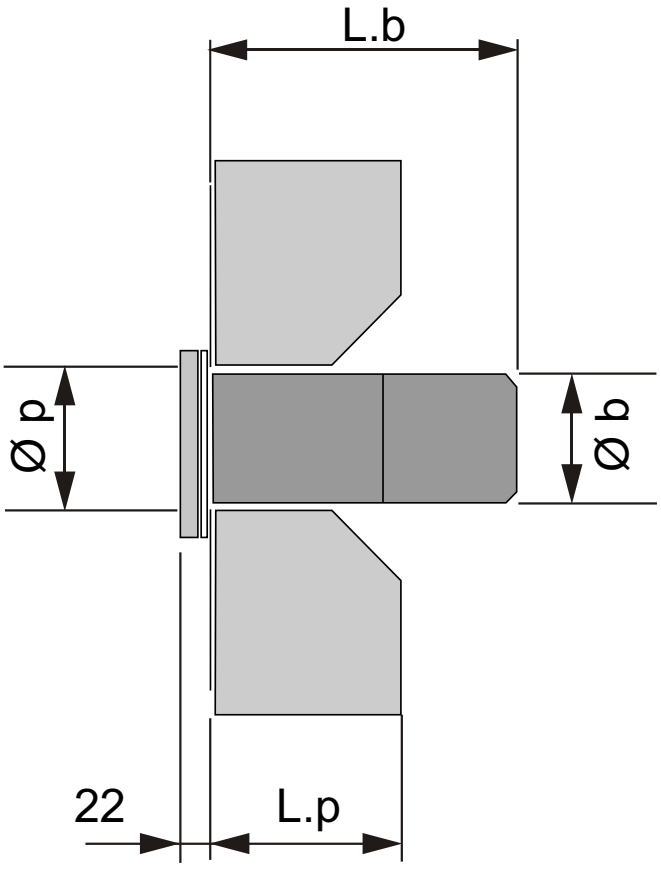
	Length Burner dimension		Door drilling	
Model	Ø b	L.b (min)	Ø p (mm)	L.p (mm)
XC-K 3 116 - 125	115	300	135	169
XC-K 3 200	160	300	180	170
XC-K 3 300 XC-K 3 348 - 400	160	300	180	171

In case of operation with diesel fuel it is necessary to check the correct calibration of the burner every 6 months of operation.
If the burner is not correctly adjusted, proceed to check the condition of the tube bundle and, where necessary, clean it.
Then proceed with a new burner adjustment.
Cleaning of the tube bundle is however mandatory on an annual basis.

Flames which are too short cause overheating in the front of the furnace and combustion products, not sufficiently cooled, entering the smoke pipes at too high temperatures can seriously damage the generator.
The manufacturing companies of the burners can supply the dimensions of the flames which their appliances develop.

ATTENTION: THE BURNER
it must be calibrated to a power value equal to or less than the thermal capacity (Burnt Power) indicated on the data plate of the generator.

if this indication is not followed, warranty will be excluded.



3.5.2 - INSTALLING THE BURNER

The burner must be mounted to the door of the boiler guaranteeing perfect sealing of the combustion products.
The burner is supplied with **a piece of ceramic fiber cord which must be placed on the blast tube of the burner to fully seal the space between the blast tube and the slot in the door.**
Make sure that no gaps remain between the blast tube and the slot on the refractory material inside the door.

Should a cone larger than the diameter of the blast tube be mounted, it must be removed before mounting the burner on the support plate and put back afterwards.
With the burner mounted, check that the electric cables are long enough to allow the door to open 90°.
For gas-fired burners, flexible hoses cannot be used for connections. Therefore it must be possible to disconnect the final section of the gas adduction tube by means of a threaded or flanged joint.

WARNING!
The seat of the burner nozzle must be as precise as possible to avoid backfires or heat which would cause the burner connection plate to burn red.

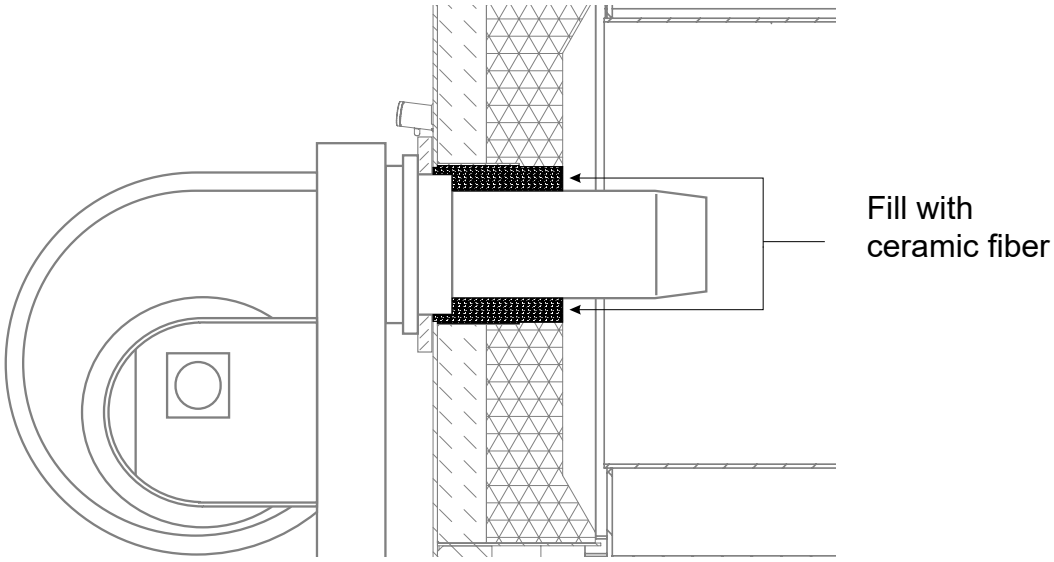
If the enlargement of the hole is inaccurate or increased for assembly convenience, after assembling the burner, take care to fill completely and carefully, with the ceramic fiber supplied, the free space between the mouthpiece and the refractory of the front door.

If there is an adapter flange for the door / burner coupling, make sure that the flue gaskets are installed on both coupling surfaces.

Graph the burner fixing screws to facilitate subsequent removals.

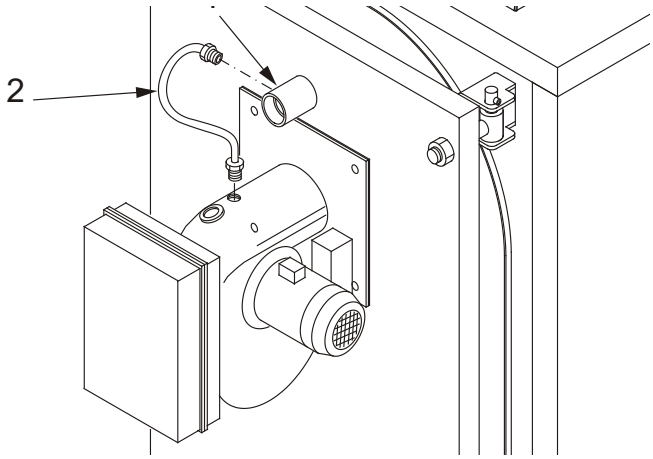
IMPORTANT
BEFORE STARTING THE BURNER, CAREFULLY CHECK THE CORRECT CONNECTION OF ALL SAFETY DEVICES

activate the function of POST VENTILATION of the burner



3.5.3 - CONNECTING FLAME SIGHT GLASS TO BURNER

The flame sight glass is provided with a 1/8" threaded connection (pos. 1) upon which a 9 mm pressure test nipple is mounted.
It can be used with a silicon tube to measure the backpressure in the combustion chamber.
In place of this test nipple, which must be kept, an appropriate fitting will be mounted to connect the flame sight glass directly to the pressure chamber downstream the burner fan by means of a copper tube (pos.2).
The air blown by the fan will conveniently cool the sight glass and keep it from blackening.
If the cooling tube is not connected to the sight glass, it could break.

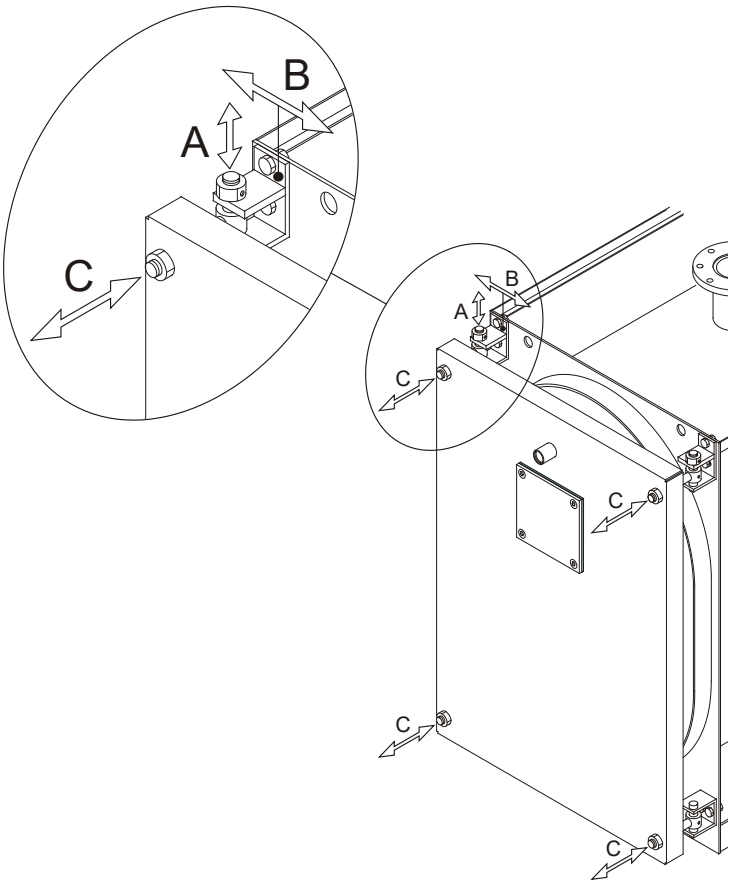


ATTENTION:
the flame sight glass can be very hot; therefore pay the utmost attention.

3.6 - FURNACE DOOR: ADJUSTMENT, OPENING AND CLOSING

3.6.1 - XC-K 3 BOILERS

For all these models, the door is hinged and fixed according to figure In these cases, the door is mounted with four equal hinges: the two on the left side are normally used as rotation hinges (from right to left), while the two on the right side are used as closing hinges; the door is then secured with 4 nuts.
It will be exactly the opposite when the door is opened from the left to the right.
To invert rotation, just move the rear locknuts to the opposite side.



On the door are possible the following adjustments model by model
XC-K 3 116 ÷ 200 only adjustment C
XC-K 3 300 ÷ 400 only adjustment B - C

A) Vertical adjustment: Not possible.

B) Crosswise rotation: loosening the hinges fixed on the front plate of the boiler and moving them sideways.

C) Axial rotation: screwing different tightening nuts.

IMPORTANT NOTE

Before opening the door of the furnace, take the following

safety measures:
- Close the fuel supply to the burner.
- Cool the boiler off by having water circulate and then disconnect electrical power.
- Place a sign on the boiler with the following text:

DO NOT USE, BOILER MAINTENANCE UNDERWAY, OUT OF SERVICE.

3.7 - FLUE GAS EXHAUST PIPE CONNECTION

To connect the flue gas exhaust pipe, local and national standards must be observed.
It is recommended to insulate the pipe connecting to the chimney to reduce heat loss and noise.

Along the section connecting the boiler to the flue there must be suitable points for measuring flue gas temperature and analysing combustion products.

Use only exhaust pipes suitable for the type of fuel used. The supplier will have no contractual or extra-contractual liability for damage caused due to incorrect installation and use and anyway failure to comply with the instructions provided by the manufacturer.

When performing replacement installations, ALWAYS replace the flue gas exhaust accessory as well.
The flue must comply with standards in force.

3.8 - CONNECTION

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.
d) Ask for the intervention of professionally qualified personnel.

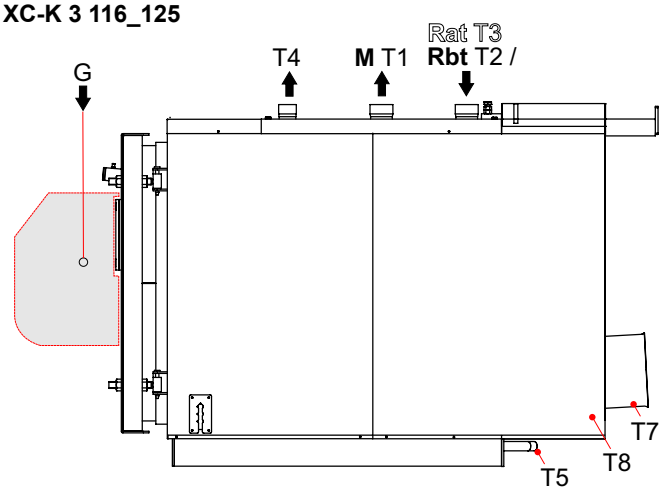
Attention!
Do not mix the heating water with incorrect concentrations of antifreeze or anti-corrosion substances! This could damage the gaskets and cause noise during operation.
Unical will not be held liable for damage to persons, animals or objects due to failure to comply with the above instruction.

The mains pressure must be within 0.5 and 6 bar (in the event of greater pressure install a pressure reducer).

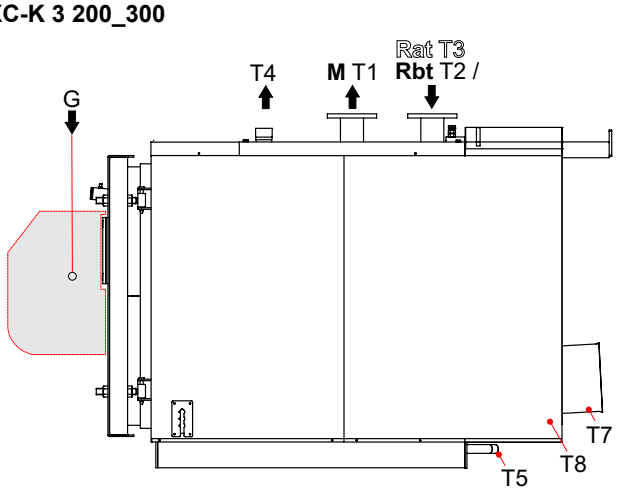
Warning!
If it is not necessary to have the 2 returns in the system, ever use the low temperature return Rbt (T2).

XC-K 3	CONNECTIONS						
	G Gas Inlet [Inch]	**M (T1)** Flow [PN 6 - DN]	**R (at / bt)** **(T2 - 3)** Return [PN 6 - DN]	**T4** Expansion vassel [PN 6 - DN]	**T5** Drain Boiler [Inch]	**T7** Flue gas exhaust [Ø mm]	**T8** Condensation drain [Ø mm]
116_125	G 2"	G 2"	G 1¼	G 1"	180	DN 40	DN 40
200	65	65	G 1½	G 1"	200	DN 40	DN 40
300	80	80	G 2 "	G 1"	250	DN 40	DN 40
348_400	100	100	G 2 "	G 1"	300	DN 40	DN 40

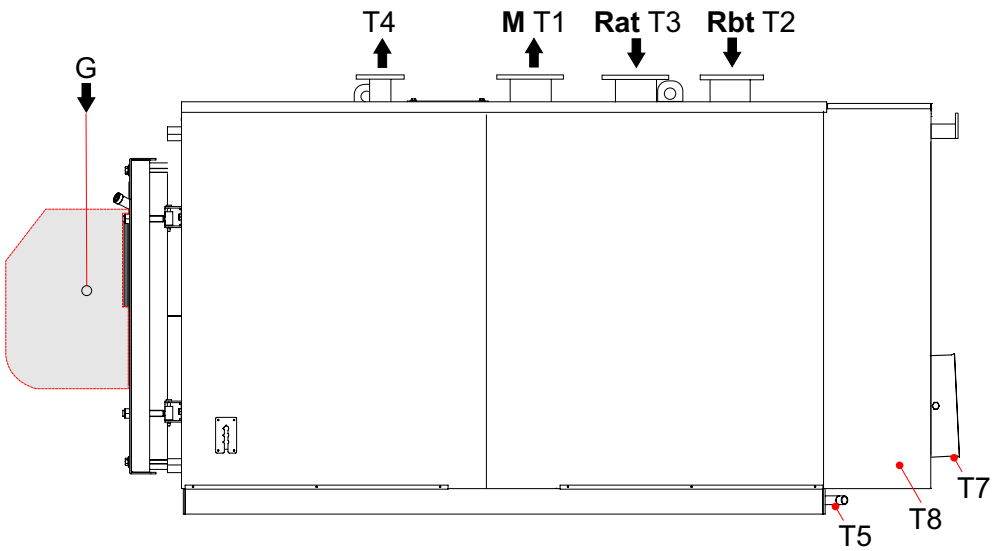
XC-K 3 116_125



XC-K 3 200_300



XC-K 3 348_400



3.8.1 - CONNECTING BOILER TO SYSTEM

Attention!
Before connecting the boiler to the heating system, thoroughly clean the piping with an appropriate product in order to eliminate metallic residue from processing and welding, oil and grease which could be present and which, reaching the boiler, could alter its functioning.
Do not use solvents to wash the system as they could damage the system and/or its components.
Failure to comply with the instructions of the following manual can cause damage to persons, animals and objects for which the manufacturer cannot be held responsible.

Attention!
Make sure that there are no mechanical tension points while connecting the pipes to avoid the risk of leakage!

Heating flow and return pipes must be connected to the boiler at the respective fittings as indicated on cap. 2.4.

For the dimensioning of the heating circuit pipes, you must take into account pressure drops caused by radiators, thermostatic valves, radiator stopping valves and by the configuration of the system.

The laying of the pipes must be designed taking every necessary precaution to avoid air pockets and to facilitate continuous degassing of the system.

Make sure that the pipes of the water and heating system are not used as earthing electrodes of the electric or telephone system. They are absolutely not suitable for this type of use. Serious damage could result for the piping, boiler and radiators in a short amount of time.

Attention!
On FLOW duct, provide all the safety measures required by current regulations. In any case, a flow switch is required which interrupts the operation of the burner in event of a water circulation stop.

The hydraulic and electrical connections are indicated in the panel booklets available on the site:

https://www.unicalag.it/catalogo-prodotti/caldaie-professionali-300/6242/controlli-e-pannelli-comando

Provide a drain pipe with a funnel and a siphon leading to an appropriate drainage at the heating safety valve. This drainage must be controlled on sight.

Attention!
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.

Connection of expansion vessel

boilers are suitable for operating with forced water circulation both with the expansion vessel opened or closed.
An expansion vessel is always necessary to compensate the increase in water volume due to heating.

The connection pipes of the expansion vessel will start from the T4 attachment (see DIMENSIONS TABLES) and must have no shut-off valve.

Connecting the filling / draining tap

A specific tap can be connected to the T5 attachment at the rear of the boiler for filling and draining.

3.9 - CONDENSATE DISCHARGE

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”.
H = Siphon head
Capacity conditions 0 and Max Fan Head

XC-K 3 116-125-200	**H = 150 mm**
XC-K 3 300	**H = 150 mm**
XC-K 3 348 ÷ 400	**H = 150 mm**

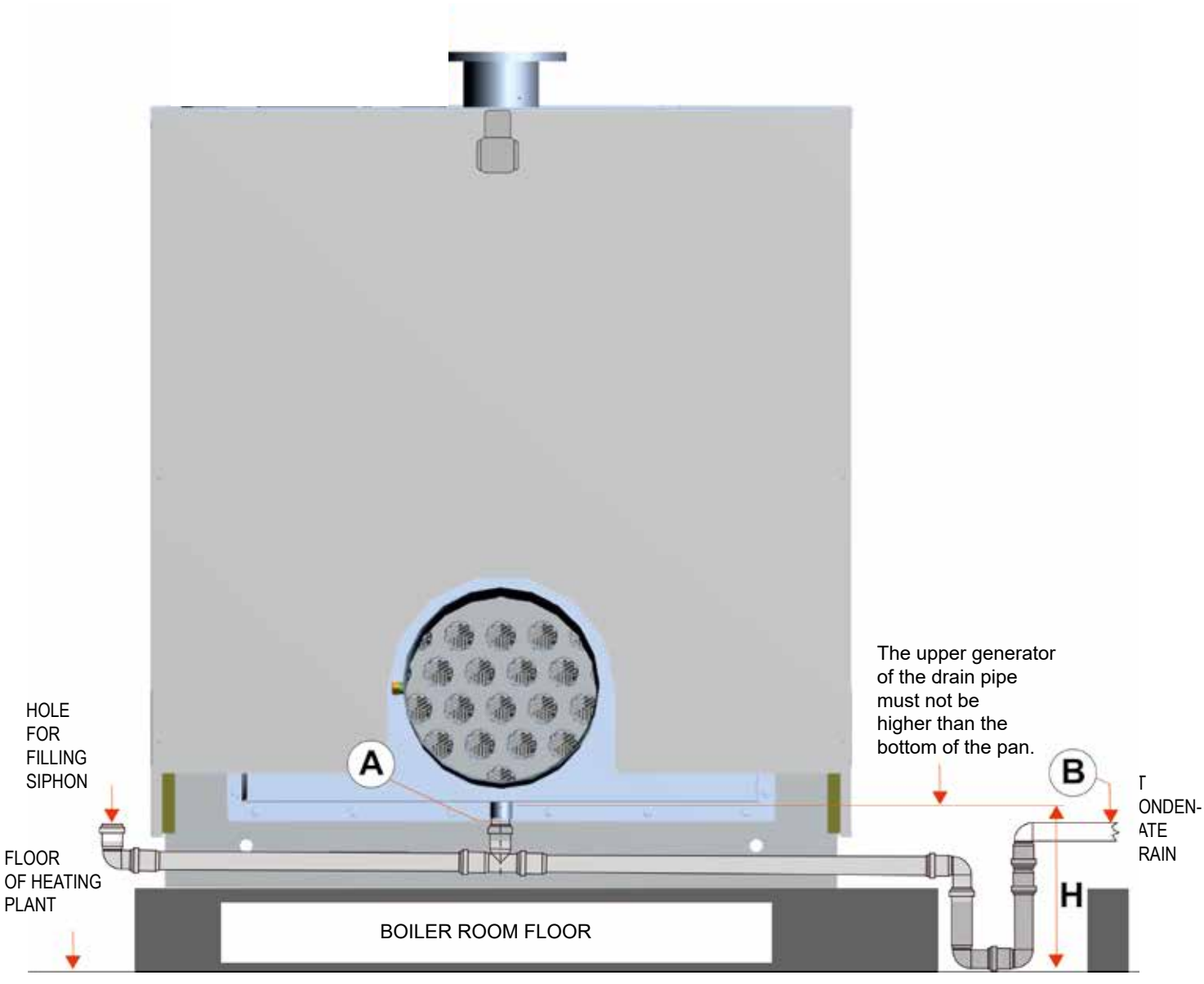
Danger!
Before commissioning the appliance:
- **check that the trap is assembled of the siphon (H)**
- **fill the trap and check that the condensation is drained properly**

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

If you do not want to or cannot create a basement, the boiler can be mounted at ground level a dig H mm deep can be made to house the siphon.

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



3.9.1 - SAFETY ITEMS

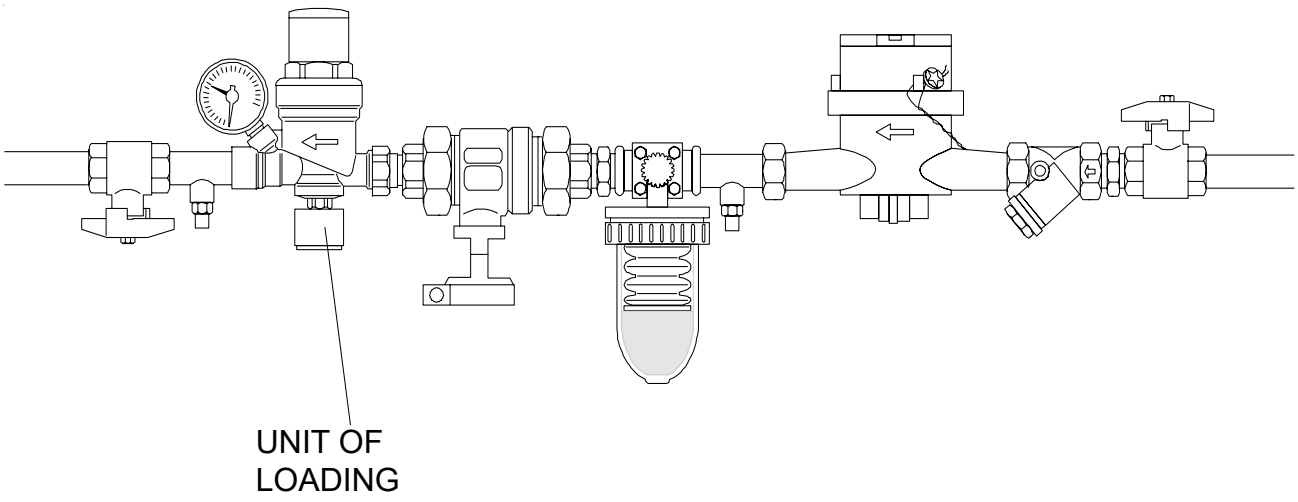
ATTENTION!
a flow switch or differential pressure switch must be mounted and connected, which prevents the burner from starting in the event of lack of water circulation.

3.10 - FILLING AND EMPTYING THE SYSTEM

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

To fill the system, you must provide a filling valve on the system's return.

EXAMPLE OF THE SYSTEM'S LOADING UNIT



3.11 - ASSEMBLING CASING

(vedere istruzioni 00340613 contenute nel kit montaggio mantellature 00473269)

Terminato il montaggio delle mantellature, fissare le targhette dati di caldaia ed installazione al pannello laterale dopo aver sgrassato la parte interessata con apposito solvente.

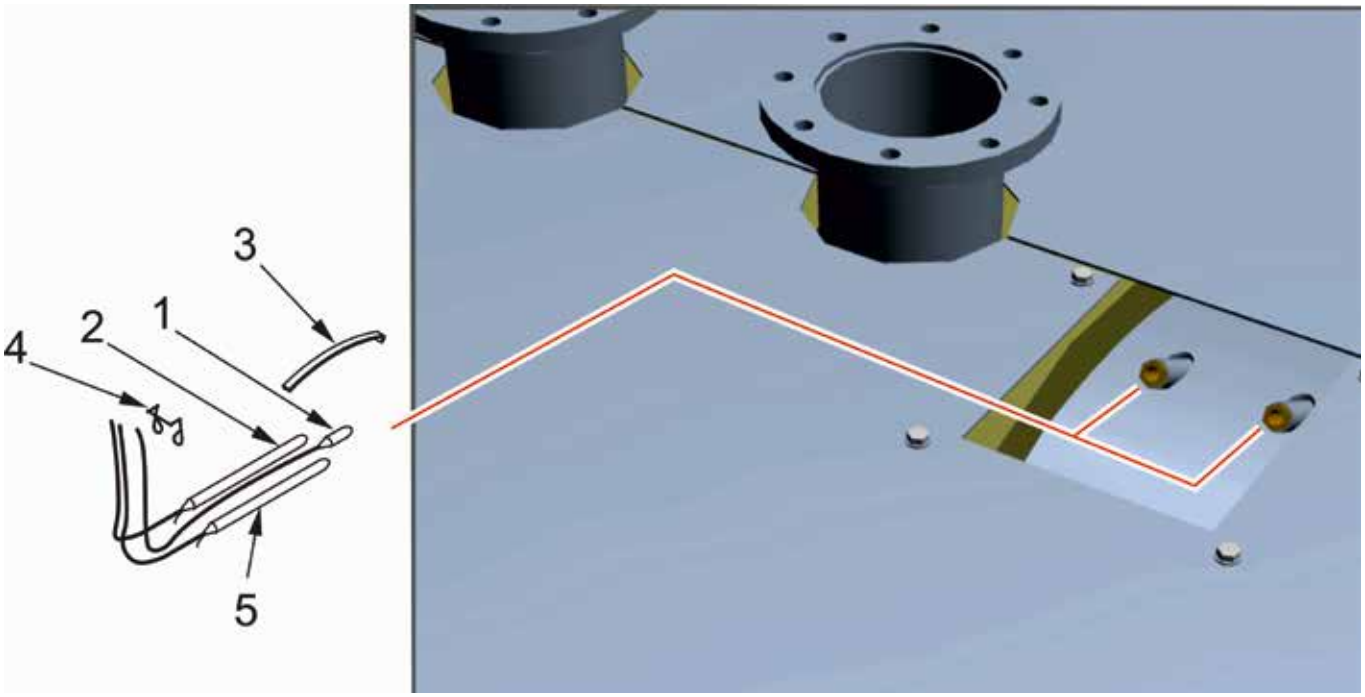
The plates are included in the document envelope.

Tabella mantelli per modello

XC-K 3	n. side casing		n. piece side casing	n. piece back casing
	dx	sx		
116	2	2	4	1
125	2	2	4	1
300	2	2	4	1
300	2	2	4	1
348	2	2	4	1
400	2	2	4	1

3.11.1 - PROBE CONNECTION

(see instructions 00340613 contained in the casing assembly kit 00473269)



KEY		
N°		Description
1		Thermometer probe (where included)
2		Working thermostat probe

3		Contact spring
4		Safety spring
5		Safety thermostat probe

3.12 - ELECTRICAL CONNECTIONS

General warnings

The electrical safety of the appliance is guaranteed only when it has been properly connected to an efficient earthing system carried out as intended by safety standards in force: pipes of the gas, water and heating systems are absolutely unsuitable as earthing electrodes.

It is necessary to verify this fundamental safety requirement. If in doubt, have the electric system carefully checked by professionally qualified personnel as the manufacturer is not liable for damage caused by failure to provide an earthing system.

Have professionally qualified personnel check that the electric system is adequate for the maximum power absorbed by the appliance, indicated on the data plate. Make sure in particular that the cross-section of the cables is suitable for the power absorbed by the appliance.

Adapters, multiple sockets and/or extension cords cannot be used to power the appliance.

Use of any type of component using electric energy requires the observance of some fundamental rules, such as:

- do not touch the appliance with wet and/or moist parts of the body and/or in bare feet;
- do not pull the electric cables;
- do not leave the appliance exposed to atmospheric agents (rain, sun, etc.) unless expressly designed;
- do not allow children or unskilled persons to use the appliance.

230V electric power supply connection

Boiler installation requires connection to a 230 V - 50 Hz electric mains: this connection must performed up to standard as intended by current IEC regulations.

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.

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

The power cable must be replaced by authorised technical personnel. Failure to comply with the above can jeopardise the safety of the appliance.

Note:
control panel is not included in the supply, therefore for schemes of connection and programming refer to the instruction booklet supplied with the panel command.

https://www.unicalag.it/catalogo-prodotti/caldaie-professionali-300/6242/controlli-e-pannelli-comando

3.13 - COMMISSIONING

Commissioning must be done by professionally qualified personnel. Unical will not be held liable for damage to persons, animals or objects due to failure to comply with the aforesaid instructions.

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 condensation drain trap been filled with water 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 and HEATING pipes been cleaned thoroughly with products suitable for each circuit? have GAS and HEATING circuits been tested?	☐
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	

3.14 - ADJUSTING THE BURNER

The following instructions are intended exclusively for **service personnel authorised by the manufacturer of the burner.**

Note: FOR MAINTENANCE MANAGER
The boiler work properly, if calibrating the burner to a minimum power (Qmin) ≥ 30% of the nominal power (Qn).

ATTENTION: the BURNER
it must be calibrated at a power value equal to or lower than the heat output (Burned Power) indicated on the generator data plate.

Burner calibration and preliminary operations are provided in the burner's instruction booklet.

IN CASE OF LOW NOX BURNERS, use FLAME INVERSION KIT for Low NOx burners supplied by the burner manufacturer.

4 INSPECTIONS AND MAINTENANCE

OBBLIGO!
indossare guanti protettivi

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.

We therefore recommend stipulating an inspection or maintenance contract.

Inspections help to determine the actual status of the appliance and to compare it with the nominal status. This is done through measuring, controls and observation.

Maintenance is required to eliminate any differences between the actual status and the nominal status. This is normally done by cleaning, setting and replacing individual components subject to wear.

Maintenance intervals and their extent are determined by a specialist based on the status of the appliance ascertained through inspection.

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.

Before proceeding with maintenance, always perform the following operations:

- Disconnect the electric mains switch.
- Isolate the appliance from the electric mains by means of an isolated device with a contact opening of at least 3 mm (e.g. safety devices or power switches) and make sure that it cannot be re-connected accidentally.
- Close the gas shut-off valve upstream the boiler.
- Close any shut-off valves on the heating flow and return pipes.

After having completed all maintenance work, always perform the following operations:

- Open the heating flow and return pipes.
- If necessary, restore the heating system pressure until it reaches the static pressure relative to the highest point of the system.
- Open the gas shut-off valve.
- Reconnect the appliance to the electric mains and engage the switch.
- Make sure the appliance is gas tight and watertight.
- Vent the heating system and restore pressure if necessary.

Should you decide to temporarily deactivate the boiler, you must:
a) shut off the various supplies: electric, water and fuel;
b) empty the water system if antifreeze is not used.

Boiler body maintenance

Danger!
Before performing any maintenance, make sure the boiler and its components have cooled off.

Disconnect the boiler from the electric mains and shut the gas supply to the appliance.

Attention!
Before cleaning the boiler body, protect the panel board against any water sprays.

Once a year, at the end of the heating season, the boiler must receive a general cleaning.
Before performing any maintenance, make sure that all the precautions referred to in the previous point have been taken.
To proceed with maintenance you must:
- disconnect power by acting on the main switch;
- remove the burner, which could be overhauled at the same time;
- open the furnace door to access the combustion chamber;
- make sure the internal parts are intact.

Checking gasket status

Check the status of the seal gaskets which must not show signs of deterioration; if so, they must be replaced, using only original spare parts.

Maintenance of burner

Burner maintenance must be carried out by personnel authorised by its manufacturer (or else the warranty shall be terminated).

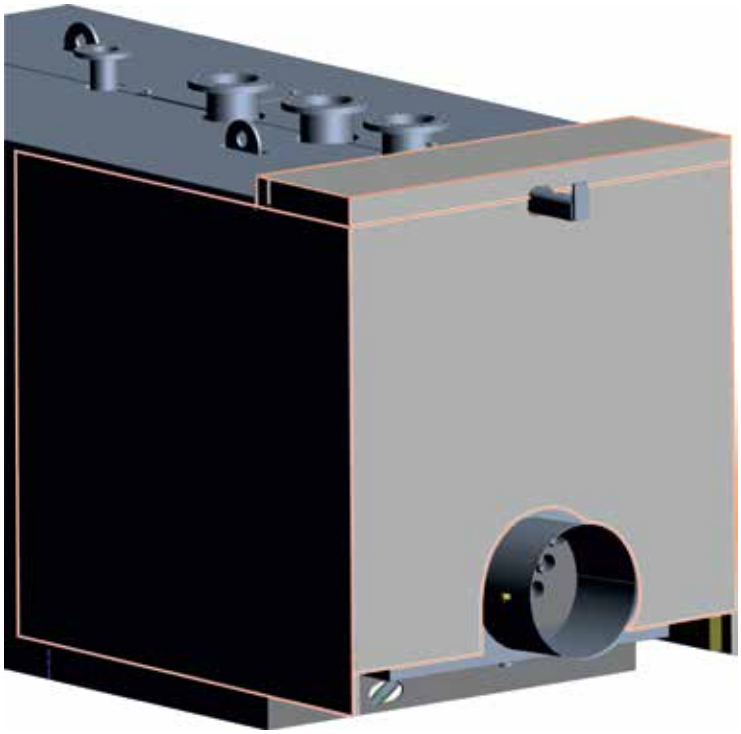
Checking ignition electrode

Burner maintenance must be carried out by personnel authorised by its manufacturer (or else the warranty shall be terminated).

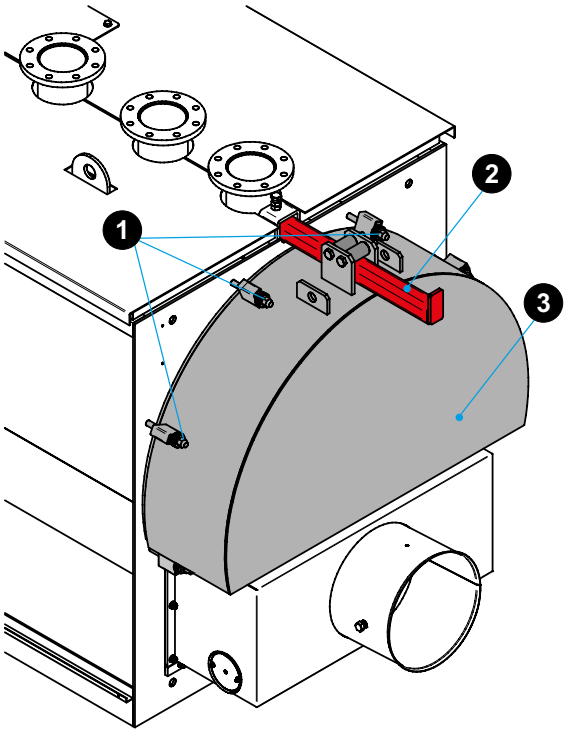
Components to check during yearly inspection		
COMPONENT:	**VERIFY:**	**CONTROL/INTERVENTION MEASURE:**
Safety thermostat	Does the thermostat place the boiler in safety when overheating?	Bring the boiler to operating temperature with the pumps stopped.
System expansion vessel	Does the vessel contain the right amount of air?	Check the nitrogen pressure. Pressurise the boiler (open the pump bleeder). Open the heating circuit closing valves.
Door gaskets	Does smoke seep through the door gaskets?	Further tighten the door nuts. Replace the sealing gasket.
Door gaskets	Does smoke seep through the smoke chamber gaskets?	Further tighten the smoke chamber nuts. Replace the sealing gaskets.

Rear door opening for maintenance operations

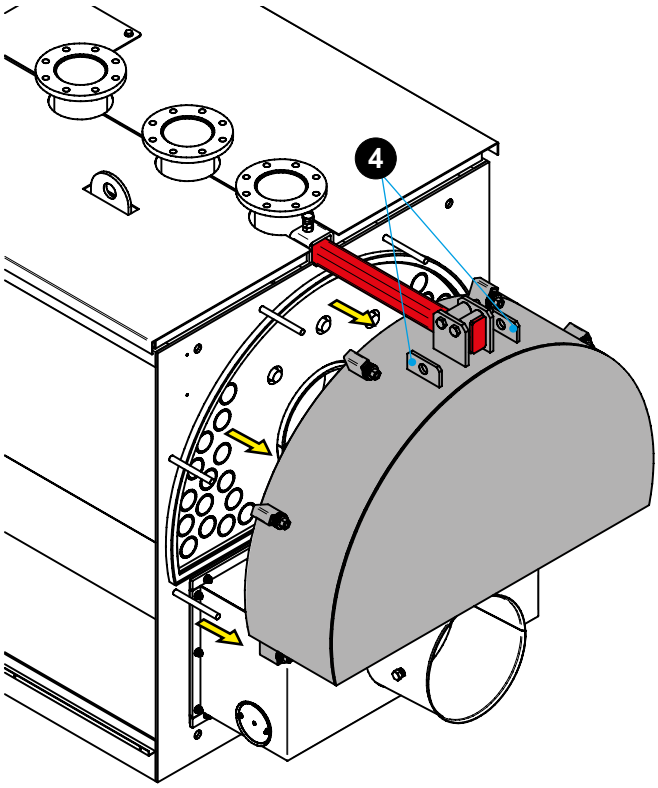
- Remove the casings:
  rear, right side, left side and cover



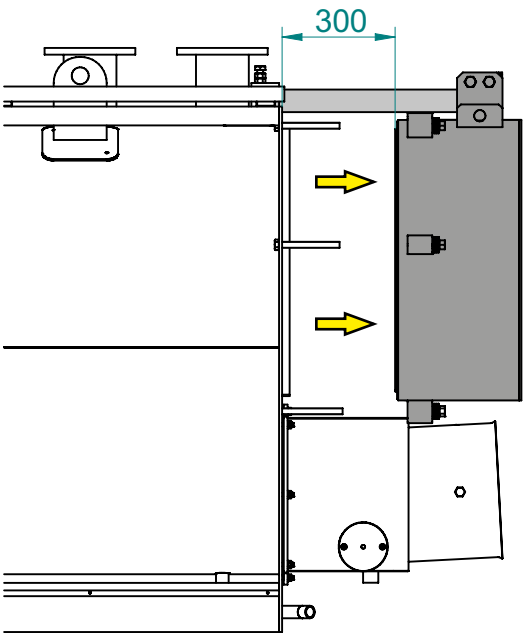
- Remove the fixing nuts **“1”** of the rear door **“3”**



- Remove carefully door **” 3 “** using the slide **“ 2 “**.
  (limit stop at 300 mm)
- If necessary, remove whole door using
  hydraulic crane, (lifting holes **” 4 “**).



- After maintenance operations, reassemble the rear door, checking correct tightening of the nuts **“1”**, after a few hours of operation.



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