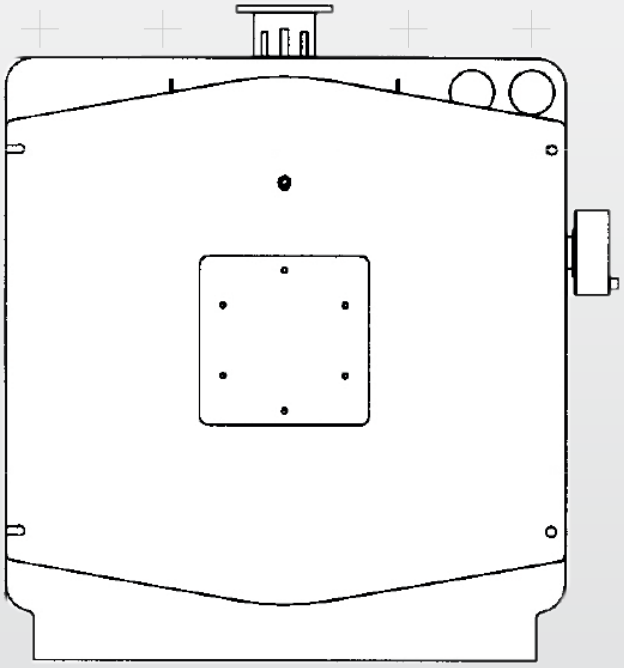
EN

Hot water heat generators

REX 450 ÷ 600



INSTALLATION, USE AND MAINTENANCE MANUAL

CE

REX_450_600_6bar_en_02 - 03/2024

INDEX

SYMBOLS USED IN THE MANUAL

DANGER
To indicate actions that, if not performed correctly, can result in injury of generic origin or may generate malfunction or damage to the appliance; therefore require particular caution and adequate preparation.

IT IS FORBIDDEN
To indicate operations that SHOULD NOT be performed.

IMPORTANT
To indicate particularly useful information and important.

The illustrations and data presented are not binding. The company reserves the right to make without prior notice any changes it deems appropriate for continuous improvement and constant updating.

1 General information

INTRODUCTION

Dear Customer,
Thank you for having chosen an appliance of the series **REX**, a high quality and efficiency product, reliable and safe.
We recommend entrusting its maintenance to **Professionally Qualified Personnel** who, when necessary, uses original spare parts.
This manual contains important information and suggestions that must be observed for easier installation and best possible use of the appliance.

IMPORTANT
Failure to observe the instructions in this manual will void the warranty conditions.

RANGE

MODEL	CODE
REX 450	83820010
REX 600	83822010
REX 450 exp	83820012
REX 600 exp	83822012

COMPLIANCE

REX boilers comply with the following European Directives:
- European Regulation on Gas Equipment GAR 2016/426/EU
- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU
- Efficiency Directive 92/42/EEC

NOTE

The serial number is indicated on the boiler technical nameplate.

WARRANTY

The warranty conditions for boilers series **REX** are included in the CONSTRUCTION - WARRANTY CERTIFICATE supplied with the product.

WARNINGS

IMPORTANT

- The appliance must be used for the purposes for which it has been expressly designed and any manufacturer's liability shall be excluded in case of damage to persons, animals or property due to insufficient maintenance or improper use.
- This manual is an integral part of the boiler and must be carefully read before installation and commissioning of the appliance. Moreover, it must be carefully stored for subsequent consultations and must ALWAYS accompany the boiler during its entire life-cycle (from installation to disposal). In case of damage or loss, request a copy from **ICI CALDAIE S.p.A.** Technical Assistance Service.
- The appliance is delivered in several separated packages. Upon receipt, check that the supply is intact and undamaged and promptly contact the **ICI CALDAIE S.p.A.** if it does not correspond to the order.
- The installation of **REX** boilers must be performed by a Certified Body which, at the end of the operation, must provide the owner with the declaration of conformity certifying that the installation has been correctly carried out, namely in compliance with the Standards and the national and local Laws in force, and with the indications included in the instruction manuals supplied by **ICI CALDAIE S.p.A.**.
- The maintenance of the appliance is a legislative obligation. The User must have it carried out by an Authorised Company or by qualified personnel (maintenance technician) in compliance with the requirements of the local Standards in force.
- Ordinary and extraordinary maintenance must be carried out by qualified personnel in order to promptly detect any damage to the boiler body under pressure and to the safety and control accessories.
- The boiler is used to heat water at a temperature lower than the boiling temperature at atmospheric pressure and must be connected to a heating and/or domestic hot water production system, within the limits of its performance and power.

PROHIBITIONS

IT IS FORBIDDEN

- Operate electrical devices or appliances such as switches, household appliances, etc. if you smell fuel or unburnt materials. In this case:
  - *ventilate the room by opening doors and windows*
  - *close the fuel shut-off device*
  - *ask the Technical Assistance Service or qualified personnel to intervene as soon as possible.*
- Any technical or cleaning operation carried out before disconnecting the appliance from the power supply mains, by positioning the system main switch and the control panel main switch to "OFF".
- Modifying safety or adjustment devices without the boiler manufacturer's authorisation and indications.
- Plug or dimensionally reduce the ventilation openings of the installation room. The ventilation openings are essential for proper combustion.
- Exposing the boiler to atmospheric agents. It is not designed to operate outdoor and it does not feature automatic anti-freeze systems.
- Leave flammable substances and containers in the room where the appliance is installed.
- Disperse the packaging material in the environment and leave it within the reach of children as it may be a potential source of danger. It must be disposed of in accordance with the legislation in force.

HAZARDS

DANGER

- In case of water leakages, disconnect the boiler from the power supply mains, close the water supply and contact, as soon as possible, the Technical Assistance Service Authorised by **ICI CALDAIE S.p.A.** or qualified personnel.
- Sensing the presence of fuel in the thermal power plant, it is appropriate to follow the precautions below to avoid the risk of explosions and fires:
  - *do not smoke or cause sparks*
  - *do not turn on lights or electrical devices in general (mobile phones)*
  - *open doors and windows*
  - *close the fuel shut-off valve normally placed outside the thermal power plant*
  - *disconnect the power supply by means of the switch which is usually located outside of the plant room.*
- During the normal operation, the appliance has hot parts, such as the channel and the flue gas box, which in case of accidental contact without appropriate personal protection can cause severe burns.
- An incorrect adjustment of the closing door or an insufficient chimney draught can cause the presence of smoke inside the heating plant room, leading to fatal intoxications due to carbon monoxide, which is by nature colourless and odourless. Therefore, make sure that the boiler is correctly adjusted and installed and that the heating plant room features vents compliant with the standards in force.

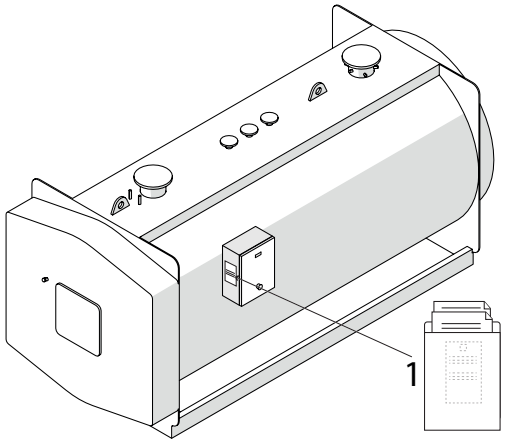
IDENTIFICATION

Each **REX** boiler can be identified through the construction plate (1) inside the envelope of the documents supplied with the boiler, which includes technical/efficiency information such as:

- serial number or identification marking
- heat input in kW
- nominal thermal flow in kW
- types of fuels which can be used
- maximum operating pressure.
- CE marking

IMPORTANT

The boiler installer **MUST** apply the construction plate, at the end of installation, in the front upper side of one of the side panels of the cover, so that it can be easily identified and read. In case of loss, request a copy to the Technical Assistance Service of **ICI CALDAIE S.p.A.** providing the serial number indicated in the CONSTRUCTION CERTIFICATE - WARRANTY or the sale delivery note.



The appliance is also accompanied by **construction certificate** attesting the successful result of the hydraulic test.

IMPORTANT

The installation must be performed in compliance with the local standards by **qualified personnel**, namely by personnel with specific technical skills in the field of the heating system components. An incorrect installation may cause damage to persons or property for which the manufacturer will not be liable.

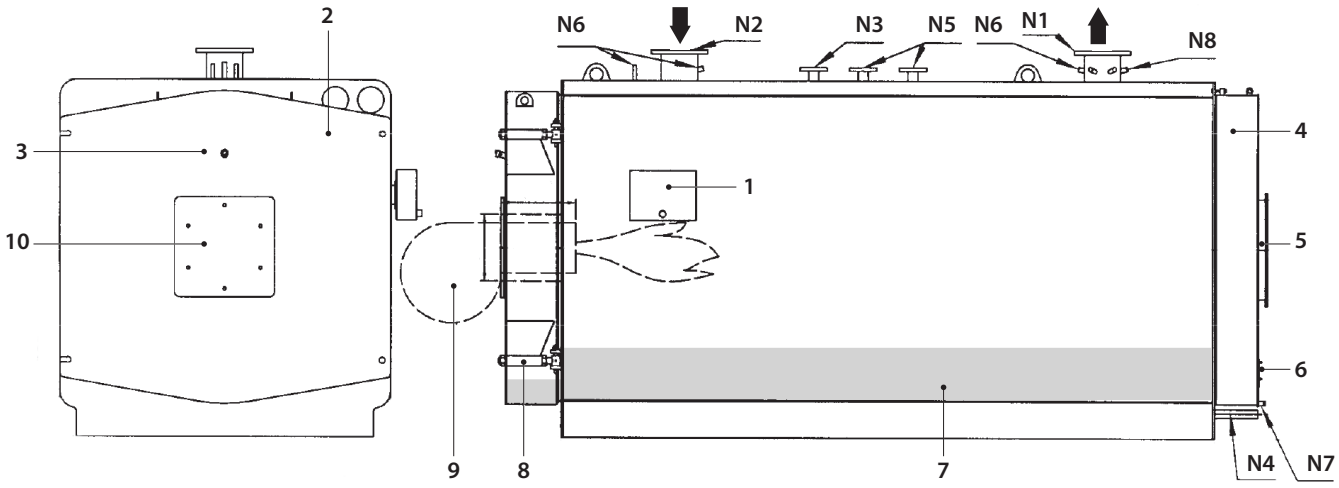
During **commissioning** check the effectiveness of all adjustment and control devices in the control panel.
The **warranty** validity is subject to compliance with the instructions in this manual.

APPLIANCE DESCRIPTION

High-efficiency **ICI CALDAIE S.p.A. REX** steel boilers must be used for heating systems with water temperature within 60° and 100°C and/or in a system for domestic hot water production, within the limits of their performance and power.
The chosen control panel should be equipped with a safety thermostat with manual reset from 110°C.
They have been provided with cylindrical furnace with reverse flame closed at the back by a fully wet convex bottom, supported by a stub and that can be coupled with forced draft burners.
Some of the main characteristics of the equipment are listed below:

- boiler body made in quality steel, made up by the front tube plate flanged towards the furnace with RSB process and by the convex, instead of flat, rear plate, for better resistance to the internal pressure, with laser-cut holes
- cylindrical combustion chamber, with reverse flame, closed at the back with fully wet convex bottom, supported by a stub. The flame runs through the central part, while the hot gases return peripherally to the front, partially wet, part to be conveyed to the tube bundle
- EN10217-2 P235GH fire tubes, welded to the front and rear tube plates, equipped with helical turbulators
- rear smokebox made in steel metal sheet, consisting of a single piece that can be easily opened to inspect the fire tubes, fastened by means of bolts, complete with chimney fitting and cleaning door
- containment tube bundle equipped with connections necessary for the system and the operating equipment, all welded with approved processes carried out by qualified welders
- casing made with easily removable painted steel panels, that protect the insulation made with high-density fibreglass wool mats
- front door made in steel metal sheet thermally insulated with ceramic fibre, fitted on hinges, that can be easily opened by means of drilled ring nuts and with supplied lever.

STRUCTURE

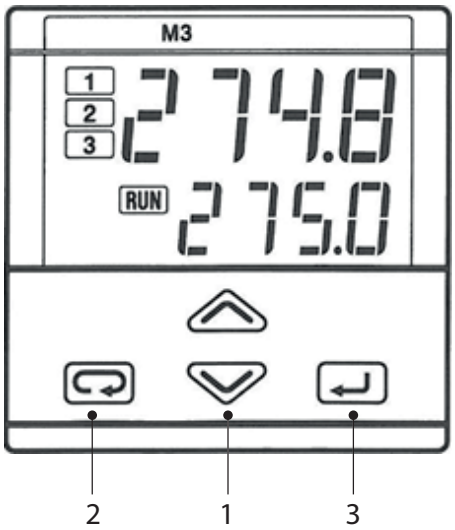


1 *Control panel (accessory)*
2 *Front door*
3 *Flame inspection window*
4 *Rear smokebox*
5 *Flue gas drain fitting*
6 *Inspection door*
7 *Insulating casing*
8 *Door hinges*
9 *Burner (accessory)*
10 *Burner support flange*

N1 Boiler flow fitting
N2 Boiler return fitting
N3 Instruments fitting
N4 System intake/drain fitting
N5 Safety valve(s) fitting
N6 Bulb-holder pockets
N7 Condensate drain fitting

CONTROL PANEL (STANDARD)

ELECTRONIC REGULATOR



The controller displays the temperature of the water in the boiler and allows setting three thresholds on the probe working range.

Functions

OP1 – Burner ON/OFF value
OP2 – Burner second stage value
OP3 – Anti-condensate pump stop value

Displaying and changing output values

OP1
Open the main screen and below the temperature indication you can read the burner ON/OFF setting value.
Use the directional arrows (1) to increase or decrease, wait 2 seconds and the parameter will automatically be saved.

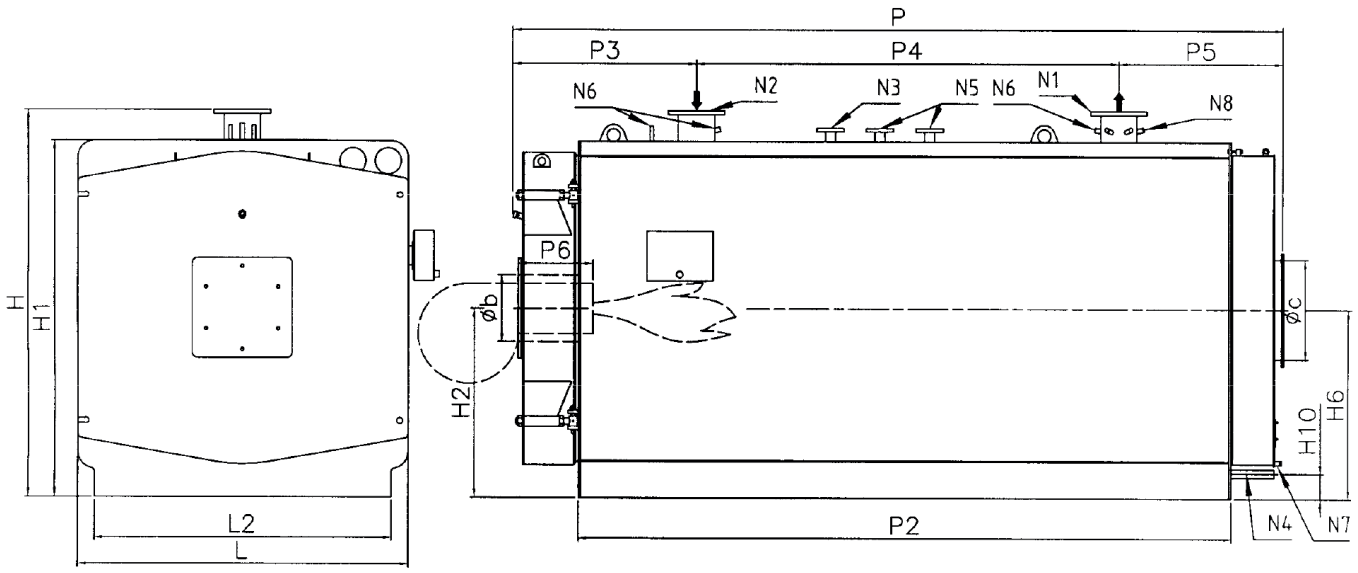
OP2
From the main screen, press the key (2) and the parameter A2S.P is the burner second stage value.
Use the directional arrows (1) and confirm with key (3).

OP3
From the main screen, press key (2) and then (3).
A3S.P parameter is the anti-condensate pump OFF value.
Use the directional arrows (1) and confirm with key (3).

WIRING DIAGRAM
See the diagram inside the electric panel.

DIMENSIONS AND CONNECTIONS

Mod 400÷600



Dimensions

Description	u.m.	REX			
		450	600	450 exp	600 exp
H	mm	2326	2529	2326	2529
H1	mm	2140	2340	2140	2340
H2	mm	1135	1235	1135	1235
H6	mm	1135	1235	1135	1235
H10	mm	150	150	150	150
L	mm	1980	2180	1980	2180
L2	mm	1780	1980	1780	1980
P	mm	4660	5261	4660	5270
P2	mm	3946	4488	3946	4448
P3	mm	1105	1174	1105	1174
P4	mm	2550	3100	2550	3050
P5	mm	1005	987	1005	1046
P6	mm	500-550	530-580	500-550	530-580
Øb	mm	400	450	400	450
Øc	mm	600	650	600	650

For BIOGAS generators, add 40 mm to measurement P6

Fittings

Description	u.m.	REX			
		450	600	450 exp	600 exp
N1	DN/in	200	250	200	250
N2	DN/in	200	250	200	250
N1/N2	PN	16	16	16	16
N3	DN/in	50	65	50	65
N4	DN/in	1"1/4	1"1/4	1"1/4	1"1/4
N5	DN/in	50	65	50	65
N6	DN/in	1/2"-3/4"	1/2"-3/4"	1/2"-3/4"	1/2"-3/4"
N7	DN/in	1/2"	1/2"	1/2"	1/2"
N8	DN/in	1/2"	1/2"	1/2"	1/2"

TECHNICAL DATA

DESCRIPTION	u.m.	REX			
		450	600	450 exp	600 exp
Effective rated [1]	kW	4500	6000	4500	6000
Flow thermal	kW	4865	6480	4865	6480
Efficiency at 100% (ref. P.C.I.) [1]	%	92,5	92,59	92,5	92,59
Max gas flow rate - G20	Stm^3/h	514,81	685,71	514,81	685,71
Max gas flow rate - G30	kg/h	382,09	508,93	382,09	508,93
Max gas flow rate - G31	kg/h	377,95	503,41	377,95	503,41
Max flue gas flow rate	kg/h	7670,67	10217,08	7670,67	10217,08
Efficiency at 30% (ref. N.C.V.) [1]	%	91,9	91,9	91,9	91,9
Flue gas pressure drop	mbar	10	12	10	12
Heat losses through the chimney	%	6,7	6,61	6,7	6,61
Heat losses through the casing	%	0,8	0,8	0,8	0,8
Heat losses with burner off	%	0,1	0,1	0,1	0,1
Flue gas temperature (Nom. output, air = 20°C) - GAS	°C	179	177	179	177
Flue gas temperature (Nom. output, air = 20°C) - OIL	°C	182	180	182	180
Flue gas temperature (Nom. output, air = 20°C) - FUEL OIL	°C	182	180	182	180
CO_2 - GAS	%	10,5	10,5	10,5	10,5
CO_2 - OIL	%	13,5	13,5	13,5	13,5
CO_2 - FUEL OIL	%	14	14	14	14
Fluid pressure drop (ΔT=12K)	mbar	124,5	90,6	52	62
Nominal pressure	bar	6	6	6	6
Total capacity	l	4900	6900	4900	6900
Total weight	Kg	7920	11330	7920	11630
Rated frequency ~ voltage	Volt ~ Hz	230 ~ 50	230 ~ 50	230 ~ 50	230 ~ 50
Electric protection rating	IP	55	55	55	55
Absorbed power [3]	W	20	20	20	20
Allowed fuels		Methane - LPG - Diesel - Naphtha			

[1] *Average temperature 70°C.*

[2] *Efficiency Directive 92/42/EEC.*

[3] *With electronic control unit (circulator and burner excluded).*

CONTROL PANEL

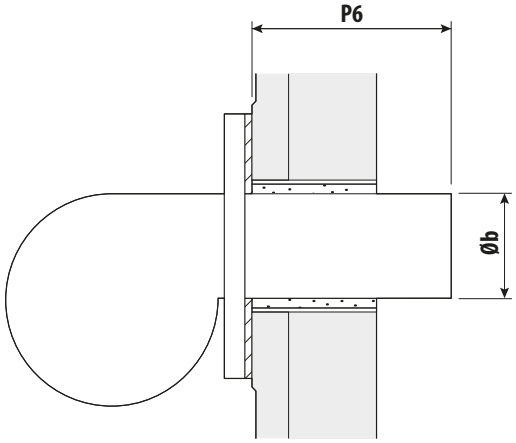
The control panels which can be installed on **REX** boilers are mentioned in the table.
They must be ordered separately from the boiler and for to their technical and installation characteristics refer to the manual provided with the panel.
To choose the most appropriate control panel for the system refer also to the **CATALOGUE**, and to use it refer to the manual supplied with the control panel.

Description	Code
Eterm boiler control panel	QATRXETERM01
Eterm boiler control panel	QATRXETERM02
Eterm easy manager panel	QCTETERM

BURNERS

The burners that can be installed on the **REX** boilers must be CE marked according to European Directives:
- European Regulation on Gas Equipment GAR 2016/426/EU
- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Machinery Directive 2006/42/EC (for liquid fuel burners)

They must also be able to operate on boilers with flame inversion combustion chamber.
Since the optimal operation of the boiler depends on the correct selection of the burner and its adjustment, find below some points to take into account:
- The firing range of the burner must include the boiler operating point (flow-back pressure in combustion chamber considering the pressure at the base of the chimney as ZERO)
- the length of the combustion head must be adequate to the penetration into the combustion chamber provided by ICI and shown in the table
- the length and shape of the flame must be suitable to the flame inversion combustion chambers. The burner manufacturers have this information as they are required by certification.



Description	u.m.	REX			
		450	600	450 exp	600 exp
P6	mm	500-550	530-580	500-550	530-580
Øb	mm	400	450	400	450

For BIOGAS generators, add 40 mm to measurement P6

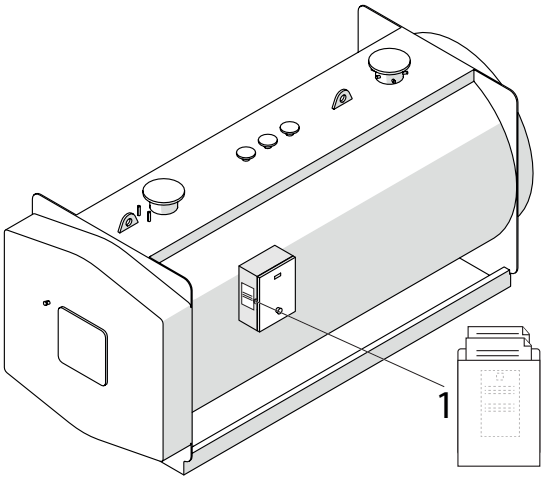
2 *Installation*

PRODUCT RECEIPT

The boilers are provided already covered with embossed aluminium with protective heat-shrink film.

– The document envelope (1) contains:
  - adhesive nameplate
  - instruction manual
  - construction certificate and warranty

Inside the combustion chamber there is the turbulator unit to be inserted in the fire tubes during boiler installation.

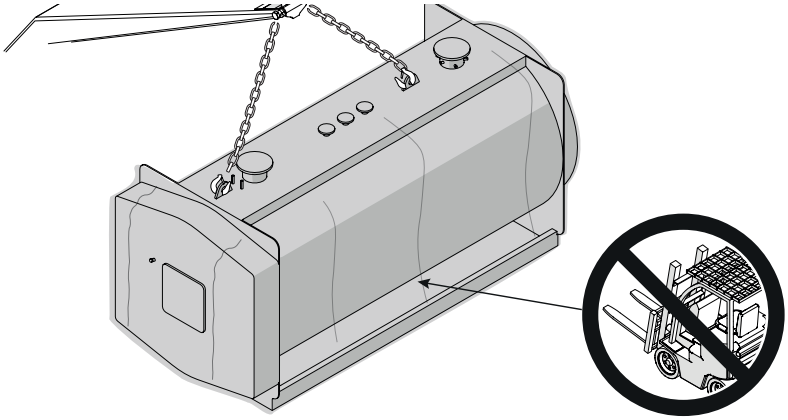


IMPORTANT
The instruction manual is an integral part of the appliance and it MUST be carefully read before installing and commissioning the boiler, carefully stored for further consultations and it MUST always accompany the boiler.

IMPORTANT
PACKAGING: as for the package, **ICI CALDAIE S.p.A.** complies with the specific recycling systems of each country, ensuring an optimal reuse of them. All the materials used for the packaging respect the environment and can be recycled, such as wood, plastic, cardboard.

HANDLING

REX boilers are equipped with fittings for lifting operations and, in any case, they must be carefully moved with equipment suitable for their dimensions and weights.



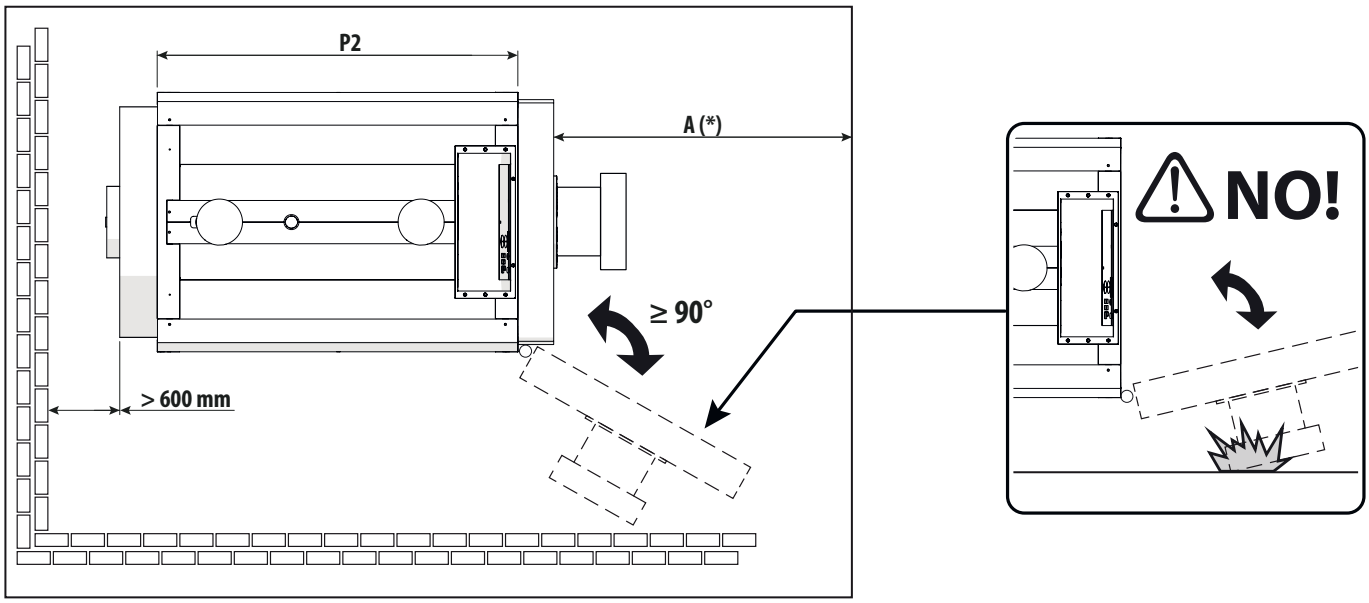
ATTENTION
The Personal Protective Equipment required by current legislation must be used.

ATTENTION
– Do not expose the packed product to direct sunlight.

INSTALLATION ROOM

The **REX** boiler installation room must be for exclusive use, meet the Technical Standards and Legislation in force and equipped with adequately sized ventilation openings.
The spaces around the boiler and towards the ceiling must be suitable for:
- installing the appliance
- reaching the safety devices
- maintenance
- repairing any breakage
- opening the door of the installed burner, considering its opening direction (towards the right or the left)

It is recommended to position the boiler, if possible, lifted from the floor to minimise dust extraction by the burner fan.



IMPORTANT

- The front space (A) must be greater than the boiler length to be able to extract the turbulators or replace a fire tube in case of breakage.
- In the case of several boilers installed in the same room, check the accessibility to the most remote boiler to be able to perform ordinary and extraordinary maintenance.

ATTENTION

- Consider the spaces necessary to access the adjustment and safety devices and to perform maintenance.
- If the burner is fed with gas of specific weight greater than that of the air, the electrical parts must be positioned at least 500 mm from the ground.

SYSTEM CLEANING

Before connecting the boiler to the system, it is RECOMMENDED to wash the pipes thoroughly in order to remove any residues which may compromise the correct operation of the boiler.

HYDRAULIC CONNECTIONS

STARTING HYDRAULIC CIRCUIT

The hydraulic circuit must be built by an authorised company or by qualified personnel, in compliance with the Technical Standards and the Law in force.
The components shall be charged to the installer that, at the end of the works, must issue a declaration of conformity.

IMPORTANT
ICI CALDAIE S.p.A. is not liable for any harm to people, animals or property damage caused by errors in the choice of components or in the construction of the plant.

IMPORTANT

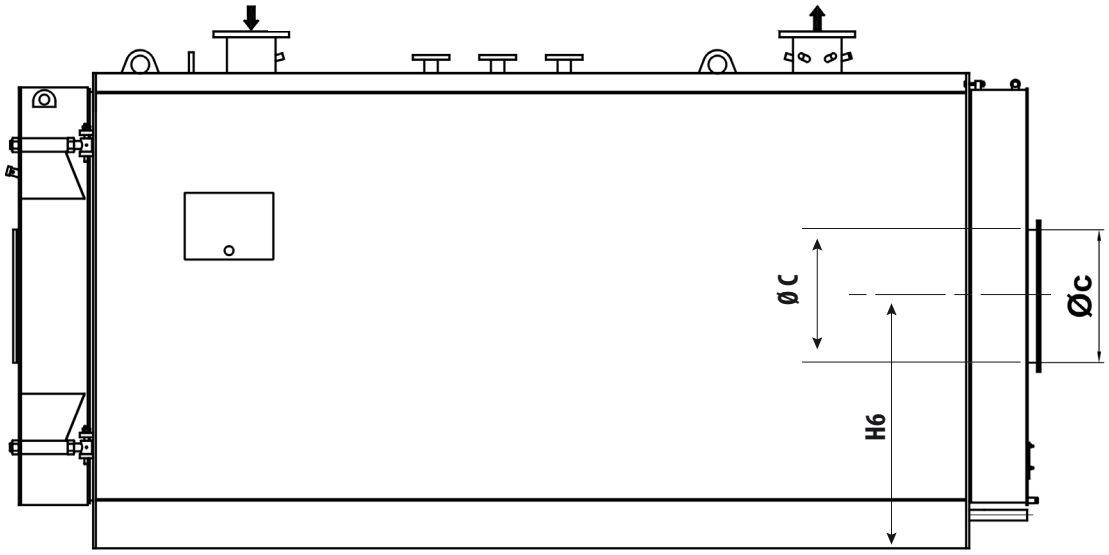
- Make sure that the hydraulic pressure measured downstream of the pressure regulator on the supply line does not exceed the operating pressure indicated on the boiler nameplate.
- Make sure that the drains of the safety valves of the boiler and the heater, if any, are connected to a drain funnel, so that the valves do not flood the room in case of intervention.
- Make sure that the water and heating system pipes are not used as earthing point of the electrical system.
- Once the heating system has been filled, it is recommended to close the supply tap and keep it closed so that any system losses can be signalled by an hydraulic pressure drop detected on the system manometer.
- For reasons of technical expertise, the system components must be chosen and installed by the installer, that must operate in accordance with good practice regulations and Laws in force.

WATER CIRCULATION

The temperature difference between flow and return must not exceed 30°C in order to avoid thermal shocks to the boiler. The return temperature from the system must be higher than 50°C (with exclusive methane gas or LPG operation) in order to protect the boiler from corrosion due to acid flue gas condensate.
The warranty does not cover any damage caused by the condensate.
It is useful to mitigate the return temperature by installing a mixing valve and/or a recirculation pump.

FLUE GAS DISCHARGE AND COMBUSTION AIR SUCTION

The main chimney features, such as height, section, type of outlet in the atmosphere, control points, smoke mass, must be established by a company specialised in the sector that will operate according to the applicable Standards and Legislation. The connection between chimney and generator (smoke duct) must be made according to the specific plant requirements.



Description	u.m.	REX			
		450	600	450 exp	600 exp
H6	mm	1135	1235	1135	1235
Øc	mm	600	650	600	650

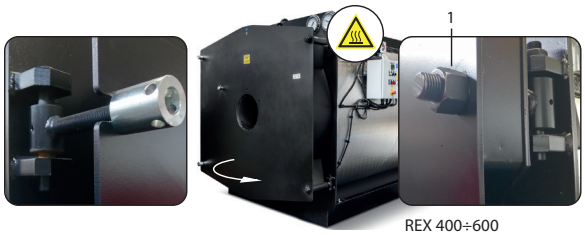
IMPORTANT
The smoke duct must have a diameter equal to or larger than the boiler fitting.

DANGER
- the chimney must ensure the draught necessary for the boiler operation and provided for by the Technical Standards in force, considering a "zero" pressure at the connection with the smoke duct
- unsuitable or badly dimensioned chimneys and smoke ducts can cause condensation problems and adversely affect the combustion parameters

FRONT DOOR OPENING

The door is adjusted in the factory with standard opening to the left (Sx) and hinges on the right (Dx).

DANGER
It is DANGEROUS TO UNSCREW the ferrules (8) on the side of the hinges. This may cause the door to detach, with possible serious harm to people and property damage.



REX 400÷600

FRONT DOOR ADJUSTMENT

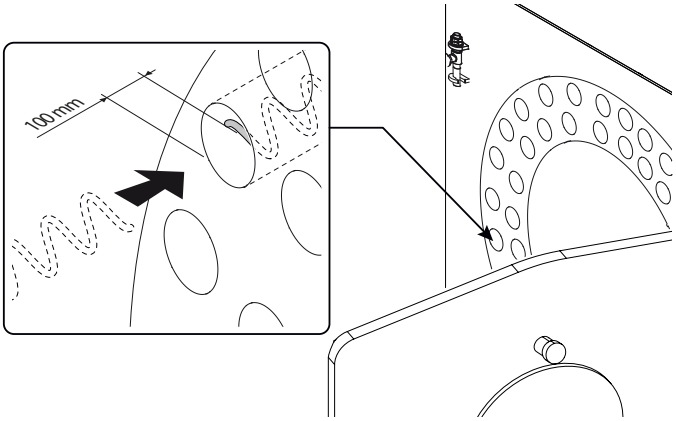
DANGER
Incorrect door adjustment with consequent damage to people and property voids the warranty conditions.

DANGER
THERE MUST BE NO FLUE GAS LEAKS.

Check the proper adjustment in depth ensuring that the door, manually pushed up to the stop plate, naturally returns remaining ajar. This is to ensure the hinge side fume seal.

TURBULATOR ASSEMBLY

To assemble the turbulators supplied with the boiler, open the door and insert the turbulators completely into the smoke pipes, until they penetrate by at least 100 m.



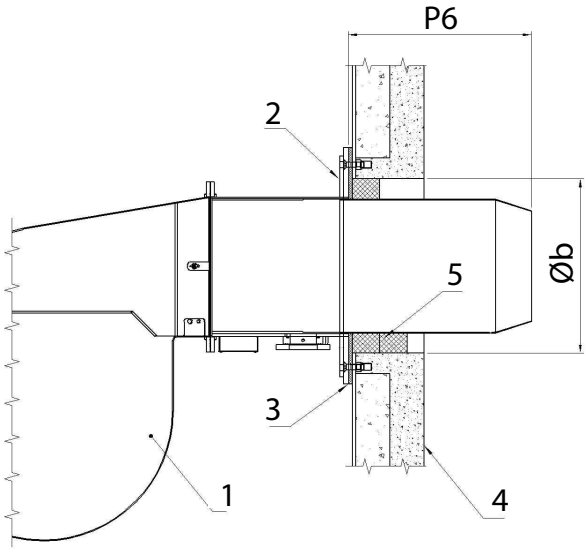
DANGER

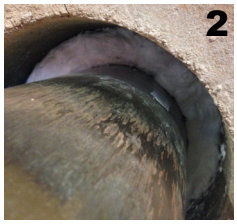
The turbulators have very pointed and sharp ends. Therefore, wear suitable protective gloves during insertion (equipment according to current regulation).

BURNER ASSEMBLY

Having chosen the burner to be used, refer to the Manual supplied with it for information about:
- the installation and fastening to the boiler
- the connection to the fuel supply
- the electrical connections
- the adjustments to be made
- maintenance
- the necessary checks.

IMPORTANT
The insulating mat supplied as standard with the generator must be wrapped around the nosepiece for at least one full turn in order to protect the burner flange from the flame. The insulating mat does not need to fill the gap up to the door insulation inner surface. If the material supplied is not suitable for the burner used, use another material that can also resist to 1000°C and whose size is appropriate to fully close the gap.





1 *Burner*
2 *Flange*
3 *Gasket*
4 *Door*
5 *Insulating mat*

IMPORTANT
For fuel oil/biogas operation, the door should have concrete insulation and be equipped with suitable tie-rods. Any changes and/or failure to disclose information during sales will void the warranty conditions.

ELECTRICAL CONNECTIONS

The electric system of a heating plant room used only to heat the buildings must be made by an authorised company that must comply with regulations, some of which are general while others are specific for the single types of use or combustion.

IMPORTANT
Connect the earth cable to an effective earthing system. **ICI CALDAIE S.p.A.** is not liable for any damage caused by the lack of the earthing system and the failure to comply with the instructions of the wiring diagrams.

PROHIBITION
Do not use the water and heating system pipes for the **earthing connections**.

WATER TREATMENT

The thermal system water must comply with the Laws in force, therefore it is good practise to use treatment units when the line water is particularly rich in calcium carbonate, which causes scale build-ups and corrosion.
The table includes some indicative values:

Characteristics	Scale	Filling water	Circuit water
pH*		-	7,5 - 11
Hardness (CaCo2)	°Fr	< 15	-
Iron (Fe)**	mg/kg	-	< 0.5
Copper (Cu)**	mg/kg	-	< 0.1
Oxygen (O_2)	mg/l	< 0.05***	-
Appearance		Clear	Possibly clear

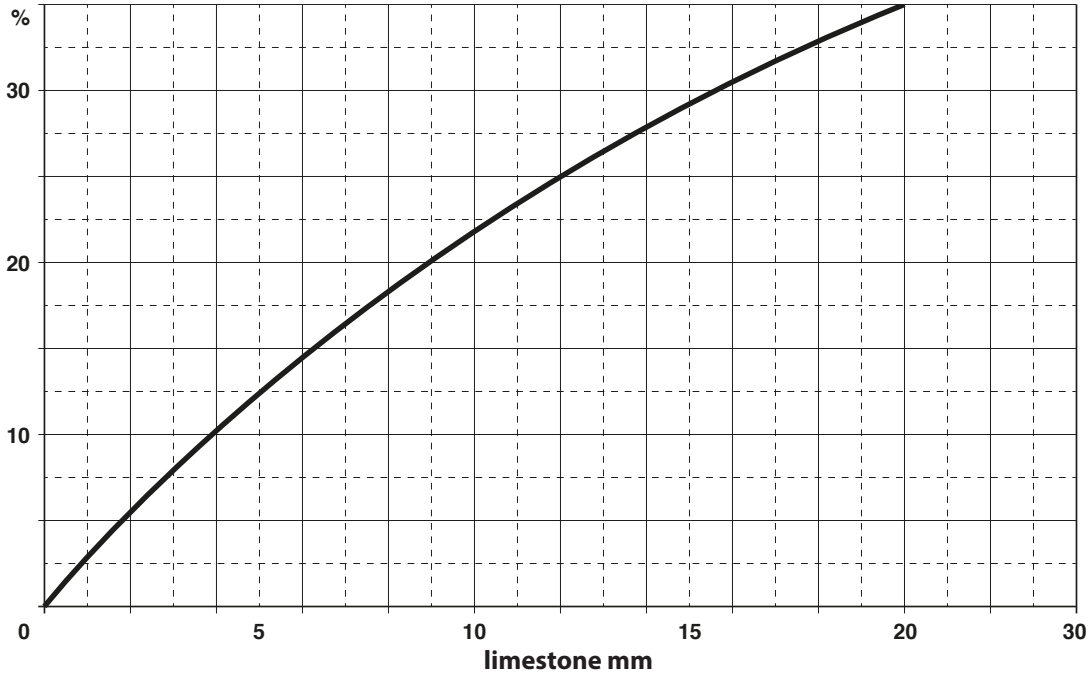
* If there are aluminium components (radiators) in the heating system, the pH value must be between 7.5 and 8 in order to avoid severe corrosion damage.
** Higher values indicate on-going corrosion phenomena.
*** In case of agents which form oxygen film and/or surplus, do not observe this value with intermittent operation or operation without deaerator, but use the additive.

LIMESTONE BUILD-UPS

Limestone build-ups reduce the heat exchange between the combustion gases and water, leading to an abnormal increase of temperature of the parts exposed to the flame and thus to a significant reduction of the service life of the boiler.
Limestone gathers in the points where the wall temperature is higher and the best defence against it, at the construction level, is to eliminate the superheating areas.
Scale build-ups form an insulating layer which decreases the heat exchange of the boiler, penalising its efficiency. This means that a significant part of the heat obtained from the combustion is not fully transferred to the system water, but is lost through the chimney.

LIMESTONE DIAGRAM

Lost heat



CORROSION ON WATER SIDE

The corrosion of the metal surfaces of the boiler on the water side is due to the iron transit into the solution through its ions (Fe+). In this process, the presence of dissolved gases, in particular oxygen and carbon dioxide, is very important. Corrosion phenomena often occur with softened and/or demineralised water, which by nature is more aggressive against iron (acid water with Ph < 7); in these cases, even when scale build-ups are prevented, corrosions can occur and it is necessary to treat the water with corrosive process inhibitors.

SYSTEM FILLING AND EMPTYING

FILLING

- Before filling the system, disconnect the power supply by positioning the system main switch to "**OFF**" and check that the drain valve of the boiler is closed
- open the filling valve of the boiler and the shut-off valve of the water system and allow the water to enter slowly, in quantities proportional to the venting capacity of the automatic or manual air separators, and until the expansion vessel pre-filling static pressure value can be read on the manometer
- close the previously opened boiler filling valve and the water system filling valve
- heat the water for the first time until reaching the system maximum permitted temperature. During this operation, the air contained in the water is vented through the system's automatic or manual air separators
- once the air has been expelled, bring the pressure back to the preset value and close the manual and/or automatic supply tap.
- After the initial filling, it is necessary to prevent oxygen and untreated water from entering the system.
- The entry of oxygen causes corrosion, while untreated water causes the formation of limestone.
- Both conditions must be avoided.

NOTE

The system venting will be completed, if necessary, upon the first commissioning of the boiler.

EMPTYING

- Before starting to empty the system, disconnect the power supply by positioning the system main switch to "**OFF**"
- check that the hydraulic system shut-off valve is closed
- connect a rubber hose to the drain valve of the boiler and convey it towards a drain pocket
- close the shut-off devices of the thermal system parts which must not be emptied
- slowly open the boiler drain valve. To facilitate the draining, open the air separators on the system
- once the operation is complete, close the previously opened air separators and the drain valve.

3 Use

PRELIMINARY CHECKS

Before commissioning the boiler and carrying out the functional tests, check that:
- the turbulators are installed
- the system has been filled and the hydraulic circuit pressure, in a cold state, is correct
- the flue gases are correctly discharged and there are correctly dimensioned vents
- electrical connections and earth connection are correctly carried out
- the rotors of the circulation pumps are not blocked
- the fuel supply line has been correctly built and that the fuel is available
- hydraulic and fuel circuit taps are open.

COMMISSIONING

To start the boiler after performing the preliminary checks it is necessary to:
- set the regulation thermostat on the control panel to the desired temperature
- check that the release button of the safety thermostat inside the control panel is reset
- correctly adjust the control panel devices according to the installed model
- set the main switch of the control panel to "**ON**"
- the rotors of the circulation pumps are not blocked
- the fuel supply line has been correctly built and that the fuel is available
- hydraulic and fuel circuit taps are open
- check for voltage presence at the control panel and burner.

The boiler will perform the ignition phase and will operate until the set temperatures will be reached.

IMPORTANT
In case of **LOCK-OUT STOP** of the burner, refer to its technical manual.

CHECKS AFTER COMMISSIONING

Once the start-up has been performed, check that the appliance stops and then restarts:
- by modifying the boiler thermostat calibration
- by operating on the control panel main switch
- by operating on the ambient thermostat or chronothermostat
- check the tightness of the door gasket and repeat the adjustment in case of leakages
- check the correct operation of pumps
- check the boiler stop by positioning the system main switch to "**OFF**"
- check the safety thermostat triggering.

If all the conditions are met, start the boiler, bring it to its full operation and collect the combustion data.

NOTE

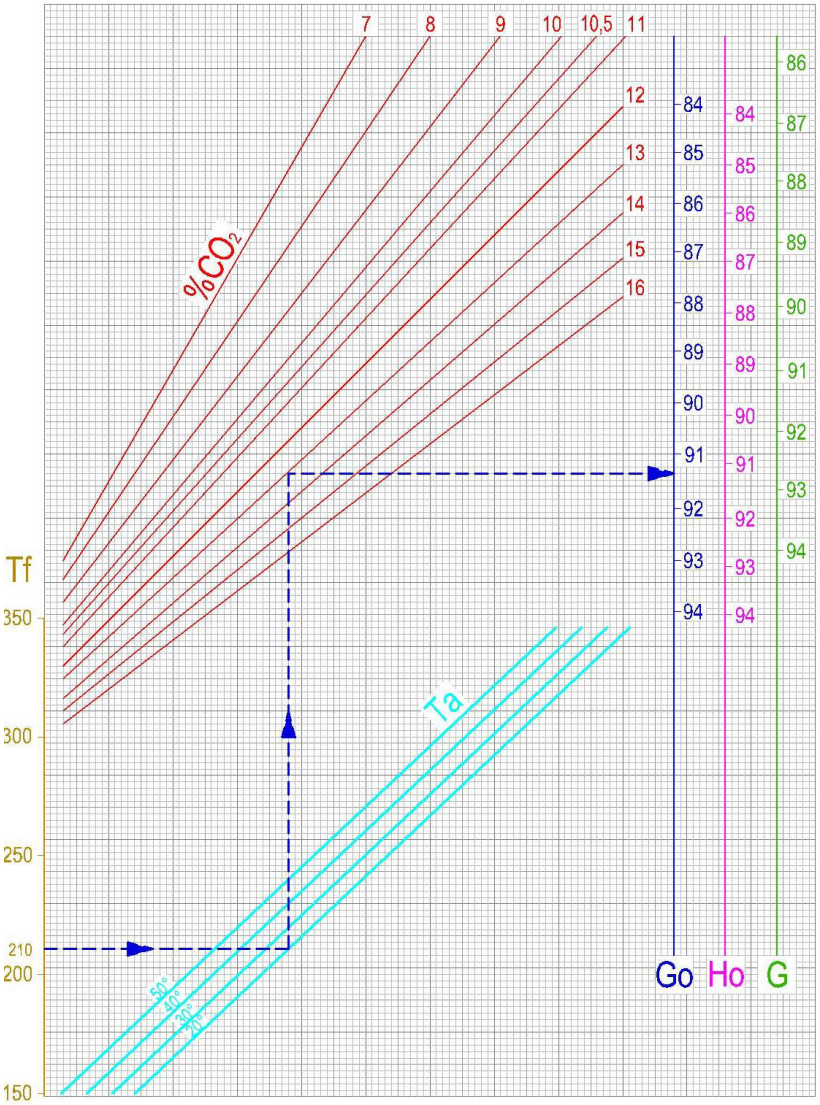
The flame inspection window is equipped with a hose connector which can be used both as a pressure test connection and for cooling the flame inspection window.

Combustion guide values:

FUEL	$\%CO_2$	Flue gas temperature	% CO
Gas	10	190°C	0 – 20 ppm
Diesel fuel	13	195°C	10 – 80 ppm
Nafta	13,5	200°C	50 – 150 ppm

A diagram determines the boiler efficiency according to the flue gas and air temperature and the carbon dioxide percentage ($\%CO_2$), but without considering the losses through the boiler casing.

Efficiency diagram (significant losses only) (%)



Tf Flue gas temperature in chimney °C
Ta Ambient temperature in °C
G Gas
Go Diesel fuel
Ho Nafta

Example

Flue gas temperature:	210 °C
Ambient temperature:	20 °C
$\%CO_2$	13%
Fuel:	Diesel fuel
Efficiency:	**91.4%**

The pressurisation must fall within the values indicated in the table of the technical data.

STOP PERIODS

SHORT PERIODS OF TIME

In case of system switch-off for a short period of time:
– position the central panel switches and the control panel switch to "**OFF**"

IMPORTANT
If the external temperature is below ZERO:
– the boiler must be electrically powered
– the fuel supply must be opened
– the boiler thermostat must be adjusted to the minimum value
– the ambient thermostat or chronothermostat must be activated and adjusted to about 10°C or switched to the **anti-freeze** mode.

LONG PERIODS OF TIME

If the boiler is not used for a long time, it is recommended to:
– position the central panel switches and the control panel switch to "**OFF**"
– close the fuel and water interception valves of the hydraulic system.

IMPORTANT
If the external temperature is below ZERO:
– empty the heating system if there is the risk of frost
– use anti-freeze liquid (propylene glycol) until a maximum percentage of 3%.

DECOMMISSIONING OF OLD APPLIANCES

Decommissioned appliances contain materials which can be recycled and their constructive elements can be easily separated. In this way, the different components can be sorted out for recycling or disposal.
It is required to carefully dispose of dangerous waste in compliance with the laws in force in the country of destination of the appliance.

4 *Maintenance*

Periodic maintenance is prescribed by Law and must be performed only by qualified personnel, at least once a year or more frequently, depending on the boiler output and on the fuel used.
The boiler maintenance and cleaning operations are essential for its safety and to keep its efficiency high, extending its service life.

IMPORTANT
Before performing any maintenance or cleaning:
- disconnect the power supply by positioning the system main switch and that of the burner, if any, to "**OFF**"
- close the fuel supply
- use all Personal Protective Equipment required by current Standards and Legislation
- wait for the boiler and the system to cool down.

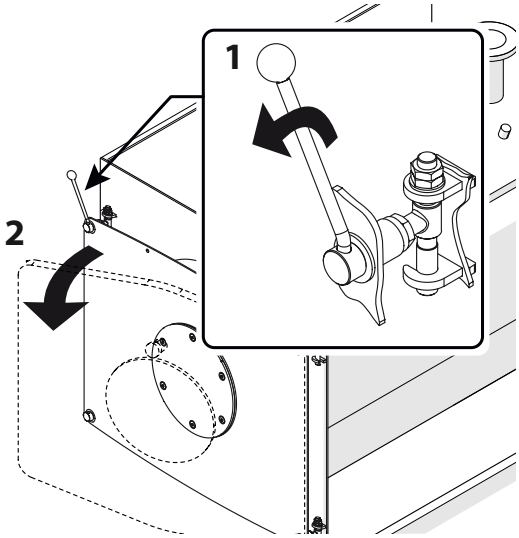
BOILER

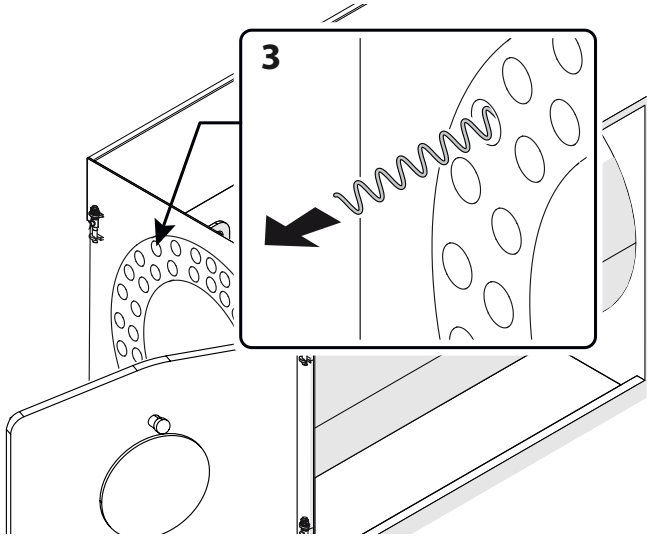
External cleaning

To perform the external cleaning of the boiler (cover) use cloths moistened with water mixed with denatured alcohol or specific non-abrasive detergents. Dry the surfaces thoroughly after cleaning.

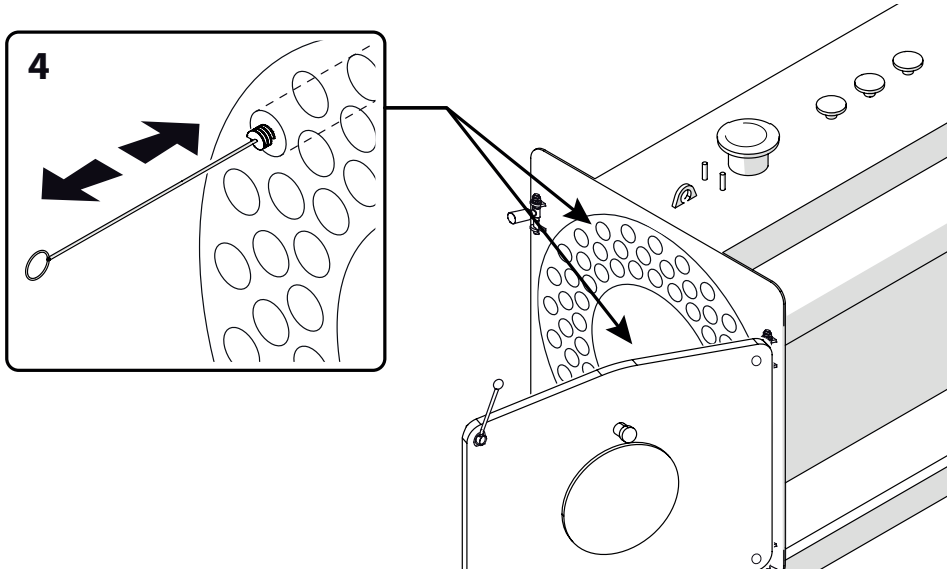
Internal cleaning

To perform the internal cleaning:
- disconnect from the burner anything which may hinder the door opening
- loosen the ring nuts with handle (1), open the door (2) and extract the turbulators (3)





– remove the inspection door of the smokebox
– clean the surfaces of tube bundle and combustion chamber with a brush (4) and/or other suitable tools
– suck, through the smokebox cleaning door, any deposit build-up.



If necessary, remove the smokebox and replace the gasket before refitting it.
Once the cleaning operation is completed, reassemble all the components, replacing those worn out and operating by following the previous procedure in the reverse order.

BURNER

For burner maintenance and cleaning follow the instructions on the burner manual or any other indication provided by the burner manufacturer.

ANY ANOMALIES AND REMEDIES

ANOMALY	CAUSE	REMEDY
The boiler gets dirty easily	Badly adjusted burner	Check the burner adjustment (flue gas analysis)
	Clogged chimney	Clean the flue gas path and the chimney
	Dirt burner air path	Clean burner air coil
The boiler does not reach the correct temperature	Dirt boiler body	Clean the flue gas path
	Wrong boiler/burner match	Compare burner data with tabulated matches
	Insufficient power to the burner	Check the burner adjustment
	Wrong adjustment	Check the correct operation
		Check the set temperature
The boiler switches to thermal safety lock-out	Wrong adjustment	Check the correct operation
		Check the set temperature
		Check the electrical wiring
		Check the probe bulbs
	Lack of water	Check the circuit pressure
	Air presence	Check the circuit pressure
		Check the vent valve
The boiler is at the correct temperature but the heating system is cold	Presence of air in the system	Vent the system
	Faulty circulation pump	Unlock the circulation pump
	Minimum Thermostat wrong adjustment (if any)	Check the set temperature
	Faulty minimum Thermostat (if any)	Check the efficiency
Unburned material odour	Flue gases dispersion into the environment	Check the boiler body cleanliness
		Check the flue gas pipe cleanliness
		Check the tightness of boiler, flue gas pipe and chimney
		Check the door tightness
Gas smell	Gas supply circuit	Check sealing, possible obstructions, combustion quality
Frequent safety valve triggering	Excessive pressure in the system circuit	Check load pressure
		Check pressure regulator
		Check calibration
	Malfunction of the system expansion vessel	Check the efficiency

ENVIRONMENTAL PROTECTION AND DISPOSAL

Protection and respect for the environment is a fundamental principle for **ICI CALDAIE S.p.A.**.
The quality of products, lower costs and protection of the environment are of equal importance for the company. **ICI CALDAIE S.p.A.**, also through ISO 14001 certification, strictly adheres to European laws and standards for the protection and preservation of the environment.
In order to reduce its impact on the environment, the company uses the best technology and materials in its production processes and always considers their economic impact.
Thermal insulators are special waste and must therefore be disposed of in compliance with the applicable legislation.

5 Useful information and declarations

QR CODE

How to register your appliance

The appliance must be registered once the product has been installed, either before or after start-up.

Follow these steps:

- Obtain a smartphone (iPhone, Samsung Galaxy, Htc, Blackberry etc.) or a tablet
- after downloading and installing a "QR Reader" application (any free application is usually more than enough), open it and point the camera on the QR code located on the plate of your appliance (circled in the image)
- you will be sent back to a web page on which to register the data of your appliance and system by completing the indicated spaces.

Once registered, authenticate your e-mail address by clicking on the link that will be sent by e-mail to the provided inbox.
An additional e-mail will then be received with the credentials to access all services specifically developed by **ICI CALDAIE S.p.A.** for those who will register their boiler through the QR Code.
Registration entitles you, even in future months and years, to take advantage of promotions and specific services for registered appliances (e.g.: discounts on spare parts, spare parts kits on sale, free routine maintenance for certain types of products, etc.).

For information, contact the ICI headquarter or the local representative offices.
www.icicaldaie.com - info@icicaldaie.com

ICI CALDAIE S.p.A.
Via G. Pascoli, 38 – Frazione Campagnola
37059 Zevio (VR)
Telephone +39 045 8738511-Fax +39 045 8731148
info@icicaldaie.com – VAT number IT 00227490232
Company certified according to ISO 9001, OHSAS 18001 & ISO 14001
icicaldaie.com

DECLARATION OF CONFORMITY

The undersigned Emanuela Lucchini, CEO of ICI CALDAIE S.p.A., with registered office in Via G. Pascoli, 38 - 37059 Campagnola di Zevio (VR), Italy.

Declares that the boilers:

REX/REX F
REX K/REX K F
REX DUAL/REX DUAL F

conform to the type described in the EC certification and comply with the following Council Directives:

– European Regulation on Gas Equipment GAR 2016/426/EU
– Electromagnetic Compatibility Directive 2014/30/EU
– Low Voltage Directive 2014/35/EU
– Efficiency Directive 92/42/EEC

Zevio, 07/05/2018

ICI CALDAIE S.p.A.
Direttore Generale
Emanuela Lucchini

6 Notes

Cooke Industries - Phone: +64 9 579 2185 Email: sales@cookeindustries.co.nz Web: www.cookeindustries.co.nz

ICI CALDAIE SpA
37059 Fraz. Campagnola di Zevio (Verona) Italy
Via G. Pascoli 38 Phone: +39 0458738511 Fax:+39 0458731148
info@icicaldaie.com www.icicaldaie.com