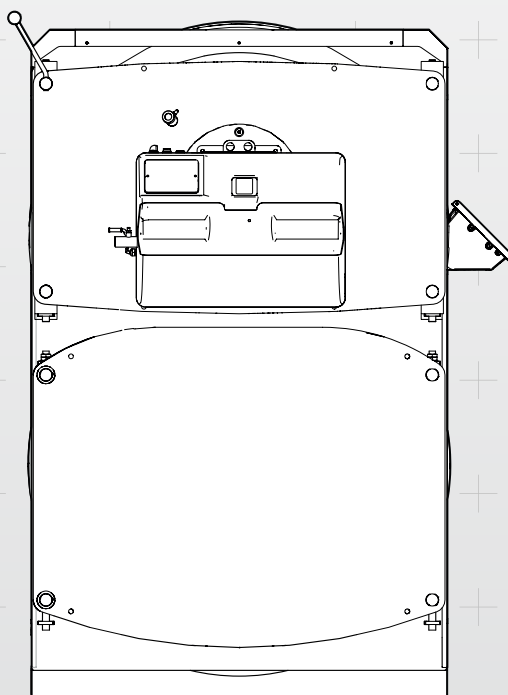




EN

Low NOx steel condensing boilers

# CODEX 1000-1600 GT



INSTALLATION, USE AND MAINTENANCE MANUAL



CODEX 1000-1600 GT\_EN Ed. 00 - 05/2019

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## 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 **CODEX GT**, 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

BOILER		BOILER
MODEL	CODE	CODE
CODEX 1000 GT	81022203	17010195
CODEX 1200 GT	81022213	
CODEX 1400 GT	81022303	
CODEX 1600 GT	81022313	

## COMPLIANCE

**CODEX GT** 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.

Models up to 400kW comply with the Ecodesign of Energy-using Products Directive 2009/125/EC and with the delegated Regulation (EU) no. 813/2013.



## 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 **CODEX GT** boilers must be performed by a Certified Company 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.

## 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

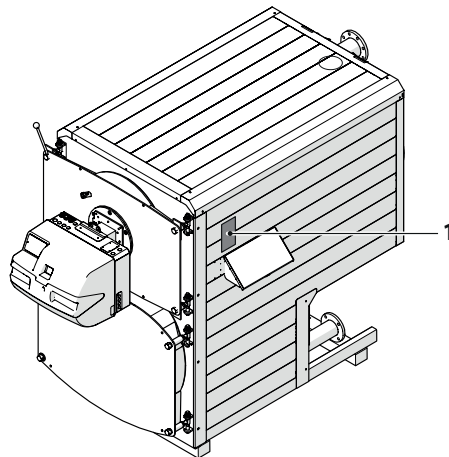
Each **CODEX GT** Boiler can be identified by means of the technical data plate inside the envelope of the documents supplied with the Boiler, which includes technical/efficiency informations such as:

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



### IMPORTANT

The installer of the Boiler **MUST** apply the technical data plate (1) **mandatorily**, once the installation is complete, **in a position which is visible and legible with the appliance installed**. In case of deterioration or loss, request a duplicate from **ICI CALDAIE S.p.A.** Technical Assistance Service providing the Boiler serial number.



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

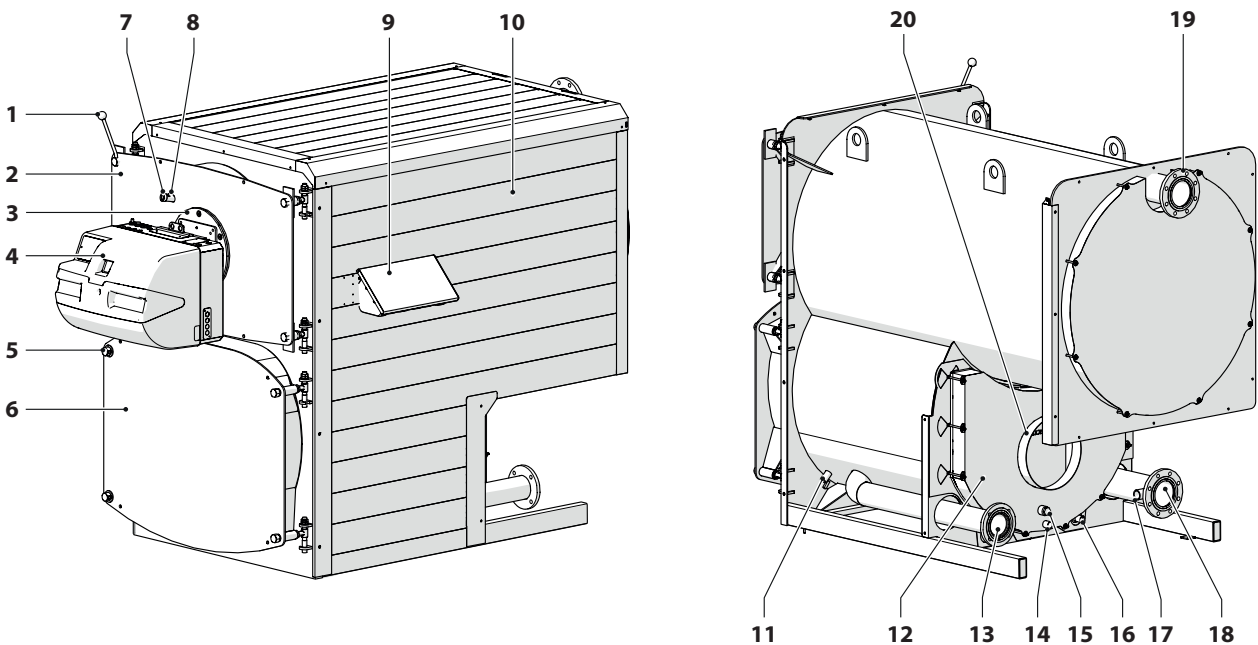
The **CODEX GT** appliances by **ICI Caldaie S.p.A.** are condensing Boilers made in AISI 316 Ti STAINLESS steel with three-pass furnace for the production of hot water at a maximum temperature of 110°C. They are provided with pre-mixed, modulating burner for gaseous fuels with cylindrical, heat radiating body and low NOx emissions.

They are equipped with two-stage progressive or premixed modulating gas burner, with cylindrical combustion head and radiation with low emissions of NOx. The Nominal Efficiency of the **CODEX GT** reaches 108% (REF. NCV) e ★★★★★ (in compliance with Directive 92/42/EEC).

The control panel suitable for the Boiler can be indifferently installed either on the right side or on the left side of the appliance. Some of the main characteristics of the Boiler are listed below:

- **chassis** made of steel vertical profile structure, complete with base
- **large-size cylindrical furnace** made of TIG welded AISI 316 Ti stainless steel, able to withstand condensate attacks
- The **CODEX GT** appliances by **ICI Caldaie S.p.A.** are condensing Boilers made in AISI 316 Ti STAINLESS steel with three-pass furnace for the production of hot water at a maximum temperature of 110°C. They are provided with pre-mixed, modulating burner for gaseous fuels with cylindrical, heat radiating body and low NOx emissions
- **welding performed with TIG procedure**, a method which does not require any material to be added, and thus ensures that the main mechanical characteristics of stainless steel are preserved, as well as its capability to resist acid condensate corrosion
- **flow flange fitting and two system return fittings**, to distinguish the Boiler inlet and ensure the minimum possible temperature at the lowest point, thus getting the most out of condensate benefits, even in the presence of medium-high temperature return
- **smokebox** which can collect the produced condensate, which is then drained through a trap to be connected to the neutraliser (where provided) and thus to the domestic hot water drain line
- **very high water content** and low thermal load
- **"hot" surfaces insulated** with extra-thick glass wool mats, protected by painted steel panels which are easy to disassemble
- **front door with reversible opening**, made of steel sheet, thermally insulated with ceramic fibre
- radiant **premixed modulating burner**, which can provide any power output between the min and the max, according to the instant load request; it allows maximum acoustic comfort and low polluting emissions.

## STRUCTURE

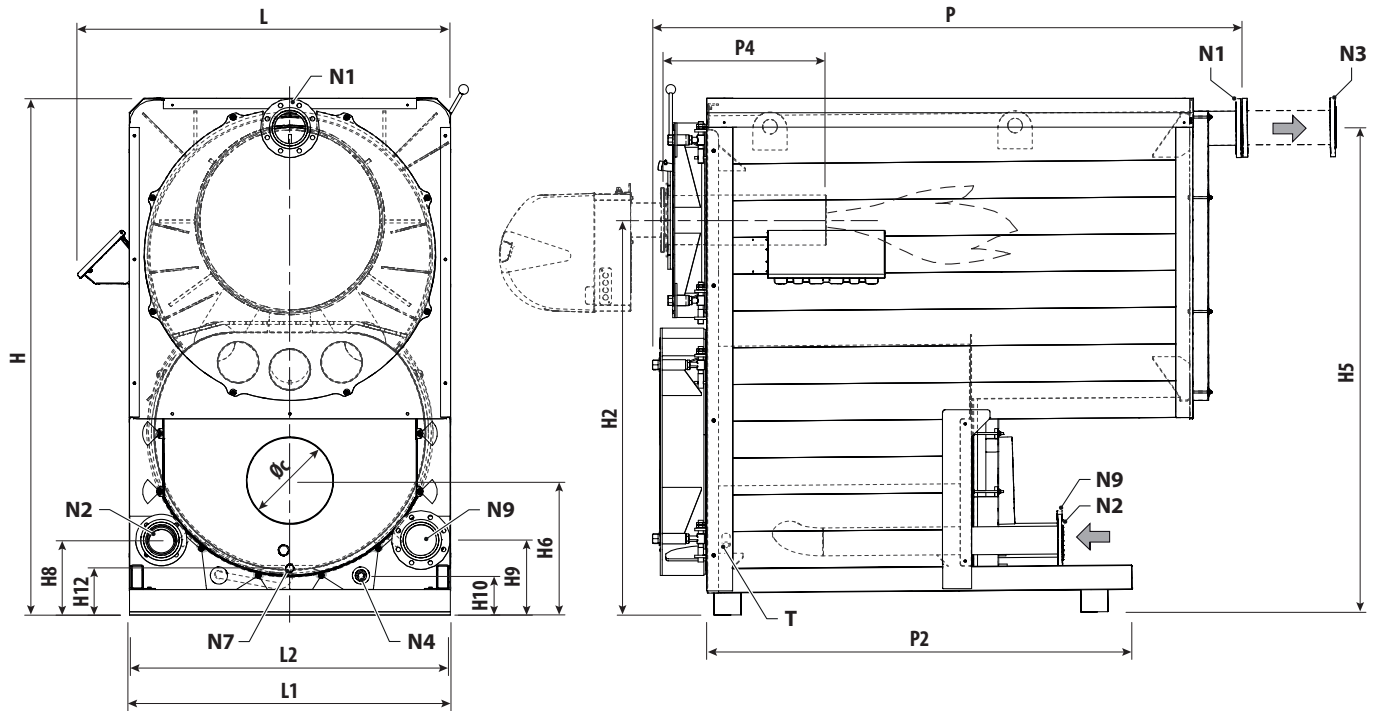


- 1 Door opening handle
- 2 Upper door
- 3 Burner support flange
- 4 Burner
- 5 Hinges
- 6 Lower door
- 7 Flame inspection window

- 8 Combustion chamber pressure test connection
- 9 Control panel (accessory)
- 10 Insulating casing
- 11 Inspection fitting
- 12 Smokebox
- 13 Medium-temperature return

- 14 Condensate drain
- 15 Available fitting
- 16 Boiler drain
- 17 Available fitting
- 18 Low-temperature return
- 19 System flow
- 20 Flue gas drain fitting

# DIMENSIONS AND CONNECTIONS



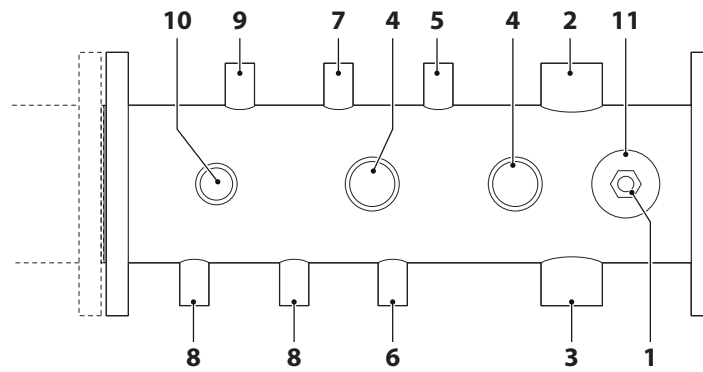
## Dimensions

Description	u.m.	CODEX GT			
		1000	1200	1400	1600
H	mm	2020	2020	2165	2165
H2	mm	1522	1522	1610	1610
H5	mm	1880	1880	2022	2022
H6	mm	450	450	427	427
H8	mm	202	202	205	205
H9	mm	202	202	205	205
H10	mm	62	62	62	62
H12	mm	91	91	68	68
L	mm	1493	1493	1573	1573
L1	mm	1310	1310	1390	1390
L2	mm	1298	1298	1378	1378
L4	mm	1060	1060	1165	1165
P	mm	2443	2443	2437	2437
P2	mm	1732	1732	1725	1725
P6	mm	250-300	250-300	250-300	250-300
Øb	mm	280	280	320	320
Øc	mm	350	350	400	400

## Attachments

Description	u.m.	CODEX GT			
		1000	1200	1400	1600
N1	DN/in	125	125	125	125
N2	DN/in	100	100	100	100
N1/N2	PN	6	6	6	6
N4	DN/in	1"	1"	1"	1"
N7	DN/in	1"	1"	1"	1"
N9	DN/in	125	125	125	125

## Stub N3 for accessories



Description	u.m.	CODEX GT			
		1000	1200	1400	1600
1	DN/in			1/2"	
2				1" 1/2	
3				1" 1/2	
4				1" 1/4	
5				1/2"	
6				1/2"	
7				1/2"	
8				1/2"	
9				1/2"	
10				3/4"	
11				1/2"	

### NOTE

For further details, see the chapter **"Starting hydraulic circuit"**.



## TECHNICAL DATA

DESCRIPTION	u.m.	CODEX GT			
		1000	1200	1400	1600
Type of appliance		B23			
Fuel		G20			
		G30 - G31			
Effective rated <sup>[1]</sup>	kW	914	1097	1280	1463
	kcal/h	786400	943680	1100960	1258240
Nominal power <sup>[2]</sup>	kW	1000	1200	1400	1600
	kcal/h	860000	1032000	1204000	1376000
Max. thermal flow rate	kW	930	1116	1302	1488
	kcal/h	800.000	960.000	1.120.000	1.280.000
Min. thermal flow rate	kW	-	-	-	-
	kcal/h	-	-	-	-
Efficiency at 100% (ref. P.C.I.) <sup>[1]</sup>	%	98,3	98,3	98,3	98,3
100% efficiency (ref. NCV) <sup>[2]</sup>	%	107,5	107,5	107,5	107,5
30% efficiency (ref. NCV) <sup>[1]</sup>	%	98,5	98,5	98,5	98,5
30% efficiency (ref. NCV) <sup>[2]</sup>	%	108,5	108,5	108,5	108,5
Efficiency of 100% (stars) <sup>[3]</sup>	%	****	****	****	****
Efficiency of 30% (stars) <sup>[3]</sup>	%	****	****	****	****
Max gas flow rate - G20	Stm <sup>3</sup> /h	98,44	118,12	137,81	157,5
Max gas flow rate - G30	kg/h	73,06	87,67	102,28	116,89
Max gas flow rate - G31	kg/h	72,27	86,72	101,17	115,63
Max air flow rate	kg/h	180,83	210,97	271,25	376,73
Max flue gas flow rate	kg/h	1466,76	1759,99	2053,37	2346,75
Max. fluid flow rate	kg/h	34400	41280	48160	55040
Min fluid flow rate	kg/h	4128	4816	6192	8600
Pressure drops on exhaust side	mbar	4,2	6,2	8,3	10,8
Sound power <sup>[5]</sup>	dB(A)	87,7	87,7	96,0	96,0
CO emissions	mg/ kWh	0	0	0	0
NOx emissions	mg/ kWh	50	50	50	50
NOx class <sup>[4]</sup>		6	6	6	6
Max chimney loss <sup>[2]</sup>	%	1,3	1,3	1,3	1,3
Casing loss <sup>[2]</sup>	%	0,3	0,3	0,3	0,3
Loss with burner Off <sup>[2]</sup>	%	0,1	0,1	0,1	0,1
Fume temperature (Rated input - air=20°C) - G20 <sup>[2]</sup>	°C	40	40	40	40
CO <sub>2</sub> - G20	%	9	9	9	9
CO <sub>2</sub> - G30	%	-	-	-	-
CO <sub>2</sub> - G31	%	-	-	-	-
Condense production	kg/h	116,65	139,97	163,3	186,64
Fluid pressure drop (ΔT=12K)	mbar	34	48	66	86
Rated pressure	bar	5	5	5	5
Total capacity	l	1900	1900	1828	1828
Total weight	Kg	2100	2100	2570	2570
Power supply	V ~ Hz	230 ~ 50	230 ~ 50	230 ~ 50	230 ~ 50
Electric protection rating	IP	40	40	40	40
Maximum absorbed power	W	3000	3000	5500	5500

<sup>[1]</sup> Average temperature 70°C.

<sup>[2]</sup> Flow/ret. temperature 50/30°C.

<sup>[3]</sup> Efficiency Directive 92/42/EEC

<sup>[4]</sup> Ref. Standard UNI/EN 15502-1; 2015.

<sup>[5]</sup> Ref. EN 15036.

G20 (PCI - Hi). 9.45 kW/m<sup>3</sup> (15°C, 1013 mbar)

G30 (PCI - Hi). 12.68 kW/kg (15°C, 1013 mbar)

G31 (PCI - Hi). 12.87 kW/kg (15°C, 1013 mbar)

## CONTROL PANEL (ACCESSORY)

The control panels which can be installed on **CODEX GT** Boilers are mentioned in the table.

They must be ordered separately from the Boiler according to their technical characteristics and to the needs of the system served; it is recommended to see also the **ICI Caldaie S.p.A. CATALOGUE**.

For the installation, refer to the manual supplied with the panel.

Description	Code
Thermostatic control panel	QACC10ELMCE
<b>eterm</b> Boiler control panel	QETERM01CE
<b>eterm</b> system control panel	QETERM02
<b>eterm</b> Easy manager panel	QCTETERM

## BURNERS

The burners are supplied together with **CODEX GT** Boilers and are CE marked in accordance with 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.



### IMPORTANT

To fit the burners on the **CODEX GT** Boilers refer to the specific chapter "BURNER ASSEMBLY" and to the relevant manual of the appliance.

# 2 Installation

## PRODUCT RECEIPT

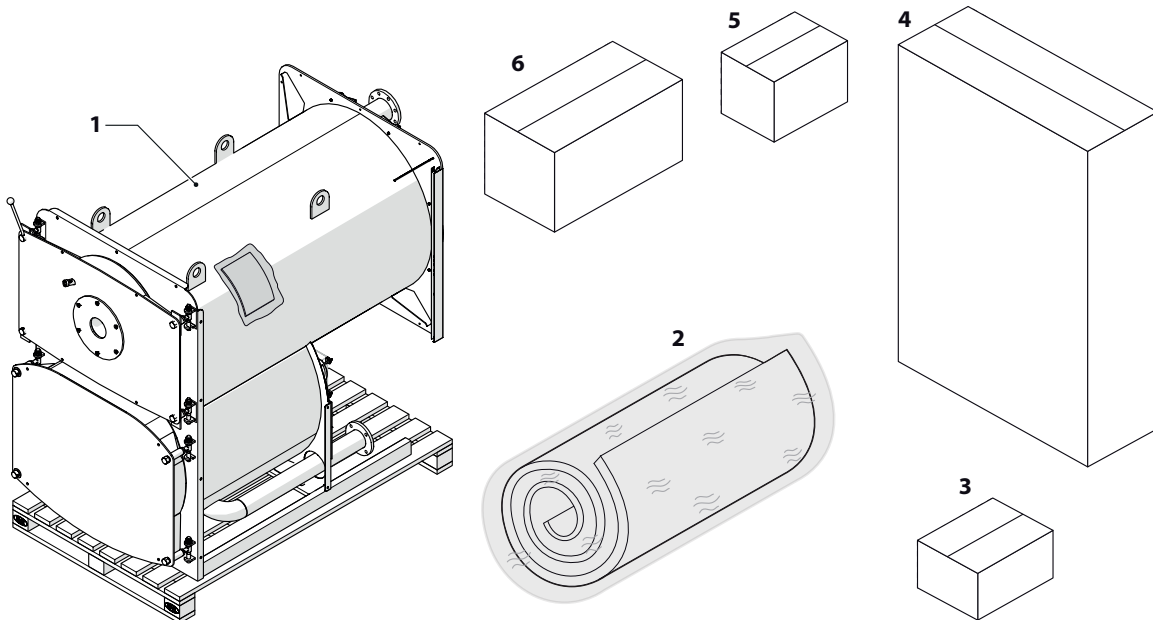
Each phase of the appliance installation must be carried out by **Qualified Personnel, wearing appropriate Personal Protective Equipment (PPE)**, in compliance with the national and local Laws in force.



An incorrect installation of the appliance or the failure to use PPE can cause severe damage to persons or property for which the Manufacturer **DECLINES ANY RESPONSIBILITY**.

**CODEX GT** Boilers are supplied in six packages, indicated below, positioned on one pallet:

- **BOILER BODY (1)**
- thermally insulating mineral wool **MATS (2)** and fastening springs
- **SLAT SUPPORT KIT (3)**
- **SLATS (4)**
- **CONTROL PANEL (5)**
- **BURNER (6)**



### IMPORTANT

Upon receipt of **CODEX GT** Boiler, make sure that the supply is intact and undamaged and promptly contact **ICI CALDAIE S.p.A.** if it does not correspond to the order



### 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 Boiler.

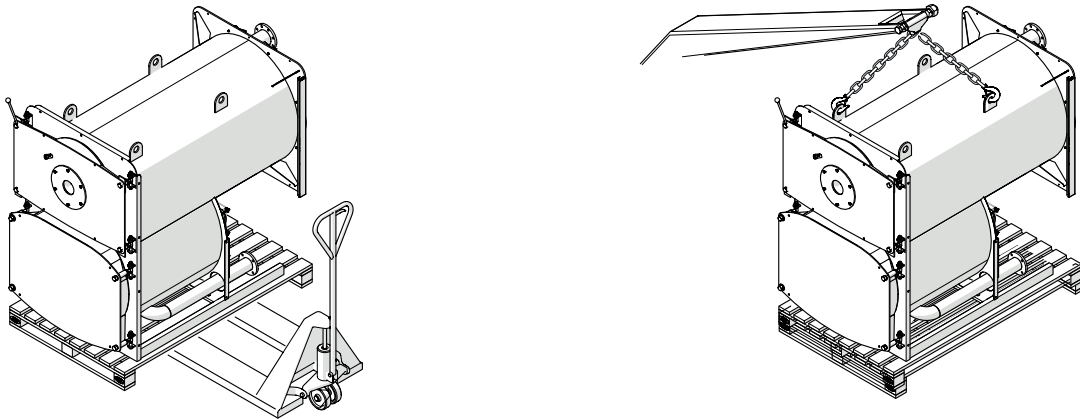


### IMPORTANT

**PACKAGING:** as for packages, **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

**CODEX GT** 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

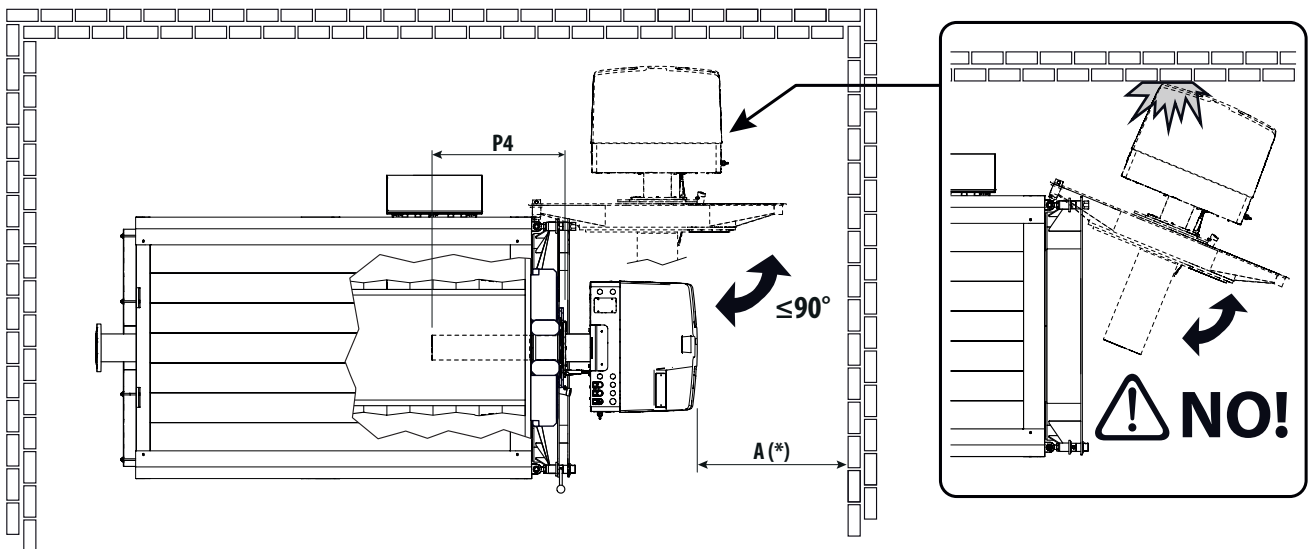
The Personal Protective Equipment required by current legislation must be used.

## INSTALLATION ROOM

The room where **CODEX GT** Boilers are to be installed must be exclusively used for them, compliant with the Technical Standards and the Law in force and equipped with adequately dimensioned vents.

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).



(\*)  $A \geq P4$  (see "Size and fittings")



### ATTENTION

- Consider the spaces necessary to access the adjustment and safety devices and to perform maintenance in compliance with the legislation in force in the place of installation.
- 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.



### IMPORTANT

**COMBUSTION AIR:** **CODEX GT** Boilers **MUST** be installed in rooms which are permanently vented with adequately dimensioned vents, according to the appliance's thermal power, and which comply with the Technical Standards and the national and local Laws in force at the place of installation.

## SYSTEM CLEANING

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

## HYDRAULIC CONNECTIONS

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

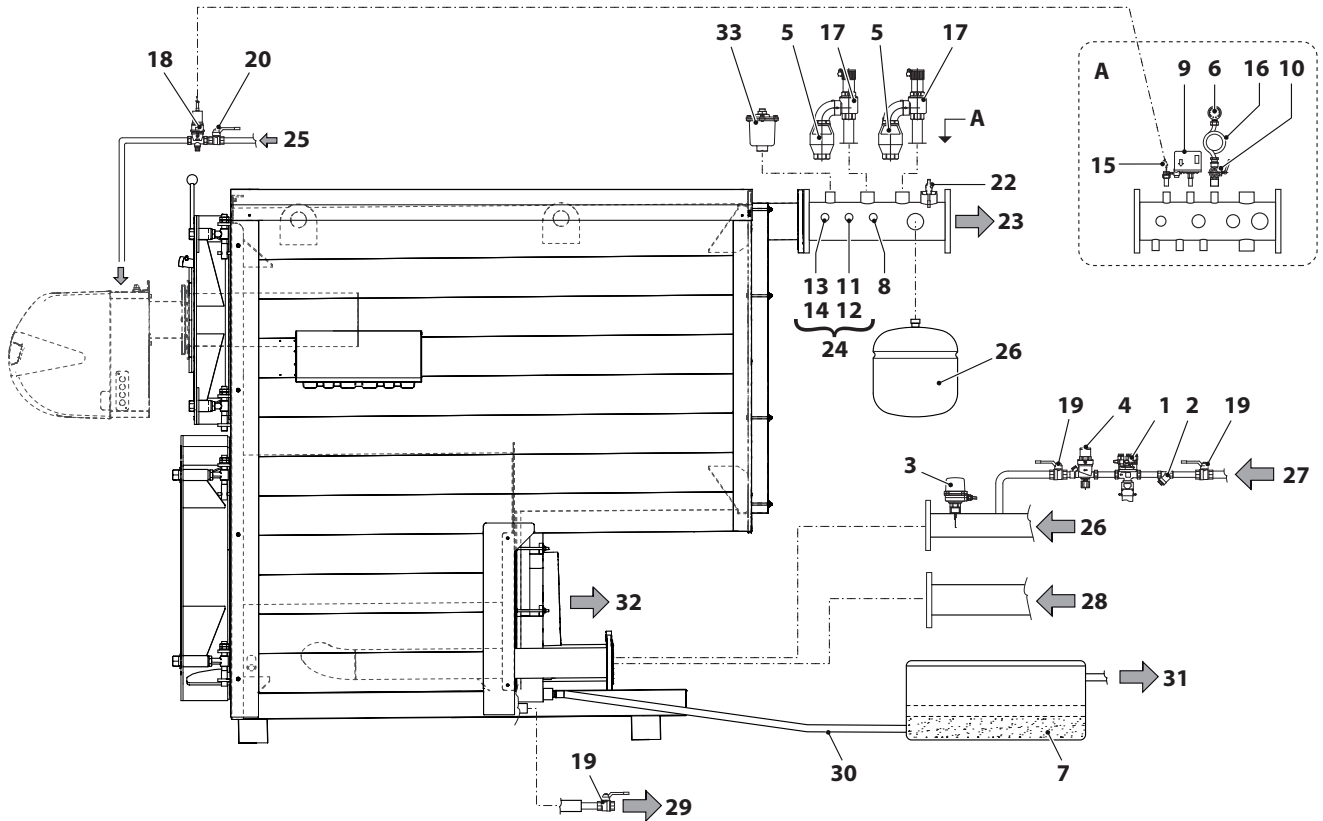
**ICI CALDAIE S.p.A.** is not liable for any harm to people, animals or property damage caused by errors in the choice of components or in the construction of the plant.



### 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 plate.
- Make sure that the drains of the safety valves of the Burner and of 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.

# STARTING HYDRAULIC CIRCUIT



## NOTE

If only one return is required, always use the low temperature one.

- |  |  |   |
|--|--|---|
| 1 Hydraulic backflow preventer               | 12 Safety thermostat probe                                   | 23 System flow                                |
| 2 Y-shaped filter                            | 13 Setting thermostat probe no.1                             | 24 Probe holding sheaths inside the boiler    |
| 3 Flow switch                                | 14 Setting thermostat probe no.2                             | 25 Natural gas inlet                          |
| 4 Filling unit                               | 15 Fuel shut-off valve probe                                 | 26 Low-temperature return                     |
| 5 Drain funnel with articulated elbow pipe   | 16 Shock-absorbing pipe                                      | 27 Water inlet for system refill or top up    |
| 6 Pressure gauge                             | 17 Safety valve no.1 (no. 2 with thermal power above 580 kW) | 28 Medium-temperature return                  |
| 7 Condensate neutraliser (see ICI catalogue) | 18 Fuel shut-off valve                                       | 29 Boiler drain                               |
| 8 Control pocket                             | 19 Manual shut-off valve                                     | 30 Acid condensate outlet                     |
| 9 Pressure transducer                        | 20 Gas manual shut-off valve                                 | 31 Neutralised condensate outlet              |
| 10 Pressure gauge tap                        | 21 Expansion vessel  | 32 Chimney fitting combustion flue gas outlet |
| 11 Thermometer probe                         | 22 Level probe glow plug (optional)                          | 33 Air bleed valve                            |

## FLUE EXHAUST

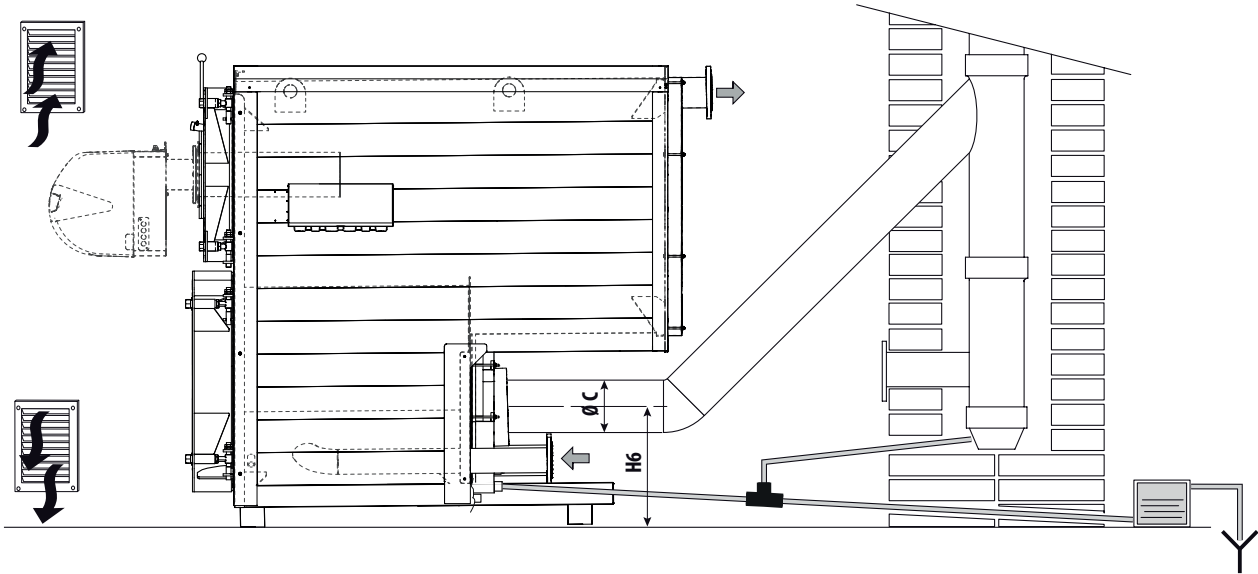
The smoke duct and the connection to the chimney must be built in compliance with the Standards and the Laws in force, with rigid pipes, suitable for the temperature, resistant to condensate, mechanical stresses and sealed.



### IMPORTANT

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

Indicative scheme



Description	u.m.	CODEX GT			
		1000	1200	1400	1600
H6	mm	450	450	427	427
Ø C	mm	350	350	400	400



### DANGER

- the chimney must ensure the draught necessary for the Boiler operation and provided 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 problems and adversely affect the combustion parameters
- non-insulated drain pipes can lead to a potential risk and the tightness of the joints must be ensured with materials resistant to the temperatures of the drain flue gases (we recommend at least 250°C)
- check that the chimney has an adequate draught and that is free from bottlenecks and waste.

## CONDENSATE DRAIN

**CODEX GT** Boilers are equipped with a condensate drain pipe, derived from the appliance and the flue gas drain.

The condensate is acid and **MUST** be treated, by the installer, in compliance with the national and local Laws in force in the country of installation.

The condensate acidity can be periodically checked using litmus test paper to determine the pH.

For the choice of the condensate neutraliser, which is system ACCESSORY to be ordered and purchased separately, use the ICI catalogue.



### IMPORTANT

- The condensate drain pipe must be sealed and have dimensions  $\geq$  than those of the appliance drain pipe and of the trap and it must not have bottlenecks and reductions.
- It is recommended that it always has a slope  $\geq$  than 3% towards the drain.

## DOOR OPENING

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



### IMPORTANT

The hinges of the opening side must have the nut (1) loosened and the conical washer (2) positioned towards the base of the adjustment tie-rod.

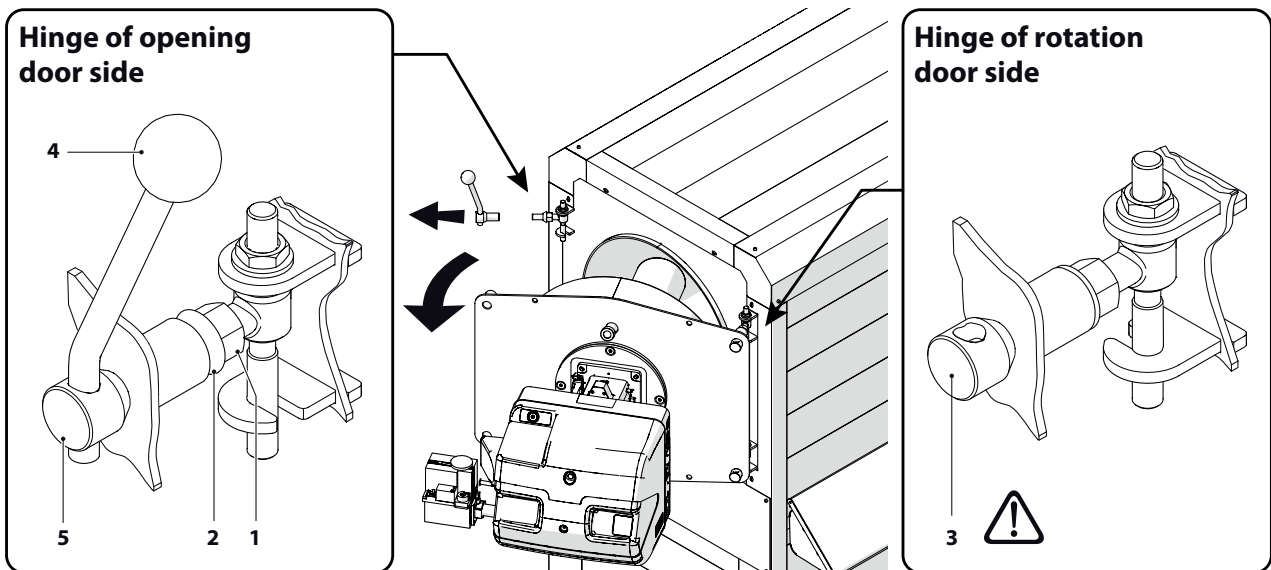


### DANGER

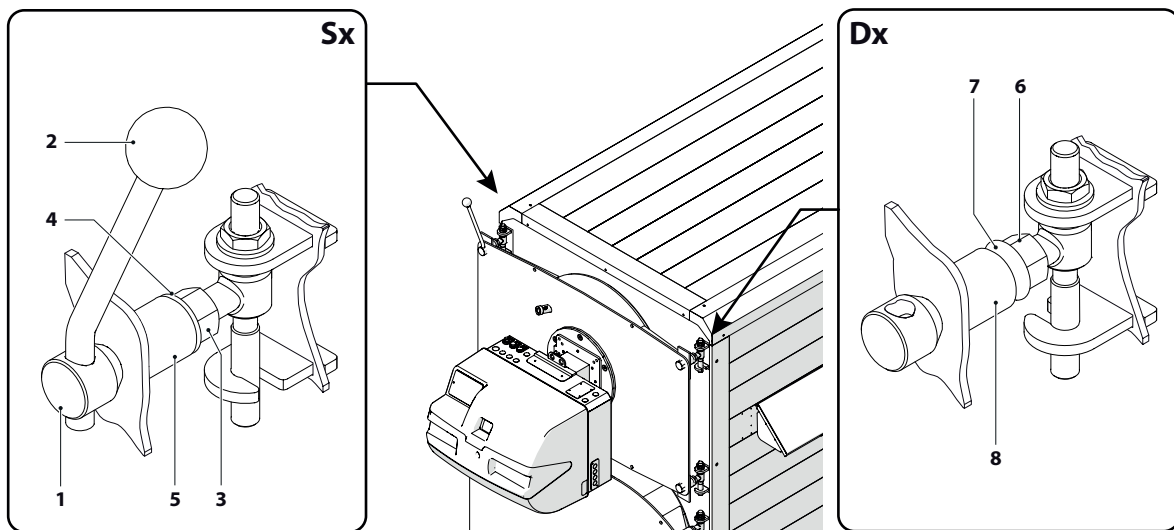
**IT IS DANGEROUS TO UNSCREW** the ring nuts (3) of the door rotation hinges. Unscrewing them could cause the detachment of the door, with possible severe damages to persons and property.

Before opening the door:

- close the gas line shut-off valves and disconnect the pipes
- use the lever (4) to unscrew and extract the ring nuts (5) of the two hinges on the opening side of the door and pull it carefully.



## DOOR OPENING INVERSION (FROM THE RIGHT TO THE LEFT)



### Left hinge:

- screw the ring nuts (1) of the left side with the lever (2) in such a way that the distance of the door from the appliance front plate is the same and the sealing gasket is uniformly pressed.
- screw the nuts (3), of the left tie-rods, until the conical washers (4) are inserted into the door mechanical tubes (5). Properly tighten the nuts (3).

### Right hinge:

- loosen the nuts (6) and disengage the conical washers (7) from the door mechanical tubes (8).

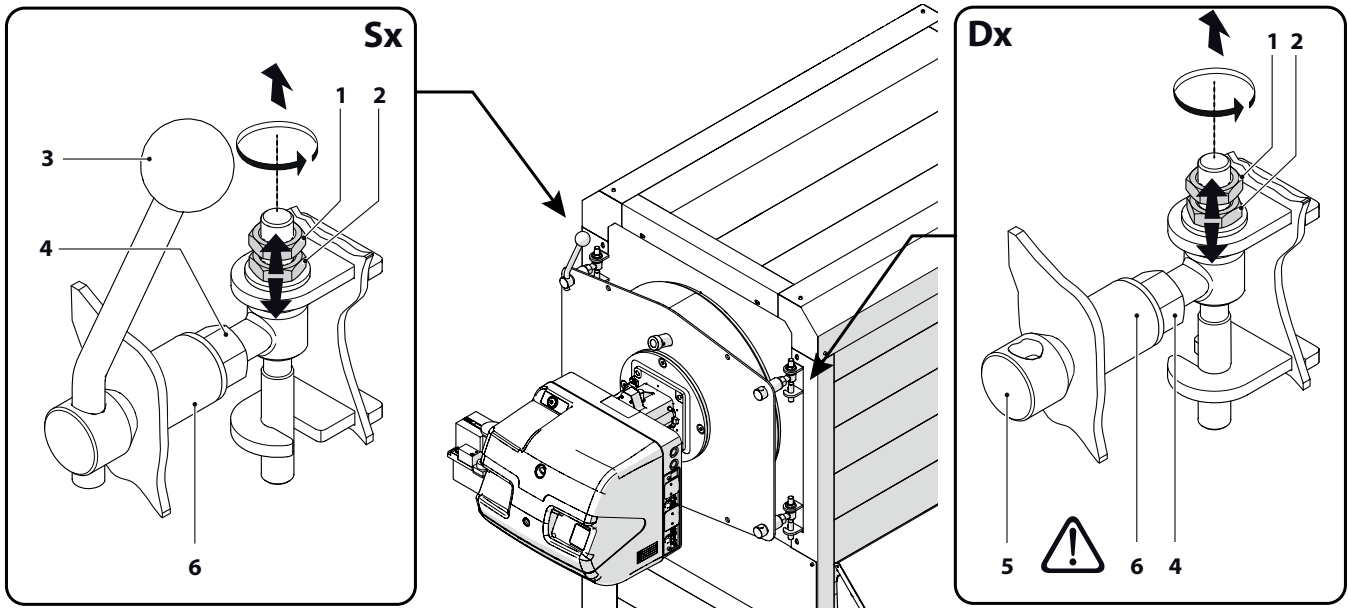


## DOOR ADJUSTMENT



### DANGER

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



### VERTICAL ADJUSTMENT

To make the adjustment:

- with the door ajar, loosen the counter-nuts (1) of the hinge units
- act on the adjustment nuts (2) to lift or lower the door by centring the gasket on the stop plate, then block the counter-nuts (1).

### HORIZONTAL ADJUSTMENT

Close the door with the lever (3) and check that the distance between the appliance front plate and the door wall is the same on both sides. If not:

- with the door ajar, loosen the locking nuts (4) of the hinge units
- work on ring nuts (5) to adjust the distance of the door from the appliance front plate
- tighten the nuts (4) locking the conical washers in the pipes (6).



### DANGER

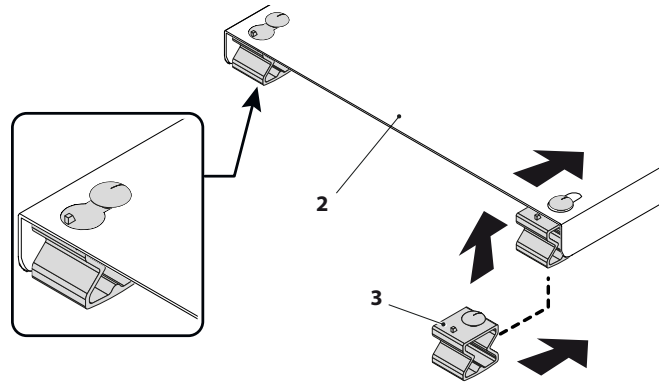
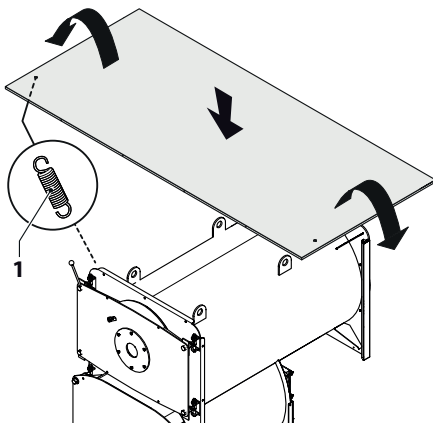
**When cross-changing ferrules, always make sure that the other two ferrules are fastened, so that they hold the door.**

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.

## INSULATING CASING ASSEMBLY

To fit the insulating casing proceed as follows:

- wrap the thermally insulating mats around the Boiler body and lock them with the supplied springs (1)
- prepare all the slats (2) inserting the locking plugs (3) in the corners of each one of them, as shown in the figure below

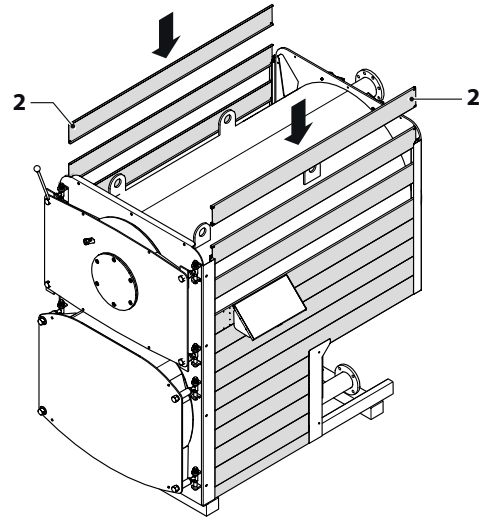
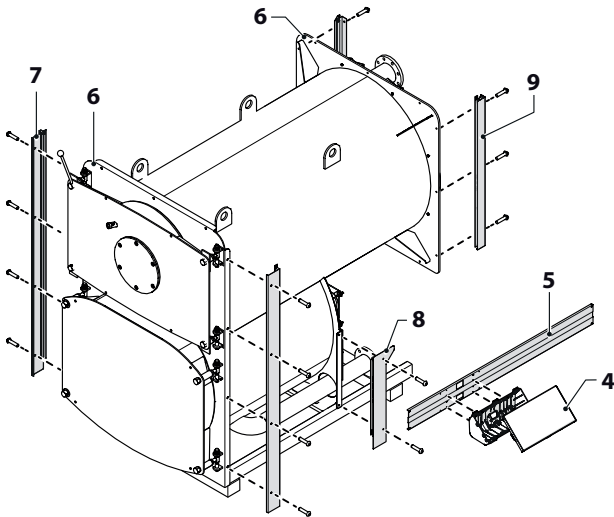


- open the control panel (4) and fasten it to the panel supporting slat (5) using the supplied screws and nuts
- fasten the front (6) and rear (9) pillars to the base and to the plates (6) using the supplied screws and nuts
- insert the slats (2) on the lateral side

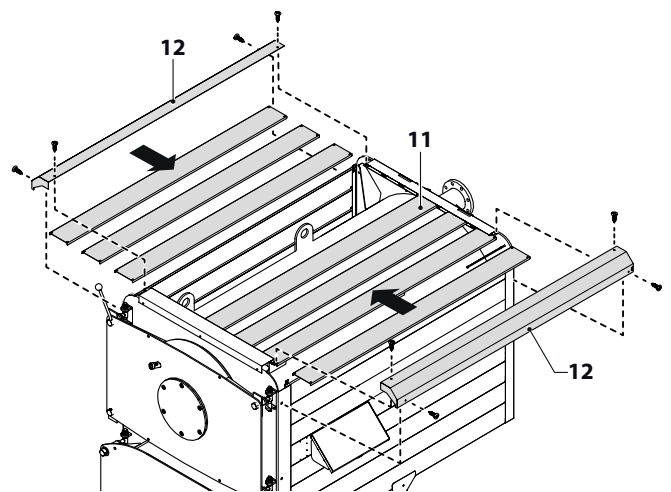
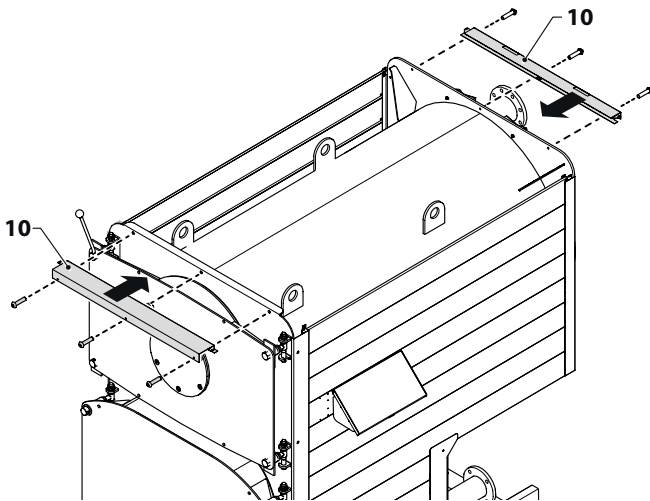


### IMPORTANT

The panel supporting slat (5) must be the ninth one on the side featuring the control panel.



- fasten the two cross beams (10) to the plates (6), insert the upper slats (11), fasten the end profiles (12) using the supplied self-threading screws.



## BURNER ASSEMBLY

For the activities listed below, concerning the burner:

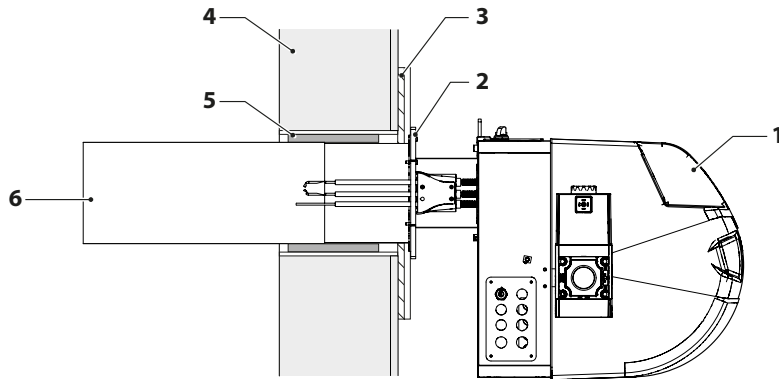
- installation and fastening to the Boiler
- the connection to the fuel supply
- the electrical connections
- the adjustments to be made
- maintenance
- the necessary checks.

refer to the Manual supplied with the appliance.



### IMPORTANT

Insert the thermoceramic material strip, supplied with the insulating casing, into the gap between the burner combustion head and the door. The strip must be wrapped around the combustion head for at least one entire circumference, without having to fill the whole thickness of the gap.



- 1 Burner
- 2 Flange
- 3 Gasket
- 4 Door
- 5 Thermoceramic material
- 6 Combustion head

## ELECTRICAL CONNECTIONS

The electrical system of **CODEX GT** Boilers must be built by an Authorised Company that must refer to the wiring diagrams supplied with the Boiler, with the control panel and with the burner. Moreover, it must operate in compliance with the Technical Standards and the national and local Laws in force.

Once the work is complete, the Authorised Company must issue the **Declaration of Conformity** of the system built.



### IMPORTANT

**It is mandatory to:**

- use an omnipolar thermal-magnetic line circuit breaker complying with the Standards CEI-EN (contact opening of at least 3 mm)
- observe the connection L (Phase) - N (Neutral). Keep the earth conductor longer than the power supply conductors by approximately 2 cm
- 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*		-	7-8
Hardness (CaCo2)	°Fr	< 15	-
Iron (Fe)**	mg/kg	-	< 0.5
Copper (Cu)**	mg/kg	-	< 0.1
Oxygen (O2)	mg/l	< 0.05***	-
Appearance		Clear	Possibly clear

\* 8 is the maximum acceptable pH value in case of radiators in aluminium or light alloys.

\*\* 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

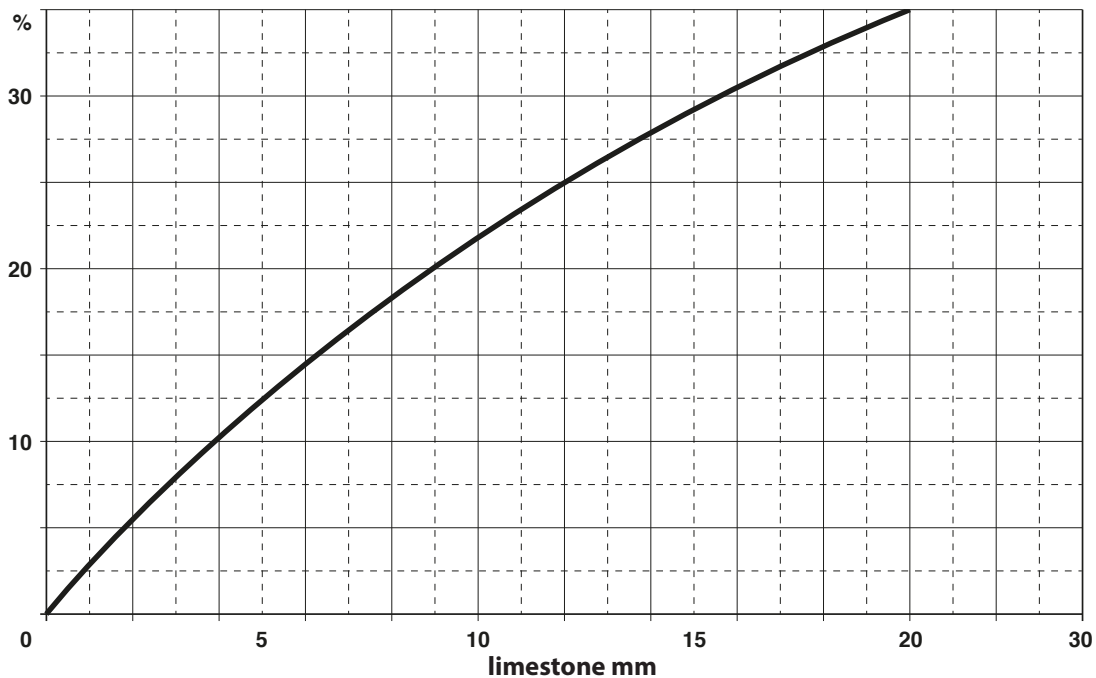
Limestone build-ups reduce the heat exchange between the combustion gases and water, leading to an abnormal increase of temperature of the parts exposed to the flame and thus to a significant reduction of the Boiler service life.

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 Boiler metal surfaces on the water side is due to the iron transit into 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, corrossions can occur and it is necessary to treat the water with corrossive 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 Boiler drain valve is closed
- open the Boiler filling valve and the shut-off valve of the hydraulic system and make the water 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 hydraulic 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 the 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 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
- check that the type of gas is the right one, that the fuel supply line has been correctly built and that the fuel is available
- hydraulic and fuel circuit taps are open
- check that the condensate drain of the Boiler is not clogged
- check that the rotors of the circulation pumps are not blocked.

## COMMISSIONING

To start the Boiler after performing the preliminary checks it is necessary to:

- set the regulation thermostats on the control panel to the correct temperatures
- 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
- position the system "main" switch and the control panel "main" switch to "ON"
- operate on the ambient thermostat or chronothermostat and activate a heat request

The Boiler will perform the ignition phase and will operate until the adjusted 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.

Once that the stopping and starting test has been performed, proceed with the following operations:

- 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.*



### IMPORTANT

The burners can operate for a time **NOT longer than 24 hours**, after which it is necessary to stop and restart the burner.

## 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 period of 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 thermal system
- 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 the control panel switch 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

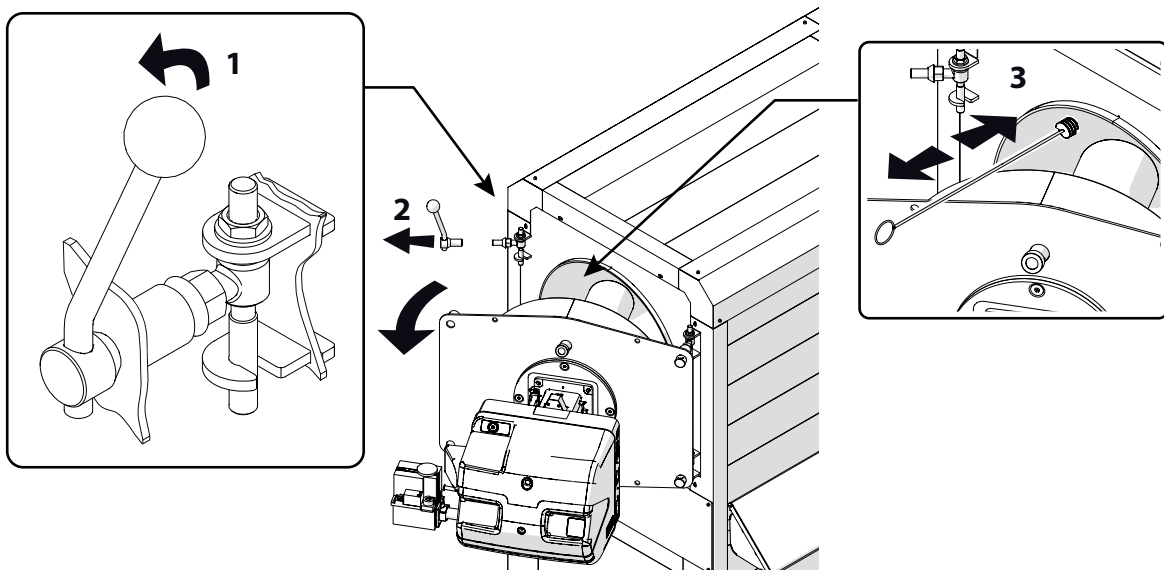
### External cleaning

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

### Boiler internal cleaning

To perform the internal cleaning:

- disconnect from the burner anything which may hinder the door opening (e.g. gas train)
- loosen the 4 nuts or the two ring nuts with the lever (1) and open the door (2)



- clean the combustion chamber surfaces with a suitable tool (e.g. brush with plastic bristles or aspirator)
- disengage the flue gas exhaust fitting and remove the deposits trapped into the smokebox using an aspirator
- once the cleaning operation is completed, reassemble all the components, replacing the worn ones and operating by following the previous procedure in the reverse order.

## BURNER

For the burner maintenance and cleaning operations, refer to the content of the burner Manual supplied with **CODEX GT** Boiler.

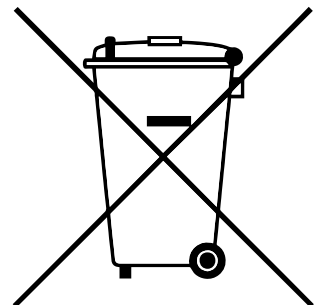


## ANY ANOMALIES AND REMEDIES

ANOMALY	CAUSE	REMEDY	
The boiler gets dirty easily	Badly adjusted burner	Check the burner adjustment (flue gas analysis)	
	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	
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. System for 24 or 72 h operation without continuous supervision.



## INFORMATION FOR THE DISPOSAL OF ELECTRICAL AND ELECTRONIC EQUIPMENT



### IMPORTANT

This product contains electrical and electronic equipment which cannot be disposed of through the normal means of municipal waste collection. There are separate collection centres for these products. Electrical and electronic equipment must be treated separately and in compliance with the laws in force in the respective Country.

# 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. Then an additional e-mail will be received with the credentials to access all the services that **ICI CALDAIE S.p.A.** has developed specifically for those who will register its 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 info: [assistenza@icicaldaie.com](mailto:assistenza@icicaldaie.com) o **+39 0458738573**

## DECLARATION OF CONFORMITY



**ICI CALDAIE S.p.A.**

Via G. Pascoli, 38 – Campagnola  
37059 Zevio (VR)  
Telephone +39 045 8738511-Fax +39 045 8731148  
info@icaldaie.com – VAT number IT 00227490232  
Company subject to management and coordination by FINLUC s.r.l.  
(R.l. n. 02245640236)  
Company certified according to ISO 9001, OHSAS 18001 & ISO 14001  
icaldaie.com

## DECLARATION OF CONFORMITY WITH EUROPEAN COMMUNITY STANDARDS

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:

### CODEX GT

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
- Efficiency Directive 92/42/EEC
- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU

Zevio, 07/02/2018

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

A handwritten signature in black ink, appearing to be 'E. Lucchini', written over the printed name of the signatory.











## **ICI CALDAIE SpA**

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