



**THERMOROSSI**

*HEATING TECHNOLOGY AND INNOVATION*

**INSTALLATION, USE AND MAINTENANCE GUIDE**

***Heater ARDHEA - ARDHEA F***

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## “CE” DECLARATION OF CONFORMITY

In accordance with the following directives:

European Directive	73/23/EEC and its amending directive	93/68/EEC		
	89/336/EEC and its amending directives	93/68/EEC	92/31/EEC	93/97/EEC
	EN 13240 : 2001 , EN 13240 : 2001 / A2 : 2004			

Thermorossi S.p.A., Via Grumolo 4 - ARSİERO (VI), declares that the ARDHEA heaters have been designed and manufactured in compliance with the safety requirements of the standards for EC marking.  
This declaration refers to the entire range of the specified series.

ARSİERO , 24 September 2008

  
THERMOROSSİ S.p.A.

# 1 INTRODUCTION

## 1.1 GENERAL GUIDELINES

This installation, use and maintenance guide is an integral and essential part of the product and must be kept by the user. Before commencing with the installation, use and maintenance of the product, carefully read all the instructions contained in this booklet. At the time of installation of the appliance all local regulations, including those that refer to national and European regulations, must be observed. The Manufacturer recommends carrying out all the maintenance operations described in this manual.

This appliance must only be used as intended by the manufacturer. Any other use is considered incorrect and therefore hazardous; consequently, the user shall be totally liable for the product if used improperly. Installation, maintenance and repairs must be carried out by personnel with professional qualifications and in compliance with current regulatory standards and in accordance with the instructions of the manufacturer of the appliance. Use only original spare parts.

Incorrect installation or poor maintenance could injure or damage people, animals or things; in this case the manufacturer shall be relieved of all responsibility. Before commencing any cleaning or maintenance operation ensure that the appliance has been disconnected from the mains power supply by means of the main system switch or some other disconnecting device installed upstream from the appliance. The product must be installed in locations suitable for fire-fighting and furnished with all the services (power and outlets) which the appliance requires for a correct and safe operation. Any repairs or actions carried out on any systems, components or internal parts of the appliance, or on any of the accessories supplied with it, that are not specifically authorised by Thermorossi s.p.a. will automatically void the warranty and the manufacturer's responsibility, pursuant to D.P.R. 224 of 24/05/1988, art. 6/b. Use only original Thermorossi spare parts. If the appliance is sold or transferred to another user ensure that the guide is handed over with it.

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## 1.2 SAFETY GUIDELINES

### PERSONAL INJURY



This safety symbol identifies important messages throughout the manual. Read the information marked by this symbol carefully as non-observance of this message can cause serious injury to persons using the heater.

### DAMAGE TO PROPERTY



This safety symbol identifies messages or instructions that are fundamental for the heater to function well. Failure to observe these symbols could result in serious damage to the heater and system.

### INFORMATION



This safety symbol signals instructions that are important for the good operation of the heater or heating system. The appliances will not function correctly if the instructions are not observed correctly.

## 1.3 STANDARDS AND RECOMMENDATIONS

**NORMATIVE REFERENCES** :national and international standards used as reference guides for the design, industrialization and production of the products:

- European directive 73/23/CEE- Standard CEI 61/50

- European directive 93/68/EC

- Standard CEI EN 60204 - European directive 89/336/CEE - Standard CEI 64-8 (IEC 364) - EN 13240

### RECOMMENDATIONS



Before using the appliance, carefully read every section of this instruction manual as knowledge of the information and the regulations contained in it are essential for a correct use of the appliance.

The entire operation concerning the connection of the electric panel must be carried out by expert personnel; no responsibility will be accepted for damages, even to third parties, if the instructions for installation, use and maintenance of the appliance are not followed scrupulously. Modifications made to the appliance by the user or on his behalf, must be considered to be under his complete responsibility. The user is responsible for all the operations required for the installation and maintenance of the appliance before and during its use.

### GENERAL WARNINGS



**Caution:** the appliance must be connected to a system provided with a PE conductor (in compliance with the specifications of 73/23/EEC, 93/98/EEC, concerning low voltage equipment).

Before installing the appliance check the efficiency of the earth circuit of the power supply system.

**Caution:** the power supply line must have a section which is suitable for the power of the equipment. The cable section must in any case be no less than 1.5 mm<sup>2</sup>. The appliance must be powered with a voltage of 220/240 V and 50 Hz. Voltage variations which exceed or are lower than 10% of the nominal value can cause poor functioning or damage the electrical device. Position the appliance so that the electric power plug is easily accessible.

Ensure that a suitable differential switch is installed upstream from the equipment.



**CAUTION: IT IS MANDATORY TO EARTH THE HEATER AS ILLUSTRATED IN THE DIAGRAM IN PARA. 4.5. FAILURE TO OBSERVE THIS INSTRUCTION WILL LEAD TO SERIOUS DAMAGE (the boiler could corrode to the point of creating holes in the boiler itself ) TO THE HEATER BODY WHICH IS NOT COVERED BY THE GUARANTEE. HAVE AN ELECTRICIAN CHECK THE EARTHING. THERE MUST BE NO ELECTRIC POTENTIAL (VOLTS) BETWEEN THE EARTH OF THE HEATER AND THE ACTUAL EARTH OF THE PLANT.**

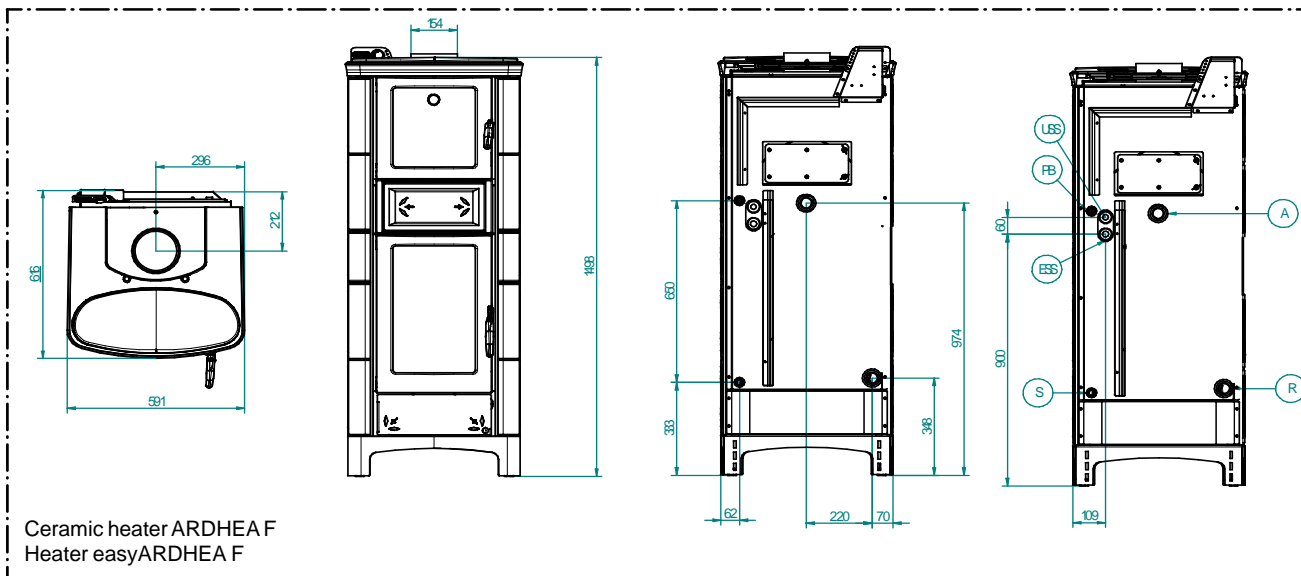
## 1.4 TRANSPORTATION AND STORAGE

**TRANSPORTATION AND HANDLING** The boiler body must always be in a vertical position when handled and exclusively by means of trolleys. Take special care to protect the electric panel, the glass, the ceramics and all the fragile parts from mechanical impact which could damage them and their correct functioning.

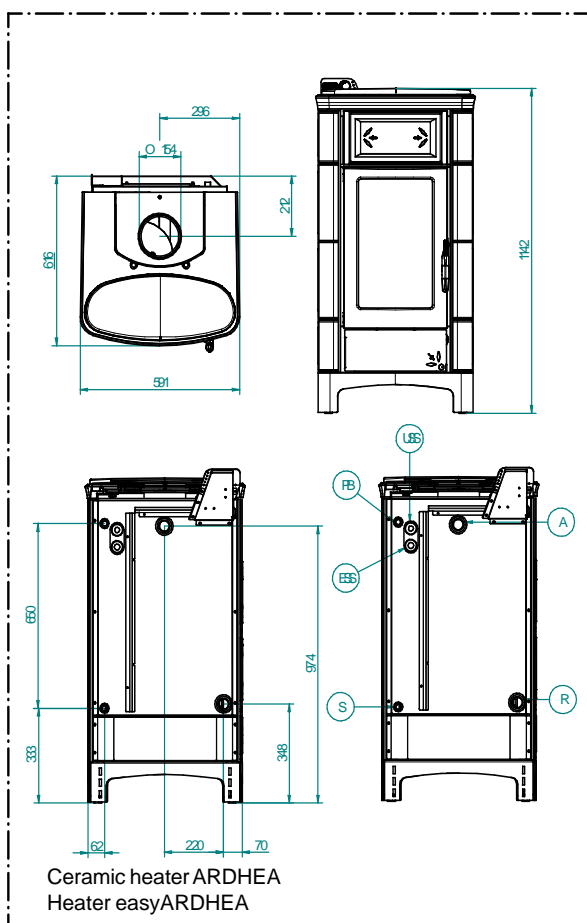
**STORAGE** : The heater must be stored in a humid-free environment and sheltered from the weather; do not place the heater directly on the floor. The Company denies all responsibility for damage caused to wood floors or floors made from any other material. It is inadvisable to store the heater for long periods of time.

## 2 TECHNICAL CHARACTERISTICS (\*)

### 2.1 TECHNICAL DATA



Ceramic heater ARDHEA F  
Heater easyARDHEA F



Ceramic heater ARDHEA  
Heater easyARDHEA

	easy ARDHEA ceramic ARDHEA	easy ARDHEA F ceramic ARDHEA F
Height (mm)	1142	1498
Depth (mm)	616	616
Width (mm)	591	591
Weight (kg)	209	261
	234	295
D. smoke outlet (mm)	154	154
Minimum draught (Pa)	12	12
Thermal power at firebox (kW)	30	30
Thermal power output to air (kW)	3.7	3.7
Thermal power output to water (kW)	19.3	19.3
Efficiency %	74.8 %	74.8 %
Water content (l)	33	33
Average smoke temperature (°C)	290.2	290.2
Smoke capacity (g/s)	19.8	19.8
CO <sub>2</sub> emissions (%)	10.12	10.12
CO emissions (ppm at 13% O <sub>2</sub> )	4814	4814
Operating pressure (bar)	1	1
Max operating pressure (bar)	3	3
Electricity	220 V 50 Hz	220 V 50 Hz
Reload time (min)	60	60

A - plant delivery  
R - plant return  
ESS - safety heat exchanger inlet  
USS - safety heat exchanger outlet  
S - outlet  
PB - pocket

\* The values were obtained using pieces of firewood (9 pieces) for a total of 7.7 kg having L=250 mm where the lower Thermal Value was 3900 kcal/kg and the humidity 12.1%. The use of wood with different characteristics than these will result in less power output, less efficiency output and more ash produced. Moreover the glass on the feed door will become dirtier sooner.

### 3 GENERAL DESCRIPTION

#### 3.1 OPERATING PRINCIPLE

Your heater has been constructed to satisfy in full all your heating and practical needs.

#### 3.2 THE FUEL

The fuel to use is common wood having 10-20% humidity and a Thermal Value of 2500-4000 Kcal/Kg. Obviously if using a better or drier wood the thermal value (and consequently the heat produced by the heater ) will increase. Knowing which fuel to use and actually using the right fuel is one of the most important aspects to observe in order to ensure that your heater and flue outlet are not damaged.

All types of solid fuel are suitable but we recommend using only hard and well-seasoned wood.

We advise against using wet wood or wood that has been seasoned for less than 18/20 months, as it can cause malfunctions and the formation of tarry deposits, as well as not giving the correct thermal performance.

All woods have different heat outputs: for example, 1Kg of beech equals 1.15Kg of birch, 1.6 Kg of fir, 0.5 Kg of briquettes... The heat outputs can also vary considerably depending on the type of fuel used.

Do not burn generic waste or plastics but above all never used petrol or inflammable liquids.

If using briquettes you must halve the fuel consumption.



**Special attention must be given to the characteristics of the wood: The good performance of the generator depends on the type of wood used and on its degree of seasoning.. The use of fuel that does not conform to the specifications set out above immediately invalidates the warranty on the heater. Do not use the appliance as an incinerator.**

**The appliance is hot to the touch when operating and the external surfaces are extremely hot: so take care !!**

### 4 INSTALLATION

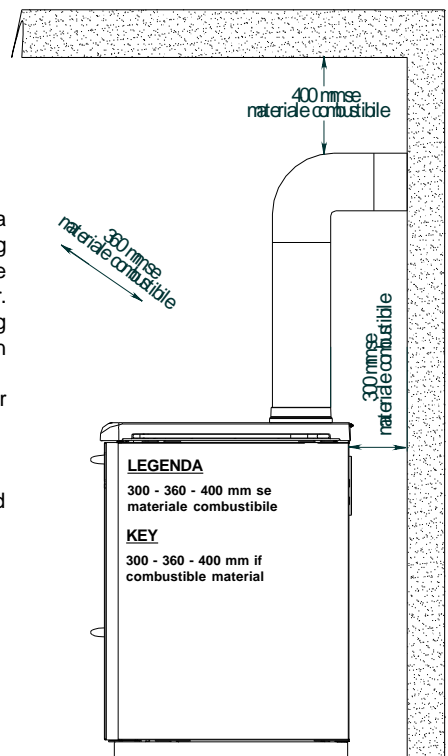
#### 4.1 POSITIONING THE HEATER



**CAUTION :** Always use trolleys to move the appliance and the appliance must always be in a vertical position. To unpack the heater, once the wood crate has been removed, remove the casing (in reverse order as set out in par.4.13). Remove the screws at the base of the heater and remove the base from the bottom pallet. Follow the general guidelines set out in paragraph 1.1 to the letter. Above all ensure that the flooring of the room where the heater will be installed is capable of bearing the weight of the appliance plus the weight of the water contained in it and the weight of the fuel in the firebox.

**CAUTION:** The room in which the appliance will operate must be adequately ventilated (minimum air intake 1300 m<sup>3</sup>/h).

The heater must be positioned at a minimum safe distance from walls and furnishings. This distance will have to be increased considerably if the objects surrounding the appliance are inflammable (matchboarding, furniture, curtains, picture frames, sofas, etc...). The recommended minimum distances are illustrated in the drawing below on the right. Installation in the vicinity of heat-sensitive materials is only permitted if suitable insulating protection is placed between the object and the appliance (ref. Uni 10683).



#### 4.2 MOUNTING CERAMIC CASING FOR ARDHEA F - ARDHEA HEATERS

Take care when removing the ceramics from the packaging as they are particularly fragile.

After unpacking the heater remove the 2 screws that secure the heater to the pallet (the 2 screws are positioned on the pallet). After having levelled the heater using a spirit level and raising or lowering the mounting feet, making the connections with the heating system and electrical system (see para.4.4 , 4.5 , 4.6 , 4.7 , 4.8 , 4.9 , 4.10, 4.11 ), proceed to mount the casing as illustrated below :

-Remove the cover **D** by unscrewing the screws **C-C1-C2** (figure 4).

-Undo screw **B** and remove the cast iron cover **E** (figure 4), screw in screw **B1** (supplied) in the hole freed by screw **B**.

-Undo screws **P** and remove the ceramic supports **O** (figure 4).

-Undo the 4 screws **R** and remove the support **Q** (figure 1).

-Fasten the ceramic **H** to support **Q** by bending the 4 wings as indicated in Detail **S** and fasten it once again with the screws removed earlier (figure 2).

-Next fasten the ceramic supports **O** with screws **P** (figure 1).

-Next fasten ceramics **G , H , I , L** . To firmly fasten the ceramics to the heater you need to bend the "wings " (4 for each ceramic), before inserting the ceramic as shown in Detail **N** and Detail **M** (for heater mod. ARDHEA F follow the indications in Figure 3, for heater mod. ARDHEA follow the indications in Figure 6)

- Next place the cast iron cover **E** and raise or lower it by means of the screws **F** (figure 4).
- Next fasten cover **D** with the screws **C,C1,C2** (figure 4).
- Lastly position ceramic **A** (figure 4).

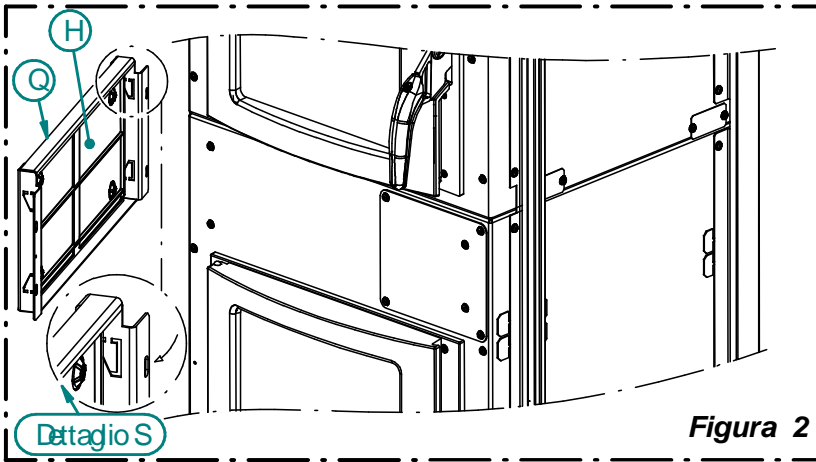


Figura 2

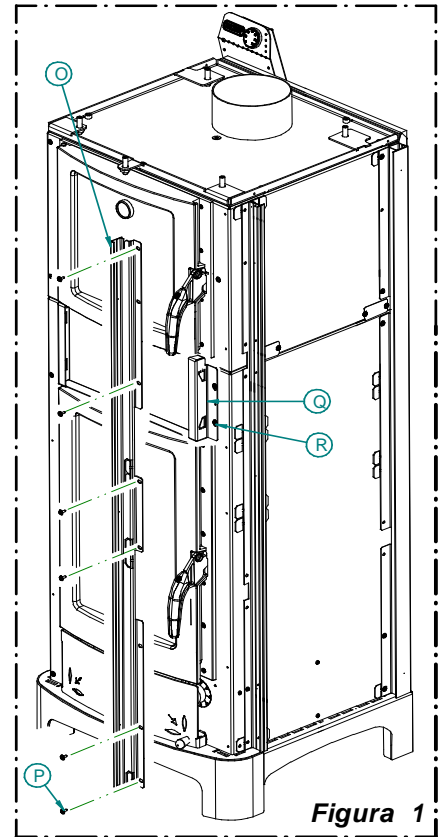


Figura 1

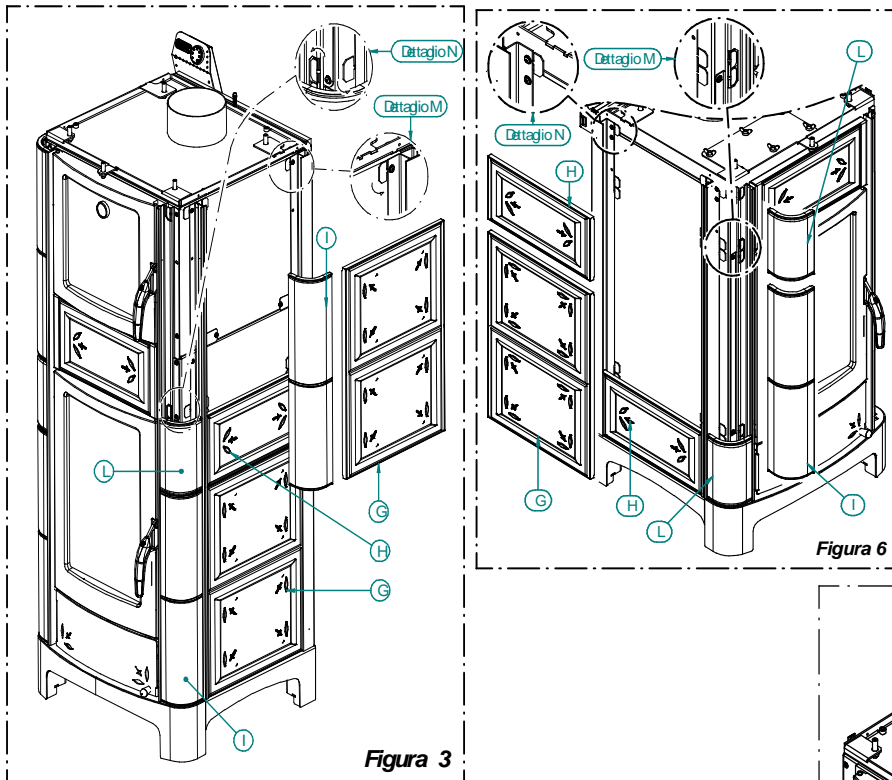


Figura 3

Figura 6

LEGENDA	KEY
Figura	Figure
Dettaglio	Detail

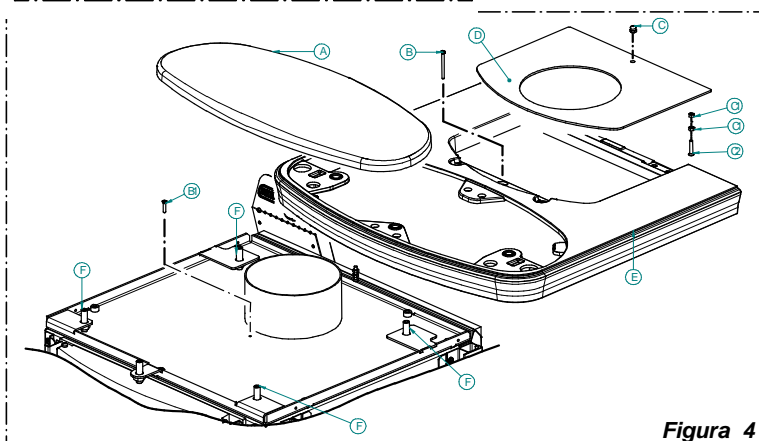


Figura 4

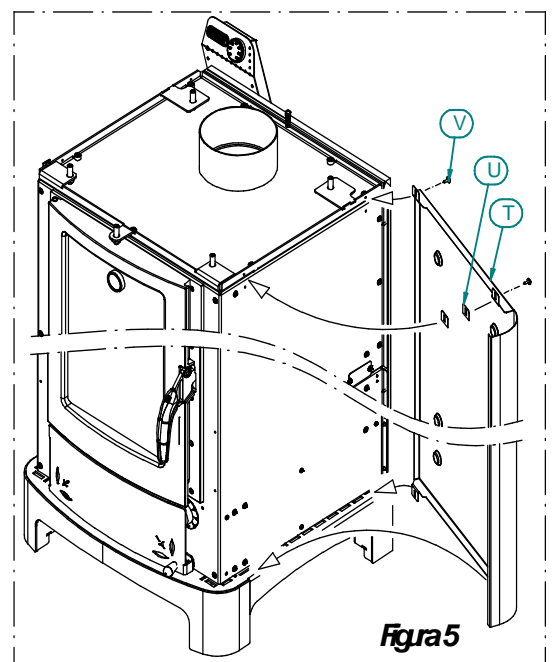


Figura 5

### 4.3 MOUNTING EASY CASING FOR ARDHEA - ARDHEA F HEATERS

The casing on the EASY model is factory-mounted before being packaged.

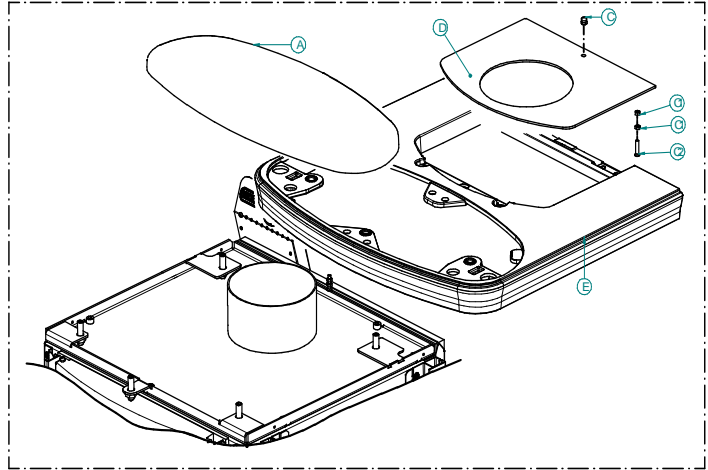
When moving the heater it is advisable to remove the top cover to avoid accidental breakages or falls, proceed as illustrated below:

-Remove the cover **D** by unscrewing the bolts **C-C1-C2**.

-Remove the cast iron cover **E**, and remove the cook top **A**.

After unpacking the heater and removing the cover remove the 2 screws that secure the heater to the pallet (the 2 screws are positioned on the base).

After having levelled the heater using a spirit level and raising or lowering the mounting feet, making the connections with the heating system and electrical system (see para.4.4 , 4.5 , 4.6 , 4.7 , 4.8 , 4.9 , 4.10, 4.11 ), replace the cover removed earlier.



### 4.4 ASSEMBLING THE SAFETY HEAT EXCHANGER

Install the safety heat exchanger in accordance with the following procedure:

-Remove the ceramic supports **O** and **Q** as indicated in the previous pages (figure 1).

-Remove the cover **1** (figure on the right).

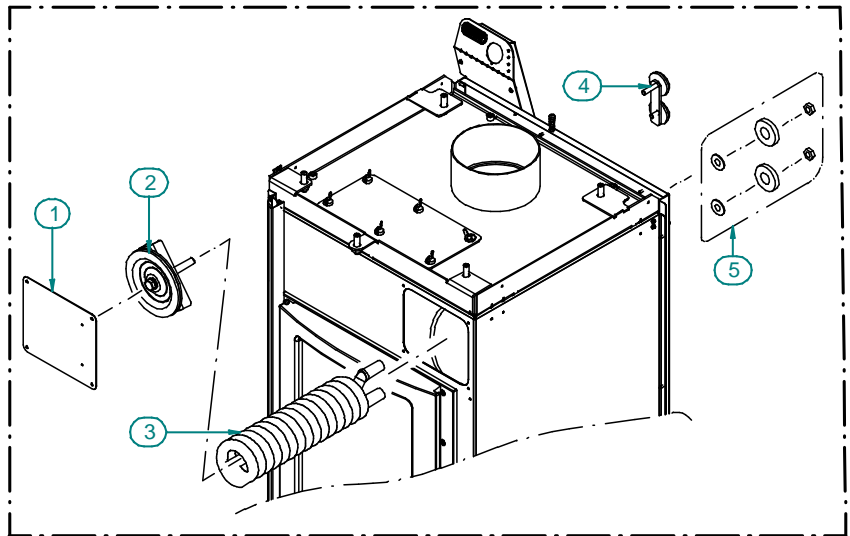
-Unscrew and remove the flange **2** (figure on the right).

-Remove the rear plugs **4** (figure on the right).

-Insert the safety heat exchanger **3** and secure it with the hardware **5** (figure on the right).

-Next fasten the flange **2**, the cover **1** and replace the ceramic supports **O** and **Q**.

By installing a thermal safety blowdown valve between the heat exchanger and the water mains the excess heat is absorbed as soon as the heater, due to external causes, rises to excessively high temperature values. This function is called fast disconnection phase.



If the safety heat exchanger is installed to produce domestic hot water the guarantee for the generator is immediately voided.

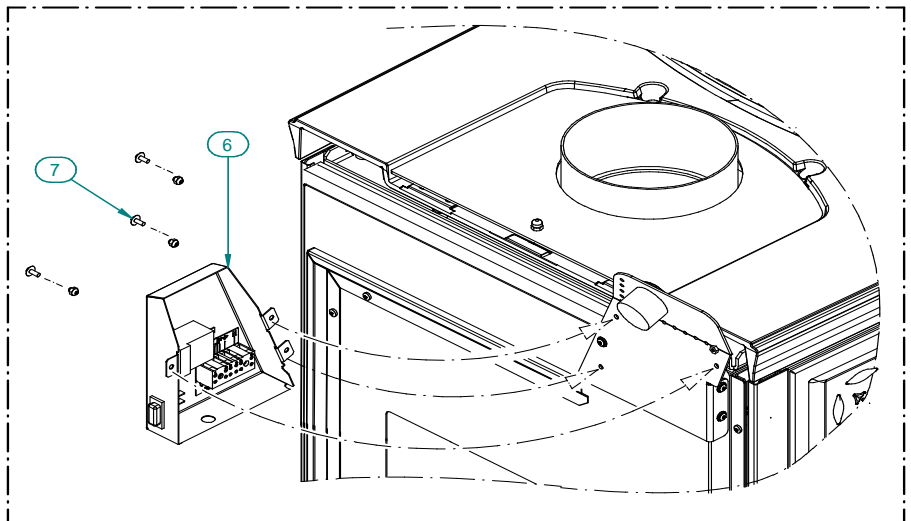
### 4.5 HEATER ELECTRICAL WIRING

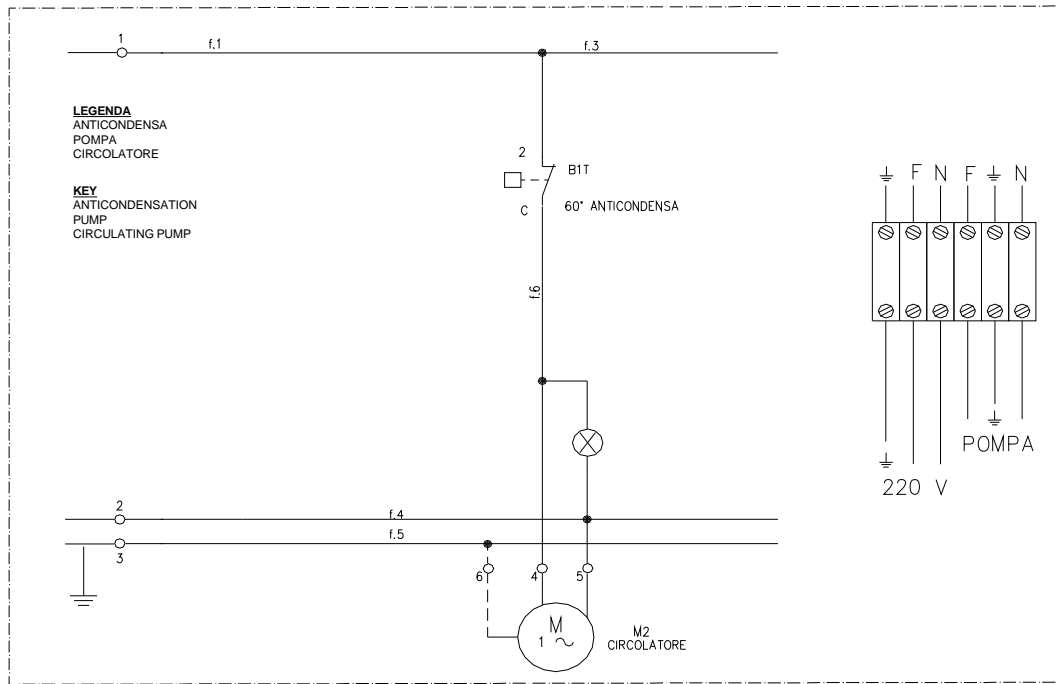
To make the electrical connections:

-Disconnect the electrical panel **6** by acting on the hardware **7**.

-Execute the electrical wiring as indicated in the diagram and in the instructions on the next page.

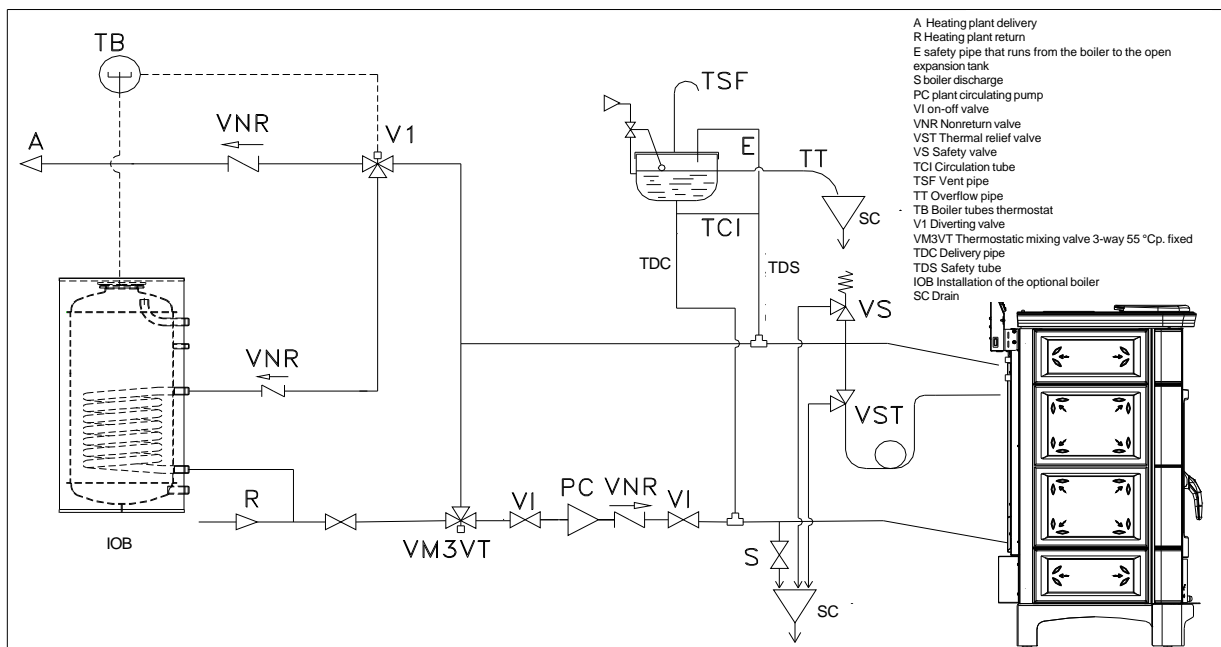
-Replace the panel.





**CAUTION: IT IS MANDATORY TO EARTH THE HEATER AS ILLUSTRATED IN THE ABOVE DIAGRAM. IF THIS INSTRUCTION IS NOT OBSERVED SERIOUS DAMAGE, WHICH IS NOT COVERED BY WARRANTY, WILL RESULT TO THE BODY OF THE HEATER. HAVE AN ELECTRICIAN CHECK THE EARTHING. THERE MUST BE NO ELECTRIC POTENTIAL (VOLTS) BETWEEN THE EARTH OF THE HEATER AND THE ACTUAL EARTH OF THE PLANT.**

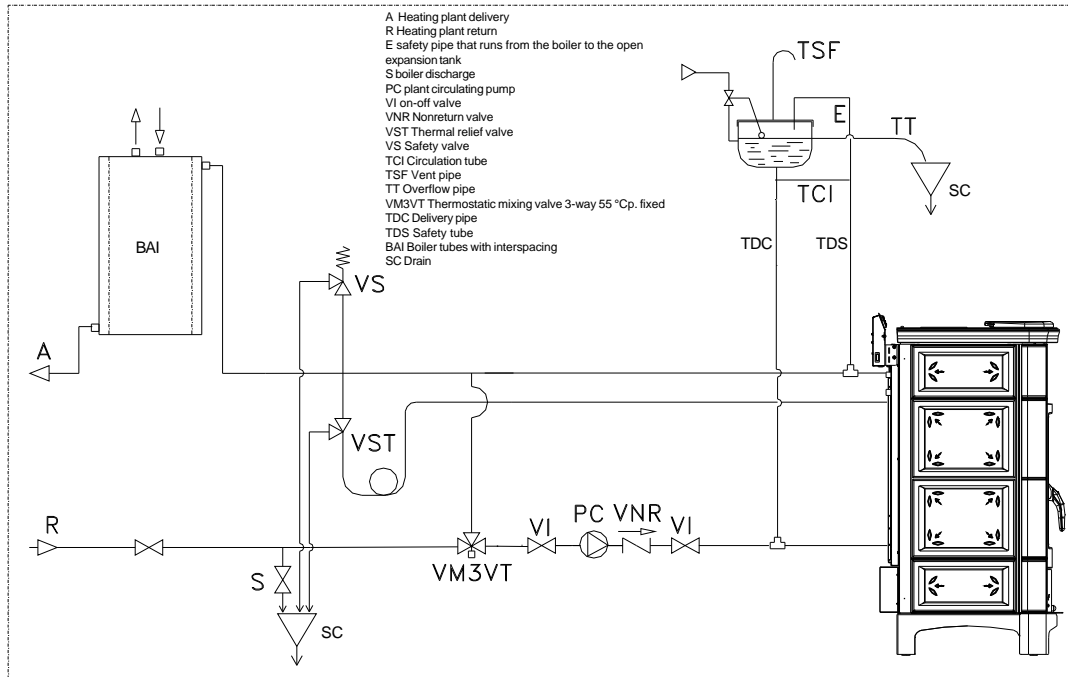
#### 4.6 GUIDELINES FOR THE HYDRAULIC CONNECTIONS OF THE HEATER WITH BOILER COILS (OPEN EXPANSION TANK) .



**CAUTION: TO ENSURE CORRECT INSTALLATION AND PLANT SAFETY READ CAREFULLY THE INSTRUCTIONS IN PARA. 4.10.**

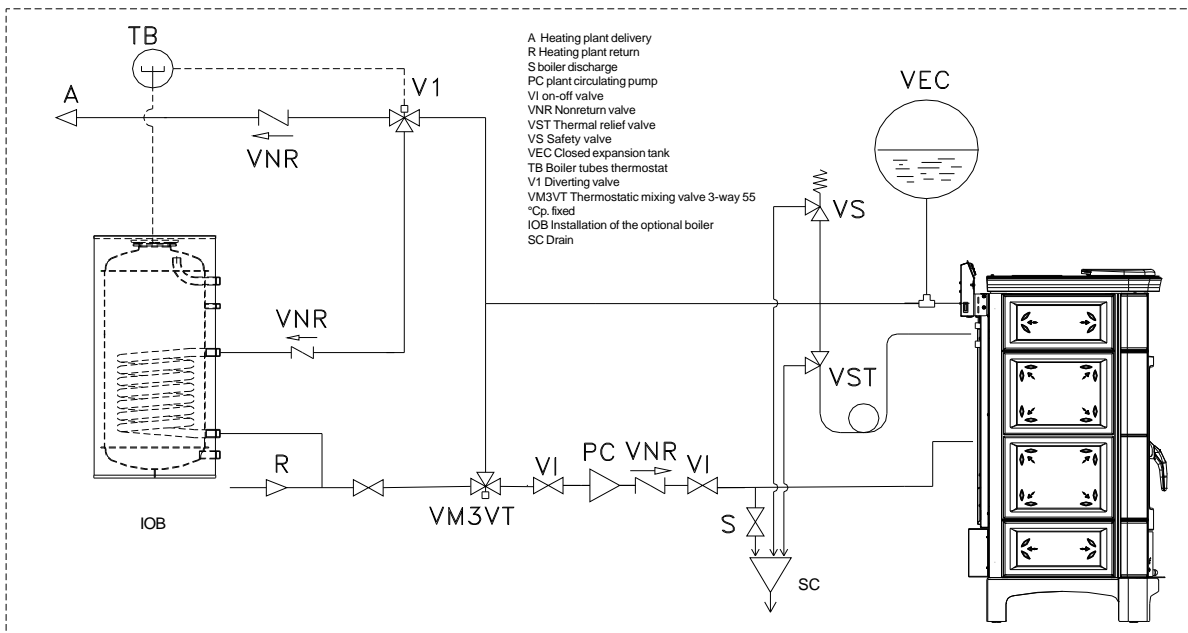


**4.7 GUIDELINES FOR THE HYDRAULIC CONNECTIONS OF THE HEATER WITH INTERSPACED BOILER COILS (OPEN EXPANSION TANK).**



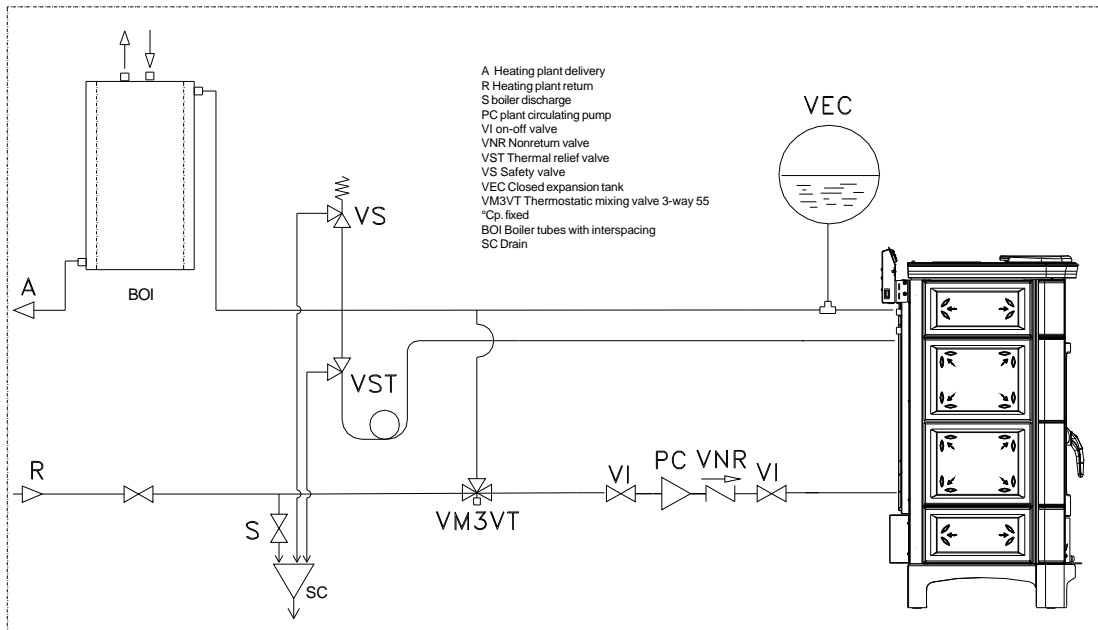
**CAUTION : TO ENSURE CORRECT INSTALLATION AND PLANT SAFETY READ CAREFULLY THE INSTRUCTIONS IN PARA. 4.10.**

**4.8 GUIDELINES FOR THE HYDRAULIC CONNECTIONS OF THE HEATER WITH BOILER COILS (CLOSED EXPANSION TANK).**



**CAUTION: TO ENSURE CORRECT INSTALLATION AND PLANT SAFETY READ CAREFULLY THE INSTRUCTIONS IN PARA. 4.10.**

#### 4.9 GUIDELINES FOR THE HYDRAULIC CONNECTIONS OF THE HEATER WITH INTERSPACED BOILER COILS (CLOSED EXPANSION TANK).



**CAUTION: TO ENSURE CORRECT INSTALLATION AND PLANT SAFETY READ CAREFULLY THE INSTRUCTIONS IN PARA. 4.10.**

#### 4.10 INSTRUCTIONS FOR EXECUTING HYDRAULIC SYSTEM.

According to UNI 10412/2 the heater can be installed with open expansion tank or closed expansion tank: the authorised technician should make the decision as to the most suitable solution.

##### Open system prescriptions

Systems with open expansion tank, must be provided with :

- open expansion tank
- safety tube
- delivery pipe
- circulating pump control thermostat (included in the generator panel).
- circulation system.
- Acoustic alarm activation thermostat.
- Acoustic alarm.

**These devices must be installed on the generator's delivery tube, within not more than 1 metre from the machine.**

The **expansion tank** must have a useful capacity (that is, the volume between the water level of the inactive plant and the water level just below the overflow orifice) that is not less than the expansion volume indicated in UNI 10412/2.

The plant water content must be indicated in the design. The expansion tank must consist of a covered container, installed above the highest point reached by the water in the system, at a sufficient height to ensure at that point a greater pressure than the atmospheric pressure, during the normal operation of the system. The expansion tank must be fitted with a breather tube venting to the atmosphere having a section that is at least equal with the section of the safety tube.

The drain of the overflow pipe must be visible and the tube must extend downwards.

The overflow pipe can also be used as a breather pipe, as long as its section is not less than the section of the safety tube. By visible drain we mean any system that makes the drain easily and safely identifiable. The expansion tanks, the safety pipes, the inflow pipes and the overflow pipes must be protected against freezing. The expansion tanks can be installed outdoors where there is no danger of freezing or where provisions have been taken to protect them against freezing. The project must specify the methods used to protect the expansion tanks, the breather pipes and the overflow pipes against freezing, if necessary.

**The heat generator must be connected to a safety pipe and a delivery pipe** in accordance with the diagrams in para. 4.6 and 4.7. The safety tube must connect the top part of the generator with the atmosphere and be free of counter inclinations, apart from the section that leads to the top part of the expansion tank. If desired, a connection can be made between the safety tube and the delivery tube to ensure circulation by gravity. The safety tubing must lead to the expansion tank.

If the safety tube discharges to the top part of the expansion tank, the latter could be connected to the safety tubing by means of a circulation tube that could be fitted with an on-off valve kept open under normal working conditions. The use of one single safety tube to service several generators is permitted. In this case the sections of the safety tube that connect the individual generators to the common tubing must be sized according to the power of the generator to which they are connected, whereas the common tubing must be sized based on the overall power of the generators.

In the case of several generators using a single safety tube, if you decide to separate a generator, you can apply, to the tube connecting each generator to the safety tube, a three-way on-off valve having a passage section that is not less than the section of the safety tube related to that particular generator, in order to ensure that in every position the generator is connected to the atmosphere either by means of the safety tube or through a vent pipe attached to the third passageway. The diameter of the breather pipe must be at least equal to the diameter of the safety tube. The three-way valves must

- be fitted with a discharge that is conveyed in such a way as to prevent injury to persons
- indicate the flow direction, the manoeuvring sense and the connection flange on the generator side
- have construction characteristics that guarantee the passageway to the generator is always free. In the event of an incomplete manoeuvre, it must guarantee, as far as the other two passageways are concerned, that one is not completely closed and the other only partially open or closed due to the lack of limit blocks. The expansion tubing, the vent and the discharge tubes must be protected against freezing in locations where this phenomenon is possible. The solution adopted must be described in the design project.

**Each generator must be fitted with a delivery tube** to permit the heat generator to fill up quickly with water arriving from the tank. The delivery tube must be fitted either directly in the expansion tank or in the lower part of the heat generator. The delivery tube must connect the lowest part of the generator with the lowest part of the expansion tank, and there must be no counter inclinations which could impede the circulation by gravity in the circuit, consisting of the safety and delivery tubes, the generator and the expansion tank.

### Instructions for closed system

Systems with closed expansion tank, must be provided with :

- a) safety valve
- b) thermal relief valve or thermal safety outlet (positive safety)
- c) closed expansion tank
- d) circulating pump activation thermostat (included in the generator panel ).
- e) acoustic alarm activation thermostat.
- f) acoustic alarm
- g) pressure gauge thermometer
- h) circulation system.

**These devices must be installed on the generator's delivery tube, within not more than 1 metre from the machine.**

**The safety valve** must be connected to the highest part of the heat generator or the outlet tube, next to the generator. The length of the section of tube between the generator fitting and the safety valve must not be more than one metre. There must be no cocks that can cut off the tube connecting the safety valve to the heat generator and the section must not be less than the inlet section of the safety valve or the sum of the inlet sections if there are several valves that head a single tube, at any point whatsoever along its length. The outlet tube of the safety valve must be installed in such a way that it does not prevent the normal functioning of the valves and will not cause injury to persons ; the outlet must be located as close as possible to the safety valve and be accessible and visible. The diameter of the outlet tube must not in any case be less than the diameter of the safety valve outlet fitting. The outlet fitting diameter is the minimum internal diameter of the valve outlet upstream from any existing internal threading.

The valve discharge pressure, equal to the calibration pressure and increased by the overpressure, must not exceed the maximum working pressure of the heat generator. The designer must ensure that the maximum pressure existing at every point of the system does not exceed the maximum working pressure of each of its components.

The discharge capacity of the safety valve must be calculated according to the prescriptions set out in UNI 10412/2.

The diameter of the minimum net cross section of the valve inlet must in any case be not less than 15 mm.

**The maximum working pressure of the closed expansion tank** must not be less than the calibration pressure of the safety valve, plus the specific overpressure of the valve itself, with any difference in height between the tank and the valve taken into account, and the pressure generated by the functioning of the pump. The capacity of the expansion tank or tanks is evaluated according to the overall capacity of the plant as per the design. The closed expansion tanks must comply with current regulations governing pressure appliances in terms of design, construction, conformity assessment and utilization. The rated volume of the closed expansion tank must be sized in relation to the expansion volume of the water in the system .

The heat generator must be connected directly to the plant's expansion tank or group of expansion tanks with a tube having an internal diameter no less than 18 mm. The connecting tube, which may consist of plant parts, must not be fitted with any shutoff cocks or have reduced sections. One three-way on-off valve may be installed for connecting the tank to the atmosphere for maintenance operations. This device must be protected against accidental manoeuvres. The connecting tube must be fitted in such a way that no scaling or deposit points are created.

If several heat generators power a single system or secondary circuit, each heat generator must be connected directly to the system's expansion tank or group of expansion tanks sized overall for the total volume of water contained in the same plant or independent circuit. When it is necessary to separate the single heat generator from the expansion tank or group of expansion tanks, then a three-way tap having the same characteristics as those listed above must be installed on the tube that connects the generator to the expansion tank, in order to ensure that the generator is in any case connected either with the expansion tank or with the atmosphere in every position. The expansion tanks, connecting tubes, the vent and smoke exhaust pipes must be protected against freezing in areas where this could occur. The solution adopted for this purpose must be described in the project.

Given that the circulation of the water in the heat generator must be maintained in any system and in all operating conditions within the limits prescribed by the supplier of the generator, in closed expansion tank heating systems, in which the circulation of the water is assured by means of an electric pump, the pump stopping must not cause, in any operating condition, the temperature to rise above the limit prescribed in these instructions.

If the characteristics of the system are such as to determine that this limit is exceeded even with concomitant blocking of the fuel flow, due to the effect of residual heat, additional devices must be installed to dispose of the residual heat.

**Manual or manual-automatic loading generators, in closed expansion tank heating systems, must be fitted internally with a cooling system designed by the manufacturer of the appliance (safety heat exchanger )**, activated by a thermal safety valve that does not require auxiliary energy, to guarantee that the max temperature limit imposed by the standard is not exceeded. The connection between the supply unit and the valve must be free of interceptions; interception is only permitted if the valve is activated by a specific tool. The pressure upstream from the cooling circuit must be at least 1.5 bar.

**The previous chapter does not replace UNI 10412/2 to which it makes reference . The qualified installer must in any case be fully aware of this standard and its amending versions.**

#### **4.11 RECOMMENDATIONS FOR THE EXECUTION OF THE HYDRAULIC AND ELECTRIC SYSTEM**



Before installing your central heating cooker we recommend that your flue outlet has a suitable draught.

We recommend connecting the plant circulating pump to the heater's control panel.

We recommend installing nonreturn valves to prevent natural circulation phenomena between the heater and the plant (see drawing par. 4.6 - 4.7 - 4.8 - 4.9 -4,10 ). The presence of open boilers causes natural circulation on the water surface with subsequent oxygenation of the water. The presence of natural circulation produces condensation and can consequently cause corrosion to parts of the heater.

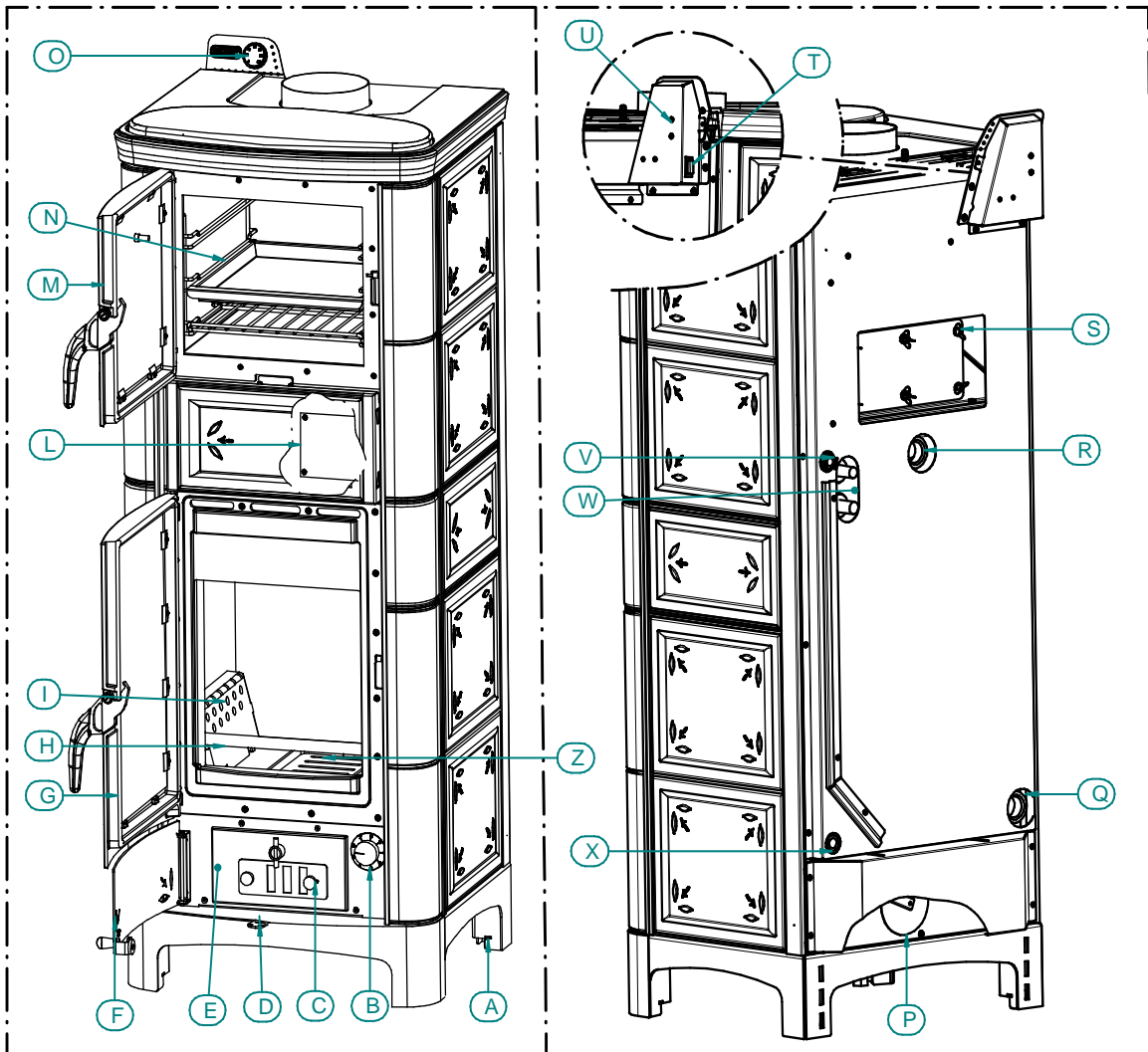


We recommend you earth the heater and check the efficiency of the earthing of the electrical system to which the heater is connected.

**THERMOROSI DECLINES ALL LIABILITY FOR THE CORRECT OPERATION AND LIFE OF THE APPLIANCE IF THE INSTRUCTIONS SET OUT ABOVE ARE NOT FOLLOWED TO THE LETTER. ANY TECHNICAL OPERATION CARRIED OUT BY OR ON BEHALF OF THERMOROSI AS A RESULT OF FAILURE TO OBSERVE THE INSTRUCTIONS WILL NOT BE COVERED BY THE GUARANTEE .**

## 5 USE OF THE HEATER

### 5.1 DESCRIPTION OF PARTS AND MAIN CONTROLS OF THE HEATER



- A - Adjustable mounting feet.
- B - Automatic combustion air thermostat adjustment knob
- C - Primary combustion air regulator - Combustion air rekindler.
- D - Secondary combustion air regulation lever.
- E - Ash pan.
- F - Bottom door.
- G - Feed door.
- H - Baffle plate.
- I - Secondary combustion air box.
- L - Safety heat exchanger cover.
- M - Oven door.
- N - Oven.
- O - Water thermometer.
- P - Automatic combustion air thermostat.
- Q - Plant return.
- R - Plant delivery.
- S - Cleaning cover (in the model without oven the cleaning cover is located under the cast iron cover).
- T - Circulating pump on indicator light.
- U - Anticondensation thermostat.
- V - Thermostat probe and thermometer pocket.
- W - Safety heat exchanger.
- X - Boiler drain.
- Z - Grate.

## 5.2 LIGHTING AND STARTING THE HEATER

### 5.2.1 LIGHTING, STARTING AND OPERATING HEATER IN MANUAL OPERATING MODE.



Before using the heater make sure that all the movable parts are in position; also remove any labels and stickers from the glass to avoid having permanent traces remain on the surfaces. Check also that the hydraulic and electrical connections have been executed correctly following the procedures set out in this manual.

To start the heater completely open the *manual primary combustion air regulator C* (all open to the left), completely open the *manual secondary combustion air regulation lever D* (all open to the left) (figure 1), completely open the automatic combustion air thermostat to pos. 8 and make sure that the grate is not clogged. Make a small fire by burning paper or cardboard with wood chips or small kindling, and add bigger and bigger pieces as the fire takes off. When the fire is burring brightly, close the *manual primary combustion air regulator C* to the minimum position (almost completely closed towards the right - leave an opening of approx. 2mm), leave the *manual secondary combustion air regulation lever D* in the maximum open position (all open to the left) and close the automatic combustion air thermostat to the pos. 0 (figure 2). The heating pump kicks in as soon as the anti-condensation thermostat calibrated at 60°C gives the activate signal to the circulating pump. The effective output is achieved using firewood having a diameter of roughly 7-8 cm, obviously larger pieces can be used but with a lower effective output. To rekindle the fire, use the supplied riddling tool to free the grate of the combustion ash.

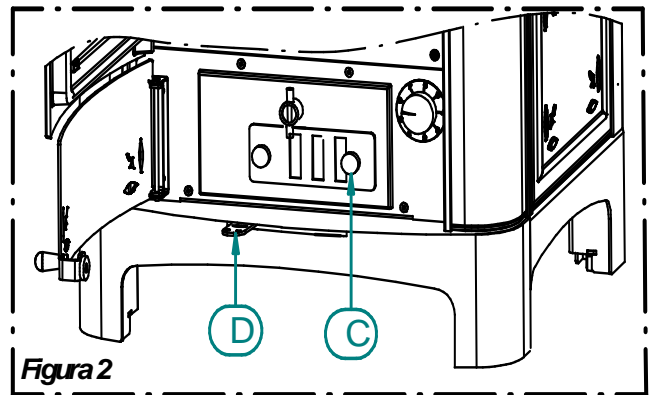
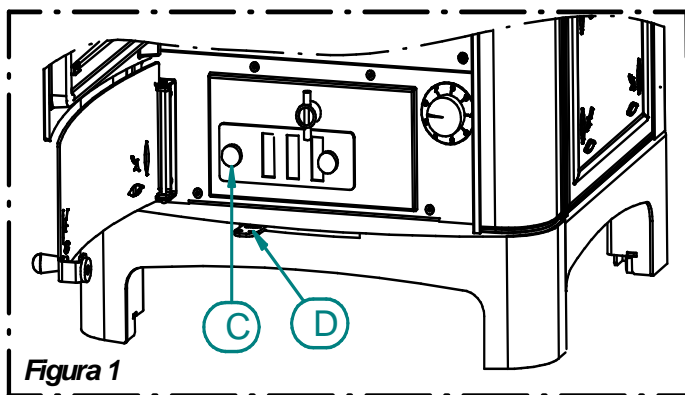
**CAUTION: IN MANUAL OPERATING MODE THE AUTOMATIC COMBUSTION AIR THERMOSTAT MUST BE SET IN POSITION 0. IF YOU LEAVE THE AUTOMATIC COMBUSTION AIR THERMOSTAT IN POSITION 8 AND/OR LEAVE THE MANUAL PRIMARY COMBUSTION AIR REGULATOR OPEN YOU SERIOUSLY RISK CAUSING THE WATER IN THE BOILER TO BOIL WITH SUBSEQUENT DAMAGE TO IT AND/OR THE PLANT THAT WILL NOT BE COVERED BY THE GUARANTEE AS THIS WOULD BE DAMAGE CAUSED BY USER'S NEGLIGENCE.**

**CAUTION:** The heater must always work with the firebox door firmly closed.

**CAUTION:** Do not use the heater in strong wind conditions.

**CAUTION :** The wood load must always be suitable for the actual thermal absorption requirements of the plant. Large loads of wood in limited absorption conditions create long periods of unburned wood remaining in the firebox. This situation leads to the distillation of the wood with the resulting formation of considerable quantities of fumes and vapours that are only partially burned. The fumes condensate in the heater and in the tubes and create tarry deposits.

**CAUTION:** To obtain the thermal power declared in para.2 you must follow the instructions set out in that paragraph and load the wood parallel with the baffle plate in the firebox(para. 5.1 ).

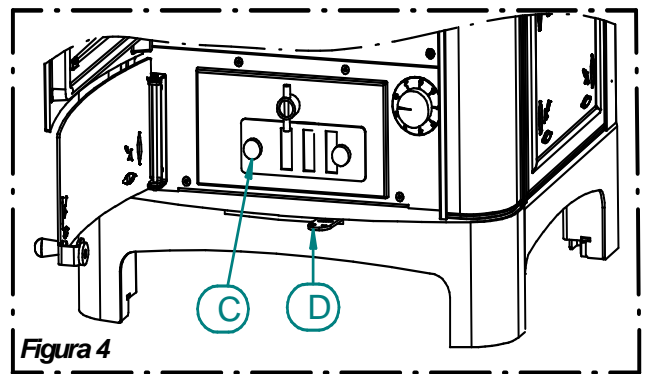
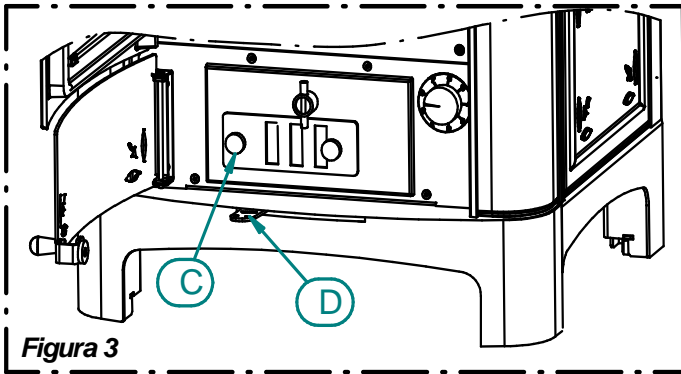


### 5.2.2 LIGHTING, STARTING AND OPERATING HEATER IN AUTOMATIC OPERATING MODE.



Before using the heater make sure that all the movable parts are in position; also remove any labels and stickers from the glass to avoid having permanent traces remain on the surfaces. Check also that the hydraulic and electrical connections have been executed correctly following the procedures set out in this manual.

To start the heater completely open the *manual primary combustion air regulator C* (all open to the left), completely open the *manual secondary combustion air regulation lever D* (all open to the left) (figure 1), completely open the automatic combustion air thermostat to pos. 8 and make sure that the grate is not clogged. Make a small fire by burning paper or cardboard with wood chips or small kindling, and add bigger and bigger pieces as the fire takes off. When the fire is burring brightly, close the *manual primary combustion air regulator C* to the minimum position (almost completely closed towards the right), and close the *manual secondary combustion air regulation lever D* (all closed to the right) (figure 4). Regulate the combustion air flow using the *automatic combustion air thermostat adjustment knob B* according to the system's actual absorption requirements. The heating pump kicks in as soon as the anti-condensation thermostat calibrated at 60°C gives the activate signal to the circulating pump. The effective output is achieved using firewood having a diameter of roughly 7-8 cm, obviously larger pieces can be used but with a lower effective output. To rekindle the fire, use the supplied riddling tool to free the grate of the combustion ash.



**CAUTION: IF YOU LEAVE THE THE MANUAL PRIMARY COMBUSTION AIR REGULATOR AND/OR THE MANUAL SECONDARY COMBUSTION AIR REGULATION LEVER OPEN YOU SERIOUSLY RISK CAUSING THE WATER IN THE BOILER TO BOIL WITH SUBSEQUENT DAMAGE TO IT AND/OR THE PLANT THAT WILL NOT BE COVERED BY THE GUARANTEE AS THIS WOULD BE DAMAGE CAUSED BY USER'S NEGLIGENCE .**

**CAUTION: The heater must always work with the firebox door firmly closed .**

**CAUTION: Do not use the heater in strong wind conditions.**

**CAUTION : The wood load must always be suitable for the actual thermal absorption requirements of the plant. Large firewood loads in limited absorption conditions result in the unburnt wood remaining in the firebox for long periods of time This situation encourages the distillation of the wood resulting in the formation of large quantities of gases and vapours that are only partially burned. The gases condense in the central heating cooker and in the tubes and create tarry deposits..**

**CAUTION: To obtain the thermal power declared in para.2 you must follow the instructions set out in that paragraph and load the wood parallel with the baffle plate in the firebox(para. 5.1 ).**

### 5.3 HOW TO USE THE OVEN (only for mod. ARDHEA F).

Before using the oven the heater must be run at full working capacity for 10 hours to completely eliminate the odour produced by the baking of the silicone paints used on the heater .

During this operation the oven door should be left slightly ajar and leave the *baking fumes outlet plug* inside the oven closed.

When baking we recommend always leaving the *baking fumes outlet plug* inside the oven slightly open (see drawing).

## 6 CLEANING AND MAINTENANCE



### 6.1 FOREWORD

Your heater does not require any special maintenance; simply adhere to the simple and basic but regular controls and general cleaning. This will guarantee regular operation and optimal output at all times. As for all machines that run on solid fuel, the main enemy is undoubtedly the dirt generated by ash, condensation, poor fuels; consequently it is important to clean the heater once a year. It is advisable to regularly run the generator for several moments with the air intakes completely open : this creates a kind of internal self-cleaning action of the heater which transforms the unburned substances into ash. The air inlets can be cleaned with an ordinary vacuum cleaner. If the product is unused for a prolonged period of time it is mandatory to inspect the smoke channel and outlet to ensure that there are no obstructions before use. It is necessary to accurately follow the directions given below: Otherwise severe damages may occur for the product, the installation, objects and the people who use the generator.

### 6.2 CLEANING AND MAINTAINING THE HEATER

**AT EACH FUEL FEED** make sure that the grate is unlogged to ensure the unobstructed flow of combustion air: this operations can be carried out using the supplied scraper and riddling tool.

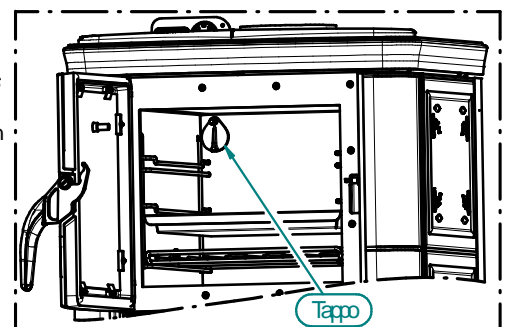
**AT EACH FUEL FEED** check that the fuel fed into the firebox catches fire correctly. Always ensure that this occurs to prevent dangerous explosions in the firebox caused by the accumulation of unburnt gases. If these explosions prove to be rather violent the manufacturer declines all responsibility for the mechanical resistance of the glass and heater parts.

**AT EACH FUEL FEED** do not overload the heater: keep to the declared consumption rate, max. 8.4 Kg/h at each load up (using wood having the characteristics set out in para.2).

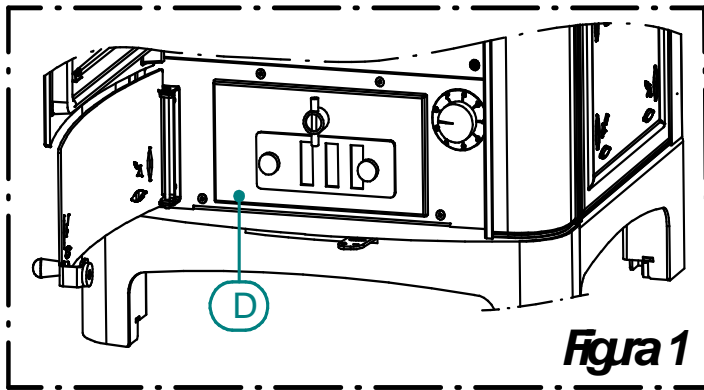
**EVERY 10 hours** of operation empty the ash pan (figure 1).

**EVERY DAY** clean the glass to remove combustion residues (the appliance must be cold for cleaning purposes ): the glass keeps cleaner if you observe the instructions for loading the wood given in para. 5.2.1 and 5.2.2.

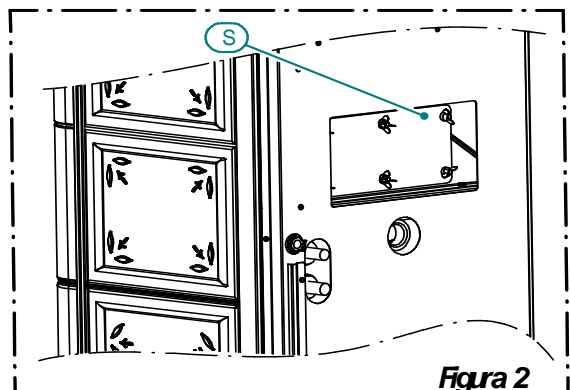
LEGENDA	KEY
Figura	Figure
Tappo	plug



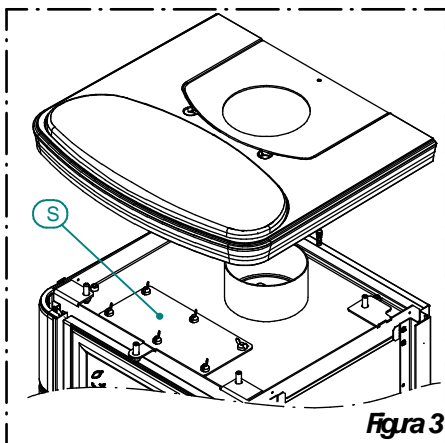




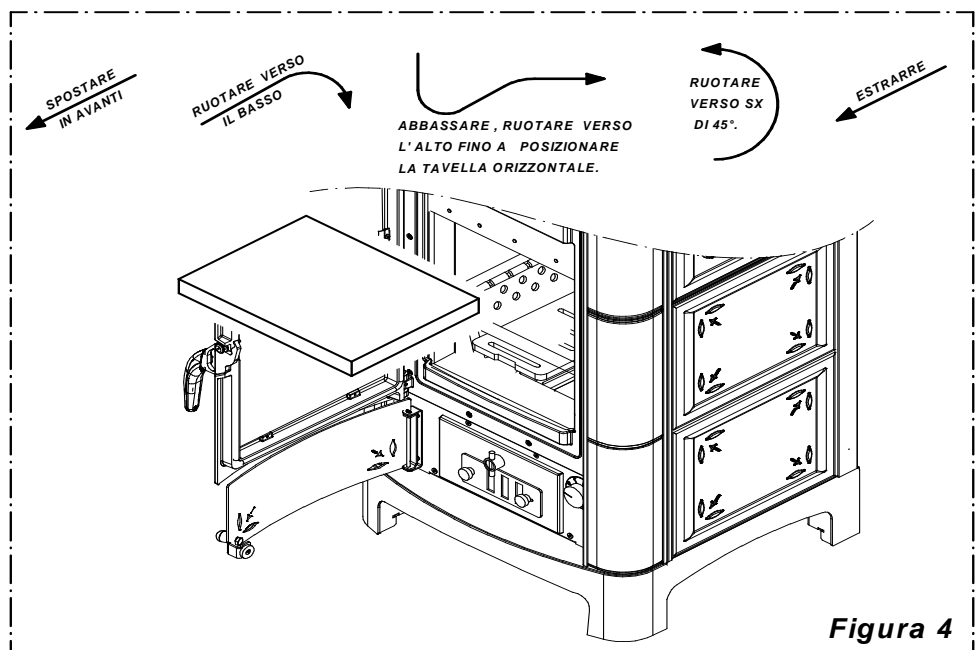
**Figura 1**



**Figura 2**



**Figura 3**



**Figura 4**

**LEGENDA**

Figura  
Spostare in avanti  
Ruotare verso il basso  
Abbassare, ruotare verso l'alto fino a posizionare la tavella orizzontale  
Ruotare verso sx di 45°

**KEY**

Figure  
move forward  
rotate downwards  
lower, rotate upwards until the tile is horizontal  
rotate to the left by 45°

**EVERY 15 days** or whenever necessary, clean the internal surfaces of the heat exchanger and the tube bundle by opening the feed door but firstly remove the vermiculite tile (figure 4) and remove cover **S** (in the ARDHEA F heater located at the back (figure 2), in the ARDHEA heater it is located under the cast iron cover (figure 3).

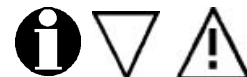
**AT THE END OF THE WINTER SEASON OR WHENEVER NECESSARY** we recommend thoroughly cleaning the heater firebox, using brushes and vacuum cleaner.

**TWICE A YEAR** clean the smoke exhaust, including the flue outlet.

A vacuum device simplifies the cleaning procedure. Use a damp cloth or a scrunched up piece of newspaper, dampened and rolled in the ash, to wipe the glass of the feed door until it is perfectly clean. Do not clean the glass while the generator is operating. The side panels must be cleaned when the heater is cold using a soft cloth and water only for the ceramic casing. If the heater has an easy casing then use only a soft cloth to clean the surfaces .

**THERMOROSI SPA DECLINES ALL RESPONSIBILITY FOR DAMAGES TO THINGS AND/OR PERSONS CAUSED BY THE FAILURE TO OBSERVE THESE INSTRUCTIONS..**

**6.3 CLEANING AND MAINTAINING THE OVEN (ONLY FOR F MODELS)**



The oven must be cleaned when it is cold. Wash with warm water and detergent, do not use abrasive products, scourers, steel wool or acids that could damage the oven surfaces. After use, rinse the mobile parts thoroughly with water and dry them with a soft cloth or chamois. For stubborn stains use normal non-abrasive detergents or specific products for stainless steel, which are easily accessible on the market, or a little hot vinegar.

Hot fruit acids (e.g.: lemons, prunes, etc...) leave marks on stainless steel surfaces that are difficult to remove, this could make the stainless steel dull and cause it to yellow. Clean the oven after use to make it easier to remove baking residues and to avoid burning them next time the oven is used . All these instructions must be carried out after the heater has cooled down. The yellowing of the oven does not affect its performance. The deformation of the oven during use is possible but this does not affect its functionality. You may find some soot inside the oven.



## 7 SMOKE EXHAUST TUBE



Due to the frequent accidents caused by poor functioning of flue outlets installed in private dwellings, we have prepared the following paragraph to assist the installer in his inspection of the parts concerned with eliminating the gases produced by combustion.

The smoke exhaust must be installed in compliance with UNI7129/92, UNI 10683 and EN14785 and must respect the following reference values: The instructions provided in the regulations mentioned above must be accurately followed: Otherwise severe damages may occur for the product, the installation, objects and the people who use the generator.

### 7.1 GENERAL:

A flue outlet for the evacuation of combustion products into the atmosphere must satisfy the following requirements :

- be sealed against the penetration of combustion products, watertight and thermally insulated;
- be made from materials capable of resisting normal mechanical stress, heat and the action of the combustion products and condensate produced by them over long periods of time;
- have vertical runs and be completely free of any narrow sections along its entire length;
- be kept clean at all times as soot or unburnt oil deposits reduce its section and could, if the deposits are large, catch fire inside the flue outlet; be suitably insulated to avoid phenomena of condensate or cooling of tubes, particularly if located on the external wall of a building;
- be at a suitable distance from combustible or easily inflammable materials separated by means of an air gap or insulation;
- have a clean out chamber for the collection of solid materials and condensate below the first smoke pipe. Access to this chamber must be possible by means of an opening fitted with an airtight metal door.
- have a circular, square or rectangular internal section: in the latter two the corners must be rounded with a radius measuring a minimum of 20mm;
- have an internal section that is slightly larger than the section of the appliance exhaust pipe; in any case, have the following minimum sections:
  - for a height of up to 5m 600cm<sup>2</sup>
  - for a height between 5 and 7m 400cm<sup>2</sup>
  - for a height greater than 7m 300cm<sup>2</sup>

If the section is too small it reduces the flue outlet draft. If the section is too big it can cause inadequate draft if the section is not insulated. Whereas if it is well-insulated it can increase the draft.

- be at least 4m from the floor on which the appliance is installed;
  - be fitted at the top with a cap that fulfils definite requirements;
  - must not be installed in inhabited locations as the flue outlet is always slightly more pressurised than its surroundings.
- If you use a large pre-existing chimney, you can adapt it by installing a stainless steel chimney liner, then filling in the spaces between the liner and the chimney with insulating material. The flue outlet enabled to discharge the combustion smoke from the central heating cooker cannot also be enabled to discharge smoke from other appliances.

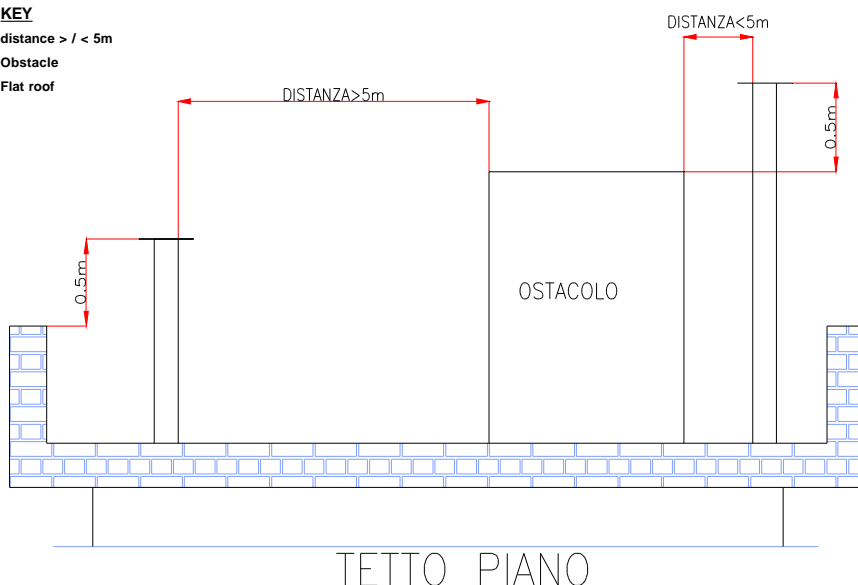
### 7.2 ESSENTIAL REQUIREMENTS FOR THE CHIMNEY CAP

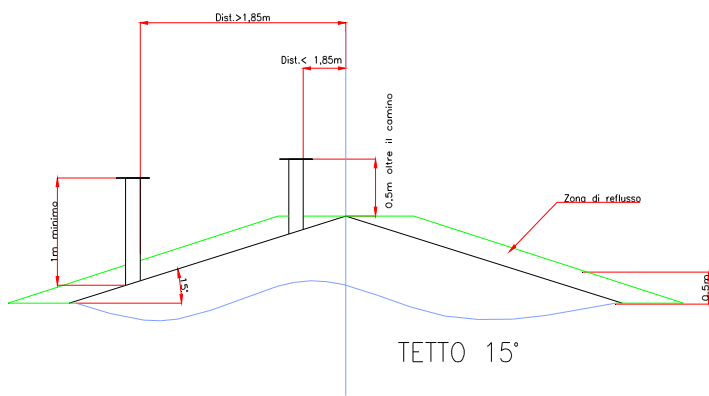
#### LEGENDA

Distanza > / < 5m  
Ostacolo  
Tetto piano

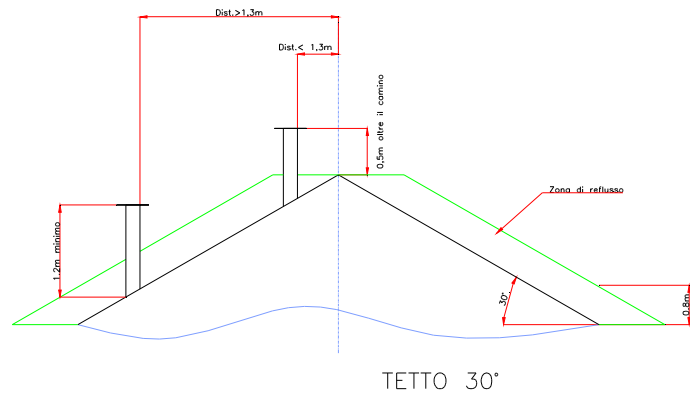
#### KEY

distance > / < 5m  
Obstacle  
Flat roof

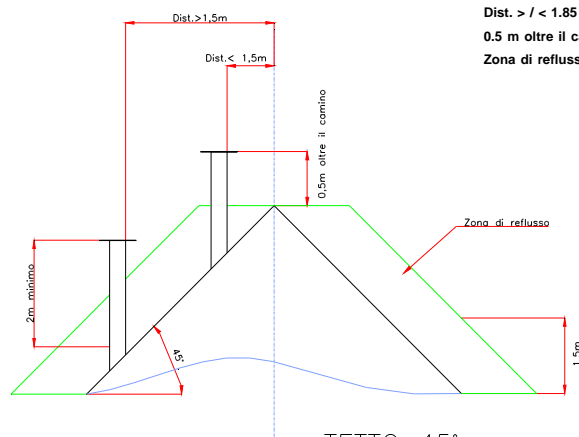




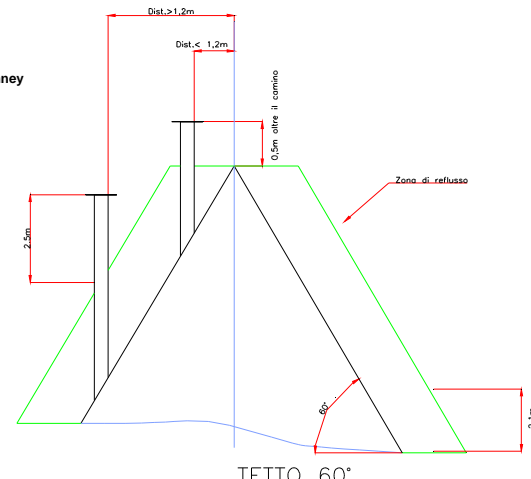
TETTO 15°



TETTO 30°



TETTO 45°



TETTO 60°

**LEGENDA**

TETTO 15°, 30° 45° 60°  
 Dist. > / < 1.85 m  
 0.5 m oltre il camino  
 Zona di reflusso

**KEY**

roof 15°, 30° 45° 60°  
 Dist. > / < 1.85 m  
 0.5 m beyond the chimney  
 Flow-back zone

A chimney cap is a device that is normally placed on top of a flue outlet for the purpose of facilitating dispersion of the combustion products; it must satisfy the following requirements;

- have a useful exhaust section that is at least double the section of the flue outlet on which it is inserted;
- have a shape that prevents the entry of snow or rain into the flue outlet;
- be built in such a way that venting of the combustion products is guaranteed regardless of wind direction. The diagrams show how the chimney should be constructed.



If the flue outlet should catch on fire contact the fire brigade immediately.

**7.3 VENTILATION OF THE ROOMS**



It is essential for the room in which the appliance is installed to be well-ventilated, also to guarantee secondary air for combustion in the heater. The natural air flow occurs directly through permanent apertures to the outside made in the walls of the room, or by means of single or multiple ventilation ducting.

The ventilating air must come from outside and if possible, away from sources of pollution. Indirect ventilation is also allowed by taking in air from rooms adjacent the one where the insert eater is installed taking into account all the warnings and limitations specified below.

•The apertures in the walls must comply with the following requirements:

- have an unobstructed section of at least 6cm<sup>2</sup> for each Kw of installed thermal power, with a minimum limit of 100cm<sup>2</sup>;
- be made in such a way that the vent openings, both on the inside and outside of the wall, cannot be obstructed;
- be protected with grills or similar systems in order not to reduce the section described above;
- be situated at floor-level.

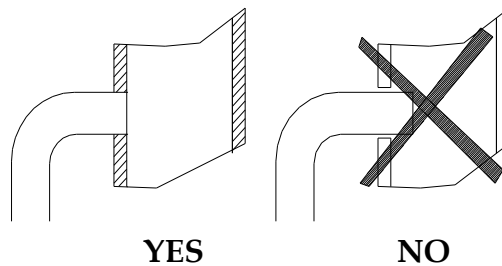
The air flow can also be obtained from an adjacent room as long as:

- the adjacent room is equipped with direct ventilation in compliance with the points described above;
- in the room to be ventilated the installed appliances are only connected to one flue outlet;
- the adjacent room is not used as a bedroom or a common area of the building;
- the adjacent room is not a room with a fire hazard, such as storage sheds, garages, combustible material store rooms, etc...;

- the adjacent room does not become a vacuum compared to the room to be ventilated due to an opposite draught effect;
- the air flow from the adjacent room to the room to be ventilated is unobstructed through the permanent apertures having an overall net section of no less than that indicated above. These apertures can be obtained by enlarging the space between the door and the floor.

Caution: Extraction fans (e.g.: kitchen range hoods ..) could cause problems if operating in the same room or area as the appliance.

#### **7.4 CONNECTION TO THE FLUE OUTLET**



Before connecting the heater to the flue outlet it is advisable to check the flue outlet draft. This operation can be carried out with a vacuummeter: the depression detected by the gauge must correspond to the optimal value indicated in para.2.

***We recommend having an expert technician control the flue outlet at least once a year.***

***Poor draft causes poor combustion which results in a reduced power.***

It is important to be aware of the fact that in terms of correct functioning and safe usage the flue outlet is just as important as the heater. The smoke pipes must be connected to the flue outlet in the same room in which the heater is installed or in an adjacent room and must satisfy the following requirements:

- be airtight and be capable of resisting normal mechanical stress, heat and the action of the combustion products and condensate over long periods of time. The temperature of the gases, at any point in the channel, must be above dew point;
- the joints must be sealed tight; if materials are used for this purpose they must be capable of resisting high temperatures;
- be in full view, easily accessed for removal and installed in such a way as to be capable of resisting normal thermal expansion;
- be installed in such a way that end of the tube with the smaller diameter faces the smoke vent and the end with the larger diameter faces the flue outlet
- have a horizontal run with a minimum upward slope of 3-5% (3-5 cm for each metre of tube ). The horizontal-sloped part must not be longer than 1/4 of the height of the flue outlet, and in any case must have a maximum length of 2.5m;
- have no more than 3 changes of direction, including the flue outlet connector, and with internal corners that are a minimum of 90°. The changes of direction must only be made with curved elements;
- have (as described in the figure above) the axis of the female end perpendicular to the opposite wall of the flue outlet, without protruding into the pipe;
- Have, along its entire length, a section which is equal to or greater than that of the appliance's exhaust tube fitting;
- Have no shut off devices ( damper): if devices such as these are already installed they must be eliminated.

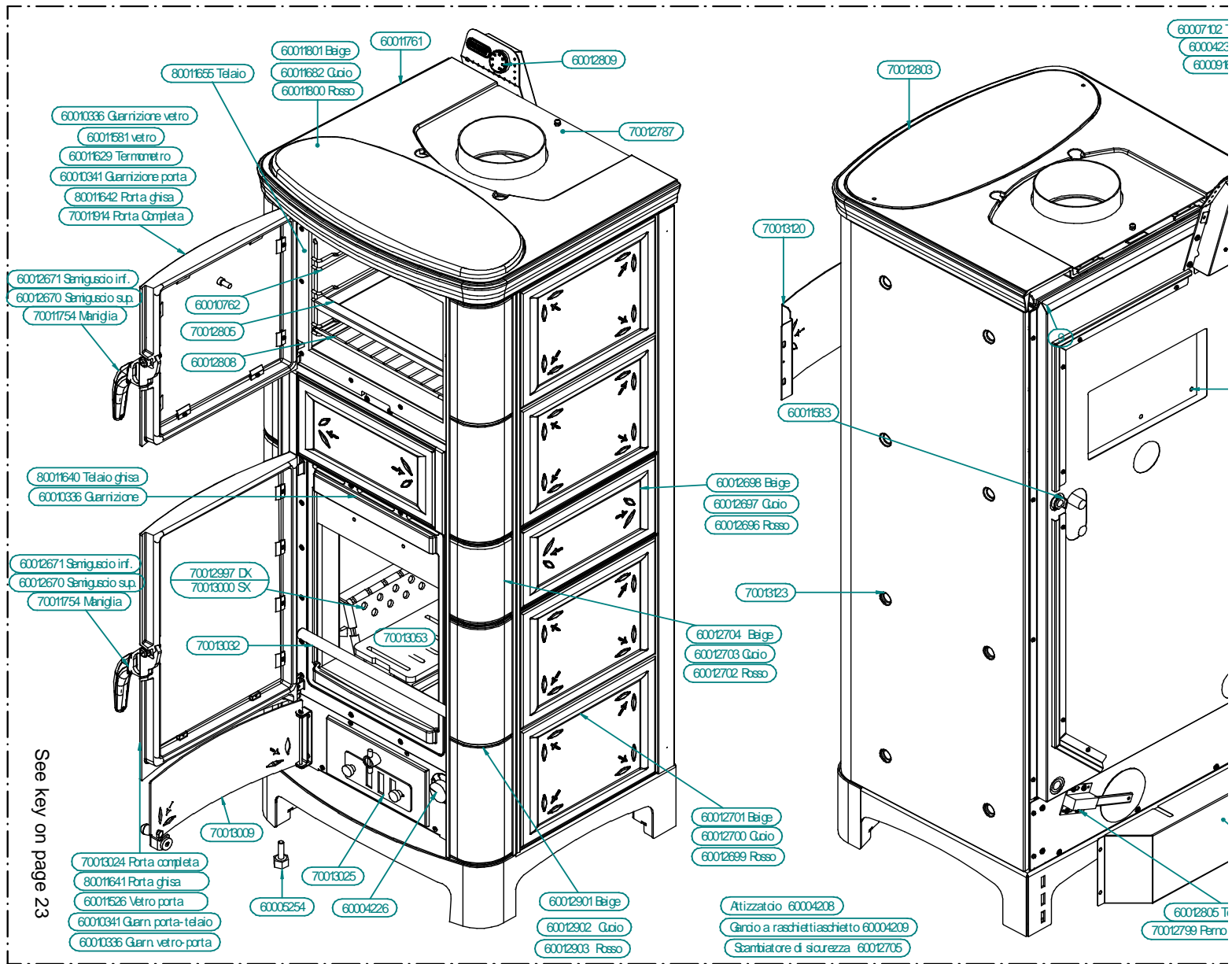
**The previous chapter does not replace UNI 7129/92 and UNI 10683/98 to which it makes reference. The qualified installer must in any case be fully aware of this standard and its amending versions.**

## 8 TROUBLESHOOTING

### 8.1 PROBLEMS CAUSES AND REMEDIES FOR ARDHEA HEATERS

Difficulty in achieving first start up	Burner clogged	Clean the burner using scraper, riddling tool and suction unit
	Wood has high humidity content or too thick	Use smaller and more seasoned pieces of wood
	No air in the room	Create a suitable opening for the air (see para. 7.3)
	Poor draught	See cause-remedies "Poor draught" (described below)
	Wood not yet perfectly alight	Open the "manual primary combustion air regulator – combustion air rekindler C" (para. 5.1) and wait until it is burning
The water in the boiler tends to boil	The ash pan and/or "the manual primary combustion air regulator – combustion air rekindler C" is open	Close the ash pan and/or "the manual primary combustion air regulator – combustion air rekindler C"
	The pumps are not active	Check the pumps
Tendency to generate condensation (presence of humidity /water in the ash pan and under the heater)	Faulty anti-condensation thermostat	Replace the anti-condensation thermostat
	Poor draught	See cause-remedies "Poor draught" (described below)
	Low temperature in the boiler	Keep the automatic draught regulator in position 7-8 Connect pumps to the panel
The boiler does not heat sufficiently	Using wood pieces that are too thick	Split the wood into smaller pieces
Smoke in the room. Difficulty in keeping the fire going. Difficulty in reaching the oven temperature. Flame is not affected by draught variations. Puffing while operating. Soot in the chimney hood. Does not burn during the night (unburned wood left in the firebox). Water does not reach required temperature.	Poor draught	See cause-remedies "Poor draught" (described below)
	No air in the room	Create a suitable opening for the air (see para. 7.3)
Does not burn during the night (the fuel burns too quickly). Uncontrolled combustion.	Excessive draught	Reduce the draught by inserting a register in the chimney.
Difficulty in controlling the temperature.	Variable draught	Raise the flue outlet, install an anti down draught cap at the top of the flue.
	Excessive draught	Reduce the draught by inserting a register in the chimney.
	Poor draught	Check the chimney: presence of narrowing, too many bends, poor insulation, section too small / clean the flue outlet / the heater
Variable combustion rhythm. Combustion is only good at times, almost seems as if it depends on the wind conditions.	No air in the room	Create a suitable opening for the air (see para. 7.3)





## **LEGENDA**

**Rosso**  
**Cuoio**  
**Beige**  
**Telaio ghisa**  
**Guarnizione**  
**Semiguscio inf.**  
**Semiguscio sup.**  
**Maniglia**  
**Spia verde**  
**Morsettiera**  
**Termostato a 60°C**  
**Porta completa**  
**Porta ghisa**  
**Vetro porta**  
**Guarn. porta-telaio**  
**Guarn vetro-porta**  
**Attizzatoio**  
**Gancio a raschietto**  
**Scambiatore di sicurezza**  
**Termostato aria**  
**Perno per termostato aria**  
**DX**  
**SX**

## **KEY**

**Red**  
**Leather**  
**Beige**  
**Cast iron frame**  
**Gasket**  
**Bottom half shell**  
**Top half shell**  
**Handle**  
**Green light**  
**Terminal block**  
**THERMOSTAT AT 60°C**  
**Complete door**  
**Cast door**  
**Door glass**  
**Door - frame gasket**  
**Glass door gasket**  
**Riddling tool**  
**Scraper-shaped hook**  
**Safety heat exchanger**  
**Air thermostat**  
**Pin for air thermostat**  
**RH**  
**LH**