

FONDERIE SIME S.p.A. of Via Garbo 27 - Legnago (VR) - Italy declares that its diesel-burning boilers are produced in accordance with the requirements of article 3 paragraph 3 of Directive PED 97/23/EEC and according to proper manufacturing practice, as they are designed and manufactured in accordance with UNI EN 303 -1: 2002 standards.

CONTENTS

1 BOILER DESCRIPTION

| | | |
|-----|--------------------------|----|
| 1.1 | INTRODUCTION | 34 |
| 1.2 | DIMENSIONAL DETAILS | |
| 1.3 | TECHNICAL FEATURES | 35 |
| 1.4 | LOSS OF HEAD | 36 |
| 1.5 | FUNCTIONAL DIAGRAM | |
| 1.6 | COMBUSTION CHAMBER | 37 |
| 1.7 | COMPATIBLE BURNERS | |

2 INSTALLATION

| | | |
|-----|-----------------------------|----|
| 2.1 | BOILER ROOM | 38 |
| 2.2 | BOILER ROOM DIMENSIONS | |
| 2.3 | CONNECTING UP SYSTEM | |
| 2.4 | CONNECTING UP FLUE | |
| 2.5 | FITTING THE CASING "RONDÒ" | |
| 2.6 | ELECTRICAL CONNECTION | 39 |

3 USE AND MAINTENANCE

| | | |
|-----|--------------------------------|----|
| 3.1 | COMMISSIONING THE BOILER | 40 |
| 3.2 | LIGHTING AND OPERATION | |
| 3.3 | REGULAR CLEANING | |
| 3.4 | FROST POTECTION | 41 |
| 3.5 | USER WARNINGS | |

1 BOILER DESCRIPTION

1.1 INTRODUCTION

The new "RONDÒ - ESTELLE" series of cast iron boilers has been designed in compliance with the Efficiencies Directive CEE 92/42.

They use light oil and have a perfectly balanced combustion with a very high thermal

efficiency for economical performance.

This manual provides the instructions for the following boiler models:

- "RONDÒ" for central heating only, matchable with a separate boiler unit "BA100 - BA150 - BA200"
- "ESTELLE" for central heating only, with

combustion hinged door, matchable with a separate boiler unit "BA100 - BA150 - BA200".

The components for "RONDÒ" installation are supplied in three separate packages: boiler body, casing with enclosed documents and control panel.

1.2 DIMENSIONAL DETAILS

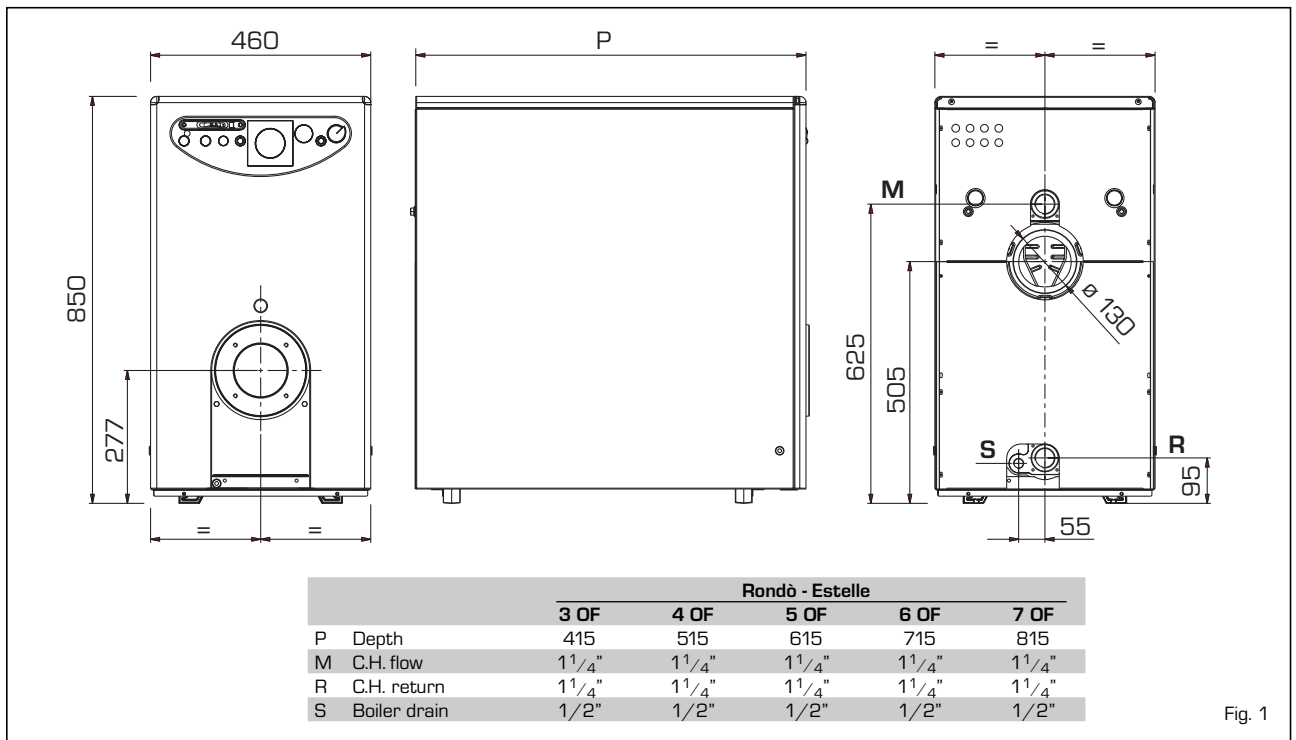


Fig. 1

1.2.1 D.H.W. storage tank BA

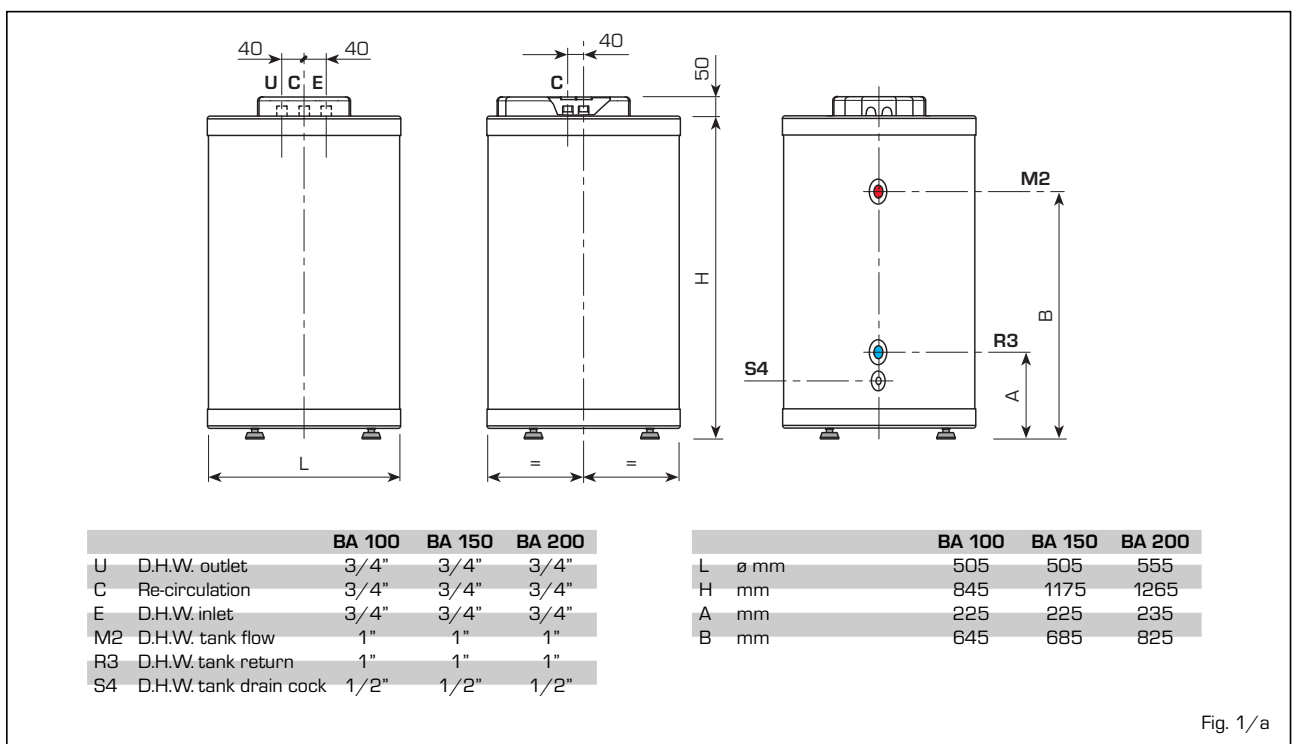


Fig. 1/a

1.3 TECHNICAL FEATURES

| | | RONDÒ - ESTELLE | | | | | BA tank | | |
|-------------------------------------|-------|-----------------|-----------|-----------|-----------|-----------|---------|-------|-------|
| | | 3 OF | 4 OF | 5 OF | 6 OF | 7 OF | 100 | 150 | 200 |
| Output | | | | | | | | | |
| Minimum | kW | 18,9 | 24,5 | 32,5 | 41,7 | 49,9 | - | - | - |
| Maximum | kW | 23,5 | 31,3 | 40,0 | 48,1 | 57,5 | - | - | - |
| Input | | | | | | | | | |
| Minimum | kW | 21,1 | 27,2 | 36,0 | 46,1 | 55,0 | - | - | - |
| Maximum | kW | 26,2 | 34,8 | 44,3 | 53,1 | 63,3 | - | - | - |
| Sections | n° | 3 | 4 | 5 | 6 | 7 | - | - | - |
| Maximum water head | bar | 4 | 4 | 4 | 4 | 4 | - | - | - |
| Water content | l | 12,8 | 16,8 | 20,8 | 24,8 | 28,8 | - | - | - |
| Smokes loss of head | | | | | | | | | |
| Minimum/Maximum | mbar | 0,05/0,11 | 0,12/0,16 | 0,15/0,21 | 0,30/0,35 | 0,32/0,43 | - | - | - |
| Water loss of head* | mbar | 5 | 10 | 15 | 20 | 25 | - | - | - |
| Combustion chamber pressure | mbar | -0,02 | -0,02 | -0,02 | -0,02 | -0,02 | - | - | - |
| Suggested chimney depression | mbar | 0,07/0,13 | 0,14/0,18 | 0,17/0,23 | 0,32/0,37 | 0,34/0,45 | - | - | - |
| Smokes temperature | | | | | | | | | |
| Minimum/Maximum | °C | 160/185 | 160/185 | 160/185 | 160/170 | 160/170 | - | - | - |
| Smokes flow | | | | | | | | | |
| Minimum/Maximum | m³n/h | 24,0/31,6 | 32,4/41,4 | 42,9/52,8 | 54,8/63,3 | 65,5/73,8 | - | - | - |
| Smokes volume | dm³ | 9 | 12 | 15 | 18 | 21 | - | - | - |
| CO₂ | % | 12,5 | 12,5 | 12,5 | 12,5 | 12,5 | - | - | - |
| C.H. adjustment range | °C | 30÷85 | 30÷85 | 30÷85 | 30÷85 | 30÷85 | - | - | - |
| D.H.W. adjustment range | °C | - | - | - | - | - | 30÷65 | 30÷65 | 30÷65 |
| D.H.W. flow rate Δt 30°C** | l/h | - | - | - | - | - | 918 | 990 | 1308 |
| D.H.W. tank capacity | l | - | - | - | - | - | 100 | 150 | 200 |
| D.H.W. maximum water head | bar | - | - | - | - | - | 6 | 6 | 6 |
| Weight | kg | 109 | 135 | 161 | 186 | 212 | 82 | 102 | 122 |

* With Δt 10°C

** With the sanitary water at inlet temperature 15°C - Boiler temperature 80°C

RONDÒ/ESTELLE technical features - NOx: Class 3 (Burner with low polluting emissions)

| | | 3 OF | 4 OF | 5 OF | 6 OF | 7 OF |
|-------------------------------------|-------|-------|-------|-------|-------|-------|
| Output | | | | | | |
| Minimum | kW | - | 18,0 | 27,5 | 36,2 | 45,0 |
| Maximum | kW | 19,7 | 27,6 | 32,8 | 45,7 | 55,1 |
| Input | | | | | | |
| Minimum | kW | - | 20,0 | 30,5 | 40,0 | 49,6 |
| Maximum | kW | 21,9 | 30,7 | 36,3 | 50,5 | 60,7 |
| Sections | n° | 3 | 4 | 5 | 6 | 7 |
| Maximum water head | bar | 4 | 4 | 4 | 4 | 4 |
| Water content | l | 12,8 | 16,8 | 20,8 | 24,8 | 28,8 |
| Pérdidas de carga lado humos | | | | | | |
| Minimum | mbar | - | 0,04 | 0,08 | 0,20 | 0,22 |
| Maximum | mbar | 0,06 | 0,07 | 0,13 | 0,31 | 0,44 |
| Water loss of head (Δt 10°C) | mbar | 5 | 10 | 15 | 20 | 25 |
| Combustion chamber pressure | mbar | -0,02 | -0,02 | -0,02 | -0,02 | -0,02 |
| Suggested chimney depression | | | | | | |
| Minimum | mbar | - | 0,06 | 0,10 | 0,22 | 0,24 |
| Maximum | mbar | 0,08 | 0,09 | 0,15 | 0,33 | 0,46 |
| Smokes temperature | | | | | | |
| Minimum | °C | - | 110 | 130 | 140 | 155 |
| Maximum | °C | 140 | 145 | 145 | 155 | 180 |
| Smokes flow | | | | | | |
| Minimum | m³n/h | - | 24,3 | 36,8 | 48,7 | 59,5 |
| Maximum | m³n/h | 26,8 | 37,4 | 43,9 | 61,5 | 72,8 |
| Smokes volume | dm³ | 9 | 12 | 15 | 18 | 21 |
| CO₂ | % | 12,8 | 12,8 | 12,9 | 12,8 | 13,0 |
| C.H. adjustment range | °C | 30÷85 | 30÷85 | 30÷85 | 30÷85 | 30÷85 |
| Weight | kg | 109 | 135 | 161 | 186 | 212 |

1.4 LOSS OF HEAD

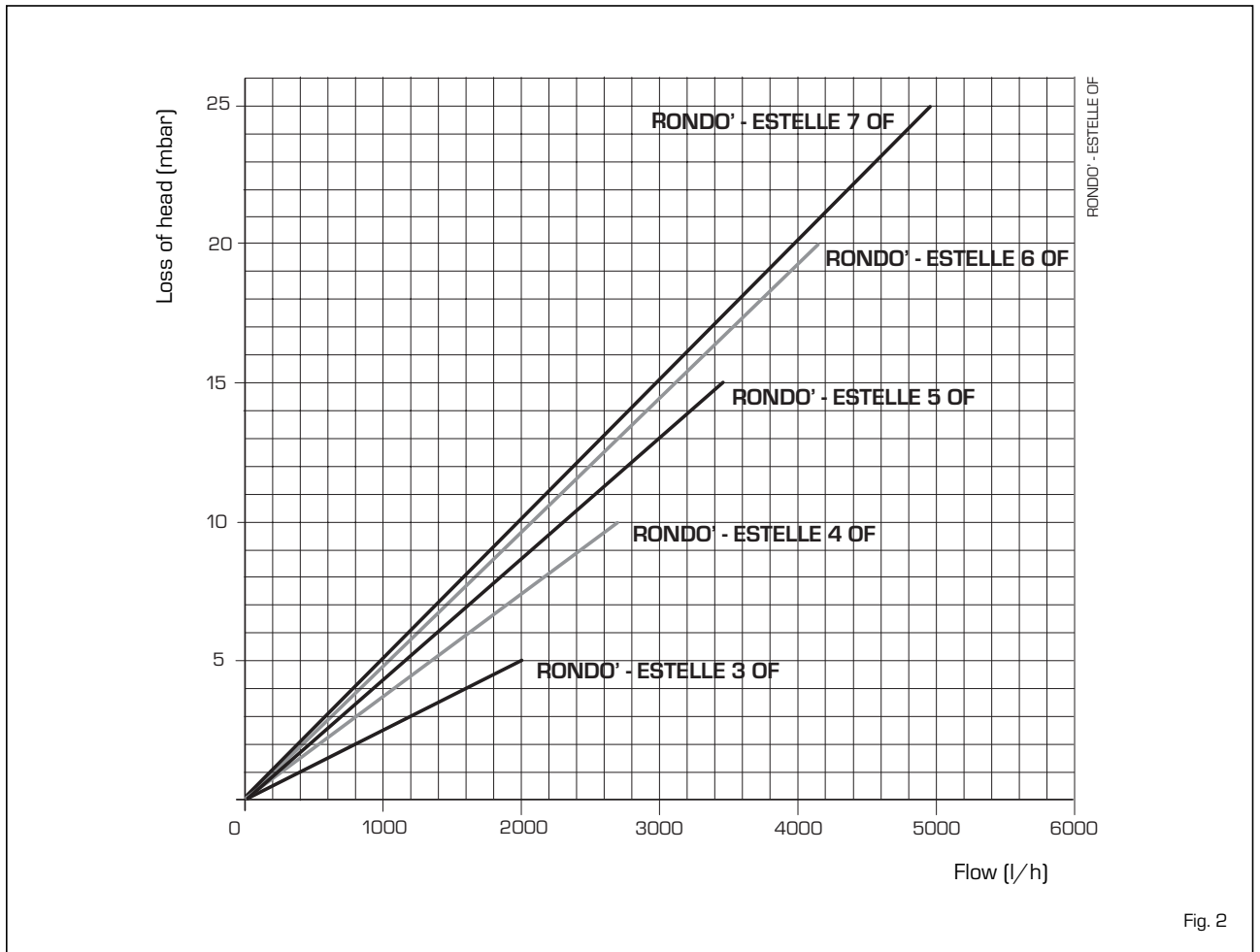


Fig. 2

1.5 FUNCTIONAL DIAGRAM

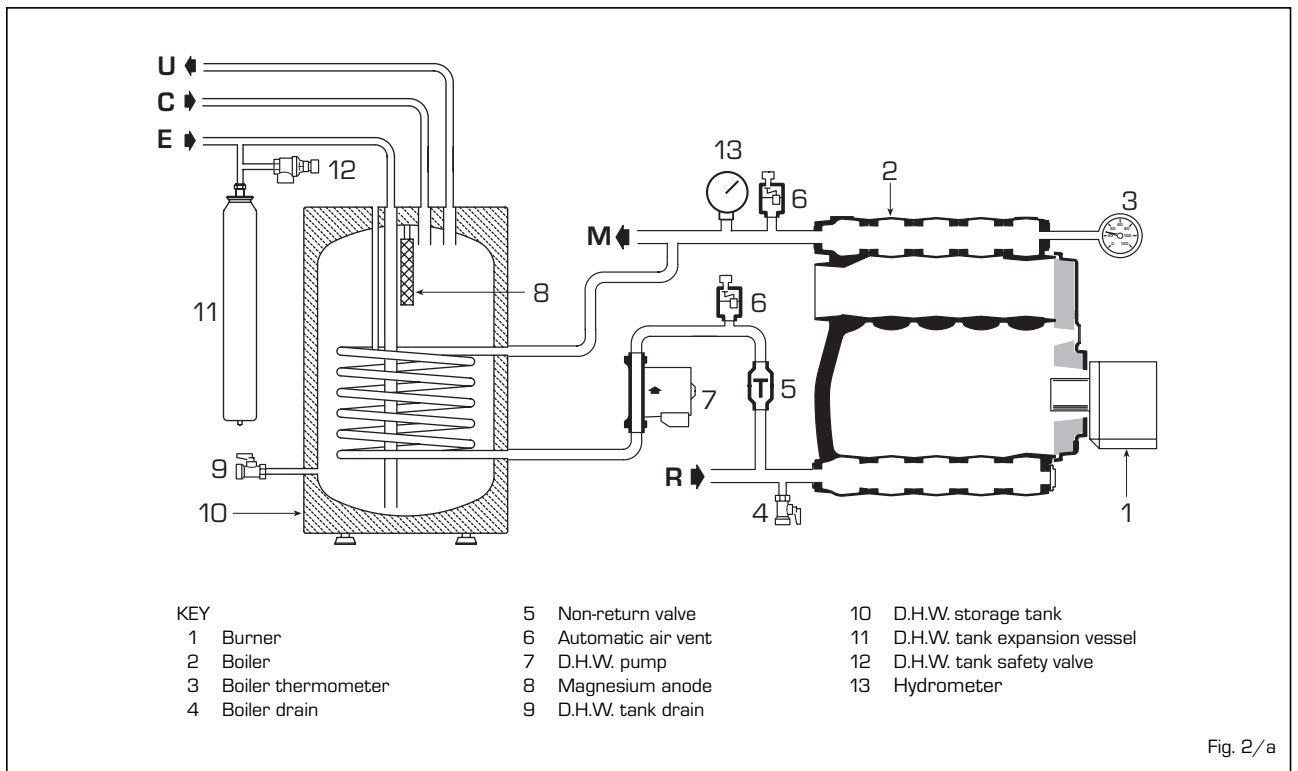


Fig. 2/a

1.6 COMBUSTION CHAMBER

The combustion chamber is of the straight flow type and complies with standard EN 303-3 appendix E.

The dimensions are shown in fig. 3.

| | L | Volumen |
|--------------------|-----|-----------------|
| | mm | dm ³ |
| Rondò/Estelle 3 OF | 305 | 17,5 |
| Rondò/Estelle 4 OF | 405 | 24,0 |
| Rondò/Estelle 5 OF | 505 | 30,5 |
| Rondò/Estelle 6 OF | 605 | 37,0 |
| Rondò/Estelle 7 OF | 705 | 43,5 |

1.7 COMPATIBLE BURNERS

In general, the oil burner that is compatible with the boiler should use spray of the semi solid type.

Sections 1.71- 1.7.2 shows the matching table of the burners together with the boilers have been tested with.

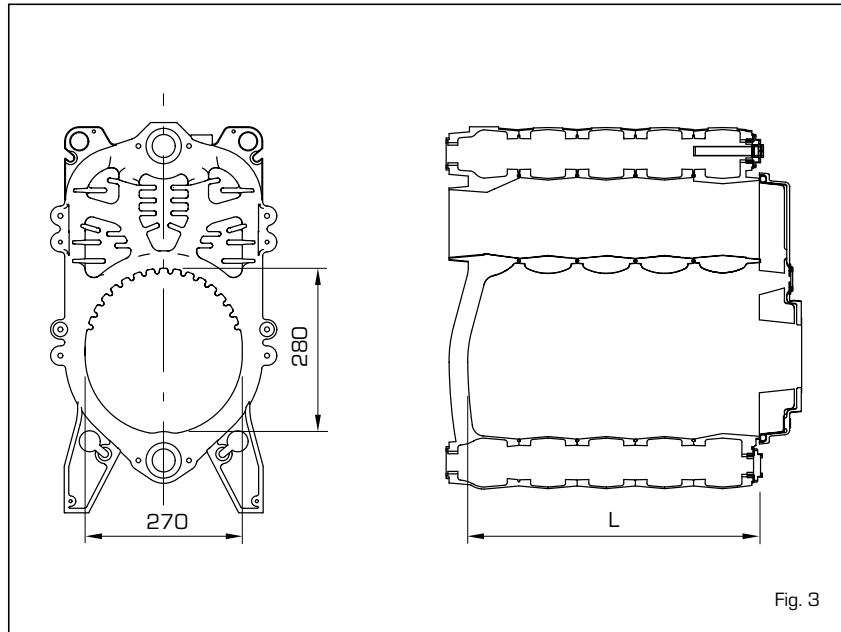


Fig. 3

1.7.1 "RIELLO" burners

| Model | Nozzle | | Atomising angle | | Pump pressure | | | |
|--------------------|-------------|------------|-----------------|-------|---------------|--------------|--------------|------|
| | Type | P min ø | P max ø | P min | P max | P min bar | P max bar | |
| | | | | | | | | |
| Rondò/Estelle 3 OF | RG0.1R | DELAVAN | 0,50 | 0,60 | 60°W | 60°W | 11,5 | 12,0 |
| | R2000 G26 R | DANFOSS | 0,50 | 0,55 | 60°S | 60°S | 10,5 | 12,0 |
| Rondò/Estelle 4 OF | RG1R | DELAVAN | 0,65 | 0,75 | 80°W | 60°W | 12,5 | 13,0 |
| | R2000 G38 R | DELAVAN | 0,60 | 0,75 | 80°W | 60°W | 13,0 | 12,5 |
| Rondò/Estelle 5 OF | RG1R | DELAVAN | 0,85 | 1,00 | 60°W | 60°W | 11,5 | 11,5 |
| | R2000 G46 R | DELAVAN | 0,75 | 0,85 | 80°W | 60°W | 13,9 | 14,0 |
| Rondò/Estelle 6 OF | RG2 | DELAVAN | 1,00 | 1,10 | 60°W | 60°W | 10,0 | 10,0 |
| | R2000 G120 | DELAVAN | | 1,10 | 60°W | 60°W | | 12,0 |
| Rondò/Estelle 7 OF | RG2 | DELAVAN | 1,10 | 1,25 | 60°W | 60°W | 11,0 | 11,0 |
| | R2000 G120 | DELAVAN | | 1,25 | 60°W | 60°W | | 13,0 |

1.7.2 "SIME" burners - NOx: Class 3 (Burner with low polluting emissions)

| Model | Nozzle | | Atomising angle | | Pump pressure | | | |
|--------------------|----------------|------------|-----------------|-------|---------------|--------------|--------------|------|
| | Type | P min ø | P max ø | P min | P max | P min bar | P max bar | |
| | | | | | | | | |
| Rondò/Estelle 3 OF | BLUE MACK 1 LC | DANFOSS | 0,50 | 0,50 | 80°H | 80°H | 12,0 | 12,0 |
| Rondò/Estelle 4 OF | BLUE MACK 1 LC | DANFOSS | 0,65 | 0,65 | 60°S | 60°S | 12,0 | 12,0 |
| Rondò/Estelle 5 OF | BLUE MACK 2 LC | DANFOSS | 0,75 | 0,75 | 60°H | 60°H | 12,0 | 12,0 |
| Rondò/Estelle 6 OF | BLUE MACK 2 LC | DANFOSS | 1,10 | 1,10 | 60°H | 60°H | 12,0 | 12,0 |
| Rondò/Estelle 7 OF | BLUE MACK 3 | DANFOSS | 1,25 | 1,25 | 60°S | 60°S | 10,0 | 12,8 |

NOTE: The best emission values are obtained with Danfoss 60°H nozzles. Use of Danfoss 60°H nozzles is recommended in the field to ensure continued dependable burner functioning.

1.7.3 Burners assembly

The boiler door details is shown in figure 4 for burner mounting.

The burners must be regulated such that the CO₂ value is that indicated in point 1.3, with a tolerance of ± 5%.

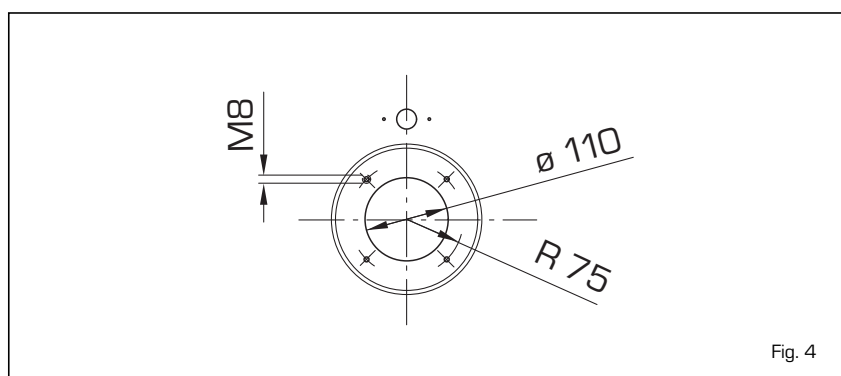


Fig. 4

2 INSTALLATION

2.1 BOILER ROOM

The boiler room should feature all the characteristics required by standards governing liquid fuel heating systems.

2.2 BOILER ROOM DIMENSIONS

Position the boiler body on the foundation bed, which should be at least 10 cm high. The body should rest on a surface allowing shifting, possibly by means of sheet metal. Leave a clearance between the boiler and the wall of at least 0.60 m, and between the top of the casing and the ceiling of 1 m (0.50 m in the case of boilers with incorporated D.H.W. tank). The ceiling height of the boiler room should not be less than 2.5 m.

2.3 CONNECTING UP SYSTEM

When connecting up the water supply to the boiler, make sure that the specifications given in fig. 1 are observed. All connecting unions should be easy to disconnect by means of tightening rings. A closed expansion tank system must be used.

2.3.1 Filling the water system

Before connecting the boiler, thoroughly flush the system to eliminate scale which could damage the appliance.

Filling must be done slowly to allow any air bubbles to be bled off through the air valves. In closed-circuit heating systems, the cold water filling pressure and the pre-charging pressure of the expansion vessel should be no less than or equal to the height of the water head of the installation (e.g. for water head of 5 meters, the vessel pre-charging pressure and installation filling pressure should be at least 0.5 bar).

2.3.2 Characteristics of feedwater

Water supplying the heating circuit must be treated in accordance with UNI-CTI 8065 standards.

It is absolutely essential to treat water in the heating system in the following cases:

- For extensive systems (with high contents of water).
- Frequent addition of water into the system.
- Should it be necessary to empty the system either partially or totally.

2.3.3 D.H.W. storage tank

The "RONDÒ -ESTELLE" boilers may be matched with the separate boiler units "BA100 -BA150 -BA200".

The glass enamelled D.H.W. storage tank comes with a magnesium anode to protect the boiler and an inspection flange for checking and cleaning.

The magnesium anode must be checked annually and replaced if it is worn.

Fit a safety valve calibrated to 6 bar on the tubing of the cold water supply to the boiler unit (12 fig. 2).

In case the system pressure is excessive fit an appropriate pressure reducer. If the safety valve calibrated to 6 bar frequently intercepts, fit an expansion vessel with a capacity of 8 litres and a maximum pressure of 8 bar (11 fig. 2). The tank should be of the membrane type, made of natural rubber "caoutchouc", which is suitable for foods.

2.4 CONNECTING UP FLUE

The flue is of fundamental importance for the proper operation of the boiler; if not installed in compliance with the standards, starting the boiler will be difficult and there will be a consequent formation of soot, condensate and encrustation. The flue used to expel combustion products into the atmosphere must meet the following requirements:

- be constructed with waterproof materials, and resistant to smoke temperature and condensate;
- be of adequate mechanical resilience and of low heat conductivity;
- be perfectly sealed to prevent cooling of the flue itself;
- be as vertical as possible; the terminal section of the flue must be fitted with a static exhaust device that ensures constant and efficient extraction of products generated by combustion;
- to prevent the wind from creating pressure zones around the chimney top

greater than the uplift force of combustion gases, the exhaust outlet should be at least 0.4 m higher than structures adjacent to the stack (including the roof top) within 8 m;

- have a diameter that is not inferior to that of the boiler union: square or rectangular-section flues should have an internal section 10% greater than that of the boiler union;
- the useful section of the flue must conform to the following formula:

$$S = K \frac{P}{\sqrt{H}}$$

S resulting section in cm²

K reduction coefficient for liquid fuels:

- 0.045 for firewood
- 0.030 for coal
- 0.024 for light oil
- 0.016 for gas

P boiler input in kcal/h

H height of flue in meters, measured from the flame axis to the top of the flue reduced by:

- 0.50 m for each change of direction of the connection union between boiler and flue;
- 1.00 m for each metre of union itself.

2.5 FITTING THE CASING "RONDÒ"

The casing and the control panel are supplied in separate cardboard packages.

The housing package also contains the boiler documents and the glass wool for insulating the cast iron body. To fit the casing,

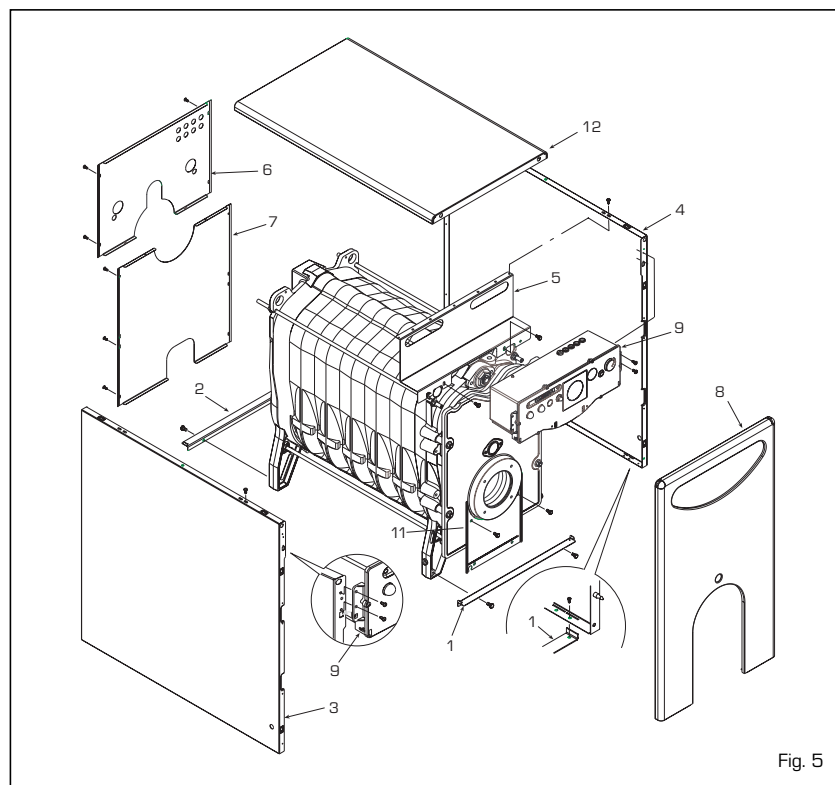


Fig. 5

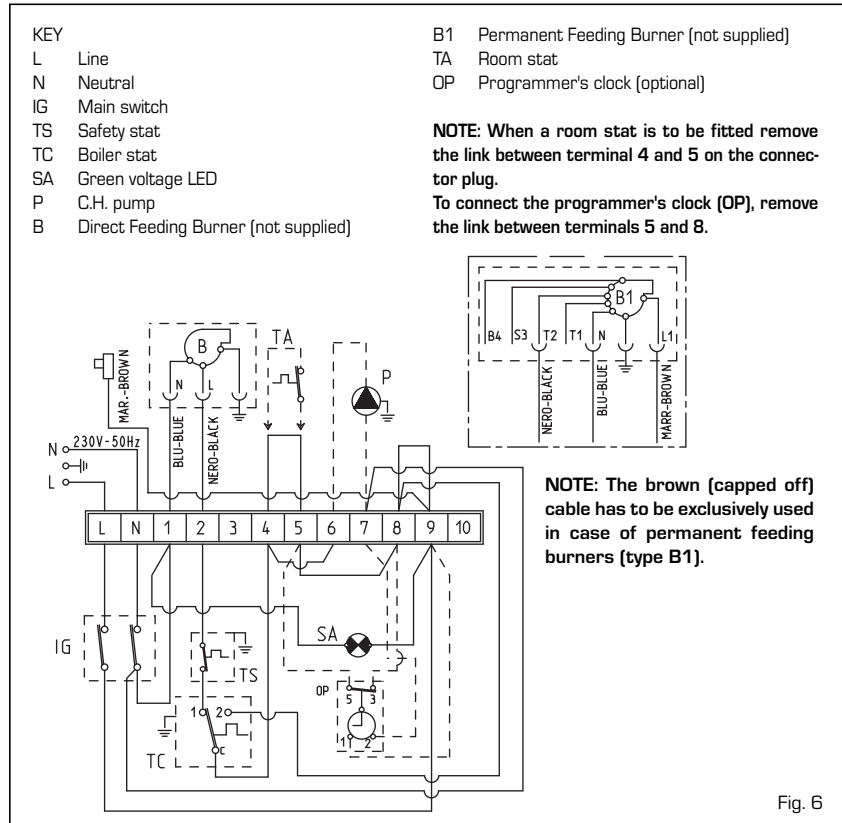
proceed as follows (fig. 5):

- fit the lower front (1) and back (2) brackets to the heads with the four TE screws supplied;
- insert the upper bracket (5) fixing it to the front head with the two TE screws.
- insulate the cast iron body with glass wool, fixing it with the two springs supplied;
- assemble the panel (11) making sure that the TE screws are already fitted on the combustion chamber door.
- fit the left side (3) and the right side (4) by inserting them in the tangs on the brackets (1-2) depending on the model.
- fix the sides to the upper brackets (5 - 1) with the four self-tapping screws supplied;
- fit the two back panels (6) and (7) of the sides with the ten self-tapping screws supplied;
- fit the control panel (9) inserting the two lower tangs of the panel on the drains on the sides, and fix it with the four self-tapping screws supplied. Before carrying out this operation unwind the capillaries of the two thermostats and the thermometer and place the respective feelers in the sheath (10), fixing all with a capillary pin;
- fit the front panel (8) fixing it to the sides with pin clutches;
- complete the assembly by fixing the lid (12) to the sides with pin clutches.

NOTE: Remove the "Testing Certificate" from inside the combustion chamber and keep together with the instructions manual.

2.6 ELECTRICAL CONNECTION

The boiler is fitted with an electricity cable, and requires a 1ph - 230V - 50Hz power supply through the main switch protected



by fuses.

The room thermostat (required for enhanced room temperature control) should be installed as shown in fig. 6. Connect the burner with the cable supplied.

NOTE:

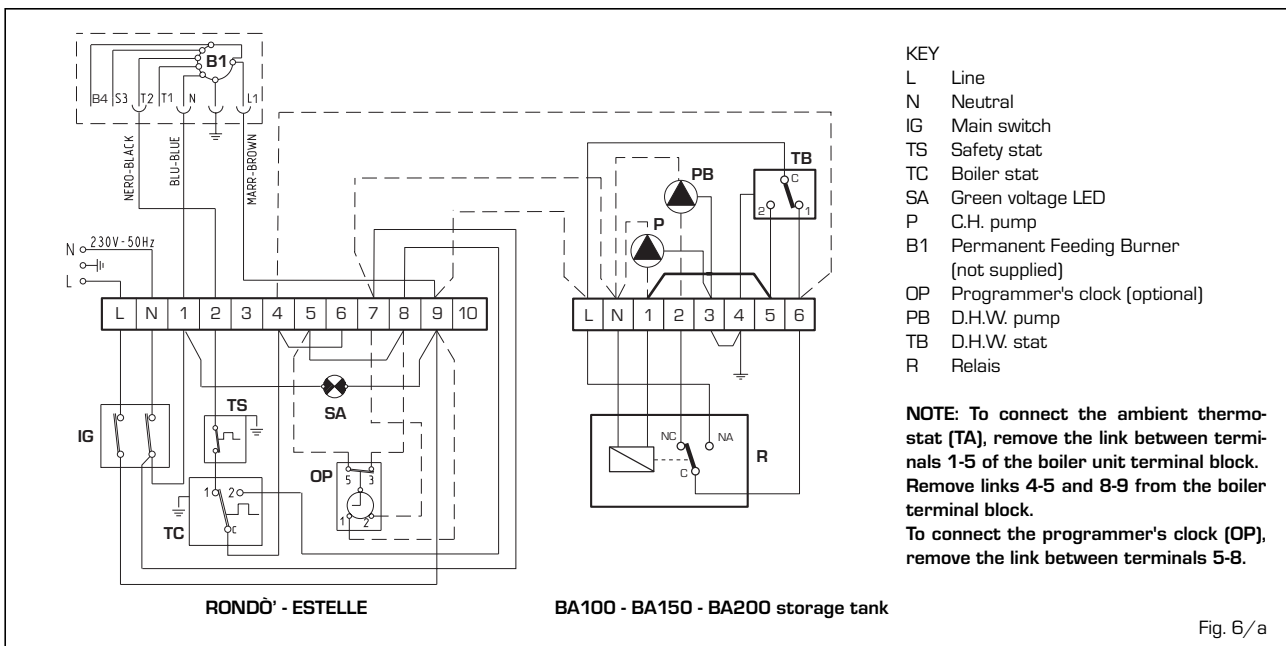
Device must be connected to an efficient earthing system.

SIME declines all responsibility for injury caused to persons due to failure to earth the boiler. Always turn off the power supply before doing any work on the electrical panel.

2.6.1 Electrical connection to the BA boiler unit

To connect the boiler to the boiler unit proceed with the following operations:

- remove the casing lid of the boiler and the back protection of the control panel in order to have access to the terminal board of the boiler;
- remove the protection of the boiler unit to have access to the terminal board of the boiler unit (fig. 7);
- connect the cables as shown in the diagram (fig. 6/a).



3 USE AND MAINTENANCE

3.1 COMMISSIONING THE BOILER

When commissioning the boiler always make sure that:

- the system has been filled with water and adequately vented;
- the flow and return valves are fully open;
- the flue and chimney are free from obstructions;
- the electrical connections to the mains and the earthing are correct;
- no flammable liquids or materials are near the boiler;
- check that the circulating pump is not locked.

3.2 LIGHTING AND OPERATION

3.2.1 Lighting the boiler (fig. 7)

- To light the boiler proceed as follows:
- check that the "Testing Certificate" has been removed from inside the combustion chamber;
 - switch on the main switch (1) and verify that the green LED (3) turns on to confirm the presence of voltage. The burner will start;
 - turn the boiler stat knob (5) to a temperature no lower than 60°C. The set temperature value can be checked on the thermometer (4).
 - set the temperature of the hot-water service by pressing the thermostat of the boiler unit (6). The set temperature value can be checked on the thermometer (7).

3.2.2 Safety stat (fig. 7)

The manually reset safety stat (2) trips to switch-off the burners immediately when the boiler temperature exceeds 100°C. To restart the boiler, unscrew the black cover and press the button underneath. **If the problem occurs frequently, call an authorised technical assistance centre for the necessary checks to be carried out.**

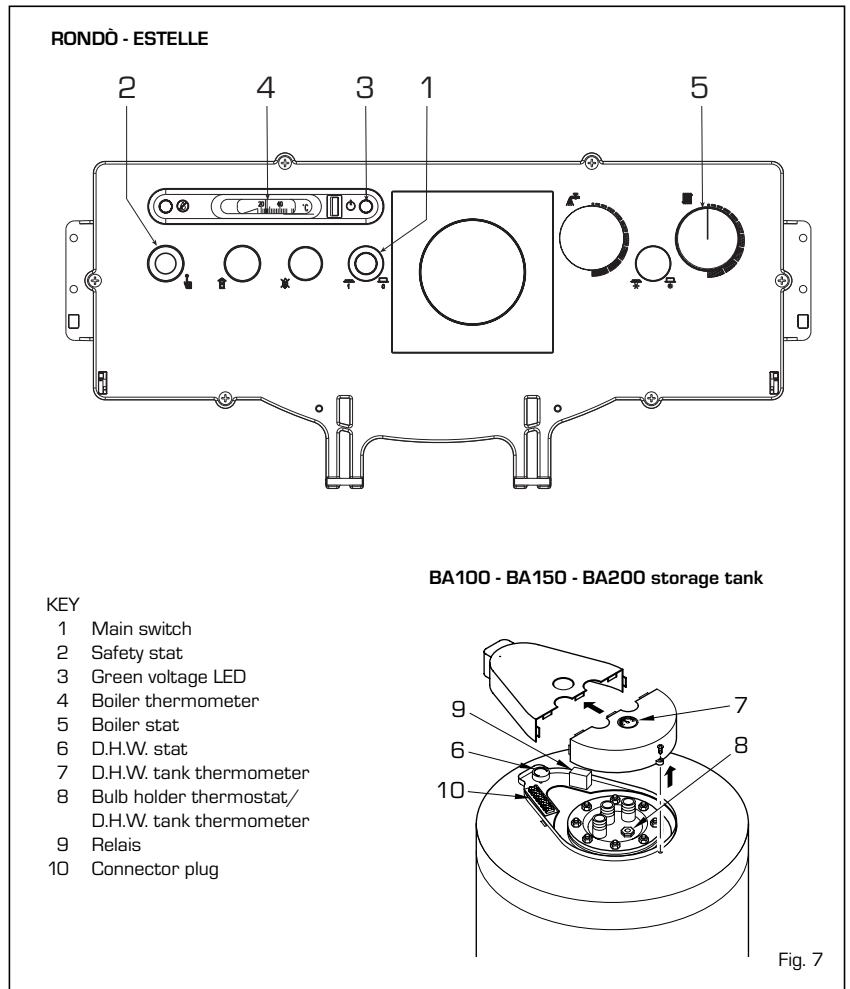
3.2.3 System filling

Periodically check the pressure values of the hydrometer (13 fig. 2/a) mounted onto the system, when the system is cold, should range between 1 and 1.2 bar. If the pressure is less than 1 bar, reset the system.

3.2.4 Turn off boiler (fig. 7)

To temporarily turn off the boiler turn off the electricity supply by pressing the main switch (1). The following operations must be carried out if the plant will not be in use for a lengthy period of time:

- position the main switch of the plant on off;
- turn the fuel and water taps of the cen-



tral heating plant off;

- empty the central heating plant if there is danger of frost:

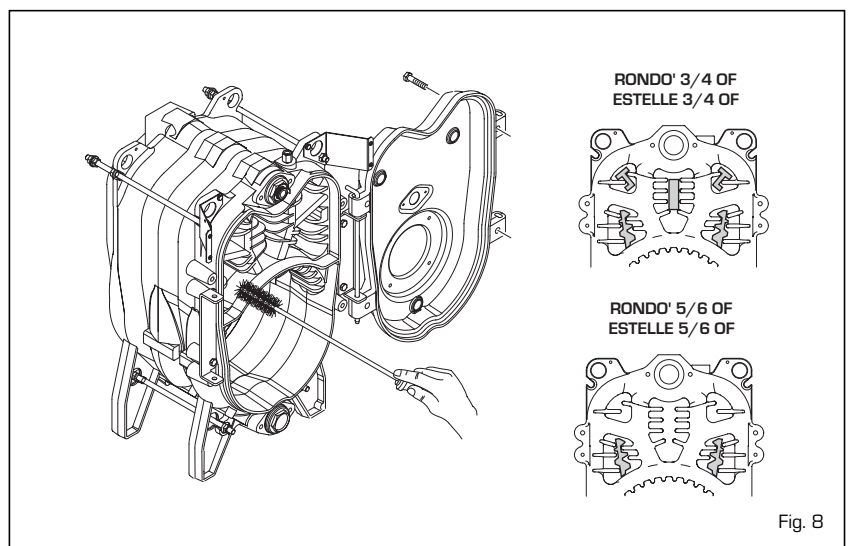
electrical supply before servicing or maintenance is carried out.

3.3 REGULAR CLEANING

Maintenance of the boiler should be carried out annually by an authorised service engineer. Disconnect the boiler from the

3.3.1 Smoke side boiler (fig. 8)

To carry out cleaning of the smoke passages remove the screws that fix the door to the body of the boiler and with the special cleaning brush clean the internal surfaces



and the smoke evacuation tube well, removing any deposits.

Once the maintenance is completed, the baffles have to be fitted onto the original positions (ref. "RONDO/ESTELLE 3-4-5-6 OF" models). In the "ESTELLE" versions the maintenance operations can be carried out without removing the burner.

3.3.2 Tank unit protection anode

The tank unit comes with a protection magnesium anode (fig. 9). This non-rust anode in normal operating conditions has life span of 5 years. It is, however, advisable to check the erosion annually and replace it if worn. To disassemble the tank unit flange (1), remove the cover (5) and unscrew the two nuts that fix the upper cover (4). Then lift the upper cover (4) which is simply inserted with pressure.

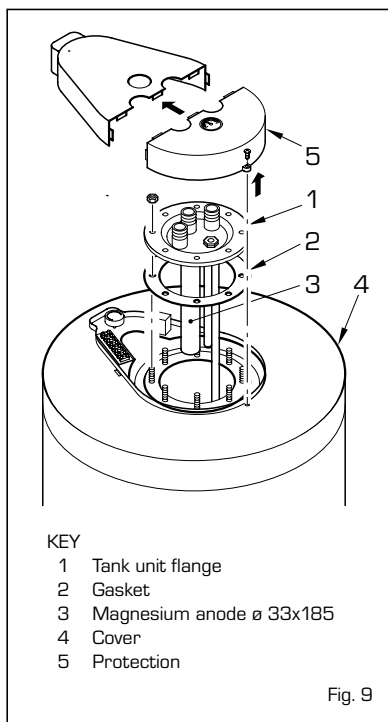


Fig. 9

3.3.3 Disassembly of the casing

To disassemble the casing of the boiler, proceed as follows (fig. 10):

- remove the cover (12) fixed with pin clutches;
- remove the panel (8) which are fixed to the sides by pin clutches;
- remove the control panel (9) whose sides are fixed by four self-tapping screws;
- remove the back panels (6) and (7) which are fixed to the sides by ten self-tapping screws;
- disassemble the left side (3) unscrewing the screws fixing it to the upper bracket (5), and remove the screws that fix it to the lower bracket (1);
- disassemble the right side (4) following the same operations.

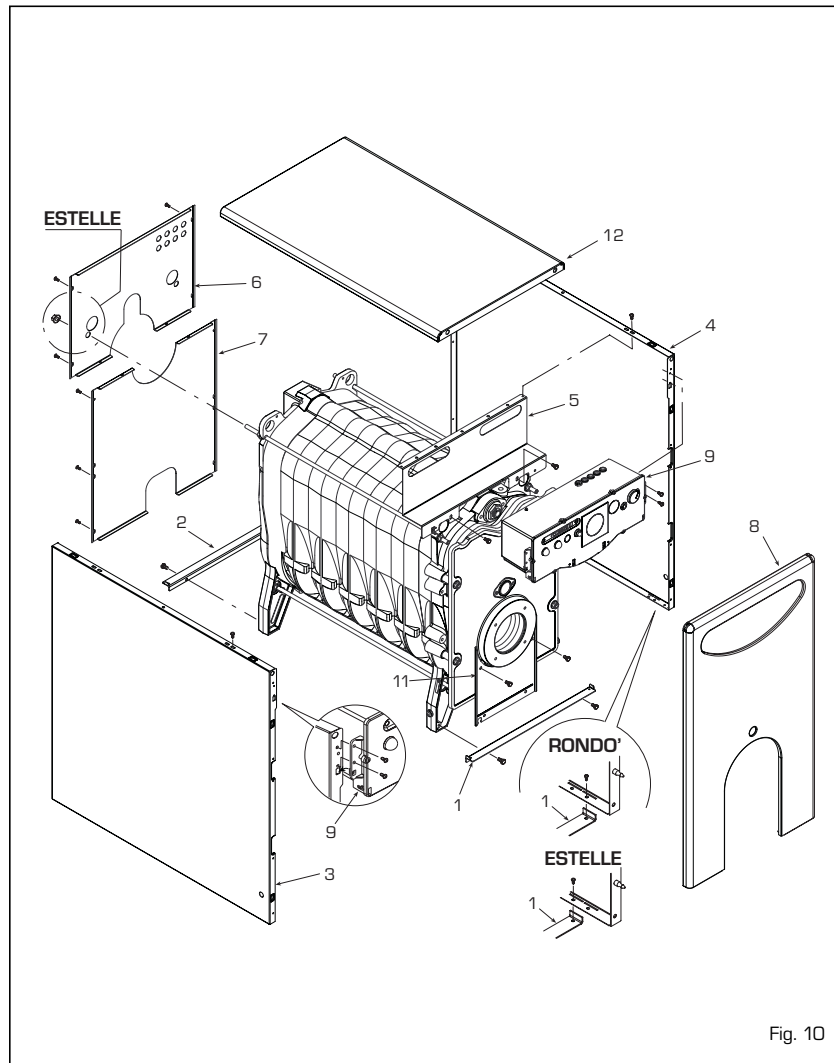


Fig. 10

3.3.4 Fault finding

Hereafter we outline a number of potential problems that may occur on the appliance and the relevant list of actions required. A working fault, in most cases, provokes the "lock out" signal onto the control panel of the control box.

When this light turns on, the burner can operate again only after the reset button has been pressed; if this has been done and a regular ignition occurs, it means the failure can be defined momentary and not dangerous. On the contrary, if the "lock out" stays, the cause of the fault, as well as the relevant action must be made according to the following chart:

The burner does not ignite

- Check the electric connections.
- Check the regular fuel flow, the cleanliness of the filters, of the nozzle and air vent from the tube.
- Check the regular spark ignition and the proper function of the burner.

The burner ignites regularly but the flame goes out immediately

- Check the flame detection, the air cali-

bration and the function of the appliance.

Difficulty in regulating the burner and/or lack of yield

- Check: the regular flow of fuel, the cleanliness of the boiler; the non obstruction of the smoke duct, the real input supplied by the burner and its cleanliness (dust).

The boiler gets dirty easily

- Check the burner regulator (smoke analysis), the fuel quantity, the flue obstruction and the cleanliness of the air duct of the burner (dust).

The boiler does not heat up

- Control the cleanliness of the shell, the matching, the adjustment, the burner performances, the pre-adjusted temperature, the correct function and position of the regulation stat.
- Make sure that the boiler is sufficiently powerful for the appliance.

Smell of unburnt products

- Control the cleanliness of the boiler shell and the flue, the airtightness of the boiler and of the flue ducts (door, combustion chamber, smoke ducts, flue, washers).

-
- Control the quality of the fuel.

Frequent intervention of the boiler shut-off valve

- Control the presence of air in the system, the function of the circulation pumps.
- Check the load pressure of the appliance, the efficiency of the expansion tanks and the valve calibration.

3.4 FROST PROTECTION

In the event of frost, ensure that the central heating plant is functional and effective frost protection interlocks are in place to protect against frost damage

3.5 USER WARNINGS

When faults occur and/or the equipment does not operate correctly, turn the boiler off and contact the authorised service engineer.