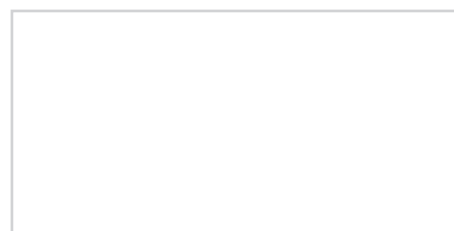


# SOLIDA EV

ISTRUZIONI PER L'INSTALLAZIONE E LA MANUTENZIONE



IT	RO	SL
PT	RUS	
ES	FR	
ENG	DE	



**Gentile Cliente,**  
metta in funzione la sua nuova caldaia entro 30gg dalla data di installazione. Potrà così beneficiare, oltre alla garanzia legale, anche della garanzia convenzionale Sime riportata in questo manuale.

## INDEX

<b>1</b>	<b>MAIN WARNINGS</b> .....	34
<b>2</b>	<b>SUPPLY</b> .....	34
<b>3</b>	<b>DIMENSIONAL TECHNICAL CHARACTERISTICS</b> .....	35
3.1	DESCRIPTION	
3.2	OVERALL DIMENSIONS	
3.3	TECHNICAL DATA	
3.4	PRESSURE DROP	
<b>4</b>	<b>INSTALLATION</b> .....	37
4.1	BOILER ROOM	
4.2	CONNECTION TO THE CHIMNEY	
4.3	CONNECTION TO THE SYSTEM	
4.4	ASSEMBLING THE ACCESSORIES	
4.5	ASSEMBLING THE CASING	
4.6	DRAUGHT REGULATOR	
4.7	SAFETY EXCHANGER	
4.8	HYDRAULIC CONNECTION DIAGRAMS	
<b>5</b>	<b>USE AND MAINTENANCE</b> .....	41
5.1	PRELIMINARY CHECKS BEFORE COMMISSIONING	
5.2	BOILER THERMOMETER	
5.3	AIR ADJUSTMENT	
5.4	CLEANING	
5.5	MAINTENANCE	
5.6	DISPOSAL OF THE EQUIPMENT	

# 1 MAIN WARNINGS

The instruction manual is an integral part of the product and must be delivered to the user. Carefully read the warnings contained in the manual on installation, use and maintenance of the appliance. Carefully store the manual for future reference.

Installation must be carried out by qualified personnel in compliance with the standards in force and following the instructions provided by the manufacturer. Improper installation can damage persons or objects, which the company is not responsible for.

Ensure that the product is intact. In case of doubt, do not use the appliance and contact the supplier. Packaging components must be disposed of in compliance with the standards in force.

Before any maintenance operation on the appliance, disconnect the power supply using the system switch.

In case of failure or malfunction, deactivate the appliance avoiding any repair or direct intervention. Only refer to qualified techni-

cal personnel. Any repair must be carried out by using original spare parts only.

Failure to comply with that above can compromise the integrity of the system and single components, being a potential danger for the user's safety, which the company is not responsible for.

**Maintenance of the appliance and chimney is required at least once a year.**

# 2 SUPPLY

As indicated in fig. 1, the boiler is supplied in two different packaging:

- Cast iron boiler body with flue gas chamber and adjusting dampers, ash collecting tray and draught thermostatic regulator. A bag containing: 2 handles for the ports, one screw with bakelite knob for manually adjusting the air gate dumper, a contact spring for the thermometer bulb and a M6 lever to be fastened to the air gate dumper. "Test report" and "De-

claration of conformity" to be stored together with the documents of the boiler.

- Carton packaging with casing, thermometer and document kit. The document kit includes: instruction manual, warranty certification, BOILER TECHNICAL DATA plate and label module to apply on the declaration of conformity.

**ATTENTION: The BOILER TECHNICAL DATA plate included in the document kit is**

**adhesive and must be applied on a side of the casing by the installer.**

**The serial number of the iron case body is indicated on the riveted plate on the rear upper side of the body.**

**To facilitate transport, the load and drain of the boiler are placed on the upper side and are equipped with lifting hooks.**

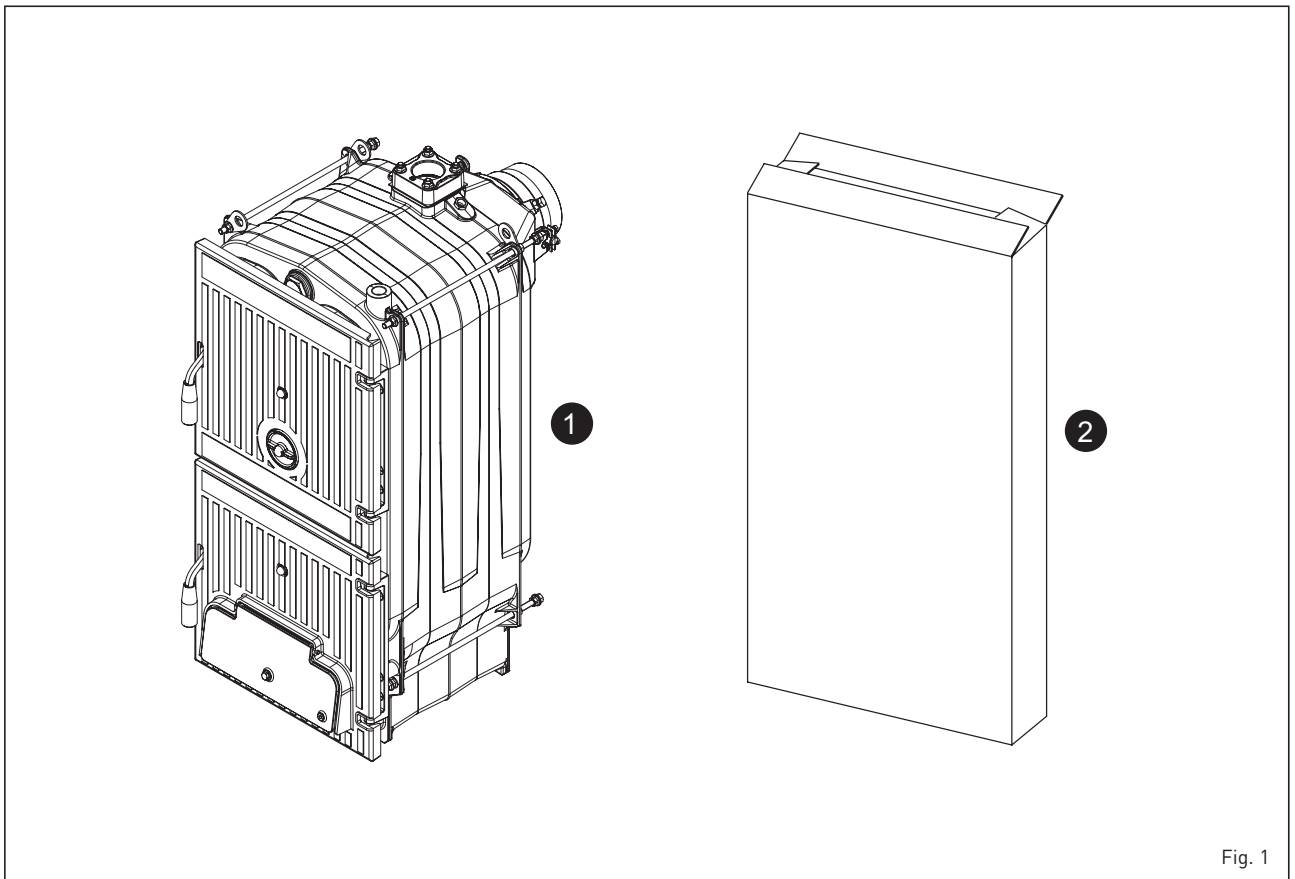


Fig. 1

### 3 TECHNICAL AND DIMENSIONAL CHARACTERISTICS

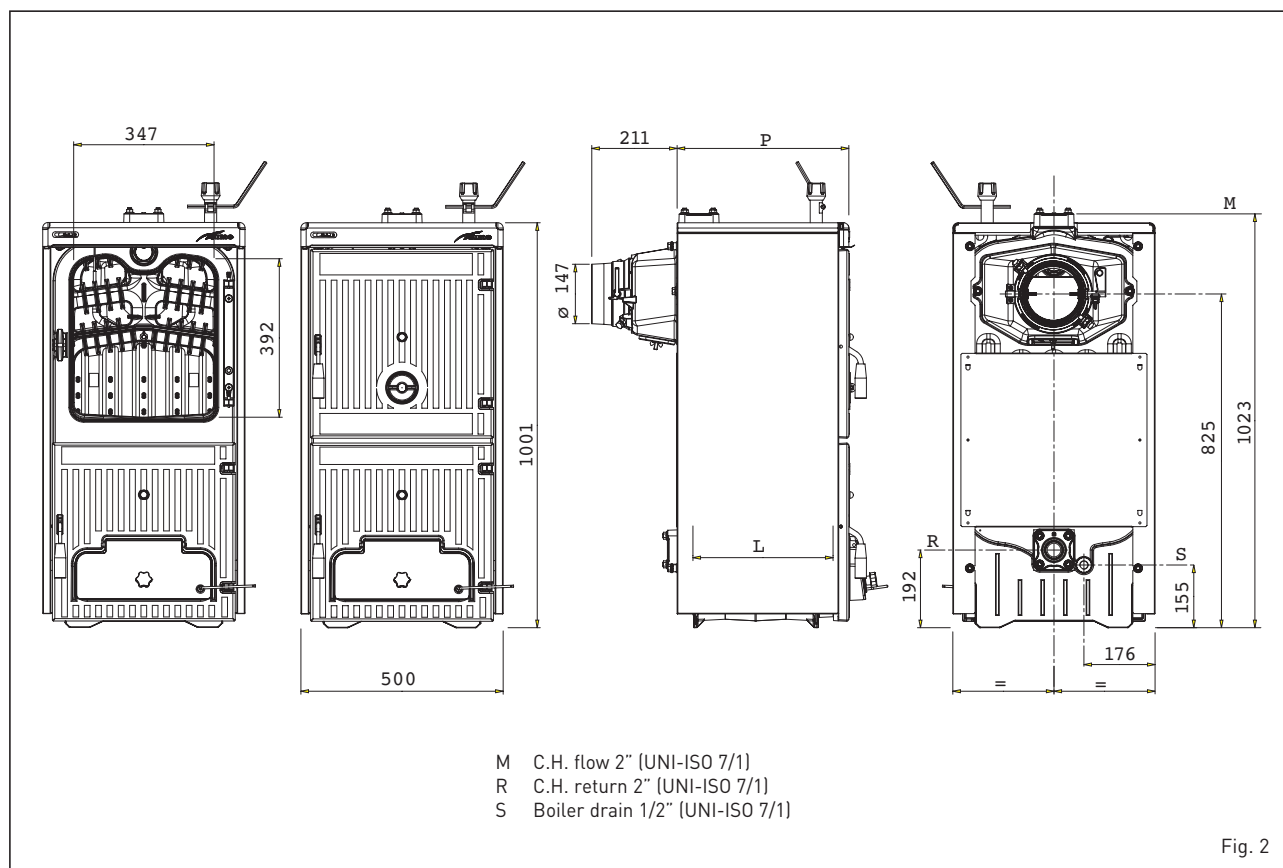
#### 3.1 DESCRIPTION

Wood is an alternative source of energy and it is also precious; therefore, use it in the

best way using suitable technologies for combustion. Iron cast and traditional combustion wood boilers **SOLIDA EV** are designed to en-

sure maximum thermal yield optimising draught. The boilers are in compliance with PED Directive 2014/68/UE and Standard EN 303-5/2012.

#### 3.2 OVERALL DIMENSIONS (fig. 2)



#### 3.3 TECHNICAL DATA

SOLIDA EV		3	4	5	6	7
Coal-fired thermal output	kW	23.0	34.0	45.0	56.0	67.0
Maximum power at wood	kW	20.0	30.0	40.0	49.0	58.0
Wood load thermal output	kW	14.0	20.5	27.5	34.0	40.0
Performance class EN 303-5/2012		1	1	1	1	1
Duration of a coal-fired	h	≥ 4	≥ 4	≥ 4	≥ 4	≥ 4
Duration of a wood load	h	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2
Load volume	dm <sup>3</sup>	42,7	66,4	90,2	113,9	137,7
Minimum chimney depression	mbar	0.08	0.10	0.12	0.13	0.15
<b>Dimensions</b>						
P (depth)	mm	425	575	725	875	1025
L (combustion chamber depth)	mm	260	410	560	710	860
Number of elements	n°	3	4	5	6	7
Max. operating temperature	°C	95	95	95	95	95
Min. temperature of water returned to the plant	°C	50	50	50	50	50
Max working pressure	bar	4	4	4	4	4
Test pressure	bar	6	6	6	6	6
Boiler capacity	l	30	39	48	57	66
Weight	kg	226	288	350	412	474

3.3.1 Technical data with kit that can be switched from class 1 to class 3 (to be requested separately)

SOLIDA EV		3	4	5	6	7
Kit that can be switched from class 1 to class 3		8075990	8075991	8075992	8075993	8075994
Heat capacity with wood	kW	11,0	17,5	24,0	29,5	35,0
Wood load thermal output	kW	8,4	13,7	19,0	23,5	28,0
Performance class EN 303-5/2012		3	3	3	3	3
Duration of a wood load	h	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2
Load volume	dm <sup>3</sup>	37,5	58,3	79,2	100,0	120,9
Minimum chimney depression	mbar	0,20	0,20	0,20	0,20	0,20

3.4 HEAD LOSSES (fig. 3)

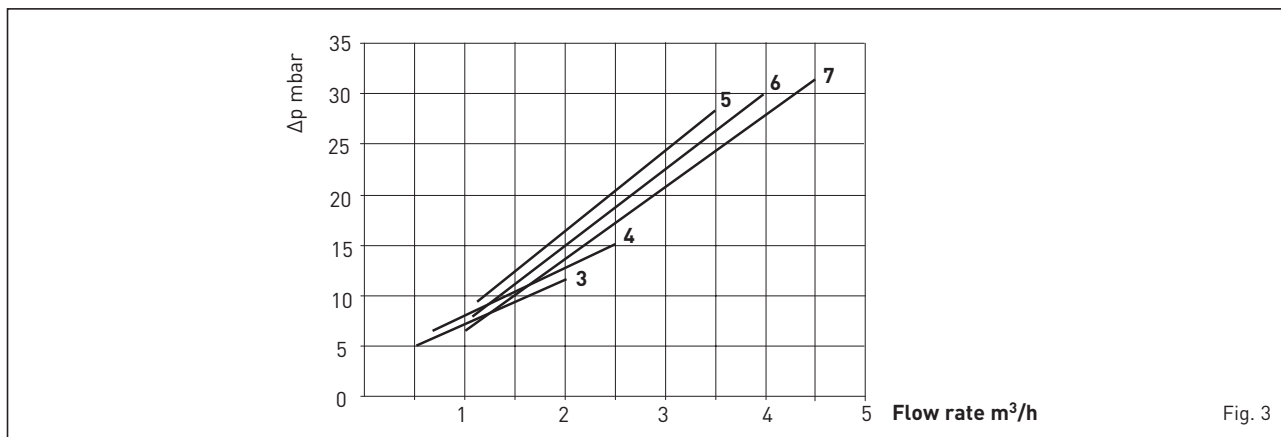


Fig. 3

## 4 INSTALLATION

### 4.1 BOILER ROOM

Check that the room has the requirements and features in accordance to the rules in force. Furthermore, the room should be aired, in order to have a regular combustion. Therefore it is necessary to practice some openings in the walls of the room, which correspond to the following requirements:

- They should have a free section of at least 6 cm<sup>2</sup> for each 1,163 kW (1000 kcal/h). The minimum opening section shouldn't be smaller than 100 cm<sup>2</sup>. The section can also be calculated, using the following ratio:

$$S = \frac{Q}{100}$$

where "S" is expressed in cm<sup>2</sup>.

"Q" is expressed in kcal/h

- The opening should be situated on the lower part of an outer wall, preferably on the opposite of the one for the combustion gas discharge.

#### 4.1.1 Positioning in the power station (fig. 4)

The boiler must be installed on a non-combustion base.

Once the boiler has been installed, it must be horizontal and stable, in order to reduce any vibrations and noise.

Always leave free space behind the boiler, so as to allow opening and maintenance on the fan.

**CAUTION: The minimum distances indicated in the figure are bounding and only refer to models with power exceeding 35 kW.**

### 4.2 CONNECTION TO THE FLUE

A flue should correspond to the following requirements:

- It should be of waterproof material and

resistant to temperature of smokes and related condensations.

- It should be of a sufficient mechanical resistance and a weak thermal conductivity.
- It should be perfectly hermetic in order to avoid cooling of the flue.
- It should have the most possible vertical process and the terminal part should have a static aspirator, which assures an efficient and constant discharge of the combustion product.
- In order to avoid the wind creating a very high pressure around the chimney, so that it prevails on the ascensional force of the combustion gas, it is necessary that the discharge orifice hangs over at least 0,4 meters of whatever structure adjacent the chimney itself (including the roof ridge) of at least 8 meters.
- The flue shouldn't have a diameter inferior to the boiler connection; for flues with square or rectangular sections, the internal section should be higher than 10% compared to the boiler connection one.
- The net section of the flue can be obtained from the following ratio:

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

S section resulting in cm<sup>2</sup>

K reduction coefficient:

- 0,045 for wood
- 0,030 for carbon

P boiler capacity in kcal/h

H height of the chimney in meters measured from the flame axis at the exhaust of the chimney in the atmosphere. For the dimensioning of the flue you should consider the effective height of the chimney in meters, measured from the flame axis at the top, diminished with:

- 0,50 m for each direction changing of the connection tube between boiler and flue;
- 1,00 m for each horizontal development meter of the connection itself.

### 4.3 CONNECTION OF THE PLANT

The connections should be easily disconnected by means of pipelines with revolving joints. It is always advisable to assemble suitable interception shutters on the piping of the heating installation.

**CAUTION: It is obligatory to assemble safety valves on the system not included in supply.**

#### 4.3.1 Filling the system

**Before connecting the boiler, it is good practice to make water circulate inside the pipes to remove any foreign body that can compromise the proper operation of the apparatus.**

The filling operation must be carried out slowly to allow air bubbles to exit from the specific vents placed on the heating system.

In closed circuit heating systems, the cold loading pressure of the system and the pre-inflating pressure of the expansion tank must correspond, or at least not be lower than the height of the system static column (e.g., for a 5 m static column, the pre-load pressure of the tank and the load pressure of the system must correspond to the minimum value of 0.5 bars, at least).

#### 4.3.2 Features of the feed water

The heating circuit supply water must be treated in compliance with Standard UNI-COI 8065.

Remember that even small deposits of few millimetres thick cause a considerable over-heating of the boiler walls, resulting in serious consequences.

THE TREATMENT OF THE WATER USED FOR THE HEATING INSTALLATION IS ABSOLUTELY NECESSARY IN THE FOLLOWING CASES:

- Very vast plants (with high water con-

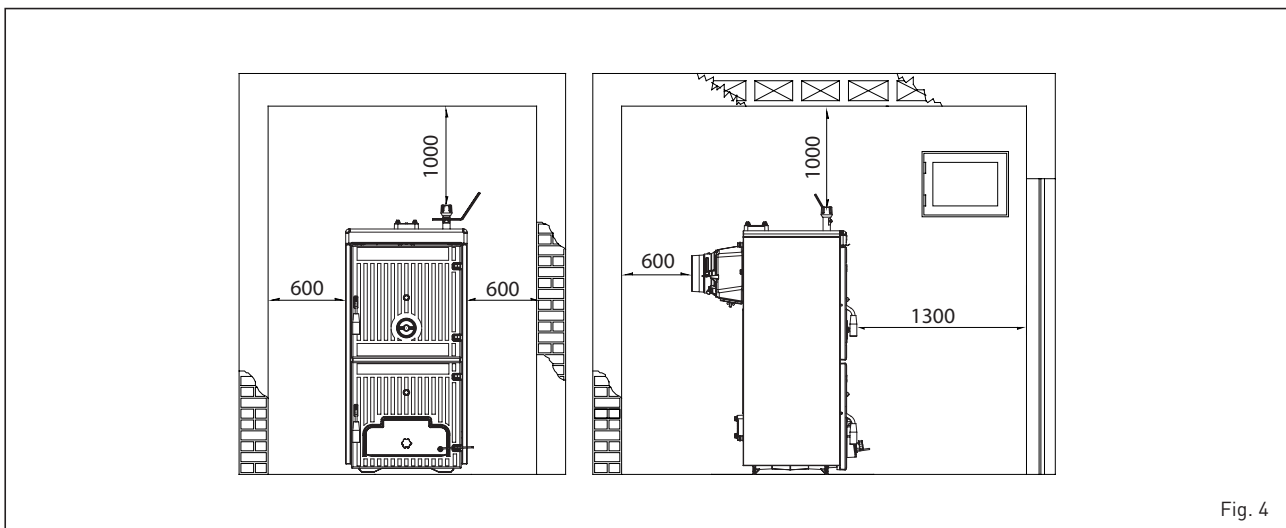


Fig. 4

tents).

- Frequent replenishment water inlets in the plant.
- If the partial or total emptying of the plant should be necessary.

#### 4.4 ASSEMBLING THE ACCESSORIES (fig. 5 - fig. 5/a)

The port closing handles and the screw with knob for the air gate damper regulation is supplied separately, as they can be damaged during transport.

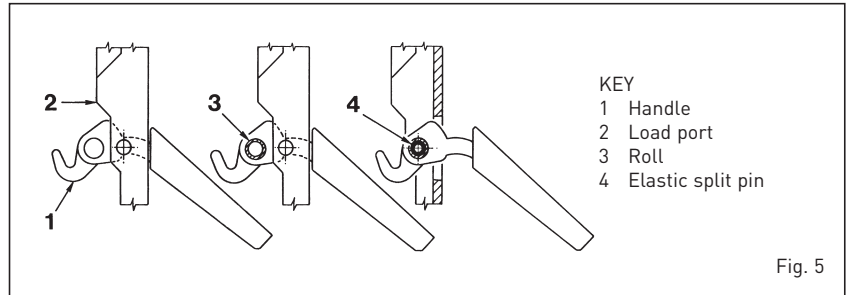
Both the handles and the screw with knob are contained in nylon bags inside the ash collecting tray.

To assemble the handles, proceed in the following way (fig. 5):

- Take a handle (1), insert it in the load port slot (2) and insert the roll (3) inside the handle hole; block the handle by inserting the elastic split pin (4).
- Carry out the same operation for the handle of the ash-pit port.

To assemble the screw with knob, proceed in the following way (fig. 5/a):

- Remove screw M8 x 60 that fastens the air gate damper to the ash-pit port and



- KEY
- 1 Handle
  - 2 Load port
  - 3 Roll
  - 4 Elastic split pin

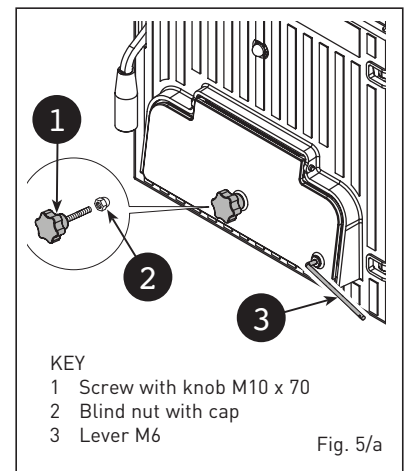
Fig. 5

tighten the screw with Bakelite knob (1) supplied. Place the blind nut with cap (2) at the end of screw M 10.

- Fasten lever M6 (3) to the air gate damper placing it in a horizontal direction on the right. The lever has an opening at its end, where the chainlet of the thermostatic regulator will be connected.

#### 4.5 ASSEMBLING THE CASING (fig. 6)

From the rear of the boiler, on two upper tie rods, three nuts are tightened: the second and the third nut serve to place correctly the lateral sides of the casing. On the lo-



- KEY
- 1 Screw with knob M10 x 70
  - 2 Blind nut with cap
  - 3 Lever M6

Fig. 5/a

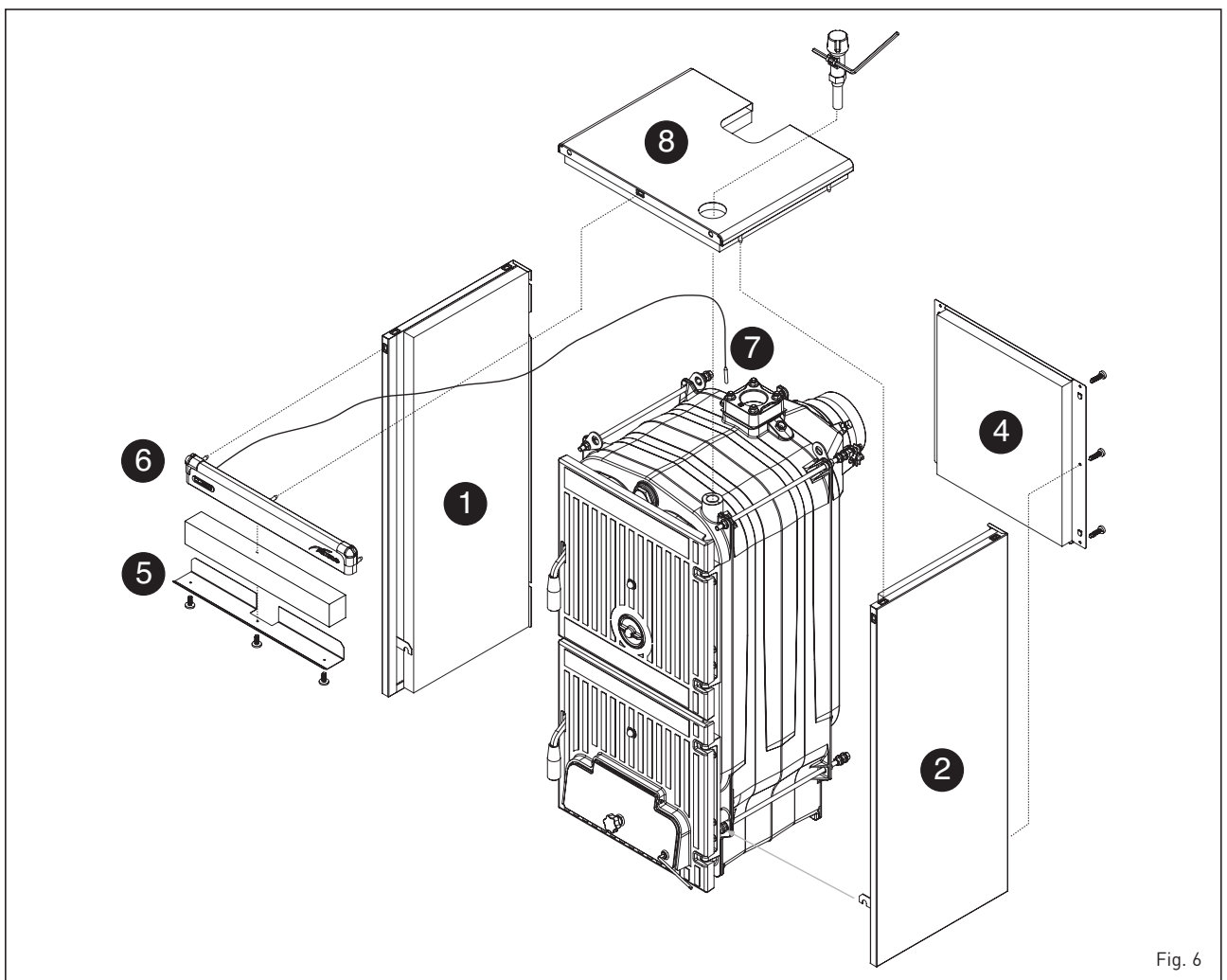


Fig. 6

wer tie rods, both in the front and rear side of the boiler, two nuts are tightened, one of which is used to block the side support brackets.

The assembly of the casing components must be carried out in the following way:

- Unscrew with some rotations the second or third nut of each tie rod.
- Connect the left side (1) on the lower and upper tie rod of the boiler and adjust the position of the nut and lock-nut of the upper tie-rod.
- Block the side by tightening the locknuts.
- In order to assembly the right side (2) proceed in the same way.
- Connect the rear panel (4) introducing the two splines in the vents obtained on each side and lock it with self-threading screws.
- The protection deflector (5) is fixed to the control panel (6) with three self-threading screws. Insert the mineral wool between the two components.
- Fasten the front panel (6) using the pressure pins.
- Unwind the capillary of the thermometer (7) and introduce it in the left sheath of the rear head introducing the contact spring which must be cut at about 45 mm. The thermometer cable must be placed above the insulation and must not contact directly the iron cast body.
- Fasten the cover (8) to the sides of the boiler using the pressure pins.
- Apply the BOILER TECHNICAL DATA adhesive plate on the right or left side of the covering, so as to be legible when the appliance is installed.

**NOTICE: Store the "Test report" and "Declaration of conformity" placed in the combustion chamber together with the documents of the boiler.**

#### 4.6 DRAUGHT REGULATOR WITH THERMOSTATIC OPERATION

By means of the draught regulator with thermostatic operation, a continuous variability of the air introduced in the boiler furnace can be obtained.

By means of a connecting chainlet, this regulator acts on the lower primary air intake port.

Once the set temperature has been reached, the regulator decreases the opening of the air intake port automatically, so to slow down the combustion and prevent over-heating.

In order to optimise the combustion on the upper load port, place a round adjusting port that distributes the secondary air countercurrent compared to the path of the combustion products.

This process further increases the yield and allows exploiting the combustion more effectively.

Two types of thermostatic regulators can be assembled on the boilers.

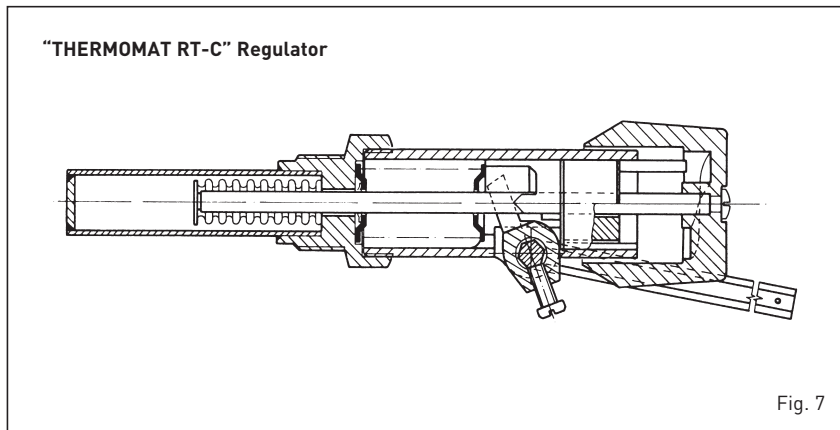


Fig. 7

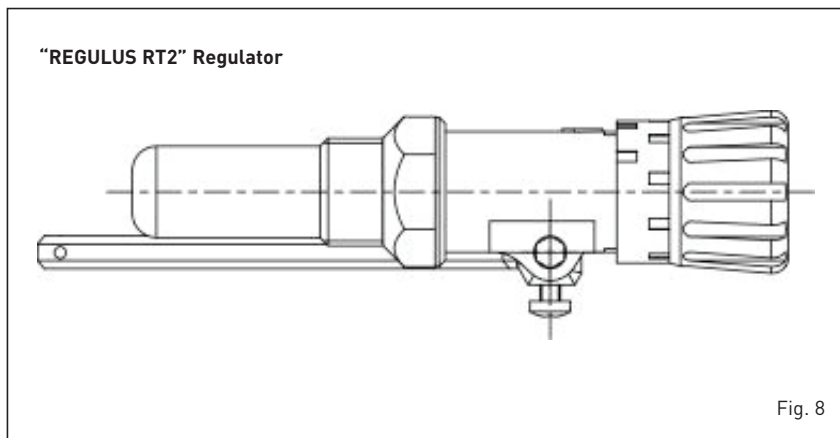


Fig. 8

##### 4.6.1 "THERMOMAT RT-C" Regulator (fig. 7)

The "Thermomat" regulator is equipped with a thermosetting resin knob of an adjustment field from 30 to 100 °C. Screw the regulator on the 3/4" opening of the anterior head and orientate the red index on the upper part.

The lever with the chainlet should be introduced in the regulator holder after having assembled the instrument holder board and after having removed the plastic lock. If the joint is taken out, which fixes the lever with the chainlet, take care in assembling it again in the same position.

After having placed the knob at 60°C, block the lever with the chainlet in a slightly inclined position downwards, so that the chainlet will be in axis with the air gate damper. For the adjustment of the "Thermomat", which essentially consists in the determination of the chainlet length, proceed in the following way:

- Place the knob at 60°C.
- Switch on the boiler with opened air gate damper.
- When the water temperature of 60° C is reached in the boiler, fix the chainlet in such a way on the lever of the air gate damper, in order to obtain an opening of about 1 mm.
- Now the regulator is calibrated and it is possible to choose the desired operating temperature by rotating the knob.

##### 4.6.2 "REGULUS RT2" Regulator (fig. 8)

The adjustment field is included between 30 and 90°C (fig. 8). Follow the same instructions of the "Thermomat" regulator for the assembly and the activation.

#### 4.7 SAFETY EXCHANGER

The safety exchanger is supplied upon request with a kit:

- code 8105200 for SOLIDA EV 3/4/5
- code 8105201 for SOLIDA EV 6/7.

The kit must be used on closed expansion tank systems with power lower than 35 kW. Its function is to cool the boiler in case of over-temperature, by using a thermal discharge valve connected to the exchanger inlet hydraulically.

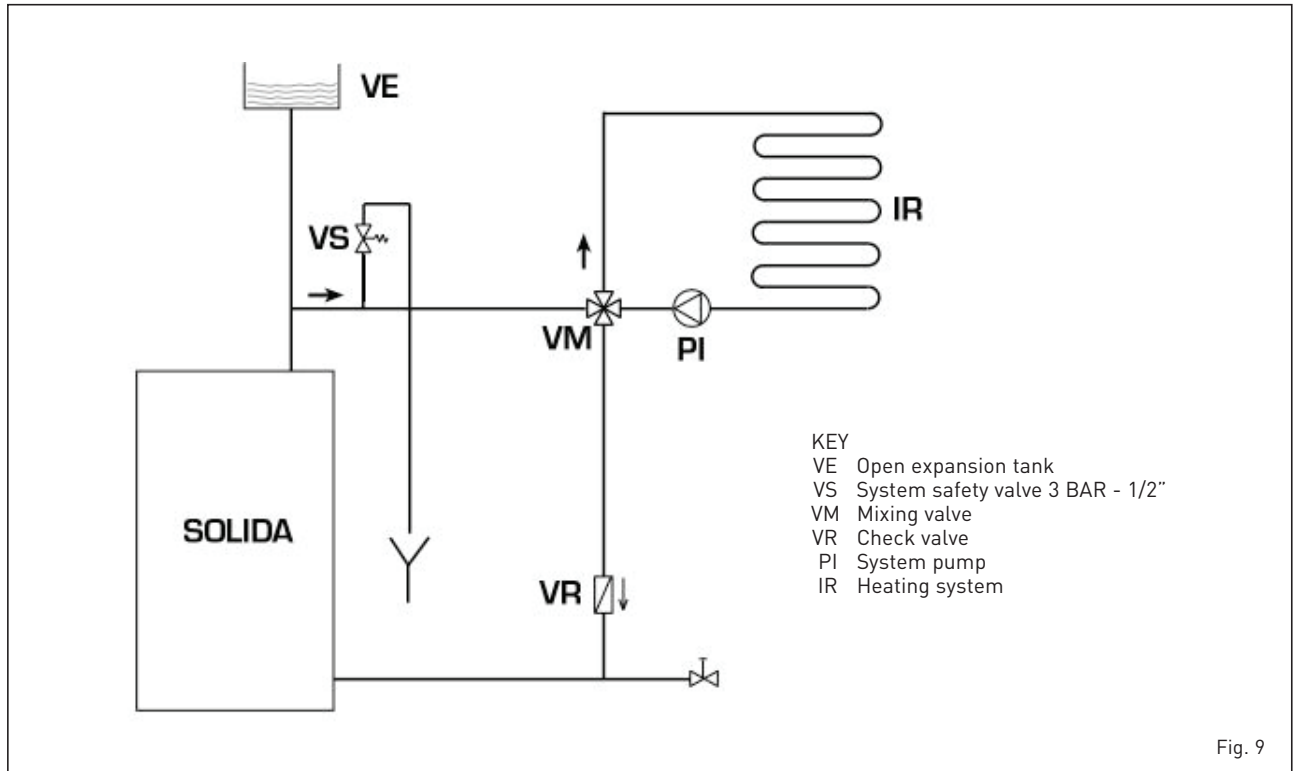
In correspondence to the exchanger outlet, place one drainpipe with funnel and a siphon that drive to a suitable discharge. The discharge must be visible for inspection.

**ATTENTION: Failure to comply with this precaution, a possible activation of the thermal discharge valve can damage persons, animals and objects, which the manufacturer is not responsible for. Before commissioning the boiler, ensure that the water flow of the thermal discharge valve is guaranteed.**

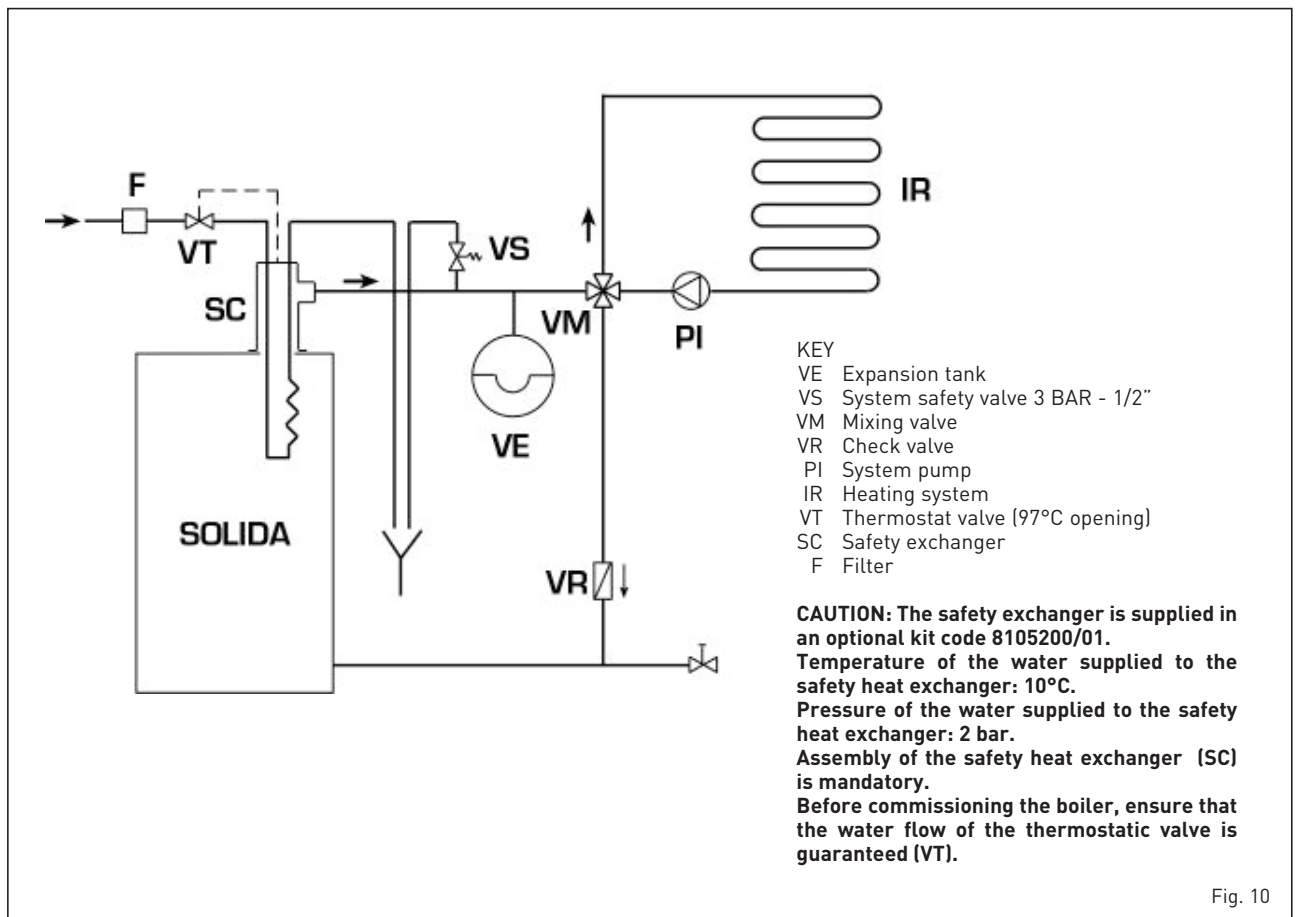


## 4.8 HYDRAULIC CONNECTION DIAGRAMS

### 4.8.1 Open expansion tank system (fig. 9)



### 4.8.2 Closed expansion tank system and safety exchanger with thermostatic valve (fig. 10)



## 5 USE AND MAINTENANCE

### 5.1 PRELIMINARY CHECKS BEFORE COMMISSIONING

Before commissioning the boiler, comply with the following instructions:

- The system connected to the boiler should be with open expansion tank system (fig. 9).
- The pipe connecting the boiler to the expansion tank must have a suitable diameter in compliance with the standards in force.
- The heating pump must always run during the boiler operation.
- The operation of the pump must never be interrupted by an environment thermostat.
- If the system is equipped with 3 or 4-way mixing valve, this must always be opened towards the system.
- Ensure that the draught regulator runs regularly and there are no obstructions that block the automatic operation of the air gate dumper.

### 5.2 BOILER THERMOMETER (fig. 11)

Indicates the temperature of the boiler wa-

ter (pos. 1).

### 5.3 AIR ADJUSTMENT (fig. 11)

The primary air is adjusted automatically by means of a thermostatic valve; on the other hand, the secondary air is adjusted by means of a round port placed on the upper side of the load port and must be adjusted by the user.

At the first start-up, the primary and secondary air must be adjusted, considering that the primary air determines the boiler power and, therefore, the amount of wood that is burnt and the secondary air completes the combustion.

The optimal regulation of the **SOLIDA EV** operation is reached when both the boiler and chimney will be "in temperature". Depending on the wood used and its humidity, rotate the round port (anti-clockwise to open and clockwise to close) so to take the flame to optimal conditions: orange-pink-white with a blue centre.

**CAUTION:**  
Secondary air regulator with high temperatures!  
Use gloves or suitable equipment to not

get burned.

### 5.4 CLEANING (fig. 12)

Cleaning operations must be carried out frequently, by cleaning, besides the flue channels, also the ash-pit port, removing the ash in the collecting tray. For cleaning the flue channels, use a specific scraper.

### 5.5 MAINTENANCE

Do not perform any maintenance work, dismantling or removal of parts without properly emptying the boiler first. The boiler must not be emptied when the water is hot.

**CAUTION: The safety valve on the system must be inspected by technically qualified personnel in accordance with the laws of the country of distribution and instructions for use of the safety valve.**

If the system is completely emptied and remains unused for some time, the safety valve must be inspected before it is used again.

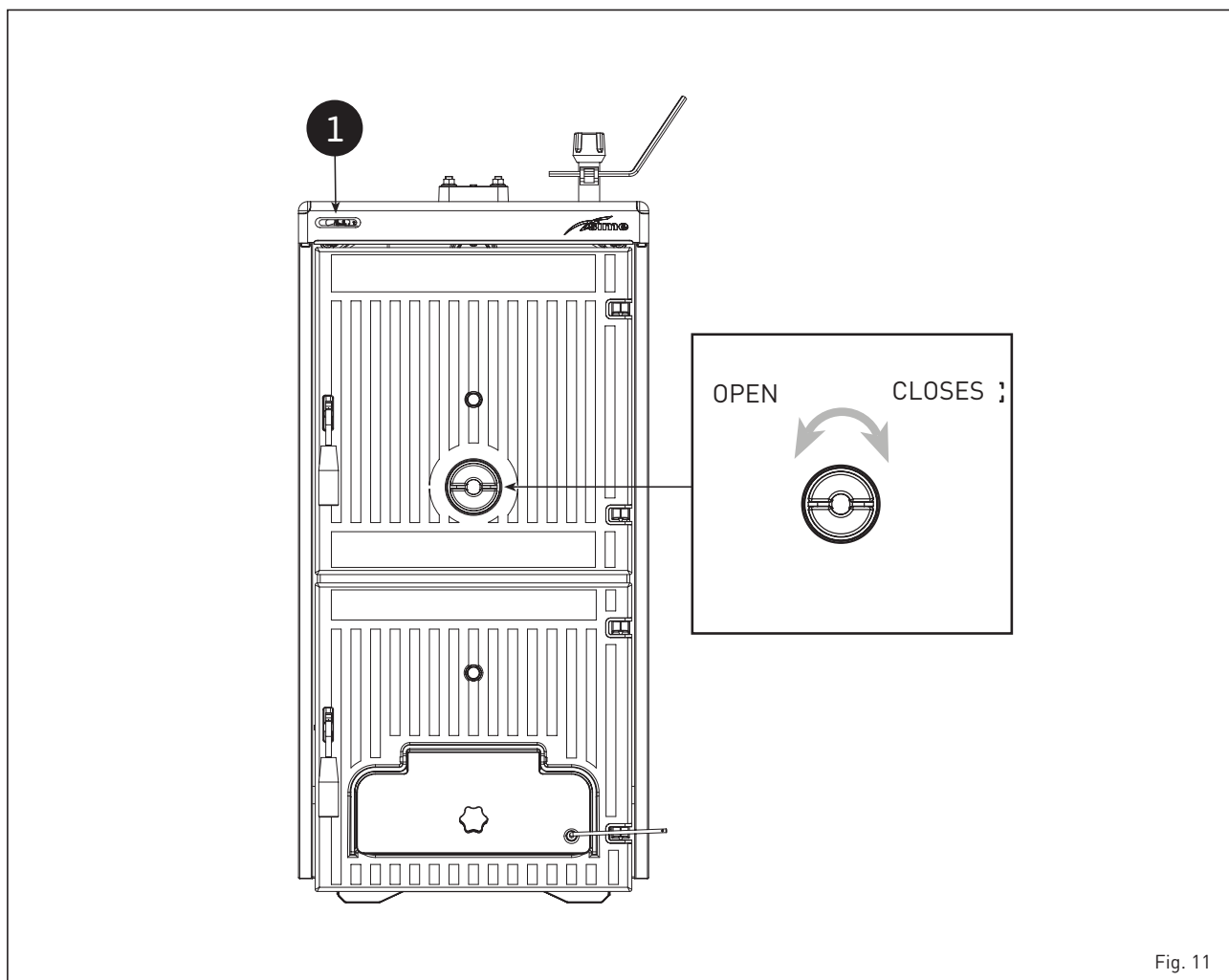


Fig. 11

If the safety valve should malfunction and cannot be re-calibrated, replace it with a new 1/2" valve calibrated to 3 BAR and conforming with Directive PED 2014/68/UE.

#### 5.6 DISPOSAL OF THE EQUIPMENT

Once it reaches the end of its operating life, the equipment MUST BE RECYCLED in line with current legislation.

IT MUST NOT be disposed of together with urban waste.

It can be handed over to recycling centres, if there are any, or to retailers that offer this service.

Recycling prevents potential damage to the environment and health. It allows to recover a number of recyclable materials, with considerable savings in terms of money and energy.

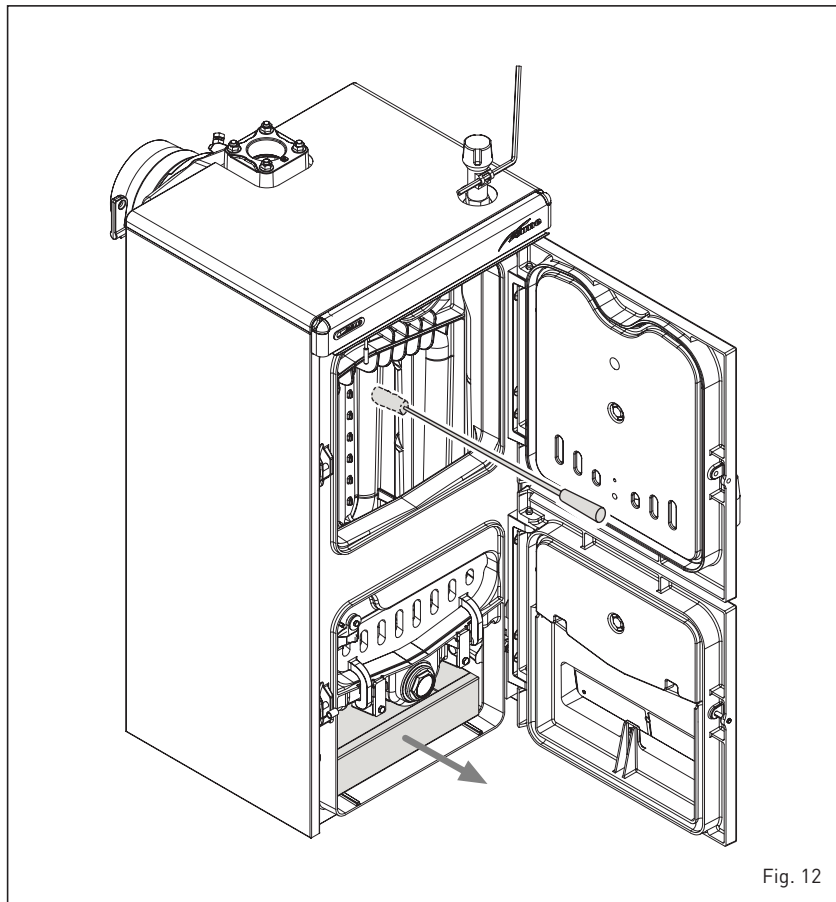


Fig. 12