

INSTALLER INSTRUCTIONS

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IMPORTANT

When carrying out commissioning of the boiler, you are highly recommended to perform the following checks:

- Make sure that there are no liquids or inflammable materials in the immediate vicinity of the boiler.
- Make sure that the electrical connections have been made correctly and that the earth wire is connected to a good earthing system.
- Check that the flue pipe for the outlet of the products of the combustion is unobstructed.
- Make sure that any shutoff valves are open.
- Make sure that the system is charged with water and is thoroughly vented.
- Check that the circulator is not blocked.

1 DESCRIPTION OF THE BOILER

1.1 INTRODUCTION

One of the features of the cast iron thermal group with the integrated gas-oil burner is its functional silence and it has been designed in accordance with the European directives CEE 92/42. The perfectly balanced combustion

and the high yield allows it to economise considerably the operating costs. The instructions relative to the following models are indicated in the present manual:

- "SOLO 20-30-40" for heating only
- "DUETTO 30" for heating and hot water production with instant tank

- "AQUA 30 - 40" for heating and hot water production with accumulative tank.

The instructions given in this manual are provided to ensure proper installation and perfect operation of the appliance and should be strictly followed.

1.2 DIMENSIONS

1.2.1 "SOLO - DUETTO" version

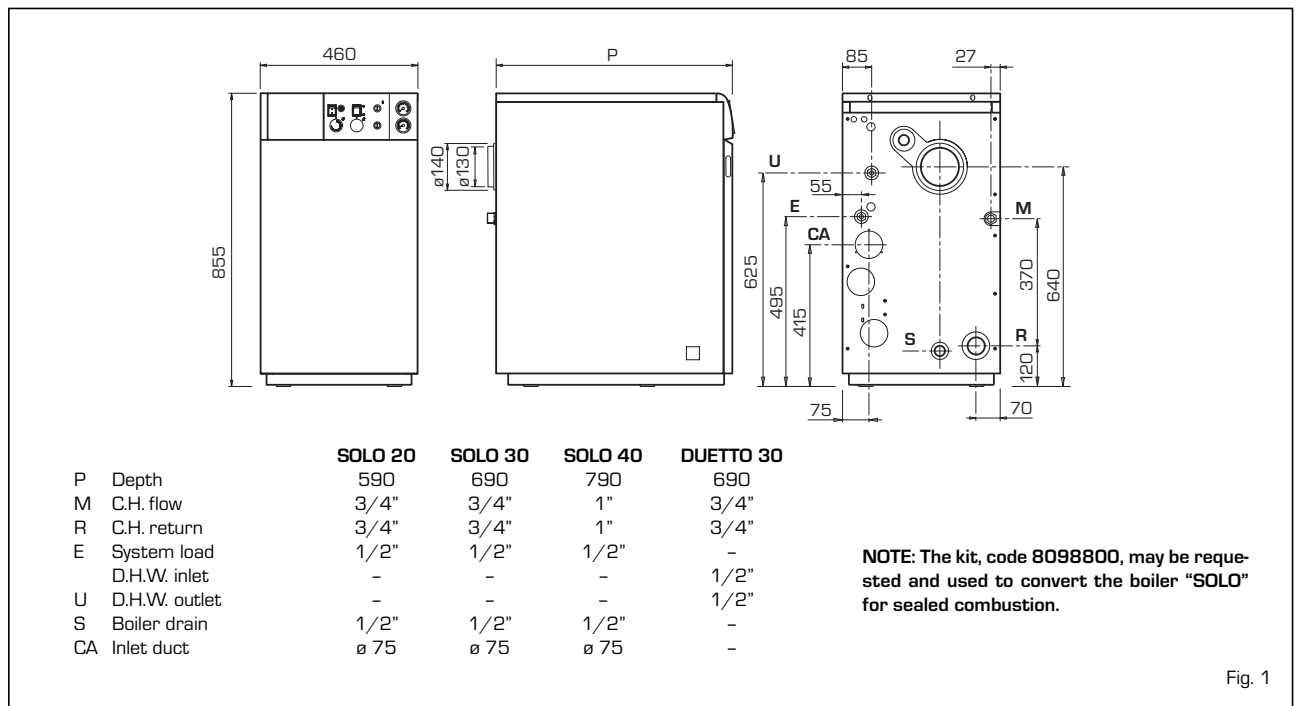


Fig. 1

1.2.2 "AQUA" version

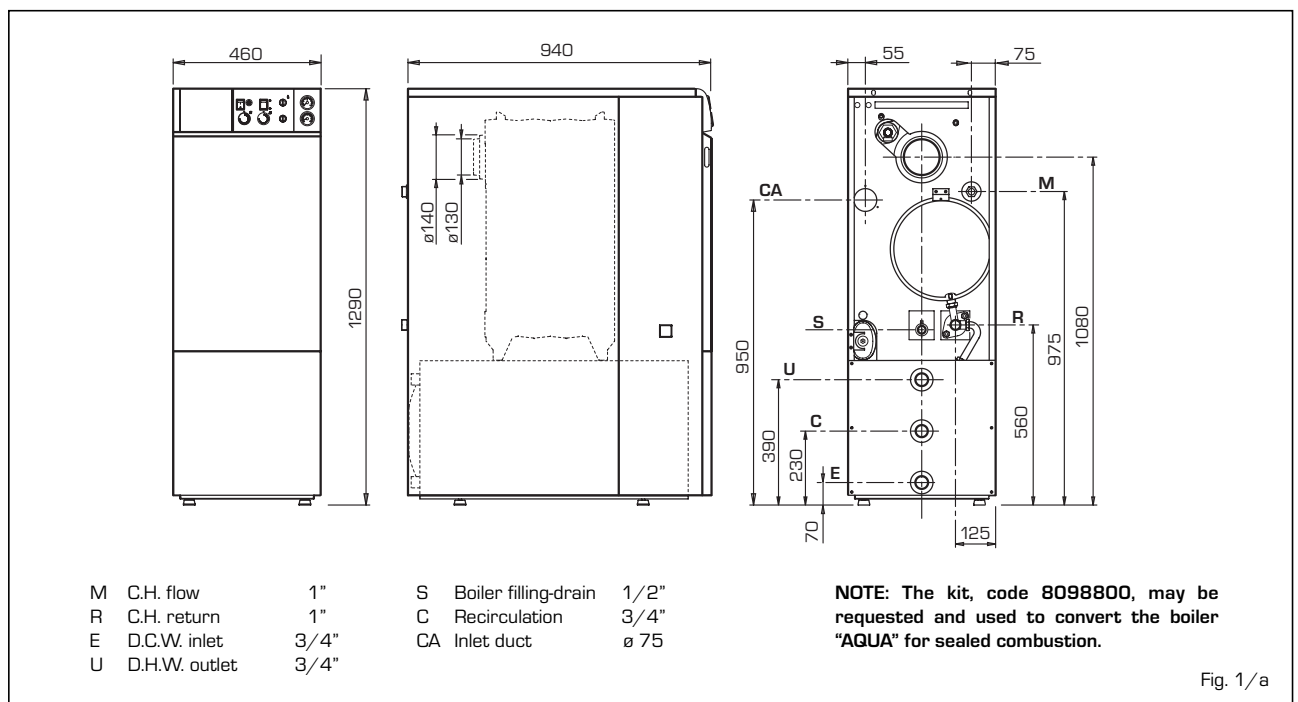


Fig. 1/a

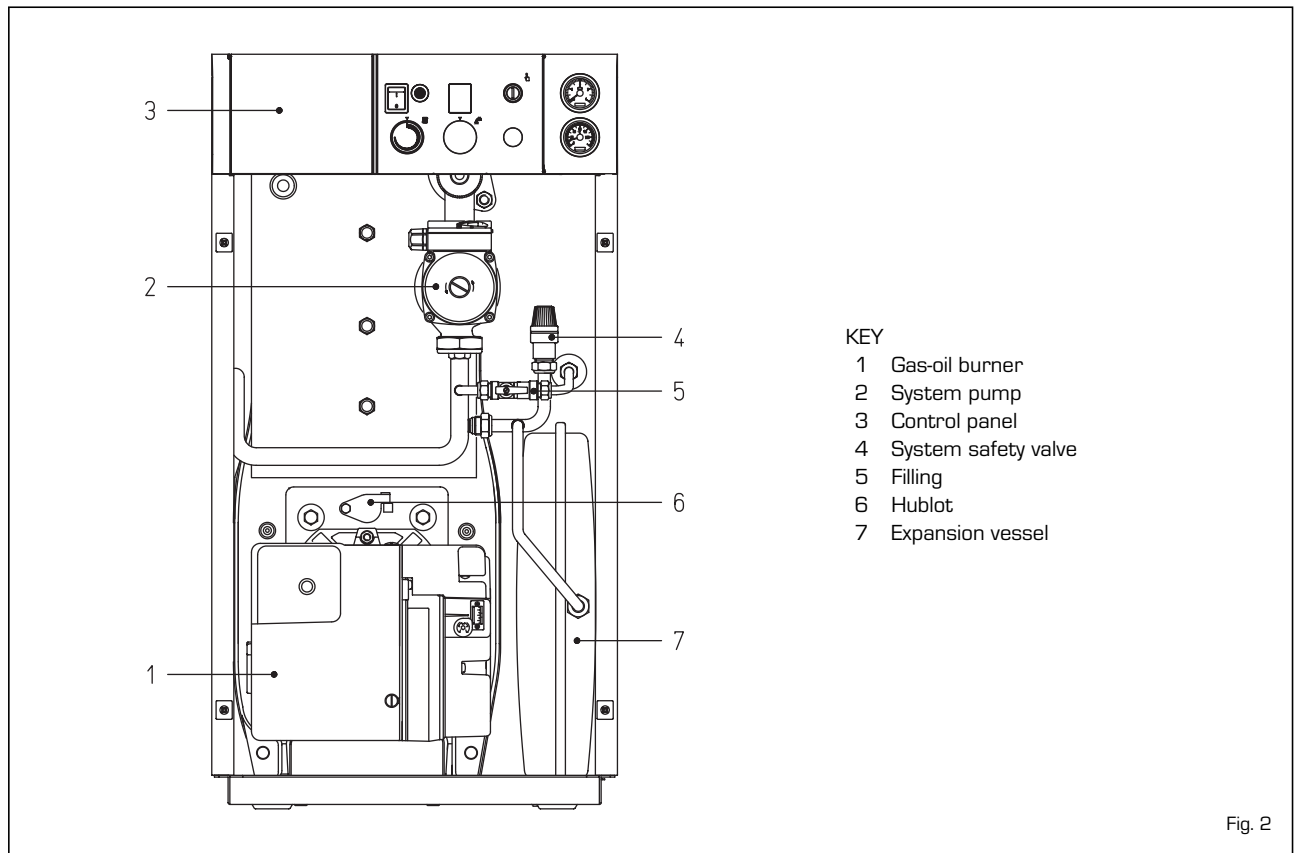
1.3 TECHNICAL FEATURES

		SOLO 20	SOLO 30	SOLO 40	DUETTO 30	AQUA 30	AQUA 40
Heat output *	kW	18.9	29.4 (26.1)	40.0 (35.2)	29.4 (28.1)	29.4 (26.1)	40.0 (35.2)
	kcal/h	16,300	25,300 (22,500)	34,400 (30,300)	25,300 (24,200)	25,300 (22,500)	34,400 (30,300)
Heat input *	kW	21.5	33.4 (29.7)	45.4 (40.0)	33.4 (31.9)	33.4 (29.7)	45.4 (40.0)
	kcal/h	18,500	28,700 (25,600)	39,000 (34,400)	28,700 (27,400)	28,700 (25,600)	39,000 (34,400)
Type		B23	B23	B23	B23	B23	B23
Elements	n°	3	4	5	4	4	5
Maximum water head	bar	4	4	4	4	4	4
Water content	l	18	22	26	30	32	36
Expansion vessel							
Water content/Preloading pressure	l/bar	7/1	10/1	10/1	10/1	10/1	12/1
Loss of head smoke	mbar	0.10	0.12	0.16	0.12	0.12	0.16
Loss of head water (Δt 10°C)	mbar	150	150	150	250	250	250
Combustion chamber pressure	mbar	- 0.02	- 0.01	- 0.01	- 0.01	- 0.01	- 0.01
Suggested chimney depression	mbar	0.12	0.13	0.17	0.13	0.13	0.17
Smoke temperature	°C	197	221	210	221	221	210
Smoke flow *	m ³ st/h	270	42.0 (37.4)	570 (50.2)	41.9 (40.0)	42.0 (37.4)	570 (50.2)
CO₂	%	12.5	12.5	12.5	12.5	12.5	12.5
Maximum temperature	°C	95	95	95	95	95	95
Power consumption	W	220	220	175	195	220	175
Adjustment range heating	°C	45÷85	45÷85	45÷85	45÷85	45÷85	45÷85
Adjustment range D.H.W.	°C	-	-	-	-	30÷60	30÷60
D.H.W. production							
Tank capacity	l	-	-	-	-	100	100
D.H.W. flow rate EN 625	l/min	-	-	-	12.2	20.9	20.9
Contin. D.H.W. flow rate Δt 30°C *	l/h	-	-	-	792	840 (750)	840
Recuper. time between 25°C and 55°C	min	-	-	-	-	12	12
D.H.W. expansion vessel	l	-	-	-	-	4	4
Minimum D.H.W. flow rate	l/min	-	-	-	2,5	-	-
D.H.W. tank maximum water head	bar	-	-	-	6	7	7
Gas-oil burner							
Burner nozzle *		0.50 60°W	0.75 60°B	0.85 60°B	0.65 60°W	0.75 60°B	0.85 60°B
			(0.65 60°W)	(0.75 60°W)		(0.65 60°W)	(0.75 60°W)
Pump pressure *	bar	12	12 (13)	13	13 (12)	12 (13)	13
Head regulator position *		-	1	3	2 (1.5)	1	3
Shutter regulator position *		2.5	5.9 (5.3)	8 (5.9)	6 (5.8)	5.9 (5.3)	8 (5.9)
Weight	kg	93	123	148	162	240	268

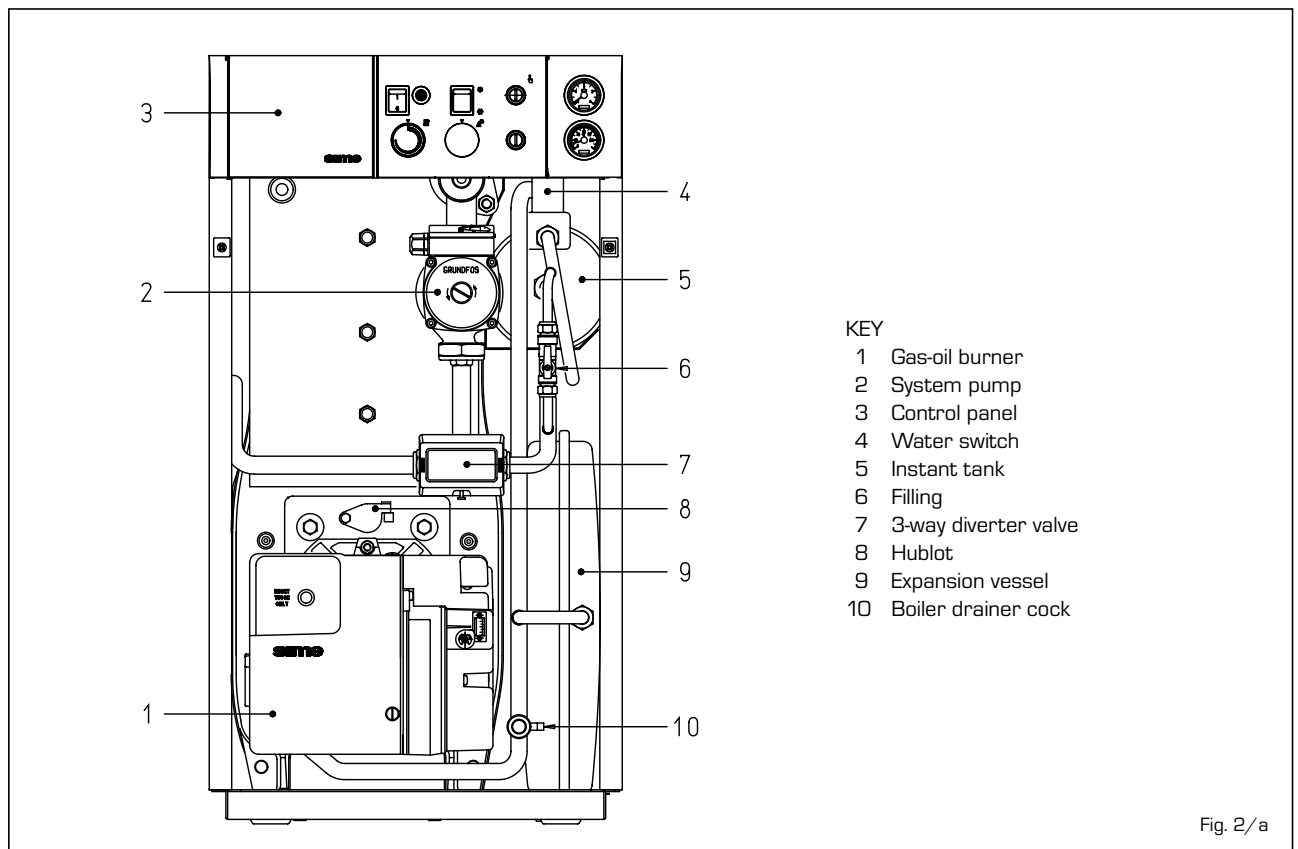
* The data shown between the brackets refer to the factory settings.

1.4 MAIN COMPONENTS

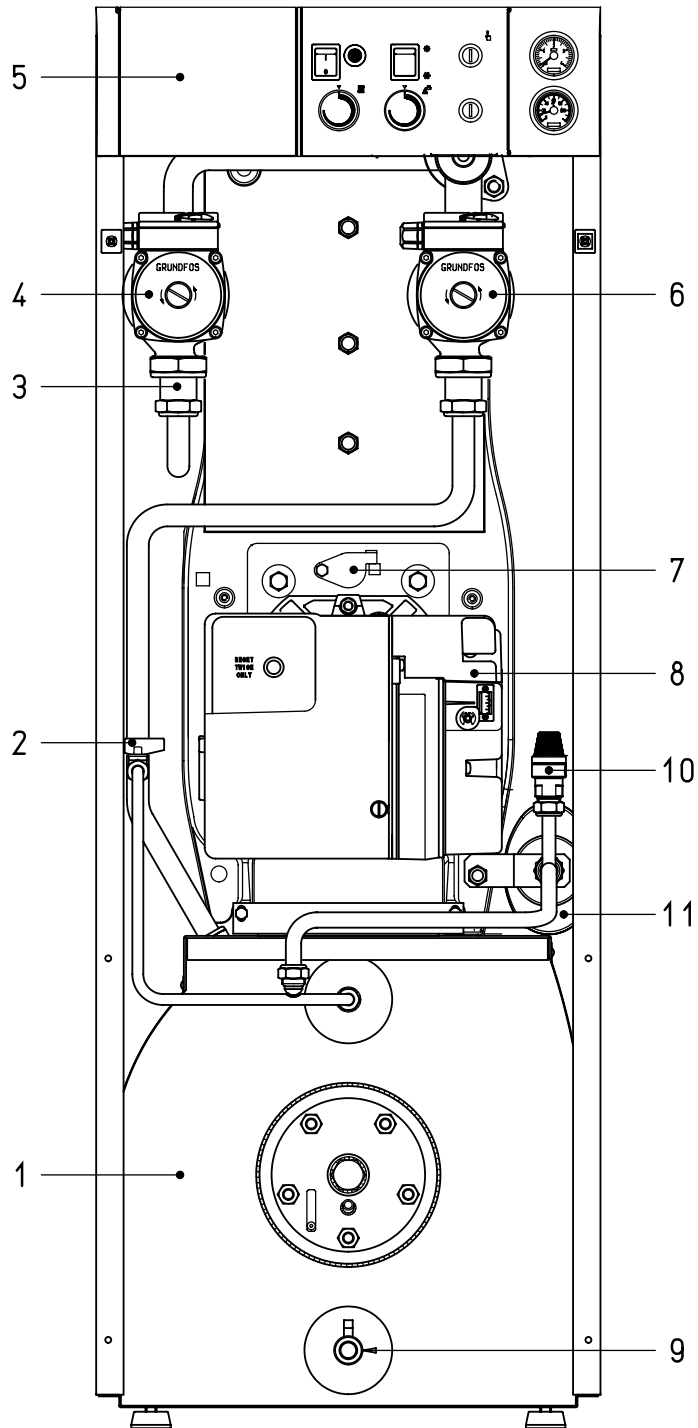
1.4.1 "SOLO 20 - 30 - 40" version



1.4.2 "DUETTO 30" version



1.4.3 "AQUA 30 - 40" version

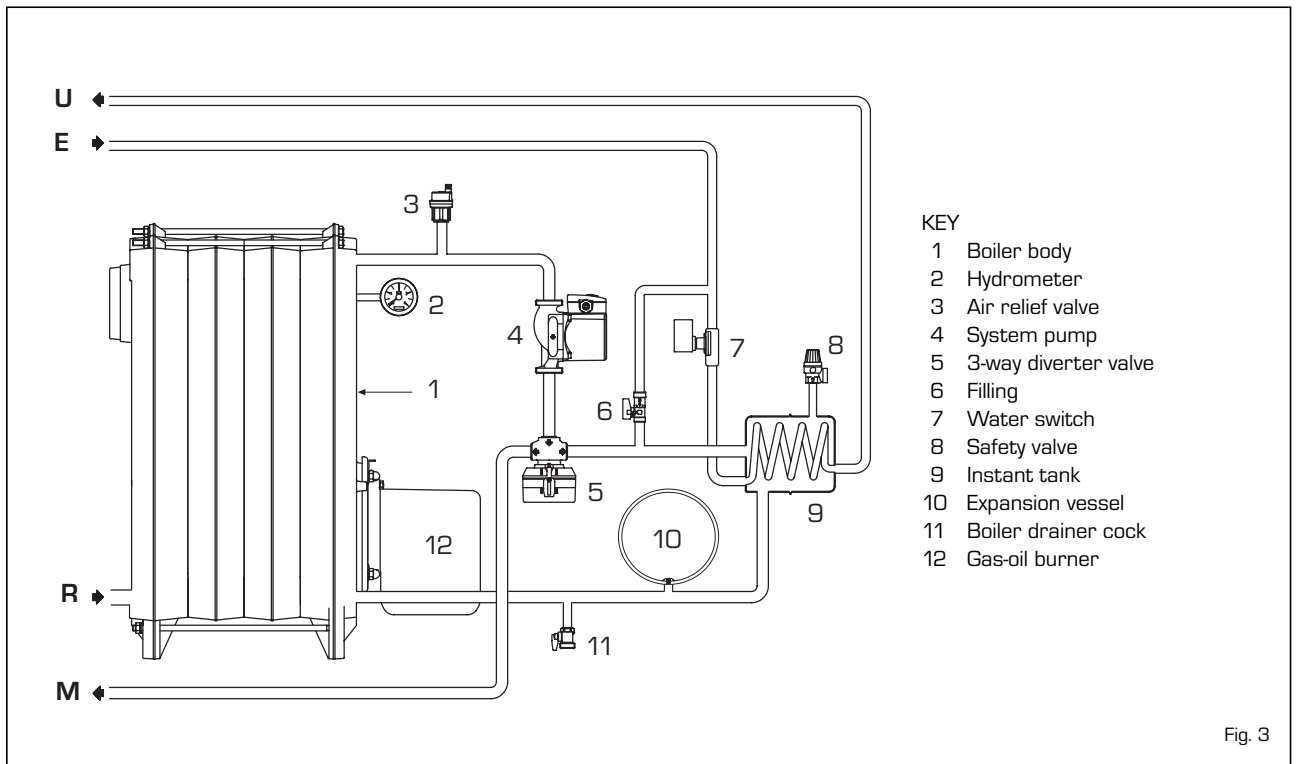


- | | |
|------------------|----------------------|
| KEY | 6 Tank pump |
| 1 100 litre tank | 7 Hublot |
| 2 Filling | 8 Gas-oil burner |
| 3 Control valve | 9 Tank drainer cock |
| 4 System pump | 10 Tank safety valve |
| 5 Control panel | 11 Expansion vessel |

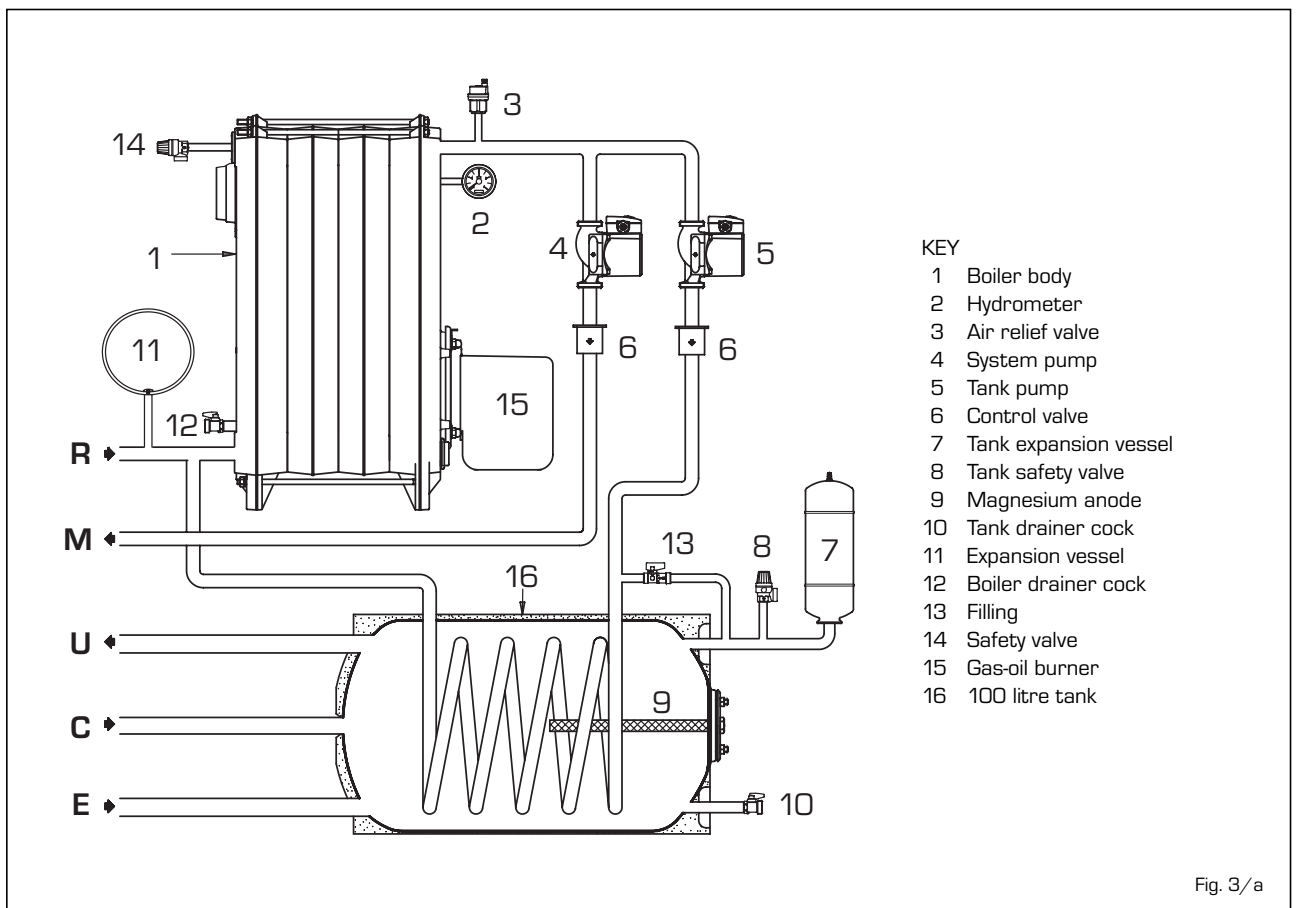
Fig. 2/b

1.5 FUNCTIONAL DIAGRAM

1.5.1 "DUETTO 30" version



1.5.2 "AQUA 30 - 40" version



2 INSTALLATION

2.1 BOILER ROOM

The boilers with a rating of more than 35 kW must be equipped with a technical room whose dimensions and requirements correspond to the current standards and regulations.

The minimum distance between the walls of the room and the boiler must not be less than 0.60 m., while the minimum height between the top of the boiler and the ceiling must be at least 1 m. which can be reduced to 0.50 m. for boilers with incorporated heaters [however the minimum height of the boiler room must not be less than 2,5 m]. The boilers with a rating of less than 35 kW can be installed only in perfectly air-vented rooms. To circulate air in the room, air vents must be made on the outside walls which satisfy the following requirements:

- Have a total surface area of at least 6 cm² for each installed Kw of thermal capacity and however not less than 100 cm².
- To be situated as close as possible to the floor, unobstructable and protected by a grate which does not reduce the air passage area.

2.2 CONNECTING UP SYSTEM

Before proceeding to connect up the boiler, you are recommended to make the water circulate in the piping in order to eliminate any foreign bodies that might be detrimental to the operating efficiency of the appliance. For connecting up the pipes, make sure to follow the indications illustrated in fig. 1. The connections should be easy to disconnect using pipe unions with orientable connections. **The shutoff valve must be connected to a suitable flow system and return pipes**

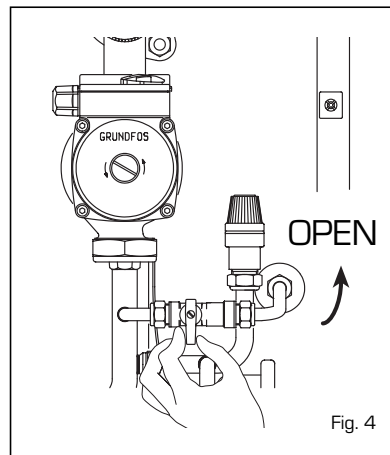
2.2.1 System filling

The boiler and the relative system must be filled operating on the bearing tap and the pressure of cold charging the system must be included between **1 - 1.2 bar**. During filling the main switch should be left open.

Filling must be done slowly so as to allow any air bubbles to be bled off through the provided air vents. This operation can be made easy by positioning horizontally the incision of the block screw of the shutoff valve.

Upon completing the filling, put the screw back to its original position.

At the end of the operation make sure that the tap is closed (fig. 4).



2.2.2 D.H.W. production on "DUETTO - AQUA" versions

When hot treated water is required in the "DUETTO" version, the switch which commutes the diverter valve is immediately inserted supplying hot water practically at once.

In order that the boiler be capable of supplying treated water in the "AQUA" version, all the air in the boiler's serpentine must be bled off at the first ignition.

This operation is made easy by positioning horizontally the incision of the block screw of the shutoff valve (3 fig. 2/b). After all the air has been bled off, put the screw back to its original position.

2.2.3 Characteristics of feedwater

To prevent lime scale and damage to the tap water exchanger, the water supplied should have a hardness of no more than 20°F.

In all cases the water used should be tested and adequate treatment devices should be installed. To prevent lime scale or deposits on the primary exchanger, the water used to supply the heating circuit should be treated in accordance with UNI-CTI 8065 standards. It is absolutely essential that the water is to be treated in the following cases:

- Very extensive systems (with high contents of feedwater).
- Frequent addition of makeup water into the system.
- In case it is necessary to empty the system either partially or totally.

2.3 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, condensation and encrustation.

A flue therefore must satisfy 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: 0.024

P boiler input in Kcal/h

H height of the flue in meters measured from the flame axis to the flue outlet into the atmosphere. When dimensioning the flue, the effective height of the flue in meters must be considered, 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 for each horizontal metre of the union itself.

Our boilers are the B23 type and do not need any particular connections other than the one to the flue as described above.

2.4 FUEL ADDUCTION

The fuel can be fed into the thermal group sideways, the ducts must be passed through the aperture on the right or left hand side of the shell for connection to the pump (fig. 5 - 5/a).

Important

- Make sure, before turning on the boiler, that the return tube is free. An excessive counter-pressure would break the pump seal.
- Make sure that the tubes are sealed.
- The maximum depression of 0.4 bar (300 mmHg) (see *Table 1*) must not be exceeded. Gas is freed from the fuel above that value and can cause cavitation of the pump.
- It's advisable to bring the return tube in the depression systems up to the same height of the intake tube. In this case the foot valve is unnecessary. If instead the return tube arrives above the fuel level, the foot valve is indispensable.

Starting the pump

Turn on the burner to start the pump and check the flame ignition. If a "lock out" occurs before fuel arrival, wait for at least 20 seconds then press the burner release button "RESET" and wait for the whole start-up operation to repeat until the flame lights up.

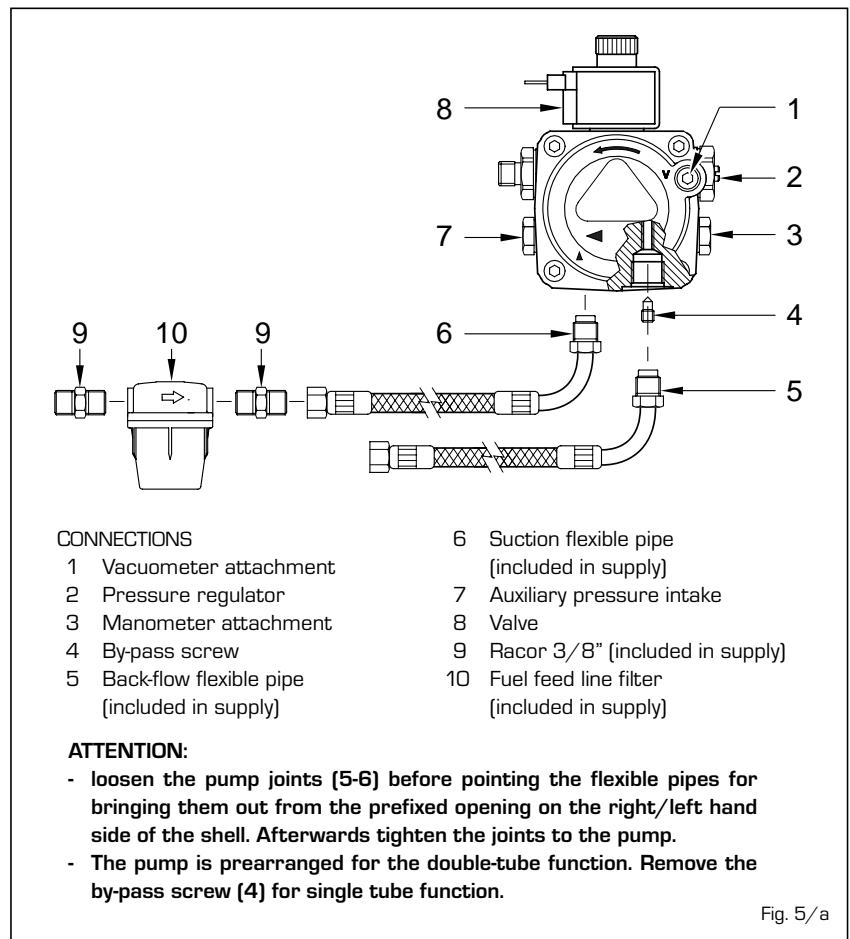
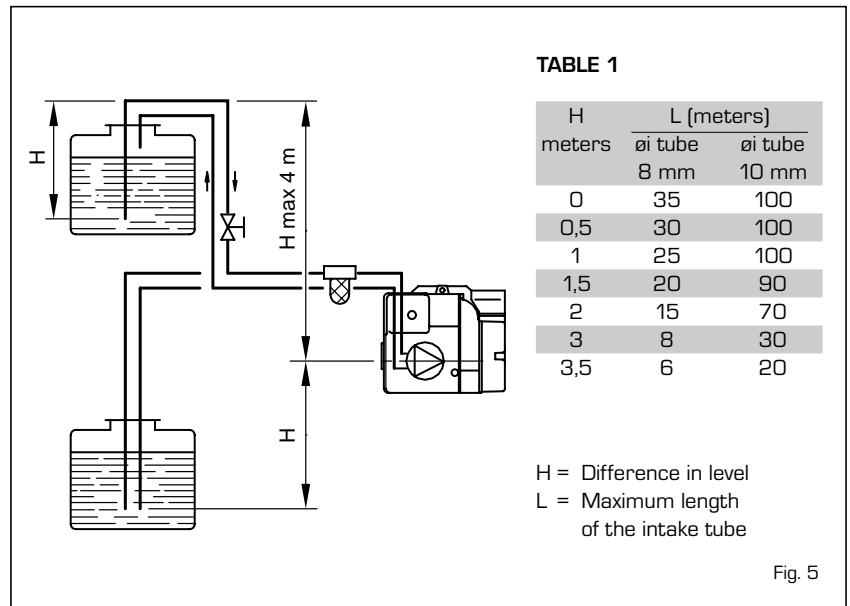
2.5 BURNER ADJUSTMENTS

Each unit is shipped with a burner unit equipped with a nozzle and calibrated at the factory; it is recommended, however, that the settings listed under point 1.3 be checked, with reference to atmospheric pressure at sea level. If it is necessary to adjust the burner differently from the factory settings, this should be done by authorised personnel following the instructions provided below.

Remove the shell door (fig. 12) to access the burner unit's controls.

2.5.1 Air lock adjustment

To adjust the air lock, loosen the screw (1 fig. 6) and slide the graduated scale (2 fig. 6) indicating the position air lock position.



The values for adjustment of each unit are given in point 1.3.

2.5.2 Pump pressure adjustment

To adjust gas-oil pressure, turn the screw (3 fig. 6/a) and check pressure with a pressure gauge connected to

the intake (2 fig. 6/a), making sure pressure corresponds to the value given under point 1.3.

2.5.3 Combustion head adjustment

To adjust the combustion head, dismantle the burner, removing the identi-

fied in fig. 13.

Dismantle the combustion head by loosening the two screws on the sides that hold it to the collar and adjust using a screwdriver as shown in figure 6/b observing the positions shown in the table.

NOTE: This type of adjustment cannot be carried out on model "SOLO 20".

2.6 HEATER UNIT

In "SOLO 20 - 30" and "AQUA 30" models, the heater unit comes on with the consensus of the burner, after a delay of a maximum of 90 seconds required to bring fuel in the nozzle holder area up to a temperature of 65°C.

Once this temperature has been reached, the thermostat, which is located above the preheater (1 fig. 13/b), will give consensus for the burner to start. The heater will remain on for as long as the burner stays on and go off when the burner goes off.

The "DUETTO 30" model has a lower power heater which remains on all the time after the main switch is turned on in the control panel in winter only.

The first time it is turned on at the beginning of the season, it may be difficult for the burner to come on, and the boiler may stop working if the operating cycle is begun before the correct fuel temperature has been reached. When it is started again, enough time will have passed (2 - 3 minutes) for the fuel to have reached the correct temperature for start-up. "SOLO 40" and "AQUA 40" model have no heater unit, as it is not required.

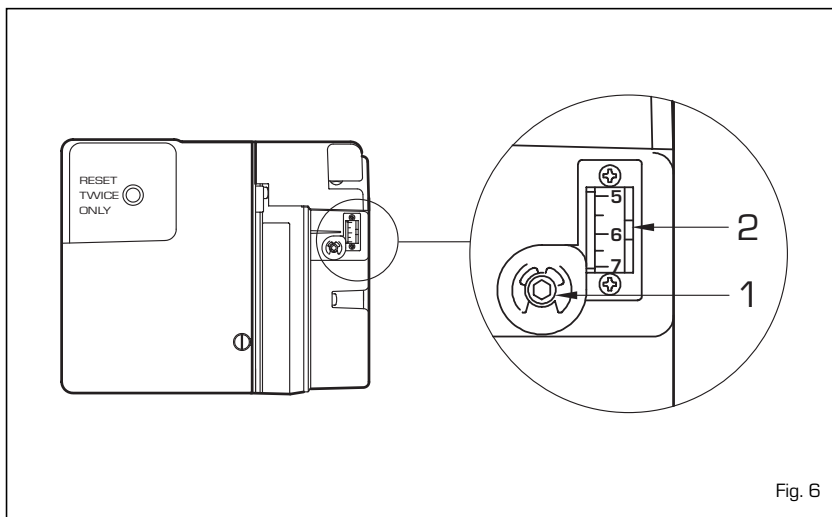


Fig. 6

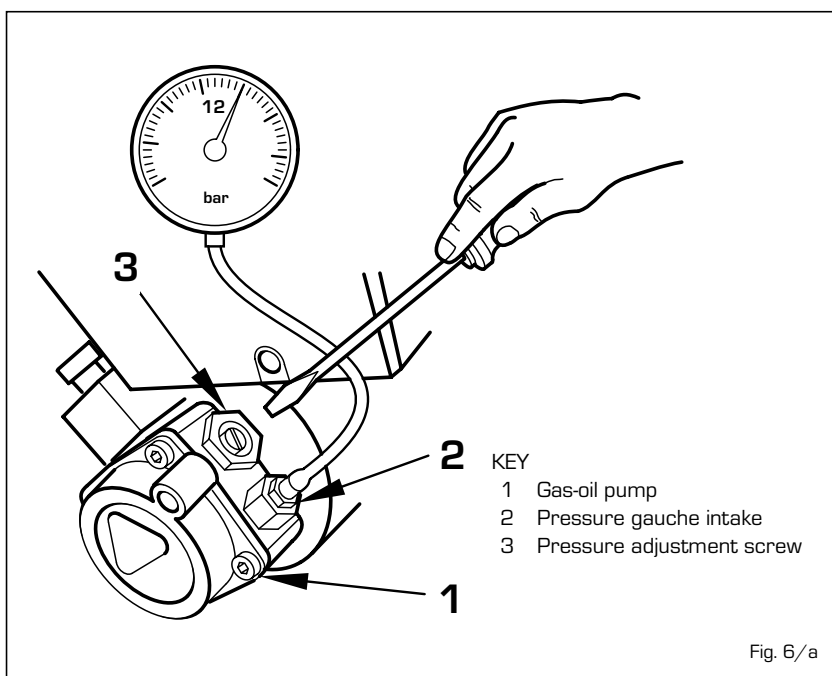


Fig. 6/a

2.7 ELECTRICAL CONNECTION

The boiler is supplied with an electric cable and the electric power supply to the boiler must be 230V-50Hz single-phase through a fused main switch.

The stat cable, whose installation is compulsory for obtaining a better adjustment of the room temperature, must be connected as shown in fig. 7.

NOTE: Device must be connected to an efficient earthing system. SIME declines all responsibility for injury or damage to persons resulting from the failure to provide for proper earthing of the appliance. Always turn off the power supply before doing any work on the electrical panel.

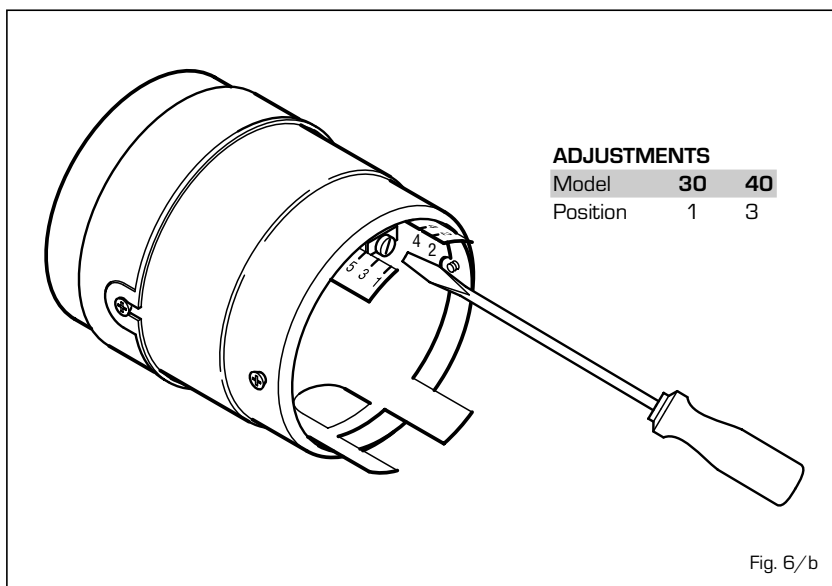
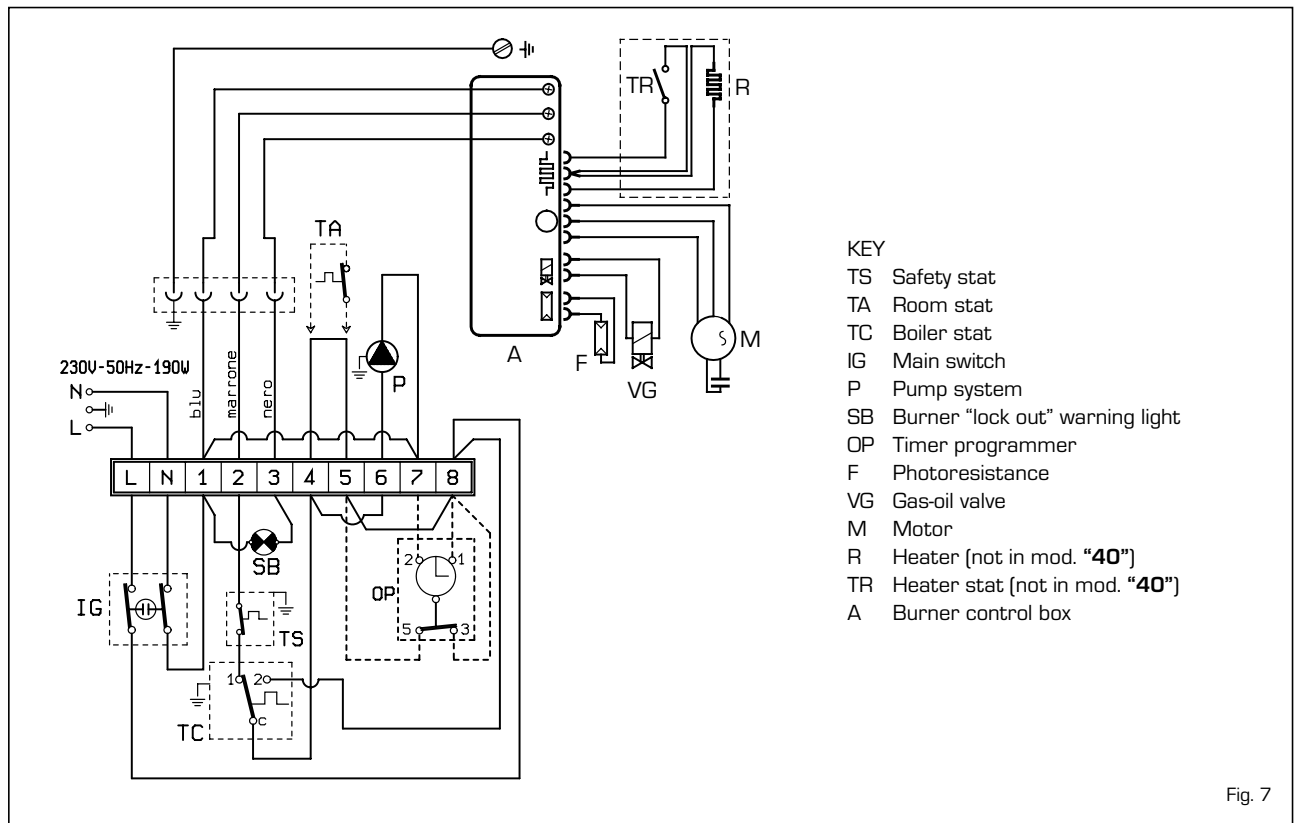
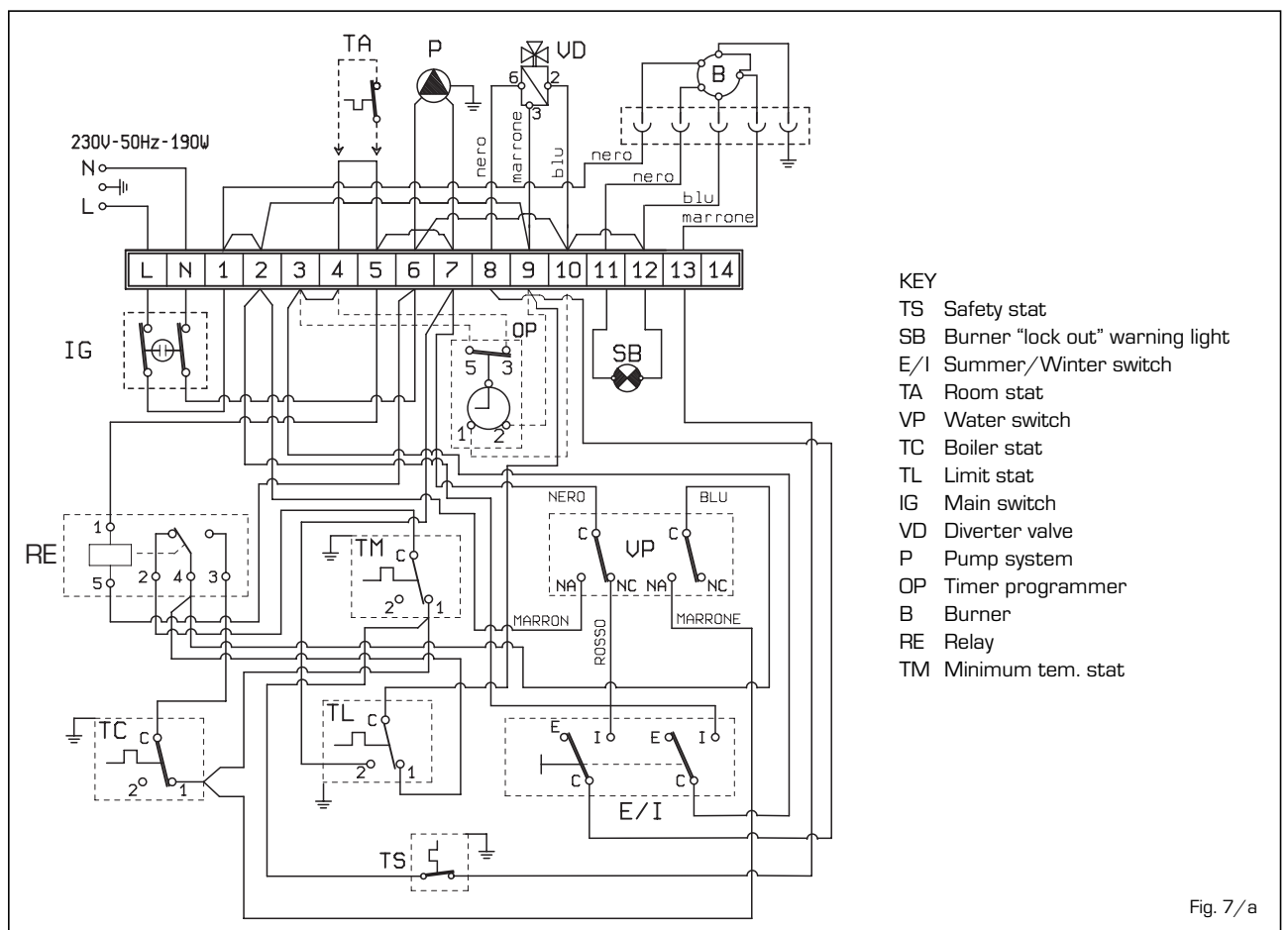


Fig. 6/b

2.7.1 "SOLO 20 - 30 - 40" wiring diagram



2.7.2 "DUETTO 30" wiring diagram



2.7.3 "AQUA 30 - 40" wiring diagram

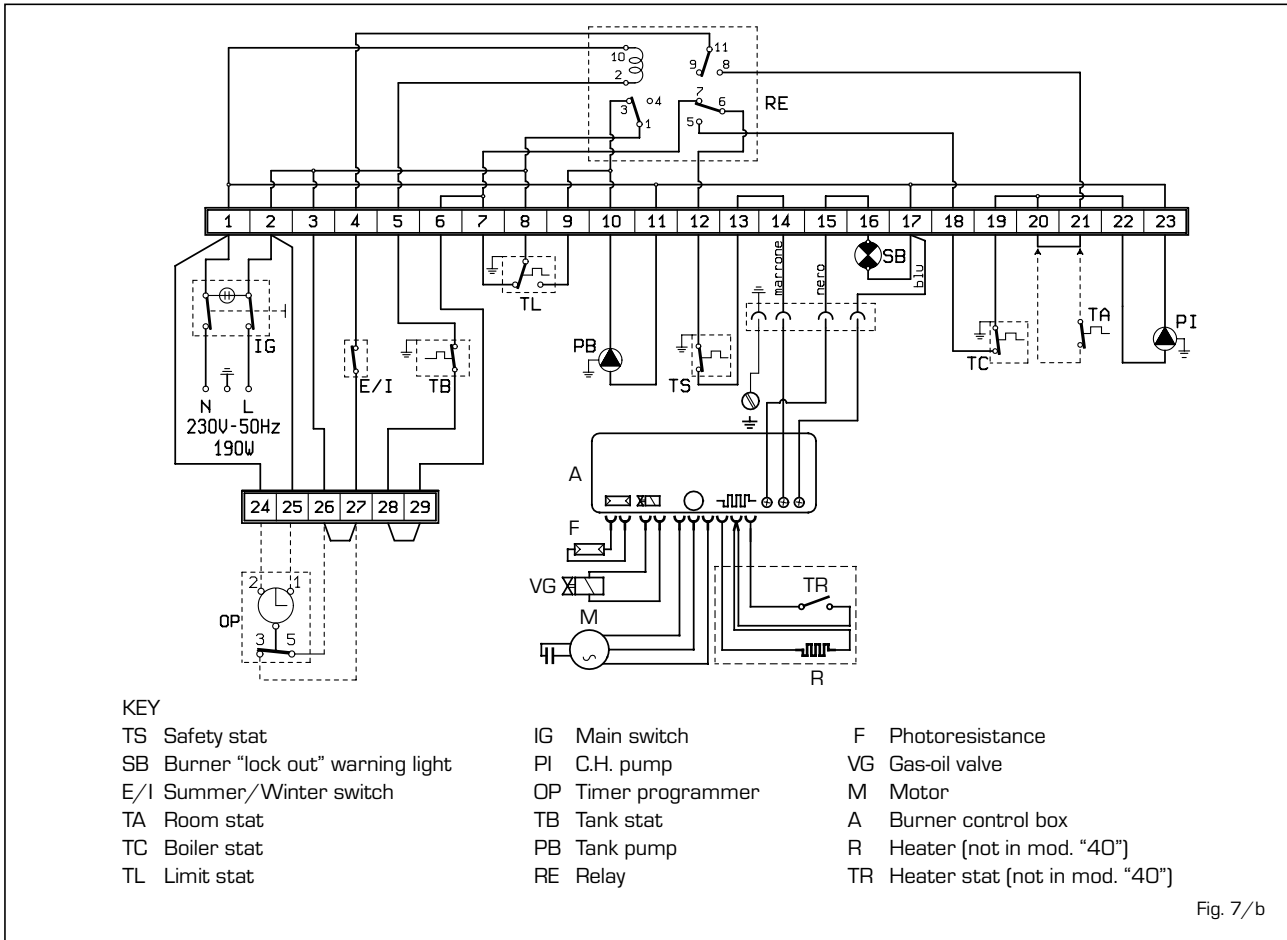
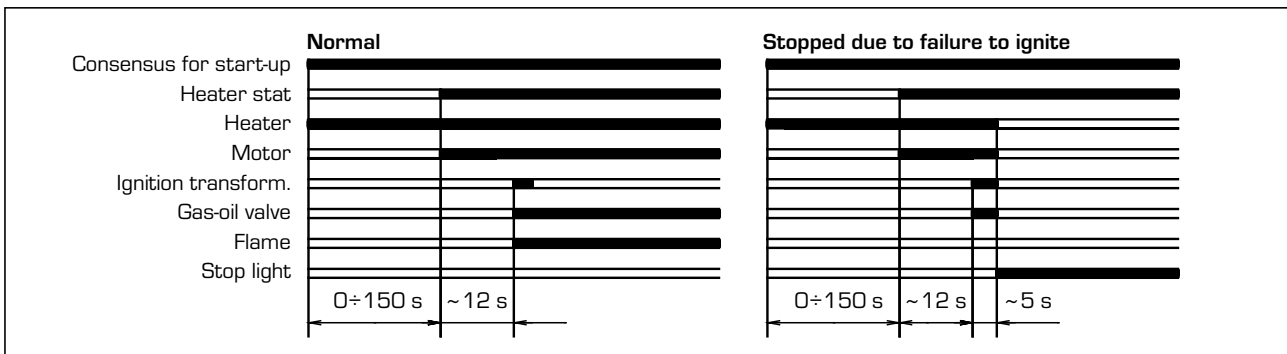


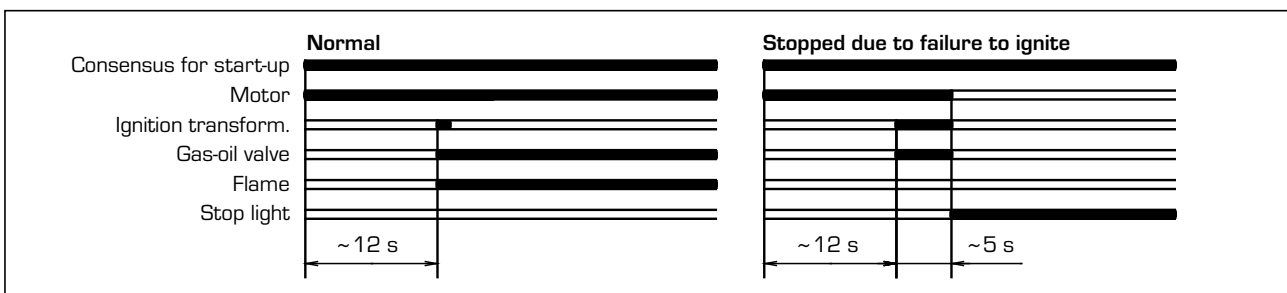
Fig. 7/b

2.7.4 "SOLO 20 and 30 - AQUA 30" functional diagram



NOTE: On "DUETTO 30", without stat, the heater is always fed in winter position.

2.7.5 "SOLO 40 - AQUA 40" functional diagram



3 CHARACTERISTICS

3.1 COMBUSTION CHAMBER DIMENSIONS

The combustion chamber is a direct passage type and is conform to the EN 303-3 standard annex E.

The dimensions are shown in fig. 8. An adequate protection panel is mounted on the inside wall of the rear head of all the models.

	L mm	Volume m ³
SOLO 20	277	0,013109
SOLO 30	377	0,019028
DUETTO 30	377	0,019028
AQUA 30	377	0,019028
SOLO 40	477	0,024947
AQUA 40	477	0,024947

3.2 HEATING PUMP CHARACTERISTICS

The characteristics of the pump system installed on the thermal gas-oil group are shown in fig. 9.

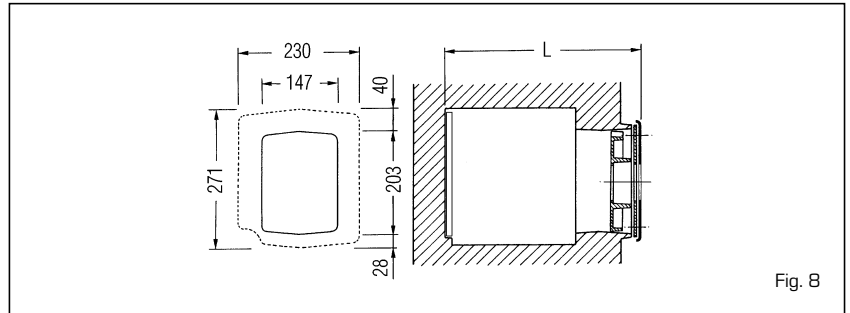


Fig. 8

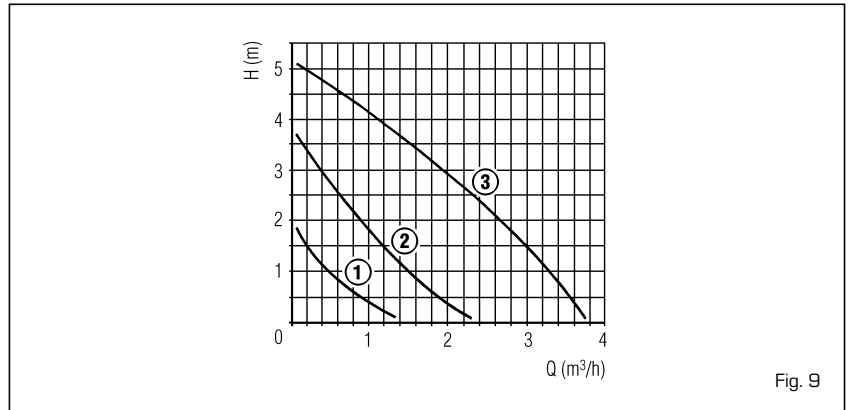


Fig. 9

4 USE AND MAINTENANCE

4.1 TIMER PROGRAMMER (optional)

The control panel allows the use of a timer supplied in kit form upon request, complete with mounting instructions (fig. 10).

Make the electric connection as shown in point 2.6 eliminating the boiler junction-box.

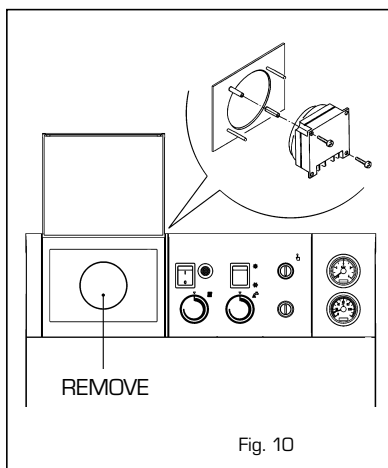


Fig. 10

4.2 TANK MAINTENANCE

The preparation of hot treated water in the "AQUA" version is guaranteed by a heater in porcelain glass, complete with magnesium anode for protecting the heater and inspection flange for control and cleaning.

The magnesium anode should be periodically controlled and substituted whenever worn out.

4.3 REPLACING THE SWITCH VALVE ACTUATOR

To remove the switch valve actuator, follow these instructions (fig. 11):

- Switch off the power supply.
- Disconnect the Molex connector.
- Push the button (1) while simultaneously turning the actuator anticlockwise to remove it from the valve body.
- To reassemble the actuator, perform the same procedure in reverse.

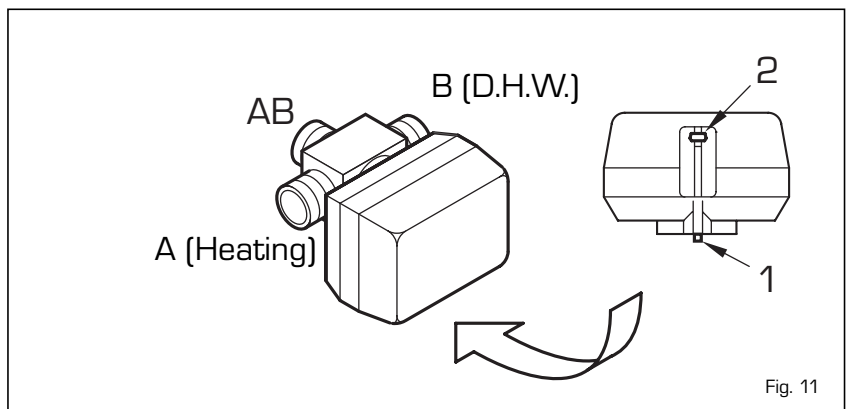


Fig. 11

WARNING:

In the event of a fault, the switch valve can be operated in “intermedi-

ate” mode, by pushing the manual opening valve (2) until it is locked in position halfway along its travel.

This will keep both outlets, heating and sanitary, partially open.

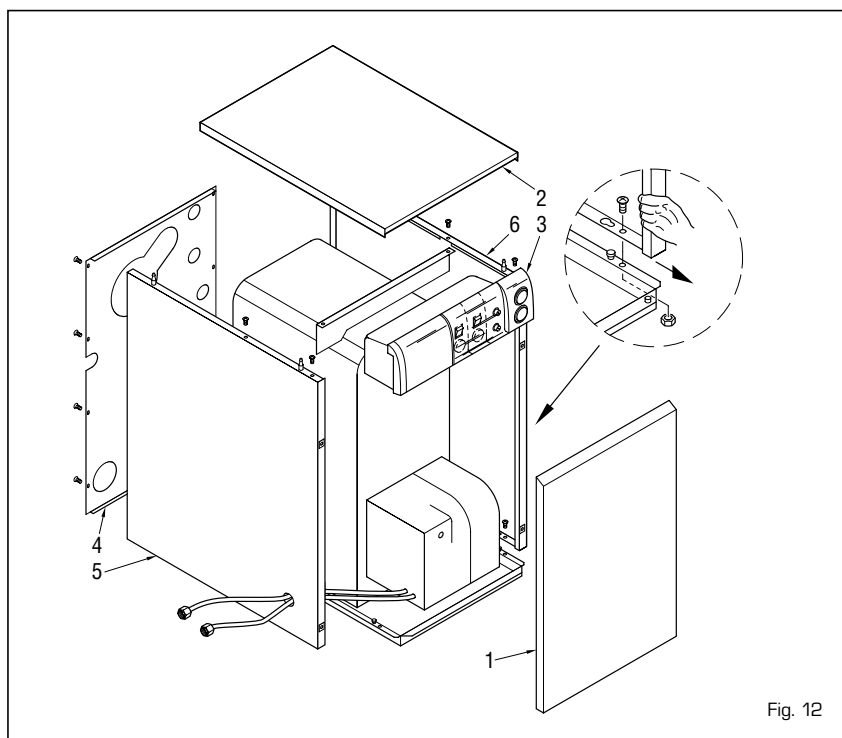


Fig. 12

4.4 DISASSEMBLY OF OUTER CASING

The shell can be completely disassembled for an easy maintenance of the boiler by following the numeric steps shown in fig. 12 (“SOLO - DUETTO” model) and fig. 12/a (“AQUA” model).

4.5 DISASSEMBLY OF EXPANSION VESSEL

The heating expansion tank is disassembled in the following manner:

- Make sure that the boiler has been emptied of water;
- Unscrew the union which connects the expansion tank;
- Remove the expansion tank.

Before filling up the system make sure that the expansion tank is reloaded at the pressure of $0.8 \div 1$ bar.

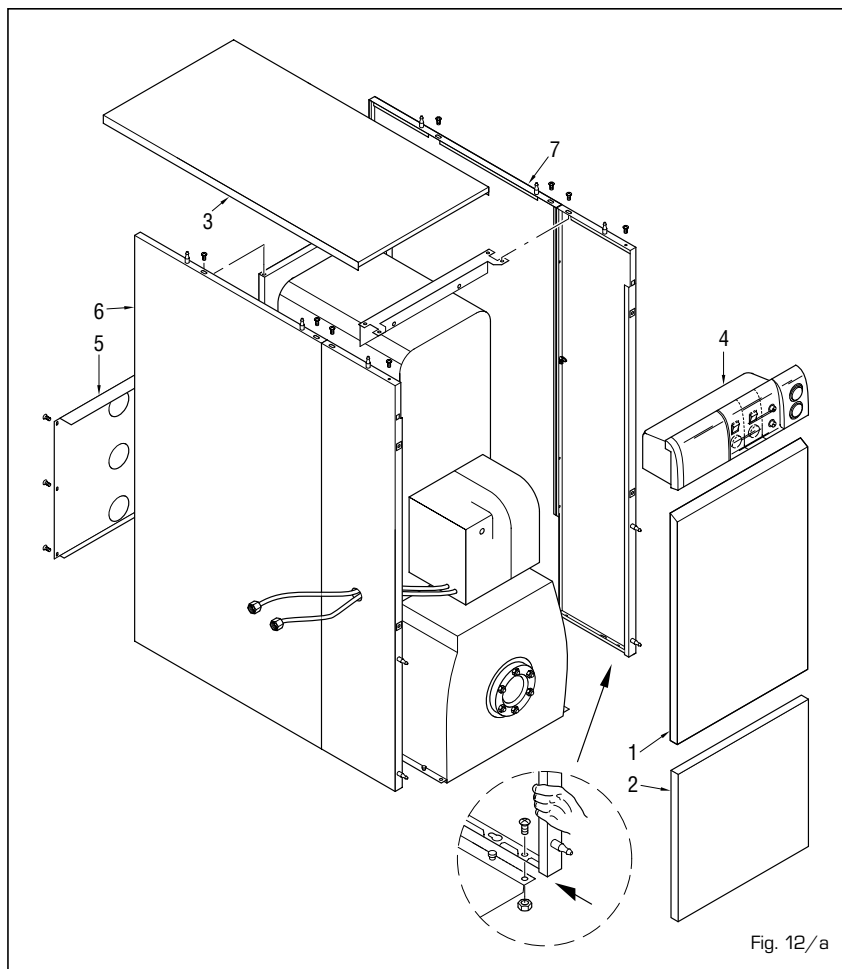


Fig. 12/a

4.6 BURNER MAINTENANCE

To dismantle the burner from the boiler door, remove the nut (fig. 13).

- To access the internal part of the burner, remove the air lock unit held in place by two screws to the sides and remove the right hand shell, which is held in place by four screws, taking care not to damage the O-ring seal. OR.
- To dismantle the nozzle holder and heater unit, proceed as follows:
 - open the cover, which is held in place by a screw, and remove the heater cables (1 fig. 13/a) protected by a heat resistant sheath; remove the fairlead and pass the cables through the hole.
 - remove the two cables from the ignition electrodes fastened in

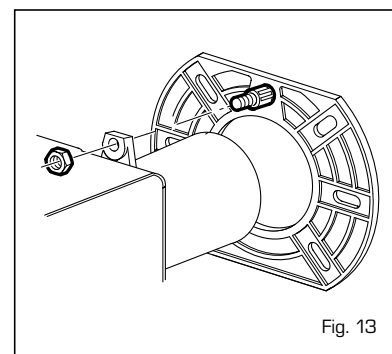


Fig. 13

place with a faston.

- loosen the union (2 fig. 13/a) and remove the four screws which fasten the collar (3 fig. 13/a) to the burner.
- To dismantle the eater or thermostat, refer to figure 13/b.

4.7 CLEANING AND MAINTENANCE

Preventive maintenance and checking of the efficient operation of the equipment and safety devices must be carried out at the end of each heating

season exclusively by the authorised technical staff.

4.7.1 Cleaning smoke ducts

Use an adequate swab for cleaning the smoke ducts of the boiler. After cleaning, position the circulators in their original position (fig. 14).

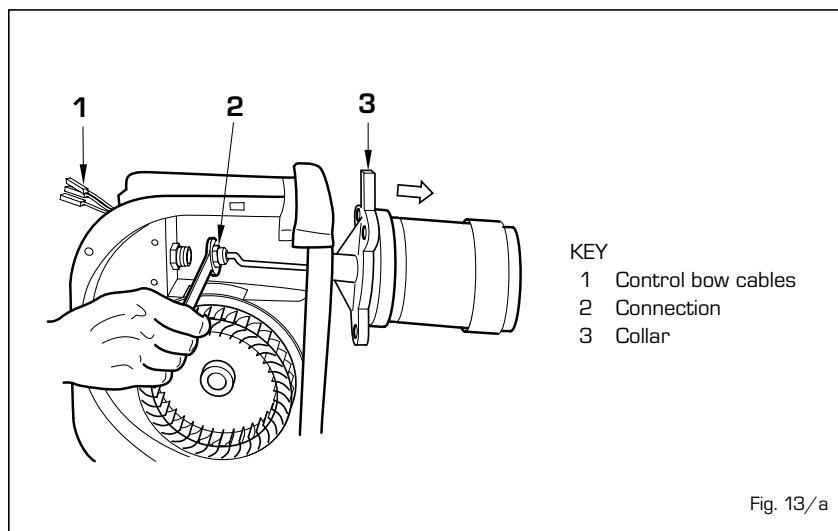


Fig. 13/a

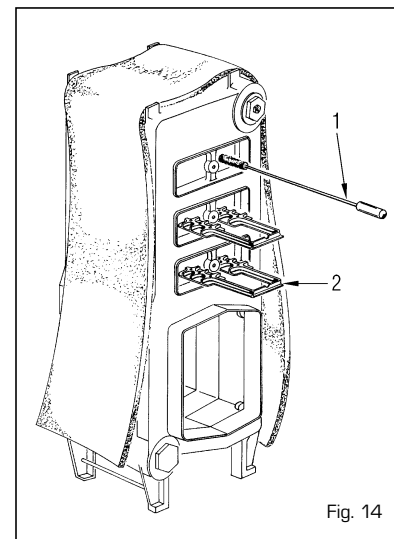


Fig. 14

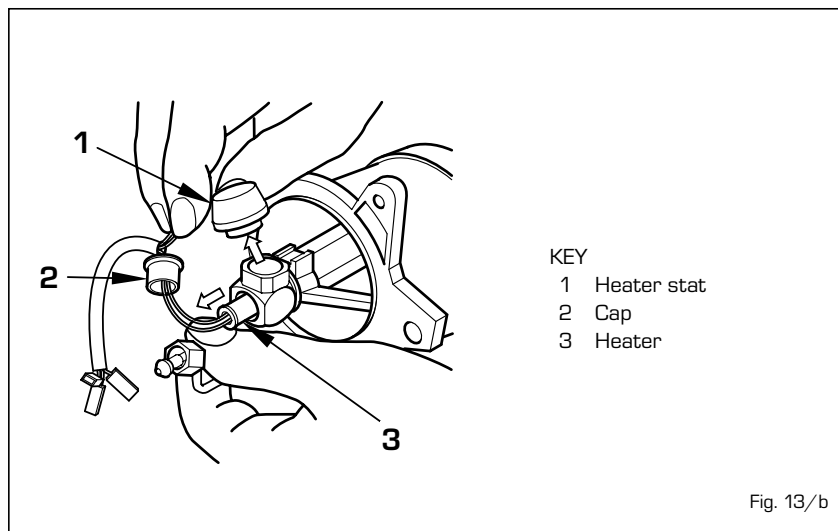


Fig. 13/b

4.7.2 Cleaning combustion head

The combustion head is cleaned in the following manner (fig. 15) :

- Disconnect the high tension cables from the electrodes.
- Unscrew the fixture screws of the circulator support and remove it.
- Brush the propeller delicately (turbulence disc).
- Carefully clean the photo-resistance of eventual deposits of dirt deposited on its surface.
- Clean the remaining components of the combustion head of eventual deposits.
- Upon completion re-assemble the unit in the opposite way as described above taking care to respect the indicated measurements.

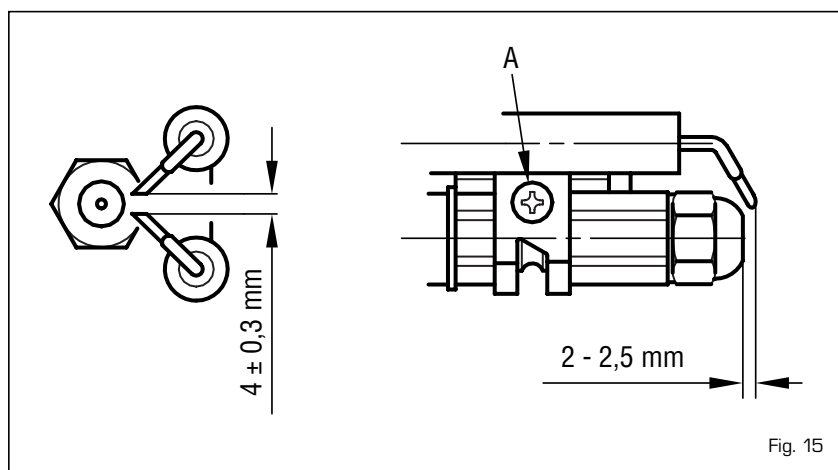


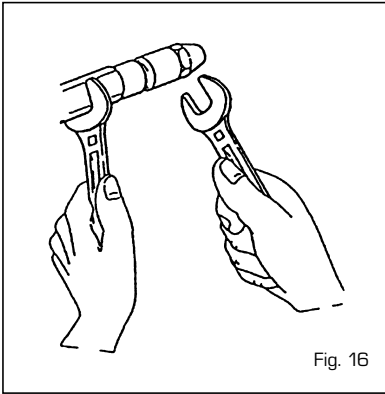
Fig. 15

4.7.3 Substitution of nozzle

The nozzle should be substituted at the beginning of every heating system for guaranteeing the correct fuel flow and a good spray efficiency. The nozzle is substituted in the following manner:

- Disconnect the high tension cables from the electrodes.

- Loosen the fixture screw (A fig. 15) of the electrodes support and remove it.
- Block the spray door using a n°19 spanner and unscrew the nozzle with a n°16 spanner (fig. 16).



4.8 FAULT FINDING

There follow a list of some reasons and the possible remedies for a series of faults which could happen causing a failure or an irregular function of the appliance. A function fault, in most cases, causes the "lock out" signal on the control panel to turn on. When

this light turns on, the burner can only function again after the reset button has been pressed; once this has been done and a regular ignition occurs, the failure can be defined momentary and not dangerous.

On the contrary, if the "lock out" persists, then the cause of the fault as well as the remedy must be looked for in the following faults:

The burner does not ignite

- Check the electric connections.
- Check the regular fuel flow, the cleanness 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 calibration and the function of the appliance.

Difficulty in regulating the burner and/or lack of yield

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

The boiler gets dirty easily

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

The boiler does not heat up

- Control the cleanness 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 cleanness 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 shutoff 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.

USER INSTRUCTIONS

WARNINGS

- In case of fault and/or incorrect operation, deactivate it without making any repairs or taking any direct action. If fuel or combustion is smelt, air the room and close the fuel interception device. Contact the authorised technical staff.
- The installation of the boiler and any servicing or maintenance job must be carried out by qualified personnel.
- It is absolutely prohibited to block the intake grilles and the aeration opening of the room where the equipment is installed. The intake grilles are indispensable for a correct combustion.

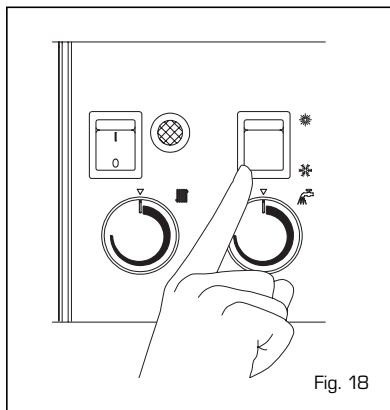
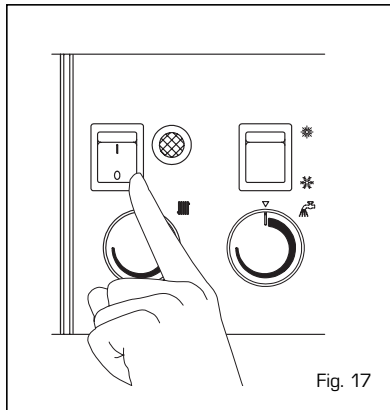
IGNITION AND OPERATION

BOILER IGNITION

Press the main switch for lighting the boiler (fig. 17).

In the "DUETTO - AQUA" version choose the position Summer/Winter on the switch (fig. 18):

- The boiler operates in treated phase with the switch in the position ☀ (SUMMER)



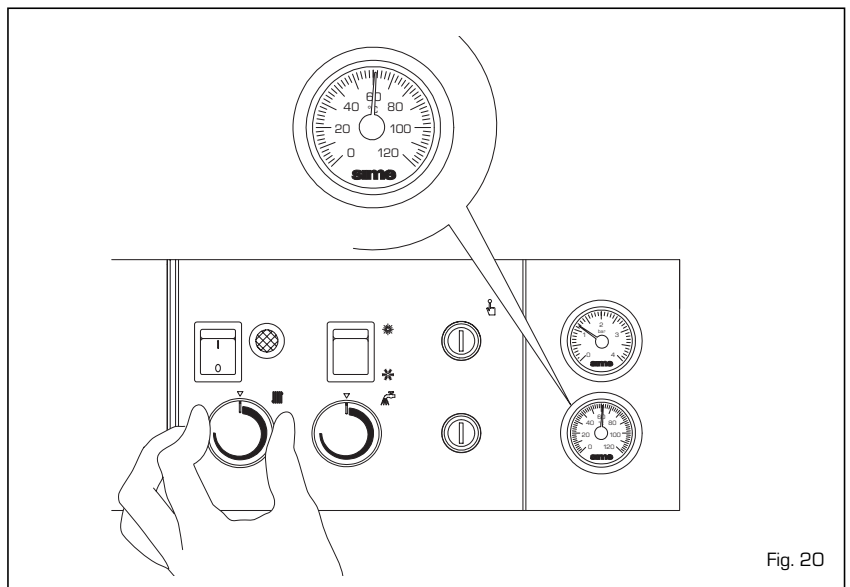
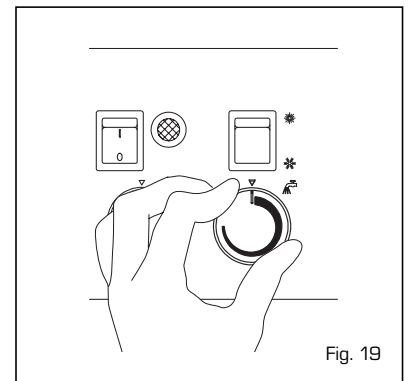
- The boiler operates both in treated phase as well as for heating with the switch in the position ❄ (WINTER). The room stat or the chronostat will stop the operation of the boiler.

TEMPERATURE ADJUSTMENT

- The heating temperature in the "AQUA" version can be adjusted by turning the knob of the thermostat (fig. 19).
- The heating temperature in the "SOLO - DUETTO - AQUA" version can be adjusted by turning the knob of the thermostat which has a range of between 45 and 85°C. The temperature setting can be

checked on the thermometer.

To ensure optimal boiler efficiency at all times, we recommend not to drop below a minimum working temperature of 60°C (fig. 20).



SAFETY STAT

The safety stat is of the manually resetting type and opens, causing the main burner to turn off immediately, whenever the temperature of 110°C is exceeded in the boiler. To restore boiler operation, unscrew the black cap and reset the button (fig. 21).

Should the appliance “lock out” again, please approach the authorised technical staff.

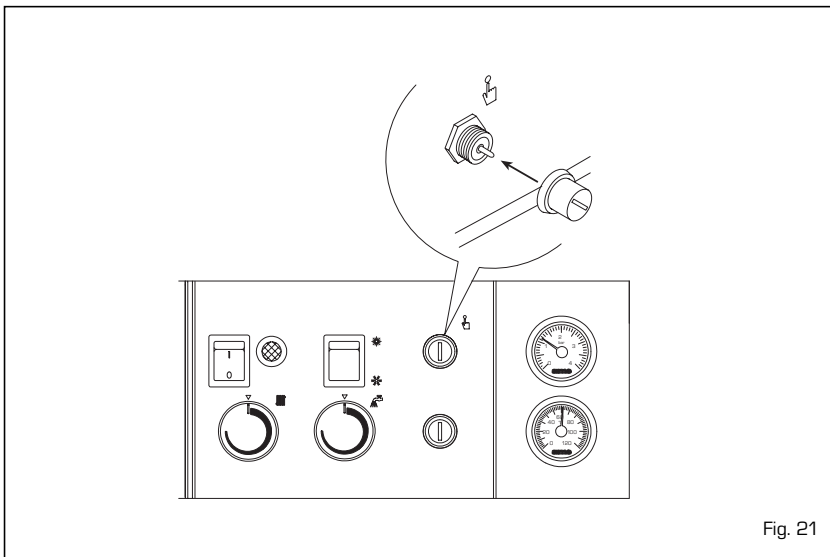
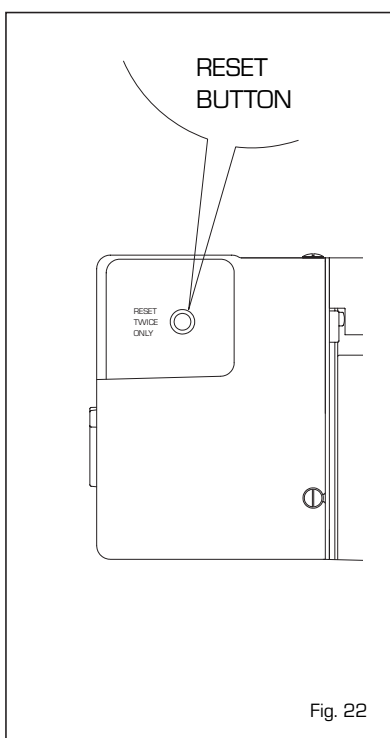
BURNER RESTART

In case that ignition or operation faults occur, the main burner “locks out” and the red lamp lights up on the control panel. Press the “RESET” button to restart the ignition conditions until the flame lights up (fig. 22). This operation can be repeated 2-3 times at maximum and in case of failure contact the authorised technical staff.

ATTENTION: Make sure that there is fuel in the tank and that the taps are open. After each fill up of the tank it is advisable to interrupt the operation of the burner for about one hour.

TURNING OFF BOILER

It is sufficient to press the main switch to turn off the boiler (fig. 17). Close both the gas-feed pipe tap and



the water tap if the boiler remains inoperative for a long period.

amount by operating on the vent knob of any radiator.

SYSTEM FILLING

Check periodically that the hydrometer has pressure values at a switched-off system of 1 - 1.2 bar. If the pressure is less than 1 bar, re-charge it rotating the knob anti-clockwise.

After the operation check that the tap is properly closed (fig. 23).

Should the pressure exceed the foreseen limit, discharge the superfluous

CLEANING AND MAINTENANCE

At the end of each heating season, it is essential to have the boiler thoroughly checked and cleaned out.

Preventive maintenance and checking of the efficient operation of the equipment and safety devices must be carried out exclusively by the authorised technical staff.

