

INSTALLER'S INSTRUCTIONS

CONTENTS

1	DESCRIPTION OF THE BOILER	pag. 52
2	INSTALLATION	pag. 54
3	FEATURES	pag. 61
4	USE AND MAINTENANCE	pag. 63

IMPORTANT

It is advisable to check the following before turning on the boiler for the first time:

- Check that there are no liquids or flammable materials in the immediate vicinity of the boiler.
- Check that electrical connections have been made correctly and that the ground wire is connected to a proper grounding system.
- Open the gas cock and check the seal on connections, including the burner connection.
- Check that the boiler is set up to run on the type of gas available.
- Check that the flue through which the products of combustion are eliminated is free.
- Check that gate valves are open, if there are any.
- Check that the heating system has been filled with water and air has been bled out of it.
- Turn on the circulation pump, unless it is commanded by an automatic system.
- Bleed air out of the gas pipe using the pressure intake bleed valve located on the gas valve inlet.
- Check that none of the regulation, control and safety devices have been tampered with.

NOTE: When turning the generator back on, or if the boiler has not been used for some time, it is advisable to bleed gas pipes for air. If this is not done, burner ignition may be delayed, possibly causing the boiler to shut down. Wait at least 20 seconds from the time the indicator light comes on before releasing it.

If there is no voltage, the burner will shut down immediately. When the voltage is restored, the boiler will start functioning again automatically. When the gas pressure is insufficient, the burner immediately turns off and the insufficient gas pressure warning signal is enabled.

If this occurs, the boiler cannot be started up using the device's release button, for safety reasons.

The boiler will be ignited automatically when the pressure returns to the minimum pressure setting on the gas pressure switch (10 mbar).

1 DESCRIPTION OF THE BOILER

1.1 INTRODUCTION

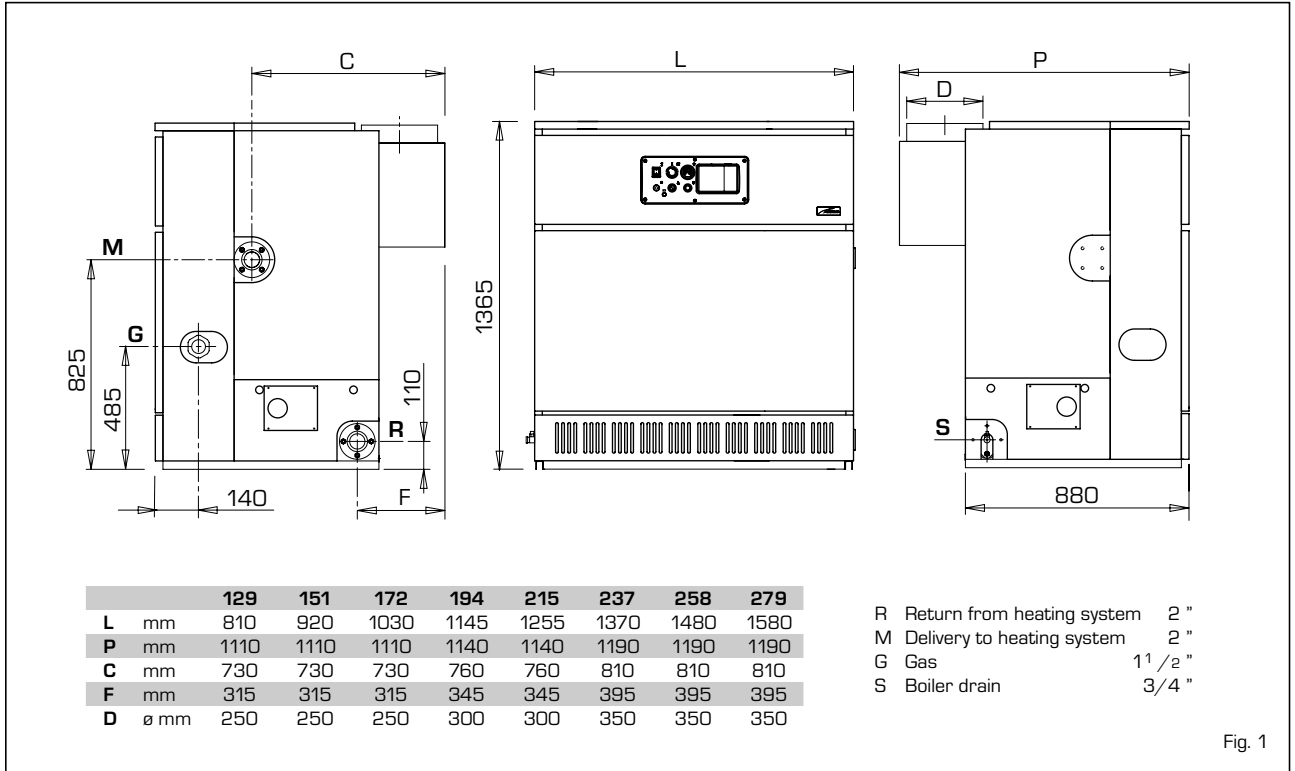
"RS Mk.II" boilers are hot water generators for mid to high power heating systems. They consist of 7 to 14 cast iron elements grouped in sets covering the thermal power

produced by 129,0 kW to 279,1 kW. They are designed and built in accordance with European directives 90/396/CEE, 89/336/CEE, 73/23/CEE, and 92/42/CEE and European standard EN 656.

They can run on natural gas (methane), butane (G30) or propane (G31).

Follow the instructions provided in this manual to ensure correct installation and perfect functioning of the boiler.

1.2 DIMENSIONS



1.3 TECHNICAL DATA

		129	151	172	194	215	237	258	279
Thermal power	kW	129,0	150,6	172,2	193,7	215,2	236,5	257,8	279,1
Thermal capacity	kW	145,9	170,0	194,2	218,2	242,1	266,0	290,0	313,6
Electric power absorbed	W	80	80	80	80	80	80	80	80
Degree of electrical insulation		IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Heating elements	n°	7	8	9	10	11	12	13	14
Water content	l	67,5	77,0	86,5	96,0	105,5	115,0	124,5	134,0
Max. operating pressure	bar	5	5	5	5	5	5	5	5
Category		II2H3+	II2H3+	II2H3+	II2H3+	II2H3+	II2H3+	II2H3+	II2H3+
Type		B11	B11	B11	B11	B11	B11	B11	B11
Maximum temperature	°C	95	95	95	95	95	95	95	95
Main nozzles									
Quantity	n°	6	7	8	9	10	11	12	13
Methane gas	ø mm	4,30	4,30	4,30	4,30	4,30	4,30	4,30	4,30
G30 - G31	ø mm	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50
Gas rate of flow									
Methane gas	m³st/h	15,44	17,99	20,55	23,10	25,63	28,16	30,70	33,20
Butane (G30)	kg/h	11,50	13,41	15,32	17,21	19,10	20,98	22,88	24,74
Propane (G31)	kg/h	11,32	13,19	15,07	16,93	18,79	20,64	22,50	24,34
Gas pressure at burners									
Methane gas	mbar	9,7	9,7	9,7	9,7	9,7	9,7	9,7	9,7
Butane (G30)	mbar	28	28	28	28	28	28	28	28
Propane (G31)	mbar	35	35	35	35	35	35	35	35
Gas supply pressure									
Methane	mbar	20	20	20	20	20	20	20	20
Butane (G30)	mbar	30	30	30	30	30	30	30	30
Propane (G31)	mbar	37	37	37	37	37	37	37	37
Weight	kg	542	612	682	757	829	904	974	1044

1.4 SHIPPING

"RS Mk.II" thermal units are supplied in three separate packs:

PACK N. 1

Cast iron body strapped onto pallet, complete with:

- n° 2 flanges with 2" collar for heating system delivery and return
- n° 1 blind flange
- n° 1 flange with 3/4" connection for drain cock
- n° 2 combustion chamber doors with cast iron indicator door
- n° 2 sheaths for thermostats and thermometer
- n° 1 water distributor located in the boiler return manifold, supplied in two different lengths:

L = 406 mm vers. "151÷194"

L = 851 mm vers. "215÷279".

PACK N. 2

Wooden crate containing:

- flue gas chamber to be assembled
- cardboard box containing skirt
- main burners, one for each element in the body minus one
- burner manifold
- plastic bag containing:
 - n° 13 tornillos M5 x 8 screws for anchoring burners to manifold
 - n° 32 self-tapping 12E x 1/2" screws for fastening various parts of the flue gas chamber and skirt
 - n° 4 M8x30 screws with plate, flat washer and M8 nut for anchoring flue gas chamber to boiler body
 - n° 1 3/4" drain cock with cap.

PAQUETE n° 3

Cardboard box containing:

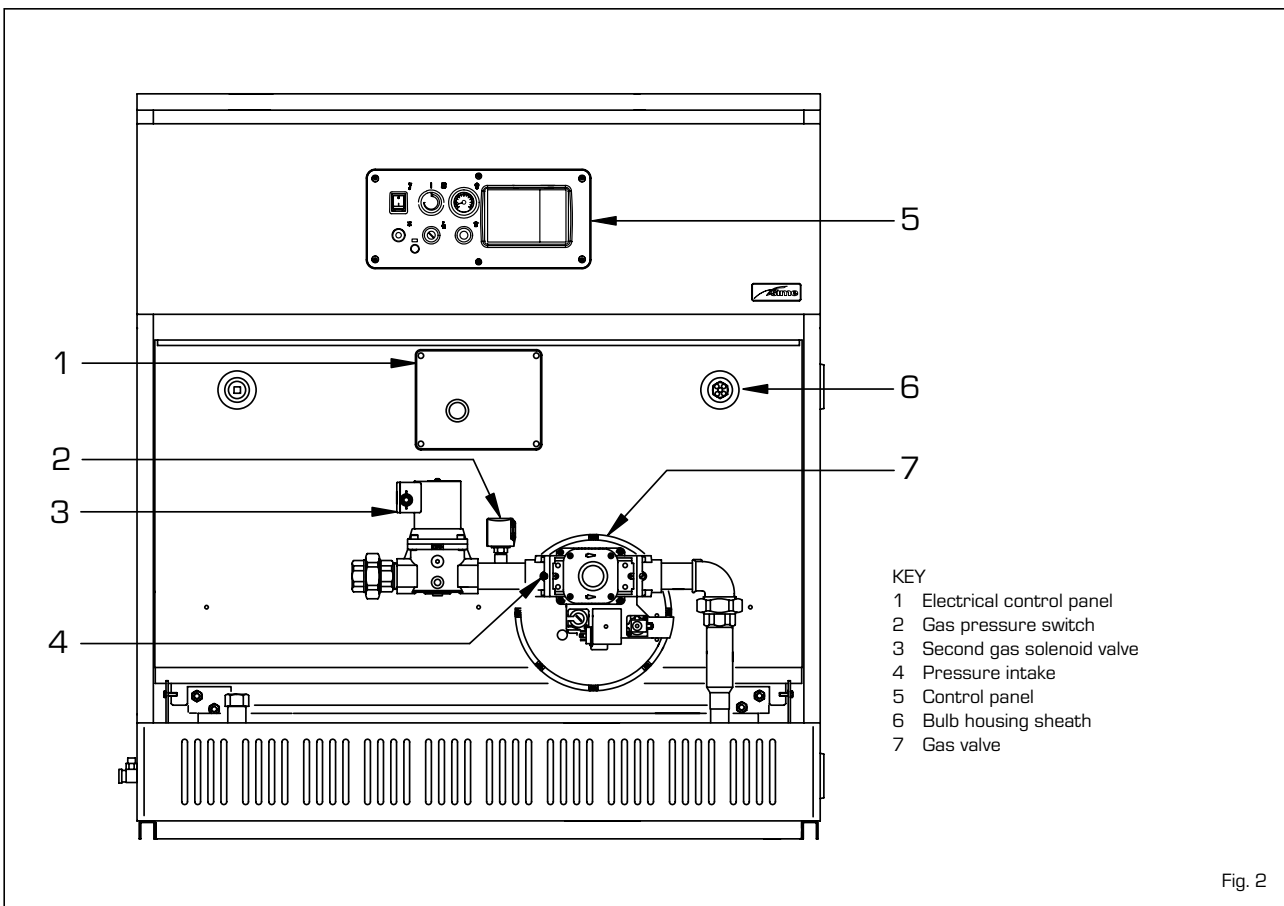
- Gas assembly, comprising:
 - main gas valve with coil unit
 - gas pressure switch
 - pressure intake
 - second gas solenoid valve

- gas pressure switch
- pressure intake
- second gas solenoid valve

- Electric control panel, consisting of:
 - BRAHMA SM 191.1 control device
 - interference filter
 - ignition and detection electrodes
 - sockets for connection with control panel
 - anchoring screws

- Control panel consisting of:
 - two-step control thermostat
 - manually reset safety thermostat
 - thermometer
 - gas pressure indicator light
 - device shutdown indicator light
 - illuminated main switch
 - anchoring screws.

1.5 FRONT INSIDE VIEW



2 INSTALLATION

The boiler must be installed in a fixed location and only by specialized and qualified firms in compliance with all instructions contained in this manual.

Furthermore, the installation must be in accordance with current standards and regulations.

2.1 BOILER ROOM AND VENTILATION

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

The minimum height of the boiler room must comply with what is indicated in fig. 3 in relation to the overall thermal capacity.

The minimum distance between the walls of the room and the outer points on the boiler (right and left sides and rear) must be no less than 0.60 m.

It is possible to place a number of apparatus next to each other, on condition that all the safety and control devices can be easily reached. In addition, to circulate air in the room, air vents must be made on the outside walls for which the surface area must never be less than 3,000 cm² and 5,000 cm² for gas with a density greater than 0.8. The distance between the boiler and any fuels stored in the area must be sufficient to prevent the fuels from reaching a hazardous temperature, and in no case less than 4 metres.

2.2 CONNECTION WITH HEATING SYSTEM

Connections with the heating system should be easy to disconnect, made with rotating pipe unions. It is always advisable to assemble suitable gate valves on the heating system delivery and return pipes.

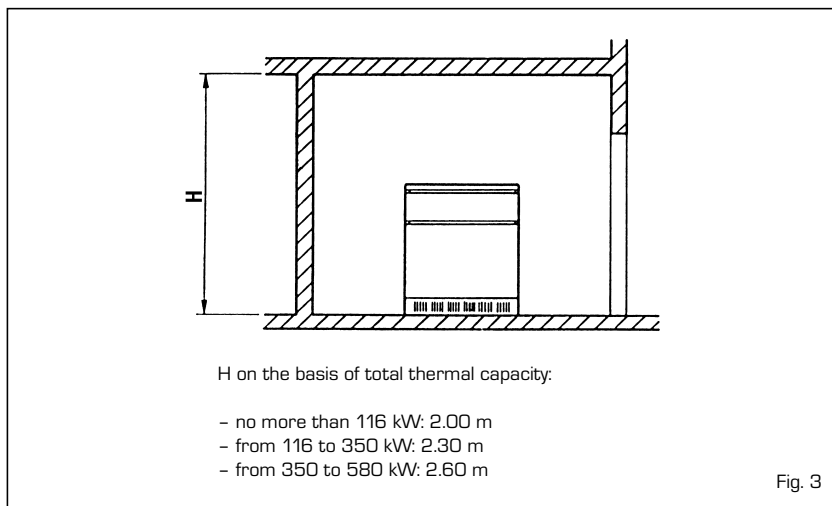
WARNING:

In order to ensure proper distribution of water in the cast iron body, the heating system delivery and return pipes must be connected to the same side of the boiler. The boiler is supplied with connections on the right side, though they may be moved to the left side by moving the flanges and their collars and the corresponding water distributor.

It is advisable to ensure that the temperature difference between the heating system delivery and return pipes does not exceed 20°C; installation of a mixer valve with an anti-condensation pump is advisable for this purpose.

WARNING:

The heating system's circulation pump(s) must be turned on when the boiler is on. An automatic precedence system is recommended for this purpose.



The gas connection must be made with seamless galvanised steel pipes (such as Mannesmann pipes), with threaded, sealed joints, excluding three-piece unions except for the start and end connections.

Pipes must pass through walls in a sealed sheath. In determining the size of the gas pipe from the meter to the boiler, take into account both rate of flow in volume (consumption) in m³/c and the density of the gas in question.

The section of pipes in the heating system must be sufficient to ensure that the gas supply fulfils maximum demand, limiting pressure drop from the meter to any utility to no more than:

- 1,0 mbar in the case of gases in the second family (methane gas)
- 2,0 mbar in the case of gases in the third family (G30-G31).

On the inside of the skirt is an adhesive plate bearing technical data identifying the boiler and the type of gas which it is set up to burn.

2.2.1 Filter on gas pipe

To prevent poor valve functioning or, in some cases, exclusion of the safety devices provided, assemble an adequate filter on the gas pipe inlet.

2.3 CHARACTERISTICS OF WATER SUPPLY

The water used to supply the heating circuit should must 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 large heating systems (with large water content)
- Frequent topping up of water in the system
- When the system must be partially or totally emptied.

2.4 FILLING THE HEATING SYSTEM

It is a good idea to circulate water in the pipes before connecting up the boiler in order to eliminate any foreign matter which could affect boiler functioning.

Fill the heating system slowly to permit air bubbles to come out through the outlets on the heating system.

The pressure at which the heating system is filled with cold water and the pre-inflation pressure of the expansion tank must correspond to, and in no case be less than, the height of the static column on the heating system (for example, in the case of a static column of 5 metres, tank pre-filling pressure and filling pressure must at least correspond to a minimum of 0.5 bar).

2.5 FLUE

The flue for evacuation of the products of combustion of natural draught boilers into the atmosphere must meet the following requirements:

- sealed against products of combustion, waterproof and heat insulated;
- made of materials which can resist normal mechanical stress, heat and the action of products of combustion and condensation produced by them over time;
- vertically oriented and free of choking throughout its length;
- adequately insulated to prevent condensation or cooling of flue gases, especially if located outside the building or in unheated premises;
- separated from combustible or highly flammable materials by an air space or appropriate insulation;
- provided with a chamber at least 500 mm high for collection of solid materials and condensation underneath the entrance to the first channel. This chamber must be accessible through an opening with a metal door which does not let air in;

- circular, square or rectangular internal section; if square or rectangular, corners must be rounded off with a radius of no less than 20 mm; hydraulically equivalent sections are also permitted;
 - fitted with a chimney pot at its top, the outlet of which must be outside of the so-called reflux area to prevent formation of counter-pressure preventing the products of combustion from being freely released into the atmosphere.
- The minimum heights shown in fig. 4 must be complied with;
- without mechanical intake devices at the top of the flue;
 - if the flue passes through or adjacent to inhabited rooms, there must be no over-pressure.

2.5.1 Flue size

The correct sizing of the flue is an essential condition for efficient boiler operation. The main factors to be taken into consideration for calculating the section are the heat input of the boiler, the type of fuel, the percentage of CO₂, the mass flow of smoke at nominal load, the temperature of the smoke, the roughness of the internal wall, and the effect of gravity on the draught pressure, which must take into account the external temperature and the altitude.

Table 1 shows specific parameters pertaining to "RS Mk.II" boilers.

2.6 BOILER BODY

The cast iron body is supplied ready assembled; if it cannot enter the boiler room assembled, it may be supplied dismantled. Follow the instructions below to assemble the body:

- Prepare components by cleaning the housings of the conical nipples with thinner.
- Introduce the plaster seam into the groove provided for the flue gas seal, pressing gently (fig. 5).
- Prepare one of the two intermediate heating elements with a 1/2" perforated stud, lubricating the conical nipples with boiled linseed oil before introducing them (fig. 5/a).
- Prepare the head, following the same procedure, and bring it into position adjacent to the intermediate element. Add only one element at a time.
- Assemble the heating elements using the pair of tie rods supplied assembled with their accessories, code 6050900 (fig. 6), exerting pressure on the upper hub and on the lower hub simultaneously. In the event that the elements should not move forward in parallel during this operation, introduce the chisel into the tighter part and force the two parts to be joined into parallel. The two elements are properly joined when their outer edges come into contact.
- Introduce the plaster seam into the

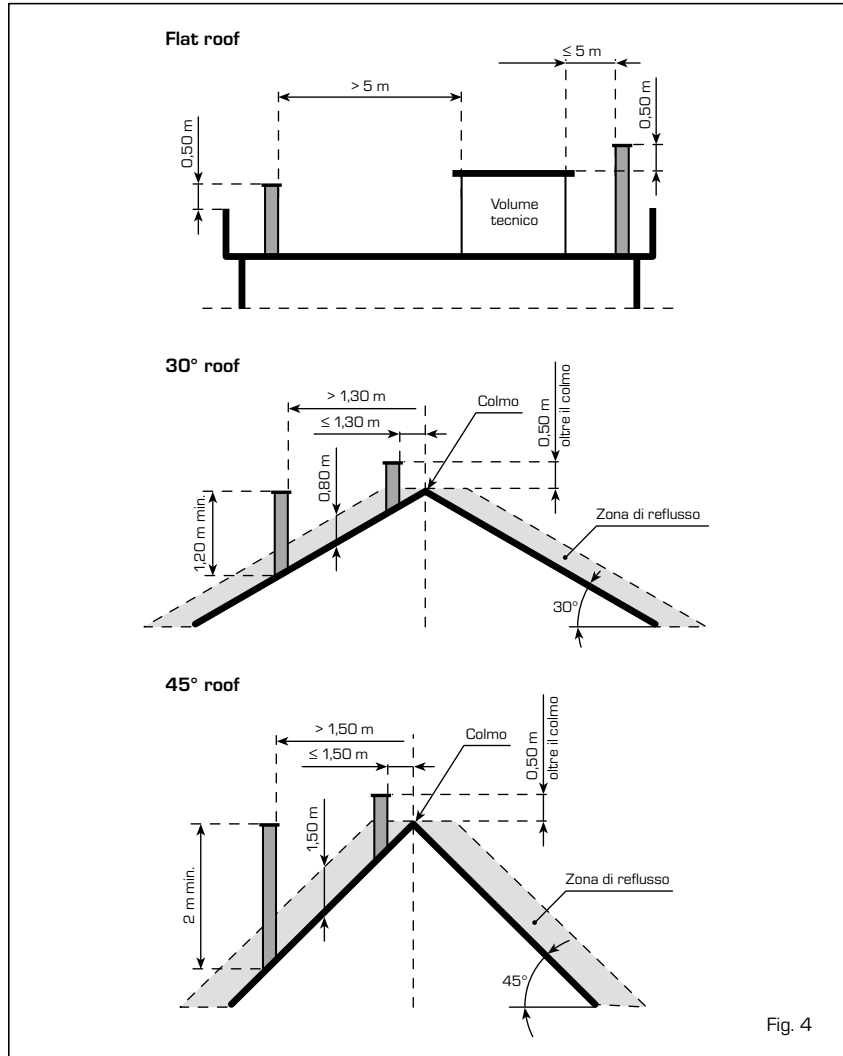


Fig. 4

TABLE 1

	Thermal capacity kW	Flue gas temperature °C	Flue gas rate of flow gr/s
RS 129 Mk.II	145,9	154	109,4
RS 151 Mk.II	170,0	170	111,7
RS 172 Mk.II	194,2	173	118,6
RS 194 Mk.II	218,2	153	160,8
RS 215 Mk.II	242,1	160	164,2
RS 237 Mk.II	266,0	143	206,9
RS 258 Mk.II	290,0	148	213,6
RS 279 Mk.II	313,6	154	212,5

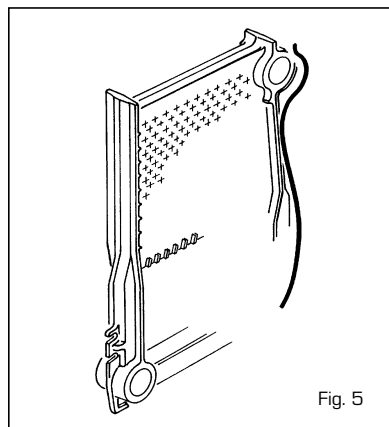


Fig. 5

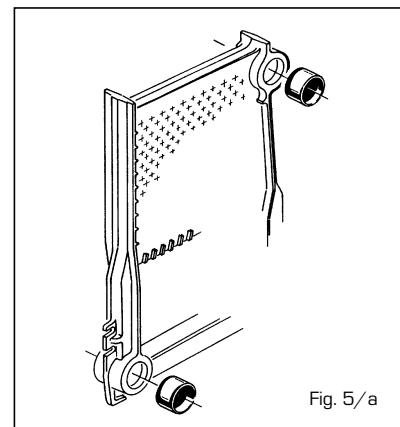
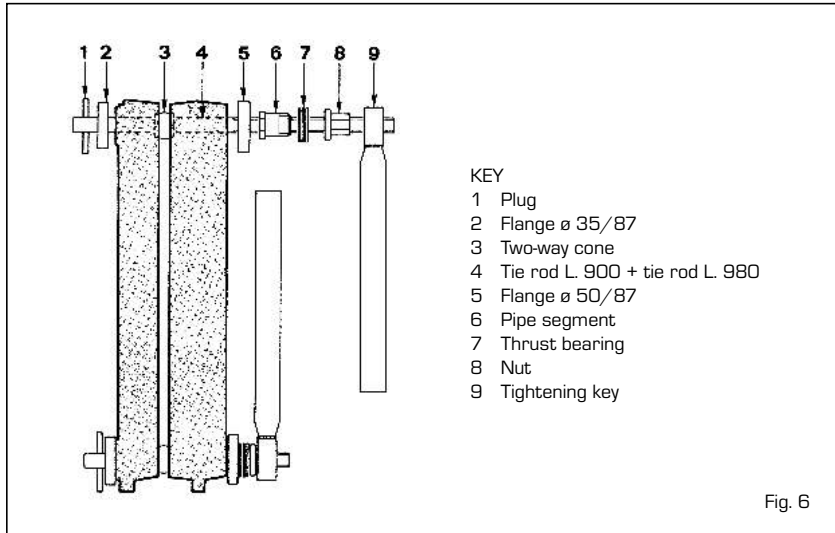


Fig. 5/a



groove in the element just mounted and proceed to join the other elements until the body is complete.

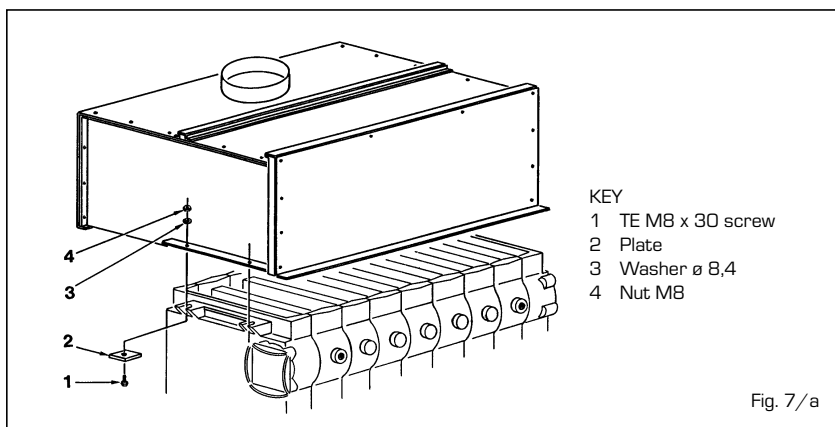
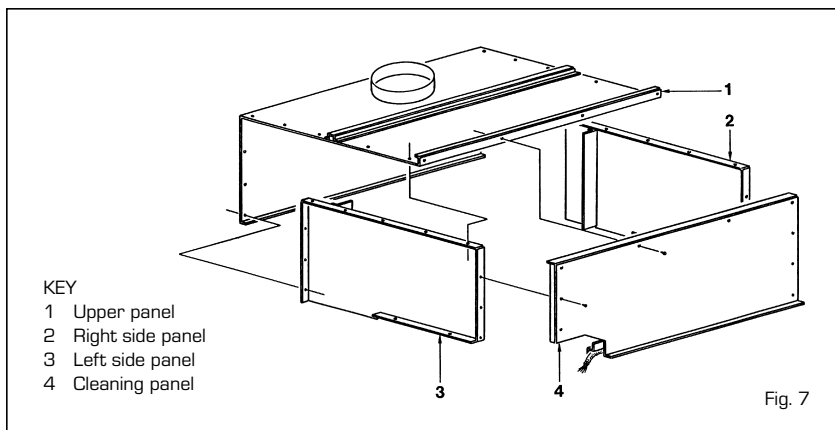
NOTE: Before making the connection with the heating system, test the cast iron body at a pressure of 7.5 bar.

2.7 ASSEMBLING THE FLUE GAS CHAMBER

The flue gas chamber is supplied in four

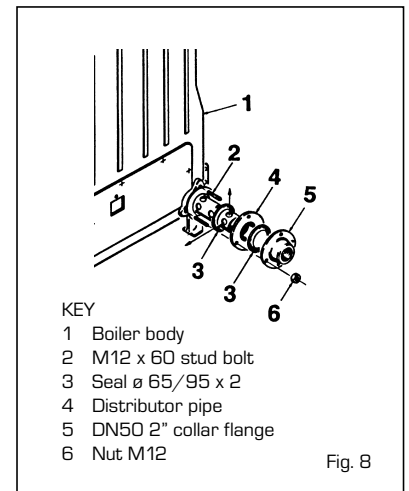
pieces to be joined with screws supplied (fig. 7). It is assembled by anchoring the right side panel (2) to the upper panel (1) with nine self-tapping TE 12E x 1/2" screws.

The same operation must be performed on the left side panel (3). Lastly, anchor the cleaning panel in place (4). When assembly is complete, position the flue gas chamber above the cast iron body. Anchor the flue gas chamber to the body using the four plates and the four TE M8 x 30 screws supplied (fig. 7/a).



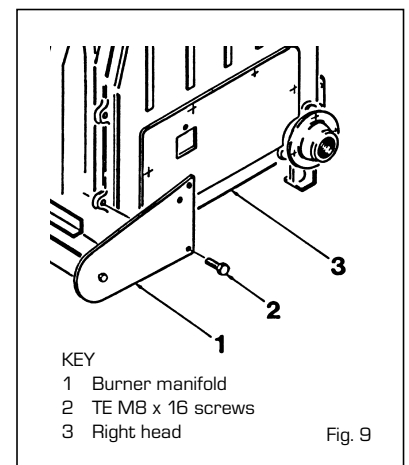
2.8 ASSEMBLING THE WATER DISTRIBUTOR

The water distributor on the return line coming in from the heating system is located on the right side of the generator. If it is necessary to move it to the left side, check that the two rows of holes in the distributor are directed upwards and toward the front of the boiler (fig. 8).



2.9 ASSEMBLING THE BURNER MANIFOLD

To assemble the burner manifold, screw in the four TE M8 x 16 screws on the threaded ribs of the two heads of the boiler body (fig. 9).



2.10 ASSEMBLING THE BURNERS

Once the burner manifold has been assembled, insert the burners in the combustion chamber one at a time, ensuring that the slits in the burner are turned upward. Push so that the burner support goes into the hole in the cast iron wall and divides the elements (fig. 10). Anchor the burner to the manifold with a TCB M5 x 8 screw.

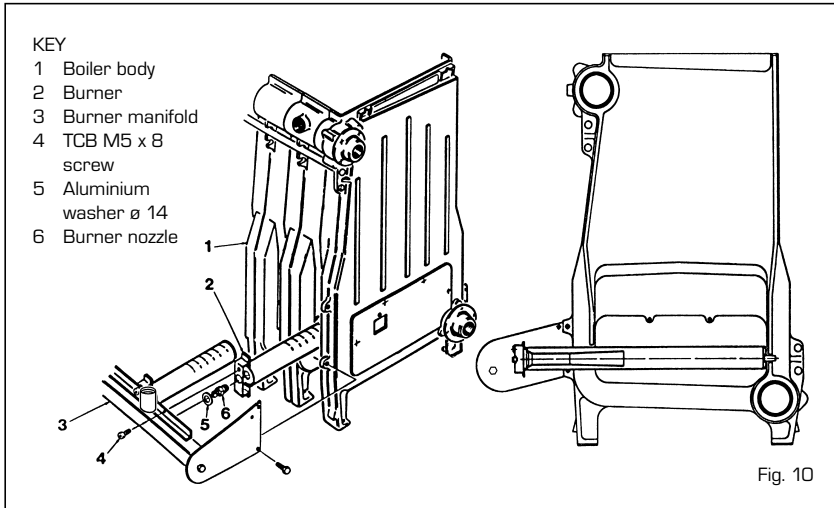


Fig. 10

2.11 ASSEMBLING THE SKIRT

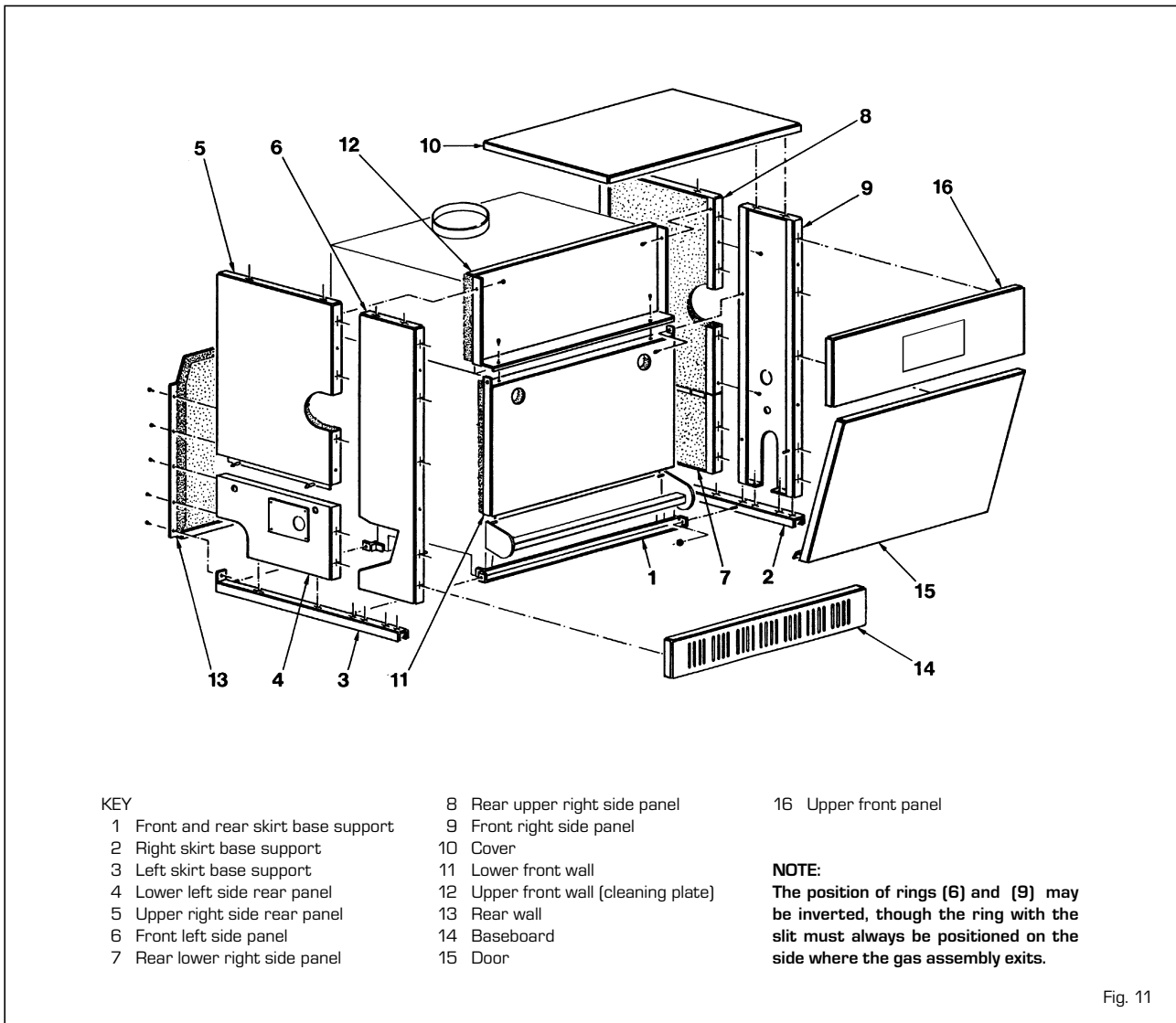
Proceed as follows to assemble the skirt (fig. 11):

- Position the front and back supports of the skirt base (1) between the feet on

the two heads.

- Anchor the side supports (2) and (3) to the front and back of the skirt base (1) with the M6 nuts supplied.
- Anchor panel (4) to panel (5) and panel (7) to panel (8) using the connecting pins.

- and panels (7-8) to panel (9) using connecting pins, anchoring them together with two 7SP x 1/2" self-tapping screws.
- Assemble panels (4) and (6) on the base (3), anchoring them on connecting pins. Proceed in the same way to anchor panels (7) and (9) to the base (2).
- Position the lower front wall (11) by fitting it in between the screws on the burner manifold support brackets and the cast iron body; anchor the walls to panels (6) and (9) with two 7SP x 1/2" self-tapping screws.
- Position the upper front wall (12) by anchoring it to panels (5-8) and to wall (11) using four 7SP x 1/2" self-tapping screws.
- Anchor the rear wall (13) to panels (4-5) and (7-8) using the eight 7SP x 1/2" self-tapping screws supplied.
- Assemble the baseboard (14), anchoring it to panels (6) and (9) using connecting pins.
- Proceed in the same way to anchor the upper front panel (16) in place.
- Assemble the cover (10) and the door (15).



KEY

- 1 Front and rear skirt base support
- 2 Right skirt base support
- 3 Left skirt base support
- 4 Lower left side rear panel
- 5 Upper right side rear panel
- 6 Front left side panel
- 7 Rear lower right side panel

- 8 Rear upper right side panel
- 9 Front right side panel
- 10 Cover
- 11 Lower front wall
- 12 Upper front wall (cleaning plate)
- 13 Rear wall
- 14 Baseboard
- 15 Door

- 16 Upper front panel

NOTE:

The position of rings (6) and (9) may be inverted, though the ring with the slit must always be positioned on the side where the gas assembly exits.

Fig. 11

2.12 ASSEMBLING THE GAS ASSEMBLY

Connect the gas assembly to the burner manifold as shown in fig. 12.

The gas assembly may be assembled on the right or left side of the manifold.

WARNING: in case of the gas assembly is mounted on the left side of the manifold, remove and rotate the gas valve of 180° to get access frontally at the regulations.

2.13 ASSEMBLING THE CONTROL PANEL (fig. 12/a)

Remove the control panel's protective cover and insert the wiring guard on the front upper panel, anchoring it in place with the screws provided. Replace the cover. Proceed to assemble the instrument panel, anchoring it in place with the screws provided. Insert the instrument bulbs in their sheaths: first insert the control thermostat bulb, pushing it in until it touches the bottom of the sheath.

WARNING: To ensure correct temperature control in the boiler, the bulbs of the control and safety devices must be inserted in the sheath from the side corresponding to the heating system delivery and return connections. If the heating system delivery and return connections are on the left side of the generator, the gas assembly must also be assembled on the left side to permit this arrangement.

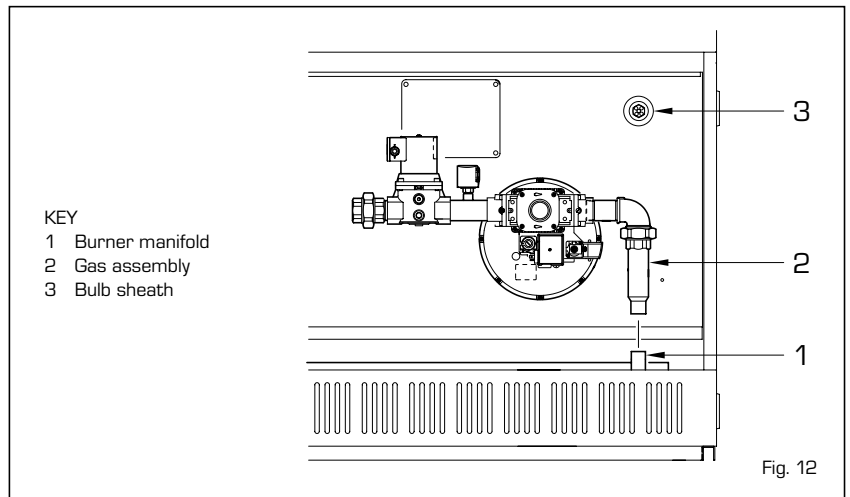
2.14 ASSEMBLING THE ELECTRICAL PANEL (fig. 12/b)

Remove the cover of the electrical panel and anchor the control panel to the lower front wall using the screws provided.

Connect the two sockets to the plugs from the control panel. Complete the electrical panel by hooking up the gas valve, the second gas solenoid valve, the gas pressure switch and the coil. Unwind the cables of the ignition and detection electrodes emerging from the electrical panel. Insert the ignition electrode in the hole between the head and the intermediate on the gas assembly side, anchoring it to the two stud bolts (fig. 12/c).

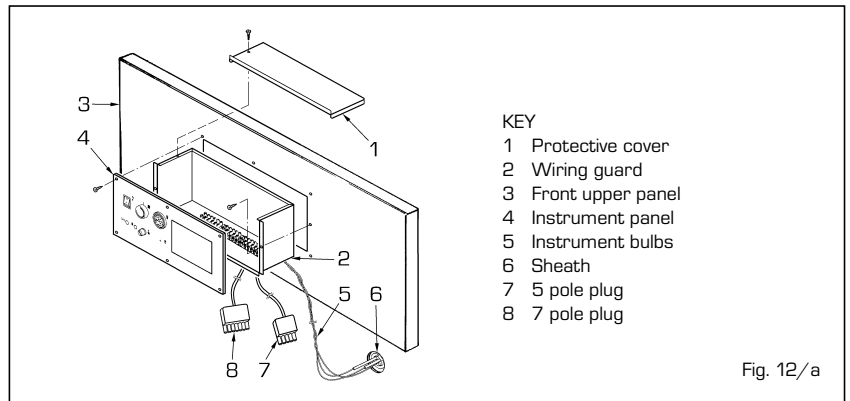
Perform the same operation on the detection electrode, which will go in the hole provided between the head and the intermediary at the other end of the body.

NOTE: When assembling the two electrodes, be very careful not to break their ceramic coating; they must be replaced immediately if it is broken. All gas connections must be tested for seal after assembly using soapy water or products manufactured specifically for the purpose, without using open flame.



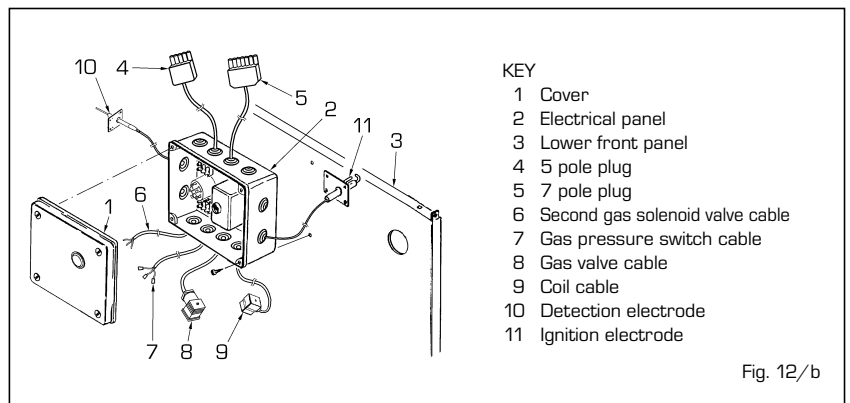
- KEY
- 1 Burner manifold
 - 2 Gas assembly
 - 3 Bulb sheath

Fig. 12



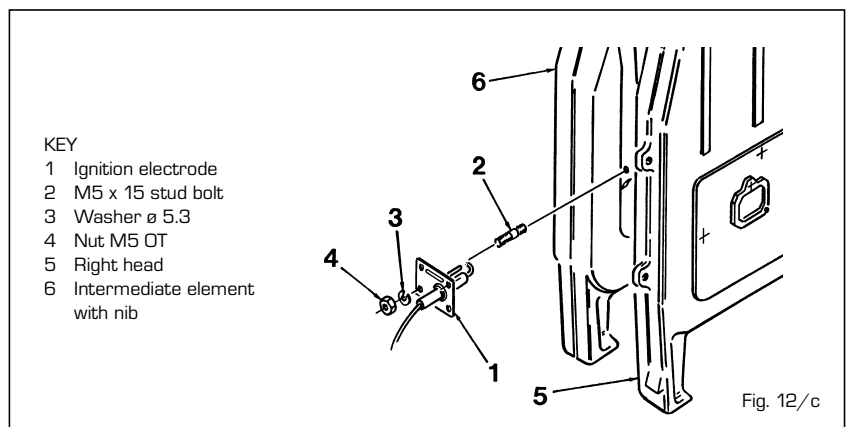
- KEY
- 1 Protective cover
 - 2 Wiring guard
 - 3 Front upper panel
 - 4 Instrument panel
 - 5 Instrument bulbs
 - 6 Sheath
 - 7 5 pole plug
 - 8 7 pole plug

Fig. 12/a



- KEY
- 1 Cover
 - 2 Electrical panel
 - 3 Lower front panel
 - 4 5 pole plug
 - 5 7 pole plug
 - 6 Second gas solenoid valve cable
 - 7 Gas pressure switch cable
 - 8 Gas valve cable
 - 9 Coil cable
 - 10 Detection electrode
 - 11 Ignition electrode

Fig. 12/b



- KEY
- 1 Ignition electrode
 - 2 M5 x 15 stud bolt
 - 3 Washer ø 5.3
 - 4 Nut M5 OT
 - 5 Right head
 - 6 Intermediate element with nib

Fig. 12/c

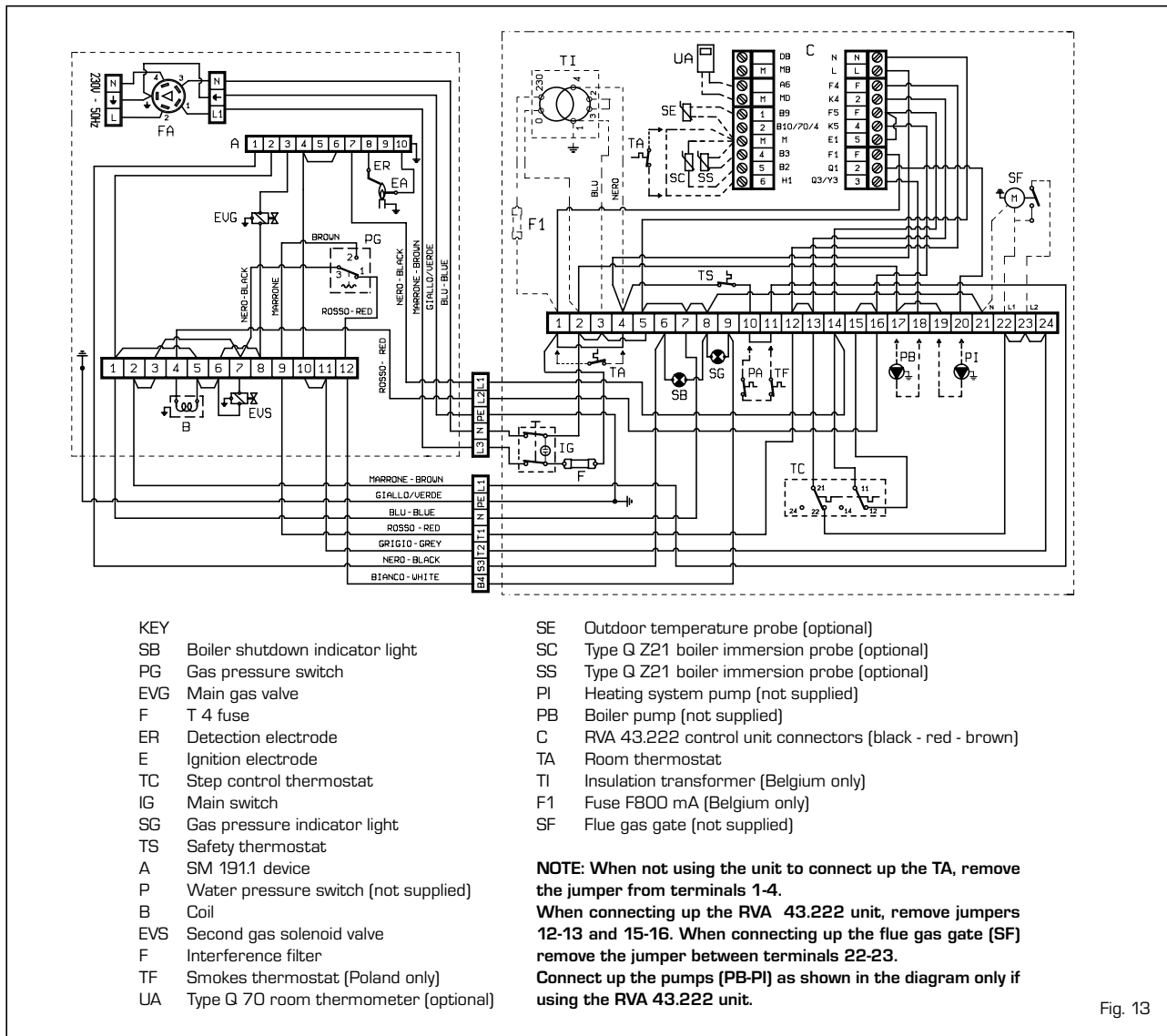


Fig. 13

2.15 ELECTRICAL CONNECTION

The electrical power supply must be connected to terminals L and N and to the panel complying with all phase and neutral positions as shown in the diagram. If they are not connected properly, the flame detection circuit will not work and the boiler will be shut down. The boiler must be connected up to a single phase 230V-50Hz power supply through a main switch protected by fuses with at least 3 mm between contacts (fig. 13).

NOTE: The device must be connected to an efficient grounding system. SIME shall not accept any liability for damage or injury resulting from failure to ground the boiler. Turn off the power supply before performing any operations on the electrical panel.

2.16 RVA43.222 CONTROL UNIT (optional)

All boiler functions can be controlled by the

optional control unit code 8096303, supplied with an outdoor temperature probe (SE) and boiler immersion probe (SC) (fig. 14). Use of the control unit requires connection of an additional series of low voltage connectors for connection of probes and the room temperature control unit (the connectors are supplied in a bag in the

control panel). The bulb of the sensor of the external D.H.W. tank (SS), optional code 6277110, must be inserted in the hot water sheath and the boiler probe (SC) in the boiler sheath. To assemble the outdoor temperature probe (SE), follow the instructions provided on its packaging.

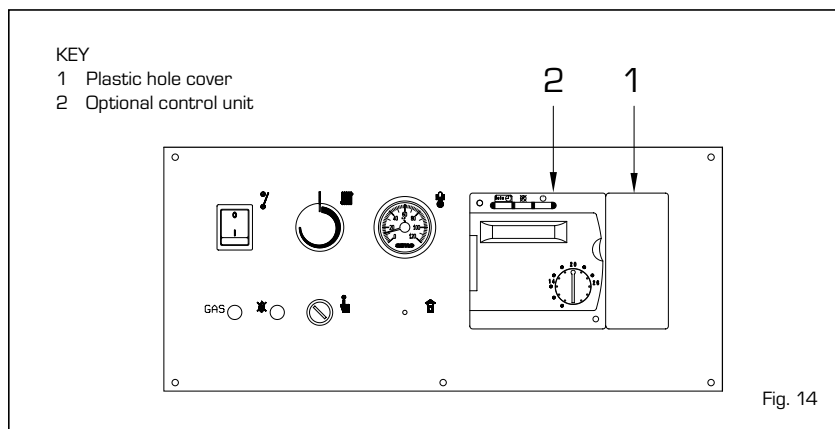


Fig. 14

Refer to the wiring diagram in fig. 13 for electrical connections.

WARNING: to grant the correct operation of the plant set the boiler thermostat at the maximum value.

2.16.1 Features and functions

“RVA 43.222” is realized as regulator of one boiler mono or bi-stadium or regulator of cascade connections to manage 16 boilers maximum.

Economical operation

- Heat production may be turned on or off in the presence of integration with accumulation.
- Boiler temperature control on the basis of climate, permitting environmental compensation.
- Direct heating circuit management (with pump) for each controller.
- Automatic adaptation to climatic curve on the basis of the building’s thermal inertia and the presence of “free heat” sources (with environmental compensation).
- On/off optimisation (accelerated heating and early off feature).
- Daily economy function calculated on the basis of the dynamic characteristics of the building.
- Automatic summer/winter switch.

Protective functions

- Minimum and maximum delivery temperature settings.
- Differentiated anti-freeze protection for boiler, hot water tank and heating system.

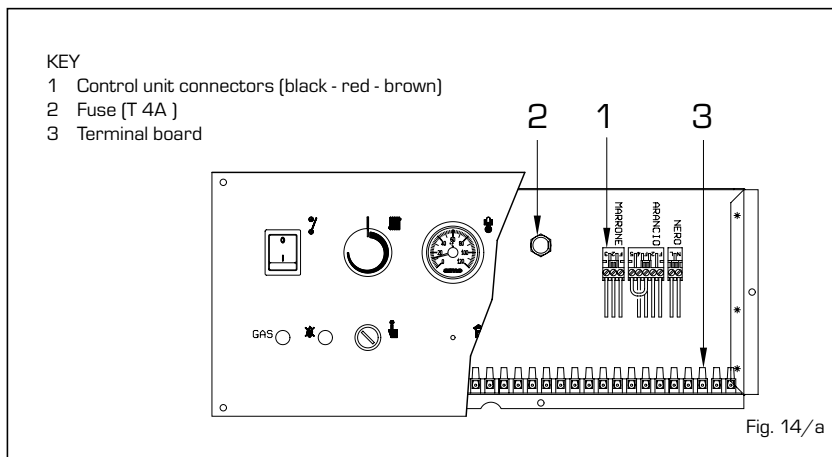


Fig. 14/a

- Boiler overheating protection.
- Pump seizing up protection.
- Burner protection with minimum operating temperature.

Operative functions

- Simplified start-up.
- All calibration operations are performed on control unit.
- Standard weekly programming.
- All calibration operations and operating settings can be read on leds and display.
- Relay and probe tests.

Hot water production

- Daily scheduling.
- Minimum hot water delivery temperature may be set for reduced time period.
- Control of hot water tank filling pump.
- Selectable priority of hot water circuit.

Other technical features

- Easy connection with digital environmental unit (QAA 70).

2.16.2 Electrical connection

The electrical circuit includes a series of connectors for installation of an optional control unit, marked with different colours: black, red and brown (fig. 14/a). Connectors are polarised so that order cannot be inverted. To install the control unit, connect these connectors and remove jumpers 12 - 13 and 15 - 16 from the terminal board (fig. 13). The control unit also permits use of room temperature control units and probes; polarised, coloured connectors for these are located in a bag inside the control panel.

3 FEATURES

3.1 ELECTRONIC IGNITION

"RS Mk.II" boilers have automatic ignition (with no pilot light), so they have an SM 191.1 electronic control and protection device with a built-in transformer (fig. 15).

Ignition and flame detection are controlled by two sensors at the ends of the burner: Ignition takes place directly in the burner; the utmost safety is guaranteed, with tripping times of within 2 seconds in the event that the flame accidentally goes out or there is no gas supply.

3.1.1 Functioning cycle

Before turning on the boiler use a volt meter to check that the terminal board has been wired up correctly, complying with the phase and neutral positions shown in the diagram.

Press the switch on the control panel. At this point the boiler will start up, sending a current discharge through the SM191.1 programmer to the ignition electrode while opening the gas valve.

When the gas pressure is insufficient, the pressure switch does not enable the start-up cycle and the insufficient gas pressure warning signal is enabled. Burner ignition normally takes 1 to 2 seconds.

In the event that ignition fails, the boiler shutdown signal will be triggered. Let us sum up how this can happen:

- Air in the gas pipes

The boiler performs the cycle normally, sending voltage to the ignition electrode, which continues to discharge for a maximum of 8 seconds. If the burner is not ignited, the boiler shuts down.

This may occur the first time the boiler is started up or when it has been inactive for some time and there is air in the pipes. It may be caused by failure to open the gas valve due to an interruption in the electrical coil.

- Ignition electrode fails to discharge

The gas valve to the burner normally opens; if this does not occur within 8 seconds the boiler will shut down.

This may be the result of an interruption in the electrode cable, or the cable may not be properly fastened to terminal 10; or the boiler's transformer may have been burnt out.

- The flame is not detected

The electrode continues to discharge even though the burner is already ignited. After about 8 seconds the discharge will

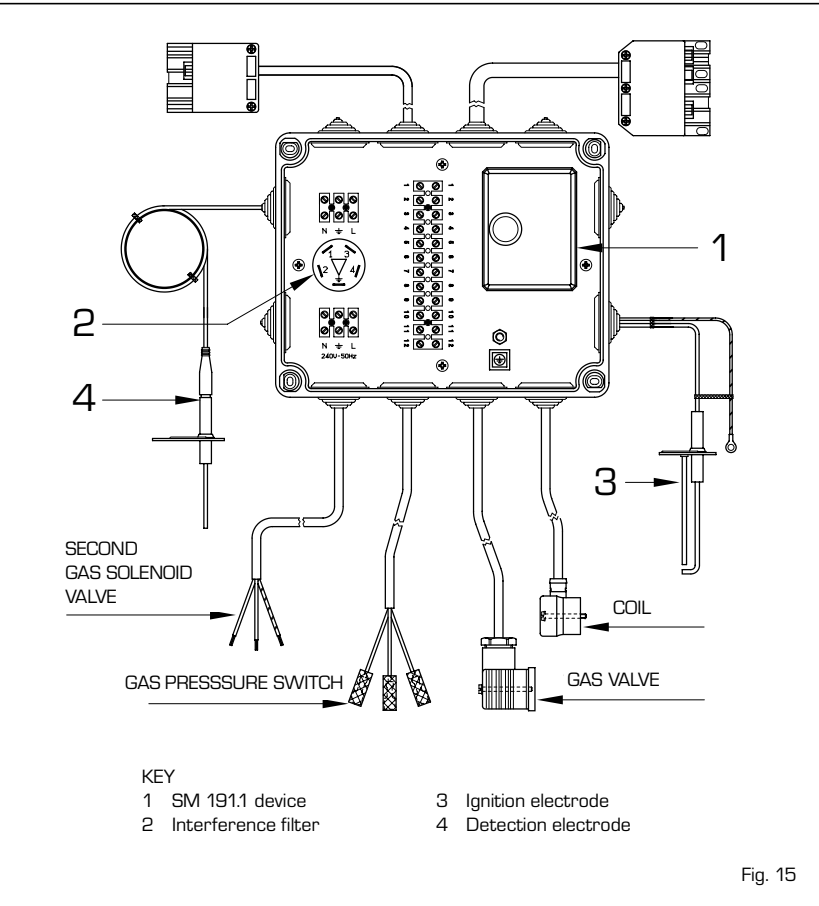


Fig. 15

stop and the burner will be shut down, while the device's shutdown indicator light will come on.

This occurs if phase and neutral have not been connected properly on the terminal board. The detection electrode cable may be interrupted or the electrode itself may be grounded; the electrode may be worn and require replacement.

NOTE: if the device shuts down, press the illuminated pushbutton only after waiting at least 20 seconds from when the indicator light came on, or the device will not be released.

3.1.2 Ionisation circuit

The ionisation circuit may be controlled using a micro-ammeter with a dial or, better yet, a digital reading, with a scale of 0 to 50 μ .

The micro-ammeter's terminals must be wired up to the detection electrode cable in series. During regular operation the reading fluctuates around 6-12 μ . The minimum ionisation current at which the device may be shut down is around 1 μ .

If this occurs, check that there is proper electrical contact and check the end of the electrode and its ceramic guard for wear.

3.2 STEP CONTROL THERMOSTAT

"RS Mk.II" boilers have a control thermostat with dual contacts with differentiated calibration which permit a reduction in power before the burner goes out completely through the coil assembly (fig. 22) mounted on the gas valve control.

This step modulation system offers the following advantages:

- Higher overall boiler yield.
- Limitation of temperature increases in the cast iron body (thermal inertia) to within acceptable values when the burner goes out.

3.3 OPPOSED INSTALLATION OF TWO BOILERS

On request, accessories may be supplied to permit opposed installation of two boilers so as to reduce overall dimensions and permit easy connection with the flue by allowing flue gases to be evacuated through a single duct (fig. 16-17).

Table 2 shows the dimensions of the two combined boilers and stack diameter.

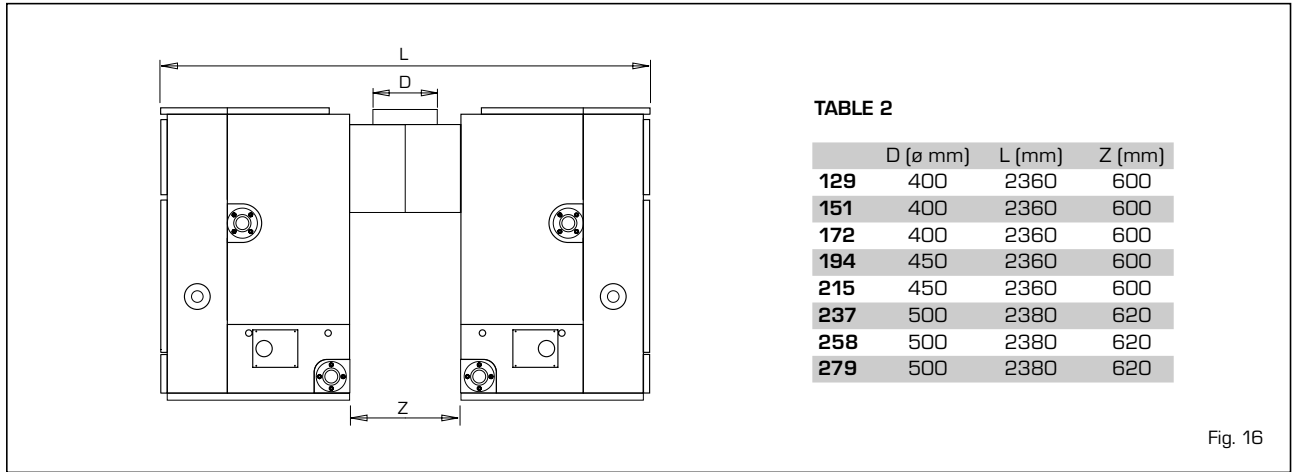


Fig. 16

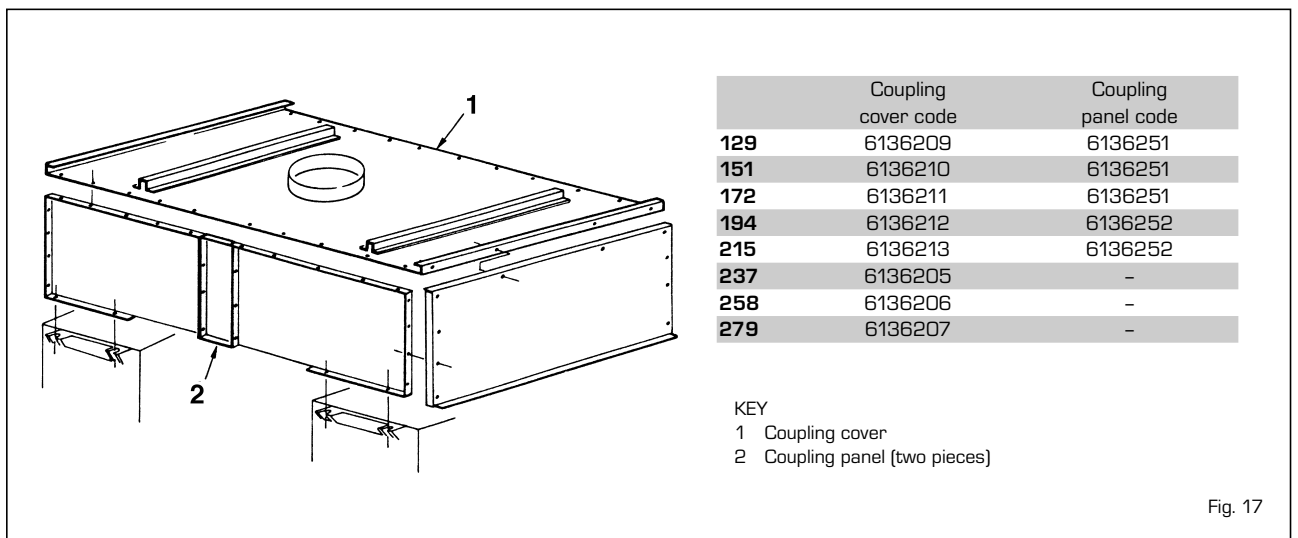


Fig. 17

3.4 BOILER CIRCUIT LOAD LOSS

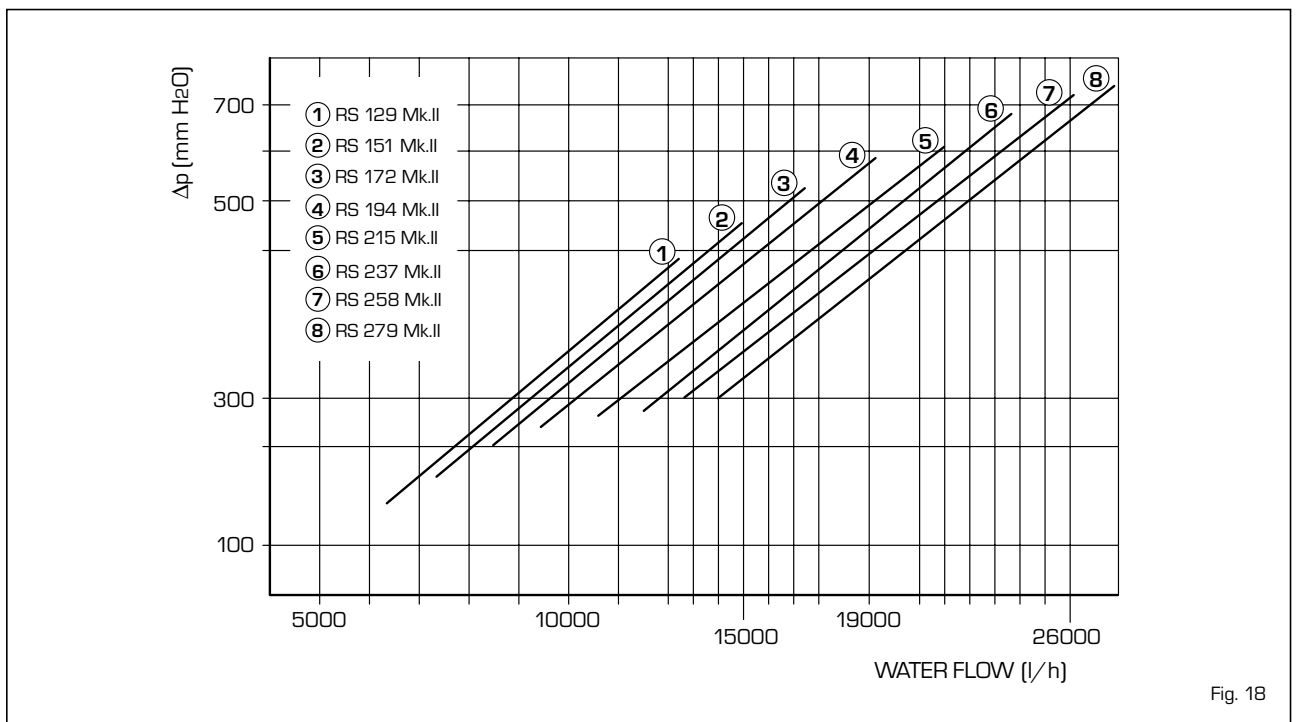


Fig. 18

4 USE AND MAINTENANCE

4.1 GAS VALVE

Boilers are normally produced with a HONEYWELL V4085 gas valve (fig. 19).

NOTE:

The seal on the slow opening control (accelerator 5) must not be tampered with in any way or the valve guarantee will be nullified.

4.1.1 Rectified connector

The electrical command on valve V4085 is supplied by a rectified connector (code 6243600), which must be replaced if it is broken. Follow the instructions in fig. 20 to replace it.

4.2 GAS VALVE ADJUSTMENT

“RS Mk.II” boilers have a gas valve with a coil assembly which permits power to be reduced by about 40% of the rated power level before the burner goes out all the way through a control thermostat with dual contacts. SIME sets the maximum pressure setting and the reduced pressure setting on the production line, and these settings should not be changed except in the case of change to another type of gas (butane or propane), in which case they may be changed complying with the values shown in Table 3.

This operation must be performed exclusively by authorised service technicians, or the guarantee will be nullified.

Operations involved in adjustment of pressure settings must be carried out in a certain order, adjusting the maximum pressure first and then the reduced pressure.

4.2.1 Adjusting maximum and minimum pressure

Proceed as follows to set the maximum pressure (fig. 21):

- Connect the column or pressure gauge to the pressure intake on the burner manifold.
- Slacken screw (4) all the way.
- Set the thermostat knob to the maximum value.
- Turn on the power supply to the boiler.
- Slacken lock nut (1) and turn union (3): turn the union anti-clockwise to reduce pressure, or clockwise to increase it.
- Tighten lock nut (1).
- Turn on the main switch repeatedly, checking that pressure corresponds to the values specified in Table 3.

After setting maximum pressure, set minimum pressure as follows (fig. 21):

- Once again, use the column or a pressure gauge to read pressure.
- Turn off the power supply to the coil (2)
- Turn on the boiler and allow it to operate

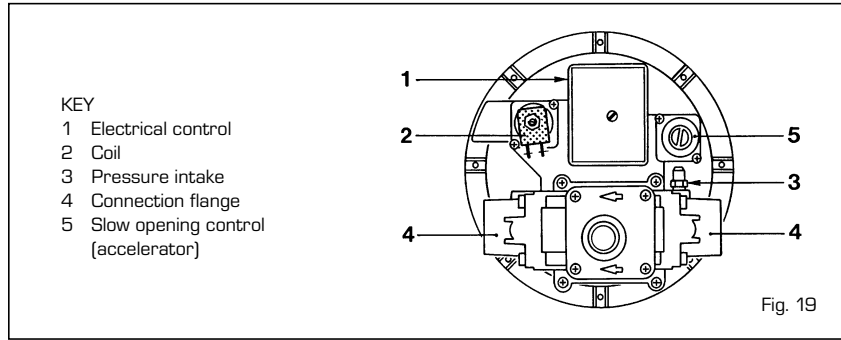
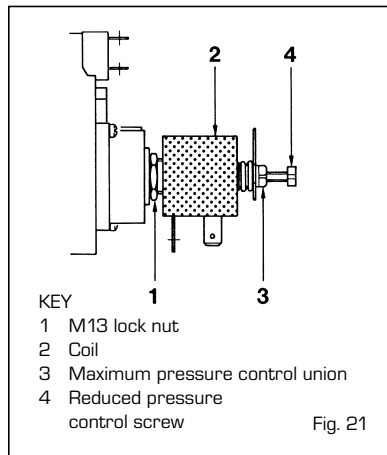
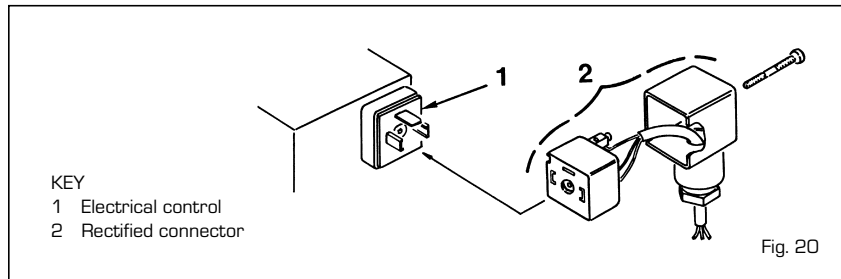


TABLE 3

Type of gas	Reduced burner pressure mbar	Max. burner pressure mbar
Methane - G20	6	9,7
Butane - G30	15	28
Propane - G31	15	35



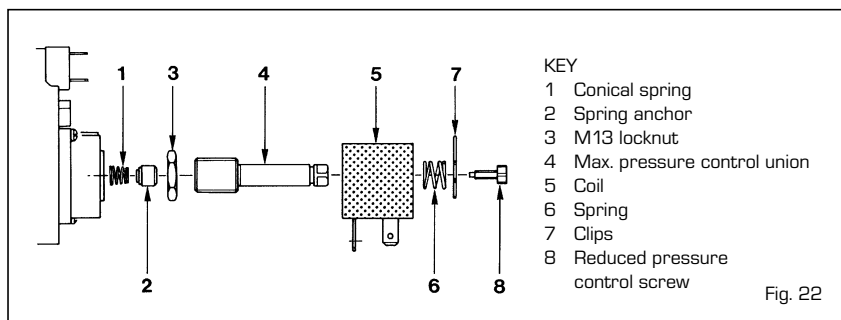
- Leave the thermostat knob in this position and turn the screw (4) to find the reduced pressure value specified in Table 3 for the type of gas in use; turn screw (4) anti-clockwise to decrease pressure or clockwise to increase pressure.
- Restore the power supply to the coil.
- Turn on the main switch repeatedly, checking that pressure corresponds to the specified value.

4.3 SECOND GAS SOLENOID VALVE

The gas assembly is normally produced with a second gas solenoid valve which is normally closed.

4.4 COIL

Coil components are identified in fig. 22.



4.5 TRANSFORMATION TO ANOTHER TYPE OF GAS

A kit is supplied containing everything required for transformation to butane gas (G30) or propane gas (G31).

Transformation from one type of gas to another requires replacement of the main nozzles and the conical spring (1, fig. 22). Proceed as specified in point 4.2.1 to adjust operating pressures.

When finished, apply the plate provided in the kit for identification of the gas for which the boiler is set up to the skirt.

NOTE: All gas connections must be tested for seal using soapy water or products intended for the purpose after assembly. DO NOT USE OPEN FLAME.

4.6 CLEANING AND MAINTENANCE

At the end of the heating season, perform boiler cleaning and maintenance as follows (fig. 23):

- Turn off the power supply to the electrical panel.
- Remove the skirt door (2) and baseboard (1).
- Unhook the upper front panel (3) and hook it to the pins below it.
- Remove the cover (6).
- Remove the screw holding each burner (7) in place and remove the burner from the combustion chamber.
- Remove the screws holding the upper inside panel (4) in place.
- Remove the screws holding the cleaning panel in place (5).
- Clean the flue gas passageways with a

brush.

- Next clean the burners, blowing air through them under pressure.
- Check the positioning and wear of electrodes.
- Clean the stack union and check the efficiency of the flue.
- After assembly, test the seal of all gas connections using soapy water or a product manufactured for the purpose. Do not use open flame.

Preventive maintenance and control of the functioning of the device and its safety systems must be performed exclusively by authorised technical service technicians.

4.7 FAULT FINDING

The power supply to the ring is on but the boiler does not start.

- Check the gas supply to the boiler.
- Check that the safety and control thermostats are closed.
- Gas is not reaching the pressure switch.
- Check that the electronic device is working, and replace it if necessary.

The boiler comes on and goes off continually, as does the red gas pressure switch indicator light.

- Check the pressure drop of the gas mains when the boiler starts up. The dynamic pressure value at the gas valve inlet must be no less than 9.7 mbar.
- Check the gas line.
- Check for load loss in any solenoid valves or safety devices installed upstream of the gas assembly.
- Check gas pressure switch setting and

functioning, and replace the switch if necessary.

The ignition electrode discharges but the burner is not ignited.

- There may be air in the pipe the first time the burner is turned on for the first time or if it has been inactive for a long time.
- Check whether the rectifier card in the connector supplying the gas solenoid valve is functioning, and replace it if necessary.
- The valve coil's electrical winding is interrupted; it must be replaced.

The ignition electrode does not discharge.

- The electrical cable is interrupted or is not properly fastened to terminal 10.
- The device's transformer has burnt out and must be replaced.

No flame detection.

- The phase and neutral positions on the terminal board have not been complied with.
- Check if the ground wire is connected.
- The electrode cable is interrupted or not correctly fastened to terminal 8.
- The detection electrode is grounded.
- The electrode is very worn or its ceramic guard has been ruined. It must be replaced.
- The device is faulty and must be replaced.
- Phase/phase electrical lines may require application of a transformer; code 6239700.

The boiler works only at the rated pressure and does not permit pressure reduction.

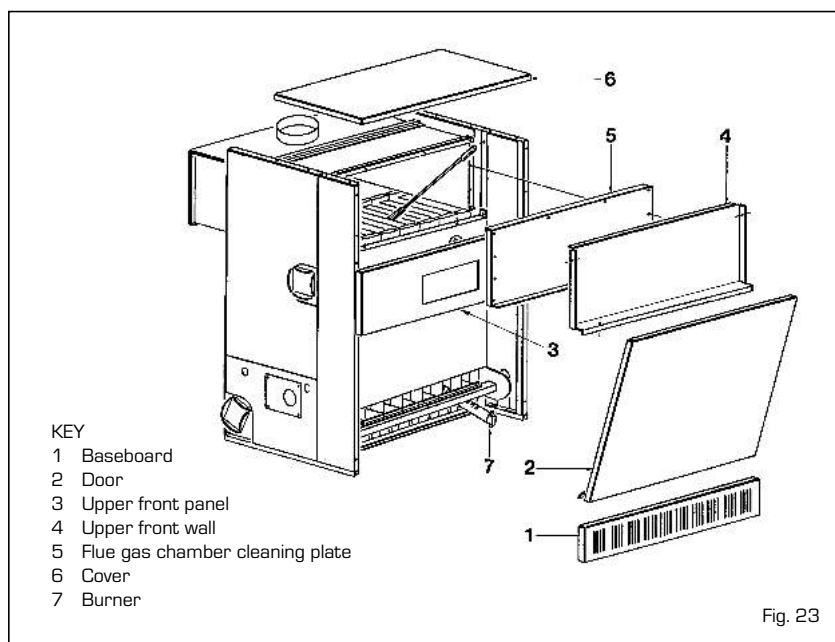
- Check for voltage at the ends of the coil.
- The coil and winding are interrupted and must be replaced.
- The rectifier card supplying the coil is interrupted and must be replaced.
- There is not differential between the settings of the two contacts on the control thermostat. It must be replaced.
- Check the setting of the reduced pressure control screw on the coil assembly (4, fig. 21).

The boiler goes out easily and creates condensation.

- Check that the main burner flame is adjusted correctly and that gas consumption is proportionate to boiler power.
- Poor ventilation in the room in which the boiler is installed.
- Flue has insufficient draught or does not meet requirements.
- The boiler is working at temperatures which are too low. Adjust the boiler thermostat to a higher temperature.

The thermostat turns the boiler on again with a temperature difference which is too high.

- Replace the control thermostat; it is incorrectly set.



USER'S INSTRUCTIONS

WARNINGS

- In the event of malfunctioning or breakdown, turn off the boiler, and do not attempt to repair it yourself. Contact your local authorised technical service centre.
- Boiler installation and all other service and maintenance operations must be performed by qualified personnel. Never tamper with any of the devices which the manufacturer has sealed.
- Never obstruct the air intake grids or the ventilation openings in the room in which the boiler is installed.

TURNING ON AND OPERATING THE BOILER

TURNING ON THE BOILER (fig. 1)

To turn on the boiler, simply set the control thermostat knob (5) to 60°C and press the main switch (1); the boiler will start automatically.

WARNING:

When the gas pressure is insufficient, the burner immediately turns off and the insufficient gas pressure warning signal is enabled (2). In this event, the boiler cannot be started again using the release button (6) for safety reasons. The boiler will automatically start again when the minimum pressure required by the gas pressure switch (10 mbar) is restored.

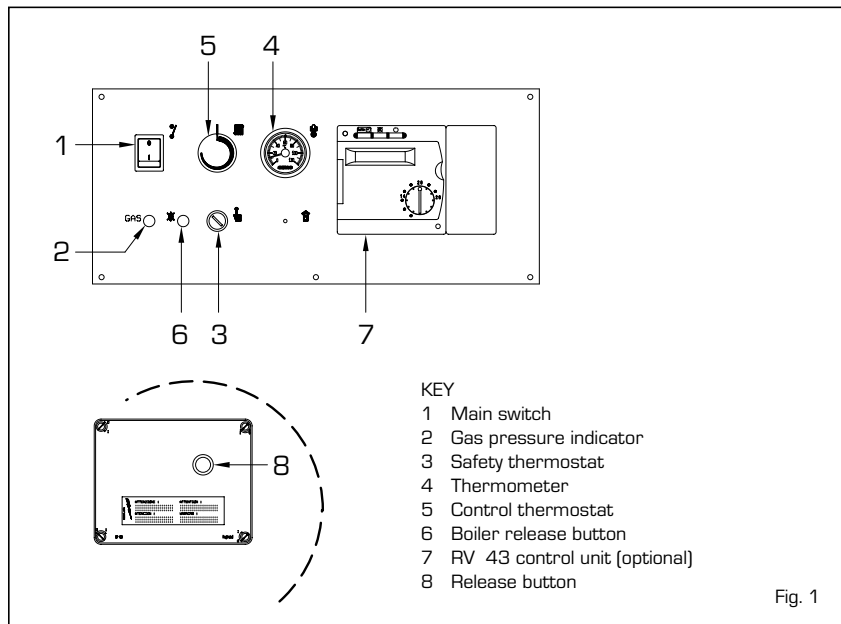
HEATING TEMPERATURE CONTROL (fig. 1)

Temperature may be controlled using the thermostat knob (5) within a range of 40 to 85°C. To ensure optimal performance of the generator, do not go below a minimum operating temperature of 60°C; this will prevent formation of condensation which could cause the cast iron body to deteriorate with time.

RELEASING THE ELECTRONIC DEVICE (fig. 1)

"RS Mk.II" boilers have automatic ignition (with no pilot light) and have an SM 191.1 electronic control and protection device. The boiler starts when the main switch (1) is pressed, sending discharge current to the ignition electrode through the programmer while simultaneously opening the gas valve. The burner will normally ignite within 1 or 2 seconds. Various factors may cause ignition to fail, triggering the signal which shuts down the boiler (1); if this occurs, press the release button (8) and the boiler will automatically start again.

If the boiler fails to ignite correctly and you have already pushed the release button two or three times, request the assistance of an authorised service technician.

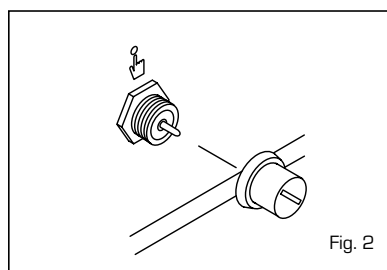


TURNING OFF THE BOILER (fig. 1)

To turn the boiler off completely, turn off the power using the main switch (1). Turn off the gas supply cock if the generator will not be used for some time.

SAFETY THERMOSTAT

The manually reset safety thermostat (3, fig. 1) is tripped when the boiler temperature exceeds 95°C, shutting off the main burner immediately. To start the boiler again,



remove the black cover and reset the button (fig. 2) once the boiler temperature has fallen below the level to which the thermostat is set.

TRANSFORMATION FOR USE OF ANOTHER TYPE OF GAS

If it is necessary to transform the boiler to burn a different type of gas, contact authorised SIME technical service personnel.

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 authorized technical staff.

CONTROL UNIT (optional)





Follow the instructions provided below to make the best use of your "RVA 43.222/109" control unit:

TO TURN ON THE HEATING

- Turn on the main switch.
- Set the correct hour of the day and the day of the week.
- Place in automatic mode with the button .



TO SET THE HOUR


Select the line	Display	Set the regulation with the buttons
	1	 hour of the day
	2	 day of the week



HOW TO USE THE AUTOMATIC MODE

In the automatic mode the temperature of the room is regulated on the basis of the periods of heating chosen.




- Push the button .

NOTE: Select the heating periods according to one's daily requirements; in this way it is possible to significantly save on energy.

TO ACTIVATE CONTINUOUS HEATING

The continuous heating mode keeps the temperature of the room at the set level via the regulating knob.



- Push the "Continuous Operation" button .
- Regulate the room temperature with the regulating knob.

TO SET THE STANDBY MODE

(when the user is away for a long period of time)

The standby mode keeps the temperature of the room at the level of antifreeze protection.






- Push the "Standby mode" button .



MEANING OF THE SYMBOLS

On the display a few of the symbols indicate the current operating state. The appearance of a line under one of these symbols signals that the corresponding operating state is "active".



 Heating at the nominal temperature (regulating knob)

 Heating at reduced temperature (line ).

 Heating at antifrost protection temperature (line .

NOTE: For further information on the symbols and the operating state refer to the detailed description of the heating plant.

TO VARY THE HOT WATER PRODUCTION

The production of hot water can be activated or deactivated by the push of a button.





- Push the button "Hot water" .

IF THE HOT WATER IS TOO HOT OR TOO COLD

Select the line	Display	Set the desired temperature
	13	 °C



IF THE ROOMS ARE TOO HOT OR TOO COLD



- Check that current operating state on the display.
- In the case of **nominal temperature** . Increase or reduce the temperature of the room with the regulating knob.
- In the case of **reduced temperature** .



Select the line	Display	Change the temperature with the buttons
	14	 °C



















NOTE: After each regulation wait at least two hours for the new temperature to expand through the room.

TO CHANGE THE HEATING PERIODS

Select the line	Display	Pre-select the weekly block or the single day
	5	 1-7 = week 1 = Lu/7 = Do



With reference to the day chosen set the changes as following:

Period requested	Push button	Display	Set hour	For °C
Period 1	Start 	6		
	End 	7		
Period 2	Start 	8		
	End 	9		
Period 3	Start 	10		
	End 	11		

NOTE: The heating periods automatically repeat on a weekly basis.

To this end select the automatic mode.


It is possible to reset the standard programme on line 23 by pushing the buttons + and - at the same time.

IF THE HEATING DOES NOT WORK PROPERLY

- Refer to the detailed documentation on the heating system, following the fault finding instructions.



TO MEASURE GAS COMBUSTION

- Push the "chimneysweep" button . The heating will work according to the level requested.



HOW TO SAVE ENERGY WITHOUT FOREGOING ON COMFORT

- A temperature of around 21°C is advised in the rooms that are used. Every degree above this will increase heating costs by 6-7%.
- Aerate the rooms only for a brief period, opening the windows completely.
- In the rooms that are not used place the regulating valve in the antifreeze position.
- Leave the space in front of the radiators free from obstructions (remove furniture, curtains...).
- Close windows and blinds to reduce dispersion of heat.

