

GB

# Super four

*Installation and  
servicing instructions*



*The code of practice for the installation,  
commissioning & servicing for central heating systems*

CERTIFICAZIONE  
DEL SISTEMA DI  
QUALITÀ AZIENDALE

**ISO 9001**  
registered by



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***The code of practice for the installation,  
commissioning & servicing for central heating systems***

Please refer to commissioning instructions for filling in the log book

Note: All CORGI registered installers carry a CORGI ID Card.  
You can check your installer is CORGI Registered by calling 01256 372300

## IMPORTANT

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

- Make sure that the system is charged with water and is thoroughly vented.
- Make sure that any shutoff valves are open.
- Check that the pipe for expulsion of products of combustion is unobstructed and has been properly installed.
- Make sure that the boiler is set for operation for the type of gas supplied.
- Open the gas tap and check the soundness of the connections, including that of the burner.
- Purge the system, bleeding off the air present in the gas pipe by operating the air relief valve on the gas valve inlet.
- Make sure that the electrical connections have been made correctly and that the earth wire is connected to a good earthing system.
- Check whether the circulating pumps are obstructed; if so, clear them out.
- Check that there are no liquids or inflammable materials in the immediate vicinity of the boiler.

# 1 DESCRIPTION OF BOILER

## 1.1 INTRODUCTION

“SUPER FOUR” boilers are gas-fired thermal appliances for C.H. and D.H.W. production.

They are defined as “sealed-room” appliances because the air necessary

for combustion is drawn in from outside the ambiances in which they are installed.

They come complete with all safety and control devices and appurtenances required by current standards, and are built in compliance with the

European Directives pr EN 483 - pr EN 625. These appliances can be fired by natural gas and L.P.G. (G30 - G31).

The instructions given in this manual are provided for the installer to ensure proper installation and perfect operation of the appliance.

## 1.2 DIMENSIONS

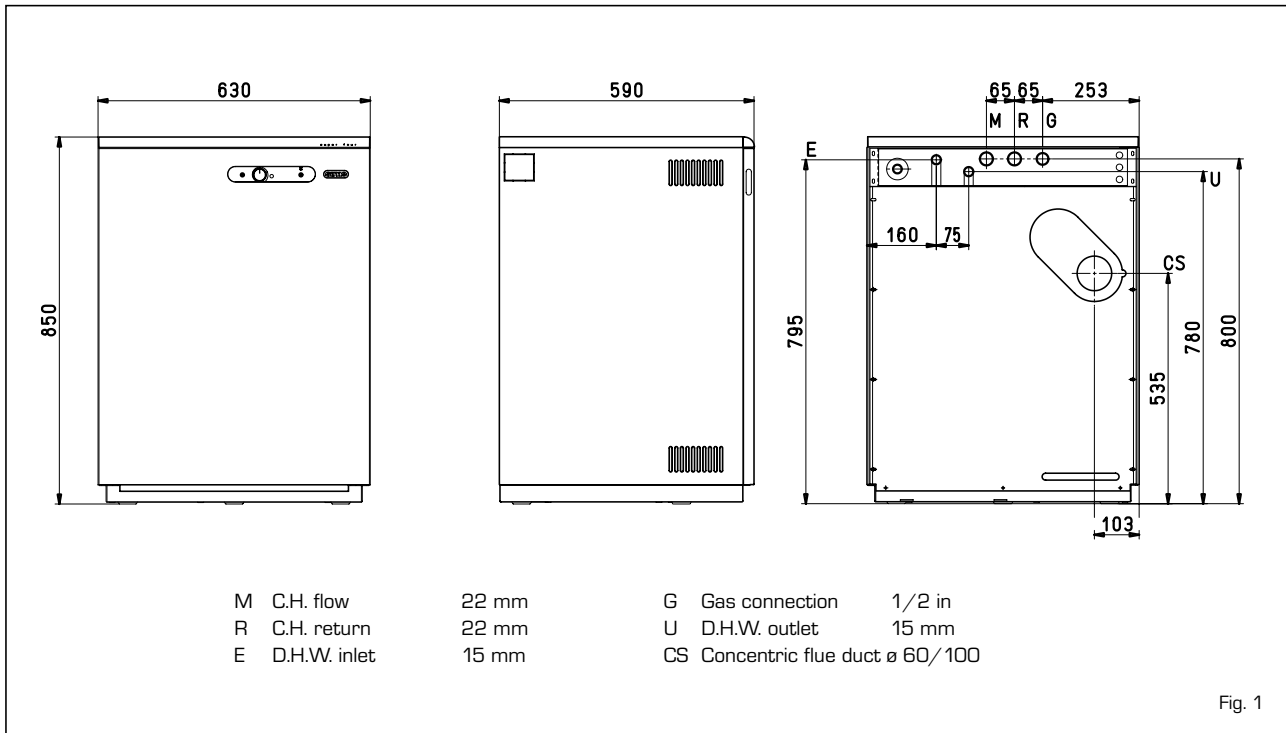


Fig. 1

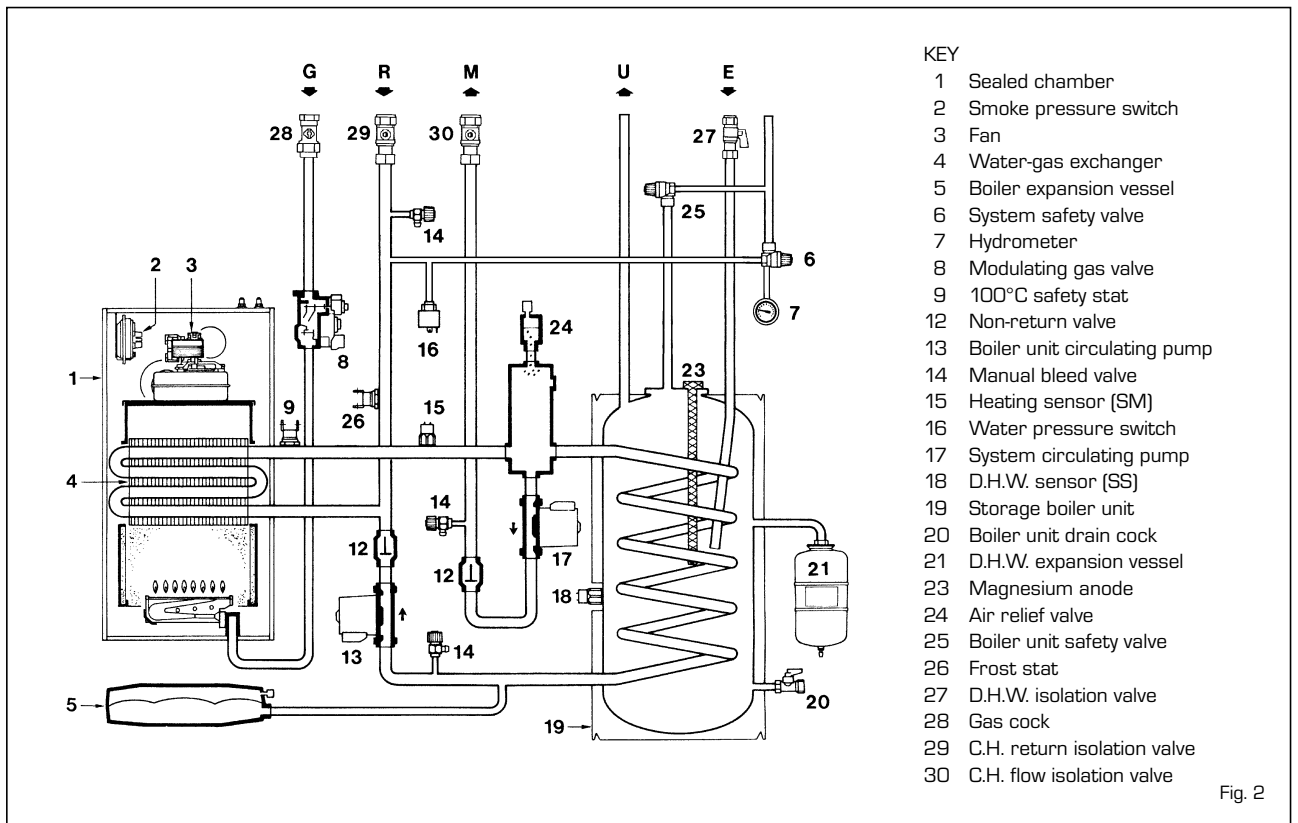
## 1.3 TECHNICAL FEATURES

SUPER FOUR		
<b>Heat output</b>		
Maximum	kW	28.5
Minimum	kW	15.1
<b>Heat input</b>		
Maximum	kW	31.6
Minimum	kW	18.0
<b>Boiler water capacity</b>	l	4.7
<b>Electric power</b>	W	150
<b>Maximum water head</b>	bar	3
<b>Boiler expansion vessel</b>		
Capacity	l	8
Pre-loading pressure	bar	1
<b>D.H.W. production</b>		
D.H.W. flow rate (EN 625)	l/min	15.3
D.H.W. continuous flow rate with $\Delta t$ 30°C	l/h	815
Tank recovery time from 40 to 70°C	min	5
Tank capacity	l	50
Maximum water head D.H.W. system	bar	7
D.H.W. expansion vessel	l	2.5
<b>Weight</b>	kg	115
<b>Category</b>	II <sub>2H3+</sub>	
<b>Type</b>	C <sub>12</sub> -C <sub>32</sub> -C <sub>52</sub>	

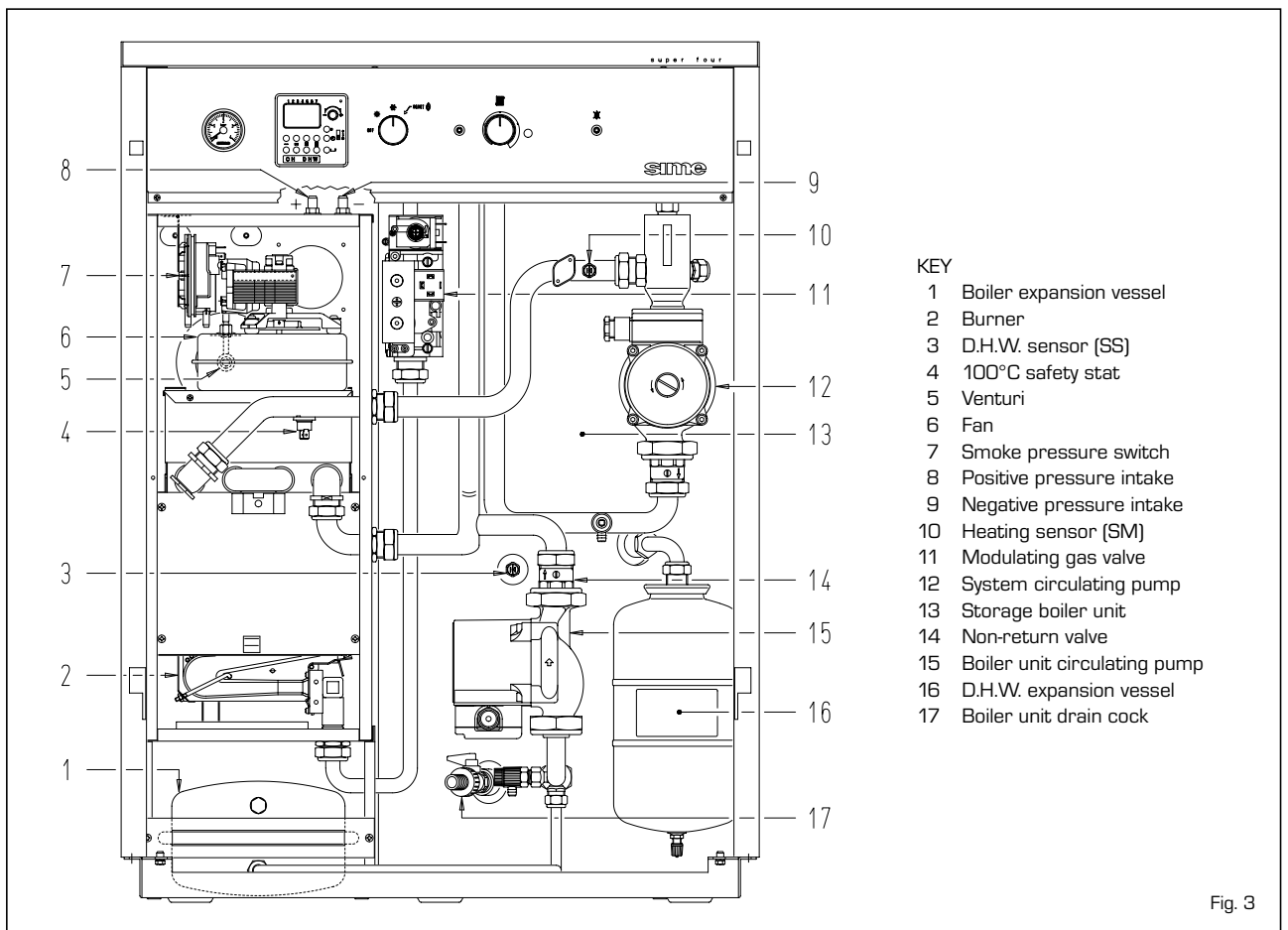
SUPER FOUR		
<b>Smokes temperature</b>	°C	140
<b>Smokes flow</b>	gr/s	21.9
<b>Main gas nozzles</b>		
Quantity	n°	15
Natural gas	ø mm	1.30
G30 - G31	ø mm	0.77
<b>Gas consumption *</b>		
Natural gas	m <sup>3</sup> s/h	3.34
L.P.G. (G30)	kg/h	2.49
L.P.G. (G31)	kg/h	2.45
<b>Burner gas pressure</b>		
Natural gas	mbar	11
L.P.G. (G30)	mbar	28
L.P.G. (G31)	mbar	35
<b>Gas supply pressure</b>		
Natural gas	mbar	20
L.P.G. (G30)	mbar	30
L.P.G. (G31)	mbar	37
<b>Flue duct maximum length</b>		
concentric ø 60/100	m	3

\* The gas consumptions refer to the calorific value at standard conditions at 15°C - 1013 mbar

### 1.4 FUNCTIONAL DIAGRAM



### 1.5 INSIDE FRONT VIEW



## 2 INSTALLATION

Installation is to be understood as permanent and must be carried out exclusively by specialized and qualified firms, in compliance with all the instructions and provisions set out in this manual.

### 2.1 BOILER ROOM

Since the "SUPER FOUR" version boilers do not exceed the limit of 35 kW, they may be installed, without any constraints regarding location or supply of air for combustion, in any domestic ambience.

### 2.2 CONNECTING UP SYSTEM

Before proceeding to connecting up the boiler, you are recommended to get water to circulate in the piping in order to eliminate any foreign bodies that might be detrimental to the operating efficiency of the appliance. When making the hydraulic connections, make sure that the dimensions indicated in fig. 1 are respected. **The discharge pipe of the two safety valves (6-7 fig. 13) must be connected to a collector funnel for channelling away any discharge in the case of the safety valves going into action.** The gas connection must be made using seamless steel tubes (Mannesmann type).

**NOTE: To connect the gas cock to the boiler, undo the union and the washer (2 fig. 13).**

Where the piping has to pass through walls, a suitable insulating sleeve must be provided. When sizing gas piping, from the meter to the boiler, take into account both the volume flow rates (consumption) in m<sup>3</sup>/h and the relative density of the gas in question. The sections of the piping making up the system must be such as to guarantee a supply of gas sufficient to cover the maximum demand, limiting pressure loss between the gas meter and any apparatus being used to not greater than:

- 1.0 mbar for family II gases (natural gas);
- 2.0 mbar for family III gases (L.P.G.).

An adhesive data plate is stuck on the inside of the panel; it contains all the technical data identifying the boiler and the type of gas for which the boiler is arranged.

#### 2.2.1 Filter on gas pipe

The gas valve used on the "SUPER

FOUR" boilers is fitted standard with an inlet filter, which, however, is not able to entrap all the impurities in the gas or in gas mains pipes. To prevent malfunctioning of the valve, or in certain cases even cutting out of the safety device with which the valve is equipped, install an adequate filter on the gas pipe.

### 2.3 CHARACTERISTICS OF FEEDWATER

Where the mains water has a hardness of more than 20-25° Fr, the feedwater must be suitably softened both for the domestic water circuit and for the central heating circuit, so as to prevent formation of boiler scale due to lime deposits, since this could lead to a reduced heat exchange.

It should be remembered that even small encrustations of just a few millimetres thick, on account of their low thermal conductivity, cause a considerable overheating of the walls of the boiler with serious consequences.

**IT IS ABSOLUTELY ESSENTIAL THAT THE WATER USED FOR THE CENTRAL HEATING SYSTEM SHOULD BE TREATED IN THE FOLLOWING CASES:**

- very extensive system (with high contents of feedwater);
- frequent addition of makeup water into the system.

Should it be necessary to empty the system either partially or totally, the subsequent refilling should be carried out using suitably treated water.

**NOTE: If the water pressure from the mains is above 4 bar, a pressure reducing valve should be fitted.**

### 2.4 SYSTEM FILLING

With the system cold, the charge pressure must be between 1 and 1.2 bar. During system filling, you are recommended to keep the switching knob turned OFF. The system should be filled slowly, so that any air bubbles can be bled off through the air relief valves.

To facilitate this operation, set the groove on the release screw of the non-return valves horizontally.

In the event of the pressure in the system dropping below 0.6 bar during operation (owing to elimination of gases dissolved in the water), the boiler will shut off automatically, and the red warning light (11 fig. 11) will start flashing. Bring the water filling pressure

re to 1-1.2 bar, which can be read on the hydrometer. Once the correct pressure has been restored, the warning light will turn off automatically and the boiler will start operating again. Should the pressure have risen well above the limit envisaged, release the excess pressure by opening the relief valve on any radiator.

### 2.5 COAXIAL AIR INLET-FLUE OUTLET ASSEMBLY

The air inlet-flue outlet assembly is supplied upon demand in a separate kit (Code 8084802). It includes:

- coaxial duct  $\varnothing$  60/100 L. 840, with wind-proof (anti-blowback) head already fixed to the flue discharge duct;
- pipe bend  $\varnothing$  60/100 with fixing screws;
- fixing clamp;
- rubber ring nut for external closing;
- sponge-rubber gasket.

The aluminium ring nut for internal closing with locking screws is supplied separately in the package containing the boiler.

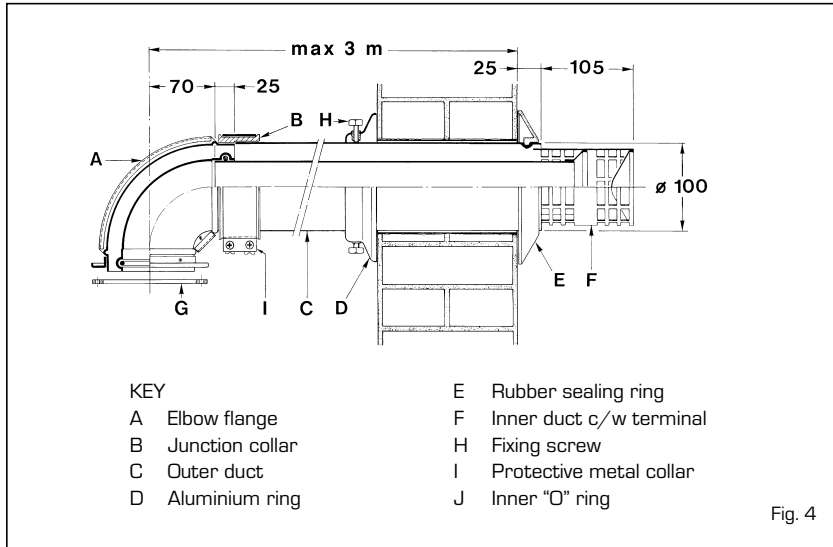
#### 2.5.1 Assembly of coaxial duct kit

In order to assembly follow closely what is indicated in fig. 4.

- Make a hole in the wall sufficiently large to allow for insertion of a  $\varnothing$  130 mm PVC pipe of the same length as the thickness of the wall it has to pass through. Then fix the PVC pipe in place using cement mortar.

**WARNING: When cutting the pipe, remember that the  $\varnothing$  60 mm flue discharge tube must be approx. 25 mm longer than the air intake tube.**

- Before sliding the pipe into the hole made in the wall, insert the rubber sealing ring (E) into its seat made in the tube.
- Push the tube outwards until the gasket comes out. Pull the pipe inwards bringing the ring to rest on the wall.
- Slide the inner ring (D) and the metal collar (I) onto the pipe.
- Push the flue discharge duct (F) fully home in the bend and fasten the metal collar (I) in position, tightening the two fixing screws.
- Fasten the duct (C) by tightening the two screws (H) on the aluminium ring nut (D).

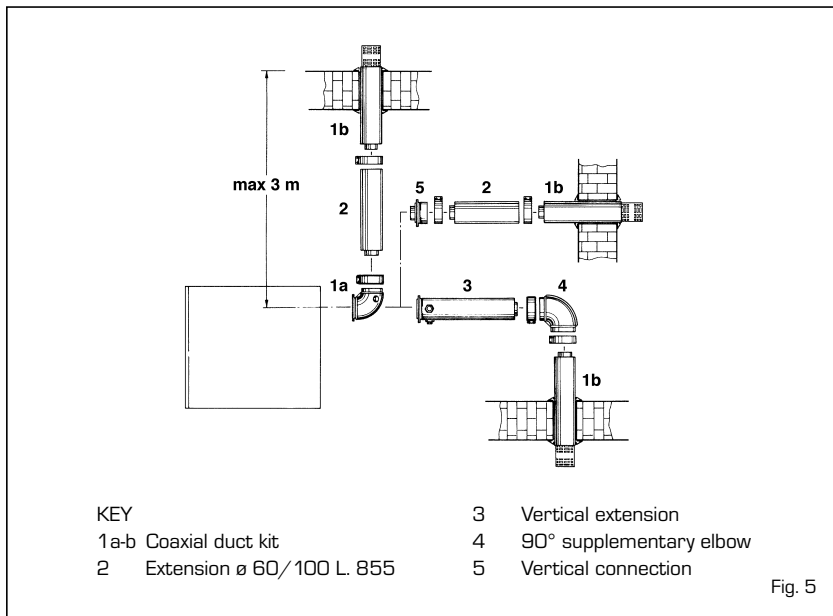


**NOTE:** The air intake-flue outlet assembly must slope gently downwards to prevent rain water getting into the boiler.

### 2.5.2 Coaxial air intake-flue outlet assembly accessories

In addition to the coaxial duct kit, also the following can be supplied on request (fig. 5):

- extension  $\varnothing$  60/100 L. 855 (Code 8084800);
- supplementary 90° pipe elbow  $\varnothing$  60/100 (Code 8085600);
- vertical extension  $\varnothing$  60/100 L. 590 (Code 8086900).
- vertical connection  $\varnothing$  60/100 (Code 8086901).



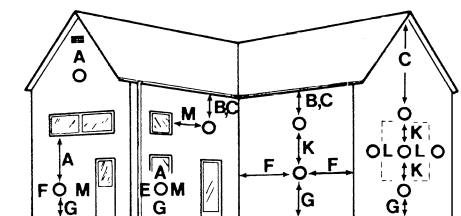
**NOTE:** With the pipe bend supplied in the kit, the maximum length of piping should not exceed 3 m. In the case where the supplementary elbow (4 fig. 5) is used, the total length of piping can reach a maximum of 1.6 m. When the vertical extension (3 fig. 5) is used, the terminal part of the pipe must always come out horizontally.

### 2.5.3 Positioning outlet terminals

The outlet terminals for forced-draught appliances may be located in the external perimeter walls of the building. To provide some indications of possible solutions, *Table 1* gives the minimum distances to be observed, with reference to the type of building shown in fig. 6.

**TABLE 1**

Siting of terminal	Minimum spacing	
	mm	in
A Directly below an openable window air vent or any other ventilation opening	300	12
B Below guttering, drain pipes or soil pipes	75	3
C/D Below eaves, balconies or carport roof	200	8
E From vertical drain pipes or soil pipes	75	3
F From internal or external corners	300	12
G Above adjacent ground, roof or balcony level	300	12
H From a surface facing the terminal	600	24
I From a terminal facing the terminal	1,200	48
J From an opening in the carport (eg door; window into dwelling)	1,200	48
K Vertically from a terminal on the same wall	1,500	60
L Horizontally from a terminal on the same wall	300	12
M Adjacent to opening	300	12



#### Under Carport with open sides

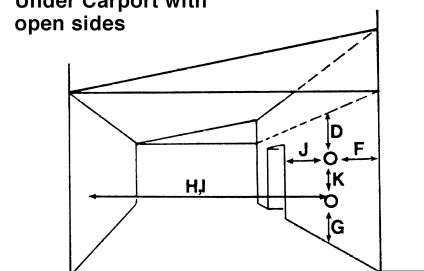


Fig. 6

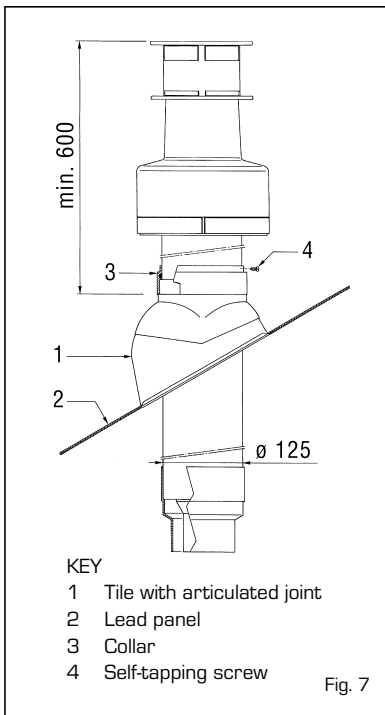
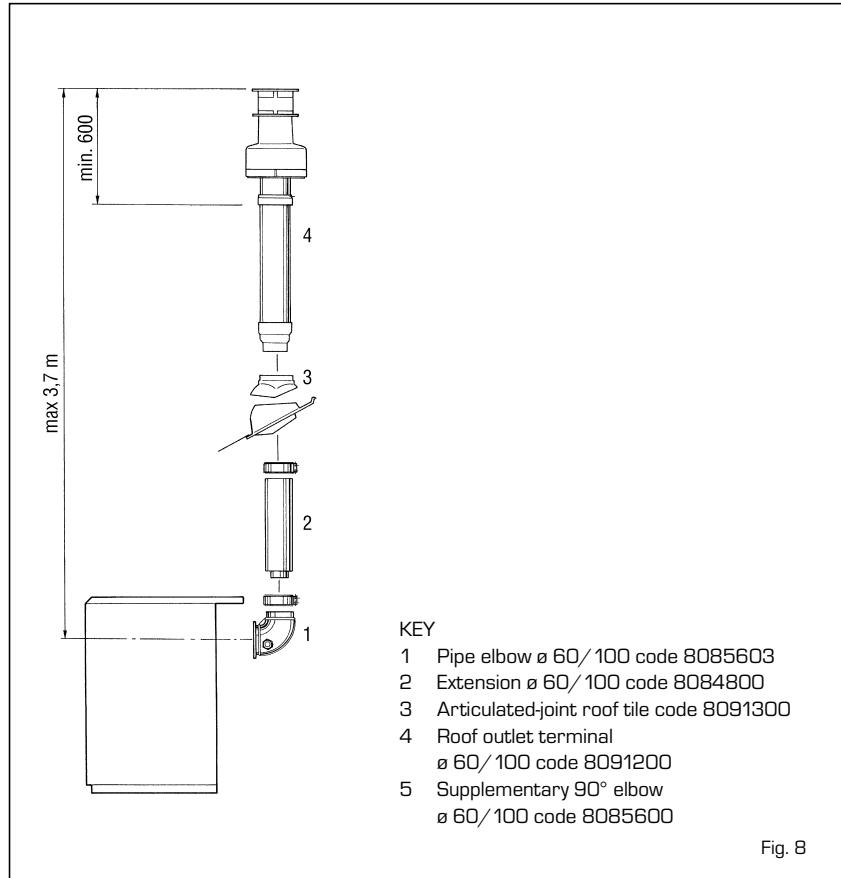
## 2.5.4 Coaxial duct outlet on roof

The accessories to be used for this type of installation and some of the connecting systems that may be adopted are illustrated in fig. 8.

When assembling the accessories, remember that the roof discharge terminal (L. 1,280 mm) cannot be shortened and that the articulated joint of the roof tile allows roof pitches of between 25° and 45°. The tile is a plane roofing tile and comes fitted with a shaped and folded lead panel (dimensions 160 x 440) for adaptation to the roof. When joining the tile to the terminal, use the collar inserted on the latter; fastening it in position with the three self-tapping screws provided (fig. 7).

When positioning the roof tile, make sure to leave a distance of not less than 600 mm from the discharge top of the roof-outlet terminal.

**It is possible to insert up to a maximum of three extensions and reach a maximum rectilinear distance of 3.7 m. Should it be necessary to make two changes of direction in the pipe development, the maximum length of the pipe must not exceed 2 m.**



## 2.6 ELECTRICAL CONNECTION

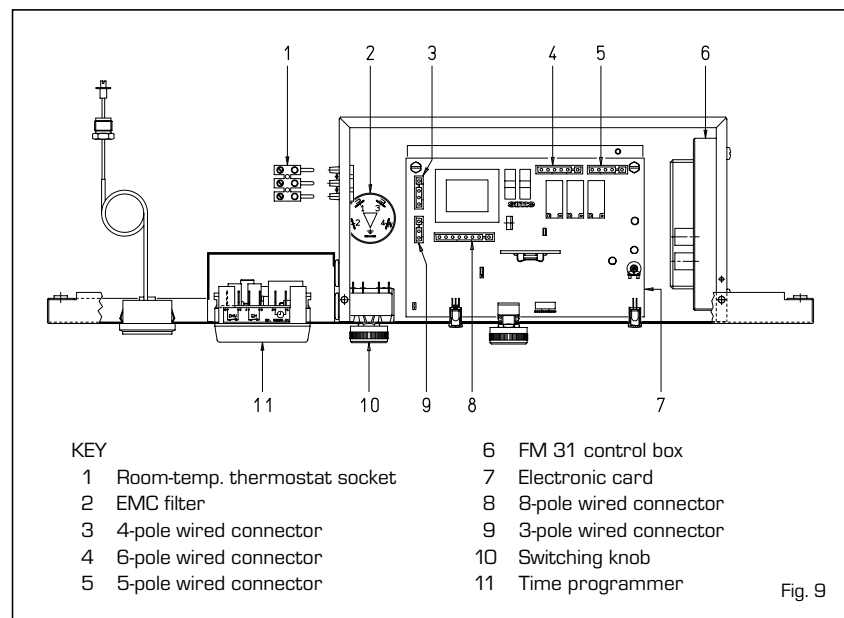
The electric power supply to the boiler must be 230 V - 50 Hz single-phase through a fused main switch, with at least 3 mm spacing between contacts. You are recommended to install a room

temperature thermostat to ensure better regulation of temperature and comfort of indoor ambience. This thermostat must be Class II, in compliance with the Standard EN 60730.1.

**NOTE: SIME declines all responsibility for injury or damage to persons, animals or things, resulting from improper earthing of the appliance.**

### 2.6.1 Electric switchboard

The electric switchboard consists of a fused electronic card for controlling temperature and flame modulation, with a built-in trimmer for adjusting heating power output and warning leds that indicate some of the possible failure that may cause irregular operation or failure of the boiler (fig. 9).



## 2.6.2 Wiring diagram

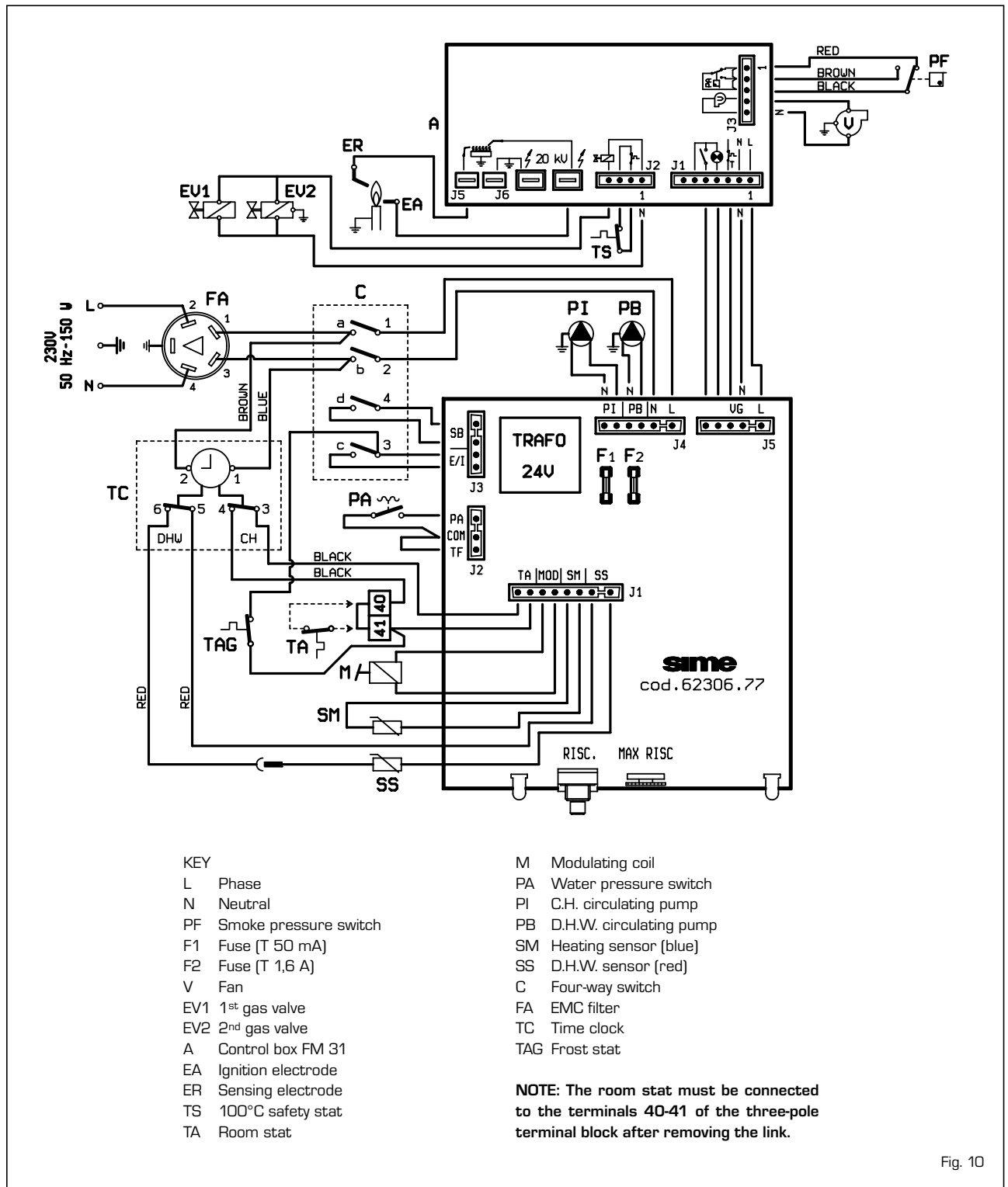


Fig. 10



### 3 CHARACTERISTICS

#### 3.1 ELECTRONIC CARD

The electronic card of "SUPER FOUR" boilers is equipped with control leds which signal some of the possible failures that can cause an irregular and/or improper operation of the appliance. The leds are arranged on the card as indicated in fig. 11 and marked with the following wordings:

- "RICHIESTA" [5 fig. 11]: green led alight on demand for D.H.W. or heating.
- "LD1" [8 fig. 11]: red led alight to indicate FM 31 programmer is blocked.
- "LD2" [11 fig. 11]: green led alight when electric power is reaching the card. Red led flashing to indicate absence of water.

#### 3.1.1 Devices present on electronic card

The electronic card of the "SUPER FOUR" boilers is equipped with the following devices:

- "MET-GPL" connector [10 fig. 11]  
The "L.P.G.-MET" connector link must be inserted on the type of gas for which the boiler is arranged.

- "POT. ACC." trimmer [7 fig. 11]  
The electronic card has an "IGNITION PRESSURE" trimmer for varying the pressure level upon ignition (STEP) of the gas valve. According to the type of gas for which the boiler is arranged, the trimmer must be regulated so as to obtain a pressure of approx. 3.5 mbar at the burner for natural gas and 7 mbar for L.P.G. (G30 - G31).

To increase pressure, turn the trimmer clockwise; to reduce pressure, turn the trimmer counter-clockwise.

Fig. 12 gives an indication of where to set the trimmer according to the type of gas used.

Before regulating the trimmer, make sure that the "L.P.G.-MET" connector [10 fig. 11] is connected to the type of gas for which the boiler is arranged.

**NOTE:** After setting the pressure level upon ignition (STEP) according to the type of gas, check that the pressure for heating is still at the value previously set.

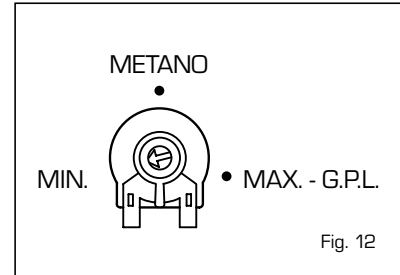
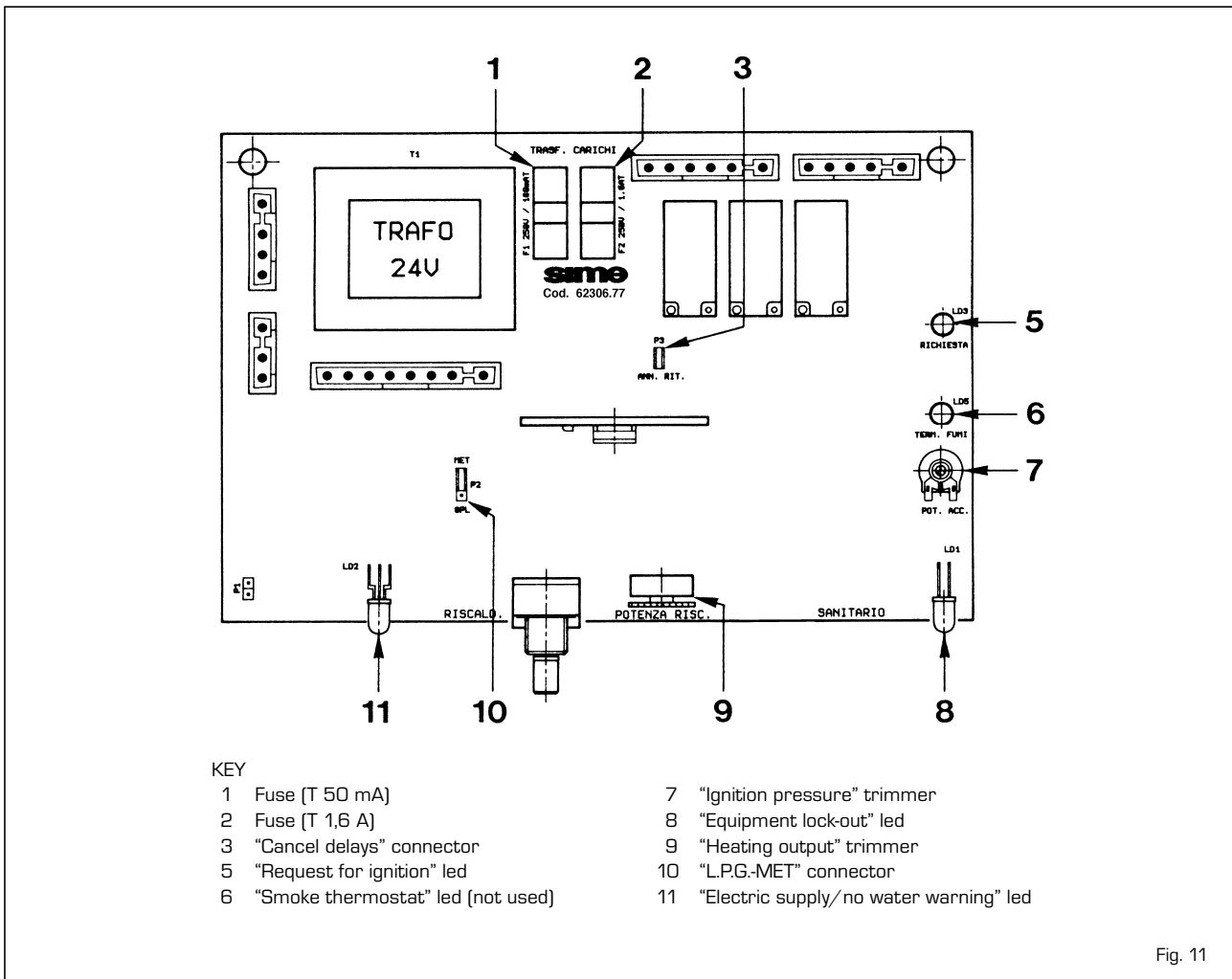


Fig. 12

- "ANN. RIT." connector [3 fig. 11]  
In the heating phase, the electronic card is programmed to include a burner technical delay interval of approx. 2 minutes, which occurs both at system cold starting and at subsequent re-ignitions. The aim is to overcome the problem of repeated ignition and turning off with very short time intervals



KEY

- |                                     |   |
|-------------------------------------|---|
| 1 Fuse (T 50 mA)                    | 7 "Ignition pressure" trimmer             |
| 2 Fuse (T 1,6 A)                    | 8 "Equipment lock-out" led                |
| 3 "Cancel delays" connector         | 9 "Heating output" trimmer                |
| 5 "Request for ignition" led        | 10 "L.P.G.-MET" connector                 |
| 6 "Smoke thermostat" led (not used) | 11 "Electric supply/no water warning" led |

Fig. 11

between. This could occur in particular in systems presenting high head losses. At each restart after the period of slow ignition, the boiler will set itself for about 1 minute at the minimum modulation pressure, and will then move to the heating pressure value set.

When the connecting link is inserted, both the programmed technical pause and the period of operation at minimum pressure in the start-up phase will be cancelled.

In this case, the times elapsing between turning off and subsequent re-ignition will depend on a temperature difference of 8°C detected by the SM sensor.

**NOTE: It is essential that the operations described above be carried out by authorized technical staff.**

### 3.2 TEMPERATURE SENSORS

The "SUPER FOUR" boilers are equipped with sensors for detecting temperature:

- C.H. sensor, located on the outlet pipe of the primary exchanger (SM)
- D.H.W. sensor located on the hot water storage boiler unit (SS).

**The sensors are NTC mod. ST03 ones and are interchangeable.**

Table 2 shows the resistance values that are obtained on the sensors as the temperature varies.

**TABLE 2**

Temperature °C	Resistance Ω
20	12,000
30	8,300
35	6,900
40	5,800
45	4,900
50	4,100
55	3,500
60	3,000
70	2,200
80	1,700

**NOTE: Should the SM sensor be shorted, the boiler will not operate either for central heating or for hot water; should, instead, the SS sensor be shorted, the boiler will operate only for central heating.**

### 3.3 ELECTRONIC IGNITION

The "SUPER FOUR" version boilers

are of the type with automatic ignition (without pilot burner).

They are therefore equipped with FM 31 electronic control and protection (6 fig. 9). Ignition and flame detection is controlled by two electrodes located on the burner.

These guarantee maximum safety with intervention times, for accidental switching off or gas failure, of within one second.

#### 3.3.1 Operating cycle

Turn the switching knob located on the control board to either SUMMER or WINTER to check for presence of voltage supply (green warning lamp lights up).

The boiler is now ready to start working upon demand for heating or drawing off of domestic water; a discharge current is sent to the ignition electrode through the FM 31 programmer, and the gas valve opens at the same time.

Burner ignition normally takes place within 2 or 3 seconds starting from the moment when the discharge current reaches the ignition electrode. However, it is possible for ignition failures to occur, with consequent activation of signal indicating that the equipment has "locked out".

Failures may be due to one of the following causes:

#### - Gas failure

The appliance runs through the cycle normally sending electric power to the ignition electrode.

The electrode continues spark discharge for a maximum of 10 sec. If the burner does not ignite, the equipment "locks out".

This may occur upon first ignition or after long periods of boiler lay-off when there is air in the pipes. It may be caused by the gas tap being closed or by one of the valve coils having a break in the winding, so that the valve cannot open.

#### - Ignition electrode fails to spark

In the boiler, only the gas to the burner is seen to open. After 10 sec. the equipment "locks out".

This may be due to a break in the wire of the electrode, or the wire not properly fastened to the equipment electric terminal; or else, the transformer has burnt out.

#### - No detection of flame

The continuous spark discharge of the electrode is noted starting from ignition, even though the burner is lit. After 10 seconds have elapsed, the sparks cease, the burner goes out, and the warning light indicating equipment "lock-out" lights up.

This occurs when the position of line and neutral has not been respected on the terminal block.

There is a break in the wire to the sensing electrode, or the electrode itself is touching earth; the electrode is worn out and needs replacing.

When there is a sudden voltage failure, the burner shuts out immediately; when power supply returns, the boiler will start up again automatically.

### 3.4 SMOKE PRESSURE SWITCH

The smoke pressure switch is located inside the sealed-room (7 fig. 3).

To gain access to the pressure switch, first you must release the four hinges and remove the fixing screw of the front wall.

A Venturi tube system, fastened inside the fan unit and connected to the pressure switch by means of two silicone pipes, ensures start-up of the burner only when the fan is operating. Impurities and possible formations of condensate, which are more likely in cold periods of the year, could cause the pressure switch not to function and the boiler to fail to start. The pressure switch is set in the factory at the optimal values of 8-9 mm H<sub>2</sub>O.

This is able to guarantee operation of the boiler even with air intake and flue outlet pipes have the maximum limit of length allowed.

### 3.5 WATER FAILURE SAFETY DEVICE

The boiler is equipped with a water pressure switch (8 fig. 13) set at 0.6 bar, which goes into action, blocking boiler operation, whenever the pressure inside the boiler is less than the calibration value.

When the pressure switch trips, a red warning lamp starts flashing (11 fig. 11). To restore burner operation, turn the charge cock and bring the pressure back to a value between **1** and **1.2 bar**.

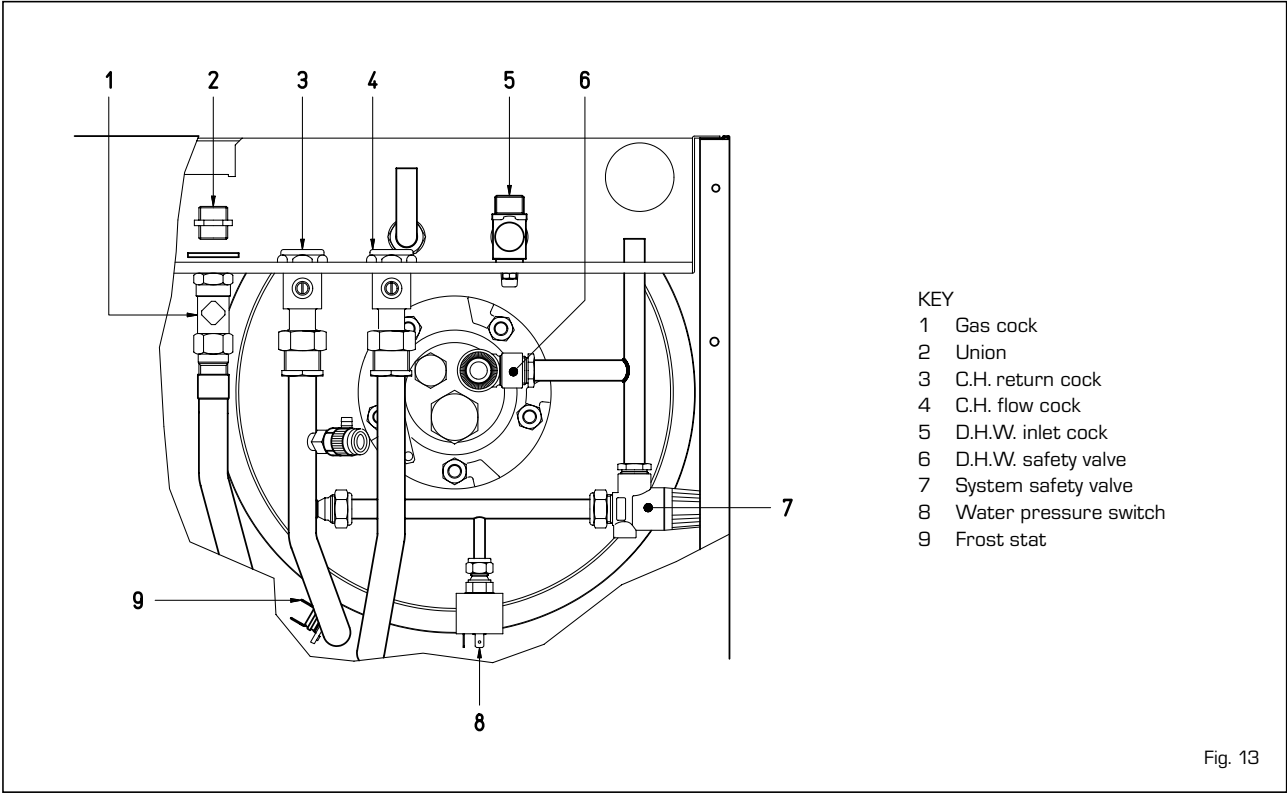


Fig. 13

**3.6 SYSTEM AVAILABLE HEAD**

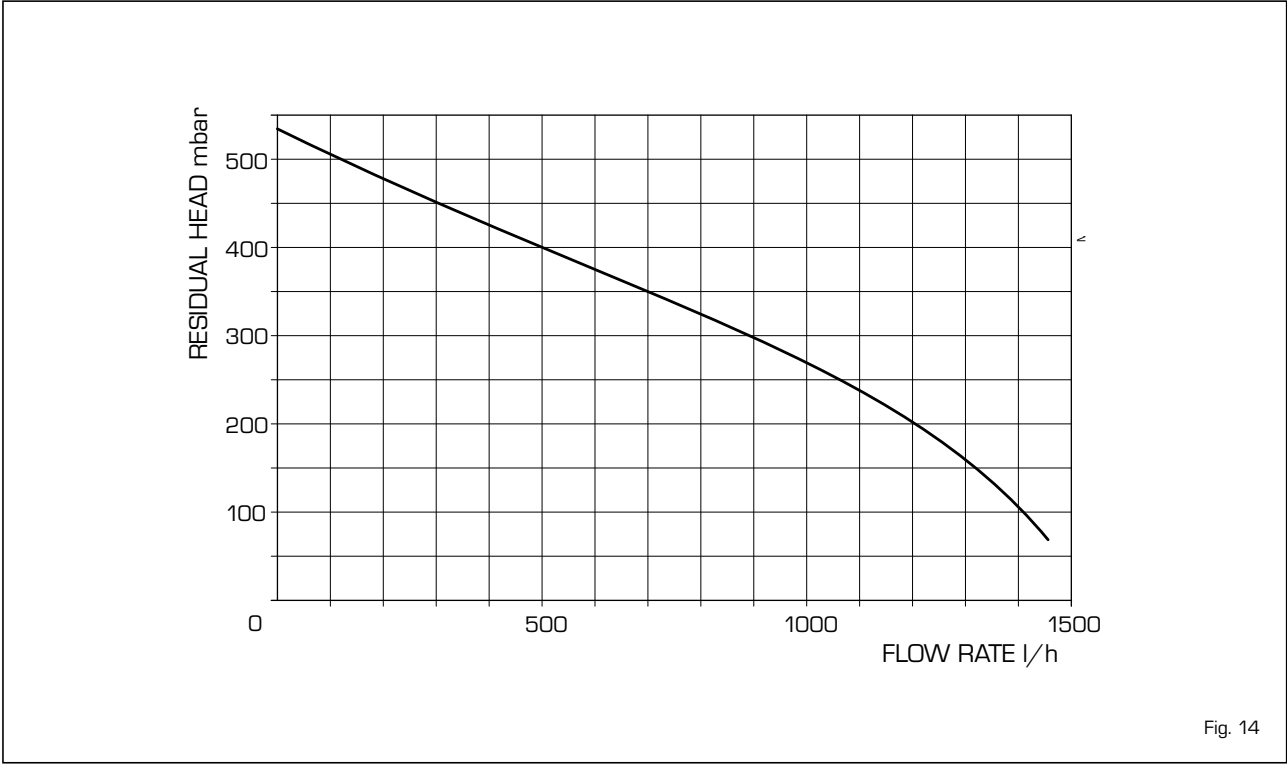


Fig. 14

## 4 USE AND MAINTENANCE

### SIME SUPPORT THE BENCHMARK INITIATIVE

All relevant sections of the logbook must be filled in at the time of installation and thereafter service information on the back page of the logbook.

Commissioning of the boiler is not complete until the logbook is filled in.

#### 4.1 PRODUCTION OF D.H.W.

The production of hot water for washing purposes is guaranteed by a porcelain enamelled steel boiler unit provided with an inspection flange for checks and cleaning, and a magnesium anode protecting the boiler unit.

**The magnesium anode must be inspected periodically. Should it be worn out, replace it; otherwise, the boiler unit warranty will be rendered null and void.**

The temperature of D.H.W. is fixed and is set on the electronic card.

**NOTE: Should the boiler unit fail to produce D.H.W., turn it off and make sure that the system has been suitably purged by operating the manual air valves.**

#### 4.2 GAS VALVE

The "SUPER FOUR" boilers come equipped standard with a SIT 837 TANDEM gas valve (fig. 15).

#### 4.3 GAS VALVE ADJUSTMENT

Since all "SUPER FOUR" versions are flame-modulation boilers, they have the gas valve set at two pressure values: maximum and minimum. According to the type of gas burnt, these correspond to the values given in *Table 3*. Calibration of the gas pressures at the maximum and minimum values is done by SIME in the factory. Consequently, they should not be altered. Only when you switch from one type of gas supply (methane) to another (butane or propane), it is permitted to alter the operating pressure.

**It is essential that this operation be carried out exclusively by authorized technical staff.**

When the gas pressures are to be reset, this must be done following a set order: first the maximum pressure and then the minimum.

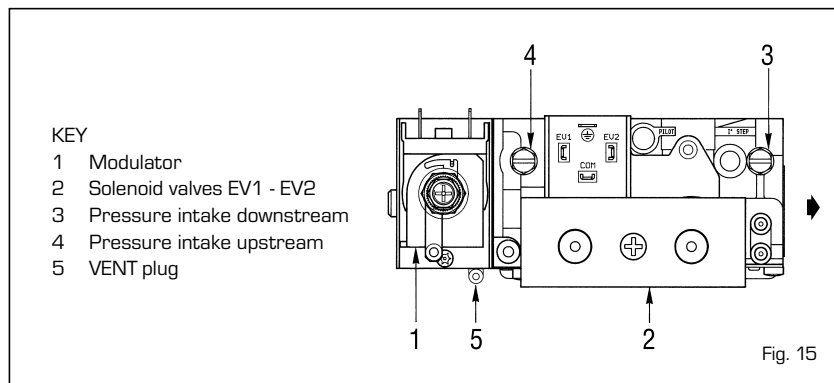


TABLE 3

Type of gas	Burner max. pressure mbar	Burner min. pressure mbar
Natural gas - G20	11	2
L.P.G. - G30	28	7
L.P.G. - G31	35	7

#### 4.3.1 Maximum pressure adjustment

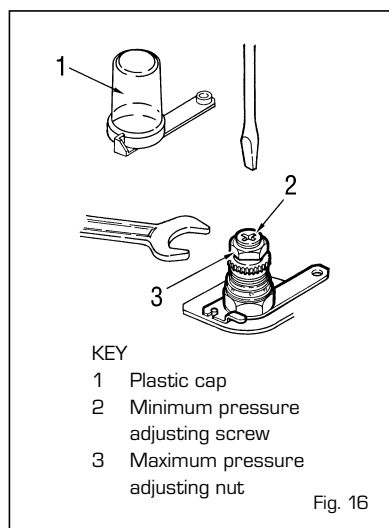
To set the maximum pressure, proceed as follows (fig. 16):

- connect a pressure column or pressure gauge to the pressure intake downstream of the gas valve;
- remove the plastic cap (1);
- set the switching knob to SUMMER and open the D.H.W. tap at a high flow rate;
- with the boiler lit, using a  $\varnothing$  10 spanner, turn the nut (3) to arrive at the maximum pressure value given in *Table 3*: to reduce the pressure, turn the nut counterclockwise; to increase the pressure, turn it clockwise;
- turn off and re-ignite the boiler a number of times, keeping the D.H.W. tap open all the time, and check that the pressure corresponds to the values given in *Table 3*.

#### 4.3.2 Minimum pressure adjustment

To set the minimum pressure, proceed as follows (fig. 16):

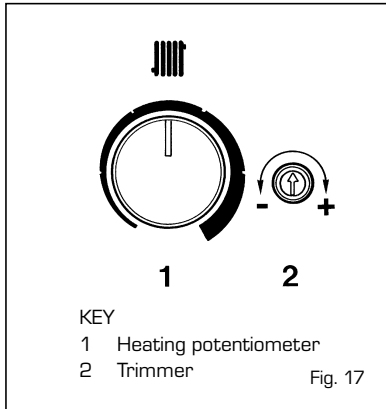
- again use a pressure column or a pressure gauge to check the pressure;
- disconnect supply to the modulator;
- set the switching knob to SUMMER and open the hot water tap;
- with the boiler lit, blocking the nut (3), turn the screw (2) to arrive at the minimum pressure value given in *Table 3*: to reduce the pressure, turn the screw counterclockwise; to increase the pressure, turn it clockwise;
- turn off and re-ignite the boiler a number of times, keeping the D.H.W. tap open all the time, and check that the pressure corresponds to the values given in *Table 3*;
- restore electric power to the modulator and replace plastic cap (1).



#### 4.4 ADJUSTMENT OF HEAT OUTPUT FOR HEATING

To adjust boiler heat output for heating purposes, i.e., modifying the setting made at the factory, which is approximately 18,5 kW, use a screwdriver to adjust the heating heat output trimmer (2 fig. 17). To increase working pressure, turn the trimmer clockwise (towards the + sign); to reduce pressure, turn the trimmer counterclockwise (towards the - sign).

In this way the boiler will start operating at the preset pressure value, and when the temperature approaches the value chosen on the heating knob,



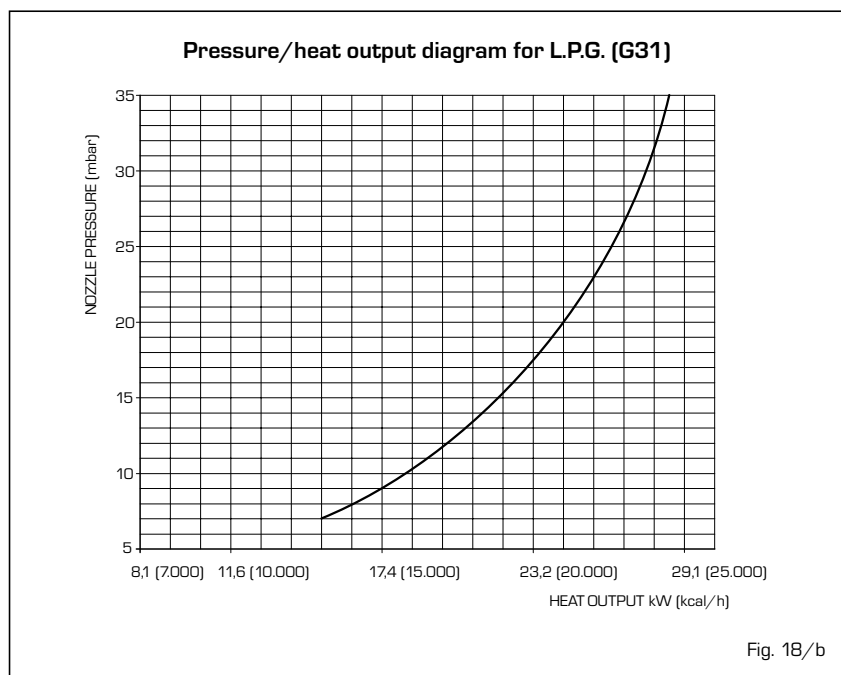
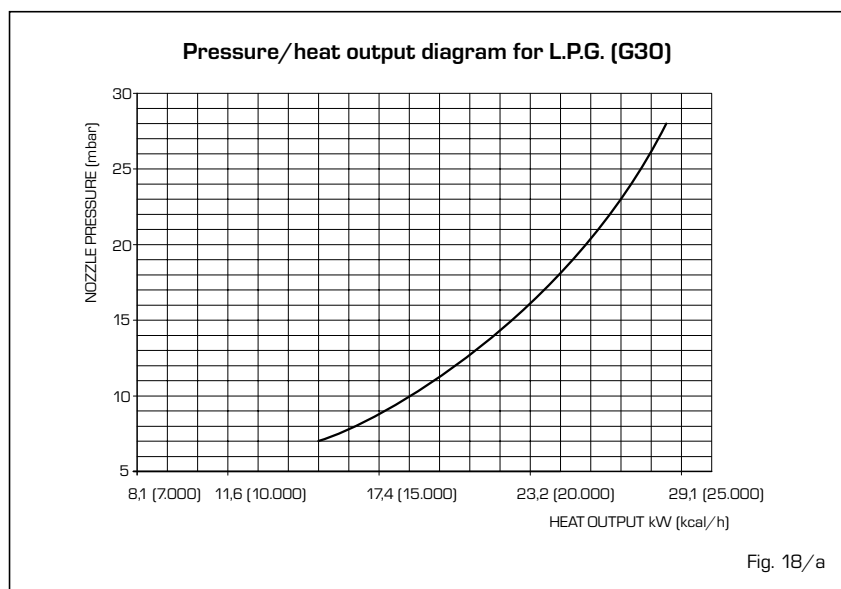
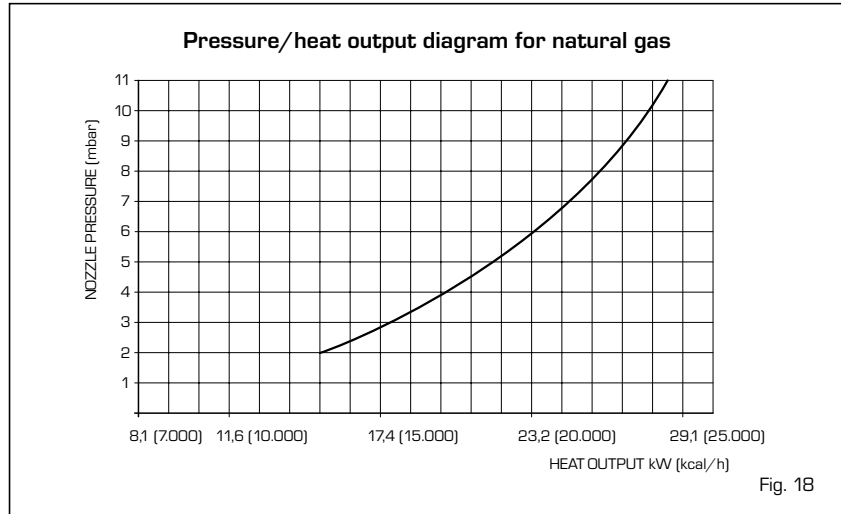
according to a sequence already set on the electronic adjustment card, will start modulating automatically, thus supplying the system with the actual power required. When the temperature read by the sensor corresponds to the value selected on the potentiometer, the boiler will already be at minimum burner flame.

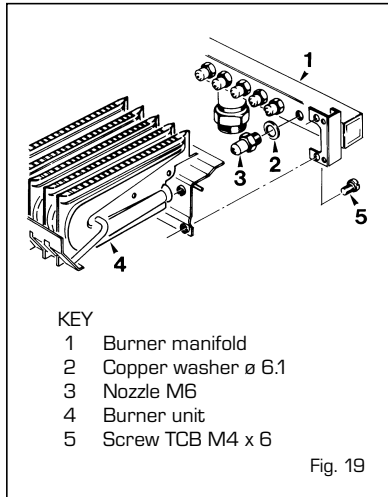
At this point, the potentiometer will cause the burner to go out. To facilitate the operations of adjusting heating output, see the pressure/heat output diagrams for natural gas or L.P.G., shown in figs. 18 - 18/a - 18/b.

#### 4.5 CONVERSION TO DIFFERENT GAS

To convert to L.P.G. (G30) or L.P.G. (G31), first replace the main nozzles. Proceed as follows (fig. 19):

- close the gas tap;
- disassemble the front panel of the outer casing;
- remove the closing plate of the sealed chamber, loosening off the four hinges and the two fixing screws;
- remove the front closing plate of the combustion chamber, unscrewing the four screws;
- slide out the burner unit (4);
- unscrew the screws (5) and replace the main nozzles (3) located on the burner manifold (1), inserting the copper washer (2). Use a  $\varnothing 7$  spanner to perform this operation;
- reassemble all the parts, proceeding in reverse order;
- remove the "L.P.G.-MET" connector link on the card (10 fig. 11) and set it on "L.P.G.". **To change the slow ignition value, regulate the "IGNITION PRESSURE" trimmer (7 fig. 11), so as to obtain a pressure to the burner of approx. 7 mbar.**
- To set the values of maximum and minimum gas pressure, follow the





instructions given in section 4.3. The gas feed pressure must under no circumstances exceed 50 mbar:

- after having ultimated the conversion of the boiler, please stick onto the casing panel the plate showing the relevant feeding gas which is included into the conversion kit.

**NOTE: After assembling all the gas connections, a test for gas tightness must be carried out using soapy water or special products. DO NOT USE NAKED FLAMES.**

#### 4.6 DISASSEMBLY OF EXPANSION VESSEL

To disassemble the boiler expansion vessel, proceed as follows:

- make sure that the water has been emptied out of the boiler;
- unscrew the connection connecting the expansion vessel to the boiler and the two self-tapping screws that fasten the system to the bracket.

**NOTE: Before refilling the system, make sure that the expansion vessel is pre-loaded at 1 bar pressure.**

#### 4.7 CLEANING AND MAINTENANCE

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

- turn the switching knob to OFF to stop electric power reaching the boiler;
- close the gas feed cock;
- disassemble the outer casing;
- remove the smoke chamber, unscrewing the screws that fasten it

to the combustion chamber;

- disassemble the gas burner-manifold unit, as described in Section 4.5;
- to clean the burners, blow in a jet of air, so as to remove any dust particles that may have accumulated;
- clean the heat exchanger, removing any dust or residue from combustion;
- when cleaning the heat exchanger or the burners, chemical products or steel brushes **MUST NOT BE USED**;
- make sure that the tops of the burners with the holes are free from encrustations;
- reassemble the items removed from the boiler, making sure to follow the correct sequence;
- check the chimney to make sure that the flue is clean;
- check operation of the equipment and of the main burner.

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

#### 4.8 FAULT FINDING

**Main burner does not start either to draw off D.H.W. or heating.**

- Check operation of smoke pressure switch.
- Check, and if necessary replace, smoke pressure switch.
- Replace electronic card.
- Check if SM is interrupted.

**Fan turns but burner does not start.**

- Check whether connection tubes of smoke pressure switch PF are obstructed and, if necessary, clean away impurities or condensate.
- Smoke pressure switch PF needs recalibrating or, better still, replacing with a new factory-calibrated one.

**Fan fails to turn.**

- Check whether electric power is reaching the terminals of the activator motor.
- Motor winding is burnt out; replace.
- Replace electronic card.

**Main burner fails to modulate both in D.H.W. phase and in heating phase.**

- Modulator M has a break in winding; replace.
- Electronic card is faulty; replace.

**Boiler makes noises and a sizzling sound.**

- Check whether circulating pumps are obstructed; if necessary, clear

them out.

- Unclog impeller of circulating pump, clearing away any impurities or sediments.
- Circulating pump is burnt out; replace.
- Check boiler output is adequate for actual needs of heating system.

**Boiler safety valve keeps going into action.**

- Check whether system cold charge pressure is too high; keep to recommended values.
- Check whether safety valve is out of calibration; if necessary, replace.
- Check pre-loading pressure of expansion vessel.
- Replace expansion vessel if faulty.

**Radiators fail to heat up in winter.**

- Knob is set to SUMMER. Turn it to WINTER.
- Room stat TA is set too low or needs replacing because faulty.
- Electrical connections of room stat TA are wrong.

**Radiators warm up also in summer.**

- Check for right setting of knob.
- Check no impurities are present in the non-return valve seat.
- Non-return valve is faulty; replace.
- Install non-return valve on system return pipe.

**Main burner burns badly: flames too high, too yellow.**

- Check that pressure of gas reaching burner is regular.
- Check burners are clean.

**Water from boiling unit isn't sufficiently hot.**

- Air is still present at the top of the boiler. Purge off through air relief valve.
- Reduce hot-water drawing-off rate.

**Smell of unburnt gases.**

- Check boiler is properly clean.
- Check draught is sufficient.
- Check whether gas consumption is too high.

**Boiler operates but does not increase temperature.**

- Check whether gas consumption is not lower than it should be.
- Check boiler is clean.
- Check boiler is sized in proportion to system.





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