

# INSTALLER INSTRUCTIONS

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**FONDERIE SIME S.p.A.** of Via Garbo 27 - Legnago (VR) - Italy declares that its hot water boilers, which bear the CE mark under Gas Directive 90/396/CEE and are fitted with a safety thermostat calibrated to a maximum of 110°C, **are not subject** to application of PED Directive 97/23/CEE as they meet the requirements of article 1 paragraph 3.6 of the Directive.

## 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.
- Open the gas tap and check the soundness of the connections, including that of the burner.
- Make sure that the boiler is set for operation for the type of gas supplied.
- Check that the flue pipe for the outlet of the products of the combustion is unobstructed and has been properly installed.
- Make sure that any shutoff valves are open.
- Make sure that the system is charged with water and is thoroughly vented.
- Check that the circulating pump is not locked (CAUTION: Remember to release the pump coupled with the control panel, if necessary, to protect the electronic control card).
- Purge the system, bleeding off the air present in the gas pipe by operating the pressure relief valve on the gas valve inlet.

# 1 DESCRIPTION OF THE BOILER

## 1.1 INTRODUCTION

“FORMAT” boilers are gas-fired thermal appliances for central heating and domestic hot water production, designed and manufactured to satisfy the needs of multiple dwelling and modern plant requirements. They comply with the european directives 90/396/CEE, 89/336/CEE, 73/23/CEE,

92/42/CEE and with the european specifications EN 297 - EN 483.

These appliances can be fired by natural gas (methane) and butane gas (G30) or propane gas (G31).

This booklet provides the instructions for the following boiler models:

- “FORMAT 25 OF - 30 OF” with electronic ignition and modulation,

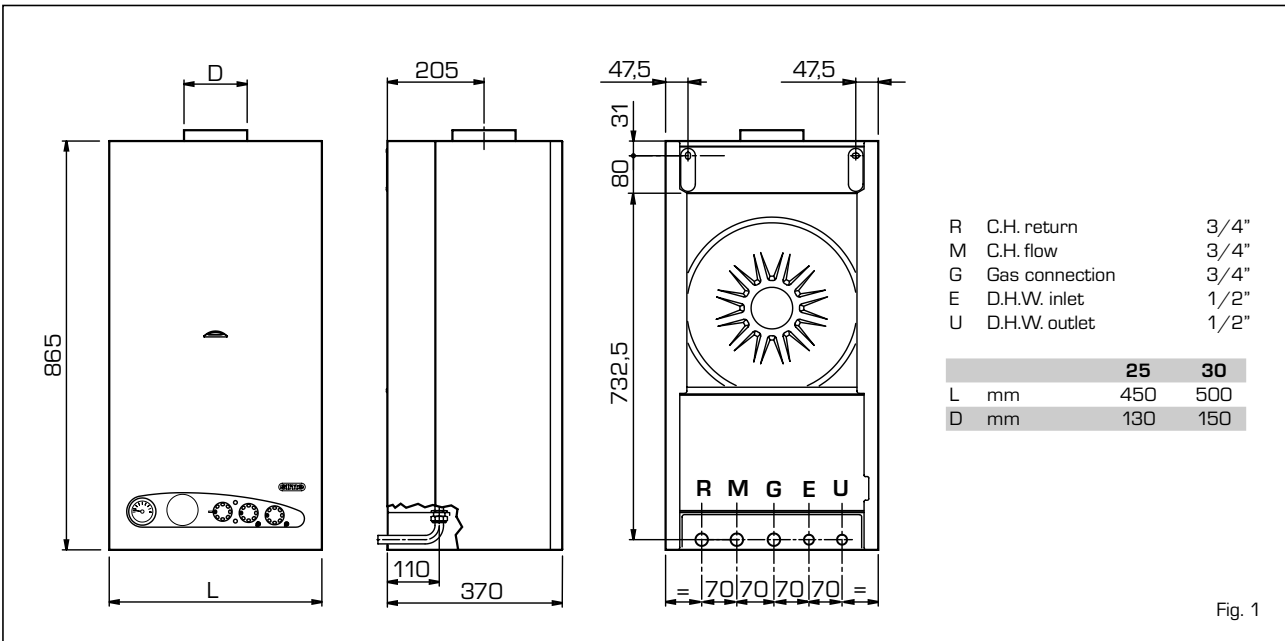
natural draught.

- “FORMAT 25 BF - 30 BF” with electronic ignition and modulation, room sealed forced-draught.

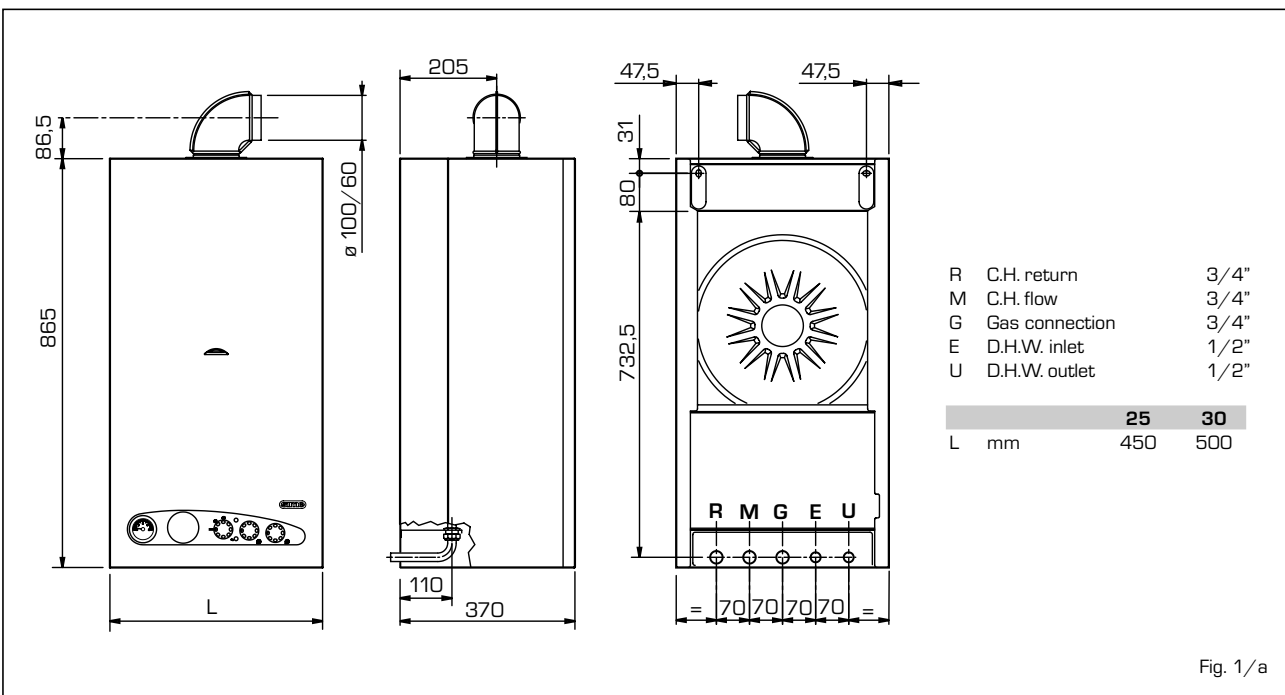
The instructions given in this manual are provided to ensure proper installation and perfect operation of the appliance

## 1.2 DIMENSIONS

### 1.2.1 “FORMAT 25 OF - 30 OF”



### 1.2.2 “FORMAT 25 BF - 30 BF”



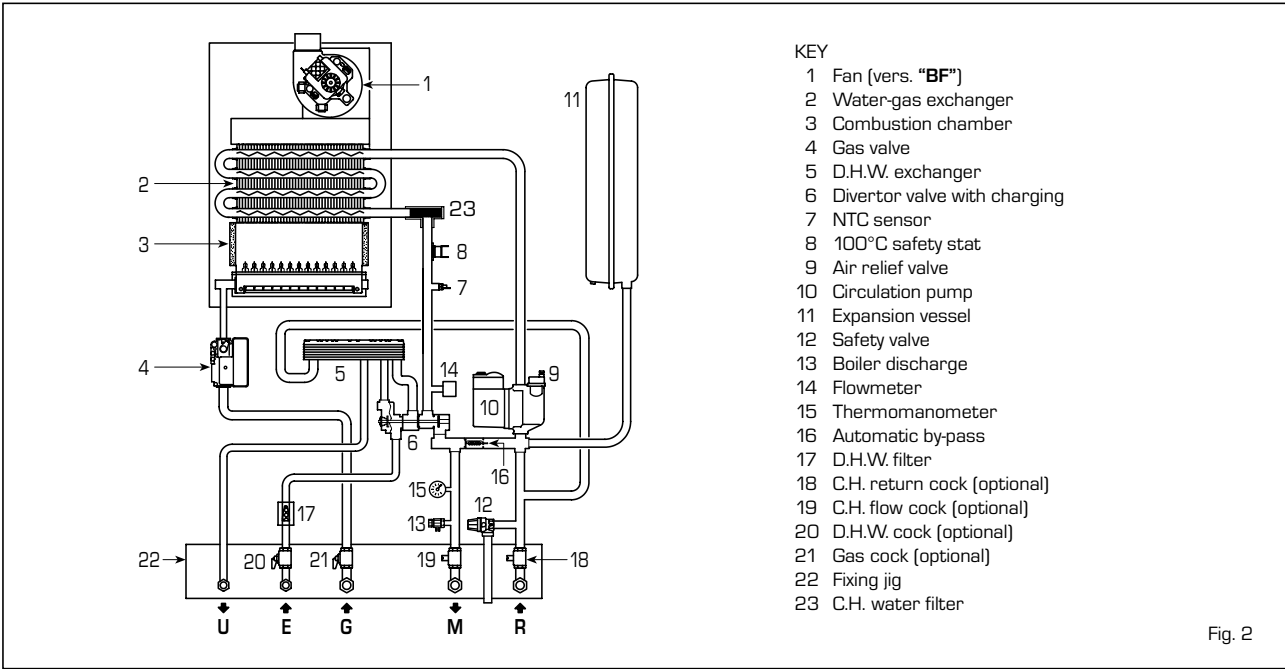
### 1.3 TECHNICAL FEATURES

		25 OF	30 OF	25 BF	30 BF
<b>Heat output</b>					
Nominal	kW	23.3	28.6	23.3	29.0
	kcal/h	20,000	24,600	20,000	24,900
Minimum	kW	9.3	11.7	9.3	11.5
	kcal/h	8,000	10,100	8,000	9,900
<b>D.H.W. heat output</b>					
Nominal	kW	23.3	28.6	23.3	29.0
<b>Heat input</b>					
Nominal	kW	25.8	31.6	25.8	31.6
Minimum	kW	10.8	13.5	10.8	13.5
<b>Water content</b>	l	2.4	2.4	3.4	3.4
<b>Adsorbed power consumption</b>	W	105	110	150	160
<b>Electrical protection grade</b>	IP	44	44	44	44
<b>Maximum water head</b>	bar	3	3	3	3
<b>Maximum temperature</b>	°C	95	95	95	95
<b>Expansion vessel</b>					
Water content	l	7	10	7	10
Preloading pressure	bar	1	1	1	1
<b>CH. setting range</b>	°C	40÷80	40÷80	40÷80	40÷80
<b>D.H.W. setting range</b>	°C	40÷60	40÷60	40÷60	40÷60
<b>D.H.W. flow rate (EN 625)</b>	l/min	10.5	12.7	10.5	12.7
<b>Continuous D.H.W. flow rate <math>\Delta t</math> 30°C</b>	l/min	11.1	13.6	11.1	13.8
<b>Minimum D.H.W. flow rate</b>	l/min	2	2	2	2
<b>D.H.W. pressure</b>					
Minimum	bar	0.5	0.5	0.5	0.5
Maximum	bar	7	7	7	7
<b>Smokes temperature</b>	°C	119	120	135	150
<b>Smokes flow</b>	gr/s	21.0	22.5	19.0	20.3
<b>Category</b>		II <sub>2H3+</sub>	II <sub>2H3+</sub>	II <sub>2H3+</sub>	II <sub>2H3+</sub>
<b>Type</b>		B <sub>11B5</sub>	B <sub>11B5</sub>	B <sub>22-C12-C32-C42-C52</sub>	C <sub>12-C32-C42-C52</sub>
<b>Weight</b>	kg	35	41	43	49
<b>Main burner nozzle</b>					
Quantity	n°	13	15	13	15
Methane	ø mm	1.30	1.30	1.30	1.30
G30 - G31	ø mm	0.75	0.77	0.75	0.76
<b>Gas consumption *</b>					
Methane	m <sup>3</sup> st/h	2.72	3.34	2.72	3.34
Butane (G30)	kg/h	2.02	2.48	2.02	2.48
Propane (G31)	kg/h	1.99	2.40	1.99	2.40
<b>Burner gas pressure</b>					
Methane	mbar	2÷9	2÷10.5	2÷9.6	2.3÷11.1 **
Butane (G30)	mbar	5÷27	5.2÷27.9	5÷27	5.5÷26.8 **
Propane (G31)	mbar	5÷35	6.9÷35.5	5÷35	6.9÷34.9 **
<b>Gas supply pressure</b>					
Methane	mbar	20	20	20	20
Butane (G30)	mbar	30	30	30	30
Propane (G31)	mbar	37	37	37	37

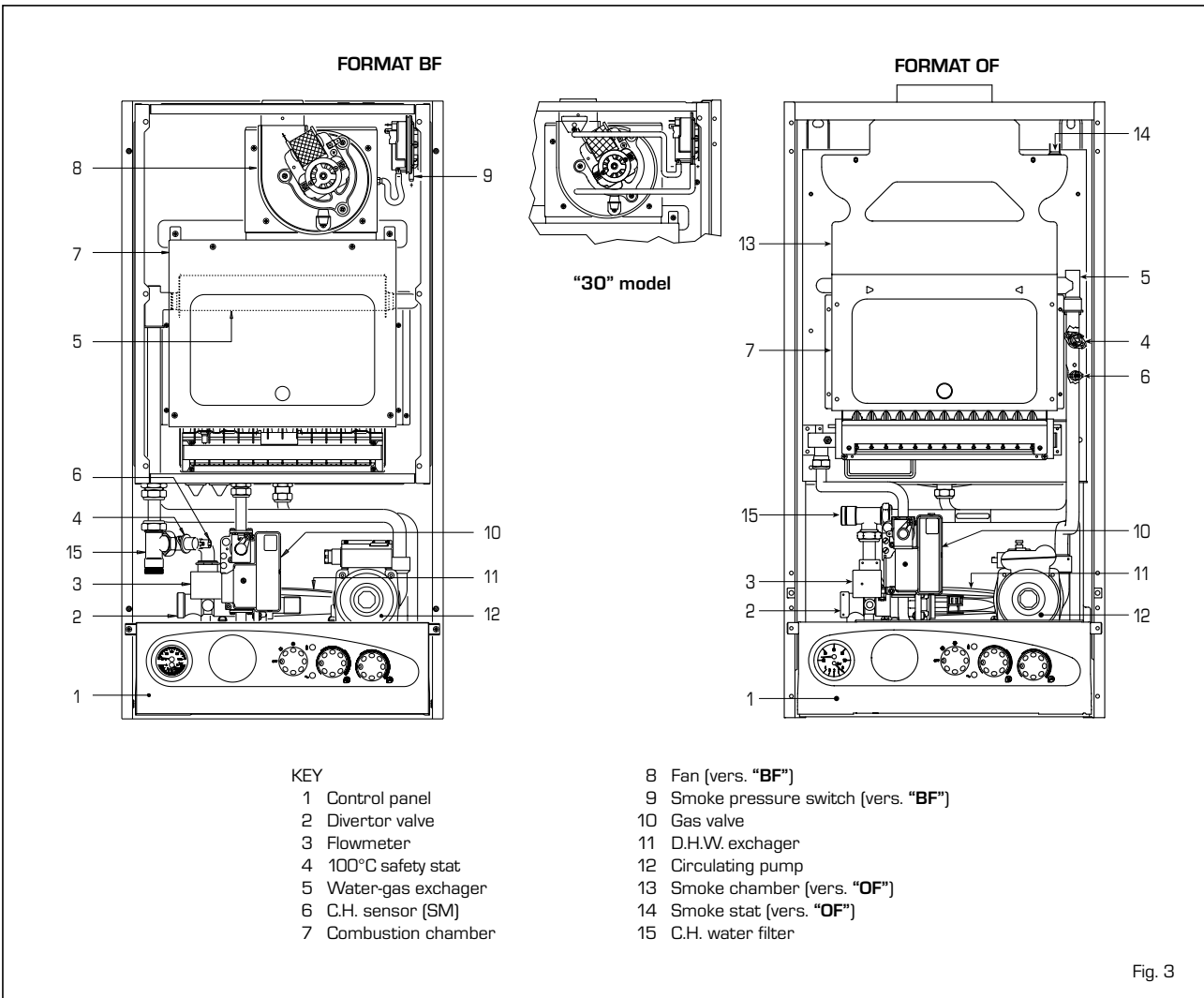
\* The gas consumptions refer to the calorific value at standard conditions at 15°C - 1013 mbar.

\*\* Differential measure between the pressure upstream of the gas valve and the depression in the room sealed

1.4 FUNCTIONAL DIAGRAM



1.5 MAIN COMPONENTS



## 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 VENTILATION OF BOILER ROOM

The "25 OF - 30 OF" version boilers must be installed in adequately ventilated domestic rooms. It is essential that in rooms where the boiler are installed at least as much air can arrive as required by normal combustion of the gas consumed by the various appliances.

Consequently, it is necessary to make openings in the walls for the air inlet into the rooms. These openings must meet the following requirements:

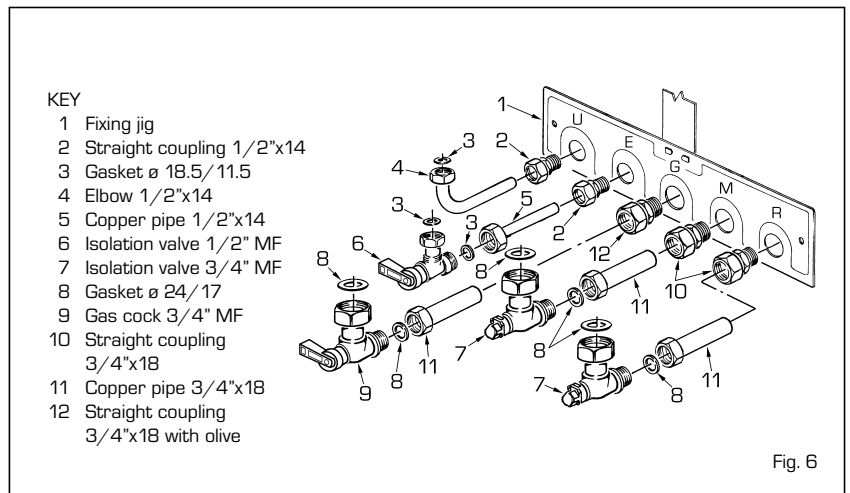
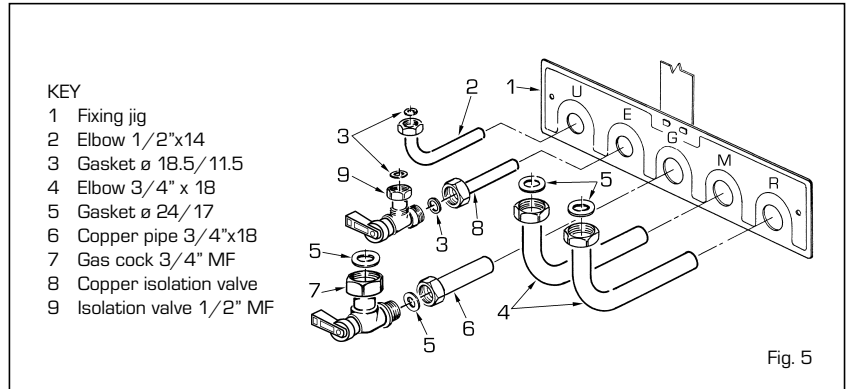
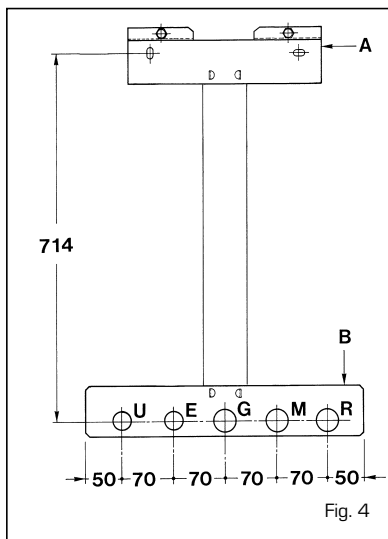
- have a total free section of at least 6 cm<sup>2</sup> for every kW of heat input, with a minimum of 100 cm<sup>2</sup>;
- They must be located as close as possible to floor level, not prone to obstruction and protected by a grid which does not reduce the effective section required for the passage of air.

The "25 BF - 30 BF" version boilers may instead be installed, without any constraints regarding location or supply of air for combustion, in any domestic rooms.

### 2.2 INSTALLATION PLATE

To mount the installation plate supplied as an optional extra [kit code 8075407], follow the instructions written below (fig. 4):

- Fix the connecting sheet to plate (A) and lower plate (B).
- With the template complete, fix plate (A) to the wall using the two boiler support screws.
- Check that plate (B) is perfectly horizon-



tal using a spirit level.

- Connect the bends or connecting valves supplied in the optional kit to the system pipes.

#### 2.2.1 Fitting the pipe elbows (optional)

To fit the connecting elbows supplied in kit code 8075418, follow the instructions reported in fig. 5.

#### 2.2.2 Fitting isolating valves (optional)

To fit the isolating valves, supplied in kit code 8091806, follow the instructions mentioned in fig. 6.

#### 2.2.3 Replacement wall kit for other makes (optional)

The kit code 8093900 is supplied complete with mounting instructions.

### 2.3 CONNECTING UP SYSTEM

Before proceeding to connect up the boiler, you are recommended to make the air circulating in the piping in order to eliminate any foreign bodies that might be detrimental to the operating efficiency of the appliance.

The discharge pipe of the safety valve must be connected to a collector funnel for channelling away any discharge if the safety valve goes into action.

If the heating system is on a higher floor than the boiler, install the on/off taps supplied in kit code 8091806 on the heating system delivery/return pipes.

The gas connection must be made using seamless steel pipe (Mannesmann type), galvanized and with threaded joints provided with gaskets, excluding three-piece connections, except for initial and end connections. 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 (butane or propane).

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

### 2.3.1 Filter on the gas pipe

The gas valve is supplied ex factory with an inlet filter, which, however, is not adequate to entrap all the impurities in the gas or in gas main pipes.

To prevent malfunctioning of the valve, or in certain cases even to cut out the safety device with which the valve is equipped, install an adequate filter on the gas pipe.

### 2.4 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 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.

### 2.5 SYSTEM FILLING

Filling of the boiler and the system is done by the charge cock (2 fig. 7).

The charge pressure, with the system cold, must be between **1** and **1.2 bar**.

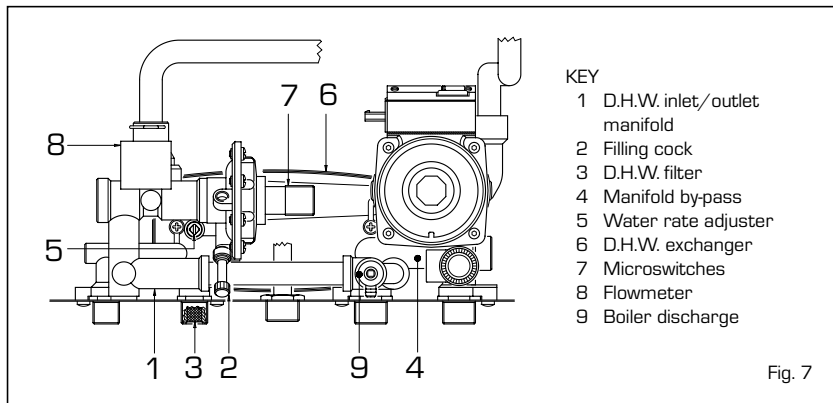
During system filling you are recommended to keep the main switch turned OFF.

Filling must be done slowly so as to allow any air bubbles to be bled off through the air valves. Should the pressure have risen well above the limit expected, discharge the over pressure by opening the pressure-relief valve.

### 2.6 FLUE

The flue for the atmospherical expulsion of the combustion products from natural draught appliances must meet the following requirements:

- Be gas-tight to the combustion products, waterproof and thermally insulated.
- Be built of materials suitable for keep resisting to normal mechanical stresses, heat, and the action of combustion products and their possible condensates.
- Follow a vertical path and not present any throttling throughout its entire length.
- Be adequately insulated to prevent phenomena of condensation or smokes cooling, in particular if located outside the building or in unheated ambiances.
- Be set at an adequate distance from



combustible or easily inflammable material by means of an air gap or suitable insulating material.

- Have beneath the mouth of the first smoke duct a chamber for collecting solid material and any condensate; the height of the chamber must be at least 500 mm. Access to the chamber must be guaranteed by means of an opening provided with an air-tight metal door.
- Have a circular, square, or rectangular internal cross section; in the case of square or rectangular sections, the corners must be rounded off with a radius of not less than 20 mm. However, hydraulically equivalent cross sections are allowed.
- Be equipped with a chimney-pot at the top, which must be outside the so-called back-flow zone, so as to prevent the formation of back-flow, which prevents free discharge of the products of combustion into the atmosphere.
- Be devoid of mechanical means of suction located at the top of the pipe.
- No overpressure should be present in a chimney that passes within or close up to inhabited rooms.

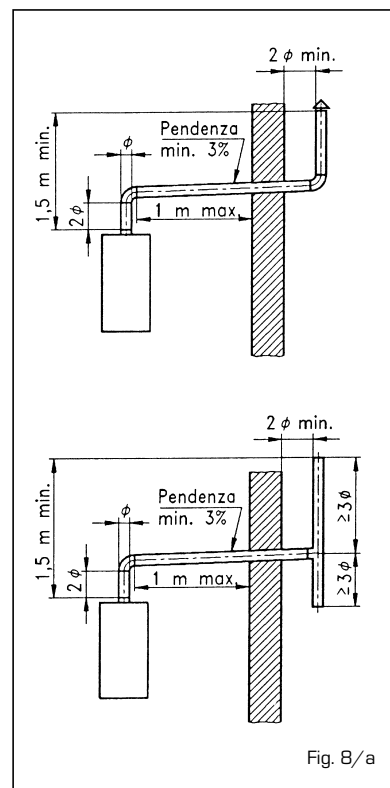
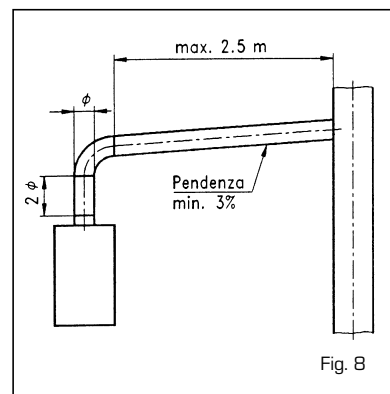
### 2.6.1 Connecting up flue

Fig. 8 refers to the connection of the boiler "25 OF - 30 OF" to the flue or chimney through smoke ducts. When making the connection, in addition to respecting the dimensions given, you are recommended to use gas-tight materials capable of resisting over time mechanical stresses and the smokes heat.

At any point along the smoke duct, the temperature of the combustion products must be higher than the dew point. More than a total of three changes of direction must be made, including the inlet connection to the chimney/flue.

For any changes of direction use only curved pipe lengths.

Fig. 8/a shows some applications of draught terminals that ensure proper expulsion of the combustion products, in case of discharge through the wall.



### 2.7 "25 BF - 30 BF" COAXIAL DUCT

The air inlet-smoke outlet assembly  $\phi$  60/100 is supplied in a kit code 8084805 complete with mounting instructions.

## 2.7.1 Installation of diaphragm

The diaphragm is normally supplied together with boiler version "30 BF". See fig. 9 for positioning.

**ATTENTION: Install the diaphragm only when the length of the  $\varnothing$  60/100 coaxial pipe is less than 1 m.**

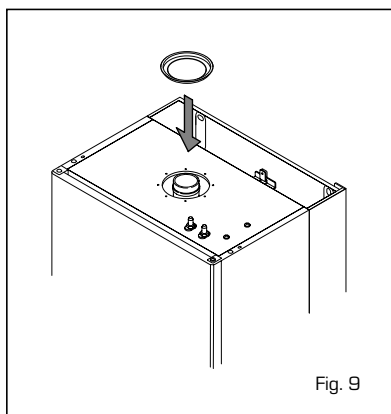


Fig. 9

## 2.7.2 Coaxial duct accessories

The accessories to be used for this type of installation and some of the connecting systems that may be adopted are illustrated in fig. 10.

**With the pipe bend included in the kit, the maximum length of the piping should not exceed 3 m.**

When the vertical extension code 8086900 is used, the terminal part of the pipe must always come out horizontally.

## 2.7.3 Positioning the 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. 10/a.

## 2.7.4 Coaxial duct outlet on the roof

The roof discharge terminal L. 1284 cannot be shortened and when positioning the tile, the minimum distance from the discharge head terminal must not be less than 600 mm (fig. 11).

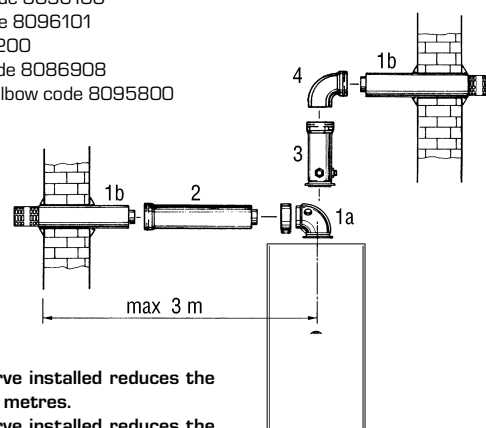
The accessories to be used for this type of installation and some of the connecting systems that may be adopted are illustrated in fig. 12.

**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 chan-**

### KEY

- 1a-b Coaxial duct kit code 8084805
- 2a Extension L. 1000 code 8096100
- 2b Extension L. 500 code 8096101
- 3 Vertical extension L. 200 with take-off point code 8086908
- 4 Supplementaty 90° elbow code 8095800



### IMPORTANT:

- Each additional 90° curve installed reduces the available length by 0.90 metres.
- Each additional 45° curve installed reduces the available length by 0.45 metres.

Fig. 10

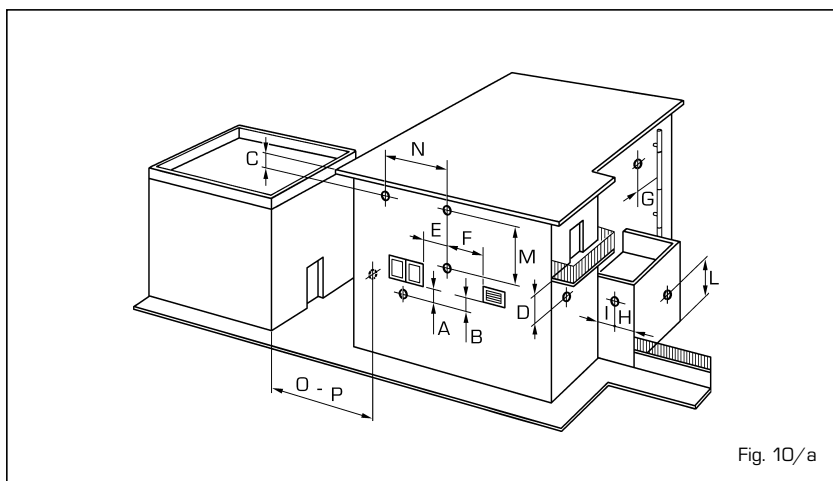


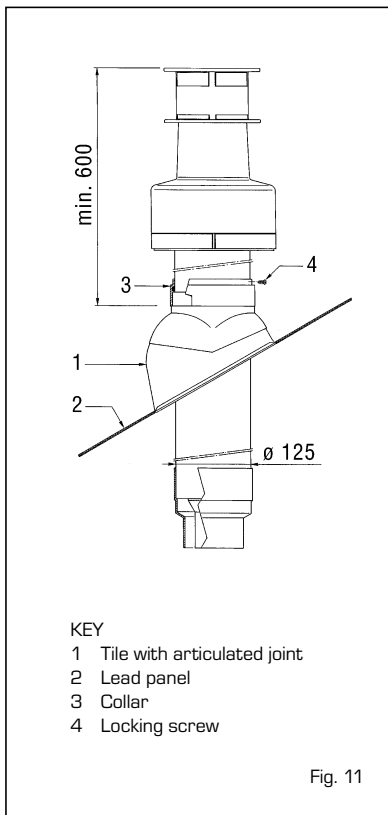
Fig. 10/a

TABLE 1

Siting of terminal	Appliances from 7 to 35 kW (distances in mm)
A - below openable window	600
B - below ventilation opening	600
C - below eaves	300
D - below balcony (1)	300
E - from adjacent window	400
F - from adjacent ventilation opening	600
G - from horizontal or vertical soil or drain pipes (2)	300
H - from corner of building	300
I - from recess in building	300
L - from ground level or other treadable surface	2500
M - between two terminals set vertically	1500
N - between two terminals set horizontally	1000
O - from a surface facing without openings or terminals	2000
P - as above but with openings and terminals	3000

- 1) Terminals below a practicable balcony must be located in such a way that the total path of the smoke from its outlet point from the terminal to its outlet point from the external perimeter of the balcony, including the height of possible railings, is not less than 2000 mm.
- 2) When siting terminals, where materials that may be subject to the action of the combustion products are present in the vicinity, e.g., eaves, gutters and downspouts painted or made of plastic material, projecting timberwork, etc., distances of not less than 1500 mm must be adopted, unless adequate shielding is provided to guard these materials.

ges of direction in the pipe development, the maximum length of the pipe must not exceed 2 m.



## 2.8 "25 BF - 30 BF" SEPARATE PIPES

When installing the pipes, follow closely the requirements of the current standards, as well as the following practical pointers:

- With direct intake from outside, when the pipe is longer than 1 m, you are recommended to insulate the piping so as to prevent formation of dew on the outside of the piping during particularly hard periods of the year.
- With the outlet pipe outside the building or in cold indoor environments, insulation is necessary to prevent burner failure in starting.  
In such cases, provide for a condensate-collector system on the piping.
- With the outlet pipe outside the building or in cold indoor environments, insulation is necessary to prevent burner failure in starting.  
In such cases, provide for a condensate-collector system on the piping.

**The maximum overall length of the intake and exhaust ducts depends on the head losses of the single fittings installed (excluding the doublers) and must not be greater than 7.00 mm H<sub>2</sub>O (vers. "25") and 11.00 mm H<sub>2</sub>O (vers. "30").**

For head losses in the fittings, refer to Table 2.

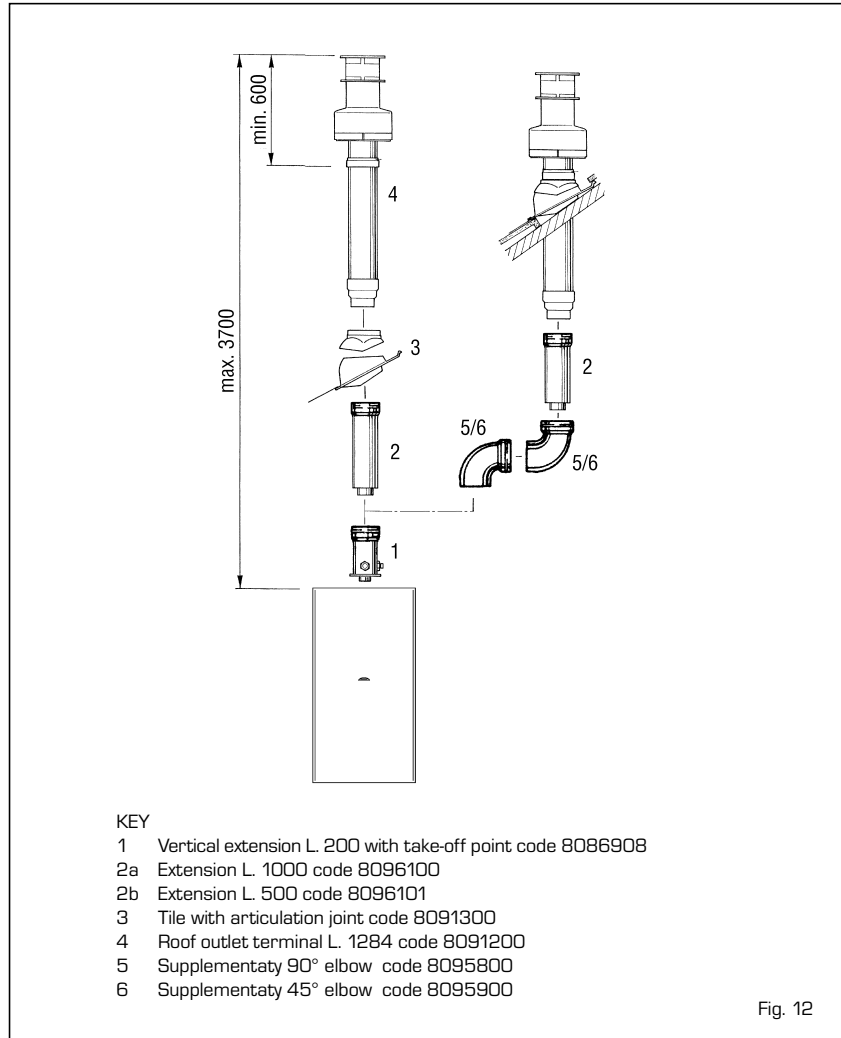


TABLE 2

Accessories ø 80	Head loss (mm H <sub>2</sub> O)					
	"25" version			"30" version		
	Inlet	Outlet	Roof outlet	Inlet	Outlet	Roof outlet
90° elbow MF	0,30	0,40	-	0,30	0,50	-
45° elbow MF	0,20	0,30	-	0,20	0,40	-
Extension L. 1000 (horizontal)	0,20	0,30	-	0,20	0,40	-
Extension L. 1000 (vertical)	0,30	0,20	-	0,30	0,30	-
Outlet terminal	-	0,30	-	-	0,40	-
Intake terminal	0,10	-	-	0,10	-	-
Doubler fitting	0,20	-	-	0,30	-	-
Roof outlet terminal L.1390	-	-	0,50	-	-	0,60
Tee condensation outlet	-	0,90	-	-	1,10	-

Example of allowable installation calculation ("25" version) in that the sum of the head losses of the single fittings is less than 7.00 mm H<sub>2</sub>O:

	Intake	Outlet
7 meter horizontal pipe ø 80 x 0.20	1.40	-
7 meter vertical pipe ø 80 x 0.30	-	2.10
n° 2 90° elbows ø 80 x 0.30	0.60	-
n° 2 90° elbows ø 80 x 0.40	-	0.80
N° 1 terminal ø 80	0.10	0.30
<b>Total head loss</b>	<b>2.10</b>	<b>+ 3.20 = 5.3 mm H<sub>2</sub>O</b>

With this total head loss, remove the ø 38 baffle from the intake pipe.

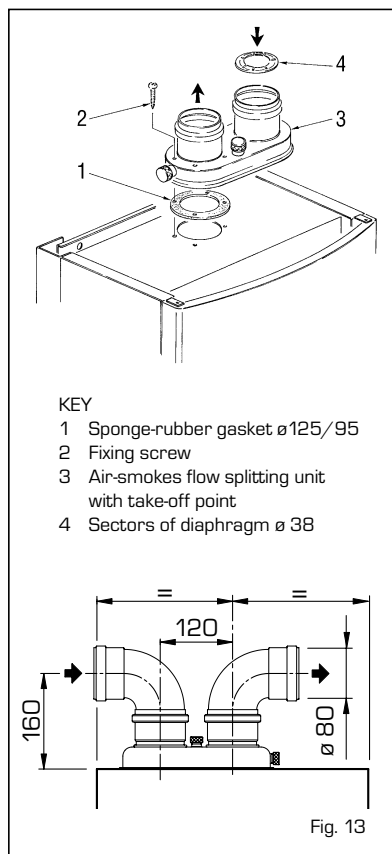


### 2.8.1 Separate pipe accessories

Kit code 8093000 is supplied for this purpose (fig. 13).

The sectored diaphragm is to be used according to the maximum head loss allowed in both pipes, as given in fig. 14.

The complete range of accessories necessary for satisfying all installation require-



ments is reported in fig. 15.

### 2.8.2 Separate-pipes roof outlet

The roof outlet terminal L. 1390 cannot be shortened and when positioning the tile, the minimum distance from the discharge head terminal must not be less than 700 mm (fig. 16).

The accessories to be used for this type of installation and some of the connecting systems that may be adopted are illustrated in fig. 17.

There is the possibility of doubling the air-intake and smoke-outlet pipes and then bring-

ing them back together again so as to obtain a concentric discharge by using the doubler fitting (7 fig. 17).

In these cases, when assembling, recover the silicone gasket used on the terminal adapter (5 fig. 16), which is to be replaced by the doubler; and insert it into the seat made in the doubler.

**For this type of discharge the sum of the maximum rectilinear development allowed for the pipes must not exceed 7.00 mm H<sub>2</sub>O ("25" vers.) and 11.00 mm H<sub>2</sub>O ("30" vers.).** When calculating the lengths of pipe, take into account the parameters given in the **Table 2**.

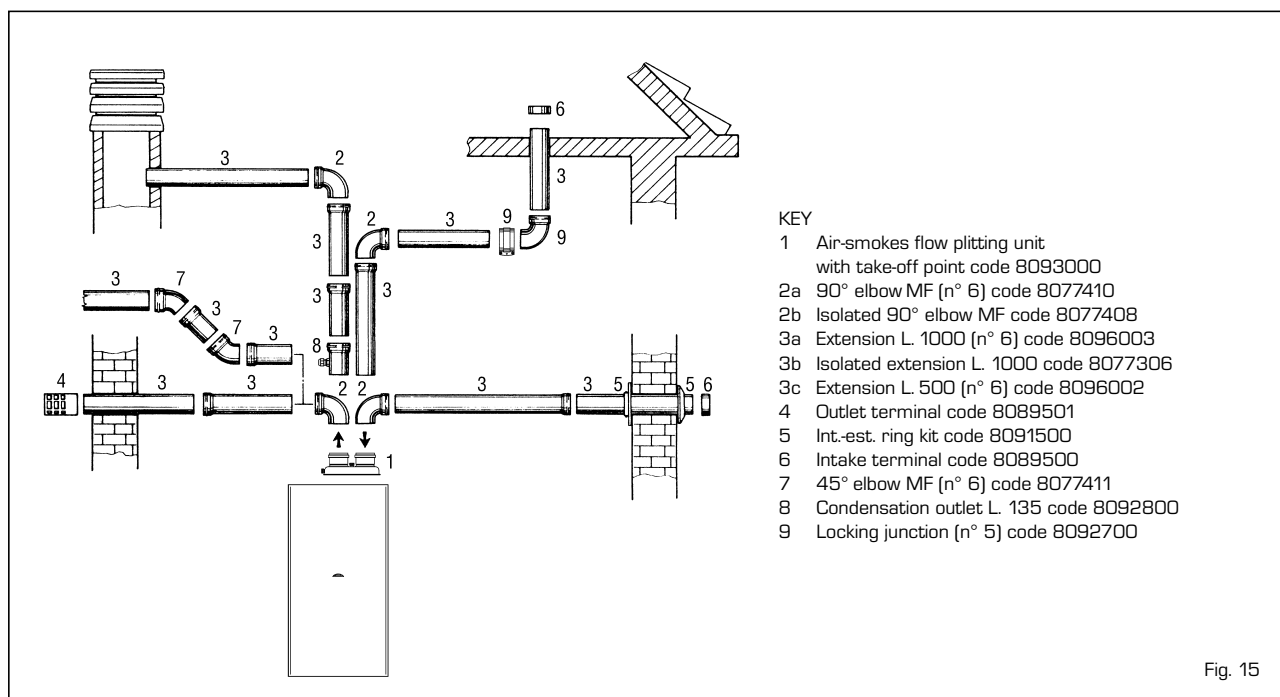
"25 BF" version			"30 BF" version		
Sectors of diaphragm to remove	Total head loss		Sectors of diaphragm to remove	Total head loss	
	mm H <sub>2</sub> O	Pa		mm H <sub>2</sub> O	Pa
1	0 ÷ 2	0 ÷ 19,6	1	0 ÷ 2	0 ÷ 19,6
2	2 ÷ 3	19,6 ÷ 29,4	2	2 ÷ 3	19,6 ÷ 29,4
4	3 ÷ 4	29,4 ÷ 39,2	3	3 ÷ 4	29,4 ÷ 39,2
6	4 ÷ 5	39,2 ÷ 49,0	4	4 ÷ 5	39,2 ÷ 49,0
Remove diaphragm	5 ÷ 7	49,0 ÷ 68,6	5	5 ÷ 6	49,0 ÷ 58,8
			6	6 ÷ 7	58,8 ÷ 68,6
			Remove diaphragm	7 ÷ 11	68,6 ÷ 107,8

"25 BF" version B22 type		
Sectors of diaphragm to remove	Total head loss	
	mm H <sub>2</sub> O	Pa
1	0 ÷ 1	0 ÷ 9,8
2	1 ÷ 2	9,8 ÷ 19,6
3	2 ÷ 4	19,6 ÷ 39,2
4	4 ÷ 5	39,2 ÷ 49,0
5	5 ÷ 6	49,0 ÷ 58,8
6	6 ÷ 7	58,8 ÷ 68,6
Remove diaphragm	7 ÷ 8	68,6 ÷ 78,4

Fig. 14



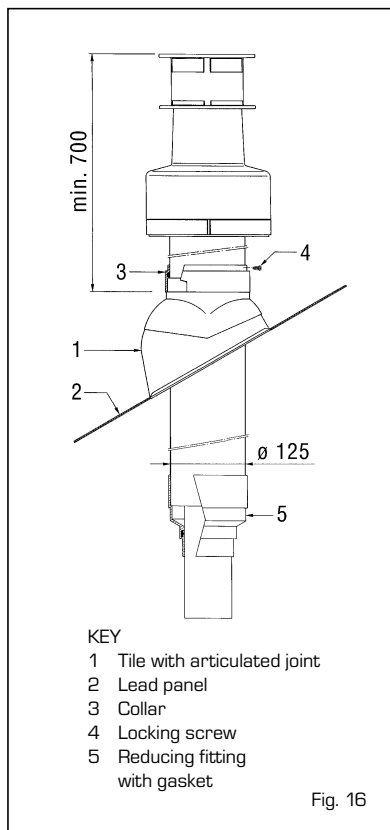


Fig. 16

## 2.9 FORCED OUTLET

The "25 BF" version can also be installed as a **B22 type** apparatus by assembling the stub pipe inlet/outlet kit cod. 8089950.

The kit comes with a sector diaphragm, instruction sheet and a label with the room aeration warnings to be attached to the boiler casing. The sector diaphragm must be used according to the maximum load loss allowed by the duct, as indicated in fig. 14.

The complete range of fittings required to carry out the installation is given in fig. 18. **The maximum length of the duct is determined by the load losses of the single attached fittings (excluding the inlet/outlet stub pipe) and should not be greater than 8.00 mm H<sub>2</sub>O.**

To calculate the load loss of the individual fittings attached see **Table 2**.

## 2.10 ELECTRICAL CONNECTION

The boiler is supplied with an electric cable. Should this require replacement, it must be purchased exclusively from SIME.

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

**NOTE: Device must be connected to an efficient earthing system.**

**SIME declines all responsibility for injury or damage to persons, animals or things, resulting from the failure to provide for proper earthing of the appliance.**

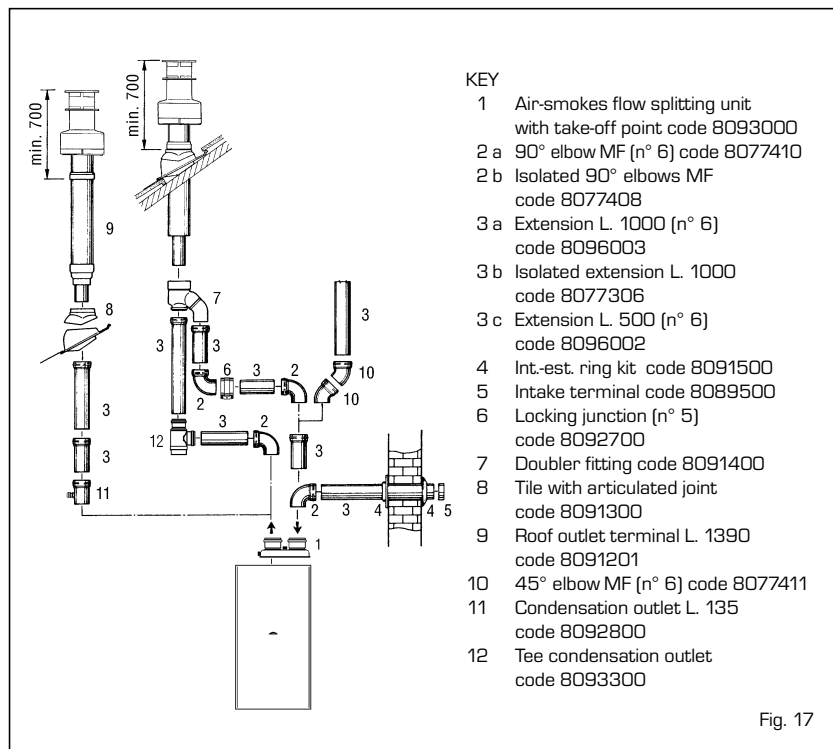


Fig. 17

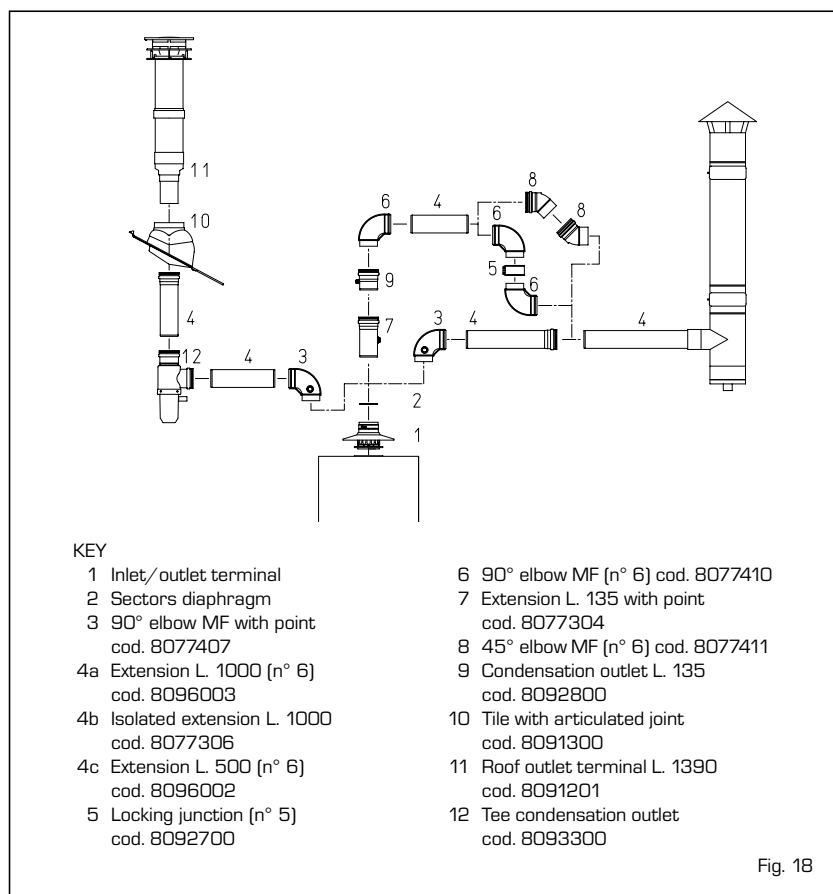


Fig. 18

### 2.10.1 Electric switchboard

To access the electrical panel, turn off the power supply and then remove the front panel and the two screws that anchor the control panel to the sides (see point 4.7).

The panel will tilt forward at a sufficient angle to allow access to the components.

To remove the protection, unscrew the fixing screws and use a screwdriver to release the upper tabs and free it from the control panel (fig. 19).

### 2.10.2 Room stat connection

To gain access to connector TA, remove the control panel cover (7 fig. 9) and con-

nect the room stat to the terminals 22-23 after having removed the jumper.

**The thermostat or timer-thermostat,**

**recommended for better room temperature control, must be class II as specified by standard EN 60730.1 (clean contact).**

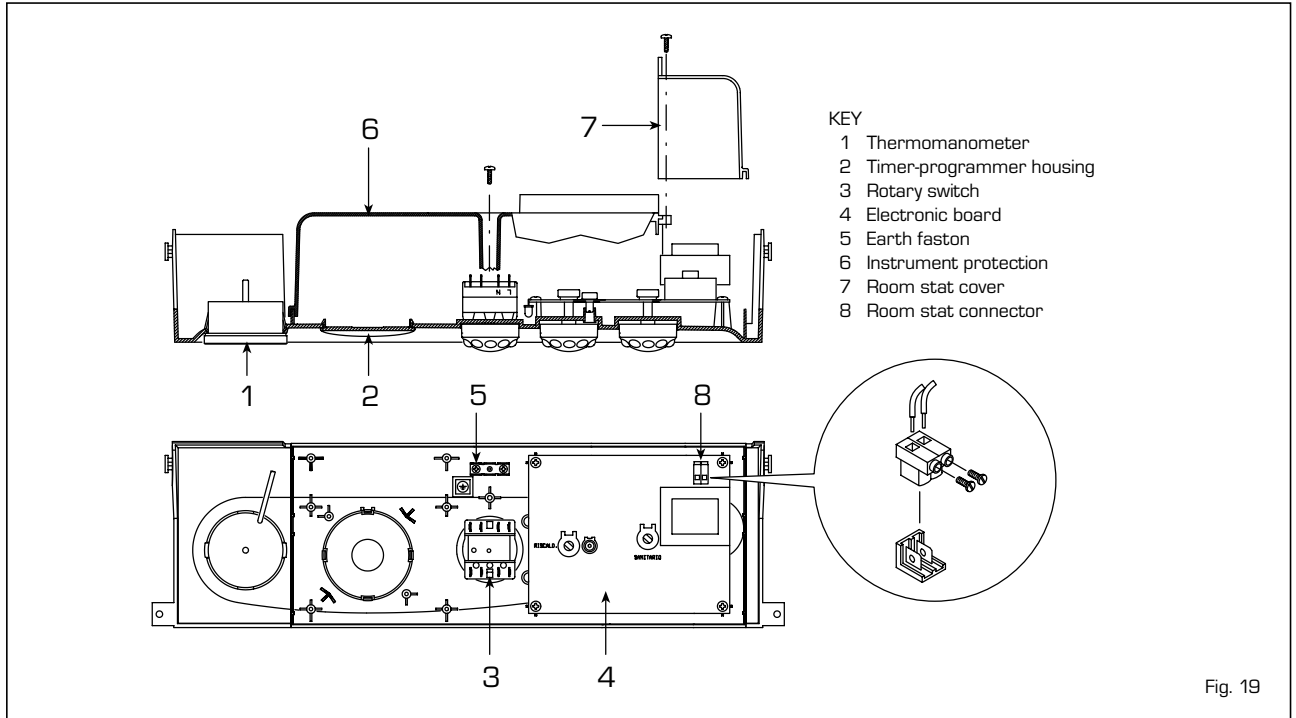
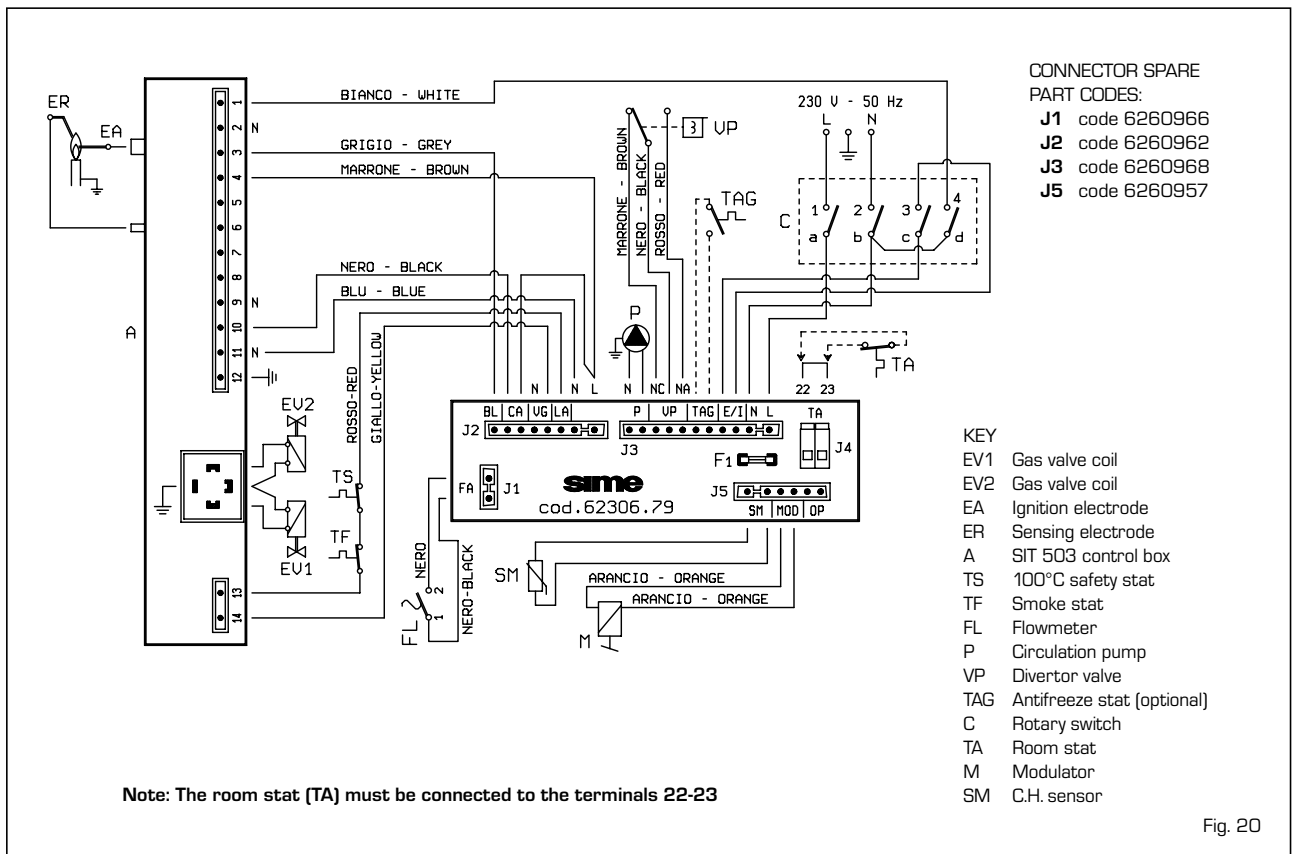


Fig. 19

### 2.10.3 "25 OF - 30 OF" wiring diagram with SIT control box



CONNECTOR SPARE  
PART CODES:  
J1 code 6260966  
J2 code 6260962  
J3 code 6260968  
J5 code 6260957

KEY  
EV1 Gas valve coil  
EV2 Gas valve coil  
EA Ignition electrode  
ER Sensing electrode  
A SIT 503 control box  
TS 100°C safety stat  
TF Smoke stat  
FL Flowmeter  
P Circulation pump  
VP Divertor valve  
TAG Antifreeze stat (optional)  
C Rotary switch  
TA Room stat  
M Modulator  
SM C.H. sensor

Fig. 20

2.10.4 "25 BF - 30 BF" wiring diagram with SIT control box

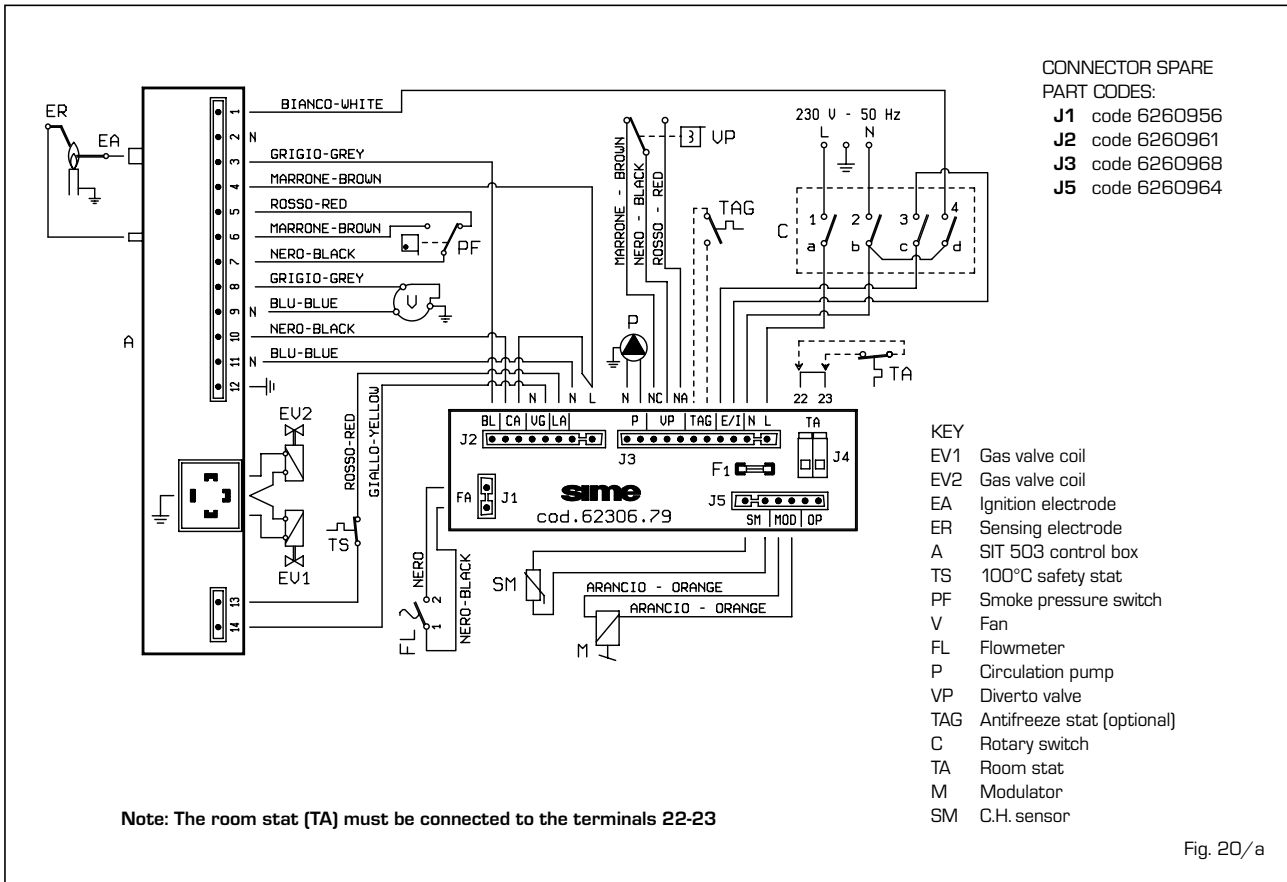


Fig. 20/a

2.10.5 "25 OF - 30 OF" wiring diagram with HONEYWELL control box

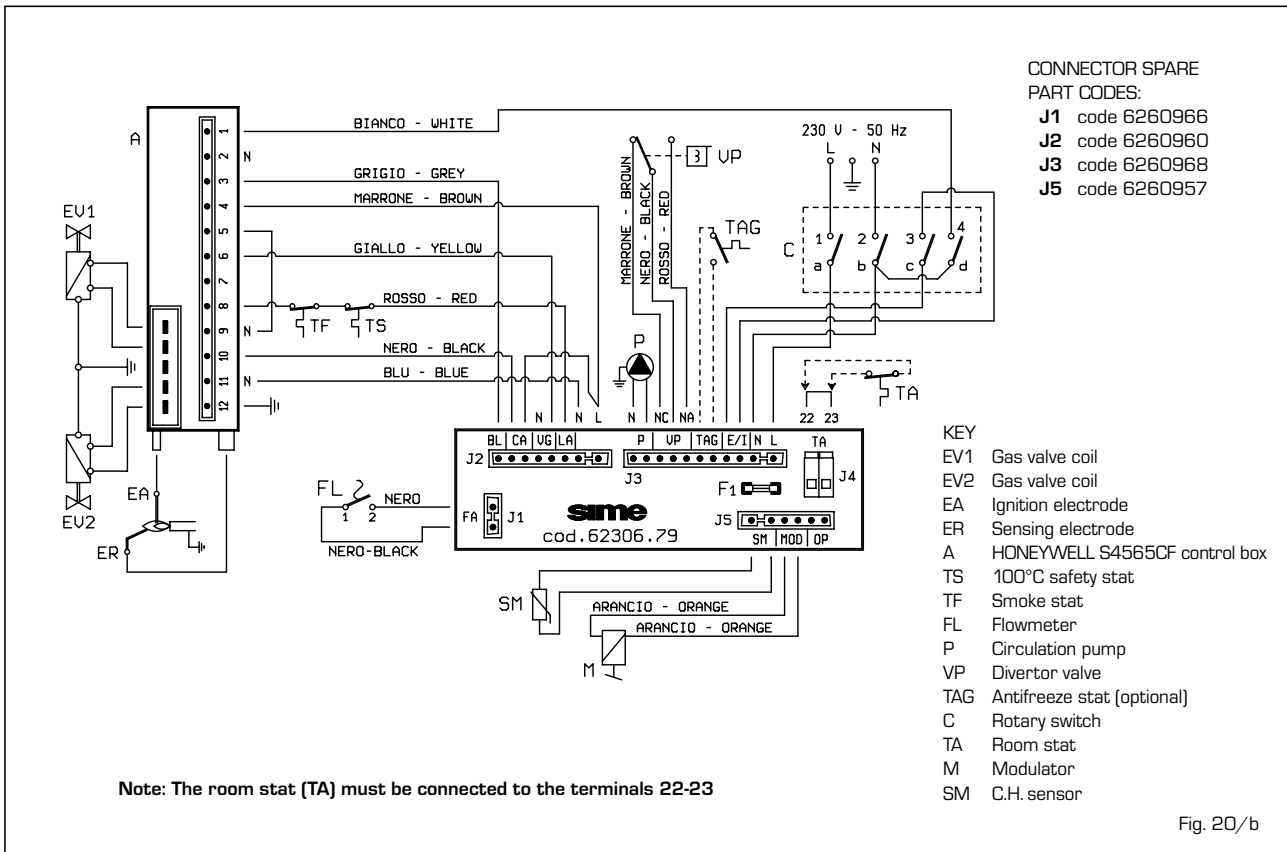
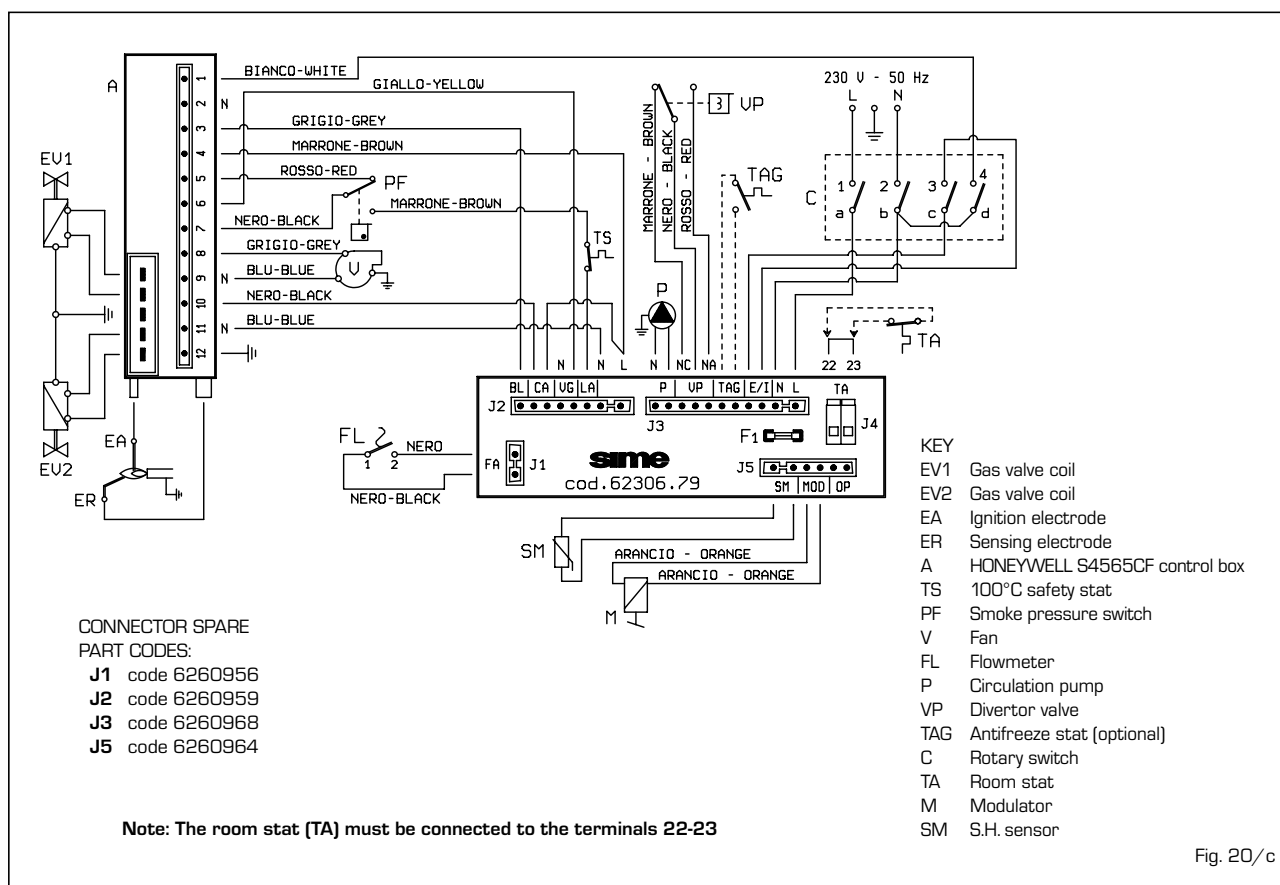


Fig. 20/b

## 2.10.6 "25 BF - 30 BF" wiring diagram with HONEYWELL control box



## 3 CHARACTERISTICS

### 3.1 ELECTRONIC BOARD

The electronic boards are manufactured in compliance with the EEC 73/23 low-voltage directives. They are supplied with 230V and, through a built-in transformer, send a voltage of 24V to the following components: modulator, C.H. sensor and time programmer. An automatic and continuous modulation system enables the boiler to adjust the heat output to the various system requirements or the User's needs. The electronic components are guaranteed against a temperature range of -10 to +60°C.

#### 3.1.1 Central heating operation

Upon demand for heating from the room temperature stat, the circulation pump is activated, and approximately 90 seconds must elapse for the burner to start operating. This will happen only if the temperature is set above the value detected by the heating sensor. The setting range is between 40 and 80°C. The heat output can be varied according to the system needs by adjusting

the trimmer [1 fig. 21]. At start-up of each working cycle, after the period of slow ignition having a duration of approx. 5 sec, the boiler will set itself at the heat output set on the "Minimum heating pressure" trimmer.

#### 3.1.2 D.H.W. operation

Upon demand for hot water, the boiler starts instantaneously when the microswitch on the pressure switch valve trips. The required power output is regulated, via flame modulation, by the hot water sensor, which will compare the temperature read with the temperature set on the potentiometer. The adjustment range is between 40 and 60°C. When the heating flow sensor is at 75°C the electronic limiter will trip and switch-off the burner. The burner will re-ignite when the temperature falls below 2 °C.

#### 3.1.3 Control leds

The electronic board is equipped with control leds which show some of the possible failures

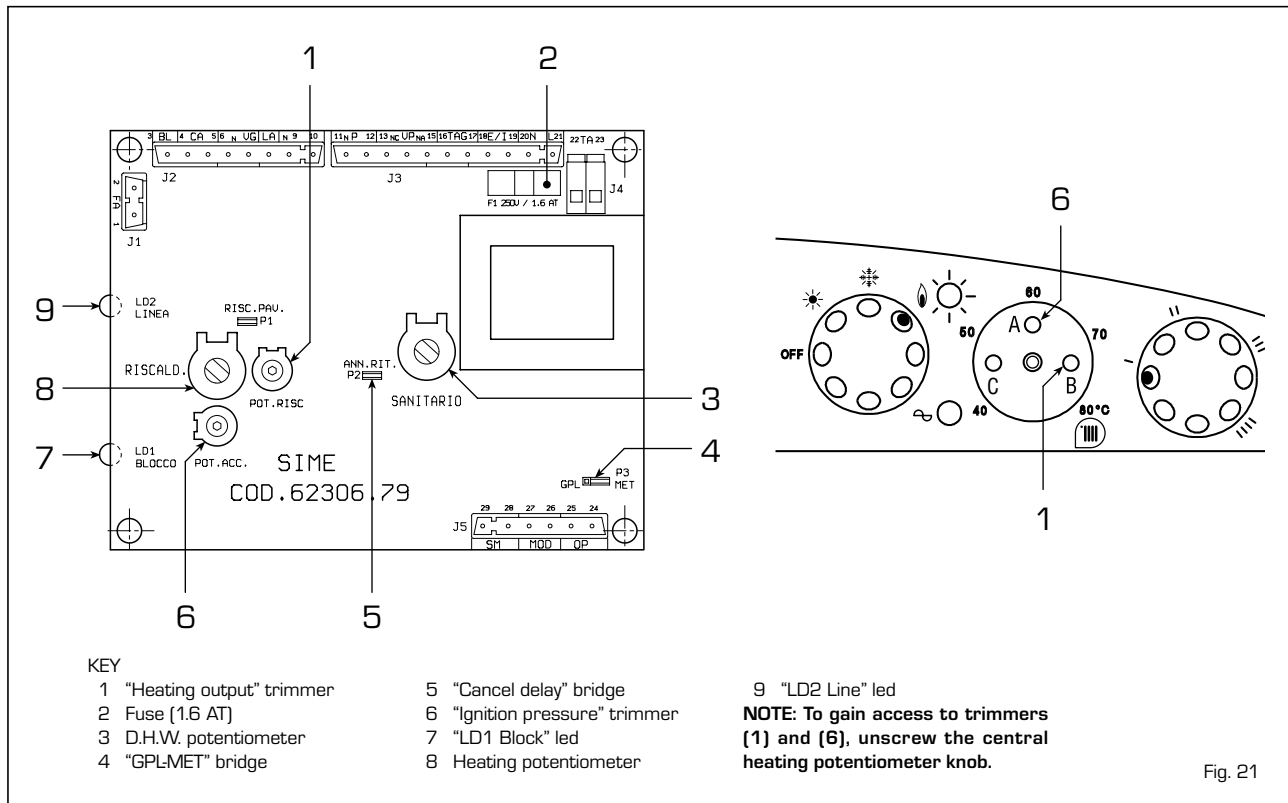
that can cause an irregular and/or improper operation of the appliance. The leds are located on the card as indicated in fig. 21 and marked with the following wording:

- "LD1 BLOCCO"  
Red led on when control box, safety stat and/or smoke stat trips.
- "LD2 LINEA"  
Green led off when there is no tension present.

#### 3.1.4 Devices available on the electronic board

The electronic board is equipped with the following devices:

- "POT. RISC." trimmer [1 fig. 21]  
Sets the maximum heating power value. To increase the value turn the trimmer clockwise; to reduce the value turn the trimmer anticlockwise.
- "POT. ACC." trimmer [6 fig. 21]  
Trimmer to vary the pressure level upon ignition (STEP), of the gas valve.



According to the type of gas for which the boiler is equipped, the trimmer must be regulated so as to obtain a pressure of approx. 3 mbar at the burner for methane gas and 7 mbar for butane gas (G30) and propane gas (G31). To increase pressure, turn the trimmer clockwise; to reduce pressure, turn the trimmer counterclockwise. The slow ignition pressure level can be set during the first 5 seconds following burner ignition. **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.**

– **"GPL-MET" connector** (4 fig. 21)

The connector link must be inserted on the type of gas for which the boiler is equipped.

– **"ANN. RIT." connector** (5 fig. 21)

In the heating phase, the electronic board 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 ignitions and turning off with very short time intervals 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 startup phase will be cancelled. In this case, the times elapsing between turning off and subsequent re-ignition will depend on a temperature difference of 3°C detected by the SM sensor (heating flow sensor).

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

### 3.2 TEMPERATURE SENSOR

The "FORMAT" boilers are equipped with sensor for detecting temperature:

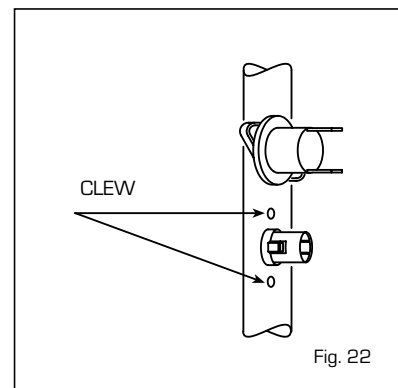
The probe acts as a limit thermostat, switching-off the burner when the temperature measured is higher than 90°C; the reset temperature is set at 80°C.

**When probe (SM) has tripped, the boiler will not function for either service. Table 3 shows the resistance values (Ω) that are obtained on the sensor as the temperature varies.**

**TABLE 3**

Temperature (°C)	Resistance (Ω)
20	12.764
30	8.579
35	7.102
40	5.915
45	4.955
50	4.173
55	3.533
60	3.006
70	2.208
80	1.650

In case of replacement, the thermistor will have to be fitted onto the relevant clew, located on the flow pipe (fig. 22).



### 3.3 CONTROL BOX

The boilers are equipped with HONEYWELL S4565CF and/or SIT 503 electronic control and protection. 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

Before igniting the boiler, use a voltmeter to make sure that the electrical connection to the terminal block has been made properly, respecting the position of line and neutral,

as shown in the diagram.

Rotate the selector to summer or winter, the red led should light up.

The boiler is now ready to start working upon demand for heating or drawing off of D.H.W.; a discharge current is sent to the ignition electrode through the programmer, and the gas valve opens at the same time. Burner ignition normally takes place within 2 or 3 seconds.

However, it is possible for ignition failures to occur, with consequent activation of signal indicating that the control box has "locked out".

#### - Gas failure

The control box 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 control box "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 cock being closed or by one of the valve coils having a break in the winding, so that the valve cannot open. The HONEYWELL valve connector is defective.

#### - Ignition electrode fails to spark

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

This may be due to a break in the wire of the electrode or to the wire not properly fastened to the electric terminal of the control box; 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 phase and neutral has not been respected on the terminal block.

There could have a break in the wire of the sensing electrode or the electrode itself is touching earth: the electrode is worn out and needs replacing. The control box is defective.

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

### 3.3.2 Operating cycle

At each start-up the programmers perform

a self-check which, if there is a malfunction or parasite flame signal, disables the program start.

The programmer will not start when the air pressure switch is not in the non-venting position.

### 3.4 "25 OF - 30 OF" SMOKE SAFETY DEVICE

This is a safety device against possible smoke emission into the ambience (14 fig. 3). The safety device goes into action by blocking operation of the gas valve when the return of the smoke into the ambience is continuous and in quantities that might constitute a danger.

The intervention of the device locks out the appliance because the burner has not ignited. In this case, place the rotary switch to the (0) position must be pressed for the boiler to restart automatically.

Should the boiler continue to "lock out", it will be necessary to make a careful check on the flue pipe, making all the necessary modifications and amendments so that it can work properly.

### 3.5 "25 BF - 30 BF" SMOKE PRESSURE SWITCH

The pressure switch is factory set at the optimal values of 4.5 - 6 mm H<sub>2</sub>O ("25" vers.) and 10-13 mm H<sub>2</sub>O ("30" vers.).

This enables the boilers operation even with air intake and smoke outlet pipes at the maximum limit of the length allowed (9 fig. 3).

Impurities and possible formations of condensate, which are more likely in cold periods of the year, could lead the pressure switch not to work and the boiler fail to start.

### 3.6 NO WATER FLOW SAFETY DEVICE

The boiler has a flow switch (8 fig. 7) which is tripped when it does not detect water flow in the primary circuit (>400 l/h), preventing the burner from functioning.

To start the burner again, check the pressure in the system and make sure that the pump and the flow switch are working properly.

### 3.7 SYSTEM AVAILABLE HEAD

The head available for the heating plant is shown as a function of the flow in graph in fig. 24.

### 3.8 TIME PROGRAMMER (optional)

The control panel is designed to allocate a timer-programmer, code 8092203, which can be supplied upon request. To fit the timer, remove the housing blanking piece from the control panel and, with the panel open, fit the timer to the panel using the screws supplied therein.

Remove the faston that links the terminal 3 of the rotary switch and connect it to the terminal 3 of the time-clock.

Connect the unit as shown in the wiring diagram (fig. 25).

### 3.9 MAINS ELECTRICITY CONNECTION

Use a separate electricity supply to connect the room stats and relative zone valves or pumps.

The micro or relay contact connection is made to terminals 22-23 (TA) of the circuit board after having removed the jumper (fig. 26).

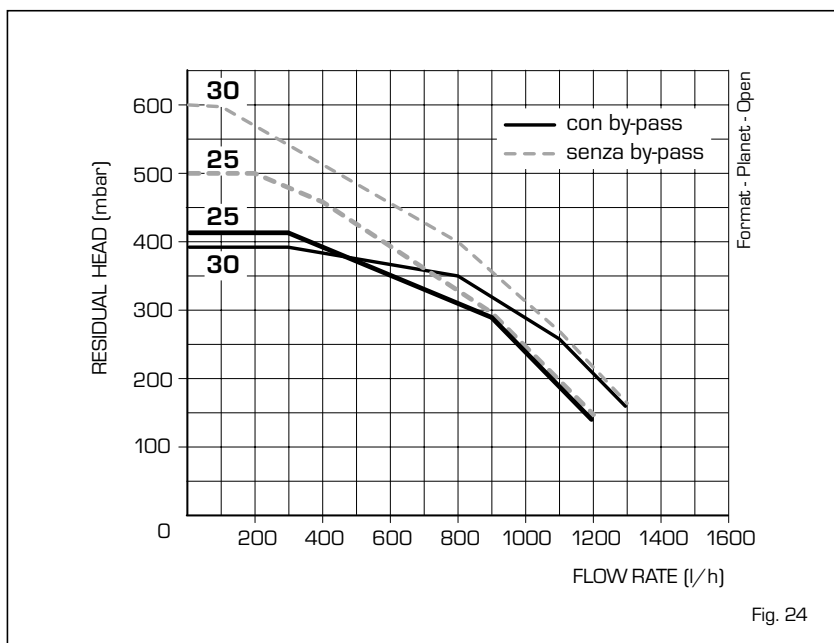
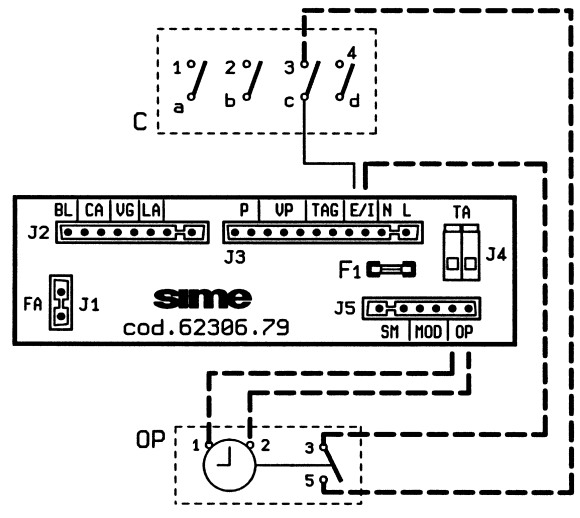
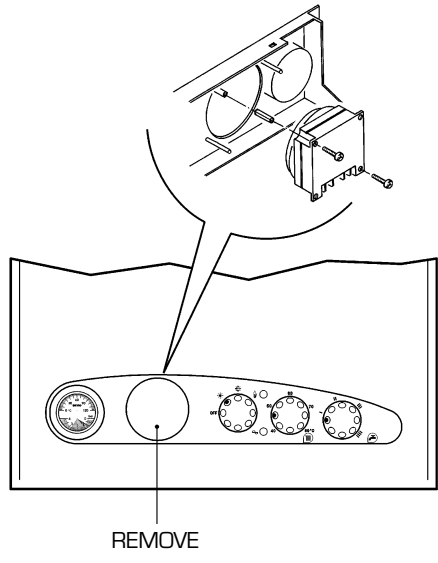


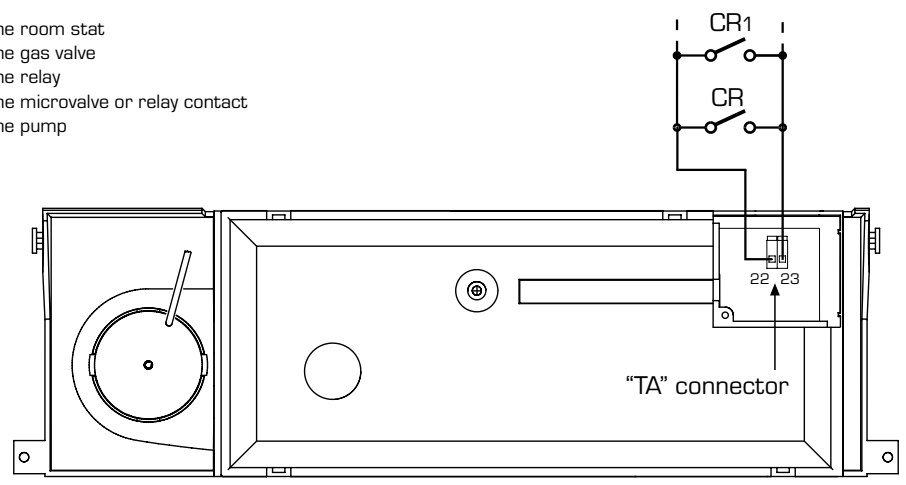
Fig. 24



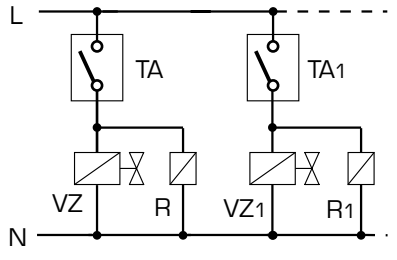
KEY  
 OP Time programmer  
 C Rotary switch

Fig. 25

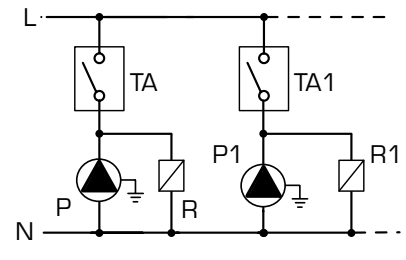
KEY  
 TA-TA1 Zone room stat  
 VZ-VZ1 Zone gas valve  
 R-R1 Zone relay  
 CR-CR1 Zone microvalve or relay contact  
 P-P1 Zone pump



**1. CIRCUIT WITH ZONE VALVES**



**2. CIRCUIT WITH ZONE PUMPS**



NOTE: The relays are only used where the zone valves are not fitted with micros.

Fig. 26



## 4 USE AND MAINTENANCE

### 4.1 TEMPERATURE ADJUSTMENT OF D.H.W.

The system with a potentiometer for adjusting the temperature of D.H.W. with a setting range from 40° to 60°C offers a double advantage:

- 1) The boiler adapts perfectly to any type of D.H.W. system, whether the mixing system is a mechanical or a thermostat-controlled type.
- 2) The thermal output is dosed according to the temperature required, which means a considerable saving in fuel.

**NOTE:** In order to avoid any misunderstanding please remember that the value obtained by the product of temperature difference (in °C) between D.H.W. output and input into the boiler by the hourly flow rate measured on the tap, where hot water is drawn off (l/h), cannot be higher than the useful output developed by the boiler. For measurements and checks on flow rate and temperature of D.H.W., use suitable instruments, taking into consideration any heat dispersion along the stretch of piping between the boiler and the measuring point.

### 4.2 ADJUSTMENT OF D.H.W. FLOW RATE

To adjust the hot water flow rate, use the flow-rate regulator on the pressure switch valve (5 fig. 7). Remember that the flow rates and corresponding temperatures of use of hot water, given in section 1.3, have been obtained by positioning the selector of the circulation pump on the maximum value. **Should there be any reduction in the D.H.W. flow rate, the filter installed on the inlet to the pressure switch valve (3 fig. 7) will need cleaning.**

### 4.3 GAS VALVE

The "FORMAT" boilers, are equipped standard with the SIT 837 TANDEM gas valve (fig. 27) and with HONEYWELL VK 4105M gas valve (fig. 27/a). The gas valve is set at two pressure values: maximum and minimum. According to the type of gas burnt, these correspond to the values given in Table 4. The gas pressures at the maximum and minimum values, are factory set. Consequently they must not be altered.

Only when you switch the appliance 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 is carried out exclusively by authorized technical staff. When the working pressures have been adjusted, reseal the regulators.**

When the gas pressures are to be reset, this must be done following a set order first setting the MAXIMUM and then the MINIMUM.

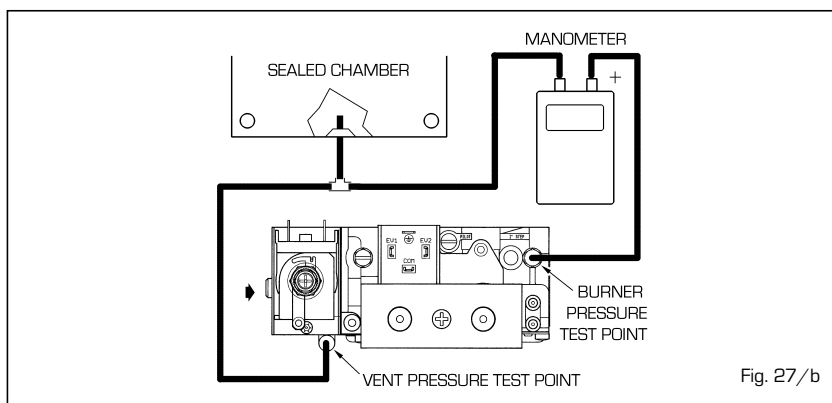
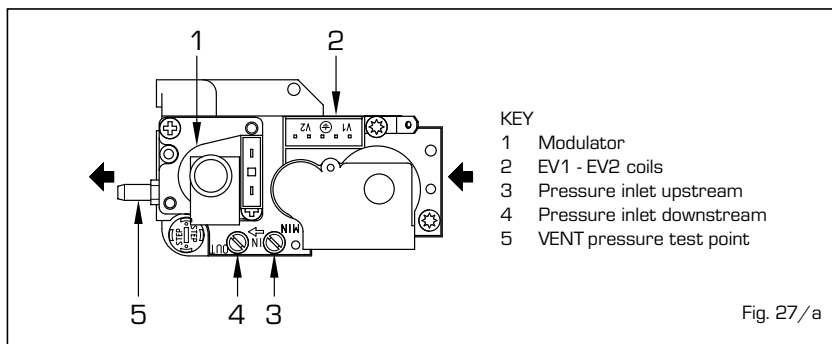
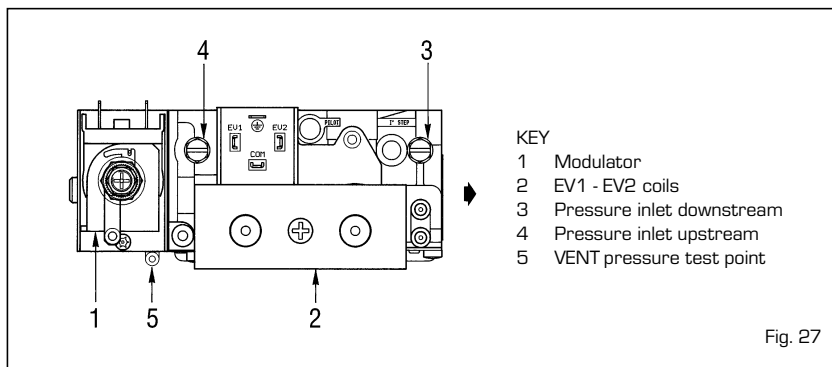


TABLE 4

Type of gas	Burner max. pressure mbar	Modulator current mA	Burner min. pressure mbar	Modulator current mA
Methane - G20	9 - 11	130	2	0
Butane - G30	27 - 28	165	5	0
Propane - G31	35	165	5 - 7	0

#### 4.3.1 Maximum pressure adjustment valve SIT (fig. 28)

To set the maximum pressure, proceed as follows:

- Connect the pressure column or a pressure gauge to the pressure inlet downstream of the gas valve. In the "30 BF" versions, instead, connect the manometer as shown in fig. 27/b.
- Remove the plastic cap (1).
- Set the knob of the D.H.W. potentiometer to the maximum value.
- Ignite the boiler by operating the switch and open the hot water tap.
- Using a  $\varnothing$  10 spanner, turn the nut (3) to arrive at the maximum pressure value

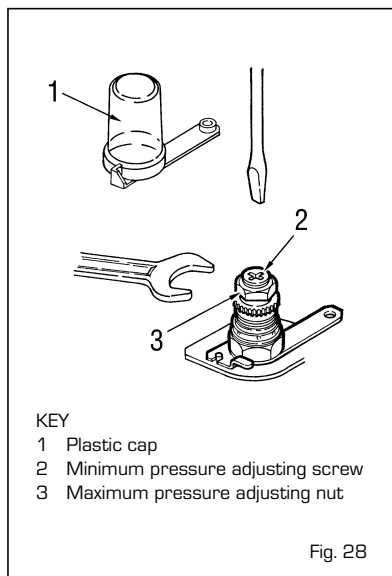
given in Table 4: to reduce the pressure, turn the nut counterclockwise; to increase the pressure, turn it clockwise.

- Operate the main switch a number of times, keeping the hot water tap open all the time, and check that the pressure corresponds to the values given in Table 4.

#### 4.3.2 Minimum pressure adjustment valve SIT (fig. 28)

After having adjusted the maximum pressure, calibrate the minimum pressure as follows:

- Disconnect the electric power to the modulator:



- With the domestic hot water potentiometer knob on maximum, the domestic hot water tap open and the burner ignited, turn the screw (2) keeping locked the nut (3) to achieve the minimum pressure value given in **Table 4**: to reduce the pressure, turn the screw counterclockwise; to increase the pressure, turn it clockwise.
- Operate the main switch 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 4**.
- Restore electric power to the modulator.
- Replace the plastic cap (1) in position.

#### 4.3.3 Maximum pressure adjustment valve HONEYWELL (fig. 28/a)

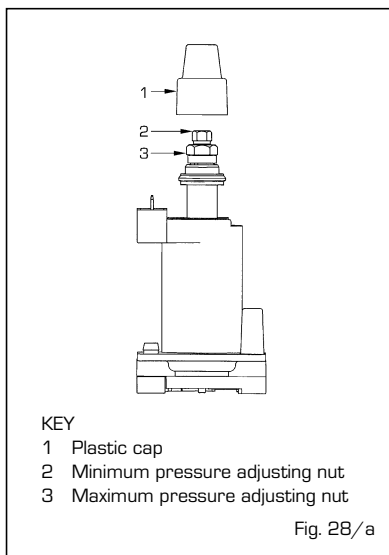
To set the maximum pressure, proceed as follows :

- Connect the pressure column to the pressure inlet downstream of the gas valve.
- For the "BF" models connect the pressure column as shown in fig. 27/b.
- Remove the plastic cap on the modulator (1).
- Set the knob of the D.H.W. potentiometer to the maximum value.
- Ignite the boiler and open the D.H.W. cock.
- Using a  $\varnothing 9$  spanner, turn the nut (3) to achieve the maximum pressure value given in **Table 4**: to reduce the pressure, turn the nut counterclockwise; to increase the pressure, turn it clockwise.
- Operate the main switch a number of times, keeping the D.H.W. cock open all the time, and check that the pressure corresponds to the values given in **Table 4**.

#### 4.3.4 Minimum pressure adjustment valve HONEYWELL (fig. 28/a)

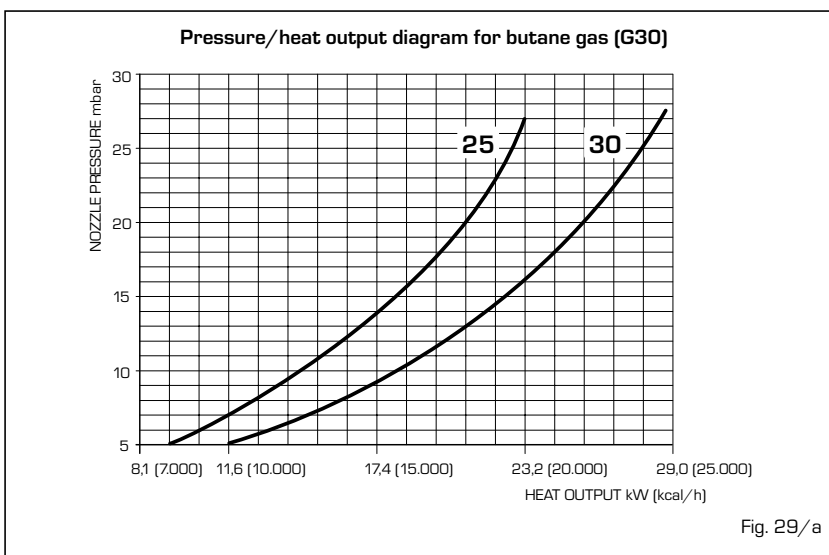
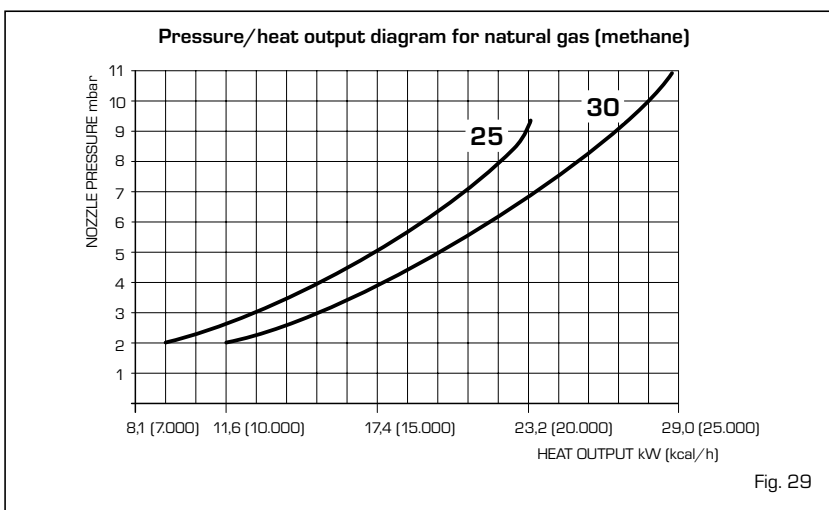
After adjusting maximum pressure, proceed to calibrate minimum pressure:

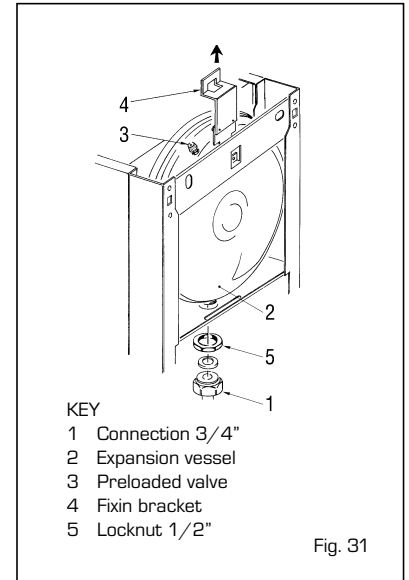
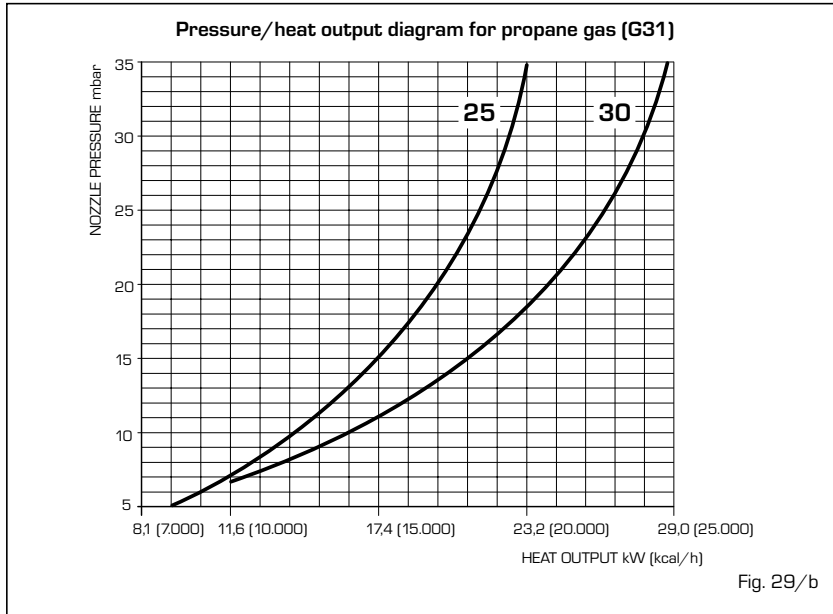
- Disconnect the electric power supply from the modulator.
- With the hot water potentiometer knob set to the maximum, the hot water tap turned on and the burner lit, hold nut (3) locked in place and simultaneously turn nut (2) using a fixed  $\varnothing 7$  wrench to identify the minimum pressure value shown in **Table 4**: turn the nut anti-clockwise to reduce pressure or clockwise to increase it.
- Turn the boiler on and off repeatedly while keeping the hot water tap turned on, checking that pressure corresponds to the values shown in **Table 4**.
- Connect up the power supply to the modulator again.
- Replace the 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 16 kW, use a screwdriver to adjust the heating heat output trimmer (1 fig. 21). To increase working pressure, turn the trimmer clockwise; to reduce pressure, turn the trimmer counterclockwise. To facilitate the operations of adjusting heat output, see the pressure/heat output diagrams for natural gas (methane) and butane or propane gas (figg. 29 - 29/a - 29/b).



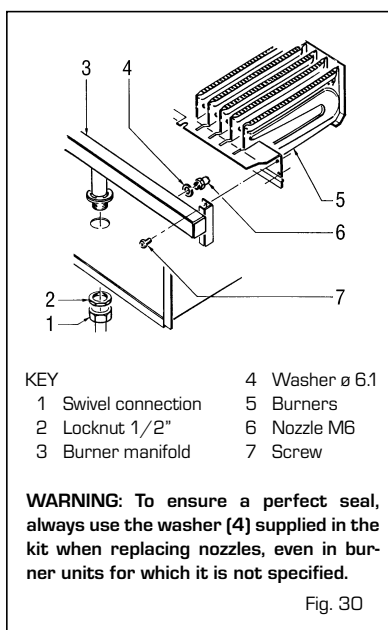


#### 4.5 GAS CONVERSION

A kit is supplied complete with the necessary change-over materials for operation with butane gas (G30) or propane gas (G31). Operate in the following manner for changing over from one gas to another (fig. 30):

- Close the gas cock.
- Slide out the burner unit.
- Replace the main nozzles supplied in a kit (6), inserting the copper washer (4). Use a  $\varnothing 7$  spanner to perform this operation.
- Remove the "GPL-MET" connector link on the card and set it on "GPL" (4 fig. 21).
- To set the values of maximum and minimum gas pressure, follow the instructions given in section 4.3, according to the type of gas valve used.

**When the working pressures have been adjusted, reseal the regulators.**



- 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 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. The conversion to different gas must be carried out exclusively by authorized technical personnel.**

#### 4.6 DISASSEMBLY OF EXPANSION VESSEL

To disassemble the expansion vessel, proceed as follows (fig. 31):

- Make sure that the water has been emptied out of the boiler.
- Unscrew the connection (1) and the locknut (2).

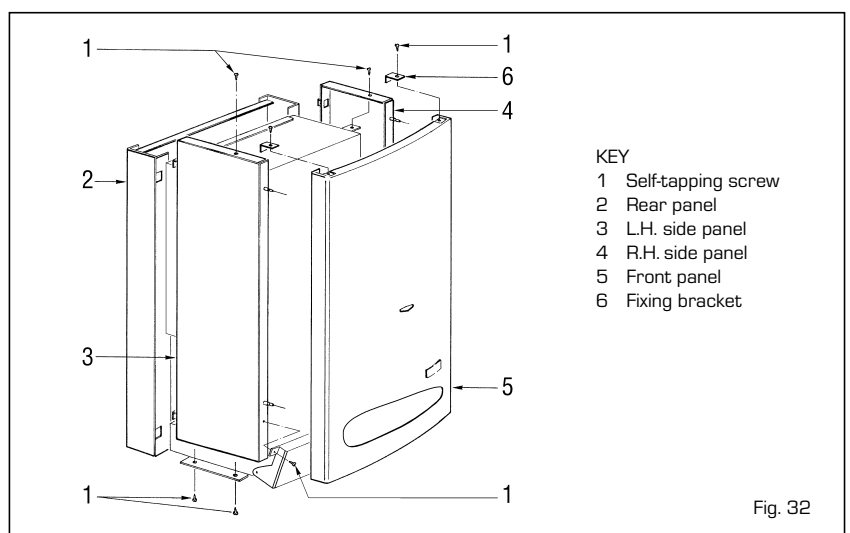
- Remove the bracket and the expansion vessel (4).

**NOTE: Before refilling the system, using a pressure gauge attached to the valve (3) make sure that the expansion vessel is preloaded at a pressure of 0.8 to 1 bar.**

#### 4.7 REMOVAL OF OUTER CASING

It is possible to completely disassemble the shell for an easy maintenance of the boiler following these simple instructions (fig. 32):

- Remove the two screws and bracket (6) locking the front panel to the sides.
- Pull the front panel forwards so as to release it from the slot-in pins located on the sides.
- Unscrew the two screws fixing the instrument panel to the sides.
- Unscrew the four screws fixing the sides to the instrument panel support.
- Push the sides (3) and (4) upwards, sliding them out of their slots.



## 4.8 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 main switch off to stop electric power reaching the boiler and close the gas feed cock.
- Remove the outer casing as described in section 4.7.
- Remove the gas burner manifold unit (fig. 30).
- To clean the burner, 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 the main burner.
- After assembly of all the gas connections, these must be tested for soundness, using soapy water or appropriate products.  
**DO NOT USE NAKED FLAMES.**
- Do not use calcium chloride to treat the plastic component during generator maintenance.

**Preventive maintenance and checking of efficient operation of equipment and safety devices must be carried out exclusively by authorized technical personnel.**

### 4.8.1 Cleaning the C.H. water filter (fig. 33)

To clean the filter, close the delivery/return on/off taps, turn off the power to the control panel, remove the casing and empty the boiler using the drain provided (9 fig. 7) until the hydrometer shows "zero". Place a container for collection underneath the filter, unscrew the cap and proceed to clean the filter, removing impurities and limestone deposits. Check the seal o-ring before reassembling the cap with the filter

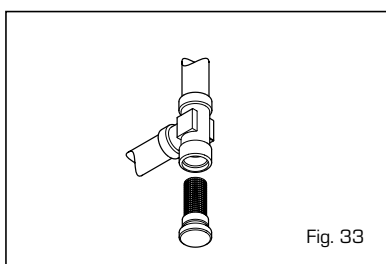


Fig. 33

## 4.9 FAULT FINDING

**The burner does not ignite and the circulator is working.**

- Check that the water pressure reads 1 - 1.2 bar:
- The flowmeter is faulty, replace it.
- The flow switch has been tripped because the heating circuit filter is obstructed with impurities; it needs cleaning.

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

- Check flowmeter; if necessary, replace it.
- The smoke stat has tripped; reset it.
- Check whether electric power is reaching the gas valve actuator; check its operation and, if necessary, replace it.
- Check operation of the smoke pressure switch ("BF" vers.).
- The fan is operating but at low rpm, so failing to activate the smoke pressure switch ("BF" vers.); replace the fan.
- Replace the electronic card.

**Boiler turns on, but after 10 seconds "locks out".**

- Check that during electric wiring the position of line and neutral have not been inverted.
- The sensing electrode is faulty; replace it.
- The control box is faulty; replace it.

**Gas valve fails to modulate in D.H.W. and C.H. modes.**

- The sensor is interrupted; replace it.
- The modulator has a break in winding; replace it.
- Check that the current to the modulator complies with the specifications
- The electronic card is faulty; replace it.

**Main burner fails to start in D.H.W. production mode.**

- Unscrew completely the screw of the pressure switch valve (5 fig. 7)
- Check that the filter on the pressure switch valve inlet is clean (3 fig. 7).
- Mains water charge pressure is too low; install water-lift system.
- The microswitch of the pressure switch valve is faulty; replace it.

**D.H.W. is very hot but at low flow rate.**

- Exchanger or D.H.W. outlet pipe obstructed by lime deposits; remove encrustations.

**D.H.W. potentiometer and heating potentiometer fails to regulate properly.**

- Check that the sensor in question is in contact with the pipe; use silicone paste to improve sensitivity.
- The sensor in question is faulty; replace.

**Boiler is noisy or heat exchanger makes a sizzling sound.**

- Check whether circulation pump P is obstructed; if necessary clear it out.
- Unclog impeller of circulation pump, clearing away any impurities or sediments.

- Circulation pump is burnt out or has a lower rpm than required; replace it.
- Check boiler output is adequate for actual needs of heating system.

**Boiler safety valve keeps tripping.**

- Check charge cock is closed. If it doesn't close properly, replace it.
- Check system cold charge pressure is not too high; keep to recommended values.
- Check whether safety valve is out of calibration; if necessary, replace it.
- Check whether the vessel is sufficiently capacious to contain the water for the system.
- Check preloading pressure of expansion vessel.
- Replace expansion vessel if faulty.

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

- The rotary switch is on "Summer"; switch to "Winter".
- The room stat is set too low or needs replacing because faulty.
- The electrical connections of the room stat are wrong.
- The microswitch of divertor valve is faulty; replace it.

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

- Check that pressure of burner gas is regular.
- Check burners are clean.
- Check coaxial assembly has been installed correctly ("BF" vers.).

**Smell of unburnt gases.**

- Check boiler is properly clean.
- Check draught is sufficient.
- Check gas consumption is not too high.

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

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

**In the "FORMAT" boilers, upon demand for D.H.W. or heating, fan fails to turn at max speed.**

- Make sure that the smoke pressure switch is working and that the relative contact is in the rest position.
- Check whether connection tubes of smoke pressure switch are obstructed and, if necessary, clean away impurities or condensate.
- The smoke pressure switch needs replacing.
- Replace electronic board.

# USER INSTRUCTIONS

## WARNINGS

- In case of fault and/or incorrect equipment operation, deactivate it, without making any repairs or taking any direct action. Contact the nearest Authorised Technical Service Centre.
- The installation of the boiler and any servicing or maintenance job must be carried out by qualified personnel. Under no circumstances, the devices sealed by the manufacturer can be tampered with.
- It is absolutely prohibited to block the intake grilles and the aeration opening of the room where the equipment is installed.

## LIGHTING AND OPERATION

### BOILER IGNITION

Open the gas valve and light the appliance by turning the rotary switch to summer position ☀ (fig. 1).

The green led indicates that electricity is being supplied to the appliance.

- With the rotary switch in the summer position ☀, the boiler will start-up upon demand for domestic hot water, and run at full power to reach the selected temperature.

The gas feeding pressure will then automatically vary to ensure that the required temperature is kept constant.

- With the rotary switch in the winter position ❄, once the boiler has reached the value set on the heating potentiometer, it will start to modulate in automatically in order to supply the required power output to the system.

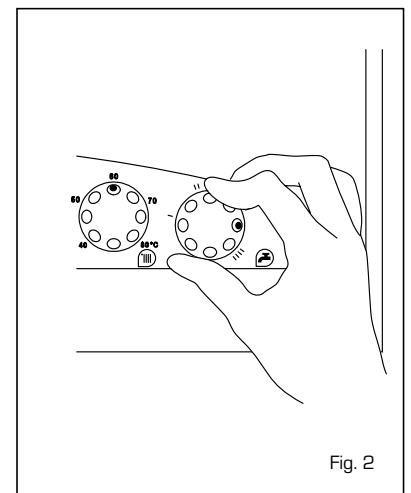
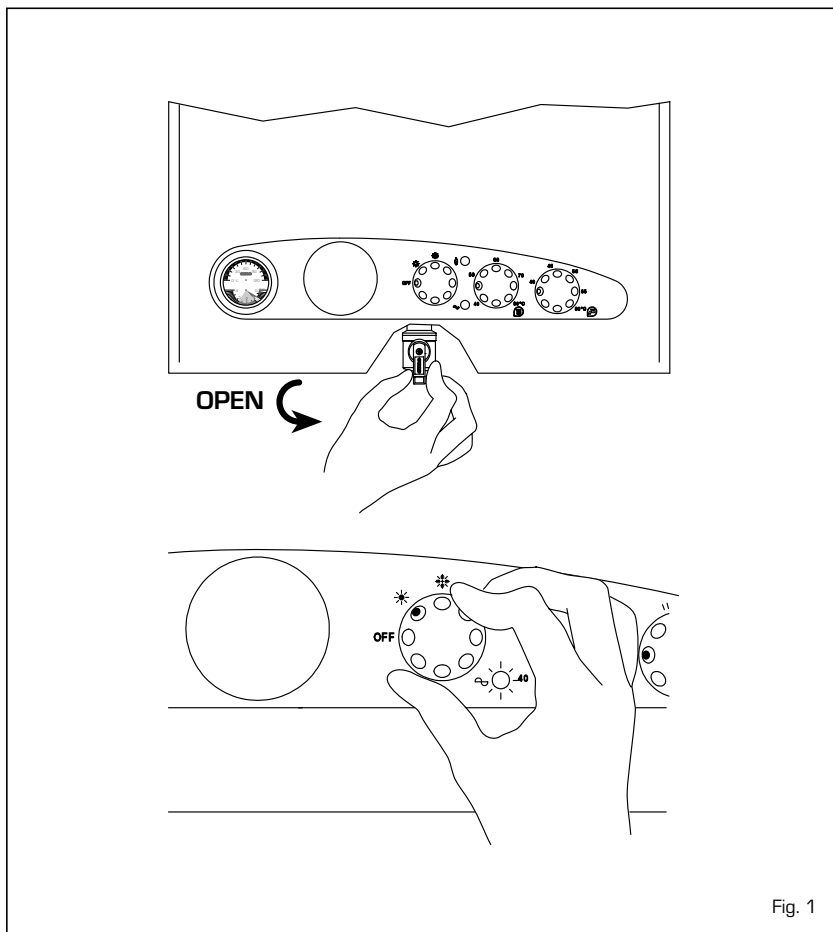
The operation of the boiler will be stopped through the intervention of the thermostat or timer.

### TEMPERATURES ADJUSTMENT

- The D.H.W. temperature can be adjusted by turning the knob of the D.H.W. potentiometer (☺) which has a range of between 40 to 60°C (fig. 2).

- The C.H. temperature can be adjusted by turning the knob of the C.H. potentiometer (☹) which has a range of between 40 to 80°C.

To ensure optimal boiler efficiency at all times, we recommend not to drop below a minimum working temperature of 50°C (fig. 2).



### LOCK OUT RESET OF THE CONTROL BOX

If the burner does not ignite, the red lock out indicator (🔴) will light up (fig. 3).

In order to re-attempt boiler ignition, place the rotary switch to the 🔴 position and release it immediately, then turn it back to the summer ☀ or winter ❄.

Should the appliance again "lock out", please approach the authorized technical staff.

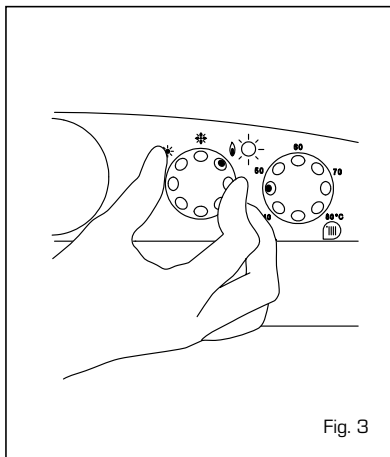


Fig. 3

### TURNING OFF BOILER

To turn off the boiler set the switch to "OFF" and close the gas-feeding pipe tap if the boiler remains inoperative for a long period (fig. 1).

### SYSTEM FILLING (fig. 4)

Check periodically that the thermomanometer shows a reading of between 1 - 1.2 bar (1), with the system cold.

**If the pressure drops below the blue scale (1), the boiler will not operate.**

**To re-set the pressure, rotate the charging valve to the anticlockwise direction until the thermomanometer reading re-enters the blue scale (1).**

Once this operation is completed, make sure the tap is closed.




In case the pressure goes above the limit, empty the exceeding pressure by opening the pressure relief valve on any radiator.

The blue part of the scale (2) indicates the

working pressure range with the heating in operation. Should the pressure exceed the values of the blue scale (2), causing the safety valve intervention, call the authorized technical staff.

### "25 OF - 30 OF" SMOKE SAFETY DEVICE

This is a safety device against possible smoke emission into the ambience.

The safety device switches off the gas valve when the return of the smokes into the ambience is continuous and then dangerous. The intervention of this device locks out the appliance because the burner is not ignited. In this case, turn the rotary switch to the  position (fig. 3) and release it immediately, then turn it back to the summer  or winter .

**Should the boiler "lock out" again, you must call the authorized technical staff.**

### GAS CONVERSION

Should it be necessary to convert the appliance to a different gas from the one for which the boiler has been equipped, approach the technical staff.

### 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.**

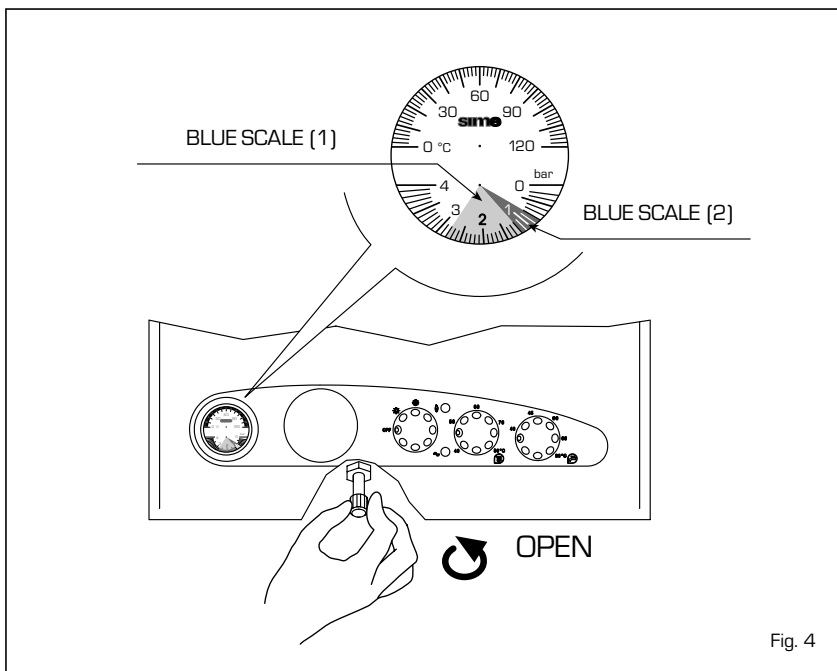


Fig. 4

**The boiler is supplied with an electric cable. Should this require replacement, contact exclusively with the authorized technical staff.**

### TIME PROGRAMMER (optional)

With the selector in the "AUTO" position, the boiler operation is regulated according to the temperatures set for the programmed time periods.

During start-up, the second selector must be in the "RUN" position. Programming:

#### - Setting the time (fig. 5)

Move the selector to "⊕". To change the hour on the display, press the "h" button, to change the minutes, press the "m" button.

To set the day, press button "1..7" until the arrow points to the correct day (1 = Monday ..... 7 = Sunday).

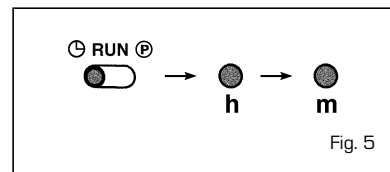


Fig. 5

#### - Setting the programme (fig. 6)

The programmer has 8 start-up programmes and 8 shutdown options.

To make programming easier, 3 start-up and 3 shutdown programmes have already been set up for each day of the week, as follows:

Programa	Hora de encendido	Hora de apagado
1	06.00	-
2	-	09.00
3	12.00	-
4	-	14.00
5	18.00	-
6	-	22.00

**NOTE: Programmes from 7 to 16 are not pre-set.**

To select programmes other than those pre-set, move the selector to the "P" position: "0:00 1" will appear on the display: the first three figures indicate the hour and minutes, the fourth figure is the number of the programme.

Programmes with odd numbers are switch-on times (daytime temperature) and are indicated on the display by a light bulb symbol. Programmes with even numbers indicate the temperature reduction (night).

Use button "1..7" to select the day of the week (from 1 to 7), or the period (1 ÷ 5, 6 - 7; 1 ÷ 6; or every day if the programme has to be repeated every day of the week). Set the hour and minutes using buttons "h" and "m".

The operation in memorized by pressing button "P"

The display then changes to the further programme. Repeat the same operations to set the successive programmes. At the end of the programming. Move the selector to the "RUN" position.

- **Cancelling one or more programmes** (fig. 7)

The programmed switch-on time and switch-off time must be cancelled for each individual programme by moving selector (2) to the "P" position.

Select the required programme with button (3), press button (4) to cancel the settings for that day (the triangular day indicator should disappear).

If a part of the programme is cancelled, when selector (2) is returned to the "RUN" position, an error message will appear on the clock display together with an indication of the incorrect programme. To cancel all the programmes, move

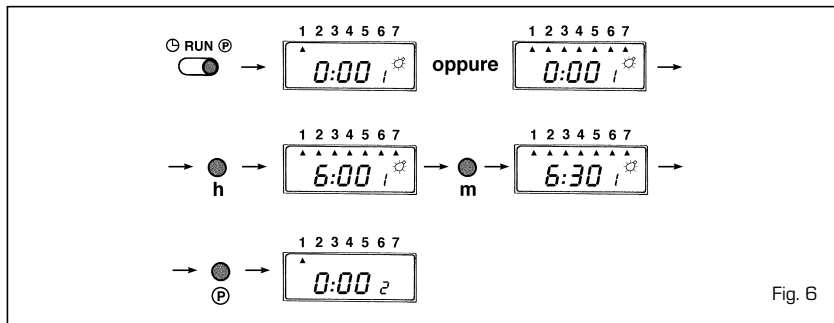


Fig. 6

the selector to the "P" position and press buttons (3) and (5) simultaneously.

- **Setting the "SKIP" function** (fig 7)

The SKIP function defuses the programmes when going out for the day, during which no heating is required.

To start this function, press button (7);

the button is only active when selector (2) is in the "RUN" position.

**Once selected, the SKIP function becomes active at 0:00 of the following day and lasts for 24 hours.**

**Once activated, it cannot be defused. Consequently the normal programme will only be resumed after 24 hours.**

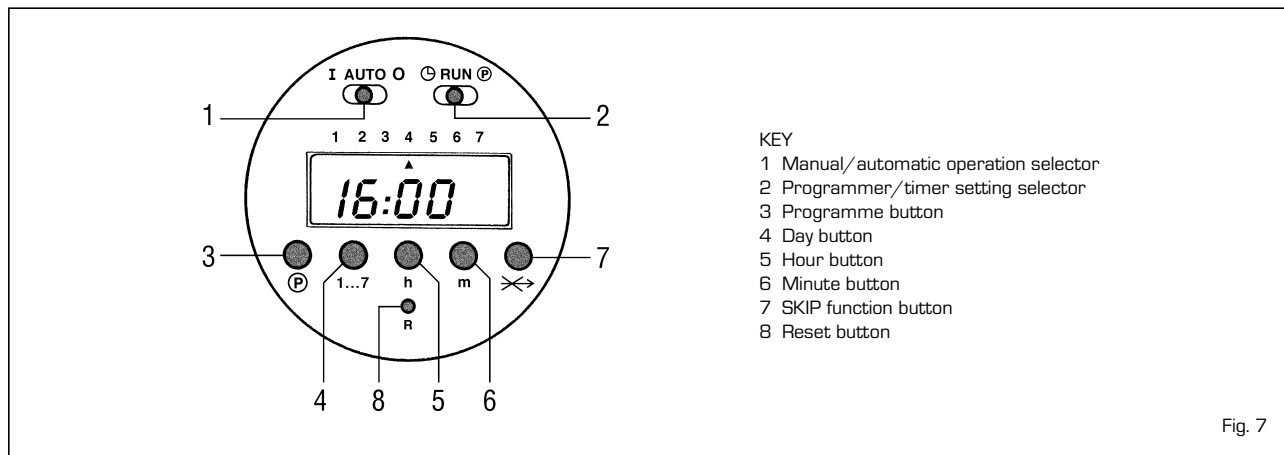


Fig. 7