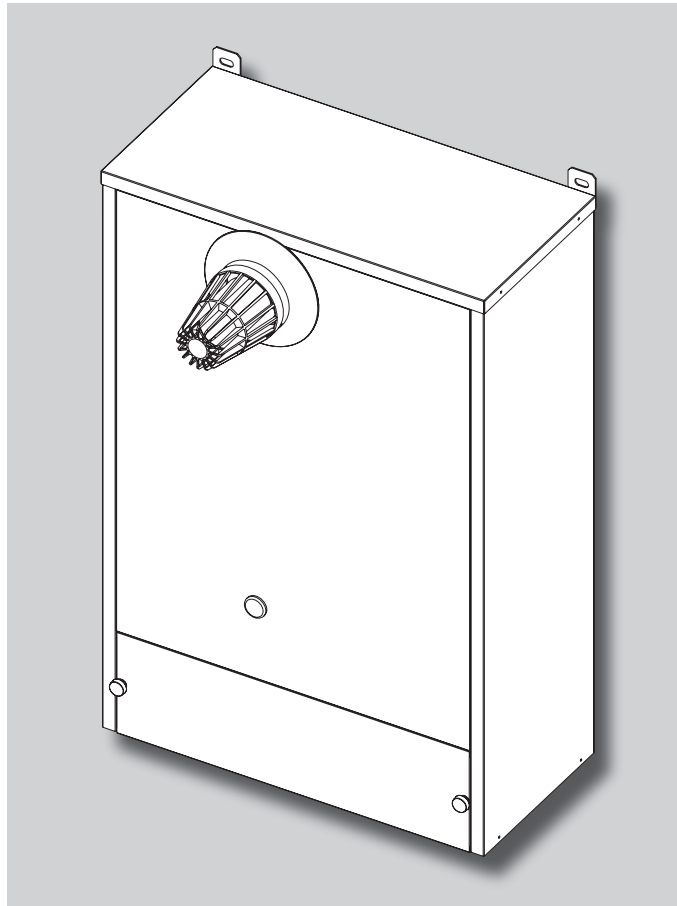




*Lamborghini*  
CALORECLIMA



WALL-HUNG, GAS-FIRED,  
SEALED BOILER,  
FOR CENTRAL HEATING



## Externa 30 O

**OPERATING, INSTALLATION  
AND MAINTENANCE  
INSTRUCTIONS**



cod. 3540T54/0 - 04/2009 (Rev. 00)



- Carefully read the warnings in this instruction booklet, as they provide important indications on the safety of installation, operation and maintenance.
- The instruction booklet is an integral and essential part of the product and must be carefully kept by the user for future reference.
- If the appliance is sold or transferred to another owner, or if it is moved, always check that the booklet accompanies the boiler for reference by the new owner and/or installer.
- The installation and maintenance operations must be performed according to the standards in force, the instructions of the manufacturer and must be carried out by professionally qualified personnel.
- Incorrect installation or poor maintenance may cause damage to people, animals or things. The manufacturer declines all liability for damage deriving from errors in the installation and operation of the appliance, and in any case from the failure to observe the instructions provided by the manufacturer.
- Before performing any cleaning or maintenance operations, disconnect the appliance from the mains power supply using the system switch and/or the corresponding on-off devices.
- In the event of faults and/or poor operation of the appliance, it should be deactivated. Do not attempt to repair the appliance. Contact professionally qualified personnel only.
- The products must only be repaired-replaced by professionally qualified personnel, using original spare parts only. Failure to heed this warning may affect the safety of the appliance.
- To ensure the correct operation of the appliance, annual maintenance must be performed by qualified personnel.
- This appliance must only be used for the purposes it has specifically been designed for. All other uses are considered improper and thus dangerous.
- After having removed the packaging, check that the contents are intact.
- The parts of the packaging must not be left within the reach of children, as they are potential sources of danger.
- In case of doubt do not use the appliance and contact the supplier.



This symbol indicates **“Warning”** and is placed near all warnings regarding safety. Such provisions must be strictly adhered to so as to avoid danger and damage to people, animals and things.



This symbol highlights a note or an important warning.



<b>1. Operating instructions.....</b>	<b>4</b>
1.1 Introduction .....	4
1.2 Control panel .....	4
1.3 Ignition and shut-down .....	5
1.4 Settings .....	5
1.5 Maintenance.....	6
1.6 Troubleshooting.....	6



<b>2. INSTALLATION.....</b>	<b>7</b>
2.1 General instructions.....	7
2.2 Place of installation .....	7
2.3 Water connections .....	7
2.4 Gas connection .....	9
2.5 Electrical connections .....	9
2.6 Flues .....	11



<b>3. SERVICE AND MAINTENANCE.....</b>	<b>12</b>
3.1 Settings .....	12
3.2 Commissioning.....	14
3.3 Maintenance.....	15
3.4 Troubleshooting.....	17



<b>4. CHARACTERISTICS AND TECHNICAL SPECIFICATIONS.....</b>	<b>20</b>
4.1 Dimensions and fittings .....	20
4.2 Overall view and main components .....	21
4.3 Hydraulic diagram.....	22
4.4 Technical data table .....	23
4.5 Diagrams .....	24
4.6 Wiring diagram .....	25





# 1. OPERATING INSTRUCTIONS

## 1.1 Introduction

Dear Customer,

Thank you for having chosen the **Externa 30 O**, an advanced-concept LAMBORGHINI wall-hung boiler featuring cutting-edge technology, high reliability and constructional quality. Please carefully read this manual and keep it for future reference.

The **Externa 30 O** is a **high efficiency** heat generator for central heating systems, operating on natural gas or LPG (the type of gas can be configured at the moment of installation) and managed by an advanced **microprocessor-based** control system.

The boiler body is made up of a **copper heat exchanger**, the special shape of which guarantees high heat exchange efficiency in all operating conditions, and an **atmospheric burner** featuring electronic ignition with ionisation flame control.

The boiler is intended for outdoor installation only.

The accessories supplied with the boiler also include a variable-speed pump, expansion vessel, safety valve, air pressure switch, water pressure switch, temperature sensors and safety thermostat.

The **microprocessor-based** control system means that the operation of the appliance is almost completely automatic. The central heating output is automatically regulated by the control system according to requirements. The domestic hot water output (with external storage installed) is automatically and continuously controlled to ensure both comfort and economical operation.

The user simply has to set the temperature required inside the home (using the optional, yet recommended room thermostat) or set the system temperature and the required domestic hot water outlet temperature. The regulation and control system will then ensure optimum operation all year round.

**It MUST NOT** be used for pool or spa heating.

## 1.2 Control panel

To access to the control panel, open the front door, unscrewing the two black knobs.

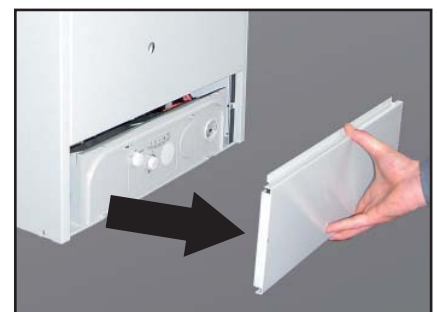
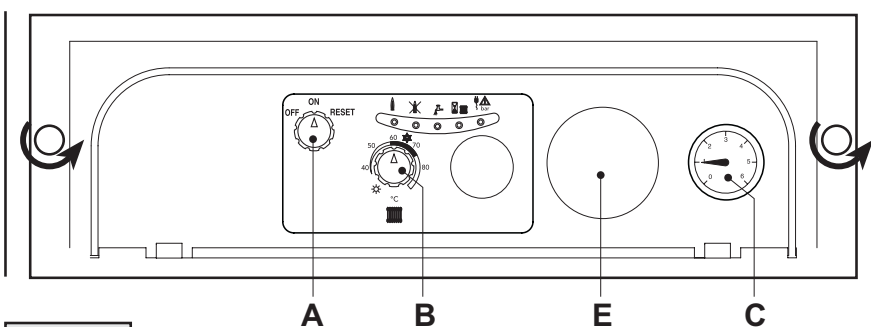


Table 1

LED	1 2 3 4	POS.	DESCRIPTION
1		A	OFF/ON/RESET switch
2		B	Central heating temperature setting
3		C	Hydrometer
4		E	Clock fitting
			Insufficient system pressure (light flashing)
			Mains power (light on)

fig. 1

## 1.3 Ignition and shut-down

### Ignition

- Open the gas cock upstream of the boiler.
- Close or insert any switches or power plugs upstream of the boiler
- Place the main switch "A" in the ON position.
- Place knob "B" in the Winter position and set the room thermostat, if fitted, to the required temperature value. At this point, the burner will ignite and the boiler will start operating automatically, managed by its control and safety devices.



If, after having correctly performed the ignition operations, the burners do not ignite and the shut-down warning light is on, wait around 15 seconds, then turn knob A to the RESET position and release it. The control unit will be reset and will repeat the ignition cycle. If, after a number of attempts, the burners do not ignite, refer to the paragraph on troubleshooting.

### Shut-down

Close the gas cock upstream of the boiler, turn knob "A" to OFF and disconnect the appliance from the mains power supply.




When the boiler is off the boiler anti-freeze protection is not active. For extended periods of inactivity during the winter months, in order to avoid damage due to freezing, all the water should be drained from the boiler, both the domestic hot water and the central heating system; alternatively, drain only the domestic hot water and place the special antifreeze fluid in the central heating system.

## 1.4 Settings

### Summer/Winter setting and system temperature control

With knob "B" Fig. 1 in the position of the symbol  (Summer), the central heating function is deactivated.

Only the production of domestic hot water is activated (with the optional external hot water cylinder installed).

With the knob "B" Fig. 1 in the position of the symbol  (Winter), both the central heating function and domestic hot water are active.

Turning the knob clockwise increases the central heating water temperature, anticlockwise decreases it. The temperature can be set from a minimum of 35° to a maximum of 85°. It is not recommended, however, to operate the boiler below 45°.

### Setting the ambient temperature (using the optional room thermostat)

Set, using the room thermostat or remote control, the temperature required inside the rooms. Based on the command from the room thermostat, the boiler is ignited and heats the system water to the set central heating outlet temperature. When the required temperature inside the rooms is reached, the boiler switches off.

If no room thermostat or remote control is available, the boiler will maintain the system at the set central heating outlet temperature.

### Domestic hot water temperature control

Set the storage temperature, using knob "D" (supplied in the optional kit).





### System water pressure control

The boiler is fitted with a cock for manually filling the central heating system. The filling pressure when the system is cold, as read on the boiler hydrometer, must be around 1.0 bar.

If the pressure drops during operation (due to the evaporation of the gas dissolved in the water) to a value lower than the minimum described above, the User must restore the initial value using the filling cock. Once the operation is completed, always close the filling cock.

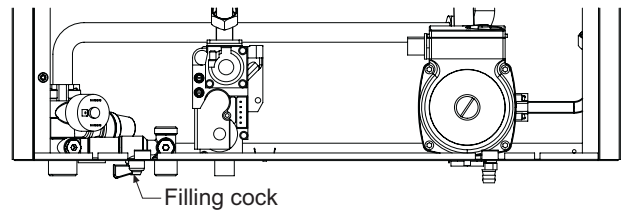


fig. 2

## 1.5 Maintenance

It is recommended to have annual maintenance of the heating system performed by qualified personnel, and at least biennial checks on the combustion device. Please refer to Chap. 3.3 in this manual for further information.

The casing, the control panel and the aesthetic parts of the boiler can be cleaned using a soft and damp cloth, dipped in soapy water if necessary. Do not use abrasive detergents or solvents.

## 1.6 Troubleshooting

Any anomalies or operating faults are signalled by the LEDs on the control panel.

The following table lists the faults that may arise due to simple problems that can be resolved by the user.

LED	Problem	Solution
	Boiler shut-down	Check if the gas cocks upstream of the boiler and on the counter are open. Turn knob "A" Fig. 1 to "Reset" and then release it. In the event of repeated boiler shut-downs, contact the nearest service centre.
	Insufficient system pressure (light flashing)	Fill the system when cold to 1-1.5 bar, using the cock located on the boiler. Close the cock after use.

Before calling the service centre, check that the problem is not due to no gas or mains power supply.

## 2. INSTALLATION

### 2.1 General instructions



This appliance must only be used for the purposes it has been specifically designed for. This appliance is used to heat water to below boiling temperature at atmospheric pressure and must be connected to a central heating and/or hot warm distribution system, according to its characteristics, performance and heating capacity. All other uses are considered improper.

THE APPLIANCE SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURED'S INSTALLATION INSTRUCTIONS, LOCAL GAS FITTING REGULATIONS, MUNICIPAL BUILDING CODES, WATER SUPPLY REGULATIONS, ELECTRICAL WIRING REGULATIONS, AS 5601 / AG 601 - GAS INSTALLATIONS AND ANY OTHER RELEVANT STATUTORY REGULATIONS.

Incorrect installation may cause damage to people, animals and things. The manufacturer will not be held liable in such events.



### 2.2 Place of installation

The appliance is intended for outdoor installation only.

The place of installation must in any case be free of dust, inflammable objects or materials and corrosive gases.

The boiler is supplied ready for wall-hung installation. The rear frame of the appliance has a two slots for fastening it to the wall, using screws with metal wall plugs. The fastening to the wall must provide stable and effective support of the appliance.

Upon request a metal wall drilling template is available. This is used exclusively to trace the holes for fastening the appliance onto the wall, and can be reused for more than one appliance.

### 2.3 Water connections

The heat capacity of the appliance should be established in advance by calculating of the heating requirements of the building according to the standards in force. For correct operation and long-life of the boiler, the hydraulic system must be suitably proportioned and always fitted with all the accessories that guarantee regular operation.

In the case where the central heating outlet and inlet pipes follow paths whereby, at some points, pockets of air may form, air vent valves should be installed at such points.

In addition, a drain device should be installed at the lowest point in the system, to allow complete emptying.

If the boiler is installed at a lower level than the system, a flow-stop valve should be fitted to prevent the natural circulation of water in the system.

The thermal head between the outlet manifold and the return inlet of the boiler should not exceed 20°C.



Do not use the water pipes as the earth for electrical appliances.

Before installation, carefully clean all the pipes in the system to remove any residues or impurities that may affect the correct operation of the appliance.

Make the connections to the corresponding fittings, as shown in fig. 3.

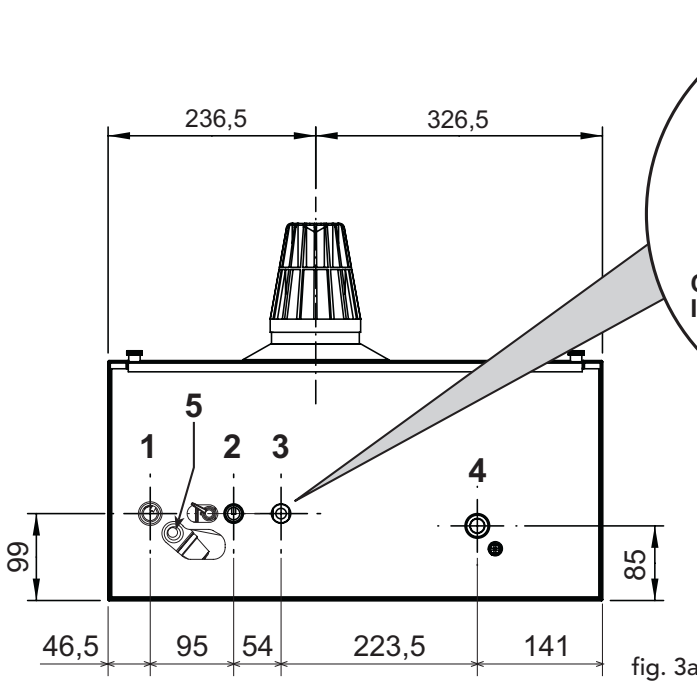


fig. 3a

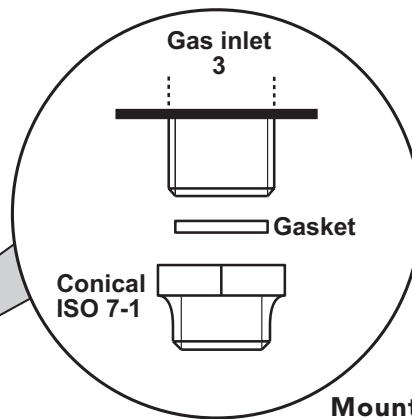


fig. 3b

**Mount threaded adapter before installation**

**Key**

- 1 CH flow, 3/4"
- 2 Filling cock
- 3 Gas inlet, 1/2"
- 4 CH return, 3/4"
- 5 Pressure relief valve discharge

It is recommended to fit on-off valves between the boiler and the central heating system; these allow the boiler to be isolated from the heating system, if necessary.

Make the connections to the boiler in a way that its internal tubing is not subject to stress.

The connection kit shown in fig. 4a and 4b can be supplied upon request.

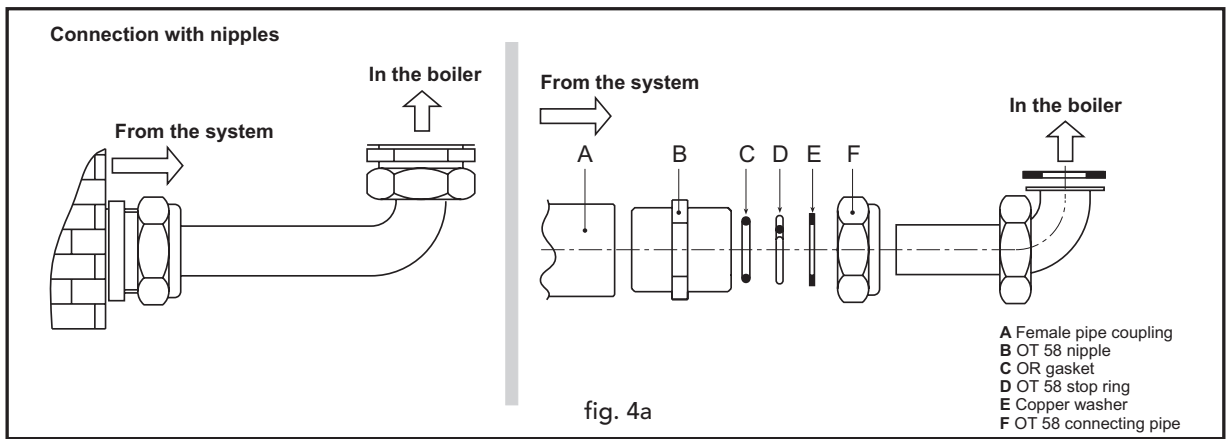


fig. 4a

- A Female pipe coupling
- B OT 58 nipple
- C OR gasket
- D OT 58 stop ring
- E Copper washer
- F OT 58 connecting pipe

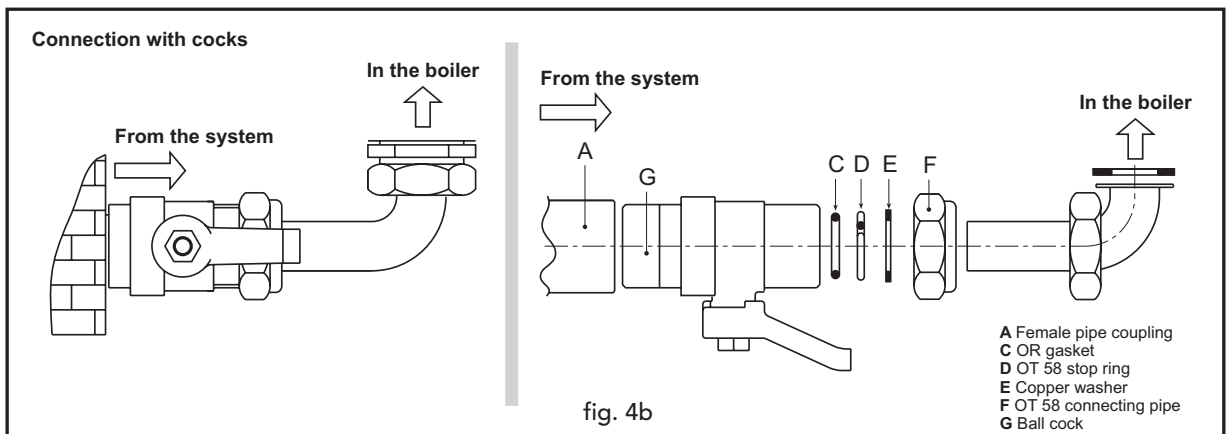


fig. 4b

- A Female pipe coupling
- C OR gasket
- D OT 58 stop ring
- E Copper washer
- F OT 58 connecting pipe
- G Ball cock



## **Pressure relief valve**

**Externa 30 O** incorporates a pressure relief valve discharging at 300 kPa.



The discharge of the pressure relief valve must be connected to a collection container, to avoid water spilling onto the ground in the event of over-pressure in the central heating circuit. The manufacturer of the boiler will not be held liable if this warning is not heeded, and the discharge valve intervenes and floods the room.

## **Characteristics of the system water**

In the case of water with hardness above 25 French degrees, the water should be suitably treated, to avoid any deposits in the boiler caused by hard water, or corrosion caused by aggressive water. It should also be remembered that even minor deposits measuring just a few millimetres thick can cause, due to their low thermal conductivity, significant overheating of the walls of the boiler, with consequent serious problems.

The water must always be treated in the case of very large systems (with high water capacity) or systems with the frequent inlet of recovered water. If, in these cases, the system needs to be partially or completely emptied, it must be refilled with treated water.

## **Filling the boiler and the system**

The boiler is fitted with a ball cock for manually filling the central heating system. The filling pressure, when the system is cold, must be around 1 bar. If the pressure drops during operation (due to the evaporation of the gas dissolved in the water) to a value lower than the minimum described above, the User must restore the initial value using the filling cock. For correct boiler operation, the pressure, when hot, must be around 1,5÷2 bar. Once the operation is completed, always close the filling cock.

## **2.4 Gas connection**



Before making the connections, check that the appliance is configured for operation with the type of fuel available, and carefully clean all the gas pipes in the system, to remove any residues that may affect the correct operation of the boiler.

The gas connections must be made at gas inlet (see fig. 3 - key 3), with a rigid metal pipe, or a stainless steel flexible continuous-wall pipe, fitting a gas cock between the system and the boiler. Before installation, mount the threaded adapter ISO 7-1 contained in boiler package, as shown in fig. 3b. Check that all the gas connections for tightness.

The capacity of the gas counter must be sufficient for the simultaneous use of all the connected appliances. The diameter of the gas pipe, which leaves the boiler, does not necessarily determine the choice of the diameter of the pipe used between the appliance and the gas counter; this must be chosen according to its length and the pressure drop, according to the standards in force.



Do not use the gas pipes as the earth for electrical appliances.

## **2.5 Electrical connections**

### **Connection to the mains power supply**

The boiler should be connected to a single-phase, 240 Volt-50 Hz electrical line.



The electrical safety of the appliance is ensured only when the appliance is correctly connected to an effective earth system, as prescribed by the safety standards in force. Have professionally qualified personnel check the efficiency and the rating of the earth system. The manufacturer is not liable for any damage caused by the appliance not being correctly earthed. In addition, make sure that the electrical system is adequately rated for the maximum power absorbed by the appliance, indicated on the boiler rating plate, and in particular that the cross-section of the wires is suitable for the power absorbed by the appliance.

The boiler is pre-wired and fitted with a cable for connection to the electrical line. The connections to the mains supply must be made using a fixed connection, featuring a two-pole switch with a contact





opening of at least 3 mm. Max 3A fuses must be installed between the boiler and the line. The correct polarity must be followed (PHASE: brown wire / NEUTRAL: blue wire / EARTH: yellow-green wire) in the electrical connections.



If the supply flexible cord is damaged or the unit needs repairs it shall only be done by a qualified person authorised by the supplier.

If replacing the electrical power cable, use only the "HAR H05 VV-F" cable, 3x0.75 mm<sup>2</sup>, with a maximum external diameter of 8 mm.

### Accessing the electrical terminal block

Follow the indications shown in figs. 5a and 5b to access to the electrical terminal block. The layout of the terminals for the various connections is shown in the wiring diagram, in the chapter on Technical Specifications.

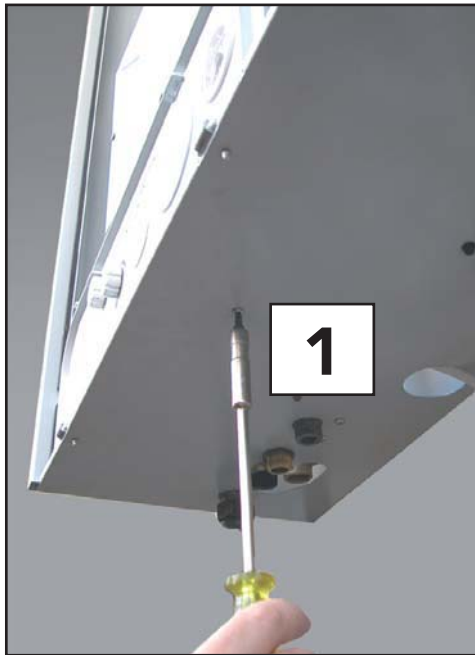


fig. 5a

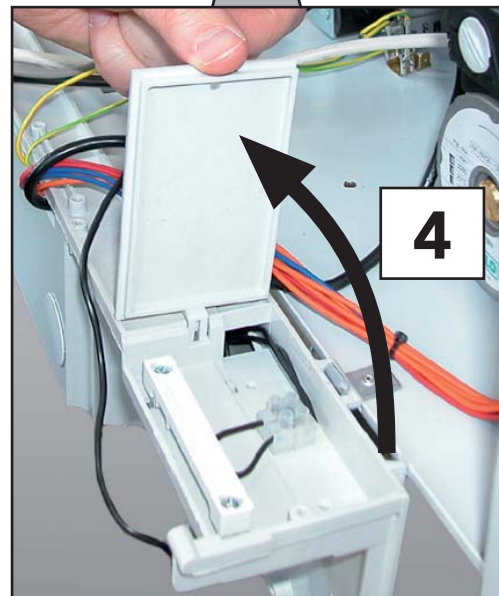
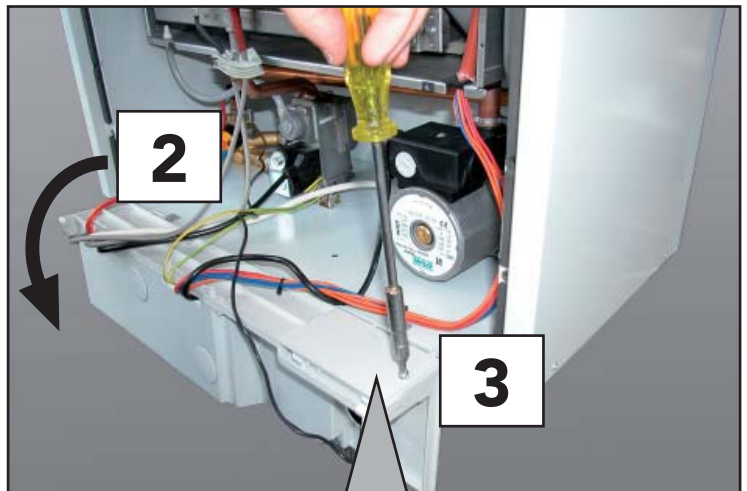


fig. 5b

### Room thermostat



**WARNING: THE ROOM THERMOSTAT MUST NOT HAVE LIVE CONTACTS. CONNECTING 240V TO THE ROOM THERMOSTAT TERMINALS WILL CAUSE IRREVERSIBLE DAMAGE TO THE ELECTRONIC BOARD.**

When connecting a room thermostat with a daily or weekly program, or a timer, avoid taking the power supply to these devices from their switch contacts. Their power supply must derive from a direct connection to the mains or using batteries, depending on the type of device.

## 2.6 Flues

Boiler is supplied as standard with horizontal concentric terminal, exit on front panel.

For correct operation of the boiler it is necessary to mount the concentric terminal following instructions below:



- 1) Mount and fix boiler on the wall.
- 2) Insert rubber gasket on terminal.
- 3) Insert terminal on appliance concentric bend. Be sure to insert completely terminal on the bend.
- 4) Push gasket on boiler front panel. Check correct sealing between gasket and front panel.





## 3. SERVICE AND MAINTENANCE

### 3.1 Settings

All the adjustment and conversion operations must be performed by Qualified Personnel, such as personnel from the Local Customer Service Centre.

LAMBORGHINI declines all liability for damage to persons and/or things deriving from tampering with the appliance by non-authorized persons

Conversion of supply gas

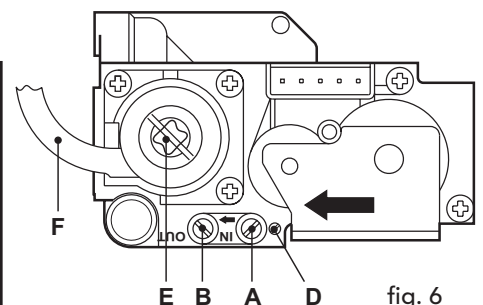
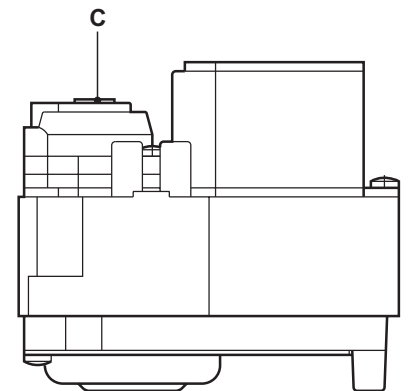
The appliance can operate on Natural Gas or LPG as the supply gas, and is factory configured for use with one of the two gases, as is clearly marked on the packaging and on the rating plate on the appliance itself. If the appliance has to be used with a gas other than the one it has been set for, the special conversion kit must be used, as shown below:

- 1 Replace the nozzles in the main burner, installing the nozzles indicated in technical data table in Chap. 4, according to the type of gas used
- 2 Adjust the minimum and maximum pressures in the burner (ref. corresponding paragraph), setting the values indicated in technical data table for the type of gas used.
- 3 Change the position of Jumper 02 on the electronic board (ref. corresponding paragraph).
- 4 Apply the adhesive label in the conversion kit next to the rating plate, to confirm the conversion operation.

#### Adjusting the burner pressure

This appliance, featuring flame modulation, has two set pressure values: the minimum and maximum, which must be the values indicated in technical data table, according to the type of gas.

- Connect a suitable pressure gauge to the pressure test point "B", located downstream of the gas valve.
- Disconnect the pressure compensation pipe "F".
- Remove the protection cap "C".
- Turn the potentiometer P3 (located on the control board) to the minimum position (anticlockwise).
- Operate the boiler in central heating mode.
- Adjust the minimum pressure using the screw "D", clockwise to decrease it and anticlockwise to increase.
- Turn the potentiometer P3 to the maximum position (clockwise).
- Adjust the maximum pressure using the screw "E", clockwise to increase it and anticlockwise to decrease it.
- Reconnect the pressure compensation pipe "F".
- Replace the protection screw "C".



#### Key

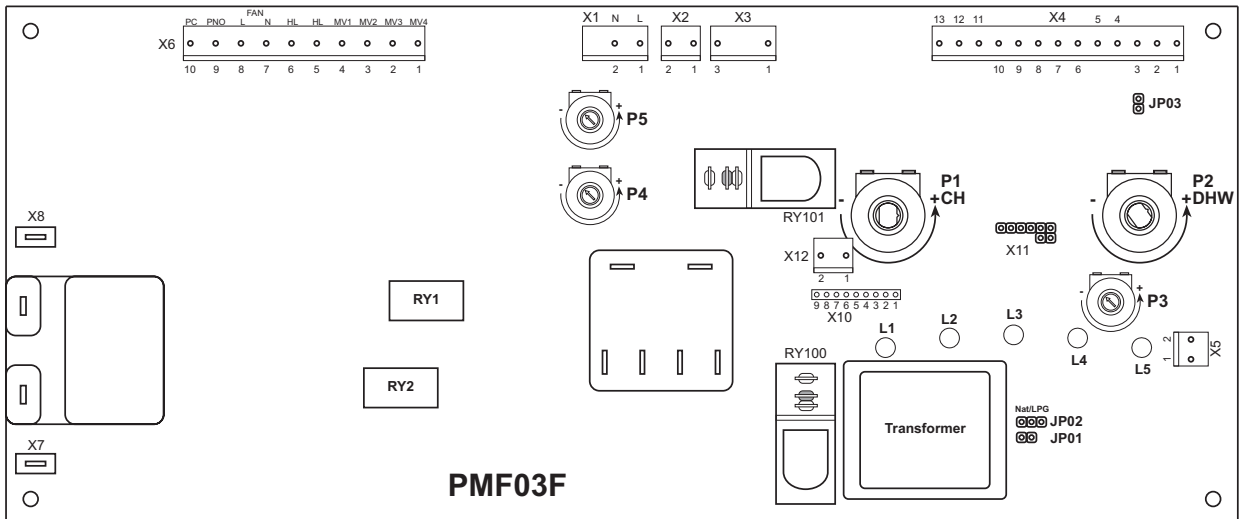
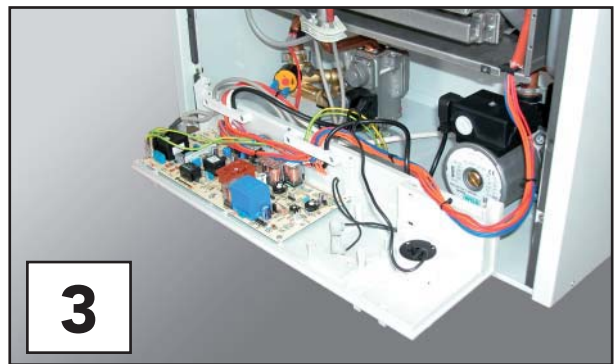
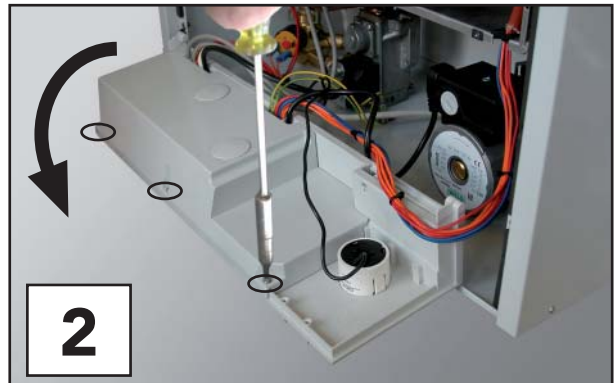
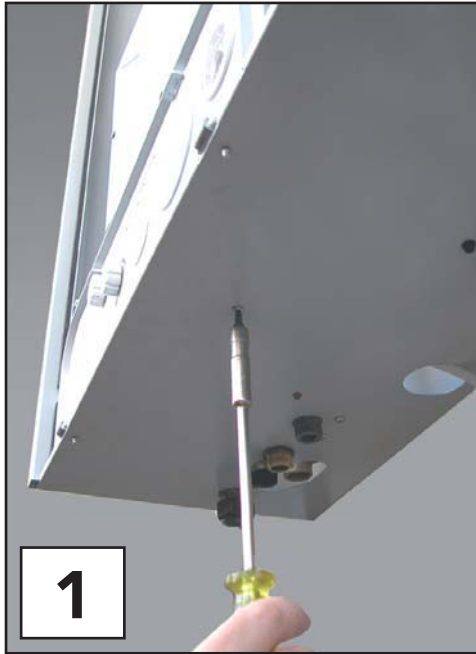
- A Pressure test point upstream
- B Pressure test point downstream
- C Protection screw
- D Minimum pressure adjustment screws
- E Maximum pressure adjustment screws
- F Pressure compensation pipe

Once the pressure check or adjustment has been performed, the adjustment screws must be sealed using the corresponding seal or paint.

fig. 6

## Adjustments on the electronic board

Follow the indications shown in the figure to access the electronic board.



### Jumper adjustment

<b>JP01 inserted</b>	Set when optional 3 way valve for DHW (CH pump runs during DHW mode)
<b>JP01 not inserted</b>	(Factory default) boiler only for CH
<b>JP02:</b>	
	<b>Jumper inserted for natural gas operation</b>
	<b>Jumper inserted for LPG operation</b>

Potentiometer adjustment	
<b>P1</b>	Central heating temperature adjustment
<b>P2</b>	Domestic hot water temperature control
<b>P3</b>	Heating output adjustment
<b>P4</b>	Gas pressure adjustment for ignition
<b>P5</b>	Factory set; do not tamper



### **Adjusting the maximum heating output**

This adjustment may only be performed electronically using the adjustment potentiometer "P3", starting with a system temperature less than the maximum of the setting thermostat (system temperature 50 , 60°C).

Connect a suitable pressure gauge to the pressure test point located downstream of the gas valve; turn the temperature control knob to the maximum value, then adjust the pressure to the value required, using the pressure-output diagram in the chapter on technical specifications. Once this operation has been completed, turn the burner on and off 2 or 3 times using the thermostat and check that the pressure remains stable at the set value. If not, a further fine adjustment must be performed, until the pressure remains stable at the set value. When the burner is ignited to check the calibration pressure, turn the setting thermostat knob to the maximum value, otherwise the procedure will be incorrect.

### **Adjusting the heating $\Delta t$ by varying the flow-rate/discharge head of the pump**

The thermal head,  $\Delta t$  (difference between the central heating outlet and inlet temperature) must be less than 20°C. This is checked by varying the flow-rate and discharge head of the pump, using the speed control (or switch) on the pump itself. Note that increasing the speed of the pump decreases the  $\Delta t$ , and vice-versa.

## **3.2 Commissioning**



The appliance must only be commissioned for use by Qualified Personnel, such as personnel from our sales organisation or the local Customer Service Centre.

Checks to be performed during the first ignition, and after all maintenance operations which may have required the disconnection from the systems or intervention on the safety devices or parts of the boiler:

### **Before igniting the boiler:**


- Open any on-off valves between the boiler and systems.
- Check the gas system for tightness, proceeding with care and using a soapy water solution to find any leaks from the connections.
- Fill the system with water and ensure that the air contained in the boiler and the system has been completely vented, by opening the air vent valve on the boiler and any vent valves in the system.
- Check that there are no water leaks in the heating system, in the domestic hot water circuits, in the connections or in the boiler.
- Check the correct connection of the electrical system.
- Check that the appliance is properly earthed.
- Check that the pressure value and gas rate for the heating system are correct.
- Check that there are no inflammable liquids or materials in the immediate vicinity of the boiler.

### **Igniting the boiler**

- Open the gas cock upstream of the boiler.
- Vent the air in the pipe upstream from the gas valve.
- Close any switches or insert any plugs upstream of the boiler
- Place the main switch in the ON position.
- Place knob "B" in the Winter position to a value higher than 50°C and set the room thermostat, if fitted, to the required temperature value. At this point, the burner will ignite and the boiler will start operating automatically, managed by its control and safety devices.



If, after correctly having performed the ignition operations, the burners do not ignite and the shut-down warning light is on, wait around 15 seconds and then turn knob "A" (Fig. 1) to the RESET position and release it. The control unit will be reset and will repeat the ignition cycle. If, after a number of attempts, the burners do not ignite, refer to the paragraph "Troubleshooting".


 In the case of power failures while the boiler is in operation, the burners will switch off. When mains power returns, the burners will automatically re-ignite.

## Checks during operation

- Check the fuel circuit and the water system for tightness.
- Check the efficiency of the flues and air-flue gas pipes during the operation of the boiler.
- Check that the water circulation between the boiler and the systems is correct.
- Ensure that the gas valve modulates correctly both in the central heating phase and the production of domestic hot water.
- Check the correct ignition of the boiler, by performing a series of ignition and shut-down tests using the room thermostat or the remote control.
- Ensure that the consumption of fuel indicated by the counter corresponds to the values shown in the technical data table in Chap. 4.
- Check that there is the correct flow rate of domestic hot water with the  $\Delta t$  declared in the table: do not rely on measurements effected using empirical systems. The measurements should be made using special instruments at a point as close as possible to the boiler, considering the dispersion of heat from the piping.
- Ensure that without the request for heating the burner ignites correctly when opening a hot water tap. Check that during operation in central heating mode, when opening a hot water tap, the heating pump switches off, the domestic hot water pump starts and there is regular production of domestic hot water.

## Shut-down

Close the gas cock upstream of the boiler and disconnect the appliance from the mains power supply.

 For extended periods of inactivity during the winter months, in order to avoid damage due to freezing, all the water should be drained from the boiler, both the domestic hot water and the central heating system; alternatively, drain only the domestic hot water and place the special antifreeze fluid in the central heating system.

## 3.3 Maintenance

 The following operations must only be performed by Qualified Personnel, such as personnel from our sales organisation or local Customer Service Centre.

### Seasonal checks on the boiler and the stack

The following checks should be made on the appliance at least once a year:

- The control and safety devices (gas valve, flow-meter, thermostats, etc.) must be working properly.
- The pipes and the air-flue gas terminals must be free of obstacles and not have any leaks.
- The gas and water systems must be perfectly tight.
- The burner and the heat exchanger must be clean. Follow the instructions in the next paragraph.
- The electrodes must be free of deposits and positioned correctly.
- The pressure of the water in the system when cold must be around 1 bar; if not, restore this value.
- The expansion vessel must be full.
- The gas rate and the pressure must correspond to the values indicated in the corresponding tables.
- The circulation pumps must not be blocked.





### Opening the casing

Follow the indications shown in the figure to open the casing.



### Cleaning the boiler and the burner

The body and the burner must not be cleaned using chemical products or steel brushes. Special care must be taken to ensure all the systems relating to the sealed compartment are tight (gaskets, cable glands, etc.), to

avoid air leaks which, causing a drop in the pressure inside in chamber, may activate the differential pressure switch and thus shut-down the boiler. Special attention must also be paid, after all the operations have been completed, to checking and performing all the ignition phases and operation of the thermostats, gas valve and circulation pump.



After these checks, ensure that there are no gas leaks.

### Analysis of combustion

Two test points are installed inside the boiler, one for the flue gases and the other for the intake air.

To make the measurements, proceed as follows:

- 1) Remove the boiler casing
- 2) Open the air and flue gas sample points in the sealed compartment;
- 3) Insert the probes as far as possible;
- 4) Open a hot water tap;
- 5) Adjust the domestic hot water temperature to the maximum setting.
- 6) Wait 10-15 minutes to allow the boiler to reach stable operating conditions\*
- 7) Make the measurements.



Analysis performed when the boiler is not in stable operating conditions may lead to errors in measurement.



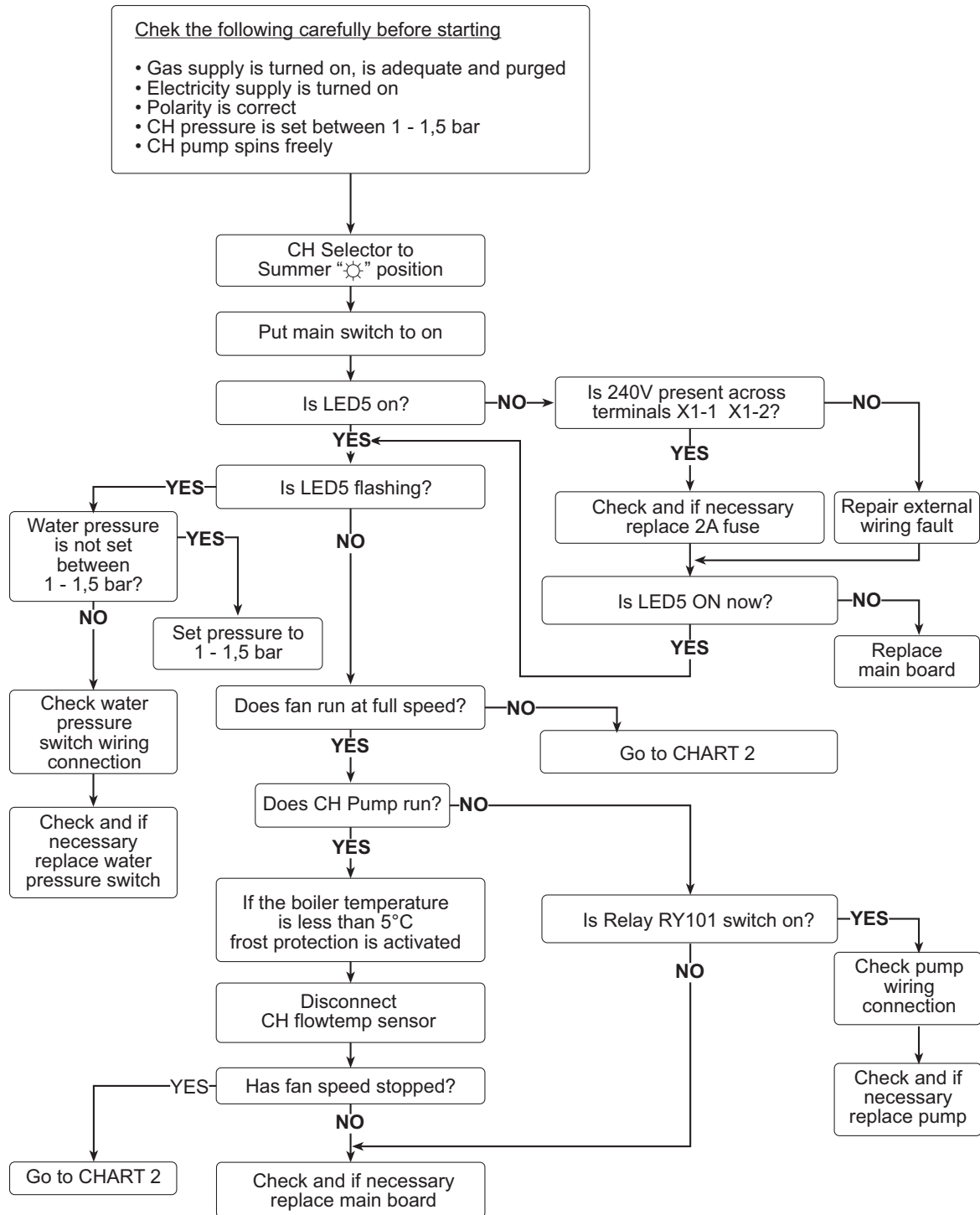


## 3.4 Troubleshooting

### Troubleshooting

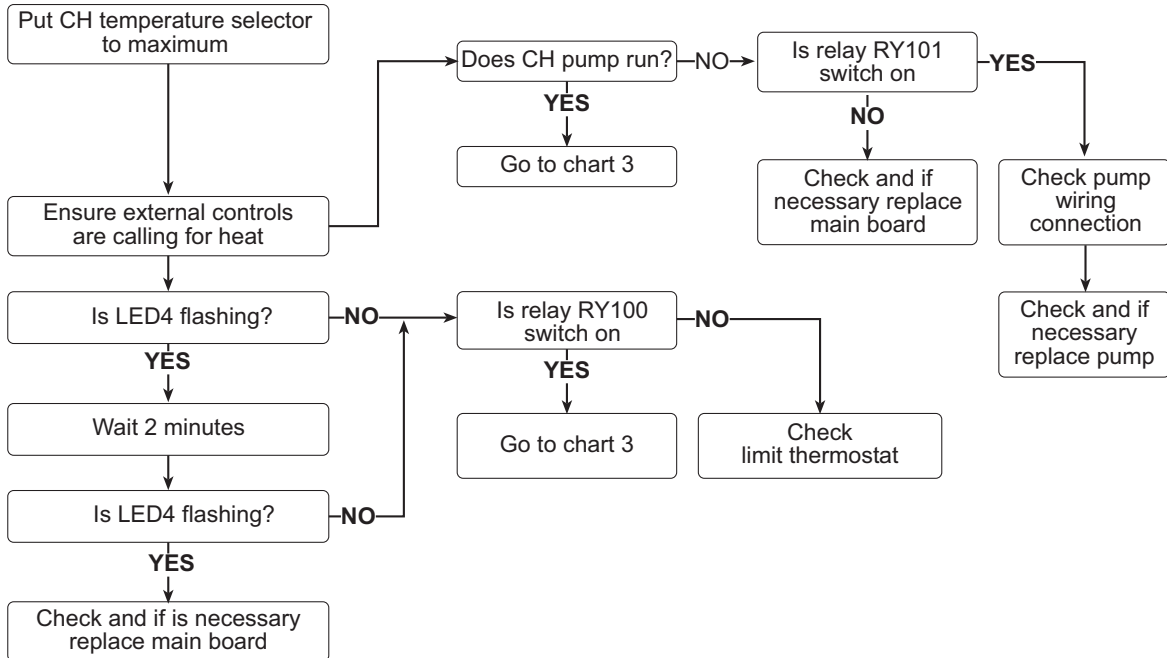
Flow Diagram 1

#### Checking Power Supply-System Pressure and Anti-freeze Protection

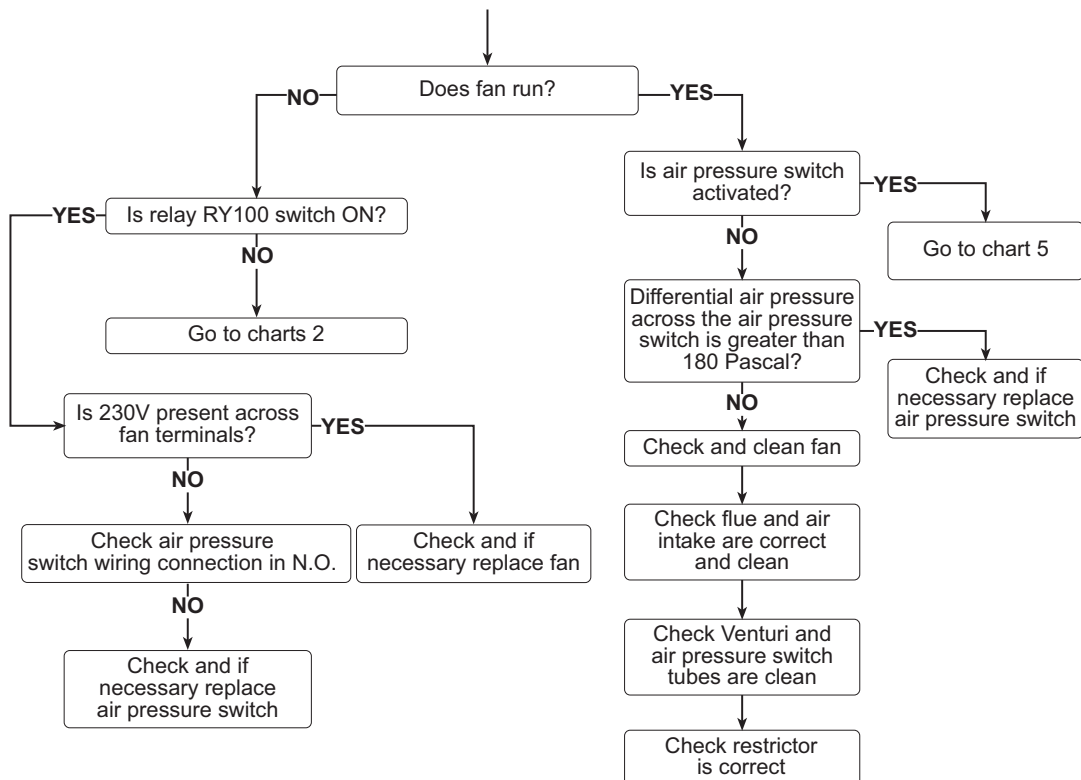




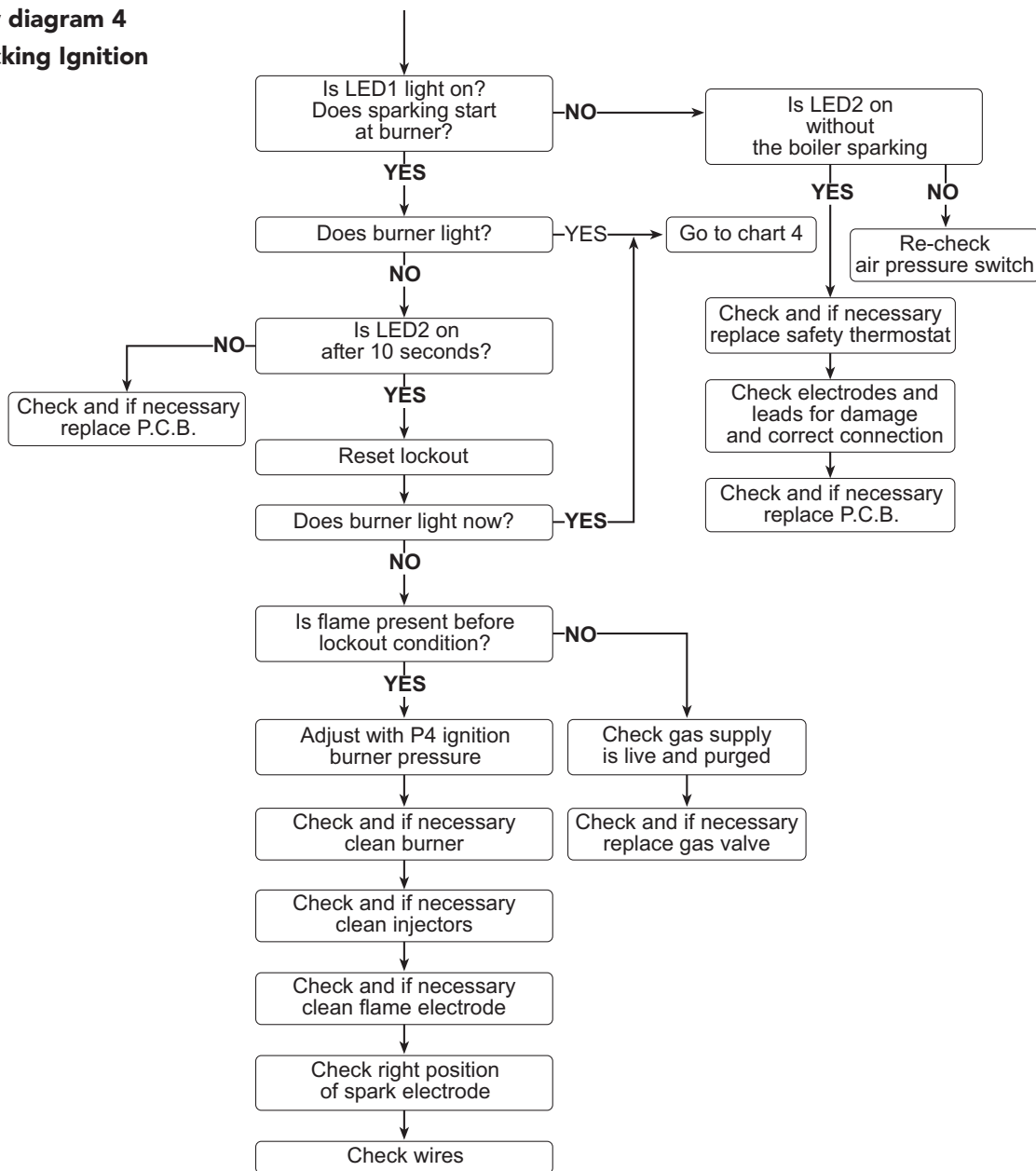
**Flow diagram 2**  
**Checking Central Heating Operation**



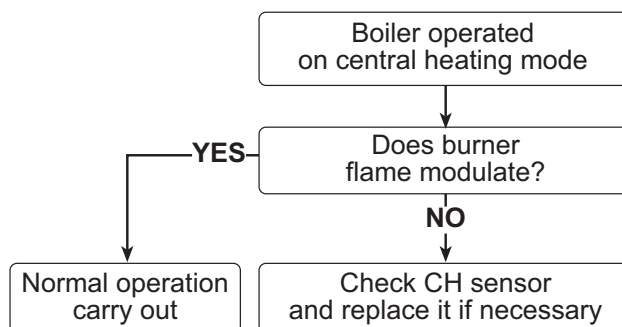
**Flow diagram 3**  
**Checking the Fan/Flue Gas Circuit**



**Flow diagram 4**  
**Checking Ignition**



**Flow diagram 5**  
**Checking Domestic Hot Water Modulation**





## 4. CHARACTERISTICS AND TECHNICAL SPECIFICATIONS

### 4.1 Dimensions and fittings

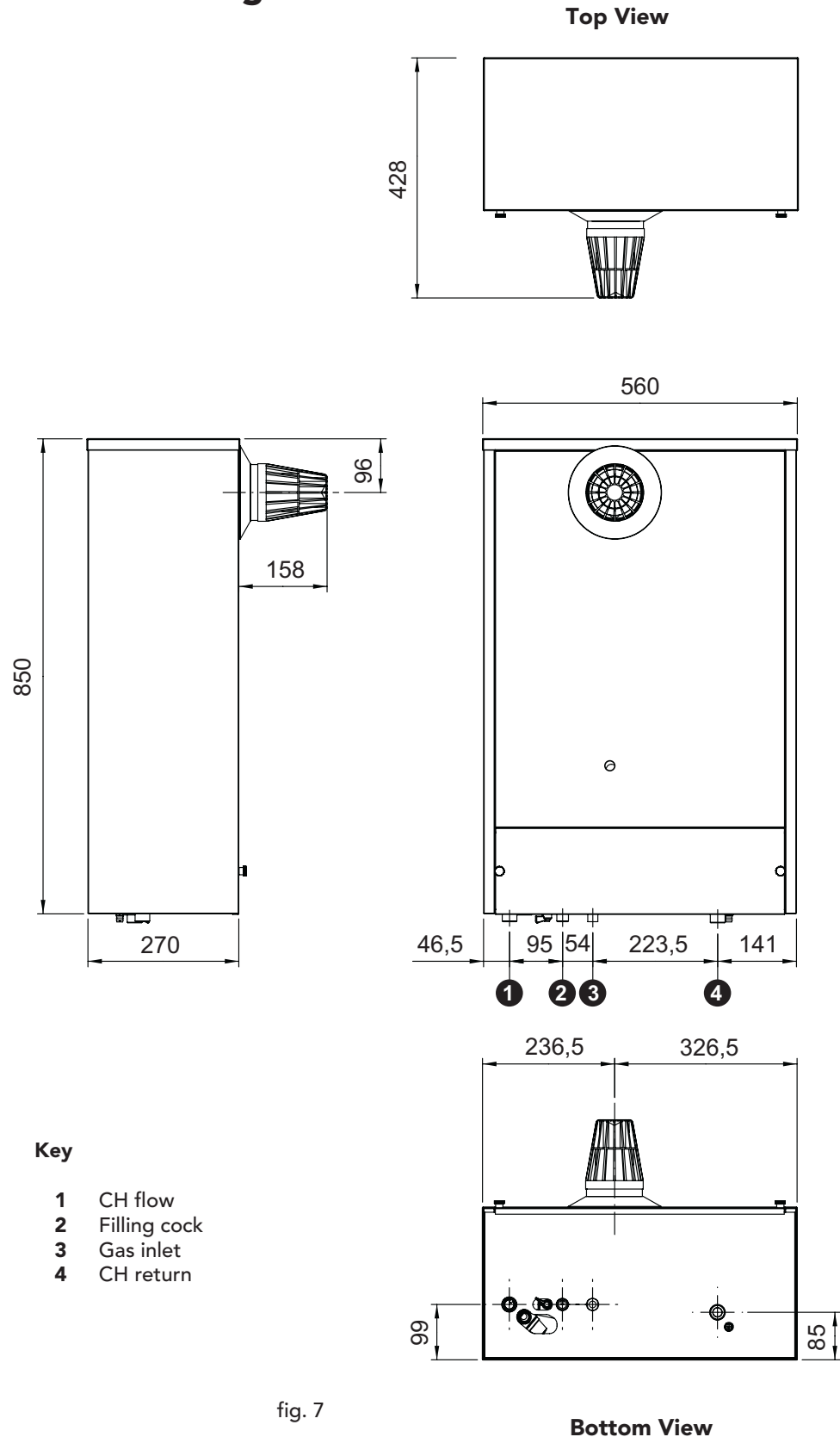


fig. 7

## 4.2 Overall view and main components

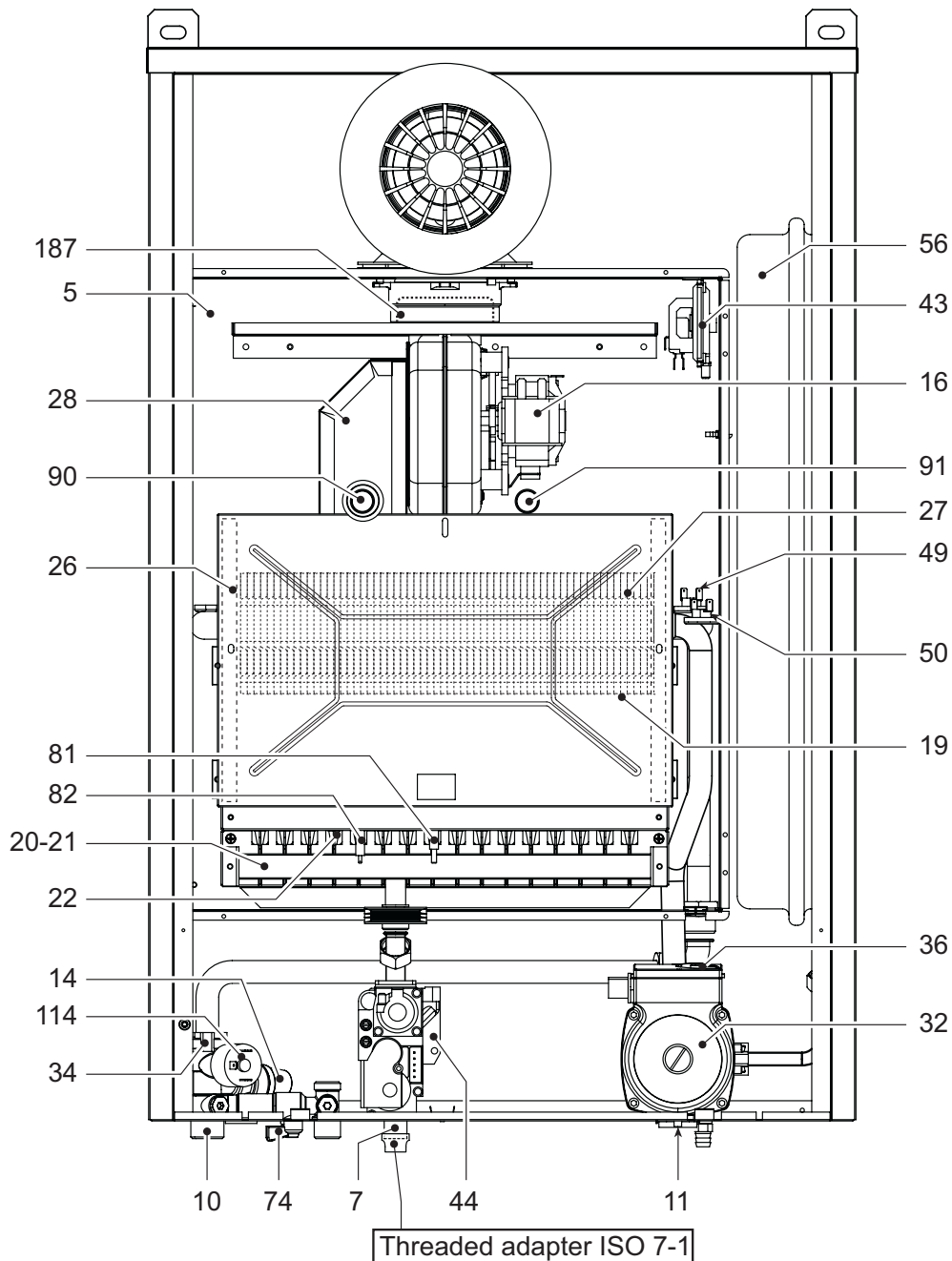


fig. 8

### Key

<b>5</b>	Sealed compartment	<b>27</b>	Copper heat exchanger	<b>56</b>	Expansion vessel
<b>7</b>	Gas inlet	<b>28</b>	Flue collector from heat exchanger	<b>74</b>	Filling cock
<b>10</b>	Central heating outlet	<b>32</b>	Central heating pump	<b>81</b>	Ignition electrode
<b>11</b>	Central heating inlet	<b>34</b>	Central heating temperature sensor	<b>82</b>	Detection electrode
<b>14</b>	Safety valve	<b>36</b>	Automatic air vent	<b>90</b>	Flue outlet pressure test point
<b>16</b>	Fan	<b>43</b>	Air pressure switch	<b>91</b>	Air outlet pressure test point
<b>19</b>	Combustion chamber	<b>44</b>	Gas valve	<b>114</b>	Water pressure switch
<b>20</b>	Burner assembly	<b>49</b>	Safety thermostat	<b>187</b>	Flue gas restrictor
<b>21</b>	Main nozzle	<b>50</b>	Central heating limit thermostat		
<b>22</b>	Burner				
<b>26</b>	Combustion chamber insulation				



### 4.3 Hydraulic diagram

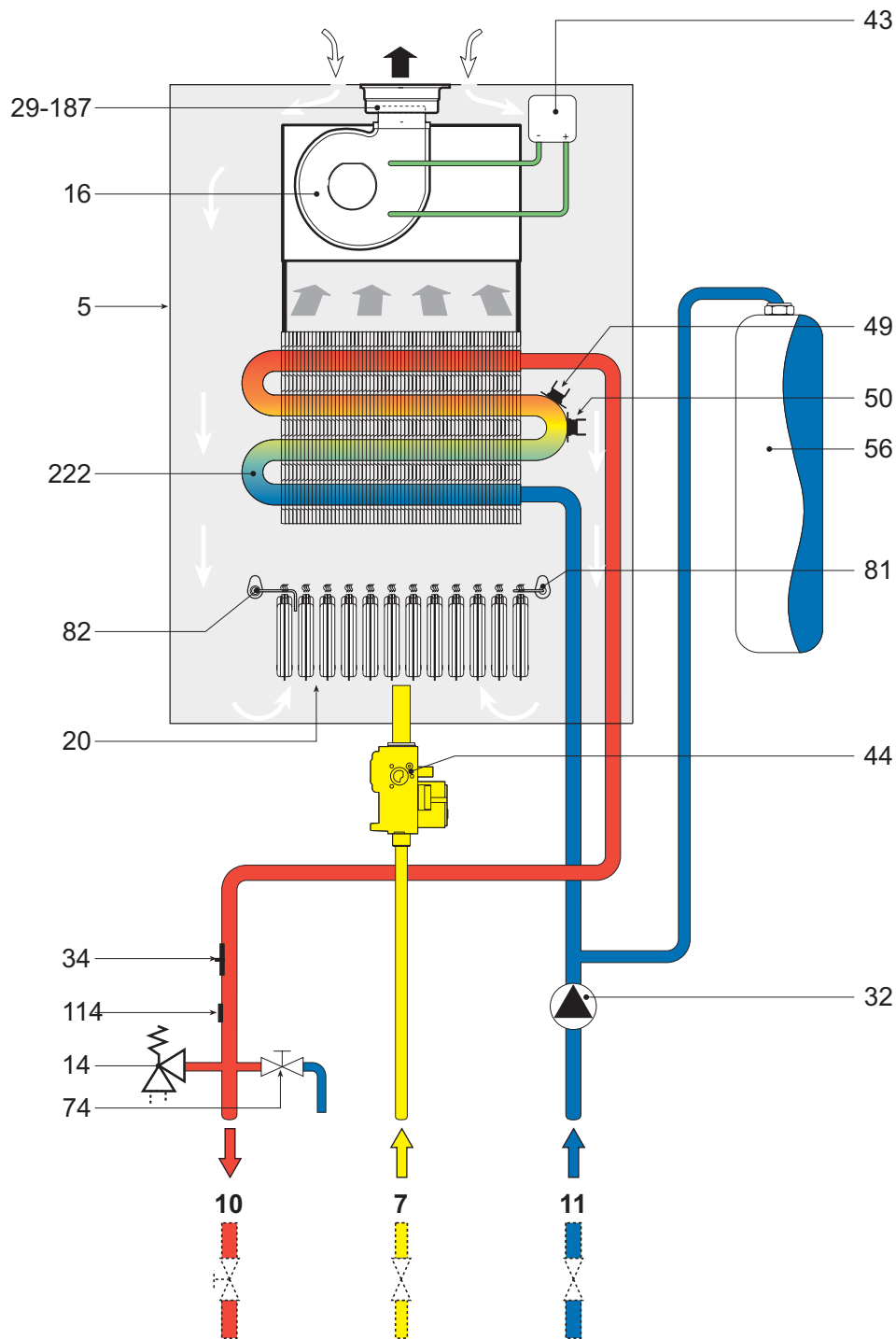


fig. 9

#### Key

- |                                    |  |                                  |
|------------------------------------|--|----------------------------------|
| <b>5</b> Sealed compartment        | <b>32</b> Central heating pump             | <b>56</b> Expansion vessel       |
| <b>7</b> Gas inlet                 | <b>34</b> Central heating temp. sensor     | <b>74</b> Filling cock system    |
| <b>10</b> Central heating outlet   | <b>43</b> Air pressure switch              | <b>81</b> Ignition electrode     |
| <b>11</b> Central heating inlet    | <b>44</b> Gas valve                        | <b>82</b> Detection electrode    |
| <b>16</b> Fan                      | <b>49</b> Safety thermostat                | <b>187</b> Flue gas restrictor   |
| <b>20</b> Burner assembly          | <b>50</b> Central heating limit thermostat | <b>222</b> Copper heat exchanger |
| <b>29</b> Flue gas outlet manifold |  |                                  |

## 4.4 Technical data table

<b>Table 11</b>			
<b>Output</b>		<b>Pmax</b>	<b>Pmin</b>
Power Output	Natural Gas kW	30	17
	Universal LPG kW	27,9	15,6
<b>Gas supply</b>		<b>Pmax</b>	<b>Pmin</b>
Main injectores, Natural Gas (G20)	mm	16 x 1,35	
Inlet pressure, Natural Gas (G20)	kPa	1,13	
Burner pressure, Natural Gas (G20)	kPa	0,83	0,25
Natural gas consumption	MJ/h	132	77,6
Main nozzles, LPG	mm	16 x 0,77	
Supply pressure, LPG	kPa	2,75	
Burner pressure, LPG	kPa	2,50	0,70
LPG gas rate consumption	MJ/h	120	69,7
<b>Central heating</b>			
Maximum central heating operating temperature	°C	100	
Maximum central heating operating pressure	kPa	300	
Safety valve	kPa	300	
Minimum central heating operating pressure	kPa	80	
Expansion vessel capacity	litres	10	
Expansion vessel pre-fill pressure	kPa	100	
Hot water capacity	litres	1,7	
<b>Dimensions, weights, fittings</b>			
Height	mm	760	
Width	mm	460	
Depth	mm	272	
Weight with packaging	kg	51	
Gas system fittings	inches	1/2"	
System filling fittings	inches	1/2"	
Central heating system fittings	inches	3/4"	
<b>Power supply</b>			
Max Power Absorbed	W	125	
Power supply voltage/frequency	V-Hz	240-50/60	
Index of protection	IP	X5D	



## 4.5 Diagrams

### Pressure - output diagrams

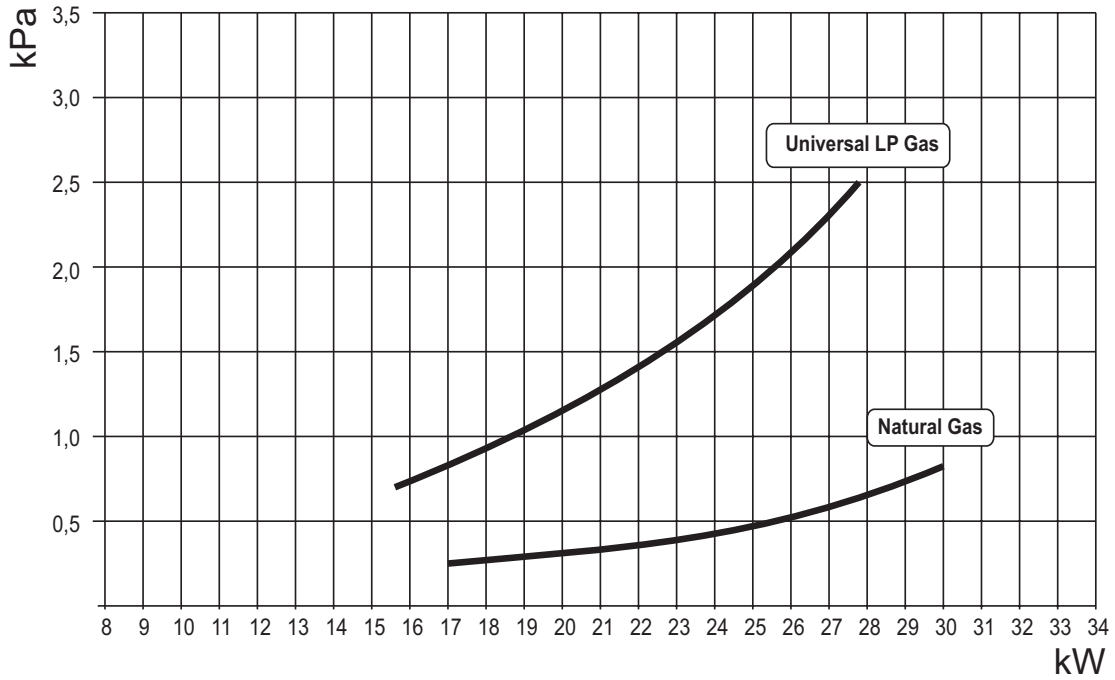
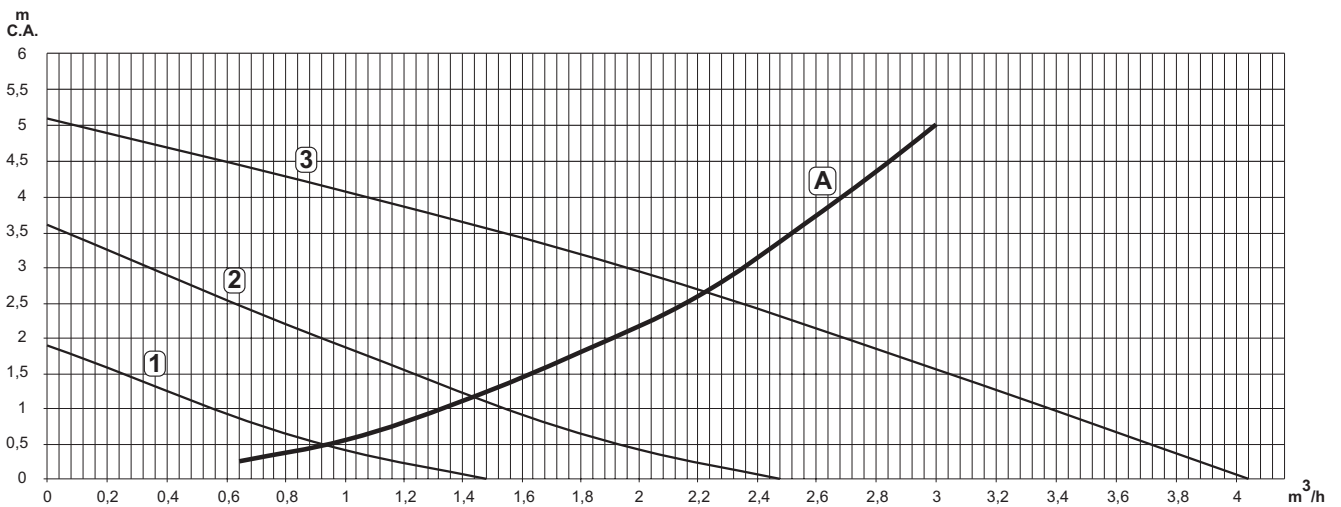


fig. 10

### Discharge head available to system



#### Legenda

- 1 - 2 - 3 = Pump switch positions
- A = Boiler pressure drop

fig. 11



## 4.6 Wiring diagram

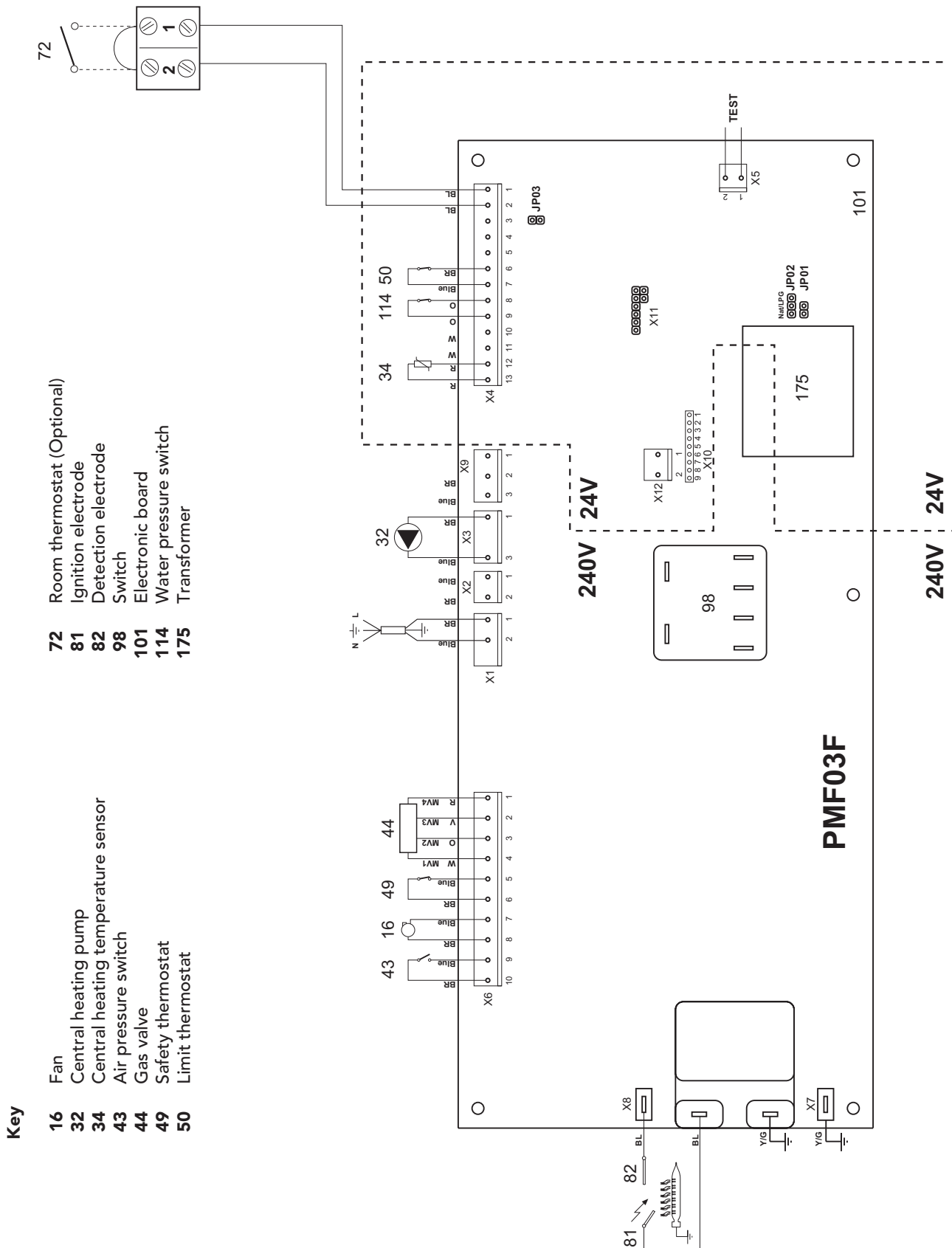


fig. 12





