

BALI RTFS

EN



INSTALLATION, USE AND MAINTENANCE



Dear Customer,

Thank you for choosing and buying one of our boilers. Please read these instructions carefully in order to install, operate, and maintain this equipment properly.

GENERAL NOTES FOR THE INSTALLER, MAINTENANCE TECHNICIAN AND USER

This INSTRUCTION BOOKLET is an integral and essential part of this product and must be handed to the user by the installer for safekeeping and consultation when necessary. This instruction booklet is to be handed over with the equipment should it be sold or transferred.

The boiler must only be used for the purposes that are expressly foreseen. Any other use is to be considered improper and therefore dangerous.

The installation must be carried out in compliance with current standards and following the manufacturer's instructions contained in this booklet. Incorrect installation may result in harm to people, animals, and/or property, and the manufacturer accepts no responsibility for such damage.

The unit must be installed in a room that is sufficiently well ventilated, in compliance with current standards and laws.

The Manufacturer does not accept any contractual or extra-contractual responsibility for any damage caused due to errors in installation or operation, or resulting from failure to follow the instructions below.

Before installing this equipment make sure that the technical data for the unit meet the requirements for its proper use in the plant.

Also check that the equipment is complete and that it has not been damaged in transit or during handling.

Do not install any equipment that is clearly damaged and/or defective.

For all equipment with optional extras or kits (including electrical items), only original accessories must be used.

When installing the equipment do not throw the packing away. All the materials can be recycled and must be taken to specific separated collection areas.

Keep the packing out of reach of children, as, by its very nature, it may constitute a source of danger.

Should the equipment break down and/or function defectively, switch it off and do not attempt to repair it yourself. Call in only qualified personnel.

Any repairs to this product must be made using only original spare parts. Failure to comply with the above may compromise the safety of the equipment and expose people, animals, and property to danger.

The owner is obliged to have routine maintenance carried out on the equipment once a year, as indicated in the programme given in the relevant section of this booklet, in order to ensure that it works efficiently and correctly.

Where the equipment is not to be used for an extensive period of time, disconnect it from the electrical power supply and shut the fuel stopcock.

Where there is a danger of freezing, add antifreeze. Draining the system is not recommended as this may damage the overall system. For this purpose use non-freeze products specifically made for multi-metal heating equipment.

IMPORTANT

For equipment powered by gas fuel, if the smell of gas is sensed in the area, proceed as follows:

- **Do not activate any electrical switches or start any electrical equipment.**
- **Do not light any flames and do not smoke.**
- **Shut the central gas stopcock.**
- **Open all doors and windows.**
- **Contact a Service Centre, qualified installer, or the gas supply company.**
- **Using naked flames to check for gas leaks is completely forbidden.**

WARNING

This boiler unit is built for installation in the destination Country specified on the technical data plate.

Installation in any country other than that indicated may pose a danger to people, animals, or property.

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1. INSTRUCTIONS FOR THE USER

1.1. Control panel

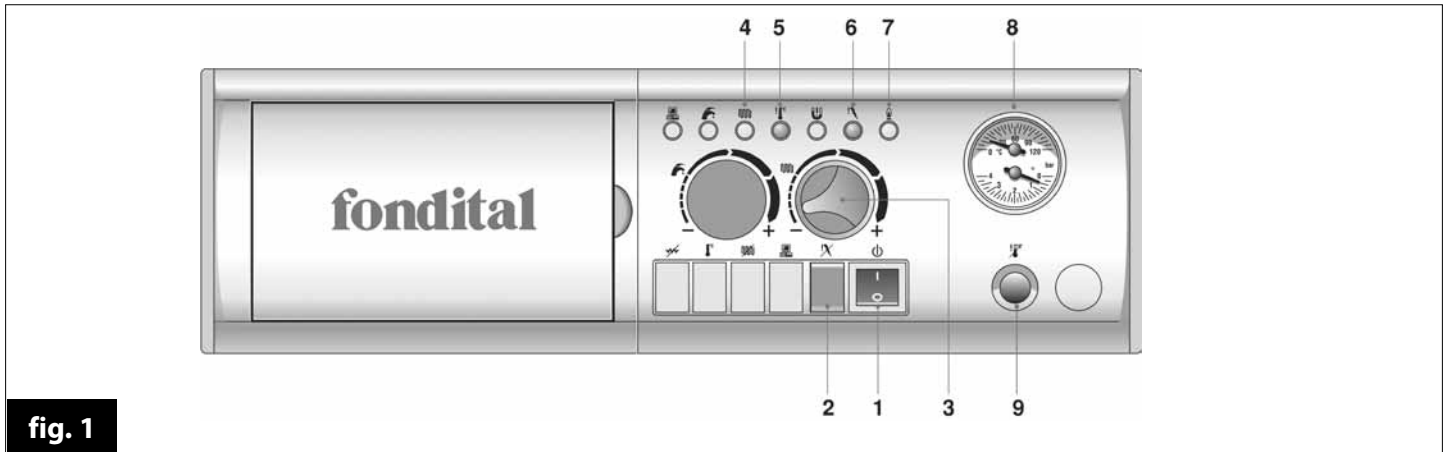


fig. 1

1. General switch with line light (Green)
2. Reset button
3. Temperature adjustment for the heating water
4. Heating Pump operation light (Yellow)
5. Excess temperature cut-out LED (Red)
6. Burner cut-out LED
7. Burner operation LED (Yellow)
8. Thermometer
9. Safety thermostat-reset manually.

General lit switch (Green) (1)

When the switch is in the 0 position the boiler is switched off and the switch is not lit.

When the switch is in the I position the boiler is switched on and the switch is lit.

Reset button (2)

When the reset button is pressed the boiler is restarted.

Temperature adjustment for the heating water (3)

This knob is used to set the temperature for the water in the heating system. It can be set between a minimum of 45°C and a maximum of 85°C.

Heating function LED (Yellow) (4)

This LED indicates that the system is calling for heating.

Excess temperature cut-out LED (Red) (5)

This light indicates that the cut-out connected to the safety thermostat has tripped due to malfunctioning. It must be reset manually.

Burner cut-out LED (Red) (6)

This light indicates that the burner safety device has tripped due to a malfunction.

Burner operation LED (Yellow) (7)

This light indicates that the burner is operating.

Thermometer/Pressure Gauge (8)

The thermometer/pressure gauge's function is to display the temperature and pressure of the water in the boiler.

Manual excess temperature cut-out reset (9)

The thermostat reset button can be accessed by removing the protective cover. The safety thermostat is used to protect the boiler in case of a fault.

1.2. Operating the Boiler (Fig. 1)

1.2.1. Switching On

- Open the fuel stopcock.
- Switch the boiler's main switch **1** to the **ON** position (the switch lights up).
- Turn the heating water temperature adjustment knob **3** to set the temperature required for the heating system.
- Set the ambient temperature using the ambient thermostat (where fitted).
- When the heating system calls for heat the heating request light **4** comes on.
- When the burner is operating, the burner operation light **7** comes on.

Please Note: When igniting the burner after the boiler has been out of use for a long period of time, especially in the case of LPG boilers, there may be airlocks in the pipes.

The boiler's burner may cut-out a few times. Restart the burner using the reset button (see the paragraphs that follow).

1.2.2. Burner cut-out

When any functioning faults arise the boiler's burner cuts out automatically.

The cut-out light (**6**) comes on. Should this happen proceed as follows:

- First check the fuel supply, make sure that the gas stopcock is open and that the gas mains have gas in them by lighting a cooking ring in the kitchen for example.
- Having checked the fuel supply reset the burner by pushing the reset button **2** on the control panel: if the equipment does not restart and cuts out again, after trying three times contact an authorised Service Centre or qualified personnel to carry out maintenance. If the burner cuts out frequently this is a sign that there is an ongoing operating fault. Contact qualified personnel or an authorised Service Centre for maintenance.

1.2.3. Cut-out due to excess temperature

Should the red cut-out light indicating excess temperature **5** come on, this means that the safety thermostat cut-out has tripped and must be reset manually. This is due to an operating fault and an authorised Service Centre or qualified personnel must be contacted for maintenance.

1.2.4. Cut-out due to a fault in the air intake / flue gas discharge system

Should any conditions occur that give rise to a fault in the functioning of the air intake and flue gas discharge system, the boiler goes into stand-by mode.

It remains in this mode until correct operating conditions are reinstated.

WARNING

To solve this problem qualified personnel must be called in or an authorised Service Centre must be contacted to carry out maintenance work on the equipment.

1.3. Maintenance

The user is obliged to have routine maintenance done on the boiler and the burner once a year.

Correct maintenance of the boiler allows it to work under the best conditions, protects the environment, and makes the equipment fully safe for people, animals, or property.

The boiler must be maintained by qualified personnel.

The user may only clean the bodywork on the boiler, and this must be done using products for cleaning furniture.

Do not use water!

1.4. Notes for the User

The user is not authorised to remove the bodywork on the boiler and to work on parts inside.

NOBODY, INCLUDING QUALIFIED PERSONNEL, IS AUTHORISED TO MODIFY THE BOILER.

Qualified personnel may install specific original kits on the boiler.

The Manufacturer accepts no responsibility for damage to people, animals, or property that may arise due to tampering or incorrect work done on the boiler.

The heating system can be effectively protected against icing by using specific non-freeze products that are suitable for multi-metal systems.

Do not use non-freeze products for car engines, and check the effectiveness of the product used over time.

This boiler is fitted with a thermometer to allow you to check the water temperature.

2. TECHNICAL CHARACTERISTICS AND DIMENSIONS

2.1. Technical characteristics

This is a boiler with a high performance heat-exchange casing that works with gas burners at atmospheric pressure.

The following models are available:

RTFS E 18 with a heat output of 18 kW.

RTFS E 24 with a heat output of 24 kW.

RTFS E 32 with a heat output of 32 kW.

RTFS E 36 with a heat output of 36.5 kW.

These boilers can be supplied in a **PV** version, which means that they have a circulation pump and an 8 lit. expansion tank.

These boilers meet the essential requirements laid down in EEC Directives for this product and Gas Directive 93/396/EEC dated 29th June 1990,

Performance Directive 92/42/EEC dated 21st May 1992,

EMC Directive 89/336/EEC dated 3rd May 1989, as amended by Directive 92/31/EEC dated 28th April 1992, European Community Low Voltage Directive 73/23/EEC dated 19th February 1973, as amended by Directive 93/68/EEC dated 22nd July 1993,

and is fitted with all the safety devices called for in the current standards for this type of product.

The main technical characteristics of the boiler are listed below.

- High-performance cast iron heat exchanger.
- Insulation in glass wool with thick aluminized paper (50 mm).
- Bodywork in electrically galvanised steel plating, epoxy-polyester powder coated.
- Lit main switch.
- LED indications for: power on, heating pump operating, burner operating, excess temperature cut-out, burner cut-out.
- Heating temperature selector (45/85°C).
- Safety limit thermostat (110°C).
- Flue gas pressure switch
- Thermometer/Pressure Gauge
- System drain stopcock.
- Electrical system with printed electric circuit.
- Provision for electrical connection for a heating pump.
- Provision for an electrical collection for a safety pressure switch to guard against insufficient water.
- Provision for connecting up a card for managing a remote boiler (optional kit).
- Provision for connecting up a climatic unit (optional kit).
- Provision for connecting up a card for managing three heating areas (optional kit).
- 8 lit expansion tank (for PV models).
- Single-speed circulation unit (for PV models).

2.2. Dimensions

| MODEL | L (mm) | DELIVERY | RETURN | GAS SUPPLY |
|-----------|-----------|----------|--------|------------|
| RTFS E 18 | 510 | G1" | G1" | G 1/2" |
| RTFS E 24 | 510 | G1" | G1" | G 1/2" |
| RTFS E 32 | 610 | G1" | G1" | G 1/2" |
| RTFS E 36 | 610 | G1" | G1" | G 1/2" |

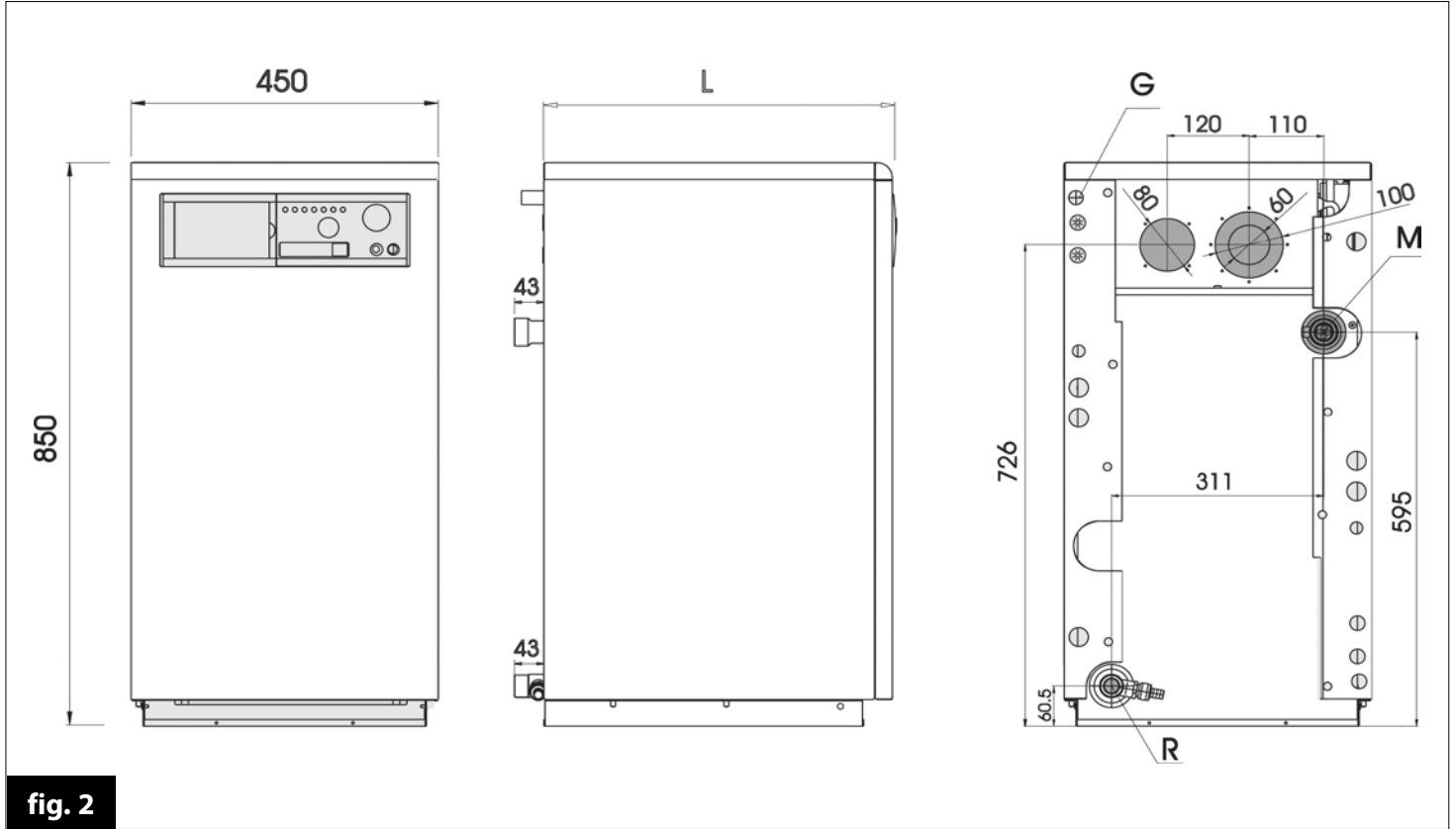


fig. 2

2.3. Operating data

| | | MODELS | | | |
|-----------------------------------|---------------------|-------------------------|-----------|-----------|-----------|
| | | RTFS E 18 | RTFS E 24 | RTFS E 32 | RTFS E 36 |
| EC Performance Class | | ★★ | ★★ | ★★★ | ★★★★ |
| EC PIN | | 49BN3788 | | | |
| Category | | II2H3+ | | | |
| Type | | C12, C32, C42, C52, C82 | | | |
| Heat output | kW | 18 | 24 | 32 | 36.5 |
| Heat input | kW | 20 | 26.6 | 34.4 | 39.2 |
| Performance at nominal load | % | 89.8 | 90.2 | 93.1 | 93.1 |
| Performance at reduced load (30%) | % | 88.53 | 89.23 | 92.08 | 92.14 |
| Maintenance losses T=50 | % | 2.5 | 2.2 | 1.9 | 1.5 |
| Flue losses with burner OFF | % | 0.2 | 0.2 | 0.2 | 0.2 |
| Flue losses with burner ON | % | 7.7 | 7.6 | 5 | 5.4 |
| N° heat exchange elements | N° | 3 | 3 | 4 | 4 |
| Net weight | Kg | 125 | 125 | 160 | 160 |
| Water content | l | 10 | 10 | 13.4 | 13.4 |
| Minimum water flow | l/h | 400 | 520 | 690 | 780 |
| Maximum operating pressure | bar | 4 | 4 | 4 | 4 |
| Working Temperature | °C | 45 - 85 | 45 - 85 | 45 - 85 | 45 - 85 |
| Electrical Power Supply | V-Hz | 230/50 | 230/50 | 230/50 | 230/50 |
| Electrical Power | W | 50 | 50 | 60 | 60 |
| Fuses on Power Supply | A | 4 | 4 | 4 | 4 |
| Methane G20 | | | | | |
| CO2 value | % | 5.7 | 7.6 | 8.3 | 8.2 |
| Flue gas temperature | °C | 120/130 | 120/130 | 110/120 | 120/130 |
| Flue gas mass flow | Kg/h | 42 | 55 | 67 | 76 |
| Number of main burner nozzles | N° | 3 | 3 | 3 | 3 |
| Diameter of main burner nozzles | mm | 2.1 | 2.4 | 2.9 | 2.9 |
| Diameter of main pilot nozzle | mm | 2 x 0.27 | 2 x 0.27 | 2 x 0.27 | 2 x 0.27 |
| Gas pressure at burner | mbar | 9.5 | 11.0 | 9.5 | 12.0 |
| Gas flow (15°C / 1013 mbar). | Stm ³ /h | 2.11 | 2.81 | 3.64 | 4.15 |
| Diaphragm | mm | See notes. Page 10 | | | |
| Gas G30 | | | | | |
| CO2 value | % | 7.2 | 9.8 | 9.7 | 11.1 |
| Flue gas temperature | °C | 120/130 | 120/130 | 120/130 | 120/130 |
| Flue gas mass flow | Kg/h | 42 | 55 | 67 | 76 |
| Number of main burner nozzles | N° | 3 | 3 | 3 | 3 |
| Diameter of main burner nozzles | mm | 1.25 | 1.50 | 1.7 | 1.8 |
| Diameter of main pilot nozzle | mm | 1 x 0.22 | 1 x 0.22 | 1 x 0.22 | 1 x 0.22 |
| Gas pressure at burner | mbar | 27 | 26 | 25.5 | 26 |
| Gas flow (15°C / 1013 mbar). | Kg/h | 1.6 | 2.1 | 2.7 | 3.1 |

3. INSTRUCTIONS FOR THE INSTALLER

3.1. Installation standards

This boiler must be installed in compliance with current laws and standards, which are taken as being an integral part of this booklet.

3.2. Installation

3.2.1. Packing

These boilers are supplied packed in a strong cardboard box on a wooden pallet. On removing the cardboard box make sure that the boiler is complete.

The packing materials can be recycled.

Dispose of them via specific waste collection points.

Keep the packing out of reach of children, as, by its very nature, it may constitute a source of danger. The Manufacturer accepts no responsibility for damage to people, animals, or property due to failure to observe the instruction above.

The package includes the installation, operation, and maintenance manual.

3.2.2. Choosing where to install the boiler

The following must be taken into account when choosing where to install the boiler:

- It is advisable to leave at least 50 cm on each side of the boiler to facilitate future maintenance.
- Do not install in damp or dusty rooms.
- The boiler room must not be accessible to outsiders, children, or animals.

3.2.3. Installing the boiler

Before connecting the boiler to the piping for the hot water and heating systems, clean the piping carefully to eliminate any metal residue left during working and welding, and any oil or grease that may be left and that could damage the boiler or alter the way it works if it reaches the boiler.

NB: Do not use solvents as these could damage the components.

The Manufacturer accepts no responsibility for damage to people, animals, or property due to failure to observe the instructions above.

To install the boiler proceed as follows:

- Unscrew the four screws that attach the brackets that connect the boiler to the timber pallet (Fig. 3)
- Remove the boiler from the pallet without damaging it.
- Put spacers between the floor and the boiler's feet if necessary, to make the installation

stable.

- Connect the boiler to the system's feed and return pipes.
- Remember that the plumbing system must



include all the safety and control elements required in terms of current standards (safety valve, water pressure switch, heat discharge valve, pressure gauge, etc.).

- Connect the boiler up to the air intake and flue pipes.
- Connect the ambient thermostat, the heating pump, and the heating water pressure switch to the electrical system.
- Connect up the electricity supply.

3.2.4. Ventilation of boiler room

These boilers have airtight combustion chambers.

It is obligatory that the boiler be installed in an adequate room in terms of the current standard, **which is taken as an integral part of this booklet.**

3.2.5. Flue gas discharge and combustion-supporting air intake system

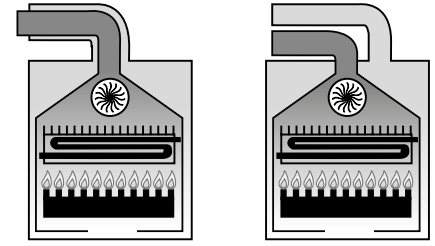
These boilers have a coupling for a flue pipe and another coupling for a combustion-supporting air intake, both of which are suitable for connecting up to Ø 80 mm duct pipes.

The smoke ducts from the boiler are to be connected to a smoke flue formed as indicated in current standards, **which are taken as being an integral part of this booklet.**

Type C12

This boiler is designed to be connected up to horizontal flue gas and air intake terminals, connected to the outside air by means of a coaxial or split pipes.

The distance between the air intake and the flue gas ducts must be at least 250 mm and both terminals are to be positioned within a square with 500 mm sides.



• Coaxial air intake/flue gas duct, Ø 160 mm

Configuration allowed:

- N° 1 flanged stub pipe
- N° 3 metres coaxial duct
- N° 1 air intake/flue gas terminal.

Notes:

- Reduce the maximum length by 1 metre for each 90° elbow.
- Reduce the maximum length by 0.5 metres for each 45° elbow.
- Models **RTFS 18** and **RTFS 24**: for installations with an equivalent length of less than 1 metre, install a 75 mm diaphragm.
- Model **RTFS 32**: for all installations, install a 78 mm diaphragm.
- **RTFS 36** models: for installations with an equivalent length of less than 1 metre, install a 78 mm diaphragm.

• Split air intake/flue gas, Ø 80 mm duct

Configuration allowed:

- N° 2 flanged stub pipes
- N° 19 metres of air intake duct
- N° 19 metres of flue gas duct
- N° 1 air intake terminal
- N° 1 flue gas terminal

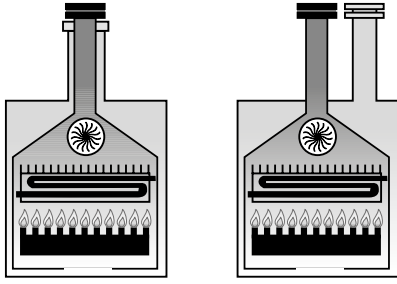
Notes:

- Reduce the maximum length by 1 metre for each 90° elbow.
- Reduce the maximum length by 0.5 metres for each 45° elbow.
- Models **RTFS 18** and **RTFS 24**: for installations with an equivalent length of less than 2+2 metres, install a 42 mm diaphragm on the air intake.
- Models **RTFS 32** and **RTFS 36**: for installations with an equivalent length of less than 9+9 metres, install a 40 mm diaphragm on the air intake.

Type C32

This boiler is designed to be connected up to vertical flue gas and air intake terminals, connected to the outside air by means of a coaxial pipe or split pipes.

The distance between the air intake pipe and the flue gas ducts must be at least 250 mm and both terminals are to be positioned within a square with 500 mm sides.



• **Coaxial air intake/flue gas duct, Ø 160 mm**

Configuration allowed:
 N° 1 flanged stub pipe
 N° 4 metres coaxial duct
 N° 1 roof-mounted air intake/flue gas terminal.

Notes:

- Reduce the maximum length by 1 metre for each 90° elbow.
- Reduce the maximum length by 0.5 metres for each 45° elbow.

• **Split air intake/flue gas, Ø 80 mm duct**

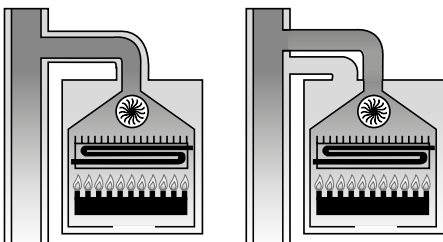
Configuration allowed:
 N° 2 flanged stub pipes
 N° 19 metres of air intake duct
 N° 19 metres of flue gas duct
 N° 1 air intake terminal
 N° 1 flue gas terminal

Notes:

- Reduce the maximum length by 1 metre for each 90° elbow.
- Reduce the maximum length by 0.5 metres for each 45° elbow.
- Models **RTFS 18** and **RTFS 24**: for installations with an equivalent length of less than 2+2 metres, install a 42 mm diaphragm on the air intake.
- Models **RTFS 32** and **RTFS 36**: for installations with an equivalent length of less than 9+9 metres, install a 40 mm diaphragm on the air intake.

Type C42

This boiler is designed to be connected up to a collective chimney system made up of two pipes, one for the combustion-supporting air intake and the other for the discharge of flue gas resulting from combustion, by means of a coaxial pipe or split ducts. The distance between the air intake pipe and the flue gas ducts must be at least 250 mm and both terminals are to be positioned within a square with 500 mm sides.



The chimney is to comply with current standards.

• **Split air intake/flue gas, Ø 80 mm duct**

Configuration allowed:
 N° 2 flanged stub pipes
 N° 2 metres of air intake duct
 N° 2 metres of flue gas duct

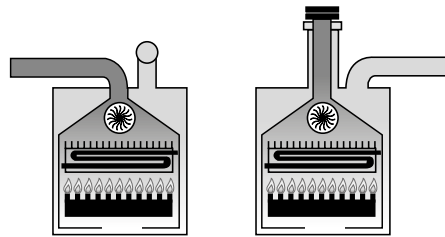
Notes:

- Reduce the maximum length by 1 metre for each 90° elbow.
- Reduce the maximum length by 0.5 metres for each 45° elbow.
- Models **RTFS 18** and **RTFS 24**: install a 42 mm diaphragm on the air intake.
- Model **RTFS 32** and **RTFS 36**: install a 40 mm diaphragm on the air intake.

Type C52

This boiler is designed to be connected up to separate flue and combustion-supporting air intake pipes.

These pipes may open out into areas at differing pressures. The two terminals may not be positioned on opposite walls.



• **Split air intake/flue gas, Ø 80 mm duct**

Roof-mounted flue gas pipe
 Configuration allowed:
 N° 2 flanged stub pipes
 N° 1 metre of air intake duct
 N° 30 metres of flue gas duct
 N° 1 air intake terminal
 N° 1 roof-mounted flue gas terminal

Notes:

- **1 metre of air intake duct is equivalent to 2 metres of vertical flue gas duct.**
- Reduce the maximum length by 1 metre for each 90° elbow.
- Reduce the maximum length by 0.5 metres for each 45° elbow.
- Models **RTFS 18** and **RTFS 24**: for installations with an equivalent vertical flue gas duct length of less than 18 metres, install a 40 mm diaphragm on the air intake.
- Model **RTFS 32** and **RTFS 36**: for installations with an equivalent vertical flue gas duct length of less than 4 metres, install a 42 mm diaphragm on the air intake.

Wall-mounted flue piping

Configuration allowed:

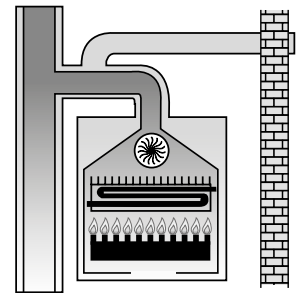
N° 2 flanged stub pipes
 N° 19 metres of air intake duct
 N° 19 metres of flue gas duct
 N° 1 air intake terminal
 N° 1 flue gas terminal

Notes:

- **1.6 metres of air intake piping is equivalent to 1 metre of horizontal flue gas piping.**
- Reduce the maximum length by 1 metre for each 90° elbow.
- Reduce the maximum length by 0.5 metres for each 45° elbow.
- Models **RTFS 18** and **RTFS 24**: for installations with an equivalent length of less than 9+9 metres, install a 40 mm diaphragm on the air intake.
- Model **RTFS 32** and **RTFS 36**: for installations with an equivalent length of less than 2+2 metres, install a 42 mm diaphragm on the air intake.

Type C82

This boiler is designed to be connected to a terminal for taking in combustion-supporting air and an individual or collective chimney.



The chimney is to comply with current standards.

• **Split air intake/flue gas, Ø 80 mm duct**

Configuration allowed for maximum distance:
 N° 2 flanged stub pipes
 N° 4 metres of air intake duct
 N° 1 metre of smoke flue duct
 N° 1 air intake terminal

Notes:

- **1.6 metres of air intake duct is equivalent to 1 metre of horizontal gas flue duct.**
- Reduce the maximum length by 1 metre for each 90° elbow.
- Reduce the maximum length by 0.5 metres for each 45° elbow.
- Models **RTFS 18** and **RTFS 24**: install a 42 mm diaphragm on the air intake.
- Model **RTFS 32** and **RTFS 36**: install a 40 mm diaphragm on the air intake.

3.2.6. On site measurement of combustion performance

To determine combustion performance the following measurements must be taken:

- The temperature of the combustion-supporting air.
- The flue gas temperature and CO₂ percentage in samples drawn from the hole provided for this purpose in the flue gas duct.

Taking the specific measurements with the boiler running at normal load.

3.2.7. Connecting to the gas mains

The gas supply pipe is to have a cross-section that is equal to or greater than that on the burner.

Installation standards must be complied with and are taken as being an integral part of this booklet.

Remember that before putting an internal gas distribution system into service, before it is connected to the meter, it must be checked for leaks.

If any part of the system is inaccessible the leak test must be carried out before the pipes are covered up.

The leak test must not be carried out using combustible gas. Use air or nitrogen for this purpose.

Once there is gas in the pipes, checking for leaks using a naked flame is forbidden.

Use the products made for this purpose that are available on the market.

3.2.8. Connecting to the electricity power supply

These boilers have a terminal board for connecting up a three-pole power supply cable, and a suitable cable clamp to prevent it being torn out.

This boiler must be connected to a **230V-50Hz** electrical power supply.

When forming the connection respect the phase/neutral polarity.

Installation standards must be complied with and are taken as being an integral part of this booklet.

A two-pole switch must be fitted upstream of the boiler to allow all maintenance work to be carried out in complete safety.

The power supply to the boiler must be fitted with a differential magnetic thermal trip-switch of a suitable tripping power.

The electrical power supply must be safely earthed.

This basic safety requirement must be checked. In case of doubt, call in professionally qualified personnel to check the electrical system carefully.

The Manufacturer accepts no responsibility whatsoever for any damage caused due to failure to earth the system. Piping for gas, plumbing, or heating systems are not suitable for earthing this system.

3.2.9. Plumbing connections

Before installation the system should be cleaned in order to remove the impurities that may come from the components as far as possible, as these could damage the circulation or heat exchange units.

The CH delivery and return pipes must be connected up to the respective couplings on the boiler.

When sizing the piping for the heating system, bear in mind the load losses caused by radiators, thermostatic valves, radiator gate valves, and the configuration of the system itself.

3.2.10. Installation of original kits

The Manufacturer provides original kits for installing clock programmers, cards for managing a remote boiler, and for installing a heat-regulating unit.

These original kits are to be installed in compliance with the instructions supplied with them.

3.3. Filling the system

Once all the connections in the system have been completed, the heating circuit can be filled.

This must be carried out carefully, and in the following steps:

- Open the bleed valves on the radiators and make sure that the vent valve installed in the boiler room is working.
- Gradually open the relevant stopcock to fill the system and make sure that all automatic air vents installed in the system are working properly.
- Close the vent valve as soon as water comes out of it.
- Use the pressure gauge installed in the boiler room to check when the pressure reaches 0,8 / 1 bar.
- Having started the boiler and brought the system up to its working temperature, stop the pump and repeat the air bleeding operations.
- Allow the system to cool and return the water pressure to 0,8 / 1 bar.

WARNING

As regards treating water in domestic heating systems, it is advisable to use specific products that are suitable for multi-metal plants, in order to optimize performance and safety, preserve these conditions over time, ensure regular operation of auxiliary equipment as well, and minimize energy consumption, in compliance with the applicable laws and standards.

In this regard specific products must be used that are suitable for multimetal plants.

Note: The boiler is fitted with a drain stopcock at the front of the unit that can be used to empty the system.

3.4. Starting the boiler

3.4.1. Preliminary checks

Before starting the boiler it is best to check that:

- The chimney has been installed in compliance with instructions.

When the boiler is running no products generated by combustion are to leak from any gaskets.

- The boiler power supply is 230 V – 50 Hz.
- The system is properly filled with water (pressure on the water gauge 0,8 / 1 bar).
- All stopcocks in the system's piping are open.
- The fuel supply stopcock is open.
- There are no gas leaks.
- The external main switch is on.
- The boiler's safety valve is not blocked.
- There are no water leaks.

To speed up and facilitate igniting the boiler for the first time, bleed the air out of the gas piping using the gas pressure valve socket. Close the pressure socket carefully after bleeding the system.

3.4.2. Switching on and off

For switching the boiler on and off, follow the "User's Instructions".

The plant pump must be connected directly to the boiler terminal board (terminals 11 and 12).

3.5. Wiring diagrams

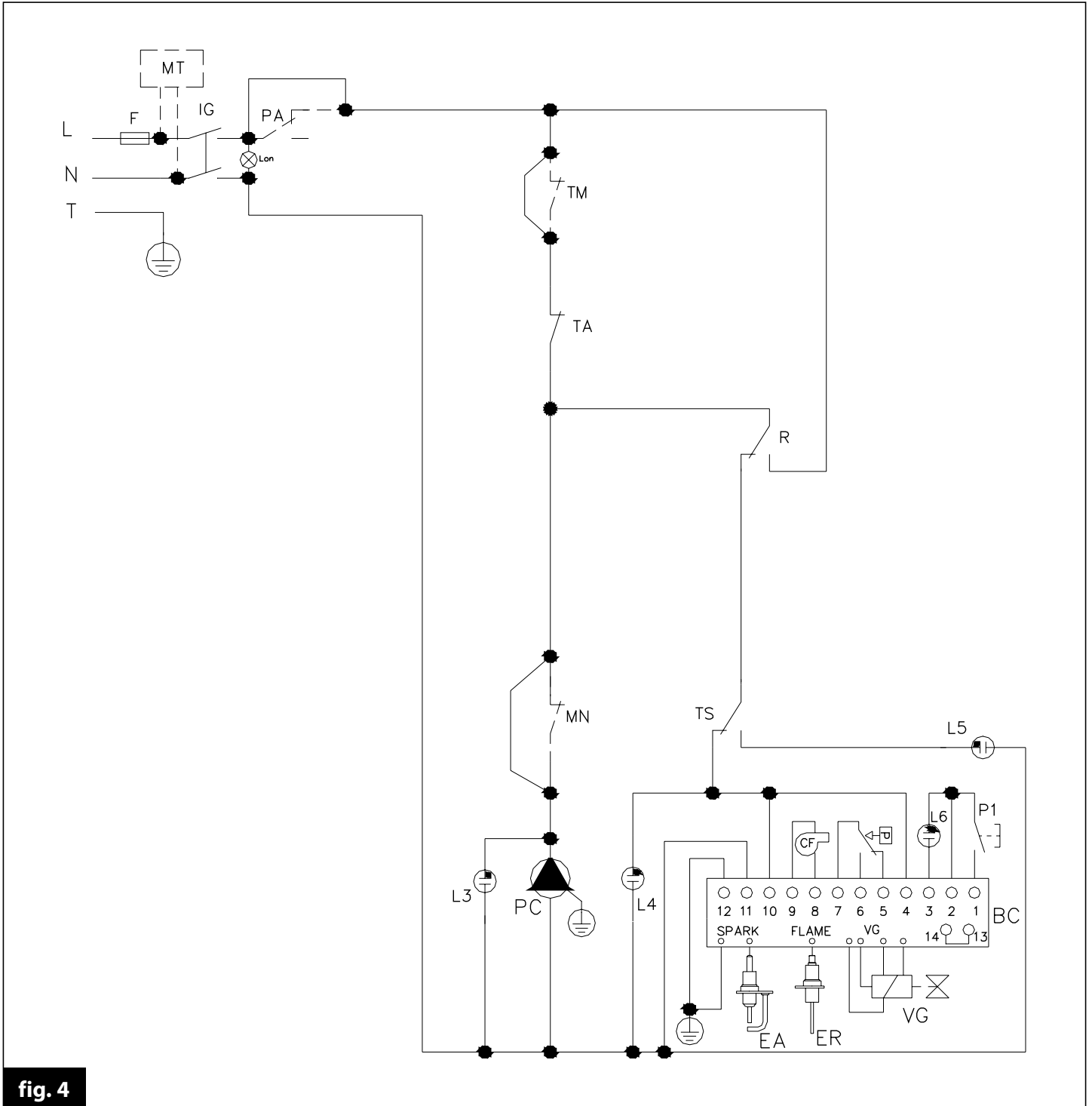


fig. 4

IG: Main Switch (marked "on/off" on the printed circuit).
R: Heating thermostat (marked "Tr" on the printed circuit).
Lon: Power on indication
TS: Safety Thermostat
L3: Heating circulation unit indication
Fu1: Protection fuse F4A 250V
L4: Burner ON indication
BC: Flame check
L5: Safety thermostat indication
P1: Burner reset button
L6: Burner cut-out indication
PC: Heating circulation unit
MT: Motor timer (optional) [marker "TIMER" on the printed circuit]

VG: Gas valve
TM: Contact Timer (optional) [marked "TIMER" on the printed circuit]
PZ: Ignition spark unit
PA: Water pressure switch (optional) [marked with the pressure switch symbol on the printed circuit]
EA: Ignition electrode
MN: Minimum thermostat (optional) [marked "Tm" on the printed circuit]
ER: Flame detection electrode
TA: Ambient thermostat
PR: Circulation pump
BR: Ignition card connection
PCB1: Printed Circuit Board

a = Blue
br = Brown
g = Grey
p = Pink
v = Violet
bl = Dark Blue
bk = Black
gn = Green
r = Red
y = Yellow
w = White
ygn = Yellow/Green
o = Orange

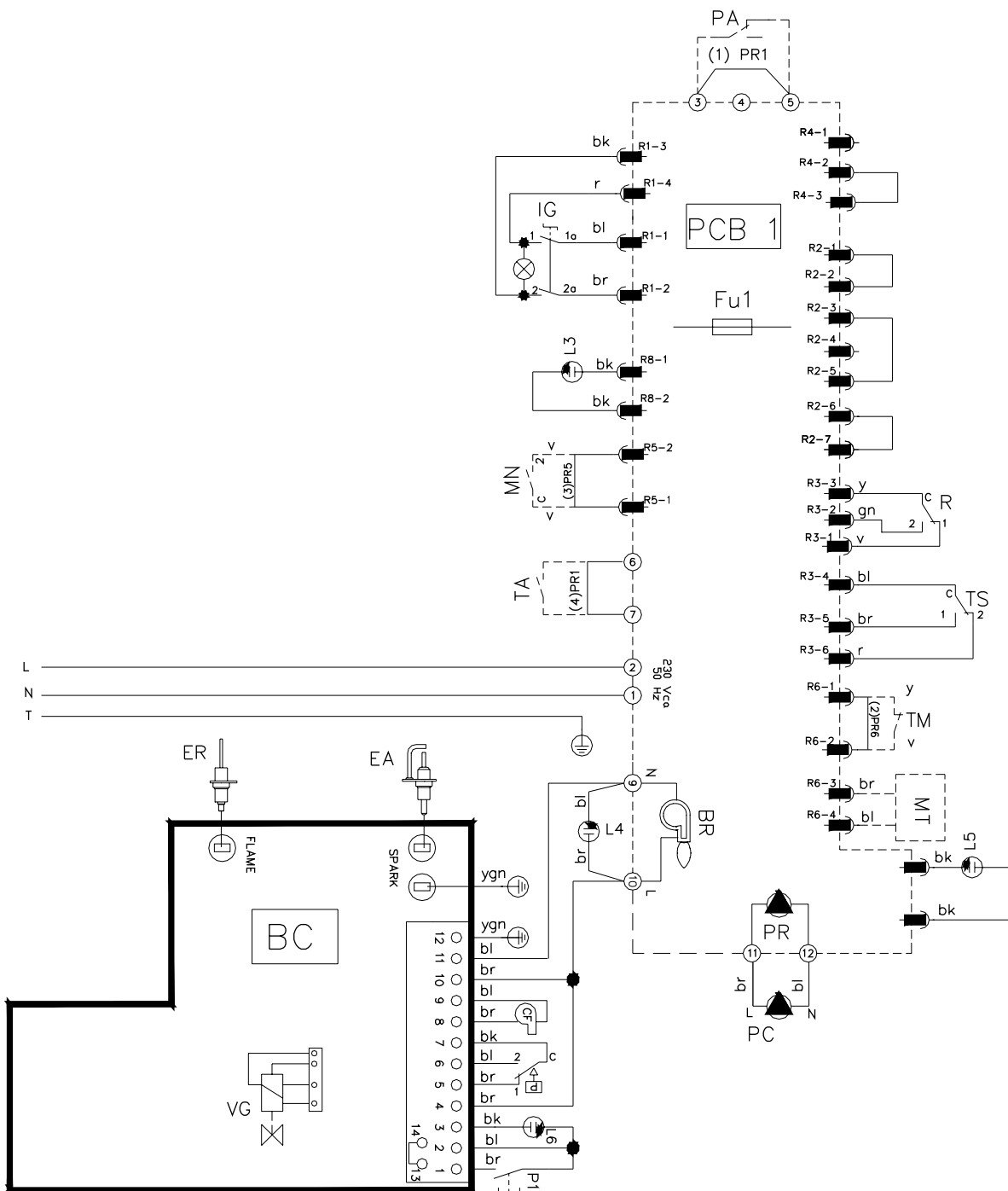


fig. 5

- IG:** Main switch (marked "on/off" on the printed circuit).
- R:** CH thermostat [marked "Tr" on the printed circuit].
- Lon:** Power on indication
- TS:** Safety thermostat
- L3:** Heating circulation unit indication
- Fu1:** Protection fuse F4A 250V
- L4:** Burner ON indication
- BC:** Flame check
- L5:** Safety thermostat indication
- P1:** Burner reset button
- L6:** Burner cut-out indication
- PC:** Circulation pump
- MT:** Motor timer (optional) [marked "TIMER" on the printed circuit]

- VG:** Gas valve
- TM:** Contact timer (optional) [marked "TIMER" on the printed circuit]
- PZ:** Ignition spark unit
- PA:** Water pressure switch (optional) [marked with the pressure switch symbol on the printed circuit]
- EA:** Ignition electrode
- MN:** Minimum thermostat (optional) [marked "Tm" on the printed circuit]
- ER:** Flame detection electrode
- TA:** Ambient thermostat
- PR:** Circulation pump
- BR:** Ignition card connection
- PCB1:** Printed circuit board

- a** = Blue
- br** = Brown
- g** = Grey
- p** = Pink
- v** = Violet
- bl** = Dark Blue
- bk** = Black
- gn** = Green
- r** = Red
- y** = Yellow
- w** = White
- ygn** = Yellow/Green
- o** = Orange

3.6. Gas conversion

Changing a boiler supply gas from methane to LPG and vice versa is only to be carried out by qualified personnel. To check the setting values for the nozzles and gas supply pressure, use a pressure gauge connected to the pressure sockets on the valves.

3.6.1. Methane to LPG

Proceed as follows:

- Remove the methane nozzle from the pilot burner after unscrewing the nut that holds the olive and vent the gas supply duct to the pilot burner.
- Position the LPG nozzle checking that it is as indicated in the technical data table, and after repositioning the gas supply duct tighten the nut that secures the olive.
- Remove the methane nozzle on the main burner and fit the LPG nozzle, checking that this is as indicated in the technical data table.
- Unscrew the pressure regulating cap on

the gas valve and tighten the pressure regulating screw all the way.

- Screw the pressure regulating cap back on and seal it (using paint or a self-adhesive label, for example).
- Check the gas circuit for leaks, especially the points that were disconnected.
- Affix the self-adhesive label provided that indicates the type of gas and pressure for which the equipment is now set.

3.6.2. LPG to methane

Proceed as follows:

- Remove the LPG nozzle from the pilot burner after unscrewing the nut that holds the olive and vent the gas supply duct to the pilot burner.
- Position the methane nozzle checking that it is as indicated in the technical data table, and after repositioning the gas supply duct tighten the nut that secures the olive.
- Remove the LPG nozzle on the main burner and fit the methane nozzle, checking that this is as indicated in the technical data table.

- Unscrew the pressure regulating cap on the gas valve and unscrew the pressure regulating screws so that the pressure at the outlet is as specified in the technical data table.
- Screw the pressure regulating cap back on and seal it (using paint or a self-adhesive label, for example).
- Check the gas circuit for leaks, especially the points that were disconnected.
- Affix the self-adhesive label provided that indicates the type of gas and pressure for which the equipment is now set.

4. MAINTENANCE

In order to ensure that the equipment is efficient and that it functions correctly, maintenance must be carried out annually, based on the programme laid out below:

It is compulsory for all maintenance (and repair) operations to be carried out by qualified personnel.

Before starting any maintenance work that involves replacing components and/or cleaning the inside of the boiler, disconnect the equipment from the electrical power supply.

Maintenance programme

Routine maintenance must include the following checks:

- check general integrity of the boiler.
- check gas supply to the boiler for leaks.
- check ignition of the boiler.
- check boiler's combustion parameters by analysing the flue gas content (this check is done every two years if the boiler is installed on its own.

Where the boiler is installed in a cascade system, this check must be run annually).

- check integrity, good state of preservation, and leak test on the flue gas duct.

- check the integrity of safety devices on the boiler in general.
- check for water leaks and rusting on the boiler's couplings.
- check the efficiency of the system's safety valve.

The following cleaning is to be done (with the boiler cold):

- general internal cleaning of the boiler.
- cleaning of the burner and resetting of the same as necessary.
- cleaning of the flue gas side of the heat exchanger. This can be done using swabs and vacuum cleaners to remove soot deposits on the sides and heat exchanger fins.

Alternatively specific chemical products can be used in compliance with the instructions for use of the same.

Do not use inflammable products such as petrol, solvents or any other such material to clean the heat exchanger.

When working on the boiler for the first time, check.

- suitability of the boiler room.
- ventilation openings in the room.
- flue gas discharge system and diameters and lengths of this.
- that the boiler has been correctly installed as per the instructions in this booklet.

If the equipment is not suitable to work correctly, or where it poses any danger to people, animals or property, inform the person responsible for the plant and draw up a statement in this regard.



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