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Wall hung, fanflue, roomsealed, high efficiency gas boiler

# User manual and Installation instructions

## ADVANCE

Models

G.C. Appl. No.

<b>ADVANCE 150V</b>	<b>41-583-35</b>	<b>BOILER</b>
<b>ADVANCE 180V</b>	<b>41-583-36</b>	<b>BOILER</b>
<b>ADVANCE 240V</b>	<b>41-583-37</b>	<b>BOILER</b>



Congratulations on your choice.

The Biasi **ADVANCE OV** are condensing high efficiency sealed chamber fan flue gas boilers. They are fully electronically controlled and have electronic ignition.

The materials they are made of and the control systems they are equipped with give you safety, a high level of comfort and energy savings to allow you to get the greatest benefit out of independent heating.

The Biasi **ADVANCE OV** allow a higher efficiency by reducing the flue gas temperature such that the water vapour formed during the combustion is condensed out.

This allows a gain of useful heat that otherwise would be lost.



Biasi UK Ltd is a licensed member of the Benchmark Scheme which aims to improve the standards of installation and commissioning of domestic heating and hot water systems in the UK and to encourage regular servicing to optimise safety, efficiency and performance. Benchmark is managed and promoted by the Heating and Hot water Industry Council. For more information visit [www.centralheating.co.uk](http://www.centralheating.co.uk).



**DANGER:** The indications marked with this symbol must be observed to prevent accidents of mechanical or generic origin (e.g.: Injuries or bruises).



**DANGER:** The indications marked with this symbol must be observed to prevent accidents of electric origin (electrocution).



**DANGER:** The indications marked with this symbol must be observed to prevent the risk of fire or explosion.



**DANGER:** The indications marked with this symbol must be observed to prevent accidents of heat origin (burns).



**ATTENTION:** The indications marked with this symbol must be observed to prevent malfunctioning and/or damage to materials of the appliance or other objects.



**ATTENTION:** The indications marked with this symbol are important information that must be carefully read.



## Remember that...



WARNING

- ✓ **The manual** must be read thoroughly, so that you will be able to use the boiler in a safe and sensible way and must be carefully kept. It may be necessary for reference in the future.
- ✓ **The first firing** must be carried out by a competent and responsible Gas Safe engineer.
- ✓ **The manufacturer**
  - disclaims all liability for any translations of the present manual from which incorrect interpretation may occur;
  - cannot be held responsible for non-observance of instructions contained in this manual or for the consequences of any procedure not specifically described.

Please ensure that the installer has fully completed the Benchmark Checklist on the inside back pages of the installation instructions supplied with the product and that you have signed it to say that you have received a full and clear explanation of its operation. The installer is legally required to complete a commissioning checklist as a means of complying with the appropriate Building Regulations (England and Wales).

All installations must be notified to Local Area Building Control either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer who should, on receipt, write the Notification Number on the Benchmark Checklist.

This product should be serviced regularly to optimise its safety, efficiency and performance. The service engineer should complete the relevant Service Record on the Benchmark Checklist after each service.

The Benchmark Checklist will be required in the event of any warranty claim.

- ✓ **Before lighting the boiler** you are advised to have a Gas Safe Registered Engineer check that the installation of the gas supply is
  - gas-tight;
  - of the correct gauge for the flow to the boiler;
  - fitted with all the safety and control devices required by the current Regulations.
- ✓ **Ensure that**
  - if converting to a sealed system that the installer has connected and terminated a pressure relief valve in a manner which allows safe discharge and a pressure expansion vessel sized according to the system size. The manufacturers are not responsible for damage caused by opening of the pressure relief valve and consequent escape of water, if this is not connected and terminated.
  - the installer has connected the condensate outlet to a suitable drain pipe.
  - ensure that all transit caps and protective packaging is removed.

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✓ **On detecting the smell of gas:**

- do not operate any electrical switches, the telephone or any device that may produce sparks;
- open the windows and doors at once to create a draught of air which will purge the area;
- shut off the gas cocks;
- get the assistance of a qualified person. Emergency telephone number

**Tel. 0800 111999.**

- ✓ **Do not touch the appliance** with parts of the body that are wet or damp and/or bare feet.
- ✓ **Do not block or modify** the condensate outlet and pipe work.
- ✓ **In case of structural work** or maintenance near the flue and flue terminal turn off the appliance. On completion of the work, have a professionally qualified person check there efficiency.
- ✓ **Repairs** (under guarantee) must be carried out only by a Biasi an approved engineer, using genuine spare parts. Thus do no more than switching off the boiler yourself (see the instructions).
- ✓ **Your boiler** allows heating up of water to a temperature less than boiling point therefore it
  - must be connected to a central heating system and/or a hot water supply system, compatible with its performance and output;
  - can be used only for those purposes for which it has been specially designed;
  - must not be touched by children or by those unfamiliar with its operation;
  - must not be exposed to weather conditions.
- ✓ **During the operation** it is quite normal that the boiler produces a white plume of condensation vapour from the flue terminal. This is due to the high efficiency of the appliance and may be particularly evident with low outdoor temperatures.

## Safe handling of substances

Biasi products are manufactured in accordance with ISO 9001 and do not, and will not, contain any hazardous materials or substances such as asbestos, mercury or C.F.C.'s. The appliance packaging does not contain any substances, which may be considered a hazard to health.

When handling or lifting always use safe techniques.

- Keep your back straight, bend your knees, don't twist.
- Move your feet, avoid bending forwards and side ways and keep the load as close to your body as possible.

Where possible transport the boiler using a sack truck or other suitable trolley.

Always grip the boiler firmly, and before lifting feel where the weight is concentrated to establish the centre of gravity, repositioning yourself as necessary.

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### Combustion chamber panels

*Material:* mineral fibres

*Known hazards* - Some people can suffer reddening and itching of the skin. Fibre entry into the eye will cause foreign body irritation, which can cause severe irritation to people wearing contact lenses. Irritation to respiratory tract.

*Precautions* - Dust goggles will protect eyes. People with a history of skin complaints may be particularly susceptible to irritation. High dust levels are only likely to arise following harsh abrasion. In general, normal handling and use will not present high risk. Follow good hygiene practices; wash hands before, touching eyes, consuming food, drinking or using the toilet.

*First aid* - Medical attention must be sought following eye contact or prolonged reddening of the skin.

### Sharp Edges

Caution should be taken when handling the boiler to avoid sharp edges on the boiler.

## Boiler installation and commissioning tips

- ✓ **The installation** must be carried out by a qualified Gas Safe Registered Engineer who will be responsible for observing the current Regulations and the completion of the Benchmark Gas Boiler System Commissioning Checklist, located at the back of this User manual.

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## Installing the boiler...

- ✓ You must ensure that you remove the transit caps and plugs from the boiler connections which are fitted to every boiler.
- ✓ Keep the boiler clear of dust during installation and in particular do not allow any dust or debris to enter the top of the boiler where the flue connection is made. It is recommended that you put a dust sheet over the top of the boiler until you are ready to make the flue connection.
- ✓ Please remember to remove all air from the heating system.
- ✓ This boiler allows you to control the flow temperature of the central heating system at very low levels. For underfloor heating system a temperature limiting device (e.g. a safety thermostat) is recommended to stop the boiler in case that the water temperature exceeds the design temperature.
- ✓ You are strongly advised to flush out the system both hot and cold in order to remove any system and installation debris to the British Standard BS 7593 code of practice.
- ✓ It is also sensible to initially fire and commission the boiler before connecting any external controls such as a room thermostat. By following this procedure, if you have a subsequent problem this method can eliminate the external controls from your fault analysis.
- ✓ Some products incorporate an anti cycling time delay. It is normal when first switching the boiler on for the boiler to operate on heating for a few seconds then switch off. After 3 - 4 minutes has elapsed the boiler will then re ignite and operate perfectly normally.
- ✓ If you are in any doubts as to the installation or operation of the boiler please read the instruction manuals thoroughly and then if necessary contact Biasi UK for advice and assistance.
- ✓ Guarantee conditions. The guarantee registration form must be returned within 30 days of purchase, failure to comply will invalidate the guarantee.

Please remember that if you are in any doubt about the installation of this product you can contact our Technical Help line on tel. 01922 714 600.

### **Abbreviations used in the manual:**

C.H. = Central heating

D.H.W. = Domestic hot water

D.C.W. = Domestic cold water

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Appliance category: II2H3P (gas G20 20 mbar, G31 37 mbar)

Country of destination: United Kingdom (GB) Ireland (IE)

This appliance conforms with the following EEC directive:

Regulation (EU) 2016/426 on appliances burning gaseous fuels

Efficiency Directive 92/42/EEC

Electromagnetic Compatibility Directive 2014/30/EU

Low Voltage Directive 2014/35/EU

Ecodesign Requirements Directive 2009/125/EC

The manufacturer, in the continuous process to improve his products, reserves the right to modify the data expressed in the present documentation at any time and without prior notice.

The present documentation is an informative support and it can not be considered as a contract towards third parties.

# APPLIANCE DESCRIPTION

## 1 APPLIANCE DESCRIPTION

### 1.1 Overview

The model and serial number of the boiler is shown on the bottom of the boiler.

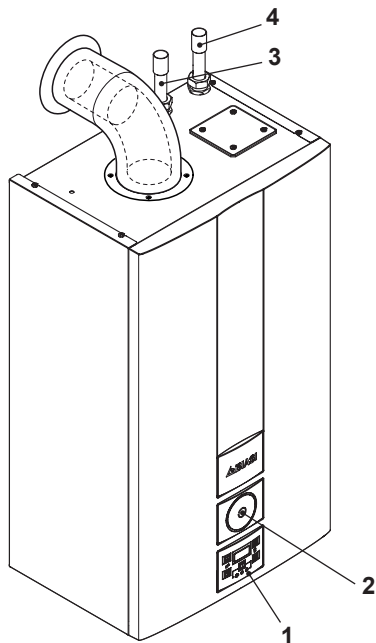


Fig. 1.1

- 1 Controls panel
- 2 Housing for optional time switch (C.H. control)
- 3 C.H. flow pipe
- 4 C.H. return pipe

### 1.2 Isolation valves

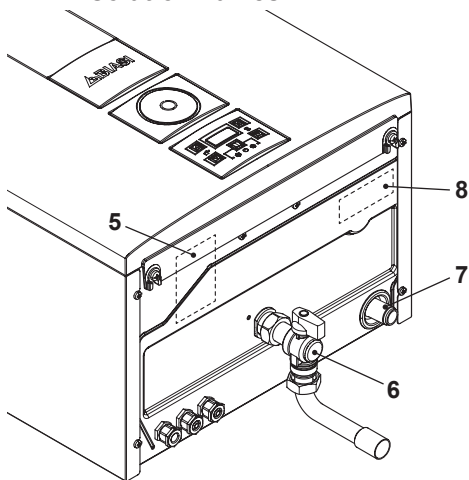


Fig. 1.2

- 5 Gas supply label
- 6 Gas inlet valve
- 7 Condensate drain pipe
- 8 Model and serial number of the boiler label



# APPLIANCE DESCRIPTION

## 1.3 Control panel

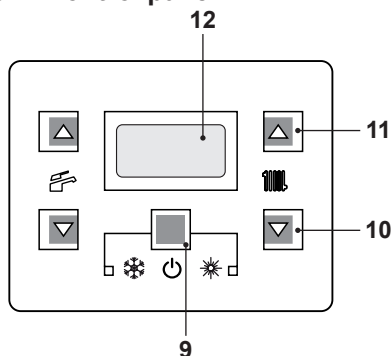


Fig. 1.3

- 9 Reset/Stand-by/Winter/Summer key
- 10 Boiler temperature reduce key
- 11 Boiler temperature increase key
- 12 LCD display



**RESET that takes all parameters back to the factory value occurs only by setting "parameter 08=04". Reset is displayed by switch on of all symbols present on the display.**



## 1.4 LCD general features

For the boiler technical information refer to the section "TECHNICAL INFORMATION" on page 21.





Fig. 1.4







### KEY











RESET	The symbol indicates that the boiler can be directly reactivated by the user, by pressing the reset button
	The symbol indicates that the fault requires intervention on behalf of specialised technical assistance
	All symbols represented with lines that surround them, indicate that the symbol is flashing

### SIGNAL DISPLAYED BY THE LCD

LCD	FUNCTION
Er 01 + RESET	Lack of burner ignition on safety lockout
Er 02 + RESET	Safety thermostat intervention lockout
Er 03 + RESET	General lockout
Er 04 + 	Faulty primary circuit (no water or absence of flow)
Er 05 + 	Faulty fan control system

## APPLIANCE DESCRIPTION

LCD	FUNCTION
Er 06 + 	Faulty C.H. temp. probe NTC
Er 08 + 	Faulty external temp. probe NTC
Er 09 + 	Faulty flue temp. probe NTC
Er 10 + RESET	Flue probe intervention lockout
	Flame detection error (An flashing + number error flashing)
Er 12 + 	Faulty central heating temp. probe NTC (return).
Er 13 + 	Differential temperature Flow and return >40K
Er 14 + RESET	Faulty pump or primary temperature above 105°C
Er 15 + RESET	None or too low water flow; Faulty pump (temp. difference between probes higher than 35° C)
Er 16 + RESET	Possible exchange of NTC probes (Flow or Return) or pump wrongly mounted (upside – down)
Er 17 + RESET	Faulty C.H. temp. probe NTC (Flow or Return)
Er 18 + RESET	Faulty primary circuit (no water or absence of flow)
Er 25 + RESET	Flame detection error
Er 69	Wiring error lockout

LCD	FUNCTION
	Boiler Stand-By, hyphens are turned on in sequence to simulate running /antifreeze protection activated)
	Boiler waiting for heat request
	Boiler in winter mode (C.H.) The primary circuit temperature is displayed.
	Boiler on demand for C.H. power.
	Burner ignition (spark)
	Flame present (Burner on)
	Boiler in anti-freeze phase (bP flashing + temperature flashing). Boiler protection only.
	Boiler in antifrost phase (AF flashing + temperature flashing). System protection via additional external thermostat.
	Set C.H. (all other symbols are disabled)
	Remote control connected (one flash every 4 sec.)

## APPLIANCE DESCRIPTION

LCD	FUNCTION
	Pump activated for the post-circulation phase ( <b>Po</b> flashing + temperature flashing)
	Delayed burner ignition for setting the system ( <b>uw</b> flashing + temperature flashing)
	Maintenance required The wrench symbol is flashing (without showing any error)
	Boiler in chimney sweep function. The activation of the chimney sweep occurs configuring the "parameter P09=01" and is visualized: LP= minimum D.H.W. hP= minimum heating cP= maximum heating dP= maximum D.H.W..
	The transition occurs with keys 11 (increase) and 10 (decrease) D.H.W. temperature. The writing on the display alternates.

# INSTRUCTIONS FOR USE

## 2 INSTRUCTIONS FOR USE

### 2.1 Warnings

Biasi UK Ltd support the Benchmark initiative. The Benchmark Checklist is located at the back of this manual and should be completed by the Installing/Commissioning Engineer and handed over to the User for future reference by other visiting Engineers.

Also included is the Service Interval Record card that should be completed by the Service Engineer following the annual service maintenance of the boiler and system.

All Gas Safe Registered Installers carry a Gas Safe ID card, and have a registration number. Both should be recorded in your Benchmark Checklist. You can check your Installer is registered by calling Gas Safe direct on 0800 408 5500, or go on line at [www.GasSafeRegister.co.uk](http://www.GasSafeRegister.co.uk).

In order to guarantee safety and correct operation, it is essential that all the tests are carried out by a competent and responsible service engineer before lighting up the boiler.

The tests are described in the installation instructions in section "COMMISSIONING" on page 56.

Ensure that the C.H. circuit is filled with water.

**If you are in any doubt regarding this procedure you are advised to contact your Installer or an Approved Engineer.**

This appliance is provided with a built in anti-freeze system that operates the boiler when the temperature is below 5 °C.

Therefore, when the boiler is not lit or used in cold weather, with consequent risk of freezing do not switch off the boiler at the fused spur isolation switch or close the gas inlet cock.



In a non permanent live connection format this option will not function. An alternative solution can be an external frost thermostat connected through your wiring center.

When you do not expect to use the boiler for a long period and the boiler is not to be used for frost protection then follow the instructions given in section "Switching off" on page 15.

**If you experience any difficulty with the operation of the boiler, switch off the boiler immediately at the fused spur isolation switch and contact your Installer or an approved Service Engineer.**

You may find it necessary to vent air from your radiator circuit using your radiator key.

### 2.2 Ignition

- Check that the gas supply cock located in the lower part of the boiler and the valves are open Fig. 2.1.

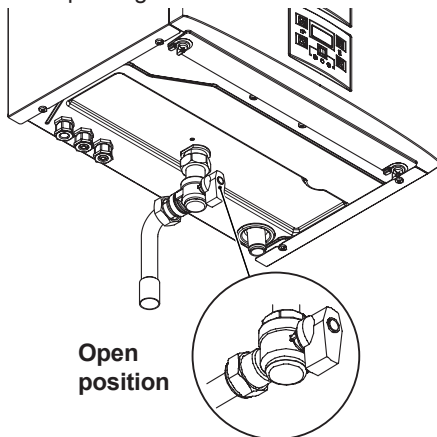


Fig. 2.1

- Turn on the electricity supply to the boiler, switching on the fused spur isolation

# INSTRUCTIONS FOR USE

switch. The LCD display displays the state within which the boiler is found (last memorised) Fig. 2.2.

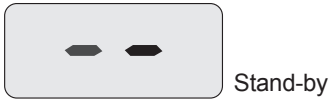



Fig. 2.2

## C.H. functioning

- Press the key 9 for 2 seconds until  symbol appears on the display Fig. 2.3.

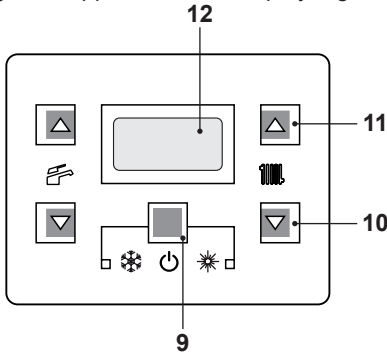


Fig. 2.3


The LCD display displays the boiler temperature (primary circuit) and  symbol; the °C symbol slowly flashes Fig. 2.4.



Fig. 2.4

## 2.3 C.H. circuit temperature

The output temperature of C.H. water can be adjusted by pressing keys 10 (reduce) and 11 (increase) (Fig. 2.3) from a minimum of about 25°C to a maximum of about 85°C. Press one of the two keys once to display

the "set" value. Press again to access the modification.

Signal given by the LCD display:


- The heating flow "set" temperature and the symbol  flash. The background of the display is illuminated (Fig. 2.5).



Fig. 2.5

## Adjustment of temperature WITHOUT the external temperature probe (optional) fitted

Adjust the C.H. water flow as follows:

- from 25 to 35 with an external temperature included between 5 and 15°C
- from 35 to 60 with an external temperature included between -5 and +5°C
- from 60 to 85 with an external temperature less than -5°C.

Your installer can recommend the best suited settings for your heating system.

You can see the actual flow temperature from your boiler at all times on the LCD screen.

## Power request in C.H. power.



When the boiler has a call for heat in the C.H. mode, the  symbol is displayed on the display followed by an increase of the C.H.. water flow temperature. The  symbol flashes (Fig. 2.6).



Fig. 2.6

# INSTRUCTIONS FOR USE

## Adjusting the C.H. temperature with the external temp. probe installed

When the external temp. probe (optional) is installed your boiler automatically adjusts the temperature of the C.H. system water flow in relation to the external temperature. In this case the boiler must be set by a qualified installer (see "Setting the K coefficient of the external temperature probe" on page 62).

However, if the ambient temperature is not comfortable, the flow temperature of the heating system can be adjusted by  $\pm 15^{\circ}\text{C}$  by acting on keys 10 (reduce) and 11 (increase) (Fig. 2.3).

### Activation for 24 hours:

**This function is non operational in a non permanent live connection format.**

Pressing keys 10 and 11 (Fig. 2.7) at the same time for 2 seconds until the letters "th" appear on the LCD display which alternates with the word "on" (Fig. 2.8).

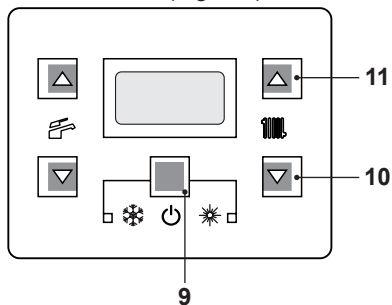


Fig. 2.7



Fig. 2.8


Following, the LCD display shows the main circuit temperature which alternates with the word "th". The symbol  flash Fig. 2.9.



Fig. 2.9

### Deactivation/End of function:

The function will end when the time set passes or when the function status is set to "oF".

Hold down keys 10 and 11 (Fig. 2.7).

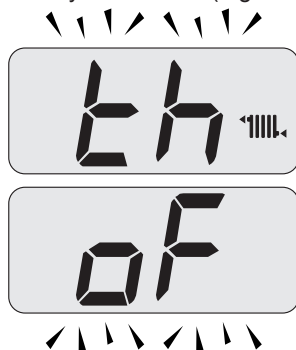



Fig. 2.10

# INSTRUCTIONS FOR USE

## 2.4 Switching off

Press the key for 2 seconds 9 (Fig. 2.11) until the  symbol appears on the display (Fig. 2.12).

- If necessary, empty the hydraulic circuits see section "Emptying the C.H. system" on page 74.

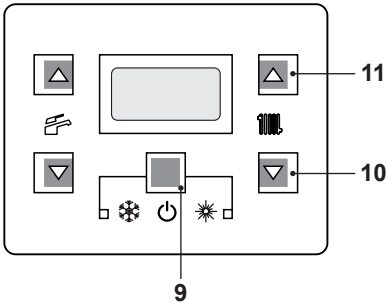


Fig. 2.11



Fig. 2.12

If a long period of inactivity is envisioned:

- Switch off the electricity supply to the boiler, by means of the fused spur isolation switch;
- Shut off the gas supply cock fitted under the boiler and the valves for the water circuits Fig. 2.13;

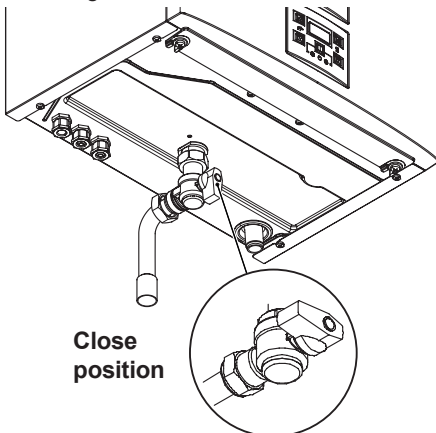


Fig. 2.13

USE

## USEFUL ADVICE

### 3 USEFUL ADVICE

#### 3.1 Central Heating

For your comfort and added system control, you can install a room thermostat but you should not shut off the radiator in that room or have a TRV fitted on the radiator.

If a radiator (or a convector) does not heat up, check that no air is present in it and that its valve is open. If the ambient temperature is too high, do not alter the radiator valves. Reduce the central heating temperature instead by means of the room thermostat or by pressing the 10 and 11 heating adjustment keys (Fig. 3.1).

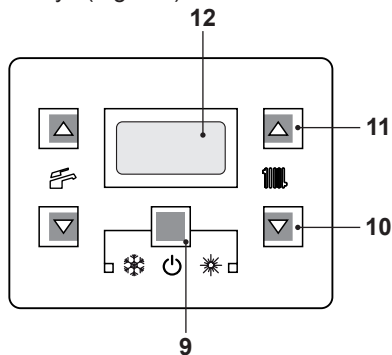


Fig. 3.1

#### 3.2 Frost protection

The built in anti frost system protects the boiler from frost damage but does not provide any protection for the system, this feature is only operational in a permanent live connection format.

If the external temperature can reach values lower than 0°C, it is recommended that the entire system is activated adjusting the room thermostat at a low temperature.

The anti-freeze function is also activated with the boiler in stand-by (Fig. 3.2).

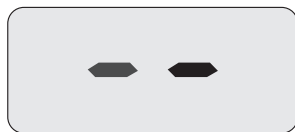


Fig. 3.2

Therefore, when the boiler is not lit and used in cold weather, with consequent risk of freezing do not switch off the boiler at the fused spur isolation switch or close the gas inlet cock.

If the boiler is deactivated, have a qualified technician empty the boiler and the C.H. system.

System protection can be archived by incorporating an external frost protection thermostat into you heating system wiring plan.

#### 3.3 Condensate drain

The condensate drain must not be modified or blocked. Blockage of the condensate drain, caused by debris or freezing, can cause automatic shutdown of the boiler. If freezing is suspected and the pipe run is accessible an attempt may be made to free the obstruction by pouring hot water over the exposed pipe an cleaning any blockage from the end of the pipe.

If this fails to remedy the problem the assistance of a Gas Safe registered installer or in IE a competent person should be sought.

#### 3.4 Periodic maintenance

For efficient and continuous operation of the boiler, it is advisable to arrange maintenance and cleaning by an Authorised Service Centre Engineer, at least once a year. During the service, the most important components of the boiler will be inspected and cleaned. This service can be part of a maintenance contract. In particular, you are advised to have the following checks car-



## USEFUL ADVICE

ried out:

- condensing heat exchanger
- burner;
- exhaust fume duct and flue;
- bleeding of air from the central heating system;
- general check of the appliance's operation.

Please refer to the servicing information on section "MAINTENANCE" on page 73.

### 3.5 External cleaning



**Before carrying out any cleaning, disconnect the appliance from the electrical mains, using the fused spur isolation switch fitted adjacent to the appliance.**

To clean the external panels, use a cloth soaked in soapy water. Do not use solvents, abrasive powders or sponges.

**Do not** carry out cleaning of the appliance and/or its parts with readily flammable substances (for example petrol, alcohols, naphtha, etc.).

### 3.6 Operational faults

If the boiler does not function and a code that alternates between the letter **Er** and the writing **reset** (see "LCD general features" on page 9) appear on the LCD display, it indicates that the safety lock-out has stopped the boiler. The display background flashes (Fig. 3.3).

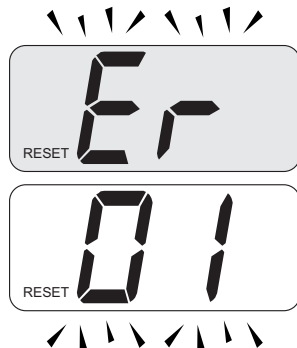


Fig. 3.3

For the first lighting up and following maintenance procedures for the gas supply, it may be necessary to repeat the resetting operation several times so as to remove the air present in the pipe work.


Safety lock-out may occur even in case of a blockage of the condensate drainage (e.g. plugged drain pipe). It is advisable to check the condensate drainage pipe and traps for cleanness.

Press the reset key on the boiler control panel 9 (Fig. 3.1) to reset its functioning.



**In this case and in case of persistent lock-out call a competent and responsible Service Engineer.**

### Other operational faults signalled on the LCD display

If the LCD display displays a code that alternates between the letter **Er** and the  symbol, the boiler has an anomaly that cannot be reset.

The display background flashes (Fig. 3.4).

## USEFUL ADVICE

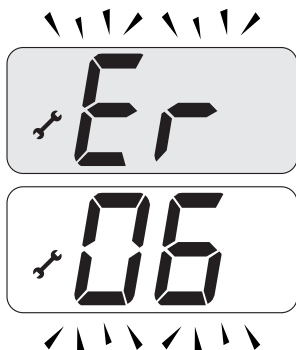


Fig. 3.4



In order to reset good functioning of the boiler, call a competent and responsible Service Engineer.

### Noise due to air bubbles are heard during operation

Check that the F&E tank ball valve is operating correctly.  
Bleed any air present in the radiators, if necessary.

### If water should occasionally leak from the boiler

Shut off the valves and call an Authorised Service Centre Engineer.



In this case or in case of problems other than those mentioned here, switch off the boiler, as described in section "Switching off" on page 15 and call a competent and responsible Service Engineer.

### 3.7 Displaying in INFO mode

The INFO mode allows the display of some information on the boiler functioning status. In case of malfunctioning of the boiler, it may be useful to communicate such information to the Authorised Service Centre Engineer

so that the causes can be understood.

In order to access the INFO mode, press keys 9 and 11 (Fig. 3.5) at the same time until the letter **d** appears on the display that alternates with a code (Fig. 3.6).

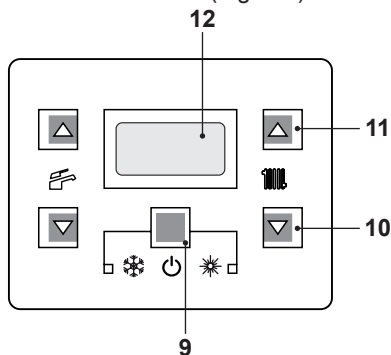


Fig. 3.5

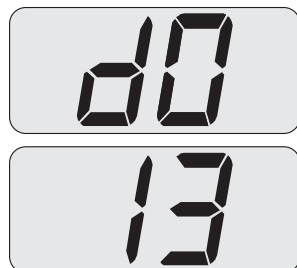


Fig. 3.6

To scroll the values press 10 (reduce) and 11 (increase) keys. In order to exit the INFO mode, hold keys 9 and 11 (Fig. 3.5) pressed at the same time.

The table summarises the possible values visible in INFO mode.

Value visualised	Index
Primary circuit pressure (not present)	d0 + - -
External temperature	d1 + value
K curve value configured in settings	d2 + value

## USEFUL ADVICE

Offset climatic curve value	d3 + value
Calculated heating set point (with climatic curve or set configured)	d4 + value
Temperature NTC delivery	d5 + value
Temperature NTC return	d6 + value
Domestic set point (not present)	c0 + - -
Temp. D.H.W. output (not present)	d7 + - -
D.H.W. capacity (not present)	c2 + - -
Flue temperature	d8 + value
Fan speed	d9 + value
Pressure transducer pressure (not present)	dA + - -
Ionization value	dB + value
Number of months to maintenance	c3 + value
3 star status (ON=01, OFF=00) (not present)	cF + - -
Code HW - BIC	dc + value
Revision HW - BIC	dd + value
Code FW - BIC	dE + value
Revision FW - BIC	dF + value

### 3.8 Remote anomaly code

If the boiler is connected to remote (optional), a code that indicates a boiler anomaly is displayed in the centre of the display. The anomaly in progress is indicated by a numeric code followed by the letter E. The table summarises the possible codes displayed on the remote.

Anomaly	Code
Lack of burner ignition	01E
Safety thermostat lockout	02E
General lockout	03E
Faulty primary circuit (no water or absence flow)	04E

Faulty fan control system	05E
Faulty C.H. temp. probe NTC	06E
Faulty D.H.W. temp. probe NTC	- -
Faulty external temp. probe NTC	08E
Faulty flue temp. probe NTC	09E
Flue probe intervention lock-out	10E
Flame detection error	11E
No circulation, of faulty pump or intervention primary temperature limit.	14E
None or too low water flow; Faulty pump (temp. difference between probes higher than 35°C)	15E
Possible exchange of NTC probes (Flow or Return) or pump wrongly mounted (upside – down)	16E
Faulty C.H. temp. probe NTC (Flow or Return)	17E
Faulty primary circuit (no water or absence of flow)	18E
Flame detection error	25E

### 3.9 Flue probe and safety thermal fuse



**If the flue thermal cut-off fuse is triggered, the boiler goes into safety lockout. To restore normal boiler operation, please contact an Authorized Service Centre.**

The flue probe and safety thermal fuse 14 indicated in Fig. 3.7 are a safety device. The flue probe 14 intervenes when the flue temperature exceeds 110°C placing the boiler in safety block switching it off.

To reset normal boiler functioning, just press the 9 (Fig. 3.5) key.

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## USEFUL ADVICE

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If flue probe 14 does not intervene and, therefore does not send the boiler into security lockout, flue thermal fuse 14 is triggered as an additional safety device to protect the flue outlet pipe.

To restore the normal operation of the boiler, contact the Authorized Service Centre.

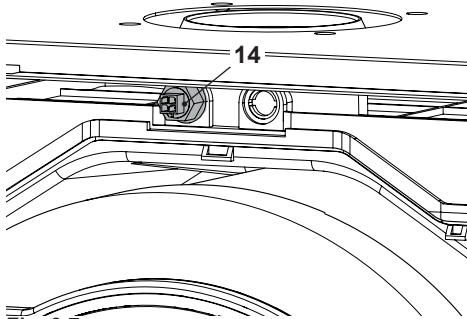


Fig. 3.7

# TECHNICAL INFORMATION

## 4 TECHNICAL INFORMATION

### 4.1 Overview

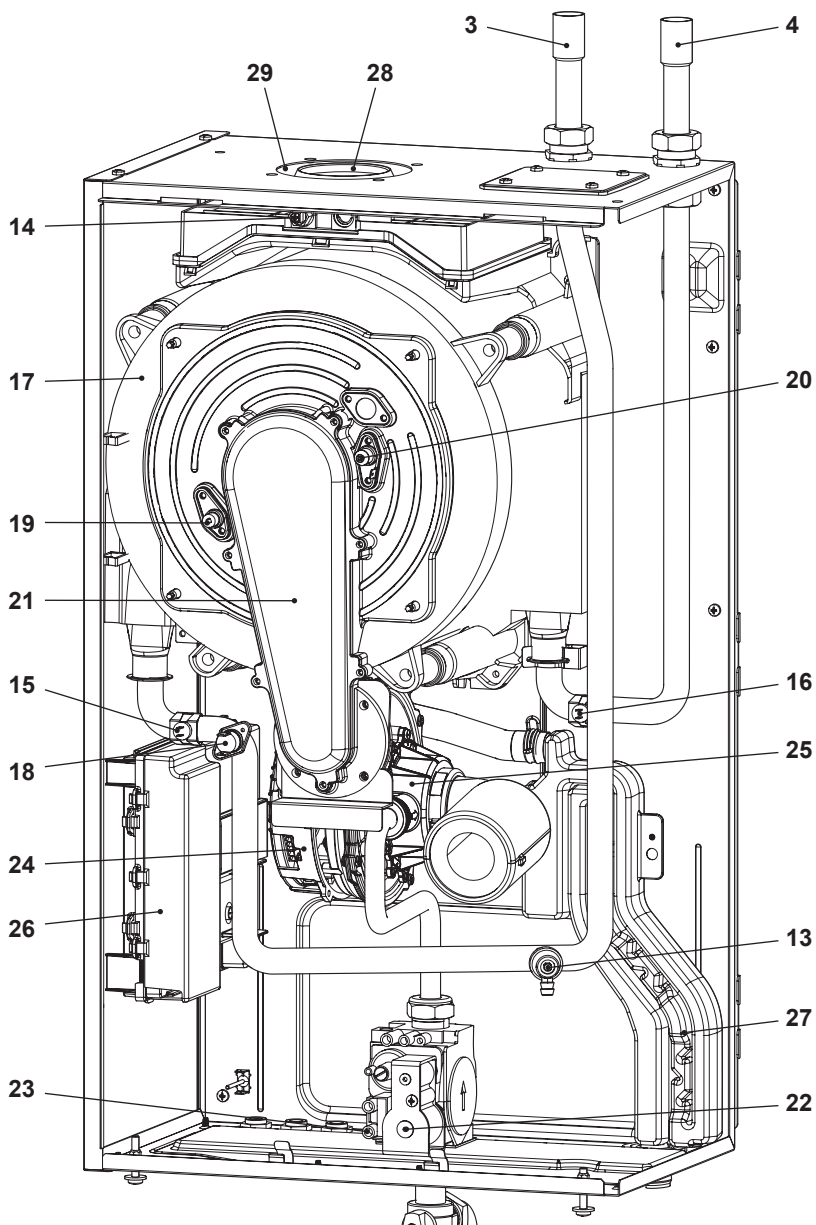


Fig. 4.1

# TECHNICAL INFORMATION

## 4.2 Main diagram

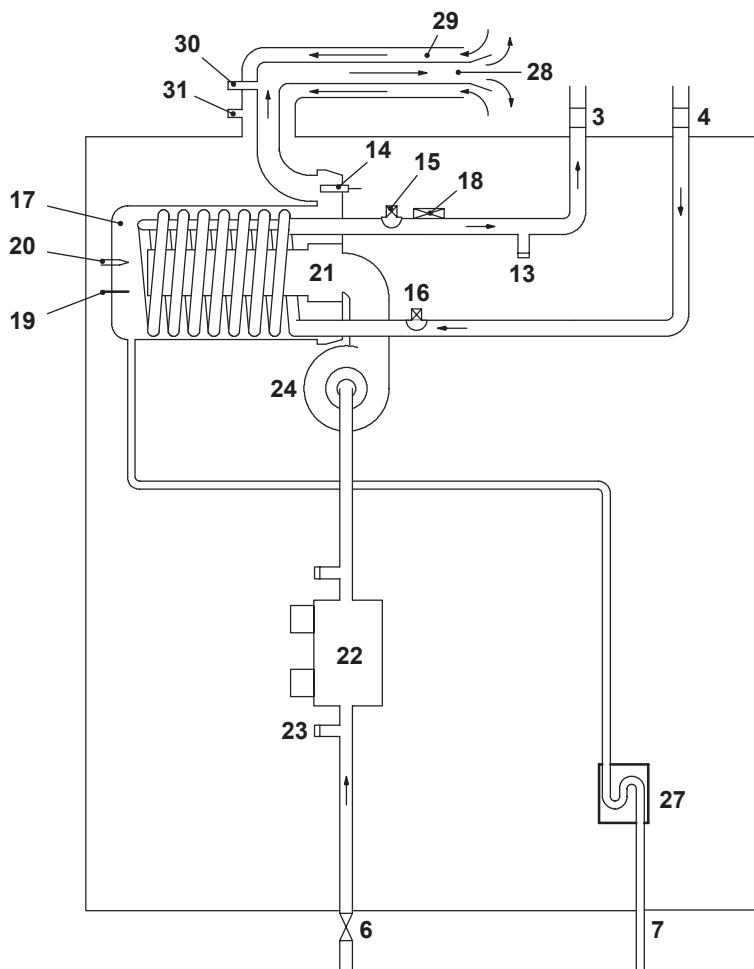


Fig. 4.2

- |    |  |    |                            |
|----|--|----|----------------------------|
| 3  | C.H. flow pipe                                     | 17 | Condensing heat exchanger  |
| 4  | C.H. return pipe                                   | 18 | Safety thermostat          |
| 6  | Gas inlet valve                                    | 19 | Flame-detecting electrode  |
| 7  | Condensate drain pipe                              | 20 | Ignition electrode         |
| 13 | Main circuit drain valve                           | 21 | Burner                     |
| 14 | Flue temperature probe NTC and Safety thermal fuse | 22 | Gas valve                  |
| 15 | C.H. flow temp. probe NTC                          | 23 | Gas valve inlet test point |
| 16 | C.H. return temp. probe NTC                        | 24 | Fan                        |
|    |  | 25 | Air/gas mixer              |

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## TECHNICAL INFORMATION

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- 26** Control box containing: External temperature probe terminal block, remote terminal block, D.H.W. tank terminal block, power supply terminal block, external controls pump terminal block
- 27** Condensate trap
- 28** Flue outlet pipe
- 29** Air intake pipe
- 30** Flue exhaust sampling point
- 31** Air sampling point

# TECHNICAL INFORMATION

## 4.3 Technical data ADVANCE 150V

Heat input		
Nominal net <sup>(A)</sup>	kW	17,0
	BTU/h	58006
Nominal gross <sup>(B)</sup>	kW	18,9
	BTU/h	64387
Minimum net <sup>(A)</sup>	kW	5,1
	BTU/h	17402
Minimum gross <sup>(B)</sup>	kW	5,7
	BTU/h	19316

Useful output		
Maximum	kW	16,5
	BTU/h	56300
Minimum	kW	4,8
	BTU/h	16378
Maximum condensing	kW	18,1
	BTU/h	61760
Minimum condensing	kW	5,3
	BTU/h	18084

Central heating		
Min/Max flow temperature settings*	°C	25 -80
Maximum pressure	kPa	250
	bar	2,5
Minimum pressure	kPa	30
	bar	0,3
Pressure loss (in 1000 l/h)	kPa	7,6
	bar	0,08
Seasonal efficiency G20 <sup>(C)</sup>	%	88,5
Seasonal efficiency G31 <sup>(C)</sup>	%	90,5

\* to the minimum useful output

<sup>(A)</sup> referred to the net calorific value at 15 °C and 1013,25 mbar: G20 = 34,02 MJ/m<sup>3</sup> - G31 = 46,34 MJ/kg

<sup>(B)</sup> referred to the gross calorific value at 15 °C and 1013,25 mbar: G20 = 37,78 MJ/m<sup>3</sup> - G31 = 50,37 MJ/kg

<sup>(C)</sup> The value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated have been certified by a notified body.

<sup>(D)</sup> Values subject to tolerance

Gas supply pressures			
Gas		Pa	mbar
Natural G20	<b>Nom</b>	2000	20
	<b>Min</b>	1700	17
	<b>Max</b>	2500	25
Propane G31	<b>Nom</b>	3700	37
	<b>Min</b>	2500	25
	<b>Max</b>	4500	45



# TECHNICAL INFORMATION

Gas rate maximum		
Natural G20	m <sup>3</sup> /h	1,80
Propane G31	kg/h	1,32
Gas rate minimum		
Natural G20	m <sup>3</sup> /h	0,54
Propane G31	kg/h	0,40

Gas restrictors references	Ø mm /100
Natural G20	465
Propane G31	380
Air/gas mixer restrictors	
Natural G20	18 yellow
Propane G31	18 yellow

Electrical data		
Voltage	V~	230
Frequency	Hz	50
Nominal Power consumption	W	24
Minimum Power consumption	W	11
Stand-by Power consumption	W	3
Protection degree	IPX5D	
External fuse rating	A	3
Internal fuse rating	A	N° 2 - 2 AF

Flue design		
Boiler type		
B23P C13 C33 C43 C53 C63 C83		
Ø Coaxial	mm	60/100
Ø Twin split pipes	mm	80/80
Ø Roof	mm	60/100
Ø Roof	mm	80/125
Nominal heat flow rate <sup>(A) (E)</sup>	kW	n.a.
Exhaust temperature <sup>(E)</sup>	°C	68,0
Mass flow rate <sup>(E)</sup>	kg/s	0,0077

Flue gas figures		
Nominal heat input <sup>(A) (E)</sup>	kW	n.a.
CO <sub>2</sub> content with gas G20	%	n.a.
O <sub>2</sub> content with gas G20	%	4,1
CO content with gas G20	ppm	106,0
Exhaust temperature <sup>(E)</sup>	°C	68,0
NOx class		6
Weighted NOx	ppm	20

<sup>(E)</sup> Values refer tests with a 1 m flue working at the nominal heat input

CO <sub>2</sub> contents		
Nominal heat input <sup>(A) (E)</sup>	kW	17,0
CO <sub>2</sub> content with gas G20 (range min - max)	%	9,0 - 9,6
CO <sub>2</sub> content with gas G31 (range min - max)	%	10,0 - 10,6
Minimum heat input <sup>(A) (E)</sup>	kW	5,1
CO <sub>2</sub> content with gas G20 (range min - max)	%	8,2 - 8,8
CO <sub>2</sub> content with gas G31 (range min - max)	%	9,3 - 9,9

Other specifications		
Height	mm	700
Width	mm	400
Depth	mm	290
Weight (dry)	kg	30,0
Water volume in the boiler (up to 1 bar)	l (kg)	2,0

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# TECHNICAL INFORMATION

Model(s):	<b>ADVANCE 150V</b>
Condensing boiler:	Yes
Low-temperature boiler (**):	No
B1 boiler:	No
Cogeneration space heater:	No
If yes, equipped with a supplementary heater:	-
Combination heater:	No

Item	Symbol	Value	Unit
<b>Rated heat output</b>	$P_{rated}$	17	kW

For boiler space heaters and boiler combination heaters: Useful heat output

At rated heat output and high-temperature regime (*)	$P_4$	16,5	kW
--	-------	------	----

At 30% of rated heat output and low-temperature regime (**)	$P_1$	5,5	kW
---	-------	-----	----

Auxiliary electricity consumption

At full load	$el_{max}$	0,024	kW
--------------	------------	-------	----

At part load	$el_{min}$	0,011	kW
--------------	------------	-------	----

In standby mode	$P_{SB}$	0,003	kW
-----------------	----------	-------	----

Item	Symbol	Value	Unit
<b>Seasonal space heating energy efficiency</b>	$\eta_s$	92	%

Seasonal energy efficiency class		A	
----------------------------------	--	---	--

For boiler space heaters and boiler combination heaters: Useful efficiency

At rated heat output and high-temperature regime (*)	$\eta_4$	87,3	%
--	----------	------	---

At 30% of rated heat output and low-temperature regime (**)	$\eta_1$	96,9	%
---	----------	------	---

Other items

Standby heat loss	$P_{stby}$	0,055	kW
-------------------	------------	-------	----

Ignition burner power consumption	$P_{ign}$	-	kW
-----------------------------------	-----------	---	----

Annual energy consumption	$Q_{HE}$	52	GJ
---------------------------	----------	----	----

Sound power level, indoors	$L_{WA}$	51	dB
----------------------------	----------	----	----

Emission of nitrogen oxides	$NO_x$	36	mg/kWh
-----------------------------	--------	----	--------

For combination heaters:

Declared load profile			
Daily electricity consumption	$Q_{elec}$		kWh
Annual electricity consumption	AEC		kWh

Water heating energy efficiency			
Water heating energy efficiency	$\eta_{wh}$		%
Daily fuel consumption	$Q_{fuel}$		kWh
Annual fuel consumption	AFC		GJ

Contact details See manual cover

(\*) High-temperature regime means 60°C return temperature at heater inlet and 80°C feed temperature at heater outlet.

(\*\*) Low temperature means for condensing boilers 30°C, for low-temperature boilers 37°C and for other heaters 50°C return temperature (at heater inlet).

# TECHNICAL INFORMATION

## 4.4 Technical data ADVANCE 180V

Heat input		
Nominal net <sup>(A)</sup>	kW	21,0
	BTU/h	71655
Nominal gross <sup>(B)</sup>	kW	23,3
	BTU/h	79537
Minimum net <sup>(A)</sup>	kW	5,1
	BTU/h	17402
Minimum gross <sup>(B)</sup>	kW	5,7
	BTU/h	19316

Useful output		
Maximum	kW	20,3
	BTU/h	69266
Minimum	kW	4,8
	BTU/h	16378
Maximum condensing	kW	22,4
	BTU/h	76432
Minimum condensing	kW	5,3
	BTU/h	18084

Central heating		
Min/Max flow temperature settings*	°C	25 -80
Maximum pressure	kPa	250
	bar	2,5
Minimum pressure	kPa	30
	bar	0,3
Pressure loss (in 1000 l/h)	kPa	7,6
	bar	0,08
Seasonal efficiency G20 <sup>(C)</sup>	%	88,6
Seasonal efficiency G31 <sup>(C)</sup>	%	90,6

\* to the minimum useful output

<sup>(A)</sup> referred to the net calorific value at 15 °C and 1013,25 mbar: G20 = 34,02 MJ/m<sup>3</sup> - G31 = 46,34 MJ/kg

<sup>(B)</sup> referred to the gross calorific value at 15 °C and 1013,25 mbar: G20 = 37,78 MJ/m<sup>3</sup> - G31 = 50,37 MJ/kg

<sup>(C)</sup> The value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated have been certified by a notified body.

<sup>(D)</sup> Values subject to tolerance

Gas supply pressures			
Gas		Pa	mbar
Natural G20	<b>Nom</b>	2000	20
	<b>Min</b>	1700	17
	<b>Max</b>	2500	25
Propane G31	<b>Nom</b>	3700	37
	<b>Min</b>	2500	25
	<b>Max</b>	4500	45

# TECHNICAL INFORMATION

Gas rate maximum		
Natural G20	m <sup>3</sup> /h	2,22
Propane G31	kg/h	1,63
Gas rate minimum		
Natural G20	m <sup>3</sup> /h	0,54
Propane G31	kg/h	0,40

Gas restrictors references	Ø mm /100
Natural G20	465
Propane G31	380
Air/gas mixer restrictors	
Natural G20	18 yellow
Propane G31	18 yellow

Electrical data		
Voltage	V~	230
Frequency	Hz	50
Nominal Power consumption	W	36
Minimum Power consumption	W	12
Stand-by Power consumption	W	3
Protection degree		IPX5D
External fuse rating	A	3
Internal fuse rating	A	N° 2 - 2 AF

Flue design		
Boiler type		
B23P C13 C33 C43 C53 C63 C83		
Ø Coaxial	mm	60/100
Ø Twin split pipes	mm	80/80
Ø Roof	mm	60/100
Ø Roof	mm	80/125
Nominal heat flow rate <sup>(A) (E)</sup>	kW	n.a.
Exhaust temperature <sup>(E)</sup>	°C	69,0
Mass flow rate <sup>(E)</sup>	kg/s	0,0118

Flue gas figures		
Nominal heat input <sup>(A) (E)</sup>	kW	n.a.
CO <sub>2</sub> content with gas G20	%	n.a.
O <sub>2</sub> content with gas G20	%	3,9
CO content with gas G20	ppm	225,0
Exhaust temperature <sup>(E)</sup>	°C	69,0
NOx class		6
Weighted NOx	ppm	26

<sup>(E)</sup> Values refer tests with a 1 m flue working at the nominal heat input

CO <sub>2</sub> contents		
Nominal heat input <sup>(A) (E)</sup>	kW	21,0
CO <sub>2</sub> content with gas G20 (range min - max)	%	9,1 - 9,7
CO <sub>2</sub> content with gas G31 (range min - max)	%	10,1 - 10,7
Minimum heat input <sup>(A) (E)</sup>	kW	5,1
CO <sub>2</sub> content with gas G20 (range min - max)	%	8,2 - 8,8
CO <sub>2</sub> content with gas G31 (range min - max)	%	9,3 - 9,9

Other specifications		
Height	mm	700
Width	mm	400
Depth	mm	290
Weight (dry)	kg	30,0
Water volume in the boiler (up to 1 bar)	l (kg)	2,0

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# TECHNICAL INFORMATION

Model(s):	<b>ADVANCE 180V</b>
Condensing boiler:	Yes
Low-temperature boiler (**):	No
B1 boiler:	No
Cogeneration space heater:	No      If yes, equipped with a supplementary heater: -
Combination heater:	No

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
<b>Rated heat output</b>	$P_{rated}$	20	kW	<b>Seasonal space heating energy efficiency</b>	$\eta_s$	92	%
				Seasonal energy efficiency class		A	
For boiler space heaters and boiler combination heaters: Useful heat output				For boiler space heaters and boiler combination heaters: Useful efficiency			
At rated heat output and high-temperature regime (*)	$P_4$	20,3	kW	At rated heat output and high-temperature regime (*)	$\eta_4$	87,0	%
At 30% of rated heat output and low-temperature regime (**)	$P_1$	6,8	kW	At 30% of rated heat output and low-temperature regime (**)	$\eta_1$	96,9	%
Auxiliary electricity consumption				Other items			
At full load	$e_{lmax}$	0,036	kW	Standby heat loss	$P_{sby}$	0,055	kW
At part load	$e_{lmin}$	0,012	kW	Ignition burner power consumption	$P_{ign}$	-	kW
In standby mode	$P_{SB}$	0,003	kW	Annual energy consumption	$Q_{HE}$	64	GJ
				Sound power level, indoors	$L_{WA}$	52	dB
				Emission of nitrogen oxides	$NO_x$	45	mg/kWh

For combination heaters:

<b>Declared load profile</b>				<b>Water heating energy efficiency</b>	$\eta_{wh}$		
Daily electricity consumption	$Q_{elec}$		kWh	Daily fuel consumption	$Q_{fuel}$		kWh
Annual electricity consumption	AEC		kWh	Annual fuel consumption	AFC		GJ

Contact details

See manual cover

(\*) High-temperature regime means 60°C return temperature at heater inlet and 80°C feed temperature at heater outlet.

(\*\*) Low temperature means for condensing boilers 30°C, for low-temperature boilers 37°C and for other heaters 50°C return temperature (at heater inlet).

# TECHNICAL INFORMATION

## 4.5 Technical data ADVANCE 240V

Heat input		
Nominal net <sup>(A)</sup>	kW	25,0
	BTU/h	85304
Nominal gross <sup>(B)</sup>	kW	27,8
	BTU/h	94687
Minimum net <sup>(A)</sup>	kW	7,5
	BTU/h	25591
Minimum gross <sup>(B)</sup>	kW	8,3
	BTU/h	28406

Useful output		
Maximum	kW	24,4
	BTU/h	83256
Minimum	kW	7,0
	BTU/h	23885
Maximum condensing	kW	26,8
	BTU/h	91445
Minimum condensing	kW	7,8
	BTU/h	26615

Central heating		
Min/Max flow temperature settings*	°C	25 -80
Maximum pressure	kPa	250
	bar	2,5
Minimum pressure	kPa	30
	bar	0,3
Pressure loss (in 1000 l/h)	kPa	9,6
	bar	0,10
Seasonal efficiency G20 <sup>(C)</sup>	%	88,6
Seasonal efficiency G31 <sup>(C)</sup>	%	90,6

\* to the minimum useful output

<sup>(A)</sup> referred to the net calorific value at 15 °C and 1013,25 mbar: G20 = 34,02 MJ/m<sup>3</sup> - G31 = 46,34 MJ/kg

<sup>(B)</sup> referred to the gross calorific value at 15 °C and 1013,25 mbar: G20 = 37,78 MJ/m<sup>3</sup> - G31 = 50,37 MJ/kg

<sup>(C)</sup> The value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated have been certified by a notified body.

<sup>(D)</sup> Values subject to tolerance

Gas supply pressures			
Gas		Pa	mbar
		Natural G20	<b>Nom</b>
<b>Min</b>	1700		17
<b>Max</b>	2500		25
Propane G31	<b>Nom</b>	3700	37
	<b>Min</b>	2500	25
	<b>Max</b>	4500	45

# TECHNICAL INFORMATION

Gas rate maximum		
Natural G20	m <sup>3</sup> /h	2,65
Propane G31	kg/h	1,94
Gas rate minimum		
Natural G20	m <sup>3</sup> /h	0,79
Propane G31	kg/h	0,58

Gas restrictors references	Ø mm /100
Natural G20	530
Propane G31	430
Air/gas mixer restrictors	
Natural G20	21 blue
Propane G31	21 blue

Electrical data		
Voltage	V~	230
Frequency	Hz	50
Nominal Power consumption	W	40
Minimum Power consumption	W	14
Stand-by Power consumption	W	3
Protection degree	IPX5D	
External fuse rating	A	3
Internal fuse rating	A	N° 2 - 2 AF

Flue design		
Boiler type		
B23P C13 C33 C43 C53 C63 C83		
Ø Coaxial	mm	60/100
Ø Twin split pipes	mm	80/80
Ø Roof	mm	60/100
Ø Roof	mm	80/125
Nominal heat flow rate <sup>(A) (E)</sup>	kW	n.a.
Exhaust temperature <sup>(E)</sup>	°C	73,0
Mass flow rate <sup>(E)</sup>	kg/s	0,0136

Flue gas figures		
Nominal heat input <sup>(A) (E)</sup>	kW	n.a.
CO <sub>2</sub> content with gas G20	%	n.a.
O <sub>2</sub> content with gas G20	%	3,9
CO content with gas G20	ppm	196,0
Exhaust temperature <sup>(E)</sup>	°C	73,0
NOx class		6
Weighted NOx	ppm	24

<sup>(E)</sup> Values refer tests with a 1 m flue working at the nominal heat input

CO <sub>2</sub> contents		
Nominal heat input <sup>(A) (E)</sup>	kW	25,0
CO <sub>2</sub> content with gas G20 (range min - max)	%	9,0 - 9,6
CO <sub>2</sub> content with gas G31 (range min - max)	%	10,0 - 10,6
Minimum heat input <sup>(A) (E)</sup>	kW	7,5
CO <sub>2</sub> content with gas G20 (range min - max)	%	8,2 - 8,8
CO <sub>2</sub> content with gas G31 (range min - max)	%	9,3 - 9,9

Other specifications		
Height	mm	700
Width	mm	400
Depth	mm	290
Weight (dry)	kg	33,5
Water volume in the boiler (up to 1 bar)	l (kg)	2,0

(2074)

# TECHNICAL INFORMATION

Model(s):	<b>ADVANCE 240V</b>
Condensing boiler:	Yes
Low-temperature boiler (**):	No
B1 boiler:	No
Cogeneration space heater:	No
If yes, equipped with a supplementary heater:	-
Combination heater:	No

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
<b>Rated heat output</b>	$P_{rated}$	24	kW	<b>Seasonal space heating energy efficiency</b>	$\eta_s$	92	%
				Seasonal energy efficiency class		A	
For boiler space heaters and boiler combination heaters: Useful heat output				For boiler space heaters and boiler combination heaters: Useful efficiency			
At rated heat output and high-temperature regime (*)	$P_4$	24,4	kW	At rated heat output and high-temperature regime (*)	$\eta_4$	87,8	%
At 30% of rated heat output and low-temperature regime (**)	$P_1$	8,1	kW	At 30% of rated heat output and low-temperature regime (**)	$\eta_1$	96,7	%
<b>Auxiliary electricity consumption</b>				<b>Other items</b>			
At full load	$el_{max}$	0,040	kW	Standby heat loss	$P_{stby}$	0,055	kW
At part load	$el_{min}$	0,014	kW	Ignition burner power consumption	$P_{ign}$	-	kW
In standby mode	$P_{SB}$	0,003	kW	Annual energy consumption	$Q_{HE}$	76	GJ
				Sound power level, indoors	$L_{WA}$	53	dB
				Emission of nitrogen oxides	$NO_x$	43	mg/kWh

For combination heaters:

<b>Declared load profile</b>				<b>Water heating energy efficiency</b>	$\eta_{wh}$		%
Daily electricity consumption	$Q_{elec}$		kWh	Daily fuel consumption	$Q_{fuel}$		kWh
Annual electricity consumption	AEC		kWh	Annual fuel consumption	AFC		GJ

Contact details

See manual cover

(\*) High-temperature regime means 60°C return temperature at heater inlet and 80°C feed temperature at heater outlet.

(\*\*) Low temperature means for condensing boilers 30°C, for low-temperature boilers 37°C and for other heaters 50°C return temperature (at heater inlet).



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# GENERAL REQUIREMENTS

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## 5 GENERAL REQUIREMENTS



Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit [www.centralheating.co.uk](http://www.centralheating.co.uk) for more information.

Our Company supports the Benchmark initiative. The Benchmark Checklist is located at the back of this manual and should be completed by the Installing/Commissioning Gas Safe Registered Engineer and handed over to the User for future reference by other visiting Engineers. Also included is the Service Interval Record card that should be completed by the Service Engineer following the annual service maintenance of the boiler and system. For Ireland (IE), it is necessary to complete a "Declaration of Conformity" to indicate compliance to I.S.813.2002.

This appliance must be installed by a competent person in accordance with the Gas Safe (installation & Use) Regulations.

### 5.1 Related documents

The installation of this appliance must be in accordance with the relevant requirements of the current Gas Safe (Installation & Use) Regulations, the Local Building Regulations, the current I.E.E. Wiring Regulations, the Regulations and by-laws of the local water undertaking, and in Scotland, in accordance with the Building Standards (Scotland) Regulation. Health and safety document n° 635 "Electricity at work regs."

It should also be in accordance with the British Standard Codes of Practice:

In Ireland (IE). The installation must be carried out by a Competent Person and registered with the RGII and installed in accordance with the current edition of I.S.813.2002 "Domestic Gas Installations" the current Building Regulations and reference should be made to the current ETCI rules for electrical installations.

### 5.2 Location of appliance

The appliance may be installed in any room or internal space, although particular attention is drawn to the requirements of the current I.E.E. Wiring Regulations, and in Scotland, the electrical provisions of the Building Regulations applicable in Scotland, with respect to the installation of the appliance in a room containing a bath or shower.

For Ireland (IE), reference should be made to the current edition of I.S.813.2002 and the current ETCI rules for electrical installations.

**Where a room-sealed appliance is installed in a room containing a bath or shower, any electrical switch or appliance control, utilising mains electricity should be so situated that it cannot be touched by a person using the bath or shower.**

The location must permit the provision of an adequate flue and termination. For unusual locations special procedures may be necessary and BS 6798 gives detailed

# GENERAL REQUIREMENTS

guidance on this aspect.

A compartment used to enclose the appliance must be designed specifically for this purpose. This appliance is not suitable for external installation.

## 5.3 Flue system

The provision for satisfactory flue termination must be made as described in BS 5440 part 1.

For Ireland (IE), refer to I.S.813.2002.

The appliance must be installed so that the flue terminal is exposed to external air.

It must not be installed so that the terminal discharges into another room or space as an outhouse or lean-to. It is important that the position of the terminal allows a free passage of air across at all times.

The terminal should be located with due regard for the damage or discoloration that might occur to building products in the vicinity.

In cold and/or humid weather water vapour may condense on leaving the flue terminal; the effect of such "steaming" must be considered.

Plumbing may easily occur at the terminal. Where possible, terminal position which could cause a nuisance should be avoided.

The minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in Fig. 5.1.

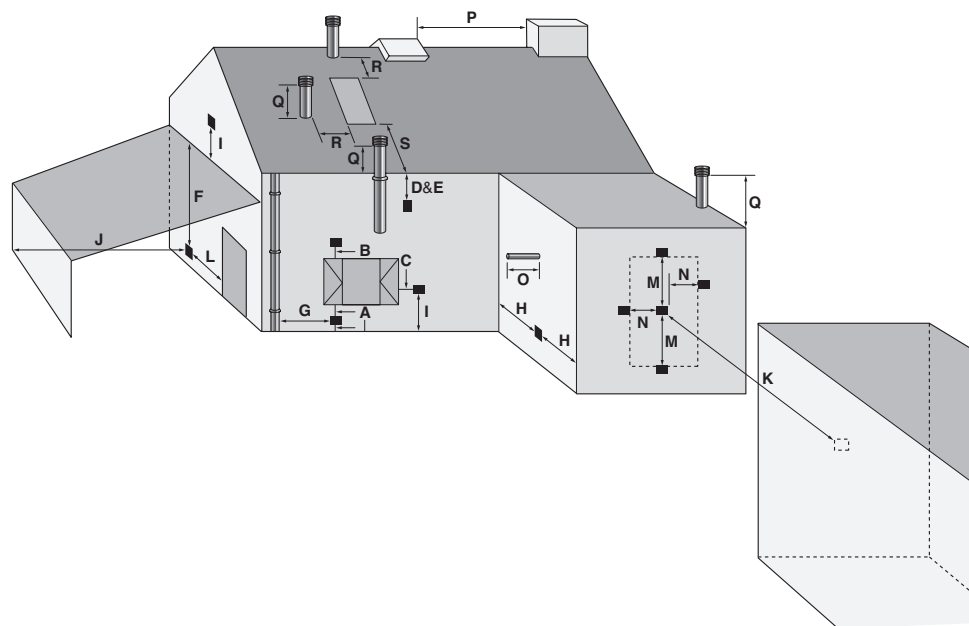


Fig. 5.1

# GENERAL REQUIREMENTS

Symbol	Location position	Minimum dimensions (mm)
A *	Directly below an opening, air brick, opening window, etc.	300
B *	Above an opening, air brick, opening window, etc.	300
C *	Horizontally to an opening, air brick, opening window, etc.	300
D **	Below temperature-sensitive building components, e.g. plastic gutter soil pipes or drain pipes	75
E **	Below eaves	200
F	Below balconies	200
G	From a vertical drain pipe or soil pipe	150
H ***	From an internal or external corner	300
I	Above ground, roof or balcony level	300
J	From a surface facing a terminal	600
K	From a terminal facing a terminal	1 200
L	From an opening in the car-port (e.g. door, window) into the dwelling	Not recommended
M	Vertically from a terminal on the same wall	1 500
N	Horizontally from a terminal on the same wall	300
O	From the wall on which the terminal is mounted	Please refer to the flue assembly instructions
P	From a vertical structure on the roof	600
Q	Above intersection with the roof	600
R	From a roof window and terminal	600
S	From a roof window and terminal	2 500

\* In addition, for temperature and structural reasons, the terminal should not be near than 150 mm to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a sealed window frame.

\*\* A heat protection shield should also be installed.

\*\*\* The reference to external corners does not apply to building protrusions not exceeding 450 mm, such as disused chimneys on external walls.

## 5.4 Gas supply

The Gas meter is connected to the service pipe by the local gas region or a local gas region contractor.

If the gas supply for the boiler serves other appliances ensure that an adequate supply is available both to the boiler and the other appliance when they are in use at the same time.

Pipework must be of adequate size. Pipes of a smaller size than the boiler inlet connection should not be used.

Installation pipes should be fitted in accordance with BS 6891 and the complete installation should be tested for tightness.

For Ireland (IE), refer to I.S.813.2002.

# GENERAL REQUIREMENTS

## 5.5 Air supply

The room in which the boiler is installed does not require a purpose provided air vent.

## 5.6 Ventilation

If installed in a cupboard or compartment, it is not necessary to provide additional ventilation for cooling for this particular product. However consideration must be given to clearance requirements for maintenance (section "Precautions for installation" on page 42) and under no circumstances must stored articles be allowed to come into contact with the boiler or flue pipe.

## 5.7 Condensate drain

Ensure that the condensate discharge complies with the national or local regulations in force.

The condensate pipe must be fitted in accordance with Building Regulations.

Drain pipe material should be resistant to acid as the condensate is slightly acid with a pH less than 6.5.

The boiler includes a trap (27 on page 21) that prevents the combustion products entering the drain.

The boilers incorporate a condensate trap with a 225 mm seal to comply with BS 6798: 2008. The schematic diagrams of possible connections are given in Fig. 5.2 and Fig. 5.3.

The length of the condensate pipe should be kept to a minimum, any external pipe should not be more than 3 m in 32 mm pipe and insulated to prevent freezing.

External pipe runs should only be considered if absolutely no alternative is available.

To avoid condensate being trapped:

- the drain pipe should be run with a fall of at least 2.5° (45 mm/m) away from the boiler;
- the number of bends and joints should be kept at minimum;
- the drain pipe should be adequately fixed to

prevent pipe sagging.

If a part of the drainpipe runs externally this part should be kept as short as possible and protected to reduce the risk of freezing.

### Connection of condensate drainage pipe to internal soil and vent stack.

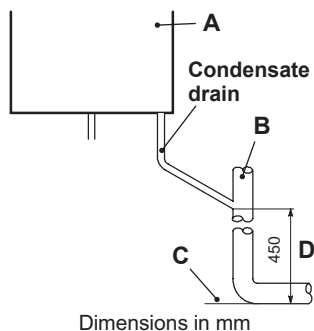


Fig. 5.2

- A Boiler
- B Internal soil and vent stack
- C Invert
- D 450 mm up to three storeys

### Connection of condensate drainage pipe downstream of a sink waste trap

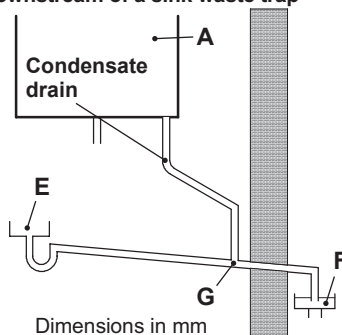


Fig. 5.3

- A Boiler
- E Sink
- F Open end of condensate drainage pipe direct into gully below grating but above water level
- G Min. Ø 32 mm, insulation and trace heating are options that should be considered to avoid freezing

# GENERAL REQUIREMENTS

## 5.8 Water circulation (C.H.)

Detailed recommendations are given in BS 6798, BSEN 12828: 2003, BSEN 12831: 2003 & BSEN 14446: 2004; the following notes are given for general guidance.

For Ireland (IE), refer to I.S.813.2002.

### Pipework

Copper tubing to BSEN 1057 is recommended for water pipes. Jointing should be either with capillary soldered or with compression fittings. Where possible pipes should have a gradient to ensure air is carried naturally to air release points and water flows naturally to drain taps. The appliance has a built-in automatic air release valve, it should be ensured as far as possible that the appliance heat exchanger is not a natural collecting point for air.

Except where providing useful heat, pipes should be insulated to prevent heat loss and to avoid freezing.

Particular attention should be paid to pipes passing through ventilated spaces in roofs and under floors.

### Central heating system

The appliances are designed for open vented central heating water systems, but may be fitted to a sealed central heating system provided the necessary components, such as expansion vessel and pressure safety relief valve are fitted to the system. The installation should be designed to operate with a flow temperature of up to 95°C.

If a sealed system is to be used then only a competent person must fill it.

The hydraulic resistance curves for the appliances are given in Fig. 5.4.

If thermostatic radiator valves are fitted, one radiator must be fitted with two lock shield valves, to enable correct operation of the pump-overrun facility.

The following paragraphs outline the specifications of the items fitted to the appliances.

### Appliance hydraulic resistance

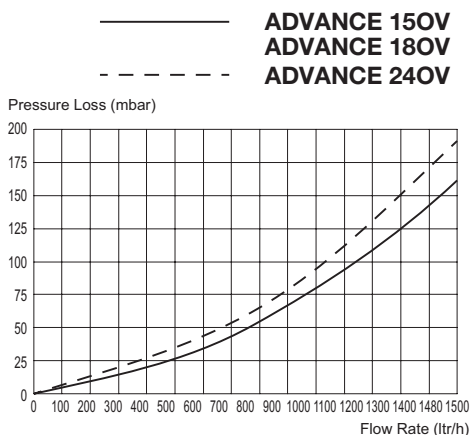


Fig. 5.4

### By-pass

In the central heating system an external by-pass must be fitted.

It protects the main heat exchanger in case of reduced or interrupted water circulation through the heating system due to the closing of thermostatic valves or cock-type valves within the system.

The by-pass may be calibrated to assure a minimum flow of 200-300 lts/hr through the main heat exchanger.

The fitting of an external by-pass helps to prevent and limit system noise.

### Air release points

These must be fitted at all high points where air will naturally collect and must be sited to facilitate complete filling of the system.

### Safety valve open vent system

A safety valve need not be fitted to an open vented system. (See "Safety valve sealed system" for sealed systems)

### Pump

The pump should be fitted on the flow pipe from the boiler and have isolating valves each side.

# GENERAL REQUIREMENTS

A variable duty pump should be set to give a temperature difference of no greater than 20°C between the flow and return, with the boiler controls set at "MAX", which is approximately 80°C to give a flow rate as shown in Fig. 5.5.

See Fig. 5.4 for pressure loss of the boiler.

High resistance microbore systems may require a higher duty pump.

## Flow rate

If it is necessary to alter the flow rate, the system can be fitted with a lockable balancing valve in the main flow or return pipes shown as valve "A" in Fig. 5.7. The flow rate through the boiler must not be allowed to fall below that given in Fig. 5.5.

Flow Rate
MINIMUM FLOW RATE 300 l/h This is equal to 20°C differential at minimum heat input.

Fig. 5.5

## Open vented water system

The boiler must be supplied from an unrestricted water supply taken from a feed and expansion cistern situated at a maximum height of 27 metres (90 ft) above the boiler. The cold feed must be 15 mm minimum size. The vent must rise continuously and be unrestricted. The vent pipe must have a minimum size of 22 mm.

It is important that the relative positions of the pump, cold feed and open vent are as shown in Fig. 5.9.

## Domestic hot water cylinder

SINGLE FEED INDIRECT CYLINDERS ARE NOT SUITABLE

The domestic hot water cylinder must be of the double feed fully indirect coil type.

## Sealed water systems

The installation must comply with the ap-

propriate requirements of the current issue of BS4814, BS5449, BS6759, BS6798 and BS7074 Part 1 and 2.

See Fig. 5.7 for a suggested layout.

**! A suitable pressure release valve, expansion vessel and fill in loop must be installed, these are not supplied with this boiler.**

## Safety valve (sealed system only)

A safety valve must be fitted to a sealed system.

It shall be preset, non-adjustable with a lift pressure of 3 bar, incorporating seating of a resilient material, a test device and a connection for drain.

The drain from the safety valve must be routed outside the building, must not discharge above an entrance or window or any type of public access area, be clear of any electrical fittings and positioned so that any discharge can be seen.

## Expansion vessel (sealed system only)

A diaphragm type expansion vessel, conforming to the current issue of BS4814 (see also BS7074 Part 1 and 2) must be connected at a point close to the inlet side of the circulating pump, see the diagrammatic layout, Fig. 5.7 unless laid down differently by the manufacturer.

The expansion vessel volume depends on the total water system volume and the initial system design pressure. For any system an accurate calculation of vessel size is given in the current issue of BS5449 and BS7074 Part 1. Example: For an initial design pressure of 0.7 bar, the minimum total vessel volume required is 0.063 x Total System Volume.

**! A higher initial design pressure requires a larger volume expansion vessel.**

The charge pressure must not be less than the

# GENERAL REQUIREMENTS

static head of the system, that is, the height of the highest point of the system above the expansion vessel.

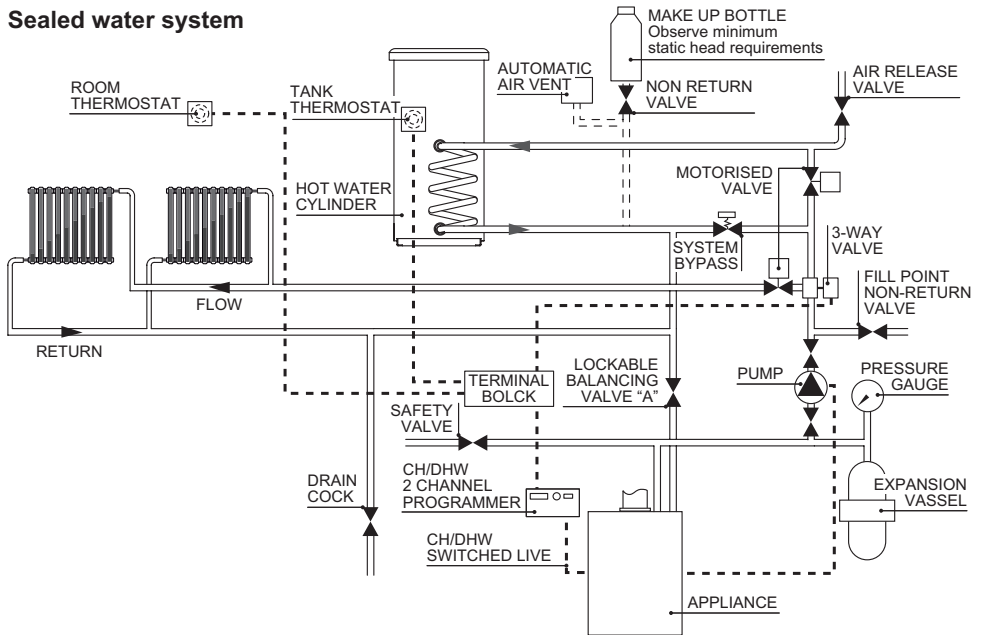
section "Technical data ADVANCE 150V" on page 24, section "Technical data ADVANCE 180V" on page 27 and section "Technical data ADVANCE 240V" on page 30.

The water content of the boiler is given in

Expansion vessel requirements					
Vessel charge and initial system pressure	bar	0.5	0.75	1.0	1.5
Total water content of system using 8 L (1.54 gal) capacity expansion vessel supplied with appliance	L	96	84	73	50
For systems having a larger capacity multiply the total system capacity in litres (gallons) by these factors to obtain the total minimum expansion vessel capacity required in litres		0.0833	0.093	0.109	0.156

Fig. 5.6

## Sealed water system



INSTALLATION

Fig. 5.7

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# GENERAL REQUIREMENTS

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## Pressure gauge (sealed system only)

A pressure gauge with a set pointer and covering at least 0 to 4 bar (0 to 60 lb/in) shall be fitted permanently to the system in a position where it can be seen when filling the system.

## Water Makeup (sealed system only)

Provision should be made for replacing water loss from the system using a make up bottle mounted in a position higher than the top point of the system, connected through a non-return valve to the return side of either the heating circuit or the hot water cylinder.

Alternatively, provision for make up can be made using a filling loop.

In an open vent system this function is undertaken by the ball valve in the feed and expansion tank, it is important that this is correctly installed and maintained.

## Mains water feed: central heating

There must be no direct connection to the mains water supply even through a non return valve, without the approval of the Local Water Authority.

## Filling (sealed system only)

A method for initially filling the system and replacing water lost during servicing must be provided and it must comply with local water authority regulations.

The correct method is shown in Fig. 5.8.

The temporary connection must be removed immediately after filling.

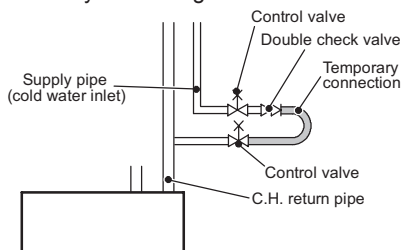


Fig. 5.8

frequent filling of the system could cause premature scaling of the heat exchanger.

## 5.9 Water treatment

### C.H. circuit

Where a new boiler is fitted to a new system with either plastic or copper pipes, it is important the system is fully flushed, on completion, to ensure flux residues, swarf, oils and other installation debris is removed.

Where a new boiler is fitted to an existing system, it is important the debris from the existing system is fully removed in order to ensure the efficiency of the new appliance is maintained. Details on flushing procedure are given in the section "Initial filling of the system" on page 56 of this manual.

The installer should ensure that no leaks exist either inside the boiler or on the system as



# GENERAL REQUIREMENTS

## Open vent water system with flow and return connected to top pipes.

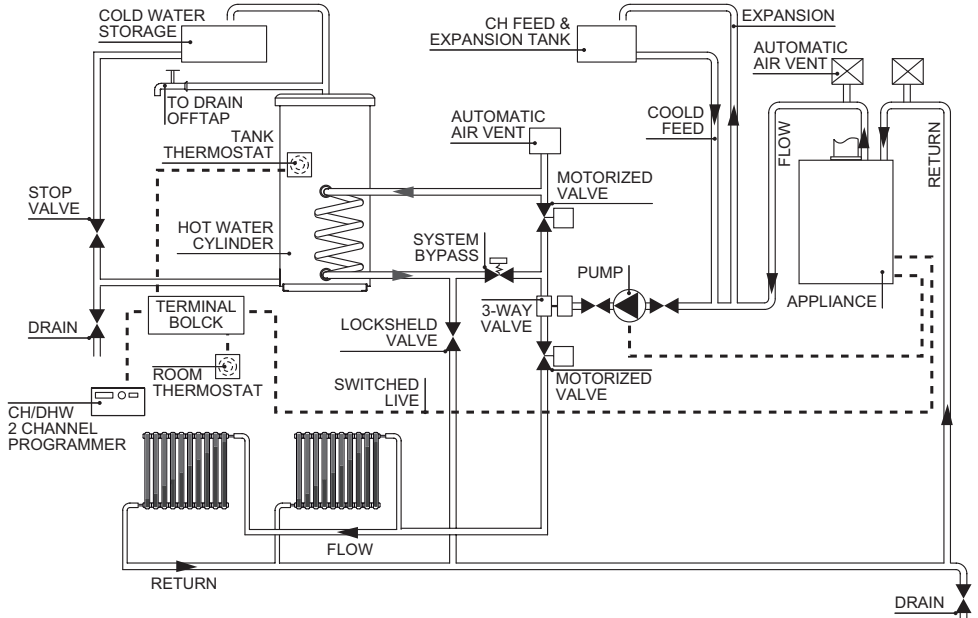


Fig. 5.9

### 5.10 Electrical supply

#### **Warning, this appliance must be earthed.**

External wiring to the appliance must be carried out by a competent person and be in accordance with the current I.E.E. Regulations and any local regulations which apply. Reference should be made to the current ETCI rules for electrical installations. For Ireland (IE), refer to I.S.813.2002.

The boiler is supplied for connection to a 230 V~ 50 Hz supply.

**! The mains supply to this appliance must be protected with a 3A mains fuse, under no circumstance should this fuse rating be exceeded.**

The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance by the use of a fused spur isolation switch. Its installation permits a

complete switching off in the conditions of the overvoltage category III. Alternatively it can be connected with a 3A fused three pin plug and unswitched shuttered socket outlet both complying with BS 1363.

The point of connection to the electricity supply must be readily accessible and adjacent to the appliance, except where the appliance is installed in a bathroom, this must then be sited outside the bathroom.

# INSTALLATION

## 6 INSTALLATION

### 6.1 Warnings

**The use of gas appliances is subject to statutory control; it is essential to observe the current regulations and laws in force (see also chapter 5).**

**The appliance must discharge combustion products directly outside or into a suitable exhaust duct designed for this purpose. Combustion products must be discharged using original flue kits only, since they are integral parts of the boiler.**

**The appliance is not suitable for receiving condensate coming from the combustion products evacuation system.**

**Combustion air must avoid contents of chlorine, ammonia, or alkali agents. Installation of a boiler near a swimming pool, a washing machine, or a laundry does expose combustion air to these aggressive contents”.**

Before installing the boiler on an existing C.H. system, flush it out thoroughly before fitting the boiler.

This procedure is to remove the presence of any residues or impurities that could compromise good functioning of the boiler.

After flushing it is necessary to treat the system.

The conventional warranty does not cover any problems deriving from failure to comply with such provisions.

For Propane, the appliance must also conform with the requirements of the distributors and comply with current Regulations and laws in force.

The condensate drain must be connected to a suitable drain, or discharged in a safe manner.

The electrical wiring must conform with current Regulations, in particular:

- the boiler must be earthed using the correct bonding clamp.
- a fused spur isolation switch, must be installed near to the boiler that allows complete isolation in category III over voltage conditions.

Refer to section "Electric connection" on page 49 in this chapter for the electrical connections.

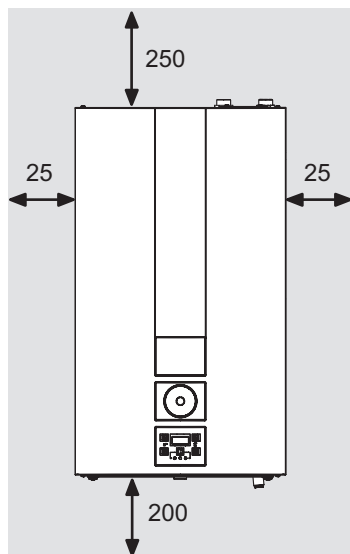
**Under no circumstances will the manufacturer be held responsible if the warnings and instructions contained in this manual have not been complied with.**

### 6.2 Precautions for installation

**The following prescriptions must be respected for installation:**

- The boiler must be fixed to a strong wall.
- The dimensions for the flue system (detailed in section "Choice of flue" on page 45) and the correct procedures for installing the flue, depicted in the instruction leaflet included with the flue kit, must be complied with during installation.
- To allow maintenance procedures it is necessary to leave the minimum clearances indicated in Fig. 6.1.

# INSTALLATION



All measurements are in mm

Fig. 6.1

- When installing the boiler in a cupboard, cover or alcove allow at least 5 mm permanent clearance from the front face of the boiler. Also ensure sufficient clearance to allow free access for servicing.
- Before installing the boiler on an existing C.H. system, flush it out thoroughly before fitting the boiler, so as to remove system debris.

It is advisable to equip the system with a quality magnetic system filter, you should also use a Buildcert approved water-treatment product in the circulating water.

The latter option in particular, has an anti-corrosive effect by promoting formation of a protective skin on metal surfaces and neutralising gases present in the water.

Biasi UK strongly recommend that matched system chemicals are used, this will ensure that no unwanted chemical reactions take place as system chemical manufactures en-

sure own brand compatibility.

## 6.3 Installing the bracket

### Precautions

Before mounting the bracket, check that the dimensions for fitting the flue system are complied with (refer to the leaflet included with the flue kit, packed separately).

Utilise the paper template supplied with the boiler to determine the fixing position for the bracket and boiler. Securely mount the bracket to the wall using appropriate fixings suitable for the type of wall construction and capable of supporting the total (wet) load. Refer to the weight given in the technical data tables specific for each model.

# INSTALLATION

## 6.4 Overall dimensions

The boiler respects the following dimensions:

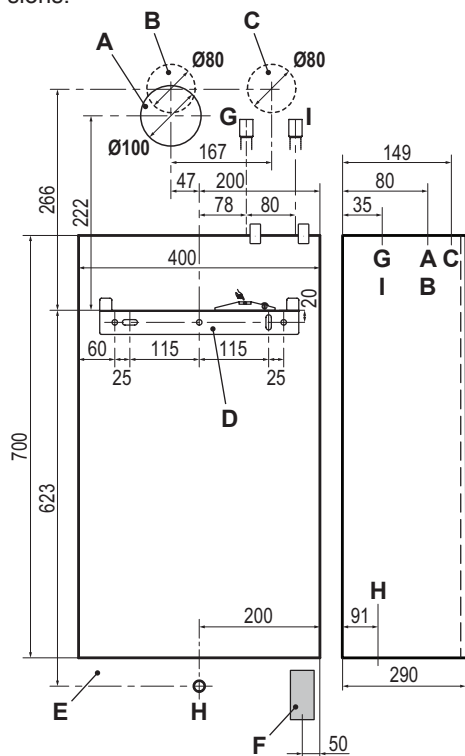


Fig. 6.2

- A Flue outlet / air intake pipe (co-axial Ø 100/60)
- B Flue outlet pipe Ø 80 mm (twin kit)
- C Air intake pipe Ø 80 mm (twin kit)
- D Bracket
- E Electric connections area
- F Condensate drain connection area
- G C.H. flow
- H Gas
- I C.H. return

## 6.5 Joints

The boiler uses the following fittings:

Functions	Pipe sizes (o.d)
Gas, C.H. return, C.H. flow	Ø 22
Condensate drain	Ø 20 mm (rubber)

sizes in mm o.d.

Condensate drained with Ø 21.5 mm solvent weld pipe

## 6.6 Central heating service connections

- The boiler is supplied with 22 mm copper tails for both upwards (Fig. 6.3) flow and return pipe routing suitable for compression or soldering connections. The paper template supplied with the boiler, gives a real size view of the copper pipes that helps to identify them.



**Under no condition should the feed and expansion pipes be isolated or isolation able between the boiler and the F&E tank, the placing of any form of valve in the pipes between the boiler and tank constitute a serious danger.**



**Use extreme care if soldering the joints near to the appliance. If boiler is located in tight space it is recommended to remove the pipes from the boiler.**

- Connect the central heating system pipes to the central heating flow and return pipes on the boiler.

# INSTALLATION

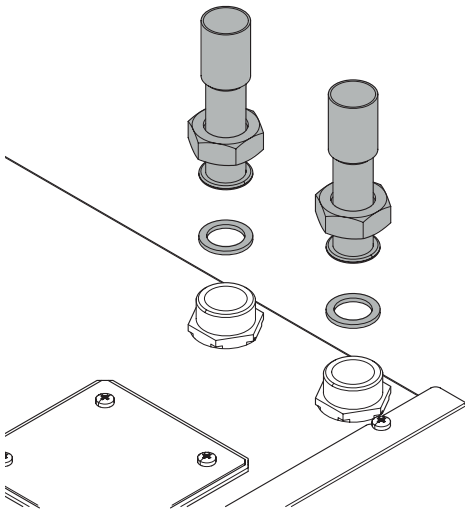


Fig. 6.3

- Mount the boiler on its bracket.
- Fix the C.H. valves and gas cock "J" ( $\frac{3}{4}$ "") to the boiler using the  $\frac{3}{4}$ " gaskets.
- Fit the condensate drain 7 (Fig. 6.4) in the drainage pipework.
- See also section "Condensate drain" on page 36 in this manual.

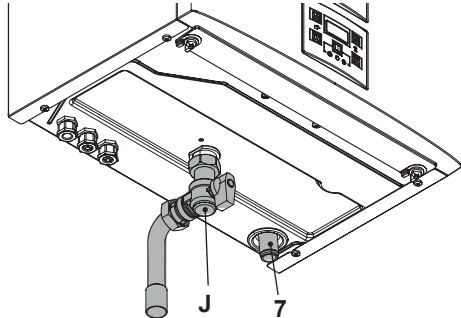


Fig. 6.4

## 6.7 Fitting the flue system

For a correct installation of the flue pipe, refer to the sheet provided together with the pre-selected kit.

The horizontal run of the flue pipes must incline about 1.5 degrees (25 mm per meter); therefore the terminal must be higher than the intake at the boiler.

The standard horizontal flue kit must be fitted horizontal as the inner flue exhaust pipe is already angled with the correct incline.

### CORRECT system for installing the wall flue

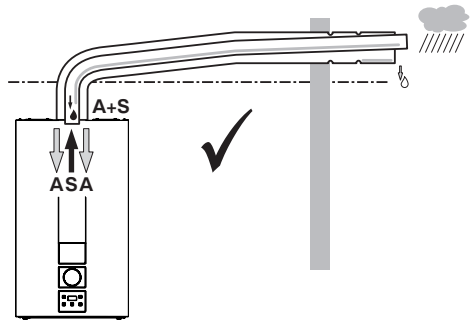


Fig. 6.5

A = air intake  
S = flue exhaust

## 6.8 Choice of flue

The flue exhaust/air intake can be installed in the mode:

C13 C33 C53 C63



**The terminal must be higher than the boiler.**

The following kits to be connected to the boiler are available:

# INSTALLATION

## Wall flue exhaust kit (Fig. 6.6 A)

This kit allows the flues to be exhausted in the rear wall or at the side of the boiler.

Coaxial pipe Ø 60/100 (A)	
Nominal length	0.915 m
Minimum length	0.5 m
Maximum length	10 m

### Type C<sub>13</sub>

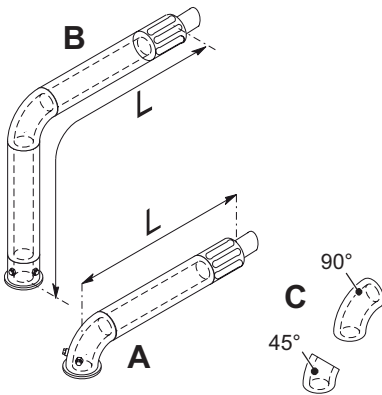


Fig. 6.6

## Vertical flue exhaust kit with 90° bend (Fig. 6.6 B)

This kit allows the boiler exhaust axis to be lifted by 635 mm.

The terminal must always exhaust horizontally.

Coaxial pipe Ø 60/100 with 90° bend (B)	
Nominal length	1.55 m
Minimum length	0.5 m
Maximum length	10 m

## Additional bends at 45° or 90° (Fig. 6.6 C)

Coaxial bends Ø 60/100 mm.

These bends when used with the pipe reduce the maximum length of the flue pipe by:

For the bend of 45° loss	0.5 m
For the bend of 90° loss	1 m

## Exhaust intake split pipes kit Ø 80 mm - (Fig. 6.7) - (Fig. 6.8)

This kit allows the flue exhaust to be separated from the air intake.

Split pipes kit Ø 80 mm	
Minimum length	0.5 m
Maximum length (a + b)	40 m

**N.B:** The air intake and the flue outlet must not terminate on opposite sides of the building (EN 483).

### Type C<sub>13</sub>

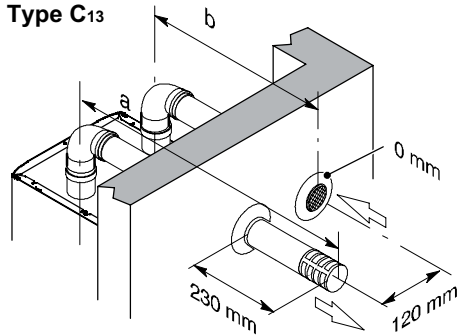


Fig. 6.7

Bends of Ø 80 mm at 90° and at 45° are available that reduce the maximum total length of the pipes by:

For the bend of 45° loss	0.9 m
For the bend of 90° loss	1.65 m

### Type C<sub>53</sub>

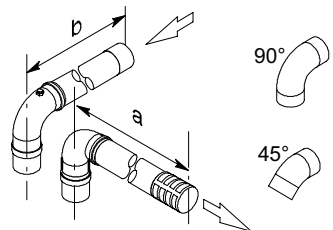


Fig. 6.8

# INSTALLATION

## Roof flue exhaust kit (Fig. 6.9)

This kit exhausts directly to the roof.

Coaxial pipe	Ø 60/100 mm	Ø 80/125 mm
Nominal height	0.96 m	0.96 m
Maximum height	10 m	10 m

### Type C<sub>33</sub>

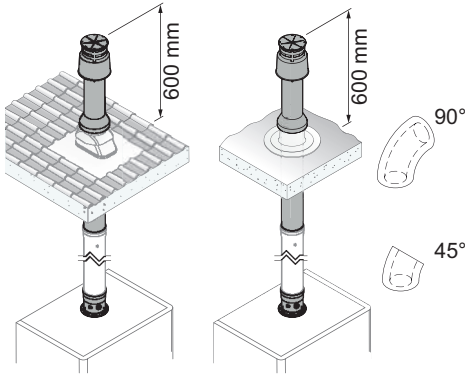


Fig. 6.9

Extensions are available for reaching the maximum height.

Bends at 90° and at 45° are available that reduce the maximum total length of the pipes by:

For the bend of 45° loss	0.5 m
For the bend of 90° loss	1 m

### Plumbing kit A (Fig. 6.10)

Coaxial Ø 60/100 mm + vertical part Ø 60 mm (flue outlet).

Coaxial Ø 60/100 mm (b) + vertical part Ø 60 mm (a)	
Telescopic coaxial flue	0.45-0.95 m
Maximum length (a + b)	15 m

This kit allows the products of combustion to be discharged at a different location to the air intake to avoid nuisance issues.

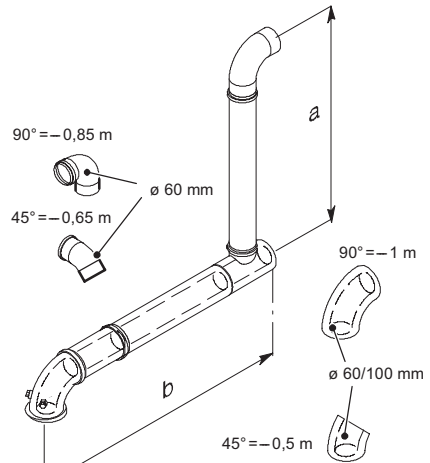


Fig. 6.10

60 mm elbows and extensions can be added to the vertical section.

Each additional elbow reduces the overall acceptable length of the flue system as follows:

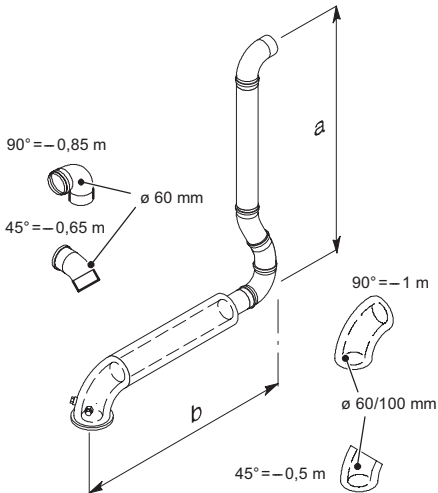
For the bend of 45° (60/100 mm) loss	0.5 m
For the bend of 90° (60/100 mm) loss	1 m
For the bend of 45° (60 mm) loss	0.65 m
For the bend of 90° (60 mm) loss	0.85 m

### Plumbing kit B (Fig. 6.12) (Fig. 6.11)

Push on type Ø 60 mm vertical plume management kit

This kit allows the products of combustion to be discharged at a different location, when used with the standard horizontal flue kit.

# INSTALLATION

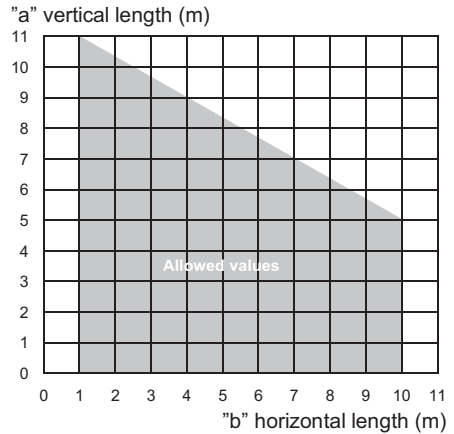


**Fig. 6.11**

Each additional elbow reduces the overall acceptable length of the flue system as follows:

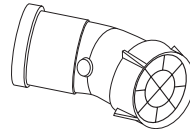
For the bend of 45° (60/100 mm) loss	0.5 m
For the bend of 90° (60/100 mm) loss	1 m
For the bend of 45° (60 mm) loss	0.65 m
For the bend of 90° (60 mm) loss	0.85 m

The chart Fig. 6.12 gives the maximum allowed value for **a + b** of (Fig. 6.11).



**Fig. 6.12**

A Plume deflector is available to assist in overcoming boundary nuisance issues.



**Fig. 6.13**



# INSTALLATION

## 6.9 Electric connection

- Unscrew screws "K" and remove the front panel "L" by pulling it and pushing it towards the top so that it is freed from the top housing Fig. 6.14.

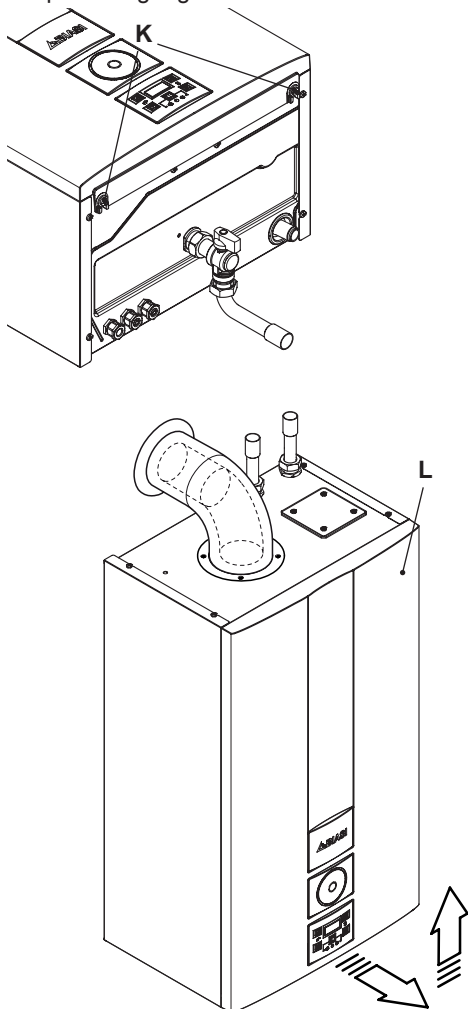


Fig. 6.14

- Identify the terminal block cover lid "M" (Fig. 6.15) and open it.

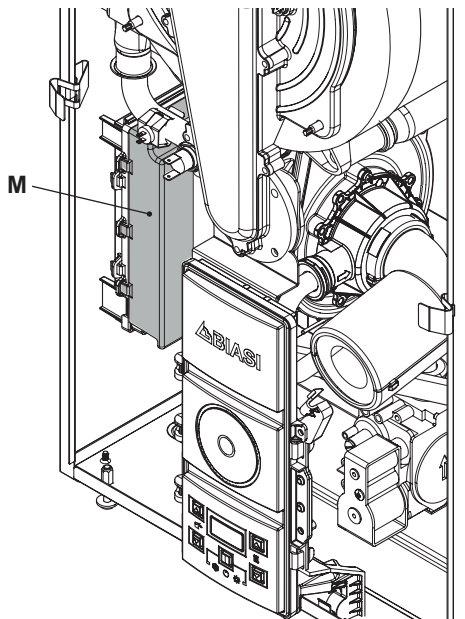


Fig. 6.15

### Electric power supply connection

- Connect the electric power supply cable coming from the fused spur isolation switch to the power supply terminal block of the boiler Fig. 6.16 keeping the same connections for the live (brown wire) and the neutral (blue wire). External 3A fuse or fused plug with same current rating is recommended.
- **Connect the earth cable (yellow/green) to an effective earth.**



**The earth cable must be the longest of the electric power supply cables.**

The appliance's electric power supply cable or wire must have a section no less than 0.75 mm<sup>2</sup>, it must be kept away from hot or sharp parts and however conform to the technical regulations in force.

# INSTALLATION

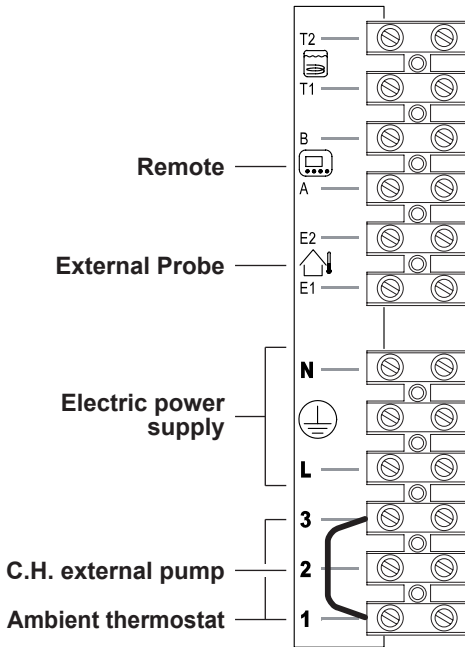


Fig. 6.16

The route of the boiler and ambient thermostat's electric power supply cable or wires must follow the route indicated in Fig. 6.17.

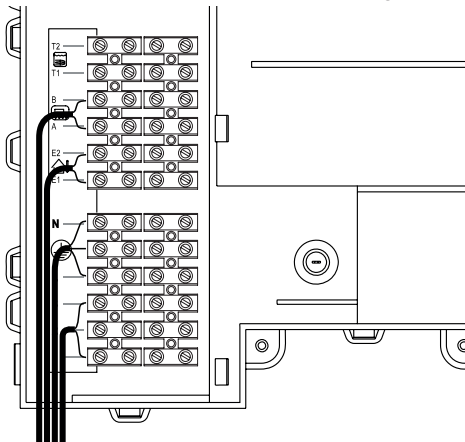


Fig. 6.17

Allow the cables to exit the boiler by using the relevant cable clamps "N" (Fig. 6.18).

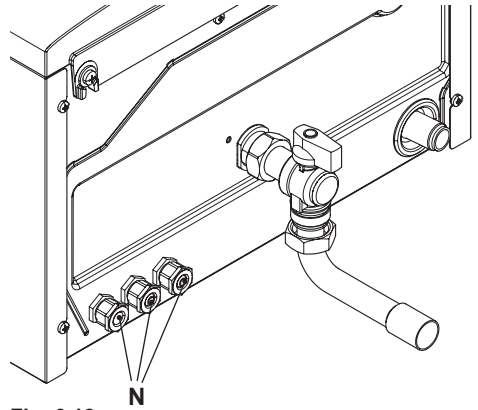


Fig. 6.18

## 6.10 Electric connection of pump

Use the clamps indicated in Fig. 6.19 to connect the C.H. external pump.

### C.H. external pump

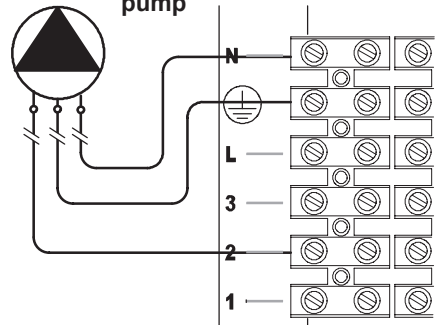


Fig. 6.19

## 6.11 Connecting the room thermostat or zone valves

Use the clamps indicated in Fig. 6.16 to connect the ambient thermostat.

**Remove the electric jumper present between "1 and 3" when connecting any type of ambient thermostat.**

The electric cables of the ambient thermostat are inserted between clamps "1 and 3" as in Fig. 6.20 or Fig. 6.21 or Fig. 6.22.

# INSTALLATION

Potential clean contacts of the Ambient Thermostat

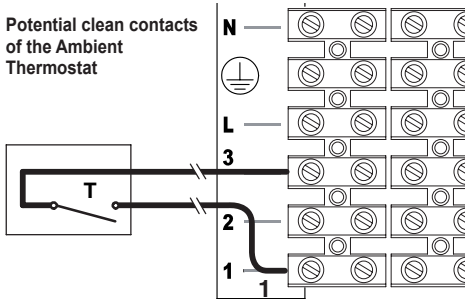


Fig. 6.20

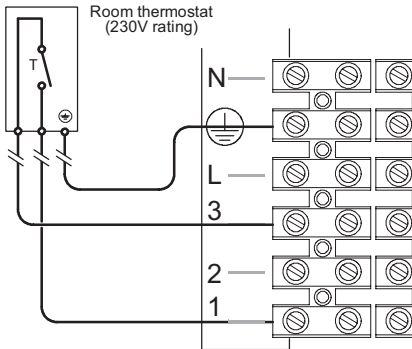


Fig. 6.21

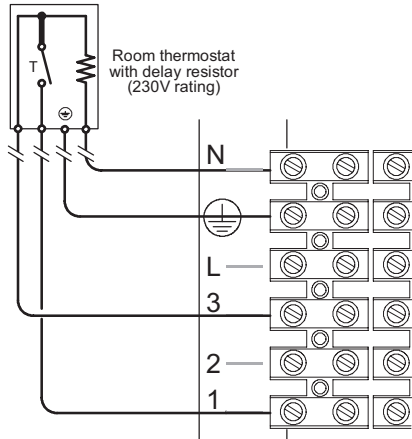


Fig. 6.22

The thermostat must be insulation class II (□) or must be correctly connected to earth.

## Connecting the zone valves controlled by the ambient thermostat

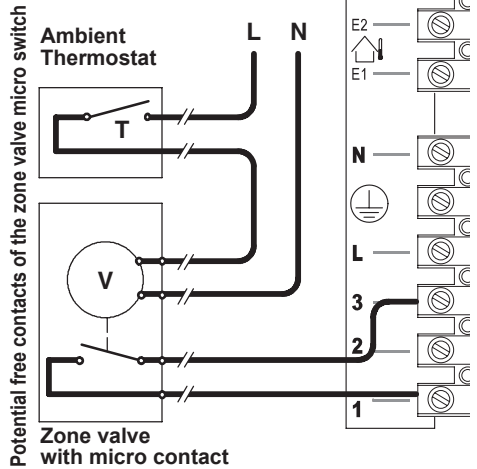


Fig. 6.23

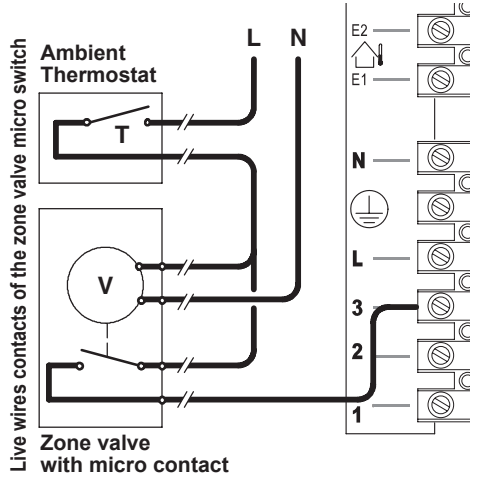


Fig. 6.24

INSTALLATION

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# INSTALLATION

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**If the Ambient Thermostat is connected with live wires (Fig. 6.24) may lead dangerous voltage inside the appliance as well. Ensure they are isolated. In case of doubt turn off the general system switch.**

Use the ambient thermostat's clamps indicated in Fig. 6.16 and Fig. 6.17. to connect the zone valve Insert the electric cables of the zone valve's micro switch contacts in clamps "1 and 3" of the ambient thermostat's terminal block as in Fig. 6.17.

**Remove the electric jumper between "1 and 3".**

The route of the boiler and ambient thermostat's electric power supply cable or wires must follow the route indicated in Fig. 6.17. Allow the cables to exit the boiler by using the relevant cable clamps "N" (Fig. 6.18).

In Fig. 6.25 the boiler is permanently connected to the main supply. The boiler operation is controlled by the external control terminal block.

In Fig. 6.26 the boiler is not permanently connected to the supply line. The boiler operation is controlled by switching the mains supply.

In this case, when the boiler is switched off some important features like the antifreeze system, the monitoring of the boiler by the operation lights, the post circulation of the pump, etc. are completely deactivated.

For these reasons it is advisable to use the first diagram (Fig. 6.25).

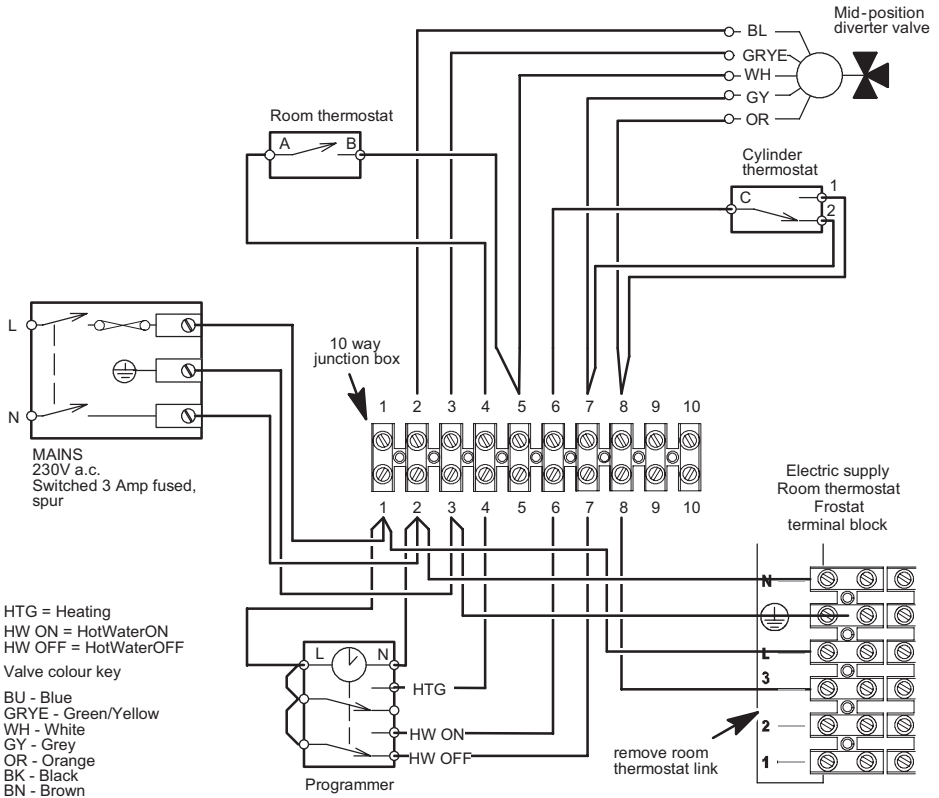
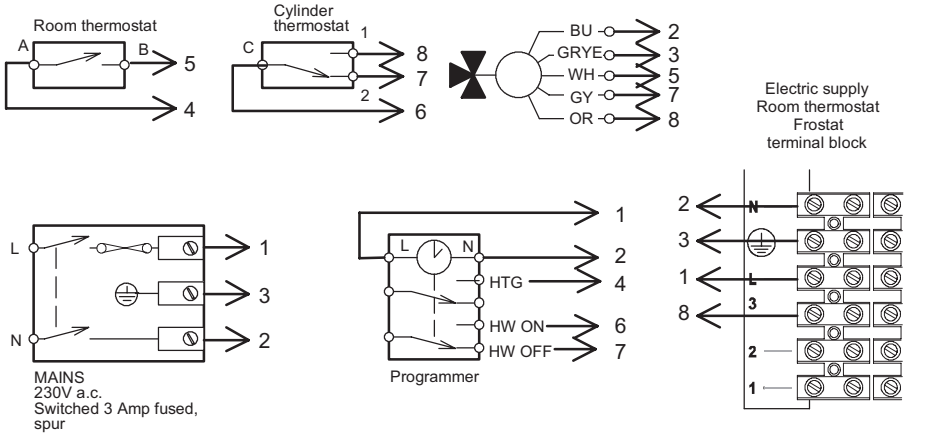
## 6.12 Connecting to a cylinder

Two schematic wiring diagrams are given in this section showing two possible ways to connect an external programmer to a mid-position diverter valve to provide independent timed and thermostatic control of heating and hot water.

Fig. 6.25 and Fig. 6.26 are divided in two parts. The upper shows the single components used on the diagrams with their connection to the 10 way junction box. The bold numbers represent the terminal of the junction box where the component must be connected to.

The lower part shows how to realize a system that provides independent timed and thermostatic control of heating and hot water.

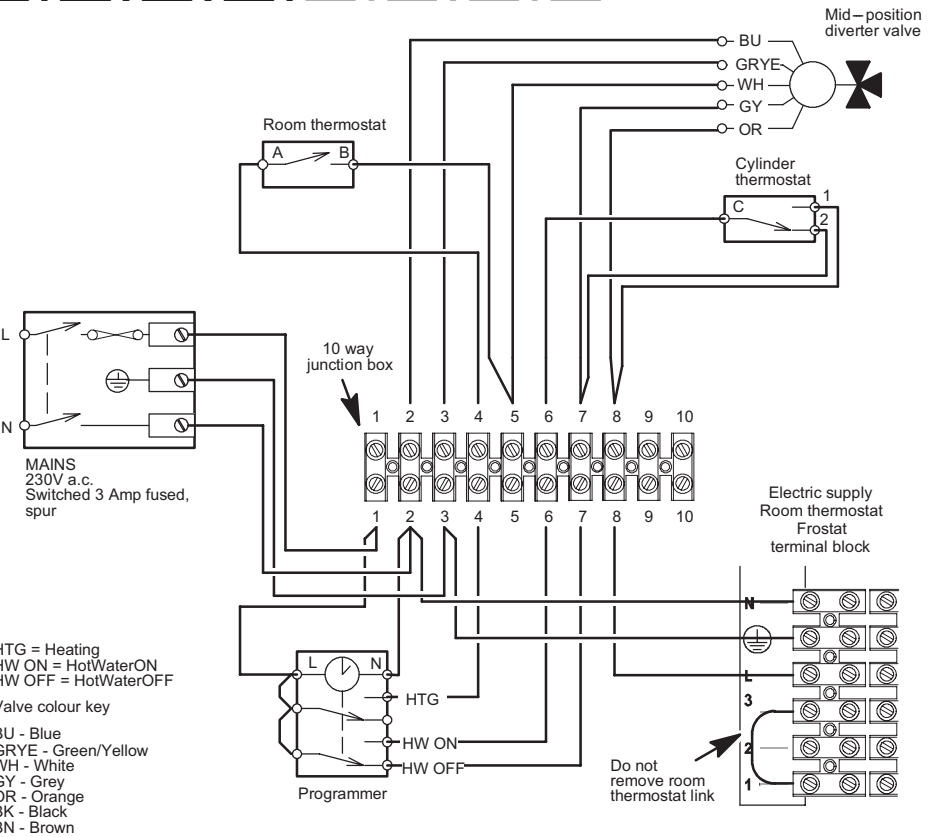
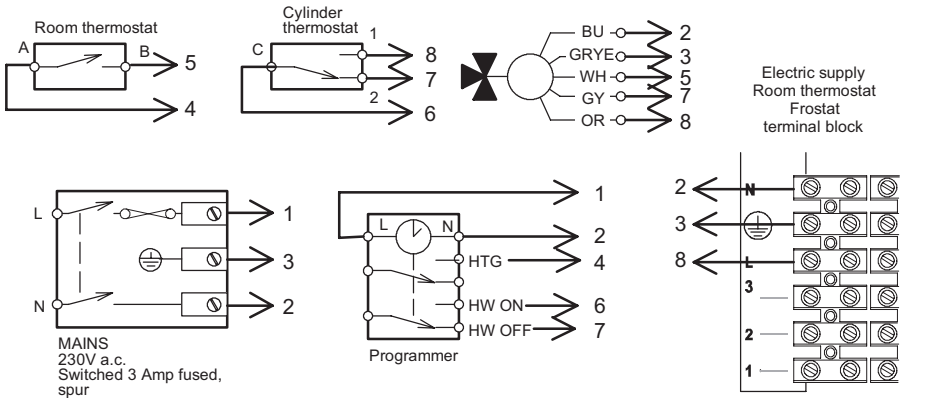
# INSTALLATION



INSTALLATION

Fig. 6.25 Permanent live Y - plan

# INSTALLATION



**Fig. 6.26** - Not permanent live Y - plan

# INSTALLATION

## 6.13 Installation of the external temperature probe (optional)

The external probe must be installed on the external wall of the building avoiding:

- Direct sunlight.
- Humid walls or walls subject to the formation of mildew.
- Installation near to fans, drain outlets or chimneys.
- It is recommended to be installed on a north aspect wall at least 1 m below any eaves and at least 2 m above ground.



**This device is not recommend for systems that contain a hot water cylinder**

## 6.14 Electric connection between the boiler and the external probe

To connect the external probe to the boiler use electric cables with a section no less than 0.50 mm<sup>2</sup>.

**The electric cables for connecting the external probe to the boiler must cover different channels to the voltage ones (230 V), since they are powered at a safety low voltage and their maximum length must not exceed 20 meters.**

Use the clamps indicated in Fig. 6.27 to connect the external probe.

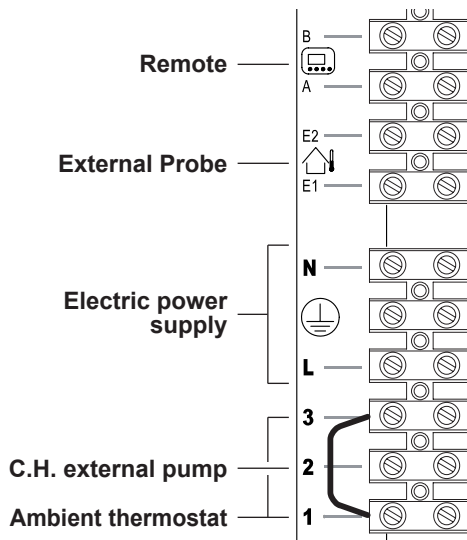


Fig. 6.27

The route of the external probe's connection wires must follow the route indicated in Fig. 6.17.

Allow the cables to exit the boiler by using the relevant cable clamps "N" (Fig. 6.18).

## 6.15 Remote electric connection (optional)

Use the clamps indicated in Fig. 6.27 to connect the remote.

To connect the remote control to the boiler, refer also to the REMOTE CONTROL booklet.

**Do not remove the electric jumper connected on the ambient thermostat terminal block between "1 and 3" Fig. 6.27.**

The route of the remote control cable must follow the route indicated in Fig. 6.17.

Allow the cables to exit the boiler by using the relevant cable clamps "N" (Fig. 6.18).

# COMMISSIONING

## 7 COMMISSIONING

### 7.1 Warnings

The commissioning of this boiler and system must only be undertaken by a Gas Safe Registered Engineer in accordance with the requirements of the Gas Safe Installation and Use Regulations and be approved by Gas Safe.

Ensure that the Benchmark Checklist is satisfactorily completed during the commissioning process. The Checklist is located at the end of this manual. This manual should be handed to the user following completion of the installation and commissioning process. Failure to comply with these requirements may invalidate the manufacturers guarantee.

For Ireland (IE), it is necessary to complete a "Declaration of Conformity" to indicate compliance to I.S.813.2002.

### 7.2 Electrical installation

Preliminary electrical system checks to ensure electrical safety shall be carried out by a competent person. i.e. polarity, earth continuity, resistance to earth and short circuit. If a fault has occurred on the appliance the fault finding procedure should be followed as specified in the service manual.

### 7.3 Gas supply installation

- Inspect the entire installation including the gas meter, test for tightness and purge, all as described in BS 6891;  
For Ireland (IE), refer to I.S.813.2002.
- Open the gas cock 6 (Fig. 7.1) on the appliance and check the gas connector on the appliance for leaks.

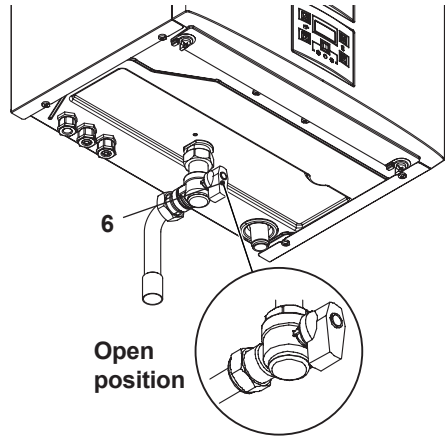


Fig. 7.1

### 7.4 Initial filling of the system

When fitting the boiler into a sealed system, it will be necessary to fit an expansion vessel, pressure gauge and pressure relief valve, external to the boiler. These items are available from most plumbing suppliers.

- Open the C.H. flow and return valves.
- Remove the front and side panels of the case (section "Dismantling the external panels" on page 73).
- Gradually open stopcock at the filling point connection to the C.H. system until water is heard to flow; do not open fully.
- Open each radiator air vent starting at the lowest point of the system and close it only when clear water, free of bubbles, flows out.
- Purge the air from the pump by unscrewing the pump plug; release the pump shaft by turning in the direction indicated by the arrow on the information plate.
- Replace the pump plug.
- Continue filling the system. The actual reading should ideally be 1,3 bar and not less than 0,3 bar.



# COMMISSIONING

- Check the operation of the pressure relief valve (sealed system only) (Fig. 7.2) by lifting the lever or turning the knob on the valve gently to ease the valve of its seat.
- Checking that water is discharged, release the lever and ensure that the valve seats correctly and does not leak. Where this is not possible a manual check should be carried out.
- Release the cold water to the initial design pressure.

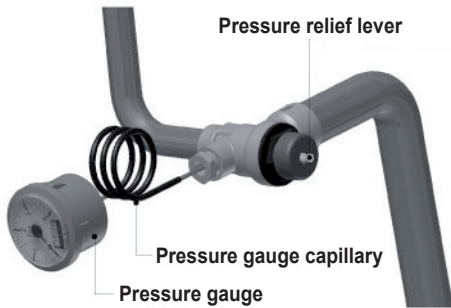


Fig. 7.2

**NOTE: THESE COMPONENTS ARE NOT SUPPLIED BY BIASI UK LTD.**

**!** Do not use the pressure relief valve to drain the system, because dirt or debris could prevent the valve seating correctly. If the valve leaks or sticks closed, then replace it.

- Close all air release valves on the C.H. system.
- Inspect the boiler and the system for water tightness and remedy any leaks discovered.
- Cold flush the system to remove any loose particles and any system debris before starting the boiler for the first time

**The flushing procedure must be in line with BS7593:2006 Treatment of Water in D.H.W. & C.H. Systems.**

**When the installation and second filling are completed turn on the C.H. system and run it until the temperature has reached the boiler operating temperature. The system must then be immediately flushed through.**

**This procedure must be repeated twice more.**

**During this operation a C.H. flushing detergent must be used in the quantities as specified by the appropriate manufacturer, whose function it is to dissolve any foreign matter which may be in the system.**

## INHIBITION (Primary Heating Circuit)

On the final refilling of the heating system it is important to ensure the system water is treated with a suitable scale and corrosion inhibitor in accordance with the manufacturer's instructions.

**Only inhibitors that carry the Buildcert approved label should be used.**

## 7.5 Condensate pipe and traps

The full length of the condensate pipe should be checked for leaks.

Before running the boiler, ensure that the built in condensate trap and any other trap in the drain system is correctly filled with water.



**Fill the built in condensate trap by removing the flue elbow and pouring a cupful of water into the flue outlet (Fig. 7.3).**

**Warning do not allow water to enter the outer air intake**

# COMMISSIONING

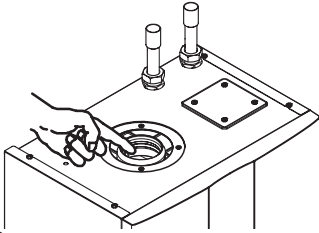


Fig. 7.3

An alternative, to the removal of the flue elbow, pour the water through the flue sampling point (Fig. 7.4).

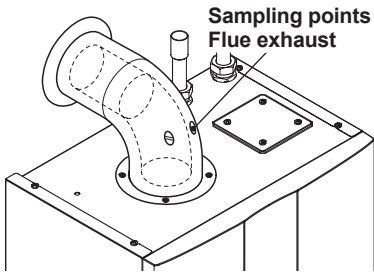


Fig. 7.4

## 7.6 Checking the gas supply pressure

This boiler has been factory tested to the highest quality control standards and set for the minimum and maximum gas working pressures, connected to a 1 m flue and a gas supply pressure of 20 mbar.

Any variation in gas supply pressure or flue length may result in the customer experiencing a harmonic noise from the boiler. In these circumstances, it may be necessary to reset the burner gas pressures in accordance with section Gas Valve of the Service Manual.

It should be noted that a Flue Gas Analyser is required for this procedure.

## 7.7 Checking the inlet pressure

- Remove the boiler front panel, see section "Dismantling the external panels" on page 73.
- With the boiler switched on at full rate (maximum output power), check the supply pressure by using the 23 point in Fig. 7.5 and compare the value with that reported on the Gas supply pressure table (minimum inlet pressure) in the section "Technical data ADVANCE 15OV" on page 24, "Technical data ADVANCE 18OV" on page 27 and "Technical data ADVANCE 24OV" on page 30.
- Ensure the test nipple 23 in Fig. 7.5 is firmly closed.

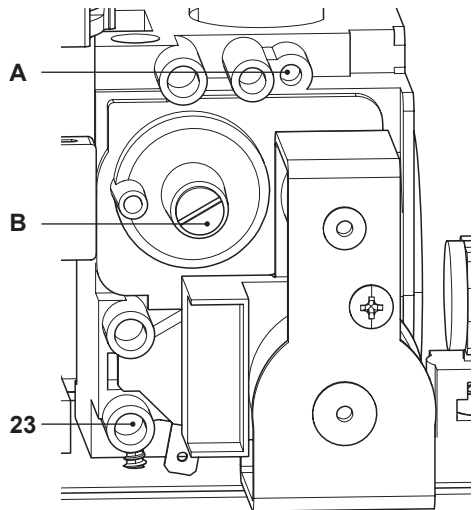


Fig. 7.5

If it does not comply with the required pressure check the gas supply line and governor for faults and/or correct adjustment.

Where the boiler is connected to a gas supply which has a zero set governor then it is necessary under the Gas Safe (Installation and Use) Regulations 26.9. to perform a combustion analysis test for CO/CO<sub>2</sub> (The limits for the boiler is

# COMMISSIONING

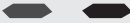
given in the section "Technical data ADVANCE 150V" on page 24, "Technical data ADVANCE 180V" on page 27 and "Technical data ADVANCE 240V" on page 30: CO<sub>2</sub> contents / other flue gas figures) and complete the Certificate of Exemption section of the Benchmark.

**Important:** after the checks all of the test points must be sealed and tested for tightness.

## 7.8 Lighting the boiler

Some products incorporate an anti cycling time delay. It is normal when first switching the boiler on for the boiler to operate on heating for a few seconds then switch off. After 3-4 minutes has elapsed the boiler will then re ignite and operate perfectly normally.

If external controls are fitted (e.g. Time clock, room thermostat) ensure they "call for heat".

- Electrically power the boiler by switching on the double pole isolation switch. The LCD will display, the  symbol (Fig. 7.6).

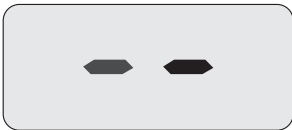



Fig. 7.6

- Press the 9 key for 2 seconds until  symbol appears on the display Fig. 7.7.

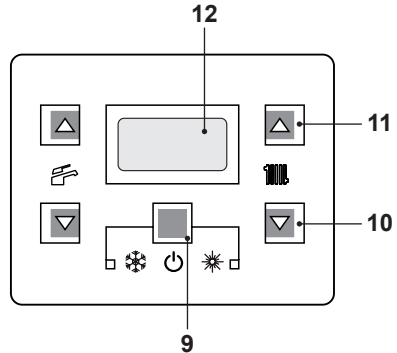


Fig. 7.7


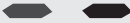


The LCD display displays the boiler temperature (primary circuit) and the  symbol; the °C symbol slowly flashes Fig. 7.8.



Fig. 7.8

- Open the gas cock
- Make sure that the ambient thermostat is in the "heat request position".
- Check the correct functioning of the boiler.
- Check the gas pressures and flow rates as shown in section "GAS CONVERSION" on page 71 of this booklet.
- Check that the condensate produced during operation fills the syphon and is regularly drained in the draining pipe.
- Switch off the boiler by pressing the 9 (Fig. 7.7) key for 2 seconds until the  symbol appears on the LCD display (Fig. 7.6).
- Press the 9 key for 2 seconds until  symbol appear on the display Fig. 7.8. The LCD display displays the boiler temperature (primary circuit) and the  symbol; the °C symbol slowly flashes Fig. 7.8.

# COMMISSIONING

The boiler will now go through an ignition sequence and the burner will light.

If after four ignition attempts (about four minutes) the boiler does not function and a code that alternates between the letter **Er** and the writing **reset** appear on the LCD display, it indicates that the safety lock-out has stopped the boiler. The display background flashes (Fig. 7.9).

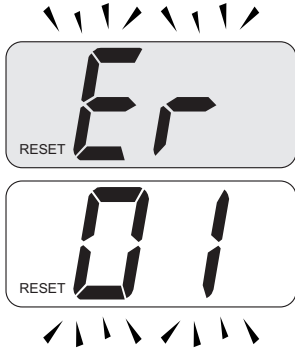


Fig. 7.9

Press the reset key on the boiler control panel 9 (Fig. 7.7) to reset its functioning.

For the first lighting up and following maintenance procedures for the gas supply, it may be necessary to repeat the resetting operation several times so as to remove the air present in the pipework.

After five consecutive resetting attempts the reset button is inhibited. To restore its function it is necessary to switch the boiler off and on from the electrical mains, using the fused spur isolation switch fitted adjacent to the appliance.

## 7.9 Checking the ignition device

With the burner on high flame close the gas cock.

After four ignition attempts (about four minutes) the boiler does not function and a code that alternates between the letter **Er**

and the writing **RESET** appear on the LCD display, it indicates that the safety lock-out has stopped the boiler. The display background flashes (Fig. 7.10).

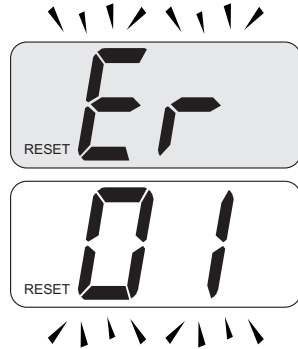


Fig. 7.10

Press the reset key 9 on the boiler control panel to reset its functioning.

## 7.10 Checking the flue system

The flue system should be visually checked for soundness. Check all clamps, gaskets and fixing are secure and tight.

Ensure that the flue terminal is sited correctly in accordance with the flue fitting instructions and Fig. 5.1 on page 34 of this manual.

To carry out a combustion check refer to the instructions given in the section "Combustion analysis check" on page 76 of this manual.

Reference figures are given in the " section "Technical data ADVANCE 15OV" on page 24, "Technical data ADVANCE 18OV" on page 27 and "Technical data ADVANCE 24OV" on page 30 (Flue gas figures).

## 7.11 Checking the condensate drain pipe

Check the soundness and integrity of the condensate drain pipe.

Verify the cleanness and correct filling of the

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# COMMISSIONING

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condensate traps.

## 7.12 Instructing the user

Hand over this combined User & Installation manual and the Service manual to the end user and explain how to use the unit.

Take the User step by step through the lighting instructions.

Show the User how to switch off the appliance quickly and indicate the position of the electric supply isolator.

Explain the proper use and adjustment of all system controls; this will ensure the greatest possible fuel economy.

Explain the function and use of the function selector.

Explain and demonstrate the function of time and temperature controls (if fitted).

Explain how to turn off the appliance for both short and long periods and advise on the precautions necessary to prevent damage should the appliance be inoperative when freezing conditions may occur.

Fill in the details required on the Boiler Guarantee Certificate and hand to the User advising them to return the correct section for boiler Guarantee registration.

Finally, advise the User that, for continued safe and efficient operation, the appliance must be serviced by a competent person at least once a year.

The user is responsible for keeping the documentation integral and within reach for consultation.

# ADVANCED COMMISSIONING

## 8 ADVANCED COMMISSIONING

### 8.1 Enabling functioning of the external temperature probe by the remote control

Functioning with the external probe in the boiler must be enabled if the remote control (optional) is used.

Act on the programming of the REMOTE control to enable its functioning if the remote control (optional) is used.

- Press button  $\mathbb{P}$  for more than 3 seconds to enter in *INFO* mode.

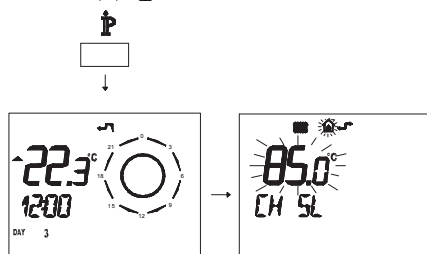


Fig. 8.1

Press buttons  $\text{DAY}$  and  $\text{ON}$  at the same time to enter the transparent programming (Fig. 8.2).

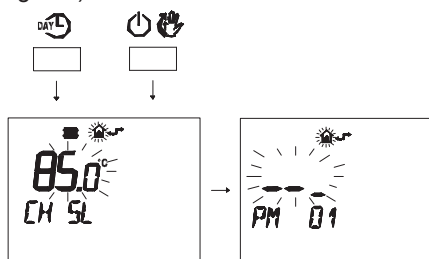


Fig. 8.2

- Press buttons  $\mathbb{F}$   $\blacktriangledown$  or  $\mathbb{F}$   $\blacktriangle$  to display the "PM15" program that enables the external probe (Fig. 8.3).

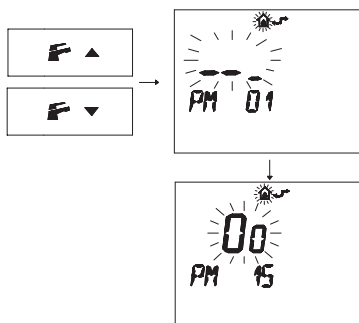


Fig. 8.3

- Modify the programmed SET by pressing buttons  $\blacktriangle$   $\text{UP}$  or  $\blacktriangledown$   $\text{UP}$  until a **setting of 60** is displayed, wait for the number programmed to flash (Fig. 8.4).

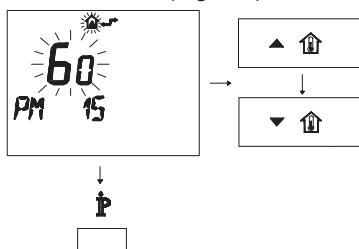


Fig. 8.4

- To exit programming, press button  $\mathbb{P}$ .

### 8.2 Setting the K coefficient of the external temperature probe

The boiler is set with a K coefficient equal to zero for boiler functioning without the probe connected.

If the boiler is **NOT EQUIPPED** with the remote control (optional) refer to Fig. 8.5.

# ADVANCED COMMISSIONING

C.H. flow temperature °C

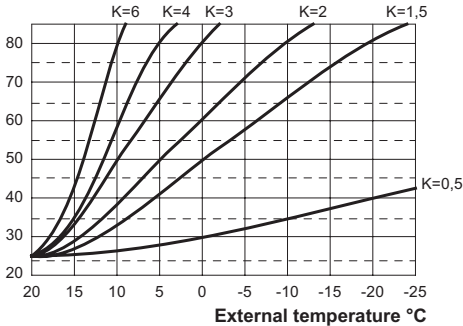


Fig. 8.5

If the boiler is **EQUIPED** with the remote control (optional) refer to Fig. 8.6. In this case K setting must be done from the remote control.

C.H. flow temperature °C

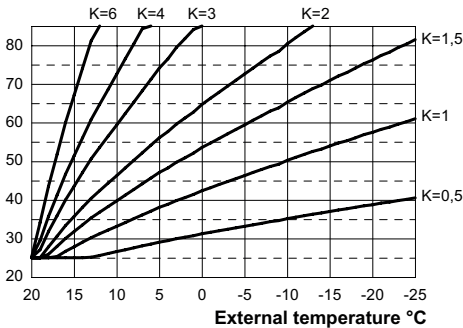


Fig. 8.6

The K coefficients is a parameter that increases or reduces the boiler flow temperature when the outside temperature changes. When installing the external probe it is necessary to set this parameter based on the efficiency of the heating system in order to optimise the flow temperature (Fig. 8.6). E.g. In order to have a flow temperature at the heating system of 60°C with an external temperature of -5°C, set a K at 1.5 (sectioned line in Fig. 8.6).

## Sequence for setting the K coefficient

- Enter in "programming mode" by sequentially pressing and holding keys 9 - 10 - 11 (Fig. 8.7) for 10 seconds at the same time until the letters **Pr** that alternate with code 01 are displayed on the LCD display, indicating that "parameter 01", has been activated (Fig. 8.8).

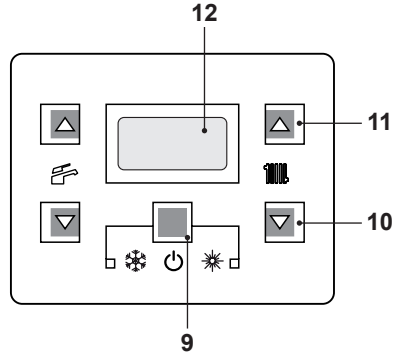


Fig. 8.7

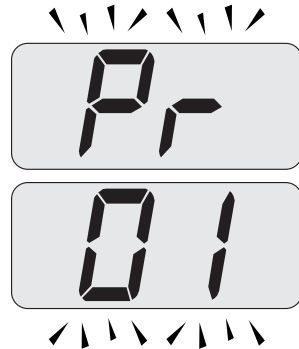


Fig. 8.8

- Scroll the various parameters using keys 10 or 11 until the letters **Pr** that alternate with code 15 are displayed on the LCD display, indicating that "parameter 15" (Fig. 8.9) has been activated.

# ADVANCED COMMISSIONING



Fig. 8.9

- Press keys 9 and 11 (Fig. 8.7) at the same time until the value of parameter 15 (Fig. 8.10) is displayed on the LCD display.



Fig. 8.10

- Using keys 10 or 11 it is possible to change the value of parameter 15 from a minimum of **01** to a maximum of **60** based on the selected bend of the K coefficient in Fig. 8.6 (the value read on the display corresponds to K coefficients decimal values).
- By pressing key 9 (Fig. 8.7) confirmation of the inserted value is obtained.
- Press keys 9 and 10 (Fig. 8.7) at the same time to exit without changing the value (return to the parameters list Fig. 8.9).
- Press sequentially keys, 9 - 10 and then 11 (Fig. 8.7) and hold in for 10 seconds to exit the "programming mode".

At this point the system flow temperature will follow the trend in relation to the K coefficient set.

However, if the ambient temperature is not comfortable, the flow temperature of the heating system can be increased or reduced by  $\pm 15^{\circ}\text{C}$  by pressing keys 10 (reduce) and 11 (increase) (Fig. 8.7).

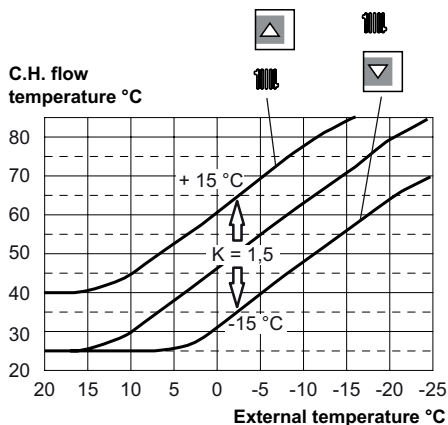



Fig. 8.11

The temperature trend when changing the setting made with keys 10 and 11 for a **K 1,5** is shown in Fig. 8.11.

## Sequence for setting the K coefficient with the remote control connected

Act on the programming of the REMOTE control to select the setting of the K coefficient.

- Electrically feed the boiler by activating the bipolar switch envisioned during installation.
- Press button  for more than 3 seconds to enter in **INFO** (Fig. 8.12) mode.

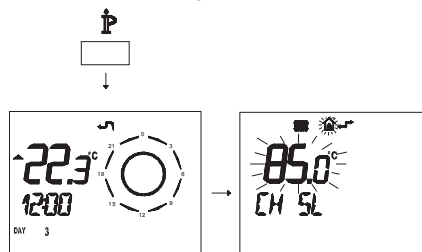



Fig. 8.12



# ADVANCED COMMISSIONING

Press button **OK**  to display the **K REG** window (Fig. 8.13).

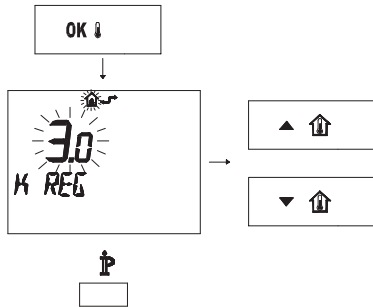





Fig. 8.13

It is possible to change the value using buttons  and . Press button  to exit from mode **INFO** (Fig. 8.13).

## 8.3 Setting the pump post-circulation

The pump, in heating function, is set for a post-circulation of about one minute at the end of each heat request.

This time can be changed by a minimum of zero to a maximum of four minutes.

- Enter in "programming mode" by sequentially pressing keys 9 - 10 - 11 (Fig. 8.14) for 10 seconds at the same time until the letters **Pr** that alternate with code **01** are displayed on the LCD display, indicating that "parameter 01" (Fig. 8.15) has been activated.

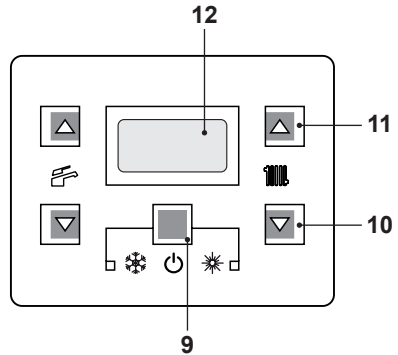


Fig. 8.14

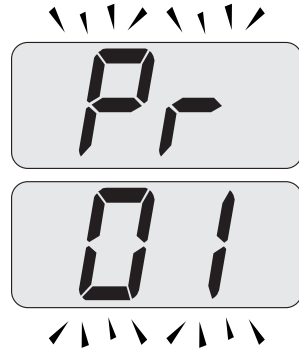


Fig. 8.15

- Scroll the various parameters using keys 10 or 11 until the letters **Pr** that alternate with code **11** are displayed on the LCD display, indicating that "parameter 11" (Fig. 8.16) has been activated.

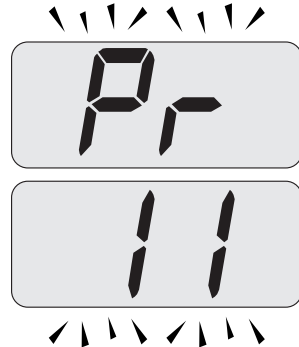


Fig. 8.16

# ADVANCED COMMISSIONING

- Press keys 9 and 11 (Fig. 8.14) at the same time until the value of parameter 11 (10=60 seconds) (Fig. 8.17) is displayed on the LCD display.

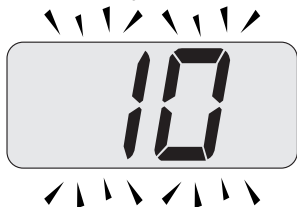


Fig. 8.17

- It is possible to modify parameter 11 by **00=0s** to **99=600s** using keys 10 or 11 (each increase or reduction by a unit on the display corresponds to 6 seconds).
- By pressing key 9 (Fig. 8.14) confirmation of the inserted value is obtained.
- Press keys 9 and 10 (Fig. 8.14) at the same time to exit without changing the value (return to the parameters list Fig. 8.16).
- Press sequentially keys, 9 - 10 and then 11 (Fig. 8.14) and hold in for 10 seconds to exit the "programming mode".

## Programming using the REMOTE control

- Press button **P** for more than 3 seconds to enter in **INFO** mode (Fig. 8.18).

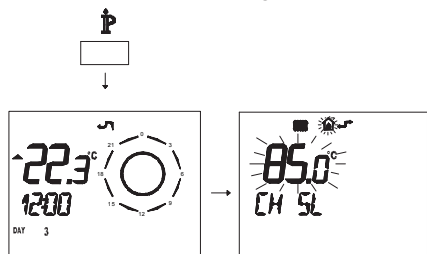


Fig. 8.18

- Press buttons **DAY** and **POWER** at the same time to enter transparent programming (Fig. 8.19).

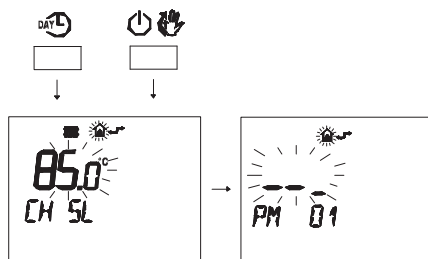


Fig. 8.19

- Press buttons **F**▲ or **F**▲ to display the "PM11" program of the pump post-circulation (Fig. 8.20).

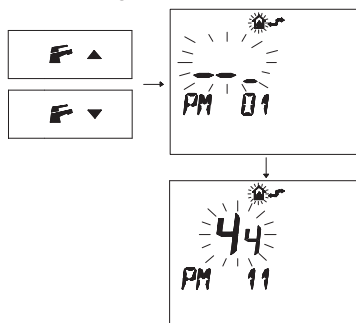


Fig. 8.20

- To modify the programmed SET, act on buttons ▲**UP** or ▼**DOWN** and wait for the programmed number to flash (Fig. 8.21). Each step increased or decreased corresponds to 1 second.

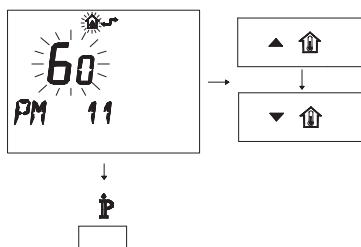


Fig. 8.21

- To exit programming, press button **P**.

# ADVANCED COMMISSIONING

## 8.4 Selecting the reignition frequency

When the boiler functions in normal on/off heating mode, the minimum time between two ignitions is set at three minutes (re-ignition frequency).

This time can be changed by a minimum of zero to a maximum of eight and a half minutes.

- Enter the "programming mode" by sequentially pressing key 9 - 10 - 11 (Fig. 8.22) for 10 seconds at the same time until the letters **Pr** that alternate with code **01** are displayed on the LCD display, indicating that "parameter 01" (Fig. 8.23) has been activated.

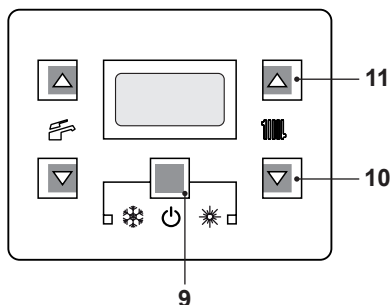


Fig. 8.22



Fig. 8.23

- Scroll the various parameters using keys 10 or 11 until the letters **Pr** that alternate with code **10** are displayed on the LCD

display, indicating that "parameter 10" (Fig. 8.24) has been activated.

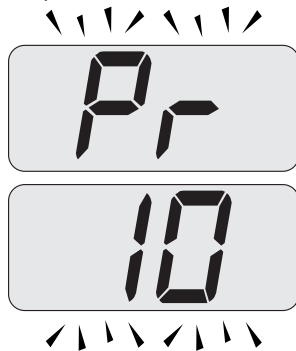


Fig. 8.24

- Press keys 9 and 11 (Fig. 8.22) at the same time until the value of parameter 10 (30=180 seconds) is displayed on the LCD display (Fig. 8.25).



Fig. 8.25

- It is possible to modify parameter 10 by **00=0s** to **99=600s** using keys 10 or 11 (each increase or reduction by a unit on the display corresponds to 6 seconds).
- By pressing key 9 (Fig. 8.22) confirmation of the inserted value is obtained.
- Press keys 9 and 10 (Fig. 8.22) at the same time to exit without changing the value (return to the parameters list Fig. 8.24).
- Press sequentially keys, 9 - 10 and then 11 (Fig. 8.22) and hold in for 10 seconds to exit the "programming mode".

### Programming using the REMOTE control

Act on the programming of the REMOTE control to select a minimum time between

# ADVANCED COMMISSIONING

two ignitions when the boiler functions in normal on/off heating mode.

- Press button **P** for more than 3 seconds to enter in **INFO** mode (Fig. 8.26).

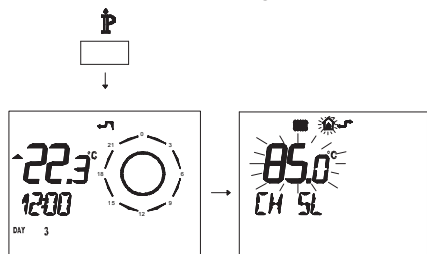


Fig. 8.26

- Press buttons **DAY** and **POWER** at the same time to enter transparent programming (Fig. 8.27).

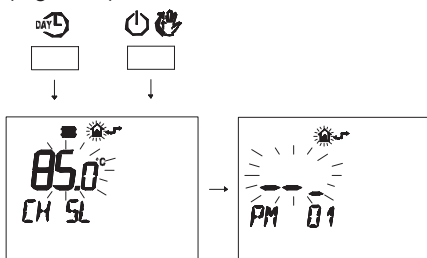


Fig. 8.27

- Press buttons **F** and **▲** or **F** and **▼** to display the "PM10" program for selecting the ignition frequency (Fig. 8.28).

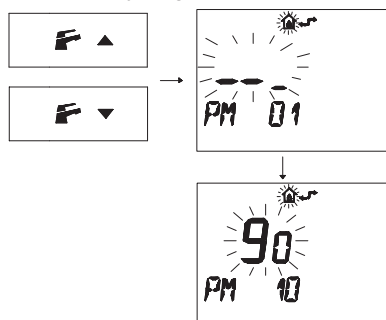


Fig. 8.28

In Fig. 8.28 a SET programmed at **90** is displayed corresponding to a re-ignition time of

about 3 minutes.

The adjustment field is from 0 to 8 and half minutes.

Each step increased or decreased corresponds to 2 seconds.

- To modify the programmed SET, act on buttons **▲** and **⬆** or **▼** and **⬆** and wait for the number programmed to flash (Fig. 8.29).

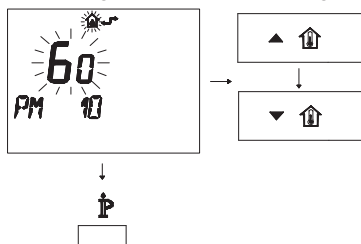


Fig. 8.29

- To exit programming, press button **P**.

## 8.5 Boiler adjustment record

**Important:** at the end of the settings operation it is important to update the table with new settings (Fig. 8.30).

This is to allow the correct setting of this boiler in case of replacement of the main control p.c.b.

PARAMETER	DIGIT	VALUES
Boiler type (to be updated with the complete range)	Pr 01	
Type of water sensors (C.H.)	Pr 02	
Pump speed	Pr 03	
Zone valve setting Room Thermostat / Remote Control	Pr 04	
Gas type	Pr 05	
D.H.W. maximum temperature °C	Pr 06	-----

## ADVANCED COMMISSIONING

PARAMETER	DIGIT	VALUES
C.H. flow max temperature °C	Pr 07	
Factory parameters reset	Pr 08	
Flue sweep function	Pr 09	
C.H. reignition frequency	Pr 10	
C.H. pump post-circulation	Pr 11	
Max. useful output in C.H. mode	Pr 12	
C.H. pump working type	Pr 13	
Ignition power	Pr 14	
K value (external probe diagram)	Pr 15	
Not used	Pr 16	
D.H.W. burner turn off function	Pr 17	-----
NTC on the C.H. return	Pr 18	
LCD type	Pr 19	
Not used	Pr 20	-----
Not used	Pr 21	-----
D.H.W. flow minimum	Pr 22	-----
Not used	Pr 23	-----
Duty Cycle Zone	Pr 24	
C.H. flow temperature in antifreeze protection mode °C	Pr 25	
Maximum temperature at main exchanger outlet in D.H.W. pre-heating mode °C	Pr 26	-----
C.H. minimum setpoint	Pr 27	
Maintenance intervals	Pr 28	
NTC inlet probe	Pr 29	-----
Correct pressure C.H. system	Pr 30	

Fig. 8.30

- Enter the "programming mode" by sequentially pressing and holding in keys, 9 - 10 and then 11 (Fig. 8.31) for 10 seconds until the letters **Pr** that alternate with code **01** are displayed on the LCD display, indicating that "parameter 01" (Fig. 8.32) has been activated.

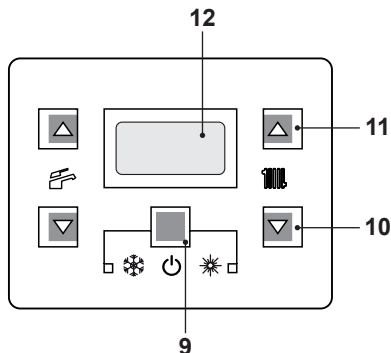


Fig. 8.31

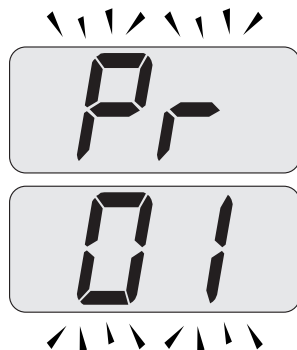


Fig. 8.32

- Press keys 9 and 11 (Fig. 8.31) at the same time until the value of parameter 01 (25=ADVANCE 150V, 26=ADVANCE 180V or 29=ADVANCE 240V) is displayed on the LCD display (Fig. 8.33).

## ADVANCED COMMISSIONING

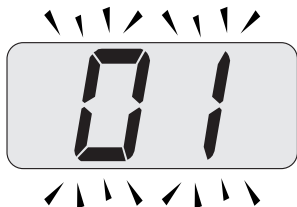


Fig. 8.33

- Press keys 9 and 10 (Fig. 8.31) at the same time to exit without changing the value (return to the parameters list Fig. 8.32).
- Scroll the various parameters using keys 10 or 11 until the letters **Pr** that alternate with code **02** are displayed on the LCD display, indicating that "parameter 02" has been activated.
- Repeat all the above setting sequences in order to visualize the parameters and their values.
- Set the following parameter:

PARAMETER	LCD	VALUE
Pump speed	<b>Pr 03</b>	00
Zone valve setting Room Thermostat / Remote Control	<b>Pr 04</b>	00
NTC on the C.H. return	<b>Pr 18</b>	01
LCD type	<b>Pr 19</b>	02
NTC inlet probe	<b>Pr 29</b>	00

- Press sequentially keys, 9 - 10 and then 11 (Fig. 8.31) and hold in for 10 seconds to exit the "programming mode".

# GAS CONVERSION

## 9 GAS CONVERSION

### 9.1 Warnings

The commissioning of this boiler and system must only be undertaken by a Gas Safe Registered Engineer, qualified to work on Liquefied Petroleum Gas (LPG) in accordance with the requirements of the Gas Safe Installation and Use Regulations.

Components used to adapt it to the type of gas available must be genuine parts only.

Factory setting = Natural gas.

### 9.2 Operations and gas setting



Check that the gas cock mounted on the gas piping to the boiler is closed and that the appliance is not powered.

- Remove the body's front panel and turn the control panel as shown in section "MAINTENANCE" on page 73.
- Unscrew the connector "A" and remove the pipe "B" (Fig. 9.1).

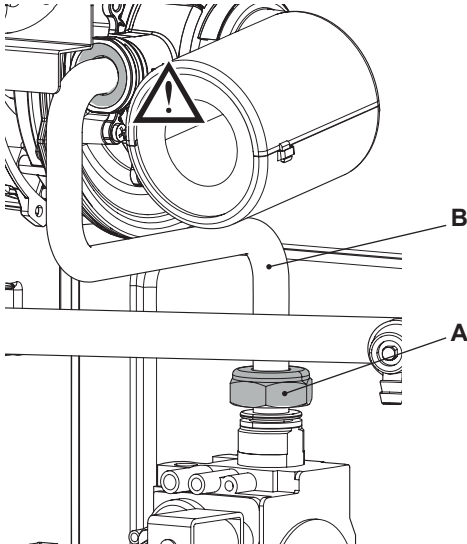


Fig. 9.1

- Carry out gas conversion by correctly replacing the gas restrictor (Fig. 9.2), referring to the section "Technical data ADVANCE 150V" on page 24, "Technical data ADVANCE 180V" on page 27 and "Technical data ADVANCE 240V" on page 30.

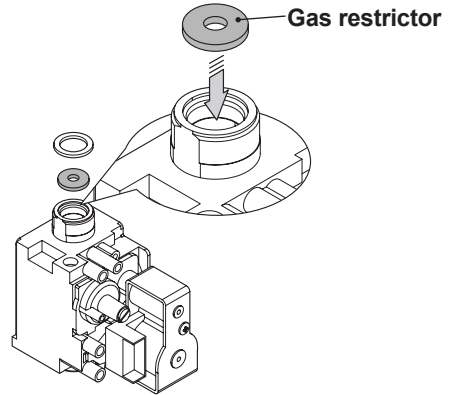


Fig. 9.2



Attention, to reassemble repeat the operations carried out in reverse order. Be careful not to damage the OR gasket of the gas pipe when inserting the pipe in the air/gas mixer. After any service operation on the components of the gas circuit check all the connections for gas tightness.

The boiler is factory set for functioning with Natural gas (G20).

To set the functioning of the boiler with **LPG (G31)** gas, carry out the following settings:

- Enter in "programming mode" by sequentially pressing and holding in keys 9 - 10 - 11 (Fig. 9.3) for 10 seconds until the letters **Pr** that alternate with code **01** are displayed on the LCD display, indicating that "parameter 01" (Fig. 9.4) has been activated.

## GAS CONVERSION

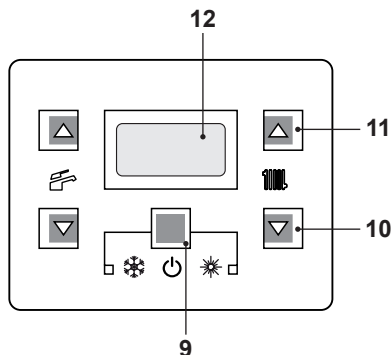


Fig. 9.3



Fig. 9.4

- Scroll the various parameters using keys 10 or 11 until the letters **Pr** that alternate with code **05** are displayed on the LCD display, indicating that "parameter 05" (Fig. 9.5) has been activated.



Fig. 9.5

- Press keys 9 and 11 (Fig. 9.3) at the same time until the value of parameter 05 (00=G20) is displayed on the LCD display (Fig. 9.6).



Fig. 9.6

- By pressing key 11 three times, it is possible to change the value of parameter 05 from **00**=G20 to **05**=G31, which is ok for LPG gas.
- By pressing key 9 (Fig. 9.3) confirmation of the inserted value is obtained.
- Press keys 9 and 10 (Fig. 9.3) at the same time to exit without changing the value (return to the parameters list Fig. 9.5).
- Press sequentially keys, 9 - 10 and then 11 (Fig. 9.3) and hold in for 10 seconds to exit the "programming mode".
- Calibrate the gas valve according to the instructions given in the Service manual, section Gas valve - Adjustment.
- Reposition the controls panel and re-mount the front panel of the body.
- Apply the label indicating the gas nature and pressure value for which the appliance is regulated. The self adhesive label is contained in the transformation kit.

**!** "Warning if during any PCB re programming you disengage the power supply to the boiler you may corrupt the software setup, ensure you wait at least 10 seconds after any re programming before any power isolation event takes place".



# MAINTENANCE

## 10 MAINTENANCE

### 10.1 Warnings

The procedures detailed in this chapter **must be carried out only by a Gas Safe Registered Engineer**. Thus you are advised to contact an Authorised Service Agent.

**For Ireland (IE), the servicing work must be carried out by a competent RGII registered Person.**

For efficient and continuous operation of the boiler you are advised to have, at least once a year, maintenance and cleaning done by an Approved Service Engineer.

**Isolate the appliance from the electricity supply** by turning off the fused spur isolation switch adjacent to the appliance.

**Turn off the gas cock**, before carrying out any procedures, whatsoever, for cleaning, maintenance, opening or dismantling boiler panels.



**Other devices i.e. external controls may lead dangerous voltage inside the appliance as well. Ensure they are isolated. In case of doubt turn off the general system switch.**

The Engineer should complete the Service Interval Record at the back of the manual.

### 10.2 Dismantling the external panels

#### Front panel

• Unscrew screws "A" and remove the front panel "D" by pulling it and pushing it towards the top so that it is freed from the top housings (Fig. 10.1 and Fig. 10.2).

#### Side panels

Loosen screws "B - F" and "C - H" in Fig. 10.1 and remove the two side panels "E"

and "G" by pulling towards the outside.

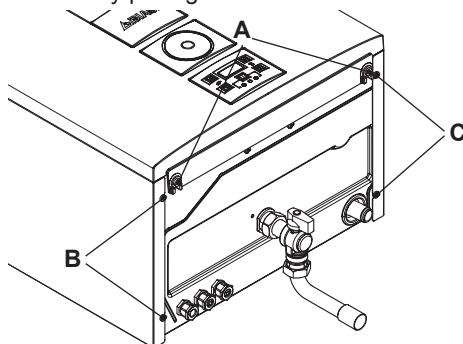


Fig. 10.1

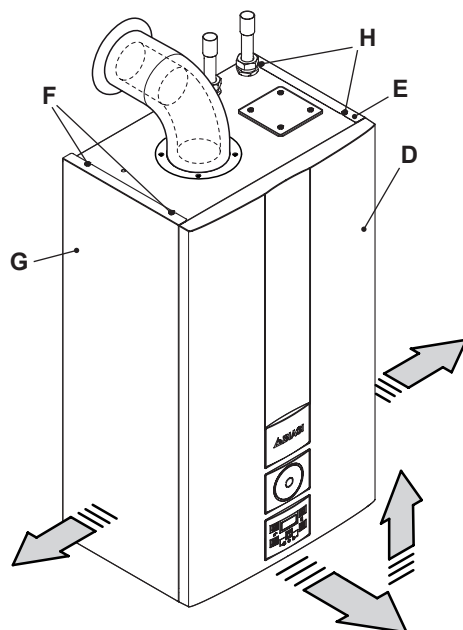


Fig. 10.2

#### Control panel

Turn the controls panel "I", as shown in Fig. 10.3, to access in an optimal manner the components inside the boiler.

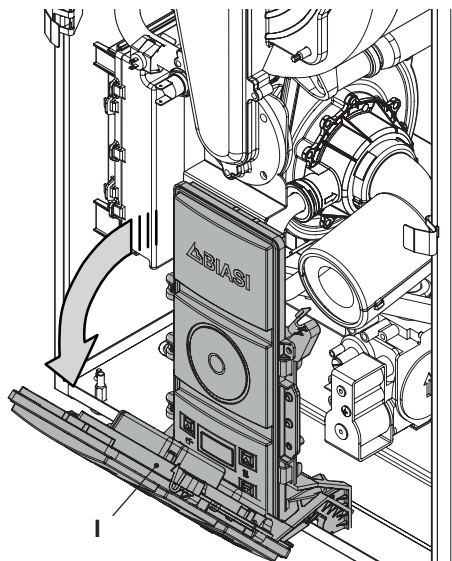


Fig. 10.3

## 10.3 Reassembly the external panels

### Side panels

Fit the external panels "E" and "G" in the reverse order to that described on section "Dismantling the external panels" on page 73.

### Front panel

- Fit the front panel "D", hooking it on the upper side.
- Push the case panel "D" down and in until completely held in place (Fig. 10.4) step 1-2.
- Repeat the same operation on the opposite side of the front panel "D", (Fig. 10.4) step 3-4.
- Ensure that the front panel edge is close-fitting to the side panels.
- Lock in place the panel "D" with the appropriate screws "A" (Fig. 10.1).

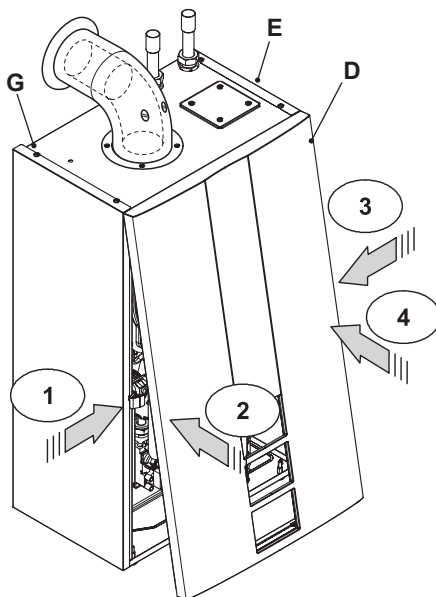


Fig. 10.4

## 10.4 Emptying the C.H. system

- Close the Feed and expansion tank cold water feed valve.
- Loosen the central heating drain cock 13 indicated in Fig. 10.5.

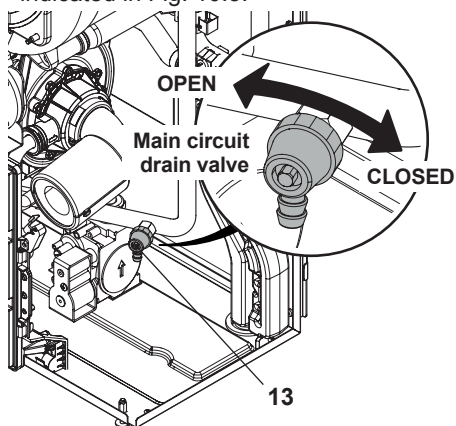


Fig. 10.5

# MAINTENANCE

## 10.5 Cleaning the condensing primary exchanger and the burner

Removing the fan burner unit 21 in Fig. 10.6.

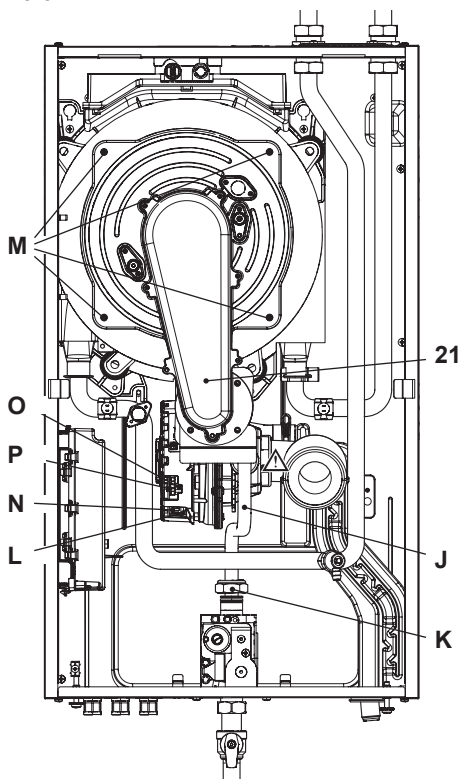


Fig. 10.6

- Remove the front panel and lower the controls panel (see "Dismantling the external panels" on page 73).
- Unscrew the connector "K" and remove the pipe "J".
- Unhook the silencer pipe.
- Insert a flat screwdriver in the connector recess "L" and lever towards the bottom, disconnect the connector at the same time "N" by pulling towards the front (Fig. 10.6).
- Disconnect the fan connector "O" by pressing the plastic hook "P" positioned at the bottom part of the connector (Fig.

10.6).

- Unscrew screws "M" and remove the fan burner unit 21 (Fig. 10.6)
- Extract the burner casing by pulling it outwards.
- The silicon seal on the front wall of the combustion chamber Fig. 10.7 and the seal on the air/gas pipe cover (Fig. 10.8) must be replaced if worn.

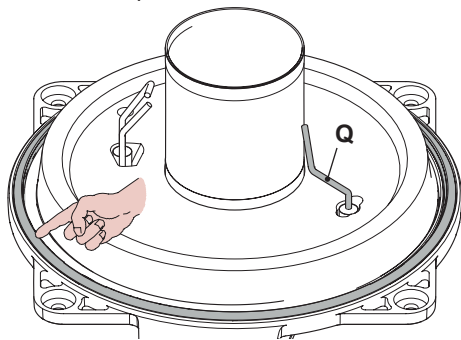


Fig. 10.7

- The detection electrode "Q" in Fig. 10.7 also functions as a sensor for the correct drainage of the condensate. Should the mentioned electrode come into contact with the condensate water present within the combustion chamber it sends the boiler into safety lockout. Therefore, should the insulation be wet or deteriorated, provide for the substitution of the same.

**Remove any limescale from the detection electrode and replace it if worn.**

**Caution:** After any periodical servicing or disturbance the combustion chamber silicon seal Fig. 10.7 and the Air-gas duct gasket (Fig. 10.8) must be fully inspected and replaced at the discretion of the service engineer.

After any disturbance to the chamber door seal the appliance must undergo a full analytical combustion performance check.

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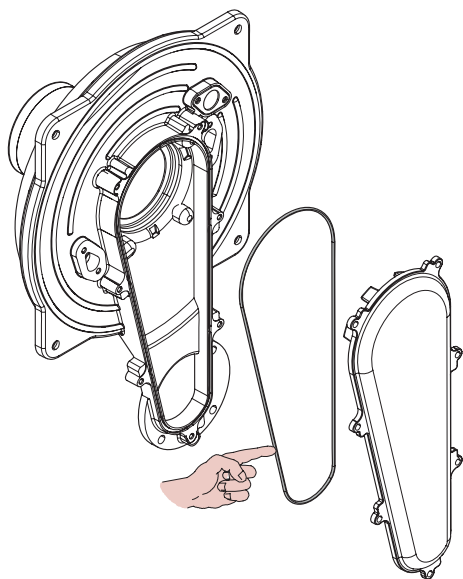


Fig. 10.8

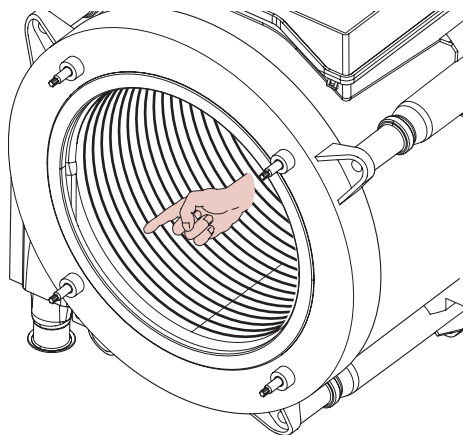


Fig. 10.9

If the condensate primary exchanger elements are dirty (notable only after removing the burner body), brush them using a bristle brush and remove the dirt using a suction device.

The burner does not require any particular maintenance, just remove dust using a bris-

tle brush.  
More specific maintenance will be valued and carried out by a Gas Safe Registered Engineer.

**!** Attention, to reassemble repeat the operations carried out in reverse order. Be careful not to damage the OR gasket of the gas pipe when inserting the pipe in Air box.  
After any service operation on the components of the gas circuit check all the connections for gas leaks.

## 10.6 Check the pressure of the heating expansion vessel (sealed system only)

Drain the heating circuit as described in section "Emptying the C.H. system" on page 74 and check that the expansion vessel pressure is not less than 1 bar. If the pressure is less, see to correct pressurisation.

## 10.7 Checking the flue system

Have the integrity of the flue outlet and air intake pipe, checked periodically, at least once a year. For all the above maintenance operations it is advisable to call an approved Service Engineer.

## 10.8 Combustion analysis check

It is recommended that a combustion analysis check is made. Remove the plug as indicated in Fig. 10.10 and carry out combustion analysis check and adjustment if necessary as described in the section Gas valve - Adjustment of the Service manual.

# MAINTENANCE

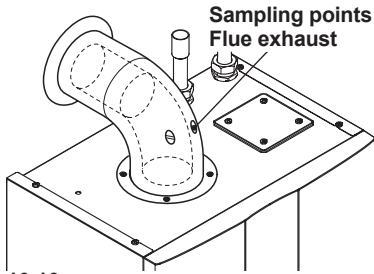


Fig. 10.10

- Make sure that the ambient thermostat is in the position “call for heat”.
- Activate the “flue sweep function” at maximum heating power (see "Setting the boiler flue sweep function" on page 78).
- Check the combustion of the boiler using the outlets located on the flue tubes (Fig. 10.10) and compare the data measured with that following.

Model ADVANCE 150V		
Nominal heat input <sup>(A) (E)</sup>	kW	17,0
Nominal efficiency	%	96,9
Combustion efficiency	%	98,4
Air index	n	1,3
Flue gas CO <sub>2</sub> content	%	9,0 - 9,6
Flue gas O <sub>2</sub> content	%	4,1
Flue gas CO content	ppm	106
Flue gas temperature	°C	68,0

Values refer to tests with a an 80 mm double exhaust split by 1 + 1 m and natural gas G20 and a supply / return heating temperature of 60°/80°C.

Fig. 10.11

Model ADVANCE 180V		
Nominal heat input <sup>(A) (E)</sup>	kW	21,0
Nominal efficiency	%	96,6
Combustion efficiency	%	98,2
Air index	n	1,3
Flue gas CO <sub>2</sub> content	%	9,1 - 9,7
Flue gas O <sub>2</sub> content	%	3,9
Flue gas CO content	ppm	225
Flue gas temperature	°C	69,0

Values refer to tests with a an 80 mm double exhaust split by 1 + 1 m and natural gas G20 and a supply / return heating temperature of 60°/80°C.

Fig. 10.12

Model ADVANCE 240V		
Nominal heat input <sup>(A) (E)</sup>	kW	25,0
Nominal efficiency	%	97,4
Combustion efficiency	%	98,3
Air index	n	1,3
Flue gas CO <sub>2</sub> content	%	9,0 - 9,6
Flue gas O <sub>2</sub> content	%	3,9
Flue gas CO content	ppm	196
Flue gas temperature	°C	73,0

Values refer to tests with a an 80 mm double exhaust split by 1 + 1 m and natural gas G20 and a supply / return heating temperature of 60°/80°C.

Fig. 10.13

The values in the tables are measured at the nominal useful power with factory calibration.

## 10.9 Checking the condensate drain pipe

The condensate drain pipe 27 (Fig. 10.14) does not require any particular maintenance but just check:

- That no solid deposits have formed, if so remove them.
- That the condensate drain piping is not clogged.

# MAINTENANCE

To clean the inside of the siphon, remove it and turn it upside down to remove any dirt.

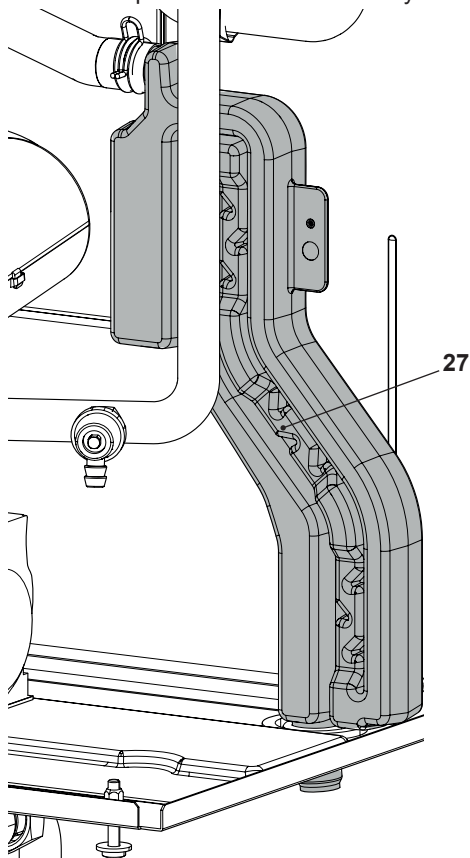


Fig. 10.14

## 10.10 Visual inspection of appliance

Visually inspect all water joints, seals and connections for any evidence of leakage and retighten, grease or replace them as necessary.

## 10.11 Checking the gas supply pressure

Check appliance for gas tightness. Re-check operational pressures as described in section "Checking the gas supply

pressure" on page 58 of this manual.

## 10.12 Water inhibitor concentration

Where chemical products are used the level of water treatment should be checked on an annual basis and re treated after full or partial drain down.

A conductivity meter can be used to check the correct concentration of inhibitor in the heating water.

## 10.13 Setting the boiler flue sweep function

With the boiler set in flue sweep mode, it is possible to exclude some boiler automatic functions making check and control operations easier.

- Enter in "programming mode" by sequentially pressing and holding in keys, 9 - 10 and then 11 (Fig. 10.15) for 10 seconds until the letters **Pr** that alternate with code **01** are displayed on the LCD display, indicating that "parameter 01" (Fig. 10.16) has been activated.

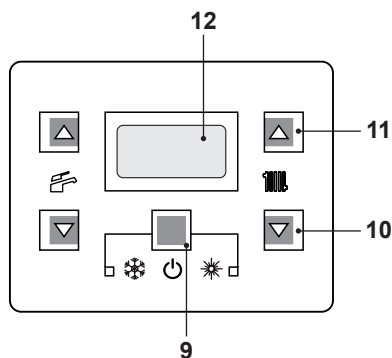


Fig. 10.15



Fig. 10.16

**Flue sweep function at minimum output in domestic hot water mode**

- Press keys 10 and 11 (Fig. 10.15) at the same time until the LCD display displays the letters LP that alternate with the heating water temperature value (e.g.45), indicating the activation of the "flue sweep function" at minimum output (Fig. 10.17).

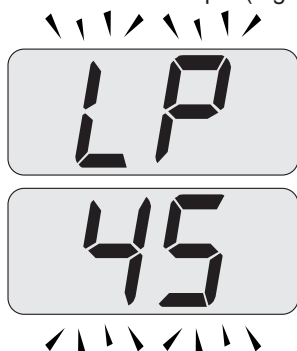


Fig. 10.17

**Flue sweep function at minimum output in heating mode**

- By pressing 11 (Fig. 10.15) it is possible to change power in flue sweep mode: with the letters hP on the LCD display which alternate between the heated water temperature (i.e.32), we are in the "flue sweep function" at the minimum power during heating (Fig. 10.18).



Fig. 10.18

**Flue sweep function at maximum output in heating mode**

- Press key 11 to vary the output in chimney sweep mode: when the LCD display displays the letters cP that alternate with the heating water temperature value (e.g.60), the "flue sweep function" is at maximum (eventually range rated) output in heating mode (Fig. 10.19).



Fig. 10.19

- Press sequentially keys, 9 - 10 and then 11 (Fig. 10.15) and hold in for 10 seconds to exit the "flue sweep mode" and return to the previously set boiler status (Fig. 10.20).



Fig. 10.20

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# MAINTENANCE

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## Note to service engineers

It is required that the burner seal lip seal and mixing chamber seal along with the flame detection electrode are inspected every year and replaced if required.

Failure to inspect the flame detection probe, seals and replace as required may render the guarantee void.



## 11 BENCHMARK COMMISSIONING AND SERVICING SECTION

It is a requirement that the boiler is installed and commissioned to the manufacturers instructions and the data fields on the commissioning checklist completed in full.

To instigate the boiler guarantee the boiler needs to be registered with the manufacturer within one month of the installation.

To maintain the boiler guarantee it is essential that the boiler is serviced annually by a Gas Safe Registered Engineer who has been trained on the boiler installed. The service details should be recorded on the Benchmark Service Interval Record and left with the householder.



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# GAS BOILER SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the boiler as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission according to the manufacturer's instructions and complete this Benchmark Commissioning Checklist will invalidate the warranty. This does not affect the customer's statutory rights.

Customer name:		Telephone number:	
Address:			
Boiler make and model:			
Boiler serial number:			
Commissioned by (PRINT NAME):		Gas Safe register number:	
Company name:		Telephone number:	
Company address:			
		Commissioning date:	
<b>To be completed by the customer on receipt of a Building Regulations Compliance Certificate*</b>			
Building Regulations Notification Number (if applicable):			
<b>CONTROLS</b> (tick the appropriate boxes)			
Time and temperature control to heating	Room thermostat and programmer/timer Load/weather compensation		Programmable room thermostat Optimum start control
Time and temperature control to hot water	Cylinder thermostat and programmer/timer		Combination Boiler
Heating zone valves	Fitted		Not required
Hot water zone valves	Fitted		Not required
Thermostatic radiator valves	Fitted		Not required
Automatic bypass to system	Fitted		Not required
Boiler interlock			Provided
<b>ALL SYSTEMS</b>			
The system has been flushed and cleaned in accordance with BS7593 and boiler manufacturer's instructions			Yes
What system cleaner was used?			
What inhibitor was used?			Quantity litres
Has a primary water system filter been installed?			Yes No
<b>CENTRAL HEATING MODE</b> measure and record:			
Gas rate	m <sup>3</sup> /hr	OR	ft <sup>3</sup> /hr
Burner operating pressure (if applicable)	mbar	OR Gas inlet pressure	mbar
Central heating flow temperature			°C
Central heating return temperature			°C
<b>COMBINATION BOILERS ONLY</b>			
Is the installation in a hard water area (above 200ppm)?			Yes No
If yes, and if required by the manufacturer, has a water scale reducer been fitted?			Yes No
What type of scale reducer has been fitted?			
<b>DOMESTIC HOT WATER MODE</b> Measure and Record:			
Gas rate	m <sup>3</sup> /hr	OR	ft <sup>3</sup> /hr
Burner operating pressure (at maximum rate)	mbar	OR Gas inlet pressure at maximum rate	mbar
Cold water inlet temperature			°C
Hot water has been checked at all outlets			Yes Temperature °C
Water flow rate			l/min
<b>CONDENSING BOILERS ONLY</b>			
The condensate drain has been installed in accordance with the manufacturer's instructions and/or BS5546/BS6798			Yes
<b>ALL INSTALLATIONS</b>			
Record the following:	At max. rate:	CO ppm	AND CO/CO <sub>2</sub> Ratio
	At min. rate: (where possible)	CO ppm	AND CO/CO <sub>2</sub> Ratio
The heating and hot water system complies with the appropriate Building Regulations			Yes
The boiler and associated products have been installed and commissioned in accordance with the manufacturer's instructions			Yes
The operation of the boiler and system controls have been demonstrated to and understood by the customer			Yes
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer			Yes
Commissioning Engineer's Signature			
Customer's Signature			
(To confirm satisfactory demonstration and receipt of manufacturer's literature)			

\*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



# SERVICE RECORD

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

## Service Provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions. Always use the manufacturer's specified spare part when replacing controls.

<b>SERVICE 01</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

<b>SERVICE 02</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

<b>SERVICE 03</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

<b>SERVICE 04</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

<b>SERVICE 05</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

<b>SERVICE 06</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

<b>SERVICE 07</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

<b>SERVICE 08</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

<b>SERVICE 09</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

<b>SERVICE 10</b>				Date:			
Engineer name:							
Company name:							
Telephone No:							
Gas safe register No:							
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub>	%	
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub>	%	
Comments:							
Signature							

\*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.





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