

## Installation and Service Manual

Gas Fired Wall Mounted Condensing Combination Boiler

**EcoBlue Advance Combi**

24 - 28 - 33 - 40

These instructions include the Benchmark Commissioning Checklist and should be left with the user for safe keeping. They must be read in conjunction with the Flue Installation Guide.

## Model Range

### Baxi EcoBlue Advance 24 Combi ErPD

G.C.N° 47-077-14

### Baxi EcoBlue Advance 28 Combi ErPD

G.C.N° 47-077-15

### Baxi EcoBlue Advance 33 Combi ErPD

G.C.N° 47-077-16

### Baxi EcoBlue Advance 40 Combi ErPD

G.C.N° 47-077-17

## Building Regulations and the Benchmark Commissioning Checklist

**Building Regulations (England & Wales) require notification of the installation of a heating appliance to the relevant Local Authority Building Control Department. This can be achieved via a Competent Persons Self Certification Scheme as an option to notifying the Local Authority directly.**

The Health & Safety Executive operates the 'Gas Safe Register', a self-certification scheme for gas heating appliances.

This company is a member of the Benchmark initiative and fully supports the aims of the programme. Its aim is to improve the standards of installation and commissioning of central heating systems in the UK and to encourage the regular servicing of all central heating systems to ensure safety and efficiency.

Building Regulations require that installations should comply with manufacturer's instructions. It is therefore important that the commissioning checklist is completed by the installer. The relevant section of Building Regulations only relates to dwellings. Therefore the checklist only applies if the appliance is being installed in a dwelling or some related structure.

The flowchart opposite gives guidance for installers on the process necessary to ensure compliance with Building Regulations.

### The Benchmark Scheme

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.



ISO 9001  
FM 00866



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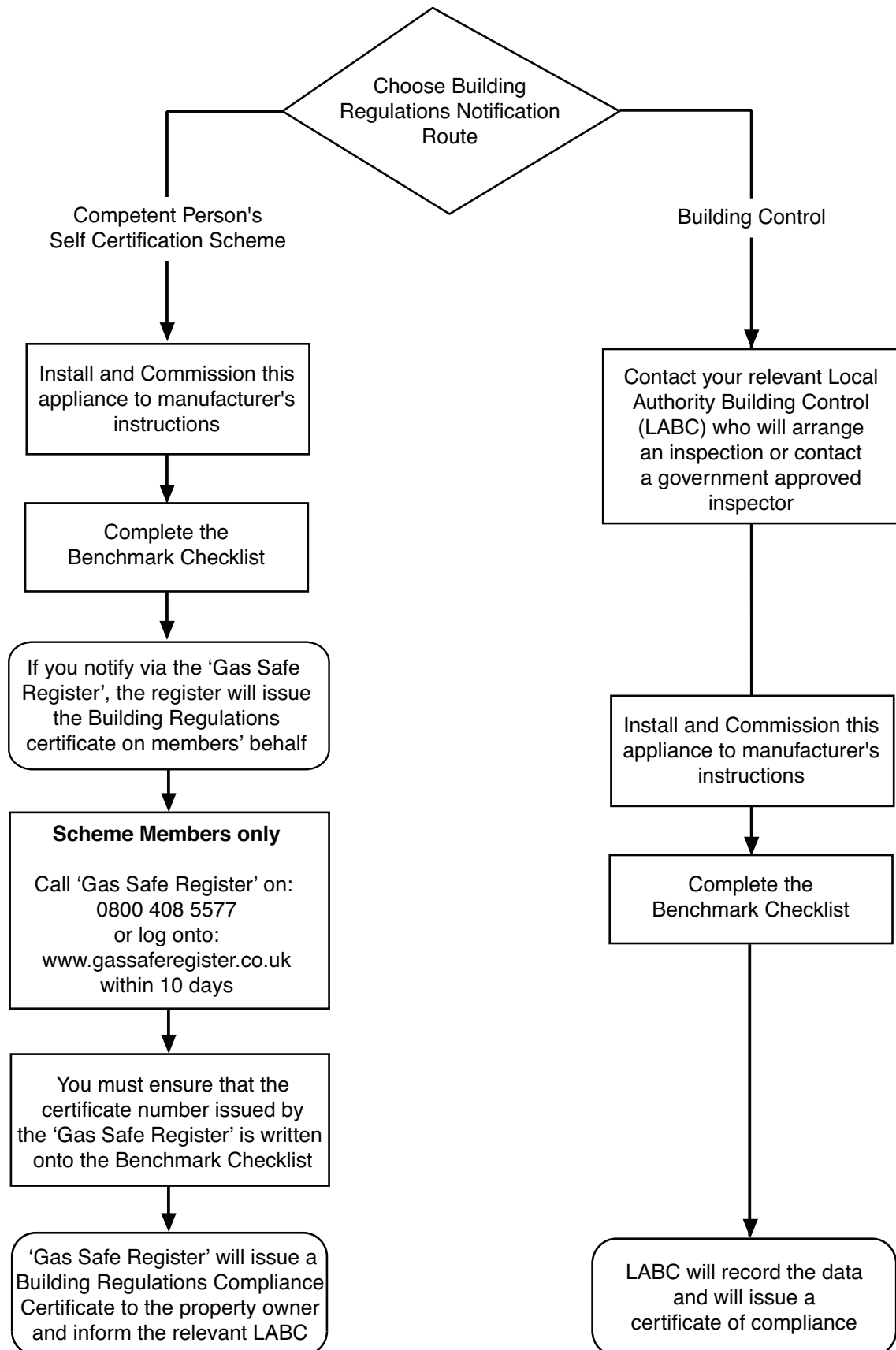
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Full acknowledgement of author and source must be given.

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You have just purchased one of our appliances and we thank you for the trust you have placed in our products. Please note that the product will provide good service for a longer period of time if it is regularly checked and maintained. Our customer support network is at your disposal at all times.

# Installer Notification Guidelines



# Contents

<b>1</b>	<b>Introduction</b> .....	<b>7</b>
1.1	General .....	7
1.2	Additional Documentation .....	7
1.3	Symbols Used .....	8
1.4	Abbreviations .....	8
1.5	Extent of Liabilities .....	9
1.5.1	Manufacturer's Liability .....	9
1.5.2	Installer's Responsibility .....	10
1.6	Homologations .....	10
1.6.1	CE Marking .....	10
1.6.2	Standards .....	11
<b>2</b>	<b>Safety</b> .....	<b>12</b>
2.1	General Safety Instructions .....	12
2.2	Recommendations .....	12
2.3	Specific Safety Instructions .....	13
2.3.1	Handling .....	13
<b>3</b>	<b>Technical Specifications</b> .....	<b>14</b>
3.1	Technical Data .....	14
3.2	Technical Parameters .....	15
3.3	Dimensions and Connections .....	16
3.4	Electrical Diagram .....	17
<b>4</b>	<b>Description of the Product</b> .....	<b>18</b>
4.1	General Description .....	18
4.2	Operating Principle .....	19
4.2.1	Central Heating Mode .....	19
4.2.2	Domestic Hot Water Mode .....	19
4.2.3	Boiler Frost Protection Mode .....	19
4.2.4	Pump Protection .....	19
4.3	Main Components .....	20
4.4	Control Panel Description .....	21
4.5	Standard Delivery .....	22
4.6	Accessories & Options .....	22
4.6.1	Optional Extras .....	22
<b>5</b>	<b>Before Installation</b> .....	<b>23</b>
5.1	Installation Regulations .....	23
5.2	Installation Requirements .....	24
5.2.1	Gas Supply .....	24
5.2.2	Electrical Supply .....	24
5.2.3	Hard Water Areas .....	24
5.2.4	Bypass .....	24
5.2.5	System Control .....	24
5.2.6	Treatment of Water Circulating Systems .....	25
5.2.7	Showers .....	25
5.2.8	Expansion Vessel (CH only) .....	25
5.2.9	Safety Pressure Relief Valve .....	26
5.3	Choice of the Location .....	27
5.3.1	Location of the Appliance .....	27
5.3.2	Data Plate .....	27
5.3.3	Bath & Shower Rooms .....	27
5.3.4	Ventilation .....	27
5.3.5	Condensate Drain .....	28
5.3.6	Clearances .....	30
5.3.7	Flue/Chimney Location .....	31
5.3.8	Horizontal Flue/Chimney Systems .....	33

5.3.9	Flue/Chimney Lengths .....	34
5.3.10	Flue/Chimney Trim .....	34
5.3.11	Terminal Guard .....	34
5.3.12	Flue/Chimney Deflector .....	34
5.3.13	Flue/Chimney Accessories .....	34
5.4	Transport .....	34
5.5	Unpacking & Initial Preparation .....	35
5.5.1	Unpacking .....	35
5.5.2	Initial Preparation .....	35
5.5.3	Flushing .....	35
5.6	Connecting Diagrams .....	36
5.6.1	System Filling and Pressurising .....	36
5.6.2	Domestic Hot Water Circuit .....	36
<b>6</b>	<b>Installation .....</b>	<b>37</b>
6.1	General .....	37
6.2	Assembly .....	37
6.2.1	Fitting the Pressure Relief Discharge Pipe .....	37
6.2.2	Connecting the Condensate Drain .....	38
6.3	Preparation .....	38
6.3.1	Panel Removal .....	38
6.4	Air Supply / Flue Gas Connections .....	39
6.4.1	Connecting the Flue/Chimney .....	39
6.5	Electrical Connections .....	41
6.5.1	Electrical Connections of the Appliance .....	41
6.5.2	Connecting External Devices .....	41
6.6	Filling the Installation .....	41
6.7	External Controls .....	42
6.7.1	Installation of External Sensors .....	42
6.7.2	Optional Outdoor Sensor .....	42
<b>7</b>	<b>Commissioning .....</b>	<b>43</b>
7.1	General .....	43
7.2	Checklist before Commissioning .....	43
7.2.1	Preliminary Electrical Checks .....	43
7.2.2	Checks .....	43
7.3	Commissioning Procedure .....	44
7.3.1	De-Aeration Function .....	44
7.4	Gas Settings .....	44
7.4.1	Check Combustion - 'Chimney Sweep' Mode .....	44
7.5	Configuring the System .....	46
7.5.1	Check the Operational (Working Gas Inlet Pressure & Gas Rate) .....	46
7.6	Final Instructions .....	46
7.6.1	Handover .....	46
7.6.2	System Draining .....	47
<b>8</b>	<b>Operation .....</b>	<b>48</b>
8.1	General .....	48
8.2	To Start-Up .....	48
8.3	To Shutdown .....	48
8.4	Use of the Control Panel .....	49
8.5	Frost Protection .....	49
<b>9</b>	<b>Settings .....</b>	<b>50</b>
9.1	Parameters .....	50

<b>10</b>	<b>Maintenance</b> .....	<b>51</b>
10.1	General .....	51
10.2	Standard Inspection & Maintenance Operation .....	52
10.3	Specific Maintenance Operations Changing Components .....	53
10.3.1	Spark Ignition & Flame Sensing Electrodes .....	53
10.3.2	Fan .....	54
10.3.3	Air / Gas Venturi .....	54
10.3.4	Burner .....	55
10.3.5	Insulation .....	55
10.3.6	Flue Sensor .....	56
10.3.7	Igniter .....	56
10.3.8	Heating Flow & Return Sensors .....	56
10.3.9	Safety Thermostat .....	56
10.3.10	DHW NTC Sensor .....	56
10.3.11	Pump - Head Only .....	57
10.3.12	Pump - Complete .....	57
10.3.13	Automatic Air Vent .....	57
10.3.14	Safety Pressure Relief Valve .....	58
10.3.15	Heating Pressure Gauge .....	58
10.3.16	Plate Heat Exchanger .....	59
10.3.17	Hydraulic Pressure Sensor .....	59
10.3.18	DHW Flow Regulator & Filter .....	60
10.3.19	DHW Flow Sensor ('Hall Effect' Sensor) .....	60
10.3.20	Diverter Valve Motor .....	60
10.3.21	Main P.C.B. .....	61
10.3.22	Boiler Control P.C.B. .....	61
10.3.23	Expansion Vessel .....	62
10.3.24	Gas Valve .....	62
10.3.25	Setting the Gas Valve (CO <sub>2</sub> Check) .....	63
<b>11</b>	<b>Troubleshooting</b> .....	<b>64</b>
11.1	Error Codes .....	64
11.2	Fault Finding .....	64
<b>12</b>	<b>Decommissioning Procedure</b> .....	<b>70</b>
12.1	Decommissioning Procedure .....	70
<b>13</b>	<b>Spare Parts</b> .....	<b>71</b>
13.1	General .....	71
13.2	Spare Parts List .....	71
<b>14</b>	<b>Notes</b> .....	<b>72</b>
	<b>Benchmark Commissioning Checklist</b> .....	<b>74</b>

# 1 Introduction

## Warning

This boiler can be used by children aged 8 years and above and by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge when they have been given supervision or instruction concerning the safe use of the device and understand the resulting risks. Children must not be allowed to play with the appliance. Cleaning and user maintenance must not be carried out by children without supervision.

## 1.1 General



### WARNING

Installation, repair and maintenance must only be carried out only by a competent person. This document is intended for use by competent persons.

All Gas Safe registered engineers carry an ID card with their licence number and a photograph. You can check your engineer is registered by telephoning 0800 408 5500 or online at [www.gassaferegister.co.uk](http://www.gassaferegister.co.uk)

This appliance must be installed in accordance with the manufacturer's instructions and the regulations in force. If the appliance is sold or transferred, or if the owner moves leaving the appliance behind you should ensure that the manual is kept with the appliance for consultation by the new owner and their installer. Read the instructions fully before installing or using the appliance.

**In GB**, this must be carried out by a competent person as stated in the Gas Safety (Installation & Use) Regulations (as may be amended from time to time).

**Definition of competence:** A person who works for a Gas Safe registered company and holding current certificates in the relevant ACS modules, is deemed competent.

**In IE**, this must be carried out by a competent person as stated in I.S. 813 "Domestic Gas Installations".

The addition of anything that may interfere with the normal operation of the appliance without express written permission from the manufacturer or his agent could invalidate the appliance warranty. In GB this could also infringe the Gas Safety (Installation and Use) Regulations.

The appliance is designed as a boiler for use in residential domestic environments on a governed meter supply only. The selection of this boiler is entirely at the owner's risk. If the appliance is used for purposes other than or in excess of these specifications, the manufacturer will not accept any liability for resulting loss, damage or injury.

**The manufacturer will not accept any liability whatsoever for loss, damage or injury arising as a result of failure to observe the instructions for use, maintenance and installation of the appliance.**



### WARNING

Check the information on the data plate is compatible with local supply conditions.

## 1.2 Additional Documentation

These Installation & Service Instructions must be read in conjunction with the Flue Installation Guide supplied in the Literature Pack.

Various timers, external controls, etc. are available as optional extras. Full details are contained in the relevant sales literature.

## 1.3 Symbols Used

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In these instructions, various levels are employed to draw the user's attention to particular information. In so doing, we wish to safeguard the user's safety, prevent hazards and guarantee correct operation of the appliance. Each level is accompanied by a warning triangle



### **DANGER**

Risk of a dangerous situation causing serious physical injury.



### **WARNING**

Risk of a dangerous situation causing slight physical injury.



### **CAUTION**

Risk of material damage.



Signals important information .



Signals a referral to other instructions or other pages in the instructions.

## 1.4 Abbreviations

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- ▶ **DHW:** Domestic hot water
- ▶ **CH:** Central heating
- ▶ **GB:** Great Britain
- ▶ **IE:** Ireland
- ▶ **BS:** British standard
- ▶ **HHIC:** Heating and Hotwater Industry Council
- ▶ **Pn:** Nominal output
- ▶ **Pnc:** Condensing output
- ▶ **Qn:** Nominal heat input
- ▶ **Qnw:** Nominal domestic hot water heat input
- ▶ **Hs:** Gross calorific value




## 1.5 Extent of Liabilities

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### 1.5.1 Manufacturer's Liability

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Our products are manufactured in compliance with the requirements of the various European applicable Directives. They are therefore delivered with  marking and all relevant documentation. In the interest of customers, we are continuously endeavouring to make improvements in product quality. All the specifications stated in this document are therefore subject to change without notice.

The manufacturer will not accept any liability for loss, damage or injury arising as a result of:-

- ▶ Failure to abide by the instructions on using the appliance.
- ▶ Failure to regularly maintain the appliance, or faulty or inadequate maintenance of the appliance.
- ▶ Failure to abide by the instructions on installing the appliance.

**This company declares that no substances harmful to health are contained in the appliance or used during appliance manufacture.**

The appliance is suitable only for installation in GB and IE and should be installed in accordance with the rules in force, and only used in a suitably ventilated location.

**In GB**, the installation must be carried out by a Gas Safe Registered Installer. It must be carried out in accordance with the current and relevant requirements of legislation and guidance including the:-

- Gas Safety (Installation & Use) Regulations.
- The appropriate Building Regulations either The Building Regulations, The Building Regulations (Scotland), Building Regulations (Northern Ireland).
- The Water Fittings Regulations or Water Byelaws in Scotland.
- The Current I.E.E. Wiring Regulations.

Where no specific instructions are given, reference should be made to the relevant British Standard Code of Practice.

**In IE**, the installation must be carried out by a competent person and installed in accordance with the current edition of I.S. 813 'Domestic Gas Installations', the current Building Regulations and reference should be made to the current ETCl rules for electrical installation.

**Prior to commissioning all systems must be thoroughly flushed and treated with inhibitor (see section 5.2.6). Failure to do so will invalidate the appliance warranty.**

Incorrect installation could invalidate the warranty and may lead to prosecution.

## 1.5.2 Installer's Responsibility

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The installer is responsible for the installation and initial start up of the appliance. The installer must adhere to the following instructions:

- ▶ Read and follow the instructions given in the manuals provided with the appliance.
- ▶ Carry out installation in compliance with the prevailing legislation and standards.
- ▶ Ensure the system is flushed and inhibitor added.
- ▶ Install the flue/chimney system correctly ensuring it is operational and complies with prevailing legislation and standards, regardless of location of the boiler's installation.
- ▶ Only the installer should perform the initial start up and carry out any checks necessary.
- ▶ Explain the installation to the user.
- ▶ Complete the Benchmark Commissioning Checklist - this is a condition of the warranty !
- ▶ Warn the user of the obligation to check the appliance and maintain it in good working order.
- ▶ Give all the instruction manuals to the user.

## 1.6 Homologations

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### 1.6.1 CE Marking

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#### EC - Declaration of Conformity

Baxi Heating UK Limited being the manufacturer / distributor within the European Economic Area of the following:-

Baxi EcoBlue Advance 24 - 28 - 33 - 40 Combi ErPD

declare that the above is in conformity with the provisions of the Council Directive

2009/142/EC 92/42/EEC 2004/108/EC 2006/95/EC  
2009/125/EC 2010/30/EU

and has been subject to the following conformity procedures laid down in

Annex 2 - Article 3 of 2009/142/EC

under the supervision of the British Standards Institution, a Notified Body authorized by the United Kingdom Competent Authority, and carrying the Notified Body Number 0086.

Type test for purpose of Regulation 5 certified by:  
Notified Body 0085.

Product/Production certified by:  
Notified Body 0086.

For GB/IE only.

## 1.6.2 Standards

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### Codes of Practice - refer to the most recent version

In GB the following Codes of Practice apply:

Standard	Scope
BS 6891	Gas Installation.
BS 5546	Installation of hot water supplies for domestic purposes.
BS EN 12828	Heating systems in buildings.
BS EN 12831	Heating systems in buildings - Calculation of load.
BS EN 14336	Installation & commissioning of water based heating systems.
BS 6798	Installation of gas fired hot water boilers.
BS 5440 Part 1	Flues.
BS 5440 Part 2	Ventilation.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.
BS 4814	Specification for Expansion Vessels using an internal diaphragm, for sealed hot water systems.
IGE/UP/7/1998	Guide for gas installations in timber framed housing.

In IE the following Codes of Practice apply:

Standard	Scope
I.S. 813	Domestic Gas Installations.
The following standards give valuable additional information;	
BS 5546	Installation of hot water supplies for domestic purposes.
BS EN 12828	Heating systems in buildings.
BS EN 12831	Heating systems in buildings - Calculation of load.
BS EN 14336	Installation & commissioning of water based heating systems.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.

## 2 Safety

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### 2.1 General Safety Instructions

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#### DANGER

If you smell gas:

1. Turn off the gas supply at the meter
2. Open windows and doors in the hazardous area
3. Do not operate light switches
4. Do not operate any electrical equipment
5. Do not use a telephone in the hazardous area
6. Extinguish any naked flame and do not smoke
7. Warn any other occupants and vacate the premises
8. Telephone the National Gas Emergency Service on:- 0800 111 999

### 2.2 Recommendations

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#### WARNING

Installation, repair and maintenance must be carried out by a **Gas Safe Registered Engineer** (in accordance with prevailing local and national regulations).

When working on the boiler, always disconnect the boiler from the mains and close the main gas inlet valve.

After maintenance or repair work, check the installation to ensure that there are no leaks.



#### CAUTION

The boiler should be protected from frost.

Only remove the casing for maintenance and repair operations. Replace the casing after maintenance and repair operations.

## 2.3 Specific Safety Instructions

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### 2.3.1 Handling

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#### General

- The following advice should be adhered to, from when first handling the boiler to the final stages of installation, and also during maintenance.
- Most injuries as a result of inappropriate handling and lifting are to the back, but all other parts of the body are vulnerable, particularly shoulders, arms and hands. Health & Safety is the responsibility of EVERYONE.
- There is no 'safe' limit for one man - each person has different capabilities. The boiler should be handled and lifted by TWO PEOPLE.
- Do not handle or lift unless you feel physically able.
- Wear appropriate Personal Protection Equipment e.g. protective gloves, safety footwear etc.

#### Preparation

- Co-ordinate movements - know where, and when, you are both going.
- Minimise the number of times needed to move the boiler - plan ahead.
- Always ensure when handling or lifting the route is clear and unobstructed. If possible avoid steps, wet or slippery surfaces, unlit areas etc. and take special care on ladders/into lofts.

#### Technique

- 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 sideways 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. See the 'Installation' section of these instructions for recommended lift points.

#### Remember

- The circumstances of each installation are different. Always assess the risks associated with handling and lifting according to the individual conditions.
- If at any time when installing the boiler you feel that you may have injured yourself STOP !! DO NOT 'work through' the pain - you may cause further injury.

**IF IN ANY DOUBT DO NOT HANDLE OR LIFT THE BOILER - OBTAIN ADVICE OR ASSISTANCE BEFORE PROCEEDING !**

### 3 Technical Specifications

#### 3.1 Technical Data

<b>Appliance Type</b>	C <sub>13</sub>	C <sub>33</sub>	C <sub>53</sub>
<b>Appliance Category</b>	CAT I <sub>2H</sub>		
<b>Heat Input CH Qn Hs (Gross)</b>			
		Max	Min
24 model	kW	22.2	5.2
28 model	kW	26.6	6.3
33 model	kW	31.1	7.6
40 model	kW	35.5	8.9
<b>Heat Output CH Pn (Non-Condensing)</b>			
		Max	Min
24 model	kW	20.0	4.6
28 model	kW	24.0	5.5
33 model	kW	28.0	6.6
40 model	kW	32.0	7.8
<b>Heat Output CH Pnc (Condensing)</b>			
		Max	Min
24 model	kW	21.2	4.9
28 model	kW	25.3	6.0
33 model	kW	29.6	7.1
40 model	kW	33.9	8.4
<b>Heat Input DHW Qnw Hs (Gross)</b>			
		Max	
24 model	kW	27.4	
28 model	kW	32.1	
33 model	kW	37.8	
40 model	kW	45.8	
<b>Heat Output DHW</b>			
		Max	
24 model	kW	24.0	
28 model	kW	28.0	
33 model	kW	33.0	
40 model	kW	40.0	
<b>Gas Nozzle Injector</b>			
24 model	mm	Ø 5.0	
28 model	mm	Ø 5.6	
33 model	mm	Ø 6.6	
40 model	mm	Ø 6.6	
<b>NO<sub>x</sub> Class</b>	5		
<b>Temperatures</b>			
C.H. Flow Temp (adjustable)	25°C to 80°C max (± 5°C)		
D.H.W. Flow Temp (adjustable)	40°C to 60°C max (± 5°C) dependent upon flow rate		
<b>Weights</b>			
	<b>(24/28 model)</b>		
Packaged Boiler Carton	42.3kg		
Installation Lift Weight	36kg		
	<b>(33 model)</b>		
Packaged Boiler Carton	44.3kg		
Installation Lift Weight	38kg		
	<b>(40 model)</b>		
Packaged Boiler Carton	45.3kg		
Installation Lift Weight	39kg		

**Electrical Supply** 230V~ 50Hz  
(Appliance must be connected to an earthed supply)

<b>Power Consumption</b>		
24 model	W	85
28 model	W	90
33 model	W	95
40 model	W	100

**Electrical Protection**  
IPX5D (without integral timer)  
IP20 (with integral timer)

**External Fuse Rating** 3A

**Internal Fuse Rating** F2L

**Condensate Drain**  
To accept 21.5mm (3/4 in) plastic waste pipe

<b>Flue Terminal Dimensions</b>	Diameter	100mm
	Projection	125mm

<b>Connections</b>	copper tails	
Gas Inlet	-	22mm
Heating Flow	-	22mm
Heating Return	-	22mm
Cold Water Inlet	-	15mm
Hot Water Outlet	-	15mm
Pressure Relief Discharge	-	15mm

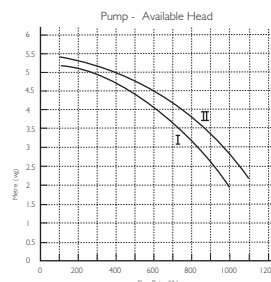
<b>Outercase Dimensions</b>		
Casing Height	-	763mm
Overall Height Inc Flue Elbow	-	923mm
Casing Width	-	450mm
Casing Depth	-	345mm

<b>Clearances</b>	
Above Casing	175 mm Min
Below Casing	150 mm* Min
Front	450 mm Min (For Servicing)
Front	5 mm Min (In Operation)
L.H. Side	5 mm Min
R.H. Side	5 mm Min

\*This is MINIMUM recommended dimension. Greater clearance will aid installation and maintenance.

**NOTE:** All data in this section are nominal values and subject to normal production tolerances.

**Pump**  
Available Head See graph below



**Central Heating Primary Circuit Pressures**

	bar
Safety Discharge	3
Max Operating	2.5
Min Operating	0.5
Recommended Operating Range	1-2

<b>DHW Circuit Pressures</b>	bar
Max Operating	8
Min Operating	0.15

<b>Flow Rates</b>	(24)	(28)	(33)	(40)
	l/min	l/min	l/min	l/min
DHW Flow Rate @ 30°C Rise	10.9	12.9	15.3	18.3
DHW Flow Rate @ 35°C Rise	9.8	11.5	13.5	16.4
Min Working DHW Flow Rate	2	2	2	2

Where Low Flow Taps or Fittings are intended to be used in the DHW system connected to a Baxi EcoBlue Advance Combi it is strongly recommended that the DHW flow rate DOES NOT fall below 2.5 l/min. This will ensure reliable operation of the DHW function.

**Expansion Vessel - (For Central Heating only. Integral with appliance)**

	bar
Min Pre-charge Pressure	1.0
	(24 & 28) (33 & 40)
	litre litre
Max Capacity of CH System	125 155
Primary Water Content of Boiler (unpressurised)	2.5 2.5

#### NATURAL GAS ONLY !

<b>Max Gas Rate</b> (Natural Gas - G20) (After 10 mins)	
24 model	m <sup>3</sup> /h 2.61
28 model	m <sup>3</sup> /h 3.05
33 model	m <sup>3</sup> /h 3.59
40 model	m <sup>3</sup> /h 4.35

**Dynamic (nominal) Inlet Pressure** (Natural Gas - G20)  
mbar 20  
with a CV of 37.78 MJ/m<sup>3</sup>

#### Product Characteristics Database (SEDBUK)

**SAP 2009 Annual Efficiency is 89%**

This 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 has been certified by 0085.

## 3.2 Technical Parameters

Technical parameters for boiler combination heaters

<b>Baxi EcoBlue Advance Combi ErPD</b>			<b>24</b>	<b>28</b>	<b>33</b>	<b>40</b>
Condensing boiler			Yes	Yes	Yes	Yes
Low-temperature boiler <sup>(1)</sup>			No	No	No	No
B1 boiler			No	No	No	No
Cogeneration space heater			No	No	No	No
Combination heater			Yes	Yes	Yes	Yes
<b>Rated heat output</b>	$P_{rated}$	kW	20	24	28	32
Useful heat output at rated heat output and high temperature regime <sup>(2)</sup>	$P_4$	kW	20.0	24.0	28.0	32.0
Useful heat output at 30% of rated heat output and low temperature regime <sup>(1)</sup>	$P_1$	kW	6.7	8.0	9.4	10.7
<b>Seasonal space heating energy efficiency</b>	$\eta_s$	%	93	93	93	93
Useful efficiency at rated heat output and high temperature regime <sup>(2)</sup>	$\eta_4$	%	88.0	87.9	88.0	87.9
Useful efficiency at 30% of rated heat output and low temperature regime <sup>(1)</sup>	$\eta_1$	%	98.0	98.0	98.1	98.0
<b>Auxiliary electricity consumption</b>						
Full load	$el_{max}$	kW	0.030	0.035	0.040	0.040
Part load	$el_{min}$	kW	0.014	0.014	0.014	0.014
Standby mode	$P_{SB}$	kW	0.003	0.003	0.003	0.003
<b>Other items</b>						
Standby heat loss	$P_{stby}$	kW	0.035	0.035	0.040	0.045
Ignition burner power consumption	$P_{ign}$	kW	-	-	-	-
Annual energy consumption	$Q_{HE}$	kWh GJ	17204 62	20645 74	24086 87	27527 99
Sound power level, indoors	$L_{WA}$	dB	51	52	53	55
Emissions of nitrogen oxides	$NO_x$	mg/kWh	22	20	24	24
<b>Domestic hot water parameters</b>						
<b>Declared load profile</b>			XL	XL	XXL	XXL
Daily electricity consumption	$Q_{elec}$	kWh	0.151	0.168	0.215	0.172
Annual electricity consumption	$AEC$	kWh	33	37	47	38
<b>Water heating energy efficiency</b>	$\eta_{wh}$	%	90	88	86	85
Daily fuel consumption	$Q_{fuel}$	kWh	21.340	21.980	27.850	28.570
Annual fuel consumption	$AFC$	GJ	16	17	22	23
(1) 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).						
(2) High temperature regime means 60°C return temperature at heater inlet and 80°C feed temperature at heater outlet.						

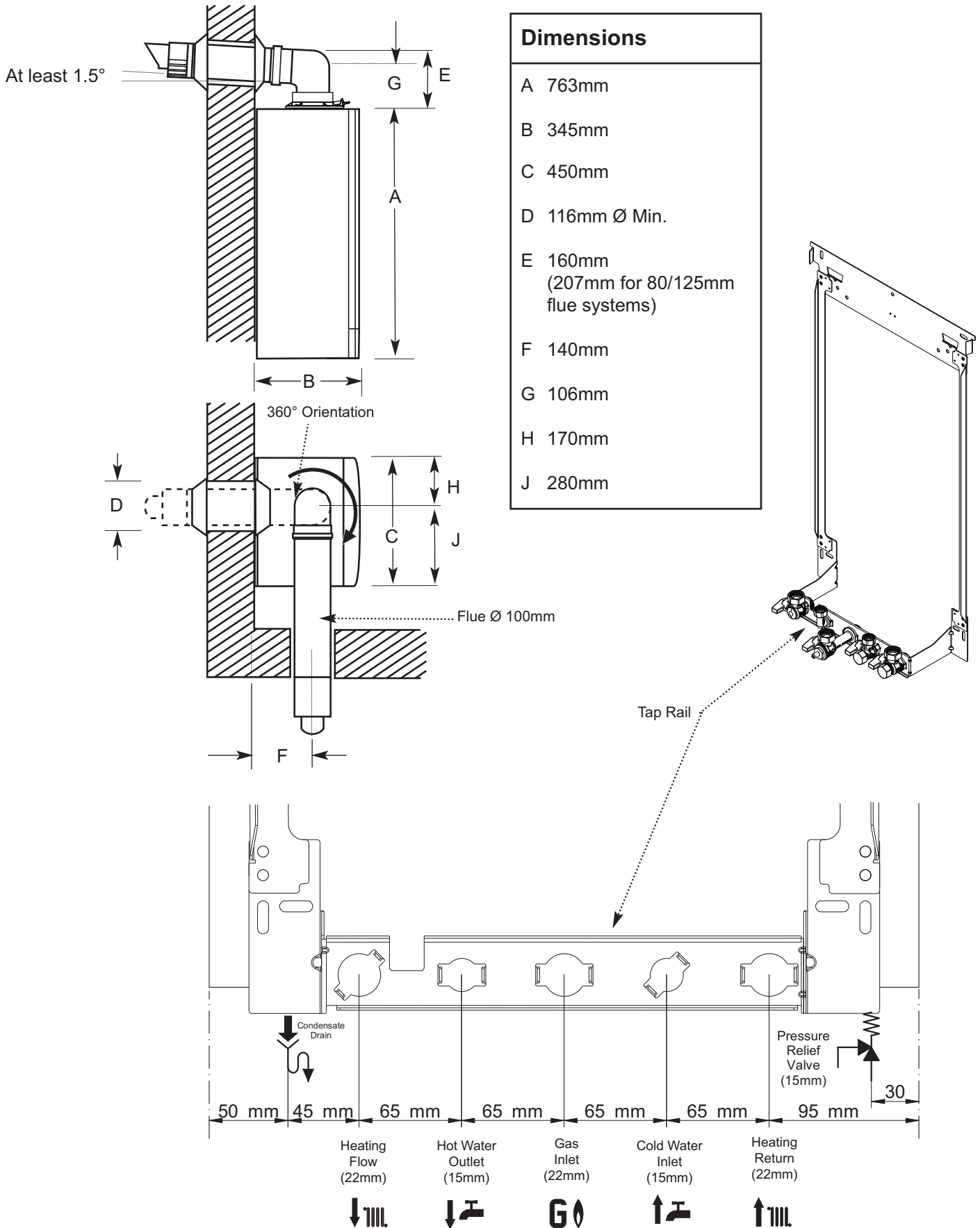


**See**

The back cover for contact details.

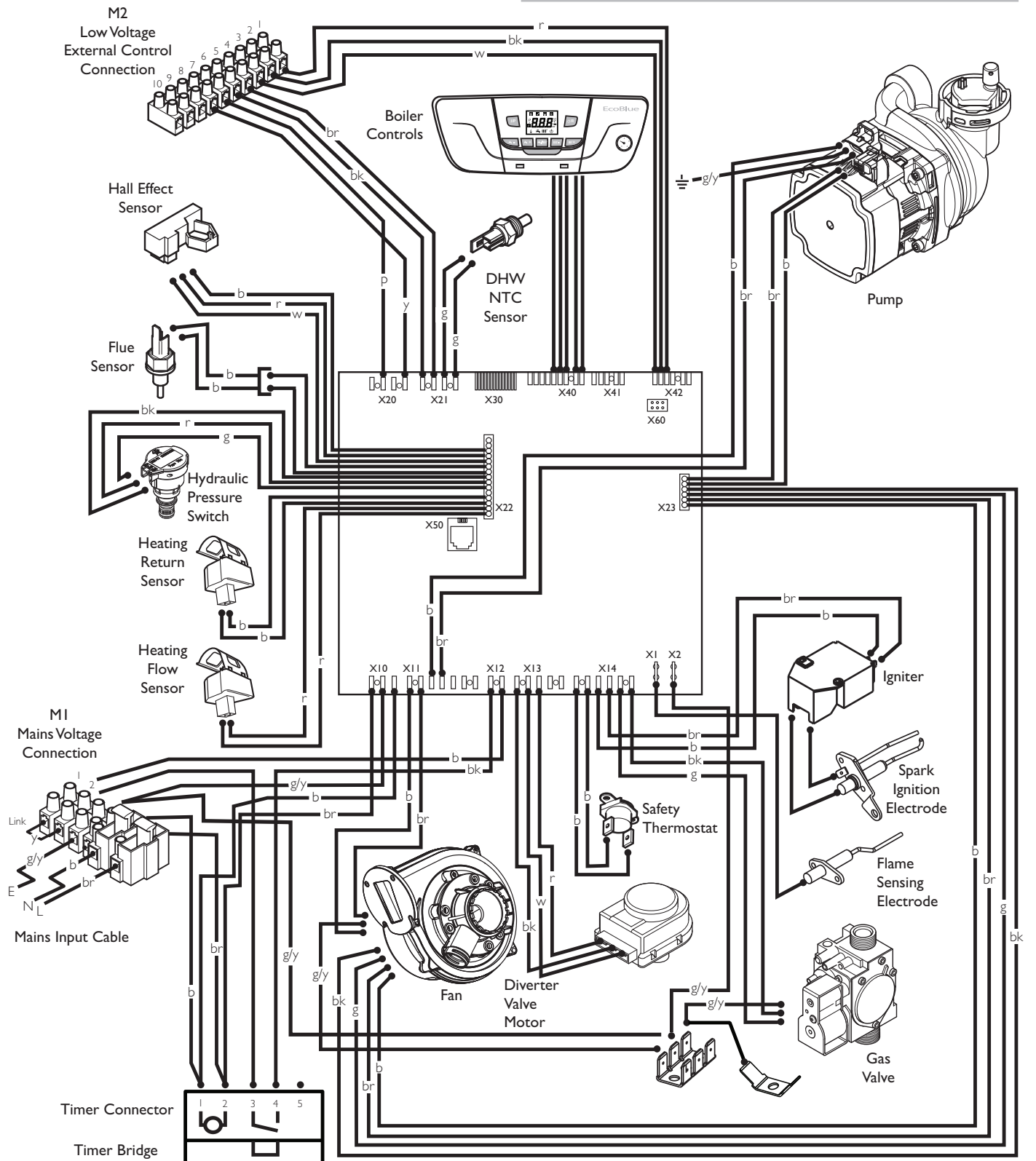
### 3.3 Dimensions and Connections

There must be no part of the air duct (white tube) visible outside the property.





### 3.4 Electrical Diagram



#### Key To Wiring Colours

- |            |                    |
|------------|--------------------|
| b - Blue   | r - Red            |
| bk - Black | g - Green          |
| br - Brown | g/y - Green/Yellow |
| w - White  | y - Yellow         |
| gr - Grey  | p - Purple         |

## 4 Description of the Product

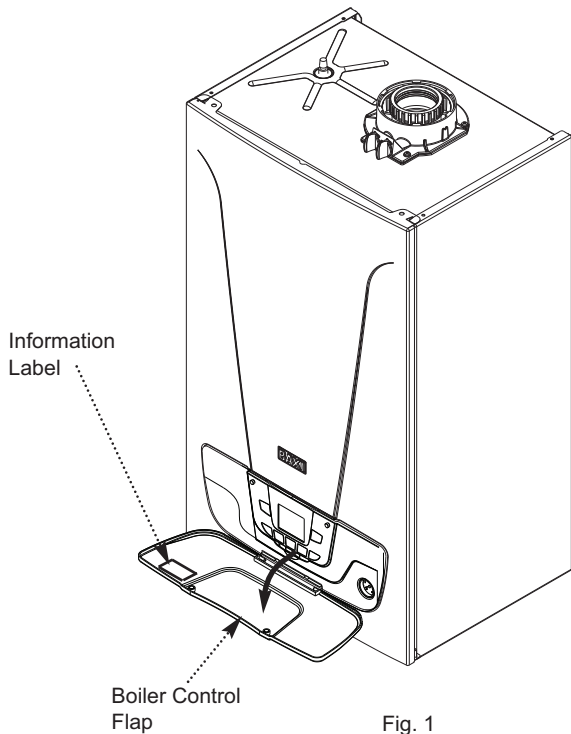


Fig. 1

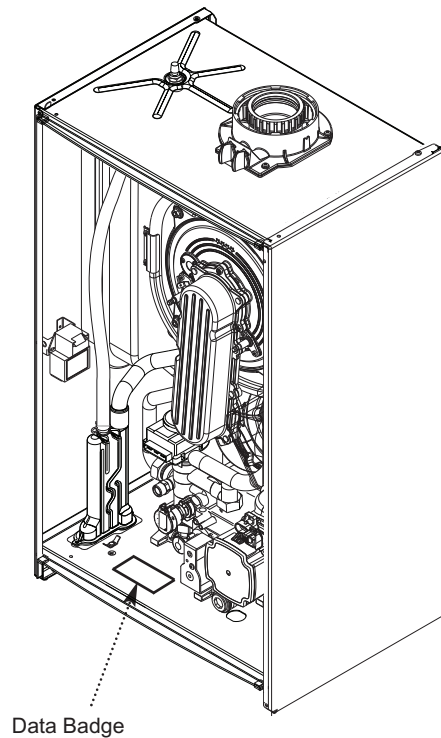


Fig. 2

Control Box removed for clarity

### 4.1 General Description

1. The Baxi EcoBlue Advance Combi boilers are fully automatic gas fired wall mounted condensing combination boilers. They are room sealed and fan assisted, and will serve central heating and mains fed domestic hot water.

2. The boiler is set to give a maximum output of :-

24 model -	24 kW DHW 21.2 kW CH Pnc (Condensing)
28 model -	28 kW DHW 25.3 kW CH Pnc (Condensing)
33 model -	33 kW DHW 29.6 kW CH Pnc (Condensing)
40 model -	40 kW DHW 33.8 kW CH Pnc (Condensing)

3. The boiler is factory set for use on Natural Gas (G20).

4. The boiler is suitable for use only on fully pumped sealed heating systems. Priority is given to domestic hot water.

5. The boiler data badge gives details of the model, serial number and Gas Council number and is situated on the boiler lower panel. It is visible when the control box is lowered (Fig. 2).

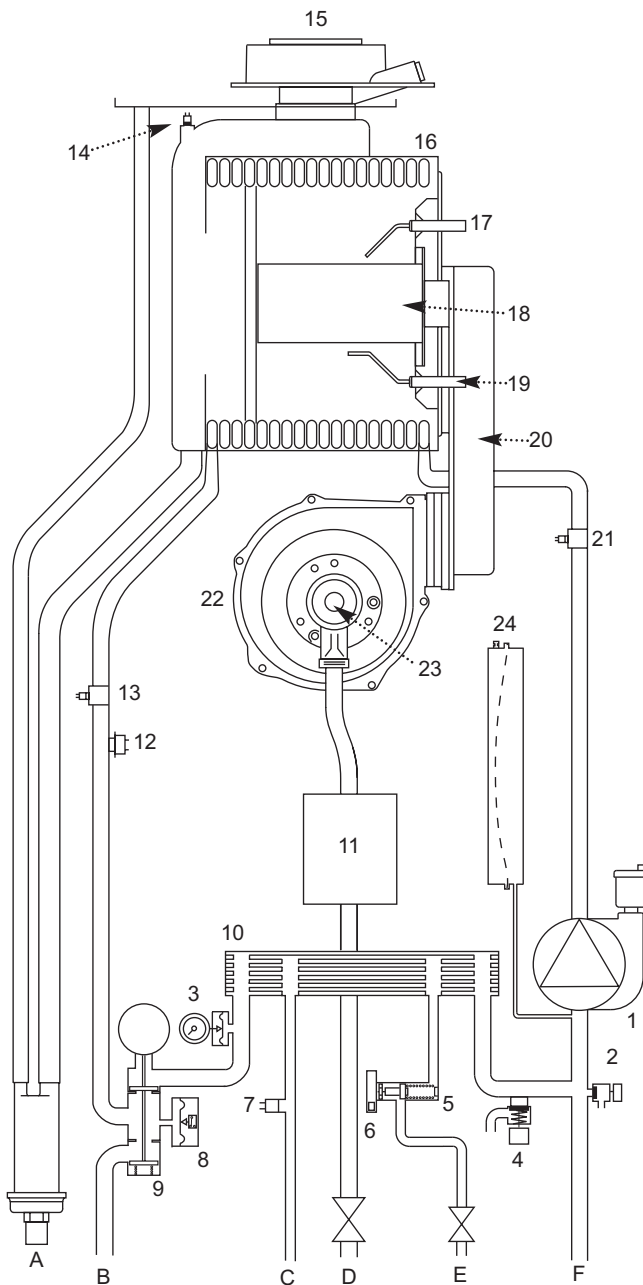
6. The boiler model, serial number and Gas Council number are also shown on the information label behind the boiler control flap (Fig. 1). This is for user reference.

7. The boiler is intended to be installed in residential/domestic environments on a governed meter supply only.

8. The boiler must be installed with one of the purpose designed flues such as one of the standard horizontal telescopic flue kits detailed in the Flue Installation Guide.

**i** All systems must be thoroughly cleansed, flushed and treated with inhibitor (see section 5.2.6).

**👉** These Installation & Servicing Instructions MUST be read in conjunction with the Flue Installation Guide supplied in the Literature Pack.



### Boiler Schematic Layout


#### Key

- |  |                                |
|--|--------------------------------|
| 1. Pump with Automatic Air Vent                              | 12. Safety Thermostat (105° C) |
| 2. Boiler Drain Tap  | 13. Heating Flow Sensor        |
| 3. Pressure Gauge  | 14. Flue Sensor                |
| 4. Safety Pressure Relief Valve                              | 15. Boiler Adaptor             |
| 5. DHW Flow Sensor/Filter/Restrictor                         | 16. Primary Heat Exchanger     |
| 6. Domestic Hot Water Priority Sensor ('Hall Effect' Sensor) | 17. Spark Ignition Electrode   |
| 7. Domestic Hot Water NTC Sensor                             | 18. Burner                     |
| 8. Hydraulic Pressure Switch                                 | 19. Flame Sensing Electrode    |
| 9. Three Way Valve & Motor                                   | 20. Air/Gas Collector          |
| 10. Plate Heat Exchanger                                     | 21. Heating Return Sensor      |
| 11. Gas Valve  | 22. Fan                        |
|  | 23. Air/Gas Venturi            |
|  | 24. Expansion Vessel           |

#### Connections:-

- A – Condensate Drain
- B – Heating Flow
- C – Domestic Hot Water Outlet
- D – Gas Inlet
- E – Cold Water Inlet On/Off Valve and filter
- F – Heating Return

## 4.2 Operating Principle

The boiler can be set in 3 operating modes:- 'Summer' (DHW only), 'Winter' (CH & DHW) or 'Heating Only' (CH only) by use of the  button.


### 4.2.1 Central Heating Mode

1. With a demand for heating, the pump circulates water through the primary circuit.
2. Once the burner ignites the fan speed controls the gas rate to maintain the heating temperature measured by the temperature sensor.
3. When the flow temperature exceeds the setting temperature, a 3 minute delay occurs before the burner relights automatically (anti-cycling). The pump continues to run during this period.
4. When the demand is satisfied the burner is extinguished and the pump continues to run for a period of 3 minutes (pump overrun).

### 4.2.2 Domestic Hot Water Mode

1. Priority is given to the domestic hot water supply. A demand at a tap or shower will override any central heating requirement.
2. The flow of water will operate the DHW Sensor (Hall Effect Sensor) which requests the 3 way valve to change position. This will allow the pump to circulate the primary water through the DHW plate heat exchanger.
3. The burner will light automatically and the temperature of the domestic hot water is controlled by the temperature sensor.
4. When the domestic hot water demand ceases the burner will extinguish and the diverter valve will remain in the domestic hot water mode, unless there is a demand for central heating.

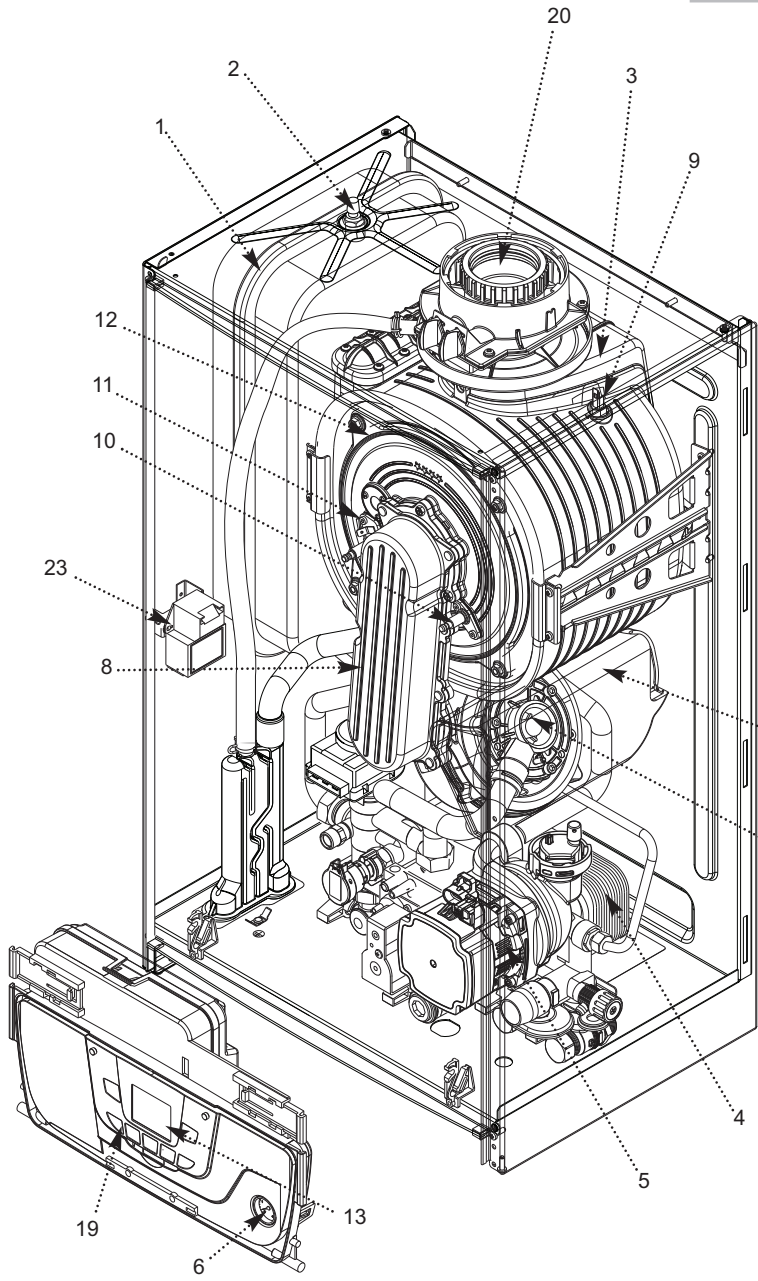
### 4.2.3 Boiler Frost Protection Mode

1. The frost protection mode is integral to the appliance and functions as long as there is power to the boiler, as indicated by the standby signal .
2. With CH & DHW or CH only selected, when the boiler temperature falls below 5°C the boiler will fire until a temperature of 30°C is reached.
3. If DHW only is selected, when the boiler CH temperature falls below 5°C the boiler will fire until a temperature of 30°C is reached. When the boiler DHW temperature falls below 5°C the boiler will fire until a temperature of 7°C is reached.
4. Further protection can be incorporated by using a system frost thermostat.

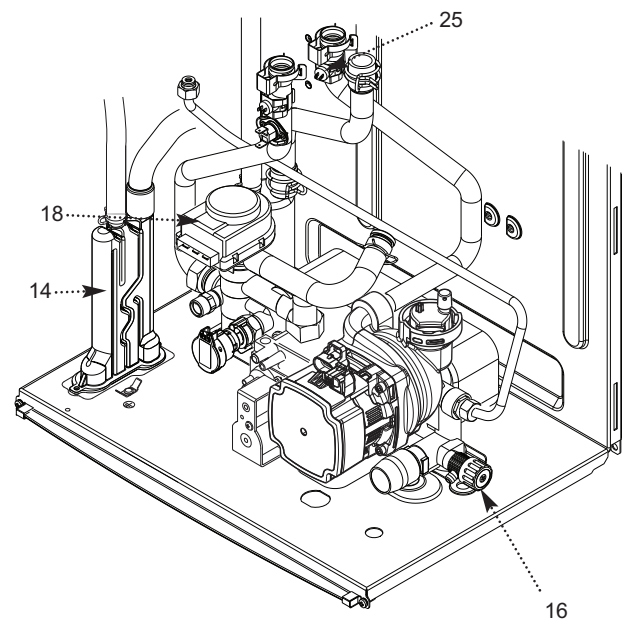
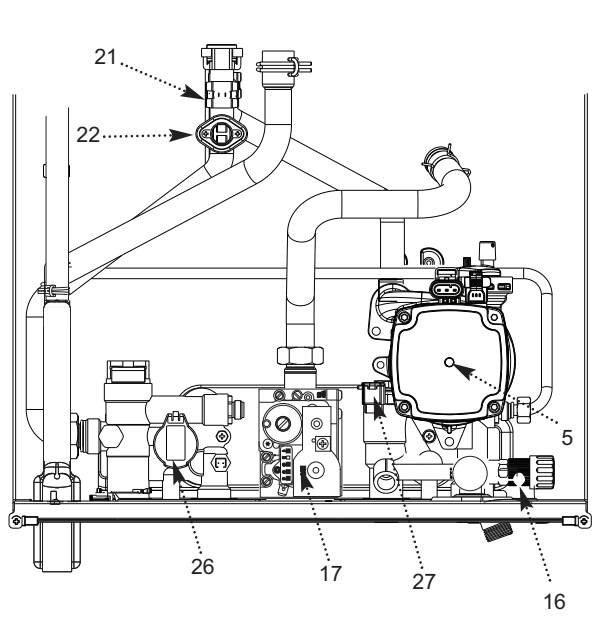
### 4.2.4 Pump Protection

1. This activates once a week if there has been no demand. The pump runs for 30 seconds to prevent sticking.

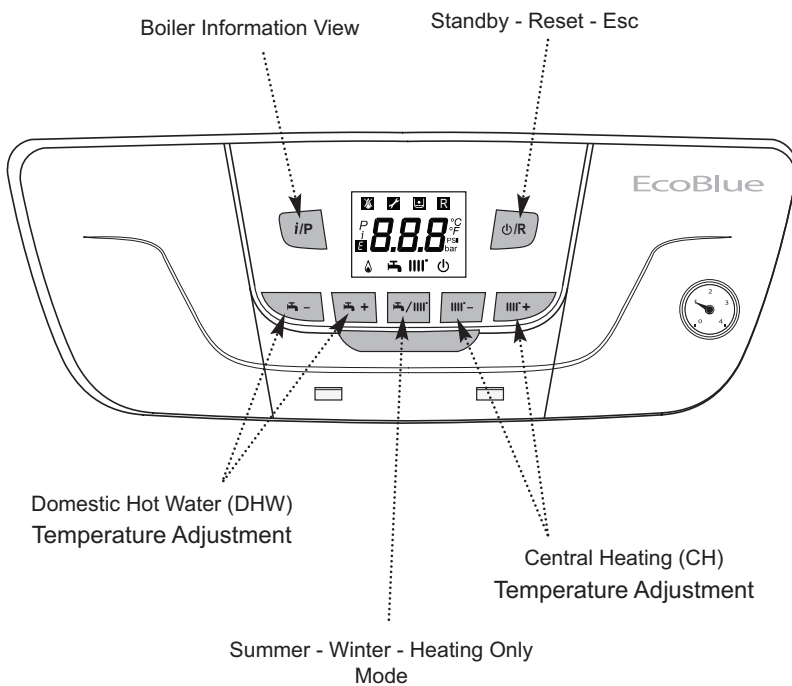
### 4.3 Main Components












1. Expansion Vessel
2. Expansion Vessel Valve - Do NOT use as vent
3. Primary Heat Exchanger
4. Plate Heat Exchanger
5. Pump with Automatic Air Vent
6. Central Heating System Pressure Gauge
7. Fan Assembly with Venturi
8. Air/Gas Collector
9. Flue Sensor
10. Flame Sensing Electrode
11. Spark Ignition Electrode
12. Combustion Box Cover & Burner
13. Control Box Display
14. Condensate Trap
15. Safety Pressure Relief Valve
16. Drain Off Point
17. Gas Valve
18. Diverter Valve Motor
19. Boiler Controls
20. Boiler Adaptor
21. Heating Flow Sensor
22. Safety Thermostat
23. Igniter
24. Air Box
25. Heating Return Sensor
26. Hydraulic Pressure Sensor
27. Domestic Hot Water Priority Sensor ('Hall Effect' Sensor)

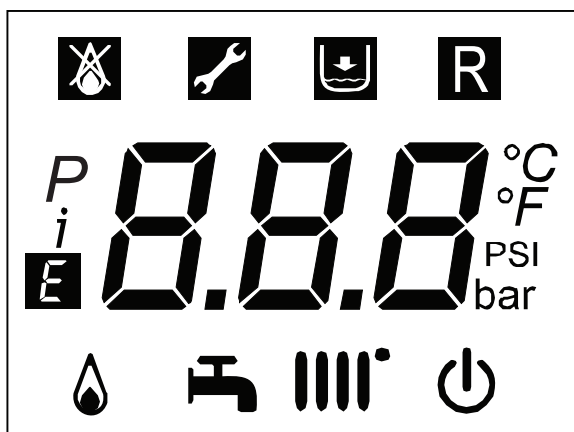


## 4.4 Control Panel Description













### Key to Controls

-  Standby - Reset - Esc Button
- iP* Boiler Information View Button
-  Increase CH Temperature Button
-  Decrease CH Temperature Button
-  Increase DHW Temperature Button
-  Decrease DHW Temperature Button
-  Summer / Winter / Only Heating Mode Button
  -  Summer - DHW only mode
  -  Winter - DHW & CH mode
  -  Heating Only - Only CH mode



Display showing all available characters

### Display Description

-  DHW and CH OFF (frost protection still enabled)
-  Indicate errors that prevent burner from igniting
-  Error - Not resettable by user
-  Water pressure too low
-  Indicates an error resettable by the user
- P* Indicates navigation in programming mode (parameter)
- i* Indicates navigation in programming mode
-  Generic error
-  Burner lit
-  DHW mode (symbol will flash with demand)
-  Heating mode (symbol will flash with demand)
- °C  
°F Units for temperature
- PSI  
bar Units for pressure
-  Service due

## 4.5 Standard Delivery

---

1. The pack contains:

- ▶ Boiler
- ▶ Wall mounting plate (pre-plumbing jig) including isolation valves
- ▶ Fittings pack
- ▶ Literature pack
  - Installation & Servicing Manual (including 'benchmark')
  - User Guide Instructions
  - Flue Accessories & Fitting Guide
  - Registration Card
  - Fernox Leaflet
  - Adey Leaflet
  - Wall Template
  - Product Leaflet
  - Package Leaflet

## 4.6 Accessories & Options

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### 4.6.1 Optional Extras

---

1. Various timers, external controls, etc. are available as optional extras.

- ▶ Plug-in Mechanical Timer Kit ----- 7212341
- ▶ Plug-in Digital Timer Kit ----- 7212342
- ▶ Wireless RF Mechanical Thermostat Kit ----- 7212343
- ▶ Wireless RF Digital Programmable Room Thermostat Kit ---- 7212344
- ▶ Single Channel Wired Programmable Room Thermostat Kit - 7212438
- ▶ Wired Outdoor Weather Sensor ----- 7213356
- ▶ Two Channel Wired Programmer Kit ----- 7212443
- ▶ Single Channel Wired Programmer Kit ----- 7212444
- ▶ Mechanical Room Thermostat ----- 7209716
- Flue Accessories (elbows, extensions, clamps etc.)  
(refer to the Flue Accessories & Fitting Guide supplied in the literature pack.)
- ▶ Remote relief valve kit ----- 512139
- ▶ Boiler discharge pump ----- 720648301
- ▶ 1M Drain Pipe 'Trace Heating' Element ----- 720644401
- ▶ 2M Drain Pipe 'Trace Heating' Element ----- 720664101
- ▶ 3M Drain Pipe 'Trace Heating' Element ----- 720664201
- ▶ 5M Drain Pipe 'Trace Heating' Element ----- 720664401\*

\*Where the drain is between 3 & 5 metres a 5 metre kit can be used and "doubled back" upon itself.

Any of the above MUST be fitted ONLY by a qualified competent person. Further detail can be found in the relevant sales literature and at [www.baxi.co.uk](http://www.baxi.co.uk)

## 5 Before Installation

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### 5.1 Installation Regulations

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#### **WARNING**

Installation, repair and maintenance must only be carried out only by a competent person. This document is intended for use by competent persons,

Installation must be carried out in accordance with the prevailing regulations, the codes of practice and the recommendations in these instructions. Please refer to 1.5.1 and 1.6.2

Installation must also respect this instruction manual and any other applicable documentation supplied with the boiler.

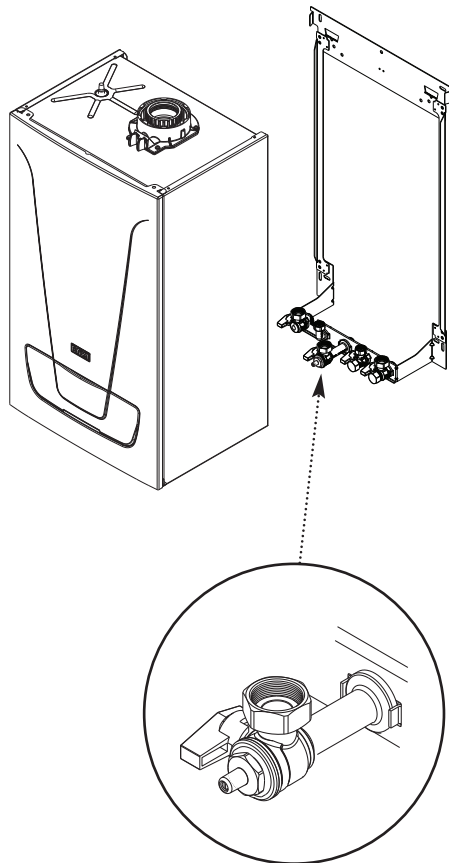


Fig. 3

Gas Service Cock

## 5.2 Installation Requirements

### 5.2.1 Gas Supply

1. The gas installation should be in accordance with the relevant standards. In GB this is BS 6891 (NG). In IE this is the current edition of I.S. 813 "Domestic Gas Installations".
2. The connection to the appliance is a 22mm copper tail located at the rear of the gas service cock (Fig. 3).
3. Ensure that the pipework from the meter to the appliance is of adequate size, and the demands of any other gas appliances in the property are taken into consideration. Do not use pipes of a smaller diameter than the boiler gas connection (22mm). **UNLESS** the stated gas rate can be achieved with pipe of lesser diameter and with all other gas appliances operating at maximum rate.
4. The gas service cock incorporates a pressure test point. The service cock must be on to check the pressure.

### 5.2.2 Electrical Supply

1. External wiring must be correctly earthed, polarised and in accordance with relevant regulations/rules. In GB this is the current I.E.E. Wiring Regulations. In IE reference should be made to the current edition of ETCI rules.
2. The mains supply is 230V ~ 50Hz fused at 3A.



The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance.

Connection may be via a fused double-pole isolator with a contact separation of at least 3mm in all poles and servicing the boiler and system controls only.

### 5.2.3 Hard Water Areas



Only water that has NOT been artificially softened must be used when filling or re-pressurising the primary system. If the mains cold water to the property is fitted with an artificial softening/treatment device the source utilised to fill or re-pressurise the system must be upstream of such a device.

### 5.2.4 Bypass

1. The boiler is fitted with an automatic integral bypass.

### 5.2.5 System Control

1. Further external controls (e.g. room thermostat sensors) **MUST** be fitted to optimise the economical operation of the boiler in accordance with Part L of the Building Regulations. A range of optional controls is available. Full details are contained in the relevant Sales Literature.



### 5.2.6 Treatment of Water Circulating Systems

---

1. All recirculatory water systems will be subject to corrosion unless an appropriate water treatment is applied. This means that the efficiency of the system will deteriorate as corrosion sludge accumulates within the system, risking damage to pump and valves, boiler noise and circulation problems.
2. When fitting new systems flux will be evident within the system, which can lead to damage of system components.
3. BS7593 gives extensive recommendations on system cleansing and water treatment.
4. All systems must be thoroughly drained and flushed out using an appropriate proprietary flushing agent.
5. A suitable inhibitor must then be added to the system.
6. All system additives (flushing agents, cleansers, inhibitors etc.) must comply with the requirements of BS7593. Full instructions are supplied with the products and for further information contact the additive manufacturer directly or consult their website.



Failure to flush and add inhibitor to the system will invalidate the appliance warranty.

7. It is important to check the inhibitor concentration after installation, system modification and at every service in accordance with the inhibitor manufacturer. (Test kits are available from inhibitor stockists.)
8. For information or advice regarding any of the above contact Baxi Customer Support 0344 871 1545.

### 5.2.7 Showers

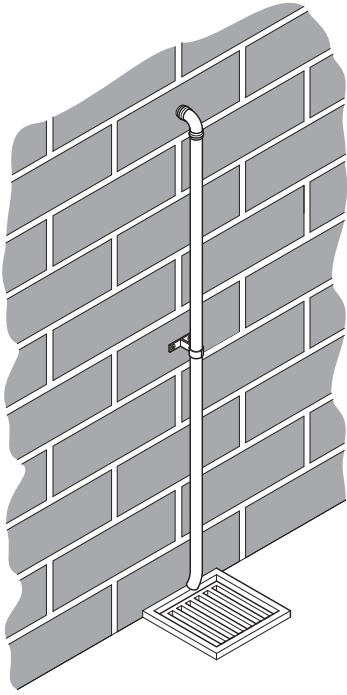
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1. If a shower control is supplied from the appliance it should be of the thermostatic or pressure balanced type. Thermostatic type shower valves provide the best comfort and guard against water at too high a temperature. Existing controls may not be suitable - refer to the shower valve manufacturer.

### 5.2.8 Expansion Vessel (CH only)

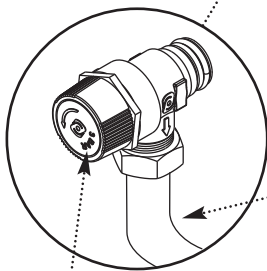
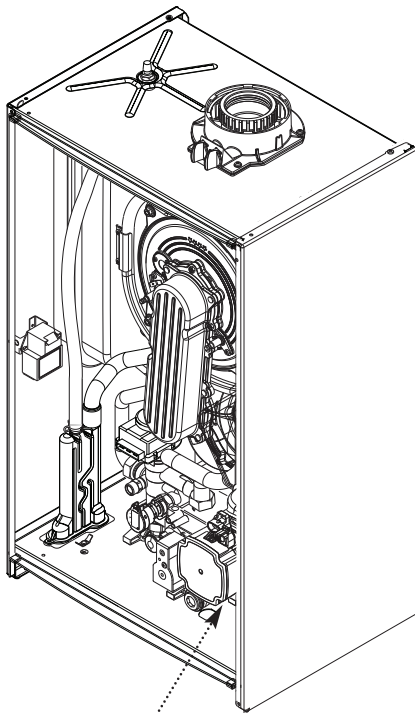
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1. The appliance expansion vessel is pre-charged to 1.0 bar. Therefore, the minimum cold fill pressure is 1.0 bar. The vessel is suitable for correct operation for system capacities up to 125 litres (24 & 28)/155 litres (33 & 40). For greater system capacities an additional expansion vessel must be fitted. For GB refer to BS 7074 Pt 1. For IE, the current edition of I.S. 813 "Domestic Gas Installations".
2. Checking the charge pressure of the vessel - to check the charge accurately ensure the system is cold. It is also necessary to relieve the pressure by draining the boiler. Using a suitable gauge check the pressure at the valve on the underside of the vessel. Adjust the pressure as required and repressurise the system.



The end of the pipe should terminate facing down and towards the wall

Fig. 4



Control Box  
removed for clarity

Discharge Pipe

Pressure Relief Valve

Fig.5

## 5.2.9 Safety Pressure Relief Valve



See B.S. 6798 for full details.

1. The pressure relief valve (Fig. 5) is set at 3 bar, therefore all pipework, fittings, etc. should be suitable for pressures in excess of 3 bar and temperature in excess of 100°C.

2. The pressure relief discharge pipe should be not less than 15mm diameter, run continuously downward, and discharge outside the building, preferably over a drain. It should be routed in such a manner that no hazard occurs to occupants or causes damage to wiring or electrical components. If it is anticipated that any part of the pipe may be subject to freezing it should be suitably insulated. The end of the pipe should terminate facing down and towards the wall (Fig. 4).

3. The discharge must not be above a window, entrance or other public access. Consideration must be given to the possibility that boiling water/steam could discharge from the pipe.



The relief valve must never be used to drain the system

4. A remote relief valve kit is available to enable the boiler to be installed in cellars or similar locations below outside ground level.

5. A boiler discharge pump is available which will dispose of both condensate & high temperature water from the relief valve. It has a maximum head of 5 metres.



Section 6.2.1 gives details of how to connect the pipe to the boiler.

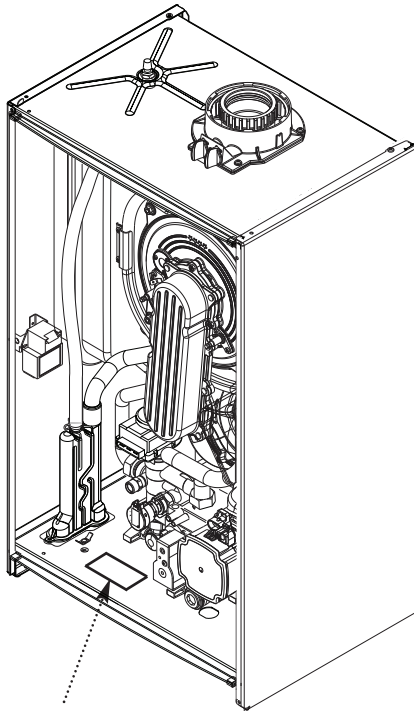
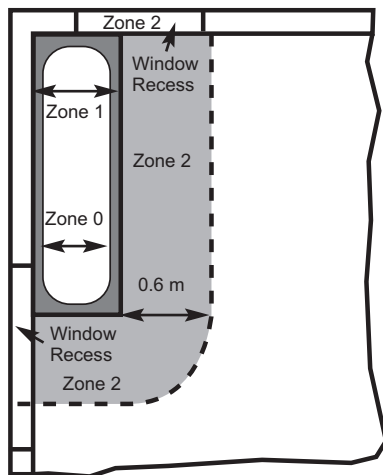
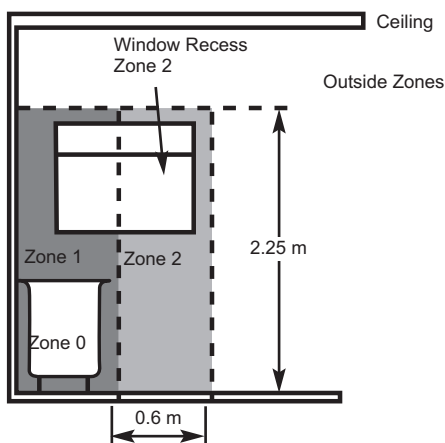


Fig. 6

Data Badge

Fig. A  
In GB OnlyFig. B  
In GB Only

## 5.3 Choice of the Location

### 5.3.1 Location of the Appliance

1. The boiler may be fitted to any suitable wall with the flue passing through an outside wall or roof and discharging to atmosphere in a position permitting satisfactory removal of combustion products and providing an adequate air supply. The boiler should be fitted within the building unless otherwise protected by a suitable enclosure i.e. garage or outhouse. (The boiler may be fitted inside a cupboard-see Section 5.3.4).

2. Where the boiler is sited in an unheated enclosure and during periods when the heating system is to be unused it is recommended that the permanent live is left on to give BOILER frost protection. **NOTE: THIS WILL NOT PROTECT THE SYSTEM !**

3. If the boiler is fitted in a room containing a bath or shower reference must be made to the relevant requirements.

**In GB** this is the current I.E.E. Wiring Regulations and Building Regulations.

**In IE** reference should be made to the current edition of I.S. 813 "Domestic Gas Installations" and the current ETCI rules.

4. If the boiler is to be fitted into a building of timber frame construction then reference must be made to the current edition of Institute of Gas Engineers Publication IGE/UP/7 (Gas Installations in Timber Framed Housing).

### 5.3.2 Data Plate

1. The boiler data badge gives details of the model, serial number and Gas Council number and is situated on the boiler lower panel. It is visible when the control box is lowered (Fig. 6).

### 5.3.3 Bath & Shower Rooms

**i** Where an integral timer is NOT FITTED the boiler has a protection rating of IPX5D and if installed in a room containing a bath or shower can be within Zone 2 (but not 0 or 1).

Figs. A & B shows zone dimensions for a bathtub. For other examples refer to the Current I.E.E. Wiring Regulations).

Reference must be made to the relevant requirements.

**In GB** this is the current I.E.E. Wiring Regulations and Building Regulations. **In IE** reference should be made to the current edition of I.S. 813 "Domestic Gas Installations" and the current ETCI rules.

**i** If the boiler is fitted with an integral timer it **CANNOT** be installed in Zone 0, 1 or 2.

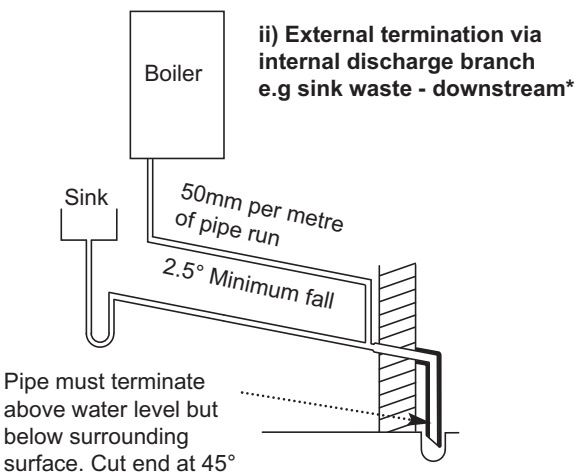
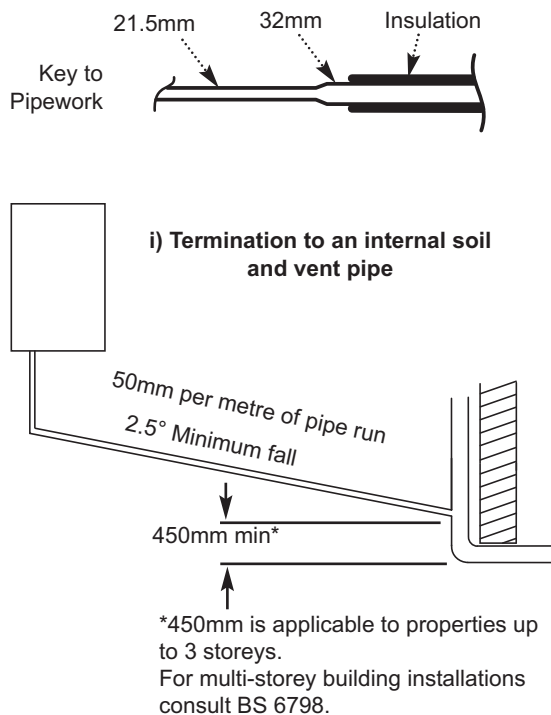
### 5.3.4 Ventilation

1. Where the appliance is installed in a cupboard or compartment, no air vents are required. BS 5440: Part 2 refers to room sealed appliances installed in compartments. The appliance will run sufficiently cool without ventilation.

Examples are shown of the following methods of termination:-

- i) to an internal soil & vent pipe
- ii) via an internal discharge branch (e.g. sink waste) downstream of the trap
- iii) to a drain or gully
- iv) to a purpose made soakaway
- v) pumped into an internal discharge branch (e.g. sink waste) downstream of the trap
- vi) pumped into an external soil & vent pipe
- vii) to a drain or gully with extended external run & trace heating

**It is strongly recommended to discharge internally into the household drainage system. If connecting to a rain water drain, that drain MUST discharge into a foul drain.**



\*It is NOT RECOMMENDED to connect upstream of the sink or other waste water receptacle !

### 5.3.5 Condensate Drain



**FAILURE TO INSTALL THE CONDENSATE DISCHARGE PIPEWORK CORRECTLY WILL AFFECT THE RELIABLE OPERATION OF THE BOILER.**

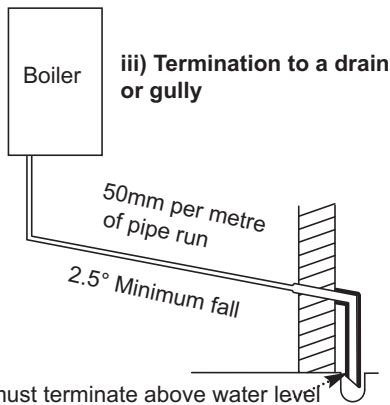
CAREFUL CONSIDERATION MUST BE GIVEN TO THE POSSIBILITY OF THE PIPEWORK BEING SUBJECT TO FREEZING CONDITIONS AND APPROPRIATE MEASURES TAKEN TO PREVENT BLOCKAGE. CORRECT INSTALLATION IN ACCORDANCE WITH THIS SECTION WILL CONSIDERABLY MINIMISE THE LIKELIHOOD OF BLOCKAGE AND SUBSEQUENT BOILER LOCK-OUT.

A CONDENSATE DISCHARGE PUMP AND PIPE 'TRACE HEATING' ARE AVAILABLE AS ACCESSORIES - see paragraphs 5.3.6.12 to 5.3.6.15 for further details.

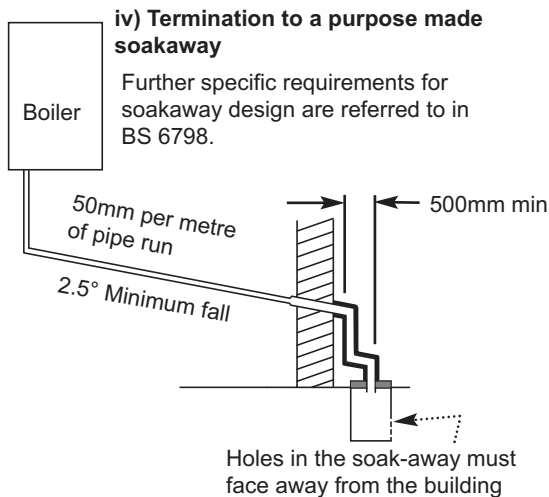
The condensate discharge pipe **MUST NOT RISE** at any point along its length. There **MUST** be a fall of AT LEAST 2.5° (50mm per metre) along the entire run EXCEPT when employing a suitable condensate pump in basement and cellar or similar applications.

The boiler condensate trap incorporates a seal of 75mm, therefore it is unnecessary to install an air break and trap in the discharge pipework.

1. The condensate outlet will accept 21.5mm (3/4in) plastic overflow pipe. **It is strongly recommended that this discharges internally into the household drainage system.** Where this is not possible, discharge into an outside drain is permissible providing every possible precaution is taken to prevent freezing.
2. Ensure the discharge of condensate complies with any national or local regulations in force. **BS 6798 & Part H1 of the Building Regulations give further detailed guidance.**
3. The discharge pipe should be run in a proprietary drain pipe material e.g. PVC, PVC-U, ABS, PVC-C or PP.
4. Metal pipework is NOT suitable for use in condensate discharge systems.
5. The pipe should be a minimum of 21.5mm diameter and must be supported using suitably spaced clips of the correct design to prevent sagging.
6. **It is advisable that the full length of condensate pipe is run internally and preferably be less than 3 metres.**
7. **Internal runs greater than 3 metres or runs in cold areas should use 32mm waste pipe.**
8. **External runs MUST be a MINIMUM of 32mm and fully insulated with material suitable for external use.**



Pipe must terminate above water level but below surrounding surface. Cut end at 45°

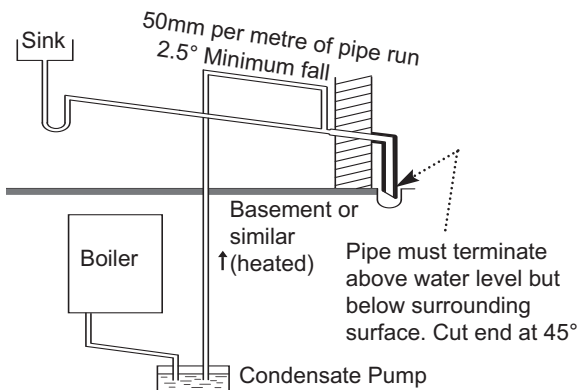


**iv) Termination to a purpose made soakaway**

Further specific requirements for soakaway design are referred to in BS 6798.

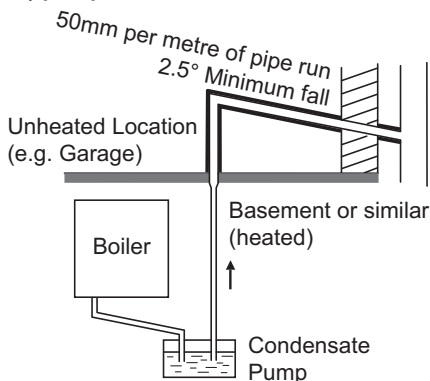
Holes in the soak-away must face away from the building

**v) pumped into an internal discharge branch (e.g. sink waste) downstream of the trap**



Pipe must terminate above water level but below surrounding surface. Cut end at 45°

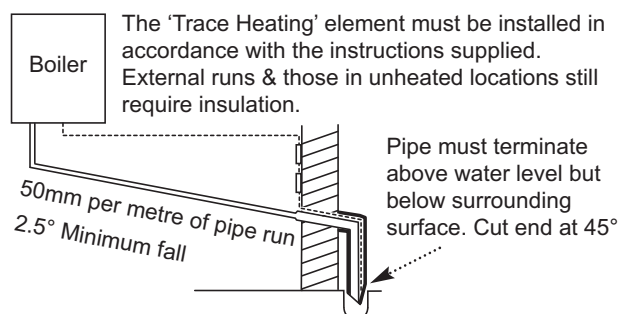
**vi) pumped into an external soil & vent pipe**



Unheated Location (e.g. Garage)

Basement or similar (heated)

**vii) to a drain or gully with extended external run & trace heating**



9. If the boiler is fitted in an unheated location the entire condensate discharge pipe should be treated as an external run and sized and insulated accordingly.

10. In all cases discharge pipe must be installed to aid disposal of the condensate. To reduce the risk of condensate being trapped, as few bends and fittings as possible should be used and any burrs on cut pipe removed.

11. When discharging condensate into a soil stack or waste pipe the effects of existing plumbing must be considered. If soil pipes or waste pipes are subjected to internal pressure fluctuations when WC's are flushed or sinks emptied then back-pressure may force water out of the boiler trap and cause appliance lockout.

12. A boiler discharge pump is available which will dispose of both condensate & high temperature water from the relief valve. It has a maximum head of 5 metres. Follow the instructions supplied with the pump.

13. Condensate Drain Pipe 'Trace Heating' Elements are available in various lengths, 1, 2, 3 & 5 metres. Where the drain is between 3 & 5 metres a 5 metre kit can be used and "doubled back" upon itself.

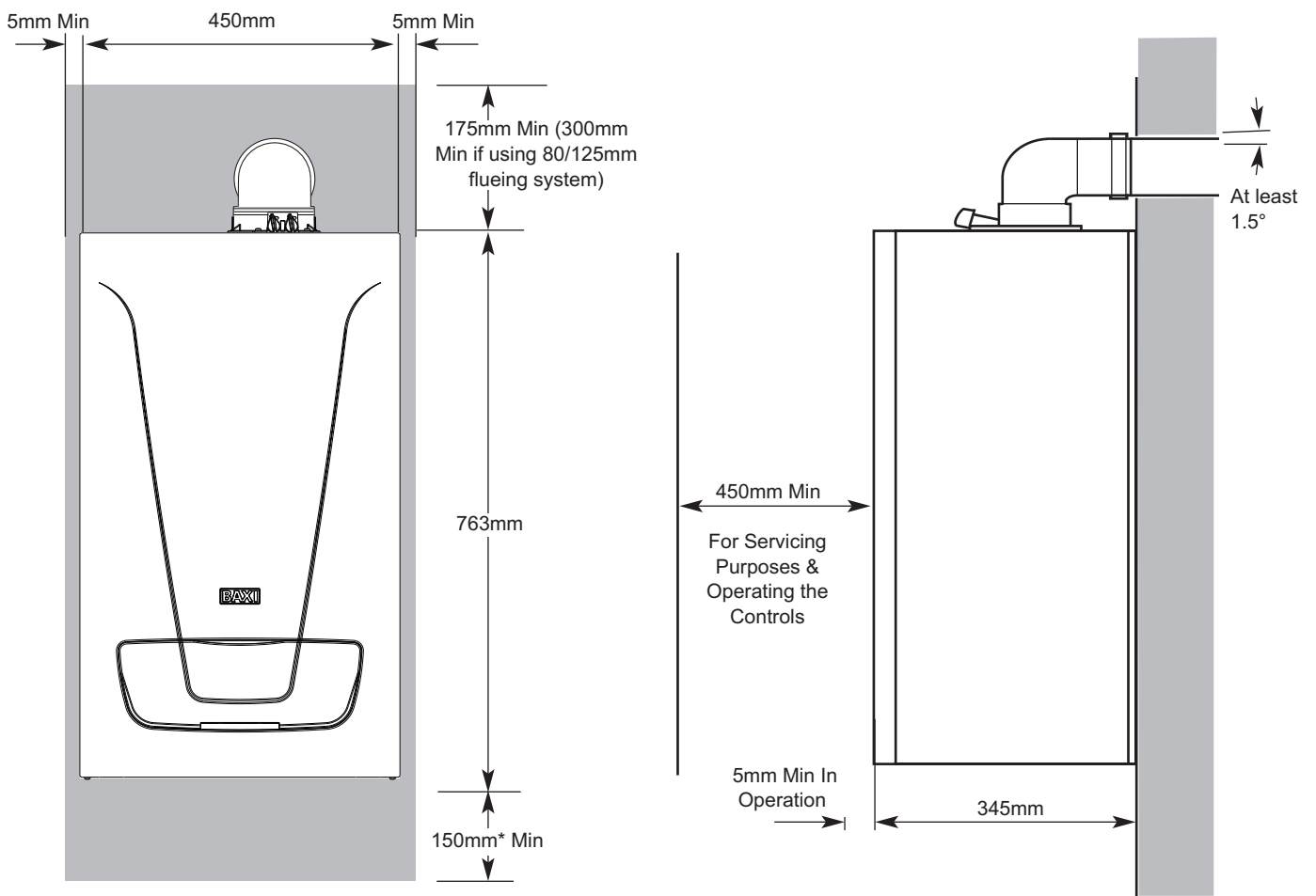
14. It is possible to fit the element externally on the condensate drain or internally as detailed in the instructions provided.

15. The fitting of a 'Trace Heating' Element is NOT a substitute for correct installation of the condensate drain. ALL requirements in this section must still be adhered to.

### 5.3.6 Clearances

1. A flat vertical area is required for the installation of the boiler.
2. These dimensions include the necessary clearances around the boiler for case removal, spanner access and air movement. Additional clearances may be required for the passage of pipes around local obstructions such as joists running parallel to the front face of the boiler.

\*This is MINIMUM recommended dimension. Greater clearance will aid installation and maintenance.



\*This is MINIMUM recommended dimension. Greater clearance will aid installation and maintenance.

Fig.7

### 5.3.7 Flue/Chimney Location

1. The following guidelines indicate the general requirements for siting balanced flue terminals. For GB recommendations are given in BS 5440 Pt 1. For IE recommendations are given in the current edition of I.S. 813 “Domestic Gas Installations”.



Due to the nature of the boiler a plume of water vapour will be discharged from the flue. This should be taken into account when siting the flue terminal.

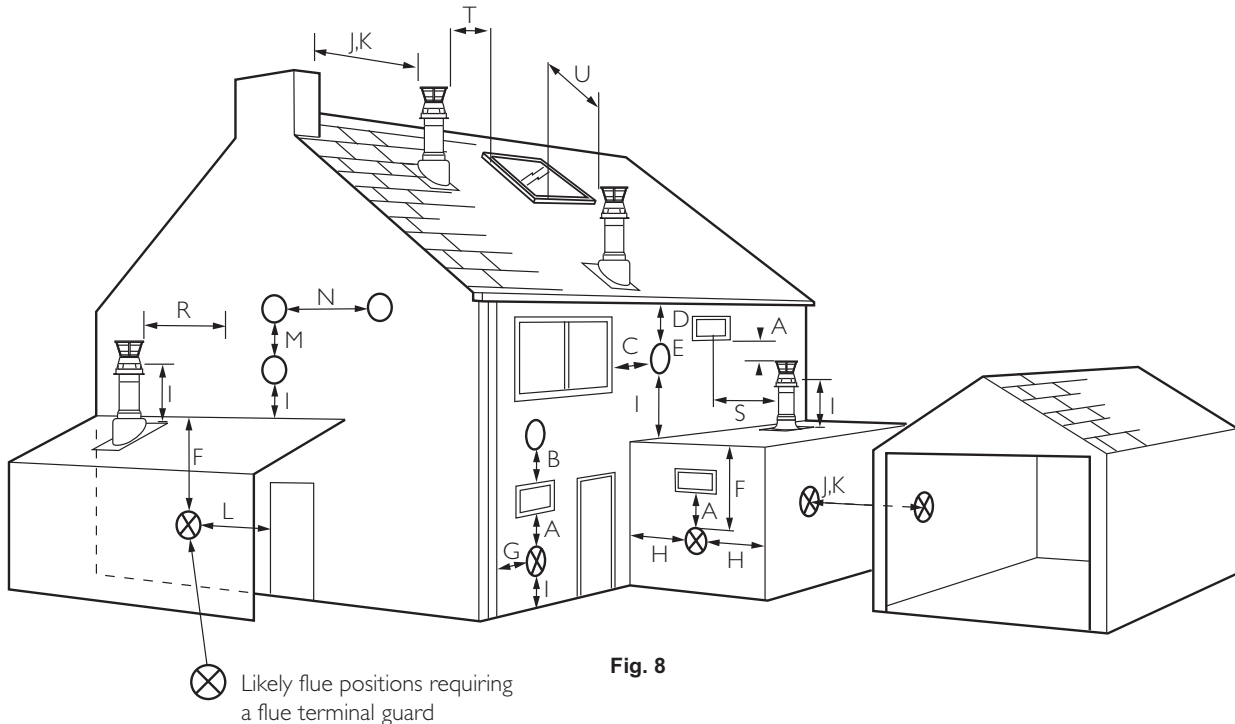


Fig. 8

Terminal Position with Minimum Distance (Fig. 8) (mm)

A <sup>1</sup> Directly below an opening, air brick, opening windows, etc.	300
B <sup>1</sup> Above an opening, air brick, opening window etc.	300
C <sup>1</sup> Horizontally to an opening, air brick, opening window etc.	300
D <sup>2</sup> Below gutters, soil pipes or drain pipes.	25 (75)
E <sup>2</sup> Below eaves.	25 (200)
F <sup>2</sup> Below balconies or car port roof.	25 (200)
G <sup>2</sup> From a vertical drain pipe or soil pipe.	25 (150)
H <sup>2</sup> From an internal or external corner.	25 (300)
I Above ground, roof or balcony level.	300
J From a surface or boundary line facing a terminal.	600
K From a terminal facing a terminal (Horizontal flue).	1200
From a terminal facing a terminal (Vertical flue).	600
L From an opening in carport (e.g. door, window) into the dwelling.	1200
M Vertically from a terminal on the same wall.	1500
N Horizontally from a terminal on the same wall.	300
R From adjacent wall to flue (vertical only).	300
S From an adjacent opening window (vertical only).	1000
T Adjacent to windows or openings on pitched and flat roofs	600
U Below windows or openings on pitched roofs	2000

<sup>1</sup> In addition, the terminal should be no nearer than 150 mm to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a window frame.

<sup>2</sup> Only **ONE** 25mm clearance is allowed per installation. If one of the dimensions D, E, F, G or H is 25mm then the remainder **MUST** be as shown in brackets, in accordance with B.S.5440-1.

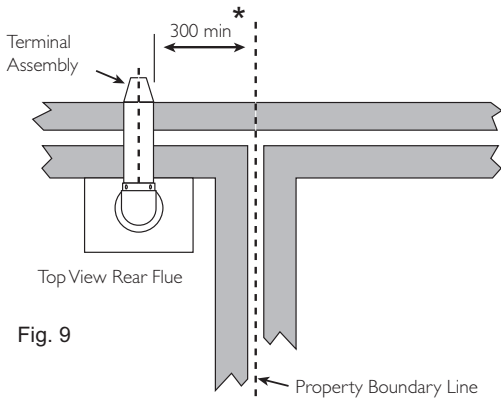


Fig. 9

**i** Under car ports we recommend the use of the plume displacement kit. The terminal position must ensure the safe and nuisance - free dispersal of combustion products.

2. If the terminal discharges onto a pathway or passageway, check that combustion products will not cause a nuisance and that the terminal will not obstruct the passageway.

3. If a terminal is less than 2 metres above a balcony, above ground or above a flat roof to which people have access, then a suitable terminal guard must be provided.

\*4. Reduction to the boundary is possible down to 25mm but the flue deflector must be used (see 5.3.12).

**i** The distance from a fanned draught appliance terminal installed parallel to a boundary may not be less than 300mm in accordance with the diagram opposite (Fig. 9).

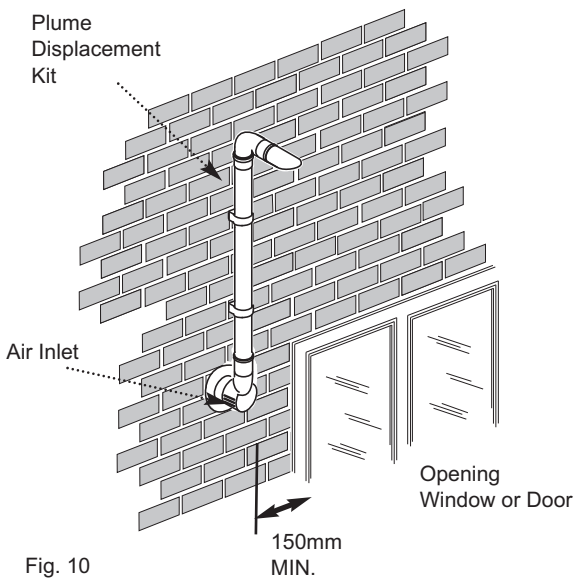
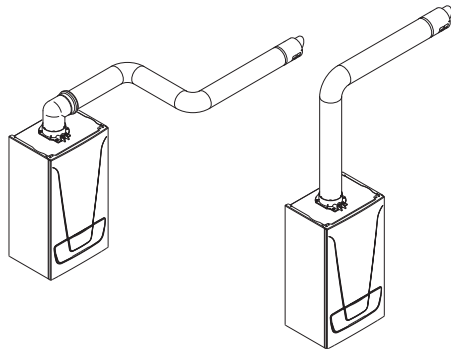
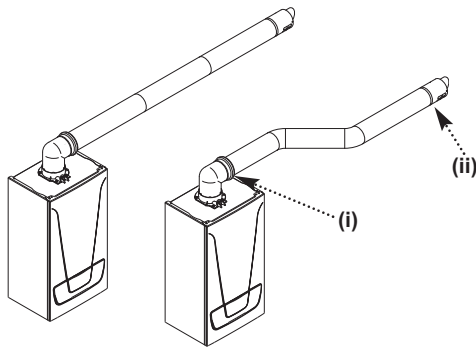


Fig. 10

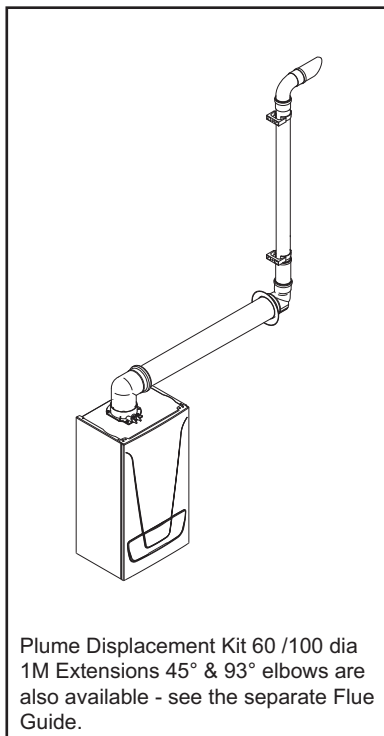
**i** If fitting a Plume Displacement Flue Kit, the air inlet must be a minimum of 150mm from any opening windows or doors (see Fig. 10).

**i** The Plume Displacement flue gas discharge terminal and air inlet must always terminate in the same pressure zone i.e. on the same facing wall.





**Horizontal Flues**



**5.3.8 Horizontal Flue/Chimney Systems**

1. The standard telescopic flue is suitable only for horizontal termination applications.

2. All fittings should be fully engaged. The approximate engagement is 40mm. Apply the lubricant supplied to the seal on each fitting to aid assembly.

3. Maximum permissible equivalent flue lengths are:-

	(60/100)	(80/125)
Horizontal Concentric	10 metres	20 metres

4. Any additional "in line" bends in the flue system must be taken into consideration.

Their equivalent lengths are:-

Concentric Pipes:

135° bend	0.5 metres
93° bend	1.0 metres

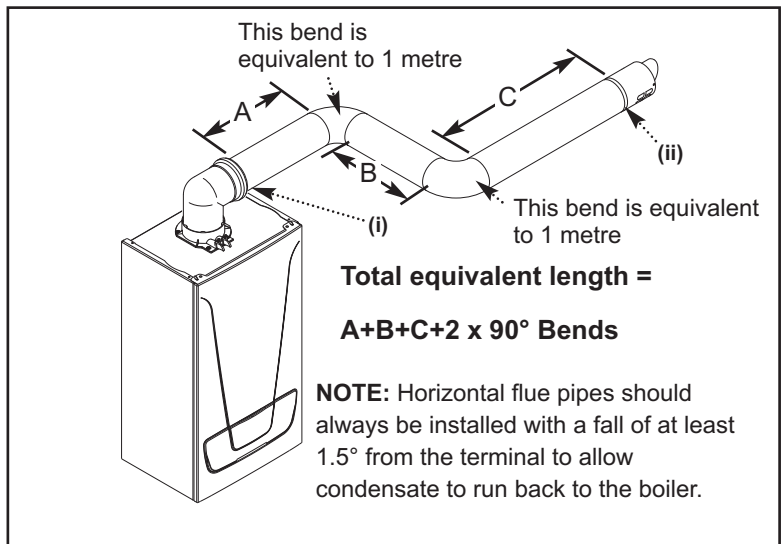
**i** Flue length is measured from point (i) to (ii) as shown. The elbow supplied with the standard horizontal telescopic flue kit is not included in any equivalent length calculations.

Read this section in conjunction with the Flue Installation Guide supplied with the boiler.

**WARNING**

**SUPPORT** - All flue systems MUST be securely supported at a MINIMUM of once every metre & every change of direction. It is recommended that every straight piece is supported irrespective of length. Additional supports are available as accessories.

**VOIDS** - Consideration must be given to flue systems in voids and the provision of adequate access for subsequent periodic visual inspection.



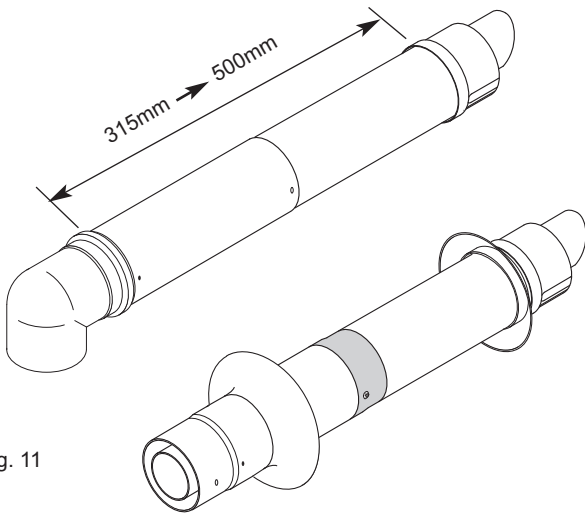


Fig. 11

Ensure that no part of the white outer chimney duct is visible

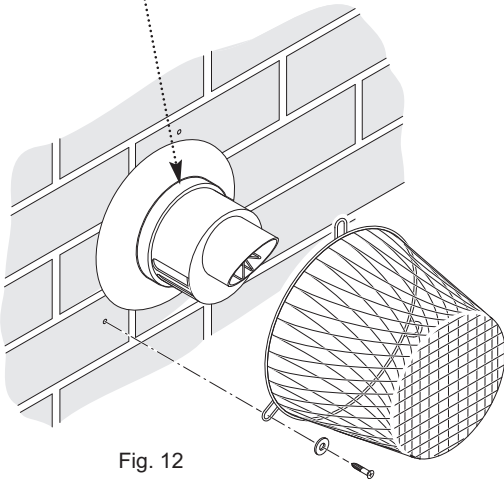


Fig. 12

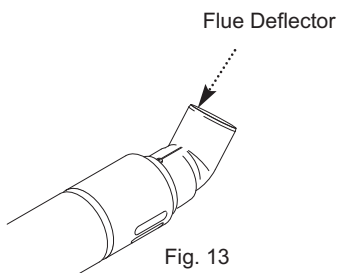
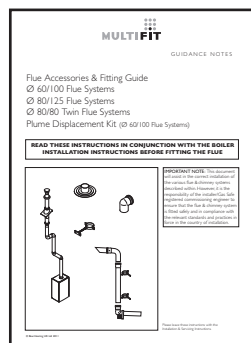


Fig. 13



### 5.3.9 Flue/Chimney Lengths

1. The standard horizontal telescopic flue kit allows for lengths between 315mm and 500mm from elbow to terminal without the need for cutting (Fig. 11). Extensions of 250mm, 500mm & 1m are available.

The maximum permissible equivalent flue length is:

- 10 metres (60/100 system - vertical & horizontal)
- 20 metres (80/125 system - vertical & horizontal)
- 15 metres (80/80 twin pipe)
- 8 metres (60/100 system - vertical connected to ridge terminal)

### 5.3.10 Flue/Chimney Trim

1. The flexible flue trims supplied can be fitted on the outer and inner faces of the wall of installation.

### 5.3.11 Terminal Guard

1. When codes of practice dictate the use of terminal guards (Fig. 12) 'Multifit' accessory part no. 720627901 can be used (**NOTE:** This is not compatible with Flue Deflector referred to below).

2. There must be a clearance of at least 50mm between any part of the terminal and the guard.


3. When ordering a terminal guard, quote the appliance name and model number.

4. The flue terminal guard should be positioned centrally over the terminal and fixed as illustrated.

### 5.3.12 Flue/Chimney Deflector

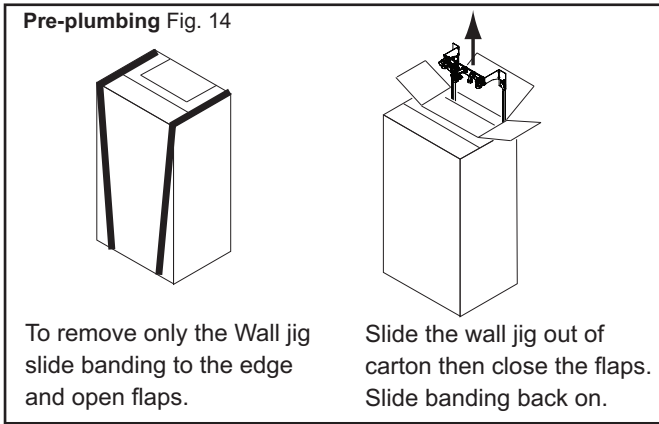
1. Push the flue deflector over the terminal end. It may point upwards as shown, or up to 45° either way from vertical. Secure the deflector to the terminal with screws provided (Fig. 13).

### 5.3.13 Flue/Chimney Accessories

 For full details of Flue Accessories (elbows, extensions, clamps etc.) refer to the Flue Accessories & Fitting Guide supplied in the literature pack.

## 5.4 Transport

1. This product should be lifted and handled by two people. When lifting always keep your back straight and wear protective equipment where necessary. Carrying and lifting equipment should be used as required. e.g. when install in a loft.



## 5.5 Unpacking & Initial Preparation

### 5.5.1 Unpacking

**i** **RISK ASSESSMENT** - Before commencing the installation it is recommended that the 'Five Steps to Risk Assessment' document published by the HSE is consulted, and an assessment performed as described.

**GAS SUPPLY** - The gas supply, gas type and pressure must be checked for suitability before connection.

1. See 'Section 2.3.1 Handling' before unpacking or lifting the boiler.

2. Follow the procedure on the carton to unpack the boiler or see Fig. 14a.

3. If pre-plumbing (Fig. 14) - the wall jig and fitting kit can be removed without removing the carton sleeve. Simply slide banding to the edge and open the perforated flap, lift out the jig, fitting kit and instructions. If the boiler is to be install at a later date, close the flap and reposition the banding straps, the boiler can now be store safely away.

**i** A small amount of water may drain from the boiler in the upright position.

### 5.5.2 Initial Preparation

1. After considering the location position the fixing template on the wall ensuring it is level both horizontally and vertically.

2. Mark the position of the fixing slots for the wall mounting plate indicated on the template.

3. Mark the position of the centre of the flue hole (rear exit). For side flue exit, mark as shown (Fig. 15).

4. If required, mark the position of the gas and water pipes. Remove the template (Fig. 17).

5. Cut the hole for the flue (minimum diameter 116mm).

6. Drill the wall as previously marked to accept the wall plugs supplied. Secure the wall mounting plate using the fixing screws.

7. Using a spirit level ensure that the plate is level before finally tightening the screws (Fig. 16).

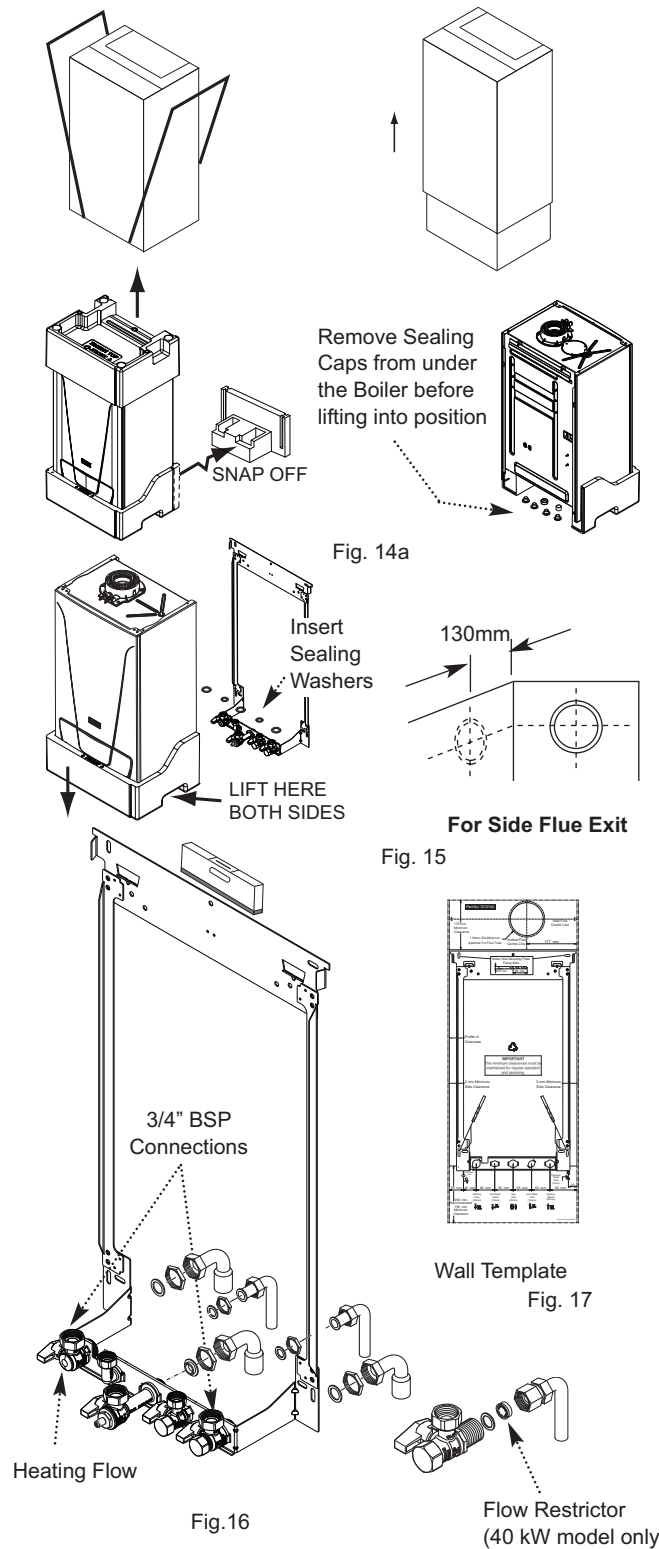
8. Connect the gas and water pipes to the valves on the wall mounting plate using the copper tails supplied. Ensure that the sealing washers are fitted between the connections.

**i** **NOTE: 40kW models ONLY** - ensure the flow restrictor is inserted in cold water inlet connection (Fig. 16). On other models the restrictor is factory fitted internally.

**👉** Fit the filling loop as described in the instructions supplied with it.

### 5.5.3 Flushing

1. Flush thoroughly and treat the system according to guidance given in B.S. 7593.



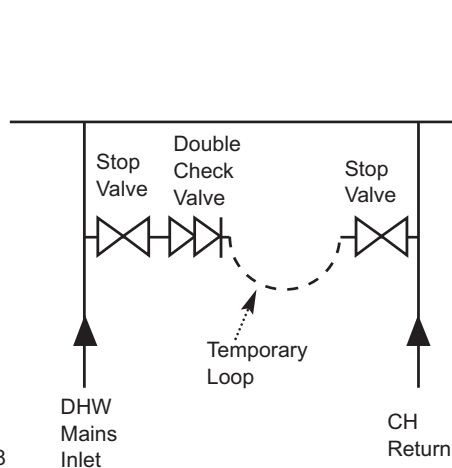


Fig. 18

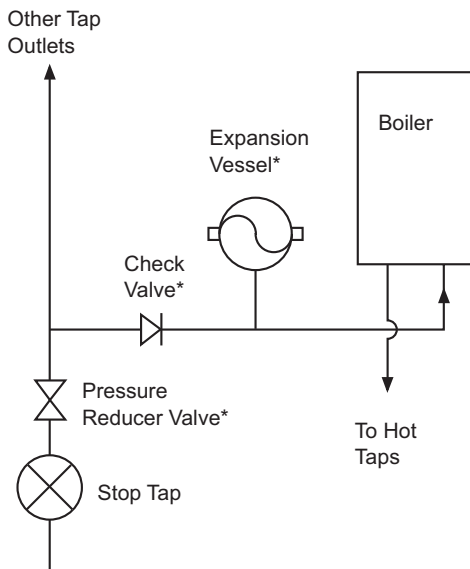


Fig. 19

\*See 5.6.2. for instances when these items may be required

In instances where the mains water supply incorporates a non-return backflow prevention device, or any other device that includes one\*, it is possible for a build-up of pressure to occur. This may result in damage to the boiler and other appliances. To prevent damage to the boiler it is strongly recommended that a suitable mini expansion vessel is fitted on the mains water inlet between the boiler and the non-return device. \*(The manufacturer of the device should be consulted if there is any doubt regarding the presence of a non-return feature).

Even in circumstances where a non-return device is not fitted any future modifications to the mains inlet (e.g. fitting of a water meter) should be considered and an expansion vessel fitted. Baxi cannot accept any responsibility for damage to the boiler if these recommendations are not followed.

Where Low Flow Taps or Fittings are intended to be used in the DHW system connected to a Baxi EcoBlue Combi it is strongly recommended that the DHW flow rate DOES NOT fall below 2.5l/min. This will ensure reliable operation of the DHW function.

## 5.6 Connecting Diagrams

### 5.6.1 System Filling and Pressurising

1. A filling point connection on the central heating return pipework must be provided to facilitate initial filling and pressurising and also any subsequent water loss replacement/refilling.
2. A filling loop is supplied with the boiler. Follow the instructions provided with it.
3. The filling method adopted must be in accordance with all relevant water supply regulations and use approved equipment.
4. Your attention is drawn to:  
for GB: Guidance G24.2 and recommendation R24.2 of the Water Regulations Guide.  
for IE: the current edition of I.S. 813 "Domestic Gas Installations".
5. The sealed primary circuits may be filled or replenished by means of a temporary connection between the circuit and a supply pipe, provided a 'Listed' double check valve or some other no less effective backflow prevention device is permanently connected at the inlet to the circuit and the temporary connection is removed after use.

### 5.6.2 Domestic Hot Water Circuit

1. All DHW circuits, connections, fittings, etc. should be fully in accordance with relevant standards and water supply regulations.
2. Your attention is drawn to:  
for GB: Guidance G17 to G24 and recommendation R17 to R24 of the Water Regulations Guide.  
for IE: the current edition of I.S. 813 "Domestic Gas Installations".
3. The Water Regulations recommendations for England and Wales prohibits backflow from appliances into the wholesome water supply due to thermal expansion. However this type of instantaneous combination boiler, with less than 15 litres of stored capacity, does not require any backflow prevention device as any thermal expansion is accommodated within the appliance. It is possible in certain circumstances that other cold water demands (e.g. washing machines, flushing of W.C.s) may affect the DHW function of the boiler. In these instances the fitting of a backflow prevention device and expansion vessel is recommended.

**i** If a check valve, loose jumpered stop cock, water meter or water treatment device is fitted (or may be in the future) to the wholesome water supply connected to the boiler domestic hot water (DHW) inlet supply then a suitable expansion device may be required.

4. The boiler's maximum working mains pressure is 8 bar, therefore all pipework, connections, fittings, etc. should be suitable for pressures in excess of 8 bar. A pressure reducing valve must be fitted for pressures in excess of 8 bar. The manufacturer of any outlet fittings, such as a shower valve, may require a lower maximum pressure. The pressure reduction must take account of all fittings connected to the DHW system.

## 6 Installation

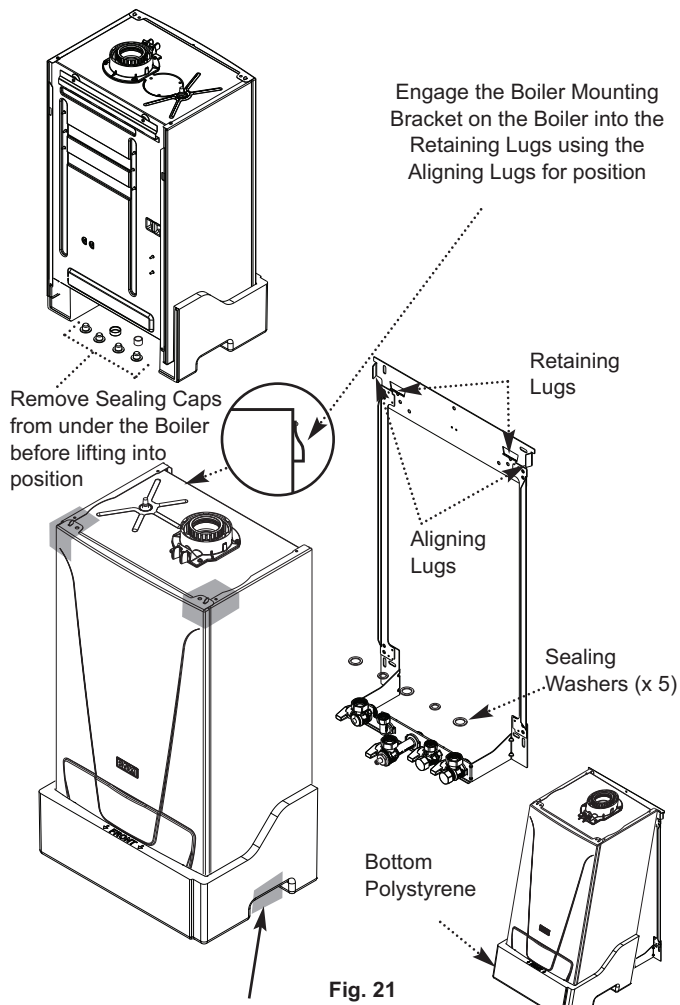


Fig. 21

When the Boiler Mounting Bracket on the Boiler is in position on the Retaining Lugs, the bottom polystyrene may be discarded allowing the boiler to swing into position

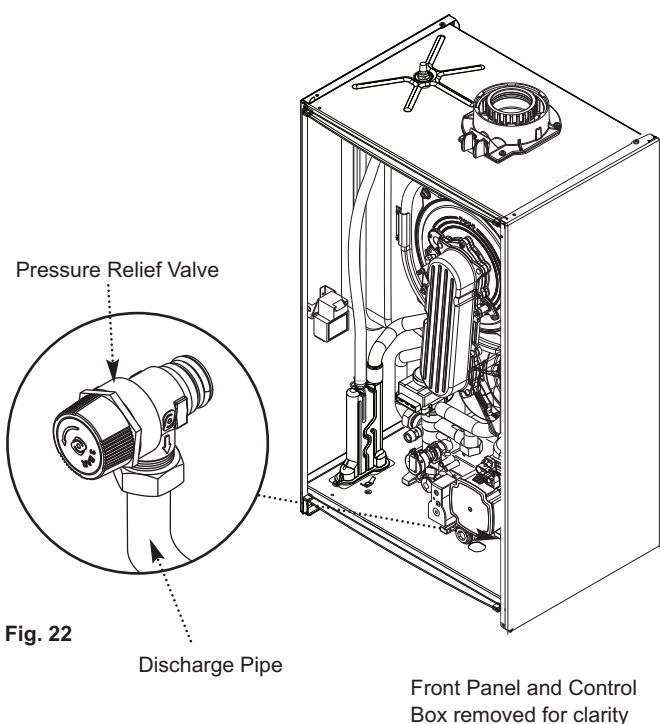


Fig. 22

Front Panel and Control Box removed for clarity

### 6.1 General

1. Remove the sealing caps from the boiler connections including the condensate trap.

**i** A small amount of water may drain from the boiler once the caps are removed.

2. Lift the boiler as indicated by the shaded areas. The boiler should be lifted by TWO PEOPLE. Engage the mounting bracket at the top rear of the boiler into the retaining lugs on the wall jig using the aligning lugs for position (Fig.21) (see 'Handling' section 2.3.1).

3. Insert the sealing washers between the valves and pipes on the wall jig and the boiler connections.

4. Tighten all the connections.

### 6.2 Assembly

#### 6.2.1 Fitting the Pressure Relief Discharge Pipe

1. Remove the discharge pipe from the kit.

2. Determine the routing of the discharge pipe in the vicinity of the boiler. Make up as much of the pipework as is practical, including the discharge pipe supplied.

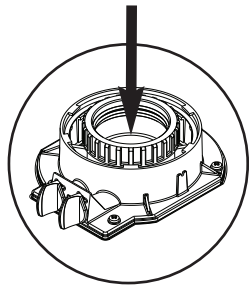
**i** Make all soldered joints before connecting to the pressure relief valve. Do not adjust the position of the valve. The discharge pipe must be installed before pressurising the system.

3. The pipework must be at least 15mm diameter and run continuously downwards to a discharge point outside the building. See section 5.2.9 for further details.

4. Utilising one of the sealing washers, connect the discharge pipe to the adaptor and tighten the nut hand tight, plus 1/4 turn to seal.

5. Complete the discharge pipework and route it to the outside discharge point.

Prime Trap by pouring 300ml of water into flue spigot



Front Panel and Control Box removed for clarity

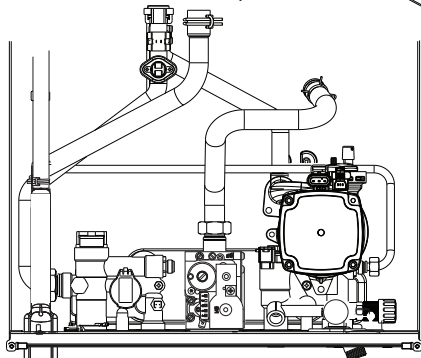
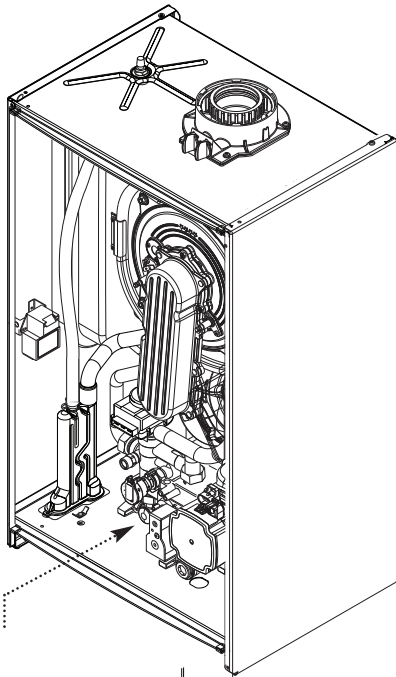
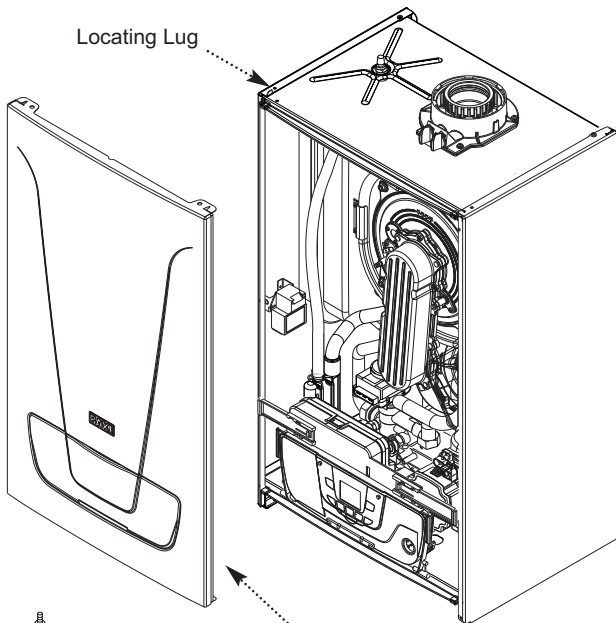


Fig. 23

Condensate Trap Connection (elbow supplied)

Locating Lug




Case Front Panel

Case Front Panel Securing Screws

## 6.2.2 Connecting the Condensate Drain

1. Remove the blanking cap, and using the elbow supplied, connect the condensate drain pipework to the boiler condensate trap outlet pipe.

 Ensure the discharge of condensate complies with any national or local regulations in force (see British Gas “Guidance Notes for the Installation of Domestic Gas Condensing Boilers” & HHIC recommendations).

2. The elbow will accept 21.5mm (3/4in) plastic overflow pipe which should generally discharge internally into the household drainage system. If this is not possible, discharge into an outside drain is acceptable. See section 5.3.5 for further details.

3. The boiler condensate trap should be primed by pouring approximately 300ml of water into the flue spigot. Do not allow any water to fall into the air inlet.

## 6.3 Preparation

### 6.3.1 Panel Removal

1. Remove the securing screws from the bottom of the case front panel.

2. Lift the panel slightly to disengage it from the locating lugs on top of the case and remove it.

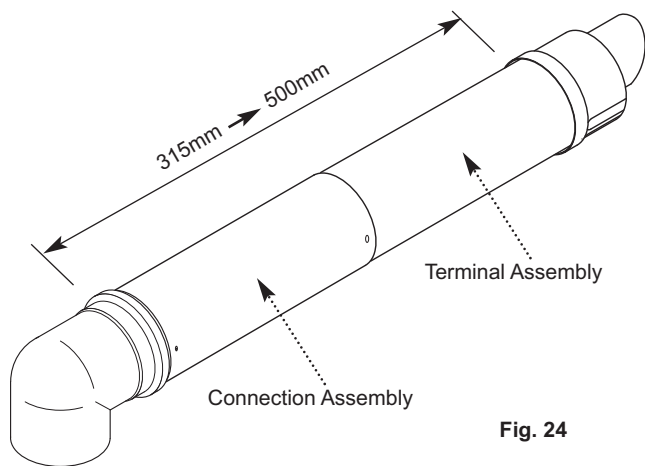


Fig. 24

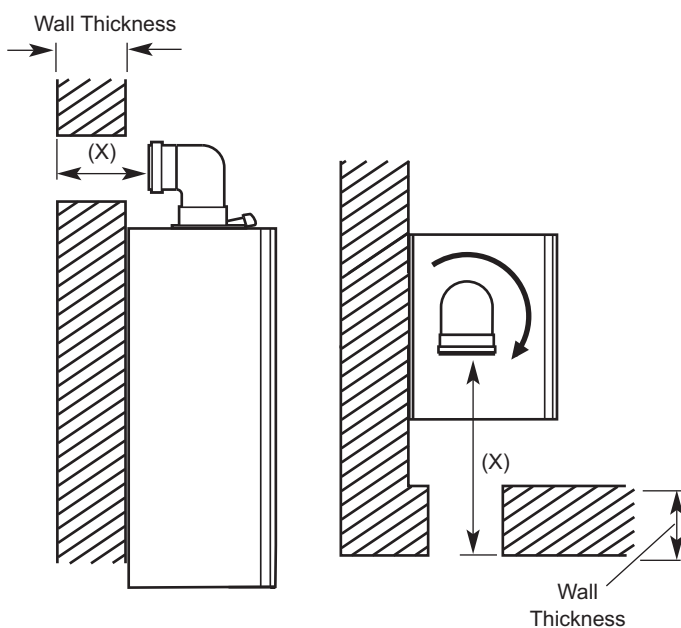


Fig. 25

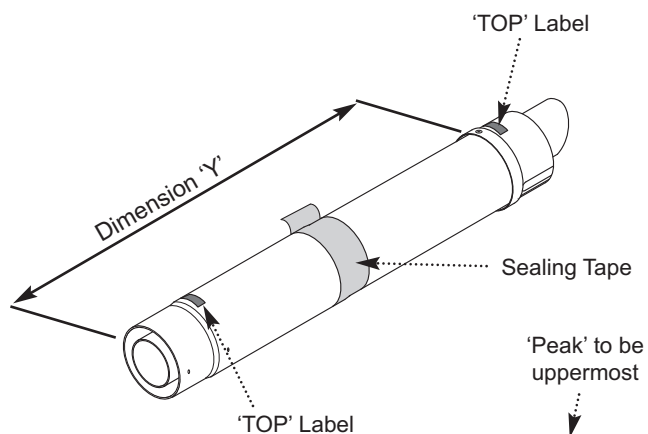


Fig. 27

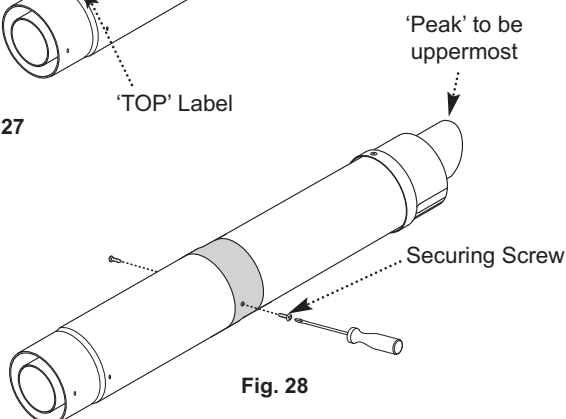


Fig. 28

## 6.4 Air Supply / Flue Gas Connections

### 6.4.1 Connecting the Flue/Chimney

#### HORIZONTAL TELESCOPIC FLUE (concentric 60/100)

1. There are two telescopic sections, the terminal assembly and the connection assembly, a roll of sealing tape and two self tapping screws. A 93° elbow is also supplied.
2. The two sections can be adjusted to provide a length between 315mm and 500mm (Fig. 24) when measured from the flue elbow (there is 40mm engagement into the elbow).
3. Locate the flue elbow on the adaptor at the top of the boiler. Set the elbow to the required orientation (Fig. 25).

**i** The flue elbow is angled at 93 degrees to ensure a fall back to the boiler.

4. Measure the distance from the outside wall face to the elbow. This dimension will be known as 'X' (Fig. 25).
5. If the distance from the flue elbow to the outside face of the wall ('X' in Fig. 25) is less than 250mm the connection assembly can be discarded and the terminal assembly fitted directly into the elbow.
6. In instances where the dimension 'X' (Fig. 25) is between 250mm and 315mm it will be necessary to shorten the terminal assembly by careful cutting to accommodate walls of these thicknesses.
7. To dimension 'X' add 40mm. This dimension to be known as 'Y'.
8. Adjust the two telescopic sections to dimension 'Y' and seal the joint with the tape provided (Fig. 27). Ensure that the labels marked 'TOP' on the terminal and connection assemblies are uppermost.
9. Using the clearance holes in the connection assembly secure it to the terminal assembly using the screws supplied with the telescopic flue (Fig. 28).

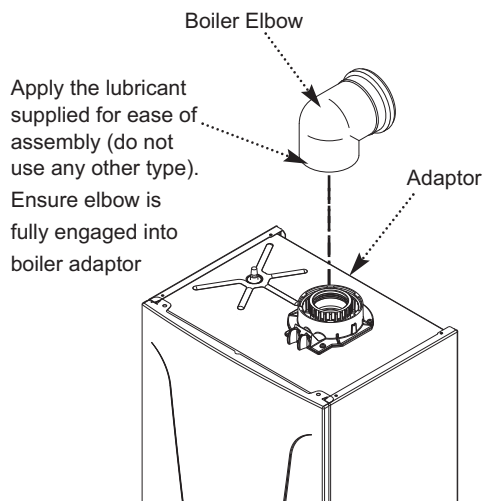


Fig. 29

10. Remove the flue elbow and insert the flue through the hole in the wall. Fit the flue trims if required, and refit the elbow to the boiler adaptor, ensuring that it is pushed fully in. Secure the elbow with the screws supplied in the boiler fitting kit (Fig. 29).

11. Draw the flue back through the wall and engage it in the elbow. It may be necessary to lubricate to ease assembly of the elbow and flue (Fig. 30).

12. Ensure that the terminal is positioned with the slots to the bottom (Fig. 31). Secure to the elbow with the screws supplied with the telescopic flue (Fig. 30).

**i** It is essential that the flue terminal is fitted as shown to ensure correct boiler operation and prevent water entering the flue.

13. Make good between the wall and air duct outside the building, appropriate to the wall construction and fire rating.

14. If necessary fit a terminal guard (see Section 5.3.11).

**i** There must be no part of the air duct (white tube) visible outside the property.

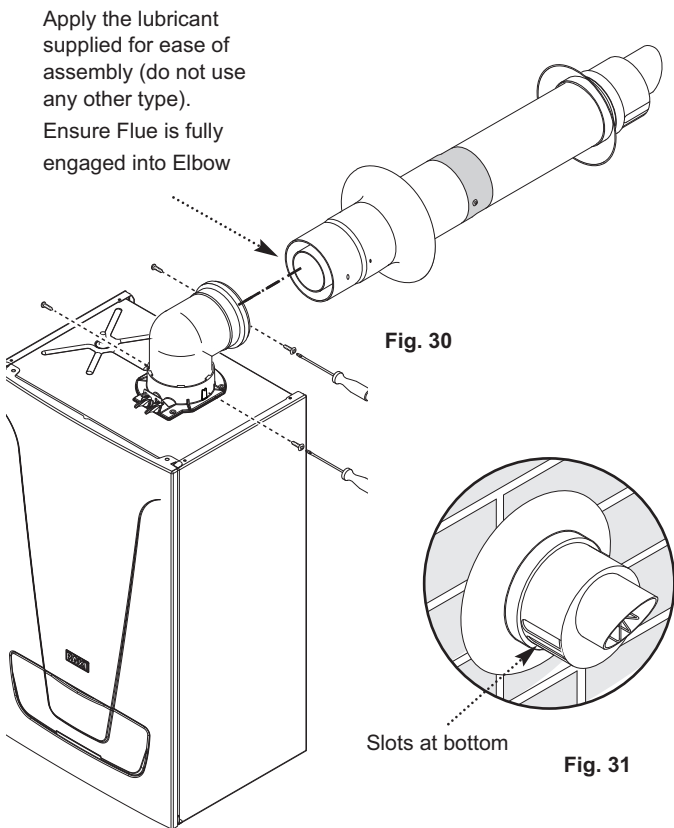


Fig. 30

Slots at bottom

Fig. 31



**IMPORTANT**

- Any wiring to the boiler, from either the mains or an external control, **MUST** be cable of the following specification:- 0.75mm 3183/4/5Y (depending on installation) multi strand flexible cable conforming to BS 50525-2-11.
- Cable of the above specification is sufficiently flexible to withstand normal regular opening and closing of the facia/control box as expected during routine servicing and other maintenance work.
- Use **ONLY** cable glands supplied with the boiler, or provided as spares by the manufacturer.
- Under no circumstances must solid core cable be used as it is not intended for applications where movement may occur. The use of solid core cable could result in situations potentially hazardous to health.
- These points must be considered when initially wiring the boiler to the installation, and if replacing any wiring during the service life of the boiler.

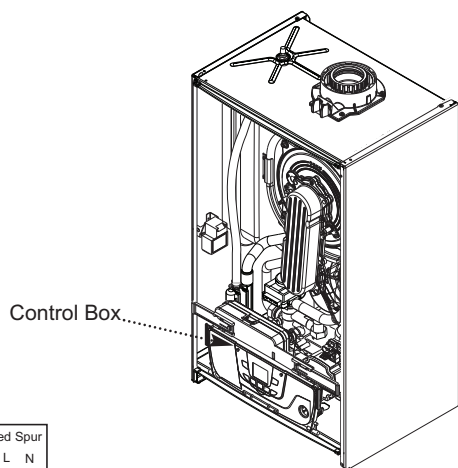


Fig. 34

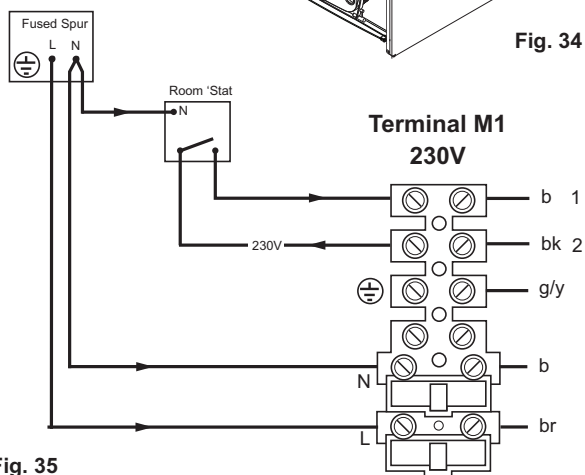


Fig. 35

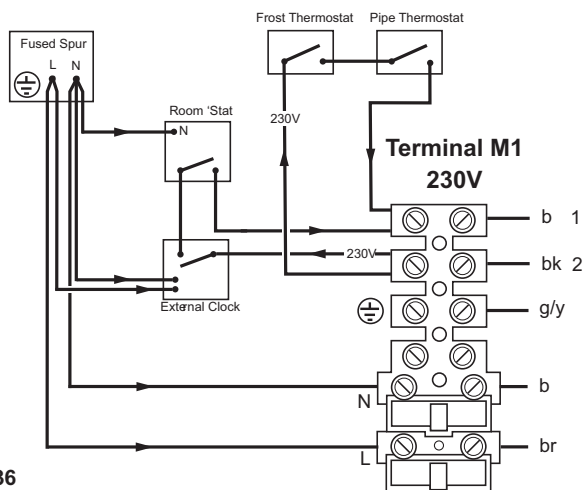


Fig. 36

## 6.5 Electrical Connections

### 6.5.1 Electrical Connections of the appliance

**The boiler must be connected to the mains fused 3A 230V 50HZ supply & control system using cable of 3 core 0.75mm 3183Y multi strand flexible type (see IMPORTANT note opposite).**

1. See Section 5.2.2. for details of the electrical supply. Undo the securing screws and lift the case front panel off.
2. Hinge the control box downwards. Disengage the securing tabs and open the terminal block cover. (Fig. 34).
3. If the mains cable fitted is not long enough slacken the gland nut in the right of the boiler lower panel and pass the new mains cable through it. Remove the grommet adjacent to the gland nut, pierce the diaphragm and insert the cable from the external control system.
4. Leave sufficient slack in the cables to allow the control box to be hinged fully open. Tighten the gland nut and refit the grommet and gland nut.
5. Connect the Earth, Permanent Live and Neutral wires to the terminal strip.

**i** Both the Permanent Live and Neutral connections are fused.

6. Refer to the instructions supplied with the external control(s).

**i** Any thermostat must be suitable for 230V switching.

7. Remove the link between connections 1 & 2. The 230V supply at connection 2 must be connected to the thermostat. The switched output from the thermostat must be connected to connection 1. (Figs. 35 & 36). If the room thermostat being used incorporates an anticipator it **MUST** be wired as shown in Figs. 35 & 36.

8. Replace the terminal block cover.

**i** The 230V switched signal for external controls (Frost Stat - Room Stat - Timer) must always be taken from terminal 2 at the boiler. Live, Neutral and Earth to power these controls must be taken from the Fused Spur. For the Frost Stat to operate the boiler **MUST BE IN CENTRAL HEATING MODE** i.e. **||||** symbol shown.

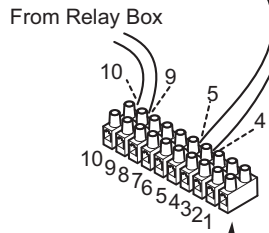
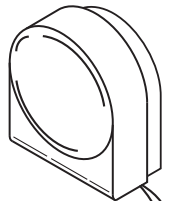
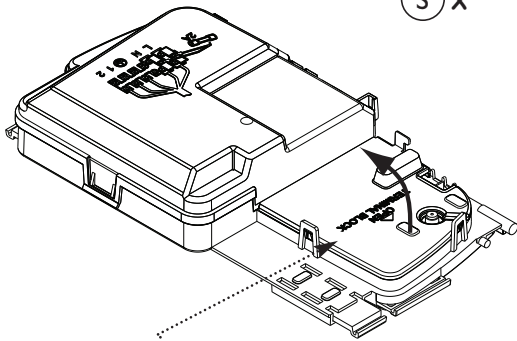
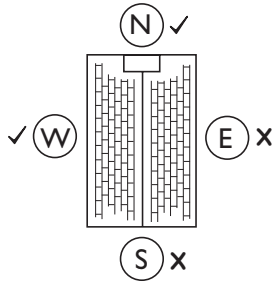
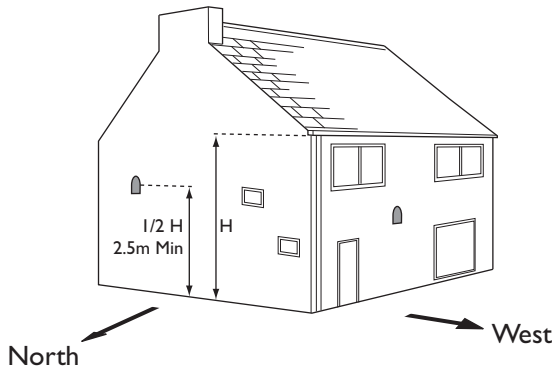
9. Engage the front panel onto the locating lugs on top of the case & secure with the securing screws at the bottom of the case.

### 6.5.2 Connecting External Devices

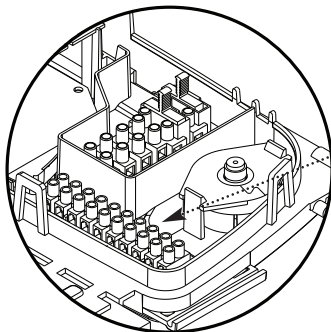
- i** 1. See Section 6.7.2. for details of fitting the optional outdoor sensor accessory.

## 6.6 Filling the Installation

- i** 1. See Section 5.2.6 and 5.6.1 for details of flushing and filling the installation.



**M2 Low Voltage Terminal Block**



## 6.7 External Controls

### 6.7.1 Installation of External Sensors

1. Various Sensors are available.

### 6.7.2 Optional Outdoor Sensor

**Full instructions are provided with the Outdoor Sensor Kit !**

#### Positioning the Sensor

1. The sensor must be fixed to an external wall surface of the property it is serving. The wall must face north or west.

**i** DO NOT position it on a south facing wall in direct sunlight !

2. The sensor should be approximately half the height of the living space of the property, and a minimum of 2.5m above ground level.

3. It must be positioned away from any sources of heat or cooling (e.g. flue terminal) to ensure accurate operation. Siting the sensor above doors and windows, adjacent to vents and close to eaves should be avoided.

#### Connecting the Sensor

1. Ensure the electrical supply to the boiler is isolated. Undo the securing screws and lift the case front panel off.

2. Hinge the control box downwards. Disengage the securing tabs and open the terminal block cover.

3. Remove one of the grommets in the boiler lower panel, pierce the diaphragm and insert the wires from the outdoor sensor.

4. Leave sufficient slack in the wires to allow the control box to be hinged fully open. Refit the grommet.

5. Connect the wires from the outdoor sensor to positions 4 & 5 on M2 as shown. Refit the cover.

#### Setting the Sensor Curve

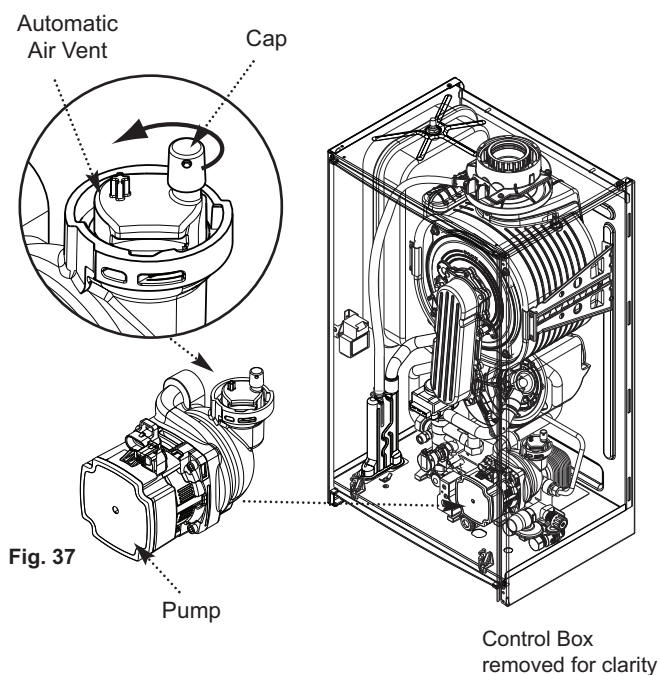
1. With the outdoor sensor fitted, the boiler central heating flow temperature is adjusted automatically to accommodate the change in heat required to optimise the efficient performance of the boiler whilst maintaining a comfortable room temperature. The central heating buttons on the boiler adjust a "simulated room temperature" used for this optimisation.

2. This functionality requires the setting of three parameters on the boiler, to suit the heating system and the optimisation can be adjusted by the user with the central heating control buttons on the boiler control panel.

**Full instructions are provided with the Outdoor Sensor Kit !**

**👉** Continue with the installation and commissioning of the boiler as described in this manual.

## 7 Commissioning



### 7.1 General

1. Reference should be made to BS:EN 12828, 12831 & 14336 when commissioning the boiler. Ensure that the condensate drain trap has been primed - see Section 6.2.2. paragraph 3.
2. At the time of commissioning, complete all relevant sections of the Benchmark Checklist at the rear of this publication.
3. Open the mains water supply to the boiler and all hot water taps to purge the DHW system.
4. Ensure that the filling loop is connected and open, then open the heating flow and return valves on the boiler. Ensure that the cap on the automatic air vent on the pump body is opened (Fig. 37).
5. The system must be flushed in accordance with BS 7593 (see Section 5.2.6) and the flushing agent manufacturers instructions.
6. Pressurise the system to 1.5 bar (Fig. 38) then close and disconnect the filling loop.
7. Test for gas tightness, turn the gas supply on and purge according to in GB BS 6891 and in IE I.S. 813 "Domestic Gas Installations".

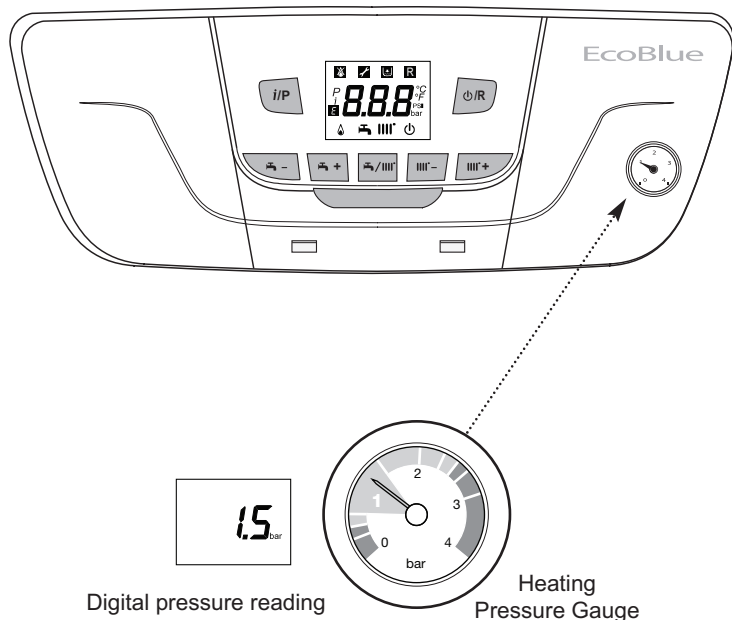
### 7.2 Checklist before Commissioning

#### 7.2.1 Preliminary Electrical Checks

1. Prior to commissioning the boiler preliminary electrical system checks should be carried out.
2. These should be performed using a suitable meter, and include checks for Earth Continuity, Resistance to Earth, Short Circuit and Polarity.

#### 7.2.2 Checks

1. Checked:
  - ▶ That the boiler has been installed in accordance with these instructions.
  - ▶ The integrity of the flue system and the flue seals.
  - ▶ The integrity of the boiler combustion circuit and the relevant seals.



Digital pressure reading which can be accessed by via the **iP** button and scrolling to setting '5'. Note there may be a slight difference between the digital & gauge reading depending on boiler operating mode.

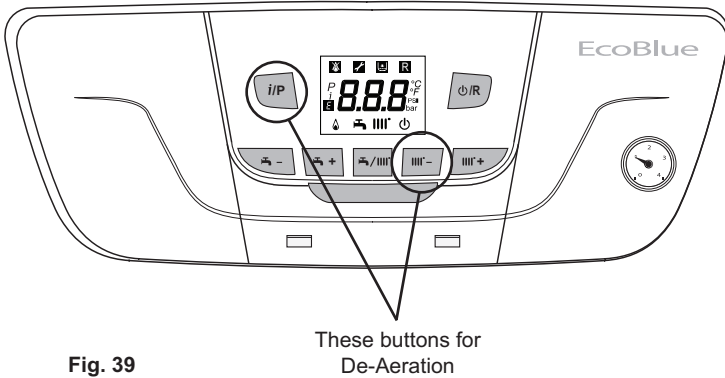


Fig. 39

**i FUNCTION INTERRUPTION**

- If the De-aeration is interrupted due to a fault the pump will cease to circulate but the function timer (approx. 10 minutes) will continue to run. For this reason it is recommended to monitor the boiler display during De-aeration. If the fault cannot be rectified quickly the function must be restarted to ensure complete De-aeration.
- In the event of a loss of power the De-aeration function needs to be restarted once the power is re-established.
- In the event of low water pressure the fault code E118 will be displayed, along with the flashing and symbols. This error can be rectified by repressurising the system to at least 1.0 bar. The pump will restart automatically once the water pressure is successfully re-established and **3 12** will reappear in the display.
- The De-aeration function can be repeated as necessary until all air is expelled from the system.

## 7.3 Commissioning Procedure

### 7.3.1 De-Aeration Function

**i** The display backlight remains lit approx. 10 minutes. If the backlight goes out during commissioning it does not mean that the process has been completed.

► This procedure **MUST** be carried out !

1. Ensure the gas is turned Off! Turn the power to the boiler ON. The software version will be displayed, followed by **2**, then **..** flashing briefly before displaying the 'Standby' symbol .

2. Press **iP** & **III-** together and hold for at least 6 seconds until **0n** is briefly displayed followed by **3 12**.

3. The De-Aeration Function is now activated. The boiler pump will run for approx. 10 minutes. During this time the pump will alternate on and off and the diverter valve will switch between heating & hot water to purge air from the system.

4. At the end of the process the boiler will return to the 'Standby' position.

## 7.4 Gas Settings

### 7.4.1 Checking Combustion - 'Chimney Sweep' Mode

- The case front panel must be fitted when checking combustion.
- Ensure the system is cold & the gas supply turned on & purged.

The person carrying out a combustion measurement should have been assessed as competent in the use of a flue gas analyser and the interpretation of the results. See Section 10.1.3.

Important: Allow the combustion to stabilise before inserting the Combustion Analyser Probe into the Test Point. This will prevent saturation of the analyser.

1. Press **OR** & **III-** together and hold for at least 6 seconds. **0n** is displayed briefly followed by **303** and the current setting point (eg. **1**, **2** or **3**) flashing alternately. **Important:** There may be a delay before the boiler fires.

2. To adjust the boiler input setting, press **III-** or **III+** button and the current setting point will flash (eg. **1**, **2** or **3**). Press the **III-** or **III+** button again to alter the boiler input setting.

**3** = MAX. HEATING input, **2** = MAX. DHW input, **1** = MIN. input

4. The combustion (CO level & CO/CO<sub>2</sub> ratio) must be measured and recorded at MAXIMUM DHW input & MINIMUM input.

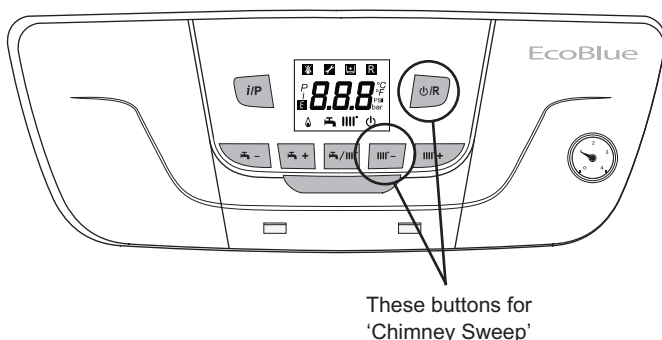
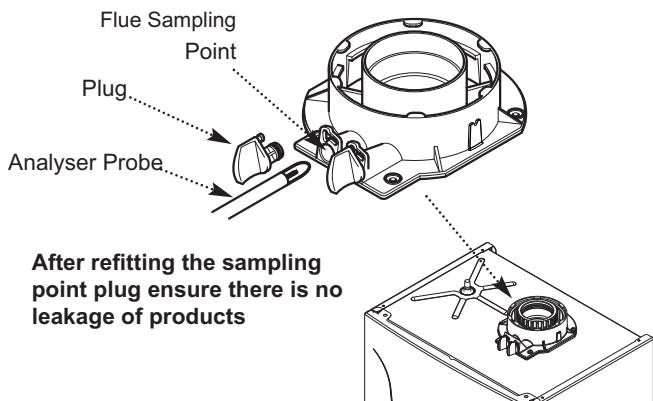
5. Follow the flow chart on the next page to comply with the requirement to check combustion on commissioning.

**i** The system **MUST** be cold to ensure the boiler is operating under full demand. To obtain an accurate measurement on smaller capacity systems it may be necessary to open one or more hot taps and remove the diverter valve motor (see Section 10.3.20) in order to maintain the boiler output.

6. Press **OR** & **III-** again for at least 6 seconds to exit.

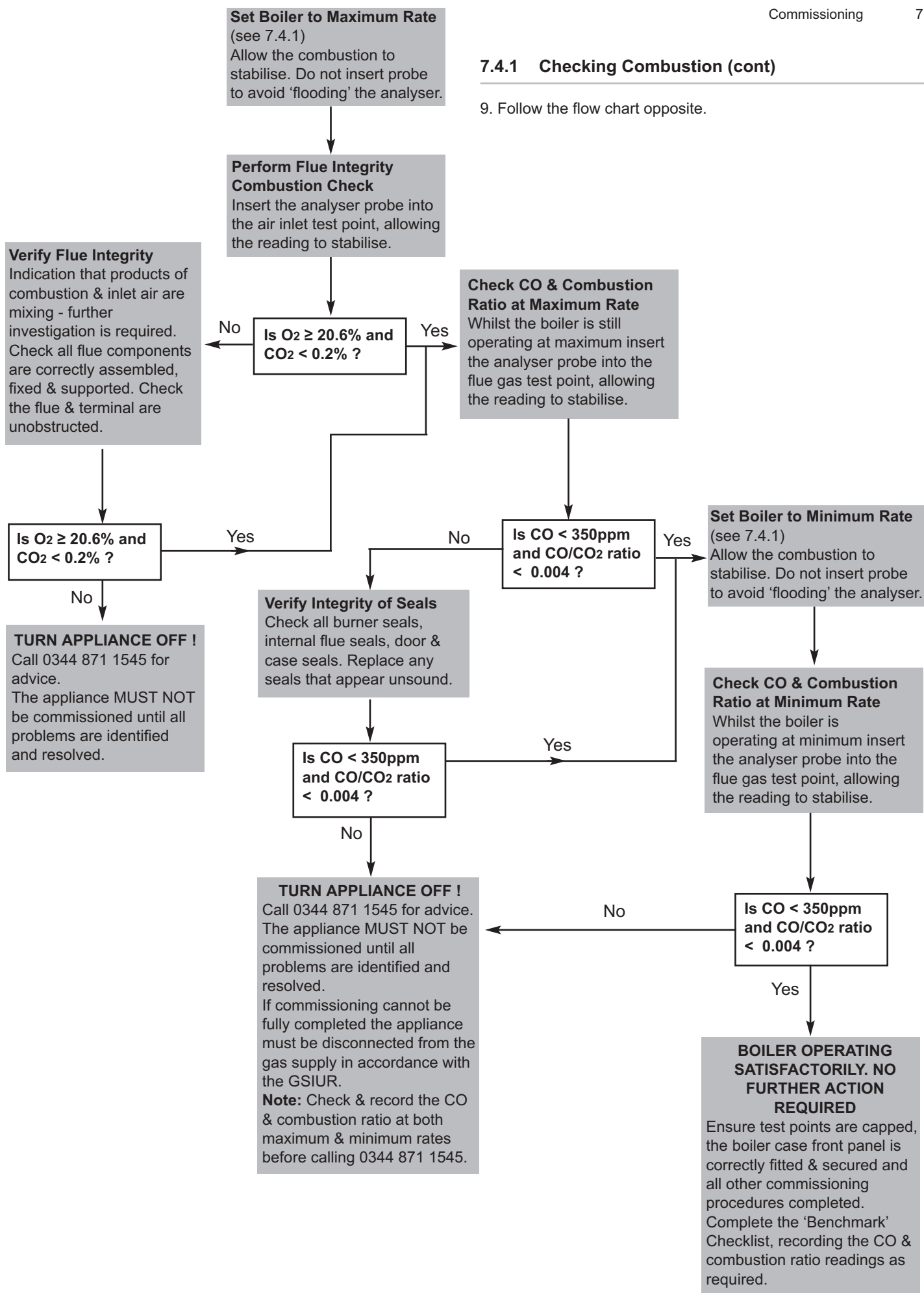
7. Press the **OR** once to bring the boiler out of 'Standby' mode.

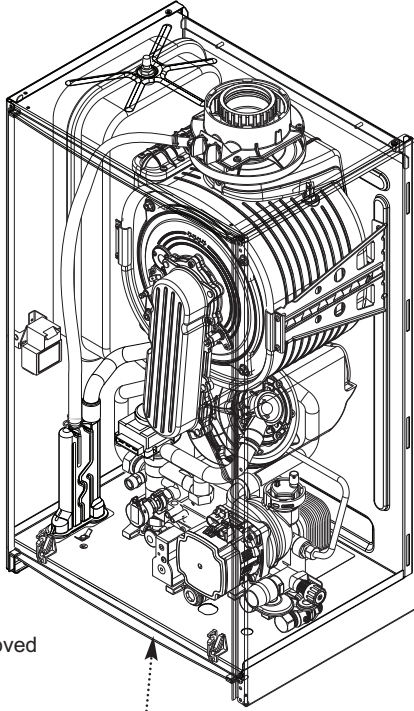
8. Use the **CH/III-** button to toggle through the CH **III-** and DHW **CH** settings to activate the required modes.



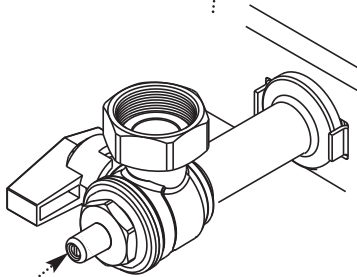
### 7.4.1 Checking Combustion (cont)

9. Follow the flow chart opposite.





Control Box removed for clarity



Gas Cock Inlet Pressure Test Point

Fig. 41

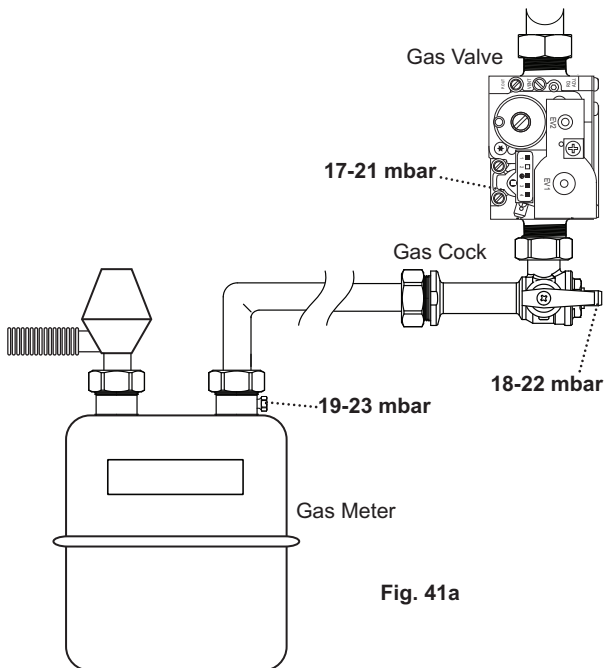


Fig. 41a

#### Working Gas Pressures

If the pressure drops are greater than shown in Fig. 41a (above) a problem with the pipework or connections is indicated. Permissible pressure drop across system pipework  $\leq 1$  mbar.

## 7.5 Configuring the System

### 7.5.1 Check the Operational (Working Gas Inlet Pressure & Gas Rate)



The system MUST be cold to ensure the boiler is operating under full demand. To obtain an accurate measurement on smaller capacity systems it may be necessary to open one or more hot taps and remove the diverter valve motor (see Section 10.3.20) in order to maintain the boiler output.

1. Press **iP** & **III** - together and hold for at least 6 seconds. **On** is displayed briefly followed by **303 & 3** flashing alternately. '3' represents MAXIMUM HEATING input.
2. Press **III** - or **III** + to adjust the input. **2** represents MAXIMUM DHW input.
3. With the boiler operating in the maximum rate condition check that the operational (working) gas pressure at the inlet gas pressure test point is in accordance with B.S. 6798 & B.S. 6891. This must be AT LEAST 17mb !
4. Ensure that this inlet pressure can be obtained with all other gas appliances in the property working. The pressure should be measured at the test point on the gas cock (Fig. 41).

#### Measure the Gas Rate

5. With any other appliances & pilot lights turned OFF the gas rate can be measured. It should be:-

Natural Gas	24 model	2.61 m <sup>3</sup> /h
	28 model	3.05 m <sup>3</sup> /h
	33 model	3.59 m <sup>3</sup> /h
	40 model	4.35 m <sup>3</sup> /h

6. Press **iP** & **III** - together and hold for at least 6 seconds to exit the function.

## 7.6 Final Instructions

### 7.6.1 Handover

1. Carefully read and complete all sections of the Benchmark Commissioning Checklist at the rear of this publication that are relevant to the boiler and installation. These details will be required in the event of any warranty work.



The warranty will be invalidated if the Benchmark section is incomplete.

2. The publication must be handed to the user for safe keeping and each subsequent regular service visit recorded.

3. Hand over the User's Operating, Installation and Servicing Instructions, giving advice on the necessity of regular servicing.

4. For IE, it is necessary to complete a "Declaration of Conformity" to indicate compliance with I.S. 813. An example of this is given in I.S. 813 "Domestic Gas Installations". This is in addition to the Benchmark Commissioning Checklist.

### Information Display

The **iP** button can be pressed so that the display shows the following information:-

- '00' alternates with Sub-Code (only when fault on boiler) or '000'
- '01' alternates with CH Flow Temperature
- '02' alternates with Outside Temperature (where Sensor fitted)
- '03' alternates with DHW Temperature
- '04' alternates with DHW Temperature
- '05' alternates with System Water Pressure
- '06' alternates with CH Return Temperature
- '07' alternates with Flue Temperature
- '08' - not used
- '10' alternates with Zone 1 CH Flow Temperature
- '11' alternates with Zone 2 CH Flow Temperature
- '12' alternates with Ion current
- '13' alternates with Burner working hours
- '14' alternates with Zone 1 CH mode
- '15' alternates with Zone 2 CH mode
- '16' alternates with DHW circuit operating mode
- '17' alternates with Boiler operating mode
- '18' alternates with Solar plant operating mode
- '19' alternates with Manufacturer information
- '20' alternates with Manufacturer information

Depending upon boiler model and any system controls connected to the appliance, not all information codes will be displayed and some that are will not have a value.

Press **⏻** to return to the normal display.

5. Set the central heating and hot water temperatures to the requirements of the user. Instruct the user in the operation of the boiler and system.

6. Instruct the user in the operation of the boiler controls.

7. Demonstrate to the user the action required if a gas leak occurs or is suspected. Show them how to turn off the gas supply at the meter control, and advise them not to operate electric light or power switched, and to ventilate the property.

8. Show the user the location of the system control isolation switch, and demonstrate its operation.

9. Advise the user that they may observe a plume of vapour from the flue terminal, and that it is part of the normal operation of the boiler.

### 7.6.2 System Draining

1. If at any time after installation it is necessary to drain & refill the central heating system (e.g. when replacing a radiator) the De-Aeration Function should be activated.



Re-pressurise the system to 1.5 bar

2. On refilling the system ensure that there is no heating or hot water demand, but that there is power to the boiler. It is also recommended that the gas supply is turned off to prevent inadvertent ignition of the burner.

3. Press **iP** & **||||-** together and hold for at least 6 seconds. The 'De-Aeration' Function will be activated.

4. The boiler pump will run for up to 10 minutes during which time the diverter valve will switch between heating & hot water. This will purge air from the system. The display will show **3 12**.

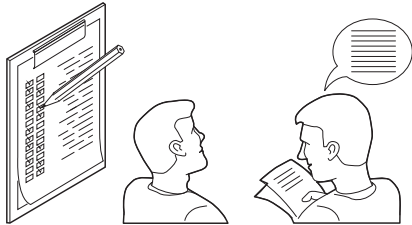
5. Once De-Aeration is complete recommission the appliance and check that the inhibitor concentration is sufficient.



See Section 7.3.1 for more detail.

## 8 Operation

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### 8.1 General

---

1. It is the responsibility of the installer to instruct the user in the day to day operation of the boiler and controls and to hand over the completed Benchmark Checklist at the back of this manual.
2. Set the central heating and hot water temperatures to the requirements of the user. Instruct the user in the operation of the boiler and system.
3. The temperature on the boiler must be set to a higher temperature than the cylinder thermostat to achieve the required hot water demand.
4. Instruct the user in the operation of the boiler and system controls.
5. Demonstrate to the user the action required if a gas leak occurs or is suspected. Show them how to turn off the gas supply at the meter control, and advise them not to operate electric light or power switched, and to ventilate the property.
6. Show the user the location of the system control isolation switch, and demonstrate its operation.
7. Advise the user that they may observe a plume of vapour from the flue terminal, and that it is part of the normal operation of the boiler.
8. The method of repressurising the primary system should be demonstrated.
9. If at any time after installation it is necessary to drain & refill the central heating system (e.g. when replacing a radiator) the De-Aeration Function should be activated (see 7.6.2).

### 8.2 To Start-up

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Switch on the boiler at the fused spur unit and ensure that the time control is in the on position and any other controls (e.g. room thermostat) are calling for heat.

Press the **⏻** once to bring the boiler out of Standby mode. The boiler will begin its start sequence.

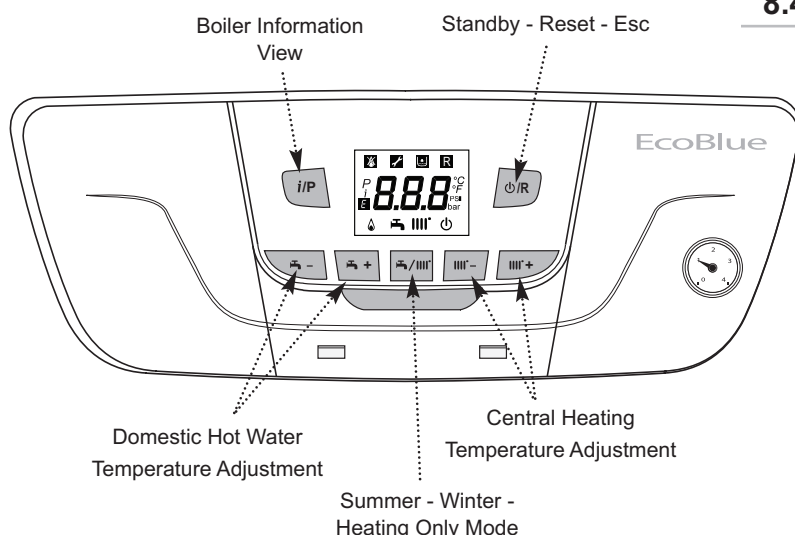
### 8.3 To Shutdown

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Isolate the mains power supply at the fused spur unit.

Isolate the gas supply at the boiler valve.





## 8.4 Use of the Control Panel

### Key to Controls

- Standby - Reset - Esc Button
- Boiler Information View Button
- Increase CH Temperature Button
- Decrease CH Temperature Button
- Increase DHW Temperature Button
- Decrease DHW Temperature Button
- Summer / Winter / Only Heating Mode Button

### Summer - Winter - Heating Only Mode

1. Press button until the required mode appears:-

- Summer - DHW only mode
- Winter - DHW & CH mode
- Heating Only - Only CH mode

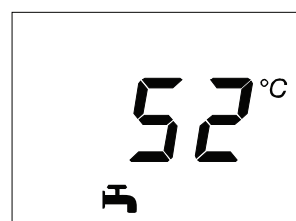
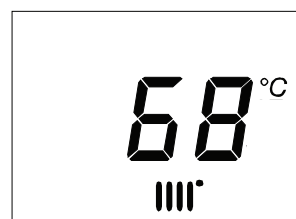
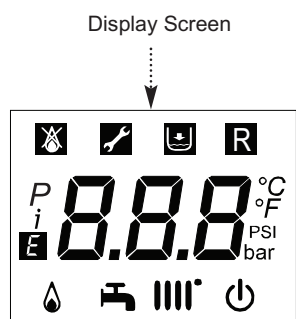
### To increase or decrease the boiler temperature

- Press to increase the Central Heating temperature.
- Press to decrease the Central Heating temperature.

An overheat thermostat (NTC) is positioned in the heat exchanger which shuts down the appliance if the boiler temperature exceeds 100°C. Press button to re-establish normal operating conditions.

### To adjust the domestic hot water temperature

- Press to increase the Domestic Hot Water temperature.
- Press to decrease the Domestic Hot Water temperature.



## 8.5 Frost Protection

- The boiler incorporates an integral frost protection feature that will operate in both Central Heating and Domestic Hot Water modes, and also when in standby ( displayed) see section 4.2.3 Boiler Frost Protection Mode.

## 9 Settings

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### 9.1 Parameters

---

The operating parameters of the boiler have been factory set to suit most systems.

## 10 Maintenance



### WARNING

When changing components ensure that both the gas and electrical supplies to the boiler are isolated before any work is started. When the component has been changed recommission the boiler as described in Section 7.

Always examine any seals or gaskets, replacing where necessary. The Case Front Panel **MUST** seal effectively against the boiler side panels.

### 10.1 General

1. For reasons of safety and economy, it is recommended that the boiler is serviced annually. Servicing must be performed by a competent person in accordance with B.S. 7967-4.

2. After servicing, complete the relevant Service Interval Record section of the Benchmark Commissioning Checklist at the rear of this publication.



During routine servicing, and after any maintenance or change of part of the combustion circuit, the following must be checked:-

- The integrity of the complete flue system and the flue seals by checking air inlet sample to eliminate the possibility of recirculation.  **$O_2 \geq 20.6\%$  &  $CO_2 < 0.2\%$**
- The integrity of the boiler combustion circuit and relevant seals.
- The operational gas inlet pressure and the gas rate as described in Section 7.5.1.
- The combustion performance as described in 'Check the Combustion Performance' below.

#### 3. Competence to carry out Checking Combustion

**Performance** B.S. 6798 'Specification for Installation & Maintenance of Gas Fired Boilers not exceeding 70kWh' advises that:-

- The person carrying out a combustion measurement should have been assessed as competent in the use of a flue gas analyser and the interpretation of the results.
- The flue gas analyser used should be one meeting the requirements of BS7927 or BS-EN50379-3 and be calibrated in accordance with the analyser manufacturers' requirements.
- Competence can be demonstrated by satisfactory completion of the CPA1 ACS assessment, which covers the use of electronic portable combustion gas analysers in accordance with BS 7967, Parts 1 to 4.

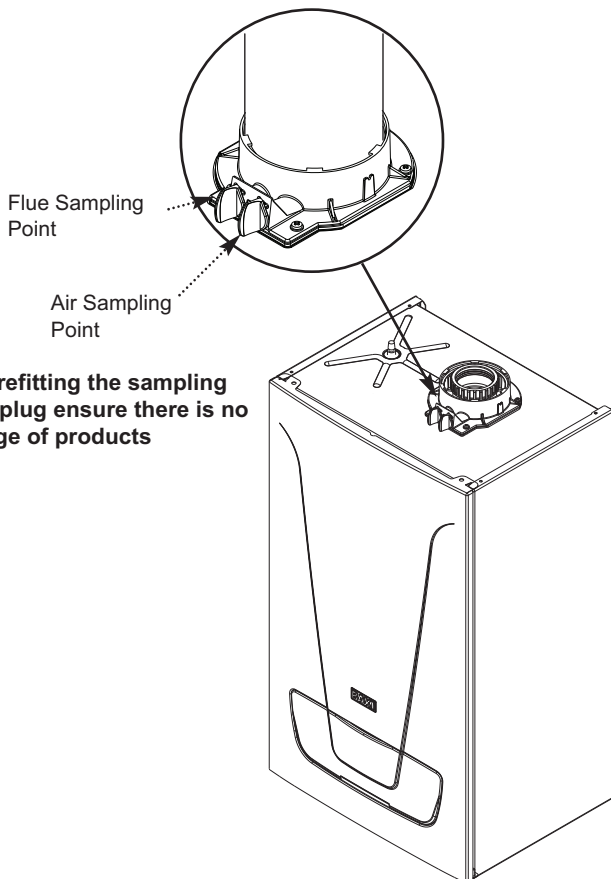
#### 4. Check the Combustion Performance (CO/CO<sub>2</sub> ratio)



Set the boiler to operate at maximum rate as described in Section 7.4.

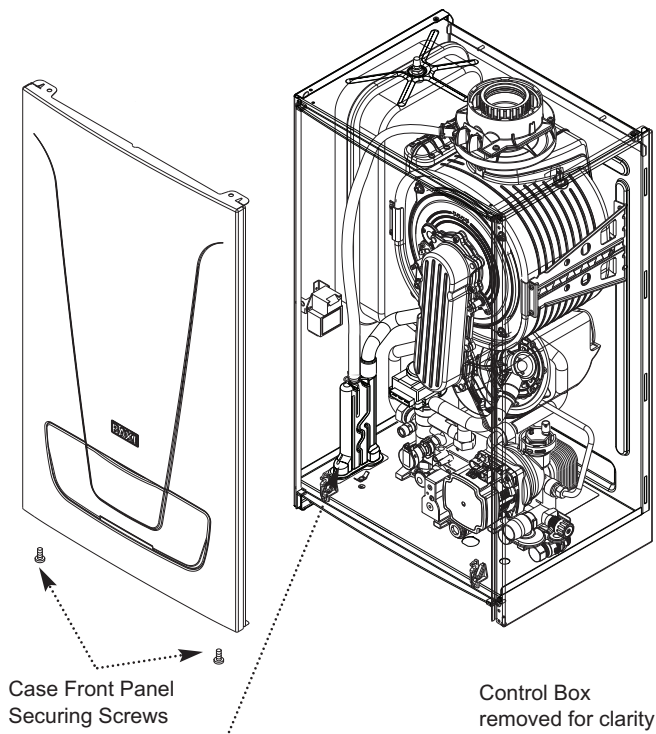
5. Remove the plug from the flue sampling point, insert the analyser probe and obtain the CO/CO<sub>2</sub> ratio. **This must be less than 0.004.** If the combustion reading (CO/CO<sub>2</sub> ratio) is greater than this, and the integrity of the complete flue system and combustion circuit seals has been verified, and the inlet gas pressure and gas rate are satisfactory either:-

- Perform the 'Standard Inspection and Maintenance' (Section 10.2) & re-check.
- Perform 'Setting the Gas Valve' (Section 10.3.25) & re-check.
- Replace and set the gas valve (Sections 10.3.24 & 25) & re-check.



## 10.2 Standard Inspection and Maintenance Operation

**i** When performing any inspection or maintenance personal protective equipment must be used where appropriate.



1. Ensure that the boiler is cool and that both the gas and electrical supplies to the boiler are isolated.
2. Remove the screws securing the case front panel. Lift the panel slightly to disengage it from the tabs on top of the case (Fig. 43). Hinge down the control box.
3. To aid access disconnect the igniter plug & disconnect the two pipes from the top of the condensate trap and the drain pipe from the trap outlet. Undo the screw & washer securing the trap to the boiler lower panel.
4. Disengage the lip on the trap from the slotted bracket and remove the trap. Take care not to spill any residual condensate on the controls and P.C.B. Thoroughly rinse the trap and examine the gasket on the trap base, replacing if necessary.
5. Remove the clip securing the gas feed pipe to the air/gas venturi. Disconnect the pipe. Do not break the joint between the pipe and gas valve unless necessary.
6. Note their position and disconnect the electrode leads and the fan electrical plugs (Fig. 46).
7. Undo the four 10mm nuts retaining the combustion box cover to the heat exchanger.
8. Carefully draw the fan, collector and cover assembly forward (Fig. 46).
9. Clean any debris from the heat exchanger and check that the gaps between the coils are clear.
10. Inspect the burner, electrodes position (Fig. 45) and insulation, cleaning or replacing if necessary. Clean any dirt or dust from the boiler.

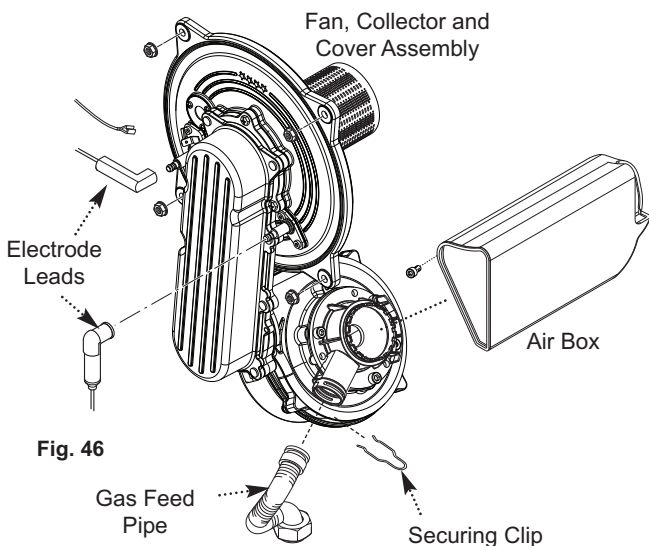
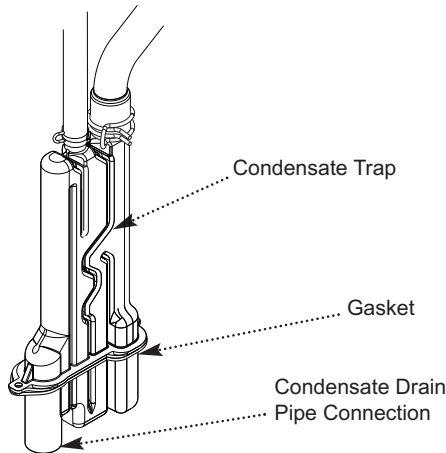
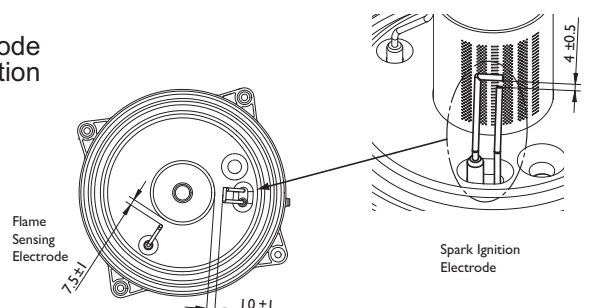


Fig. 46

11. Carefully examine all seals, insulation & gaskets, replacing as necessary. Look for any evidence of leaks or corrosion, and if found determine & rectify the cause.
12. Prime the trap and reconnect the pipes to the top. Reassemble in reverse order.

### Electrode Position

Fig. 45



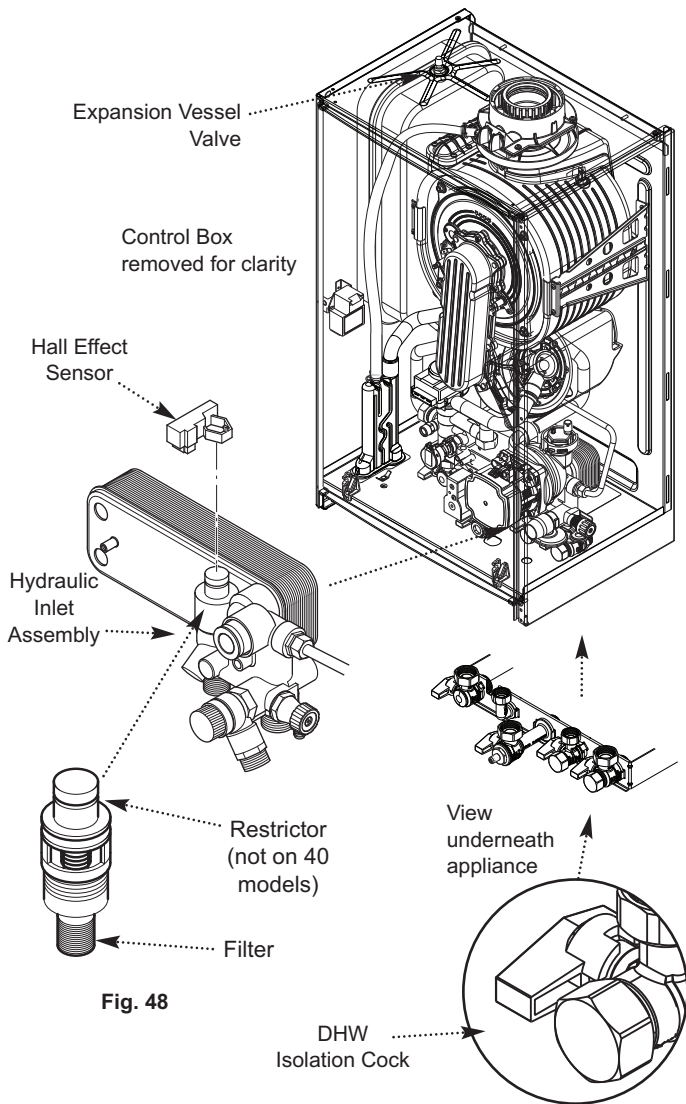


Fig. 47

Fig. 48

**Expansion Vessel Charge - 1.0 bar**

13. To check the charge accurately ensure the system is cold. It is also necessary to relieve the pressure by draining the boiler. Using a suitable gauge check the pressure at the valve on the underside of the vessel. Adjust the pressure as required and repressurise the system.

**i** A right angled valve extension will aid checking and repressurising.

**DHW Filter (Fig. 48)**

14. If the flow of domestic hot water is diminished, it may be necessary to clean the filter.

15. Turn the cold mains isolation cock (Fig. 47) off and draw off from a hot tap.

16. Disconnect the pump cable, remove the retaining clip and extract the filter cartridge and rinse thoroughly in clean water. Reassemble and check the flow.

17. Check the operation of the Safety Pressure Relief Valve. Simulate 'Flame Failure' fault by isolating the supply at gas cock and operating the boiler. **E** 133 should be displayed.

18. Reassemble the appliance in reverse order, ensuring the front case panel is securely fitted. Recommission the boiler.

19. Complete the relevant Service Interval Record section of the Benchmark Commissioning Checklist at the rear of this publication and then hand it back to the user.

**10.3 Specific Maintenance Operations Changing Components**



**WARNING**

When changing components ensure that both the gas and electrical supplies to the boiler are isolated before any work is started. When the component has been changed recommission the boiler as described in Section 7.

Always examine any seals or gaskets, replacing where necessary. The Case Front Panel **MUST** seal effectively against the boiler side panels.

See Section 10.2 paragraph 2 for removal of case panel door etc.

**10.3.1 Spark Ignition & Flame Sensing Electrodes**

1. Note their position and disconnect the electrode leads. Remove the retaining screws securing each of the electrodes to the combustion box cover and remove the electrodes, noting their orientation.

2. Check the condition of the sealing gaskets and replace if necessary. Reassemble in reverse order (Fig. 49).

3. If satisfactory combustion readings are not obtained ensure the electrode position is correct and perform the combustion check again.

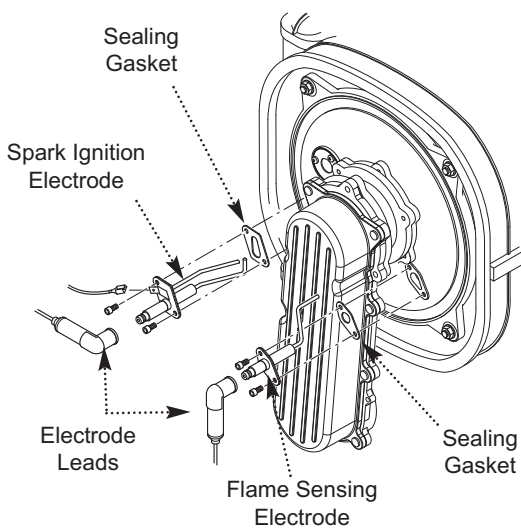
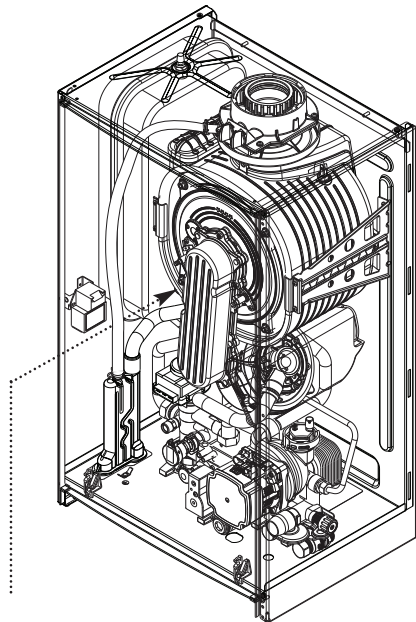


Fig. 49



### 10.3.2 Fan (Figs. 50 & 51)

1. Remove the clip securing the gas feed pipe to the air/gas venturi. Disconnect the pipe.
2. Undo the screws securing the air/gas collector to the extension piece and disconnect the fan electrical plugs (Fig. 50).
3. Remove the collector and fan assembly, being careful to retain the gasket.
4. Undo the securing screw and remove the airbox, disengaging it from the fan venturi. Undo the screws securing the fan to the collector. Retain the gasket.
5. Undo the screws securing the venturi to the fan (noting its position) and transfer to the new fan, replacing the seal if necessary. Examine the gasket(s) and replace if necessary.

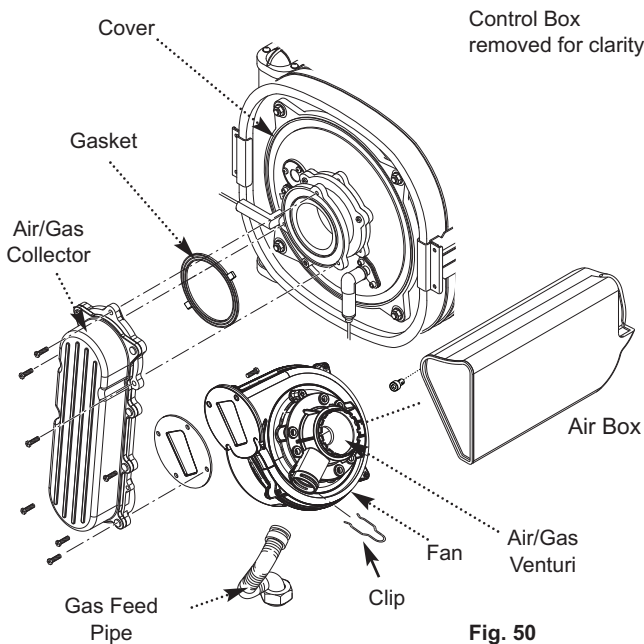


Fig. 50

### 10.3.3 Air/Gas Venturi (Figs. 50 & 51)

1. Undo the securing screw and remove the airbox, disengaging it from the fan venturi. Remove the clip securing the gas feed pipe to the venturi.
2. Undo the screws securing the collector to the extension piece and disconnect the fan electrical plugs.
3. Remove the collector and fan assembly, being careful to retain the gasket.
4. Undo the screws securing the venturi to the fan (noting its position) and fit the new venturi, replacing the seal if necessary. Examine the gasket and replace if necessary.
5. After changing the venturi check the combustion - see Section 7.4.1.

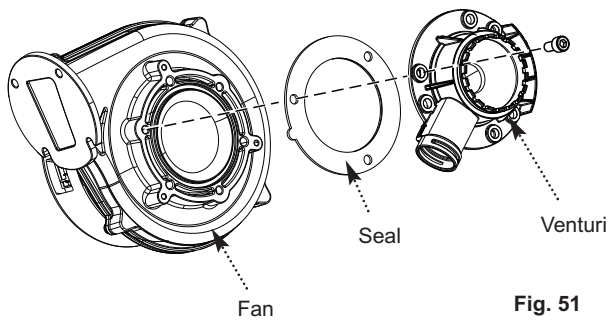


Fig. 51

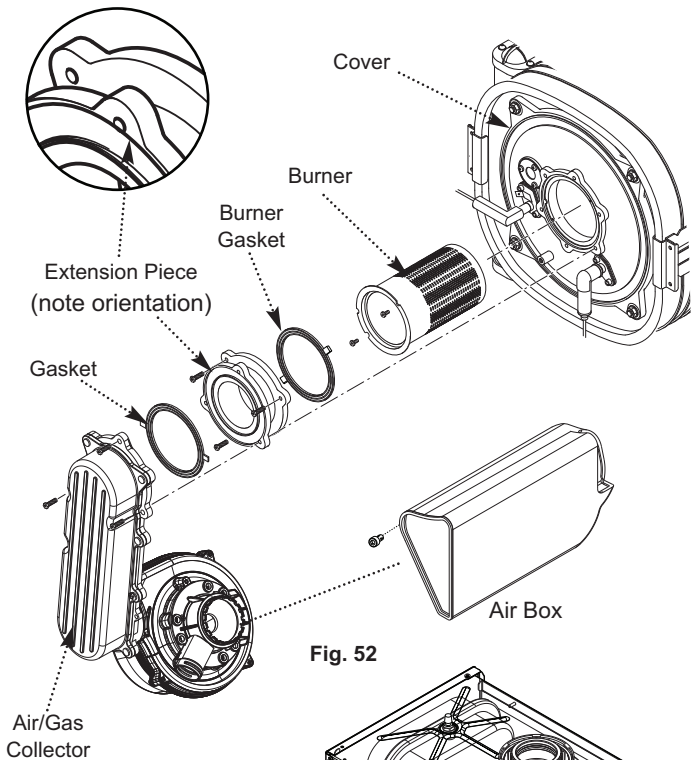


Fig. 52

### 10.3.4 Burner

1. Undo the securing screw and remove the airbox, disengaging it from the fan venturi. Remove the clip securing the gas feed pipe to the air/gas venturi and disconnect the fan electrical plugs.
  2. Undo the screws securing the air/gas collector to the extension piece. Note its position and remove the extension piece (where fitted) from the cover.
  3. Undo the screws securing the burner. Withdraw the burner from the cover and replace with the new one.
  4. Examine the gasket(s), replacing if necessary.
- i** Note that the gaskets are not the same !
5. After changing the burner check the combustion.

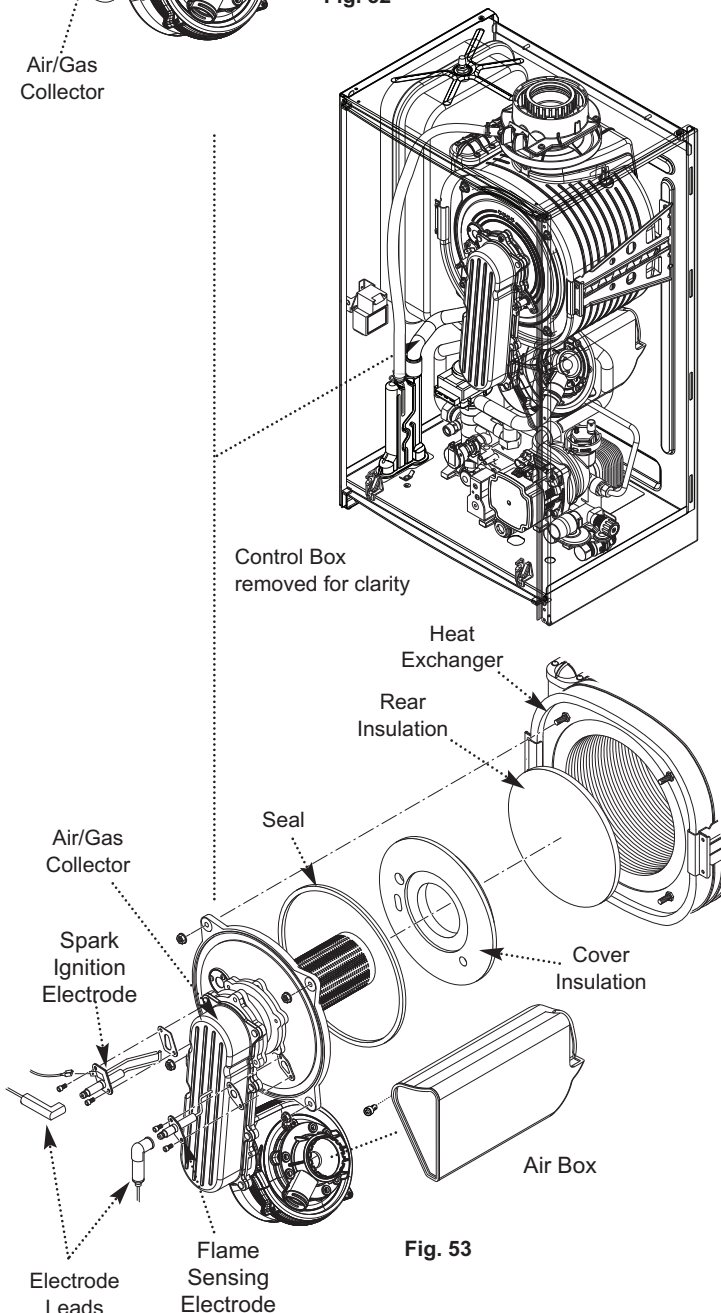


Fig. 53

### 10.3.5 Insulation (Fig. 53)

1. Undo the securing screw and remove the airbox, disengaging it from the fan venturi. Remove the clip securing the gas feed pipe to the air/gas venturi and disconnect the fan electrical plugs.
2. Remove the electrodes as described in section 13.1.
3. Undo the nuts holding the cover to the heat exchanger. Draw the air/gas collector, fan and cover assembly away.
4. Remove the cover insulation piece.
5. Fit the new insulation carefully over the burner and align it with the slots for the electrodes.
6. If the rear insulation requires replacement, remove it and all debris from the heat exchanger. Also it may be necessary to separately remove the spring clip from the pin in the centre of the heat exchanger and the 'L' shaped clips embedded in the insulation.
7. Do not remove the shrink-wrapped coating from the replacement rear insulation. Keep the insulation vertical and press firmly into position.
8. Examine the cover seal and replace if necessary. Reassemble in reverse order.

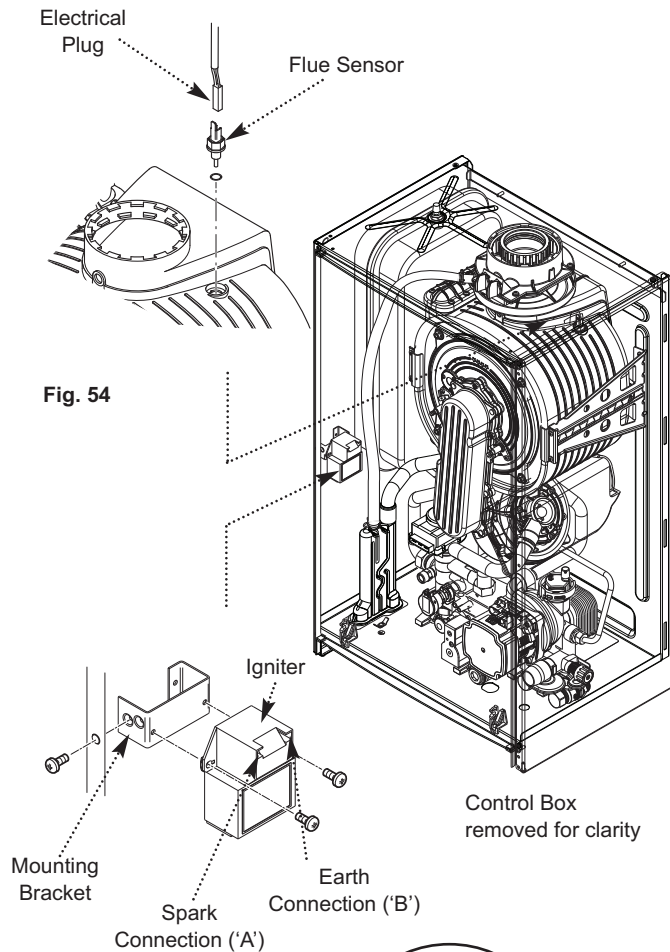


Fig. 54

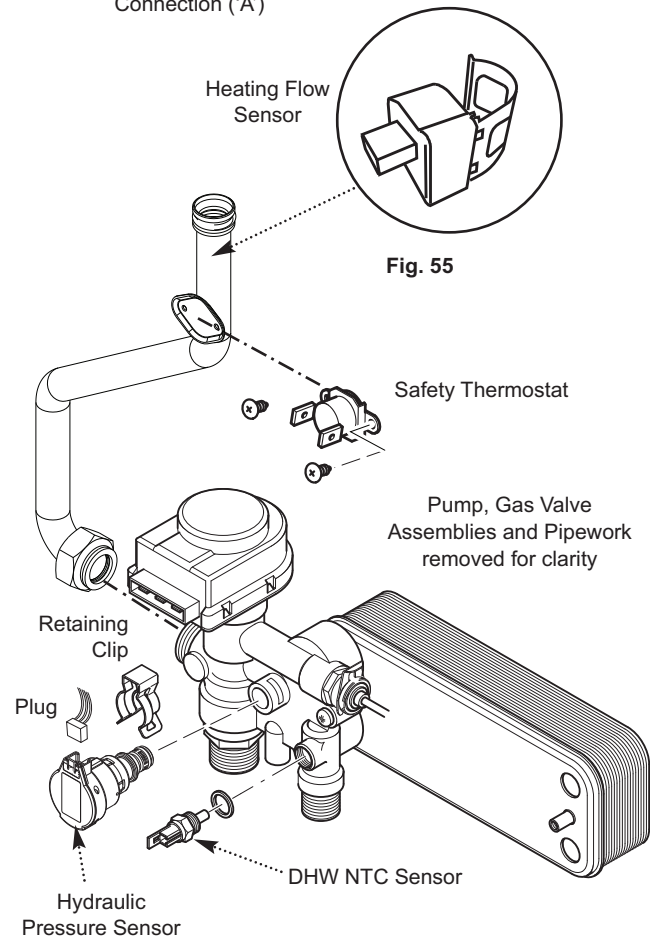


Fig. 56

### 10.3.6 Flue Sensor

1. Ease the retaining tab on the sensor away and disconnect the electrical plug.
3. Turn the sensor 90° anticlockwise to remove - it is a bayonet connection.
4. Reassemble in reverse order.

### 10.3.7 Igniter (Fig. 54)

1. Note the position of the ignition & sensing leads and disconnect them. Also disconnect the igniter feed plug.
2. Undo the screw securing the igniter mounting bracket to the left hand side panel. Remove the igniter and bracket and transfer the bracket to the new igniter.
3. Reassemble in reverse order, reconnecting the plug and leads to the igniter.

### 10.3.8 Heating Flow & Return Sensors (Fig. 55)

1. There is one sensor on the flow (red wires) and one sensor on the return (blue wires). Note: For access to the return sensor first remove the fan and air/gas collector (see 10.3.2).
2. After noting the position prise the sensor clip off the pipe and disconnect the plug.
3. Connect the plug to the new sensor and ease the clip onto the pipe as close to the heat exchanger as possible.

### 10.3.9 Safety Thermostat (Fig. 56)

1. Pull the two spade connections off the safety thermostat.
2. Remove the screws securing the thermostat to the mounting plate on the flow pipe.
3. Reassemble in reverse order, ensuring that the connections are pushed fully on.

### 10.3.10 DHW NTC Sensor (Fig. 56)

1. Turn off the mains cold water supply tap and draw off the residual domestic hot water.
2. Ease the retaining tab on the sensor away and disconnect the electrical plug.
3. Unscrew the sensor from the hydraulic outlet assembly. Examine the sealing washer, replacing if necessary.
4. Reassemble in reverse order. The plug will only fit one way.



### 10.3.11 Pump - Head Only (Fig. 57)

1. Drain the boiler primary circuit and disconnect the electrical plug from the pump motor.
2. Remove the socket head screws securing the pump head to the body and draw the head away.
3. Reassemble in reverse order.

### 10.3.12 Pump - Complete (Fig. 58)

1. Drain the boiler primary circuit and disconnect the electrical plug from the pump motor.
2. Undo the two screws securing the body to the pipe and manifold and draw the pump forwards.
3. Unscrew the automatic air vent from the pump body.
4. Examine the 'O' ring seals on the return pipe and manifold, replacing if necessary.
5. Fit the air vent to the pump body and reassemble in reverse order.

### 10.3.13 Automatic Air Vent (Fig. 58)

1. Drain the boiler primary circuit and unscrew the automatic air vent from the pump body.
2. Examine the 'O' ring seal, replacing if necessary and fit it to the new automatic air vent.
3. Reassemble in reverse order.

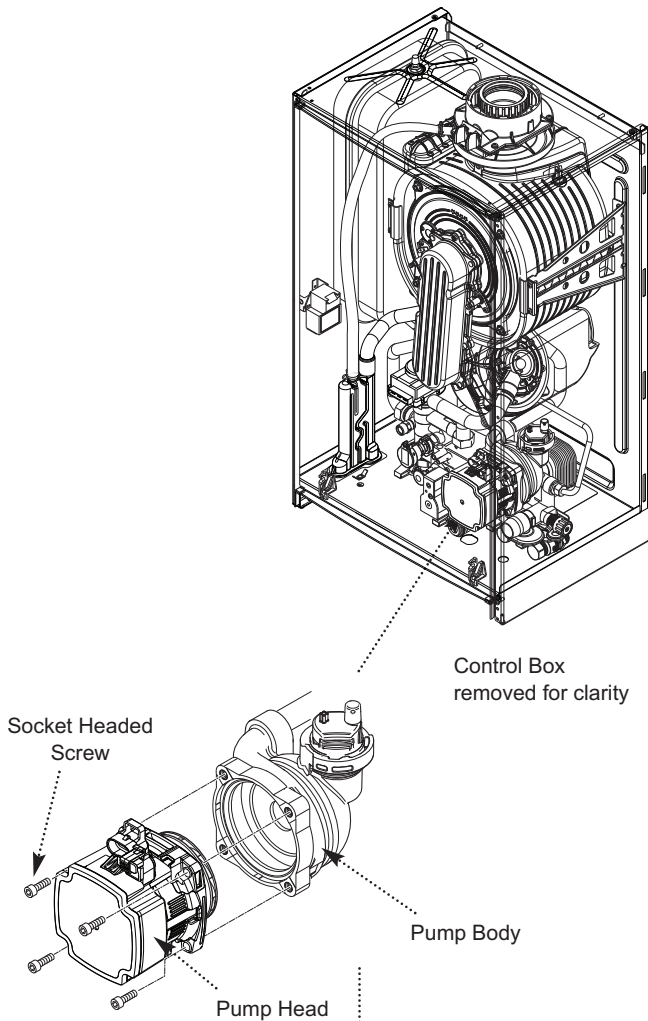


Fig. 57

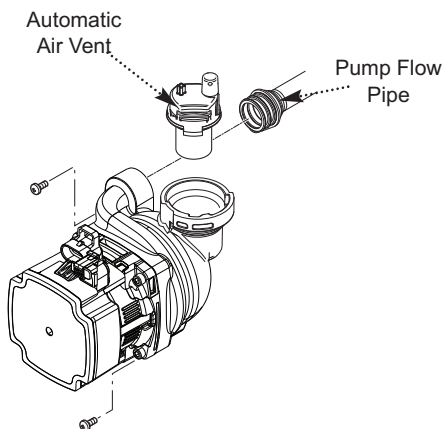


Fig. 58

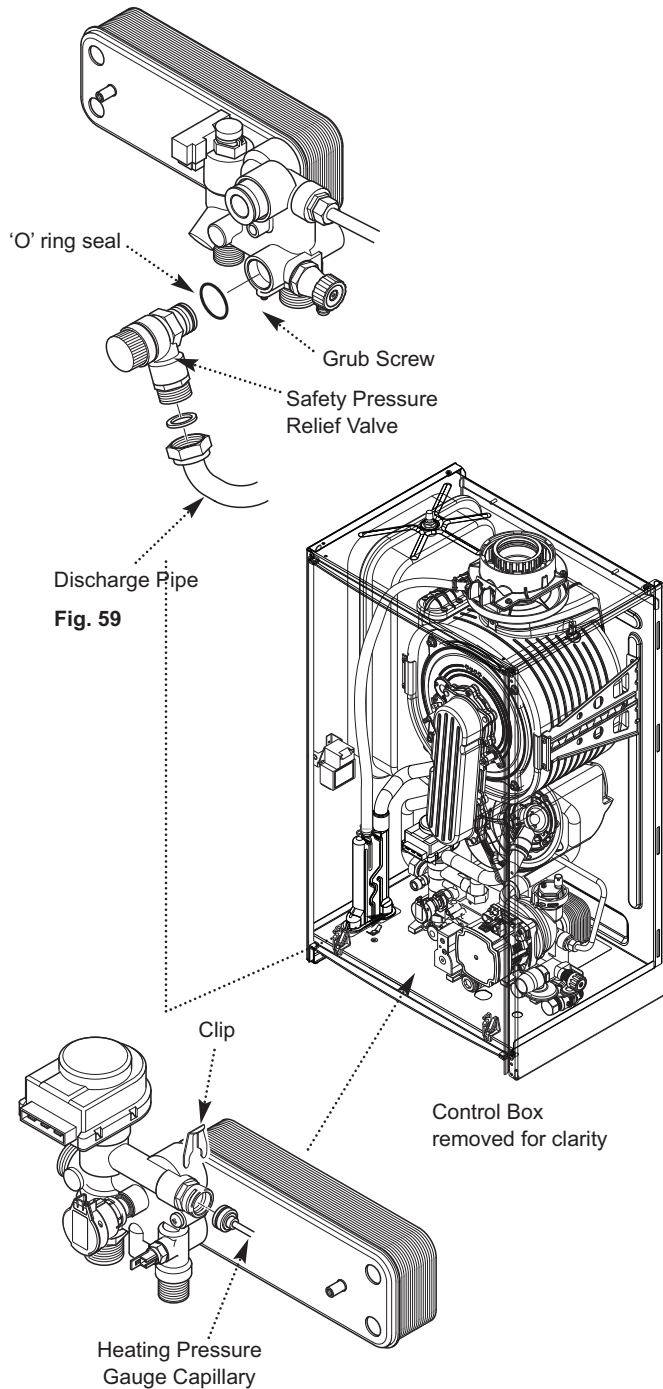


Fig. 59

Fig. 60

Fig. 61

### 10.3.14 Safety Pressure Relief Valve (Fig. 59)

1. Close the flow and return isolation taps and drain the primary circuit.
2. Disconnect the discharge pipework from the valve. Remove the sealing grommet.
3. Slacken the grub screw securing the pressure relief valve and remove from the inlet assembly.
4. On reassembly ensure that the 'O' ring is in place and the sealing grommet is correctly refitted to maintain the integrity of the case seal.

### 10.3.15 Heating Pressure Gauge (Figs. 60 & 61)

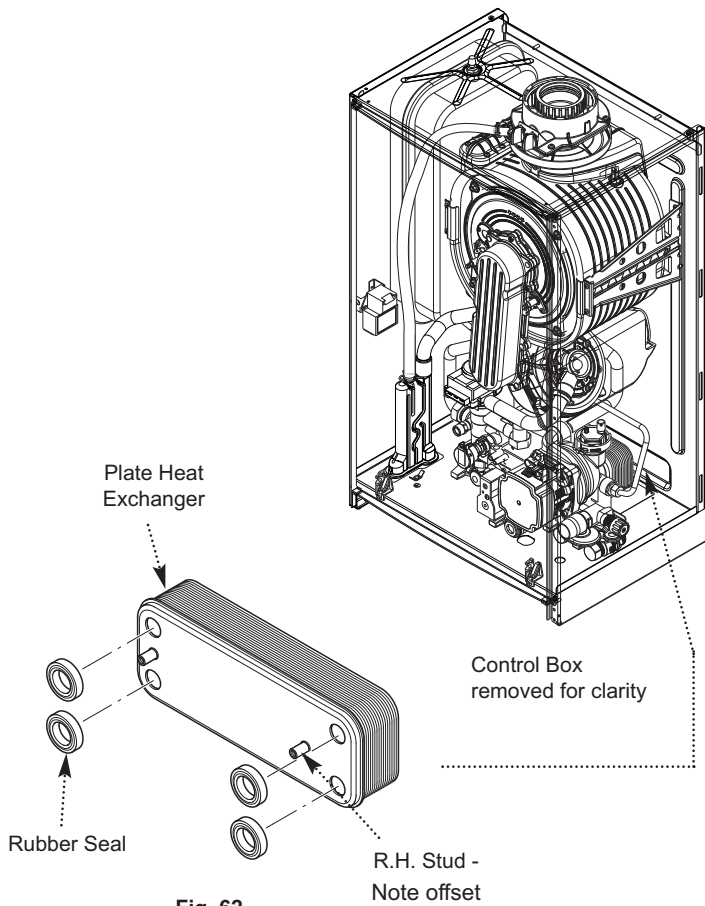
1. Close the flow and return isolation taps and drain the primary circuit.
2. Hinge the control box downwards. Remove the clip securing the pressure gauge capillary to the hydraulic assembly.
3. Disengage the securing tabs and open the terminal block cover. Prise apart the clips that hold the gauge cap.
4. Remove the gauge, cap and gasket.
5. Fit the new gauge, ensuring that the capillary is routed to prevent any sharp bends. Locate the ridge on the gauge body in the slot in the control box.
6. Reassemble in reverse order and ensure the gasket is in position to maintain the integrity of the case seal.

### 10.3.16 Plate Heat Exchanger (Figs. 62 & 63)

1. Close the flow & return isolation taps and the cold mains inlet. Drain the primary circuit and draw off any residual DHW.
2. Refer to Section 10.2 paragraphs 5 to 9 and remove the fan etc.
3. Undo the screws securing the plate heat exchanger to the hydraulic assembly.
4. Withdraw the plate heat exchanger by manoeuvring it to the rear of the boiler, then upwards and to the left to remove.

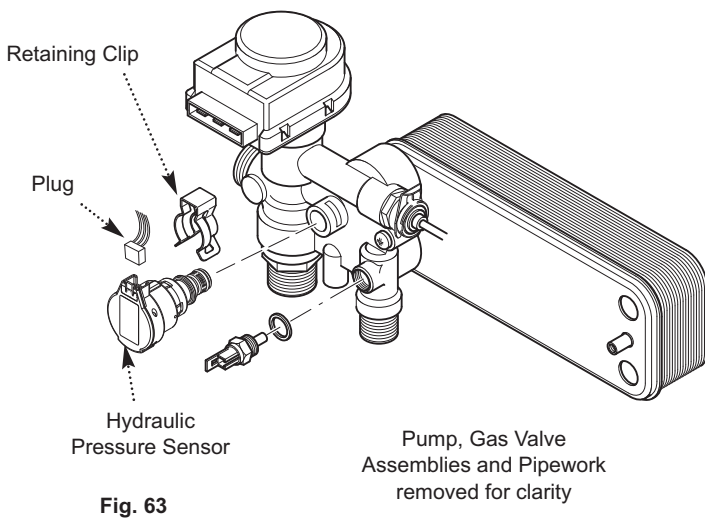
#### Seals

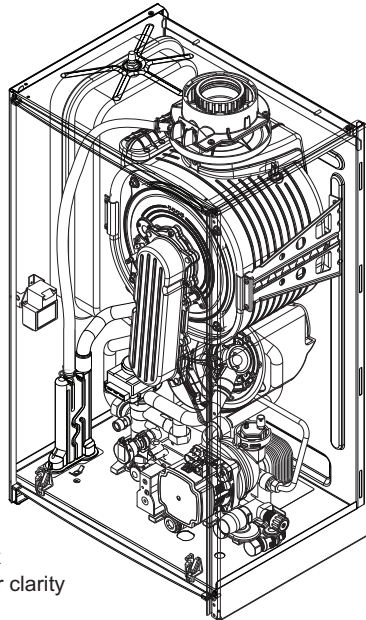
5. There are four rubber seals between the hydraulic assembly and heat exchanger which may need replacement.
6. Ease the seals out of the hydraulic assembly. Replace carefully, ensuring that the seal is inserted parallel and pushed fully in.
7. When fitting the new heat exchanger note that the right hand location stud is offset towards the centre (Fig. 62).
8. Reassemble in reverse order.



### 10.3.17 Hydraulic Pressure Sensor (Fig. 63)

1. Close the flow and return isolation taps and drain the primary circuit. For ease of access remove the fan and collector assembly.
2. Remove the plug from the sensor and pull the retaining clip upwards.
3. Reassemble in reverse order.





### 10.3.18 DHW Flow Regulator & Filter (Fig. 64)

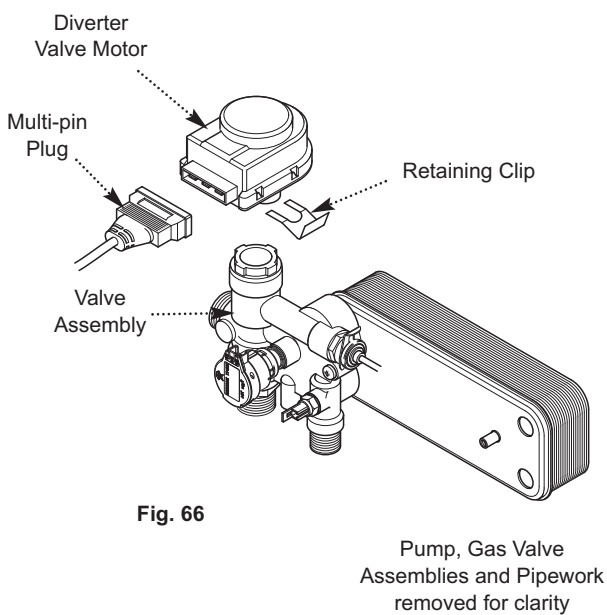
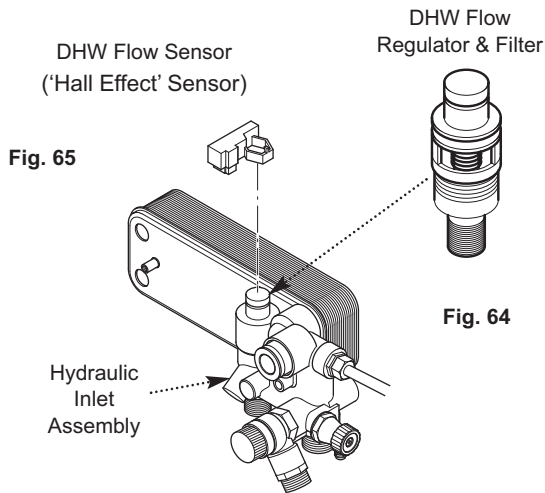
1. Close the cold mains inlet and draw off any residual DHW.
2. Pull off the hall effect sensor. Undo the filter assembly from the inlet/return manifold.

### 10.3.19 DHW Flow Sensor ('Hall Effect' Sensor) (Fig. 65)


1. Pull the sensor off the DHW inlet manifold.
2. Disconnect the plug from the sensor and connect it to the new component.
3. Fit the new sensor, ensuring it is correctly oriented and fully engaged over the manifold.

### 10.3.20 Diverter Valve Motor (Fig. 66)


1. Disconnect the multi-pin plug. Pull off the retaining clip and remove the motor.
2. The motor can now be replaced,
3. When fitting the new motor it will be necessary to hold the unit firmly while depressing the valve return spring.



### 10.3.21 Main P.C.B. (Fig. 67)

1. Ensure that the power to the boiler is isolated.
2. Release the clips securing the control box cover and lift away.
3. Note the position of all plugs and wires on the P.C.B. and disconnect them.  
 See Section 3.3 Electrical Diagram for details.
4. Undo the 5 securing screws and remove the P.C.B. It is retained at the left by two spring latches and the right hand edge locates in a slot.
5. Reassemble in reverse order, ensuring that the harnesses to the Control P.C.B. and terminal M2 are routed under the Main P.C.B. Check the operation of the boiler.

### 10.3.22 Boiler Control P.C.B. (Fig. 67)

1. Ensure that the power to the boiler is isolated.
2. Release the clips securing the control box cover and lift away.
3. Note the position of all plugs and wires on the P.C.B. and disconnect them.  
 See Section 3.3 Electrical Diagram for details.
4. Undo the 5 securing screws and remove the P.C.B. It is retained at the left by two spring latches and the right hand edge locates in a slot.
5. Disconnect the link harness between the Main & Control P.C.B.'s and undo the 4 screws securing the Control P.C.B.
6. Remove the Control P.C.B. and fit the new component. Reassemble in reverse order, ensuring that the harnesses to the Control P.C.B. and terminal M2 are routed under the Main P.C.B. Check the operation of the boiler.

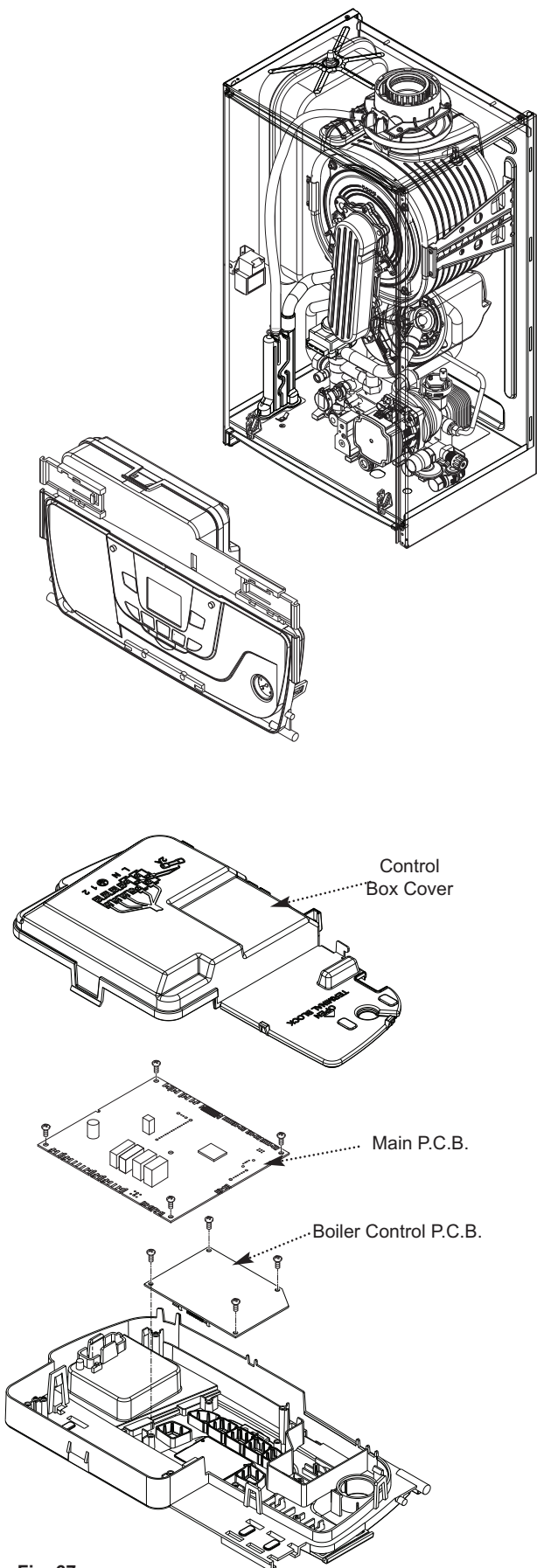


Fig. 67

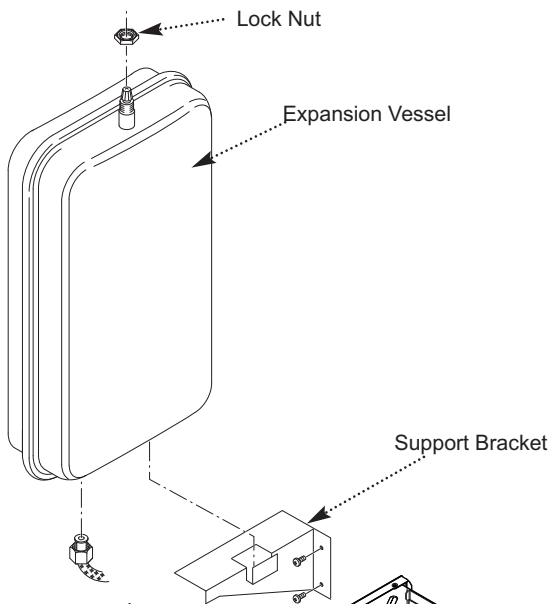


Fig. 69

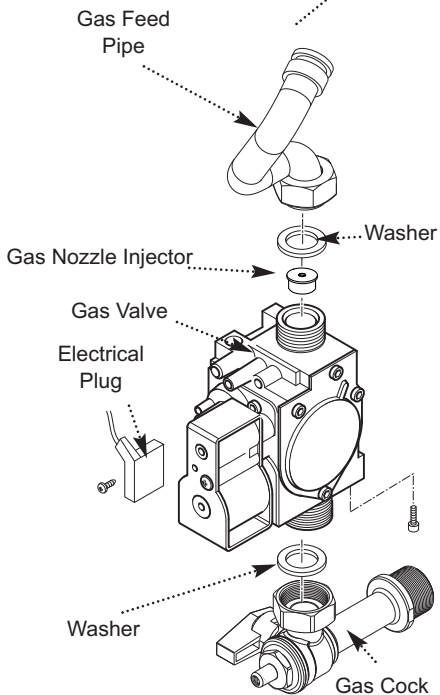
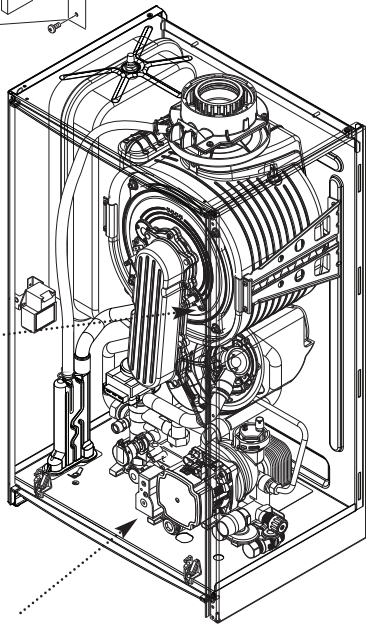


Fig. 68

### 10.3.23 Expansion Vessel

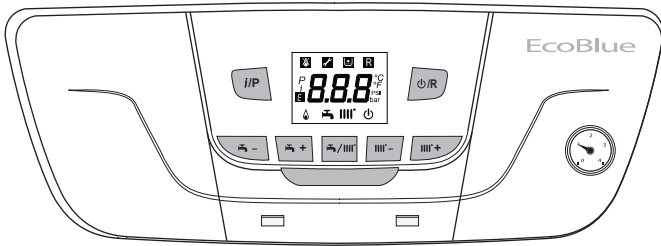
1. Close the flow and return isolation taps and drain the boiler primary circuit.
2. Undo the nut on the pipe connection at the bottom of the vessel, and slacken the nut on the hydraulic inlet assembly.
3. Remove the screws securing the support bracket, and withdraw the bracket.
4. Whilst supporting the vessel undo and remove the locknut securing the vessel spigot to the boiler top panel.
5. Manoeuvre the vessel out of the boiler.
6. Reassemble in reverse order.

### 10.3.24 Gas Valve (Fig. 69)

**i** After replacing the valve the CO<sub>2</sub> must be checked and adjusted as detailed in Section 10.3.25 Setting the Gas Valve. Only change the valve if a suitable calibrated combustion analyser is available, operated by a competent person - see section 10.1.3.

1. Undo the screw and disconnect the electrical plug.
2. Turn the gas cock off and undo the nut on the gas valve inlet underneath the boiler.
3. Undo the nut on the gas valve outlet. Ease the pipe aside.  
NOTE: The gas nozzle injector is inserted in the gas valve outlet.
4. Remove the screws securing the gas valve to the boiler bottom panel. Remove the valve.
5. Transfer the gas nozzle injector to the new valve, ensuring it sits in the valve outlet. Examine the sealing washers, replacing if necessary.
6. Reassemble in reverse order.

**i** Check gas tightness & CO<sub>2</sub> !



**‘Chimney Sweep Mode’**

- This function must not be activated whilst the burner is lit.
- The case front panel must be fitted when checking combustion.
- Ensure the system is cold

1. Press **⏻R** & **||||-** together and hold for at least 6 seconds. **On** is displayed briefly followed by **303** flashing alternately with **1**, **2** or **3**.
2. **3** represents MAXIMUM HEATING input, **2** represents MAXIMUM DHW input whilst **1** denotes MINIMUM input.
3. Press **||||-** or **||||+** to adjust the input.
4. The valve must be checked and set at MAXIMUM DHW input & MINIMUM input.

**10.3.25 Setting the Gas Valve (CO<sub>2</sub> Check)**

**i** The CO<sub>2</sub> must be only be checked and adjusted to set the valve if a suitable calibrated combustion analyser is available, operated by a competent person - see Section 10.1.3.

1. The combustion (CO<sub>2</sub>) may be checked after running the boiler for several minutes. To do this it is necessary to operate the boiler in ‘Chimney Sweep Mode’.

The CO<sub>2</sub> should be 8.7% ± 0.2 at MAXIMUM

2. It is possible to alter the CO<sub>2</sub> by adjustment of the gas valve. At maximum rate the Throttle Adjustment Screw should be turned, using a suitable 2.5 hexagon key, until the correct reading is obtained (Fig. 100).

**i** Turning clockwise will reduce the CO<sub>2</sub>. Anticlockwise will increase the CO<sub>2</sub>.

3. The CO<sub>2</sub> must then be checked at minimum rate.

The CO<sub>2</sub> should be 8.4% ± 0.2 at MINIMUM

4. With the boiler on minimum, the Offset Adjustment Screw must be altered, using a suitable 4mm hexagon key, after removing the cap (Fig. 100).

**i** Turning anti-clockwise will reduce the CO<sub>2</sub>. Clockwise will increase the CO<sub>2</sub>.

5. Check the Combustion Performance (CO/CO<sub>2</sub> ratio). This must be less than 0.004.

**i** Refit the sampling point plug and ensure there is no leakage of products.

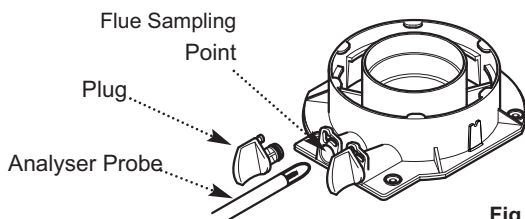


Fig. 70

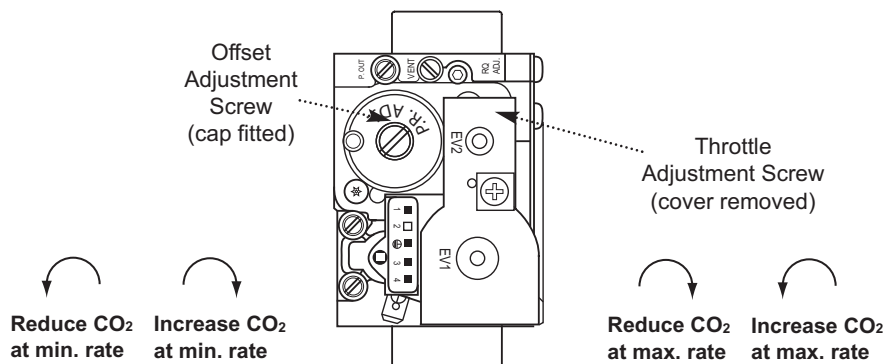


Fig. 71

Gas Valve

If the CO<sub>2</sub> is reset at minimum rate it must be rechecked at maximum rate again and adjusted if required. If the CO<sub>2</sub> is reset at maximum rate it must be rechecked at minimum rate and adjusted if required.

Do not turn the adjustment screws more than 1/8 of a turn at a time. Allow the analyser reading to settle before any further adjustment

# 11 Troubleshooting

Table Of Error Codes

<b>E</b> 20		Central Heating NTC Fault
<b>E</b> 28		Flue NTC Fault
<b>E</b> 40		Central Heating Return NTC Fault
<b>E</b> 109	<b>R</b>	Possible Circulation Fault
<b>E</b> 110	<b>R</b>	Safety Thermostat Operated (pump fault)
<b>E</b> 111	<b>R</b>	Safety Thermostat Operated (over temperature)
<b>E</b> 117		Primary System Water Pressure Too High
<b>E</b> 118		Primary System Water Pressure Too Low
<b>E</b> 125	<b>R</b>	Circulation Fault (Primary)
<b>E</b> 128		Flame Failure (no lock-out)
<b>E</b> 130		Flue NTC Operated
<b>E</b> 133	<b>R</b>	Interruption Of Gas Supply or Flame Failure
<b>E</b> 151	<b>R</b>	Flame Failure
<b>E</b> 160	<b>R</b>	Fan or Fan Wiring Fault
<b>E</b> 321		Hot Water NTC Fault
<b>E</b> 384		False Flame

The **iP** button can be pressed so that the display shows

the following information:-

'00' alternates with Sub-Code (only when fault on boiler) or '000'

'01' alternates with CH Flow Temperature

'02' alternates with Outside Temperature (where Sensor fitted)

'03' alternates with stored DHW Temperature

'04' alternates with DHW Temperature

'05' alternates with System Water Pressure

'06' alternates with CH Return Temperature

'07' alternates with Flue Temperature

'08' - not used

'09' alternates with Collector Temperature

'10' alternates with Zone 1 CH Flow Temperature

'11' alternates with Zone 2 CH Flow Temperature

'12' alternates with Ion current

'13' alternates with Burner working hours

'14' alternates with Zone 1 CH mode

'15' alternates with Zone 2 CH mode

'16' alternates with DHW circuit operating mode

'17' alternates with Boiler operating mode

'18' alternates with Solar plant operating mode

'19' alternates with Manufacturer information

'20' alternates with Manufacturer information

## 11.1 Error Codes

1. If a fault occurs on the boiler an error code may be shown by the facia display.

2. The codes are a flashing number, either two or three digit, preceded by the symbol **E**:-

**E** followed by 20, 28, 40, 160 or 321 indicates possible faulty components.

**E** 110 and 111 indicate overheat of the primary system water.

**E** 117 is displayed when the primary water pressure is greater than 2.7 bar. Restoring the correct pressure will reset the error.

**E** 118 is displayed when the primary water pressure is less than 0.5 bar. Restoring the correct pressure will reset the error.

**E** 133, indicates that the gas supply has been interrupted, ignition has failed or the flame has not been detected.

**E** 128 is displayed if there has been a flame failure during normal operation.

**E** 125 is displayed in either of two situations:-

i) If within 15 seconds of the burner lighting the boiler temperature has not changed by 1°C.

ii) If within 10 minutes of the burner lighting the boiler actual temperature twice exceeds the selected temperature by 30°. In these instances poor primary circulation is indicated.

3. By pressing the 'Reset' button for 1 to 3 seconds when

**E** 110, 125 & 133 are displayed it is possible to relight the boiler.

4. If this does not have any effect, or the codes are displayed regularly further investigation is required.

## 11.2 Fault Finding

1. Check that gas, water and electrical supplies are available at the boiler.

2. Electrical supply = 230V ~ 50 Hz.

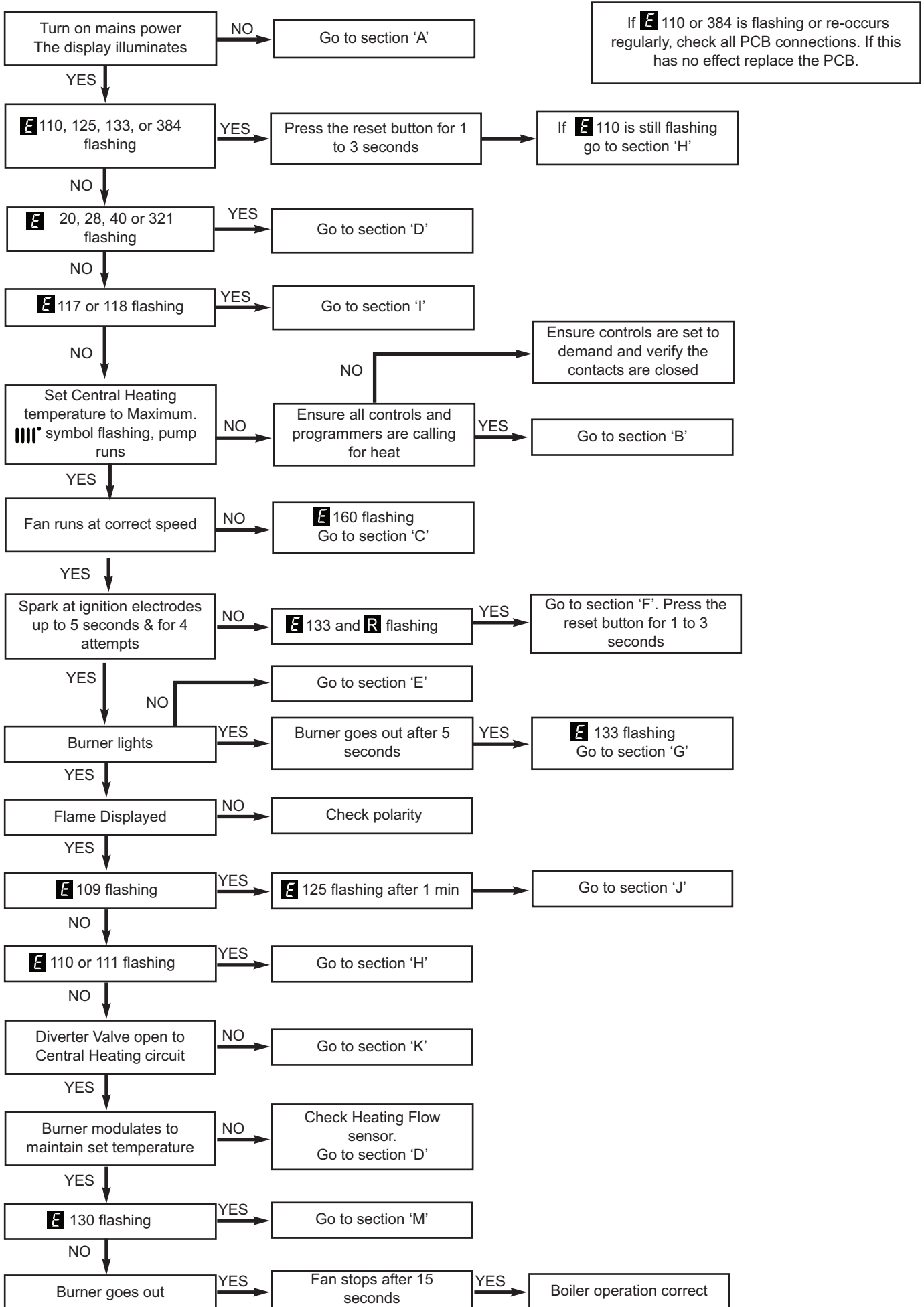
3. The preferred minimum gas pressure is 20 mb (NG).

4. Carry out electrical system checks, i.e. Earth Continuity, Resistance to Earth, Short Circuit and Polarity with a suitable meter.

**NOTE:** These checks must be repeated after any servicing or fault finding.

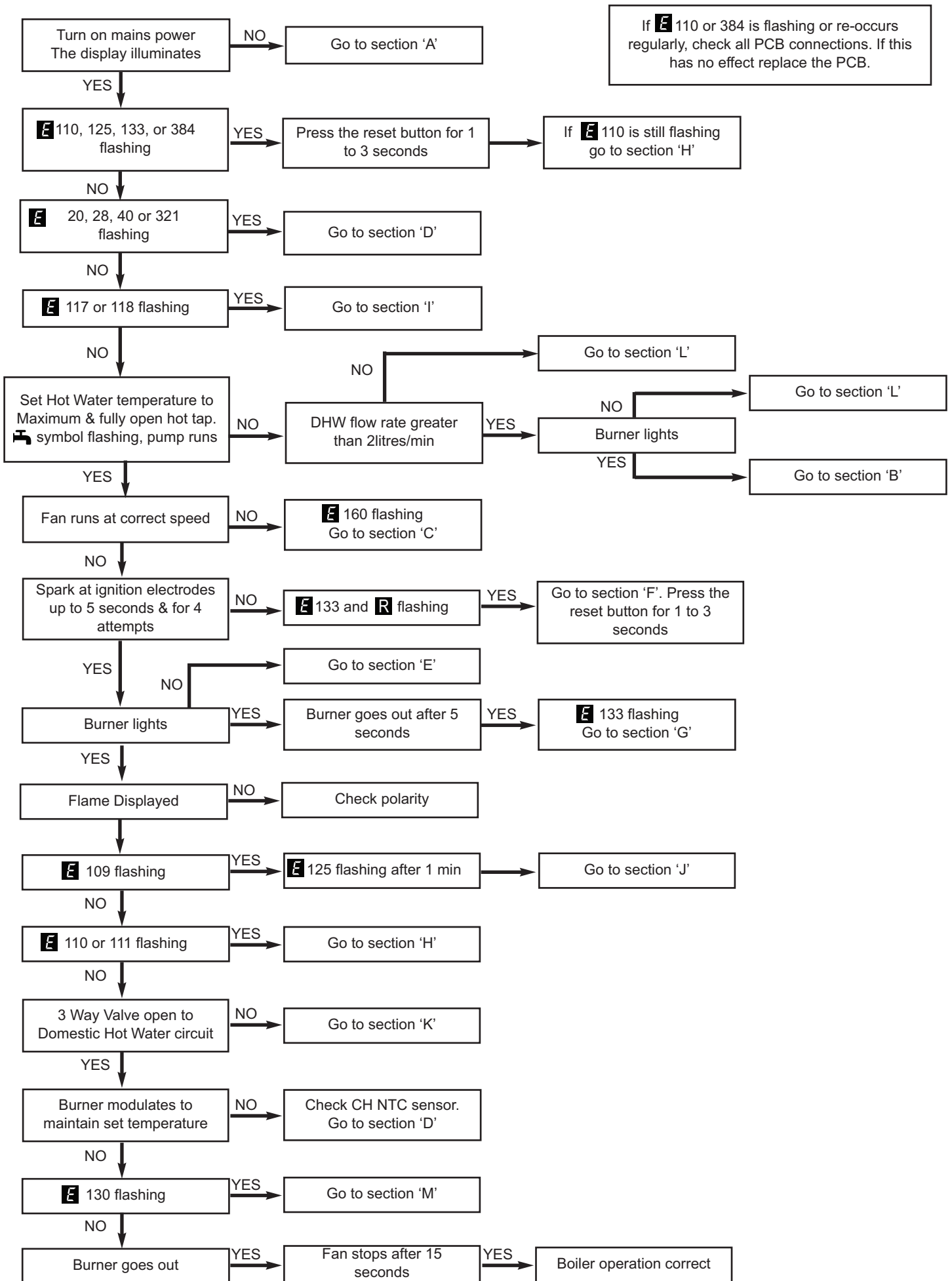
5. Ensure all external controls are calling for heat and check all external and internal fuses. Before any servicing or replacement of parts, ensure the gas and electrical supplies are isolated.





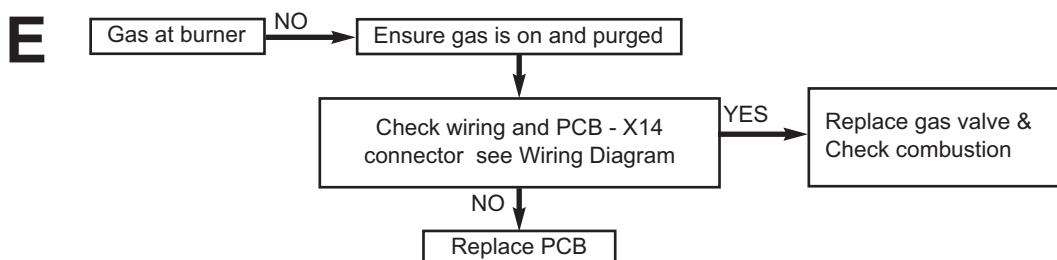
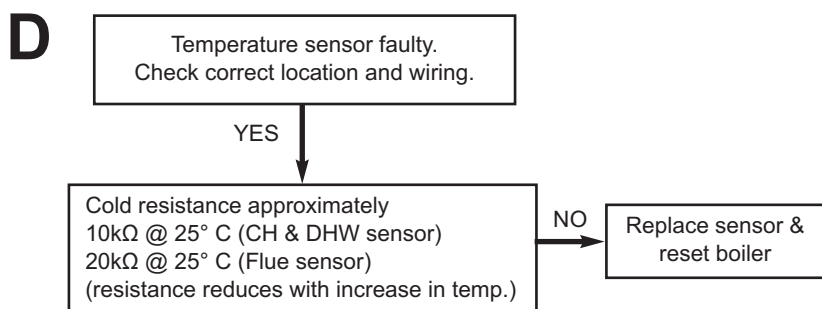
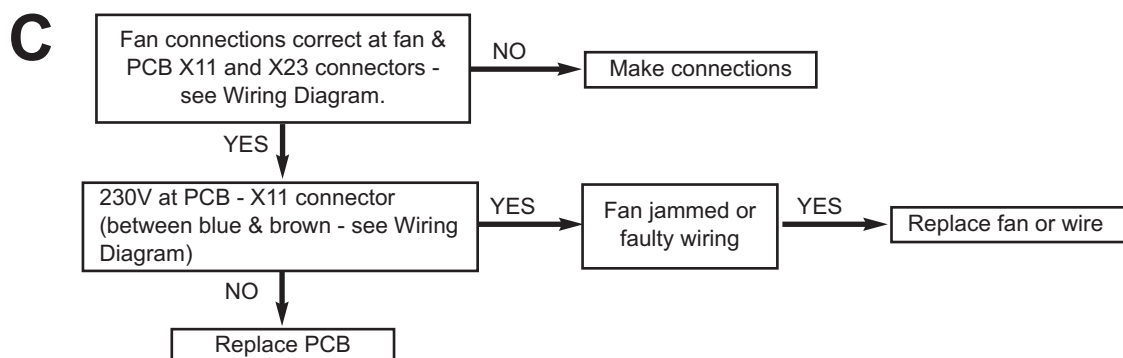
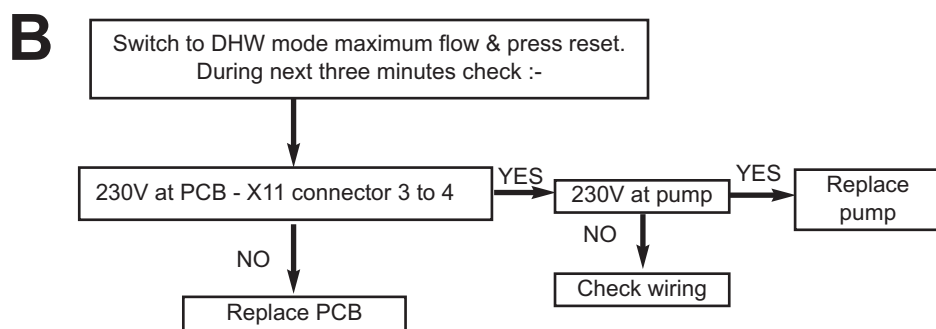
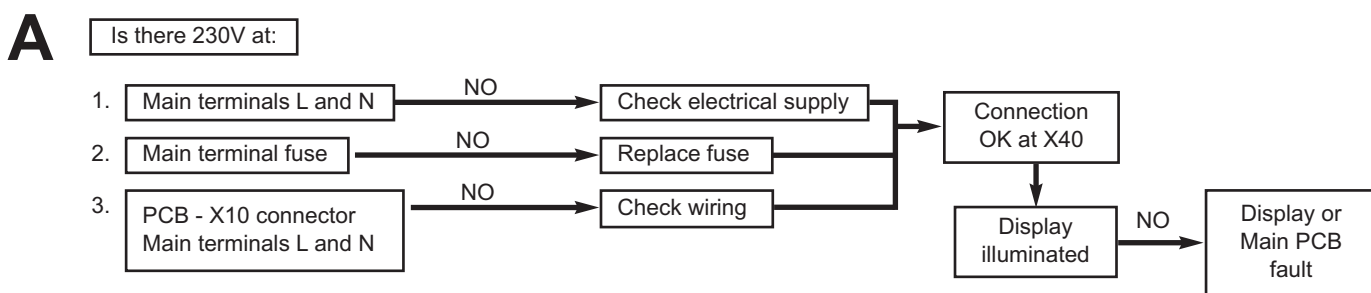
If **E 110** or **384** is flashing or re-occurs regularly, check all PCB connections. If this has no effect replace the PCB.

Domestic Hot Water - Follow operational sequence



If **E** 110 or 384 is flashing or re-occurs regularly, check all PCB connections. If this has no effect replace the PCB.

### Fault Finding Solutions Sections



**F**

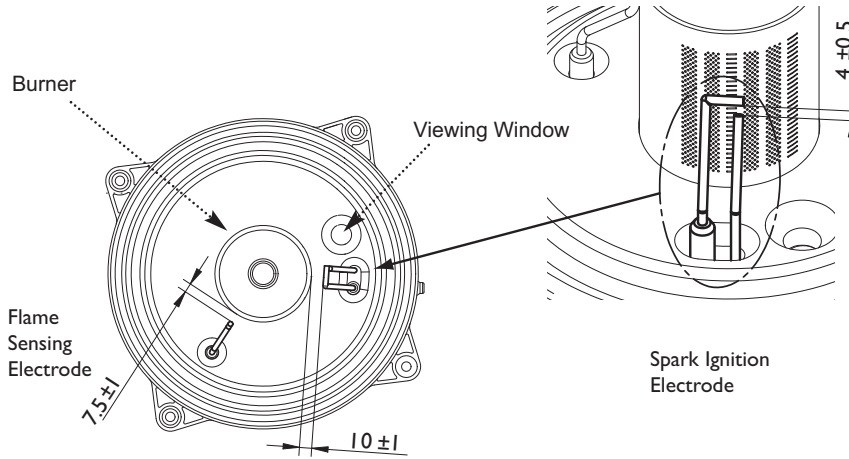
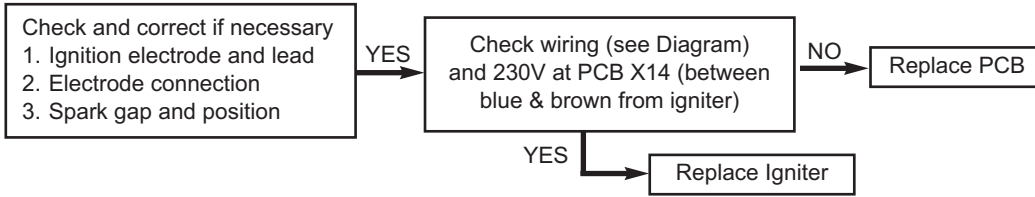
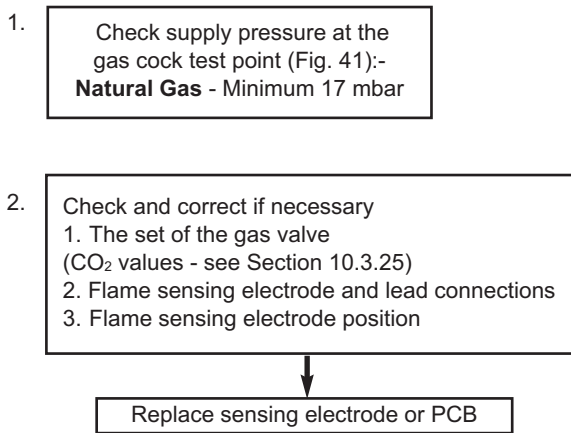


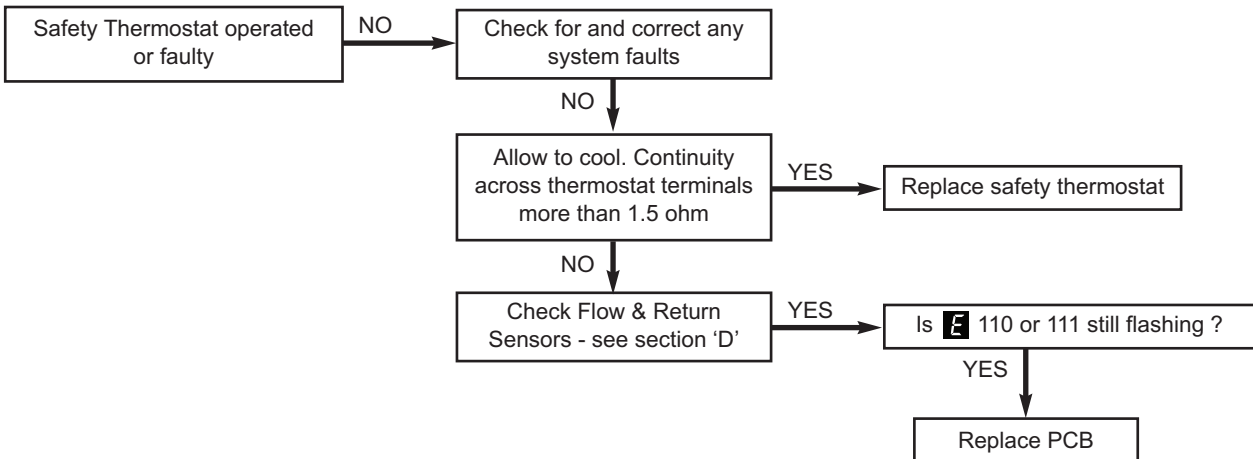
Fig. 72

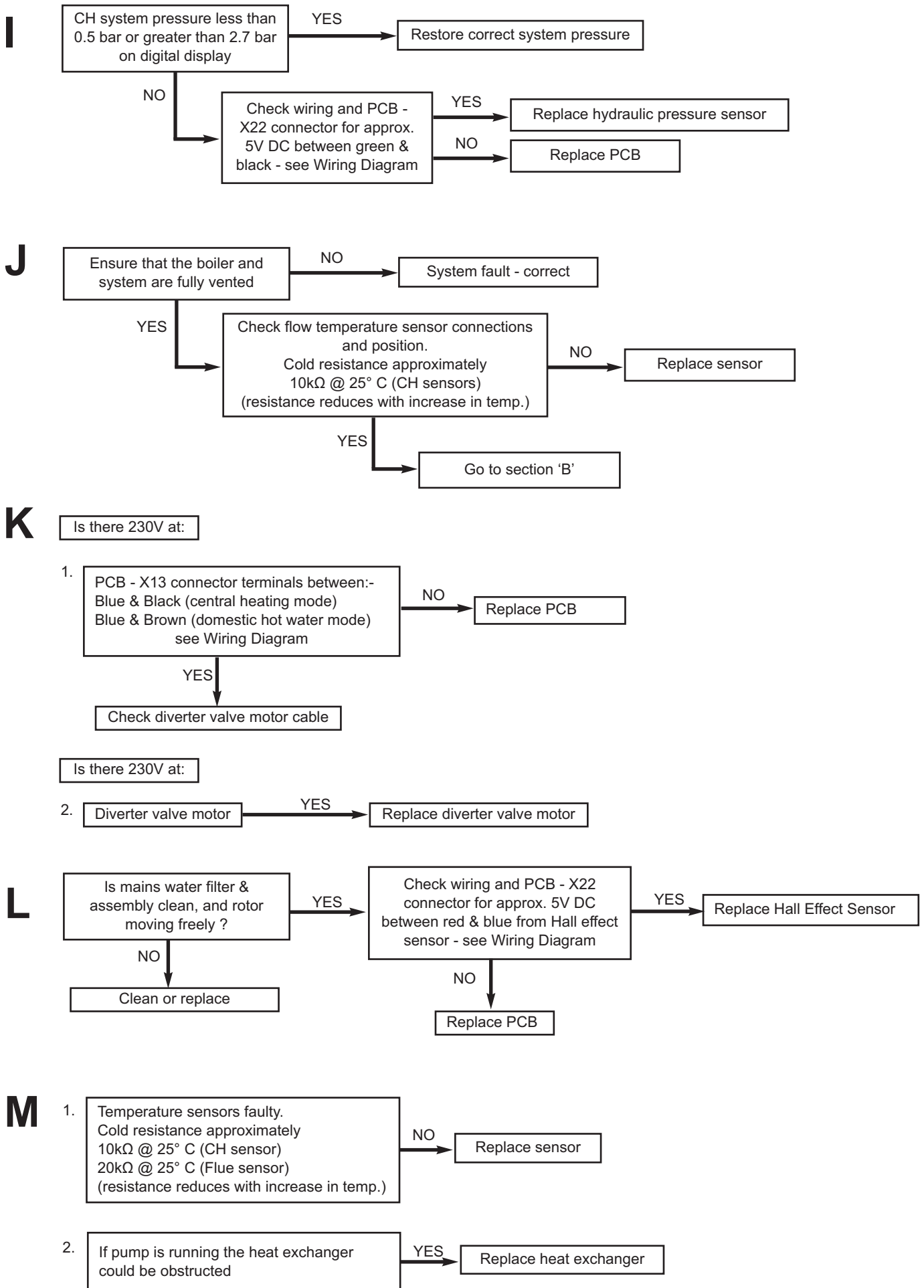
Electrode Position

**G**



**H**





## 12 Decommissioning

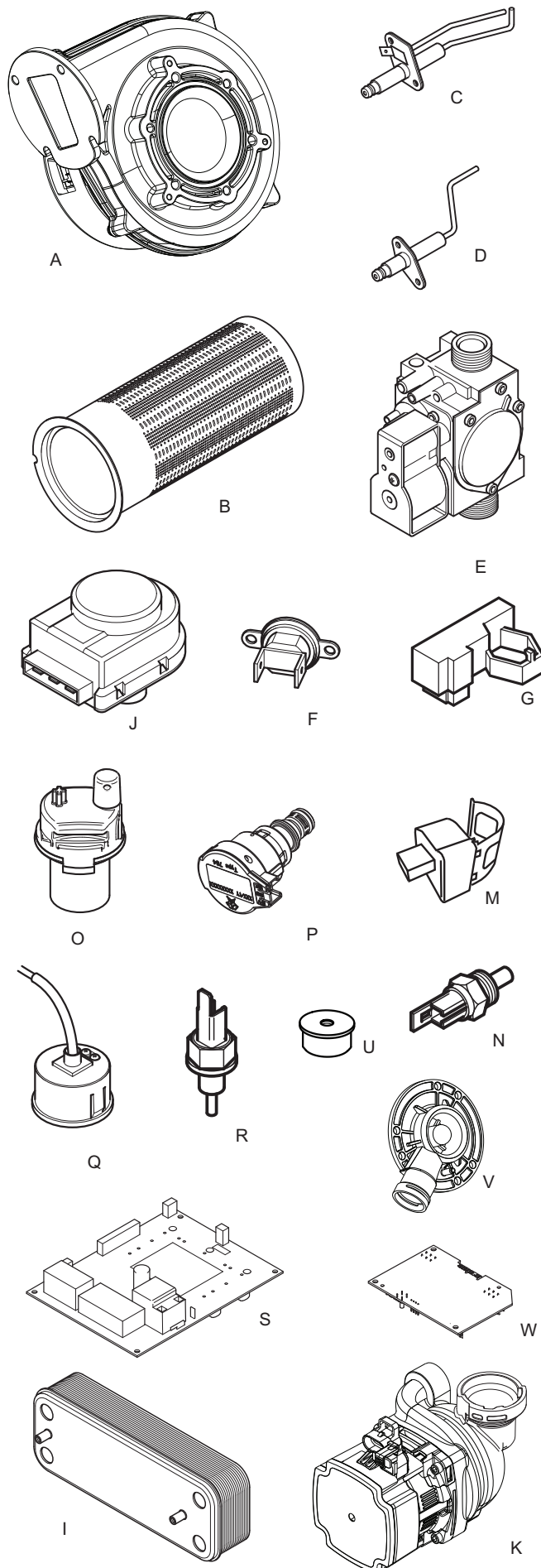
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### 12.1 Decommissioning Procedure

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1. Disconnect the gas & electric supplies and isolate them.
2. Drain the primary circuit and disconnect the filling device.
3. Dismantle the chimney system and remove the boiler from the wall mounting frame.

## 13 Spare Parts



### 13.1 General

1. If, following the annual inspection or maintenance any part of the boiler is found to need replacing, use Genuine Baxi Spare Parts only.

### 13.2 Spare Parts List

Key No.	Description	Manufacturers Part No.
A	Fan Fan - 40 only	720768101 7211861
B	Burner - 24 & 28 Burner - 33 Burner - 40	7212447 7212449 7212448
C	Spark Ignition Electrode	720767301
D	Flame Sensing Electrode	7211855
E	Gas Valve	7214341
F	Safety Thermostat	720765301
G	Hall Effect Sensor	720788201
I	Plate Heat Exchanger	720852401
J	Diverter Valve Motor	720788601
K	Pump	7220533
M	Heating Flow/Return Sensor	720747101
N	DHW NTC Sensor	720789201
O	Pump Automatic Air Vent	720787601
P	Hydraulic Pressure Switch	720789001
Q	Heating Pressure Gauge	7212896
R	Flue Sensor	720851401
S	PCB - 24 ErP PCB - 28 ErP PCB - 33 ErP PCB - 40 ErP	7222707 7222709 7222711 7222712
U	Ø5.0 Gas Nozzle Injector - 24 Ø5.6 Gas Nozzle Injector - 28 Ø6.6 Gas Nozzle Injector - 33 Ø6.8 Gas Nozzle Injector - 40	7211862 7214344 7211864 7214346
V	Air/Gas Venturi - 24 Air/Gas Venturi - 28 Air/Gas Venturi - 33 & 40	7211858 7211859 7211860
W	Boiler Control HMI PCB	7211868







# 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					Programmable room thermostat									
										Load/weather compensation					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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	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	<b>AND</b>	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	<b>AND</b>	CO <sub>2</sub> %
Comments:					
Signature					

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## Baxi Customer Support



**0344 871 1545**

### Opening hours

Monday - Friday, 8.00am-6.00pm

Weekends and Bank Holidays, 8.30am-2.00pm

Please note calls may be recorded for training and monitoring purposes



**baxi.co.uk**

Register now to activate your warranty:

**[www.baxi.co.uk/registration](http://www.baxi.co.uk/registration)**

For the warranty to be maintained, please make sure...

- 1** Benchmark checklist is completed
- 2** Warranty is registered within 30 days
- 3** The boiler has an annual service

For full terms and conditions, visit [www.baxi.co.uk/terms](http://www.baxi.co.uk/terms). Failure to adhere to terms and conditions will void your manufacturer's warranty.



Baxi  
Brooks House,  
Coventry Road,  
Warwick, CV34 4LL



Please ensure the boiler is installed in accordance with these installation instructions and that you adhere to the Building Regulations.

e&oe

All descriptions and illustrations provided in this document have been carefully prepared but we reserve the right to make changes and improvements in our products which may affect the accuracy of the information contained in this leaflet. All goods are sold subject to our standard Conditions of Sale which are available on request.

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