



## Installation and Service Manual

High Efficiency Wall Hung Condensing Gas Boiler

**Baxi Combi**

224 — 228 — 424 — 428

428 LPG

**Dear Customer,**

Thank you very much for buying this appliance.

Please read through the manual carefully before using the product, and keep it in a safe place for later reference. In order to ensure continued safe and efficient operation we recommend that the product is serviced regularly. Our service and customer service organisation can assist with this.

We hope you enjoy years of problem-free operation with the product.

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# 1 Safety

## 1.1 Benchmark

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### 1.1.1 Building Regulations and the Benchmark Commissioning Checklist

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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 selfcertification 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.

### 1.1.2 The Benchmark Scheme

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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.

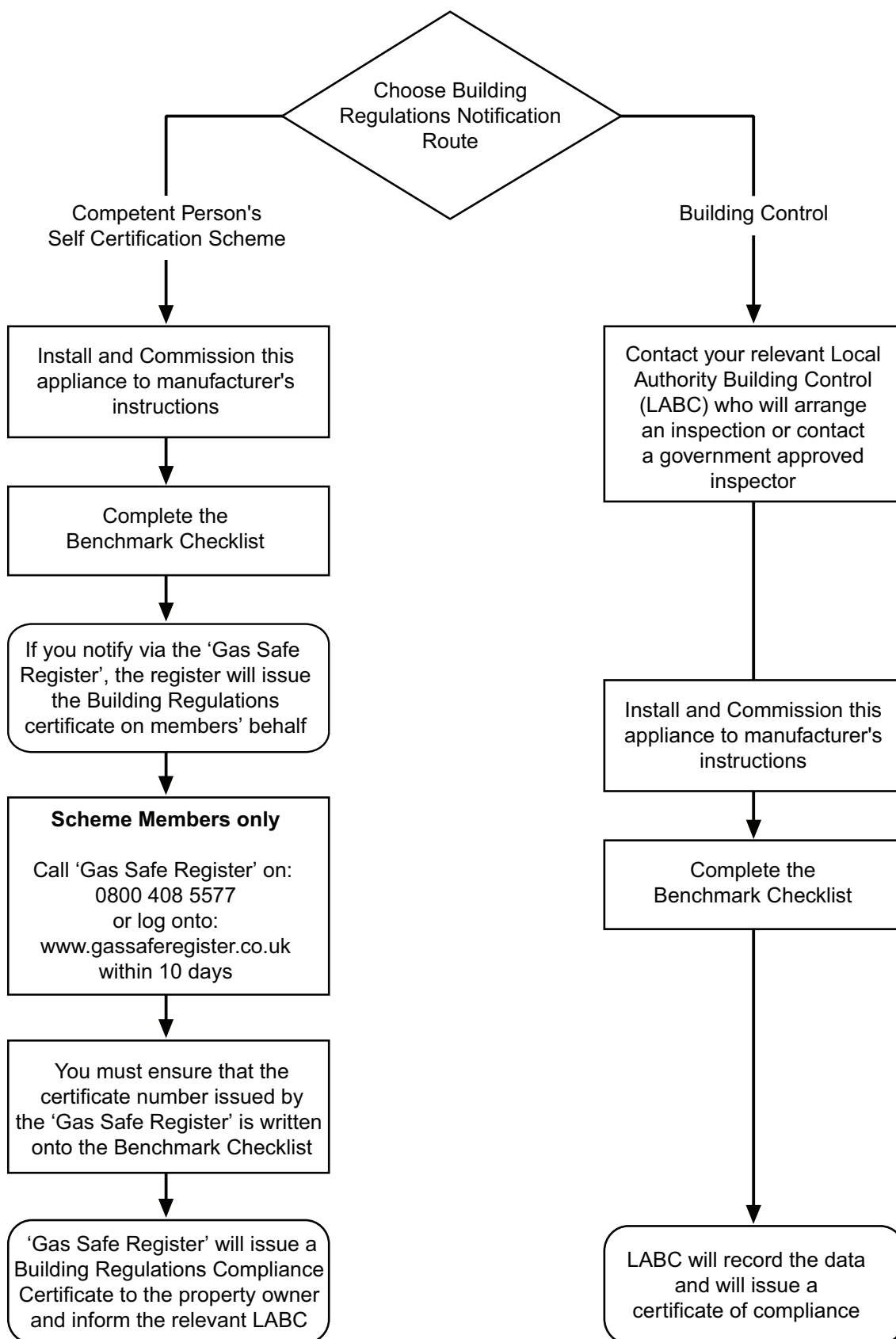
Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit [www.centralheating.co.uk](http://www.centralheating.co.uk)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

Fig.1 Benchmark



1.1.3 Installer Notification Guidelines

Fig.2 Installer Notification Guidelines



AD-3000696-01

## 1.2 General safety instructions



### Danger

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.



### Danger

If you smell gas:

1. Do not use a naked flame, do not smoke, do not operate electrical contacts or switches (doorbell, light, motor, lift, etc.).
2. Shut off gas supply.
3. Open the windows.
4. Trace possible leaks and seal them immediately.
5. If the gas leak is before the gas meter, contact the supplier
6. Telephone the National Gas Emergency Service on:- 0800 111 999.



### Danger

If you smell flue gases:

1. Switch off the boiler.
2. Open the windows.
3. Trace possible leaks and seal them immediately.



### Warning

Do not touch the flue gas pipes. Depending on the boiler settings, the temperature of the flue gas pipes may exceed 60°C.



### Warning

Do not touch the radiators for long periods. Depending on the boiler settings, the temperature of the radiators may exceed 60°C.



### Warning

Take precautions with the domestic hot water. Depending on the boiler settings, the domestic hot water temperature may exceed 65°C.



### Danger

Before any work, switch off the mains supply to the boiler.



### Caution

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

## 1.3 Recommendations



### Warning

Installation and maintenance of the boiler must be carried out by a qualified installer in accordance with local and national regulations.



### Warning

If the mains lead is damaged, it must be replaced by the original manufacturer, the manufacturer's dealer or another suitably skilled person to prevent hazardous situations from arising.



### Warning

Always disconnect the mains supply and close the main gas tap when working on the boiler.



**Caution**

- Make sure the boiler can be reached at all times.
- The boiler must be installed in a frost-free area.
- In the case of a fixed connection to the power cord, you must always install a main double pole switch with an opening gap of at least 3 mm (EN 60335-1).
- Drain the boiler and central heating system if you are not going to use your home for a long time and there is a chance of frost.
- The frost protection does not work if the boiler is out of operation.
- The boiler protection only protects the boiler, not the system.
- Check the water pressure in the system regularly. If the water pressure is lower than 0.8 bar, the system must be topped up (recommended water pressure between 1 and 2 bar).

**Important**

Keep this document near to the boiler.

**Important**

Casing panels may only be removed for maintenance and servicing purposes. Refit all panels when maintenance work and servicing are complete.

**Note**

Instruction and warning labels must never be removed or covered and must be clearly legible throughout the entire service life of the boiler. Replace damaged or illegible instruction and warning labels immediately.

**Note**

The boiler must not be modified in any way.

## 1.4 Specific safety instructions

### 1.4.1 Handling

**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 NO HANDLE OR LIFT THE BOILER — OBTAIN ADVICE OR ASSISTANCE BEFORE PROCEEDING !**

## 1.5 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 Directives applicable. They are therefore delivered with the **CE** marking and any documents necessary. In the interests of the quality of our products, we strive constantly to improve them. We therefore reserve the right to modify the specifications given in this document.

Our liability as manufacturer may not be invoked in the following cases:

- Failure to abide by the instructions on installing the appliance.
- Failure to abide by the instructions on using the appliance.
- Faulty or insufficient maintenance of the appliance.

### 1.5.2 Installer's liability

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The installer is responsible for the installation and initial commissioning of the appliance. The installer must abide by the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Install the appliance in compliance with prevailing legislation and standards.
- Carry out initial commissioning and any checks necessary.
- Explain the installation to the user.
- If maintenance is necessary, warn the user of the obligation to check the appliance and keep it in good working order.
- Give all the instruction manuals to the user.

### 1.5.3 User's liability

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To guarantee optimum operation of the system, you must abide by the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Call on a qualified professional to carry out installation and initial commissioning.
- Get your installer to explain your installation to you.
- Have the required inspections and maintenance carried out by a qualified installer.
- Keep the instruction manuals in good condition close to the appliance.

## 2 About this manual

### 2.1 General

This manual is intended for the installer of a Baxi Combi boiler.

### 2.2 Additional documentation

These Installation & Service Instructions must be read in conjunction with the Flue Accessories Fitting 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.

### 2.3 Symbols used

#### 2.3.1 Symbols used in the manual

This manual uses various danger levels to draw attention to special instructions. We do this to improve user safety, to prevent problems and to guarantee correct operation of the appliance.



#### **Danger**

Risk of dangerous situations that may result in serious personal injury.



#### **Danger of electric shock**

Risk of electric shock.



#### **Warning**

Risk of dangerous situations that may result in minor personal injury.



#### **Caution**

Risk of material damage.



#### **Important**

Please note: important information.



#### **See**

Reference to other manuals or pages in this manual.

### 2.4 Abbreviations/Glossary

<b>BS</b>	British Standard
<b>CH</b>	Central heating
<b>DHW</b>	Domestic hot water
<b>GB</b>	Great Britain
<b>Hi</b>	Lower heating value (LHV)
<b>Hs</b>	Higher heating value (HHV)
<b>IE</b>	Ireland
<b>PCU</b>	PCB for managing burner operation
<b>Pn</b>	Nominal output
<b>Pnc</b>	Condensing output
<b>PWM</b>	Pulse wide modulation
<b>Qn</b>	Nominal input
<b>SU</b>	Safety PCB

## 3 Technical specifications

### 3.1 Homologations

#### 3.1.1 Safety, Performance & Quality

This boiler has been assessed by an appropriate Notified Body and shown to meet the requirements of all Directives and Regulations as applicable. These Directives and Regulations lay down requirements for the safety and efficiency of the appliance, together with its design, construction and use of materials. They also require the production process to be covered by an approved and monitored system of quality assurance.

#### 3.1.2 Certifications

Tab.1 Certifications

CE certificate number	0085CQ0192
NOx class	6
Boiler type	C <sub>13</sub> , C <sub>33</sub>

#### 3.1.3 Gas category

Tab.2 Gas category, type and supply pressure

Gas category	Gas type	Supply pressure (mbar)
I <sub>2H</sub>	G20	20

#### 3.1.4 Standards

**Codes of Practice — refer to the most recent version**

Tab.3 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.

Tab.4 In IE the following Code of Practice apply:

Standard	Scope
IS 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.

## 3.2 Technical data

### 3.2.1 Technical information



**Important**

All data in these sections are nominal and subject to normal production tolerances.



**Important**

LPG information can be found in Technical information - LPG, page 75

Tab.5 General

Baxi Combi			224	228	424	428
Gas Council Numbers			47-077-21	47-077-22	47-077-23	47-077-24
Nominal heat input Domestic Hot Water — Maximum Rate	Nett (Qn Hi)	kW	24.7	28.9	24.7	28.9
	Gross (Qn Hs)	kW	27.4	32.1	27.4	32.1
Nominal Heat Input Central Heating — Maximum Rate	Nett (Qn Hi)	kW	20.6	24.7	20.6	24.7
	Gross (Qn Hs)	kW	22.9	27.4	22.9	27.4
Nominal Heat Input — Minimum Rate	Nett (Qn Hi)	kW	4.9	4.9	4.9	4.9
	Gross (Qn Hs)	kW	5.4	5.4	5.4	5.4
Nominal heat output 80/60°C — Domestic Hot Water — Maximum Rate	Pn	kW	24.0	28.0	24.0	28.0
Nominal heat output 80/60°C — Central Heating — Maximum Rate	Pn	kW	20.0	24.0	20.0	24.0
Nominal heat output 80/60°C — Central Heating — Factory Setting	Pn	kW	20.0	20.0	20.0	20.0
Nominal heat output 80/60°C — Minimum Rate	Pn	kW	4.8	4.8	4.8	4.8

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Nominal heat output 50/30°C — Central Heating — Maximum Rate	Pnc	kW	21.8	26.1	21.8	26.1
Nominal heat output 50/30°C — Central Heating — Minimum Rate	Pnc	kW	5.2	5.2	5.2	5.2

Tab.6 Central heating circuit specifications

<b>Baxi Combi</b>			<b>224</b>	<b>228</b>	<b>424</b>	<b>428</b>
Maximum pressure	bar		3	3	3	3
Minimum pressure	bar		0.5	0.5	0.5	0.5
Central heating temperature adjust- ment $\pm 5^\circ\text{C}$	$^\circ\text{C}$		25/80	25/80	25/80	25/80
Expansion vessel water capacity	litres		7.0	7.0	7.0	7.0
Expansion vessel pre charge pres- sure	bar		1.0	1.0	1.0	1.0
Maximum capacity of central heat- ing system	litres		120	120	120	120
Primary water content of boiler (un- pressurised)	litres		2.5	2.5	2.5	2.5

Tab.7 Domestic hot water circuit specifications

<b>Baxi Combi</b>			<b>224</b>	<b>228</b>	<b>424</b>	<b>428</b>
Maximum pressure	bar		8.0	8.0	8.0	8.0
Dynamic minimum pressure	bar		0.5	0.5	0.5	0.5
Minimum working water flow rate	l/min		2.0	2.0	2.0	2.0
Specific flow rate (D)	l/min		11.5	13.4	11.5	13.4
Domestic hot water temperature range adjustment $\pm 5^\circ\text{C}$	$^\circ\text{C}$		35/60	35/60	35/60	35/60
Production of domestic water with $\Delta T = 30^\circ\text{C}$	l/min		11.4	13.3	11.4	13.3
Production of domestic water with $\Delta T = 35^\circ\text{C}$	l/min		9.8	11.5	9.8	11.5

Where low flow taps or fittings are intended to be used in the DHW system connected to the boiler, 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.

Tab.8 Characteristics of combustion

<b>Baxi Combi</b>			<b>224</b>	<b>228</b>	<b>424</b>	<b>428</b>
Natural gas rate (G20) Qmax	$\text{m}^3/\text{h}$		2.61	3.06	2.61	3.06
Natural gas rate (G20) Qmin	$\text{m}^3/\text{h}$		0.52	0.52	0.52	0.52
Diameter of coaxial discharge pipes	mm		60/100 & 80/125	60/100 & 80/125	60/100 & 80/125	60/100 & 80/125



**Important**  
**Dynamic (nominal) inlet pressure** (Natural gas — G20) 20mbar  
 with a CV of 37.78 MJ/m<sup>3</sup>

Tab.9 Electrical specifications

<b>Baxi Combi</b>			<b>224</b>	<b>228</b>	<b>424</b>	<b>428</b>
Nominal electrical power supply voltage	V		230	230	230	230
Nominal electrical power supply frequency	Hz		50	50	50	50

<b>Baxi Combi</b>		<b>224</b>	<b>228</b>	<b>424</b>	<b>428</b>
Nominal power consumption when firing	W	84	94	84	94
External fuse rating	Amp	3	3	3	3
F2 Internal fuse rating — Connection board 'B'	Amp	0.5	0.5	0.5	0.5
F1 Internal fuse rating — Main PCB board 'A'	Amp	1.6	1.6	1.6	1.6

**Important**

Boiler must be connected to an earth supply.

Tab.10 Other specifications

<b>Baxi Combi</b>		<b>224</b>	<b>228</b>	<b>424</b>	<b>428</b>
Degree of protection against humidity (EN 60529) without plug-in timer / receiver fitted	IP	IPX5D	IPX5D	IPX5D	IPX5D
Degree of protection against humidity (EN 60529) with plug-in timer / receiver fitted	IP	IPX0	IPX0	IPX0	IPX0
Dimensions (height/width/depth)	mm	700/395/279	700/395/279	700/395/279	700/395/279

Tab.11 Connections (copper tails)

<b>Baxi Combi</b>		<b>224</b>	<b>228</b>	<b>424</b>	<b>428</b>
Gas inlet	mm	22	22	22	22
Heating flow	mm	22	22	22	22
Heating return	mm	22	22	22	22
Cold water inlet	mm	15	15	15	15
Hot water outlet	mm	15	15	15	15
Pressure relief discharge	mm	15	15	15	15
Condensate discharge drain plastic waste pipe	mm	21.5	21.5	21.5	21.5

Tab.12 Clearances

<b>Baxi Combi</b>		<b>224</b>	<b>228</b>	<b>424</b>	<b>428</b>
Above casing	mm	183	183	183	183
Below casing (min)	mm	200	200	200	200
Below casing (recommended)	mm	250	250	250	250
Front — for servicing (min)	mm	450	450	450	450
Front — for servicing (recommended)	mm	1000	1000	1000	1000
Front — for operation	mm	6	6	6	6
Sides LH	mm	5	5	5	5
Sides RH	mm	5	5	5	5

Tab.13 Weights

<b>Baxi Combi</b>		<b>224</b>	<b>228</b>	<b>424</b>	<b>428</b>
Packaged boiler	kg	30.0	30.0	30.5	30.5
Boiler lift weight (dry)	kg	26.0	26.0	26.0	26.0
Installed weight (dry)	kg	28.0	28.0	28.5	28.5
Installed weight when filled with water	kg	30.5	30.5	31.0	31.0

### 3.2.2 Technical parameters

Tab.14 Technical parameters for boiler combination heaters

<b>Baxi Combi</b>			<b>224</b>	<b>228</b>	<b>424</b>	<b>428</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>	<i>P<sub>rated</sub></i>	kW	20	24	20	24
Useful heat output at rated heat output and high temperature regime <sup>(2)</sup>	<i>P<sub>4</sub></i>	kW	20.0	24.0	20.0	24.0
Useful heat output at 30% of rated heat output and low temperature regime	<i>P<sub>1</sub></i>	kW	6.7	8.0	6.7	8.0
<b>Seasonal space heating energy efficiency</b>	<i>η<sub>s</sub></i>	%	93	93	93	93
Useful efficiency at rated heat output and high temperature regime	<i>η<sub>4</sub></i>	%	88.1	88.0	88.1	88.0
Useful efficiency at 30% of rated heat output and low temperature regime	<i>η<sub>1</sub></i>	%	97.8	97.8	97.8	97.8
<b>Auxiliary electricity consumption</b>						
Full load	<i>el<sub>max</sub></i>	kW	0.028	0.038	0.028	0.038
Part load	<i>el<sub>min</sub></i>	kW	0.011	0.011	0.011	0.011
Standby mode	<i>P<sub>SB</sub></i>	kW	0.003	0.003	0.003	0.003
<b>Other items</b>						
Standby heat loss	<i>P<sub>stby</sub></i>	kW	0.069	0.069	0.069	0.069
Ignition burner power consumption	<i>P<sub>ign</sub></i>	kW	0.000	0.000	0.000	0.000
Annual energy consumption	<i>Q<sub>HE</sub></i>	GJ	62	74	62	74
Sound power level, indoors	<i>L<sub>WA</sub></i>	dB	48	50	48	50
Emissions of nitrogen oxides	<i>NO<sub>x</sub></i>	mg/kWh	38	40	38	40
<b>Domestic hot water parameters</b>						
<b>Declared load profile</b>			XL	XL	XL	XL
Daily electricity consumption	<i>Q<sub>elec</sub></i>	kWh	0.151	0.151	0.151	0.151
Annual electricity consumption	<i>AEC</i>	kWh	33	33	33	33
<b>Water heating energy efficiency</b>	<i>η<sub>wh</sub></i>	%	86	85	86	85
Daily fuel consumption	<i>Q<sub>fuel</sub></i>	kWh	22.770	22.930	22.770	22.939
Annual fuel consumption	<i>AFC</i>	GJ	17	17	17	17
(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.						



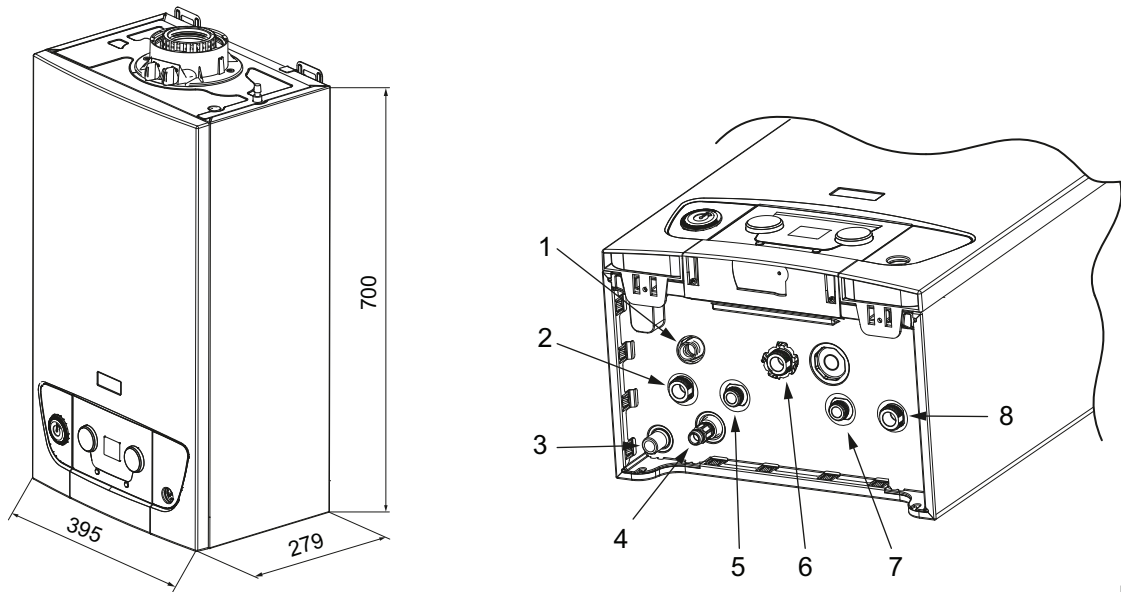
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The back cover for contact details.



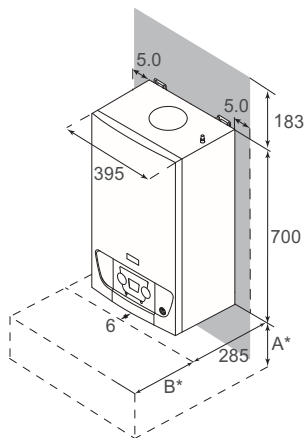
### 3.3 Dimensions and connections/clearances

Fig.3 Dimensions and connections



PN-000501

Fig.4 Clearances



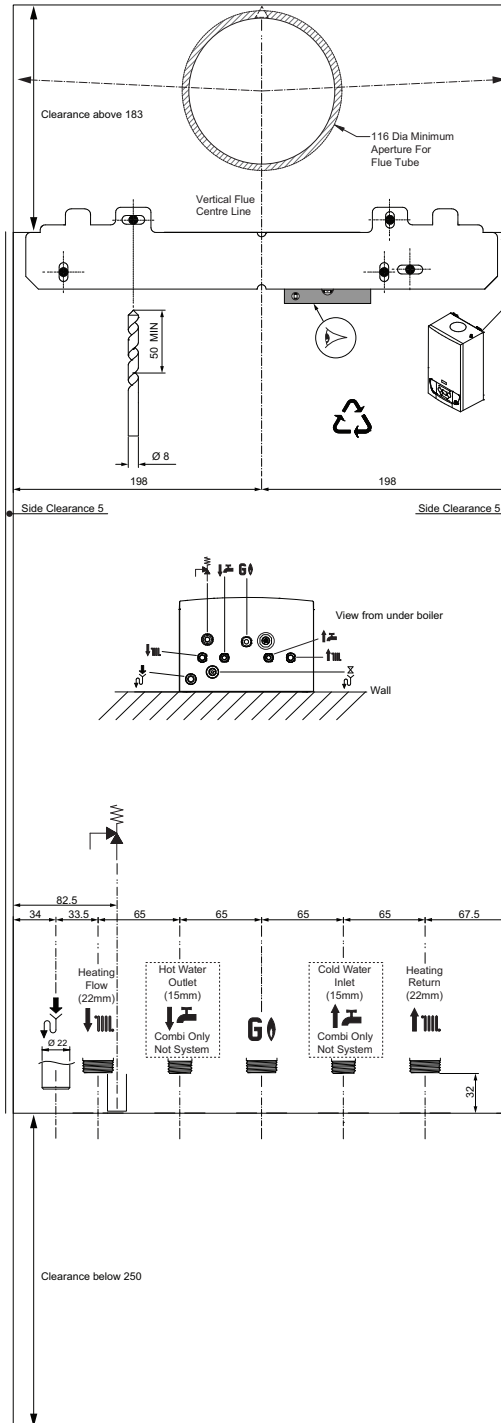
PN-000503

- 1 Safety valve
- 2 Heating circuit water flow
- 3 Condensate discharge
- 4 Heating system/boiler drain tap
- 5 Domestic hot water outlet
- 6 Gas inlet
- 7 Mains cold water inlet
- 8 Heating circuit water return

- A\*** Clearances below — 200mm minimum, 250mm recommended
- B\*** Clearances in front — 450mm minimum, 1000mm recommended

The clearances shown in the diagram are minimum requirements to allow for case removal, spanner access and air movement. These should be observed at all times and kept clear of obstructions.

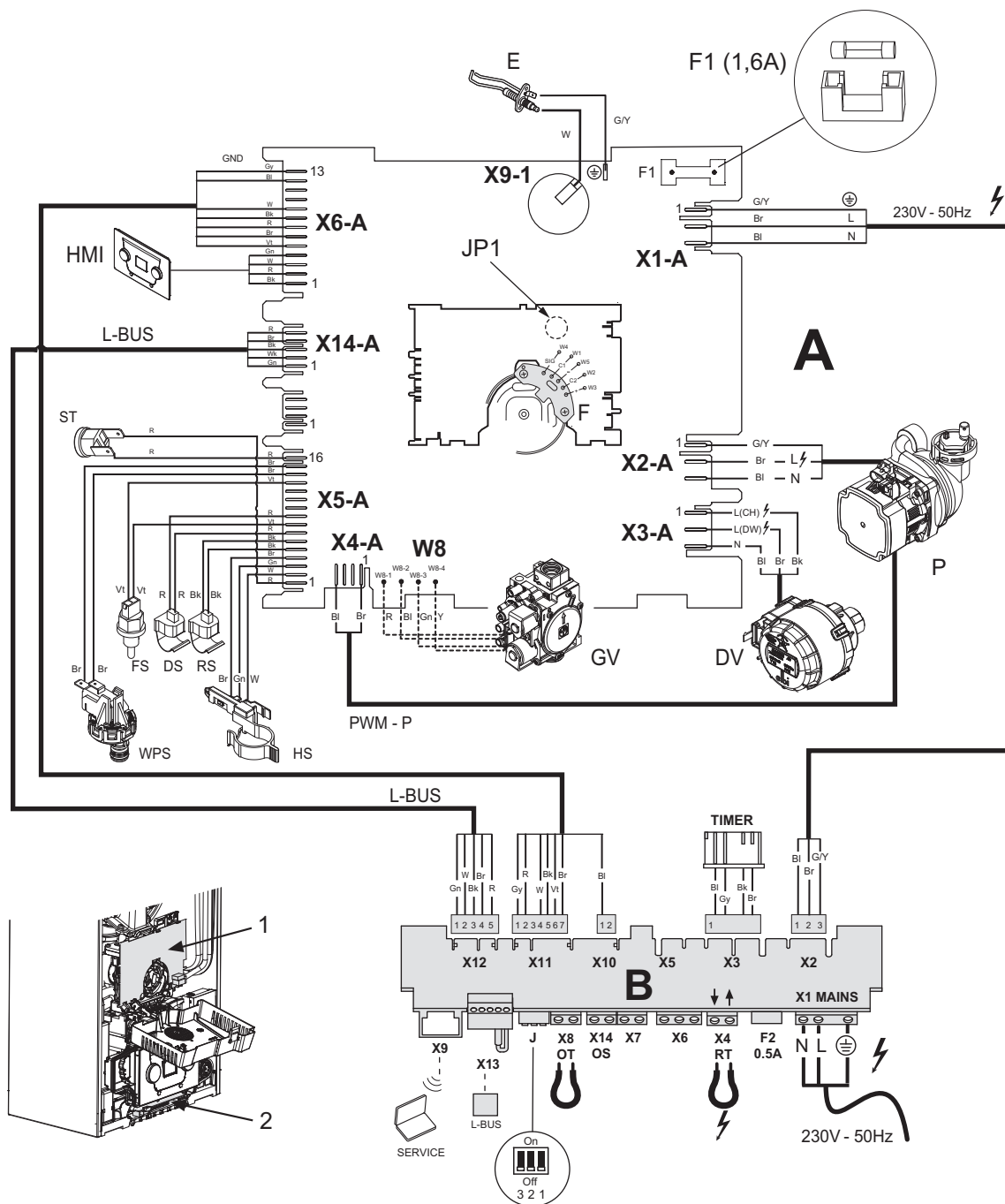
Fig.5 Paper template



PN-000504

### 3.4 Electrical diagram

Fig.6 Electrical diagram



PN-0000505

- 1 Circuit board 'A'
- 2 Circuit board 'B'

Tab.15 Circuit board wiring

Br	Brown	Gy	Grey	Gn	Green
Bl	Blue	R	Red	W	White
G/Y	Green/Yellow	Vt	Violet	⚡	Mains (230V)
Bk	Black				

Tab.16 Electrical connections inside the boiler (A)

X1-A	Electrical power supply 230 V — 50 Hz <ul style="list-style-type: none"> <li>• 1: Earthing connector</li> <li>• 2: L (230 V)</li> <li>• 3: N</li> </ul>
X2-A	Pump <ul style="list-style-type: none"> <li>• 1: Earth connection</li> <li>• 2: L (230 V)</li> <li>• 3: N</li> </ul>
X3-A	3-way valve <ul style="list-style-type: none"> <li>• 1: <b>L (CH)</b> 230 V — Heating circuit opening command</li> <li>• 2: <b>L (DW)</b> 230 V — Domestic water circuit opening command</li> <li>• 3: N — Common</li> </ul>
X4-A	Pump PWM signal
X5-A	Sensor connection <ul style="list-style-type: none"> <li>• <b>HS</b>: domestic water request</li> <li>• <b>RS</b>: heating circuit water return</li> <li>• <b>DS</b>: heating circuit water flow</li> <li>• <b>FS</b>: flue gas</li> <li>• <b>WPS</b>: hydraulic pressure switch</li> <li>• <b>ST</b>: safety thermostat</li> </ul>
X6-A	Boiler PCB and control panel connection (electrical connection board)
X13-A	Not used
X14-A	Connection <b>L-BUS</b>

Tab.17 Electrical connections to be made to the boiler (B)

X1-B	Electrical power supply 230 V — 50 Hz <ul style="list-style-type: none"> <li>• 1: Earthing connector</li> <li>• 2: L (230 V)</li> <li>• 3: N</li> </ul>
X4-B	Room thermostat/timer (230V)
X6-B	Not used
X7-B	Solar probe connection
X8-B	On-Off/R-Bus - Room thermostat connection (the jumper must be REMOVED to connect a device)
X9-B	Service connection ( <b>SERVICE</b> )
X13-B	Connection <b>L-BUS</b>
X14-B	Outside sensor connection ( <b>OS</b> )
J	Dip-Switch <ul style="list-style-type: none"> <li>• 1: Maximum heating temperature <b>OFF</b> = 80°C - <b>ON</b> = 45°C (floor system)</li> <li>• 2: <b>OFF</b> = Maximum output (heating) - <b>ON</b> = Boiler output 50% (heating)</li> <li>• 3: <b>DO NOT ADJUST</b></li> </ul>

## 4 Description of the product

### 4.1 General description

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The Baxi Combi condensing boiler is a gas-fuelled boiler. The purpose of this boiler is to heat water to a temperature that is lower than boiling point at atmospheric pressure. It must be connected to a heating installation and to a domestic hot water distribution system that is compatible with its power and performance ratings. Features of this boiler:

- Low pollutant emissions.
- High-efficiency heating.
- Combustion products discharged through a coaxial connector.
- Front control panel with display.
- Lightweight and compact.

### 4.2 Operating principle

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#### 4.2.1 Air-gas adjustment

---

The air is drawn in by the fan and gas injected directly at the top of the mixer valve. The fan rotation speed is regulated automatically by the electronic board based on temperature adjustment and other parameters. The gas and air are mixed in the manifold. The gas/air ratio ensures that the quantity of gas and air are adjusted correctly to always obtain optimal combustion. The gas/air mixture is fed into the burner at the front of the heat exchanger. The mixture is ignited by the spark electrode.

#### 4.2.2 Combustion

---

The burner heats the heating water circulating in the heat exchanger. When the temperature of the combustion gas is lower than the dew point (around 55 °C), the water vapour contained in the combustion gas condenses in the flue gas side of the heat exchanger. The heat recovered during this condensation process (the latent heat or condensing heat) is also transferred to the heating water. Once cooled, the combustion gases are discharged through the flue exhaust. The condensed water is discharged through a trap.

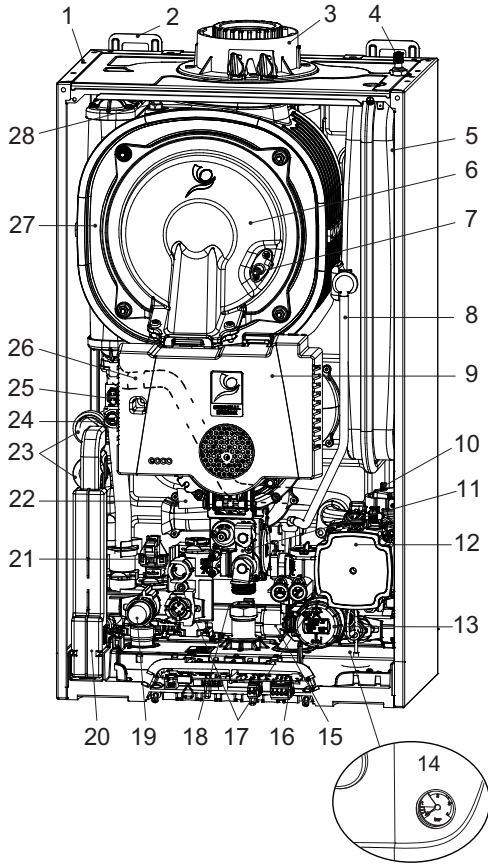
#### 4.2.3 Central heating and domestic hot water production

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In boilers used for heating and for producing domestic hot water, an integrated plate heat exchanger heats the domestic water. The heated water is then channelled to the heating installation or to the plate heat exchanger via a diverter valve. A flow sensor detects that a hot water tap has been turned on and communicates this to the printed circuit board (PCB), which switches the diverter valve to the hot water position and activates the pump. The diverter valve is spring-loaded but only consumes electricity when switching from one position to another. Priority is given to domestic hot water.

### 4.3 Main components

Fig.7 Component description

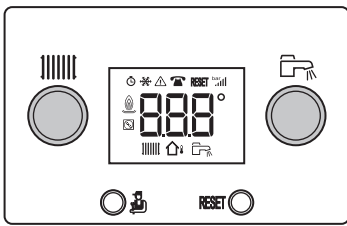


- 1 Boiler case
- 2 Mounting slots for wall bracket
- 3 Flue adaptor
- 4 Expansion vessel air control/filling valve
- 5 Expansion vessel
- 6 Burner door
- 7 Detection/ignition electrode
- 8 Water circuit-expansion vessel connection pipe
- 9 Air-gas assembly (control board, fan, mixer valve)
- 10 Automatic air vent
- 11 Gas valve
- 12 Pump
- 13 3-way valve
- 14 Pressure gauge (fitted on the panel)
- 15 Domestic hot water priority sensor
- 16 Boiler electrical connection board
- 17 Domestic hot water plate heat exchanger fastening screws
- 18 Domestic hot water plate heat exchanger
- 19 Pressure relief valve
- 20 Condensate trap
- 21 Hydraulic pressure sensor
- 22 Silencer
- 23 Trap quick connection (with gaskets)
- 24 Heating circuit water flow sensor
- 25 Overheat safety thermostat
- 26 Heating circuit water return sensor (behind the silencer)
- 27 Heat exchanger
- 28 Flue gas temperature sensor

PN-0000506

### 4.4 Control panel description

Fig.8 Control panel

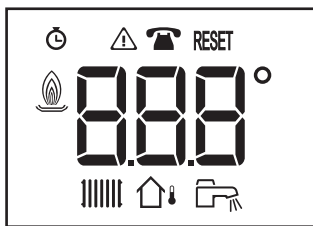


PN-0000509

#### 4.4.1 Description of the keys

- Heating temperature control knob
- Level access button: Information, Installer or Chimney Sweep
- RESET** Manual reset button
- Domestic hot water temperature control knob

Fig.9 Display screen



PN-0000510

#### 4.4.2 Description of the display

- Hour run meter
- Malfunction
- Maintenance
- RESET** Reset necessary
- Burner status
- Heating mode
- Outside temperature sensor
- Domestic hot water mode

## 4.5 Standard delivery

### 4.5.1 Contents of the carton

The boiler is delivered in a carton comprising:

- a wall-hung gas boiler;
- a bracket for fastening the boiler to the wall;
- a paper template;
- an installation and service manual;
- a user manual.
- a fitting kit, including taps and tail pipes.

## 4.6 Accessories and options

### 4.6.1 Optional accessories

The table below shows the accessories available for this boiler range.

Tab.18 Optional accessories

Part number	Accessory
7658276	Baxi plug-in 24 hr mechanical timer combi - RH
7658523	Baxi plug-in 7 day digital timer combi - RH
7658781	Baxi plug-in receiver 24 hr RF programmable mech room thermostat-combi
7658789	Baxi plug-in receiver 7 day RF digital programmable room thermostat-combi
7212438	Baxi single channel wired programmable room thermostat
7212444	Baxi single channel wired timer
720971601	Baxi room thermostat
720330001	Baxi wired weather sensor
720648301	Multifit condensate & PRV combined pump
720644401	Multifit 1m condensate drain pipe 'trace heating' element
720664101	Multifit 2m Condensate drain pipe 'trace heating' element
720664201	Multifit 3m condensate drain pipe 'trace heating' element
720664401	Multifit 5m condensate drain pipe 'trace heating' element
7659335	Baxi 200-400 stand off kit
5121379	Multifit remote secondary PRV kit
248221	Multifit filling loop (Not required for 424 and 428)

For Flue Accessories (elbows, extensions, clamps etc.) refer to the Flue Installation Guide supplied in the literature pack.

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

## 5 Before installation

### 5.1 Installation regulations

---



#### Warning

Installation, repair and maintenance must only be carried out 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 code of practice and the recommendations in these instructions.

Installation must also respect the following points:

- This instruction manual and any other applicable documentation
- Building Regulations
- British Standards
- Gas Safety Regulations
- Water Supply Regulations

### 5.2 Installation requirements

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#### 5.2.1 Gas supply

---

The gas installation should be in accordance with the relevant standards. In GB this is BS 6891. In IE this is the current edition of IS 813 Domestic Gas Installations.

The connection to the appliance is a 22mm copper tail located at the rear of the gas service cock.

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.

#### 5.2.2 Electrical supply

---

External wiring must be correctly earthed, polarised and in accordance with relevant regulations/rules. In GB this is the current IEE Wiring Regulations. In IE reference should be made to the current edition of ETCI rules.

The mains supply is 230V ~ 50Hz fused at 3A.



#### Important

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.

**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.**



**i 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 fascia/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.

**5.2.3 Hard water area**

---

**i Important**

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**

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The boiler is fitted with an automatic integral bypass.

**5.2.5 System control**

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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.

Any proprietary OpenTherm control MUST allow individual adjustment of CH and DHW temperature.

**5.2.6 Treatment of water circulating systems**

---

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.

When fitting new systems flux will be evident within the system, which can lead to damage of system components.

BS 7593 gives extensive recommendations on system cleansing and water treatment.

All systems must be thoroughly drained and flushed out using appropriate proprietary flushing agent.

A suitable inhibitor must then be added to the system.

All system additives (flushing agents, cleansers, inhibitors etc.) must comply with the requirements of BS 7593. Full instructions are supplied with the products and for further information contact the additive manufacturer directly or consult their website.



**Important**

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

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.)

For information or advice regarding any of the above contact Baxi Customer Support 0344 871 1545.

**5.2.7 Showers**

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)**

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 120 litres. 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 IS 813 Domestic Gas Installations.

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.

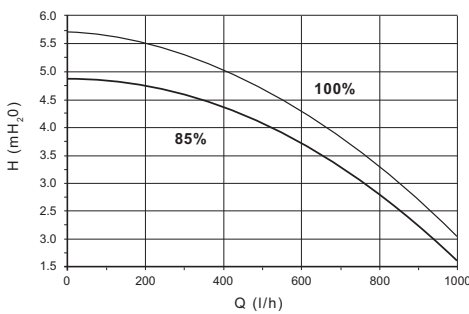
**5.2.9 Pump available head**

This is a two-speed (85% CH and 100% DHW) high static head pump fit for installation on any type of single or double pipe CH system. The automatic air valve incorporated in the pump allows quick venting of the heating systems.

Tab.19 Pump head

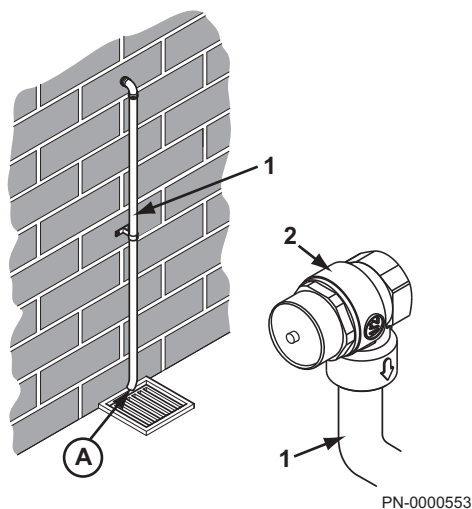
Q	Flow	85%	Speed in the CH mode
H	Head	100%	Speed in the DHW mode

Fig.10 Available pump head graph



PN-0000511

Fig.11 Discharge pipe



### 5.2.10 Safety pressure relief valve

- 1 Discharge pipe
- 2 Pressure relief valve
- A The end of the pipe should terminate facing down and towards the wall



#### See

See BS 6798 for full details.

The pressure relief valve 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.

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.

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.



#### Important

The relief valve must never be used to drain the system.

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

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.

## 5.3 Choice of the location

### 5.3.1 Location of the boiler

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.)

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 !**

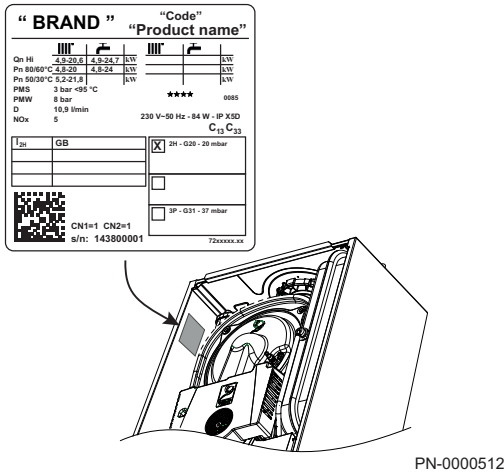
If the boiler is fitted in a room containing a bath or shower reference must be made to the relevant requirements.

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

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

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).

Fig.12 Data plate position



### 5.3.2 Data plate and service label

The data plate is located on the top inner part of the boiler. To see it, remove the front panel of the boiler. The data plate provides important information about the boiler.

Tab.20 Description of the data plate

"BRAND"	Commercial brand
"Product name"	Model name
"Code"	Product code
Qn Hi	Nominal input
Pn	Effective rated output (delivery 80° C return 60° C)
PMS	Maximum heating circuit pressure (bar)
	Maximum domestic water circuit pressure (bar)
D	Specific flow rate (l/min)
NOx	NOx class
IP	Protection rating
V-Hz-W	Power supply and output
Cxx/Bxx	Flue gas exhaust type
II2HM3B/P — IT (example)	Gas category used (depends on the country of destination)
C1/C2	Factory parameters
s/n	Serial number

Fig.13 Service label position

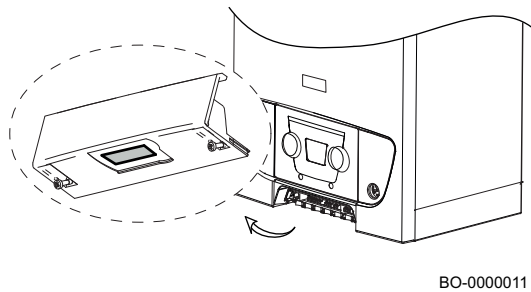


Fig.14 Service label

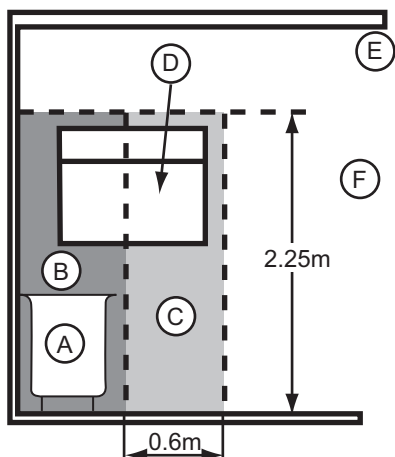
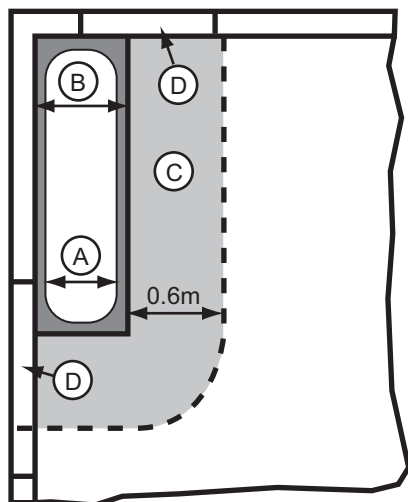


The service label is at the base of the cover of the terminal block under the control panel.

Tab.21 Description of the service label

"Code"	Product code
"Product name"	Model name
"s/n"	Serial number

Fig.15 Bathroom 1 and 2



PN-0000400

### 5.3.3 Bath and shower rooms

- A Zone 0
- B Zone 1
- C Zone 2
- D Window recess Zone 2
- E Ceiling
- F Outside zones

**i Important**  
Where an optional plug-in integral timer, RF receiver or thermostat 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).

**i Important**  
A boiler fitted with an optional plug-in integral timer, RF receiver or thermostat CANNOT be fitted in any zone.

Bathroom 1 and 2 ( in GB only) shows zone dimensions for a bathtub. For other examples refer to the Current IEE Wiring Regulations). Reference must be made to the relevant requirements.

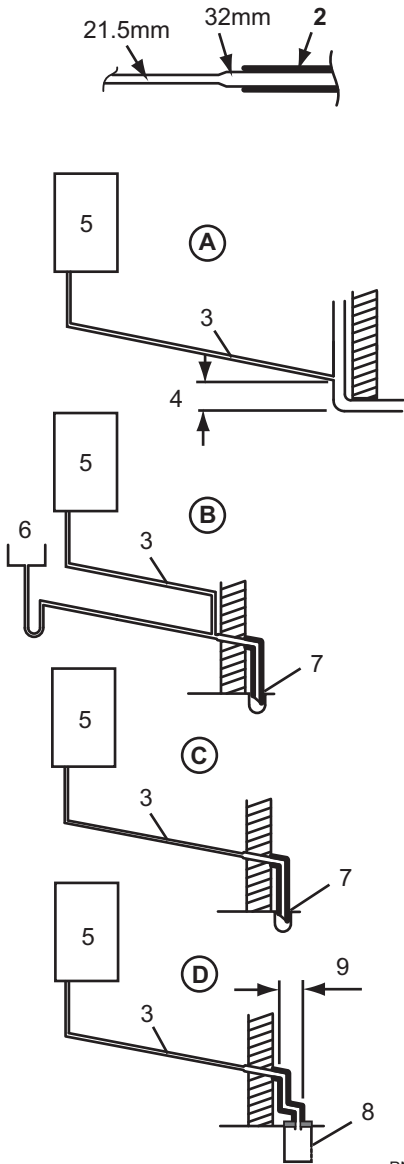
In GB this is the current IEE. Wiring Regulations and Building Regulations.

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

### 5.3.4 Ventilation

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.

Fig.16 Pipework and method of termination



PN-0000389

### 5.3.5 Condensate drain

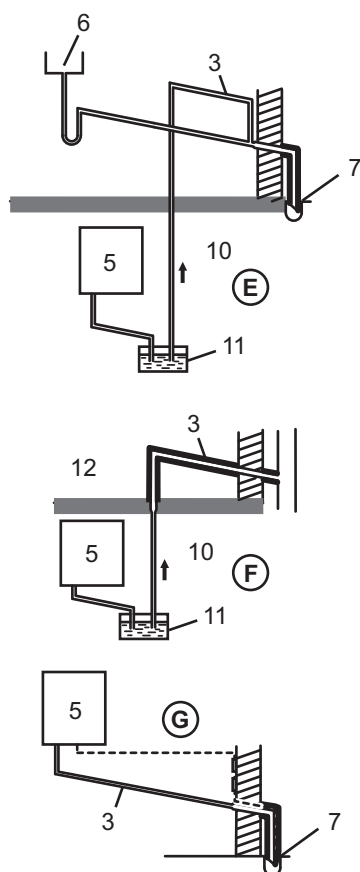
It is strongly recommended to discharge internally into the household drainage system. If connecting to a rain water drain, that drain **MUST** discharge into a foul drain.

- 1 Pipework.
- 2 Insulation.
- 3 50mm per metre of pipe run — 2.5° minimum run.
- 4 450mm minimum is applicable to properties up to 3 storeys. For multi-storey building installations consult BS 6798.
- 5 Boiler.
- 6 Sink.
- 7 Pipe must terminate above water level but below surrounding surface. Cut end at 45°.
- 8 Holes in the soak-away must face away from the building.
- 9 500mm minimum.
- 10 Basement or similar (heated)
- 11 Condensate pump
- 12 Unheated Location (e.g. Garage)

Tab.22 Examples are shown of the following methods of termination

Key	Description
A	Termination to an internal soil and vent pipe.
B	External termination via internal discharge branch e.g. sink waste — downstream (It is NOT RECOMMENDED to connect upstream of the sink or other waste water receptacle!)
C	Termination to a drain or gully.
D	Termination to a purpose made soakaway Further specific requirements for soakaway design are referred to in BS 6798
E	Pumped into an internal discharge branch (e.g. sink waste) downstream of the trap.
F	Pumped into an external soil and vent pipe.
G	Termination to a drain or gully with extended external run and trace heating. The "Trace Heating" element must be installed in accordance with the instructions supplied. External runs and those in unheated locations still require insulation.

Fig.17 Methods of termination continued



PN-0000455

**i Important**

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.

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.

The condensate outlet will accept 21.5mm ( $\frac{3}{4}$ in) 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.

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.**

The discharge pipe should be run in a proprietary drain pipe material e.g. PVC, PVC-U, ABS, PVC-C or PP.

Metal pipework is **NOT** suitable for use in condensate discharge systems.

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.

**It is advisable that the full length of condensate pipe is run internally and preferably be less than 3 metres.**

**Internal runs greater than 3 metres or runs in cold areas should use 32mm waste pipe.**

**External runs MUST be a MINIMUM of 32mm and fully insulated with material suitable for external use.**

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.

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.

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 backpressure may force water out of the boiler trap and cause appliance lockout.

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.

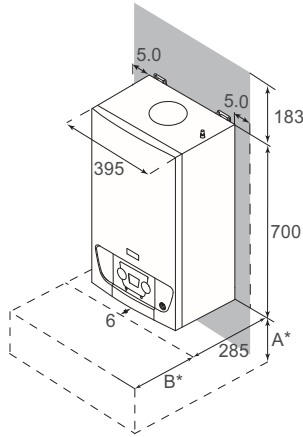
Condensate Drain Pipe "Trace Heating" Elements are available in various lengths, 1, 2, 3 & 5 metres. Where the drain is between 3 & 5 metres a 5 metre kit can be used and "doubled back" upon itself.

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

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

Fig.18 Clearances



PN-0000503

A flat vertical area is required for the installation of the boiler and it should be capable of bearing the weight of the boiler when full of water.

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.

- A\*** Clearance below — 200mm minimum, 250mm recommended
- B\*** Clearance in front — 450mm minimum, 1000mm recommended

### 5.3.7 Flue/chimney location

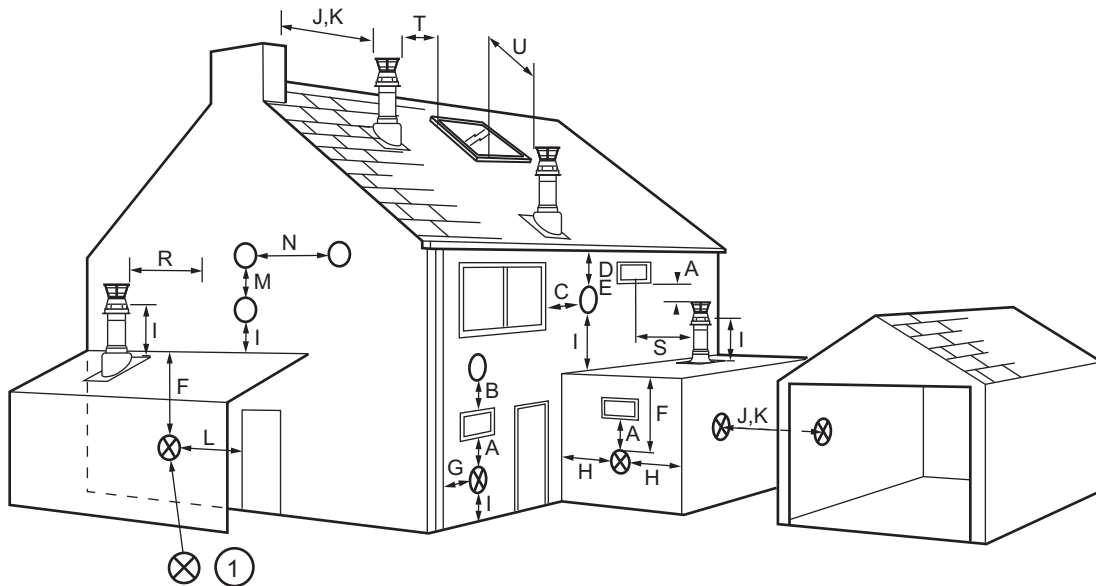
The following guidelines indicate the general requirements for siting balanced flue terminals. For GB recommendations are given in BS 5440 Pt 1. For IE recommendations are given in the current edition of I.S. 813 Domestic Gas Installations.



**Important**

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.19 Flue outlets



PN-0000456

- 1 Flue positions marked ⊗ require a flue terminal guard.



Tab.23 Terminal position with minimum distance

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

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

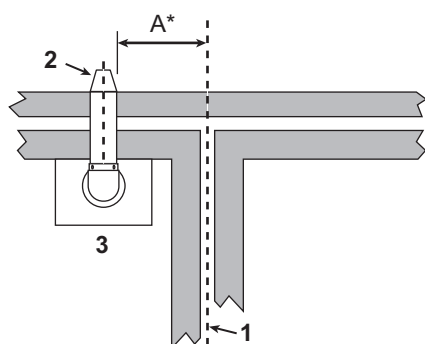
(2) Only ONE 25mm clearance is allowed per installation. If one of the dimension D,E,F,G or H is 25mm then the remainder MUST be as shown in brackets, in accordance with BS 5440-1.

**i Important**  
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.

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.

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.

Fig.20 Property boundary



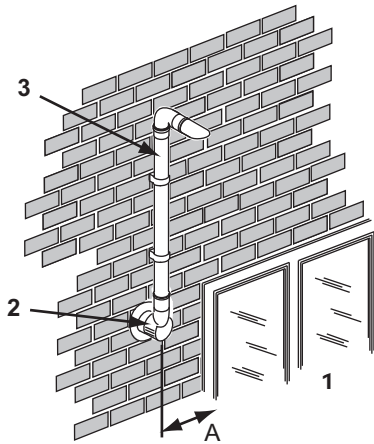
PN-0000457

- 1 Property boundary line
- 2 Terminal assembly
- 3 Top view rear flue
- A 300mm minimum\*

\*Reduction to the boundary is possible down to 25mm but the flue deflector must be used.

**i Important**  
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.21 Plume displacement kit



PN-0000458

- 1 Opening window or door
- 2 Air inlet
- 3 Plume displacement kit
- A 150mm minimum



**Important**

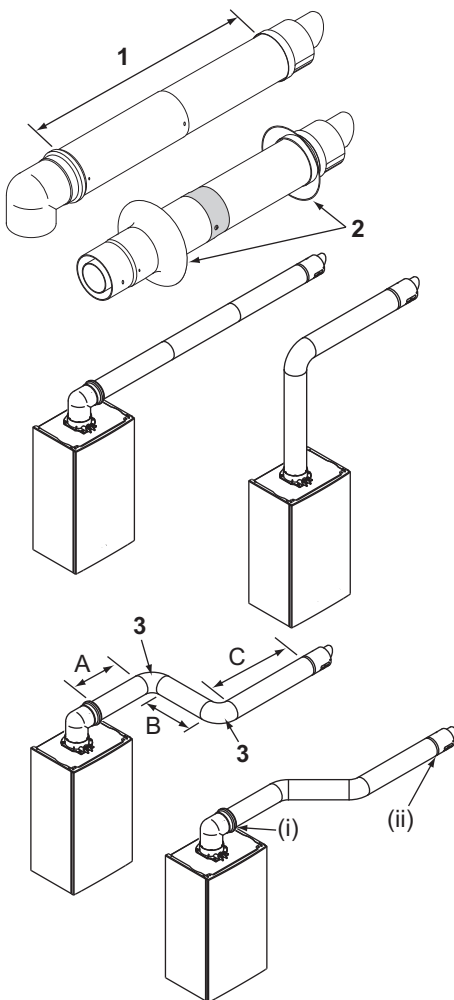
If fitting a Plume Displacement Flue Kit, the air inlet must be a minimum of 150mm from any opening windows or doors.



**Important**

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.

Fig.22 Horizontal flues



PN-0000459

- 1 315mm to 500mm
- 2 Flue trims
- 3 This bend is equivalent to 1 metre

**Total equivalent length = A+B+C+2x90° bends**



**Important**

Horizontal flue extensions should always be installed with a fall of at least 1.5° from the terminal to allow condensate to run back to the boiler.

The standard telescopic flue is suitable only for horizontal termination applications. It allows for lengths between 315mm and 500mm from elbow to terminal without the need for cutting. Extensions of 250mm, 500mm and 1m are available.

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

Tab.24 Maximum permissible equivalent flue lengths are:-

Horizontal concentric	60/100 Diameter	80/125 Diameter
	10 metres	20 metres

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

Tab.25 Their equivalent lengths are:-

Concentric pipes	135° bend	0.5 metres
	93° bend	1.0 metres

The elbow supplied with the standard horizontal telescopic flue kit is not included in any equivalent length calculations.



**Important**

Flue length is measured from point (i) to (ii) as shown.



**See**

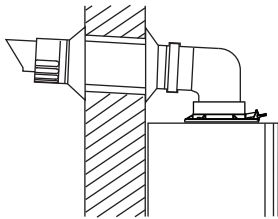
Read this section in conjunction with the Flue Installation Guide supplied with the boiler. This document includes details of vertical flue/chimney systems and plume displacement kits.

**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.23 Flexible flue trims

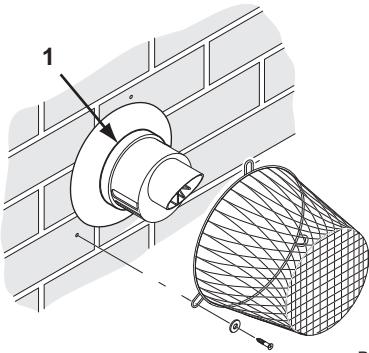


PN-0000390

### 5.3.9 Flue/chimney trim

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

Fig.24 Terminal guard



PN-0000460

### 5.3.10 Terminal guard

- ENSURE THAT NO PART OF THE WHITE OUTER CHIMNEY DUCT IS VISIBLE.**

When codes of practice dictate the use of terminal guards Multifit accessory part no. 720627901 can be used

**Important**

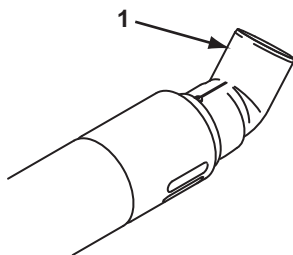
This guard is not compatible with Flue Deflector referred to below.

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

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

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

Fig.25 Flue deflector



PN-0000461

### 5.3.11 Flue/chimney deflector

- Flue deflector

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.

### 5.3.12 Flue/chimney accessories

**See**

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

## 5.4 Transport

---

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

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### 5.5.1 Unpacking

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**Important**

**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.



**See**

Handling, page 9 before unpacking or lifting the boiler.

Follow the procedure on the carton or see the diagrams below to unpack the boiler.

- Lift the boiler to a vertical position **(1)**.
- Remove the straps and the strip of tape **(2)-(3)-(4)**.
- Remove the accessories **(5)**.
- Remove the polystyrene by slipping it off upwards **(6)**.
- Remove the carton by pulling it upwards **(7)**.
- Snap off the rear part of the polystyrene at the bottom **(8)**.



**Important**

**Polystyrene base should be removed completely if fitting the boiler into a space with minimum side clearances of 5mm each side.**

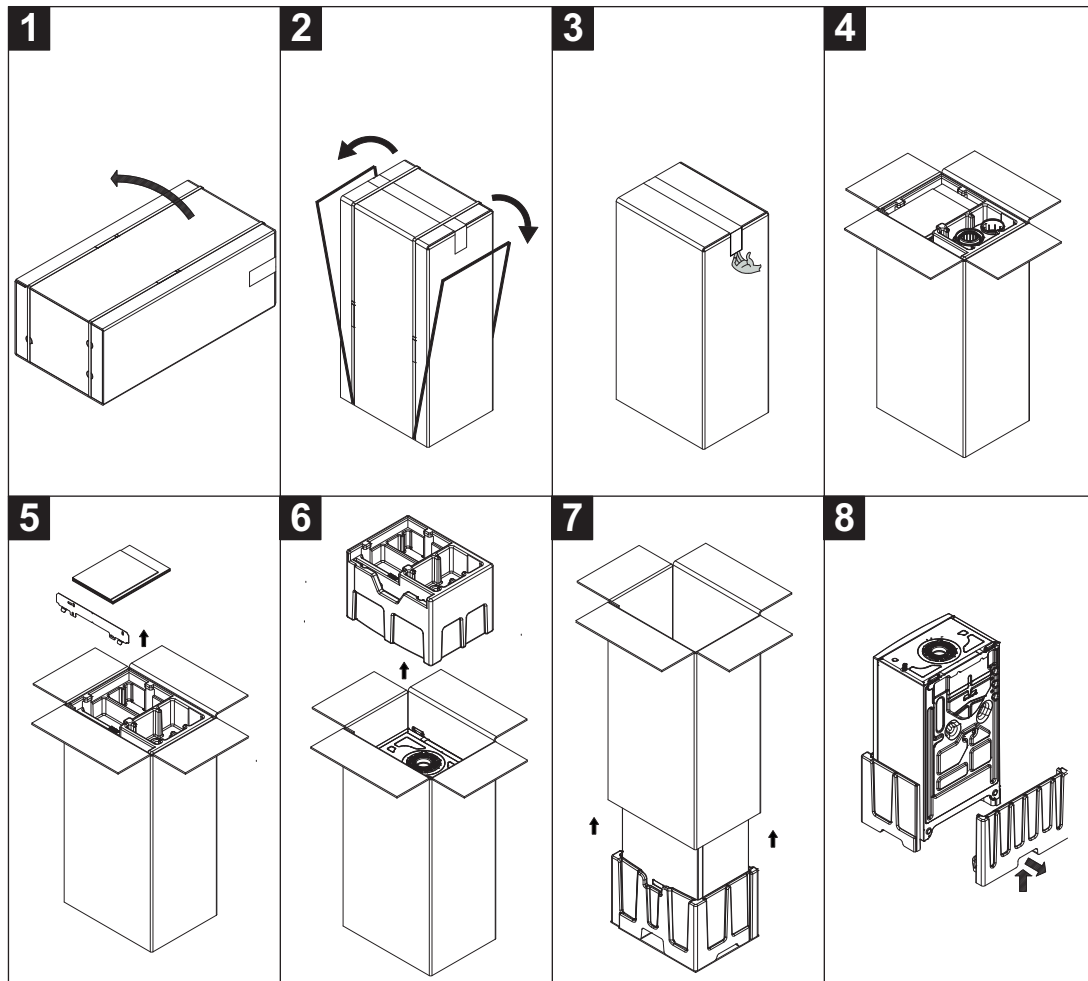
If removing the polystyrene base the sealing caps can also be removed at this stage.



**Important**

**Care must be taken to avoid damage from any residual water in the boiler**

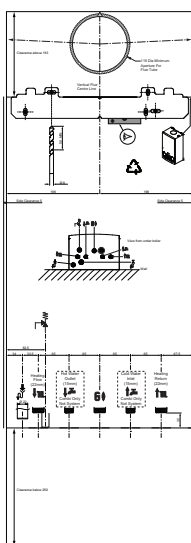
Fig.26 Unpacking



PN-0000513

### 5.5.2 Initial preparation

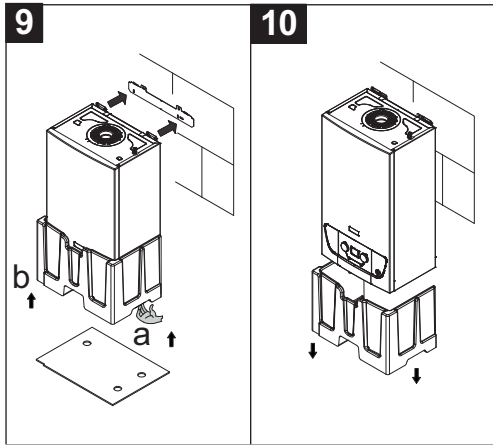
Fig.27 Template



PN-0000514

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 bracket indicated on the template.
3. Mark the position of the centre of the flue hole (rear exit). For side flue exit, mark as shown.
4. If required, mark the position of the gas and water pipes. Remove the template.
5. Cut the hole for the flue (minimum diameter 116mm).
6. Drill the wall as previously marked to accept suitable wall plugs. Secure the wall bracket using appropriate fixing screws.

Fig.28 Mounting the boiler



PN-0000515

7. Using a spirit level ensure that the wall bracket is level before finally tightening the screws
8. Lift the boiler by gripping "a" and "b" and hook the boiler onto the wall bracket (9).
9. Remove the polystyrene by slipping it off downwards (10).
10. Remove the sealing caps from the pipes underneath the boiler

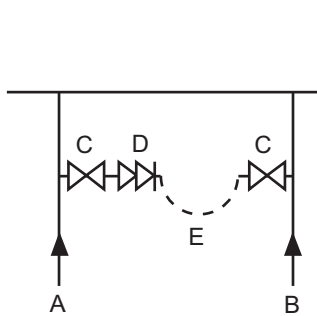


**Warning**

Some residual water may escape when removing the sealing caps. Take precautions to avoid damage to components!

## 5.6 Connecting diagrams

Fig.29 System filling circuit



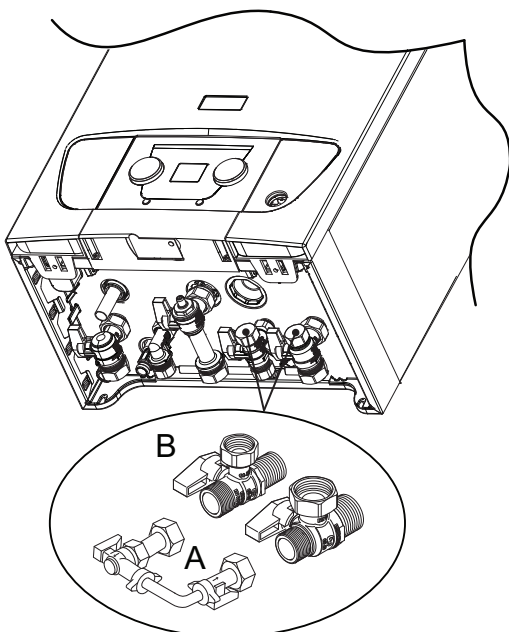
PN-0000347

### 5.6.1 Filling information

- A Domestic hot water mains inlet
- B Central heating return
- C Stop valve
- D Double check valve
- E Temporary loop

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.

Fig.30 Filling loop



PN-0000517

- A Filling loop
- B Flow and return taps

A filling loop is supplied with the 424 and 428 models.

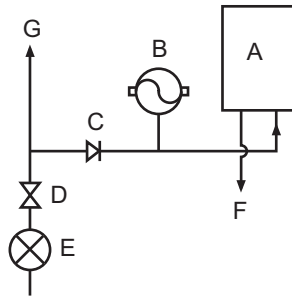
The filling method adopted must be in accordance with all relevant water supply regulations and use approved equipment.

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.

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.

Fig.31 Circuit plan



PN-0000350

## 5.6.2 Domestic hot water circuit

A	Boiler
B	Expansion vessel
C	Check valve
D	Pressure reducer
E	Stop tap
F	To hot tap
G	Other tap outlets

All DHW circuits, connections, fittings, etc. should be fully in accordance with relevant standards and water supply regulations.

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 IS 813 Domestic Gas Installations.

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 WCs) may affect the DHW function of the boiler. In these instances the fitting of a backflow prevention device and expansion vessel is recommended.



### Important

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.

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

### 6.1 General

Installation must be carried out in accordance with the prevailing regulations, codes of practice and the recommendations in this manual.



**Danger**

If the boiler is installed in a compartment do not use it for storage purposes. Do not obstruct any purpose provided ventilation openings.



**Caution**

Where the boiler is sited in an unheated enclosure provision must be made to protect against frost, e.g. frost thermostat, pipe thermostat.



**Important**

If the boiler stand-off kit has been used the copper tails are reversible and can be used here.

**Ensure the sealing caps are removed** from the boiler connections under the boiler (including the condensate trap).



**Important**

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

Remove the taps, elbow and sealing washers from the fitting kit.

Connect the appropriate tap to the heating flow and return pipework, gas supply and mains cold inlet. The elbow must be connected to the DHW flow pipe.

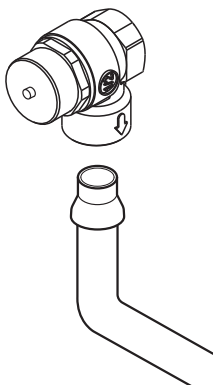
Using the sealing washers provided connect the taps and elbow to the boiler.

Ensure all joints are tight.

### 6.2 Assembly

#### 6.2.1 Fitting the pressure relief discharge pipe

Fig.32 Pressure relief pipe connection



PN-0000554

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.



**Important**

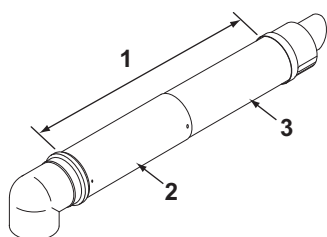
Make all soldered joints before connecting to the pressure relief valve. Do not adjust the position of the valve. The discharge pipe must be installed before pressurising the system.

3. The pipework must be at least 15mm diameter and run continuously downwards to a discharge point outside the building.
4. Firmly engage the flange on the pipe into the pressure relief valve outlet grommet, ensuring it is pushed fully in.
5. Complete the discharge pipework and route it to the outside discharge point.
6. The pipework must be clipped at suitable intervals to support it, commencing as close to the boiler as possible.



## 6.3 Air supply/flue gas connections

Fig.33 Telescopic flue



PN-0000462

### 6.3.1 Connecting the flue/chimney

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

- 1 315mm to 500mm
- 2 Connection assembly
- 3 Terminal assembly

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.

The two sections can be adjusted to provide a length between 315mm and 500mm when measured from the flue elbow (there is 40mm engagement into the elbow).

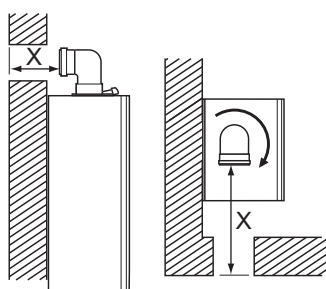
1. Locate the flue elbow on the adaptor at the top of the boiler. Set the elbow to the required orientation.



#### Important

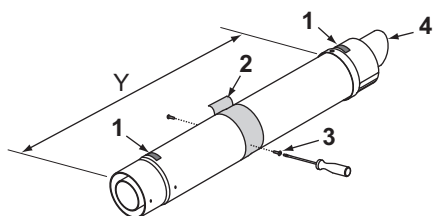
The flue elbow is angled at 93° to ensure a fall back to the boiler.

Fig.34 Flue dimension X



PN-0000463

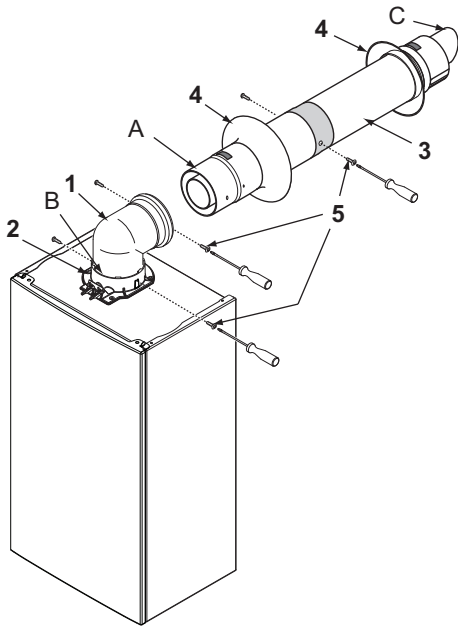
Fig.35 Flue dimension Y



PN-0000464

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

Fig.36 Attaching the flue



PN-0000465

8. 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.

- 1 Flue elbow
- 2 Boiler adaptor
- 3 Telescopic flue
- 4 Flue trim
- 5 Securing screw
- A Apply the lubricant supplied for ease of assembly (**do not use any other type**). Ensure flue is fully engaged into elbow.
- B Apply the lubricant supplied for ease of assembly (**do not use any other type**). Ensure elbow is fully engaged into boiler adaptor.
- C Peak to be uppermost

- 9. 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.
- 10. Ensure that the terminal is positioned with the slots to the bottom. Secure to the elbow with the screws supplied with the telescopic flue.



**Important**

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

- 11. Make good between the wall and air duct outside the building, appropriate to the wall construction and fire rating.
- 12. If necessary fit a terminal guard.



**Important**

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

## 6.4 Electrical connections



**See**

Electrical supply, page 24 for details of the electrical supply.



**Warning**

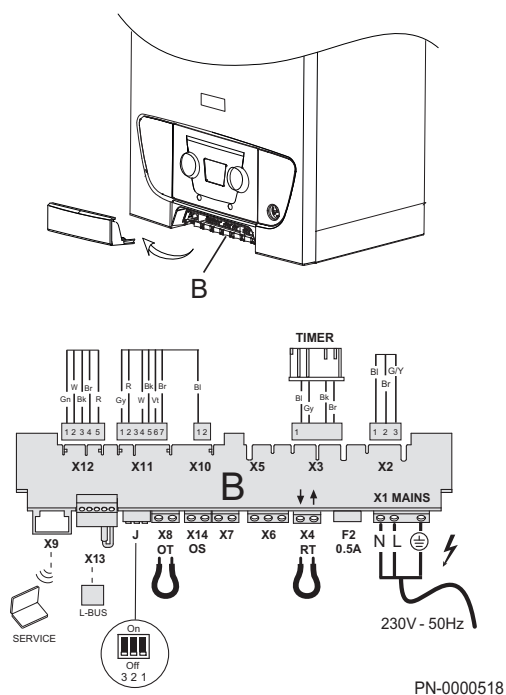
Check that the total nominal consumption of the accessories connected to the appliance is less than 1 amp. If it is higher, a relay must be installed between the accessories and the electronic board.

### 6.4.1 Panel removal to make electrical connection

Remove the plastic protective coating from the front of the boiler.

Unscrew the two screws retaining the electrical cover at the bottom of the front panel and then remove the cover.

Fig.37 Electrical connections



## 6.4.2 Electrical connections of the boiler

Access the connection board located below the control panel to make the electrical connections by:

1. Fully unscrewing the two screws retaining the electrical cover at the bottom of the front panel and then remove the cover.
2. Connect the electrical power supply to the X1 terminal on the connection board as shown on the label located on the inside of the electrical cover. Route the cables to the rear using the integral channel guides. Additional cable ties can be used if 5-core cable is used.



### Important

The blue X1 Mains terminal block can be removed to ease the access for wiring.

- |     |   |
|-----|---|
| X1  | Electrical power supply 230V~50Hz   |
| X4  | 230V Room thermostat (remove the link)                                      |
| X6  | Not used  |
| X7  | Not used  |
| X8  | On/Off — R-Bus — Low voltage/voltage free Room thermostat (remove the link) |
| X9  | Service connection (PC)   |
| X13 | L-Bus connection  |
| X14 | Outside sensor (OS) connection  |
|     | 1 X14 – 1. Outside sensor   |
|     | 2 X14 – 2. Common   |
| J   | Dip-switch  |
|     | 1 J1. Maximum heating temperature: OFF = 80°C = 45°C (floor system)         |
|     | 2 J2. OFF = Maximum output (heating) — ON = Boiler output 50% (heating)     |
|     | 3 J3. <b>DO NOT ADJUST!</b>   |



### See

Electrical diagram, page 19 for more information.

## 6.4.3 Connecting a room thermostat

The terminals can be accessed by removing the electrical cover as described in Electrical connections of the boiler, page 43.

### 230V Room Thermostat

When using a 230V Room Thermostat it must be connected to Terminal X4 on circuit board B. See diagram.

**The X4 link wire must be removed from the terminal.**



### Important

The X4 terminal block for the 230V Room Thermostat can be removed to ease the access for wiring.

### Low Voltage/Voltage Free Room Thermostat

These connections are not polarity sensitive.

When using a Low voltage/Voltage free Open Therm type room thermostat it must be connected to Terminal X8 on connection board B. See diagram.

**The X8 link wire must be removed from the terminal.**

Replace the electrical cover and secure with the 2 screws.

### 6.4.4 Connecting & setting outdoor weather sensor



**See**

Please read the instructions supplied with the sensor. They give information about positioning the sensor and routing the sensor cable.

1. Ensure the electrical supply to the boiler is isolated. Fully undo the two screws retaining the electrical cover at the bottom of the front panel and remove the cover.
2. Connect the sensor cable to the grey T-OUT connector (X14). There is no polarity.
3. Ensure that there is power to the boiler (though it is not necessary for there to be any heating demand).

Fig.38 Connect to X14

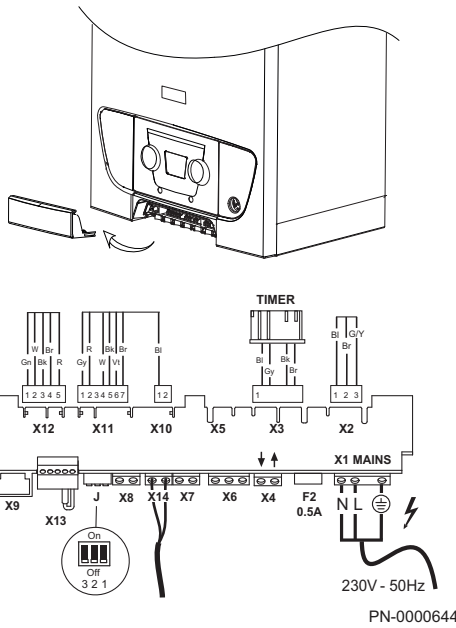
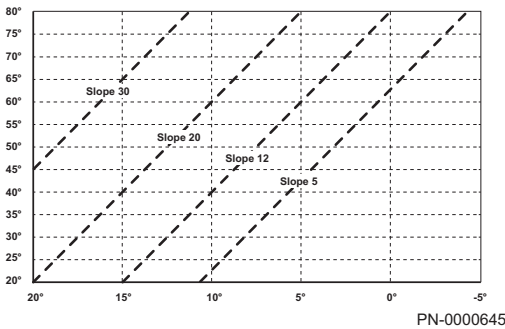


Fig.39 Graph of slopes



4. The central heating control knob should be turned clockwise until the value which corresponds with the desired slope (as shown on the graph) is displayed.

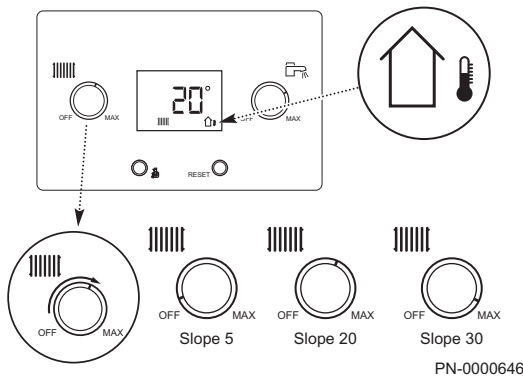


**Important**

If a Baxi uSense smart thermostat is connected to the boiler the slope must be set using the uSense App. The boiler display will not show the slope but will still be active.

5. Normally the display will show the current temperature of the water in the boiler. As the knob is turned the display will show the selected slope. For example if slope '12' is selected at an outside temperature of 0°C the boiler flow temperature will be 80°C. Consider the type of dwelling and discuss with the user their requirements to determine the most appropriate curve.
6. Explain to the user how to select a different temperature slope.

Fig.40 Display & control knobs



## 6.5 Filling the installation

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### 6.5.1 Flushing the system

---

Flush thoroughly and treat the system according to guidance given in BS 7593.

### 6.5.2 Fill the installation

---

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.

1. A filling loop is supplied with the 424/428 models. It can be fitted to the cold mains inlet and the CH return isolation taps.
2. Fill the installation using approved equipment and in accordance with all relevant water supply regulations.

**i** **Important**

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 IS 813 "Domestic Gas Installations".
3. 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.
  4. Fill or replenish the sealed primary circuits by means of a temporary connection between the circuit and a supply pipe:
    - Permanently connect a "Listed" double check valve or some other no less effective backflow prevention device at the inlet to the circuit.
    - Remove the temporary connection after use

## 7 Commissioning

### 7.1 General

---

Reference should be made to BS:EN 12828, 12831 & 14336 when commissioning the boiler. Ensure that the condensate drain trap has been primed.

At the time of commissioning, complete all relevant sections of the Benchmark Checklist at the rear of this publication.

Open the mains water supply to the boiler and all hot water taps to purge the DHW system.

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.

The system must be flushed in accordance with BS 7593 and the flushing agent manufacturer's instructions.

Pressurise the system to 1.5 bar then close and disconnect the temporary filling loop except where a permanent loop is fitted.

Test for gas tightness, turn the gas supply on and purge according to GB BS 6891 and in IE I.S. 813 "Domestic Gas Installations" .

### 7.2 Checklist before commissioning

---

#### 7.2.1 Preliminary electrical checks

---



##### **Important**

Consideration must be given to Health & Safety Document 635 (The Electricity at Work Regulations, 1989).

- Prior to commissioning the boiler preliminary electrical system checks should be carried out.
- 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

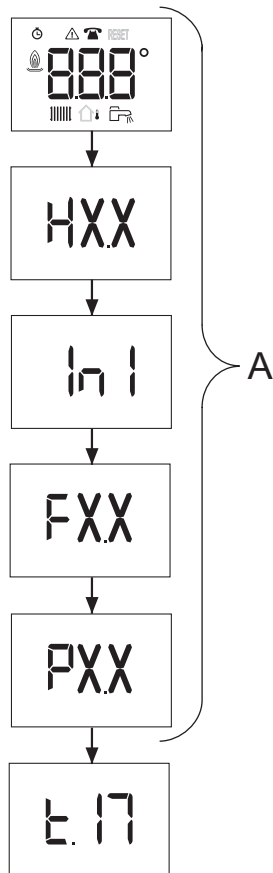
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Check:

- 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.
- That the condensate trap has been primed.
- That the electrical cover has been refitted.

## 7.3 Commissioning procedure

Fig.41 Initialisation process



PN-0000519

### 7.3.1 De-Aeration function

Before turning on the power to the boiler, rotate the Central Heating control knob fully clockwise.

The purpose of the function is to remove as much air as possible from the heating system. It operates automatically on the boiler's first power up and lasts approximately 5 minutes.

Turn on the power to the boiler. The display shows an initialisation sequence briefly before displaying t.17 to indicate the sequence has started. At the end of the de-aeration process the flame symbol is seen in the display whilst the boiler does a flame ionisation check.

**A** Initialisation sequence before de-aeration starts



#### Important

If during this first commissioning process the power to the boiler is interrupted the de-aeration function will restart automatically.



#### Caution

Only the initial de-aeration process during commissioning is performed automatically. Any subsequent de-aeration carried out, for example after a system drain down, must be done manually.

To start the process manually, press the RESET button for approximately 5 seconds and release. The display will show dAf briefly and then t.17 to indicate that the process has started.

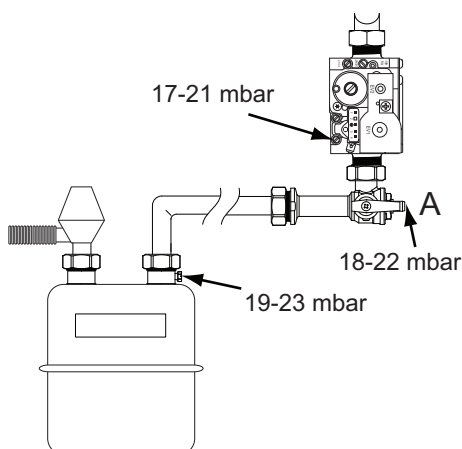


#### Caution

If the power is lost to the boiler during a manual de-aeration the process does NOT restart automatically! Re-establish the power and manually restart the de-aeration.

## 7.4 Gas settings

Fig.42 Gas meter to valve



PN-0000361

### 7.4.1 Check the operational (working gas inlet pressure and gas rate)

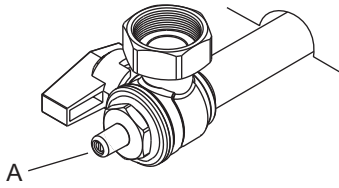
**A** If the pressure drops are greater than shown in the diagram opposite, a problem with the pipework or connections is indicated. Permissible pressure drop across system pipework  $\leq 1$  mbar.



#### Important

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 in order to maintain the boiler output.

Fig.43 Gas inlet test point



PN-0000362

**A Gas inlet test point**

1. 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 BS 6798 & BS 6891. This must be AT LEAST 17mb !
2. 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.
3. **Measure the gas rate** — With any other appliances & pilot lights turned OFF the gas rate can be measured. It should be:-

Tab.26 Natural gas

224 model	2.61 m <sup>3</sup> /h
228 model	3.06 m <sup>3</sup> /h
424 model	2.61 m <sup>3</sup> /h
428 model	3.06 m <sup>3</sup> /h



**See**

Technical information - LPG, page 75 for LPG values

**7.4.2 Checking combustion - chimney sweep mode**

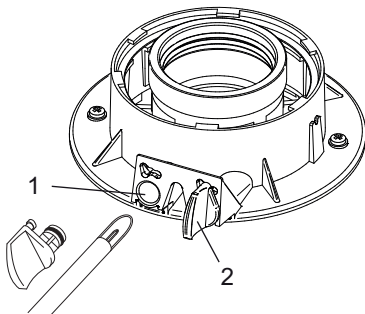


**See**

If the appliance cannot be operated on central heating for more than 10 minutes without reaching maximum temperature refer to Combustion check on small heating systems, page 74.

- The case front panel must be fitted when checking combustion.
- Ensure the system is cold and the gas and electric supplies are turned on.

Fig.44 Flue adaptor test points



PN-0000363



**Important**

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.

- 1 Combustion test point
- 2 Incoming air for combustion test point



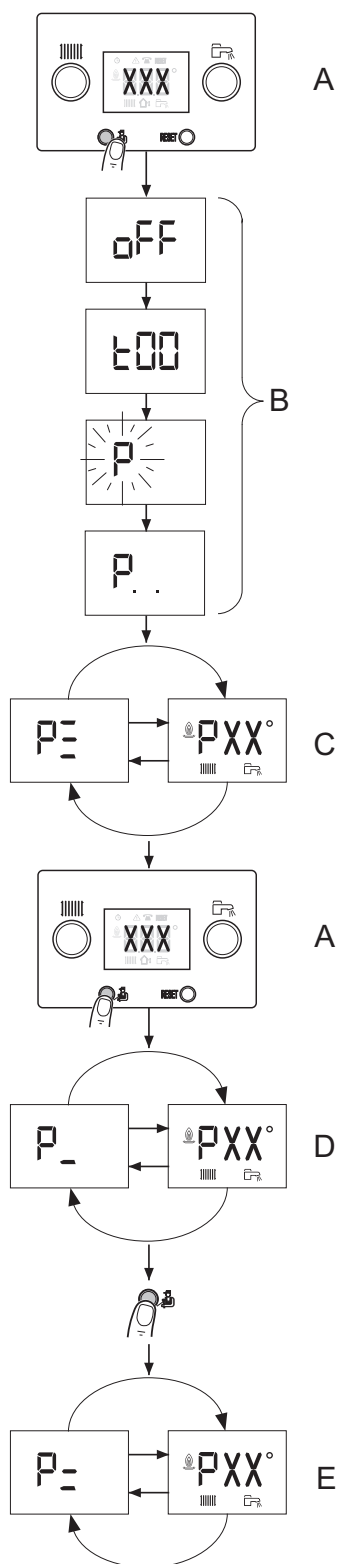
**Important**

Allow the combustion to stabilise before inserting the Combustion Analyser Probe into the Test Point (1). This will prevent saturation of the analyser.

The combustion must be measured and recorded at the Maximum and Minimum heat inputs.



Fig.45 Chimney sweep procedure



PN-0000516

### Measuring the combustion



#### Important

The system MUST be cold to ensure the boiler is operating under full demand.

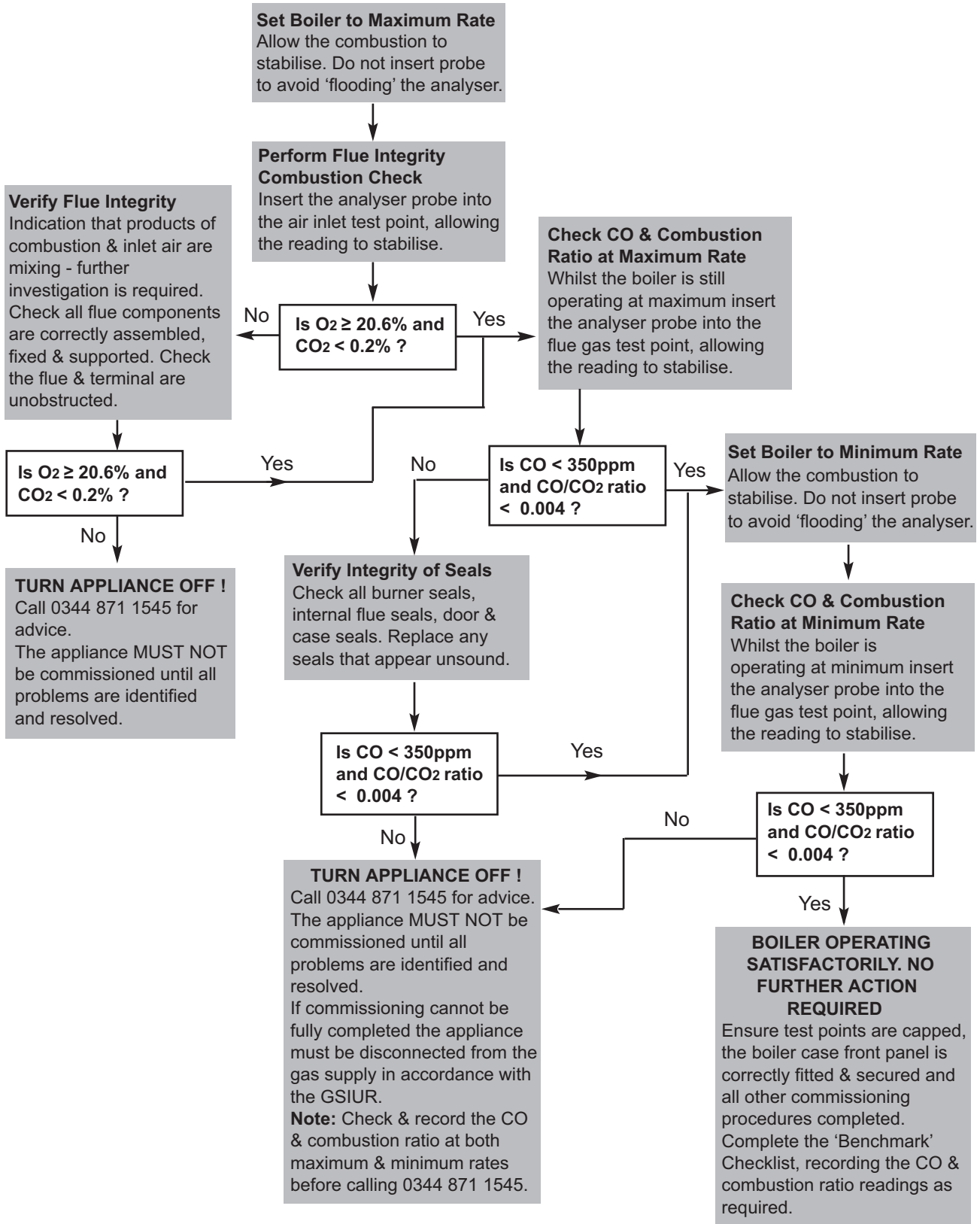
1. Turn the Central Heating and Domestic Hot Water control knobs fully clockwise.
2. Activate the Chimney Sweep mode by pressing the Chimney Sweep button for 3 seconds (A). The display will show the activation sequence (B) then a "P" with 3 bars alongside it alternating with the current water temperature (C). This indicates the Maximum Domestic Hot Water rate.
3. Check the CO and CO<sub>2</sub> levels at the Maximum rate and record the result in the Benchmark log at the back of this manual.
4. Press the Chimney Sweep button (A) again to set the boiler to its minimum rate. The display shows a "P" with 1 bar alongside it alternating with the current water temperature (D).
5. Check the CO and CO<sub>2</sub> levels at the Minimum rate and record the result in the Benchmark log at the back of this manual.
6. A further press of the Chimney Sweep button (A) will set the boiler to its Maximum Central Heating Rate. The display shows a "P" with 2 bars alongside it alternating with the current water temperature (E).
7. To exit the Chimney sweep function press and hold the Chimney sweep button for approximately 3 seconds and release.
8. Replace the plug in the flue adaptor test point. Fig. 42.



#### See

If the appliance cannot be operated on central heating for more than 10 minutes without reaching maximum temperature refer to Combustion check on small heating systems, page 74.

Fig.46 Combustion procedure



PN-000466

## 7.5 Configuring the system

### 7.5.1 System draining

If at any time after installation it is necessary to drain and refill the central heating system (e.g. when replacing a radiator) the De-Aeration function must be activated to avoid air being trapped in the system.



#### See

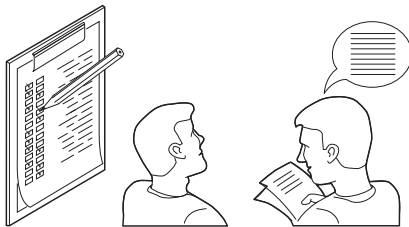
De-Aeration function, page 47.

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

## 7.6 Final instructions

### 7.6.1 Handover

Fig.47 People



PN-0000333

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.



#### Important

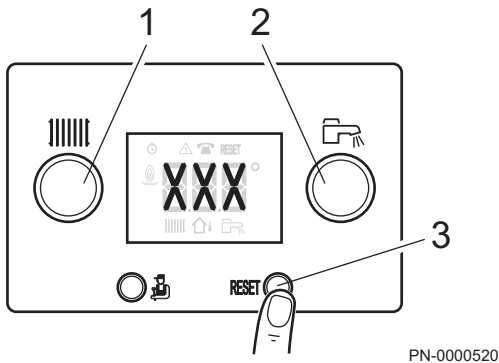
**The warranty will be invalidated if the Benchmark section is incomplete.**

2. The publication must be handed to the user for safe keeping and each subsequent regular service visit recorded.
3. Complete the Package Fiche in the User Guide.
4. Hand over the User Guide and Installation and Servicing Instructions, giving advice on the necessity of regular servicing.
5. **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.
6. 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.
7. Instruct the user in the operation of the boiler controls.
8. 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.
9. Show the user the location of the system control isolation switch, and demonstrate its operation.
10. 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 Operation

### 8.1 Use of the control panel

Fig.48 Operating the controls



#### 8.1.1 Control

The controls are operated by the buttons and knobs shown.

- 1 Central heating water temperature control
- 2 Domestic Hot Water temperature control
- 3 Reset button

Where an outdoor sensor (weather compensation) device is connected to the boiler the central heating control (item 1) adjusts the setting of the curve, not the boiler flow temperature. It will have been set by the installer who should be consulted for advice if you require other settings.

### 8.2 Start up

If there is no power to the boiler, switch on 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 **RESET** button once to bring the boiler out of Standby mode. The boiler will begin its start sequence. This procedure performs a series of tests, after which the installation is purged (this takes approximately five minutes).

### 8.3 Shutdown

- Isolate the mains power supply at the fused spur unit.
- Isolate the gas supply at the boiler valve.
- Protect the boiler from frost.



#### Important

The boiler is not protected against frost once it has been shut down.

### 8.4 Frost protection

Where possible, draining the system should be avoided. If the system is to be unused during winter months several precautions must be taken:

- A suitable antifreeze solution added to the system.
- Any parts of the system that are in unheated areas of the dwelling fitted with a device such as a pipe thermostat or frost thermostat.
- Power must remain supplied to the boiler and controls.
- Gas must remain supplied to the boiler.

The boiler pump will operate if the system temperature drops below 7°C. If the temperature falls to 4°C the burner will ignite and remain lit until the temperature reaches 10°C. At this temperature the burner will extinguish but the pump will continue to operate for 15 minutes. This feature will protect the boiler and to some extent adjacent parts of the system but additional devices must be incorporated to guarantee frost protection.

## 9 Settings

### 9.1 Functions

The operating functions of the boiler have been factory set to suit most systems. See table below for a list of display functions.



**See**

Accessing the information menu, page 69 for further information.

### 9.2 Information menu

Tab.27 Information list

Information	Description
	Status
	Sub-status
	Heating water temperature (°C) <ul style="list-style-type: none"> <li>The  symbol flashes</li> </ul>
	Domestic hot water temperature (°C) <ul style="list-style-type: none"> <li>The  symbol flashes</li> <li>If no domestic hot water sensor connected: display — — —</li> </ul>
	Outside temperature (°C) <ul style="list-style-type: none"> <li>The  symbol flashes.</li> </ul>
	Burner status
	Energy meter on the heating water circuit <ul style="list-style-type: none"> <li>The  symbol flashes.</li> <li>The displayed value flashes.</li> </ul>
	Energy meter on the domestic hot water circuit <ul style="list-style-type: none"> <li>The  symbol flashes.</li> <li>The displayed value flashes.</li> </ul>
	Information on the boiler not available

## 10 Maintenance

### 10.1 General



#### 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.

Always examine any seals or gaskets, replacing where necessary. The case front panel **MUST** seal effectively against the boiler side panels.

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 BS 7967-4.

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



#### Important

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<sub>2</sub> ≥ 20.6% & CO<sub>2</sub> < 0.2%**
- The integrity of the boiler combustion circuit and relevant seals.
- The operational gas inlet pressure and the gas rate.
- The combustion performance as described in "Check the Combustion Performance" below.

**Competence to carry out checking combustion performance** BS 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 BS 7927 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.

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

**Set the boiler to operate at maximum rate.**



#### See

Checking combustion - chimney sweep mode, page 48 for details.

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" .
- Perform "Setting the Gas Valve" .
- Replace and set the gas valve.

## 10.2 Standard inspection and maintenance operations

### 10.2.1 Periodic check and maintenance procedure



#### Warning

Before performing any operation, make sure the boiler is not powered on. Once the maintenance operations are complete, reset the original boiler operating parameters if they were changed.



#### Warning

Wait for the combustion chamber and pipes to cool down.



#### Important

The appliance must not be cleaned using abrasive, aggressive and/or easily flammable substances (e.g. petrol or acetone).

The following checks must be performed every year in order to ensure efficient boiler operation:

1. Check the appearance and seal of the gaskets in the gas circuit and the combustion circuit;
2. Check the condition and correct position of the flame detection and ignition electrode;
3. Check the condition of the burner and that it is correctly fastened;
4. Check for any impurities located inside the combustion chamber. To do so, use a vacuum cleaner or the cleaning kit available as an accessory;
5. Check the pressure of the heating system;
6. Check the pressure of the expansion vessel;
7. Check that the fan is working correctly;
8. Check that the intake and exhaust pipes are not obstructed;
9. Check for any impurities inside the siphon;

### 10.2.2 Checking the water pressure

In order for the boiler to operate correctly, the pressure of the water in the heating circuit must be between 1.0 and 1.5 bar. Restore the water pressure if necessary.

Fig.49



PN-0000382

### 10.2.3 Checking the expansion vessel

Check the expansion vessel and replace it if necessary. Check its pre-charge every year and restore the pressure to 1 bar if necessary.

### 10.2.4 Checking the automatic air vent

Check that the pump venting valve is working. In the event of a leak, replace the valve.

### 10.2.5 Checking the burner and cleaning the heat exchanger

1. Isolate the unit from the gas & electrical supplies.
2. Remove the front panel.
3. Remove the silencer.



#### Important

Reposition the silencer inside the boiler before refitting the air-gas unit.

4. Open the air/gas cover and remove all the connectors from the PCB.

5. Close the air/gas cover.
6. Completely remove the air/gas and burner/unit by unscrewing the four M6 nuts and undoing the  $\frac{3}{4}$ " nut below the gas valve.
7. Check that the detection/spark electrode is not worn. Replace the electrode if necessary.
8. Check the condition of the burner, the gasket and the insulation board.
9. Any loose deposits in the heat exchanger should be removed using a vacuum cleaner.
10. A brush with plastic bristles can be used to dislodge any stubborn deposits, which should then also be removed by vacuum.
11. Do not use any chemicals to clean the heat exchanger.
12. The burner does not require any maintenance as it is self-cleaning. Check that there are no cracks and/or other damage on the surface of the burner. If the burner is damaged, replace it.
13. Reassemble in reverse order.

### 10.3 Specific maintenance instructions

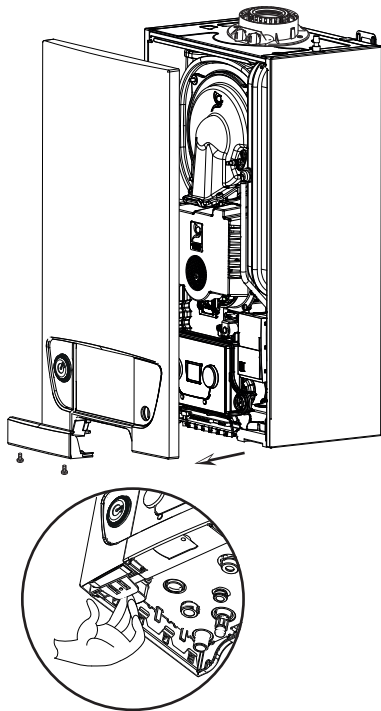


#### Warning

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.

Always examine any seals or gaskets, replacing where necessary. The case front panel **MUST** seal effectively against the boiler side panels.

Fig.50 Remove front panel



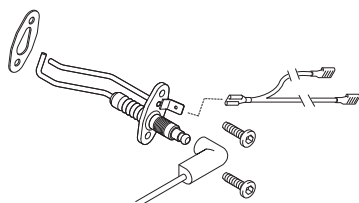
To remove the case front panel proceed as follows:

- Remove the two screws retaining the electrical cover.
- Remove the electrical cover.
- Disengage the two clips on the case front panel and lift the panel slightly to remove it from the lip on top of the case.

PN-0000521



Fig.51 Remove detection/spark ignition electrode

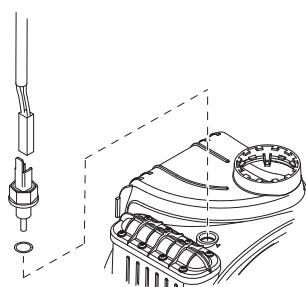


PN-0000331

### 10.3.1 Detection/spark ignition electrode

1. Disconnect the electrode lead and earthing cable.
2. Using a T15 Torx key, remove the retaining screws securing the electrode to the combustion chamber door and remove the electrode, noting its orientation.
3. Fit the new electrode with the sealing gasket.
4. Reassemble in reverse order.

Fig.52 Remove NTC flue sensor

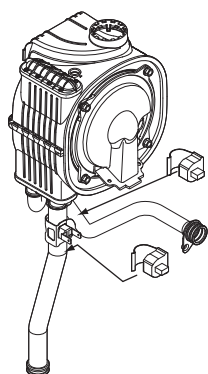


PN-0000332

### 10.3.2 NTC flue sensor

1. Turn the sensor 90° anticlockwise to remove — it is a bayonet connection.
2. Ease the retaining tab on the sensor away and disconnect the electrical plug.
3. Fit new sensor and reassemble in reverse order.

Fig.53 Removing the flow and return sensors



PN-0000522

### 10.3.3 Flow and return sensors

There is one sensor on the flow (red wires) and one sensor on the return (black wires).

1. Remove the air/gas unit.

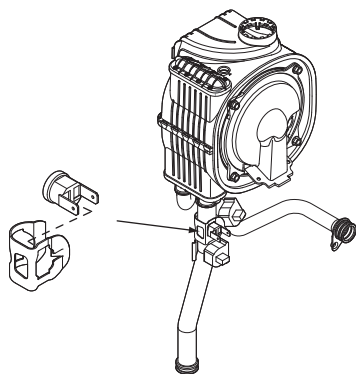


**See**

Air/gas unit, page 58 to remove.

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 in its original position.

Fig.54 Removing the safety overhear thermostat

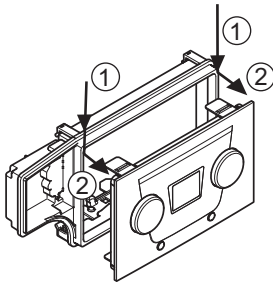


PN-0000523

### 10.3.4 Safety overhear thermostat

1. Pull the two spade connections off the safety overhear thermostat.
2. Prise the thermostat clip with the safety overhear thermostat off the pipe
3. Fit new safety thermostat on the pipe using heat-sink paste.
4. Connect the two spade connections to the safety overhear thermostat ensuring that they are pushed fully on.

Fig.55 HMI removal



PN-0000524

### 10.3.5 HMI control

1. Remove the screws from the link/timer
2. Hinge the control box downwards.
3. Disengage the optional timer plug and ease the cable out of its housing.
4. Unclip the back cover of the control box and remove it.
5. Unplug the wire harness on the HMI control.
6. Release the clips securing the HMI control and remove it.
7. Fit the new HMI control and reassemble in reverse order ensuring all plugs and cables are seated correctly.

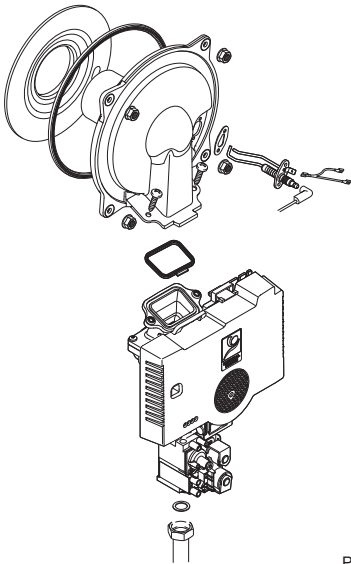


#### Important

Ensure that wiring is correctly routed with no wires trapped during reassembly.

### 10.3.6 Burner/combustion chamber door assembly

Fig.56 Removing the burner



PN-0000525

1. Remove the detection/spark electrode.

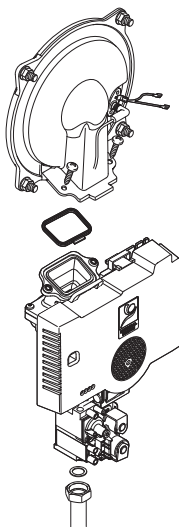


#### See

Detection/spark ignition electrode, page 57

2. Hinge the control box down.
3. Hinge down the air/gas cover and disconnect all wiring plugs from the PCB, noting their positions. Close the air/gas cover.
4. Using a 10mm spanner/socket, undo the 4 nuts holding the combustion chamber door cover to the heat exchanger.
5. Undo the gas valve nut (30mm A/F).
6. Draw the combustion chamber/burner door assembly with the air/gas unit away.
7. Remove the two Torx T30 screws holding the combustion chamber/burner door assembly to the air/gas unit and disengage the tab on the cover from the air/gas unit.
8. Fit new combustion chamber/burner door assembly to the air/gas unit and reassemble in reverse order.

Fig.57 Removing the air gas unit



PN-0000526

### 10.3.7 Air/gas unit

1. Disconnect the electrode lead and earthing cable.
2. Hinge the control box down.
3. Hinge down the air/gas cover and disconnect all wiring plugs from the PCB, noting their positions. Close the air/gas cover.
4. Disconnect the silencer from behind the air/gas unit.
5. Undo the gas valve nut.
6. Remove the two Torx T30 screws securing the air/gas unit to the burner combustion chamber door assembly.
7. Push the flexible gas pipe downwards and ease the air/gas unit away from the burner combustion chamber door assembly.
8. Fit the new air/gas unit to the burner combustion chamber door assembly and reassemble in reverse order.



#### Important

Ensure the silencer is correctly positioned.

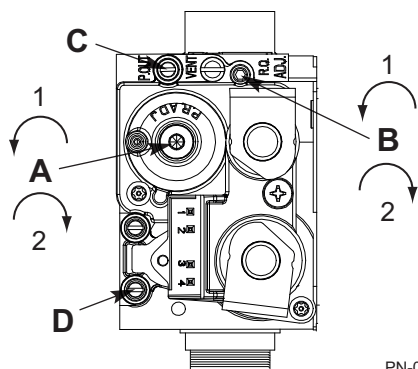
#### Setting the gas valve



#### Important

The CO<sub>2</sub> must only be checked and adjusted to set the valve if a suitable calibrated combustion analyser is available, operated by a responsible person.

Fig.58 Adjusting the gas valve



PN-0000527

- A Minimum rate (offset) adjustment screw.
- B Maximum rate adjustment screw.
- C Burner gas pressure outlet.
- D Gas supply pressure outlet.

**Important**

The case front panel must be fitted when checking combustion.

- Run the boiler for several minutes before checking the CO and CO<sub>2</sub>. To do this it is necessary to operate the boiler in Chimney sweep mode. Ensure the boiler is at Maximum rate.
- Insert the test probe in the flue sample point and allow the reading to stabilise.

**See**

Checking combustion - chimney sweep mode, page 48. If the appliance cannot be operated on central heating for more than 10 minutes without reaching maximum temperature refer to Combustion check on small heating systems, page 74.

**See**

Technical information - LPG, page 75 for details of LPG CO and CO<sub>2</sub> values

The CO<sub>2</sub> at MAXIMUM rate should be 9% +0.4, -0.2. Alter the CO<sub>2</sub> if necessary by adjusting the gas valve.

- Use the Maximum rate adjustment screw (B) to alter the CO<sub>2</sub>. Turn anti-clockwise (B1) to increase the CO<sub>2</sub> or clockwise (B2) to reduce the CO<sub>2</sub>.

**Important**

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

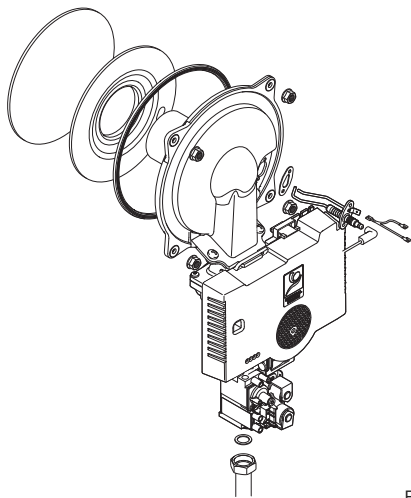
- Set the boiler to Minimum rate and check the CO<sub>2</sub>. The CO<sub>2</sub> at MINIMUM rate should be 8.5% +0.1, -0.4. Alter the CO<sub>2</sub> if necessary by adjusting the gas valve.
- Use the Minimum rate adjustment screw (A) to alter the CO<sub>2</sub>. Turn clockwise (A2) to increase the CO<sub>2</sub> or anti-clockwise (A1) to decrease the CO<sub>2</sub>.
- Check the combustion performance (CO/CO<sub>2</sub> ratio). This must be less than 0.004.

**Important**

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.

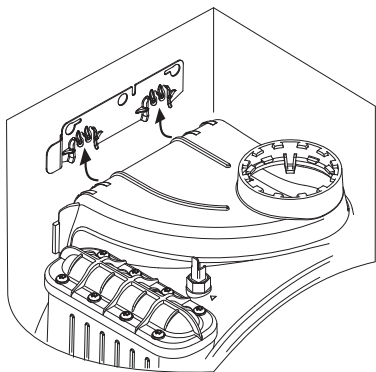
- Press the Chimney sweep button for 3 seconds to exit the function.
- Refit the sampling point plug and ensure there is no leakage of products.

Fig.59 Removing the insulation



PN-0000528

Fig.60 Heat exchanger location bracket



PN-0000529

### 10.3.8 Insulation

1. Remove the Detection/spark ignition electrode.



**See**

Detection/spark ignition electrode, page 57.

2. Hinge the control box down.
3. Hinge down the air/gas cover and disconnect all wiring plugs from the PCB, noting their positions. Close the air/gas cover.
4. Undo the nuts holding the combustion chamber/burner door cover to the heat exchanger.
5. Undo the gas valve nut.
6. Draw the combustion chamber/burner door with the air/gas unit away.
7. Remove the cover insulation piece.
8. Fit the new insulation piece carefully over the burner and align it with the slot for the electrode.
9. If the rear insulation requires replacement, remove it and all debris from the heat exchanger.
10. Examine the cover seal and replace if necessary. Reassemble in reverse order.

### 10.3.9 Heat exchanger

1. Remove the boiler front panel.
2. Hinge down the controls door.



**Warning**

Ensure all wiring and electronics are protected before draining down.

3. Close the flow and return isolation taps.
4. Drain the primary circuit using the drain point provided.
5. Remove the flue thermistor.
6. Remove the condensate trap by lifting clear and pulling forward.
7. Disconnect the flow and return overhear thermistor.
8. Disengage the wires from the securing clip and move to one side.
9. Hinge down the air/gas cover and disconnect the wiring from the PCB. Remove the air gas unit.
10. Remove the flow pipe by disengaging the clips and easing the pipe down.



**Warning**

Care must be taken to avoid damage due to residual water in the heat exchanger.

11. Remove the return pipe by disengaging the clip to the heat exchanger and the screw at the rear of the pump. Rotate the pipe to allow removal of heat exchanger.
12. Disconnect the condensate pipe from the condensate trap spigot.



**Important**

Disconnecting the condensate system may ease trap removal.

13. Ease the rear condensate trap from the heat exchanger and remove.
14. Whilst supporting the heat exchanger, disengage the clip from the front. Ease the heat exchanger down and away from the boiler.
15. Reassemble in reverse order.



**Warning**

Care must be taken with the heat exchanger support/spring clip when reassembling. Ensure the guides on the rear of the heat exchanger engage fully with the 2 retaining tags on the boiler chassis.

## 10.4 Hydraulics maintenance

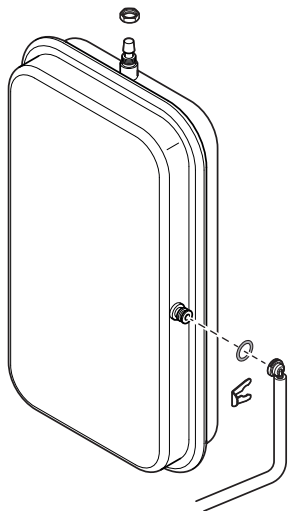
### 10.4.1 Expansion vessel



#### Warning

Take precautions to protect other components from water damage when removing the expansion vessel.

Fig.61 Removing the expansion vessel



PN-0000530

1. Close the flow and return isolation taps and drain the primary circuit.
2. Relieve the pressure from the expansion vessel.
3. Prise off the securing clips and disconnect the braided hose from the vessel and hydraulic inlet assembly, taking care as water may still be in the vessel.
4. Ensure that the braided hose is free of restriction, as a boiler with a blocked hose will exhibit symptoms similar to one with a failed vessel.



#### Important

Where the hose is found to be blocked it must be cleared or replaced and the vessel re-charged to 1 bar.

5. If the hose is clear support the vessel, undo the locknut and manoeuvre the vessel out of the boiler.
6. Reassemble in reverse order and recharge to 1 bar.

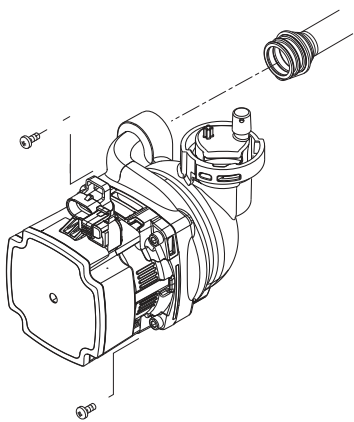
### 10.4.2 Pump - complete



#### Warning

Take precautions to protect other components from water damage when removing the pump and auto air vent.

Fig.62 Removing the pump



PN-0000531

1. Hinge the control box down.
2. Close the flow and return isolation taps and drain the boiler primary circuit. Disconnect the electrical plugs from the pump motor.
3. Undo the screws securing the body to the pipe and manifold and draw the pump forward to remove.
4. Examine the "O" ring seals on the return pipe and manifold, replacing if necessary.
5. Reassemble in reverse order.

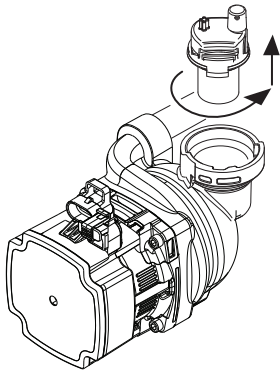
### 10.4.3 Auto air vent



#### Warning

Take precautions to protect other components from water damage when removing the air vent.

Fig.63 Removing the auto air vent

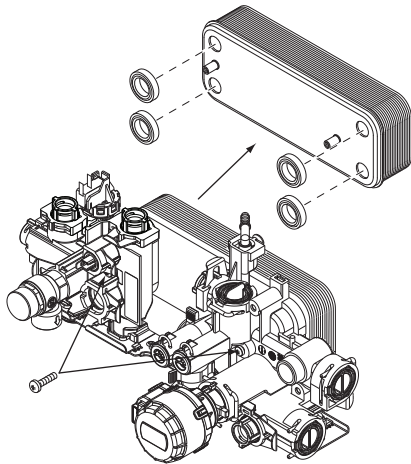


PN-0000532

1. Close the flow and return isolation taps and drain the boiler primary circuit.
2. Unscrew the automatic air vent anti-clockwise and lift away from the pump body.
3. Fit the new air vent and O-ring seal.
4. Reassemble in reverse order.

### 10.4.4 Plate heat exchanger

Fig.64 Removing the plate heat exchanger



PN-0000533

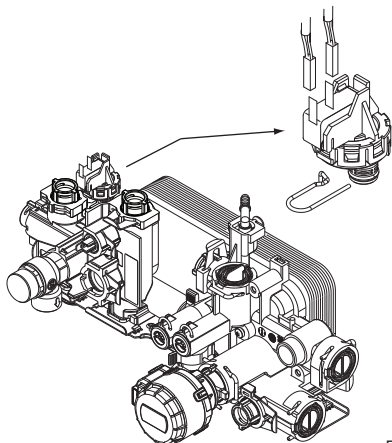


#### Important

It is recommended to isolate the cold water mains stop cock to the dwelling.

1. Close the flow and return isolation taps and the cold mains inlet.
  2. Drain the primary circuit and draw off any residual DHW.
  3. Hinge the control box downwards.
  4. Remove the air/gas unit.
- See**
- Air/gas unit, page 58, paragraph 1 to 6 to remove.
5. Undo the screws securing the plate heat exchanger to the hydraulic assembly.
  6. Withdraw the plate heat exchanger by manoeuvring it to the rear of the boiler, then upwards and to the left to remove.
- Seals**
7. There are four rubber seals between the hydraulic assembly and heat exchanger which may need replacement.
  8. Ease the seals out of the hydraulic assembly. Replace carefully, ensuring that the each seal is inserted parallel and pushed fully in.
  9. Reassemble in reverse order.

Fig.65 Removing the hydraulic pressure sensor



PN-0000534

#### 10.4.5 Hydraulic pressure sensor

1. Close the flow and return isolation taps.
2. Drain the primary circuit.
3. Hinge the control box down.
4. Remove the air/gas unit.

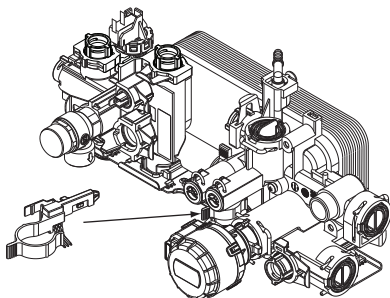


**See**

Air/gas unit, page 58, paragraph 1 to 6 to remove.

5. Pull the two spade connections off the hydraulic pressure sensor.
6. Draw the securing clip forwards to release the sensor and remove.
7. Fit new sensor and reassemble in reverse order.

Fig.66 Removing the DHW flow sensor (Hall effect sensor)



PN-0000535

#### 10.4.6 DHW flow sensor (hall effect sensor)

1. Hinge the control box down.
2. Remove the air/gas unit.

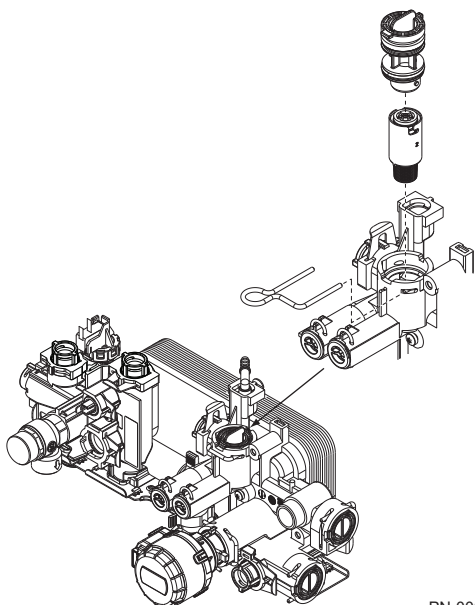


**See**

Air/gas unit, page 58, paragraph 1 to 6 to remove.

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

Fig.67 Removing the DHW flow regulator and filter



PN-0000536

#### 10.4.7 DHW flow regulator and filter



**Important**

It is recommended to isolate the cold water mains stop cock to the dwelling.

1. Close the cold mains inlet.
2. Drain off any residual DHW.
3. Hinge the control box down.
4. Remove the air/gas unit.

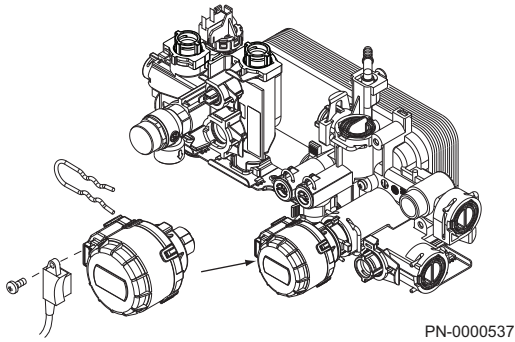


**See**

Air/gas unit, page 58, paragraph 1 to 6 to remove.

5. Pull out the securing clip and prise the regulator and filter assembly out of the hydraulic inlet assembly.
6. Twist the body to unlock the bayonet connection on the filter and remove the regulator.
7. Examine and clean the filter or replace.
8. Fit the new regulator and reassemble in reverse order.

Fig.68 Removing the diverter valve motor



#### 10.4.8 Diverter valve motor

1. Hinge the control box down.
2. Remove the air/gas unit.



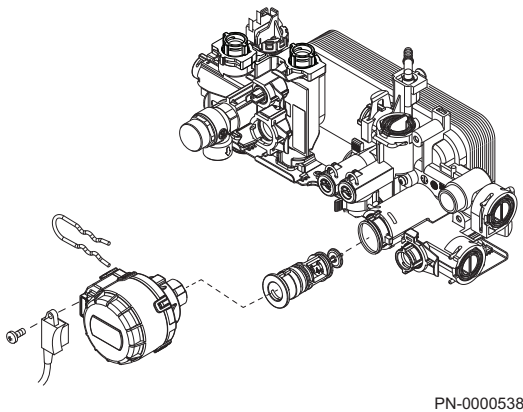
**See**

Air/gas unit, page 58, paragraph 1 to 6 to remove.

3. Undo the screw securing the electrical plug to the motor unit. Disconnect the plug.
4. Hold the motor in place against the spring pressure of the valve and removing the securing clip.
5. Remove the motor.
6. When fitting the new motor it will be necessary to hold the unit firmly while depressing the valve return spring.
7. Reassemble in reverse order.

#### 10.4.9 Diverter valve cartridge

Fig.69 Removing the diverter cartridge



1. Close the flow and return isolation taps.
2. Drain the primary circuit.
3. Hinge the HMI control box down.
4. Remove the air/gas unit.
5. Remove the diverter valve motor.



**See**

Diverter valve motor, page 64

6. Remove the pressure gauge clip and ease the pressure gauge away from its housing.



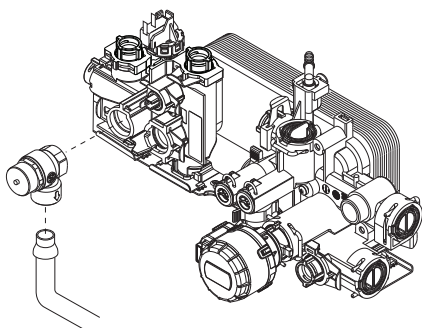
**Important**

It is recommended to completely remove the pressure gauge to ease the access to the diverter cartridge. Push the plastic retaining spring clips away and press the gauge out.

7. Remove the clip securing the central heating filter.
8. Grip the central heating filter firmly and pull away. Note the orientation of the o-ring seal.
9. Remove the diverter valve cartridge clip.
10. Grip the cartridge firmly and pull away from the o-ring seal.
11. Reassemble in reverse order.

#### 10.4.10 Pressure relief valve

Fig.70 Removing the pressure relief valve



**Important**

It may be necessary to dismantle the PRV pipework.

1. Remove the pipe from the pressure relief valve outlet by gripping firmly and pulling down.
2. Reassemble in reverse order.



## 11 Troubleshooting

### 11.1 Error codes

Error messages are displayed according to the type of fault.

#### Temporary fault

A temporary fault is indicated by an 'H' followed by a two-digit code number (e.g. .02). This code flashes and alternates with a second two-digit code (e.g. .06) that indicates the specific fault.

A temporary fault prevents the boiler operating but will automatically reset once the cause of the fault has been resolved.



#### See

Fault finding — temporary faults, page 65 for a list of temporary faults and their possible solutions.

#### Permanent fault

A permanent fault 'Lock out' is indicated by an 'E' followed by a two-digit code number (e.g. .02). This code flashes and alternates with a second two-digit code (e.g. .07) which indicates the specific fault.

A permanent fault prevents the boiler operating and will not automatically reset. Once the fault condition has been rectified the RESET button must be pressed for 3 seconds to restart the boiler.



#### Warning

Pressing the RESET button for 5 seconds will start the de-aeration process! The boiler will run in de-aeration for approximately 5 minutes before restarting.



#### See

Fault finding - permanent faults, page 66 for a list of permanent faults and their possible solutions.

### 11.2 Fault finding — temporary faults

Tab.28 Temporary fault finding guide

Group code	Specific code	Description	Probable cause	Check/Reason
H:01	.00	Communication error between gas valve and PCB	Fault in air/gas unit Loose connection to gas valve	Replace air gas unit Check gas valve connection from PCB
H:01	.05	Maximum difference between the flow and return temperature exceeded	Non-existent or insufficient circulation Sensor error	Check circulation/pump Check water pressure Check sensors are operating correctly Check that the sensor has been correctly fitted Check the cleanliness of the heat exchanger
H:01	.08	CH Flow temperature increasing too fast	Non-existent or insufficient circulation Sensor error	Check circulation Check water pressure Check sensors are operating correctly Check that the sensor has been correctly fitted Check the cleanliness of the heat exchanger
H:01	.14	Maximum flow temperature exceeded	Non-existent or insufficient circulation	Check circulation.

Group code	Specific code	Description	Probable cause	Check/Reason
H:01	.18	No circulation of water	Non-existent or insufficient circulation Sensor error	Check circulation Check water pressure Check sensors are operating correctly Check that the sensor has been correctly fitted Check the cleanliness of the heat exchanger Check pump
H:01	.21	DHW flow temperature increasing too fast	Non-existent or insufficient circulation Sensor error	Check circulation Check water pressure Check sensors are operating correctly Check that the sensor has been correctly fitted Check the cleanliness of the heat exchanger
H:02	.02	No input of parameters C1/C2	PCB not configured	Input C1/C2
H:02	.03	Incorrect configuration settings C1/C2	Incorrect C1/C2	Reset C1/C2
H:02	.04	Parameter error	Incorrect parameters	Reset C1/C2
H:02	.06	Low system water pressure	Water leak on boiler Water leak on system	Check boiler Check system Repressurise system
H:03	.00	Communication error with NTC flue sensor	Sensor not, or badly connected Bad connection Sensor fault	Check wiring Check sensors are operating correctly Check that the sensor has been correctly fitted Replace the sensor if necessary
H:03	.01	Communication error with the HMI PCB	HMI not connected	Check wiring
H:03	.02	No flame during operation	No ionization current	Purge gas supply to remove air Check gas valve is fully opened Check supply pressure Check operation and setting of the gas valve unit Check air inlet and flue gas discharge flues are not blocked Check that there is no recirculation of flue gases

### 11.3 Fault finding - permanent faults

Tab.29 Permanent fault finding guide

Group code	Specific code	Description	Probable cause	Check/Reason
E:00	.04	Return temperature sensor open-circuit	Sensor not or badly connected Bad connection Sensor fault	Check the wiring Check that the sensors are operating correctly Check that the sensor has been correctly fitted Replace the sensor if necessary
E:00	.05	Return temperature sensor short-circuit	Sensor not or badly connected Bad connection Sensor fault	Check the wiring Check that the sensors are operating correctly Check that the sensor has been correctly fitted Replace the sensor if necessary

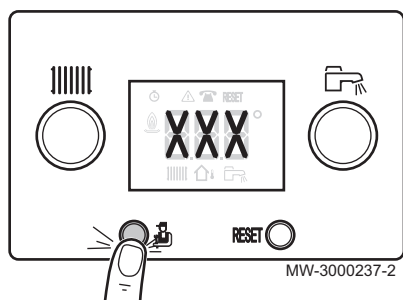
Group code	Specific code	Description	Probable cause	Check/Reason
E:01	.04	5 x flame loss in 24 hours with burner on	No ionization current	Purge the gas supply to remove air Check that the gas valve is fully opened Check the supply pressure Check the operation and setting of the gas valve unit Check that the air inlet and flue gas discharge flues are not blocked Check that there is no recirculation of flue gases
E:01	.11	Incorrect fan speed	External draught over the boiler Defective gas/air unit	Check for adequate draw on the chimney connection Check the gas/air unit and replace if necessary
E:01	.12	Temperature measured by return sensor greater than flow sensor	Bad connection Sensor fault Sensor not or badly connected Water circulation direction reversed Flow and return pipes reversed	Replace the sensor if necessary Check the circulation (direction, pump, valves) Check that the sensors are operating correctly Check that the sensor has been correctly fitted Check pipework configuration
E:01	.17	No circulation	No circulation Sensor not or badly connected Sensor fault	Vent the air in the heating system Check the water pressure Check the wiring Check the circulation (direction, pump, valves) Check the cleanliness of the heat exchanger Check that the sensors are operating correctly Check that the sensor has been correctly fitted Replace the sensor if necessary
E:01	.20	Maximum flue gas temperature reached (> 140 Deg C)	No circulation Sensor fault	Vent the air in the heating system Check the water pressure Check the wiring Check the circulation (direction, pump, valves) Check the cleanliness of the heat exchanger Check that the sensors are operating correctly Check that the sensor has been correctly fitted Replace the sensor if necessary
E:02	.00	Boiler reset in progress	Reset button pushed	Boiler carrying out reset (Information only)
E:02	.07	Low system water pressure	Water leak on boiler Water leak on system	Check boiler Check system Repressurise system
E:02	.16	On board CSU time-out	Check PCB for damage	Replace the PCB if necessary
E:02	.17	Permanent loss of communication between gas valve and boiler PCB	Fault in air/gas unit Loose connection to gas valve	Replace air/gas unit Check gas valve connection from PCB
E:02	.19	Jumper 1 changed	Check position of jumper 1	Put jumper 1 to the off position
E:02	.20	Jumper 2 changed	Check position of jumper 2	Put jumper 2 to the off position

Group code	Specific code	Description	Probable cause	Check/Reason
E:02	.21	Jumper 3 changed	Check position of jumper 3	Put jumper 3 to the off position
E:02	.47	Connection to external device unsuccessful	Check wiring to external device	Check wiring
E:02	.48	Configuration to external device unsuccessful	Check pairing to external	Pair the devices
E:04	.00	Gas Valve fault	Gas valve not detected	Check the wiring Check resistance across gas valve terminals Replace gas valve if necessary
E:04	.01	Flow temperature sensor short-circuited	Sensor not or badly connected Bad connection Sensor fault	Check the wiring Check that the sensors are operating correctly Check that the sensor has been correctly fitted Replace the sensor if necessary
E:04	.02	Flow temperature sensor open-circuited	Sensor not or badly connected Bad connection Sensor fault	Check the wiring Check that the sensors are operating correctly Check that the sensor has been correctly fitted Replace the sensor if necessary
E:04	.03	Critical flow temperature reached	Non-existent or insufficient circulation	Check circulation
E:04	.04	Flue temperature sensor short-circuited	Sensor not or badly connected Bad connection Sensor fault	Check the wiring Check the sensors are operating correctly Check the sensor has been correctly fitted Replace the sensor if necessary
E:04	.05	Flue temperature sensor open-circuited	Sensor not or badly connected Bad connection Sensor fault	Check the wiring Check the sensors are operating correctly Check the sensor has been correctly fitted Replace the sensor if necessary
E:04	.06	Critical flue gas temperature reached	No circulation Sensor fault	Vent the air in the heating system Check the water pressure Check the wiring Check the circulation (direction, pump, valves) Check the cleanliness of the heat exchanger Check that the sensors are operating correctly Check that the sensor has been correctly fitted Replace the sensor if necessary
E:04	.08	Maximum safe temperature reached (Safety thermostat open-circuited)	No circulation Sensor not or badly connected Bad connection Sensor fault	Vent the air in the heating system Check the water pressure Check the wiring Check the circulation (direction, pump, valves) Check the cleanliness of the heat exchanger Check that the sensors are operating correctly Check that the sensor has been correctly fitted Replace the sensor if necessary

Group code	Specific code	Description	Probable cause	Check/Reason
E:04	.10	5 burner start-up failures	No ignition	Check cabling of ignition transformer Replace the ionization/ignition electrode Check the breakdown to earth Check the condition of the burner set Check the earthing Defective gas/air unit
			Ignition arc but no flame formation	Check that the gas valve is fully opened Check the supply pressure Purge the gas supply to remove air Check the operation and setting of the gas valve unit Check that the air inlet and flue gas discharge flues are not blocked Check the wiring on the gas valve Defective gas/air unit
			Presence of flame but insufficient ionization (<1μA)	Check that the gas valve is fully opened Check the supply pressure Replace the ionization/ignition electrode Check the earthing Check the wiring on the ionization/ignition electrode
E:04	.12	False flame signal	Short-term fluctuation of the mains Ionization current present even though there is no flame The burner remains very hot (CO <sub>2</sub> too high) Defective gas/air unit	Press the RESET button for 5 seconds Replace the ionization/ignition electrode Set the CO <sub>2</sub> Check the gas/air unit and replace if necessary
E:04	.13	Fan rotor blocked	Fan seized Wiring to fan damaged	Replace air/gas unit
E:04	.17	Problem on the gas valve	Defective gas/air unit	Replace gas/air unit

## 11.4 Accessing the information menu

Fig.71 Press the  key




1. The  key is used to access the various menus and to scroll up and down the information in the Information menu.

Fig.72 Accessing the information menu



PN-0000540

2. To access the Information menu, briefly press the key once.



**Caution**

A long press (approximately 3 seconds) of the button will activate functions intended only for your installer or service engineer. If this occurs, press the button again for 3 seconds to exit the function.



**Important**

Five minutes after the key is pressed for the last time, the display goes back to the main display, once the venting cycle has been completed.

### 11.5 Reading out operating parameters

Pressing the button enables you to view information about how the boiler is working.

1. Press this button for one second to view the operating mode (e.g. "t.17" = purging in progress).
2. Press this button for one second again to view the operating sub-status or the corresponding function that is active (e.g. "u.00" = boiler in standby mode).
3. Press this button for one second again to view the operating temperature in the heating system: The symbol followed by the temperature in °C will flash.
4. Press this button for one second again to view the operating temperature in the domestic water system: The symbol followed by the temperature in °C will flash.
5. Press this button for one second again to view the power level from 0 to 100: The symbol and the number relating to the level of operating power will flash.

Press and hold the button for more than three seconds to exit this menu.

### 11.6 Statuses and sub-statuses

- The **STATUS** is the instantaneous operating phase of the boiler at the moment of display.
- The **SUB-STATUS** is the instantaneous operating phase of the boiler within the STATUS at the moment of display.

Tab.30 List of statuses

STATUS	DISPLAY
Standby	t00
Heat request	t01
Burner on	t02
Operating in heating mode	t03
Operating in domestic water mode	t04
Burner off	t05
Pump post circulation	t06
Burner off to reach the temperature setpoint	t08
Temporary fault	t09
Permanent fault (fault to be reset manually)	t10
Chimney sweep function at minimum output	t11
Chimney sweep function at maximum output in heating mode	t12
Chimney sweep function at maximum output in domestic water mode	t13
Manual heat request	t15
Frost protection function active	t16

STATUS	DISPLAY
Venting function active	t17
Electronic board overheated (wait for it to cool)	t18
Boiler in reset phase	t19

Tab.31 List of sub-statuses

SUB-STATUS	DISPLAY
Standby	U00
Wait time until next ignition in heating mode	U01
Pre-ventilation	U13
Burner pre-ignition	U17
Burner ignition	U18
Flame check	U19
Fan operation with active request	U20
Operation at set temperature setpoint	U30
Operation at limited temperature setpoint	U31
Operation at maximum output available	U32
Level 1 gradient detected	U33
Level 2 gradient detected	U34
Level 3 gradient detected	U35
Flame protection active	U36
Stabilisation time	U37
Boiler start at minimum output	U38
Post ventilation	U41
Fan off	U44
Output reduction due to high flue gas temperature	U45
Pump post circulation	U60

## 12 Decommissioning

### 12.1 Decommissioning procedure

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Disconnect the gas & electric supplies and isolate them.

Drain the primary circuit and disconnect the filling device.

Dismantle the chimney system and remove the boiler from the wall mounting frame.



# 13 Spare parts

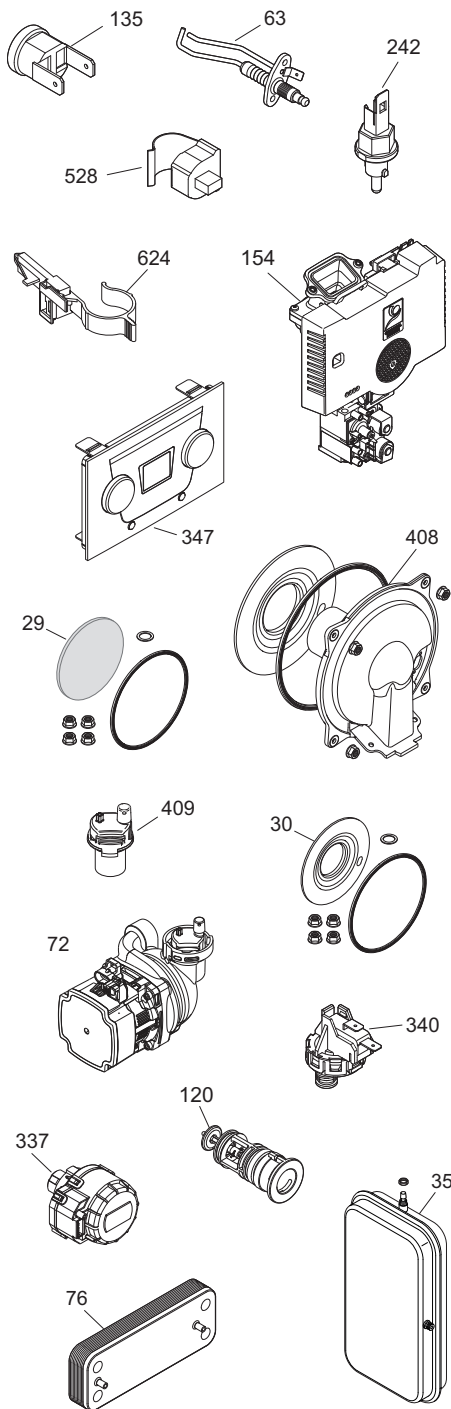
## 13.1 Short parts list

The following spares are available:



**See**  
LPG spare parts, page 77

Fig.73 Spare parts



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Tab.32 Part number and description of spare parts

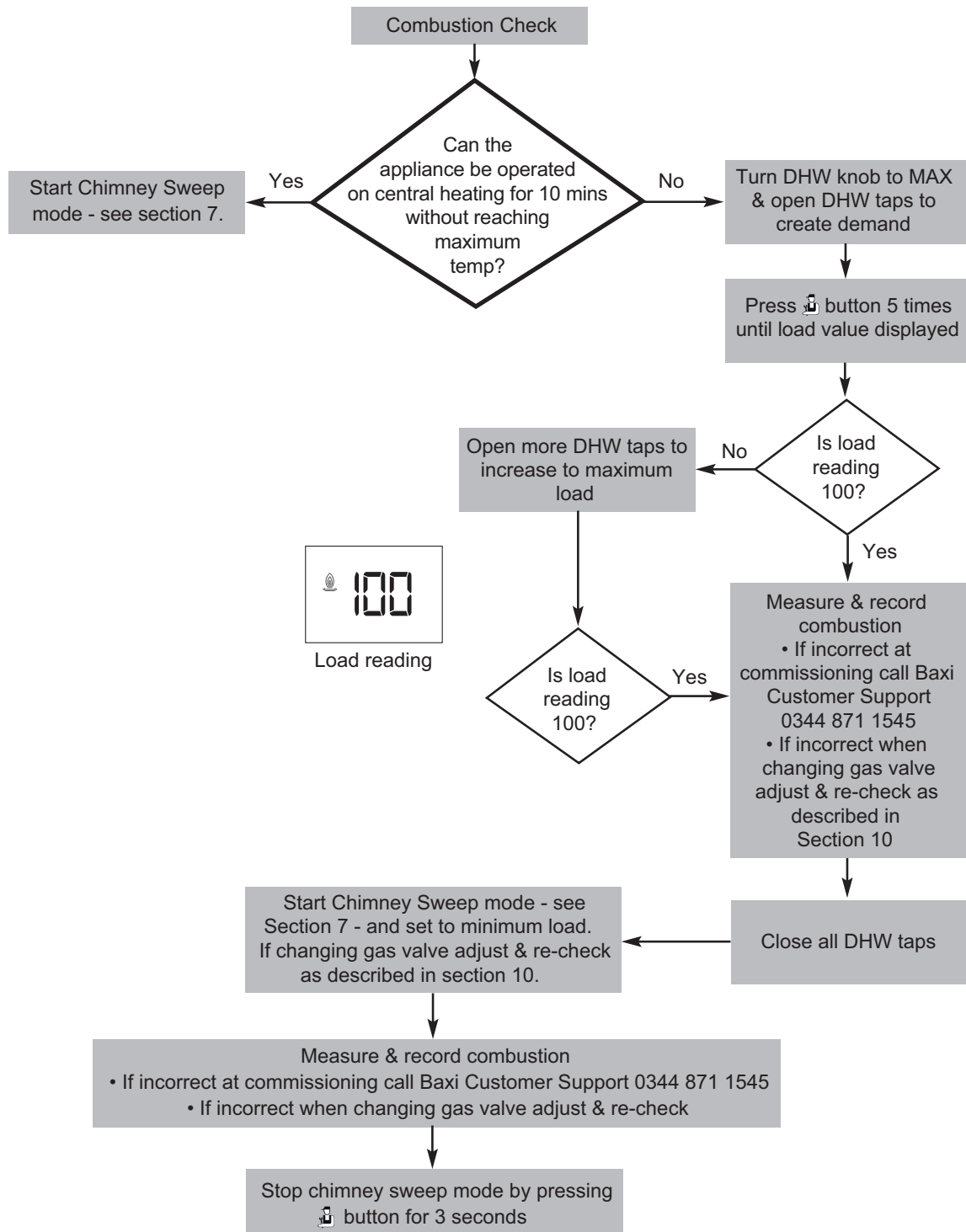
Key No.	Description	Part Number
135	Safety thermostat	7661894
63	Detection/Spark ignition electrode	7661804
528	Flow sensor and Return sensor	7662085
242	NTC flue sensor	7662034
624	Hall effect sensor	7662101
154	Air/Gas unit 24kW <b>Natural Gas only</b> Air/Gas unit 28kW <b>Natural Gas only</b>	7661938 7661952
347	HMI control	7662052
408	Burner assembly	7662070
29	Insulation rear	7661741
30	Insulation front	7661745
72	Pump assembly	7220533
340	Hydraulic pressure sensor	7662048
337	Diverter valve motor	7662047
120	3-way valve cartridge	7661857
76	Plate heat exchanger 24kW Plate heat exchanger 28kW	7661816 7661819
35	Expansion vessel	7661749
409	Auto air vent	72077601

# 14 Appendix

## 14.1 Combustion check on small heating systems

1. Use the procedure shown below to carry out the combustion check.

Fig.74 Small system combustion check



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## 14.2 LPG model supplement

### 14.2.1 Technical information - LPG



**Important**  
All data in these sections are nominal and subject to normal production tolerances.

Tab.33 General

<b>Baxi Combi</b>			<b>428 LPG</b>
Gas Council Numbers			47-077-27
Nominal heat input Domestic Hot Water — Maximum Rate	Nett (Qn Hi)	kW	28.9
	Gross (Qn Hs)	kW	31.4
Nominal Heat Input Central Heating — Maximum Rate	Nett (Qn Hi)	kW	24.7
	Gross (Qn Hs)	kW	26.9
Nominal Heat Input — Minimum Rate	Nett (Qn Hi)	kW	4.9
	Gross (Qn Hs)	kW	5.3
Nominal heat output 80/60°C — Domestic Hot Water — Maximum Rate	Pn	kW	28.0
Nominal heat output 80/60°C — Central Heating — Maximum Rate	Pn	kW	24.0
Nominal heat output 80/60°C — Central Heating — Factory Setting	Pn	kW	20.0
Nominal heat output 80/60°C — Minimum Rate	Pn	kW	4.8
Nominal heat output 50/30°C — Central Heating — Maximum Rate	Pnc	kW	26.1
Nominal heat output 50/30°C — Central Heating — Minimum Rate	Pnc	kW	5.2

Tab.34 Characteristics of combustion

<b>Baxi Combi</b>		<b>428 LPG</b>
LPG gas rate (G31) Qmax	kg/h	2.25
Diameter of coaxial discharge pipes	mm	60/100 & 80/125

### 14.2.2 Technical parameters - LPG

Tab.35 Technical parameters for boiler combination heaters

<b>Baxi Combi</b>			<b>428 LPG</b>
Condensing boiler			Yes
Low-temperature boiler <sup>(1)</sup>			No
B1 boiler			No
Cogeneration space heater			No
Combination heater			Yes
<b>Rated heat output</b>	<i>Prated</i>	kW	24
Useful heat output at rated heat output and high temperature regime <sup>(2)</sup>	$P_4$	kW	24.0
Useful heat output at 30% of rated heat output and low temperature regime	$P_1$	kW	8.0
<b>Seasonal space heating energy efficiency</b>	$\eta_s$	%	93
Useful efficiency at rated heat output and high temperature regime	$\eta_4$	%	88.0
Useful efficiency at 30% of rated heat output and low temperature regime	$\eta_1$	%	97.8
<b>Auxiliary electricity consumption</b>			

Baxi Combi			428 LPG
Full load	$el_{max}$	kW	0.038
Part load	$el_{min}$	kW	0.011
Standby mode	$P_{SB}$	kW	0.003
<b>Other items</b>			
Standby heat loss	$P_{stby}$	kW	0.069
Ignition burner power consumption	$P_{ign}$	kW	0.000
Annual energy consumption	$Q_{HE}$	GJ	74
Sound power level, indoors	$L_{WA}$	dB	50
Emissions of nitrogen oxides	$NO_X$	mg/kWh	40
<b>Domestic hot water parameters</b>			
<b>Declared load profile</b>			XL
Daily electricity consumption	$Q_{elec}$	kWh	0.151
Annual electricity consumption	$AEC$	kWh	33
<b>Water heating energy efficiency</b>			85
Daily fuel consumption	$Q_{fuel}$	kWh	22.939
Annual fuel consumption	$AFC$	GJ	17
(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.

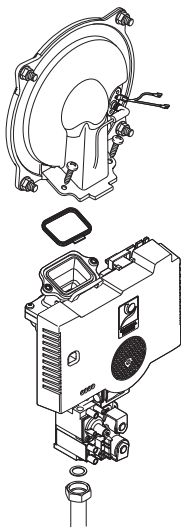
### 14.2.3 Gas Category - LPG

Tab.36 LPG gas category, type and supply pressure

Gas category	Gas Type	Supply pressure (mbar)
CAT II <sub>2H 3P</sub>	G31	37

### 14.2.4 Setting the gas valve - LPG

Fig.75 Removing the air/gas unit



PN-0000526

1. Disconnect the electrode lead and earthing cable.
2. Hinge the control box down.
3. Hinge down the air/gas cover and disconnect all wiring plugs from the PCB, noting their positions. Close the air/gas cover.
4. Disconnect the silencer from behind the air/gas unit.
5. Undo the gas valve nut.
6. Remove the two Torx T30 screws securing the air/gas unit to the burner combustion chamber door assembly.
7. Push the flexible gas pipe downwards and ease the air/gas unit away from the burner combustion chamber door assembly.
8. Fit the new air/gas unit to the burner combustion chamber door assembly and reassemble in reverse order.

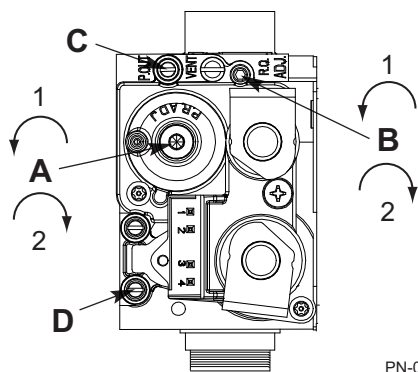
**Important**

Ensure the silencer is correctly positioned.

#### Setting the gas valve

**Important**The CO<sub>2</sub> must only be checked and adjusted to set the valve if a suitable calibrated combustion analyser is available, operated by a responsible person.

Fig.76 Adjusting the gas valve



PN-0000527

- A Minimum rate (offset) adjustment screw.
- B Maximum rate adjustment screw.
- C Burner gas pressure outlet.
- D Gas supply pressure outlet.

**Important**

The case front panel must be fitted when checking combustion.

- Run the boiler for several minutes before checking the CO and CO<sub>2</sub>. To do this it is necessary to operate the boiler in Chimney sweep mode. Ensure the boiler is at Maximum rate.
- Insert the test probe in the flue sample point and allow the reading to stabilise.

**See**

Checking combustion - chimney sweep mode, page 48. If the appliance cannot be operated on central heating for more than 10 minutes without reaching maximum temperature refer to Combustion check on small heating systems, page 74.

The CO<sub>2</sub> at MAXIMUM rate should be 10.3% +0.5, -0.1. Alter the CO<sub>2</sub> if necessary by adjusting the gas valve.

- Use the Maximum rate adjustment screw (B) to alter the CO<sub>2</sub>. Turn anti-clockwise (B1) to increase the CO<sub>2</sub> or clockwise (B2) to reduce the CO<sub>2</sub>.

**Important**

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

- Set the boiler to Minimum rate and check the CO<sub>2</sub>. The CO<sub>2</sub> at MINIMUM rate should be 9.7% +0.1, -0.5. Alter the CO<sub>2</sub> if necessary by adjusting the gas valve.
- Use the Minimum rate adjustment screw (A) to alter the CO<sub>2</sub>. Turn clockwise (A2) to increase the CO<sub>2</sub> or anti-clockwise (A1) to decrease the CO<sub>2</sub>.
- Check the combustion performance (CO/CO<sub>2</sub> ratio). This must be less than 0.004.

**Important**

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.

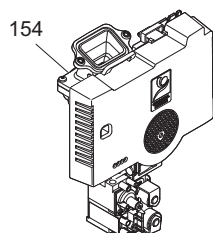
- Press the Chimney sweep button for 3 seconds to exit the function.
- Refit the sampling point plug and ensure there is no leakage of products.

#### 14.2.5 LPG spare parts

The following spares item is available for the 28kW LPG Combi model.

Key No.	Description	Part number
154	Air/Gas unit — 28kW LPG only	7679781

Fig.77 Spare parts — LPG



PN-0000543

### 14.3 Benchmark 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				<b>OR</b>		ft <sup>3</sup> /hr				
Burner operating pressure (if applicable)	mbar				<b>OR Gas inlet pressure</b>		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				<b>OR</b>		ft <sup>3</sup> /hr				
Burner operating pressure (at maximum rate)	mbar				<b>OR Gas inlet pressure at maximum rate</b>		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		

ALL INSTALLATIONS					
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.



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## 14.4 Service records

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

### Service Provider

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

<b>SERVICE 01</b>		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %
Comments:					
Signature					
<b>SERVICE 02</b>		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %
Comments:					
Signature					
<b>SERVICE 03</b>		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %
Comments:					
Signature					
<b>SERVICE 04</b>		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %
Comments:					
Signature					
<b>SERVICE 05</b>		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %
Comments:					
Signature					
<b>SERVICE 06</b>		Date:			
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	AND	CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO	ppm	AND	CO <sub>2</sub> %
Comments:					
Signature					

<b>SERVICE 07</b>					Date:
Engineer name:					
Company name:					
Telephone No:					
Gas safe register No:					
Record:	At max. rate:	CO	ppm	<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					

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









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## 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

**CE**  
0085



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



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**BAXI**