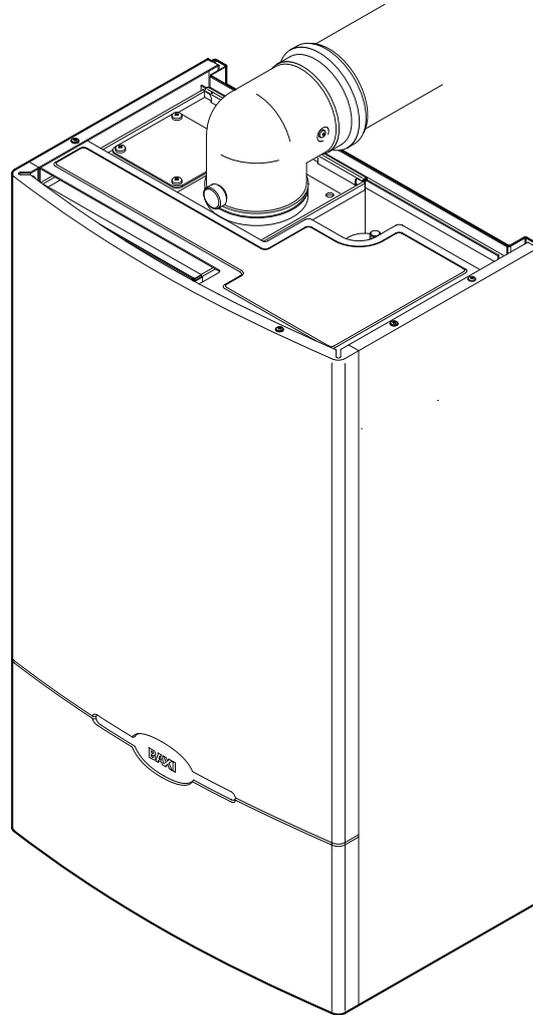


BAXI

Installation & Servicing Instructions



Baxi Combi 133 HE Plus Baxi Combi 100 HE Plus Baxi Combi 80 HE Plus

Gas Fired Wall Mounted Condensing
Combination Boiler

These instructions include the Benchmark Commissioning Checklist
and should be left with the user for safe keeping.

Natural Gas

Baxi Combi 133 HE Plus

G.C.N° 47 075 14

Baxi Combi 100 HE Plus

G.C.N° 47 075 15

Baxi Combi 80 HE Plus

G.C.N° 47 075 16

Building Regulations and the Benchmark Commissioning Checklist

Building Regulations (England & Wales) require notification of the installation of a heating appliance to the relevant Local Authority Building Control Department. From 1 April 2005 this can be achieved via a Competent Persons Self Certification Scheme as an option to notifying the Local Authority directly. Similar arrangements will follow for Scotland and will apply in Northern Ireland from 1 January 2006.

CORGI operate a Self Certification Scheme for gas heating appliances.

These arrangements represent a change from the situation whereby compliance with Building Regulations was accepted as being demonstrated by completion of the Benchmark Logbook (which was then left on site with the customer).

With the introduction of Self Certification Schemes, the Benchmark Logbook is being withdrawn. However, a similar document in the form of a commissioning checklist and service interval record is incorporated at the back of these instructions.

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.

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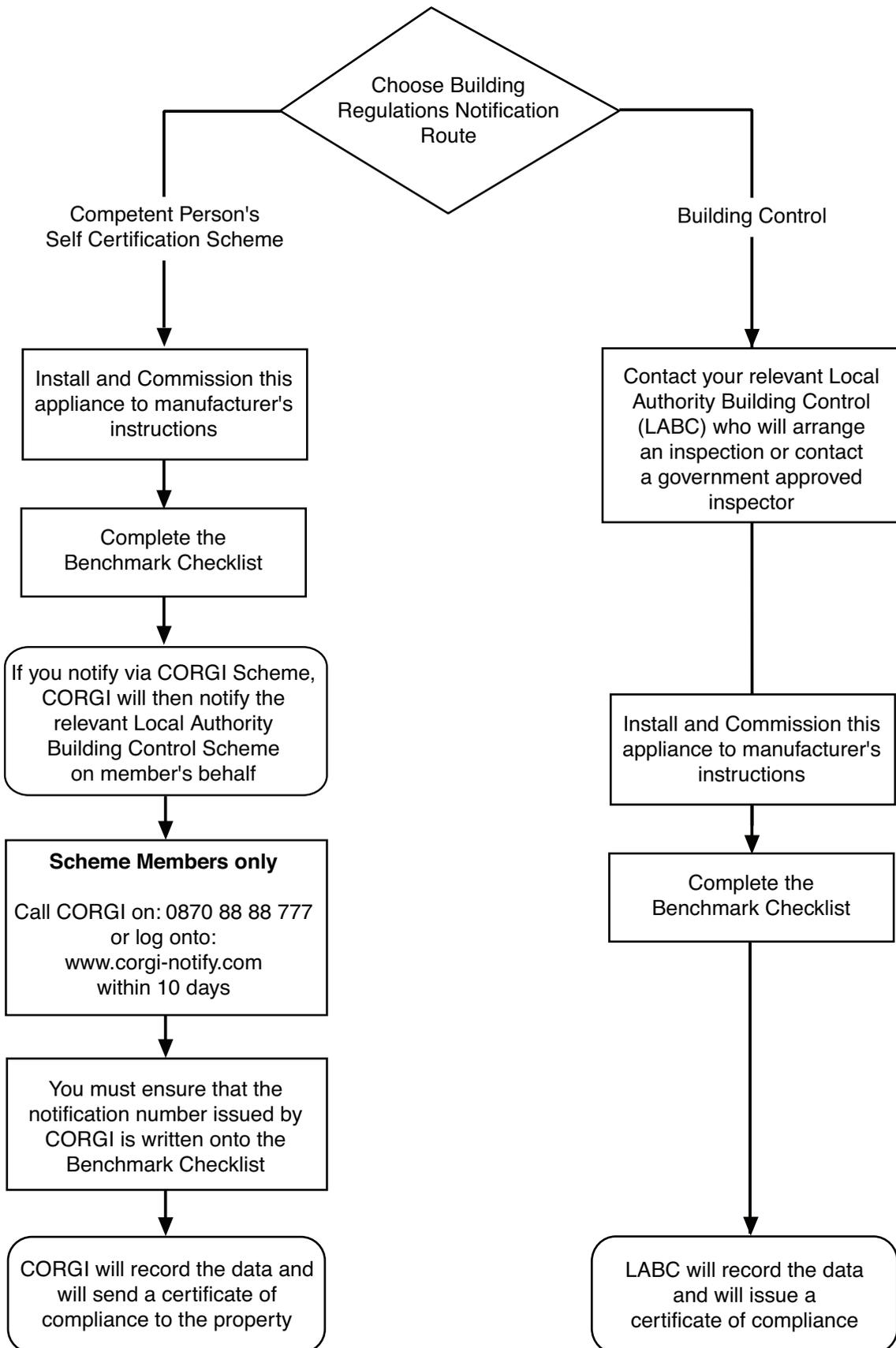
"Baxi" supports



Baxi is a BS-EN ISO 9001
Accredited Company

The code of practice for the installation,
commissioning & servicing of central
heating systems.

This product has an energy rating (A) on a scale of A to G.
For more information see www.boilers.org.uk. This is a certification mark.



IMPORTANT - Installation, Commissioning, Service & Repair

This appliance must be installed in accordance with the manufacturer's instructions and the regulations in force. Read the instructions fully before installing or using the appliance.

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

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

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

Lifting - This product should be lifted and handled by two people. For recommended hand holds see section 8.4. Stooping should be avoided and protective equipment worn where necessary. Carrying & lifting equipment should be used as required, e.g. when installing in a loft space.

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

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

All CORGI registered installers carry a CORGI identification card and have a registration number. You can check your installer is registered by telephoning 0870 4012300 or writing to:-

1 Elmwood,
Chineham Business Park,
Crockford Lane,
Basingstoke. RG24 8WG

or check online at www.corgi-gas-safety.com

The boiler meets the requirements of Statutory Instrument "The Boiler (Efficiency) Regulations 1993 N° 3083" and is deemed to meet the requirements of Directive 92/42/EEC on the energy efficiency requirements for new hot water boilers fired with liquid or gaseous fuels:-

Type test for purpose of Regulation 5 certified by:
Notified Body 0087.

Product/Production certified by:
Notified Body 0086.
Ref: 86-BL-647

For GB/IE only.

Baxi declare that no substances harmful to health are contained in the appliance or used during appliance manufacture.

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

In GB, the installation must be carried out by a CORGI Registered Installer. It must be carried out in accordance with the relevant requirements of the:

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

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

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

All systems must be thoroughly flushed and treated with inhibitor (see section 6.1).

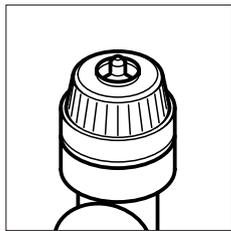
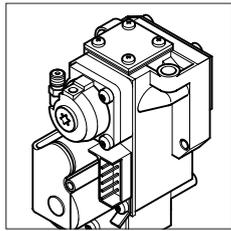
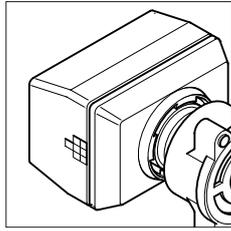
Codes of Practice, most recent version should be used

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 5449	Forced circulation hot water 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.

In IE the following Codes of Practice apply:

Standard	Scope
I.S. 813	Domestic Gas Installations.
The following BS standards give valuable additional information;	
BS 5546	Installation of hot water supplies for domestic purposes.
BS 5449	Forced circulation hot water systems.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.



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1.0 Introduction

This boiler is fitted with a flow switch interlock that prevents it from firing when the heating demand is satisfied.

1.1 Description

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

2. The boiler is preset to give a maximum output of 23.9 kW (81,500 Btu/h) for central heating and (39.0 kW (133,000 Btu/h) 133 model) (30.2 kW (102,000 Btu/h) 100 model) (23.9 kW (81,500 Btu/h) 80 model) for hot water. In central heating mode the boiler will automatically adjust down to (10.6 kW (36,000 Btu/h) 133 model) 9.1 kW (31,000 Btu/h) 100 & 80 models) according to system load.

3. They are designed for use on Natural Gas (G20) only.

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

5. A label giving details of the model, serial number and Gas Council number is situated on the rear of the lower door panel (Fig. 1).

6. The boiler data badge is positioned on the air box door (Fig. 2).

7. The boilers are intended to be installed in residential / commercial / light industrial E.M.C. environments on a governed meter supply only.

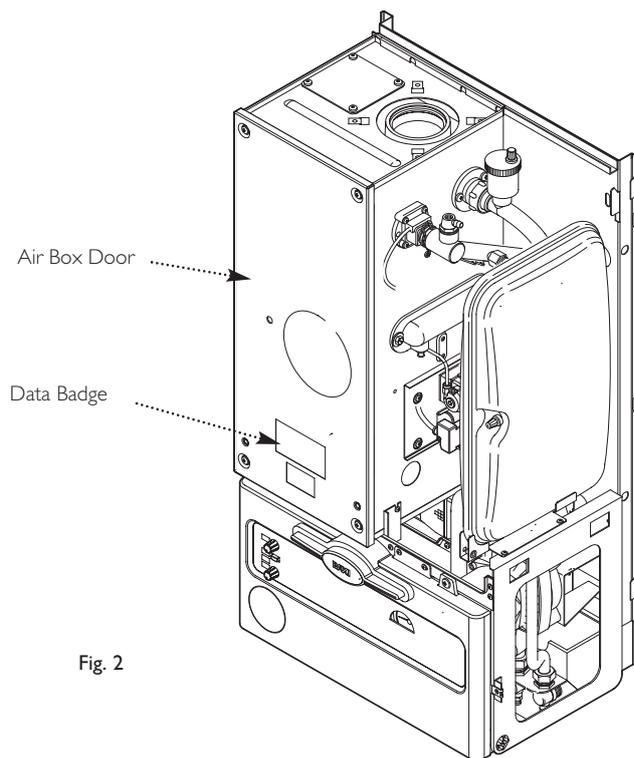
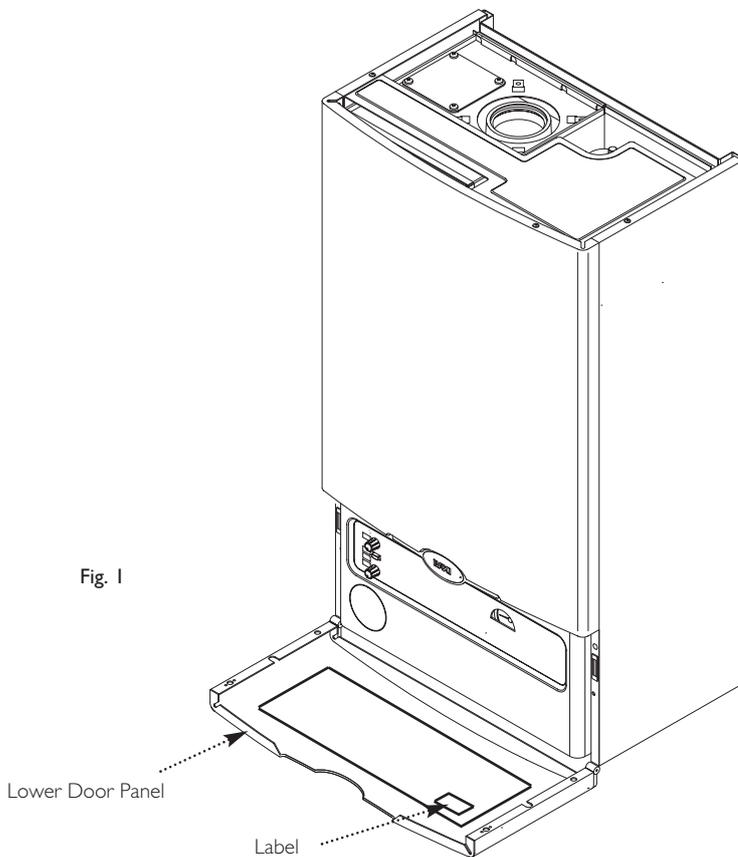
8. The boilers must be installed with one of the purpose designed flues such as the standard horizontal flue kit, part n° 236921.

1.2 Important Information

Man-made mineral fibre

- Some component parts of this appliance (insulation pads, gaskets and rope seals) are manufactured from man-made mineral fibre.
- Prolonged or excessive exposure to this material may result in some irritation to the eyes, skin or respiratory tract.
- It is advisable to wear gloves when handling these items.
- Irritant dust will only be released from the items if they are broken up or subjected to severe abrasion. In these instances a suitable dust mask and goggles should be worn.
- Always thoroughly wash hands after installation, servicing or changing components.
- When disposing of any items manufactured from man-made mineral fibre care must be exercised.
- If any irritation of the eyes or severe irritation of the skin is experienced seek medical attention.

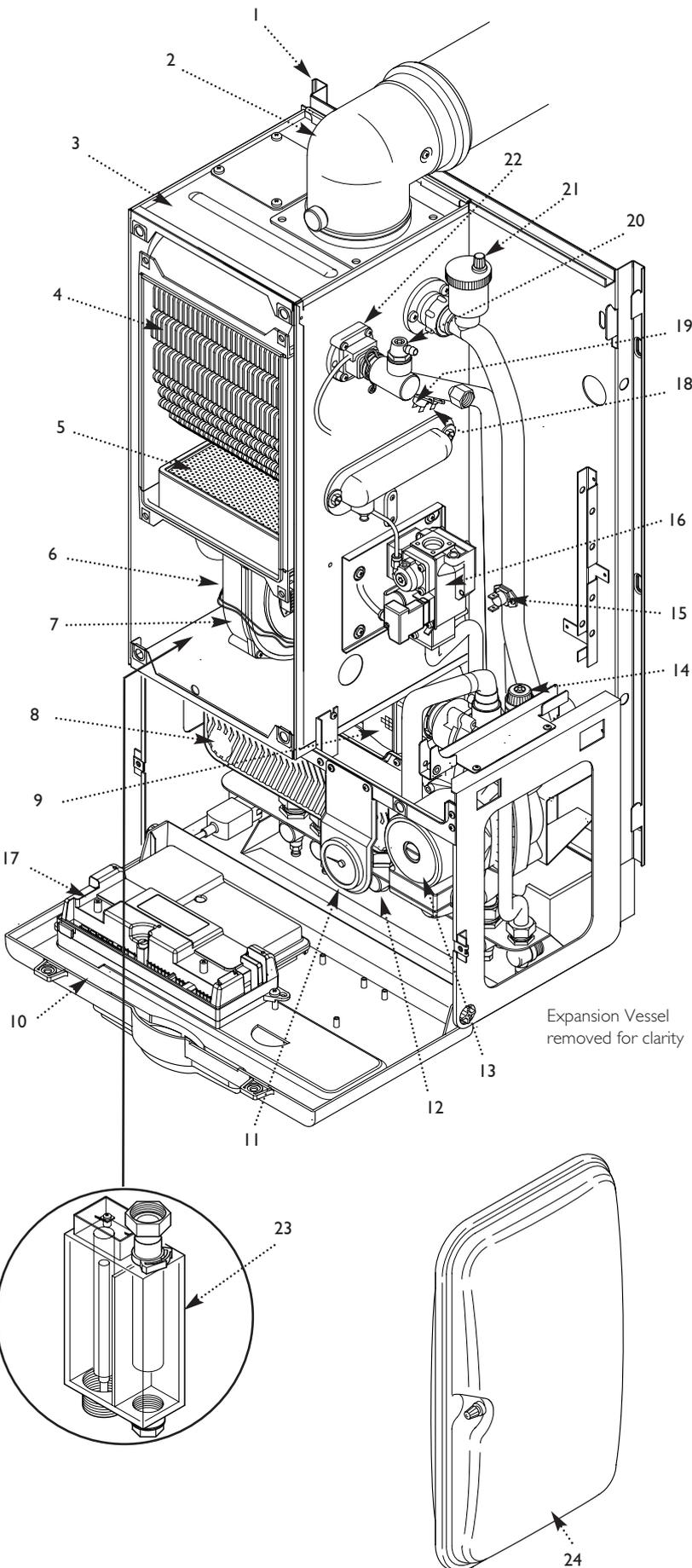
NOTE: All Illustrations show the Combi 133 HE Plus unless otherwise stated. The PCB Connection Cover is removed for clarity.



2.0 General Layout

2.1 Layout

1. Wallplate
2. Flue Elbow
3. Air Box
4. Heat Exchanger
5. Burner
6. Fan Protection Thermostat
7. Fan Assembly
8. DHW Plate Heat Exchanger
9. Three Way Valve
10. Facia Box
11. Water Pressure Gauge
12. Gas Tap
13. Circulation Pump
14. Pressure Relief Valve
15. Return Thermistor
16. Gas/Air Ratio Valve
17. PCB
18. Flow Temperature Safety Thermostat
19. Flow Temperature Thermistor
20. Manual Air Vent
21. Automatic Air Vent
22. Flow Switch (Dry Fire Protection)
23. Condensate Trap
24. Expansion Vessel



2.2 Optional Extras

KIT	PART N°
FLUE EXTENSION KITS (110/70)	
Horizontal Flue Kit 4M max	
Flue Extension 0.25M	241692
Flue Extension 0.5M	241694
Flue Extension 1M (Use two kits for 2M etc.)	241695
Flue Bend - 45° (Reduce overall length of flue by 0.5m when fitting this bend)	241689
Flue Bend - 90° (Reduce overall length of flue by 1m when fitting this bend)	241687
Horizontal Extended Flue (1.75M)	511457
VERTICAL FLUE KITS (110/70) 5M max	
Vertical Flue Terminal	242802
Vertical Boiler Connection	5106888
VERTICAL FLUE (80/80)	
Kit Boiler Connection Twin	242757
CONTROL ACCESSORIES	
RF Programmable Room Thermostat	5117204
Electro-Mechanical Timer	5117493
Filling Loop Kit	5111095
Plume Displacement Kit	5117383

3.0 Appliance Operation

NOTE: All delay timers mentioned in 3.1 and 3.2 are overridden by domestic hot water demand.

3.1 Central Heating Mode

1. With a demand for heating, the pump circulates water through the primary circuit. At a flow rate of approximately 4.5 l/min the central heating flow switch operates, initiating the ignition sequence.
2. The main burner ignites at a low rate, then the fan/gas valve and proportionator control the gas rate to maintain the heating temperature measured by the thermistor sensor.
3. When the flow temperature exceeds the set temperature, a 1 minute pump overrun occurs followed by 3 minutes anticycle. If the flow temperature is low enough the burner will then relight automatically otherwise pump overrun and anticycle will occur again.
4. When the demand is satisfied the burner is extinguished and the pump continues to run for a period of 1 minute (Pump Overrun).

3.2 Domestic Hot Water Mode

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

3.3 Boiler Frost Protection

1. The boiler incorporates an integral frost protection feature. It will operate in both summer and winter modes. If the boiler temperature falls below 8°C ($\pm 5^\circ$) then the boiler will fire until a temperature of 15°C ($\pm 5^\circ$) is reached.

3.4 Pump Protection

1. The control system continually monitors the time since the pump last operated. This will result in the pump being run for 1 minute if it has not run in the last 24 hours to prevent seizure.

4.0 Technical Data

4.1 Combi 133 HE Plus

Appliance Type	C ₁₃	C ₃₃
Appliance Category	CAT I _{2H}	
Heat Input Gross DHW	Max	
	kW	45.45
	Btu/h	155,000
Heat Input Gross CH	Max	
	kW	33.7
	Btu/h	115,000
Heat Output CH	Max	
	kW	30.0
	Btu/h	102,000
Non Condensing (70°C Mean Water temp)	Max	
	kW	30.0
	Btu/h	102,000
Condensing (40°C Mean Water temp)	Max	
	kW	31.4
	Btu/h	107,000
Max Gas Rate	(Natural Gas) (After 10 Mins)	
	m ³ /h	4.2
	ft ³ /h	148.3
Inlet Pressure (Natural Gas)	20	
	mbar	20
	in wg	8
Electrical Supply	230V~ 50Hz (Appliance must be connected to an earthed supply)	
Power Consumption	200W	
External Fuse Rating	3A	
Internal Fuse Rating	3.15A	

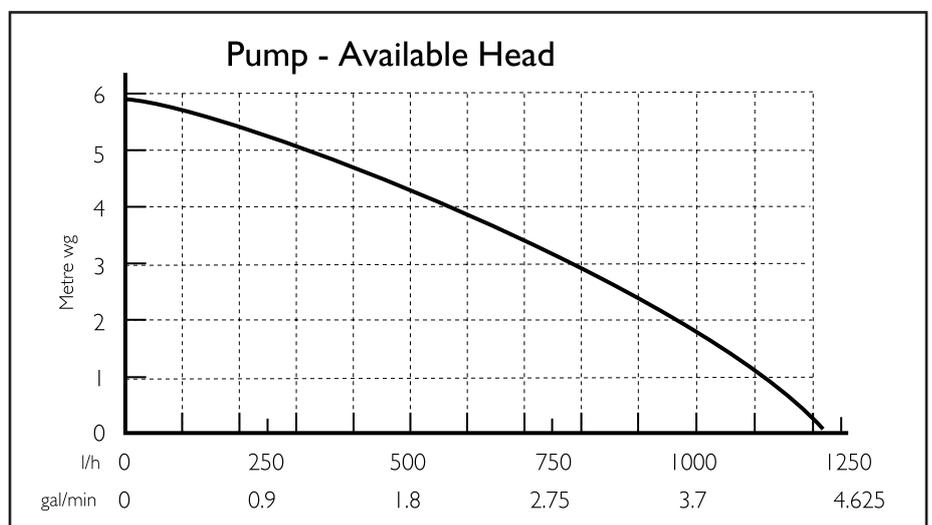
Flue Terminal Dimensions	Diameter	110mm
	Projection	150mm
Connections	compression	
Gas Supply	- 1/2" BSPF	
Central Heating Flow	- 22mm	
Central Heating Return	- 22mm	
Cold Water Mains Inlet	- 15mm	
DHW Flow	- 15mm	
Pressure Relief Discharge	- 15mm	
Condensate Drain	- 1" BSP	
Outercase Dimensions		
Casing Height	- 850mm	
Overall Height Inc Flue		
Elbow	- 1000mm	
Casing Width	- 490mm	
Casing Depth	- 320mm	
Clearances		
Both Sides	5mm Min	
Above Casing	200mm Min	
Below Casing	200mm Min	
Front	500mm Min (For Servicing)	
Front	5mm Min (In Operation)	
Weights	kg	lb
Packaged Boiler Carton	58.2	128.3
Packaged Flue Kit	3.8	8.4
Weight Empty	53.2	117.3
Installation Lift Weight	44.4	98
Central Heating Primary Circuit Pressures	bar	lb/in ²
Safety Discharge	3	43.5
Max Operating	2.5	36.3
Min Operating	0.7	10.2
Recommend Operating	1-2	14.5-29
Recommended System Temperature Drop	Condensing 20°C	

DHW Circuit Pressures	bar	lb/in ²
Max Operating	10	145
Min Operating	0.1	1.45
Min Operating Pressure at 16 l/min	1.6	23.2
Flow Rates	l/min	gal/min
DHW Flow Rate @ 30°C Rise	18.7	4.11
DHW Flow Rate @ 35°C Rise	16	3.52
Min Working DHW Flow Rate	1.9	0.43
Pump	Available Head See graph below	
Expansion Vessel	- (For Central Heating only. Integral with appliance)	
Min Pre-charge Pressure	bar	lb/in ²
	0.95	13.8
Nominal Pre-charge Pressure	1	14.5
	litre	gal
Max Capacity of CH System	125	27.5
Primary Water Content of Boiler (unpressurised)	3.5	6.2
DHW Expansion Vessel	See Section 6.6 for information	
Temperatures		
C.H. Flow Temp (adjustable)	55° C to 82° C max (± 0.5° C)	
D.H.W. Flow Temp (adjustable)	45° C to 55° C max (± 0.5° C) dependent upon flow rate	
NO_x Class	5	
CO/CO₂ Ratio	0.002	
Electrical Protection	IPX4	

SEDBUK Declaration For Combi 133 HE Plus

The efficiency is 90.7 %

This value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated has been certified by 0086.



4.0 Technical Data

4.2 Combi 100 HE Plus

Appliance Type	C ₁₃	C ₃₃
Appliance Category	CAT I _{2H}	
Heat Input Gross DHW	Max	
kW	33.7	
Btu/h	115,000	
Heat Input Gross CH	Max	Factory Set
kW	33.7	26.95
Btu/h	115,000	92,000
Heat Output CH	Non Condensing (70°C Mean Water temp)	
	Max	Factory Set
kW	30.0	23.9
Btu/h	102,000	81,500
	Condensing (40°C Mean Water temp)	
	Max	Factory Set
kW	31.4	25.1
Btu/h	107,000	85,600
Max Gas Rate	(Natural Gas) (After 10 Mins)	
m ³ /h	3.1	
ft ³ /h	110.0	
Inlet Pressure (Natural Gas)		
mbar	20	
in wg	8	
Electrical Supply	230V~ 50Hz (Appliance must be connected to an earthed supply)	
Power Consumption	200W	
External Fuse Rating	3A	
Internal Fuse Rating	3.15A	

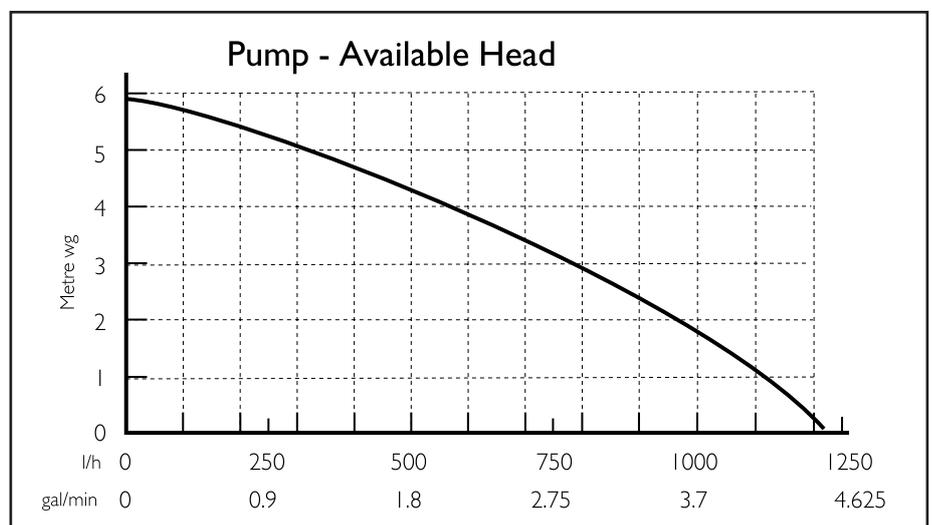
Flue Terminal Dimensions	Diameter	110mm
	Projection	150mm
Connections	compression	
Gas Supply	-	1/2" BSPF
Central Heating Flow	-	22mm
Central Heating Return	-	22mm
Cold Water Mains Inlet	-	15mm
DHW Flow	-	15mm
Pressure Relief Discharge	-	15mm
Condensate Drain	-	1" BSP
Outer Case Dimensions		
Casing Height	-	850mm
Overall Height Inc Flue	-	
Elbow	-	1000mm
Casing Width	-	490mm
Casing Depth	-	320mm
Clearances		
Both Sides	5mm Min	
Above Casing	200mm Min	
Below Casing	200mm Min	
Front	500mm Min (For Servicing)	
Front	5mm Min (In Operation)	
Weights	kg	lb
Packaged Boiler Carton	58.2	128.3
Packaged Flue Kit	3.8	8.4
Weight Empty	53.2	117.3
Installation Lift Weight	44.4	98
Central Heating Primary Circuit Pressures	bar	lb/in ²
Safety Discharge	3	43.5
Max Operating	2.5	36.3
Min Operating	0.7	10.2
Recommend Operating	1-2	14.5-29
Recommended System Temperature Drop	Condensing 20°C	

DHW Circuit Pressures	bar	lb/in ²
Max Operating	10	145
Min Operating	0.1	1.45
Min Operating Pressure at 12 l/min	0.54	7.83
Flow Rates	l/min	gal/min
DHW Flow Rate @ 30°C Rise	14	3.08
DHW Flow Rate @ 35°C Rise	12	2.64
Min Working DHW Flow Rate	1.9	0.43
Pump	Available Head See graph below	
Expansion Vessel	- (For Central Heating only. Integral with appliance)	
Min Pre-charge Pressure	bar	lb/in ²
	0.95	13.8
Nominal Pre-charge Pressure	1	14.5
	litre	gal
Max Capacity of CH System	125	27.5
Primary Water Content of Boiler (unpressurised)	3.5	6.2
DHW Expansion Vessel	See Section 6.6 for information	
Temperatures		
C.H. Flow Temp (adjustable)	55° C to 82° C max (± 0.5° C)	
D.H.W. Flow Temp (adjustable)	45° C to 55° C max (± 0.5° C) dependent upon flow rate	
NO_x Class	5	
CO/CO₂ Ratio	0.002	
Electrical Protection	IPX2	

SEDBUK Declaration For Combi 100 HE Plus

The efficiency is 90.8 %

This value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated has been certified by 0086.



4.0 Technical Data

4.3 Combi 80 HE Plus

Appliance Type	C ₁₃	C ₃₃
Appliance Category	CAT I _{2H}	
Heat Input Gross DHW	Max	
	kW	26.95
	Btu/h	92,000
Heat Input Gross CH	Max	
	kW	26.95
	Btu/h	92,000
Heat Output CH	Non Condensing (70°C Mean Water temp)	
	Max	
	kW	23.9
	Btu/h	81,500
	Condensing (40°C Mean Water temp)	
	Max	
	kW	25.1
	Btu/h	85,600
Max Gas Rate	(Natural Gas) (After 10 Mins)	
	m ³ /h	2.5
	ft ³ /h	87.9
Inlet Pressure (Natural Gas)		
	mbar	20
	in wg	8
Electrical Supply	230V~ 50Hz (Appliance must be connected to an earthed supply)	
Power Consumption	200W	
External Fuse Rating	3A	
Internal Fuse Rating	3.15A	

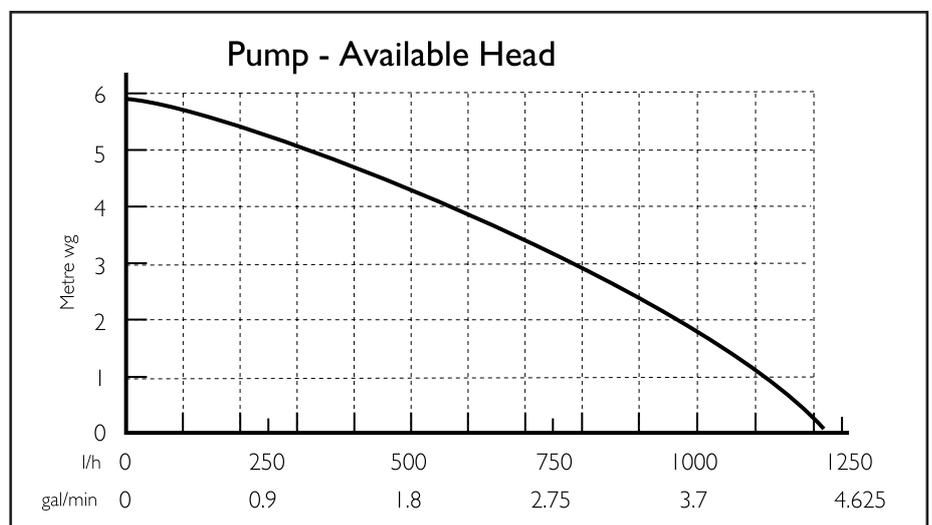
Flue Terminal Dimensions	Diameter	110mm
	Projection	150mm
Connections	compression	
Gas Supply	-	1/2" BSPF
Central Heating Flow	-	22mm
Central Heating Return	-	22mm
Cold Water Mains Inlet	-	15mm
DHW Flow	-	15mm
Pressure Relief Discharge	-	15mm
Condensate Drain	-	1" BSP
Outer Case Dimensions		
Casing Height	-	850mm
Overall Height Inc Flue		
Elbow	-	1000mm
Casing Width	-	490mm
Casing Depth	-	320mm
Clearances		
Both Sides	5mm Min	
Above Casing	200mm Min	
Below Casing	200mm Min	
Front	500mm Min (For Servicing)	
Front	5mm Min (In Operation)	
Weights	kg	lb
Packaged Boiler Carton	58.2	128.3
Packaged Flue Kit	3.8	8.4
Weight Empty	53.2	117.3
Installation Lift Weight	44.4	98
Central Heating Primary Circuit Pressures	bar	lb/in ²
Safety Discharge	3	43.5
Max Operating	2.5	36.3
Min Operating	0.7	10.2
Recommend Operating	1-2	14.5-29
Recommended System Temperature Drop	Condensing 20°C	

DHW Circuit Pressures	bar	lb/in ²
Max Operating	10	145
Min Operating	0.1	1.45
Min Operating Pressure at 10 l/min	0.39	23.2
Flow Rates	l/min	gal/min
DHW Flow Rate @ 30°C Rise	11.7	2.57
DHW Flow Rate @ 35°C Rise	10	2.20
Min Working DHW Flow Rate	1.9	0.43
Pump	Available Head See graph below	
Expansion Vessel	- (For Central Heating only. Integral with appliance)	
Min Pre-charge Pressure	bar	lb/in ²
	0.95	13.8
Nominal Pre-charge Pressure	l	14.5
	litre	gal
Max Capacity of CH System	125	27.5
Primary Water Content of Boiler (unpressurised)	3.5	6.2
DHW Expansion Vessel	See Section 6.6 for information	
Temperatures		
C.H. Flow Temp (adjustable)	55° C to 82° C max (± 0.5° C)	
D.H.W. Flow Temp (adjustable)	45° C to 55° C max (± 0.5° C) dependent upon flow rate	
NO_x Class	5	
CO/CO₂ Ratio	0.002	
Electrical Protection	IPX2	

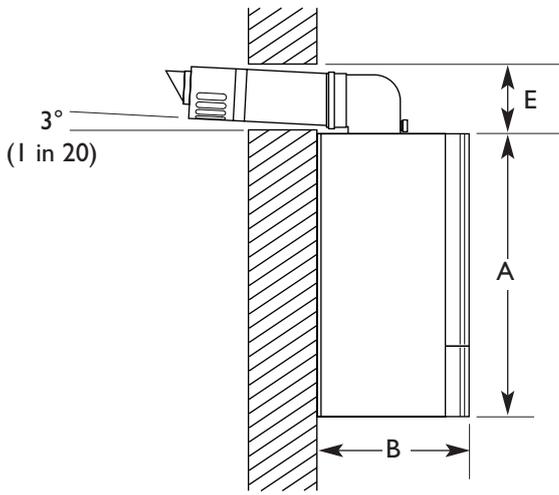
SEDBUK Declaration For Combi 80 HE Plus

The efficiency is 90.8%

This value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated has been certified by 0086.



5.0 Dimensions and Fixings

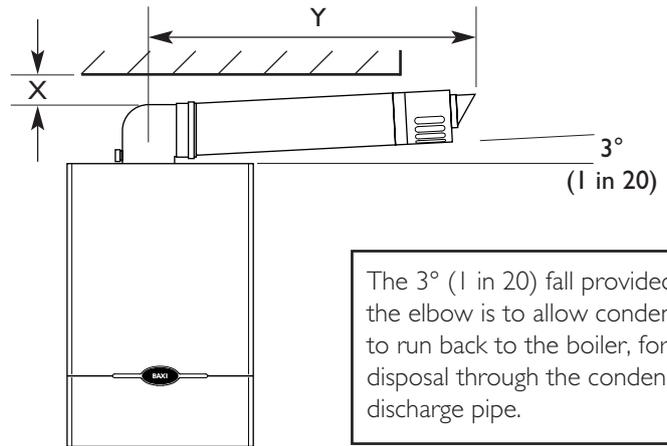
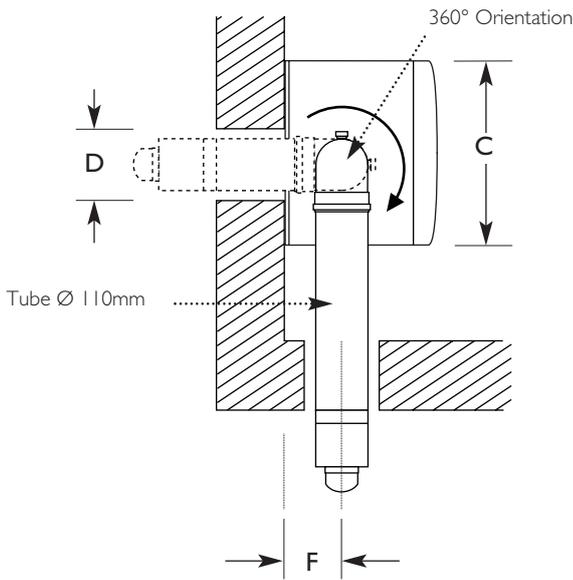


DIMENSIONS	
A	850mm
B	320mm
C	490mm
D	125mm Ø Min.
E	150mm
F	136mm

SIDE FLUE (left and right)

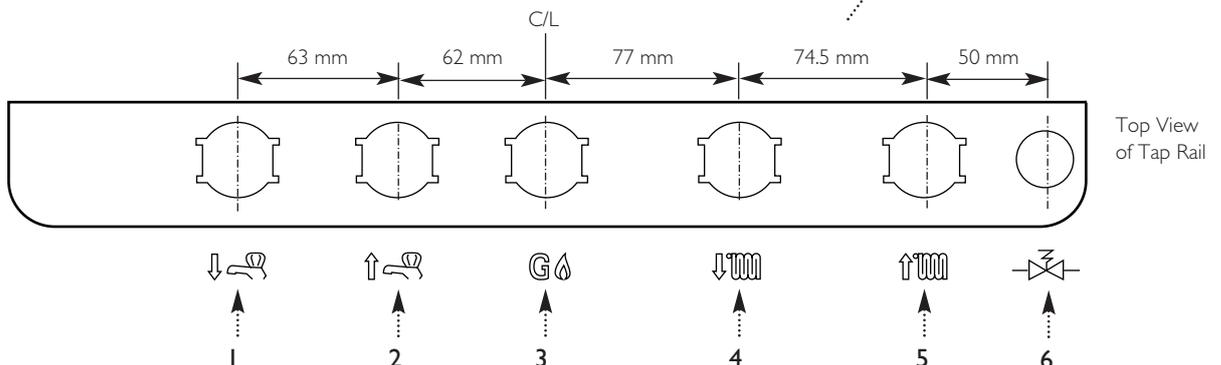
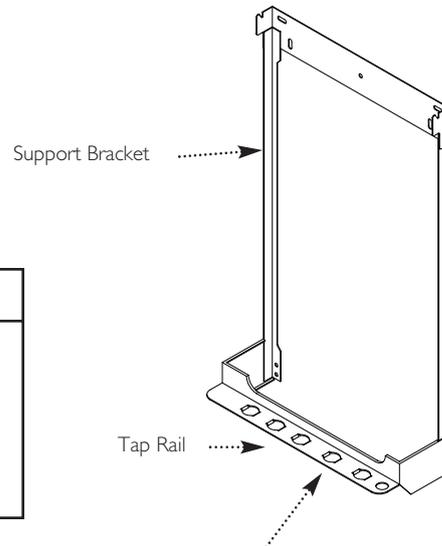
For every 1m of horizontal flue length, the clearance above the top of the flue elbow should be 55mm to incorporate the 3° (1 in 20) fall in the flue from the terminal to the elbow.

Flue length (Y)	Clearance (X)
up to 1m	55mm
1m - 2m	110mm
2m - 3m	165mm



The 3° (1 in 20) fall provided by the elbow is to allow condensate to run back to the boiler, for disposal through the condensate discharge pipe.

Key To Support Bracket	
1 Domestic Hot Water Outlet	4 Central Heating Flow
2 Cold Water Inlet	5 Central Heating Return
3 Gas Supply	6 Pressure Relief



6.0 System Details

6.1 Central Heating Circuit

I. The appliance is suitable for fully pumped SEALED SYSTEMS ONLY.

This boiler is fitted with a flow switch interlock that prevents it from firing when the heating demand is satisfied.

The boiler is designed so that it will heat the house to the desired room temperature as quickly as possible by running at the maximum radiator temperature of 82°C. Once this room temperature is achieved the boiler will then reduce the radiator temperature to as low a level as possible, while still achieving the desired room temperature, thereby giving the most efficient use of gas and the most comfortable room temperature possible.

The boiler will be able to achieve this performance **if a room thermostat is fitted or with a fully TRV'd system without a bypass.**

This boiler does not require a bypass. To comply with Part L1 of the Building Regulations the heating system into which the boiler is installed should include the following:

- a) zone controls
- b) timing controls
- c) boiler control interlocks

Such a system needs to be fully pumped and must provide independent temperature and time control to both the heating and hot water circuits and have a boiler interlock.

The boiler should be controlled so that it operates on demand only. Where it is proposed to effect control by thermostatic radiator valves, a room thermostat (or other device such as a flow switch - a flow switch is integral to this boiler) should also be provided to switch off the boiler when there is no demand for heating or hot water.

The interlock for CH circuit can be provided in either of the following ways:

- a) A Room Thermostat with at least the radiator nearest the room stat not TRV'd.
- b) A fully TRV'd system without a bypass.

A fully TRV'd system with a bypass that has not been valved off does not comply with Part L1 of the Building Regulations.

If the system is fully TRV'd with a bypass then this feature will not be available, in this case the radiator temperature can be reduced to provide more efficient operation. (see User instructions).

- The condensate drain and pipes must be free from leaks.

Information

In GB it is necessary to comply with the Water Supply (Water Fittings) Regulations 1999 (or for Scotland, The Water Byelaws 2000, Scotland). The Baxi Combi 133, 100, 80 HE Plus Combination Boilers are an Approved Product under the Water Regulations.

To comply with the Water Regulations your attention is drawn to The Water Regulations Advisory Service (WRAS) which gives full details of the requirements.

In IE the requirements given in the current edition of I.S. 813 "Domestic Gas Installations" and the current Building Regulations must be followed.

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.
- All systems must be thoroughly drained and flushed out. Using for example Betz-Dearborn Sentinel X300 or X400 or Fernox Superfloc Universal Cleanser. They should be used following the flushing agent manufacturer's instructions.
- System additives - corrosion inhibitors and flushing agents/descalers should comply to BS7593 requirements, e.g. Betz-Dearborn Sentinel X100 and Fernox-Copal which should be used following the inhibitor manufacturer's instructions.

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 manufacturer's instructions. (Test kits are available from inhibitor stockists.)
- For information or advice regarding any of the above contact Technical Enquiries.

6.0 System Details

6.2 System Control

1. The boiler is designed for use in a heating system that incorporates external controls, i.e. a minimum of a timer device.

2. Suitable timer kits are available as optional extras.

6.3 System Filling and Pressurising (Fig. 3)

1. A filling point connection on the central heating return pipework must be provided to facilitate initial filling and pressurising and also any subsequent water loss replacement/refilling.

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

3. 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".

4. The sealed primary circuits may be filled or replenished by means of a temporary connection between the circuit and a supply pipe, provided a 'Listed' double check valve or some other no less effective backflow prevention device is permanently connected at the inlet to the circuit and the temporary connection is removed after use.

5. To aid removal of air from the system whilst filling, move the diverter valve to the CH position by using the installer parameters (see Section 10.4).

6.4 Expansion Vessel - CH only (Fig. 4)

1. The appliance expansion vessel is pre-charged to 1 bar (14.5 lb/in²). Therefore, the minimum cold fill pressure is 1 bar. The vessel is suitable for correct operation for system capacities up to 125 litres (27.5gal). For greater system capacities an additional expansion vessel must be fitted. For GB refer to BS 7074 Pt 1. For IE, the current edition of I.S. 813 "Domestic Gas Installations".

6.5 Pressure Relief Valve (Fig. 4)

1. The pressure relief valve is set at 3 bar, therefore all pipework, fittings, etc. should be suitable for pressures in excess of 3 bar.

2. The pressure relief discharge pipe should not be less than 15mm dia, 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. The end of the pipe should terminate facing down and towards the wall.

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

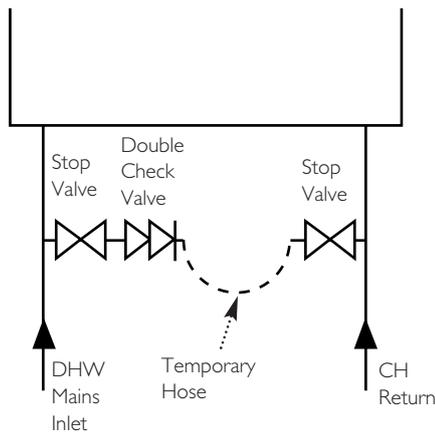
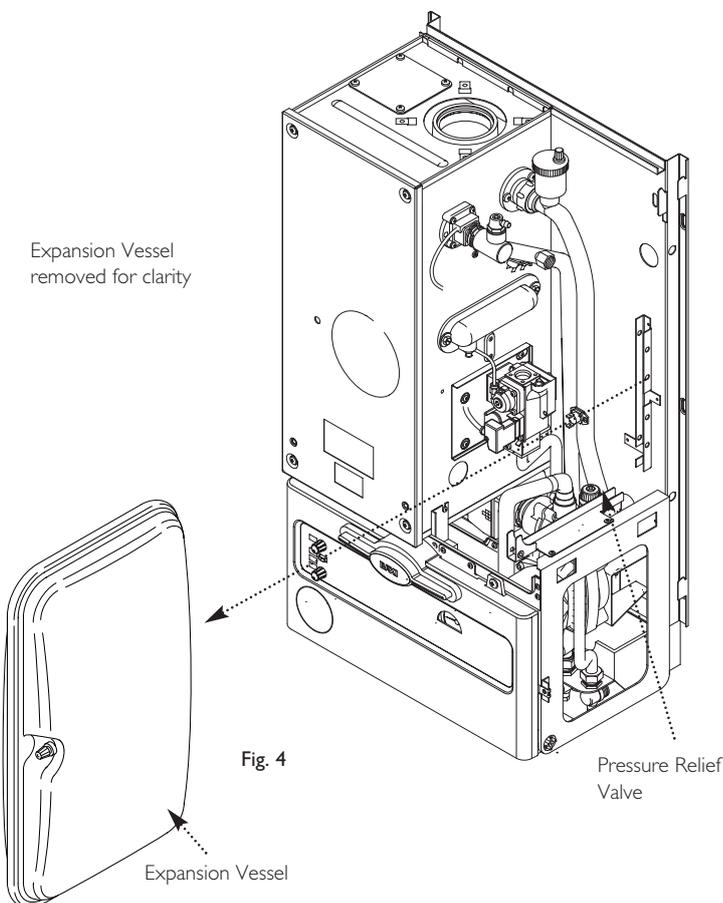
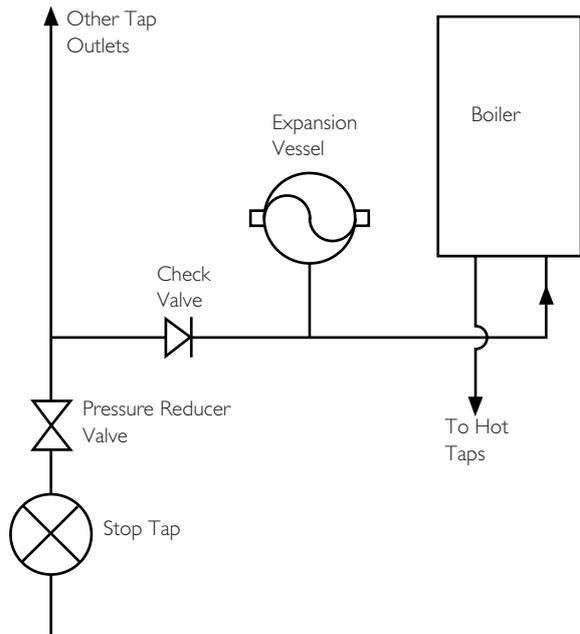


Fig. 3



6.0 System Details



6.6 Domestic Hot Water Circuit

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

2. When installed in accordance with 1 above this appliance does not require a check valve to meet water supply regulations. However when the system includes any device which prevents water expanding back towards the supply, then an expansion vessel must be fitted (e.g. Zilmet 160ml, R¹/₂ 15 bar).

3. If the hot water expansion is not provided for, then high pressures can develop which may result in damage to fittings and devices on the system.

4. The boiler's maximum working mains pressure is 10 bar (150 lb/in²), therefore all pipework, connections, fittings, etc. should be suitable for pressures in excess of 10 bar. A pressure reducing valve must be fitted for pressures in excess of 10 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.

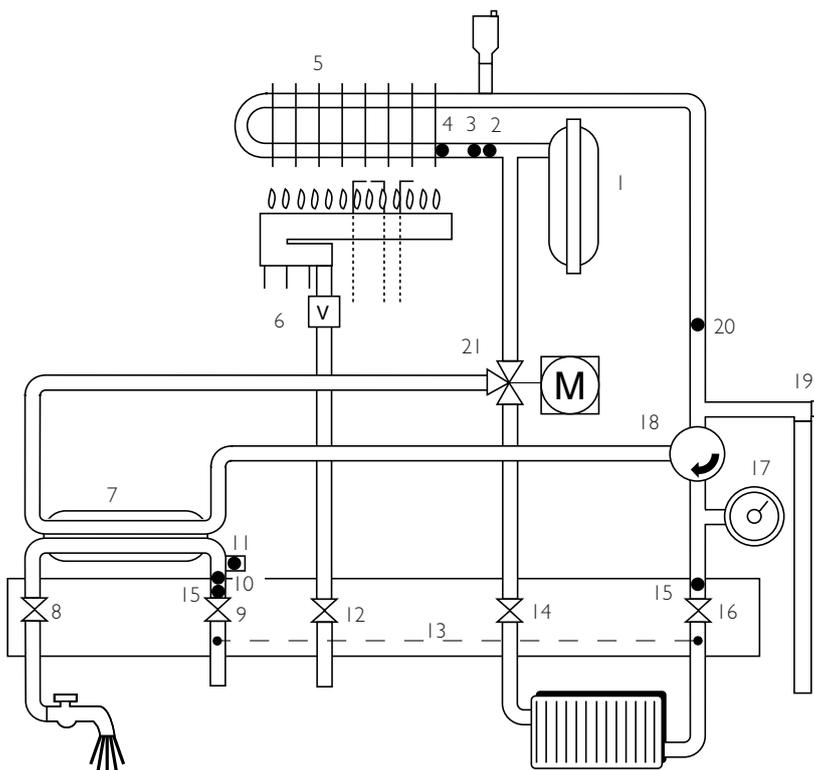
5. Optimum hot water delivery of 16 l/min (133 model), 12 l/min (100 model), 10 l/min (80 model) may be obtained by fitting the flow regulator supplied.

6.7 Showers

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

6.8 Hard Water Areas

1. If the area of the installation is recognised as a HARD WATER AREA then a suitable device should be fitted to treat the mains water supply to the boiler. Contact your Water Distribution Company for advice on suitable devices.



Key

1 Expansion Vessel	12 Gas Inlet
2 Flow Thermostat	13 Filling Loop
3 Flow Thermistor	14 CH Flow Valve
4 Flow Switch	15 Filter
5 Primary Heat Exchanger	16 CH Return Valve
6 Gas Valve	17 Pressure Gauge
7 DHW Plate Heat Exchanger	18 Pump
8 DHW Flow Valve	19 Pressure Relief Valve
9 DHW Mains Inlet	20 Return Thermistor
10 Flow Regulator	21 3 Way Valve
11 DHW Flow Switch	

7.0 Site Requirements

7.1 Location

NOTE: Due to the high efficiency 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.

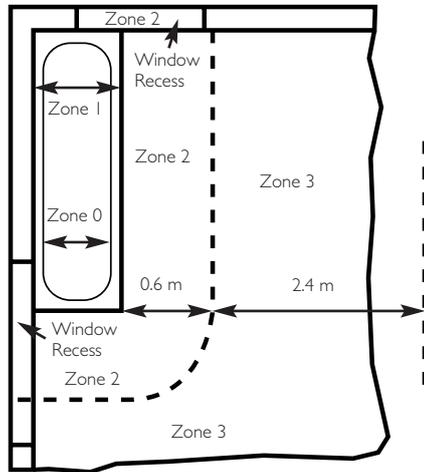


Fig. A In GB Only

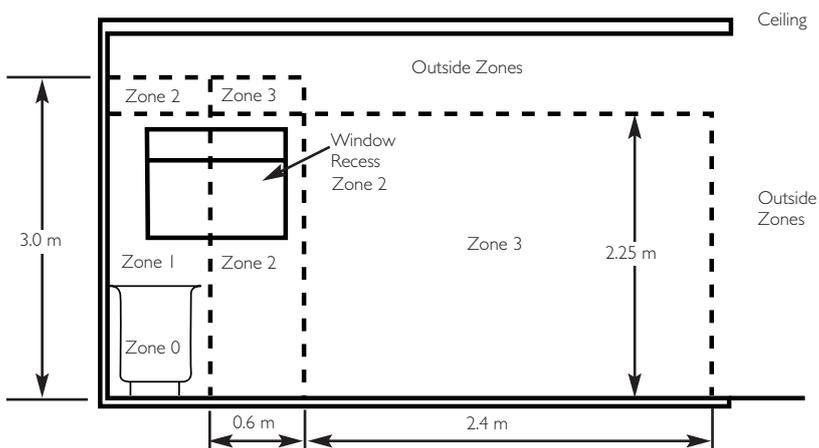


Fig. B In GB Only

1. The boiler may be fitted to any suitable non-flammable wall with the flue passing through an outside wall or roof and discharging to atmosphere in a position permitting satisfactory removal of combustion products and providing an adequate air supply. The boiler should be fitted within the building unless otherwise protected by a suitable enclosure i.e. garage or outhouse. (The boiler may be fitted inside a cupboard - see Section 7.2).

2. If the boiler is sited in an unheated enclosure then it is recommended to incorporate an appropriate device for frost protection in the system controls.

3. If the boiler is fitted in a room containing a bath or shower, the 100 HE Plus and 80 HE Plus can only be fitted in zone 3, the 133 HE Plus has a higher protection level and may be fitted in zone 2 (Figs. A & B shows zone dimensions for a bathtub. For other examples refer to Section 601 of the Current I.E.E. Wiring Regulations) reference must be made to the relevant requirements. In GB this is the current I.E.E. Wiring Regulations and Building Regulations.

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

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

7.2 Ventilation of Compartments

1. Where the appliance is installed in a cupboard or compartment, **no air vents are required. The appliance will run sufficiently cool without extra ventilation.**

Minimum Cupboard Size (inside dimensions)
Height - 1250mm Width - 590mm Depth - 400mm

NOTE: The ventilation label on the front of the outer case **MUST NOT BE REMOVED** when the appliance is installed in a compartment or cupboard.

2. BS 5440: Part 2 Clause 4.2 refers to room sealed appliances installed in compartments.

7.0 Site Requirements

7.3 Clearances (Fig. 6 & 7)

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

7.4 Gas Supply

1. 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 I.S. 813 "Domestic Gas Installations".
2. The connection to the appliance is a 1/2" BSPF.
3. Ensure that the pipework from the meter to the appliance is of adequate size. **Do not use pipes of a smaller diameter than 22mm up to the boiler connection.**

7.5 Electrical Supply

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

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

WARNING: The PCB Control and Fan Assembly is 325 Vdc. Isolate at supply before access.

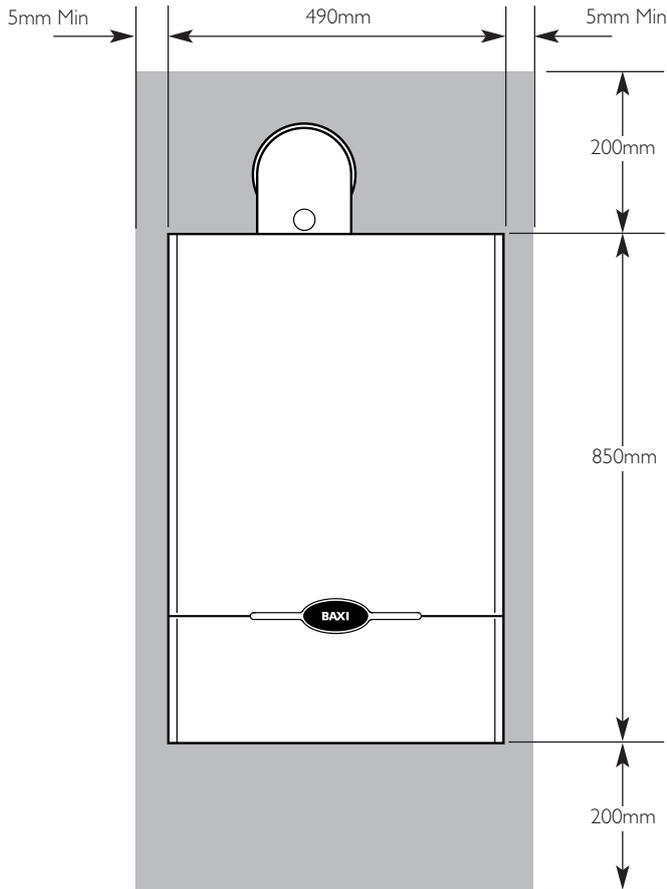


Fig. 6

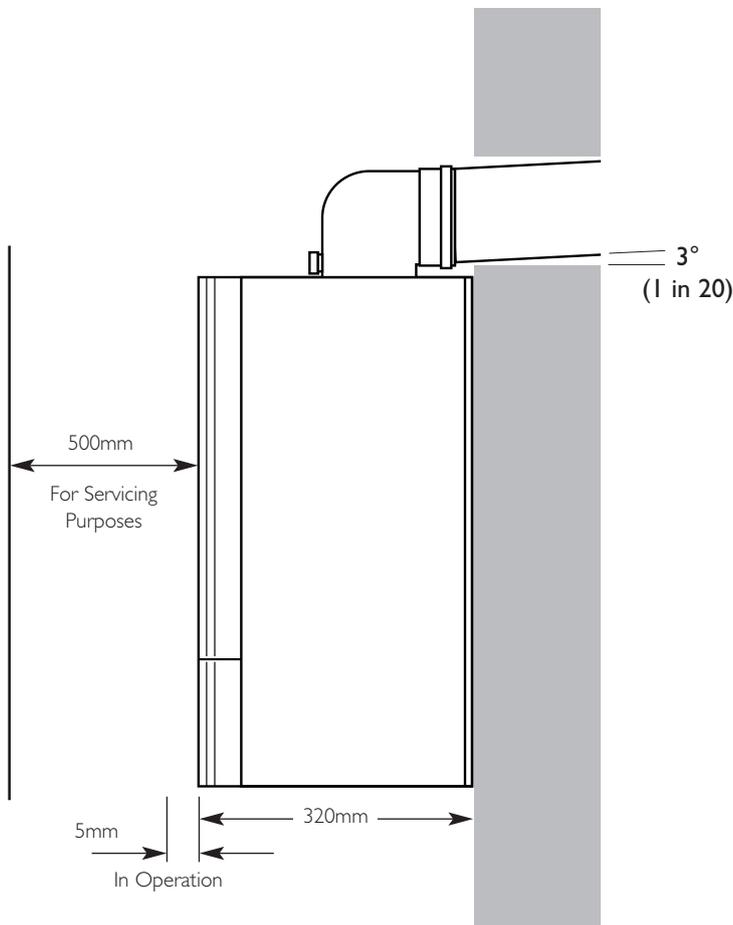


Fig. 7

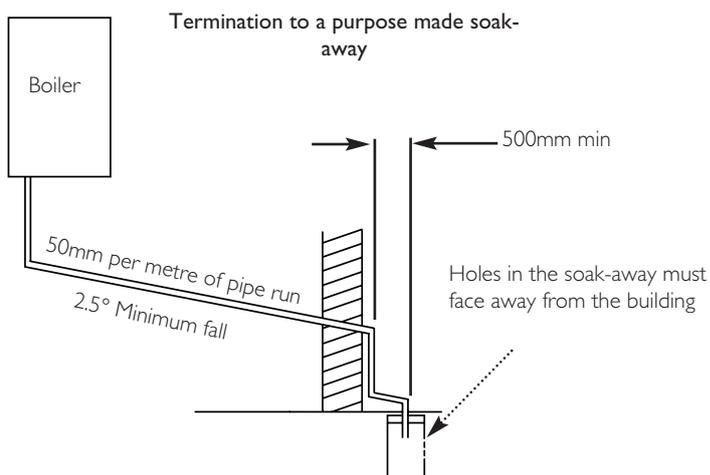
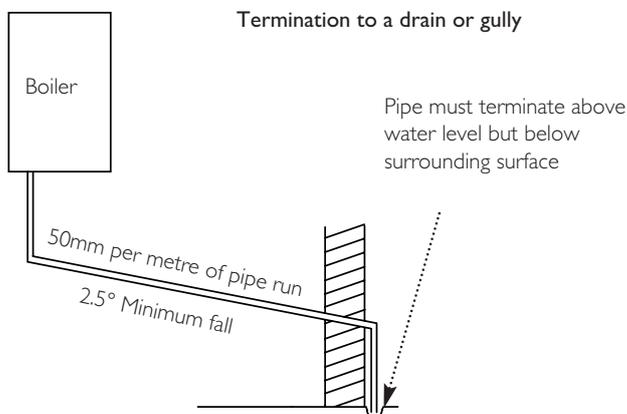
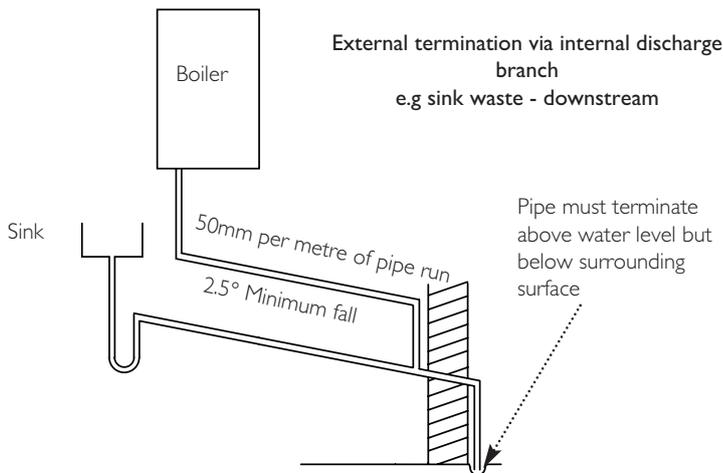
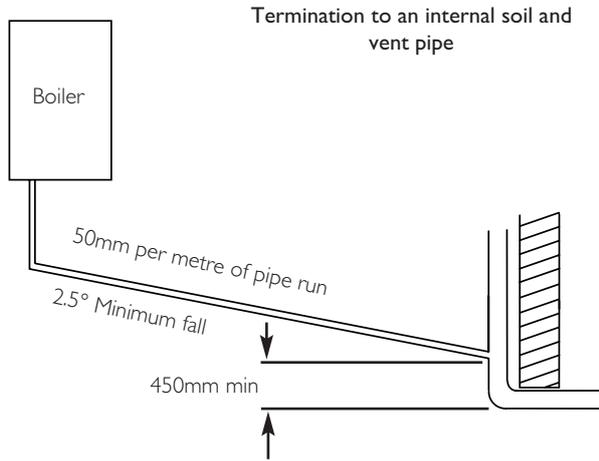
7.0 Site Requirements

7.6 Condensate Drain

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

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.

NOTE: It is unnecessary to fit an air break in the discharge pipe.



1. The condensate outlet terminates in a 1" BSP nut and seal for the connection of 21.5mm ($\frac{7}{8}$ in) plastic overflow pipe which should generally discharge internally into the household drainage system. If this is not possible, discharge into an outside drain is acceptable.

2. Ensure the discharge of condensate complies with any national or local regulations in force.

BS 6798:2000 & Part H1 of the Building Regulations give further guidance.

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

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

5. The pipe should be a minimum of 21.5mm diameter and must be supported using suitably spaced clips to prevent sagging.

6. It is advisable to keep the condensate pipe internal.

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

8. If the boiler is fitted in an unheated location the entire condensate discharge pipe should be treated as an external run.

9. 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.

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

Examples are shown of the following methods of termination:-

- to an internal soil & vent pipe
- via an internal discharge branch (e.g. sink waste)
- to a drain or gully
- to a purpose made soakaway

7.0 Site Requirements

7.7 Flue

NOTE: Due to the high efficiency 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.

Terminal Position with Minimum Distance (Fig. 10)	(mm)
A ^a Directly below an opening, air brick, opening windows, etc.	300
B ^a Above an opening, air brick, opening window etc.	300
C ^a Horizontally to an opening, air brick, opening window etc.	300
D Below gutters, soil pipes or drain pipes.	25
E Below eaves.	25
F Below balconies or car port roof.	25
G From a vertical drain pipe or soil pipe.	25
H From an internal (i) or external (ii) corner.	(i) 25 (ii) 115
I Above ground, roof or balcony level.	300
J From a surface or boundary line facing a terminal.	600
K From a terminal facing a terminal (Horizontal flue).	1200
From a terminal facing a terminal (Vertical flue).	600
L From an opening in carport (e.g. door, window) into the dwelling.	1200
M Vertically from a terminal on the same wall.	1500
N Horizontally from a terminal on the same wall.	300
R From adjacent wall to flue (vertical only).	300
S From an adjacent opening window (vertical only).	1000

Table 2

^a In addition, the terminal should be no nearer than 150 mm to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a window frame. See BS 5440 Pt. 1.

NOTE: The distance from a fanned draught appliance terminal installed parallel to a boundary may not be less than 300mm in accordance with the diagram below

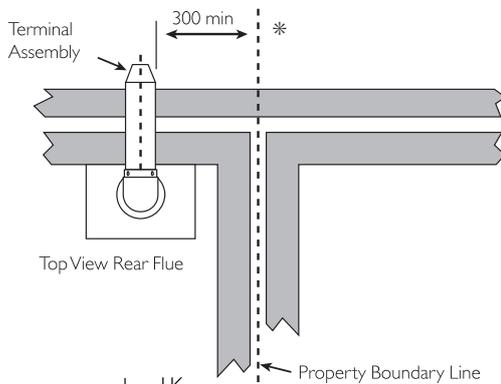


Fig. 9

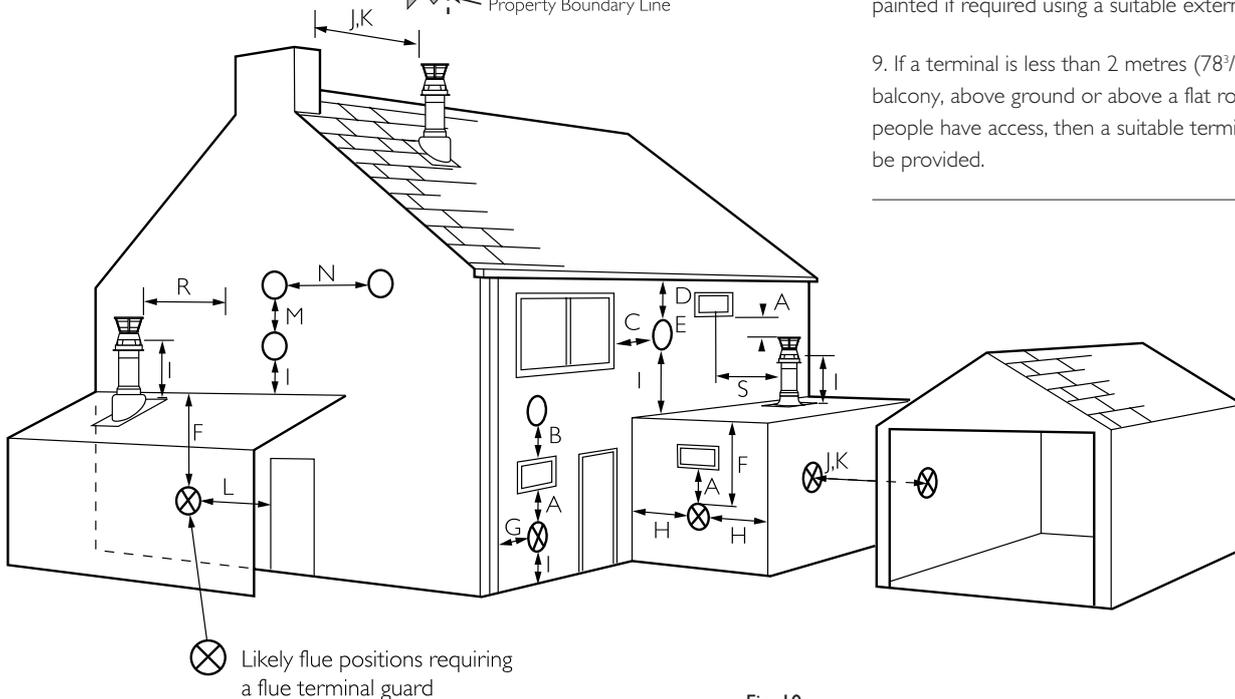


Fig. 10

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

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

3. Take into consideration the effect the plume of vapour may have on neighbours when siting the flue.

4. Adjacent surfaces close to the flue terminal may need protection from the effects of condensation. Alternatively a flue deflector kit (part no. 248167) is available.

5. For installation of the flue into an internal corner at the 25mm dimension the flue deflector kit (part no. 248167) must be fitted.

6. * Reduction to the boundary is possible down to 25mm but the flue deflector kit (part no. 248167) must be fitted.

7. If required a suitable terminal guard is available from Baxi for use with the flue deflector.

8. For fitting under low soffits and eaves it is acceptable for the flue to project upto 500mm from the face of the wall to the inside of the air intake. This can be painted if required using a suitable external paint.

9. If a terminal is less than 2 metres (78³/₄ in) above a balcony, above ground or above a flat roof to which people have access, then a suitable terminal guard must be provided.

7.0 Site Requirements

7.8 Flue Dimensions

See Section 2.2. The standard horizontal flue kit allows for flue lengths between 270mm and 800mm from elbow to terminal (Fig. 11).

The maximum permissible equivalent flue length is: 4 metres horizontal (Fig. 12).

NOTE: Each additional 45° of flue bend will account for an equivalent flue length of 0.5m.
eg. 45° = 0.5m, 90° = 2 x 45° = 1m etc.

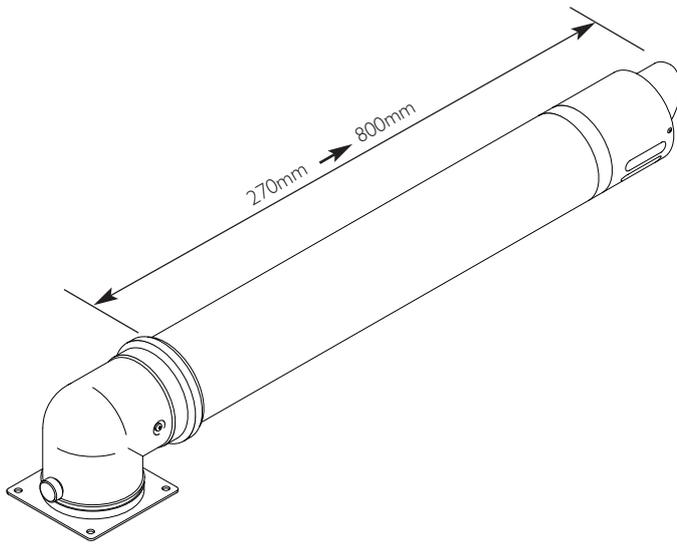


Fig. 11

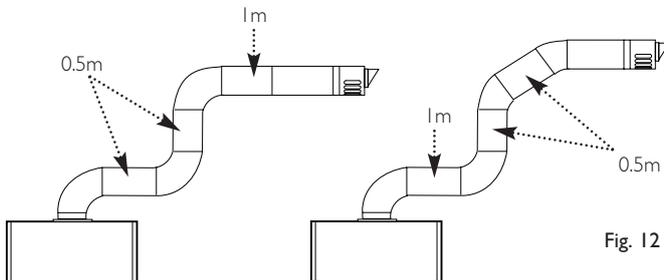


Fig. 12

Pictorial examples of flue runs where EQUIVALENT flue length equals 4m

7.9 Terminal Guard (Fig. 13)

1. When codes of practice dictate the use of terminal guards, they can be obtained from most Plumbers' and Builders' Merchants.

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

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

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

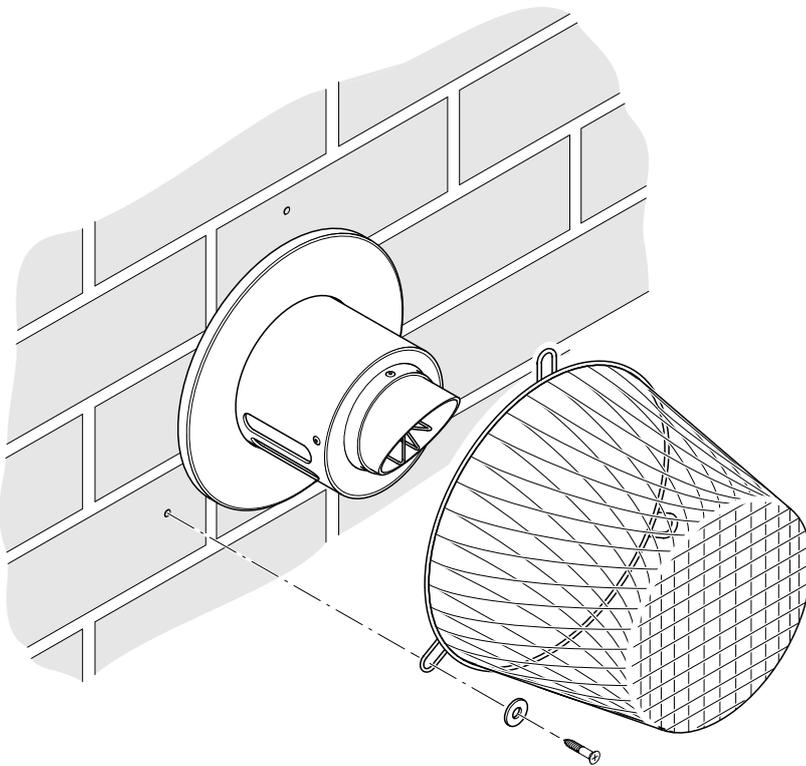


Fig. 13

7.0 Site Requirement

7.10 Flue options

Concentric

The maximum equivalent lengths are 4m (horizontal) or 5m (vertical). These lengths exclude the standard elbow and flue/terminal assembly (horizontal) and terminal assembly (vertical).

Twin Flue

The total maximum equivalent flue length is 40m.

NOTE: Each 1m of flue duct should be calculated as 2m.

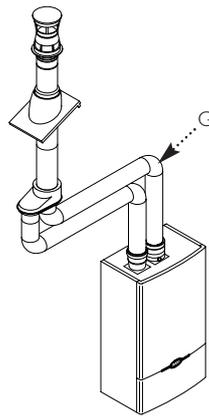
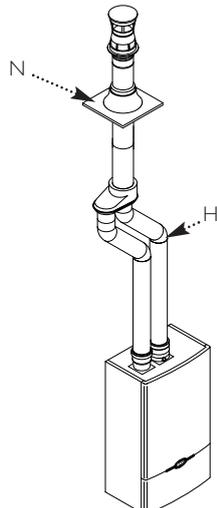
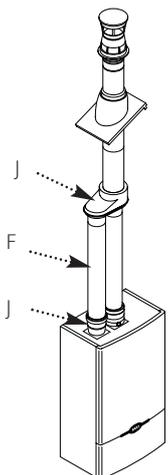
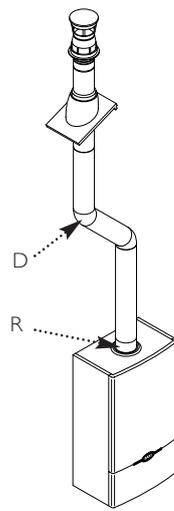
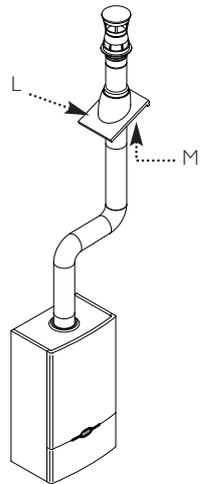
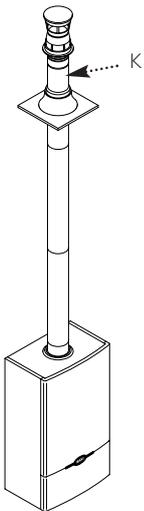
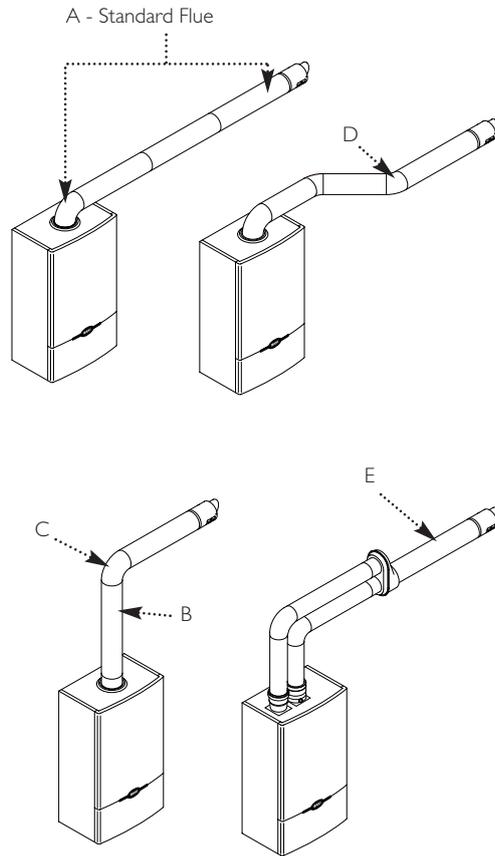
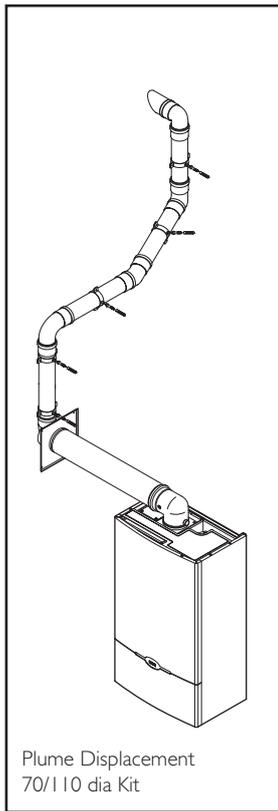
Any additional "in line" bends in the flue system must be taken into consideration. Their equivalent lengths are:

Concentric Pipes:	45° bend	0.5 m
	93° bend	1.0 m

Twin Flue Pipe:	45° bend (air duct)	1.3 m
	45° bend (flue duct)	2.6 m
	90° bend (air duct)	4.8 m
	90° bend (flue duct)	9.6 m

Detailed examples of equivalent flue length calculation are given in the Installation Guidance Notes for each flue system type.

(Documents 243501 and 243502 for concentric and twin pipe respectively).



Key	Accessory	Size	Baxi Code Number
Concentric Flue System 110mm diameter			
A	Horizontal flue kit	850mm	236921
B	Straight extension kit	1000mm	241695
		500mm	241694
		250mm	241692
C	Bend kit	93°	241687
D	Bend kit (pair)	45°	241689
E	Horizontal flue terminal		243013BAX
	Clamp	110mm	243014BAX
Twin Flue System 80mm diameter			
F	Straight extension kit	1000mm	238690
		500mm	238692
		250mm	238694
G	Bend kit	90°	246139
H	Bend kit (pair)	45°	246138
Universal Vertical Flue Kits			
J	Twin flue adaptor kit		242757
K	Vertical flue terminal		242802
L	Universal roof tile	25°/50°	243015
M	Roof cover plate kit		243131
N	Flat roof flashing		243016BAX
R	Boiler connection vertical concentric		242886
	Clamp	80mm	238684

8.0 Installation

8.1 Initial Preparation

Check Site Requirements (section 7.0) before commencing.

The gas supply, gas type and pressure must be checked for suitability before connection (see Section 7.4).

NOTE: If the boiler is to be pre-plumbed, follow both these instructions and those on the boiler pack.

1. Remove the fixing template (Fig. 14) from the fixing carton.
2. Position the template on the wall ensuring it is level both horizontally and vertically.
3. Mark the position of the top centre hole for the wallplate.
4. Mark the condensate discharge pipe area.
5. Mark the centre of the flue hole (rear exit).

For side exit: project the horizontal side flue centre line into the corner of the room and along the wall to where the flue hole will be drilled (Fig. 14).

The diagram (Fig. 14a) shows the dimensions required to ensure any horizontal flue is installed with the correct fall to the boiler. Mark the offset (V) dimension and if required, mark the position of the gas and water pipes. Remove the template.

6. Cut the hole for the flue (preferably with a 125mm/5" diameter core boring tool), ensuring that the hole is drilled at approx 3° up from the horizontal. Both wall faces immediately around the cut hole should be flat.

7. Drill and plug the wall as previously marked. Secure the wallplate to the wall by the top centre hole.

8. Ensuring the wallplate is level both horizontally and vertically, drill and plug the remaining 4 securing positions at the top and bottom through the wallplate. Utilising the slots available ensure the wallplate is square and secure to the wall.

9. Connect the gas, water and the pressure relief discharge pipes to the valves on the support bracket using the compression fittings supplied.

10. Loosely route the condensate discharge pipe to the area previously marked.

8.2 Flushing

1. Insert a tube into the valve outlet furthest from the filling loop (Fig. 15).
2. Flush thoroughly (see System Details, Section 6.0).

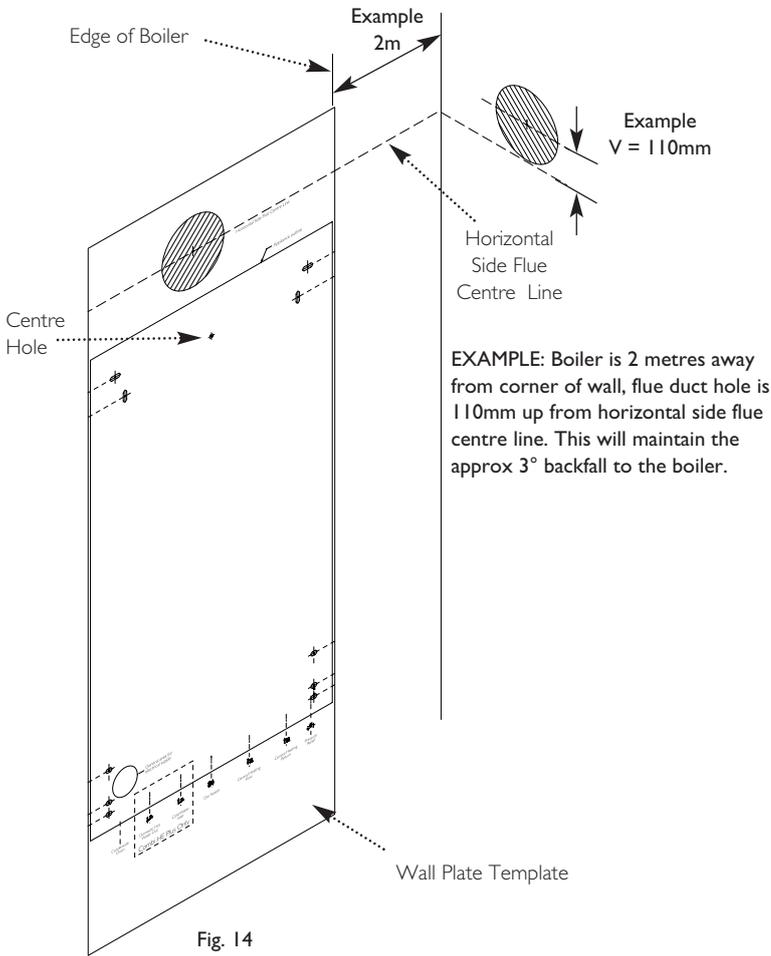
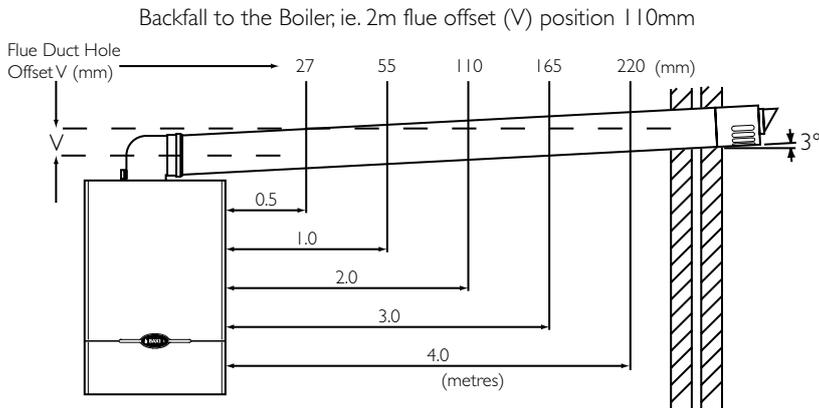


Fig. 14



Distance in metres from boiler to the wall.
For pipe lengths greater than 4m increase the off-set by 52mm for every additional metre to maintain approx 3° inclination.

Fig. 14a

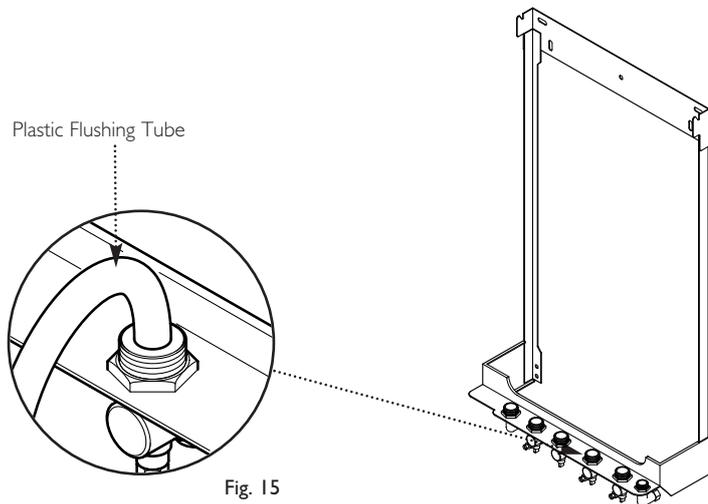


Fig. 15

The symbols for each connection are on the support bracket.

8.0 Installation

8.3 Preparing The Boiler

1. Remove the outer carton.
2. Hinge up the lower door panel (Fig. 16).
3. Remove the outer case fixing screws (Fig. 16). Slide the outercase upwards to disengage the hooks on the backplate and remove (Fig. 17).

NOTE: Service Guidance Note Label is fitted to the inside of the outercase (Fig. 17).

4. Remove the sealing plugs from the copper bends.
5. Remove cardboard transit packaging at the left hand rear of the boiler before lifting the boiler onto the support bracket.
6. Stand the boiler on its base by using the rear lower edge as a pivot.

NOTE: A small amount of water may drain from the boiler in the upright position.

Baxi declare that no substances harmful to health are contained in the appliance or used during construction of the appliance.

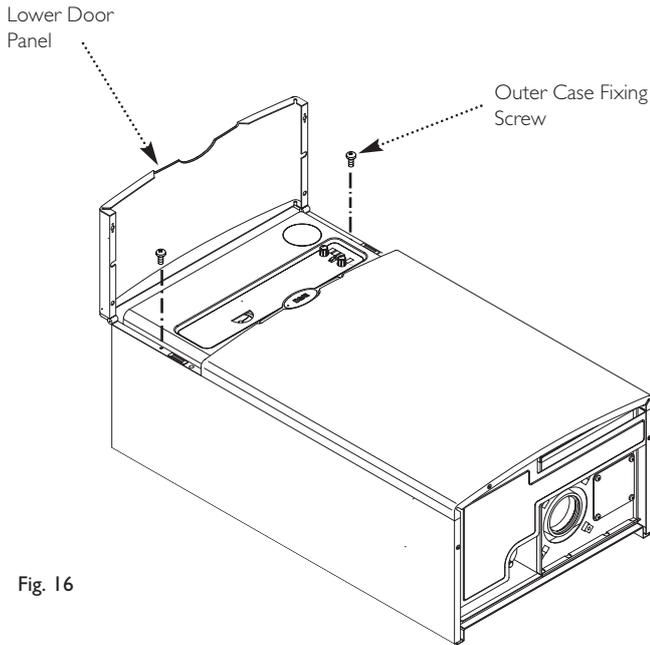


Fig. 16

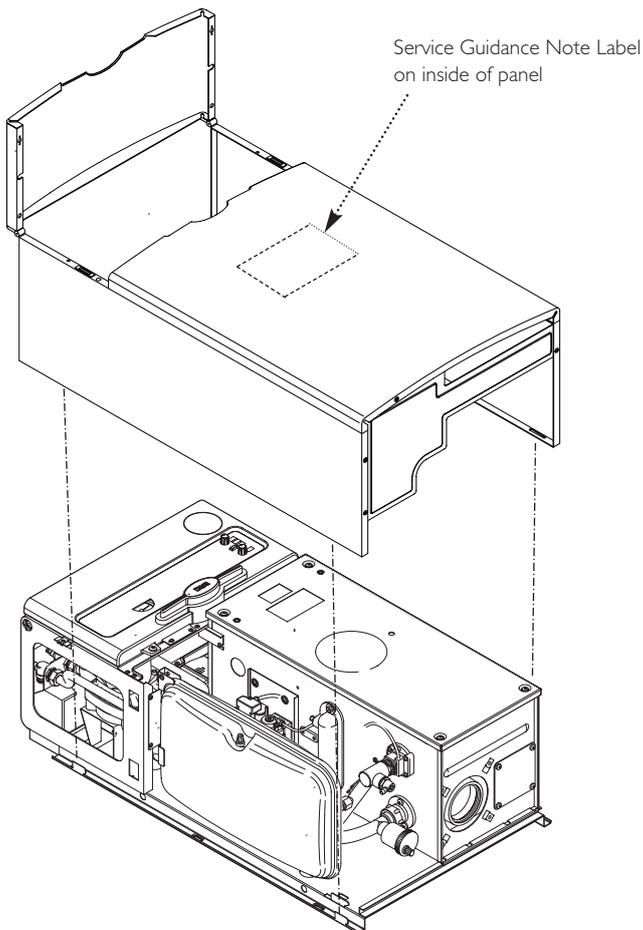


Fig. 17

8.0 Installation

8.4 Fitting The Boiler (Fig. 18)

1. Remove the tape from the tap rail on the support bracket.
2. Lift the boiler over the support bracket using the lifting points shown in Fig. 18 and engage onto the top hooks (see Lifting paragraph page 4).

NOTE: When installing in Loft/Small Compartment access for lifting the boiler from the front can be gained for two people using the lifting points (Fig. 18).

3. To gain access to the connections between boiler and valves, release the fascia securing screws ($1/4$ turn) and hinge down the fascia box.

4. Make the connections in the following sequence:

- a) Gas connection first to centralise the boiler. **The gas sealing washer is an integral part of the gas tap.**

The Combi HE is designed to operate under nominal water supply conditions. If the hot water delivery is greater than 18 l/min (133 model), 14 l/min (100 model), 12 l/min (80 model) the flow regulator must be fitted to the Domestic Hot Water inlet.

- b) Domestic hot water cold feed, if necessary fit the water flow regulator ensuring that it is fitted the correct way round (Fig. 20). **NOTE: Ensure water inlet filter is fitted.**

- c) The remaining connections ensuring the fibre sealing washers are inserted between the valve outlet face and the flange on the copper pipes of the water circuit and pressure relief connections (Fig. 20).

5. Tighten the connections in the sequence listed above.

8.5 Condensate Drain (see section 7.6)

1. Connect the condensate drain using the 1" BSP nut and seal supplied.

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

2. The condensate outlet terminates in a 1" BSP nut and seal for the connection of 21.5mm ($3/4$ in) plastic overflow pipe which should generally discharge internally into the household drainage system. If this is not possible, discharge into an outside drain is acceptable.

NOTE: To ensure the correct operation and integrity of the condensate drainage system - Carefully pour approximately 1 cupful (250ml) of water into the flue products exhaust, at the top of the heat exchanger (Fig. 19) to ensure a seal is made in the trap.

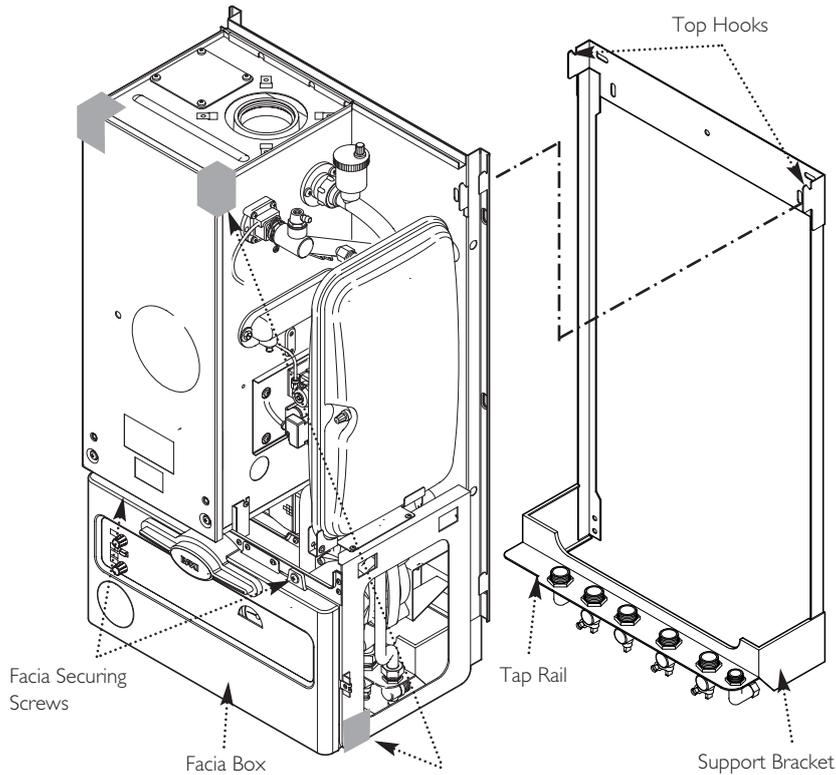
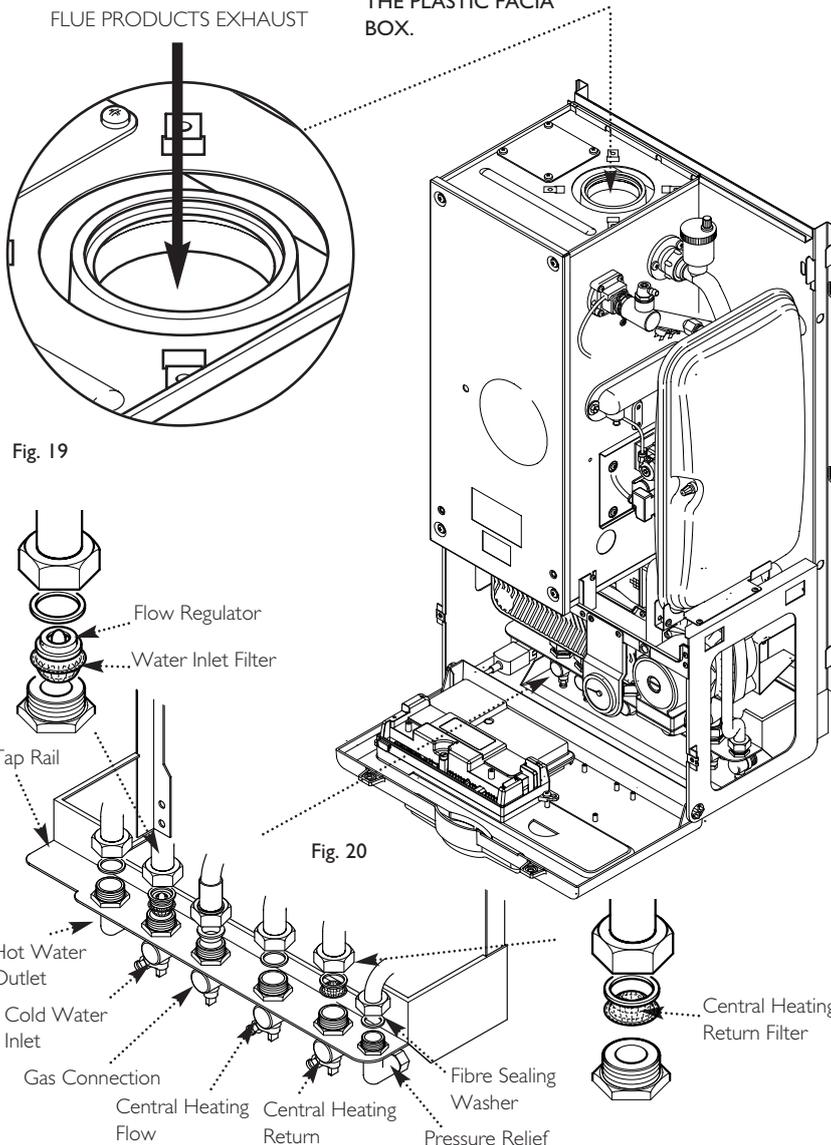


Fig. 18
Suggested Lifting Points shown as shaded area.
DO NOT LIFT USING THE PLASTIC FACIA BOX.



8.0 Installation

8.6 Fitting The Flue

Before fitting the flue, check the condensate drain integrity (see section 8.5).

IMPORTANT: The flue should always be installed with a 3° (1 in 20) fall from terminal to elbow, to allow condensate to run back to the boiler.

HORIZONTAL FLUE

1. The standard flue is suitable for lengths 270mm minimum to 800mm maximum (measured from the edge of the flue elbow outlet).

Rear Flue: maximum wall thickness - 614mm
Side Flue: maximum wall thickness - Right Hand 462mm, Left Hand 537mm when installed with minimum side clearances of 5mm.

2. For rear exit - measure the wall thickness (Fig. 21) and to this dimension add 201mm. This dimension to be known as (X).

i.e. (X) = wall thickness + 201mm

3. Take the flue and mark off (X) from the terminal end as indicated in the diagram (Fig. 22).

Check your dimensions.

The flue tubes are fixed together. Cut through both tubes whilst resting the flue on the semi-circular packing pieces. Deburr both tube ends.

4. For left hand exit - measure the distance from the edge of the support bracket to the inner face of the wall (Fig. 21) and to this dimension add the wall thickness + 268mm. This dimension to be known as (Y).

i.e. (Y) = support bracket to wall + wall thickness + 268mm

5. Take the flue and mark off (Y) from the terminal end as indicated (Fig. 22).

6. For right hand exit - measure the distance from the edge of the support bracket to the inner face of the wall and to this dimension add the wall thickness + 343mm. This dimension to be known as (Z).

i.e. (Z) = support bracket to wall + wall thickness + 343mm

7. Take the flue and mark off (Z) from the terminal end as indicated (Fig. 22).

Check your dimensions.

The flue tubes are fixed together. Cut through both tubes whilst resting the flue on the semi-circular packing pieces. Deburr both tube ends.

IMPORTANT: Check all measurements before cutting. When cutting ensure the cut does not interfere with the inner flue support bracket (Fig. 23).

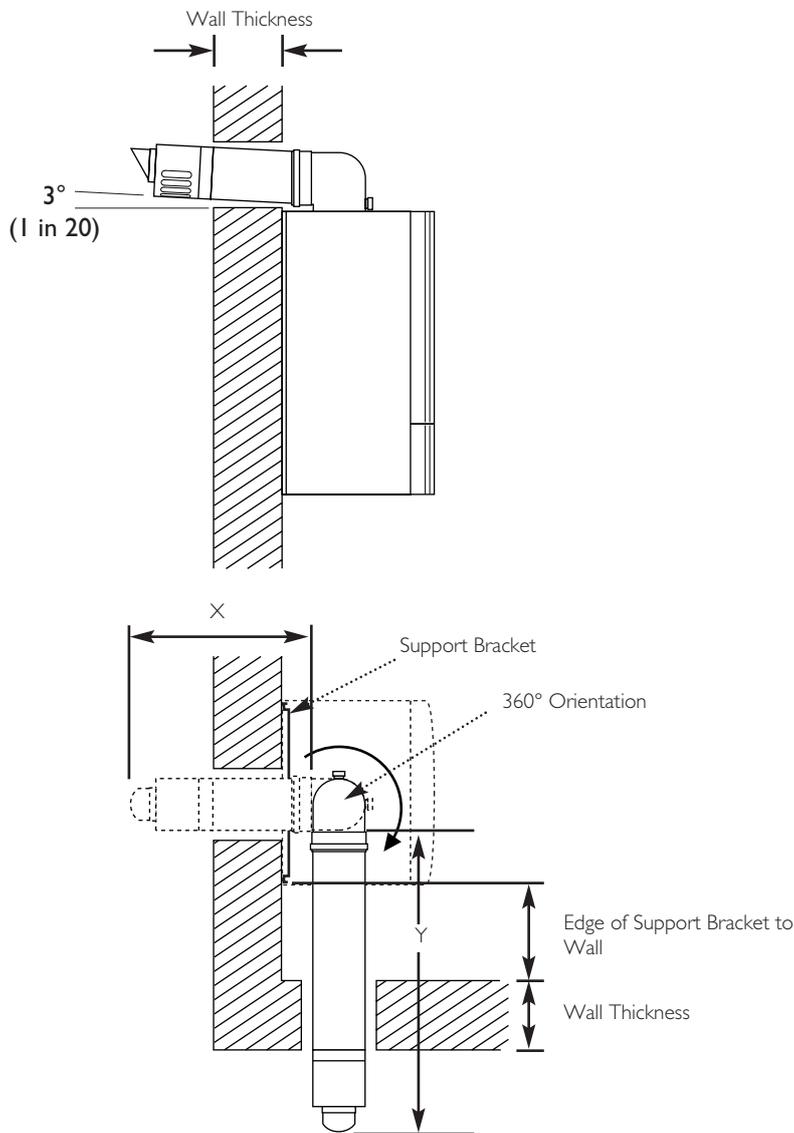


Fig. 21

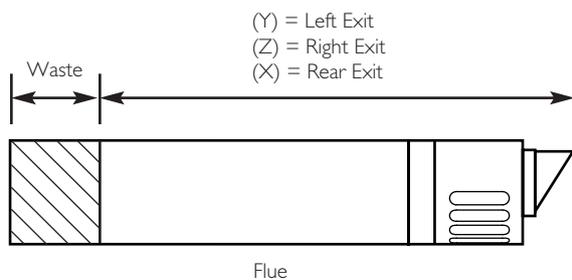


Fig. 22

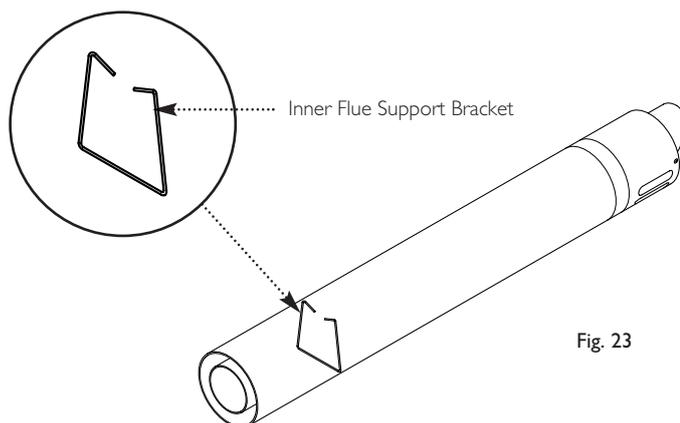


Fig. 23

8.0 Installation

8.6 Fitting the Flue (Cont)

8. Ensure the inner flue support bracket is positioned in the flue (Fig. 24).

9. Engage the flue into the flue elbow using soap solution to ease the engagement ensuring the flue is assembled as shown (Fig. 25).

10. Place the gasket over the flue exit on the boiler (Fig. 25).

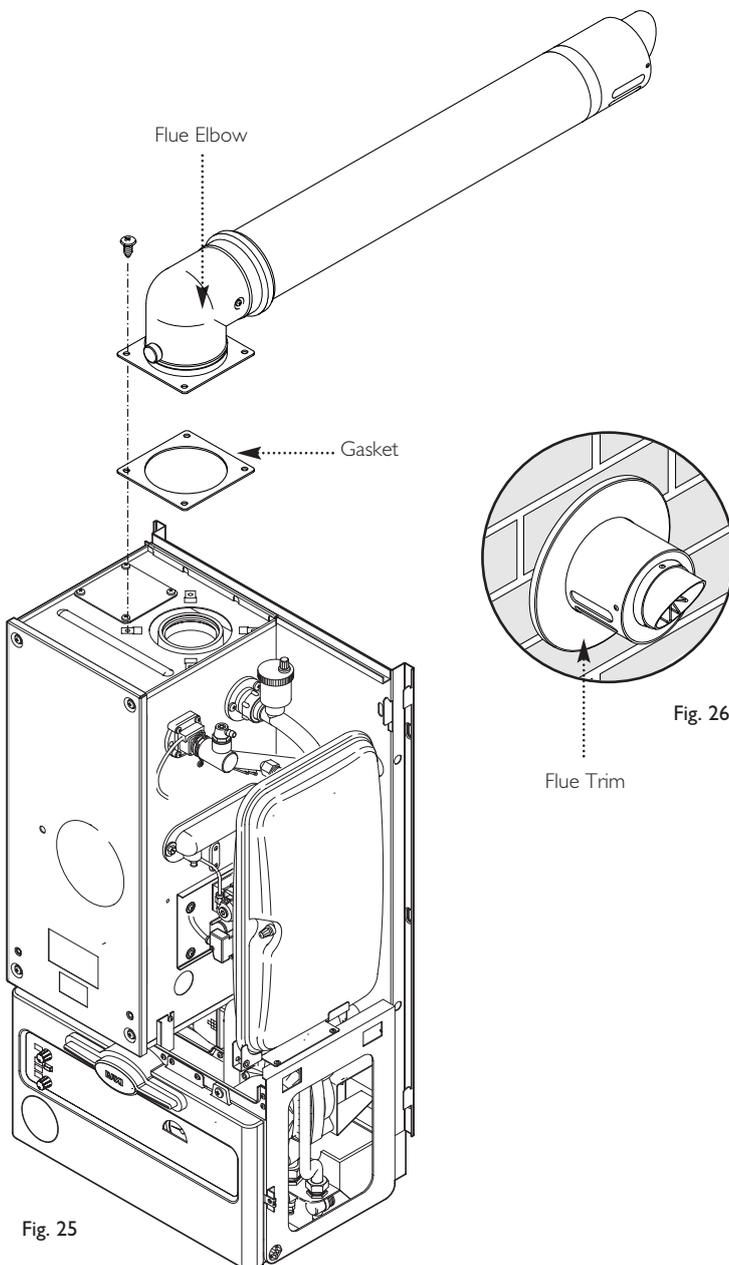
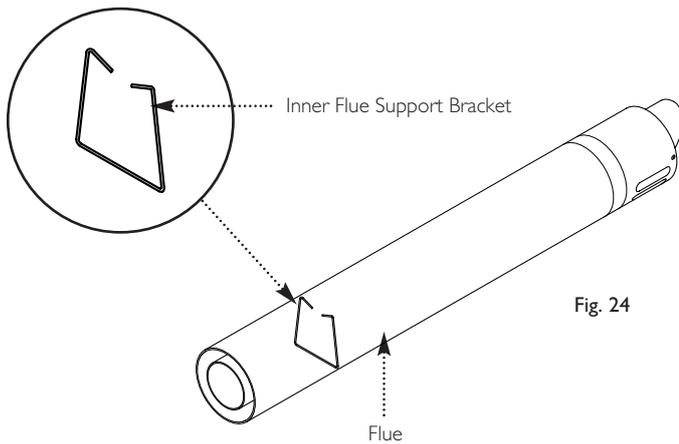
11. Slide the flue assembly through the hole in the wall. Ensure angled inner end slopes downwards (Fig. 26).

12. Engage the elbow on to the flue connection on top of the boiler. Secure with the four screws supplied in the kit.

13. Make good between the wall and air duct outside the building ensuring the 3° drop between the terminal and elbow.

14. The flue trim should be fitted once the installation is complete and the flue secure (Fig. 26). Apply a suitable mastic to the inside of the trim and press against the wall finish, making sure the brickwork is dust free and dry.

15. If necessary fit a terminal guard (see Section 7.9).



VERTICAL FLUEING

1. Only a flue approved with the Baxi Combi HE Plus Boiler Range can be used.

2. For information on vertical flues consult the Baxi Flue Guide Brochure or Notes for Guidance supplied with the vertical flue pack.

8.0 Installation

8.7 Making The Electrical Connections (Fig. 26a)

WARNING: This appliance must be earthed.

1. The electrical connection is on the rear left hand side of the unit.
2. Remove the electrical plug and lead assembly from the hardware pack.
3. Connect L, N & E of the lead into the fused double pole isolator serving the boiler. Connect the plug to the socket at the back left at the bottom of the boiler.
4. Remove the metal shield from the hardware pack and connect it over the plug.
5. If fitting an integral timer please refer to the instructions supplied with the kit.
6. Check the electrical installation for; earth continuity, short circuits, resistance to earth, correct polarity and fuse failure (see Section 8.13 Electrical System Checks).

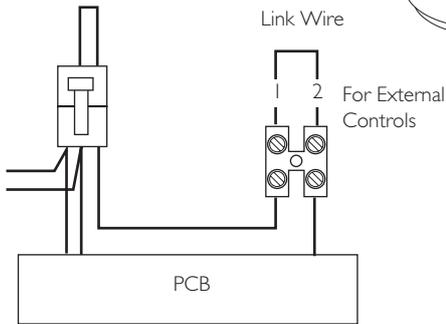
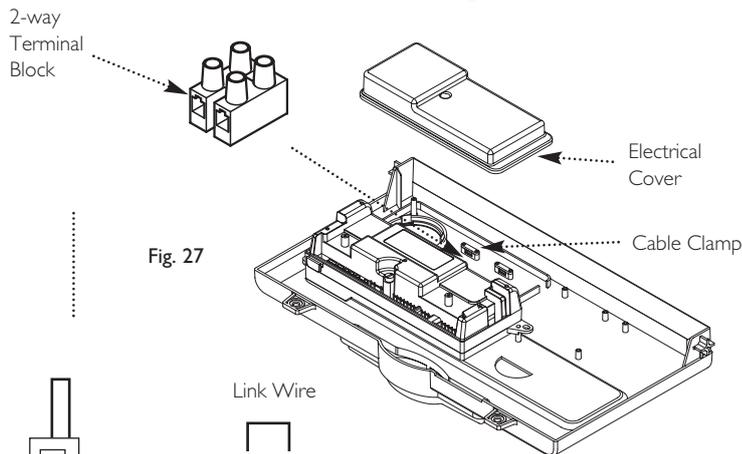
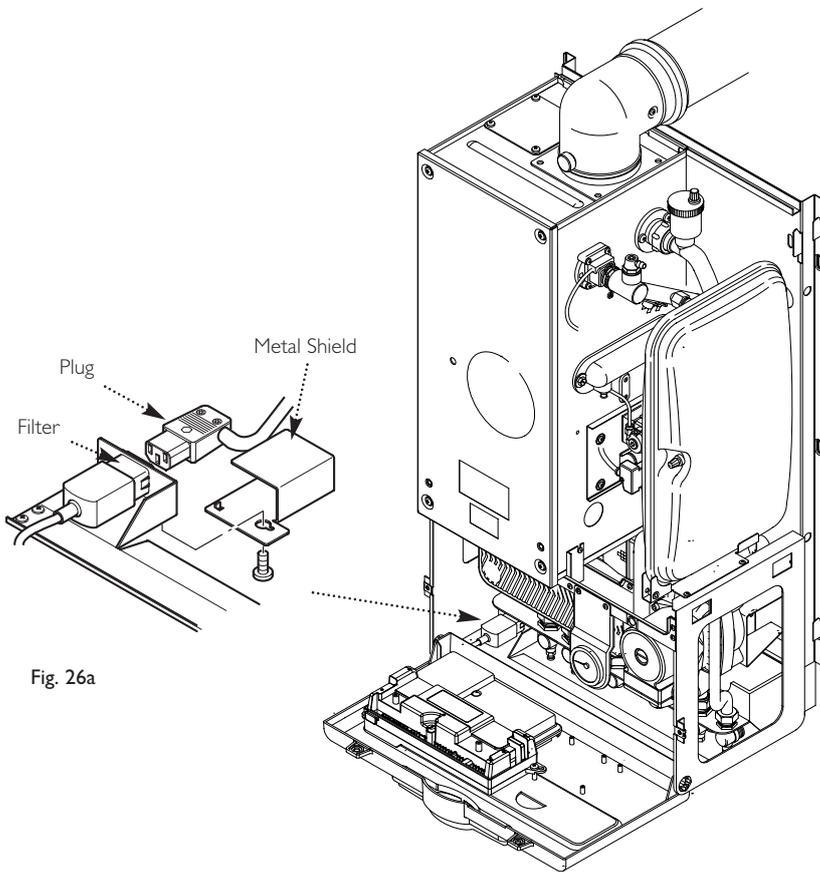


Fig. 28

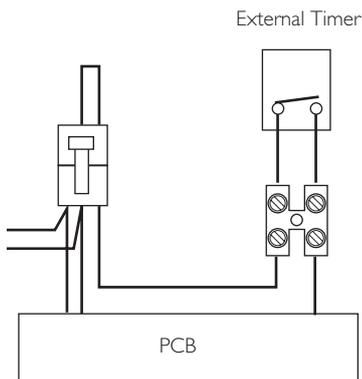


Fig. 29

8.8 Connecting an External Timer

1. Undo the screw securing the electrical cover and remove (I33 HE Plus only) (Fig. 27).
2. To connect an external timer switch circuit, remove the link wire between terminals 1 & 2 and connect the switch circuit (Figs. 28 & 29).
3. A cable clamp is provided for incoming cables.

8.0 Installation

8.9 Fitting a Room Thermostat

1. To fit a 2-wire thermostat, remove link and wire the thermostat switch between positions 1 & 2 (Figs. 30a). A cable clamp is provided for incoming cables.

8.10 Fitting a Frost Thermostat

1. The frost thermostat is connected between positions 1 and 2 (Fig. 31) or between mains isolator and position 2 (Fig. 31).
2. Secure the incoming cable/s with the cable clamp and replace the cover.

8.11 Electrical System Checks

1. **Earth Continuity Check:** Isolate the appliance at mains supply. Using a multimeter set to ohm's scale, test between any appliance earth point and the earth pin on the socket. The resistance should be less than 1 ohm. If the resistance is greater than 1 then check all earth wires for continuity and ensure that all connections are clean and tight.

WARNING: If the resistance is still greater than 1ohm the fault still exists and it could be dangerous to work with the appliance live.

2. **Short Circuit Check:** Isolate the control system, set all switches and thermostats to calling for heat. Set the meter on ohm's scale. Test from L to N on control system terminal block - if the resistance reads zero there is a short circuit.

3. **Resistance to Earth Check:** Isolate the control system, set all switches and thermostats to calling for heat. Set the meter on ohm's scale. Test between L and E - the resistance should be greater than 1 mega ohm.

4. **Polarity Check:** If all the tests you have carried out so far are OK, then reconnect the system to the mains supply. Set the meter on Volts AC scale (starting at the highest voltage). Test at terminals:

- L and N - meter should read approx 240 Vac
- L and E - meter should read approx 240 Vac
- N and E - meter should read from 0 to 15 Vac

5. **Fuse Check:** Remove the fuse, check fuse on ohm's scale there should be no resistance (infinity) or maximum reading. If no reading is obtained change the fuse. Check fuse is 3A.

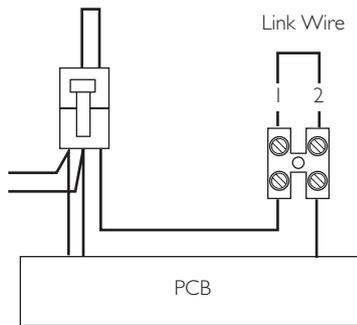
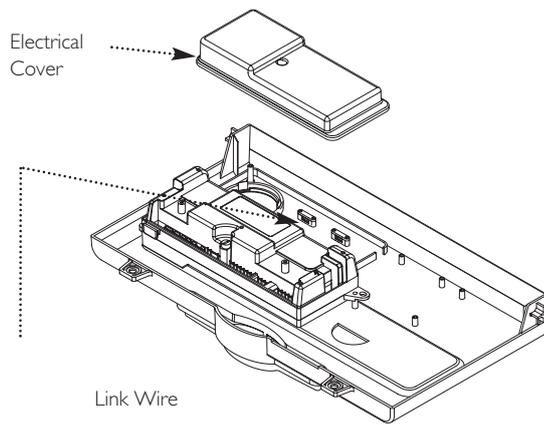


Fig. 30

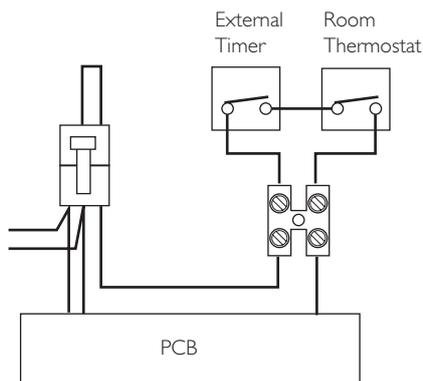


Fig. 30a

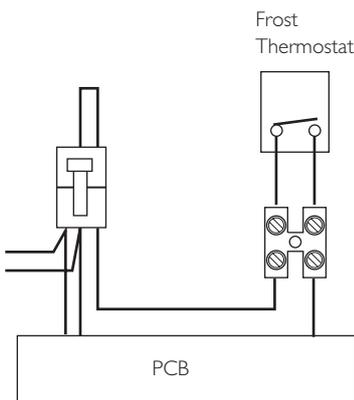
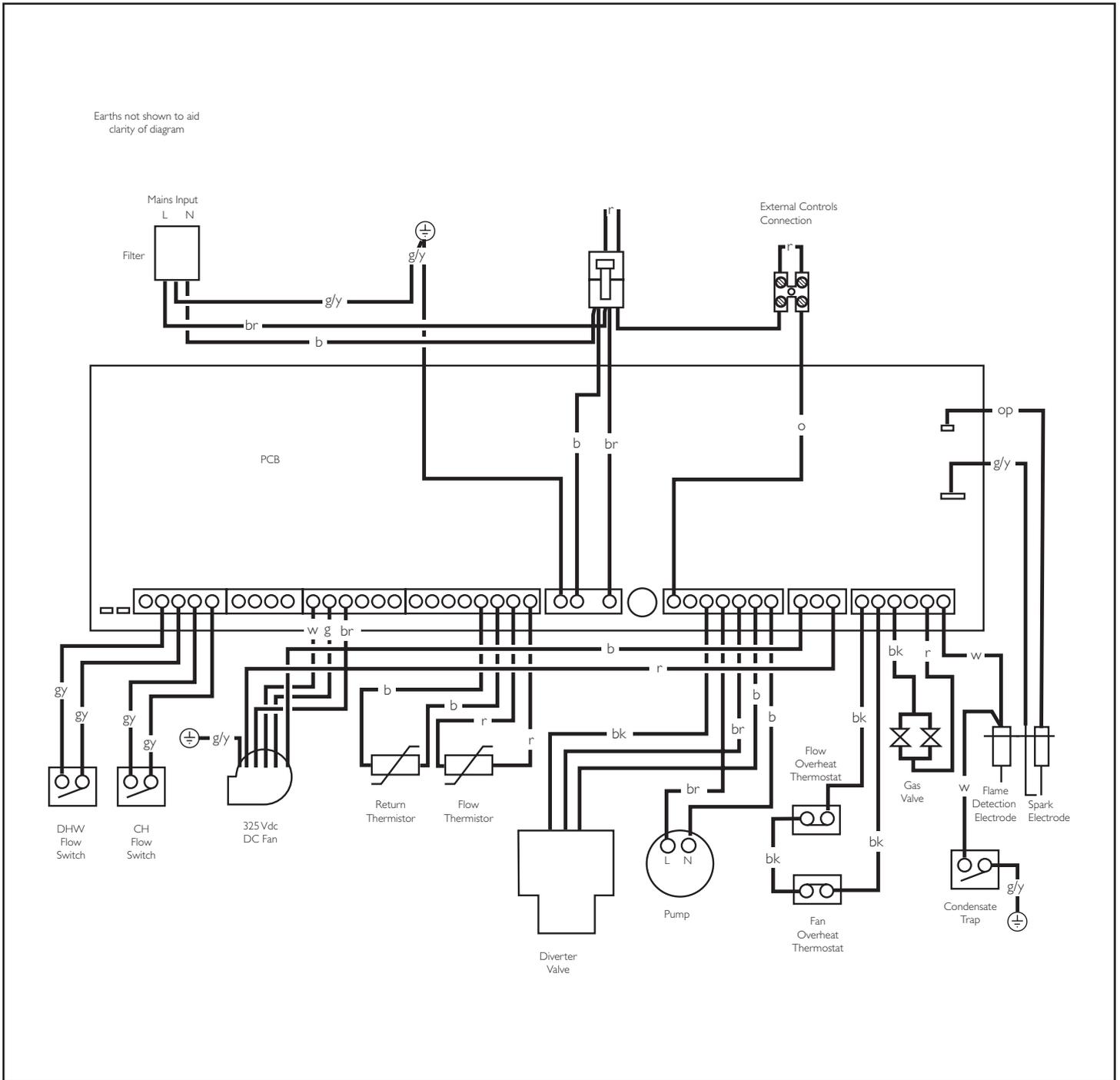


Fig. 31



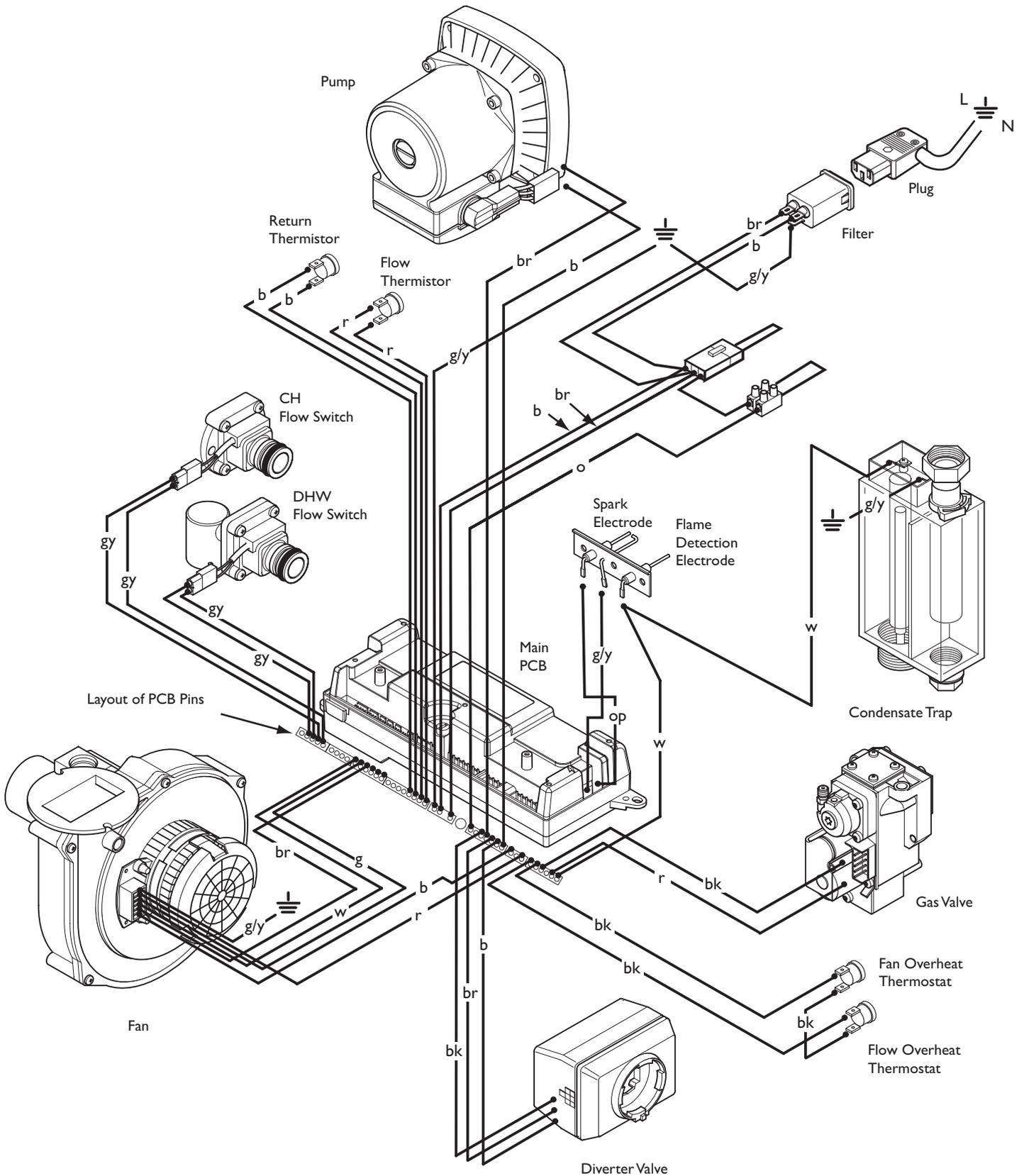
Key To Wiring Colours

b - Blue	r - Red
bk - Black	g - Green
gy - Grey	g/y - Green/Yellow
w - White	o - Orange
br - Brown	y - Yellow
op - Opaque	

Key To Wiring Colours

- | | |
|-------------|--------------------|
| b - Blue | r - Red |
| bk - Black | g - Green |
| gy - Grey | g/y - Green/Yellow |
| w - White | o - Orange |
| br - Brown | y - Yellow |
| op - Opaque | |

9.2 Illustrated Wiring Diagram



10.0 Commissioning the Boiler

10.1 Commissioning the Boiler

NOTE: The information shown on the display is explained on the label on the inside of the lower door panel (see Fig. 38).

1. Open the cold feed to the boiler.
2. Open all hot water taps to purge the Domestic Hot Water Circuit.
3. Ensure that the filling loop is connected and open, then open the heating flow and return valves on the boiler (see Section 10.4 Filling the System).
4. Open the manual and automatic air vents (Fig. 32) (ensure all external controls are turned on and calling for heat).
5. The system must be flushed in accordance with BS 7593 (see Section 6.1) and the flushing agent manufacturers instructions, further guidance can be obtained from BS 5449 Section 5.
6. Refill the system and add inhibitor following the inhibitor manufacturer's instructions. Vent air as described in Step 4.
7. Complete the label supplied with the inhibitor and attach to the inside of the boiler case. Detail of system treatment should be added for future reference.
8. Pressurise the system to 1.5 bar then close and disconnect the filling loop.
9. Turn the gas supply on and purge according to in GB BS 6891 and in IE IS 813 "Domestic Gas Installations".
10. Turn the gas service cock anticlockwise to the ON position and check for gas soundness up to the gas valve.
11. Run the system and check the boiler for correct operation.

NOTE: These boilers are self-regulating and the gas rate will vary continuously between maximum and minimum modulation depending on the system or DHW load. The maximum CH input is factory set to 26.95kW. This can be increased to 33.7kW on the 133 and 100 models - see section 10.2.

No adjustment of the gas valve is possible.

12. After a period of 3 minutes and with all the system controls calling for heat, check the gas pressure at the inlet tapping of the gas valve (Fig. 34) is greater than 14mbar and the gas rate is no greater than 4.2m³/h (133 model) 3.1m³/h (100 model) 2.5m³/h (80 model).

WARNING: The PCB Control and Fan Assembly is 325 Vdc. Isolate at supply before access.

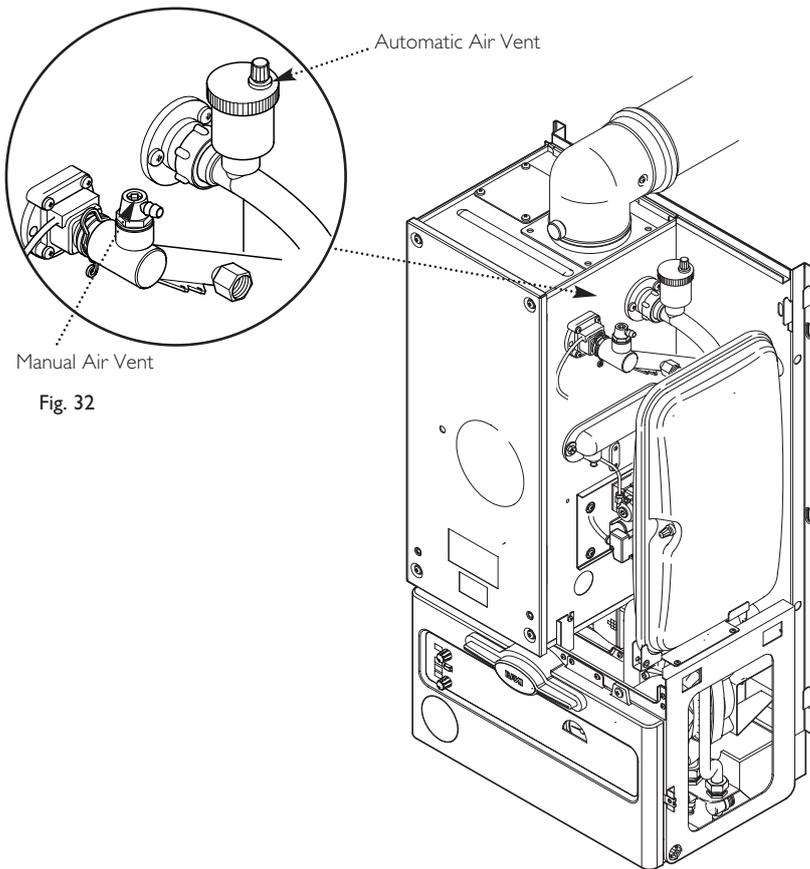


Fig. 32

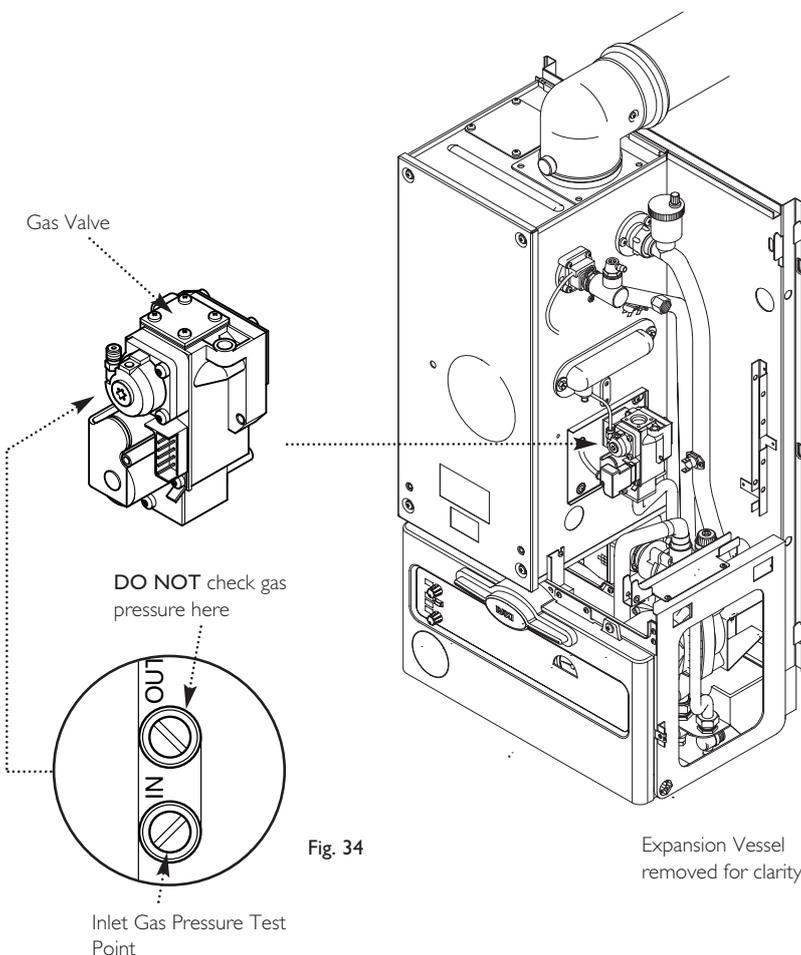


Fig. 34

Expansion Vessel removed for clarity

10.2 Increasing Central Heating Output To 100,000 Btu/hr (Fig. 35) (Combi 133 & 100 HE Plus only)

1. The boiler is factory set for a maximum output of 80,000 Btu/hr. The boiler will automatically vary its output to match the system load giving the most efficient use of gas and the most comfortable room temperature possible.

2. If the CH system is greater than 80,000 Btu/hr then to increase the maximum output of the boiler to 100,000 Btu/hr proceed as follows:

- a) Isolate the mains supply to the boiler.
- b) Remove the outer case.
- c) Lower the hinge down facia box.
- d) Remove the PCB connection cover.
- e) At the extreme left hand side of the PCB there are two jumpers. Remove the red one labelled CN12.

3. Reassemble in reverse order.

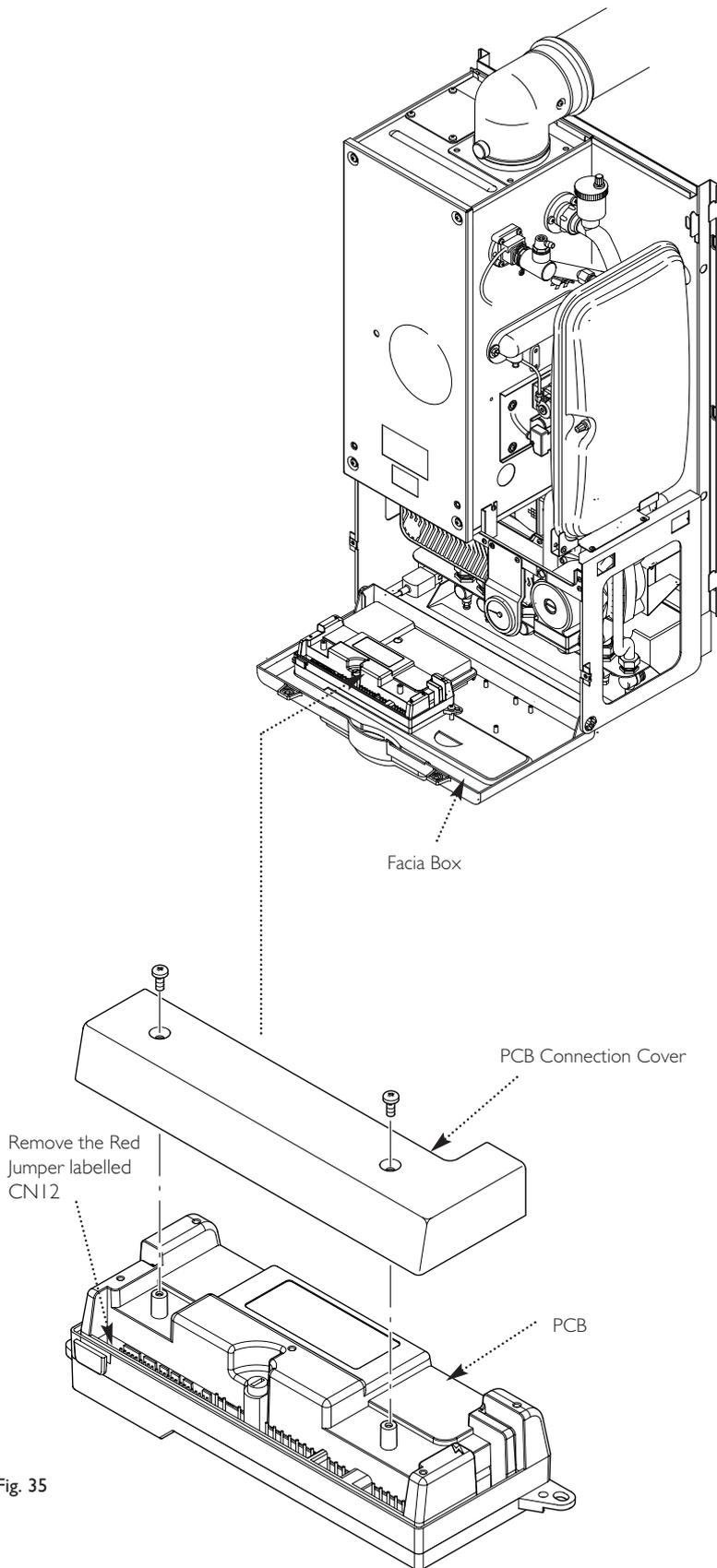


Fig. 35

10.3 Switching Off The Intelligent Pre-heat (Fig. 36)

1. The boiler includes an intelligent pre-heat feature. This feature ensures that the domestic hot water to the tap is pre-heated when, and only when, the user required domestic hot water the previous week. For example, if the user only requires hot water between 7.00am and 8.00am on Monday then the boiler will log this demand and then the next week will only pre-heat between 7.00am and 8.00am on Monday. During the first week of operation from power on no pre-heating will occur.

2. The pre-heat switches the boiler on for approximately 1 minute every 40 minutes whenever it is required.

3. The boiler is factory set with the pre-heat feature on. If the user wishes to disable this feature then proceed as follows:

- a) Isolate the mains supply to the boiler.
- b) Remove the outer case.
- c) Lower the hinge down facia box.
- d) Remove the PCB connections cover.

e) At the the extreme left hand side of the PCB there are two jumpers (one Blue, one Red). Remove both Blue and Red jumpers.

4. Reassemble in reverse order.

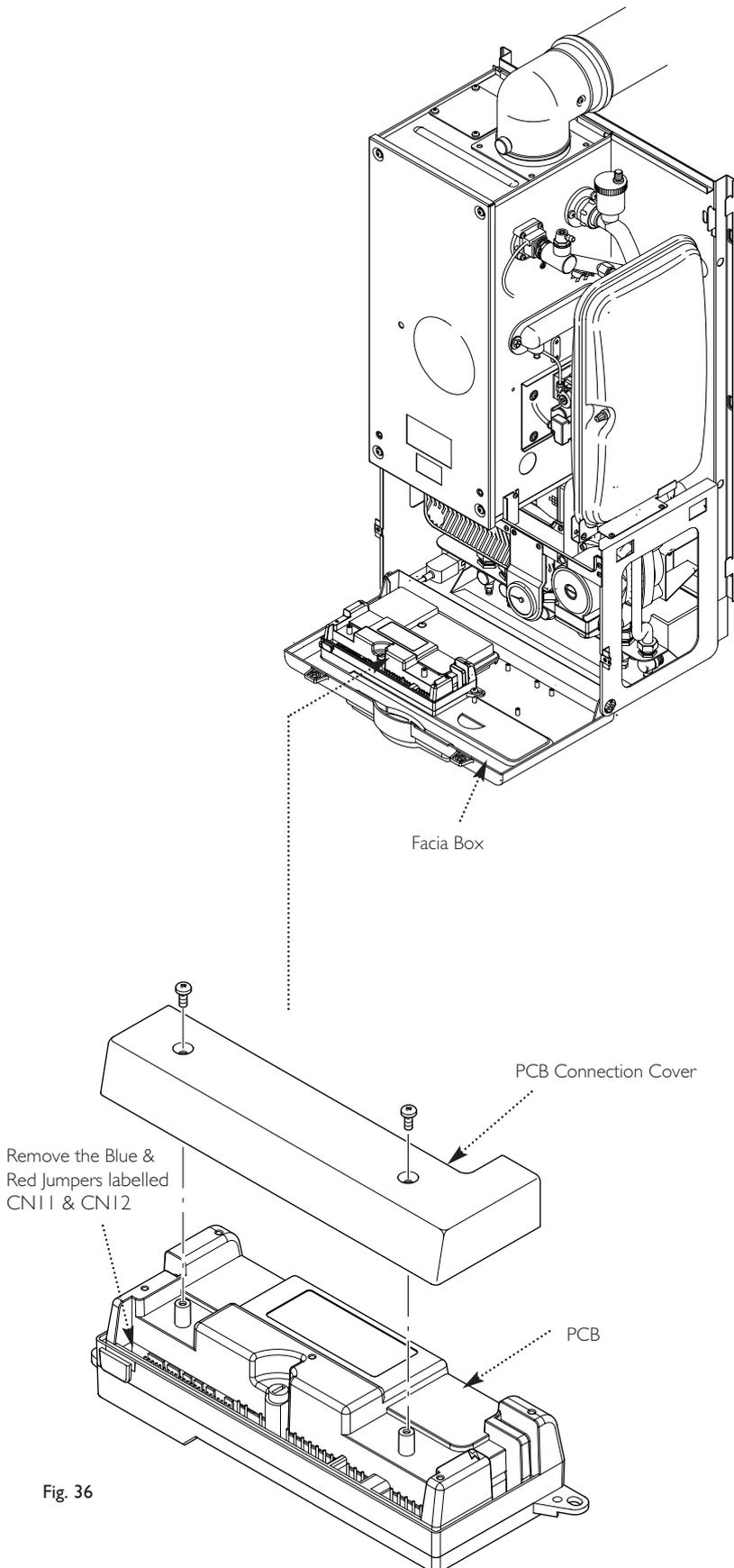


Fig. 36

10.4 Filling the System

1. When filling the system move the diverter valve to the central heating position as follows;

- a) Ensure that no DHW taps are on.
 - b) Turn power on to the boiler.
 - c) Ensure that any external controls are calling for heat.
 - d) After 10 seconds turn the boiler off at the isolation switch.
 - e) The diverter valve will now be in the central heating position. There is no need to reset the position of the diverter valve after filling.
-

11.0 Fitting the Outer Case

11.1 Fitting The Outer Case

1. Fit the outercase to the appliance ensuring that the four slots in the side flanges align with the hooks on the chassis (Fig. 38).

2. Insert the two fixing screws into the sides of the chassis (Fig. 39).

3. Close the lower door panel against the retaining magnets (Fig. 39).

4. Instruct the user in the operation of the boiler controls. Hand over both the Users Operating and Installation and Servicing Instructions, giving advice on the necessity of regular servicing.

5. Advise the user that a plume of vapour from the flue terminal is normal, and that there is no need for concern.

6. Advise the user that if intelligent pre-heat is on, pre-heating will not occur for the first week of operation.

7. Set the User preferences. See User Label on lower door panel (Fig. 38) or user's operating instructions (set CH/DHW temperatures).

8. Carefully read and complete all sections of the Benchmark Commissioning Checklist at the rear of this publication that are relevant to the appliance and installation. These details will be required in the event of any warranty work. The publication must be handed to the User for safe keeping and each subsequent regular service visit recorded.

9. For IE, it is necessary to complete a "Declaration of Conformity" to indicate compliance to 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.

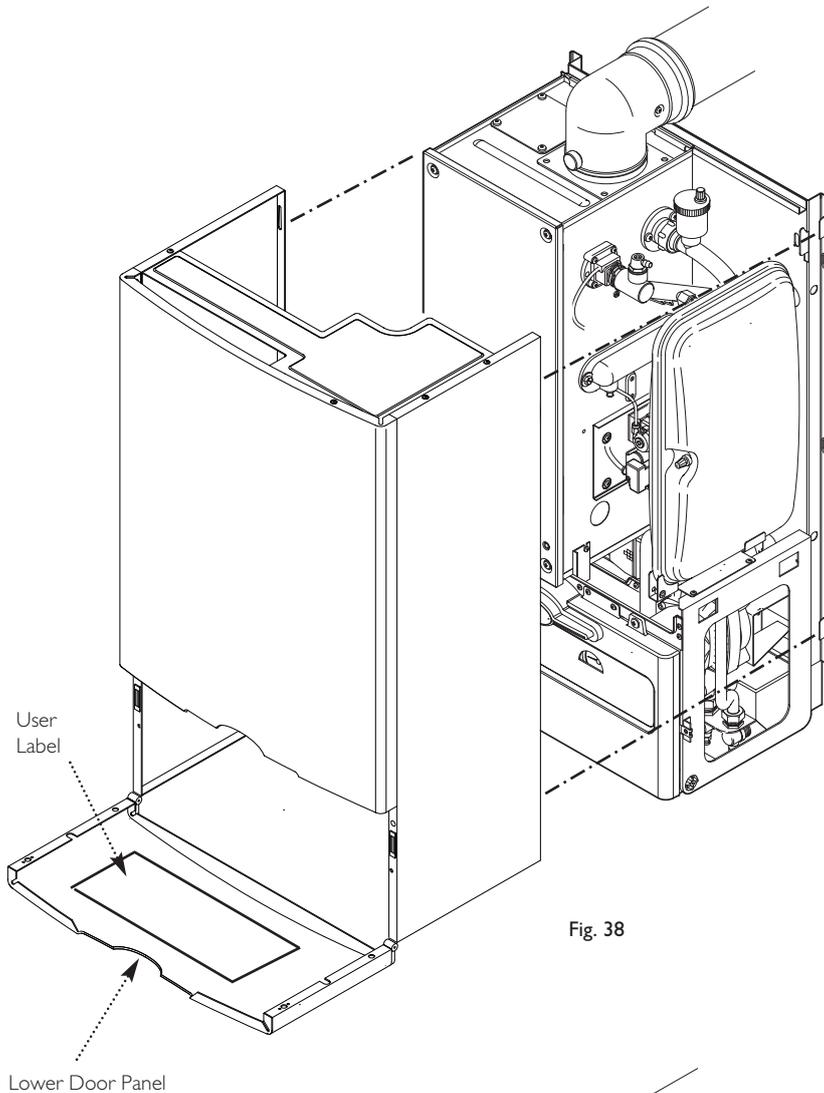


Fig. 38

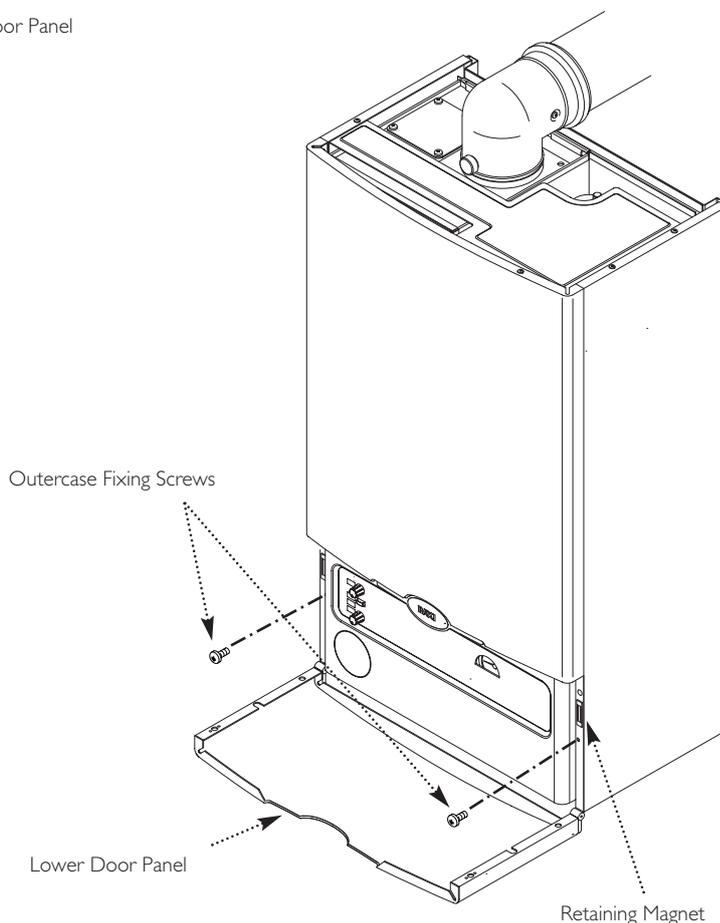


Fig. 39

12.0 Servicing the Boiler

12.1 Annual Servicing

IMPORTANT: When servicing ensure that both the gas and electrical supplies to the boiler are isolated before any work is started.

“The boiler cannot be switched off at the boiler, therefore it is important to isolate the electrical supply at the mains fuse.”

Hazardous materials are not used in the construction of Baxi products, however reasonable care during service is recommended.

When replacing the combustion box door after servicing it is essential that the retaining screws are tightened fully.

1. For reasons of safety and economy, it is recommended that the boiler is serviced annually. Before servicing please read Section 1.2 Important Information.

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

3. Ensure that the boiler is cool.

4. Ensure that both the gas and electrical supplies to the boiler are isolated.

5. Remove the outercase and lower door panel (see Fitting the Outercase, Section 11.0 in reverse).

WARNING: The PCB Control and Fan Assembly is 325 Vdc. Isolate at supply before access.

6. Release the four 1/4 turn screws securing the air box door panel and remove the door (Fig. 40).

7. Disconnect the three lead terminals from the combustion box door taking note of their positions (Fig. 40).

8. Undo the four screws securing the combustion box door and remove the door (Fig. 41).

9. Visually check for debris/damage and clean or replace if necessary the following:

- a) Burner (**Fragile (133 model) - handle with care.**)
- b) Heat exchanger fins.
- c) Fan compartment (Check also for condensate leaks).
- d) Insulation.
- e) Door seals - **Important: Pay particular attention to the condition of the combustion box door seals.**
- f) Electrodes.
- g) The condensate trap must be thoroughly cleaned at every service (see section 13.24 for removal).
NOTE: If necessary remove the trap drain plug and place a vessel underneath to catch the condensate (care should be taken as this could be hot). Clean the trap and refit the drain plug. Check for leaks.
- h) Top of heat exchanger.

NOTE: General cleaning can be undertaken using a vacuum. However debris should only be gently blown off the burner skin due to its fragile nature (133 HE Plus).

10. Check system pressure is between 1 and 2.5 bar.

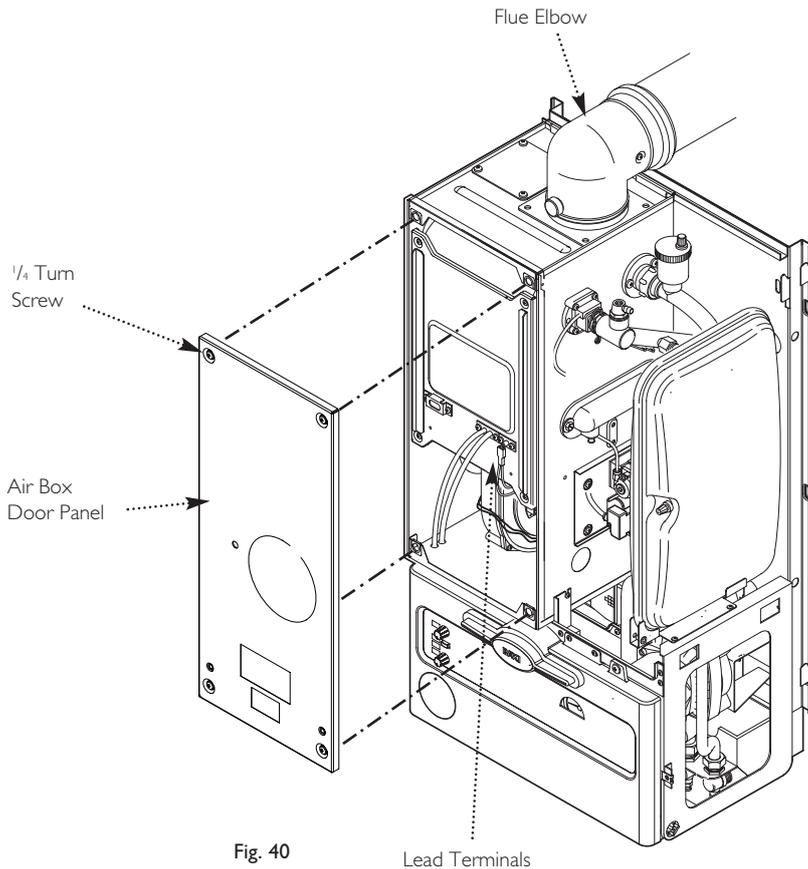


Fig. 40

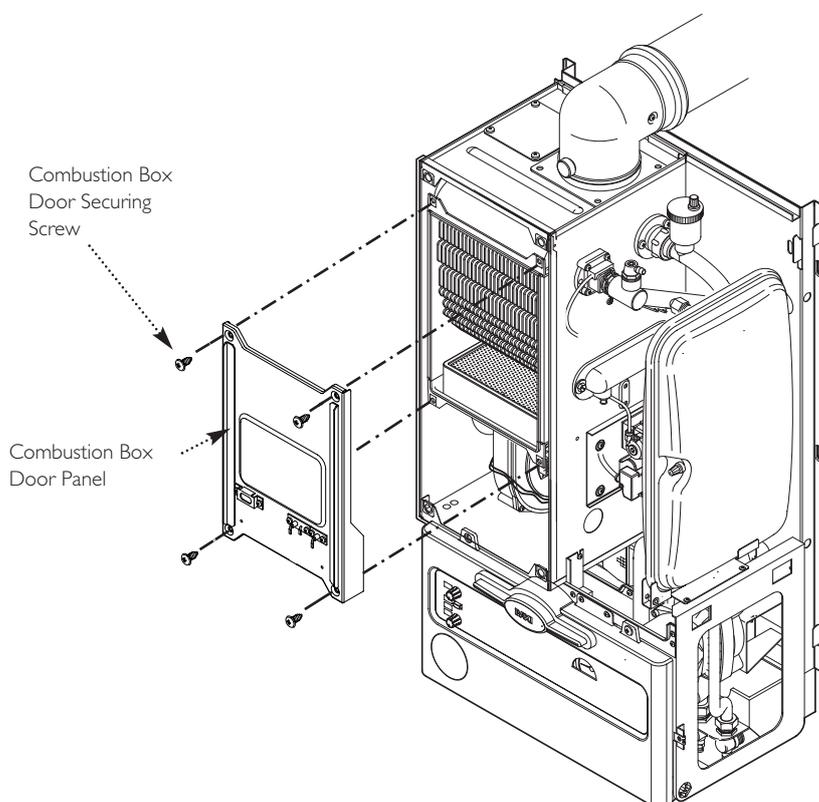


Fig. 41

12.0 Servicing the Boiler

12.1 Annual Servicing (Cont)

NOTE: The information shown on the display is explained on the label on the inside of the lower door panel (see Fig. 38).

11. To clean the heat exchanger and burner proceed as follows:

- Disconnect the electrical leads to the fan component protection sensor (Fig. 42).
- Loosen the screw retaining the gas injector pipe at the venturi (100 & 80 HE Plus models)
- Undo the two wing nuts to disconnect the fan (Fig. 42).
- Remove the fan and disconnect the electrical supply to it (Fig. 42).
- Remove the gas injector pipe from the gas valve (push-fit) (Fig. 42).
- Undo the condensate trap securing nut, lock nut and the condensate drain pipe. Remove the condensate trap and disconnect the sensor leads (Fig. 43).
- Remove the two screws securing the burner and remove the burner. Visually inspect the internal burner baffle for obstruction (Fig. 44).

NOTE: The 133 HE Plus burner skin is fragile - handle with care. Clean and if necessary replace the burner (Fig. 44).

- Loosen the two screws retaining the heat exchanger support bracket and slide to the left to remove (Fig. 44).
- Remove the four screws securing the heat exchanger/combustion box base and withdraw the base.
- Lower the central insulation panels and check condition (Fig. 44). Replace the insulation pads if necessary.
- Ensure the heat exchanger fins are clear of any obstruction, use a thin bladed tool to remove debris. The use of a torch at the heat exchanger top and a mirror held under the heat exchanger will aid observation of the heat exchanger fins.
- Check condition of all seals. **Important: Pay particular attention to the condition of the combustion box door seals.**
- Reassemble in reverse order, applying a suitable silicon based grease to "O" rings and seals - Greasil 4000 (Approved Silicone Grease).

12. Check CO/CO² ratio at flue sampling point (Fig. 41a). See section 4.0.

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

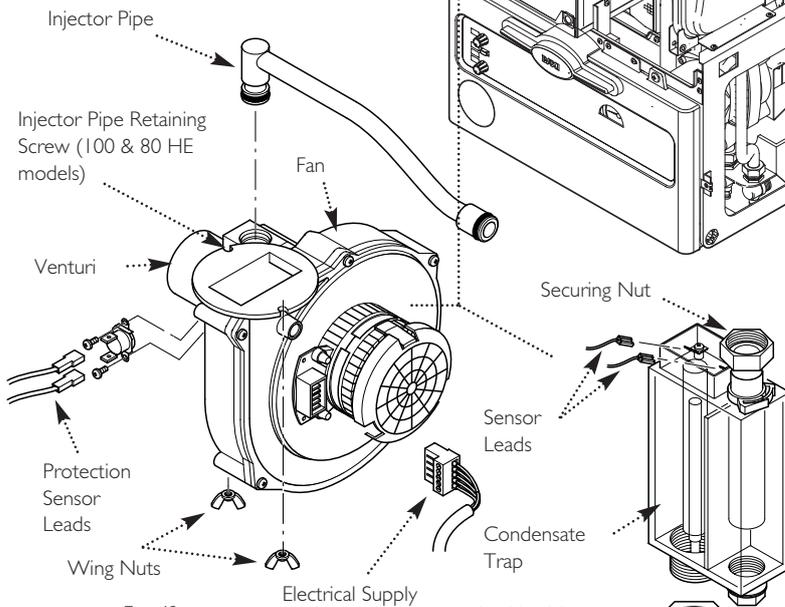
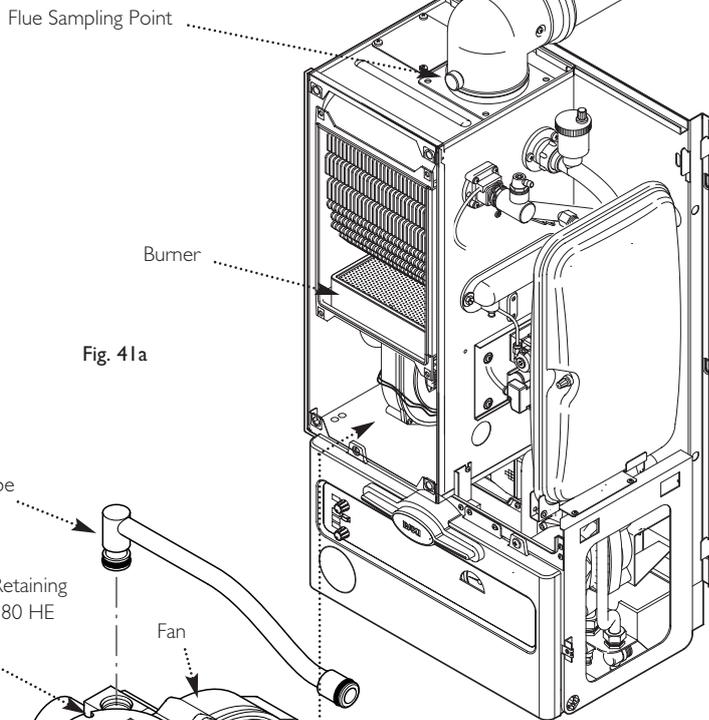


Fig. 42

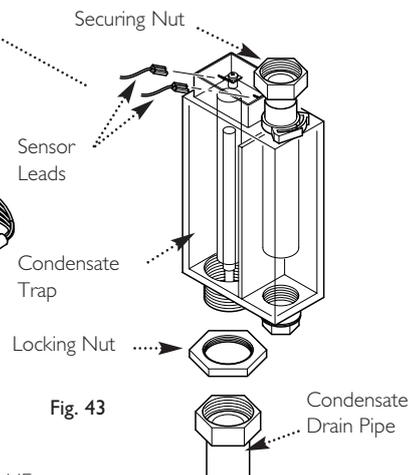


Fig. 43

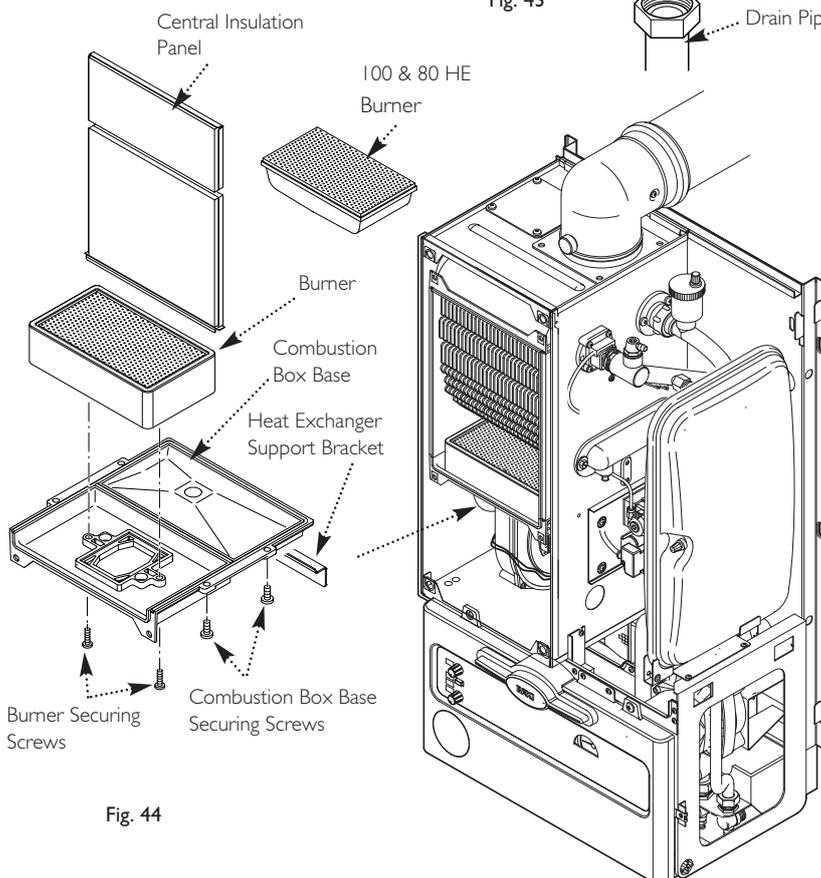


Fig. 44

13.0 Changing Components

13.1 Changing Components

IMPORTANT: When servicing ensure that both the gas and electrical supplies to the boiler are isolated before any work is started.

“The boiler cannot be switched off at the boiler, therefore it is important to isolate the electrical supply at the mains fuse.”

Hazardous materials are not used in the construction of Baxi products, however reasonable care during service is recommended.

When replacing the combustion box door after changing components, it is essential that the retaining screws are tightened fully.

1. Remove the outer case and lower door panel (see “Fitting the Outercase” Section 11.0).

WARNING: The PCB Control and Fan Assembly is 325 Vdc. Isolate at supply before access.

2. Isolate the water circuit and drain the system as necessary. There are 4 drain points:

- a) Flow Valve
- b) Heat Exchanger Manifold (Fig. 45)
- c) Return Valve
- d) Cold Water Inlet

NOTE: When reassembling always fit new ‘O’ rings, ensuring their correct location on the spigot. Green “O” rings are used for gas joints and Black “O” rings for water joints. Use Greasil 4000 (Approved Silicone Grease).

3. After changing a component re-commission the boiler where appropriate and check the inhibitor concentration (see Section 6.1 and 10.1).

The air vents, flowswitch, thermistor, safety thermostat and expansion vessel can be accessed after removal of the outer case.

13.2 Manual and Automatic Air Vent (Fig. 46)

1. Drain the boiler.

2. Undo the manual air vent from the flow pipe or the automatic air vent from the return pipe and retain the sealing washer.

3. Remove the air vent.

4. Fit the new air vent and reassemble in reverse order.

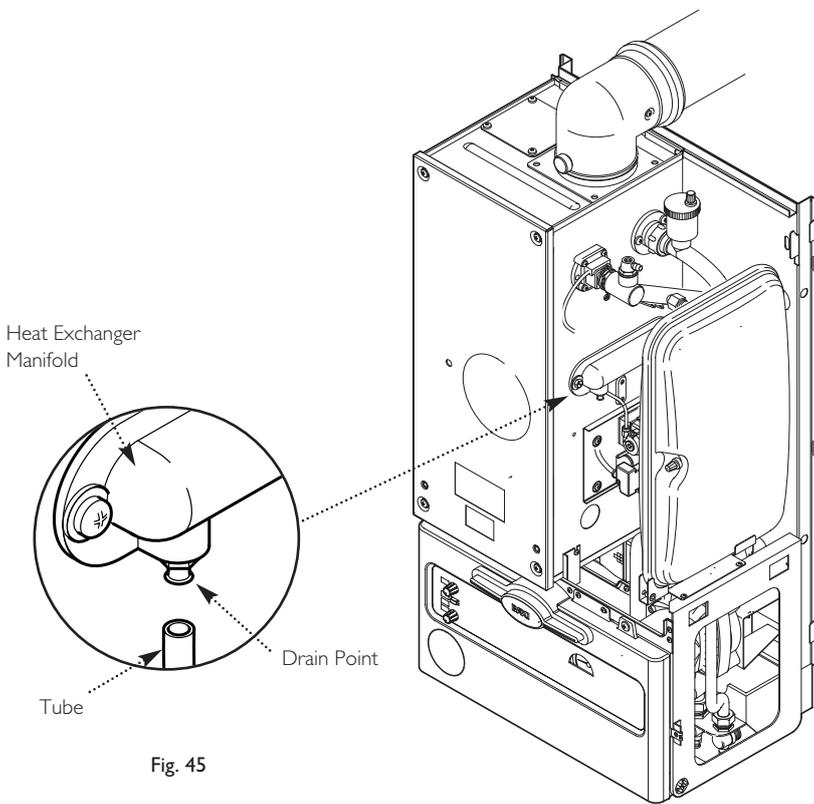


Fig. 45

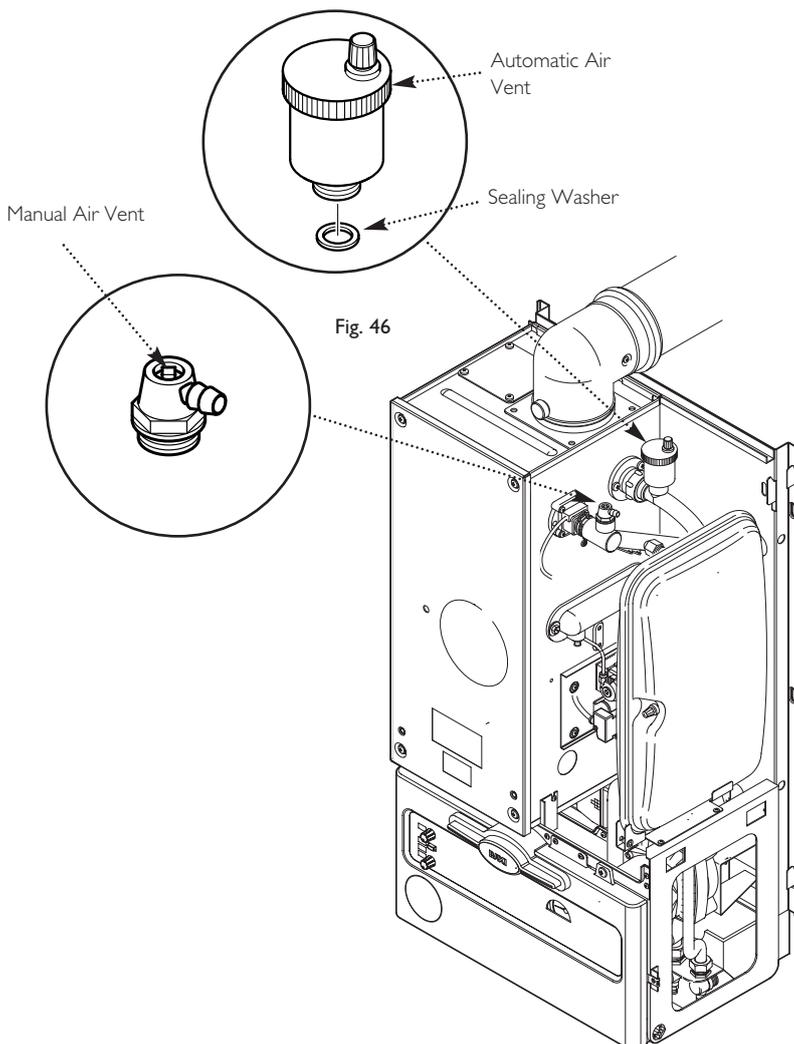


Fig. 46

13.0 Changing Components

13.3 Flowswitch (Fig. 47)

1. Drain the boiler (see Section 13.1 paragraph 2 & 3).
2. It may be necessary to remove the expansion vessel (see Section 13.5).
3. Remove the clip securing the flow pipe to the flowswitch.
4. Remove the two screws securing the flow switch to the boiler.
5. Disconnect the inline electrical connection.
6. Remove the flowswitch.
7. Fit the new flowswitch and reassemble in reverse order.
8. Recommission the boiler and check the inhibitor concentration (see Section 6.1 and 10.1).

13.4 Flow or Return Temperature Thermistors and Safety Thermostat (Figs. 48 & 49)

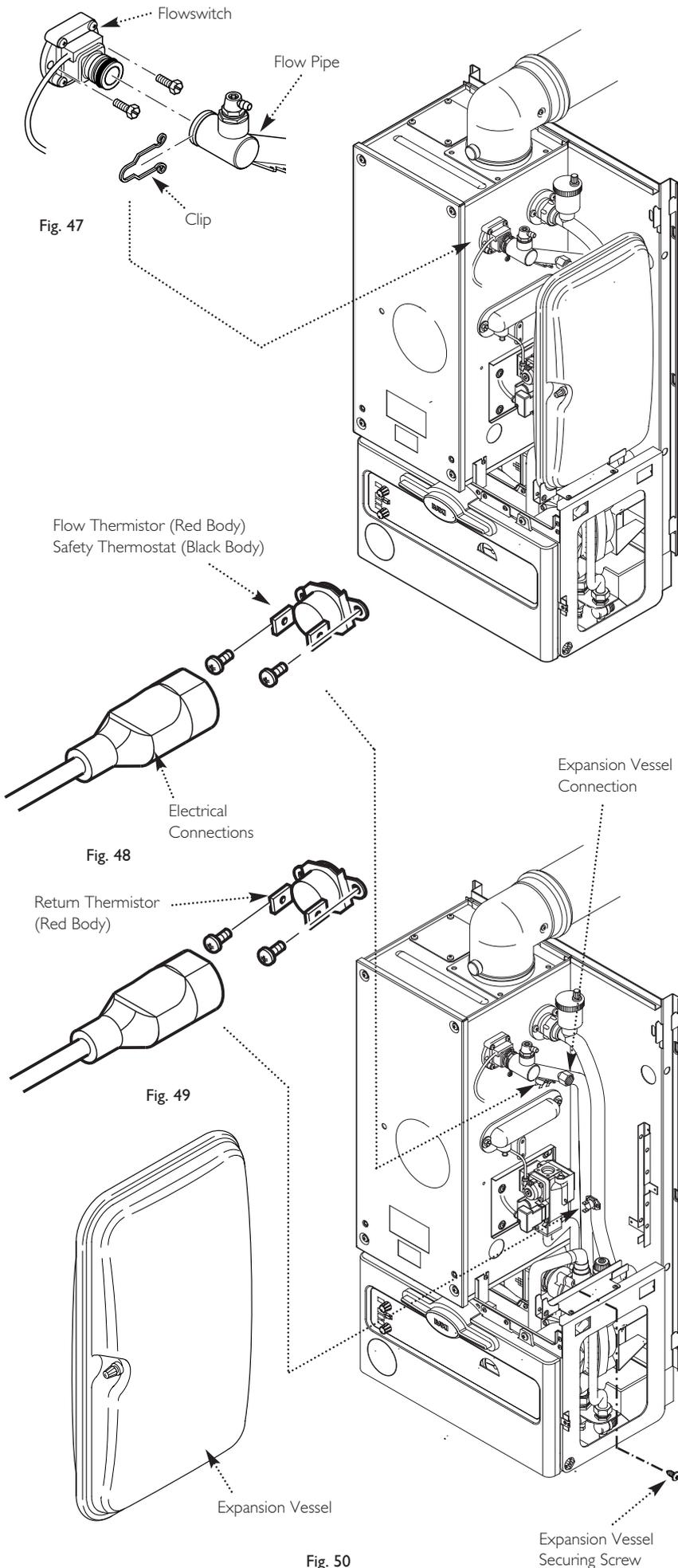
1. The procedure is the same for both the thermistors and the safety thermostat, although the components are not interchangeable.
2. Remove the electrical connection from the component.
3. Unscrew the component from the pipe.
4. Fit the new thermistor or safety thermostat and reassemble in reverse order.

13.5 Expansion Vessel (Fig. 50)

1. Drain the boiler (see Section 13.1 paragraph 2 & 3).
2. Loosen the securing screw at the base of the expansion vessel.
3. Whilst supporting the vessel under the expansion vessel connection and retain the sealing washer.
4. Remove the expansion vessel.
5. Fit the new expansion vessel and reassemble in reverse order.

13.6 Re-pressuring Expansion vessel

1. The charge pressure is 1.0 bar.
2. Close the central heating flow and return isolating valves.
3. Drain the boiler (see Section 13.1 paragraph 2 & 3).
4. The "Schraeder" valve is positioned centrally at the side of the appliance. Pressurise to 1.0 bar.
5. Open the isolating valves and recharge the system to between 1.0 bar and 2.5 bar. Vent the system as necessary.



13.0 Changing Components

The pump, 3-way diverter valve, pressure gauge, pressure relief valve, plate heat exchanger and DHW flow switch can be accessed after hinging down the fascia box.

1. Release the fascia securing screws ($1/4$ turn) and hinge down the fascia box (Fig. 51).

13.7 Pump (Fig. 51)

1. If only the head needs replacing, a standard Grundfos UPS 15-60 pump head is interchangeable (see section 13.9 for details).

2. This must be switched to setting N° 3 (Fig. 52).

13.8 Pump (Complete) (Fig. 53)

1. Drain the boiler (see Section 13.1 paragraph 2 & 3).

2. Unplug the wiring harness from the pump.

3. Remove the four screws retaining the pump backplate to the hydraulic manifold.

NOTE: Ensure nuts are not dislodged.

4. Remove the pump.

5. Fit the new pump and reassemble in reverse order.

13.9 Pump (Head Only) (Fig. 54)

1. Drain the boiler (see Section 13.1 paragraph 2 & 3).

2. Unplug the wiring harness from the pump.

3. Remove the four socket head screws securing the pump head and separate it from the housing.

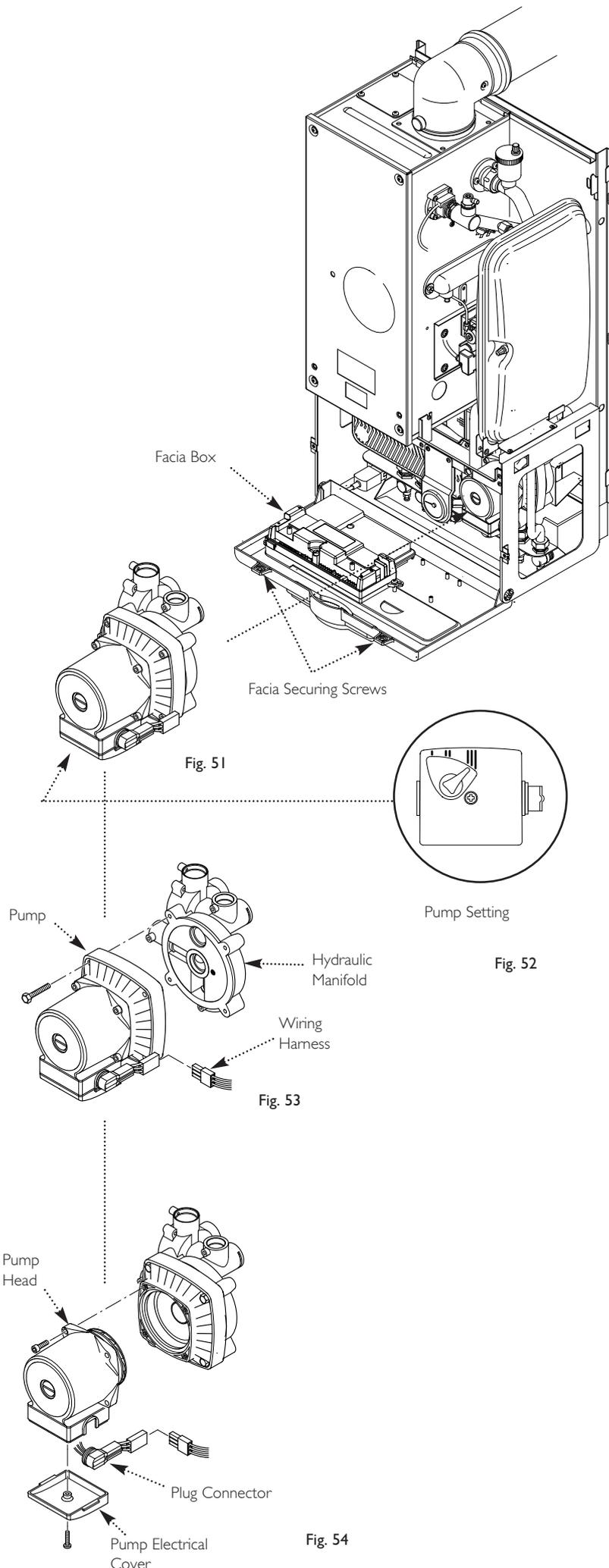
4. Remove the screws retaining the pump electrical covers on the original and replacement heads.

5. From the replacement UPS 15-60 pump head remove the strain relief cable gland and discard.

6. Remove the plug connector from the old pump head and wire it into the UPS 15-60 pump head.

7. Replace the electrical cover to the new pump head and assemble with the electrical box at 6 o'clock to the housing.

8. Check that the pump has been switched to setting N° 3 (Fig. 52) and reconnect the wiring harness plug.



13.0 Changing Components

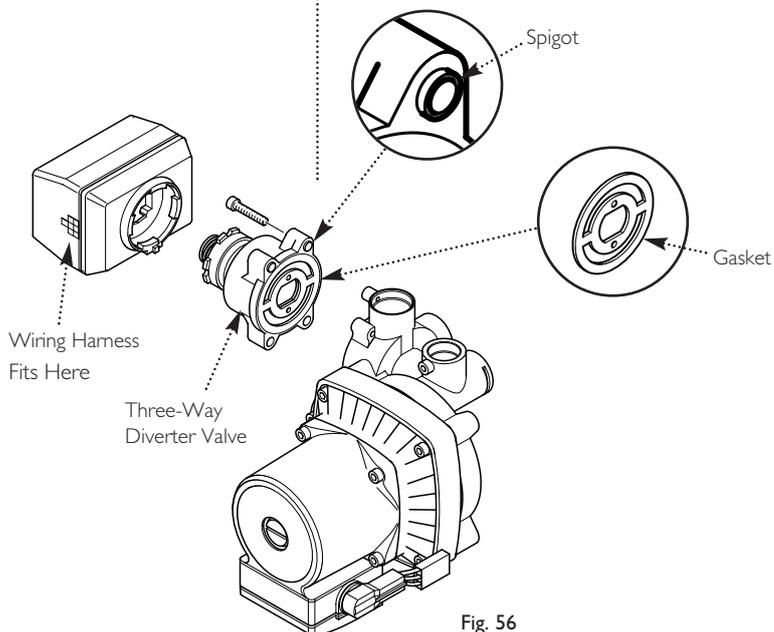
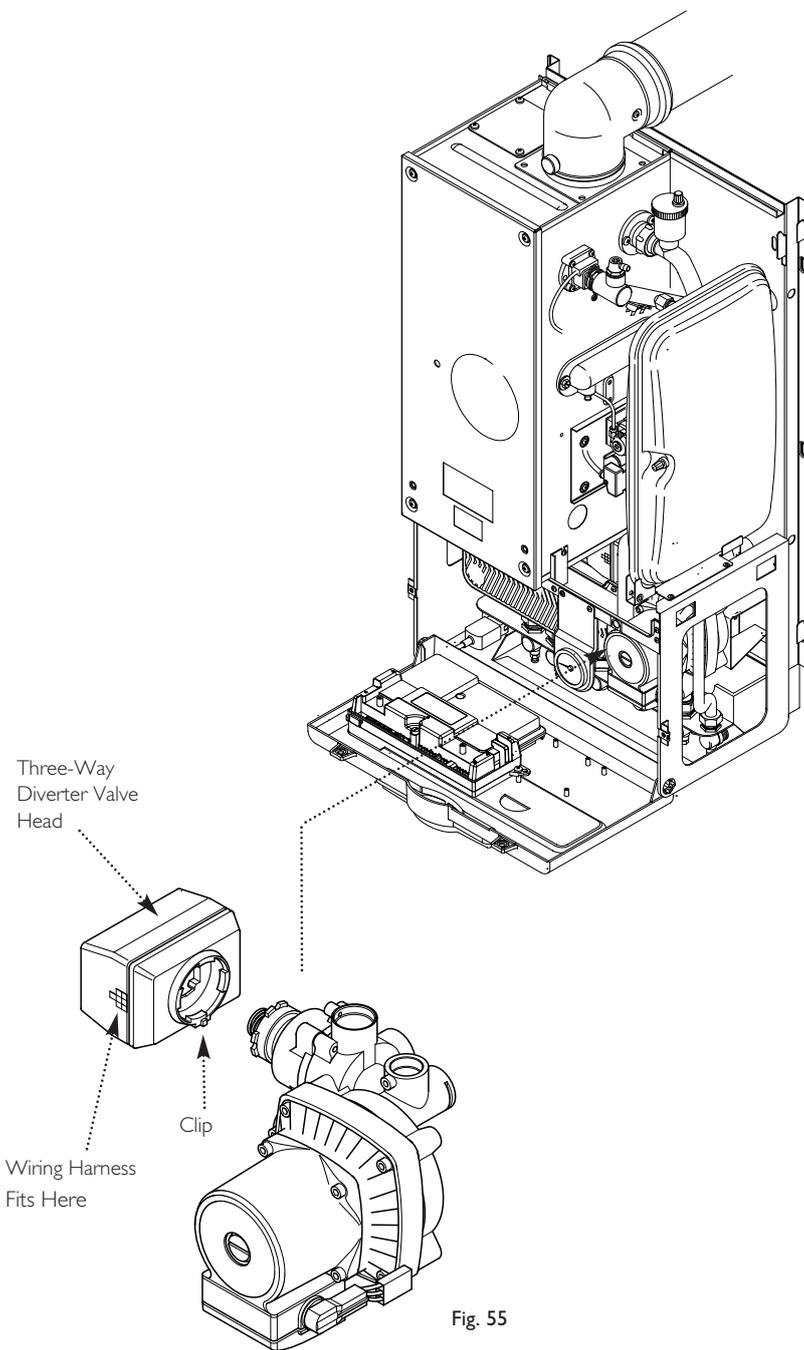
13.10 Three-Way Diverter Valve (Head Only) (Fig. 55)

If only the head needs replacing:

1. Unplug the wiring harness from the 3-way diverter valve.
2. Depress the clip and revolve the head through 30° and remove.
3. Fit replacement head and reassemble in reverse order.

13.11 Three-Way Diverter Valve (Complete) (Fig. 56)

1. Drain the boiler (see Section 13.1 paragraph 2 & 3).
2. Unplug the wiring harness from the 3-way diverter valve.
3. Remove the four socket screws retaining the 3-way valve.
4. Remove the 3-way valve.
5. Fit the new 3-way valve ensuring the gasket is in place and that the spigots are at the top to fit into the recesses on the manifold and reassemble in reverse order.



13.0 Changing Components

13.12 Pressure Gauge (Fig. 57)

1. Drain the boiler (see Section 13.1 paragraph 2 & 3).
2. Undo the nut retaining the capillary in the connection at the return pipe (Fig. 58).
3. Depress the two lugs on either side of the pressure gauge and feed through the bracket.
4. Fit new pressure gauge and reassemble in reverse order.

13.13 Pressure Relief Valve (Fig. 59)

1. The pressure relief valve is positioned on the hydraulic manifold at the back of the pump.
2. Drain the boiler (see Section 13.1 paragraph 2 & 3).
3. Disconnect the union between the valve and the discharge pipe.
4. Slacken the screw retaining the valve.
5. Pull the valve upwards to disengage it.
6. Fit the new pressure relief valve and reassemble in reverse order.

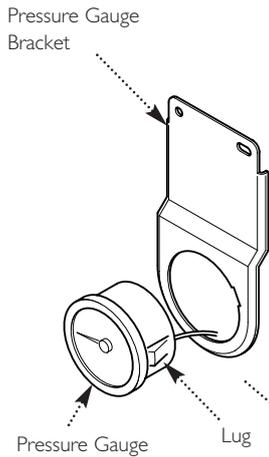


Fig. 57

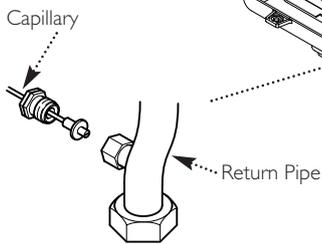


Fig. 58

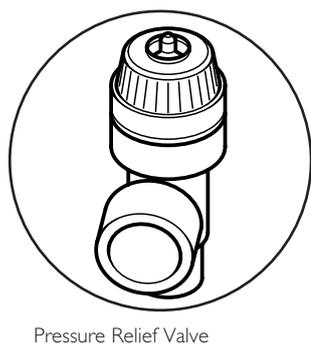
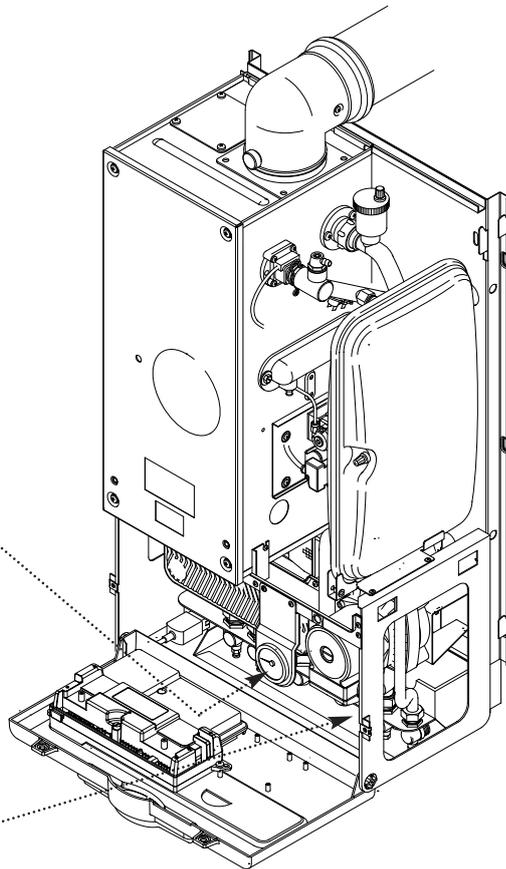
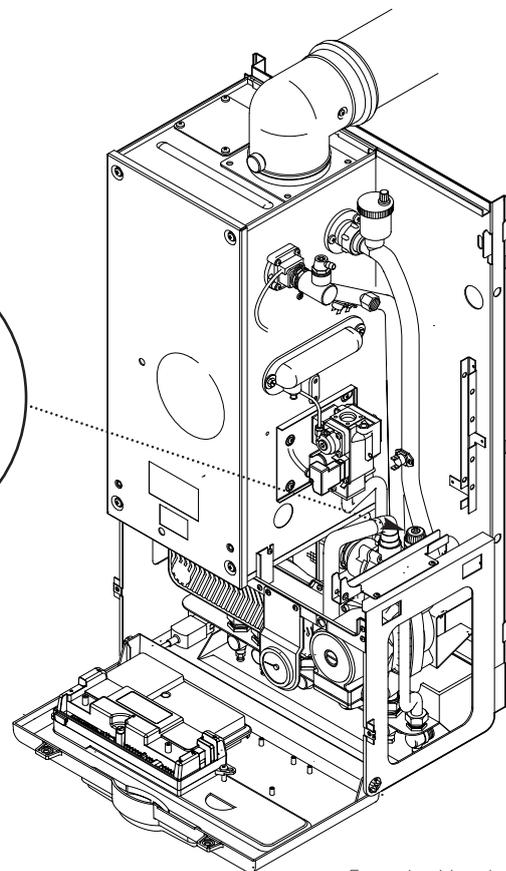


Fig. 59



Expansion Vessel
removed for clarity

13.0 Changing Components

13.14 DHW Plate Heat Exchanger

1. Drain the boiler (see Section 13.1 paragraph 2 & 3).
2. Remove the four screws securing the plate heat exchanger to the manifolds (Fig. 60).
NOTE: Ensure nuts are not dislodged from the manifolds.
3. Remove the plate heat exchanger cover (Fig. 61)
4. Remove the 'O' rings from the manifolds and replace with new 'O' rings (Fig. 61).
5. Taking care not to displace the 'O' rings fit the new plate heat exchanger ensuring the nuts are retained in the manifolds.
6. Refit the plate heat exchanger cover.

13.15 DHW Flow Switch (Fig. 62)

1. Drain the boiler (see Section 13.1 paragraph 2 & 3).
2. Remove the DHW plate heat exchanger (see section 13.14).
3. Disconnect the inline electrical connection.
4. Remove the clip at right hand side of the flow switch.
5. Undo the DHW inlet connection.
6. Remove the flow switch assembly and undo the second clip.
7. Fit the new flow switch and reassemble in reverse order.
8. Ensure that both clips are fully inserted from the front.
9. Fit the DHW plate heat exchanger.

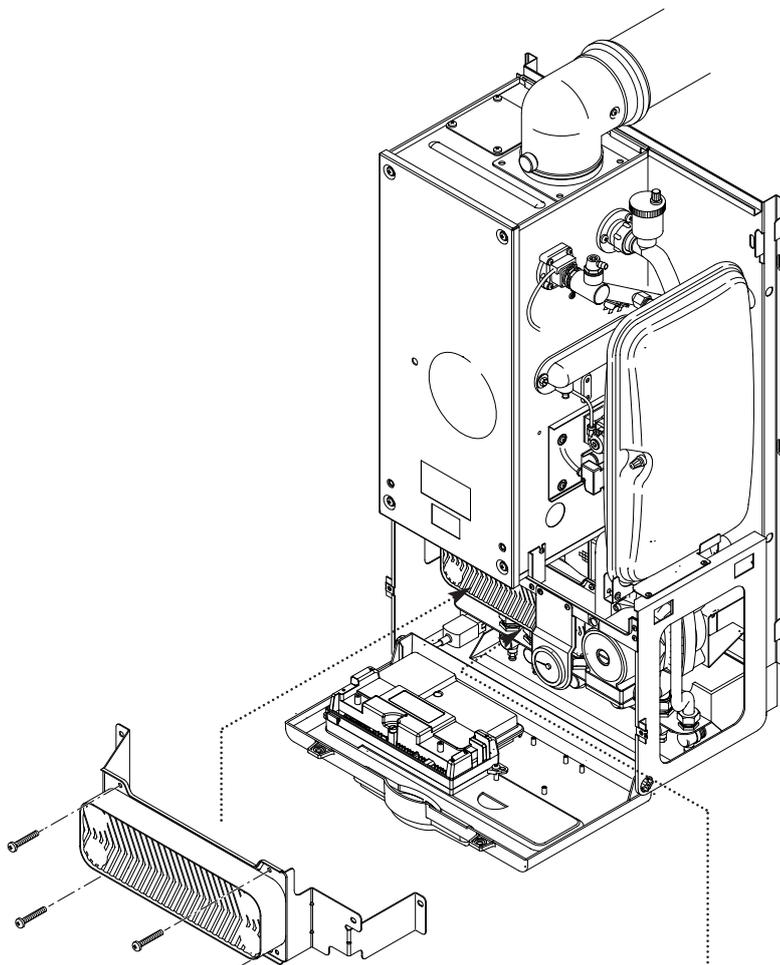


Fig. 60

Plate Heat Exchanger
Securing Screws

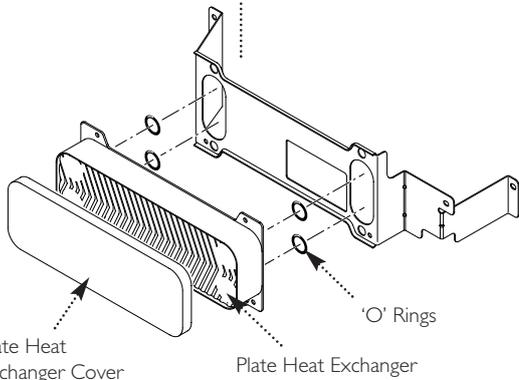


Plate Heat
Exchanger Cover

'O' Rings
Plate Heat Exchanger

Fig. 61

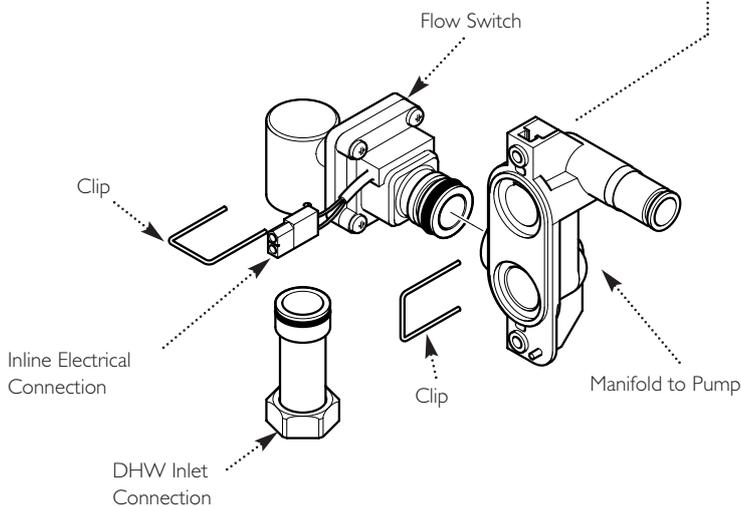


Fig. 62

13.0 Changing Components

13.16 PCB (Fig. 63)

WARNING: The PCB Control and Fan Assembly is 325 Vdc. Isolate at supply before access.

1. Pull the control knobs off their spindles and remove the plastic button covers. Refit them onto the new PCB (Fig. 63a).
2. Release the fascia securing screws ($1/4$ turn) and hinge down the fascia box.
3. Remove the screws securing the PCB connection cover.
4. Remove the screws securing the PCB and disconnect the electrical connections noting their positions although they are one way fitting.

NOTE: Check the PCB for the presence of input jumpers - see section 10.2 & 10.3. Set the new PCB as the original.

5. Fit the new PCB and reassemble in reverse order.

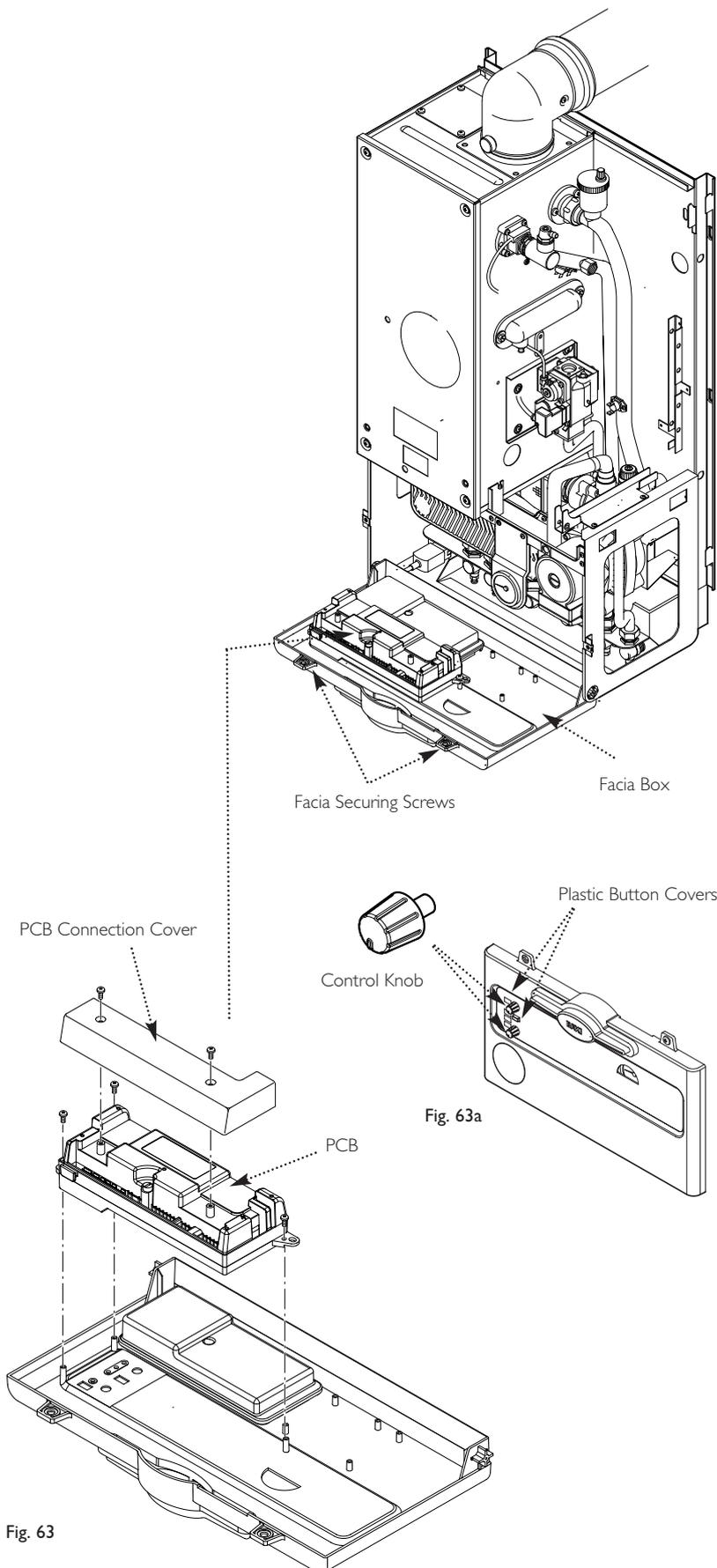


Fig. 63

Fig. 63a

13.0 Changing Components

The fan and venturi, gas valve, injector pipe, condensate trap, fan protection thermostat, spark and sensing electrode can be accessed and changed on the removal of the airbox door panel.

1. Remove the airbox door panel by loosening the four $\frac{1}{4}$ turn screws (Fig. 64).

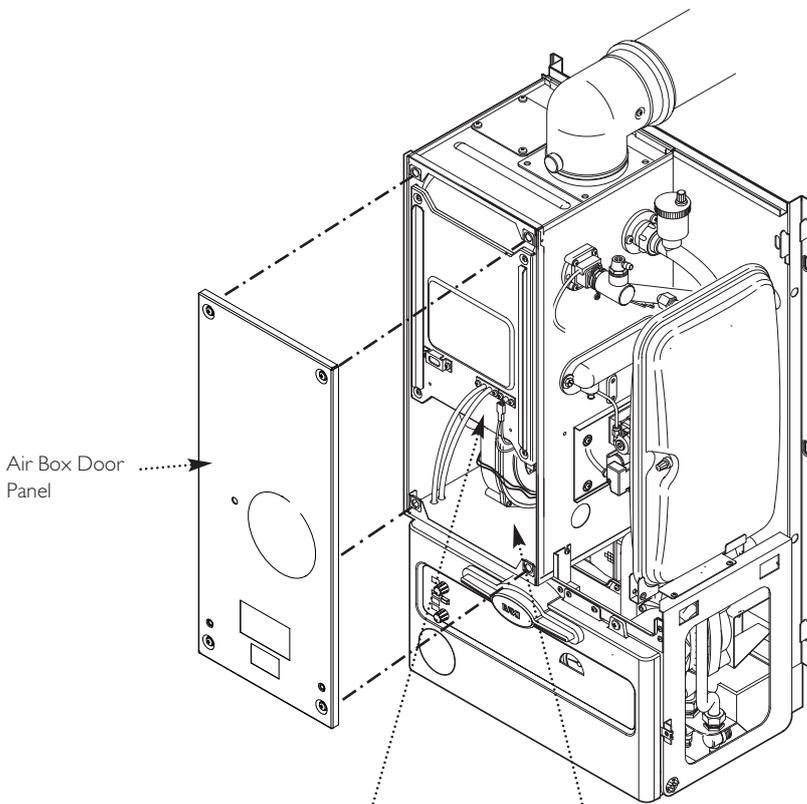


Fig. 64

13.20 Spark and Sensing Electrode (Fig. 65)

1. Disconnect the leads to the electrode noting their positions (left to right):

Spark	-	Opaque Lead
Earth	-	Green/Yellow Lead
Sensing	-	White Lead

2. Remove the two screws securing the electrode to the combustion box door and remove the electrode.

3. Fit the new electrode and new gasket, reassemble in reverse order, ensuring the spark gap of $3.5\text{mm} \pm 0.5\text{mm}$ is maintained.

13.21 Fan and Fan Protection Thermostat (Fig. 66)

WARNING: The PCB Control and Fan Assembly is 325 Vdc. Isolate at supply before access.

1. Remove the electrical connections to the fan protection thermostat on the fan.

2. **Replacing the thermostat:-** Unscrew the thermostat and replace with the new thermostat. Reassemble in reverse order.

3. **Replacing the fan:-** Remove the wing nuts securing the fan to the base of the combustion box.

4. Loosen the screw retaining the gas injector pipe at the venturi (100 & 80 HE Plus models)

5. Lower the fan and disconnect the electrical supply from the right hand front of the fan. Remove the fan/venturi assembly.

6. Remove the screws securing the venturi to the fan and remove the venturi together with the gasket.

7. Remove the fan protection thermostat and fix it to the new fan, together with the venturi and gasket.

8. Fit the new fan and reassemble in reverse order.

The injector pipe, condensate trap and gas valve can be changed after the removal of the fan.

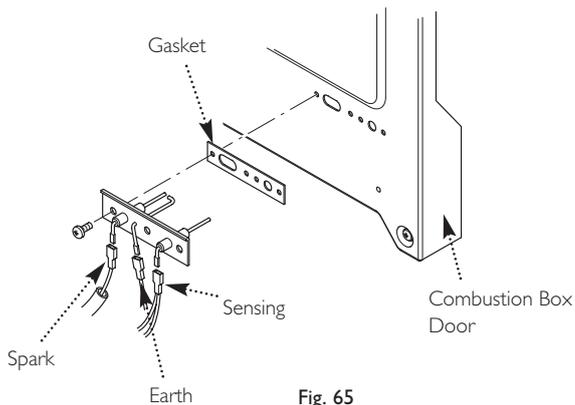


Fig. 65

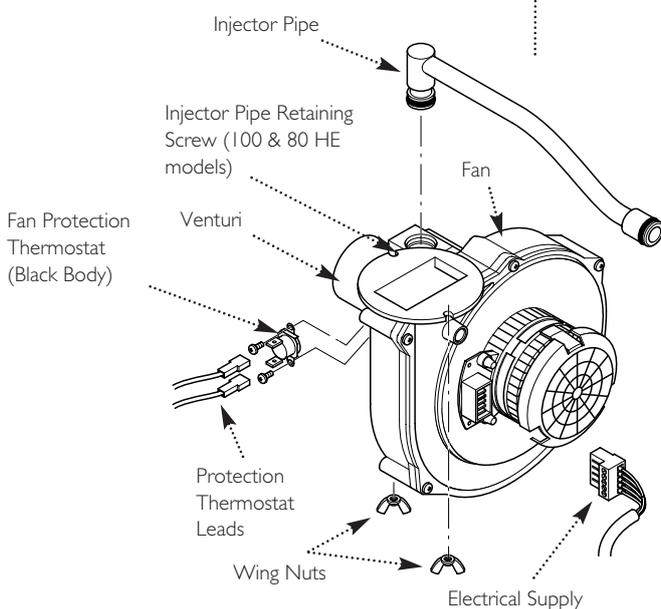


Fig. 66

13.0 Changing Components

It is necessary to remove the fan before changing the injector pipe, condensate trap and gas valve (see section 13.21).

13.22 Injector Pipe (Fig. 67)

1. Loosen the screw retaining the gas injector pipe at the venturi (100 & 80 HE Plus models)
2. Remove the injector pipe by pulling out from the 'O' ring joint in the gas valve.
3. Fit the new injector pipe and reassemble in reverse order, applying Greasil 4000 (Approved Silicone Grease) to both "O" rings.

13.23 Gas Valve (Fig. 67)

1. Release the facia securing screws $\frac{1}{4}$ turn and hinge down the facia box.
2. Loosen nut at gas inlet pipe at tap rail.
3. Undo the gas pressure pipe from the gas valve.
4. Undo the screw and disconnect the electrical plug from the gas valve.
5. Remove the two gas valve securing screws from inside the air box holding the gas valve.
6. Remove the gas valve and inlet pipe from the airbox side.
7. Remove the four screws securing the gas inlet pipe to the valve and refit to the new valve.
8. Remove the aluminium spacer and its gasket and "O" ring from the gas valve.
9. Fit the aluminium spacer, "O" ring and its gasket to the new valve.
10. Fit the new gas valve and reassemble in reverse order. Test for gas soundness. **NOTE:** It is essential that you ensure gas soundness as they are under negative pressure.

13.24 Condensate Trap (Fig. 68)

1. Disconnect the condensate trap from the base of the heat exchanger.
2. Disconnect the condensate drain (outside the boiler) from the condensate trap.
3. Undo the condensate trap lock nut.
4. Remove the condensate trap from the boiler.
5. Disconnect the sensor leads.

Fit the new condensate trap and reassemble in reverse order.

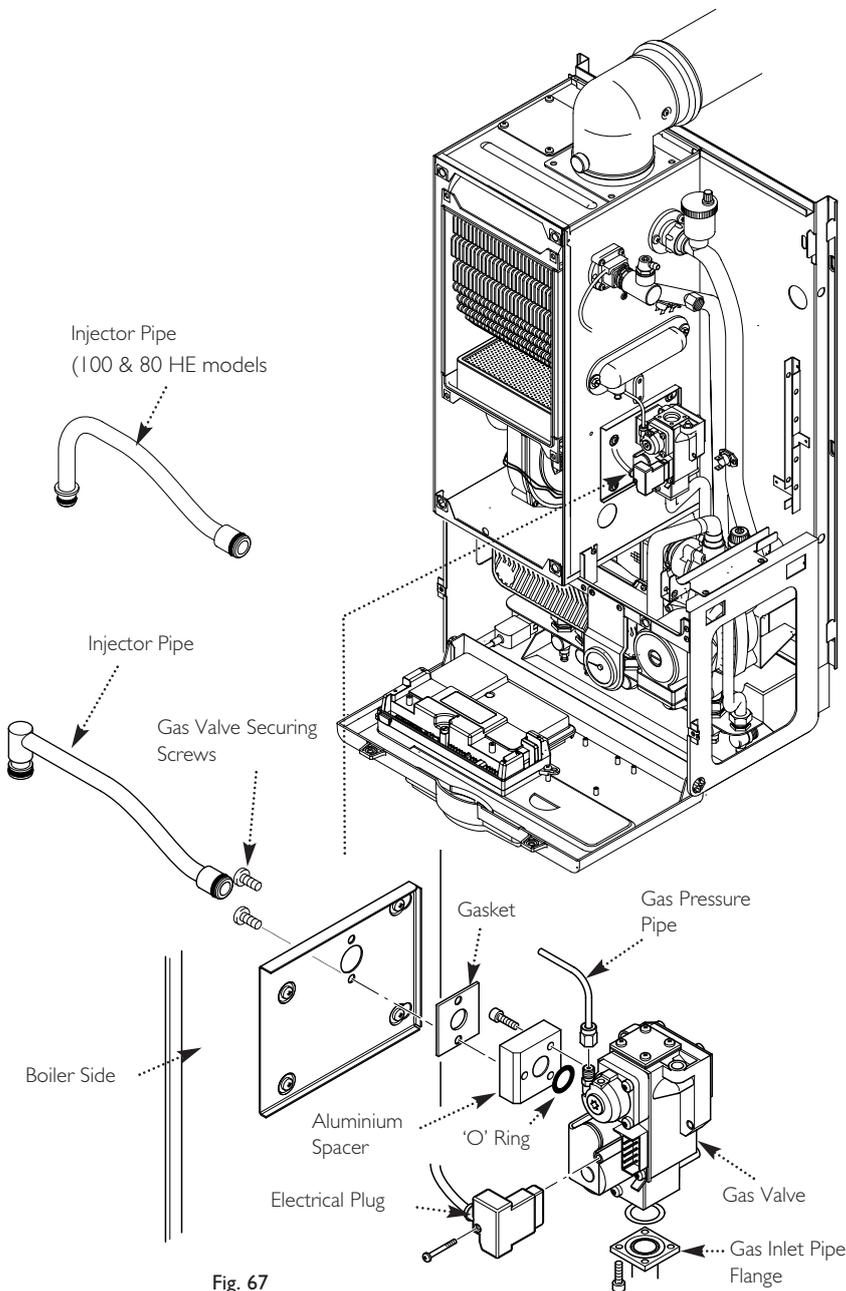


Fig. 67

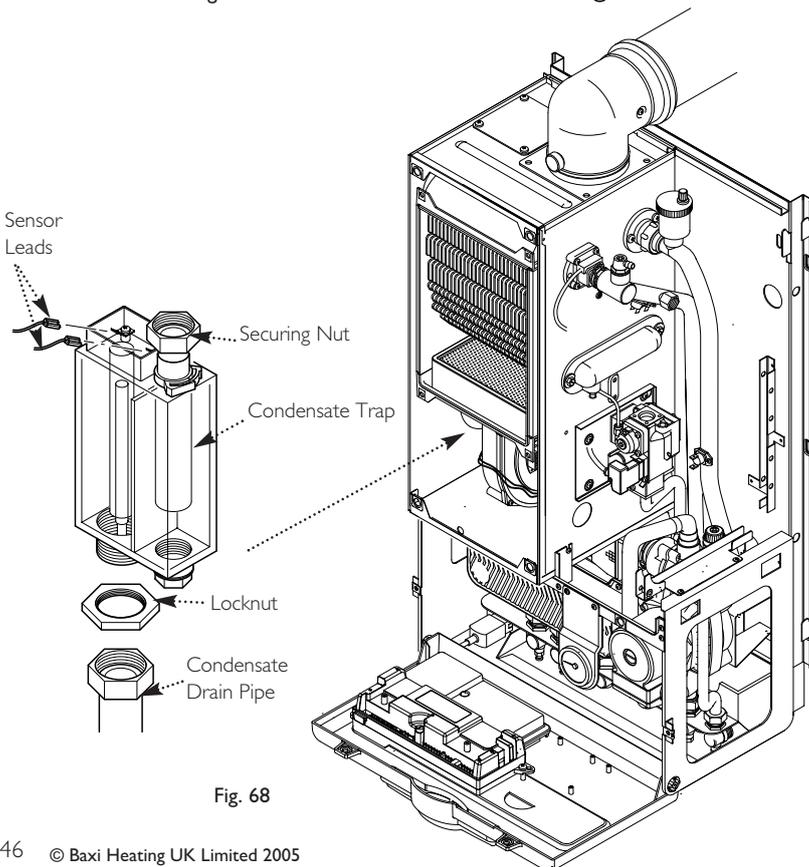


Fig. 68

13.0 Changing Components

The burner and heat exchanger can be changed after removal of the combustion box door. To change the heat exchanger, the fan and burner must be removed first (see section 13.21 & 13.25).

1. Remove the combustion box door by undoing the four 1/4 turn securing screws.

13.25 Burner (Fig. 69)

WARNING: The burner skin is fragile (I33 model): (HANDLE WITH CARE)

1. Remove the two 8mm hex head screws securing the burner to the base of the combustion box.
2. Remove the burner carefully from the combustion box base, inspect gasket for damage, replace if necessary.
3. Fit the new burner and reassemble in reverse order.

13.26 Heat Exchanger

1. Drain the boiler (see section 13.1 paragraph 2 & 3).

WARNING: The PCB Control and Fan Assembly is 325 Vdc. Isolate at supply before access.

2. Remove the fan and condensate trap (see section 13.21 and 13.24).
3. Undo the screws securing the flow switch and return connections. Remove the flow switch and return connection (Fig. 70).
4. Undo the screws securing the heat exchanger manifold and remove the manifold (Fig. 71).
5. Undo the screws on the bracket supporting the heat exchanger and remove bracket.
6. Lift the heat exchanger assembly (Fig. 72) and rotate the bottom upwards whilst pulling it forwards out of the airbox.
7. Fit the new heat exchanger and reassemble in reverse order.
8. Recommission the boiler and check the inhibitor concentration (see Section 6.1 and 10.1).

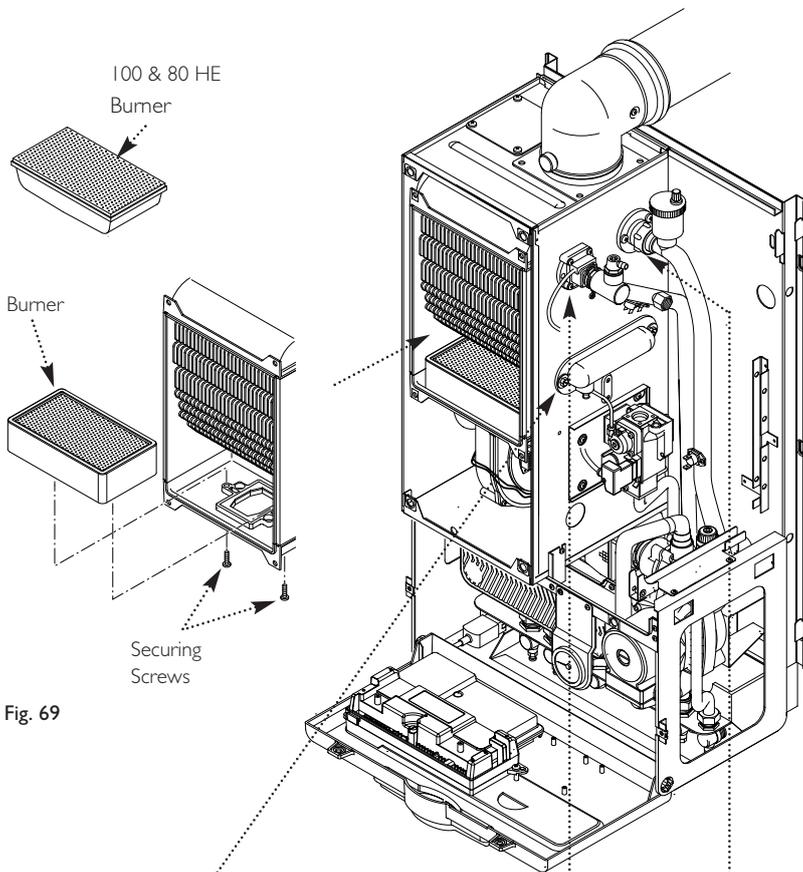


Fig. 69

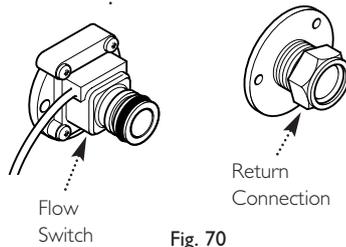


Fig. 70

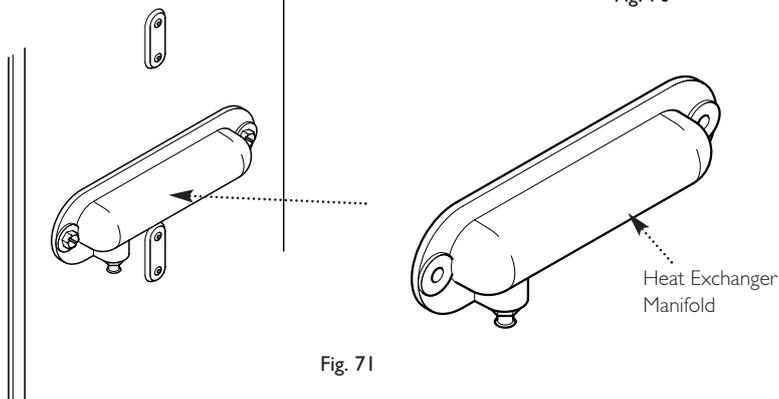


Fig. 71

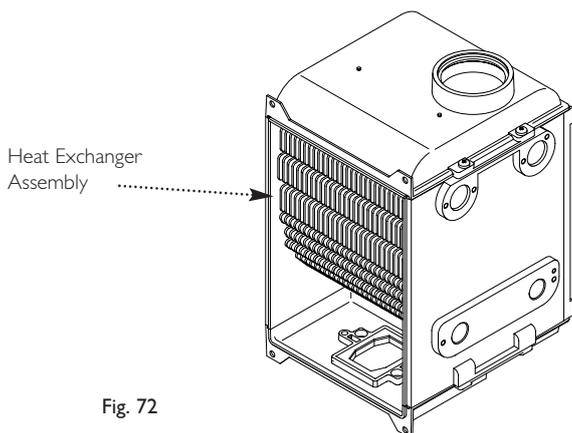


Fig. 72

13.0 Changing Components

13.27 Heat Exchanger Insulation Pads (Fig. 73)

1. Remove the fan and condensate trap (see section 13.21 and 13.24).
2. Remove the burner (see section 13.25).
3. Remove the four bolts securing the combustion box base.
4. Remove the combustion box base.
5. Pull the central insulation panel down from the centre of the heat exchanger and remove the insulation pads.
6. Check combustion box seal for damage, replace if necessary.
7. Fit the new insulation pads and reassemble in reverse order.

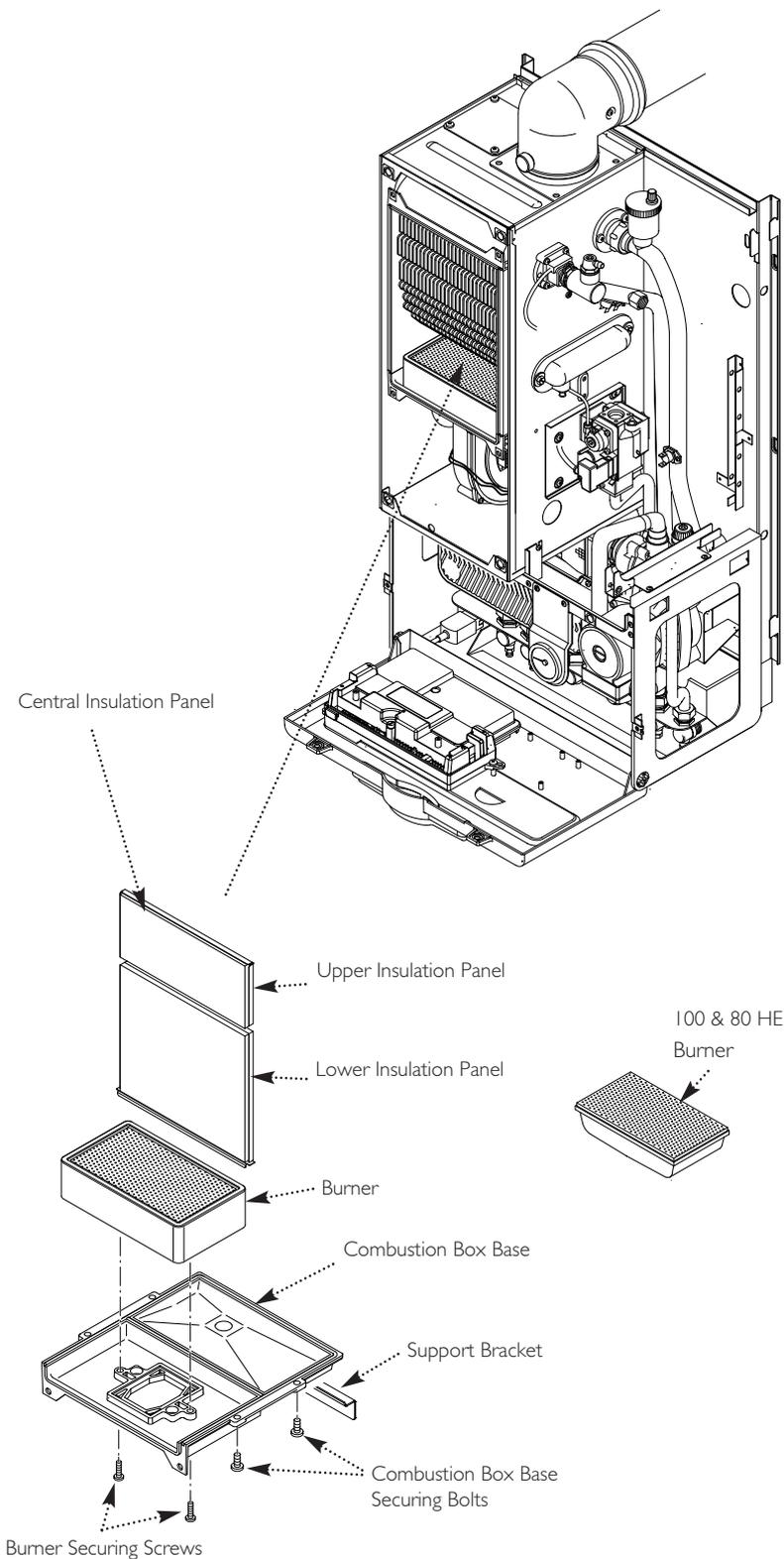
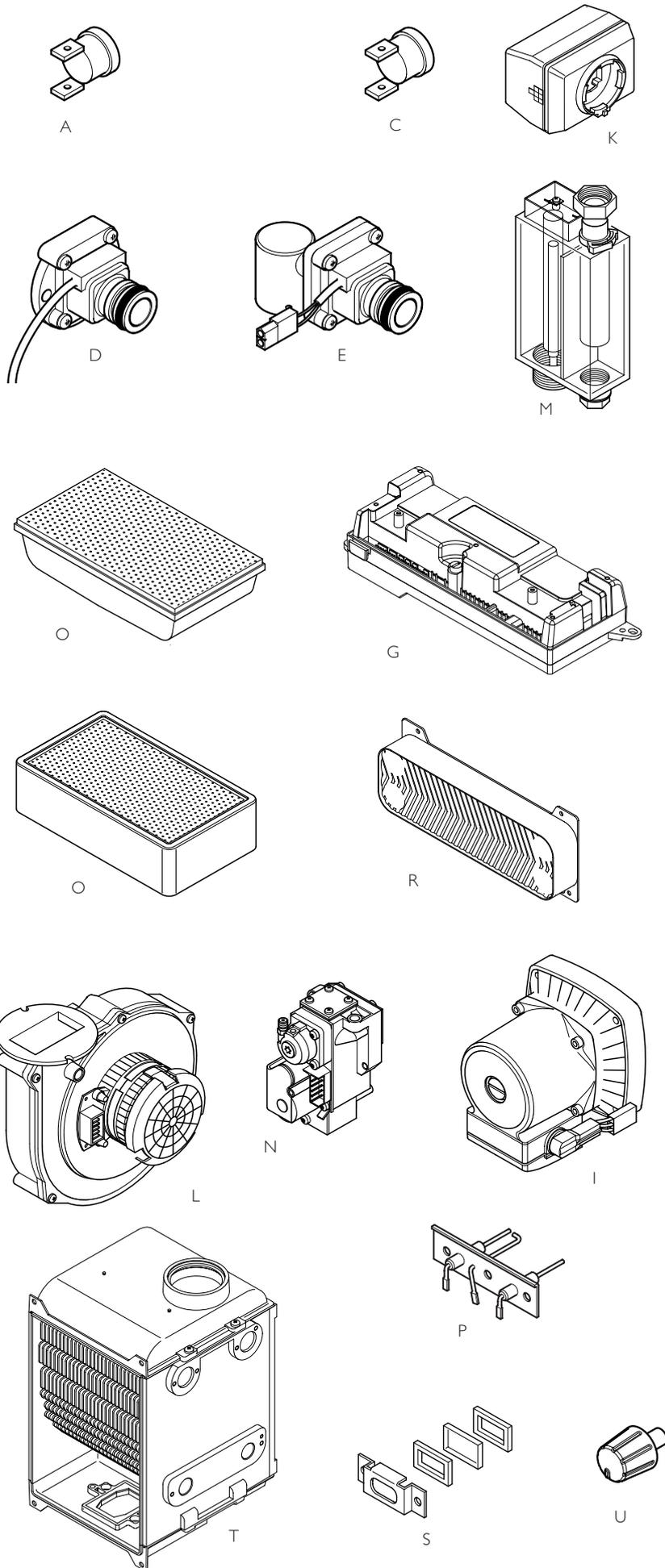


Fig. 73

14.0 Short Parts List

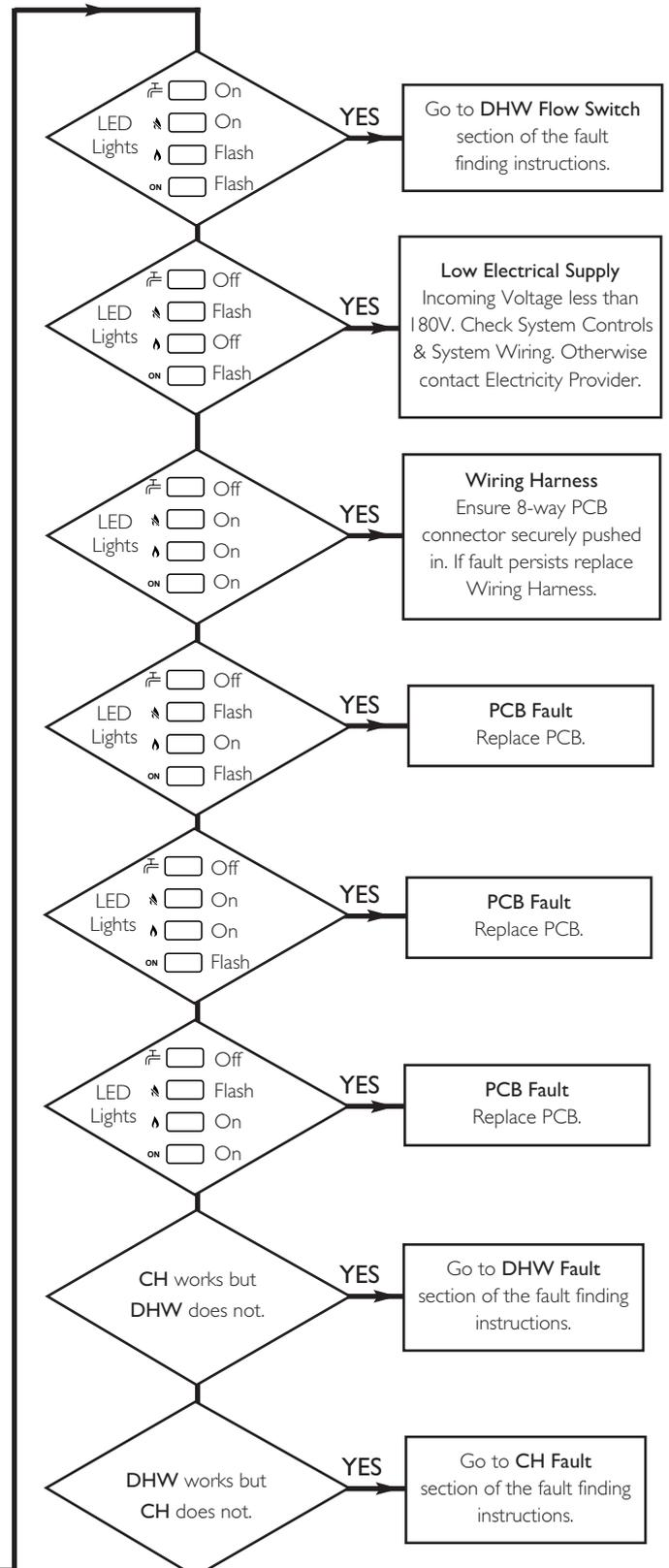
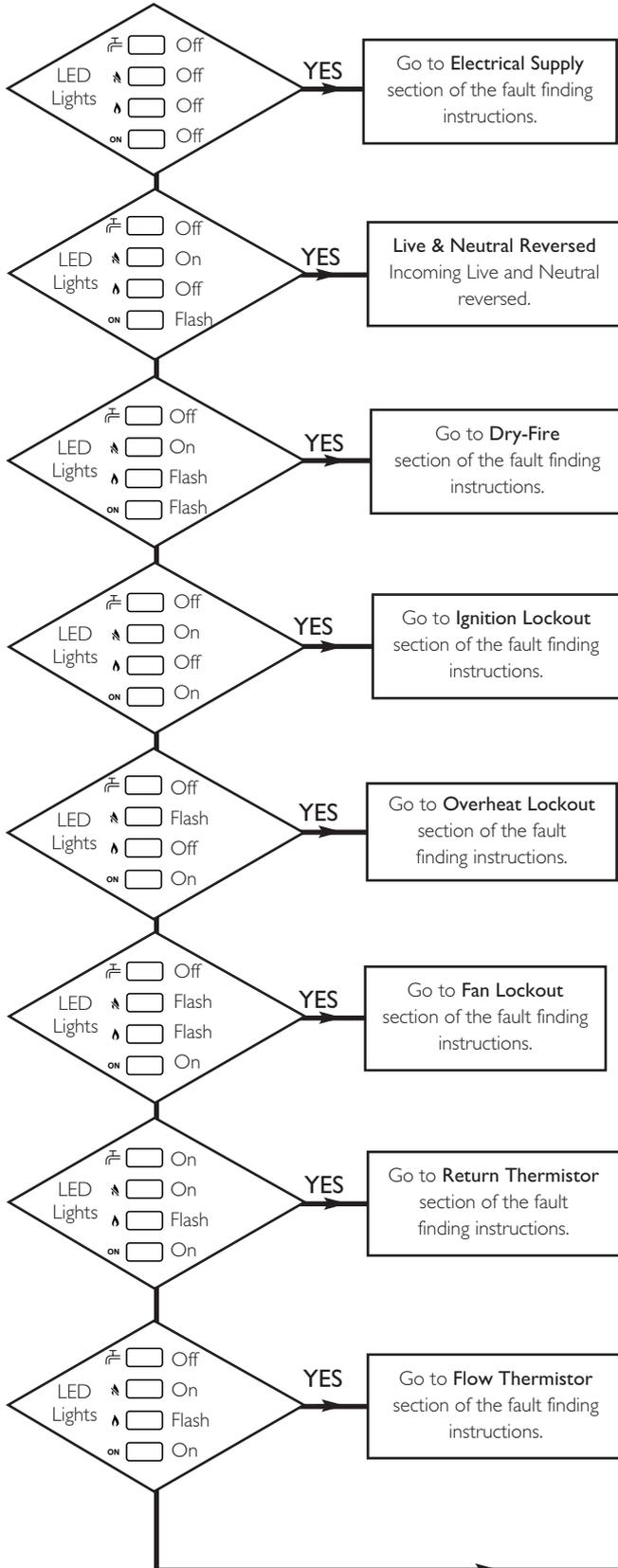
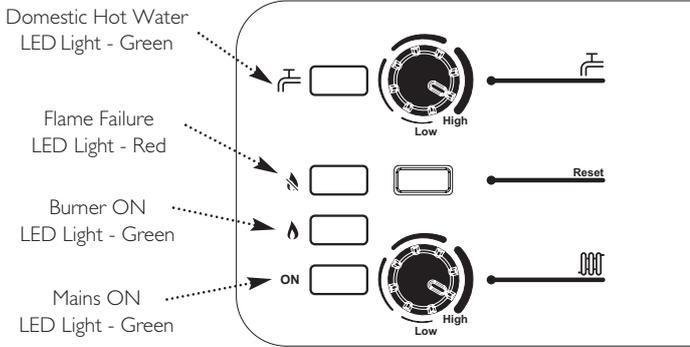
Short Parts List

Key No.	G.C. No.	Description	Manufacturers Part No.
A	E58 933	Flow Thermistor (Red) / Return Thermistor	240670
C	E58 912	Safety Thermostat (Black) / Fan Protection	242235
D	E06 059	Flow Switch Kit	242459
E		DHW Flow Switch Kit	247502
G		PCB - enclosure	5110991
I		Pump	240395
K	E58 935	Divertor Valve Head	243341
L		Fan (133 HE) Fan (100 & 80 HE)	5109926 5109925
M		Condensate Trap Kit	5111714
N	E78 749	Gas Valve Kit	247222
O	E58 900	Burner (133 HE) Burner (100 & 80 HE)	245199 5107430
P		Electrode Kit	5110992
R		Plate Heat Exch. Kit	247224
S	E06 085	Inspection Window Assy	242484
T	E06 097	Heat Exchanger Assy	242497
U		Control Knob	5109996

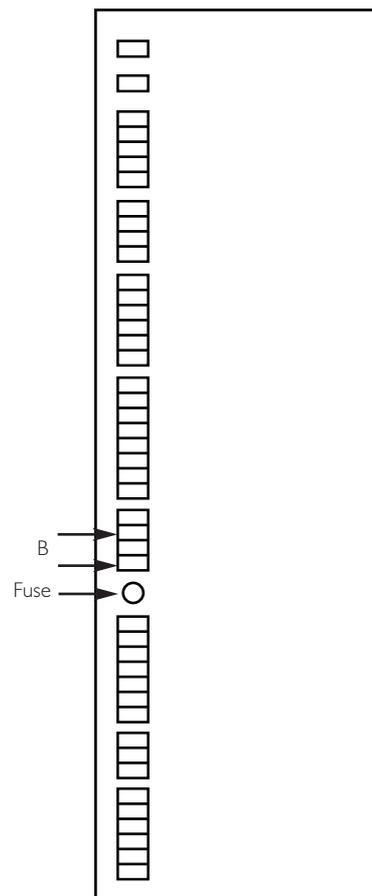
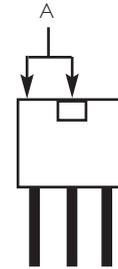
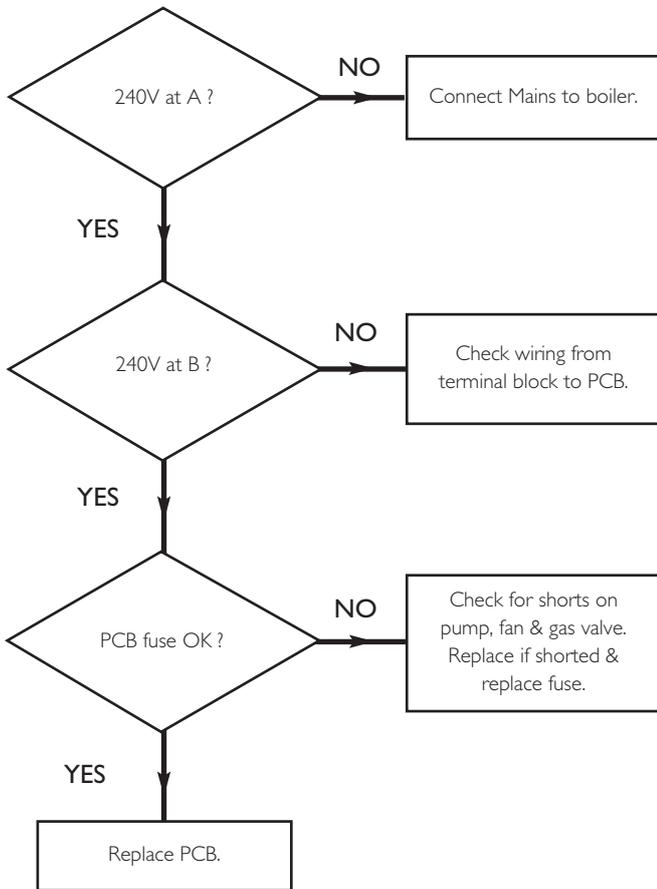
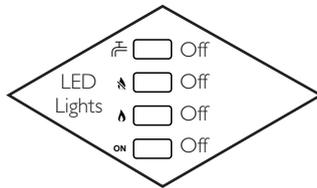


15.0 Fault Finding

Before performing fault finding carry out preliminary electrical checks for earth, continuity and polarity. See Section 8.13



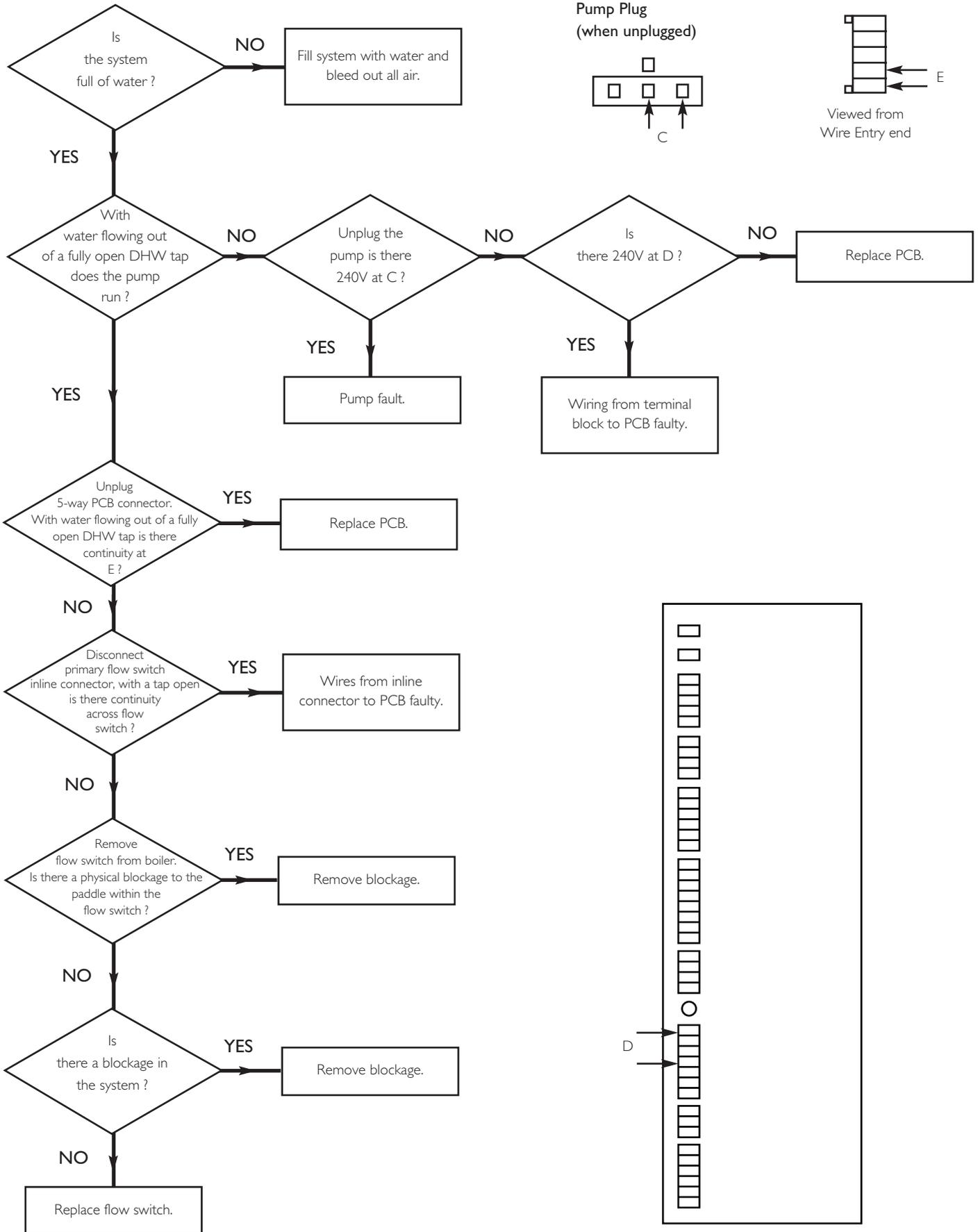
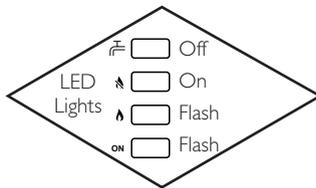
ELECTRICAL SUPPLY



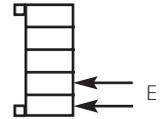
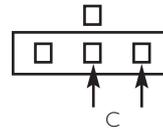
15.0 Fault Finding

15.0 Fault Finding

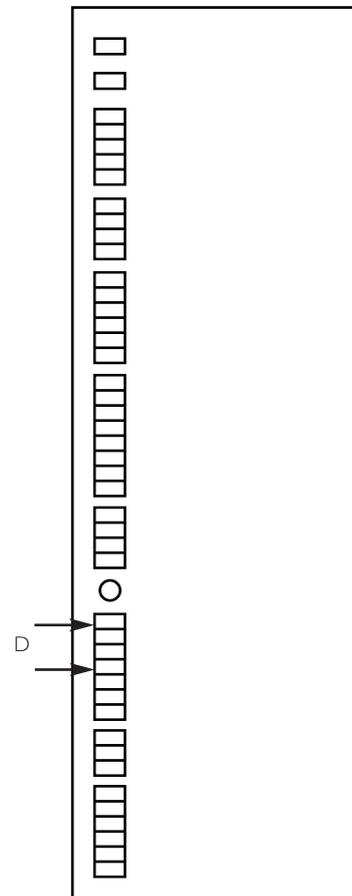
DRY-FIRE



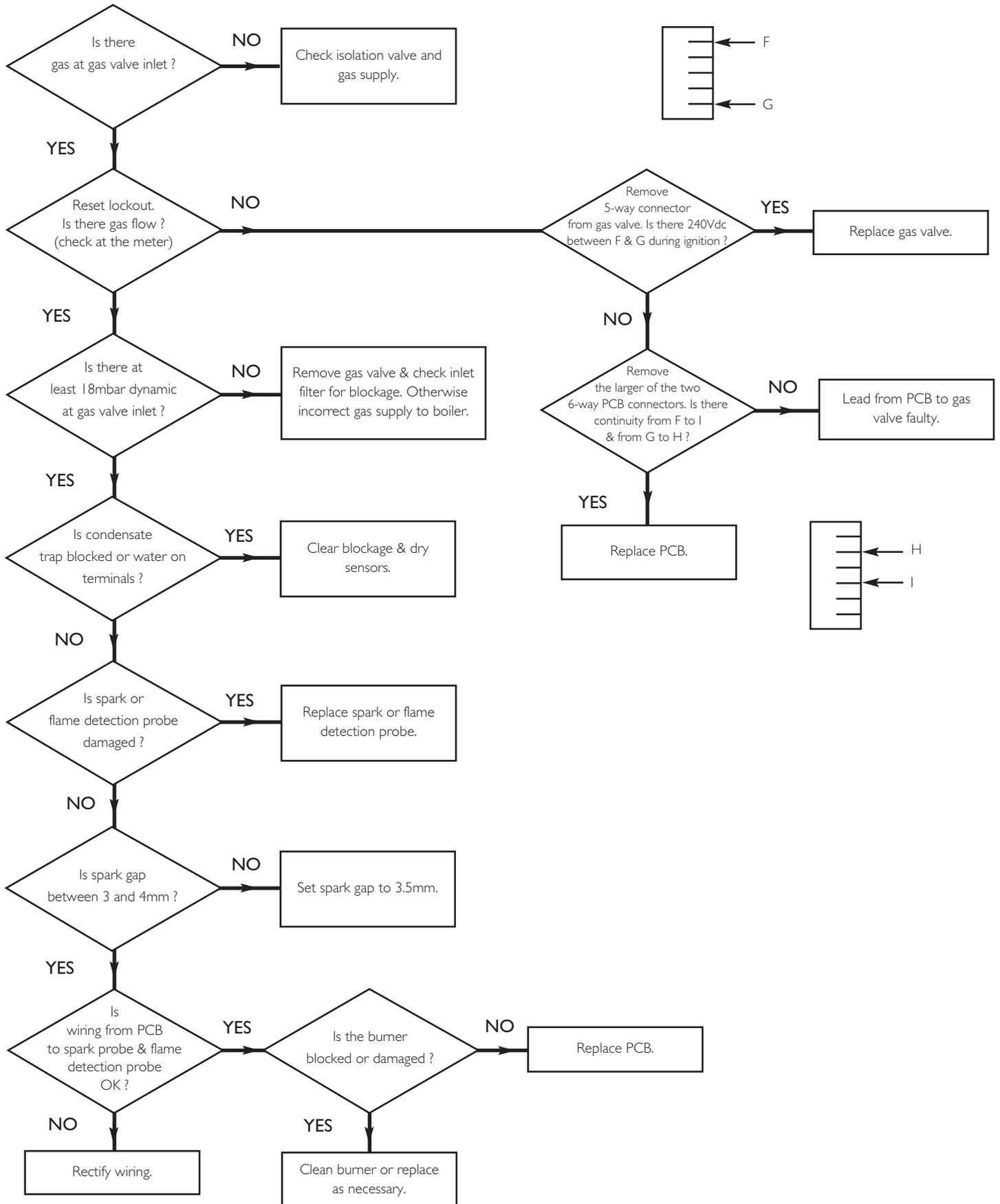
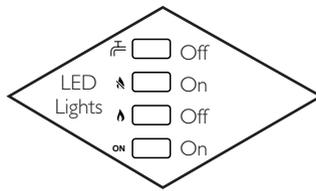
Pump Plug (when unplugged)



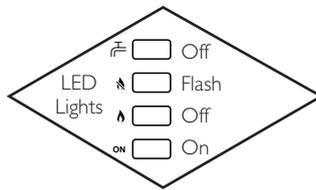
Viewed from Wire Entry end



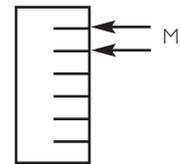
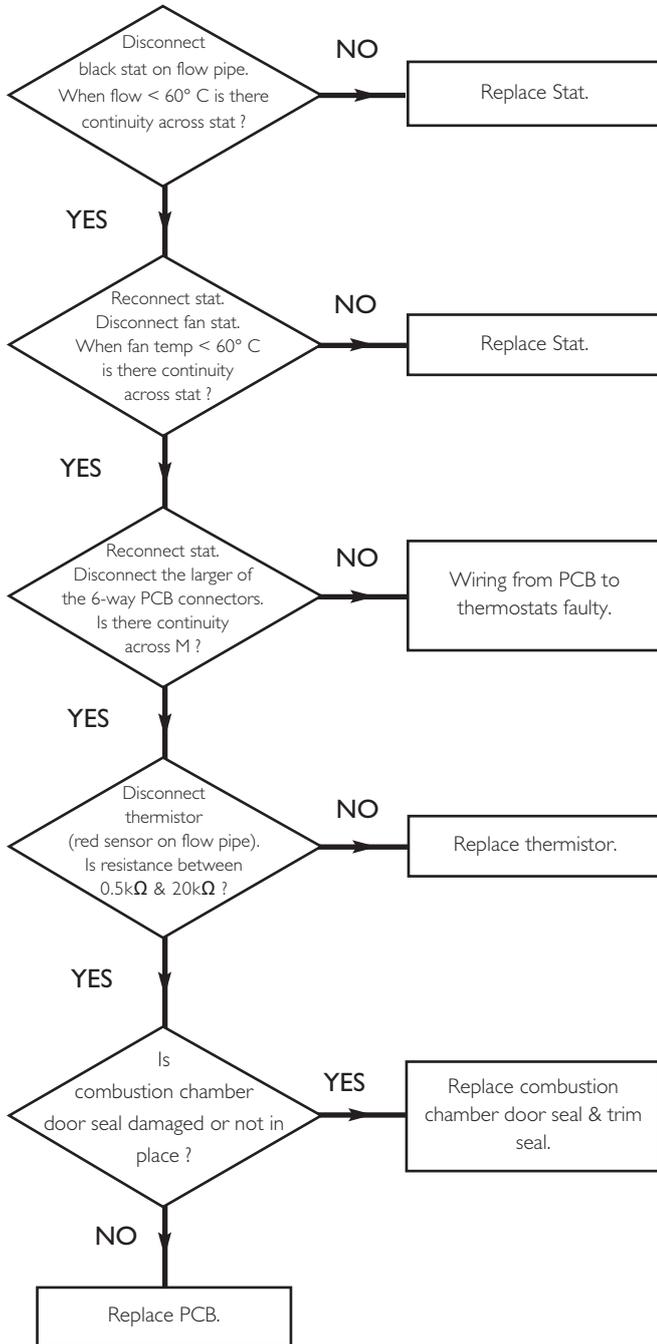
Ignition Lockout



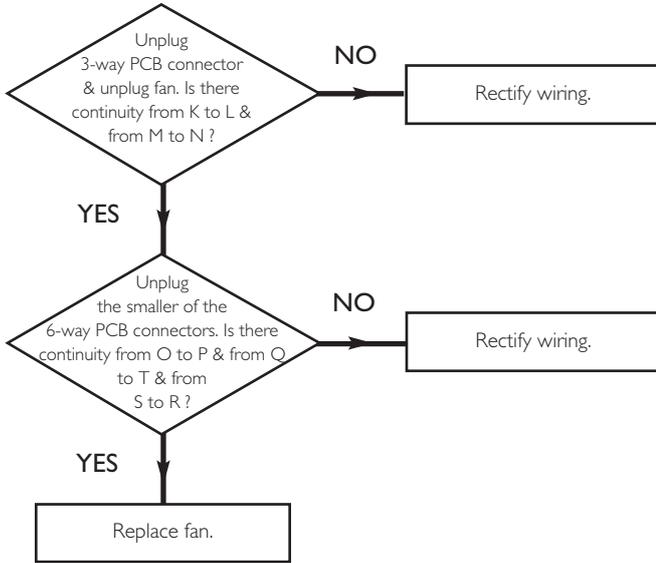
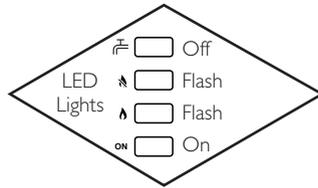
OVERHEAT LOCKOUT



15.0 Fault Finding

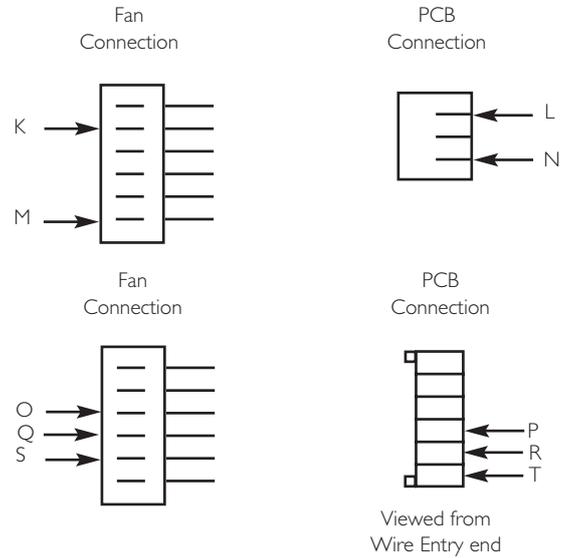


FAN

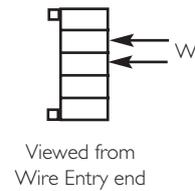
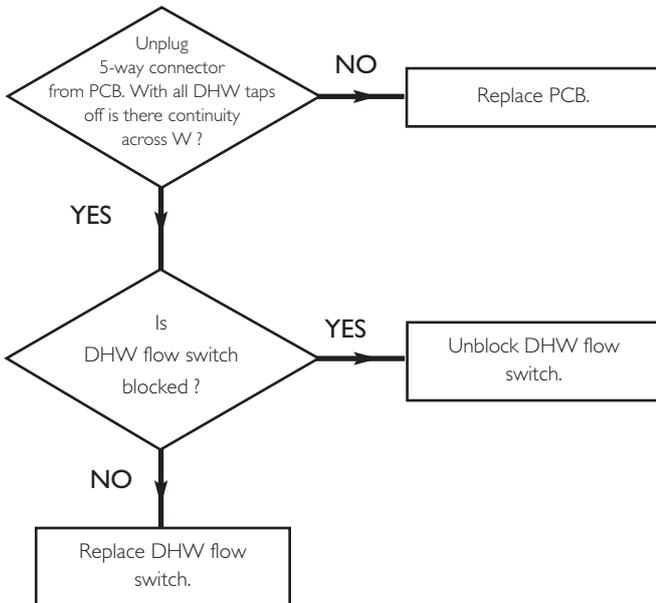
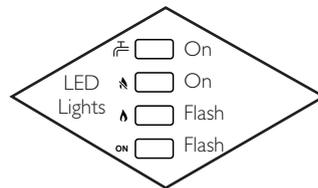


15.0 Fault Finding

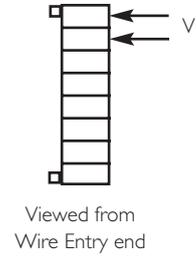
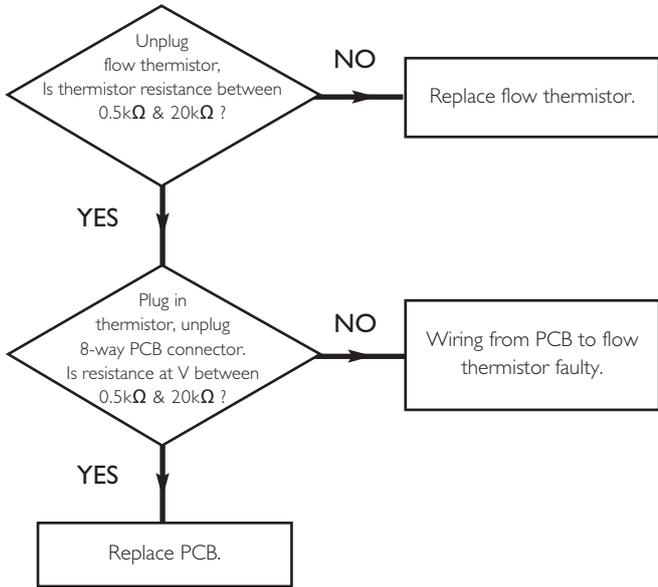
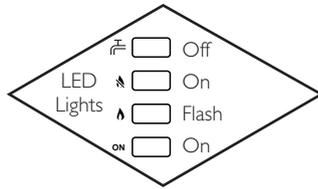
NOTE: The fan is supplied with 325 Vdc. Fan Fault Finding should only be carried out after the boiler has been electrically isolated.



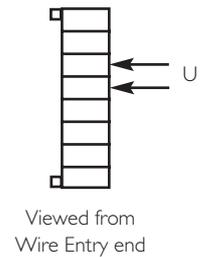
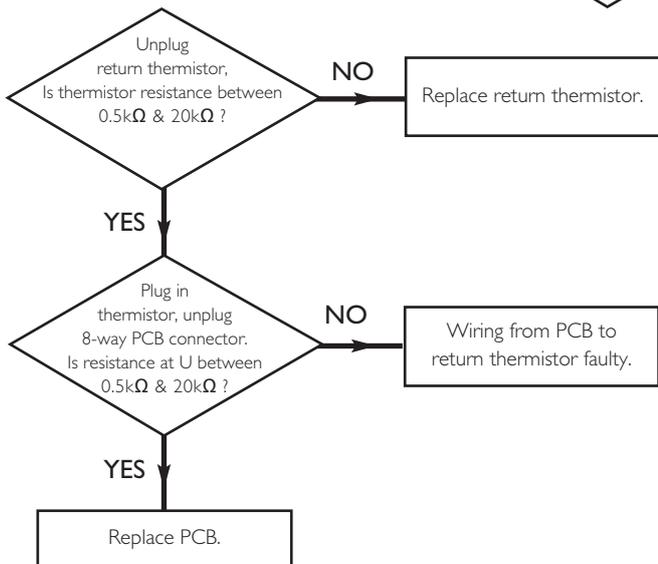
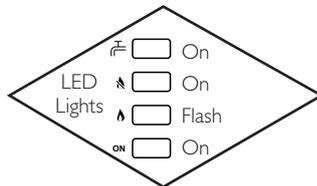
DHW FLOW SWITCH



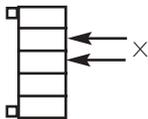
FLOW THERMISTOR



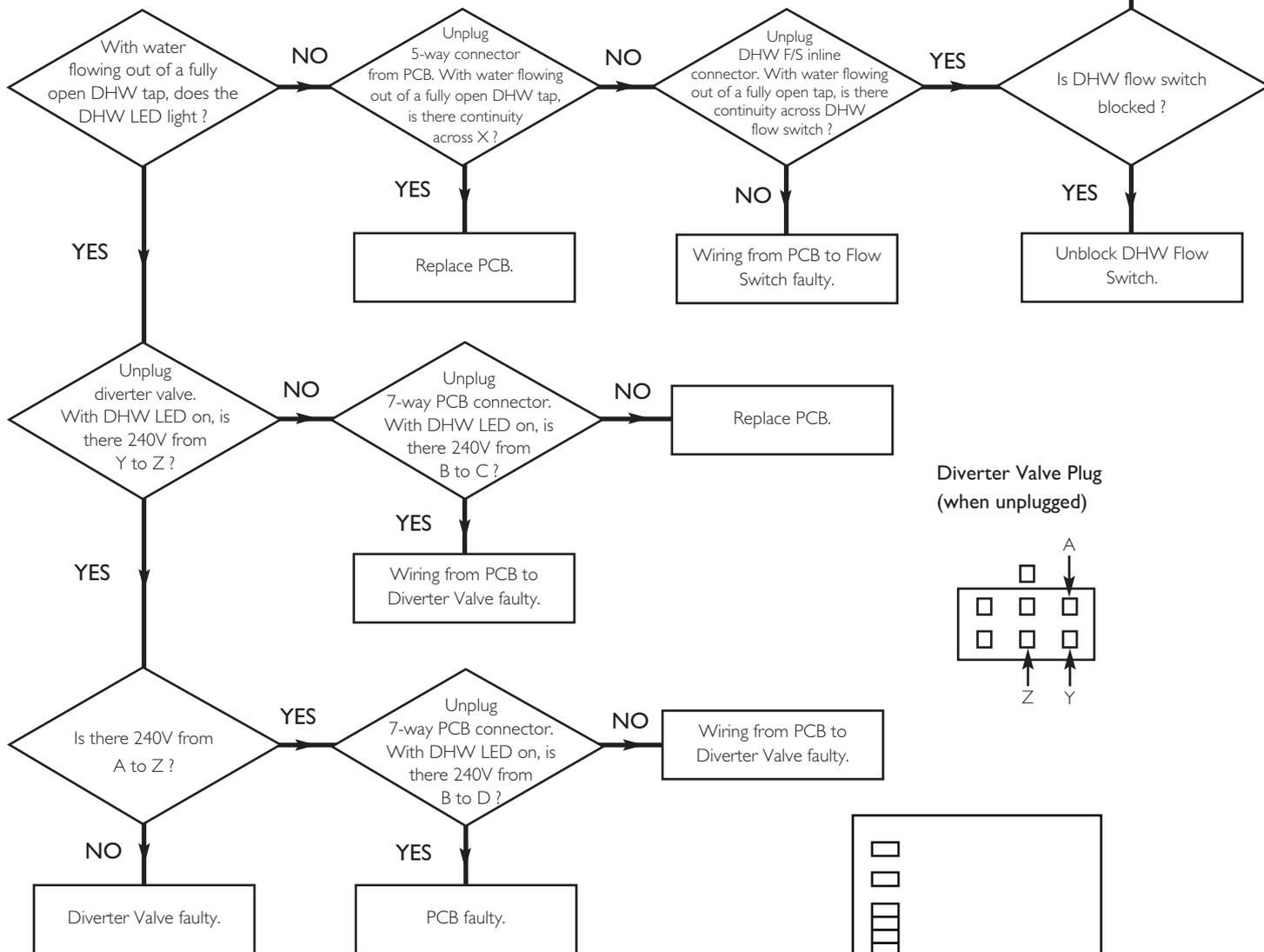
RETURN THERMISTOR



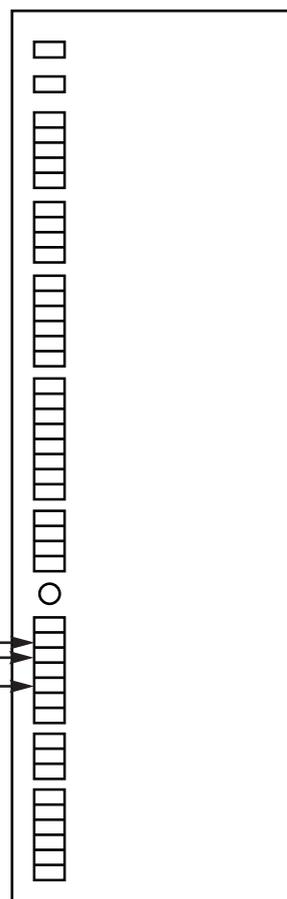
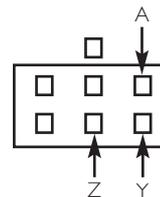
DHW Fault



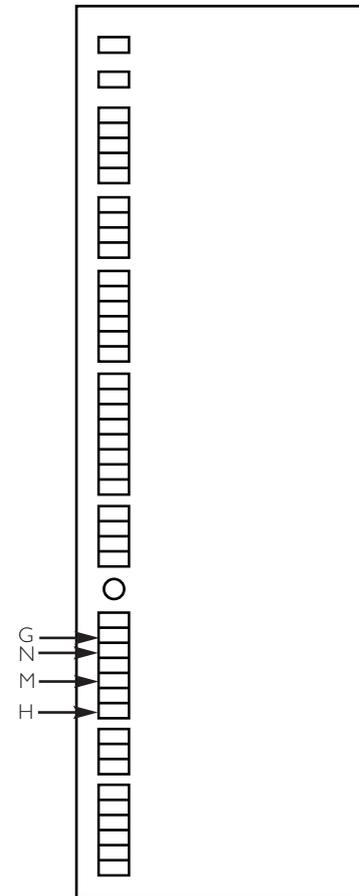
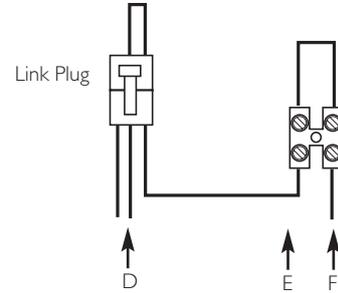
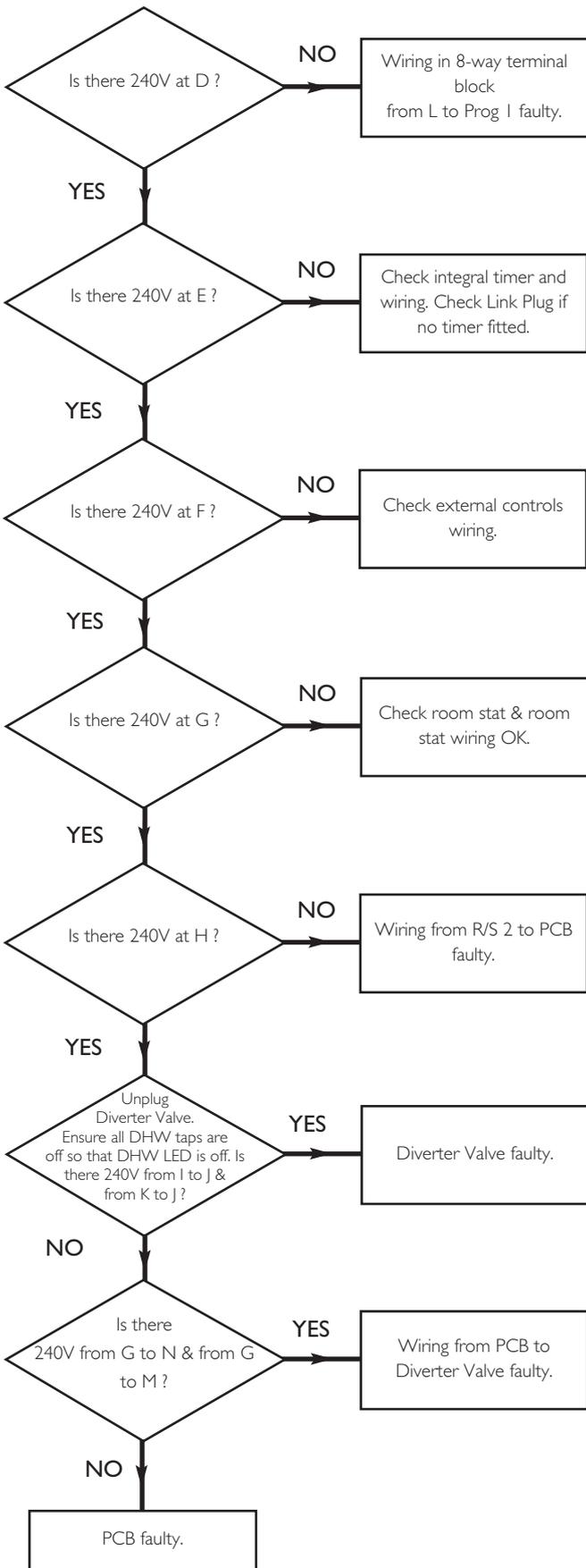
Viewed from Wire Entry end



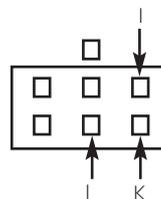
Diverter Valve Plug (when unplugged)



CH Fault

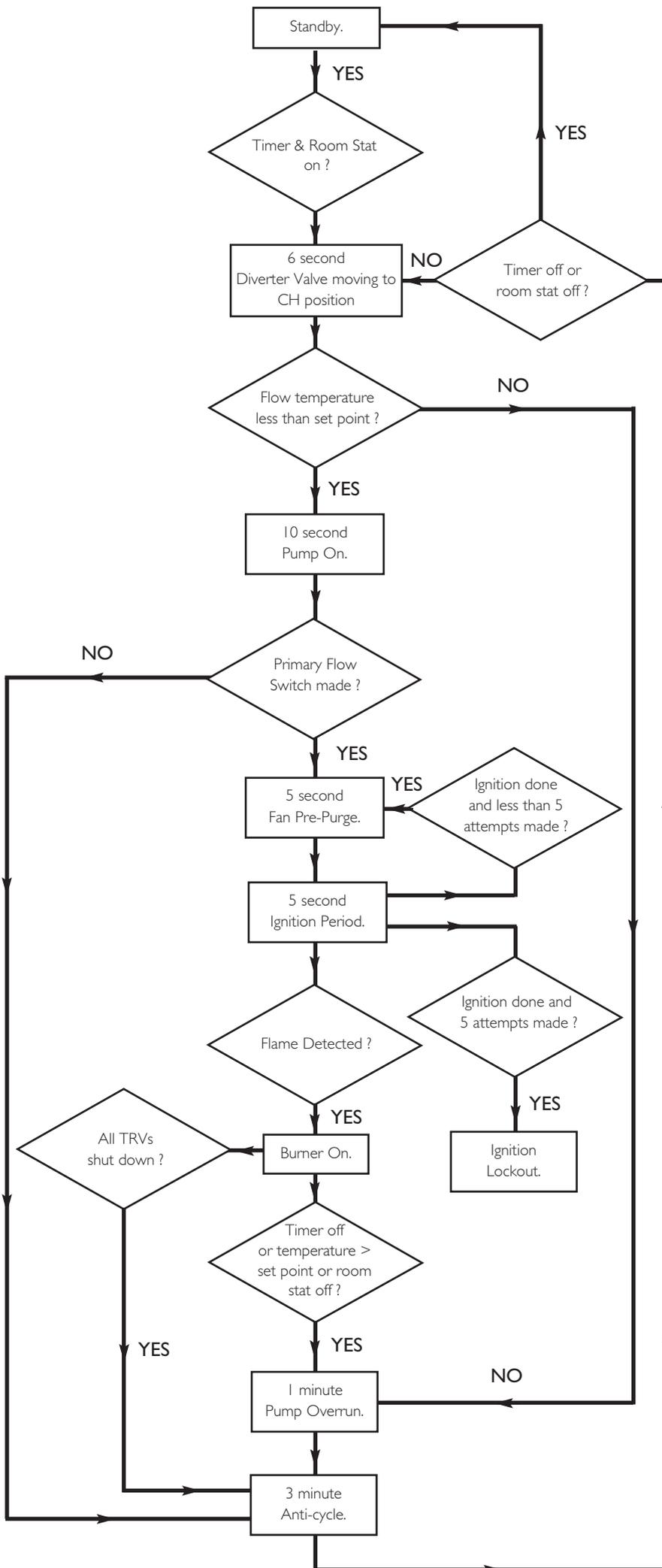


Diverter Valve Plug (when unplugged)



16.0 Operational Flow Chart

16.2 Central Heating Mode



1. **Standby:** The diverter valve, pump, fan, spark generator and gas valve are off. If the timer and room stat are on then Diverter Valve moving to CH position occurs.

2. **Diverter Valve moving to CH position:** The diverter valve moves to the CH position while the pump, fan, spark generator and gas valve are off. After 6 seconds if the flow temperature is less than the set point then Pump On occurs. After 6 seconds if the flow temperature is greater than the set point then Pump Overrun occurs.

3. **Pump On:** The diverter valve and pump are on while the fan, spark generator and gas valve are off. After 10 seconds if the flow switch has made then Fan Pre-Purge occurs. After 10 seconds if the flow switch has not made then Anti-cycle occurs.

4. **Fan Pre-Purge:** The diverter valve, pump and fan are on while the spark generator and gas valve are off. After 5 seconds Ignition occurs.

5. **Ignition:** The diverter valve, pump, fan, spark generator and gas valve are on. If a flame is detected then Burner On occurs. If a flame is not detected within 5 seconds and less than 5 ignition attempts have been made then Fan Purge occurs. If a flame is not detected within 5 seconds and 5 ignition attempts have been made then Ignition Lockout occurs.

6. **Burner On:** The diverter valve, pump, fan and gas valve are on while the spark generator are off. Flow temperature is controlled by varying the fan speed (and thereby the gas rate) to achieve optimum operation. If the flow temperature is greater than the set point or the timer is off or the room stat is off then Pump Overrun occurs. If the TRVs all shut down then Anti-cycle occurs.

7. **Pump Overrun:** The diverter valve and pump are on while the fan, spark generator and gas valve are off. After 1 minute Anti-cycle occurs.

8. **Anti-cycle:** The diverter valve, pump, fan, spark generator and gas valve are off. After 3 minutes Diverter Valve moving to CH position occurs.

9. **Ignition Lockout:** The diverter valve, pump, fan, spark generator and gas valve are off. The boiler can only be reset by manually using the reset button.

NOTE: If a tap or shower is switched on during CH Burner On then DHW Burner On occurs. If a DHW demand occurs during any other part of CH operation then DHW Purge occurs.



GAS BOILER COMMISSIONING CHECKLIST

BOILER SERIAL No. _____ NOTIFICATION No. _____

CONTROLS To comply with the Building Regulations, each section must have a tick in one or other of the boxes

TIME & TEMPERATURE CONTROL TO HEATING	ROOM T/STAT & PROGRAMMER/TIMER <input type="checkbox"/>	PROGRAMMABLE ROOMSTAT <input type="checkbox"/>
TIME & TEMPERATURE CONTROL TO HOT WATER	CYLINDER T/STAT & PROGRAMMER/TIMER <input type="checkbox"/>	COMBI BOILER <input type="checkbox"/>
HEATING ZONE VALVES	FITTED <input type="checkbox"/>	NOT REQUIRED <input type="checkbox"/>
HOT WATER ZONE VALVES	FITTED <input type="checkbox"/>	NOT REQUIRED <input type="checkbox"/>
THERMOSTATIC RADIATOR VALVES	FITTED <input type="checkbox"/>	
AUTOMATIC BYPASS TO SYSTEM	FITTED <input type="checkbox"/>	NOT REQUIRED <input type="checkbox"/>

FOR ALL BOILERS CONFIRM THE FOLLOWING

THE SYSTEM HAS BEEN FLUSHED IN ACCORDANCE WITH THE BOILER MANUFACTURER'S INSTRUCTIONS?

THE SYSTEM CLEANER USED _____

THE INHIBITOR USED _____

FOR THE CENTRAL HEATING MODE, MEASURE & RECORD

GAS RATE m³/hr ft³/hr

BURNER OPERATING PRESSURE (IF APPLICABLE) N/A mbar

CENTRAL HEATING FLOW TEMPERATURE °C

CENTRAL HEATING RETURN TEMPERATURE °C

FOR COMBINATION BOILERS ONLY

HAS A WATER SCALE REDUCER BEEN FITTED? YES NO

WHAT TYPE OF SCALE REDUCER HAS BEEN FITTED? _____

FOR THE DOMESTIC HOT WATER MODE, MEASURE & RECORD

GAS RATE m³/hr ft³/hr

MAXIMUM BURNER OPERATING PRESSURE (IF APPLICABLE) N/A mbar

COLD WATER INLET TEMPERATURE °C

HOT WATER OUTLET TEMPERATURE °C

WATER FLOW RATE lts/min

FOR CONDENSING BOILERS ONLY CONFIRM THE FOLLOWING

THE CONDENSATE DRAIN HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS? YES

FOR ALL INSTALLATIONS CONFIRM THE FOLLOWING

THE HEATING AND HOT WATER SYSTEM COMPLIES WITH CURRENT BUILDING REGULATIONS

THE APPLIANCE AND ASSOCIATED EQUIPMENT HAS BEEN INSTALLED AND COMMISSIONED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS

IF REQUIRED BY THE MANUFACTURER, HAVE YOU RECORDED A CO/CO₂ RATIO READING? N/A YES CO/CO₂ RATIO

THE OPERATION OF THE APPLIANCE AND SYSTEM CONTROLS HAVE BEEN DEMONSTRATED TO THE CUSTOMER

THE MANUFACTURER'S LITERATURE HAS BEEN LEFT WITH THE CUSTOMER

COMMISSIONING ENG'S NAME PRINT _____ CORGI ID No. _____

SIGN _____ DATE _____

SERVICE INTERVAL RECORD

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

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

SERVICE 1 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 2 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 3 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 4 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 5 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 6 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 7 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 8 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 9 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 10 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

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

BAXI

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e&oe

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