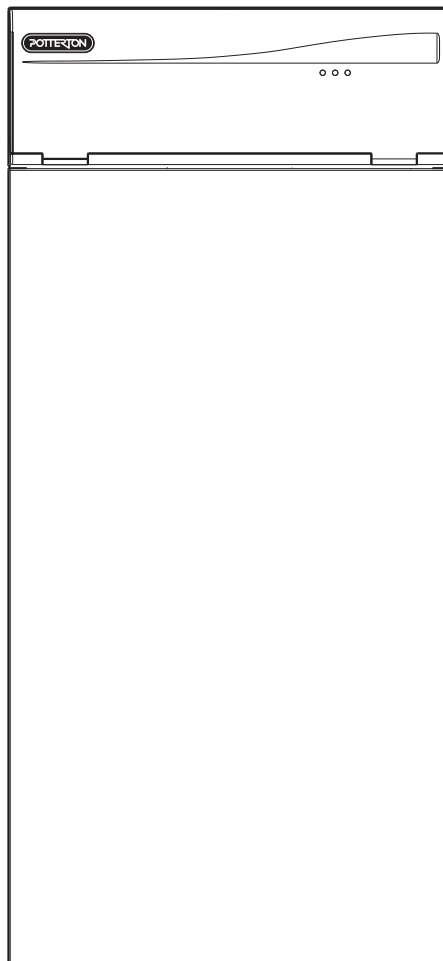


# Installation & Service Instructions

## Promax FSB 30 HE

Floor Standing  
Fanned Flue  
Condensing Boiler



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

## Natural Gas

Potterton Promax FSB 30 HE

G.C. No 41 595 39

### The Benchmark Scheme

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

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

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**WARNING:** Any person who does any unauthorised act in relation to a copyright work may be liable to criminal prosecution and civil claims for damages.

## 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.

The Health & Safety Executive operates the 'Gas Safe Register', 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.

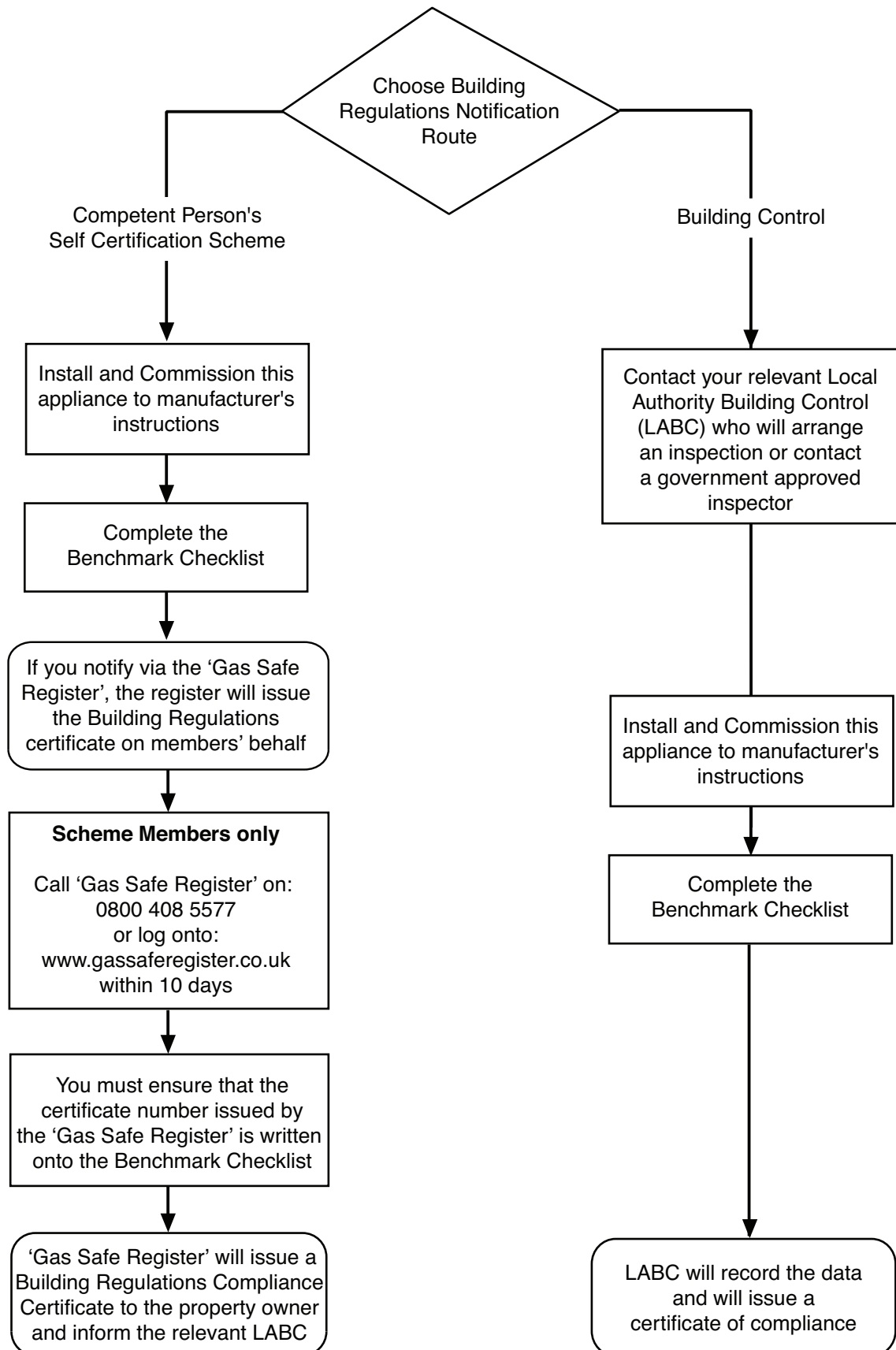
This company is a member of the Benchmark initiative and fully supports the aims of the programme. Its aim is to improve the standards of installation and commissioning of central heating systems in the UK and to encourage the regular servicing of all central heating systems to ensure safety and efficiency.

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.



ISO 9001  
FM 00866



## 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 Gas Safe registered company and holding current certificates in the relevant ACS modules, is deemed competent.

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

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

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

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

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.

For GB/IE only.

This company 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 Gas Safe 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 6.2).**

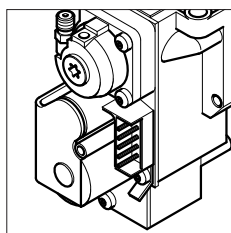
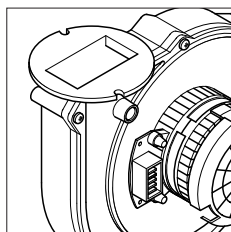
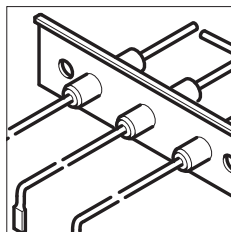
**Codes of Practice**, most recent version should be used

### 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 EN 12828	Heating systems in buildings.
BS EN 14336	Installation & commissioning of water based heating systems.
BS 6798	Installation of gas fired hot water boilers.
BS 5440 Part 1	Flues.
BS 5440 Part 2	Ventilation.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.

### In IE the following Codes of Practice apply:

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



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## 1.0 Introduction

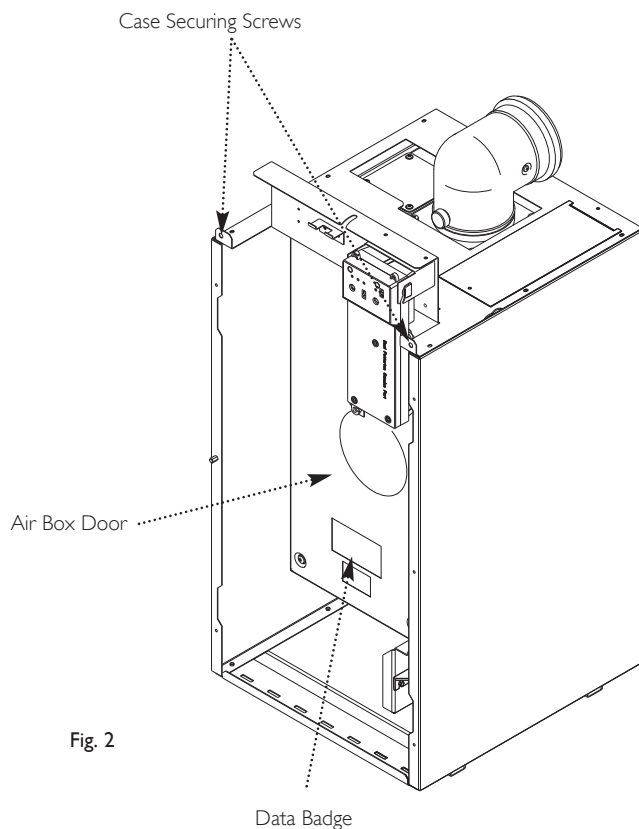
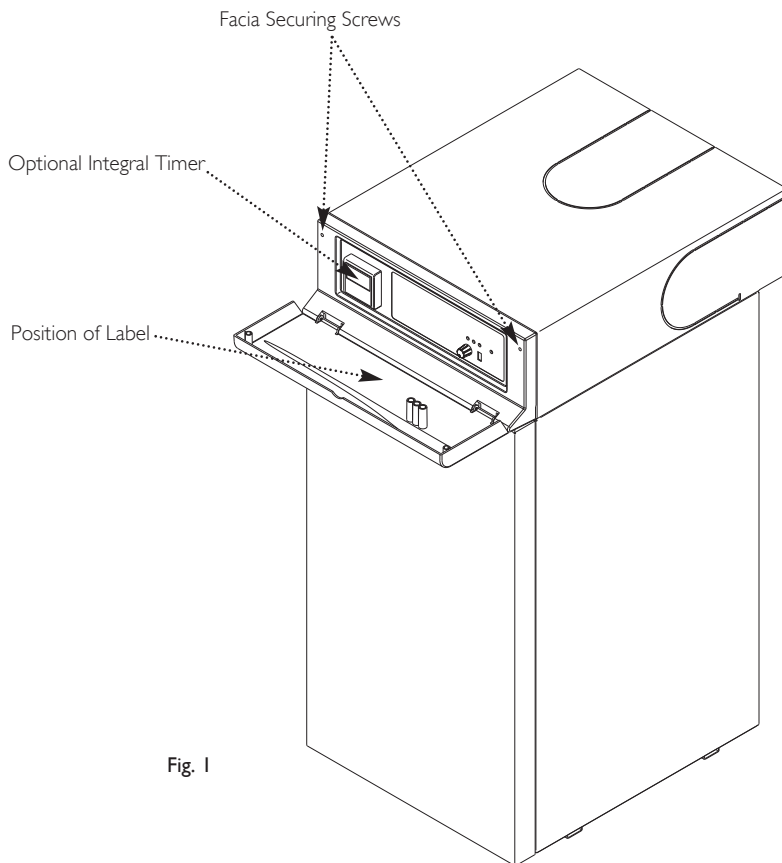
### 1.1 Description

1. The Potterton Promax FSB 30 HE is a gas fired room sealed fan assisted condensing central heating boiler.
2. The maximum output of the boiler is 30.18 kW. The boiler automatically adjusts the output down to 9.2 kW according to system load.
3. The boiler is designed for use on Natural Gas (G20) only.
4. The boiler is suitable for fully pumped open vented and sealed systems, providing heating and hot water.
5. A label giving details of the model, serial number and Gas Council number is situated on the rear of the drop down facia panel (Fig. 1).
6. The boiler data badge is positioned on the air box door (Fig. 2).
7. The boiler is intended to be installed in residential / domestic environments on a governed meter supply only.
8. The boiler must be installed with one of the purpose designed flues such as the standard horizontal flue kit, part no 236921.

### 1.2 Important Information

#### Man-made mineral fibre

- Some component parts of this boiler (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.



## 2.0 General Layout

### 2.1 Layout (Figs. 3, 4, 5 & 6)

1. Condensate Pump
2. Flue Elbow (supplied in std. flue kit)
3. Heat Exchanger
4. Burner
5. Air Box
6. Fan Protection Thermostat - Black
7. Fan Assembly
8. Condensate Trap
9. PCB Housing Assembly
10. Gas Tap
11. Gas / Air Ratio Valve
12. Flow Pipe Connection
13. Return Pipe Connection
14. Flow Temperature Safety Thermostat - Black
15. Flow Temperature Thermistor - Red
16. Flow Switch (dry fire protection)
17. Position of Optional Integral Timer Wiring
18. Pipe Access Panel
19. Manual Air Vent

### 2.2 110Ø Concentric Flues & Optional Extras

KIT	PART N°
Standard Flue Kit 850mm (inc. elbow)	236921
Extended Flue Kit - 1.75M (inc. elbow)	5111457
Flue Plume Deflector Kit	248167
Terminal Guard (suitable for use with above)	248484

#### FLUE EXTENSION KITS (110/70)

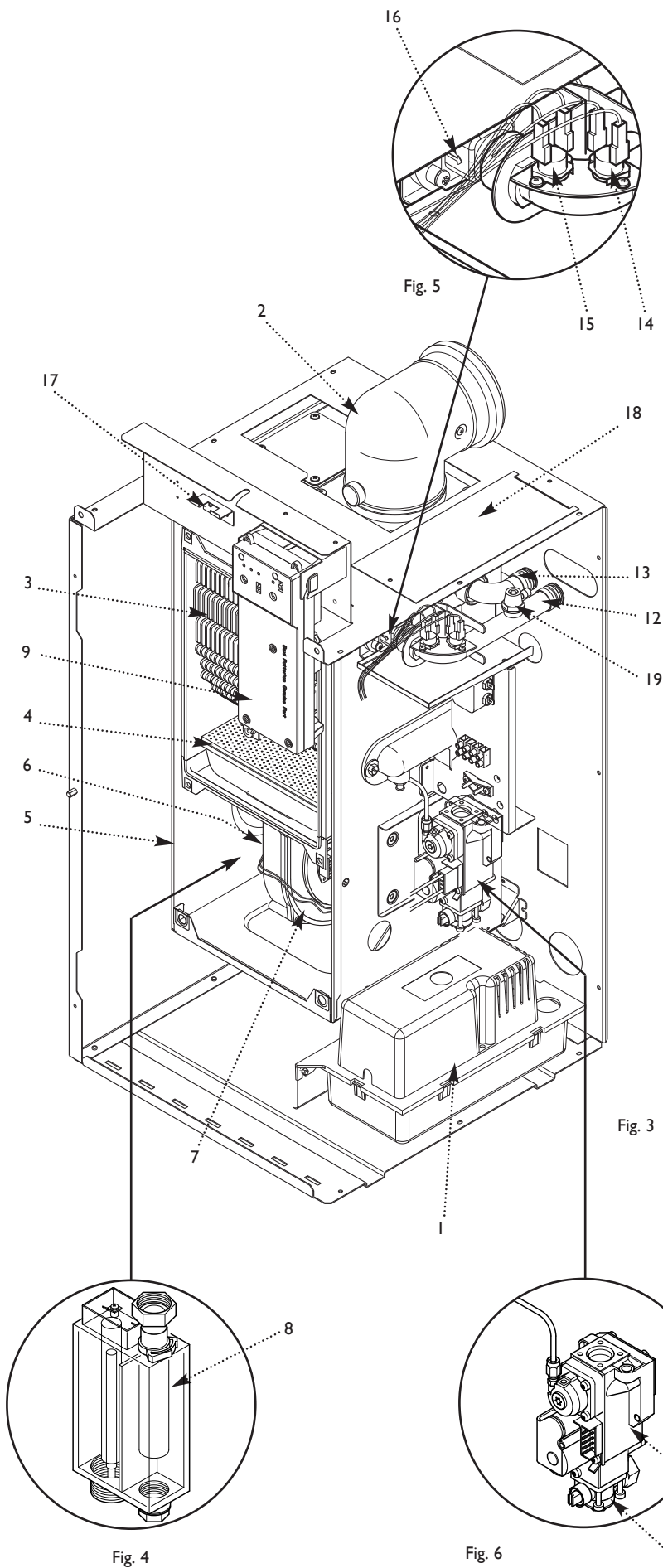
Flue Extension 250mm	241692
Flue Extension 500mm	241694
Flue Extension 1000mm (Use two kits for 2M etc.)	241695
Flue Bend x 2 - 45° (Reduce overall length of flue by 0.5m when fitting this bend)	241689
Flue Bend - 93° (Reduce overall length of flue by 1m when fitting each bend)	241687

#### VERTICAL FLUE

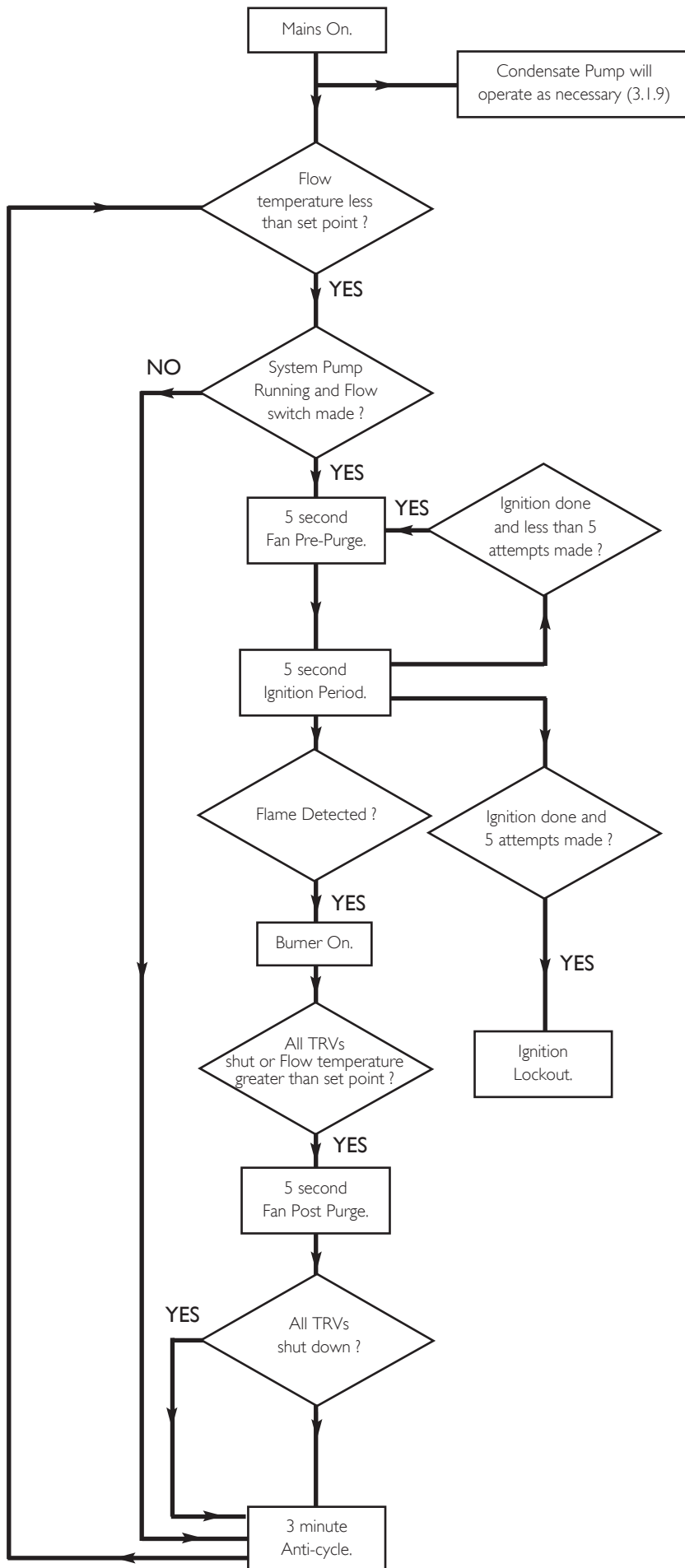
Vertical Flue Terminal	242802
Vertical Flue Adaptor	5106888

See Section 7.12 for more flue option details

Integral Twin Channel Timer	5117455
-----------------------------	---------



### 3.1 Boiler Operation



1. **Switched Live On:** When switched live is supplied to the boiler and the flow temperature is less than the set point the sequence below commences.

2. **Flow Switch:** 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.

3. **Fan Pre-Purge:** The flow switch is made and the fan is on while the spark generator and gas valve are off. After 5 seconds ignition occurs.

4. **Ignition:** The flow switch is made, 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.

5. **Burner On:** The flow switch is made, fan and gas valve are on while the spark generator is 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 TRVs all shut down then fan post purge occurs.

6. **Fan Post Purge:** The fan is on while the spark generator and gas valve are off. After 5 seconds if the TRVs are shut down then anti-cycle occurs.

7. **Anti-cycle:** The fan, spark generator and gas valve are off.

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

9. **Condensate Pump:** Condensate accumulates in a reservoir within the pump assembly. The pump may run at any time, independent of boiler operation, to discharge the condensate to drain.



Appliance Type	C <sub>13</sub>	C <sub>33</sub>	
Appliance Category	CAT I 2H		
Heat Input (Q)(Gross)	Max	Min	
	kW	33.76	10.3
Heat Output (P)	(Non Condensing 70° C Mean Water Temp)		
	Max	Min	
	kW	30.18	9.2
Heat Output (P)	(Condensing 40° C Mean Water Temp)		
	Max	Min	
	kW	32.61	10.0
Max Gas Rate	(2H - G20 - 20mbar)		
(After 10 Mins)			
	kW Input	33.76	
	m³/hr	3.4	
Inlet Pressure at Gas Valve	(Natural Gas)		
	Min	18.1 mbar	
	Max	22.5 mbar	
	(see Section 10.1)		
Injector (Natural Gas)			
	Diameter	6.5mm	
CO/CO <sub>2</sub> Ratio	0.001		
NO <sub>x</sub> Class	5		

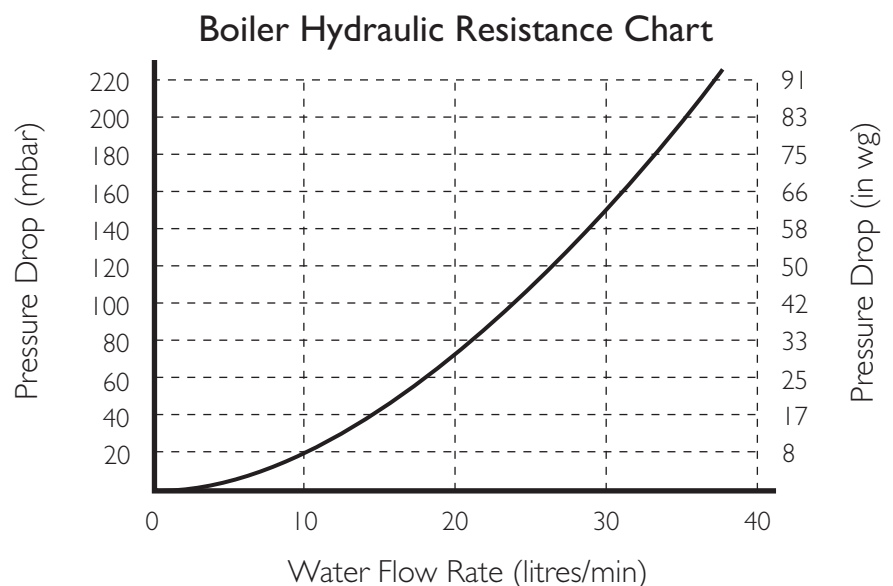
<b>Horizontal Flue Terminal Dimensions</b>	Diameter -	110mm
	Projection -	150mm
<b>Connections</b>		
Gas Supply	-	15mm
Central Heating Flow	-	28mm
Central Heating Return	-	28mm
Condensate Drain (Pump)	-	10mm o.d.
<b>Outer Case Dimensions</b>		
Casing Height	-	850mm
Casing Width	-	390mm
Casing Depth	-	520mm
<b>Minimum Clearances</b> (For unventilated compartments see Section 7.2)		
Both Sides	-	5mm
Above Casing	-	15mm
Under fixed worktop - (It is recommended that any worktop is removable)	-	25mm
Front (For Servicing)	-	500mm
Front (In Operation)	-	5mm
<b>Weights</b>		kg
Packaged Boiler Carton	-	49.5
Packaged Flue Kit	-	3.6
Installation Lift Weight	-	37.5
Installed Weight (dry)	-	44.5
<b>Recommended System Temperature Drop</b>		20°C
Condensing		

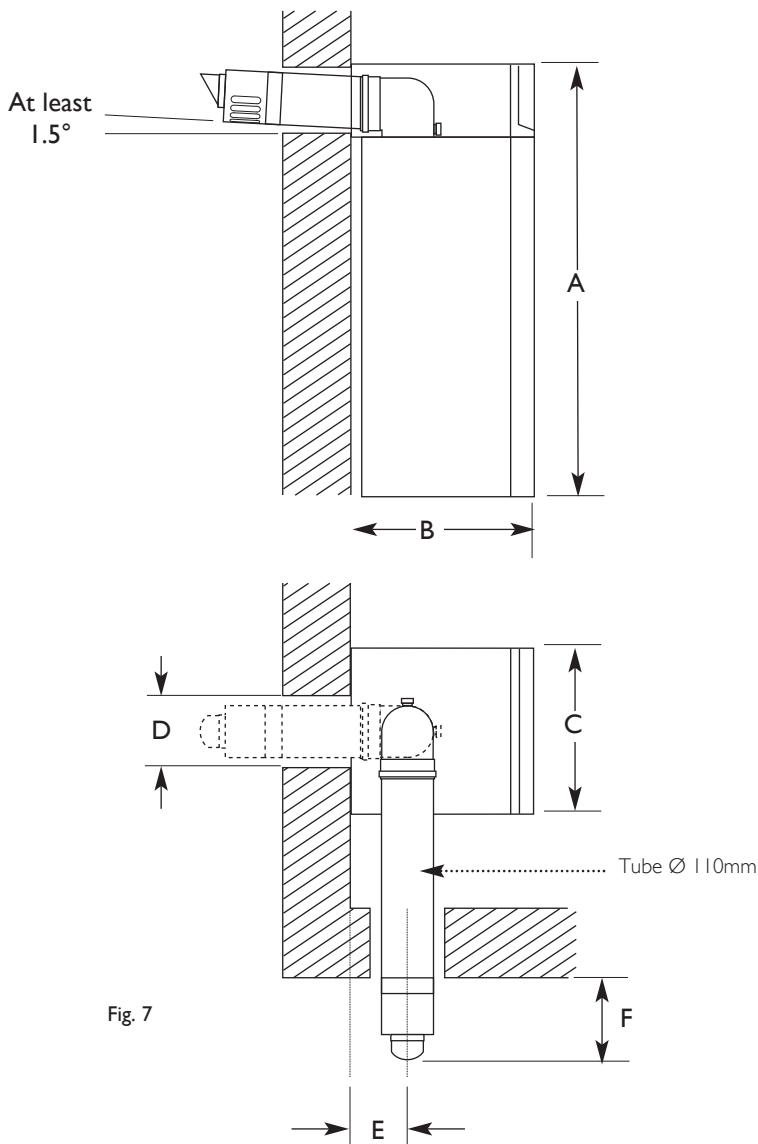
<b>Electrical Supply</b>	230V~ 50Hz
The boiler must be connected to an earthed supply. A permanent and switched live are required. The boiler has a 4 wire connection.	
<b>Power Consumption</b>	80W
<b>External Fuse Rating</b>	3A
<b>Internal Fuse Rating</b> (BS 4265)	
Fuse	3.15 AT (PCB)
<b>Electrical Protection</b>	IPXX
<b>Water Content</b>	litres
	2.6
<b>Static Head</b>	
max	30 metres
min	1 metre
<b>Low Head</b>	0.2m min
<b>System Detail</b>	
Fully pumped open vented & sealed systems. No bypass required.	
<b>Controls</b>	
boiler thermostat, safety thermostat, flow switch, electronic flame sensing, temperature protection thermostat & condensate blockage and level sensors	
<b>Boiler Flow Temperature</b> (adjustable)	55° C to 78° C (± 5° C)
<b>Condensate Pump</b>	
Head	3 metres
Flow Rate	1.8 l/min
Connection	10mm o.d. (pipe supplied)

### SEDBUK Declaration

The efficiency is 90.9%

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 0087.





### DIMENSIONS

A	850mm
B	520mm
C	390mm
D	125mm Ø Min.
E	175mm
F	150mm

The 1.5° fall provided by the elbow is to allow condensate to run back to the boiler, for discharge through the condensate disposal system.

### SIDE FLUE (left and right)

For every 1m of horizontal flue length, the clearance above the top of the flue elbow should be 27.5mm to incorporate the 1.5° fall in the flue from the terminal to the elbow. **It is especially important to consider this when fitting the boiler under a work top !**

Flue length (Y)	Clearance (X)
up to 1m	27.5mm
1m - 2m	55mm
2m - 3m	82.5mm
3m - 4m	110mm

## 6.0 System Details

---

### 6.1 Water Circulating Systems

1. The boiler is suitable for use with open vent fully pumped systems and sealed systems .

**The following conditions should be observed on all systems:**

- The static head must not exceed 30m of water.
  - The boiler must not be used with a direct cylinder.
  - Drain cocks should be fitted to all system low points.
  - All gas and water pipes and electrical wiring must be installed in a way which would not restrict the servicing of the boiler.
  - Position isolating valves as close to circulating pump as possible.
- 

### 6.2 Treatment of Water Circulating Systems

1. All recirculatory water systems will be subject to corrosion unless they are flushed and an appropriate water treatment is applied. To prevent this, follow the guidelines given in BS 7593 "Treatment of Water in Domestic Hot Water Central Heating Systems" and the treatment manufacturers instructions.

2. Treatment must involve the use of a proprietary cleanser, such as Sentinel X300 or X400, or Femox F3 and an inhibitor such as Sentinel XI00 or Femox MB-I.

3. Full instructions are supplied with the products, for further information contact Sentinel (0800 389 4670) or Femox (0870 870 0362).

<b>Failure to flush and add inhibitor to the system will invalidate the appliance warranty.</b>
---

4. It is important to check the inhibitor concentration after installation, system modification and at every service in accordance with the inhibitor manufacturer's instructions. (Test kits are available from inhibitor stockists.)

5. For information or advice regarding any of the above contact Technical Enquiries 0844 871 1555.

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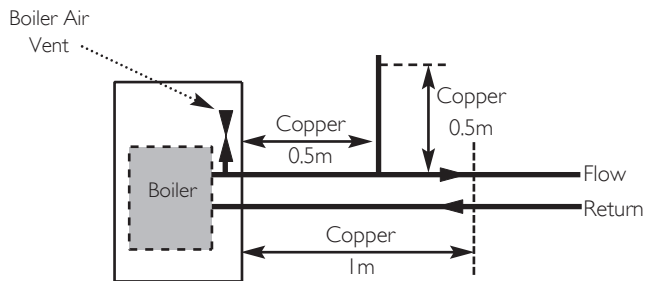


Fig. 9

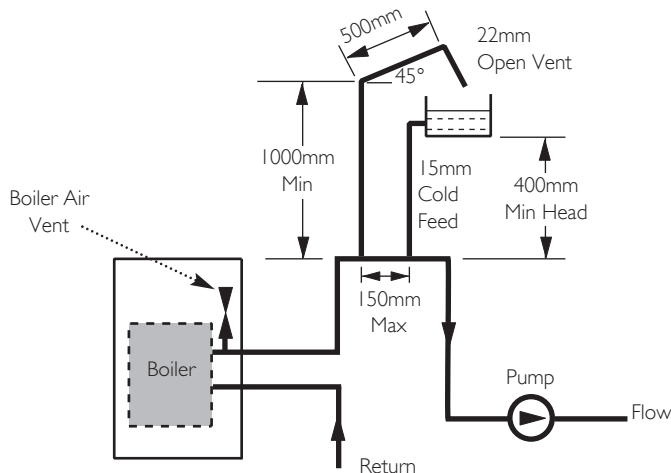


Fig. 10

Typical Low Head Installation

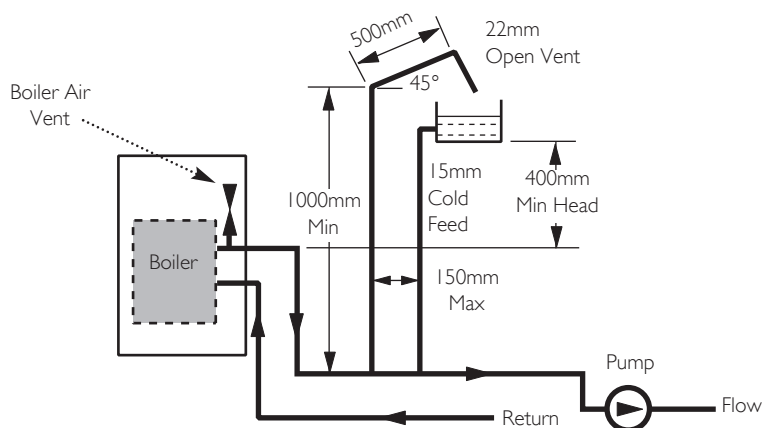


Fig. 11

If Conditions Require,  
This System Possible

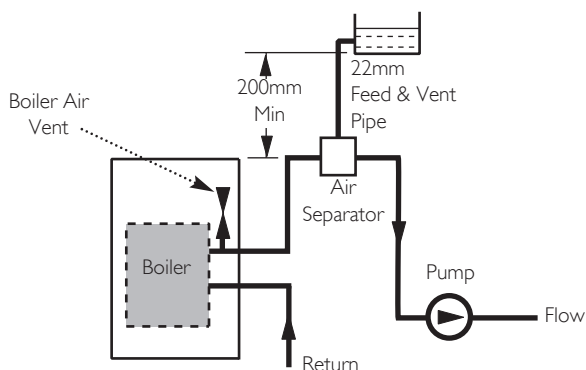


Fig. 12

Alternative Low Head Installation

## 6.0 System Details

### 6.3 Pipework

1. The sizes of flow and return pipes from the boiler should be determined by normal methods, according to the requirements of the system.
2. The connection tails for the boiler are 28mm diameter. The 28mm section of the tails can be cut back to 22mm if required.
3. The flow & return tails are push - fit 'O' ring and clip connections within the boiler case.
4. A 20 °C drop in temperature across the system is recommended for condensing boilers. Existing radiators may be oversized and so allow this, but where radiator sizing is marginal it may be advisable to retain a system temperature drop of 11 °C.
5. In systems using non-metallic pipework it is necessary to use copper pipe for the boiler Flow and Return. The copper must extend at least 1 metre from the boiler and include any branches (Fig. 9).

6. This boiler does not require a bypass.

### 6.4 Low Head Installation

1. Using a close couple arrangement the minimum head is as shown in the diagrams (Figs. 10 & 11) subject to the following conditions:
  - a) The pump being adjusted to give a 20°C drop across the boiler.
  - b) The pump must be fitted on the flow.
  - c) The pump must be fitted in accordance with the pump manufacturer's instructions.
  - d) The open vent pipe must be taken up from a tee in a horizontal section of the flow pipe.
2. For heads below 400mm then an alternative utilising a combined vent and feed pipe may be connected (Fig. 12). This must be a minimum of 22mm diameter. It is recommended that an air separator is fitted when using a combined feed and vent pipe.

### 6.5 Air Vents

**For correct operation of the flow switch the boiler and system MUST be completely vented.**

1. A manual air vent is fitted on the flow pipe, to enable complete venting of the boiler. The pipe access panel must be removed to do this.
2. Additional vents should be fitted at suitable points on the system as required.

Key to colours

b - Blue

br - Brown

w - White

o - Orange

gr - Grey

g/y - Green/Yellow

## 6.0 System Details

### 6.6 System Controls & Wiring

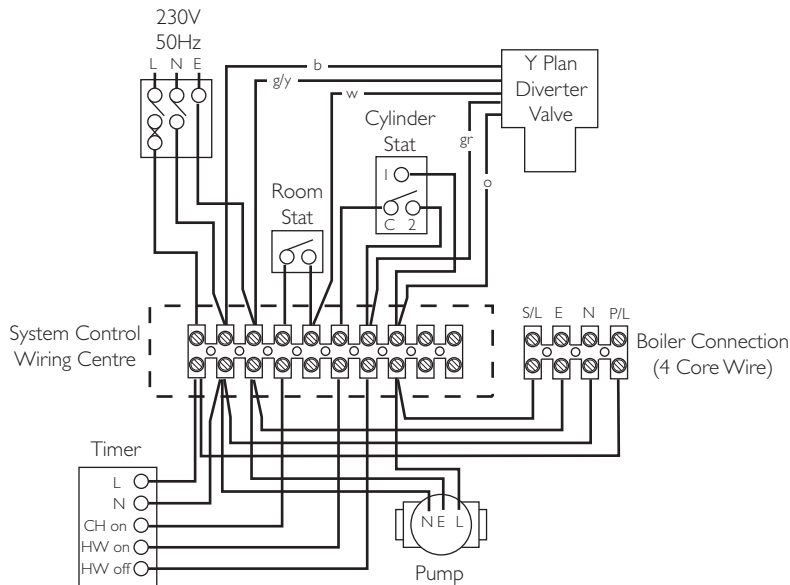
This boiler requires a permanent live for operation of the condensate pump and frost protection.

1. 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

2. 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 and system pump interlock.

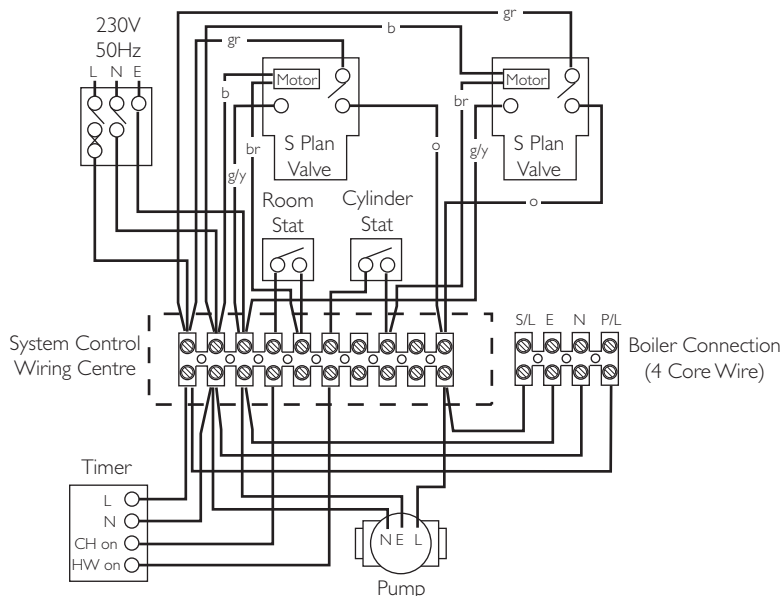
3. The boiler should be controlled so that it operates on demand only. Where it is proposed to effect control by thermostatic radiator valves a room thermostat should also be provided to switch off the boiler when there is no demand for heating.



**Y Plan, Room Thermostat System, CH Interlocked By Room Thermostat, DHW Interlocked By Cylinder Thermostat**

At least the Radiator(s) near the Room Thermostat not TRV'd

Pump run from Switched Live



**S Plan, Room Thermostat System, CH Interlocked By Room Thermostat, DHW Interlocked By Cylinder Thermostat**

At least the Radiator(s) near the Room Thermostat not TRV'd

Pump run from Switched Live

## 6.0 System Details

### 6.7 Sealed Systems (Fig. 13)

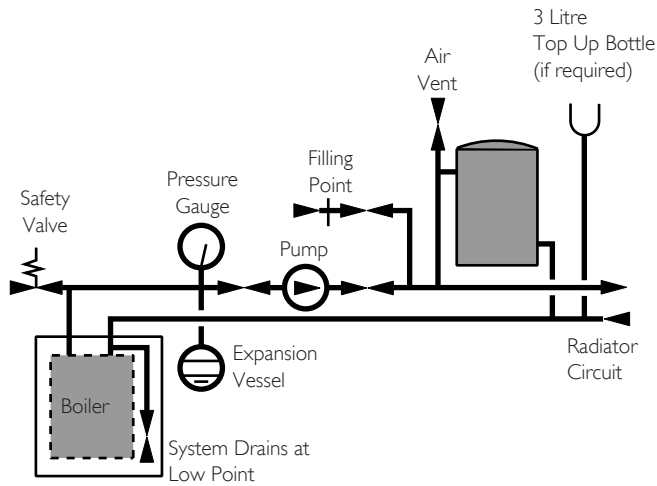


Fig. 13

Max Boiler Flow  
Temp = 82° C

Method of determining minimum expansion  
vessel volume for sealed systems.

Vessel Charge Pressure (Bar)	Initial System Pressure (Bar)	Multiply Total Water Content Of System By (Litres)
0.5	0.5	0.067
	1.0	0.112
	1.5	0.207
	2.0	0.441
1.0	1.0	0.087
	1.5	0.152
	2.0	0.330
1.5	1.5	0.125
	2.0	0.265

Table. 1

Example :- System Volume = 75 litres  
Vessel Charge Pressure = 1.0 bar  
Initial System Pressure = 1.5 bar  
Then :-  $75 \times 0.152 = 11.4$  litres  
Expansion Vessel Volume

#### NOTE

Where a vessel of the calculated size is not obtainable then the next available larger size should be used.

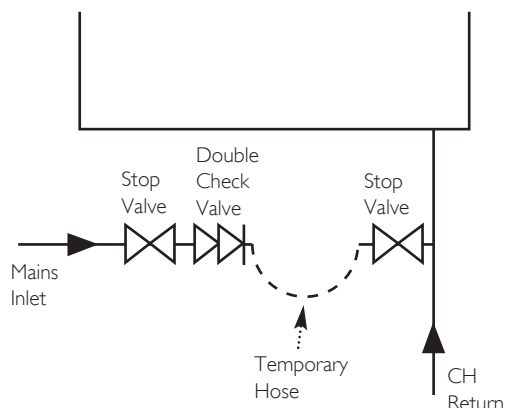


Fig. 14

1. **SAFETY VALVE** - A safety valve complying with the requirements of BS 6750 Part 1 must be fitted close to the boiler on the flow pipe by means of a horizontal or vertically upward connection with no intervening valve or restrictions and should be positioned to facilitate testing. The valve should be pre-set and non-adjustable to operate at a pressure of 3 bar (45 lbf/in<sup>2</sup>). It must be arranged to discharge any water or steam through a pipe to a safe outlet position.

2. **PRESSURE GAUGE** - A pressure gauge of minimum range 0-4 bar (0-60 lbf/in<sup>2</sup>) with a fill pressure indicator must be fitted to the system, preferably at the same point as the expansion vessel in an easily visible position.

3. **EXPANSION VESSEL** - An expansion vessel complying with the requirements of BS 4814 must be fitted to the system by means of a connection close to the inlet side of the circulating pump in accordance with the manufacturers instructions, the connecting pipe being unrestricted and not less than 15mm (1/2 in) nominal size. The volume of the vessel should be suitable for the system water content and the nitrogen or air charge pressure should not be less than the system static head (See Table. 1).

Further details of sealed system design can be obtained from BS 5449 and the British Gas publication entitled 'Specifications for Domestic Wet Central Heating Systems'.

4. **FILLING POINT** - 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. The sealed primary circuits may be filled or replenished by means of a temporary connection between the primary 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. The filling method adopted must be in accordance with all relevant water supply regulations and use approved equipment.

Your attention is drawn to, for GB: Guidance G24.2 and recommendation R24.2 of the Water Regulations Guide. for IE: the current edition of I.S. 813 "Domestic Gas Installations".

5. **MAKE UP SYSTEM** - A method of replacing water lost from the system should be provided either by means of a make up vessel of not more than 3 litres (5 pints) capacity, mounted above the highest point of the system, or by re-pressurisation of the system.

6. **VENTING** - A method of venting the system during filling and commissioning must be provided by fitting automatic air vents or by venting manually.

7. **HOT WATER STORAGE** - The hot water storage vessel must be of the indirect coil type.

8. **COMPONENTS** - All components used in the system must be suitable for operation at 110°C (230°F) and at the pressure allowed by the safety valve.

## 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.

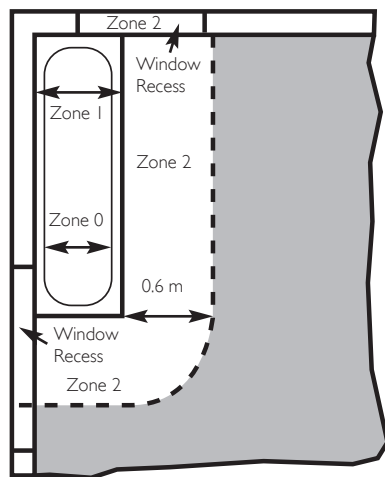


Fig. A In GB Only

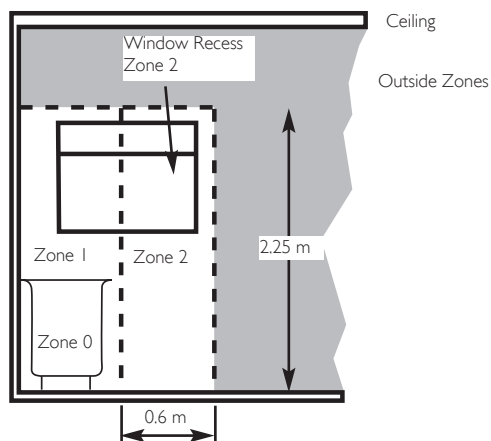


Fig. B In GB Only

1. The boiler must be fitted on a suitable flat and level surface capable of supporting the weight. Any wall behind the boiler must be at 90° to the floor to allow case top cover to fit correctly.

2. The flue must pass through an outside wall or roof and discharge to atmosphere in a position permitting satisfactory removal of combustion products and providing an adequate air supply.

3. The boiler should be fitted within the building unless otherwise protected by a suitable enclosure i.e. garage or outhouse.

4. The boiler incorporates a frost protection device. This will only protect the boiler. To ensure protection of the system pipework and components it is recommended to incorporate an appropriate device within the system controls.

5. If the boiler is fitted in a room containing a bath or shower, it **MUST NOT BE** fitted in zone 0, 1 or 2, **ONLY** within the shaded area (Figs. A & B shows zone dimensions for a bathtub. For other examples refer to the Current I.E.E. Wiring Regulations) reference must be made to the relevant requirements:-  
In GB this is the current I.E.E. Wiring Regulations and Building Regulations.  
In IE reference should be made to the current edition of I.S. 813 "Domestic Gas Installations" and the current ETCL rules.

6. 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 Compartment

1. Where the boiler is installed in a cupboard or compartment, no air vents are required for cooling purposes providing that the minimum dimensions below are maintained.

Width	400mm
Height	875mm
Depth	525mm

2. Any compartment should be large enough to house the boiler only.

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

## 7.0 Site Requirements

### 7.3 Clearances (Figs. 15 & 16)

1. 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. For side flue installations also See Section 8.1, Figs. 20 & 21.

2. It is recommended that any worktop is removable for servicing access.

### 7.4 Gas Supply

1. Check that the information concerning the state of adjustment given on the data plate is compatible with local supply conditions.

2. 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".

3. The connection to the boiler is a 15mm tail on the gas service cock. The tail protrudes through the boiler rear panel and is protected by a transit bracket which may be removed to aid connection.

4. Ensure that the pipework from the meter to the boiler is of adequate size. (If the boiler is further than 3 metres from the Gas Meter 22mm pipe should be used). **Do not use pipes of a smaller diameter than the boiler gas 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 ETCL rules.

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

**NOTE: "The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance and system".**

Connection may be via a fused double-pole isolator with a contact separation of at least 3mm in all poles, **which must be in an accessible position to the user** and serve the boiler and system controls only.

**There is no method of isolating the boiler at the user interface.**

3. Four core cable is required to supply the boiler as a permanent live is necessary for the operation of the condensate pump and frost protection.

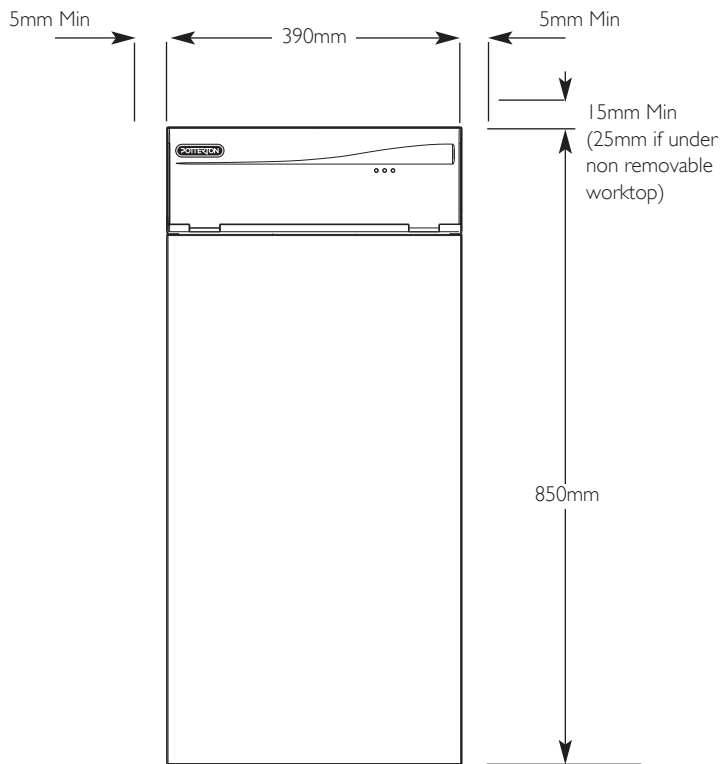


Fig. 15

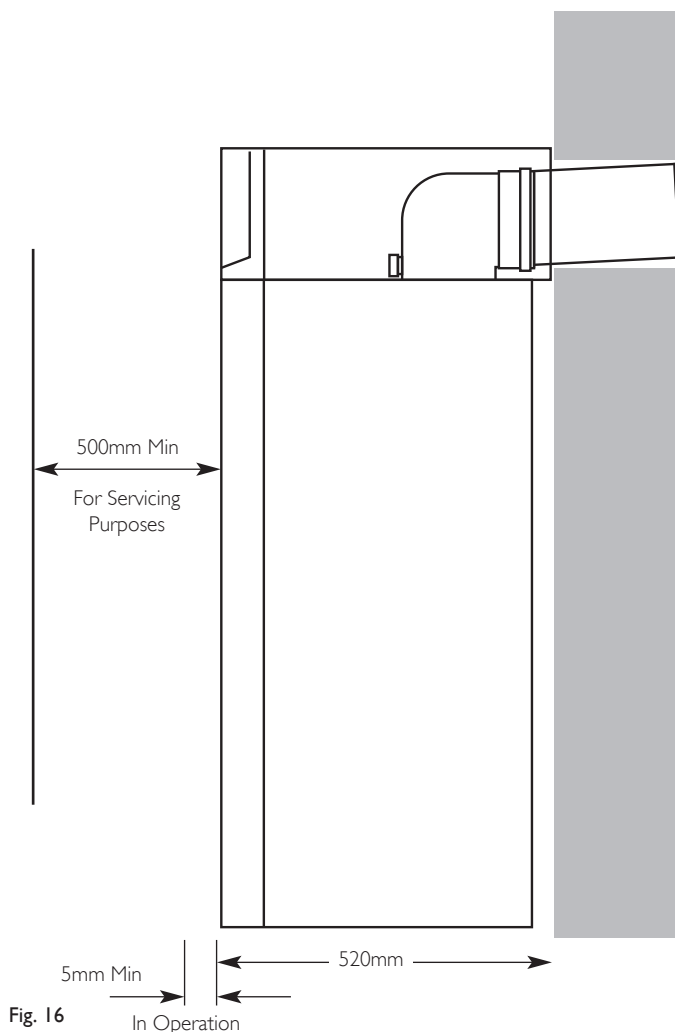


Fig. 16



## 7.0 Site Requirements

### 7.6 Condensate Disposal - Pump

1. This boiler incorporates an automatic pumped condensate system. See the graph opposite for available pump flow rates.
2. 3.5 metres of flexible 10mm PVC pipe are supplied with the boiler. 0.5 metres of this length remains coiled within the boiler to allow removal of the pump assembly. This must not be uncoiled to provide extra length.
3. A fitting and securing clip (Fig. B) to accept the 10mm PVC pipe and connect to 21.5mm overflow pipe is also supplied.
4. The 10mm pipe can be routed to a maximum of 3 metres vertically and then discharge via gravity or be routed horizontally (Fig. A). A combination of vertical and horizontal runs is permissible.
5. The pipe must be supported, either using suitably spaced clips or run within larger diameter pipe. When using clips take care not to deform the pipe.
6. When routing the pipe through a wall it must be suitably sleeved. Also the pipe must not be exposed to sources of heat, and should be protected in locations where it may be damaged.
7. The pipe should be routed so that any sharp bends, dips and loops are avoided. A minimum radius of 100mm is recommended for any bends. No slope is necessary and air breaks are not required on the pumped part of the condensate run.
8. If the boiler is fitted in an unheated location the entire length of condensate pipe should be treated as external, and run within insulated larger diameter pipe.

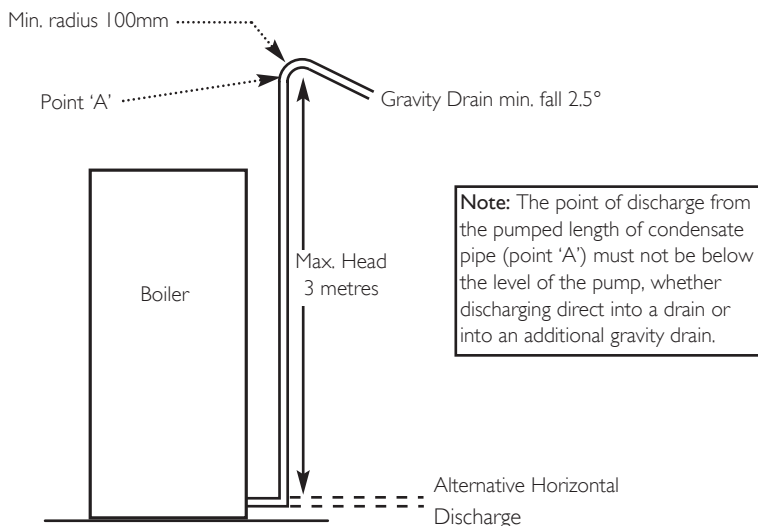
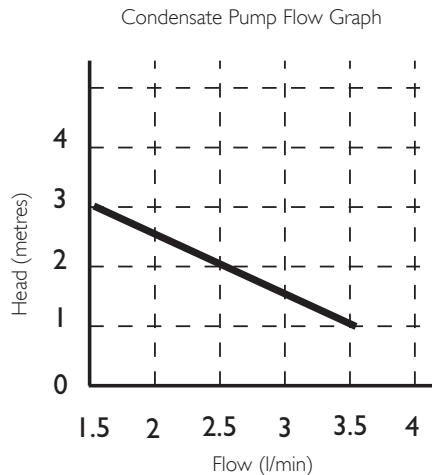


Fig. A

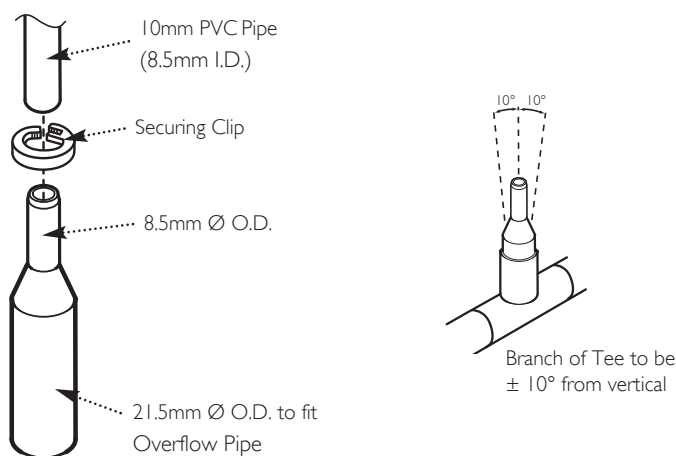


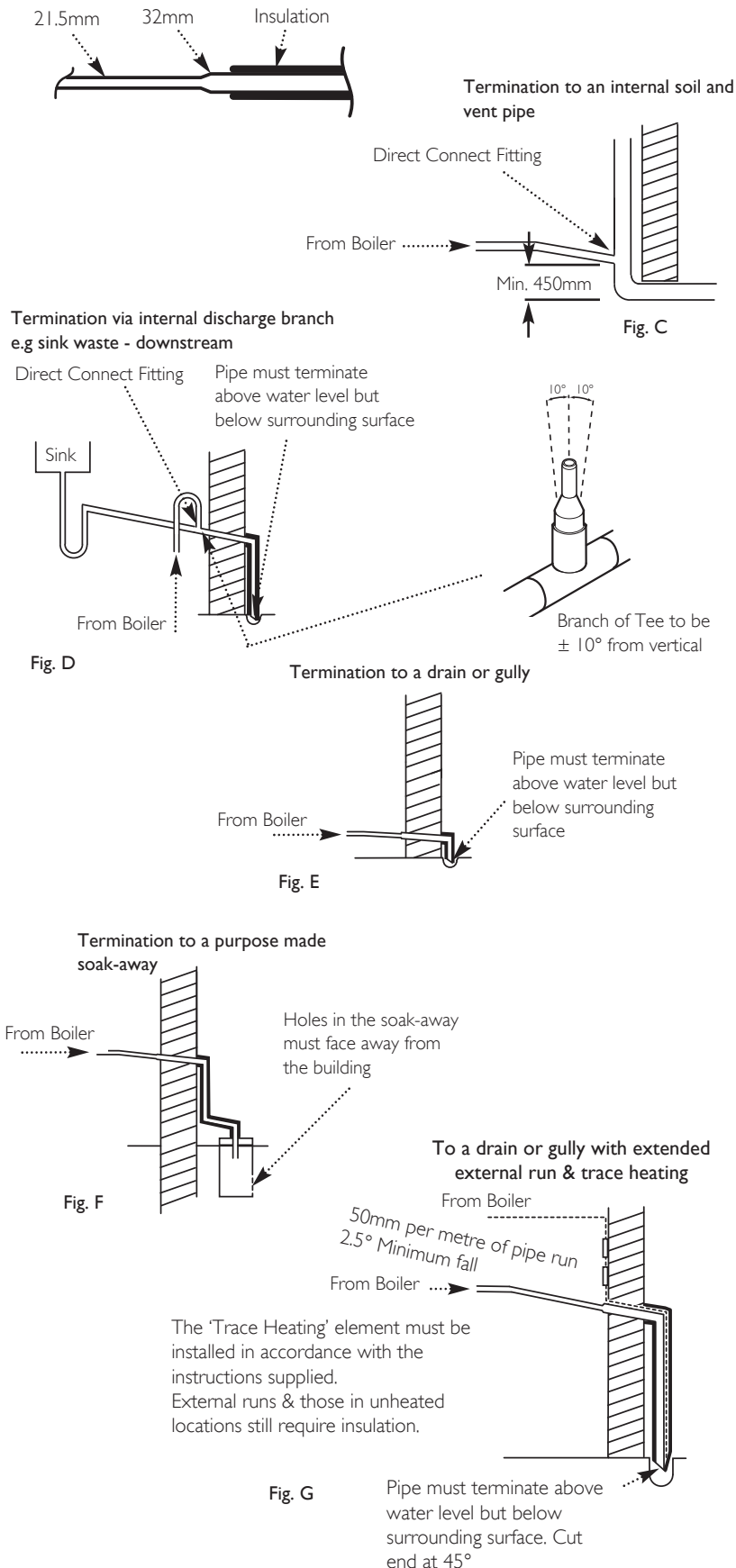
Fig. B

Condensate Pipe  
Direct Connect  
Fitting

Examples are shown of the following methods of termination:-

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

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



## 7.0 Site Requirement

### 7.7 Condensate Drain - Unpumped

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

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

PIPE 'TRACE HEATING' ELEMENT ARE AVAILABLE AS ACCESSORIES.

1. The condensate connection will accept 21.5mm (3/4in) plastic overflow pipe. **It is strongly recommended that this discharges internally into the household drainage system.** Where this is not possible, discharge into an outside drain is permissible providing every possible precaution is taken to prevent freezing.

2. Ensure the discharge of condensate complies with any national or local regulations in force. **BS 6798 & Part H1 of the Building Regulations** give further detailed guidance.

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

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

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

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

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

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

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

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

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

12. **Condensate Drain Pipe 'Trace Heating' Elements** are available in various lengths. 'MULTIFIT' part nos.:-

1 metre 720644401	2 metre 720664101
3 metre 720664201	5 metre 720664401*

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

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

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

A <sup>1</sup>	Directly below an opening, air brick, opening windows, etc.	300
B <sup>1</sup>	Above an opening, air brick, opening window etc.	300
C <sup>1</sup>	Horizontally to an opening, air brick, opening window etc.	300
D <sup>2</sup>	Below gutters, soil pipes or drain pipes.	25 (75)
E <sup>2</sup>	Below eaves.	25 (200)
F <sup>2</sup>	Below balconies or car port roof.	25 (200)
G <sup>2</sup>	From a vertical drain pipe or soil pipe.	25 (150)
H <sup>2</sup>	From an internal or external corner.	(i) 25 (300) (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
T	Adjacent to windows or openings on pitched and flat roofs	600
U	Below windows or openings on pitched roofs	2000

Table. 2

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

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

**NOTE:** The distance from a fanned draught boiler terminal installed parallel to a boundary may not be less than 300mm\* in accordance with the diagram below, unless the flue deflector kit is used (see 7.8.6 opposite)

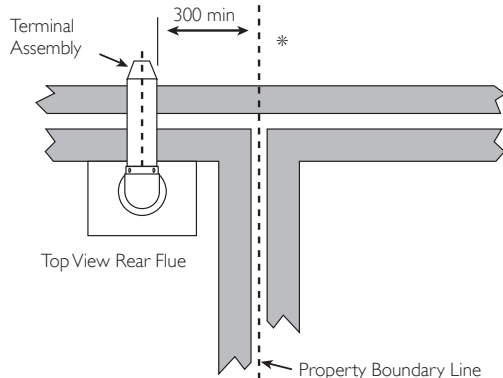


Fig. 16a

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

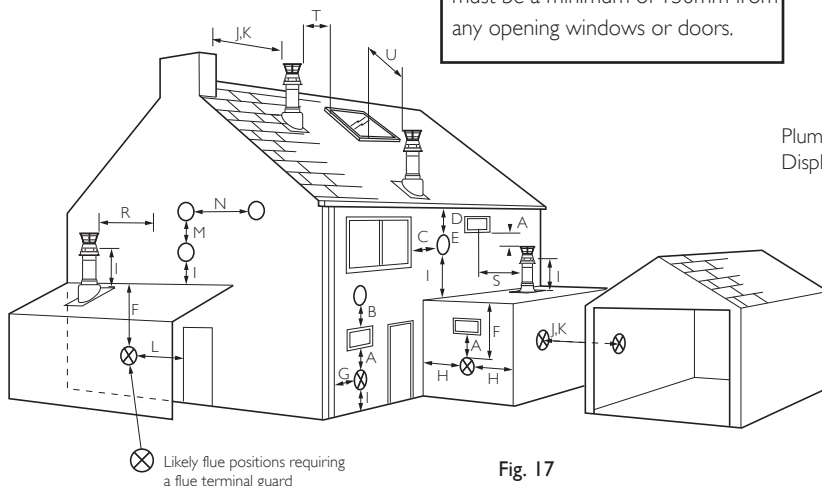


Fig. 17

## 7.0 Site Requirements

### 7.8 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.

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. When siting the flue take into consideration the effect the plume of water vapour may have on neighbours.

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 plume deflector kit (part no. 248167) must be fitted.

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

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

8. If required a suitable terminal guard (part no. 248484) is available from Potterton for use with the flue deflector. See also Section 7.11.

9. For fitting under low soffits and eaves the Plume Displacement Kit or Flue Deflector Kit is recommended.

#### IMPORTANT:

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

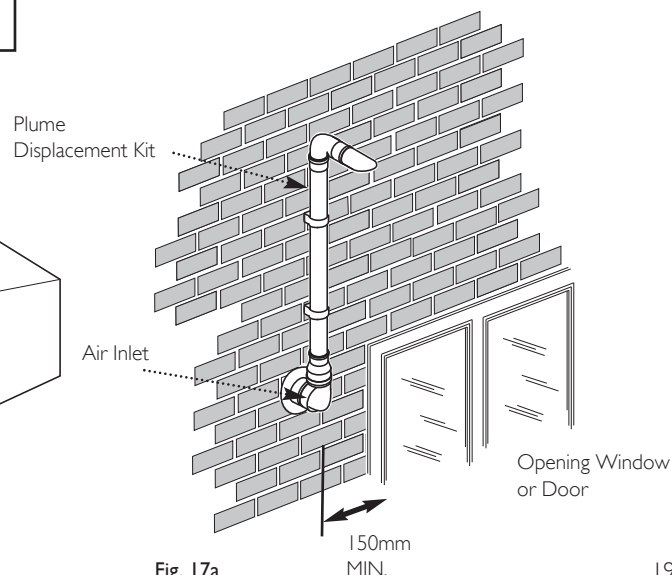


Fig. 17a

## 8.0 Flue Options

### 8.1 Horizontal Flue Systems

Only a flue approved with the Potterton Promax FSB 30 HE Plus can be used.

#### Concentric

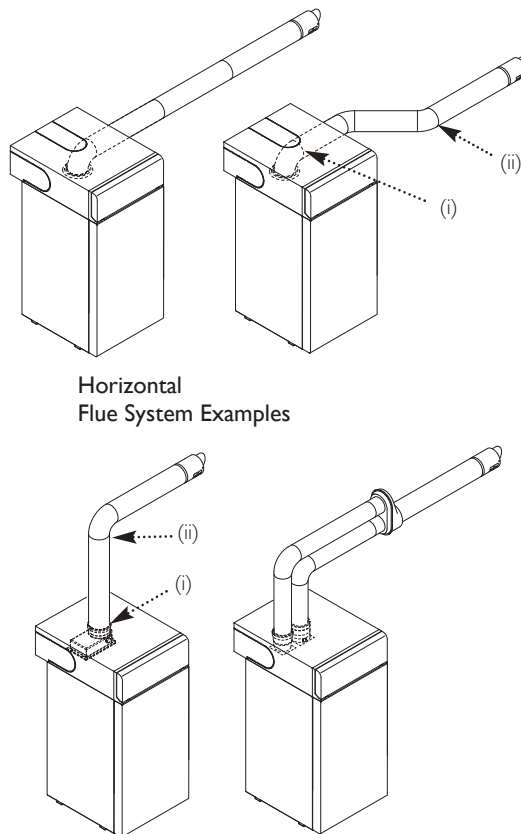
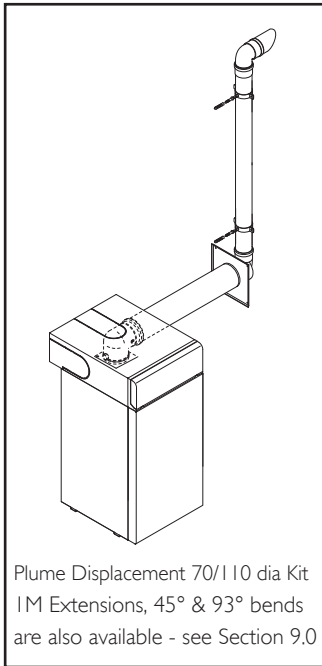
The maximum equivalent lengths are 4m (horizontal) or (vertical). Their lengths exclude the standard elbow and flue/terminal assembly (horizontal) and terminal assembly (vertical).

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

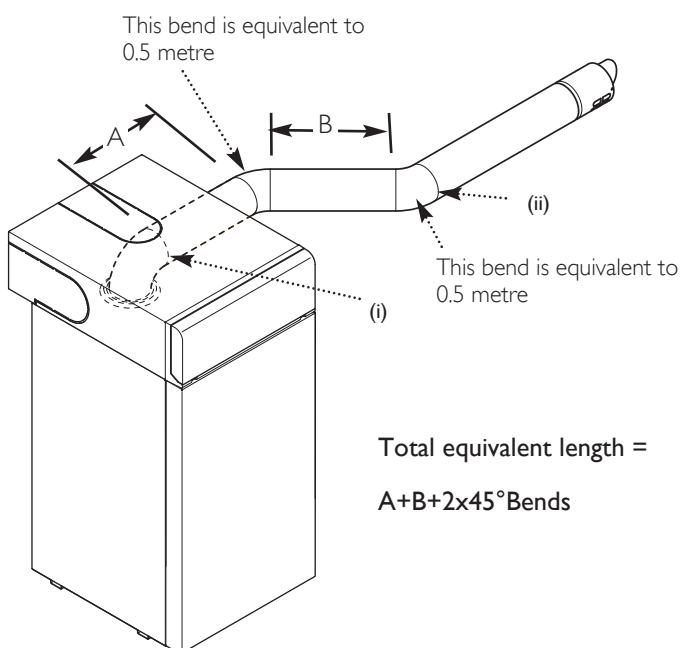
Concentric Pipes:	45° bend	0.5 m
	93° bend	1.0 m

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

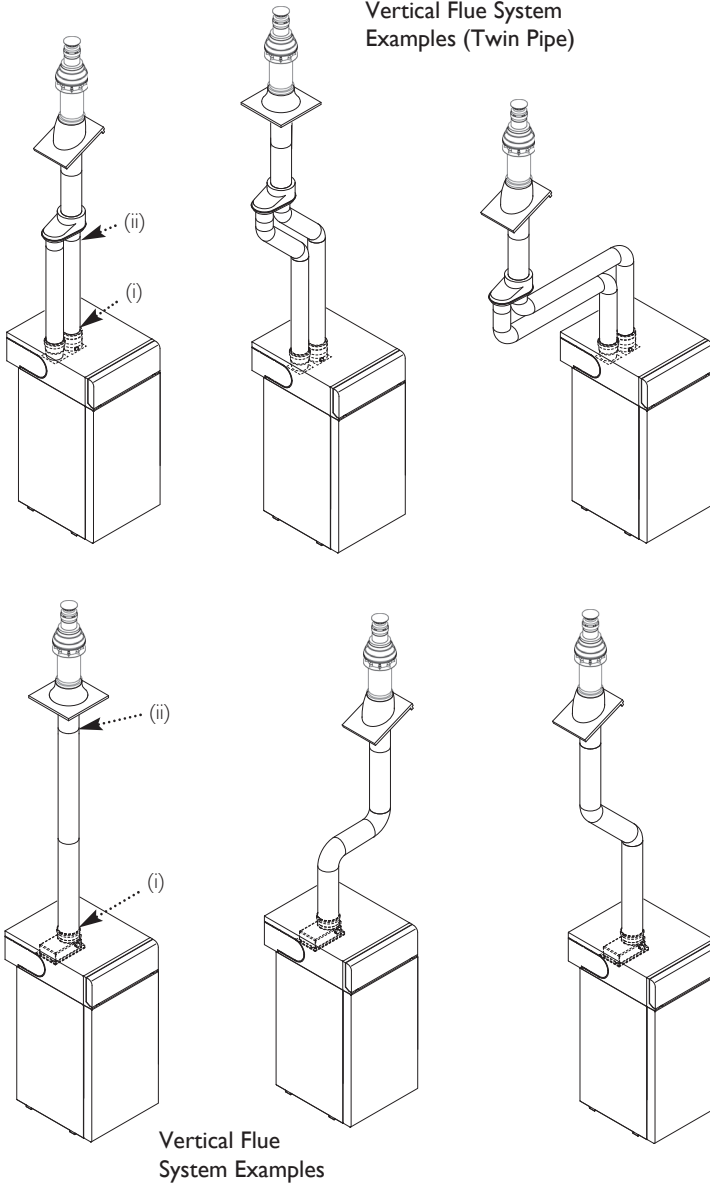
**IMPORTANT:** All flue systems must be securely supported at least once every metre. Suitable pipe supports are available as accessories.



**NOTE:** Horizontal flue pipes should always be installed with a 1.5° fall from the terminal to allow condensate to run back to the boiler.



## Vertical Flue System Examples (Twin Pipe)



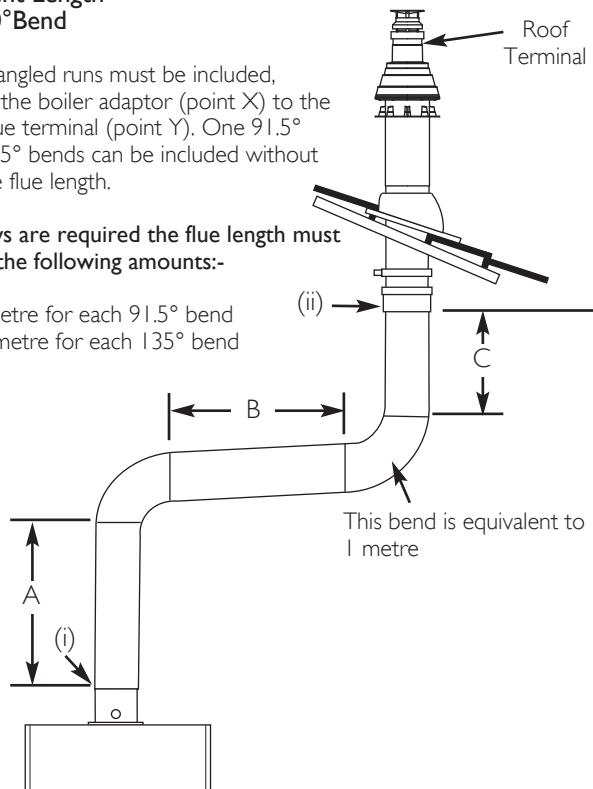
Vertical Flue System Examples

### Total Equivalent Length = $A+B+C+1 \times 90^\circ \text{ Bend}$

All vertical and angled runs must be included, measured from the boiler adaptor (point X) to the joint with the flue terminal (point Y). One  $91.5^\circ$  bend or two  $135^\circ$  bends can be included without reduction of the flue length.

If further elbows are required the flue length must be reduced by the following amounts:-

1 metre for each  $91.5^\circ$  bend  
0.5 metre for each  $135^\circ$  bend



## 8.0 Flue Options

### 8.2 Twin & Vertical Flue Systems

#### Concentric

The maximum equivalent lengths are 4m (vertical). Their lengths exclude the standard elbow and terminal assembly (vertical).

#### Twin Flue

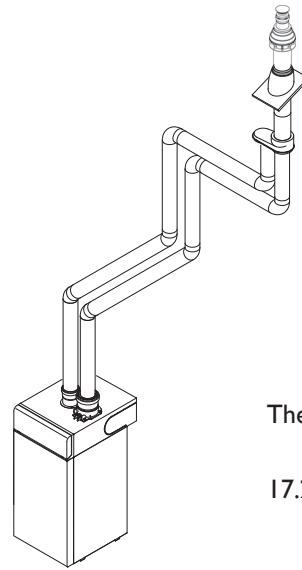
The total maximum equivalent flue length is 150m.

**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:	135° bend	0.5 m
	93° bend	1.0 m
Twin Flue Pipe:	135° bend (air duct)	1.3 m
	135° bend (flue duct)	2.6 m
	90° bend (air duct)	4.8 m
	90° bend (flue duct)	9.6 m

**IMPORTANT:** All flue systems must be securely supported at least once every metre. Suitable pipe supports are available as accessories.



The total equivalent length for this example is  
 $17.2 + 34.4 = 51.6$  metres.

AIR DUCT			
	Equivalent Length Value	N° of fittings/pipes	Sub total
1m extension	1m	5	5.0m
135° bend	1.3m	2	2.6m
91.5° bend	4.8m	2	9.6m
Equivalent Length Air Duct = <b>17.2m</b>			
FLUE DUCT			
	Equivalent Length Value	N° of fittings/pipes	Sub total
1m extension	2m	5	10.0m
135° bend	2.6m	2	5.2m
91.5° bend	9.6m	2	19.2m
Equivalent Length Flue Duct = <b>34.4m</b>			

## 8.0 Flue Options

### 8.3 Flue Accessories

Key	Accessory	Size	Code No
<b>FLUE GROUP B</b>			
<b>Concentric Flue System 110mm diameter</b>			
AI	Horizontal Flue Terminal	850mm	243013BAX
A	Horizontal Flue Terminal (incl elbow)		236921
B	Flue Extension	1000mm	241695
		500mm	241694
		250mm	241692
C	Flue Bend	93°	241687
D	Flue Bend (pair)	135°	241689
U	Pipe Support	110mm	243014BAX
T	Vertical Flue Boiler Adaptor		5106888
S	Flue Terminal Deflector		248167

### FLUE GROUP P

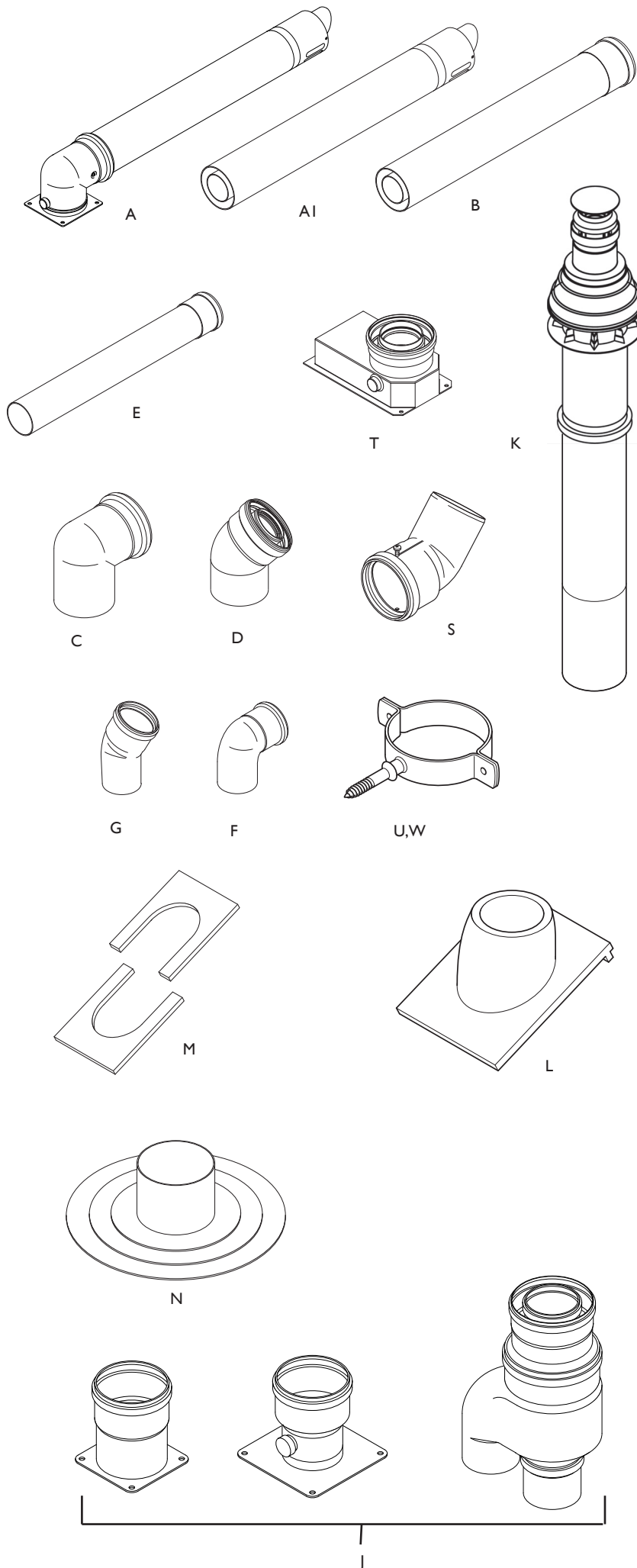
#### Twin Flue System 80mm diameter

E	Flue Extension	1000mm	246137
		500mm	246136
		250mm	246135
F	Flue Bend (pair)	90°	5121560
G	Flue Bend (2 pair)	135°	5121561
J	Vertical Flue Boiler Adaptor Kit		242757
W	Pipe Support (pair)	80mm	5111081

### FLUE GROUP B,P

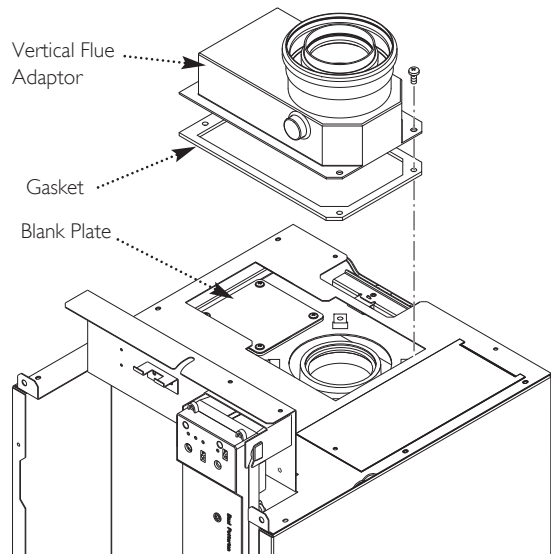
#### Vertical Flue Kits

K	Vertical Flue Terminal		242802
L	Pitched Roof Flashing	25°/50°	243015
M	Roof Cover Plate		243131
N	Flat Roof Flashing		243016BAX



## 8.0 Flue Options

### For Vertical Flues



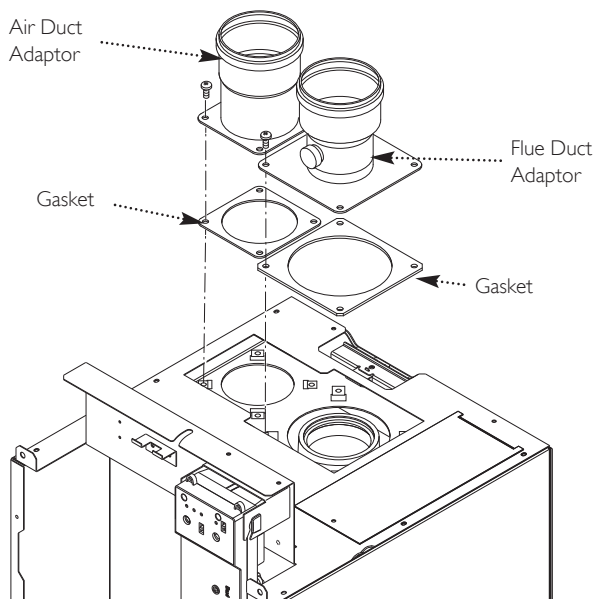
#### 8.4 For Vertical Flue Systems

1. Undo the screws securing the blanking plate to the boiler top panel. Discard the plate.
2. Fix the vertical adaptor and gasket to the top panel with the previously removed screws.

#### 8.5 For Twin Flue Systems

1. Undo the screws securing the blanking plate to the boiler top panel. Discard the plate.
2. Fix both the air and flue adaptors with their gaskets onto the boiler top panel. Secure with screws.

### For Twin Flues





## 8.0 Flue Options

### 8.6 For Roof Terminals

1. In the case of a pitched roof 25 - 50 degrees, position the lead tile to replace/flash over existing roof tiling. Make an aperture in the roof suitable for the lower tube of the roof terminal and ensure the integrity of the roof cover is maintained. The adjustable plastic collar can either be positioned on the lead tile or the lower tube of the roof terminal prior to the final positioning of the vertical flue through the tile. Check the collar is correctly located to suit required roof pitch (either 25° to 38° or 37° to 50°). From inside the roof adjust the flue to a vertical position and secure to the roof structure with the clamp supplied.

2. For flat roof installations the aluminium flashing must be incorporated into the roof covering and the appropriate aperture made in the roof decking. The vertical flue is lowered onto the flashing making sure the collar of the flue locates securely with the flashing. (A mastic seal may be necessary). From inside the roof, adjust the flue to a vertical position and secure to the roof structure with the clamp supplied.

**IMPORTANT:** If the boiler is not fitted immediately after the flue system, temporary precautions must be taken to prevent rain entry into the room of installation. Any precautionary measures must be removed prior to commissioning the boiler.

### 8.7 Flue Dimensions

The standard horizontal flue kit allows for flue lengths between 270mm (10<sup>3</sup>/<sub>8</sub>"") and 800mm (32") from elbow to terminal (Fig. 18).

**The maximum permissible equivalent flue length is: 4 metres.**

**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.

### 8.8 Terminal Guard (Fig. 19)

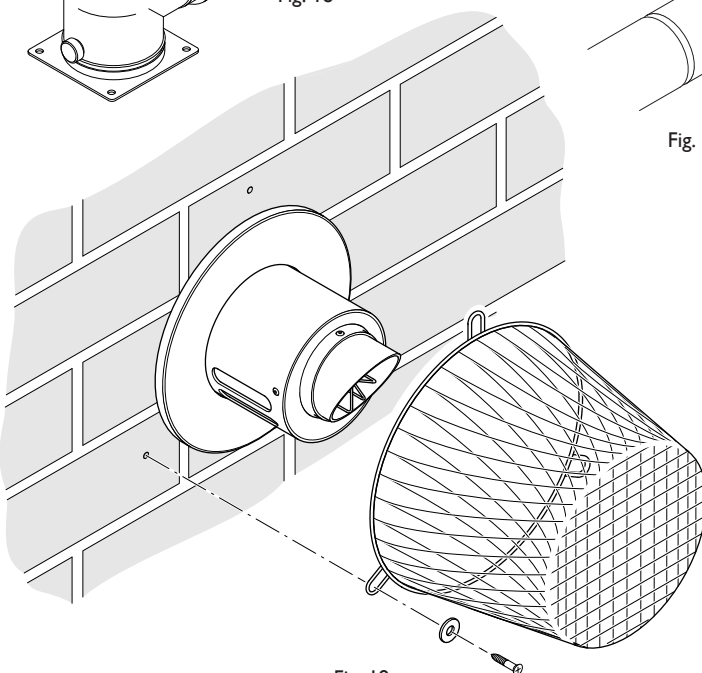
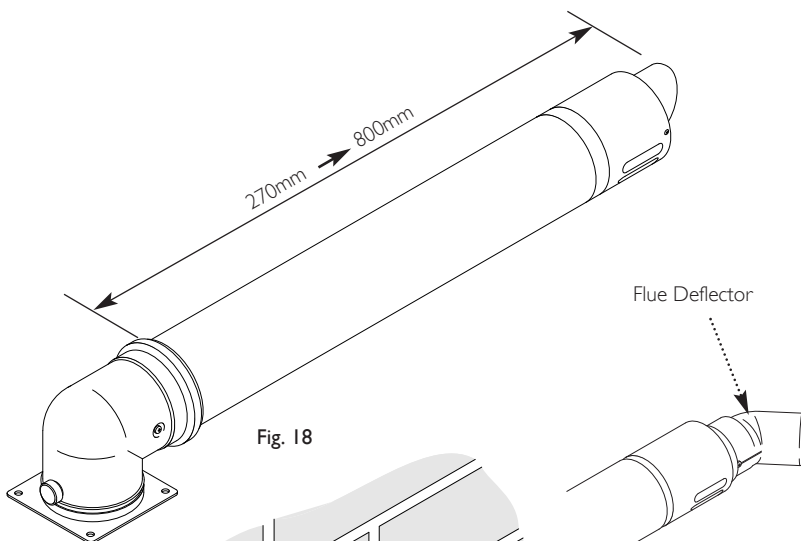
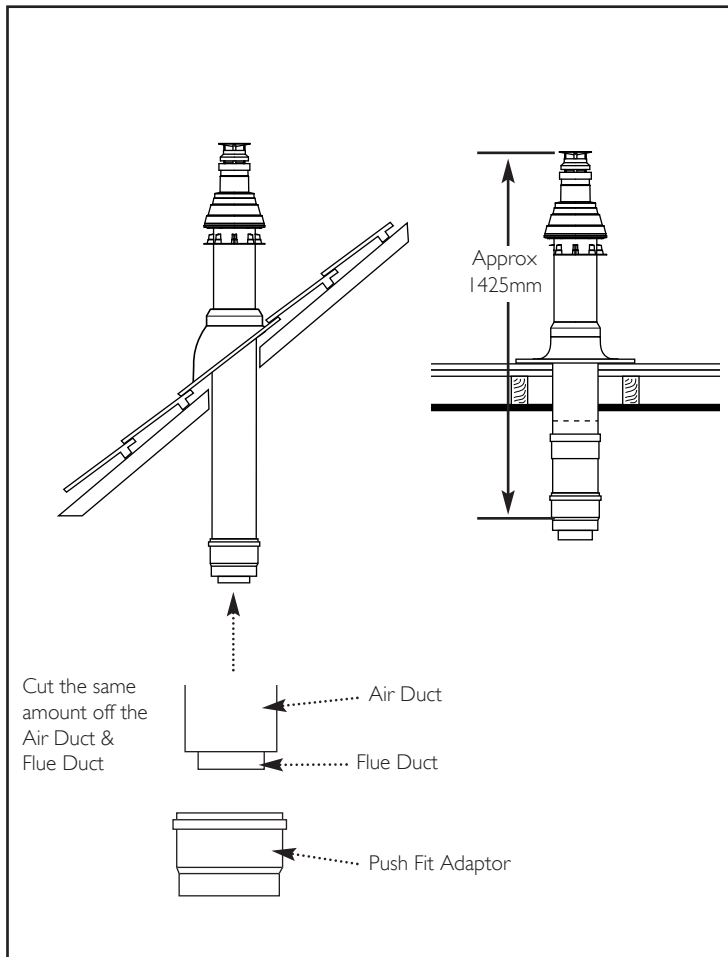
1. When codes of practice dictate the use of terminal guards, they can be obtained from most Plumbers' and Builders' Merchants.

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

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

### 8.9 Flue Deflector (Fig. 18a)

1. If required, push the flue deflector over the terminal end and rotate to the optimum angle for deflecting plume. Secure the deflector to the terminal with screws provided.





## 9.0 Plume Displacement

### 9.1 Plume Displacement Kit (P.D.K.)

#### Kit No 5121371

##### Content of kit

- 1 70/110 Concentric Flue
- 1 1m 70 Dia Exhaust Flue Pipe
- 2 Support Brackets
- 1 93° Elbow/Plume Outlet Assembly
- 1 Flue Trim
- 2 "O" Rings
- 1 Elbow with Gasket

1. This kit is recommended for installations where the condensate plume emitted from the flue may cause a nuisance or affect the surroundings.

2. The terminal must be positioned outside the building with the outlet connection upwards.

3. The 70Ø pipe connects to the outlet of the concentric terminal assembly. The elbow/plume outlet must be fitted to the end of the 70Ø pipe.

**NOTE:** The plume outlet must always be at least 45° to the wall, with the 'peak' uppermost to prevent rain entry (Figs. A & B), and be at least 2 metres above ground level. It must be secured as shown in Fig. C.

The outlet must be positioned so that any condensate plume is directed away from adjacent surfaces.

4. It is possible to reduce or increase (with the addition of extensions) the length of either or both the 70/110 concentric and 70Ø exhaust.

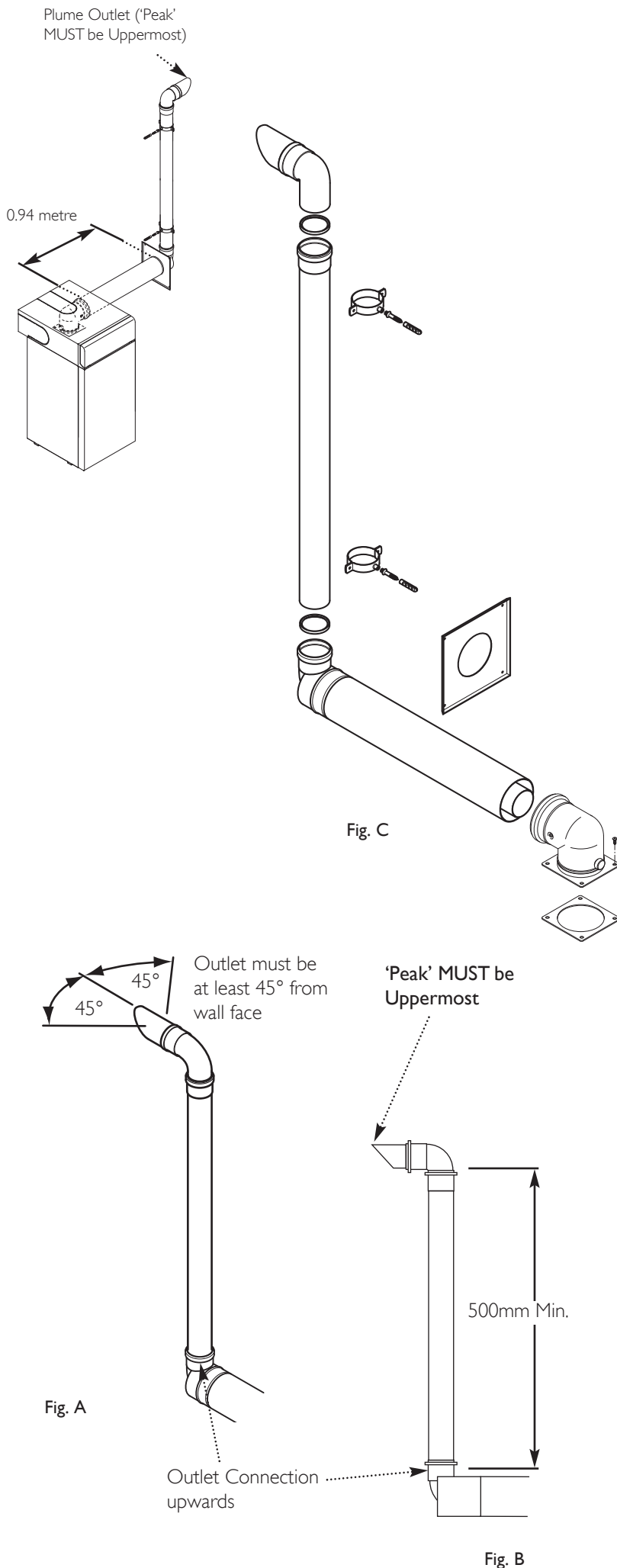
5. Standard concentric flue extension kits may be added between the boiler elbow and the terminal assembly.

6. The minimum length of the concentric flue is 100mm when measured from the edge of the boiler flue elbow. There is a further 45mm engagement into the elbow.

**IMPORTANT:** The maximum equivalent length of concentric flue is:- **4 metres**  
Additional elbows may be fitted in the concentric flue, but the equivalent length must be reduced by 1 metre (93° elbow) or 0.5 metres (45° elbow).

7. 70Ø 1 metre extensions (including support bracket), and additional 93° & 45° elbows are available. Any additional 93° & 45° elbows must be accounted for when calculating flue lengths. 70Ø 93° elbows are equivalent to 3.5 metres of straight length and 45° elbows to 1 metre.

**NOTE:** Permitted positions of the plume outlet relative to doors, windows etc. are the same as for conventional concentric flues as detailed in the main Installation & Servicing Instructions and BS5440 Pt. 1. It is **NOT** necessary to fit a terminal guard over the air inlet or the plume outlet.



## 9.0 Plume Displacement

### 9.2 Determining Permissible Lengths - P.D.K.

In the graph the solid line diagonal represents the relationship between the concentric flue assembly (and any extensions) and the 70Ø exhaust (and any extensions or additional bends).

#### Example 1 - Not Permissible

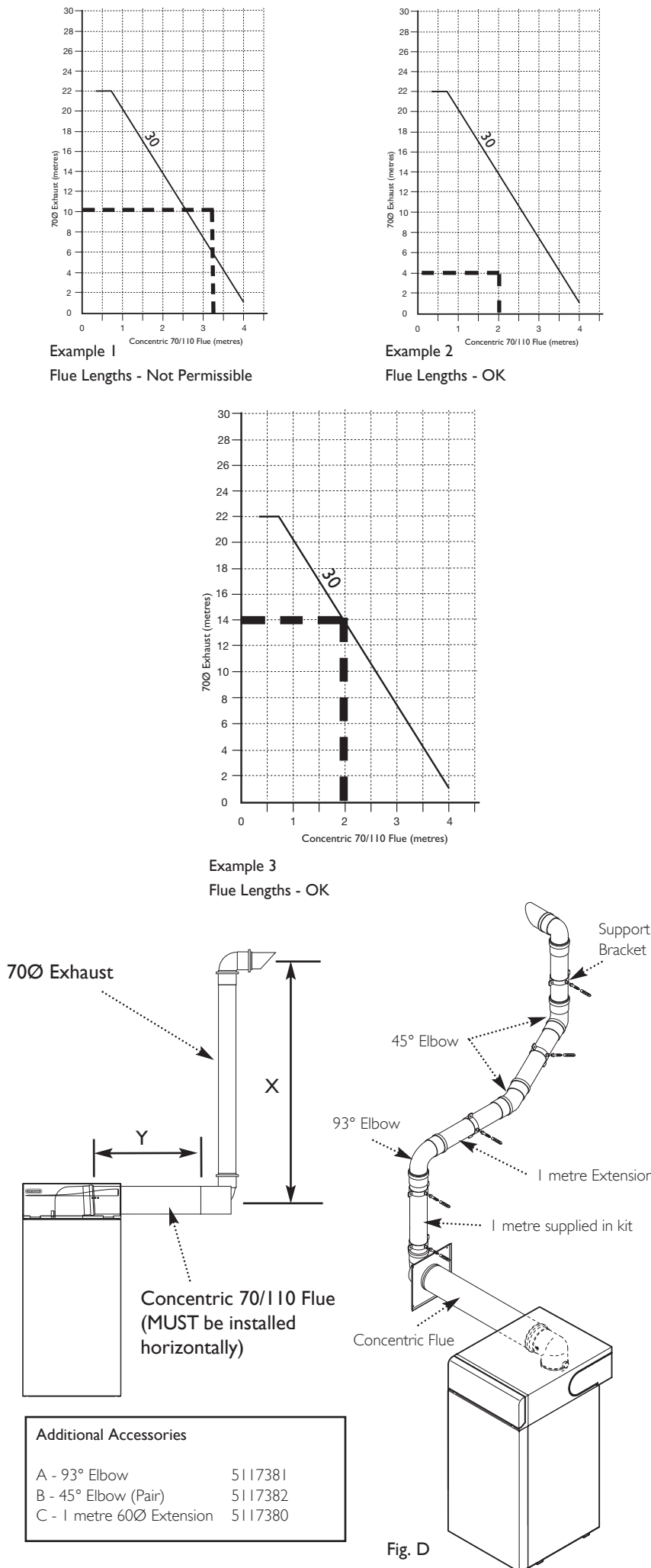
If, for instance, a concentric length of 3.25 metres was required and the 70Ø exhaust needed to be 10 metres the graph shows that this combination would NOT be permissible as the intersection point would be above the solid diagonal line.

#### Example 2 - Flue Lengths OK

Where both lengths have been determined they can be applied to the graph to check that the installation is permissible. For example, if it was known that 2 metres of concentric flue and 4 metres of 70Ø exhaust were required, the values could be applied to the graph as shown in Example 2.. As the point of intersection of the dotted lines is below the solid diagonal line, the combination of lengths is shown to be acceptable.

#### Example 3 - Flue Lengths OK

In the example shown, assume that the concentric part of the flue needs to be 2 metres long. Find the position of '2' on the horizontal axis of the graph and then project upwards to the solid diagonal line. This is represented by the vertical thick dotted line. Where this dotted line intersects with the solid diagonal line on the graph, project across to the vertical axis. As can be seen this corresponds with 14 metres. Therefore, the total equivalent length of the 70Ø exhaust can be up to 14 metres. Any elbow equivalencies must be accounted for i.e. 93° elbows are equal to 1 metre, each 45° elbow to 0.5 metres.



#### Flue Length - Worked Example

In Fig. D opposite an additional 93° elbow and pair of 45° elbows have been included in the 70Ø exhaust. Also 3 straight extension pieces have been used.

To calculate total length:-

Length of 70Ø supplied in kit =	1 metre
3 x 1 metre Extensions =	3 metres
1 x 93° Elbow =	1 metre
2 x 45° Elbow =	1 metre (0.5 metres each)

Total 70Ø = 6 metres

After consulting the table in Example 3 it can be determined that the concentric flue could be up to approximately 3.25 metres long.

## 9.0 Plume Displacement

### 9.3 General Fitting Notes - P.D.K.

1. Cut a hole in the external wall which the horizontal concentric flue assembly will pass through.
2. When completed the terminal must be at least 2 metres above ground level (Fig. E).
3. Measure and cut to size the concentric assembly and any extensions that are being used.
4. Insert the concentric assembly through the hole from outside the building and mark the position of the flue trim securing holes.
5. Drill and plug the wall to accept the flue trim securing screws, and re-insert the concentric assembly through the wall.
6. Connect any extensions that are being used to the concentric assembly. Engage the extension or concentric assembly in the boiler flue elbow.
7. Fit the boiler flue elbow to the boiler top panel, ensuring the gasket is in place (Fig. F).

Ensure that the concentric assembly is horizontal and that the external air inlet is to the bottom. Any extensions should fall back to the boiler.

8. Use suitable brackets to support the concentric assembly and any extensions, and make good inside and outside. Secure the flue trim to the wall.

9. The 70Ø exhaust can now be fitted to the spigot at the terminal end.

10. If it is necessary to shorten the 70Ø exhaust or any of the extensions, the excess material must be cut from the plain end of the pipe.

11. Determine the position of the 70Ø exhaust and mark on the wall a suitable position for the support bracket. Drill and plug the wall. If extensions are being used, a support bracket is supplied in each kit.

12. Engage the M6 threaded part of the mounting bolt in the boss on the support bracket. Using the bracket for leverage, screw the mounting bolt into the plugged hole until the bracket is secure and level (Fig. G).

13. Slacken the two screws securing the retaining strap to the bracket, and pivot the strap aside to allow fitting the 70Ø exhaust.

14. Complete the installation of the 70Ø exhaust, securing in the brackets. Fit the 93° elbow and plume outlet. Ensure the plume outlet is at least 45° to the wall and that the 'peak' is uppermost.

15. Continue with installation and commissioning of the boiler.

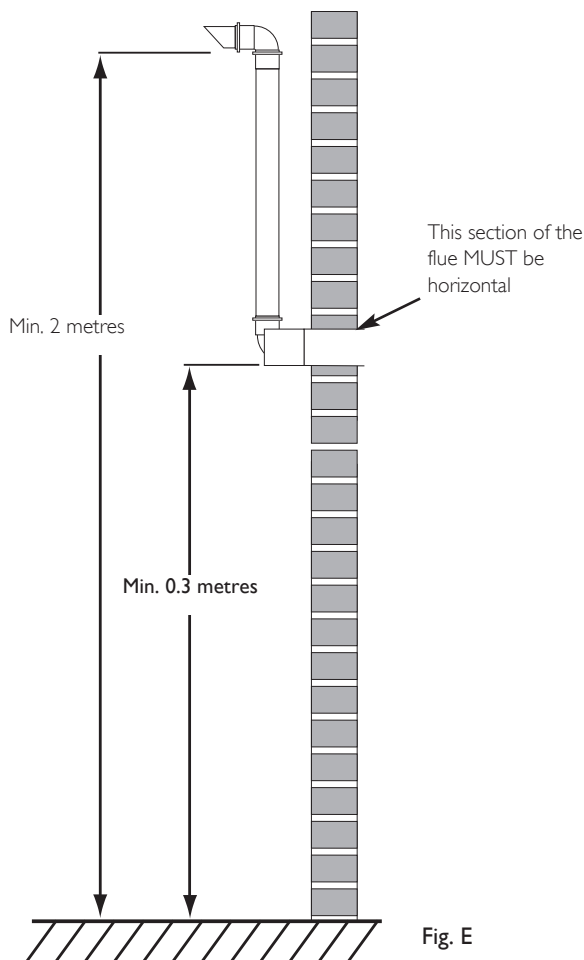


Fig. E

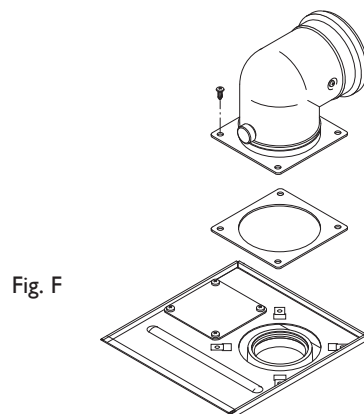


Fig. F

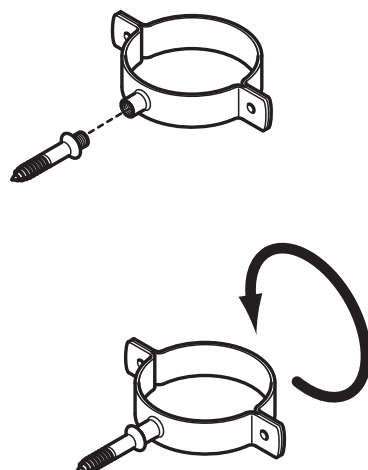


Fig. G

## 9.0 Plume Displacement

### 9.3 General Fitting Notes - P.D.K. (cont.)

16. For aesthetic purposes it is permissible to route the 70Ø exhaust in an enclosed box, but the air inlet and plume outlet MUST remain in free air.

17. It is also possible to separate the plume outlet from the 93° elbow to allow the flue to be installed as shown in Fig. H.

18. When the plume outlet is positioned under a balcony or other projection (Figs. I & J) it must protrude at least 200mm (it is not necessary to extend it further than this).

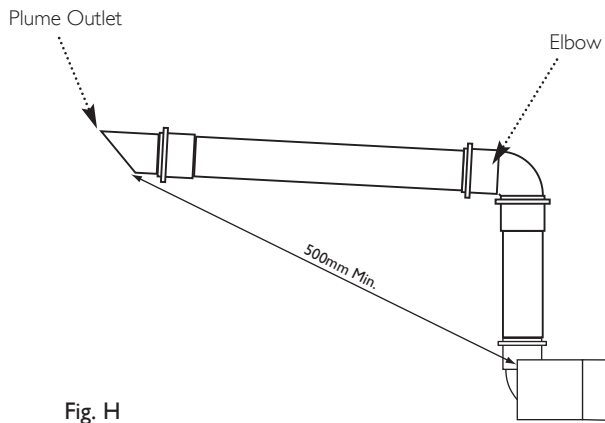


Fig. H

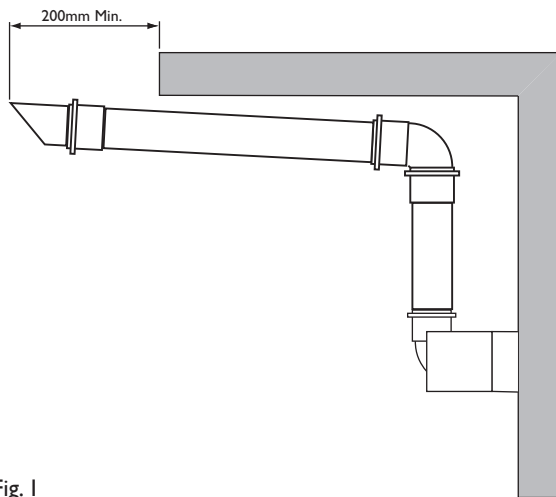


Fig. I

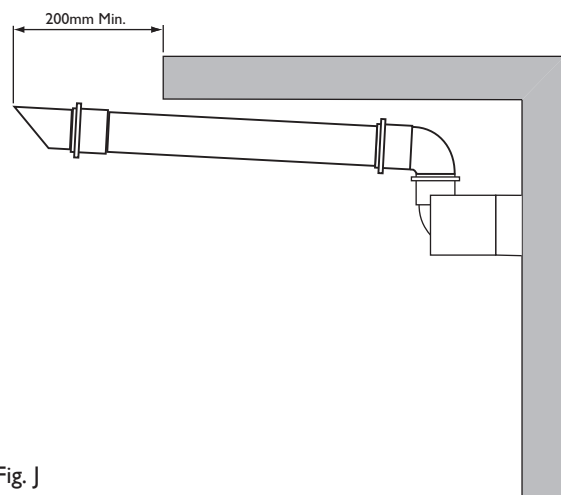


Fig. J

## 10.0 Installation

Check Site Requirements before commencing.

### 10.1 Initial Preparation & Installation

1. Remove the outer carton.
2. For the boiler to operate correctly it must be level in both planes. Place the fixing template in the proposed boiler position ensuring that it is level.
3. 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. 20). The diagram (Fig. 21) 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, water and condensate pipes. Remove the template.

4. Cut the hole for the flue (minimum diameter 125mm, see table (Fig. 20) for wall thicknesses and flue hole diameters).

5. Complete any pipework and wiring that will be inaccessible once the boiler is in position.

6. Undo the securing screws and remove the fascia, front door panel and top panel (see Figs. 1 & 2 on page 6). Remove the securing screw and disengage the pipe access panel.

### 10.2 Making the Water Connections

1. If desired the flow and return tails supplied with the boiler can be fitted at this stage and secured with the spring clips. The flow and return connections are identified on the boiler rear panel. The flow pipe incorporates a manual air vent.

2. Note that the seal is made by use of an 'O' ring, therefore some pipe movement will be evident even though a water tight seal has been achieved. Excessive force could result in damage to the connection.

3. Make all soldered joints before connecting the tails to the boiler to avoid damaging the 'O' rings.

4. Refit the pipe access panel.

### 10.3 Making the Gas Connection

1. The connection to the boiler is a 15mm tail on the gas service cock. The tail protrudes through the boiler rear panel and is protected by a transit bracket which may be removed to aid connection (see Fig. 22).

2. If solder joints are being used for the gas connection, remove the gas tap from the valve as excessive heat may damage the 'O' ring seal.

### 10.4 Priming the Condensate Trap

1. Using a funnel and tube, carefully pour approximately 1 cupful (250ml) of tap water into the flue products exhaust at the terminal or flue elbow sampling point to ensure a seal is made in the trap.

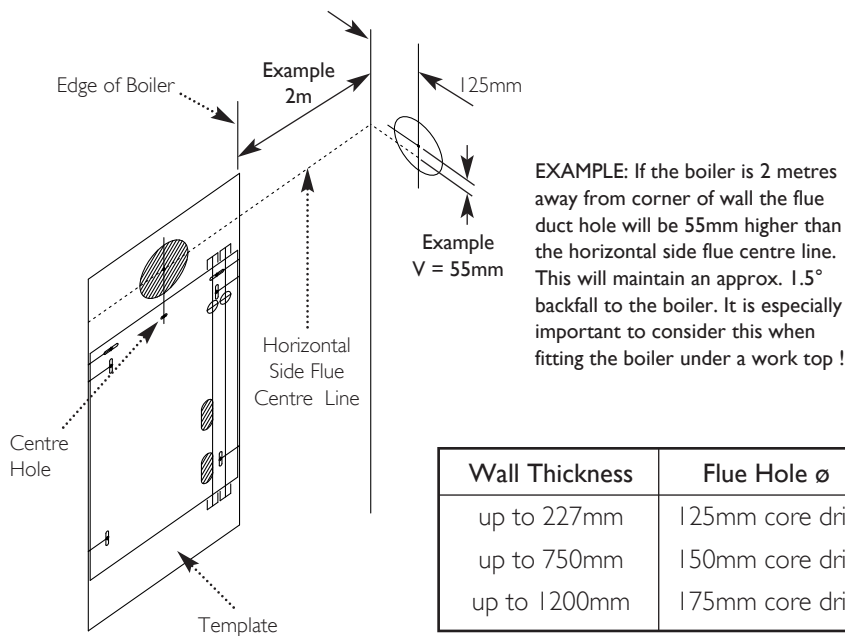


Fig. 20

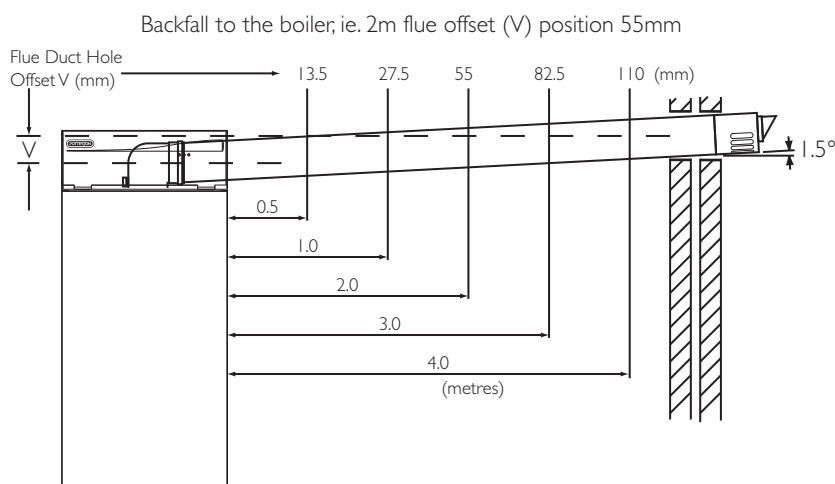


Fig. 21

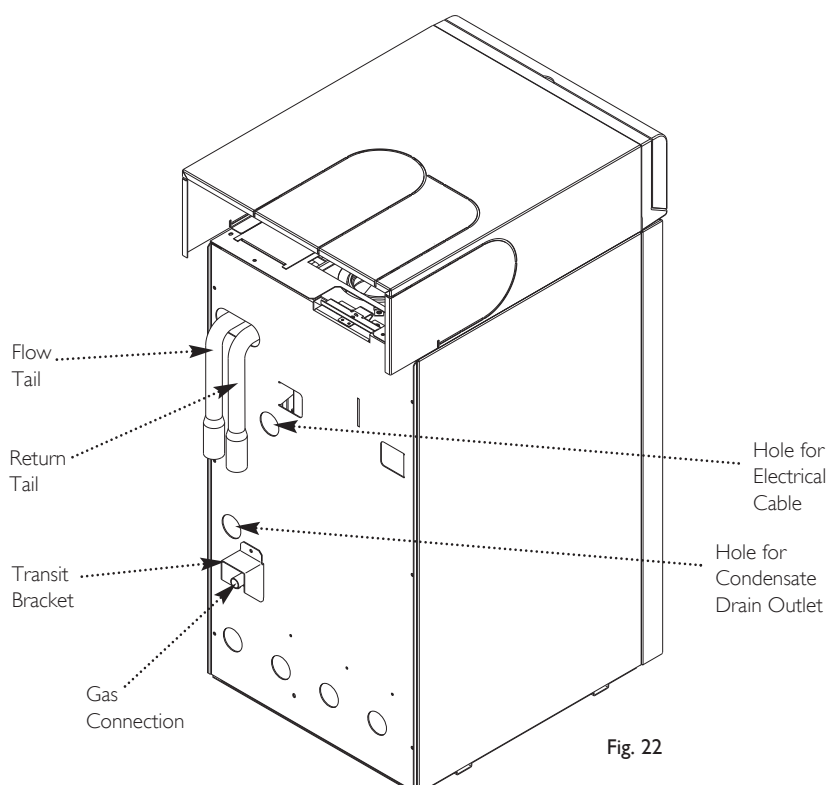


Fig. 22

## 10.0 Installation

### 10.5 Fitting the Standard Flue

**IMPORTANT:** The flue should always be installed with at least 1.5° fall from terminal to elbow, to allow condensate to run back to the boiler.

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 - 575mm

**Side Flue:** maximum wall thickness - 535mm

2. **For rear exit** - measure the wall thickness (Fig. 26) and to this dimension add 270mm. This dimension to be known as (X).

i.e. (X) = wall thickness + 270

3. Take the flue and mark off (X) from the terminal end as indicated in the diagram (Fig. 27).

4. **For side exit** - measure the distance from the edge of the boiler case to the inner face of the wall (Fig. 26) and to this dimension add the wall thickness + 280mm. This dimension to be known as (Z).

i.e. (Z) = case to wall + wall thickness + 280

5. Take the flue and mark off (Z) from the terminal end as indicated (Fig. 27).

**Before cutting check your dimensions !**

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

**NOTE:** When cutting ensure the cut does not interfere with the inner flue support bracket (Fig. 27a).

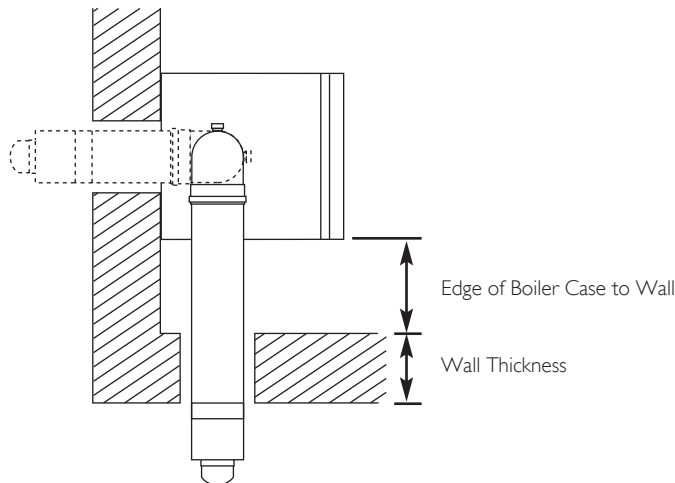
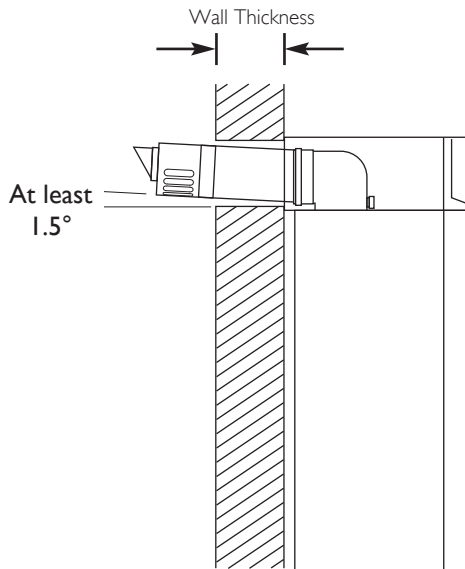


Fig. 26

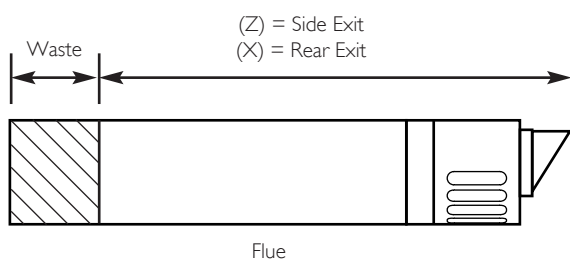


Fig. 27

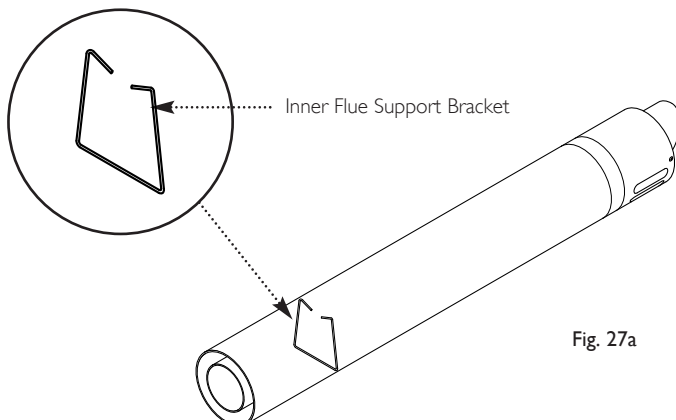


Fig. 27a

### 10.5 Fitting the Standard Flue (Cont)

7. Ensure the inner flue support bracket is positioned in the flue (Fig. 28).

8. Engage the flue into the flue elbow using soap solution to ease the engagement, ensuring the flue terminal is positioned as shown (Fig. 29).

9. Place the gasket over the flue exit on the boiler.

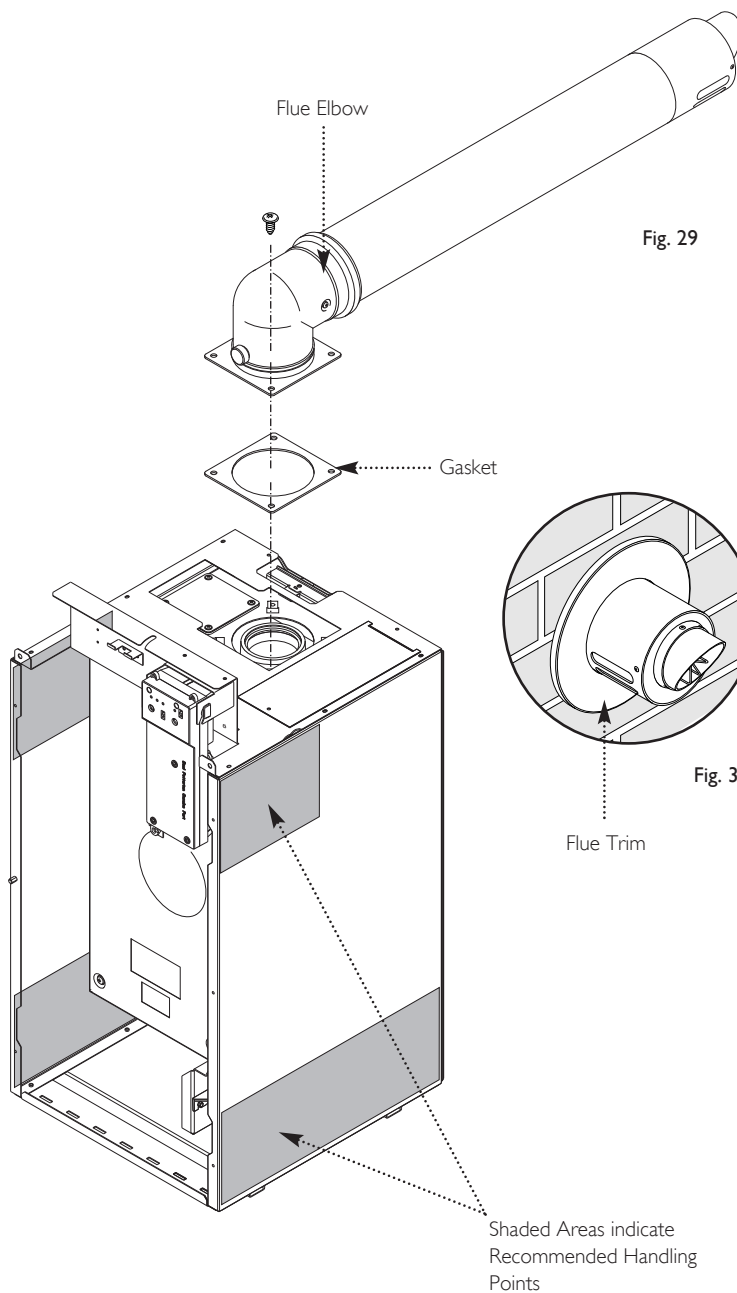
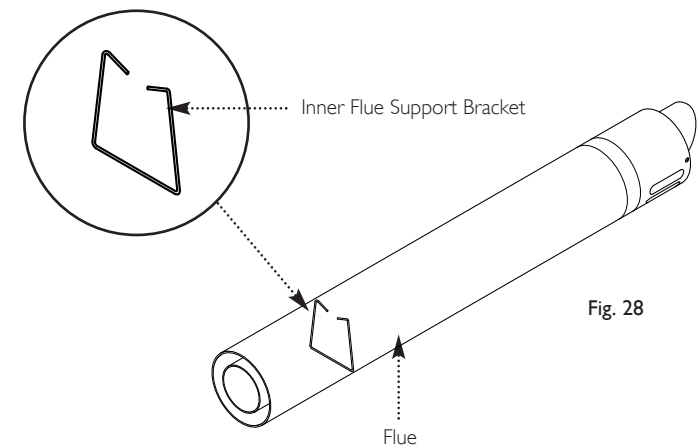
10. Slide the flue assembly through the hole in the wall.

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

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

13. The flue trim should be fitted once the installation is complete and the flue secure (Fig. 30). 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.

14. If necessary fit a flue plume deflector kit and/or terminal guard (see Sections 7.6 & 7.11).



### 10.6 Making the Condensate Drain Connection (See Sections 7.6 & 7.7)

1. 3.5 metres of flexible 10mm PVC pipe are supplied with the boiler, ready connected to the pump. 0.5 metres of this length remains coiled within the boiler to allow removal of the pump assembly. This must not be uncoiled to provide extra length.

2. A fitting and securing clip (Fig. B) to accept the 10mm PVC pipe and connect to 21.5mm overflow pipe is also supplied. When using this fitting to connect to a 21.5mm overflow tee piece the branch must be vertical  $\pm 10^\circ$  (Fig. C).

3. Feed the pipe through the grommet in the rear panel and connect to the drain system.

4. The 10mm pipe can be routed to a maximum of 3 metres vertically and then discharge via gravity or be routed horizontally (Fig. A). A combination of vertical and horizontal runs is permissible.

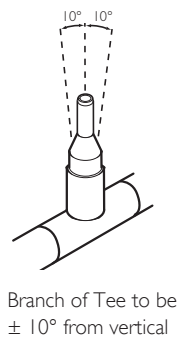
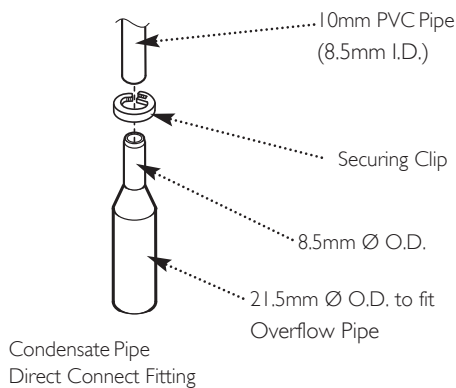
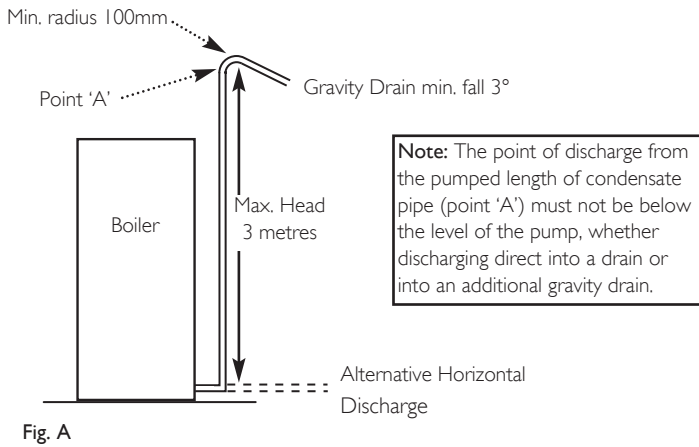
5. The pipe must be supported, either using suitably spaced clips or run within larger diameter pipe. When using clips take care not to deform the pipe.

6. When routing the pipe through a wall it must be suitably sleeved. Also the pipe must not be exposed to sources of heat, and should be protected in locations where it may be damaged.

7. The pipe should be routed so that any sharp bends, dips and loops are avoided. A minimum radius of 100mm is recommended for any bends. No slope is necessary and air breaks are not required on the pumped part of the condensate run.

8. If the boiler is fitted in an unheated location the entire length of condensate pipe should be treated as external, and run within insulated larger diameter pipe.

9. Ensure that the condensate can discharge freely (without blockage or restriction of the pipe) into the drain (See Sections 7.7 for details).





## 10.0 Installation

### 10.7 Making The Electrical Connections

**WARNING: This boiler must be earthed**

**IMPORTANT:** Four core cable is required to supply the boiler as a permanent live is necessary for the operation of the condensate pump and frost protection.

1. The electrical connections are on the right hand side of the boiler. Depending upon the nature of the installation it may be preferable to wire up to the boiler first before manoeuvring into position.

2. Undo the two screws securing the cable clamp and place to one side (Fig. 31).

3. Route the incoming electrical cable(s) from the system control wiring centre through the grommet in rear of the boiler and the grommet in the support bracket. This will prevent damage to the cable(s).

4. Lay the cable through the cable clamp to gauge the length of wire required when it is connected to the 4-way terminal block.

5. Connect the (S/L), ( $\oplus$ ), (N) and (P/L) wires to the 4-way terminal block (Fig. 33) and refit the cable clamp (Fig. 31).

#### INTEGRAL PROGRAMMER

6. If the optional integral programmer is being fitted it can be done at this stage. Consult the instructions supplied in the programmer kit.

7. Check the electrical installation for; earth continuity, short circuits, resistance to earth, correct polarity and fuse rating.

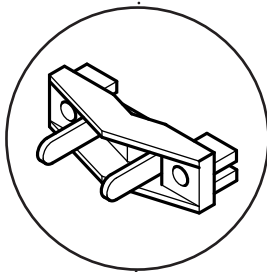
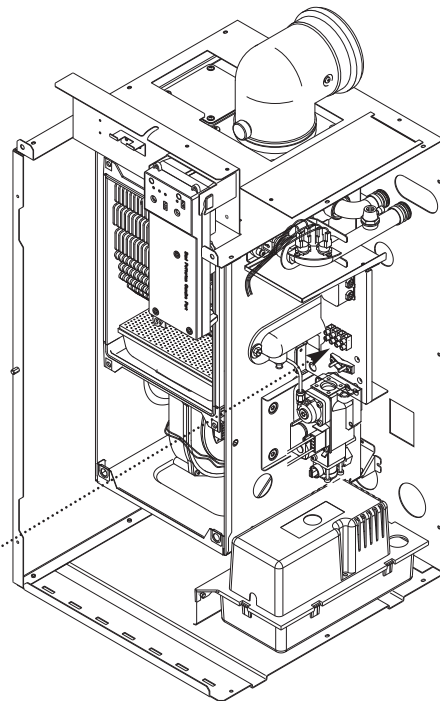


Fig. 31

Cable Clamp

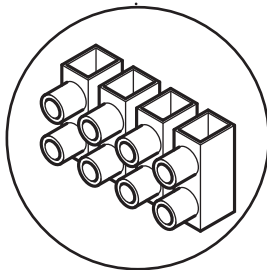


Fig. 32

4-way Terminal Block

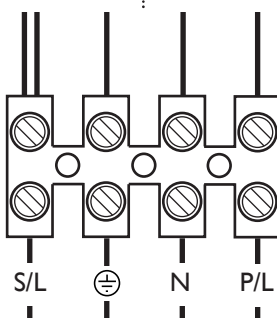
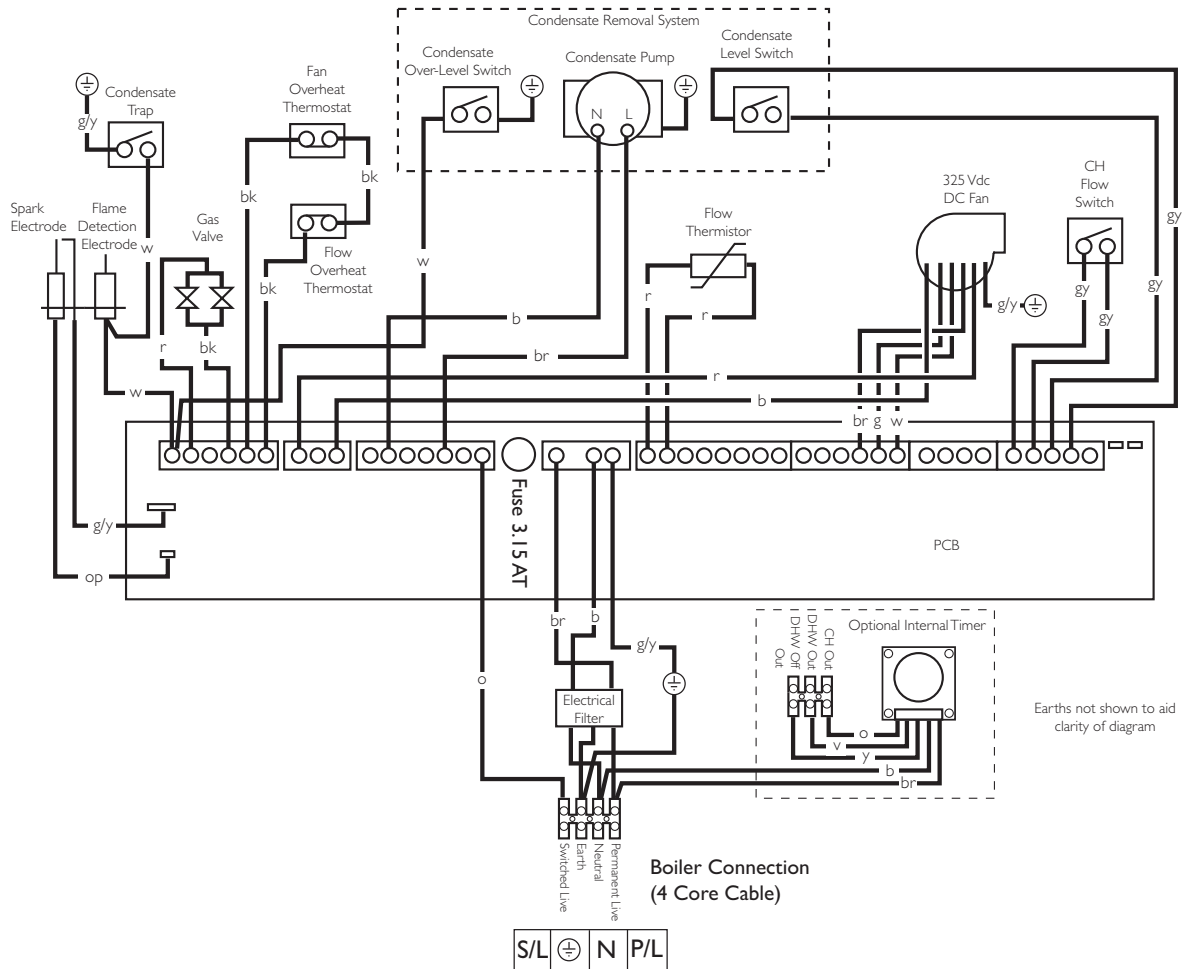


Fig. 33

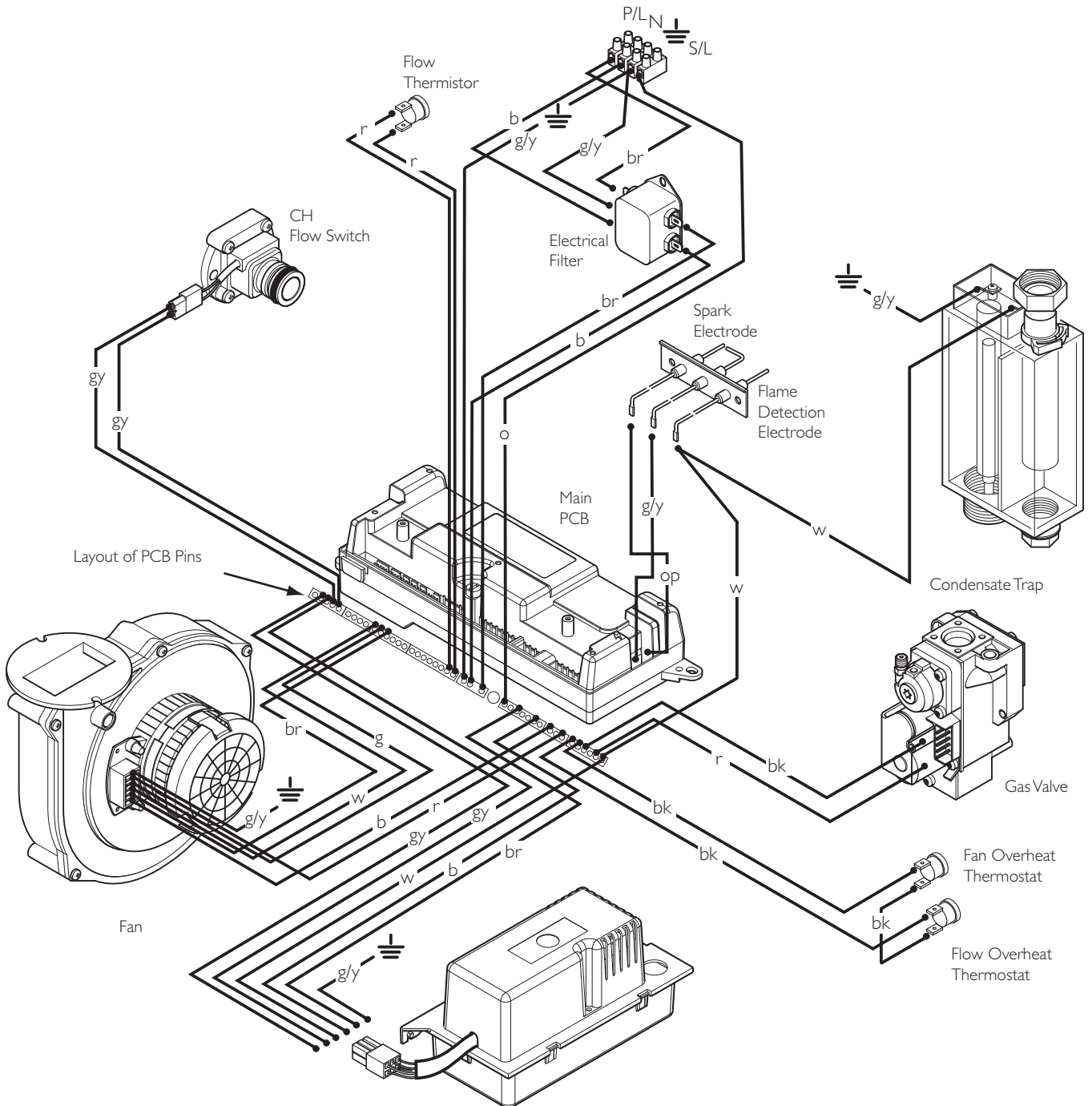
Wiring from System Controls	
S/L	Switched Live
$\oplus$	Earth
N	Neutral
P/L	Permanent Live



### Key To Wiring Colours

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

## 11.2 Illustrated Wiring Diagram



### Wiring Key

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

## 12.0 Commissioning the Boiler

### 12.1 Commissioning the Boiler

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

1. Reference should be made to BS:EN 12828 & 14336 when commissioning the boiler.
2. At the time of commissioning, complete all relevant sections of the Benchmark Checklist at the rear of this publications.
3. Flush the whole system using a suitable flushing agent (see Section 6.2) and vent the radiators. Check for water leaks.
4. Refill the system with inhibitor following the inhibitor manufacturer's instructions and BS 7593 Code of Practice for Treatment of Water in Domestic Hot Water Central Heating Systems (see Section 6.2).
5. 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.
6. Turn the gas supply on and purge according to in GB BS 6891 and in IE I.S. 813 "Domestic Gas Installations".
7. Turn the gas service cock anticlockwise to the ON position and check for gas tightness up to the gas valve (Fig. 34). Turn the power to the boiler ON.

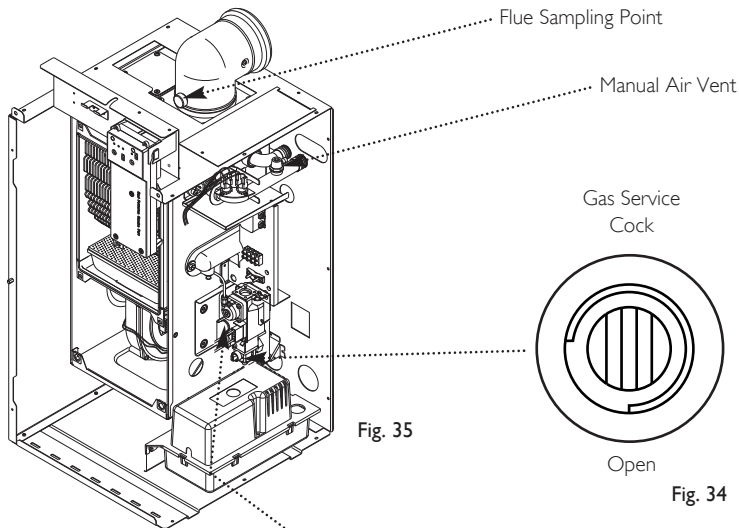
**NOTE:** The 12,15,18,24 are self-regulating dependent upon the system load. The 30 HE will modulate between inputs of 33.76kW and 10.3kW. The 30 HE input is factory set at 24.5kW and can be altered to 33.76kW - see section 10.8.  
**No adjustment of the gas valve is permissible.**

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

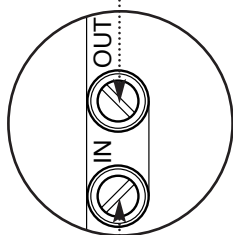
**IMPORTANT:** The combustion for this appliance has been checked, adjusted and preset at the factory for operation on the gas type specified on the appliance data plate. However, it is still necessary to check the combustion as part of commissioning (see Flow Chart 12.2). Do not adjust the air/gas ratio valve.

### 12.2 Priming the Condensate Pump

1. Using a funnel and tube, carefully pour approximately 1 litre of tap water into the flue products exhaust at the terminal or flue elbow sampling point to fill the trap and allow the condensate pump reservoir to fill.
2. Continue filling with water until the condensate pump operates.
3. Check that the condensate drain pipework is not leaking and that it is discharging correctly to drain.
4. See Fig. 36a for operation of LEDs on boiler facia.



DO NOT check gas pressure here



Inlet Gas Pressure Test Point

Fig. 36

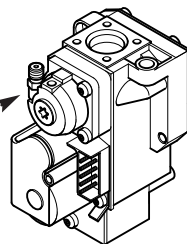


Fig. 34

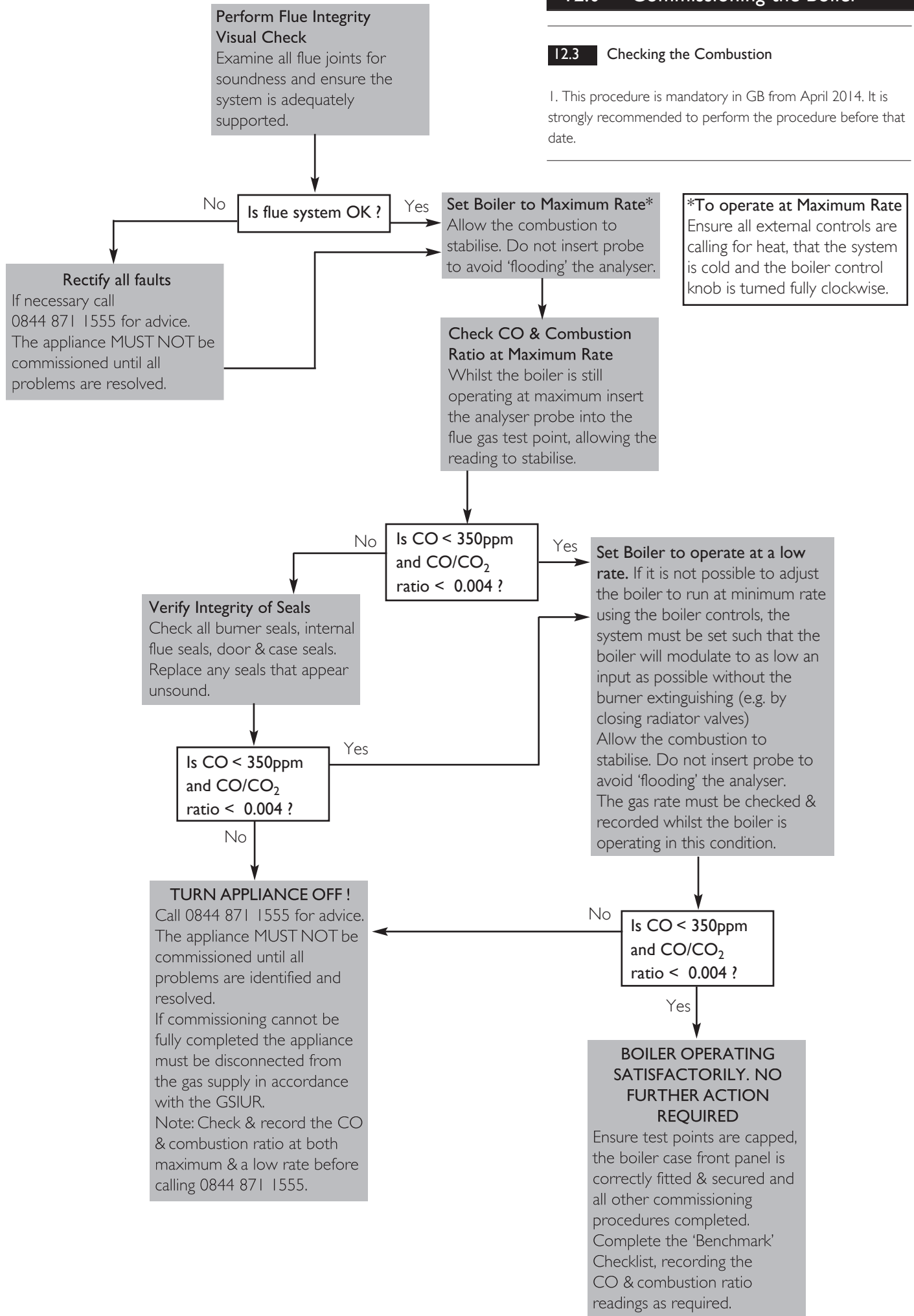
	<b>Central Heating Control Knob</b> (No OFF Position)	Turn the Central Heating Control Knob clockwise to increase or anticlockwise to decrease the boiler flow temperature.
	<b>Reset Button</b>	The Reset Button should extinguish the Flame Failure Light and restore normal operation.
	<b>Mains On</b> (Green Light)	This indicates that there is electricity to the Boiler.
	<b>Burner On</b> (Green Light)	This indicates that the Burner has fired up and is heating your system.
	<b>Flame Failure</b> (Red Light)	If Flame Failure Light is ON. Press the Reset Button. If Flame Failure occurs persistently consult your Installer or Service Engineer.

Fig. 36a

## 12.0 Commissioning the Boiler

### 12.3 Checking the Combustion

1. This procedure is mandatory in GB from April 2014. It is strongly recommended to perform the procedure before that date.

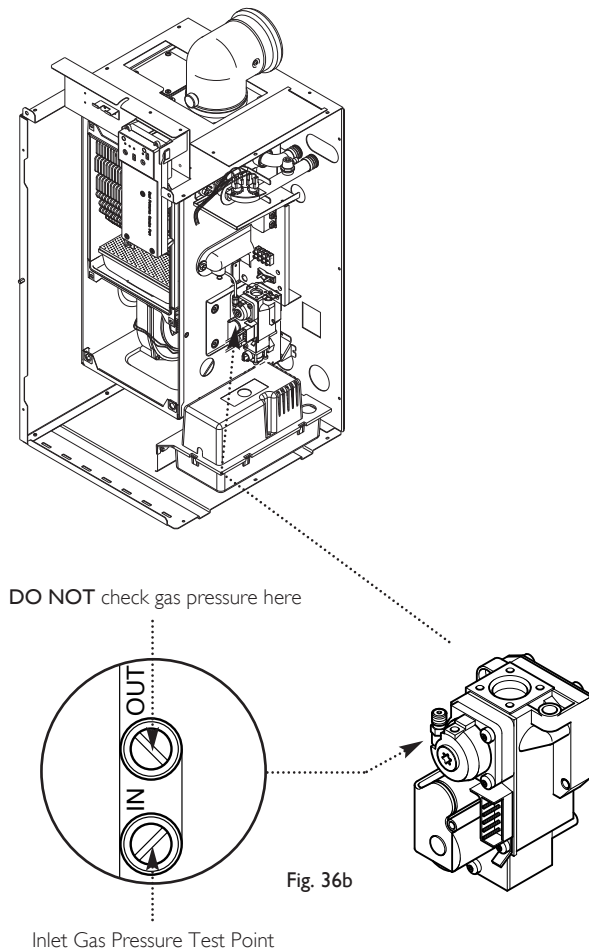


### 12.4 Check the Operational (Working) Gas Inlet Pressure

1. Ensure that all controls are calling for heat and maximum load is applied to the system.
2. With the boiler operating in the maximum rate condition check that the operational (working) gas pressure at the inlet gas pressure test point is in accordance with B.S. 6798 & B.S. 6891.
3. Ensure that this inlet pressure can be obtained with all other gas appliances in the property working.

#### Measure the Gas Rate

4. With any other appliances & pilot lights turned OFF the gas rate can be measured. It should be as shown in Section 4.0 Technical Data.
5. Carefully read and complete all sections of the Benchmark Commissioning Checklist at the rear of this publication that are relevant to the boiler and installation. These details will be required in the event of any warranty work. The publication must be handed to the user for safe keeping and each subsequent regular service visit recorded.
6. For IE, it is necessary to complete a "Declaration of Conformity" to indicate compliance with I.S. 813. An example of this is given in I.S. 813 "Domestic Gas Installations". This is in addition to the Benchmark Commissioning Checklist.



## 13.0 Completion

### 13.1 Fitting The Case Panels & Facia

1. Refit the case top panel and front door, securing with the screws previously removed (Fig.37).
2. Locate the facia panel and secure with the screws previously removed (Fig. 38).
3. The "Important Ventilation Information" label can be removed unless the boiler is installed in an unventilated compartment.

### 13.2 'Benchmark' Checklist

1. Carefully read and complete all sections of the Benchmark Commissioning Checklist at the rear of this publication that are relevant to the boiler and installation. **These details will be required in the event of any warranty work.** The publication must be handed to the user for safe keeping and each subsequent regular service visit recorded.
2. 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.

### 13.3 Handover

1. Instruct the user in the operation of the boiler and system controls. Hand over the User's Operating, Installation and Servicing Instructions, giving advice on the necessity of regular servicing.
2. Demonstrate to the user the action required if a gas leak occurs or is suspected. Show them how to turn off the gas supply at the meter control, and advise them not to operate electric light or power switches, and to ventilate the property.
3. Show the user the location of the system control isolation switch, and demonstrate its operation.
4. Advise the user that they may observe a plume of vapour from the flue terminal, and that it is part of the normal efficient operation of the boiler.

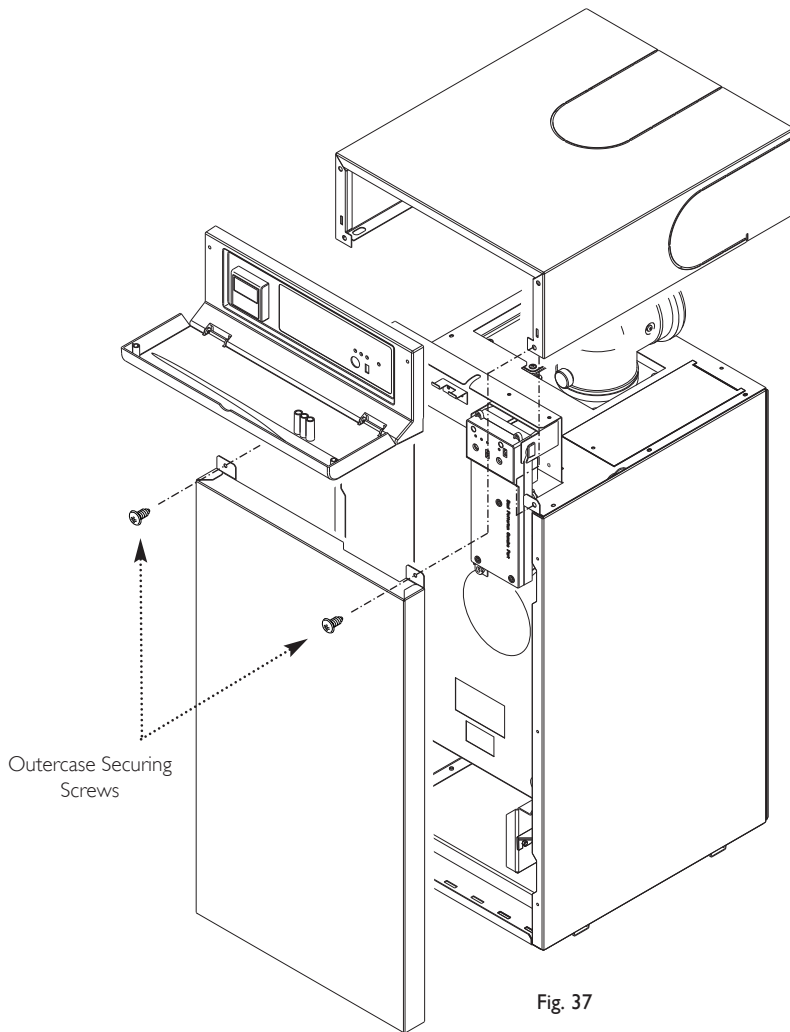


Fig. 37

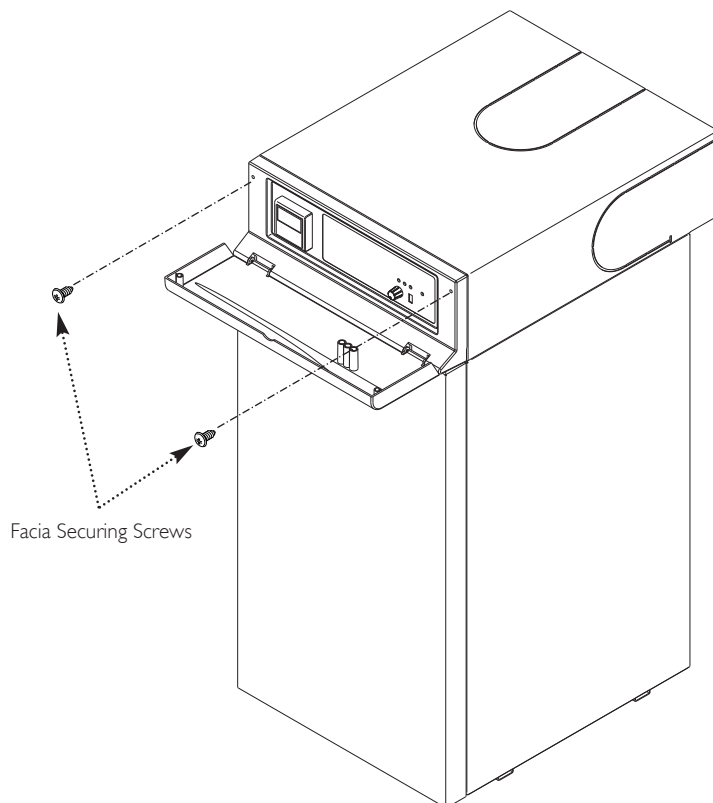


Fig. 38

## 14.0 Servicing the Boiler

### 14.1 Annual Servicing

**WARNING: The PCB Control and Fan Assembly are 325 Vdc. Isolate system controls before access.**

**IMPORTANT:** When servicing ensure that both the gas and electrical supplies, including Switched and Permanent Live to the boiler are isolated before any work is started.

The four LEDs on the facia will all be OFF.

It is important to isolate the electrical supply at the system isolation switch as it is not possible to do this on the boiler itself.

Hazardous materials are not used in the construction of this product, however reasonable care during service is recommended - see Section 1.2.

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. Servicing must be performed by a competent person in accordance with B.S. 7967-4.

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

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

- The integrity of the complete flue system and the flue seals.
- The integrity of the boiler combustion circuit and relevant seals as described in Section 14.2.
- The operational gas inlet pressure as described in Section 12.2.1 to 12.2.3 and the gas rate as described in 12.2.4.
- The combustion performance as described in 'Check the Combustion Performance' (14.1.4 to 14.1.6 below).

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

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

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

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

4. Set the boiler to operate at maximum rate as described in Section 12.3.

5. Remove the cap from the flue sampling point, insert the analyser probe and obtain the CO/CO<sub>2</sub> ratio. **This must be less than 0.004.**

6. If the combustion reading (CO/CO<sub>2</sub> ratio) is greater than this, and the integrity of the complete flue system and combustion circuit seals has been verified, and the inlet gas pressure and gas rate are satisfactory either:

- Perform the 'Annual Servicing - Inspection' (Section 14.2) & re-check.
- Replace the gas valve (Section 15.8) & re-check.



## 14.0 Servicing the Boiler

### 14.2 Annual Servicing - Inspection

**WARNING: The PCB Control and Fan Assembly are 325 Vdc. Isolate system controls before access**

1. Ensure that the boiler is cool.
2. Remove the fascia and front door panel.
3. Release the four 1/4 turn screws securing the air box door panel and remove the panel (Fig. 39).
4. Disconnect the three leads from the terminals (Fig. 40).
5. Undo the four screws securing the combustion box door and remove the door (Fig. 41).
6. Visually check for debris/damage and clean or replace if necessary the following:
  - a) Burner.
  - 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.
  - h) The condensate pump
  - i) Top of heat exchanger.

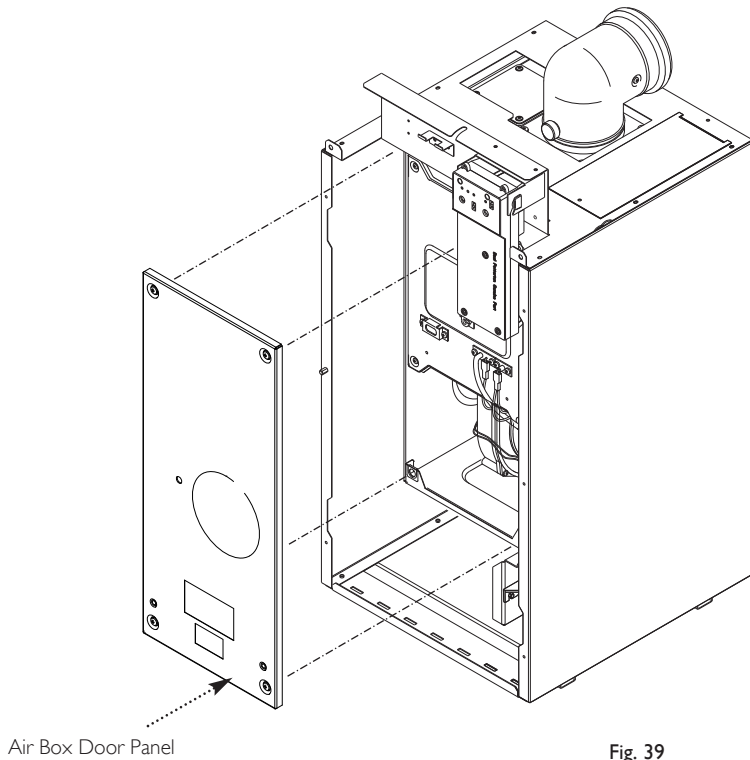


Fig. 39

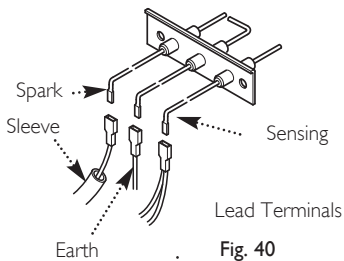


Fig. 40

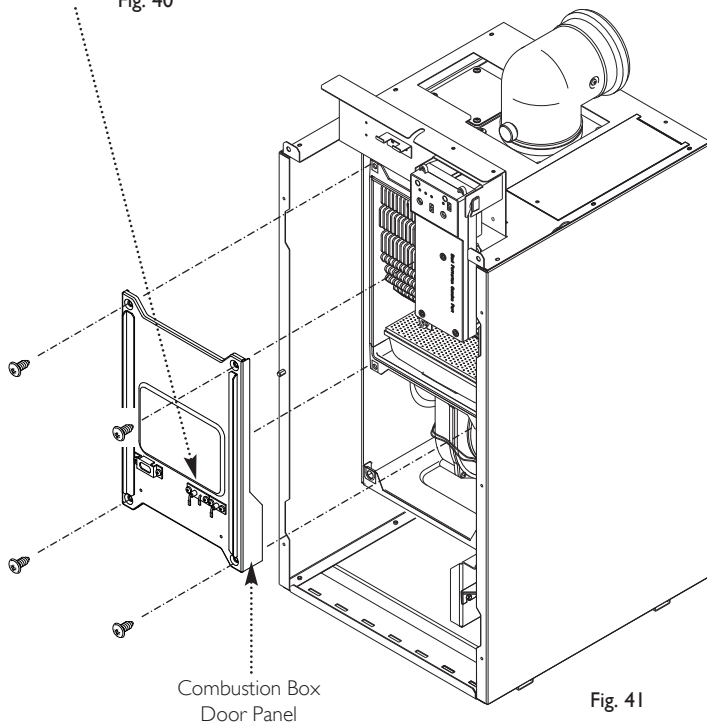


Fig. 41

### 14.2 Annual Servicing - Inspection (Cont)

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

- a) Disconnect the electrical leads to the fan component protection sensor (Fig. 42).
- b) Loosen the screw retaining the gas injector pipe at the venturi (Fig. 42).
- c) Undo the two wing nuts to disconnect the fan (Fig. 42).
- d) Remove the fan and disconnect the electrical supply to it (Fig. 42).
- e) Remove the gas injector pipe from the gas valve (push-fit) (Fig. 42).

f) Remove the condensate trap drain plug and place a vessel underneath to catch the condensate (care should be taken as this could be hot). The condensate drain pipe may be removed to increase access.

g) Undo the condensate trap securing nut, lock nut and the condensate drain pipe. Remove the condensate trap and disconnect the sensor leads (Fig. 43). Clean the trap and refit the drain plug.

h) Remove the two screws securing the burner and remove the burner. Visually inspect the internal burner baffle for obstruction, check seal around baffle for cracks/damage. Clean with a soft brush.

i) Loosen the two screws retaining the heat exchanger support bracket and slide to the left to remove (Fig. 44).

j) Remove the four screws securing the heat exchanger/combustion box base and withdraw the base.

k) Lower the central insulation panel and check condition (Fig. 44). Replace the lower insulation pad if necessary.

l) Ensure the heat exchanger fins are clear of any obstruction.

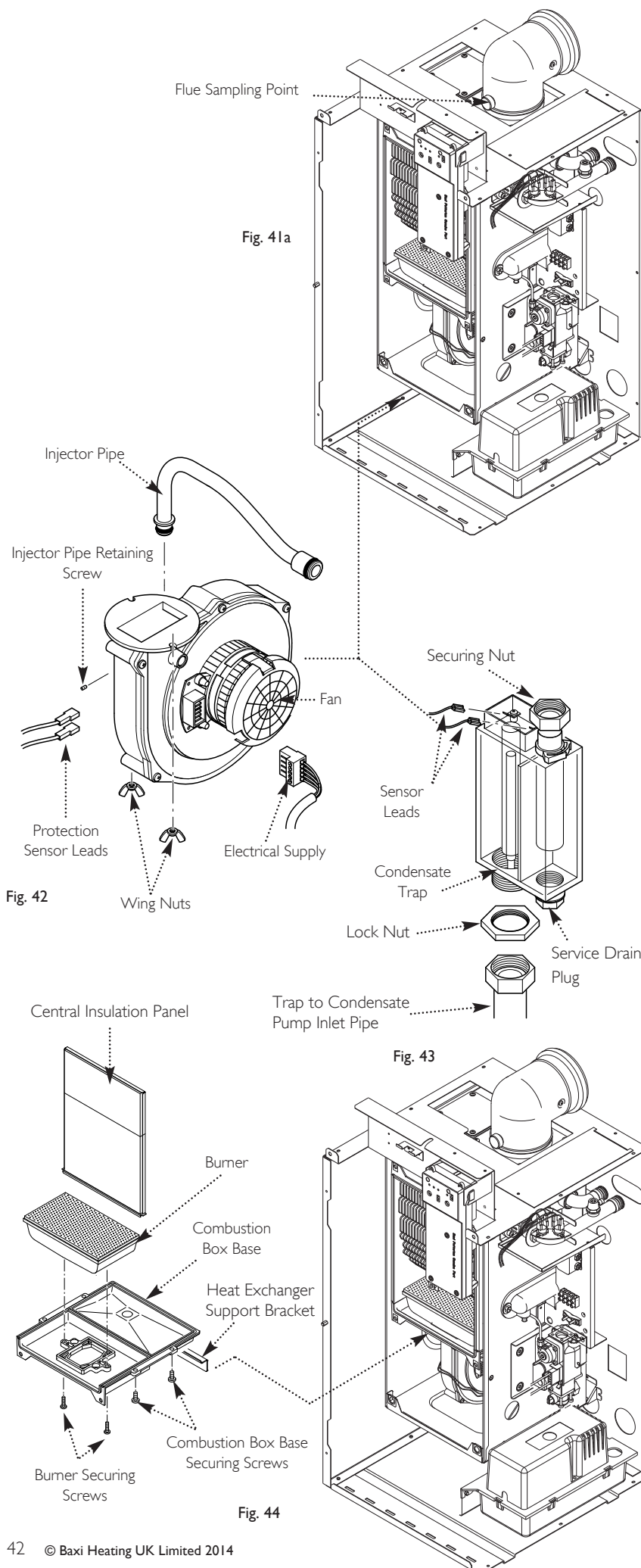
m) Check condition of all seals. **Important: Pay particular attention to the condition of the combustion box door seals.**

n) Reassemble in reverse order and check for leaks.

8. Check the operation of the condensate pump and drain pipework (see Section 10.1)

9. Check CO/CO<sub>2</sub> ratio at flue sampling point (Fig.41a). See section 4.0.

10. 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.



## 15.0 Changing Components

### 15.1 Changing Components & Preparation

**WARNING: The PCB Control and Fan Assembly are 325 Vdc. Isolate system controls before access.**

**IMPORTANT:** Ensure that both the gas and electrical supplies, including Switched and Permanent Live to the boiler are isolated before any work is started. The four facia LEDs will be all OFF.

It is important to isolate the electrical supply at the system isolation switch as it is not possible to do this on the boiler itself.

Hazardous materials are not used in the construction of this product, however reasonable care is recommended - see Section 1.2.

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

Remove the facia and front door panel.

For the replacement of some components it will be necessary to drain the boiler. Proceed as follows:-

1. Isolate the water circuit and drain the system as necessary. A drain point is located on the heat exchanger manifold at the right hand side of the boiler (Fig. 45) to enable the heat exchanger to be drained.
2. Place a tube on the drain point to drain water away from the electrics. Turn anticlockwise to open (Fig. 45).
3. After changing a component recommission the boiler where appropriate and check the inhibitor concentration (see Section 6.2 and 10.1).

The thermistor, safety thermostat, interface PCB and the flow switch can be accessed after removal of the pipe access panel (Fig. 46).

### 15.2 Flow Temperature Thermistor and Safety Thermostat (Fig. 46)

1. The procedure is the same for both the thermistor and the safety thermostat.
2. Remove the pipe access panel and disconnect the electrical connections from the sensor.
3. Remove the sensor from the pipe.
4. Fit the new thermistor or safety thermostat and reassemble in reverse order.

Fig. 45

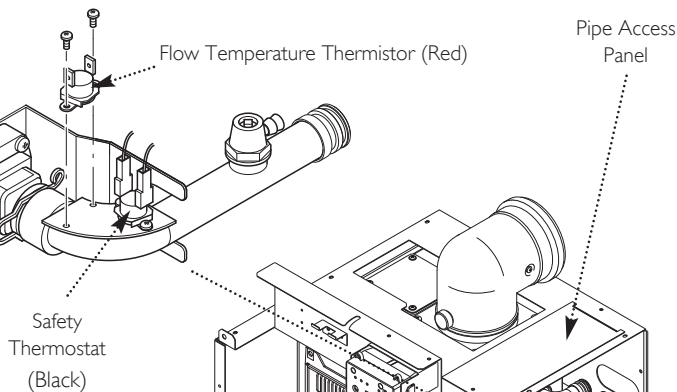
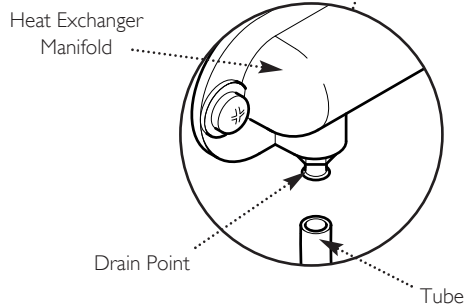


Fig. 46

## 15.0 Changing Components

### 15.3 Flowswitch (Fig. 47)

1. Drain the boiler (see Section 13.1 paragraph 2 & 3).
2. Remove the pipe access panel and remove the securing clip from the 'O' ring joint between the flow pipe and the system. Undo screws on support bracket.
3. Remove the securing clip from the 'O' ring joint between the flow pipe and the flowswitch.
4. Remove the two screws securing the flow switch to the boiler.
5. Disconnect the inline electrical connection and remove the flowswitch.
6. Fit the new flowswitch and reassemble in reverse order.
7. Recommission the boiler and check the inhibitor concentration (see Section 6.2 and 10.1).

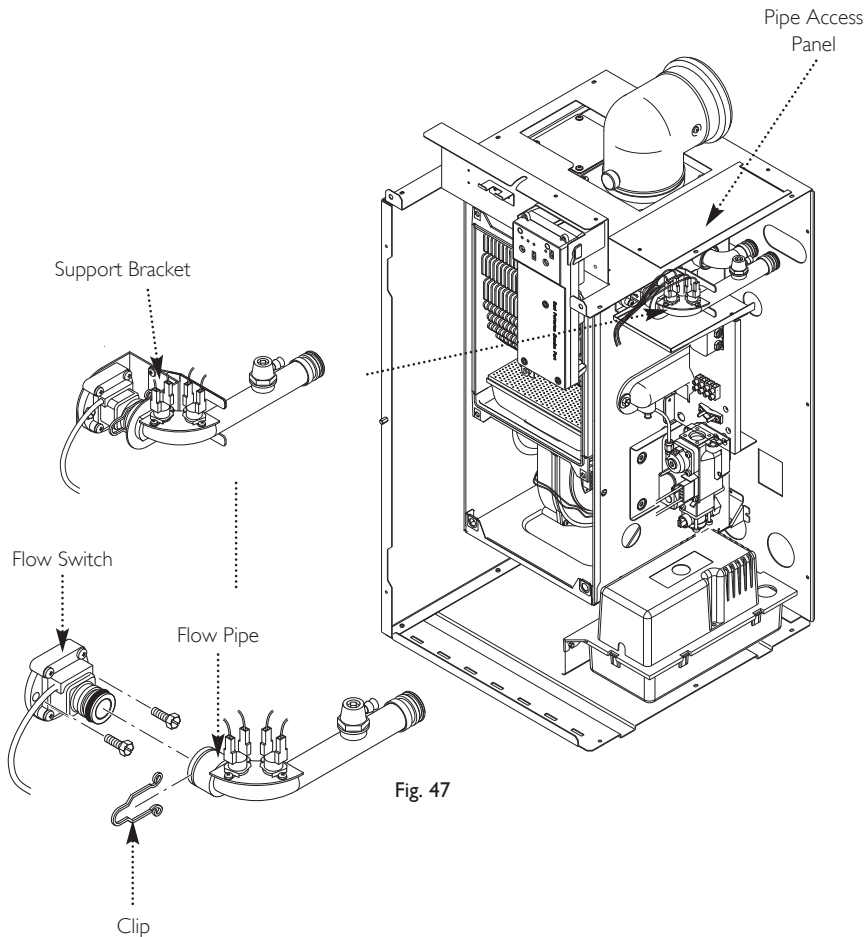


Fig. 47

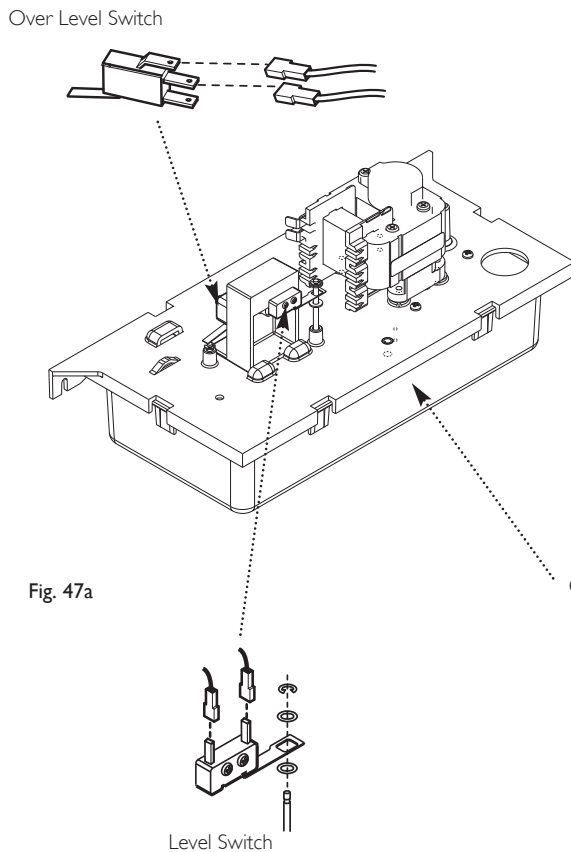


Fig. 47a

Condensate Pump  
(Cover Removed)

Level Switch

### 15.4 Condensate Pump - Complete (Fig. 47a)

1. Remove the pipe from the trap to the pump inlet and disconnect the electrical plug.
2. Lift the pump off the support studs and ease it forwards. Release the snap fit clip and disconnect the condensate outlet pipe.
3. Connect the condensate outlet pipe to the new pump using the new clip provided.
4. With the new pump in place on the studs, refit the trap discharge pipe, ensuring the 'O' ring is in place. Reconnect the electrical plug.
5. Neatly coil the excess condensate outlet pipe adjacent to the pump, ensuring that it is not kinked or restricted.
6. Check operation of the pump - See Section 10.2.

### 15.5 Condensate Pump - Level Switches (Fig. 47a)

1. Remove the complete Condensate Pump as described in Section 13.4, and remove the cover.
2. Disconnect the wires from the switch(es) and remove the retaining screws. On the Level Switch remove the circlip and washers connecting the plunger to the actuating arm.
3. Fit the new switch(es). Align the actuating arm of the Level Switch with the plunger, ensuring that there is a washer at each side of the arm.
4. Reconnect the wires. On the Over Level Switch there is no connection to the lower spade terminal.
5. Check operation of the pump - See Section 10.2.

## 15.0 Changing Components

### 15.6 PCB (Figs. 48 & 49)

**WARNING: The PCB Control and Fan Assembly are 325 Vdc. Isolate system controls before access.**

1. Pull the control knob off the spindle and remove the plastic button cover. Refit them onto the new PCB (Fig. 48).
2. Remove the top right hand securing screw and swing out the PCB housing. Remove the PCB cover and disconnect the electrical plugs noting their positions
3. Remove the screw securing the PCB to the housing. The PCB can be removed from the housing.
4. Ensure that the two jumpers are fitted to the new PCB as shown (Fig. 49).
5. Reconnect the plugs, fit the new PCB to the housing and reassemble in reverse order.

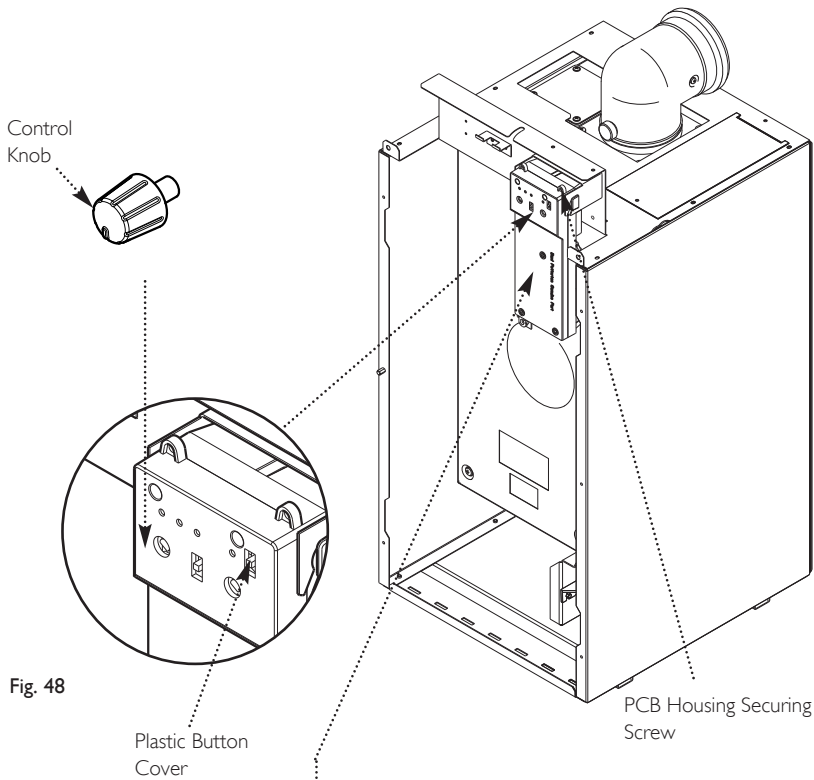


Fig. 48

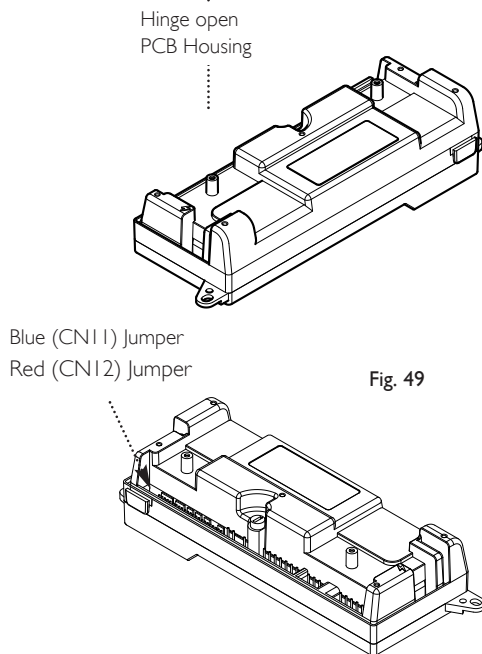


Fig. 49

## 15.0 Changing Components

The fan and venturi, gas valve, injector pipe, condensate trap, fan protection sensor, spark and sensing electrodes 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. 50).

### 15.7 Spark and Sensing Electrodes (Fig. 51)

1. Disconnect all three leads from tabs.

Spark	-	Opaque cable
Earth	-	Green/Yellow cable
Sensing	-	White cable
2. Remove the two screws securing each of the electrodes to the combustion box door and remove the electrodes.
3. Fit the new electrodes (and new gasket, as required) and reassemble in reverse order.

### 15.8 Fan (Fig. 52)

**WARNING: The PCB Control and Fan Assembly are 325 Vdc. Isolate system controls before access.**

1. Loosen the screw holding the injector pipe into the venturi.
2. Remove the electrical connections to the fan and protection sensor on the fan.
3. Remove the wing nuts securing the fan to the base of the combustion box.
4. Lower the fan and remove.
5. If changing the fan, remove the screws securing the venturi and fan protection sensor bracket, noting the positions of the injector opening and sensor bracket, fix them to the new fan.
6. 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.

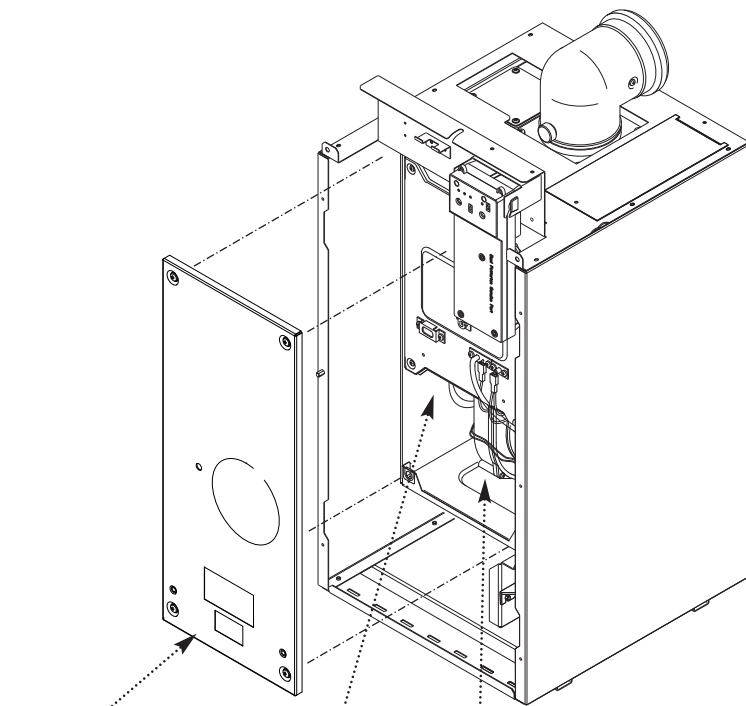


Fig. 50

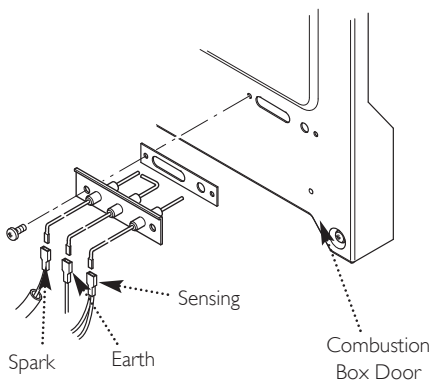


Fig. 51

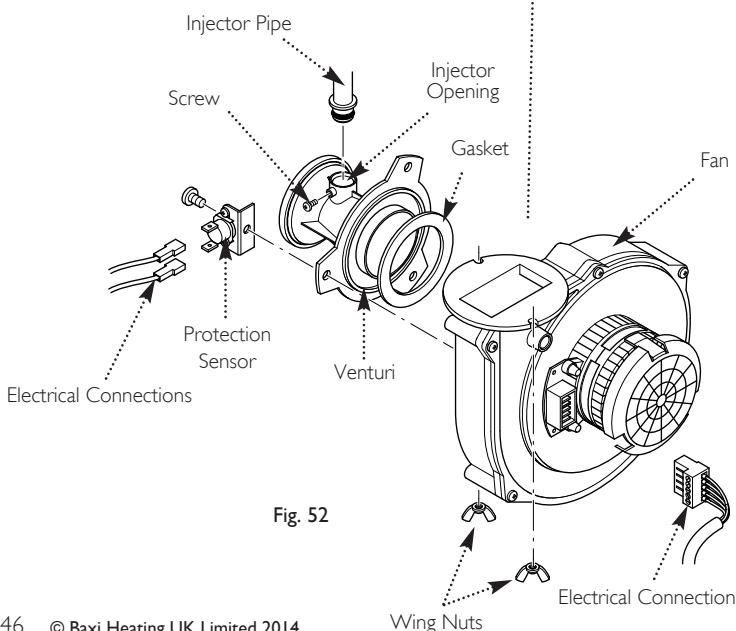


Fig. 52



## 15.0 Changing Components

The removal of the fan is necessary to enable the changing of the injector pipe, condensate trap and gas valve (see section 13.6).

### 15.9 Injector Pipe (Fig. 53)

1. Remove the injector pipe by pulling out from the 'O' ring joint in the gas valve.
2. Fit the new injector pipe and reassemble in reverse order.

### 15.10 Gas Valve (Fig. 53)

**IMPORTANT:** After replacing the valve the CO<sub>2</sub> must be checked as detailed in Section 14.1.4 to 14.1.6. Only change the valve if a suitable calibrated combustion analyser is available, operated by a competent person - see Section 14.1.3.

1. Isolate gas supply and disconnect the gas tap by removing the four screws.
2. If required remove the condensate pump to increase access (see Section 13.4) and undo the case pressure pipe from the valve.
3. Disconnect the electrical plug from the gas valve.
4. Remove the fan (see Section 13.6) and injector pipe.
5. Remove the two gas valve securing screws from inside the air box holding the gas valve, and remove the valve.
6. Remove the aluminium spacer and its gasket from the gas valve.
7. Fit the aluminium spacer and its gasket to the new valve.
8. Fit the new gas valve and reassemble in reverse order.

**NOTE:** Check for gas tightness after replacing gas valve.

9. Check the CO<sub>2</sub> level. If the level is greater than that quoted, telephone the Technical Enquiries for further advice.

### 15.11 Condensate Trap (Fig. 54)

1. Disconnect the condensate trap from the base of the heat exchanger.
2. Disconnect the condensate drain 'O' ring connection from the condensate trap and condensate pump. For ease of access also remove the pump.
3. Undo the condensate trap lock nut.
4. Remove the condensate trap from the boiler.
5. Disconnect the sensor leads.
6. Fit the new condensate trap and reassemble in reverse order. When refitting the pipe from the trap to the pump ensure that all seals and connections are made.
7. Prime the condensate trap (fill first chamber), check for leaks (see Section 8.5).

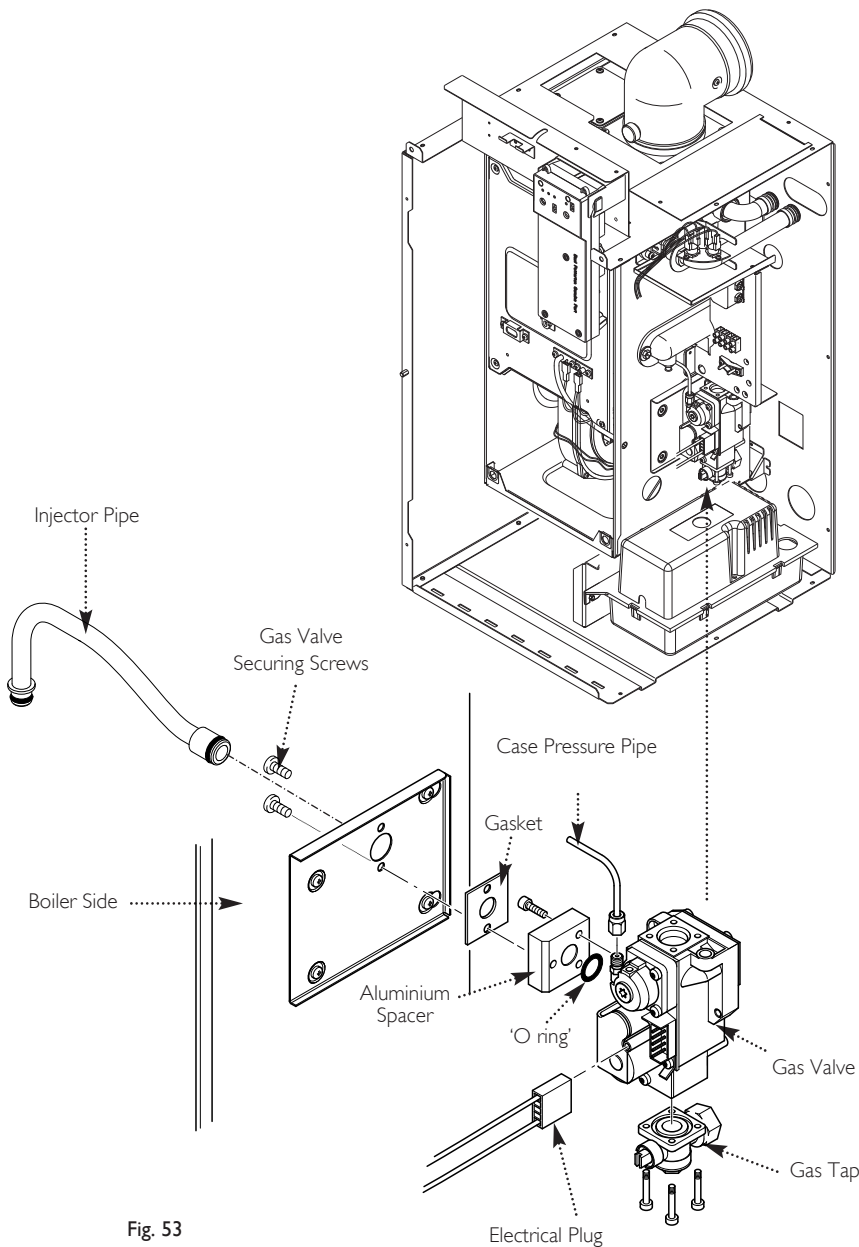


Fig. 53

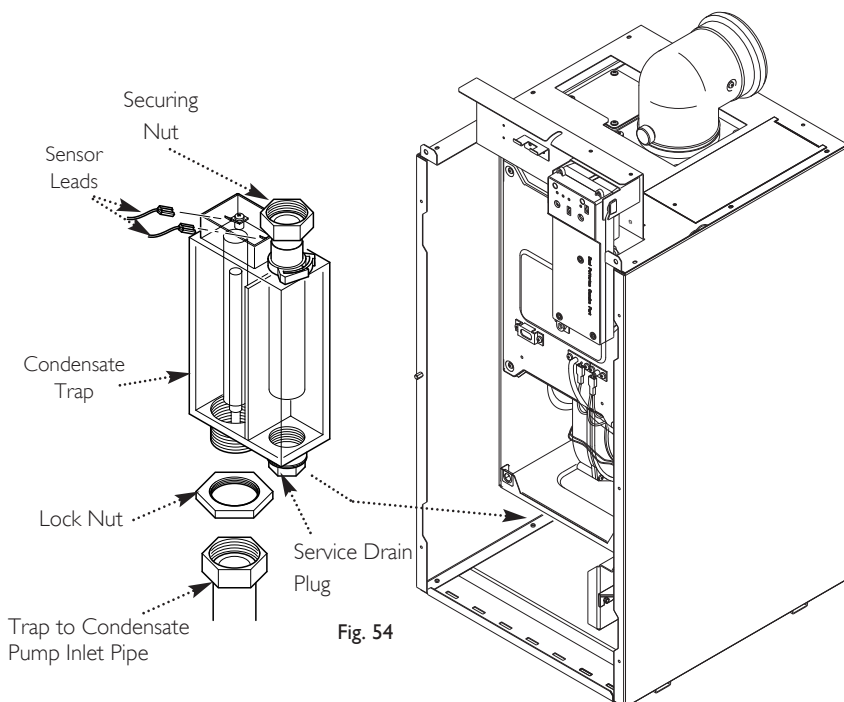


Fig. 54

## 15.0 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 13.6 and 13.10).

1. Remove the combustion box door by removing the four securing screws (Fig. 55).

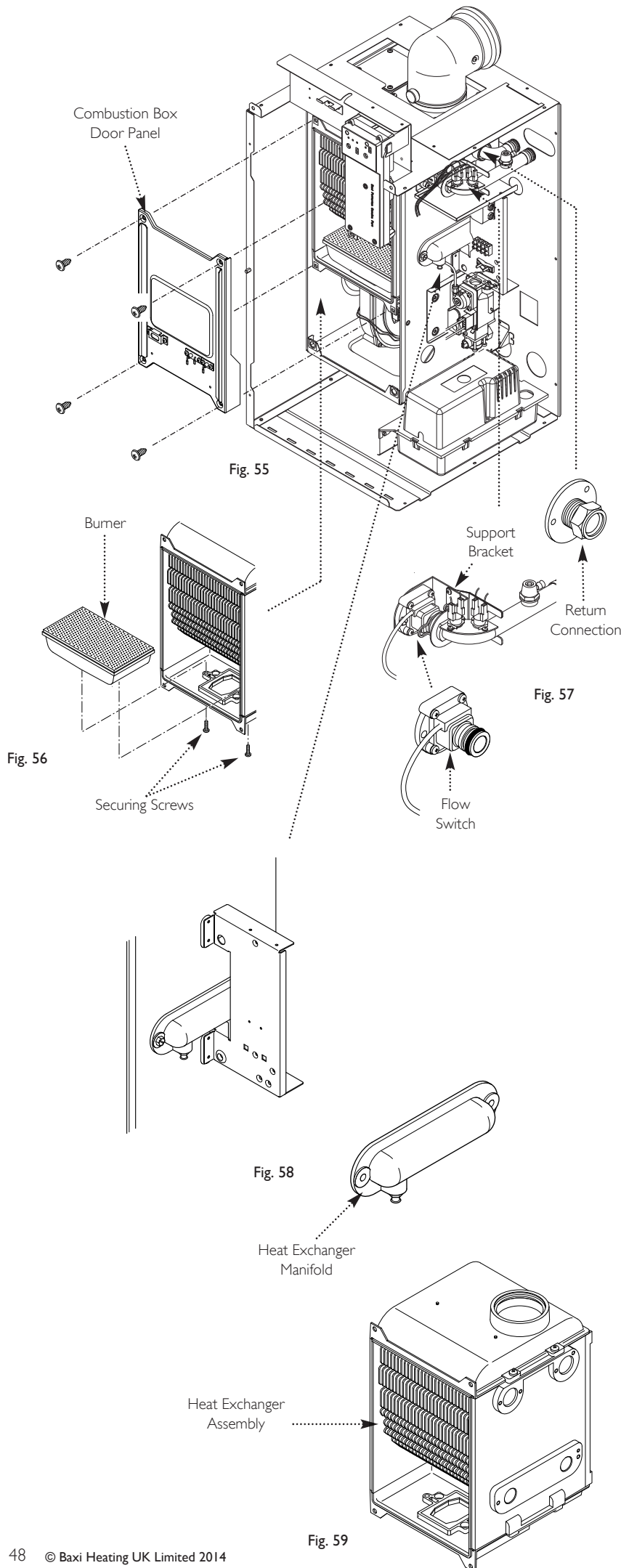
**IMPORTANT:** On refitting the combustion box door check the condition of the combustion box door seals.

### 15.12 Burner (Fig. 56)

1. Remove the two screws securing the burner to the base of the combustion box.
2. Remove the burner carefully from the combustion box base.
3. Check the burner seal on the heat exchanger base, replace if necessary. Fit the new burner and reassemble in reverse order.

### 15.13 Heat Exchanger

1. Drain the boiler (see section 13.1 paragraph 2 & 3).
2. Remove all components in the base of the airbox.
3. Undo the screws on the support bracket. Remove the screws securing the flow switch and return connections and remove the connections (Fig. 57).
4. Remove the screws securing the heat exchanger manifold and remove the manifold (Fig. 58).
5. Ease the combustion box left hand side panel to clear the stud, lift the heat exchanger assembly (Fig. 59) and rotate the bottom upwards whilst pulling it forwards out of the airbox.
6. Ensure that the heat exchanger is disengaged from the flue elbow and clear of the stud in the left hand side of the combustion box.
7. Fit the new heat exchanger and reassemble in reverse order.
8. Recommission the boiler and check the inhibitor concentration (see Section 6.2 and 10.1).





## 15.0 Changing Components

### 15.14 Heat Exchanger Lower Insulation Pad (Fig. 60)

1. Remove all components in the base of the airbox.
2. Remove the burner (see section 13.10).
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 lower insulation pad.
6. Fit the new insulation pad and reassemble in reverse order.

### 15.15 Heat Exchanger Upper Insulation Pad (Fig. 60)

1. Remove all components in the base of the airbox.
2. Remove the burner (see section 13.10).
3. Remove the heat exchanger (see section 13.11).
4. Remove the four bolts securing the combustion box base.
5. Remove the combustion box base.
6. Pull the central insulation panel down from the centre of the heat exchanger.
7. Fit the new insulation pad and reassemble in reverse order.

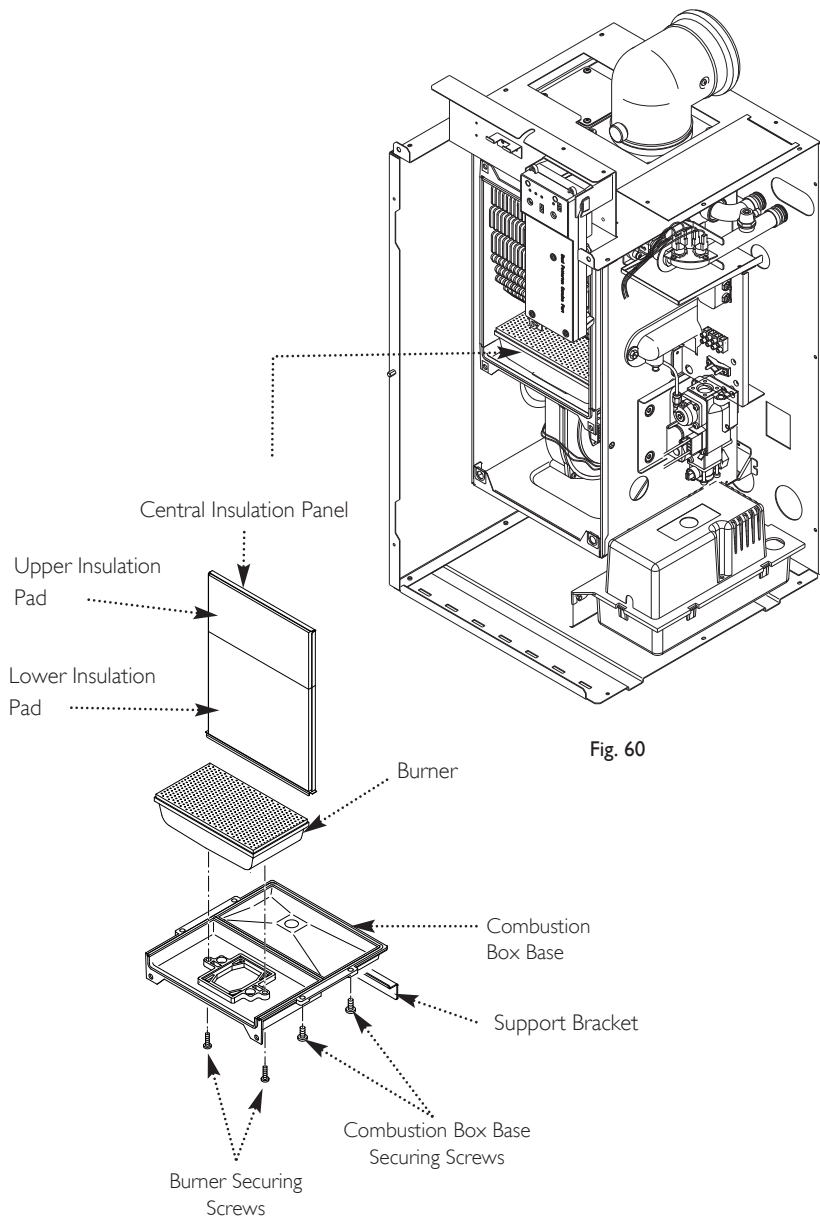
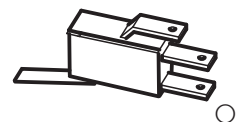
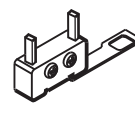
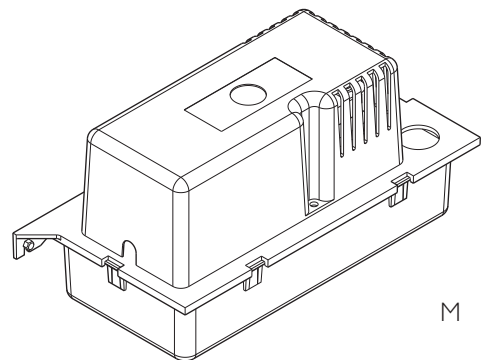
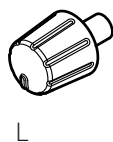
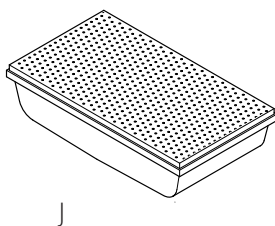
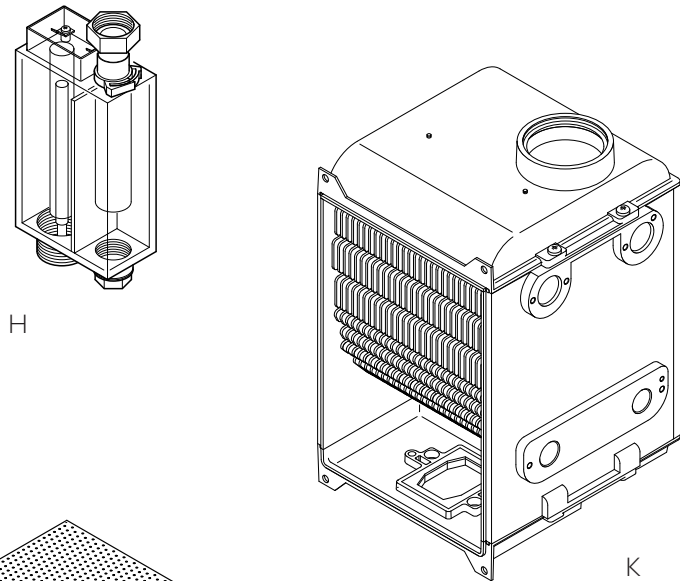
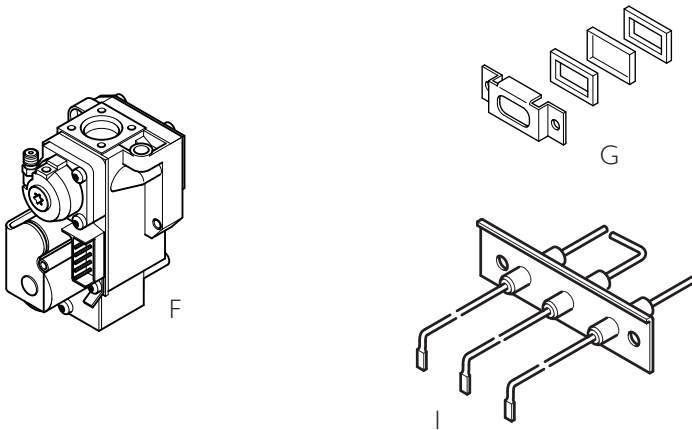
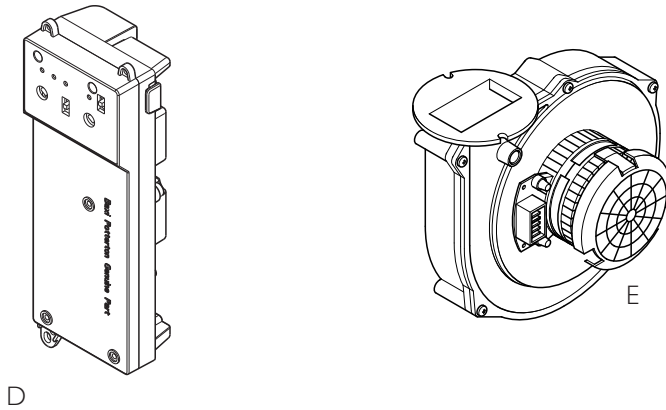
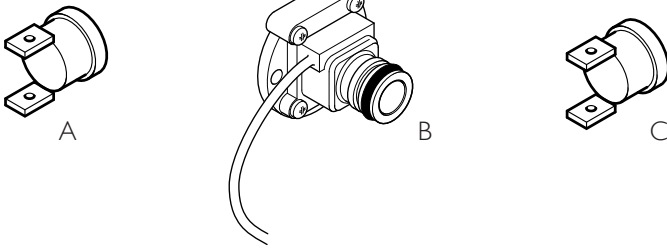


Fig. 60

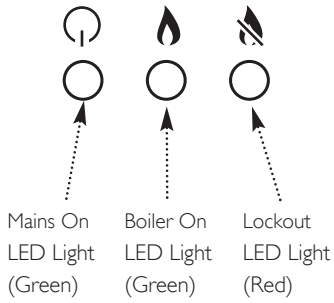
## 16.0 Short Parts List

### Short Parts List

Key No.	G.C. No.	Description	Manufacturers Part No.
A	E06 058	Flow Temperature Thermistor (Red)	240670
B	E06 059	Flow Switch	242459
C	E06 060	Safety Thermostat (Black)	242235
D		PCB	5129147
E		Fan	5109925
F		Gas Valve	241900
G	E06 085	Viewing Window	242484
H		Condensate Trap	5111714
I		Electrodes Kit	5132366
J		Burner Assy	5107430
K	E06 097	Heat Exchanger Assy	242497
L		Control Knob	5109996
M		Condensate Pump	5117661
N		Level Switch	5117591
O		Over Level Switch	5117592



## 17.0 Fault Finding

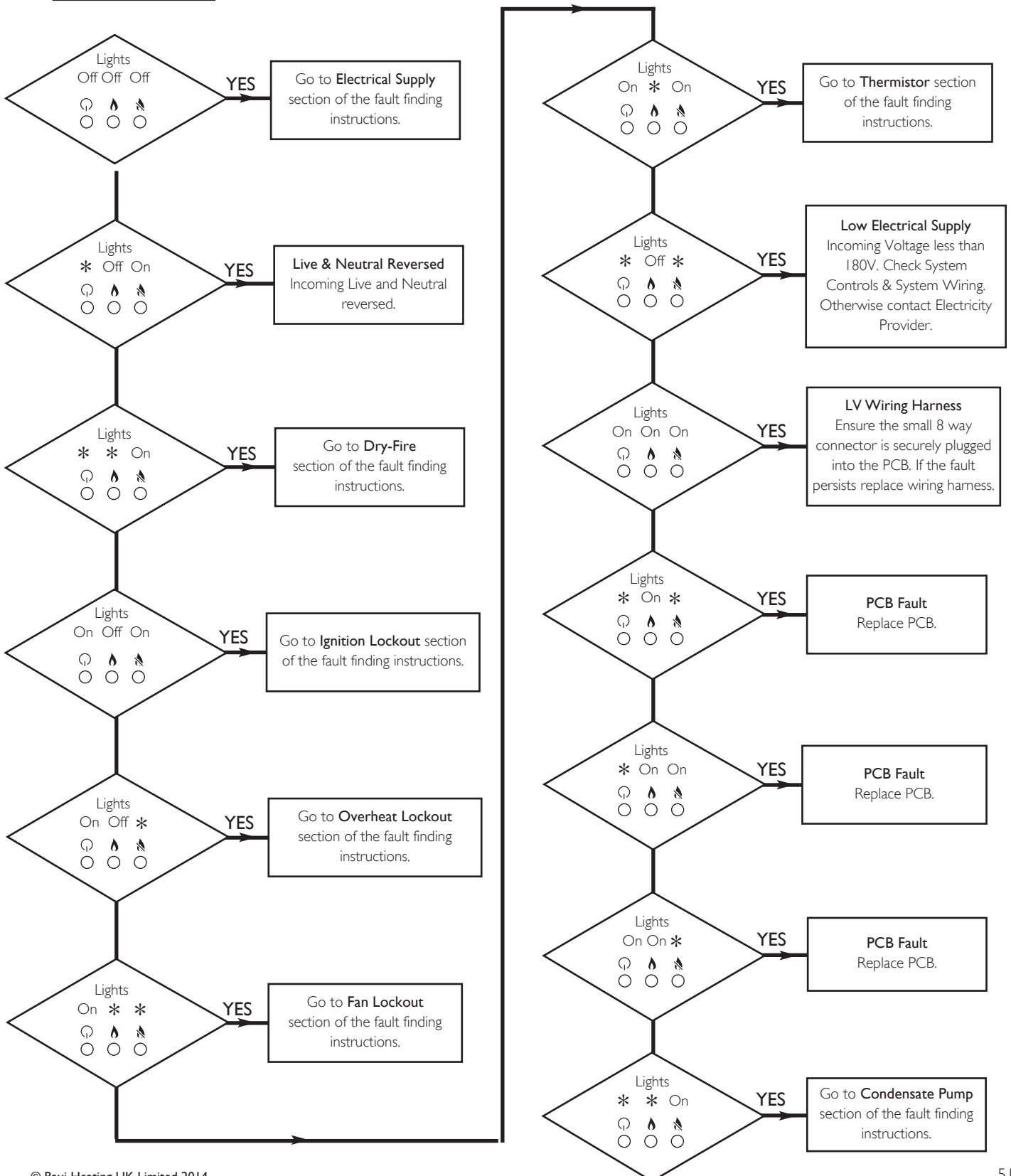


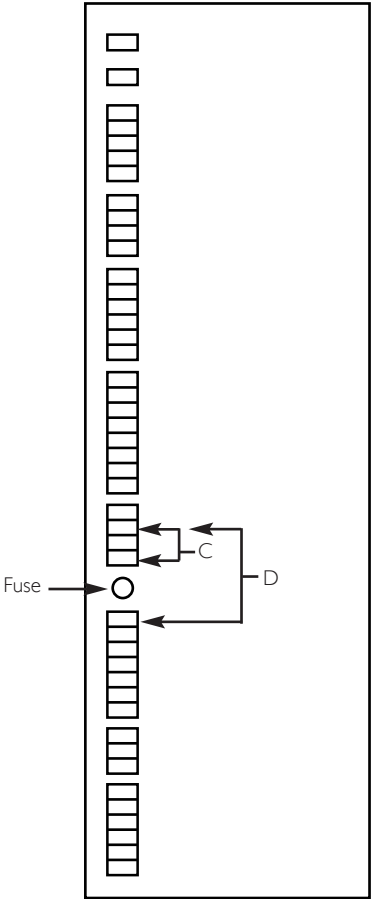
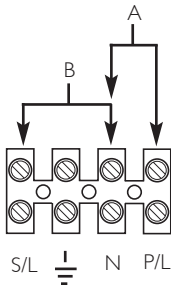
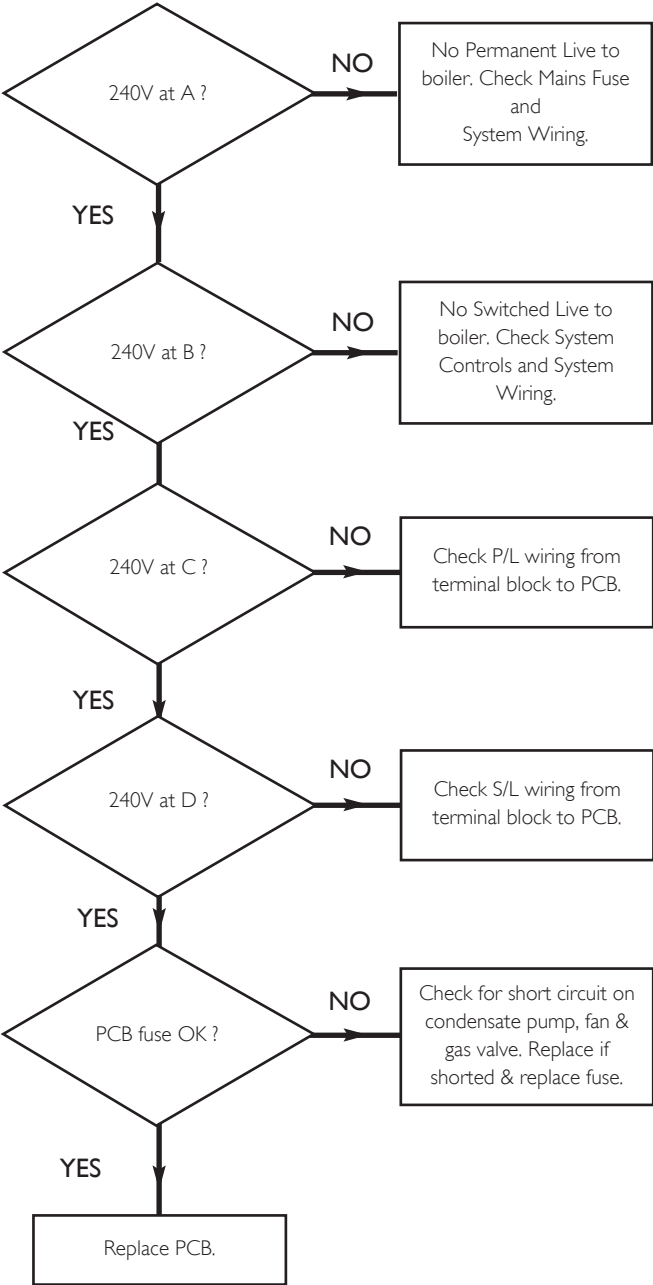
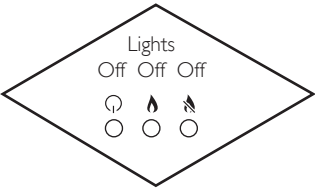
\* denotes LED flashing

NOTE: The fan is supplied with 325 Vdc.

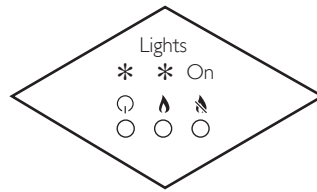
Fan Fault Finding should only be carried out after the boiler has been electrically isolated.

General Fault Finding should only be carried out by someone who is appropriately qualified.

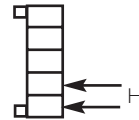
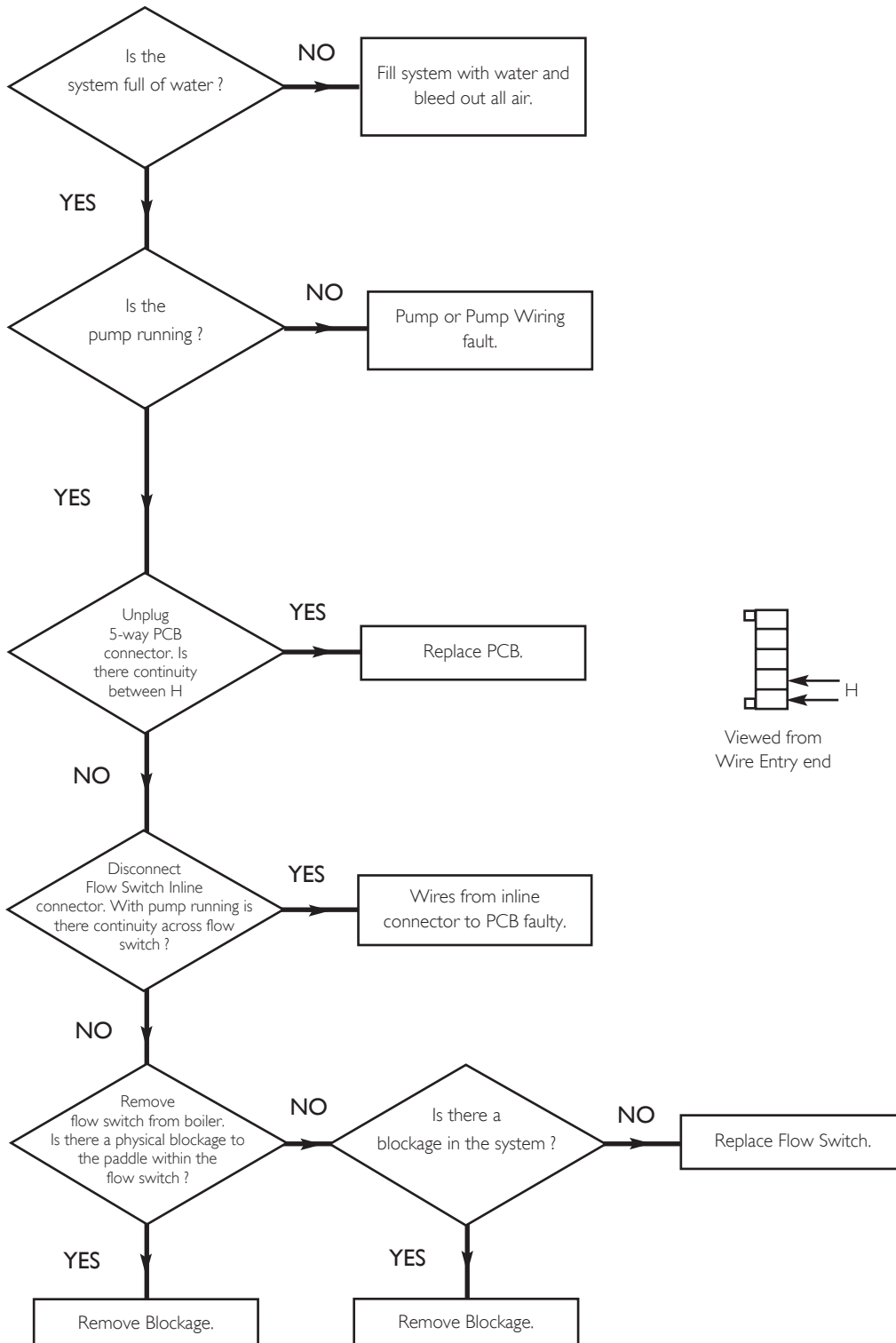




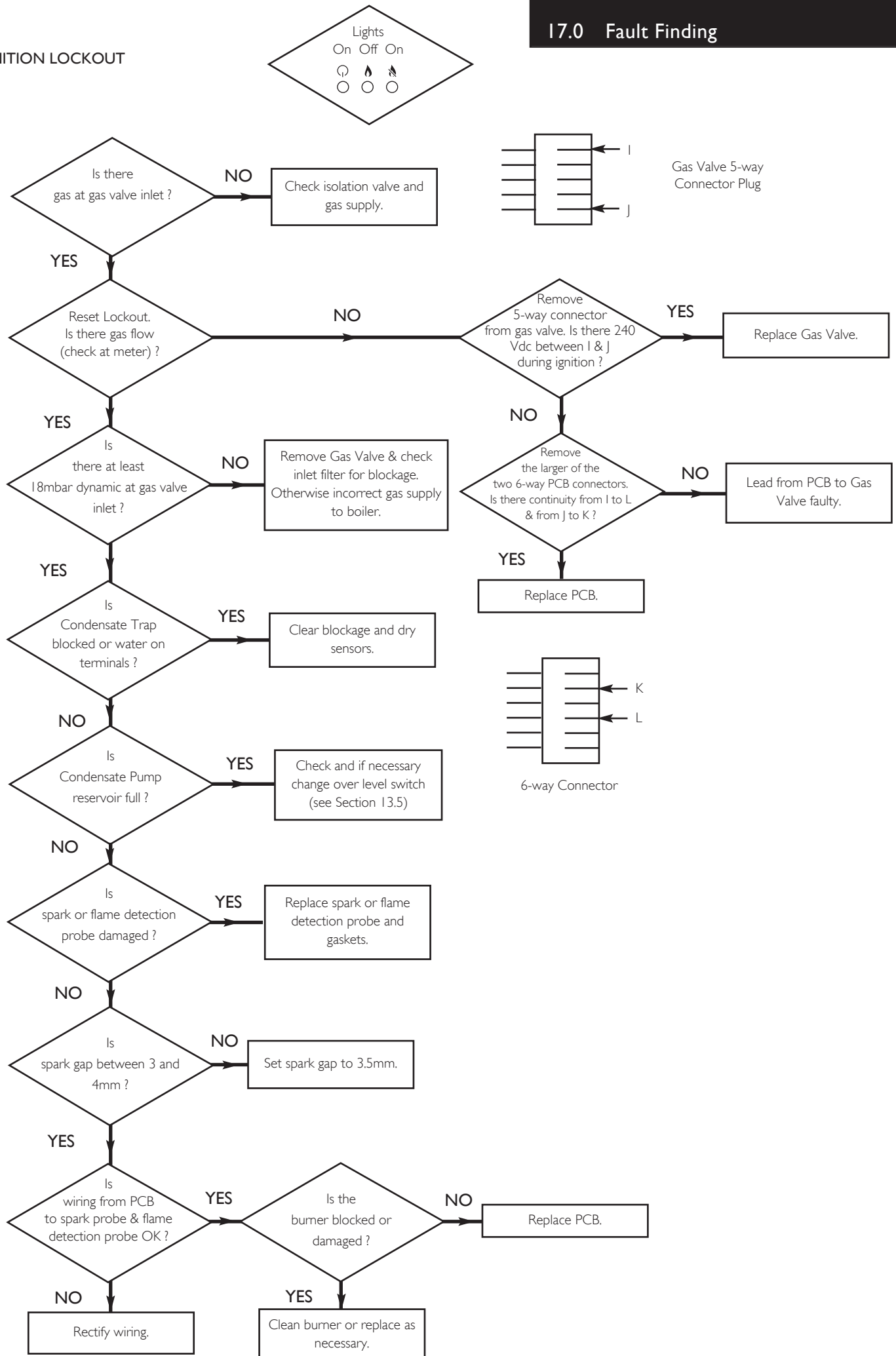
## DRY-FIRE



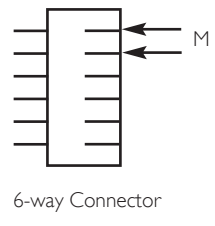
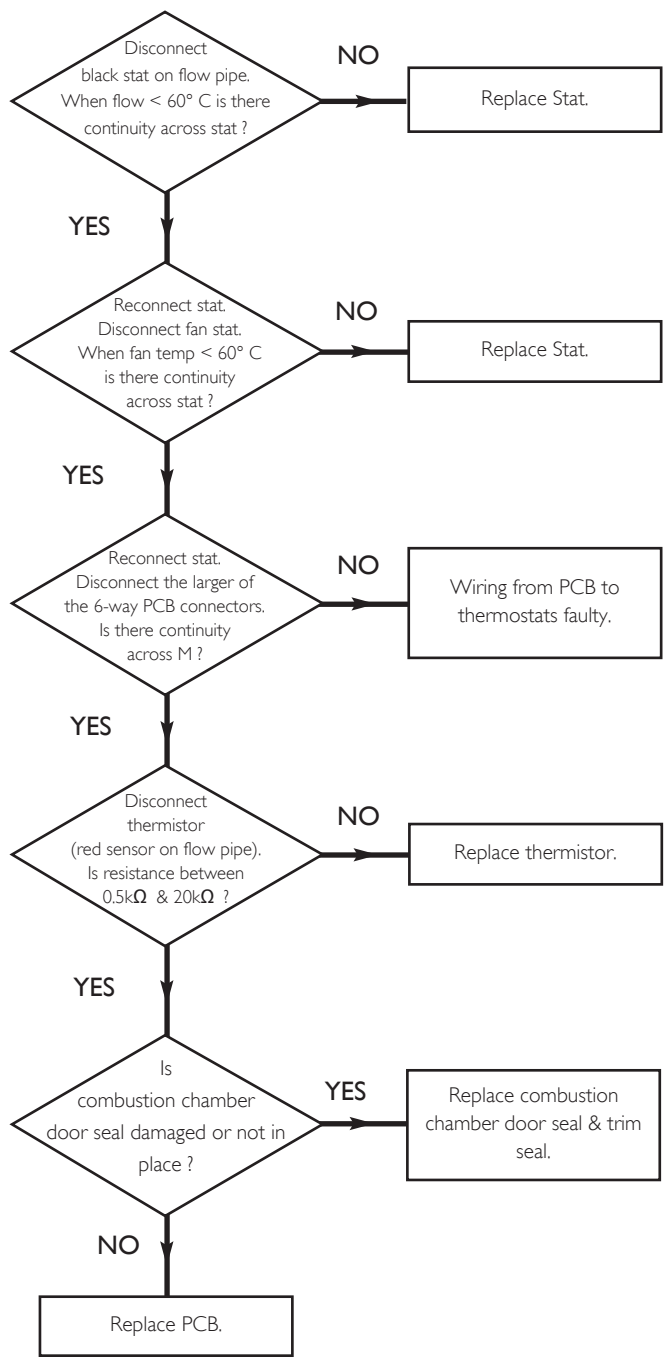
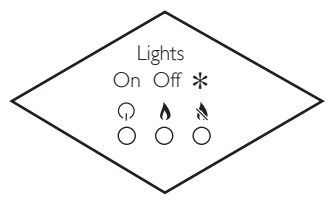
## 17.0 Fault Finding



Viewed from  
Wire Entry end

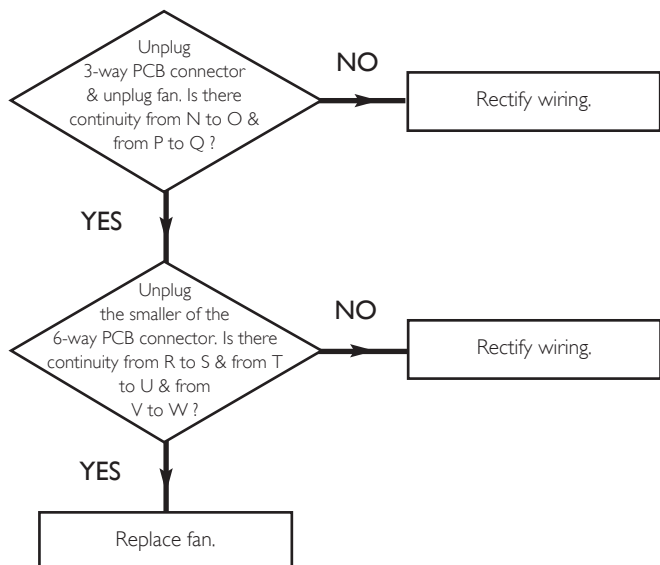
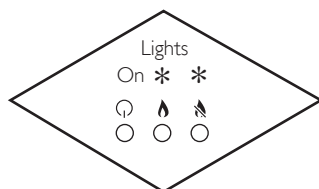


OVERHEAT LOCKOUT



6-way Connector

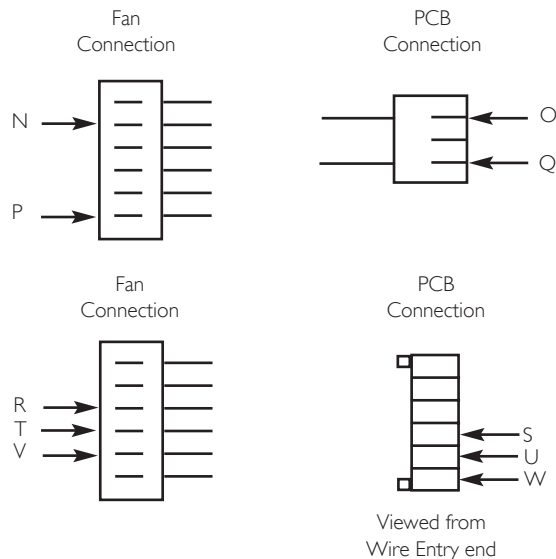
## FAN LOCKOUT



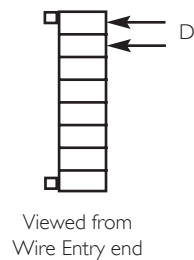
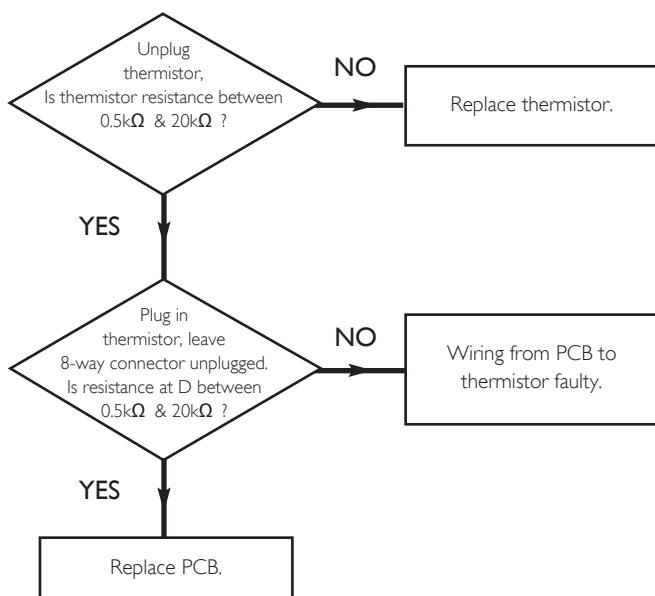
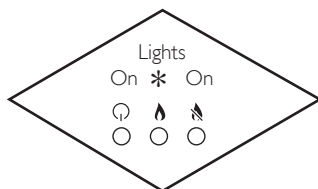
## 17.0 Fault Finding

NOTE: The fan is supplied with 325 Vdc.

Fan Fault Finding should only be carried out after the boiler has been electrically isolated.

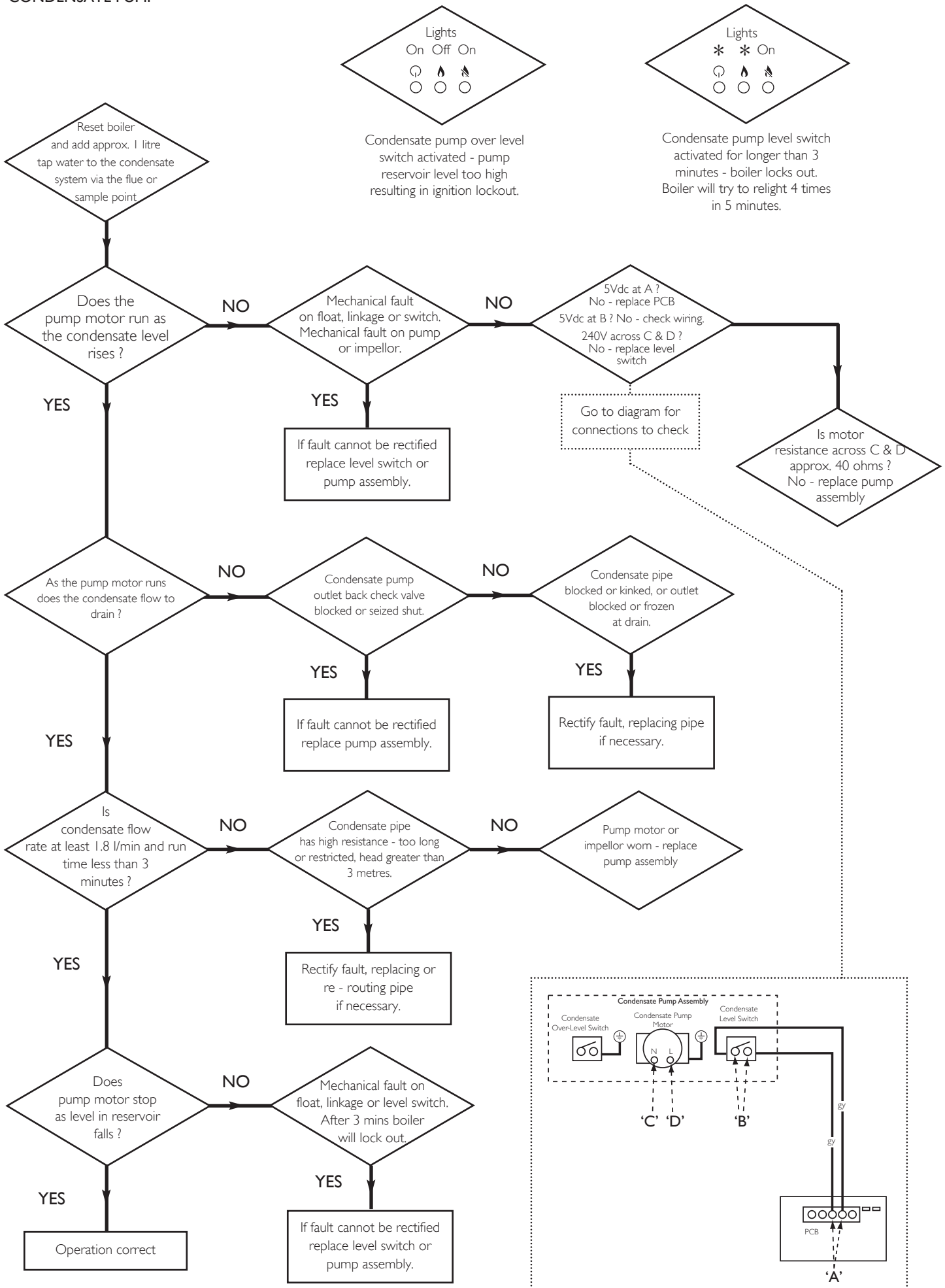


## THERMISTOR





## CONDENSATE PUMP



# GAS BOILER SYSTEM COMMISSIONING CHECKLIST

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

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

Customer name:										Telephone number:														
Address:																								
Boiler make and model:																								
Boiler serial number:																								
Commissioned by (PRINT NAME):										Gas Safe register number:														
Company name:										Telephone number:														
Company address:																								
										Commissioning date:														
<b>To be completed by the customer on receipt of a Building Regulations Compliance Certificate*</b>																								
Building Regulations Notification Number (if applicable):																								
<b>CONTROLS</b> (tick the appropriate boxes)																								
Time and temperature control to heating										Room thermostat and programmer/timer					Programmable room thermostat									
										Load/weather compensation					Optimum start control									
Time and temperature control to hot water										Cylinder thermostat and programmer/timer					Combination Boiler									
Heating zone valves										Fitted					Not required									
Hot water zone valves										Fitted					Not required									
Thermostatic radiator valves										Fitted					Not required									
Automatic bypass to system										Fitted					Not required									
Boiler interlock															Provided									
<b>ALL SYSTEMS</b>																								
The system has been flushed and cleaned in accordance with BS7593 and boiler manufacturer's instructions																		Yes						
What system cleaner was used?																								
What inhibitor was used?																		Quantity		litres				
Has a primary water system filter been installed?																		Yes		No				
<b>CENTRAL HEATING MODE</b> measure and record:																								
Gas rate										m³/hr					OR					ft³/hr				
Burner operating pressure (if applicable)										mbar					OR Gas inlet pressure					mbar				
Central heating flow temperature																				°C				
Central heating return temperature																				°C				
<b>COMBINATION BOILERS ONLY</b>																								
Is the installation in a hard water area (above 200ppm)?																		Yes		No				
If yes, and if required by the manufacturer, has a water scale reducer been fitted?																		Yes		No				
What type of scale reducer has been fitted?																								
<b>DOMESTIC HOT WATER MODE</b> Measure and Record:																								
Gas rate										m³/hr					OR					ft³/hr				
Burner operating pressure (at maximum rate)										mbar					OR Gas inlet pressure at maximum rate					mbar				
Cold water inlet temperature																				°C				
Hot water has been checked at all outlets																		Yes		Temperature		°C		
Water flow rate																				l/min				
<b>CONDENSING BOILERS ONLY</b>																								
The condensate drain has been installed in accordance with the manufacturer's instructions and/or BS5546/BS6798																		Yes						
<b>ALL INSTALLATIONS</b>																								
Record the following:										At max. rate:					CO					ppm				
										AND					CO/CO₂					Ratio				
										At min. rate: (where possible)					CO					ppm				
										AND					CO/CO₂					Ratio				
The heating and hot water system complies with the appropriate Building Regulations																		Yes						
The boiler and associated products have been installed and commissioned in accordance with the manufacturer's instructions																		Yes						
The operation of the boiler and system controls have been demonstrated to and understood by the customer																		Yes						
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer																		Yes						
Commissioning Engineer's Signature																								
Customer's Signature																								
(To confirm satisfactory demonstration and receipt of manufacturer's literature)																								

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



## SERVICE RECORD

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

### Service Provider

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

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

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

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

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

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

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

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

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

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

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

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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.

## **POTTERTON**

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