BAXI

Installation & Servicing Instructions

Baxi 100/2 HE Plus

Wall Mounted Powered Flue Condensing Boiler
Gas Fired Central Heating Unit

Please leave these instructions with the user

Natural Gas

Baxi 100/2 HE Plus
G.C.N° 41 075 34

Baxi is one of the leading manufacturers of domestic heating products in the UK.

Our first priority is to give a high quality service to our customers. Quality is designed into every Baxi product - products which fulfil the demands and needs of customers, offering choice, efficiency and reliability.

To keep ahead of changing trends, we have made a commitment to develop new ideas using the latest technology - with the aim of continuing to make the products that customers want to buy.

Everyone who works at Baxi has a commitment to quality because we know that satisfied customers mean continued success.

We hope you get a satisfactory service from Baxi. If not, please let us know.

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.

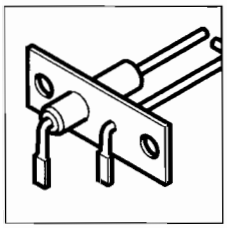
CE

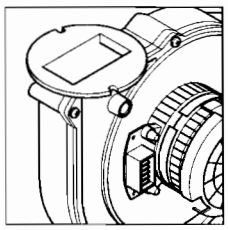
ENERGY EFFICIENCY RECOMMENDED

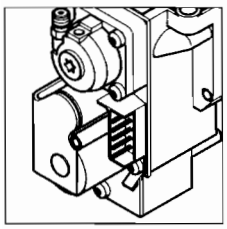
benchmark

Baxi is a BS-EN ISO 9001 Accredited Company

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







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0.0 Legislation

IMPORTANT - Installation, Commissioning, Service & Repair

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

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

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

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

Lifting - This product should be lifted and handled by two people. For recommended hand holds see section 8.3. Stooping should be avoided and protective equipment worn where necessary. Carrying & lifting equipment should be used as required, e.g. when installing in a loft space.

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

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

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

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

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

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

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

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

All systems must be thoroughly flushed and treated with inhibitor (see section 6.2).

"Benchmark"
Installation, Commissioning and Service Record Log Book

Please ensure that your installer has completed the Installation and Commissioning sections of the Log Book and hands the Log Book over. The details of the Log Book will be required in the event of any warranty work. Keep the Log Book in a safe place and ensure that the relevant sections are completed at each subsequent regular service visit.

All CORGI registered installers carry a CORGI identification card and have a registration number. Both should be recorded in your boiler Log Book. You can check your installer is registered by telephoning +44 (0)1256 372300 or writing to:-

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

Codes of Practice, most recent version should be used

In GB the following Codes of Practice apply:

Standard	Scope
BS 6891	Gas Installation.
BS 5546	Installation of hot water supplies for domestic purposes.
BS 5449	Forced circulation hot water systems.
BS 6798	Installation of gas fired hot water boilers.
BS 5440 Part 1	Flues.
BS 5440 Part 2	Ventilation.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.

In IE the following Codes of Practice apply:

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

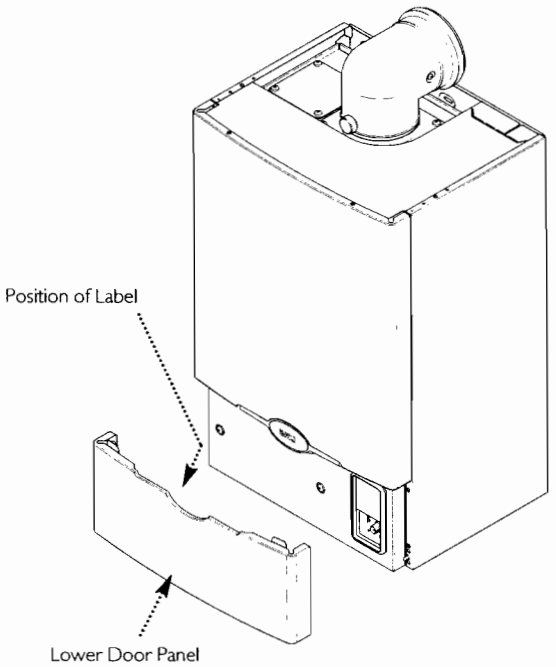


Fig. 1

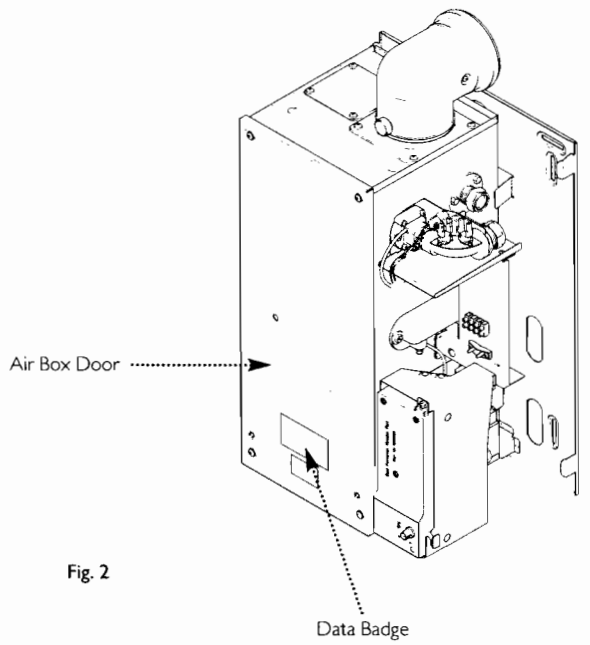


Fig. 2

1.0 Introduction

1.1 Description

1. The Baxi 100/2 HE Plus is a gas fired room sealed fan assisted condensing central heating boiler.

2. The maximum output of the boiler is preset at 75,000 Btu/hr. The boiler will automatically adjust down to 30,000 Btu/hr according to the system load. If required, the output can be set to 100,000 Btu/hr. Please refer to section 8.8.

3. It is designed for use on Natural Gas (G20).

4. The boiler is suitable for fully pumped open vented central heating and domestic hot water systems and sealed systems.

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

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

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

2.0 General Layout

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

1. Wall Plate
2. Flue Elbow
3. Heat Exchanger
4. Burner
5. Air Box
6. Fan Protection Thermostat
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)

2.2 Optional Extras

KIT	PART N°
FLUE EXTENSION KITS (110/70)	
Flue Extension 0.25M	241692
Flue Extension 0.5M	241694
Flue Extension 1M (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 - 90° (Reduce overall length of flue by 1m when fitting each bend)	241687
Horizontal Extended Flue (1.75M)	5111457
VERTICAL FLUE (110/70)	
Vertical Flue Terminal	242802
Vertical Flue Adaptor	5106888

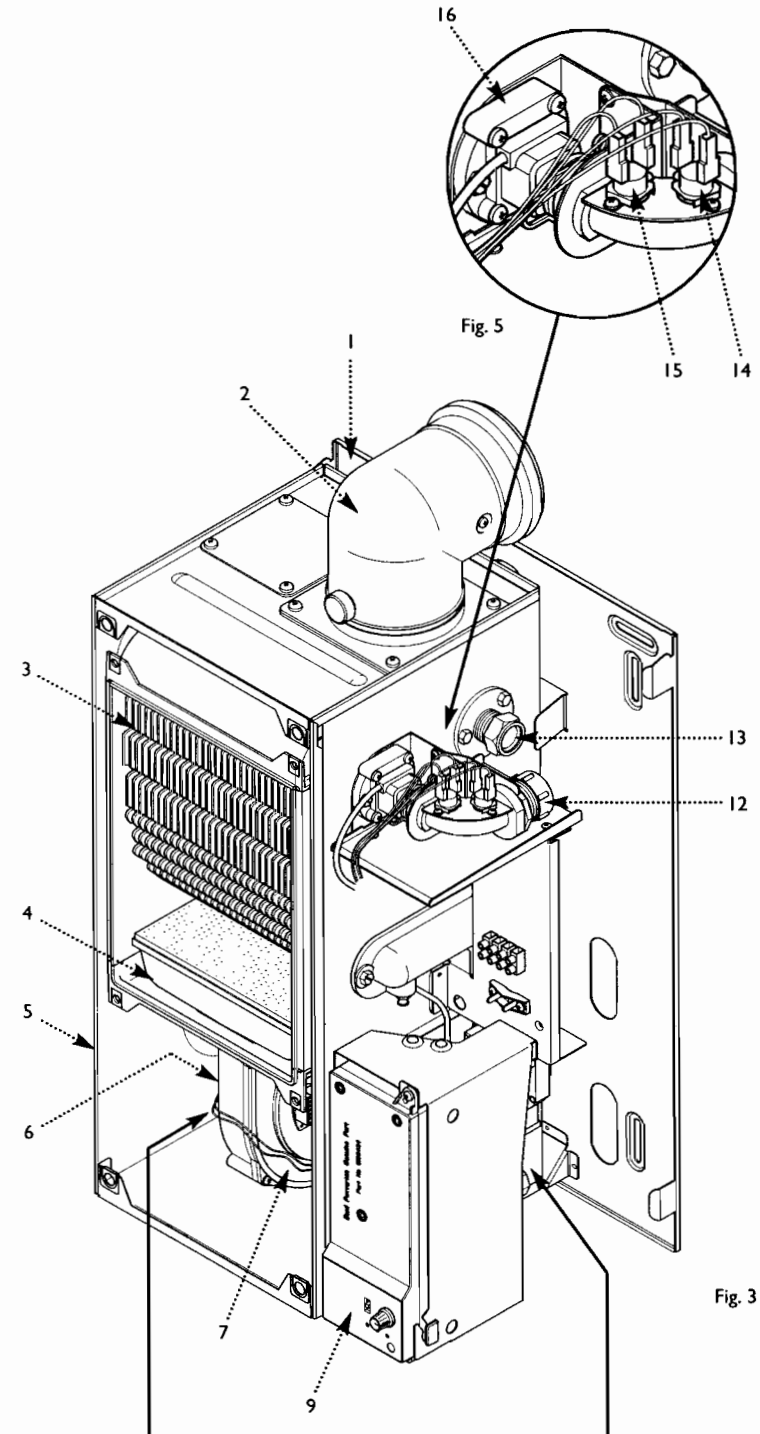


Fig. 5

Fig. 3

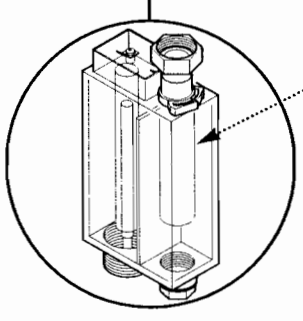


Fig. 4

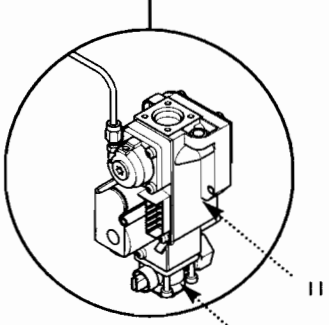
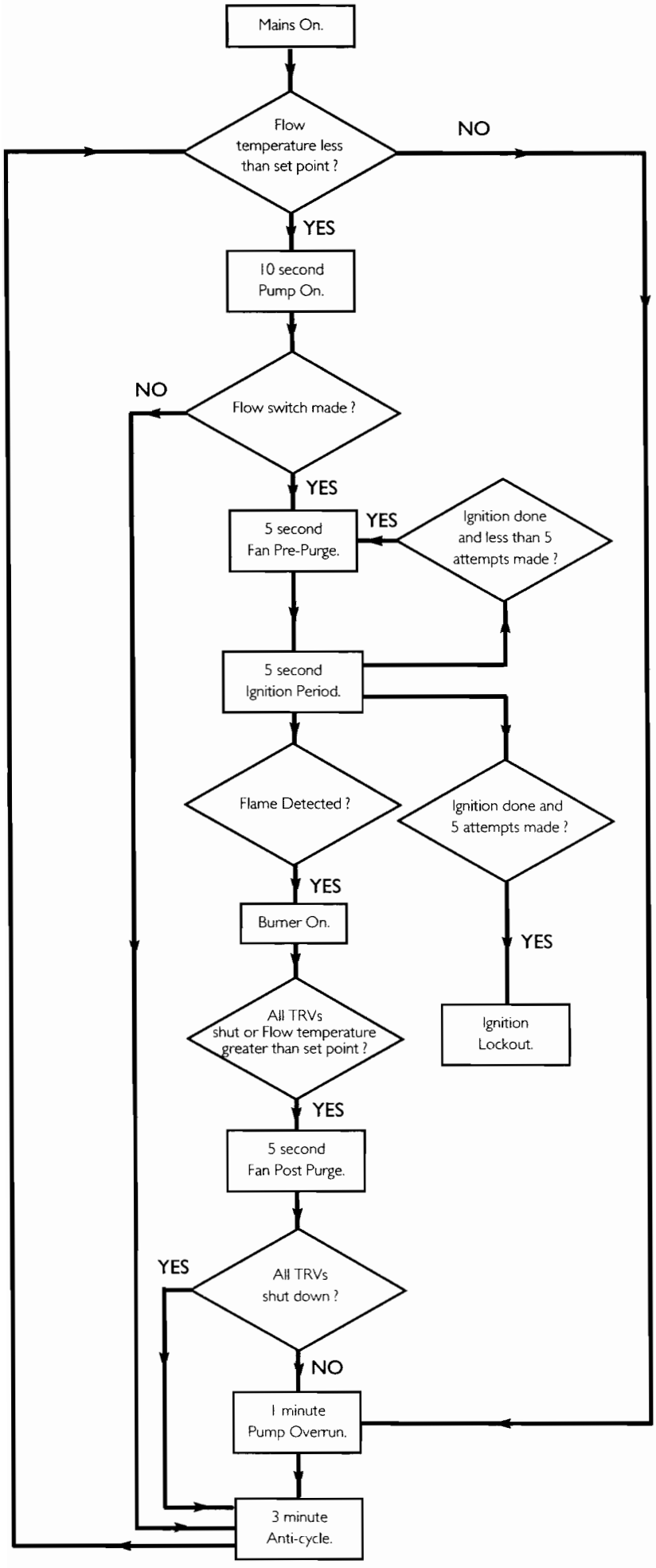


Fig. 6



3.0 Appliance Operation

3.1

1. **Switched Live On:** When the switched live switches on if the flow temperature is less than the set point then pump overrun occurs. When the switched live switches on if the flow temperature is greater than the set point then pump overrun occurs.

2. **Pump On:** The pump is on while the fan, spark generator and gas valve are off. After 10 seconds if the flow switch has made then fan pre-purge occurs. After 10 seconds if the flow switch has not made then anti-cycle occurs.

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

4. **Ignition:** The pump, fan, spark generator and gas valve are on. If a flame is detected then burner on occurs. If a flame is not detected within 5 seconds and less than 5 ignition attempts have been made then fan purge occurs. If a flame is not detected within 5 seconds and 5 ignition attempts have been made then ignition lockout occurs.

5. **Burner On:** The pump, 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 pump and fan are on while the spark generator and gas valve are off. After 5 seconds if the TRVs are not shut down then pump overrun occurs. After 5 seconds if the TRVs are shut down then anti-cycle occurs.

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

8. **Anti-cycle:** The pump, fan, spark generator and gas valve are off. After 3 minutes if the flow temperature is less than the set point then pump on occurs. After 3 minutes if the flow temperature is greater than the set point then pump overrun occurs.

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

4.0 Technical Data

Appliance Type		C_{13}	C_{33}
Appliance Category		CAT I_{2H}	
Heat Input (Gross)		Max	Min
(see note)	kW	33.76	10.3
	Btu/h	115,200	35,140

Heat Output
(Non Condensing 70° C Mean Water Temp)

	Max	Min
kW	30.18	9.2
Btu/h	102,980	31,390

Heat Output
(Condensing 40° C Mean Water Temp)

	Max	Min
kW	32.61	10
Btu/h	113,280	34,120

Max Gas Rate	(Natural Gas) (After 10 Mins)	
Btu/hr	102,980	75,000
m^3/h	2.95	2.31
ft^3/h	104.2	81.6

Inlet Pressure at Gas Valve (Natural Gas)
Min 18.1 mbar
Max 22.5 mbar
(see Section 10.1)

Injector (Natural Gas)
6.5mm Diameter

CO/CO^2 Ratio 0.001

Nox Class	5	
Horizontal Flue Terminal Dimensions	Diameter	110mm
	Projection	150mm

Connections

Gas Supply	-	½in BSPT
Central Heating Flow	-	28mm
Central Heating Return	-	28mm
Condensate Drain	-	1 in BSP

Outercase Dimensions

Overall Height Inc Flue Elbow	-	750mm
Casing Height	-	600mm
Casing Width	-	390mm
Casing Depth	-	320mm

Clearances
(For unventilated compartments see Section 7.5)

Both Sides	5mm Min
Above Casing	200mm Min
Below Casing	50mm Min
Front (For Servicing)	500mm Min
Front (In Operation)	5mm Min

Weights	kg
Packaged Boiler Carton	36.2
Packaged Flue Kit	3.6
Installation Lift Weight	26.0

Recommended System Temperature Drop

Condensing	20°C	36°F

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

Power Consumption 80W

External Fuse Rating 3A

Internal Fuse Rating (BS 4265)
Fuse 3.15 AT (PCB)

Electrical Protection IPX2

Water Content
litres 2.6
pints 4.6

Static Head
max 30 metres (100 ft)
min 1 metre (3.25 ft)

Low Head 0.2m (8 in) min

System Detail
fully pumped open vented & sealed systems

Gas Connection
G½" B.S.P. Thread

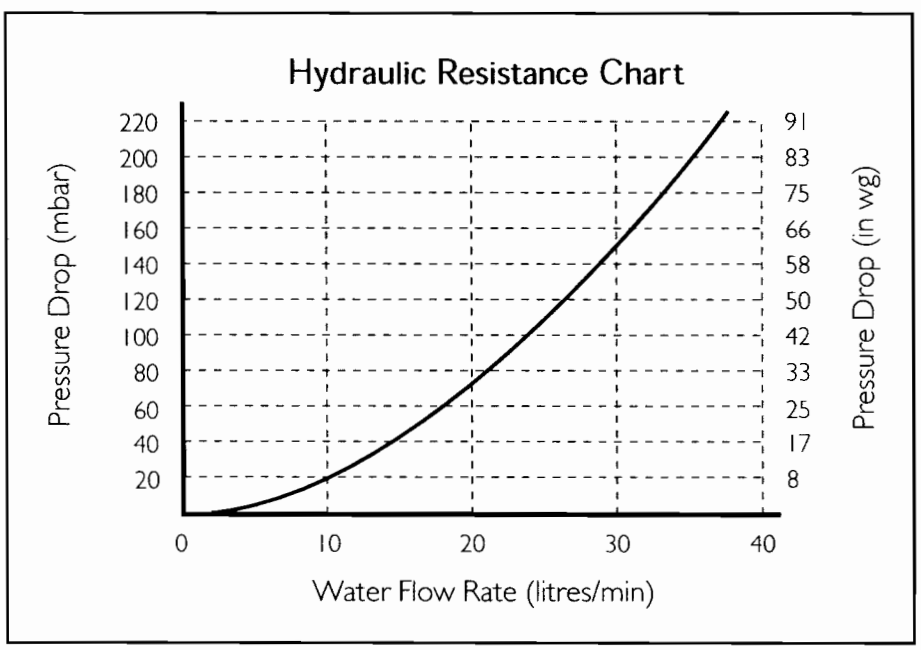
Controls
boiler thermostat, safety thermostat, flow switch, electronic flame sensing, temperature protection thermostat & condensate blockage sensor

NOTE: The maximum output of the boiler is factory set at 22.0kW (75,000 Btu/hr). This can be altered to 30.18kW (102,980 Btu/hr) - see section 8.8.

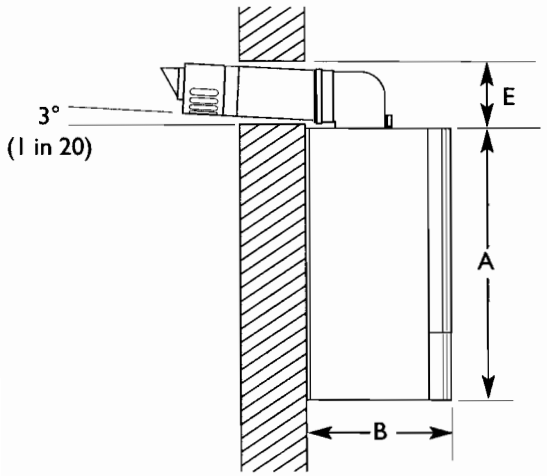
SEDBUK Declaration For 100/2 HE Plus

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



5.0 Dimensions and Fixings



DIMENSIONS	
A	600mm
B	320mm
C	390mm
D	125mm Ø Min.
E	150mm
F	125mm

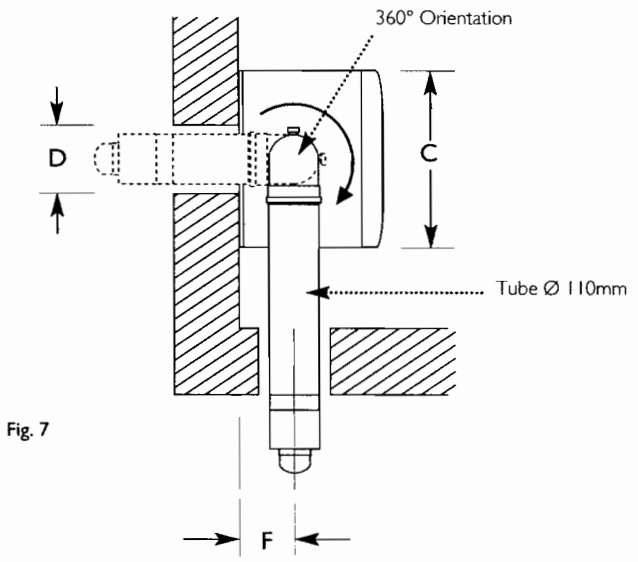


Fig. 7

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

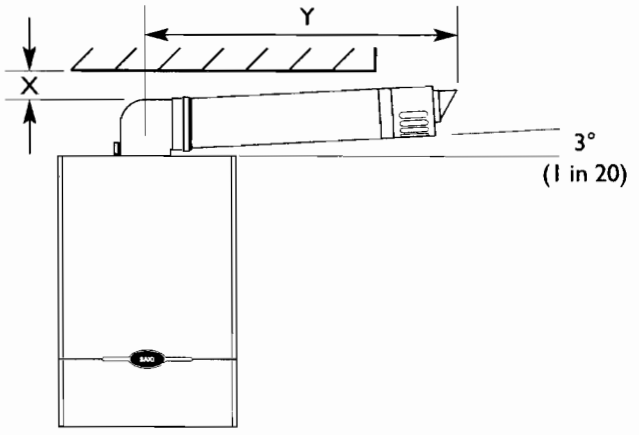


Fig. 8

SIDE FLUE (left and right)

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

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

6.0 System Details

6.1 Water Circulating Systems

1. The appliance 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 (100ft) 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.
- It is recommended that the return pipe is fitted with an automatic air vent as close to the boiler as is practical.

6.2 Treatment of Water Circulating Systems

- All recirculatory water systems will be subject to corrosion unless an appropriate water treatment is applied. This means that the efficiency of the system will deteriorate as corrosion sludge accumulates within the system, risking damage to pump and valves, boiler noise and circulation problems.
- When upgrading existing systems that exhibit evidence of sludging, it is advisable to clean the system prior to treatment in order to remove any sludge and reduce the likelihood of these deposits damaging new components.
- When fitting new systems flux will be evident within the system, which can lead to damage of system components.
- All systems must be thoroughly drained and flushed out. The recommended flushing and cleansing agents are Betz-Dearborn Sentinel X300 or X400 and Fernox Superfloc Universal Cleanser which should be used following the flushing agent manufacturer's instructions.
- System additives - corrosion inhibitors and flushing agents/descalers should be suitable for aluminium and comply to BS7593 requirements. The only system additives recommended are Betz-Dearborn Sentinel X100 and Fernox-Copal which should be used following the inhibitor manufacturer's instructions.

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

- It is important to check the inhibitor concentration after installation, system modification and at every service in accordance with the manufacturer's instructions. (Test kits are available from inhibitor stockists.)
- For information or advice regarding any of the above contact the Baxi Helpline.

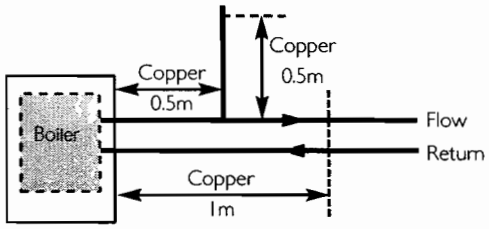


Fig. 9

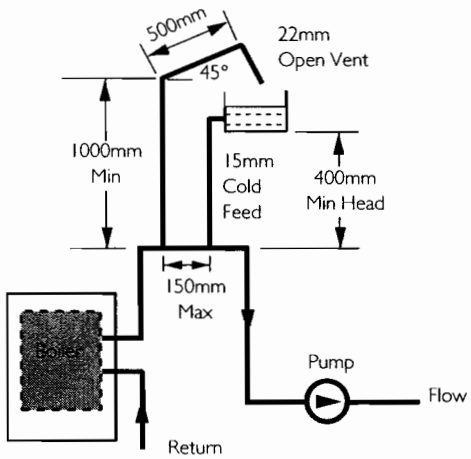


Fig. 10 **Typical Low Head Installation**

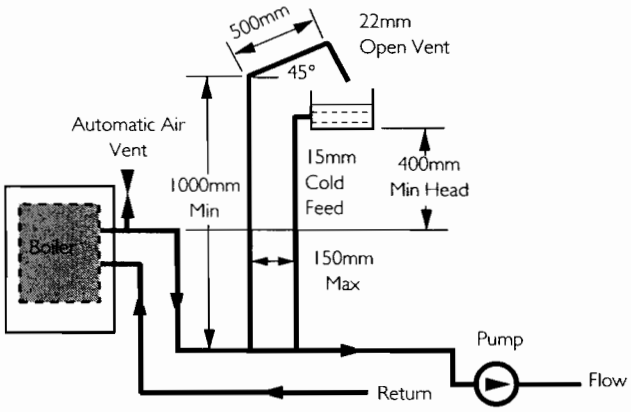


Fig. 11 **If Conditions Require, This System Possible**

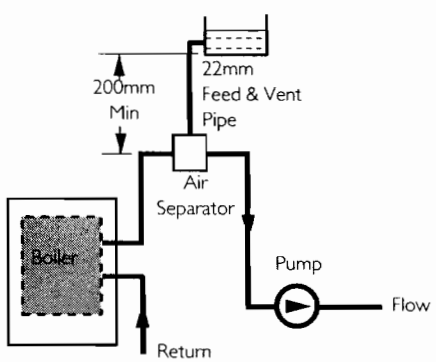


Fig. 12 **Alternative Low Head Installation**

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. The connection to the boiler is 28mm (compression).

2. Due to space requirements within the boiler outercase, pipework should comprise of solder fittings.

3. A 20 °C (36°F) 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 (20°F).

4. 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).

6.4 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:

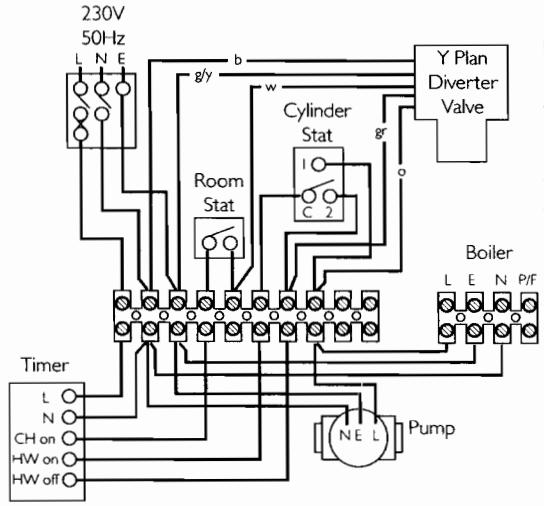
a) The pump being adjusted to give an 20°C drop across the boiler.
b) The pump must be fitted on the flow.
c) The pump must be fitted in accordance with the pump manufacturer's instructions.
d) The open vent pipe must be taken up from a tee in a honzontal section of the flow pipe.

An alternative Low Head Installation (Fig. 12)

2. For heads below 400mm then a combined vent and feed pipe may be connected. 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 Thermal Stores

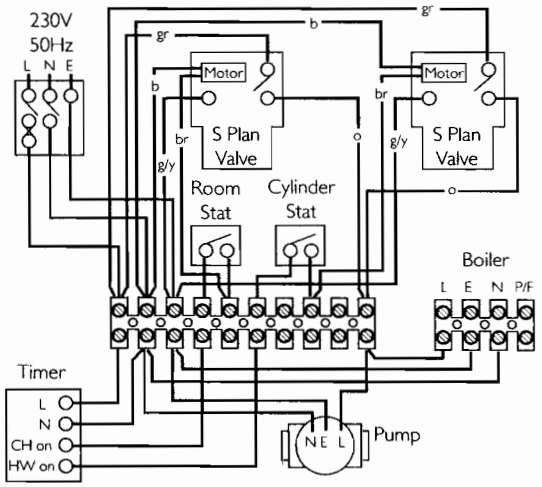
1. When the 100/2 HE Plus is fitted in conjunction with a thermal store, both jumpers must be removed from the PCB, see Fig. 32 Section 8.8.



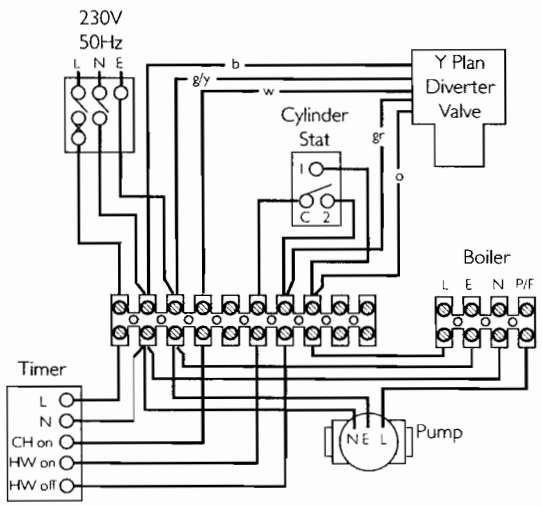
Key to colours

b - Blue
br - Brown
w - White
o - Orange
gr - Grey
g/y - Green/Yellow

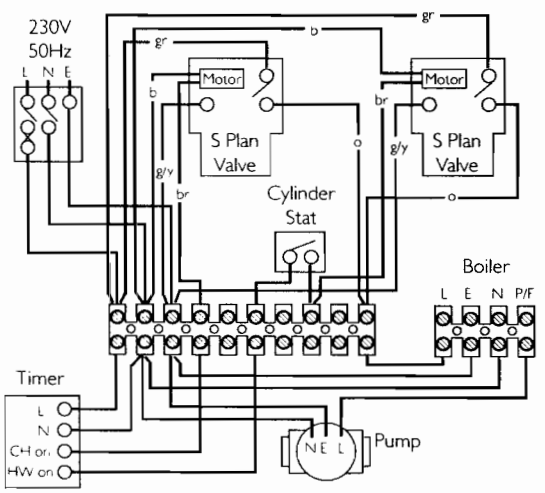
Y Plan, Room Thermostat System, CH Interlocked By Room Thermostat
At least the Radiator(s) near the Room Thermostat not TRV'd
Pump run from Switched Live
By-pass permitted but not required for Part L1 compliance



S Plan, Room Thermostat System, CH Interlocked By Room Thermostat
At least the Radiator(s) near the Room Thermostat not TRV'd
Pump run from Switched Live
By-pass permitted but not required for Part L1 compliance



Y Plan, Fully TRV'd System, CH Interlocked By Boiler Flow Switch
Room Thermostat should not be fitted
Pump must be run from Boiler P/F connection for Part L1 compliance
By-pass not permitted (must be valved off) for Part L1 compliance



S Plan, Fully TRV'd System, CH Interlocked By Boiler Flow Switch
Room Thermostat should not be fitted
Pump must be run from Boiler P/F connection for Part L1 compliance
By-pass not permitted (must be valved off) for Part L1 compliance

6.0 System Details

6.6 System Controls

This boiler does not require a bypass.
This boiler does not require a permanent live.
The pump only needs wiring directly to the boiler for fully TRV'd systems.

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 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 (or other device such as a flow switch - a flow switch is integral to this boiler) should also be provided to switch off the boiler when there is no demand for heating or hot water.

4. The interlock for the CH circuit can be provided by either a Room Thermostat or a fully TRV'd system with the pump wired back to the boiler without a bypass. Connection diagrams for both options for Y and S plan systems are shown.

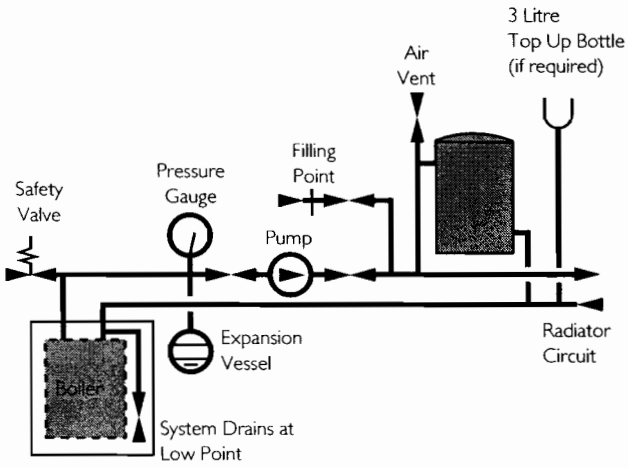


Fig. 13

Max Boiler Flow
Temp = 82° C

Method of determining minimum valve of expansion vessel volume for sealed systems using Baxi Boilers

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 x 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.

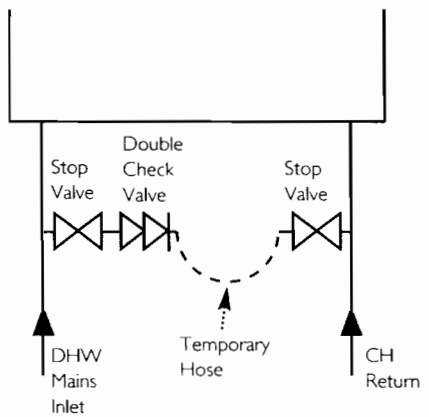


Fig. 14

6.0 System Details

6.7 Sealed Systems (Fig. 13)

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/in²). 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/in²) 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 (½ 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-pressunsation 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. 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.

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

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

3. If the boiler is fitted in a room containing a bath or shower, it can only be fitted in zone 3, (Figs. A & B shows zone dimensions for a bathtub. For other examples refer to Section 601 of the Current I.E.E. Wiring Regulations) reference must be made to the relevant requirements. In GB this is the current I.E.E. Wiring Regulations and Building Regulations.
In IE reference should be made to the current edition of I.S. 813 "Domestic Gas Installations" and the current ETCI rules.

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

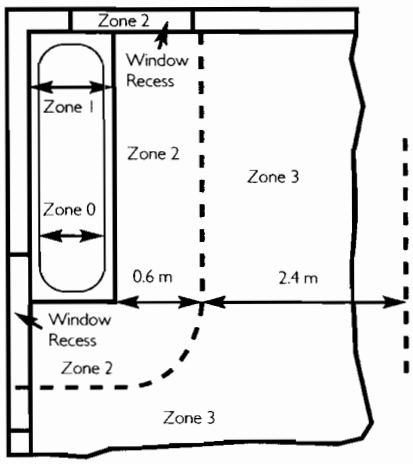


Fig. A In GB Only

7.2 Ventilation of Compartments

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.

Sides	15mm
Top	200mm
Bottom	50mm
Front	30mm

2. If the boiler is installed in a smaller cupboard or compartment it must be ventilated according to BS 5440 Part 2 and the minimum clearances given in section 4.0 "Technical Data" maintained.

3. 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 appliance is installed in a compartment or cupboard.

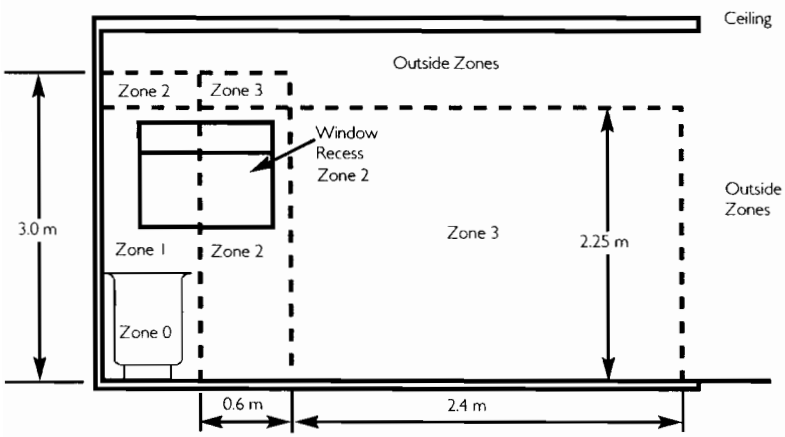


Fig. B In GB Only

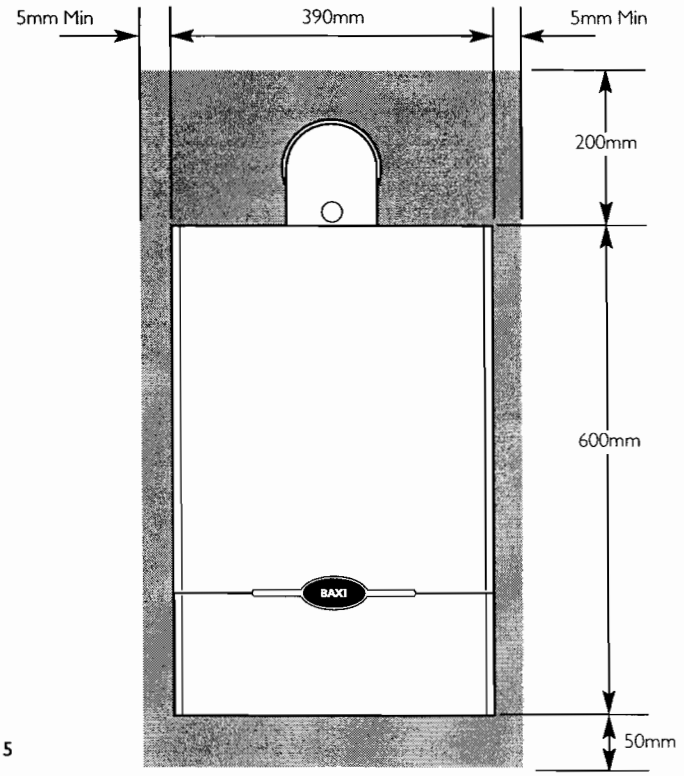


Fig. 15

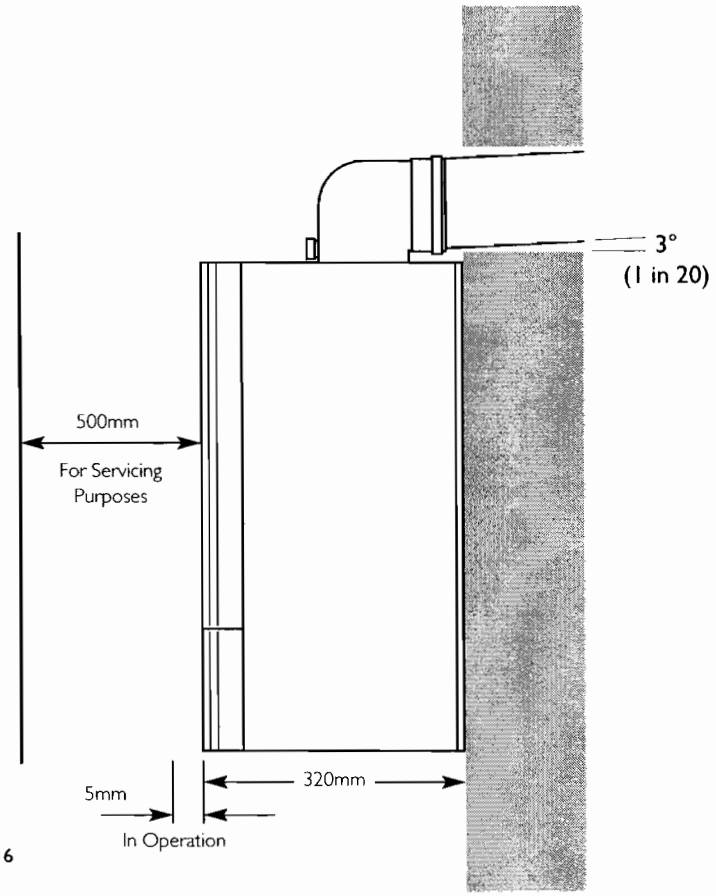


Fig. 16

7.0 Site Requirements

7.3 Clearances (Figs. 15 &16)

1. A flat vertical area is required for the installation of the boiler.

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

3. For unventilated compartments see Section 7.2.

7.4 Gas Supply

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

2. The connection to the appliance is a ¾in BSP Internal Threaded Connection located at the rear of the gas service cock (Fig. 6).

3. Ensure that the pipework from the meter to the appliance is of adequate size. (22mm pipework must be connected to the appliance gas service cock. This should extend for at least 3 meters back towards the gas meter). **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 ETCI rules.

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

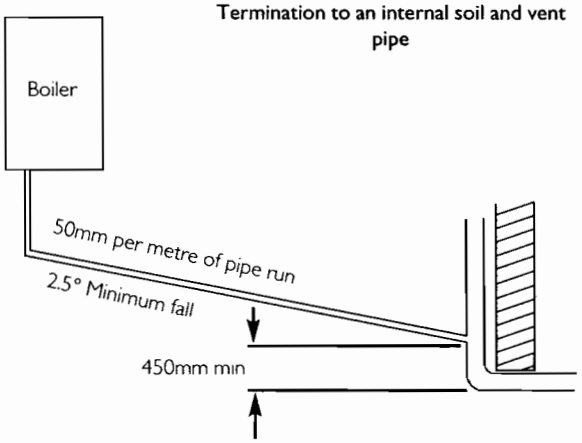
NOTE: "The method of connection to the electricity supply must facilitate complete electrical isolation of the appliance".

Note! There is no method of isolating the boiler, at the user interface.

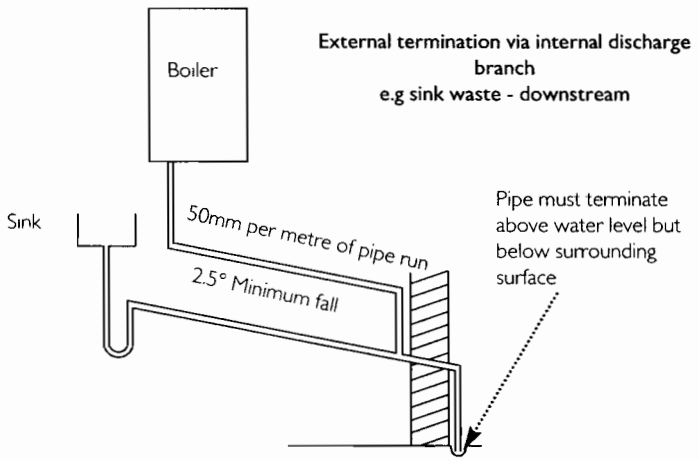
Connection may be via a fused double-pole isolator with a contact separation of at least 3mm in all poles and servicing the boiler and system controls only.

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

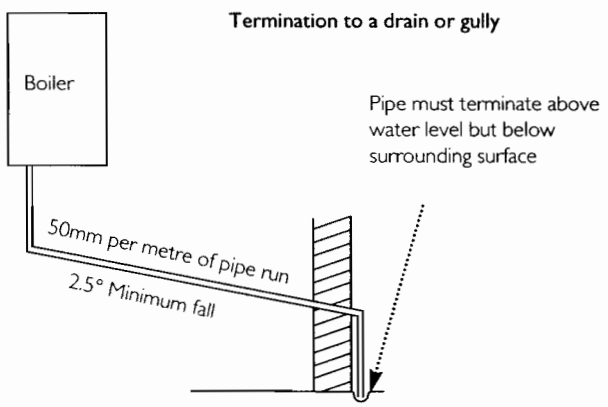
Termination to an internal soil and vent pipe



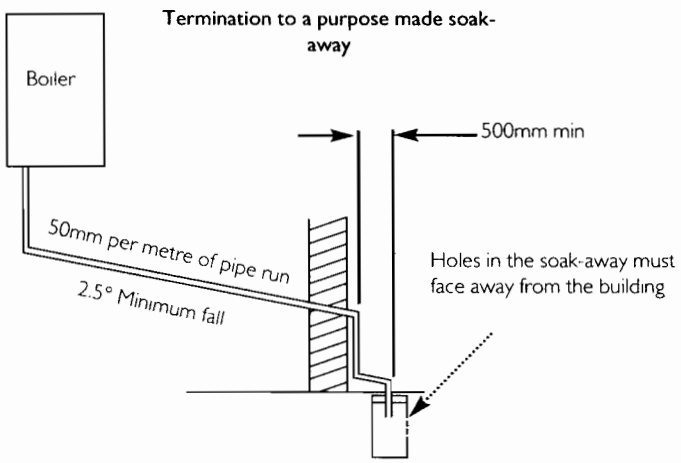
External termination via internal discharge branch
e.g sink waste - downstream



Termination to a drain or gully



Termination to a purpose made soak-away



7.0 Site Requirements

7.6 Condensate Drain

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

The condensate discharge pipe MUST NOT RISE at any point along its length. There MUST be a fall of AT LEAST 2.5° (50mm per metre) along the entire run.

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

1. The condensate outlet terminates in a 1" BSP nut and seal for the connection of 21.5mm (¾in) plastic overflow pipe which should generally discharge internally into the household drainage system. If this is not possible, discharge into an outside drain is acceptable.

2. Ensure the discharge of condensate complies with any national or local regulations in force.
BS 6798:2000 & Part H1 of the Building Regulations give further guidance.

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

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

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

6. Any pipe fitted externally must be kept as short as possible to minimise the potential of freezing.

7. Any condensate discharge pipework external to the building (or in an unheated part of it e.g. garage) must be insulated to protect against frost. It is also recommended that the pipe diameter is increased to 32mm.

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

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

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

Examples are shown of the following methods of termination.-
i) to an internal soil & vent pipe
ii) via an internal discharge branch (e.g. sink waste)
iii) to a drain or gully
iv) to a purpose made soakaway

7.7 Flue

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

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

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

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

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

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

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

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

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

9. If a terminal is less than 2 metres (78¾ in) above a balcony, above ground or above a flat roof to which people have access, then a suitable terminal guard must be provided.

	Terminal Position with Minimum Distance (Fig. 17)	(mm)
A[a]	Directly below an opening, air brick, opening windows, etc.	300
B[a]	Above an opening, air brick, opening window etc.	300
C[a]	Horizontally to an opening, air brick, opening window etc.	300
D	Below gutters, soil pipes or drain pipes.	25
E	Below eaves.	25
F	Below balconies or car port roof.	25
G	From a vertical drain pipe or soil pipe.	25
H	From an internal (i) or external (ii) corner.	(i) 25 (ii) 115
I	Above ground, roof or balcony level.	300
J	From a surface or boundary line facing a terminal.	600
K	From a terminal facing a terminal (Horizontal flue).	1200
	From a terminal facing a terminal (Vertical flue).	600
L	From an opening in carport (e.g. door, window) into the dwelling.	1200
M	Vertically from a terminal on the same wall.	1500
N	Horizontally from a terminal on the same wall.	300
R	From adjacent wall to flue (vertical only).	300
S	From an adjacent opening window (vertical only).	1000

Table. 2

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

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

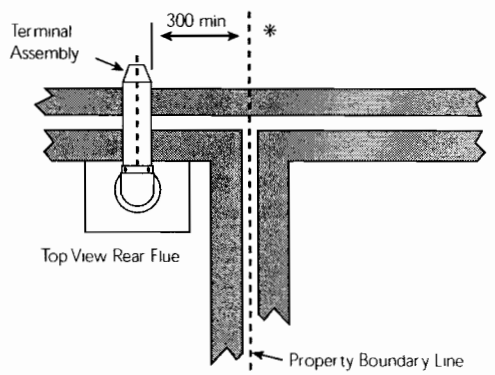


Fig. 16a

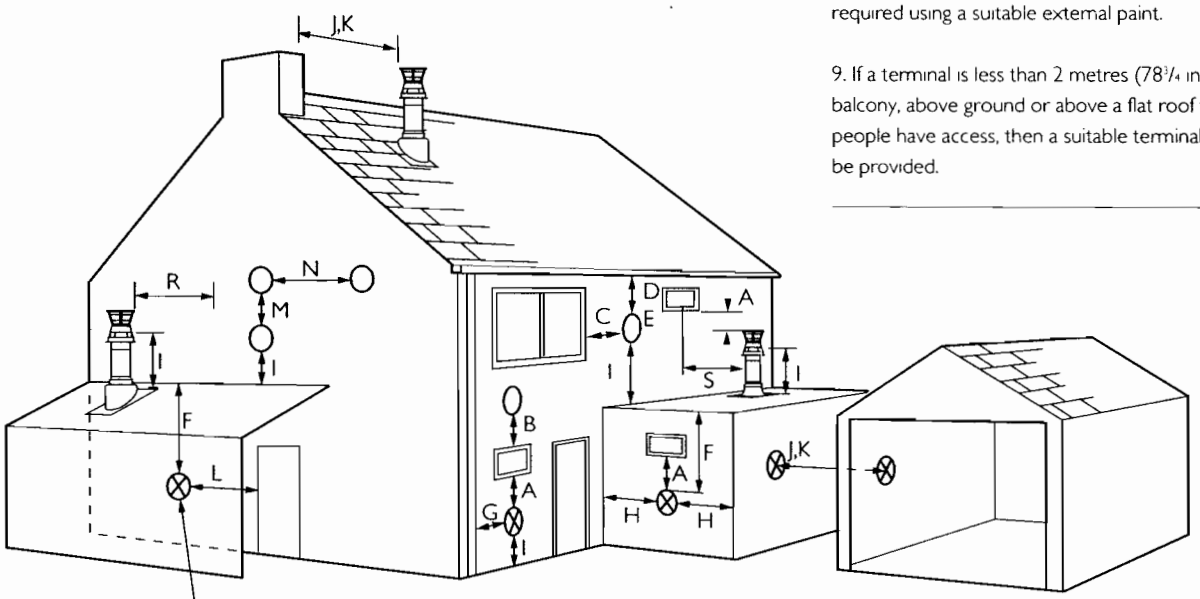


Fig. 17

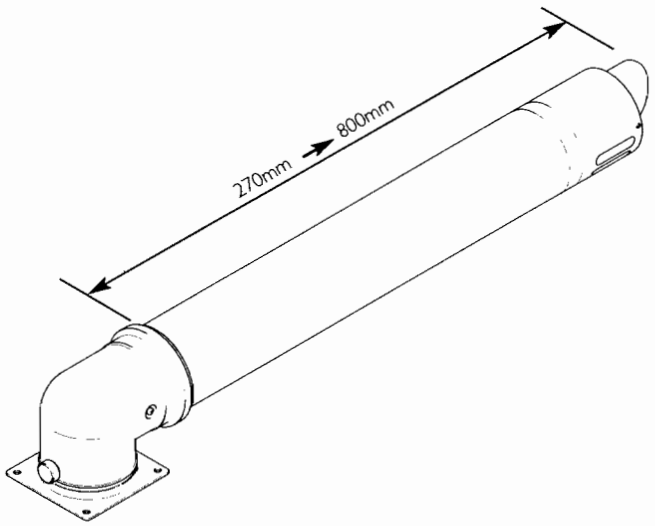


Fig. 18

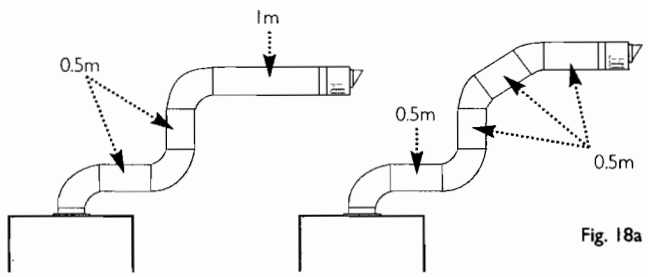


Fig. 18a

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

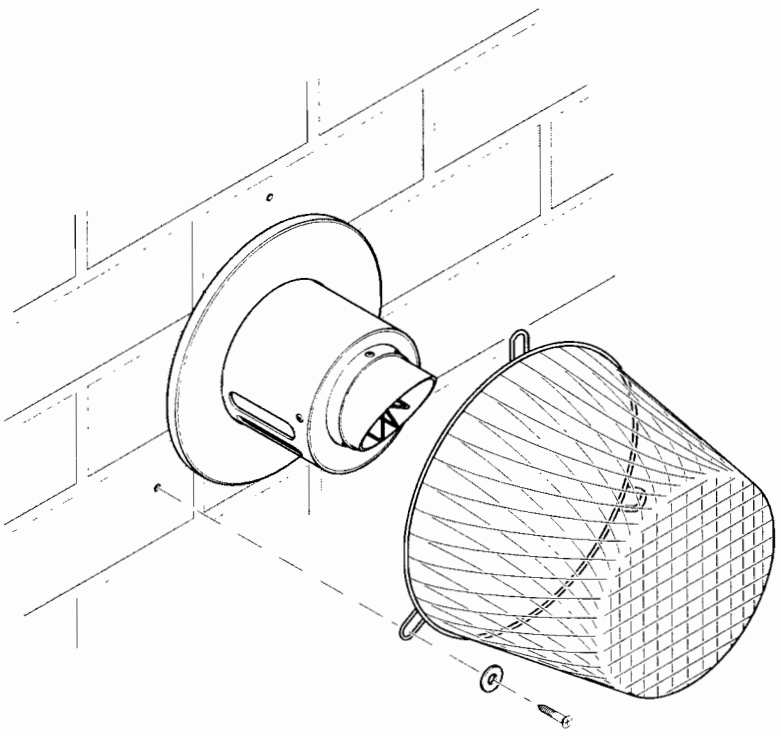


Fig. 19

7.0 Site Requirements

7.8 Flue Dimensions

See Section 2.2. The standard horizontal flue kit allows for flue lengths between 270mm (10⅝") and 800mm (32") from elbow to terminal (Fig. 18).

The maximum permissible equivalent flue length is: 4 metres (Fig. 18a).

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.

7.9 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.

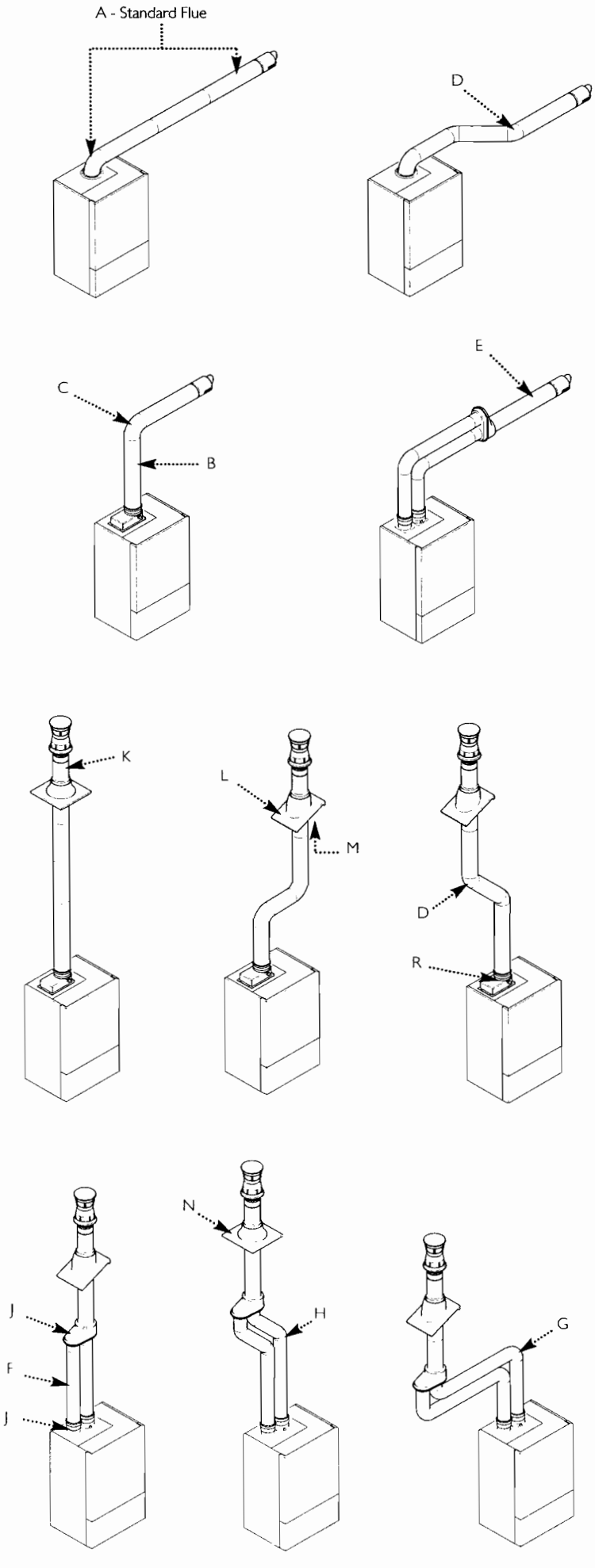
2. When ordering a terminal guard, quote the appliance model number.

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

7.10 Vertical Flue

1. Only a flue approved with the Baxi 100/2 HE Plus can be used.

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



7.0 Site Requirement

7.11 Flue options

Concentric

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

Twin Flue

The total maximum equivalent flue length is 150m.

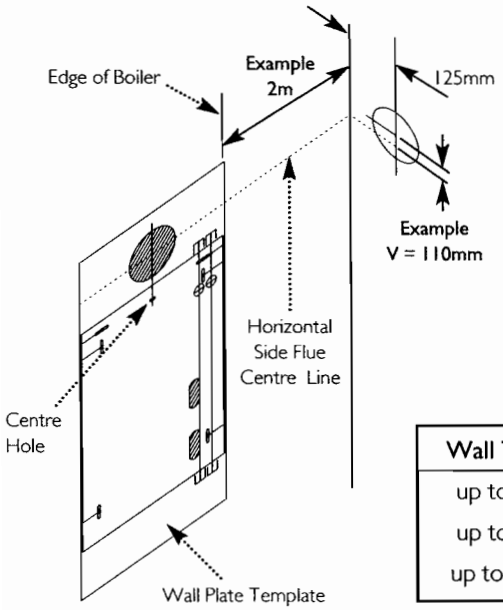
NOTE: Each 1m of flue duct should be calculated as 2m.

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

Concentric Pipes:	45° bend	0.5 m
	93° bend	1.0 m
Twin Flue Pipe:	45° bend (air duct)	1.3 m
	45° bend (flue duct)	2.6 m
	90° bend (air duct)	4.8 m
	90° bend (flue duct)	9.6 m

Detailed examples of equivalent flue length calculation are given in the Installation Guidance Notes for each flue system type.
(Documents 243501 and 243502 for concentric and twin pipe respectively).

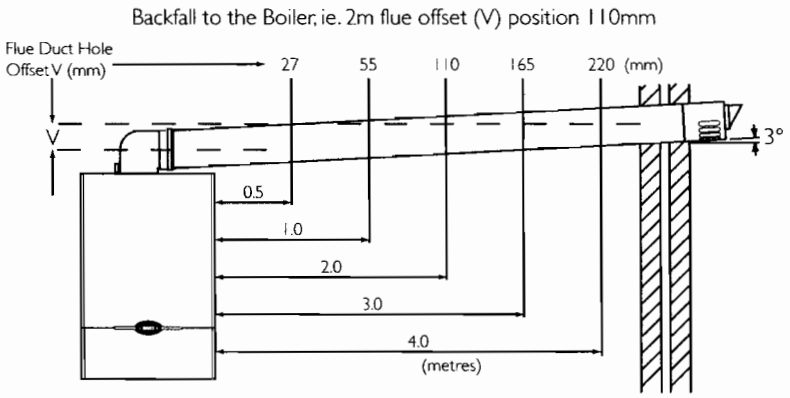
Key	Accessory	Size	Baxi Code Number
Concentric Flue System 110mm diameter			
A	Horizontal flue kit	850mm	236921
B	Straight extension kit	1000mm	241695
		500mm	241694
		250mm	241692
C	Bend kit	93°	241687
D	Bend kit (pair)	45°	241689
E	Horizontal flue terminal		243013BAX
	Clamp	110mm	243014BAX
Twin Flue System 80mm diameter			
F	Straight extension kit	1000mm	238690
		500mm	238692
		250mm	238694
G	Bend kit	90°	246139
H	Bend kit (pair)	45°	246138
Universal Vertical Flue Kits			
J	Twin flue adaptor kit		242757
K	Vertical flue terminal		242802
L	Universal roof tile	25°/50°	243015
M	Roof cover plate kit		243131
N	Flat roof flashing		243016BAX
R	Vertical flue adapter		5106888
	Clamp	80mm	238684



EXAMPLE: Boiler is 2 metres away from corner of wall, flue duct hole is 110mm up from horizontal side flue centre line. This will maintain the approx 3° backfall to the boiler.

Wall Thickness	Flue Hole ø
up to 227mm	125mm core drill
up to 750mm	150mm core drill
up to 1200mm	175mm core drill

Fig. 20



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

Fig. 21

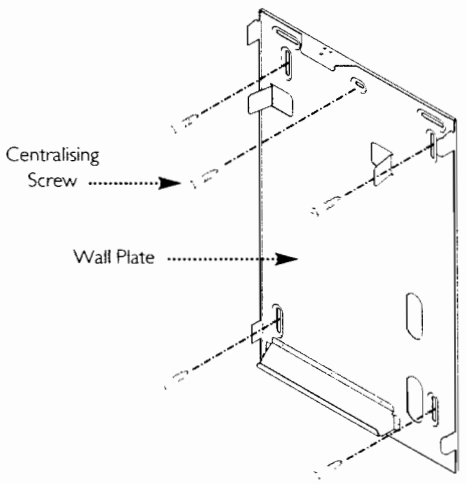


Fig. 22

8.0 Installation

Check Site Requirements (section 7) before commencing.

8.1 Initial Preparation

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

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

1. Remove the fixing template (Fig. 20) from the carton.

2. After considering the site requirements (see Section 7.0) position the template on the wall ensuring it is level both horizontally and vertically.

3. Mark the position of the centre hole for the wall plate (Fig. 20).

4. 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 and water pipes. Remove the template.

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

6. Drill and plug the wall as previously marked. Secure the wall plate using the centre hole (Fig. 22).

7. Ensuring the wall plate is level both horizontally and vertically, drill and plug at least 4 securing positions at the top and bottom through the wall plate. Utilising the slots available ensure the wall plate is square and secure to the wall (Fig. 22).

8. Loosely route the condensate discharge pipe to the lower left hand side of the wall plate.

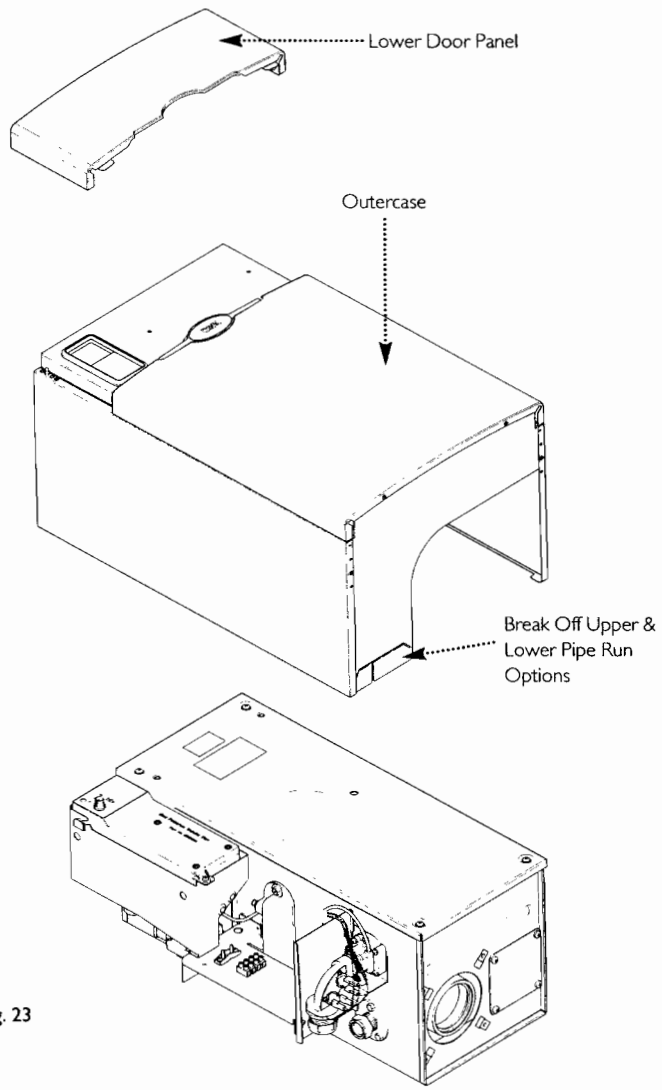


Fig. 23

8.0 Installation

8.2 Preparing The Boiler

1. Remove the outer carton.

2. Remove the internal packaging.

3. Lift the outercase upwards and remove (Fig. 23).

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

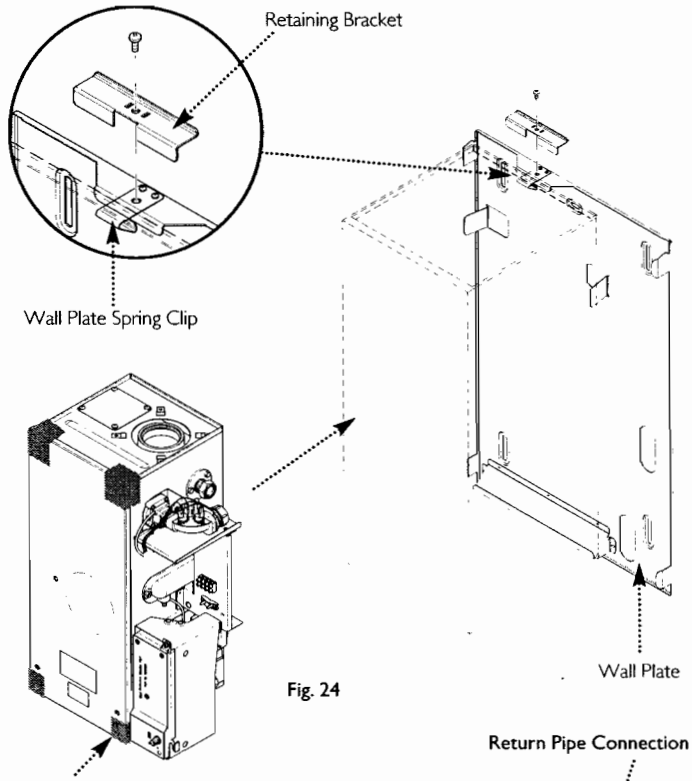


Fig. 24

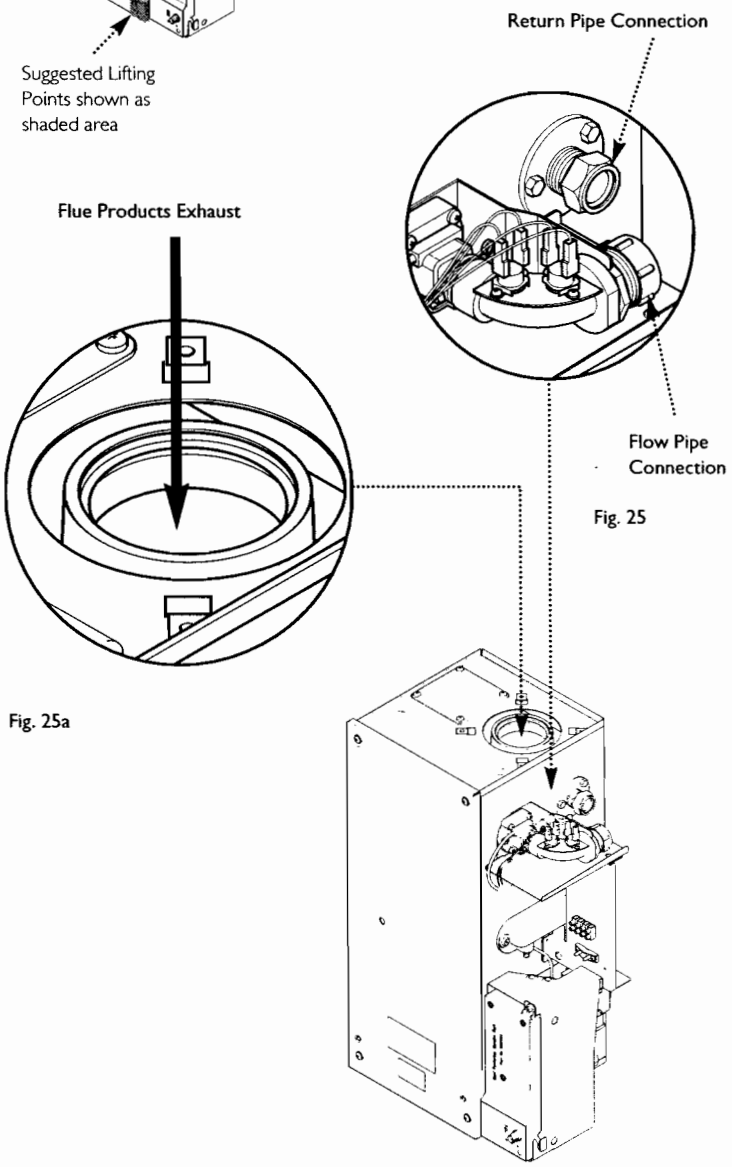


Fig. 25

Fig. 25a

8.0 Installation

8.3 Fitting The Boiler (Fig. 24)

1. Remove the screw and retaining bracket from the wall plate spring clip.

2. Offer up the boiler to the wall plate using the lifting points shown in Fig. 24 and locate the rear bottom edge onto the self locating support at the base of the wall plate. (See **Lifting** paragraph page 4.)

NOTE: When installing in Loft/Small Compartment access for lifting the boiler from the front can be gained for two people using the lifting points. (Fig. 24).

3. Rotate the boiler and engage into temporary spring retaining latch.

4. Ensure the boiler is secured with the retaining bracket and screw previously removed, immediately.

5. Remove thread protection caps from the FLOW and RETURN connections.

8.4 Making the Water Connections (Fig. 25)

1. The boiler has two side water connections, the front connection being FLOW and the rear connection being RETURN.

2. It is essential that Flow and Return pipes are connected to the correct fittings. The flow connection incorporates the boiler thermostats and a flow switch. To avoid damage to the flow switch when tightening the flow connection the use of two spanners is recommended.

3. A copper elbow, compression nut and olive are provided in the kit for the return connection.

NOTE: Drain cocks should be fitted to all system's low points and vents to all high points.

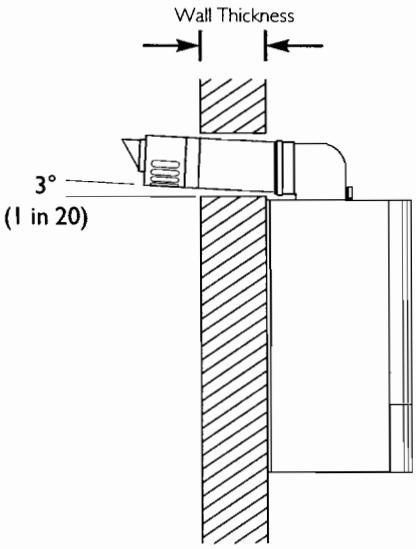
4. Ensure that any pipework is routed so as to leave the boiler via the spaces at the rear of the outer case, either at the top or at the bottom. Break Off panels are provided, top and bottom. **Pipework within the confines of the outercase should consist of solder fittings.**

NOTE: It is important that the pipework does not interfere with the correct fitting of the outer case and a space of 14mm clearance must be left between any vertical pipes and the outer edge of the wall plate.

8.5 Making the Condensate Drain Connection

1. Connect the condensate drain using the 1"BSP nut and seal supplied. (see section 7.6).

NOTE: To ensure the correct operation and integrity of the condensate drainage system - Carefully pour approximately 1 cupful (250ml) of water into the flue products exhaust, at the top of the heat exchanger (Fig. 25a) to ensure a seal is made in the trap.



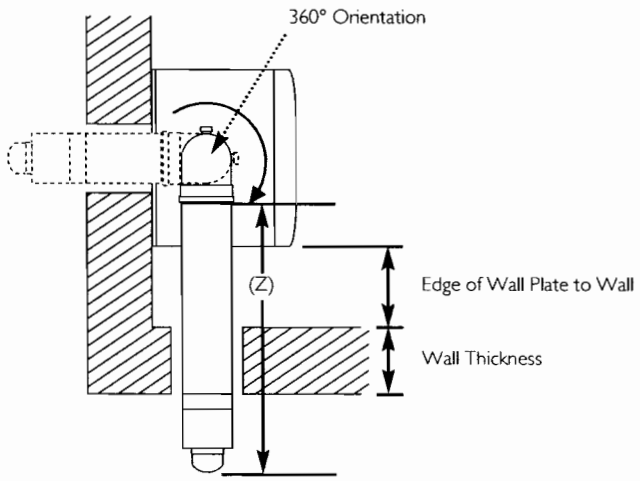


Fig. 26

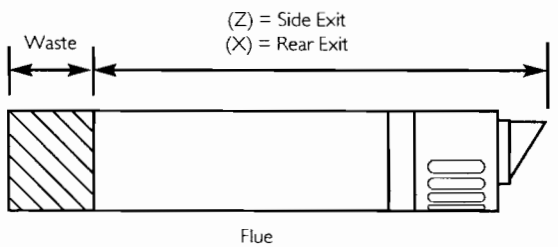


Fig. 27

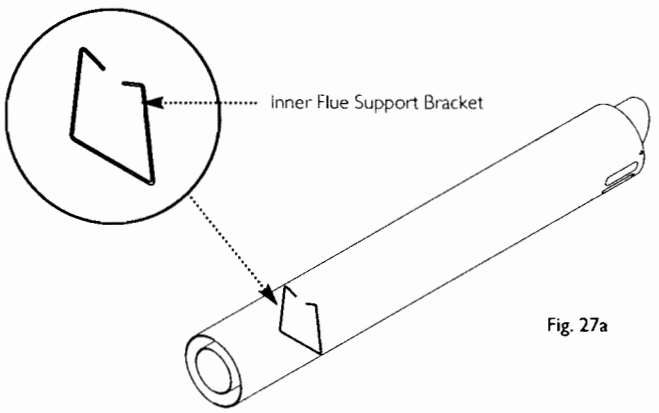


Fig. 27a

8.0 Installation

8.6 Making the Gas Connection

1. Connect the gas supply to the G½ (½in BSPT Internal) gas tap. This is located on the lower right side of the boiler, access by hinging down the PCB housing (see Fig. 32).

8.7 Fitting The Flue

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

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

HORIZONTAL FLUE

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

Rear Flue: maximum wall thickness - 630mm
Side Flue: maximum wall thickness - 565mm (left or right)

2. **For rear exit** - measure the wall thickness (Fig. 26) and to this dimension add 210mm. This dimension to be known as (X).
i.e.
(X) = wall thickness + 210

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

Check your dimensions.

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

4. **For side exit** - measure the distance from the edge of the wall plate to the inner face of the wall (Fig. 26) and to this dimension add the wall thickness + 250mm. This dimension to be known as (Z).
i.e.
(Z) = wall plate to wall + wall thickness + 250

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

Check your dimensions.

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

IMPORTANT: Check all measurements before cutting.

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

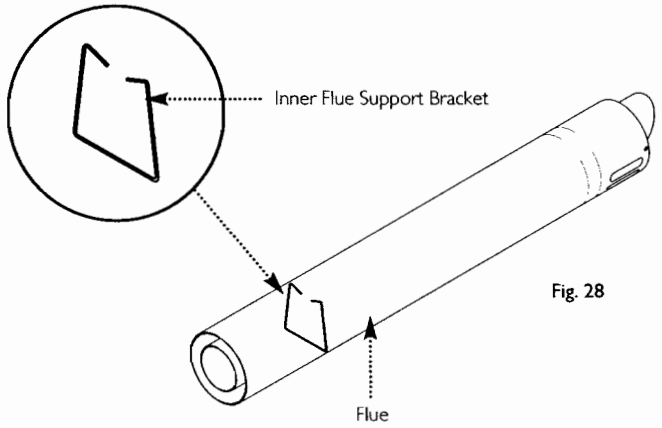


Fig. 28

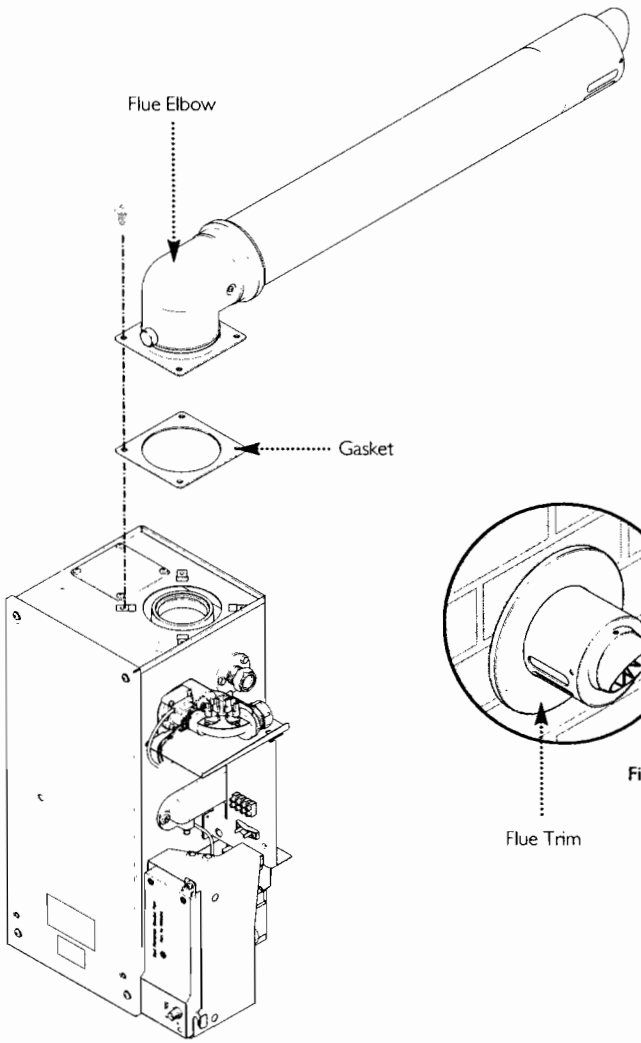


Fig. 29

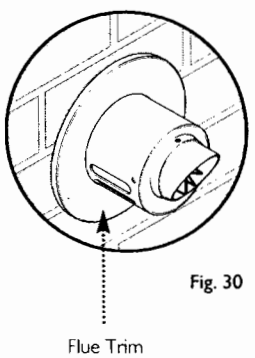


Fig. 30

8.7 Fitting the Flue (Cont)

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

7. Engage the flue into the flue elbow using soap solution to ease the engagement ensuring the flue is assembled as shown (Fig. 29).

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

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

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

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

12. 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.

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

VERTICAL FLUEING

1. Only a flue approved with the Baxi 100/2 HE Plus can be used.

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

8.8 Making The Electrical Connections

WARNING: This appliance must be earthed

1. The electrical connections are on the right hand side of the unit.

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

3. The boiler is factory set to give a maximum output of 22.0 kW (75,000 Btu/hr). The Control PCB jumper positions are as follows:

CN11 (Blue) CN12 (Red)

If the installation requires a greater output to achieve the desired room temperature, this can be increased to 30.18 kW (103,000 Btu/hr) and the boiler can be adjusted as follows (Fig. 32):

a) Remove the top right hand securing screw and hinge down the PCB housing.
b) Remove the Red jumper labelled CN12 from the bottom left hand side of the PCB.
c) Hinge back up the PCB housing and secure with screw.

If the boiler is to be used in conjunction with a Thermal Store, the boiler can be adjusted as follows (Fig. 32):

a) Remove the top right hand securing screw and hinge down the PCB housing.
b) Remove the Blue and Red jumpers labelled CN11 and CN12 from the bottom left hand side of the PCB.
c) Hinge back up the PCB housing and secure with screw.

4. Route the incoming electrical cable/s through the grommet in the support bracket. This will prevent damage to the cable.

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

6. Connect the (S/L), (N) and (⏚) wires to the 4-way terminal block (Fig. 33) and refit the cable clamp (Fig. 31).

7. The pump can be wired directly to the system controls or to the P/F connector on the boiler. For full TRV installation refer to section 6.6.

8. **The P/F connection should only be used on a full TRV system without a bypass.**

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

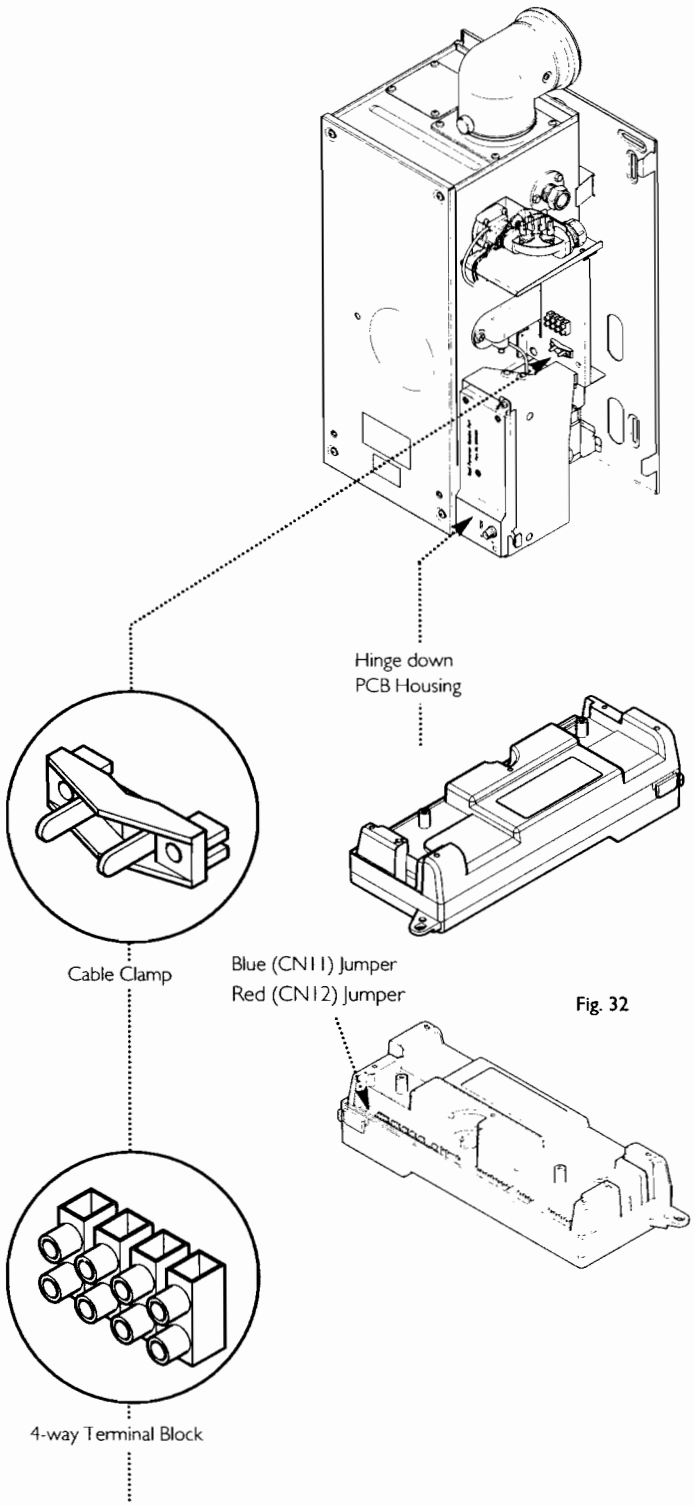
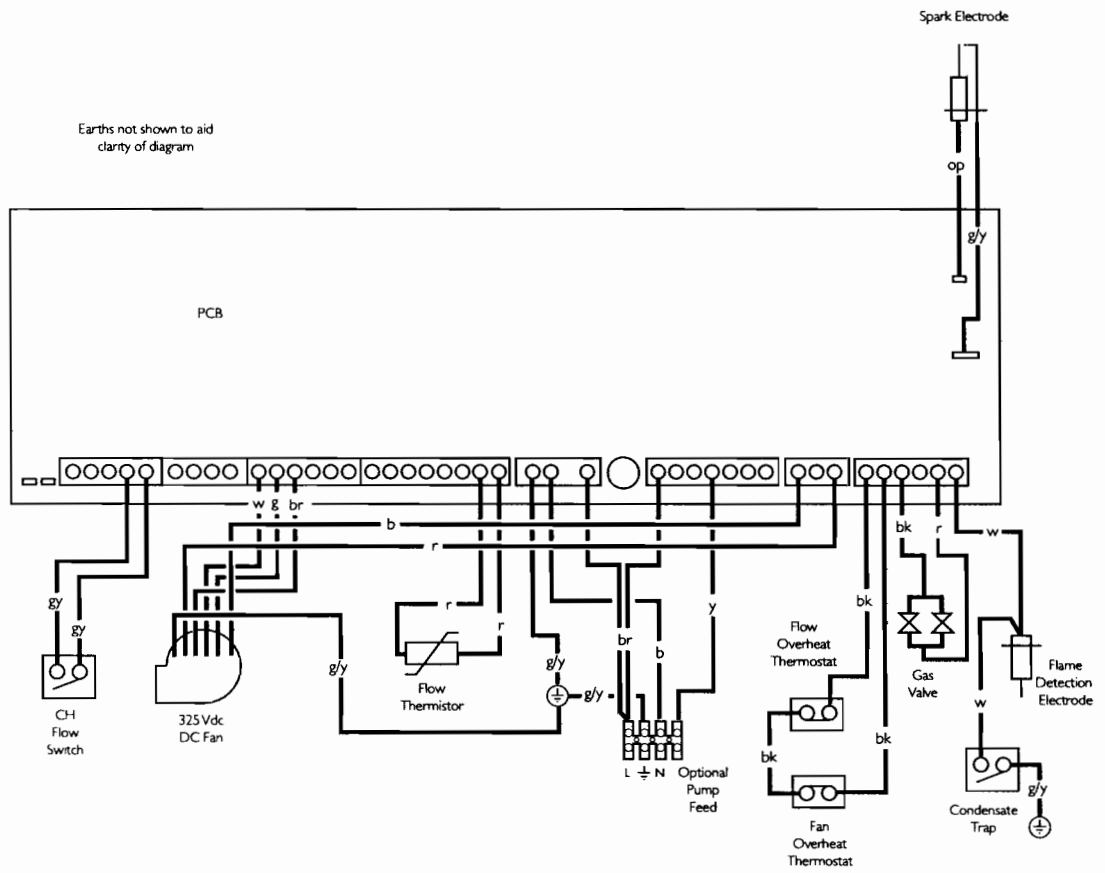


Fig. 31

Fig. 32

Fig. 33

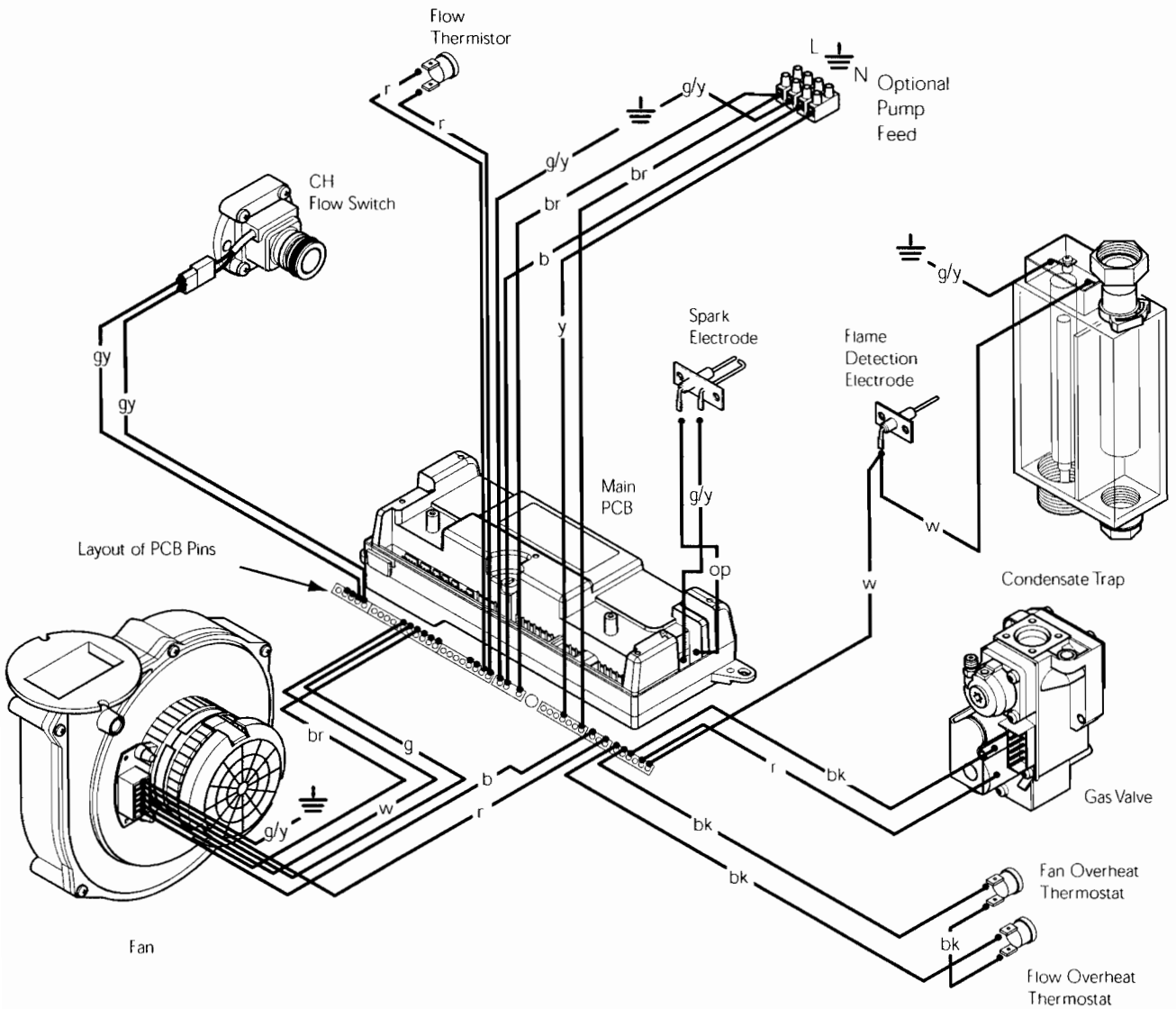
9.1 Schematic Wiring Diagram



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

9.2 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

10.0 Commissioning the Boiler

10.1 Commissioning the Boiler

1. Reference should be made to BS 5449 Section 5 when commissioning the boiler.

2. Flush the whole system using a suitable flushing agent (see Section 6.2) and vent the radiators. Check for water leaks.

3. 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).

4. 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.

5. Turn the gas supply on and purge according to in GB BS 6891 and in IE I.S. 813 "Domestic Gas Installations".

6. Remove the top RH securing screw and hinge down the PCB housing to gain access to the gas service cock (see Fig. 32). Turn the gas service cock anticlockwise to the ON position and check for gas soundness up to the gas valve (Fig. 34).

7. Turn the boiler control knob fully clockwise to 'HIGH' (Fig. 35) and run the system and check the boiler for correct operation.

NOTE: The boiler is self-regulating and the gas rate will modulate between inputs of 33.76kW and 10.3kW dependent upon the system load. The input is factory set at 24.90kW and can be altered to 33.76kW - see section 8.8. No adjustment of the gas valve is permissible.

8. With the system cold and all controls calling for heat check the gas pressure at the inlet tapping of the gas valve (Fig. 36). The pressure must be a minimum of 18.1 mbar (Working Pressure). Check that the gas rate is no greater than 3.3m³/h.

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

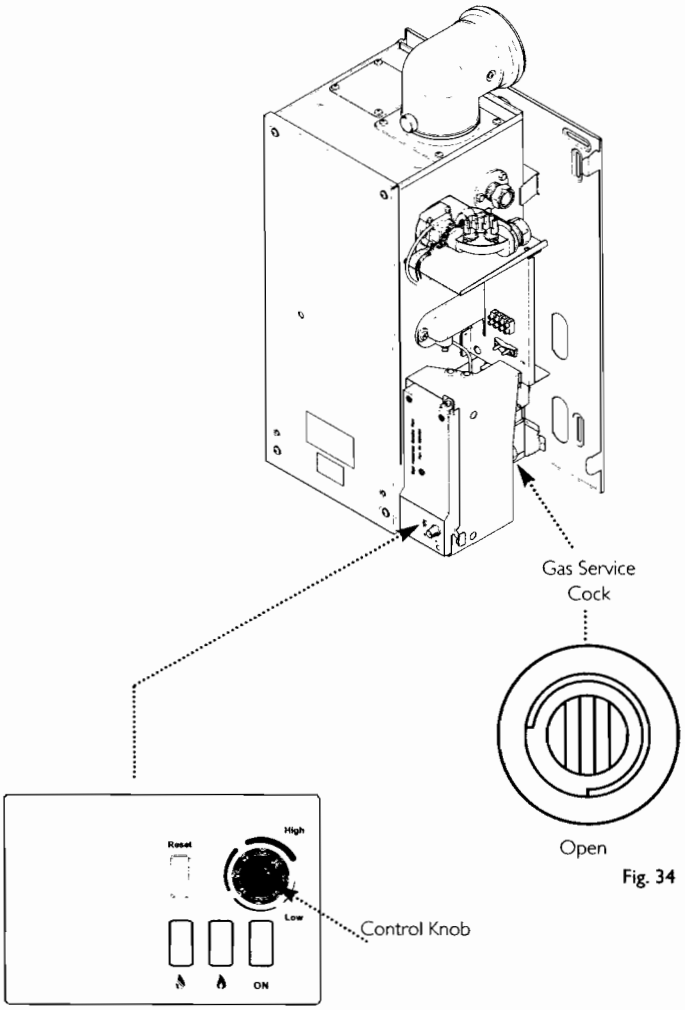


Fig. 34

Fig. 35

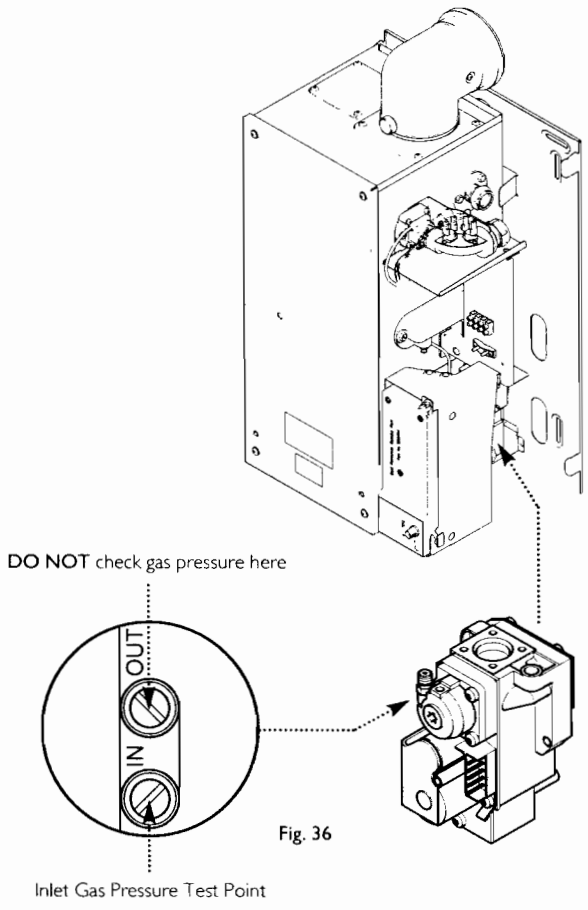


Fig. 36

11.0 Fitting the Outer Case

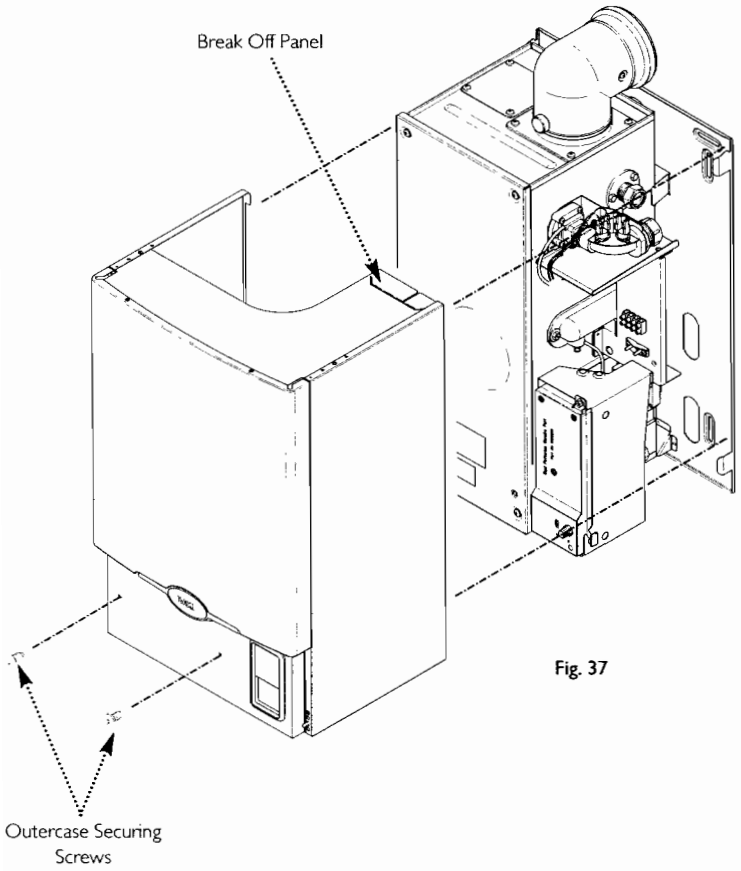


Fig. 37

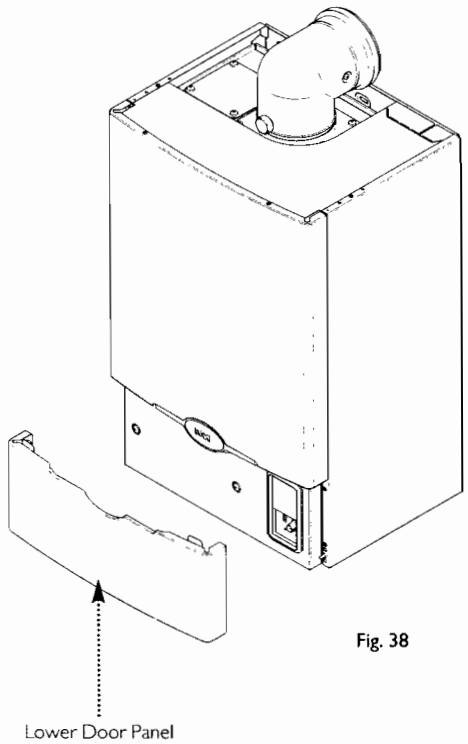


Fig. 38

11.1 Fitting The Outer Case

1. Position the outercase over the boiler engaging the lugs in the side flanges over the hooks on the wall plate. Break off top or bottom panel as required to accommodate pipework runs (Fig.37).

2. Using the two screws supplied in the kit, secure the outercase to the combustion box (Fig. 37).

3. Replace the lower front door panel (Fig. 38).

4. The "Important Ventilation Information" label can be removed unless the appliance is installed in an unventilated compartment.

5. Carefully read and complete all sections of the "Benchmark" Installation, Commissioning and Service Record Log Book that are relevant to the appliance and installation. The details of the Log Book will be required in the event of any warranty work. The Log Book must be handed to the user for safe keeping and each subsequent regular service visit recorded.

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" Log Book.

6. Instruct the user in the operation of the boiler controls. Hand over the User's Operating, Installation and Servicing Instructions and the Log Book, giving advice on the necessity of regular servicing.

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

8. Complete the label supplied with the inhibitor and stick to the inside of the boiler case. Detail of system treatment must be recorded in the Benchmark Log Book.

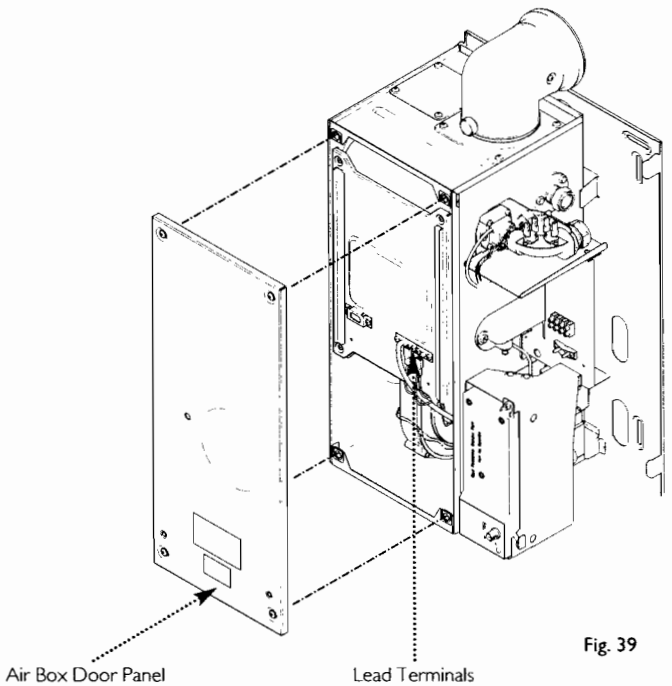


Fig. 39

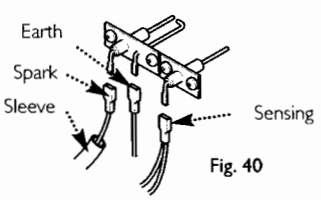


Fig. 40

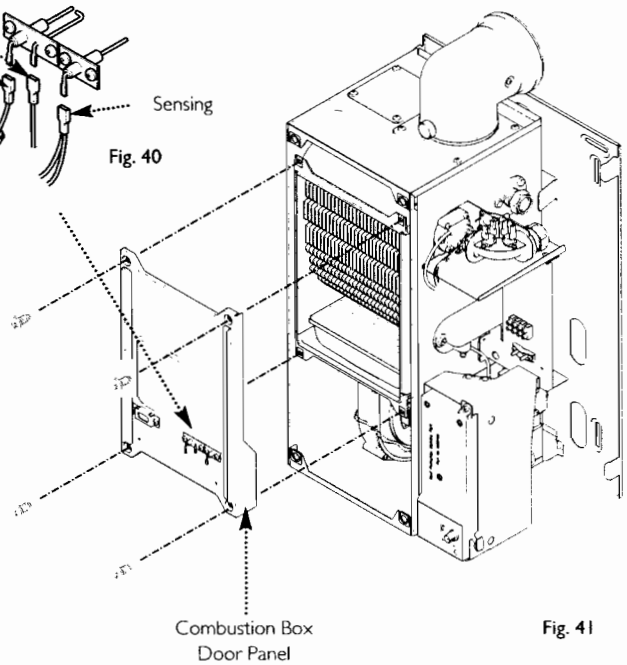


Fig. 41

12.0 Servicing the Boiler

12.1 Annual Servicing

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

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

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

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

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

2. After servicing, complete the relevant section of the "Benchmark" Installation, Commissioning and Service Record Log Book. This should be in the possession of the user.

3. Ensure that the boiler is cool.

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

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

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

6. Release the four ¼ turn screws securing the air box door panel and remove the door (Fig. 39).

7. Disconnect the leads from the centre and right hand terminals (earth and flame sensing probe) (Fig. 40). Reconnect in reverse order.

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

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

a) Burner.
b) Heat exchanger fins.
c) Fan compartment (Check also for condensate leaks).
d) Insulation.
e) Door seals-**Important:** Pay particular attention to the condition of the combustion box door seals.
f) Electrodes.
g) The condensate trap must be thoroughly cleaned at every service (see section 13.9 for removal).
NOTE: Remove the trap drain plug and place a vessel underneath to catch the condensate (care should be taken as this could be hot). Clean the trap and refit the drain plug. Check for leaks.
h) Top of heat exchanger.

12.1 Annual Servicing (Cont)

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

g) 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.

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

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

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

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

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

m) Reassemble in reverse order and check for leaks.

11. Check CO/CO^2 ratio at flue sampling point (Fig.41a). See section 4.0.

12. Complete the relevant section of the "Benchmark" Installation, Commissioning and Service Record Log Book and hand it back to the user.

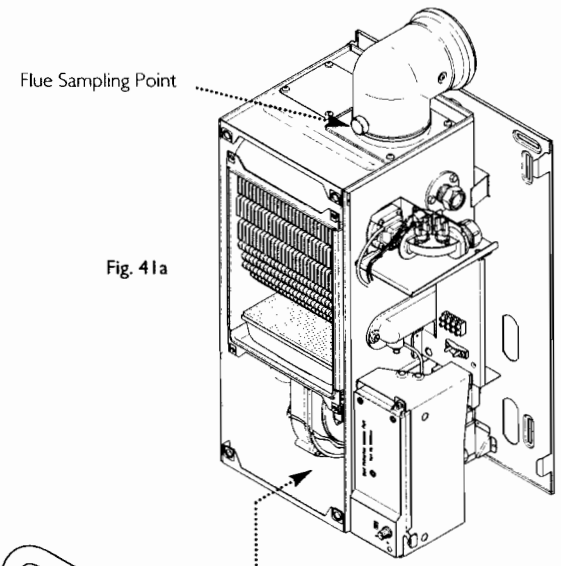


Fig. 41a

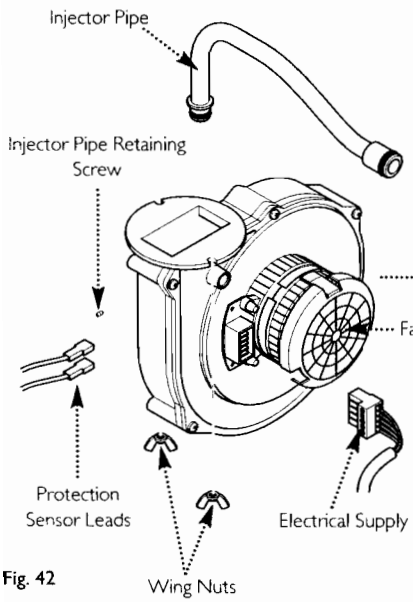


Fig. 42

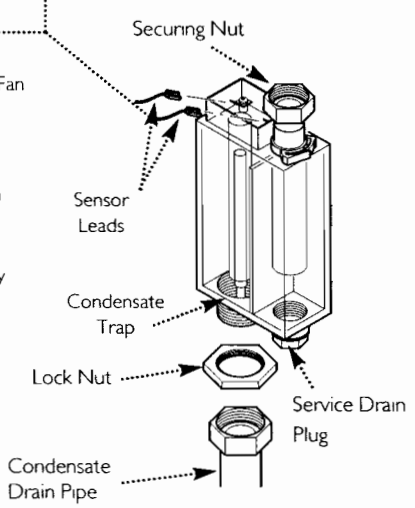


Fig. 43

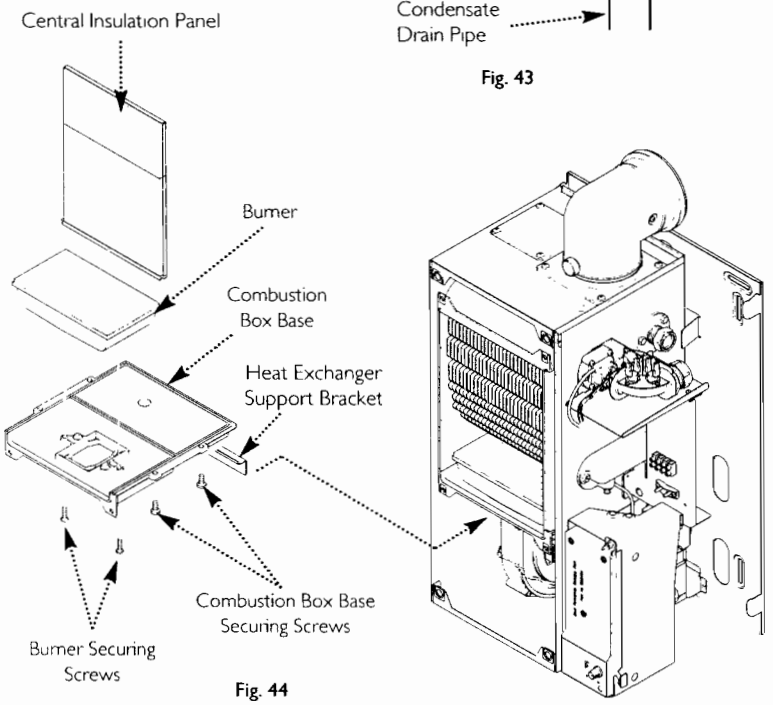


Fig. 44

13.0 Changing Components

13.1 Changing Components

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

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

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

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

1. Before changing any components please read Section 1.2 Important Information.

2. Remove the outer case and lower door panel (see "Fitting the Outercase" Section 11.0).

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

3. 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.

4. Place a tube on the drain point to drain water away from electrics. Turn anticlockwise to open (Fig. 45).

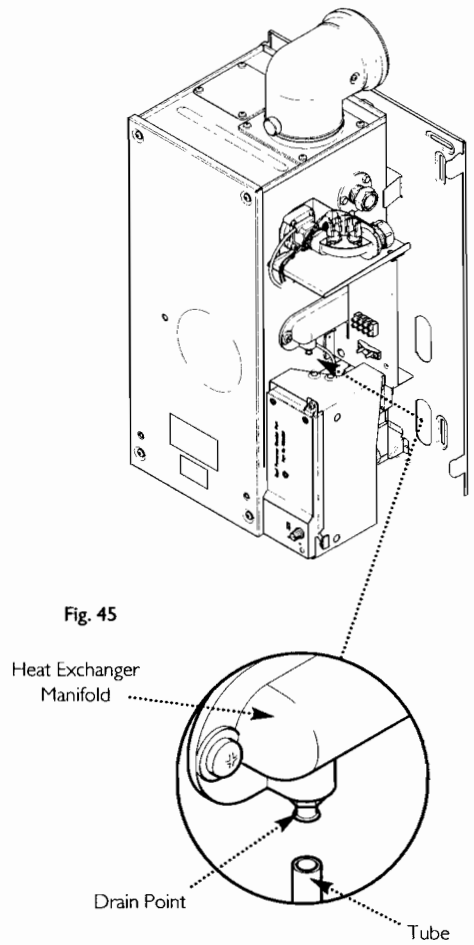


Fig. 45

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

5. After changing a component re-commission 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 outer case.

13.2 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 electrical connections from the sensor.

3. Unscrew the sensor from the pipe.

4. Fit the new thermistor or safety thermostat and reassemble in reverse order.

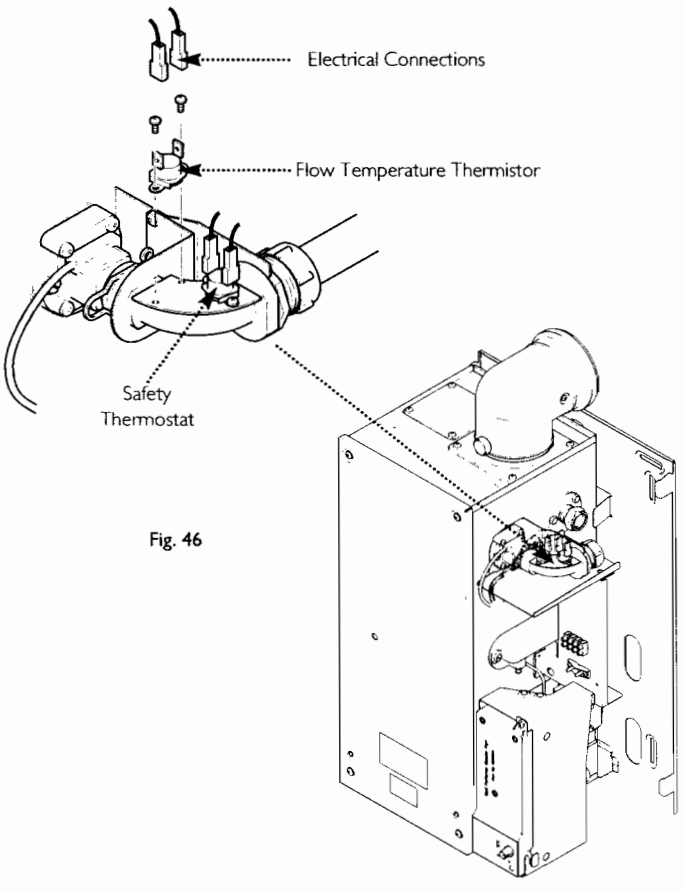


Fig. 46

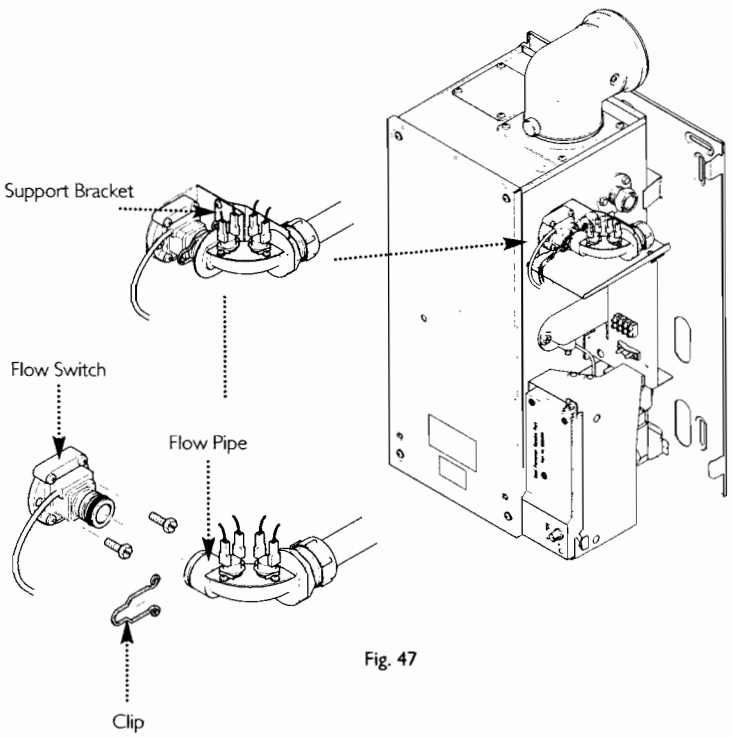


Fig. 47

13.3 Flowswitch (Fig. 47)

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

2. Disconnect pipework, loosen elbow locking nut and undo screws on support bracket.

3. Remove the clip securing the flow pipe to the flowswitch.

4. Remove the two screws securing the flow switch to the boiler.

5. Disconnect the inline electrical connection.

6. Remove the flowswitch.

7. Fit the new flowswitch and reassemble in reverse order.

8. Recommission the boiler and check the inhibitor concentration (see Section 6.2 and 10.1).

13.0 Changing Components

13.4 PCB (Figs. 48 & 49)

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

1. Pull the control knob off the spindle and remove the plastic button cover. Refit them onto the new PCB (Fig. 48).

1. Remove the top right hand securing screw and hinge down the PCB housing and disconnect the electrical connections noting their positions

NOTE: Check the PCB for the presence of input jumpers - see section 8.8. Set the new PCB as the one removed.

2. Lift Control PCB housing out of hinge housing of metal bracket.

3. Fit the new PCB Housing Assembly and reassemble in reverse order.

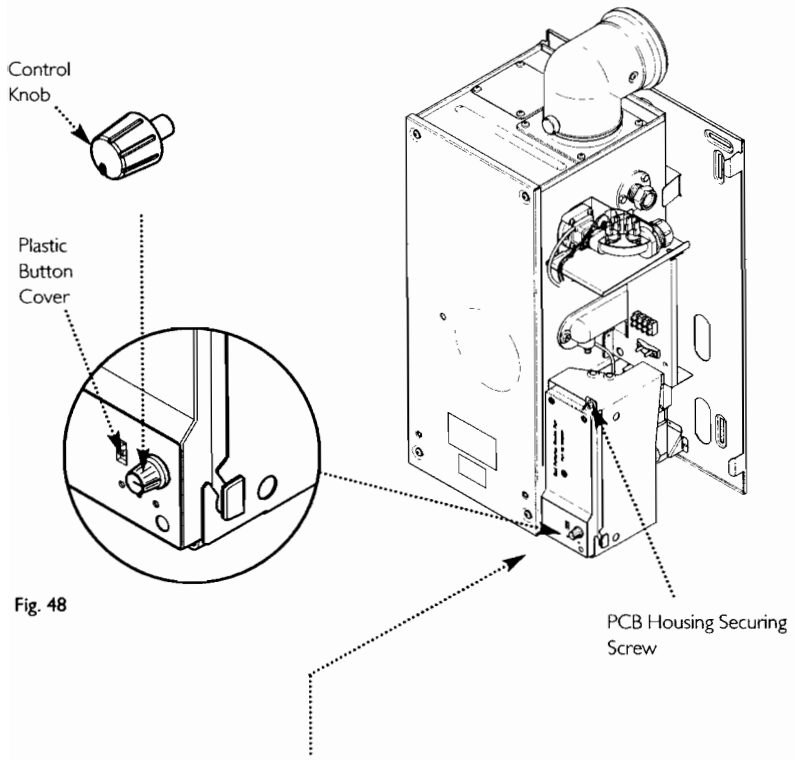


Fig. 48

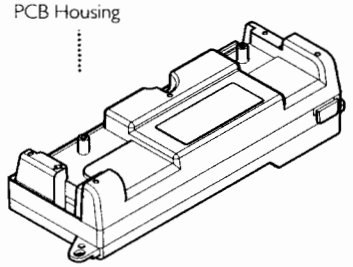
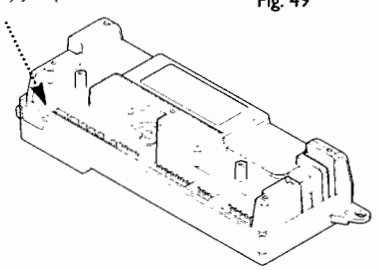


Fig. 49



13.0 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 /4 turn screws (Fig. 50).

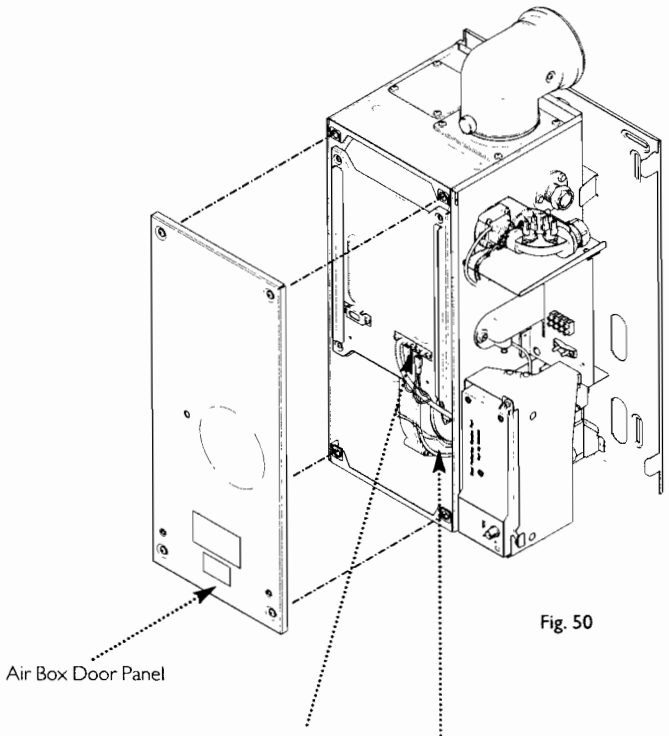


Fig. 50

13.5 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.

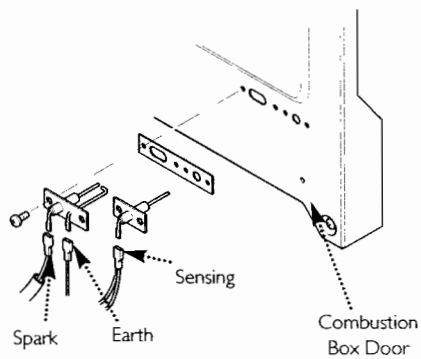


Fig. 51

13.6 Fan (Fig. 52)

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

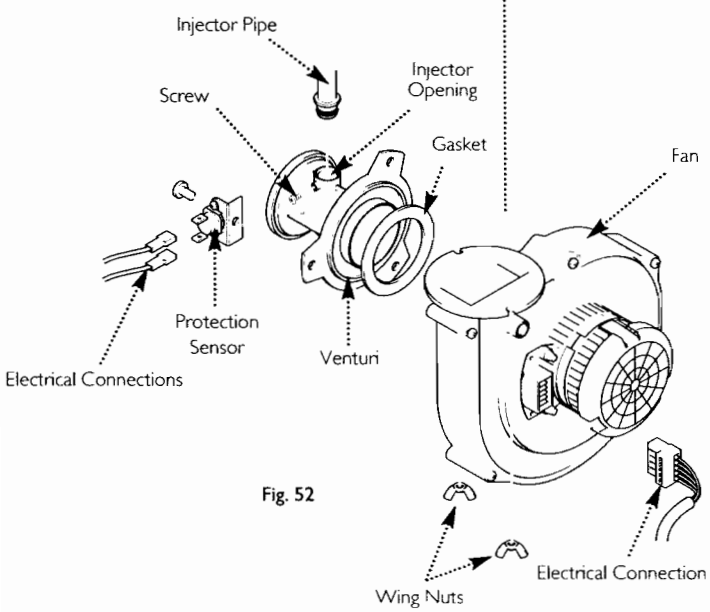


Fig. 52

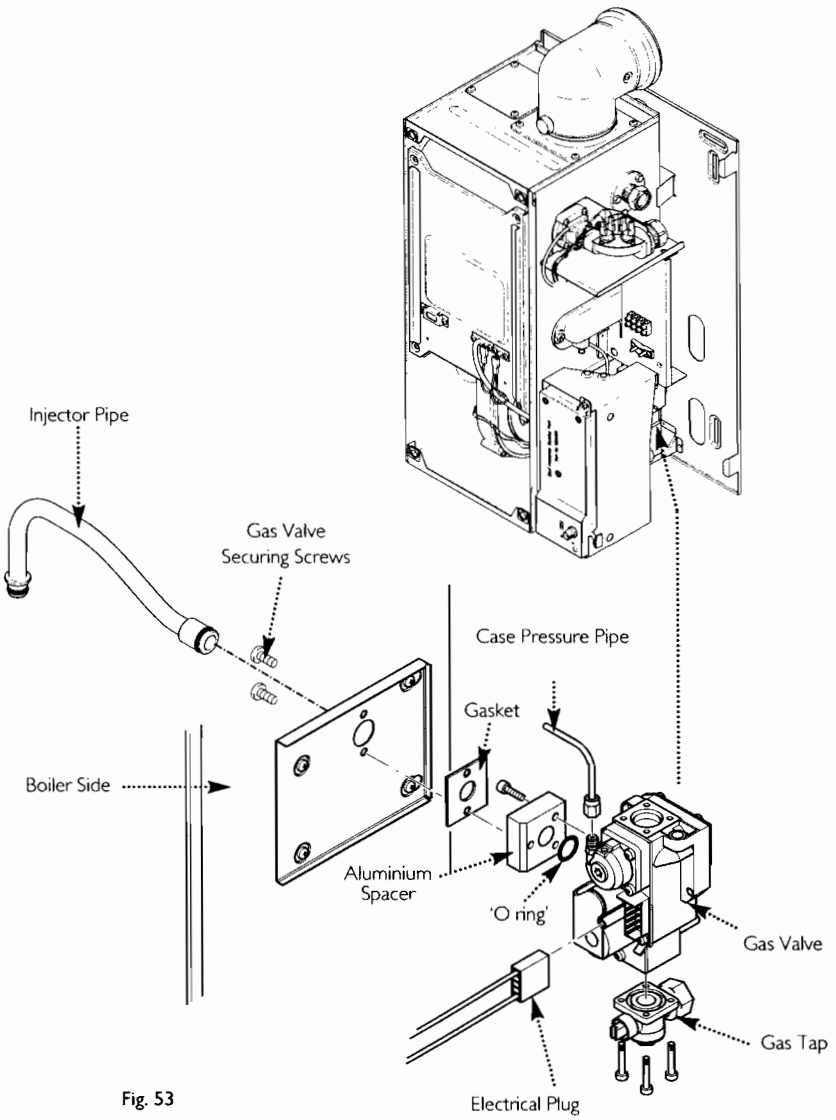


Fig. 53

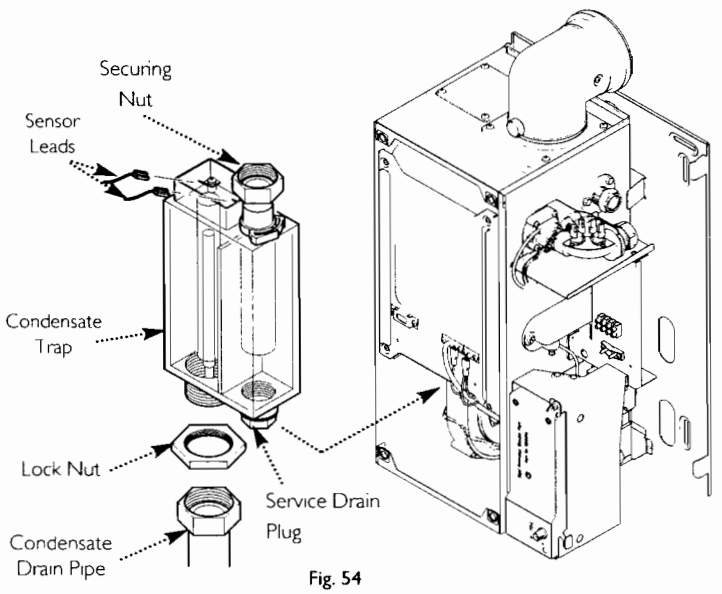


Fig. 54

13.0 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).

13.7 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.

13.8 Gas Valve (Fig. 53)

1. Remove the Control PCB (see Section 13.4).

2. Isolate gas supply and disconnect the gas tap by removing the four screws.

3. Undo the case pressure pipe from the gas valve.

4. Disconnect the electrical plug from the gas valve.

5. Remove the fan (see section 13.6) and injector pipe.

6. Remove the two gas valve securing screws from inside the air box holding the gas valve.

7. Remove the gas valve from the airbox side.

8. Remove the aluminium spacer and its gasket from the gas valve.

9. Fit the aluminium spacer and its gasket to the new valve.

10. Fit the new gas valve and reassemble in reverse order.

NOTE: Check for gas tightness after replacing gas valve.

13.9 Condensate Trap (Fig. 54)

1. Disconnect the condensate trap from the base of the heat exchanger.

2. Disconnect the condensate drain (outside the boiler) from the condensate trap.

3. Undo the condensate trap lock nut.

4. Remove the condensate trap from the boiler.

5. Disconnect the sensor leads.

6. Fit the new condensate trap and reassemble in reverse order.

7. Prime the condensate trap (fill first chamber), check for leaks.

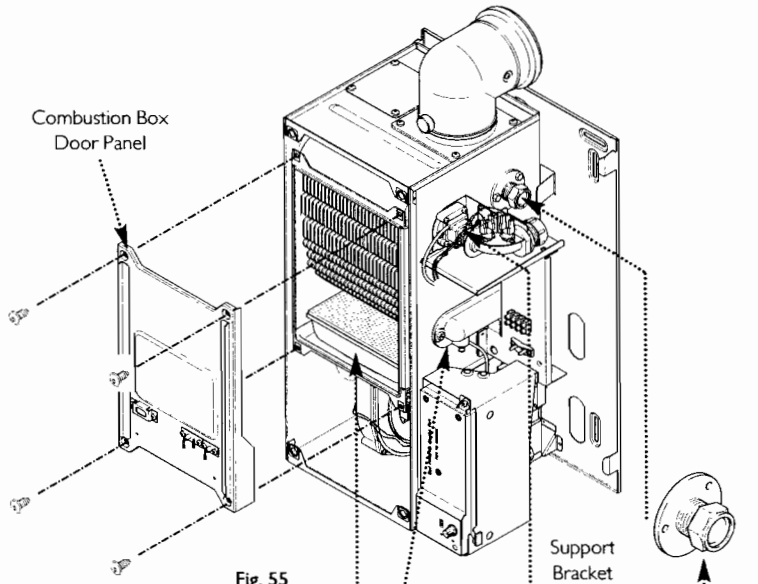


Fig. 55

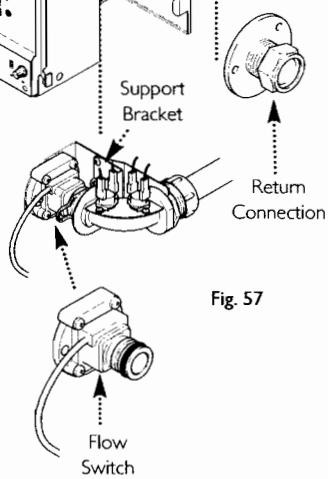


Fig. 57

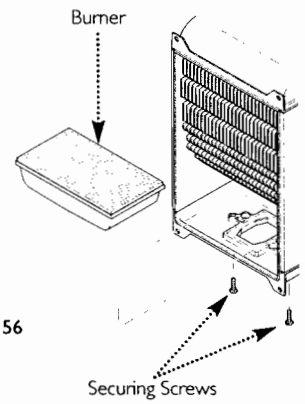
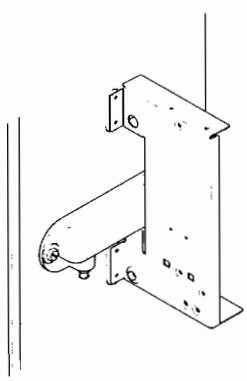


Fig. 56



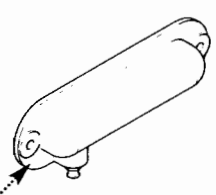


Fig. 58

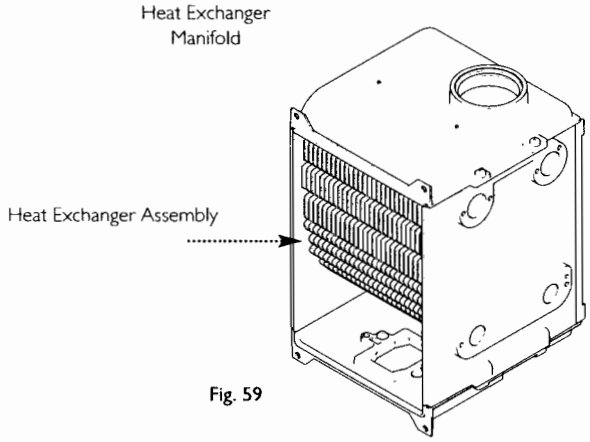


Fig. 59

13.0 Changing Components

The burner and heat exchanger can be changed after removal of the combustion box door. To change the heat exchanger, the fan and burner must be removed first (see section 13.6 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.

13.10 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.

13.11 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. Lift the heat exchanger assembly (Fig. 59) and rotate the bottom upwards whilst pulling it forwards out of the airbox.

6. Fit the new heat exchanger and reassemble in reverse order.

7. Recommission the boiler and check the inhibitor concentration (see Section 6.2 and 10.1).

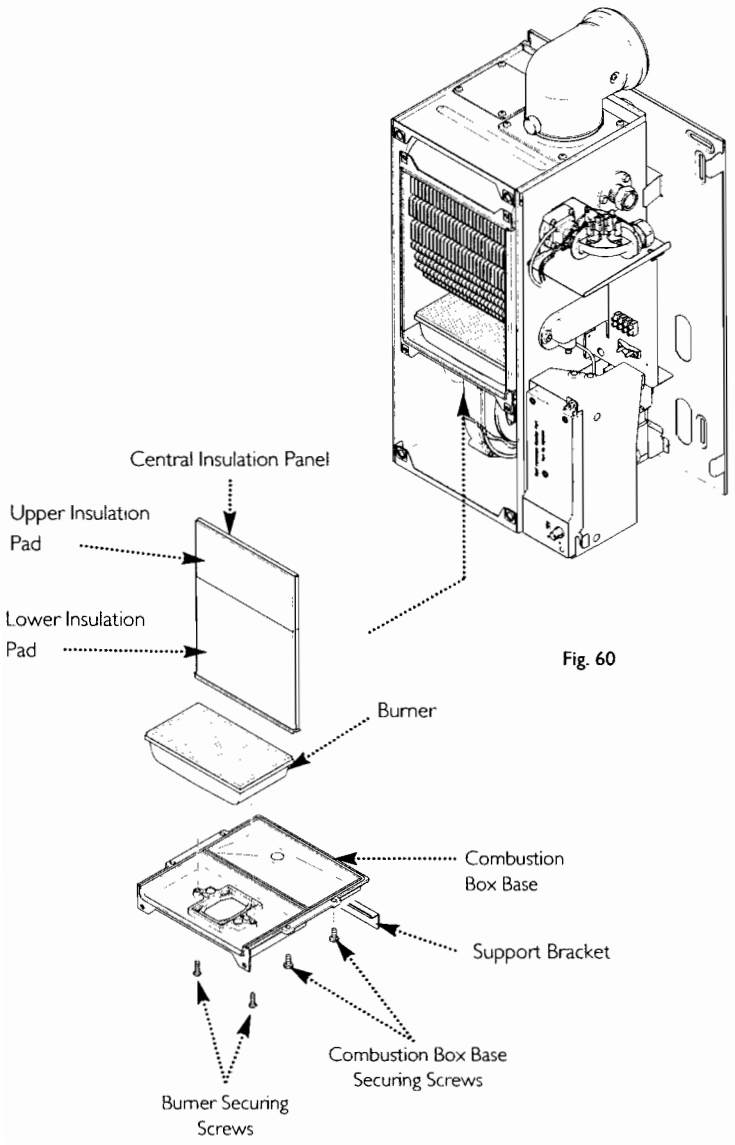


Fig. 60

13.0 Changing Components

13.12 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.

13.13 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).

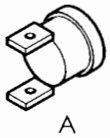
3. Remove the heat exchanger (see section 13.11).

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.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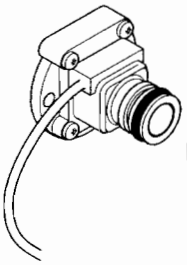
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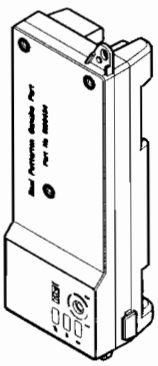
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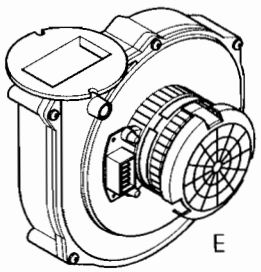
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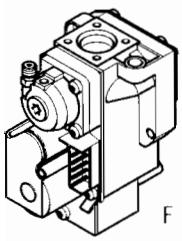
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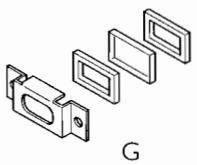
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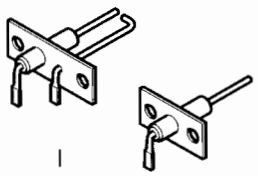
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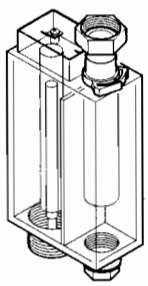
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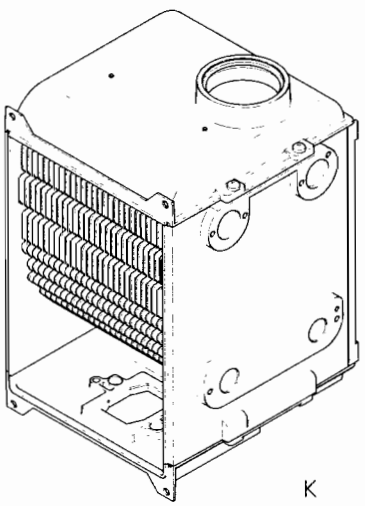
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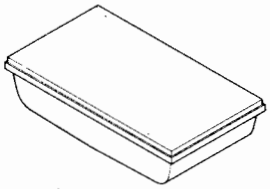
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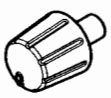
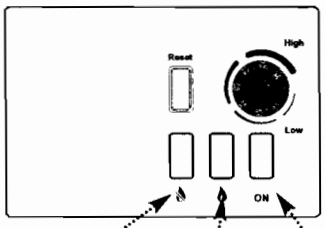

L

14.0 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 (100/2HE)	5110991
E		Fan	5109925
F		Gas Valve	241900
G	E06 085	Viewing Window	242484
H		Condensate Trap	5111714
I		Electrodes Kit	5110992
J		Burner Assy	5107430
K	E06 097	Heat Exchanger Assy	242497
L		Control Knob	5109996



Lockout LED Light (Red)

Boiler On LED Light (Green)

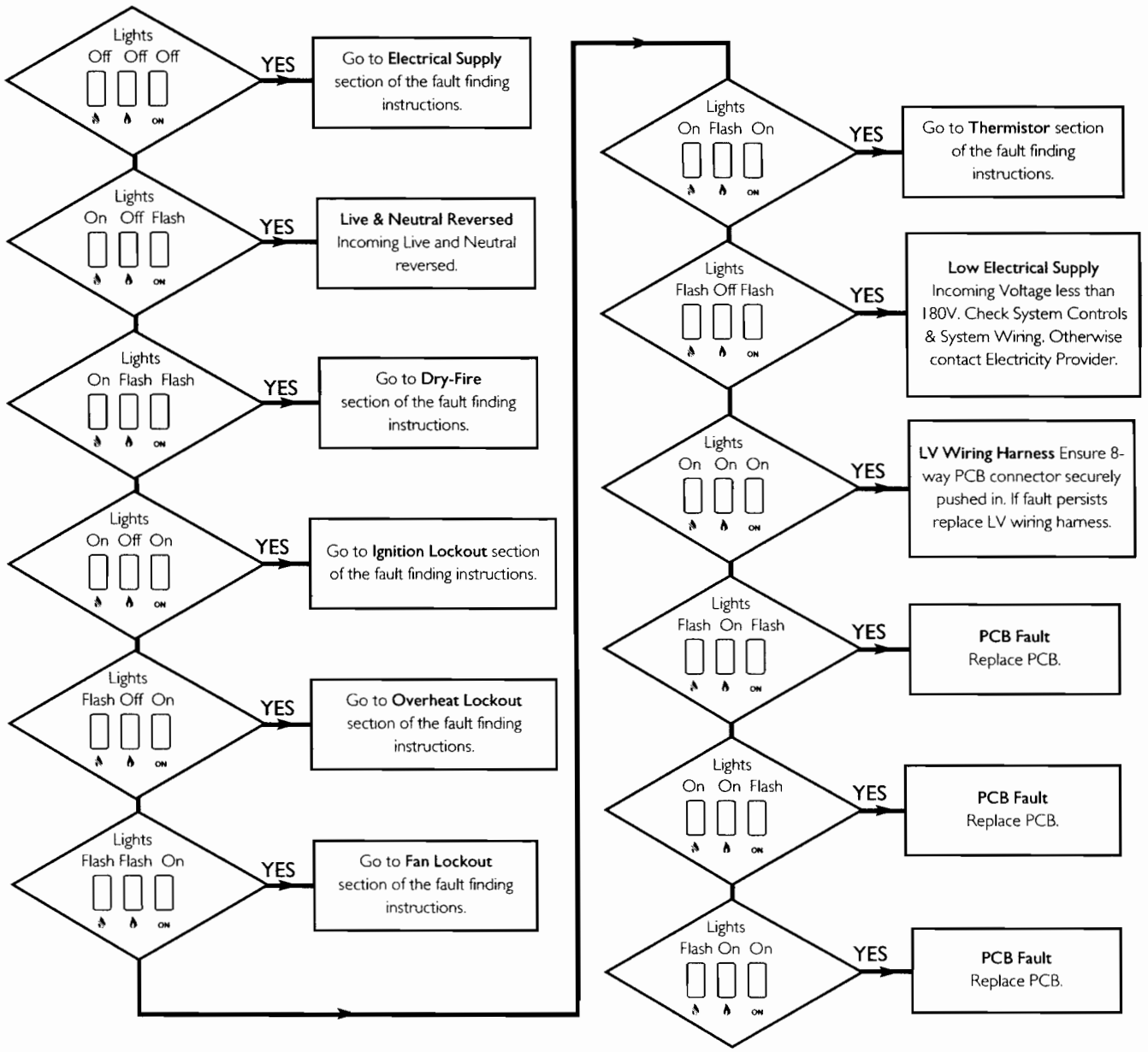
Mains On LED Light (Green)

15.0 Fault Finding

NOTE: The fan is supplied with 325 Vdc.

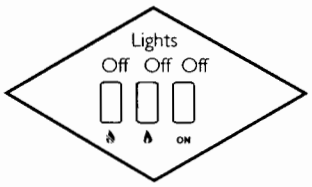
Fan Fault Finding should only be carried out after the boiler has been electrically isolated.

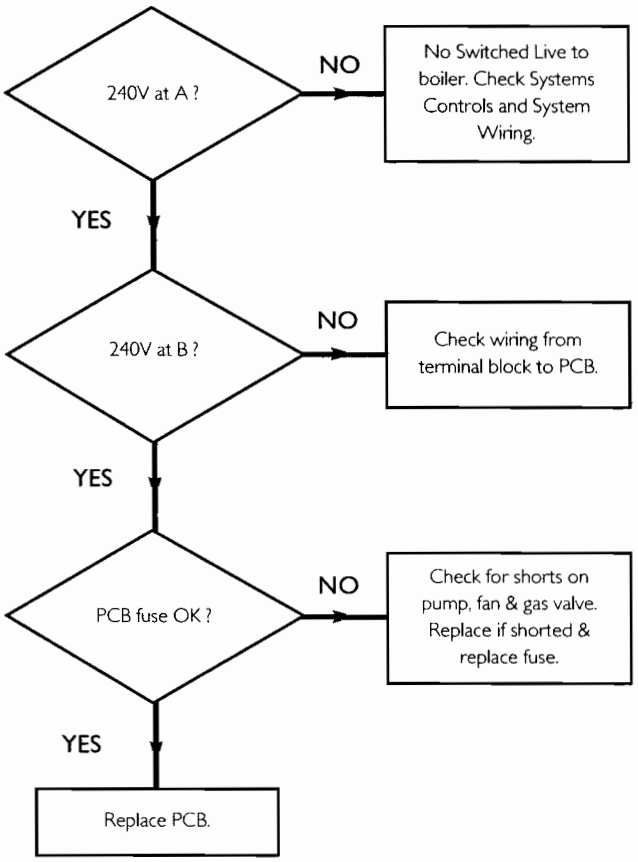
General Fault Finding should only be carried out by someone who is appropriately qualified.

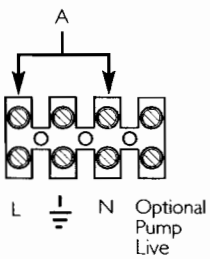


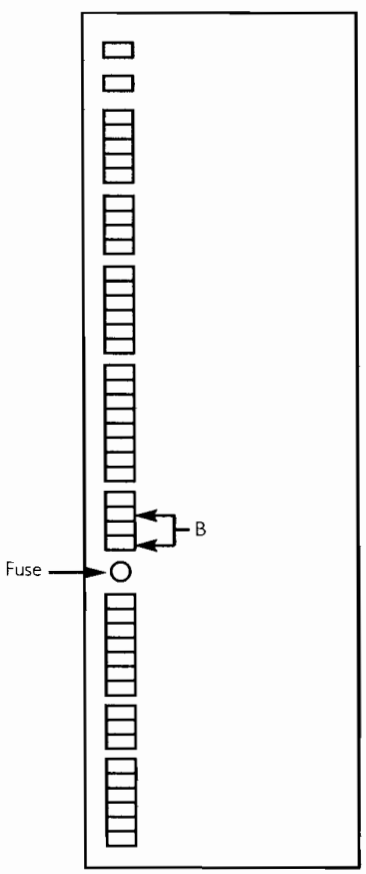
15.0 Fault Finding

ELECTRICAL SUPPLY



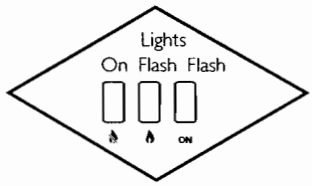






15.0 Fault Finding

DRY-FIRE



Is the system full of water ?

NO → Fill system with water and bleed out all air.

YES

Is the pump running ?

NO → Is the pump run off the switched live?

NO → Turn mains off & on. After 5 sec, is there 240V at E?

NO → Turn mains off, unplug 7-way connector to PCB. Is there continuity between F and G ?

YES → Replace PCB.

NO → Wiring from terminal block to PCB faulty.

YES → Pump or Pump Wiring fault.

YES → Pump or Pump Wiring fault.

YES

Unplug 5-way PCB connector. Is there continuity between H (run pump from switched live) ?

YES → Replace PCB.

NO

Disconnect Flow Switch Inline connector. With pump running is there continuity across flow switch ?

YES → Wires from inline connector to PCB faulty.

NO

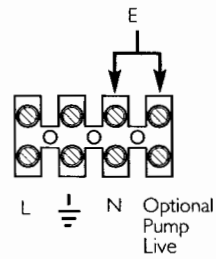
Remove flow switch from boiler. Is there a physical blockage to the paddle within the flow switch ?

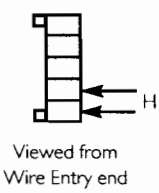
NO → Is there a blockage in the system ?

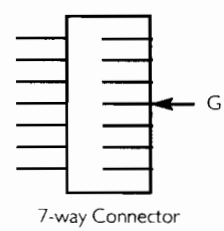
NO → Replace Flow Switch.

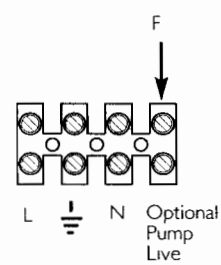
YES → Replace Blockage.

YES → Replace Blockage.

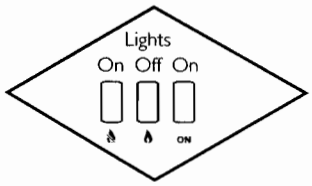








IGNITION LOCKOUT



Is there gas at gas valve inlet ?

NO → Check isolation valve and gas supply.

YES

Reset Lockout. Is there gas flow (check at meter) ?

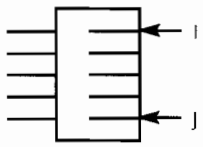
NO → Remove 5-way connector from gas valve. Is there 240 Vdc between I & J during ignition ?

YES → Replace Gas Valve.

NO → Remove the larger or the two 6-way PCB connectors. Is there continuity from I to L & from J to K ?

YES → Replace PCB.

NO → Lead from PCB to Gas Valve faulty.



5-way Connector

YES

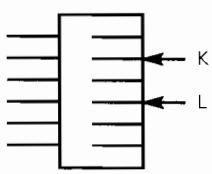
Is there at least 18mbar dynamic at gas valve inlet ?

NO → Remove Gas Valve & check inlet filter for blockage. Otherwise incorrect gas supply to boiler.

YES

Is Condensate Trap blocked or water on terminals ?

YES → Clear blockage and dry sensors.



6-way Connector

NO

Is spark or flame detection probe damaged ?

YES → Replace spark or flame detection probe and gaskets.

NO

Is spark gap between 3 and 4mm ?

NO → Set spark gap to 3.5mm.

YES

Is wiring from PCB to spark probe & flame detection probe OK ?

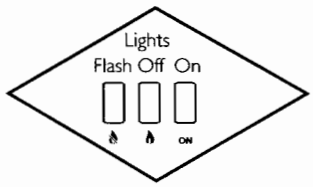
YES → Is the burner blocked or damaged ?

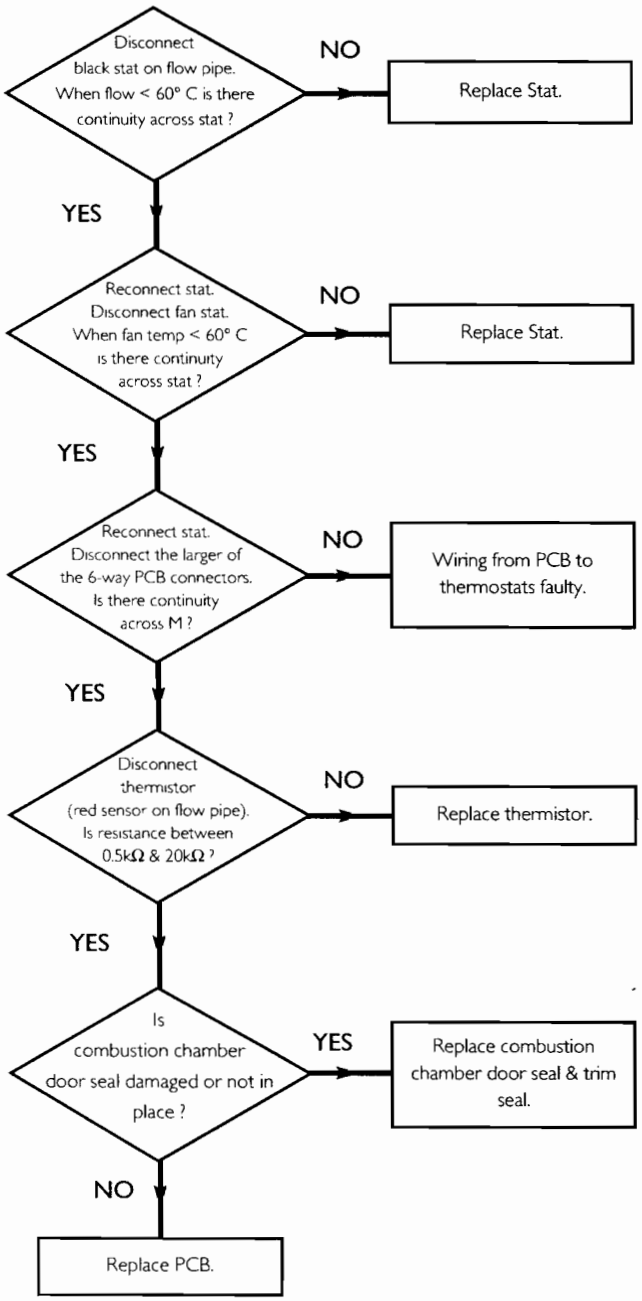
NO → Replace PCB.

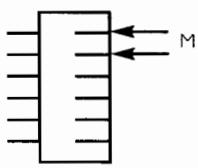
YES → Clean burner or replace as necessary.

NO → Rectify wiring.

OVERHEAT LOCKOUT







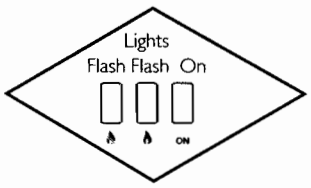
6-way Connector

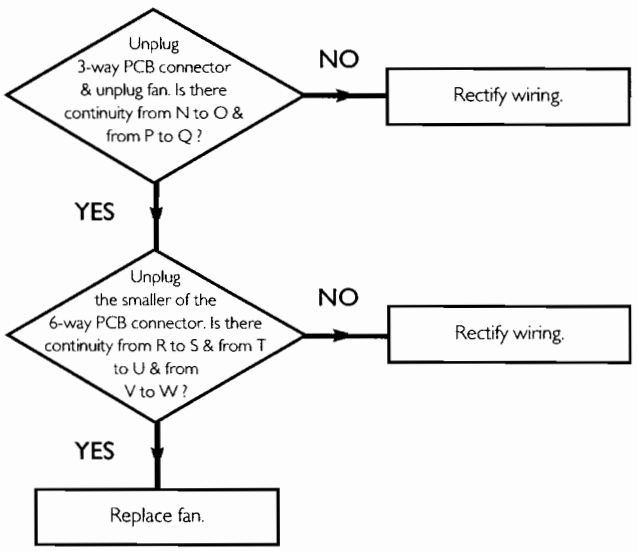
15.0 Fault Finding

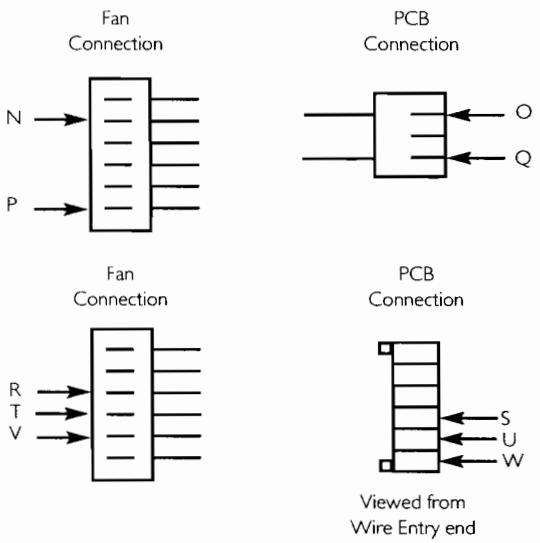
NOTE: The fan is supplied with 325 Vdc.

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

FAN LOCKOUT

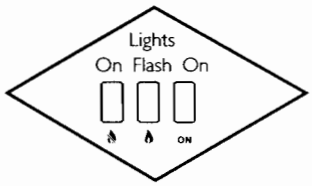


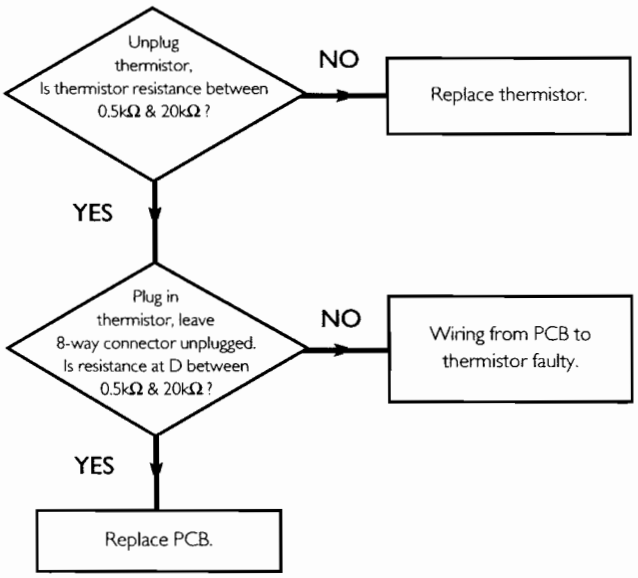


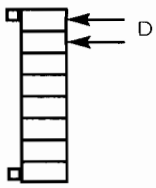


15.0 Fault Finding

THERMISTOR







Viewed from
Wire Entry end

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