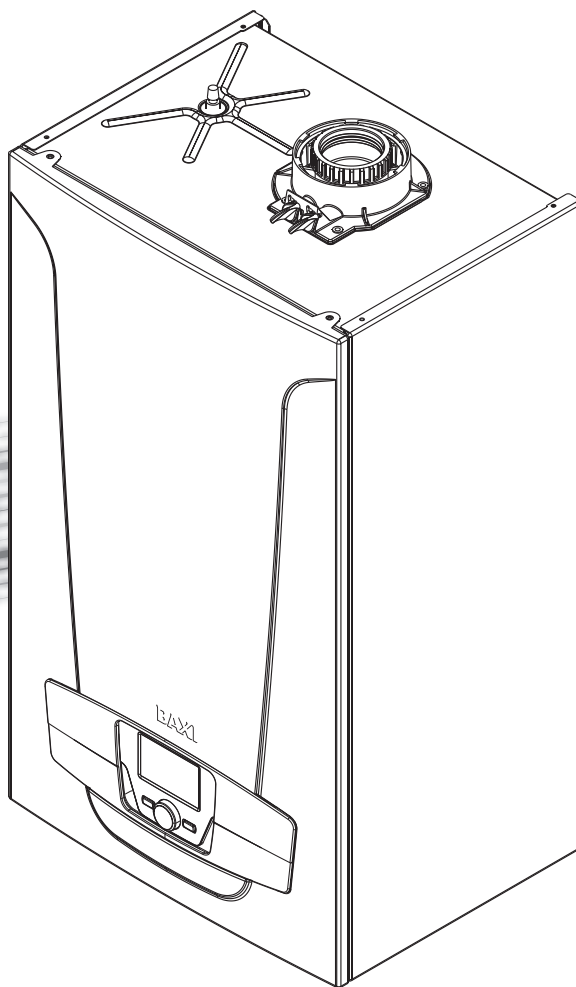




Installation & Servicing Instructions



Platinum 2 Combi GA Range

Gas Fired Wall Mounted Condensing
Combination Boiler

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

Natural Gas

Baxi Platinum 2 Combi 28 GA

G.C.N° 47-075-61

Baxi Platinum 2 Combi 33 GA

G.C.N° 47-075-62

Baxi Platinum 2 Combi 40 GA

G.C.N° 47-075-63

The Benchmark Scheme

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

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

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Full acknowledgement of author and source must be given.

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

Building Regulations and the Benchmark Commissioning Checklist

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

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

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

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

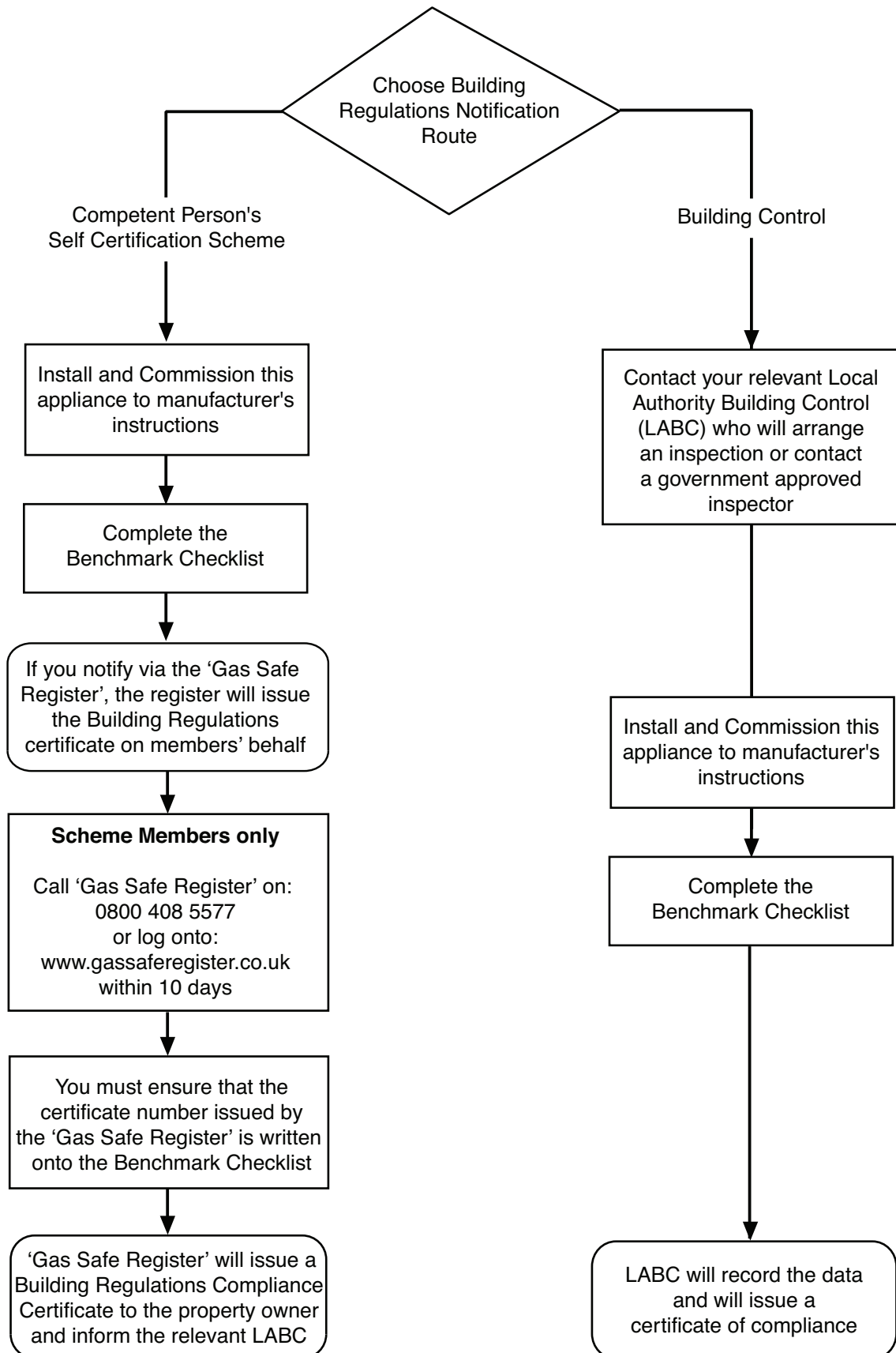
This company is a member of the Benchmark initiative and fully supports the aims of the programme. Its aim is to improve the standards of installation and commissioning of central heating systems in the UK and to encourage the regular servicing of all central heating systems to ensure safety and efficiency.

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

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



ISO 9001
FM 00866



IMPORTANT - Installation, Commissioning, Service & Repair

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

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

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

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

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

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

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

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 0085.

Product/Production certified by:
Notified Bodies 0086.

For GB/IE only.

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

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

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

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

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

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

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

Codes of Practice - refer to the most recent version

In GB the following Codes of Practice apply:

Standard	Scope
BS 6891	Gas Installation.
BS 5546	Installation of hot water supplies for domestic purposes.
BS EN 12828	Heating systems in buildings.
BS EN 12831	Heating systems in buildings - Calculation of load.
BS EN 14336	Installation & commissioning of water based heating systems.
BS 6798	Installation of gas fired hot water boilers.
BS 5440 Part 1	Flues.
BS 5440 Part 2	Ventilation.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.

In IE the following Codes of Practice apply:

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

General

The following advice should be adhered to, from when first handling the boiler to the final stages of installation, and also during maintenance.

Most injuries as a result of inappropriate handling and lifting are to the back, but all other parts of the body are vulnerable, particularly shoulders, arms and hands. Health & Safety is the responsibility of EVERYONE.

There is no 'safe' limit for one man - each person has different capabilities. The boiler should be handled and lifted by TWO PEOPLE.

Do not handle or lift unless you feel physically able.

Wear appropriate Personal Protection Equipment e.g. protective gloves, safety footwear etc.

Preparation

Co-ordinate movements - know where, and when, you are both going.

Minimise the number of times needed to move the boiler - plan ahead.

Always ensure when handling or lifting the route is clear and unobstructed. If possible avoid steps, wet or slippery surfaces, unlit areas etc. and take special care on ladders/into lofts.

Technique

When handling or lifting always use safe techniques - keep your back straight, bend your knees. Don't twist - move your feet, avoid bending forwards and sideways and keep the load as close to your body as possible.

Where possible transport the boiler using a sack truck or other suitable trolley.

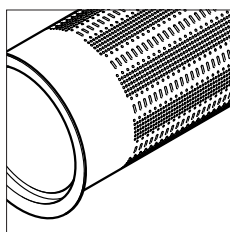
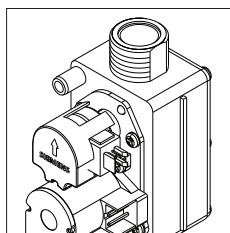
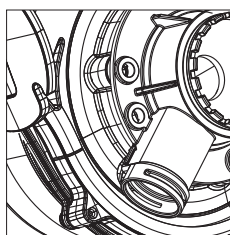
Always grip the boiler firmly, and before lifting feel where the weight is concentrated to establish the centre of gravity, repositioning yourself as necessary. See the 'Installation' section of these instructions for recommended lift points.

Remember

The circumstances of each installation are different. Always assess the risks associated with handling and lifting according to the individual conditions.

If at any time when installing the boiler you feel that you may have injured yourself STOP !!
DO NOT 'work through' the pain - you may cause further injury.

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



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1.0 Introduction

1.1 Description

1. The Baxi Platinum 2 Combi GA Range are fully automatic gas fired wall mounted condensing combination boilers. They are room sealed and fan assisted, and will serve central heating and mains fed domestic hot water.

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

28 model -	28 kW DHW 25.9 kW CH (Condensing)
33 model -	33 kW DHW 30.3 kW CH (Condensing)
40 model -	40 kW DHW 33.6 kW CH (Condensing)

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

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

5. The boiler data badge gives details of the model, serial number and Gas Council number and is situated on the inner door panel. It is visible when the case front panel is removed (Fig. 2).

6. The boiler is intended to be installed in residential / commercial / light industrial E.M.C. environments on a governed meter supply only.

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

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

1.2 Optional Extras

Various low voltage external controls are available as optional extras. Full details are contained in the relevant sales literature.

1.3 Contents of Pack

The pack contains:-

- Boiler
- Wall Plate inc. Taps
- Template
- Fittings & Literature Pack

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

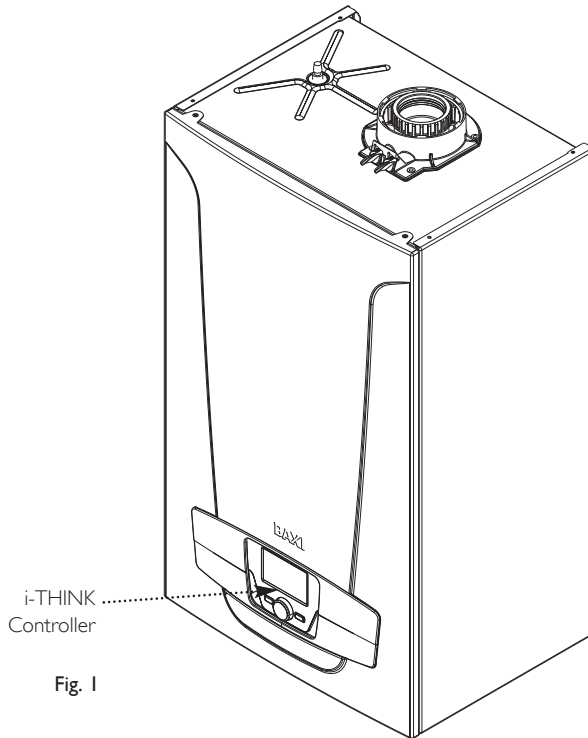


Fig. 1

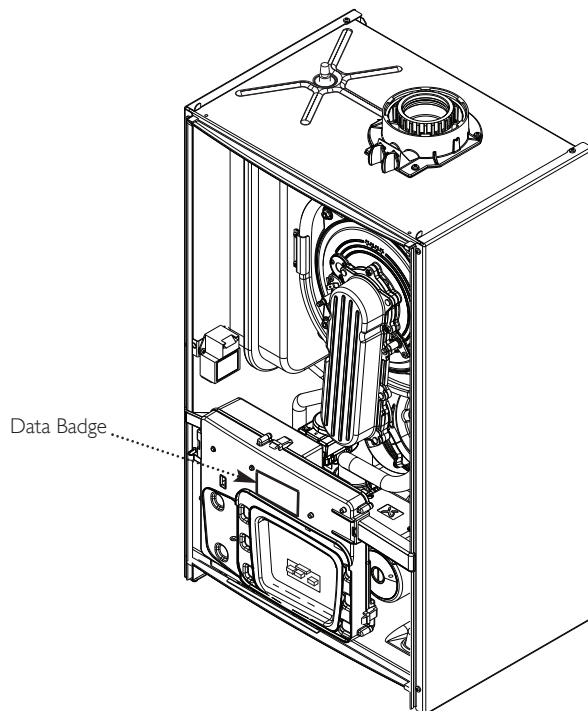
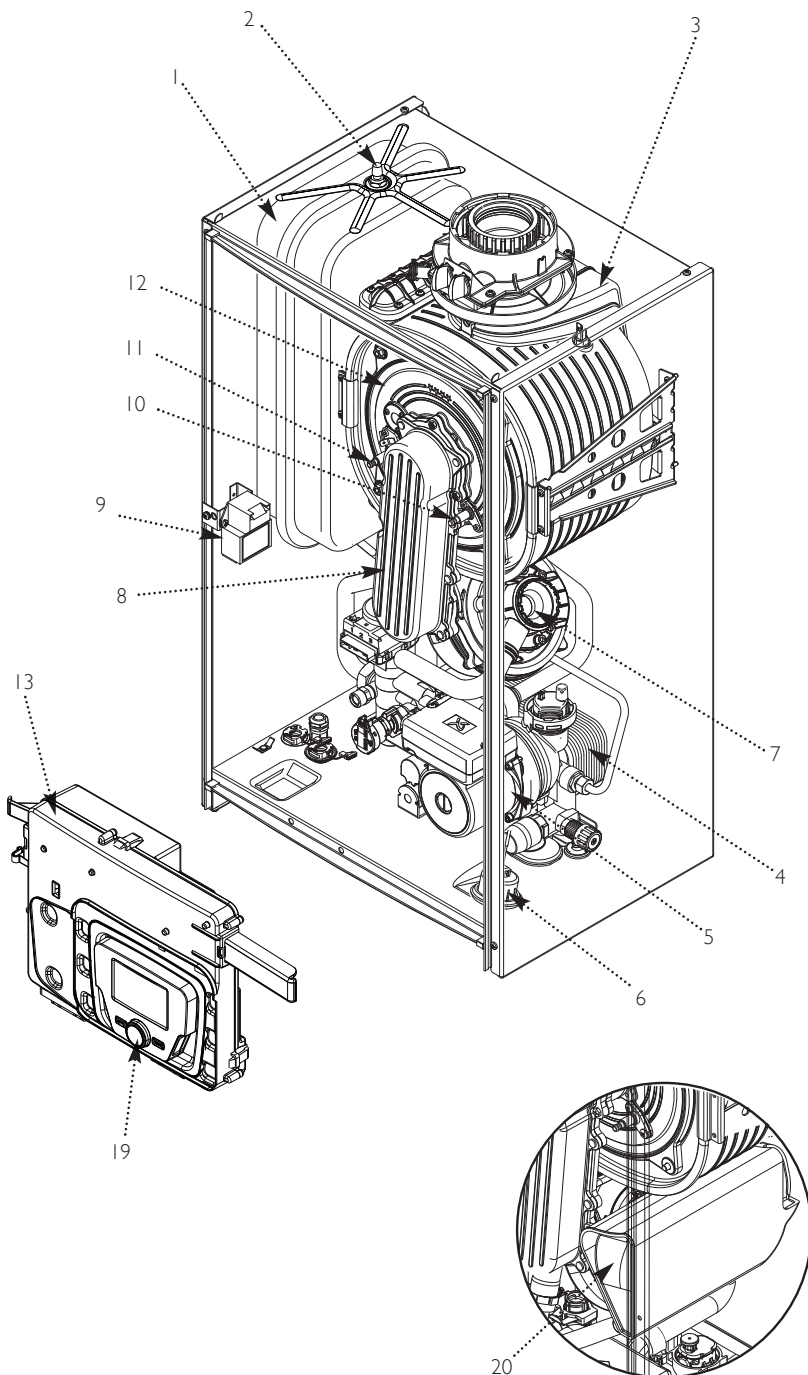


Fig. 2

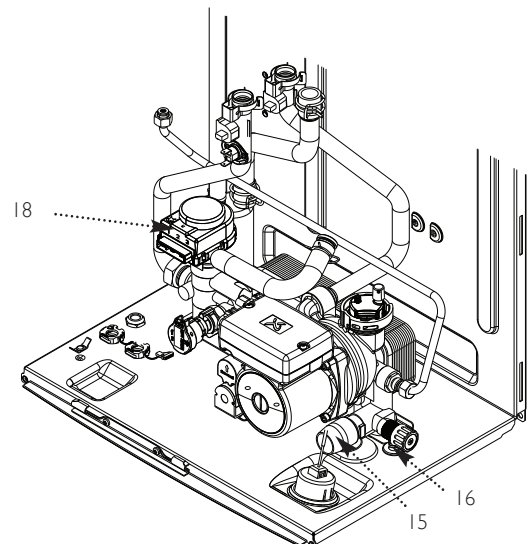
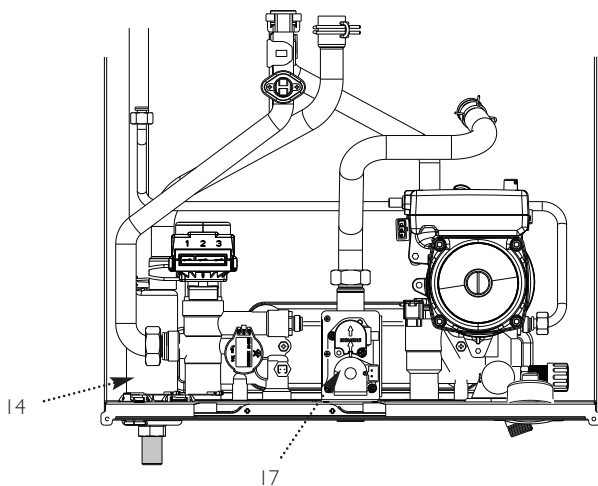
2.0 General Layout

2.1 Layout

1. Expansion Vessel
2. Expansion Vessel Valve (N.B. NOT air vent !)
3. Primary Heat Exchanger
4. DHW Plate Heat Exchanger
5. Pump with Automatic Air Vent
6. Central Heating System Pressure Gauge
7. Fan Assembly
8. Air/Gas Collector
9. Ignitor
10. Flame Sensing Electrode
11. Spark Ignition Electrode
12. Combustion Box Cover & Burner
13. Control Box Display
14. Condensate Trap
15. Safety Pressure Relief Valve
16. Drain Off Point
17. Gas Valve
18. Diverter Valve Motor
19. i-THINK Controller
20. Air Box (28 kW model ONLY)



Item 20 is on 28 kW model only. All illustrations show 33/40 models.



3.0 Appliance Operation

3.1 Central Heating Mode

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

3.2 Domestic Hot Water Mode

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

3.3 Frost Protection Mode

1. The frost protection mode is integral to the appliance and functions as long as there is power and gas supplied to the boiler. If the system temperature falls below 5° C then the boiler will fire on its minimum setting until a flow temperature of 30° C is reached. Further protection can be incorporated by using a system frost thermostat.

3.4 Pump Protection

1. The pump will automatically operate for 1 minute in every 24 hours to prevent sticking.

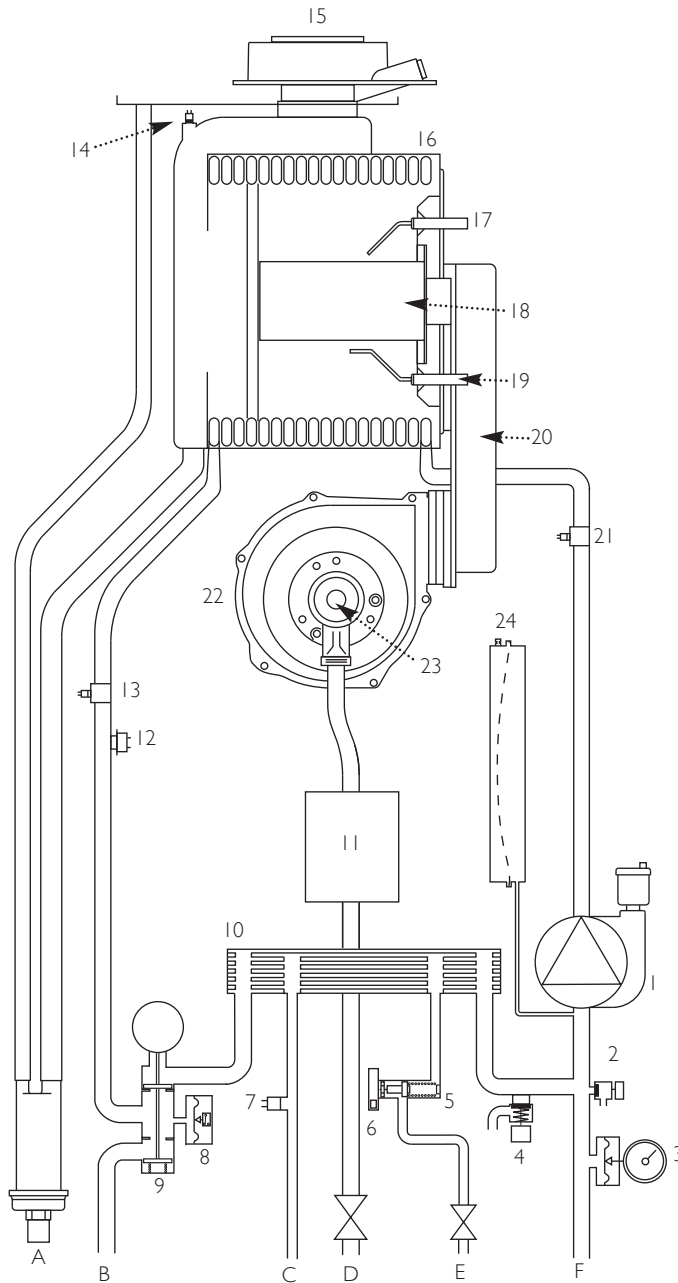


Fig. 3

Key

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

*On 40kW models the restrictor is in the Cold Water Inlet connection

Connections:-

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

4.1

Appliance Type	C ₁₃	C ₃₃	C ₄₃	C ₅₃
Appliance Category	CAT I _{2H}			
Heat Input CH (Net)		Max	Min	
28 model	kW	24	2.9	
33 model	kW	28	3.4	
40 model	kW	32	4.1	
Heat Output CH (Non-Condensing)		Max	Min	
28 model	kW	24	2.4	
33 model	kW	28	2.8	
40 model	kW	32	4.0	
Heat Output CH (Condensing)		Max	Min	
28 model	kW	25.3	3.1	
33 model	kW	29.6	3.6	
40 model	kW	33.8	4.4	
Heat Input DHW (Net)		Max		
28 model	kW	28.9		
33 model	kW	34.0		
40 model	kW	41.2		
Heat Output DHW		Max		
28 model	kW	28		
33 model	kW	33		
40 model	kW	40		
Max Gas Rate	(Natural Gas - G20) (After 10 mins)			
28 model	m³/h	2.96		
33 model	m³/h	3.49		
40 model	m³/h	4.23		
Inlet Pressure (Natural Gas - G20)				
mbar		20		

SEDBUK Declaration

SAP 2005 Seasonal Efficiency is 91.1%
SAP 2009 Annual Efficiency is 89%

This value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated has been certified by 0087.

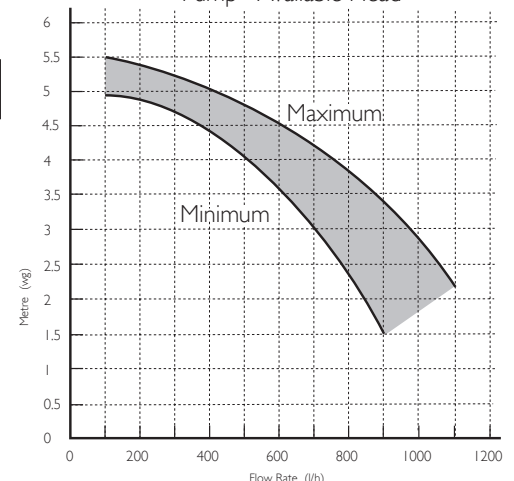
Electrical Supply	230V~ 50Hz (Appliance must be connected to an earthed supply)	
Power Consumption		
28 model W	135	
33 model W	145	
40 model W	140	
Electrical Protection	IPX5D	
External Fuse Rating	3A	
Internal Fuse Rating	F2L	
Condensate Drain	To accept 21.5mm (3/4 in) plastic waste pipe	
Flue Terminal Dimensions	Diameter	100mm
	Projection	125mm
Connections	copper tails	
Gas Supply	-	22mm
Heating Flow	-	22mm
Heating Return	-	22mm
Cold Water Inlet	-	15mm
Hot Water Outlet	-	15mm
Pressure Relief Discharge	-	15mm
Outercase Dimensions		
Casing Height	-	763mm
Overall Height Inc Flue Elbow	-	923mm
Casing Width	-	450mm
Casing Depth	-	353mm
Clearances		
Above Casing	175 mm Min	
Below Casing	150 mm* Min	
Front	450 mm Min (For Servicing)	
Front	5 mm Min (In Operation)	
L.H. Side	5 mm Min	
R.H. Side	5 mm Min	
*This is MINIMUM recommended dimension. Greater clearance will aid installation and maintenance.		
Weights		
Packaged Boiler Carton	(28)	43kg
Installation Lift Weight	(28)	37kg
Packaged Boiler Carton	(33)	44.5kg
Installation Lift Weight	(33)	38.5kg
Packaged Boiler Carton	(40)	45.5kg
Installation Lift Weight	(40)	39.5kg

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

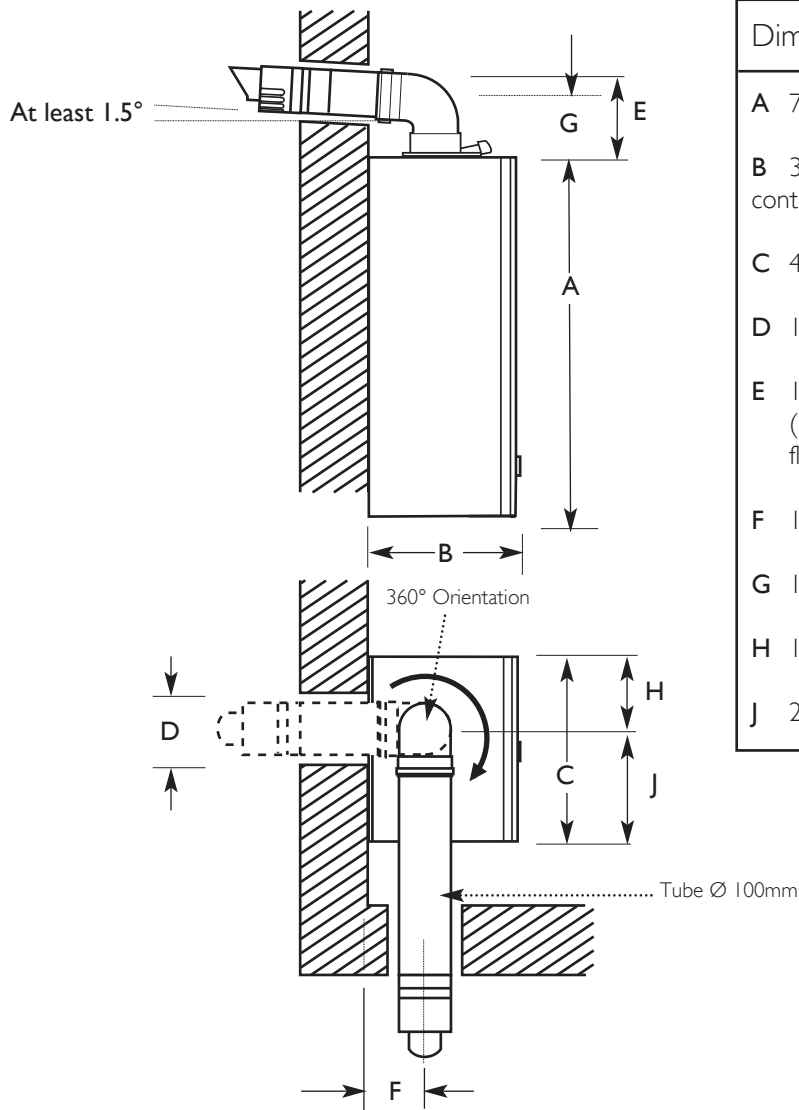
NO _x Class	5		
Central Heating Primary Circuit Pressures			
			bar
Safety Discharge			3
Max Operating			2.5
Min Operating			0.5
Recommended Operating Range			1-2
DHW Circuit Pressures			
			bar
Max Operating			8
Min Operating			0.15
Flow Rates	(28)	(33)	(40)
	l/min	l/min	l/min
DHW Flow Rate @ 30° C Rise	12.9	15.3	18.3
DHW Flow Rate @ 35° C Rise	11.5	13.5	16.4
Min Working			
DHW Flow Rate	2	2	2
IMPORTANT: Where Low Flow Taps or Fittings are intended to be used in the DHW system connected it is strongly recommended that the DHW flow rate DOES NOT fall below 2.5l/min. This will ensure reliable operation of the DHW function.			
Pump			
Available Head	See graph below		
Expansion Vessel	- (For Central Heating only. Integral with appliance)		
			bar
Min Pre-charge Pressure			0.5
	(28)	(33 & 40)	litre
Max Capacity of CH System			125
			155
Primary Water Content of Boiler (unpressurised)	2.5	2.8	
Temperatures			
C.H. Flow Temp (adjustable)	25°C to 80°C max (± 5°C)		
D.H.W. Flow Temp (adjustable)	35°C to 60°C max (± 5°C) dependent upon flow rate		

Pump

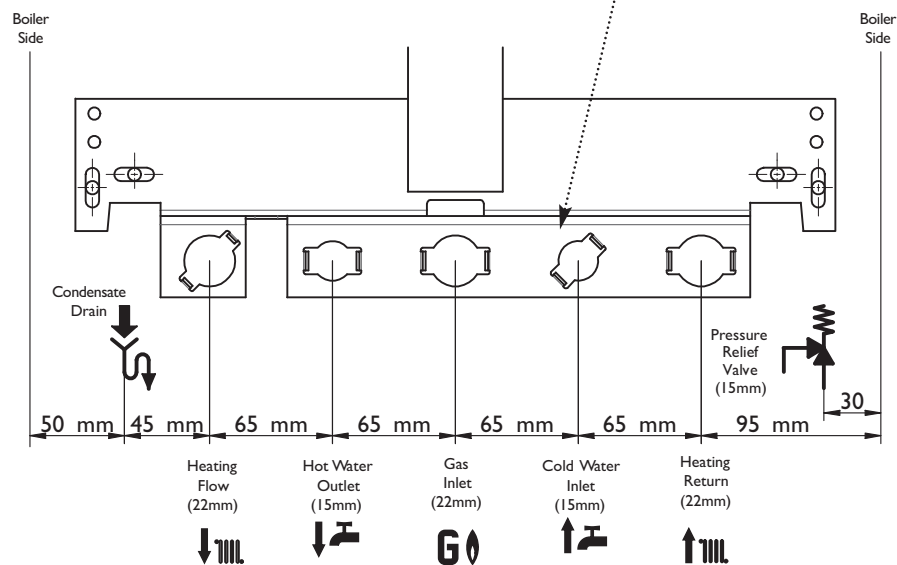
Pump - Available Head



5.0 Dimensions and Fixings



Tap Rail



6.0 System Details

6.1 Information

1. The Baxi Platinum 2 Combi GA Condensing Combination Boiler is a 'Water Byelaws Scheme - Approved Product'. To comply with the Water Byelaws your attention is drawn to the following installation requirements and notes (IRN).

- a) IRN 001 - See text of entry for installation requirements and notes.
- b) IRN 302 - Byelaw 14.

2. Reference to the WRc publications, 'Water fittings and materials directory' and 'Water supply byelaws guide' give full details of byelaws and the IRNs.

6.2 Treatment of Water Circulating Systems

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

2. Treatment must involve the use of a proprietary cleanser, such as Sentinel X300 or X400, or Fernox F3 and an inhibitor such as Sentinel X100 or Fernox MB-1.

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

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

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

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

6.3 Bypass

1. The boiler is fitted with an automatic integral bypass. Some systems may require an additional external bypass.

6.4 System Control

1. Further external controls (e.g. room thermostat or sensors) MUST be fitted to optimise the economical operation of the boiler in accordance with Part L of the Building Regulations (2010). A range of optional controls is available. Full details are contained in the relevant Sales Literature.

6.0 System Details

6.5 System Filling and Pressurising

1. A filling point connection on the central heating return pipework must be provided to facilitate initial filling and pressurising and also any subsequent water loss replacement/refilling.
2. A filling loop is supplied with the boiler. Follow the instructions provided with it.
3. The filling method adopted must be in accordance with all relevant water supply regulations and use approved equipment.
4. Your attention is drawn to:
for GB: Guidance G24.2 and recommendation R24.2 of the Water Regulations Guide.
for IE: the current edition of I.S. 813 "Domestic Gas Installations".
5. The sealed primary circuits may be filled or replenished by means of a temporary connection between the circuit and a supply pipe, provided a 'Listed' double check valve or other similarly effective backflow prevention device is permanently connected at the inlet to the circuit and the temporary connection is removed after use.

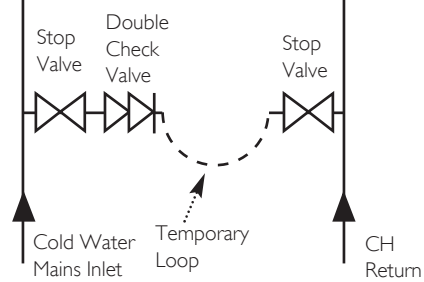
6.6 Expansion Vessel (Central Heating only)

1. The appliance expansion vessel is pre-charged to 0.5 bar. Therefore, the minimum cold fill pressure is 0.5 bar. The vessel is suitable for correct operation for system capacities up to 125 litres (28) or 155 litres (33/40). For greater system capacities an additional expansion vessel must be fitted. For GB refer to BS 7074 Pt 1. For IE, the current edition of I.S. 813 "Domestic Gas Installations".

6.7 Safety Pressure Relief Valve (Fig. 6)

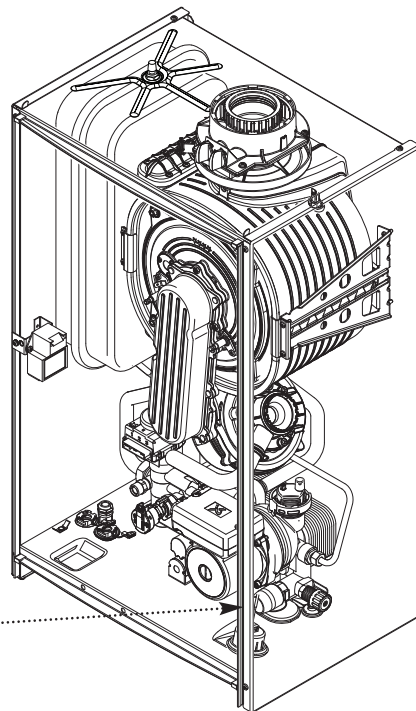
1. The pressure relief valve is set at 3 bar, therefore all pipework, fittings, etc. should be suitable for pressures in excess of 3 bar and temperature in excess of 100°C.
2. The pressure relief discharge pipe should be not less than 15mm dia, run continuously downward, and discharge outside the building, preferably over a drain. It should be routed in such a manner that no hazard occurs to occupants or causes damage to wiring or electrical components. The end of the pipe should terminate facing down and towards the wall (Fig. 6a).
3. The discharge must not be above a window, entrance or other public access. Consideration must be given to the possibility that boiling water/steam could discharge from the pipe.
4. A remote relief valve kit is available to enable the boiler to be installed in cellars or similar locations below outside ground level (kit no. 5121379).
5. A boiler discharge pump is available, part no. 720648301. This pump will dispose of both condensate & high temperature water from the relief valve. It has a maximum head of 5 metres.

Fig. 4



Filling Loop Connections
(Loop supplied with Boiler)

Fig. 5



Control Box removed for clarity

Fig. 6

Pressure Relief Valve

Discharge Pipe

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

Fig. 6a

6.8 Domestic Hot Water Circuit (Fig. 7)

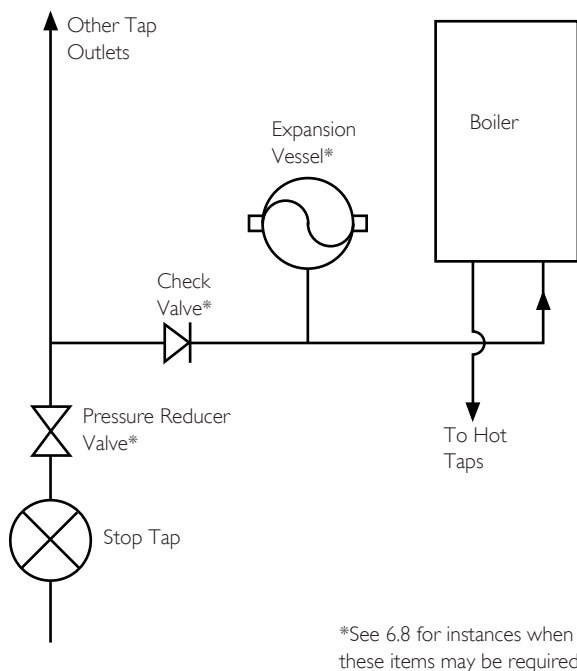


Fig. 7

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

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

2. Your attention is drawn to:
for GB: Guidance G17 to G24 and recommendation R17 to R24 of the Water Regulations Guide.
for IE: the current edition of I.S. 813 "Domestic Gas Installations".

3. The Water Regulations recommendations for England and Wales prohibits backflow from appliances into the wholesome water supply due to thermal expansion. However this type of instantaneous combination boiler, with less than 15 litres of stored capacity, does not require any backflow prevention device as any thermal expansion is accommodated within the appliance.

It is possible in certain circumstances that other cold water demands (e.g. washing machines, flushing of W.C.s) may affect the DHW function of the boiler. In these instances the fitting of a backflow prevention device and expansion vessel is recommended.

4. Also if there is an existing check valve, loose jumpered stop cock, water meter or water treatment device already fitted to the wholesome water supply connected to the boiler domestic hot water (DHW) inlet supply then a suitable expansion device may be required.

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

6.9 Showers

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

6.10 Hard Water Areas

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

7.0 Site Requirements

7.1 Location

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 7.3).

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

3. If the boiler is fitted in a room containing a bath or shower reference must be made to the relevant requirements. In GB this is the current I.E.E. Wiring Regulations and Building Regulations.

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

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

7.2 Clearances (Figs. 8 & 9)

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

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

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

7.3 Ventilation of Compartments

1. Where the appliance is installed in a cupboard or compartment, no air vents are required.

2. BS 5440: Part 2 refers to room sealed appliances installed in compartments. The appliance will run sufficiently cool without ventilation.

Fig. 8

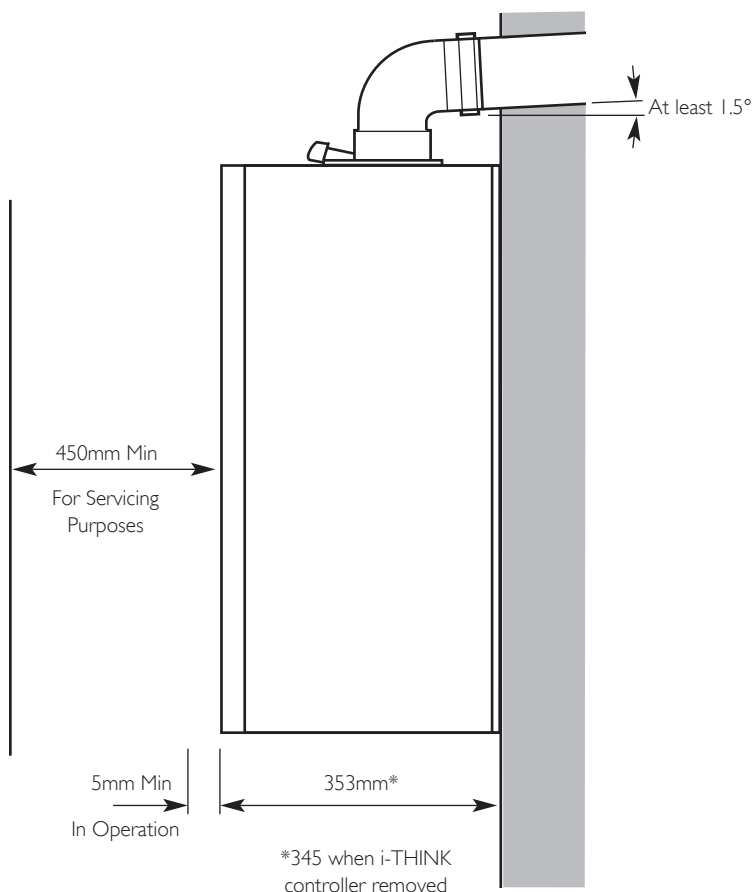
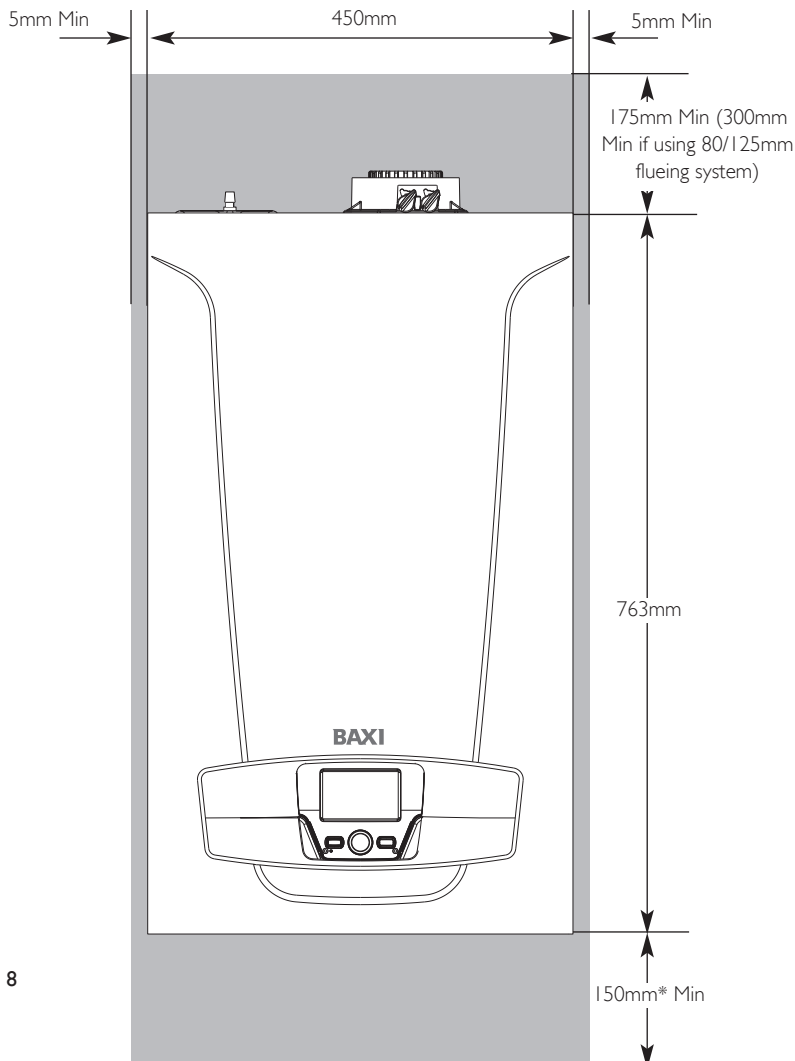


Fig. 9

7.0 Site Requirement

7.4 Gas Supply

1. The gas installation should be in accordance with the relevant standards. In GB this is BS 6891 or in IE the current edition of I.S. 813 "Domestic Gas Installations".
2. The connection to the appliance is a 22mm copper tail located at the rear of the gas service cock (Fig. 10).
3. Ensure that the pipework from the meter to the appliance is of adequate size, and the demands of any other gas appliances in the property are taken into consideration. Do not use pipes of a smaller diameter than the boiler gas connection (22mm).

7.5 Electrical Supply

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

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

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.

7.6 Bath & Shower Rooms

1. If the boiler is fitted in a room containing a bath or shower it can be fitted in zone 2, (Figs. A & B shows zone dimensions for a bathtub. For other examples refer to the Current I.E.E. Wiring Regulations) reference must be made to the relevant requirements.
In GB this is the current I.E.E. Wiring Regulations and Building Regulations.
In IE reference should be made to the current edition of I.S. 813 "Domestic Gas Installations" and the current ETCL rules.

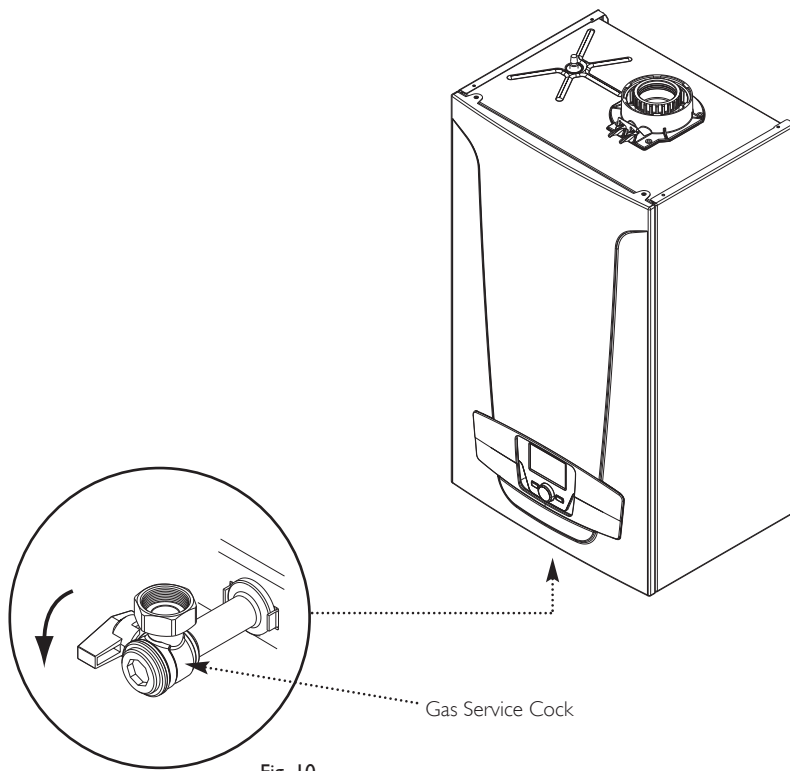


Fig. 10

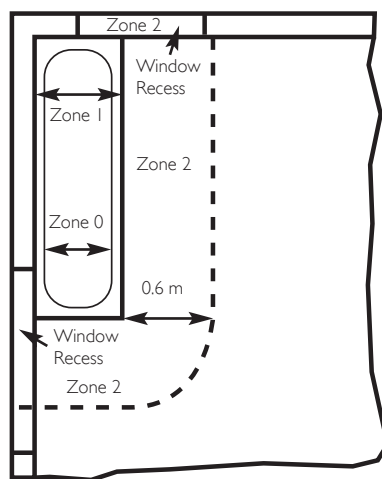


Fig. A In GB Only

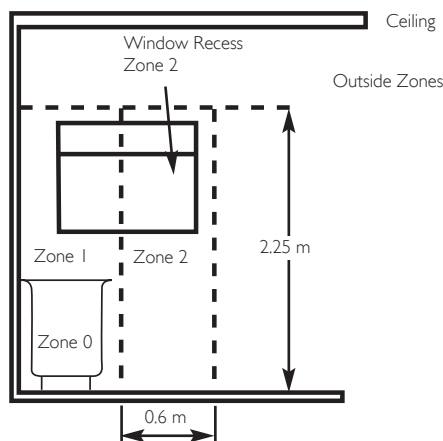


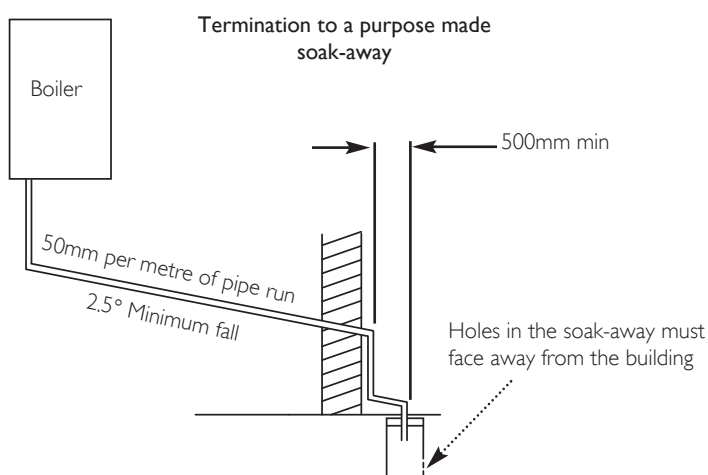
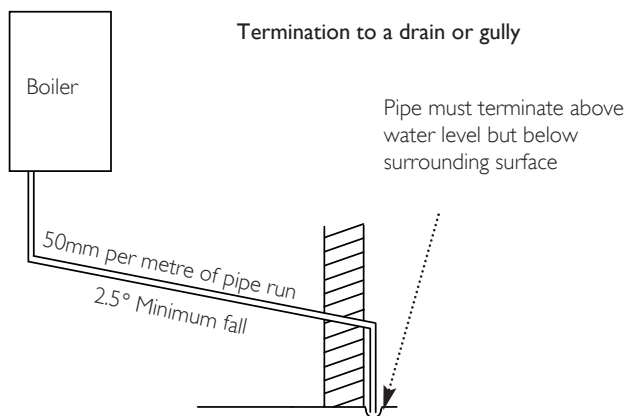
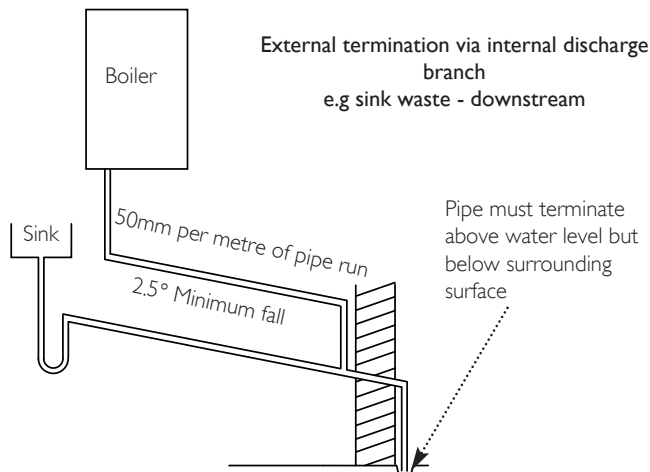
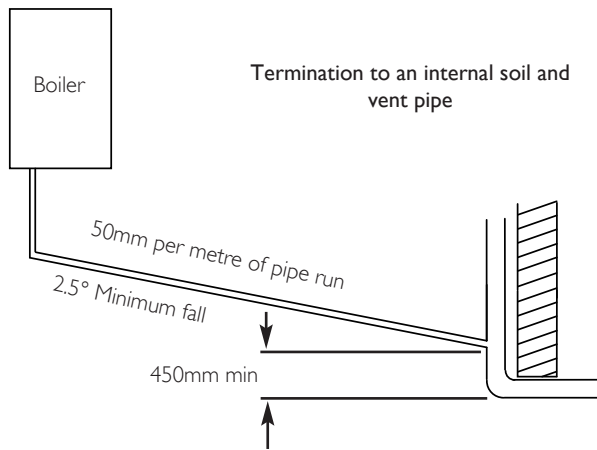
Fig. B In GB Only

7.7 Condensate Drain

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

CAREFUL CONSIDERATION MUST BE GIVEN TO THE POSSIBILITY OF THE PIPEWORK BEING SUBJECT TO FREEZING CONDITIONS AND APPROPRIATE MEASURES TAKEN TO PREVENT BLOCKAGE.

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.



1. The condensate outlet will accept 21.5mm (3/4in) plastic overflow pipe which should generally discharge internally into the household drainage system. If this is not possible, discharge into an outside drain is acceptable.

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

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

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

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

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

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

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

8. External runs **MUST** be a **MINIMUM** of 32mm and fully insulated.

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

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

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

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

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

¹ 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.

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

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

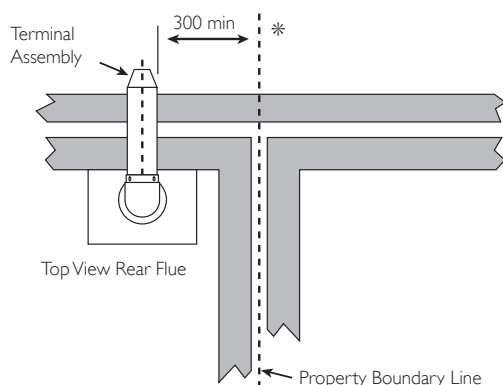


Fig. 11

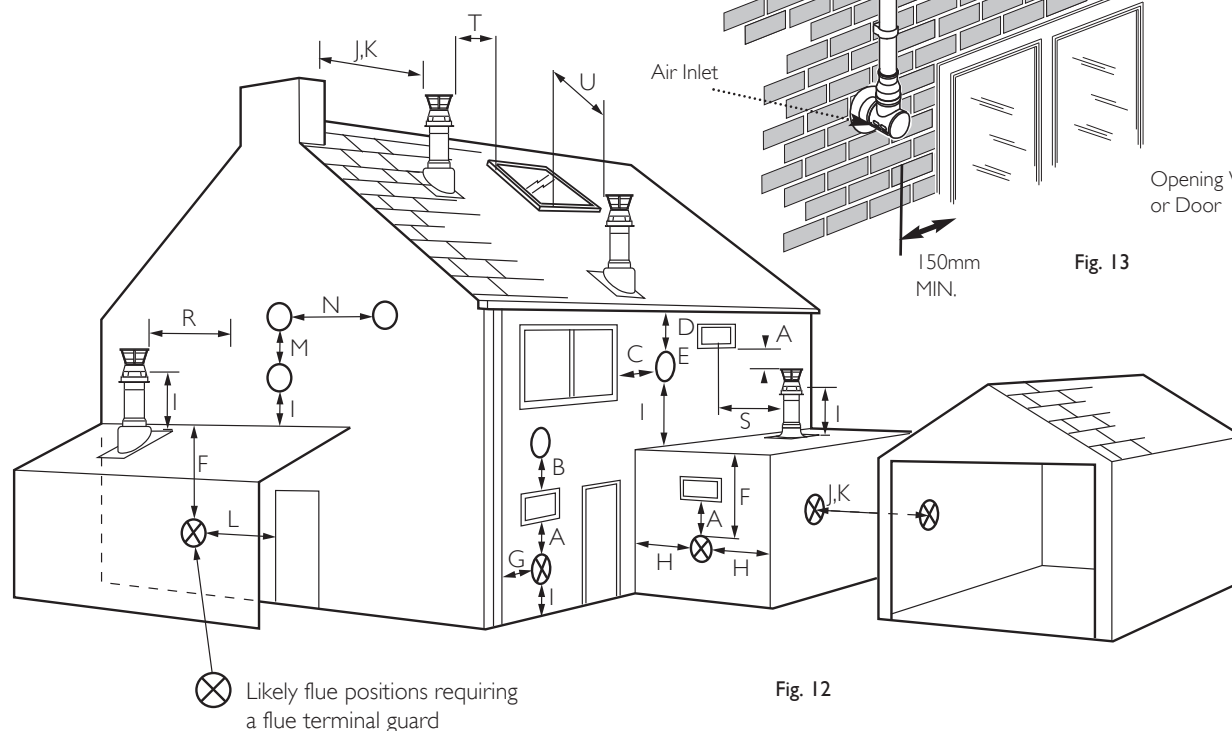


Fig. 12

7.0 Site Requirements

7.8 Flue

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

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

IMPORTANT:

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

*4. Reduction to the boundary is possible down to 25mm but flue deflector part no. 5111068 must be used.

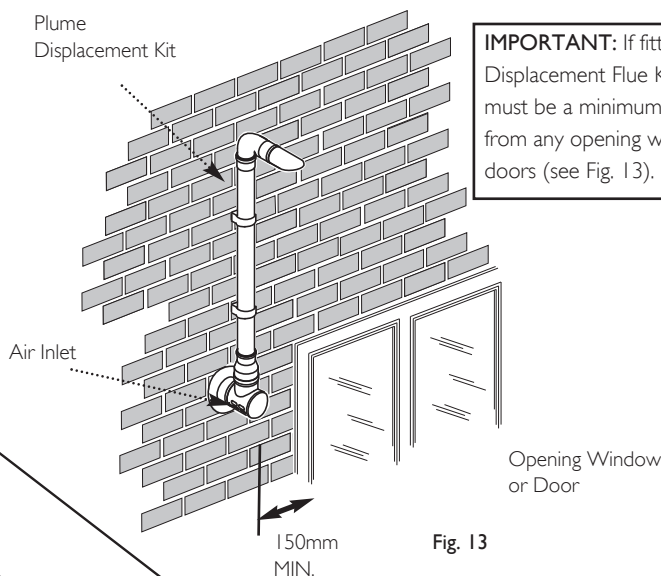


Fig. 13

IMPORTANT: If fitting a Plume Displacement Flue Kit, the air inlet must be a minimum of 150mm from any opening windows or doors (see Fig. 13).

8.0 Flue Options

8.1 Horizontal Flue Systems

1. The standard flue is suitable only for horizontal termination applications.
2. All fittings should be fully engaged. The approximate engagement is 40mm. Apply the lubricant supplied to the seal on each fitting to aid assembly.
3. Maximum permissible equivalent flue lengths are:-

	(60/100)	(80/125)
Horizontal Concentric	10 metres	20 metres
4. Any additional "in line" bends in the flue system must be taken into consideration. Their equivalent lengths are:-

Concentric Pipes:		
135° bend	0.5 metres	
93° bend	1.0 metres	
5. The elbow supplied with the standard horizontal telescopic flue kit is not included in any equivalent length calculations.

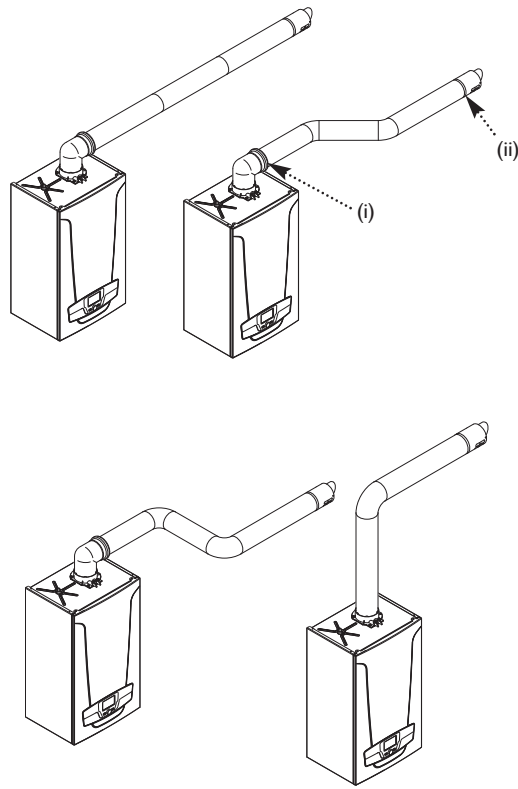
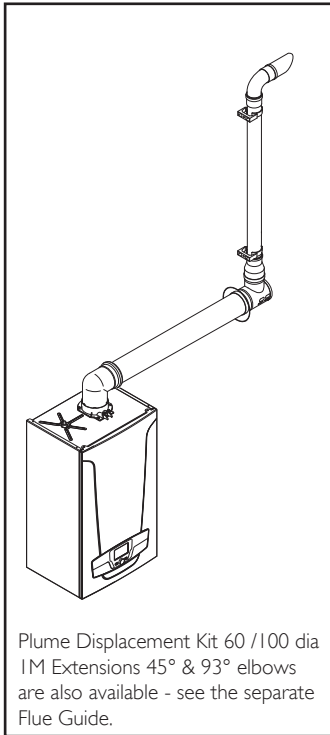
NOTE: Flue length is measured from point (i) to (ii) as shown.

IMPORTANT

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

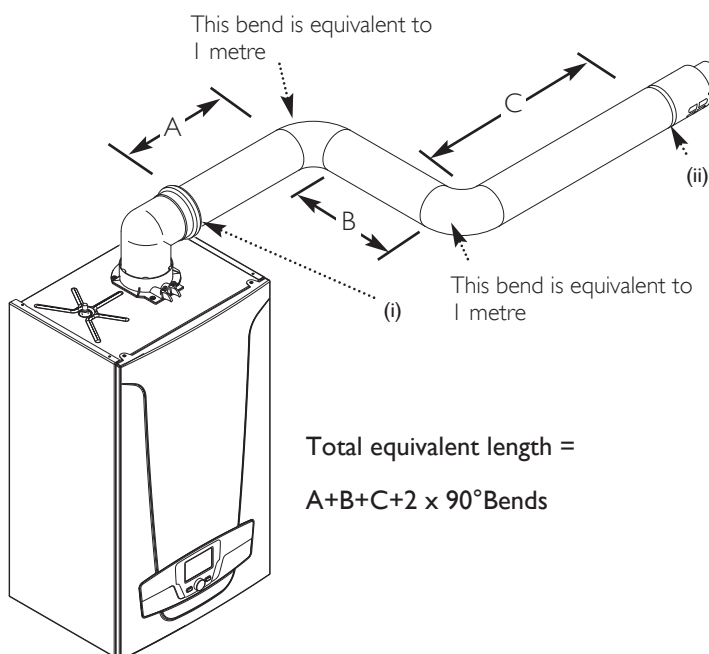
VOIDS - Consideration must be given to flue systems in voids and the provision of adequate access for subsequent periodic visual inspection.

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



Horizontal Flues

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



8.0 Flue Options

8.2 Flue Lengths

The standard horizontal telescopic flue kit allows for lengths between 315mm and 500mm from elbow to terminal without the need or cutting (Fig. 14).

Extensions of 250mm, 500mm & 1m are available.

The maximum permissible equivalent flue length is:

10 metres (60/100 system - vertical & horizontal)

20 metres (80/125 system - vertical & horizontal)

15 metres (80/80 twin pipe)

8 metres (60/100 system - vertical connected to ridge terminal)

8.3 Flue Trim

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

8.4 Terminal Guard (Fig. 15)

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

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

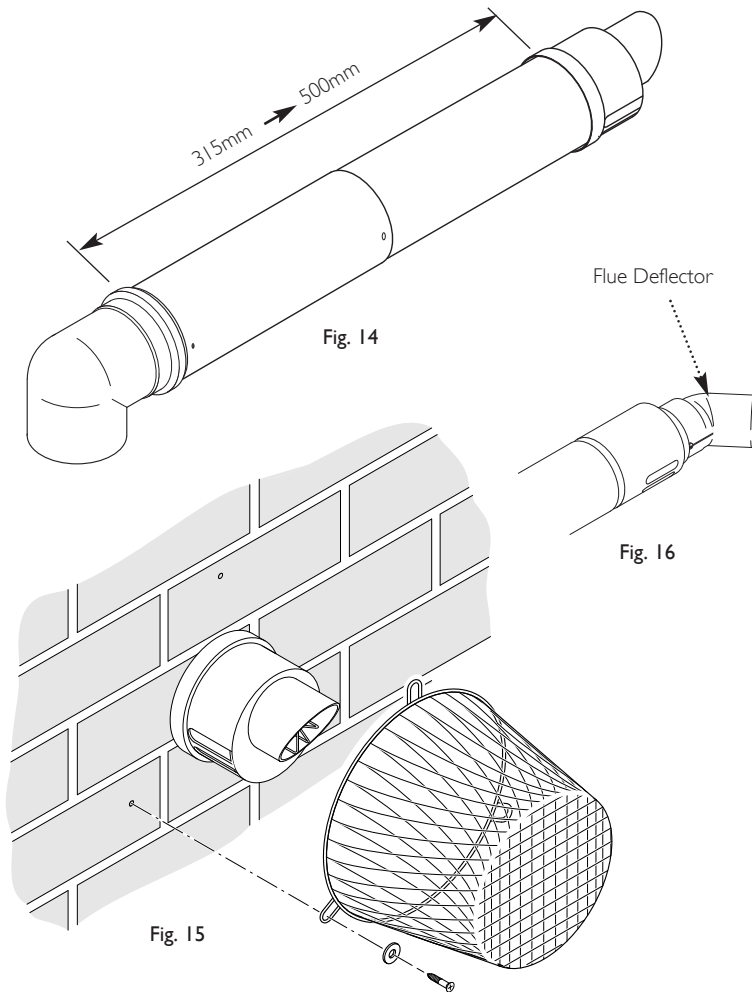
3. The flue terminal guard should be positioned centrally over the terminal and fixed as illustrated.

8.5 Flue Deflector (Fig. 16)

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

8.6 Flue Accessories

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



9.0 Installation

9.1 Unpacking & Initial Preparation

IMPORTANT

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

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

NOTE: A small amount of water may drain from the boiler in the upright position. If pre-plumbing it will be necessary to turn the carton over to access the wall plate first.

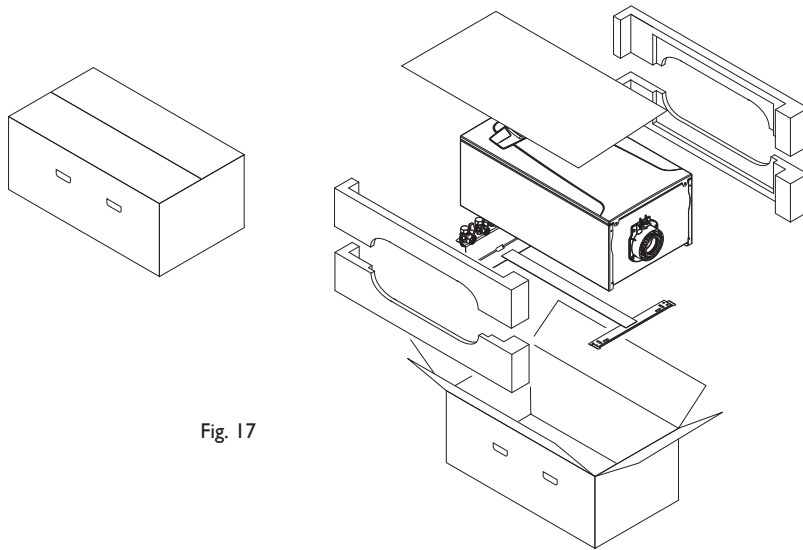
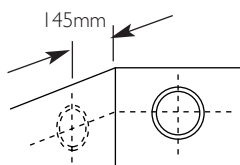
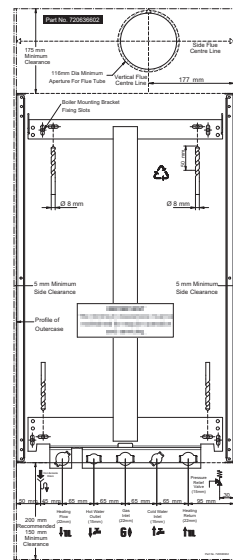


Fig. 17



For Side Flue Exit

Fig. 18



Wall Template

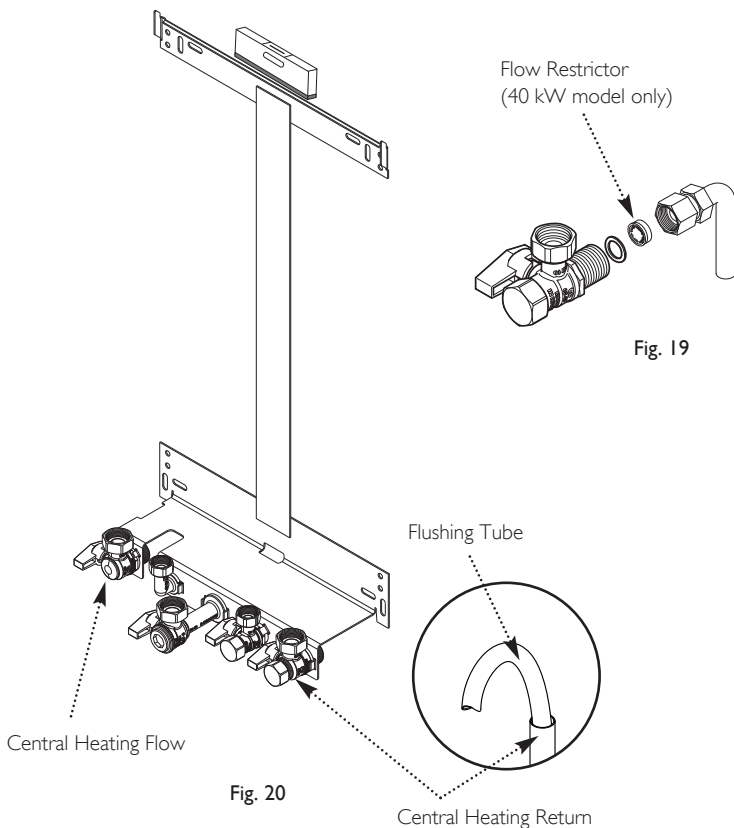


Fig. 19

Fig. 20

1. Remove staples, open flaps and remove the cardboard sheet. Remove the polystyrene side pieces and literature. Two people can then lift out the boiler (Fig. 17). Disengage the wall plate from the boiler.

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

3. Mark the position of the two most suitable fixing slots for the wall plate and boiler lower fixing holes.

4. Mark the position of the centre of the flue hole (rear exit). For side flue exit, mark as shown (Fig. 18).

5. If required, mark the position of the gas and water pipes. Remove the template.

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

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

8. Using a spirit level ensure that the plate is level before finally tightening the screws.

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

NOTE: 40kW models ONLY - ensure the flow restrictor is inserted in cold water inlet connection (Fig. 19). On other models the restrictor is factory fitted internally.

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

9.2 Flushing

1. Connect a tube to the heating flow or return pipe (Fig. 20).

2. Flush thoroughly (see System Details, Section 6.2).

9.0 Installation

9.3 Fitting The Boiler

1. Remove the sealing caps from the boiler connections.

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

2. Lift the boiler as indicated by the shaded areas. The boiler should be lifted by TWO PEOPLE. Engage the mounting bracket at the top rear of the boiler on the wall plate (Fig. 21) (see **Safe Manual Handling** page 5).

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

4. Tighten all the connections.

9.4 Fitting the Safety Pressure Relief Discharge Pipe (Fig. 22)

1. Remove the discharge pipe from the kit and determine the routing of the discharge pipe in the vicinity of the boiler. Make up as much of the pipework as is practical, including the discharge pipe supplied.

IMPORTANT: Make all soldered joints before connecting to the pressure relief valve. The relief valve is intentionally angled to the right of the boiler. **DO NOT** adjust the position of the valve. The discharge pipe must be installed before pressurising the system.

3. The pipework must be at least 15mm diameter and run continuously downwards to a discharge point outside the building. See section 6.7 for further details.

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

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

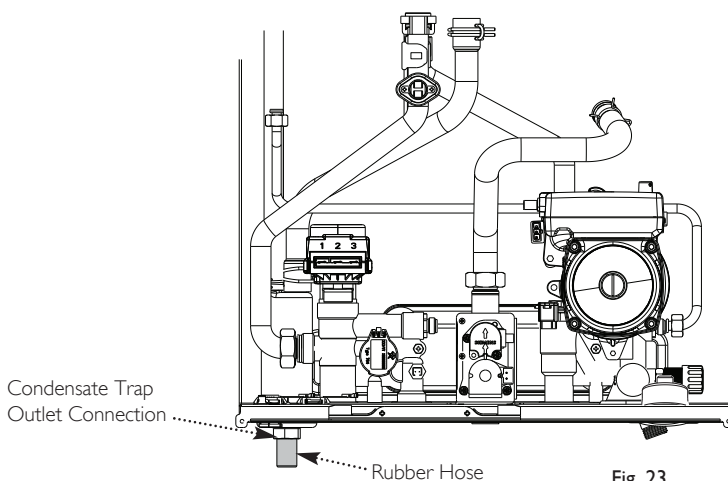
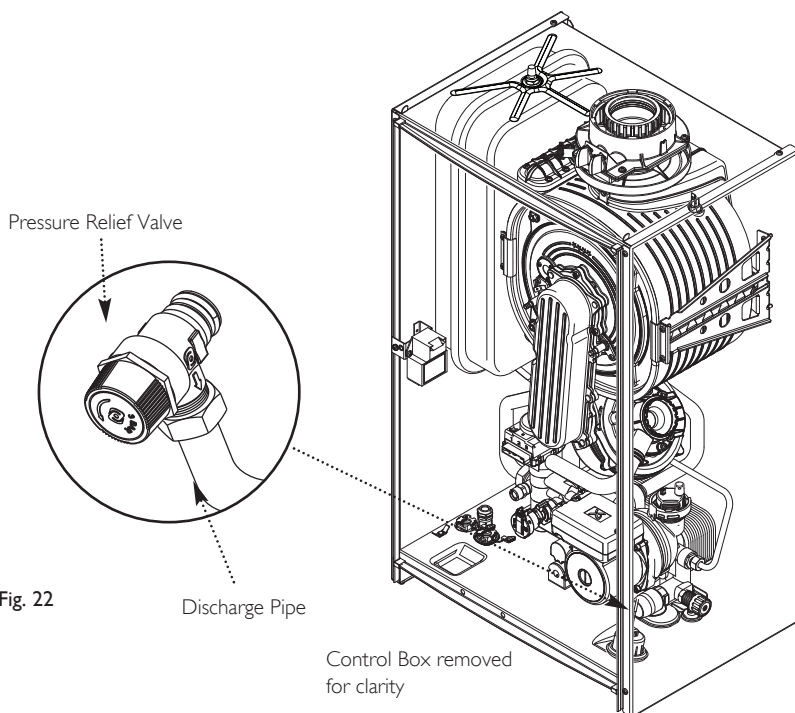
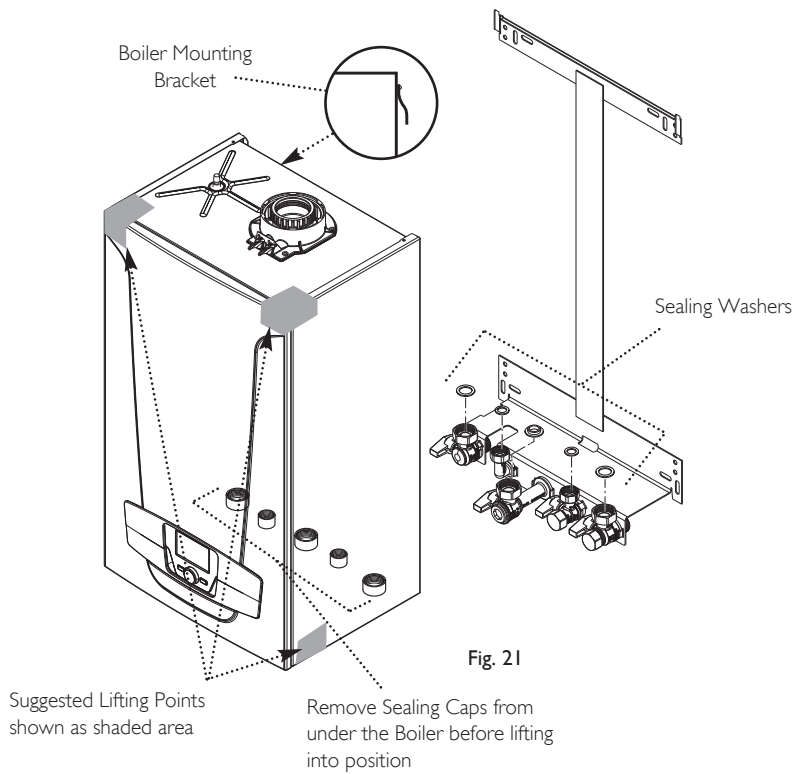
9.5 Condensate Drain (see section 7.7) (Fig. 23)

1. Using the short piece of rubber hose supplied, connect the condensate drain pipework to the boiler condensate trap outlet pipe. When connecting the hose, ensure that the condensate sump is not inadvertently unscrewed.

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

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

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



9.0 Installation

9.6 Fitting The Flue

HORIZONTAL TELESCOPIC FLUE

1. There are two telescopic sections, the Terminal Assembly and the Connection Assembly, a roll of sealing tape and two self tapping screws. A 93° elbow is also supplied. The outer duct of the Connection Assembly is painted white. On the Terminal Assembly the outer duct is unpainted.

2. The two sections can be adjusted to provide a length between 315mm and 500mm (Fig. 24) when measured from the flue elbow (there is 50mm engagement into the elbow).

3. Locate the flue elbow on the adaptor at the top of the boiler. Set the elbow to the required orientation (Fig. 25).

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

4. Measure the distance from the outside wall face to the elbow. This dimension will be known as 'X' (Fig. 25).

5. If the distance from the flue elbow to the outside face of the wall ('X' in Fig. 25) is less than 250mm the Connection Assembly can be discarded and the Terminal Assembly fitted directly into the elbow.

6. In instances where the dimension 'X' (Fig. 25) is between 250mm and 315mm it will be necessary to shorten the Terminal Assembly by careful cutting to accommodate walls of these thicknesses.

7. To dimension 'X' add 50mm. This dimension to be known as 'Y'.

8. Adjust the two telescopic sections to dimension 'Y' and seal the joint with the tape provided (Fig. 27). Ensure that the labels marked 'TOP' on the Terminal and Connection Assemblies are uppermost.

9. Using the clearance holes in the Connection Assembly secure it to the Terminal Assembly using the screws supplied (Fig. 28).

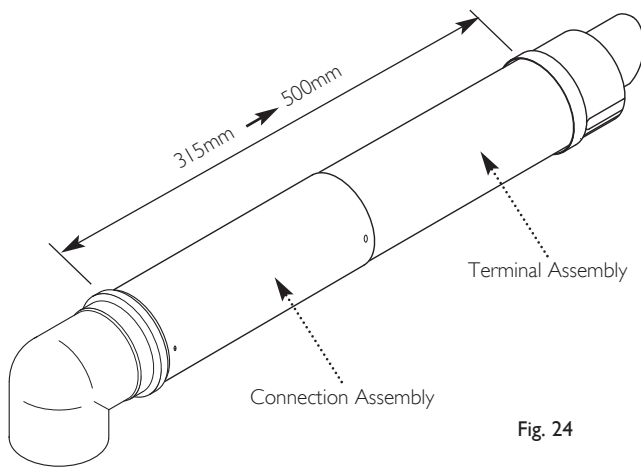


Fig. 24

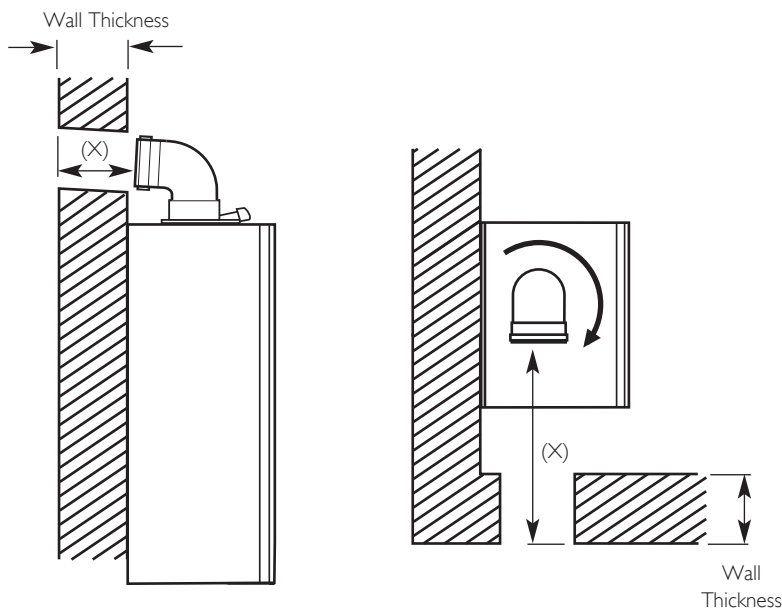


Fig. 25

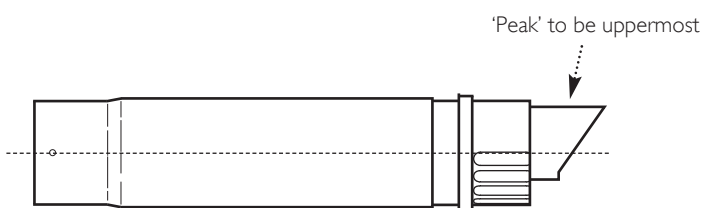


Fig. 26

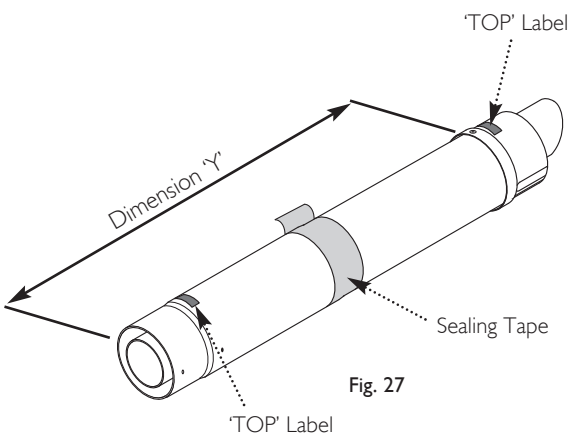


Fig. 27

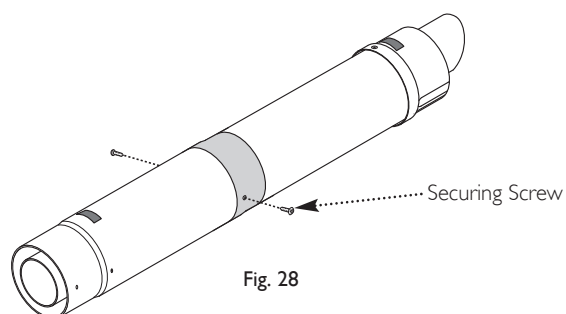


Fig. 28

9.0 Installation

9.6 Fitting the Flue (Cont)

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

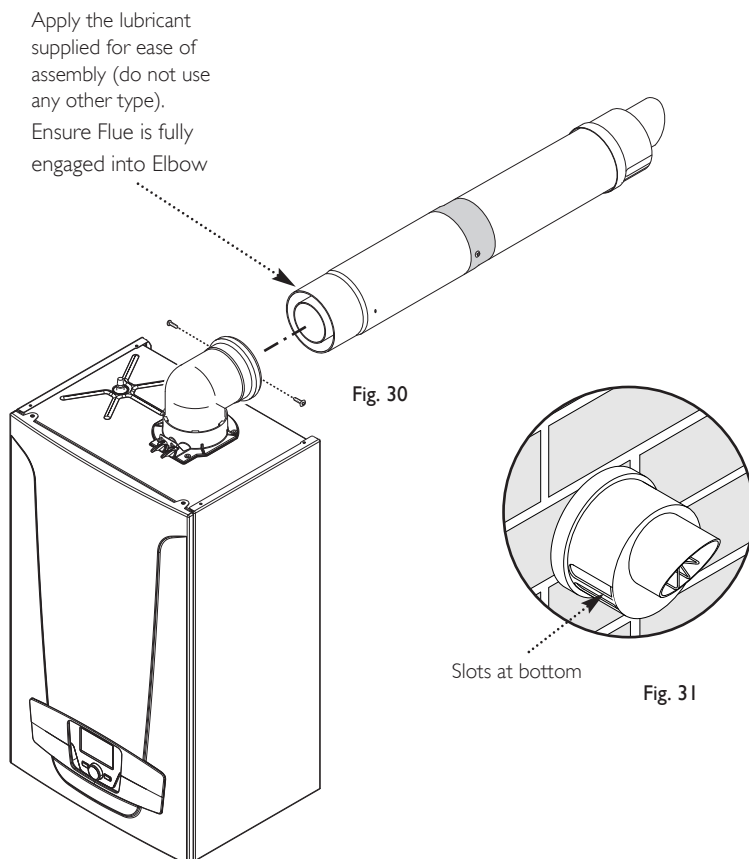
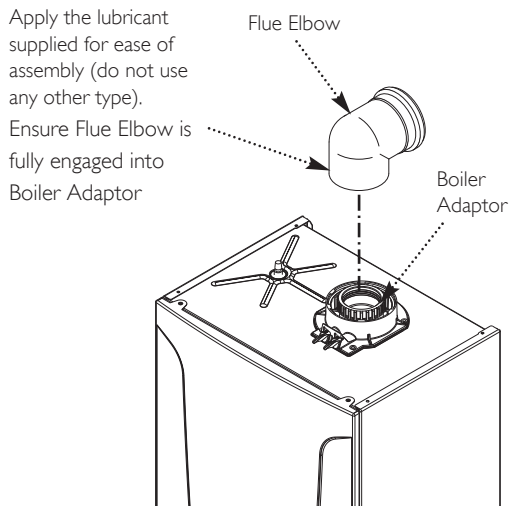
11. Draw the flue back through the wall and engage it in the elbow. It may be necessary to lubricate to ease assembly of the elbow and flue (Fig. 30).

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

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

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

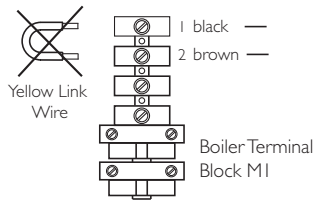
14. If necessary fit a terminal guard (see Section 8.4).



10.1 The De-Aeration Process

1. It is recommended that the De-Aeration Process is carried out prior to firing the boiler for the first time, as part of commissioning. This will assist in removing residual air from the boiler.

NOTE: If Low Voltage Controls are to be fitted the Link Wire must be used. However, do **NOT** connect this link wire across 1 & 2 of terminal block M1 (Fig. 32) until the De-Aeration process has been completed. **If the system controls have been wired ensure there is no heat demand before carrying out De-Aeration.** The outer case front panel does not need to be removed to carry out the De-Aeration procedure.



Link wire detail.

Fig. 32

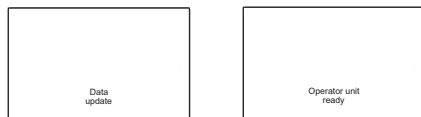
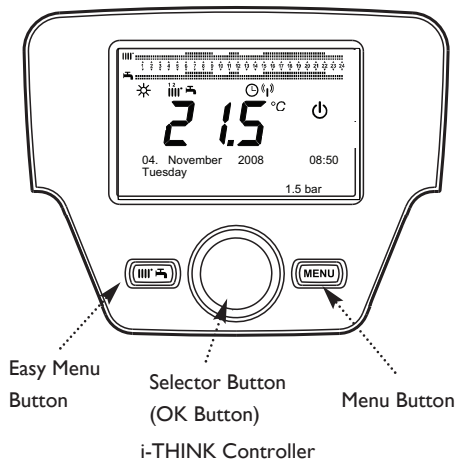




Fig. 33

2. Open the mains water supply to the boiler and all hot water taps to purge the DHW system. Ensure that the filling loop is connected and open, then open the heating flow and return valves on the boiler.
3. Open the cap on the automatic air vent on the pump body. The system must be flushed in accordance with BS 7593 (see Section 6.2) and the flushing agent manufacturers instructions.
4. Pressurise the system to 1.5 bar then close and disconnect the filling loop.
5. Turn the gas supply on and purge according to in GB BS 6891 and in IE I.S. 813 "Domestic Gas Installations". Test for gas tightness.
6. Connect the boiler flying lead to a fused spur and turn on the power. On initial power up, 'Test Mode' will be displayed briefly followed by 'Press OK button min 5s'. Press the Selector Button (OK Button) for a minimum of 5 seconds to continue. 'Data Update' will be displayed for several minutes whilst the i-THINK controller configures its settings. 'Operator unit ready' will be displayed when the process is complete (Fig. 33).
7. Using the Selector Button, select Language (English) and set the Year, Month, Day and Time.

De-Aeration Function

8. Press and hold the  and  buttons for 6 seconds. Fig. 2. 'Chimney sweep function' will be displayed. Turn the Selector Button (Fig. 33) until 'De-Aeration Function' is displayed. Press the Selector Button to activate. '312 De-Aeration Function' will be shown. The boiler pump will run for approximately 10 minutes, during which time the diverter valve will switch between heating & hot water. This will assist in venting air from the boiler. All radiators and bleed points must still be vented.
9. If the system pressure drops below 0.5bar during De-Aeration an error symbol 'E' will be displayed and the process will stop. The test will restart automatically once the system has been refilled and repressurised. The error will clear from the screen and '312 De-Aeration Function' will reappear. **NO BUTTONS ARE TO BE PRESSED.** As part of this process the pump may stop for a period before restarting. Once the test is complete the main screen display will reappear.

10. Turn off the power and remove the i-THINK controller. Remove the outer case front panel and refit the i-THINK Controller to the front of the boiler. The display will show 'Data Update' for approximately 20 seconds and 'Operator Unit Ready' will be displayed. The Operational Gas Inlet Pressure and Gas Rate can now be checked. See Section 12.2 of the boiler manual for details.

IMPORTANT: Gas Rate Measurement (Section 12.2 of the Boiler Instructions). The system MUST be completely cold to ensure the boiler is operating under full demand. If this cannot be maintained for sufficient time to measure the gas rate, remove the diverter valve motor and the DHW Hall sensor and fully open a hot tap(s) to prevent the boiler switching off by reaching temperature. Ensure the correct orientation of the Hall sensor when reassembling.

11. On completion, the boiler link wire can be connected if required and any remaining system wiring completed. Ensure all controls are calling for heat.

IMPORTANT: The combustion for this appliance has been checked, adjusted and preset at the factory for operation on the gas type specified on the appliance data plate. No measurement of the combustion is necessary. The measurement of the CO is not essential but if taken the results can be recorded in the Benchmark Document. The air/gas ratio valve is not adjustable.

11.1 Making The Electrical Connections

1. **IMPORTANT:** First remove the i-THINK controller, then undo the securing screws and lift the case front panel off. Ensure that power to the boiler is isolated.

2. Disengage the securing tab at the left and hinge the control box downwards. Undo the terminal block cover securing screw and remove the cover (Fig. 34).

3. The boiler is supplied with a mains input lead connected. Remove the grommet adjacent to the gland nut, pierce the diaphragm and insert the cable from the external control system.

4. Leave sufficient slack in the cables to allow the Control Box to be hinged fully open. Tighten the gland nut and refit the grommet.

NOTE: Both the Permanent Live and Neutral connections are fused. The mains supply is 230V ~ 50Hz fused at 3A (see Section 7.5 for further details).

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

6. When fitting the boiler to an existing installation it may be desired to retain the external control system already in place. In such circumstances the wiring should be as shown in Fig. 36 for example, and the i-THINK controller set to 'On' heating operation with no timed 'off' periods (as supplied). **NO LOW VOLTAGE EXTERNAL CONTROLS (except the Outdoor Sensor) CAN BE FITTED IN THIS INSTANCE!**

IMPORTANT: Any thermostat shown in Fig. 36 **MUST** be suitable for 230V switching.

7. The 230V supply at terminal 2 must be connected to the control system. The switched output from the control system must be connected to terminal 1. If the room thermostat being used incorporates an anticipator it **MUST** be wired as shown in Fig. 36.

8. Once wiring is complete replace all covers.

NOTE: If the i-THINK Controller is to be used as a timer or room unit, or if any of the available Low Voltage external controls (with the exception of the Outdoor Sensor) are to be used IT IS NOT POSSIBLE TO CONNECT A FROST OR PIPE THERMOSTAT TO TERMINAL M1. In these instances the link wire must be connected to 1 & 2 of Terminal M1.

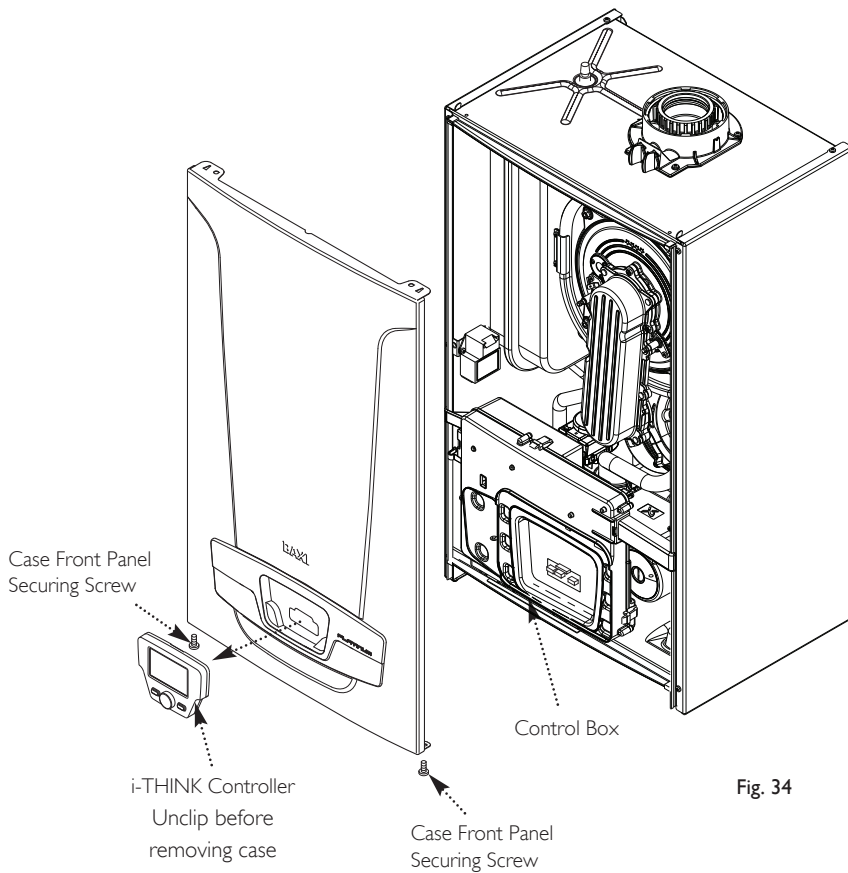


Fig. 34

NOTE: When using an existing external control system the 230V switched signal for external controls (Frost Stat - Room Stat - Timer) must always be taken from terminal 2 at the boiler. Live, Neutral and Earth to power these controls must be taken from the Fused Spur.

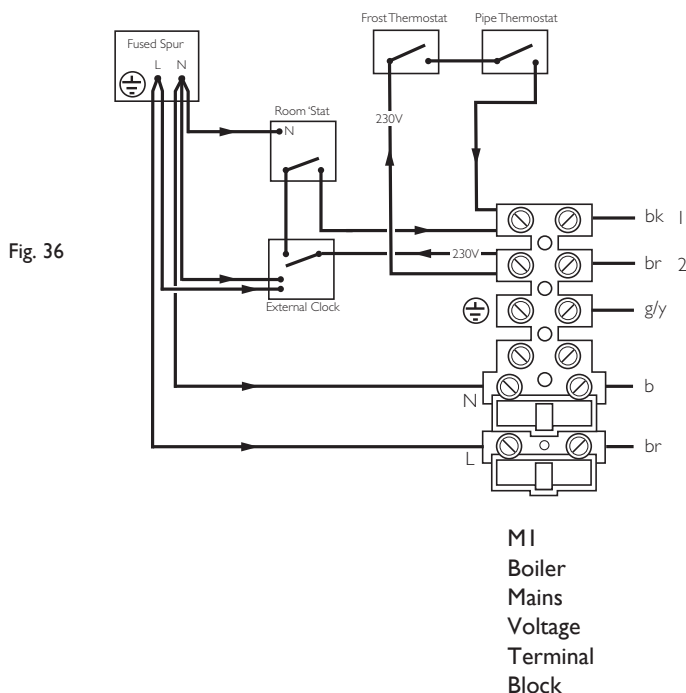


Fig. 36

11.2 Preliminary Electrical Checks

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

2. These should be performed using a suitable meter, and include checks for Earth Continuity, Resistance to Earth, Short Circuit and Polarity.

11.3 i-THINK Controller (Fig. 37)

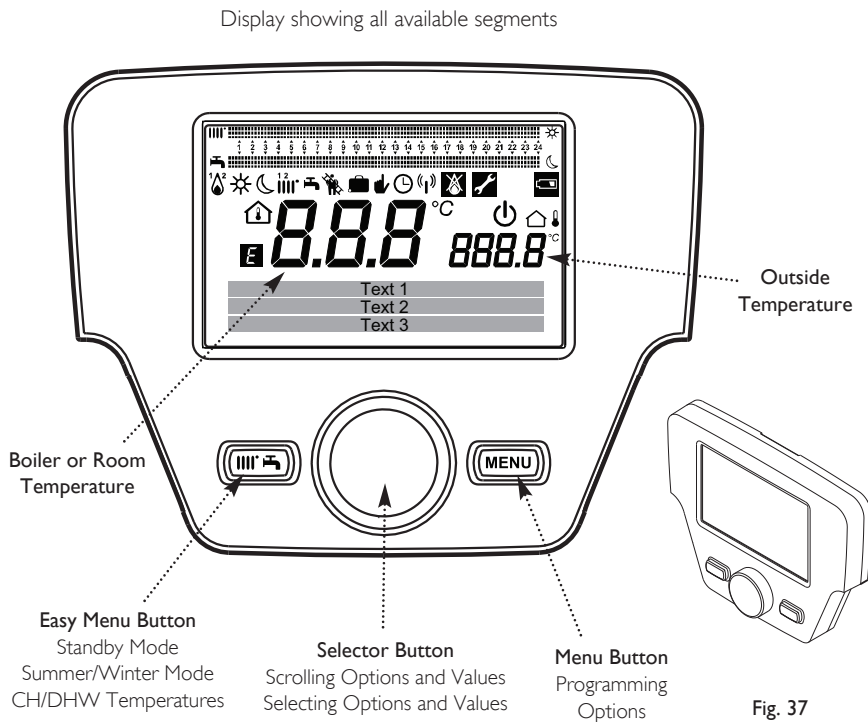


Fig. 37

i-THINK Controller

Display Descriptions

- Burner in Operation
- Heating to the Comfort Set Point
- Heating to the Reduced Set Point
- Central Heating Times Active
- DHW Times Active
- Combustion Check Function Active
- Holiday Function Active
- Manual Override
- Time Switch Function Active
- i-THINK Controller & Main PCB Established
- i-THINK Controller programmed as Room Sensor
- Error Message
- Stand By - Appliance On/Off (Off = Frost Protection)
- Outdoor Sensor Connected
- System / Appliance Attention Required
- Maintenance / Special Mode
- Change Battery (only if radio control fitted)

1. The i-THINK Controller is effectively an interface which allows the householder to programme the appliance to provide the desired comfort levels for the central heating and hot water. It also gives information on the appliance – error codes, primary system pressure etc.

2. Whilst the i-THINK Controller is on the appliance the standard screen displays the appliance flow temperature. External sensors/room thermostats can be connected to monitor and control the room and domestic hot water temperatures.

3. The i-THINK Controller may be removed from the appliance and used as a programmable room unit – in which case the standard screen displays the room temperature.

4. If the i-THINK Controller is to be used as a room unit it must be programmed so that the appliance will recognise it as such.

11.0 Electrical

11.4 Room Unit Installation Procedure

1. **Room unit location:** The wall cradle should be located in the main living room while giving consideration to the following points:

The place of installation should be chosen such that the sensor can capture the room temperature as accurately as possible without getting adversely affected by direct solar radiation or other heat or refrigeration sources (about 1.5 meters above the floor).

There must be sufficient clearance around the unit, enabling it to be fitted and removed.

IMPORTANT: A TRV should not be fitted to the radiator in the same room as the i-THINK Controller working as a Room Sensor. If a TRV has been installed on this radiator, the TRV must remain set open at all times, otherwise the house holder will experience room temperature control problems.

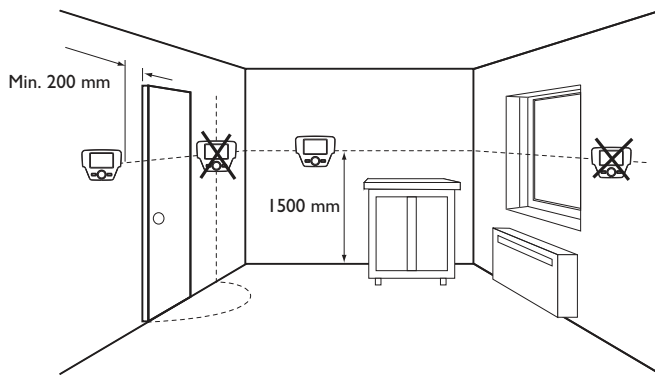


Fig. 40

IMPORTANT: DO NOT CONNECT any Low Voltage controls to Mains Voltage Terminal M1 ! Irreparable damage may occur !

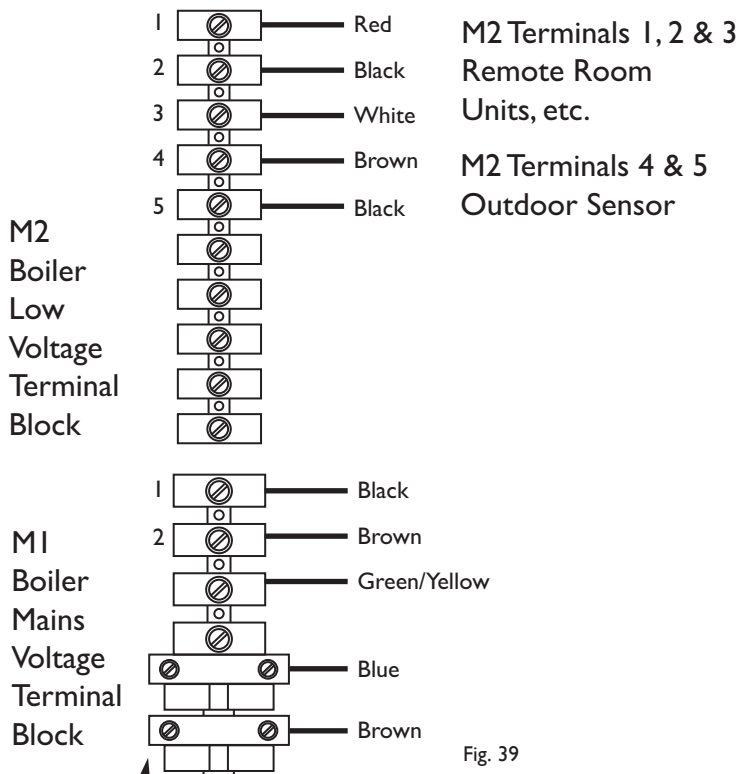
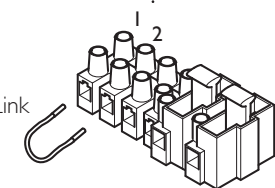


Fig. 39



Link Wire to be fitted across 1 & 2 of M1 when Low Voltage controls connected to M2.

11.5 Low Voltage Terminal M2

NOTE: Only Baxi supplied Low Voltage control accessories must be used with this boiler.

- When directed in Baxi control accessory literature to connect wiring to 'Boiler Wiring Terminals (see Boiler Manual for details)' the wiring **MUST** be connected to Terminal M2.
- Where used, the Outdoor Sensor must be connected to Terminals 4 & 5 of M2. Other Baxi Low Voltage control accessories must be connected to terminals 1, 2 & 3 of M2:-
Terminal 1 (Red) = Live (for display backlight)
Terminal 2 (Black) = Ground
Terminal 3 (White) = Data Signal
- When Baxi control accessories are connected to Terminal M2 the yellow link wire supplied in the boiler fitting kit **MUST** be fitted to terminals 1 & 2 of M1 Mains Voltage Terminal Block, except when using the Outdoor Sensor. This may be used with a 230V control system.

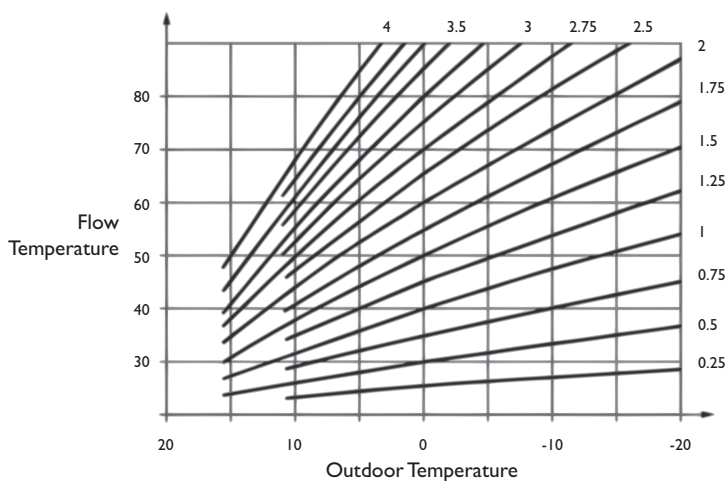
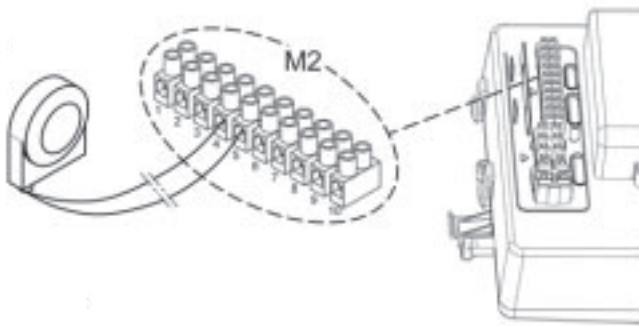
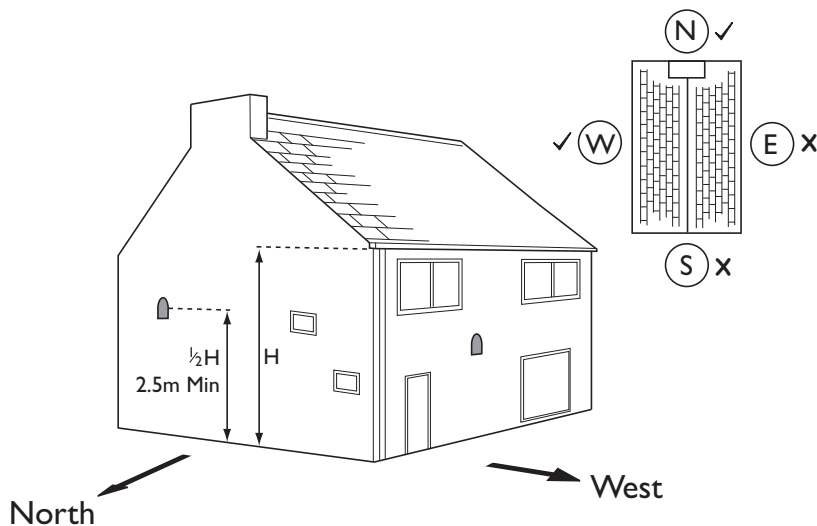
11.6 Positioning the Outdoor Sensor

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

NOTE: DO NOT position the sensor in direct sunlight !

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

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



11.7 Connecting the Outdoor Sensor

1. Ensure the electrical supply to the boiler is isolated and remove the i-THINK controller. Undo the securing screws and lift the case front panel off.

2. Disengage the securing tab and hinge the control box downwards. Undo the terminal block cover securing screw and remove the cover.

3. Remove one of the grommets, pierce the diaphragm and insert the wires from the Outdoor Sensor.

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

5. Connect the wires from the Outdoor Sensor (two core "bell wire" is suitable) to positions 4 & 5 on M2 as shown. Refit the cover.

6. When correctly connected the outside temperature and icon will be display on the i-THINK Controller.

11.8 Setting the Sensor Curve

1. The default curve is 1.5. If it is desired to change the curve, proceed as follows. Ensure that there is power to the boiler.

2. Press **[MENU]** and then press **[FAN]** and **[MENU]** for 6 seconds. 'Chimney sweep function' will be displayed.

3. Turn the Selector Button **[SEL]** until 'Commissioning' is displayed. Press the Selector Button.

4. Turn the Selector Button **[SEL]** until 'Temps/mode CH1' is displayed. Press the Selector Button.

5. Turn the Selector Button until 'Heating curve slope' is displayed and the number '720' is shown at the right of the screen.

6. Press the Selector Button **[SEL]** so that the number at the bottom right of the screen flashes. Turn the Selector Button until this number corresponds with the desired curve on the graph opposite.

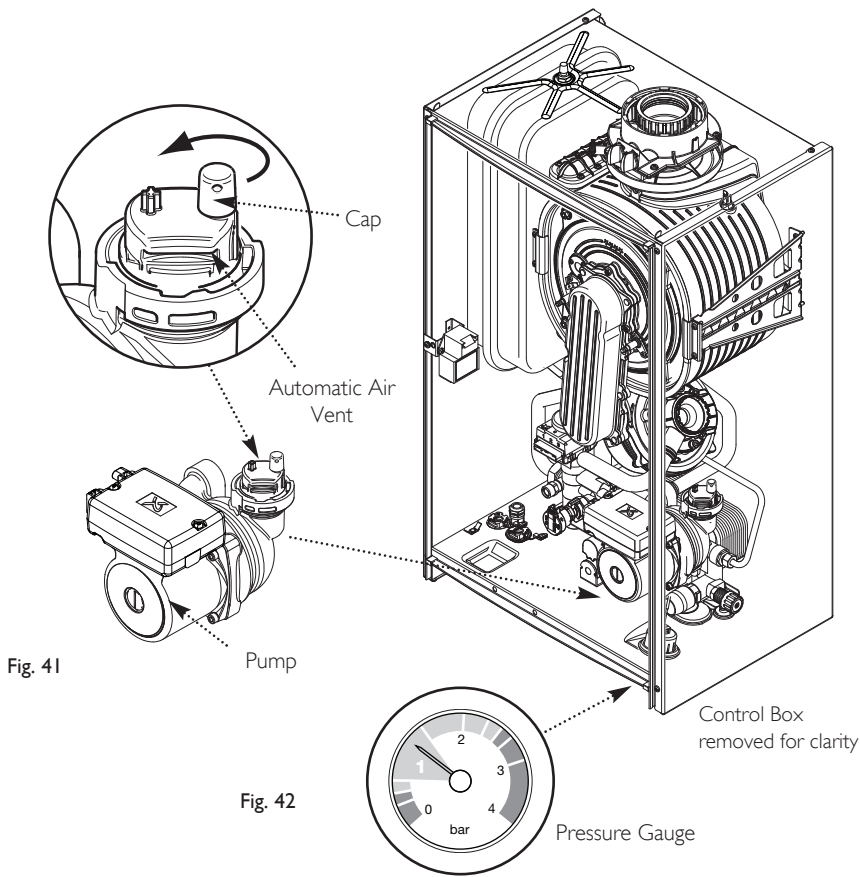
7. Press **[SEL]** to confirm and **[MENU]** to exit.

12.0 Commissioning

12.1 Commissioning the Boiler

It is recommended that the De-Aeration Process is carried out prior to firing the boiler for the first time, as part of commissioning. This will assist in removing residual air from the boiler.

1. Reference should be made to BS:EN 12828, 12831 & 14336 when commissioning the boiler.
2. At the time of commissioning, complete all relevant sections of the Benchmark Checklist at the rear of this publications.
3. Open the mains water supply to the boiler and all hot water taps to purge the DHW system. Ensure that the filling loop is connected and open, then open the heating flow and return valves on the boiler.
4. Open the cap on the automatic air vent on the pump body (Fig. 41). The system must be flushed in accordance with BS 7593 (see Section 6.2) and the flushing agent manufacturers instructions.
5. Pressurise the system to 1.5 bar (Fig. 42) then close and disconnect the filling loop.
6. Turn the gas supply on and purge according to in GB BS 6891 and in IE I.S. 813 "Domestic Gas Installations". Test for gas tightness.



12.0 Commissioning

12.2 Check the Operational (Working) Gas Inlet Pressure & Gas Rate

IMPORTANT: The system MUST be completely cold to ensure the boiler is operating under full demand. If this cannot be maintained for sufficient time to measure the gas rate, remove the diverter valve motor and Hall effect sensor and fully open a hot tap(s) to prevent the boiler switching off by reaching maximum temperature.

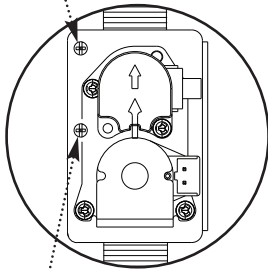
1. To set the boiler to operate at maximum rate ensure all external controls e.g. room stat, timer etc. are calling for heat and turn on the mains electrical supply.

2. With the boiler operating in the maximum rate condition check that the operational (working) gas pressure at the inlet gas pressure test point is in accordance with B.S. 6798 & B.S. 6891.

3. Ensure that this inlet pressure can be obtained with all other gas appliances in the property working.

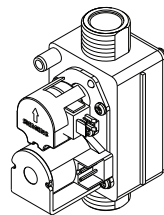
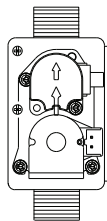
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DO NOT check gas pressure here



Inlet Gas Pressure Test Point

Fig. 43



Control Box removed for clarity



Diverter Valve Motor

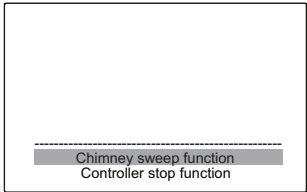
Retaining Clip

Hall Effect Sensor

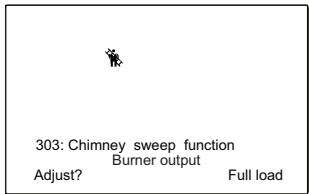
Fig. 43a


12.2 Check the Operational (Working) Gas Inlet Pressure & Gas Rate (cont)

4. Press  and  for 6 seconds. 'Chimney sweep function' will be displayed.



5. Press the Selector Button . Chimney sweep function on and the display screen will appear briefly until the screen below appears.





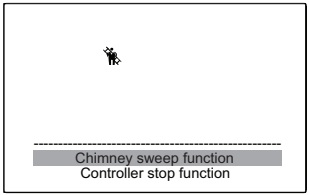
6. Press the Selector Button . Rotate the button either clockwise or anticlockwise until 'Full Load' or 'Partial Load' is displayed. Press the button to select.

Measure the Gas Rate

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

28 kW model	2.96 m ³ /h
33 kW model	3.49 m ³ /h
40 kW model	4.23 m ³ /h

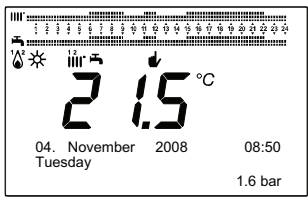
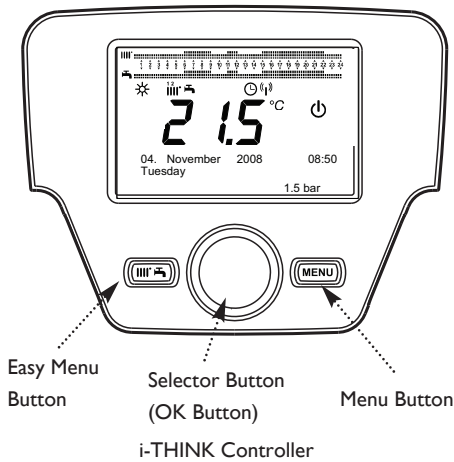
8. To deactivate the function press  and  for 6 seconds. The screen below appears.



9. Press the Selector Button  to turn off. Chimney sweep function off will appear briefly and then wait until the display screen is shown.

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

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



Display Screen

Fig. 43b

13.1 Completion

1. Replace the case front panel, and secure with the screws previously removed. Re-fit the i-THINK Controller.
2. This publication must be handed to the user for safe keeping and each subsequent regular service visit recorded.
3. Set the central heating and hot water temperatures to the requirements of the user. Instruct the user in the operation of the boiler and system.
4. Instruct the user in the operation of the boiler controls. Hand over the i-THINK Set Up Guided/User's Operating/Important Warranty booklet and the Installation & Servicing Instructions, giving advice on the necessity of regular servicing.
5. Demonstrate to the user the action required if a gas leak occurs or is suspected. Show them how to turn off the gas supply at the meter control, and advise them not to operate electric light or power switches, and to ventilate the property.
6. Show the user the location of the system control isolation switch, and demonstrate its operation.
7. Advise the user that they may observe a plume of vapour from the flue terminal, and that it is part of the normal operation of the boiler.

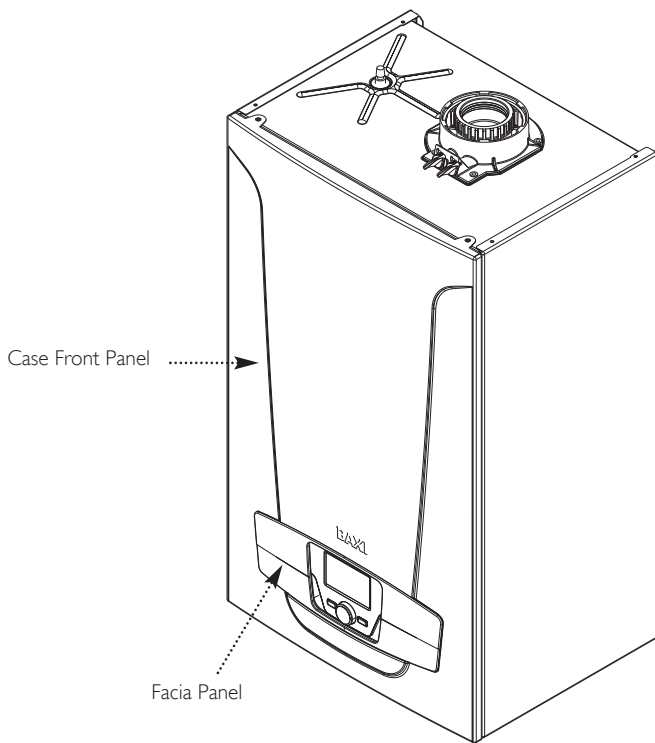


Fig. 44

14.0 Servicing

14.1 Annual Servicing

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

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

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

- The integrity of the complete flue system and the flue seals.
- The integrity of the boiler combustion circuit and relevant seals as described in Section 14.2.
- The operational gas inlet pressure as described in Section 12.2.1 to 12.2.7 and the gas rate as described in 11.2.8.
- The combustion performance as described in 'Check the Combustion Performance' (14.1.4 to 14.1.6 below).

3. Competence to carry out Checking Combustion Performance

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

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

Check the Combustion Performance (CO/CO₂ ratio)

4. Set the boiler to operate at maximum rate as described in Section 16.1.1 to 16.1.6.

5. Remove the plug from the flue sampling point, insert the analyser probe and obtain the CO/CO₂ ratio. **This must be less than 0.004.**

6. If the combustion reading (CO/CO₂ ratio) is greater than this, and the integrity of the complete flue system and combustion circuit seals has been verified, and the inlet gas pressure and gas rate are satisfactory either:

- Perform the 'Annual Servicing - Inspection' (Section 14.2) & re-check
- Adjust the gas valve (Section 16.0) & re-check
- Replace the gas valve (Section 15.23) & re-check

14.2 Annual Servicing - Inspection

1. Ensure that the boiler is cool.

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

3. Remove the screws securing the case front panel. Lift the panel slightly to disengage it from the studs on top of the case (Fig. 45) and hinge down the Control Box.

4. Disconnect the condensate drain pipe and unscrew the sump from the bottom of the condensate trap assembly (Fig. 46). Remove any deposits from the sump and trap. Clean as necessary and replace the sump.

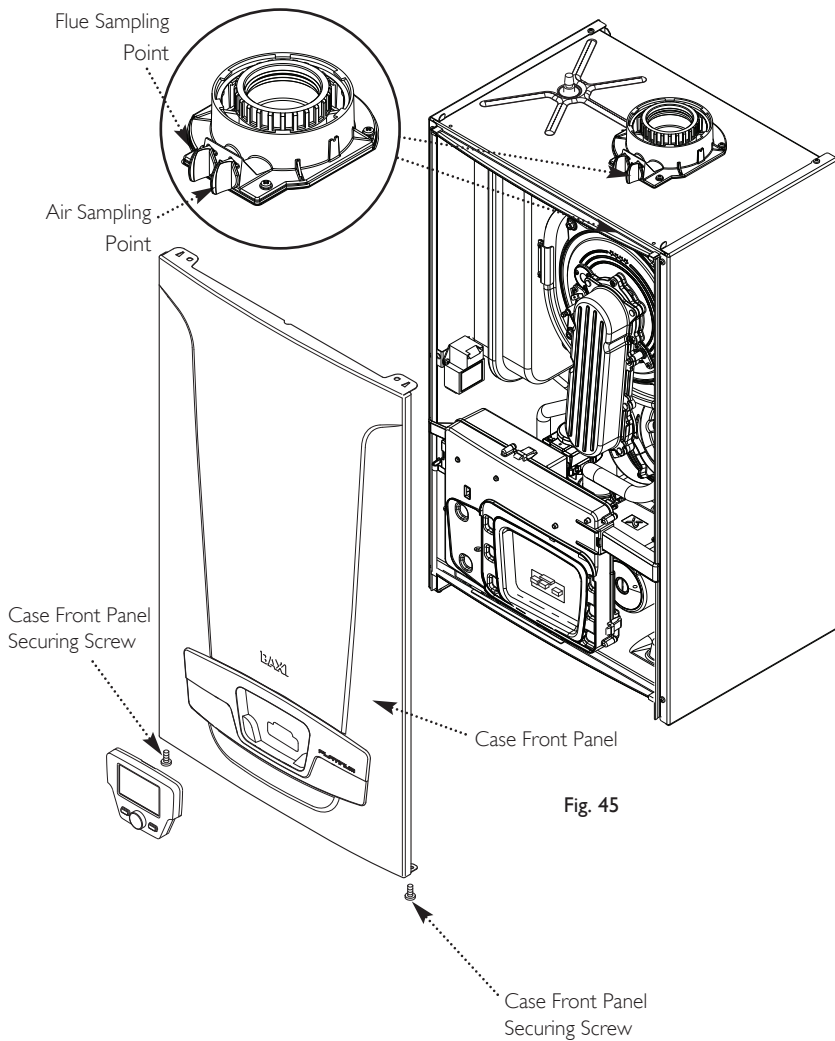


Fig. 45

IMPORTANT: Before commencing any work on the boiler or controls ensure that the installation is isolated. In 'Standby' mode (if no error is displayed) approximately 160 - 170 volts is present at the flame sensing lead !

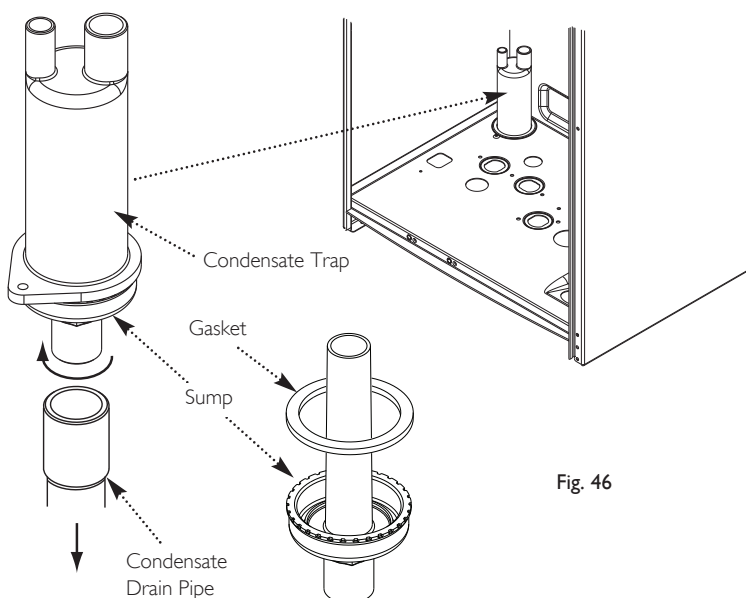


Fig. 46

14.0 Servicing

14.2 Annual Servicing Inspection (Cont)

5. Remove the clip securing the gas feed pipe to the air/gas venturi. Disconnect the pipe. Do not break the joint between the pipe and gas valve unless necessary.

6. Disconnect the electrode leads, noting their position, and the fan electrical plugs and earth wiring (Fig. 48).

7. Undo the four nuts retaining the combustion box cover to the heat exchanger.

8. Carefully draw the fan, collector and cover assembly forward (Figs. 48).

9. Clean any debris from the heat exchanger and check that the gaps between the tubes are clear.

10. Inspect the burner, electrodes position and insulation, cleaning or replacing if necessary. Clean any dirt or dust from the air box.

11. Carefully examine all seals & gaskets, replacing as necessary. Look for any evidence of leaks or corrosion, and if found determine & rectify the cause.

12. Reassemble in reverse order, ensuring the front case panel is securely fitted.

DHW Filter & Turbine Assy. (Fig. 50)

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

14. Turn the DHW isolation cock (Fig. 49) off and draw off from a hot tap.

15. Remove the retaining clip and extract the filter cartridge and rinse thoroughly in clean water. Reassemble and check the flow. Ensure that the turbine spins freely.

16. Recommission the boiler as described in Section 11.0.

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

14.3 Reset 'Service Due'

1. After 11 months of operation the 'Service Due' message will be shown on the boiler display. (If the installation has been subject to prolonged electrical isolation or power cuts this period may be longer than 11 months)

2. Once the service has been completed satisfactorily the 'Service Due' message can be reset.

3. Press **[MENU]** then press **[III]** & **[MENU]** together for 6 seconds. Use the Selector Button **[O]** to scroll to 'Commissioning Menu', press and scroll to 'Service/Special Operation'.

4. Press the Selector Button **[O]** to reset the service timer and press **[MENU]** to exit.

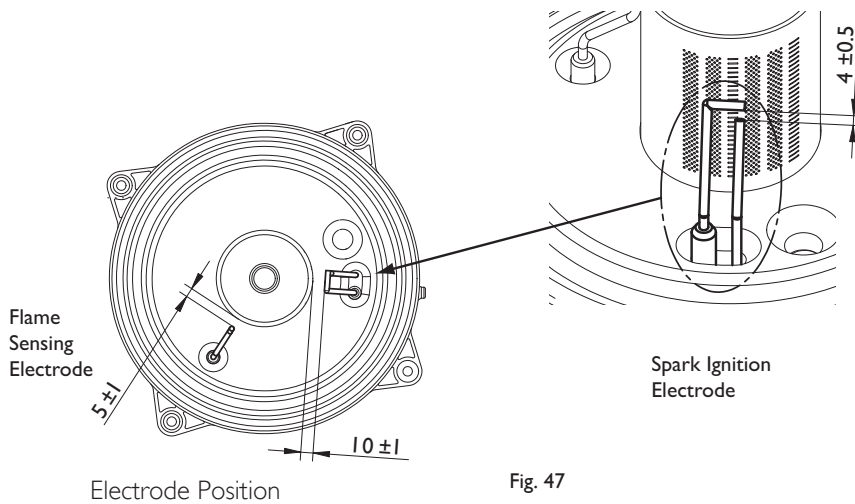


Fig. 47

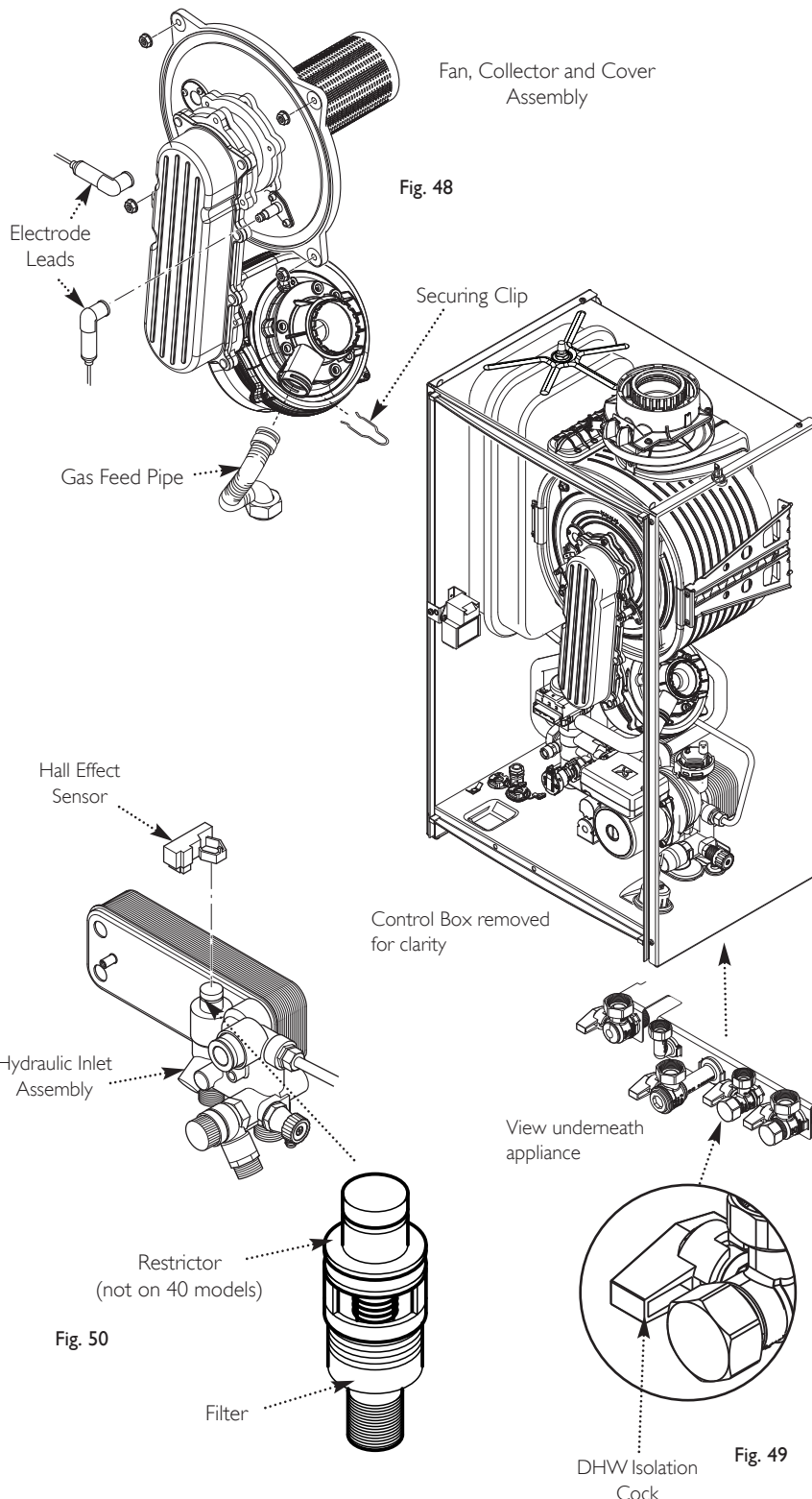


Fig. 49

15.0 Changing Components

IMPORTANT: When changing components ensure that both the gas and electrical supplies to the boiler are isolated before any work is started. In 'Standby' mode (if no error is displayed) approximately 160 - 170 volts is present at the flame sensing lead !
When the component has been changed recommission the boiler as described in Section 12.0.
Always examine any seals or gaskets, replacing where necessary. The Case Front Panel **MUST** seal effectively against the air box side panels.

See Section 14.1 "Annual Servicing" for removal of case panel, door etc.

15.1 Igniter (Fig. 51)

1. Disconnect the igniter feed plug, ignition and earth leads, noting their positions.
2. Undo the screw securing the bracket to the boiler.
3. Remove the igniter and transfer the bracket to the new component.
4. Reassemble in reverse order.

15.2 Spark Ignition and Flame Sensing Electrodes (Fig. 52)

1. Disconnect the electrode leads, noting their positions.
2. Remove the retaining screws securing each of the electrodes to the combustion box cover and remove the electrodes.
3. Check the condition of the sealing gaskets and replace if necessary. Reassemble in reverse order.
4. After changing the Flame Sensing Electrode check the combustion - see Section 15.1.
5. If satisfactory combustion readings are not obtained ensure the electrode position is correct and perform the combustion check again.

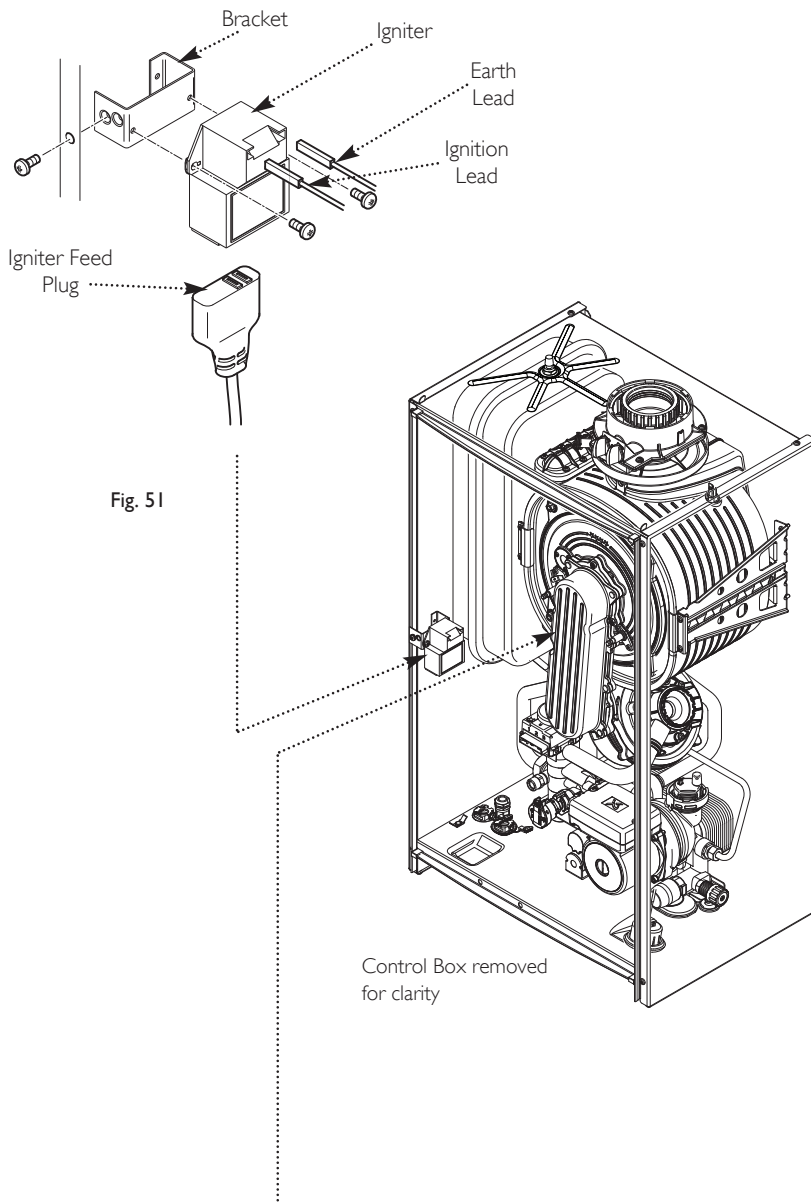


Fig. 51

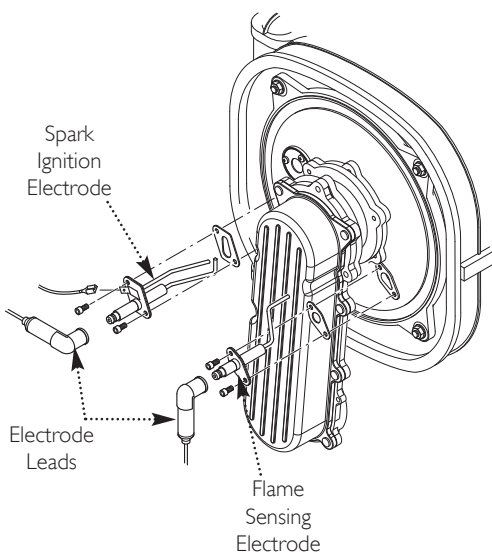


Fig. 52

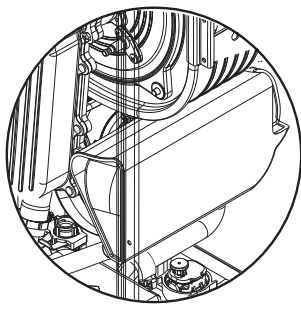
15.0 Changing Components

15.3 Fan (Fig. 53)

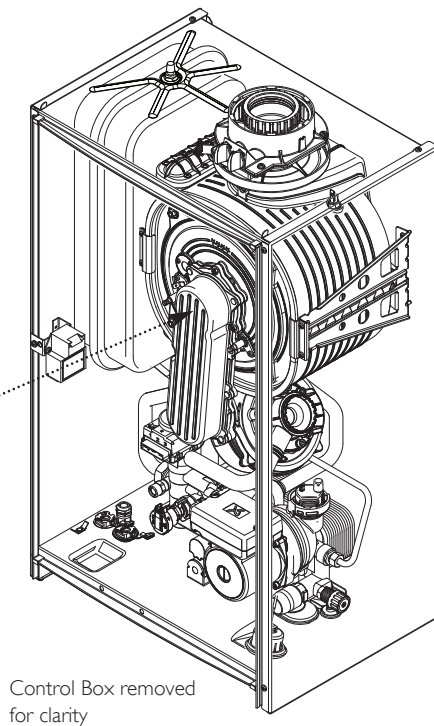
1. Remove the clip securing the gas feed pipe to the air/gas venturi. Disconnect the pipe.
2. Undo the screws securing the collector to the cover (33/40 kW models) or extension piece (28 kW model), disconnect the fan electrical plugs and earth wiring.
3. Remove the collector and fan assembly, being careful to retain the gasket.
4. Undo the screws securing the fan to the collector. Retain the gasket.
5. Undo the screws securing the venturi to the fan (noting its position) and transfer to the new fan, replacing the seal if necessary.
6. Examine the gasket(s) and replace if necessary.
7. Reassemble in reverse order.

15.4 Air/Gas Venturi (Figs. 53 & 54)

1. Remove the clip securing the gas feed pipe to the venturi.
2. Undo the screws securing the collector to the cover (33/40 kW models) or extension piece (28 kW model) and disconnect the fan electrical plugs.
3. Remove the collector and fan assembly, being careful to retain the gasket.
4. Undo the screws securing the venturi to the fan (noting its position) and fit the new venturi, replacing the seal if necessary.
5. Examine the gasket and replace if necessary.
6. Reassemble in reverse order.



Air Box is on 28 kW model only. All illustrations show 33/40 models. It will be necessary to remove this before replacing the Fan, Venturi & Burner.



Control Box removed for clarity

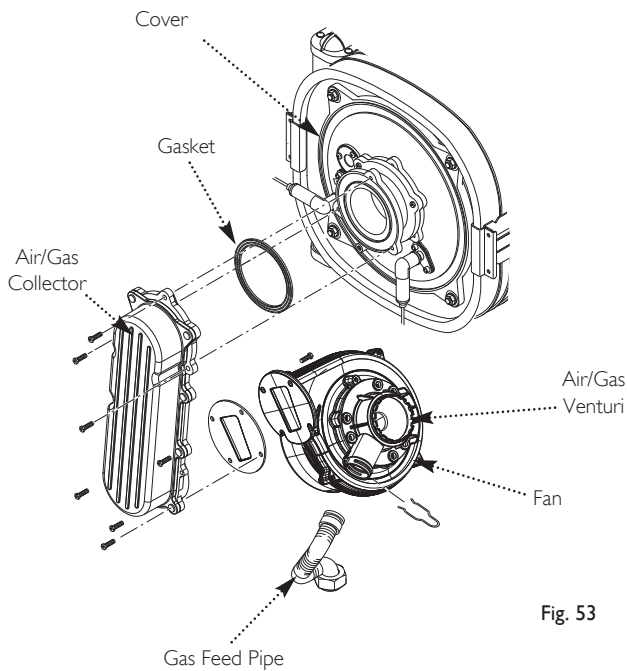


Fig. 53

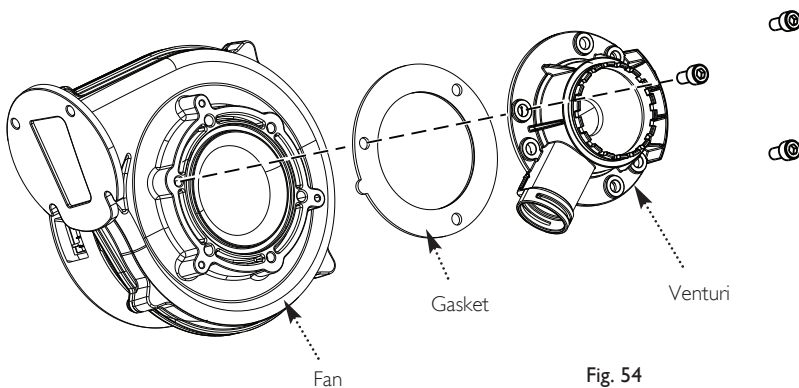


Fig. 54

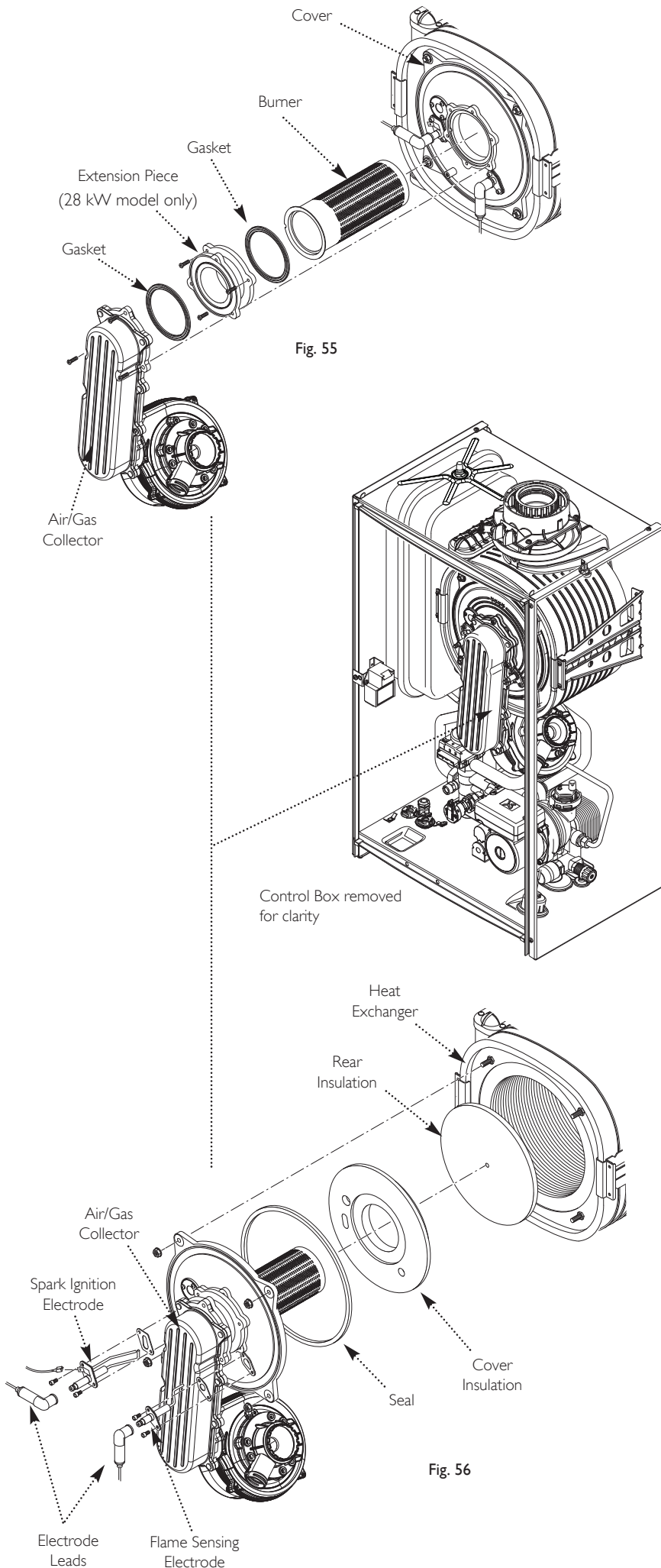
15.0 Changing Components

15.5 Burner (Fig. 55)

1. Remove the clip securing the gas feed pipe to the air/gas venturi and disconnect the fan electrical plugs.
2. Undo the screws securing the collector to the cover (33/40 kW models) or extension piece (28 kW model). Remove this extension piece from the cover (on 28 kW models).
3. Withdraw the burner from the cover and replace with the new one.
4. Examine the gasket(s), replacing if necessary.
5. Reassemble in reverse order.

15.6 Insulation (Fig. 56)

1. Remove the clip securing the gas feed pipe to the venturi and disconnect the fan electrical plugs.
2. Remove the electrodes as described in section 15.2.
3. Undo the nuts holding the cover to the heat exchanger. Draw the air/gas collector, fan and cover assembly away.
4. Remove the cover insulation piece.
5. Fit the new insulation carefully over the burner and align it with the slots for the electrodes.
6. If the rear insulation requires replacement, remove it and all debris from the heat exchanger. Also it may be necessary to separately remove the spring clip from the pin in the centre of the heat exchanger and the 'L' shaped clips embedded in the insulation.
7. Do not remove the shrink-wrapped coating from the replacement rear insulation. Keep the insulation vertical and press firmly into position.
8. Examine the cover seal and replace if necessary. Reassemble in reverse order.



15.0 Changing Components

15.7 Flue Sensor (Fig. 57)

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

15.8 Heating Flow & Return Sensors (Fig. 58)

1. There is one sensor on the flow (red wires) and one sensor on the return (blue wires).
2. After noting the position prise the sensor clip off the pipe and disconnect the plug.
3. Connect the plug to the new sensor and ease the clip onto the pipe as close to the heat exchanger as possible.

15.9 Safety Thermostat (Fig. 58)

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

15.10 DHW NTC Sensor (Fig. 59)

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

15.11 Hydraulic Pressure Sensor (Fig. 59)

1. Close the flow and return isolation taps and drain the primary circuit.
2. Disconnect the plug from the sensor.
3. Prise off the spring clip and remove the sensor. Examine the 'O' ring, replacing if necessary.
4. Reassemble in reverse order.

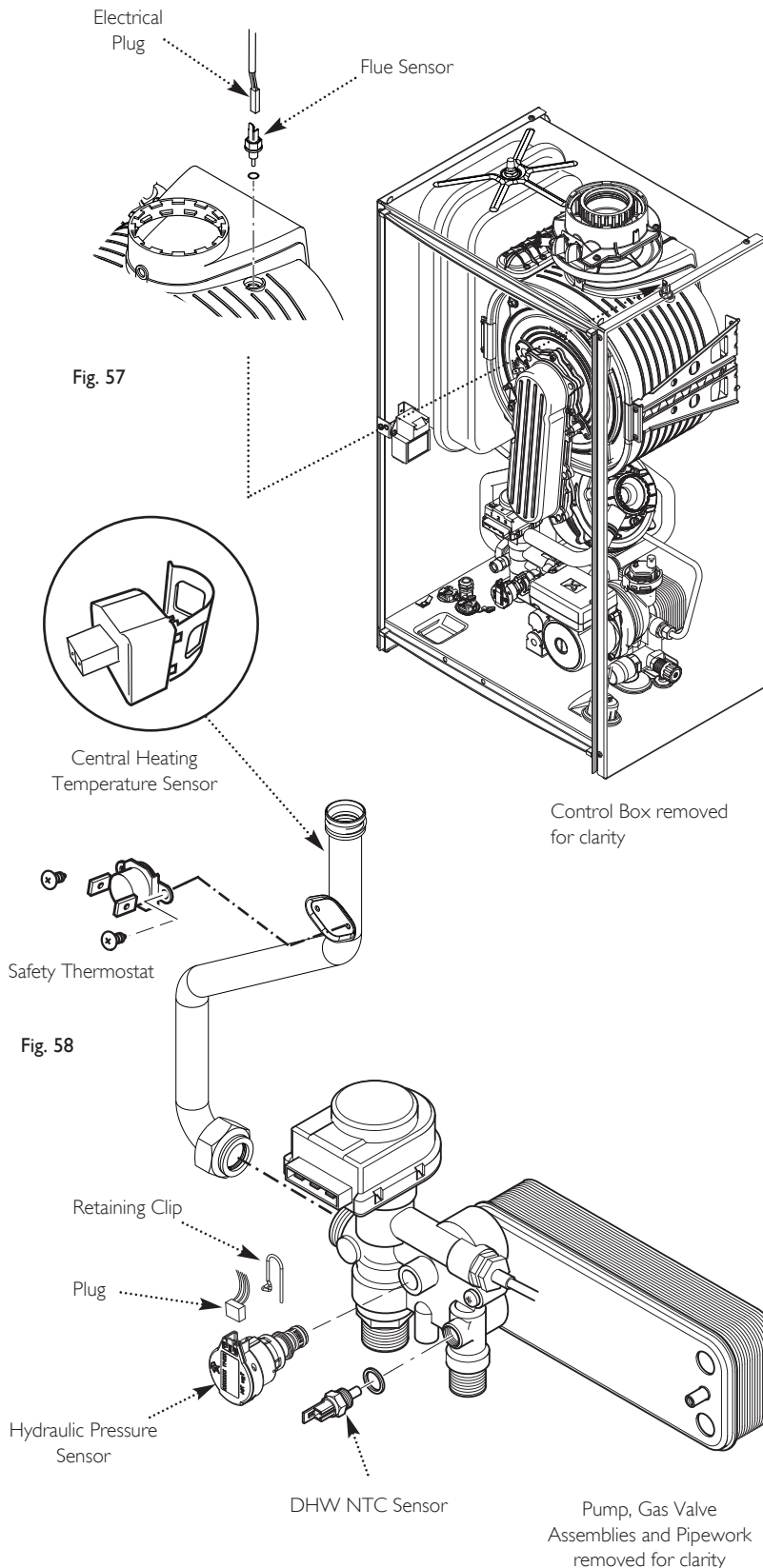


Fig. 59

15.0 Changing Components

15.12 Pump - Head Only (Fig. 60)

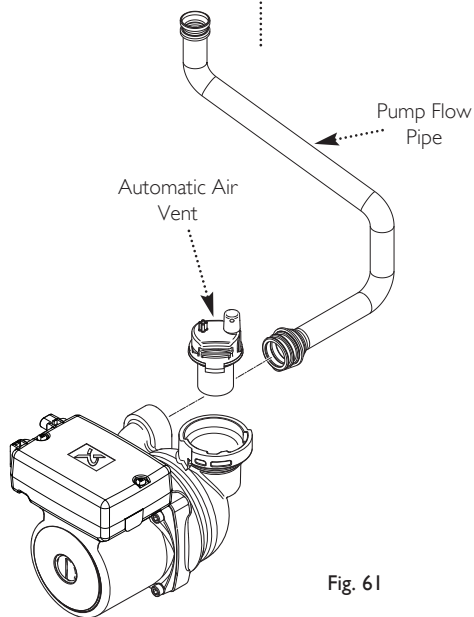
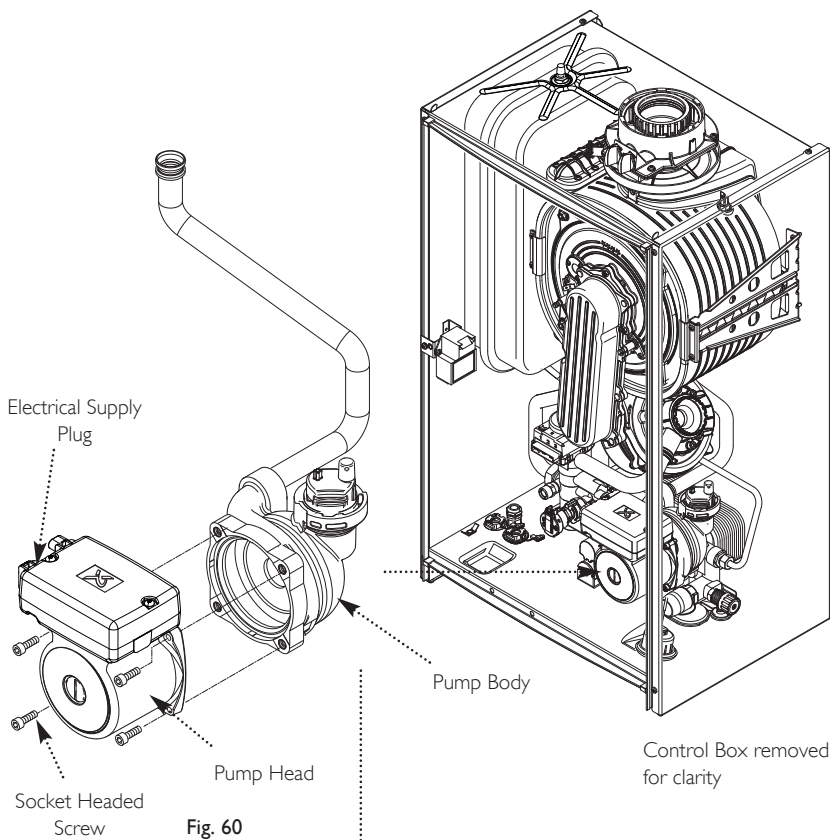
1. Disconnect the electrical supply plug at the pump and the modulation feed wire part way along its length.
2. Close the flow and return isolation taps and drain the primary circuit. Remove the socket head screws securing the pump head to the body and draw the head away.
3. Reassemble in reverse order.

15.13 Pump - Complete (Fig. 61)

1. Disconnect the electrical supply plug from the pump.
2. Close the flow and return isolation taps and drain the primary circuit. Undo the two screws securing the body to the inlet assembly and pump flow pipe. Draw the complete pump forwards.
3. Pull off the securing clip and remove the automatic air vent. Transfer them to the new pump body.
4. Examine the 'O' ring seals, replacing if necessary and reassemble in reverse order.

15.14 Automatic Air Vent (Fig. 61)

1. Close the flow and return isolation taps and drain the primary circuit. Disconnect the gas pipe from the venturi.
2. The automatic air vent is a bayonet fitting. Remove by twisting anticlockwise.
3. Fit the new automatic air vent, ensuring the 'O' ring is fitted and the cap is open. Reassemble in reverse order.



15.0 Changing Components

15.15 Hall Effect Sensor (Fig. 62)

1. Ease the sensor upwards off the hydraulic inlet manifold assembly.
2. Disconnect the electrical plug from the sensor.
3. Connect the plug to the new sensor. Carefully fit the new sensor to the hydraulic assembly, ensuring it is fully down.

15.16 Safety Pressure Relief Valve (Fig. 63)

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

15.17 Pressure Gauge (Figs. 64 & 65)

1. Close the flow and return isolation taps and drain the primary circuit.
2. Remove the gauge from the boiler lower panel.
3. Remove the clip securing the pressure gauge capillary.
4. Fit the new gauge, ensuring that the capillary is routed to prevent any sharp bends. Reassemble in reverse order and ensure the gauge is firmly in position to maintain the integrity of the case seal.

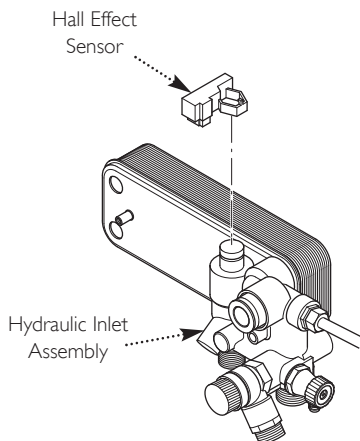
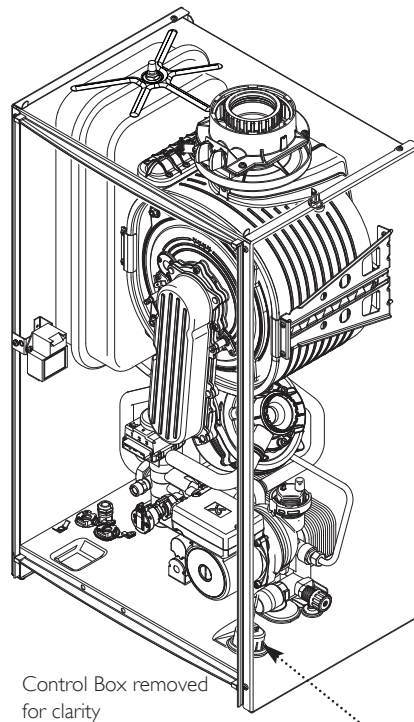


Fig. 62

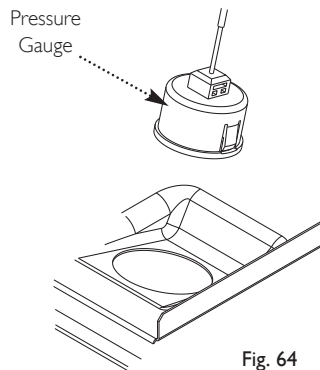


Fig. 64

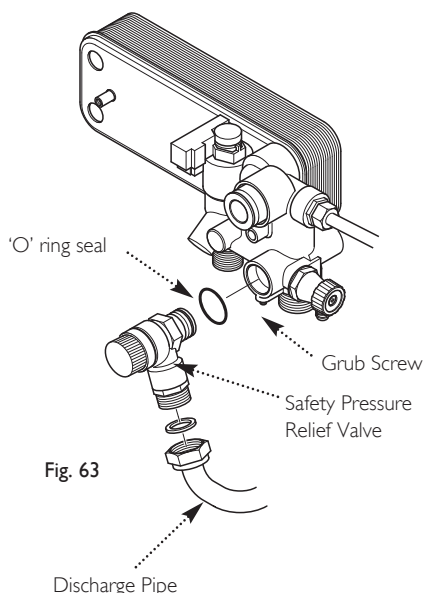


Fig. 63

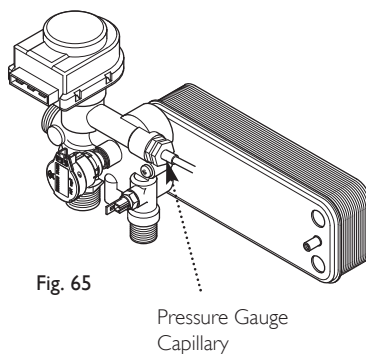


Fig. 65

15.0 Changing Components

15.18 Plate Heat Exchanger (Fig. 66)

1. Close the flow & return isolation taps and the cold mains inlet. Drain the primary circuit and draw off any residual DHW.
2. Remove the gas valve as described in Section 15.22 and disconnect the pressure gauge capillary.
3. Undo the screws securing the plate heat exchanger to the hydraulic inlet & outlet assemblies.
4. Withdraw the plate heat exchanger upwards and remove.

Seals

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

15.19 Diverter Valve - Motor & Valve Assembly (Fig. 67)

1. To replace the motor, disconnect the multi-pin plug.
2. Pull off the retaining clip and remove the motor.
3. The motor can now be replaced, or the valve assembly removed.
4. Drain the primary circuit and draw off any hot water once the isolating taps are closed. Disconnect the pressure gauge capillary and h/exchanger flow pipe.
5. Undo the nuts on the tap rail under the boiler. Remove the screws securing the valve assembly to the boiler bottom panel and plate heat exchanger.
6. Remove the valve assembly. Examine all seals and washers, replacing if necessary. Transfer the DHW NTC and hydraulic pressure sensor to the new valve and reassemble in reverse order.

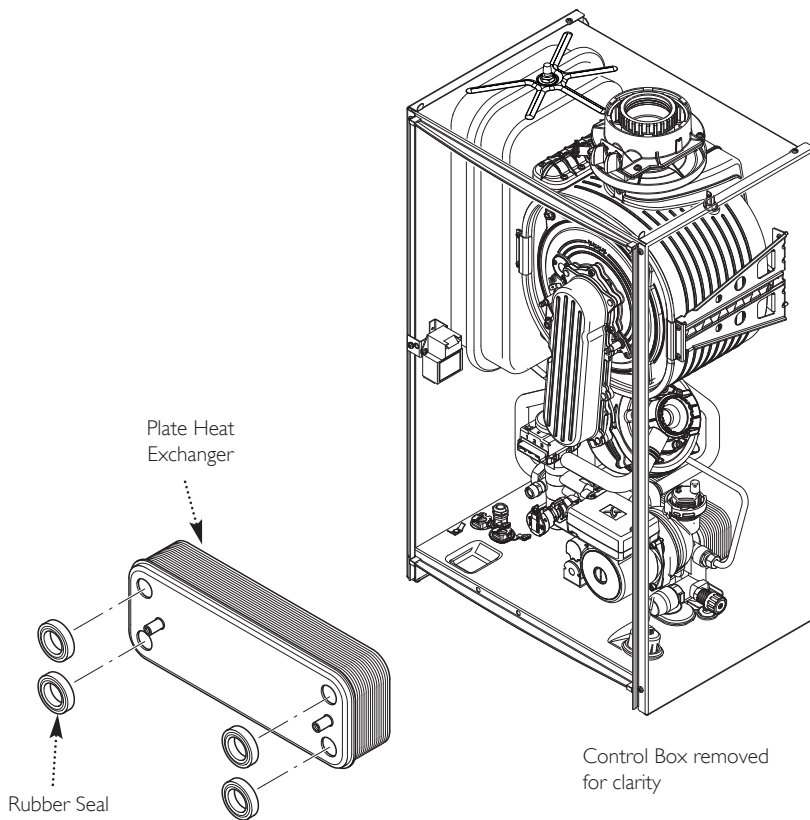


Fig. 66

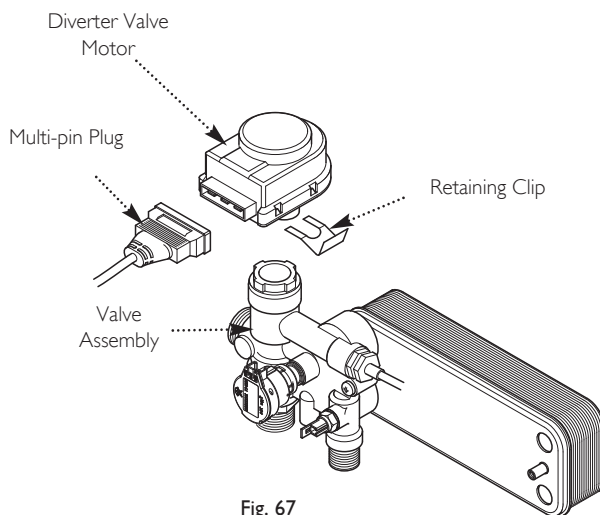


Fig. 67

15.0 Changing Components

15.20 P.C.B. (Fig. 68)

1. Ensure the power to the boiler is isolated.
2. Remove the screws securing the control box cover and release the cover retaining barbs from their slots.
3. Note the position of all plugs and wires on the P.C.B. and disconnect them.
4. Undo the securing screws and remove the P.C.B.
5. Reassemble in reverse order and check the operation of the boiler.

15.21 P.C.B. Bridge (Fig. 68)

1. Ensure the power to the boiler is isolated and remove the i-THINK Controller.
2. Remove the screws securing the control box cover and release the cover retaining barbs from their slots.
3. Note the position of all plugs and wires on the main P.C.B. and disconnect them.
4. Undo the securing screws and remove the main P.C.B. and then undo the screws and remove the P.C.B. Bridge. Transfer the bridge harness to the new P.C.B. Bridge.
5. Reassemble in reverse order and check the operation of the boiler.

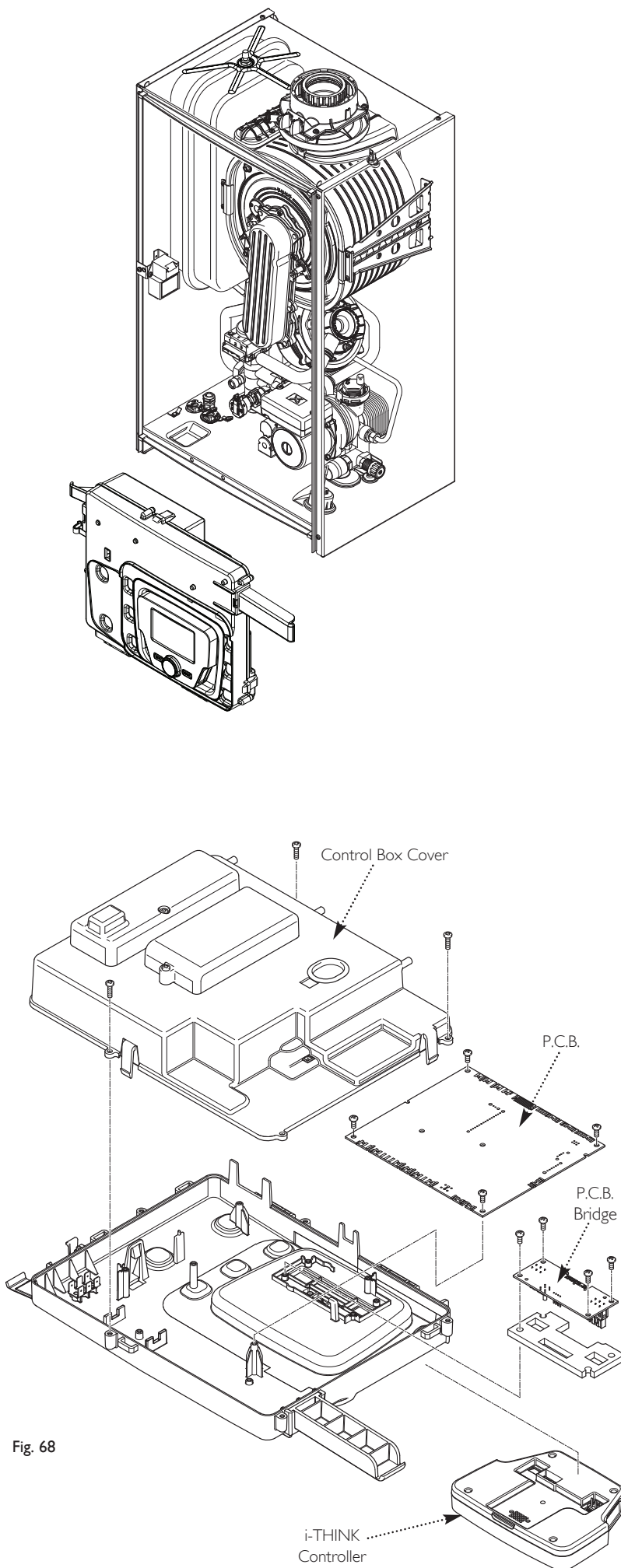


Fig. 68

15.0 Changing Components

15.22 Gas Valve (Fig. 69)

IMPORTANT: After replacing the valve the CO₂ must be checked as detailed in Section 16.0 Combustion. Only change the valve if a suitable calibrated combustion analyser is available, operated by a competent person - see section 14.1.

1. Turn the gas cock off and undo the nut under the boiler. Retain the washer.
2. Remove the electrical plugs from the valve.
3. Undo the nut on the venturi inlet pipe and ease the pipe aside, retaining the washer.
4. Remove the nut securing the gas valve to the boiler bottom panel.
5. Reassemble in reverse order, ensuring the washers are in place, and check the combustion (Sections 16.0).

NOTE: Check for gas tightness after replacing gas valve.

15.23 Expansion Vessel (Fig. 70)

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

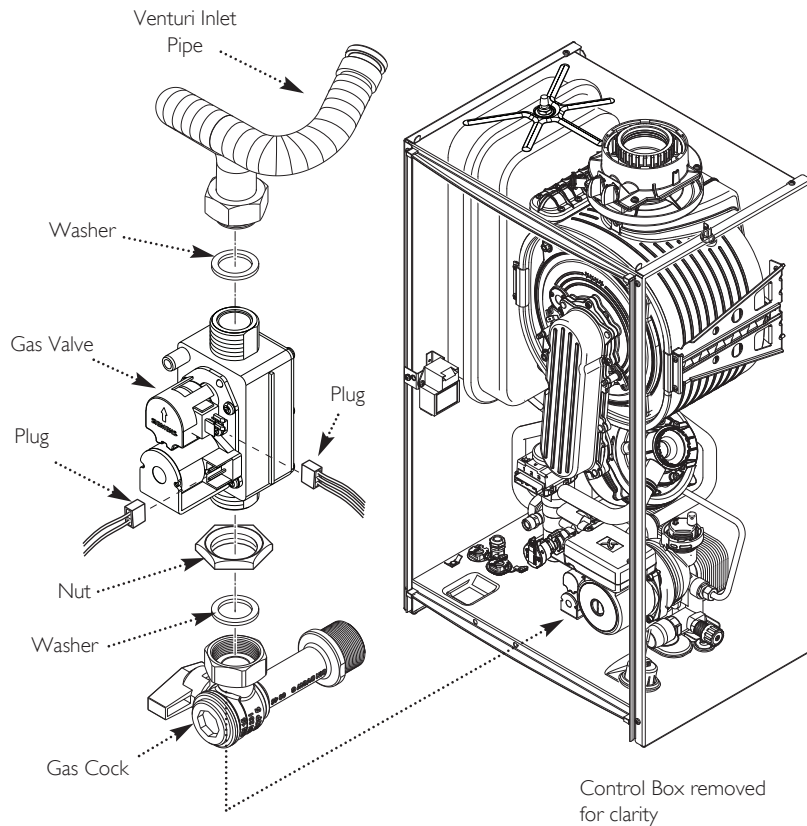


Fig. 69

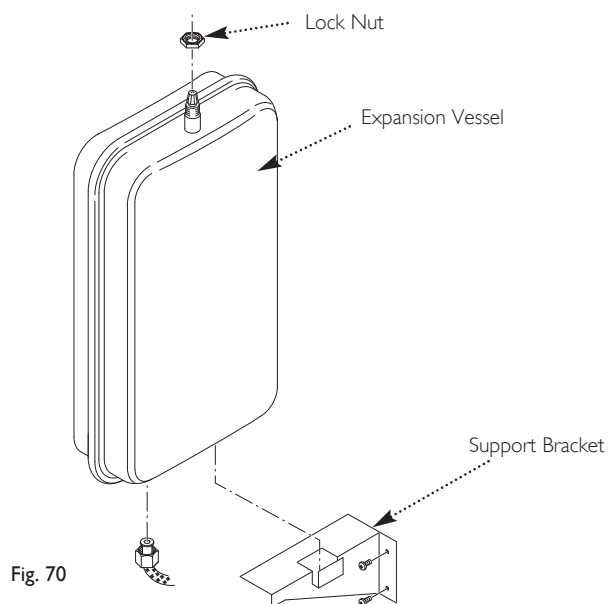


Fig. 70

16.0 Combustion

IMPORTANT: DO NOT insert the Analyser Probe into the Test Point immediately. This will prevent saturation of the analyser. Allow the boiler to stabilise before taking any reading.

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

The flue gas analyser used should be one meeting the requirements of BS7927 or BS-EN50379-3 and be calibrated in accordance with the analyser manufacturers' requirements.

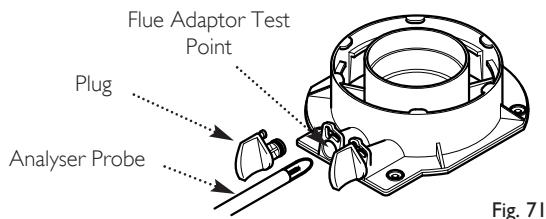


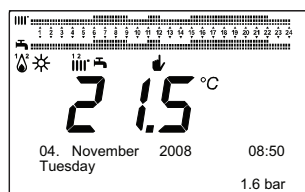
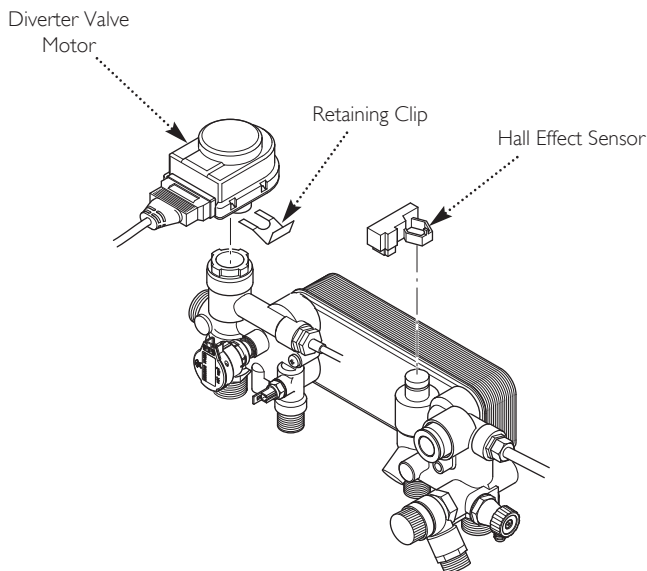
Fig. 71

New boiler - Full Load 8.0 - 9.5% CO₂

New boiler - Partial Load 7.0 - 8.5% CO₂

Boiler 100+ hours - Full & Partial Load 8.3 - 9.7% CO₂

Boiler 100+ hours - Full & Partial Load 3.6 - 6.1% O₂



16.1 Checking the Combustion

IMPORTANT: The system MUST be completely cold to ensure the boiler is operating under full demand. If this cannot be maintained for sufficient time to measure the gas rate, remove the diverter valve motor and Hall effect sensor and fully open a hot tap(s) to prevent the boiler switching off by reaching maximum temperature.

1. The measured CO₂ is dependent upon the length of time the boiler has operated (actual firing time, NOT CH demand time) and also if a new sensing electrode or burner has been recently fitted.

2. A new boiler (up to 100 hours operating time) or boiler with new sensing electrode or burner will give:-

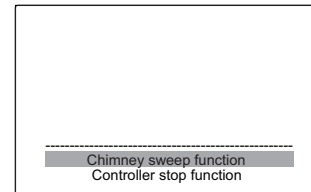
Full Load 8.0 - 9.5% CO₂

Partial Load 7.0 - 8.5% CO₂

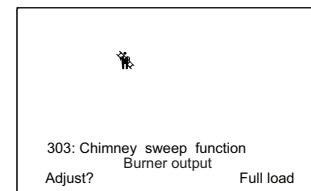
3. A boiler with over 100 hours operating time will give:-

Full & Partial Load 8.3 - 9.7% CO₂

4. Press and for 6 seconds. 'Chimney sweep function' will be displayed.



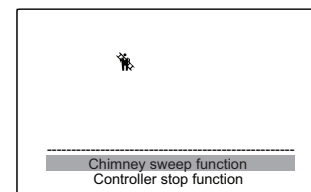
5. Press the Selector Button . Chimney sweep function on and the display screen will appear briefly until the screen below appears.



6. Press the Selector Button . Rotate the button either clockwise or anticlockwise until 'Full Load' or 'Partial Load' is displayed. Press the button to select.

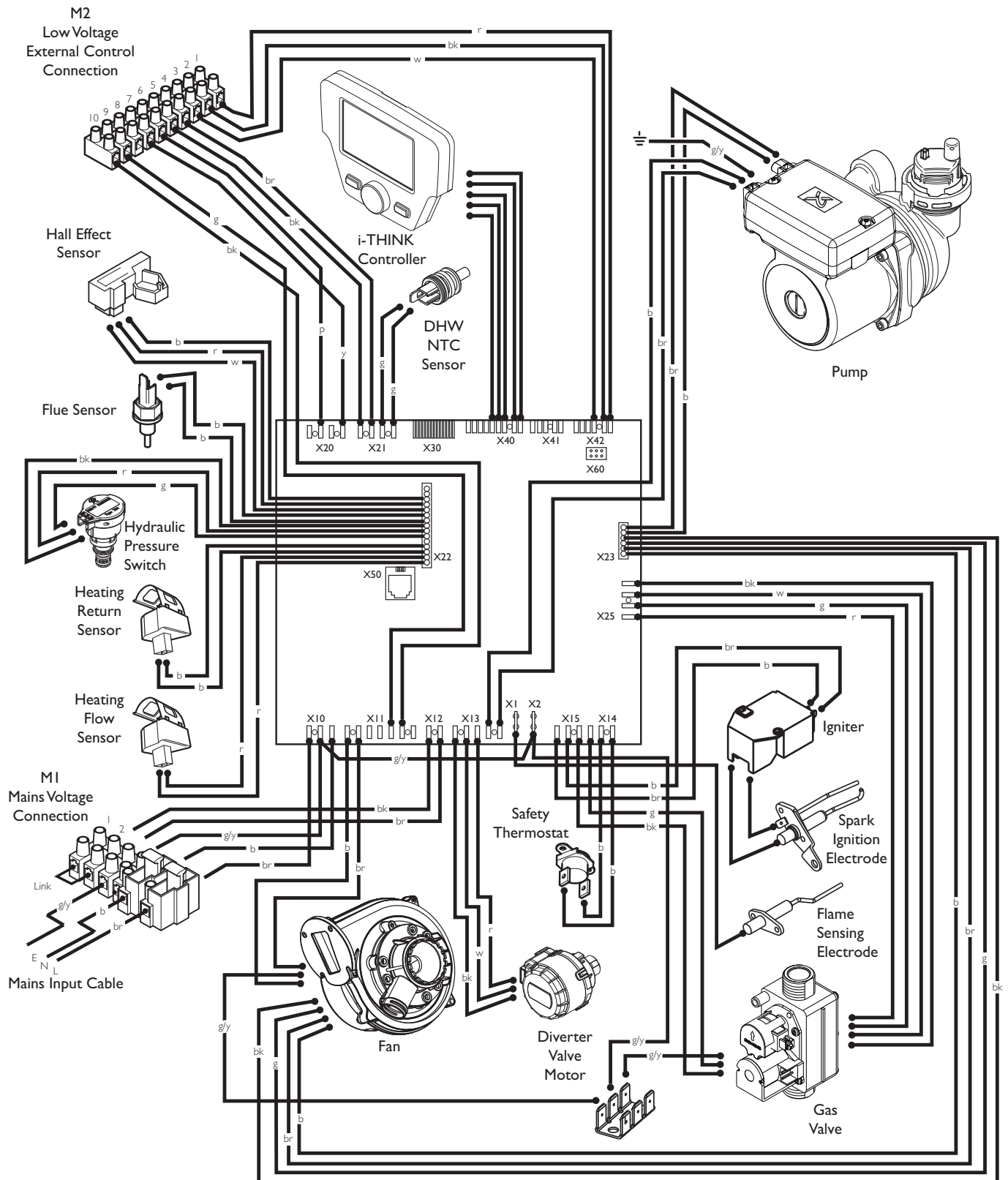
7. Measure and note the CO₂.

8. To deactivate the function press and for 6 seconds. The screen below appears.



9. Press the Selector Button to turn off. Chimney sweep function off will appear briefly and then wait until the display screen is shown.

17.1 Illustrated Wiring Diagram



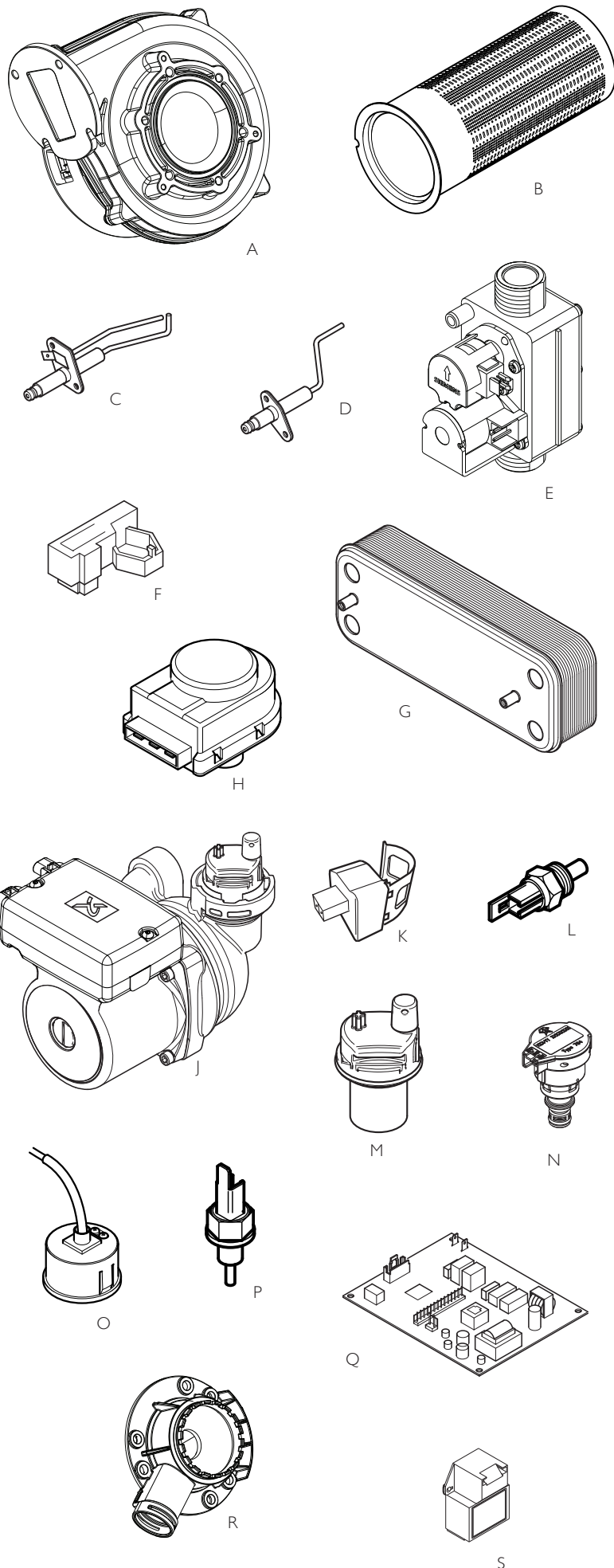
Key To Wiring Colours

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

18.0 Short Parts List

Short Parts List

Key No.	Description	Manufacturers Part No.
A	Fan (28/33)	720908801
	Fan (40)	720909001
B	Burner (28/33)	720767901
	Burner (40)	720785201
C	Spark Ignition Electrode	720908401
D	Flame Sensing Electrode	720908601
E	Gas Valve	720910001
F	Hall Effect Sensor	720788201
G	Plate Heat Exchanger (28)	720790001
	Plate Heat Exchanger (33/40)	720790201
H	Diverter Valve Motor	720788601
J	Pump	720910801
K	Heating Flow/Return Sensor	720747101
L	DHW NTC Sensor	720789201
M	Pump Automatic Air Vent	720777601
N	Hydraulic Pressure Sensor	720789001
O	Pressure Gauge	720910601
P	Flue Sensor	720851401
Q	PCB 28	720912001
	PCB 33	720912201
	PCB 40	720912401
R	Venturi 28	720909201
	Venturi 33	720909401
	Venturi 40	720909601
S	Igniter	720913201



Reset Function


When an error is displayed press the Selector Button  then rotate it until 'Yes' is displayed and press again.

Table Of Error Codes

E 20	Central Heating NTC Fault
E 28	Flue NTC Fault
E 40	Central Heating Return NTC Fault
E 109	Pre-circulation Fault (Air in Boiler - Temporary Fault)
E 110	Safety Thermostat Operated
E 117	Primary System Water Pressure Too High
E 118	Primary System Water Pressure Too Low
E 125	Circulation Fault (Primary)
E 128	Flame Failure - In Operation
E 130	Flue NTC Operated
E 133	Flame Failure - At Ignition (after 4 attempts)
E 151	PCB Internal Fault
E 154	Flow/Return Sensor Temperature Test
E 160	Fan or Fan Wiring Fault (Fan Not Running)
E 270	Circulation Fault (Dry Fire)
E 321	Hot Water NTC Fault
E 384	False Flame (Flame Without Demand)
E 385	Input Voltage Too Low
E 386	Fan Speed Not Achieved

19.1 Initial Fault Finding Checks

1. Check that gas, water and electrical supplies are available at the boiler.
2. Electrical supply = 230V ~ 50 Hz.
3. The preferred minimum gas pressure is 20 mbar.
4. Carry out electrical system checks, i.e. Earth Continuity, Resistance to Earth, Short Circuit and Polarity with a suitable meter.

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

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

19.2 Error Codes

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

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

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

E 110 indicates overheat of the primary system water.

E 117 is displayed when the primary water pressure is greater than 2.7 bar.

E 118 is displayed when the primary water pressure is less than 0.5 bar.

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

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

E 125 is displayed in either of two situations:-

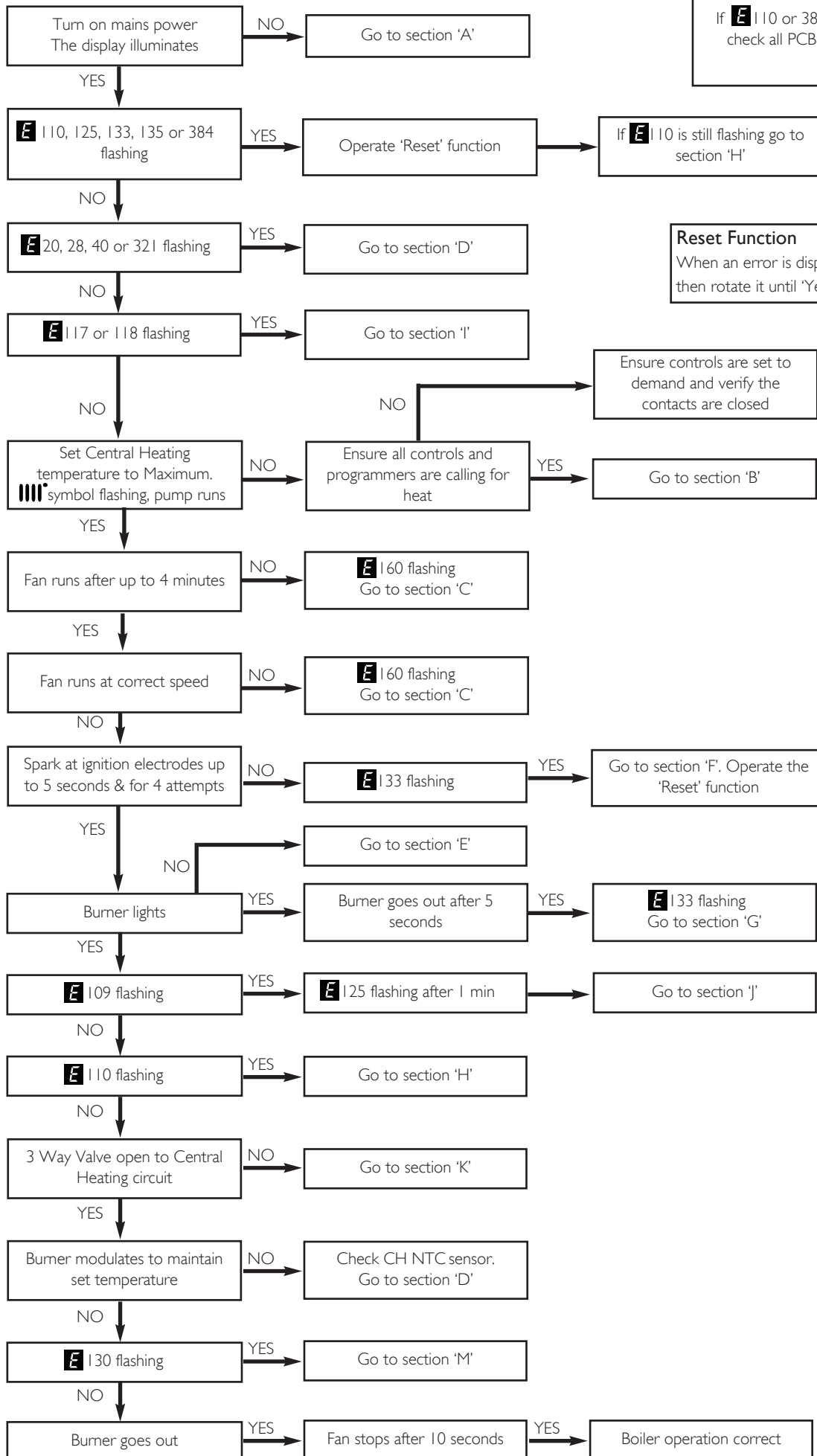
- i) If between 15 and 30 seconds of the burner lighting the boiler temperature has not changed by 1°C.
 - ii) If within 10 minutes of the burner lighting the boiler actual temperature twice exceeds the selected temperature by 30°.
- In these instances poor primary circulation is indicated.

3. By 'Resetting' when:-

E 110, 125, 133, 128 & 384 are displayed it is possible to relight the boiler.


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

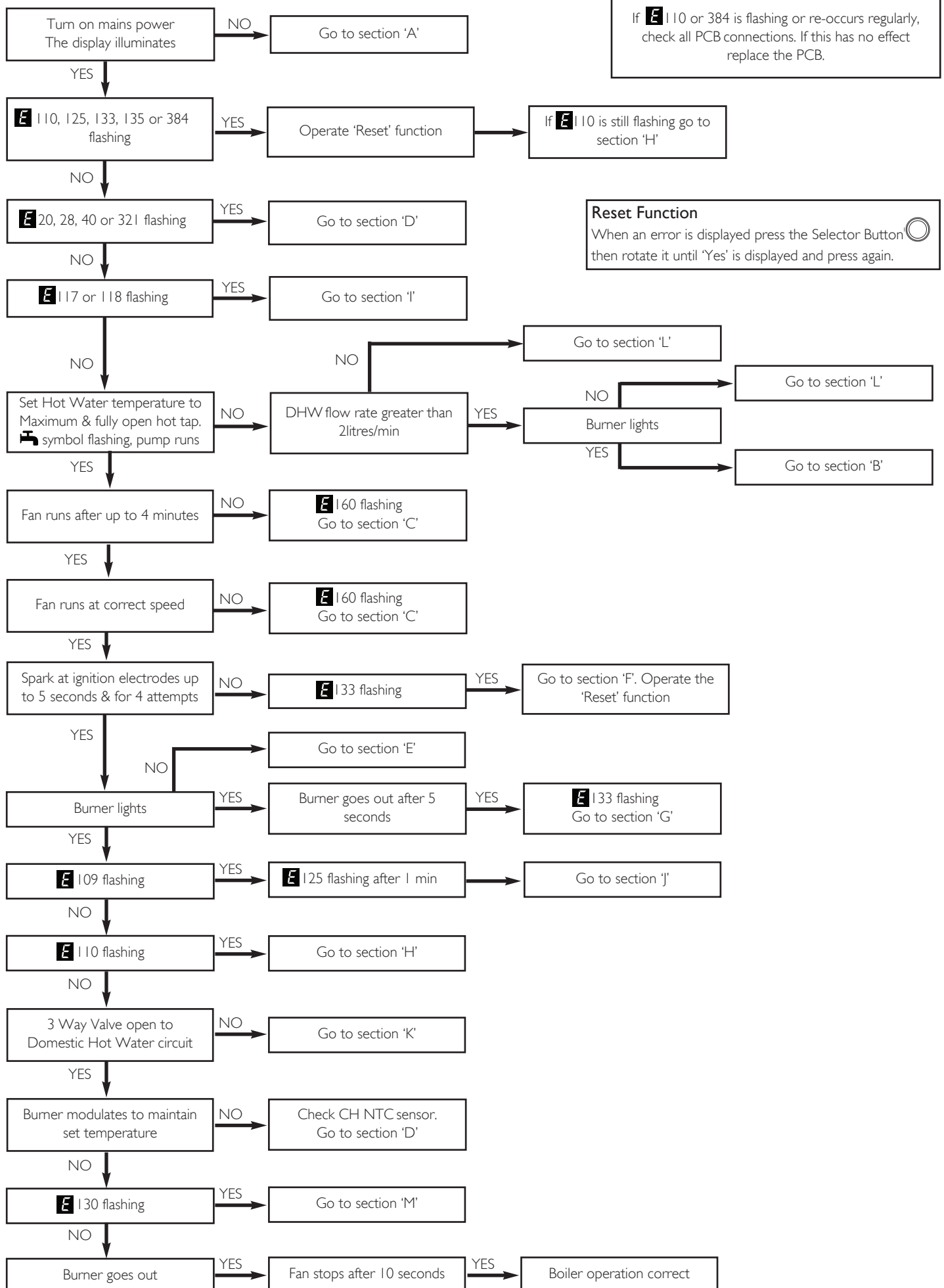
Refer to "Illustrated Wiring Diagram" for position of terminals and components
Central Heating - Follow operational sequence



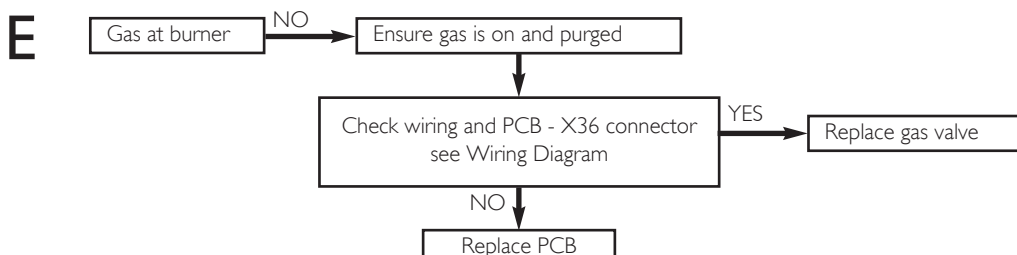
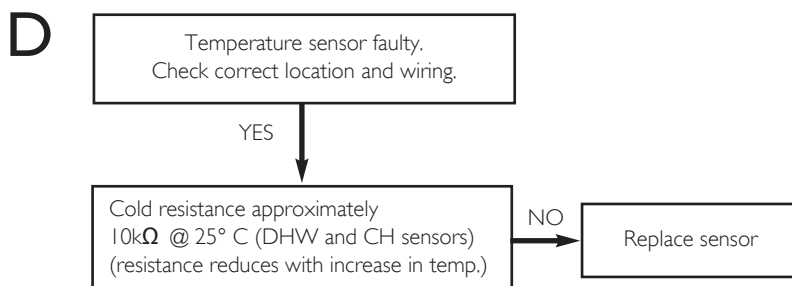
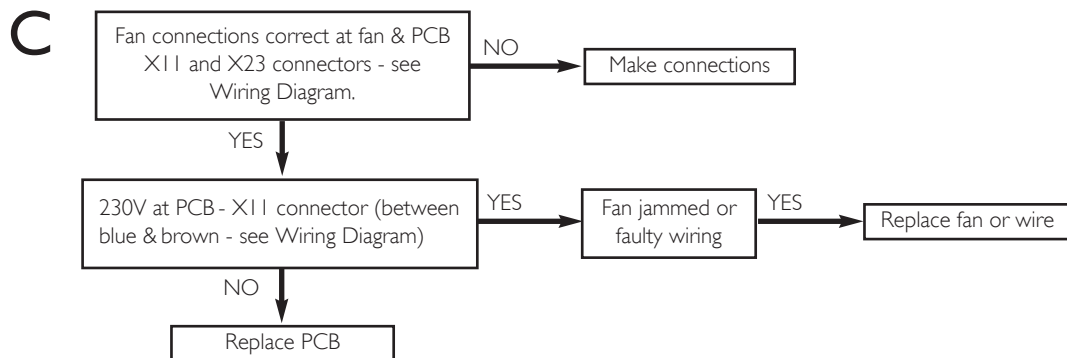
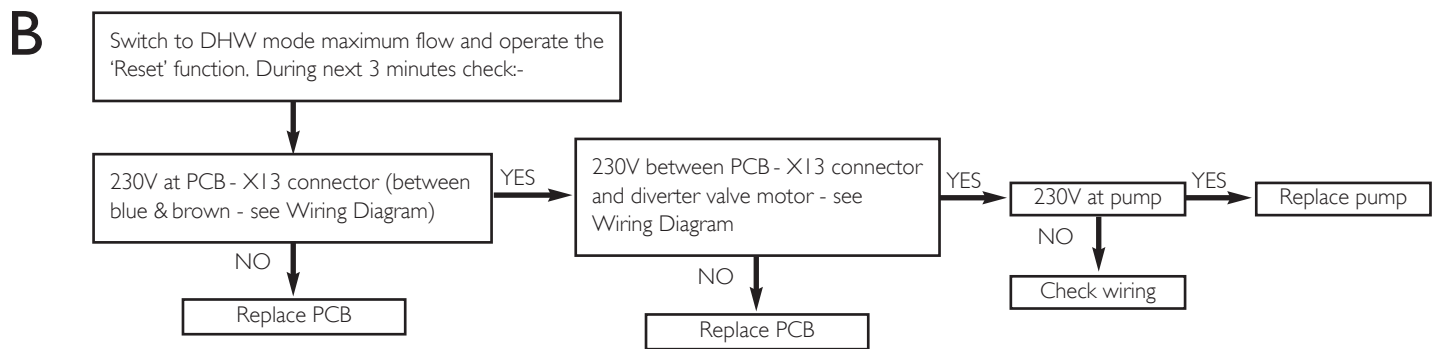
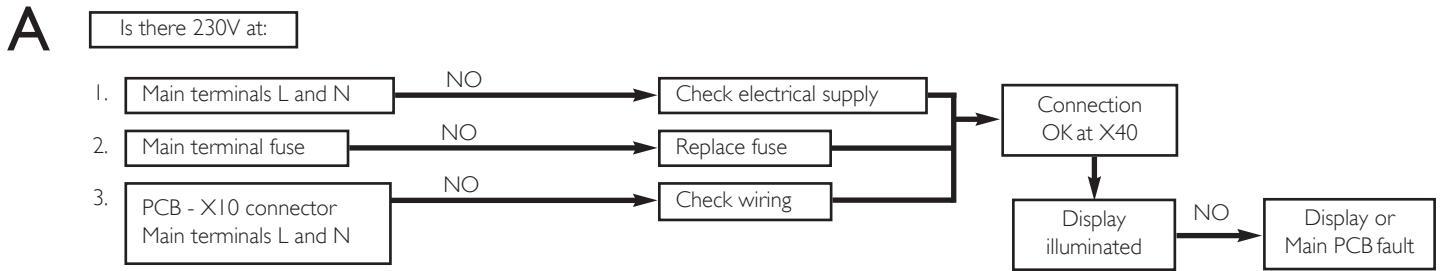
If **E110** or 384 is flashing or re-occurs regularly, check all PCB connections. If this has no effect replace the PCB.

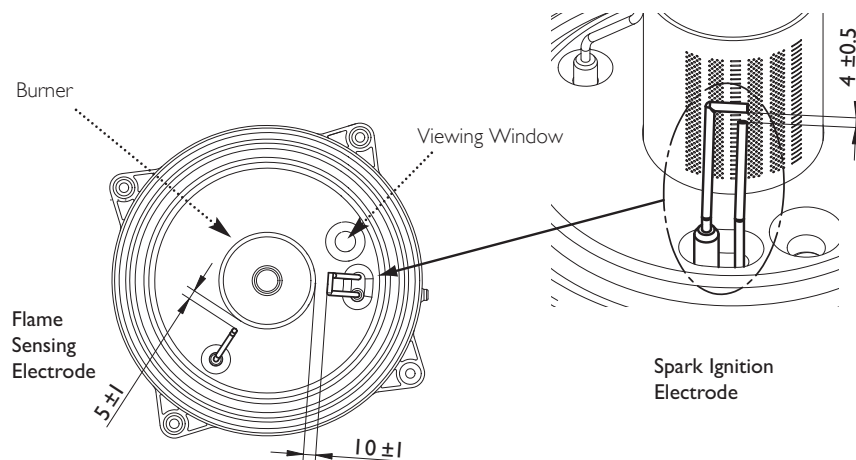
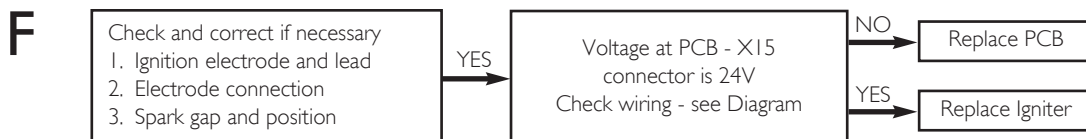
Reset Function

When an error is displayed press the Selector Button  then rotate it until 'Yes' is displayed and press again.

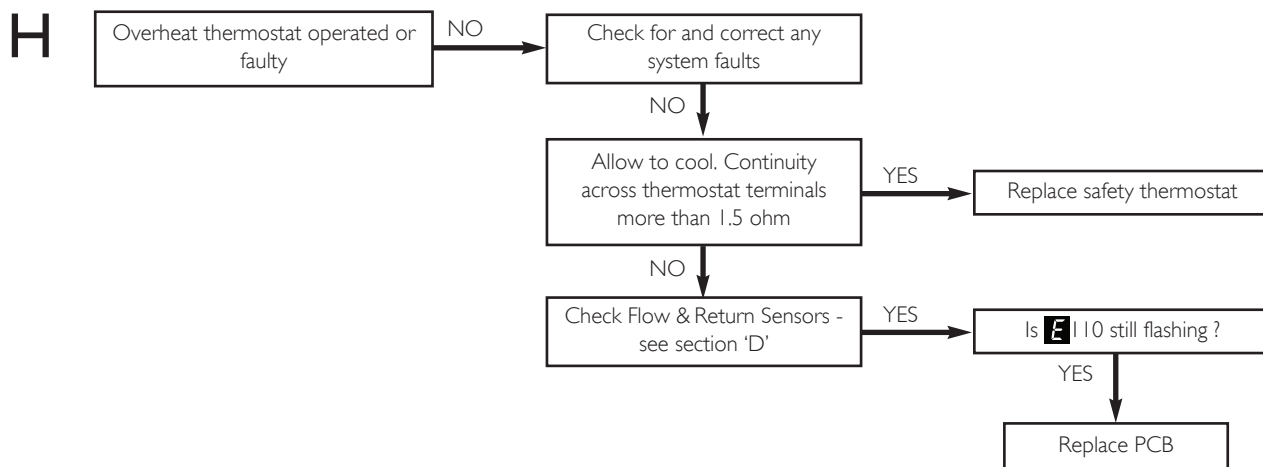
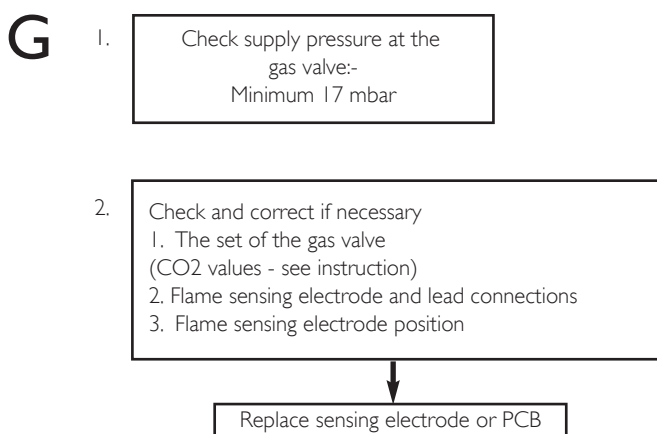


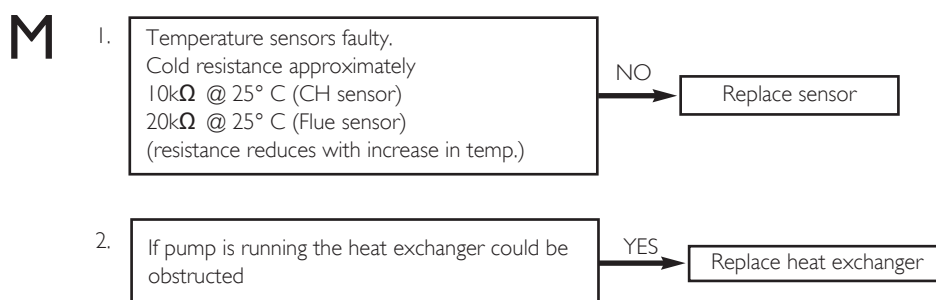
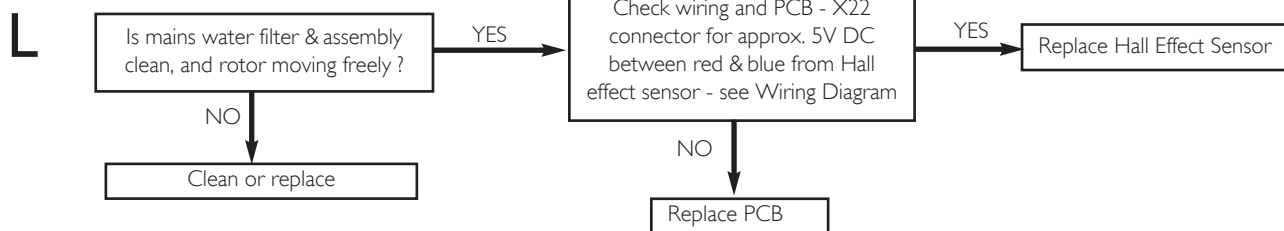
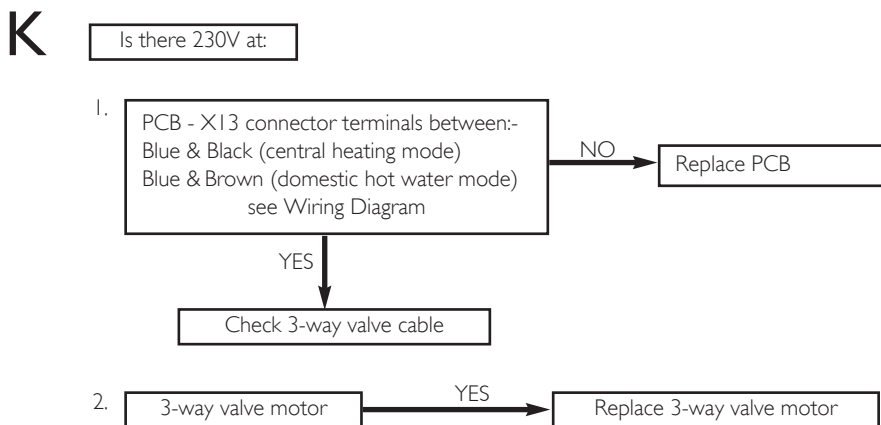
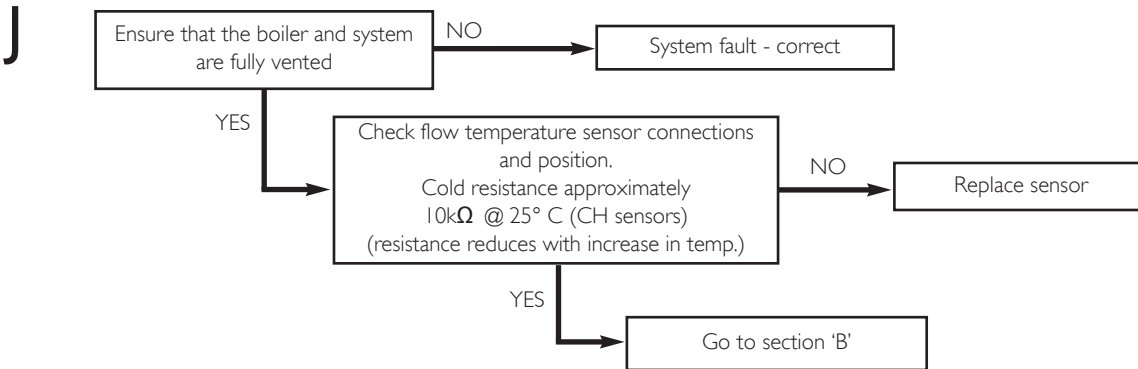
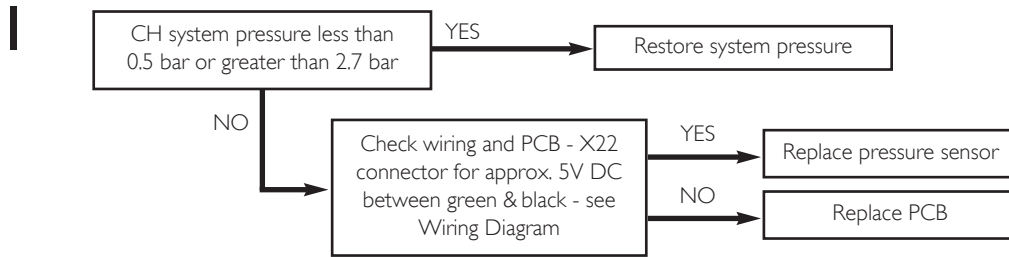
Fault Finding Solutions Sections





Electrode Position





Service Record

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

Service Provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

Always use the manufacturer's specified spare part when replacing controls.

Service 1 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Gas Safe Register No. _____

Comments: _____

Signature: _____

Service 2 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Gas Safe Register No. _____

Comments: _____

Signature: _____

Service 3 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Gas Safe Register No. _____

Comments: _____

Signature: _____

Service 4 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Gas Safe Register No. _____

Comments: _____

Signature: _____

Service 5 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Gas Safe Register No. _____

Comments: _____

Signature: _____

Service 6 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Operative ID No. _____

Comments: _____

Signature: _____

Service 7 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Gas Safe Register No. _____

Comments: _____

Signature: _____

Service 8 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Gas Safe Register No. _____

Comments: _____

Signature: _____

Service 9 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Gas Safe Register No. _____

Comments: _____

Signature: _____

Service 10 Date: _____

Engineer Name: _____

Company Name: _____

Telephone No. _____

Gas Safe Register No. _____

Comments: _____

Signature: _____

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

BAXI

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