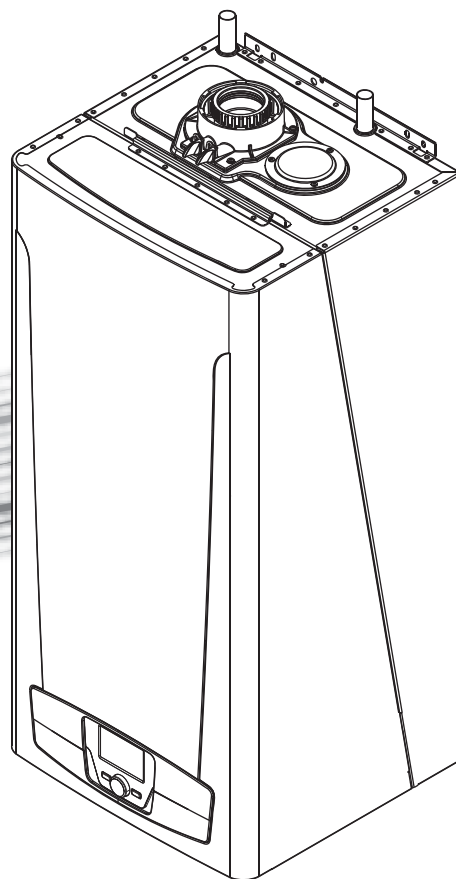


# BAXI

## Installation & Servicing Instructions



### Ecogen 24/1.0

Gas Fired Wall Mounted Condensing Boiler  
and Power Generator

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

## Natural Gas

Baxi Ecogen 24/1.0  
G.C.N° 41 075 60

## Propane

Baxi Ecogen 24/1.0 LPG  
G.C.N° 41 075 64

This appliance contains a pressure vessel filled with Helium to 23 bar.  
Do not strike, drop, drill or puncture the vessel.  
Do not unbolt any of the covers or flanges.  
The vessel contains no user serviceable parts.  
Dispose of safely - see section 18.0 for further safety information.

### The Benchmark Scheme

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

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

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The Company Secretary, Baxi Heating UK Ltd,  
Brooks House, Coventry Road, Warwick, CV34 4LL

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. From 1 April 2005 this can be achieved via a Competent Persons Self Certification Scheme as an option to notifying the Local Authority directly.

**In England and Wales** the electrical installation of an Ecogen appliance is notifiable under the current Part P building regulations.

**In Scotland** the electrical installation of an Ecogen appliance requires a building warrant (legal permission from the local authority to start the work). This building warrant has to be approved by a registered electrical installer (known formally as an 'approved certifier') or be checked by the local authority.

**In Northern Ireland** guidance should be taken from the local authority or equivalent governing body for all electrical works.

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.

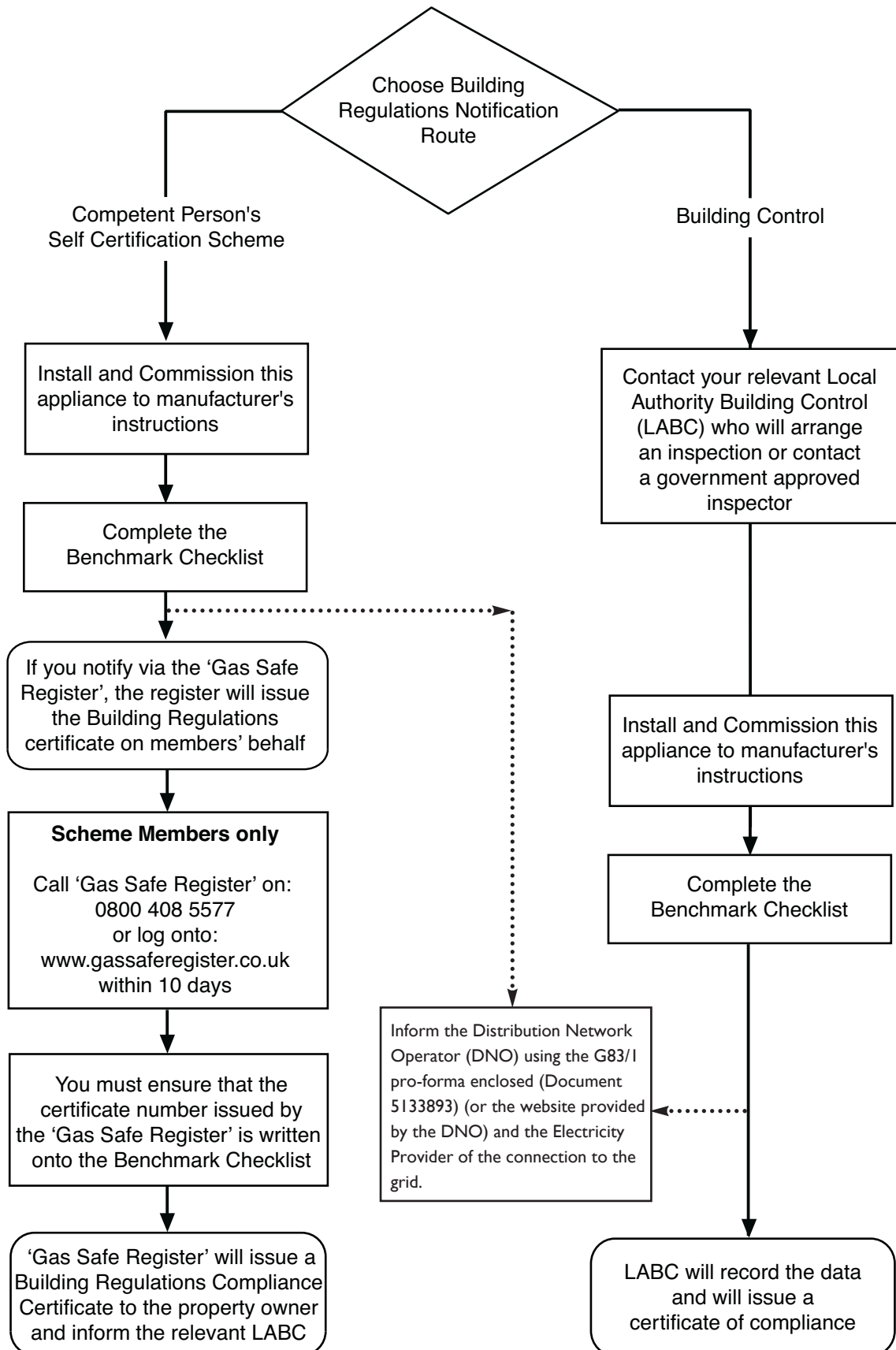
Building Regulations require that installations should comply with manufacturer's instructions. It is therefore important that the commissioning checklist is completed by the installer. The relevant section of Building Regulations only relates to dwellings. Therefore the checklist only applies if the 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.

### Electrical Regulations

The Distribution Network Operator (DNO) and the Electricity Provider must be informed of the appliances connection to the grid.

The DNO notification is achieved by the completion of a G83/1 connection pro-forma (see Document 5133893 supplied) or entry of the relevant details on the DNO website if available.



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

### 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 and Part P of the Electrical Regulations.

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

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

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

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

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

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

Product/Production certified by:  
Notified Body 0086.

For GB/IE only.

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 gas 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.  
- section 15/87 (G83/1)
- Energy Networks Association Engineering Recommendation G83/1: The recommendations for the connection of Small Scale Embedded Generators (up to 16A per phase) in parallel with Low Voltage Distribution Networks,

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 5482 Part 1	Butane & Propane Gas Installation.
BS 6891	Gas Installation.
BS 5546	Installation of hot water supplies for domestic purposes.
BS EN 12828	Heating systems in buildings.
BS EN 14336	Installation & commissioning of water based heating systems.
BS 6798	Installation of gas fired hot water boilers.
BS 5440 Part 1	Flues.
BS 5440 Part 2	Ventilation.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.

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

Standard	Scope
I.S. 813	Domestic Gas Installations.
The following standards give valuable additional information;	
BS 5546	Installation of hot water supplies for domestic purposes.
BS EN 12828	Heating systems in buildings.
BS EN 14336	Installation & commissioning of water based heating systems.
BS 7074	Expansion vessels and ancillary equipment for sealed water systems.
BS 7593	Treatment of water in domestic hot water central heating systems.
BS 7671	Requirements for electrical installations
BS 50438	Requirement for the connection of micro-generators in parallel with public low-voltage distribution networks.

## 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 using a suitable lifting device. A sack truck is ideal for manoeuvring the appliance to the room where the installation is to take place.

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 all 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 and manoeuvre the appliance into the installation site (pack weight 120 kg) using a sack truck. Keep the appliance as upright as possible at all times, see note below.

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.

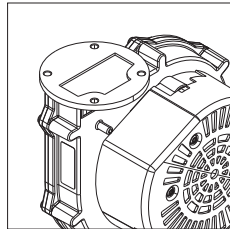
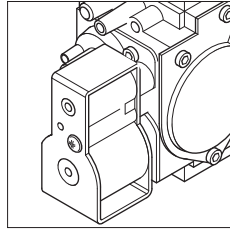
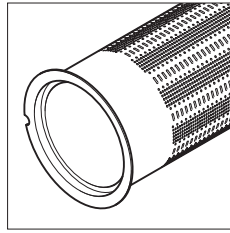
If at any time when installing the boiler you feel that you may have injured yourself STOP !!  
DO NOT 'work through' the pain - you may cause further injury.

**NOTE:** The appliance must be transported at all times in the upright position. **The appliance must not be laid on its back / side / front.**

**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 Ecogen 24/1.0 is a fully automatic gas fired wall mounted condensing heat only boiler which will produce up to 1kW of electricity for use by the householder. Any electricity excess to requirements at the time of production will be fed back into the national grid. It is room sealed and fan assisted.

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

24 kW (Heat), 1kW (Electric)

3. The boiler is suitable for use only on fully pumped sealed systems.

4. The boiler data badge gives details of the model, serial number and Gas Council number and is situated on the rear of the fascia (Fig. 1).

5. The boiler model name and serial number are also shown on the information label on the panel behind the fascia. This is for user reference.

6. Models are available for use on Natural Gas (G20) or Propane Gas (G31).

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

8. On Commissioning the appliance, the Distribution Network Operator (DNO) must be informed using the form provided.

9. The boiler must be installed with one of the purpose designed flues such as the standard horizontal telescopic flue kit, part no. 5118069.

10. **All systems must be thoroughly flushed and treated with inhibitor (see section 6.1 & 2).**

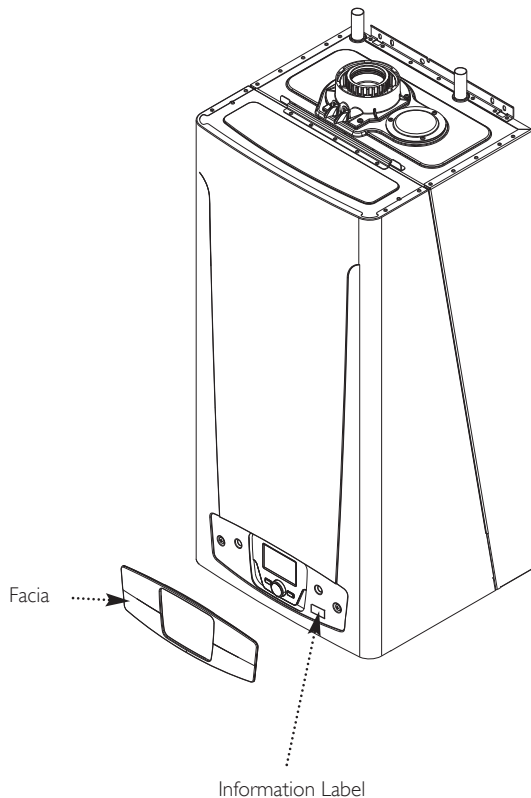


Fig. 1

### 1.2 Contents of Pack

The pack contains:-

- Boiler
- Wall Plate
- Gas Service Cock
- Fixing Screws & Wall Plugs
- Template
- Literature Pack

### 1.3 Optional Extras

1. Flueing kits - see Section 8.0
2. Removable THINK Controller
3. Wall Cradle & 5 LED Receiver Kit
4. Outside Sensor
5. Cylinder Sensor



## 2.0 General Layout

### 2.1 Layout

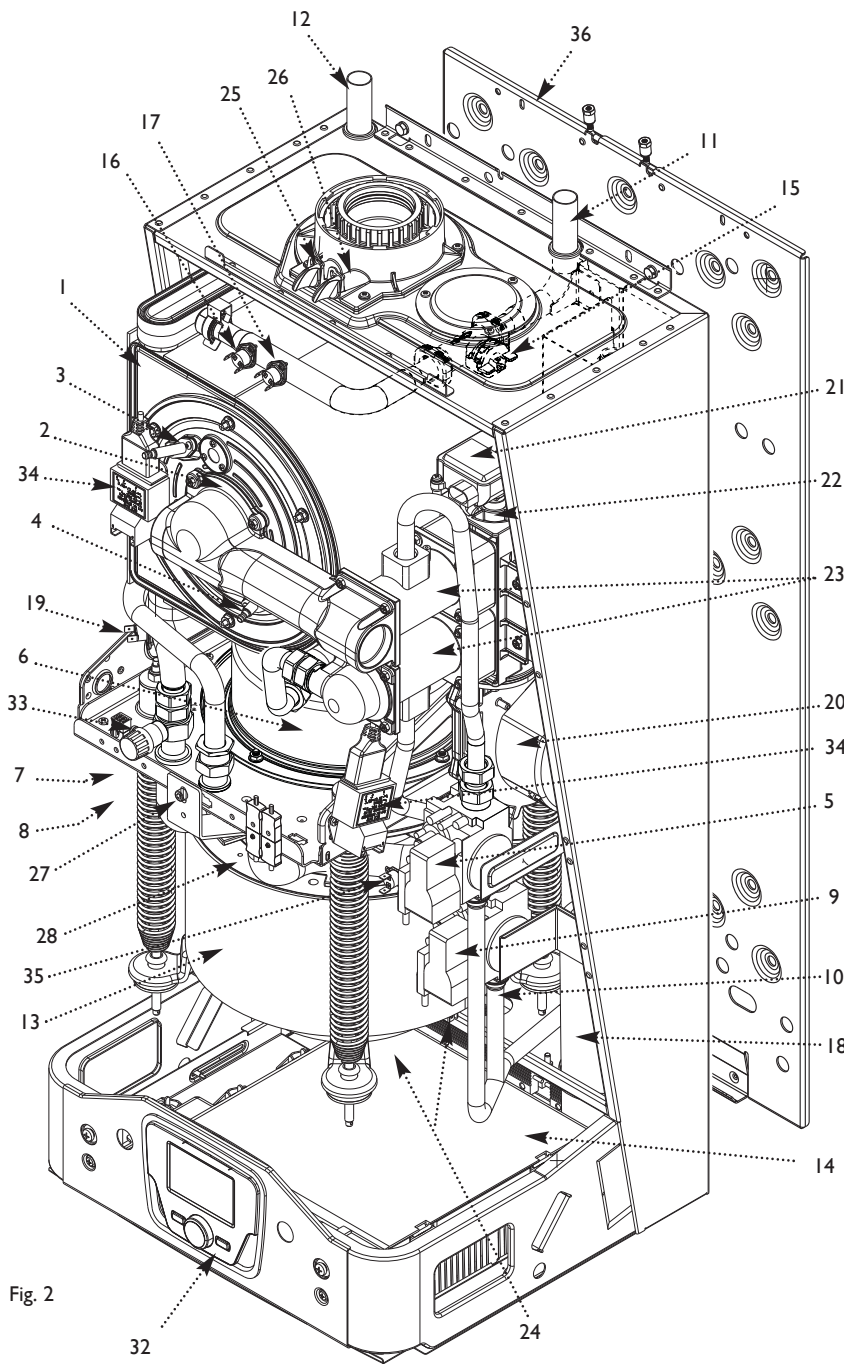
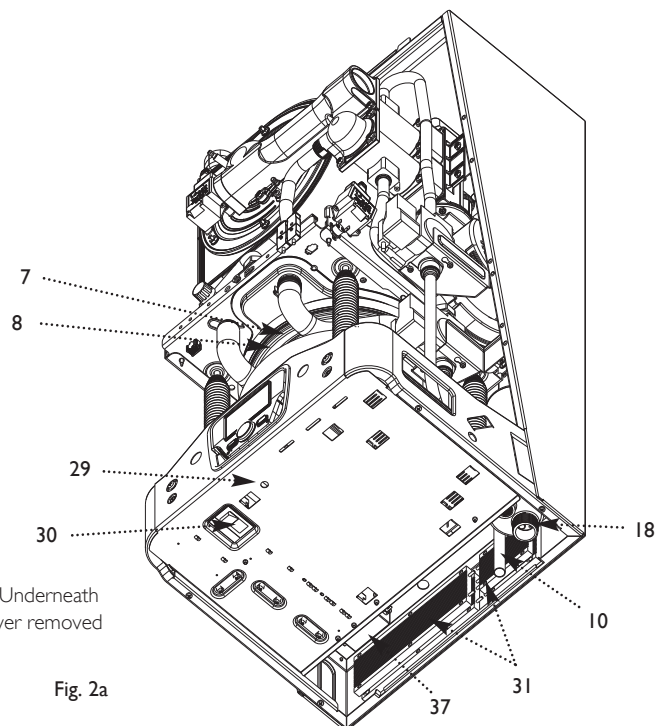


Fig. 2

- |    |                                |
|----|--------------------------------|
| 1  | Supplementary Heat Exchanger   |
| 2  | Burner - Supplementary         |
| 3  | Ignition Electrodes            |
| 4  | Flame Sensing Electrodes       |
| 5  | Supplementary Gas Valve        |
| 6  | Engine Burner                  |
| 7  | Engine Ignition Electrode      |
| 8  | Engine Flame Sensing Electrode |
| 9  | Engine Gas Valve               |
| 10 | Gas Inlet                      |
| 11 | Boiler Flow                    |
| 12 | Boiler Return                  |
| 13 | Engine Alternator              |
| 14 | PCB Control/Cover              |
| 15 | Water Flow Sensor              |
| 16 | Safety Thermostats             |
| 17 | Flow Temperature Sensor        |
| 18 | Condensate Trap                |
| 19 | Return Temperature Sensor      |
| 20 | Fan                            |
| 21 | Spool Valve Motor              |
| 22 | Spool Valve                    |
| 23 | Venturis                       |
| 24 | Overtravel Switches x 2        |
| 25 | Combustion Test Point          |
| 26 | Air Feed Test Point            |
| 27 | Transit Bracket                |
| 28 | Engine Head Thermocouples      |
| 29 | Service Reset Button           |
| 30 | Overcurrent Switch             |
| 31 | Start/Stop Resistors           |
| 32 | THINK Controller               |
| 33 | Drain                          |
| 34 | Ignition Coils                 |
| 35 | Ambient Sensor                 |
| 36 | Wall Plate                     |
| 37 | EMC Mains Filter               |



View from Underneath  
Bottom cover removed  
for Clarity

Fig. 2a



## 3.0 Appliance Operation

### 3.1 Operating Mode (Fig. 3)

1. With a demand for heating or hot water, the pump circulates water through the primary circuit. If the flow is 4.0 L/min or above the ignition sequence will start.

2. When the flow temperature reaches the set point temperature, a 5 minute delay occurs before the burner relights automatically (anti-cycling). The pump continues to run during this period.

3. When the demand is satisfied the burner is extinguished and the pump continues to run for a period of 5 minute (Pump Overrun).

### 3.2 Frost Protection Mode

1. If the boiler return temperature falls below 7° C, then the boiler pump and heating circuit pump/valve are activated or opened. If the temperature rises above 8° C, the frost protection function will be terminated. If the boiler return temperature falls below 3° C, the supplementary burner will be switched on until the return temperature reaches 25° C and the appliance frost protection is stopped.

2. If the supplementary burner is locked, the engine burner will be used. In this case, the return temperature limit to start the burner is increased from 3 to 10° C.

3. If an existing room thermostat is to be used then further protection for the system can be incorporated by using a wall mounted frost thermostat. In certain circumstances it may be necessary to fit a pipe thermostat. If the THINK Controller is used as a room sensor then it will act as a room frost protection unit as well - see Section 10.15.

### 3.3 Pump/Diverter Valve Protection

1. The pump and valve kick is a protective function aimed at preventing the pumps and valves from seizing.

2. Every friday at 3.00am, the pumps and valves connected directly to the boiler unit are switched on 30 seconds and off for 30 seconds, one by one.

### 3.4 Legionella

1. When a DHW cylinder is fitted with a temperature sensor an anti-legionella function can be activated, so that at initial DHW charge and there after at regular intervals the cylinder is heated to destroy any legionella bacteria, the cylinder temperature is raised to 65° C.

2. By default this function is not active. Customers have the choice to activate the function and set how often, or on what day, and at what time this function runs. Customers should be informed that the temperature reached may be considerably higher than their normal requirements (See Section 11.3 paragraph j).

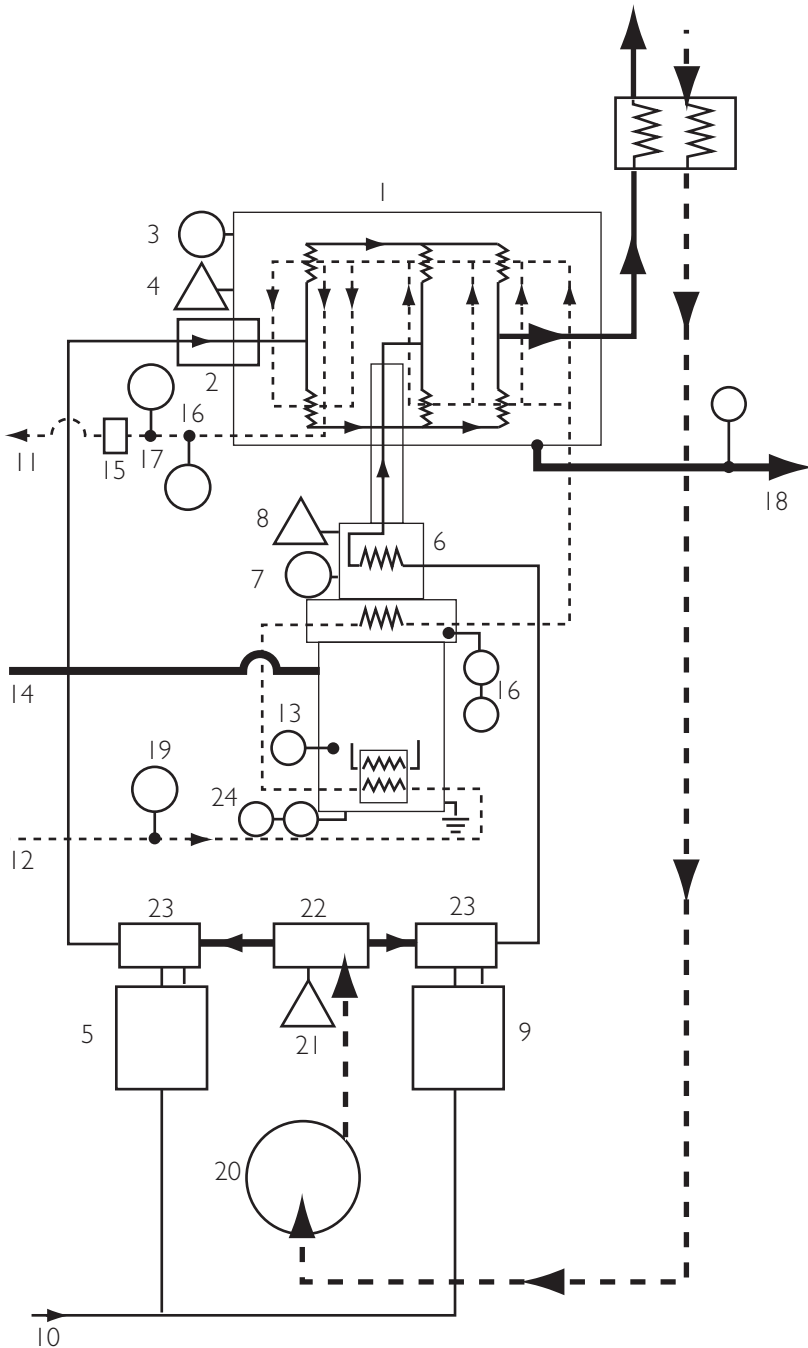


Fig. 3

#### Key

1	Supplementary Heat Exchanger	13	Engine Alternator
2	Burner - Supplementary	14	PCB Control
3	Ignition Electrodes	15	Water Flow Sensor
4	Flame Sensing Electrodes	16	Safety Thermostats
5	Supplementary Gas Valve	17	Flow Temperature Sensor
6	Engine Burner	18	Condensate Trap
7	Engine Ignition Electrode	19	Return Temperature Sensor
8	Engine Flame Sensing Electrode	20	Fan
9	Engine Gas Valve	21	Spool Valve Motor
10	Gas Inlet	22	Spool Valve
11	Boiler Flow	23	Venturis
12	Boiler Return	24	Overtravel Switches

## Country - GB/IE - Natural Gas

<b>Appliance Category</b>	CAT I <sub>2H</sub>		
<b>Max Gas Rate (m<sup>3</sup>/hr)</b>	Both 2.68	Engine 0.82	Supplementary 1.86
<b>Injector (mm)</b>	Engine 4.1	Supplementary	5.6
<b>Inlet Pressure (Natural Gas - G20)</b>	mbar	20	

## Country - GB/IE - Propane Gas

<b>Appliance Category</b>	CAT I <sub>3P</sub>		
<b>Max Gas Rate (m<sup>3</sup>/hr)</b>	Both 1.04	Engine 0.32	Supplementary 0.72
<b>Injector (mm)</b>	Engine 3.0	Supplementary	4.0
<b>Inlet Pressure (LPG - G31)</b>	mbar	37	

<b>Heat Input (Net)</b>	Max	Min
	kW	25.3

<b>Heat Input (Gross)</b>	Max	Min
	kW	28.1

<b>Heat Output (Non-Condensing)</b>	Max	Min
	kW	23.7

<b>Heat Output (Condensing)</b>	Max	Min
	kW	24.3

## 4.1 Ecogen 24/I.0 and Ecogen 24/I.0 LPG

<b>Appliance Type</b>	C <sub>13</sub>	C <sub>33</sub>	C <sub>53</sub>
<b>Electrical Supply</b>	230V~ 50Hz (Appliance must be connected to an earthed supply)		
<b>Power Consumption</b>	24 model	150W	
<b>Electrical Protection</b>	IP X4		
<b>External Fuse Rating</b>	13A		
<b>Internal Fuse Rating for pump &amp; diverter valve</b>	3.15A		
<b>Condensate Drain</b>	To accept 21.5mm (3/4 in) plastic waste pipe		
<b>Flue Terminal Dimensions</b>	Diameter	100mm	
	Projection	125mm	
<b>Connections</b>	copper tails		
Gas Supply	-	15mm	
Central Heating Flow	-	22mm	
Central Heating Return	-	22mm	
<b>Outer Case Dimensions</b>			
Casing Height	-	950mm	
Overall Height Inc Flue Elbow	-	1135mm	
Casing Width	-	450mm	
Casing Depth	-	426mm	

<b>NO<sub>x</sub> Class</b>	5
-----------------------------	---

<b>Central Heating Primary Circuit Sealed System only</b>	
Safety Discharge	bar
Max Operating	3
Min Operating	2.5
Recommended Operating Range	0.5
	1-2

<b>Hydraulic Resistance</b>	See graph below
-----------------------------	-----------------

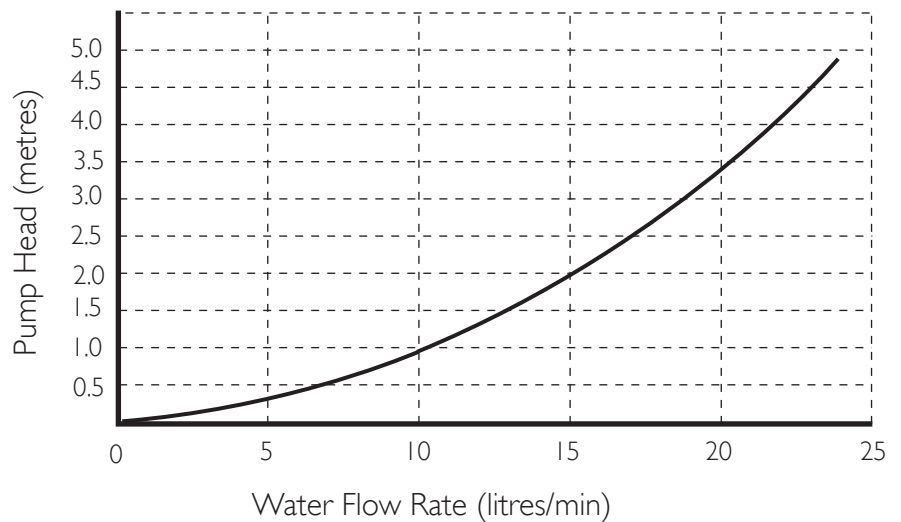
<b>Frost Thermostat</b>	5° C
-------------------------	------

### Weights

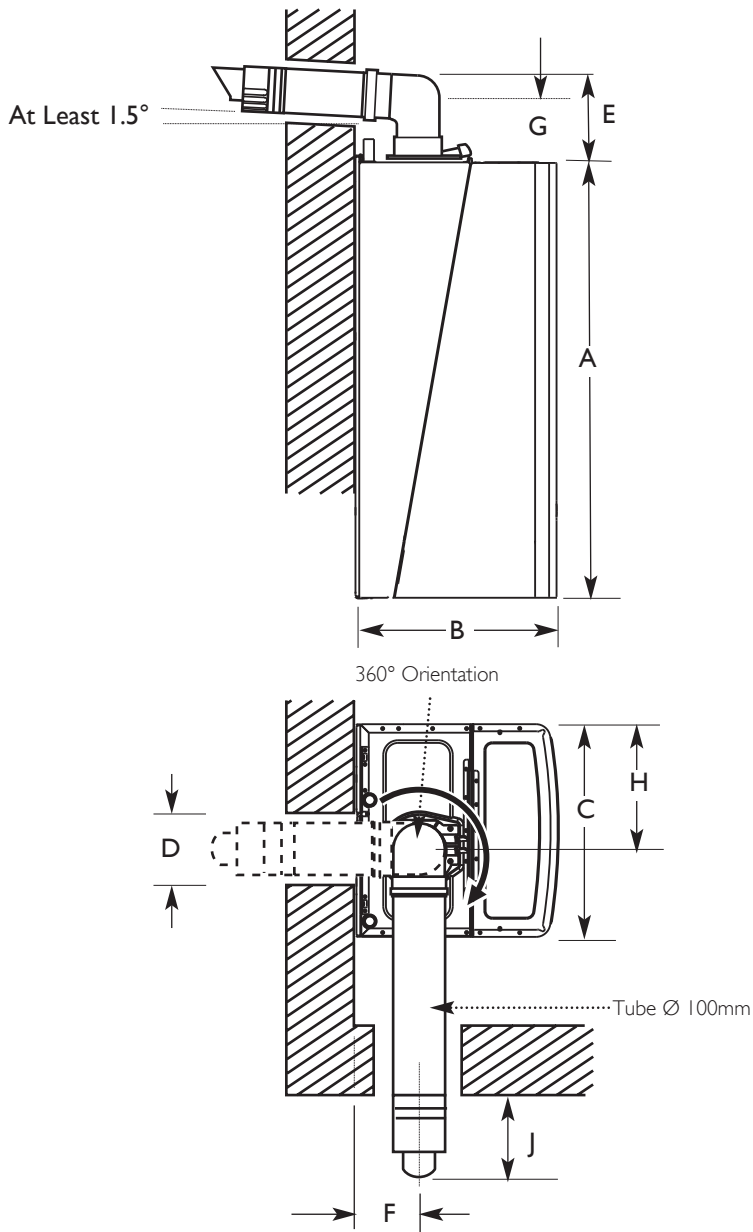
Packaged Boiler Carton	117kg
Installation Lift Weight	110kg

<b>Clearances</b>	
Above Casing	300 mm Min (horizontal flue) 200 mm Min (vertical flue)
Below Casing	200 mm Min
Front	450 mm Min (For Servicing)
Front	5 mm Min (In Operation)
L.H. Side	5 mm Min
R.H. Side	60 mm Min (In Operation)

### Appliance Hydraulic Resistance Chart



## 5.0 Dimensions and Fixings



Dimensions	
A	950mm
B	426mm
C	450mm
D	116mm Ø Min.
E	190mm Allow at least 250mm for assembly and servicing
F	133mm
G	145mm
H	268mm
J	125mm

## 6.0 System Details

### 6.1 Water Circulating Systems

1. The appliance is only suitable for use on sealed systems.

2. Ideally fit a new sealed heating system to Building Regulations part L1 (2010). If an existing sealed system is to be used the following procedure must be completed before the Ecogen is installed.

- The system must be cleaned with Fernox F3
- Power flush the system according to the power flush equipment supplier's instructions.
- Fernox MB-1 inhibitor must be added according to the supplier's instructions.

Following the treatment process a sample of system water must be taken and sent to Fernox for analysis to confirm the system cleaning and dosing process has been successful. A copy of the report to be sent to Baxi Heating UK Ltd, heateam, Ecogen team, Brooks House, Coventry Road Warwick CV3 4LL.

3. Please be aware of the resistance chart for this appliance, and if you are replacing a low resistance boiler ie. old cast iron, the system will need to be rebalanced (See Section 4).

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

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

### 6.2 Treatment of Water Circulating Systems

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

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

3. Full instructions are supplied with the products, for further information contact 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.

## 6.0 System Details

### 6.3 Pipework

1. The sizes of flow and return pipes from the boiler should be determined by normal methods, according to the requirements of the system. The connections to the boiler will accept 22mm pipe fittings. Compression fittings must be used to prevent heat damage to the boiler (as supplied see Section 9.3).

2. A 20 °C drop in temperature across the system is recommended for condensing boilers, but where radiator sizing is marginal it may be advisable to retain a system temperature drop of 11°C.

3. In systems using non-metallic pipework it is necessary to use copper pipe for the boiler Flow and Return. The copper must extend at least 1 metre from the boiler and include any branches (Fig. 4).

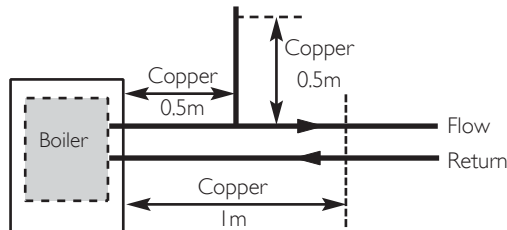


Fig. 4

### 6.4 Bypass Requirements

1. An Automatic Bypass must be fitted. The appliance requires a minimum bypass of 7 l/min for open vented systems.

### 6.5 Magnetic Cleaner (Fig. 5)

1. A 'ADEY MagnaClean TwinTech' Magnetic Filter must be fitted on the return to boiler as close to the appliance as possible. **FAILURE TO FIT THIS DEVICE WILL INVALIDATE THE APPLIANCE WARRANTY.**

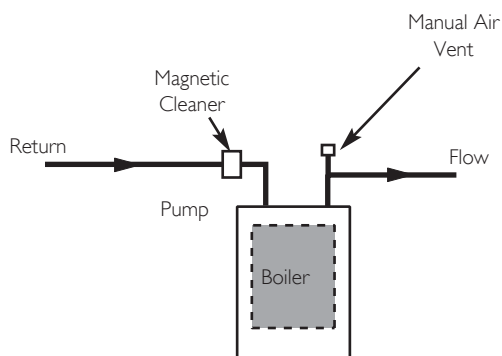


Fig. 5

### 6.6 Sealed Systems Details (Fig. 8)

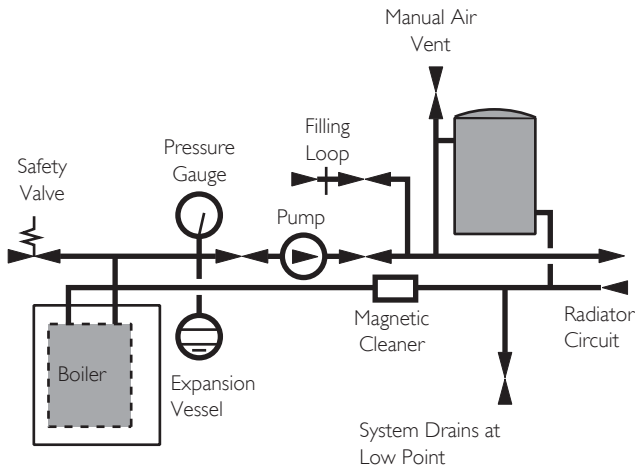


Fig. 8

Method of determining minimum valve of expansion vessel volume for sealed systems

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

Table. 1

Example :- System Volume = 75 litres  
 Vessel Charge Pressure = 1.0 bar  
 Initial System Pressure = 1.5 bar  
 Then :-  $75 \times 0.152 = 11.4$  litres  
 Expansion Vessel Volume = 12 litres

#### NOTE

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

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

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

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

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

4. **FILLING LOOP** - A filling loop connection on the central heating return pipework must be provided to facilitate initial filling and pressurising and also any subsequent water loss replacement / refilling. The sealed primary circuits may be filled or replenished by means of a temporary connection between the primary circuit and a supply pipe provided a 'Listed' double check valve or some other no less effective backflow prevention device is permanently connected at the inlet to the circuit and the temporary connection is removed after use. The filling method adopted must be in accordance with all relevant water supply regulations and use approved equipment.

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

5. **VENTING** - A method of venting the system during filling and commissioning must be provided by fitting manual vents. Care must be taken to ensure any air in the system is completely vented.

6. **HOT WATER STORAGE** - The hot water storage vessel must be of the indirect coil type. All components used in the system must be suitable for operation at 110°C and at the pressure allowed by the safety valve.

### 6.7 Controls Component Options for Intelligent Installations

1. A THINK Controller is mounted on the appliance as standard (It can be mounted on a wall cradle and configured to use as an room sensor).

**IMPORTANT:** Before running the appliance ensure parameter 5700 has been set according to the type of system installed. See sections 10.4 to 10.11 for system types and section 11.3.k for the change procedure.

2. There Are 4 other optional control components as well as the THINK Controller which can be used in conjunction with the Ecogen appliance these are: -

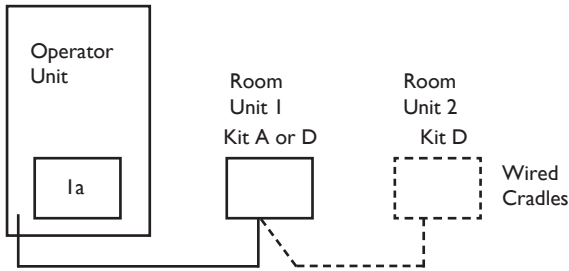
- A wired 5 LED Receiver – to run on or off the appliance.
- An RF 5 LED Receiver - to run on or off the appliance.
- A wired Wall cradle for the THINK Controller or either 5 LED Receiver.
- An RF Wall cradle for the THINK Controller.

3. The following Kits are available: -

- A) A wired Wall cradle with a wired 5 LED Receiver.
- B) An RF Wall cradle with An RF 5 LED Receiver.
- C) An RF Wall cradle with a THINK Controller.
- D) A wired Wall cradle with a THINK Controller.

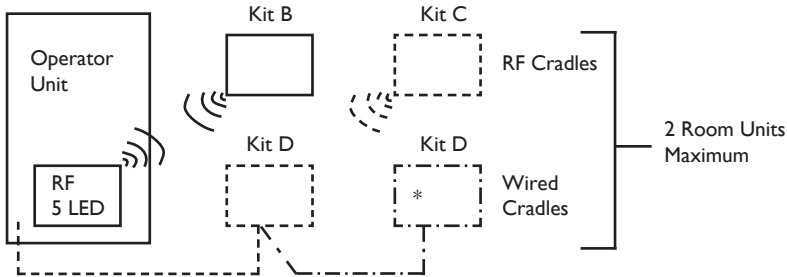
These can be combined to give the following set ups in the property

All wired connections



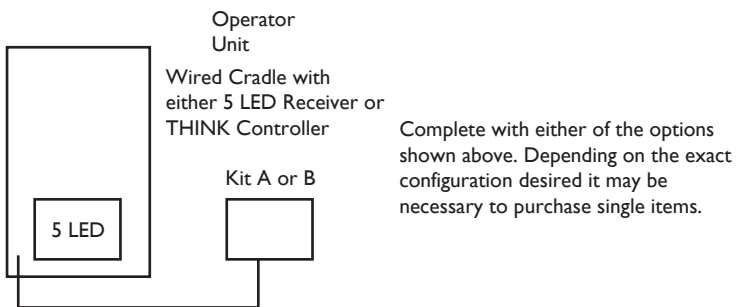
1a - THINK Controller or 5 LED Receiver

All RF connections or mixed



\* A THINK Controller here implies that the RF facility is not being used - the customer has reverted to an all wired system

All RF connections or mixed with the **user reset** off appliance



NOTE:- Either a 5 LED Receiver or a THINK Controller must be fitted to the appliance for the safety of the user or visiting service personnel.



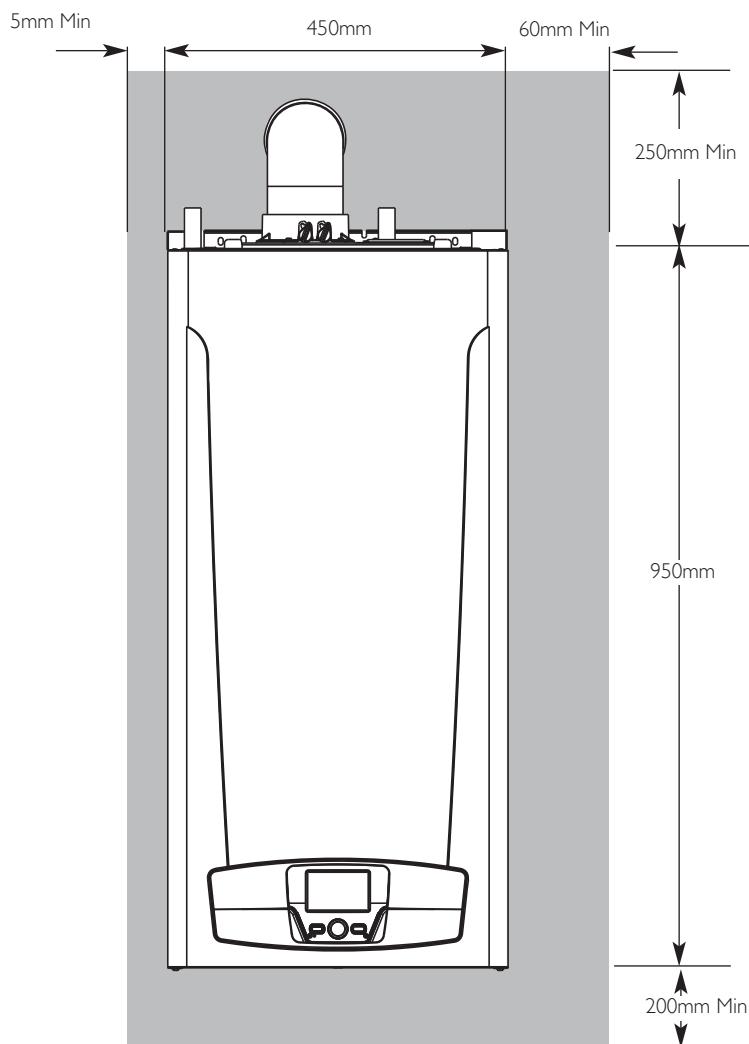


Fig. 9

Ensure that there is adequate clearance for the lifting equipment. (Genie GL-8 lifting equipment dimensions are 64cm wide x 175cm high x 95cm deep).

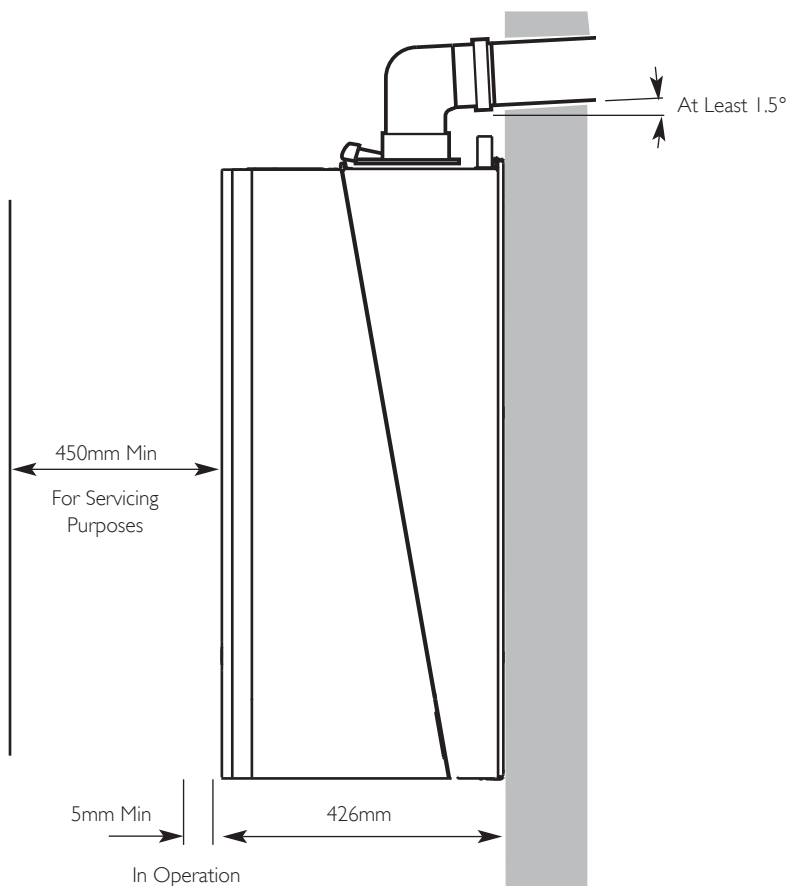


Fig. 10

## 7.0 Site Requirements

### 7.1 Location

1. Must not be located in a living space (recommend locations, garage, utility, and outhouse).
2. There must be sufficient space at the installation location and in the route to the location for manoeuvring and operating the lifting equipment (Genie GL-8 lifting equipment dimensions are 64cm wide x 175cm high x 95cm deep). This space must be maintained for future access of the lifting equipment for maintenance.
3. Wall structure must be a solid flat load bearing wall of brick or block. Partition and timber frame walls, and dot and dab plaster board are not suitable. If in doubt consult a Structural Engineer.
4. To eliminate the transmission of noise from the appliance and its pipework it is recommended that the central heating pipework is adequately routed and clipped so that contact between the structure of the building and pipework is eliminated.

### 7.2 Clearances (Figs. 9 & 10)

1. A flat vertical area is required for the installation of the boiler.
2. These dimensions include the necessary clearances around the boiler for case removal, spanner access and air movement. Additional clearances may be required for the passage of pipes around local obstructions such as joists running parallel to the front face of the boiler.
3. Ensure that there is adequate clearance for the lifting equipment (Genie GL-8 lifting equipment dimensions are 64cm wide x 175cm high x 95cm deep).

### 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.

## 7.0 Site Requirement

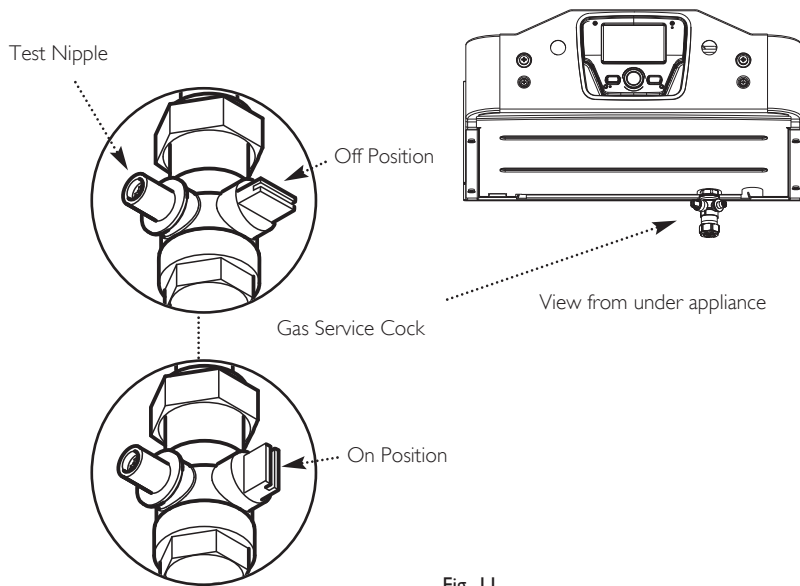


Fig. 11

### 7.4 Gas Supply

1. The gas installation should be in accordance with the relevant standards. In GB this is BS 6891 (Natural Gas) or BS 5482-1 (Propane Gas). In IE this is the current edition of I.S. 813 "Domestic Gas Installations".

2. A gas service cock is supplied to enable connection using 15mm copper pipe (Fig. 11).

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. It is recommended that 22mm diameter pipe is used to within 1m of the appliance.

### 7.5 Electrical Supply

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

2. The mains supply is 230V ~ 50Hz fused at 13A.

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

Connection must be via a 13A BSI363 Switched Fuse Spur servicing the boiler and system controls only.

**NOTE:** this appliance will not work in conjunction with prepaid meters. Prepaid meters must be replaced by the electricity provider to enable export of electricity back into the grid.

## 7.0 Site Requirements

PSR	HPER
0.5	0.295
0.6	0.282
0.7	0.269
0.8	0.256
0.9	0.243
1	0.231
1.1	0.225
1.2	0.219
1.3	0.213
1.4	0.207
1.5 to 4	0.201

### 7.6 Heating Plant Emissions Rate (HPER)

1. To enable the house holder to claim the Feed in tariff (FIT) the heating plant emission rate must be calculated and entered into the MCS certification submission and recorded in the Micro chp system commissioning checklist benchmark sheets at the back of these instructions.

See the Baxi website to calculate the HPER values

<http://www.baxi.co.uk/products/get-fit-with-baxi-ecogen.htm>.

Calculate perform - <http://www.ecogen.baxi.co.uk/mcsperform>

2. To find the Heating Plant Emissions Rates for Plant Size Ratios between 0.5 and 4.0 please see the table opposite.

### 7.7 Electrical Connection - General

1. The product must be installed by a competent trained electrician that has been on a Baxi approved course.

2. The fuse rating of the securable isolator shall be 13A.

3. A mains supply of 230V ~50Hz is required.

4. Mains wiring external to the product must be in accordance with the **current IEE (BS 7671)** Requirements for Electrical Installation (Wiring Regulations) and any local regulations.

5. Connection must be made in a way that allows complete isolation of the electricity supply - a double pole switch serving only the product and system controls. The manual isolation switch shall be capable of being secured in the off (isolation) position; this switch is to be located in an accessible position within the customer's installation.

6. Connection to the mains must be made in accordance with the latest addition of the Engineering Recommendation G83 - Recommendations for the connection of Small - Scale Embedded Generators (SSEG) in parallel with public low voltage distribution networks.

7. The Distribution Network Operator (DNO) must be provided with information regarding the SSEG Guidance Notes, installation on the day of commissioning. A notification sheet is provided which should be completed and sent to your Distribution Network Operator (DNO) - alternatively this may be done through the DNO's website.

8. Two labels (Figs. 12 & 12a) are provided to be placed at:-  
a) The consumer unit  
b) The appliance

9. The installer shall provide labelling at the supply terminals (fused cut-out), meter position, consumer unit and at all points of isolation within the users premises to indicate the presence of a micro-CHP unit. An example of the warning label to be left on site is shown (Fig. 12a).

10. There are two ways in which the Ecogen 24/1.0 appliance can be electrically installed.

Connection by dedicated circuit (Fig. 13)

Connection into an existing final circuit (Fig. 13a)

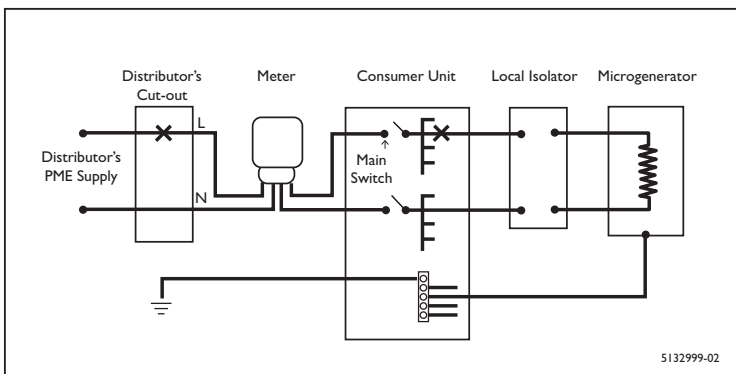
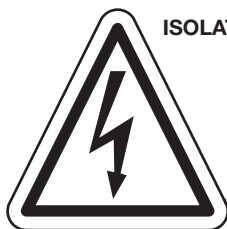


Fig. 12

## WARNING - DUAL SUPPLY



**ISOLATE BOTH MAINS AND ON-SITE GENERATION BEFORE CARRYING OUT WORK**

**ISOLATE THE MAINS AT** -----

**ISOLATE THE GENERATOR AT** -----

Fig. 12a

**IMPORTANT:** In designing a connection for the Ecogen 24/1.0 the electrical installer has to consider all the issues that would need to be covered for a conventional final circuit, including:-

**In Accordance with BS: 7671.**

- the maximum demand (and the generator output)
- the type of earthing arrangement
- the nature of the supply
- external influences
- compatibility, maintainability and accessibility
- protection against electric shock
- protection against thermal effects
- protection against over current
- isolation and switching
- equipment selection and installation issues

The electrical installer should check that the prospective fault current would not change sufficiently to exceed the fault rating of existing protective devices.

## 7.0 Site Requirements

### 7.7 Electrical Connection (cont) - Installer information

11. Whichever of the two options is chosen, it is imperative that the safety of the electrical installation is not impaired by the installation of the Ecogen 24/1.0.

12. To enable the FIT to be claimed the electricity generated and exported must be monitored by meters installed into the electricity supply as shown in Figs. 13, 13a and 13b, for the export either bidirectional meters as in Figs. 13 and 13a, or by leaving the existing meter and adding an additional meter as in Fig. 13b. An extra meter must be added just before the appliance to measure the electrical generation. The serial number must be submitted for MCS submission and recorded in both the DNO leaflet and the Micro CHP system commissioning checklist benchmark sheets at the back of these instructions.

13. **The Ecogen 24/1.0 must not be connected to an installation by means of a plug and socket.**

14. The essential criteria which must be met are given below for both options.

15. **Connection of an Ecogen to a dedicated circuit**

(i) The basic design parameters for the circuit are:

$I_b > I_g$  where  $I_b$  is the design current and  $I_g$  is the rated output current of the Ecogen

$I_n > I_b$  where  $I_n$  is the nominal current of the overload protective device

Disconnection of the final circuit in the event of an earth fault on the circuit and de-energising of the Ecogen should both occur within an overall maximum time of 0.4 s for TN systems and 0.2 s for TT systems. However, if the protective device for automatic disconnection in case of an earth fault disconnects line and neutral conductors, it is not necessary to take account of the time taken for the Ecogen to de-energise.

(ii) Where an Ecogen is connected on the same side of an RCD as final circuits protected by that RCD, the RCD must disconnect the line and neutral conductors.

(iii) The Ecogen must be provided with means of isolation and of switching off for mechanical maintenance.

16. **Connection of a Ecogen to an existing final circuit**

(i) The basic design parameters for the circuit are:

$I_z > I_n + I_g$  where  $I_z$  is the current carrying capacity of the conductors of the final circuit,  $I_n$  is the nominal current of the overload protective device and  $I_g$  is the rated output current of the Ecogen. This may require the protective device to be replaced with one having a lower nominal current rating.

Disconnection of the final circuit in the event of an earth fault on the circuit and de-energising of the Ecogen should both occur within an overall maximum time of 0.4 s for TN systems and 0.2 s for TT systems. However, if the protective device for automatic disconnection in case of an earth fault disconnects line and neutral conductors, it is not necessary to take account of the time taken for the Ecogen to de-energise.

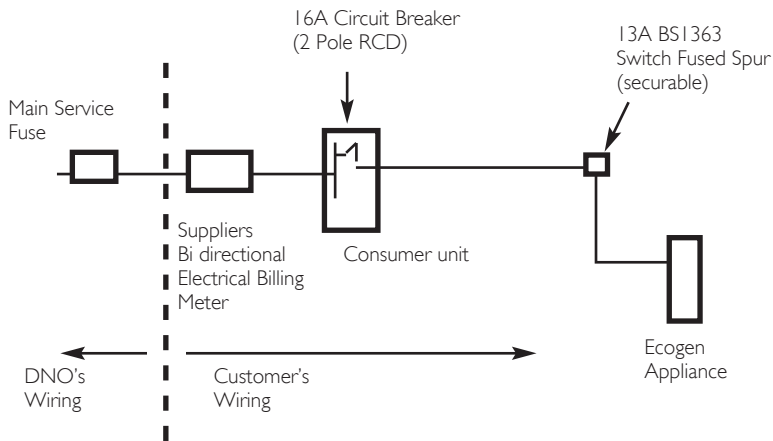


Fig. 13

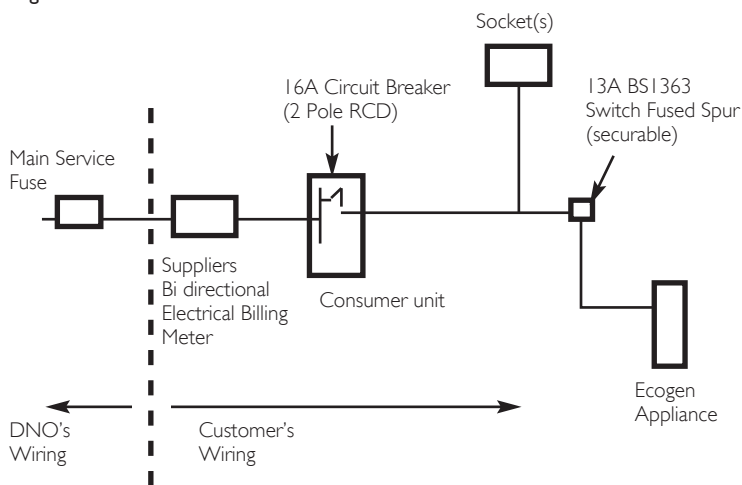


Fig. 13a

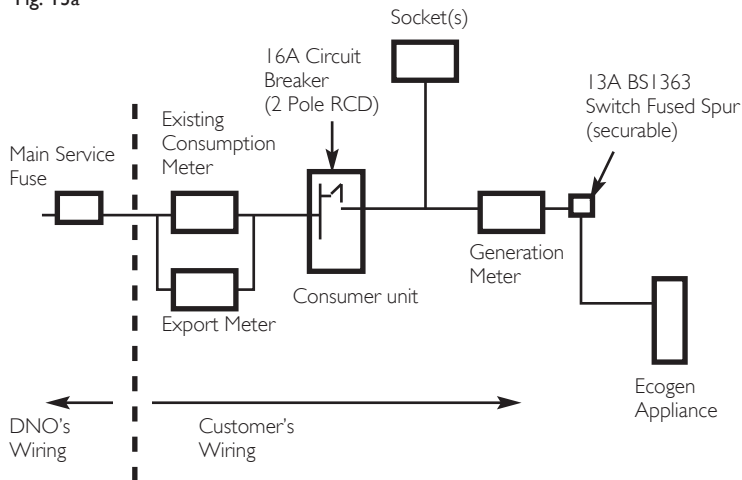
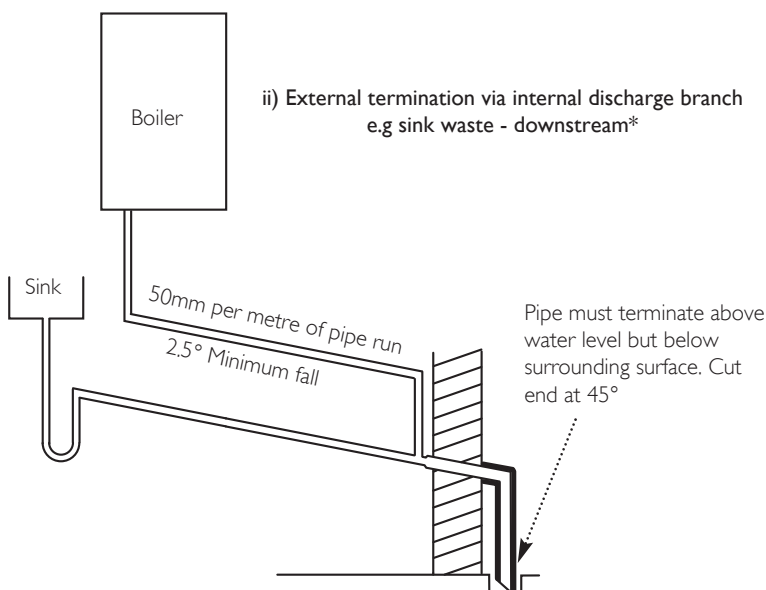
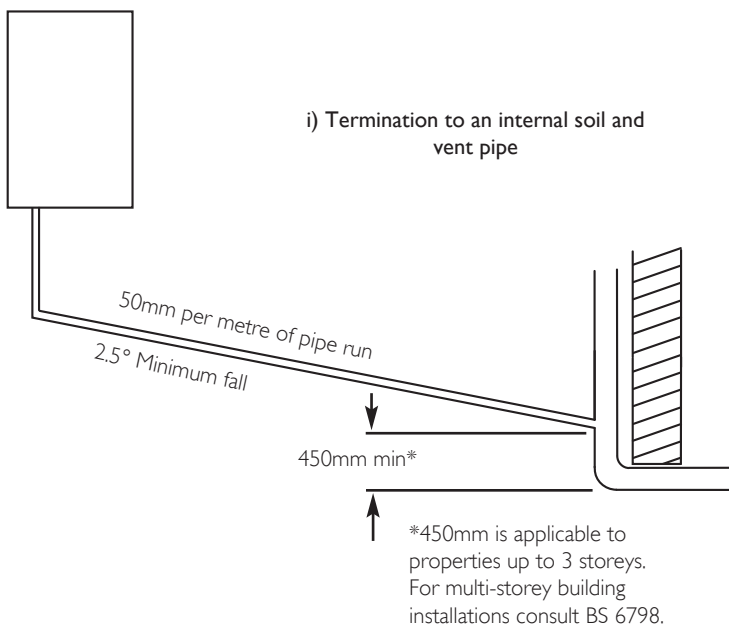
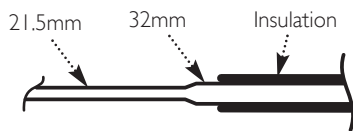


Fig. 13b

Examples are shown of the following methods of termination:-

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

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



\*It is NOT RECOMMENDED to connect upstream of the sink or other waste water receptacle !

## 7.0 Site Requirements

### 7.8 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. CORRECT INSTALLATION IN ACCORDANCE WITH THIS SECTION WILL CONSIDERABLY MINIMISE THE LIKELIHOOD OF BLOCKAGE AND SUBSEQUENT BOILER LOCK-OUT.

A CONDENSATE DISCHARGE PUMP AND PIPE 'TRACE HEATING' ARE AVAILABLE AS ACCESSORIES - see paragraphs 7.8.12 to 7.8.15 for further details.

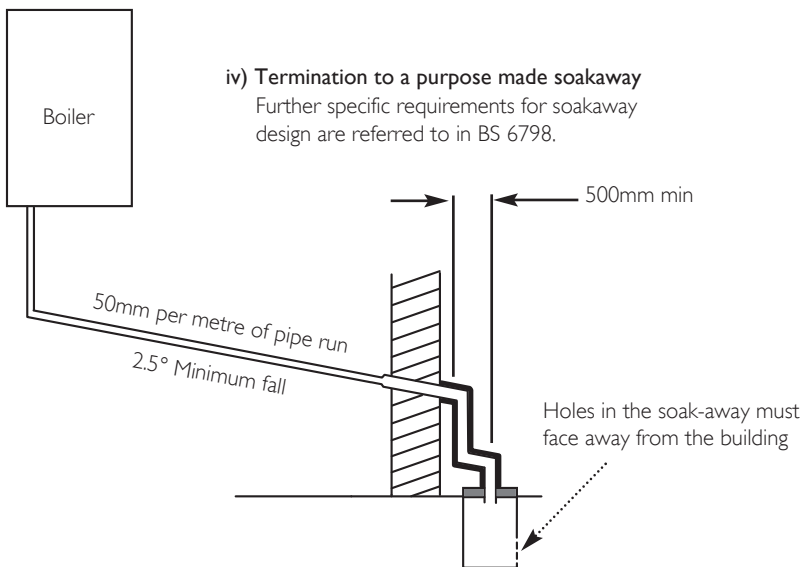
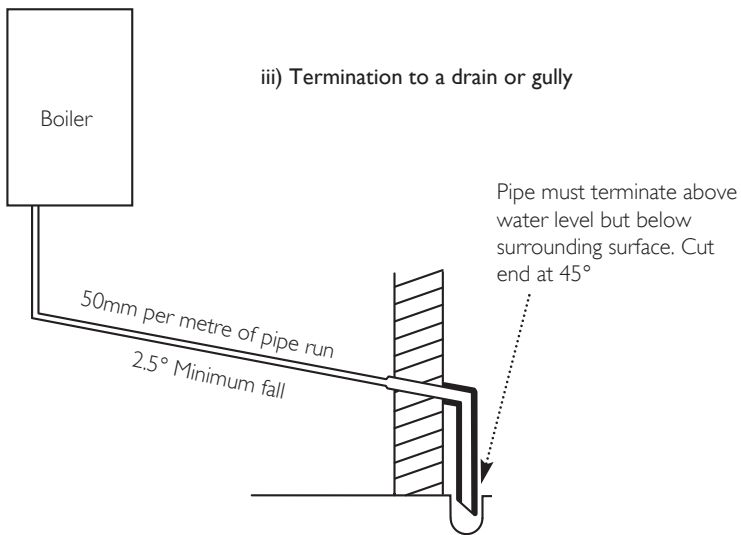
The condensate discharge pipe **MUST NOT RISE** at any point along its length. There **MUST** be a fall of **AT LEAST 2.5°** (50mm per metre) along the entire run **EXCEPT** when employing a suitable condensate pump in basement and cellar or similar applications.

The boiler condensate trap incorporates a seal of 75mm, therefore it is unnecessary to install an air break and trap in the discharge pipework.

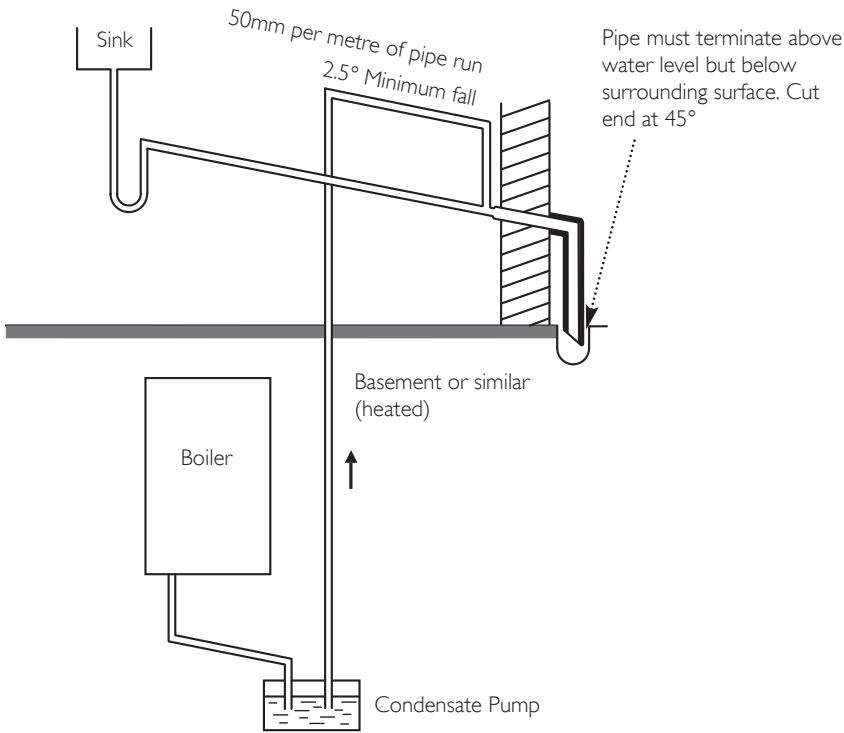
1. The condensate outlet will accept 21.5mm (3/4in) plastic overflow pipe. **It is strongly recommended that this discharges internally into the household drainage system.** Where this is not possible, discharge into an outside drain is permissible providing every possible precaution is taken to prevent freezing.
2. Ensure the discharge of condensate complies with any national or local regulations in force. **BS 6798 & Part H1 of the Building Regulations give further detailed guidance.**
3. The discharge pipe should be run in a proprietary drain pipe material e.g. PVC, PVC-U, ABS, PVC-C or PP.
4. Metal pipework is **NOT** suitable for use in condensate discharge systems.
5. The pipe should be a minimum of 21.5mm diameter and must be supported using suitably spaced clips of the correct design to prevent sagging.
6. **It is advisable that the full length of condensate pipe is run internally and preferably be less than 3 metres.**
7. **Internal runs greater than 3 metres or runs in cold areas should use 32mm waste pipe.**
8. **External runs MUST be a MINIMUM of 32mm and fully insulated with material suitable for external use.**
9. If the boiler is fitted in an unheated location the entire condensate discharge pipe should be treated as an external run and sized and insulated accordingly.
10. In all cases discharge pipe must be installed to aid disposal of the condensate. To reduce the risk of condensate being trapped, as few bends and fittings as possible should be used and any burrs on cut pipe removed.

### 7.8 Condensate Drain (cont.)

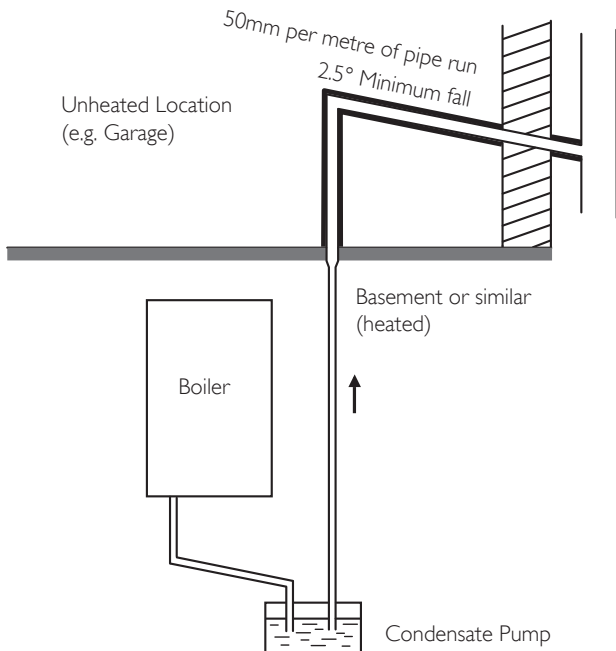
11. When discharging condensate into a soil stack or waste pipe the effects of existing plumbing must be considered. If soil pipes or waste pipes are subjected to internal pressure fluctuations when WC's are flushed or sinks emptied then back-pressure may force water out of the boiler trap and cause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



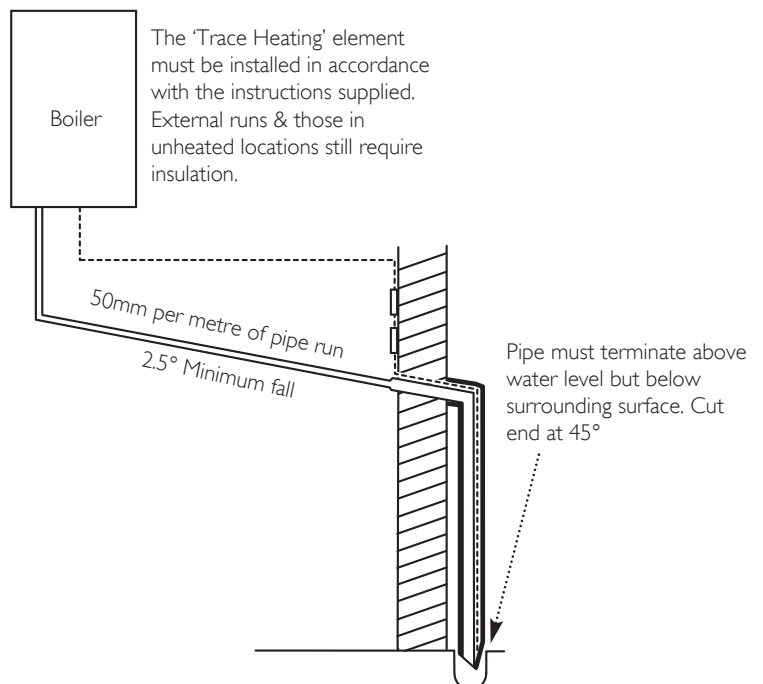
v) pumped into an internal discharge branch  
(e.g. sink waste) downstream of the trap



vi) pumped into an external soil & vent pipe



vii) to a drain or gully with extended external run & trace heating



## 7.0 Site Requirement

### 7.8 Condensate Drain (cont.)

12. A boiler discharge pump is available, 'MULTIFIT' 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. Follow the instructions supplied with the pump.

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

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

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

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

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



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

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

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

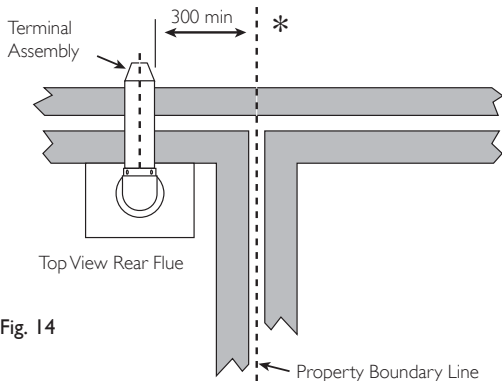


Fig. 14

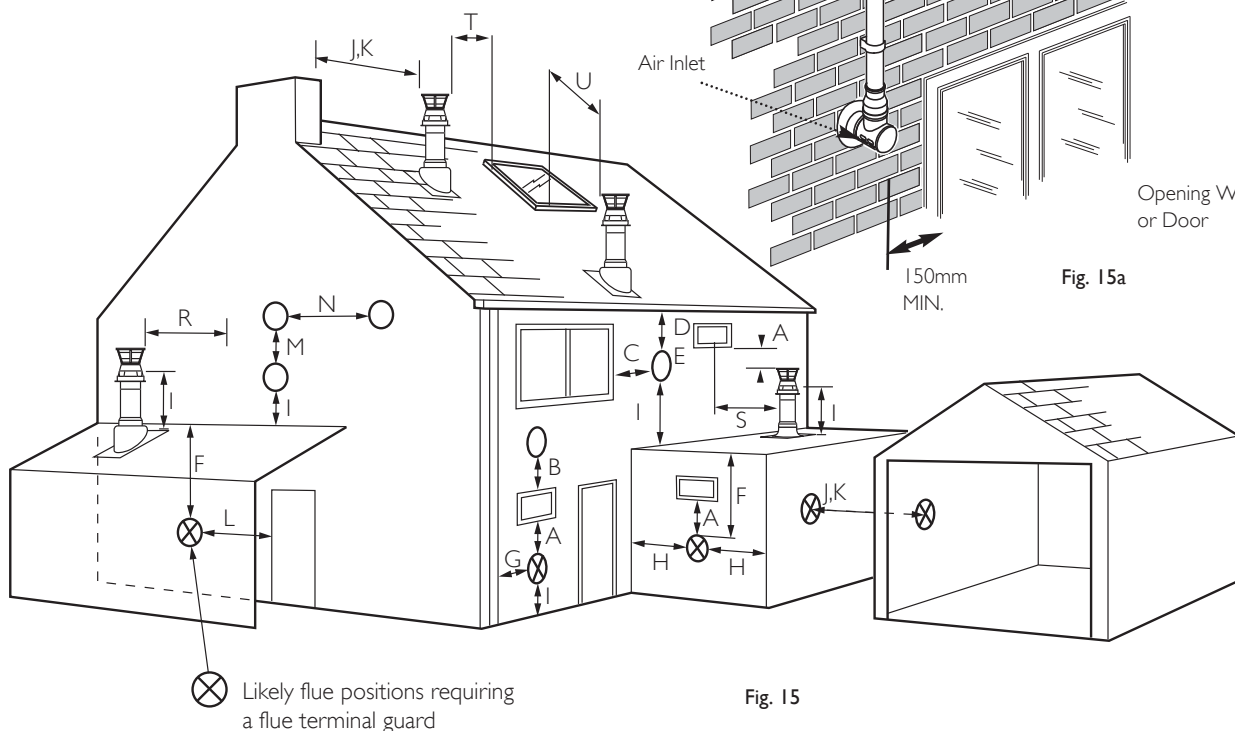


Fig. 15

## 7.0 Site Requirements

### 7.9 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.

4. \* Reduction to the boundary is possible down to 25mm but the flue deflector kit (part no. 5111068) must be fitted.

**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.

**IMPORTANT:** If fitting a Plume Displacement Flue Kit, the air inlet must be a minimum of 150mm from any opening windows or doors (see Section 8.11).

Fig. 15a

## 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 40 mm. Use the lubrication provided in the kit to aid assembly.
3. For long flue runs allow 5 mm per metre for expansion.
4. Maximum permissible equivalent flue lengths are:-

Horizontal Concentric (60/100) 5 metres

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

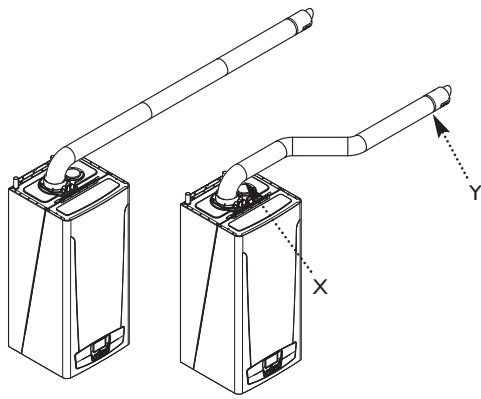
Their equivalent lengths are:-

Concentric Pipes:		
(60/100)	135° bend	0.5 metres
	93° bend	1.0 metres

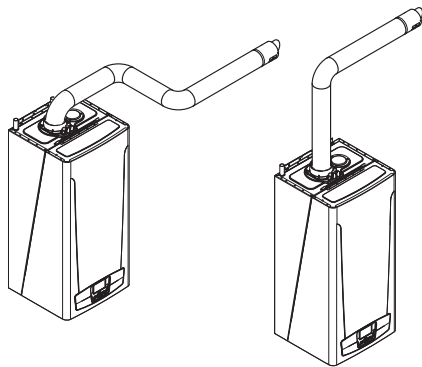
The elbow supplied with the standard horizontal telescopic flue kit is not included in any equivalent length calculations

**NOTE:** Flue length is measured from point X to Y as shown.

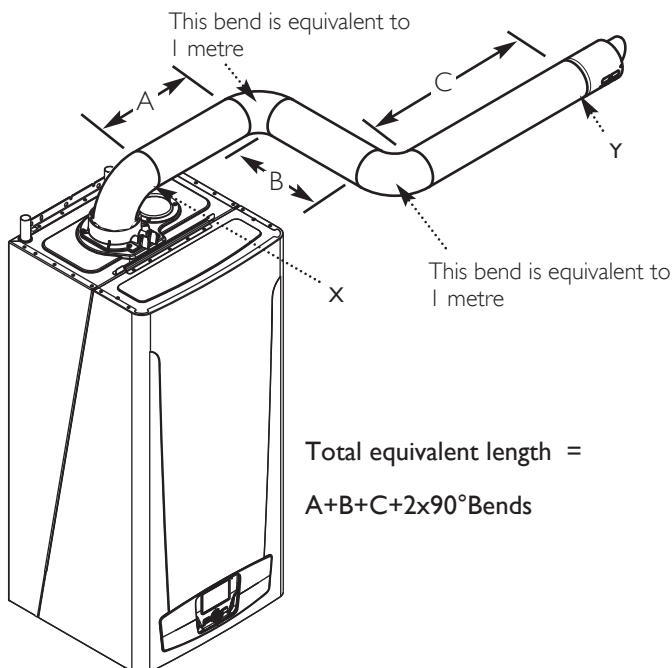
**IMPORTANT:** All flue systems must be securely supported at least once every metre. Suitable pipe supports are available as accessories.



Horizontal Flues



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



## 8.0 Flue Options

### 8.2 Twin & Vertical Flue Systems

1. Maximum permissible equivalent flue lengths are:-

Vertical Concentric (60/100)	5 metres
Vertical Twin Pipe (80/80)	10 metres

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

Their equivalent lengths are:-

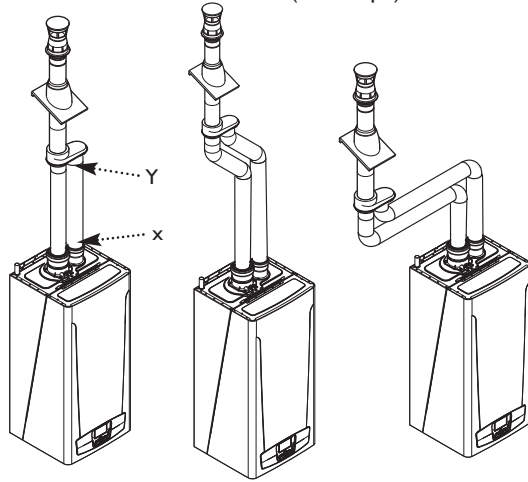
Concentric Pipes:	
135° bend	0.5 metres
93° bend	1.0 metres
Twin Flue Pipe	
135° bend	0.25 metres
91.5° bend	0.50 metres

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

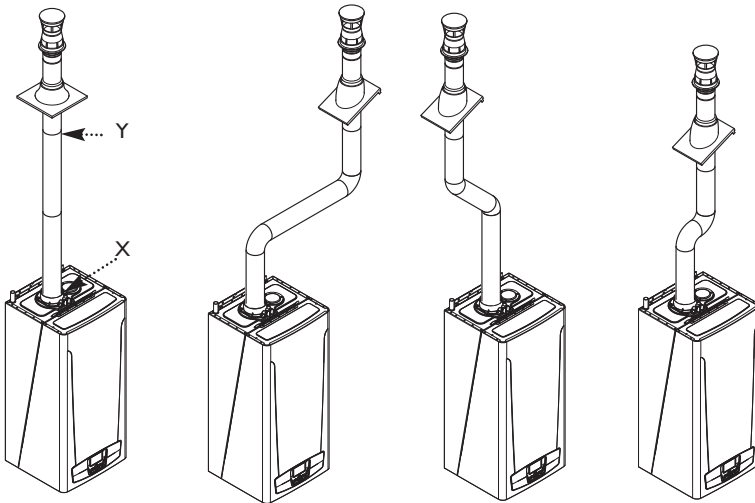
**NOTE:** Flue length is measured from point X to Y as shown.

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

Vertical Flues (Twin Pipe)



Vertical Flues

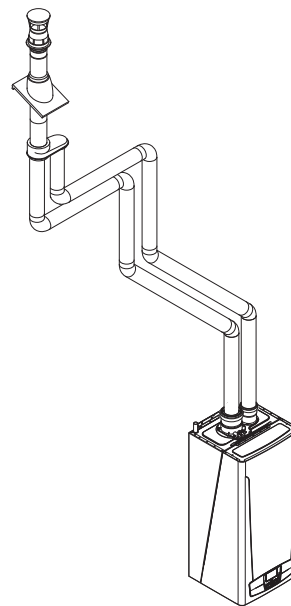
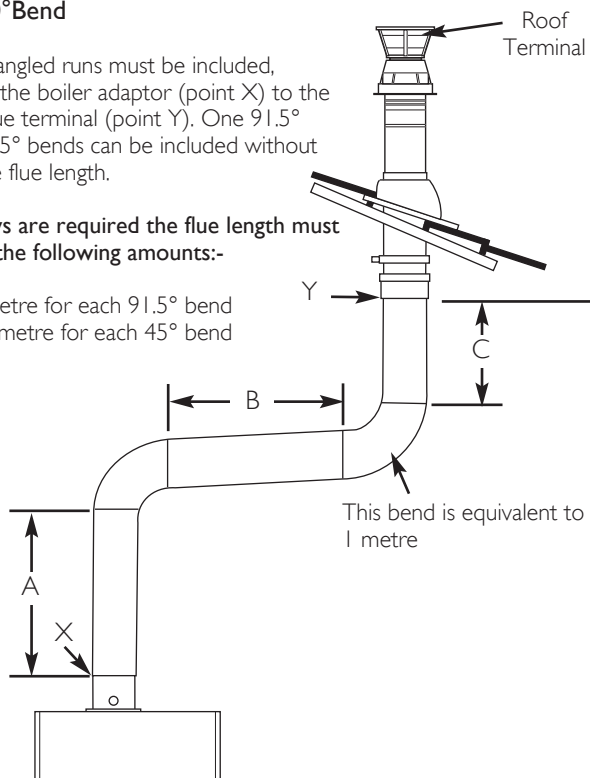


**Total Equivalent Length = A+B+C+1x90°Bend**

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

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

1 metre for each 91.5° bend  
0.5 metre for each 45° bend



The total equivalent length for this example is = 6.5 metres.

AIR DUCT		
Equivalent Length Value	N° of fittings/pipes	Sub total
1m extension		
135°bend		
91.5°bend		
Equivalent Length Air Duct = <b>6.5m</b>		

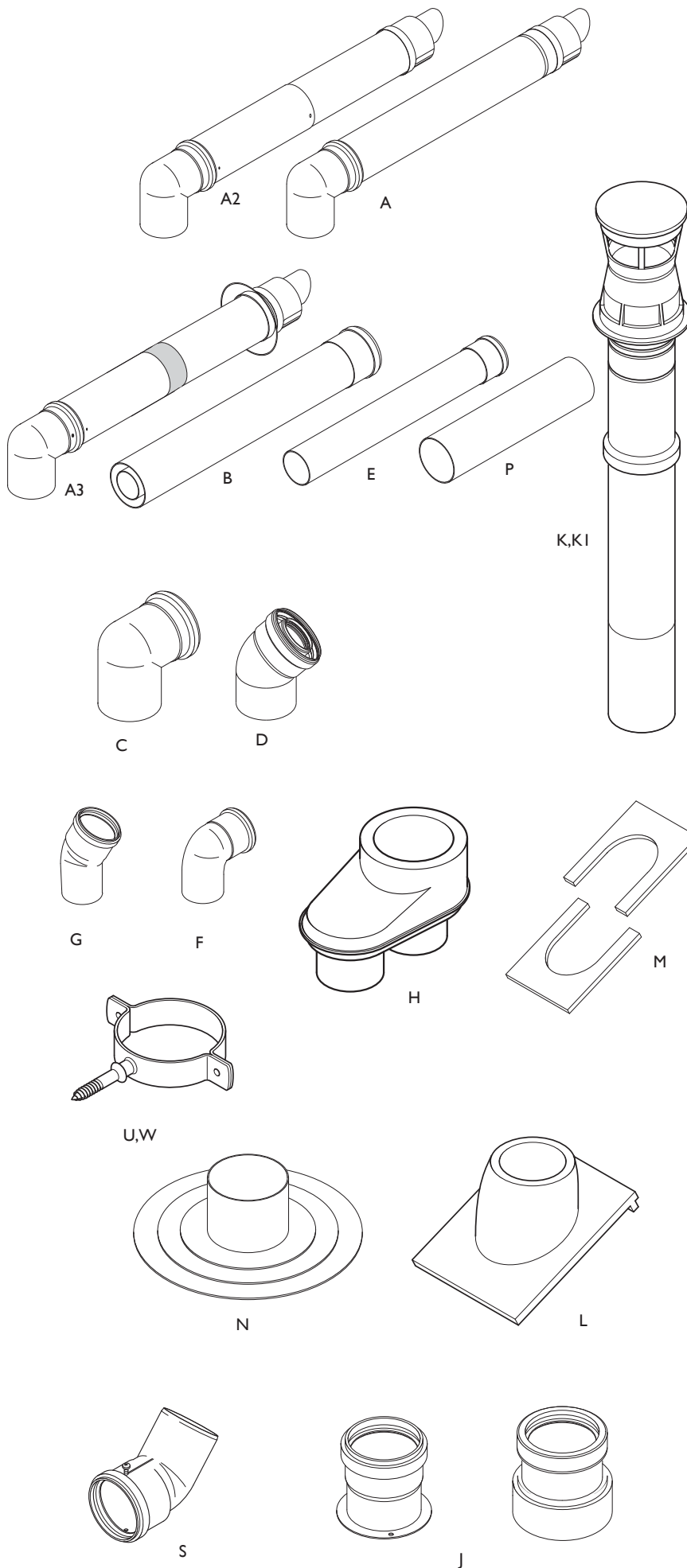
1m extension  
135°bend  
91.5°bend

FLUE DUCT		
Equivalent Length Value	N° of fittings/pipes	Sub total
1m extension		
135°bend		
91.5°bend		
Equivalent Length Flue Duct = <b>6.5m</b>		

1m extension  
135°bend  
91.5°bend

## 8.0 Flue Options

### 8.3 Flue Accessories



Key Accessory Size Code No

#### FLUE GROUP A

##### Concentric Flue System 100mm diameter

A3	Telescopic Internal Flue Kit	315-500mm	5119654
A2	Telescopic Flue (incl elbow)		5118069
A	Horizontal Flue Terminal (incl elbow)		5118489
B	Flue Extension	1000mm	5111074
C	Flue Bend	93°	5111075
D	Flue Bend (pair)	135°	5111085
U	Pipe Support (painted)	100mmØ	5111080
P	Wall Liner		5111067
S	Flue Terminal Deflector		5111068

#### FLUE GROUP N

##### Twin Flue System 80mm diameter

E	Flue Extension (pair)	1000mm	5111087
F	Flue Bend (pair)	90°	5111072
G	Flue Bend (2 pair)	135°	5111086
J	Vertical Flue Boiler Adaptor Kit		5111079
H	Vertical Flue Adaptor		5111084
W	Pipe Support (pair)	80mm	5111081

#### FLUE GROUP A, N, G

##### Vertical Flue Kits

K	Vertical Flue Terminal (80/125 use with Item H)		5111078
KI	Vertical Flue Terminal (60/100)		5118576
L	Pitch Roof Flashing	25°/50°	5122151
M	Roof Cover Plate		246143
N	Flat Roof Flashing		246144

## 8.0 Flue Options

For Twin Flue Systems fit the adaptors as follows:-

### 8.4 Flue Duct Adaptor (Fig. 17)

1. Engage the flue adaptor on the boiler adaptor, making sure that it is pushed down as far as possible.

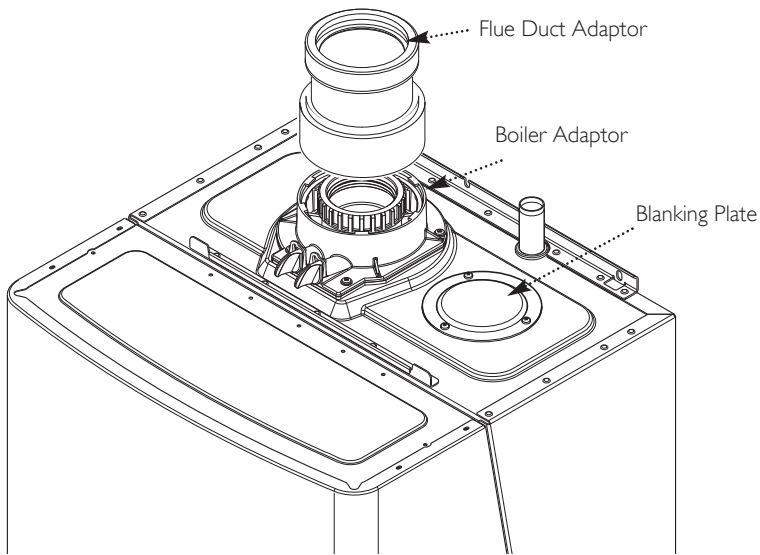


Fig. 17

### 8.5 Air duct adaptor (Fig. 18)

1. Undo the screws securing the blanking plate to the boiler top panel. Discard the plate.

2. Take one of the gaskets supplied in the kit and place on the boiler top panel.

3. Using the screws previously removed secure the inlet adaptor to the top panel.

4. Continue to fit the twin flue system.

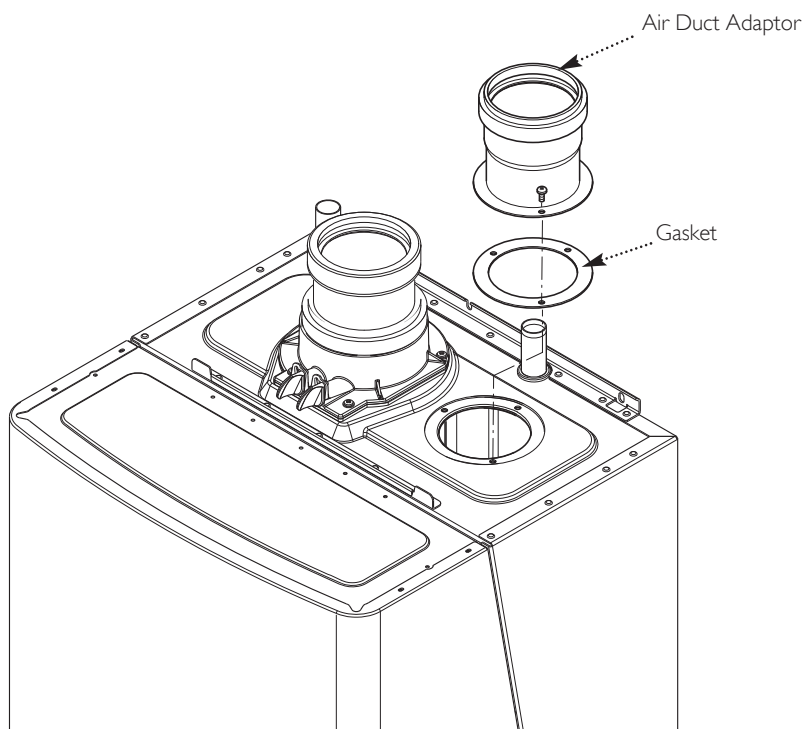


Fig. 18

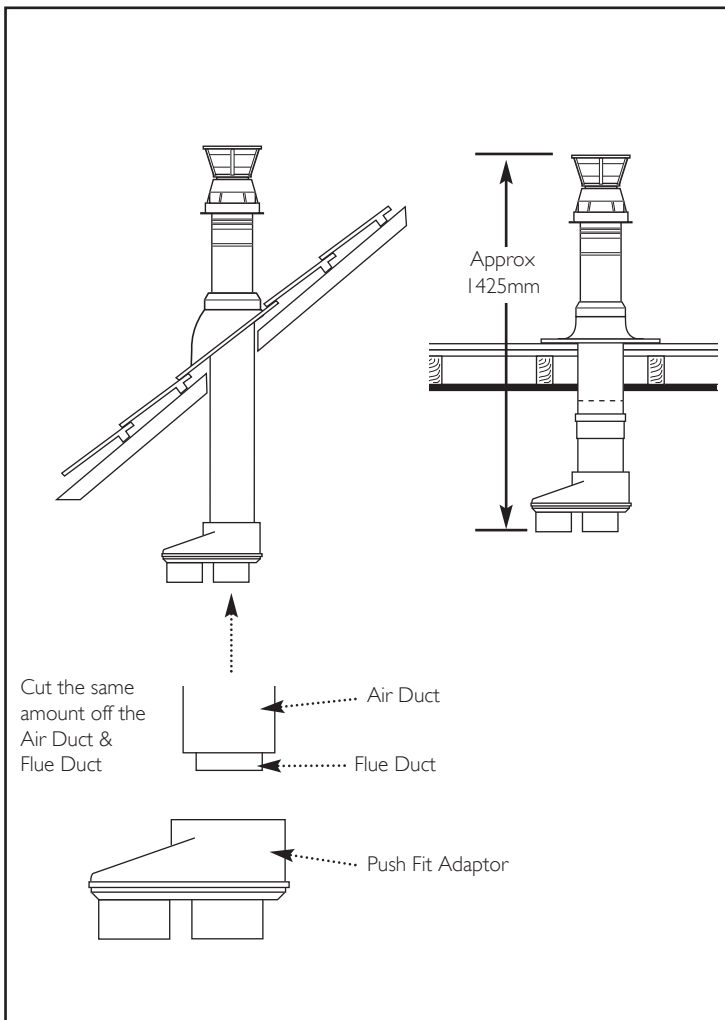
## 8.0 Flue Options

### 8.6 For Roof Terminals

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

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

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



### 8.7 Flue Dimensions

The standard horizontal telescopic flue kit allows for lengths between 315mm and 500mm from elbow to terminal (Fig. 19).

The maximum permissible equivalent horizontal flue length is:  
5 metres

### 8.8 Flue Trim

1. The rubber flue trim supplied may be fitted to either the outside wall or on the inner wall of installation.

### 8.9 Terminal Guard (Fig. 20)

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

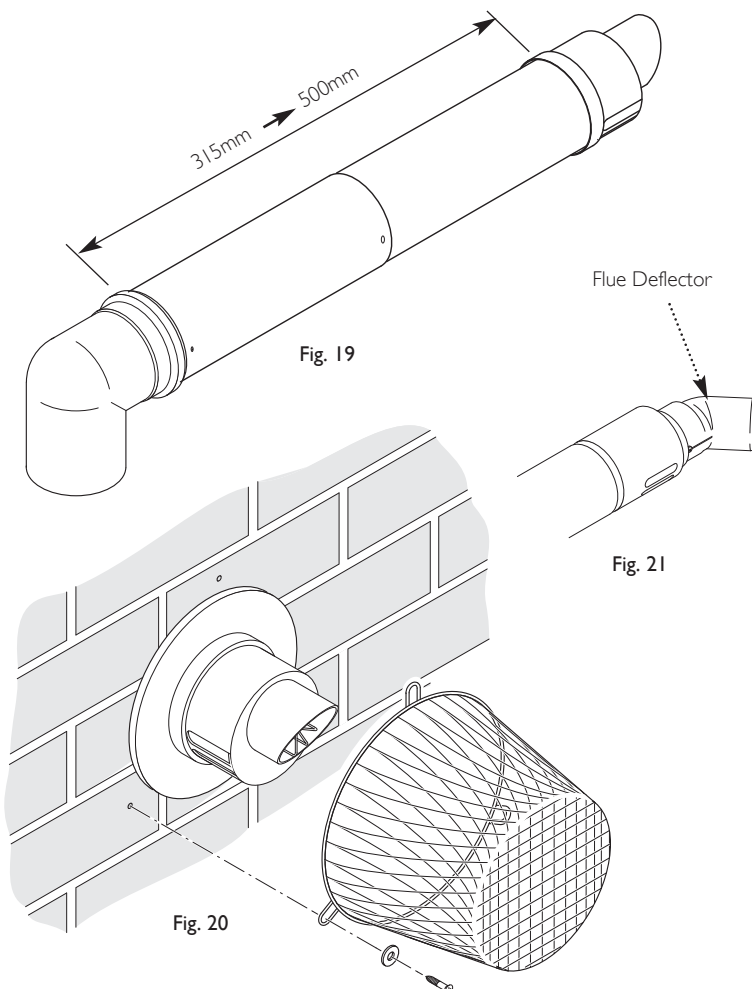
2. There must be a clearance of at least 50mm between any part of the terminal and the guard.

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

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

### 8.10 Flue Deflector (Fig. 21)

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.



## 8.0 Flue Options

### 8.1.1 Plume Displacement Kit (Fig. 21b)

#### Kit No 5118638

#### Content of kit

- 1 0.9m 60/100 Concentric Flue
- 1 1m 60 Dia Exhaust Flue Pipe
- 1 Adaptor
- 2 60 Dia Support Brackets
- 1 93° Elbow/Plume Outlet Assembly
- 1 Flexible Flue Trim
- 3 "O" Rings
- 1 'Jubilee' Clip
- 1 Elbow

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

2. The terminal must be positioned outside the building with the air inlet facing downward and outlet connection upwards.

3. The plume outlet must always be at least 45° to the wall, with the 'peak' uppermost to prevent rain entry (Figs. 21c & 21d), and be at least 2 metres above ground level. It must be secured as shown in Fig. 15a. The plume outlet must also be at least 500mm from the air inlet in any direction (Fig. 21d).

**NOTE:** The outlet must be positioned so that any condensate plume is directed away from adjacent surfaces. There must be a constant fall along the entire length of the flue system from the outlet back to the boiler.

4. It is possible to reduce or increase (with the addition of extensions) the length of either or both the 60/100 concentric and 60Ø exhaust.

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

6. The minimum length of the concentric flue is 100mm when measured from the edge of the flue elbow.

**IMPORTANT:** The maximum equivalent length of concentric flue is:- **5 metres**  
Additional bends may be fitted in the concentric flue, but the equivalent length must be reduced by 1 metre (93° elbow) or 0.5 metres (45° elbow).

7. 60Ø 1 metre extensions (including support bracket), and additional 93° & 45° elbows are available. Any additional 93° & 45° elbows must be accounted for when calculating flue lengths.

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

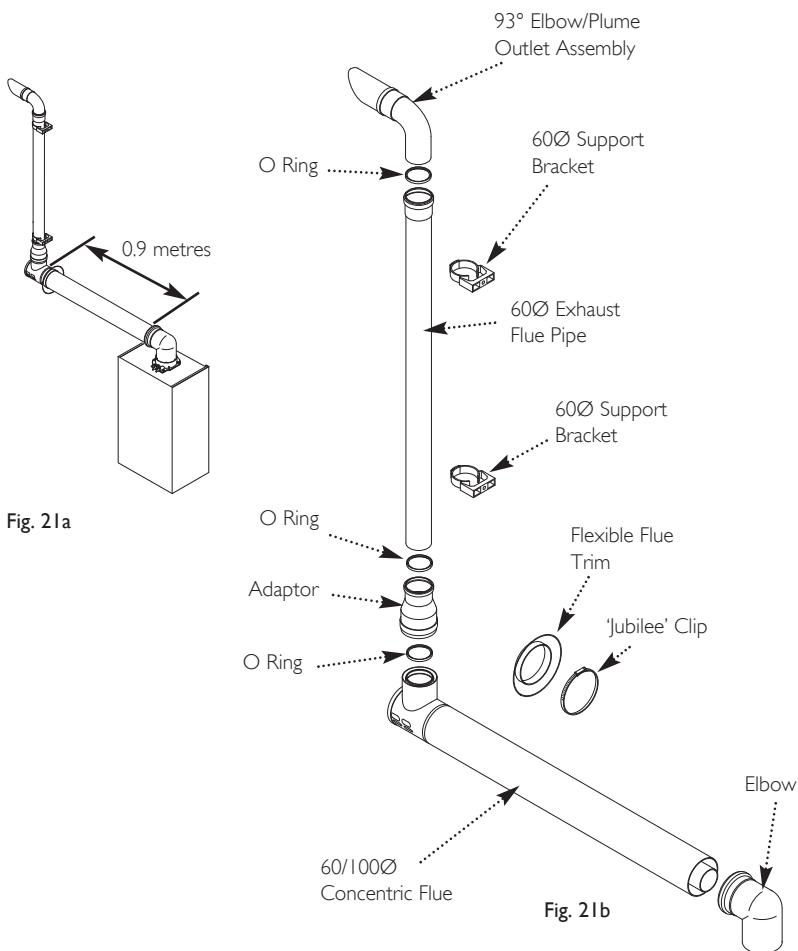


Fig. 21a

Fig. 21b

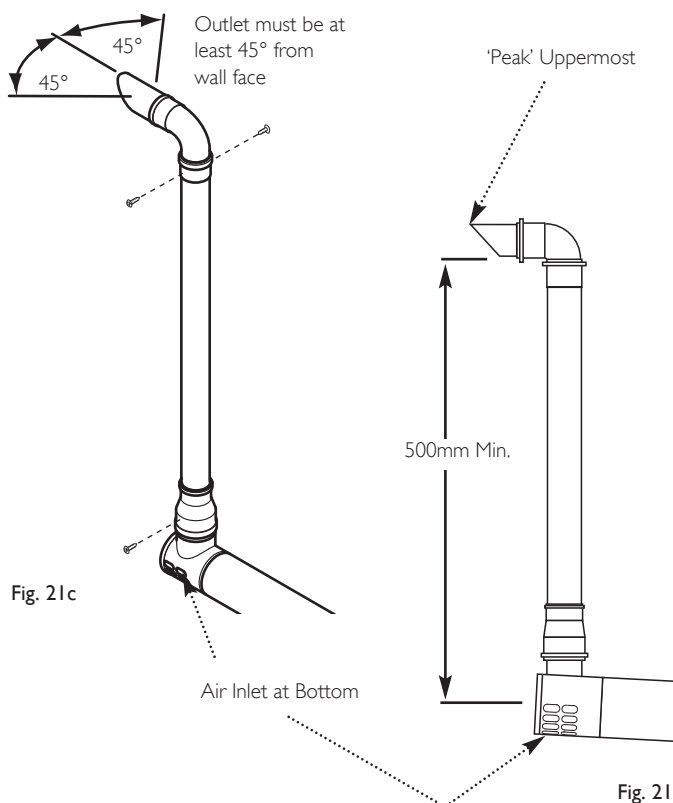


Fig. 21c

Fig. 21d



## 8.0 Flue Options

### 8.12 Determining Permissible Lengths

In the graph the solid line diagonal represents the relationship between the concentric flue assembly (and any extensions) and the 60Ø exhaust (and any extensions or additional bends).

#### Example 1 - Not Permissible

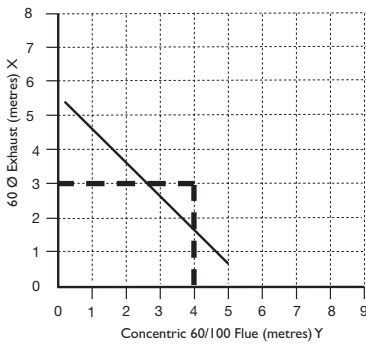
If, for instance, a concentric length of 4 metres was required and the 60Ø exhaust needed to be 3 metres the graph shows that this combination would NOT be permissible as the intersection point would be above the solid diagonal line.

#### Example 2 - Flue Lengths OK

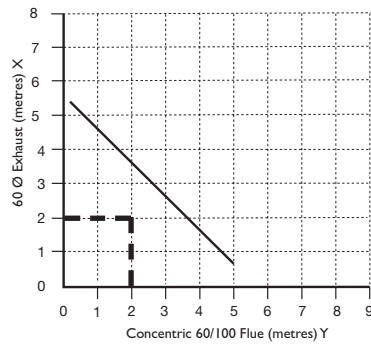
Where both lengths have been determined they can be applied to the graph to check that the installation is permissible. For example, if it was known that 2 metres of concentric flue and 2 metres of 60Ø exhaust were required, the values could be applied to the graph as shown in Example 2. As the point of intersection of the dotted lines is below the solid diagonal line, the combination of lengths is shown to be acceptable.

#### Example 3 - Flue Lengths OK

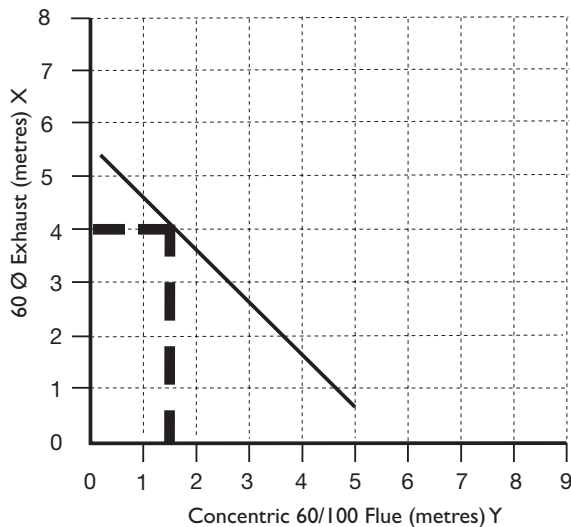
In the example shown, assume that the concentric part of the flue needs to be 1.6 metres long. Find the position of '1.6' on the horizontal axis of the graph and then project upwards to the solid diagonal line. This is represented by the vertical thick dotted line. Where this dotted line intersects with the solid diagonal line on the graph, project across to the vertical axis. As can be seen this corresponds with 4.0 metres. Therefore, the total equivalent length of the 60Ø exhaust can be up to 4.0 metres. Any elbow equivalencies must be accounted for i.e. 93° elbows are equal to 1 metre, each 45° elbow to 0.5 metres.



Example 1  
Flue Lengths - Not Permissible



Example 2  
Flue Lengths - OK



Example 3  
Flue Lengths - OK

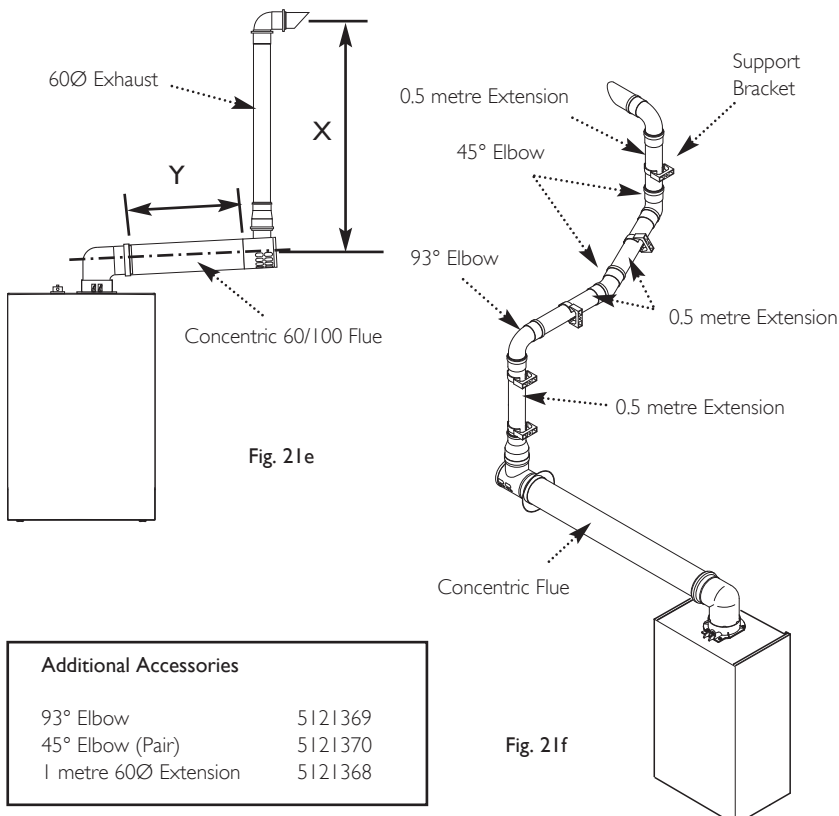


Fig. 21e

Fig. 21f

#### Additional Accessories

93° Elbow	5121369
45° Elbow (Pair)	5121370
1 metre 60Ø Extension	5121368

#### Flue Length - Worked Example

In the diagram (Fig. 21f) opposite an additional 93° elbow and pair of 45° elbows have been included in the 60Ø exhaust. Also 1 straight extension piece has been used.

To calculate total length:-

Length of 60Ø supplied in kit =	1 metre
1 metre Extension =	1 metre
1 x 93° Elbow =	1 metre
2 x 45° Elbow =	1 metre (0.5 metres each)

Total 60Ø = 4 metres

After consulting the table in Example 3 it can be determined that the concentric flue could be up to approximately 1.6 metres long.

## 8.0 Flue Options

### 8.13 General Fitting Notes

**NOTE:** The flue system may only be installed as described in this section

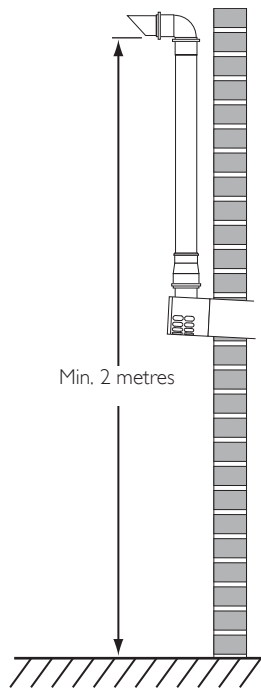


Fig. 21g

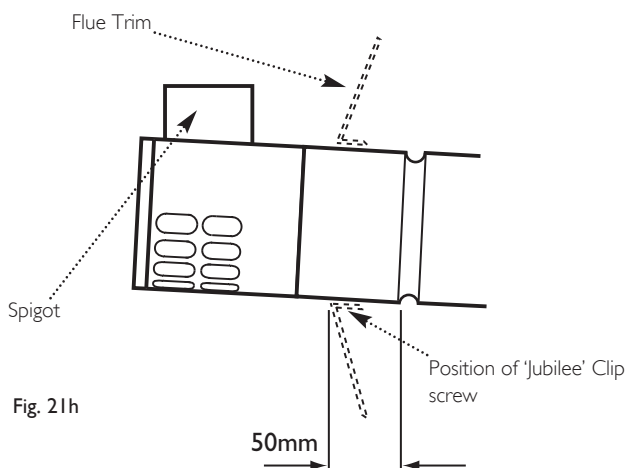


Fig. 21h

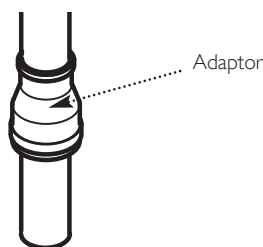


Fig. 21k

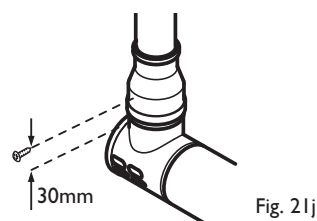


Fig. 21j

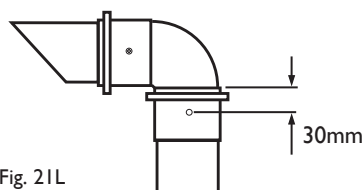


Fig. 21l

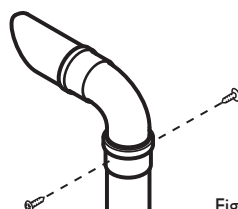


Fig. 21m

- Cut a hole in the external wall which the concentric flue assembly will pass through. The hole should allow the flue to fall back to the boiler at an angle of 1.5° to 3°.
- When completed the terminal must be at least 2 metres above ground level (Fig. 21g).
- Measure and cut to size the concentric assembly and any extensions that are being used.
- Insert the concentric assembly through the hole from outside the building.
- If required, the flexible flue trim should be fitted prior to this as it cannot be fitted after. Use the large 'Jubilee' clip to secure the trim to the flue (See Fig. 21h, trim shown dotted), with the screw part of the clip at the bottom.
- Connect any extensions or elbows that are being used to the concentric assembly. Engage the extension, elbow or concentric assembly in the boiler flue elbow. Fit the boiler flue elbow to the boiler adaptor.
- Ensure that the concentric assembly and any extensions fall back to the boiler at an angle of at least 1.5° and that the external air inlet is to the bottom.
- Use suitable brackets to support the concentric assembly and any extensions, and make good inside and outside.
- The 60Ø exhaust can now be fitted. Slide the adaptor over the plain end of the 60Ø exhaust (Fig. 21k) and engage the exhaust in the terminal. Slide the adaptor down over the spigot. Mark and drill the adaptor, using a 2mm bit, as shown in Fig. 21l. Secure the adaptor to the spigot using one of the screws supplied.
- If it is necessary to shorten the 60Ø exhaust or any of the extensions, the excess material must be cut from the plain end of the pipe.
- Determine the position of the 60Ø exhaust and mark on the wall a suitable position for the support bracket. If extensions are being used, a support bracket is supplied in each kit.
- Drill the wall, and fit the bracket(s) using the plug and screw provided.
- Mark and drill the 60Ø exhaust, using a 2mm bit, as shown in Fig. 21l. Complete the installation of the 60Ø exhaust, securing in the brackets.
- Fit the 93° elbow/plume outlet and secure with the two remaining screws supplied. Ensure the plume outlet is at least 45° to the wall and that the 'peak' is uppermost (Fig. 21m).

## 8.0 Flue Options

### 8.13 General Fitting Notes (cont.)

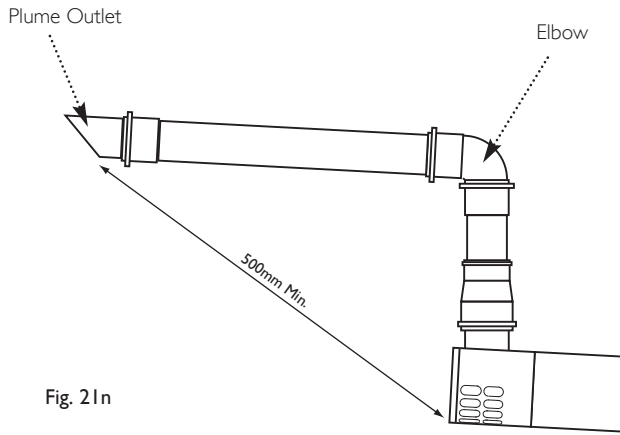


Fig. 21n

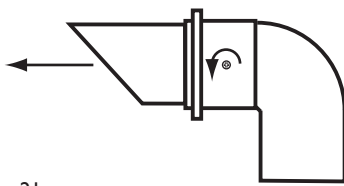


Fig. 21p

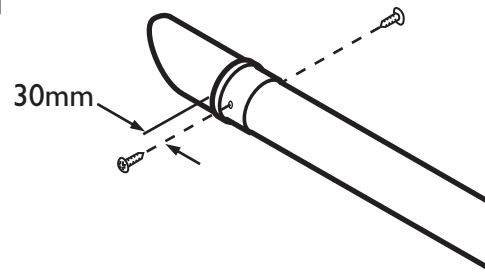


Fig. 21q

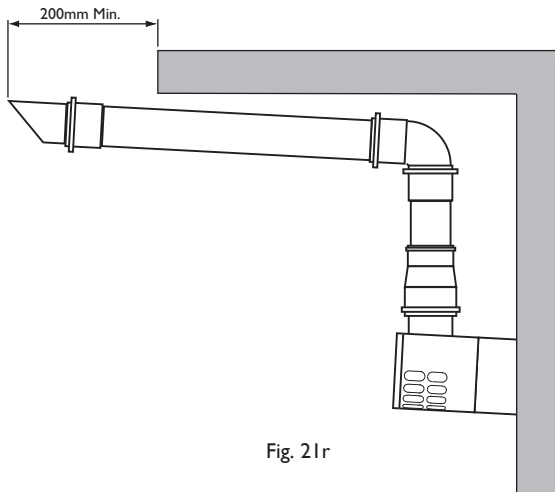


Fig. 21r

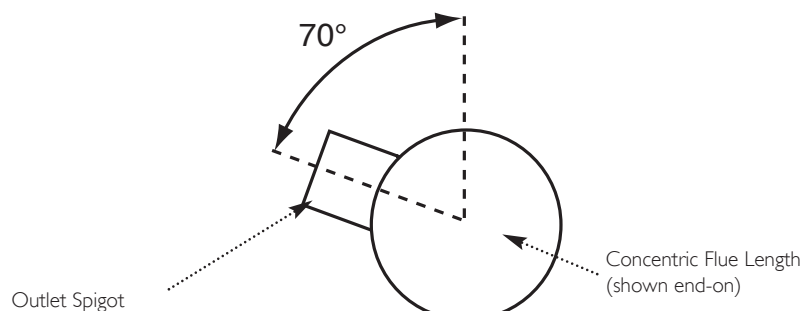


Fig. 21s

15. For aesthetic purposes it is permissible to route the 60Ø exhaust in an enclosed box, but the air inlet and plume outlet **MUST** remain in free air.

16. It is also possible to separate the plume outlet from the 93° elbow to allow the flue to be installed as shown in Fig. 21n.

17. To do this, first slacken the two screws retaining the plume outlet to the elbow, and remove the outlet (Fig. 21p). The elbow can now be used to connect the vertical to horizontal 60Ø exhaust (Fig. 21n). Retighten the screws in the elbow.

18. The outlet can now be fitted into the female end of an 60Ø extension piece. It must be secured using two of the screws supplied in the bag with the 'Jubilee' clip.

19. Mark the female end of the extension at 30mm as shown in two positions, directly opposite each other (Fig. 21q).

20. Using a suitable bit (e.g. 2mm), drill through the extension and outlet. Secure using two of the screws supplied.

21. The remaining screw must be used to secure the adaptor to the concentric terminal.

22. When the plume outlet is positioned under a balcony or other projection (Fig. 21r) it must protrude at least 200mm (it is not necessary to extend it further than this).

23. When under balconies or projections it is permissible to rotate the concentric flue length up to 70°, clockwise or anti-clockwise (Fig. 21s), if there is insufficient space to connect vertically.

24. This will allow the connection of the exhaust to the outlet spigot.

25. All other minimum & maximum dimensions must be adhered to, and the air inlet positioned such that it will not be subject to rain entry.

## 9.0 Installation

**NOTE:** - Installers of this appliance must have undergone Baxi Ecogen Training and been approved to install this appliance.

### 9.1 Unpacking & Initial Preparation

**NOTE:** Maintain the appliance upright at all times. Do not lay the appliance on its back, sides or front. Drilling of the wall or ceiling for flue and pipe work must be completed before the appliance is fitted to the wall.

The gas supply, gas type and pressure must be checked for suitability before connection (see Section 7.5).

a) Remove the shrink wrap and literature pack.

b) Remove the upper packaging to leave the appliance on the base packaging (Fig. 23).

c) Remove the back plate from the appliance by removing the 2 securing screws and undo the 2 fixing nuts on the top of the panel using a 10mm spanner (Fig. 24).

d) **Take care:-** The back panel can fall suddenly on release.

1. After considering the site requirements (see Section 7.0) position the fixing template on the wall ensuring it is level both horizontally and vertically. **Ensure that there is adequate clearance for the lifting equipment (see Section 7.2).**

2. Mark the position of the six most suitable fixing holes for the wall plate positions B+C (as marked on the template). Where possible mark the position of the centre top fixing position A (marked on template).

3. Mark the position of the centre of the flue hole (rear exit) using the paper template supplied. For side flue exit, mark as shown (Fig. 25).

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

5. Cut the hole for the flue (minimum diameter 116mm, a minimum horizontal hole of 116mm will give the correct clearance for the flue to run at the required angle).

6. Drill the single hole (10mm diameter for wall plugs provided) as previously marked and position the back plate on the wall position A on template. Push one of the wall plugs supplied through the plate and secure it to the wall with one of the 80mm screws (Fig. 26). If it is not possible to use Position A use one of the other six positions marked B+C.

7. Check that the top edge is horizontal with a spirit level. Retighten the screw. Drill the remaining 6 positions at B+C and secure the back plate to the wall.

8. **For correct installation the back plate must be absolutely flat and vertical - check before mounting the boiler. If there is any unevenness or the back plate is not mounted in the vertical plane use packing to correct any out of true.**

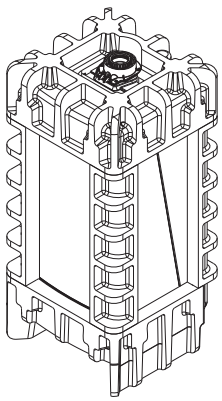


Fig. 22

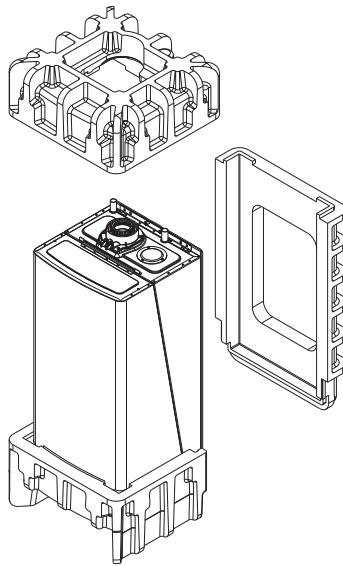


Fig. 23

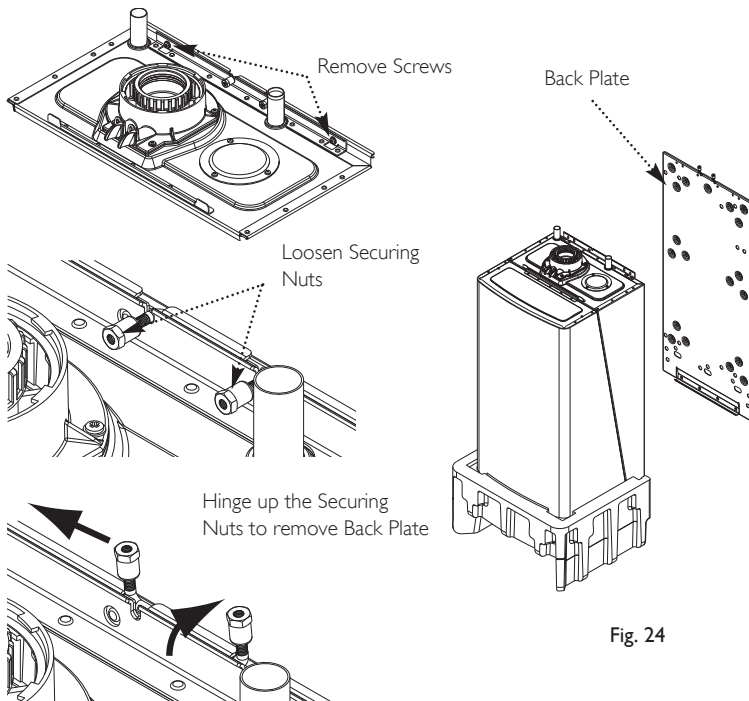
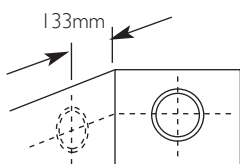


Fig. 24



For Side Flue Exit

Fig. 25

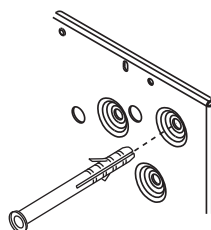


Fig. 26

## 9.0 Installation

Ensure that there is adequate clearance for the lifting equipment.

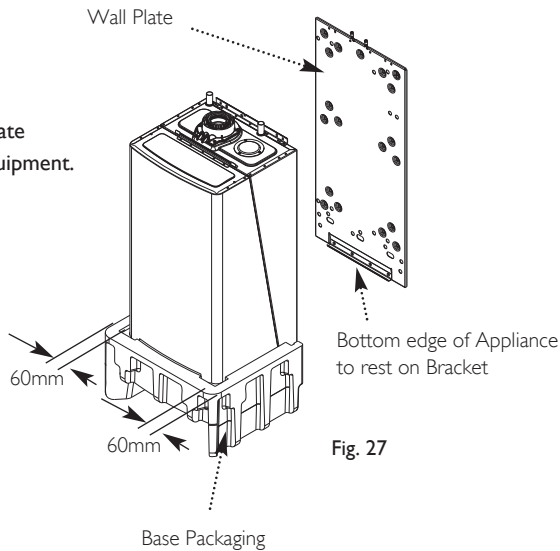


Fig. 27

Engage Securing Nuts and tighten to secure appliance

Push appliance back to wall plate and engage securing nuts

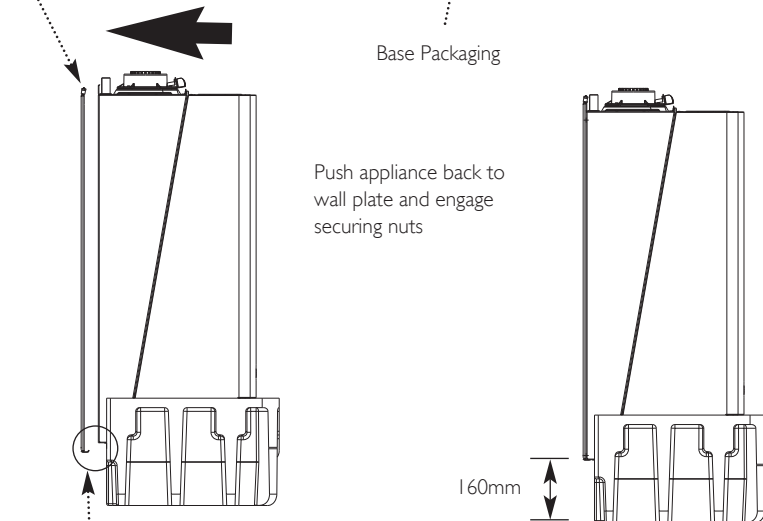


Fig. 28

Engage bottom edge of appliance on to wall plate

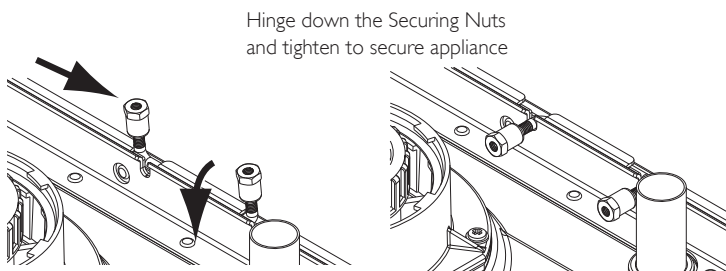


Fig. 29

Prime Trap by pouring 300ml of water into the flue spigot

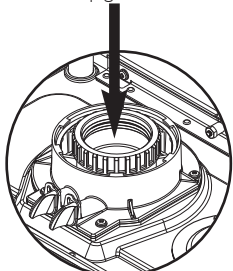


Fig. 30a

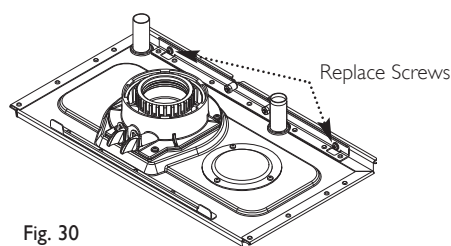


Fig. 30

### 9.2 Fitting The Boiler

1. Using a suitable lifting device, lift the appliance on its base packaging. Offer the appliance up to the wall plate and engage the bottom edge of the back of the appliance on to the wall plate (Figs. 27 & 28). **Ensure that there is adequate clearance for the lifting equipment (see Section 7.2).**

2. Push the appliance back onto the wall plate and engage the securing nuts at the top of the appliance by sliding to the right and swinging down (Figs. 28 & 29).

3. Tighten the two securing nuts on the wall plate and complete the securing of the appliance by replacing the two screws previously removed. (Figs. 29 & 30).

4. Remove the base packaging.

### 9.3 Service connections

1. Connect the central heating circuit to the top of the appliance using 22 mm compression fittings to avoid heat damage to the case and seals; the return is on the left and the flow is on the right.

**NOTE:** To assist with the purging of air from the system pour water into the flow and return connections to displace the air in the heat exchangers.

2. Connect the gas to the bottom right of the appliance using the 15 mm gas cock provided (in the top of the packaging). Remove the bottom cover and lower the control tray (See Section 10.1 paragraph 3 and Figs. 40 and 41). Install with the test nipple to the left (see Fig. 11) this allows the connection to the appliance to be tightness tested independently of the gas pipework up to the appliance which then can be tested using the test nipple on the gas meter. It may be difficult to reassemble the bottom panel if this is not done.

3. **Note:** Care must be taken to ensure that the over current switch is not disturbed from its correct position (See Fig. 2a when replacing the bottom cover). The switch should be up at the back - the 'I' should be depressed.

### 9.4 Condensate Drain - see section 7.8

1. Connect the condensate drain to the trap outlet pipe.

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

2. The connection 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 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

### 9.5 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. 31) 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. 33).

**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. 32).

5. If the distance from the flue elbow to the outside face of the wall ('X' in Fig. 32) is less than 250mm the Connection Assembly can be discarded and the Terminal Assembly cut and fitted directly into the elbow.

6. In instances where the dimension 'X' (Fig. 32) 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'.

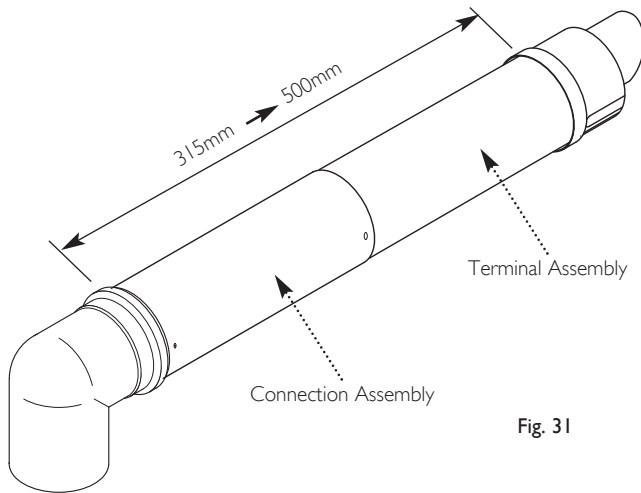


Fig. 31

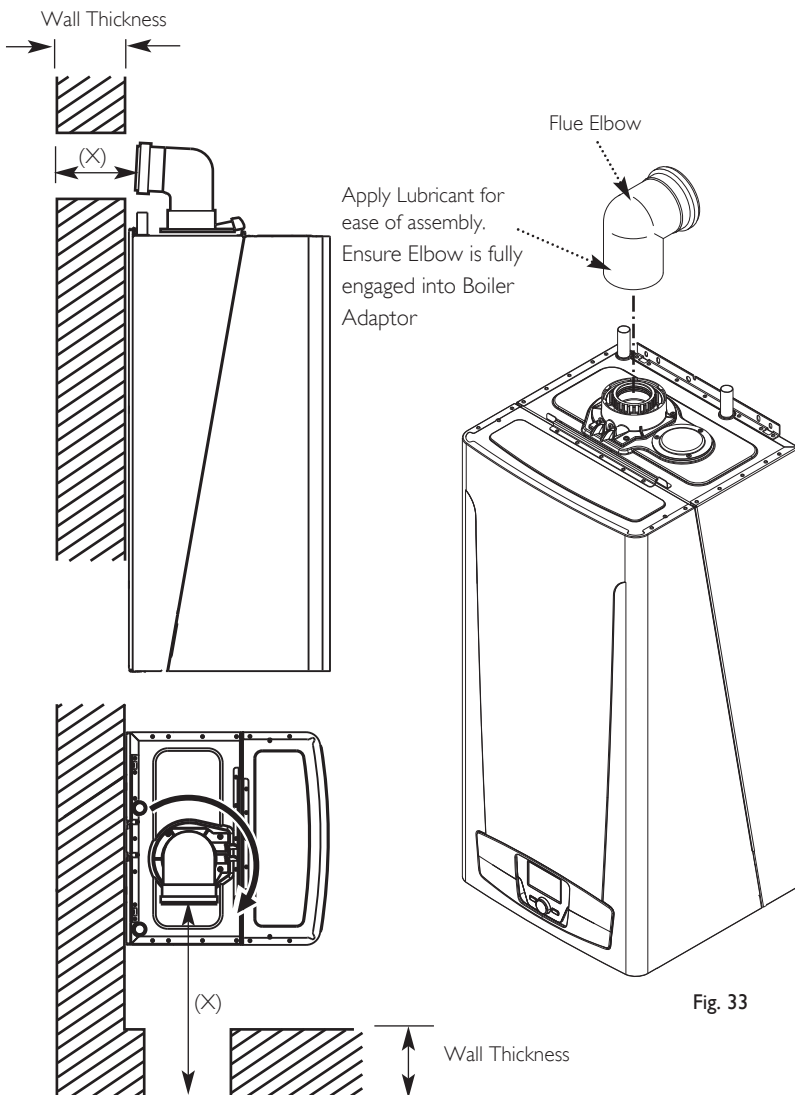


Fig. 32

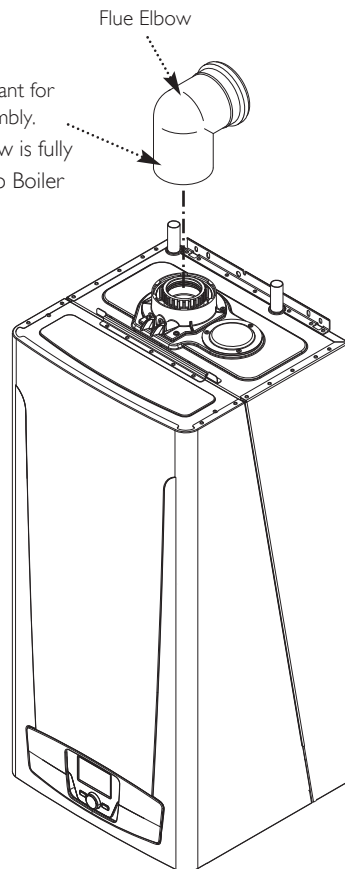


Fig. 33

## 9.0 Installation

### 9.5 Fitting the Flue (Cont)

8. Adjust the two telescopic sections to dimension 'Y' (Fig. 34). Ensure that the rivets and holes in the Connection Assembly are aligned horizontally (Fig. 35).

9. Using a 2mm bit, drill through the holes at the end of the Connection Assembly into the Terminal Assembly and secure them together using the screws supplied (Fig. 34). Seal the joint with the tape provided (Fig. 36).

10. Remove the flue elbow and insert the flue through the hole in the wall. Refit the elbow to the boiler adaptor, ensuring that it is pushed fully in (Fig. 36).

11. Draw the flue back through the wall and engage it in the elbow. It may be necessary to use soap solution or similar to ease assembly of the elbow adaptor and flue (Fig. 36).

12. Ensure that the terminal is positioned with the slots to the bottom (Fig. 37). Secure the flue to the elbow with the self drilling screws supplied (Fig. 36).

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

13. If necessary make good between the wall and air duct outside the building.

14. Fit the flue trim if required, and if necessary fit a terminal guard (see Section 8.8 & 8.9).

#### CONCENTRIC VERTICAL FLUE

15. Once the length of the vertical concentric extension has been determined mark and carefully cut off the excess material. The cut end **MUST** be square and free of burrs to ensure correct insertion into the boiler adaptor.

16. Measure 25mm from the end of the flue extension and apply a length of tape around the outer duct (Fig. 38).

17. Engage the extension into the adaptor up to this position (Fig. 39). Once the installation of the flue is complete and all support brackets are securely in place remove the tape.

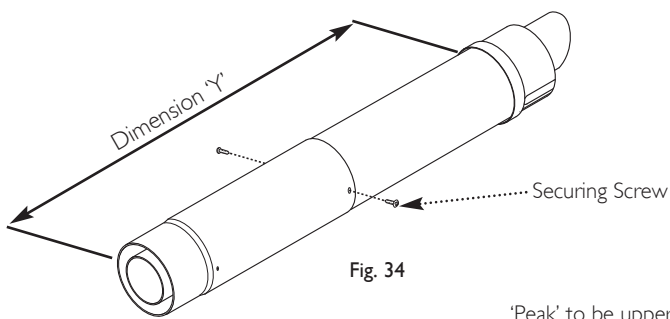


Fig. 34

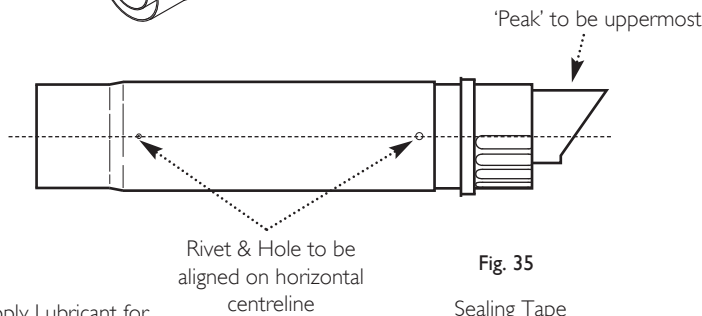


Fig. 35

Apply Lubricant for ease of assembly. Ensure Flue is fully engaged into Flue Elbow

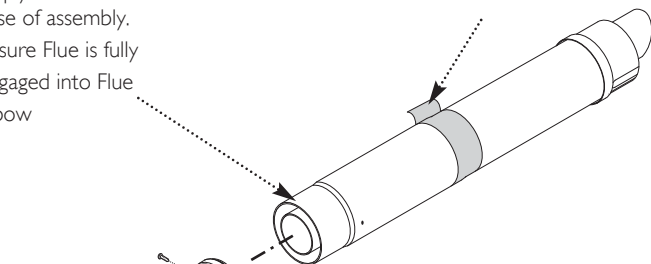


Fig. 36

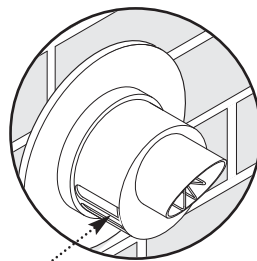


Fig. 37

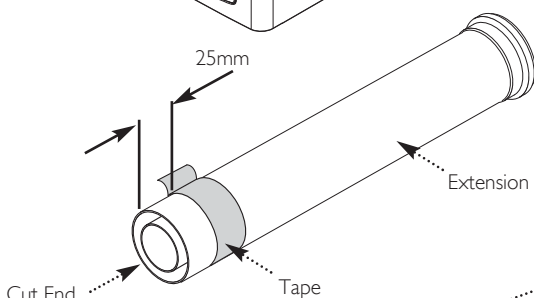


Fig. 38

Apply Lubricant for ease of assembly. Ensure Extension is fully engaged into Boiler Adaptor

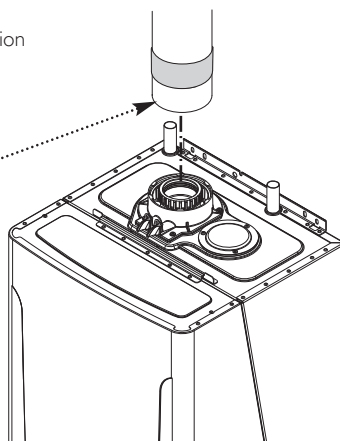


Fig. 39



## 10.0 Electrical

### 10.1 Making The Electrical Connections

This appliance shall be connected to a suitably protected electrical supply i.e., 16A - see section 7.7.

**NOTE:** Ensure all cables are secured using the cable clamps provided. When accessing the appliance controls area, take care not to let the control box drop down in an uncontrolled manner as this may cause damage.

1. To gain access to the controls tray / electrical wiring area, remove the outcase by lifting off the plastic fascia that is held on by two magnets. Undo the two screws holding the outcase, pull the bottom edge forward, lift and disengage from the top of the appliance (Fig. 40).

2. Slacken the four screws from the bottom cover and remove the cover (Fig. 40).

3. Remove the two screws holding the control tray. Pull the front of the control tray forward and lower it carefully (Fig. 41). **DO NOT allow the tray to fall in an uncontrolled manner.**

4. Ensure all cables are secured using the cable clamps provided.

5. Ensure that the lengths of the live and neutral conductors are shorter than the earth conductor, so that if the cable slips in its anchorage the current carrying conductors become taut before the earth conductor.

### 10.2 System installation options.

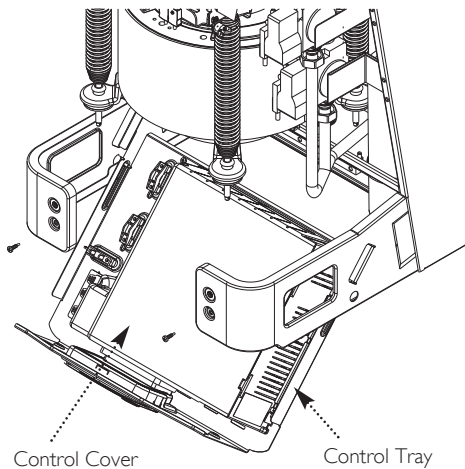
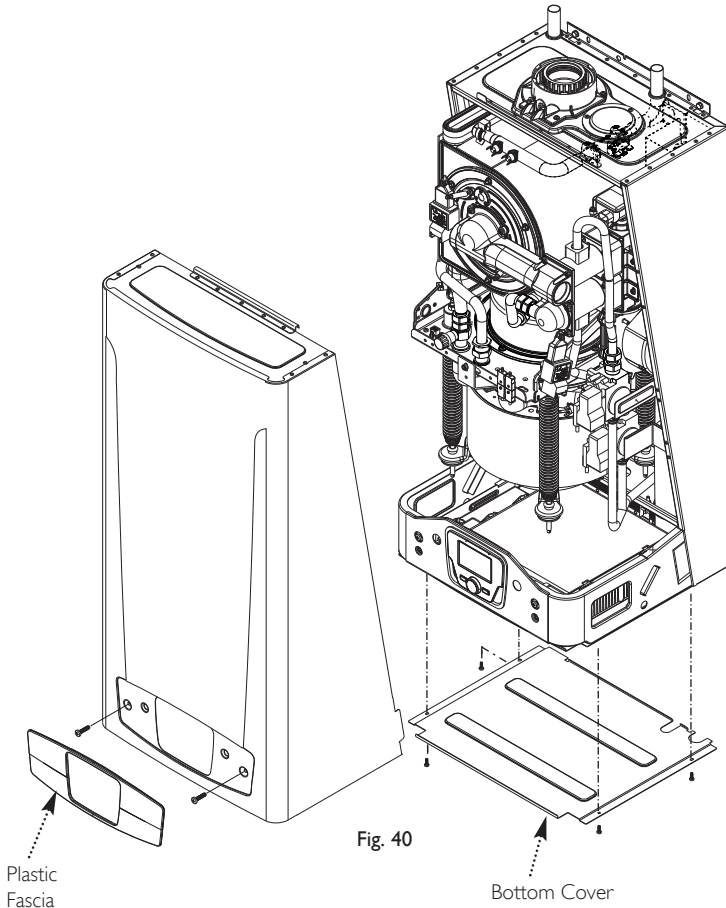
1. There are two installation options available, **Intelligent** and **Retro**. Y-plan, S-plan, W-plan and S-Plan with a second heating circuit are all available both with **Intelligent** and **Retro** installations.

**IMPORTANT:** Before running the appliance ensure parameter 5700 has been set according to the type of system installed. See sections 10.4 to 10.11 for system types and section 11.3.k for the change procedure.

A) An **Intelligent** system operates the Ecogen with room sensors, an optional extra outdoor sensor (an outdoor sensor can only be installed in conjunction with a room sensor to enable weather compensation), a DHW tank sensor or DHW tank thermostat and will give the highest overall efficiency with increased electrical power generation and is therefore the recommended way to install the appliance.

The Removable THINK Controller must be used as a Programmable Room Sensor for all intelligent installation.

B) **Retro** installations operate the Ecogen with a new or existing external system wiring centre. This means that the installer has the option to retain an existing room thermostat, DHW thermostat and programmer. An outdoor sensor for weather compensation cannot be used in this case. The THINK Controller must remain on the appliance (See Section 10.11).

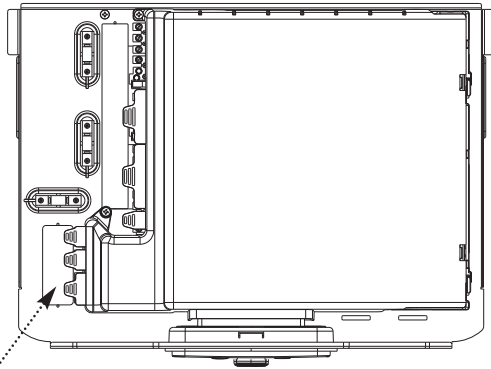


## 10.0 Electrical

### 10.3 Complete Wiring Configuration

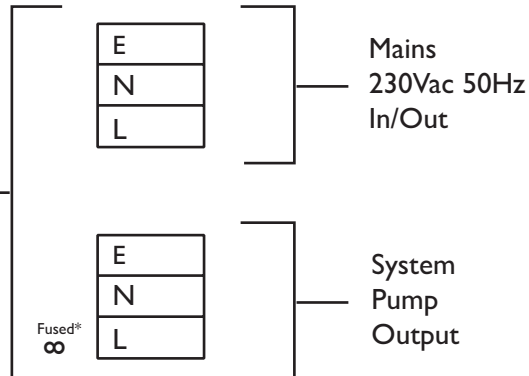
1. All wiring external to the appliance must be in accordance with I.E.E. BS 7671 - requirements for Electrical Installations.

**IMPORTANT:** Before running the appliance ensure parameter 5700 has been set according to the type of system installed. See sections 10.4 to 10.11 for system types and section 11.3.k for the change procedure.

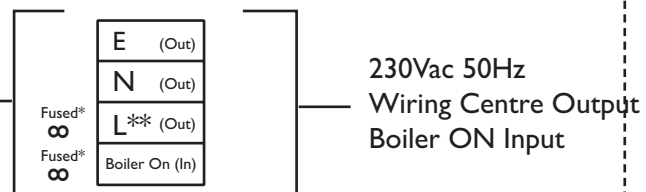


'Break-off Tabs

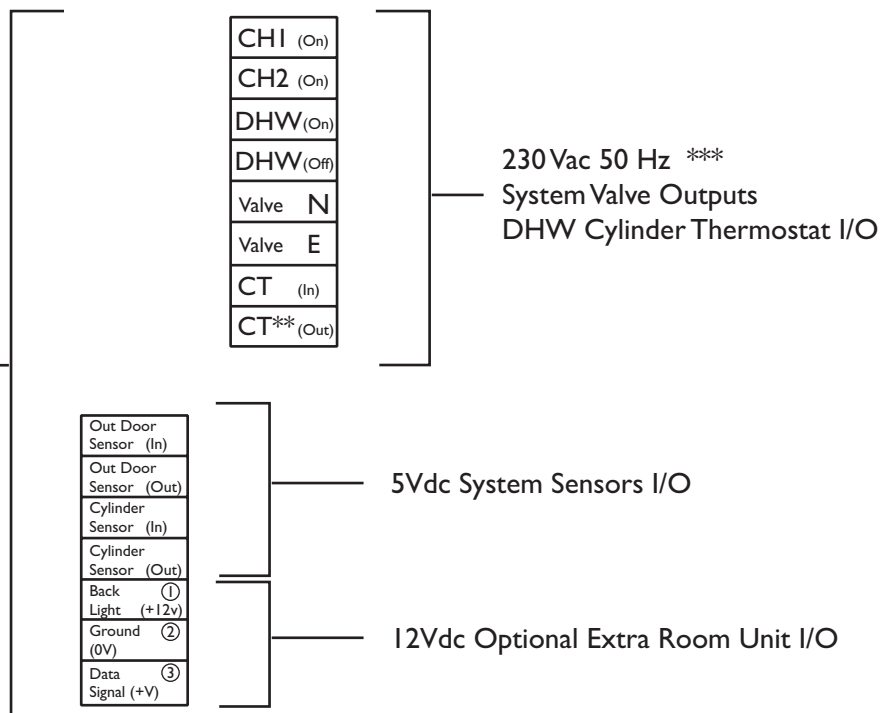
Requirement for all installation types



**Retro  
Installation**



**Intelligent  
Installations  
(Recommended)**



\* NOTE: All Fuses 3.15 A    \*\* Permanent Live once the 230V supply is connected

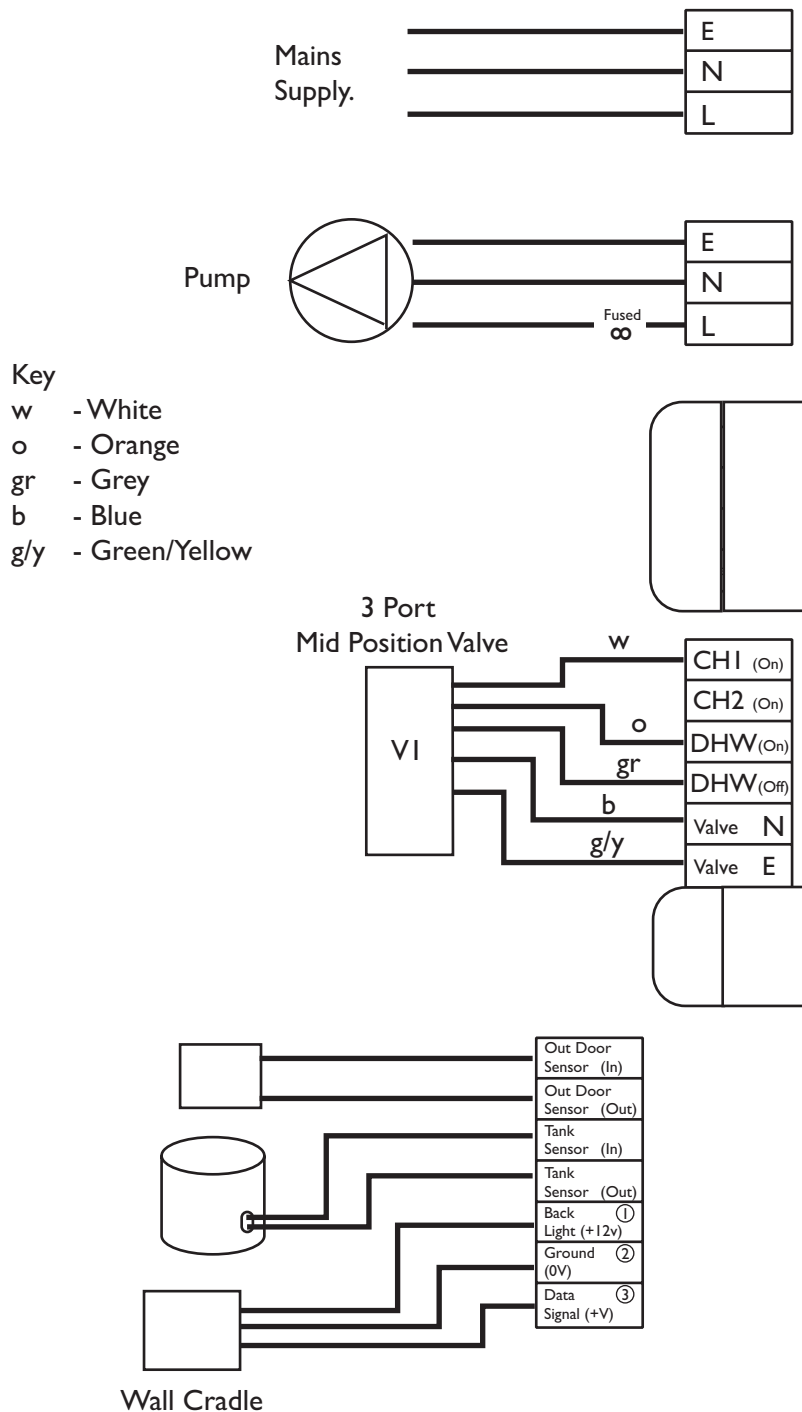
\*\*\* Ensure all system wiring is correct to wiring regulations (BS7671) and fully tested before connection to avoid any damage to the appliance controls.

10.4 Y-Plan with DHW cylinder sensor

1. The appliance MUST have a permanent Live/Neutral/Earth connection. The pump must be connected to the appliance as shown.

2. Set parameter 5700 to '2' for one heating circuit - see section 11.3.k.

**NOTE:** It is not possible to operate a second heating circuit with a Y-Plan system.



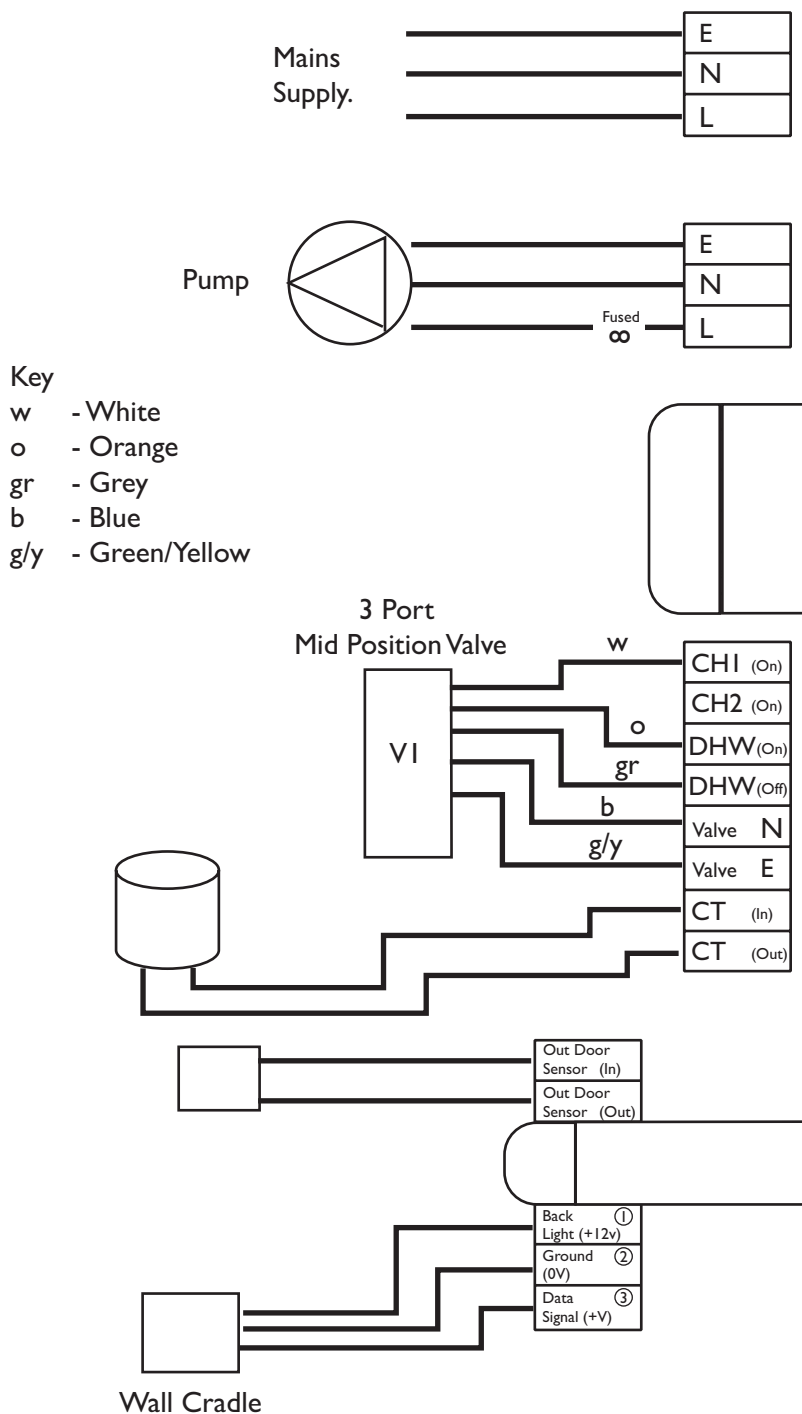
10.5 Y-Plan with DHW cylinder Thermostat

1. The appliance MUST have a permanent Live/Neutral/Earth connection. The pump must be connected to the appliance as shown.

2. Set parameter 5700 to '2' for one heating circuit - see section 11.3.k.

3. The DHW set point on the THINK Controller must be the same as the thermostat set point on the cylinder. If this is not done the DHW temperature may not be achieved or the recovery time will be increased.

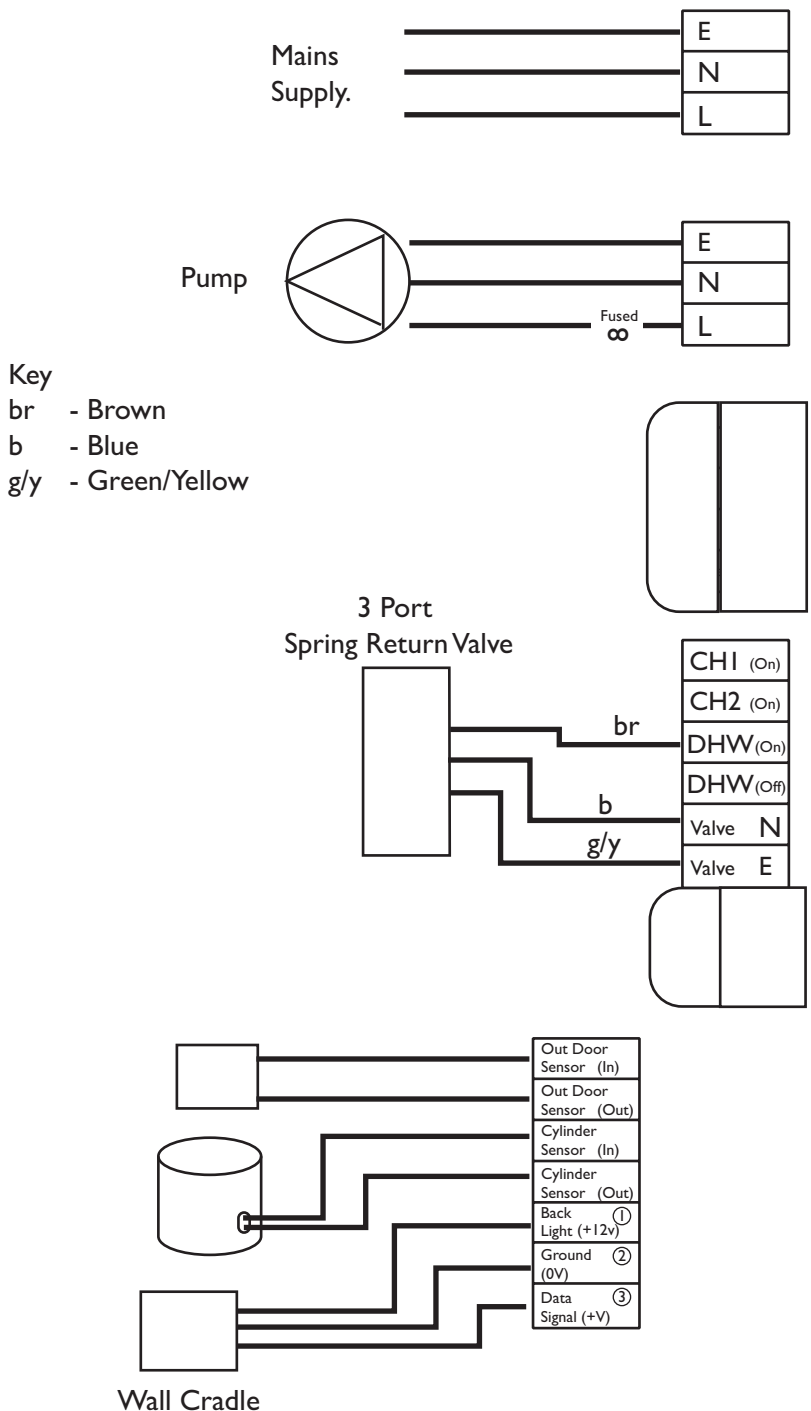
**NOTE:** It is not possible to operate a second heating circuit with a Y-Plan system.



10.6 W-Plan with DHW cylinder sensor

1. The appliance MUST have a permanent Live/Neutral/Earth connection. The pump must be connected to the appliance as shown.
2. Set parameter 5700 to '2' for one heating circuit - see section 11.3.k.
3. The rest port of the 3 port valve needs to be connected to the central heating circuit so that the valve is driven to the DHW position. It is most likely that the three port valve on an existing primary circuit will have to be turned round.

**NOTE:** It is not possible to operate a second heating circuit with a W-Plan system.

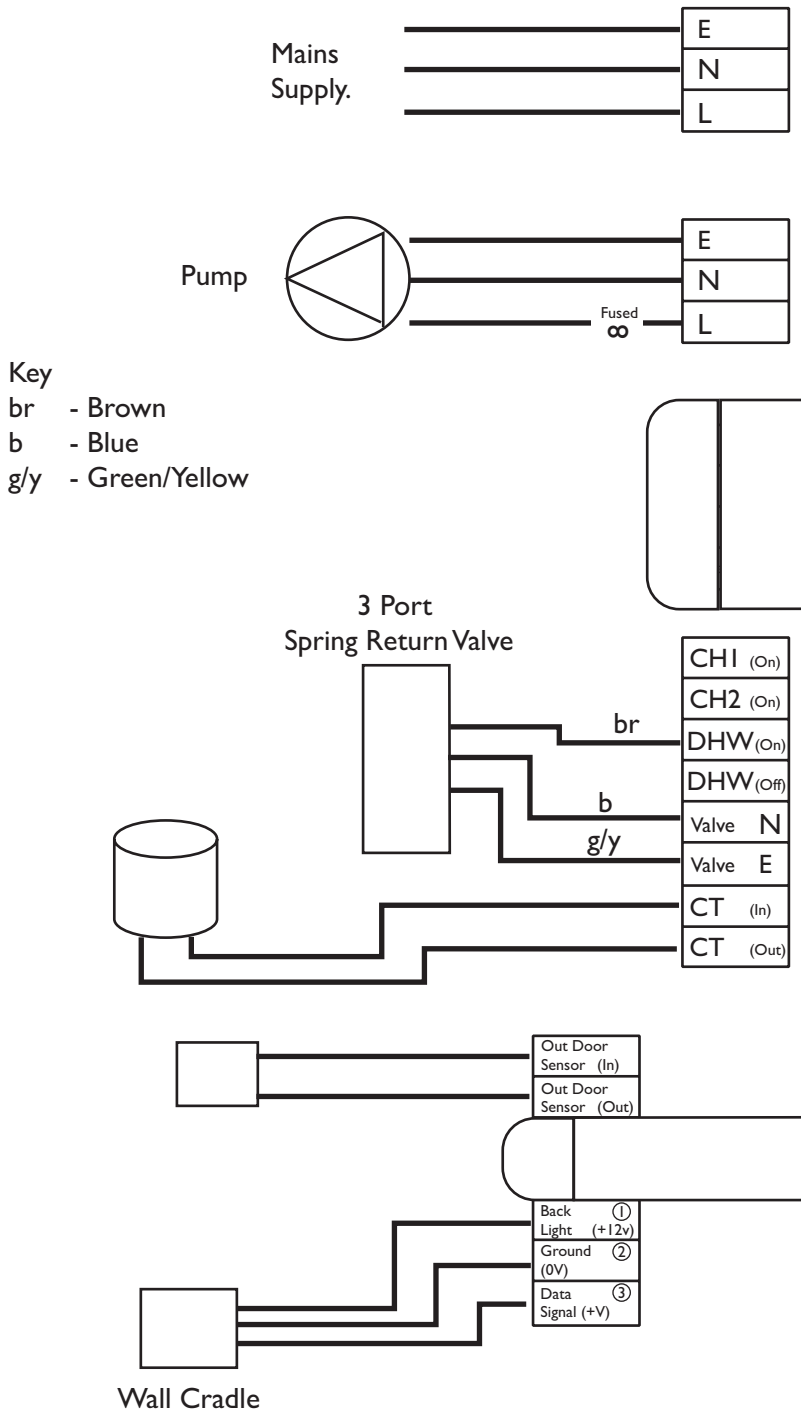


10.7

W-Plan with DHW cylinder thermostat

1. The appliance MUST have a permanent Live/Neutral/Earth connection. The pump must be connected to the appliance as shown.
2. Set parameter 5700 to '2' for one heating circuit - see section 11.3.k.
3. The rest port of the 3 port valve needs to be connected to the central heating circuit so that the valve is driven to the DHW position. It is most likely that the three port valve on an existing primary circuit will have to be turned round.
4. The DHW set point on the THINK Controller must be the same as the thermostat set point on the cylinder. If this is not done the DHW temperature may not be achieved or the recovery time will be increased.

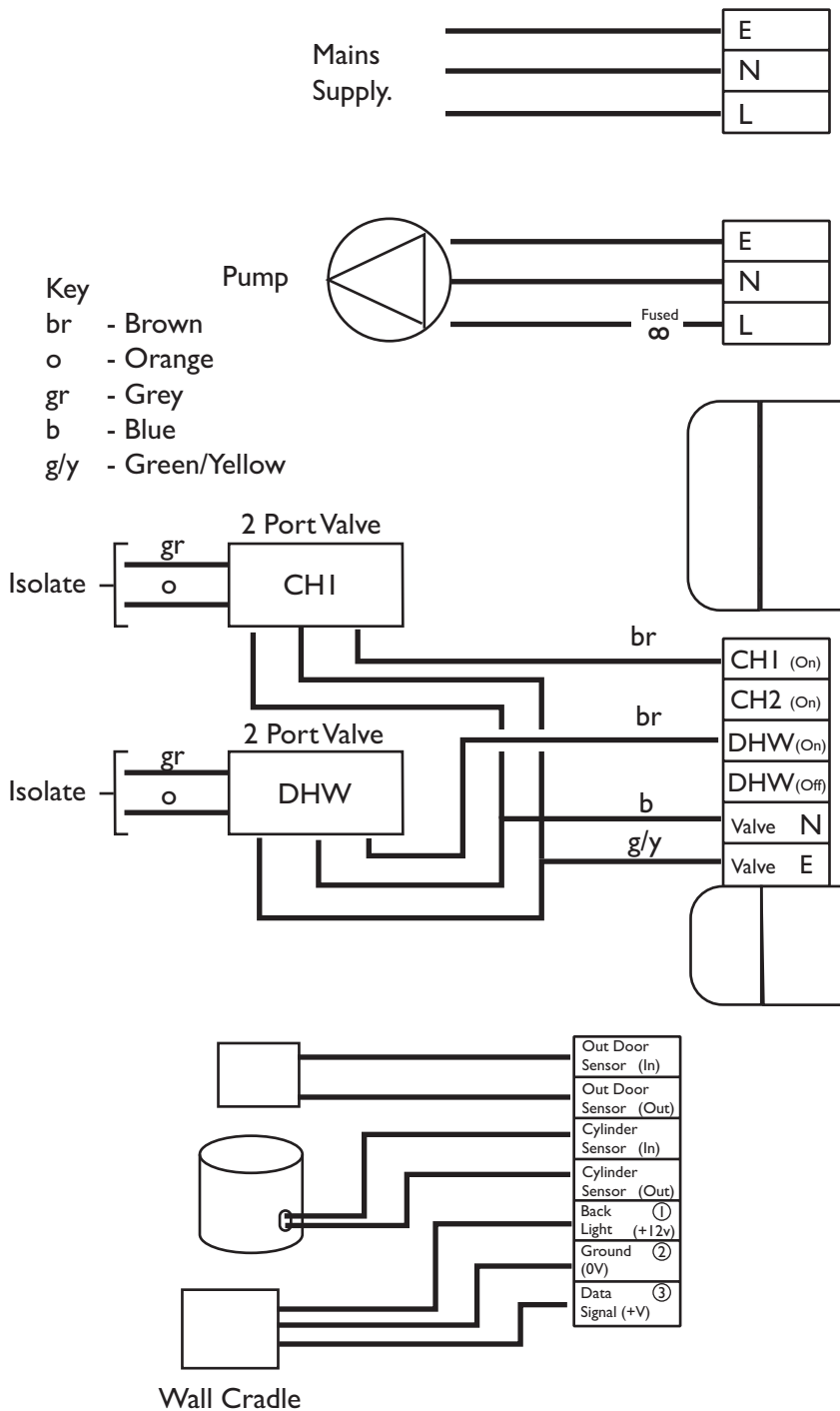
**NOTE:** It is not possible to operate a second heating circuit with a W-Plan system.



10.8 S-Plan with DHW Cylinder sensor

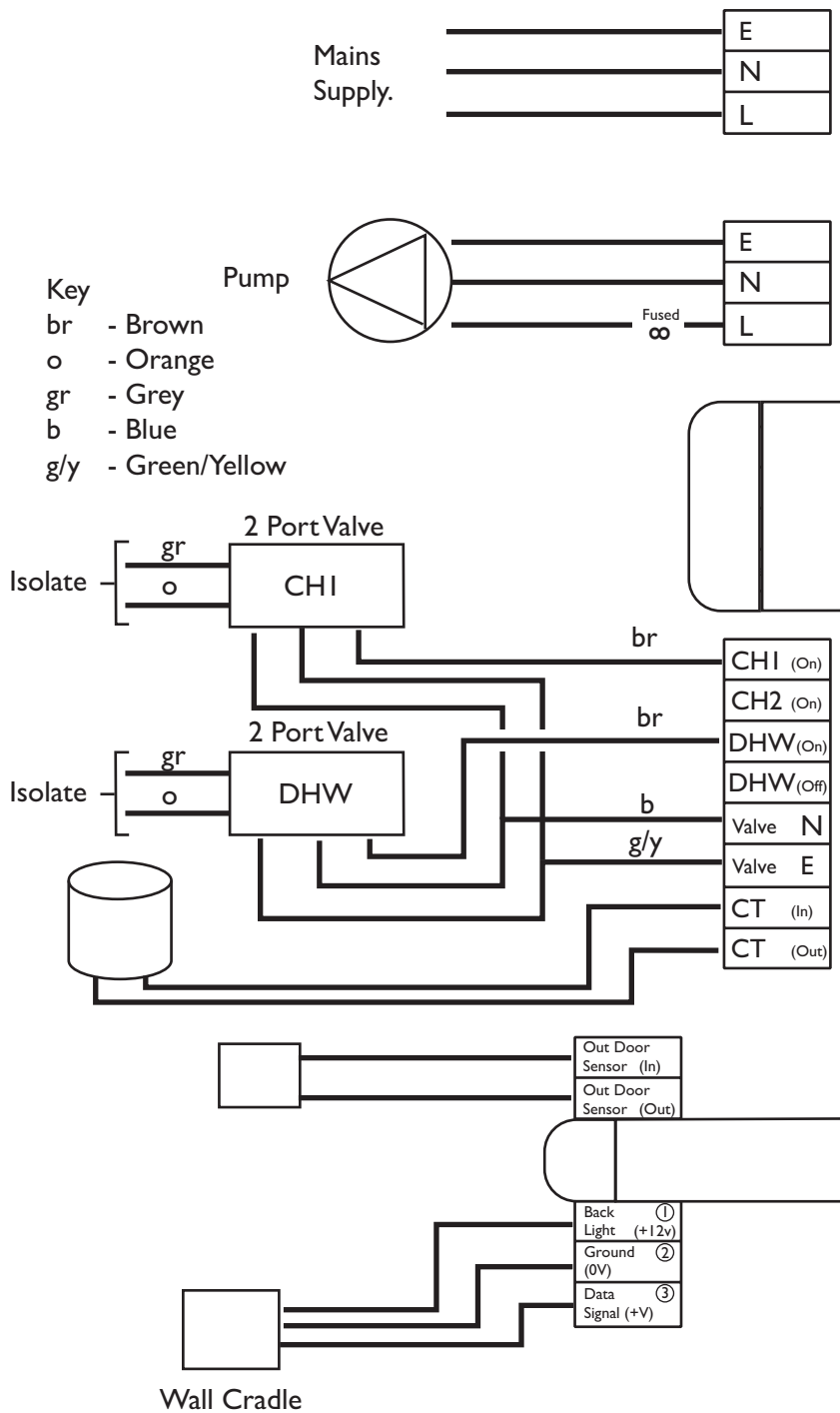
1. The appliance MUST have a permanent Live/Neutral/Earth connection. The pump must be connected to the appliance as shown.

2. Set parameter 5700 to '2' for one heating circuit - see section 11.3.k.



10.9 S-Plan with DHW Cylinder Thermostat

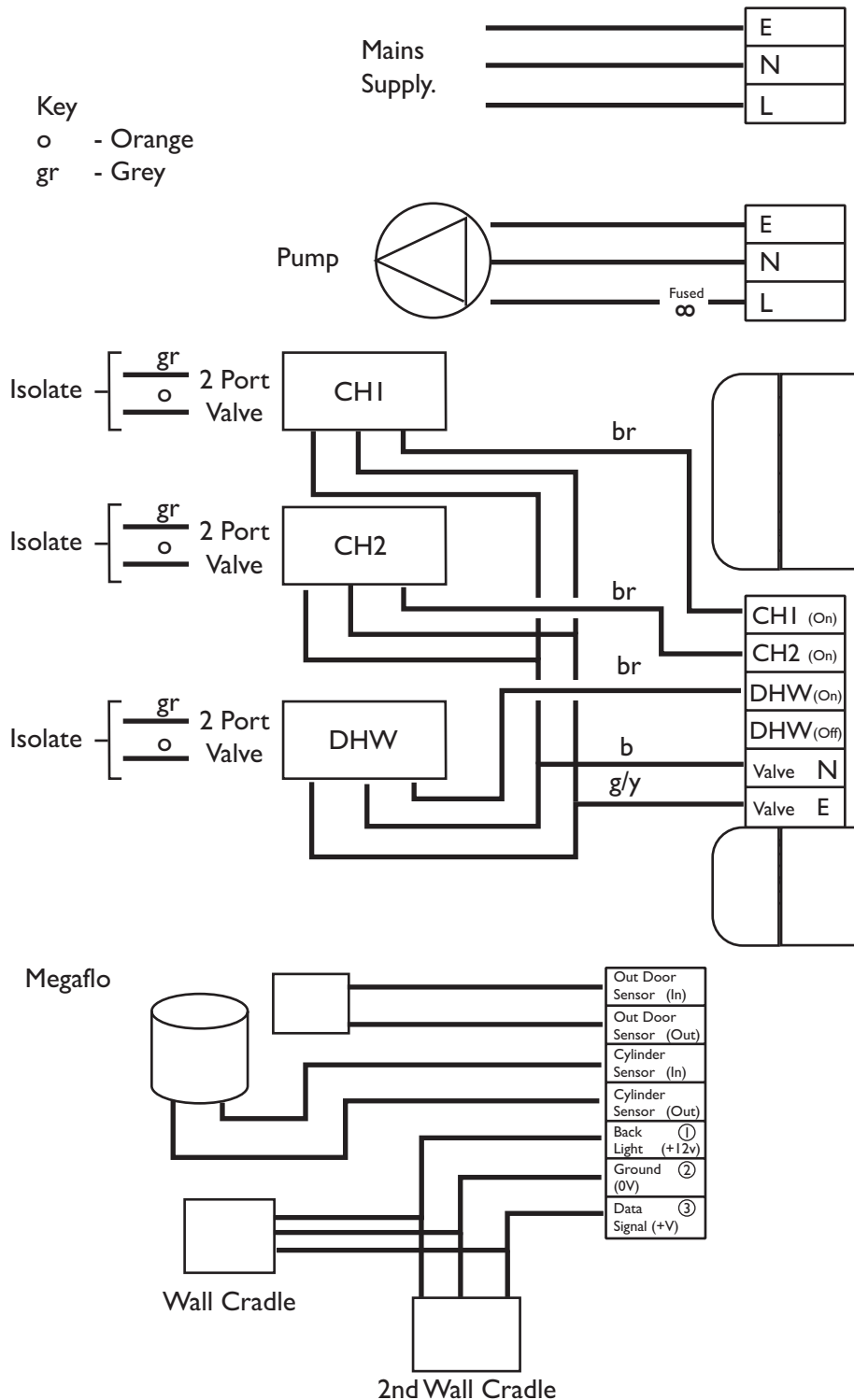
1. The appliance MUST have a permanent Live/Neutral/Earth connection. The pump must be connected to the appliance as shown.
2. Set parameter 5700 to '2' for one heating circuit - see section 11.3.k.
3. The DHW set point on the THINK Controller must be the same as the thermostat set point on the cylinder. If this is not done the DHW temperature may not be achieved or the recovery time will be increased.





10.10 S-Plan with 2nd Heating Circuit

1. The appliance MUST have a permanent Live/Neutral/Earth connection. The pump must be connected to the appliance as shown.
  2. Set parameter 5700 to '3' for two heating circuits - see section 11.3.k.
  3. To control the second heating circuit a second THINK Controller is required – this is available as an optional extra. For guidance on installing the second THINK Controller see section 11.3 paragraph k.
- Use either a cylinder sensor or thermostat as in section 10.8&9.



## Retro Installations

**NOTE:** This installation is used only if the user wishes to utilise their existing temperature and time controls.

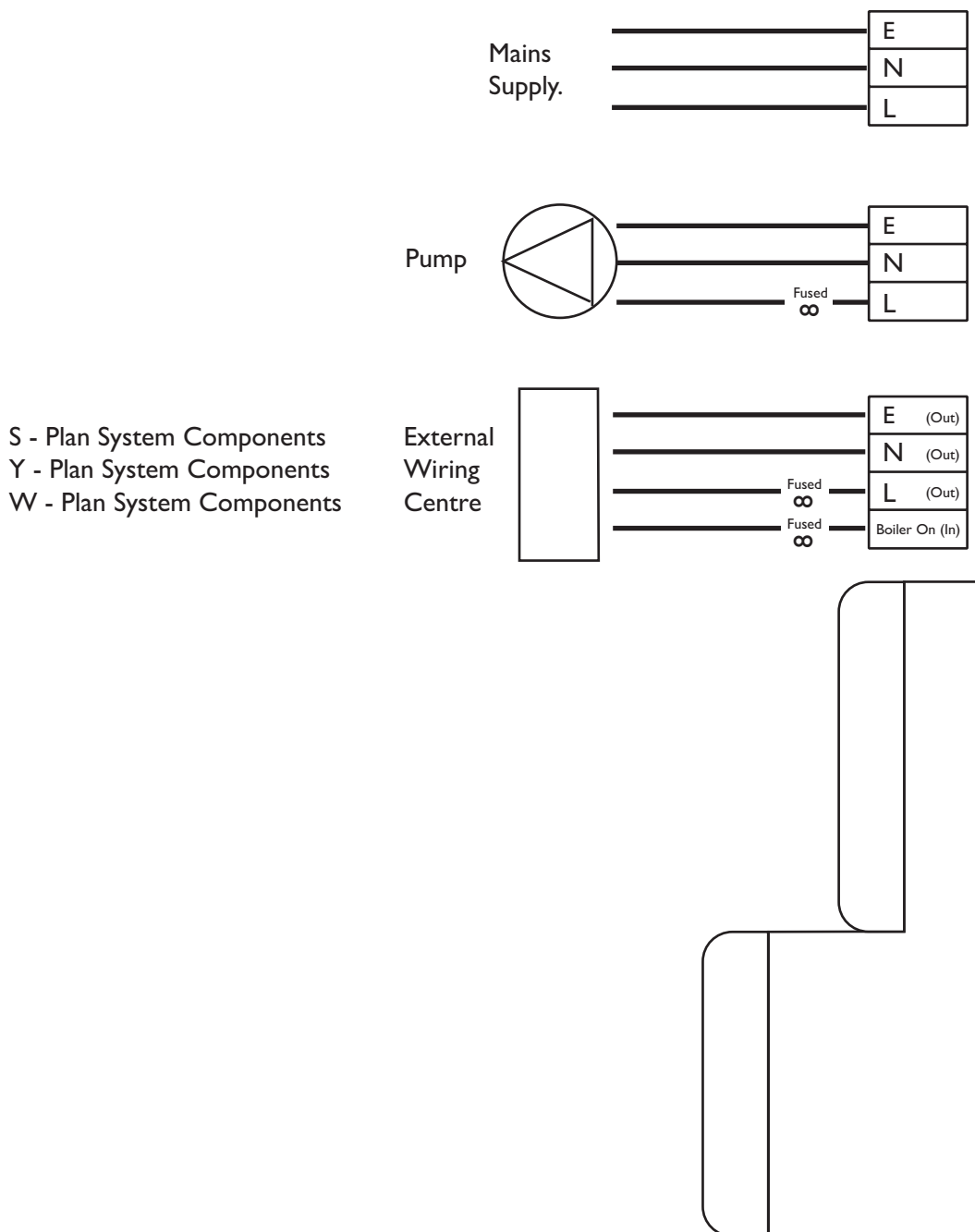
Outside and DHW sensors cannot be used. The THINK Controller must remain on the appliance.

### 10.11 Wiring Center

**NOTE:** As the boiler does not know what the actual room or DHW temperature is, the boiler temperature is fixed at 80°C. Appliance **MUST** have a permanent Live/Neutral/Earth connection. Pump **MUST** be connected directly to the appliance.

**System Requirement -** The default for parameter 5700 ('1'), is setup to control through an external wiring centre. To check the parameter - see section 11.3.k.

As an external programmer will be used to control the central heating and domestic hot water times, the installer must make sure that the boiler THINK Controller programs time for the central heating and DHW are set to 24h on (see User Manual).



Display showing all available segments

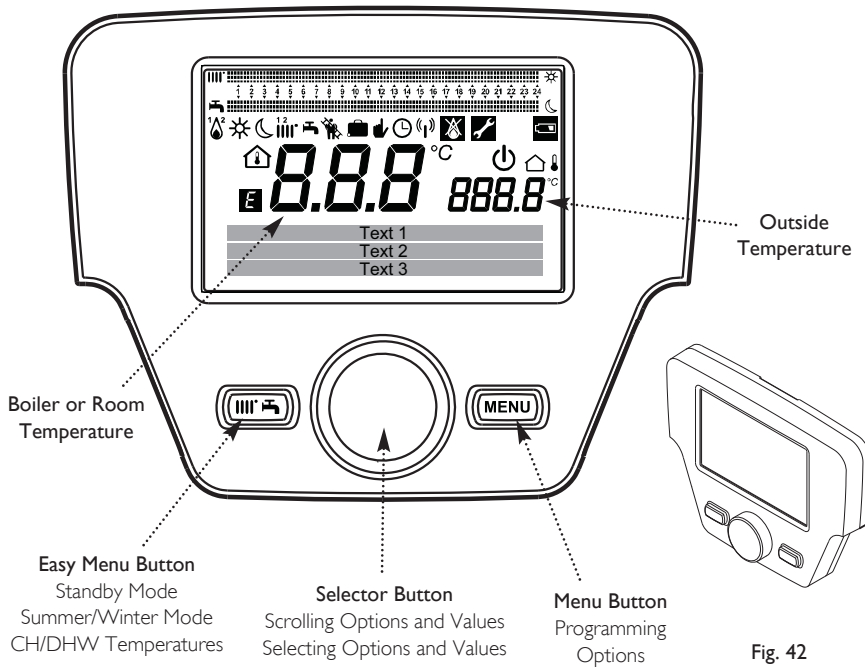


Fig. 42

## THINK Controller

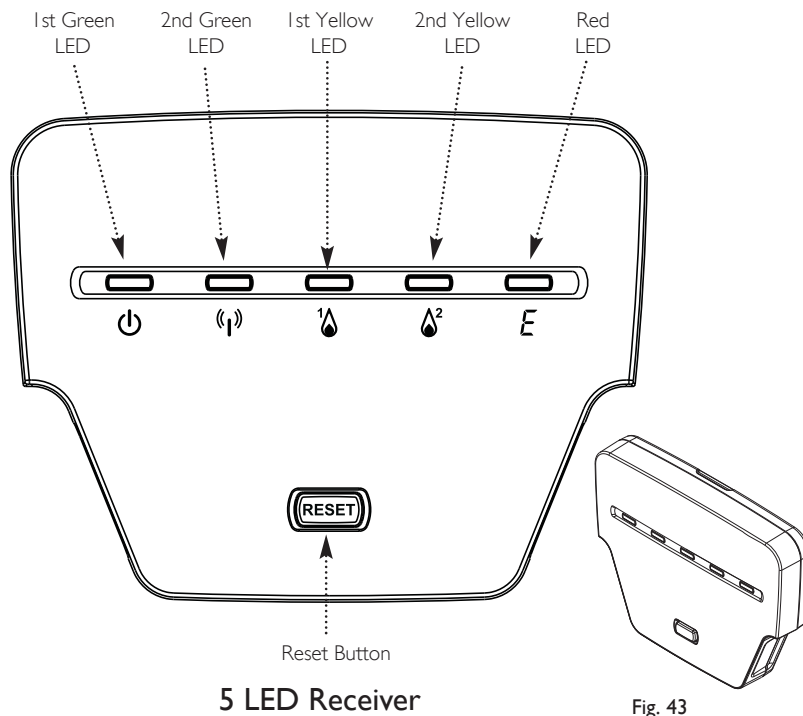


Fig. 43

### 5 LED Receiver (Fig. 43)

#### Inputs

Reset button: Used for user reset.

#### Outputs

- 1st Green LED - Mains On
- 2nd Green LED - Communication status
- 1st Yellow LED - Engine burner status
- 2nd Yellow LED - Supplementary burner status
- Red LED - Fault status

### 10.12 THINK Controller, 5 LED Receiver and Wall Cradle Accessory (Figs. 42 & 43)

#### Display Descriptions

- Burner in Operation 1 - Engine 2 - Supplementary
- 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 Overridden
- Time Switch Function Active
- Wireless Communication Established
- THINK Controller Configured as a Room Sensor
- Error Message
- Stand By - Appliance On/Off
- Outdoor Sensor Connected
- System / Appliance Attention Required
- Maintenance / Special Mode
- Change Battery (only if radio control fitted)

1. The 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 electrical power generated etc.

2. Whilst the 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 – see sections 10.3 to 10.11.

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

4. If the THINK Controller is to be used as a room sensor it must be configured so that the appliance will recognise it as such.

### 10.13 To Configure the THINK Controller as a Room Sensor

**IMPORTANT:** Before running the appliance ensure parameter 5700 has been set according to the type of system installed. See sections 10.4 to 10.11 for system types and section 11.3.k for the change procedure.

1. To configure the THINK Controller to act as a room sensor parameter 40 must be changed from Operator Unit 1 (the appliance) to Room Unit 1 (room unit).

2. To access parameter 40
  - Press the Menu Button to reveal 'Information'.
  - Press and hold Easy Menu and Menu Buttons until 'Enduser' is revealed.
  - Turn the Selector Button to highlight 'commissioning' and press to select.
  - Turn the Selector Button to highlight 'operator section' and press to select.
  - Turn the Selector Button to highlight 'Used as' and press to select, whilst flashing turn the Selector Button to show the desired room unit and press to select.

### 10.13 To Configure the THINK Controller as a Room Sensor (cont)

3. Press the menu button repeatedly until the standard screen is available. The Programmable Room Unit symbol should be shown on the screen if the THINK Controller has been configured correctly, see Fig. 42.

4. If a second THINK Controller is to be used to control either a second heating circuit or to remain on the appliance then the parameter settings are slightly altered, see Section 11.3 paragraph k and Table 2.

5. To complete the reconfiguring the main PCB must be rebooted with the information from the THINK Controller, so switch off the appliance and then repower after 10 seconds. The THINK Controller will now act as a programmable room sensor when mounted into a wall cradle.

6. The THINK Controller's can be replaced on the appliance at any time but to avoid conflict and Error 84 address collision problems, parameter 40 must be reconfigured back to 'Operator Unit 1'.

7. When an THINK Controller is mounted in a wall cradle, the 5 LED Receiver fills the space on the appliance. It acts as an indicator see fig. 43 and enables user resets to be carried out as they cannot be performed remotely.

### 10.14 To Install the 5 LED Receiver and THINK Controller

1. Isolate the appliance.
2. Remove the 5-LED Receiver from the wall cradle (as supplied).
3. Connect the wire terminals between the room unit wall cradle and the appliance controls installation area, using wire suitable for 12v. (<200m)
4. Install the wall cradle in a suitable room or hall way. (see Section 10.15)
5. Make sure the wall cradle is not in a position where it can be accidentally knocked or tampered with.
6. Remove the THINK Controller from the appliance and place it in the wall cradle.
7. Place the 5-LED Receiver onto the appliance.
8. Switch on the appliance.
9. If the THINK Controller has not been configured as a Room Sensor correctly, you may see error 84: BSB collision. If this does happen, repeat from Section 10.13 paragraph 2 while the THINK Controller is on the wall cradle. Once the parameters have been checked down power the appliance for 10 seconds and then switch the appliance back on.

#### Wiring connections to appliance - see Section 16.6

Wired THINK Controller Wall Cradle Control Terminal Function

- 1 Power supply 12v
- 2 Ground (0v)
- 3 Data Signal (+v)

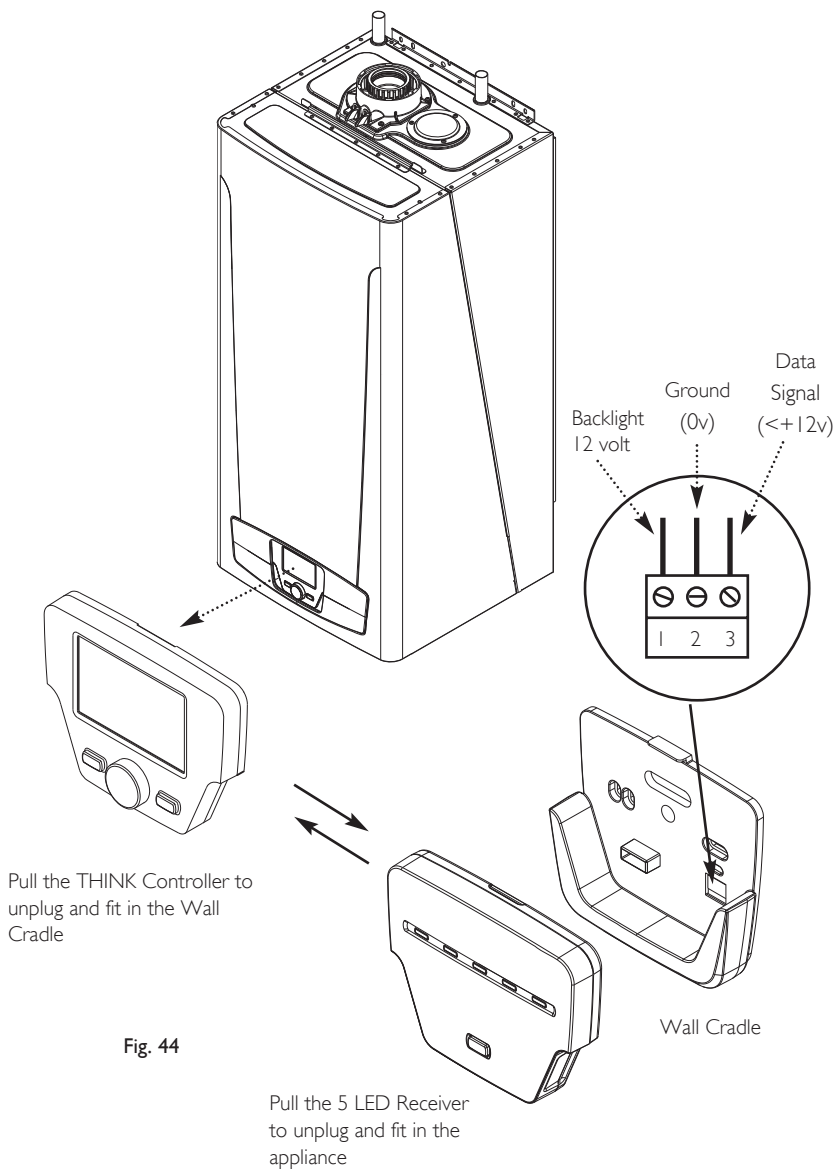


Fig. 44

## 10.0 Electrical

### 10.15 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) (Fig. 45).

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 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.

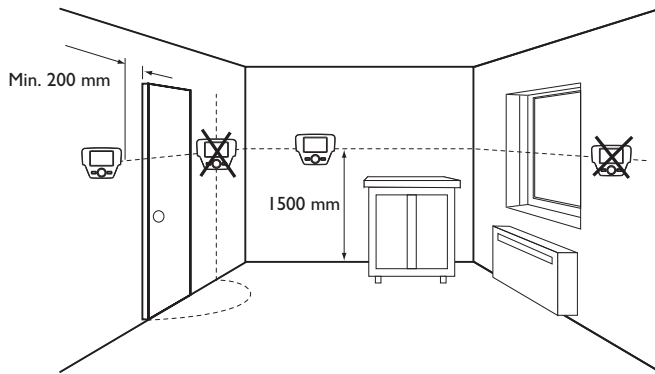


Fig. 45

### 10.16 Outside sensor unit installation procedure

1. **Outside sensor location:** The outside sensor carton is illustrated with Suitable locations and advises against locations which are likely to give poor / false readings.

2. Avoid south facing walls; preferably choose a west to north facing location.

3. The ideal height for the sensor is at approximately half the height of the living space of the dwelling and no less than 2.5m off the ground.

4. Avoid locating the sensor close to the flue terminal where the flue plume could heat the sensor and cause the appliance to switch off prematurely.

5. Two core "bell wire" is suitable.

6. When correctly connected and once the 'Save sensor' procedure has been done (See Section 11.4), the outside temperature and icon will be display on the THINK Controller (See Section 10.12 and Fig 42).

**NOTE:** The THINK Controller refresh rate will be slower than when it is mounted directly on the appliance or in a wired cradle.

**IMPORTANT:** Before running the appliance ensure parameter 5700 has been set according to the type of system installed. See sections 10.4 to 10.11 for system types and section 11.3.k for the change procedure.

### 10.17 Wireless Installation

1. If a wireless system is being installed then communication must be established between the various RF components and the special RF 5 LED Receiver which contains the transceiver for the appliance. Each kit as outlined in section 6.8 includes installation instructions. An overview is given below: -
  2. In the wireless 5 LED kit (part no. 720026201) the wireless 5 LED Receiver and the cradle are prebound but subsequent cradles holding THINK Controller for second heating circuits must be connected or 'bound' to the 5 LED transceiver.
  3. The available RF component transmitters are: -
    - The cradle – enables direct connection with the THINK Controller.
    - The outside sensor transmitter.
    - The repeater unit – enables components to be positioned in otherwise dead areas to the RF 5 LED Receiver. The repeater unit requires a mains supply.
  4. Observe the same considerations for locating the wireless THINK Controller as the wired room sensor.
  5. To bind the units together use the following procedures.
  6. Each THINK Controller must be allocated to the correct heat circuit i.e. room unit 1/room unit 2/operator unit as described in Section 10.13 and 11.3 paragraph k, this can be done on the appliance or later when in the RF cradle.
  7. Switch the appliance on and insert the RF 5 LED Receiver into either the appliance or an off appliance wired cradle.
  8. If the RF Cradle and RF 5LED Receiver came boxed together then they will be prebound. Insert the 3xAA batteries into the RF cradle and insert the THINK Controller, 'data update' will show and then the percentage progress will show if the THINK Controller is new to the appliance. After a short while 'Operator unit ready' then the standard screen will appear. The THINK Controller can now be used as an RF programmable room sensor.

9. If Error 83 appears move the THINK Controller in the RF cradle closer to the RF 5 LED Receiver. If distance/line of sight is not the problem the RF components will need to be connected or 'bound' together using the following procedure: -

10. Press and hold the reset button on the RF 5 LED Receiver around 10 seconds until the second and fourth LEDs are lit.

11. Press the menu button to enter the user menu and then press and hold the easy menu and menu buttons until the other access levels appear. Scroll down to the commissioning option and select by pressing the Selector Button. Scroll down to the wireless options and select to enter this list as shown opposite.

12. Select parameter 120, scroll to 'yes'. 'Wait' will appear until the unit is bound. As each unit is bound they will appear in the list above as being 'in operation'. If a unit does not appear, move it to a different location and then choose and confirm test mode. This will initiate a series of 24 test signals which are shown along the top of the display and sent back and shown on a line underneath. Move the unit to a location where at least 20 of these signals are echoed back. If few or no signals are received it will be necessary to use a repeater unit to relay the signal.

Wireless menu				
	Line 2	Line 3		Parameter
1.	Binding	Trigger?	no/yes	120
2.	Test mode	Trigger?	no/yes	121
3.	Room Unit 1	Delete device?	missing/in operation	130
4.	Room Unit 2	Delete device?	missing/in operation	131
5.	Room Unit 3	Delete device?	missing/in operation	132
6.	Outside sensor	Delete device?	missing/in operation	133
7.	Repeater unit	Delete device?	missing/in operation	134
8.	Operator Unit 1	Delete device?	missing/in operation	135
9.	Delete all devices	-	no/yes	140

## 11.0 Commissioning

### 11.1 Preliminary Electrical Checks

1. Reference should be made to BS:EN 12828, 14336 and 5449 Section 5 when commissioning the boiler.
2. Prior to commissioning the boiler preliminary electrical system checks should be carried out.
3. Remove the outercase, the bottom panel and lower the control tray to gain access to the electrical connections (see section 10.1).
4. These should be performed using a suitable meter, and include checks for Earth Continuity, Resistance to Earth, Earth Loop Impedance, Short Circuit and Polarity.
5. At the time of commissioning, complete all relevant sections of the Benchmark Checklist at the rear of this publication.

### 11.2 Commissioning the Boiler

**NOTE:** The transit brackets - 3 off must only be removed just before commissioning the appliance.

1. The engine is held securely for transit by 3 brackets (Figs. 48 & 49). To ensure that all 3 brackets are removed before firing the appliance, two security measures must be overcome:

a) Firstly all 3 brackets are wired together. Remove the bottom (left and right hand) brackets first (Fig. 49) by removing the screws from underneath the engine and then undo the M6 screws securing the brackets to the back of the appliance. Disengage the brackets and withdraw.

Remove the top centre bracket by removing the three M5 screws (8mm spanner) (Fig. 48).

**NOTE:** Please retain the screws and brackets in case resiting the appliance is necessary. The center bracket should also be refitted to protect the engine head during servicing.

b) This will release the second security measure now that the top bracket has been removed. The push on connector can be disengaged from the cut out and reconnected to the return temperature sensor (Figs. 48a & 48b) (the appliance will not operate until this reconnection is made, Error 40 will show).

2. Refit the control tray, the bottom panel and the outercase before switching on the appliance.

3. Ensure that the filling loop is connected and open, then open the heating flow and return valves on the boiler.

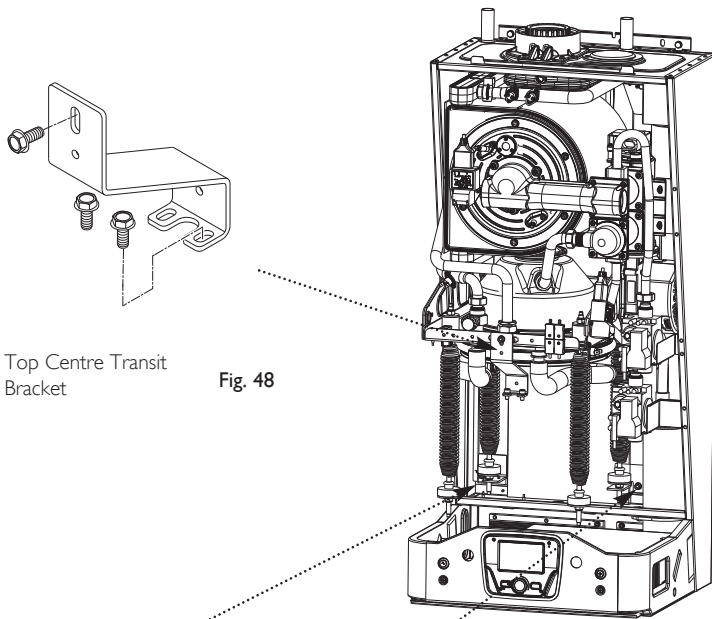
4. The system must be flushed in accordance with BS 7593 (see Section 6.1) and the flushing agent manufacturers instructions.

5. Pressurise the system to 1.5 bar then close and disconnect the filling loop.

6. Turn the gas supply on and purge the system according to in GB BS 6891 (Natural Gas) BS 5482-1 (Propane Gas) and in IE I.S. 813 "Domestic Gas Installations".

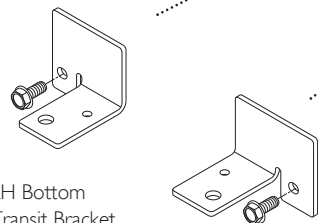
**IMPORTANT :** Lockout may occur and Error Codes E261 & E262 displayed if the gas supply pipe is not adequately purged.

7. Test for gas tightness.



Top Centre Transit Bracket

Fig. 48



LH Bottom Transit Bracket

RH Bottom Transit Bracket

Fig. 49

Engine Alternator removed for clarity to see Transit Brackets

Remove Top Centre Transit Bracket

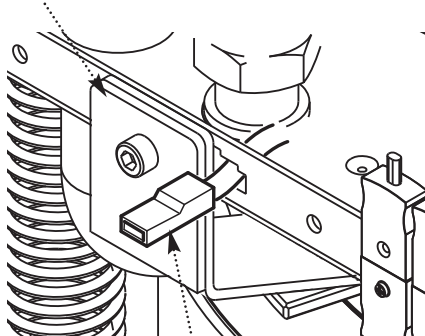
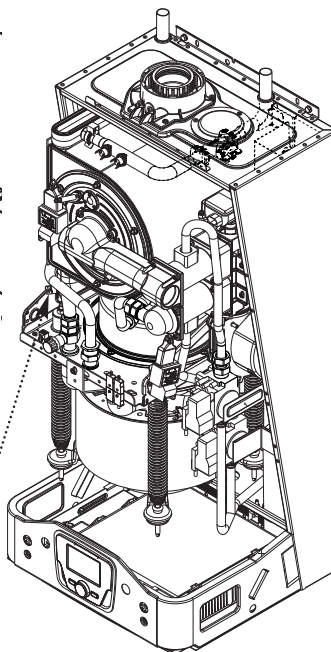


Fig. 48a

Push On Connector

When the Top Centre Transit Bracket has been removed the push on connector can be disengaged from the cut out and reconnected to the return flow sensor.



Return Temperature Sensor

Push On Connector

Fig. 48b

### 11.3 Commissioning of Controls

Every time the appliance is powered up, the controls carries out 2 checking functions

- a) **315: Initialization** – Main PCB gathers data on connections and sensors. This takes around 2 minutes.
- b) **312: Deaeration Function** – all circulation valves are opened and the circulating pump is exercised. On for 6 seconds off for 5 seconds for 4.5 minutes. See section g) Deaeration function

**A number of actions are required to complete the commissioning procedure.**

- Time and Date settings.
- Operating mode
- Temperature settings.
- DHW set point for thermostat control.
- Time Program settings.
- Chimney sweep (checking the gas rates)


**A number of commissioning actions may be required (Paragraphs g to l):**

- Deaeration Function
- Central Heating - Optimised start.
- System frost protection (outdoor sensor required).
- Legionella settings (DHW sensor only).
- Configuring the appliance for the heating system – Parameter 5700.
- 2nd Heating Circuit room unit allocation.

#### a) Date and Time Settings

When the THINK Controller is powered up initially, 'Date and Time' setting function is activated. See Section 4.0 Setting the Time in the User's Operating Instruction Booklet.

#### b) Operating Mode

To avoid unnecessary/unwanted start ups during installation and commissioning, the appliance is delivered in the standby mode which is confirmed by the (  ) symbol shown in section 10.12 Fig. 42. The standby mode will only allow the appliance to run if either: -

- Hot water boost has been selected.
- Chimney sweep function has been activated.
- Frost protection is activated for either the appliance or room.
- Deaeration allows exercising of the pump and valves for priming of the circuit and the removal of the air in the system.

To take the appliance out of standby and enable 'normal' operation: -

- From the standard screen on the THINK Controller press the easy menu button.
- Scroll the Button and press to select Standby/operation.
- 'Standby/operation – Operation' appears briefly on the THINK Controller and the action is confirmed by the disappearance of the standby symbol.

The central heating and domestic hot water active times are shown at the top of the THINK Controller as shown in fig. 42. (See paragraph e).

To set up the appliance to the modes of operation required for the householder -

- see Section 7.0 of the User's Operating Instructions.
- Section 7.1 Selecting the Space Heating Mode.
- Section 7.4 Selecting the DHW Mode.

#### c) Temperature Settings.

Please refer to the User's Operating Instructions Section 7.0.



### 11.3 Commissioning of Controls (cont)

#### d) DHW set point for thermostat control.

**Remember:** Make sure the user DHW setpoint on the THINK Controller is equal to or greater than the set point on the thermostat at the cylinder.

If this procedure is not performed the recovery time of the DHW maybe be increased unacceptably.

#### e) Time Program Setting

Please refer to the User's Operating Instructions Section 5 (CH) and Section 6 (DHW).

#### f) Chimney Sweep - Checking the gas rates - see Section 11.5.

#### g) Deaeration function

If during commissioning repeated E164 and E274 errors occur which will stop the appliance from running, (see section 17 fault finding) it may be useful to run the Deaeration function. This will run the pump and exercise the system valves to help purge the air from the system.

- To activate this function from the standard screen: -
- Press and hold both the easy menu and menu buttons until chimney sweep function appears.
- Deaeration function will appear shortly afterwards.
- Scroll down and press to select.
- '312: Deaeration function' will appear and last for 4½ mins.

This action can be used repeatedly until the 164 and 274 errors are removed. However if the problem persists check to see if shut off valves, pump valves, wiring etc are correct.

#### h) Central Heating - Optimum start activation

The engine and supplementary burners are fired so that the property is up to the set room temperature at the programme On time.

- To activate the function press the 'Menu' button to enter the programming menu.
- Press and hold 'Easy Menu' and 'Menu' button together until the access level menu appears (>8sec).
- Select 'Commissioning'.
- Select 'Temps/mode CHI'.
- Press Selector Button to confirm.
- Select 'Optimum start control max' (P 790).
- Press Selector Button.
- Change the values to the desired time.
- Press Selector Button to confirm.
- Press 'Menu' button to escape to the normal operating screen.

#### i) System Frost protection

**An outdoor sensor must be fitted to activate system frost protection.**

- To activate the function press the 'Menu' button to enter the programming menu - 'Information' appears.
- Press and hold 'Easy Menu' and 'Menu' button together until the access level menu appears (>8sec).
- Select 'Commissioning'.
- Select 'Configuration'.
- Select 'System frost protection' (P 6120).
- Press Selector Button.
- Select 'On'.
- Press Selector Button to confirm.
- Press 'Menu' to escape to normal operating screen.

**Remember: The function is most likely to activate the pump during the night. Pump activation at less than 1.5° C.**

## 11.3 Commissioning of Controls (cont)

### j) Legionella

Legionella is only possible if DHW cylinder sensor is used.

The function default activation time is 'Monday at 8:00am'.

- To modify the legionella time press 'Menu' button to enter the programming menu.
- Scroll to and select 'Domestic Hot Water'.
- Scroll to and select 'Legionella function weekday'.
- Change and confirm new day.
- Select 'Legionella funct time'.
- Change and confirm new time.

k) Configuring the appliance for the heating system – Parameter 5700.

The default setting for parameter 5700 is '1' is for a retro-efficient system with a switched live using a wiring centre – see section 10.11.

For intelligent installations change parameter 5700 to: - '2' - for one heating circuit and '3' - for two heating circuits.

From the main screen press the menu button to show 'information'.

- Press and hold the easy menu and menu buttons until 'end user' appears.
- Turn the selector button to highlight 'commissioning' and press to select.
- Turn the selector button to highlight 'Presetting parameter 5700' and press to select.
- Whilst the existing parameter is flashing turn the selector button to the desired number and press to select.

Press the menu button repeatedly to return to the standard screen.

### l) 2nd Room Unit Allocation Procedure

When two or more THINK Controller's are used as opposed to one THINK Controller with a 5 LED Receiver.

Install the wall cradles and connect to the appliances using the same connections as shown in Fig. 44 – up to two THINK Controllers can be installed in this way.

Power up the appliance:

- After the standard screen appears press the menu Button to reveal 'Information'.
- Press and hold the Easy Menu and the Menu Button until 'User' appears.
- Turn the Selector Button to highlight 'Commissioning' and press to select.
- Turn the Selector Button to highlight 'Operator unit' - parameter 40 and press to select.
- Turn the Selector Button to highlight 'Room unit 2' and press to select.
- Parameter 42 and 43 are automatically assigned and not accessible.
- Press the Menu Button repeatedly to escape to the standard screen.

Down power the appliance for ten seconds and then power up. If two heating circuits have been programmed correctly the THINK Controller's should show a small 1 and 2 next to the radiator along with the room unit symbol as in Fig. 42.

If it is required to replace the THINK Controller back on the appliance then parameter 40 must be reassigned to operator unit 1 - see section 10.13.

After all reprogramming of these parameters the appliance must be down powered and then repowered after 10 seconds.

Parameter settings for the THINK Controller when used as a room sensor with either a 5LED Receiver or THINK Controller on the appliance

On the Appliance	1st Room Unit			2nd Room Unit		
	Parameter					
5LED THINK Controller	40	42	43	40	42	43
	RUI	All HC	Central	RUI	Automatically Assigned	
	RUI	All HC	Central	RUI		

Table 2

**Reprogramming of location and central control parameters.** The default settings used for the THINK Controller on the appliance regardless of other equipment are :-

- Parameters
- 40 = Operator Unit 1
  - 42 = All Heating Circuits (All HC)
  - 43 = Central

The parameters 42 and 43 are accessed as parameter 40 as above.

### 11.4 Saving the sensor connections

1. For intelligent installations where sensors are used, after all of the connections are made and all the THINK Controller's have been programmed as room sensors, the sensor connections need to be saved.

2. From the main screen: -

- Press the Menu Button to reveal 'Information'.
- Press and hold Easy Menu + Menu for 5 seconds to reveal 'user'.
- Turn the Selector Button to highlight 'commissioning' and press to select.
- Turn the Selector Button to highlight 'configuration' and press to select.
- Turn the Selector Button to highlight 'save sensors' and press to select.
- Turn the Selector Button to highlight 'yes' and press to select.
- The 'yes' will change back to 'no' to show that the sensors have been saved.

3. The sensors that are connected to the appliance are automatically recognised and used to control the comfort levels.

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## 11.5 Starting the Appliance and Checking the Gas Rate

1. The gas valve is factory set and in normal running the burner pressure cannot be measured as it is controlled by the fan and modulates as demand on the boiler alters.
2. The gas rate must be checked (as in accordance with Gas Regulation 98 Paragraph 26/9) with any other appliances and pilot lights turned off.
3. The gas rate measurement may be made with the Engine and Supplementary burners both on maximum.

Approximate rate is:-  $\pm 5\%$  2.68 m<sup>3</sup>/hr at 20mb inlet pressure for G20 (Natural Gas) 1.04 m<sup>3</sup>/hr at 37mb inlet pressure for G31 (Propane Gas), see Section 4.1. **NOTE:** For retro-fit systems using a wiring centre - ensure that all external 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. Do not adjust the air/gas ratio valve.

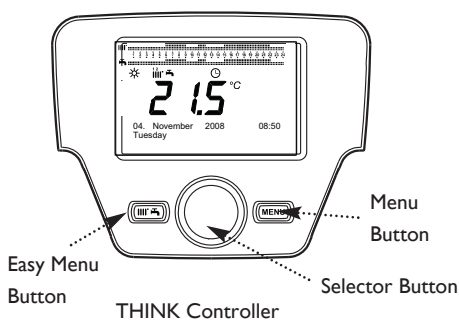
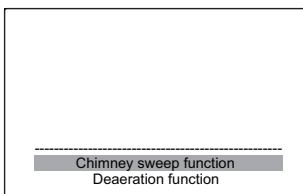
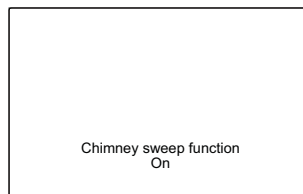


Fig. 49a

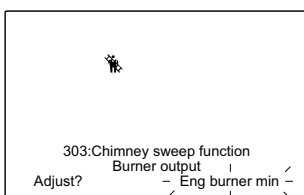
### STEP 1



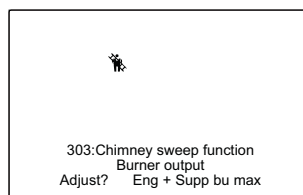
### STEP 2



### STEP 3



### STEP 4



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

Proceed to put the boiler into operation as follows:

5. Activate the chimney sweep function by pressing and holding the easy menu and menu buttons (Fig. 49a) whilst in the normal operation screen until chimney sweep function option appears. Press the Selector Button to switch the chimney sweep function on.
6. The THINK Controller will show Chimney Sweep Function on. Chimney Sweep function Burner Output Adjust appears.
  - Press the Selector Button. 'Engine burner min' will flash.
  - Use the wheel to scroll through the six options
    - a) Engine burner minimum
    - b) Engine burner maximum
    - c) Supplementary burner minimum
    - d) Supplementary burner maximum
    - e) Engine and Supplementary burners minimum
    - f) Engine and Supplementary burners maximum

7. Choose the maximum operation f) and ok your choice. No matter what the previous state is, the burners will restart before achieving the desired rate. As soon as both burners are lit as shown by the flame numbers  $1^1 2^2$ .

8. With the boiler operating in the maximum rate condition check that the operational (working) gas pressure at the inlet gas pressure test point (Fig. 50) is in accordance with B.S. 6798 & B.S. 6891.

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

## 11.0 Commissioning

### 11.5 Starting the Appliance and Checking the Gas Rate (cont)

10. Carry out the rate measurement. The burners will remain at maximum rate unless: -

- a) A fault condition occurs – the burner/s will switch off – depending on the fault.
- b) The boiler set flow condition is reached (see note) – the burners will switch off.
- c) The power generated reaches 1kW - the engine burner will modulate down.

For this reason the measurement needs to be carried out on a cold system to be sure of obtaining an accurate result.

**NOTE:** The boiler set flow temperature is set to 90° to avoid interruption of the rate measurement.

11. The chimney sweep function can be deactivated in the same manner as it is activated. It will deactivate automatically after 20 minutes, or in the event of an fault.

12. **Remember:** The engine burner will not restart until the Head Temperature is below 165°C.

## 12.0 Completion

### 12.1 Completion

1. Instruct the user in the operation of the boiler and system including the THINK Controller, explaining the operational sequence.

2. Set the central heating and hot water temperature comfort levels to the requirements of the user.

3. Carefully read and complete all sections of the Benchmark Commissioning Checklist at the rear of this publication that are relevant to the appliance and installation. These details may 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.

4. Complete the 'Notice of Installation' booklet and submit on the day of commissioning to the Distribution Network Operator.

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

6. Hand over the Users Operating, Installation and Servicing Instructions giving advice on the necessity of regular servicing. **Advise the customer of the necessity of informing the electricity provider with regard to billing and payback. See the Users Operating instructions section 13.3.**

**NOTE:** See also  
[www.baxi.co.uk/products/get-fit-with-baxi-ecogen](http://www.baxi.co.uk/products/get-fit-with-baxi-ecogen)

## 13.0 Servicing

### 13.1 General

1. For reasons of safety and economy, it is recommended that the appliance is serviced annually. Servicing must be performed by a competent person in accordance with BS 7967-4:2007.

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

**NOTE:** Service and maintenance engineers must have undergone Baxi Ecogen Training and been approved to service this appliance.

3. Before electrically isolating the appliance: remove all demands for heat and ensure the engine has disconnected from the grid. (Power = 0 kW) This will protect the engine from the stresses produced by disconnecting during electricity generation.

**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 14.14.
- The operational gas inlet pressure as described in Section 11.5 and the gas rate as described in 11.3.8.
- The combustion performance as described in 'Check the Combustion Performance' (15.1).

4. **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.

**NOTE:** It is not possible to undertake any servicing of the engine and its burner and as such it should be regarded as a sealed unit. When performing combustion checks each burner must be run independently, see section 15.0 Combustion Checks.

### 13.2 Power generation

1. Ensure the system is cold and use the chimney sweep mode to force the Engine burner to maximum rate see section 15.1.

2. Use the THINK Controller to observe the power generated.

3. Monitor the head temperature and the power via the I-think controller -see section 13.3 -safety note.

4. The power should be between 800 to 1000W within 10 minutes of the engine burner starting - the head temperature should be between 450-500 deg C.

5. If the power level is low when the head has reached temperature the engine is not producing power correctly - see section Q for fault finding on the engine.

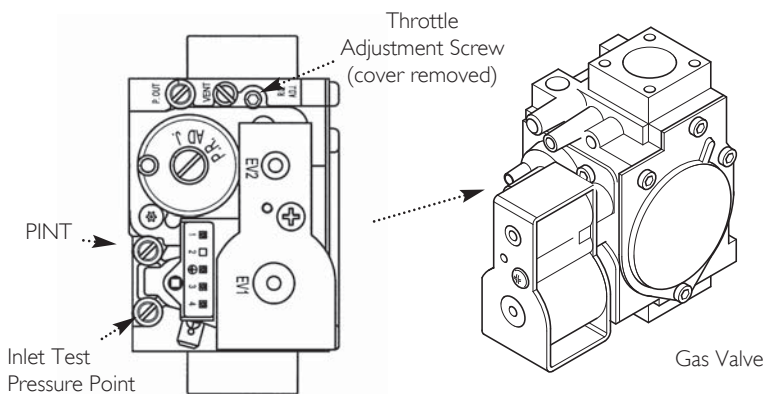
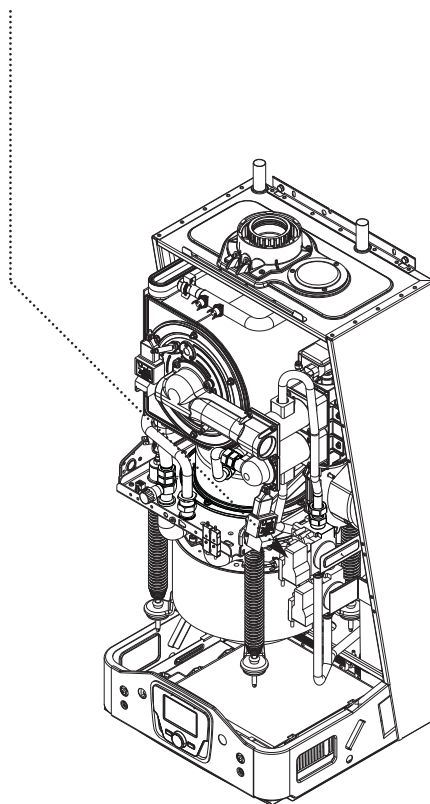


Fig. 50



## 13.0 Servicing

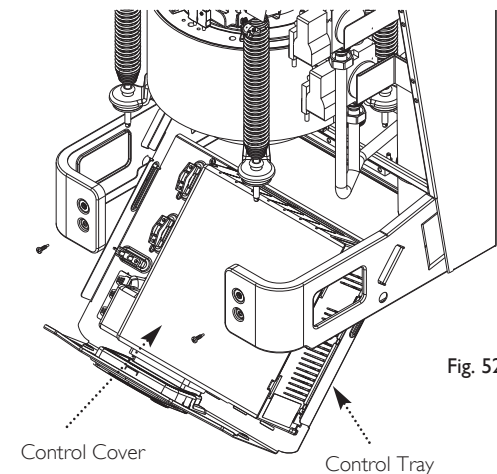
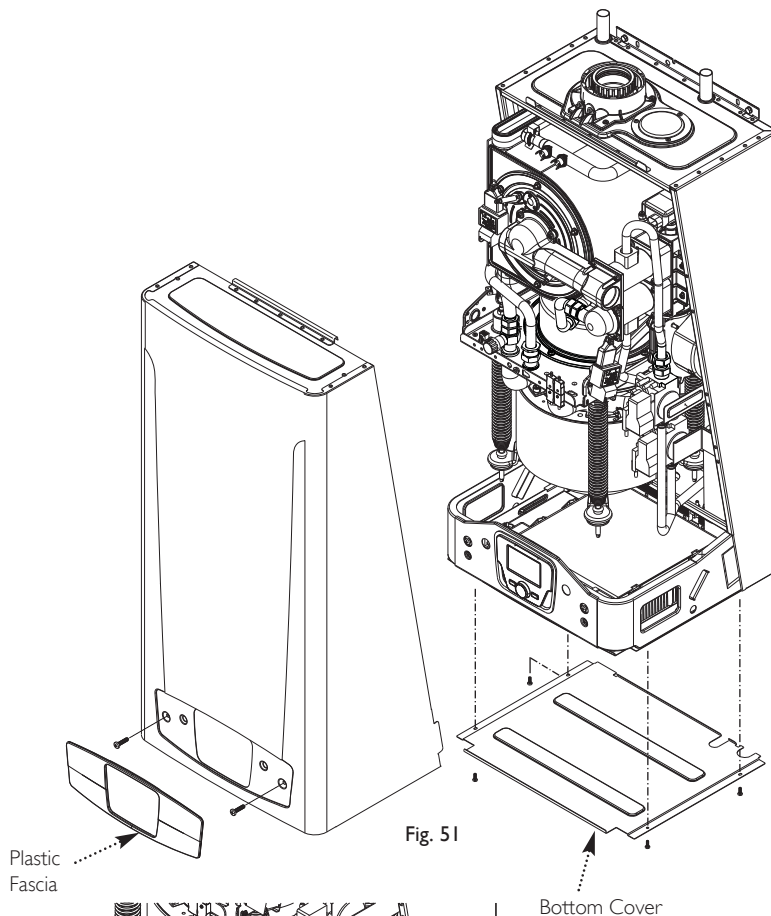
### 13.3 Servicing - Internal Integrity

**Safety Note:** Before removing the front cover, the correct shut down sequence must be followed for your own safety.

Before servicing, ensure that the boiler is cool with the engine head below 120°C – otherwise there is a risk of electric shock even with the supplies disconnected. The head temperature may be accessed via the THINK Controller. Press the MENU Button. Turn the Selector Button to highlight 'Information'. Press the Button to select. Turn Selector Button until 'head temp actual value' is shown.

Ensure that both the gas and electrical supplies to the appliance are isolated - wait a minimum of 6 minutes 30 seconds before any work is started - again there is a risk of electric shock even with the supplies disconnected.

**NOTE:** Before undertaking any service work that entails the removal and replacement of parts, ensure that the center transit bracket is refitted to protect the engine head (see Fig.48). **This bracket must then be removed before running the engine.**



1. Remove the plastic fascia on the front of the appliance which is held on by two magnets (Fig. 51).
2. Remove the two screws and the front case by pulling forward at the bottom edge and then lifting clear of the engagement at the top of the appliance (Fig. 51).
3. Undo the four screws from the bottom cover and remove the cover (Fig. 51).
4. Remove the two screws on the front of the control tray to gain access to the control tray area (Fig. 52).
5. Inspect the unit for any signs of water damage and rectify any leaks.
6. Generally check the conditions of the wiring of the appliance and the external wiring for and loose/ poor connections and remake if necessary.
7. Inspect the condition of the condensate trap for signs of debris and possible blockage. If necessary remove the service plug, drain and clean the compartment. Replace the plug, reassemble the case and check for correct operation when the appliance is running.
8. Check and clean the magnetic filter if it is of the serviceable type, otherwise replace the cartridge. If it is observed that there is excessive amounts of corrosion product - black residue/sludge check the inhibitor level in the system and top up with inhibitor solution as required.



### 13.4 Servicing – Combustion and Rate Checks

1. Perform combustion and rate checks by using the chimney sweep mode to force each burner into maximum rate (see section 15.0 Combustion Checks). Combustion reading of CO<sub>2</sub> ~ 8.7 – 9.3 and CO less than 100 ppm are acceptable for both burners. Measure the CO/CO<sub>2</sub> ratio. This valve must be less than 0.004.

2. Set each burner separately to a minimum and check that the burner stays lit with clean combustion.

3. If there is a problem with the rate or combustion see Section 15.2.

4. If there is a problem with the ignition, the following servicing should be carried out.

See SAFETY NOTE Section 13.3

#### Engine Ignition and Flame Sensing Electrodes (Fig. 53)

1. Detach the ignition and flame sense leads from the wiring harness noting their positions.

2. Undo the long nuts (7mm spanner) retaining the engine ignition and flame sense electrodes.

3. Carefully withdraw the electrodes from the engine.

4. Examine and clean or replace the electrodes as necessary. The spark gap should be 3.5 - 4.0 mm, adjust the earth pin if required (Fig. 54).

5. Always use the new gaskets provide when replacing the electrodes.

6. Replace in the reverse order.

#### Supplementary Burner and Heat Exchanger, Igniter and Flame Sensing Electrodes (Fig. 55)

1. Detach the supplementary Igniter plug.

2. Detach the flame sense lead from the wiring harness.

3. Remove the four M5 screws at the right of the supplementary air gas manifold.

4. Undo the six nuts around the burner door perimeter noting the position of the earth lead.

5. Carefully withdraw the burner door and manifold.

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

7. Inspect the burner, insulation and the electrodes, clean or replace if necessary. Reset the electrode spark gap to between 3.5 – 4.0 mm by adjusting the earth pin if required (Fig. 54).

8. If it is necessary to replace electrodes always use the gaskets provided.

9. Reassemble in the reverse order remembering to attach the earth wire.

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

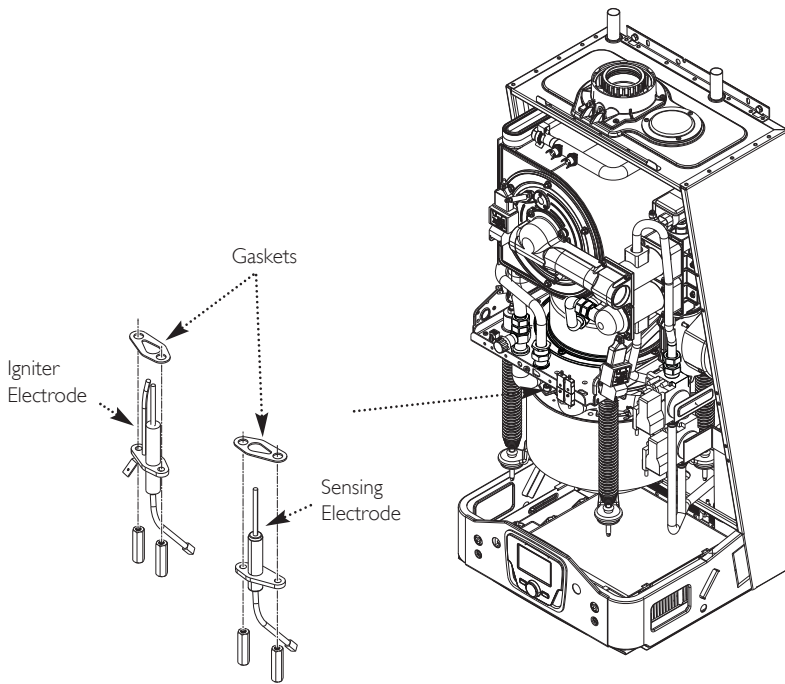


Fig. 53

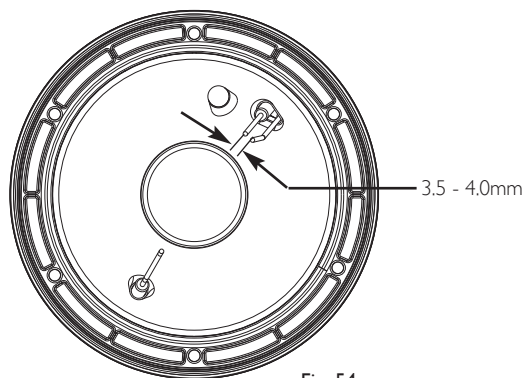


Fig. 54

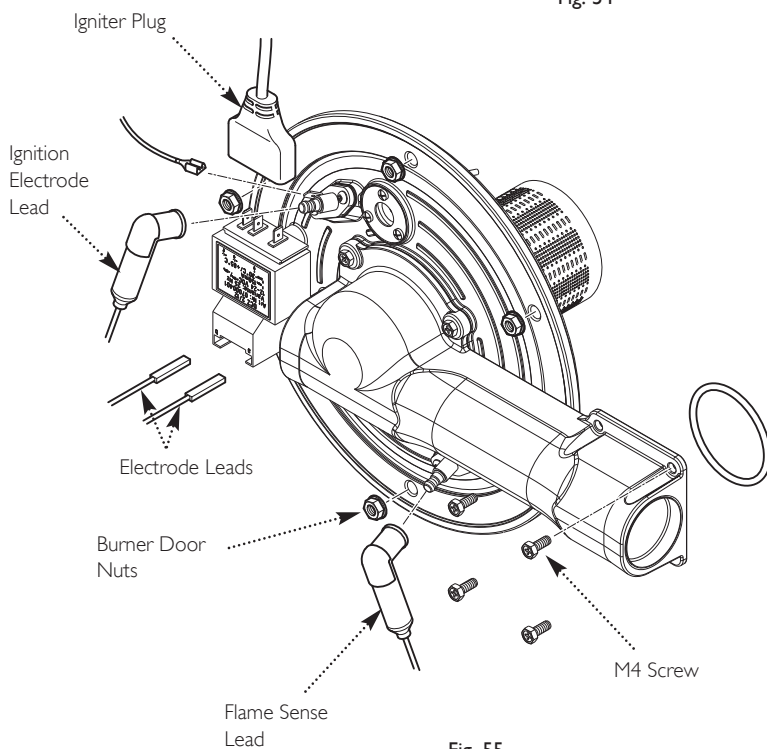


Fig. 55