

## Installation & Service Instructions

## Kingfisher Mf RSL40 - 100, CFL40 -100

### **About the Boiler**

See inside cover for models covered by these instructions.  
This Floor Mounted Fan Assisted Gas Boiler is available as Conventional or Balanced Flue.  
This boiler is for use with Natural Gas (G20) only at 20mbar and for use in GB & IE.

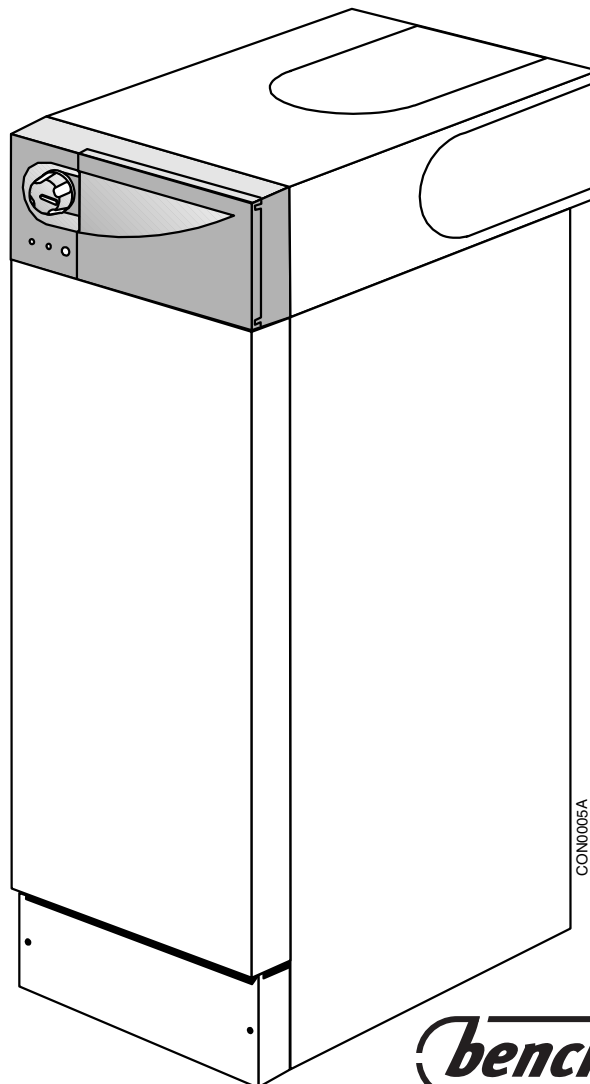
### **About Safety**

The Gas Safety (Installation and Use) Regulations 1998.

“In your own interest, and that of safety, it is law that all gas appliances are installed by competent persons, in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution.”

Installation must be in accordance with the Installation & Service Instructions and the rules in force.

**Leave these instructions and the Benchmark Log Book with the user for use on future calls.**



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

# Contents

|  |           |
|--|-----------|
| <b>Technical Data.....</b>   | <b>3</b>  |
| <b>Introduction.....</b>   | <b>5</b>  |
| Health & Safety Information.....                                     | 5         |
| Codes of Practice.....   | 5         |
| <b>1. Installation Requirements.....</b>                             | <b>6</b>  |
| 1.1 Gas Supply.....  | 6         |
| 1.2 Electricity Supply.....  | 6         |
| 1.3 Location of Boiler.....  | 6         |
| 1.4 Air Supply - CFL/RSL.....  | 7/9       |
| 1.5 Flue Systems - CFL/RSL.....                                      | 8/9       |
| 1.6 The System.....  | 11        |
| <b>2. Installation.....</b>  | <b>15</b> |
| 2.1 Install the Boiler.....  | 15        |
| 2.2 Install the Flue CFL.....  | 15        |
| Install the Flue RSL.....  | 17        |
| 2.3 Connect the Gas Supply.....                                      | 19        |
| 2.4 Connect the Water Supply.....                                    | 19        |
| 2.5 Connect the Power Supply Cable.....                              | 20        |
| 2.6 Install the Optional Programmer.....                             | 21        |
| <b>3. Commissioning.....</b>   | <b>22</b> |
| 3.1 Commission the Boiler.....                                       | 23        |
| 3.2 Final Adjustments.....   | 23        |
| 3.3 Instruct the User.....   | 24        |
| 3.4 Advise the User.....   | 24        |
| <b>4. Service &amp; Replacement of Parts.....</b>                    | <b>25</b> |
| 4.1 General Access.....  | 26        |
| 4.2 Electronic Control Board.....                                    | 27        |
| 4.3 Air Pressure Switch.....   | 27        |
| 4.4 Temperature Sensor.....  | 27        |
| 4.5 Overheat Thermostat.....   | 27        |
| 4.6 Burner, Gas Valve, Injector &<br>Electrode.....                  | 28        |
| 4.7 Combustion Chamber Insulation.....                               | 29        |
| 4.8 Fan & Flue Hood.....   | 29        |
| 4.9 Products Discharge Safety Device<br>- TTB (CFL Models Only)..... | 29        |
| <b>5. Wiring Diagrams.....</b>                                       | <b>30</b> |
| <b>6. Fault Finding.....</b>   | <b>32</b> |
| <b>7. Short List of Spares.....</b>                                  | <b>36</b> |
| <b>8. Flue Kits &amp; Optional Extras.....</b>                       | <b>38</b> |

Potterton is a member of the Benchmark initiative and fully supports the aims of the programme. Benchmark has been introduced 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.

**Important** – Failure to install and commission this appliance to manufacturer’s instructions may invalidate the warranty. This note does not affect your statutory rights.

The models covered by these instructions are:-

- Kingfisher Mf CFL 40 - G.C. No. 41 590 24
- Kingfisher Mf CFL 50 - G.C. No. 41 590 28
- Kingfisher Mf CFL 60 - G.C. No. 41 590 29
- Kingfisher Mf CFL 70 - G.C. No. 41 590 30
- Kingfisher Mf CFL 80 - G.C. No. 41 590 31
- Kingfisher Mf CFL 90 - G.C. No. 41 590 32
- Kingfisher Mf CFL 100 - G.C. No. 41 590 34

- Kingfisher Mf RSL 40 - G.C. No. 41 590 35
- Kingfisher Mf RSL 50 - G.C. No. 41 590 36
- Kingfisher Mf RSL 60 - G.C. No. 41 590 37
- Kingfisher Mf RSL 70 - G.C. No. 41 590 38
- Kingfisher Mf RSL 80 - G.C. No. 41 590 39
- Kingfisher Mf RSL 90 - G.C. No. 41 590 40
- Kingfisher Mf RSL 100 - G.C. No. 41 590 41

The boiler model and serial number are given on the boiler data label which is located on the heat exchanger cover plate.

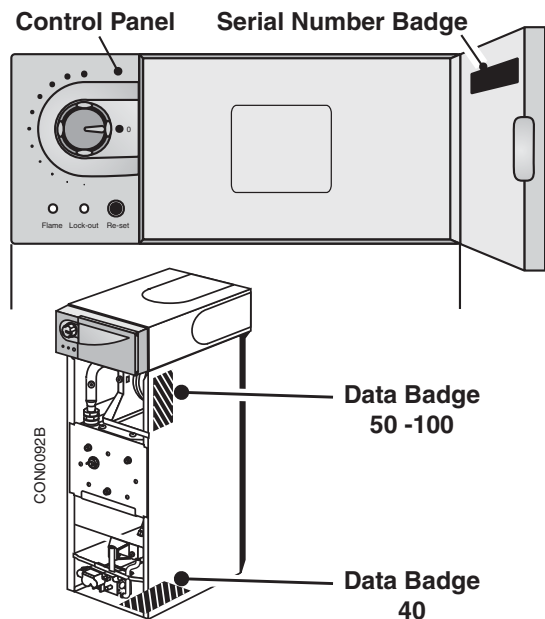


Fig. 1

## SAFETY, PERFORMANCE & QUALITY

Kingfisher Mf boilers have been assessed by a Government appointed Notified Body and shown to meet the 'Essential Requirements' of the European Gas Appliance Directive.

The Directive lays down requirements for the safety and efficiency of the appliance, together with its design, construction, and use of materials. It also requires the production process to be covered by an approved and monitored system of quality assurance.

## Technical Data

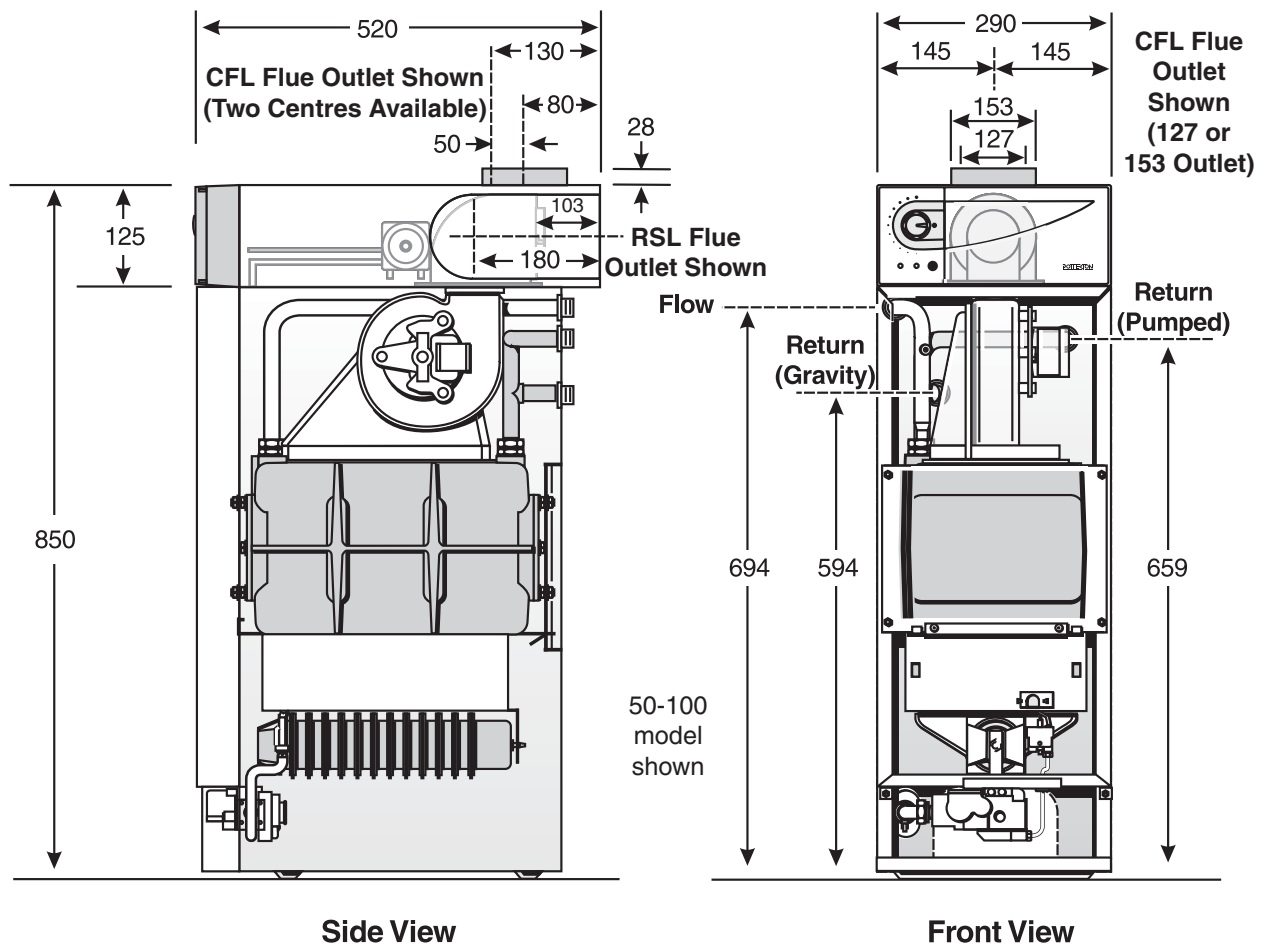
| Heat Input & Efficiency figures are quoted as gross |                    | Boiler models |        |        |        |        |         |         |
|---|--------------------|---------------|--------|--------|--------|--------|---------|---------|
|   |                    | 40            | 50     | 60     | 70     | 80     | 90      | 100     |
| Maximum Rate  |                    |               |        |        |        |        |         |         |
| Output  | kW                 | 11.72         | 14.65  | 17.58  | 20.52  | 23.45  | 26.38   | 29.31   |
|   | Btu/h              | 40,000        | 50,000 | 60,000 | 70,000 | 80,000 | 90,000  | 100,000 |
| Input   | kW                 | 14.47         | 18.31  | 22.00  | 25.60  | 28.95  | 32.98   | 36.76   |
|   | Btu/h              | 49,372        | 62,474 | 75,064 | 87,347 | 98,777 | 112,528 | 125,425 |
| Gas rate  | m <sup>3</sup> /h  | 1.38          | 1.75   | 2.10   | 2.44   | 2.76   | 3.14    | 3.50    |
|   | ft <sup>3</sup> /h | 48.73         | 61.65  | 73.98  | 86.31  | 97.42  | 110.97  | 123.75  |
| Efficiency  | %                  | 81.0          | 80.0   | 80.0   | 80.0   | 81.0   | 80.0    | 79.7    |
| Burner Pressure                                     | mbar               | 13.5          | 14.8   | 11.9   | 12.1   | 11.3   | 13.1    | 13.0    |
|   | in wg              | 5.42          | 5.92   | 4.76   | 4.54   | 4.54   | 5.24    | 5.20    |
| Injector Size                                       | mm                 | 2.9           | 3.2    | 3.7    | 3.9    | 4.3    | 4.4     | 4.7     |

|                                    |   |
|------------------------------------|---|
| Maximum Working Head               | 30.5 m (3 bar)  |
| Minimum Working Head               | 300 mm  |
| Minimum Circulating Head - Gravity | 1.2 m   |
| Gas Supply Pressure                | 20 mbar   |
| Gas Supply Connection              | Rc. ½ (½ in BSP Female)   |
| Maximum Flow Temperature           | 82 °C   |
| Flow Connection                    | 28 mm Copper  |
| Return Connections - Gravity       | 28 mm Copper  |
| Return Connections - Pumped        | 28 mm Copper  |
| Water Content                      | 6.5 litres  |
| Appliance Weight Installed - Dry   | 65.0 kg RSL / 69.0 kg CFL   |
| Electricity Supply                 | 230v ~ 50Hz Fused at 3A   |
| Internal Fuse                      | Type 2 AT (2 off)   |
| Power Consumption                  | 80 Watts (excluding pump)   |
| Classifications                    | CAT I <sub>2</sub> H<br>2H G20 20 mbar<br>B22, C12, C32 (40 - 70 models)<br>B22, C12 (80 - 100 models)<br>IP20<br>NOx Class 1 - CFL90, 100 & RSL60, 70, 80, 90, 100 models<br>NOx Class 2 - CFL40, 60, 70, 80 & RSL40, 50 models<br>NOx Class 3 - CFL50 model |

### SEDBUK Declaration for Kingfisher

| Model | Seasonal Efficiency (SEDBUK) (%) |      |
|-------|----------------------------------|------|
|       | RSL                              | CFL  |
| 40    | 78.5                             | 78.4 |
| 50    | 78.5                             | 78.5 |
| 60    | 78.5                             | 78.0 |
| 70    | 78.1                             | 78.0 |
| 80    | 78.2                             | 78.3 |
| 90    | 78.1                             | 78.0 |
| 100   | 78.0                             | 78.0 |

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



All dimensions are in mm

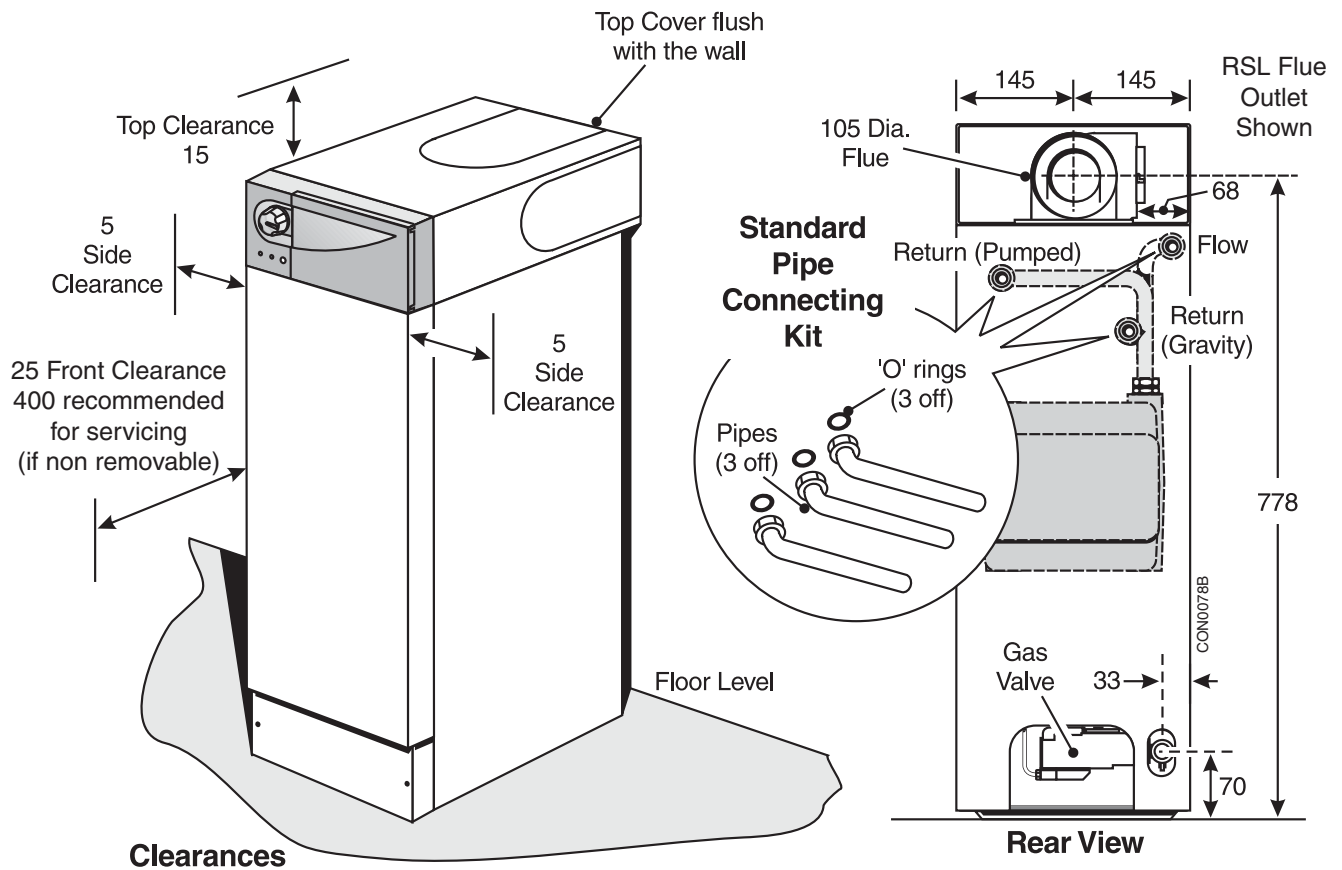


Fig. 2

## Introduction

The Gas Safety (Installation and Use) Regulations 1998.

This appliance must be installed and serviced by a competent person, in accordance with the above regulations.

In the UK 'Corgi' Registered Installers (including the regions of British Gas Services) undertake to work to a safe and satisfactory standard.

Failure to install appliances correctly could lead to prosecution.

It is in your own interest, and that of safety, to ensure that the regulations are complied with.

Kingfisher Mf boilers are fully automatically controlled, floor standing, fan powered, balanced or conventional flued appliances using a cast iron heat exchanger and are available in outputs ranging from 11.72 - 29.31 kW (40,000 - 100,000 Btu/h)

The boilers are designed for use on fully pumped open vented or sealed water systems with an indirect hot water cylinder or open vented gravity systems. **THEY MUST NOT BE CONNECTED TO A DIRECT CYLINDER.**

The boilers are for use on Natural Gas (G20) only.

Samples of the Kingfisher Mf gas boilers have been examined by Advantica Technologies Limited, a United Kingdom Notified Body. The range is certified to comply with the essential requirements of the Gas Appliance Directive 90/396/EEC, the Low Voltage Directive 72/23/EEC and shows compliance with the Electro Magnetic Compatibility Directive 89/336/EEC, the Boiler Efficiency Directive 92/42/EEC and are therefore permitted to carry the CE Mark.

### Delivery & Kits Available

**RSL Model** is delivered in two packages (1) the boiler with fittings and (2) the flue assembly.

**CFL Model** is delivered in one package.

Various flue kits and other options for the Kingfisher Mf range of boilers are shown on Pages 38 & 39.

### Health and Safety Information for the Installer and Service Engineer

Under the Consumer Protection Act 1987 and Section 6 of the Health and Safety at Work Act 1974, we are required to provide information on substances hazardous to health.

Small quantities of adhesives and sealants used in the product are cured and present no known hazards.

The following substances are also present.

### Insulation and Seals

**Material** - Man Made Mineral Fibre.

**Description** - Boards, Ropes, Gaskets.

**Known Hazards** - Some people can suffer reddening and itching of the skin. Fibre entry into the eye will cause foreign body irritation which can cause severe irritation to people wearing contact lenses. Irritation to respiratory tract.

**Precautions** - Dust goggles will protect eyes. People with a history of skin complaints may be particularly susceptible to irritation. High dust levels are only likely to arise following **harsh** abrasion. In general, normal handling and use will not present high risk, follow good hygiene practices, wash hands before, touching eyes, consuming food, drinking or using the toilet.

**First Aid** - Medical attention must be sought following eye contact or prolonged reddening of the skin.

### Codes of Practice

The boiler must be installed in accordance with: The Gas Safety (Installation and Use) Regulations 1998 and the current issue of:-

The Building Regulations, Building Standards (Scotland) Regulations, Local Building Regulations, Model and local Water Undertaking Bye-laws, IEE Wiring Regulations and Health & Safety Document No. 635 "The Electricity at Work Regulations 1989".

For Ireland install in accordance with I.S. 813 "**Installation of Gas Appliances**".

### IMPORTANT

This appliance has been certified for safety. It is therefore important that no external control device (e.g. flue dampers, economisers, etc.) be directly connected to the appliance unless covered by these Installation & Service Instructions or otherwise recommended in writing. Any direct connection of a control device not approved by Potterton could invalidate the CE Certification and normal appliance warranty.

# 1. Installation Requirements

## 1.1 Gas Supply

The meter and supply pipes must be capable of delivering this quantity of gas in addition to the demand from any other appliances in the house and must be governed at the meter.

On 90 & 100 models, due to the gas flow rate required, 22mm gas supply pipe should be used up to the inlet connection of the gas cock on the boiler.

The complete installation must be tested for gas soundness and purged as described in BS6891.

## 1.2 Electricity Supply

230V ~ 50Hz via a fused double pole switch with a contact separation of at least 3 mm in both poles adjacent to the boiler. Power consumption is approximately 80W. There must be only one common isolator for the boiler and its control system and it must provide complete electrical isolation. A plug (if fitted) must be accessible to the user after installation of the appliance.

Fuse the supply at 3 A. The minimum requirement for the power supply cable is that it should be a PVC sheathed cord at least 0.75 mm<sup>2</sup> (24 x 0.2 mm) (code designation HO5 VV-F or HO5 VVH2-F) as specified in table 16 of BS6500:1984.

All wiring external to the boiler shall comply with the latest IEE Wiring Regulations, and any local regulations which apply.

### **WARNING: THIS APPLIANCE MUST BE EARTHED.**

In the event of an electrical fault after installation of the boiler, preliminary electrical systems checks must be carried out i.e. Earth Continuity, Short Circuit, Polarity and Resistance to Earth.

## 1.3 Location of Boiler

The boiler is not suitable for external installation. The boiler must stand firm and level. No special floor protection is needed, but finishes which soften when warm e.g. linoleum and plastic floor tiles should be removed or may be protected by an insulating sheet at least 10mm thick.

The boiler must be installed so that the flue terminal is exposed to the external air. It is important that the position of the terminal allows the free passage of air across it at all times.

The boiler is suitable for installation against a combustible wall e.g. wood cladding, provided that the flue duct is not

closer than 25 mm to combustible material. A metal sleeve should be installed to surround the flue duct to provide a 25mm annular space. Further guidance is given in BS5440:1:2000, sub-clause 4.4.

If the boiler is to be installed in a timber framed building it should be fitted in accordance with the Institute of Gas Engineers document IGE/UP/7/1998 (also, British Gas Service publication Part 19 - Building and Kitchen Work). If in doubt advice must be sought from Potterton.

RSL boilers may be installed in any room, although particular attention is drawn to the requirements of the current IEE Wiring Regulations and, in Scotland, the electrical provisions of the Building Standards applicable in Scotland with respect to the installation of the boiler in a room containing a bath or shower.

CFL boilers must not be installed in bath, shower rooms, or rooms used as sleeping accommodation.

*RSL Models:* Where a room-sealed appliance is installed in a room containing a bath or shower, any electrical switch or appliance control, utilising mains electricity should be so situated that it cannot be touched by a person using the bath or shower.

*CFL Models:* Conventional flue boilers can be installed either in a kitchen or utility room or inside a suitably ventilated, purpose designed or modified compartment.

Where the installation of the boiler will be in an unusual position, special procedures may be necessary and BS6798 and BS5546 give detailed guidance on this aspect.

A compartment used to enclose the boiler must be designed and constructed specifically for this purpose. An existing compartment may be used provided that it is modified for the purpose. Details of essential features of compartment design including airing cupboard installations are given in BS6798 and BS5546 and should be complied with.

*RSL Models:* If the boiler is fitted under a worksurface it may be located next to or between kitchen cabinets or fittings providing that the front of the boiler case is visible and unobstructed, the special requirements for an enclosed compartment will not apply

If the boiler is to be fitted under a worksurface, the worksurface may need to be removed to install the boiler. It is advisable that the worksurface be removable to allow access for servicing if required.

If the boiler is to be fitted in a run of kitchen units it is recommended that the boiler is fitted first or the adjacent units removed.

The boiler requires the clearances shown in Fig. 2.

*Conventional Flue Models - See Page 7 & 8.*

*Balanced Flue Models - See Pages 9 & 10.*

## Conventional Flue Models

### 1.4 Air Supply

The air requirements must meet BS 5440 Part 2.

The room in which the boiler is installed must be ventilated. Ventilation of the room containing the boiler shall include air for combustion and correct operation of the flue (ie Draught Diverter dilution).

A permanent air vent shall be provided in an outside wall of the building either at high or low level in accordance with Table 1.

The opening may be:

- a) Directly into the room or space containing the boiler or indirectly via an opening of at least the same area.
- b) Via a duct either directly into the room or space or indirectly via an opening of at least the same free area.

Where air is drawn indirectly from outside through more than two air vents refer to BS 5440 Part 2.

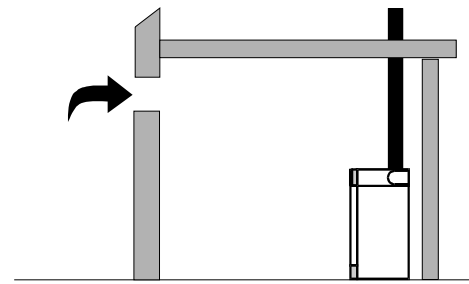
Where an extraction fan is fitted in the room containing the boiler, special ventilation requirements must be implemented. Refer to BS 5440 Part 2.

Any grille and/or duct should be so sited and of a type not to become easily blocked or flooded and should offer low resistance to airflow.

If the boiler is installed in a compartment, permanent air vents are required in the compartment, one at high level and one at low level (Table 2), either direct to the outside air or to a room.

Both high level and low level air vents must communicate with the same room or must be on the same wall to outside air.

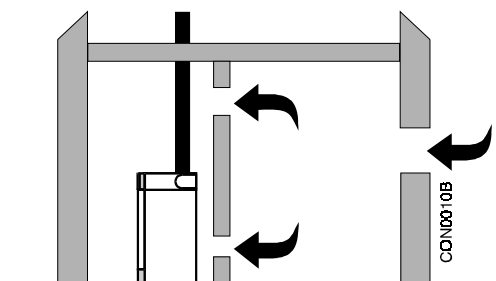
If the boiler is installed in a compartment with a door, allow at least 25 mm clearance between the front of the boiler and door for air movement. All other clearances are as Fig. 2.



**Open Flue  
Boiler In Room**

Table 1

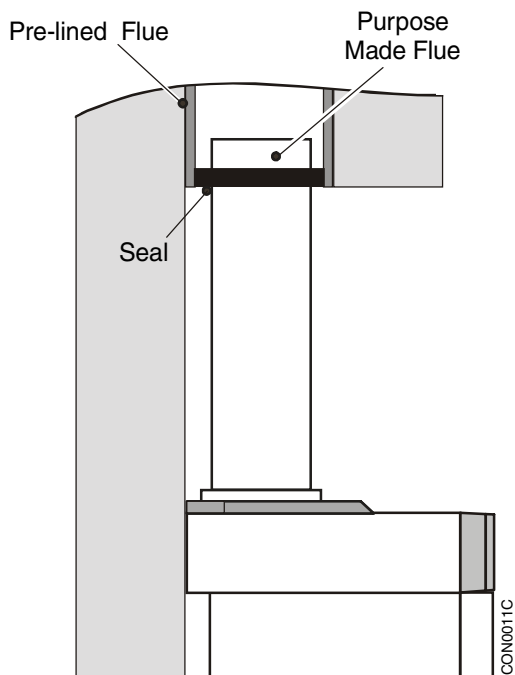
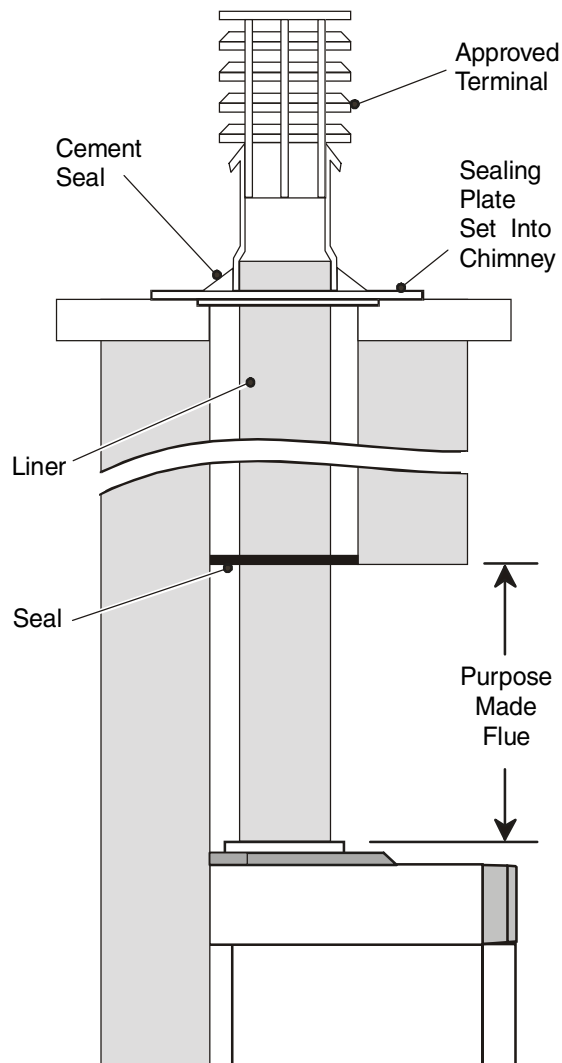
| Combustion Air   |     |
|------------------|-----|
| Free Area cm sq. |     |
| CFL40            | 35  |
| CFL50            | 51  |
| CFL60            | 68  |
| CFL70            | 84  |
| CFL80            | 101 |
| CFL90            | 117 |
| CFL100           | 134 |



**Open Flue Boiler Compartment  
Ventilated From Inside**

Table 2

| Compartment Ventilation |            |           |
|-------------------------|------------|-----------|
| Free Area cm sq.        | High Level | Low Level |
| CFL40                   | 132        | 264       |
| CFL50                   | 165        | 330       |
| CFL60                   | 198        | 396       |
| CFL70                   | 231        | 462       |
| CFL80                   | 264        | 528       |
| CFL90                   | 297        | 594       |
| CFL100                  | 331        | 662       |



## 1.5 Flue Systems

A flue system (lined throughout its length) must be provided to evacuate the flue products of combustion from the boiler. Reference should be made to the building regulations and BS 5440:1, and the flue system efficiency should be checked in accordance with BS 5440.

Ideally a flue should rise vertically and any terminal or termination point shall be positioned so that combustion products can disperse safely at all times. Therefore for practical purposes, the flue should have the shortest possible run to external atmosphere, with as near vertical rise as possible, 90° bends should be avoided. The terminal must be at least above roof level and of a type approved by British Gas.

To achieve the best performance from the boiler there should be at least 600 mm of vertical flue from the boiler flue socket. If this is not achievable, a 125 mm flue size should be used irrespective of the boiler size.

Horizontal runs should be avoided, however if a near horizontal flue run is unavoidable, the total vertical height necessary should be calculated in accordance with BS 5440:1.

If an existing chimney is used, ensure that it is thoroughly swept before lining or connecting the boiler. The liner must have an internal diameter of 100mm for the 40 to 60 models and 125mm for the 70 to 100 models.

Care should be taken to avoid condensation in the flue.

In the case of a pre-lined chimney, it must be connected to the socket of the boiler flue hood with a length of purpose made flue.

Where flue size is to be determined by calculation, the following information should be used

| Model Size | Mass Rate of Combustion Products (g/sec) | Average Temp. (°C) |
|------------|--|--------------------|
| 40         | 10.19                                    | 108                |
| 50         | 11.30                                    | 117                |
| 60         | 13.58                                    | 130                |
| 70         | 14.88                                    | 135                |
| 80         | 15.90                                    | 144                |
| 90         | 16.55                                    | 156                |
| 100        | 17.59                                    | 165                |

Next Section is 1.6 The System.

Fig. 4



## Balanced Flue Models

### 1.4 Air Supply

The air requirements must meet BS 5440 Part 2.

The room in which the boiler is installed does not require a purpose provided air vent.

If the boiler is installed in a compartment, permanent air vents are required in the compartment, one at high level and one at low level, either direct to the outside air or to a room. Both high level and low level air vents must communicate with the same room or must be on the same wall to outside air. Both the high level and low level vent must each have a combined free area in accordance with Table 3.

If the boiler is installed in a compartment with a door, allow at least 25mm clearance between the front of the boiler and the door for air movement.

### 1.5 Flue Systems & Terminal Location

*Horizontal - Concentric (Left, Right or Rear).*

The flue/terminal assembly supplied is suitable for a wall thickness of between 150mm and 400mm.

A flue/terminal assembly suitable for a wall thickness of up to 600mm is also available.

Both the flue/terminal assemblies are telescopic and the minimum lengths (150 mm/6 in) are achieved by cutting.

A 1m flue extension is available. Under no circumstances should the total flue length exceed:-

- 3.4m 40 to 70 models
- 2.4m 80 model
- 1.4m 90 model
- 1.0m 100 model

*Vertical - Concentric.*

- 3.4m 40 - 70 models Only

Where bends may be being used, the total flue length will be reduced, see Pages 17 & 18 for more details.

See separate Installation Instructions supplied with the flue.

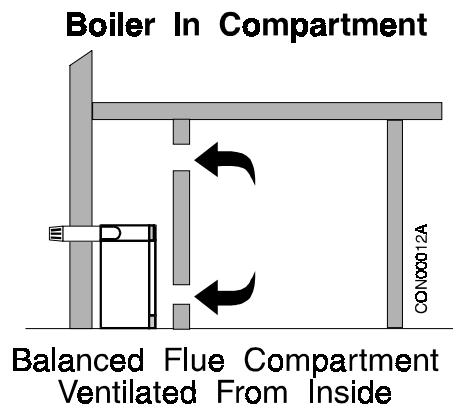
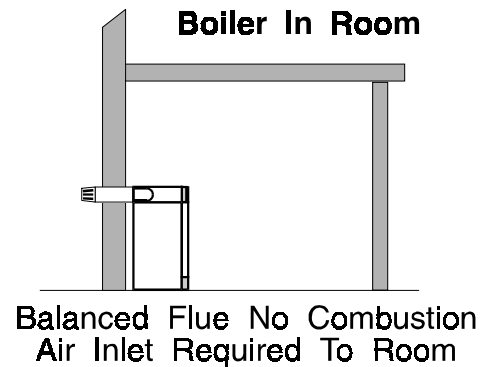


Table 3

| Compartment Ventilation |            |           |
|-------------------------|------------|-----------|
| Free Area cm sq.        | High Level | Low Level |
| RSL40                   | 132        | 132       |
| RSL50                   | 165        | 165       |
| RSL60                   | 198        | 198       |
| RSL70                   | 231        | 231       |
| RSL80                   | 264        | 264       |
| RSL90                   | 297        | 297       |
| RSL100                  | 331        | 331       |

**Note:** If ventilating directly to outside, the figures shown in Table 3 can be halved.

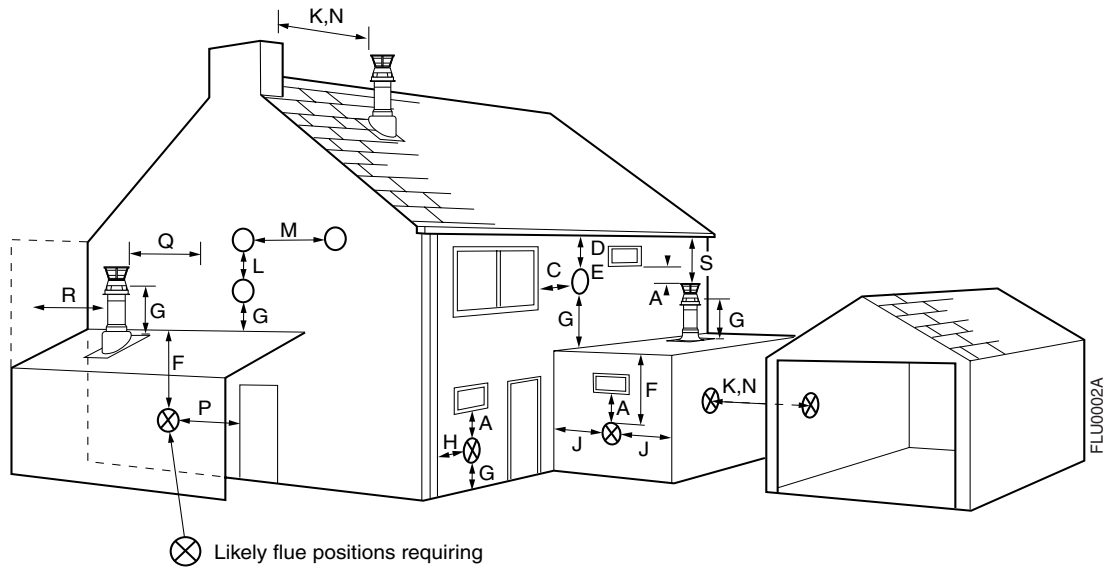


Fig. 6

- Where a horizontal flue is sited less than 2m above a balcony, above ground, or above a flat roof to which people have access, a suitable terminal guard must be fitted. This serves two purposes, to protect the terminal against damage or interference and to protect passers-by. A terminal guard is available (Sales Code: PTERMGUARDEF), this should be fitted centrally about the terminal.

**Note:** Where a flue terminal is installed less than 1 metre from a plastic, or painted gutter, or 500 mm from painted eaves, an aluminium shield 1 metre long, should be fitted to the underside of the gutter or painted surface. A suitable wall plate should be fitted to the painted wall surface of a mobile home.

- IMPORTANT:** It is absolutely ESSENTIAL, to ensure that products of combustion discharging from the terminal cannot re-enter the building, or any other adjacent building, through ventilators, windows, doors, natural air infiltration, or forced ventilation/air conditioning. If products of combustion are found to be re-entering any building, the appliance **MUST** be turned OFF IMMEDIATELY.

#### Terminal Position with Minimum Distance (mm)

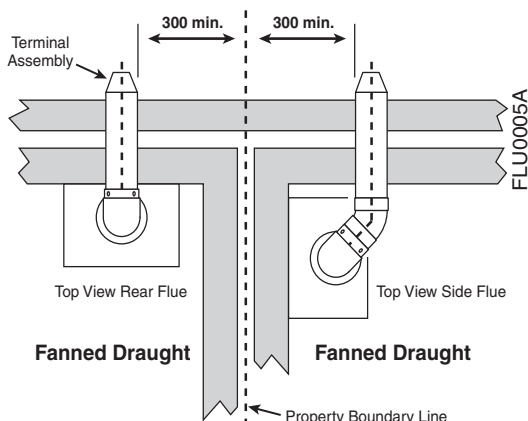
##### Fanned Draught Balanced Flue

|   |   |      |
|---|---|------|
| A | Directly below an opening, air brick, opening window etc                          | 300  |
| B | Above an opening, air brick, opening window, etc                                  | 300  |
| C | Horizontally to an opening, air brick, opening window etc                         | 300  |
| D | Below a gutter, or sanitary pipework  | 75   |
| E | Below the eaves   | 200  |
| F | Below a balcony or carport roof   | 200  |
| G | Above ground, roof or balcony level   | 300  |
| H | From vertical drain/soil pipe work  | 150  |
| J | From an internal or external corner   | 300  |
| K | From a surface facing a terminal  | 600  |
| L | Vertically from a terminal on the same wall                                       | 1500 |
| M | Horizontally from a terminal on the same wall                                     | 300  |
| N | From a terminal facing the terminal   | 1200 |
| P | From an opening in a <i>carport</i> (e.g. door, windows) into the <i>building</i> | 1200 |
| Q | From adjacent wall to flue (vertical only)  | 210  |
| R | From internal corner to flue (vertical only)                                      | 230  |
| S | Below eaves or balcony (vertical only)  | 600  |

#### Reduced Clearances

This range of boilers has been tested and approved for use with certain clearances less than those shown above.

Only one of these reductions may be used on a single installation.



|   | RSL40-70 | RSL80-100 |
|---|----------|-----------|
| D | 25       | 25        |
| E | 25       | 25        |
| F | 25       | 25        |
| H | 25       | ---       |
| J | 25       | ---       |

**Note:** The distance from a fanned draught appliance terminal installed parallel to a boundary may not be less than 300 mm in accordance with the diagram on the left.

## 1.6 The System

If plastic pipe is used for the central heating circuit there must be a run of at least 1m of uninsulated copper pipe from the boiler flow and return connections.

The boiler must be used on INDIRECT hot water systems only. It is suitable for use on open vented gravity domestic hot water/pumped central heating systems or, fully pumped systems which may be sealed or open vented.

Existing systems should be thoroughly cleansed prior to boiler installation.

The system should be designed so that the maximum static head does not exceed 30.5m and there is a minimum on fully pumped systems of 300 mm. See Fig. 8.

Gravity domestic hot water circuits should have a minimum circulating head of 1.2 m. See Fig. 7. Horizontal pipe runs should be kept to a minimum. To prevent reverse circulation in the gravity circuit when the pump is running an injector tee is incorporated.

The pump should preferably be fitted in the flow, though installation in the return is acceptable providing care is taken to ensure air is not drawn into the system due to the negative pressure effects of the pump. Isolating valves must be fitted as close as possible to allow replacement without system draining.

Drain off taps should be fitted in the pipework close to the boiler and in the low points of the system. A drain point is also provided on the heat exchanger should the boiler need draining - see Fig. 22.

### Combined Gravity Hot Water Pumped Central Heating Systems.

It is recommended that a cylinder thermostat and zone valve are used to control the temperature of the hot water and that a by-pass be installed in the gravity circuit. A suggested method of doing this is shown in Fig. 7. where the bathroom radiator is connected into the gravity circuit and is fitted with two lockshield valves. Mechanically operated thermostatic domestic hot water temperature control valves which allow the boiler to operate when the valve is closed or partially closed **MUST NOT BE FITTED UNLESS** a bypass radiator is fitted. **Note:** The boiler has one flow and two return connections. On combined gravity DHW/Pumped central heating a Tee will be needed in the flow which must be fitted directly to the connecting pipe provided.

### Fully Pumped Systems

The pump must be wired directly to the terminal block (See Fig. 20) as it will allow the pump to be controlled by the over-run device. This will ensure that the pump will continue to run after boiler shut down thus preventing nuisance operation of the overheat thermostat.

If a three port diverter valve is used as shown in Figs.8 & 9, a by-pass is not necessary since one circuit is always open. Where a pair of two port valves are used, a by-pass is necessary. It should be fitted with a lockshield valve and be adjusted to maintain a minimum flow through the boiler of 4.5 litres/min (1 gal/min) see Figs. 8 & 9.

Systems fitted with controls which allow the boiler to operate when both the hot water and central heating circuits are closed i.e. mechanically operated thermostatic control valves, must be fitted with a by-pass circuit capable of:-

1. Dissipating a minimum of 1kW (3,400 Btu/h)
2. Maintaining a minimum water flow through the boiler of 9 litres/min (2 gal/min).

A suggested method of meeting these requirements by using a bathroom radiator fitted with two lockshield valves is shown in Figs. 8 & 9.

Diagrammatic layouts of a fully pumped system and a combined pumped central heating/gravity hot water system are shown in Figs. 7 & 8.

### Sealed Systems (Fully Pumped)

#### Installation

The installation must comply with the requirements of BS 6798: 1987 and BS 5449: Pt 1. The British Gas publication "British Gas Specification for Domestic Wet Central Heating Systems" should also be consulted.

#### Safety Valve

A non-adjustable spring-loaded safety valve, preset to operate at 3 bar (45lbf/in<sup>2</sup>) shall be used. It must comply with BS 6759: Pt 1. and include a manual testing device. It shall be positioned in the flow pipe either horizontally or vertically upwards and close to the boiler. No shut-off valves are to be placed between the boiler and the safety valve. The valve should be installed into a discharge pipe which permits the safe discharge of steam and hot water such that no hazard to persons or damage to electrical components is caused.

#### Pressure Gauge

A pressure gauge incorporating a fill pressure indicator, covering the range 0 - 4 bar (60 lbf/in<sup>2</sup>) shall be fitted to the system. It should be connected to the system, preferably at the same point as the expansion vessel. Its location should be visible from the filling point.

#### Expansion Vessel

A diaphragm type expansion vessel to BS 4814: Pt 1. shall be fitted close to the inlet side of the pump. The connecting pipework should not be less than 15mm. Pipework connecting the expansion vessel should not incorporate valves of any sort. Methods of supporting the vessel are supplied by the vessel manufacturer. The nitrogen or air charge pressure of the expansion vessel shall not be less than the hydrostatic head, (height of the top point of the system above the expansion vessel).

To size the expansion vessel it is first necessary to calculate the volume of water in the system in litres. The following volumes may be used as a conservative guide to calculating the system volume.

|                               |                                  |
|-------------------------------|----------------------------------|
| Boiler Heat Exchanger:        | 6.5 litres                       |
| Small Bore Pipework:          | 1 litre per kW of system output  |
| Micro Bore Pipework:          | 7 litres                         |
| Steel Panel Radiators:        | 8 litres per kW of system output |
| Low Water Capacity Radiators: | 2 litres per kW of system output |
| Hot Water Cylinder:           | 2 litres                         |

If the system is extended, the expansion vessel volume may have to be increased unless provision has been made for extension. Where a vessel of the calculated size is not available, the next available larger size should be used. The boiler flow temperature is controlled at approximately 82°C.

The vessel size can now be determined from the information in Table 4 where V = System volume in litres.

|                                  |          |           |
|----------------------------------|----------|-----------|
| Vessel Charge Pressure (bar)     | 0.5      | 1.0       |
| Initial System Pressure (bar)    | 1.0      | 1.0       |
| Expansion Vessel Volume (litres) | V x 0.11 | V x 0.087 |

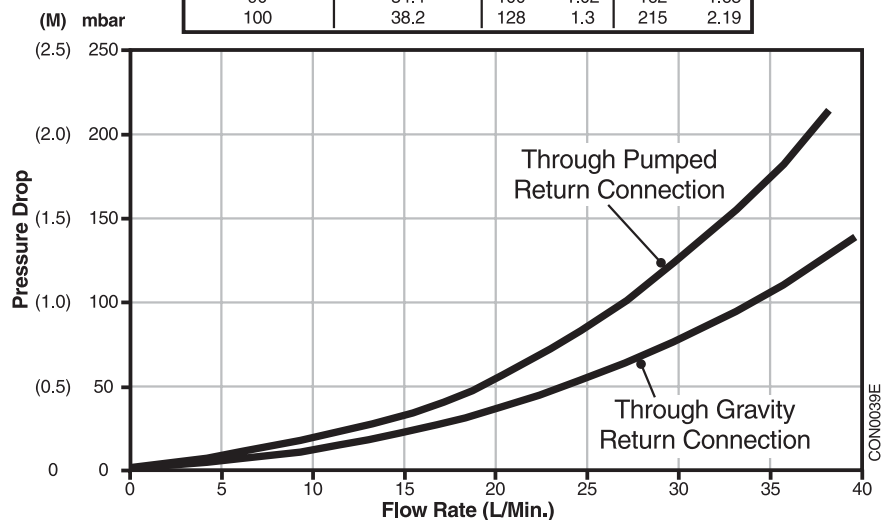
Table 4.

### Circulation Pump Selection

The resistance through the heat exchanger when operating with a water flow rate producing an 11°C temperature rise at maximum boiler output are shown in Table 5. If other controls such as 3 position valves are used in the system, the resistance through them, quoted in their manufacturers literature must be taken into account. The pump may be fitted on either flow or return. It must be fitted with two isolating valves which are positioned as close to the pump as possible. Closing of any valve must always leave the open vent unobstructed. On fully pumped systems either return connection may be used.

### Hydraulic Resistance Through Kingfisher Mf Range

| Appliance Output<br>BTU | Water Flow Rate<br>L/Min. | Gravity Return |      | Pumped Return |      |
|-------------------------|---------------------------|----------------|------|---------------|------|
|                         |                           | mbar           | m    | mbar          | m    |
| 40                      | 15.2                      | 20             | 0.2  | 30            | 0.31 |
| 50                      | 19.1                      | 32             | 0.33 | 50            | 0.51 |
| 60                      | 23                        | 48             | 0.49 | 73            | 0.74 |
| 70                      | 26.8                      | 63             | 0.64 | 98            | 1.00 |
| 80                      | 30.5                      | 80             | 0.82 | 132           | 1.35 |
| 90                      | 34.4                      | 100            | 1.02 | 162           | 1.65 |
| 100                     | 38.2                      | 128            | 1.3  | 215           | 2.19 |



### Cylinder

The hot water cylinder must be an indirect coil type or a direct cylinder fitted with an immersion calorifier suitable for operating at a gauge pressure of 0.3 bar (5 lbf/in<sup>2</sup>) in excess of safety valve setting. Single feed indirect cylinders are not suitable for sealed systems.

### Method of Make-up

Provision shall be made for replacing water loss from the system either:-

- i) from a make-up vessel or tank mounted in a position higher than the top point of the system, and connected through a non-return valve to the system on the return side of the hot water cylinder or the return side of all heat emitters.
- or
- ii) where access to a make-up vessel would be difficult by using the mains top up method or a remote automatic pressurisation and make-up unit as shown in Fig. 10.

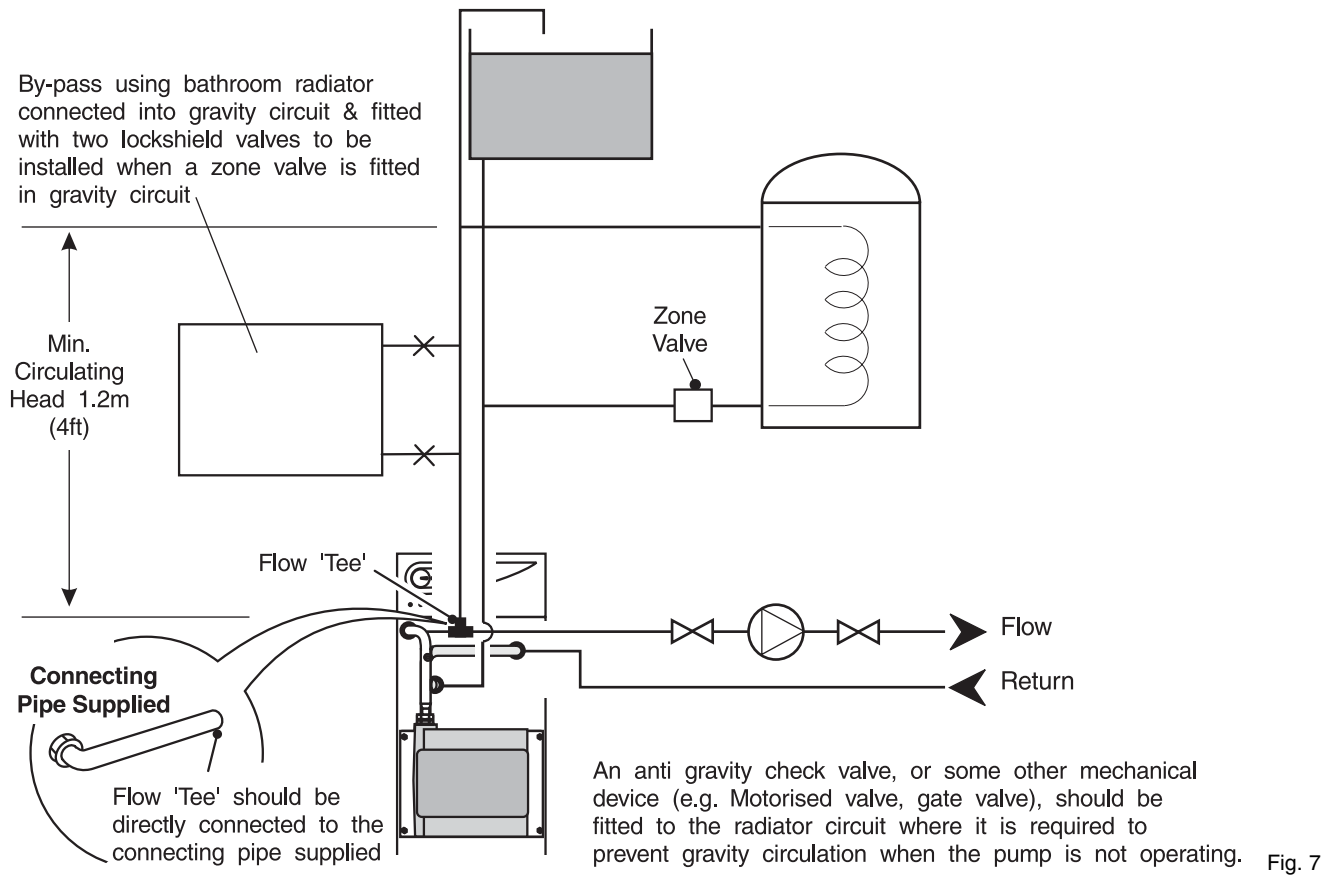
### Mains Connection

There shall be no connection to the mains water supply or to the water storage tank which supplies domestic hot water even through a non-return valve, without the approval of the Local Water Authority.

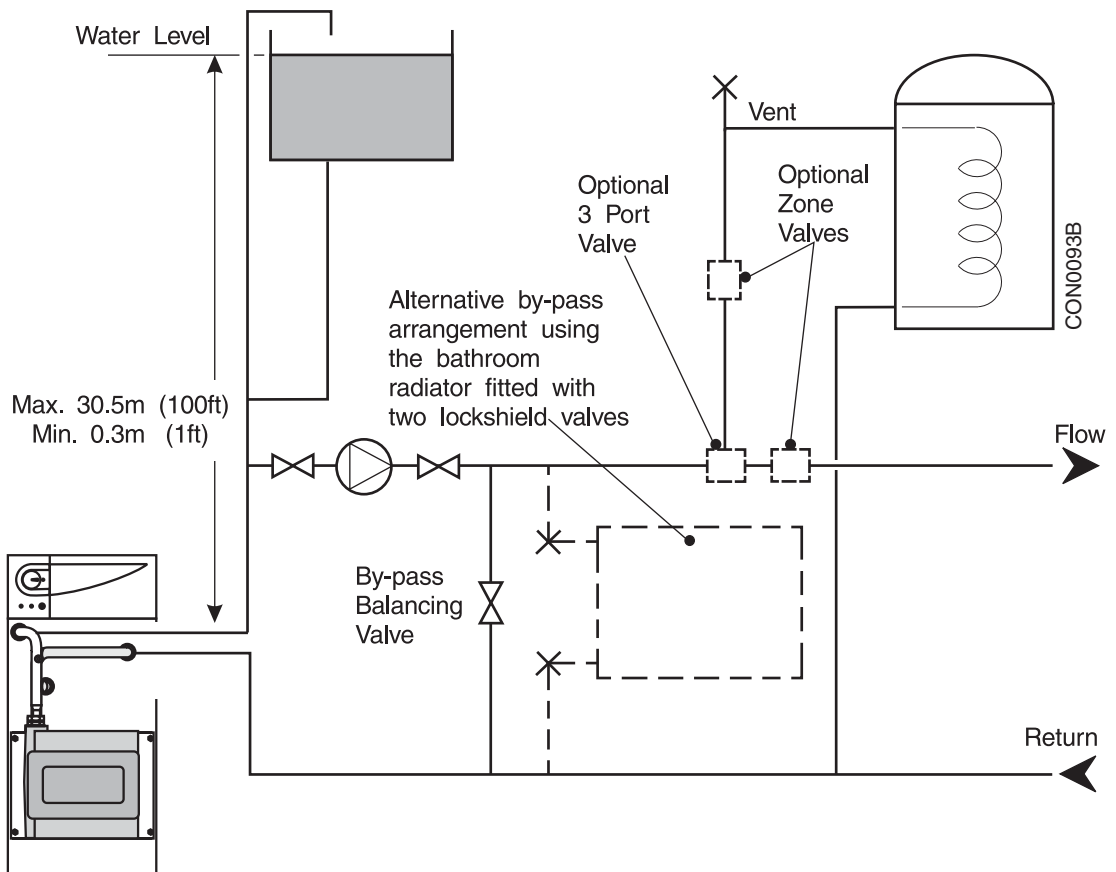
### Filling Point

The system shall be fitted with a filling point at low level which incorporates a stop valve to BS 1010 and a double check valve of an accepted type to be fitted in this order from the system mains, see Fig. 10.

## Recommended Layout - Open Vented Gravity Domestic Hot Water & Pumped Central Heating System



## Recommended Layout - Open Vented Fully Pumped System fitted with a Combined Feed & Vent



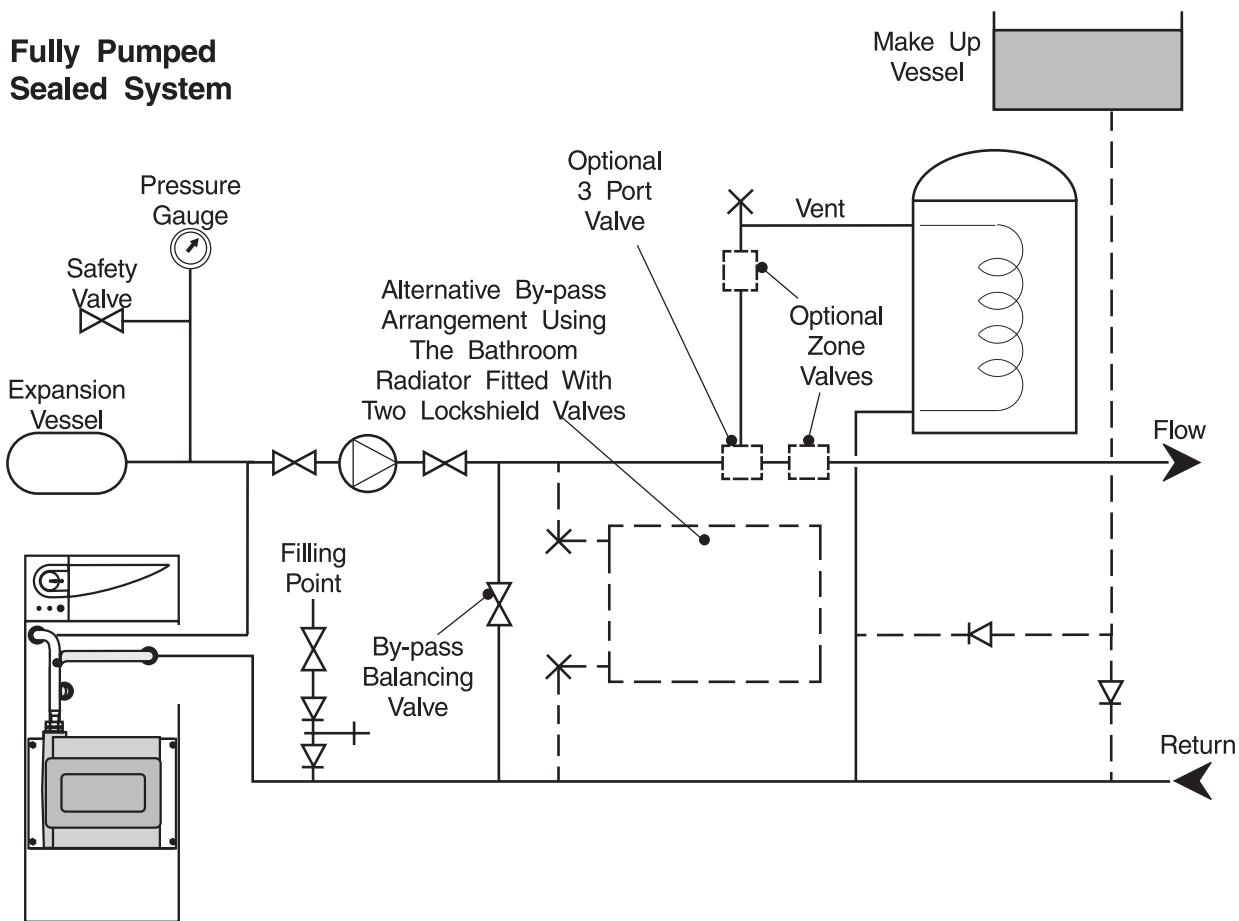
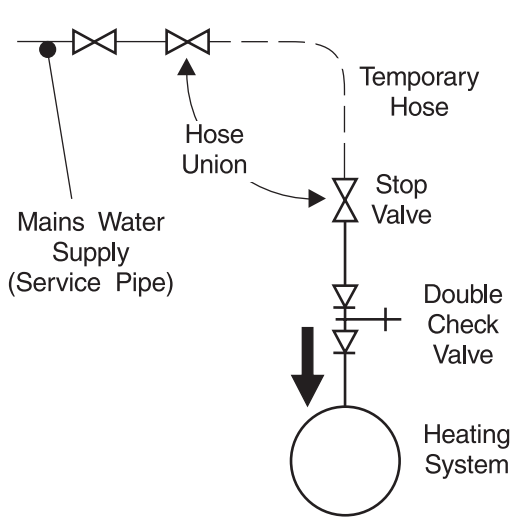


Fig. 9

### Filling A Sealed Water System (Method 1)

#### Mains Topping-Up Method

Note: This Method Of Filling A Sealed System May Only Be Used If Acceptable To local Water Undertaking



### Filling A Sealed Water System (Method 2)

#### Cistern Filling Method

Note: Cistern To Be Supplied Through A Temporary Connection From A Service Pipe Or Cold Water Distributing Pipe

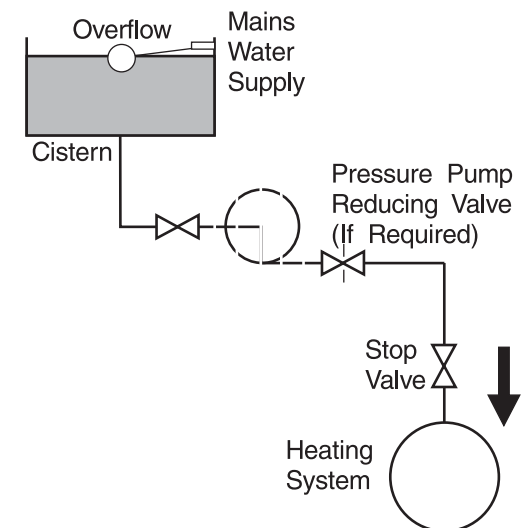


Fig.10



## 2. Installation

### 2.1 Install the boiler

These instructions assume you have decided on where the boiler will be located and the type of flue system to be used.

1. Carefully unpack the boiler. Remove and place aside the tailpipe/gravity stat kit and on CFL boilers, the ancillary bag containing the top and rear blanking plates with seal and control panel.
2. Do not discard any packaging until all the items are accounted for.
3. Temporarily position the boiler to ensure where required, the top cover touches the wall. This sets the minimum rear clearance for the pipework. Mark the position on the floor.
4. Remove the plinth - 2 screws.
5. Remove the front door - 2 screws, unhook and lift off.
6. Remove the controls panel - open flap, remove screw, unhook, disconnect the in-line connector and lift away.
7. Remove the top cover - 2 screws, pull forward and lift off.

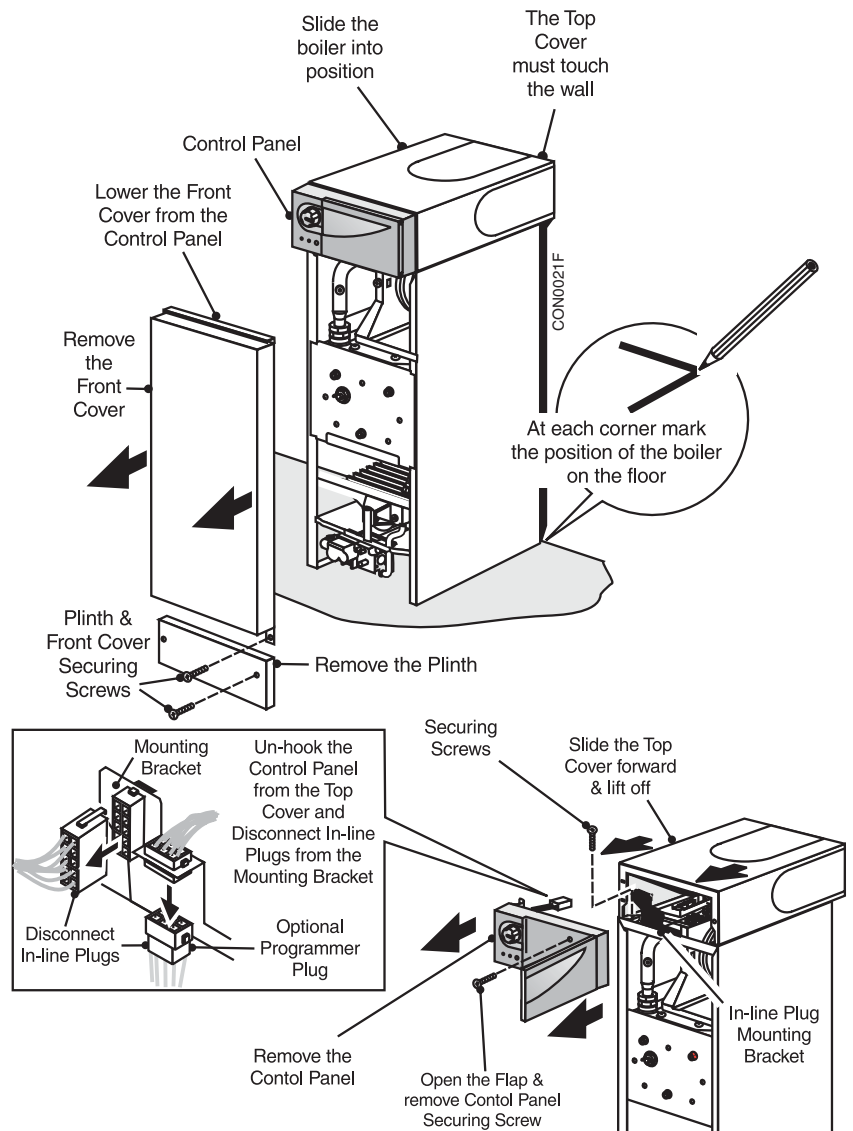


Fig. 11

### 2.2 Install the flue

Install the flue type as required.

#### Conventional Flue:

1. Loosen the 4 screws securing the flue spigot to the boiler, line the spigot up with the flue and fully tighten the screws.

**Note:** From its fully rearward position the spigot will move forward 50mm.

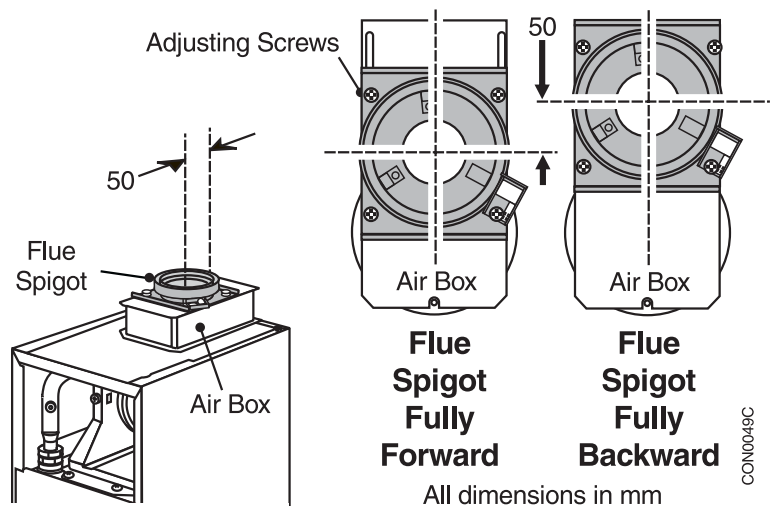


Fig. 12

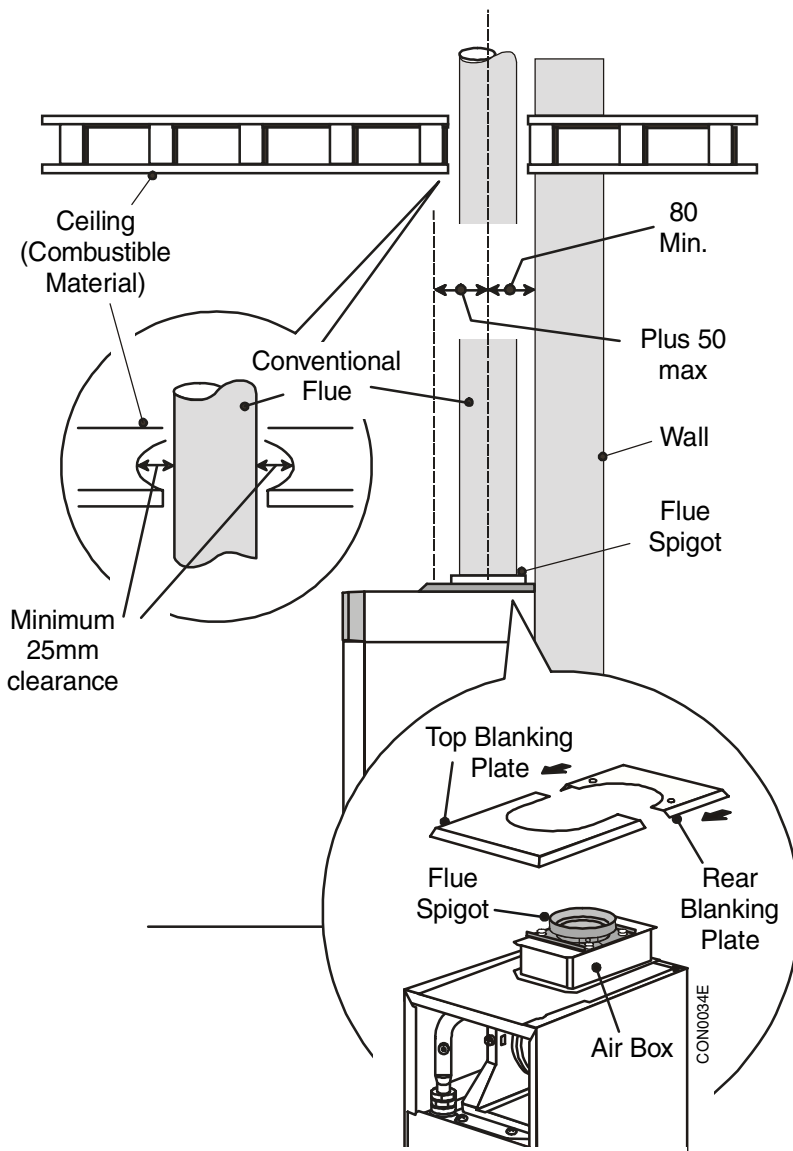


Fig. 13

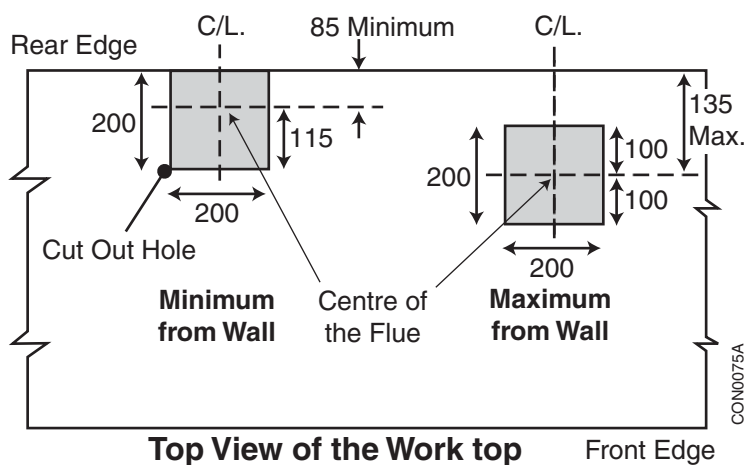


Fig. 14

2. Attach the flue to the flue spigot.

This product is fitted with a combustion products discharge safety device (TTB) which must not be taken out of operation at any time. The component is fitted to ensure that any blockage or partial blockage of the flue does not result in combustion products discharging into the room.

### Fitting under a Worktop (CFL Models)

1. Remove the top blanking plate from the boiler (if already assembled).
2. See Section 4.9 on page 28 of the Installation & Service Instructions, remove the products discharge safety device (TTB) and carefully place on top of the appliance.
3. Remove the flue spigot from the appliance by removing the 4 adjusting screws.
4. Mark the centre of the flue on the work top and cut a 200 mm square hole from this centre point. The centre point should be a minimum of 85 mm from the wall and a maximum of 135 mm from the wall being dependent on the boiler position.
5. Place boiler in position under the work top.
6. Re-fit the flue spigot as shown in Fig. 13.
7. Refit the products discharge safety device (TTB) back onto the flue spigot and secure with the screw.
8. It is a requirement that after disturbing the products discharge safety device, a full operational check should be made to ensure correct operation i.e. with the boiler fully operating, temporarily block the flue. The safety discharge device should operate and the boiler go to lockout in less than 2 minutes.
9. Unblock the flue after the test.



## Fitting the Blanking Plate

1. If the flue is not fitted in the fully forward position, the rear blanking plate will need to be cut to size, cut trim to length as required. See Fig. 15.
  - If fitting under a worktop then drill 2 pilot holes through the holes in the rear blanking plate and into the worktop. Secure the plate using 2 woodscrews (not supplied).
2. Locate the top blanking plate as shown in Fig. 15.

### Balanced Flue:

1. Mark the flue outlet hole position on the wall as illustrated.

**Note:** Ensure that the correct allowance is made for side outlet when the boiler is not being pushed fully back.

2. Carefully cut hole through wall.

Maximum flue lengths are as follows:

|                |       |
|----------------|-------|
| 40 - 70 models | 3.4 m |
| 80 model       | 2.4 m |
| 90 model       | 1.4 m |
| 100 model      | 1.0 m |

These are for rear or side flue applications see Page 17 Fig. 16.

3. Determine dimension X +20 mm See Fig.13.
4. Extend telescopic flue to the required length, minimum 20 mm overlap.
5. Drill through the pilot hole and secure with a self tapping screw.
6. Wrap tape around the joint on the outer duct to seal the flue, slide drip ring into position to coincide with the air gap in the wall cavity.
7. Slide the flue through the hole until it stops on the pin.
8. The boiler is supplied with the flue elbow set for the rear. For side outlet slacken the screws, turn the elbow as required and retighten screws.

**Note:** Ensure that the seals are still correctly located.

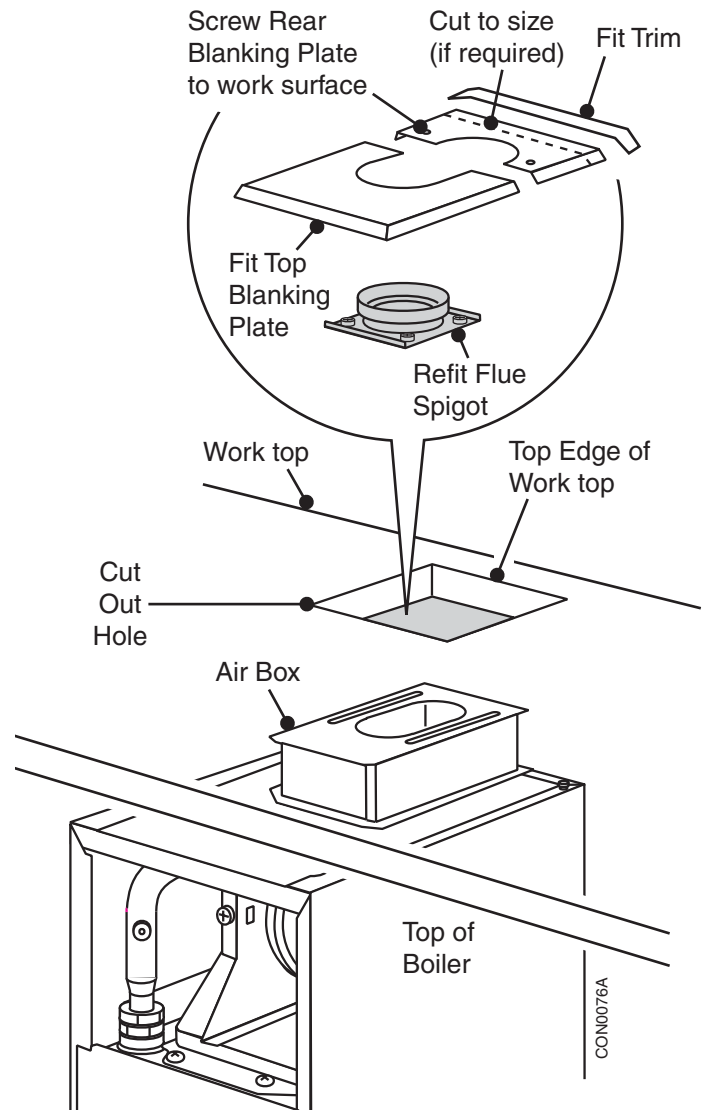


Fig. 15

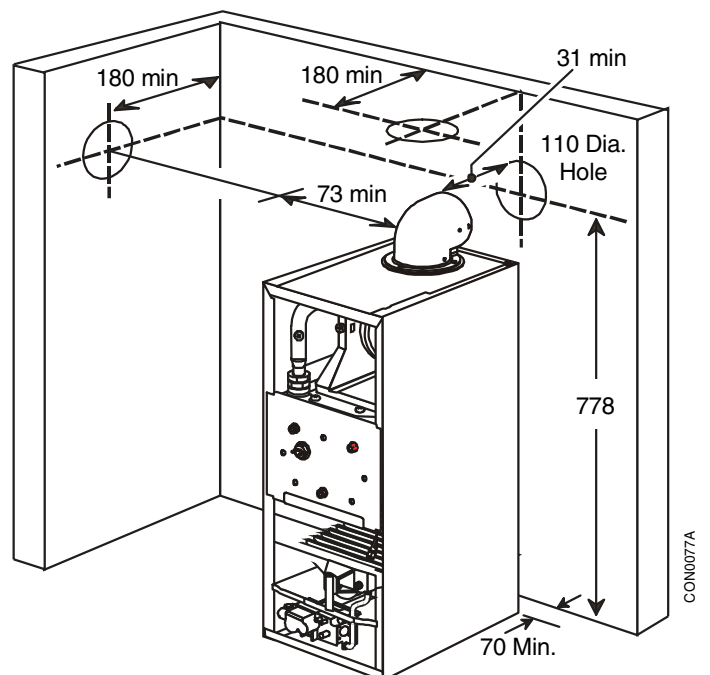


Fig. 16

9. Slide the flue back until it engages in the elbow bayonet connection, twist clockwise to lock.

10. Drill through pilot hole and lock flue in position using the self tapping screw provided.

11. Make good the wall around the flue, both inside and outside.

For optional extras refer to Page 38 & 39. If a Horizontal Extension is required this MUST be combined with a Standard Flue as shown in the Maximum Flue Length Guide.

If an in-line bend is required in the flue the following rules apply:-

A 90° in-line bend is equivalent to a 1m length of flue.

A 135° in-line bend is equivalent to a ½m length of flue.

The maximum equivalent flue resistance allowed when using bends is:-

40 - 70 models = 3.4 m.

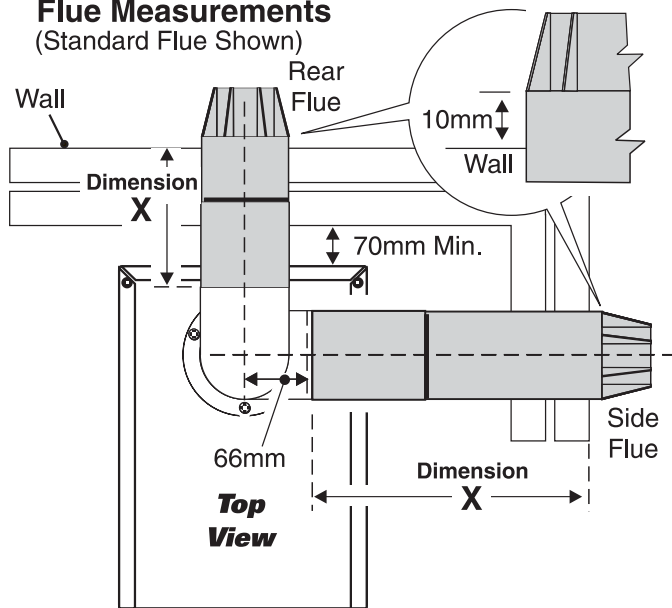
80 model = 2.4 m.

90 - 100 models - No bends allowed.

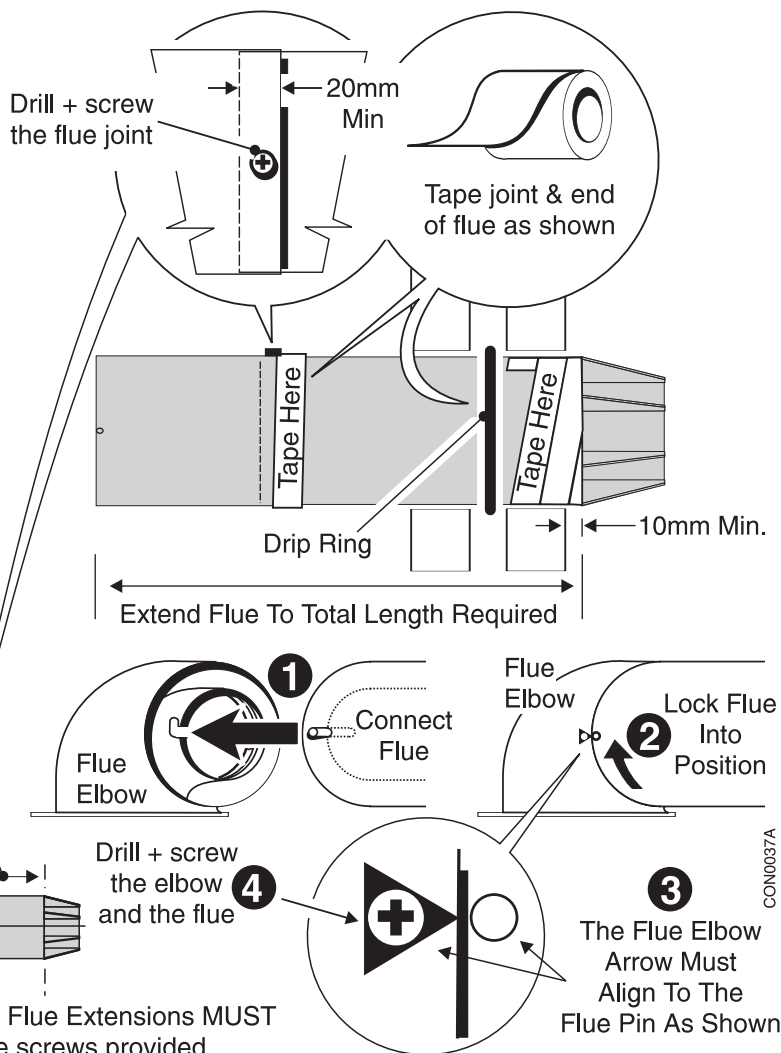
**Note:** For flue lengths less than the minimum telescopic length, the tubes can be cut to suit. Ensure that the same length is removed from the inner and outer tubes to maintain a minimum 20 mm overlap.

For further information see publication 'Combination Flues'.

**Flue Measurements**  
(Standard Flue Shown)



Flue Length = Dimension X + 20mm



**Maximum Flue Length Guide:**

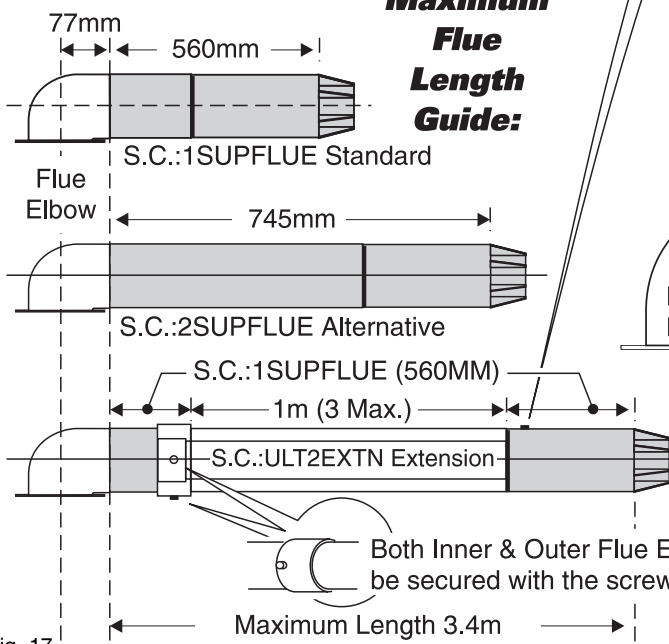


Fig. 17

## 2.3 Connect the Gas Supply

1. Ensure that the gas supply is isolated.
2. Disconnect the gas cock from the gas valve.
3. Connect the gas supply to the gas cock using a suitable adaptor.

**Important:**  
Do not solder the fitting whilst assembled to the gas cock.

The pipe diameter required will depend on the boiler model and the pipe length from the gas meter. Ensure that the gas supply pipe is selected in accordance with BS 6891 so that an adequate gas supply to the boiler is provided.

4. Connect the gas cock to the gas valve.

**Do not turn the gas supply on at this stage.**

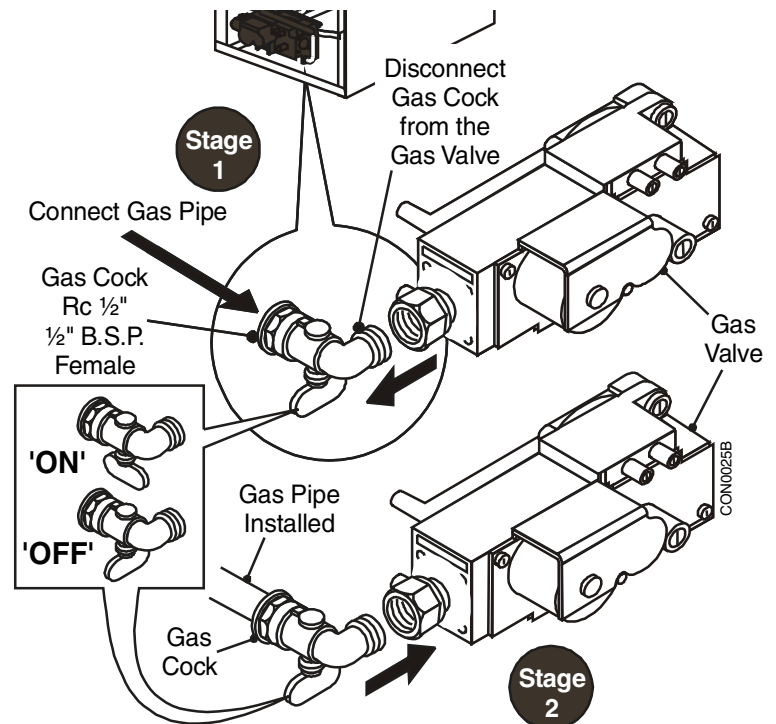


Fig. 18

## 2.4 Connect the Water System

When attaching the standard pipe connecting kit to the boiler please note that the seal is made by use of an 'O' ring, therefore some pipe movement will be evident even though a water tight seal has been achieved. Excessive force is not necessary and could result in damage to the appliance.

1. Connect system pipework to the boiler, compression fittings should be used. Arrange pipework to ensure correct venting of pipes and boiler. On gravity systems a tee is required in the flow which must be fitted directly to the connecting pipe supplied. **Note:** Drain off taps should be installed at the lowest points in the system.
2. If on a Gravity DHW system position the overheat thermostat as shown.
3. To do this - unscrew the overheat thermostat from the flow pipe and re-attach as shown using the bracket and screw found in the tail pipe/gravity stat kit.

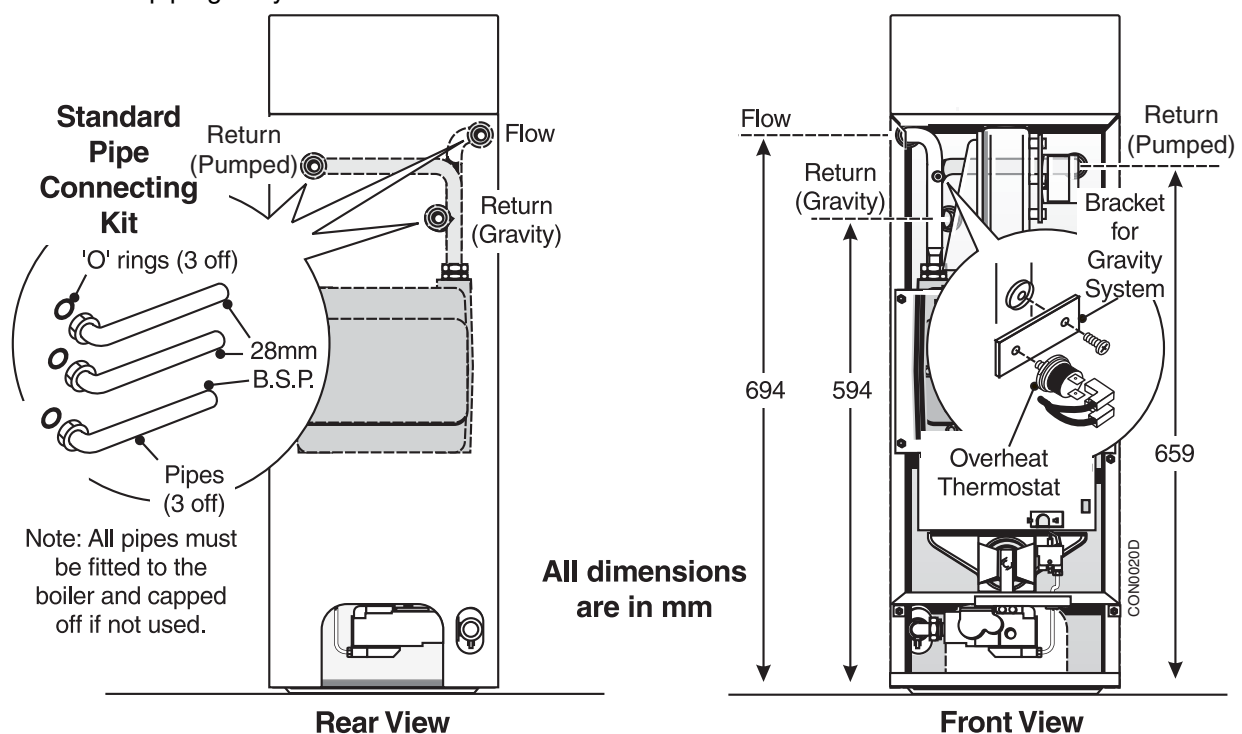


Fig. 19

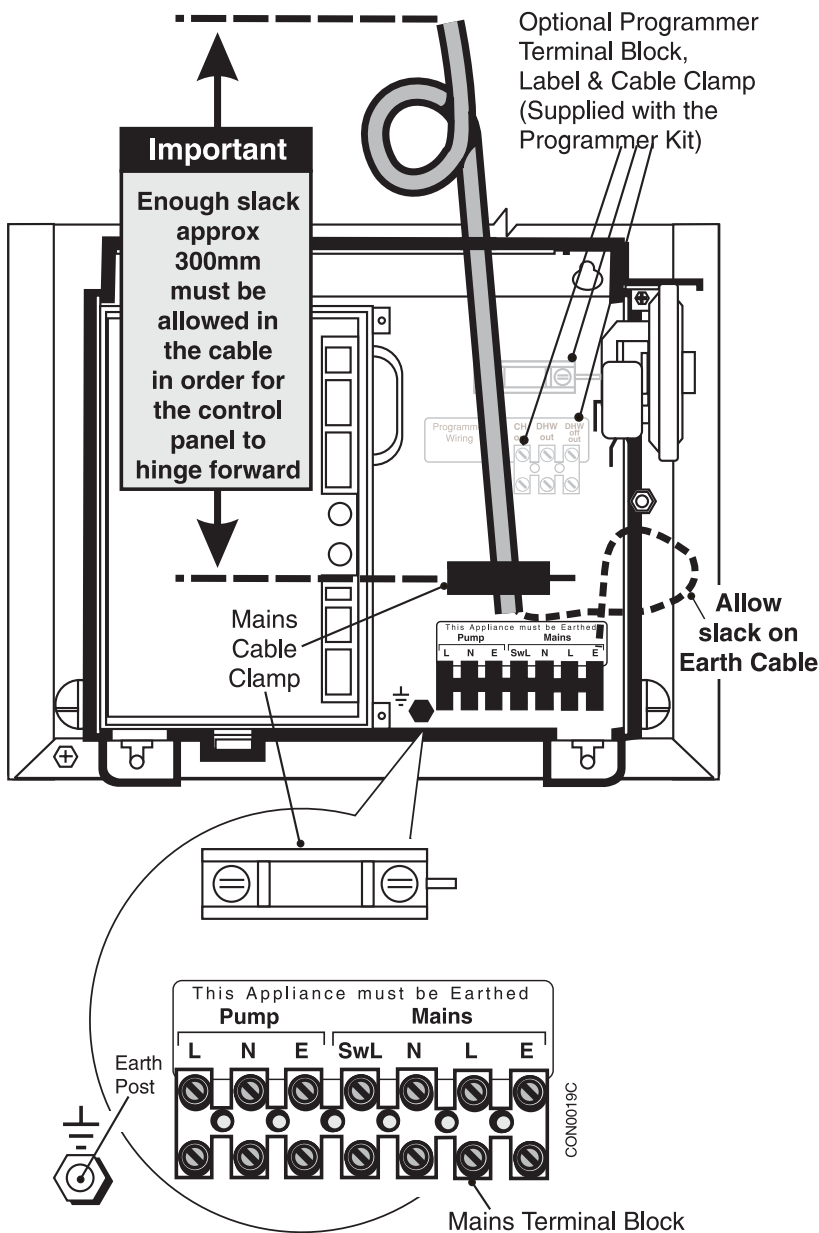


Fig. 20

## 2.5 Connect the Power Supply Cable

1. Cable clamping is provided on the front of the controls panel. Feed the cables up and over the back of the chassis, through the clamp and into the terminal connection.

**Note:** When connecting the power supply cable, ensure that the length of the earth wire is such, that if the power supply cable pulls out of the cable clamp the live and neutral wires become taut before the earth wire.

If fitting the optional integral programmer, refer to the instructions supplied with it for wiring details.

For Gravity DHW/Pumped CH Systems, the pump should be wired externally.

For Fully Pumped Systems, connect pump to Pump 'L, N, E' on the terminal block.

2. Where no integral programmer is fitted, connect the wires as follows;

### Gravity DHW/Pumped CH Systems

- a. Fit a link between terminals MAINS 'SwL' and MAINS 'L'.
- b. Switched live from external gravity DHW control circuit to MAINS 'SwL'.
- c. Neutral to MAINS 'N'.
- d. Earth to MAINS 'E'.
- e. The pump should be wired externally.

### Fully Pumped Systems

- a. Permanent live to terminal MAINS 'L'
- b. Switched live from external controls to MAINS 'SwL'.
- c. Neutral to MAINS 'N'.
- d. Earth to MAINS 'E'.
- e. Pump to PUMP 'L, N, E'.

### Open Vented Fully Pumped Systems

The boiler is fitted as standard with an overheat thermostat and pump overrun device which requires a permanent live to the boiler. This is the recommended installation method (see above).

However, in replacement situations where a permanent live is not available, it is possible to wire the boiler with 3 core cable as follows, providing the system has a separate cold

feed and vent pipes (close coupling is acceptable) see BS 5449 for further details.

- a. Re-position the overheat thermostat to Gravity DHW position as explained under 2.4, page 19.
  - b. Switched live from external control circuit to MAINS 'SwL'.
  - c. Fit a link between terminals MAINS 'SwL' and MAINS 'L'
  - d. Neutral to MAINS 'N'.
  - e. Earth to MAINS 'E'.
  - f. The pump should be wired externally.
3. Take up excess slack in the cables between the terminal block and the cable clamp, then tighten the cable clamp screws. Ensure sufficient slack is available to the cable clamps to allow the control panel to hinge freely. Check by opening the control panel.

If fitting the optional integral programmer go to section 2.6 before performing steps 4 and 5 below.

4. Secure the controls assembly to the chassis using the screw previously removed.
5. Carry out preliminary electrical system checks i.e. Earth Continuity, Short Circuit, Polarity and Resistance to Earth.

#### **Frost Thermostat:**

If a Frost Thermostat is to be fitted, the connections should be made in the wiring external to the boiler. Refer to the wiring instructions with the thermostat.

**Do not switch on the electricity supply at this stage.**

## **2.6 Install the Optional Programmer**

1. If fitting the optional integral programmer, refer to the instructions supplied with it for installation and wiring details.

# 3. Commissioning

**Important**  
 State of adjustment - Check that the state of adjustment given on the data plate is compatible with local supply conditions.

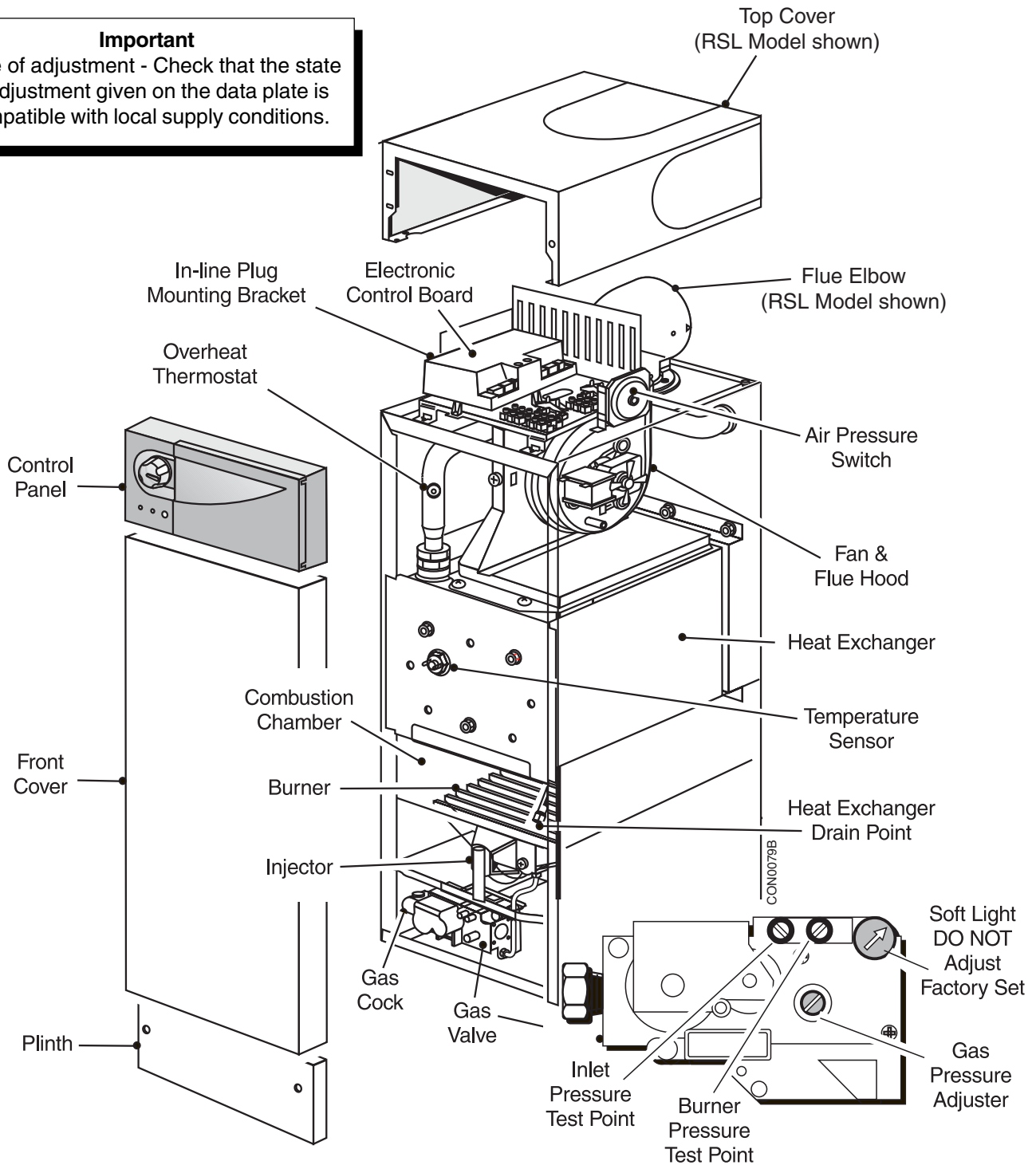


Fig. 22

**Important**  
 The commissioning and boiler adjustment must only be carried out by a suitably qualified person. Potterton offer this service on a chargeable basis.

**Important**  
 When checking for gas soundness open all windows and doors in the room. Extinguish all naked lights, cigarettes, pipes, etc.



## 3.1 Commission the Boiler (tick box when done)

**Open Vented Systems** - Remove the pump and flush the system thoroughly with cold water. Re-fit the pump. Fill and vent the system then check for leaks.



**Sealed Systems** - The system can be filled using a sealed system filler pump with a break tank or by any other method approved by the Local Water Authority. Refer to Section 1.6, 'The System' on Page 11 of these instructions.

Remove the pump and flush the system thoroughly with cold water. Re-fit the pump. Fill and vent the system until the pressure gauge registers 1.5 bar (21.5 lbf/in<sup>2</sup>) and check for leaks.



**IMPORTANT:** A pressure relief valve should not be used as the method to attain the correct cold fill pressure, unnecessary operation of this valve could cause debris in the system to foul the valve

### Step by Step Commissioning

- 1 The whole of the gas installation must be checked for soundness and purged in accordance with BS 6891.
- 2 Ensure the system has been flushed, is full of water and that the pump, radiator and any other isolating valves are open.
- 3 On Gravity DHW systems check that the overheat thermostat is fitted correctly. See Fig. 19, page 19.
- 4 Check the water system for leaks and rectify as necessary.
- 5 Re-fit the front cover, plinth, top cover and controls panel (see Fig. 24, page 26).
- 6 Set the rotary boiler switch on the user controls to 'O' Stand-by.
- 7 If a programmer is fitted, set both DHW & CH to the 'Off' position.
- 8 Turn the boiler gas service cock to the 'On' position and then turn On the main gas supply.
- 9 Preliminary electrical system checks must be carried out. They are:- Earth Continuity, Short Circuit, Polarity & Resistance to Earth.
- 10 Switch On the main electricity supply at the isolating switch or plug and socket.

11 If a programmer is fitted set both DHW & CH to the 'On' position and check that the room and cylinder thermostats, where fitted are set to high temperatures.

12 The fan will be energised and after a short period the automatic spark will light the pilot. When the pilot flame is established the main burner will ignite and the Green 'Flame' led on the control panel will illuminate.

**Note:** On initial lighting, pilot ignition may be delayed due to the presence of air in the gas supply.

13 With the main burner running, check for gas soundness around the boiler using leak detection fluid.

14 Allow the system to reach maximum working temperature and examine for leaks. Set the boiler switch to 'O' and drain the system whilst still hot.

**Note:** Should the boiler fail to operate correctly refer to the Fault Finding Guide on Page 32, and the boiler wiring diagram on Page 30 for further information.

15 Re-fill and vent the system making a final check for leaks.

On sealed systems adjust to the correct cold fill pressure. Set the pressure gauge pointer to the system design pressure.

If a by-pass circuit is fitted the by-pass valve should be adjusted with the boiler operating under minimum load conditions to maintain sufficient water flow through the boiler to ensure that the overheat thermostat does not operate under normal conditions.

### 3.2 Final Adjustments

1 Use a pressure gauge to check the inlet and burner pressures. See the Data Badge for figures.

2 Turn the boiler on and allow to run for 10 minutes.

3 Check that the inlet pressure is 20mbar with the boiler running.

4 Check that the burner pressure is in accordance with the information on the boiler data badge.

5 If burner pressure adjustment is required, turn the pressure adjusting screw anti-clockwise to increase pressure or clockwise to decrease.



6 Check at the gas meter that the gas rate is correct.



7 Shut down the boiler, remove the pressure gauges, re-fit the screws and check for gas soundness.



### Control Thermostat

At its minimum and maximum settings, the thermostat should control the water flow temperature at approximately 55°C - 82°C.

Set the temperature control knob to 'O' Standby and check that the main burner shuts down.



### Pilot Burner

The pilot is pre-set and no adjustment is required. When lit the pilot flame envelope should just cover the electrode tip. If the pilot flame is not as described, replace as covered in Section 4.6 - Servicing & Replacement of Parts.

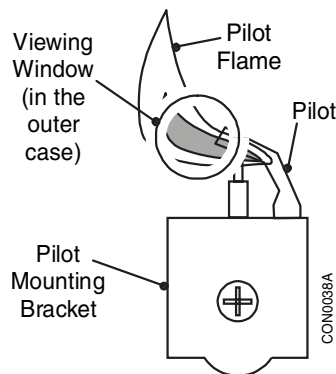


Fig. 23

### Overheat Thermostat

The overheat thermostat is pre-set and no adjustment is possible. It will require manual re-setting if an overheat condition occurs (the Red LED will be illuminated).

The re-set button is located on the controls assembly - repeated shutdown by this device should be investigated further and the fault eliminated.



### Products Discharge Safety Device (TTB) CFL Only

This component is pre-set - no adjustment is possible. In the case of flue blockage this device will operate and the boiler will go to lockout (The red LED will be illuminated). The reset button is located on the controls assembly - repeated shutdown by this device should be investigated further and fault eliminated.



### Other Boiler Controls

No further setting or checking is necessary as all boiler mounted controls are designed so that if a fault should occur they will fail safe.



### External Controls

Check that any other external controls connected in the system, such as clocks or thermostats are correctly set and control the boiler as required.



## 3.3 Instruct the User

On completion of the installation, the installer should demonstrate the operation of the boiler and its associated controls. Also hand over all the instructions.



## 3.4 Advise the User

1 If a programmer is fitted, set the time and programme the required settings as shown in the instructions supplied with the programmer.



2 Instruct the User in the safe operation of the boiler and controls.



3 Advise the User of the precautions necessary to prevent damage to the system and to the building in the event of the system remaining inoperative during frost conditions. Refer to the User's Instructions for further details



4 Advise the User that for continued efficient and safe operation of the boiler it is important that adequate servicing is carried out at least once a year by a Potterton Service Engineer or a C.O.R.G.I. Registered Installer.



5 Leave a permanent card attached to the boiler giving:



- a. Name and address of installer.
- b. Date of installation.
- c. A wiring diagram of the external control circuit.

6 And finally, complete the Benchmark Log Book and hand over all the instructions supplied.





## 4. Service & Replacement of Parts

**Read these:** To ensure continued efficient operation of the appliance, it is recommended that it is checked and cleaned as necessary at regular intervals.

The frequency of servicing will depend upon the particular installation conditions and usage but in general once per year should be adequate.

It is the law that any service work must be carried out by a competent person who is C.O.R.G.I. Registered.

Before servicing, fire the appliance and check that the flames are blue. Yellow flame and excessive lifting indicate poor combustion.

**WARNING:** Before commencing work turn the temperature control knob to 'O' Stand-by and allow the appliance to cool, isolate the electricity supply.

If the gas valve is to be removed turn off the gas supply at the appliance service cock.

**IMPORTANT:** Always test for gas soundness after completing any servicing of gas carrying components and carry out functional checks of controls.

**IMPORTANT:** Ensure that the outer white case is correctly fitted and that the sealing strip fitted to the door is forming a tight seal with the boiler casing.

### **Remember to fill in the Benchmark Log Book**

Flue gas analysis points are provided as follows, RSL Models - either side of the flue elbow, CFL Models - on the Flue Spigot, remember to swing the TTB back after the test. It is recommended that the flue gas probe is inserted so the tip is halfway into the flue so an accurate reading can be obtained.

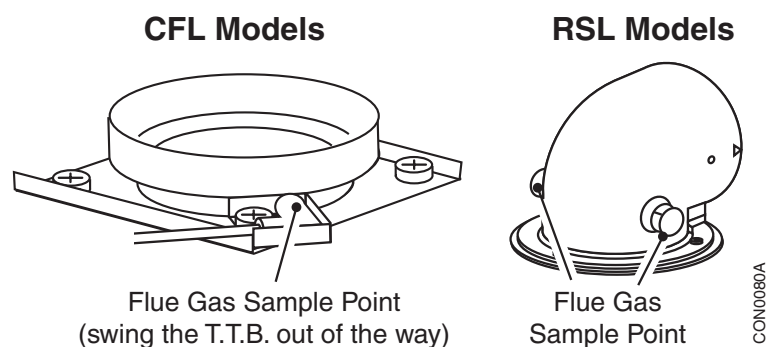


Fig. 24

### **Notes on Cleaning Boiler Components**

**Heat Exchanger** - After performing operations 4.1, 4.6 & 4.8 place a sheet of paper under the heat exchanger then using a flat blade tool (Part No. 907736), scrape the flueway fin surfaces in a downward movement. This will ensure that most of the deposits will be collected on the paper.

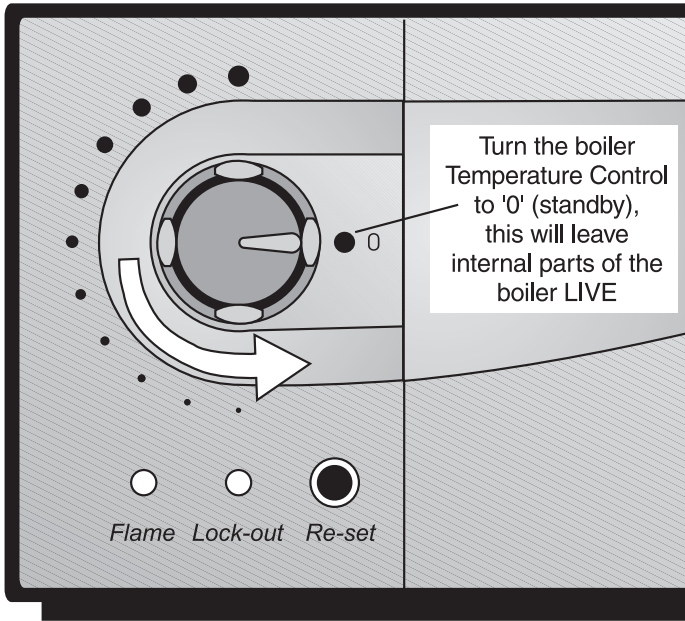
**Burner** - Brush the burner top and check that the flame ports are clear. Any blockage may be removed with a fine wire brush. Turn the burner upside down and tap gently to remove any debris (Protect the electrode).

**Electrode** - If the electrode requires cleaning wipe the surface using a solvent such as methylated spirits.

**Main Injector** - Omit this operation if the gas rate is correct, otherwise clean by blowing through. Do NOT clear the injector with a pin or wire.

**Fan Assembly** - Examine the fan impellor and carefully clean if necessary using a soft brush.

**Flue** - Inspect the flue terminal and flue/air tube for blockage and integrity, rectify if necessary.



#### 4.1 General Access

**Warning:** Before attempting to remove any component from the appliance first disconnect the mains electricity supply by removing the plug from the wall socket or by switching off the appliance at the external isolating switch.

Notes: The 'O' (stand-by) position on the boiler temperature control will leave parts of the boiler Live.

If the appliance gas valve is to be removed it will be necessary to isolate the gas supply at the appliance isolating valve.

**Important:** After removal or replacement of any gas carrying component a test for gas soundness must be made and functional check of the controls carried out.

Re-assemble all parts in reverse order.

1. Remove the plinth - 2 screws.
2. Remove the front cover - 2 screws, lower and lift away.
3. Remove the controls panel - open flap, remove screw, unhook, disconnect the in-line connector and lift away.
4. Remove the top cover - 2 screws, pull forward and lift off. (Top blanking plate should be removed - CFL only).
5. For better access, the controls tray can slide forward.
  - a. Loosen 2 screws at front of tray.
  - b. Slide tray forward until rear of tray reaches front.
  - c. Tilt tray up and pull out.
  - d. Carefully slide wires to either side of tray.
  - e. Place rear hole slots into screws loosened in 5a.

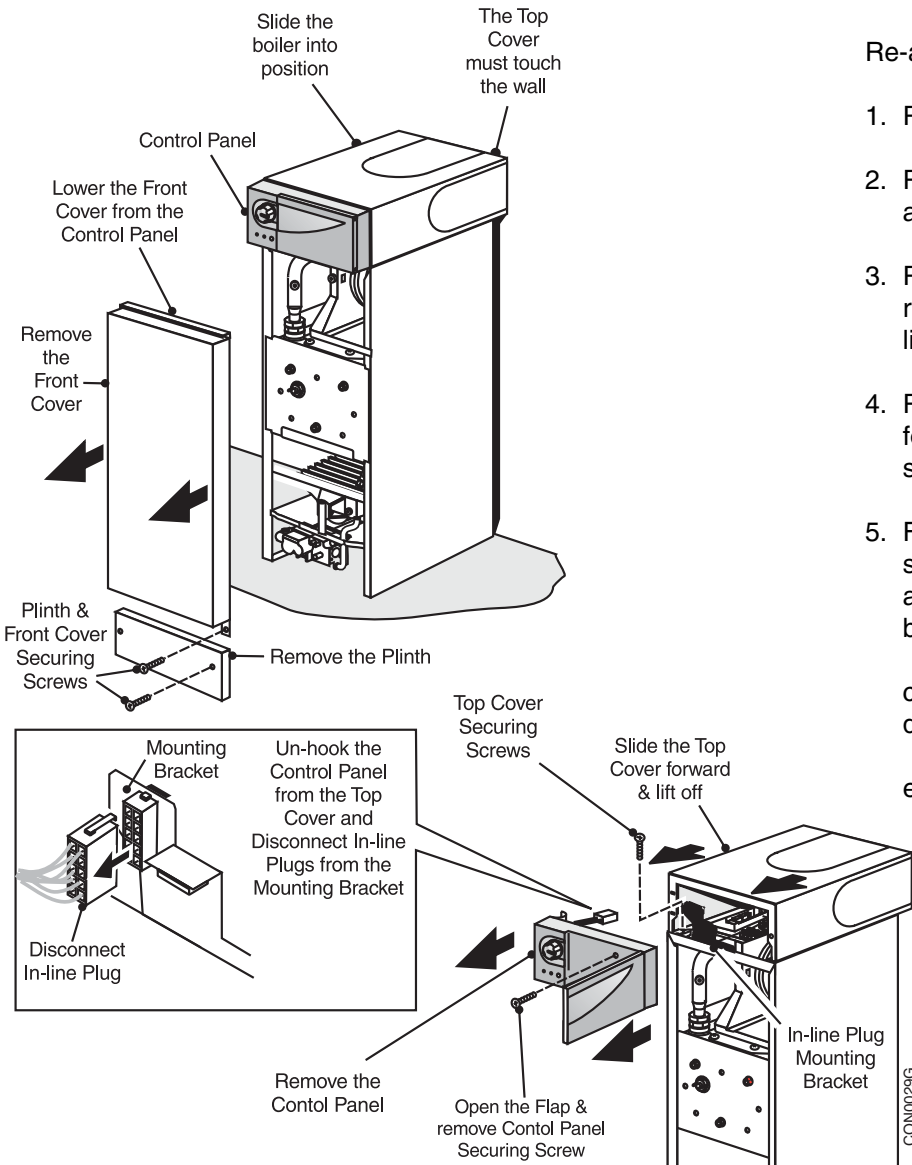


Fig. 25

## 4.2 Electronic Control Board

- Gain General Access - See 4.1  
For better access of controls tray See 4.1 Note 5.
1. Disconnect all connectors and wires, unscrew the two securing screws and remove the board.
  2. On re-assembly refer to the wiring diagram when re-connecting wires and connectors.

## 4.3 Air Pressure Switch

- Gain General Access - See 4.1
1. Remove the securing screws and allow the control panel to pivot forwards - see 4.1 Note 5.
  2. Note the wire connections and disconnect the wires to the air pressure switch.
  3. Remove the screws securing the air pressure switch to the bracket.
  4. Note the tube connections and remove the tubes from the switch.
  5. Re-assemble in reverse order.

## 4.4 Temperature Sensor

- Gain General Access - See 4.1
1. Disconnect the wires from the sensor.
  2. Depress the clips on the outside of the sensor and pull it clear of the heat exchanger.
  3. Re-assemble in reverse order, use fresh conducting paste.

## 4.5 Overheat Thermostat

- Gain General Access - See 4.1
1. Disconnect the wires from the thermostat.
  2. Unscrew the thermostat from the pipe.
  3. Re-assemble in reverse order.

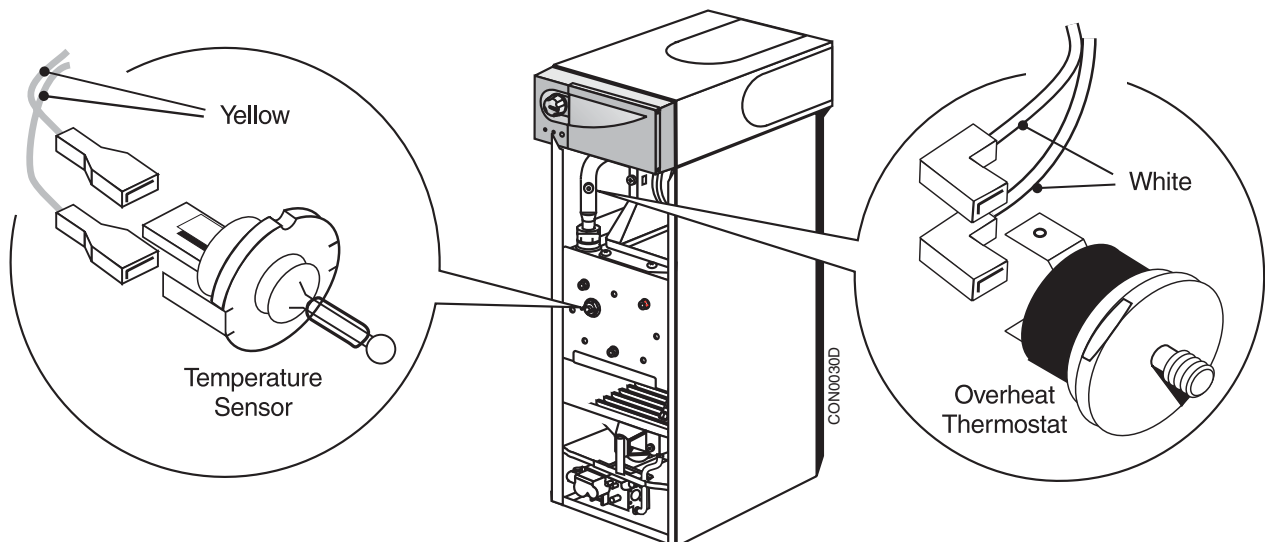
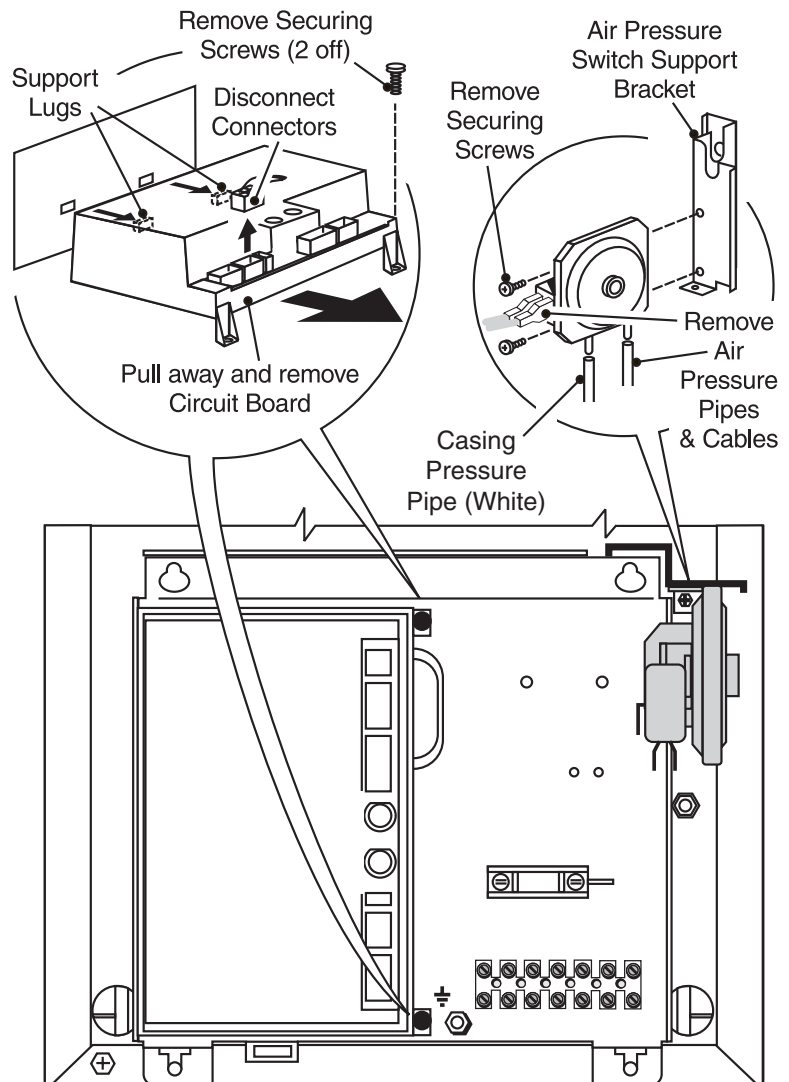
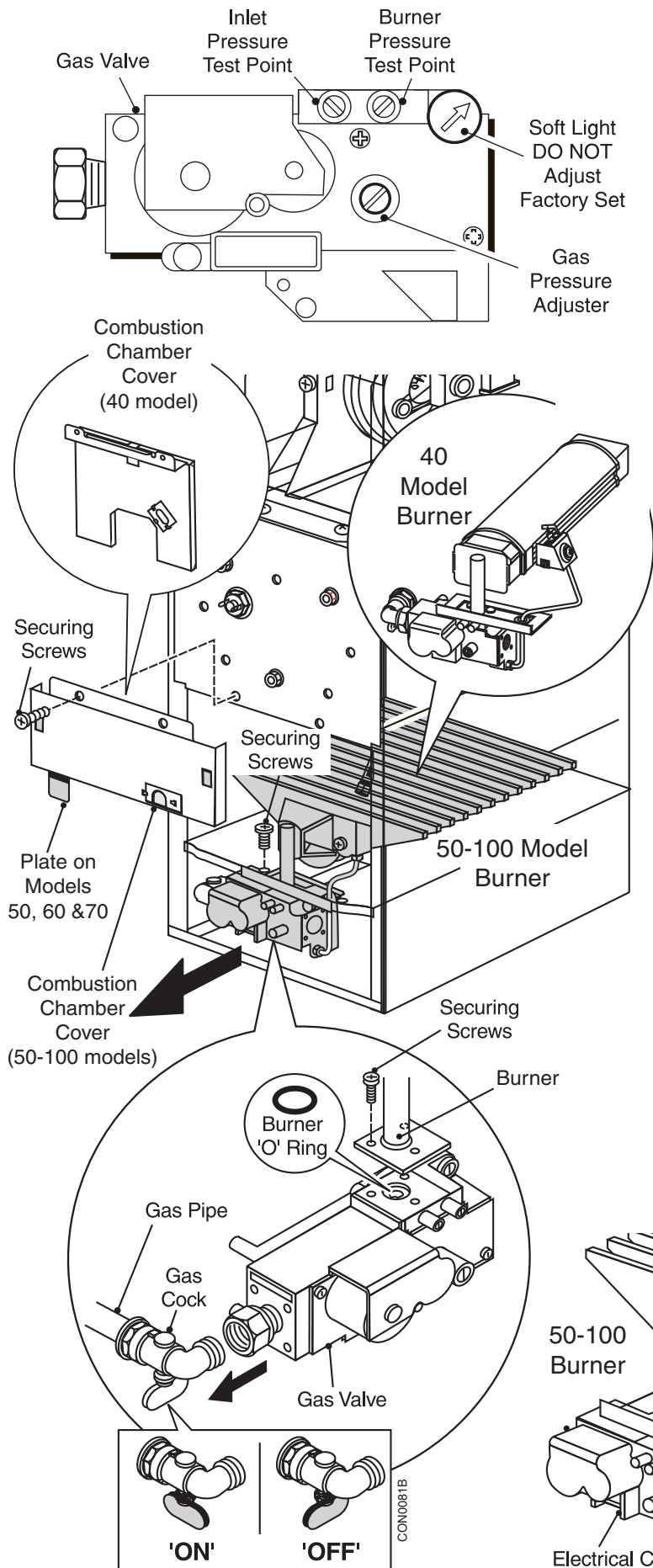


Fig. 26



#### 4.6 Burner, Gas Valve, Injector & Electrode

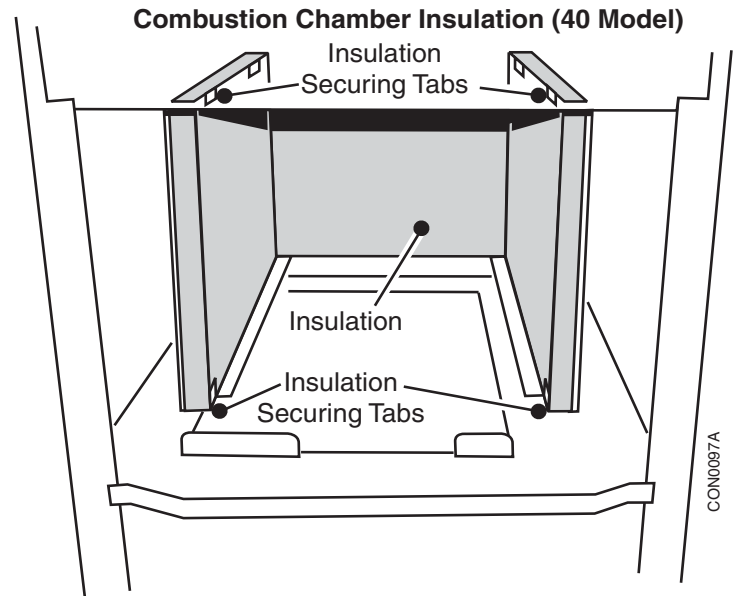
- Gain General Access - See 4.1
- 1. Disconnect the gas cock from the gas valve.
- 2. Disconnect the wiring from the gas valve.
- 3. Remove the combustion chamber cover - 2 screws.
- 4. Remove the gas valve/burner assembly - 2 screws.
- 5. Pull the assembly forwards and remove the electrode as follows:-  
Hold the electrode wire, push in and pull down at the same time and the electrode will disconnect itself.
- 6. Remove pilot tube from valve and pilot.
- 7. Disconnect the gas valve from the burner - 3 screws. Use a new 'O' ring on re-assembly.
- 8. Re-assemble in reverse order. When refitting the electrode ensure that it has clicked into position.

**Injector:** Use a 13mm or ½" (A/F) socket spanner to remove the injector, use a new sealing washer on re-assembly.

Fig. 27

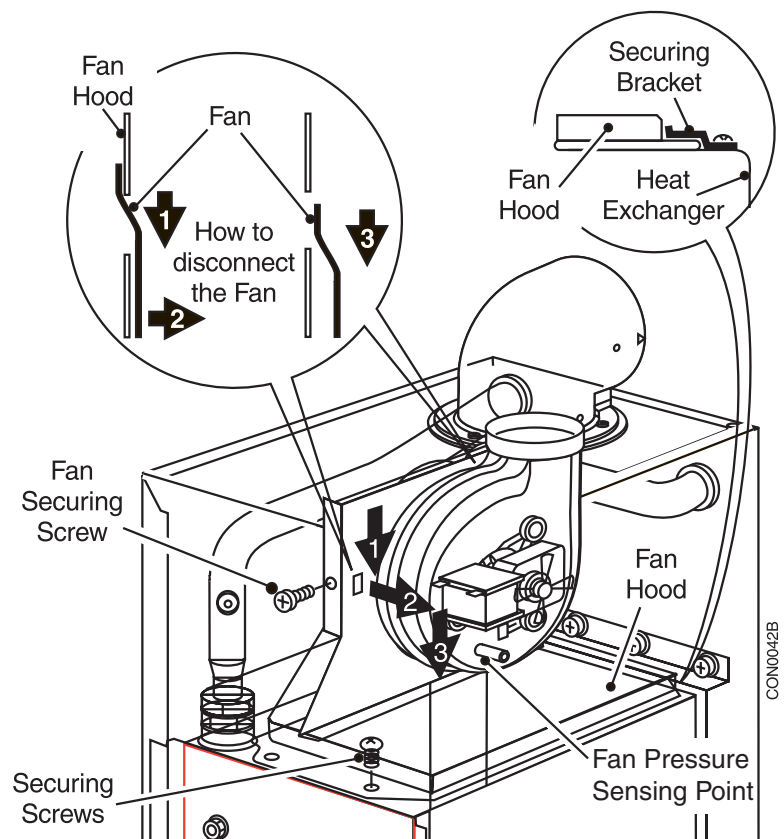
## 4.7 Combustion Chamber Insulation

- Gain General Access - See 4.1
- Remove the burner/gas valve assembly - See 4.6.
  - Remove combustion chamber front cover - 2 screws  
**Note:** To avoid release of dust and fibrous material the insulation material should be dampened before removal.
  - Push both sides of the combustion chamber inwards at the top to unclip and pull forwards out from the boiler. Replace insulation pieces as required. On 40 model carefully bend securing tabs out sufficiently to remove insulation, **DO NOT** overbend. On 50 to 100 models replace any securing clip if damaged.
  - Re-assemble in reverse order.



## 4.8 Fan & Fluehood

- Gain General Access - See 4.1
- Disconnect the tube from the fan pressure sensing point on the front of the fan housing - note how it fits.
  - Disconnect the three wires from the fan motor.
  - Remove the securing screw and carefully pull the fan down and away from the boiler.
  - Remove the fluehood - 2 screws and withdraw it from the boiler.
  - Fluehood:** On re-assembly check the seal on the fluehood and replace if damaged and ensure that the fluehood locates under the bracket at the rear of the chassis. .
  - Fan:** On re-assembly check the seal on the fan inlet and replace if damaged, ensure that the rubber seal around the fan outlet is located correctly into the base of the flue elbow.
  - Re-assemble in reverse order.



## 4.9 Products Discharge Safety Device - TTB (CFL Models Only)

- Gain General Access - See 4.1
- Note how it fits then remove the sensor. re-fit in reverse order.
  - If the device is disturbed during routine servicing an operational check should be carried out.
  - This component should only be replaced by the manufacturers original part.

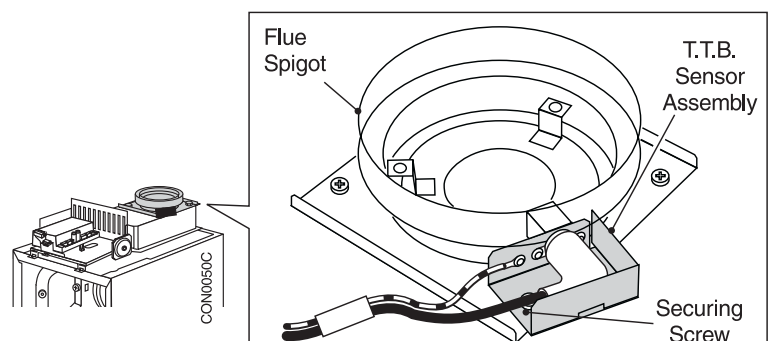


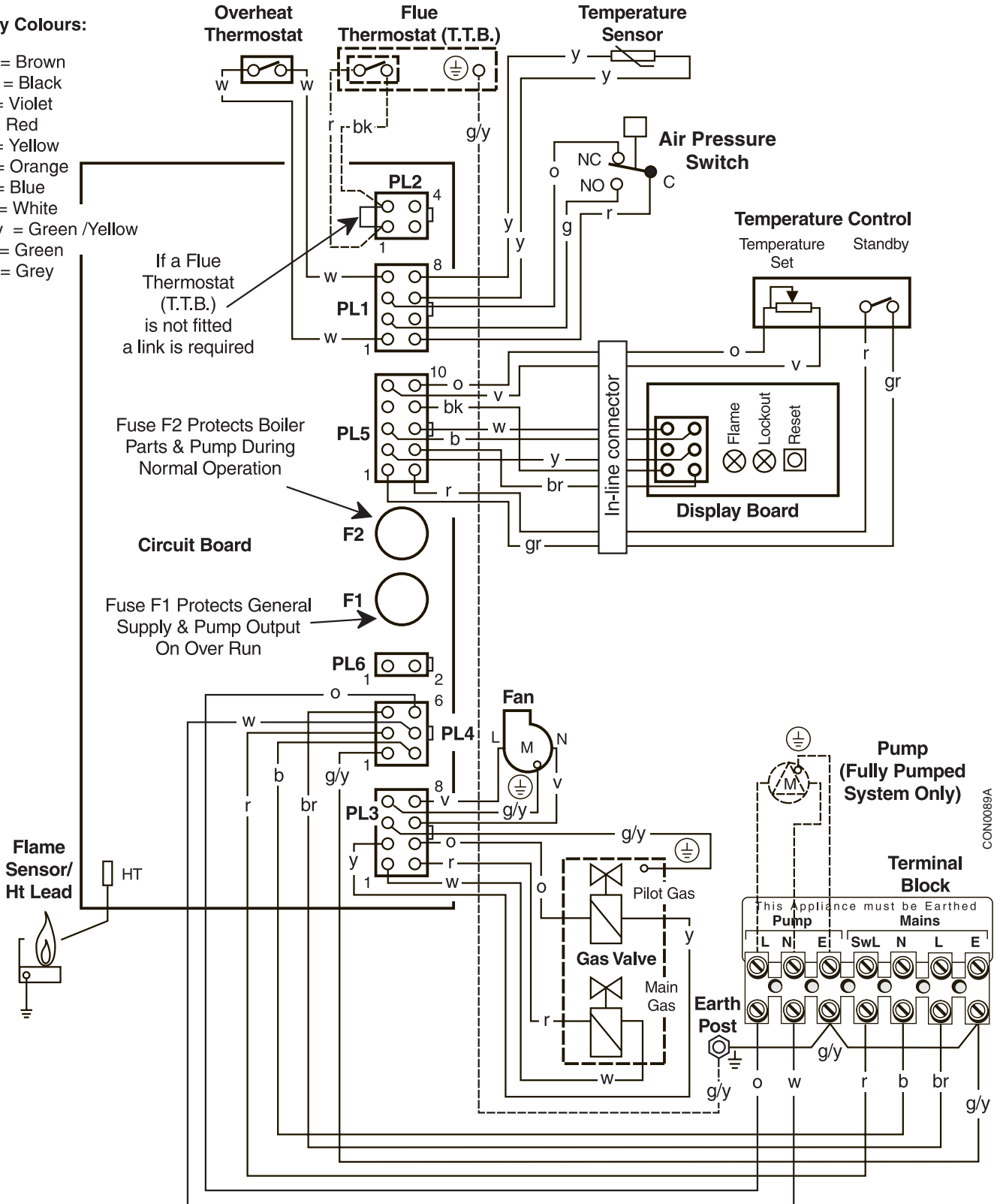
Fig. 28



# 5. Wiring Diagrams

## Key Colours:

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

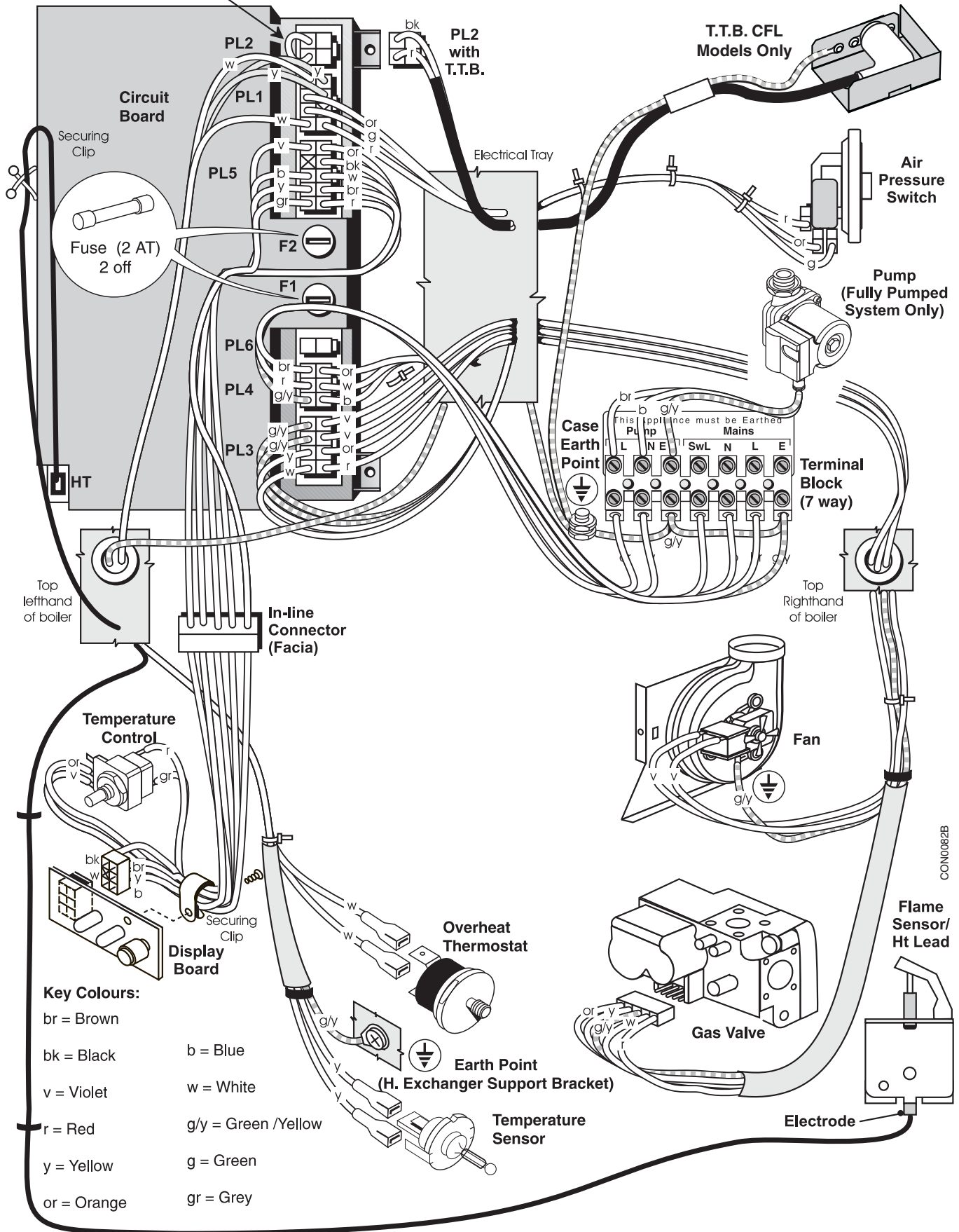


CON0089A

Fig. 29

## Kingfisher Mf Wiring Diagram

If a Flue Thermostat (T.T.B.) is not fitted a link is required



CON0082B

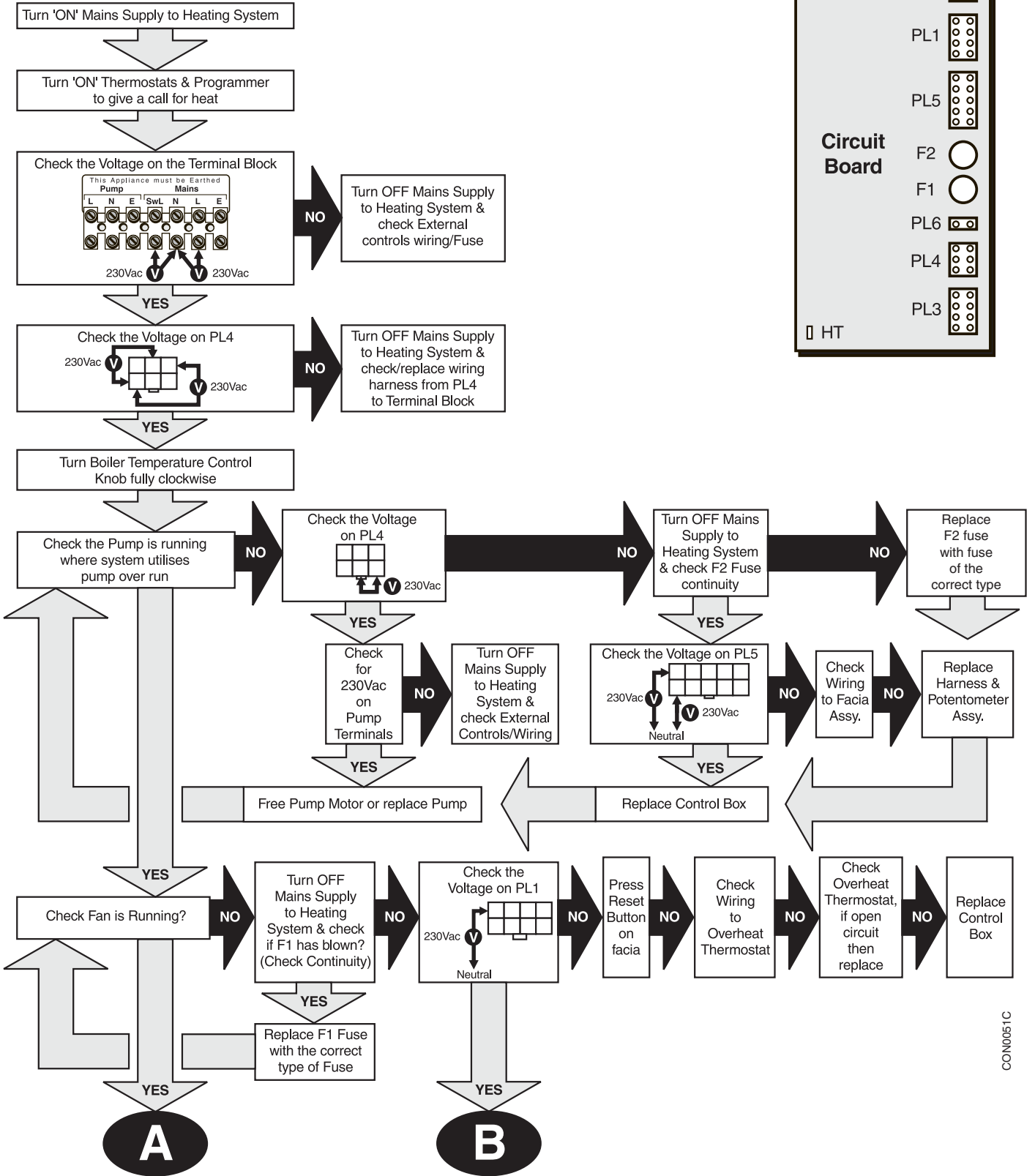
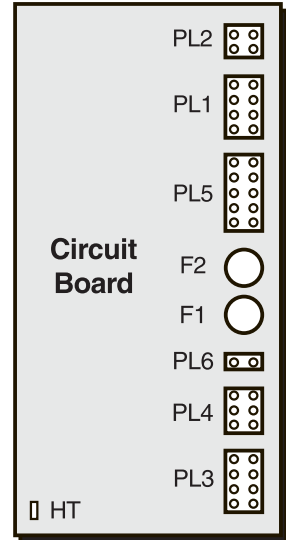
Fig. 30

# 6. Fault Finding Guide

If Red LED is 'ON' and the Boiler fails to work check the following:  
 Electrical Plugs (PL1 to PL6) are to remain connected to the Circuit Board for Fault Finding checks.

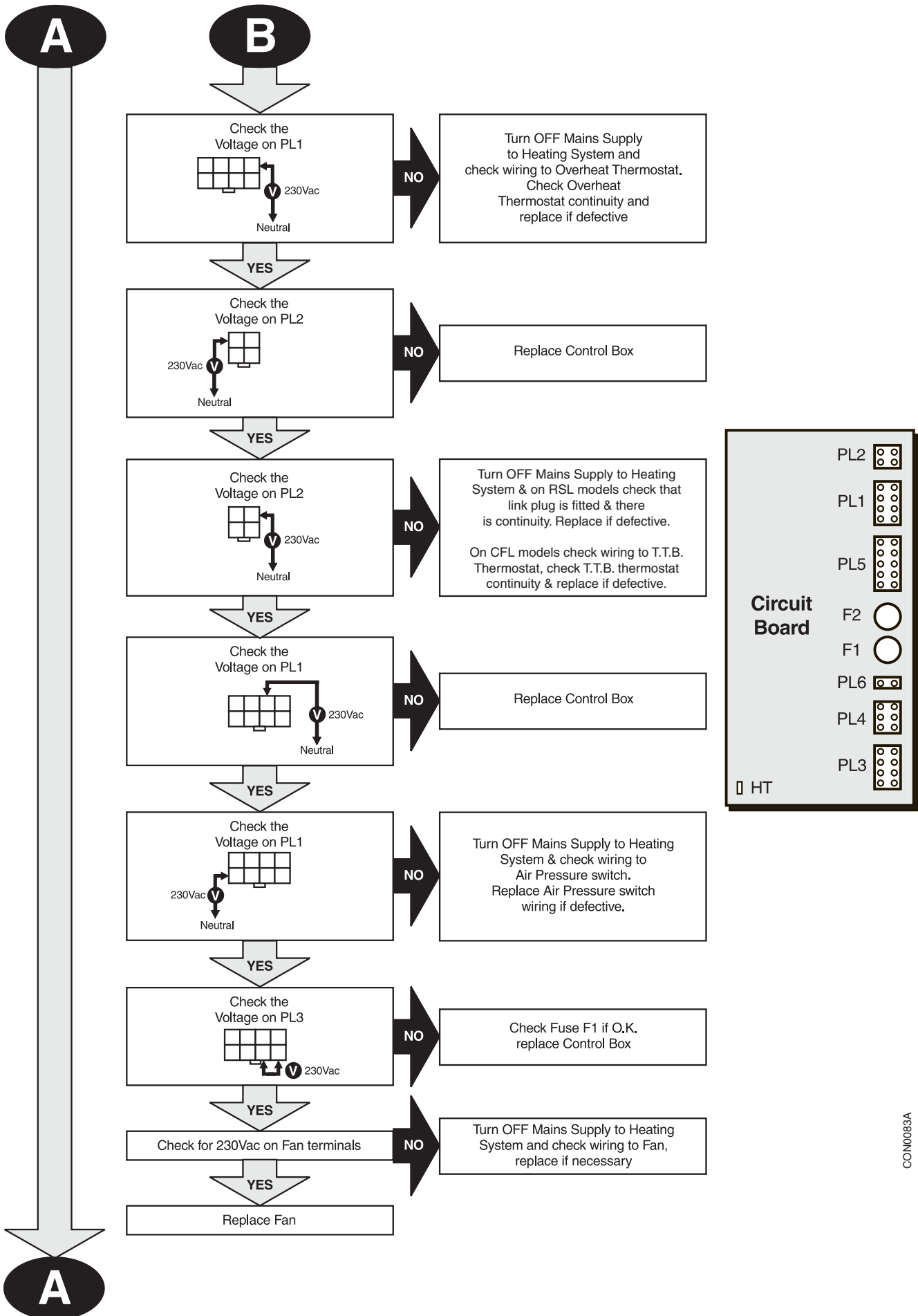
## Initial Conditions

ALL Electrical Power to the Heating System OFF - NO External Call for Heat (Thermostat & Programmer OFF)  
 Boiler Temperature Knob Set to '0' (Fully anti-clockwise 'click' OFF) - Gas & Water Connections Turned ON  
 Main Supply Voltage is between 196Vac & 253Vac.

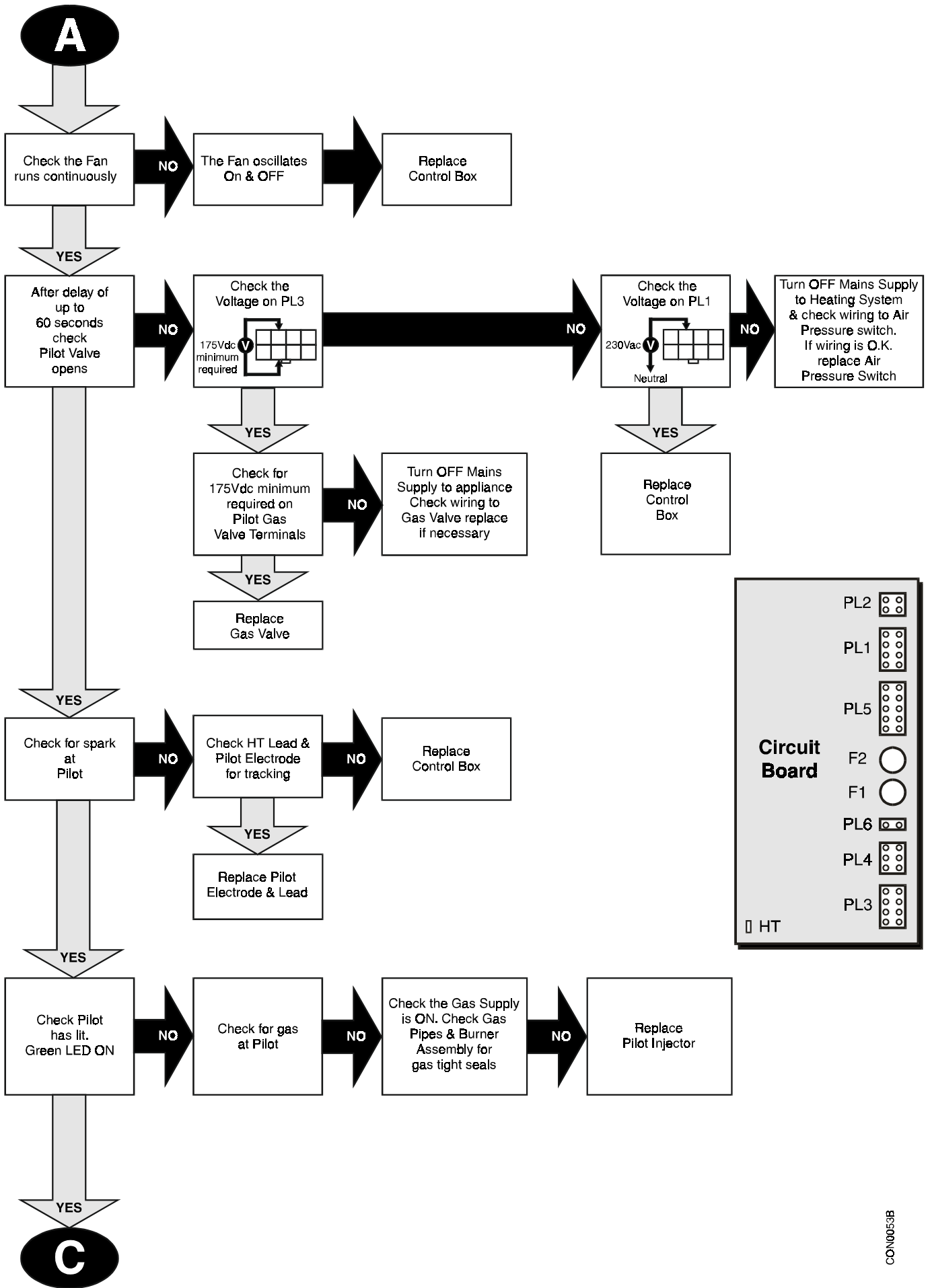


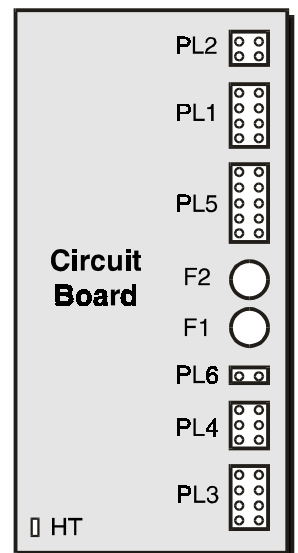
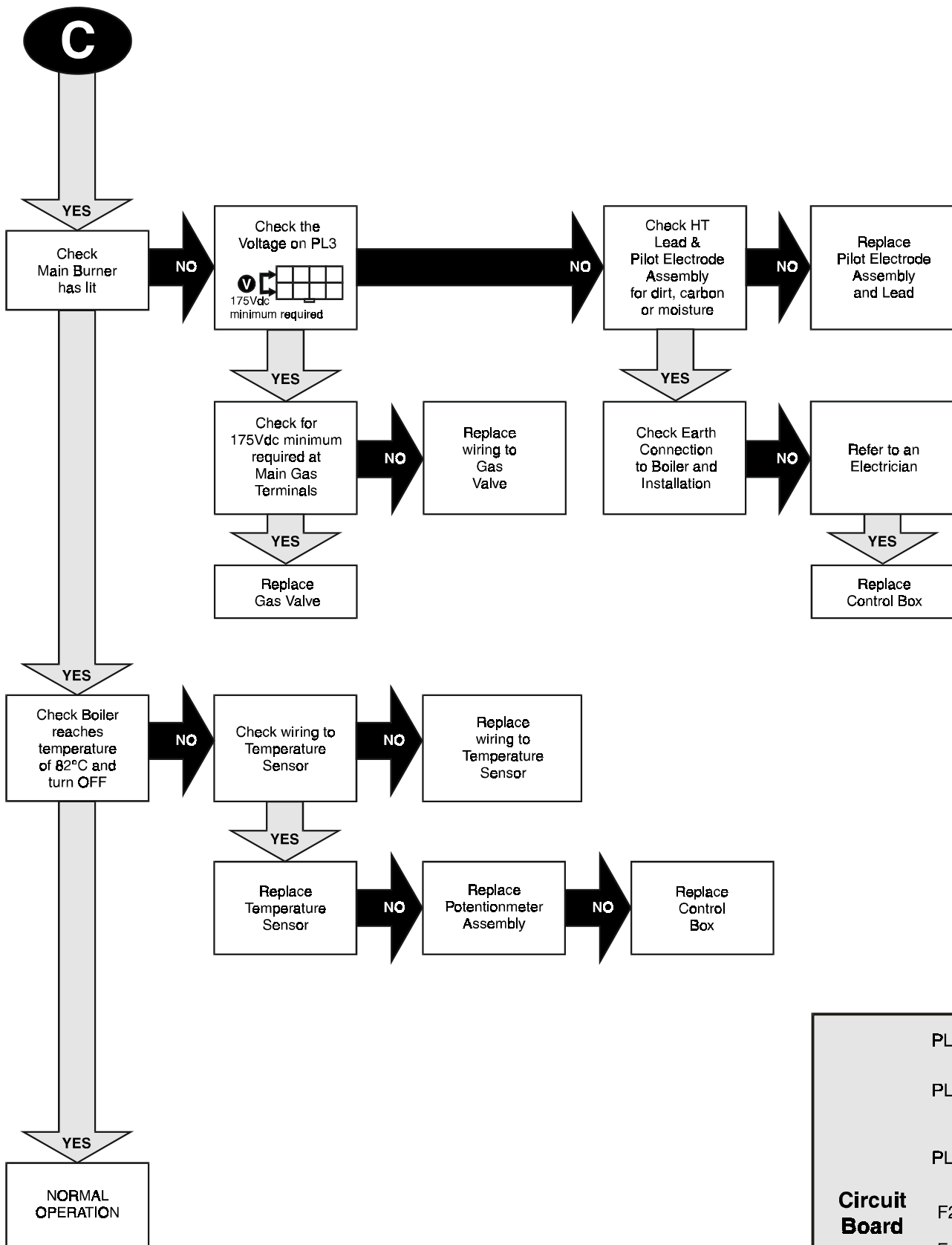
CON0051C





CON0063A





CON0054A

# 7. Short List Of Spare Parts

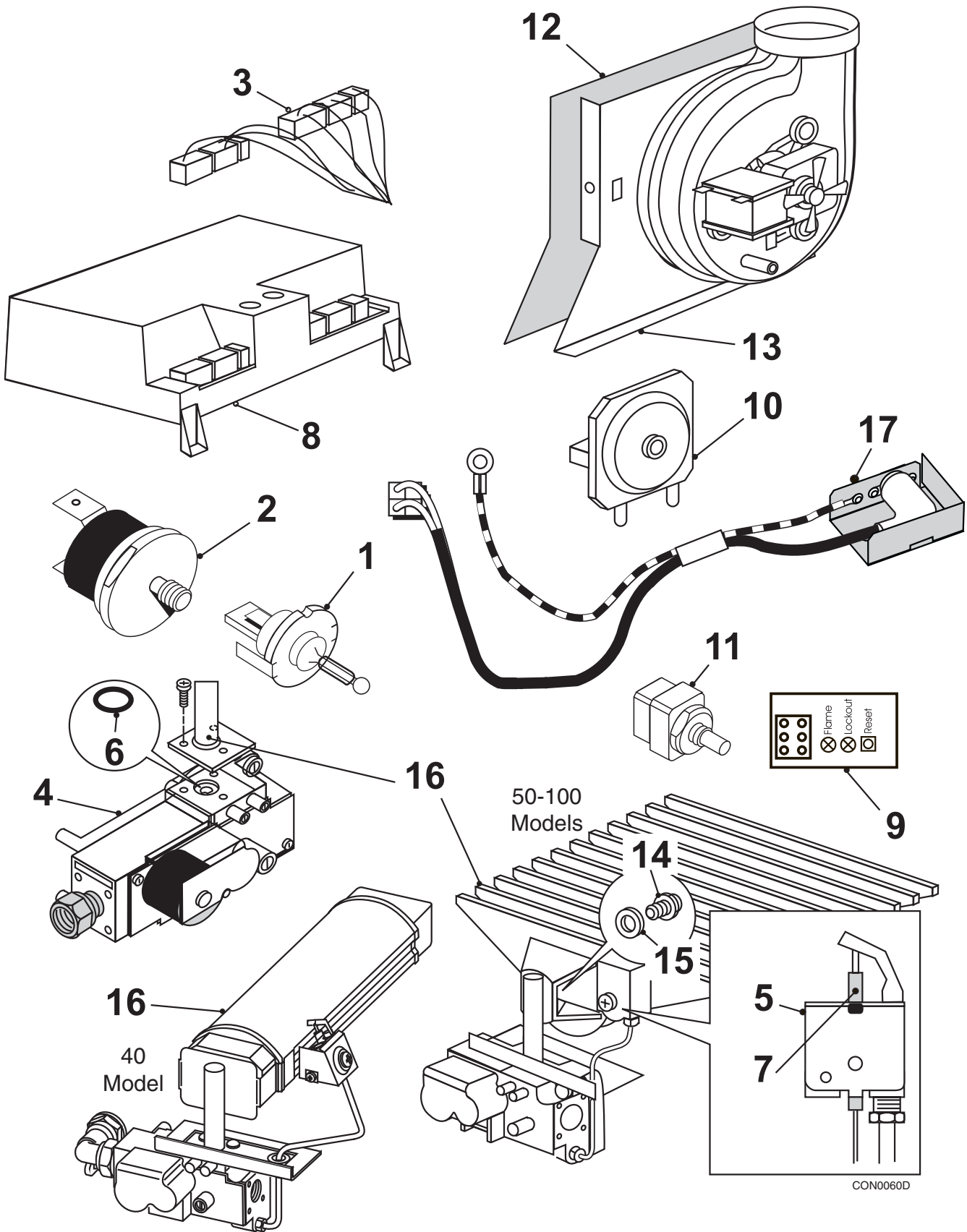


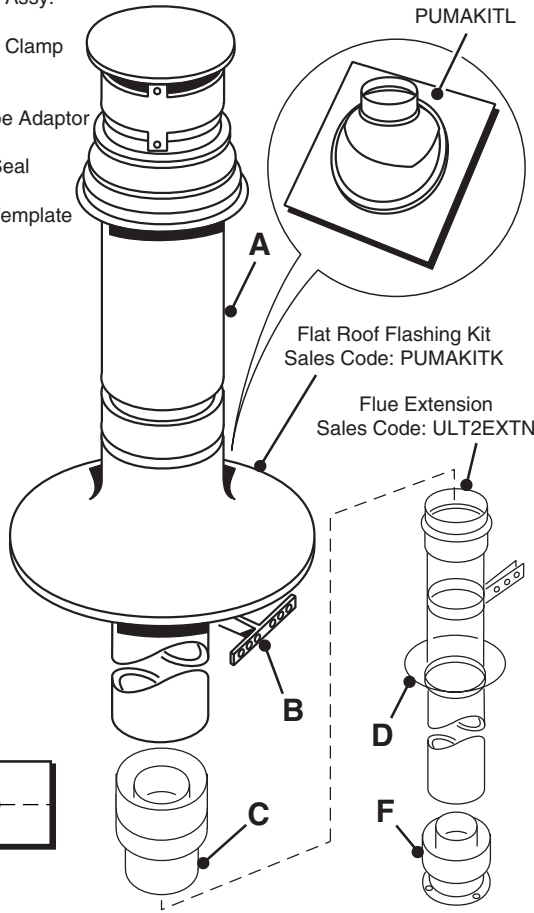
Fig. 31

| Item No. | G.C. No. | Description   | Qty. | Part No. |
|----------|----------|---|------|----------|
| 1        | E02-325  | Thermistor  | 1    | 404524   |
| 2        | 173-130  | Overheat Thermostat   | 1    | 404517   |
| 3        | E02-367  | Main Wiring Harness   | 1    | 242110   |
| 4        | E78-236  | Gas Valve Assembly CFL/RSL40 - 100                                    | 1    | 5102729  |
| 5        | 379-672  | Pilot Burner - Honeywell  | 1    | 402559   |
| 6        | 114-963  | 'O' Ring  | 1    | 401656   |
| 7        | E02-372  | Electrode - Honeywell   | 1    | 402561   |
| 8        | E02-365  | Main PCB  | 1    | 840073   |
| 9        | E02-379  | User Control Board  | 1    | 650451   |
| 10       | E78-250  | Pressure Switch Assembly - CFL50 - 100, RSL40, 60, 90, 100            | 1    | 5105796  |
|          | E78-367  | Pressure Switch Assembly - CFL40, RSL50                               | 1    | 5105795  |
|          | E02-376  | Pressure Switch Assembly - RSL70                                      | 1    | 642482   |
|          | E78-369  | Pressure Switch Assembly - RSL80                                      | 1    | 5105798  |
| 11       | E02-380  | Potentiometer/Wiring Harness Assy                                     | 1    | 840072   |
| 12       | E02-313  | Fan Gasket  | 1    | 242045   |
| 13       | E03-826  | Fan Assy c/w Gasket - CFL/RSL40 - 70                                  | 1    | 242083   |
|          | E03-827  | Fan Assy c/w Gasket - CFL/RSL80 - 100                                 | 1    | 242084   |
| 14       | E02-348  | Injector 2.9 - CFL/RSL40  | 1    | 411041   |
|          | 173-139  | Injector 3.2 - CFL/RSL50  | 1    | 411028   |
|          | 173-136  | Injector 3.7 - CFL/RSL60  | 1    | 411024   |
|          | 173-137  | Injector 3.9 - CFL/RSL70  | 1    | 411025   |
|          | E02-234  | Injector 4.3 - CFL/RSL80  | 1    | 5105584  |
|          | E02-349  | Injector 4.4 - CFL/RSL90  | 1    | 411039   |
|          | E02-350  | Injector 4.7 - CFL/RSL100   | 1    | 411040   |
| 15       | 405-562  | Injector Washer   | 1    | 400984   |
| 16       | E82-317  | Burner - Aeromatic - CFL/RSL40  | 1    | 5106796  |
|          | E78-210  | Burner - Aeromatic - CFL/RSL50 - 70                                   | 1    | 5105582  |
|          | E78-212  | Burner - Aeromatic - CFL/RSL80  | 1    | 5105583  |
|          | E02-347  | Burner - Aeromatic - CFL/RSL90 - 100                                  | 1    | 414821   |
| 17       | E78-180  | Products Discharge Safety Device - TTB<br>CFL40, 50 (Blue sleeve)     | 1    | 5102808  |
|          | E78-181  | Products Discharge Safety Device - TTB<br>CFL60 - 100 (Yellow sleeve) | 1    | 5102809  |

# 8. Flue Kits & Optional Extras

## Concentric Vertical Flue Kit Sales Code: SUPKITD

- A) Terminal Assy.
- B) Terminal Clamp Bracket
- C) Flue Tube Adaptor
- D) Ceiling Seal
- E) Ceiling Template
- F) Adaptor



Pitched Roof Flashing Kit  
Sales Code: PUMAKITL

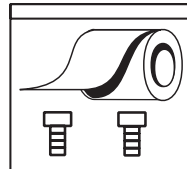
Flat Roof Flashing Kit  
Sales Code: PUMAKITK

Flue Extension  
Sales Code: ULT2EXTN

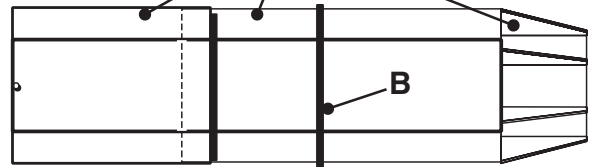
## Telescopic Horizontal Flue Kit

Sales Code: 1SUPFLUE  
(up to 300mm) Standard

Sales Code: 2SUPFLUE  
(up to 550mm) Alternative



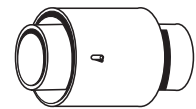
- A) Telescopic Flue Assy. (Including Terminal)
- B) Drip Ring
- C) Fixing Bag (Including Securing Screws & Tape)



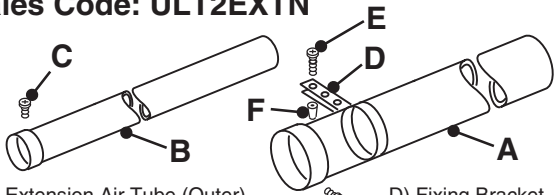
## Concentric Vertical Flue Adaptor Kit Sales Code: SUPKITC



## Telescopic In-Line Bend Adaptor Sales Code: SUPKITR

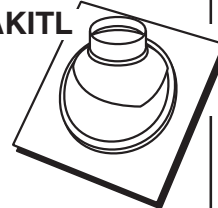


## 1m Flue Extension Kit (Max. 3 Kit) Sales Code: ULT2EXTN

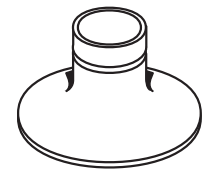


- A) Extension Air Tube (Outer)
- B) Extension Flue Tube (Inner)
- C) Self Tapping Screws (6 off)
- D) Fixing Bracket
- E) Woodscrews (2 off)
- F) Wall Plugs (2 off)

## Pitched Roof Flashing Kit Sales Code: PUMAKITL

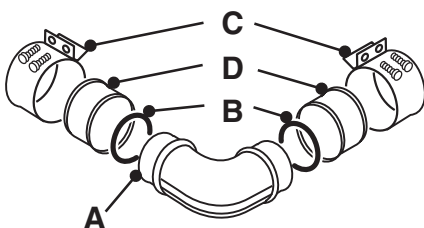


## Flat Roof Flashing Kit Sales Code: PUMAKITK



CON0094A

## 90° In-Line Bend Kit S. Code PUMAKITB    135° In-Line Bend Kit S. Code PUMAKITC



- A) 90° or 135° In-Line Elbow
- B) Product Tube 'O' Ring (2 off)
- C) Air Tube Clamp (Including Nuts & Screws)
- D) Air Tube Seal (2 off)

Fig. 32

Installation instructions included as necessary with each kit.

Installation instructions included as necessary with each kit.

**Internal Fitment Kit**  
Sales Code: SUPKITA

A) Flue Liner  
B) Rubber Seal  
C) Screws & Plugs  
D) Rope  
E) Retaining Collars

**Side Cover Kit**  
Sales Code: KMFKITE

Instructions

Screw

Washer

Side Panel

**Programmer Kit**  
Sales Code: 5106321

**Pump Mounting & Cover Kit**  
Sales Code: KMFKITD

2 Screws & Plugs

'O' Ring

Pipe

Instructions

Pump Cover

**Terminal Wall Plate Kit**  
Sales Code: KMFKITC

**Flexible Pipe Connection Kit**  
Sales Code: KMFKITB

Instructions

**Wall Plate Pack**  
Sales Code: SUPKITB

**Terminal Guard**  
Sales Code: PTERMGUARDEF

COND095A

Fig. 33

**General Enquiries**

Tel. 08706 060 780

**Technical \***

Tel. 08706 049 049

**Service \***

Tel. 08706 096 096

Fax. 01926 410 006

**Literature Request**

Tel. 08706 060 623

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