



# Installation and Servicing Instructions

## for the Midas Sfi wall mounted combination gas boiler

G.C. Appliance No.

Midas Sfi 47 494 04

### IMPORTANT

**FOR USE WITH NATURAL GAS ONLY.**

**Read these instructions thoroughly before working on the boiler.**

**Leave these instructions adjacent to the gas meter.**

# LIST OF CONTENTS

Section	Subject	Page
1	Introduction	3
2	Method of operation	3
3	General requirements	3
4	Delivery	3
5	Electricity supply	3
6	Gas supply	3
7	Air supply	4
8	Flue system	4
9	Technical data	4
10	Boiler location	5
11	Water and gas connections	5
12	Water system	6
13	Important installation notes	6
14	Sealed system requirements	7
15	Optional open system	7
16	Installation procedure	7
17	Commissioning	11
18	Balancing the system	12
19	Final assembly and handing over installation	13
20	Annual servicing	13
21	Replacement of parts	14
22	Wiring diagrams	20
23	Fault finding guides	22
24	Exploded views	28
25	Short list spare parts	30

If you have any reason to complain of any shortage of components shown in frames 1, 2 or 8, supply a list of the item(s) concerned, boiler model, your name, address and any information which may help us to avoid any further error.

Address for return:

**Spares** Administration Manager,

**Curzon** Components Ltd

**Earlsway,**

Team Valley Trading Estate,

GATESHEAD, Tyne & Wear, NE11 0RQ.

## 1. INTRODUCTION

The Midas Sfi is a fanned balanced flue combination boiler supplying a maximum of 100,000 Btu/h for domestic hot water or central heating.

The temperature of domestic hot water and central heating are both adjustable by the User.

Incorporated as standard is a programmer for control of the **central heating periods of operation**.

To enable the boiler to be positioned remote from an outside wall the boiler will operate with horizontal flue lengths of up to 3 metres. The Midas Sfi is a little unusual in that it incorporates a micro processor which provides a high level of accurate control. It is advisable to read carefully the following instructions which explain the operation of the boiler.

When the mains electricity supply is first switched on, the boiler takes 30 seconds to respond whilst the micro processor 'reads' the boiler sensors. However, the boiler is equipped with a 'Purge/Normal' switch which, in the Purge mode allows either of the two pumps to operate instantly under the control of the selector switches. This function, which is useful for removing air from the system will not allow the boiler to fire and, after venting, the switch should be returned to 'Normal'.

## 2. METHOD OF OPERATION

The Midas Sfi combination boiler operates in two distinctive modes; Central heating and Domestic hot water, see page 6. It will not supply heating and hot water at the same time, priority will always be given to hot water. Therefore if a hot water tap is turned on when the boiler is operating to provide central heating, the central heating will be interrupted until the hot water tap is turned off and the hot water store has again reached temperature.

### Central heating mode

When the central heating is switched on either by the programmer or room thermostat, water from the central heating system passes into the main heat exchanger and is heated by the burner to a minimum of 50°C and a maximum of 82°C as selected by the user control.

For the first 5 minutes of operation the boiler operates on low fan speed and at a fixed low gas rate to provide an output of 35,000 Btu/h.

If after 5 minutes the central heating control thermostat or room thermostat have not been satisfied the boiler will change to high fan speed and high gas rate. The gas rate will then modulate to suit the system demand. Should the modulated rate reduce to 35,000 Btu/h the fan will revert to low speed, the gas to fixed low rate and a further 5 minute run will commence.

If during the 5 minute run at low setting the central heating thermostat or room thermostat are satisfied, then the boiler will remain off for the remainder of the 5 minutes. After that time the boiler will commence a further run for 5 minutes at low fan speed and low gas rate and this process will continue.

This arrangement ensures that the boiler operates for most of the time on the majority of systems at low input thereby preventing rapid cycling, minimising noise and maximising efficiency.

After a demand for central heating an automatic 10 minute central heating pump overrun takes place.

### Domestic hot water

When a hot water tap is turned on a sensor within the secondary heat exchanger on the mains inlet side activates the hot water pump and fires the boiler to meet the demand. Water is pumped rapidly through the main heat exchanger to the secondary heat exchanger where it passes over a series of coils and back to the main heat exchanger for reheating.

Cold water enters the boiler and passes through the secondary heat exchanger (where heat is transferred), over another sensor and onto the hot water tap. The burner pressure is automatically modulated to maintain the desired temperature selected by the User. **The boiler will always respond to a demand for hot water by running the fan at high speed and initially the gas rate at maximum input.**

If the central heating is operating at the time, it will be interrupted whilst the boiler supplies hot water and resume operation when the hot water tap is turned off. Should the interruption occur during the 5 minute 'low fan, low gas' time the boiler will complete the remainder of the 5 minutes when returning to central heating. However, should the boiler be operating on 'high fan, high gas' to provide central heating at the time the interruption occurs it will return immediately to this setting when returning to central heating.

To prevent too much water passing through the boiler a flow regulator pre-set at 10 litres/min has been positioned alongside a filter in the inlet of the boiler. Too much water results in water delivered to the tap not being hot enough.

To deliver hot water 'instantly' the secondary heat exchanger is kept hot. To maintain this, the boiler will periodically cycle. This reheat of the secondary heat exchanger is at a low burner pressure and fan speed to minimise noise. The hot water may be switched off and the cycling stopped by switching the HW switch to the 'OFF' position, if so desired. The HW selector switch must be turned back to the 'ON' position when hot water is required.

After a reheat of the secondary heat exchanger a 30 second domestic hot water pump overrun takes place. However, after a hot water drawoff a 10 minute low fan overrun in conjunction with 30 second domestic hot water pump overrun takes place.

## 3. GENERAL REQUIREMENTS

The boiler must be installed in accordance with: The **Gas** Safety (Installation and Use) Regulations 1990, Building Regulations, Building Standards (Scotland) Regulations, Local Building Regulations, Model and local Water Undertaking Byelaws and the current **IEE** Wiring Regulations.

Detailed recommendations are stated in the following British Standard Codes of Practice: BS6891:1988, BS6798:1987, BS6700:1987, BS5546:1990, BS5440:1:1990, BS5440:2:1989 and BS5449:1990.

**NOTE: Gas Safety Installation and Use Regulations 1990:** 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. It is in your own interest, and that of safety to ensure that the law is complied with.

## 4. DELIVERY

The unit is delivered in two packages: (1). The boiler pack which contains the uncased boiler and the casing kit pack.

(2). The flue/terminal assembly type, A, B, C, D and E as required.

## 5. ELECTRICITY SUPPLY

240V~50Hz via a fused double pole switch with a contact separation of at least 3 mm in both poles or preferably a fused 3 pin plug and shuttered outlet socket (both complying with requirements of BS1363) adjacent to the boiler.

Fuse the supply at 3A. The minimum requirement for the power supply cable is that it should be a PVC sheathed flexible cord at least 0.75 mm<sup>2</sup> (24x 0.2 mm) (code designation H05 VV-F or H05 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.

**The appliance must be earthed.**

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

## 6. GASSUPPLY

The Midas Sfi requires 3.4 m<sup>3</sup>/h (120 ft<sup>3</sup>/h) of natural gas (the input after 10 minutes use at maximum). 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.

**Note:** If the gas supply to the boiler is used to supply other appliances then use 22 mm pipe. If the last 2 metres to the boiler is free from junctions then it is possible to use 15 mm pipe.

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

Maximum central heating input	36.6kW (125,000 Btu/h)
Minimum central heating input (modulation)	13.2kW (45,000 Btu/h)
Maximum central heating output	29.3kW (100,000 Btu/h)
Minimum central heating output (modulation)	9.5kW (32,500 Btu/h)
Maximum hot water input	36.6kW (125,000 Btu/h)
Maximum hot water output	29.3kW (100,000 Btu/h)
Maximum burner pressure	16.0mbar (6.4in wg)
Minimum burner pressure (modulation)	1.8mbar $\pm$ 0.2(0.7in wa $\pm$ 0.1)
Burner type	Furigas175-500-024 or Bray AB24016M
Burner injector	Furigas515-001-136 marked 470
Pilot injector	Honeywell4500-4108-005 marked 56/42A
Pilot flame	35 to 40 mm long
Spark gap	3.0to 4.0mm
Ignition	Intermittent Pilot
Weight (empty)	64 kg (140lb)
Lifting weight (installing)	56 ka (123 lb)
Water content	4.0litre 10.8gal)
Max. heating system temperature	82°C $\pm$ 2°C
Max. domestic hot water temperature	65°C $\pm$ 2°C
Max. nominal domestic hot water flow	10.0litres/min (2.2gal/min)
Domestic hot water performance	9.3litres/min 12.06gal/min) raised 45°C 12.0litres/min (2.6gal/min) raised 35°C
Max. mains water inlet pressure	10 bar (145lbf/in <sup>2</sup> )
Min. mains water inlet pressure	0.9 bar (13.0lbf/in <sup>2</sup> ) (see note in frame 22)
Max. heating system water pressure	3 bar (44lbf/in <sup>2</sup> ) (see section 14)
Min. heating system water pressure	0.5 bar (7 lbf/in <sup>2</sup> )
Max. heating system water capacity	200 litres 144gal)
Height (case)	900 mm (35½ in)
Width (case)	480 mm (18¾ in)
Depth	350 mm (13¾ in)
Clearance required: top	50 mm (2 in)
Clearance required: bottom	150 mm (6in)
Clearance required: front	610 mm (24in)
Clearance required: sides	10 mm (¾ in)
Flue terminal size	100 mm dia x 65 mm deep (4 in dia x 2½ in deep)
Water connections	15 mm and 22 mm compression fittings
Gas connection	Rc½
Data plate position	Behind case front, right of centre

Boiler output Btu/h	Temperature differential at 11°C(20°F)				Temperature differential at 20°C(38°F)				Boiler output kW
	Water flow		Pump head		Water flow		Pump head		
	litres/min	gals/h	m/water	ft/water	litres/min	gals/h	m/water	ft/water	
30,000	11.35	150	2.7	8.9					8.8
40,000	15.13	200	2.2	7.2					11.7
50,000	18.92	250	1.5	4.9					14.7
60,000	22.70	300	0.9	3.0	11.95	160	2.6	8.5	17.6
70,000	26.50	350	0.3	1.0	13.94	185	2.3	7.6	20.5
80,000	—	—	—	—	15.93	210	2.0	6.6	23.4
90,000	—	—	—	—	17.92	235	1.6	5.3	26.4
100,000	—	—	—	—	19.91	265	1.0	3.3	29.3

## 10. BOILER LOCATION

The boiler is not suitable for external installation.

The boiler must be mounted on a flat wall which is sufficiently robust to take the weight of the boiler.

The boiler is suitable for installation to a combustible wall e.g. wood cladding, provided that the air/flue tube assembly is not closer than **25mm (1in)** to combustible material. A metal sleeve should be installed to surround the air/flue tube assembly to provide a **25mm (1in)** annular space. Further guidance is given in BS5440:1:1990, sub-clauses 3.3 and 4.2.5.

If the boiler is to be installed in a timber framed building it should be fitted in accordance with the British Gas publication – “Guide for Gas Installation in Timber Framed Housing” reference DM2. If in doubt advice must be sought from the local region of British Gas or from Myson Heating.

The boiler may be installed in any room, although particular attention is drawn to the requirements of the latest IEE Wiring Regulations and, in Scotland, the electrical provisions of the building regulations applicable in Scotland, with respect to the installation of the boiler in a room containing a bath or shower.

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.

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

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

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.

Terminal Position	Minimum Spacing
Directly below an openable window, air vent or any other ventilation opening	300 mm (12 in)
Below gutters, soil pipes or drain pipes	75 mm (3 in)*
Below eaves or balconies	200 mm (8 in)*
Above adjacent ground or balcony level	300 mm (12 in)†
From vertical soil pipes or drain pipes	75 mm (3 in)
From an external or internal corner	25 mm (1 in)
From a surface facing the terminal	600 mm (24 in)
From a terminal facing the terminal	1200 mm (48 in)
Vertically from a terminal on the same wall	1500 mm (60 in)
Horizontally from a terminal on the same wall	300 mm (12 in)
Adjacent to an opening window	150 mm (6 in)
From an opening in a car port i.e. door or window into the house	1200 mm (48 in)

\* If the terminal is fitted within 850 mm (34 in) of a plastic or painted gutter/pipe or 450 mm (18 in) of painted eaves, an aluminium shield of at least 750 mm (30 in) in length should be fitted to the underside of the gutter/pipe or painted surface.

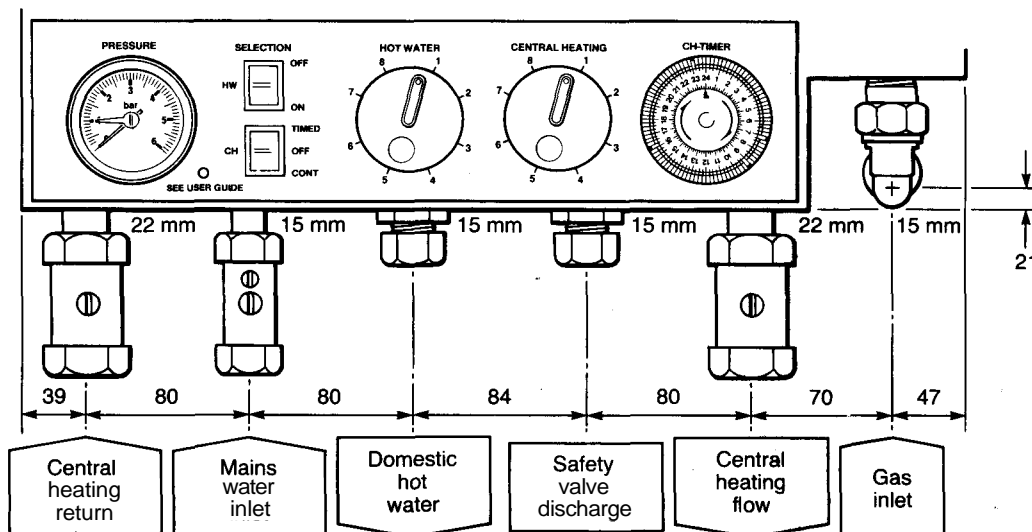
† If the terminal is fitted less than 2 m (6.6 ft) above a balcony, above ground or above a flat roof to which people have access then a suitable terminal guard must be provided and fitted.

A type KI protective guard is available from Tower Flue Components Ltd. at: Vale Rise, Tonbridge, Kent TN9 1TB. Tel: 0732 351555. The guard must be securely fitted to the wall and centrally located over the **flue** terminal. Refer to the Manufacturers instructions.

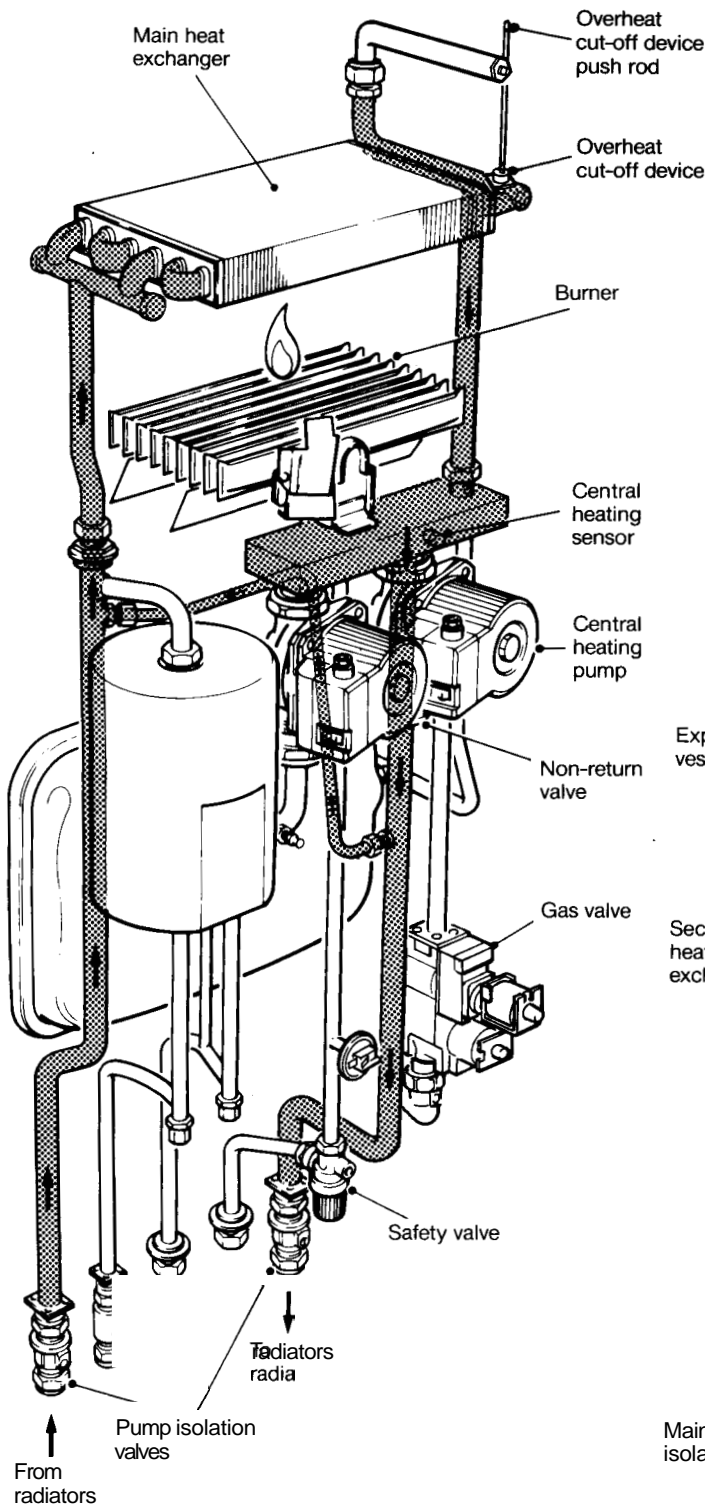
## 11. WATER AND GAS CONNECTIONS

All water connections are centred 40 mm from the wall. Compression fittings are supplied to accept 22 mm and 15 mm copper tubing to BS2871.

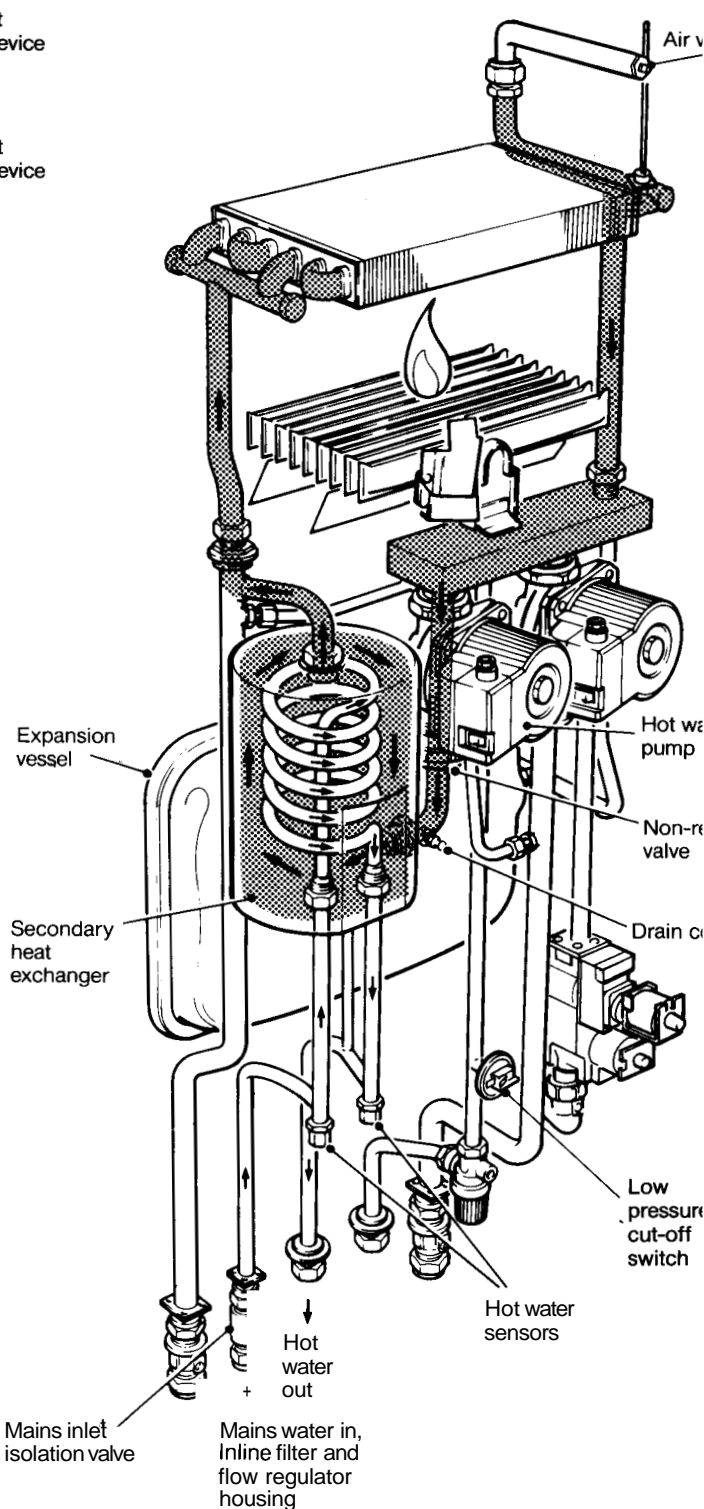
**Note:** All water connections (5) at the bottom of the boiler have been temporarily sealed with plastic plugs. Remove **ALL FIVE** plugs before any fittings are connected.



Central Heating On



Domestic Hot Water On



13. IMPORTANT INSTALLATION NOTES

1. A system by-pass is included in the Midas Sfi boiler.
2. Ensure that the isolating valves are open.
3. Mains electricity must always be connected to the boiler.
4. The water connections must be connected **as** shown in the water system schematics.
5. The maximum working pressure of the Midas Sfi is 10 bar (145 lbf/in<sup>2</sup>). If the mains water pressure is likely to exceed this, a pressure reducing valve must be fitted to the **cold** water inlet.
6. When Commissioning, the system and boiler must be vented and the pump running before the main burner is lit.
7. The system must be flushed **twice**; initially cold with all valves open, and then after the **first** heating.
8. In areas with hard or aggressive water we recommend that an inhibitor should be used for example Femox CP3. See Commissioning Instructions for details of use.
9. If used **on** open system a link must be connected between L1 & P1 on terminal **block**.
10. If there is a device which prevents the expansion of domestic water or if the domestic water supply is metered then a device must be fitted which will allow for the expansion of water.
11. If the domestic water inlet pressure is less than 13 bar, the flow regulator can be removed to **achieve** the full flow rate (see frame 50).

#### 14. SEALED SYSTEM REQUIREMENTS

1. The installation must comply with the requirements of BS6798 and BS5449.
2. A safety valve set to operate at 3 bar (45 lbf/in<sup>2</sup>) and a pressure gauge covering the range 0-4 bar (0 to 60 lbf/in<sup>2</sup>) are incorporated within the boiler.
3. A 12 litre expansion vessel to BS4814 is fitted and pre-charged to 0.5 bar (7.5 lbf/in<sup>2</sup>) is suitable for a system with a maximum water content of 120 litres (27 gal). An additional expansion vessel can be installed in the central heating system if required, refer to BS5449 Table 3 to calculate the size of the vessel.
4. Water lost from the system shall be replaced from a make-up vessel, and non return valve, mounted higher than the top of the system and connected as shown in fig. A. Where access to a make-up vessel would be difficult, make-up can be provided by pre-pressurising the system to 1.5 bar (22.5 lbf/in<sup>2</sup>) cold — see fig. B.

**Note:** Stop valves must comply with the requirements of BS1010:2.

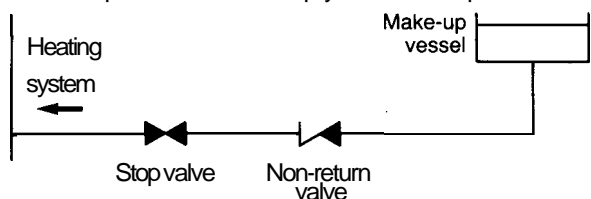


Fig A

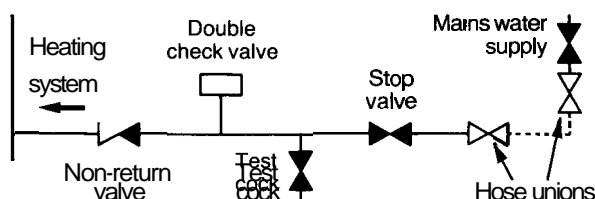


Fig. B

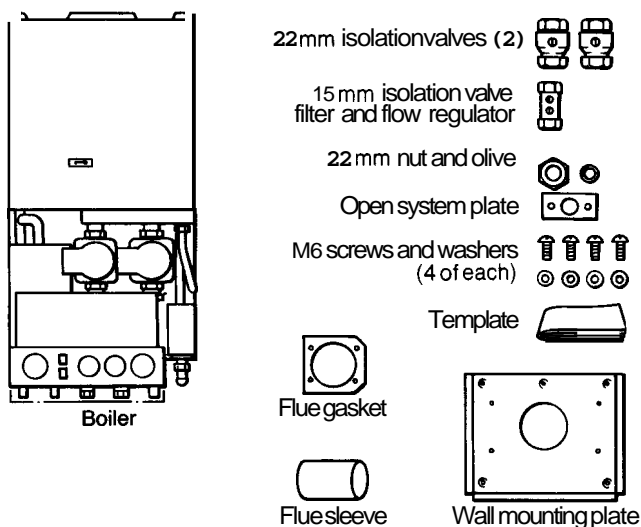
#### 15. OPTIONAL OPEN SYSTEM

This unit can be installed in an open system if required, in which case refer to frame 4 in the following installation procedure.

#### 16. INSTALLATION PROCEDURE

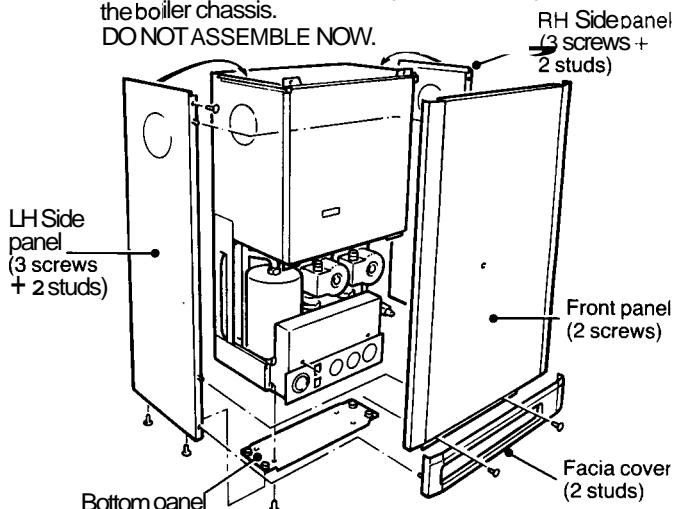
##### 1 OPEN THE MAIN BOILER PACK

The Midas Sfi is received in two packs. unpack the larger of the two. Remove the outer panels pack and place to one side, and check for the following contents.



##### CHECK THE OUTER PANELS PACK

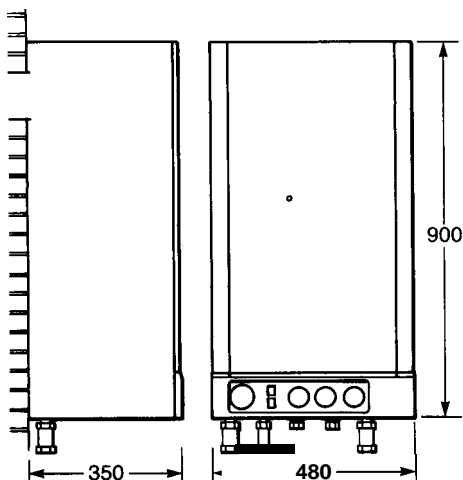
The outer panel pack contains the outer front and side panels together with the fascia cover and bottom panel. Keep these to one side in their packing until required. The illustration shows how they will eventually be fitted to the boiler chassis. **DO NOT ASSEMBLE NOW.**



##### BOILER DIMENSIONS

Clearances required for servicing:  
Top: 50 mm  
Bottom: 150 mm  
Front: 610 mm  
Side: 10 mm

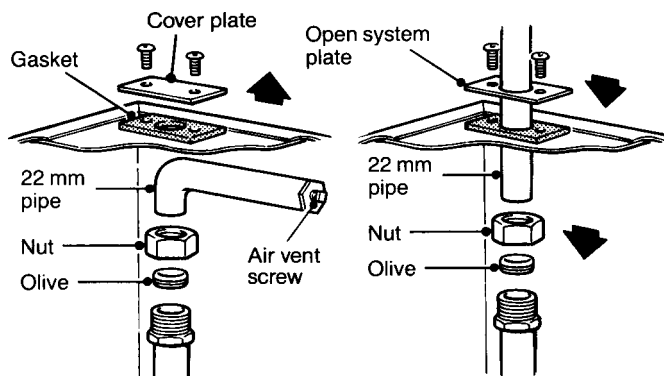
All dimensions in mm.



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

##### OPTIONAL OPEN SYSTEM

1. Remove inner case front and fan assembly, see frame 6.
2. Remove cover plate (2 screws), taking care not to damage gasket. Discard plate only.
3. Replace with open system plate supplied.
4. Loosen nut retaining the air vent. Discard.
5. The unit will now accept a 22 mm pipe, the room seal point being maintained by the plate gasket. Supplied with the boiler is an extra 22 mm nut and olive to connect the 22 mm combined cold feed and vent.



## PREPARE THE WALL

All dimensions in mm

5

310

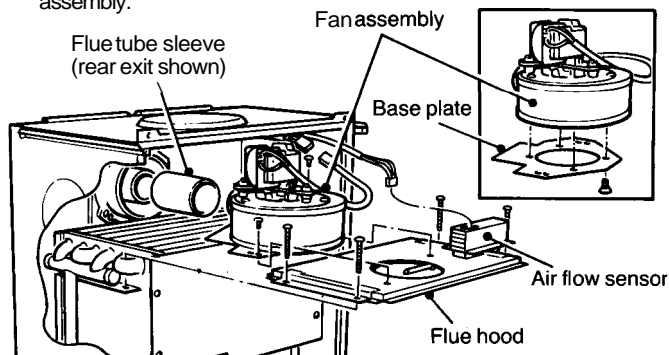
- hole and the 5 fixing holes for the wall mounting plate.
- Cut the 115 mm (4 1/2 in) dia. hole in the wall and drill and plug the fixing holes to accept 2 1/2" lg. No. 12 woodscrews.

Flue hole  
dia.  
Wall mounting plate

## PREPARE THE BOILER

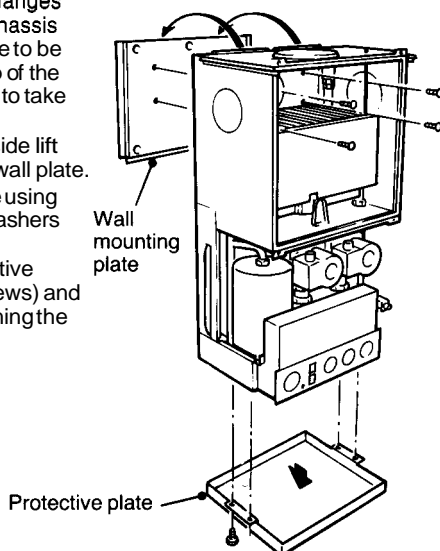
6

- Remove inner case front (4 screws).
- Disconnect the 3-way plug from the air flow Sensor and the 3-way plug and socket for the fan motor leads.
- Remove 2 screws securing fan assembly base plate to flue hood.
- Remove 4 screws securing flue hood to the combustion chamber.
- Carefully slide flue hood out from under the fan assembly (take care not to damage the gasket on the base of the fan assembly, renew if necessary before reassembly), then remove fan assembly.



## 7 SECURE THE BOILER TO THE WALL PLATE

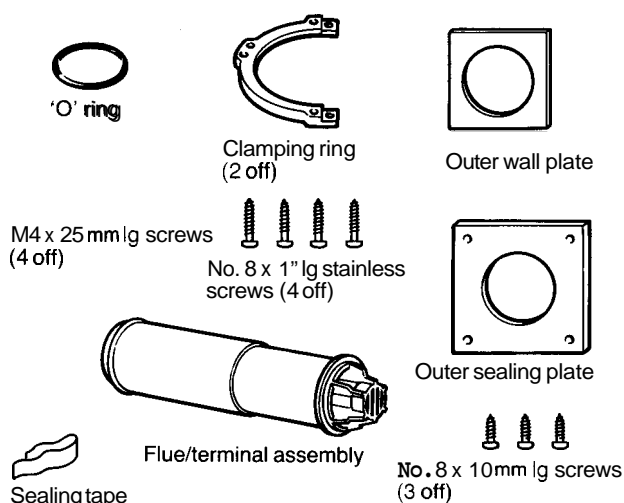
- The boiler has two flanges on the back of the chassis at the top. These are to be hooked over the top of the wall mounting plate to take the boiler's weight.
- With a man either side lift the boiler onto the wall plate.
- Secure to wall plate using the 4 screws and washers supplied.
- Remove the protective bottom plate (4 screws) and discard plate, retaining the screws.



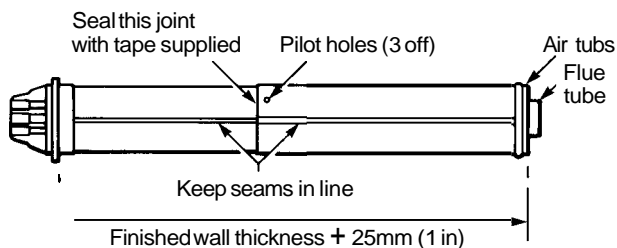
8

## UNPACK THE FLUE TERMINAL ASSEMBLY

Carefully unpack the flue terminal assembly. Do not discard the packing until all the items are found.



## 9 ADJUST THE LENGTH OF THE FLUE/TERMINAL ASSEMBLY

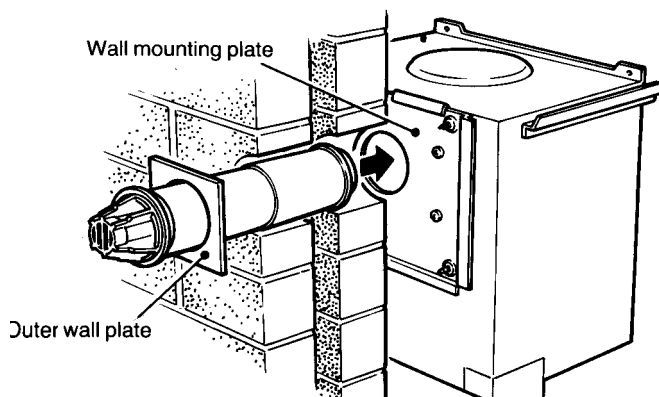


- Adjust the length of the flue/terminal assembly so that it is 25 mm (1 in) plus the finished wall thickness, from the back of the terminal flange to the end of the OUTER air tube as shown.  
**Note:** Ensure that the seams in the outer air tubes are in line.
- Drill through the three pilot holes, shown above, with a 2.8 mm drill and secure the two tubes together using the three No. 8 x 10 lg screws supplied with the flue/terminal assembly.  
**Note:** When drilling through the outer air tube take care not to damage the inner flue tube with the drill.
- Seal the centre joint with the tape supplied.

## 10 FIT THE FLUE/TERMINAL ASSEMBLY (1)

**Note:** If the wall is to be made good up to the terminal the outer wall plate need not be used.

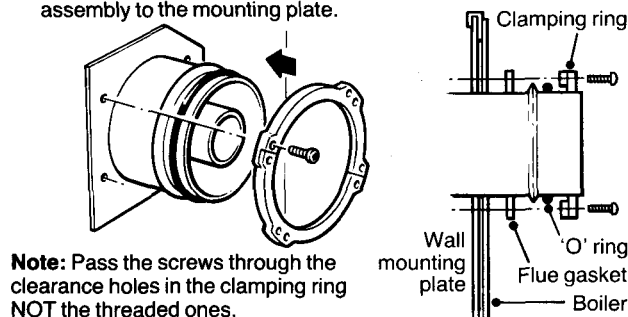
- Fit the outer wall plate over the flue/terminal assembly.
- From outside the building insert the flue/terminal assembly into the wall. Ensure that the slots in the end of the terminal are vertical.





## 11 FIT THE FLUE/TERMINAL ASSEMBLY (2)

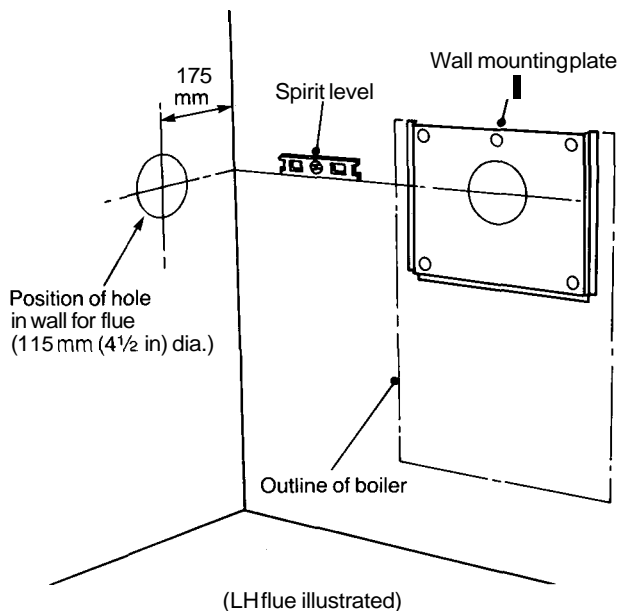
- From inside the building fit the flue gasket, supplied with the boiler, in position over the outer air tube and behind the swaged section. Fit the 'O' ring supplied with the flue, over the outer air tube and in front of the swaged section.
- Secure the flue/terminal assembly to the boiler using the two halves of the clamping ring as shown below. Ensure that the recessed side of the clamping ring is against the swaged section of the air tube.
- Secure with four M4 screws supplied, tightening to seal the flue assembly to the mounting plate.



**SIDE EXIT FLUE – Frames 13 to 18.**

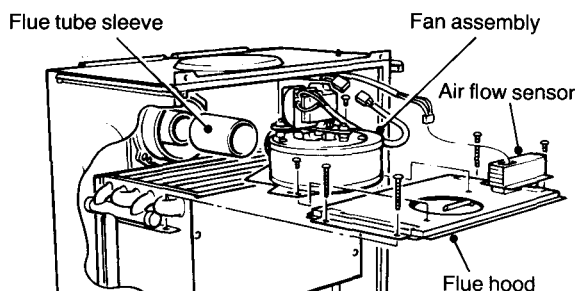
## 13 PREPARE THE WALL

- Decide upon the position of the boiler. Note that the maximum distance (using the longest flue/terminal assembly and two flue extensions) from the side of the white case to the OUTSIDE wall is 3012mm (118 1/2 in.).
- Using the template provided, mark the positions of the wall mounting fixing holes, the side of the boiler and the horizontal centre line of the flue. See frame 5.
- Continue the horizontal flue centre line across the wall and around onto the side wall. Ensure these lines are level.
- On the side wall, mark the vertical centre of the flue exit hole. This line will be 175 mm (6 7/8 in) from the wall on which the boiler is mounted.
- Check that the terminal position will meet the requirements given on page 5.
- Drill and plug the five wall mounting plate fixing holes to accept 2 1/2" lg No. 12 woodscrews.
- Cut the 115 mm (4 1/2 in) dia. hole in the side wall for the flue/terminal assembly in the position previously marked.
- Make a note of the finished wall thickness and the distance from the side wall to the side of the white case. These measurements are very important and are required in frame 15 when adjusting the flue/terminal assembly.
- Secure the wall mounting plate in position with five 2 1/2" lg No. 12 woodscrews (not supplied). Ensure it is level and the right way up.



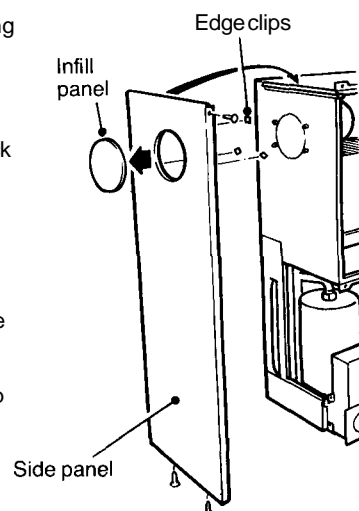
## 12 RE-ASSEMBLE THE BOILER

- Fit flue tube sleeve over the fan outlet and push fully home.
- Slide fan assembly into position ensuring that the flue tube sleeve fits over the terminal inner tube.
- Carefully slide flue hood into position under the fan assembly, taking care not to damage the gasket on the base of the fan assembly, and secure to combustion chamber (4 screws).
- Secure fan assembly to flue hood (2 screws).
- Reconnect airflow sensor 3-way plug and the 3-way plug and socket for the fan leads.
- PROCEED TO FRAME 19.**



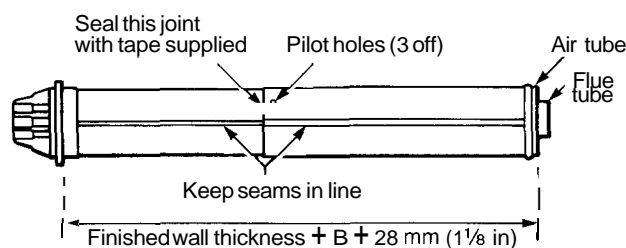
## 14 PREPARE AND FIT THE BOILER

- Prepare the boiler and secure to the wall mounting plate as described in frames 6 and 7.
- Unpack the flue/terminal assembly as framed in frame 8.
- Open the outer panels pack and take the side panel appropriate for a LH or RH exit flue.
- Push out the round infill panel after removing three edge clips.
- Fit the top edge of the side panel into position as shown.
- Secure side panel with top screw at this stage.



(LH flue exit illustrated.)

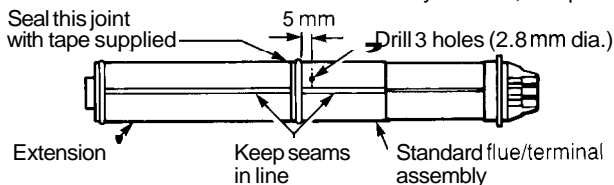
## ADJUST THE LENGTH OF THE FLUE/TERMINAL ASSEMBLY



(B = distance between the wall and the side of the boiler case)

- Using the measurements noted in frame 13, adjust the length of the flue/terminal assembly as shown above. Measurements should be taken from the back of the terminal flange to the end of the OUTER air tube as shown.  
**Note:** Ensure that the seams in the outer air tubes are in line.
- Drill through the three pilot holes shown above, with a 2.8 mm drill and secure the two tubes together using the three No. 8 x 10 lg screws supplied with the flue/terminal assembly.  
**Note:** When drilling through the outer air tube take care not to damage the inner flue tube with the drill.
- Seal the centre joint with the tape supplied.

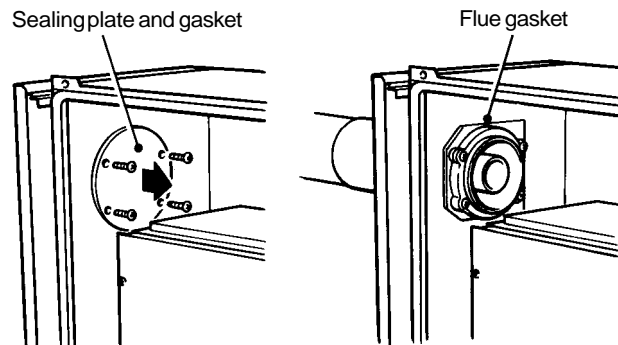
- FLUE EXTENSION** The flue extension kit allows the standard flue/terminal assembly to be extended by 965 mm (38 in) with one kit 1930mm (76 in) with two kits. A maximum of two flue extensions may be used, if required.



1. If the flue extension kit is used, connect the plain end of the extension to the swaged end of the standard flue/terminal. Ensure that the inner flue tube of the standard flue/terminal fits **INSIDE** the inner flue tube of the extension and the outer air tube fits **OVER** the air tube of the extension. Push fully home.  
**Note:** Ensure that the seams in the outer air tubes are in line.
2. Drill three equally spaced holes using a 2.8 mm drill in the position shown, through both the standard flue/terminal and the extension tube sleeve. Secure the two tubes together using the three No. 8 x 10lg screws supplied with the flue extension.  
**Note:** When drilling through the outer air tube take care not to damage the inner flue tube with the drill.
3. Seal the joints with the tape supplied with the flue extension.
4. Adjust the **OVERALL** length as described in frame 15. Secure and seal the joints.

## FIT THE FLUE/TERMINAL ASSEMBLY

1. Remove the 4 screws, sealing plate and gasket from the side through which the flue is to exit and use to seal the rear exit.
2. The flue is fitted in the same way as described in frames 10 and 11 but is secured to the chassis side from inside the fan compartment. (For ease of installation fit the lower half first.)  
**Note:** Ensure that the gasket has the edge with the corners removed towards the front of the boiler.



(LH flue illustrated)

## 18 REASSEMBLE THE BOILER

For both side exits the fan base plate has to be rotated 90° anticlockwise relative to the fan (viewed from below). Turnover the fan assembly and undo the 4 fixing screws holding the fan to the fan mounting plate, taking care not to damage either of the two gaskets, turn the fan mounting plate 90° anticlockwise and secure to the fan with the 4 screws.

### For Right Hand Exit

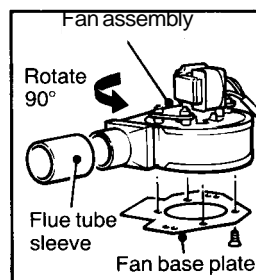
1. Position fan assembly over heat exchanger with its outlet pointing towards the flue exit hole.
2. Push flue tube sleeve onto fan outlet.
3. Carefully slide flue hood under the fan assembly, taking care not to damage the gasket on the base of the fan assembly, with the air flow sensor left of the fan.
4. Fit the free end of the flue tube sleeve over terminal inner tube and secure fan assembly to flue hood.

### For Left Hand Exit

1. Position fan assembly over heat exchanger with its outlet pointing toward the flue exit hole.
2. Cut flue tube sleeve to a length of 60mm and push onto fan outlet.
3. Carefully slide flue hood under fan assembly, taking care not to damage the gasket on the base of the fan assembly, with air flow sensor right of the fan.
4. Fit the free end of the flue tube sleeve over terminal inner tube and secure fan assembly to flue hood.

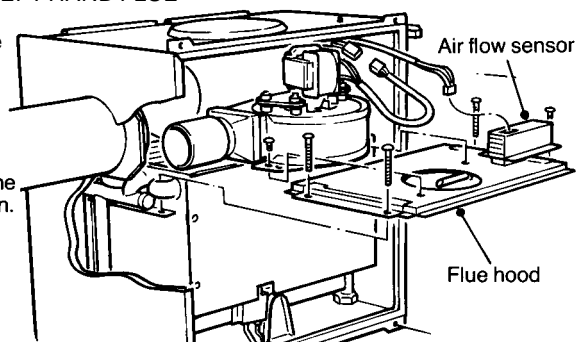
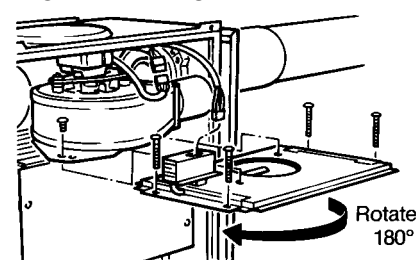
### For Both Exits

1. Secure flue hood to combustion chamber (4 screws).
2. Reconnect 3-way plug and socket for the fan motor leads.
3. Reconnect the 3-way plug to air flow sensor.



LEFT HAND FLUE

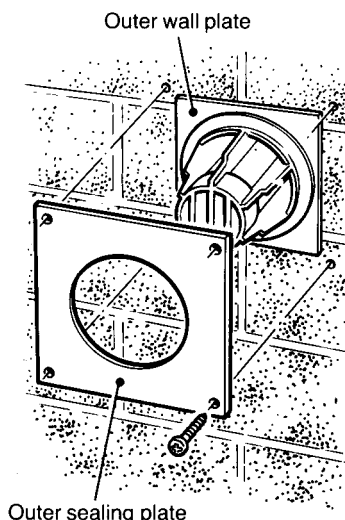
RIGHT HAND FLUE



## 19 FIT THE OUTER SEALING PLATE

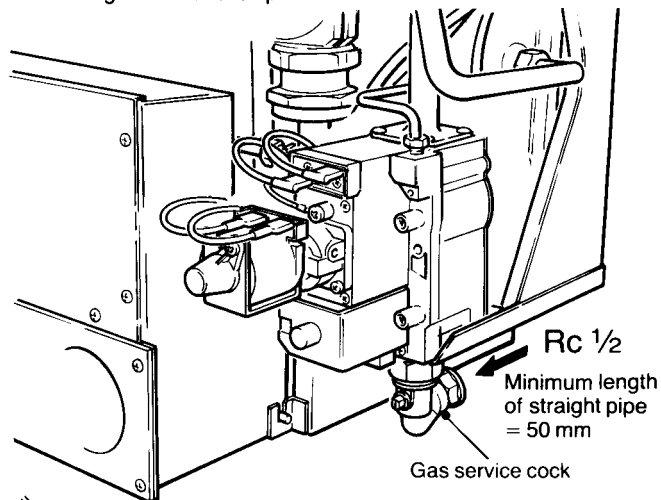
**Note:** The outer sealing plate need not be used if the wall is made good up to the terminal.

1. Place the outer sealing plate over the terminal and mark the position of the four fixing holes.
2. Remove the sealing plate and drill and plug the fixing holes, suitable for 1" lg No. 8 woodscrews.  
**Note:** The terminal should be covered before drilling to prevent debris entering the terminal.
3. Remove any covering from the terminal. Position the sealing plate over the terminal and secure to the wall with four 1" lg No. 8 screws (supplied with the flue assembly).



## 20 CONNECT THE GAS SUPPLY

1. Connect gas supply via a straight connector to the service cock. (It will be necessary to lower the control box (see frame 52) to gain access to the union nut.)
2. Test for gas soundness up to the service cock.



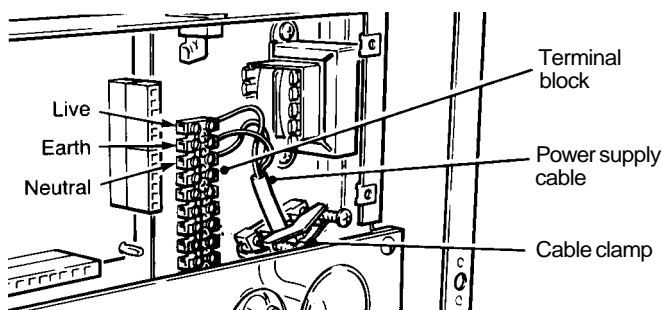
## 21 CONNECT THE POWER SUPPLY CABLE

Referral also to page 3, section 5.

1. Remove the electrics cover (4 screws) and remove the fascia panel (4 screws) and carefully pull forward (see frame 42).
2. Slacken the cable clamp (2 screws) and feed the power supply cable through it to connect with the terminal block as follows: Brown lead to 'L' (Live)  
Blue lead to 'N' (Neutral)  
Green/yellow lead to  $\varnothing$  (Earth)
3. Take up excess slack in the power supply cable between block and clamp, then tighten the cable clamp screws.

**Note:** When wiring in external controls, refer to wiring diagram on page 20. Ensure all cables are secured.

4. Leave enough cable for the control box to hinge freely.
5. When connecting the power supply cable, ensure that the length of earth lead is such, that if the power supply cable slips out of the cable clamp, the live and neutral leads become taut before the earth lead.
6. Replace electrics cover.

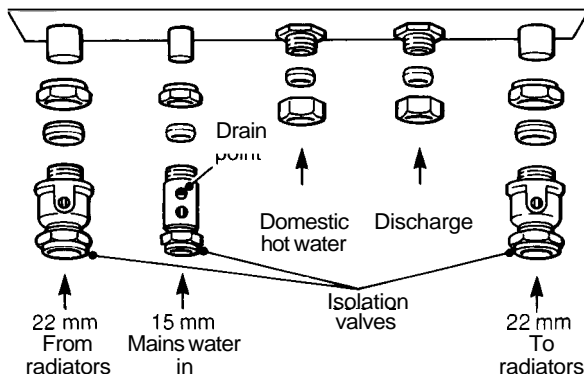


**IMPORTANT NOTE** When a room thermostat is to be fitted remove link R IN to R OUT and connect the room thermostat as shown on the back page of this booklet.

## CONNECT THE WATER SUPPLY

1. Make connections as shown below. For dimensions see page 5, section 12.
2. Fill the central heating system and open mains water supply. Ensure all valves are open and thoroughly flush the system through.  
Refill the system and pressurise to 1.5 bar (sealed systems only).  
Check for leaks and rectify where necessary.

**Note:** Any discharge from the safety valve must be directed clear of the boiler to a drain in such a manner that it may be seen but cannot cause injury to persons or property.



**Do not forget to remove the five plastic plugs from the pipe ends.**

**Note:** If the mains pressure is liable to exceed 10 bar (145 lbf/in<sup>2</sup>) then a pressure reducing valve must be fitted. For domestic water inlet pressures of between the minimum pressure of 0.4 bar and 1.3 bar the flow regulator should be removed so that the maximum flow rate can be obtained (see frame 58). The filter should be left in place in order to protect components within the appliance. Above 1.3 bar the flow regulator must be left in place.

## 17. COMMISSIONING

To vent the primary water circuit of air it is necessary to interrupt the normal procedure of the boiler. This will prevent the boiler from attempting to ignite the gas and from functioning normally.

By using the switch marked 'Normal/Purge' situated on top of the control box and the programme select switches on the front fascia the system can be purged of air.

Finally, ensure that the system is pre-pressurised to 1.5 bar (sealed systems only).

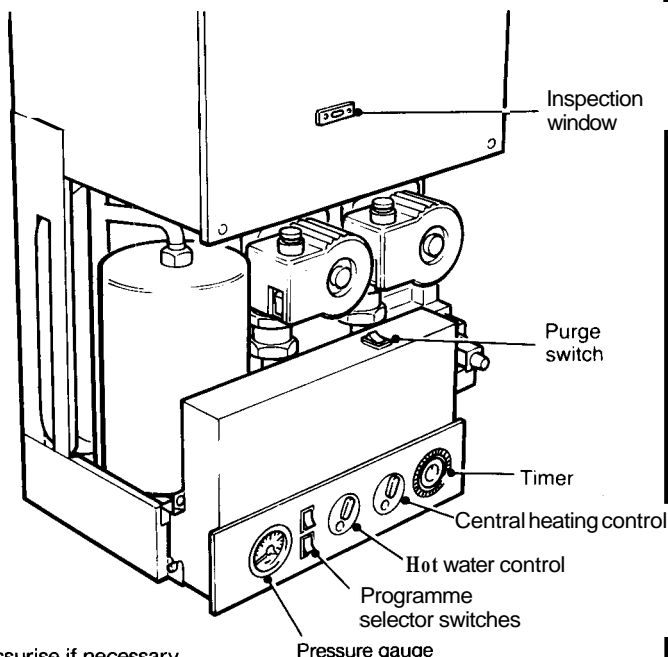
Proceed as follows:

## PURGE THE BOILER OF AIR

1. Ensure gas cock is closed (the cock is closed when the operating slot is horizontal).
2. Ensure electricity supply is switched off.
3. Set purge switch at 'PURGE'.
4. Set programme selector switches to 'HW off' and 'CH off'.
5. For sealed systems loosen the air vent bleed screw 2 to 3 turns. Refer to diagram on page 6 for the position of the air vent.
6. Switch on the electricity supply.
7. By switching the hot water selector switch to the 'ON' position and back it is possible to pulse the hot water pump. Similarly, switching the CH selector switch to the 'CONT' position will start the CH pump (provided the DW switch is in the OFF position).
8. Once the air has been eliminated close the air vent bleed screws. Set both selector switches to 'OFF' and the purge switch to NORMAL.

**Note:** When the electricity is first switched on there is a delay of approximately 30 seconds whilst the electronics 'warm up' before the boiler responds to any commands with the switch set to NORMAL. During this 'warm up' period the pumps will operate provided the switch is in the PURGE position.

9. Turn off the electricity supply.
10. Sealed systems only — Check that the system pressure is 1.5 bar. Repressurise if necessary.



## PURGE THE SUPPLY AND CHECK THE PILOT FLAME

### Purge the gas supply

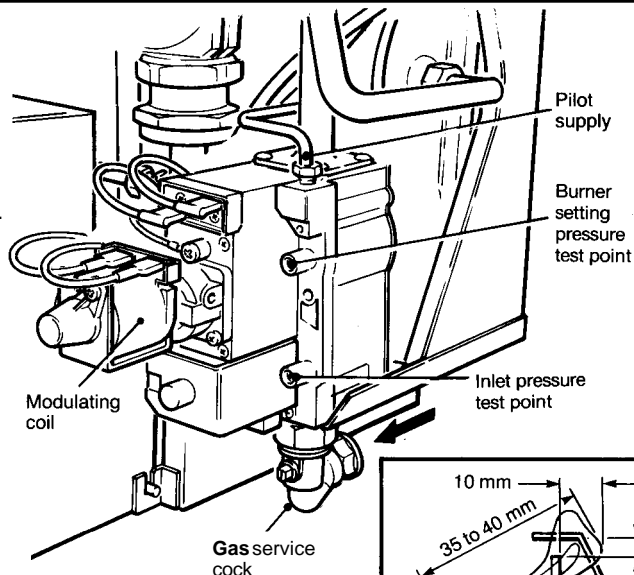
1. Loosen the gas valve inlet pressure test point screw one turn.
2. Turn on the gas supply and open the boiler service cock to purge in accordance with BS6891 (the cock is open when the operating slot is vertical). Retighten test point screw and test for gas soundness.

### Check the pilot flame

1. Remove combustion chamber front plate together with front insulation panel (4 screws). See illustration, frame 26.
2. Remove pilot shield (2 screws). See illustration, frame 32.
3. Disconnect one of the violet leads from the gas valve modulating coil.
4. Switch on the electricity supply and set the hot water and central heating controls to position 8.
5. Open a hot water tap fully and set programmer switches to 'HW on', 'CH off'. The unit will go through the ignition sequence and the pilot will light, a second or so after the pilot is lit the main gas solenoid will open and the main burner will light (at a low rate).

**Note:** The pilot burner is turned off whenever the main burner is off.

6. The pilot throttle is factory set fully open. Check that the pilot flame is 35 to 40 mm long, envelops the electrode and extends 10 mm past it. Adjust if necessary (clockwise to reduce the flame).
7. Test the pilot supply connections for gas soundness.
8. Turn off the hot water tap and select programme 'CH off/HW off'.
9. Replace the pilot shield.



10. Replace combustion chamber front plate and front insulation panel (4 screws). Proceed to frame 25.

## CHECK THE BURNER SETTING PRESSURES

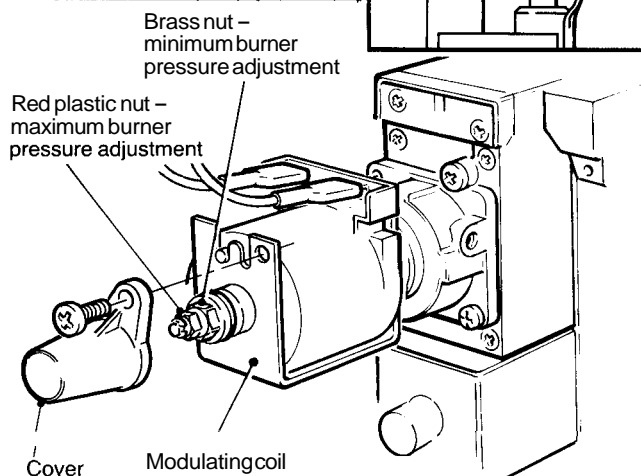
Following on from frame 24:

1. Ensure that the programmer switches are set to 'CH off', 'HW off'. Loosen the burner setting pressure test point screw on the gas valve and connect a pressure gauge.
2. Open a hot water tap fully and select 'CH off', 'HW on'. The main burner will light at the minimum input. Check that the setting pressure is 1.8 mbar  $\pm 0.2$  (0.7 in wg  $\pm 0.1$ ). To adjust the minimum setting pressure remove the gas valve modulating coil cover and adjust the brass nut, ensuring that the red plastic nut does not move (anticlockwise to decrease the pressure).

3. Turn off the hot water tap, switch off the electricity supply and reconnect the violet lead to the gas valve.
4. Switch on the electricity supply and open a hot water tap fully. The main burner will light at the maximum input. Check that the setting pressure is 16.0 mbar (6.4 in wg). To adjust the maximum setting pressure adjust the red plastic nut, ensuring that the brass nut does not move (anticlockwise to decrease the pressure).

**Note:** If either the minimum or maximum setting pressure are adjusted always recheck the other one and always switch off the electricity supply when removing and replacing the modulating coil lead.

5. Turn off the hot water tap and select programme 'CH off', 'HW off'.
6. Disconnect the pressure gauge, retighten the test point screw and replace the modulating coil cover.



7. Select programme 'CH off', 'HW on': if the main burner does not light open a hot water tap fully. With the main burner alight test the pressure test point screw for gas soundness.
8. Select programme 'CH off', 'HW off' and turn off the hot water tap it was opened.
9. Replace the inner case front (4 screws) ensuring the case seal is intact. Tighten sufficiently to form a seal.

## 18. BALANCING THE SYSTEM

It is recommended that the system is balanced with the central heating output at minimum. This fixed low rate output may be maintained longer than 5 minutes provided the following procedure is adopted.

1. Switch off the electricity supply and disconnect a violet lead from the gas valve modulating coil.
2. Switch on the electricity supply, select programme 'CH cont', 'HW off', and turn the central heating control to position 8.
3. Balance the system.
4. Switch off the electricity supply and reconnect the violet lead to the gas valve modulating coil.
5. Switch on the electricity supply and check that the boiler operates correctly.
6. Select programme 'CH cont': 'HW off' and check that the boiler operates correctly.

**Note:** During the 5 minutes heating operation at low fan and low gas rate the boiler may be turned off by using the central heating control. However if during this period the central heating control is restored to the original position the boiler will not restart until the remainder of the 5 minutes has elapsed.

The boiler can be restarted immediately for a further 5 minutes operation on low fan and low gas rate by switching the Purge/Normal switch to Purge, wait a few seconds and then set it back to Normal.

When the system has been tested, drain the water while it is still hot in order to complete the flushing process. Where an inhibitor is added to the system, for example Fernox CP3 for use with copper tube boilers, it should be used in accordance with their instructions. Where the boiler is used on an old system, special care is required. The system should be drained and flushed out, ensuring that all the radiators are drained. When filling, add the correct quantity of inhibitor for the system volume. As a guide a 3 radiator system will on average require about 2 1/4 pints, a 6 radiator system about 4 1/4 pints and a 9 radiator system about 6 1/4 pints. After the system has been filled, vent and make a final check for water soundness.

## 19. FINAL ASSEMBLY AND HANDING OVER THE INSTALLATION

1. Fit and secure the remaining outer panels and controls cover with reference to frame 2.
2. Set the timer to the correct time (do not rotate the dial anticlockwise). Hand the User Instructions to the User and instruct 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 inoperated during frost conditions.
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 qualified service engineer or the local Gas Region.
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 circuit.

## 20. ANNUAL SERVICING

The following aspects of the boiler and installation should be examined, and rectified as necessary.

1. Run the boiler and check the operation of its controls.
2. Check the installation of the flue terminal and ensure it is not obstructed.
3. Remove the combustion fan and ensure that it is clean and free of debris. Check the impeller for freedom of rotation.
4. Remove the combustion chamber front and check if the burner or heat exchanger requires cleaning.
5. Examine the main injector orifice and ensure it is clear and undamaged.
6. If a sufficiently large pilot flame cannot be achieved examine the pilot injector orifice to ensure it is clear and undamaged.
7. Inspect water filter, clean or replace if damaged.
8. When refitting the inner case check that the seal is in good condition and ensure that it compresses satisfactorily.

On completion of the service run the boiler and ensure that it operates satisfactorily.

The boiler data plate is positioned on the inner case.

The procedure for Annual Servicing is given in frames 26 to 28.

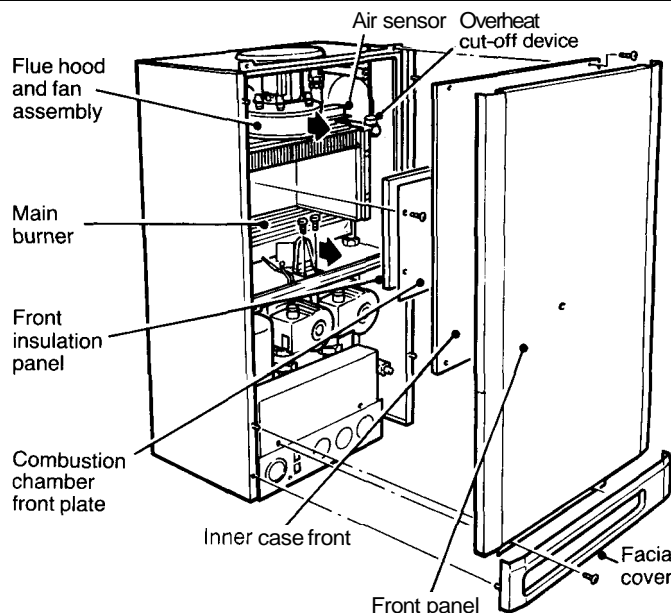
**WARNING:** Before commencing work: Set the programme selector switches to 'CH off', 'HW off'!  
Allow the boiler to cool and isolate the electricity supply.  
Turn off the gas supply at the gas service cock.

**IMPORTANT:** Always test for gas soundness after servicing any gas carrying components and check controls functions.



## DISMANTLING

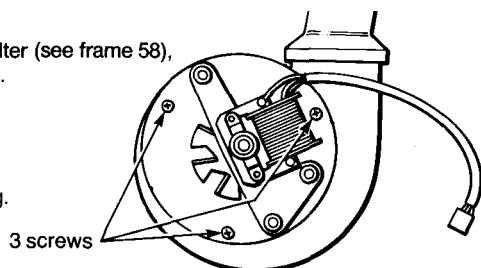
1. Pull off fascia cover.
2. Remove front panel. Undo 2 screws and pull off front panel. Keep these two decorative items safe from damage.
3. Remove inner case front (4 screws).
4. Disconnect plug coming from the fan motor.
5. Disconnect the plug from the air flow sensor.
6. Remove flue hood and fan assembly as described in frame 6, steps 3 to 5.  
**Note:** On side exit units it is first necessary to slide the hood and fan assembly sideways to disengage the flue tube.
7. Remove combustion chamber front plate together with the front insulation panel (4 screws).
8. Unscrew nuts securing pilot supply and electrode to the pilot burner body.
9. Remove pilot shield (2 screws). See frame 32, for illustration of pilot assembly.
10. Detach pilot burner body (1 screw) and lift away, taking care to retain the pilot injector.
11. Remove 2 securing screws and withdraw main burner.



## CLEANING THE BOILER

1. Brush the heat exchanger from above and below using a suitable brush. Brush back to front **NOT** sideways. Remove any fallen deposits from the boiler base.
  2. Turn the burner upside down and tap gently to remove any debris.
  3. If necessary clean pilot burner and pilot electrode with a fine wire brush and main and pilot injector by blowing/washing (see frames 30 and 31). Do **NOT** clear the injectors with a pin or wire.
  4. Gently remove fan motor/impeller from fan case (3 screws). Examine, checking that the impeller runs free and clean if necessary.
- Water Filter**
5. Remove water filter (see frame 58), clean or replace.

**Note:**  
Ensure correct motor orientation when reassembling.



## REASSEMBLY

1. Refit parts in reverse order of dismantling. Do not forget to replace the earth lead when securing the pilot burner in position. Ensure that the seal is intact when refitting the inner case front.
2. Set timer to the correct time.
3. Reconnect electricity supply.
4. Turn on gas supply at the gas cock.
5. Select program 'CH off' 'HW inst' and set the hot water and central heating controls to position 8. Check operation of main burner and pilot by opening a hot water tap fully. The unit will go through the ignition sequence and the pilot will light, a second or so after the pilot is lit the main gas solenoid will open and the main burner will light. (The pilot is turned off whenever the main burner is off). The electronics may need up to 30 seconds to warm up.
6. Return the controls and programme selector to their original settings.

## 21. REPLACEMENT OF PARTS

The procedure for the replacement of parts is given in frames 29 to 61.

**WARNING:** Before commencing work: Set the programme selector switch to 'CH off', 'HW off'!  
Allow the boiler to cool and isolate the electricity supply.  
Turn off the gas supply at the gas service cock.

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

**NOTE:** When the electricity is first switched on there is a delay of approximately 30 seconds whilst the electronics 'warm up' before the boiler responds to any commands.

Whenever the boiler central heating circuit is drained, the sealed system pressure (if applicable) must be checked upon completion. Refer to the commissioning instructions, page 11, for pressurising and purging the system.

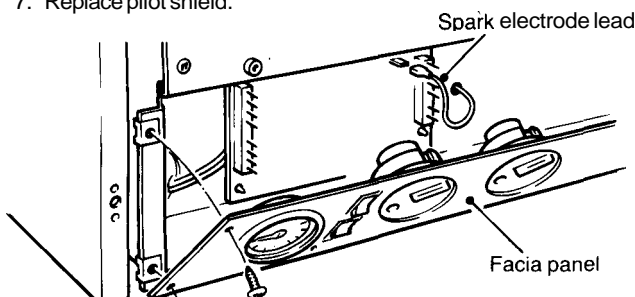
All operations require the facia cover and front panel to be removed — see frame 26, steps 1 and 2.

Frames 29 to 37 involve replacement of components within the room sealed section of the boiler. All necessitate removal of the inner case front — see frame 26, step 3 — care to be taken as the seal may partially adhere to the panel.

### TO REPLACE THE SPARK ELECTRODE

Refer to frame 32 for illustration.

1. Unscrew nut securing electrode to the pilot burner body. Loosen the pilot burner body (1 screw) to aid removal of the electrode.
2. Remove pilot shield (2 screws) and clamping bracket (2 screws).
3. Detach the facia panel (4 screws) and carefully pull forward.
4. Pull off spark electrode lead from the ignition control board, swing control box down and withdraw through the back of the control box.
5. Reassemble in reverse order with new electrode but leave the pilot shield off.
6. Check spark gap (see frame 24).
7. Replace pilot shield.



### TO REPLACE THE PILOT INJECTOR OR PILOT BURNER

Refer to frame 32 for illustration.

#### Pilot Injector

1. Unscrew nut securing pilot supply to the pilot burner body.
2. Remove pilot shield (2 screws) and clamping bracket (2 screws).
3. Detach the pilot burner body (1-screw) and lift away to carefully remove the pilot injector.
4. Reassemble in reverse order with new pilot injector leaving the pilot shield off and test for gas soundness.
5. Check pilot flame (see frame 24).
6. Replace pilot shield.

#### Pilot Burner

1. Unscrew nuts securing electrode and pilot supply to the pilot burner body.
2. Remove pilot shield (2 screws) and clamping bracket (2 screws).
3. Detach pilot burner body (1 screw) and lift away, taking care to retain the pilot injector.
4. Reassemble in reverse order with complete new pilot burner body leaving the pilot shield off and test for gas soundness. Do not forget to replace the earth lead when securing the pilot burner in position.
5. Check spark gap and pilot flame (see frame 24).
6. Replace pilot shield.

### TO REPLACE THE BURNER OR BURNER INJECTOR

**NOTE:** The burner fitted may be either Furigas (silver) or Bray (blue). Either may be used as a replacement for the other.

#### Burner

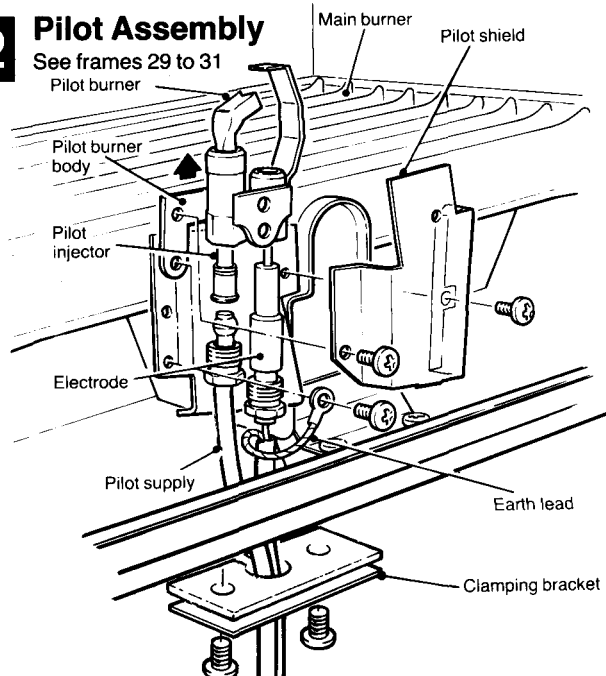
1. Remove burner as described in frame 26, steps 7 to 11.
2. Reassemble in reverse order with new burner.

#### Burner Injector

1. Remove burner as described in frame 26, steps 7 to 11.
2. Unscrew injector from the manifold (see frame 27 for illustration).
3. Replace with new injector, using a small amount of sealing compound.

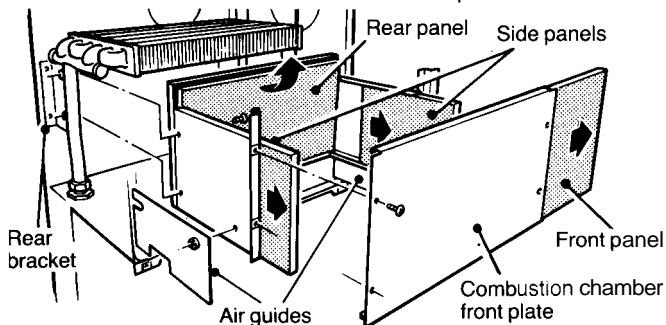
## 32 Pilot Assembly

See frames 29 to 31



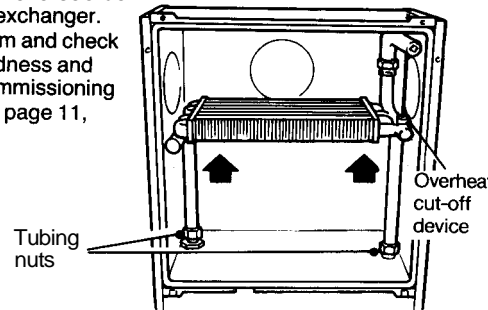
## TO REPLACE THE COMBUSTION CHAMBER INSULATION PANELS

1. Remove flue hood assembly and burner as described in frame 26, steps 4 to 11.
2. Slide out the two side panels.
3. Carefully detach the combustion chamber and air guides from the two rear brackets (6 screws).
4. Remove the rear panel by pulling forward at the top, then lifting out. Fit new panel, locating lower edge first.
5. Refit chamber and air guides onto the two rear brackets (6 screws).
6. Carefully slide in two new side panels.
7. Reassemble in reverse order with new front panel.



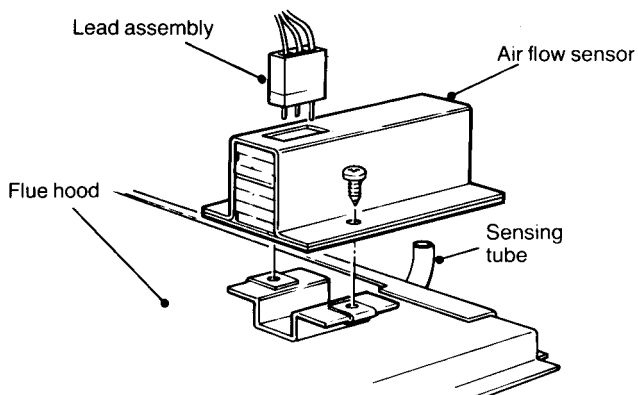
## 34 TO REPLACE THE MAIN HEAT EXCHANGER

1. Remove combustion chamber as described in frame 33, steps 1 and 3.
2. Close the system isolation valves. Drain the boiler down using the safety valve. See Water System, page 6.
3. Remove the overheat cut-off device, see frame 36.
4. Loosen two tubing nuts and remove heat exchanger (sealed system).
5. Loosen two tubing nuts and open vent connection and remove heat exchanger (open system).
6. Reassemble in reverse order with new heat exchanger. Refill the system and check for water soundness and refer to the Commissioning instructions on page 11, frame 23.



## TO REPLACE THE AIR FLOW SENSOR

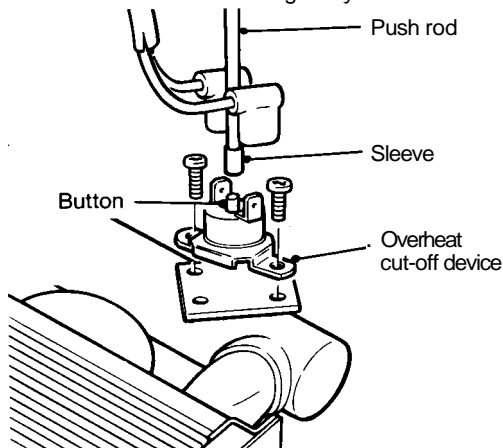
1. Remove two screws retaining air flow sensor to associate metalwork and carefully pull free from sensing tube.
2. Unplug from the lead assembly and replace with new sensor.
3. Reassemble in reverse order.



## TO REPLACE THE OVERHEAT CUT-OFF DEVICE

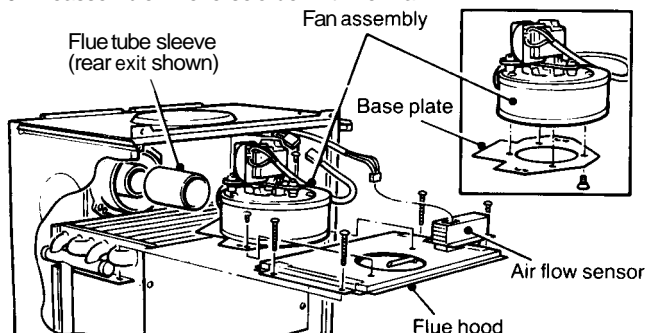
Overheat cut-off device is marked with white paint.

1. Remove the push-rod & button assembly from the cut-off device.
2. Remove the two push-on tags to the cut-off device.
3. Remove the two retaining screws.
4. Reassemble in reverse order. The tags may be refitted either way.



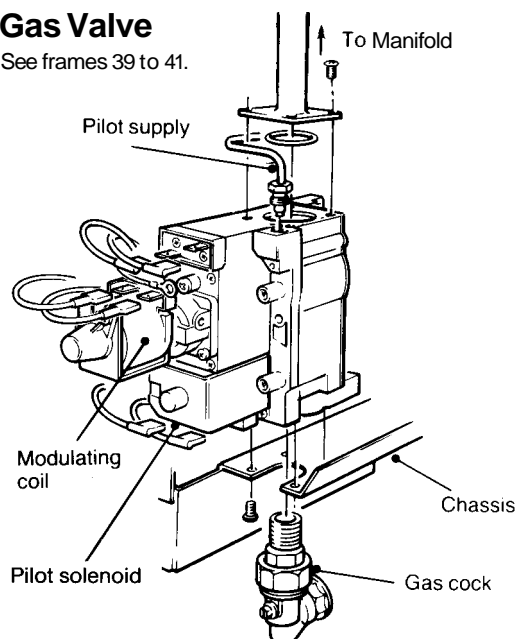
## TO REPLACE THE FAN

1. Disconnect plug/socket coming from the fan motor and lead assembly to the air flow sensor.
2. Remove 2 screws securing fan assembly to flue hood, and 4 bolts securing flue hood to combustion chamber.
3. Carefully slide flue hood out from under the fan assembly, take care not to damage the gasket on the base of the fan assembly, renew if necessary before reassembly, then remove fan and pull off the flue tube sleeve.
4. Separate the fan from its base plate (4 screws).
5. Reassemble in reverse order with new fan.



## Gas Valve

See frames 39 to 41.



## TO REPLACE THE GAS VALVE

Refer to illustration, frame 38.

1. Ensure that the gas supply is off and electricity supply is isolated.
2. Remove bottom case panel (8 screws).
3. Swing down control box (2 screws), see frame 52.
4. Remove CH pump to gain access to the top fixing screws (see frame 55).
5. Remove grey cover (1 screw) from the main solenoid to disconnect lead. Unscrew earth terminal and pull off the tag terminals (polarity not important).
6. Disconnect tag terminals from the modulating coil and pilot solenoid.
7. Disconnect pilot supply.
8. Remove 8 screws retaining the gas valve in position (4 socket type on top, 4 underneath to the chassis).
9. Transfer the union to the new valve using a little jointing compound.
10. Using new 'O' ring between manifold and valve, reassemble in reverse order taking care not to connect terminals to the wrong solenoid, refer to the wiring diagram on page 20.
11. Refill the water system and check for water soundness.
12. Test for gas soundness and refer to Commissioning instructions, page 12, frames 24 and 25.

## TO REPLACE MAIN GAS VALVE OPERATING SOLENOID

Refer to illustration, frame 38.

Ensure that the gas supply is off and electricity supply is isolated.

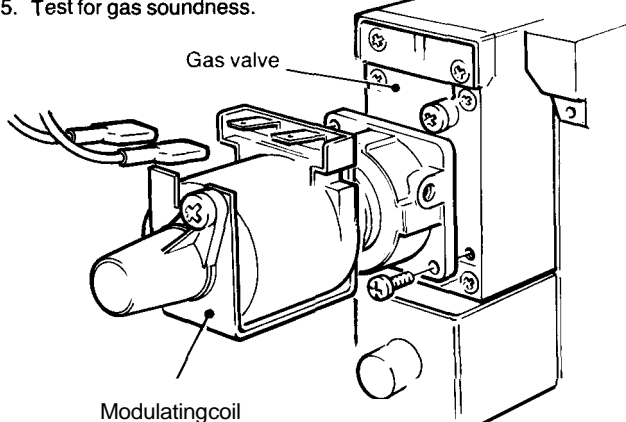
1. Disconnect the two tag terminals to the modulating coil.
2. Remove grey cover (1 screw) from the solenoid. Disconnect the earth terminal and tag terminals (polarity not important).
3. Remove the two screws retaining the modulating coil and carefully lift off the coil.
4. Remove the four screws securing the solenoid to the gas valve and carefully lift off the solenoid.

### Reassembly

Reassemble in reverse order with a new solenoid. Test for gas soundness and burner pressure, refer to Commissioning instructions, page 12, frames 24 and 25.

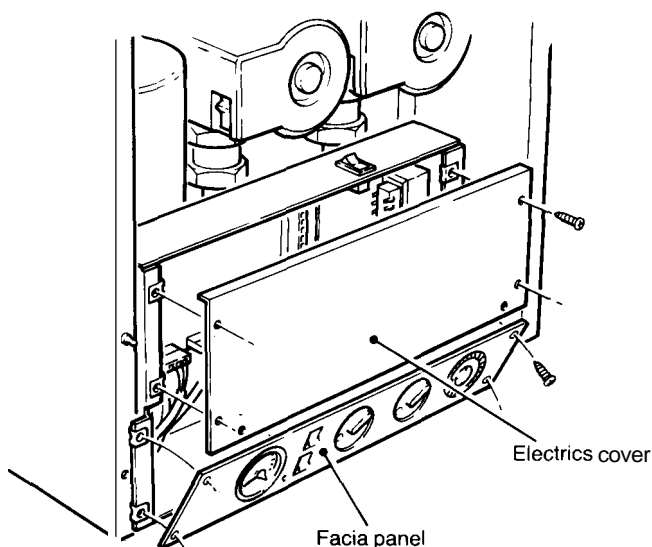
## TO REPLACE THE MODULATING COIL

1. Ensure that the gas supply is off and electricity supply is isolated.
2. Disconnect the two tag terminals.
3. Remove the two screws and carefully lift off the complete assembly.
4. Reassemble in reverse order with new coil.
5. Test for gas soundness.



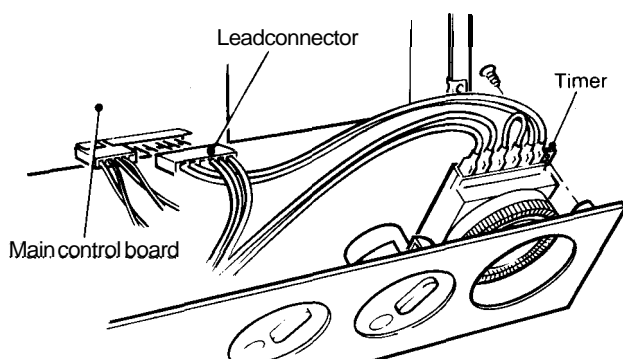
## 42 Access to the Electrics

See frames 43 to 51.



## TO REPLACE THE PROGRAMME TIMER

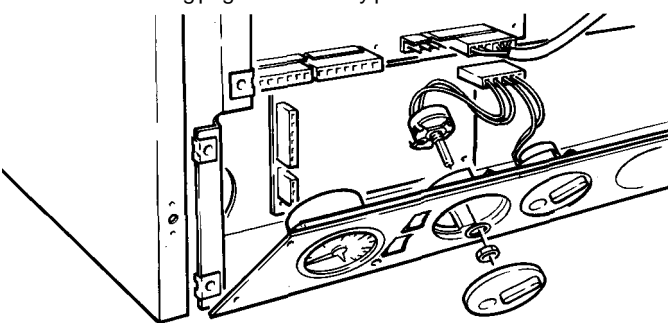
1. Detach the facia panel (4 screws), carefully pulling it forward, and remove the electrics cover (4 screws). See frame 42.
2. Noting their positions, remove all lead terminals from the programme timer.
3. Remove timer (3 screws).
4. Reassemble with new timer in reverse order. Check connections with diagram on page 20.



## TO REPLACE POTENTIOMETER AND LEAD ASSEMBLY

The controls for Central Heating and Hot Water are wired to the same connector and must both be replaced.

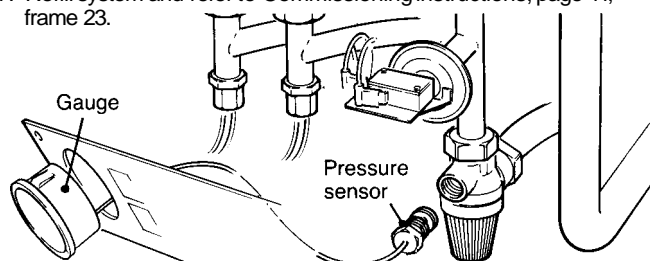
1. Detach the facia panel (4 screws), carefully pulling it forward, and remove the electrics cover (4 screws). See frame 42.
2. Pull off the lead connector from the main control board.
3. Push off both front knobs from behind through the holes in the facia panel.
4. Unscrew 2 front mounting nuts and remove both potentiometers.
5. Reassemble in reverse order with new potentiometers, ensuring that the locating pegs are correctly positioned.





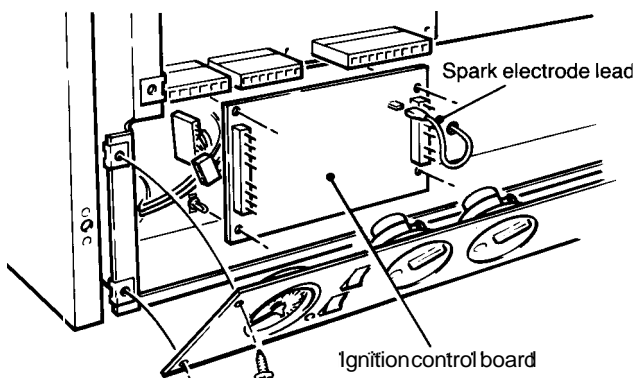
## TO REPLACE THE PRESSURE GAUGE

1. Close off the system isolation valves. Remove bottom case panel (see frame 2), drain the primary circuit by opening the safety valve.
2. Remove the bottom case panel (8 screws) and remove 2 retaining screws to allow control box to swing down. See frame 50.
3. Remove the pressure sensor capillary from pressure relief valve body.
4. Detach the fascia panel (4 screws) and carefully pull forwards. Feed the capillary through.
5. Compress clips on body of gauge and push through.
6. Reassemble with new gauge in reverse order.
7. Refill system and refer to Commissioning instructions, page 11, frame 23.



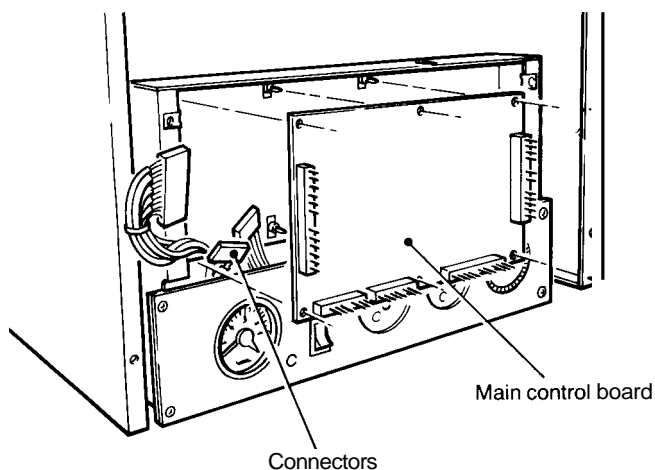
## TO REPLACE THE IGNITION CONTROL BOARD

1. Detach the fascia panel (4 screws), carefully pulling it forward, and remove the electrics cover (4 screws). See frame 42.
2. Pull off the connectors and the spark electrode lead from the ignition control board.
3. Pull the board to disengage from the support pillars and remove.
4. Reassemble in reverse order with new ignition control board.



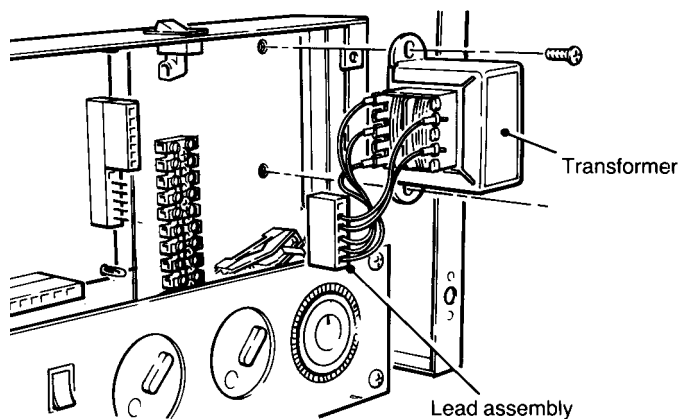
## TO REPLACE THE MAIN CONTROL BOARD

1. Remove the electrics cover (4 screws). See frame 42.
2. Carefully pull off all connectors from the main control board.
3. Pull the board to disengage from the support pillars and remove.
4. Reassemble in reverse order with new main control board.



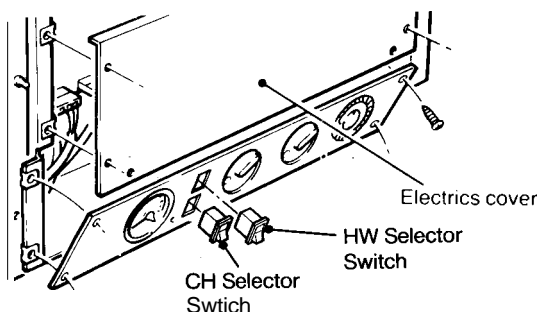
## TO REPLACE THE TRANSFORMER AND LEAD ASSEMBLY

1. Remove the electrics cover (4 screws).
2. Pull off the transformer lead assembly from the main control board.
3. Remove transformer (2 screws) from the control box.
4. Reassemble in reverse order with new transformer and lead assembly.



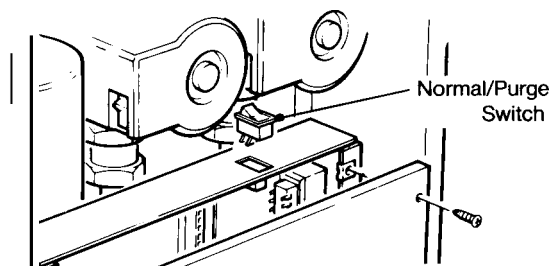
## 49 TO REPLACE THE CENTRAL HEATING SELECTOR SWITCH AND/OR THE DOMESTIC WATER SELECTOR SWITCH.

1. Detach the fascia panel (4 screws), carefully pulling it forward and remove the electrics cover (4 screws) (see frame 42).
2. Noting their positions, remove all lead terminals from the central heating selector switch and/or the domestic water selector switch.
3. Compress clips on body of switch(es) and push through.
4. Reassemble with new switch(es). Check connections with diagram on page 20.



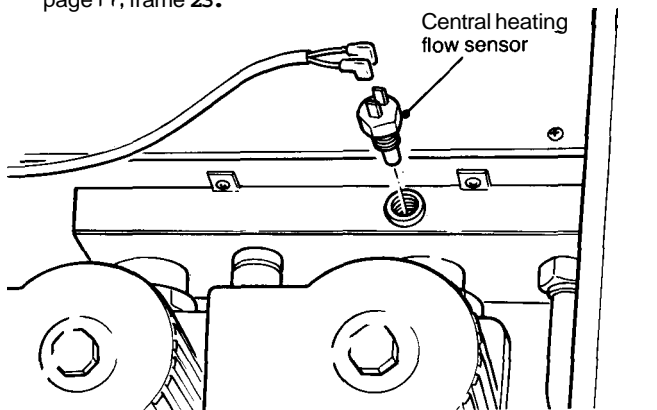
## TO REPLACE THE NORMAL/PURGE SWITCH

1. Remove the electrics cover (4 screws). See frame 42.
2. Remove the lead terminals from the normal/purge switch (polarity not important).
3. Compress clips on body of switch and push through.
4. Reassemble with new switch positioned with terminals towards the back of the control box. Check connections with diagram on page 20.



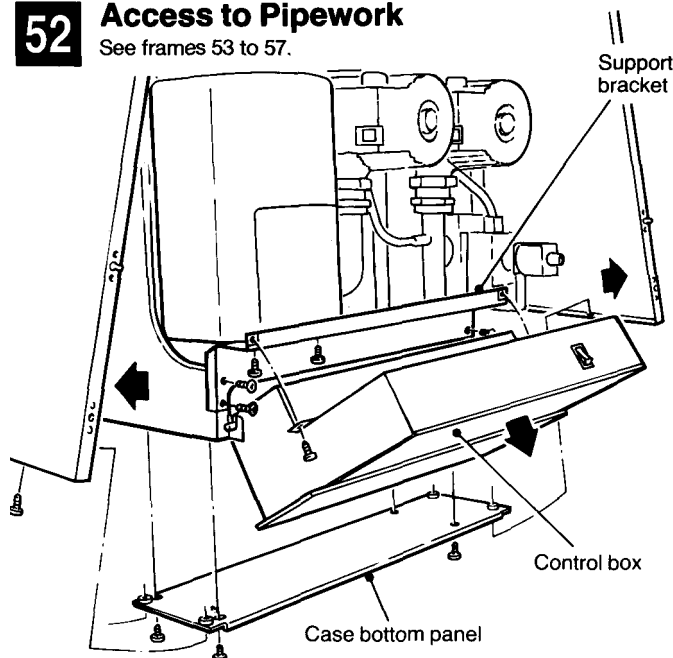
## TO REPLACE THE CENTRAL HEATING FLOW SENSOR

1. Close off the system isolation valves, remove bottom case panel (see frame 2), and drain boiler down using the safety valve.
2. **Pull** off terminals from the sensor.
3. Remove sensor.
4. Reassemble in reverse order with new sensor.
5. Refill the system and refer to the Commissioning instructions on page 11, frame 23.



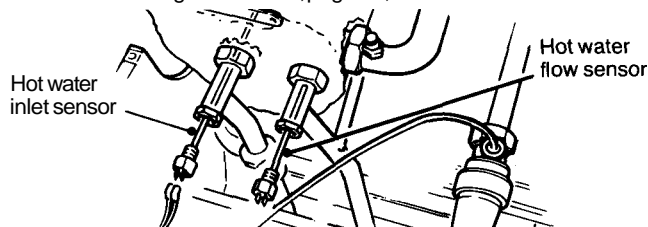
## 52 Access to Pipework

See frames 53 to 57.



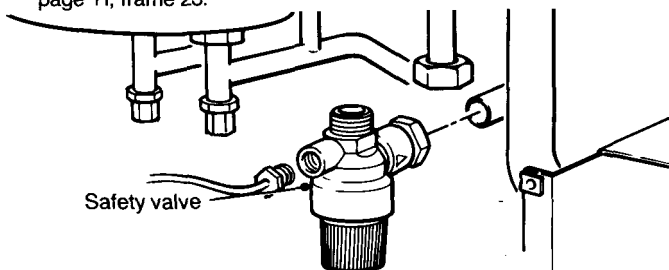
## 53 TO REPLACE A DOMESTIC HOT WATER INLET OR FLOW SENSOR

1. Close off the mains inlet isolation valve. See Water System, page 6.
2. Turn on a hot water tap to allow water to drain from the secondary heat exchanger.
3. Remove the bottom case panel (8 screws) and remove 2 retaining screws to allow the control box to swing down. See frame 52.
4. **Pull** off the sensor terminals.
5. Remove sensor. There will be a little water draining from the secondary heat exchanger.
6. Replace with new sensor and attach terminals. (Polarity not important).
7. Open mains isolation valve and refill the system. Refer to Commissioning instructions, page 11, frame 23.



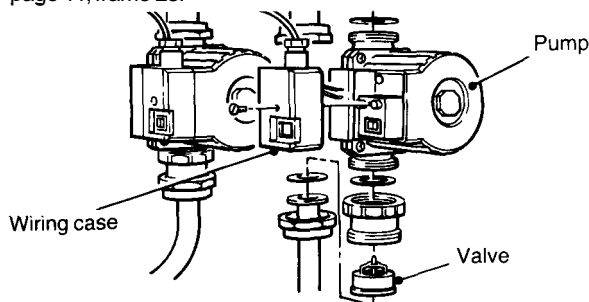
## TO REPLACE THE SAFETY VALVE

1. Close off the system isolation valves.
2. Remove the bottom case panel (8 screws).
3. Drain primary circuit using the safety valve, see Water System, page 6.
4. Remove 2 screws to allow the control box to swing down, see frame 52.
5. Disconnect pressure gauge capillary.
6. Loosen the unions holding the valve in position, taking care not to twist the pipework.
7. Reassemble in reverse order with new part and new washers.
8. Refill the system and refer to the Commissioning instructions on page 11, frame 23.



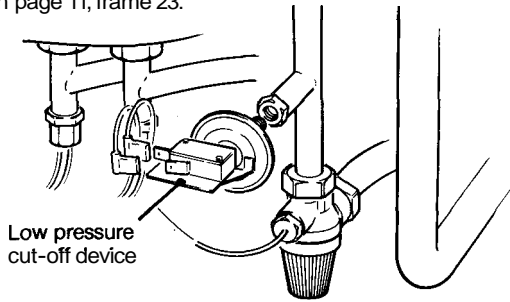
## TO REPLACE A PUMP OR NON-RETURN VALVE

1. Close off the system isolation valves.
2. Remove 2 screws and allow the control box to swing down. See frame 52.
3. Drain down boiler using the safety valve, see Water System, page 6.
4. Remove wiring case (1 screw), note connections and disconnect leads. Loosen unions and remove pump and non-return valve taking care not to twist the pipework.
5. Reassemble in reverse order with new part and new washers.
6. Refill the system and refer to the Commissioning instructions on page 11, frame 23.



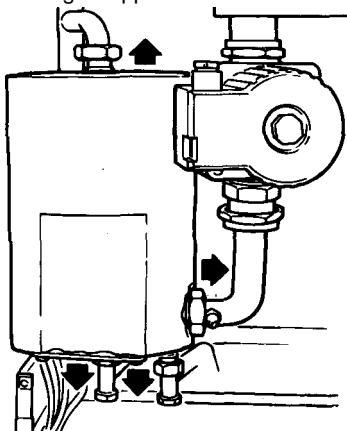
## TO REPLACE THE LOW PRESSURE CUT-OFF DEVICE

1. Ensure that the electricity supply is isolated.
2. Close off the system isolation valves. Remove bottom case panel (see frame 2), drain the primary circuit by opening the safety valve.
3. Remove 2 retaining screws to allow control box to swing down (see frame 52).
4. Disconnect electrical leads and remove low pressure cut off device.
5. Reassemble in reverse order with new part.
6. Open isolation valve and refer to the Commissioning instructions on page 11, frame 23.



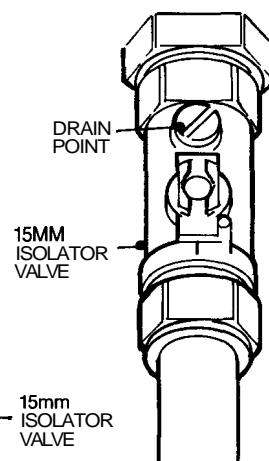
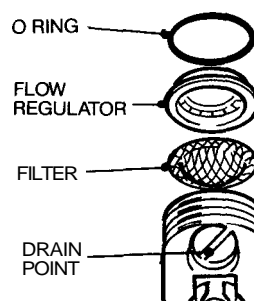
## TO REPLACE OR DESCALE THE SECONDARY HEAT EXCHANGER

1. Close off the isolation valves.
2. Remove the case bottom panel (8 screws) and remove the 2 screws to allow control box to swing down. See frame 52.
3. Drain boiler down using the safety valve. See Water System, page 6.
4. Remove the secondary heat exchanger support bracket (6 screws). See frame 52.
5. Remove both hot water sensors. See frame 53.
6. Loosen the 4 unions and remove heat exchanger.
7. Replace with new heat exchanger using new 'O' rings supplied or descale using proprietary descaling agent on 15 mm connections only.
8. Reassemble in reverse order using new 'O' rings.
9. Refill the system and refer to the Commissioning instructions on page 11, frame 23.



## TO REPLACE OR CLEAN REGULATOR AND FILTER

1. Close mains water inlet isolation valve. Drain by opening the lowest hot water taps and the drain point in the mains isolation valve.
2. The flow regulator and filter are situated in the 15 mm mains isolation valve. Unscrew the top nut, ease the inlet pipe aside and allow to drain.
3. Remove flow regulator and filter. Clean or replace with new part(s) using a new washer.
4. Reassemble in reverse order.
5. Open a hot water tap to clear air from the system.



## 59 TO REPLACE THE CASE SEAL AND VIEWING WINDOW

### Case Seal

1. The case seal is retained by the groove it sits in. Simply pull out from groove to remove.
2. Reassemble in reverse order.

### Viewing Window

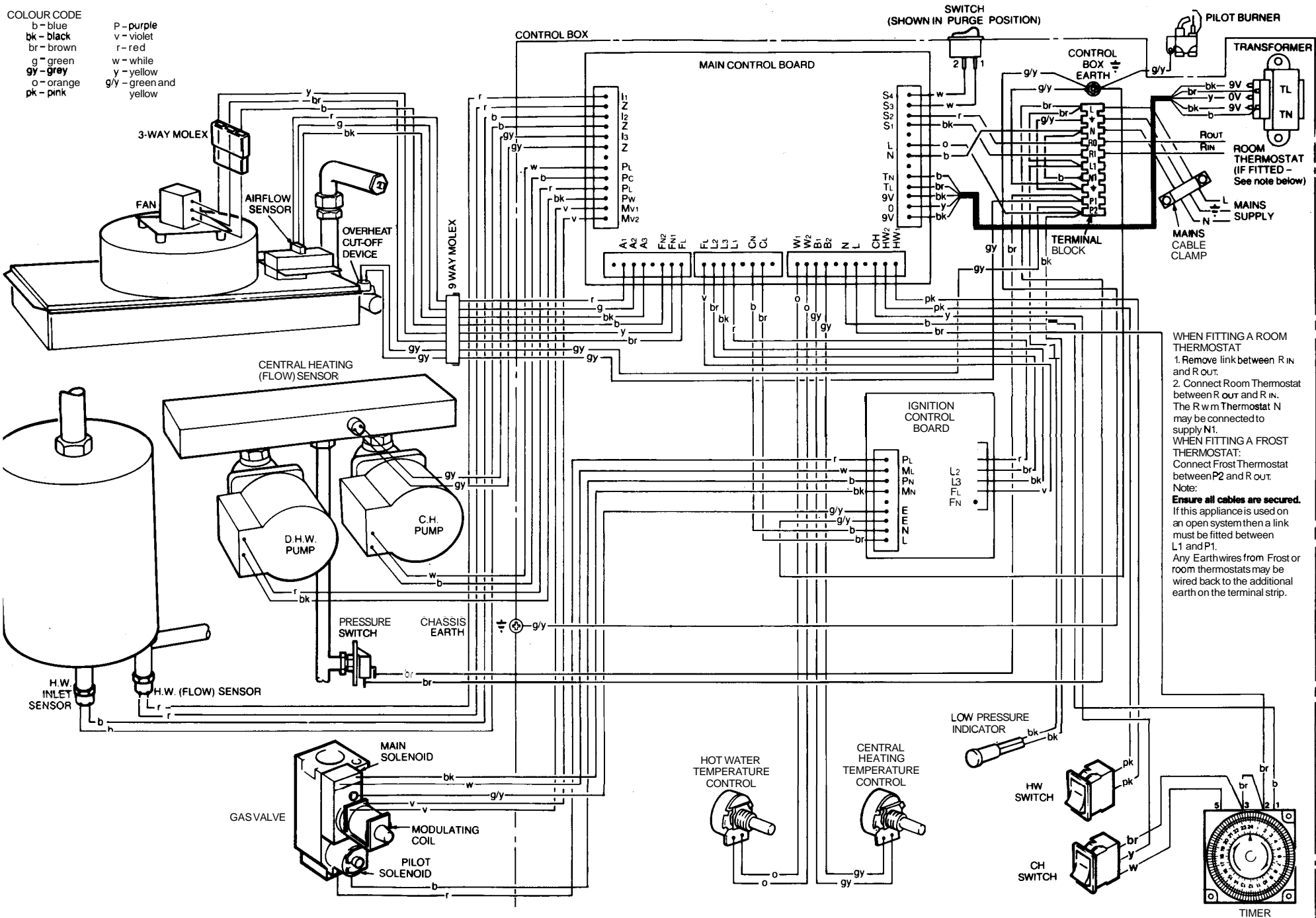
1. Remove two nuts holding window assembly to inner case (retain the nuts and bracket).
2. Remove glass and gasket.
3. Replace with new glass and gasket.
4. Reassemble in reverse order.

## 60 TO REPRESSURISE THE EXPANSION VESSEL

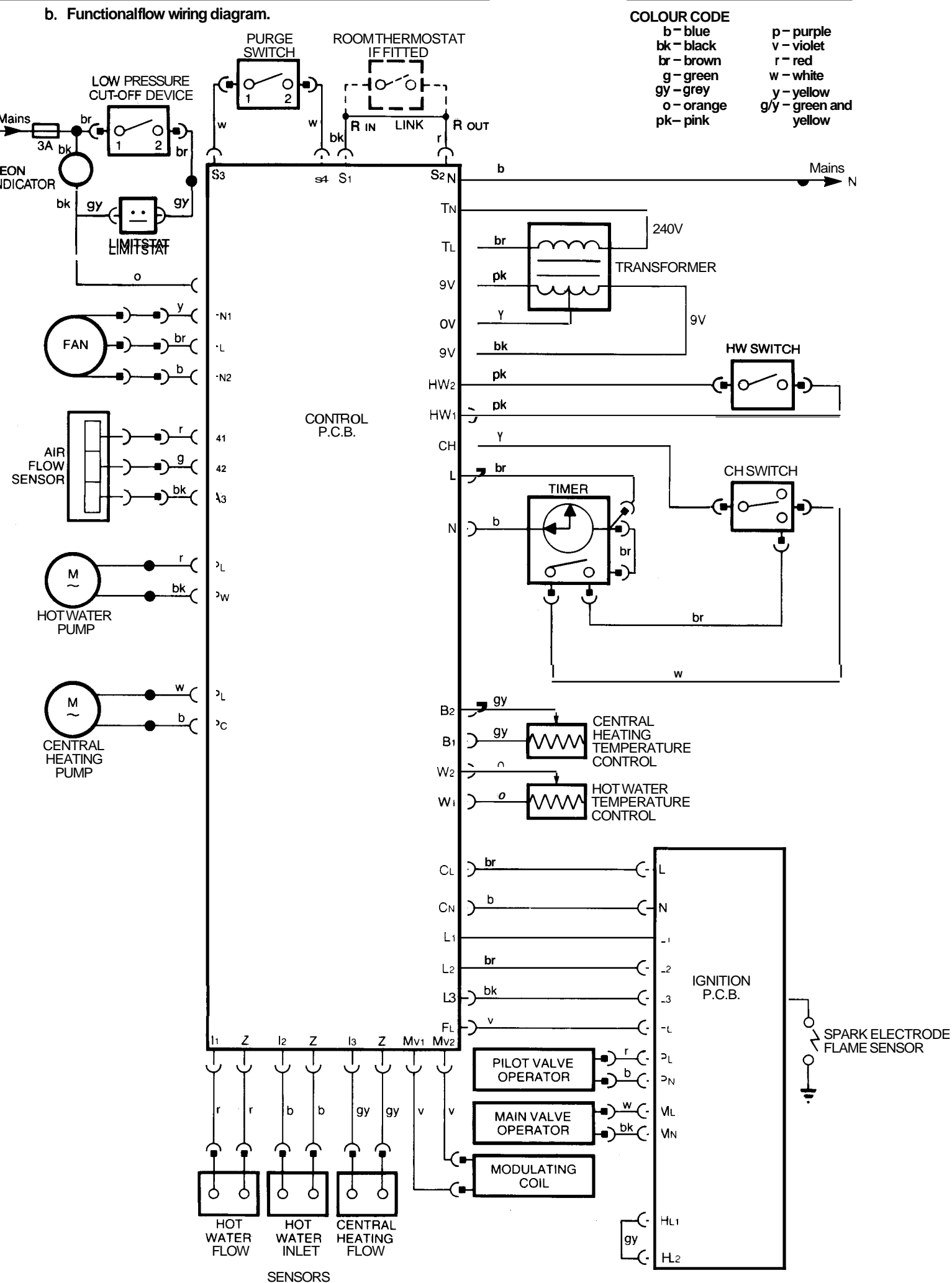
1. Ensure the electricity supply is isolated and close off the boiler isolating valves. See Water System, page 6.
2. Drain boiler down using the safety valve.
3. Connect air pump to the expansion vessel valve (located at the base of the appliance between the central heating return and main water inlet pipes) and repressurise the vessel to 0.5 bar (7.5 psi).

## TO REPLACE THE EXPANSION VESSEL

1. Replacement of the expansion vessel is a major operation. It is recommended that a new equivalent vessel is added to the system. This should be connected to a junction at the entry of the RETURN pipe to the appliance, as close to the appliance as possible. Requirement of BS5449 must be complied with for sealed systems.
2. If the faulty appliance vessel is leaking, you will need to isolate the vessel by cutting the pipe joining the vessel to the water manifold and capping the section connected to the manifold.



b. Functionalflow wiring diagram.



## 23. FAULT FINDING

### Section 1 :Appliance operating procedure.

To assist fault finding six light emitting diodes (LEDs) have been incorporated on the main control board to indicate certain functions of the board. By using these LEDs it should be possible to identify where the problem lies and to rectify.

LED 1 – Will remain on until the fan has produced enough air for complete combustion at low rate – low rate air detector.

LED 2 – Will remain on until the fan has produced enough air for complete combustion at high rate – high rate air detector.

LED 3 – On when there is a demand for the fan at high speed.

LED 4 – On when there is a demand for the central heating pump.

LED 5 – On when there is a demand for the hot water pump.

LED 6 – On when the main board calls upon the full sequence control board to light the main burner and turn on the fan (speed selection depends on LED 3).

When the appliance is operating correctly, the LED sequence is as given below.

**Notw:** 1. When electricity supply is first switched on, the board and air sensor take approx. 30 seconds to calibrate. Within this period any demand for heat will be ignored.

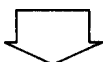
2. When the appliance is first switched to “HW inst” with the secondary heat exchanger cold, it will respond by firing at full rate for a few seconds, then at low rate to reach final temperature.

### INSTANT HOT WATER

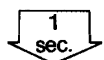
To provide instant water it is necessary to keep the insulated secondary heat exchanger within the appliance warm. Every 1–1½ hours (depending on the temperature selected at the hot water control knob) the appliance will fire for approximately 30 seconds at low gas rate and low fan speed to heat the secondary heat exchanger. This facility can be switched off if so desired, bearing in mind the boiler will be incapable of supplying hot water until ‘HW inst’ has been reselected on the programme select switch.

a. Topping up the secondary heat exchanger.

OFF 0 0 0 0 0 0  
6 5 4 3 2 1

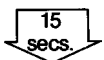


ON 0 0 0 0 0 0 Hot water pump on. Ignition sequence actuated (fan on).

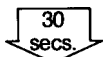


Fan building up speed.

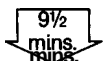
0 0 0 0 0 0 Hot water pump on. Low fan speed achieved. The pilot will light and subsequently the main burner will light at low rate.



0 0 0 0 0 0 Secondary heat exchanger up to temperature. Hot water pump on overrun. Low fan overrun.



0 0 0 0 0 0 Fan on overrun. Pump overrun finished.



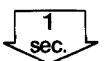
0 0 0 0 0 0 Fan Overrun finished. Everything off.

b. Turning on the hot water tap.

OFF 0 0 0 0 0 0  
6 5 4 3 2 1

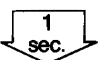


ON 0 0 0 0 0 0 Hot water pump on. Ignition sequence actuated. Fan on high speed.



Fan building up speed.

0 0 0 0 0 0 Hot water pump on. Pilot and main burner light on low air flow rate being detected from the fan.



Fan building up speed.

0 0 0 0 0 0 Hot water pump on. Main burner on high rate once high rate of air flow from the fan has been detected. Gas rate will modulate to hold water temperature at the desired level.

Note: If the water flow rate is very small and the boiler cannot modulate any lower it will hold the desired temperature by switching the gas on and off. This will be identified by LED 1 cycling with LED 3, 5 and 6 on. LED 2 and 4 off.



OFF 000000 Hot water pump on overrun. Fan on overrun.

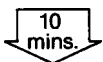


Fan slowing down to low fan.

000000 Fan speed below high rate. Hot water pump on overrun.



000000 Pump overrun finished. Fan on low overrun.



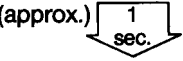
000000 Fan overrun finished.

CENTRAL HEATING ON
External cotrols (room thermostat), timer and programme select switch call for central heating.

OFF 000000
6 5 4 3 2 1

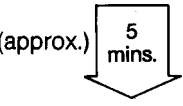


ON 000000 Central heating pump on. Ignition sequence actuated (fan on).



Fan building up speed (low rate).

000000 Central heating pump on. Low fan speed achieved. The pilot will light and subsequently the main bumer will light at low rate. If the selected temperature is reached within approx. five minutes, the appliance will simply switch off and cycle at low rate.



000000 Central heating pump on. Main bumer on. Fan at high speed.



Fan building up speed.

000000 Central heating pump on, main bumer on, fan at high speed. Only when the fan has developed enough air and the air flow detector has sensed it, will power be supplied to the modulating coil, opening up the valve to maximum output. The gas rate will modulate to maintain the selected temperature.



OFF 000000 Central heating pump on overrun.



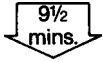
Fan slowing down.

000000 Fan speed below high rate. Central heating pump on overrun.



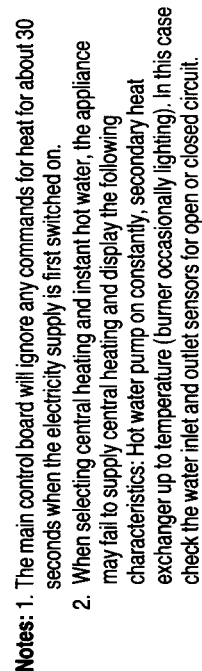
Fan slowing down.

000000 Fan speed below low rate. Central heating pump on overrun.

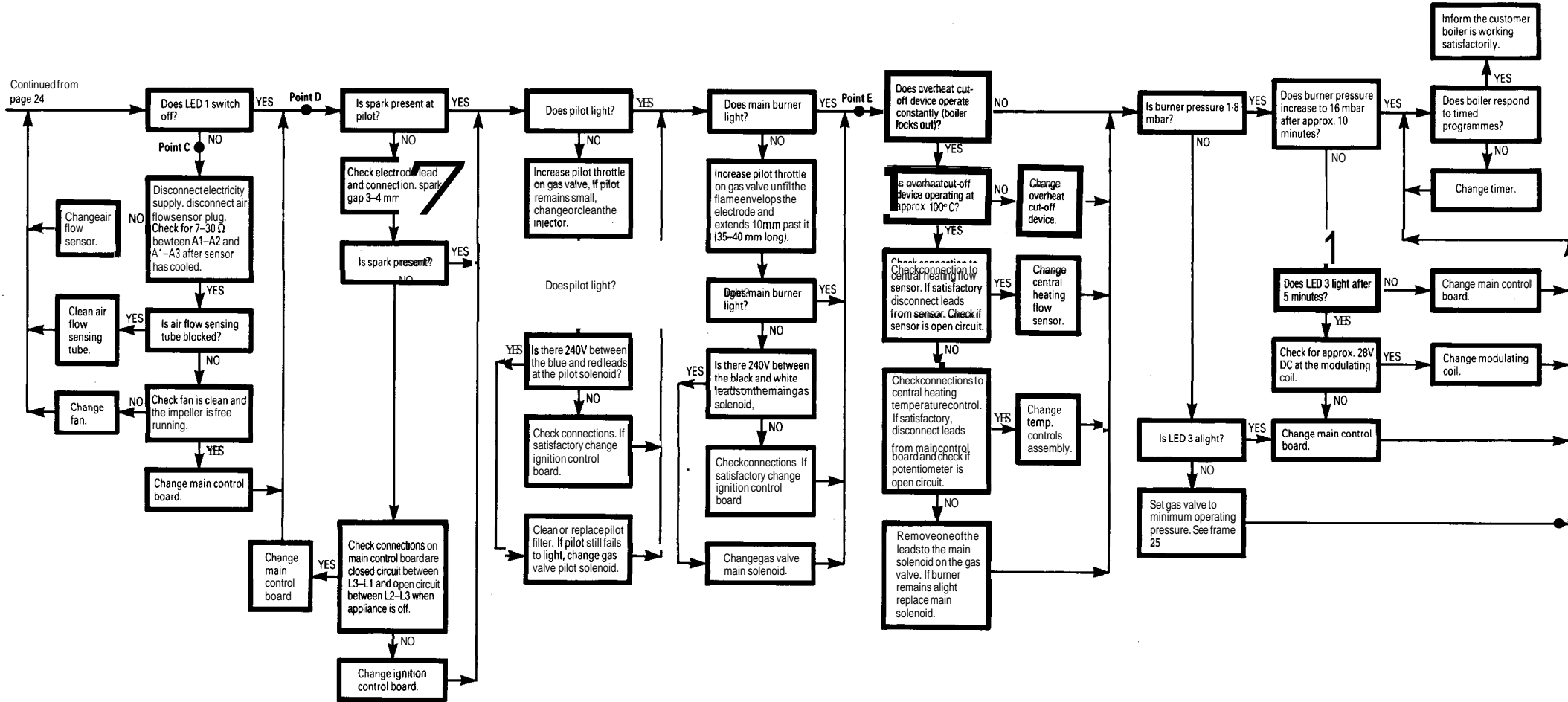


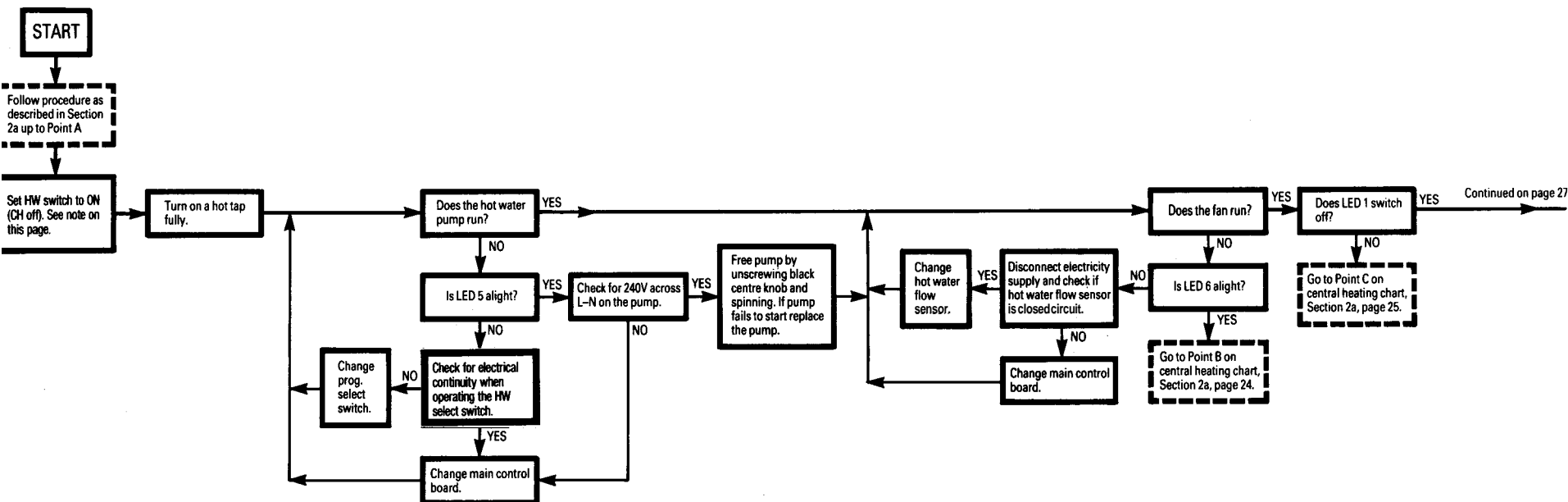
000000 Pump overrun finished.

a. No central heating.

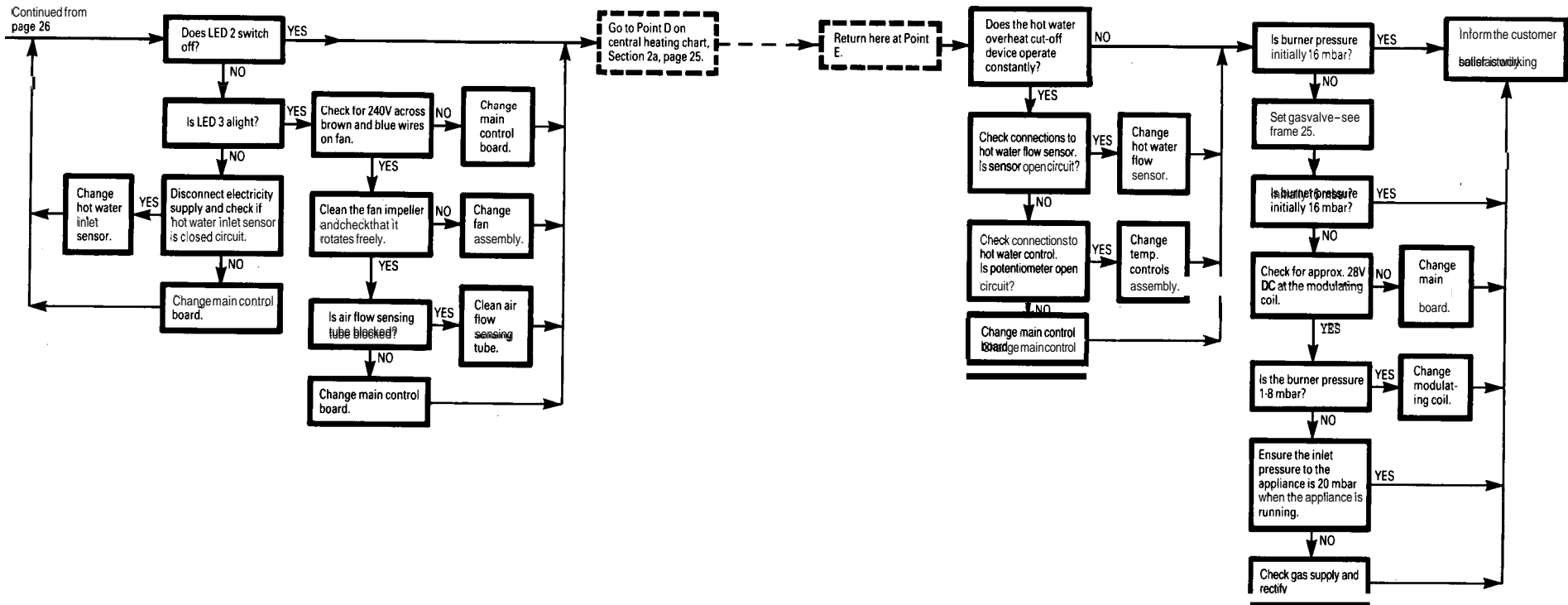






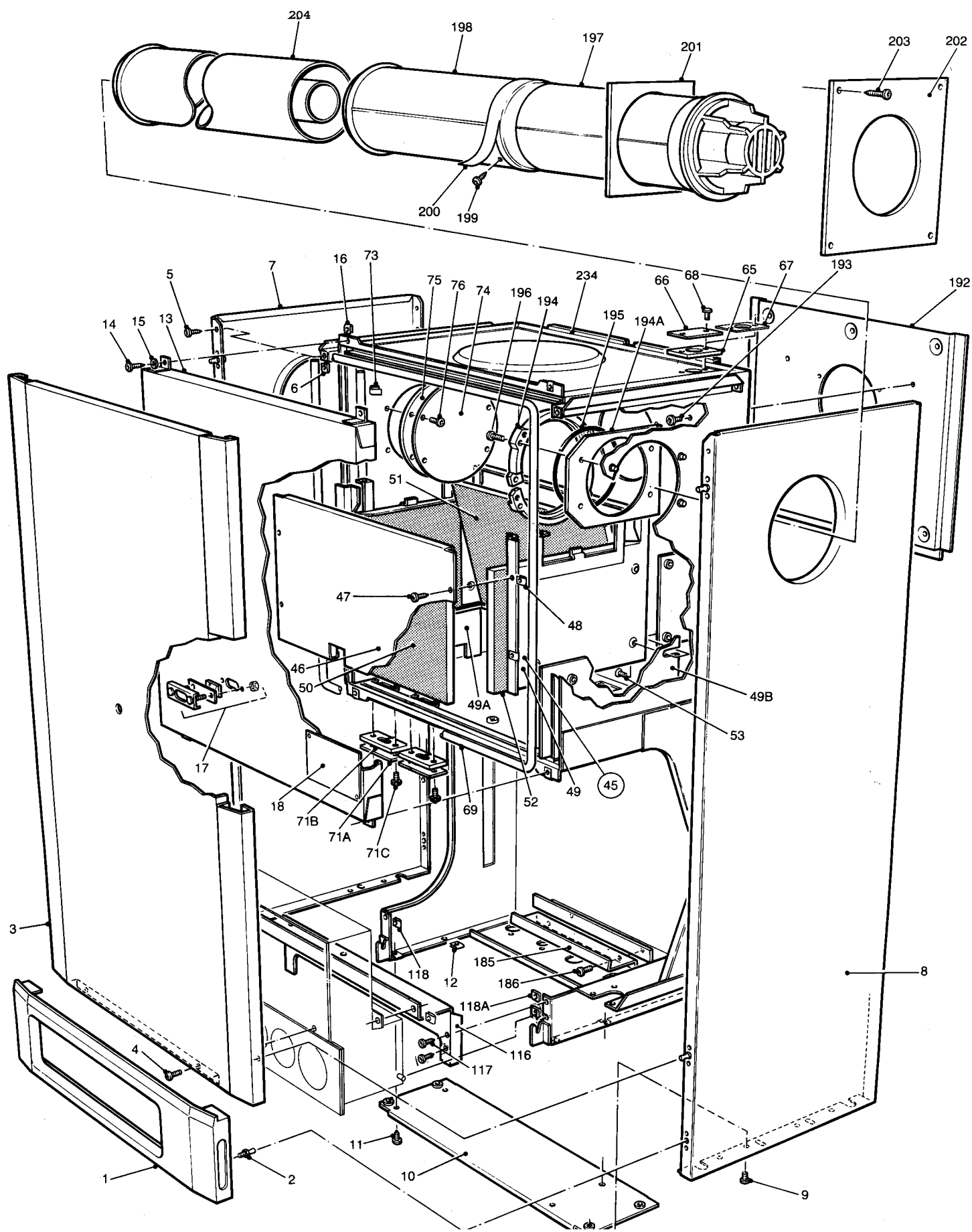


**Note:** When first switching on the electricity supply, the secondary heat exchanger within the appliance will be cold. Therefore it will bring on the gas at full rate for a few seconds before reverting to the reheat or top-up mode (low gas rate and fan speed) until the secondary heat exchanger is up to temperature. If the appliance responds correctly to Central Heating and Hot Water but fails to "top up" when the select switch is set to "HW inst" then replace the main control board.

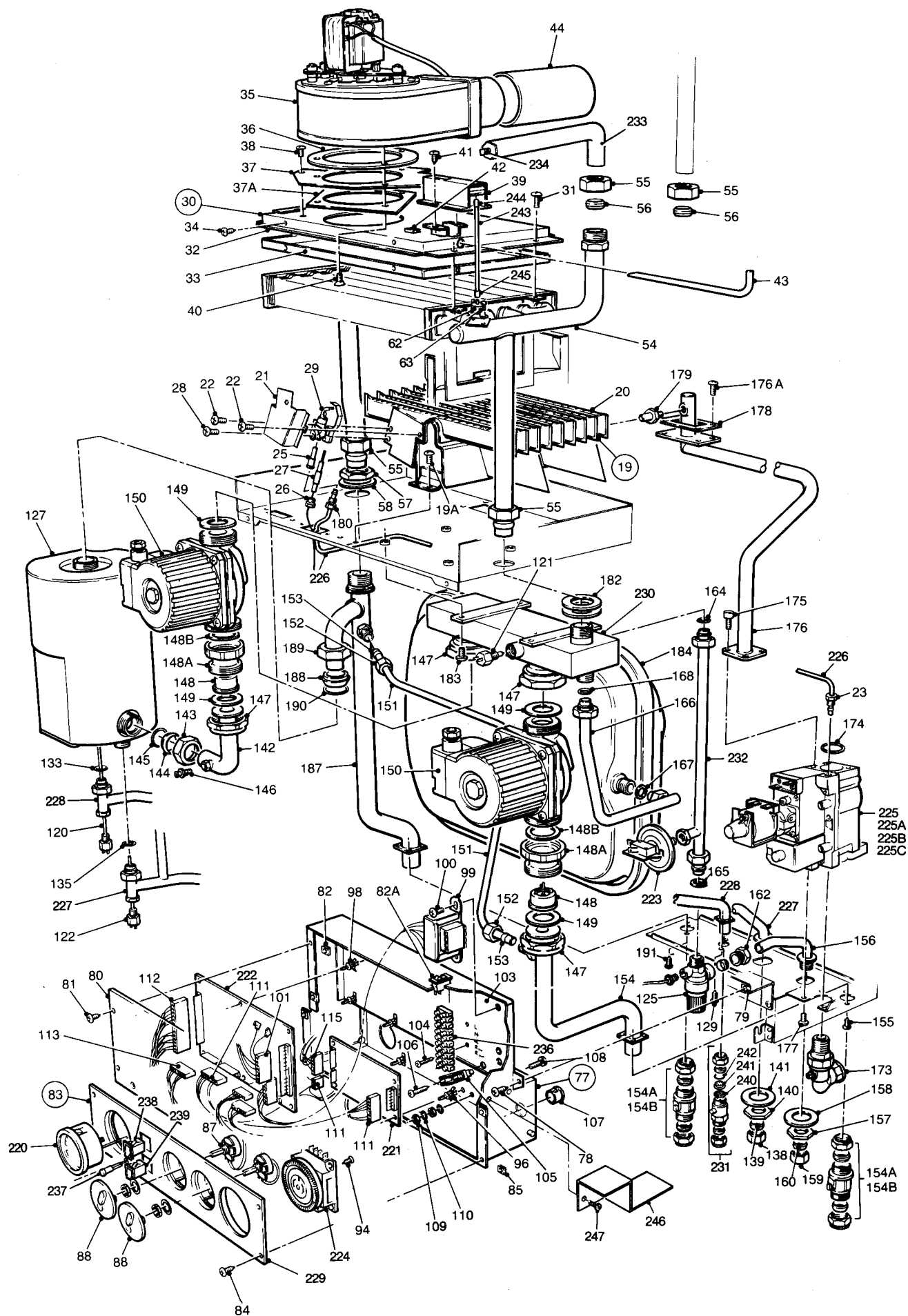


## 24. EXPLODED VIEWS

### a. Panels and chassis



b. Internal parts and pipework



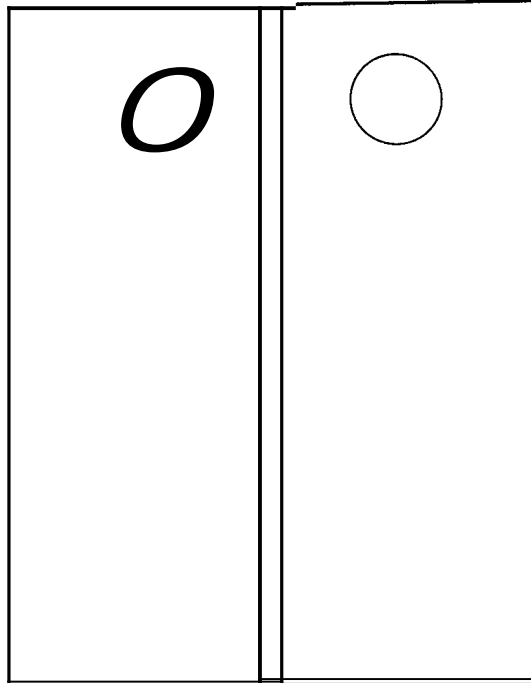
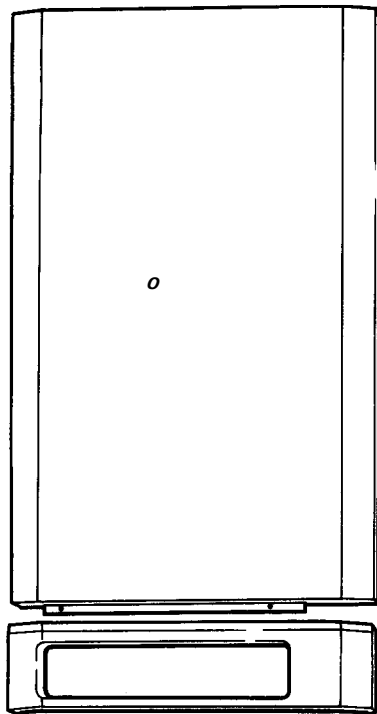
## 25. SHORT LIST SPARE PARTS

Key No.	BG.C Part No.	Item - Description	Qty.	Myson Part No.
1	377 464	Facia cover assembly	1	404A881
3	324 001	Front panel	1	404A050
7	324 002	Side panel - left hand	1	404A010
8	324 003	Side panel - right hand	1	404A011
17	377 000	Inspection window assembly	1	402A2476
19	324 008	Burner assembly	1	404A006
20	382 950	Burner - Furigas 175-500-024 (silver) Alternative to key 20A	1	404S278
20A	389 524	Burner - Bray AB24016M (blue) Alternative to key 20	1	404S076
25	381 702	Pilot injector - stamped 56/42A	1	4500-4108-005
27	377 467	Spark electrode and lead	1	404A921
29	386 532	Pilot burner body - stamped Q395A1003	1	Q395A1003
35	324 014	Fan and plug assembly	1	404A277
37A	377 200	Flue hood gasket	1	404C317
39	324 017	Airflow sensor assembly	1	404A213
50	324 022	Combustion chamber insulation - front	1	404C202
51	324 023	Combustion chamber insulation - back	1	404C203
52	324 024	Combustion chamber insulation - side	2	404C204
62	397 664	Overheat cut-off device (white)	1	309S669
87	332 756	Potentiometer assembly	1	404A041
99	332 760	Transformer assembly	1	404A049
120	332 772	Domestic hot water inlet Sensor	1	404C111
121	332 773	Central heating flow Sensor	1	404C112
122	377 290	Domestic hot water flow Sensor	1	404C622
125	397 676	Safety valve	1	404S574
133	377 142	'O ring	1	202-641-2064
135	377 142	'O ring	1	202-641-2064
145	377 143	'O ring	1	202-647-2064
148	339 967	Non-return valve	2	404S110
148B	377 253	Rubber washer	2	404C588
149	386 562	Rubber washer	4	404C587
150	382 953	Pump	2	404S135
164	377 142	'O ring	1	202-641-2064
168	377 142	'O ring	1	202-641-2064
174	121 182	'O ring	1	301S316
178	323 451	Gas manifold gasket	1	402C387
179	386 559	Burner injector	1	404S172
190	377 143	'O' ring	1	202-647-2064
220	397 573	Pressure gauge	1	800S102
221	377 483	Ignition control board	1	404S670
222	377 484	Main control board 470840	1	404C656
223	397 574	Pressure switch	1	404S667
224	397 575	Clock	1	404S634
225	397 556	Gas valve	1	VR4601M2009

3

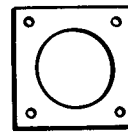
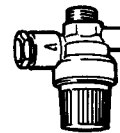
7

8

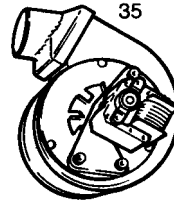


125

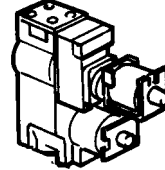
37A



35

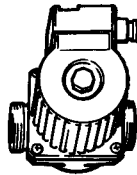


225

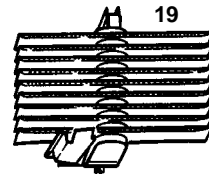


1

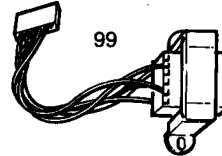
150



19



99

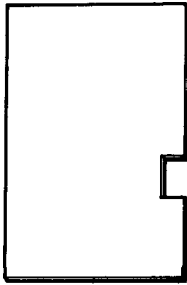
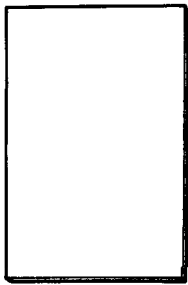


20



51

50



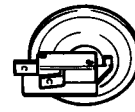
52



148



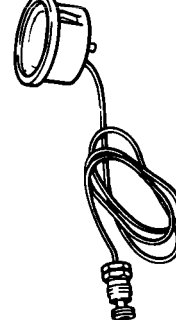
223



224



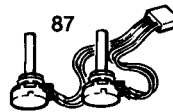
220



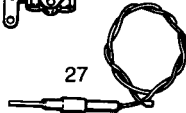
39



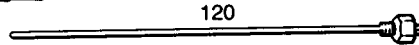
87



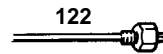
27



120



122



178



17

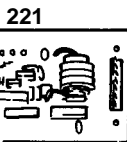


62

174



149



221

133

135

164

168



121

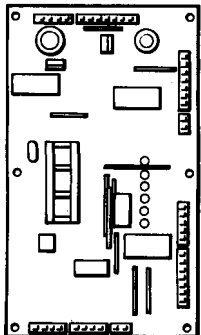


145

190

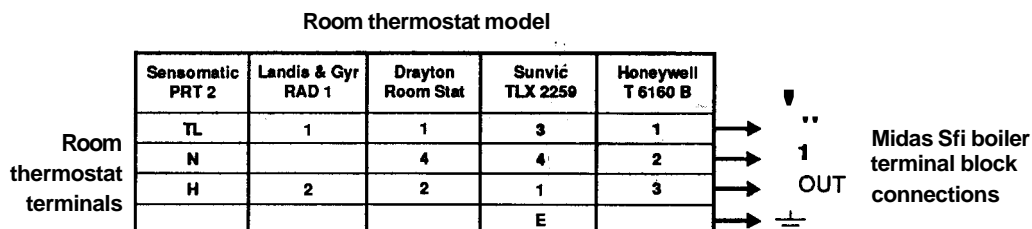


148B

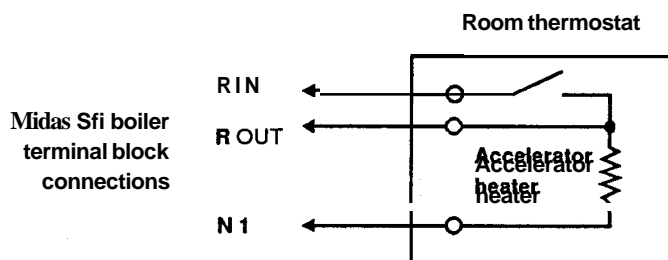


222

## WIRING CONNECTIONS TO A ROOM THERMOSTAT



For other models of room thermostat connect as follows:



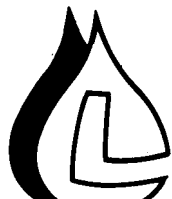
### Myson Heating

Eastern Avenue, Team Valley Trading Estate, Gateshead, Tyne & Wear, NE11 OPG, England.

Telephone: 091 482 6699. Telex: 53265 MYSEAS G. Telefax: 091 482 6141.



*The Housewarmers*



Byd... ..

This leaflet is accurate at the date of printing but will be superseded and should be disregarded if specifications and/or appearances are changed in the interests of continued improvement.

All goods sold are subject to our official Conditions of Sale, copy of which may be obtained on application.