



## **Installation and Servicing Instructions**

**Velaire Vitesse**  
**100/130, 130/170**  
**balanced flue/  
conventional flue/  
boiler house oil boiler**

**Velaire Vitesse**  
**170/250**  
**boiler house oil boiler**

**Read these Instructions thoroughly before working on the boiler**

**Velaire Vitesse 100/130, 130/170  
balanced flue/conventional flue/boiler house oil boilers**

**Velaire Vitesse 170/250 boiler house oil boiler**

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**The information given applies to all models except where the  
170/250 is listed separately.**

## 1. INTRODUCTION

The Velaire Vitesse 100/130 and 130/170 models are horizontally fired, automatic pressure jet boilers. Cased models can be installed with a conventional flue or a high level rear outlet balanced flue. As supplied, all boilers are suitable for use with kerosene (class C2, 28 second viscosity). The balanced flue models can only be used with kerosene, and the burners are fitted with a post purge unit. The conventional flue and boiler house models can be converted for use on gas oil (class D, 35 second viscosity), see burner information sheet for details.

These boilers are designed for use with an open vented central heating system, and/or an indirect hot water cylinder. They must not be connected to a direct cylinder.

They are supplied with a standard control panel. However an optional programmer kit is available which fits into the the facia panel.

Some models are available to special order with the gas oil conversion or programmer ready fitted.

The Velaire Vitesse 170/250 model is also a horizontally fired, automatic pressure jet boiler. As supplied, it is suitable for use on gas oil, and can be converted for use on kerosene. Water system requirements are as above, but being a boiler house model, no programmer kit is available.

## 2. GENERAL REQUIREMENTS

The installation of the appliance must be in accordance with:  
Building Regulations, Building Standards (Scotland) Regulations, current Institute of Electrical Engineers (IEE) Regulations and Model and Local Water Undertaking bylaws.

Detailed recommendations are contained in the following British Standards:  
BS4543, Part 3, 1990. BS5410, Part 1, 1977. BS5410 Part 2 1978, BS5449, 1990.  
BS5410 Part 2 is applicable for outputs above 44kW.

It is in your interest, and that of safety, that this appliance is installed by a competent person.

## 3. DELIVERY

The appliance is delivered as follows:

### CASED MODELS, ie CONVENTIONAL FLUE, BALANCED FLUE

- (1) Boiler with casings, standard control panel and burner fitted suitable for either conventional flue or balanced flue, as ordered.
- (2) Additional de-luxe control panel kit as required.
- (3) Additional kit for balanced flue.

### BOILER HOUSE

- (1) The boiler.
- (2) The burner and control box.
- (3) Casing kit as required.

### 170/250

- (1) The boiler with casings and control box fitted.
- (2) The burner.

#### 4. TECHNICAL DATA

MODEL: RATING:		100/130 MIN      MID      MAX			130/170 MIN      MID      MAX		
Heat Input	kW Btu/h	36.64 125,000	42.13 143,750	47.63 162,500	47.63 162,500	54.95 187,500	62.28 212,500
Heat Output	kW Btu/h	29.31 100,000	33.70 115,000	38.10 130,000	38.10 130,000	43.96 150,000	49.82 170,000
BURNER INFORMATION		SEE ADDITIONAL SHEET FOR INFORMATION					
Weight, cased model (excluding flue)	kg lb	133 293			169 373		
Water content	litres pints	23 40			31 55		
Water connections		4 x 1¼" B.S.P.					
Maximum smoke No.		1 (Bacharach)					
Conventional flue models		Minimum flue draught 12.5 N/m <sup>2</sup> (0.05 in. w.g.) Maximum flue draught 30 N/m <sup>2</sup> (0.12 in. w.g.)					
Electricity Supply		240V ~ 50Hz fused at 3A (150W burner only, excludes circulating pump)					
Oil supply pipe connection		¼" B.S.P.					
Maximum water static head		30.5m (100ft)					
Minimum water static head		0.9m (3ft)					
Maximum boiler thermostat setting		82°C (180°F)					

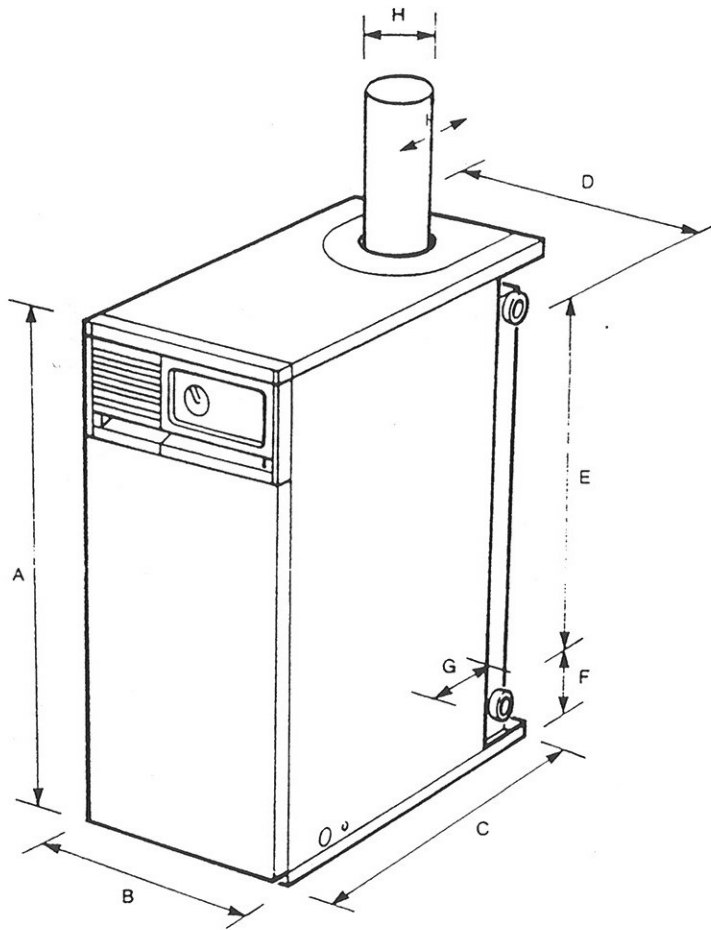
MODEL: RATING:		170/250			
		MIN	MID	MID	MAX
Heat Input	kW Btu/h	62.3 212,500	73.7 250,000	83.5 285,000	97.7 333,000
Heat Output	kW Btu/h	49.8 170,000	58.6 200,000	65.9 225,000	73.3 250,000
Weight	kg lb	227 500			
Water content	litres pints	52 92			
Water connections		4x1½" B.S.P.			
Electricity supply		240V ~ 50Hz fused at 3A (180W burner only, excludes circulating pump)			
Maximum boiler thermostat setting		79°C (175°F)			



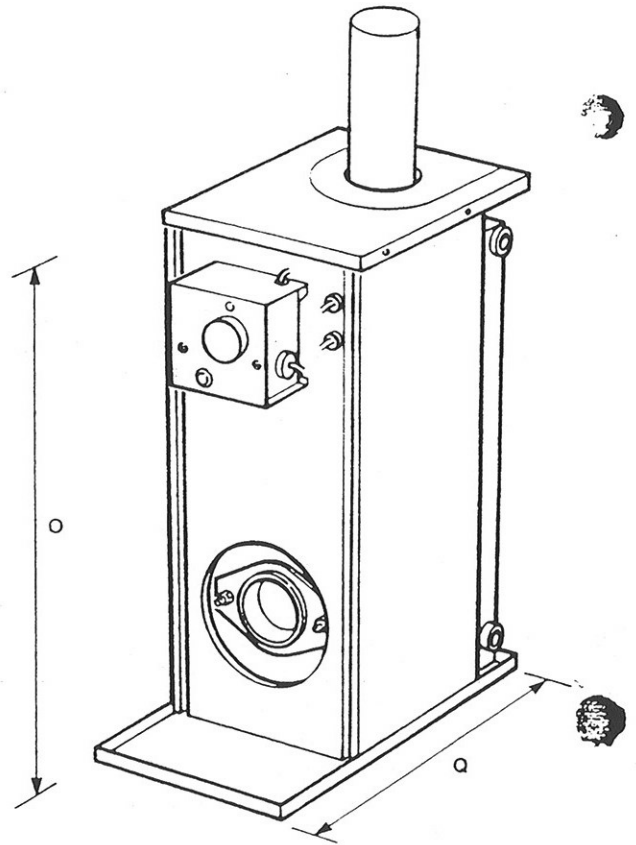
Dimensions (see Figure 1)

Model	100/130		130/170	
	mm	in	mm	in
<b>BOILER</b>				
A. Height	900	35 <sup>3</sup> / <sub>8</sub>	980	38 <sup>5</sup> / <sub>8</sub>
B. Width	450	17 <sup>3</sup> / <sub>4</sub>	450	17 <sup>3</sup> / <sub>4</sub>
C. Depth	650	25 <sup>5</sup> / <sub>8</sub>	750	29 <sup>1</sup> / <sub>2</sub>
D. Width across water connections	454	17 <sup>7</sup> / <sub>8</sub>	454	17 <sup>7</sup> / <sub>8</sub>
E. Distance between water connections	725	28 <sup>1</sup> / <sub>2</sub>	805	31 <sup>3</sup> / <sub>4</sub>
F. Height of bottom water connections above floor	81	3 <sup>1</sup> / <sub>4</sub>	81	3 <sup>1</sup> / <sub>4</sub>
G. Distance of connections from wall	55	2 <sup>1</sup> / <sub>8</sub>	55	2 <sup>1</sup> / <sub>8</sub>
<b>CONVENTIONAL FLUE</b>				
H. Flue diameter (nominal)	125	5	150	6
I. Distance of flue centre from wall	113	4 <sup>1</sup> / <sub>2</sub>	113	4 <sup>1</sup> / <sub>2</sub>
<b>BALANCED FLUE</b>				
J. Horizontal flue section (square)	280	11	280	11
K. Vertical flue section (width)	450	17 <sup>3</sup> / <sub>4</sub>	450	17 <sup>3</sup> / <sub>4</sub>
Vertical flue section (depth)	200	7 <sup>7</sup> / <sub>8</sub>	200	7 <sup>7</sup> / <sub>8</sub>
L. Maximum flue length	400	15 <sup>3</sup> / <sub>4</sub>	400	15 <sup>3</sup> / <sub>4</sub>
Minimum flue length	225	9 <sup>7</sup> / <sub>8</sub>	225	9 <sup>7</sup> / <sub>8</sub>
M. Height of flue centre above floor	1920	75 <sup>5</sup> / <sub>8</sub>	2000	75 <sup>3</sup> / <sub>4</sub>
N. Height	2105	82 <sup>7</sup> / <sub>8</sub>	2185	86
<b>BOILER HOUSE</b>				
O. Height - cased boiler	895	35 <sup>1</sup> / <sub>4</sub>	975	38 <sup>3</sup> / <sub>8</sub>
P. Height - uncased boiler	850	33 <sup>1</sup> / <sub>2</sub>	930	36 <sup>5</sup> / <sub>8</sub>
Q. Depth	614	24 <sup>1</sup> / <sub>8</sub>	714	28 <sup>1</sup> / <sub>8</sub>

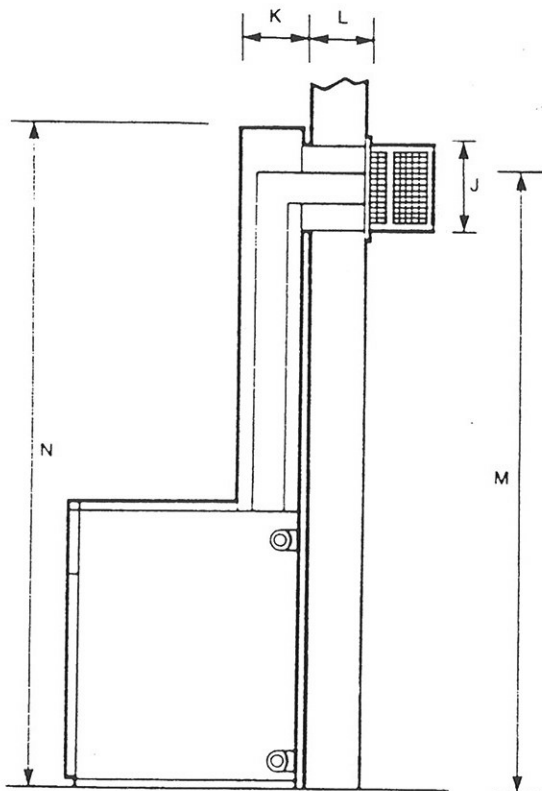
Model	170/250	
	mm	in
<b>BOILER</b>		
A. Height	1000	39 <sup>3</sup> / <sub>8</sub>
B. Width across casings	587	23 <sup>1</sup> / <sub>8</sub>
C. Depth to front of control box	780	30 <sup>3</sup> / <sub>4</sub>
C1. Depth including burner	900	35 <sup>3</sup> / <sub>8</sub>
D. Width across water connections	570	22 <sup>1</sup> / <sub>2</sub>
E. Distance between water connections	819	32 <sup>1</sup> / <sub>4</sub>
F. Height of bottom water connections above floor	120	4 <sup>3</sup> / <sub>4</sub>
G. Distance of connections from wall	70	2 <sup>3</sup> / <sub>4</sub>
H. Flue diameter (nominal)	150	6
I. Distance of flue centre from wall	150	5 <sup>7</sup> / <sub>8</sub>



Conventional flue



Boiler House



Balanced flue

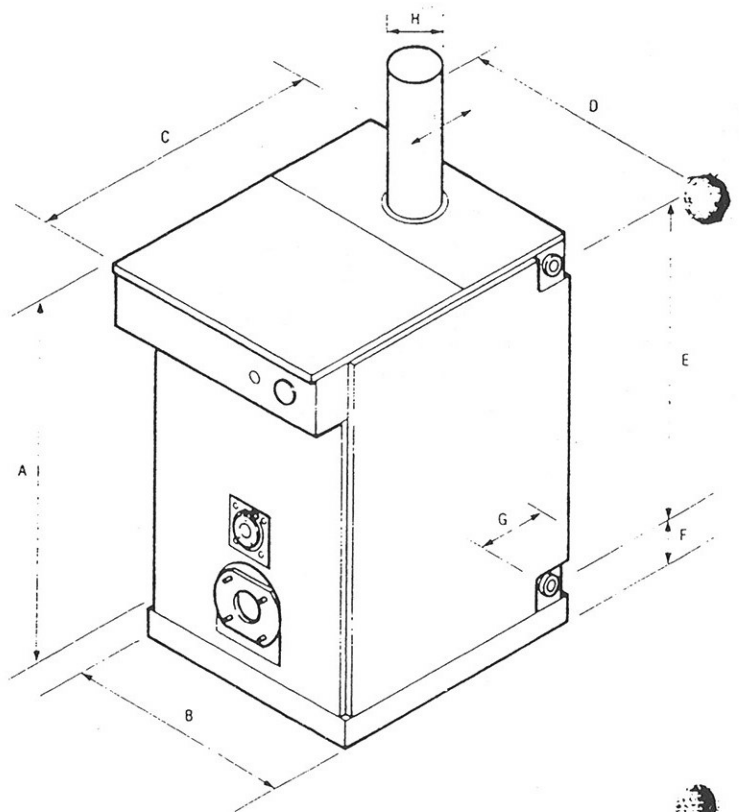


Figure. 1 Dimensions

## 5. AIR SUPPLY

### 100/130 and 130/170

There must be adequate air for combustion, and if the boiler is installed in a confined space, additional for ventilation. Data shown is taken from BS5410, Part 1, 1977.

#### Conventional Flue and Boiler House

Combustion air is drawn from the room in which the boiler is installed which must have a permanent air vent to the outside air, or to an adjacent room which itself has a permanent air vent to the outside air. The minimum free area of any such air vent is as follows: (Consideration may be given to adventitious air, e.g. around windows and doors).

MODEL	100/130		130/170	
	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>
Free area	210	33	274	43

#### Balanced Flue

Combustion air is drawn from outside through the terminal head.

#### All types of flue

If the boiler is installed in a confined space, permanent air vents are required for ventilation IN ADDITION to those above, one at high level, and one at low level, either both through the same wall to outside air, or both to the same adjacent room. The minimum free area of each of these additional vents is as follows:

MODEL	100/130		130/170	
	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>
Vents to outside	210	33	274	43
Vents to room	419	65	548	85

### 170/250 Boiler House

Data shown is taken from BS5410 Part 2 1978.

Where the room in which the boiler is installed is ventilated by natural means, it must have permanent air vents to the outside air at both high and low level. The minimum free area of any such air vent is as follows:

MODEL	170/250	
	cm <sup>2</sup>	in <sup>2</sup>
Vents at low level	489	76
Vents at high level	244	38

## 6. OIL SUPPLY

### Oil storage tank

Galvanised tanks must not be used.

The oil storage tank must be constructed to BS799, Part 5, 1987, and incorporate the following features:

1. An oil level gauge (not glass type).
2. A capacity of at least 3400 litres (750 gallons), to give economy and reasonable time periods between oil deliveries.
3. A vent pipe with a waterproof return bend or suitable cap, and of a diameter not less than filling pipe diameter.
4. A sludge valve.
5. An outlet valve at the opposite end to the sludge valve.
6. A slope of 1 in 50 (1/4in per foot length) towards the sludge valve.
7. Painted outside, but unpainted inside.

Some types of plastic tank are also suitable. The positioning of the tank should take filling, maintenance and protection from fire into account. Recommendations are given in BS5410, Part 1, 1977 and Part 2 1978.

### Fire Valve

A remote sensing fire valve must be installed. A suitable type is available from the Landon Kingsway division of Potterton Myson (part no. 860E, complete with 8m of operating cable and pulleys). The fire valve sensor must be adjacent to the boiler, it can be installed within the casing of cased boilers but away from the boiler shell. Combined fire and stop valves are also available. (Part No. 818 EM). However they must only be used in addition to the remote sensing valve.

### Oil Filter

A metal bowl filter with replaceable micronic filter element must be fitted in the oil supply pipe.

### Oil Supply Pipe

Galvanised pipe must not be used. The pipe should have an internal diameter of at least 8mm, though diameters greater than 10mm are not recommended for systems where the oil tank is below the burner, as this can cause air locks on start up. High points on the pipe should be avoided as they can cause air locks. A shut-off valve must be installed immediately before the boiler.

## 7. ELECTRICITY SUPPLY

**Warning:** This appliance must be earthed.

All electrical wiring must be carried out by a qualified electrician, and be wired in accordance with current IEE regulations, and any local regulations that may apply.

The supply to the boiler should be 240V ~ 50Hz and fused at 3A. The rating of the boiler is approximately 150W for models 100/130 and 130/170, approximately 180W for model 170/250.

IT MUST BE POSSIBLE TO COMPLETELY ISOLATE THE BOILER AND ALL ASSOCIATED CONTROLS FROM MAINS ELECTRICITY. THE COMPLETE ELECTRICAL SYSTEM MUST BE POWERED FROM A SINGLE POINT, WHICH SERVES THE HEATING SYSTEM ONLY. THIS POINT CAN BE CONNECTED USING A FUSED THREE PIN PLUG AND SHUTTERED SOCKET, BOTH COMPLYING WITH THE REQUIREMENTS OF BS1363. ALTERNATIVELY, A FUSED DOUBLE POLE SWITCH WITH A CONTACT SEPARATION OF AT LEAST 3mm ON BOTH POLES MAY BE USED.

All external cables must be rated to take at least 3A ie at least  $0.75\text{mm}^2$  (24/0.2mm) to BS6500, 1990, Table 16. On cased models a 7-way terminal block is provided for connecting the mains inlet cable and external controls to the control panel. For all balanced flue models, and for conventional flue models with internal programmer, the electricity supply to the terminal block **MUST** be a permanent live, unswitched by external controls, for the post purge unit and/or the programmer to function.

On boiler house models, a 6-way terminal block is provided for connecting the mains inlet cable and external controls to the control box.

## 8. BOILER LOCATION

The boiler does not require a special hearth. The floor surface must be firm and level, non-combustible and non-absorbent. The boiler base plate provides the necessary protection to BS5410 Part 1, additional provisions are required in Part 2.

The following minimum clearances are required for access and servicing:

Front of boiler	610mm (24in)
Side of boiler	6mm (1/2in)
Top of boiler	450mm (18in)
Boiler house side clearance	100mm (4in) (to allow removal of top casing fixing screws)

**If it is desired to install the boiler under a worktop, a portion of the worktop should be removable, to give the required clearance.**

When installing a boiler with a balanced flue, the terminal must be at least 600mm (2ft) away from any opening window, door, air brick, and internal or external corner, and at least 300mm (1ft) away from any gutter, eaves and soil pipe.

## 9. FLUE SYSTEM

### Conventional flue and boiler house

The flue must be of sufficient height to provide a draught of at least  $12.5\text{N/m}^2$  (0.05in wg) as measured at the boilers outlet. An insulated flue, terminating in a down draught free area i.e. above the roof line of a one or two storey building, will usually provide the necessary draught. A draught stabilizer should be unnecessary, unless excess draught conditions above  $30\text{N/m}^2$  (0.12wg) prevail. The cross sectional area of the flue at any point must not be less than that of the flue connection on the boiler.

Precautions are needed against excessive cooling of flue gases, and if a suitable internal flue is available, it should be used. If an existing brick chimney is used, it must be lined with a liner suitable for fuel oils. The annular space must be sealed at top and bottom, and may be loosely filled with insulating material.

An independent external flue must be of double wall construction, or effectively insulated and waterproofed.

The first 1.8m (6ft) of flue above the boiler must not be of asbestos. Aluminium must not be used for any part of the flue.

A sealed cleaning door must be provided. The flue should rise as directly as possible, and use  $135^\circ$  bends only.

A minimum air space of 25mm (1in) or as required by local regulations, must be maintained between the flue pipe and any combustible material, and in any case the temperature of such combustible material must not exceed  $100^\circ\text{C}$ .

### Balanced Flue

All flue components are supplied in the appropriate kit. If the terminal is less than 2m above a balcony, above ground, or above a flat roof to which people have access, then the terminal guard must be fitted. The terminal guard should be screwed to the wall, so that it is at least 50mm from all parts of the terminal.

## 10. WATER SYSTEM

Two flow connections (at the top of the boiler), and two return connections (at the base of the boiler), are provided, one pair for the central heating system, and one pair for the gravity feed hot water primary system. The connections for each system should be diagonally opposite. Blank off all unused water connections.

A hot water cylinder must be of the indirect type. Fit one or more drain cocks to enable the system to be fully drained.

The water system should be thoroughly flushed with cold water to remove swarf or residues, before fitting the pump.

## 11. INSTALLATION PROCEDURE

The following instructions (frames 1 to 12) apply to conventional flue and balanced flue models, boiler house models are covered after frame 12.

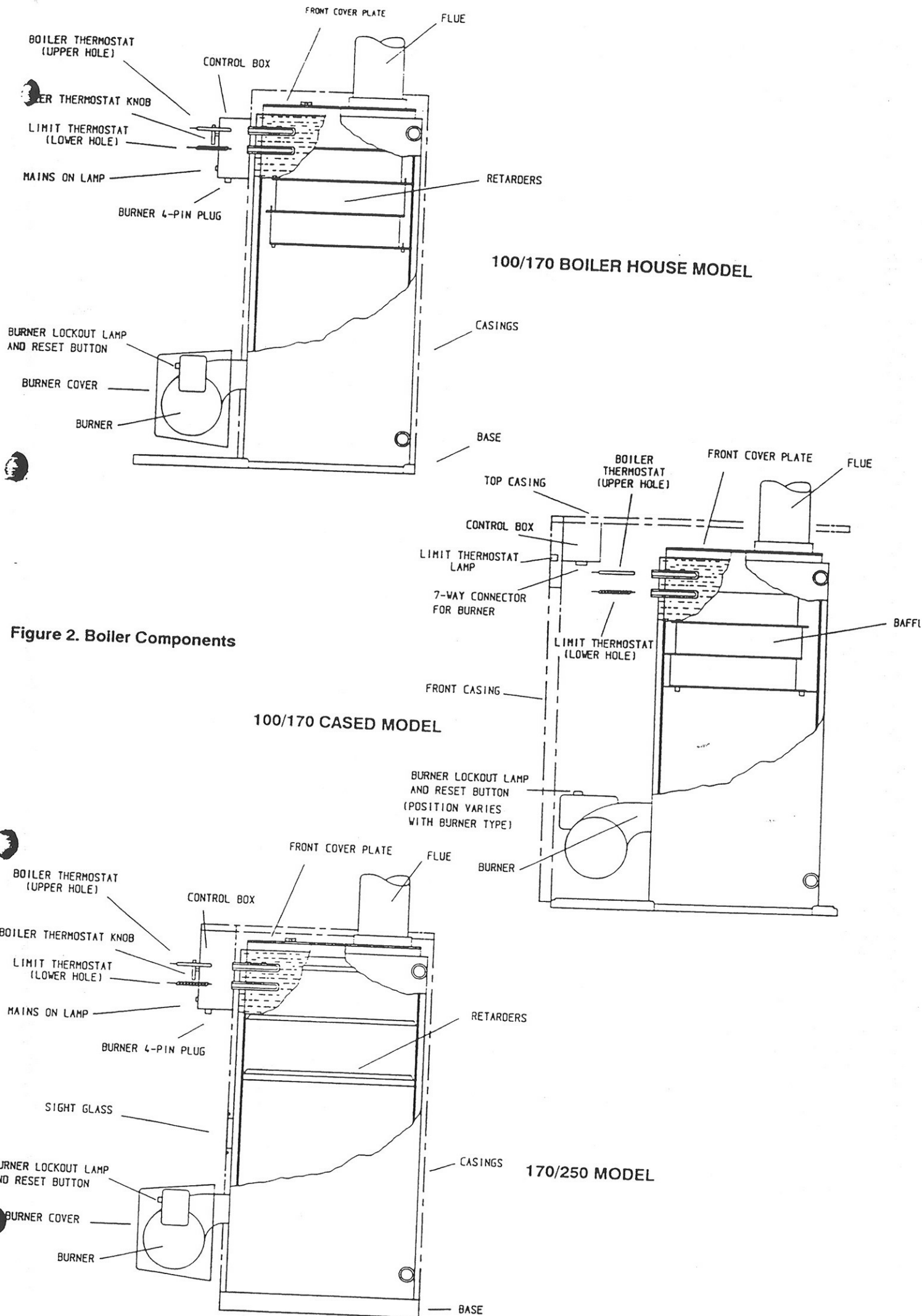


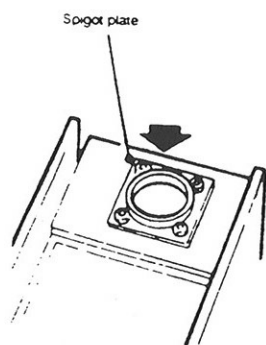
Figure 2. Boiler Components

## 1 UNPACK AND PREPARE THE BOILER

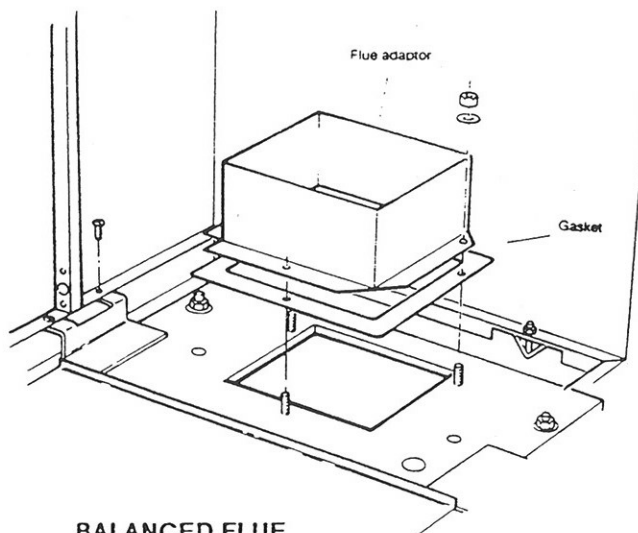
1. All Models - pull off top casing (4 studs).
2. Blank off all unused water connections.

## 2 POSITION THE SPIGOT

1. For conventional flue use spigot plate provided.
2. For balanced flue, fit flue adaptor and gasket supplied with flue kit and secure with 3 nuts and washers.



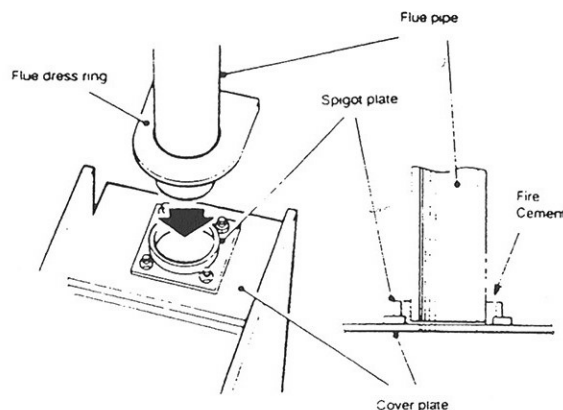
CONVENTIONAL FLUE



BALANCED FLUE

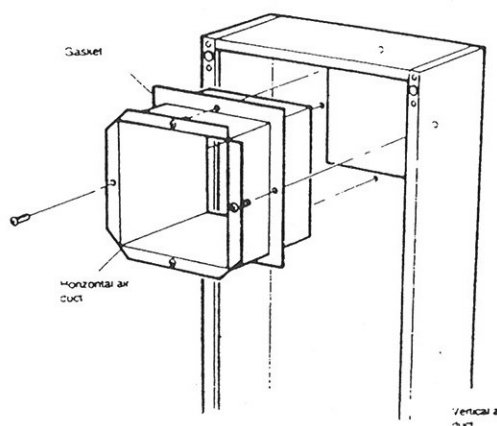
## 3 FITTING A CONVENTIONAL FLUE

1. Refer to dimensions given in Section 4 and prepare boiler as described on frame 1.
2. Fit the flue dress ring around the flue.
3. Seat the flue pipe in the spigot plate and seal the joint with fire cement.



## 4 FITTING A BALANCED FLUE (1)

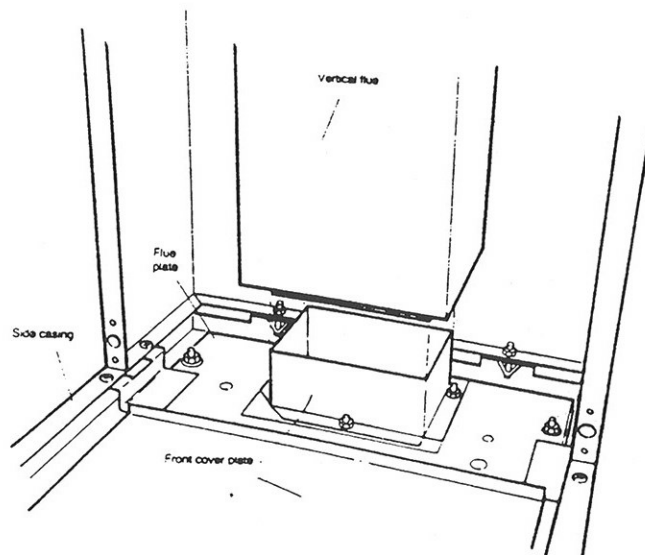
1. Having decided on the position of the boiler, cut a hole in the wall according to dimensions given in Section 4. Two screws will be secured through the holes in the back of the vertical air duct in the next section, ensure that there is adequate clearance for tips of the self tapping screws. Alternatively it may be convenient to use wood screws, screwed through into wallplugs.
2. Apply suitable sealant i.e. Silicone or cement around the hole to seal with horizontal air duct. Alternatively make good around the hole after installation if access is possible.
3. Position boiler against the wall, central to the hole.
4. Locate the vertical air duct on the rear casing (2 studs) and secure to the side casings with 2 screws as shown in frame 2, on later boilers the 2 studs have been replaced by a further 2 screws. The hole in the wall should now line up with the hole in the air duct - adjust boiler position if necessary.
5. From inside insert the horizontal air duct into the hole (seam at the top) and secure with 4 screws.





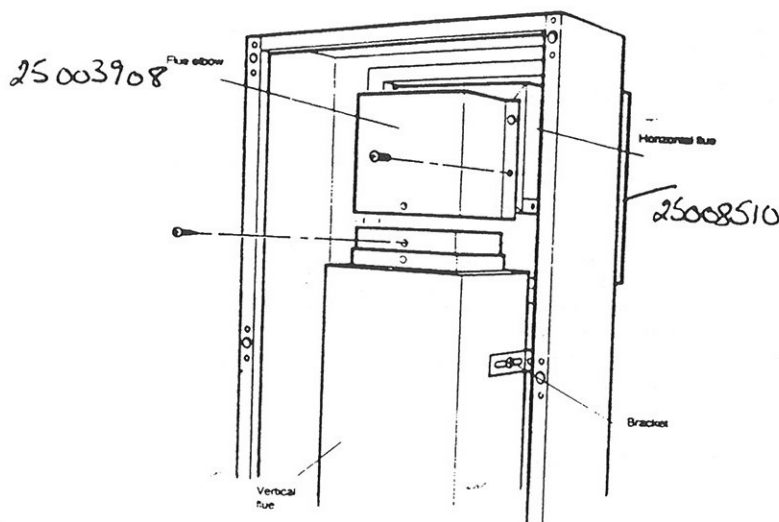
## 5 FITTING A BALANCED FLUE

1. Slide vertical flue over flue adaptor, with 3 holes in bottom of the duct locating on 3 studs on flue plate.
2. Secure vertical flue to vertical air duct with brackets provided. (self tapping screws to secure bracket to vertical flue, self tapping screws or wood screws to secure bracket to vertical air duct).



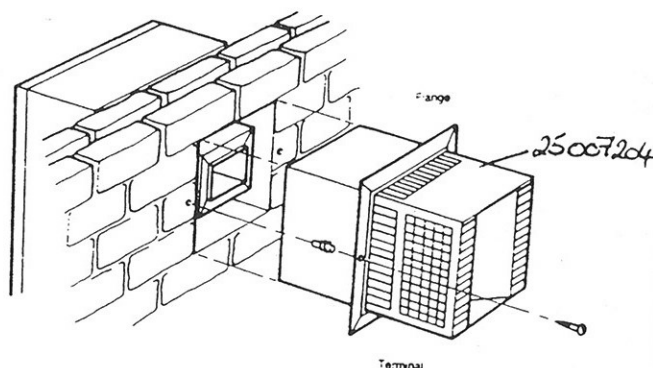
## 6 FITTING A BALANCED FLUE (3)

1. Apply gasket to flanges on flue elbow.
2. Secure to horizontal flue with 4 screws as shown.
3. Placing assembly in the horizontal air duct pull back to locate elbow on top of flue.
4. Secure with 1 screw (self taper).



## 7 FIT THE FLUE TERMINAL AND GUARD

1. Apply a layer of suitable sealant i.e. Silicone or cement around the edge of the hole.
2. From outside slide the terminal over the flue and push the outer casing fully home, so the flange seals on the sealant.
3. Secure the terminal to the wall with 2 screws, as shown.
4. Fasten the guard squarely to the wall over the terminal. A guard is not required unless the terminal can easily be reached (see section 9. flue system).



## 8 FITTING AIR DUCT FRONT PANEL

1. Check that flue is vertical and assembled correctly.
2. Push front panel onto air duct (6 studs).

## 9 CHECK THE BURNER NOZZLE AND THE RETARDERS

**Burner and nozzle (refer to burner information sheet)**

The burner is supplied preset to the pressure and with the nozzle shown, check whether this nozzle is correct for the required rating, if not, obtain the appropriate nozzle and change as described.

**Retarders (refer to fig 2)**

1. Remove the top cover from the boiler shell (2 wing nuts).
2. Check that all retarders are correctly positioned.
3. Replace the top cover and fully tighten the wing nuts.

## 10 CONNECT THE OIL SUPPLY AND WATER SUPPLY

### OIL SUPPLY

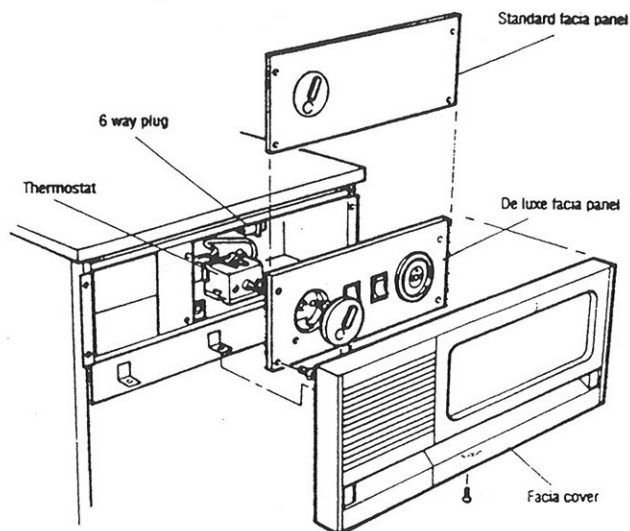
1. To ease future servicing, connect the oil supply to the burner by way of the flexible pipe provided. If a two pipe system is used it will be necessary to obtain a second flexible pipe.
2. Feed rigid copper pipe (minimum 8mm - not supplied) through the rearmost of the two holes at the base of the side panel, right hand or left hand as required. Cut the diaphragm grommet provided to accommodate so maintaining room seal.
3. It may be convenient to mount the filter and stop valve inside the casing, but ensure the filter is not directly above the burner control box, to prevent oil spillage entering the box when changing the filter.

### WATER SUPPLY

1. Connect the water supply with reference to section 10.

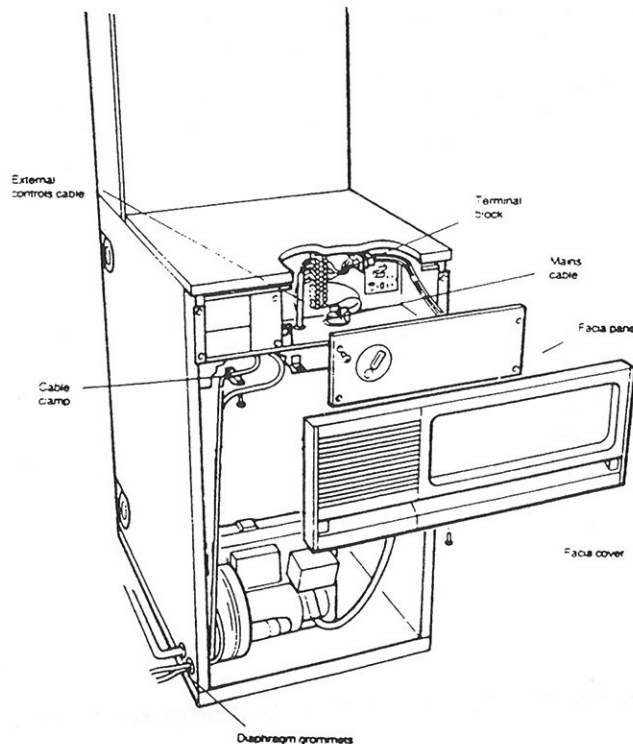
## 11 FITTING THE DE LUXE FACIA PANEL (IF REQUIRED)

1. Remove 2 or 3 screws beneath control box and lift off the facia cover.
2. Release the standard facia panel (4 screws) and carefully pull forward.
3. Push off the thermostat knob from behind using a screwdriver through the spaces provided in the facia panel.
4. Unscrew 2 front mounting screws and remove the thermostat body. Discard panel.
5. Fit thermostat to the de luxe panel with capillary uppermost. Press on the knob.
6. Connect the 6 way plug to the socket inside the control box with the purple lead forward.
7. Proceed to frame 12, steps 3 to 6.



## 12 CONNECTING THE ELECTRICITY SUPPLY

1. Remove the 3 screws beneath control box and lift off the facia cover.
2. Release the facia panel (4 screws) and carefully pull forward.
3. Feed mains cable and external controls cable through the forward hole at the base of the side panel (right hand or left hand as required) and through hole into the control box, cutting the two diaphragm grommets to accommodate and so maintain room seal.
4. Connect mains cable to the terminal block:
  - Brown (Live) to L (Permanent live for all B.F. and for C.F. with internal programmer).
  - Blue (Neutral) to N.
  - Green/Yellow (Earth) to  $\perp$
5. Connect external controls cable to the terminal block: see wiring diagrams Section 15, for details.
6. Secure mains cable and if applicable, the external controls cable, in the cable clamp provided (2 screws), and ensure that the cables do not touch the boiler shell.
7. Replace the facia panel and cover.
8. Replace the top cover.



**The following instructions apply only to boiler house models.**

The 170/250 model is similar except the casings and control box are already fitted.

1. Position the boiler in accordance with Section 8. Fit outer casing (if required), according to instructions supplied with casing pack, apart from top casing panel. Detach part of the label showing fuel type from boiler shell, before fitting, and re-attach to outside of front casing.
2. Connect the water system, see Section 10.
3. Connect the flue system, see Section 9. Seal the connection between the flue pipe and the boiler spigot with fire cement.
4. Fit the boiler control box:  
Remove the thermostat knob by pulling off.  
Remove the control box lid (two screws).  
Screw the control box base to the bracket on the front of the boiler shell, using the screws provided in the bracket.  
Connect the electricity supply to the terminal block, see Section 7 and the wiring diagrams in Section 15, and burner information manual. Secure mains cable in the cable clamp provided (two screws). Ensure that the cable(s) do not touch the boiler shell.  
Fit the control box lid and thermostat knob.
5. Carefully uncoil the thermostat capillaries, and fit the thermostat phials into their pockets in the top right corner of the boiler shell, noting the correct location shown in Figure 2. Retain the phials using the "R" clips provided.
6. The burner is supplied preset to the pressure and with the nozzle shown in the burner information sheet. Check whether the nozzle is correct for the required rating. If not, obtain the appropriate nozzle and change, then fit to boiler shell, as described in burner instructions. Connect the burner cable to the control box, using the four pin Bulgin plug.
7. Connect oil supply, see Section 6.
8. Remove the top cover from the boiler shell (two wing nuts), and check that all the retarders are correctly positioned, see Figure 2, (components diagram). Replace the top cover, and fully tighten the wing nuts.

## 12. COMMISSIONING

Refer to the burner information sheet supplied, for location of items and technical data mentioned in the following procedures:

1. Temporarily disconnect the oil pipe from the burner, run off oil into a container to purge the fuel pipe of air or foreign matter. Reconnect the oil pipe, and check for leaks, rectify if necessary. Purge air from the oil pump from the position indicated. Purging is unnecessary on a two pipe system, as air is automatically vented as the burner is started.
2. Check burner information to see if oil pump bypass plug is required for a two pipe oil supply system.
3. Connect a pressure gauge to the pressure gauge connector on the burner.
4. Check that the water system is fully vented. Check for leaks, rectify if necessary.
5. Check all external controls are set to call for heat. Set the boiler thermostat to maximum setting, and set the programmer (if fitted) to call for heat. Switch on the electricity supply. The burner fan should start immediately, and the burner should light within approximately 20 seconds. If the flame is not established within this time, the burner will go to lock-out, and the "Reset" light on the burner will be lit. WAIT FOR THREE MINUTES to allow unburnt vapour to disperse, then press the reset button on the burner to restart the burner. If lock-out again occurs, consult fault finding guide.

**NOTE:** When the electricity supply is connected to a balanced flue boiler, the post purge unit will run the burner fan for approximately 2 minutes, even if all controls are set to off, though the burner will not light. The burner fan will also continue to run for 2 minutes after the burner has been shut down by external controls, boiler thermostat, or a lock-out condition on the burner control box, to clear fumes from the boiler.

6. When the burner has lit, adjust the pump pressure to give the required output, using the pressure regulator. Turn off the boiler, remove the pressure gauge from the connection, and refit the plug.
7. **COMBUSTION TESTS MUST BE DONE WITH THE OUTER CASING FITTED ON BALANCED FLUE MODELS.** Refit top casing and front casing. Let the boiler run for 20 minutes, then check the CO<sub>2</sub> level, flue gas temperature, and smoke number, inserting the test probe into the test point on the left hand side of the boiler shell top for conventional flue models, and at the flue terminal for balanced flue models. Compare with the figures shown in the burner information sheet, and if necessary, adjust the air damper. A suitable position is that which gives a CO<sub>2</sub> reading in the range 9% to 12.5%, but normally 1% less than that which has a smoke number of 1.
8. When fully heated, re-examine the water system for leaks, and rectify if necessary. Turn off the boiler, drain the water system whilst hot, refill and vent the system.
9. **NOTE:** The boiler is fitted with a limit thermostat to switch off the burner, should the boiler overheat. The limit thermostat is of a self-resetting type, and the boiler will restart automatically as soon as the system cools. Ensure that the boiler is not cycling on the limit thermostat alone, for cased models, by checking that the limit thermostat light on the control panel does not light as the boiler cycles, for boiler house models by turning the boiler thermostat to setting 1, the burner should now switch off at a lower water temperature.

## 13. HANDING OVER THE INSTALLATION

Hand all instructions to the user or purchaser for retention. Demonstrate and explain the safe and efficient operation of the boiler. Advise the user or purchaser that for continued safe and efficient operation, it is important that servicing is carried out at least once a year.

## 14. ANNUAL SERVICING

Servicing should be carried out once or twice a year, depending on the amount of use, ie winter use only, or summer and winter use.

**WARNING:** Always turn off the oil supply at the storage tank outlet, and switch off and disconnect the electricity supply to the boiler, before commencing servicing.

**Preparation** (see Figure 2)

### Cased models:

Pull off the top casing (four studs), the front casing (4 studs), and on the balanced flue, the front of the air duct (six studs).

### Boiler house models:

Remove top casing panel, if fitted (four screws on sides). Remove burner outer cover (if fitted)

Remove the top cover from the boiler shell, by removing two wing nuts. Remove the retarders from inside the boiler shell. Separate the 7-way connector for the burner from the control panel, (4-pin Bulgin plug on boiler house models). Remove burner (see burner information sheet). Check the flue is positioned correctly, and there are no obstructions in the air ducts.

### Boiler Servicing

Clean the flue. Clean the retarders and all internal surfaces with a brush and scraper, remove all debris from inside the boiler. Remove the filter bowl from the filter in the oil pipe, and renew the element, (ensure any oil spillage does not enter burner control box). Open sludge valve on storage tank to remove sludge.

### Burner Servicing

See burner information sheet supplied.

### Re-assembly

Replace the burner in the boiler, securing as appropriate. Replace the 7-way connector (or 4 pin plug) for the burner under the control box. Replace the retarders in the boiler (see Figure 2). Replace the top cover on the boiler shell, and fully tighten the two wing nuts. Turn on the oil supply, and bleed air from the oil pump.

### Final checks

Turn on the electricity, and check that the burner lights when required. Check the pump pressure is correct for the required output. For balanced flue models, replace any damaged sealing tape around casings, and refit front of air duct.

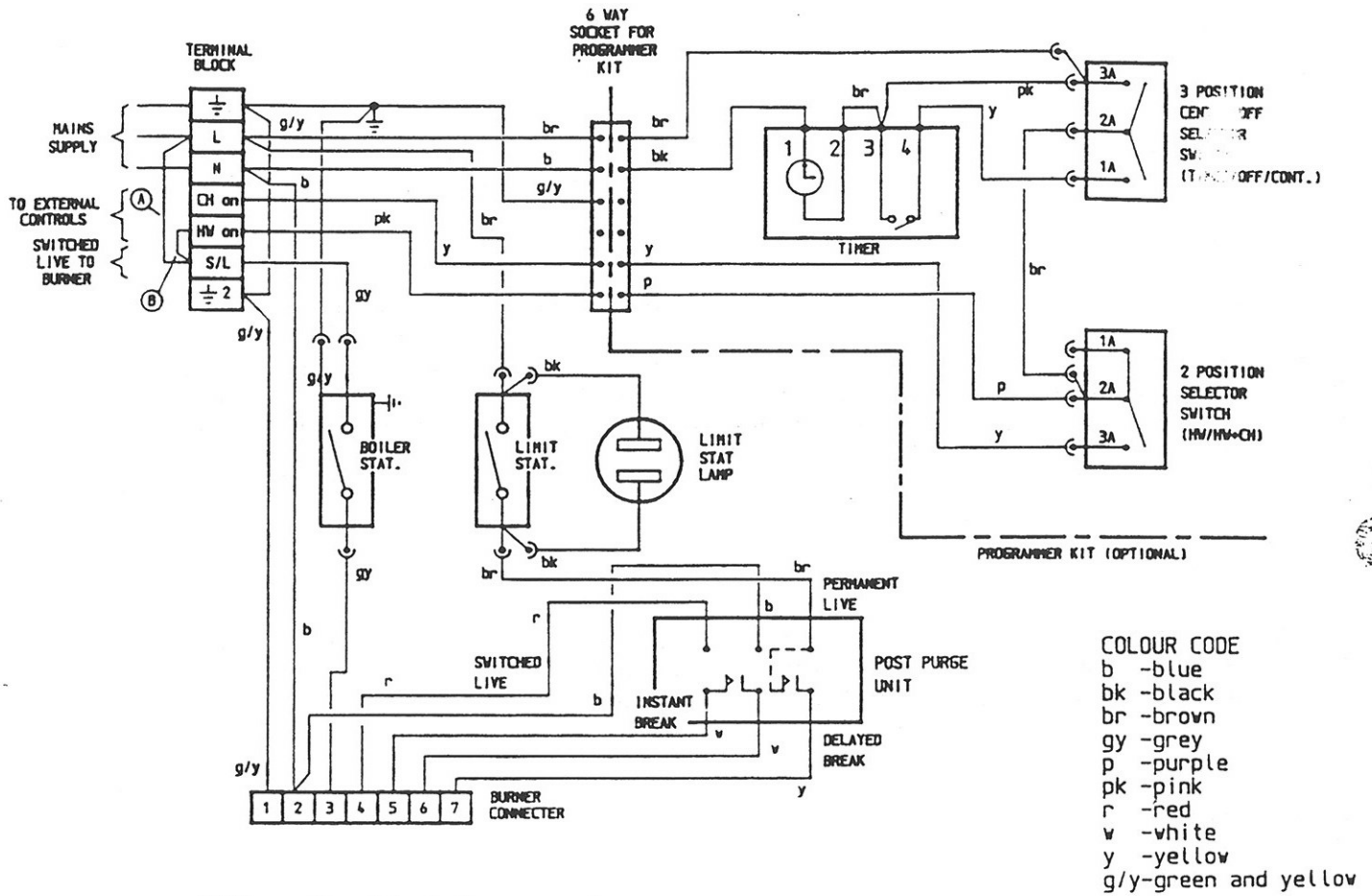
Refit front and top casings. Following the instructions given in Section 12.7, check the CO<sub>2</sub> level. Smoke number and flue gas temperature, and adjust the air damper if necessary.

Reset the timer (if fitted) to the correct time.

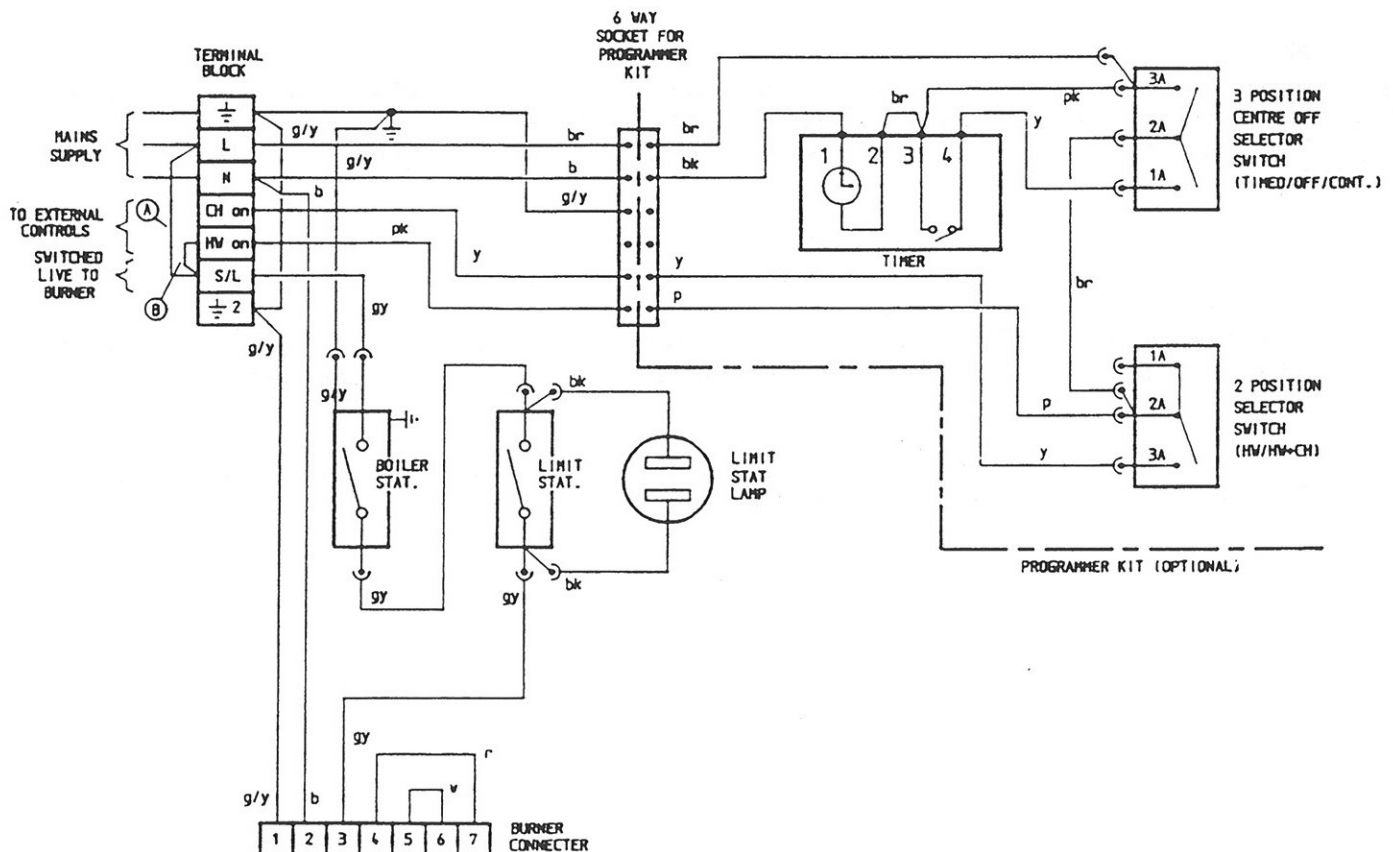
## 15. WIRING DIAGRAM

Boiler control box (the matching burner wiring is shown in the burner information sheet)

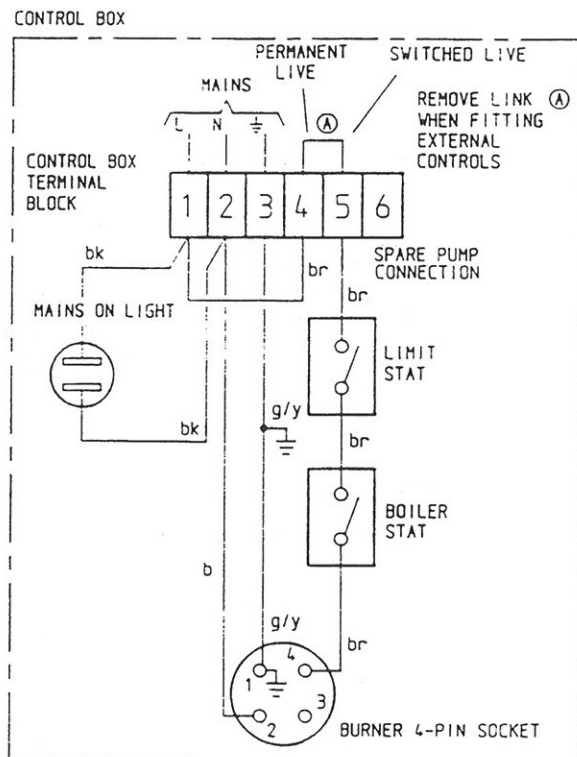
### a) Balanced flue boilers, with post purge



### b) Conventional flue boilers, no post purge







COLOUR CODE

b -blue  
bk -black  
br -brown  
g/y -green and yellow

NOTES: BALANCED FLUE BOILERS

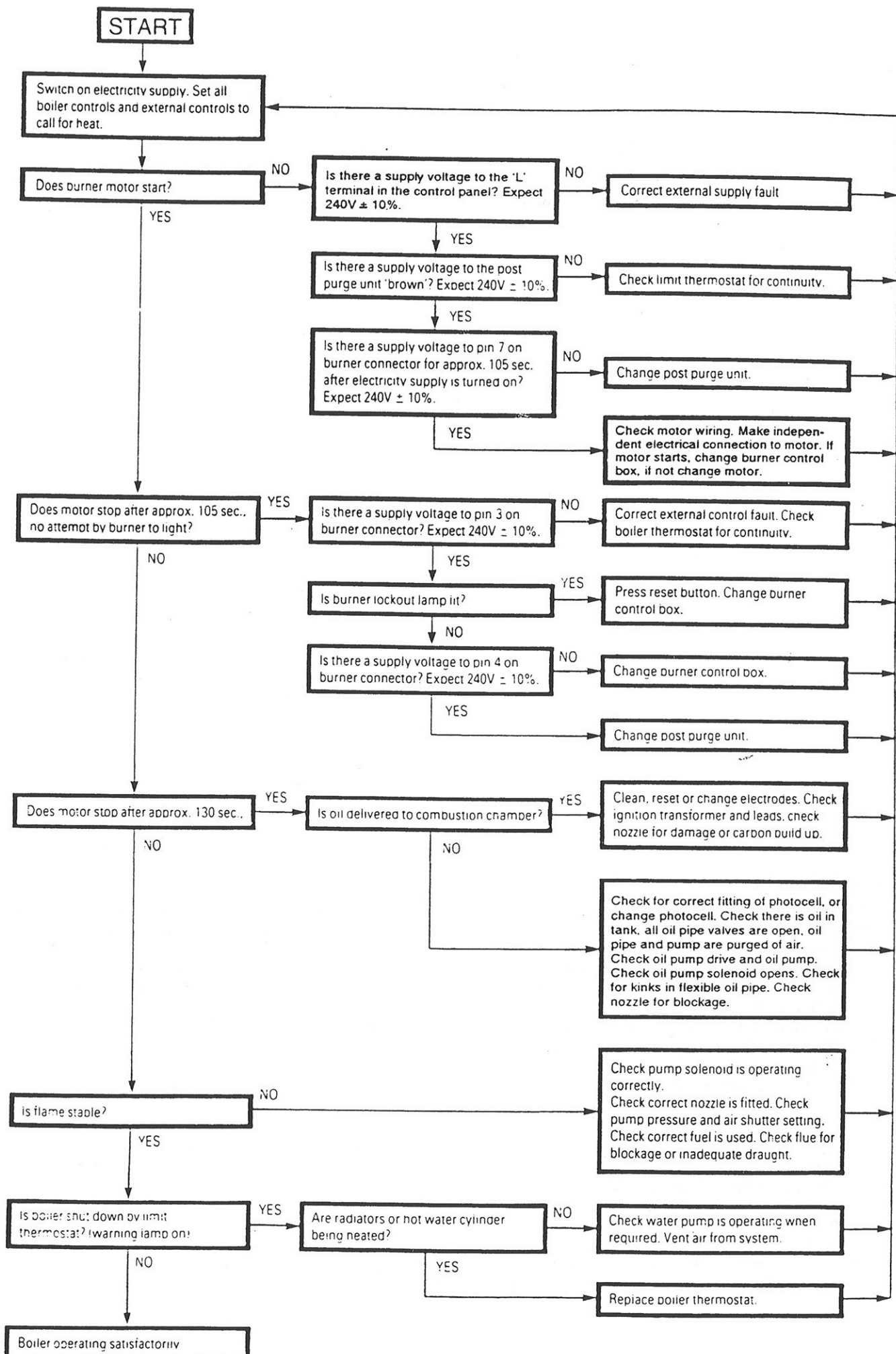
- (i) 'External controls' refer to room thermostat, cylinder thermostat, external timer/programmer, motorised valves or any combination of these, which control the electrical supply to the boiler 'switched live.' Any such combination simply ends in a wire or connection which becomes live when the boiler is required to fire, this point is connected to 'switched live. S/L'
- (ii) A link is factory fitted on the terminal block, so that the boiler will fire without any additional connections being necessary. The link is fitted in position (A) when an internal programmer is not factory fitted, and in position (B) when a programmer is factory fitted. However, the boiler may be fitted to a variety of heating systems each requiring differing wiring arrangements, and hence in many cases the link will be removed. The connection point for the circulating pump varies between the heating system types. When fitting ANY external controls remove link, whether it is in position (A) or position (B). If an internal programmer is fitted on site then:
  - (a) move link from (A) to (B) if there are no external controls.
  - (b) remove link (A) if external controls are fitted.
- (iii) For external programmer or controls, the live supply can be taken from 'L.'
- (iv) For internal programmer kit 'C.H. ON' is live to room thermostat, 'H.W. ON' is live to cylinder thermostat, then to motorised valve(s) (if fitted) and circulating pump, details varying between various systems.
- (v) Switched live from external controls goes to 'S/L' to turn on burner.

NOTES: CONVENTIONAL FLUE /BOILER HOUSE BOILERS

- (i) If an internal programmer is fitted, the mains supply must be a permanent live. See notes for balanced flue above.
- (ii) If an internal programmer is not fitted, it is acceptable to have the mains supply switched by external controls, leaving link (A) in position. In this case the boiler is connected as 'BASIC BOILER' on control manufacturers instructions.

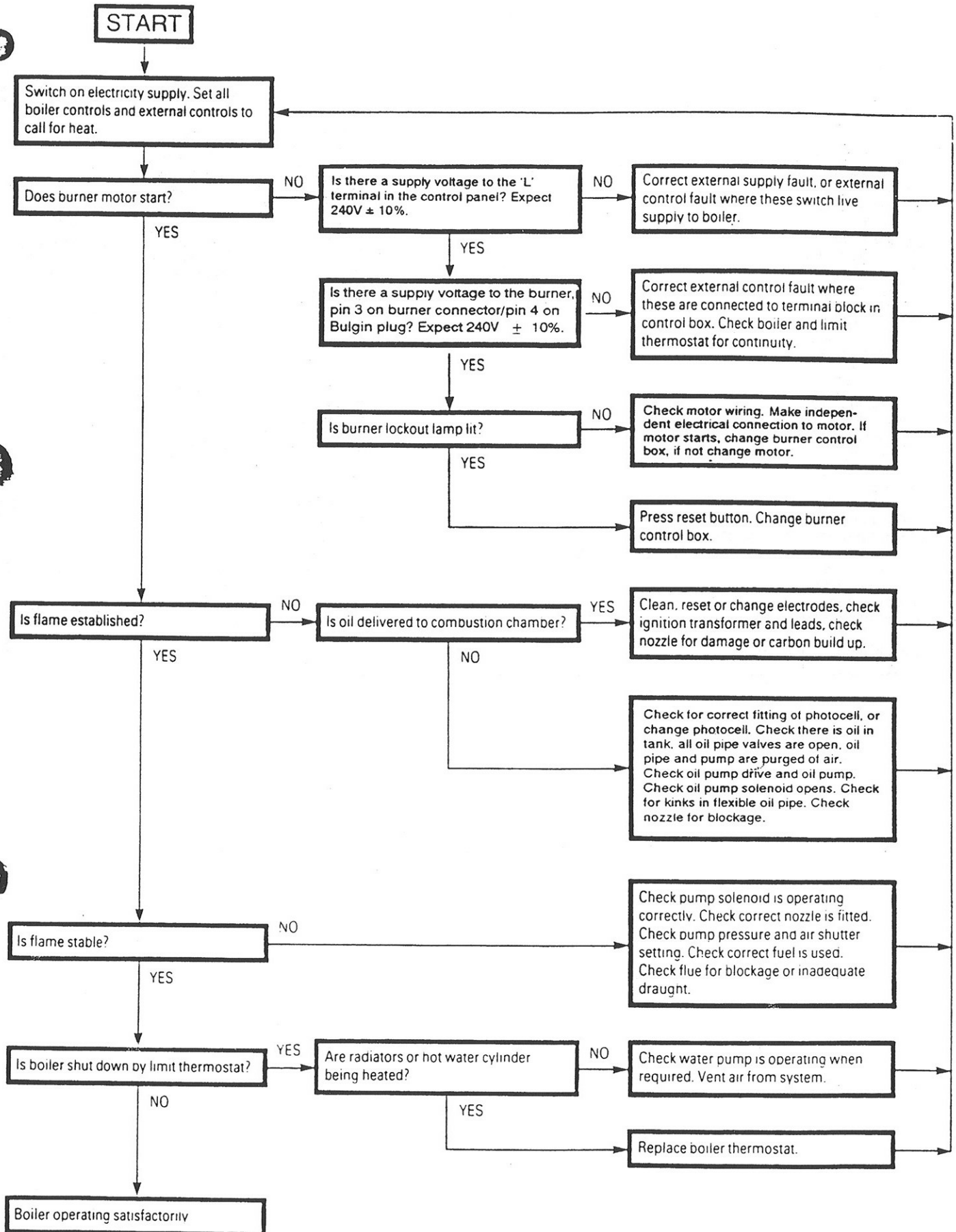
## 16. FAULT FINDING GUIDE

### a) Balanced flue boilers, with post purge





b) Conventional Flue and Boiler-House Models, no post purge.



## 17. PARTS LIST

MODEL	100/130	130/170	170/250
Front casing	25/0063/05	25/0063/06	-
Side casing - left	25/0048/05	25/0048/07	-
Side casing - right	25/0048/06	25/0048/08	-
Top casing	25/0060/07	25/0060/08	-
Flue dress ring	25/0097/03	25/0097/04	-
Front casing	25/0053/05	25/0053/06	2400-11938
Side casing - left	25/0052/06	25/0052/08	2400-11935
Side casing - right	25/0052/05	25/0052/07	2400-11936
Top casing	25/0054/04	25/0054/08	-
Flue dress ring	25/0097/07	25/0097/08	-
Rear casing	-	-	2400-11939
Front top casing	-	-	2400-12004
Rear top casing	-	-	2400-11940
Front casing	25/0063/07	25/0063/08	-
Side casing - left	25/0048/09	25/0048/11	-
Side casing - right	25/0048/10	25/0048/12	-
Rear casing	25/0053/17	25/0053/18	-
Top casing	25/0060/11	25/0060/12	-
Retarder	-	-	2400-11927
Baffle assembly	25/0025/04	25/0025/05	-
Baffle plate	22/0025/08	22/0025/09	-
Boiler thermostat Ranco C26, cased model	25/0093/02	25/0093/02	-
Boiler thermostat Ranco C26, boiler house model	2200/8471	2200/8471	2200/8471
Limit thermostat	1100/8968	1100/8968	1100/8968
Post purge unit	25/0093/01	25/0093/01	-
Burner assembly, cased model	25/0055/09	25/0055/10	-
Burner assembly, boiler house model	25/0055/12	25/0055/13	2400-11900
Gas Oil Conversion Kits	25/9012/04	25/9012/05	-