



Installation and Servicing Instructions

for the Apollo 30Si, 40Si and 50Si wall mounted gas boilers

G.C. Appliance No's.

Apollo 30Si	41 494 37
Apollo 40Si	41 494 38
Apollo 50Si	41 494 39

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	Technical data	3
3	General requirements	4
4	Delivery	4
5	Gas supply	4
6	Electricity supply	4
7	Air supply	4
8	Flue system	4
9	Boiler location	5
10	Important installation notes	5
11	Boiler dimensions and position of water and gas connections	6
12	Water system schematics	6
13	Sealed system requirements	7
14	Installation procedure	8
15	Commissioning	12
16	Boiler controls	13
17	Final assembly and handing over the installation	13
18	Annual servicing	14
19	Lighting instructions	15
20	Replacement of parts	15
21	Wiring diagrams	20
22	Fault finding guide	23
23	Exploded view	24
24	Short list spare parts	25

If you have any reason to complain of any shortage of components listed in Figs 5 or 6, supply a list of the item(s) concerned, boiler model, your name, address and any information which may help us avoid further error.

Address for return:

Spare Administration Manager

Curzon Components Ltd.

Earlsway

Team Valley Trading Estate

Gateshead, Tyne and Wear

NE11 0SA

1. INTRODUCTION

These fanned draught room-sealed wall mounted boilers are for use on natural gas only, and are suitable for rear or side exit flue.

The Apollo boilers are range rated at the following outputs:

Apollo 30 Si: 4.4 to 8.8 kW (15 000 to 30 000 Btu/h)

Apollo 40 Si: 8.8 to 11.7 kW (30 000 to 40 000 Btu/h)

Apollo 50 Si: 11.7 to 14.7 kW (40 000 to 50 000 Btu/h)

All models are factory set to the maximum output.

The boilers are designed for use only on fully pumped open vented or sealed water systems with an indirect hot water cylinder.

THEY MUST NOT BE CONNECTED TO A DIRECT CYLINDER.

2. TECHNICAL DATA

For boiler model see lighting instruction label inside the bottom cover or the data plate on the inner case. For serial No. see tag on the bottom of the inner case just above the control box (visible after removing the bottom cover).

Boiler	Apollo 30 Si	Apollo 40 Si	Apollo 50 Si
Burner type	Bray AB24013M or Furigas 175-500-018	Bray AB24054M Furigas 175-500-032	Bray AB24014M or Furigas 175-500-017
Burner injector	Bray 16/800	Bray 28/1000	Bray 16/1400
Pilot injector	Honeywell 4500-4108-005 marked 56/42A		
Pilot flame	35 to 40 mm long		
Spark gap	3.0 to 4.0 mm		
Ignition	Intermittent pilot		
Weight (empty)	27.3 kg (60 lb)		
Lifting weight (installing)	21.8 kg (48 lb)		
Water content	0.36 litre (0.08 gal)	0.43 litre (0.1 gal)	0.50 litre (0.11 gal)
Max. flow temperature	82°C		
Design temperature rise	9°C		
Maximum static head	30.5 m (100 ft)		
Minimum static head	150 mm (6 in) above the highest point in the system		
* Head loss	0.38 m (15 in)	0.54 m (21½ in)	0.71 m (28 in)
Height	711 mm (28 in)		
Width	340 mm (13¼ in)		
Depth	300 mm (11¾ in)		
Clearance required for servicing	Top	50 mm (2 in)	
	Bottom	90 mm (3½ in)	
	Front	300 mm (11¾ in)	
	Sides	5 mm (¼ in)	
Flue terminal size	100 mm dia. x 65 mm deep (4 in dia. x 2½ in deep)		
Water connections	Compression fittings to accept 22 mm copper tube to BS2871		
Gas connection	Rp½		

* Head loss given is applicable only when the flow through the boiler is 690 litres/h (2.5 gal/min) for the Apollo 30 Si, 910 litres/h (3.3 gal/min) for the Apollo 40 Si and 1146 litres/h (4.2 gal/min) for the Apollo 50 Si.

NOMINAL BOILER RATINGS

Boiler	Output		Input		Burner setting pressure	
	kW	Btu/h	kW	Btu/h	mbar	in wg
Apollo 30 Si	4.4	15 000	5.8	19 600	4.1	1.6
	8.8	30 000	11.0	37 500	14.9	6.0
Apollo 40 Si	8.8	30 000	11.4	39 000	10.0	4.4
	11.7	40 000	14.7	50 000	16.5	6.6
Apollo 50 Si	11.7	40 000	14.9	50 900	9.0	3.6
	14.7	50 000	18.3	62 500	12.2	4.9

3. GENERAL REQUIREMENTS

The boiler must be installed in accordance with: The Gas Safety (Installation and Use) Regulations 1984 and the current issue of: the Building Regulations, Building Standards (Scotland) Regulations, Local Building Regulations, Model and local Water Undertaking Byelaws and IEE Wiring Regulations.

Detailed recommendations are stated in the following British Standards: BS6891:1988, BS6798:1987, BS5546:1990, BS5440:1:1990, BS5440:2:1989 and BS5449:1:1977.

Note: Gas Safety (Installation and Use) Regulations 1984: It is the 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 cased boiler and (2) the flue/terminal assembly type A, B, C, D or E as required.

In addition a 965 mm (38 in) flue extension is available. **Under no circumstances should more than two extension kits be used.**

A plug-in programmer kit is also available to fit inside the boiler casing. This programmer simplifies wiring and is suitable for use with all external control systems shown in the system wiring diagrams supplied with the boiler.

A fit from the inside kit is available which enables the flue/terminal assembly to be fitted from inside the building.

A Vertex flue kit is available which allows the boiler to be connected to a vertical flue system.

A pump and by-pass kit is available which positions the pump in a readily accessible position, includes a built in by-pass which does not require adjusting and allows the combined cold feed and vent to be connected directly to the boiler. The kit includes an outer case extension which increases the boiler height to 861 mm.

5. GAS SUPPLY

The natural gas requirements are as follows:

Apollo 30 Si: 1.1 m³/h (37 ft³/h) Apollo 40 Si: 1.4 m³/h (51 ft³/h) Apollo 50 Si: 1.8 m³/h (62 ft³/h)

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.

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

6. 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 socket outlet (both complying with the requirements of BS1363) adjacent to the boiler.

Fuse the supply at 3 A. The minimum requirement for the power supply cable is that it should be a PVC sheathed flexible cord at least 0.75 mm² (24 x 0.2 mm) (code designation HO5 VV-F or HO5 VVH2-F) as specified in table 16 of BS6500:1984.

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

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, Short Circuit, Polarity and Resistance to Earth.

7. AIR SUPPLY

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

If the boiler is installed in a cupboard or compartment, permanent air vents are required in the cupboard or compartment, one at high level and one at low level, either direct to the outside air or to a room. Both high level and low level air vents must communicate with the same room or must be on the same wall to outside air. Both the high level and low level vent must each have a free area as stated below. The free area of each vent may be halved if the ventilation is provided directly from outside.

Apollo 30 Si: 99 cm² (15 in²) Apollo 40 Si: 133 cm² (20 in²) Apollo 50 Si: 165 cm² (25 in²)

If the boiler is installed in a cupboard or compartment with a door, allow at least 100 mm clearance between the front of the boiler and the door for air movement.

8. FLUE SYSTEM

Five telescopic flue/terminal assemblies are available and a fixed length, 965 mm (38 in), extension kit.

The flue lengths are:

Size A: 123 - 175 mm (4¾ - 7 in)

Size B: 171 - 275 mm (6¾ - 10¾ in)

Size C: 274 - 478 mm (10¾ - 18¾ in)

Size D: 362 - 652 mm (14¼ - 25¾ in)

Size E: 582 - 1092 mm (23 - 43 in)

Unless otherwise specified the C size flue/terminal will be supplied with the boiler.

The following method should be used to determine the required flue/terminal assembly.

Rear flue A = C + 83 mm (3¼ in)

Side flue A = B + C + 127 mm (5 in)

Where A = required flue length, B = inside wall to side of boiler and C = finished wall thickness.

If A is greater than 1092 mm (43 in) one or two extension kits may be used.

Note: The maximum allowable flue length is 3022 mm (119 in).

9. 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 25 mm (1 in) to combustible material. A metal sleeve should be installed to surround the air/flue tube assembly to provide a 25 mm (1 in) 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 current IEE Wiring Regulations and, in Scotland, the electrical provisions of the Building Standards applicable in Scotland with respect to the installation of the boiler in a room containing a bath or shower.

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.

The boiler requires only the clearances stated in the technical data, page 3, after installation. If it is felt that extra space is required for installation any adjacent kitchen units or fittings may have to be 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.

The minimum acceptable spacings from the terminal to obstructions, corners and ventilation openings are specified in the following table:

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 a balcony	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 internal or external corners	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 K1 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.

10. IMPORTANT INSTALLATION NOTES

1. The Apollo is to be used only on fully pumped systems, and with an indirect cylinder.
2. Only high head pumps producing at least 3.35 m (11 ft) head at a flow rate of 690 litres/h (2.5 gal/min) for the Apollo 30 Si, 910 litres/h (3.3 gal/min) for the Apollo 40 Si or 1146 litres/h (4.2 gal/min) for the Apollo 50 Si must be used.
3. Connect the pump in the flow pipe as shown in the water system schematics.
4. Mains electricity and the pump must always be connected to the boiler to allow the pump overrun to function.
5. It is important that the polarity of the mains supply is correct and that the boiler is adequately earthed.
6. For open vented systems a combined or close coupled feed and vent must be connected as shown in the water system schematics.
7. A system by-pass is essential. The by-pass should be of 15 mm pipe and must be as short as possible across the 22 mm flow and return pipes and at least 1.5 m away from the boiler. Install the by-pass as shown in the water system schematics and adjust as described in the commissioning instructions.
8. The system wiring must be completed in accordance with the diagrams supplied with the boiler.
9. When commissioning, the system must be vented and the pump running before the main burner is lit.

10. The system must be flushed twice; initially cold with the pump removed and all valves open, and then after the first heating.
11. Where the Apollo replaces an older boiler in an existing system, make sure the cylinder is indirect.
12. In areas with hard or aggressive water we recommend that Fernox CP3 inhibitor should be used. See commissioning instructions for details of use.
13. The inner case of the boiler should not be removed during installation.

11. BOILER DIMENSIONS AND POSITION OF WATER AND GAS CONNECTIONS

Refer to Fig. 1.

Overall cased dimensions:

Height: 711 mm
 Width: 340 mm
 Depth: 300 mm

Clearances required for servicing:

Top: 50 mm
 Bottom: 90 mm
 Front: 300 mm
 Sides: 5 mm

See section 9 for installation clearances.

Water connections: Compression fittings are supplied for flow and return connections to accept 22 mm copper tubing to BS2871.

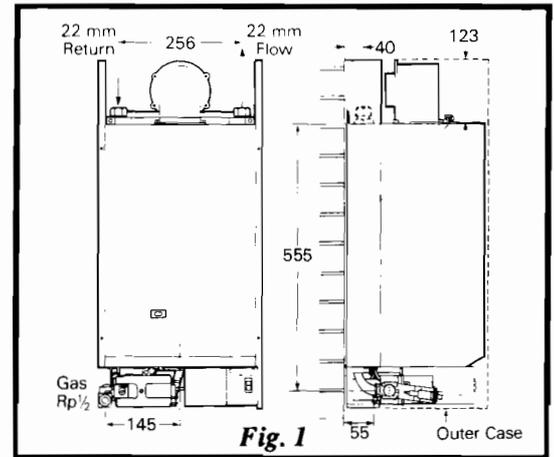


Fig. 1

12. WATER SYSTEM SCHEMATICS

a. Fully pumped open vented system with combined cold feed and vent - see Fig. 2.

The combined cold feed and vent must rise from the boiler.

Some water authorities require a stop cock in the cold feed, in which case a separate vent must be connected as shown.

b. Length of wet and dry vents for close coupled cold feed - see Fig. 3.

The distance between the cold feed and vent connection to the system must not be more than 150 mm. The point of connection of these pipes should be as close to the boiler as practicable.

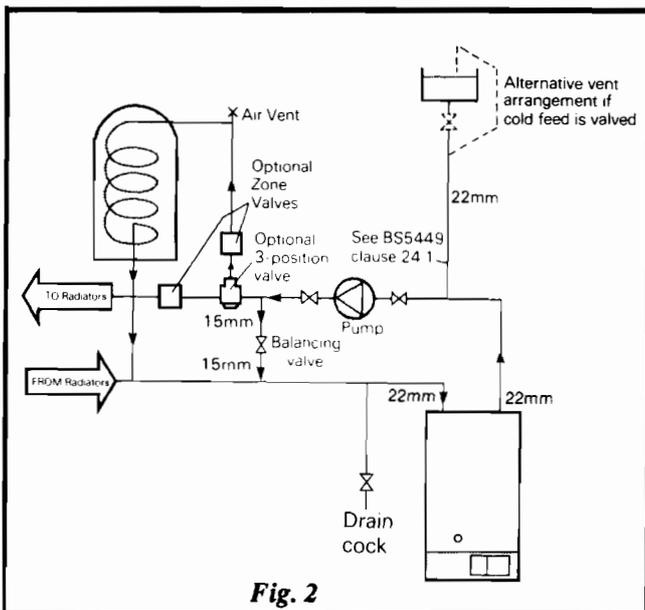


Fig. 2

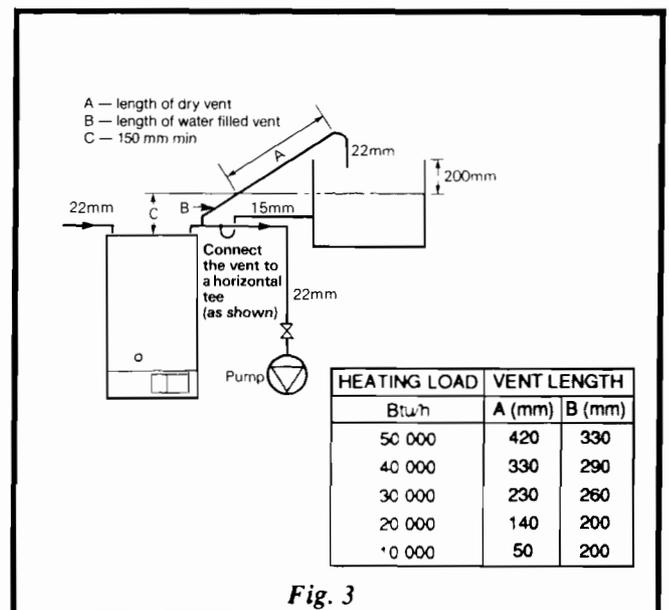


Fig. 3

The by-pass balancing valve should be of a type that is non-adjustable by the householder and must have at least 1.5 m of 22 mm pipe each side between it and the boiler.

Always ensure that the pump has sufficient static head. Check the pump manufacturers minimum head.

The flow through the boiler must not be allowed to fall below 690 litres/h (2.5 gal/min) for the Apollo 30 Si, 910 litres/h (3.3 gal/min) for the Apollo 40 Si or 1146 litres/h (4.2 gal/min) for the Apollo 50 Si while the burner is alight.

Ensure that the pump is accessible for servicing. Isolating valves must be positioned as close to the pump as possible.

Fit one or more draining taps (BS2879) to enable the water system to be fully drained.

13. SEALED SYSTEM REQUIREMENTS

Refer to Fig. 4.

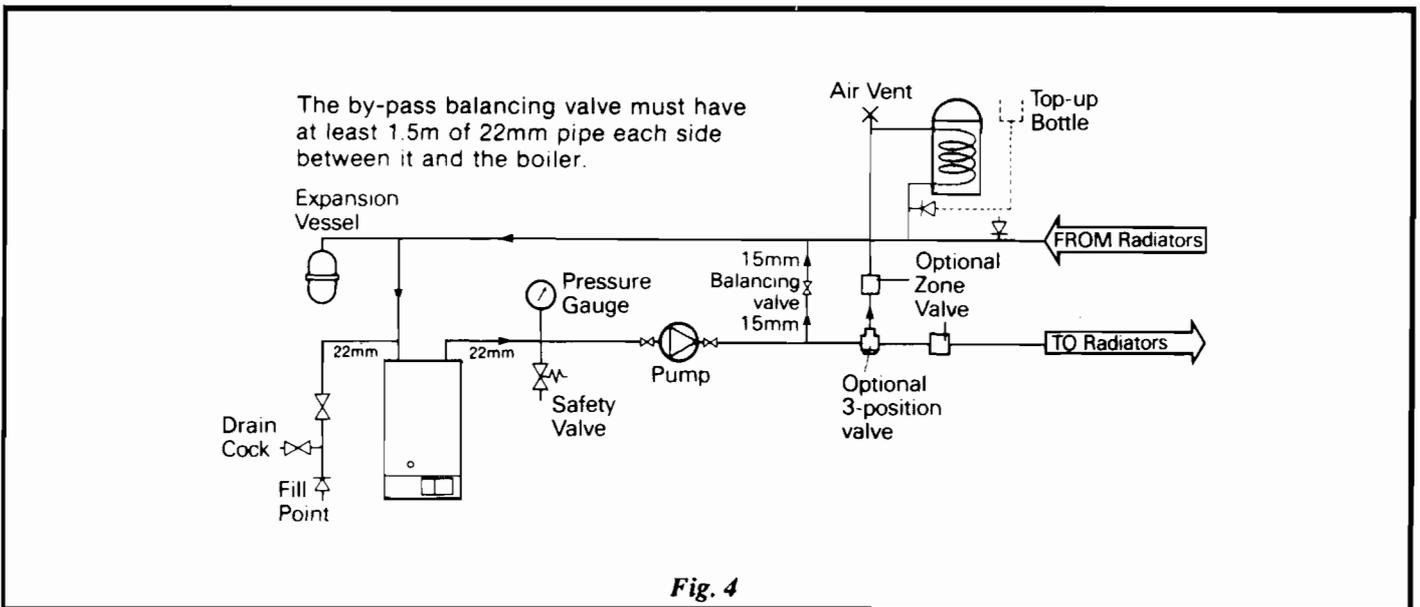
- The installation must comply with the requirements of BS6798 and BS5449:1. Maximum water temperature is $82^{\circ}\text{C} \pm 3^{\circ}\text{C}$.
- A safety valve set to operate at 3 bar (45 lbf/in²) shall be fitted in the flow pipe close to the boiler. There must not be any valves between the safety valve and the boiler. The valve should be positioned on a discharge pipe fitted to prevent any discharge creating a hazard to occupants or cause damage to electrical components and wiring.
- A pressure gauge covering at least the range 0 to 4 bar (0 to 60 lbf/in²) shall be fitted in the system.
- A diaphragm type expansion vessel, to BS4814, shall be connected at a point in the return pipe close to the boiler. The vessel must be chosen to suit the volume of water in the system and the charge pressure must not be less than the static head at the point of connection. Further details can be obtained from "Material and Installation Specification for Domestic Central Heating and Hot Water" published by British Gas and BS7074:1.

Sizing table:

Air or Nitrogen charge pressure (bar)	0.5		1.0	
Pre-pressurisation pressure (bar)	None	1.0	None	1.5
Expansion vessel volume (litres)	$A \times 0.07$	$A \times 0.120$	$A \times 0.088$	$A \times 0.160$

A = System volume (litres)

- The hot water cylinder shall either be the indirect coil type or a cylinder fitted with an immersion calorifier.
- 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 on the return side of the cylinder or radiators. Where access to a make-up vessel would be difficult, make-up can be provided by pre-pressurisation of the system.
- The system may be filled from the mains via a temporary hose connection from a draw-off tap supplied from a service pipe under mains pressure, provided that this procedure is acceptable to the local water authority. The following fittings should form a permanent part of the system and fitted in the order stated:
 - a stop valve complying to the requirements of BS1010:2.
 - a test cock.
 - an anti-vacuum valve of a type approved by the National Water Council.
 - a non-return valve of an approved type.
- Fill the system until the pressure gauge registers 1.5 bar (22 lbf/in²). Examine for leaks and rectify where necessary. Refer to the commissioning instructions, light the boiler and allow the system to reach its maximum working temperature. Examine for leaks then turn off the boiler. Drain the system while it is still hot. Refill, vent and adjust the cold fill pressure to the required value.



14. INSTALLATION PROCEDURE

14.1 Unpack the boiler - see Fig. 5.

Note: Do not stand the boiler on its end as it will damage the gas valve.

1. Carefully unpack the boiler. Do not discard the packing until all the items are found.
2. Carefully slide off the bottom cover from the boiler.
3. Remove the outer case by **slackening** the bottom fixing screw and firmly pulling the case off the fixing pins.
4. Keep the outer case, bottom cover and infill panels in a safe place so as not to damage them before fitting.

IF REAR EXIT FLUE IS TO BE USED CONTINUE ON TO SECTION 14.2. IF SIDE EXIT FLUE IS TO BE USED PROCEED TO SECTION 14.8.

14.2 Prepare the wall (rear flue).

1. Decide upon the position of the boiler using the wall mounting template supplied with the boiler. The overall size of the template is the size of the boiler plus the minimum side, top and bottom clearances.
2. When you have decided on the position of the boiler tape the template to the wall, ensuring it is level and the correct way up.
3. Make sure that the position of the flue terminal will meet the requirements given in section 9.
4. Mark the position of the hole for the flue.
5. Remove the template (do not discard it) and cut the 115 mm (4½ in) diameter hole in the wall for the flue/terminal assembly.
6. Reposition the template on the wall, mark, drill and plug the five fixing holes to accept 2½" lg. No.12 woodscrews.
7. Make a note of the finished wall thickness, this is very important and is required for section 14.5 when adjusting the length of the flue/terminal assembly.
8. Remove the template and position the wall mounting plate centrally over the hole in the wall, ensuring it is level and the right way up (studs at the bottom). Secure the mounting plate to the wall with four 2½" lg. No.12 woodscrews (not supplied).

14.3 Secure the boiler to the wall (rear flue).

Note: The inner case does not need to be removed during installation

1. Lift the boiler into position and locate the two holes in the top of the chassis over the studs on the wall mounting plate. Secure the boiler to the wall mounting plate with two M6 nuts supplied with the boiler.
2. Secure the bottom of the boiler to the wall with a 2½" lg. No.12 woodscrew (not supplied) via the hole previously drilled and plugged.
3. Remove the flue diverter from the top of the boiler taking care not to damage the gasket.
4. Connect the system flow and return pipes to the top compression unions (see water system schematics, section 12).
5. Refit the flue diverter facing to the rear.

14.4 Unpack the flue/terminal assembly - see Fig. 6.

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

14.5 Adjust the length of the flue/terminal assembly - see Fig. 7 (rear flue).

1. Using the measurement noted in section 14.2 adjust the length of the flue/terminal assembly so that it is: 83 mm (3¼ in) + finished wall thickness, from the back of the terminal flange to the end of the OUTER air tube as shown in Fig. 7.

Note: Ensure that the seams in the outer air tubes are inline.

2. Drill through the three pilot holes, shown in Fig. 7, 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.
3. Seal the centre joint with the tape supplied with the flue/terminal assembly.

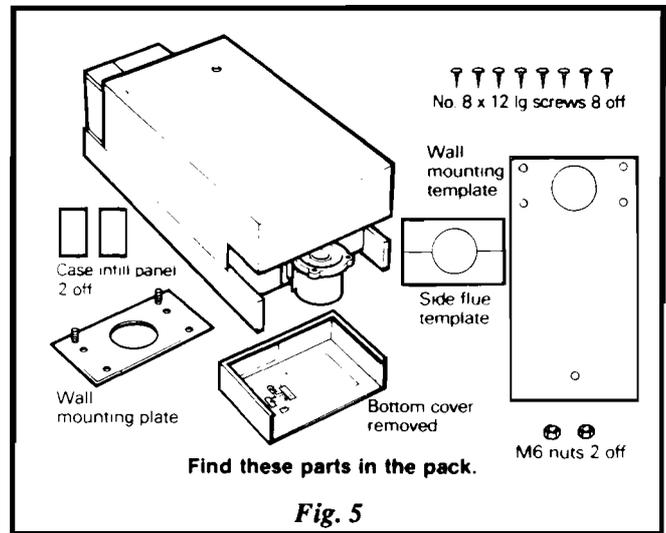


Fig. 5

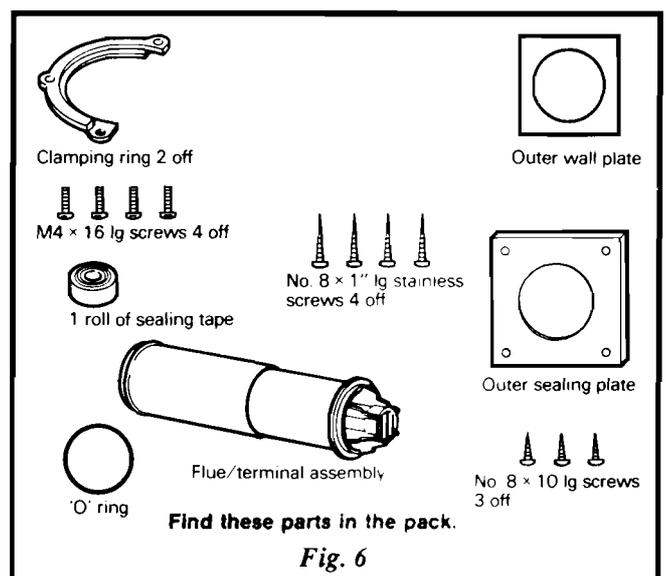


Fig. 6

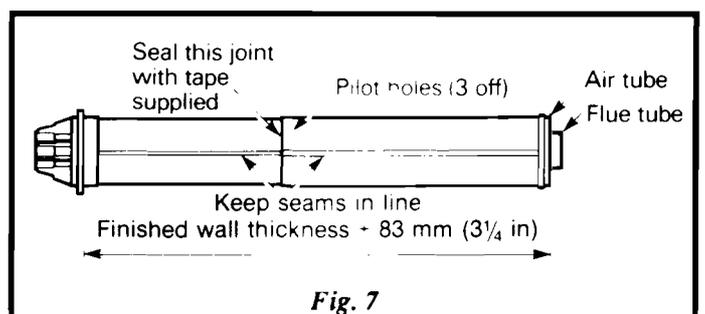


Fig. 7

14.6 Fit the flue/terminal assembly - see Fig. 8 (rear flue).

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

1. Fit the outer wall plate over the flue/terminal assembly.
2. Fit the 'O' ring in position over the outer air tube against the flared section.
3. From outside the building insert the flue/terminal assembly into the wall. Ensure that the slots in the end of the terminal are vertical.
4. Push the flue/terminal assembly towards the boiler and engage the tube into the flue diverter on top of the boiler, ensuring that the inner flue tube slides INTO the inner tube of the diverter and the outer air tube slides into the diverter.

Check that the 'O' ring is on the boiler's side of the flared section.

Push fully home until the flared end of the outer tube is in contact with the flue diverter.

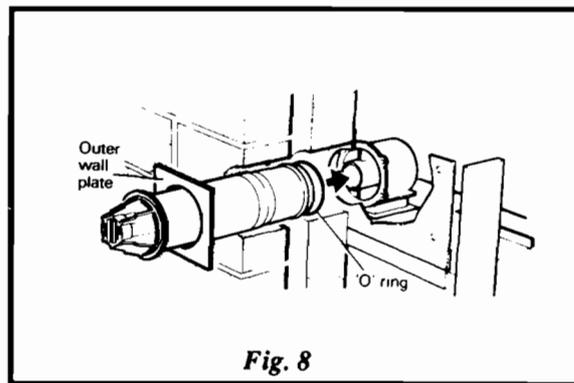


Fig. 8

14.7 Connect the flue to the boiler - see Fig. 9 (rear flue).

1. Fit the two halves of the clamping ring over the air tube as shown in Fig. 9. Ensure that the flat side is against the wall mounting plate, and the recessed side against the flared part of the air tube.
2. Secure the clamping ring to the flue diverter using the four M4 screws supplied (use the threaded holes in the clamping ring).
3. Tighten the screws to seal the flue assembly.
4. Proceed to section 14.14.

14.8 Prepare the wall - see Fig. 10 (side flue).

1. Decide upon the position of the boiler using the wall mounting template supplied with the boiler. The overall size of the template is size of the boiler plus the minimum side, top and bottom clearances. Note that the maximum distance (using the longest flue/terminal assembly and two 965 mm (38 in) flue extensions) from the side of the white case to the OUTSIDE of the wall is 2895 mm (114 in).
2. Tape the wall mounting template to the wall, ensuring it is level and the correct way up.
3. Continue the red line, on the template, horizontally across the wall until it reaches the side wall.
4. Tape the side flue template, supplied with the boiler, to the side wall so that it is in the corner and that the line just drawn lines up with the red line on the template.
5. Make sure that the position of the flue terminal will meet the requirements given in section 9.
6. Mark the positions of the four wall mounting plate fixing screws and the lower fixing screw.
7. Drill and plug the five fixing holes to accept 2½" lg. No.12 woodscrews. Mark the position of the hole in the side wall for the flue/terminal assembly.
8. Cut the 115 mm (4½ in) diameter hole in the side wall for the flue/terminal assembly.
9. Make a note of the finished wall thickness and the distance from the side wall to the side of the white case as shown on the template. These measurements are very important and are required in section 14.10 when adjusting the length of the flue/terminal assembly.
10. Remove the templates and place the wall mounting plate in position on the wall ensuring it is level and the right way up (studs at the bottom). Secure the mounting plate to the wall with four 2½" lg. No.12 woodscrews (not supplied).

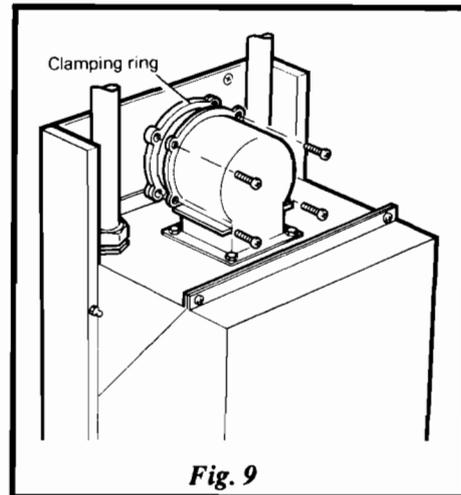


Fig. 9

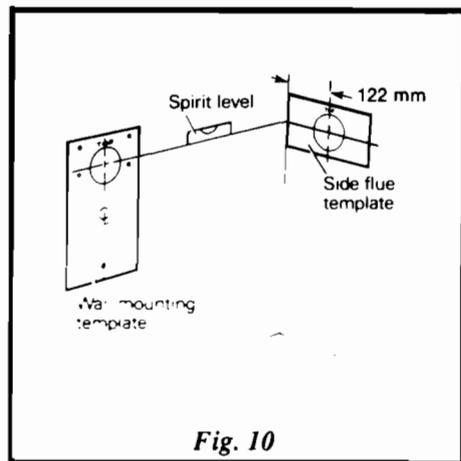


Fig. 10

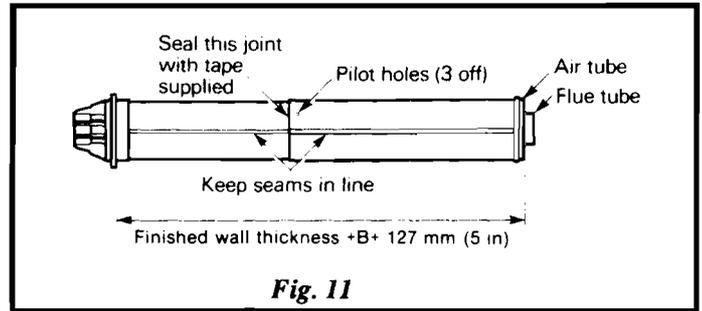
14.9 Secure the boiler to the wall (side flue).

Note: The inner case does not need to be removed during installation.

1. Lift the boiler into position and locate the two holes in the top of the chassis over the studs on the wall mounting plate. Secure the boiler to the wall mounting plate with two M6 nuts supplied with the boiler.
2. Secure the bottom of the boiler to the wall with a 2½" lg. No.12 woodscrew (not supplied) via the hole previously drilled and plugged.
3. Remove the flue diverter from the top of the boiler taking care not to damage the gasket.
4. Connect the system flow and return pipes to the top compression unions (see water system schematics, section 12).
5. Refit the flue diverter facing left or right as determined by the flue direction.
6. Unpack the flue/terminal assembly as described in section 14.4.

14.10 Adjust the length of the flue/terminal assembly - see Fig. 11 (side flue).

1. Using the measurements noted in section 14.8, adjust the length of the flue/terminal assembly so that it is: 127 mm (5 in) + A + B, from the back of the terminal flange to the end of the OUTER air tube as shown in Fig. 11. Where A is the finished wall thickness and B is the distance between the side wall and the side of the white case.
Note: Ensure that the seams in the outer air tubes are inline.
2. Drill through the three pilot holes, shown in Fig. 11, 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.
3. Seal the centre joint with the tape supplied with the flue/terminal assembly.

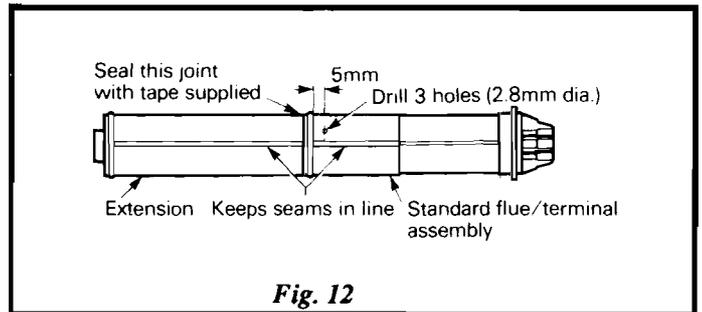


14.11 Flue extension - see Fig. 12 (side flue).

The flue extension kit allows the standard flue/terminal assembly to be extended by 965 mm (38 in).

A maximum of two flue extension may be used, if required.

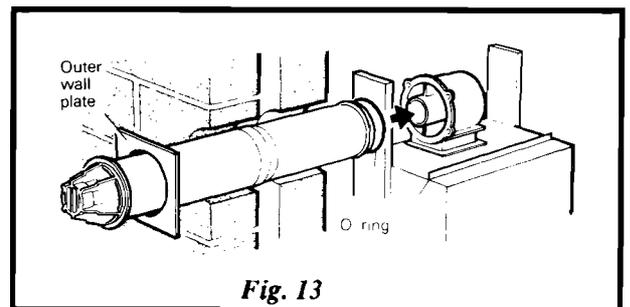
1. If the flue extension kit is used, connect the plain end of the extension to the swaged end of the standard flue/terminal assembly. Ensure that the inner flue tube of the standard flue/terminal fits **INSIDE** the inner flue tube of the extension and the outer air tube fits **OVER** the air tube of the extension. Push fully home.
Note: Ensure that the seams in the outer air tubes are inline.
2. Drill three equally spaced holes using a 2.8 mm drill in the position shown in Fig. 12, through both the standard flue/terminal and the extension tube sleeve. Secure the two tubes together using the three No.8 x 10 lg. 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 section 14.10. Secure and seal the joints.



14.12 Fit the flue/terminal assembly - see Fig. 13 (side flue).

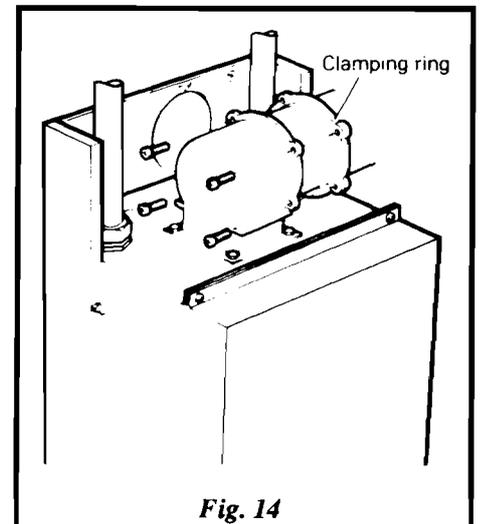
Note: If the wall is to be made good up to the terminal, the outer wall plate need not be used.

1. Fit the outer wall plate over the flue/terminal assembly.
2. Fit the 'O' ring in position over the outer air tube against the flared section.
3. From outside the building insert the flue/terminal assembly into the wall. Ensure that the slots in the end of the terminal are vertical.
4. Push the flue/terminal assembly towards the boiler and engage the tube into the flue diverter on top of the boiler, ensuring that the inner flue tube slides **INTO** the inner tube of the diverter and the outer air tube slides into the diverter. Check that the 'O' ring is on the boiler side of the flared section. Push fully home until the flared end of the outer tube is in contact with the flue diverter.



14.13 Connect the flue to the boiler - see Fig. 14 (side flue).

1. Fit the two halves of the clamping ring over the air tube as shown in Fig. 14. Ensure that the flat side is facing away from the boiler, and the recessed side is against the flared part of the air tube.
2. Secure the clamping ring to the flue diverter using the four M4 screws supplied (use the threaded holes in the clamping ring).
3. Tighten the screws to seal the flue assembly.
4. Make good the gap on the inside wall around the flue tube.



14.14 Fit the outer sealing plate - see Fig. 15.

1. Make good the outside wall around the flue duct.
Note: The outer sealing plate need not be used if the wall is made good up to the terminal.
2. Place the outer sealing plate over the terminal and mark the position of the four fixing holes.
3. 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.
4. 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/terminal assembly).

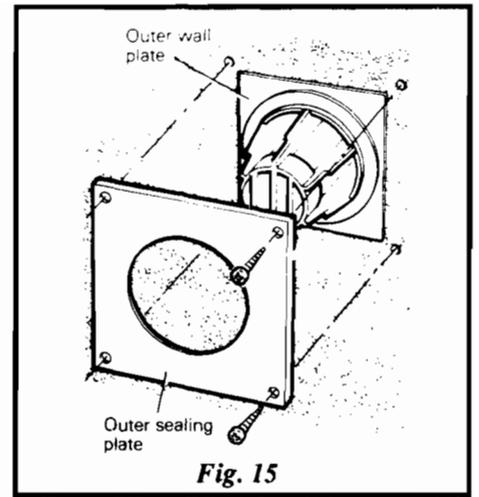


Fig. 15

14.15 Connect the gas supply - see Fig. 16.

Connect a 15 mm gas supply to the service cock.

Do not turn the gas supply on at this stage.

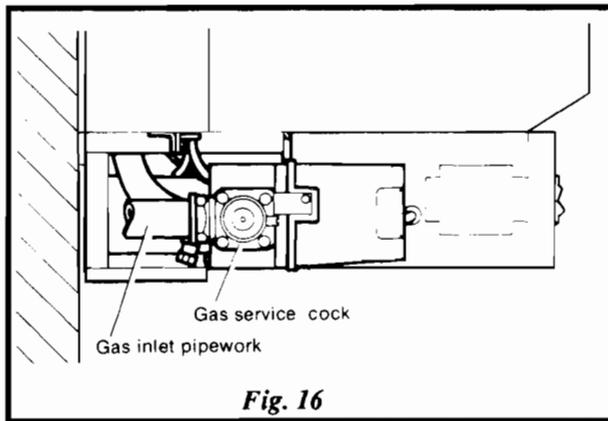


Fig. 16

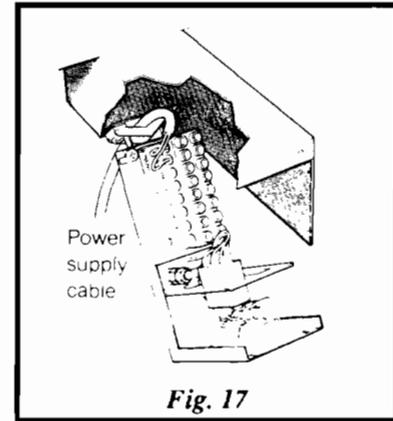


Fig. 17

14.16 Connect the power supply cable - see Fig. 17.

Note: A permanent live and the pump must be connected to the boiler.

1. Remove the screw securing the front of the wiring centre and carefully lower it.
2. Slacken two screws in the cable clamp below the wiring centre. Feed the power supply cable under the clamp and connect the wires, brown to L and blue to N on the terminal block and green and yellow to the earthing screw ($\frac{1}{2}$).
3. Keep the wiring centre in the open position, take up excess slack in the power supply cable between the terminal block and the cable clamp, then tighten the cable clamp screws. Check that the wiring centre will open and close freely without straining the power supply cable.

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

4. The pump lead and any external controls wiring should be passed through one or both of the bushes, provided at the rear of the wiring centre, and connected to the terminal block. See wiring diagram page 20.
5. If a programmer is not fitted, remove link HW to ON and connect a switched live to terminal ON.

Do not switch on the electricity supply at this stage.

14.17 Remove the inner case in readiness for commissioning.

1. With the wiring centre open slide out the fascia panel on the side of the control box.
2. Unscrew the four inner case fixing screws, two at the top, one above the gas valve and one to the left of the wiring centre, and remove the inner case.
3. If the programmer kit is not to be fitted close the wiring centre and secure in position with the fixing screw. Do not replace the fascia panel at this stage.

14.18 Fit the programmer kit.

1. With the wiring centre lowered, engage the programmer fixing into the slot in the control box and push fully home.
2. Connect the programmer 6-pin plug to the 6-pin socket on the wiring centre, push fully home until the latch engages.
3. Close the wiring centre and secure in position with the fixing screw.

14.19 Complete the installation.

1. Thoroughly flush the whole system with cold water without the pump in position. Ensure all valves are open.
2. With the pump fitted, fill, vent and check for water soundness, rectifying where necessary.

15. COMMISSIONING

See section 16 for boiler controls.

1. Test for gas soundness and purge the supply

- a. With the boiler service cock closed (the cock is closed when the operating slot is vertical), pressure test the gas supply and inlet pipework connection to the boiler service cock for soundness in accordance with BS6891.
- b. Remove the screw securing the gas valve cover and lift off the cover.
- c. Loosen the gas inlet pressure test point screw one turn. Ensure the gas supply is on and open the boiler service cock to purge in accordance with BS6891. Retighten the test point screw and test for gas soundness.

2. Check the ignition sequence

With the gas supply isolated check the ignition sequence as follows:

- a. Set the programme switch to CONT, if a programmer is fitted and check that all system controls are calling for heat.
- b. Switch on the electricity supply and set the boiler thermostat switch to HIGH. The automatic ignition sequence will start. The fan will start and after a purge period of about 10 seconds a click will be heard indicating that the start gas solenoid has opened, the ignition sparks will also be heard. The ignition sparks continue until the pilot is lit. As the gas supply is not yet turned on the ignition sparks will continue until either the electricity supply is switched off or the boiler thermostat switch is set to O.
- c. Set the boiler thermostat switch to O to terminate the ignition sequence.

3. Check the pilot flame and test the pilot supply for gas soundness

- a. Ensure that the boiler thermostat switch is set to O.
- b. Remove the two screws securing the pilot shield and lift off the shield.
- c. Disconnect and isolate one of the leads (black or white) from the main gas solenoid on the gas valve.
- d. Set the boiler thermostat switch to HIGH. The unit will go through the ignition sequence but only the pilot will light.
- e. Check that the pilot flame (35 to 40 mm long) envelops the electrode and extends 10 mm past it. Adjust if necessary (clockwise to reduce the flame). **Note:** The pilot throttle is factory set fully open.
- f. Test the pilot supply connections at the gas valve and pilot assembly for gas soundness using a suitable leak detecting fluid.
- g. Set the boiler thermostat switch to O and reconnect the main gas solenoid lead.
- h. Replace the pilot shield and secure with two screws.

4. Test the main burner supply for gas soundness

- a. Apply a suitable leak detecting fluid to the main burner manifold joint at the chassis and the gas valve and chassis connections of the gas valve manifold.
- b. Set the boiler thermostat switch to HIGH. The unit will go through the automatic 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. Test the burner and manifold connections for gas soundness.

5. Check the main burner setting pressure

After the main burner has been alight for 10 minutes:

- a. Set the boiler thermostat switch to O. Remove the burner setting pressure test point screw on the gas valve manifold and connect a pressure gauge.
- b. Set the boiler thermostat switch to HIGH and if necessary adjust the burner setting pressure to give the heat input required. Turn the adjusting screw clockwise to decrease the setting pressure.
Note: The boiler is factory set to the maximum input. See Technical Data, page 3, for the boiler ratings and setting pressures.
- c. Set the boiler thermostat switch to O, disconnect the pressure gauge and replace the pressure test point screw. Set the boiler thermostat switch to HIGH to light the main burner and test for gas soundness around the pressure test point screw using a suitable leak detecting fluid. Set the boiler thermostat switch to O to turn the boiler off.
- d. Check that the arrow on the data plate (positioned on the front of the inner case at the bottom right hand corner) is against the correct boiler rating.

Note: The pilot burner is turned off every time the main burner is off. The ignition sequence is automatically activated when the boiler thermostat requires heat.

6. Replace the gas valve cover

Replace the gas valve cover, ensuring that the cable clamp is located correctly in the cover, and secure with its screw.

7. Replace the inner case

- a. If a programmer is fitted open the wiring centre, disconnect the programmer plug and socket and slide the programmer out of the control box.
- b. Ensure that the inner case seal is intact around the boiler chassis and replace the inner case, secure with four screws. Tighten sufficiently to form a seal.
- c. If a programmer is fitted replace and reconnect the programmer then replace the wiring centre.
If a programmer is not fitted open the wiring centre, replace the fascia panel then replace the wiring centre.

8. Final water system check and addition of inhibitor

- a. When the system has been tested, ensure the boiler is off (boiler thermostat switch set to O), drain the water while it is still hot in order to complete the flushing process.
- b. When an inhibitor is added to the system, Fernox Manufacturing Co. Ltd. recommend Fernox CP3 for use with copper tube boilers and this 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 radiators are drained. When filling add the correct quantity of CP3 for the system volume. As a guide a 3 radiator system will on average require about 2¼ pints, a 6 radiator system 4¼ pints and a 9 radiator system about 6¼ pints.
- c. After the system has been filled, vent and make a final check for water soundness.

9. By-pass valve adjustment

- a. Fully close the by-pass valve and then open it one full turn. Light the boiler with the heating circuit only in operation and balance the system using pump and radiator valves to give an 11°C temperature drop across the individual radiators.
- b. Adjust the by-pass valve as necessary to give a temperature rise of 9°C across the boiler flow and return, i.e. measured before the by-pass.

16. BOILER CONTROLS (inner case, gas valve cover and facia panel removed)

Refer to Fig. 18.

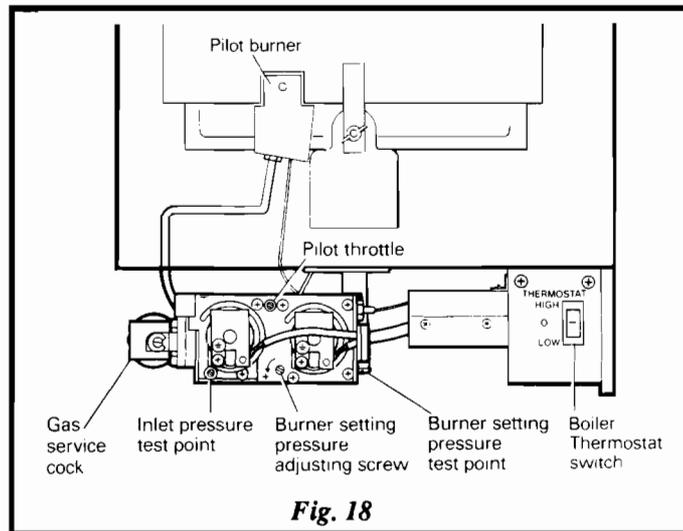


Fig. 18

17. FINAL ASSEMBLY AND HANDING OVER THE INSTALLATION

1. Before fitting the outer case, the infill panel(s) must be fitted to the side of the case. If rear exit flue has been used, fit the two panels, if side exit flue has been used fit one of the panels to the side opposite the flue. To fit an infill panel, place it in position in the case side and secure with four of the N0.8 x 12 lg. screws supplied with the boiler.
2. Lift the outer case into position over the boiler and push back to engage the fixing pins on the chassis side into the case. Secure the case in position by retightening the bottom fixing screw.
3. If a programmer is fitted, set the clock to the correct time (do not rotate the dial anti-clockwise) and the programme and selector switches to the required settings. See User instructions.
4. Hand the User instructions to the user and instruct in the safe operation of the boiler and controls.
5. Advise the User of the precautions necessary to prevent damage to the system and to the building in the event of the system remaining inoperative during frost conditions.
6. 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.
7. 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 circuit.

18. ANNUAL SERVICING

To ensure continued efficient operation of the appliance, it is recommended that it is checked and cleaned as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage but in general once per year should be adequate. It is the law that any service work must be carried out by a competent person such as British Gas or other Corgi registered personnel.

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, observe the flame picture and ensure that the boiler responds to any switches and programmer.

2. Check the installation of the flue terminal and ensure it is not obstructed.

If it is necessary to dismantle the boiler the following checks should be made.

1. Remove the combustion fan and ensure that it is clean and free of debris. Check the impellor for freedom of rotation.
2. Remove the combustion chamber front and check if the burner or heat exchanger requires cleaning.
3. Examine the main injector orifice and ensure it is clear and undamaged.
4. If a sufficiently large pilot flame cannot be achieved examine the pilot injector orifice to ensure it is clear and undamaged.
5. 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 at the bottom right hand corner.

WARNING: Before commencing work set the boiler thermostat switch to O. Allow the boiler to cool and isolate the electricity supply. Slide off the bottom cover and turn off the gas supply at the gas service cock.

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

18.1 Dismantling - see Fig. 19.

1. Slacken the screw securing the bottom of the outer case and pull off the case. Place the case safely aside to avoid possible damage.
2. Remove the one screw, above the boiler thermostat switch, securing the wiring centre and lower the wiring centre.
3. If a programmer is fitted, unplug the programmer plug from the wiring centre and slide out the programmer.
If a programmer is not fitted, slide out the fascia panel.
4. Unscrew the four inner case fixing screws, two at the top, one above the gas valve and one to the left of the wiring centre, and remove the inner case.
5. Disconnect the two wires from the fan motor, the polarity of these wires is not important.
6. Remove the three hex. hd. screws and washers securing the fan motor assembly to the fan housing and carefully withdraw the motor complete with impellor from the fan housing.
7. Remove the two hex. hd. screws securing the flue hood cover and remove the cover.
8. Slacken the two nuts securing the flue hood to the combustion chamber.
9. Remove the four screws and wing nut securing the combustion chamber front cover and withdraw the cover.
10. Undo the securing nut and remove the electrode, see Fig. 19, from the pilot assembly. Remove the grommet on the electrode lead from the burner air guide.
11. Remove the screw securing the gas valve cover and lift off the cover.
12. Remove the clamping bracket which retains the pilot supply and electrode lead at the bottom left hand corner of the chassis.
13. Undo the tubing nuts and disconnect the pilot supply, see Fig. 19, from both the pilot assembly and gas valve.
14. Carefully remove and retain the pilot injector, see Fig. 19.
15. From underneath the base of the chassis remove the two pozi screws securing the burner manifold.
16. Carefully move the pilot supply to one side and lift out the burner assembly. Take care not to lose the burner flange 'O' ring.
17. Cover the exposed gas way in the base of the chassis.

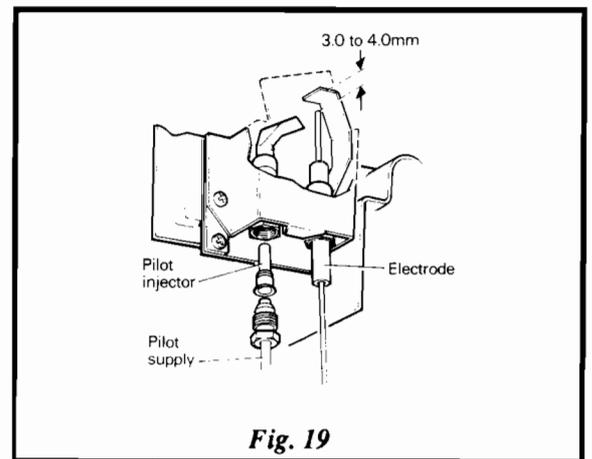


Fig. 19

18.2 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. Examine the fan impellor and carefully clean if necessary.
3. Turn the burner upside down and tap gently to remove any debris.
4. Clean the pilot burner and spark electrode with a fine wire brush if necessary.
5. Unscrew the injector from the burner manifold, clean by blowing through or washing. Do NOT clear the injector with a pin or wire. Clean the pilot injector in a similar manner.

To clean or replace the pilot filter in the gas valve refer to section 20.11.

18.3 Reassemble the boiler.

1. Replace the burner injector using a small amount of jointing compound. **Note:** The 40 Si injector uses a sealing washer.
2. Remove the protective covering from the gas way in the base of the chassis.
3. Check that the 'O' ring is in position in the burner flange.
4. Replace the burner assembly and secure with two screws previously removed.
5. Replace the pilot injector and reconnect the pilot supply to the pilot assembly and gas valve.
6. Replace the spark electrode. Ensure that the grommet on the electrode lead is fitted to the burner air guide. Check that the spark gap is 3.0 to 4.0 mm, see Fig. 19.
7. Replace the clamping bracket - bottom left hand corner of the chassis. Ensure that the pilot supply and electrode lead are behind the clamp.
8. Replace the combustion chamber front ensuring that the burner stud locates in the bracket. Secure with four screws and one wing nut.
9. Fully tighten the nuts securing the flue hood.
10. Replace the flue hood cover and secure with two screws previously removed.
11. Replace the fan motor and impellor assembly and reconnect the fan wires (the polarity of the wires is not important).
12. If a programmer is fitted, temporarily reconnect it to the wiring centre.
13. Refer to the commissioning instructions, section 15. Light the pilot and check the flame, test the pilot and main burner supplies for gas soundness, check the main burner setting pressure and replace the gas valve cover and inner case.
14. Lift the outer case into position over the boiler and push back to engage the fixing pins on the chassis side into the case. Secure in position by retightening the bottom fixing screw.
15. If a programmer is fitted, set the clock to the correct time (do not rotate the dial anti-clockwise) and the programme and selector switches to their previous settings.
16. Replace the bottom cover.

19. LIGHTING INSTRUCTIONS

See section 16 for boiler controls.

With the gas supply on, electricity supply off and the boiler thermostat switch set to O:

1. Turn on the gas and electricity supplies to the boiler.
2. Set the programme switch to CONT, if a programmer is fitted and check that all system controls are calling for heat.
3. Set the boiler thermostat switch to HIGH. The automatic ignition sequence will start. The fan will start and after a purge period of about 10 seconds a click will be heard indicating that the start gas solenoid has opened, the ignition sparks will also be heard. The pilot will light and after a second or so the main gas solenoid will open and the main burner will light.
Note: The pilot burner is turned off every time the main burner is off. The ignition sequence is automatically activated when the boiler thermostat requires heat.
4. If a programmer is fitted, ensure that the clock is set to the correct time (do not rotate the dial anti-clockwise) and that the programme and selector switches are set to their previous settings.

20. REPLACEMENT OF PARTS

WARNING: Before commencing work set the boiler thermostat switch to O. Allow the boiler to cool and isolate the electricity supply. Slide off the bottom cover and 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.

20.1 To replace the spark electrode - see Fig. 19.

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Disconnect the electrode lead from the ignition circuit board. See section 20.6.
3. Withdraw the electrode lead through the circuit board mounting box and the clamping bracket (bottom left hand corner of the chassis).
4. Undo the securing nut and remove the electrode from the pilot assembly.
5. Insert a new electrode and secure with nut. Pass the electrode lead behind the clamping bracket (bottom left hand corner of the chassis), through the side of the circuit board mounting box and connect it to the circuit board.
Ensure that the large grommet is fitted to the burner air guide and the small grommet is fitted in the side of the circuit board mounting box.
6. Replace any wiring connectors removed from the circuit board and replace the circuit board mounting plate.
7. Remove the two screws securing the pilot shield. Lift off the pilot shield and check that the spark gap is 3.0 to 4.0 mm as shown in Fig. 19.
8. Replace the pilot shield and secure with two screws.
9. Replace the inner case, programmer or facia panel, wiring centre and outer case.
10. Refer to the lighting instructions, section 19. Light the boiler and replace the bottom cover.

20.2 To replace the pilot injector - see Fig. 19.

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Remove the screw securing the gas valve cover and lift off the cover.
3. Remove the clamping bracket which retains the pilot supply and electrode lead at the bottom left hand corner of the chassis.
4. Undo the tubing nuts and disconnect the pilot supply, see Fig. 19, from both the pilot assembly and gas valve.
5. Remove the pilot injector from the pilot assembly, see Fig. 19.
6. Fit a new injector and reconnect the pilot supply.
7. Replace the clamping bracket - bottom left hand corner of the chassis. Ensure that the pilot supply and electrode lead are behind the clamp.
8. Refer to the commissioning instructions, section 15. Light the pilot and check the flame, test the pilot supply for gas soundness, replace the gas valve cover, inner case, programmer or fascia panel and wiring centre.
9. Replace the outer case.
10. Refer to the lighting instructions, section 19. Light the boiler and replace the bottom cover.

20.3 To replace the pilot burner - see Fig.19.

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Remove the screw securing the gas valve cover and lift off the cover.
3. Remove the clamping bracket which retains the pilot supply and electrode lead at the bottom left hand corner of the chassis.
4. Undo the securing nut and remove the electrode from the pilot assembly.
5. Undo the tubing nuts and disconnect the pilot supply, see Fig. 19, from both the pilot assembly and gas valve.
6. Remove the pilot injector from the pilot assembly, see Fig. 19.
7. Remove the two screws securing the pilot shield and lift off the pilot shield.
8. Remove the remaining screw securing the pilot burner and remove the pilot burner.
9. Fit a new pilot burner and secure with two screws. Replace the pilot injector, pilot supply and spark electrode. Check that the spark gap is 3.0 to 4.0 mm as shown in Fig. 19.
10. Remove the uppermost screw securing the pilot burner and replace the pilot shield securing it with two screws.
11. Replace the clamping bracket - bottom left hand corner of the chassis. Ensure that the pilot supply and electrode lead are behind the clamp.
12. Refer to the commissioning instructions, section 15. Light the pilot and check the flame, test the pilot supply for gas soundness, replace the gas valve cover, inner case, programmer or fascia panel and wiring centre.
13. Replace the outer case.
14. Refer to the lighting instructions, section 19. Light the boiler and replace the bottom cover.

20.4 To replace the burner.

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

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Remove the burner as described in section 18.1, paras 8 to 17.
3. Remove the pilot assembly and main burner injector and fit to the new burner. Use a small amount of jointing compound on the burner injector. **Note: The 40 Si injector uses a sealing washer.**
4. Using a new 'O' ring in the burner manifold flange fit the burner and reassemble as described in section 18.3, paras 2 to 9.
5. If a programmer is fitted, temporarily reconnect it to the wiring centre. Refer to the commissioning instructions, section 15. Light the pilot and check the flame, test the pilot and main burner supplies for gas soundness and replace gas valve cover, inner case, programmer or fascia panel and wiring centre.
6. Replace the outer case and bottom cover.

20.5 To replace the 'Hi' or 'Lo' thermostats.

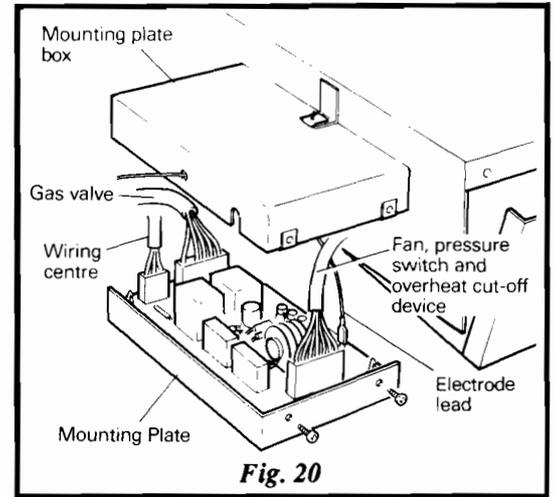
Three thermostats are mounted on the right hand (flow) pipe from the heat exchanger. The 'Hi' thermostat is marked with brown paint, the 'Lo' thermostat with white paint and the overheat cut-off device with grey paint.

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Disconnect the two wires from the thermostat.
3. Unscrew the fixing screws and remove the thermostat.
4. Ensure that the mounting plate is clean, fit the new thermostat and secure in position.
5. Reconnect the two wires. The polarity of these wires is not important. Ensure that the two grey wires go to the overheat cut-off device, a brown and yellow wire to the 'Hi' thermostat and a white and yellow wire to the 'Lo' thermostat. See wiring diagram page 20.
6. Replace the inner case, programmer or fascia panel, wiring centre and outer case.
7. Refer to the lighting instructions, section 19. Light the boiler and allow it to heat up. Check that the 'Hi' thermostat switches the boiler off and on when the boiler thermostat switch is set to HIGH. Set the boiler thermostat switch to LOW and check that the 'Lo' thermostat switches the boiler off and on.
8. Replace the bottom cover.

20.6 To replace the ignition circuit board - see Fig. 20.

The ignition circuit board is positioned on the side of the wiring centre behind the fascia panel or programmer.

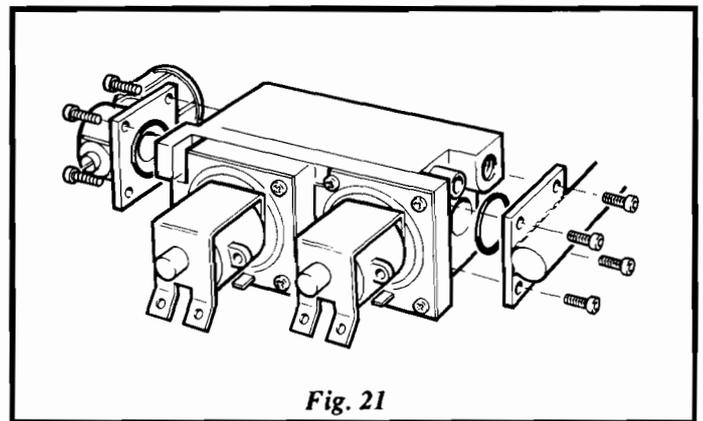
1. Remove the screw securing the front of the wiring centre and lower the wiring centre.
2. If a programmer is fitted, unplug the programmer plug from the wiring centre and slide out the programmer. If a programmer is not fitted, slide out the fascia panel.
3. From underneath the ignition circuit board mounting plate slacken the one screw securing it at the back. Remove the two screws securing it at the front and carefully lower the mounting plate withdrawing it forwards slightly to disengage the rear fixing.
4. Disconnect the wiring connector from the front, the electrode lead and the two wiring connectors from the rear of the circuit board, see Fig. 20.
5. Carefully remove the circuit board from the mounting pillars and replace with a new one.
6. Reassemble in reverse order.
7. Refer to the lighting instructions, section 19. Light the boiler and replace the bottom cover.



20.7 To replace the gas valve - see Fig. 21.

Ensure that the gas supply is off.

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Remove the screw securing the gas valve cover and lift off the cover.
3. Disconnect the push-on terminals and unscrew the earth terminal from the gas valve. (The polarity of these wires is not important but the red and blue wires must go to the inlet (pilot) solenoid and the white and black wires to the outlet (main) solenoid). See wiring diagram, page 20.
4. Remove the ignition circuit board mounting plate as described in section 20.6.
5. Remove the one screw securing the mounting plate box to the side of the wiring centre and withdraw the box. The screw is accessible from beneath the box. **Note:** When refitting the box make sure that the 'tag' at the rear of the box is located in the cut out on the side of the wiring centre before replacing the fixing screw.
6. Remove the clamping bracket which retains the pilot supply and electrode lead at the bottom left hand corner of the chassis.
7. Disconnect the pilot supply from both the gas valve and pilot assembly. Take care not to lose the pilot injector, see Fig. 19.
8. Remove the eight 3 mm socket screws securing the gas valve (four to the service cock and four to the burner manifold).
9. Withdraw the gas valve and discard the 'O' rings in the service cock and burner manifold flanges.
10. Using new 'O' rings in the service cock and burner manifold flanges (both 'O' rings are the same size) reassemble the new valve to the boiler in reverse order. Ensure that the pilot supply and electrode lead are behind the clamp in the bottom left hand corner of the chassis.
Do not replace the gas valve cover at this stage.
11. If a programmer is fitted, temporarily reconnect it to the wiring centre. Refer to the commissioning instructions, section 15. Light the pilot and check the flame, test the pilot supply connections and gas valve inlet and outlet connections for gas soundness, check the burner setting pressure, replace the gas valve cover, **inner case, programmer or fascia panel** and wiring centre.
12. Replace the outer case and bottom cover.

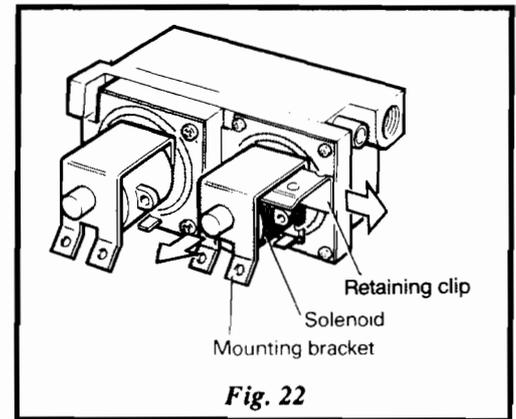


20.8 To replace the burner injector.

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Remove the burner assembly as described in section 18.1, paras 8 to 17.
3. Unscrew the injector from the manifold.
4. Screw in a replacement injector using a small amount of jointing compound. **Note:** The 40 Si injector uses a sealing washer.
5. Replace the burner assembly as described in section 18.3, paras 2 to 9.
6. If a programmer is fitted, temporarily reconnect it to the wiring centre. Refer to the commissioning instructions, section 15. Light the boiler, test the pilot and main burner supplies for gas soundness and replace the gas valve cover, **inner case, programmer or fascia panel** and wiring centre.
7. Replace the outer case and bottom cover.

20.9 To replace a gas valve solenoid - see Fig. 22.

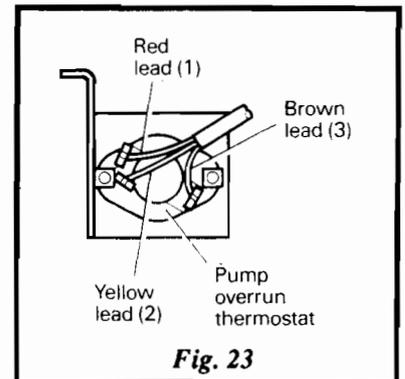
1. Remove the screw securing the gas valve cover and lift off the cover.
2. Disconnect the push-on terminals and unscrew the earth terminal from the gas valve. (The polarity of these wires is not important but the red and blue wires must go to the inlet (pilot) solenoid and the white and black wires to the outlet (main) solenoid). See wiring diagram, page 20.
3. Carefully prise out the retaining clip from behind the solenoid and lift off the solenoid and its mounting bracket, see Fig. 22.
4. Position the new solenoid into the mounting bracket and reassemble in reverse order.
5. Refer to the lighting instructions, section 19. Light the boiler and replace the bottom cover.



20.10 To replace the pump overrun thermostat - see Fig. 23.

The pump overrun thermostat is situated at the bottom right hand corner of the chassis above the wiring centre.

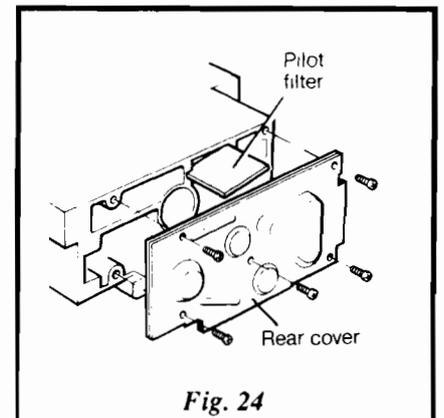
1. Remove the outer and inner cases as described in section 18.1, 1 to 4.
2. Remove the ignition control box as described in section 20.6.
3. Remove the one screw securing the pump overrun thermostat mounting bracket situated next to the wiring centre underneath the chassis. Carefully withdraw the bracket complete with thermostat.
4. Disconnect the three wires and remove the two screws securing the thermostat to the bracket.
5. Fit the new thermostat to the mounting bracket and secure with two screws.
6. Connect the three wires to the thermostat, see Fig. 23 and reassemble in reverse order.
7. Refer to the lighting instructions, section 19. Light the boiler and replace the bottom cover.
8. Allow the boiler to heat up fully then switch it off at the programmer or external controls and check that the pump continues to run for 5 to 15 minutes.



20.11 To replace the pilot filter - see Fig. 24.

Note: It is extremely unlikely that the pilot filter will become blocked. If the pilot injector and pilot supply are clear and the filter is still suspect proceed as follows: Ensure that the gas supply is off.

1. Remove the gas valve as described in section 20.7.
2. Remove the five screws securing the rear cover plate and carefully remove it, see Fig. 24. Discard the gasket.
3. Carefully remove the pilot filter, see Fig. 24 and replace with a new one.
4. Replace the rear cover using a new gasket and secure by evenly tightening the five screws.
5. Replace the gas valve in reverse order to section 20.7, but do not replace the gas valve cover or the inner and outer cases.
6. Turn on the gas supply and test the service cock to gas valve joint for gas soundness using a suitable leak detecting fluid.
7. Refer to the commissioning instructions, section 15. Light the pilot and check the flame and test the pilot supply connections for gas soundness.
8. If a programmer is fitted temporarily reconnect it to the wiring centre.
9. Apply a suitable leak detecting fluid around the gas valve rear cover and the gas valve outlet connection. Refer to the lighting instructions, section 19 and light the main burner. Test the gas valve rear cover and outlet connection for gas soundness.
10. Refer to the commissioning instructions, section 15 and replace the gas valve cover, inner case, programmer or fascia panel and wiring centre.
11. Replace the outer case and bottom cover.



20.12 To replace the programmer (if fitted).

1. Remove the screw securing the front of the wiring centre and carefully lower it.
2. Unplug the programmer plug from the wiring centre.
3. Slide out the programmer from the control box.
4. Slide the new programmer into the control box, and push fully home.
5. Connect the programmer plug to the wiring centre, close the wiring centre and secure in position with the fixing screw.
6. Refer to the lighting instructions, section 19. Light the boiler and check the controls.
7. Set the programmer clock to the correct time and the switches to their previous settings.
8. Replace the bottom cover.

20.13 To replace the air flow pressure switch.

The air flow pressure switch is situated at the top right hand corner of the chassis to the right of the fan.

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Carefully disconnect the flexible tube from the pressure switch and disconnect the three wires, noting their position.
3. Remove the two screws securing the pressure switch mounting bracket to the flue hood. **Note:** There are two fibre washers on these screws to insulate the pressure switch from the flue hood.
4. Using a new pressure switch (supplied with mounting bracket) secure the mounting bracket to the flue hood. Ensure that the two fibre washers are used.
5. Reconnect the wires to the pressure switch. See wiring diagram page 20.
6. Reconnect the flexible tube and reassemble in reverse order.
7. Refer to the lighting instructions, section 19. Light the boiler and check that the pressure switch allows the main burner to light.
8. Replace the bottom cover.

20.14 To replace the fan motor and impellor assembly.

1. Remove the outer case, inner case and the fan motor and impellor assembly as described in section 18.1, paras 1 to 6.
2. Reassemble in reverse order using the new assembly.
3. Refer to the lighting instructions, section 19. Light the boiler and check that the fan switches on and off as the main burner cycles on and off respectively.
4. Replace the bottom cover.

20.15 To replace the combustion chamber insulation.

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Remove the burner as described in section 18.1, paras 8 to 17.
3. Remove the two nuts securing the flue hood to the combustion chamber and disengage the tie rods.
4. Remove the four screws (two each side) securing the combustion chamber to the chassis. Carefully lower the combustion chamber to clear the heat exchanger and remove.
5. Slide out the front insulation panel and carefully replace with a new one.
6. Slide out the two side panels and remove the rear panel by pulling forwards at the top then lifting out.
7. Fit a new panel, lower edge first and push back into position. Slide in two new side panels.
8. Reassemble in reverse order. Ensure that the pilot supply and electrode lead are behind the clamp at the bottom left hand corner of the chassis.
9. If a programmer is fitted, temporarily reconnect it to the wiring centre. Refer to the commissioning instructions, section 15. Light the boiler, test the pilot and main burner supplies for gas soundness and replace the gas valve cover, **inner case, programmer** or facia panel and wiring centre.m cover.
10. Replace the outer case and bottom cover.

20.16 To replace the heat exchanger.

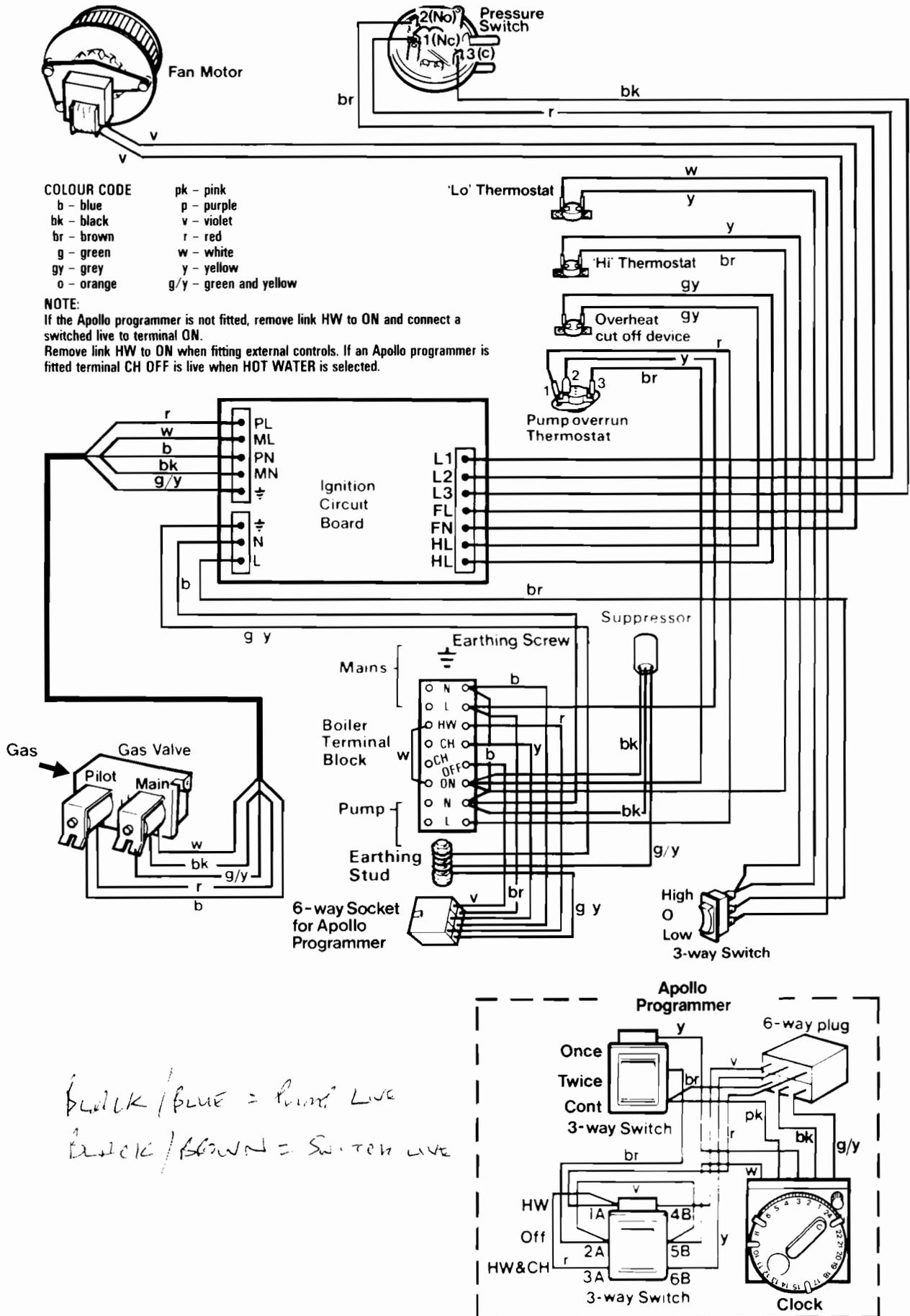
Ensure that the system is drained.

Take care when removing the heat exchanger as even with the system drained there will still be water in the heat exchanger and its connecting pipes.

1. Remove the outer and inner cases as described in section 18.1, paras 1 to 4.
2. Remove the burner as described in section 18.1, paras 8 to 17.
3. Remove the two nuts securing the flue hood to the combustion chamber and disengage the tie rods.
4. Remove the four screws (two each side) securing the combustion chamber. Carefully lower the combustion chamber to clear the heat exchanger and remove.
5. Undo the fittings securing the inlet and outlet pipes to the heat exchanger and carefully lower the heat exchanger to disengage it from the pipes.
6. Reassemble in reverse order using a new heat exchanger. Ensure that the pilot supply and electrode lead are behind the clamp at the bottom left hand corner of the chassis.
7. Fill and vent the system.
8. If a programmer is fitted, temporarily reconnect it to the wiring centre. Refer to the commissioning instructions, section 15. Light the boiler, test the pilot and main burner supplies for gas soundness and replace the gas valve cover, **inner case, programmer** or facia panel and wiring centre.
9. Replace the outer case and bottom cover.

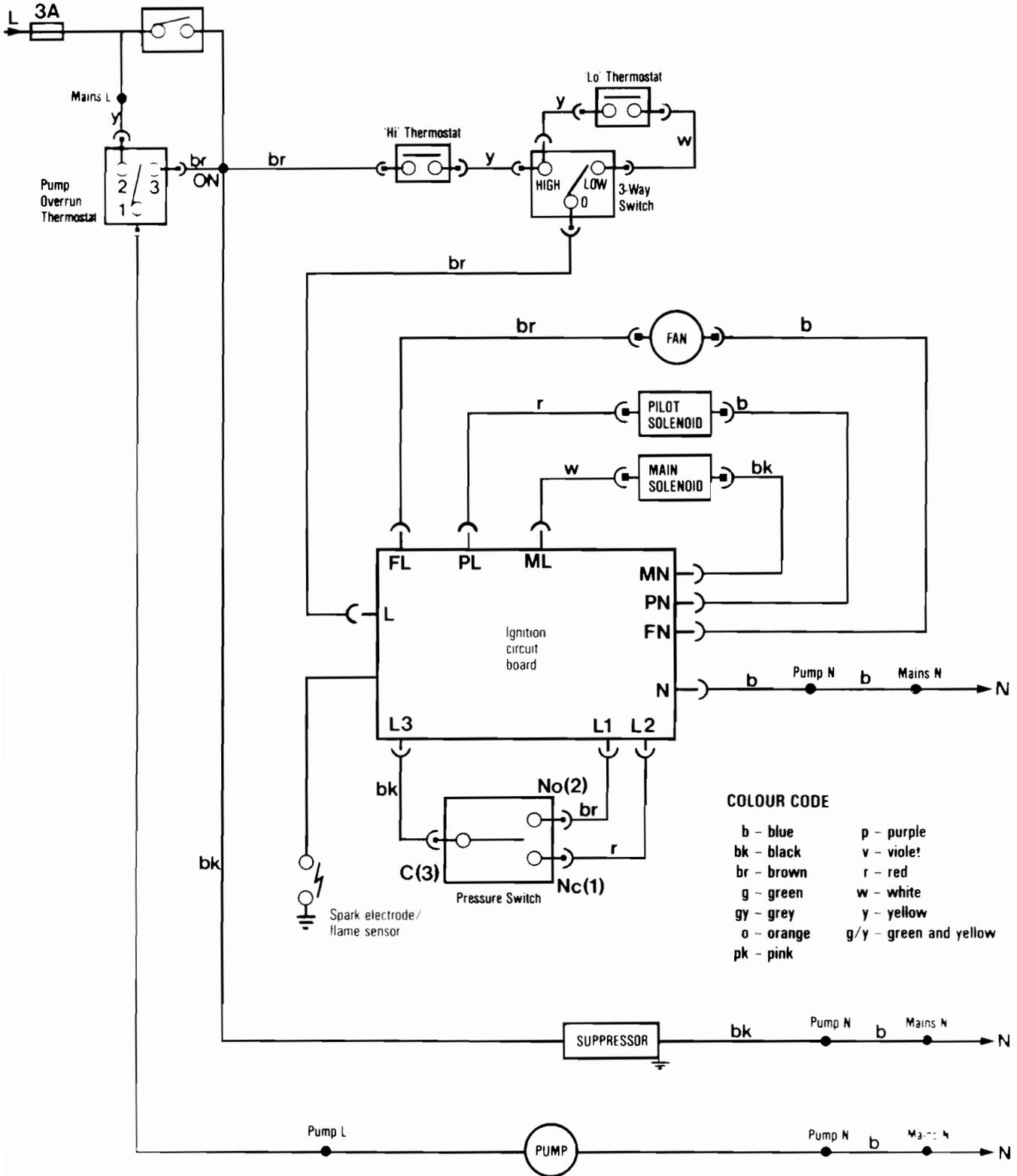
21. WIRING DIAGRAMS

a. Illustrated wiring diagram with Apollo programmer.



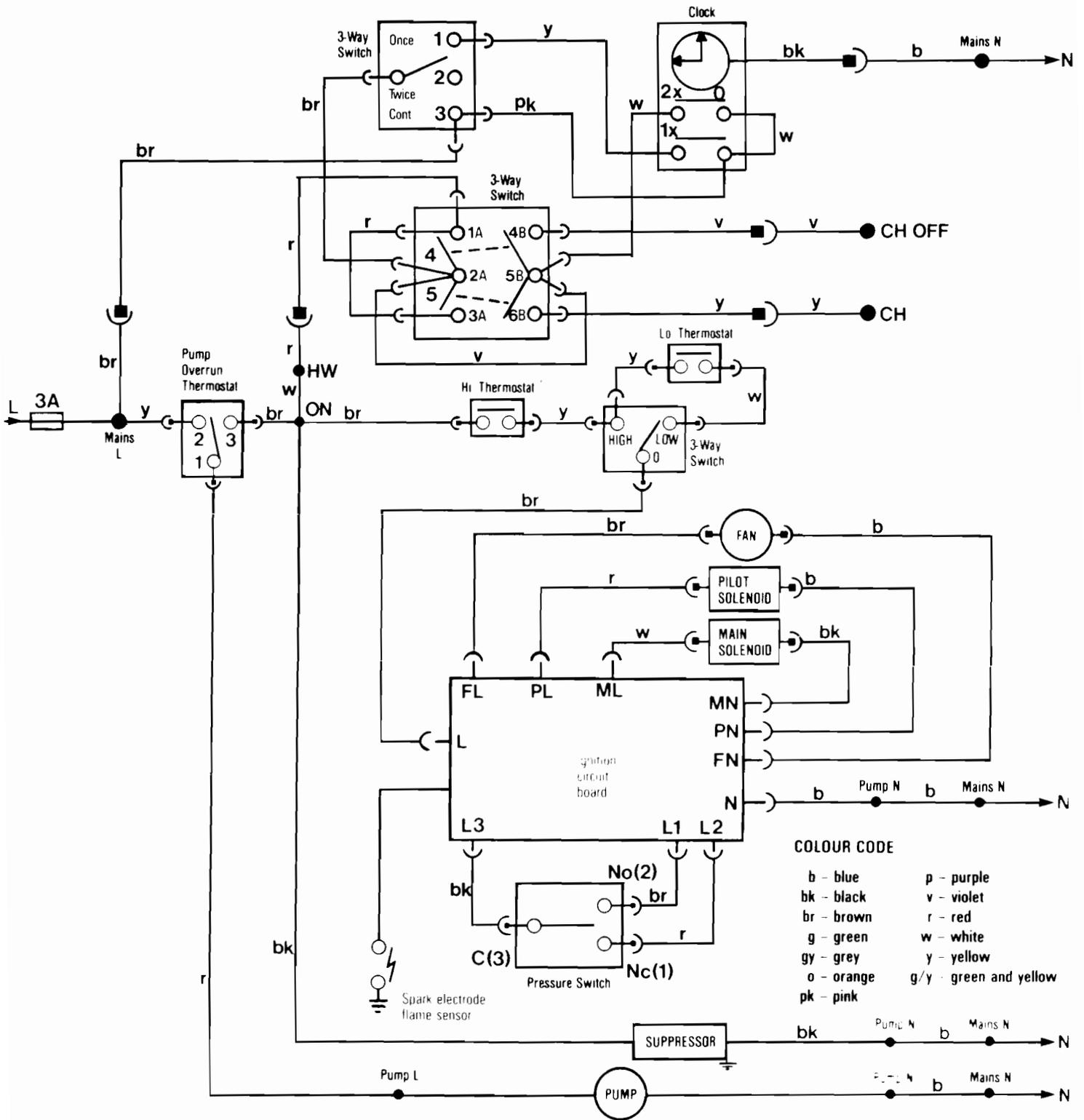
black/blue = pump live
black/brown = switch live

b. Functional flow wiring diagram without programmer.



NOTE: If a programmer is not fitted, link HW to ON to be removed and a switched live connected to terminal ON.

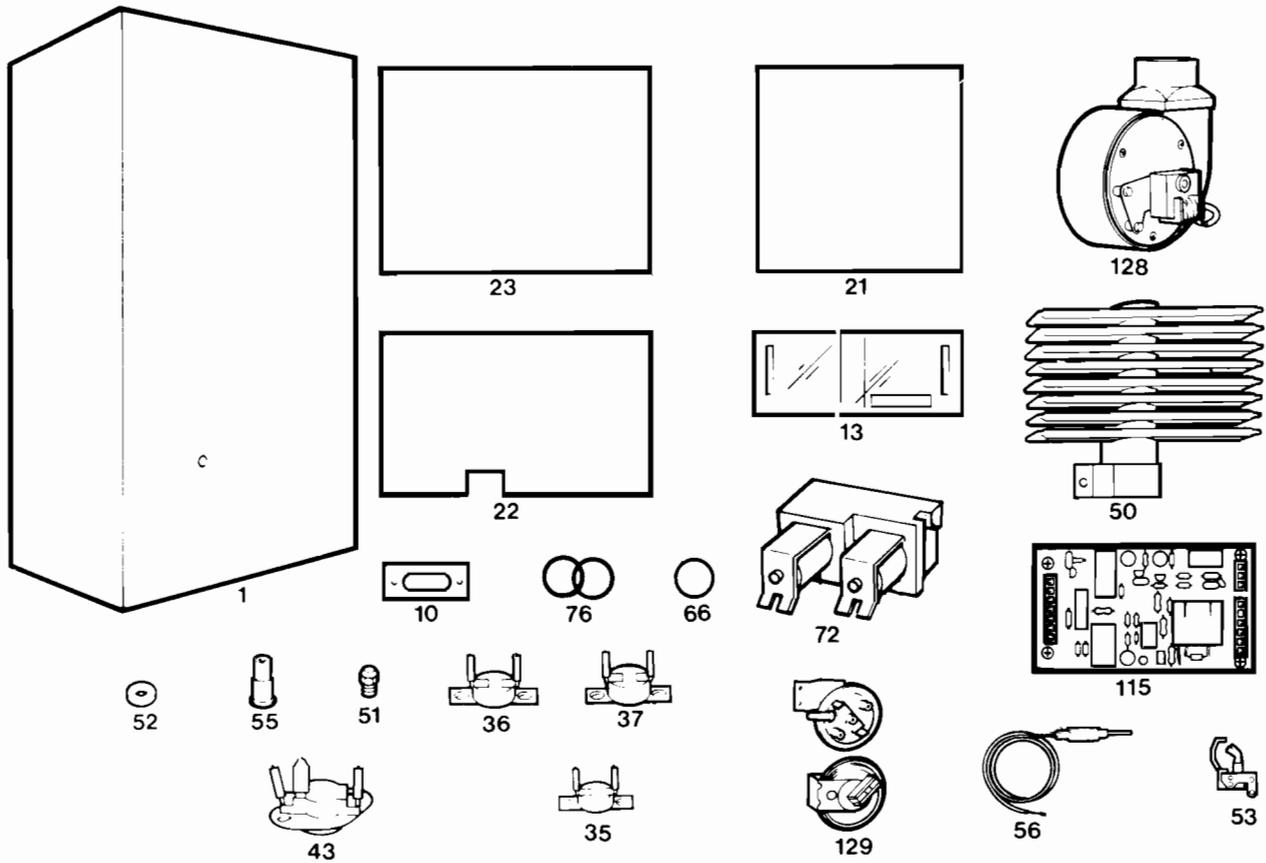
c. Functional flow wiring diagram with Apollo programmer.



NOTE: Link HW-ON is removed when any external controls are fitted.

SERVICE	SELECTOR SWITCH - CLOSED				
	1	2	3	4	5
OFF					
CH OFF HW2X		///		///	
CH OFF HW1Y	///			///	
CH - HW2+		///			///
CH - HW1+	///				///
CONT CH - HW			///		///
CONT HW			///	///	

24. SHORT LIST SPARE PARTS



Key No.	GC No.	Description	Qty.	Part No.
1	332 711	Outer case	1	402A2193
10	377 000	Inspection window assembly	1	402A2476
13		Plastic door	2	402C3081
21	323 342	Combustion chamber insulation (sides)	2	402C104
22	323 405	Combustion chamber insulation (front) - 30Si	1	402C105
22	323 343	Combustion chamber insulation (front) - 40Si, 50Si	1	402C178
23	323 406	Combustion chamber insulation (rear) - 30Si	1	402C141
23	323 344	Combustion chamber insulation (rear) - 40Si, 50Si	1	402C181
35	395 880	Overheat cut-off device	1	402S1498
36	382 397	'Hi' thermostat	1	402S114
37	382 373	'Lo' thermostat	1	402S115
43	384 208	Pump overrun thermostat	1	402S088
50	382 422	Burner - 30Si	1	402S2510
50		Burner - 40Si	1	402S3221
50	382 423	Burner - 50Si	1	402S2511
51	398 316	Main injector, Cat 16 size 800 - 30Si	1	402S067
51		Main injector, Cat 28 size 1000 - 40Si	1	402S3239
51	398 329	Main injector, Cat 16 size 1400 - 50Si	1	307S527
52	323 468	Main injector washer - 40Si	1	402C532
53	386 532	Pilot burner	1	Q395A1003
55	381 702	Pilot injector, 56/42A	1	4500-4108-005
56	377 042	Spark electrode and lead	1	402A2525
66	323 361	Burner 'O' ring	1	402S098
72	386 756	Gas valve	1	VR4700E1034
76	359 211	Gas valve 'O' ring	2	400-0016-7-32
115	377 046	Ignition PCB	1	309S374
128	332 721	Fan assembly	1	402S2240
129	386 608	Air flow pressure switch	1	309S503

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The Housewarmers



BS5258
BS6332

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