



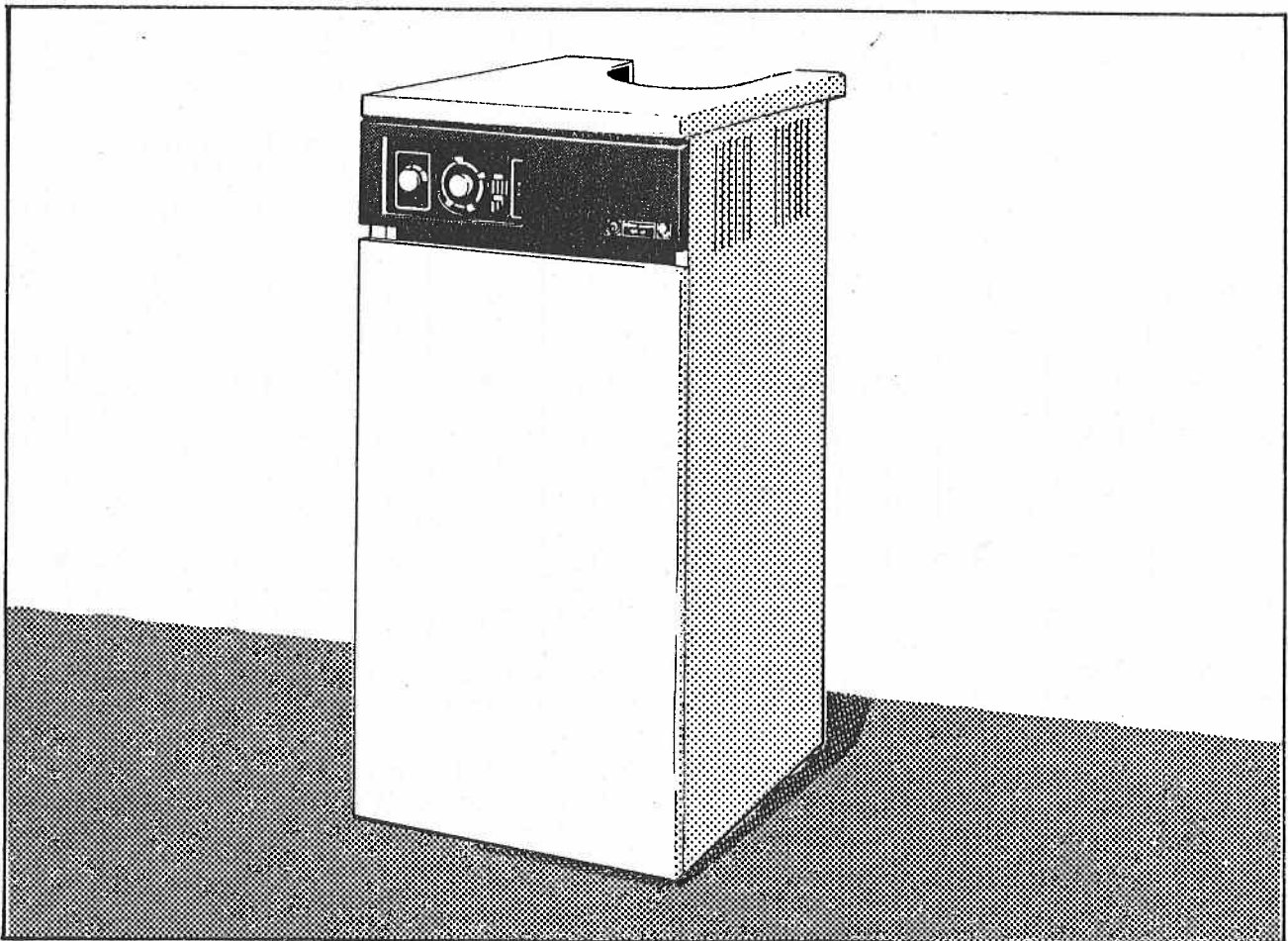
Glow worm

45-60, 65-80, 85-100

Open Flue Boilers

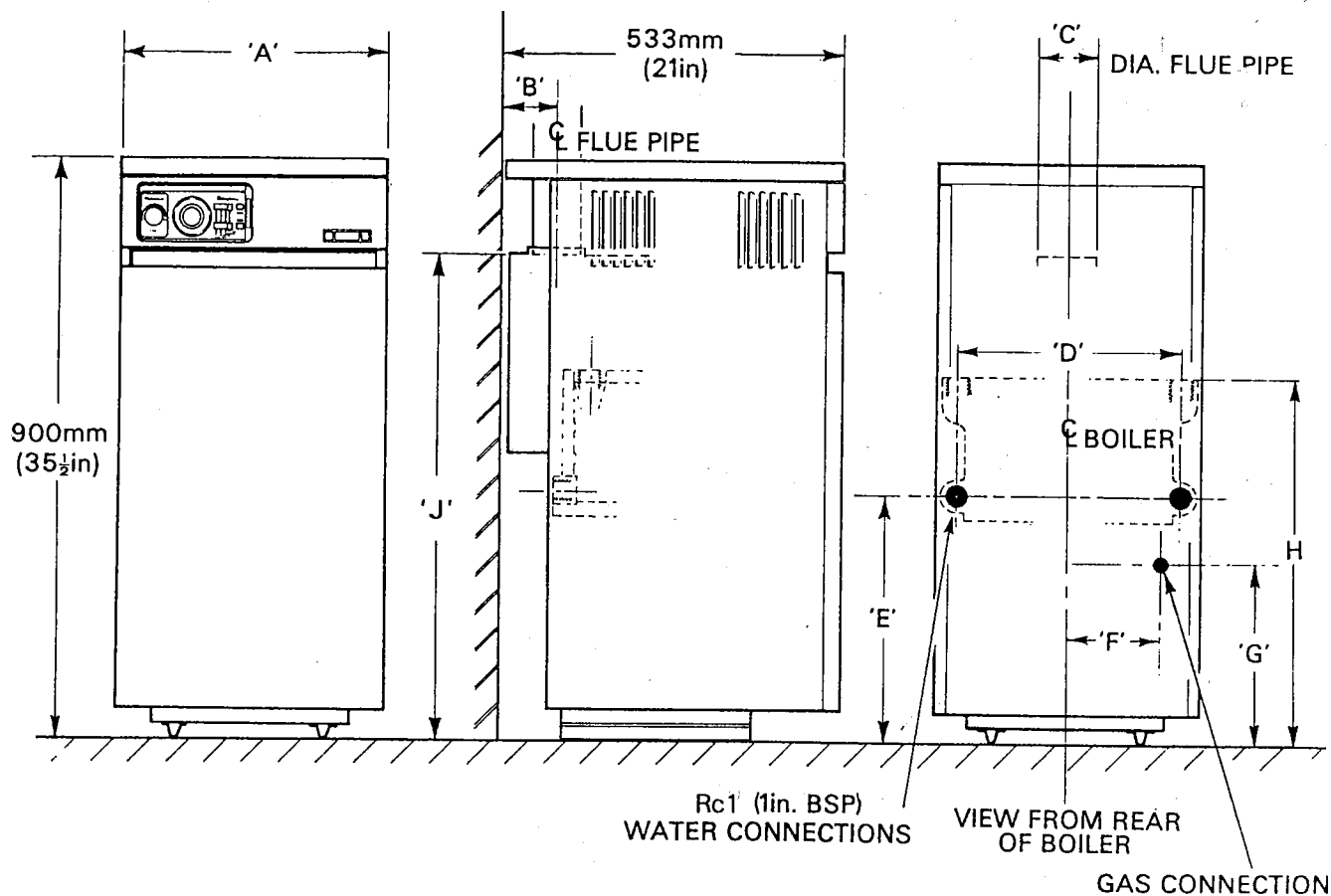
(With L & G Control Panel)

GC Nos	41.315.49	GLOW-WORM	45-60	Cat II	TN
	41.315.51	GLOW-WORM	65-80	Cat II	TN
	41.315.53	GLOW-WORM	85-100	Cat II	TN
	41.315.57	GLOW-WORM	65-80	Cat I	N
	41.315.59	GLOW-WORM	85-100	Cat I	N



Installation and Servicing Instructions

(To be left with User, or at Gas meter)



BOILER SIZE	A	B	C	D	E	F	G	H	J	Gas Conn. Cat. II _{TN}	Gas Conn. Cat. I _N
Glow-worm mm 45-60 ins	417 16 3/4	77 3	102 4	353 13 3/4	392 15 1/2	174 6 3/4	285 11 1/4	587 23	748 29 1/2	Rc 1/2 (1/2 in. BSP)	Rc 1/2 (1/2 in. BSP)
Glow-worm mm 65-80 ins	483 19	91 3 1/2	127 5	407 16	380 15	190 7 1/2	277 10 3/4	577 22 3/4	759 30	Rc 3/4 (3/4 in. BSP)	Rc 1/2 (1/2 in. BSP)
Glow-worm mm 85-100 ins	567 22 1/4	91 3 1/2	127 5	491 19 3/4	380 15	232 9 1/4	277 10 3/4	577 22 3/4	759 30	Rc 3/4 (3/4 in. BSP)	Rc 1/2 (1/2 in. BSP)

NOTES

- All electrical wiring must be carried out by a qualified electrician.
All external components shall be of the approved type and shall be wired in accordance with the I.E.E. Regulations in force at the time.
- Electrical supply: 240V., 3A., 50Hz.
- This boiler shall only be connected to a cistern water supply, with a maximum head not exceeding 27 metres (ninety feet) and have an open vent in the system.

- THE INSTALLATION OF THIS BOILER MUST BE CARRIED OUT BY A QUALIFIED INSTALLER AND MUST BE IN ACCORDANCE WITH THE RELEVANT REQUIREMENTS OF THE GAS SAFETY REGULATIONS, LOCAL BUILDING REGULATIONS, I.E.E. REGULATIONS, THE LOCAL GAS REGION, THE LOCAL AUTHORITY, THE BYELAWS OF THE LOCAL WATER UNDERTAKING AND RELEVANT RECOMMENDATIONS OF BRITISH STANDARD CODES OF PRACTICE CP 331 PART 3 : 1974, BS 5376 PART 2 : 1976, BS 5440 PART 1 : 1978, BS 5440 PART 2 : 1976, BS 5449 PART 1 : 1977 AND BS 5546 : 1979.**

Boiler type	Approx. water content		Approx. weight of appliance	
	litres	galls.	kg.	lbs.
45-60	7.0	1.54	81.2	179
65-80	8.2	1.8	96.6	213
85-100	9.0	2.0	111.0	245

- The appliance must be earthed and connections to the mains supply must be through a 3 amp fused double pole isolating switch or spur box, or an unswitched shuttered socket outlet and 3 amp fused 3-pin plug.

Heat resistant cable of at least 3 amp (16/0.20) capacity must be used for all wiring to control panel.

- 6: When installing or servicing this appliance, care should be taken when handling the edges of sheet metal parts, to avoid any possibility of injury.

FLUE CONNECTION

The integral draught diverter on the Glow-worm range of boilers makes the combustion performance independent of conditions in the secondary flue, but in common with other fuels an efficient flue is necessary to ensure a trouble-free installation.

The flue must be in accordance with British Standard B.S. 5440 Part 1.

The following notes are intended as a general guide.

1. The flue should be kept as short and as warm as possible.
2. Give maximum possible vertical rise from the appliance (min. 500mm) before using any elbow bends.
3. Terminate in an approved terminal, preferably above ridge height but at least above the eaves of a pitched roof.
4. The flue should comply with the requirements of BS 567, BS 715 or BS 835.

VENTILATION REQUIREMENTS

1. Central heating units or boilers installed in Compartments

The compartment, whether modified or specially built, should meet the following requirements:

- a. Have a half hour fire resistance from internal fire and the inside lining or finishing should be non-combustible or a class 1 finish.

The door must have at least the fire resistance of the compartment walls.

- b. For good acoustic insulation, should preferably be built of brick or clinker block plastered on at least one side and supplied with a well-fitting door.
- c. Be of sufficient size to permit access for inspection and servicing of the boiler and compartments. It should not be made larger than necessary in order to avoid the use of the compartment as a storage cupboard. The makers' recommendations regarding minimum requirements should always be obtained and observed.
- d. Be fitted with a door of sufficient size to permit the boiler to be withdrawn from the compartment.
- e. Be fitted with permanent openings for air for combustion and compartment ventilation as shown in the table below:

Position of Opening	Air from room	Air direct from outside
	High level	9.0 cm ² per kW input 2 in ² per 5,000 Btu/h input
Low level	18.0 cm ² per kW input 4 in ² per 5,000 Btu/h input	9.0 cm ² per kW input 2 in ² per 5,000 Btu/h input

		Glow-worm 45-60 Input: 18.3kW (62,500 Btu/h) / 23.7kW (81,000 Btu/h)			
Gas Group	Injector	Pressure			
		Output 13.2kW (45,000 Btu/h)		Output 17.6kW (60,000 Btu/h)	
		mbar	in. w.g.	mbar	in. w.g.
1st Family (Manufactured Gas)	G4 5.55mm (K4322)	2.5	1.0	4.1	1.65
	G5 5.8mm (K6883)	2.5	1.0	4.1	1.65
2nd Family (Natural gas)	2.7mm (K6556)	8.9	3.55	14.7	5.9

		Glow-worm 65-80 Input: 26.5kW (90,000 Btu/h) / 31.6kW (108,000 Btu/h)			
Gas Group	Injector	Pressure			
		Output 19.1kW (65,000 Btu/h)		Output 23.5kW (80,000 Btu/h)	
		mbar	in. w.g.	mbar	in. w.g.
1st Family (Manufactured Gas)	G4 6.2mm (K4150)	3.0	1.2	4.4	1.75
	G5 0.257" (K4151)	3.0	1.2	4.4	1.75
2nd Family (Natural Gas)	3.15mm (K6957)	11.0	4.4	15.8	6.3

		Glow-worm 85-100 Input: 34.6kW (118,000 Btu/h) / 39.6kW (135,000 Btu/h)			
Gas Group	Injector	Pressure			
		Output 24.9kW (85,000 Btu/h)		Output 29.3kW (100,000 Btu/h)	
		mbar	in. w.g.	mbar	in. w.g.
1st Family (Manufactured Gas)	G4 0.277" (K4682)	3.3	1.3	4.3	1.7
	G5 7.4mm (K5549)	3.3	1.3	4.3	1.7
2nd Family (Natural Gas)	3.45mm (K4153)	12.4	4.95	16.2	6.5

The figures quoted refer to the minimum acceptable *free area* when grilles are fitted to the openings. The high level and low level openings must communicate with the same room or space or must both be to outside air.

Where ventilation air to a compartment is taken from a room, then the room must be fitted with ventilation openings equivalent to those into the compartment. The compartment vents or door should not communicate with a bedroom, bed-sitting room or a room containing a bath or shower.

2. Ventilation of Rooms in which are fitted Open Flued Central Heating Appliances or Boilers either free-standing or in compartments (not including combined appliances in living rooms).

A purpose-designed ventilation opening must be provided in an outside wall of the building; this opening may be either:

- a. directly into the room or space containing the boiler or
- b. into an adjacent room or space which has an internal permanent air vent of the same size to the room containing the boiler. It is undesirable to ventilate via a kitchen, bathroom or toilet.

If the air vents are fitted to a cavity type wall, the opening through the wall shall be ducted.

The minimum effective area of all permanent air vents shall be 4.5cm² per kW, (1 in² per 5,000 Btu/h), of maximum heat input.

When the boiler is installed in a room or internal space already containing other fuel burning appliances then the air supply of such appliances should be taken into account.

The Glow-worm 45-60 *free area* will be 107 cm² (16 sq. in.), Glow-worm 65-80 will be 142 cm² (22 sq. in.), the Glow-worm 85-100 will be 178 cm² (27 sq. in.).

Extraction Fans

If an extraction fan is fitted in a room which contains any type of flued appliance, there is a possibility that, if adequate inlet openings are not provided, spillage of products from the flue will occur. If ventilators are fitted in accordance with the recommendations in the sections above, the use of extract fans should not cause draught; but where such installations are found, tests for spillage of products from the draught diverter should be carried out with the fan running.

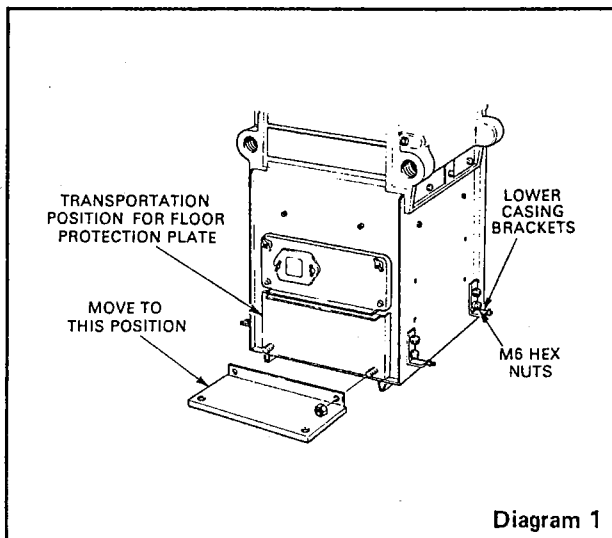


Diagram 1

INSTALLATION

The boiler must stand on a level floor, conforming with local authorities requirements and building regulations. The base temperature is within the requirements of BS 5258. The boiler may be stood on a wooden floor, but a metal base plate is required to protect plastic tiles and similar floor coverings.

The boiler casings are packed separately to avoid transit damage and are so designed to enable gas, water and flue connections to be made with the boiler on its prepared setting before final fitting of the casing sides, control panel, top and front panel. The casing brackets and a plastic bag of screws, etc., are packed with the casings.

The following procedure should be adopted:

1. The front floor protection tray is secured by two M6 hex nuts in a vertical position in front of the combustion chamber, for safety during transportation. Remove the tray from this position and using the same two nuts, secure it to the two screws protruding from the front face of the combustion chamber, below the opening. See diagram 1.

THE UPPER CASING BRACKETS MUST BE FITTED BEFORE THE WATER CONNECTIONS ARE MADE INTO THE BOILER TAPPINGS

2. Take the upper casing brackets, which are packed with the casings and fit over the screws protruding from the flue collector. Secure the upper casing brackets with the M6 hex. nuts and plain washers provided. See diagram 2.
3. Place the boiler in position, ensuring that there is sufficient clearance between the side panels and adjacent furniture. See diagram 2.

Make the gas and water connections, taking all pipes backwards. Make sure that when the side panels are fitted there will be no interference, because there are no pipe holes in the side casings.

Remove the flue cleaning door, taking care not to damage the seal and check that the flue baffle has not become dislodged in transit and is seated down into the flueway. See diagram 1A.

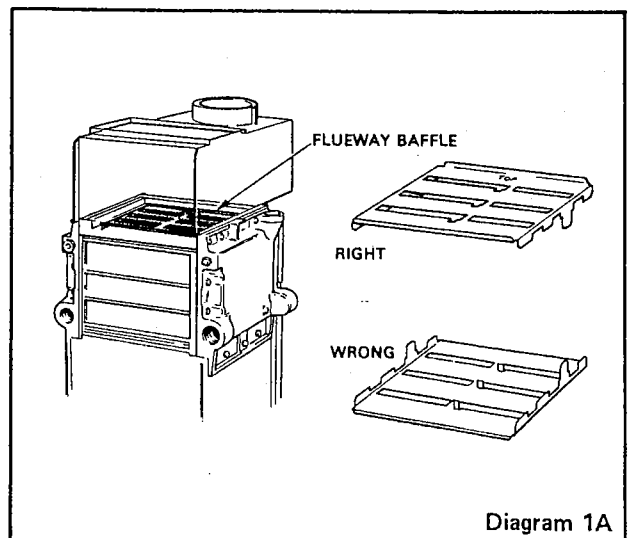
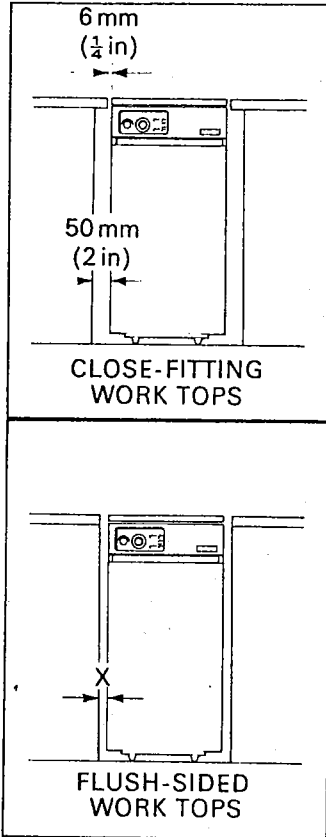


Diagram 1A

MINIMUM CLEARANCES



X:-	45-60	25 mm (1 in)
	65-80	25 mm (1 in)
	85-100	50 mm (2 in)

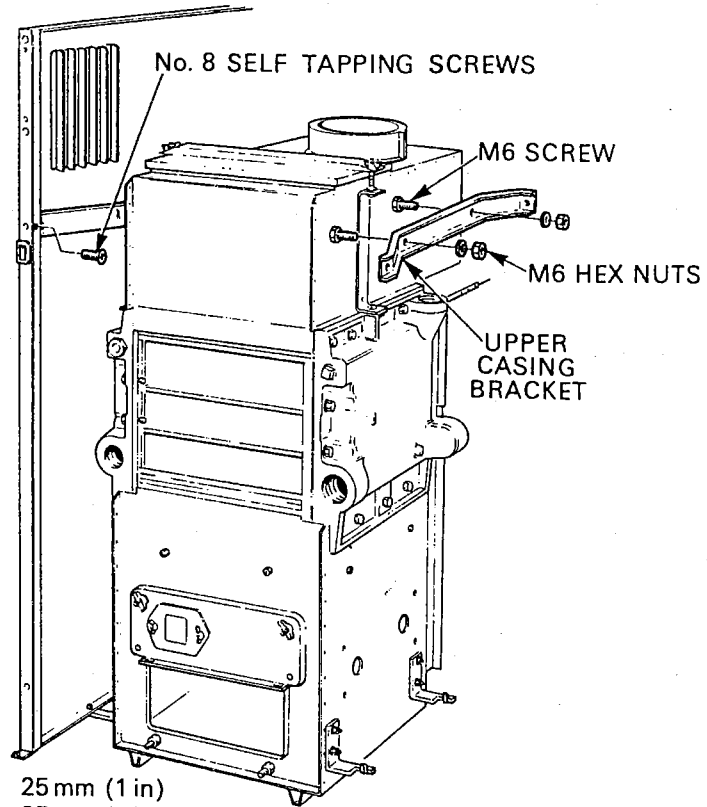


Diagram 2

4. Pipe Layout

If the small bore pack is used, i.e.: the pump is required to be within the boiler casings, the components of the pack should be assembled as shown in diagram 3A (45-60 model) or 3B (65-80, 85-100 models) to the appropriate bottom front water connection (see diagrams 4 and 5). This will always be the return.

Fit the components of the small bore pack in the following order:

45-60 model. Diagram 3A

- a. Screw one of the elbows into the appropriate bottom front water connection in the water manifold until the elbow faces outwards from the centre of the boiler and is half a turn from being tight.
- b. Screw in the hex. nipple and the other elbow until the latter is facing downwards when tightened.
- c. Rotate the whole assembly by half a turn to tighten, bringing the second elbow towards the centre of the boiler and facing upwards.
- d. Screw one of the integral valves and union to the upturned elbow, slight manipulation of the latter may be necessary.

1 in BSP 'COMMODORE 2' CIRCULATOR PUMP AND VALVES

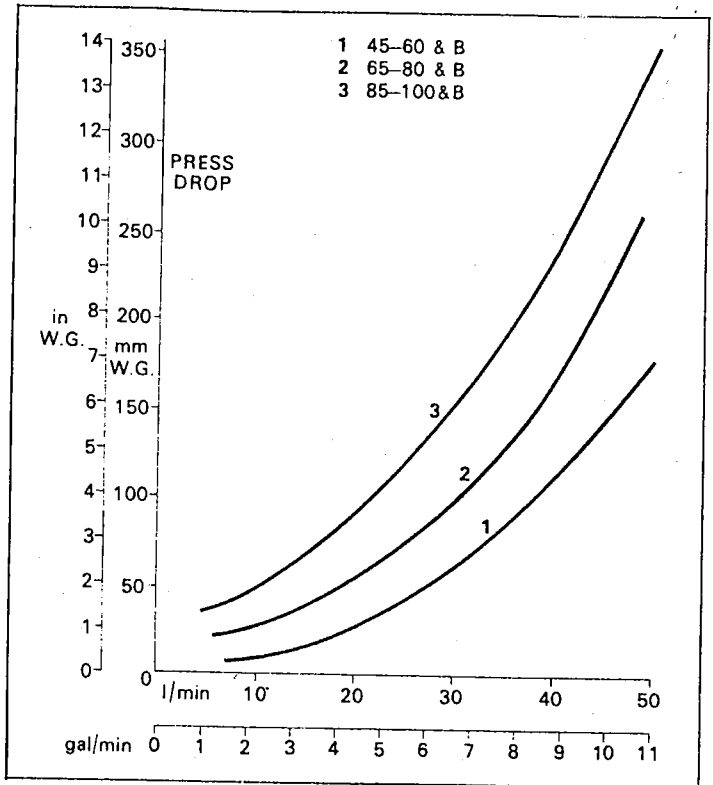
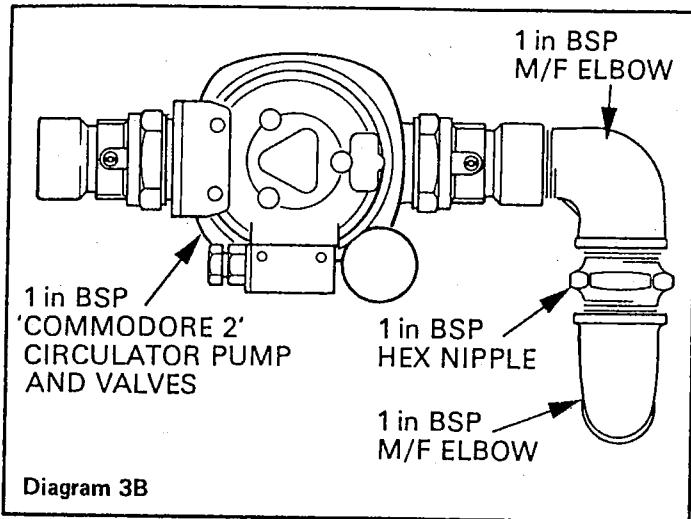
1 in BSP M/F ELBOW

1 in BSP HEX NIPPLE

1 in BSP M/F ELBOW

Diagram 3A

- e. Assemble the pump to the union on the lower integral valve already fitted to the boiler, then screw the other valve and union to the top connection on the pump.



Pressure drop across heat exchanger.

65-80, 85-100 models. Diagram 3B

- Screw one of the elbows into the appropriate bottom front water connection in the water manifold until the elbow faces outwards from the centre of the boiler and is three-quarters of a turn from being tight when the R.H. water connection is used, or one-quarter of a turn for the L.H. connection.
- Screw in the hex. nipple and the other elbow until the latter is facing upwards when tightened.
- Rotate the whole assembly three-quarters of a turn to tighten for R.H. water connection or one-quarter of a turn for L.H. connection, with the second elbow finishing facing inwards towards the centre of the boiler.

- Screw one of the integral valves and union to the elbow, slight manipulation of the latter may be necessary.
- Assemble the pump to the union on the integral valve already fitted to the boiler, then screw the other valve and union to the pump.

All models. NOTE.—All additional circuit pipework within the boiler casing should be directed to the L.H. or R.H. side of the boiler to ensure ease of access to the flue cleaning door and combustion chamber front cover for servicing, etc.

Water Connections

Gravity domestic hot water

Two 1in. BSP M/F elbows (tapered threads) must be fitted in the domestic return, as shown in diagram 4. Connections must be made as follows:

- Domestic return to bottom L.H. rear.
- Domestic flow to top L.H. rear.
- Pumped heating return to bottom L.H. front.
- Heating flow to top R.H. rear.
- Thermostat phial in top R.H. front (45-60).
- Thermostat phial pocket in top L.H. front (65-80 & 85-100).

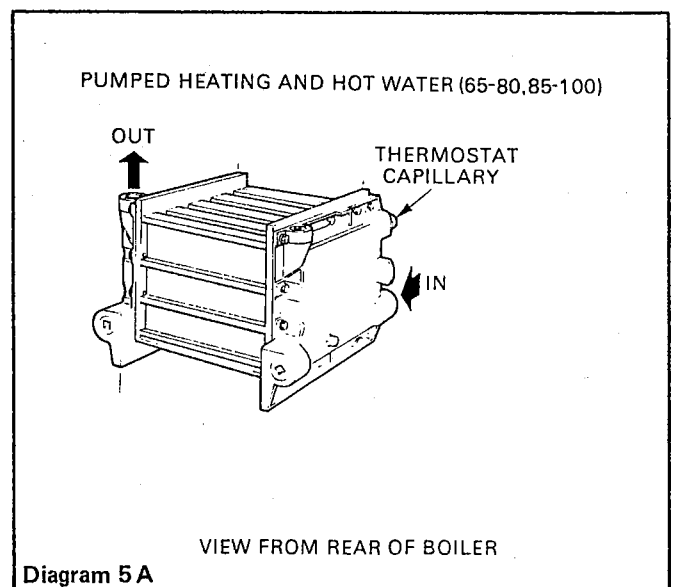
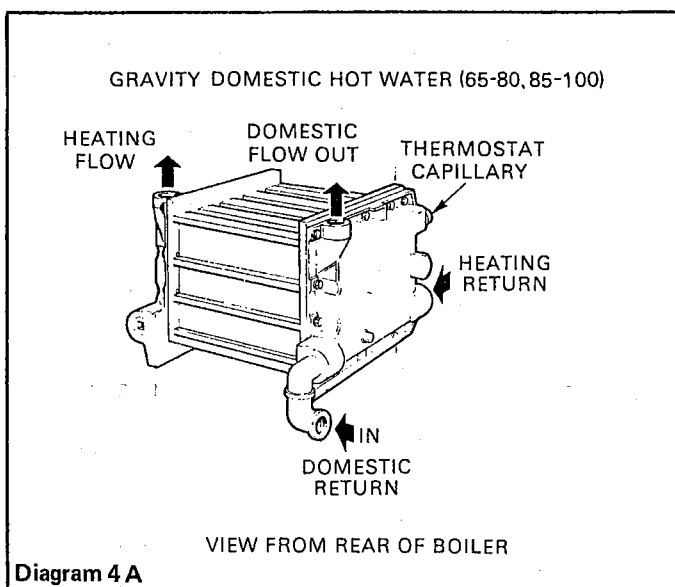
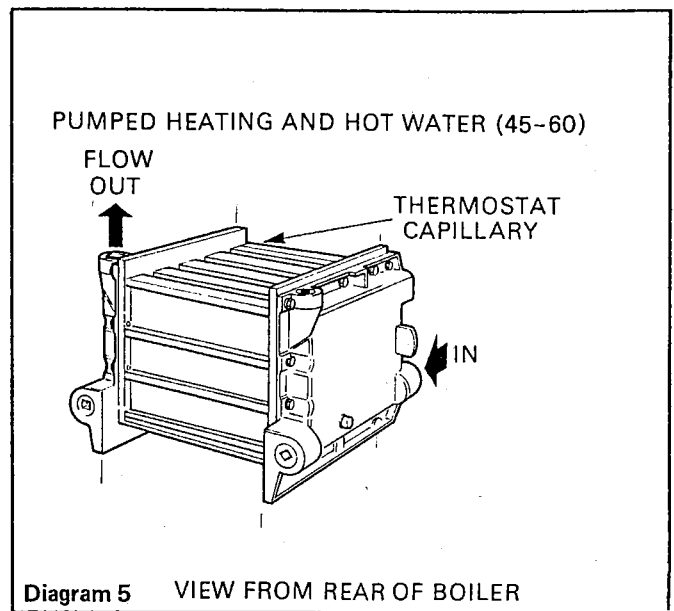
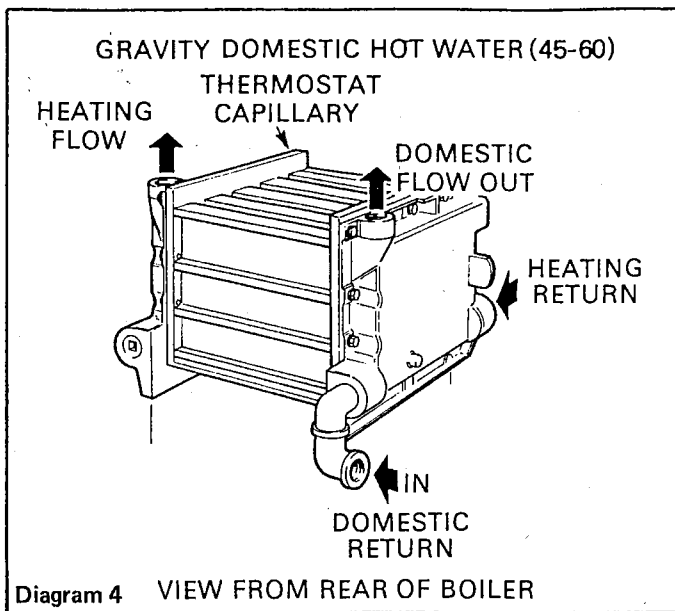
CONNECTIONS MAY BE FITTED ON OPPOSITE SIDES, BUT ALWAYS IN THE SAME RELATIVE POSITIONS, i.e. ALL THREE MUST BE MOVED FROM THE L.H. SIDE, ALSO THE PHIAL POCKET MUST BE CHANGED OVER. SEE DIAGRAM 4 OR 4A

Pumped heating and hot water

Where a single flow and return is taken from the boiler, connect as follows:

- Pumped return to bottom L.H. front.
- Flow to rear R.H. top.
- Thermostat phial pocket in top R.H. front (45-60).
- Thermostat phial pocket in top L.H. front (65-80 & 85-100).

The flow and return connections may be fitted in opposite sides if necessary (both must be changed) in which case the thermostat phial pocket must also be changed over. See diagram 5 or 5A.



5. Make the flue connection.
6. Lower the L.H. side panel on to the upturned lugs in the lower casing brackets. The locating dowel in the panel rear return flange fits into the hole in the rear end of the upper bracket and the front end of the upper bracket fits behind the panel front return flange, where it is secured with one of the No. 8 x 3/8 in. lg. Pozidriv pan hd. self-tapping screws provided. See diagram 2. Fit the other side panel similarly.
7. The control panel is packed separately in a carton. Take out the assembled panel and remove the two Pozidriv pan hd. screws at the rear of the top surface of the stove enamelled front cover. This will enable the front cover to be disengaged from the two lugs on the lower surface of the control panel and to be removed. With the four M5 x 10 mm. lg. cheese hd. screws provided, secure the control panel to the 'Nutserts' fitted in the front edge of the side panels. See diagram 6. Insert the boiler thermostat phial FULLY into the phial pocket in the water manifold and secure with the retainer.

8. Complete the wiring to the terminal strip on the top of the control panel. See diagrams 9 to 24.

Note: Programmer panel only.

As received, the programmer is set to give a selection of ten programmes. If schemes 2, 3, 4, 5 or 6 are installed, the programmer should be converted to give sixteen programmes before completing the wiring.

To do this, the chassis including the programmer should be removed from the control panel by removing the Pozidriv pan hd. screw from the R.H. end of the chassis. See diagram 6. The chassis is then moved slightly to the right, so that the tongue on the L.H. end clears the slot in the control panel. Withdraw the chassis far enough to provide access to the rear, taking care not to damage the thermostat capillary which passes through the rear of the control panel. The programmer range adjuster will be seen at the rear of the programmer. See diagram 7. To adjust for sixteen programmes, first set the hot water programme selector to the 'Continuous' position and the central heating programme selector to the 'OFF' position. See diagram 7. Then turn the programme range adjuster 90° anti-clockwise. To revert back to ten programmes, position the programme selectors as previously described and turn the programme range adjuster 90° clockwise. Replace the chassis by inserting the tongue at the L.H. end into the slot in the control panel and securing with the Pozidriv pan hd. screw. Feed the thermostat capillary backward through the rear of the control panel.

9. Bring all cables into the control panel through the grommet at the R.H. side rear. The mains cable must be passed through the cable clamp positioned on the top of the chassis before connecting into the terminal strip. Tighten the clamp screws.

10. Secure the mains lead to the top of the R.H. side panel using two of the cable clips supplied. See diagram 6. Secure the gas valve lead to the front return edge of the R.H. side panel, using the third cable clip supplied. See diagram 25.

11. When the wiring is complete, replace the front cover by engaging the two slots in the lower surface of the cover over the two lugs on the bottom of the control panel and securing with the two Pozidriv pan hd. screws previously removed.

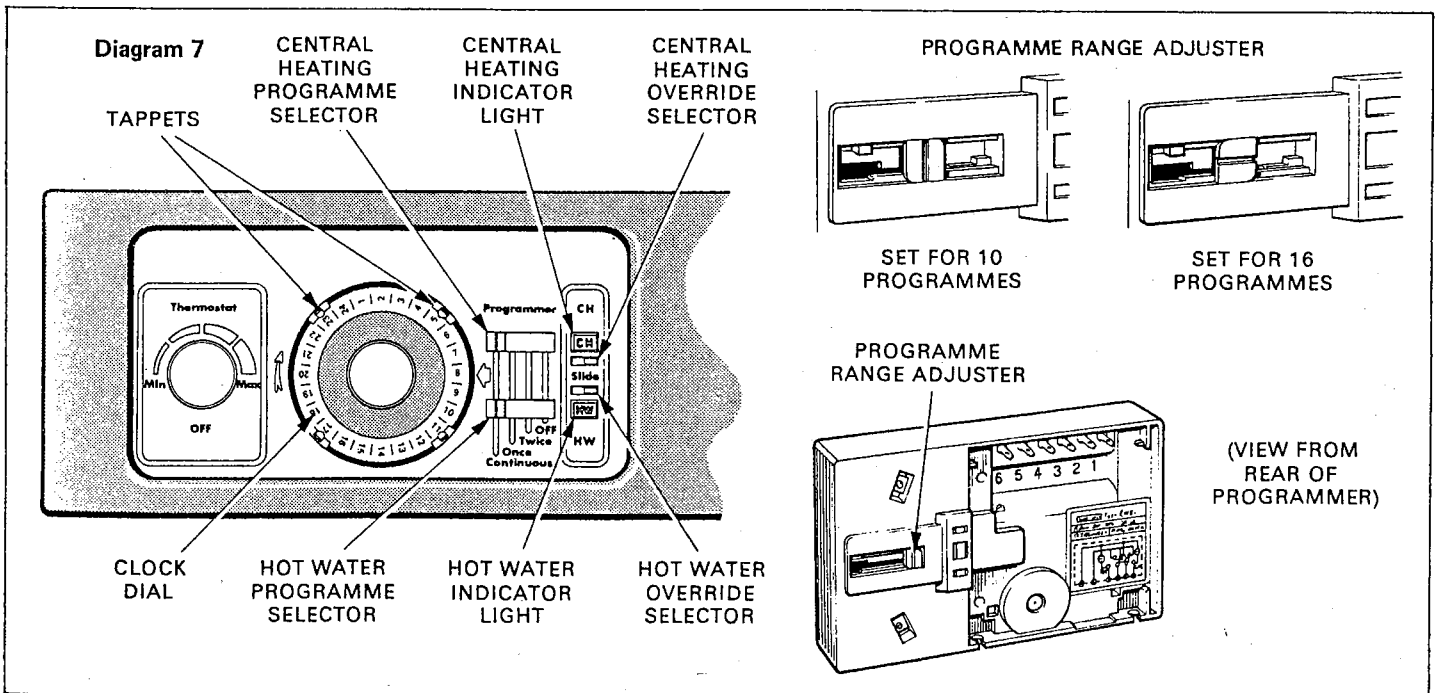
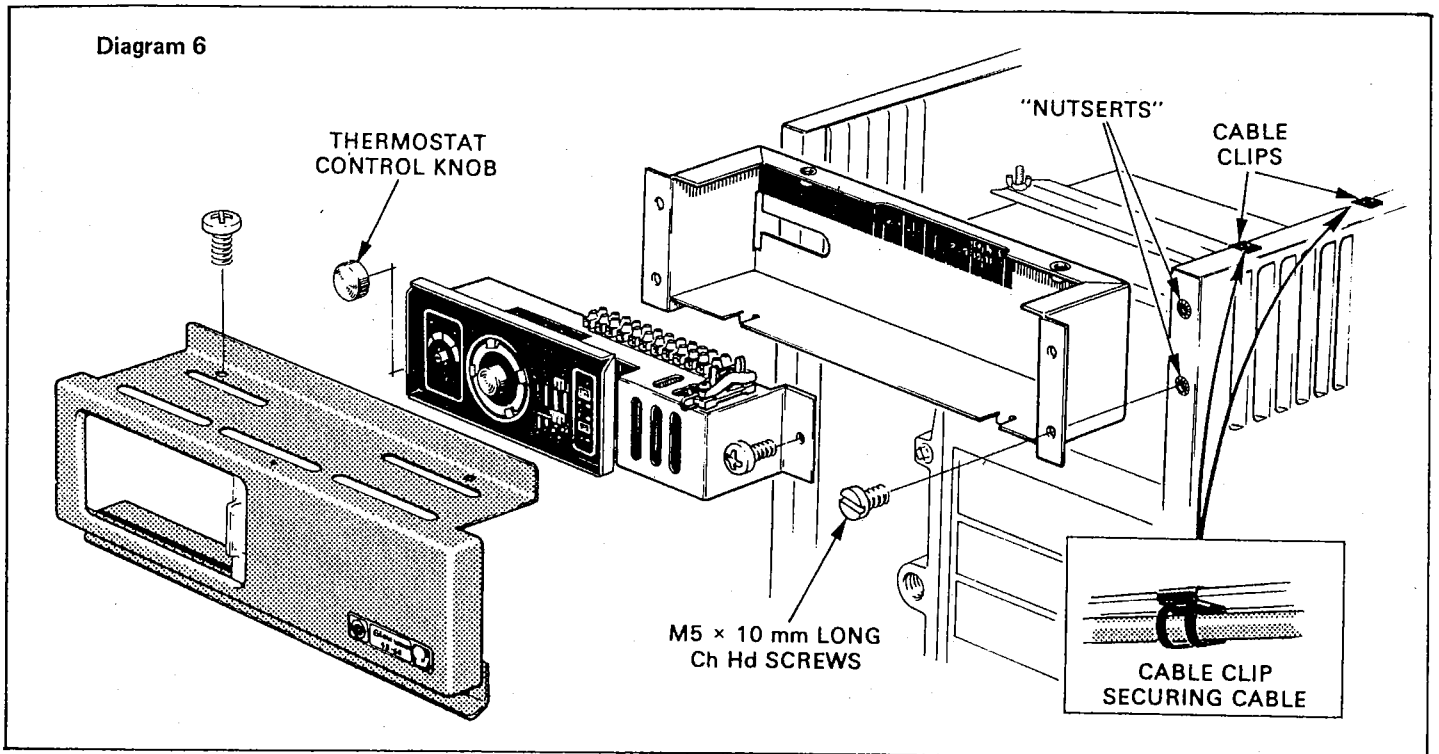
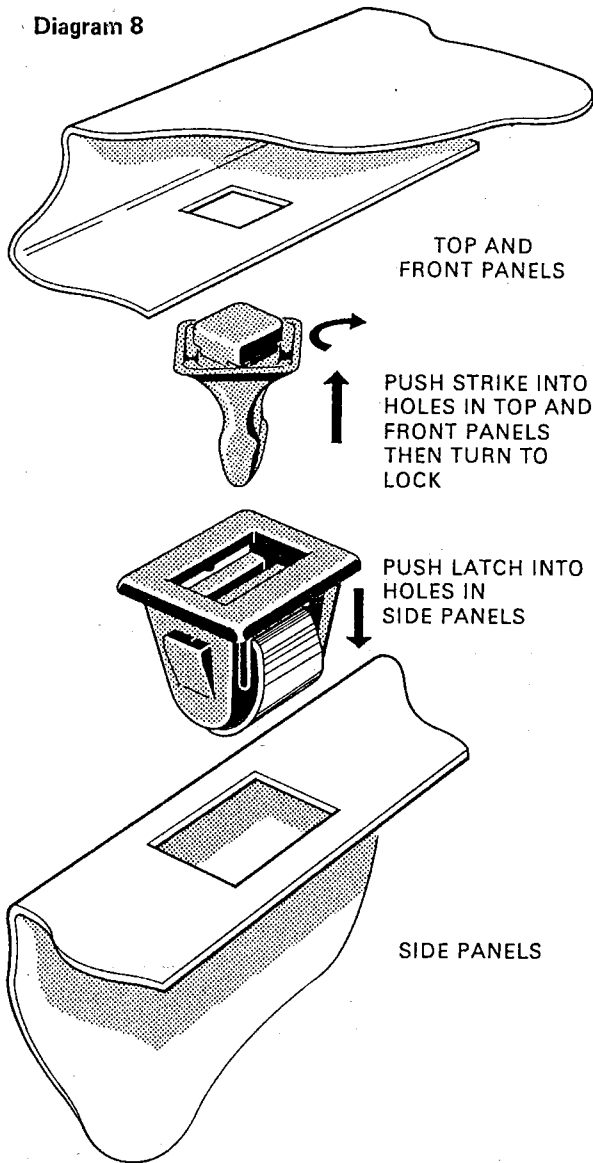


Diagram 8



INSTALLATION REMINDERS

SAFETY VALVE

Where a safety valve is fitted it should be adjacent to the boiler on the flow pipe. It should not be possible to isolate the safety valve from the boiler by means of any intermediate cock.

DRAIN-OFF COCK

A drain-off cock must be fitted to the lowest part of the system for complete drainage for subsequent servicing.

HOT WATER SERVICES

When a combined central heating and domestic hot water load is served an indirect hot water system must be used with this unit.

12. The panel fasteners are supplied loose, six door latches and six door strikes. Insert three latches into the rectangular holes in each side panel, two in the top edge and one in the upper portion of the front edge. Four of the strikes are inserted into the rectangular holes in the top panel edges and two into the upper portion of the edges of the front panel. The strikes are inserted by pressing into the holes and turning to lock into position parallel with the edges. See diagram 8.
13. Press the top panel on to the top of the inturned flanges of the side panels, so that the strikes engage into the latches. Next, locate two holes in the bottom edge of the front panel over two pegs projecting forward from the bottom of the side panels and push the top of the front panel backward so that the strikes engage into the latches in the front edges of the side panels.

CONTROL PANELS

The boiler may be fitted with either a basic type control panel or programmer type.

1. PROGRAMMER CONTROL PANEL

INSTRUCTIONS FOR COMMISSIONING THE PROGRAMMER PANEL ARE TO BE FOUND IN THE USERS INSTRUCTIONS. THE INSTALLER IS REQUESTED TO ADVISE THE USER OF THE CONTROLS SCHEME USED WITH THIS APPLIANCE AND TO GIVE GUIDANCE ON THE OPERATION OF THE CONTROLS.

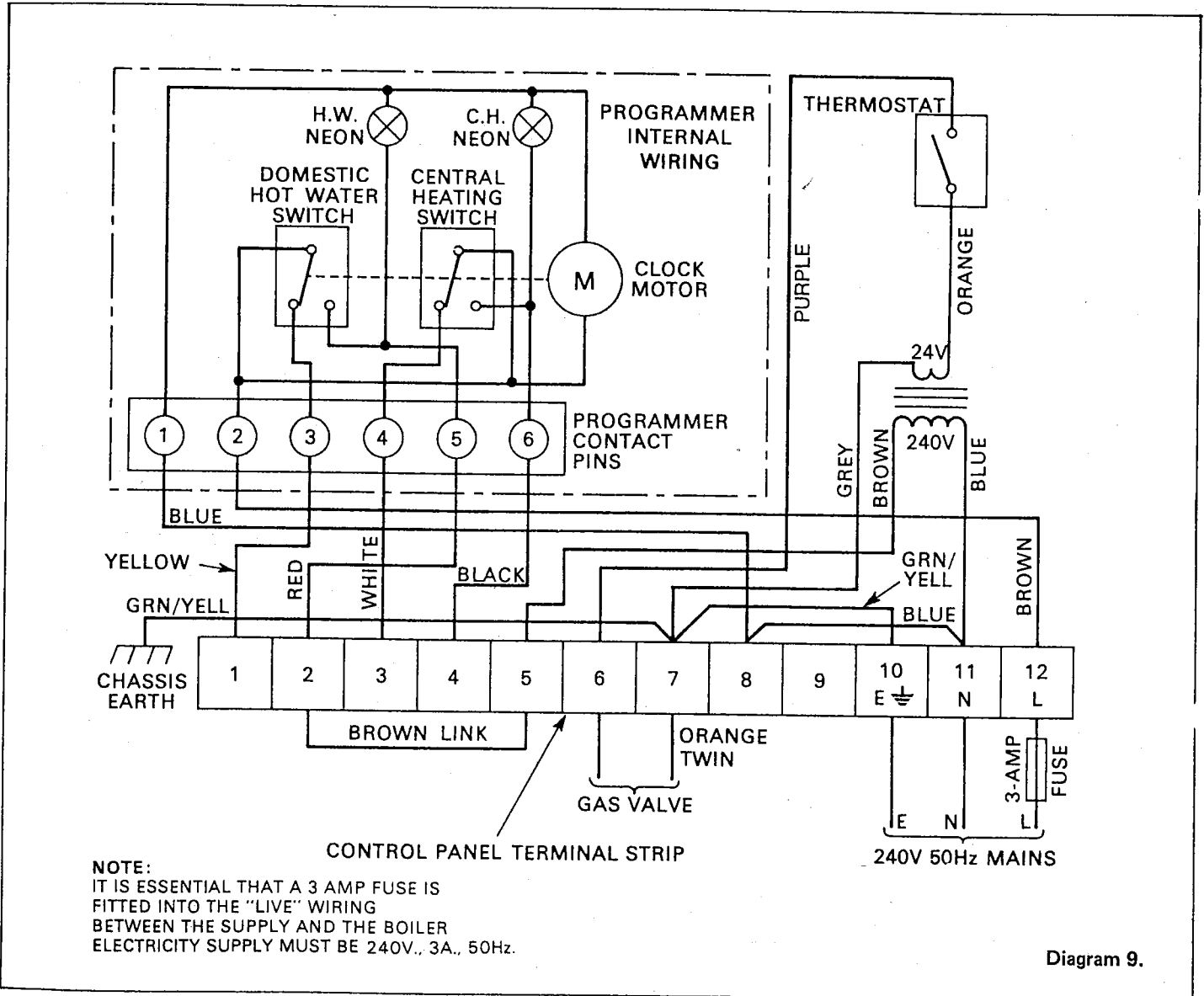
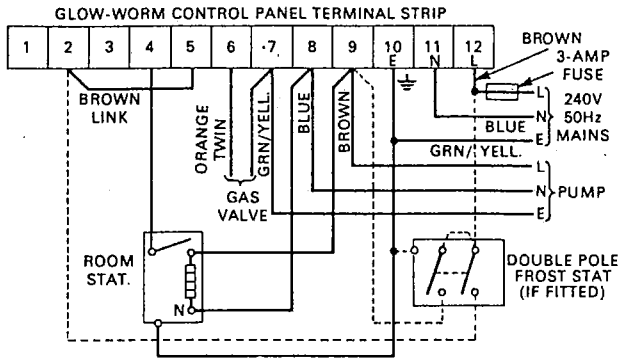


Diagram 9.

SCHEME 1 (Diagram 10)

Pumped central heating circuit with gravity hot water circulation (ten position programmer).

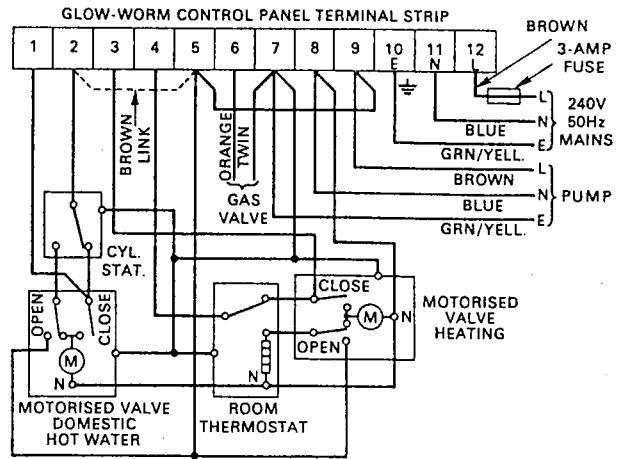
If a room thermostat is not fitted, link terminals 4 and 9.



SCHEME 4 (Diagram 13)

Independent control of central heating and domestic hot water, both pumped, using two motorised valves (sixteen position programmer).

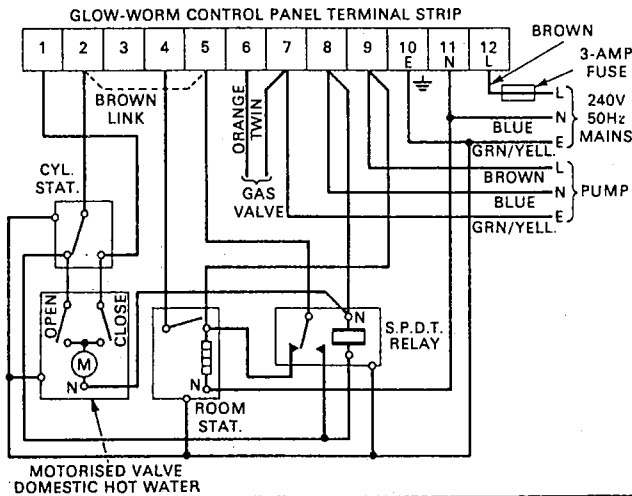
Remove brown link between terminals 2 and 5, and wire external controls and mains as shown.



SCHEME 2 (Diagram 11)

Pumped central heating circuit with gravity hot water circulation (sixteen position programmer), giving independent temperature control of domestic hot water.

Remove brown link between terminals 2 and 5, and wire external controls and mains as shown in diagram.

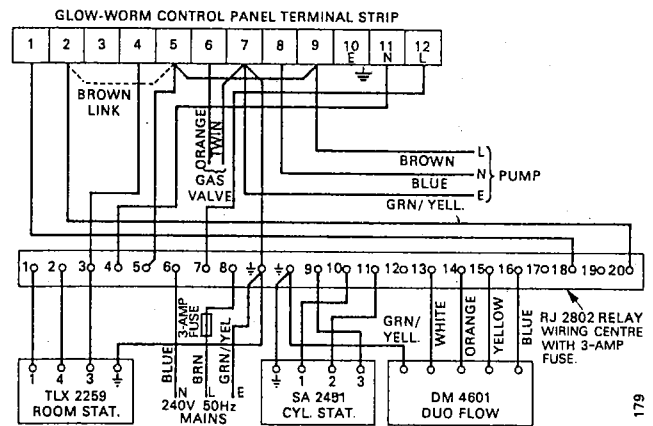


SCHEME 5 (Diagram 14)

Wiring diagram for fitting the Satchwell Duoflow system, using the sixteen position programmer.

Remove brown link between terminals 2 and 5, and wire external controls and mains as shown in diagram.

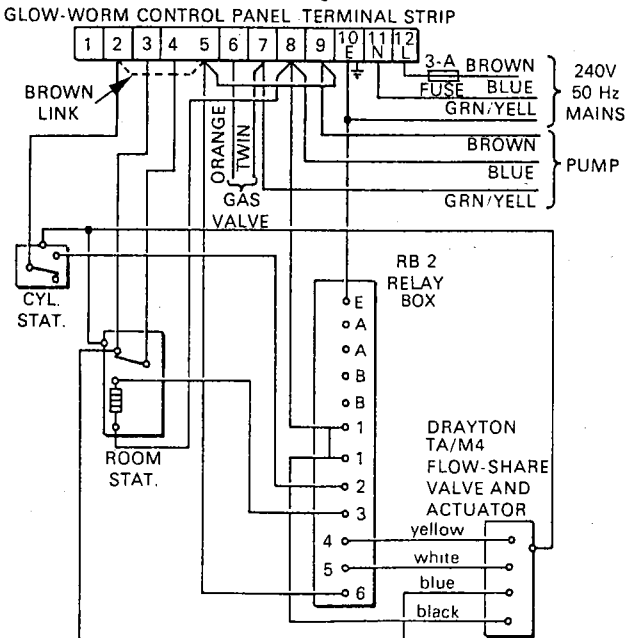
Remove links A and B from RJ2802 wiring centre.



SCHEME 3 (Diagram 12)

Central heating and domestic hot water, both pumped using a Drayton Flow-share valve (sixteen position programmer).

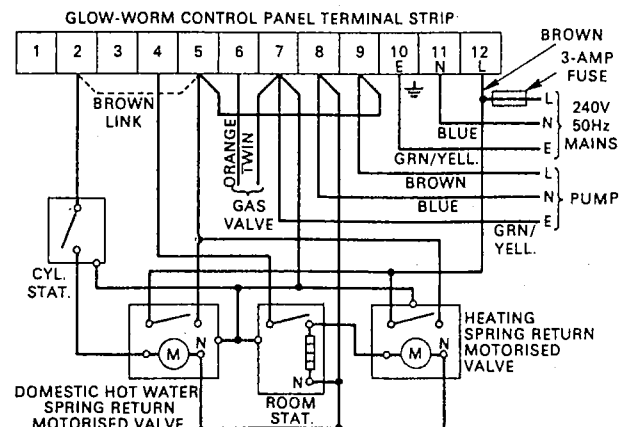
Remove brown link between terminals 2 and 5, and wire external controls and mains as shown in diagram.



SCHEME 6 (Diagram 15)

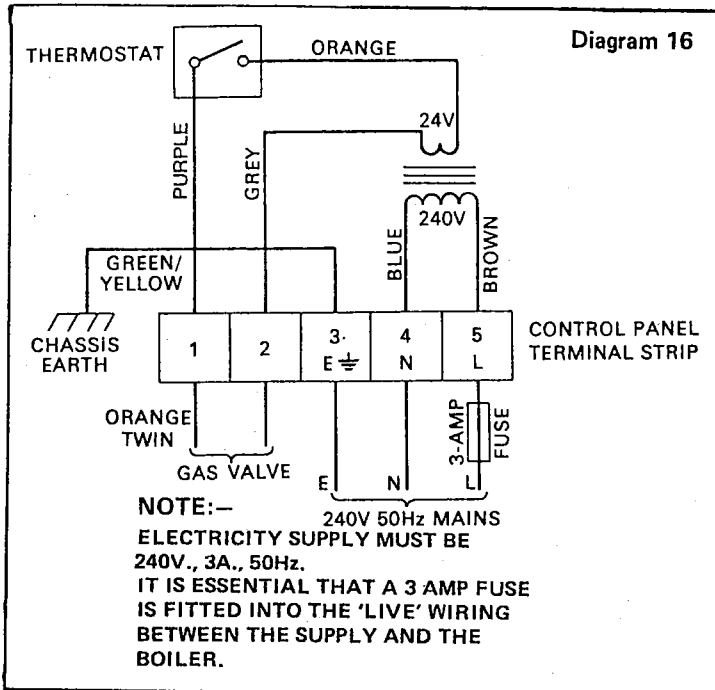
Independent control of domestic hot water and central heating, both pumped, using two spring return motorised valves (sixteen position programmer).

Remove brown link between terminals 2 and 5.



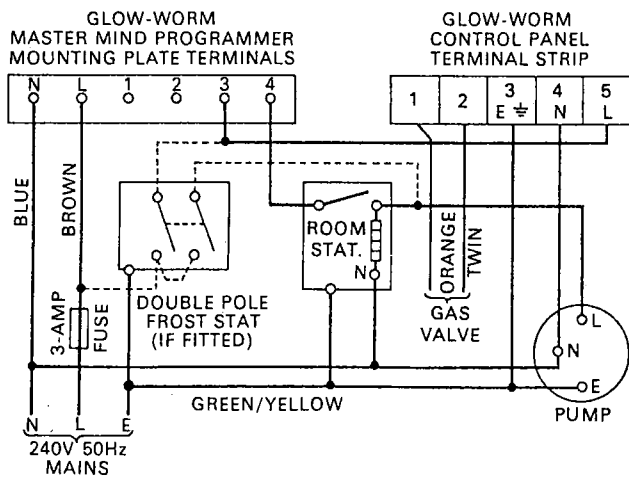
2. BASIC CONTROL PANEL

This embodies a thermostat only.



SCHEME 7 (Diagram 17)

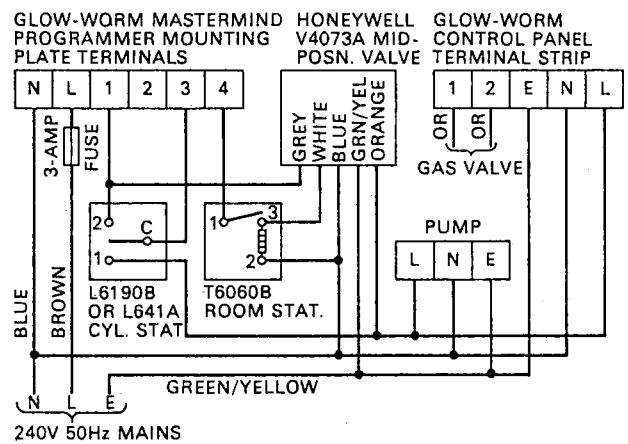
Gravity hot water, pumped central heating (ten position programmer),



SCHEME 8 (Diagram 18)

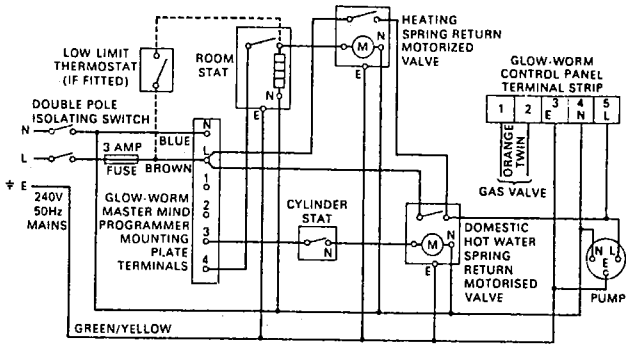
Wiring diagram for fitting the Honeywell Sundial Plan Y.

NOTE.—The piping arrangement and the installation of the controls should be in accordance with the Honeywell instructions.



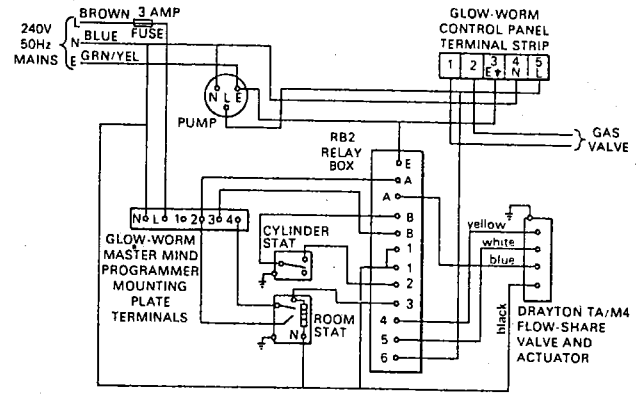
SCHEME 9 (Diagram 19)

Independent control of domestic hot water and central heating, both pumped, using two spring return motorised valves (sixteen position programmer).



SCHEME 12 (Diagram 22)

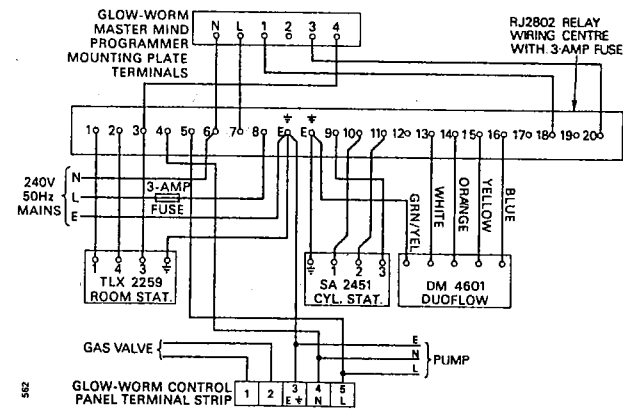
Domestic hot water and central heating, both pumped, using a Drayton Flow-share valve.



SCHEME 10 (Diagram 20)

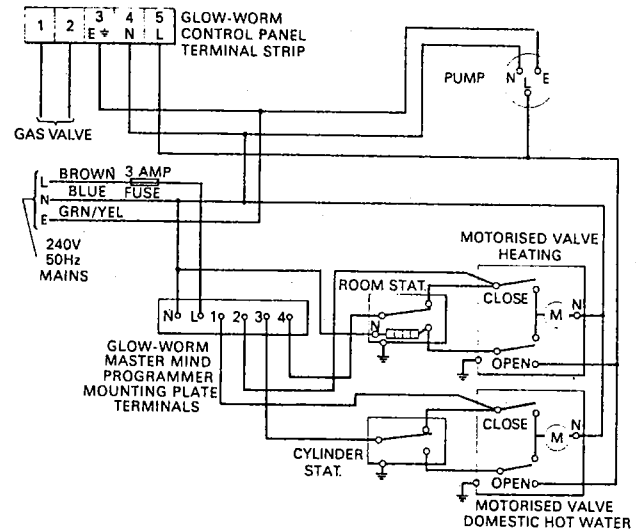
Wiring diagram for fitting the Satchwell Duoflow system, using the sixteen position programmer.

Remove links A and B from RJ2802 wiring centre.



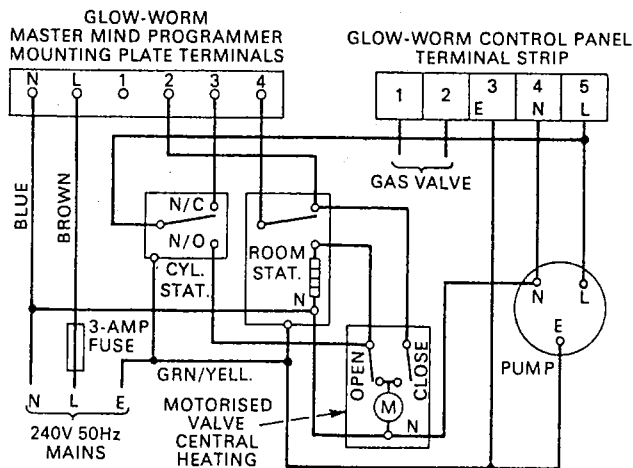
SCHEME 13 (Diagram 23)

Independent control of domestic hot water and central heating, both pumped, using two motorised valves (sixteen position programmer).



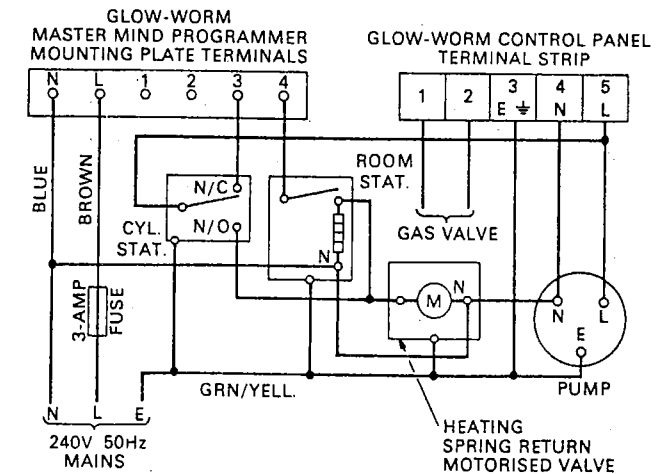
SCHEME 11 (Diagram 21)

Domestic hot water and central heating, both pumped, using one fully motorised valve (ten position programmer).



SCHEME 14 (Diagram 24)

Domestic hot water and central heating, both pumped, using one spring return motorised valve (ten position programmer).



CONTROLS

The **service gas tap** upstream of the gas valve providing overriding control of the gas supply to the boiler.

The **gas valve** performs four duties. Those of a three position gas cock; a thermomagnetic flame failure device; an electric operator and a gas pressure governor.

The **three position gas cock** allows pilot supply only, alternatively pilot and main burner supply and an 'OFF' position, incorporating 'Safety lock', giving overriding control of the gas supply to the boiler.

The **thermomagnetic flame failure device** provides for a complete shut off of all gas to the appliance in the event of the lighting pilot flame becoming extinguished.

The **electric operator** allows for the main burner to be controlled by a signal from the electric clock and from the boiler thermostat. The terminals must be kept clean. This control operates on 24 volts.

The **gas pressure governor** regulates the gas supply pressure to the burner ensuring constant rated output. Also provided on the gas control is a regulating screw to control the pilot flame size.

INITIAL LIGHTING AND ADJUSTMENT

CAUTION. The following procedure should be carried out by a qualified gas service engineer.

The pipes and fittings to the gas control and burner, and to some extent the gas pipe to the appliance will contain an appreciable amount of air. It is, therefore, necessary to purge the air from the pipes before the appliance can operate normally.

Identify the boiler controls with relevant details on diagram 25

Key

- A. Gas control knob
- B. Clock control
- C. Thermostat control
- D. Pilot burner
- E. Burner
- F. Pressure test nipple
- G. Programmer selection switches
- H. Governor adjustment
- J. Front cover
- L. Thermocouple union
- M. Pilot adjustment
- P. Flue cleaning door
- R. Service gas tap
- S. Thermostat phial and pocket (opposite side on 45-60)
- U. Sight glass
- W. Over-ride selectors
- X. Clip for gas valve lead

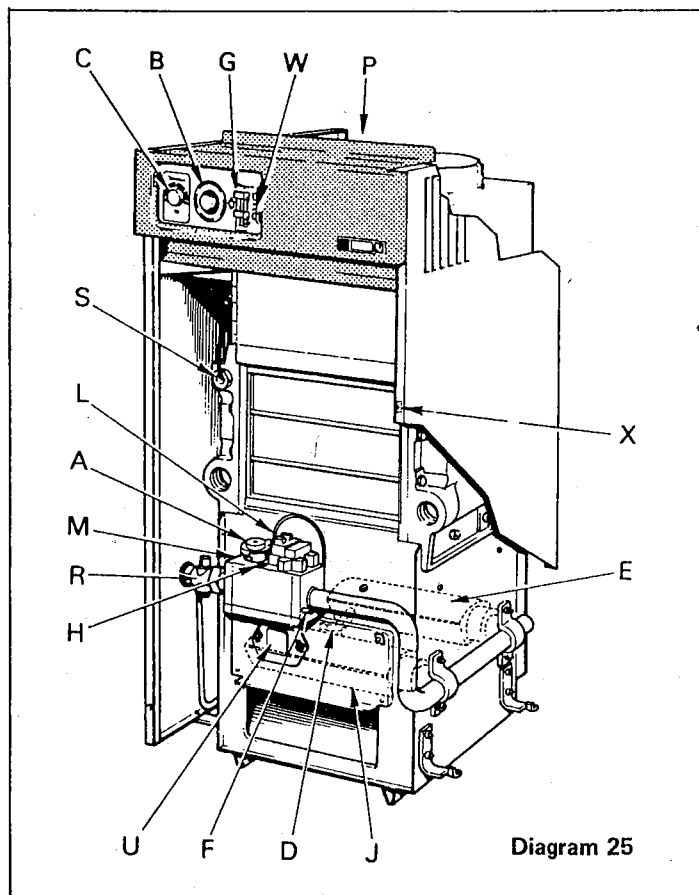


Diagram 25

LIGHTING PROCEDURE

1. Remove front cover 'J' by unscrewing the two wing nuts securing it to the combustion chamber front.
2. Check that the service tap 'R' is closed, that is, the indicator line is across the line of the pipe. See that the gas valve is in the 'OFF' position.
3. Switch on mains electricity supply.
4. See that the clock control 'B' and the programmer selection switches 'G' (when fitted) are in the 'OFF' position.
5. Set the thermostat knob 'C' to the 'OFF' position.
6. Remove the gas pressure test nipple screw 'F' and connect a water gauge to measure the gas pressure.
7. Open service tap 'R' and set the gas valve knob 'A' to pilot.
8. Apply a lighted match or taper to pilot burner 'D'. Push in gas valve knob 'A' fully, hold in for approx. 20 secs. and then release. If the pilot burner fails to light or stay alight, wait three minutes before repeating stage 8. The pilot gas rate can be adjusted if necessary as follows: Remove pilot adjustment cover screw 'M' from gas control and adjust the grub screw beneath it until the pilot burner flame envelopes 10 to 13 mm ($\frac{3}{8}$ to $\frac{1}{2}$ in.) of the thermocouple tip and ignites the main burner smoothly. Turn anticlockwise to increase pilot flame. Replace cover screw.
9. If gas valve is turned 'OFF', no attempt should be made to force knob 'A' back to pilot position until the three minutes has elapsed.

10. Make sure that the burner pilot is alight and stable, and then turn gas valve knob 'A' to 'ON' and set thermostat knob 'C' to the desired position between 'MIN' and 'MAX'. Set clock or programmer to an 'ON' position. The main burner will light at once.
11. Set gas pressure with water gauge. (See page 3 for setting pressure).
To do this: remove pressure regulator adjustment cover screw 'H', adjust internal grub screw to the required pressure. Turn clockwise to increase pressure. Replace cover screw.
12. Replace front cover 'J' and secure with the two wing nuts.

TO EXTINGUISH

The burner may be extinguished and re-established in any of the following ways:

1. By turning the programmer selection to 'OFF' or the thermostat knob 'C' to the 'OFF' position. This shuts 'OFF' the main burner only, leaving the electric clock running but not controlling and the pilot burner alight. Re-light by turning the programmer switch to required programme or thermostat knob 'C' to the required temperature.
2. By turning the gas control knob 'A' to the 'pilot' position. This shuts off the main burner only. Thermostat knob 'C' should be turned to the 'OFF' position as above; electric clock running, but not controlling; pilot burner alight. Re-light by turning gas control knob 'A' to the 'ON' position, re-set thermostat knob 'C' to the required temperature.
3. By turning gas control knob 'A' to the 'OFF' position. This results in complete shut-down of both main and pilot burners. Thermostat knob 'C' should be turned to the 'OFF' position to de-energise the gas control electric operator leaving the electric clock running but not controlling.
Follow the Users' Lighting Instructions to re-light.
No attempt should be made to force knob 'A' back to pilot position until THREE MINUTES has elapsed.
4. By turning the service tap 'R' to the 'OFF' position. This results in complete shut-down of both main and pilot burners. Thermostat knob 'C' should be turned to the 'OFF' position to de-energise the gas control electric operator, leaving the electric clock running but not controlling. Follow Users' Lighting Instructions to re-light.
5. By switching off the electricity supply. This cuts out all electrical controls and the main burners, leaving the pilot burner alight. Re-light by reconnecting to the electricity supply.
Re-set electric clock to correct time.

CONTROL CHECK-OUT

After initial lighting and adjustments have been carried out the following check-out procedure may be used to ensure the correct operation of the controls.

OPERATION OF THE ELECTRIC CLOCK

1. If the control panel incorporates a programmer, set the hot water selector switch to 'Twice'. With the main burner alight move the clock dial in a clockwise direction to an 'OFF' position. This will result in the main burner shutting off.
2. Move the clock dial in a clockwise direction to the next 'ON' position, this should result in the main burner lighting again.

Note.—There could be a slight delay before the burner is extinguished or re-lit depending on the system of installation, e.g. if motorised valves with auxiliary switches are incorporated.

OPERATION OF THERMOSTAT

1. With the main burner alight, turn the thermostat knob to the 'OFF' position. Result: the main burner should shut off.
2. Turn thermostat knob to the original setting. Result: the main burner should re-light.

OPERATION OF FLAME FAILURE DEVICE

With the main burner alight, turn the gas control knob 'A' to the 'OFF' position. After one minute the flame failure device should have closed. (A click from the control valve will indicate its operation.) After the flame failure device has closed it will be possible to re-set knob 'A' back to pilot position.

Re-light the boiler following the sequence of the Users' Lighting Instructions.

MAINTENANCE

Servicing must be carried out by a qualified gas service engineer and where appropriate a qualified electrician.

SERVICING IN GENERAL

GAS CONTROL VALVE

The servicing of this control should only be undertaken by an engineer conversant in every respect with the equipment. Thermocouple union 'L' should be tightened only quarter turn beyond finger tight to give good electrical continuity. Do not tighten further or damage may result.

BOILER FLUEWAYS

Regular cleaning of the boiler flue passages is necessary for efficient operation. Thorough cleaning should take place annually, preferably at the end of the heating season.

To clean Boiler Flueways

1. Remove the outer casing front panel and the outer casing top panel.
2. Switch off electricity supply. Turn service tap 'R' to the 'OFF' position.
3. Remove the two wing nuts securing the combustion chamber front cover 'J' and lift off the cover.
4. Remove the baffle tray from the base of the combustion chamber. This fits over a stud and is secured by a spring clip.
5. Unscrew the wing nut securing the front burner underneath the pilot burner bracket, lift so that the stud clears the bracket and withdraw the burner. Repeat for the rear burner, taking care not to damage the pilot burner.
6. Unscrew the two wing nuts securing the flue cleaning door 'P' and lift off the door. Do not damage the seal.
7. Lift out the flueway baffle. The flue passages can now be cleaned from above and below using a suitable stiff brush. When replacing the baffle, ensure that the word 'TOP' is uppermost and at the rear of the waterway and that the baffle is seated down into the flueway, see diagram 1A, page 4.

Note.—Take care not to damage the injector or pilot burner. A sheet of paper placed horizontally in the combustion chamber will help in collecting the dust.

BURNER

With the burners removed as above, they may be cleaned as follows:

1. Remove the split pin from the bottom corner of the injector end of the burner.
2. The injector end plate is secured to the body by a bayonet type fastening. Turn the end plate in an anticlockwise direction to release, it may then be withdrawn complete with venturi tube.
3. Clean all dust and lint from inside the burner with a vacuum cleaner. Also use the vacuum cleaner to remove any dust, etc., from the outside of the burner top.
4. When replacing the burners, do not over-tighten the wing nuts. These should be finger-tight only.

INJECTORS

While the burners are removed, the injectors can be seen at the R.H. side of the combustion chamber. The injectors can be unscrewed by means of a spanner and replaced as necessary. When replacing, use jointing compound on the thread to ensure gas soundness.

NOTES TO THE SERVICE ENGINEER ON THE REPLACEMENT OF PARTS

Before removing or replacing any parts, make sure that the gas supply is turned off and the electricity supply is switched off.

Heat resistant cable must be used for any replacements.

1. Gas Valve

Make sure the gas tap 'R' is in the 'OFF' position. Disconnect the 1/4 in. dia. pilot supply pipe union and ease out connection. Disconnect thermocouple union 'L'. Remove the electrical connections on the gas valve. Disconnect the union at the service tap 'R'. The gas valve can now be unscrewed from the gas manifold pipe, the manifold pipe **MUST** be supported while this is done. Re-fit the gas tap fitting to the replacement valve. When re-assembling ensure that all joints are re-made gas tight, and that thermocouple union 'L' is not tightened more than one quarter turn beyond finger tight. It will be found necessary to purge the system of air after this operation, and re-light should be done in accordance with the initial light-up procedure detailed on page 14.

Note: For Town Gas models, after disconnecting union 'R', disconnect the union elbow at the outlet side of the valve. Re-fit the short pipe and union fitting to the replacement valve.

2. Injector

For the removal of the injectors, refer to Maintenance Instructions.

3. Burner

Refer to Maintenance Instructions.

4. Pilot Burner

Remove the front cover 'J', combustion chamber baffle and front main burner, as described under "Maintenance - Boiler Flueways". Remove the clip securing the thermocouple and withdraw the thermocouple downwards clear of the pilot burner. Disconnect the 1/4 in. dia. pilot gas supply pipe at the adaptor at the bottom of the pilot burner. Take care that no dust, etc., enters the pipe whilst disconnected. Unscrew the two cheese hd. screws and hex. nuts securing the pilot burner to the bracket (see diagram 26) and remove the pilot burner. Replace in reverse order, making sure that the plain washer is fitted to the cheese hd. screw securing the pilot burner by the half hole.

5. Thermocouple

Remove the thermocouple from the pilot burner as described in (4) above. Unscrew the capillary tube at union 'L' on the gas valve and withdraw from the hole in the L.H. side of the combustion chamber. Re-assemble in reverse manner, taking care not to over-tighten at union 'L'.

6. Control Panel

For removal and replacement of the control panel, refer to item 7 of the Installation details. For details of the wiring for the various control systems refer to diagrams 9 to 24.

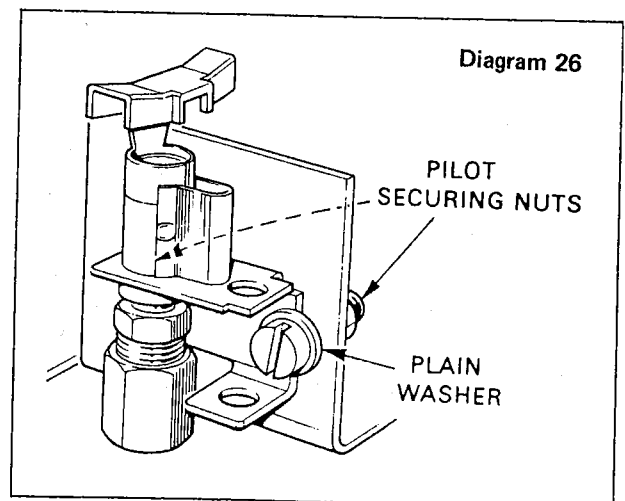
7. Electrical Controls

For access to the components in the control panel, remove the front cover by unscrewing the two Pozidriv pan hd. screws at the rear of the top surface of the cover. The cover can then be disengaged from the two lugs on the lower surface of the control panel and lifted away. Remove the thermostat phial from the phial pocket in the water manifold. Next, unscrew the Pozidriv pan hd. screw at the R.H. end of the chassis. See diagram 6. Move the chassis slightly to the right to disengage the tongue at the L.H. end from the control panel and the chassis can then be removed, carefully withdrawing the thermostat capillary and phial through the hole in the rear of the control panel. The boiler thermostat can now be removed by pulling off the control knob and unscrewing the mounting nut, removing the plain washer and amptags. The transformer is retained by two screws, nuts, plain and shakeproof washers. When replacing these, ensure that the shakeproof washers are placed between the plain washers and the nuts.

Replace the chassis and front cover in reverse order to that described, when replacing the thermostat phial ensure that it is inserted fully into the phial pocket and secured with the retainer. For details of wiring, see diagram 9.

8. Programmer

With the control panel chassis removed as in 7 above, remove the thermostat knob, pull off the six connectors for the cables to the rear of the programmer and unscrew the two Pozidriv screws securing the programmer to the chassis, situated at diagonally opposite corners. Replace in reverse order, for details of cable connections, see diagram 9.

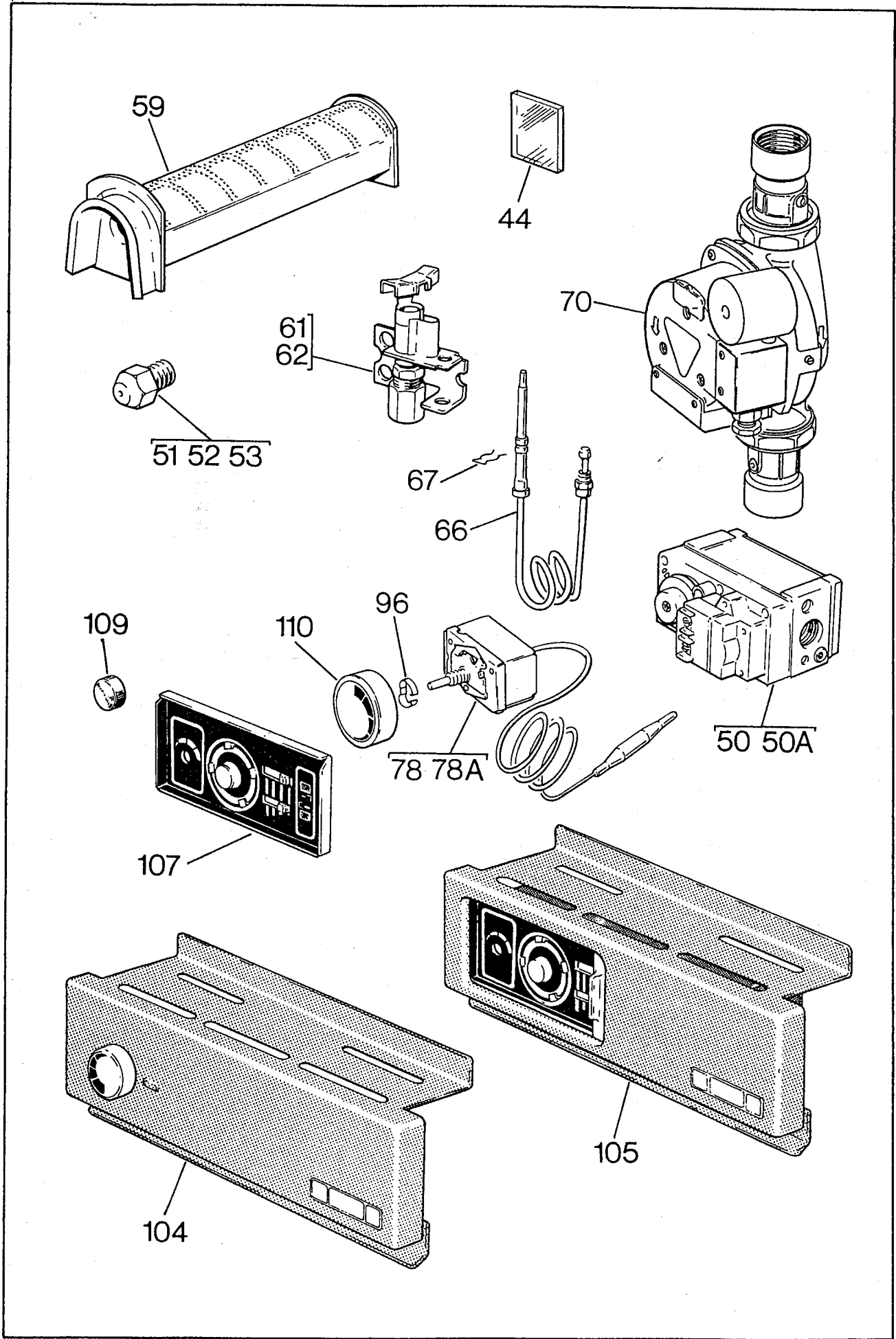


LIST OF REPLACEMENT PARTS

Key No.	G.C. Part No.	Description	Makers Part No.
44	351 661	Sight glass	K5226
50	392 767	½ in. BSP gas valve, Maclaren UK48/RBB 05 45-60 Cat II _{TN} , 65-80 Cat I _N , 85-100 Cat I _N)	K9049
50A	392 612	¾ in. BSP gas valve, Maclaren UK48/RFB03 (65-80 Cat II _{TN} , 85-100 Cat II _{TN})	K6207
51	318 482	Injector, Group 4, Town Gas (45-60)	K4322
51	318 416	Injector, Group 4, Town Gas (65-80)	K4150
51	351 637	Injector, Group 4, Town Gas (85-100)	K4682
52	351 665	Injector, Group 5, Town Gas (45-60)	K6883
52	318 417	Injector, Group 5, Town Gas (65-80)	K4151
52	351 501	Injector, Group 5, Town Gas (85-100)	K5549
53	351 666	Injector, Natural Gas (45-60)	K6556
53	315 738	Injector, Natural Gas (65-80)	K6957
53	318 419	Injector, Natural Gas (85-100)	K4153
59	351 668	Burner complete, Aeromatic 7/51944 (45-60)	K6532
59	351 725	Burner complete, Aeromatic 7/51945 (65-80)	K6790
59	351 702	Burner complete, Aeromatic 7/51946 (85-100)	K6696
61	391 458	Pilot burner, Town Gas, Maclaren 26T0846 TL028	K6517
62	391 459	Pilot burner, Natural Gas, Maclaren 26T0846 TL020	K6518
66	390 894	Thermocouple, Maclaren 2500M-36	K2674
67	390 983	Clip – thermocouple	K3580
70		Pump c/w 1 in. BSP valves, S.M.C. Commodore 2	K6012
78	382 270	Boiler thermostat Ranco G1-11674	K6519
78A	382 389	Boiler thermostat Ranco C26-P0642	FF2128
78	382 271	Boiler thermostat Ranco G1-11675	K7090
78A	382 388	Boiler thermostat Ranco C26-P0641	FF2129
96	396 216	Clip – thermostat control knob	K4158
104	355 117	Control panel – basic (45-60)	M9060
104	355 121	Control panel – basic (65-80)	M9061
104	355 123	Control panel – basic (85-100)	M9062
105	355 118	Control panel with programmer (45-60)	M9064
105	355 122	Control panel with programmer (65-80)	M9065
105	355 124	Control panel with programmer (85-100)	M9066
107	355 043	Programmer	K8800
109	355 051	Control knob – boiler thermostat (programmer panel)	K8796
110	355 044	Control knob – boiler thermostat (basic panel)	M8802

If replacement parts are required, apply to your local supplier.
Please quote the name of the appliance (e.g. 'Glow-worm 45-60') and its serial number which can be found on the data badge positioned on the front face of the flue collector.

Because of our constant endeavour for improvement, details may vary slightly from those quoted in this booklet.





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