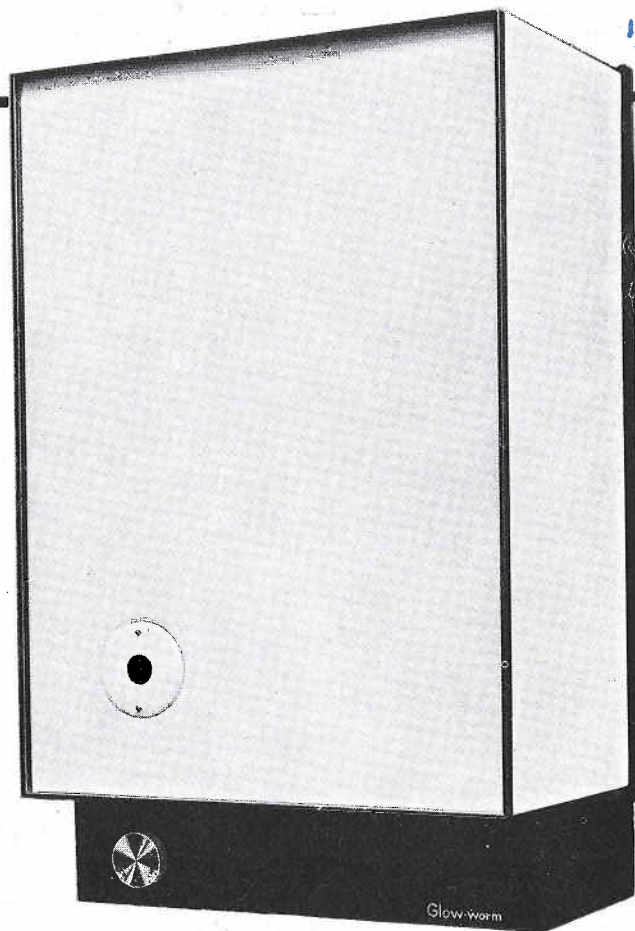


# Glow-worm

## Installation and service instructions

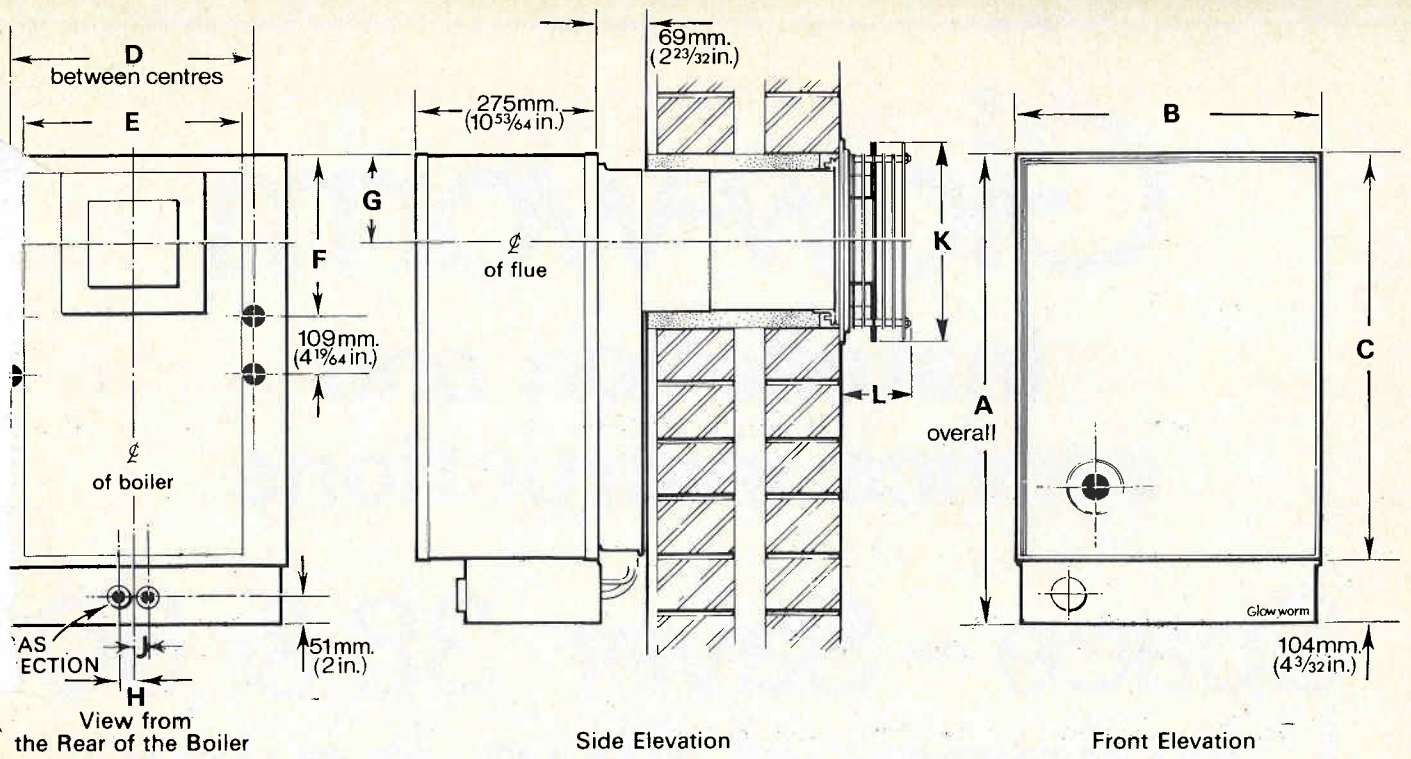
### Space – Saver 38 & 50 balanced flue boiler



1/11/88.  
control box  
M10411

**G.C. Nos. 41-315-31**  
**41-315-27**

SPACE-SAVER 38  
SPACE-SAVER 50



Model		A	B	C	D	E	F	G	H	J	K (area)	L
38	m.m.	704	380	600	286	249	222	115		10	282 sq.	111
	inch	27 <sup>2</sup> / <sub>32</sub>	14 <sup>3</sup> / <sub>32</sub>	23 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	9 <sup>5</sup> / <sub>16</sub>	8 <sup>4</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>32</sub>		2 <sup>5</sup> / <sub>16</sub>	11 sq.	4 <sup>1</sup> / <sub>4</sub>
50	m.m.	732	460	628	367	330	250	133	25		305 sq.	104
	inch	28 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>8</sub>	24 <sup>2</sup> / <sub>32</sub>	14 <sup>7</sup> / <sub>16</sub>	13	9 <sup>2</sup> / <sub>32</sub>	5 <sup>1</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>16</sub>		12 sq.	4

**Space-Saver 38**

Nominal heat input: 41,000/52,000 Btu/h (43.3/54.9 MJ/h)  
 heat output: 30,000/38,000 Btu/h (31.6/40.1 MJ/h)

Gas Group	Injector Dia.		Setting Pressure			
			30,000 Btu/h (31.6 MJ/h)		38,000 Btu/h (40.1 MJ/h)	
	Inches	m.m.	in w.g.	m/bar	in w.g.	m/bar
T4	0.224	5.7	1.20	3.00	1.9	4.8
T5	0.234	5.95	1.20	3.00	1.9	4.8
N.G.	0.118	3.0	3.8	9.4	6.3	15.7

**Space-Saver 50**

Nominal heat input: 54,000/67,000 Btu/h (57.0/70.7 MJ/h)  
 heat output: 40,000/50,000 Btu/h (42.2/52.7 MJ/h)

Gas Group	Injector Dia.		Setting Pressure			
			40,000 Btu/h (42.2 MJ/h)		50,000 Btu/h (52.7 MJ/h)	
	Inches	m.m.	in w.g.	m/bar	in w.g.	m/bar
T4	0.257	6.53	1.35	3.42	2.0	5.0
T5	0.272	6.91	1.30	3.2	1.90	4.7
N.G.	0.130	3.3	4.9	12.2	7.6	18.9

**APPROXIMATE WATER CONTENT**

Space-Saver 38 – 0.52 gallons (2.36 litres).  
 Space-Saver 50 – 0.62 gallons (2.81 litres).

**APPROXIMATE TOTAL WEIGHTS**

Space-Saver 38 – 59.5 kg (131 lbs).  
 Space-Saver 50 – 81.0 kg (178 lbs).

**This boiler should only be connected to a cistern water supply, with a maximum head not exceeding one-hundred feet and have an open vent in the system.**

**THE INSTALLATION OF THE HEATING SYSTEM SHOULD BE IN ACCORDANCE WITH BRITISH STANDARDS CODE OF PRACTICE CP.332 PART 2, CP.3006 CP.341:303 AND WHERE APPLICABLE CP.337. ALSO GAS COUNCIL PUBLICATION "VENTILATION REQUIREMENTS OF GAS APPLIANCES 1970".**

All external electrical components shall be of the approved type, and shall be wired in accordance with the I.E.E. Regulations in force at the time.

Pressure drop across heat exchanger for a 20°F water temperature differential at nominal rating is 2 in. w.g. (S-S38), 3 in. w.g. (S-S50).

Electrical connections 240 V.; 3A., 50 Hz.

**FLUE CONNECTION, TERMINAL SITING AND VENTILATION REQUIRED**

Balanced flue terminals should not be fitted in any position which would allow combustion products to feed back into adjacent doors or windows. In addition the following positions should be avoided:

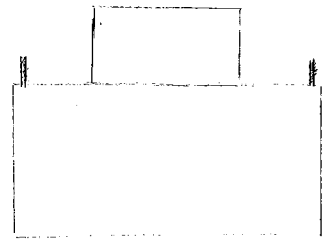
- a. Immediately beneath eaves or a balcony.
- b. At a re-entrant position on the face of the building.
- c. Adjacent to any projection on the face of the building.
- d. Where the outlet is wholly or partly beneath any opening (that is to say, any part of a window capable of being opened or any ventilator, inlet to a ventilation system or similar opening), no part of the outlet is within one foot, measured vertically, of the bottom of the opening.

Where the outlet of the appliance is less than six feet above the level of any ground, balcony, flat roof or place to which any person has access and which adjoins the wall in which the outlet is situated, the outlet should be protected by a guard of durable material.

Where the boiler is installed in a specially built or modified compartment the following requirements must be met.

- a. Have an half hour fire resistance from internal fire, and the inside lining or finishing should be noncombustible or 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 heater and compartments. It should not be made larger than necessary in order to avoid the use of the compartment for a storage cupboard. Recommendations regarding minimum requirements should always be observed. (See dia 1.).
- d. Be fitted with a door of sufficient size to permit the heater to be withdrawn from the compartment.
- e. Be fitted with permanent openings for air for compartment ventilation as shown in the table below.

4 wing nuts hold casing in place - one in each corner



Position of Opening	Air from Room	Air direct from outside
High level	9 cm <sup>2</sup> per kw input (137 cm <sup>2</sup> )	4.5 cm <sup>2</sup> per kw input (69.39 cm <sup>2</sup> )
Low level	9 cm <sup>2</sup> per kw input (137 cm <sup>2</sup> )	4.5 cm <sup>2</sup> per kw input 69.

**NOTE:**

Range rated or modulating appliances and also combined central heating/water heating appliances must be assessed at the upper limit of their rating.

# INSTALLATION

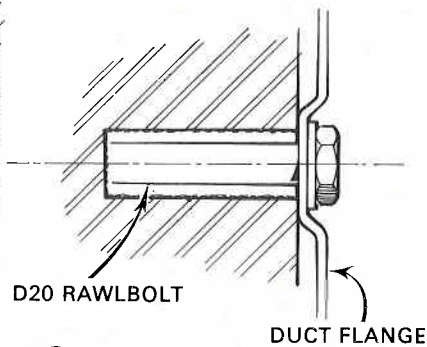
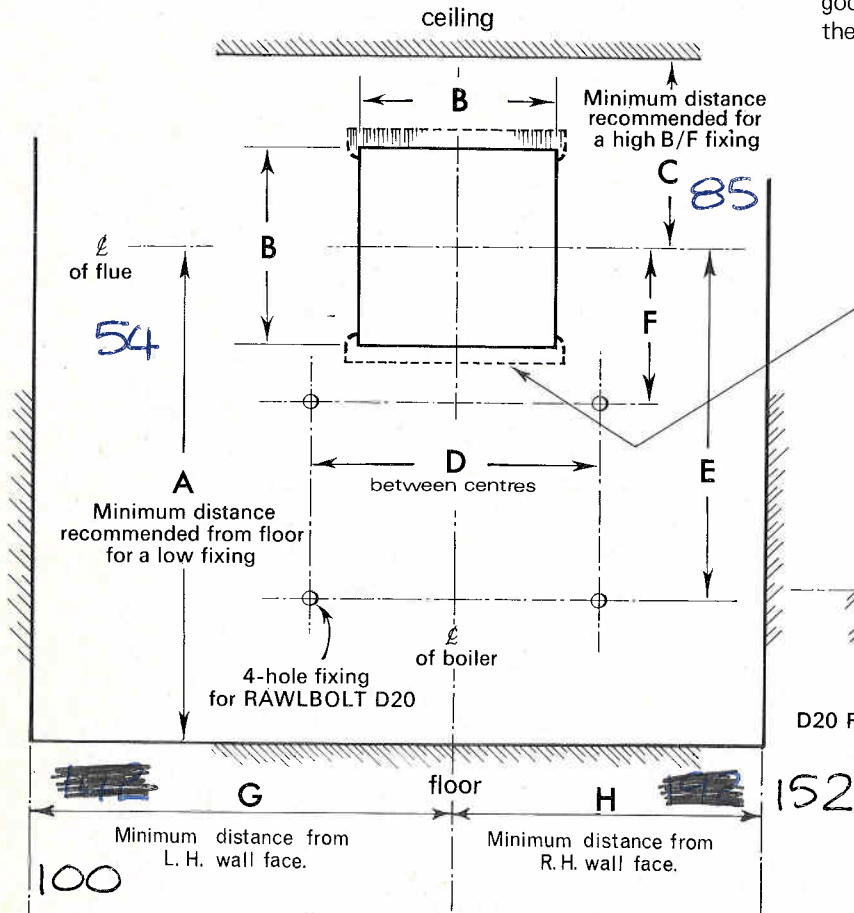
The following procedure should be adopted:

1. Check that the balanced flue duct supplied is suitable for the wall thickness through which it has to pass, see diagram 1. Standard supplied suits 10<sup>1</sup>/<sub>4</sub>" - 13" wall thickness. Shorter terminal sleeve, 5<sup>1</sup>/<sub>2</sub>" - 8<sup>1</sup>/<sub>2</sub>", is available on request. *The site selected must allow a minimum of 4" (100 m.m.) on the left hand side, and 6" (152 m.m.) on the right hand side, clearance for servicing at each side of the boiler casing.*
2. Mark out and cut a hole through the wall where the boiler is to be installed, to the dimensions shown in the diagram.

3. Mark out the four holes for the bolts securing the primary air duct to the wall. See diagram 1. Drill the holes for the D.20 Rawlbolts provided with a 1<sup>1</sup>/<sub>32</sub> inch diameter drill, the maximum diameter of the holes must not exceed 5/8 inch.
4. Remove the boiler from its carton and place it face down on the floor. Remove the two packing support angles from the unit. Unscrew the primary air duct from the boiler. Place the primary air duct in position, the balanced flue duct protruding into the prepared hole in the wall. Secure the duct to the wall with the D.20 Rawlbolts provided. Make sure the duct is firm and secure. Make a good cement seal around the flue duct inside the hole in the wall. Diag. 1.

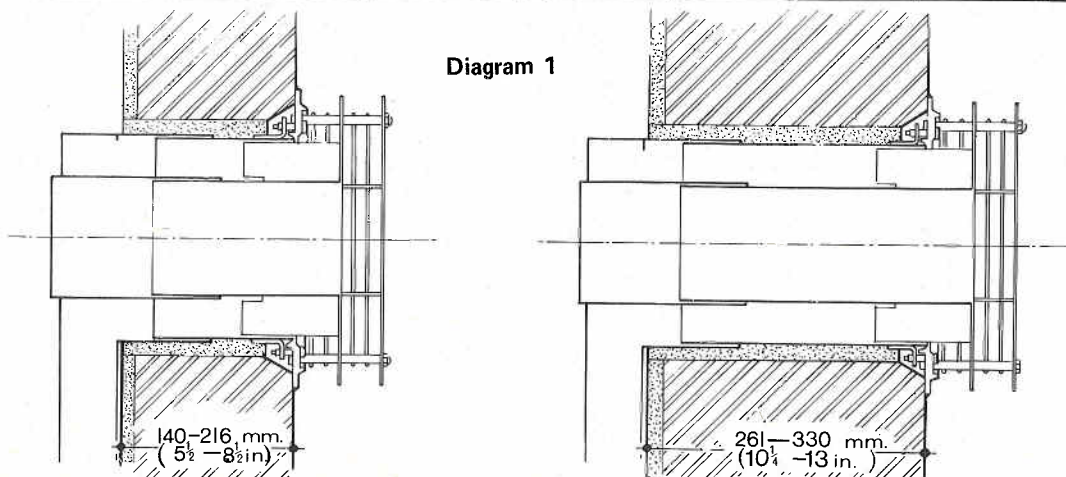
**Note:**

On outside brickwork face, clear edge of hole on top and bottom faces for the brackets on the wall sleeve and the bosses on the terminal plate etc.



Model		A	B	C	D	E	F	G	H
38	m.m.	633	212	182	223	365	156	292	342
	inch	24 <sup>5</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>32</sub>	7 <sup>3</sup> / <sub>8</sub>	8 <sup>25</sup> / <sub>32</sub>	14 <sup>3</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>32</sub>	11 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>2</sub>
50	m.m.	643	233	200	304	375	166	332	382
	inch	25 <sup>5</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>8</sub>	12	14 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>

Diagram 1



Next, complete the balanced flue installation, see diagram 2. Place the outer wall sleeve 'A' into the prepared hole from the outside, so that it fits inside the sleeve already cemented in. It should be pushed in, until the outside end of the sleeve is flush with the outside wall. **It is important to see that the brackets fastened to this wall sleeve are on the top and bottom surfaces.** Cement in position. Make good the seal between the wall sleeve 'A' and the primary air duct, using the compound provided. Clear cement from the front of the four brackets, so that the terminal frame 'B' complete with its tie bolts can be bolted into position. When the cement is sufficiently firm bolt the terminal frame in position up to the wall and cement around the edges. To allow the terminal frame to fit flush to the wall it will be necessary to relieve the top and bottom edges of the brickwork opening to clear the four small bosses on the back of the terminal frame also the four brackets on the top and bottom of the wall sleeve 'A'. Diagram 1.

**NOTE:** The frame is marked for 'TOP & BOTTOM'.

Thread four tubular spacers 'C' onto the tie bolts, also position one of the wire guard frames 'D' over the spacers and up to the terminal plate. **Thread the inner baffle and sleeve 'E' on to the tie bolts, making sure that the face marked TOP is uppermost, see diagram 2.** Push into the flue until the plate comes against the guard 'D'. Make good the seal between the inner wall sleeve and the inner baffle sleeve 'E' with the compound provided. Thread four more tubular spacers 'C' onto the tie bolts and over the spacers pass the other guard 'D'. Finally fit the terminal plate 'F' and secure the whole assembly with the 1/4 inch BSW washers and chrome plated dome nuts. If further guarding is required by local authorities a wire grille can be supplied. This is recommended, particularly if the terminal is at low level (i.e. less than 1.8 metres (6 ft) from the ground). The guard is available from Quinnel, Barrett & Quinnell Ltd., 884 Old Kent Road, London S.E.15, quoting reference Type M.

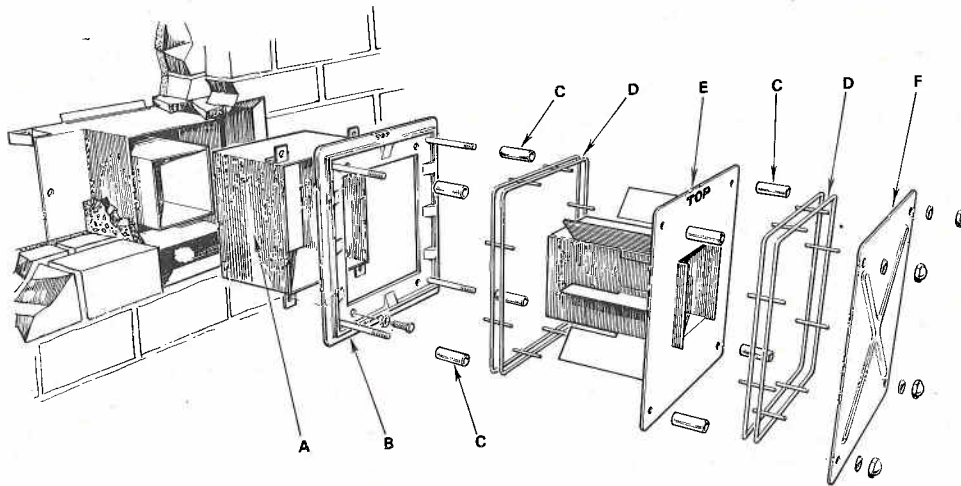
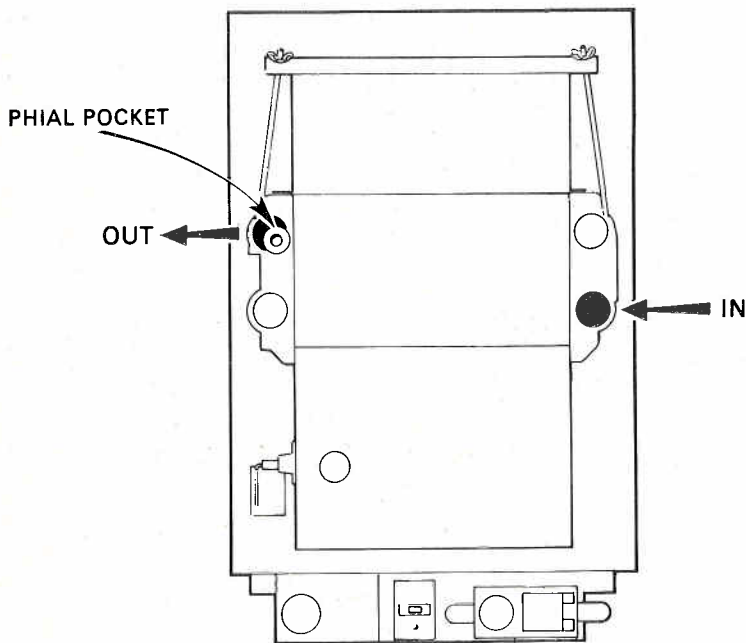


Diagram 2

## INSTALLATION OF BOILER

### PIPE LAYOUT



View from the Front

Diagram 3

### Pumped heating and hot water.

Where single flow and return is taken from the boiler.

Flow and return connections may be reversed if necessary, in which case the thermostat phial pocket must be re-sited to be at the flow side of the boiler. Fit the thermostat bulb and lock up.

**Make sure that there is clearance between the thermostat capillary and the ignition electrode and between the capillary and the front of the boiler.**

### Gravity domestic hot water.

It is important that the scheme illustrated is adopted when the gravity domestic hot water connections are being prepared. The domestic return pipe must be on the same side as the domestic flow. It must be fitted with two 1 inch M/F elbows, as illustrated, diagram 4. The heating flow and return pipes are taken from the other side of the boiler.

The thermostat phial pocket must be fitted in the heating flow side of the boiler.

The domestic flow and return pipes must be 28 mm diameter and must rise immediately on leaving the boiler.

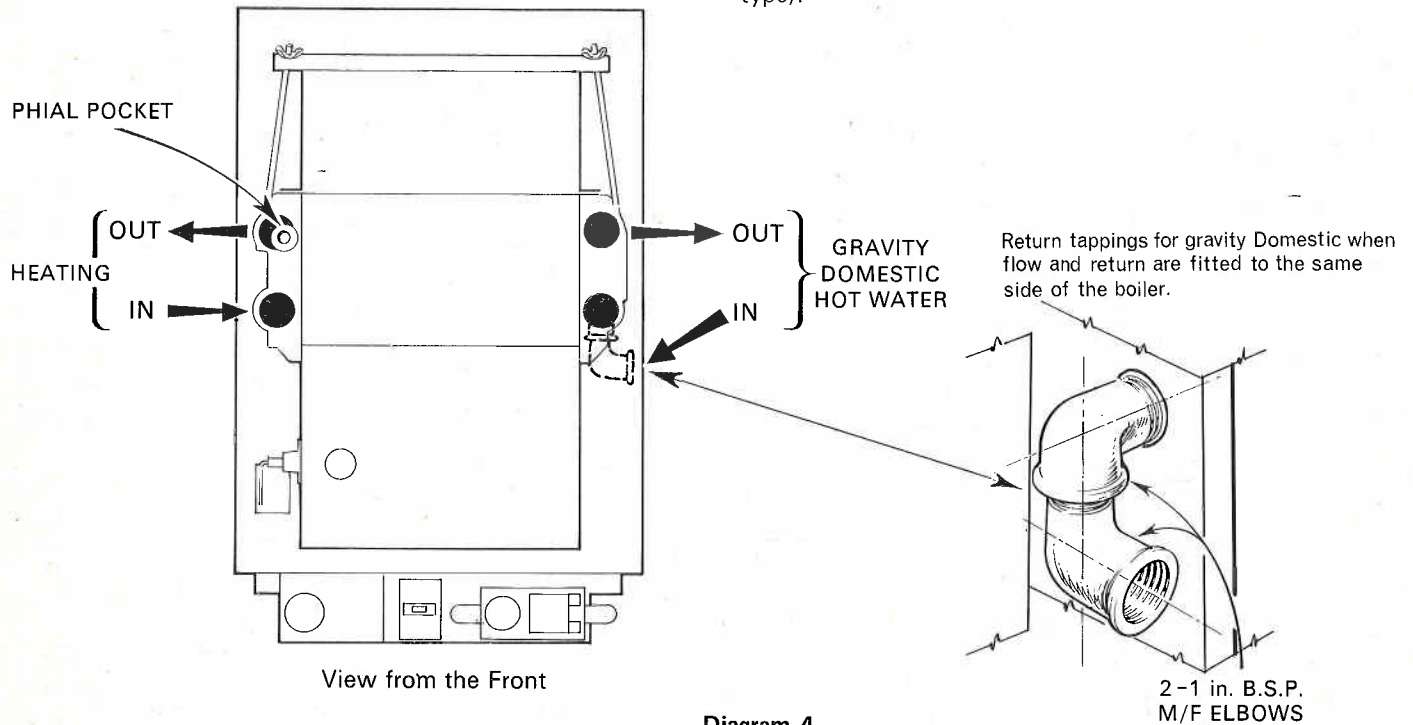
If the boiler is fitted at high level, the following considerations should be observed to obtain maximum circulating head in the domestic system.

1. Maximum vertical height between boiler and cylinder, e.g. can the cylinder be lifted from floor level?
2. The horizontal run should be made above ceiling level.
3. There should be maximum inclination on the horizontal pipe runs.
4. If the cylinder has not been lifted above floor level, long horizontal pipe runs will reduce circulation and under these conditions the inclined horizontal pipes should not exceed 8 ft. in length.

Where the boiler is fitted at low level with the cylinder on the first floor, a greater circulating head will be available and the horizontal runs can, therefore, be increased.

If the above conditions cannot be accommodated, it is suggested that pumped primaries be employed.

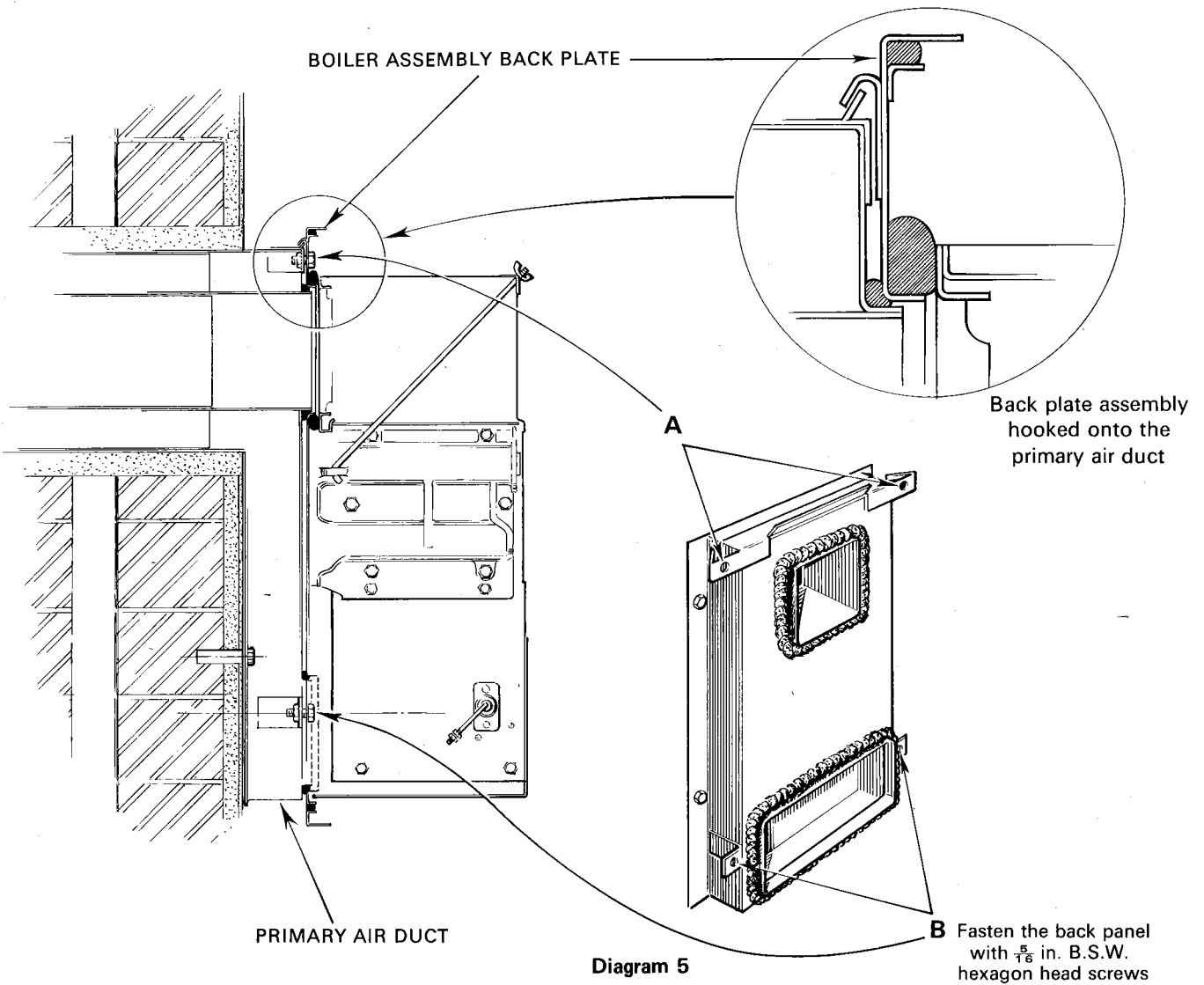
For all systems the cylinder should be indirect (not self priming type).



If scheme 7 is to be used for control use a bypass of 22 mm diameter copper, complete with valve as shown in diagram 15.

Screw the 1 inch BSP elbows into the water connection tappings at the rear of the boiler through the holes in the back panel, ensure that good sound connections are made.

Lift the boiler and position so that the turnover at the top of the back panel engages on the lip on the top surface of the primary air duct, see diagram 5. Fasten the back panel to the brackets on the primary air duct by means of the four  $\frac{5}{16}$  inch BSW screws and nuts provided at positions 'A' and 'B', diagram 5.



The water connections may now be made to the elbows fitted previously, and the gas connection to the  $\frac{1}{2}$  inch BSP union gas cock at the bottom of the boiler, in the centre.

Where a safety valve is fitted it should be adjacent to the boiler on either the flow or return pipe and carefully cleaned once a year. It should not be possible to isolate the safety valve from the boiler by means of any intermediate cock.

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

Remove the front protection plate by easing the top edge forward, then lifting slightly, the plate can then be withdrawn. Remove the burner from its separate pack. Place the burner in position in the combustion chamber by first passing the left hand end of the burner into the chamber, passing it behind the pilot and bracket and locate the pin into its location hole. The right hand end locates onto the flange on the right hand side plate. Check that the electrode is correctly positioned. See diagram 6. Refit front protection plate.

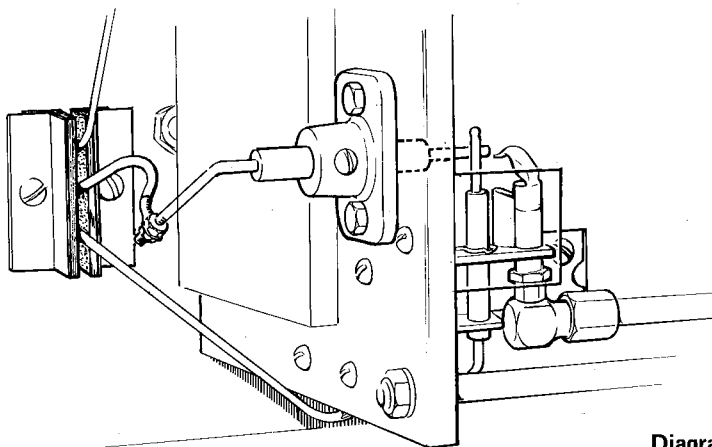
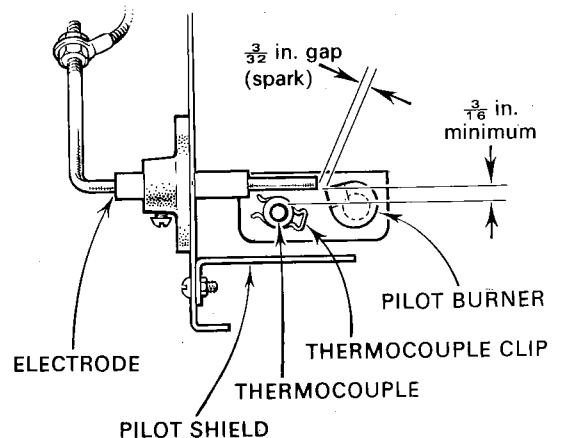


Diagram 6



## CONTROLS

*The service gas cock* 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 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.

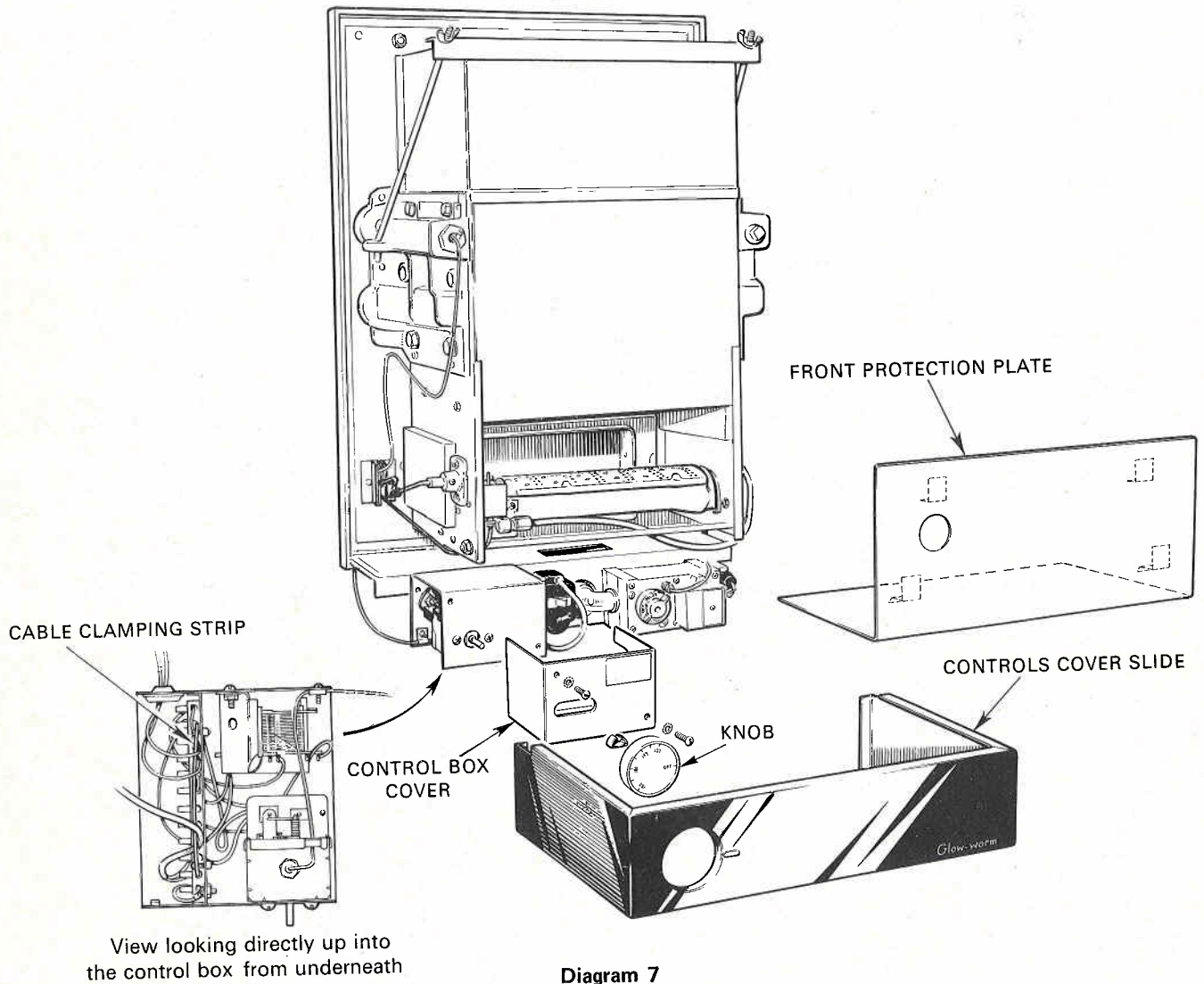
*The gas pressure governor* regulates the gas supply pressure to the burner, ensuring constant rated output. Also provided on the gas control is a regulating screw to control the pilot flame size.

## WIRING INSTRUCTIONS FOR CONTROL BOX M.5222

The mains supply required is 200/240 v., 50 Hz, fused at 3 amp. A switched fused supply point is suggested. This switch must be of the double pole type, or when a cable and plug is used, it must be switched by a double pole socket or isolated by removal from a non-switched socket.

**IT IS IMPORTANT THAT ALL CONTROLS, INCLUDING THE CIRCULATING PUMP, MUST BE WIRED INTO THE CONTROL BOX TERMINAL STRIP.**

Under certain conditions (i.e. all pumped primaries), the circulating pump is controlled by the change-over thermostat in the control box. The purpose of this is to dissipate residual heat in the boiler. The function of the change-over thermostat would be prevented if any controls were included in the main supply or pump connections, or if the pump should be supplied from an external source.



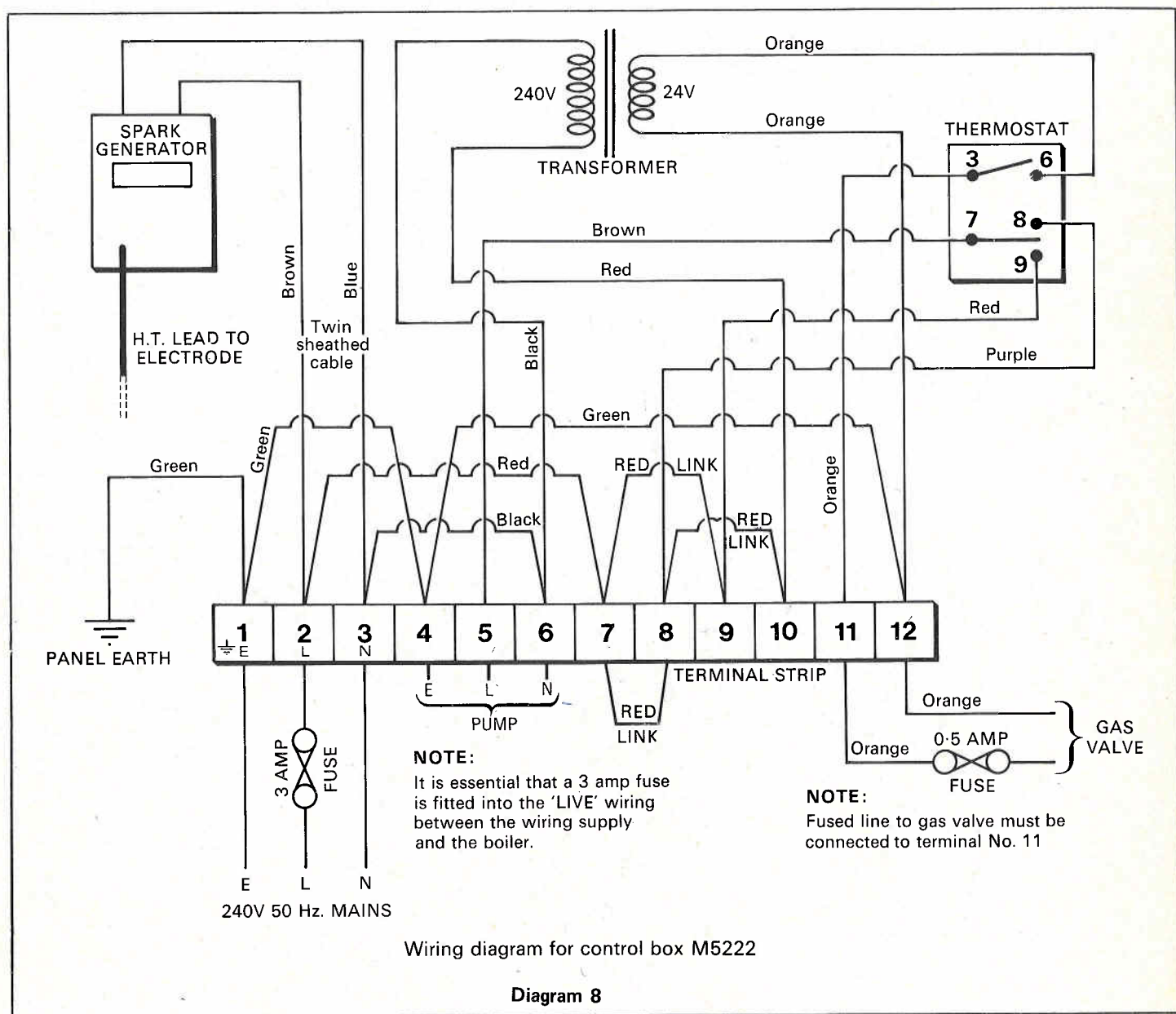
1. Remove the thermostat control knob by pulling from its spindle. (See dia 7).
2. Remove the two 4 B.A. rd. hd. screws and shakeproof washers from the cover. This releases the control box cover and the cover may now be removed.
3. Remove the control box from the back plate by unscrewing the two 2 BA slotted hex. hd. screws and hex. nuts. Withdraw for a short distance, taking care not to put a strain on the thermostat capillary or wiring.
4. Bring the mains cable to the control box through one of the clearance holes in the back plate and into the control box through the appropriate grommet. Slacken off the screws securing the cable clamp and pass the mains cable under the clamp strip and connect neutral to terminal number 3, line to terminal number 2 and earth to terminal number 1. See diagram 8.

**Note:** The outer insulation sheathing on the mains and pump leads should be stripped back for sufficient length to enable the individually insulated conductors to be clamped under the clamp strip.

5. After completing all wiring, (see diagrams 8, 9, 10 or 11), re-tighten the cable clamp strip, making sure that there is no tension on the wires at the terminal strip.

**Under no circumstances should a fuse of greater value than 0.50 amp (BSS. 2950) be fitted in the line from the control box to the gas valve. Up-rating of this fuse could cause damage to the transformer.**

6. Replace the control box on to the back plate, using the 2 BA slotted hex. hd. screws and hex. nuts. Replace the control box cover by securing it with the two 4 BA screws and washers. Then replace the thermostat knob. Make sure the mains cable to the spark generator passes through the 'U' shaped cut out in the cover.



**SCHEME 1** (Diagram 8)

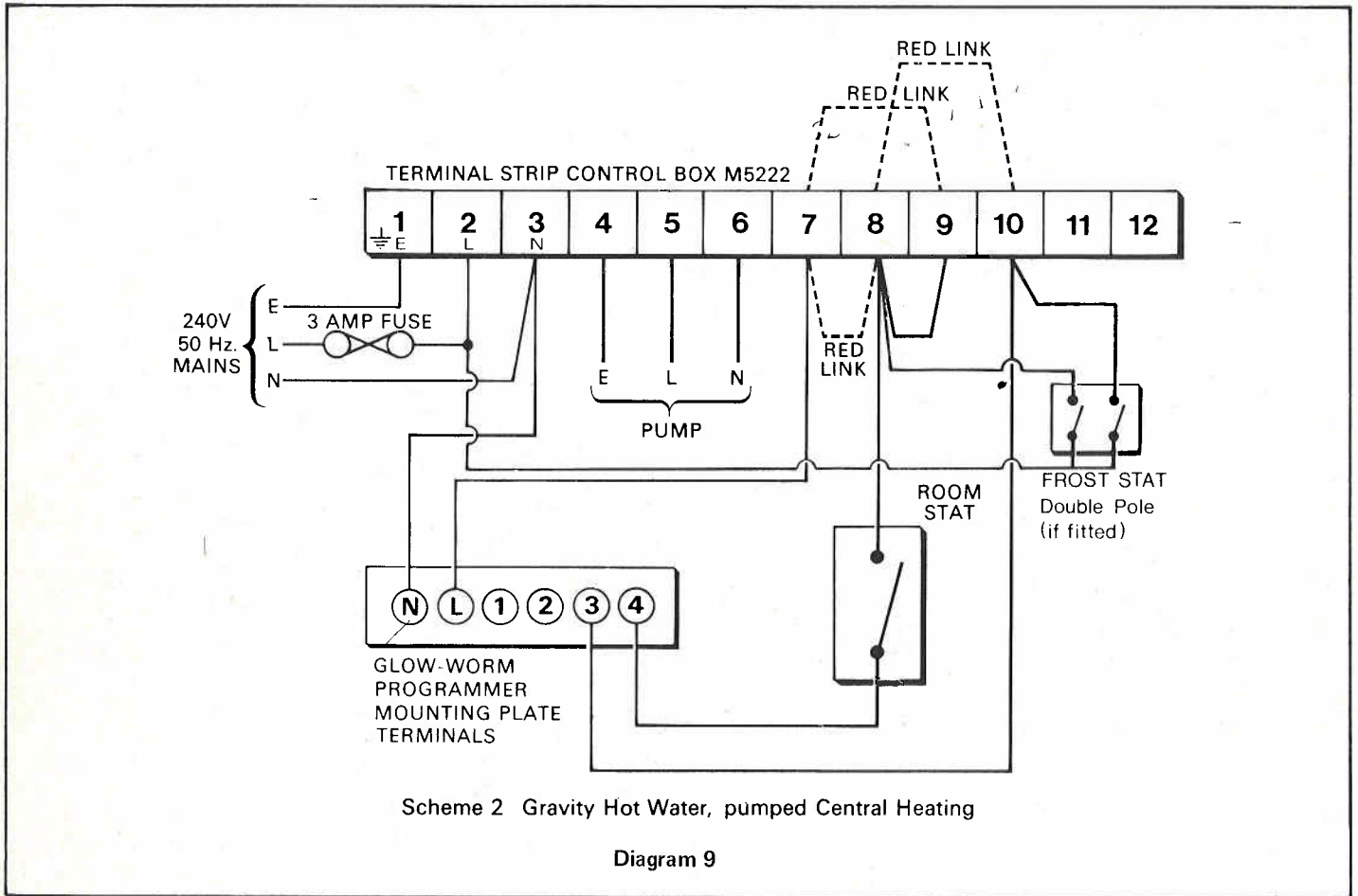
*Gravity circulation domestics without time switch, room thermostat, etc.*

Connect mains cable as described under paragraph (5). Connect the pump, earth to terminal number 4, line to terminal number 5, neutral to terminal number 6. It is suggested a switch is fitted in the line from terminal number 5 to the pump, to enable the pump to be switched off when heating is not required.

**SCHEME 2** (Diagram 9)

*A pumped central heating circuit with gravity hot water circulation, but fitted with external controls.*

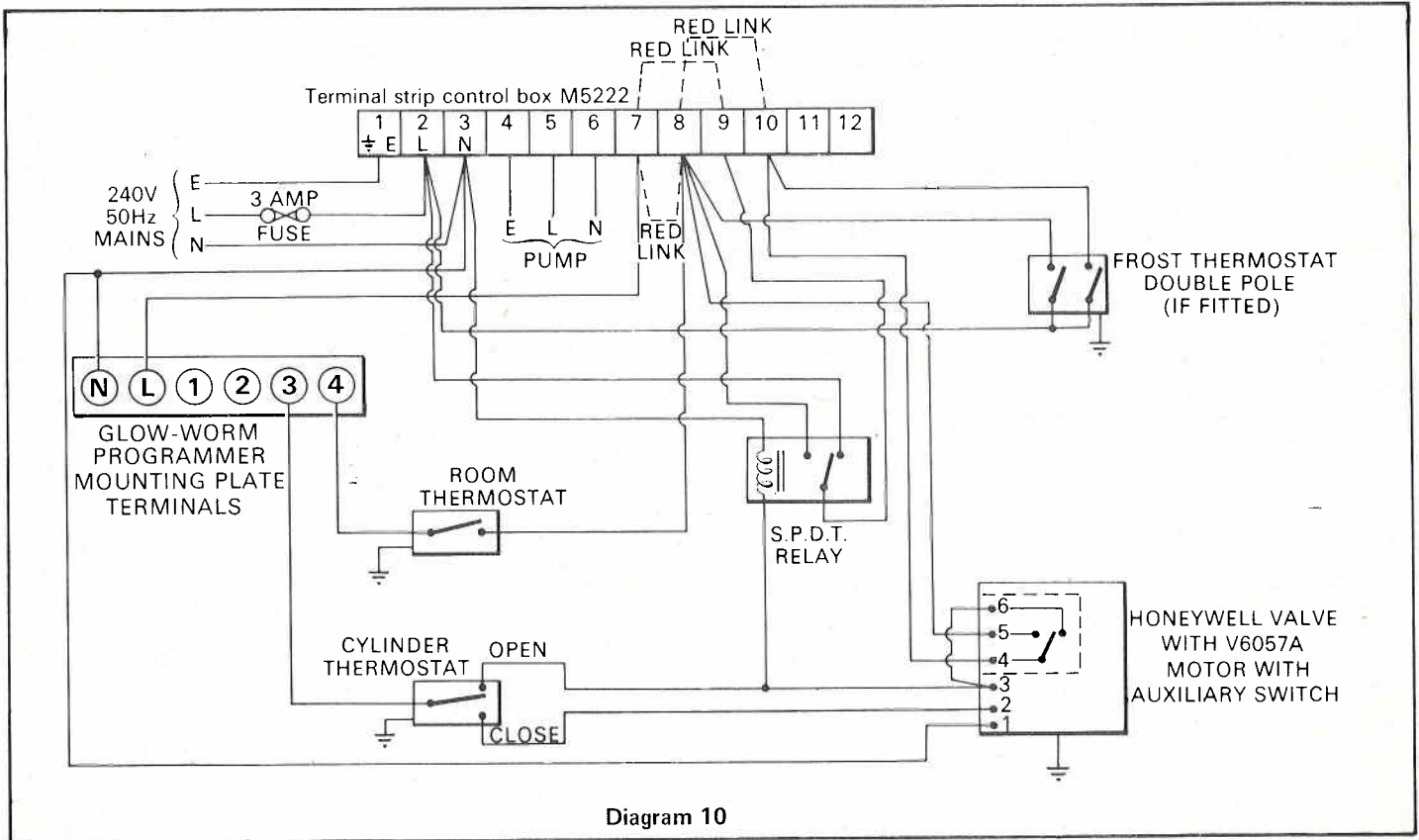
Remove the red links between terminals number 7 and 9, between terminals number 7 and 8 and between terminals number 8 and 10. Replace one link between terminals number 8 and 9. Wire external controls and mains as shown in diagram 9.



**SCHEME 3** (Diagram 10)

*A pumped central heating circuit with gravity hot water circulation, hot water temperature controlled by cylinder thermostat and Honeywell valve.*

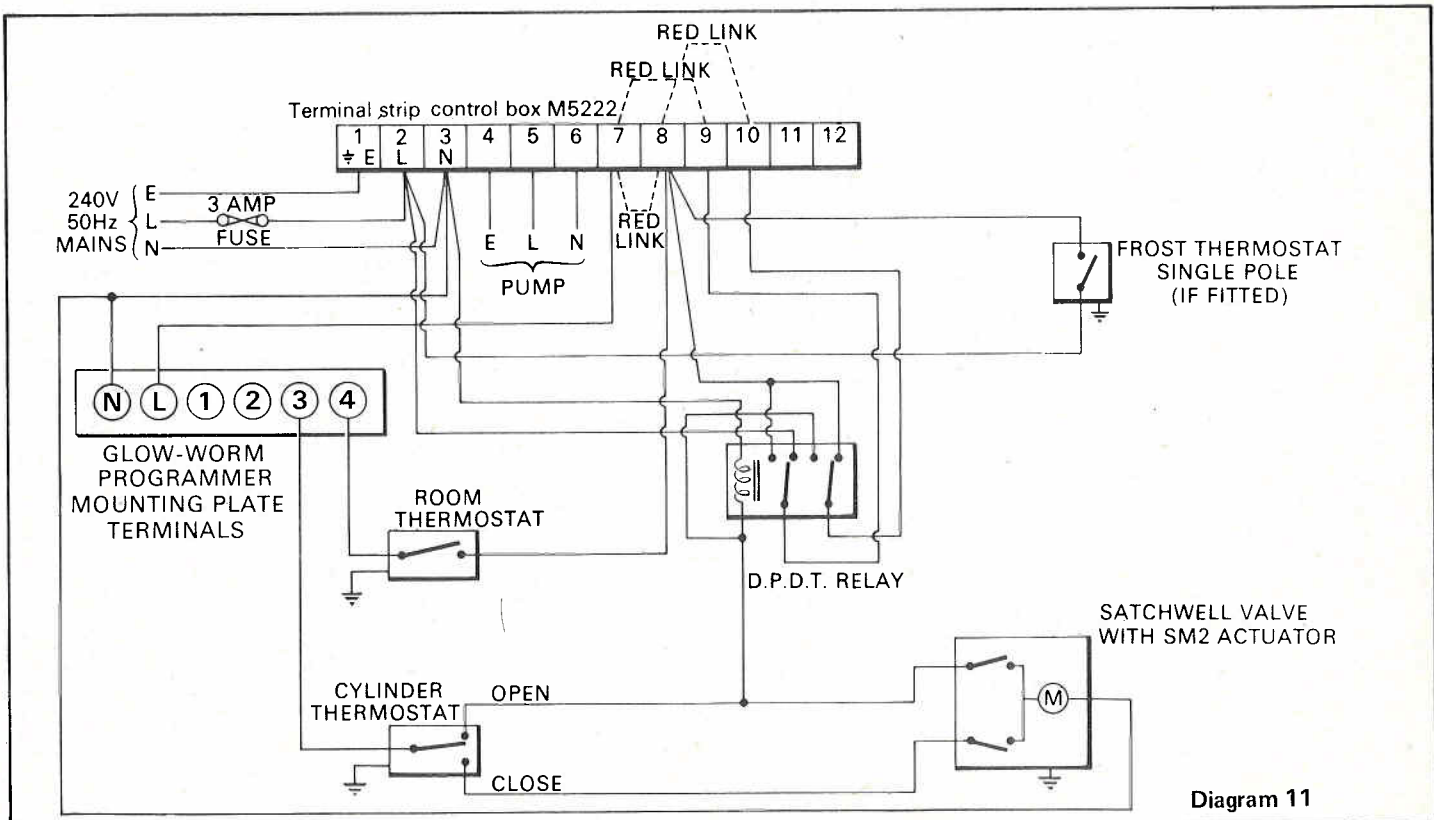
Remove red links between terminals number 7 and 9, 7 and 8 and 8 and 10. Wire external controls and mains as shown in diagram 10.



**SCHEME 4** (Diagram 11)

*A pumped central heating circuit with gravity hot water circulation, hot water temperature controlled by cylinder thermostat and Satchwell valve.*

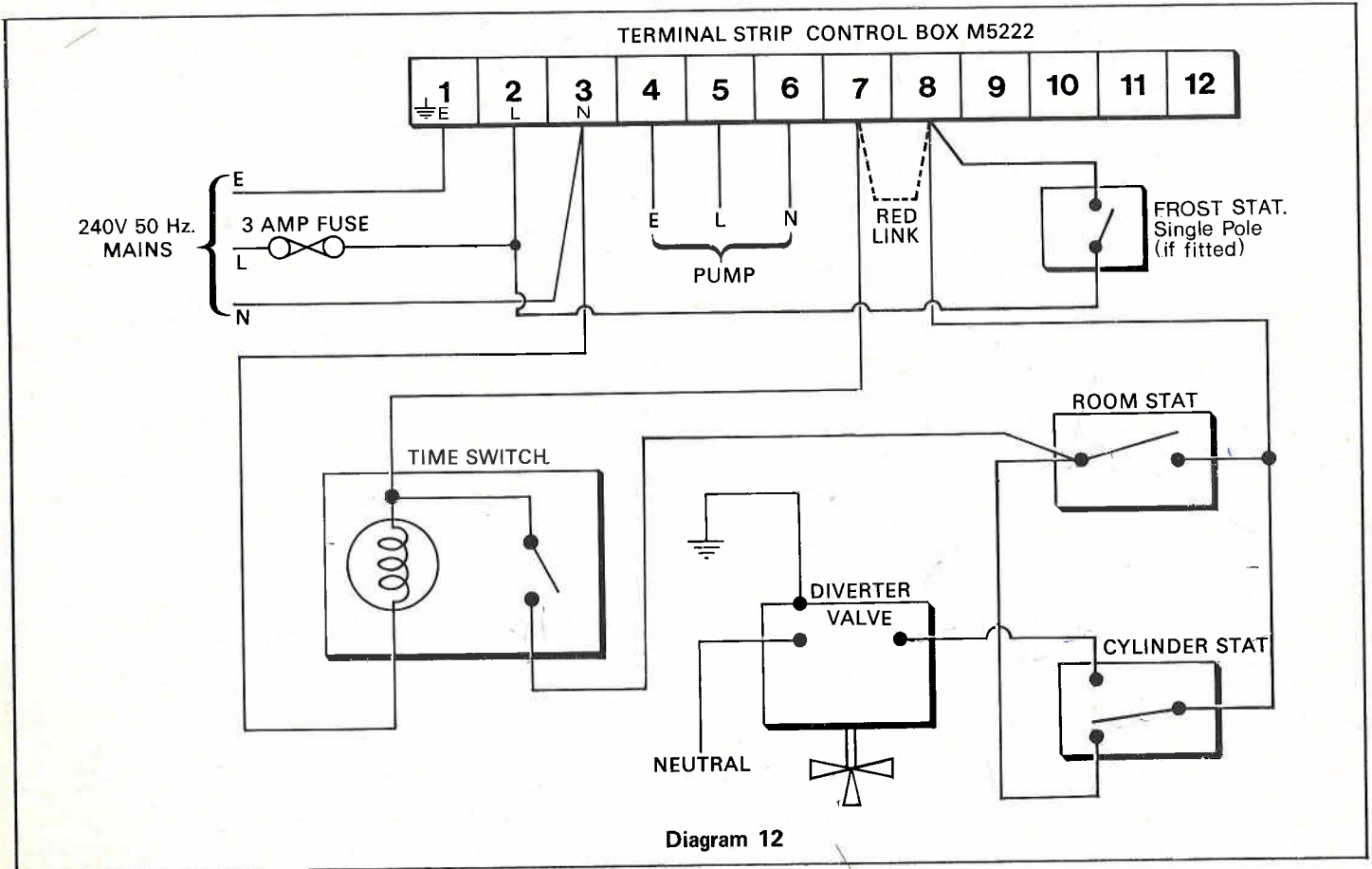
Remove red links between terminals number 7 and 9, 7 and 8 and 8 and 10. Wire external controls and mains as shown in diagram 11.



**SCHEME 5** (Diagram 12)

*Guaranteed warmth. Pumped heating and hot water with diverter valve.*

Remove the red link between terminals number 7 and 8 only. Connect external controls and mains as shown in diagram 12.

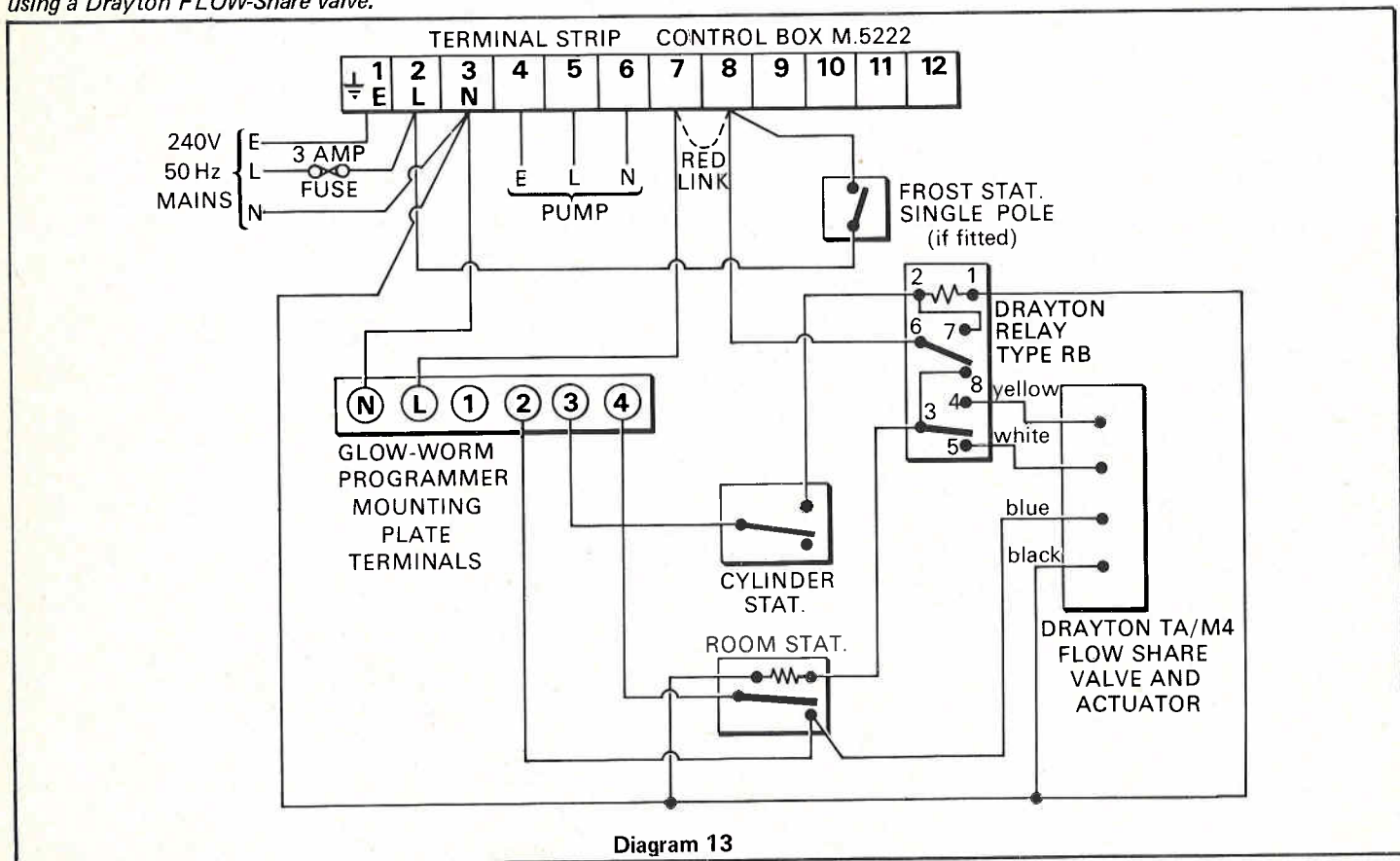


**Diagram 12**

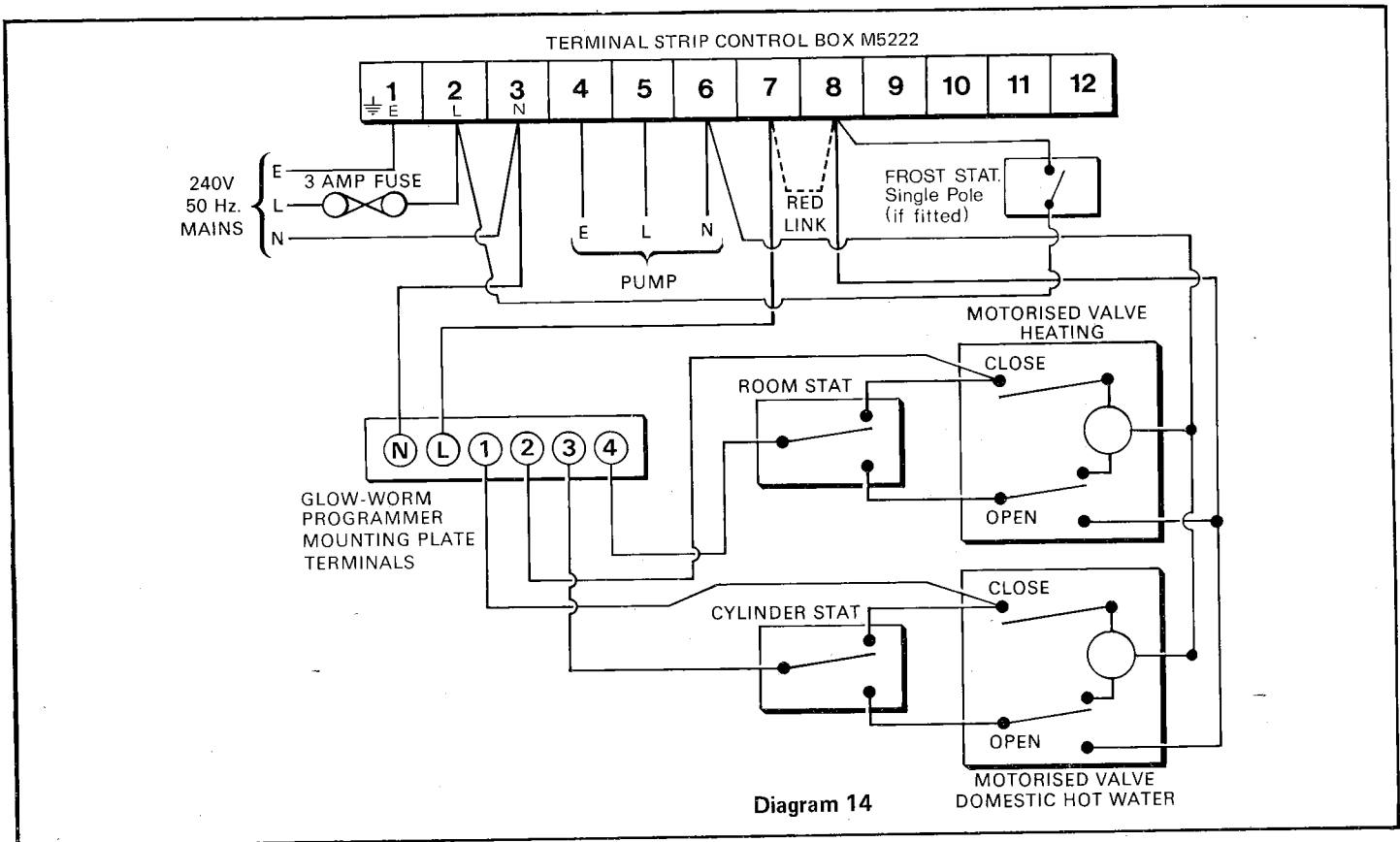
**SCHEME 6** (Diagram 13)

*Domestic hot water and central heating, both pumped, using a Drayton FLOW-Share valve.*

Remove the red link between terminals number 7 and 8 only. Wire the external controls and mains as shown.



**Diagram 13**



**SCHEME 7** (Diagram 14)

*Independent control of domestic hot water and central heating, both pumped, using two motorised valves.*

Honeywell Zone valve with V.6057A motor with auxiliary switch, or Satchwell Minival with a SM5 actuator, must be used for this scheme.

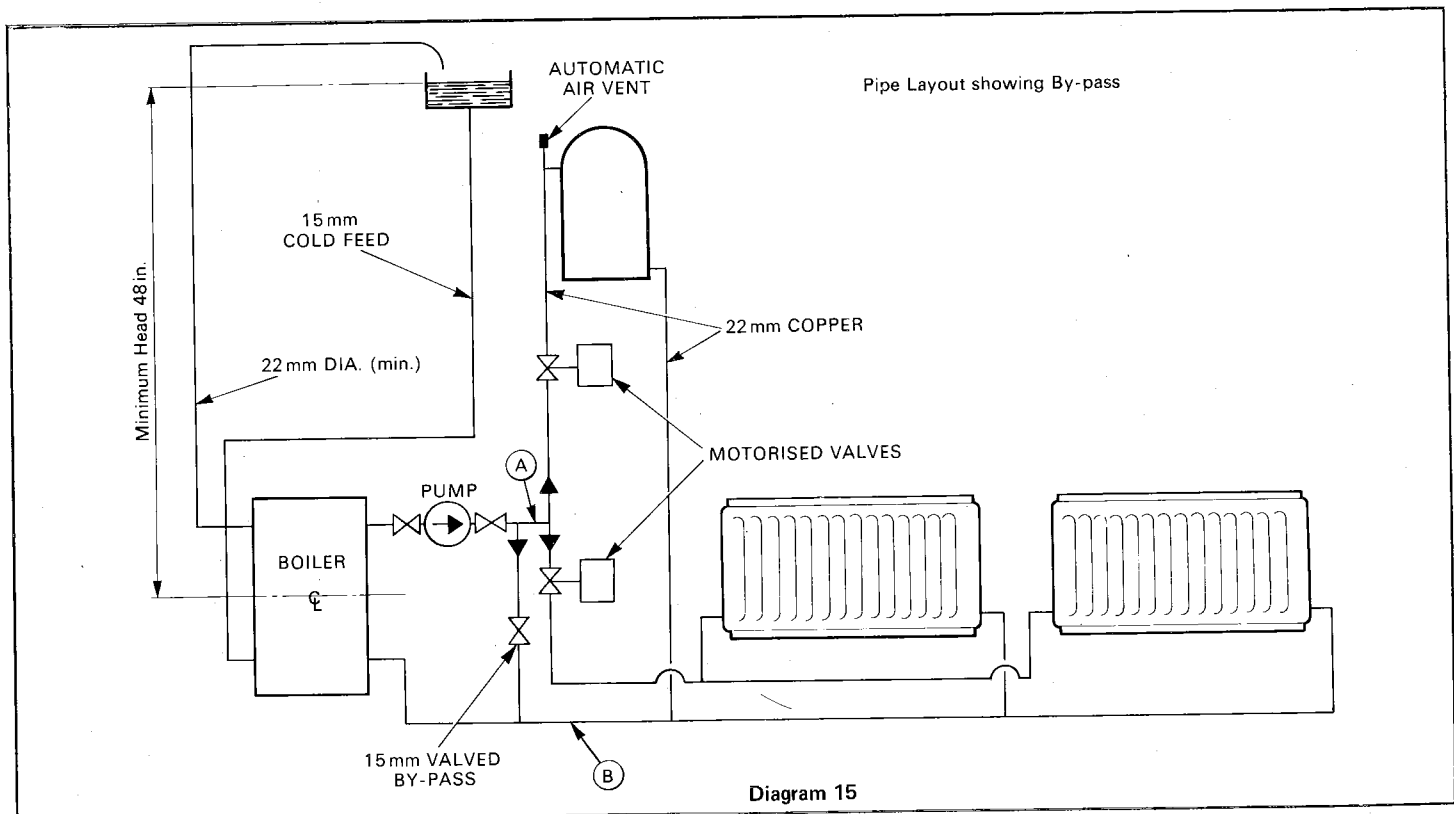
Remove the red link between terminals number 7 and 8 only. Wire the external controls and mains as shown in diagram 14.

To ensure that the central heating motorised valve closes at the end of the central heating period the programmer or time switch should have change-over contacts, as shown in diagram 14.

The Glow-worm Programmer has this change-over facility. It is also important that a 15 mm diameter valved bypass be fitted into the pipe work, as shown in diagram 15, and that the pipe work to the cylinder should not be less than 22 mm diameter copper.

To adjust the bypass, the valve should be initially set to fully open and then progressively closed to produce the correct design temperature differential between the flow and return pipes at points A and B. The temperature differential is reduced as the valve is closed. The valve should never be fully closed.

This bypass setting is done with both motorised valves open, and the whole system up to temperature.



**THE BOILER OUTER CASING SHOULD NOW BE FITTED. PASS THE CASING OVER THE BOILER BODY SO THAT THE REAR EDGES MAKE AN AIR TIGHT SEAL IN THE SEALING GROOVE ON THE BACK PLATE. SECURE FIRMLY WITH THE FOUR 1/4 INCH BSW WING NUTS AND WASHERS PROVIDED.**

Fit the control cover slide over the control box under the front outer casing. The top return flange must engage in the channel provided at the rear. Push the panel back as far as it will go, engaging the front edge with the bracket on the under side of the front outer casing.

### 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 16.

### LIGHTING PROCEDURE

1. Check that the service tap 'C' is closed, that is, the indicator line is across the line of the pipe. See that the gas valve is in the 'OFF' position ('OFF' opposite red arrow).
2. Switch on mains electricity supply.
3. See that the clock control (when fitted) is in an 'ON' period.
4. Set the thermostat knob 'B' to the 'OFF' position.
5. Remove the gas pressure test nipple screw 'E' and connect a water gauge to measure the gas pressure.
6. Open service tap 'C' and set the gas valve control knob 'A' until 'PILOT' setting is opposite the red arrow.
7. Depress gas valve control knob 'A' fully, also depress the spark igniter button 'G' and release. A single spark should ignite the pilot burner. At this stage, air may be present in the gas pipes and this operation may need to be repeated until all the air has been expelled. When the pilot burner lights keep control knob 'A' fully pushed in for one minute to heat the thermocouple. If the pilot burner fails to light or stay alight wait THREE MINUTES then repeat exactly the above sequence.

The pilot gas rate can be adjusted if necessary as follows: Remove pilot adjustment cover screw 'K' from gas control and adjust the grub screw beneath it until the pilot burner flame envelops 3/8 inch to 1/2 inch of the thermocouple tip and ignites the main burner smoothly. Replace cover screw.

8. If gas control is turned 'OFF' (knob 'A') a safety lock prevents knob 'A' from being turned on again until the thermocouple has cooled to prevent attempted re-light in an unsafe condition. No attempt should be made to force knob 'A' back to pilot position until the three minutes have elapsed.
9. When the pilot is stable and set, turn the thermostat knob 'B' to maximum setting and then turn the gas valve control knob 'A' to the 'ON' position. The main burner should light smoothly and the primary cones should be well defined when the pressure setting has been adjusted at the governor to the correct gas pressure (see page 1).

10. To set the main burner gas pressure, remove cover screw 'F' from the gas control valve, adjust internal grub screw to the required pressure, replace cover screw.
11. Turn the gas valve control knob 'A' to the 'OFF' position, remove pressure gauge and re-fit pressure test nipple screw 'E'.

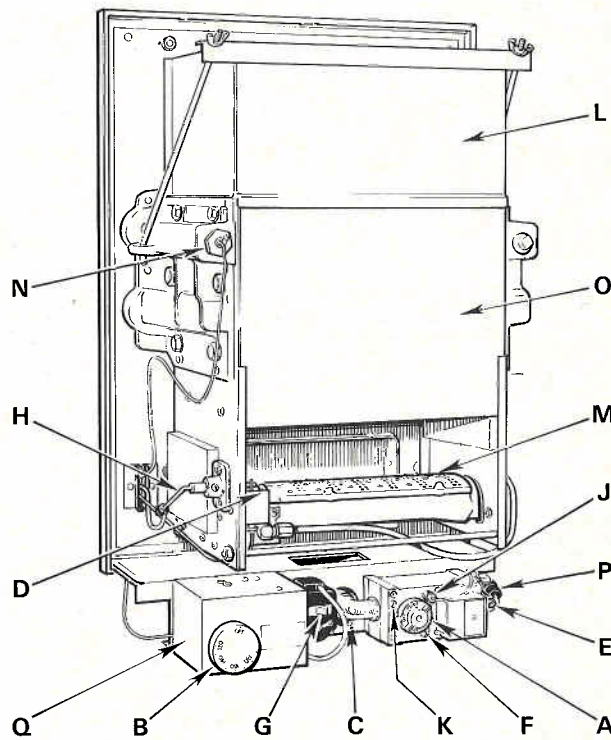


Diagram 16

### Key

- A. Gas valve control knob
- B. Thermostat control knob
- C. Service gas tap
- D. Pilot burner
- E. Pressure test nipple
- F. Governor adjustment
- G. Spark igniter button
- H. Electrode
- J. Thermocouple union
- K. Pilot adjustment
- L. Flue collector
- M. Main burner
- N. Thermostat phial & pocket
- O. Front insulation tray
- P. 0.5 amp fuse in holder
- Q. Electrical control box

## TO EXTINGUISH

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

1. By turning the programmer selector (where fitted) to 'OFF' or thermostat knob 'B' to the 'OFF' position. This shuts 'OFF' the main burner only, leaving the electric clock (when fitted) running, but not controlling, and the pilot alight. Re-light by turning the thermostat knob 'B' to the required temperature, or programmer to required programme.
2. By turning the gas control knob 'A' to the 'PILOT' position. This shuts off the main burner only. Thermostat knob 'B' should be turned to the 'OFF' position; electric clock (when fitted) running, but not controlling; pilot burner alight. Re-light by turning gas control knob 'A' to the 'ON' position, reset thermostat knob 'B' to the required temperature.
3. By turning gas valve control knob 'A' to the 'OFF' position. This results in complete shut-down of both main and pilot burners. Thermostat knob 'B' should be turned to the 'OFF' position to de-energize the gas control electric operator leaving the electric clock (when fitted) running but not controlling.  
Follow the Users' Lighting Instructions to re-light. When valve is in the 'OFF' position (knob 'A') a safety lock will prevent the cock from being re-opened if an attempt is made to re-light the boiler in an unsafe condition.  
No attempt should be made to force knob 'A' back to pilot position until three minutes have elapsed.
4. By turning the service cock 'C' to the 'OFF' position. This results in complete shut-down of both main and pilot burners. Thermostat knob 'B' should be turned to the 'OFF' position to de-energize the gas control electric operator, leaving the electric clock (when fitted) 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 burner, leaving the pilot burner alight. Re-light by re-connecting to the electricity supply.  
Re-set electric clock (when fitted) 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 AN ELECTRIC CLOCK (WHEN FITTED)

1. With the main burner alight, move the clock dial in a forward direction to an 'OFF' position. This will result in the main burner shutting off.
2. Move the clock dial in a forward direction to the next 'ON' position, this should result in the main burner lighting again.

### 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. Knob 'A' will then be locked in this position by a safety device fitted to the valve. 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.

## SERVICING

Before commencing servicing, turn off the gas supply at the main service cock and switch off the electricity supply.

### Boiler Flueways

Regular cleaning of the boiler flue passages is necessary for efficient operation, also inspection and examination of the burner and controls is essential.

1. Remove the control cover slide by pulling forward and disengaging it from the bracket under the front outer casing and the two channels at the rear. Unscrew the four wing nuts behind the boiler back panel and remove complete with the four plain washers. This will enable the outer casing to be removed.
2. Remove the front protection plate, diagram 7, by lifting slightly and then withdrawing.
3. Remove the burner by lifting carefully so that the location pin at the L.H. end clears its seating and the burner casting at the R.H. end clears the flange on the R.H. side plate. Turn the burner so that the R.H. end can be withdrawn first from the combustion chamber. Take care not to damage the pilot burner or electrode when removing.
4. Place a sheet of paper below the combustion chamber and over the controls to catch the flue debris.
5. Remove the flue collector by unscrewing the two  $\frac{1}{4}$  inch BSW wing nuts which retain the securing angle. The angle can then be lifted from the tie rods and the flue collector removed.
6. Remove the front and rear insulation trays by lifting upwards, taking care not to damage the fibre insulation inside them.
7. The boiler flueways and fins should now be cleaned thoroughly with a suitable stiff brush.

### IMPORTANT

When replacing the insulation trays, ensure that the fibre insulation faces inwards towards the boiler body, also ensure that the asbestos seal at the rear of the flue collector is in position and intact and makes a good seal.

### 8. Burner

Unscrew the four hex. nuts from the screws which clamp the burner top to the burner body and remove the screws. Take off the burner top by carefully tapping the end overhang of the top to break the fire cement seal at one end and then lever upwards to clear the sealing grooves along each side of the burner. Remove any accumulated lint and dust from the underside of the burner top *using a vacuum cleaner. A brush must not be used, as this is likely to brush the dust and lint into the holes of the gauze.* Renew the  $\frac{1}{8}$  inch dia. asbestos packing in the sealing groove in the burner body and apply a smear of fire cement on each end to ensure a good seal, before replacing the burner top and clamping down with the four retaining bolts and nuts. When tightening, pull down evenly, so that the top makes a good gas-tight seal.

## 9. Injector

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

## FROST

If the boiler is to be out of commission for any long periods during severe weather, we recommend that the whole system, including the boiler, should be drained to avoid the risk of freezing up. If in doubt, your Installation Agent will advise.

## 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.

### 1 Gas Valve (high level fixing).

Make sure that the gas cock 'C' is in the 'OFF' position. Disconnect the pilot gas supply at the gas valve. Disconnect the thermocouple union 'J' at the gas valve. Disconnect the orange electrical leads at the gas valve. Unscrew the sleeve nut connection at the gas valve outlet elbow and disconnect. For the Space-Saver 38 remove the two screws securing the spark ignition switch box bracket and draw the box and bracket forward sufficiently to clear the gas valve inlet elbow. Support the gas valve and unscrew the union nut at the gas cock 'C'. Remove the valve by pulling forward.

### Gas Valve (low level fixing).

Unscrew the four wing nuts behind the boiler back panel, and remove complete with four plain washers. This will enable the outer casing to be removed. Remove the front protection plate, diagram 7, by lifting slightly and then withdrawing. Remove the burner by lifting carefully so that the location pin at the L.H. end clears its seating and the burner casting at the R.H. end clears the flange on the R.H. side plate. Turn the burner so that the R.H. end can be withdrawn first from the combustion chamber. Take care not to damage the pilot burner or electrode when removing. Make sure the gas cock 'C' is in the 'OFF' position. Disconnect the pilot gas supply pipe at the gas valve and also at the pilot union end. Release the gland plate on the boiler back panel and ease the pilot supply pipe away from the valve. Disconnect the thermocouple union 'J' at the gas valve. Disconnect the orange electrical leads to the valve. For the Space-Saver 38 remove the two screws securing the spark ignition switch box bracket and draw the box and bracket forward sufficiently to clear the gas valve inlet elbow. Unscrew the sleeve nut connection at the gas valve outlet elbow and disconnect. Support the gas valve and unscrew the union nut at the gas cock 'C'. Access to the union nut is through the slot above it. Remove the gas valve by pulling forward. In both the above instances, when fitting the elbows into the replacement gas valve, use a little jointing compound on the threads to ensure a gas-tight seal. Re-assemble in the reverse order to that described, do not tighten thermocouple union 'J' more than one quarter turn beyond finger tight.

It will be found necessary to purge the system of air after this operation and re-lighting should be done in accordance with the initial lighting procedure detailed on page 14.

### 2. Injector

For the replacement of the injector, refer to Note (9) under "Maintenance".

### 3. Burner Top Assembly

Refer to Note (8) under "Servicing", after removing the burner as under Notes (1), (2) and (3).

### 4. Pilot Burner

Remove the main burner as in Notes (1), (2) and (3) under "Servicing".

Remove the pilot shield from the front of the pilot burner by unscrewing the  $\frac{3}{16}$  inch BSW rd. hd. screw and nut from the side panel. Diagram 6.

Disconnect the pilot feed pipe at the  $\frac{1}{4}$  inch union on the swivel elbow at the base of the pilot burner.

Remove the hex. nuts from the two round head screws holding the pilot burner to the bracket and remove the screws. Pull out the clip holding the thermocouple into the pilot burner and pull the thermocouple downwards out of the pilot burner. The pilot burner can now be removed. Replace in the reverse manner.

### 5. Thermocouple

Remove the pilot shield from the front of the pilot burner by unscrewing the  $\frac{3}{16}$  inch BSW rd. hd. screw and nut from the side panel. Next pull off the thermocouple clip and pull the thermocouple downwards. Diagram 6. Disconnect from the gas valve by unscrewing union 'J' and remove the two sealing plates on the boiler back plate, see diagram 6. The thermocouple can now be withdrawn. When replacing, union 'J' must not be tightened more than one quarter turn beyond finger tight. It is also important that the sealing plates on diagram 6 are re-made.

### 6. Spark Electrode

The spark electrode is clamped into a cast bracket screwed to the outside of the L.H. side of the combustion chamber. To remove, unscrew the nut clamping the H.T. lead to the outer end of the electrode, and remove the washers and lead. Next, unscrew the rd. hd. brass clamping screw in the cast bracket and the electrode may be withdrawn.

Replace by reversing the above procedure and ensure that the electrode is correctly positioned. Do not over tighten. See diagram 6.

### 7. Electrical Control Box

To remove the control box, first remove the controls cover, thermostat control knob and control box cover, as described in paragraphs (1), (2) and (3) under "Wiring Instructions". Disconnect all external leads at the terminal strip, slackening off the cable clamp screws to enable the wiring to be withdrawn.

Remove the thermostat phial and capillary tube from the phial pocket 'N' in the water manifold via the sealing plates in diagram 6.

Unscrew the two 2 BA hex. nuts from the control box securing screws, diagram 7, the control box may now be withdrawn.

Replace in the reverse order. For details of the wiring see diagrams 8, 9, 10, 11, 12, 13 and 14.

### 8. Thermostat

Remove the control box as in (7) above. Remove the five amp tags from the connections at the rear of the thermostat.

Slacken the screw securing the capillary clip in the control box and release the thermostat capillary.

Remove the two screws securing the thermostat to the control box. Remove the thermostat bulb from the phial pocket and remove the two sealing plates on the boiler back plate, diagram 6. The thermostat may now be removed.

Reverse the above procedure to re-fit the thermostat, making sure that the amp tag connections on the thermostat are pointing upwards. Be sure the connections are as shown in diagram 8.

#### 9. Transformer

Remove the control box as in (7) above.

Unsolder the four wire connections to the transformer.

Remove the two screws, nuts, plain and shakeproof washers securing the transformer to the control box. The transformer can now be removed.

To replace, fasten to the control box with the two screws and nuts, making sure that the shakeproof washers are placed between the plain washers and the nuts. The mains terminals must be on the inside looking from the front.

Solder the red and black mains leads to the mains terminals and the orange leads to the low voltage terminals on the opposite side.

#### 10. Gas Valve Fuse

This is located in the orange wire from the control box to the gas valve. This enables the fuse to be changed without any dismantling of the controls. The fuse holder is accessible when the controls cover is removed. To change the fuse, release the bayonet fitting of the fuseholder and carefully part the two halves. Remove the fuse link. Replace fuse (0.5 amp X 1 1/4 inch long x 1/4 inch diameter) and re-assemble fuse holder.

*Under no circumstances should a fuse of greater value than 0.50 amp (BS. 2950) be fitted in the line from the control box to the gas valve. Up-rating of the fuse could cause damage to the transformer.*

#### 11. Spark Ignition Switch Box

Remove the outer casing, the controls cover and the control box cover as described previously.

Remove the two core mains cable feed to the spark box from the terminal strip in the control box.

Disconnect the H.T. lead at the electrode end and remove the two sealing plates on the boiler back plate, see diagram 6. Unscrew the 3/16 inch BSW round head screw and hex. nut securing the spark box to the mounting bracket. The spark box may now be removed, feeding the H.T. lead through the back panel and mounting bracket.

Replace in reverse order, wiring connections for the mains lead are shown in diagram 8. Make sure good seal is made through the boiler back plate.

### FAULT FINDING CHART

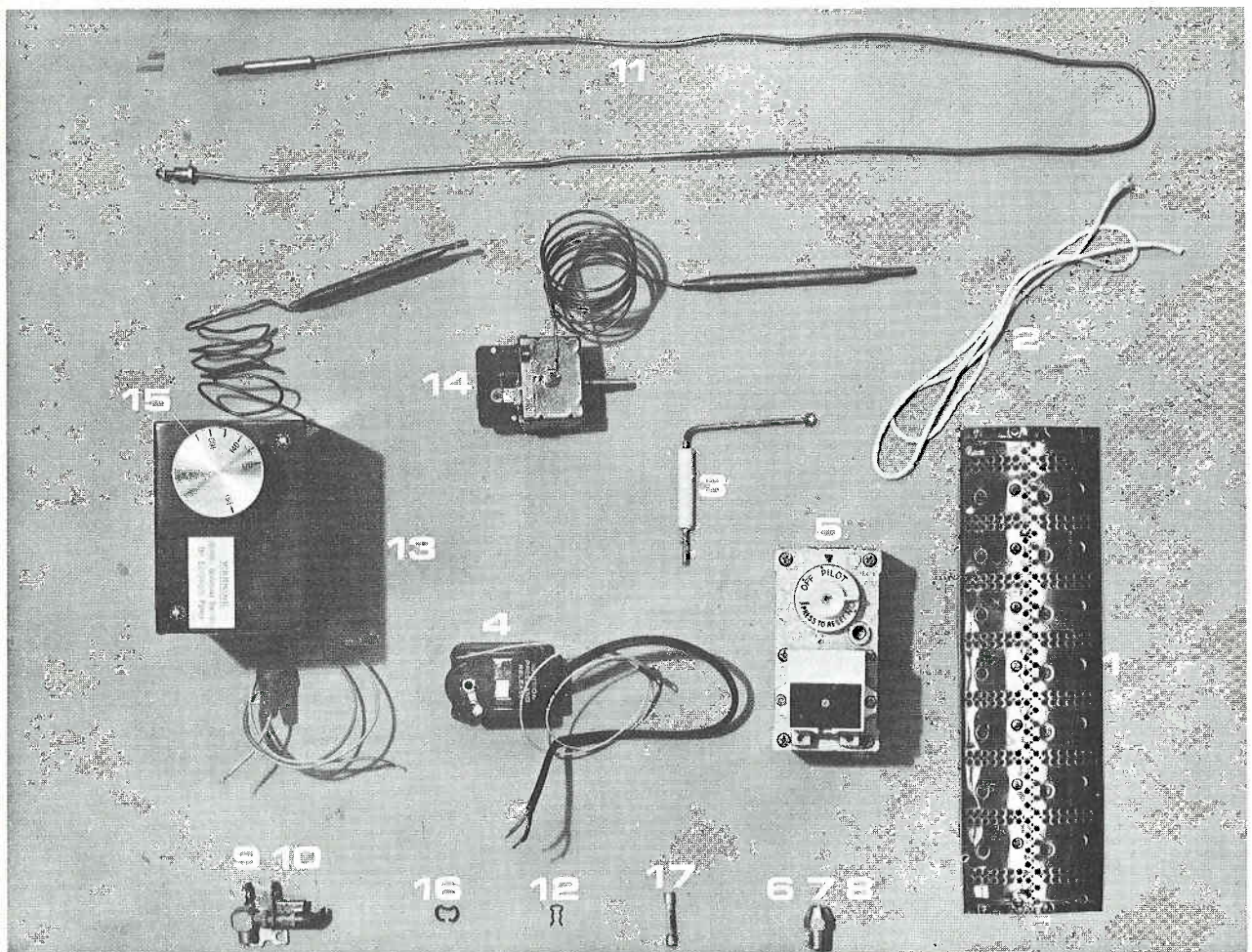
Faults	Cause	Action
Pilot: Failure to light	No spark	1. Turn off main gas at service cock. Wait three minutes. Remove boiler front cover, remove the control cover tray. Next, remove the front protection plate. Press switch on spark igniter box several times, if no spark, check igniter gap and all electrical connections between spark generator and electrode.
	No gas	2. Check pilot burner piping and injector. 3. Adjust pilot flame regulating screw.
Pilot: Failure to remain alight	Thermocouple	1. Check thermocouple connection to gas valve. This is an electrical connection and must be kept clean and dry, tighten only quarter turn beyond finger tight. 2. Check pilot flame size, adjust pilot flame regulating screw if necessary. 3. Check that pilot flame wraps around thermocouple. Adjust as necessary.
Main Burner: Failure to light	Electrical	1. Check that clock, programmer or any other ancillary control is set 'ON'. 2. Check thermostat is in 'ON' position. 3. Check main fuse at wall supply. Check 0.5 amp fuse in gas valve leads.
	Gas Valve	4. Open the fuse holder in the lead to the gas valve and remove the 0.5 amp fuse. Connect low voltage (24 volt) test lamp to the contacts in each half of the holder. If no light obtained it shows failure of gas valve or wiring. Remove test lamp, replace fuse and reconnect. 5. Check that any ancillary control fitted, e.g. room thermostat, for possible switching faults.

If replacement parts are required, apply to your local Gas Showroom. Please quote the name of the appliance, Space-Saver 38 or Space-Saver 50, and preferably its serial number, which can be found on the specification plate positioned in the bottom of the control cover.

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

### LIST OF REPLACEMENT PARTS

Item No.	Part No.	Description	Maker	Makers Part No.
1	{ K5318 K4524	Burner top assembly, type 5: S-S 38 Burner top assembly type 5: S-S 50		
2	K3720	Asbestos string, $\frac{1}{8}$ inch dia. x { 540 m.m. — S-S 38 686 m.m. — S-S 50		
3	K5229	Spark electrode	Igniters Ltd.	
4	K5429	Single spark generator	Wipac Ltd.	C.8197
5	K6466	$\frac{1}{2}$ inch BSP Midgitrol combination gas valve	Maclaren	YK 48/B 001
6	{ K5438 K4151	Injector, Group 4, Town Gas: S-S 38 Injector, Group 4, Town Gas: S-S 50		
7	{ K4323 K4397	Injector, Group 5, Town Gas: S-S 38 Injector, Group 5, Town Gas: S-S 50		
8	{ K5439, K5230	Injector, Natural Gas; S-S 38 Injector, Natural Gas; S-S 50		
9	K3397	Single pilot burner, Town gas	Maclaren	26T4126 TJ028
10	K3396	Single pilot burner, Natural gas	Maclaren	26T4126 TJ016
11	K2674	Thermocouple	Maclaren	2500M-36
12	K3580	Thermocouple clip		
13	M5222	Electrical control box		
14	K5426	Thermostat	Ranco	C77-100
15	K5423	Control knob (thermostat)		
16	K4158	Control knob clip	Lewis Spring	LS/402/17
17	K4644	Fuse, 0.5 amp (BS 2950)		



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**DOMESTIC BOILER AND HEATING APPLIANCE MANUFACTURERS**

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