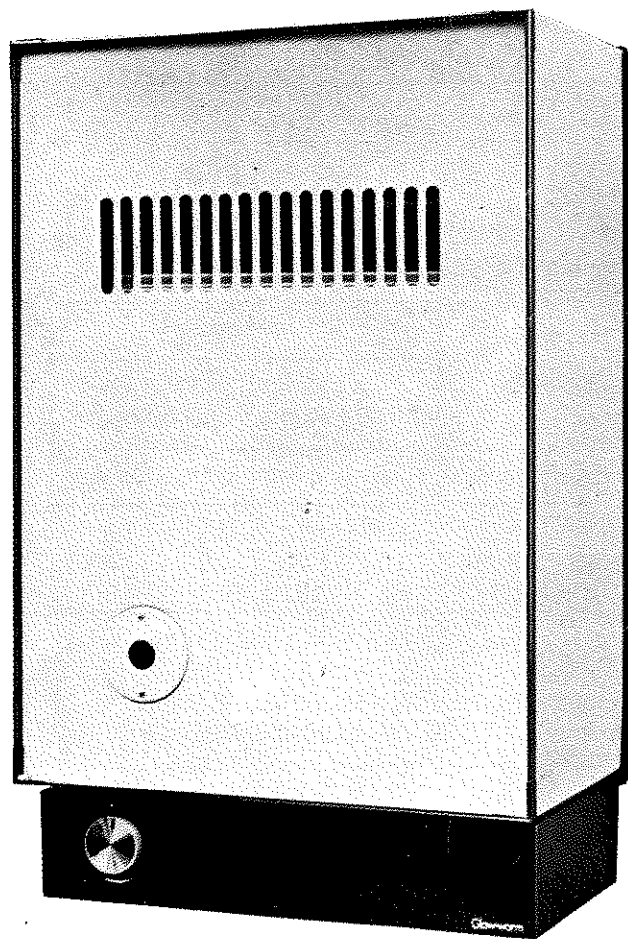


installation and service instructions

GLOW-WORM

SPACE-SAVER 38 & 52
CONVENTIONAL FLUE BOILER



G.C. Nos. 41.315.44 Space-Saver 38 C.F.
41.315.45 Space-Saver 52 C.F.

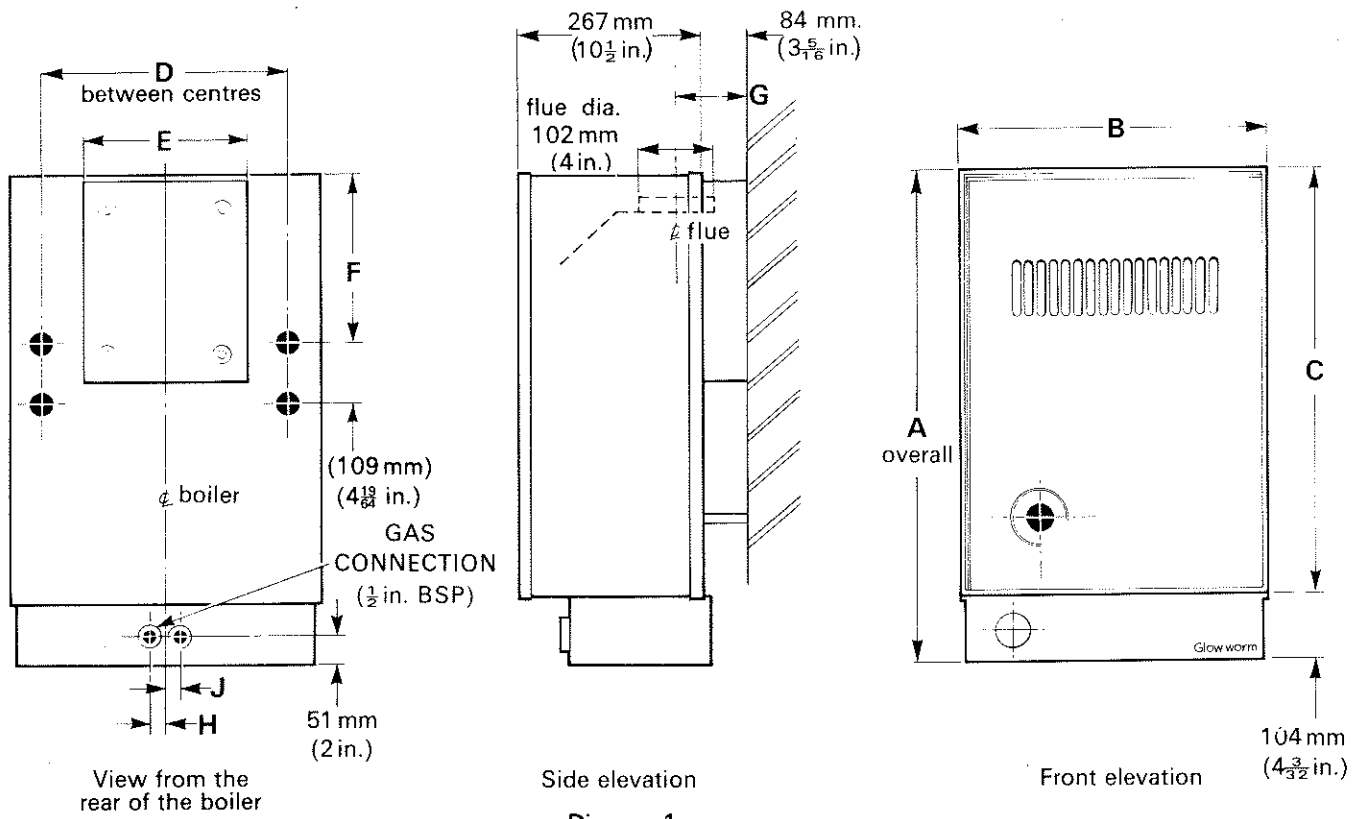


Diagram 1

Model		A	B	C	D	E	F	G	H	J
38	m.m.	704	380	600	286	183	222	96		10
	inch	27 ²³ / ₃₂	14 ³¹ / ₃₂	23 ⁵ / ₈	11 ¹ / ₄	7 ⁷ / ₃₂	8 ⁴⁷ / ₆₄	3 ²⁵ / ₃₂		2 ⁵ / ₁₆
52	m.m.	732	460	628	367	263	250	103	25	
	inch	28 ¹³ / ₁₆	18 ¹ / ₈	24 ²³ / ₃₂	14 ⁷ / ₁₆	10 ²³ / ₆₄	9 ²⁷ / ₃₂	4 ¹ / ₃₂	6 ³ / ₆₄	

Space-Saver 38 C.F.

Nominal heat input: 11.9/14.8 kW (40,500/50,500 Btu/h)
 heat output: 8.8/11.11 kW (30,000/38,000 Btu/h)

Gas Group	Injector Dia.		Setting Pressure			
			8.8 kW (30,000 Btu/h)		11.11 kW (38,000 Btu/h)	
	m.m.	inches	mbar	in w.g.	mbar	in w.g.
G.4.	5.7	0.224	3.0	1.2	4.5	1.8
G.5	5.95	0.234	3.0	1.2	4.5	1.8
N.G.	3.0	0.118	9.5	3.8	15.0	6.0

Space-Saver 52 C.F.

Nominal heat input: 15.8/20.6 kW (54,000/70,000 Btu/h)
 heat output: 11.7/15.2 kW (40,000/52,000 Btu/h)

Gas Group	Injector Dia.		Setting Pressure			
			11.7 kW (40,000 Btu/h)		15.2 kW (52,000 Btu/h)	
	m.m.	inches	mbar	in w.g.	mbar	in w.g.
G.4.	6.75	0.2656	3.0	1.2	5.0	2.0
G.5	7.04	0.277	3.0	1.2	5.0	2.0
N.G.	3.4	0.134	10.8	4.3	18.0	7.2

APPROXIMATE WATER CONTENT

Space-Saver 38 – 2.36 litres (0.52 galls).
 Space-Saver 52 – 2.81 litres (0.62 galls).

APPROXIMATE WEIGHT OF APPLIANCE

Space-Saver 38 – 57 kg (125 lbs)
 Space-Saver 52 – 68 kg (150 lbs)

NOTE: Pressure drop across heat exchanger for a 20°F water temperature differential at nominal rating is 2" w.g. (S-S 38) 3" w.g. (S-S 52)

This boiler shall 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 CP.337 (FLUES FOR GAS APPLIANCES) 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.

FLUE CONNECTION

The integral draught diverter on the Space-Saver 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 following notes are intended as a general guide, but in cases of doubt the local Gas Region should be consulted:

1. The flue should be kept as short and as warm as possible.
2. Give maximum possible vertical rise from the appliance (minimum 500 mm) 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 be constructed of the following:
 - (a) Asbestos cement to BS 567.
 - (b) Pre-cast concrete of a type acceptable to British Gas.
 - (c) Double-walled flue pipe of a type acceptable to British Gas.
 - (d) Brick, providing that the flue be lined, using either asbestos cement to BS 567 or stainless steel flexible lining.
 - (e) Where existing flues are already lined with salt-glazed earthenware pipes to BS 540 they are acceptable.

VENTILATION REQUIREMENTS 1970

1. Central heating units or boilers installed in compartments

The compartment, whether modified or specially built, shall 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 serviced or 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 cm ² per kW input	4.5 cm ² per kW input
Low level	18 cm ² per kW input	9 cm ² per kW input

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.

2. Ventilation of rooms in which are fitted conventionally 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 heater, or
- (b) (for appliances not exceeding 40 kW input) into an adjacent room or space which has an internal purpose-provided opening to the room containing the appliance.

The Space-Saver 38 and 52 **free area** will be 67 cm² and 93 cm² respectively.

The minimum effective areas of all purpose-designed ventilation openings must be 4.5 cm² per kW input.

EXTRACTION FANS

If an extract 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 downdraught, but where such installations are found, tests for spillage of products from the draught diverter should be carried out with the fan running.

INSTALLATION

- Where Rawlbolts are being used, mark out the centres for the four holes for the bolts to secure the wall mounting bracket to the wall. (It may be advantageous to use the mounting bracket as a template.) Drill the four holes $1\frac{9}{32}$ inch diameter to suit the D.20 Rawlbolts provided. The maximum diameter for these holes should not exceed $\frac{5}{8}$ inch diameter. See diagram 2.
- When FEBOLTS are used, remove the boiler from its carton and place it face down on the floor. Place the wall mounting bracket against the wall and using it as a template, drill four holes of 10 mm diameter in the wall. Secure the mounting bracket to the wall by passing the four F.10.B Febolts provided through the holes in the mounting bracket into the wall without dismantling the

bolt, until the washer is hard against the bracket. Full expansion will be achieved by turning the bolt nut 4 to 5 times. See diagram 2. When fixing to Thermalite type blocks, it is advisable to tap the bolt into the host material without first drilling a hole and then fully expand, as previously described. In the event of the bolt spinning in the hole, remove the bolt and pre-expand, then replace.

When using Rawlbolts, put the D.20 bolt provided into the $\frac{5}{8}$ inch holes previously drilled, position the mounting bracket over them, offer the washers and nuts on to the bolts and tighten. Make sure the bracket is firm and secure. Diagram 2.

Model		A	B	C	D	E	F	G
38	m.m.	120	182	100	534	292	342	39
	inch	$4\frac{23}{32}$	$7\frac{5}{32}$	$3\frac{15}{16}$	21	$11\frac{1}{2}$	$13\frac{1}{2}$	$1\frac{17}{32}$
52	m.m.	200	210	100	534	332	382	39
	inch	$7\frac{7}{8}$	$8\frac{1}{4}$	$3\frac{15}{16}$	21	$13\frac{1}{16}$	$15\frac{1}{16}$	$1\frac{17}{32}$

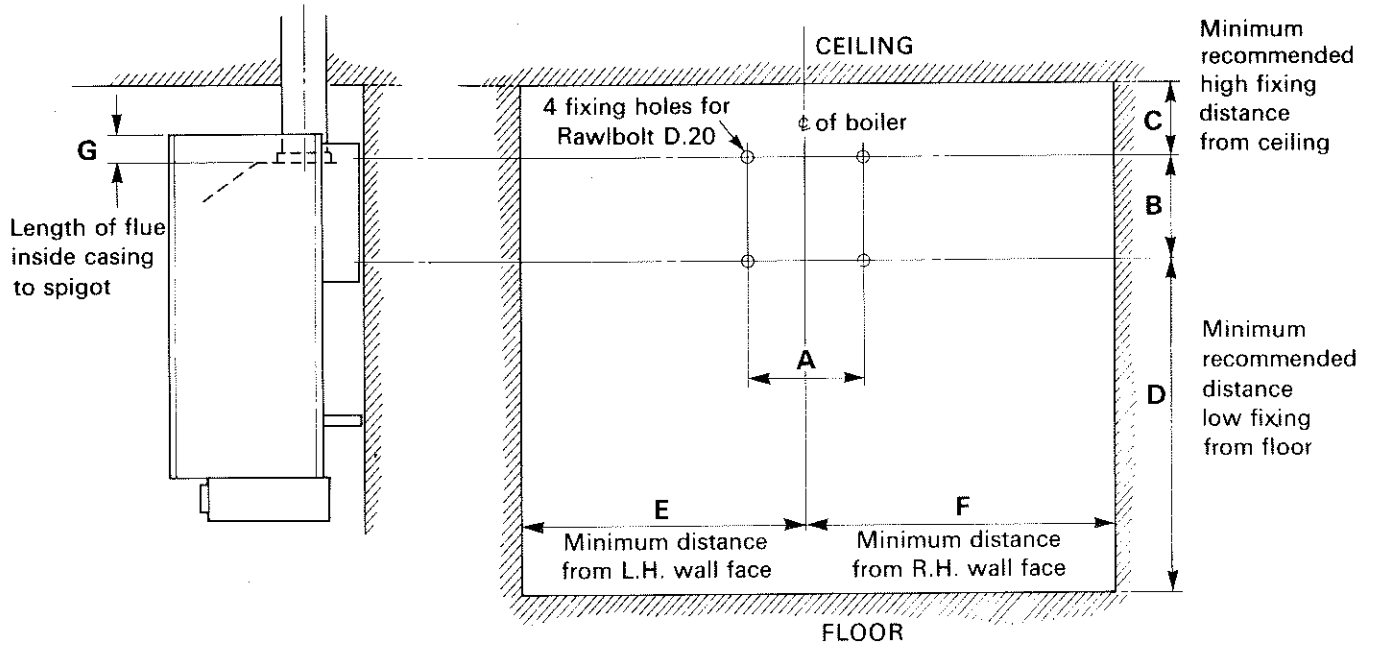


Diagram 2

INSTALLATION OF BOILER

PIPE LAYOUT

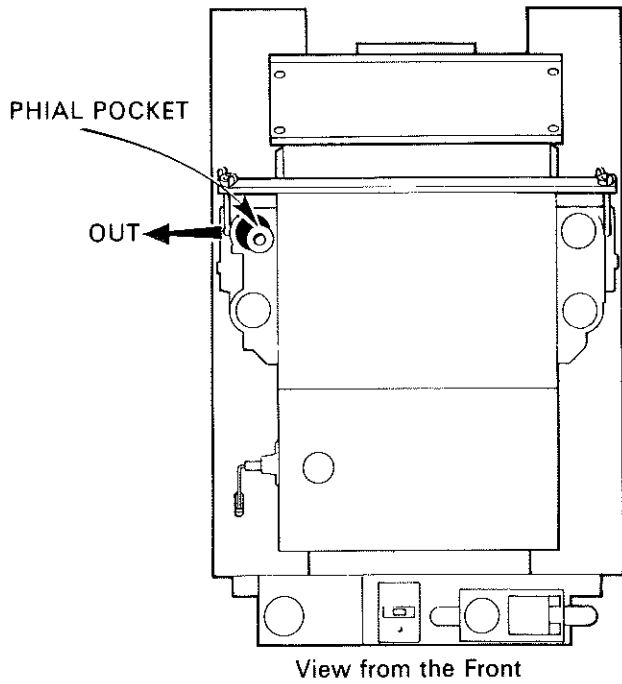


Diagram 3

Pumped heating and hot water.

Where single flow and return is taken from the boiler.

If the flow connection is taken from the R.H. side of the boiler, the thermostat phial pocket must also be re-sited at the front R.H. side top. 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 taper thread 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.

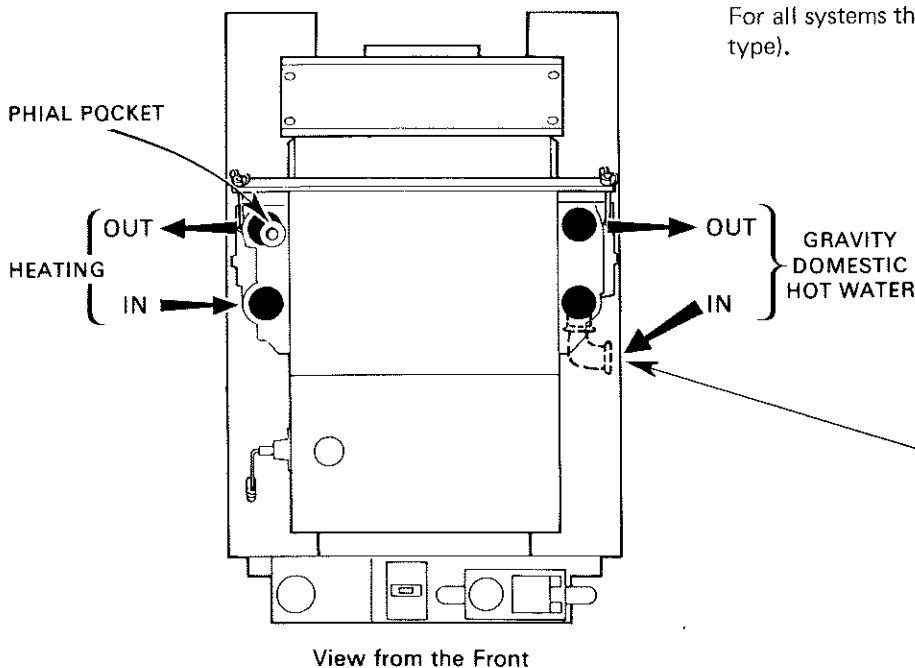
If the boiler is fitted at high level, the following considerations should be observed to obtain maximum circulating head in the domestic system.

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).



View from the Front

Diagram 4

Return tappings for gravity Domestic when flow and return are fitted to the same side of the boiler.

2-1 in. B.S.P.
M/F ELBOWS

If scheme 8 is to be used for control use a bypass of 15 mm diameter copper, complete with valve as shown in diagram 16. 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 it onto the wall mounting bracket so that the tags at the top of each of the boiler body support members engage in the 'V' shaped cut-outs at the top of the wall mounting bracket. See diagram 5.

Fasten the boiler to the wall mounting bracket by using the $\frac{5}{16}$ inch BSW screws x $\frac{1}{2}$ inch long and nuts provided. These should be entered at points 'A' and 'B' as shown in diagram 5. The condensation tray will be attached to the back of the boiler and will fit firmly against the wall.

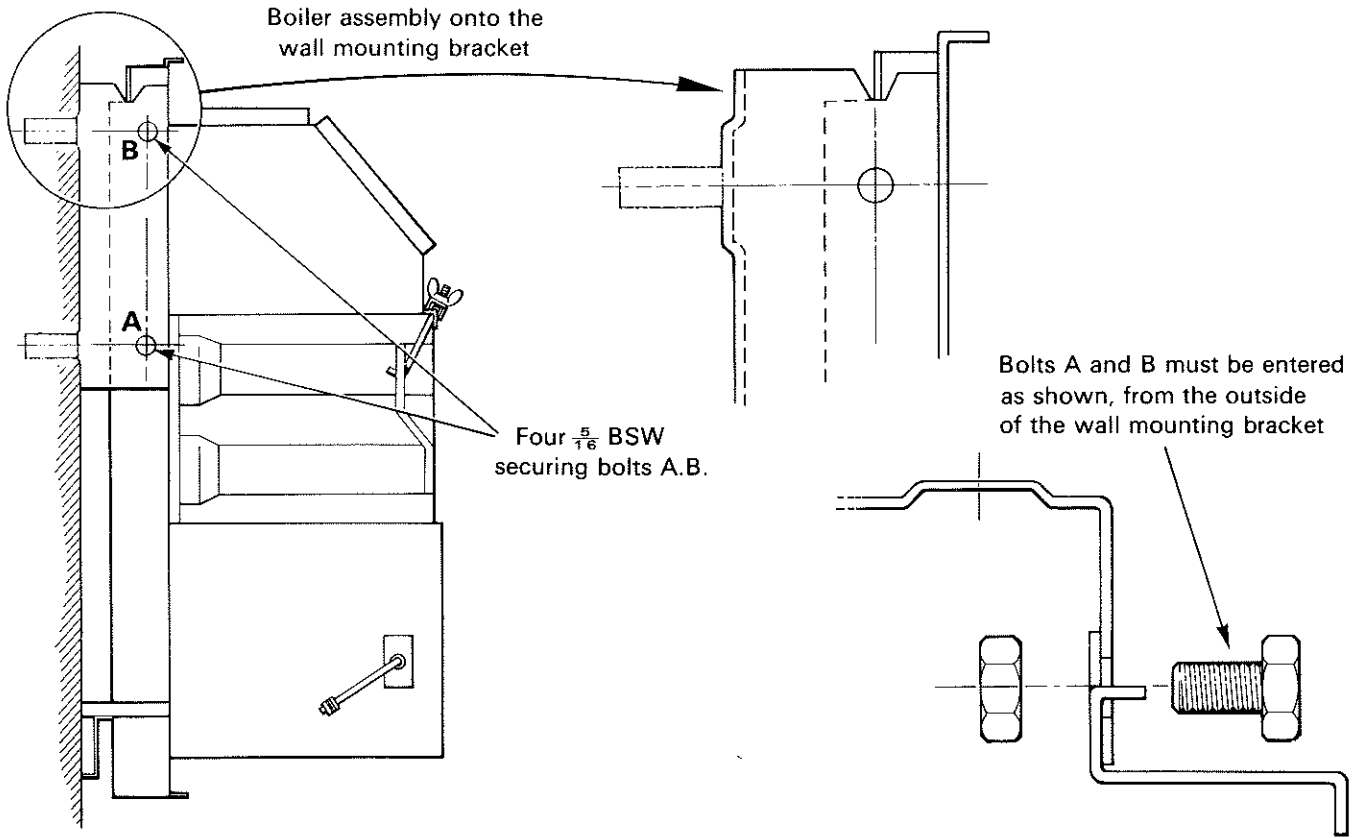


Diagram 5

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.

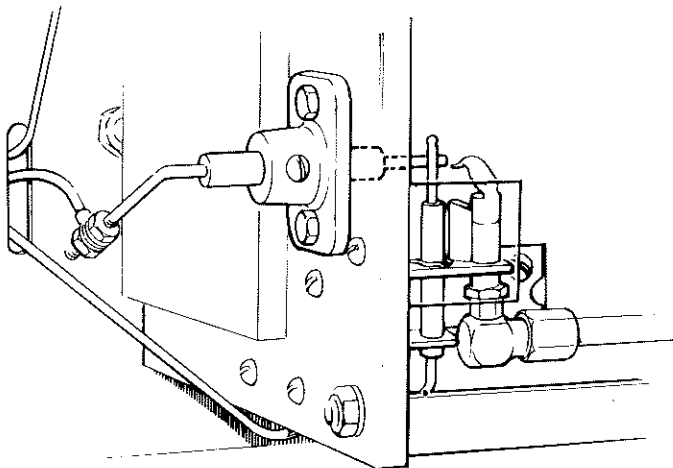


Diagram 6

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.

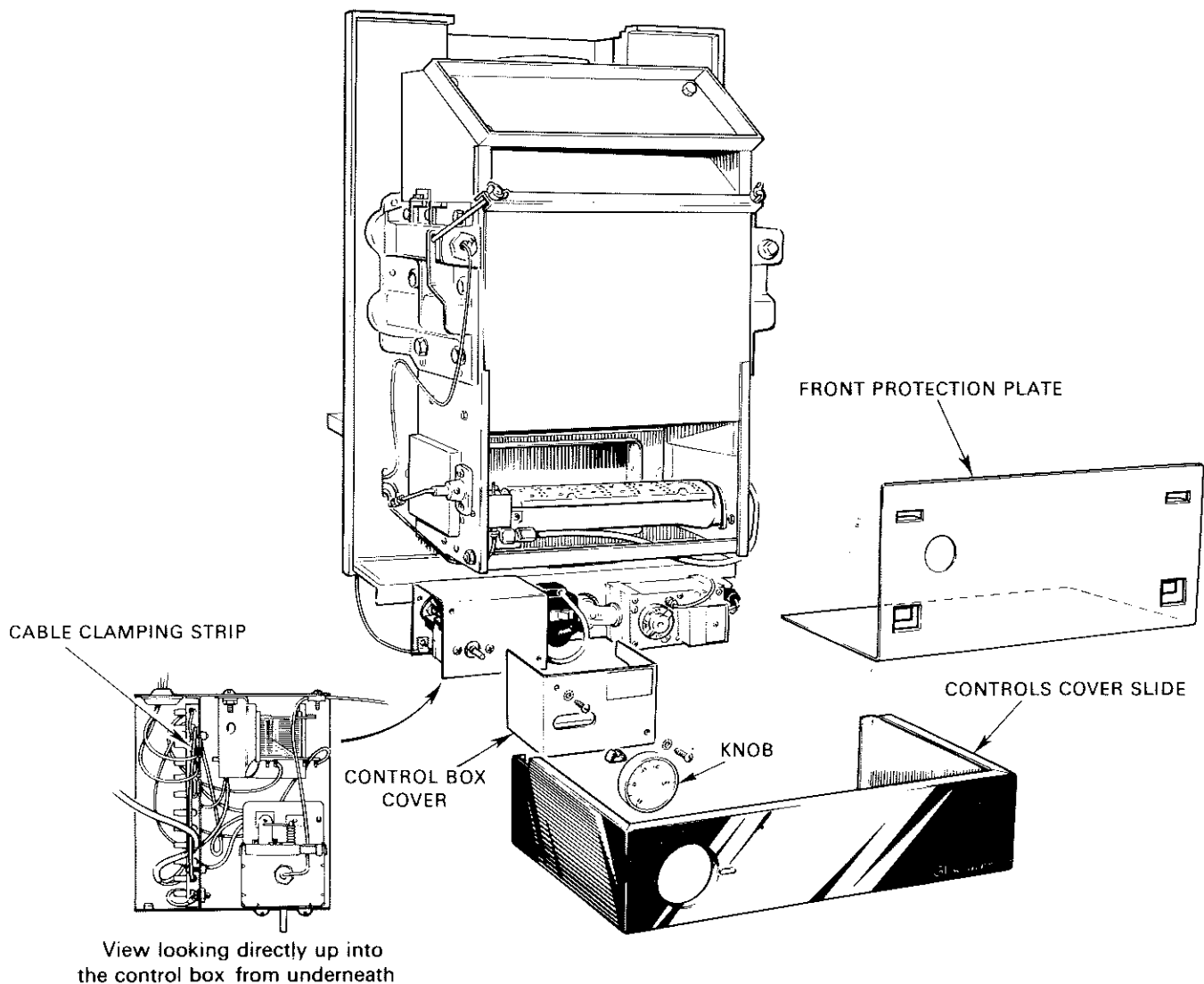


Diagram 7

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 B.A. slotted hex. hd. screws, hex. nuts and shakeproof washers. 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.

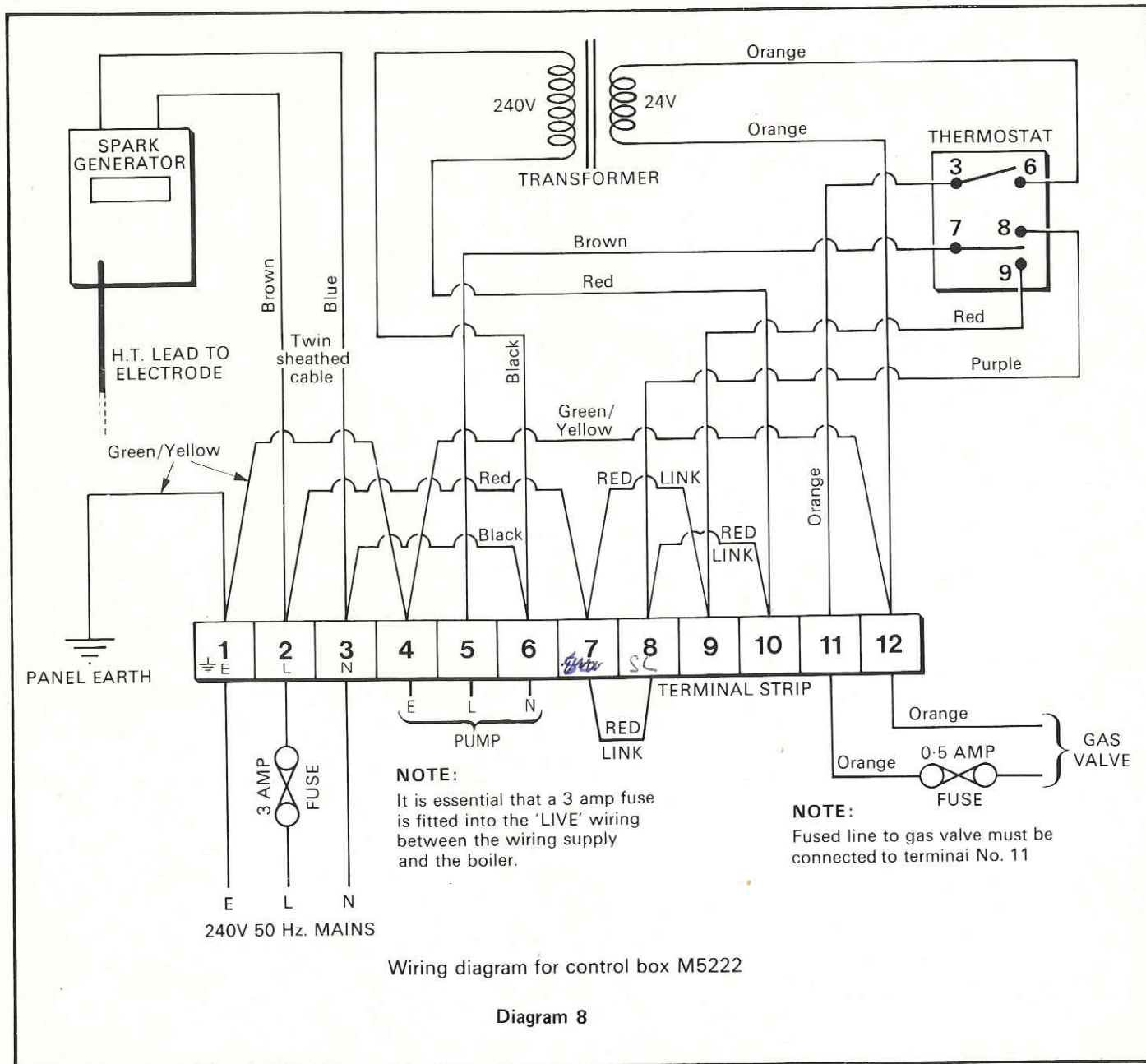
NOTE: The outer insulation sheathing on the mains and pump leads should be stripped back for sufficient length to enable the individually insulated conductors to be clamped under the clamp strip.

5. After completing all wiring, (see diagrams 9, 10, 11, 12, 13, 14 or 15), re-tighten the cable clamp strip, making sure that there is no tension on the wires at the terminal strip.
6. Replace the control box on to the back plate, using the 2 B.A. slotted hex. hd. screws, hex. nuts and shakeproof washers. Replace the control box cover by securing it with the two 4 B.A. 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 domestic without time switch, room thermostat etc.

Connect mains cable as described under paragraph (4). Connect the pump, earth to terminal number 4, line to terminal number 5, neutral to terminals 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.



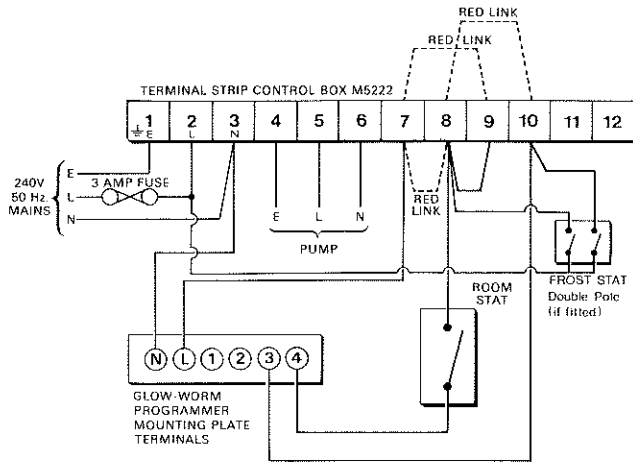
Wiring diagram for control box M522

Diagram 8

SCHEME 2 (Diagram 9)

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

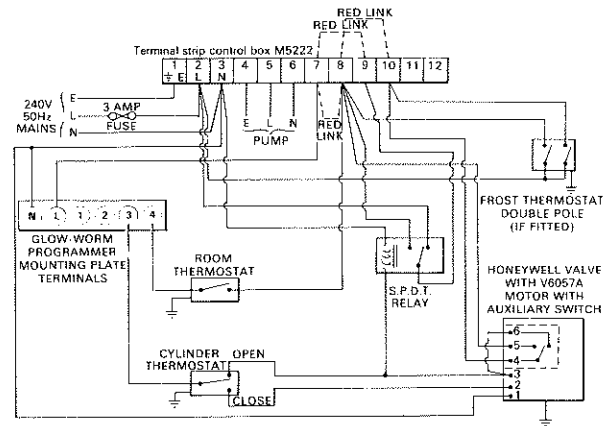
Remove the red links between terminals number 7 and 9, between terminals number 7 and 8 and between terminals number 8 and 10. Replace one link between terminals number 8 and 9. Wire external controls and mains as shown in diagram 9.



SCHEME 3 (Diagram 10)

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

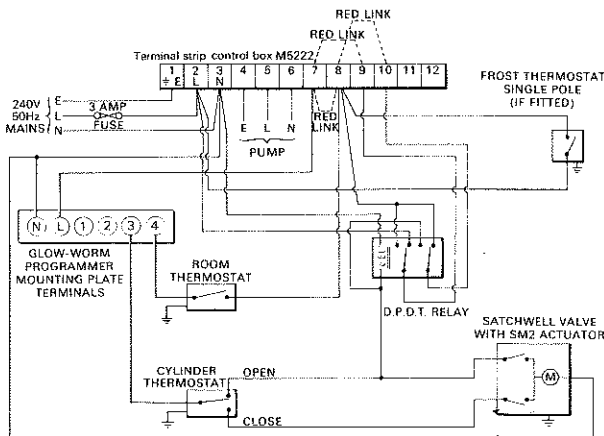
Remove red links between terminals number 7 and 9, 7 and 8 and 8 and 10. Wire external controls and mains as shown in diagram 10.



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.

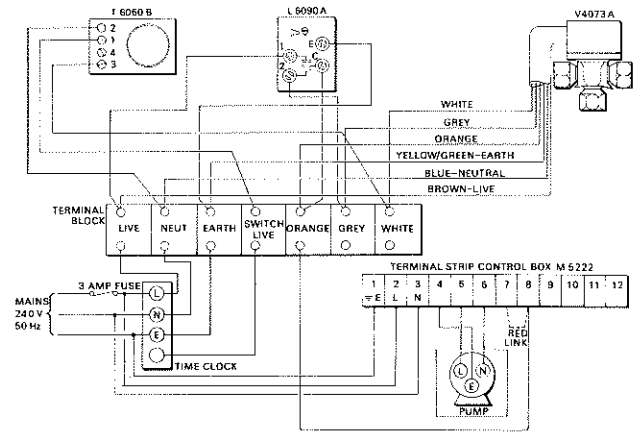


SCHEME 5 (Diagram 12)

Wiring diagram for fitting the Honeywell Sundial Plan Y.

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

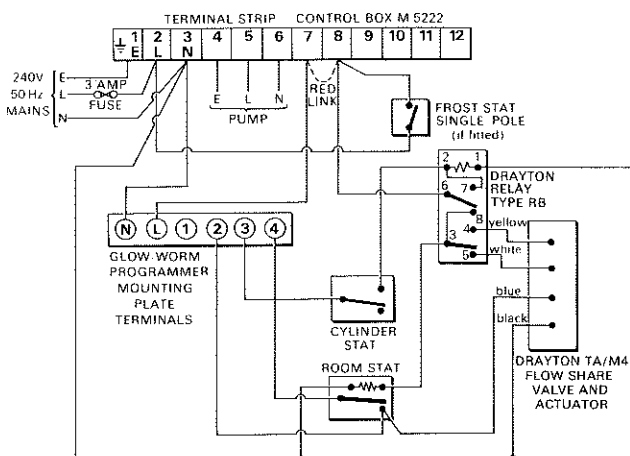
NOTE — The piping arrangement and the installation of the controls should be in accordance with the Honeywell instructions.



SCHEME 6 (Diagram 13)

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

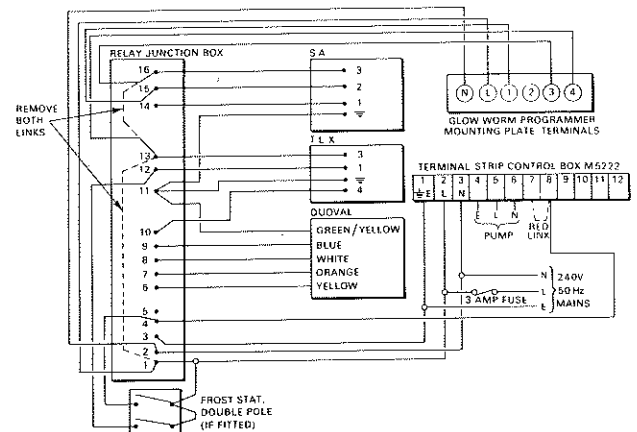
Remove the red link between terminals number 7 and 8 only. Wire the external controls and mains as shown.



SCHEME 7 (Diagram 14)

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

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



SCHEME 8 (Diagram 15)

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 15. To ensure that the motorised valves close at the end of the respective periods the programmer must have change-over contacts,

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 16, and that the pipe work to the cylinder should be in 15 mm or 22 mm diameter copper depending upon the desired flow rate, and the circuit resistance. It is suggested that a valve be fitted for regulation.

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. See diagram 16.

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

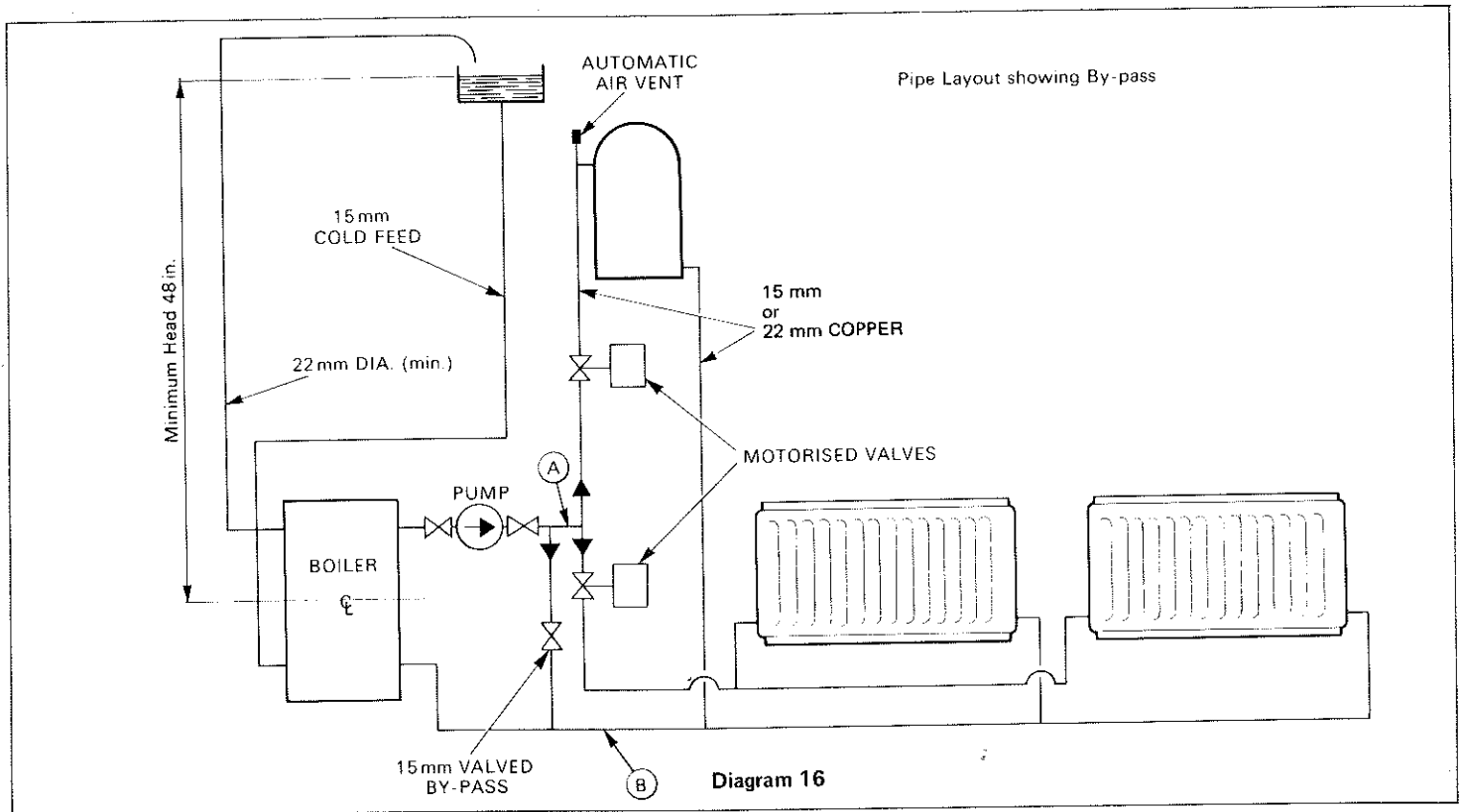
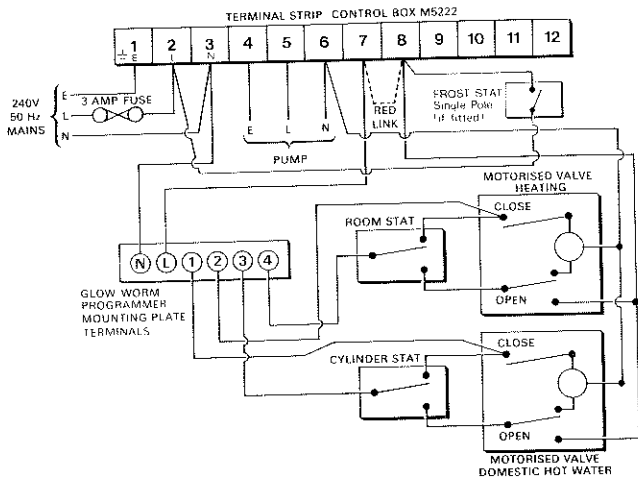


Diagram 16

The boiler outer casing may now be fitted.

Pass the casing over the boiler body so that the four 1/4" BSW screws, projecting from the back of the outer casing engage in the four holes in the boiler support members. Secure firmly with the four 1/4" 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 17.

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.
8. 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 $\frac{3}{8}$ inch to $\frac{1}{2}$ inch of the thermocouple tip and ignites the main burner smoothly. Replace cover screw.
9. 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.
10. 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 2).
11. 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.
12. Turn the gas valve control knob 'A' to the 'OFF' position, remove pressure gauge and re-fit pressure test nipple screw 'E'.

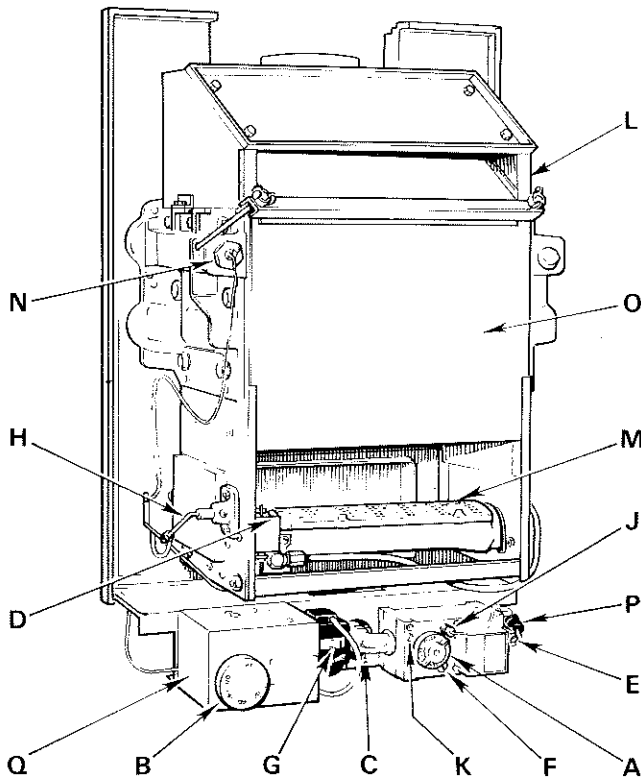


Diagram 17

Key

A.	Gas valve control knob	J.	Thermocouple union
B.	Thermostat control knob	K.	Pilot adjustment
C.	Service gas tap	L.	Flue collector
D.	Pilot burner	M.	Main burner
E.	Pressure test nipple	N.	Thermostat phial & pocket
F.	Governor adjustment	O.	Front insulation tray
G.	Spark igniter button	P.	0.5 amp fuse in holder
H.	Electrode	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 User's 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 User's 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 four 2 B.A. slotted hex. head screws and nuts from the top cover plate and lift off. Slacken off the two $\frac{3}{16}$ inch wing nuts and release the angle holding the flue cover plate in position. Let the angle and its tie rods swing downwards and remove the flue cover plate by lifting out the front edge and unhooking at the back edge.
6. Remove the front insulation tray by lifting upwards, taking care not to damage the fibre insulation inside it.
7. The boiler flueways and fins should now be cleaned thoroughly with a suitable stiff brush.

IMPORTANT

When replacing insulation tray, ensure that the fibre insulation faces inwards towards the boiler body. Make sure that the asbestos seal under the front edge of the flue cover plate is undamaged before replacing. When re-tightening the two $\frac{3}{16}$ inch BSW wing nuts make sure that the "take up" each side is of even pressure. Do not over-tighten.

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.

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 13.

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', 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.

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. See diagram 6.

Do not overtighten.

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 hole in the rear support panel, 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, 14 and 15.

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 via the hole in the rear support panel, 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 ¼ inch long x ¼ 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.

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 rear support panel and mounting bracket.

Replace in reverse order, wiring connections for the mains lead as shown in diagram 8.

FAULT FINDING CHART

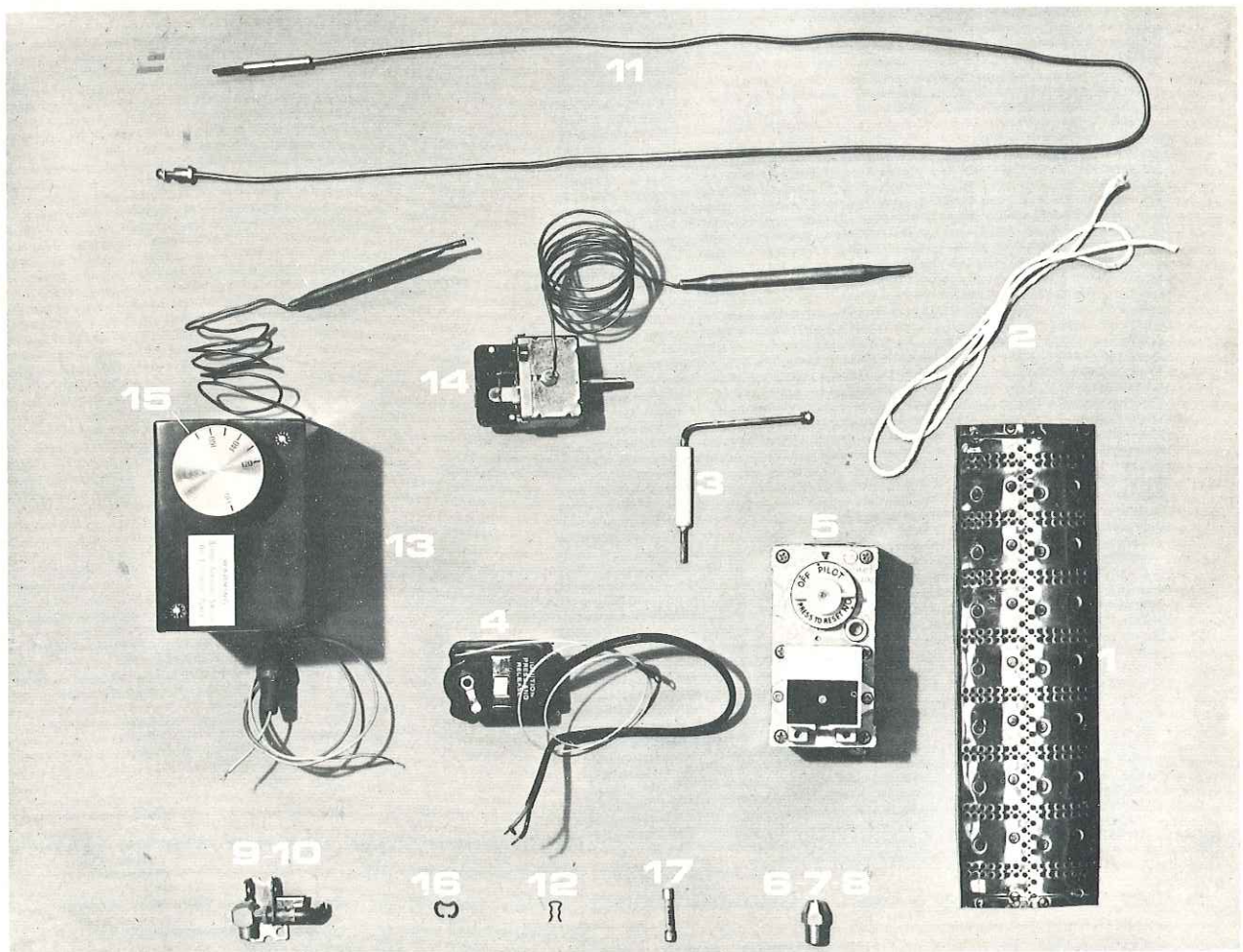
Faults	Cause	Action
Pilot: Failure to light	No spark No gas	1. Turn off main gas at service cock. Wait three minutes. Remove boiler front cover, remove the control cover tray. Next, remove the front protection plate. Press switch on spark igniter box several times, if no spark, check igniter gap and all electrical connections between spark generator and electrode. 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, make sure that it wraps around the thermocouple, adjust pilot flame regulating screw if necessary.
Main Burner: Failure to light	Electrical Gas Valve	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. 4. Open the fuse holder in the lead to the gas valve and remove the 0.5 amp fuse. Connect low voltage (24 volts) 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 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 52, 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 improvements, 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 52		
2	K3720	Asbestos string, 1/8 inch dia. x 540 m.m. – S-S 38 690 m.m. – S-S 52		
3	K5229	Spark electrode	Igniters Ltd	
4	K5429	Single spark generator	Wipac Ltd.	C.8197
5	K6466	1/2 inch BSP Midgitrol combination gas valve	Maclaren	UK 48/RBB01
6	K5438	Injector, Group 4, Town Gas: S-S 38		
7	K4152	Injector, Group 4, Town Gas: S-S 52		
8	K4323	Injector, Group 5, Town Gas: S-S 38		
9	K4682	Injector, Group 5, Town Gas: S-S 52		
10	K5439	Injector, Natural Gas: S-S 38		
11	K6193	Injector, Natural Gas: S-S 52		
12	K3397	Single pilot burner, Town gas	Maclaren	26T0142 TJ028
13	K3396	Single pilot burner, Natural gas	Maclaren	26T0142 TJ016
14	K2674	Thermocouple	Maclaren	2500M-36
15	K3580	Thermocouple clip		
16	M5222	Electrical control box M10411.		
17	K5426	Thermostat	Ranco	C77-100
18	K5423	Control knob (thermostat)		
19	K4158	Control knob clip	Lewis Spring	LS/402/17
20	K4644	Fuse, 0.5 amp (BS. 2950)		



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DOMESTIC BOILER AND HEATING APPLIANCE MANUFACTURERS

L.96/5/75