

SPRINT 80 F

Wall Mounted, Fanned, Balanced Flue Combination Boiler.

Installation & Servicing

CAUTION: To avoid the possibility of injury during the installation, servicing or cleaning of this appliance then care should be taken when handling sheet steel components.

G.C. Appliance No.

Ideal SPRINT 80 F

47 415 04

IMPORTANT:

This appliance is for use with NATURAL GAS ONLY.

NOTE TO INSTALLER:

LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER

Table 1 - GENERAL DATA

Main Burner		FURIGAS Type R No 118.500.029
Gas Control Valve		HONEYWELL VR 4920 M 2011
Burner Injector <i>Pilot Injector</i>		BRAY 10; 2400 HONEYWELL 56/42A
Gas Supply Connection		Rc. 1/2 (1/2 in. BSP/t)
Inlet Connection - DHW		15mm. O.D. Copper
Outlet Connection - DHW		15mm. O.D. Copper
Flow Connection - CH		22mm. O.D. Copper
Return Connection - CH		22mm. O.D. Copper
Maximum Working Pressure (Sealed systems)	bar (psi)	2.65 (38.5)
Maximum Static Water Head	m (ft)	27.5 (90.0)
Minimum Static Water Head (Open water systems)	m (ft)	1.8 (6.0)
Maximum DHW Inlet Pressure	bar (psi)	6.0 (87.0)
Minimum DHW Inlet Pressure	bar (psi)	1.5 (21.5)
Electrical Supply		240V ~ 50Hz
External Fuse Rating		3 A.
Water Content CH	litre (gal.)	2.9 (0.64)
Water Content DHW	litre (gal.)	0.55 (0.12)
Dry Weight	kg. (lb.)	63.0 (138.6)
Maximum Installation Weight	kg. (lb.)	53.0 (116.6)

Table 2 - PERFORMANCE DATA**(a) Central Heating**

Burner Setting Pressure (Hot)	mbar (in.w.g.)	16.0 (6.4)	9.9 (4.0)	5.7 (2.3)
Output	kW. (Btu/hr)	23.4 (80 000)	17.6 (60 000)	11.7 (40 000)
Input	kW. (Btu/hr)	29.3 (100 000)	22.8 (77 900)	15.9 (54 300)
Gas Consumption (HOT)	l/s (ft ³ /hr)	0.76 (96.3)	0.59 (75.0)	0.41 (52.3)

(b) Domestic Hot water

MAX. Burner Setting Pres- sure (Hot)	mbar. (in.w.g.)	16.0 (6.4)
Maximum DHW Output	kW. (Btu/hr)	23.4 (80 000)
DHW flowrate; 37°C. temp. rise at min. mains water pressure of 1.5 bar (21.5) at an inlet temperature of not greater than 7°C	l/m (gpm)	9.0 (2.0)

Notes;

- (a) Gas consumption is calculated using a calorific value of 38.7 MJ / m³ (1038 Btu/ft³)
- (b) The appliance is preset at the factory to the lowest nominal rating.

INTERNAL WIRING

The internal wiring of the control box is shown in Fig. 6 and 7.

A wiring diagram is also included on the 'Lighting Instruction' label affixed to the inside of the controls compartment lift off cover.

1. Release the captive screw, located at the RH side of the control panel and swing open the panel.
2. Remove the 3 screws and paint cutting washers, securing the controls inner cover and remove the cover.
3. Pass the mains lead into the bottom RH side of the controls compartment via the grommetted hole and route along the outside front edge of the bottom panel. Secure with the clips provided.
4. Wire into the supply terminals marked L, N and E. Secure with the cable clamp.

Notes: (a) The mains lead connection **MUST** be made in such a way that, should the lead slip from the anchorage, the current carrying conductors become taut before the earthing conductor.
(b) The "T" rating of the mains lead should be 70°C.

EXTERNAL CONTROLS

External wiring **MUST** be in accordance with the current I.E.E. Wiring Regulations.

Difficulty in wiring should not arise, providing the following directions are observed:

1. **Room Thermostat**
Remove the link between terminals L1 and L2 and wire in the room thermostat ; Refer Fig. 8 (c).
2. Controls that over-ride an ON/OFF control, e.g. a frost thermostat **MUST** be wired into the mains in parallel with the controls to be over-riden. Wire the frost thermostat into terminal Lo and L2 ; refer Fig. 8 (a).
3. **Time Switch**
(a) **EXTERNAL:** Wire the time switch into terminals Lo, L1 and L2 ; refer Fig. 8 (b) or Fig. 8 (d) [including room thermostat].
Note: The time switch must have isolated contacts.
(b) **OPTIONAL PROGRAMMER KIT**
Refer to the IDEAL SPRINT Programmer Kit Installation Instructions.

Note: Secure each lead with one of the cable clamps provided.

COMMISSIONING AND TESTING

Electrical Installation:

Checks to ensure electrical safety should be carried out by a competent person.

ALWAYS carry out the Preliminary Electrical System Checks as detailed in the Instructions for the British Gas Multimeter or similar test meter,

Refit the controls inner cover.

Gas Installation:

The whole of the gas installation, including the meter should be inspected and tested for soundness, and purged in accordance with the recommendations of CP.331.3.

Purging air from the gas installation may be expedited by loosening the union on the gas service cock and purging until gas is smelled.

Retighten the union and check for gas soundness.

WARNING: Whilst effecting the required gas soundness test and purging air from the gas installation, open all windows and doors, extinguish naked lights and **DO NOT SMOKE.**

INITIAL LIGHTING ; Refer Fig. 9

1. Check that the gas service cock (N) is ON and that the HEATING and WATER switches (T), (W) respectively are OFF.
2. Check that the pump is set to N°3.
3. Slacken the screw in the burner pressure test nipple(T) and connect a gas pressure gauge via a flexible tube.
4. Disconnect one of the black leads from the gas control valve.
5. Disconnect the BROWN fan lead and the YELLOW pressure switch lead from the fan mounting plate, and link the two together with the connector provided-Refer Fig 7.
6. Switch the electricity supply ON and check that all external controls are calling for heat. The 'MAINS' on neon (B) will glow.
7. Set the HEATING switch(T) to ON. The pilot solenoid should open and the intermittent spark commence, continuing until the pilot is established. Check the appearance of the pilot flame – Refer Fig. 10.

Note: The pilot flame is factory set and no adjustment should be necessary.

8. Test the pilot pipe connection for gas soundness using leak detection fluid.
9. Set the 'HEATING' switch to OFF and switch the electricity supply to OFF.
10. Reconnect the gas control, fan and pressure switch leads.
11. Fit the boiler casing,

FITTING THE CASING

WARNING: The casing **MUST be properly fitted for the boiler to operate correctly.**

Note: Before fitting the casing remove the glass fascia retaining tape (and fascia, if required).

Lift the boiler casing up to the boiler assembly and secure with the four fixing screws.

The casing **MUST** seat correctly and compress the sealing strip to make an air-tight joint.

If side clearance is limited this may be checked by ensuring that the top and bottom edges of the casing are correctly located.

IMPORTANT: This appliance must not be operated without the casing being correctly fitted and forming an adequate seal.

12. Switch the electricity supply to ON.

HOT WATER ONLY

13. Set the WATER switch to ON and the HEATING switch to OFF. The WATER neon (V) will glow and will continue to do so as long as the WATER switch is ON.
14. Turn the DHW inlet cock ON and fully open a DHW tap. Check that the pump and the fan start. After the fan has run for a few seconds the pilot solenoid should open and the intermittent spark commence, continuing until the pilot is established.
15. Once the pilot is established the main gas will come on. Check that the main burner cross lights smoothly. If this sequence does not occur then refer to the Fault Finding Section.

16. Test for gas soundness around the boiler gas components using leak detection fluid.

17. Fully open all DHW taps, to ensure that the boiler fires at maximum rate, and operate the boiler for ten minutes to stabilise the burner temperature.

Note: If the DHW inlet temperature is high e.g. (greater than 10°C) pull one of the leads off the thermistor sensor to avoid modulation.

The burner pressure should be 16.0mbar(6.4in w.g.), $\pm$ 0.5mbar (0.2in w.g.). If adjustment is required, remove the plastic cap from the adjuster (X) on the gas valve and turn the red plastic nut **CLOCKWISE** to **INCREASE** the pressure, using a 7mm spanner.

With the boiler firing as above pull one of the low voltage grey electrical leads off the Modureg solenoid.-Refer Fig1. on the gas control valve. The burner pressure should reduce to the minimum setting of 3.5mbar(1.4in w.g.) $\pm$ 0.5mbar(0.2in w.g.).

This is factory set and requires no adjustment.

18. Re-connect the grey electrical lead to the Modureg solenoid to return the burner pressure to the maximum setting.
19. Reduce the DHW draw-off rate to the minimum required to keep the boiler firing and check that the burner pressure decreases in response to DHW temperature rise.
20. Close the DHW tap and check that the main burner extinguishes and the pump stops.
21. Replace the gas valve adjuster plastic cap.

HEATING AND HOT WATER

22. Set the WATER switch to ON and the HEATING switch to ON.

The HEATING neon (U) and WATER (V) will glow.

23. Check that the pump and fan start, that the main burner ignites and crosslights smoothly; as described previously.

24. The boiler is pre-set at the factory to its lowest nominal rating, but can be range rated to suit the system design requirements ; Refer Table 2 on Page 2.

If the burner pressure setting requires adjustment proceed as follows:-

- (a) Remove the securing screw of the cover (Q) on the control panel and swing the cover aside to expose the CH setting pressure adjuster (D).
- (b) Turn the adjusting screw (D) **ANTICLOCKWISE** to **INCREASE** the pressure (or vice versa)
- (c) To ensure that the setting pressure is maintained turn the HEATING switch OFF and then ON again.

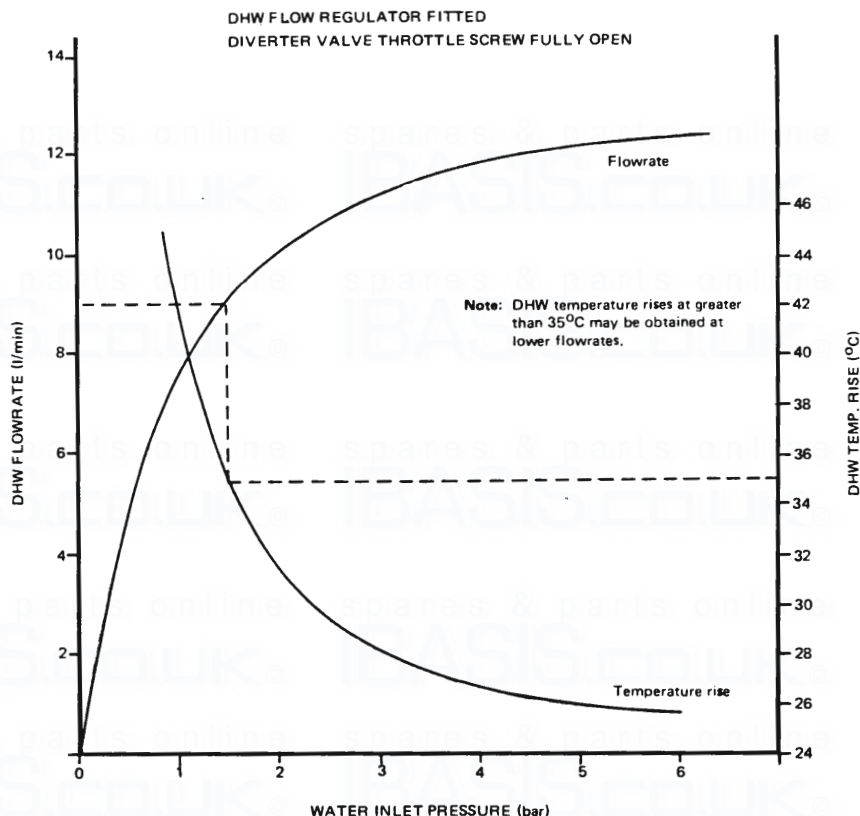


Fig. 5

DHW FLOW CHARACTERISTICS

Check the setting pressure and readjust if it has deviated more than 0.5 mbar (0.2 in w.g.).

(d) Make final adjustment as (c) above.

(e) Swing the cover (Q) back into position and secure.

25. Affix an arrow indicator arrow label, supplied, to the appropriate burner setting pressure on the Data Plate, located at the front RH side of the bottom panel.

Note: Automatic Bypass Valve. This is factory set, but if required, may be adjusted as follows:

- (a) Remove the end cap from the valve (E)-Refer Fig 9.
- (b) Turn the adjuster screw ANTICLOCKWISE to open the valve, increasing the flow through the boiler, and reducing the flow through the system.

DHW FLOW-RATE SETTING

1. Set the WATER switch to ON and the HEATING switch to OFF.
2. Fully open all DHW taps in turn and ensure that water flows freely from them.
3. Close all taps except the furthest one from the boiler and check that the boiler is firing at maximum rate.
4. Adjust the DHW flowrate by turning the throttle screw (32) on the diverter valve (22); Refer Fig. 1, until a DHW temperature of approximately 37°C rise is obtained at the tap. This corresponds to a flowrate of about 9.0 l/min (2.0 gpm).

Note: If the water supply pressure is low, a temperature rise greater than 37°C will result at the taps -refer to Fig. 5.

5. Turn off the DHW tap.
6. Remove the pressure gauge and tube and retighten the sealing screw in the pressure test nipple, ensuring that a gas tight seal is made.

GENERAL CHECKS

Make the following checks for correct operation.

1. HOT WATER MODE

- (a) Set the WATER switch to ON and the HEATING switch to OFF. Check that the WATER indicator neon glows.
- (b) Fully open a DHW tap and check that the pump starts and the main burner lights in response.
- (c) Close the DHW tap and check that the burner extinguishes and the pump stops. The WATER indicator neon should remain illuminated.

2. HEATING AND HOT WATER MODE

- (a) Set the WATER and HEATING switches to ON. Check that the main burner lights and both HEATING and WATER indicator neons glow in response.

Note: If a programmer is fitted the HEATING neon will only glow during ON periods.

- (b) Fully open a DHW tap and check that hot water is delivered.
- (c) Close the DHW tap, set the HEATING switch to OFF and check that the main burner extinguishes and the pump stops.

3. The correct operation of the programmer, if fitted, and all other system controls should be proved. Operate each control separately and check the main burner responds.
4. Check that the casing is seated correctly and compressing the sealing strip all around the casing.

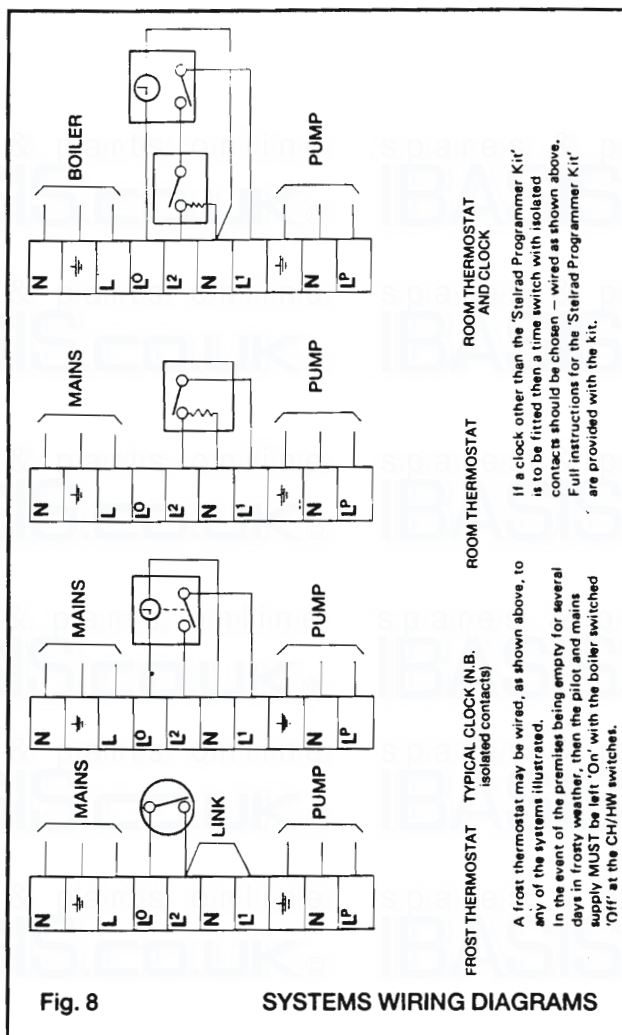
5. WATER CIRCULATION SYSTEM

- (a) With the system cold check that the initial pressure is correct to the system design requirements. For pre-pressurised systems this should be 1.0 bar (14.5 psi).
- (b) Set the RED 'fill pressure' indicator on the pressure gauge, (C) [refer Fig. 9] to the initial system pressure.
- (c) With the system hot examine all water connections for soundness. The system pressure will increase with temperature rise but should not exceed 2.5 bar (36.3 psi).
- (d) With the system still hot turn off the gas, water and electricity supplies to the boiler and drain down in order to complete the flushing process.
- (e) Refill and vent the system as described in 'Guide to System Requirements'. Clear all air locks and again check for water soundness.
- (f) Re-set the system initial pressure to the design requirements.

Finally:

1. Swing the control panel back into its working position and secure.
2. Re-fit the controls compartment front cover and set the controls to the User's requirements.

Note: If an optional Programmer Kit is fitted, refer to the Programmer Kit Installation and User's Instructions.



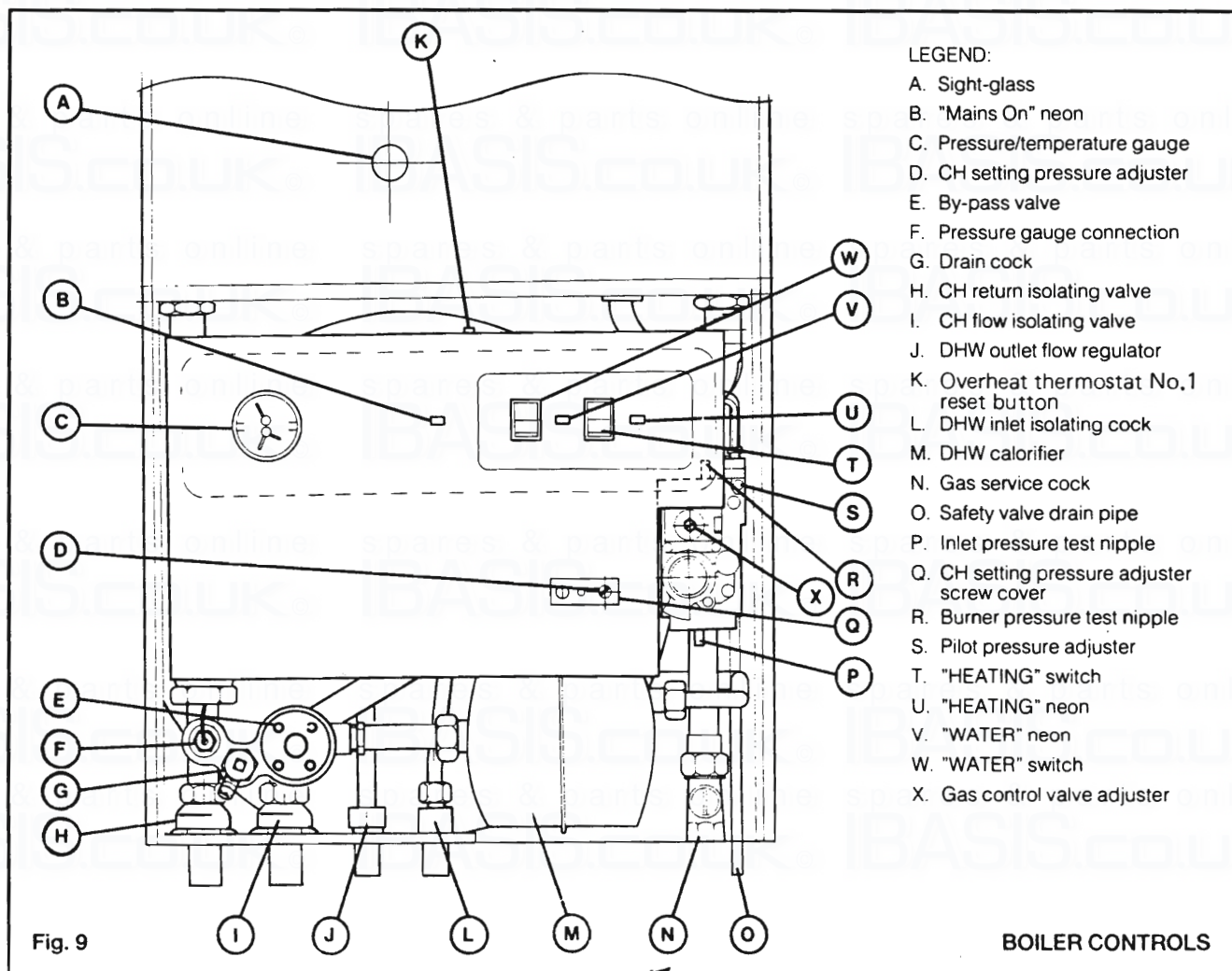
HANDING OVER

After completion of installation and commissioning of the system, the Installer should hand over to the Householder by the following actions:

1. Hand the 'User's Instructions' to the Householder and explain his/her responsibilities under the 'Gas Safety (Installation and Use) Regulations 1984'.
2. Draw attention to the Lighting Instruction label affixed to the inside of the control compartment front cover.
3. Explain and demonstrate the lighting and shutting down procedures.
4. The operation of the boiler, including the use and adjustment of ALL system controls, should be fully explained to the Householder. This then ensures the greatest possible fuel economy, consistent with household requirements of both heating and hot water consumption.

Advise the User of the precautions necessary to prevent damage to the system, and to the building, in the event of the system remaining inoperative during frost conditions.

5. Explain the function and the use of the boiler HEATING and WATER switches.
6. Explain the function of the boiler over-heat thermostat and emphasise that, if cut-out occurs, the boiler should be turned off and the local Heating Installer consulted.
7. Explain and demonstrate the function of time and temperature controls, radiator valves, etc., for the economic use of the system.
8. If an Optional Programmer Kit is fitted, then draw attention to the Programmer Kit User's Instructions and hand them to the Householder.
9. Stress the importance of regular servicing by the Local Gas Region or by a qualified Heating Engineer and that a comprehensive service should be carried out AT LEAST ONCE A YEAR.



SERVICING

THE FOLLOWING SHOULD BE CARRIED OUT AT PERIODS NOT EXCEEDING ONE YEAR

- Carry out a pre-service check and note any operational faults.
- Clean the main burner.
- Clean the heat exchanger.
- Clean the main and pilot injectors.
- Check that the flue terminal is unobstructed and that the flue system, including the inner cover is sealed correctly.
- If the appliance has been installed in a compartment check that the ventilation areas are clear.

SOME OF THE SERVICING POINTS ARE COVERED MORE FULLY IN THE FOLLOWING PARAGRAPHS.

WARNING:

Always turn OFF the gas supply at the gas service cock and switch OFF and DISCONNECT the electricity supply to the appliance BEFORE SERVICING.

IMPORTANT:

After completing servicing or exchange of components always carry out functional checks and test for gas soundness where appropriate.

TO REMOVE THE BOILER CASING-Refer INSTALLATION Frame 5.

Note: Take care not to damage the glass fascia panel (if fitted)

- Lift off the controls compartment front cover.
- Release the two captive screws at the top of the casing, and the two captive screws within the controls compartment and lift the casing off the boiler.

TO REMOVE THE MAIN BURNER AND CONTROLS ASSEMBLY ; Refer Fig. 1

- Release the captive screw at the RH side of the control panel and swing the panel open .
- Pull off the four electrical leads from the front of the gas control valve - the grey wires should be connected to the green Modureg solenoid on the valve ; Refer Fig. 1. Disconnect the earth lead from the front of the valve.
- Disconnect the ignition/detection lead from the automatic ignition PCB.
- Undo the union nut on the gas service cock.
- Undo the screw securing the gas manifold sealing plate to the backpanel.
- Support the burner assembly and remove the wingnut securing the burner front support bracket to the heat exchanger skirt.
- Draw the assembly forward and pull off the red and blue electrical leads from the back of the valve.
- Remove the assembly to a convenient working surface for attention.
- Brush off any deposits that may have fallen on to the burner head, ensuring the flame ports are unobstructed, and remove any debris that may have collected.

Note: Brushes with metallic bristles must NOT be used.

- Remove the main burner injector; ensure there is no blockage or damage.
- Replace the injector, using an approved jointing compound; sparingly
- Inspect the pilot burner, and ignition/detection electrode; ensure they are clean and in good condition. In particular, check that:
 - The pilot burner injector is not blocked or damaged.
 - The pilot burner is clean and unobstructed.
 - The ignition/detection electrode is clean and undamaged.
 - The ignition/detection lead is in good condition .
 - The spark gap is correct ; refer Fig. 10.

TO CLEAN D.H.W. FLOW REGULATOR - Refer Fig. 9

- Close the isolating valve (L) on the D.H.W. inlet.
- Open the lowest D.H.W. draw off tap.
- Undo the unions on the pipe connecting the D.H.W. OUTLET to the calorifier and remove the pipe.
- Lift out the Flow Regulator and clean carefully.
- Re-assemble in reverse order, using new sealing washers.

TO CLEAN THE FLUEWAYS

With the main burner and controls assembly removed, as previously described:

- Unplug the fan and pressure switch electrical connections from the fan mounting plate. NOTE THEIR POSITION, -Refer Fig7.
- Slacken the bottom 2 and remove the top 2 fan mounting plate screws and remove the complete assembly from the boiler.
Check that the fan is running freely and clean the impeller blades with a soft brush. Note; the impeller is finely balanced and care must be taken when handling the fan.
- Slacken the two wing nuts on top of the flue collector hood and the two wing nuts at the front of the hood.
- Disengage the tie-rods -NOTING THEIR POSITION- and remove the hood.
- Place a plastic sheet or similar beneath the heat exchanger and remove all loose deposits from the heat exchanger finned block, brushing from above and below, -and also from the copper skirt, using a suitable brush and/or clearing rod.
- Refit the flue collector hood in reverse order, replacing any damaged or deteriorating sealing gasket.
- Refit the fan assembly in reverse order.
- Refit the burner and controls assembly in reverse order not forgetting to reconnect the electrical leads to the back of the valve, these may be fitted either way round.
- Reconnect the gas and electrical supplies.
- Ensure the sight glass in the boiler casing is clean and undamaged.
- Swing the control panel closed and secure.
- Refit the boiler casing.
- Refit the controls compartment front cover.

PILOT BURNER SETTING

Light the boiler and check that the pilot flame is 50mm (2in) long, as shown in Fig.10.

The pilot adjuster screw is factory set to maximum and no further adjustment should be necessary.

However, if the pilot flame appears small, check the adjustment of the pilot pressure adjuster screw(S) (refer Fig. 9.) as follows:

- Turn the boiler OFF and remove the controls compartment front cover.
- Turn the pilot pressure adjuster screw(S) CLOCKWISE until fully CLOSED.
- Turn the pilot pressure adjuster screw ANTI-CLOCKWISE four full turns to give maximum setting.
- Relight in accordance with the 'Lighting Instructions'.

ADJUSTMENT OF GAS PRESSURE : Refer Fig. 9

After each occasion of servicing, reference should be made to Table 2 which quotes details of the rated output, in relation to the burner setting pressure and the heat input, for both Central Heating and Domestic Hot Water modes.

Any required adjustment should be made by using the pressure adjustment screw (D), for Central heating , or adjusting nut (X) for DHW.

Refer to 'Initial Lighting' on page 15.

REPLACEMENT OF COMPONENTS

WARNING:

ALWAYS turn OFF the gas supply at the gas service cock and switch OFF and DISCONNECT the electricity supply BEFORE WORKING ON THE APPLIANCE.

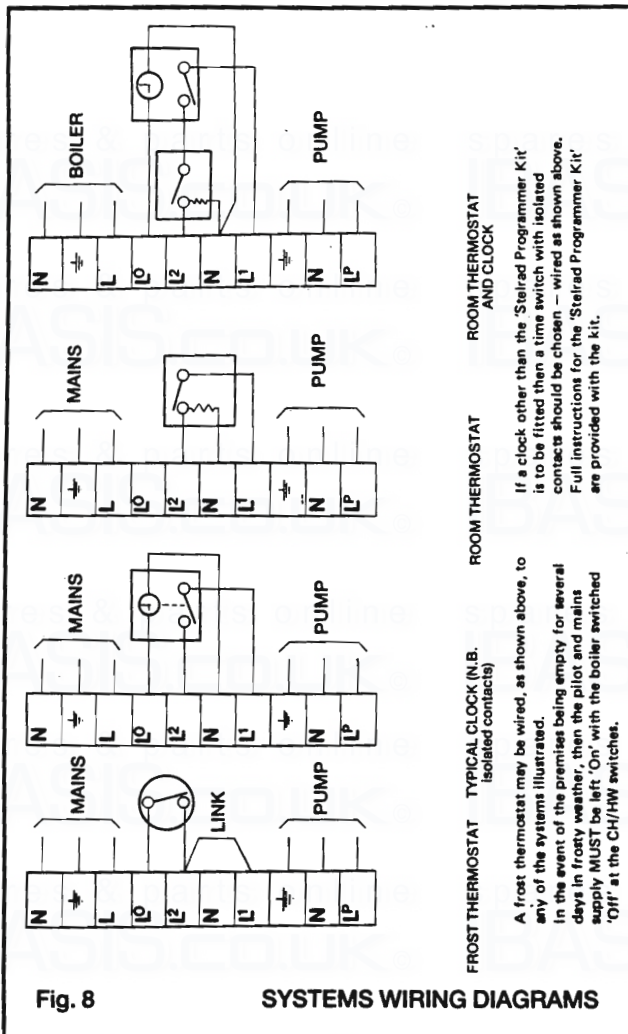
Boiler Control Thermostat - Refer Fig. 1

- Release the captive screw at the right hand side of the control panel and swing the panel open.
- Remove the two screws securing the thermostat to the mounting plate and withdraw the thermostat.
- Pull the two electrical leads off the thermostat.
- Smear the sensing head of the new thermostat with surface contact cream.
- Fit the new thermostat and re-assemble in reverse order.

Note: To replace the following components, it will be necessary to remove the boiler casing, as previously described. In all cases ensure that the boiler casing is correctly refitted.

Boiler Overheat Thermostat - No. 1 - Refer Fig. 1

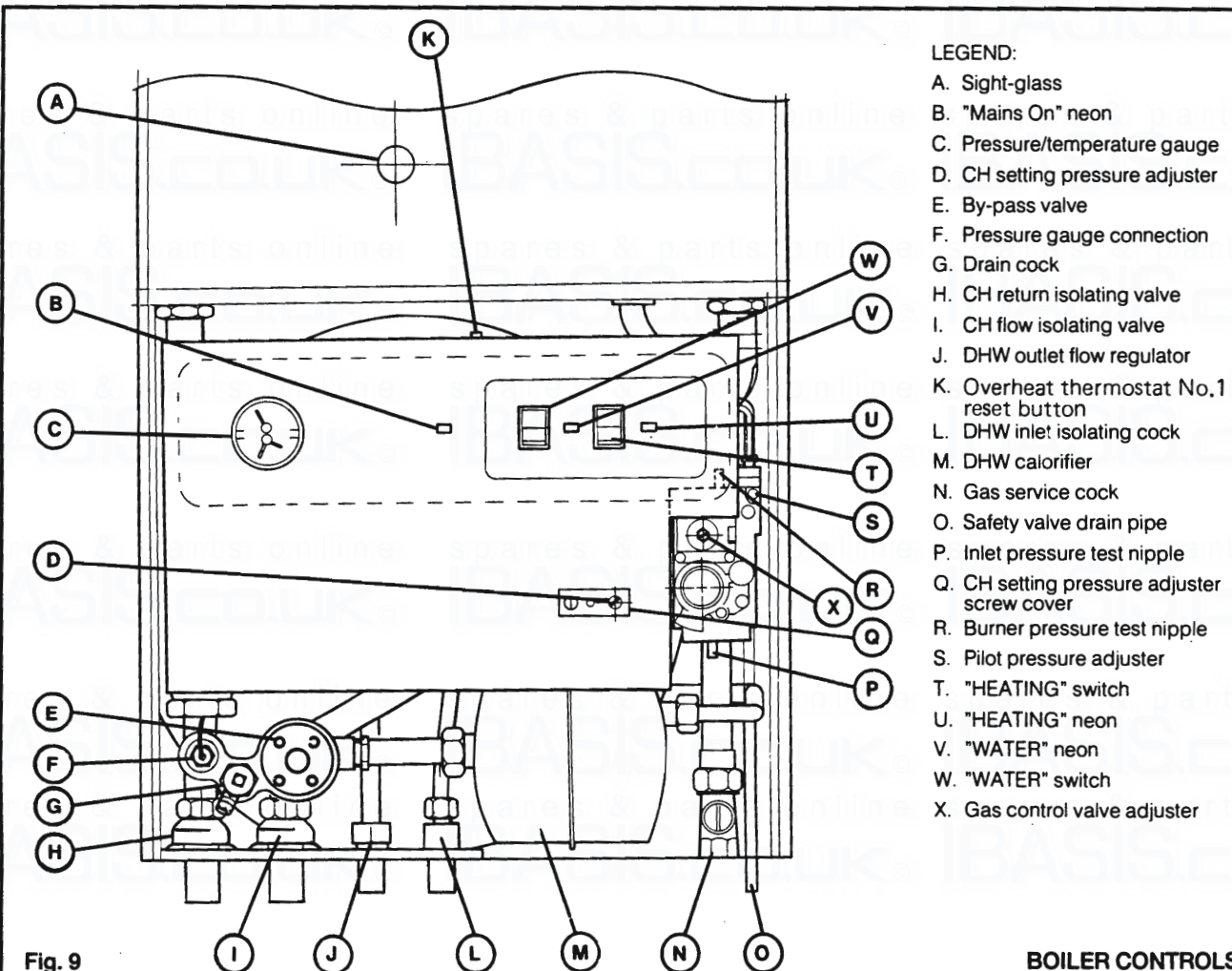
- Swing open the control panel and remove the three screws and paint cutting washers securing the controls inner cover and lift off the cover inner cover as previously described.
- Release the clip securing the thermostat "pancake" sensing head to the boiler flow pipe.
- Remove the nut securing the thermostat to the control panel.
- Pull the two electrical connections off the thermostat , and withdraw the thermostat.



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1. Hand the 'User's Instructions' to the Householder and explain his/her responsibilities under the 'Gas Safety (Installation and Use) Regulations 1984'.
 2. Draw attention to the Lighting Instruction label affixed to the inside of the control compartment front cover.
 3. Explain and demonstrate the lighting and shutting down procedures.
 4. The operation of the boiler, including the use and adjustment of ALL system controls, should be fully explained to the Householder. This then ensures the greatest possible fuel economy, consistent with household requirements of both heating and hot water consumption.
- Advise the User of the precautions necessary to prevent damage to the system, and to the building, in the event of the system remaining inoperative during frost conditions.
5. Explain the function and the use of the boiler HEATING and WATER switches.
 6. Explain the function of the boiler over-heat thermostat and emphasise that, if cut-out occurs, the boiler should be turned off and the local Heating Installer consulted.
 7. Explain and demonstrate the function of time and temperature controls, radiator valves, etc., for the economic use of the system.
 8. If an Optional Programmer Kit is fitted, then draw attention to the Programmer Kit User's Instructions and hand them to the Householder.
 9. Stress the importance of regular servicing by the Local Gas Region or by a qualified Heating Engineer and that a comprehensive service should be carried out AT LEAST ONCE A YEAR.



5. Fit the new thermostat and re-assemble in reverse order, taking care not to damage the thermostat capillary, and ensuring that the sensor is positively located.

Boiler Overheat Thermostat No. 2 – Refer Fig. 1

1. Remove the two screws securing the thermostat to the mounting plate and withdraw the thermostat.
2. Pull the two electrical leads off the thermostat.
3. Fit the new thermostat and re-assemble in reverse order.

Sightglass

1. Remove the fascia panel, if fitted, from the casing by sliding it upwards.
2. Unfasten the two nuts and washers holding the sightglass assembly to the casing front panel.
3. When fitting the new assembly, make certain the parts are in the correct order, i.e. gasket, glass, gasket and frame. Note: the frame **MUST** have the return edge at the bottom.
4. Retighten the two nuts to ensure an airtight seal. Do NOT overtighten.
5. Refit the fascia panel.

Pilot Burner Assembly: Refer Fig.1.

1. Release the captive screw at the right hand side of the control panel and swing the panel open.
2. Undo the spark electrode locking nut and withdraw the electrode and nut.
3. Undo the pilot pipe connection at the pilot burner and pull the pipe clear of the pilot burner. Do NOT lose the pilot injector which is a push fit in the pilot pipe connection to the pilot burner.
4. Remove the two screws securing the pilot burner to the main burner and withdraw the pilot burner.
5. Fit the new pilot burner and re-assemble in reverse order, ensuring that the pilot injector is in position when refitting the pilot pipe

Spark Electrode and Lead Assembly: Refer Fig.1.

1. Remove the burner and controls assembly as previously described.
2. Remove the clip securing the spark lead to the pilot supply pipe.
3. Undo the two screws securing the pilot pipe sealing plate to the underside of the burner manifold sealing plate, and remove the plate and gasket.
4. Undo the spark electrode nut and withdraw the electrode, complete with integral spark lead.
5. Fit the new spark electrode and lead and re-assemble in reverse order.

Main Burner : Refer Fig. 1.

1. Remove the burner and controls assembly as previously described.
2. Remove the pilot burner assembly as previously described.
3. Remove the two nuts securing the burner to the manifold and withdraw the burner.
4. Remove the burner end bracket and transfer to the new burner.
5. Fit the new burner and reassemble in reverse order.

Gas Control Valve :Refer Fig.1.

1. Remove the burner and controls assembly as previously described
2. Undo the pilot pipe connection at the gas valve.
3. Undo the four screws securing the gas valve outlet pipe flange and withdraw the valve. The sealing 'O' ring should be discarded and a new one fitted.
4. Unscrew the inlet pipe and transfer it to the new valve using a suitable jointing compound.
5. Fit the new gas valve ensuring that:
 - (a) The valve is fitted the right way round; an arrow engraved on the valve, indicates the direction of flow.
 - (b) The sealing 'O' ring, supplied with the valve, is correctly fitted at the outlet flange.
6. Re-assemble in reverse order.

Pilot Filter Replacement

1. With the main burner and controls assembly removed as previously described, remove the five screws securing the triangular plate on the left hand side of the gas control valve.
2. Pull out the yellow glass fibre pilot filter and discard.
3. Fit the new pilot filter and re-assemble in reverse order taking care not to damage the cork gasket.

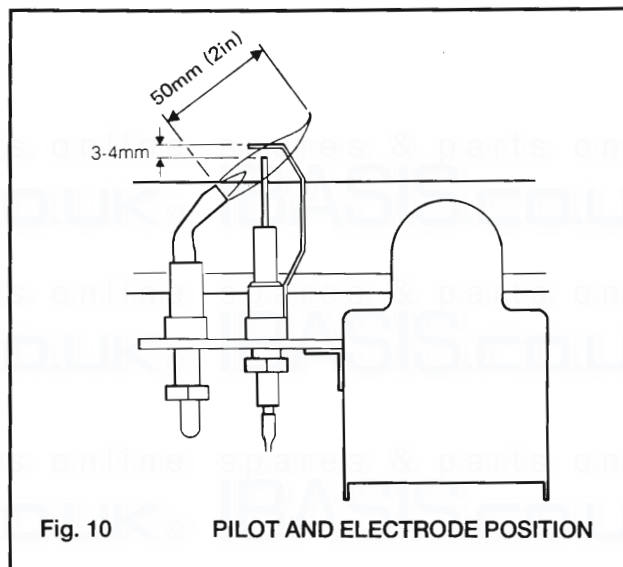


Fig. 10

PILOT AND ELECTRODE POSITION

Modureg Solenoid: Refer Fig.1.

1. Pull the two grey leads off the solenoid.
2. Remove the two screws securing the solenoid operator to the gas control valve and lift off the solenoid.
3. Fit the new solenoid in reverse order.

Complete Fan Unit: Refer Fig.1.

1. Unplug the fan and pressure switch electrical connections from the fan mounting plate, disconnect the electrical leads from the over-heat thermostat No. 2 on the LH side of the boiler, and disengage the leads from the clips on the top edge of the fan mounting plate.
2. Slacken the bottom two and remove the top two fan mounting plate securing screws. Remove the complete assembly from the boiler.
3. Remove the screw retaining the fan pressure switch wiring harness.
4. Remove the nut securing the brass pressure sensing fitting to the fan plate.
5. Remove the two screws securing the fan pressure switch.
6. Disconnect the electrical leads from the connector blocks as follows:-
 - (a) VIOLET lead from top terminal
 - (b) RED lead from second terminal
 - (c) YELLOW lead from third terminal
 - (d) BLUE lead from fourth terminal
 - (e) BROWN lead from fifth terminal
 - (f) GREEN/YELLOW lead from bottom terminal
7. Disconnect the fan earth lead from the earth post.
8. Remove the earth post from the fan mounting plate.
9. Disengage the connector blocks from the fan mounting plate.
10. Refit the pressure switch, brass pressure sensing fitting, earth post, electrical connector blocks and pressure switch wiring harness to the new fan unit.
11. Re-connect all electrical leads - refer Fig. 6 and re-assemble the completed fan unit in reverse order.

Pressure Switch - Refer Fig. 7

1. Proceed as described in steps 1 and 2 under Complete Fan Unit removal.
2. Disconnect the electrical leads from the pressure switch as follows:-
 - (a) RED lead from terminal P (COM)
 - (b) YELLOW lead from terminal 2 (NO)
 - (c) VIOLET lead from terminal 1 (NC)
3. Disconnect the pressure sensing pipe from the switch.
4. Remove the two screws securing the pressure switch to the fan plate and withdraw the switch.
5. Fit the new pressure switch and re-assemble in reverse order, ensuring that:-
 - (a) The pressure sensing pipe is connected to the tapping marked +.
 - (b) All electrical connections are correctly re-made.

Transformer: Refer Fig.11.

1. Swing open the control panel and remove the inner cover as previously described.
2. Pull the two yellow, low voltage leads, off the bottom terminals of the transformer.
Disconnect the brown, mains voltage, lead at the 'in line' connector and the blue, mains voltage lead from terminal 'N' on the terminal strip - refer Fig. 6.

3. Remove the securing nuts, screws and washer, and withdraw the transformer from the control panel.
Fit the new transformer and re-assemble in reverse order.
Ensure that all the electrical connections are correctly remade - refer Fig. 6.

LEGEND:

- | | |
|-------------------------------------|------------------------------|
| 1. Neon indicators(3-off) | 8. Insulation pad |
| 2. Neon indicator lens(3-off) | 9. Automatic ignition PCB 7A |
| 3. Selector switch(2-off) | 10. Transformer |
| 4. Fascia label | 11. Earth screw |
| 5. 12-way connector | 12. Fastening spigot(4-off) |
| 6. Overheat thermostat reset button | 13. Edge connector |
| 7. Pressure/temperature gauge | 14. PCB driver board |

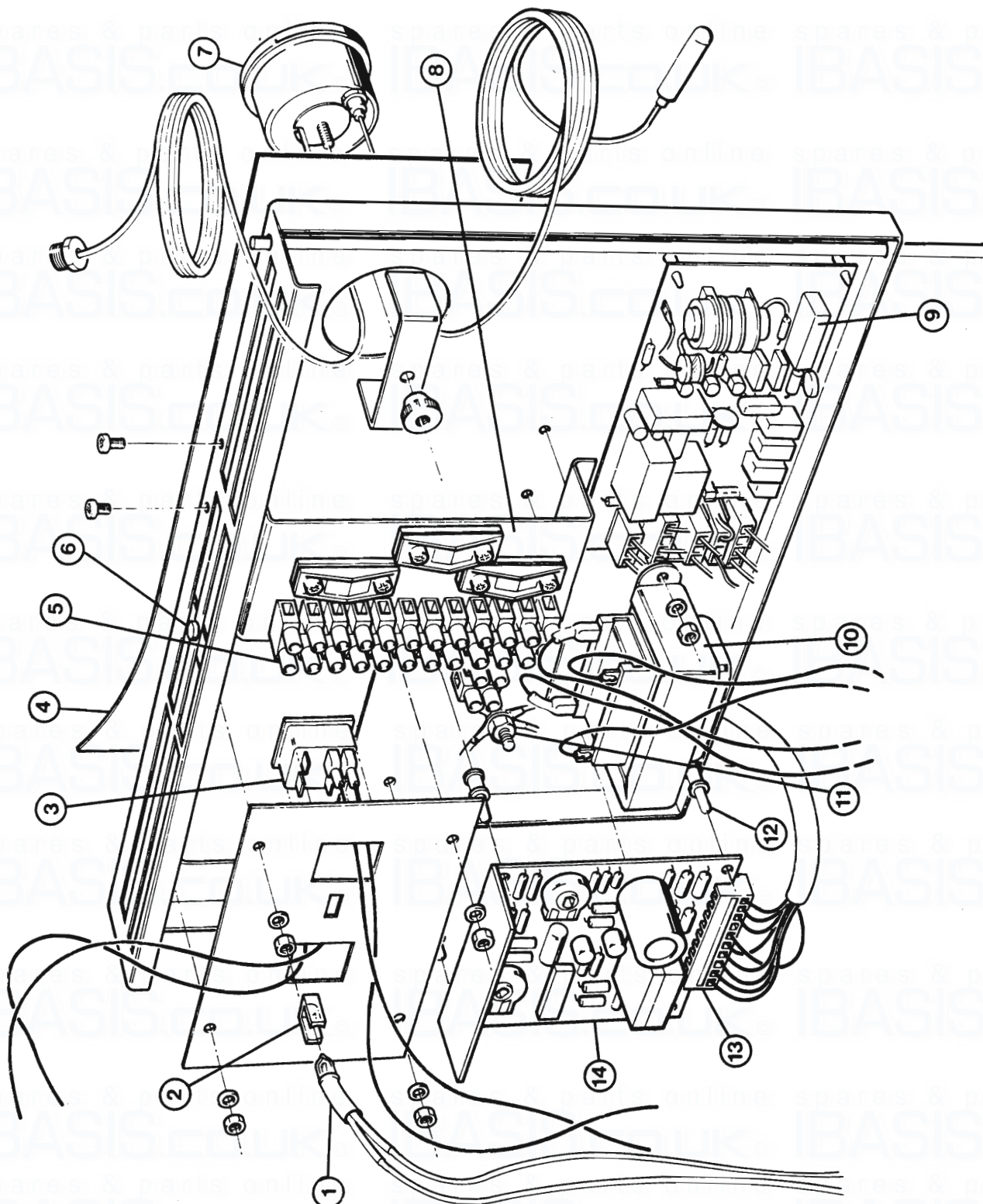


Fig. 11

BOILER CONTROL PANEL
(cover plate not shown)

HEATING AND WATER Switches: Refer Fig.11.

1. Swing open the control panel and remove the inner cover - as previously described.
2. Pull the red lead off the switch bottom terminal and the pink lead (WATER switch), or violet lead (HEATING switch), off the top terminal.
3. Compress the retaining clips and prise the defective switch out, through the front of the control panel.
4. Fit the new switch and re-assemble in reverse order.
Ensure that:
 - (a) The switch is the correct way up - the two terminals should be positioned toward the bottom of the control panel.
 - (b) All electrical connections are correctly re-made; refer Fig. 6.
 - (c) The indicator neons have not been displaced during the switch replacement.

Indicator Neons: Refer Fig.11.

1. Swing open the control panel and remove the inner cover - as previously described.
2. Disengage the neon from within the lens, contained in the control panel.
3. Disconnect the leads from the terminals marked 'N' and 'CH' ('HEATING' neon), 'HW' (WATER neon) or 'L' ('MAINS ON' neon).
4. Fit the new neon and re-assemble in reverse order. Ensure that all the electrical connections are correctly remade; refer Fig. 6.

P.C.B. Driver Board - Refer Fig. 11

1. Swing open the control panel and remove the inner cover - as previously described.
2. Disengage the board from the four mounting pegs by compressing the pegs with pliers.
3. Unplug the edge connector from the board.
4. Fit the new board and re-assemble in reverse order.

Automatic Ignition P.C.B. - Refer Fig. 11

1. Swing open the control panel and remove the inner cover as previously described.
2. Disconnect the five plugs and the ignition/detection lead from the P.C.B.
3. Disengage the board from the four mounting pegs by compressing the pegs with pliers.
4. Fit the new board and re-assemble in reverse order, ensuring that the plug-in connectors are to the left hand side.

DHW Expansion Vessel-Refer Fig.1.

1. Swing open the control panel as previously described.
2. Close the isolating valve (L) on the DHW inlet connection to the boiler-Refer Fig.9.
3. Open the lowest DHW drawoff tap.
4. Unscrew the expansion vessel from the pipe applying an appropriate counter force to prevent damage.
5. Fit the new vessel and re-assemble in reverse order.

IMPORTANT

IN ADDITION TO REMOVING THE BOILER CASING, IN ORDER TO REPLACE THE FOLLOWING COMPONENTS, IT IS ALSO NECESSARY TO DRAIN THE BOILER.

Close the isolating valves (I) and (H) on the central heating flow and return pipes of the boiler. Drain via the drain cock (G); refer Fig. 9.
There may be some slight water leakage, and gas and electrical components and the floor should be protected with water proof sheets or similar.

To refill the boiler then refer to 'Filling Instructions' on Page 13.

D.H.W. Thermistor Sensor-Refer Fig1.

1. Swing open the control panel - as previously described.
2. Pull the electrical leads off the DHW thermistor sensor, located on the boiler return pipe.
3. Unscrew the sensor from the pipe.
4. Fit the new thermistor sensor and re-assemble in reverse order.

Pressure/Temperature Gauge-Refer Fig11.

1. Swing open the control panel as previously described.
2. Unclip the temperature sensor from the boiler flow pipe.
3. Undo the SMALL hexagon nut connecting the pressure sensor to the bypass valve block, and withdraw the sensor.
4. Unclip the pressure and temperature sensor capillaries from the back of the control panel, by compressing the buckle of the retaining strap with pliers.
5. Undo the knurled nut at the back of the gauge and remove the retaining clamp.
6. Withdraw the gauge through the front of the control panel.
7. Fit the new gauge and re-assemble in reverse order.
Ensure that:
 - (a) The capillaries are carefully and neatly routed, as previously.

- (b) The gauge is correctly orientated within the control panel.
- (c) The temperature sensor is correctly positioned - on the boiler flow pipe in front of the safety valve boss.

Diverter Valve Microswitches.

1. Swing open the control panel, as previously described.
2. Pull off the clip securing the micro switches to the left hand end of the diverter valve and withdraw the switches.
3. Disconnect the electrical leads, as follows:
 - (a) YELLOW lead from the LH side terminal;
 - (b) VIOLET lead from the centre terminal;
 - (c) WHITE lead from the RH side terminal;
 - (d) Unplug the three in-line connectors in the, soldered-on PINK, BROWN and ORANGE leads.
4. Fit the new microswitches and reassemble in reverse order.
Ensure that all the electrical connections are correctly remade.

Diverter Valve:Refer Fig.1.

1. Swing open the control panel, as previously described.
2. Pull off the clip securing the micro switches to the left hand end of the diverter valve and withdraw the switches.
3. Close the isolating valve (L) on the D.H.W. connection to the boiler - refer Fig. 9
4. Open the lowest D.H.W. draw off tap.
5. Undo the five union connections and remove the valve. Discard the old sealing washers.
6. Fit the new valve, complete with the new sealing washers provided, and reassemble in reverse order.

DHW Calorifier-Refer Fig.1.

1. Close the isolating valve (L) on the DHW inlet connection to the boiler; refer Fig. 9
2. Open the lowest DHW draw-off tap.
3. Swing open the control panel - as previously described.
4. Undo the four union connections and remove the calorifier. Discard the old sealing washers.
5. Fit the new calorifier, complete with the new sealing washers provided, and reassemble in reverse order.

Note: To descale the calorifier:

- (a) Remove the calorifier from the boiler as described above.
- (b) Descale the domestic hot water coil, using a proprietary descaling agent.
- (c) Rinse thoroughly with clean water.
- (d) Re-assemble in reverse order.

WARNING:

These compounds are highly corrosive and ingestion or contact with skin, eyes and clothing MUST be avoided. Protective clothing should be worn and the descaling operation conducted out of doors or in a well ventilated area.

Pump:Refer Fig.1.

1. Swing open the control panel and remove the inner cover-as previously described.
2. Remove the burner and control assembly - as previously described.
3. Unclip the temperature gauge sensor from the boiler flow-pipe, remove the overheat thermostat "pancake" sensing head from the flow pipe and pull off the electrical leads from the control thermostat.
4. Unscrew the cable clamp and disconnect the pump lead from terminals marked 'L', N and E on the control panel, and pull the pump lead clear.
5. Pull the leads off the DHW thermistor sensor.
6. Remove the screws securing the control panel top support bracket and swing the bracket aside.
7. Slacken the 2.5mm socket screw, located on the By-pass Valve block and below the bottom pump union.
8. Undo the union connecting the pump outlet pipe to the boiler heat exchanger. Withdraw the pump, complete with inlet and outlet pipes, by rotating it to the left and lifting.
9. Undo the pump union connections and transfer the inlet and outlet pipes to the new pump using the new sealing gaskets provided.
10. Remove the four socket screws securing the pump head to the body, and rotate the head through 90° so that when fitted to the boiler the pump terminal box is uppermost. Replace the four socket screws.
11. Transfer the electrical lead to the new pump and

re-assemble in reverse order ensuring that:

- (a) The electrical connections are correctly re-made -refer to Instruction 4 and the diagram inside the pump terminal box cover.
- (b) The pump selector switch cover is correctly fitted and that the switch is set at position '3'.
- (c) The new sealing washer, provided, is fitted to the pump outlet pipe connection to the boiler heat exchanger.

Safety Valve:Refer Fig.1.

1. Remove the burner and controls assembly as previously described.
2. Unclip the temperature sensor from the boiler flow pipe.
3. Unclip the overheat thermostat "pancake" sensing head from the boiler flow pipe.
4. Remove the boiler control thermostat as previously described.
5. Undo the safety valve drain pipe union connection.
6. Undo the unions of the pipe connecting the boiler flow to the diverter valve and remove the pipe.
7. Unscrew the valve from the boiler flow pipe, applying an appropriate counter-force to prevent damage.
8. Unscrew the fitting from the valve outlet and transfer it to the new valve.
9. Fit the new valve using a suitable jointing compound ensuring that the valve is angled approximately 10° down from the horizontal, and re-assemble in reverse order.

Automatic Air Vent-Refer Fig.1.

1. Unscrew the automatic air vent from the boiler flow header, applying an appropriate counter force to prevent damage
2. Fit the new air vent in reverse order.
Note-Ensure that the vent cap is loose.

Boiler Heat Exchanger:Refer Fig.1.

IMPORTANT: Before starting the removal procedure protect the gas and electrical controls with a waterproof sheet or similar.

1. Unscrew the automatic air vent from the flow header of the heat exchanger, applying an appropriate counterforce to prevent damage.
2. Remove the fan unit as previously described.
3. Remove the burner and controls assembly and the flue collector hood, as previously described.
4. Remove the two wing nuts securing the air box bottom front panel and remove the panel.

5. Undo the two wing nuts securing the heat exchanger bottom retaining bracket and remove the bracket.
6. Support the heat exchanger and undo the union nuts on the flow header and return pipe of the heat exchanger.
7. Ease the heat exchanger forward slightly to drain any residual water from the return connection, and then withdraw the heat exchanger from the back panel.
8. Fit the new heat exchanger in reverse order.

By-pass Valve Head :Refer Fig.9.

1. Remove the four screws securing the valve head to the body, and lift off the head complete with the spring and plunger.
2. Fit new components as necessary and re-assemble in reverse order.

CH Expansion Vessel:Refer Fig.1.

In the unlikely event of the failure of the CH expansion vessel it is recommended that a new vessel if fitted exterior to the boiler. It should be positioned on the return pipe and as close to the boiler as possible. If, however, the vessel must be replaced then the following procedure may be used:

1. Remove the main burner and controls assembly as previously described.
2. Remove the pump as previously described.
3. Remove the boiler control thermostat as previously described.
4. Unclip the temperature sensor and overheat thermostat sensing head from the boiler flow pipe as previously described.
5. Disconnect the safety valve drain pipe union connection.
6. Disconnect the safety valve drain pipe union connection.
7. Undo the unions on the pipe connecting the boiler flow to the diverter valve and remove the pipe.
8. Remove the diverter valve as previously described.
9. Undo the unions on the DHW inlet pipe and remove the pipe.
10. Remove the DHW inlet pipe to the calorifier.
11. Remove the DHW calorifier as previously described.
12. Undo the pipe connection at the expansion vessel.
13. Remove the expansion vessel retaining clamp.
14. Lift out the expansion vessel.
15. Fit the new vessel and re-assemble in reverse order,using new sealing gaskets throughout.

LEGEND

- | | | | |
|------------------------|-------------------------|-------------------------------|--|
| 1. Wall mounting plate | 11. Gas service cock | 20. DHW inlet isolating valve | 30. Diverter valve microswitch assembly |
| 2. Flue outlet elbow | 12. Control panel | 21. DHW flow regulator | 31. DHW thermistor sensor |
| 3. Fan plate assembly | 13. Overheat thermostat | 22. DHW outlet | 32. DHW throttle screw |
| 4. Fan | 14. No. 1 reset button | 23. Pressure gauge connection | 33. DHW expansion vessel |
| 5. Automatic air vent | 15. Spark electrode | 24. CH flow isolating valve | 34. Temperature gauge sensor |
| 6. Flue collector hood | 16. Pilot burner | 25. CH return isolating valve | 35. Overheat thermostat No.1 |
| 7. Heat exchanger | 17. Control thermostat | 26. Drain cock | 36. CH expansion vessel |
| 8. Main burner | 18. Diverter valve | 27. Bypass valve adjuster | 37. Back panel assembly |
| 9. Gas control valve | 19. DHW calorifier | 28. Bypass valve | 38. Side flue outlet blanking plate(LHS) |
| 10. Modureg solenoid | | 29. Circulating pump | 39. Overheat thermostat No. 2 |

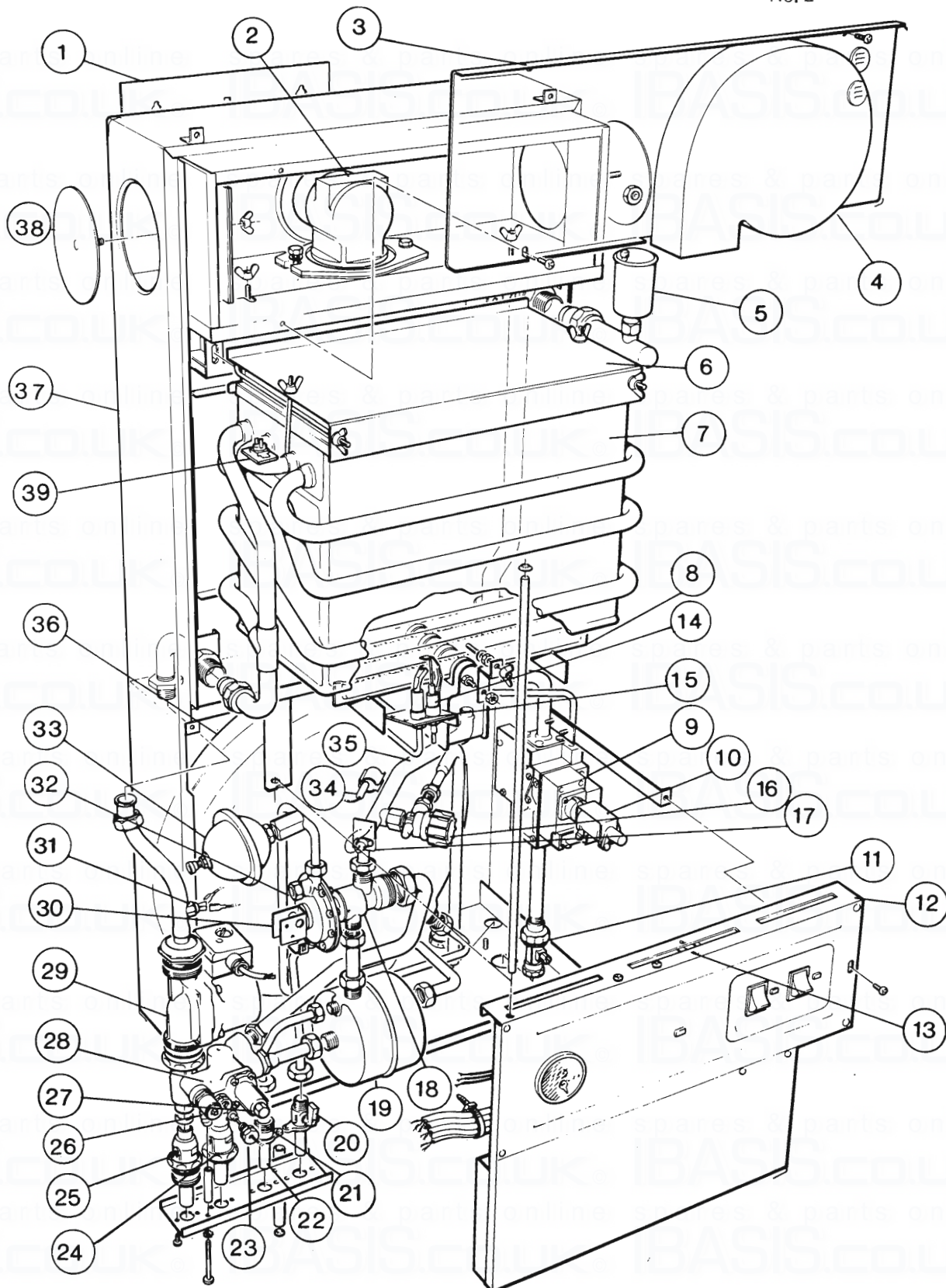


Fig.1

BOILER; Exploded View

All dimensions in mm. (ins)

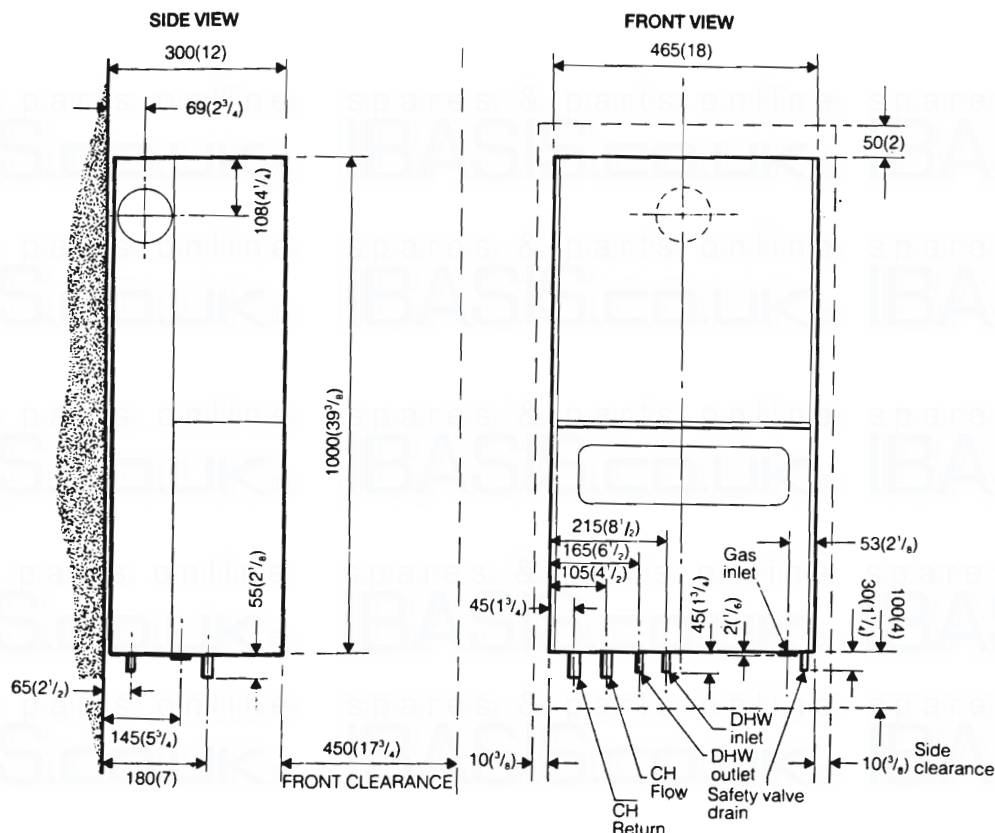


Fig.2

DIMENSIONS

WATER CONNECTIONS; Refer Fig.2

1. Central Heating

Notes:

- When the boiler output exceeds 14.4 kW (49 000 Btu/h) then 28 mm (1 in) pipes should be used, both to and from the boiler. If access is restricted, connect to the boiler in 22mm(3/4in) pipe and increase to 28mm(1in) as soon as is practicable.
- Before any connections are made to the boiler all system valves should be opened and the system thoroughly flushed with cold water.

IMPORTANT; Use Compression Fittings to avoid damage to non metallic components inside the boiler.

- Connect the central heating flow pipe to the pipe end marked 'CH FLOW'.
- Connect the central heating return pipe end marked 'CH RETURN'.
- Fill and vent the system. Check for water soundness.

Note: The cap on the automatic air vent Refer Fig1. MUST be loose at all times. When filling there may be a slight water leak from the vent, so electrical connections on the gas control valve should be protected.

2. DHW Supply : Refer Fig3

Notes:

- It is recommended that a filter be fitted on the cold water inlet supply to the boiler, and especially in hard water areas, a water softening device. The DHW supply pipe MUST be thoroughly flushed BEFORE connecting to the boiler particularly if there is no filter fitted.
- If the mains pressure is less than 1.5 bar remove the flow regulator from the DHW OUTLET pipe, as follows:
 - Release the captive screw (RHS control panel) and swing open the panel.
 - Undo the unions on the pipe connecting the DHW OUTLET to the calorifier and remove the pipe.
 - Lift out the flow regulator and re-assemble in reverse order.
- In areas where the mains water pressure is known to be high (greater than 6bar) it is recommended that a water governor be fitted on the cold inlet supply to the boiler.

IMPORTANT; Use Compression Fittings to avoid damage to non metallic components inside the boiler.

- Connect the cold water supply to the pipe end marked 'DHW INLET'.
- Connect the hot water supply pipe to the pipe end marked 'DHW OUTLET'.

3. Safety Valve Drain

Route a 15 mm OD pipe from the safety valve drain connection (bottom R.H. side of the boiler) to a position outside of the building such that any discharge of water or steam from the valve cannot create a hazard to the occupants or damage to electrical components and wiring.

GUIDE TO SYSTEM REQUIREMENTS; Refer Fig. 3

- The installation must comply with the requirements of BS.5376;2 and BS 5449;1.
- The installation should be designed to work with flow temperatures of up to 82.°C.
- All components of the system, must be suitable for a working pressure of 3 bar (45 psi) and temperature of 110.°C. Great care should be taken in making all connections so that the risk of leakage is minimised.

The following components are incorporated within the appliance.

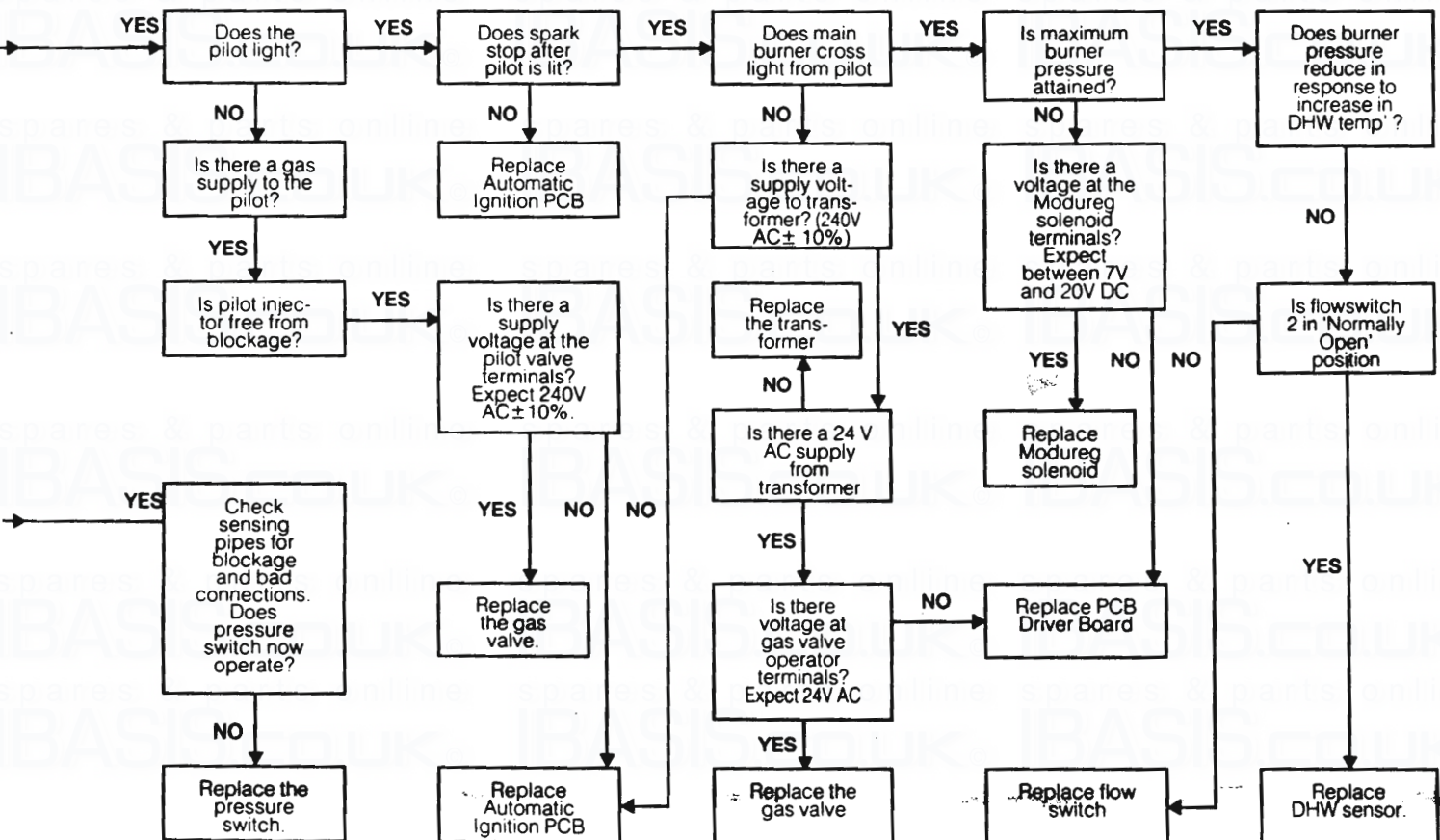
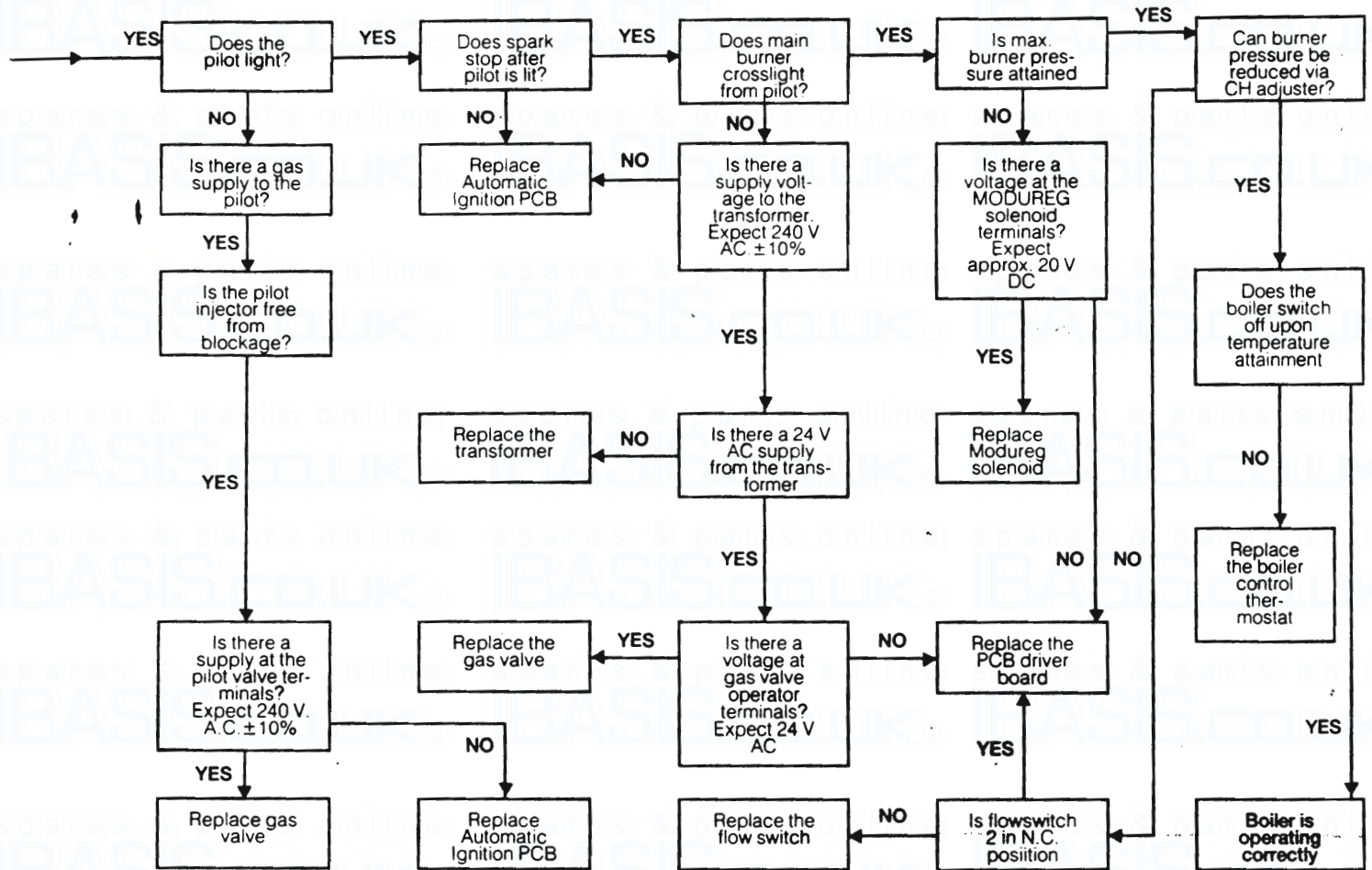
- Circulating pump
- Automatic by-pass valve
- Safety valve with a non-adjustable pre-set lift pressure of 3 bar (45 psi).
- Pressure gauge, covering a range of 0-6 bar (0 to 90 psi).
- 8 litre expansion vessel with initial charge pressure of 0.75 bar.

For further details refer to BS.5449;1 and British Gas Corporation publication; 'Specifications for Domestic Central Heating and Hot Water'.

- 'Make up' water; Provision must be made for replacing water loss from the system either:
 - From a manually filled 'make up' vessel with a readily visible water level. The vessel should be mounted at least 150 mm (6 in) above the highest point of the system and be connected through a nonreturn valve to the system fitted at least 150mm (6in) below the make-up vessel on the return side of the domestic hot water cylinder or radiators (Refer Fig. 3).
 - Where access to a 'make up' vessel would be difficult, by pre/pressurisation of the system (Refer Section 6; 'Filling').
 - The maximum cold water capacity of the system should not exceed 150 litres if not prepressurized. However, if the system is to be prepressurized the efficiency of the expansion vessel will be reduced and a larger vessel (or smaller system volume) may be necessary. If the capacity of the vessel is not considered sufficient for this, or any other reason, an additional vessel should be installed on the return to the boiler. Guidance on vessel sizing is given in Table 6.

1. Ensure that the boiler & system is full of water, free from air-locks & that the pump is running
2. Press the overheat thermostat No. 1 reset button- refer fig. 1, page 11- & continue with the fault finding procedure. If the thermostat operates before normal working

3. Remove the boiler casing, press the overheat thermostat No. 2 reset button- refer fig. 1, page 11- & continue with the fault finding procedure. If the thermostat operates before the normal working temperature is reached then replace the thermostat



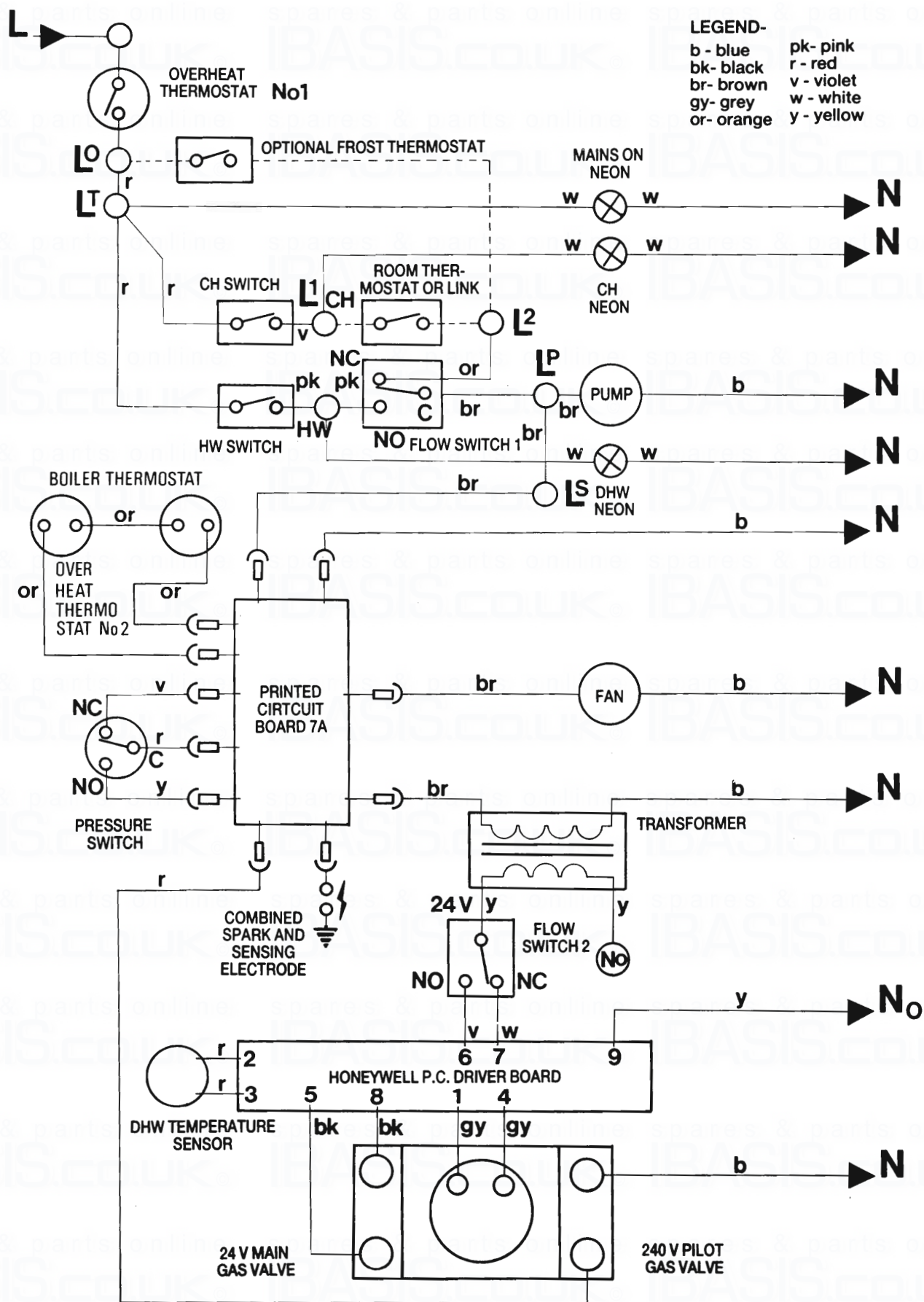


Fig. 6

Legend

b : blue
 bk : black
 br : brown
 gy : grey
 g/y : green/yellow
 or : orange
 pk : pink
 r : red
 v : violet
 w : white
 y : yellow

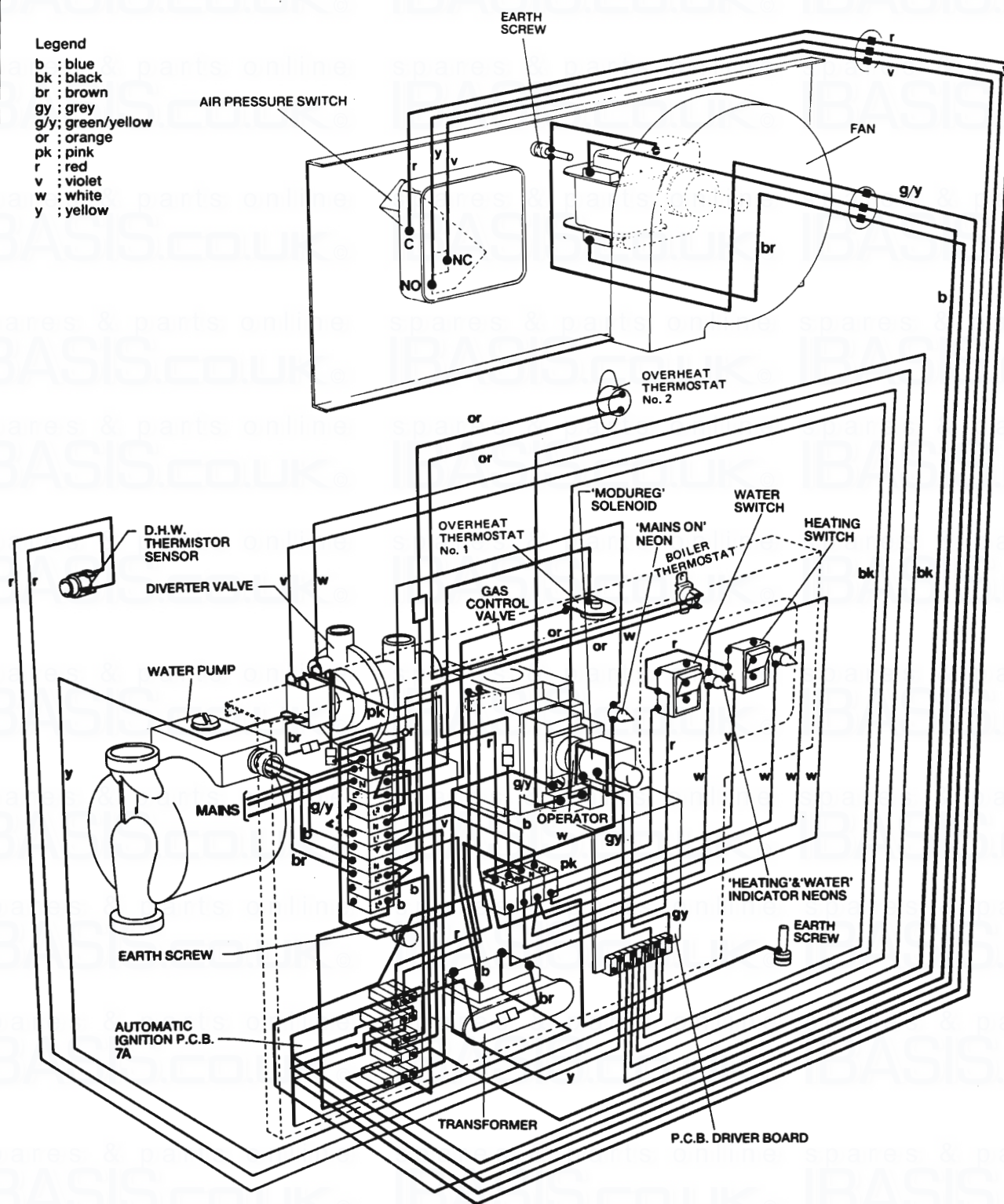
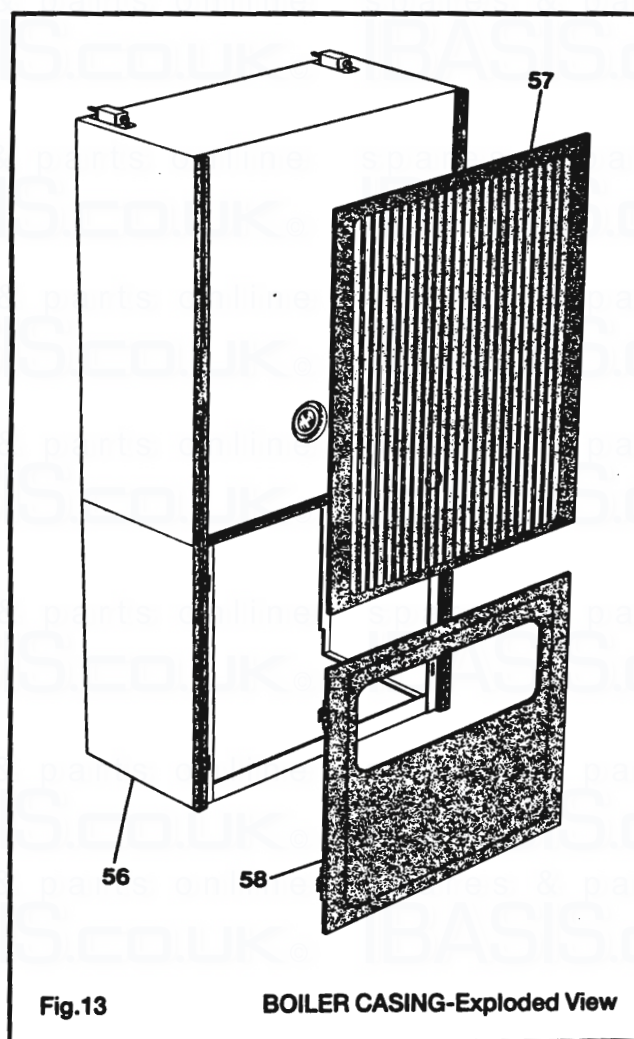
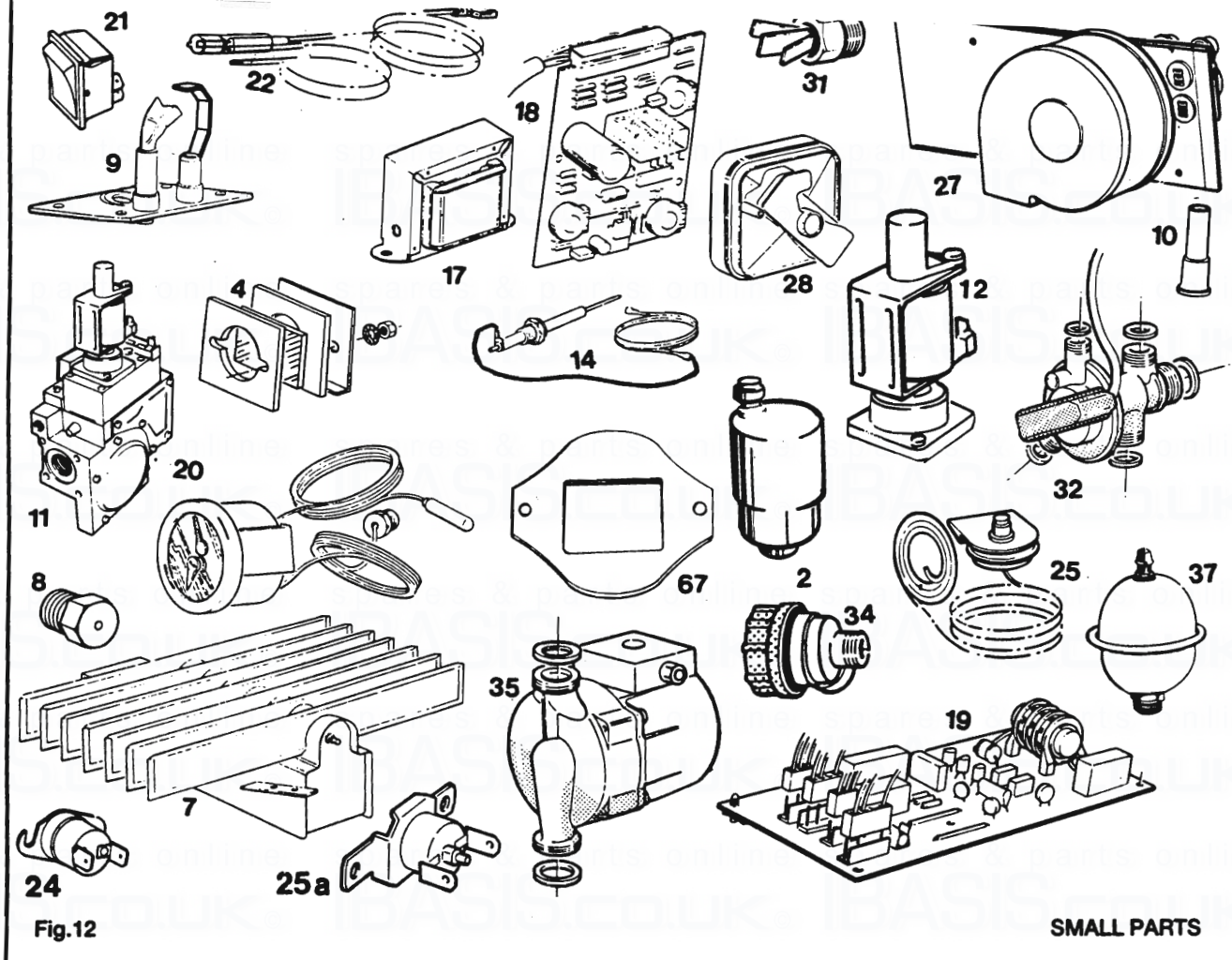


Fig. 7



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