

Microstar MZ 22C

(Microstar 20)

CONDENSING BOILER

GC No 41 851 01

Approval No AND/91/48

**This appliance is for use
with Natural Gas only**

Installation and Servicing Instructions

Leave these instructions
adjacent to the Gas Meter

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1. INTRODUCTION

General Description

The **MICROSTAR MZ 22C** is a wall mounted, balanced flue, fan assisted condensing boiler, designed specifically for use only in a sealed system. All components, including the circulating pump, are installed on an integral chassis assembly that is hung on a special wall mounted bracket. A one piece front cover is air sealed to the chassis assembly and secured by two screws. All service connections are located under the lower face of the chassis whilst the balanced flue plastic ducting is attached at the left-hand upper rear corner of the appliance. The elbowed connection of the flue allows it to be arranged either directly rearward or through a wall to the left or right-hand side of the boiler.

The boiler comprises a high efficiency, finned tube heat exchanger beneath an air fan assisted, downward firing, circular burner. Condensate formed within the heat exchanger is contained by a sump from which it passes to waste via a syphonic trap designed to prevent the water freezing in low temperature conditions. Flue gases are ducted vertically upward from the same sump to the balanced flue assembly.

The expansion vessel in the lower left corner of the chassis caters for changes in primary water volume. The vessel has a water volume of 8 litres and is precharged to 0.5 bar.

Control is accomplished with a Landis and Gyr gas

burner control (start-up and flame supervision), a Sopac boiler thermostat and a Honeywell VR4705A combination gas control. Mains powered ignition is supplied by a Brahma transformer.

Overheat protection is provided by a boiler overheat thermostat and a flue temperature thermostat, both of which function to stop gas by placing the control system in a 'lockout' condition. Both thermostats have a manual reset button accessible only after front cover removal.

A water pressure relief valve set at 3 bar provides relief to atmosphere in the event of an excessive system pressure. System pressure and flow temperature is shown in a dual gauge on the control panel.

The system controls should incorporate a time-switch or programmer, a cylinder thermostat and a room thermostat (not supplied).

An adjustable boiler bypass is incorporated in the boiler system.

figure 2 PUMP HEADS AVAILABLE

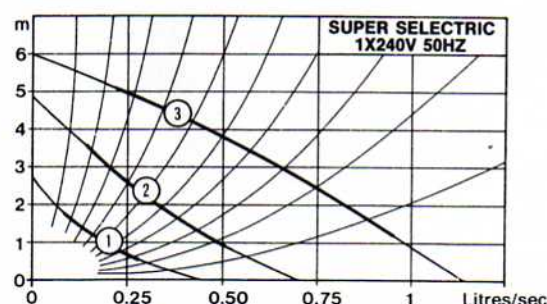
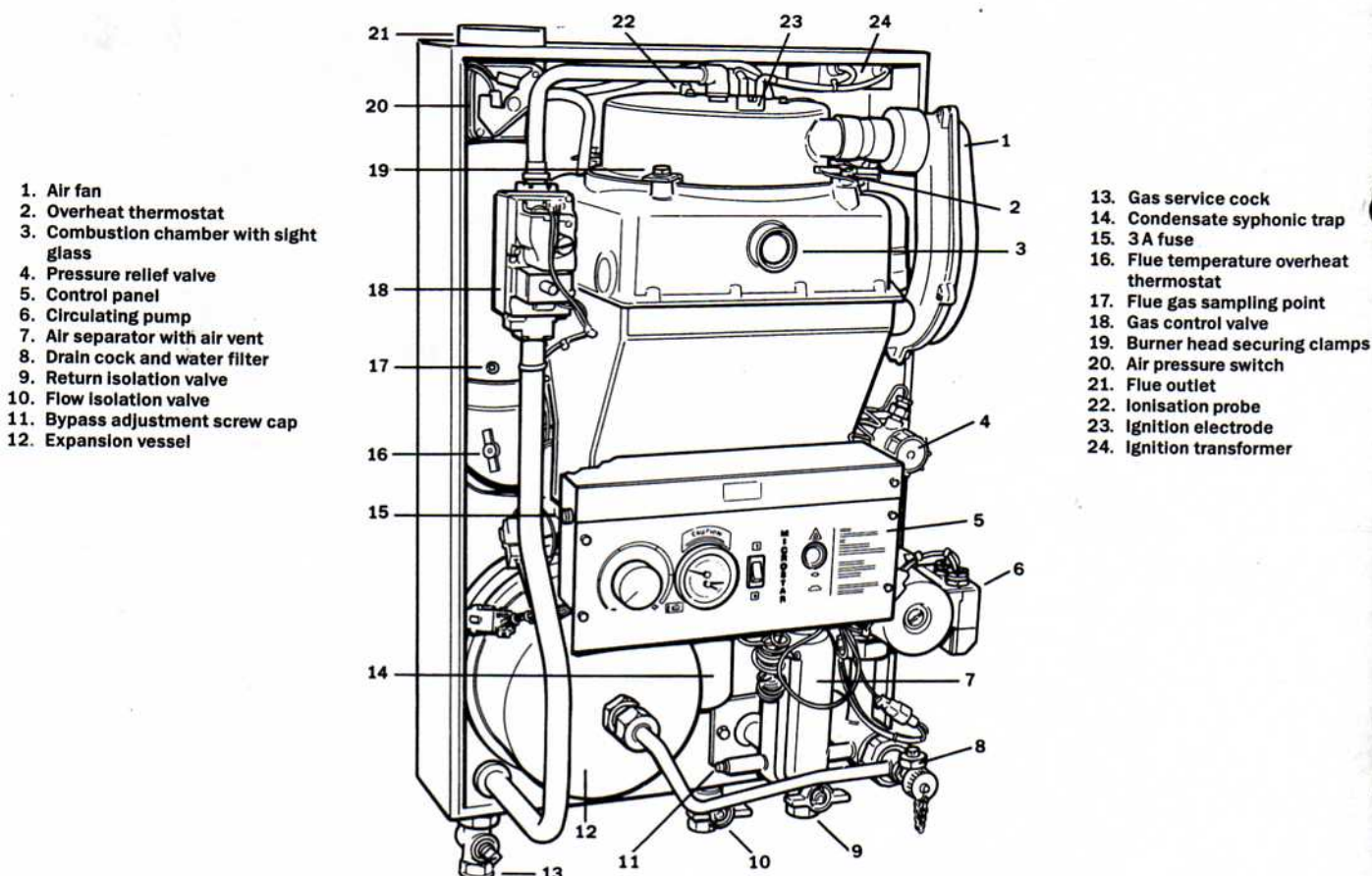


figure 1 COMPONENT LOCATION



2. TECHNICAL DATA

Table 1 PERFORMANCE DATA

Heat Input	20.6 kW	70,300 Btu/h
Heat Output 60°C flow — 40°C return	19.3 kW	66,000 Btu/h
80°C flow — 60°C return	17.8 kW	60,700 Btu/h
Burner Pressure setting	6.8 ± 0.4 mbar	
	2.72 ± 0.16 in.wg	
Gas Rate (maximum)	2.1 m³/h	
	76.5 ft³/h	
Boiler temperature differential	20°C	
Max. operating flow temperature	80°C	
Water flow rate (maximum)	12.7 l/min (2.8 galls/min)	
(minimum)	10.0 l/min (2.2 galls/min)	

NOTE: The data badge is located on the lower face of the chassis next to the electrical cable clamps.

Table 2 GENERAL DATA

Height — with flue air box	900 mm	35.4 in
Width	500 mm	19.6 in
Depth	330 mm	13.0 in
Weight (dry)	41 kg	90.0 lb
Water Content	2.5 litre	0.55 gal
Static Water Head (maximum)	30 m/3 bar/98 ft	
(minimum)	10 m/1 bar/33 ft	
Initial Design System Pressure	1.0 bar	
Water Connections	RC¾	
Gas Connection	RC¾	
Water Pressure Relief Valve Drain	15 mm copper	
Condensate Connection	1¼ in plastic	
Electrical Supply	240 V ~ 50 Hz. Fused 3 A	
Power Consumption	110 W	
Internal fuse (on control box)	3A	
Burner	Geminox Premix No 0491	
Control Box	Landis & Gyr LGA 52 150A27	
Gas Control	Honeywell VR 4705 A 4015	
Air Fan	EMB G2E 176-AA07-05	
Pressure Switch	Dungs LGW3 A1	
Boiler Control Thermostat	Sopac TUA 4C014 90-08	
Overheat Thermostat	Elmwood 2455-RM 100C	
Flue Temperature Overheat Thermostat	Elmwood 2455-RM 85C	
Circulating Pump	Grundfos UPS 15-60	
Flow Switch	Caleffi Flussostat 215	
Expansion Vessel	Zilmet type 00202	
	8 litre/0.5 bar	
Ignition Transformer	Brahma TC2L 724A	

3. GENERAL REQUIREMENTS

The installation of the boiler must be carried out by a competent person in accordance with the relevant requirements of the Gas Safety (Installation and Use) Regulations, Building Regulations, Model Water Byelaws and the Building Standards (Scotland) Regulations. It must also comply with the current I.E.E. Wiring Regulations and the relevant recommendations of the following British Standard Codes of Practice:

- | | |
|-----------|---|
| CP331.3 | Low pressure installation pipes. |
| BS.5449.1 | Forced circulation hot water systems. |
| BS.5546 | Installation of gas hot water supplies for domestic purposes. |
| BS.5440.1 | Flues (for gas appliances of rated input not exceeding 60 kW). |
| BS.5440.2 | Air supply (for gas appliances of rated input not exceeding 60 kW). |
| BS.6798 | Boilers of rated input not exceeding 60 kW. |

NOTE: The boiler is only suitable for installation in a sealed system and must not be used with an open vented system.

Location of Boiler

The boiler can be installed on the inner face of an external wall — and some internal walls — providing they are flat, vertical and capable of adequately supporting the weight of the boiler and any ancillary equipment.

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current I.E.E. Wiring Regulations and, in Scotland, the electrical provisions of the Building Regulations applicable in Scotland with respect to the installation of the boiler in a room or internal space containing a bath or shower. Where installation is in a room containing a bath or shower, any electrical switch or boiler control utilising mains electricity should be situated so that it cannot be touched by a person using the bath or shower.

Where installation will be in an unusual location, special procedures may be necessary and BS.6798 gives detailed guidance on this subject.

A compartment used to enclose the boiler **MUST** be designed and constructed specially for this purpose. An existing cupboard or compartment may be used provided it is modified for the purpose. Details of essential features of cupboard/compartment design, including airing cupboard installations, are given in BS.6798.

In siting the boiler, the following limitations **MUST** be observed:

1. The position selected for installation **MUST** allow adequate space for servicing in front of the boiler and for air circulation around the boiler.
2. This position **MUST** also permit the provision of a satisfactory balanced flue termination.

NOTE: If the boiler is to be fitted in a timber framed building, it should be fitted in accordance with the British Gas publication 'Guide for Gas Installations in Timber Frame Housing'. Reference DM2. If in doubt, advice must be sought from the Local Gas Region of British Gas.

When siting the boiler, provision must be made for the disposal of the condensate, see Section 4 — Condensate drain.

The pressure relief valve connection should be routed to an external, visible point where the discharge of steam or water cannot create a hazard to persons or property. BS.5449:1 refers.

Gas supply

The boiler requires at least 2 m³/hr (73 ft³/hr) of natural gas. The gas meter must be able to pass this amount of gas in addition to all other demands.

An existing service pipe must **NOT** be used without prior consultation with the local gas region.

Installation pipes should be fitted in accordance with CP331.3.

A service cock is supplied with the boiler.

Pipework from the meter to the boiler must be a minimum of ¾ in BSP mild steel pipe or 22 mm O.D. copper tube.

The complete installation must be tested for soundness and purged in accordance with CP331.3.

Flueing

Detailed recommendations for flueing are given in BS.5440.1. The following notes are intended for general guidance.

1. The standard half metre long balanced flue kit supplied with the boiler is suitable for a left-hand or rear facing assembly. A one metre long kit is also available. This is required for a right-hand side flue or for extra thick walls.
2. The appliance **MUST** be installed so that the flue terminal discharges directly into the external air.
3. Termination should be on a clear expanse of wall, the terminal being **NOT** less than 600 mm (24 in) away from a corner, recess or projection.
4. Do **NOT** install the terminal:
 - (a) Within 300 mm (12 in), measured vertically, from the bottom of an openable window, air vent, or any other ventilation opening.
 - (b) Within 300 mm (12 in) above adjacent ground level.
 - (c) Within 600 mm (24 in) of any surface facing the terminal.
 - (d) Within 300 mm (12 in) below eaves.
 - (e) Within 600 mm (24 in) below a balcony or car port roof.
 - (f) Where it is subject to accidental obstruction.
 - (g) Within 75 mm (3 in) below guttering.
 - (h) Within 75 mm (3 in) of drain pipes and soil pipes.

NOTE 1: Where the terminal is within 600 mm (24 in) below plastic guttering, an aluminium shield 1.5 m (5 ft)

long should be fitted to the underside of the guttering immediately beneath the guttering.

NOTE 2: The air inlet/flue outlet duct and the terminal of the boiler must **NOT** be closer than 25 mm (1 in) to combustible material.

- Where the lowest part of the terminal is less than 2 m (6,6 ft) above the level of any ground, balcony, flat roof, or place to which people have access, the terminal **MUST** be protected by a guard of suitable material. Terminal guards are available from Yorkpark Ltd.

Air supply

Detailed recommendations for air supply are given in BS.5440.2. The following notes are intended for general guidance.

Where the boiler is to be installed in a room or internal space, the boiler does not require the room or internal space containing it to have a permanent air vent.

Where the boiler is to be installed in a cupboard or compartment, permanent high and low level air vents are required for cooling purposes in the cupboard or compartment. Both vents must communicate with the same room and internal space or must be on the same wall to outside air.

The minimum effective area of the permanent air vents required in the cupboard or compartment are given in Table 3.

Table 3 AIR VENT AREAS

Position of Air Vents	Air From Room or Internal Space	Air Direct From Outside
High Level	186 cm ²	93 cm ²
	29 in ²	15 in ²
Low Level	186 cm ²	93 cm ²
	29 in ²	15 in ²

Water circulation system

The boiler is designed for use on sealed systems only and must **NOT** be used on open-vented systems or for direct hot water supply. Typical suggested layouts are shown in figure 3. An adjustable bypass valve (supplied fully closed) is incorporated in the air separator.

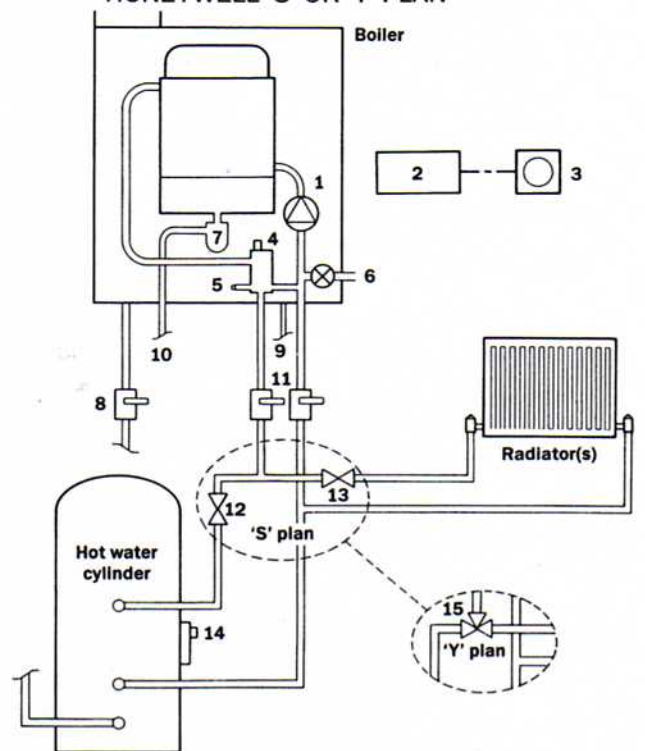
A water circulating pump, an expansion vessel and a water pressure relief valve (pre-set to 3 bar) are all incorporated in the boiler.

The boiler is intended for use in a 'pre-pressurized' mode at an initial system design pressure of 1.0 bar. A make-up vessel is therefore not required.

The expansion vessel is suitable for systems up to **80 litres** water content. For systems in excess of this capacity an additional pressurised expansion vessel will be required. BS.7074 and 'British Gas Specifications for Domestic Wet Central Heating Systems' Part 3 gives guidance in this subject.

The central heating system should be in accordance with the relevant recommendations given in BS.6798

figure 3 TYPICAL SYSTEM LAYOUT WITH HONEYWELL 'S' OR 'Y' PLAN



1. Circulating pump
2. Programmer/Time clock
3. Room thermostat
4. Air vent
5. Bypass adjuster
6. Drain/filling cock
7. Syphonic trap
8. Gas service cock
9. Pressure relief valve discharge
10. Condensate discharge
11. Flow and return isolation valves
12. Motorised valve (hot water)
13. Motorised valve (heating)
14. Cylinder thermostat
15. 3 way motorised valve

NOTE: See figures 9/10 for electrical connections.

and, in addition, for small bore and microbore systems — BS.5449.1. The domestic hot water system, if applicable, should be in accordance with the relevant recommendations of BS.5546.

Copper tubing, to BS.2871.1, is recommended for water carrying pipework.

The hot water storage vessel **MUST** be either of the indirect coil type or a direct cylinder fitted with a calorifier which is suitable for the system pressure. Hot water storage vessels should be insulated, preferably with not less than 75 mm (3 in) thick mineral fibre, or its thermal equivalent insulation.

NOTE: Single feed indirect cylinders are not suitable for sealed systems.

Pipework not forming part of the useful heating surface should be insulated to help prevent heat loss and possible freezing, particularly where pipes are run through roof spaces and ventilated under-floor spaces. Cisterns situated in areas which may be exposed to freezing conditions should be insulated.

Drain taps must be located in accessible positions which permit the draining of the whole system, including the boiler and hot water vessel. Drain taps should be at least ½ in nominal size and be in accordance with BS.2879.

Isolation cocks are provided for both the flow and return.

A drain cock/connection is fitted on the boiler in the return line to the circulating pump.

Electrical supply

Wiring external to the boiler must be in accordance with the I.E.E. Wiring Regulations and any local regulations.

The boiler is supplied for 240 V ~ 50 Hz single phase operation. Fused plug rating is 3 amp.

The method of connection to the mains supply must facilitate complete electrical isolation of the boiler, preferably by the use of an unswitched, shuttered socket outlet in conjunction with a 3 amp, 3-pin plug, both complying with BS.1363. Alternatively, a fused, double pole switch or a fused double pole switched spur with a contact separation of at least 3 mm in all poles may be used serving only the boiler and system controls.

The point of connection to the mains should be readily accessible and adjacent to the boiler — unless the boiler is installed in a bathroom, when the connection must be outside the room.

It is essential that the electrical supply in the property should be properly earthed in accordance with current I.E.E. Wiring Regulations.

NOTE: *Since the boiler casing forms part of the room sealed air intake and flue system it is essential that all electrical connection to and from the boiler be accomplished only via the air tight grommets designed for this purpose in the base of the boiler casing. Under NO circumstances may extra holes be drilled in any part of the casing.*

4. INSTALLATION

Position

Decide the position of the boiler with due regard to the provisions detailed in the Introductory paragraphs of this booklet and the Clearances and Flue/Wall thickness information detailed below.

The wall surface on which the boiler is to be mounted must be flat, vertical, and capable of supporting the boiler weight (41 kg/90 lb). Combustible wall covering need not be removed.

NOTE: *Where the boiler is to be fitted to a timber framed building, it should be fitted in accordance with the British Gas Publication 'Guide for Gas Installations in Timber Framed Housing' ref DM2.*

Clearances

For installation and/or servicing, allow the following clearances around the boiler:

Sides: 25 mm

Above: 200 mm (8 in) above chassis to allow for flue fitment.

Below: 200 mm (8 in).

Front: Access for servicing.

Flue/wall thickness

Standard Flue Kit — Suitable for a rear or left-hand facing wall where the maximum wall thickness is 450 mm.

Optional Flue Kit — Suitable for a right-hand facing wall where the outer wall face is a maximum 615 mm from the right-hand side of the boiler casing.

Service/drains

Ensure adequate space is provided for the gas, flow and return pipes and that the condensate drain and pressure relief valve outlet connections can be led to suitable points of discharge.

Unpacking

The appliance is supplied in 2 separate cartons. Check for any transit damage during unpacking.

1. The main boiler package weighs 50 kg (110 lb) and is supplied on a storage/transit pallet. The carton includes the installation template. Lay the package **front face up** on the floor and cut the packing straps. Open the flaps at either end of the carton and carefully withdraw the appliance.

Remove the two 7 mm Allen key screws in the lower **rear face** of the chassis, then lift off the front cover — bottom edge first then moved toward the top before disconnecting the earth lead.

Check the contents:

Installation and Users Instructions.

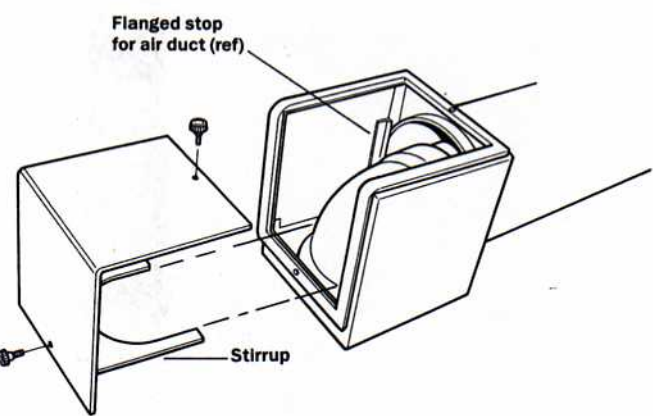
Mounting bracket.

Bottle of system inhibitor — remove from control panel.

Accessory pack of loose parts containing: 2x28 mm elbows, bag of sealing washers, gas cock, flow and

4. For a rear flue or where a left-hand flued boiler is being fitted very close to a left facing wall, position the wall seal 20 mm onto one end of the air duct.
5. For all forms of installation, fit the air box onto the end of the duct, ensuring that the end of the duct abuts the flanged stops in the box. Pass the air duct through the wall until the seal (where fitted) contacts the wall and secure the air box (E) to the top of the boiler chassis (4 screws) with the cover opening facing to the left-hand, right-hand or rear side, as required.
6. Check the two 'O' rings are fitted to the male end of the flue duct elbow and lubricate both rings and the female end of the boiler flue pipe with a silicone grease. Pass the flue duct (F) into the air duct and locate the elbow into the boiler flue duct ensuring the 'O' rings are not distorted.
7. Fit the air box cover (G) so that the stirrup locates around the boiler end of the flue duct elbow (see figure 7) and secure with the two knurled screws.

figure 7 AIR BOX COVER FITMENT



8. Where applicable on a side facing flue, make good the wall face by sealing the air duct to the inner and outer wall faces with a suitable proprietary sealant, ensuring that the duct is horizontal.
9. Position the half moon flange (B) and the terminal (A) on the flue duct and position the terminal on the wall such that the flue duct outer end is slightly upward. (This ensures that any condensate formed will drain back into the boiler.) Mark equidistant holes in this position for No. 6 x 1½ in screws, then remove the flange and terminal before drilling the holes.
10. Refit the half moon flange with the inner segment positioned at the bottom and secure the terminal to the wall with the stainless steel screws.

Gas connection

Connect the gas supply via the service cock supplied and check for soundness. See General Requirements – Gas Supply.

Water system/connections

Plan and arrange the flow and return connections (see figure 4). Fit the isolation valves but do not connect to the boiler until after initial flushing — see Commissioning.

NOTE: Where total system capacity exceeds 80 litres, an extra expansion vessel must be connected into the system. The vessel must be of the same charge pressure (0.5 bar) as the boiler fitted expansion vessel and be sized as indicated in Table 4. Where the calculated size required is not manufactured, then the next larger size should be fitted. Connection should be made at a point close to the boiler return connection with a valve free pipe size of not less than 15 mm.

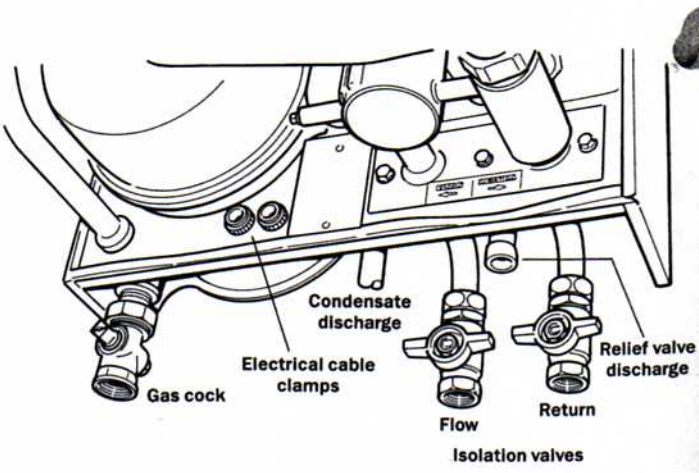
Table 4 EXTRA EXPANSION VESSEL

Litres in excess of 80	2nd Expansion vessel volume required
20	1.7
30	3.4
50	5.1

Condensate Drain

The outlet pipe from the trap should be continued by plastic tubing into the household drainage system or out through the wall using a 32 mm (1¼ in) diameter pipe to an existing drainpipe or soakaway. (The existing drain pipe must be corrosion resistant.) Ensure that any 'horizontal' lengths slope downward at a rate of 40 mm/metre and that any external sections of the pipe are protected against the possibility of blockage by freezing conditions.

figure 8 SERVICE CONNECTIONS



Water Pressure Relief Valve Discharge Pipe

Arrange and connect a drain pipe to the relief valve discharge connection. The pipe must terminate outside the building in a position where any discharge can be seen but cannot cause damage to person or property.

Electrical Connections

Typical methods of wiring the appliance using either two zone valves (Honeywell Plan 'S') or a flow sharing valve (Plan 'Y') incorporating an external programmer are shown in figures 9 and 10. For other proprietary systems follow the component manufacturer's instructions.

Where a room thermostat only is employed, remove the black wired link on the terminal block and connect the thermostat by securing the cable via the second cable entry clamp.

When external control systems are used, room thermostats and cylinder thermostats must be connected through the external source. Only if the boiler is used for separate space heating (ie without domestic hot water system) should a room thermostat be wired directly into the boiler terminal block.

figure 9 WIRING DIAGRAM FOR 'S' PLAN

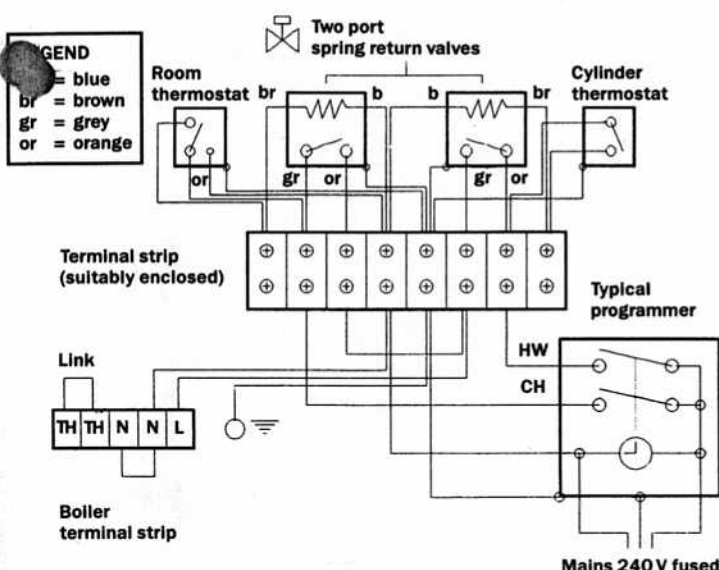
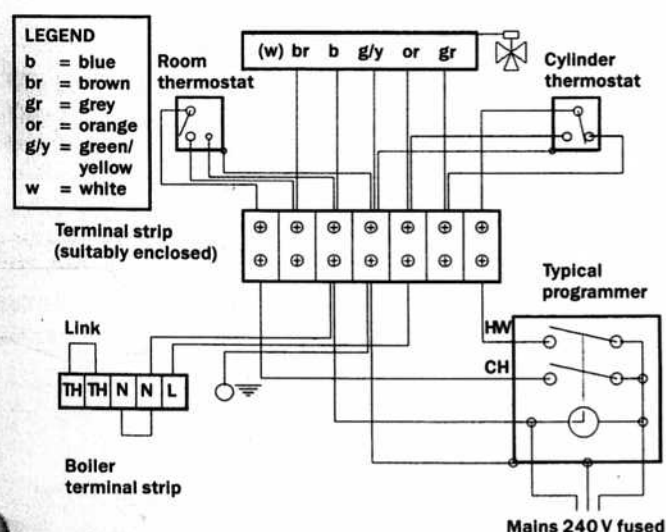
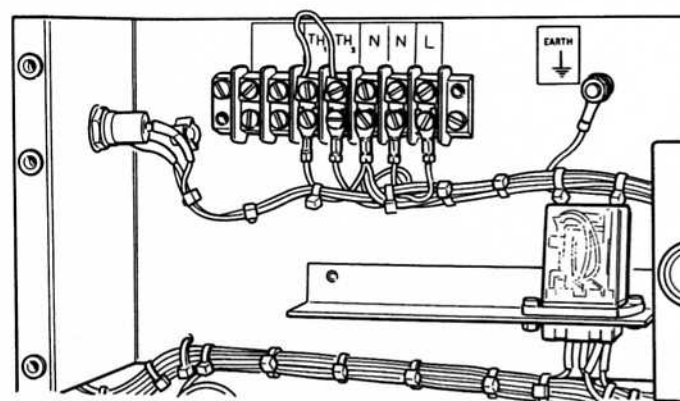


figure 10 WIRING DIAGRAM FOR 'Y' PLAN



The incoming power lead must enter the boiler via one of the two cable entry clamps in the base of the chassis. Remove the control panel top cover (2 screws) and connect the leads onto the terminal block as shown in figure 11. The cable used should be 3 core x 0.75 mm² (24 x 0.2 mm) cable to BS.6500 Table 16.

figure 11 WIRING CONNECTIONS



Connect the wire coloured brown to the terminal marked L.

Connect the wire coloured blue to either of the terminals N.

Connect the wire coloured green/yellow to the earthing stud marked to the right-hand side of the terminal block. Ensure that the length of the conductors is such that the current-carrying conductors become taut before the earthing conductor, should the cable slip from the cord anchorage. Tighten the cable entry clamps.

5. COMMISSIONING AND TESTING

Electrical Checks

Carry out the Preliminary Electrical System checks for earth continuity, short circuit, polarity and resistance to earth using a suitable multimeter.

Water Circulation System

Flushing. Before connecting the flow and return connections to the boiler, thoroughly flush the system with all radiator and control valves open until the discharge water is clean, then connect the flow and return unions to the boiler.

Filling/Venting. Filling should be accomplished by one of the following methods but it should be understood that a **permanent** connection must not be made between the boiler and the main water supply without the approval of the Local Water Authority.

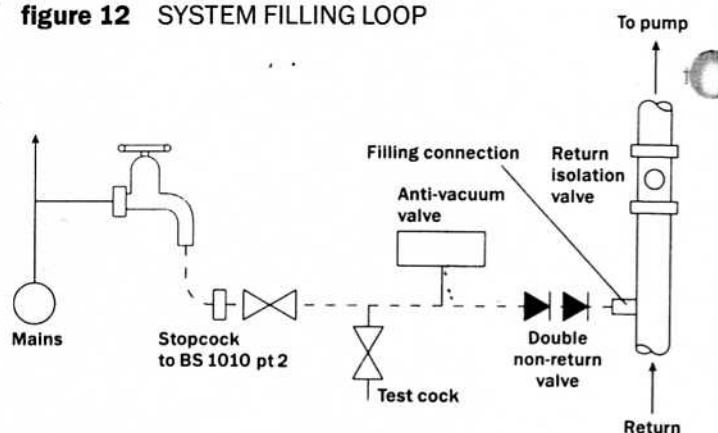
1. Through a temporary hose connection from a draw-off tap and check valve (see figure 12), supplied from a service pipe under mains pressure provided that this procedure is acceptable to the Local Water Authority. Where the mains pressure is excessive, a pressure reducing valve may be used to facilitate filling.
2. Through a self-contained unit comprising a cistern, pressure booster pump if required and, if necessary, an automatic pressure reducing valve or flow restrictor. The cistern should be supplied through a temporary connection from a service pipe or cold water distributing pipe. The unit may remain permanently connected to the heating system to provide limited automatic water make-up.
3. Through a cistern, used for no other purpose, permanently connected directly to a service pipe or cold water distributing pipe. The static head available from the cistern should be adequate to provide the desired initial system design pressure. The cold feed pipe from the cistern should include a non-return valve and a stop valve with an automatic air vent connected between them, the stop valve being located between the system and the automatic air vent. The stop valve may remain open during normal operation of the system if automatic water make-up is required.

Example — using method 1

1. Temporarily connect the mains supply to the filling connection as shown in figure 12.
2. Slacken the vent cap (if fitted) on the air separator and slowly open the filling point stop cock until water is heard to flow.
3. Starting at the lowest radiator(s) fill and vent the system until clear water is discharged. The boiler will automatically vent via the air separator vent valve discharge pipe.

NOTE: After filling the system or when refilling a system

figure 12 SYSTEM FILLING LOOP



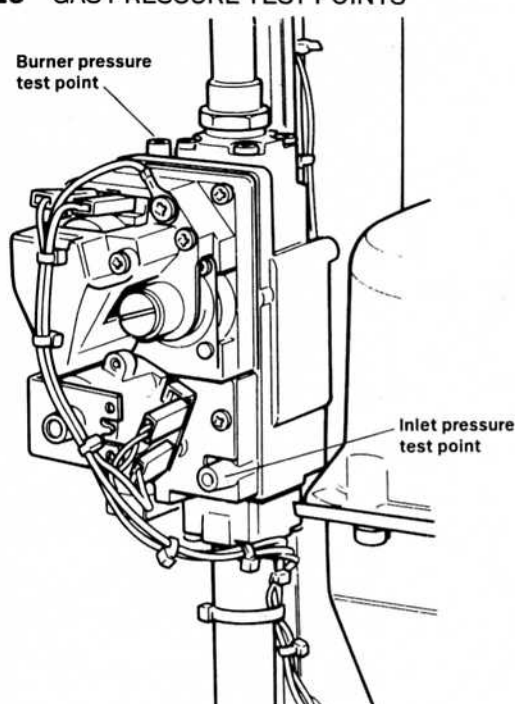
(particularly on new boilers or whenever a new pump is fitted), remove the pump vent screw and rotate the spindle with the aid of a screwdriver. Failure to accomplish this procedure may prevent the pump from starting.

4. Continue filling the system until 2.7 bar is registered on the pressure gauge then turn off the filling stop cock and check the whole system and all boiler connections for soundness.
5. Remedy any leakage as necessary then reduce the system pressure to the 'initial system design pressure' of 1.0 bar by momentarily operating the pressure relief valve (quarter turn anti-clockwise).

NOTE: This action also constitutes the statutory requirement of checking the pressure relief valve action. Check that the valve has reseated satisfactorily by ensuring that there is no further fall in pressure.

Gas Installation. Slacken the inlet test point screw in the gas control (figure 13), turn on the gas service cock and purge the system until gas is smelled. Tighten the test point screw and check for soundness. Slacken the burner pressure test point screw and attach a suitable pressure gauge.

figure 13 GAS PRESSURE TEST POINTS



Lighting the Boiler

With the On/Off switch (see figure 14) set to Off, check that the mains electrical supply, gas service cock and all water valves are on — including at least one radiator.

Set the roomstat, boilerstat and cylinderstat (if fitted) to call for heat and any programmer or timeswitch to an 'on' cycle.

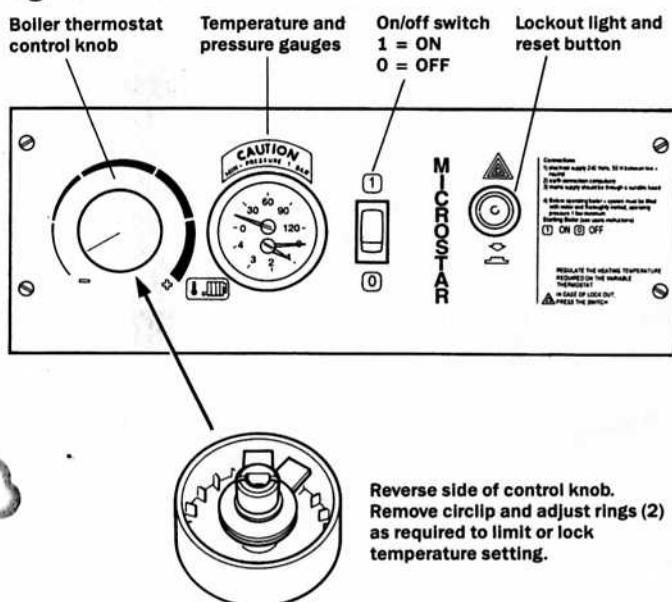
Set the On/Off switch to 1 — the switch neon will illuminate, the pump and air fan will start and after a 15 to 30 second air purging and safety period, the gas valve will open and the ignition sequence will commence.

The ignition electrode will arc continuously for approximately 2½ seconds while the boiler lights up.

NOTE: If ignition does not occur, the control will 'lockout' at which time the lockout indicator will illuminate and the air fan will stop. (The pump will continue running.) A period of approximately 30 seconds must then be allowed to elapse before pressing the lockout button to initiate a new start sequence.

When the boiler is lit, check the gas manifold and gas control for soundness using a leak detection fluid.

figure 14 CONTROL PANEL



Checking the burner pressure (see figure 13)

Operate the boiler for 5 to 10 minutes before checking the pressure. See Table 1, Technical Data. If the observed pressure is outside the tolerances, check that the inlet pressure is 20 mbar. If this is satisfactory, contact Yorkpark Ltd for advice. Turn the boiler off, remove the pressure gauge and tighten the test point screw. Turn the boiler on again and check for soundness at the pressure test point.

Check the flame picture to ensure there is adequate air for combustion. There should be no excessive lift or yellowing of the flame.

Check the system controls and the boiler thermostat at various settings to ensure that the boiler switches on and off correctly. Whilst at maximum operating temperature, examine for water soundness. Also check that the system is maintaining the set water pressure. If

the pressure has fallen, re-examine for signs of leakage and rectify as necessary.

Balancing the System

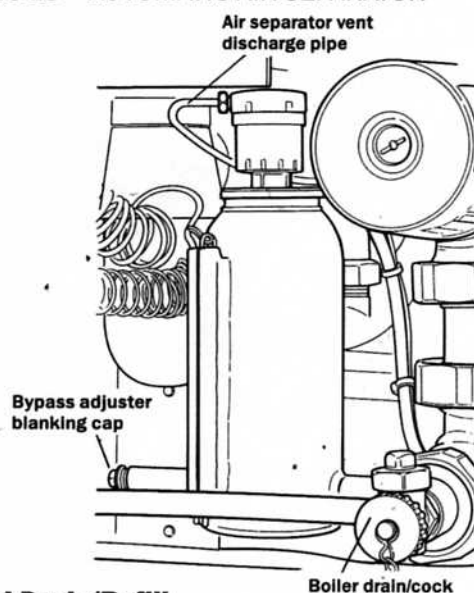
With the system thoroughly warmed up and the boiler thermostat set to maximum, set the pump speed to obtain a 20°C differential between the boiler flow and return temperature.

NOTE: Under no circumstances should pump speed '1' be used.

Bypass valve. In a radiator system with conventional control valves with one lockshield valve locked open, the boiler bypass should remain in its (supplied) fully closed setting. This will help in providing as low a return temperature as possible which is essential in maintaining the boiler in a high efficiency, condensing mode.

Where more than 50% of the system includes thermostatic radiator valves, proceed as follows: Fully close all radiator valves. The boiler will stop as the flow switch senses a lack of flow. Now gradually open the bypass valve (see figure 15) half a turn at a time until the boiler can be relit.

figure 15 AUTOMATIC AIR SEPARATOR



Final Drain/Refill

This boiler uses an aluminium alloy heat exchanger which must be protected internally by the use of an approved inhibitor such as the Geminox Inibal supplied with the boiler or Fernox Copal.

Shut down the boiler and drain the system while it is still hot. Close the drain when empty, then remove the boiler drain cock connector cap and use the filling hose to empty the contents of the supplied inhibitor bottle into the system. This quantity is sufficient for an average house system. If another proprietary brand is used, the instructions supplied with the inhibitor should be followed.

Fill, vent and pressurize the system as described under Filling/Venting, then operate the boiler again for 5 to 10 minutes to thoroughly circulate the inhibitor. Set the red pointer on the pressure gauge to 1.0 bar.

Refit the front cover by reconnecting the earth lead and hooking the top of the cover onto the top rail of the boiler chassis and pushing on the lower edge. Make sure the cover seats evenly without trapping any item around the chassis and secure with the two screws.

Handing Over

Hand the USERS INSTRUCTIONS to the user for retention and explain the operation of the boiler and the adjustment of the system controls.

Advise the user on the precautions necessary to prevent frost damage to the system and the boiler during frost conditions.

Stress the importance of leaving the system running continuously, eg on low temperature setting, in extremely cold weather.

Advise the user that for continued efficient and safe operation of the boiler, regular servicing should be carried out by the local British Gas region or by a qualified Heating Engineer.

6. ANNUAL SERVICING

Servicing as listed below should be carried out annually by a competent person.

- Check the combustion gas CO/CO₂ ratio.
- Clean the burner and electrodes.
- Wash out the heat exchanger and syphonic trap.
- Check the burner pressure.
- Recheck the combustion ratio.
- Check for satisfactory operation.

WARNING — BEFORE SERVICING, TURN OFF THE GAS SUPPLY AT THE GAS SERVICE COCK AND SWITCH OFF AND DISCONNECT THE ELECTRICAL SUPPLY TO THE BOILER.

Front Cover Removal/Fitment

Remove the two socket screws on the lower inner face of the chassis. Pull the lower end of the cover out slightly, disconnect the earth lead then lift the cover up and off the lip at the top of the chassis. Carefully ease forward to remove.

Check/renew the air sealing strip on the chassis and front cover and ensure all cables and tubes are tucked neatly within the chassis before refitting the cover in reverse order.

figure 17 FRONT CASING ATTACHMENT

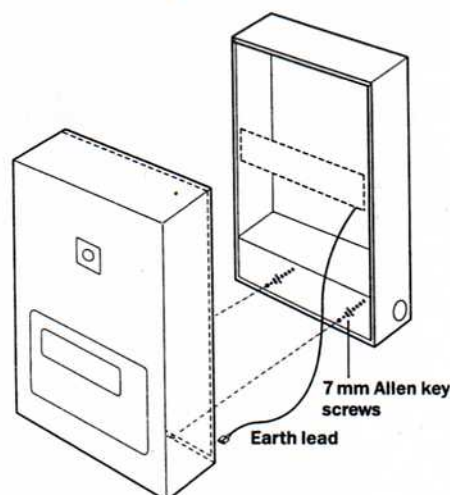
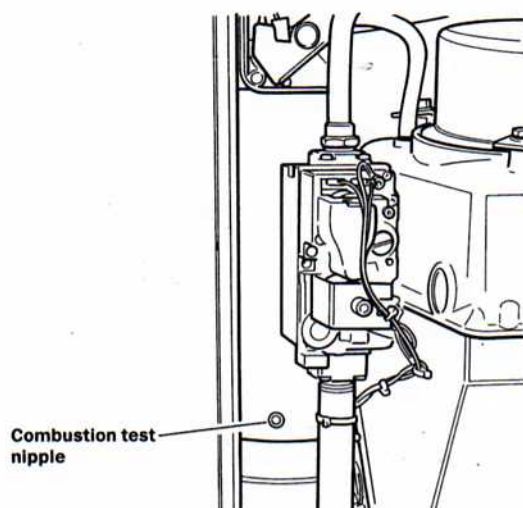


figure 16 COMBUSTION GAS TEST POINT



Check the Combustion Ratio

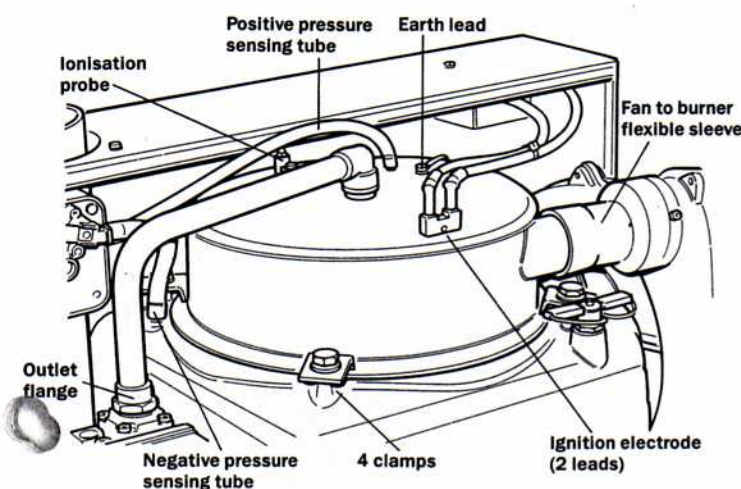
Remove the test point cap on the vertical section of the flue duct (see figure 16) and connect a combustion gas analyser probe. Carry out the check in accordance with the analyser test set instructions, then stop the boiler, disconnect the probe and refit the test point cap. If the CO/CO₂ ratio is unsatisfactory, then the syphonic trap and the heat exchanger must be cleaned.

Burner

- Disconnect both silicone pressure sensing tubes at the burner head and the combustion chamber.
- Pull both leads off the ignition electrode and disconnect the earth lead (slacken one screw) from the burner head.
- Roll back the fan to burner flexible sleeve.
- Disconnect the gas control valve outlet flange (4 screws).

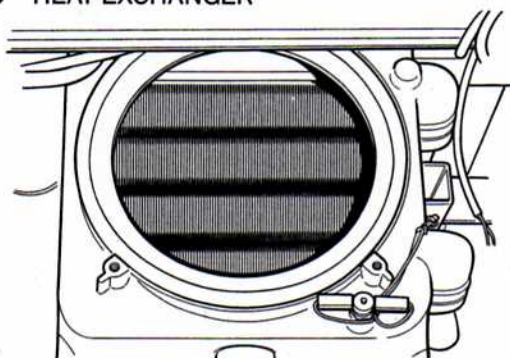
- Slacken all four but remove only the two front clamps, washers and bolts from around the burner head before carefully lifting the burner forward sufficiently to disconnect the ionisation probe lead.
- Cover the gas valve connection to avoid the ingress of dirt.

figure 18 BURNER REMOVAL/FITMENT



- Examine the rope seal in the combustion chamber head and renew as required.
- Examine and if necessary vacuum the heat exchanger finned tubes.
- Unscrew the syphonic trap bowl. Thoroughly clean under a cold tap, fill bowl with clean water and refit to the boiler.
- Using bottles of water or a hosepipe, pour at least 5 litres of water evenly over the exposed heat exchanger tubes (see figure 19). Re-clean the syphonic trap bowl and repeat this washing procedure until the bowl remains clean. Refill bowl with clean water, refit and check that there are no leaks from the trap.

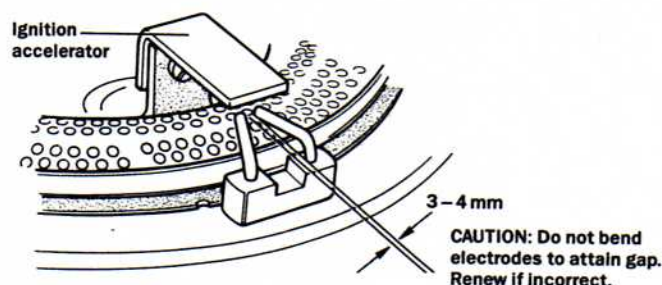
figure 19 HEAT EXCHANGER



- Clean the burner with a stiff bristle brush and vacuum cleaner, using the vacuum first on the air inlet and then on the gas inlet. Inspect for general condition.
- Visually inspect the ionisation probe and ignition electrode for cracked/broken ceramic or eroded electrodes. Clean or replace as necessary. The spark gap between the two ignition electrodes should be 3 to 4 mm. Renew if eroded beyond this gap.

NOTE: The screw secured ignition accelerator is a deflector to aid ignition (see figure 20) but does not

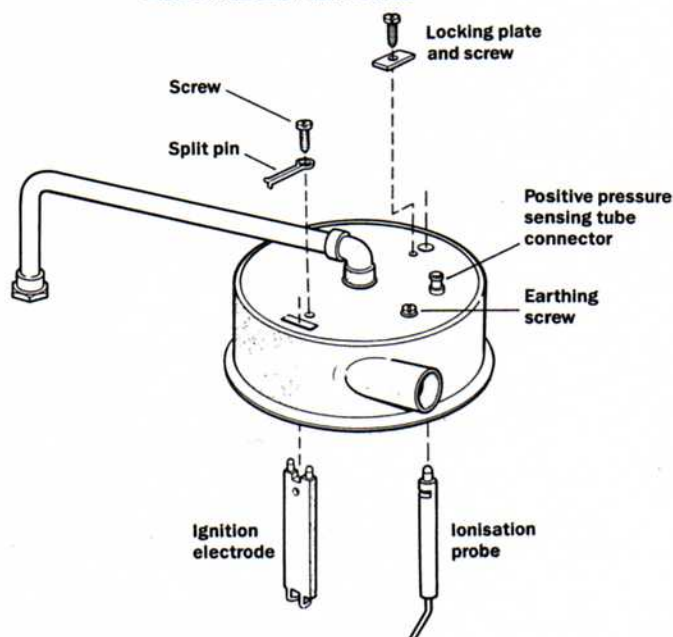
figure 20 IGNITION ELECTRODE GAP



form part of the measured ignition gap. Renew if badly eroded.

- To renew the ignition electrode, remove the securing screw and locating pin on top of the burner. The electrode can then be removed through the underside of the head. If difficult to extract, remove the ignition accelerator. Fit the new electrode in the reverse of removal.
- To renew the ionisation probe, slacken the locking screw and location lug on the top of the burner head and slide out the probe. Fit the new probe with the angled end toward the centre of the burner, locating the lug into the slot in the probe and tightening the locking screw.
- When refitting the burner assembly, first connect the ionisation probe lead, then fit and loosely locate all clamps and the gas control outlet screws before evenly tightening the clamps and the gas control screws. Reconnect the ignition electrode leads, earth lead and the air pressure switch tubing. The ignition leads are not polarity sensitive. The long, smaller diameter air pressure tube from the burner head connects to the rearmost (positive) connection on the air pressure switch.

figure 21 IONISATION PROBE AND IGNITION ELECTRODE REMOVAL



- Start and check the boiler for gas and water soundness. Check the burner pressure as described under Commissioning and recheck the combustion gas ratio.

7. COMPONENT REPLACEMENT

WARNING — TURN OFF THE GAS AND ELECTRICAL SUPPLIES BEFORE COMMENCING ANY SERVICING.

A. GENERAL

All procedures require removal/refitment of the front cover as detailed in Servicing.

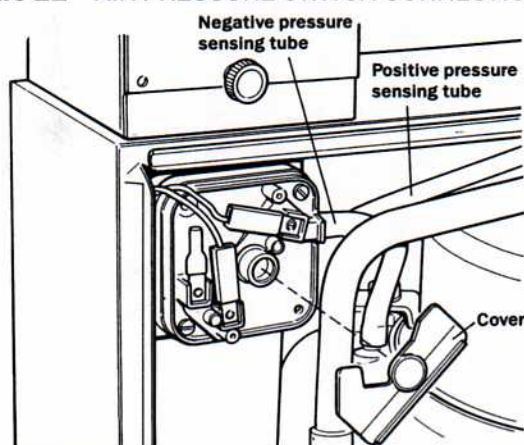
B. AIR PRESSURE SWITCH (see figure 22)

- Pull off the adjustment screw cover and disconnect the two electrical leads and pressure sensing tubes. Remove the two securing screws to detach the switch.
- When refitting, ensure the tubes are correctly reconnected:
 - Short tube** — from combustion chamber to the foremost, negative (–) connection.
 - Long tube** — from the burner head to the rearmost positive (+) connection.

NOTE: The negative stub pipe connector must be fitted with a sleeve (transferred from the old switch) to accommodate the large diameter tubing.

- Connect the electrical leads to the COM and NO terminals (polarity is immaterial) and refit the cover.
- Check for satisfactory operation by lighting the boiler before refitting the front cover.

figure 22 AIR PRESSURE SWITCH CONNECTIONS



C. AIR FAN

- Disconnect the multipin plug from the air fan and roll back the fan to burner air connecting sleeve. Lift the fan from its supporting bracket.
- Before refitting ensure the anti-vibration pads are correctly positioned as shown in figure 23 and, where applicable, transfer the outlet sleeve (one screw) to a new fan.
- Refit the fan in the reverse order. Check for correct operation by lighting the boiler before refitting the front cover.

D. OVERHEAT THERMOSTATS (Overheat and/or Flue)

- Disconnect the two electrical leads and unscrew the thermostat. When fitting a new component, apply a small quantity of heat transfer compound to the seating face. Do not overtighten. Wiring polarity is immaterial.

figure 23 OVERHEAT THERMOSTAT AND FAN ANTI-VIBRATION PADS

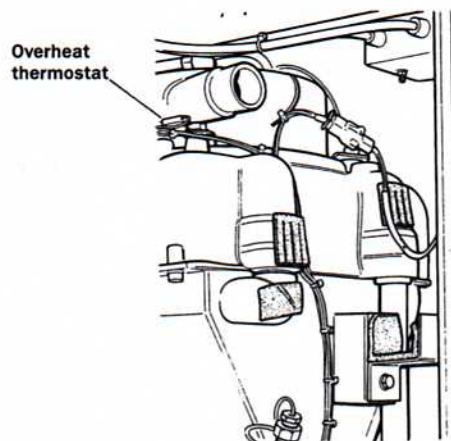
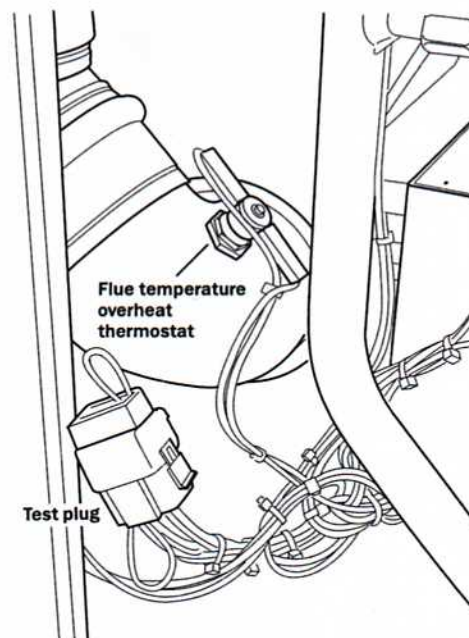


figure 24 FLUE OVERHEAT THERMOSTAT AND TEST PLUG



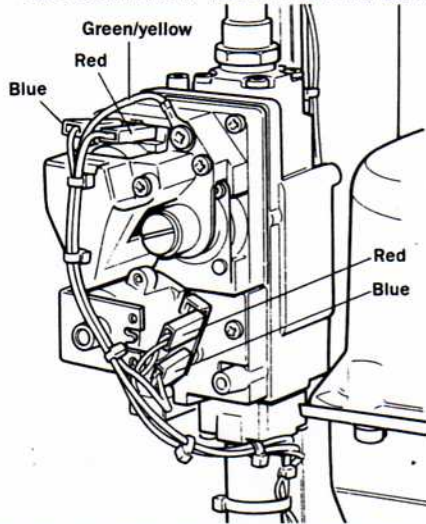
E. BURNER, IGNITION ELECTRODE AND IONISATION PROBE

- See Servicing section.

F. GAS CONTROL VALVE

WARNING — TURN OFF THE GAS AND ELECTRICAL SUPPLIES BEFORE REMOVING THE VALVE.

- Disconnect the four terminal leads and the earth lead (one screw) and remove the four screws from each inlet and outlet flange to withdraw the valve.
- Install in the reverse order using the old flange couplings with new 'O' rings or by renewing the flange couplings and 'O' rings, as required. Reconnect the terminals and earth connectors as shown in figure 25.

figure 25 GAS CONTROL VALVE WIRING CONNECTIONS

- Turn on the gas service cock and purge the inlet pipe by removing the outlet pressure test point screw until gas is smelled, then refit the screw.
- Check for satisfactory operation and burner pressure by following the lighting and checking procedure described in Commissioning and Testing.

G. CONTROL PANEL COMPONENTS

- Remove the control panel top cover (two screws) and if necessary the control panel fascia — four screws.

Control Box

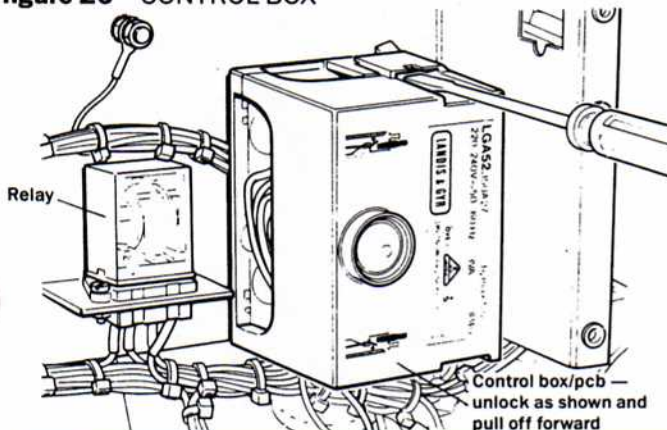
- Remove the LGA52 control box cover by inserting a screwdriver down each side as shown on the cover and pulling off. Refit by pushing straight on (see figure 26).

Boiler Control Thermostat

- Disconnect the two wiring leads from the back of the thermostat and lift the capillary phial from its pocket on the air separator after removing its securing clip. Cut the necessary nylon ties securing the leads and capillary.
- Pull off the control knob and remove the stop screw, securing screw and washer. Withdraw the control and capillary through the control panel.
- Fit the new thermostat in the reverse order, ensuring that the stop screw is fitted in the right-hand hole. Wiring polarity is immaterial. Renew the nylon ties.

Relay

- Unplug by pulling upward from the baseplate. Refit in reverse order.

figure 26 CONTROL BOX

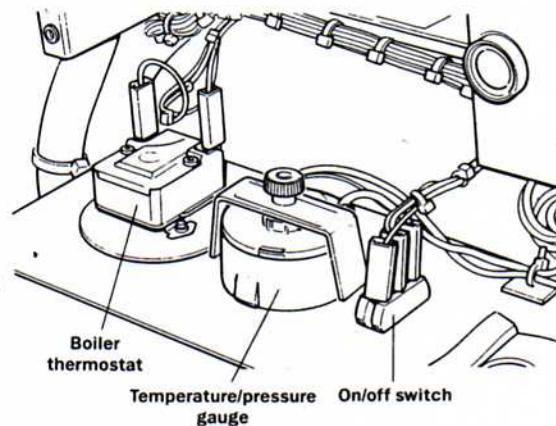
Temperature/Pressure Gauge

- Remove the pin securing the temperature sensing phial from the pocket on the air separator and detach the phial. Disconnect the pressure sensor from the pressure relief valve. (A non-return valve in the fitting on top of the pressure relief valve prevents leakage.)
- Unscrew the gauge bracket securing screw, press the nibs of the gauge casing inward to withdraw the gauge and capillaries through the front of the panel. Install in the reverse order.

On/Off Switch

- Disconnect the wiring leads and push the switch out from the rear panel.
- Snap the new switch into position from the front (with number 2 terminal at the top) and connect the leads as follows.

Top 2	Middle 1	Bottom 3
Red	Black	Blue

figure 27 CONTROLS PANEL CONNECTIONS

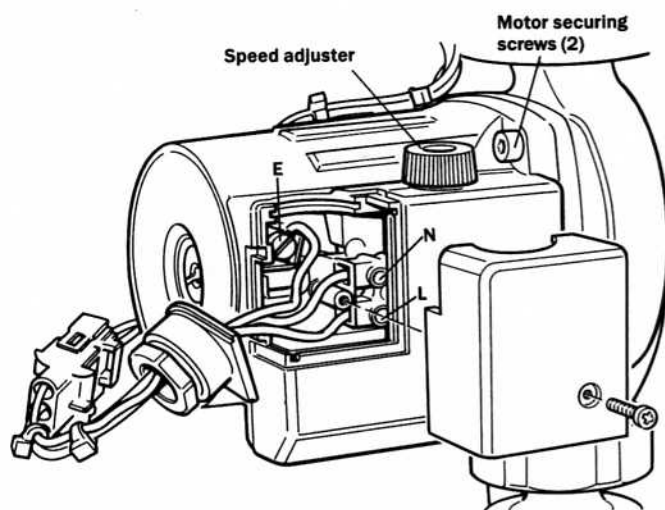
NOTE: All the following procedures require that the boiler be drained after closing the isolation valves.

H. CIRCULATING PUMP

NOTE: Either the pump motor only or the complete assembly may be removed as required.

- Drain the boiler and disconnect the pump multipin wiring connector.
- To remove only the pump motor, remove the socket screws and lift off the motor. Fit the new motor with a new 'O' ring.
- To remove the complete assembly, first remove the control panel and box assembly by firmly pulling it forward off its securing studs. Provide support to prevent straining the wiring leads. Disconnect the pump unions and slide out the pump. Install the pump assembly (flow arrow upward) using new coupling washers. Refit the control box.

figure 28 PUMP REMOVAL/FITMENT

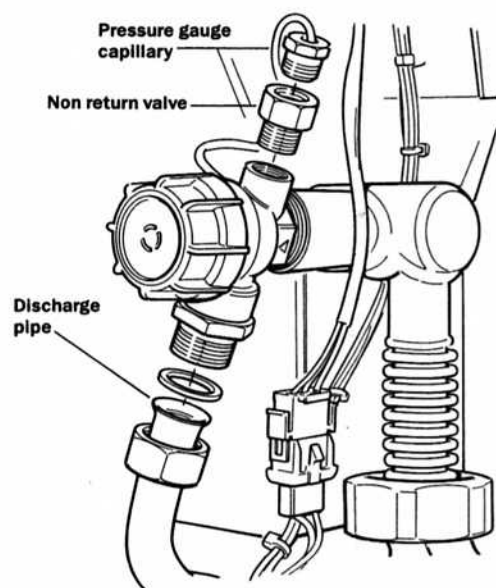


- Remove the cover plate and transfer the three wiring leads and connector from the old pump. Connect the wiring leads: black to L, blue to N, green/yellow to earth. Reposition the gland nut and refit the cover. Open the isolating valves and refill the system (see Section 5 — Filling and Venting) and check for soundness.
- Check for satisfactory operation by lighting and operating the boiler.

I. PRESSURE RELIEF VALVE

- Drain the boiler.
- Pull off the control panel and box assembly and provide it with support to avoid straining the wires.
- Disconnect the pressure gauge capillary and the pressure relief valve discharge pipe and unscrew the relief valve.
- Refit in the reverse order.
- Refill, vent and pressurize the system as described in Filling/Venting.

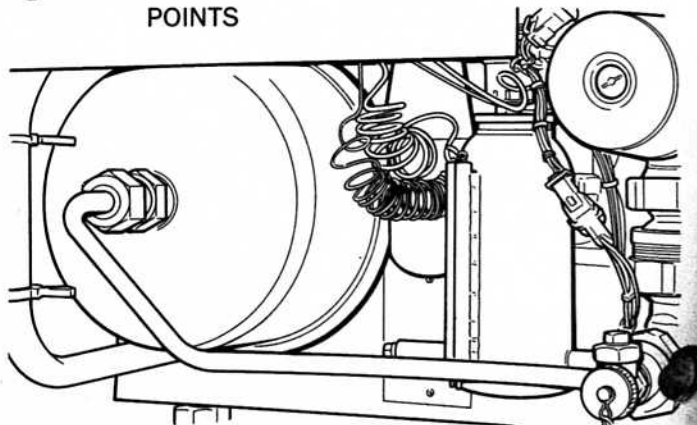
figure 29 PRESSURE RELIEF VALVE ASSEMBLY



J. EXPANSION VESSEL

- Drain the boiler.
- Disconnect the return filter union behind the boiler drain cock and the pipe union on the front of the expansion vessel. Slacken off the hexagon headed screw under the chassis that secures the vessel fixing band and slide the vessel clear of the appliance. Install the new vessel in the reverse order.

figure 30 EXPANSION VESSEL DISCONNECTION POINTS

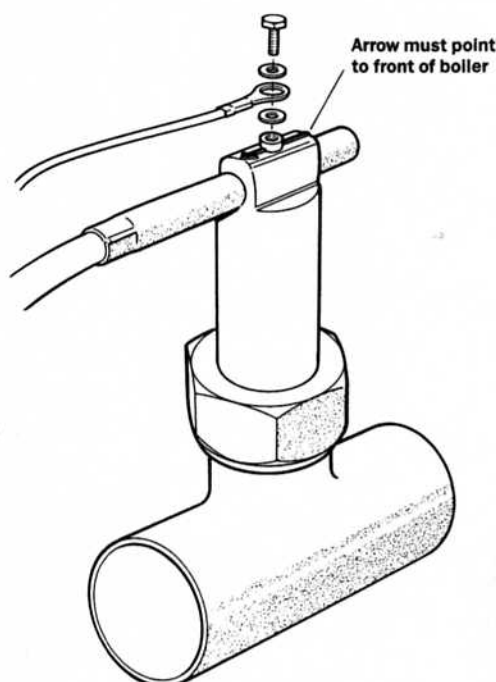


- Refill, vent and pressurize the system as described in Filling/Venting.

K. FLOW SWITCH

- Drain the boiler.
- Disconnect the switch multipin lead and unscrew the union nut to remove. (If necessary, remove the pump as described to gain access.)
- When refitting, ensure a new sealing washer is fitted and that the switch is installed with the arrow (under the earth tag) pointing directly forward (see figure 31). Reconnect the multipin plug.
- Refill, vent and pressurize the system as described in Filling/Venting and check for satisfactory operation by lighting and operating the boiler.

figure 31 FLOW SWITCH CONNECTION



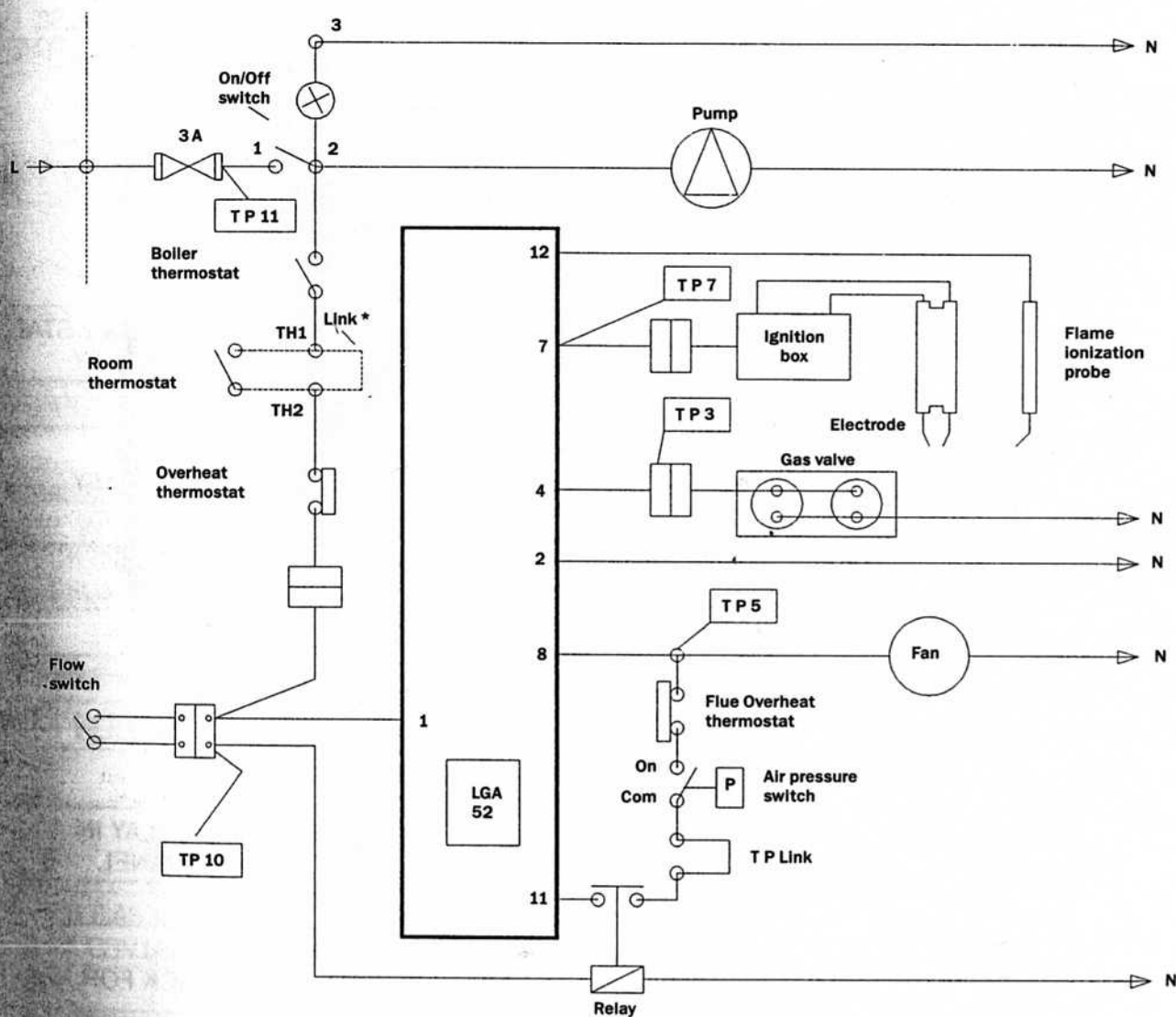
8. FAULT FINDING

If the boiler does not start — first check that there is a demand from the system, programmer or roomstat and that there is gas and electricity to the boiler.

If the boiler is in a lockout condition (indicator light on), press the lockout button. If the boiler still does not light on the next attempt, check the two manual reset overheat thermostats and reset if necessary. Check for signs of overheating.


If the boiler still does not light and/or continues to lockout, consult the fault finding charts.

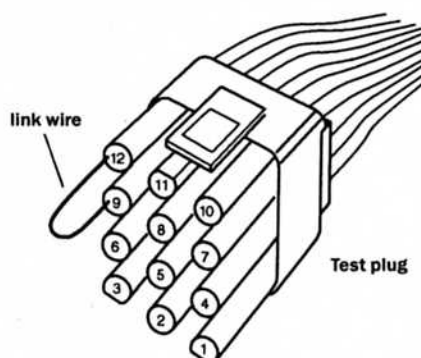
figure 32 FUNCTIONAL FLOW DIAGRAM AND TEST POINTS



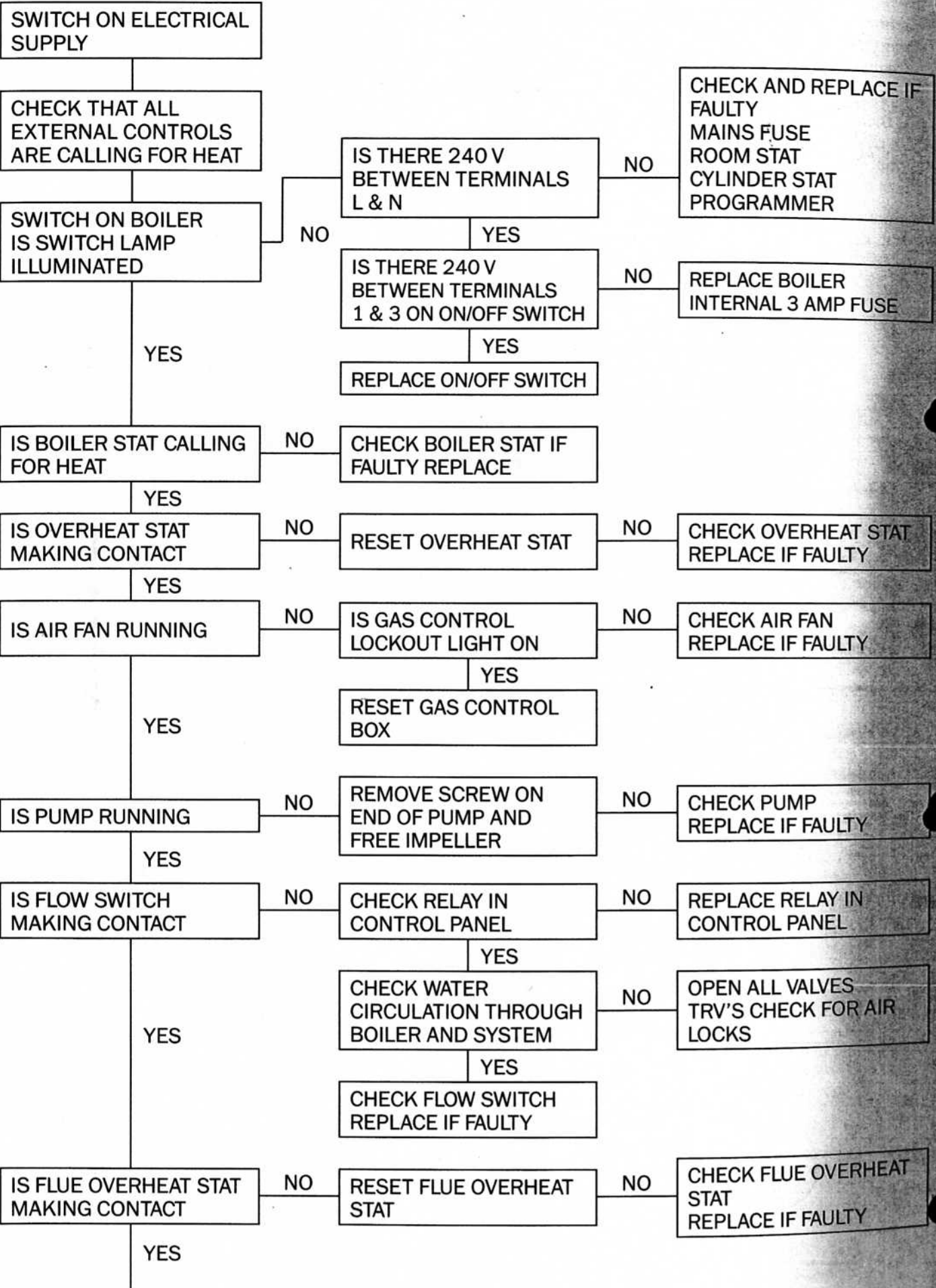
* Room thermostat or link.

 Multipin connector

 Test plug pin number



FAULT FINDING BLOCK DIAGRAM



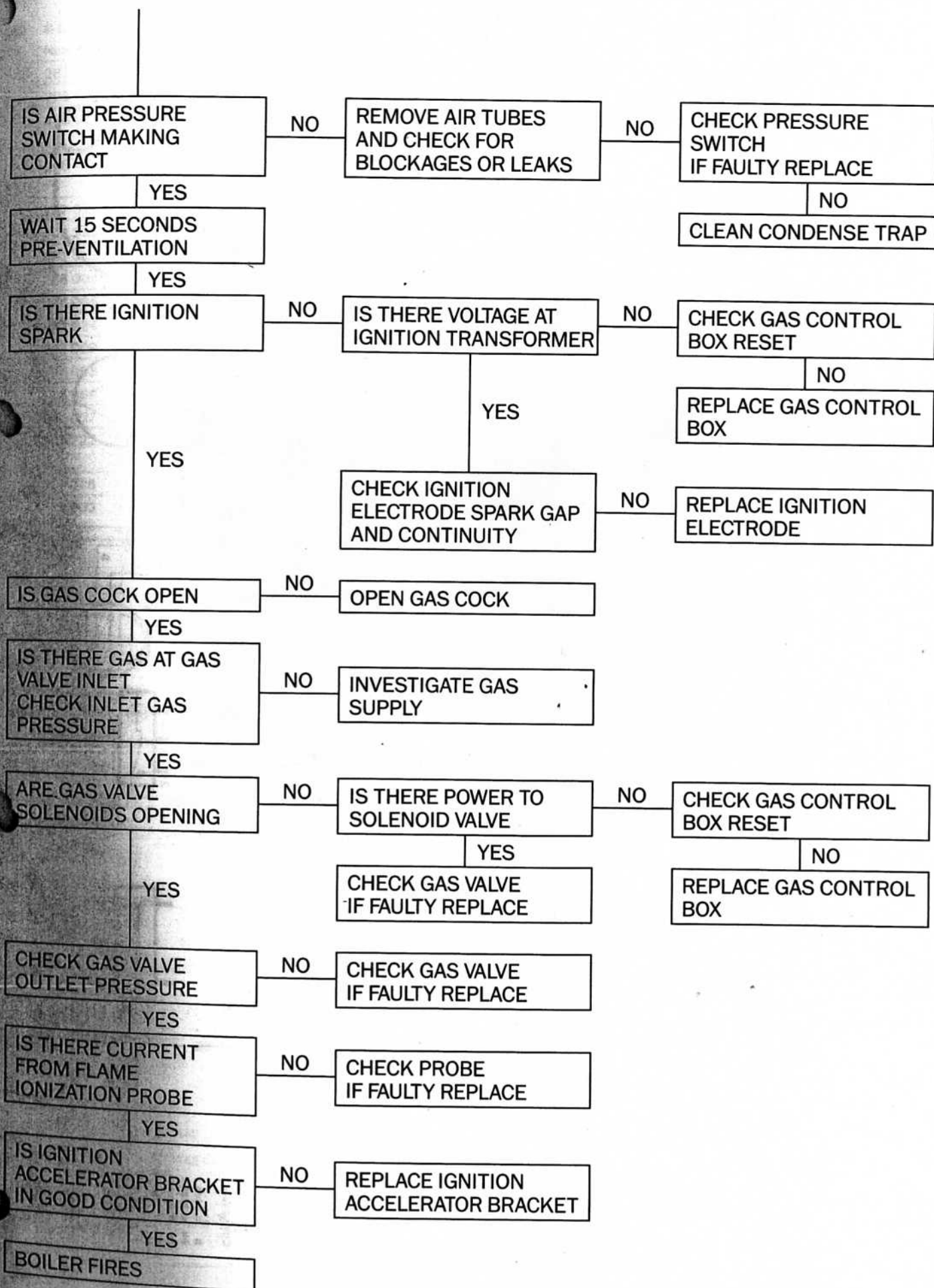
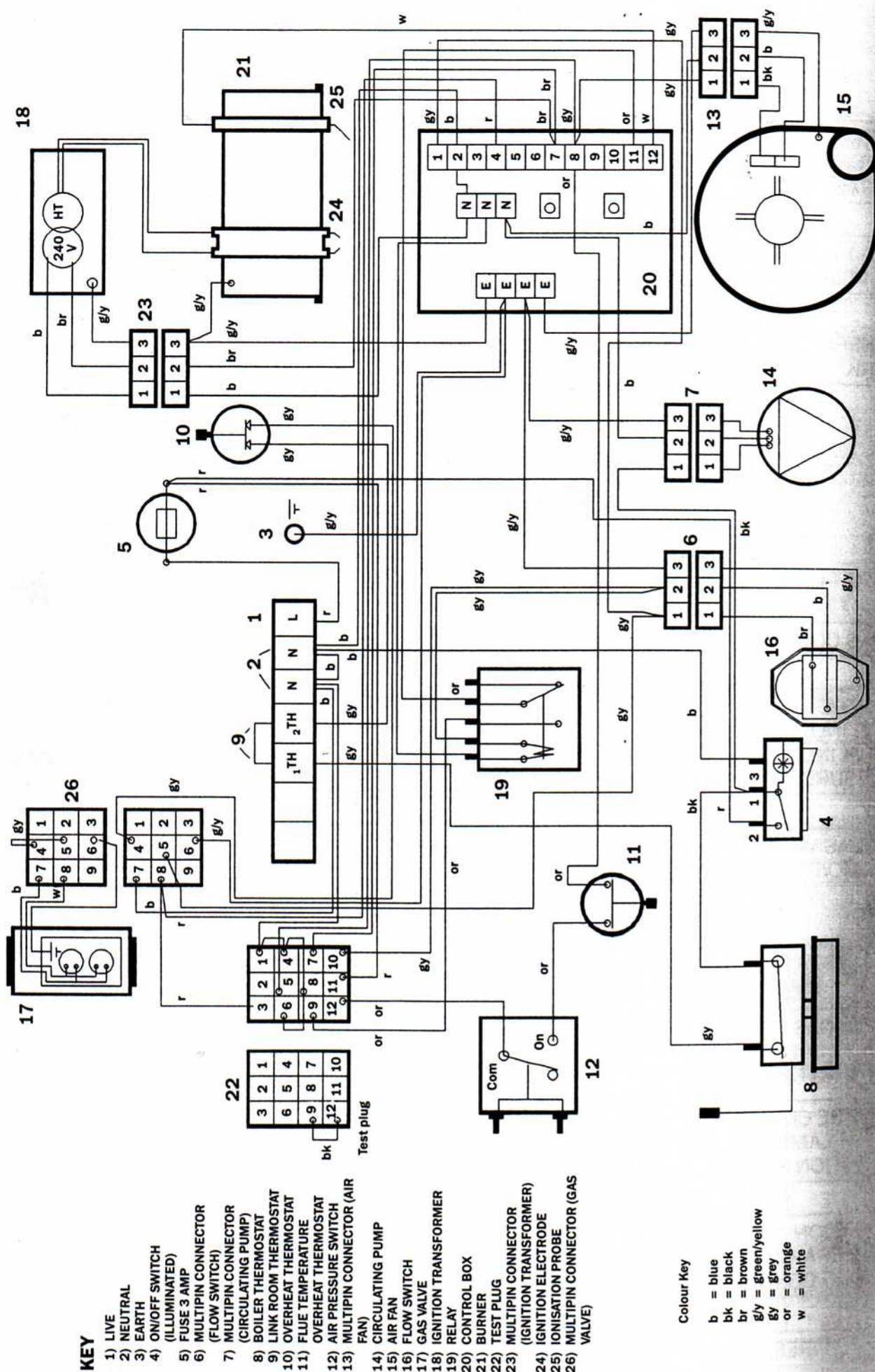


figure 33 WIRING DIAGRAM

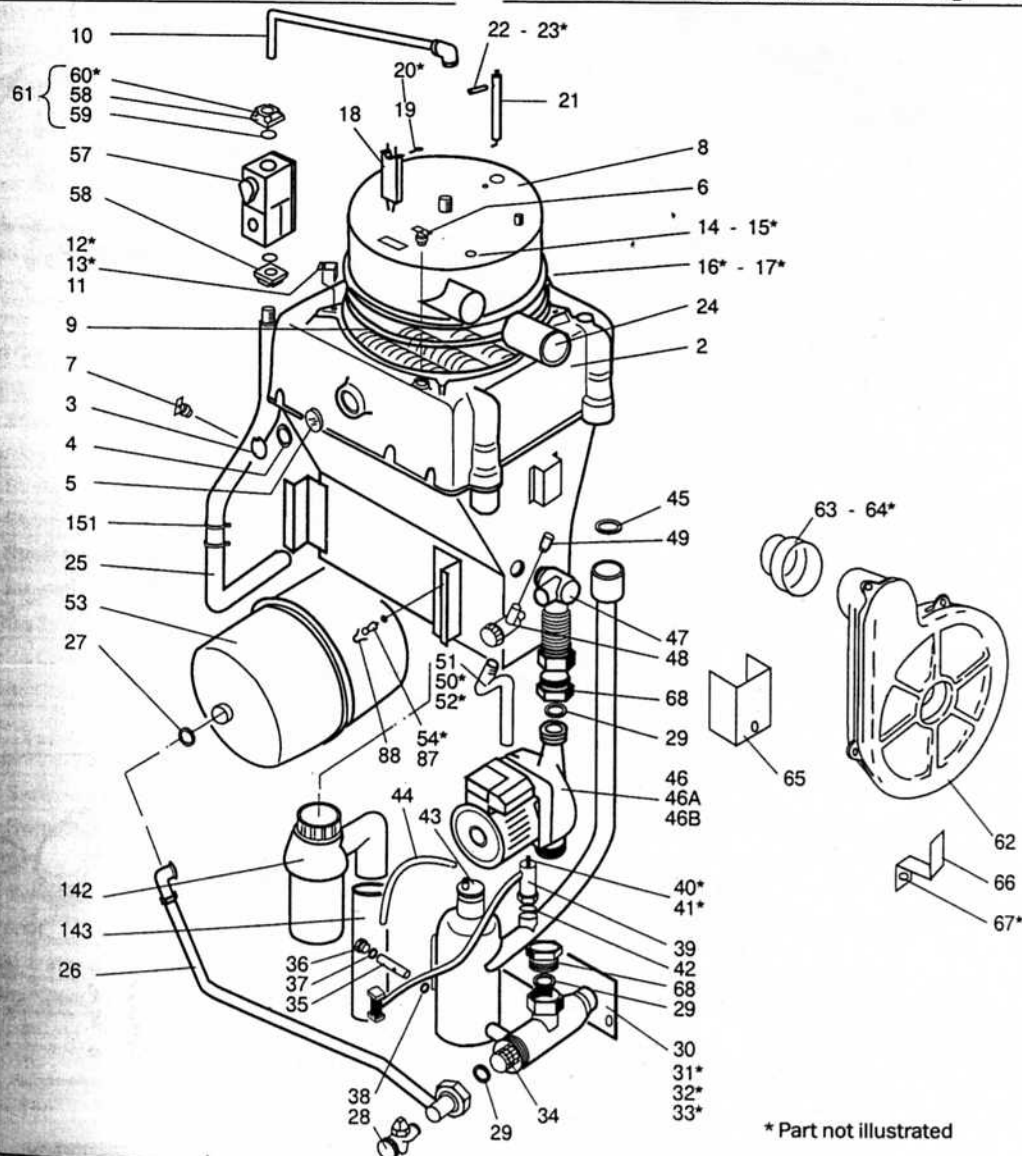


9. SHORT PARTS LIST

Key No.	G.C. Number	Description	Qty Off	Part Number
3	287 019	Sight Glass circlip	1	T40.1051
5	288 001	Sight Glass	1	T20.0582
6	378 016	Elmwood High Limit Thermostat 2455- RM 100C	1	L72.1023
7	378 450	Elmwood Flue Safety Thermostat 2455- RM 85C	1	L72.10273
16	287 022	*Ignition Accelerator	1	X00.4248
17	402 293	*Ignition Accelerator Screw	1	B20.3164
18	287 023	Ignition Electrode	1	L00.1038
21	288 004	Ionisation Probe	1	W00.5741
24	288 005	Primary Air Sleeve to Burner	1	U00.6083
28	287 024	Drain Cock	1	K50.0182
29	287 009	'O' ring	3	E00.1005
34	287 003	Line Strainer mesh filter	1	L40.8165
39	378 059	Caleffi Flow Switch	1	W00.6150
40	287 007	Air Vent	1	L90.9831
46A	383 722	Circulating Pump — Grundfos UPS 15/60	1	L30.10569
48	287 025	3 bar Pressure Relief valve	1	L90.10548
57	378 003	Honeywell Gas valve VR4705 A 4015	1	L10.10311

Key No.	G.C. Number	Description	Qty Off	Part Number
59	287 030	Honeywell Gas valve flange 'O' ring	2	L10.10607
62	287 031	Air Fan complete	1	W00.6333
69	378 014	Dungs Air Pressure Switch LGWA1	1	W00.4207
70	287 015	Air Tube to burner	1	U00.5905
71	287 016	Air Tube to boiler shell	1	U00.5742
75	378 006	Brahma Ignition transformer TC2L 724A	1	L00.10547
76	287 017	Ignition transformer HT leads	2	W00.4209
92	378 008	Landis & Gyr Control Box LGA 52150 A27	1	L10.3534
103	378 009	Sopac Jeager Boiler Thermostat TUA4C	1	L71.4202
104	287 075	Boiler Thermostat knob	1	L71.1138
108	287 082	Combined Water Temperature/ Pressure Gauge	1	L60.0770
111	378 011	Russenberger On/Off switch 1804	1	C20.10558
113	378 010	Omron Relay MY4 240 V	1	C60.10222
132	409 626	*Cover Panel assembling screws	20	B39.3055
142	287 043	Condense Syphonic Trap complete	1	V00.10597
158	287 055	Flue Outlet pipe elbow 'O' rings	2	E00.8912

figure 34

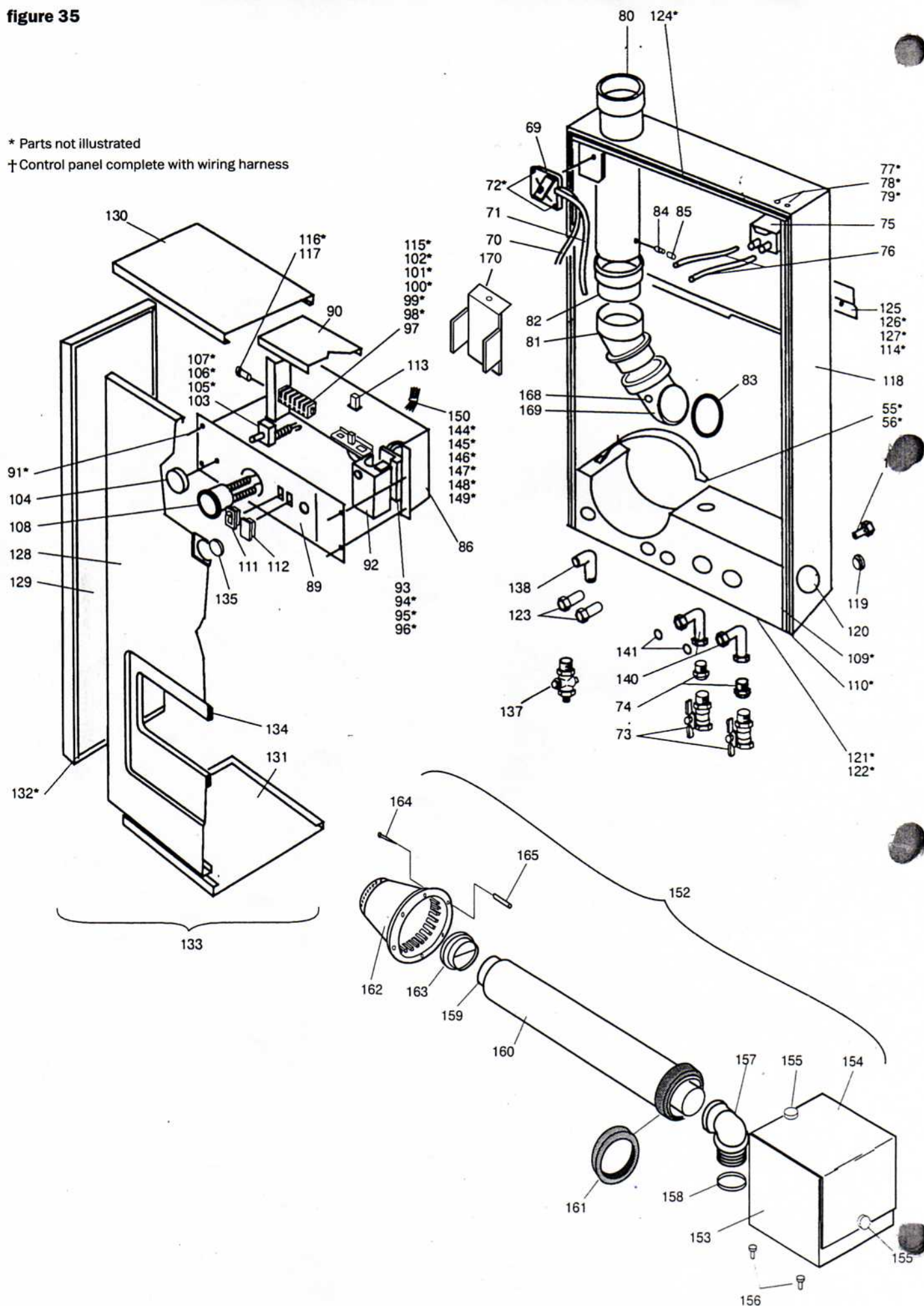


* Part not illustrated

figure 35

* Parts not illustrated

† Control panel complete with wiring harness



10. COMPLETE PARTS LIST

Position of Data Badge: Bottom Centre Main Chassis

Key No.	G.C. Number	Description	Qty Off	Part Number
2	288 000	Boiler Shell and Condenser complete	1	V00.10566
3	287 019	Circlip — Special Sight Glass	1	T40.1051
4	287 020	Washer — Special Sight Glass	1	B59.0692
5	288 001	Sight Glass	1	T20.0582
6	378 016	Thermostat — Elmwood 2455—RM 100C High Limit	1	L72.1023
7	378 450	Elmwood Flue Safety Thermostat 2455—RM 85C	1	L72.10273
8	287 100	Burner	1	X00.10550
9	288 002	Burner sealing gasket	1	V00.5904
10	288 003	Burner Gas supply pipe 15 mm	1	U00.3502
11	287 021	Burner fixing clips	4	U00.3505
12	402 962	*Burner securing bolts	4	B30.3051
13	405 161	*Burner Bolt washer	4	B50.3060
14	402 501	Burner Earth Terminal screw	1	B33.3075
15	405 123	*Burner Earth Terminal washer	1	B51.3163
16	287 022	*Ignition Accelerator	1	X00.4248
17	402 293	*Ignition Accelerator securing screw	1	B20.3164
18	287 023	Ignition Electrode	1	L00.1038
19	287 096	Ignition Electrode split pin	1	B60.3048
20	402 501	*Ignition Electrode securing screw	1	B33.3075
21	288 004	Ionisation Probe	1	W00.5741
22	287 097	Ionisation Probe fixing clip	1	X00.5193
23	402 501	*Ionisation Probe securing screw	1	B33.3075
24	288 005	Primary Air Sleeve to burner	1	U00.6083
25	287 000	Gas Entry Pipe 22 mm	1	U00.3500
26	287 001	Expansion Vessel pipe Assembly 12 mm	1	U00.10582
27	287 012	'O' ring	1	E20.3890
28	287 024	Drain Cock	1	K50.0182
29	287 009	'O' ring	3	E00.1005
30	287 002	Line Strainer and Air Separator Assembly	1	U00.10145
31	402 948	*Line Strainer Assembly bolts	3	B30.3052
32	405 408	*Line Strainer Assembly washers	3	B51.3059
33	404 653	*Line Strainer Assembly nuts	3	B40.3066
34	287 003	Line Strainer mesh filter	1	L40.8165
35	287 004	By-Pass Spindle	1	I20.4177
36	287 098	Spindle Cover nut — Special	1	K11.3136
37	287 005	Spindle Cover nut 'O' ring	1	E00.4179
38	287 005	By-Pass 'O' ring	1	E00.4179
39	378 059	Caleffi Flow Switch	1	W00.6150
40	404 650	*Flow Switch earth connection nut	1	B40.3266
41	405 405	*Flow Switch earth connection washer	2	B50.3090
42	287 006	Flow Switch 'O' ring	1	E20.3413
43	287 007	Air Vent	1	L90.9831
44	287 008	Air Separator Discharge Pipe	1	U00.5743
45	287 009	Return Pipe 'O' ring	2	E00.1005
46	385 808	Euramo Gold Circulating Pump 3 speed	1	L30.10220

Key No.	G.C. Number	Description	Qty Off	Part Number
46a	383 722	Grundfos Circulating Pump 15/60 3 speed	1	L30.10569
46b	378 007	Myson Circulating Pump SD63 3 speed	1	SD63
47	287 010	Return Pipe elbow	1	U00.10557
48	287 025	3 Bar Safety Pressure Relief valve	1	L90.10548
49	287 026	Non-Return Valve	1	L60.1047
50	287 103	*Brass Compression Nut 15 mm	1	L90.10736
51	287 011	Safety Valve Discharge Pipe	1	U00.10594
52	287 104	*Brass Compression Olive 15 mm	1	L90.10737
53	378 004	Zilmet Expansion Vessel 8 litre 00202	1	L90.3520
54	404 652	*Locknut M5 Hexagon	2	B40.3065
55	402 952	*Expansion Vessel securing bolt	1	B30.5938
56	405 408	*Expansion Vessel securing washer	1	B51.3059
57	378 003	Honeywell Gas valve VR4 705 A 4015	1	L10.10311
58	287 029	Honeywell Gas valve flange	2	L10.3545
59	287 030	Honeywell Gas valve flange 'O' ring	2	L10.10607
60	402 128	*Honeywell Gas flange securing screws	8	L10.10609
61	378 005	Honeywell Gas flange complete 4500400/102B	2	V00.10608
62	287 031	Air Fan complete — Special	1	W00.6333
63	287 032	Air Entry connector	1	U00.6031
64	409 626	*Air Entry Connector securing screw	1	B39.3055
65	287 013	Air Fan base bracket	1	U00.3510
66	287 014	Air Fan bracket	1	U00.3507
67	403 023	*Air Fan bracket bolt	1	B30.3054
68	287 105	Circulating Pump Spacers	2	K11.10675
69	378 014	Dungs Air Pressure Switch LGWA1	1	W00.4207
70	287 015	Air Tube to burner	1	U00.5905
71	287 016	Air Tube to boiler shell	1	U00.5742
72	402 169	*Air Pressure Switch securing bolt	2	B33.3076
73	287 106	Flow and Return Shut Off Valves 3/4"	2	K50.3894
74	287 107	Brass Reduction Nipple M/M 1" x 3/4"	2	K20.3021
75	378 006	Brahma Ignition transformer TC2L 724A	1	L00.10547
76	287 017	Ignition Transformer HT leads	2	W00.4209
77	402 502	*Ignition Transformer securing bolt	2	B34.3092
78	405 406	*Ignition Transformer bolt washer	2	B59.3161
79	404 651	*Ignition Transformer nut	2	B40.3064
80	287 018	Flue Outlet Pipe polypropylene 75 mm	1	U00.10593
81		Flue Outlet Bend polypropylene 45 deg	1	A20.10635
82		Polypropylene Reducer 80/75	1	A20.11866
83		Flue Outlet Bend 'O' ring seal	2	E00.10822
84	287 076	Combustion Test nipple	1	I30.1062
85	287 077	Combustion Test nipple cap	1	U00.9154
86	287 036	Control Panel chassis	1	W00.10588
87	287 078	Control Panel fixing stud	2	B10.0663

Key No.	G.C. Number	Description	Qty Off	Part Number
88	287 079	Control Panel fixing clip	2	B10.0675
89	287 037	Control Panel Fascia	1	W00.10587
90	287 038	Control Panel Top cover	1	W00.5306
91	402 164	*Control Panel screws	6	B33.7876
92	378 008	Landis & Gyr Control Box LGA 52150 A27	1	L10.3534
93	287 080	Landis & Gyr Base Plate	1	L10.3535
94	403 016	*Landis & Gyr securing bolts	2	B30.4255
95	404 652	*Landis & Gyr securing nuts	2	B40.3065
96	287 081	*Landis & Gyr spacer ferrules	2	A90.4258
97	287 095	Electrical Terminal Block	1	C19.3446
98	409 715	*Electrical Terminal Block securing screws	2	B39.8141
99	403 016	*Earth Connection bolt	1	B30.4255
100	404 652	*Earth Connection nut	2	B40.3065
101	287 101	*Earth Connection brass cup washer	1	B51.3270
102	405 289	*Earth Connection plain washer	3	B59.6245
103	378 009	Sopac Jeager Boiler thermostat TUA4C	1	L71.4202
104	287 075	Boiler Thermostat knob	1	L71.1138
105	402 153	*Boiler Thermostat securing screw	1	B20.3164
106	287 102	*Boiler Thermostat securing stud	1	L71.7475
107	287 064	*Boiler Thermostat gasket	1	E11.10780
108	287 082	Combined Water Temperature/Pressure Gauge	1	L60.0770
109	287 108	*Side Sealing Strip	2	E10.3145
110	287 109	*Bottom Sealing Strip	1	E10.3142
111	378 011	Russenberger On/Off Switch 1804 1 -	1	C20.10558
112	287 084	Spare Switch Socket blanking plate	1	C20.10557
113	378 010	Omron Relay MY4 240 V	1	C60.10222
114	287 110	*Bottom Fixing Clips	2	V00.10685
115	405 425	*Toothed Lockwasher	1	B59.10618
116	287 087	*3 amp fuse	1	C30.7676
117	287 088	Fuse Assembly complete	1	C30.6049
118	287 089	Boiler Chassis Assembly white	1	Y00.10578
119	287 090	Chassis rear spacer grommets	2	A90.3015
120	287 091	Chassis side access cover	1	A00.3134
121	287 092	*Condensate Pipe sealing grommet	1	E11.3874
122	287 093	*Safety Valve discharge pipe grommet	1	E11.10711
123	408 891	EGA Cable Access clamps complete 1 mm	2	C91.3115
124	287 074	*Top Sealing Strip	1	090.3165
125	287 073	Wall Fixing bracket white	1	Y00.9147
126	409 020	*Wall Fixing screws 2" No. 10 countersunk	5	B39.10604
127	287 072	*Wall Fixing Rawlplugs 2" No. 10	5	A90.10961
128	287 071	Cover Front Panel white	1	Y00.9138
129	287 070	Cover Side Panel, right and left, white	2	Y00.9127
130	287 069	Cover Top Panel white	1	Y00.9139
131	287 068	Cover Bottom Panel white	1	Y00.9141
132	409 626	*Cover Panel assembling screws	20	B39.3055

Key No.	G.C. Number	Description	Qty Off	Part Number
133	287 067	Cover complete	1	Y00.9135
134	287 066	Panel Cut Out sealing strip 15 x 15 mm	1	E10.3146
135	287 065	Cover Sight Glass	1	T20.3070
136	402 490	Cover securing screws	2	B31.9797
137	378 015	Gas Cock	1	YP.02361
138	287 039	Gas Cock connecting elbow	1	K10.3621
139	287 111	*Control Panel complete with Wiring Harness	1	W00.10585
140	287 041	Flow/Return Pipe connecting bend	2	Y60.8981
141	287 042	Flow/Return Elbow nylon washers	4	E20.3889
142	287 043	Condensate Syphonic Trap complete	1	V00.10597
143		Syphonic Trap plastic connecting pipe	1	A20.12032
144	287 045	*Internal Electrical connecting blocks 3 way male	4	C11.3101
145	287 046	*Internal Electrical connecting blocks 3 way female	4	C11.3108
146	287 047	*Internal Electrical connecting blocks 9 way male	1	C11.3102
147	287 048	*Internal Electrical connecting blocks 9 way female	1	C11.3107
148	287 049	*Internal Electrical connecting blocks 12 way male	1	C11.3101
149	287 050	*Internal Electrical connecting blocks 12 way female	1	C11.3106
150	287 051	Wiring Harness complete	1	W00.10589
151	408 785	Richco Mains Cable ties WIT5ORLDH	2	C90.10549
152	287 052	Balanced Flue kit complete	1	V00.10600
153	287 053	Air Box	1	Y50.10640
154	287 054	Air Box cover	1	Y50.10599
155	287 099	Air Box cover screws — Special	2	B10.3195
156	409 626	Air Box securing screws	4	B39.3055
157	287 034	Flue Outlet pipe elbow 90 deg	1	H20.1060
158	287 055	Flue Outlet pipe elbow 'O' rings	2	E00.8912
159	287 056	Flue Outlet pipe 75 mm	1	N40.10551
160	287 057	Air Inlet pipe 110 mm	1	U00.6034
161	287 058	Air Inlet pipe seal	1	U00.5931
162	287 059	Flue Terminal cover	1	H20.3194
163	287 060	Flue Terminal internal spacer	1	H20.3193
164	409 092	Flue Terminal securing screws No. 6 x 1½" stainless	4	B20.10601
165	287 112	Flue Terminal Rawlplugs No. 6 x 1½"	4	A90.10602
166	287 062	*Installation & Servicing Instructions	1	YPI.07921
167	287 063	*Users Instructions	1	YPU.07922
168		Flue Safety Thermostat connection	1	I30.11379
169		Flue outlet bend polypropylene 90 deg	1	U00.12053
170		Flue outlet support bracket	1	Y00.10807

*Not illustrated