CI/SfB
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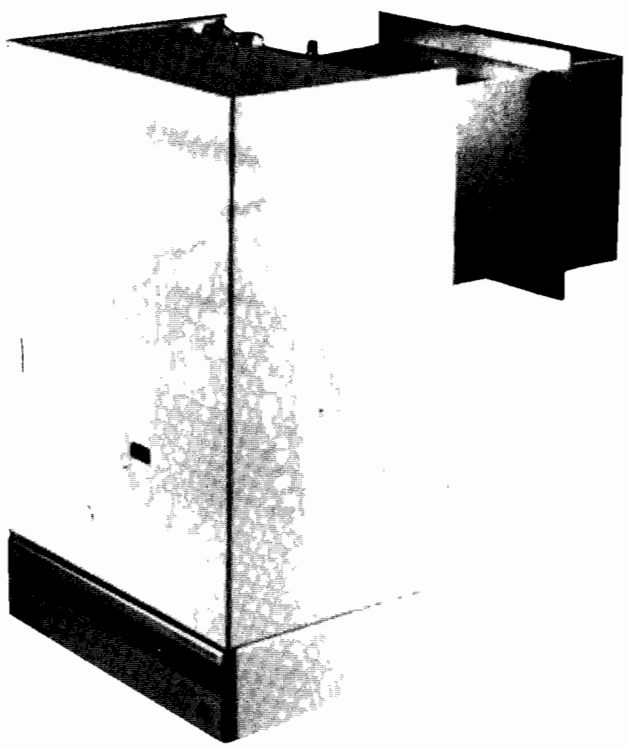
By appointment to H.M. Queen Elizabeth
The Queen Mother
Manufacturers of Domestic Boilers

TriancoGas

Wall Mounted Balanced Flue
Gas Fired Central Heating Boiler

Installation and Servicing Instructions

WM 25/45 RS G.C.No. 41.898.29
WM 45/60 RS G.C.No. 41.898.30
WM 60/75 RS G.C.No. 41.898.31



It is recommended that this appliance be installed by the British Gas Corporation or another CORGI registered installer.

(NOTE: It is a condition of the Gas Safety Regulations that all gas appliances shall be installed by a competent installer).

THIS CENTRAL HEATING BOILER IS FOR USE ON FULLY PUMPED, OPEN VENTED OR SEALED WATER SYSTEMS.

IT IS SUITABLE FOR USE ON NATURAL GAS ONLY.

THESE INSTRUCTIONS SHOULD BE LEFT ADJACENT TO THE GAS METER.

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INTRODUCTION

These balanced flue wall mounted central heating boilers require pumped circulation of hot water and cannot be used on gravity circulation systems. It is for use on Natural Gas only.

The appliance can be used wherever the maximum load required falls within the range detailed in the next column.

MODEL	MAXIMUM SYSTEM LOAD
WM 25/45 RS	7.3 kW – 13.2 kW (25,000 – 45,000 Btu/h)
WM 45/60 RS	13.2 kW – 17.6 kW (45,000 – 60,000 Btu/h)
WM 60/75 RS	17.6 kW – 22.0 kW (60,000 – 75,000 Btu/h)

TECHNICAL DATA

		25/45	45/60	60/75
Heat Input	kW	16.5	22.0	27.5
	Btu/h	56,250	75,000	93,750
Heat Output	kW	13.2	17.6	22.0
	Btu/h	45,000	60,000	75,000
Burner Pressure (cold)	mbar	13.3	12.7	13.9
	in w.g.	5.3	5.1	5.6
Injector size	mm	3.3	3.8	4.2
	in	0.130	0.15	0.165
	marking	3.3	3.8	4.2
Weight (empty) inc. Terminal and ducts	kg	30.5	34.5	37.5
	lb	67.5	76.5	82.5
Lift weight when installing	kg	21	23	25
	lb	46	51	56
Overall Dimesions:				
Height	mm	655	655	655
	in	25¾	25¾	25¾
Width	mm	409	473	537
	in	16⅛	18⅝	21⅛
Depth	mm	300	300	300
	in	$11\frac{13}{16}$	$11\frac{13}{16}$	$11\frac{13}{16}$
Minimum water flow	litre/h	680	900	1090
	gal/min	2.5	3.3	4.0
Min. static head	mm	610	610	610
	in	24	24	24
Max. static head at boiler	m	30.5	30.5	30.5
	ft	100	100	100
Water capacity of boiler	litre	0.59	0.74	0.89
	pints	1.0	1.25	1.5
Main burner		Furigas 312/500/002	Furigas 312/500/001	Furigas 312/500/000
Pilot burner		HONEYWELL Q359A 1090		
Pilot injector		HONEYWELL 45003 – 508 – 001		
Spark generator		VERNITRON 60042		
Electrode		VERNITRON 60911		
Overheat Cut-off Device		IMIT LSI 541710		
Thermocouple		HONEYWELL Q309A 2739		
Gas Valve		HONEYWELL V4635A 2046		
Gas Connection		R_c ½ (½ in. B.S.P. Int.)		
Water connections	Flow	22 mm compression fitting		
	Return	22 mm compression fitting		
Electrical Supply		240v a.c.	50 Hz	Fused at 3 amps

Clearance required for installation and servi~ , (a!' models):

Right and left hand side of boiler	10 mm (⅜ in.)
Top of boiler	75 mm (3 in.)
Underside of boiler	125 mm (5 in.)
Front of boiler	305 mm (12 in.)
Telescopic Flue (all models):	To suit a range of wall thicknesses from 225 mm (9 in.) to 350 mm (14 in.)

1.0 GENERAL

The installation of this boiler must be in accordance with the relevant requirements of the Gas Safety Regulations, the Local Building Regulations, the I.E.E. Regulations and the byelaws of the local water undertaking.

It is essential that the boiler is installed strictly in accordance with these instructions. It should be in accordance also with any relevant requirements of the local Gas Region and Local Authority and the relevant recommendations of the following British Standard Codes of Practice:-

CP331:3, CP342:1 and 2, BS 5376:2, BS 5440:1 and 2, BS 5449:1, BS5546.

2.0 LOCATION

The boiler may be installed in any room, although particular attention is drawn to the requirements of the I.E.E. Regulations and, in Scotland, the electrical provisions of the Building Standards applicable in Scotland, with respect to the installation of the boiler in a room containing a bath or shower.

NOTE: The boiler is suitable for installation to a combustible wall. If, however, the boiler is to be fitted to a timber frame construction, advice from the Local Gas Region or British Gas must be sought.

A cupboard or compartment used to enclose the boiler must be designed and constructed specifically for this purpose. An existing cupboard or compartment may be used provided that it is modified for the purpose. Details of essential features of cupboard/compartment design including airing cupboard installations are given in BS 5376:2.

3.0 GAS SUPPLY

The meter and supply pipes must be capable of delivering the quantity of gas detailed below:-

WM 25/45 RS — 1.58 m^3/h (56 ft^3/h)
WM 45/60 RS — 2.12 m^3/h (75 ft^3/h)
WM 60/75 RS — 2.64 m^3/h (93 ft^3/h)

This gas load is in addition to the demand from any other appliances in the house.

The gas installation pipework should be installed, inspected, tested for soundness and purged in accordance with CP 331:3.

4.0 ELECTRICITY SUPPLY

The supply to the boiler should be 240v 50 Hz~via a fused double pole switch having a 3 mm contact separation or a fused 3 pin plug and unswitched shuttered outlet socket, adjacent to the boiler. The supply should be fused at 3A and the cable should be rated to take at least 5A e.g. 0.75 mm^2 (24/0.2 mm). The rating of the boiler only is approx. 5VA. The external wiring between the appliance and the electrical supply shall comply with the latest I.E.E. regulations and any local regulations which apply. **The appliance must be earthed.**

To gain access to the internal wiring, undo the two screws securing the terminal box cover . Run the supply cable into the terminal strip at the marked positions.

NOTE: The earth wire of the supply cable should be made 13—19 mm (½" to ¾") longer than the live and neutral conductors when attaching to the terminal strip.

Secure the cable in the supply cable clamp provided. Replace terminal box cover and secure with two screws.

In the event of an electrical fault after installation of the appliance, preliminary electrical systems checks shall be carried out i.e. earth continuity, polarity and resistance to earth, as described in the British Gas multimeter handbook.

5.0 AIR SUPPLY

Detailed recommendations for air supply are given in BS 5440:2. The following notes are for general guidance.

No purpose provided air vents are required in a room containing this appliance. (i.e. Appliance is room sealed).

If the boiler is installed in a cupboard or compartment, ventilation is required to keep temperature of controls at correct level. Permanent air vents are required in the cupboard or compartment, one at high level and one at low level, either direct to outside air or to a room. Both high and low level air vents must communicate with the same room or must both be on the same wall to outside air. The vent must have a free area as detailed below:-

Model	Air from Room	Air direct from outside
WM 25/45 RS	144 cm^2 (22.5 in^2)	72 cm^2 (11.25 in^2)
WM 45/60 RS	198 cm^2 (30 in^2)	99 cm^2 (15 in^2)
WM 60/75 RS	248 cm^2 (37.5 in^2)	124 cm^2 (18.75 in^2)

Further reference should be made to 2.0 LOCATION for cupboard/compartment installations.

6.0 INSTALLATION NOTES

6.1 General Notes

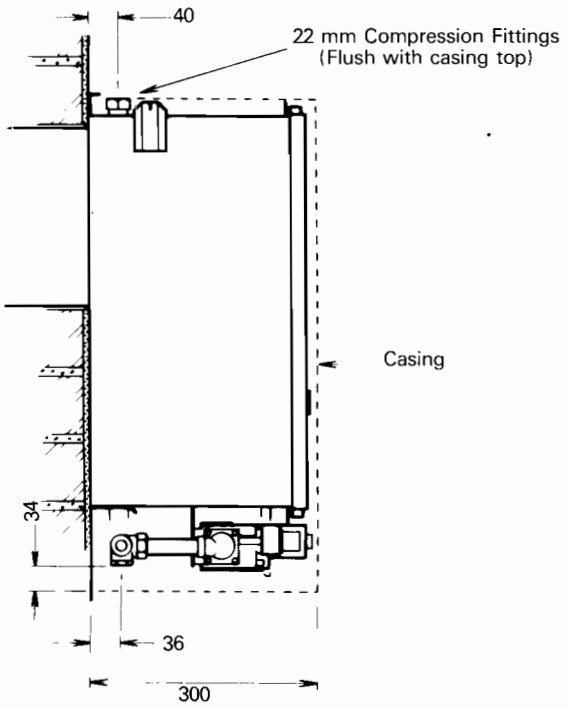
The boiler is designed for use with fully pumped open or sealed central heating systems. When domestic hot water is to be provided by the system, an indirect cylinder to BS 1566:Pt.1 that is suitable for the system pressure must be used.

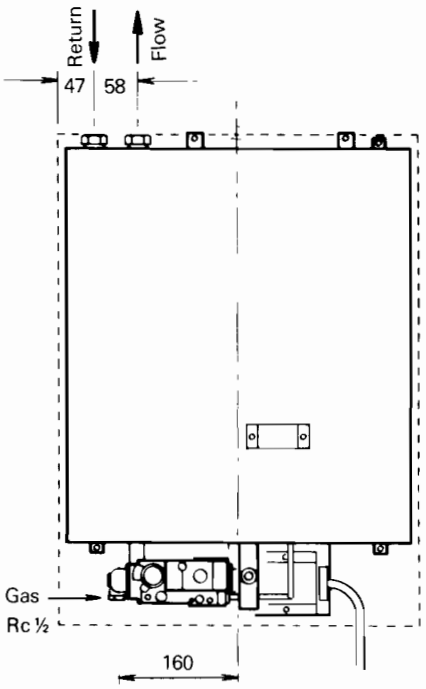
The appliance can be used wherever the maximum required output falls within the range detailed below:-

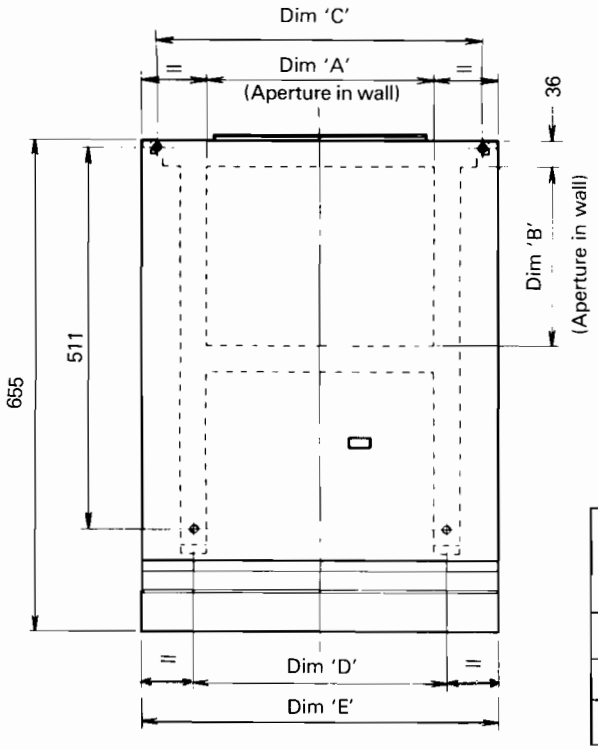
Model	Maximum System Load
WM 25/45 RS	7.3 kW—13.2 kW (25,000—45,000 Btu/h)
WM 45/60 RS	13.2 kW—17.6 kW (45,000—60,000 Btu/h)
WM 60/75 RS	17.6 kW—22.0 kW (60,000—75,000 Btu/h)

The terminal and ducts supplied are suitable for wall thickness from 225 mm (9 in.) to 350 mm 14 in.).

6.2 Boiler Dimensions, Space Requirements and Connection Details







Clearance Required for Service:

Each side	—	10 mm
Front	—	305 mm
Top	—	75 mm
Bottom	—	125

Model	Dimensions				
	A	B	C	D	E
25/45	264	235	363	293	409
45/60	306	250	427	335	473
60/75	306	250	491	335	537

Fig. 1

6.3 Flue Terminal Position

When siting the boiler, check that the flue terminal position complies with the Building Regulations. The terminal must discharge directly to outside air.

The terminal position must not be less than the minimum distances tabled below:-

Terminal Position	Minimum Distance
Directly below an openable window or other opening e.g. air brick.	300mm
Below gutters, soil pipes or drain pipes	300mm *see note(i)
Below eaves	300mm
Below balconies	600mm
From vertical drain pipes and soil pipes	75mm
From internal or external corners	600mm
Above ground, roof or balcony level	300mm *see note(ii)
From a surface facing a terminal	600mm
From a terminal facing a terminal	600mm
Vertically from a terminal on the same wall	1,500mm
Horizontally from a terminal on the same wall	300mm

Note (i) If the terminal is fitted within 850 mm of a gutter or within 450 mm of painted eaves or painted gutter, an aluminium shield at least 750 mm long should be fitted to the underside of the gutter or painted surface.

Note (ii) If the lowest part of the terminal is less than 2 metres above the level of any ground, balcony, flat roof or place to which people have access, the terminal must be protected by a guard. Protective guards are available from Tower Flue Components Ltd., Vale Rise, Tonbridge, Kent, TN9 1TB. When ordering, please quote:-

Boiler Model	Terminal Guard Designation
TriancoGas WM 25/45 RS	B. Green (G.C.No. 393 544)
TriancoGas WM 45/60 RS TriancoGas WM 60/75 RS	E. Red (G.C.No. 393 547)

6.4 Water System

6.4.1 Circulating Pump (Open Vented or Sealed Systems)

The pump should be fitted in an accessible position in the FLOW pipe from the boiler. The hydraulic pressure loss across the boiler is shown in the following table:

Model		25/45 RS	45/60 RS	60/75 RS
Flow rate	Litre/h (gal/min)	1023 (3.75)	1364 (5.0)	1705 (6.25)
Press. Loss	mm (in wg)	510 (20)	890 (35)	1320 (52)
Temp. rise across boiler	°C (°F)	11 (20)	11 (20)	11 (20)

The pressure loss across the boiler should be taken into account when selecting the correct pump duty for the system.

6.4.2. By-pass (Open Vented or Sealed Systems)

The flow through the boiler must not be allowed to fall below the flow rates detailed in the table below while the burner is alight:-

Model		25/45 RS	45/60 RS	60/75 RS
Min. flow thr'gh boiler	litre/h (gal/min)	680 (2.5)	900 (3.3)	1090 (4.0)
Temp. rise across boiler	°C (°F)	17 (31)	17 (31)	17 (31)

It is important that if the system controls e.g. motorised zone valves or thermostatic radiator valves, cause the flow through the boiler to fall below the minimum specified rate, then a 15 mm (minimum) by-pass must be fitted. See Section 8.2 for adjustment of by-pass.

6.4.3 Drain Cock (Open Vented and Sealed Systems)

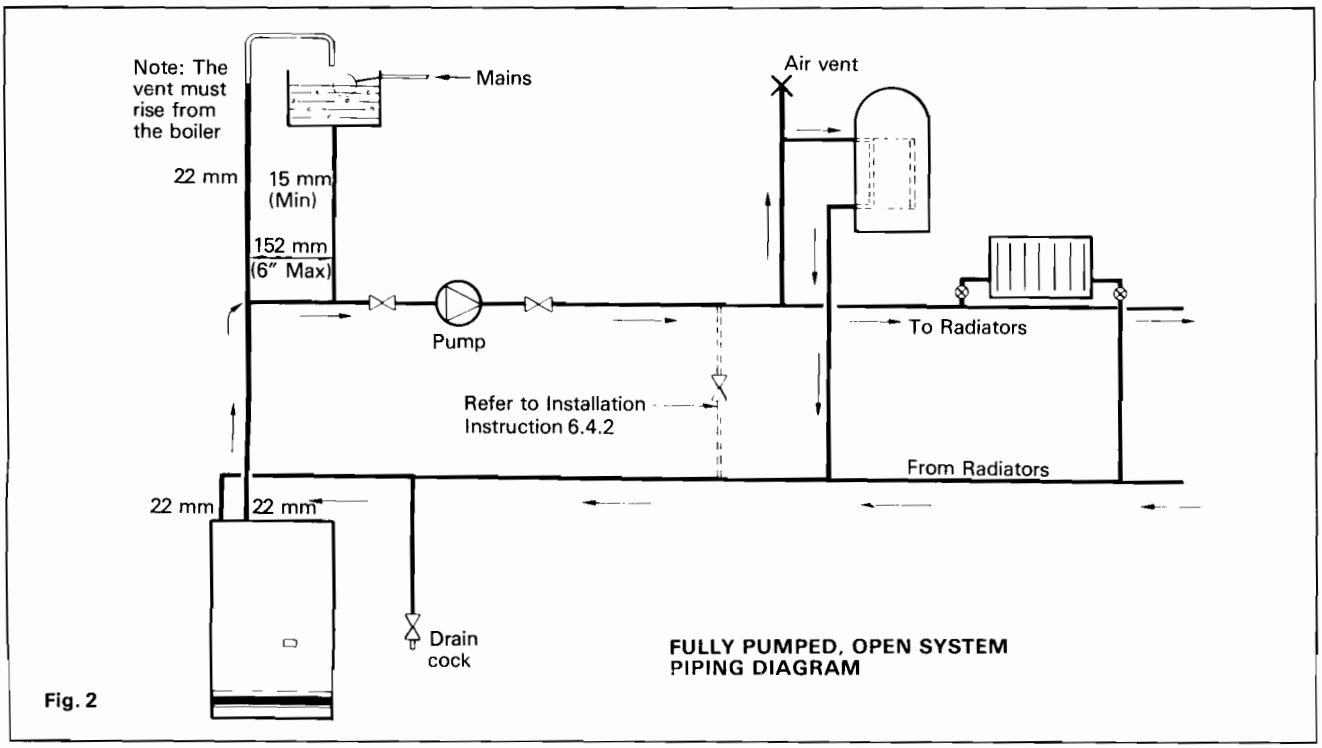
At least one drain cock should be fitted at the lowest point in the system to enable the water system to be drained.

6.4.4 Open Vented System only

Safety Valve: The provision of a safety valve on open vented systems is not necessary. However, if a safety valve is fitted it should comply with the specification detailed in section 6.4.5.

Cylinder: Any hot water storage cylinder must be an indirect type to BS 1566:Pt. 1 that is suitable for the system pressure. Single feed (self priming) indirect cylinders are NOT recommended.

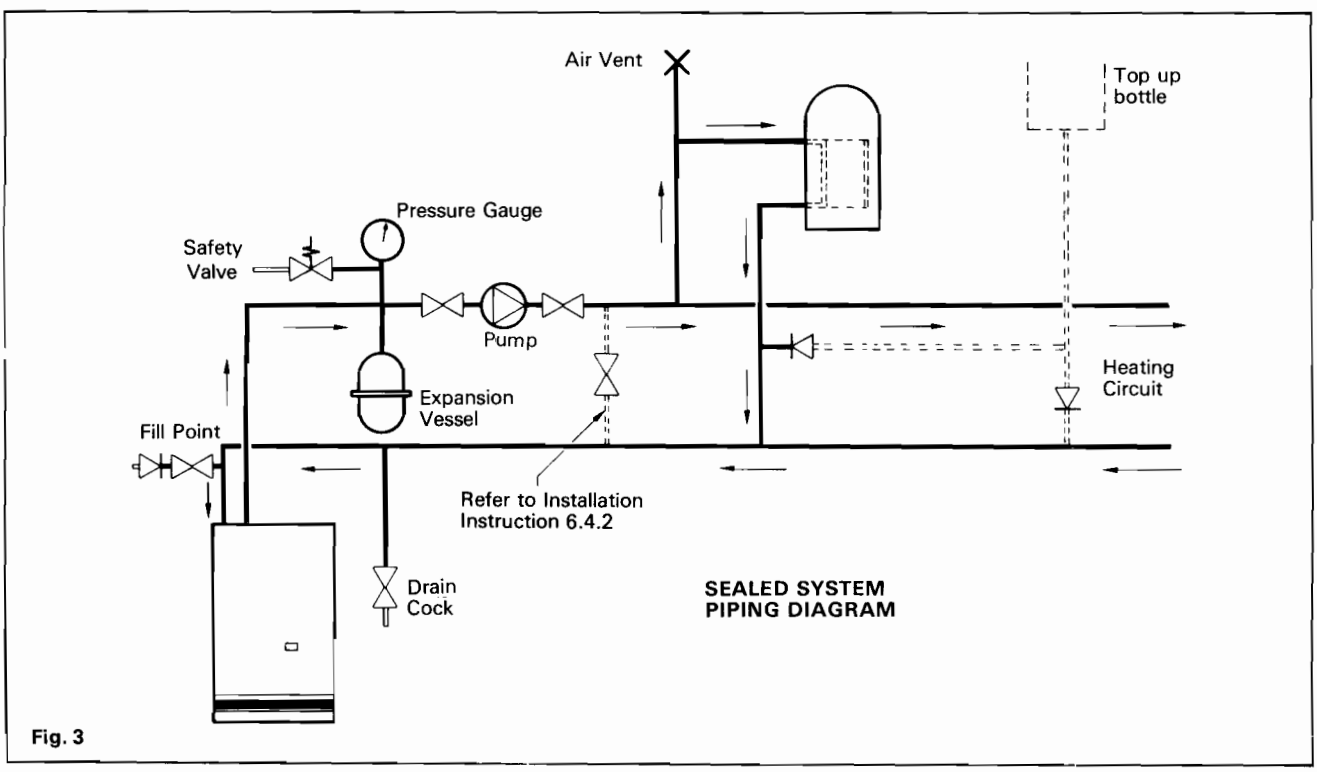
Open Vent and Cold Feed: A 22 mm minimum open vent pipe must be fitted in the FLOW pipe from the boiler and terminated above the cold feed and expansion cistern which should not be less than 22 litres (5 gal) capacity. The feed and expansion cistern must not be situated more than 30.5 metres (100 ft.) above the boiler.
A 15 mm O.D. (minimum) cold feed must be fitted to supply the system.



FULLY PUMPED, OPEN SYSTEM PIPING DIAGRAM

Fig. 2

6.4.5 Sealed System Only — General: The installation must comply with the requirements of BS 5376:2 and BS 5449:1.



SEALED SYSTEM PIPING DIAGRAM

Fig. 3

Safety Valve: A spring loaded safety valve complying with the relevant requirements of BS 759 shall be pre-set to operate at 3 bar (43.5 lbf/in^2). It should be positioned in the FLOW pipe close to the boiler, with no valves or restrictions between the safety valve and the boiler. The safety valve shall be so positioned or any discharge pipe so arranged that discharge of water or steam cannot create a hazard to occupants or damage electrical components and wiring.

Expansion Vessel: A diaphragm type expansion vessel, to BS 4814, shall be connected at a point close to the inlet side of the pump in the FLOW pipe from the boiler. The vessel must be chosen to suit the volume of water in the system and the charge pressure must not be less than the static head at the point of connection. Further details can be obtained from "Material and Installation Specification for Domestic Central Heating and Hot Water" published by British Gas.

Expansion vessel sizing table:

Air/Nit'n ch'ge pres. (bar)	0.5		1.0	
Pre-pressurisation pressure (bar)	NONE	1.0	NONE	1.5
Exp'sion vessel vol. (litre)	V x 0.087	V x 0.15	V x 0.11	V x 0.2

V = System volume (litre)

Pressure Gauge: A pressure gauge covering at least the range 0 to 4 bar (0 to 60 lbf/in^2) shall be permanently fitted to the system and visible to the person filling the system.

Cylinder: The hot water cylinder shall either be the indirect coil type or a direct cylinder fitted with an immersion calorifier.

Single feed (self-priming) indirect cylinder **MUST NOT** be used on sealed systems.

Method of Make Up: Water lost from the system should be replaced from a make up vessel connected to the system via a non-return valve and positioned higher than the top of the system on the return side of the cylinder or radiators.

Where access to a make-up vessel would be difficult, make-up can be provided by pre-pressurisation of the system.

Filling: There shall be no direct connection to the mains water supply or to a storage tank supplying domestic hot water even through a non-return valve, without the approval of the local water authority.

The system may be filled from the mains via a temporary hose but the filling point will require a non-return valve and anti-vacuum valve on the mains side of the fill point stop valve, and both valves shall be of the type approved by the National Water Council.

Commissioning: Fill the system until the pressure gauge registers 1.5 bar (22 lbf/in^2). Clear air locks, examine for leaks and rectify where necessary. Light the boiler and heat the system to maximum working temperature. Examine for leaks. Turn boiler off and drain the system while it is still hot. Refill, vent and adjust the cold fill pressure to the required value.

Disconnect any temporary connection made to the mains water supply.

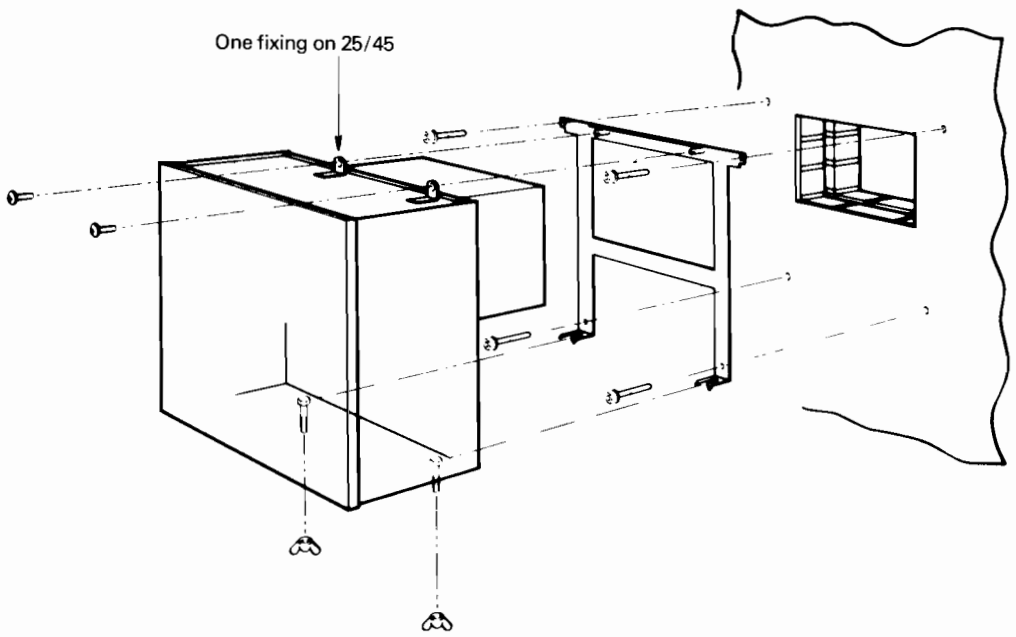


Fig. 4

7.0 INSTALLATION PROCEDURE

Unpack the boiler, swing down the controls access door and unscrew the case fixing screw (located below the piezo spark unit). Lift the casing to clear the top locating brackets and pull casing forward to remove. Remove the wallplate from the boiler as indicated in Fig. 4.

Use the wallplate as a template, referring to Fig. 1 for relative position of outer casing. Mark the position of the aperture in the wall for the flue duct and the position of the four wallplate fixing holes. Cut the aperture in the wall and drill four holes 10 mm diameter x 63 mm (2½ in.) long. Make good all plasterwork at this stage. Secure the wallplate to the wall using the anchor bolts provided. Using a 10 mm spanner, tighten the nut until the anchor bolt is secure. If the anchor bolt spins when tightened it will be necessary to expand the P.V.C. sleeve before inserting into the hole.

NOTE: If the wall is a lightweight material e.g. Durox, Siprox or Thermalite etc., it will be necessary to drill 7 mm holes and tap the anchor bolt into position.

Unpack the flue terminal and ducts. Slide the telescopic ducts apart.

Attach the balanced flue assembly to the boiler by locating the flue outlet duct onto the flue spigot on the boiler and secure with the six screws (B) provided — see Fig. 5. Lift the boiler and pass the ductwork through the aperture in the wallplate. Secure the boiler to the wallplate using the screw(s) and wing nuts provided— see Fig. 4.

From the outside of the building, enter the air inlet duct into the wall opening and slide over the air inlet duct already in position. Mark position of fixing holes. Drill and plug holes to suit No.10 x 1" screws. Adjust the telescopic ducts to suit the finished wall thickness. Seal the air inlet duct on the inside using the tape provided. Make good the external wall surface. Locate the flue terminal onto the flue outlet duct and slide the flue terminal into position. Secure the flue terminal to the wall using 2 off No.10 x 1" screws (C) provided — see Fig. 5.

When the boiler and flue have been secured, connect the gas supply (see Section 3.0), water circuit (see Section 6.4) and electrical connections (see Section 4.0).

Ensure all valves are open before thoroughly flushing the whole system with cold water (without the pump in position). Fit pump, fill system, vent and check for water soundness, rectifying where necessary.

Pressure test the gas installation pipework for soundness (Reference CP 331:3).

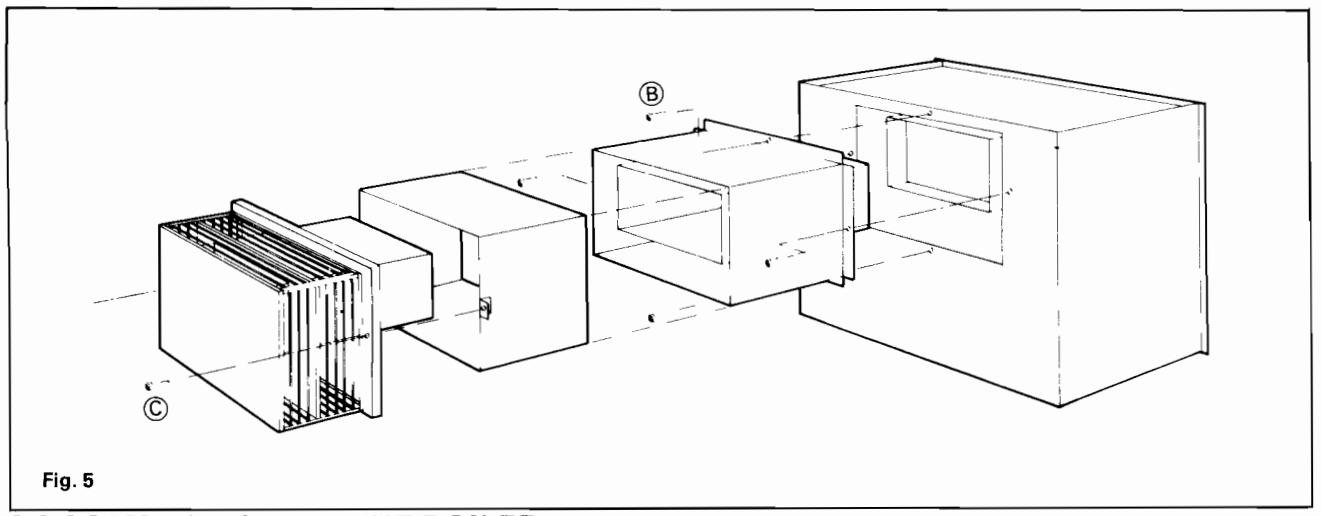


Fig. 5

8.0 COMMISSIONING THE BOILER

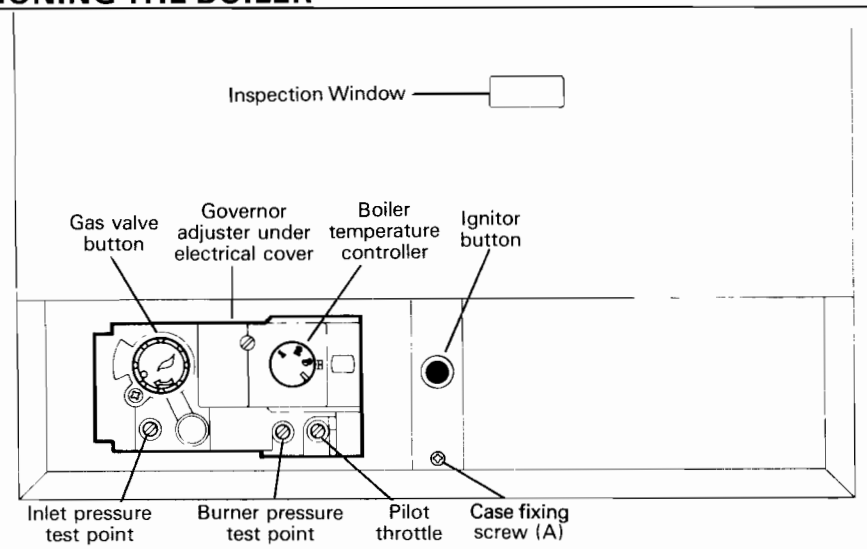


Fig. 6

8.1 Initial Lighting

a) Check that the electricity supply is ISOLATED and the gas service tap is OFF.

b) Loosen the gas control valve inlet pressure test point screw one turn.

c) Turn on the gas supply and open the gas service tap to purge gas line in accordance with CP 331:3.

d) Re-tighten the gas control valve inlet pressure test point screw.

e) Push in the gas control knob and at the same time press the ignitor button firmly, repeating if necessary until the pilot flame can be seen through the sight glass. When the pilot has lit, continue to depress the gas control valve knob for a further 15 seconds, then release slowly.

CAUTION:
If the pilot flame should be extinguished either intentionally or unintentionally, twist the gas control valve knob in the direction of the arrow. Wait for 3 minutes and repeat operation (e).

f) Check that the pilot adjuster is set so that the pilot flame envelopes the thermocouple tip by 13 mm (½") approx.

g) Loosen the burner pressure test point screw and connect a pressure gauge.

h) Set the boiler control thermostat to setting 3, ensure all system controls are calling for heat. Establish the electricity supply. Check that the main burner lights smoothly from the pilot burner.

i) Check the burner gas pressure and if necessary adjust to the relevant pressure as detailed in the table below:-

Model		25/45 RS	45/60 RS	60/75 RS
OUTPUT	kW Btu/h	13.2 45,000	17.6 60,000	22.0 75,000
INPUT	kW Btu/h	16.5 56,250	22.0 75,000	27.5 93,750
BURNER PRESSURE	mbar in w.g.	13.3 5.3	12.7 5.1	13.9 5.6

The pressure adjuster is located under the electrical cover on the gas control valve and protected by a screwed dust cap.

j) Switch OFF the electrical supply to the boiler and then disconnect the pressure gauge and re-tighten the test point screw.

k) Turn electrical supply ON and test all gas carrying components and joints for soundness using a suitable leak detection fluid.

l) Check that the boiler and all automatic controls operate satisfactorily.

NOTE:
A manual reset overheat cut-off device is fitted to the boiler and is situated at the rear of the gas control valve. The device is wired to interrupt the thermocouple circuit causing loss of pilot flame and safety shut down of the gas control valve in the event of an over heat condition. Should this occur during commissioning, the device will require resetting and the fault condition eliminated. Refer to Fault Finding — Section 5 "Overheat cut-off device operates".

m) Allow system to operate at maximum working temperature, examine for leaks. Turn the boiler OFF and drain system rapidly while still hot. Refill system and check for air locks.

NOTE:
For additional notes on the commissioning of sealed systems refer to Section 6.4.5.

8.2 Adjustment of By-pass

The boiler should be fired with a full load (i.e. central heating and domestic hot water) and the by-pass valve fully closed. Adjust the pump to give a temperature rise of 11°C (20°F) across the boiler. The system should then be switched to minimum load e.g. Hot water only or one radiator. Open the by-pass valve gradually until the boiler operates quietly at all flow temperatures.

8.3

After all adjustments and commissioning have been completed, lift the casing into position over the boiler, push back and lower to engage the top casing into the location groove. Secure the casing by screw at the base of the boiler.

8.4 Instruct the User

Hand the USER'S INSTRUCTIONS to the user or purchaser for retention and instruct in the efficient and safe operation of the boiler and heating/hot water system.

Advise the user or purchaser of the precautions necessary to prevent damage to the heating/hot water system and to the building in the event of the heating system remaining inoperative during frost conditions.

Finally, advise the user or purchaser that, for continued efficient and safe operation of the boiler, it is important that adequate servicing is carried out at intervals recommended by the local Gas Region.

NOTE—LEAVE INSTALLATION AND SERVICING INSTRUCTIONS ADJACENT TO THE GAS METER.

SERVICING

This section describes the annual servicing procedure, instructions for the replacement of faulty parts, and provides information on fault finding and spare part identification.

WARNING TURN OFF THE GAS SUPPLY AND ISOLATE THE ELECTRICITY SUPPLY BEFORE COMMENCING WORK ON THE BOILER.

SECTION A — ANNUAL ROUTINE SERVICING

This is normally confined to cleaning the burner and heat exchanger and checking the operation of the gas control.

1) To remove the casing

Swing down the controls access door and unscrew the case fixing screw (located below the piezo spark unit). Lift the casing to clear the top locating brackets and pull casing forward to remove.

2) To clean the burner

a) Undo the four screws securing the front panel to the sealed chamber and remove the panel.

b) Undo the eight screws securing the combustion chamber cover panel and remove the cover.

c) Disconnect the spark lead from the electrode.

d) Undo the themocouple securing nut to release the thermocouple from pilot burner assembly.

e) Disconnect the compression nuts on the pilot supply tube at the pilot burner and the bulkhead coupling. Remove this section of the pilot supply tube.

NOTE: Take care not to lose the pilot burner injector which is fitted into the pilot burner as a loose fit item.

f) Undo the two fixing screws securing the burner to the base of the boiler.

g) Hold down the thermocouple and withdraw the burner.

h) Inspect the burner and pilot burner and lightly brush off any deposits.

3) Inspect the thermocouple

If the thermocouple tip is burnt away or cracked, replace the thermocouple (see Section B — Replacement of Parts).

4) Inspect the Spark Electrode

If damaged, replace the electrode (see Section B — Replacement of Parts).

5) Clean Heat Exchanger

Inspect the heat exchanger for deposits. (The burner should be removed or covered during cleaning of the heat exchanger.) Brush the heat exchanger from above and below using a small stiff brush. The brush motion should be back to front and NOT sideways. Remove all deposits from the base of the boiler.

6) Reassembly

Reassemble the components in the reverse order.

7) Restore the gas and electrical supplies to the boiler and check

a) for gas soundness;

b) that the burner pressure is as stated on Data Badge;

c) for correct operation of the flame safety device;

d) for correct operation of system controls.

SECTION B — REPLACEMENT OF PARTS

WARNING TURN OFF THE GAS SUPPLY AND ISOLATE THE ELECTRICITY SUPPLY BEFORE COMMENCING WORK ON THE BOILER.

1) To replace BURNER

Refer to Section A — Annual Routine Service. Transfer the pilot burner and pilot burner shield to replacement burner and reassemble in reverse order — see Fig. 8.

2) To replace the BURNER INJECTOR

a) Remove the burner as 1) above.

b) Unscrew the burner injector from the burner manifold.

c) Screw in replacement injector, using a small amount of thread sealant.

d) Reassemble in the reverse order.

3) To replace the PIEZO UNIT

a) Remove the casing (see Section A — Annual Routine Service).

b) Disconnect the spark lead from the piezo unit.

c) Undo the nut securing the piezo unit and remove the unit.

d) Reassemble in reverse order.

4) To replace the MULTIFUNCTIONAL GAS CONTROL VALVE

a) Remove the casing (see Section A — Annual Routine Service).

b) Release the thermocouple from the gas control valve.

c) Disconnect the compression nuts on the pilot supply tube at the gas control valve and bottom of boiler, and remove supply tube.

d) Undo the screw securing the electrical cover on the gas control valve. Lift cover and detach the electrical leads. Disconnect the blue and brown wires from the amp tag connectors and remove the earth wire (green/yellow) by unscrewing the earth fixing screw. Disconnect the black wire link from amp tag connectors and retain.

e) Disconnect the two white wires from the gas valve as follows:

White wire secured at front of valve:-

Lift out the wire complete with blue connector from the valve.

White wire secured at rear of valve:-

Undo the securing nut and remove wire from the valve.

f) Undo the four screws securing the front panel to the sealed chamber and remove the panel.

g) Remove the retaining pin from the thermostat phial pocket (the lower and smaller pocket).

h) Carefully remove phial from pocket.

i) Undo the two screws securing the sealing plates to the base of the sealed chamber.

j) Pull the thermostat phial clear of the insulation sleeve and withdraw it from the boiler by manipulating it through the hole on the base of the sealed chamber.

k) Disconnect the union at the gas service tap.

l) Undo the four screws securing the flanged elbow on the oulet of the gas control valve taking care not to lose the rubber 'O' ring.

m) Undo the screw securing the gas control valve support bracket to the boiler body.

n) Remove the gas control valve. Undo the four screws securing the inlet flanged elbow taking care not to lose the rubber 'O' ring. Unscrew the two screws securing the gas control valve support bracket to the valve.

o) Inspect rubber 'O' rings and use replacements if necessary.

p) Refit the inlet flanged elbow (complete with 'O' ring) to the replacement valve.

q) Refit the gas control valve support bracket to the replacement valve.

r) Refit the black wire link retained in (d) above.

s) Reassemble in the reverse order.

t) Turn on gas and purge the supply line. Refer to lighting instructions. Light the pilot and test gas connections on inlet of gas valve and pilot supply for gas soundness.

u) Light the boiler and test for gas soundness.

v) Check for correct operation of the gas control valve. Adjust the burner pressure (refer to data badge). The pressure adjuster is located under the electrical cover on the gas control valve and protected by a screwed dust cap.

5 To replace the BOILER CONTROL THERMOSTAT (MODULATING)

a) Remove the casing (see Section A — Annual Routine Servicing).

b) Undo the screw securing the electrical cover on the gas control valve. Lift the cover and detach the electrical leads. Disconnect the blue and brown wires from the amp tag connectors and remove the earth wire (green/yellow) by unscrewing the earth fixing screw. Disconnect the black wire link from the amp tag connectors and retain.

c) Undo the four screws securing the front panel to the sealed chamber and remove panel.

d) Remove retaining pin from the thermostat phial pocket (the lower and smaller pocket).

e) Remove phial from pocket.

f) Undo the two screws securing the sealing plates to the base of the sealed chamber.

g) Pull the thermostat phial clear of the insulating sleeve and withdraw it from the boiler by manipulating it through the hole on the base of the sealed chamber.

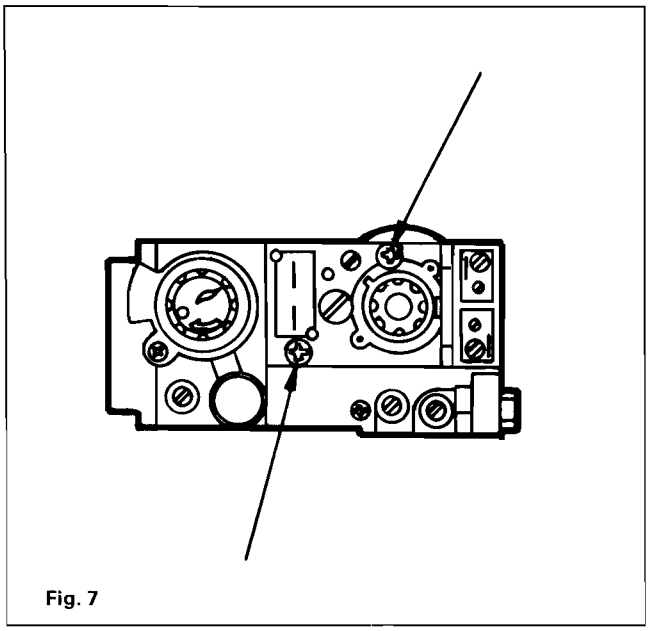


Fig. 7

h) Undo the two screws shown in Fig. 7.

i) Remove the Boiler Control Thermostat from the main body of the gas control valve, taking care not to lose the sealing gaskket.

j) Reassemble in the reverse order, taking care that the sealing gasket is in good condition and is correctly located. Renew if necessary.

k) Test for gas soundness.

l) Set the control thermostat to mark 3. Light the boiler, following the lighting procedure. Adjust the burner pressure (refer to data badge).
The pressure adjuster is located under the electrical cover on the gas control valve and protected by a screwed dust cap. Allow the system to heat up. Check that burner modulates and shuts down at a flow temperature of approx. 85-90°C. Boiling should not occur.

6 To replace the PILOT BURNER

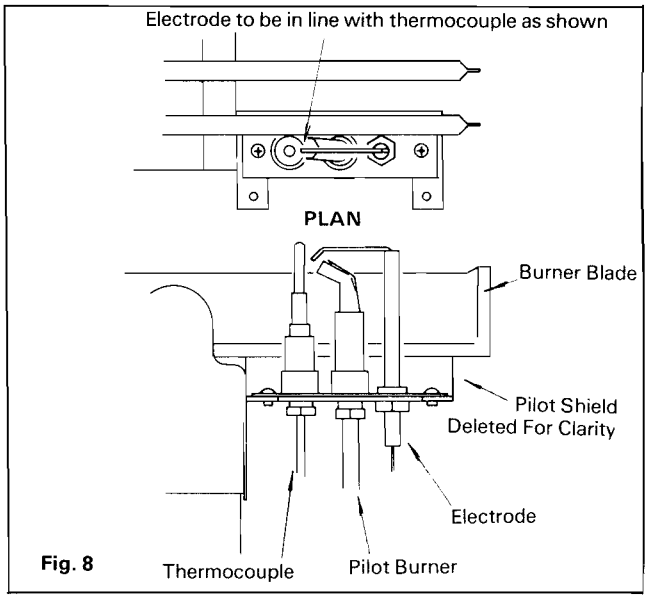


Fig. 8

a) Remove the casing (see Section A — Annual Routine Servicing).

b) Undo the four screws securing the front panel to the sealed chamber and remove the panel.

c) Undo the eight screws securing the combustion chamber cover panel and remove the cover.

d) Disconnect the spark lead from the electrode.

e) Undo the thermocouple securing nut to release the thermocouple, from the pilot burner assembly.

f) Disconnect the compression nuts on the pilot supply tube at the pilot burner and bulkhead coupling. Remove this section of the pilot supply tube.

NOTE: Take care not to lose pilot burner injector which is fitted into the pilot burner as a loose fit item.

g) Undo the two fixing screws securing pilot burner to the main burner and remove pilot burner.

h) Transfer the pilot burner injector and the spark electrode to the replacement pilot burner assembly.

i) Reassemble in the reverse order.

NOTE: The correct pilot burner position is shown in Fig. 8.

7. To replace the ELECTRODE

Refer to 6) "To replace the pilot burner" and proceed as described in steps (a) to (d). Unscrew the nut securing the electrode to the pilot burner assembly and remove electrode. Reassemble in the reverse order.

8. To replace the THERMOCOUPLE

a) Remove the casing (see Section A — Annual Routine Servicing).

b) Undo the four screws securing the front panel to the sealed chamber and remove the panel.

c) Undo the eight screws securing the combustion chamber cover and remove the cover.

d) Undo the thermocouple securing nut to release the thermocouple from the pilot burner assembly.

e) Unscrew the thermocouple end nut and remove the thermocouple from the gas control valve.

f) Undo the two screws securing the sealing plates to the base of the sealed chamber and remove sealing plates.

g) Pull thermocouple clear by manipulating it through the hole in the base of the sealed chamber.

h) Reassemble in the reverse order. Do not overtighten the thermocouple nut. A quarter turn beyond finger tight is adequate.

9. To replace the OVERHEAT CUT-OFF DEVICE

a) Remove the casing (see Section A — Annual Routine Servicing).

b) Undo the four screws securing the front panel to the sealed chamber and remove the panel.

c) Remove the retaining pin from the overheat phial pocket (the upper and larger pocket).

d) Remove phial from pocket.

e) Unscrew the two screws securing the sealing plates to the base of the sealed chamber.

f) Pull the overheat phial clear of the insulating sleeve and withdraw it from the boiler by manipulating it through the hole on the base of the sealed chamber.

g) Disconnect the two white electrical leads from the overheat device.

h) Unscrew the two screws securing the overheat device to the boiler and remove.

i) Reassemble in the reverse order.

10. To replace the HEAT EXCHANGER

a) Drain the system of water (a drain cock is usually fitted at the lowest point of the heating system).

b) Remove the casing (see Section A — Annual Routine Servicing).

c) Undo the four screws securing the front panel to the sealed chamber and remove the panel.

d) Undo the eight screws securing the combustion chamber lower panel and remove the panel.

e) Undo the three screws securing the left hand flue collector side and remove.

f) Undo the two screws securing the left hand combustion chamber side and remove the chamber side.

g) Support the left hand side of the heat exchanger and disconnect the compression nuts securing the flow and return pipes to the heat exchanger.

NOTE: Spillage of water is likely, the burner and electrical equipment should be protected.

h) Lower the left side of the heat exchanger and remove.

i) Reassemble in the reverse order.

j) Recharge system and carry out commissioning procedure.

11. To replace the PILOT FILTER (incorporated in the gas control valve).

Refer to 5) "To replace the BOILER CONTROL THERMOSTAT (MODULATING)" and proceed as described in steps (a) to (i). Then:

a) Undo four screws and remove the solenoid operator — take care not to damage cork gasket, replace if necessary.

b) Undo one screw and remove the operator mounting plate.

NOTE: This will probably require a light tap on one edge of the plate. CARE must be taken not to damage the gasket; replace if necessary.

c) Lift out pilot filter.

d) Reassemble in the reverse order.

e) Restore gas and electrical supplies to the boiler and test for gas soundness.

f) Adjust the burner pressure (refer to data badge). The pressure adjuster is located under the electrical cover on the gas valve and protected by a screwed dust cap.

g) Check for correct operation of flame safety device.

h) Check Boiler Control Thermostat operates correctly. Set the control thermostat to mark 3. Allow the system to heat up. Check that burner modulates and shuts down at a flow temperature of approx. 85°—90°C. Boiling should not occur.

12. To replace the COMBUSTION CHAMBER INSULATION

a) Remove the casing (see Section A—Annual Routine Servicing).

b) Undo the four screws securing the front panel to the sealed chamber and remove the panel.

c) Undo the eight screws securing the combustion chamber cover panel and remove the cover.

Side insulation only

d) Slide insulation from chamber side.

Front insulation only

e) Undo two nuts securing insulation retaining bracket to the combustion chamber cover panel and remove insulation.

Rear insulation only

f) Remove the main burner. (Refer to Section A—Annual Routine Servicing).

g) Lift the insulation and then lower to clear the retaining channel and the back of the heat exchanger and remove.

h) Re-assemble in the reverse order.

13 To replace the MAGNETIC CATCHES

a) Remove the casing (see Section A — Annual Routine Servicing).

b) From the rear of the casing, depress the two magnetic catch retaining pins and at the same time push the catch and remove from the casing.

c) Reassemble in reverse order.

14. To replace the VIEWING WINDOW GLASS (SEALED CHAMBER FRONT PANEL)

a) Remove the casing (see Section A—Annual Routine Servicing).

b) Undo the two retaining nuts from the window bezel.

c) Remove the complete window assembly.

d) Re-assemble in reverse order, using new gaskets provided.

15. To replace the VIEWING WINDOW GLASS (COMBUSTION CHAMBER COVER PANEL)

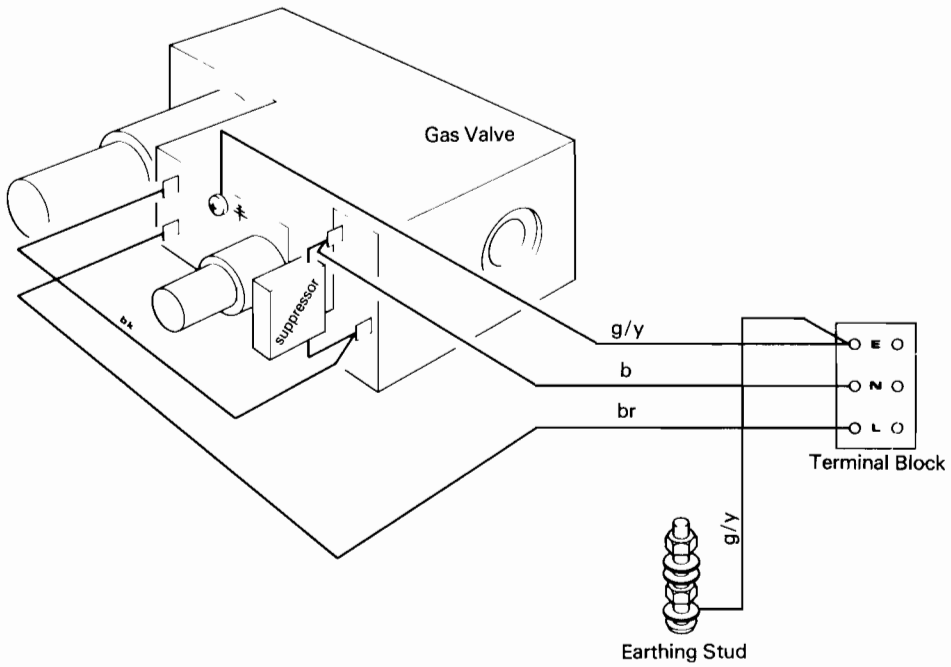
a) Remove the casing (see Section A—Annual Routine Servicing).

b) Undo the four screws securing the Front panel to the sealed chamber and remove the panel.

c) Undo the two retaining nuts from the window bezel.

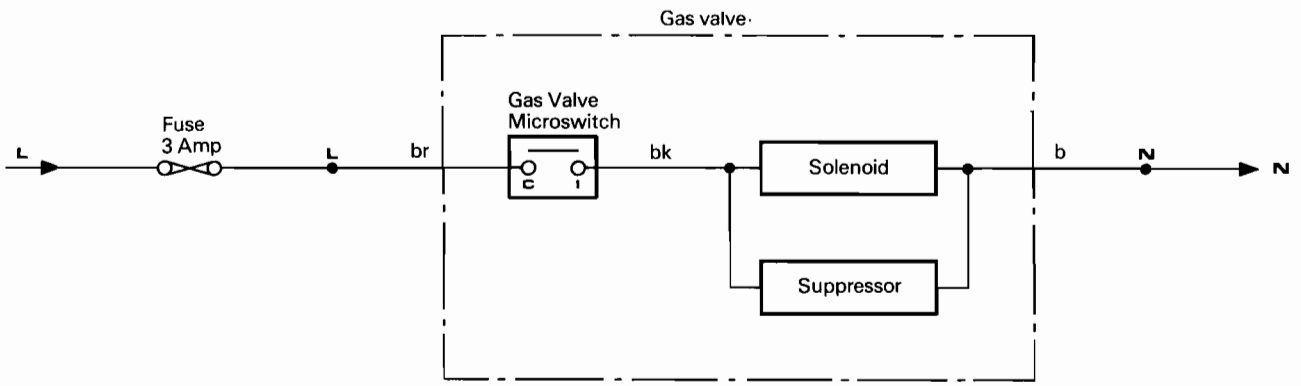
d) Remove the complete window assembly.

e) Re-assemble in reverse order, using new gaskets provided.



WIRING DIAGRAM

Fig. 9



FUNCTIONAL FLOW DIAGRAM

Fig. 10

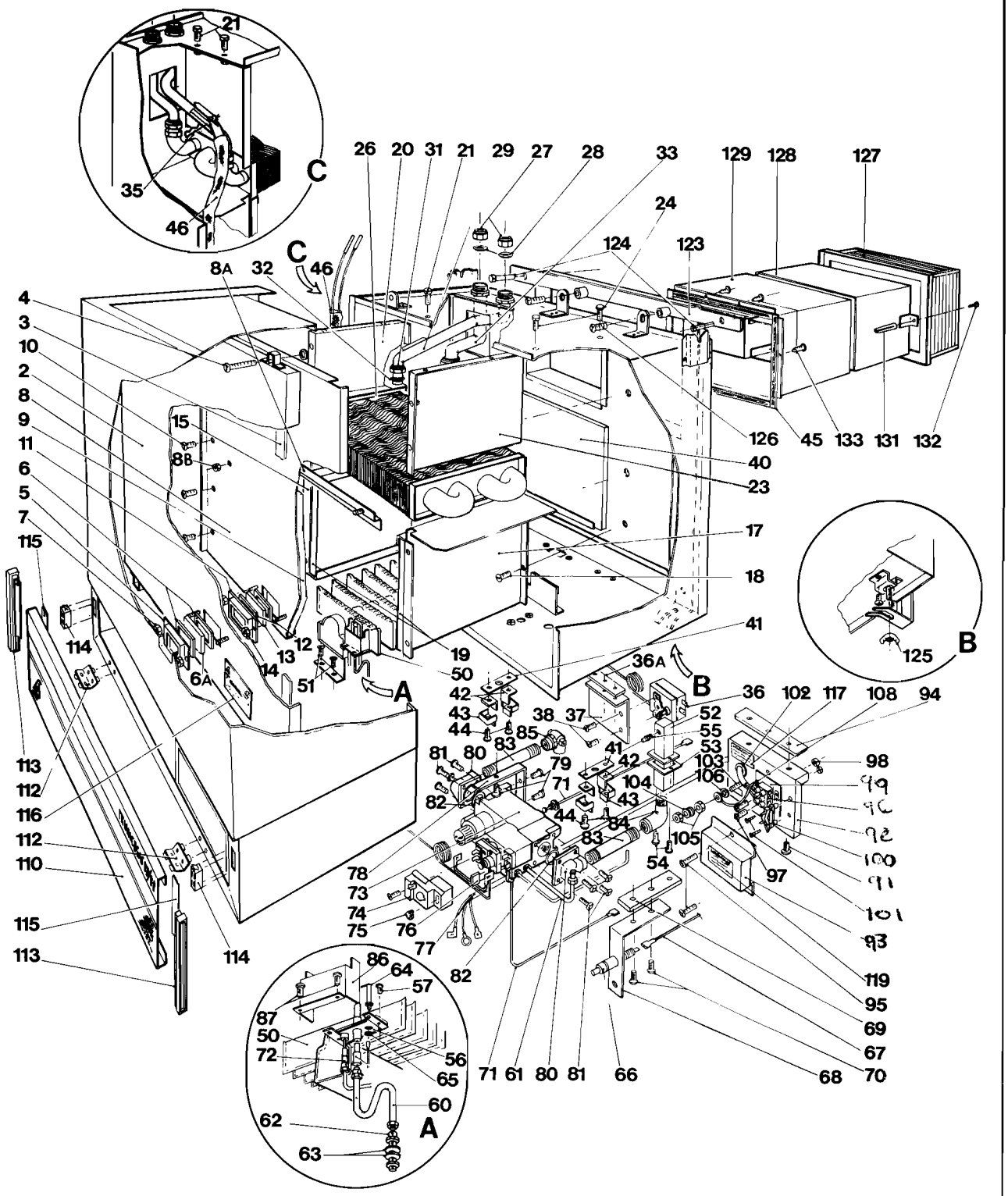
SECTION C — FAULT FINDING GUIDE

IMPORTANT:
Preliminary electrical system checks as contained in the BGC multimeter instruction book are the first electrical checks to be carried out during a fault finding procedure. On completion of the service/fault finding task which has required the breaking and remarking of electrical connections, then the checks — A. Earth Continuity, C. Polarity and D. Resistance to Earth **must** be repeated.

Cause	Remedy
1. PILOT WILL NOT LIGHT	
a) Gas inlet pressure inadequate.	Check that gas line is unrestricted.
b) Air in gas line.	Purge air from line.
c) Gas supply to pilot restricted as follows:	
i) On undoing tubing nut on pilot supply tube at gas valve and pressing gas valve button, gas does not flow freely.	Ensure pilot throttle is fully open.
ii) On undoing tubing nut on pilot supply tube at pilot burner and pressing gas valve button, gas does not flow freely.	Pilot tube blocked. Replace.
iii) As (c) (ii) but gas flows freely.	Blockage in pilot burner injector or pilot head. Clean or replace.
d) No spark	Check ignition lead connections and electrode. Check electrode gap — Faulty piezo ignitor.
2. PILOT WILL NOT REMAIN ALIGHT WHEN GAS VALVE BUTTON RELEASED	
a) Overheat Cut-Off Device has tripped.	Reset device by pressing button, situated at the centre of the thermostat. Refer to sub-section 5 "Overheat Cut-Off Device operates".
b) Pilot flame not impinging on thermocouple.	Pilot flame should envelope 9—12 mm of the thermocouple tip. Refer to 1 (c).
c) Excessive voltage drop across Overheat Cut-Off Device.	Check voltage drop. Replace overheat device if voltage drop across the terminals is greater than 1mV.
d) Thermocouple has faulty contact gas valve.	Check for tightness. **NOTE:**— These contacts should not be overtightened. One quarter of a turn beyond finger tight is adequate.
e) Faulty thermocouple.	Check the voltage between a terminal on the over-heat device and earth. The voltage should be a minimum of 8mV. Replace if found to be below this value.
f) Faulty power unit in gas valve.	Replace gas valve.
3. PILOT GOES OUT AFTER A PERIOD OF REMAINING ALIGHT	
Room sealed chamber incorrectly sealed.	Check seal around sealed chamber door. Check seal around viewing window.
4. MAIN BURNER WILL NOT IGNITE	
a) Low voltage.	For correct operation of the boiler the voltage applied must be at least 216v. Check with a volt meter.
b) No voltage on Mains Inlet terminal block.	Check wiring of terminal block and check that all external controls are calling for heat. Otherwise rectify fault in external wiring.
c) Gas valve microswitch faulty.	Check continuity of gas valve wiring. Replace Boiler Control Thermostat section of Gas Valve.
d) Open circuit in internal wiring.	Check continuity of internal wiring and replace if necessary.
e) Faulty gas valve.	Replace.
5. OVERHEAT CUT-OFF DEVICE OPERATES	
a) System air locked.	Vent system. Alter system layout if necessary.

Continued on Page 17

Cause	Remedy
b) Water circulation very low or non-existent.	Check that pump is functioning correctly and that it is wired to run while boiler is on. Alter system layout if necessary.
c) Calibration of overheat cut-off device incorrect.	Replace overheat cut-off device.
6. INSUFFICIENT HEAT OUTPUT	
a) Boiler Temperature Modulating Control set too low.	Increase setting.
b) Inlet gas pressure inadequate.	Increase gas pressure.
c) Governor setting incorrect. (Measure burner pressure only when the system is cold and with the boiler temperature modulating control set to maximum).	Check burner pressure (correct pressure stated on data plate). Reset if necessary.



EXPLODED VIEW DIAGRAM

Fig. 11

SHORT LIST OF PARTS

The following list comprises parts commonly required as replacements due to damage, expendability, or such that their failure or absence is likely to affect the safety or performance of the boiler.

Key No.	G.C.No.	Description	No. off	Maker's Part No.
5	324607	Sight glass Assembly	1	51324
6 & 13	324608	Sight glass Gasket	1	51325
36	395752	Overheat Cut-off Device	1	51311
50	324629	Burner (WM 25/45 RS)	1	51284
50	324676	" (WM 45/60 RS)	1	52284
50	324694	" (WM 60/75 RS)	1	53284
55	393237	Injector (WM 25/45 RS)	1	51283
55	324683	" (WM 45/60 RS)	1	52283
55	324695	" (WM 60/75 RS)	1	53283
56	384267	Pilot Burner	1	51285
58	382536	Pilot Orifice	1	51286
64	395725	Electrode	1	51289
65	324669	Nut	1	51291
66	393870	Piezo Spark Generator	1	51314
72	390039	Thermocouple (Honeywell)	1	51288
73	384269	Gas Control (Honeywell)	1	51305

Trianco Redfyre policy is one of continuous research and development. This may necessitate alterations to this specification.

TRIANCO

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Thorncliffe, Chapeltown, Sheffield S30 4PZ
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By appointment to H.M. Queen Elizabeth
The Queen Mother
Manufacturers of Domestic Boilers

Thorncliffe Printers Limited November 1984 Item No. 51383

CI/SfB
56.41

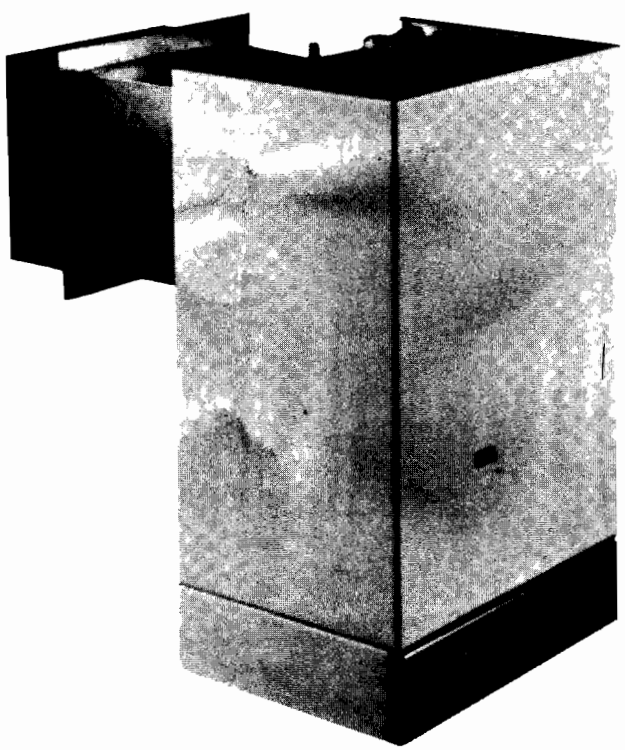
TriancoGas

Wall Mounted Balanced Flue
Gas Fired Central Heating Boiler

By Appointment to H.M. Queen Elizabeth
The Queen Mother
Manufacturers of Domestic Boilers

User Instructions

WM 25/45 RS G.C.No. 41.898.29
WM 45/60 RS G.C.No. 41.898.30
WM 60/75 RS G.C.No. 41.898.31



WARNING

IN YOUR OWN INTEREST AND THAT OF SAFETY IT IS THE LAW THAT ALL GAS APPLIANCES ARE INSTALLED BY A COMPETENT PERSON IN ACCORDANCE WITH THE GAS SAFETY REGULATIONS 1972.

ELECTRICITY SUPPLY

WARNING: THIS APPLIANCE MUST BE EARTHED

Connection should be made to a 240v 50 Hz~ supply. The appliance must be protected by a 3 amp fuse if a 13 amp (BS. 1363) plug is used or if any other type of plug is used by a 5 amp fuse in the circuit.

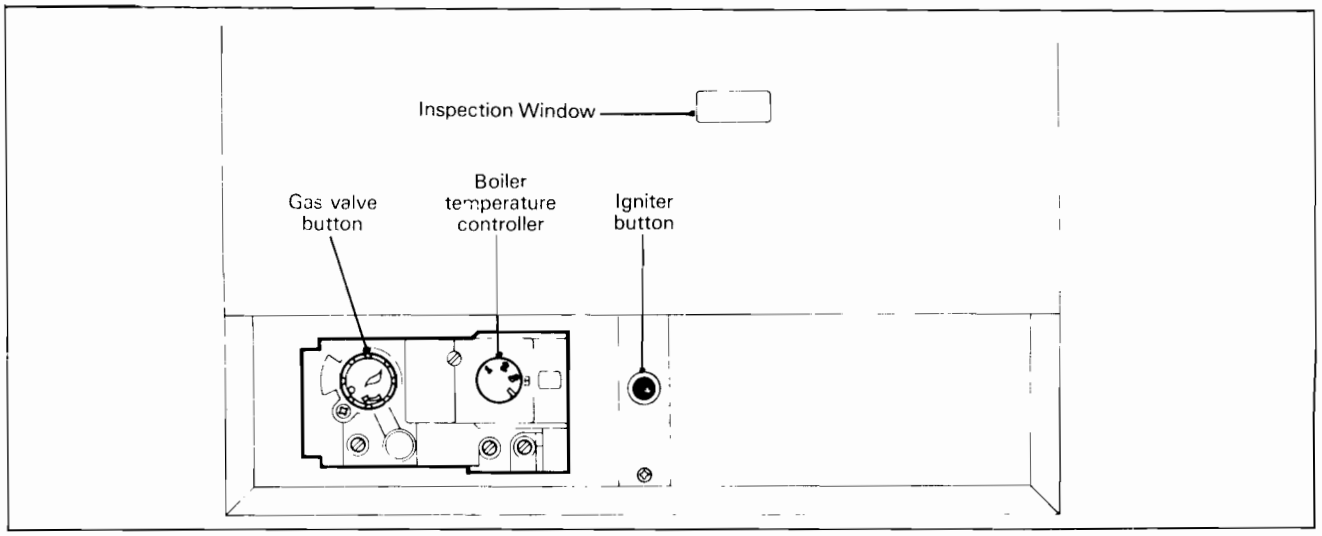
To connect a plug:

As the colour of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol ⏚ or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.



LIGHTING THE BOILER

The boiler incorporates a safety device that prevents the flow of gas to the main burner until the pilot flame is lit. To light the pilot and establish the main burner flame, follow the lighting procedure:

a) Swing down the controls cover by pulling forward on the side edges of the cover.

b) Ensure that the electrical supply to the boiler is OFF.

c) Press and hold down the start button on the gas valve. Press the ignitor button firmly, then release, repeating if necessary, until the pilot flame can be seen through the viewing window. When the pilot has lit, continue to hold down the start button for approximately 15 seconds and then release.

Warning: If the pilot flame does not remain alight or is extinguished either intentionally or unintentionally, turn the start button clockwise as far as possible (about 30°), release it and WAIT THREE MINUTES before re-attempting to light the pilot.

d) When the pilot flame is established, switch ON the electrical supply. Set programmer, if fitted, to the 'ON' position.

e) The main burner will light and can be viewed through the viewing window. The boiler thermostat and all external controls can now be set as desired.

TO TURN OFF THE BOILER

For Short Periods

If a time switch or programmer is fitted, set it to the OFF position. If there is no time switch or programmer, switch OFF the electricity supply at the isolating switch or plug and socket. In this condition, your appliance will not operate but it is ready for use. To re-start, switch ON the programmer or the electricity supply.

For longer Periods

Switch OFF the electricity supply at the isolating switch or plug and socket. Turn the start button on the gas valve clockwise as far as possible (about 30°). To re-light, follow the full instructions as in "LIGHTING THE BOILER".

NOTE: FROST PRECAUTION

A boiler and central heating system that is shut down for several hours during very cold weather may be in danger of freezing and it is advisable to protect the installation with a frost thermostat. If, however, the installation is not protected in this manner, the system should be switched on and the room thermostat set to low setting e.g. 7°C (45°F) to prevent the temperature in the building becoming too low. If the system is shut down for very long periods during very cold weather, it is advisable to completely drain the system. Draining and filling should be done by a qualified installer. Frequent draining, especially in hard water areas,

should be avoided as this may lead to scaling of the heat exchanger.

HINTS ON USING YOUR BOILER

Time Control

When choosing the operating times for your boiler you may find it useful to remember these points:

1) Central heating takes half-an-hour to an hour to become effective. It is advised that the time clock/programmer is set to bring on the heating system one hour before heating is desired. The heating system will remain effective for approximately half-an-hour to an hour after boiler shut down.
2) If the hot water cylinder is cold it will take approximately half-an-hour to provide sufficient hot water for general usage.

Boiler Temperature Controller

The boiler temperature controller enables you to select the temperature of the water leaving the boiler. It has a temperature range from approximately 60°C (140°F) at its minimum setting (1) to 90°C (194°F) at its maximum setting (3+).

Room Thermostat

The room thermostat (if fitted) should not be positioned above a source of heat e.g. a radiator or fire, or exposed to the sun, as this will cause the central heating to switch off prematurely. Follow manufacturer's instructions for best position for thermostat.

Boiler Providing Central Heating Only

It is recommended that the boiler thermostat knob is set to a high position Setting 2 to 2½ (80-85°C, 176-185°F) and it is suggested that the room thermostat (if fitted) is set to give the temperatures shown below:

Night	10°C (50°F)
Daytime	16°C (60°F)
Evening	18-21°C (67-70°F)

If no system controls are provided, the boiler thermostat can be adjusted to suit your requirements.

Boiler Providing Central Heating and Hot Water

During the winter months the boiler thermostat and room thermostat (if fitted) should be set as detailed above. If a separate cylinder thermostat is fitted to the hot water cylinder, it is recommended that it should be set at 54-60°C (134-140°F). If a cylinder thermostat is not fitted, then the domestic hot water will be at the same temperature as the central heating water, therefore care should be taken when drawing off hot water — Remember, water at 71°C (160°F) can scald.

For summer months, when the boiler is used to provide domestic hot water only, the boiler thermostat may be set to a lower temperature if no cylinder thermostat is fitted.

Access for Servicing

The following minimum clearances must be provided to allow adequate access for servicing:

Right and left hand side of boiler	— 10mm (⅜")
Top of boiler	— 75mm (3")
Underside of boiler	— 125mm (5")
Front of boiler	— 305mm (12")

Compartment Installations

If the boiler has been installed in a compartment then it must be well ventilated and the means provided for ventilation MUST NOT BE BLOCKED.

The compartment MUST NOT BE USED FOR STORAGE PURPOSES, especially combustible materials, inflammable and volatile liquids.

Cleaning

The casing can be cleaned by wiping it occasionally with a damp soapy cloth and a dry polishing cloth. DO NOT USE ABRASIVES.

No other maintenance should be undertaken except by a competent Service Engineer.

Service

To ensure maximum life and efficiency, the boiler should be serviced annually. Contact your Service Engineer or Gas Region.

SPARE PARTS AND SERVICE

All Trianco products are covered by a 12 months warranty and a nationwide team of service engineers. Service and Spares from:

Trianco Redfyre Ltd., Thorncliffe, Chapeltown, Sheffield.
Service: Tel. No. Sheffield (0742) 465862
Spares: Tel. No. Sheffield (0742) 461221

In all communications please quote the appliance name and G.C. Number. This information will be found on the rear of the facia panel.

Local Service Contractor:

Manufactured by; Trianco Redfyre Ltd., Sheffield.

Trianco Redfyre policy is one of continuous research and development. This may necessitate alterations to this specification.

Trianco Redfyre Limited

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