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The Sime RMG Range

Cast Iron Sectional Boilers with Atmospheric Burners



Installation and Servicing Instructions

LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER OR WITH THE SERVICE ENGINEER

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1 Introduction

1.1 General Features

The RMG range are floor mounted, natural draught, open flue central heating boilers, and are intended for heating commercial or industrial premises. They may also be used to supply hot water to such premises. The boilers have an external draught diverter.

The boiler body is formed of pre-assembled sections of special cast iron which, being highly resistant to corrosion, ensured a long and trouble free life. A blue stove enamelled casing is supplied with the unit.

The boiler is designed for use in an open system with either pumped central heating, hot water or pumped central heating and gravity fed hot water. Outputs range from 72kW (245700 Btu/h) — 96 kW (327600 Btu/h).

The boiler may be fitted to a common open-flue system in multi-boiler installations.

Safety control of the appliance is by a multifunctional control and associated thermocouple and ignition of the permanent pilot is by a piezo unit.

To avoid the possible intervention of the safety thermostat, due to the thermal inertia, it is preferable to keep the pump in operation at all times when the boiler is in use.

1.2 Delivery of the Boiler

The boiler is despatched to site partially assembled in two packages.

Package No. 1

The boiler fully assembled on a wooden crate.

Package No. 2

The downdraught diverter.

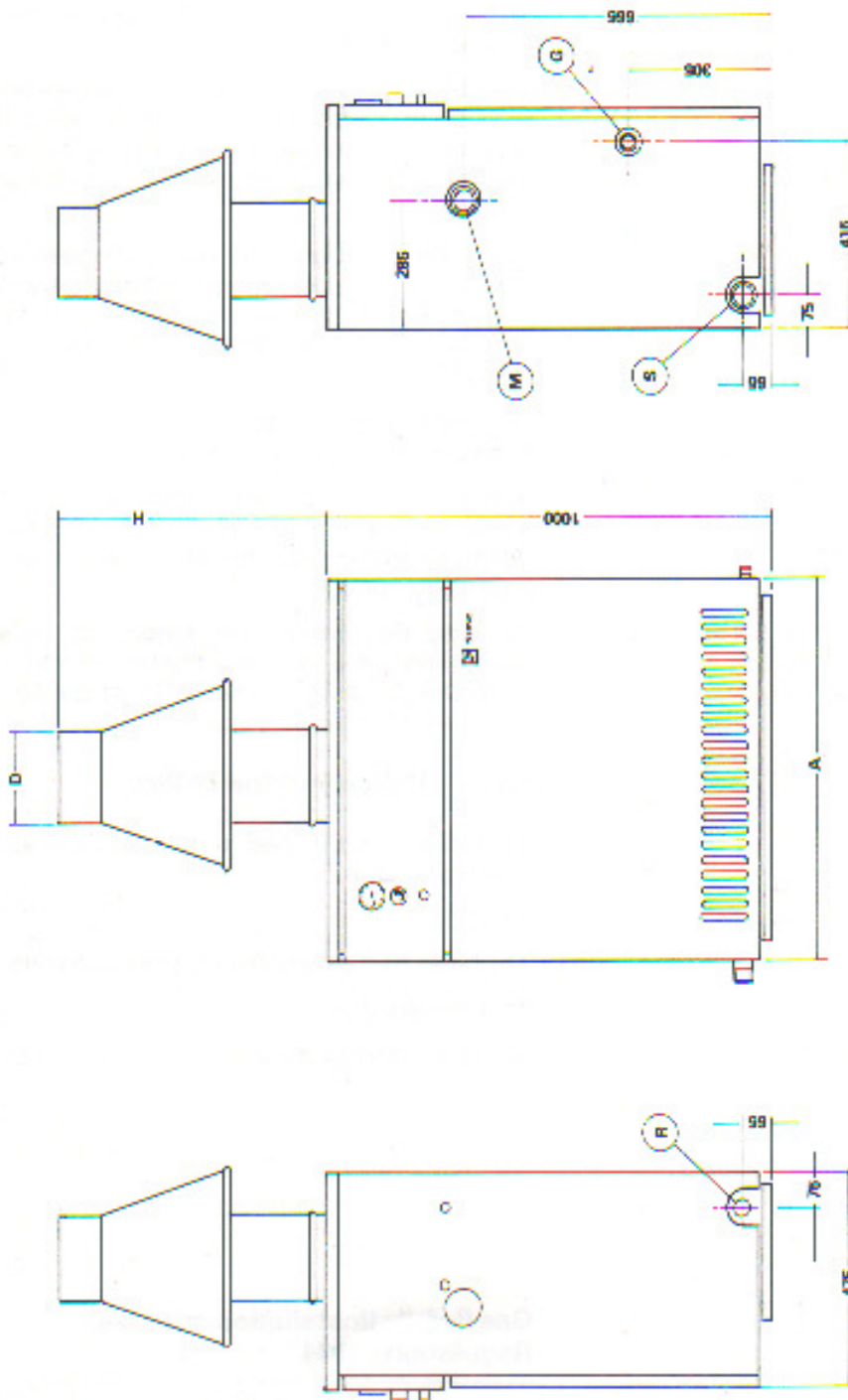
Gas Safety (Installation and Use) Regulations 1984

It is law that all gas appliances are installed by competent person* in accordance with above regulations. Failure to install appliances correctly can lead to prosecution. It is in your own interest and that of safety to ensure that the law is complied with.

*e.g. Corgi

2 Technical Data

Fig. 1 — Physical Sizes



	A	D	H	G (GAS)	M	R	S	WATER CONTENT		DRY WEIGHT	
								litres	galls	Kg	lbs
RMG 8D	840	200	825	R 3/4	R 1 1/2	R 3/4	R 1 1/2	26.5	5.8	238	525
RMG 9D	940	225	885					29.7	6.5	266	587
RMG18D	1040	225	885					33.0	7.3	294	648

Maximum working pressure 4 bar (60 p.s.i.)
 Maximum head net to exceed 40m (131ft)
 Minimum head required 2m (6.5ft)

Table 1

SIME RMG SERIES BOILERS SETTING DATA				
Item	Units	RMG 8	RMG 9	RMG10
Heat Input	kW	93.17	110.0	124.25
	Btu	317900	375,000	423950
Heat Output	kW	72	84.0	96
	Btu	245700	286500	327600
Burner Pressure	mb	12.2	11.2	11.2
	ins w.g.	4.9	4.5	4.5
Pilot Rate	kW	0.26	0.26	0.26
	Btu	887	887	887
Pilot Pressure	mb	10.2	10.2	10.2
	ins w.g.	4.0	4.0	4.0
Injector Dia x No.	mm x No.	3.0 x 7	3.0 x 8	3.0 x 9
	ins x No.	0.118 x 7	0.118 x 8	0.118 x 9
*Carbon Dioxide	%	8.0	7.6	8.3
Ex-Gross Flue Temp.	°C	208	217	215

* As measured in the primary flue. Figures given for guidance only.

3 General Requirements

3.1 Related Documents

The installation of the boiler must be in accordance with the relevant requirements of the Gas Safety (Installation and Use) Regulations 1984, Local Building Regulations, I.E.E. Regulations and the byelaws of the local Water Undertaking.

It should also be in accordance with any relevant requirements of the local gas region and local authority and the relevant recommendations of the following documents:

British Standard Codes of Practice,

CP331: 3 Low pressure installations pipes.

BS6644: Specification for installation of gas-fired hot water boilers of rated inputs between 60kW and 2MW.

CP341: 300-307 Central heating by low pressure hot water.

CP342: Centralized hot water supply.

British Gas Publications.

'Technical Notes on the Design of Flues for Non-Domestic Gas Boilers'

3.2 Location

The location chosen for the boiler must permit the provision of a satisfactory flue and an adequate air supply. The location must also provide adequate space for servicing and air circulation around the boiler.

The boiler must be installed on a level non combustible surface that is capable of adequately supporting the weight of the boiler (when filled with water) and any ancillary equipment.

Any combustible material adjacent to the boiler and the flue system must be so placed or shielded as to ensure that it does not exceed a temperature of 65°C (150°F).

Further details regarding boiler location are given in BS6644.

3.3 Gas Supply

3.3.1 Service Pipes

The local gas region should be consulted at the insulation planning stage in order to establish the availability of an adequate supply of gas.

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

3.3.2 Meters

A gas meter is connected to the service pipe by the local gas region or a local gas region contractor.

3.3.3 Installation Pipes

Installation pipes should be fitted in accordance with CP331.3

Pipework from the meter to the boiler must be of adequate size. Do not use pipes of a smaller size than the boiler gas connection.

The complete installation must be tested for soundness as described in the above Code.

3.3.4 Boosted Supplies

Where it is necessary to employ a gas pressure booster the controls must include a low pressure, cut-off switch at the booster inlet.

3.4 Flue System

Detailed recommendation for fluing are given in the British Gas Publication 'Technical Notes on the Design of Flues for the Non-Domestic Gas Boilers'. Reference should also be made to BS6644, where applicable.

The following notes are intended to give general guidance.

The cross sectional of the flue serving the boiler must be not less than the area of the flue outlet of the boiler.

Flue pipes and fittings should be constructed from one of the following materials:-

- a) asbestos cement
- b) aluminium or stainless steel
- c) cast iron — coated on inside with acid-resistant vitreous enamel

If double walled flue pipe is used it should be of a type acceptable to British Gas.

The chimney to be used must be one that is composed of or lined with a non-porous acid resistant material. (Chimneys lined with salt glazed earthenware pipes are acceptable if the pipes comply with BS65 & 540.1. A flue pipe constructed from one of the materials in (a) to (c) above should form the initial connection to lined chimneys.

Where a chimney is to be used which is not composed of or lined with a non-porous acid resistant material it should be lined with a stainless steel flexible flue liner or any other liner that is of a type acceptable to British Gas. The internal diameter of the liner must be not less than 150mm (6") for RM42, 180mm (7") for RM52 and RM62, 200mm (8") for RM72, and the number of joints must be kept to a minimum. If the flue liner is not to be connected directly to the boiler draught diverter, a flue pipe which is constructed from one of the materials in (a) to (c) above should form the connection between the draught diverter and flue liner.

Before connecting the boiler to, or inserting a liner into, a flue that has been previously used, the flue must be thoroughly swept clean of any soot and loose material. If a register plate, restrictor plate, damper etc. is fitted in the flue it must be removed before connecting the boiler to, or inserting a liner into, the flue.

Facilities should be made for disconnecting the flue pipe from the boiler for inspection and servicing purposes. Bends with removable covers should be fitted for inspection and cleaning purposes where considered appropriate.

The flue system should ensure safe and efficient operation of the boiler to which it is attached, protect the combustion process from wind effects and disperse the products of combustion to the external air.

The flue should terminate in a freely exposed position and must be so situated as to prevent the products of combustion from entering any opening in a building in such a concentration as to be prejudicial to health or a nuisance.

It is recommended that consideration be given to the fitting of a terminal at the flue outlet.

3.5 Air Supply

Detailed recommendations for air supply are given in BS 6644. The following notes are intended to give general guidance. In all cases there must be provision for an adequate supply of air for both combustion and general ventilation.

3.5.1 Air Supply by Natural Ventilation

The purpose provided space housing the boiler must have suitable openings communicating

directly with the outside air, at high level and at low level. Where communicating with the outside air is possible only by means of high level openings, ducting down to the floor level for the lower opening should be used. For an exposed boiler house, openings should be provided on all four sides, but at least on two sides. Openings should have negligible resistance and be so sited that they cannot easily be blocked or flooded. Grilles or louvres should be designed that high velocity air streams do not occur within the space housing the boiler.

The air supply requirements stated below are based upon the rated INPUT of the boiler specified in BS 6644.

For individual boiler or multi-boiler installation the basic minimum effective area requirements of the openings are as follows:-

Table 2

Position of Opening	Air Direct From Outside
Low level	540cm ² (82in ²) plus 4.5cm ² (0.7in ²) per kilowatt in excess of 60kW total rated input.
High level	270cm ² (41in ²) plus 2.25cm ² (0.35in ²) per kilowatt in excess of 60kW total rated input.

Table 3

Boiler Model	Position of Opening	Air Direct From Outside
RMG 8	High Level	344 cm ² (53in ²)
RMG 9		382 cm ² (59in ²)
RMG 10		414 cm ² (64in ²)
RMG 8	Low Level	689 cm ² (107in ²)
RMG 9		765 cm ² (119in ²)
RMG 10		829 cm ² (129in ²)

3.5.2 Air Supply by Mechanical Ventilation

The supply of air to a space housing the boiler by mechanical means should be by mechanical inlet with natural or mechanical extraction. Mechanical extract ventilation with natural inlet must not be used.

Where a mechanical inlet and a mechanical extract system is applied the following flow rates must be observed:-

Mechanical Ventilation Flow Rates Natural Draught Boiler	Flow rate per 100 Kw	
	Inlet air	Extract Air
	0.11 M ³ /S	0.045 M ³ /S

The requirements for the air supply by mechanical ventilation are given in BS 6644:1986.

Note:

For mechanical ventilation systems an automatic control should be provided to cut off the gas supply to the boiler in the event of failure of air flow in either inlet or extract fans.

3.6 Water Circulation System

Recommendations for the water circulation system are given in BS6644, CP341 and CP342.

The following notes are of particular importance.

In a combined central heating and domestic hot water system the hot water storage vessel must be of indirect cylinder or calorifier type.

The hot water storage vessel should be insulated, preferable, with not less than 75mm (3ins) thick mineral fibre, or its thermal equivalent.

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 also be insulated. Insulation exposed to the weather should be rendered waterproof.

Draining taps must be located in accessible positions which permit the draining of the whole system, including the boiler and hot water storage vessel.

The temperature difference between the flow and return water must not exceed 15°C (27°F). This limit must be maintained both during routine operation and start up of the appliance. Greater temperature differences may lead to damage of the boiler. It is also advisable to install a mixing valve. In this case the

connection to the expansion tank should be located between the mixing valve and the boiler. The circulating pump must be running before the boiler is ignited. In cases where during operation of the boiler cold water circuits must be connected, this must be done gradually to avoid thermal shock.

3.7 Electrical Supply

Electrical wiring to the boiler must be installed in accordance with the I.E.E. Regulations and any local regulations which apply. The boiler is supplied for 230/250 volts, single phase 50Hz and comes without mains cable. Fuse rating must be 3 Amp max., slow blow type.

The methods of connection to the mains electricity supply should facilitate complete electrical isolation of the boiler, preferable by use of an unswitched shuttered socket — outlet in conjunction with a fused three-pin plug both complying with the requirements of BS1363.

Alternatively, a fused double-pole switch or fused spur-box serving only the boiler may be used.

The point of connection to the mains should be readily accessible and adjacent to the boiler.

Further details regarding connection to the electricity supply are given in BS6644. For wiring instructions see Section 4.

4 Installation of Gas Boiler

4.1 General

The boiler is to be floor mounted and the space in which the boiler is to be installed must have the following minimum dimensions.

Table 4

Boiler Model	Width (side to side)	Depth (front to back)	Height
RMG 8	2050mm (80'1)	2000mm (78'1)	2250mm (88'1)
RMG 9	2150mm (84'1)	2000mm (78'1)	2250mm (88'1)
RMG 10	2250mm (88'1)	2000mm (78'1)	2250mm (88'1)

The space includes the following minimum clearances for installation and servicing.

- at the back of the boiler — 25mm (1ins)
- at the top of the boiler — 1250mm (50ins)
- at each side of the boiler — 600mm (24ins)

In addition, a minimum clearance of 1000mm (40ins) must be available at the front of the boiler to enable the boiler to be serviced.

The basic requirement in respect of protection against fire is that the temperature of combustible material in the vicinity of the flue should not exceed 65°C (150°F); in the case of a gas appliance flue pipe, this will be achieved if there is a clearance of 75mm (3ins) between the pipe and any such material.

4.2 Assembly of the Boiler

The boiler is supplied complete with casing assembled to the unit and packed in a protective crate.

Remove the boiler from its crate and place in position standing on the metal tray supplied. If removal of the casing is necessary, refer to fig. 2.

4.3 Flue Connection

With the boiler carefully positioned, connect the flue pipe into the flue socket at the rear of the boiler and seal the joint by using a suitable caulking compound. A split socket should be fitted immediately above the boiler to facilitate future removal of the boiler, should this be necessary.

If it is considered that condensation is likely to occur in the flue then provision must be made, possibly by the use of a condense tee, for the condensation to flow freely to a point where it can be drained preferably into a gully.

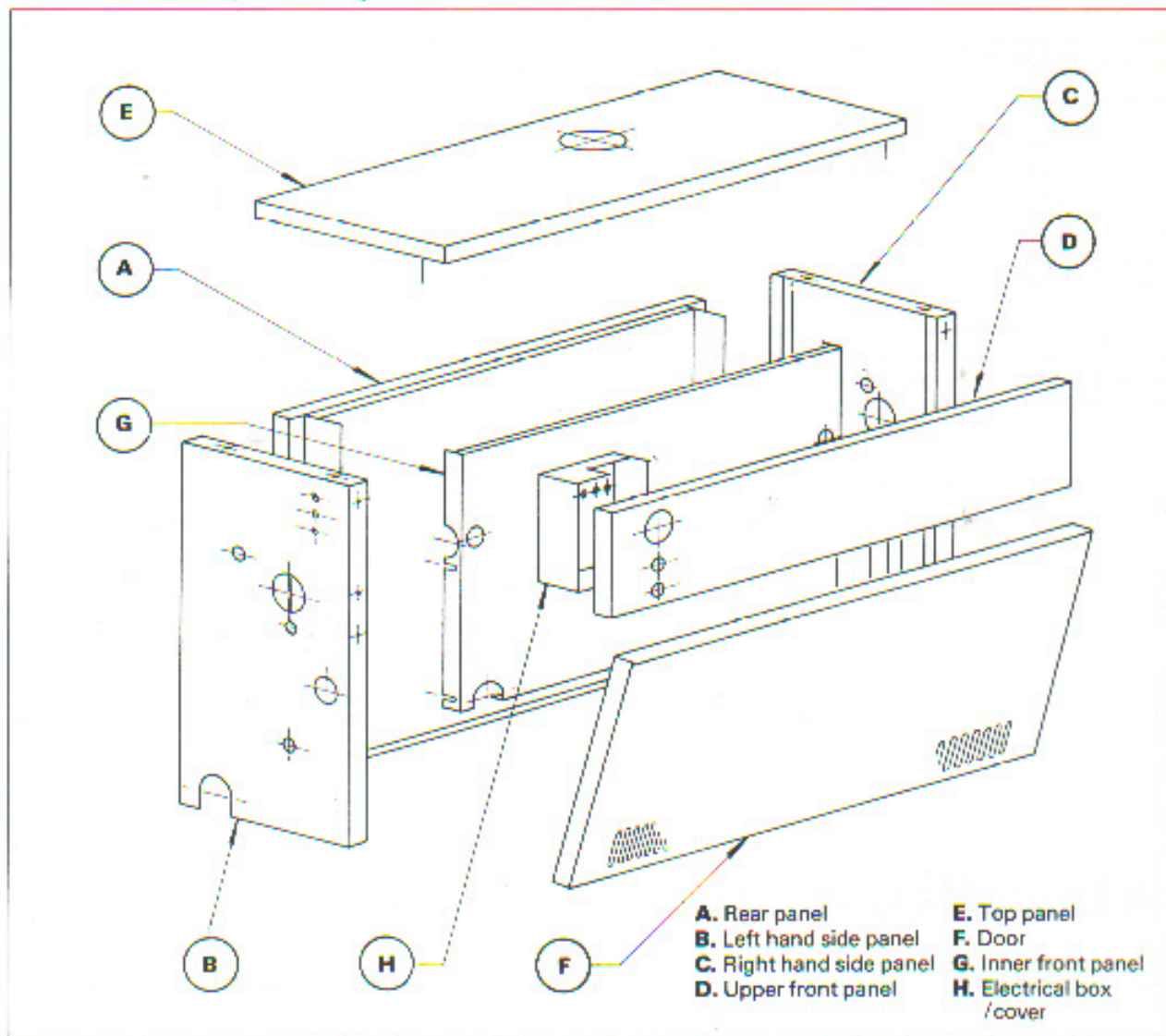
Pipework used to drain the condensation should not be less than 15mm in diameter.

An adaptor is available as an optional extra to facilitate connection of asbestos/cement flue pipe.

4.4 Gas Connection

A union type gas cock must be fitted at the gas inlet. (A control is available as an optional extra from the manufacturers.) The gas supply pipe should be connected to this gas cock at the side of the boiler. (See fig. 1)

Fig. 2 Boiler Casing Assembly



4.5 Electrical Connection

A 3 core 0.75mm² flexible cable should be connected to the appliance. The other end should be terminated with a three pin plug complying with the requirements of BS1363, and fitted with a 3A fuse, for connection to the mains supply by the use of an unswitched shutter socket. Alternatively a fused double-pole switch or fused spur-box serving only the boiler may be used.

To gain access to the terminal strip it is necessary to open the front lower panel "F", remove the door panel "D" and unscrew the two screws which fit the cover "H" to the door panel "D". (See fig. 2).

The mains cable must be connected onto the terminals 1 and 2 of the terminals strip. (See wiring diagram)

4.6 Water Connection

Water connections are made to the left hand side of the boiler. The flow is connected to the top tapping fig. 1 (M), the return connection to the bottom tapping fig. 1 (S). Both flow and return connections can be bushed down from 1½" to 1¼", if thought necessary.

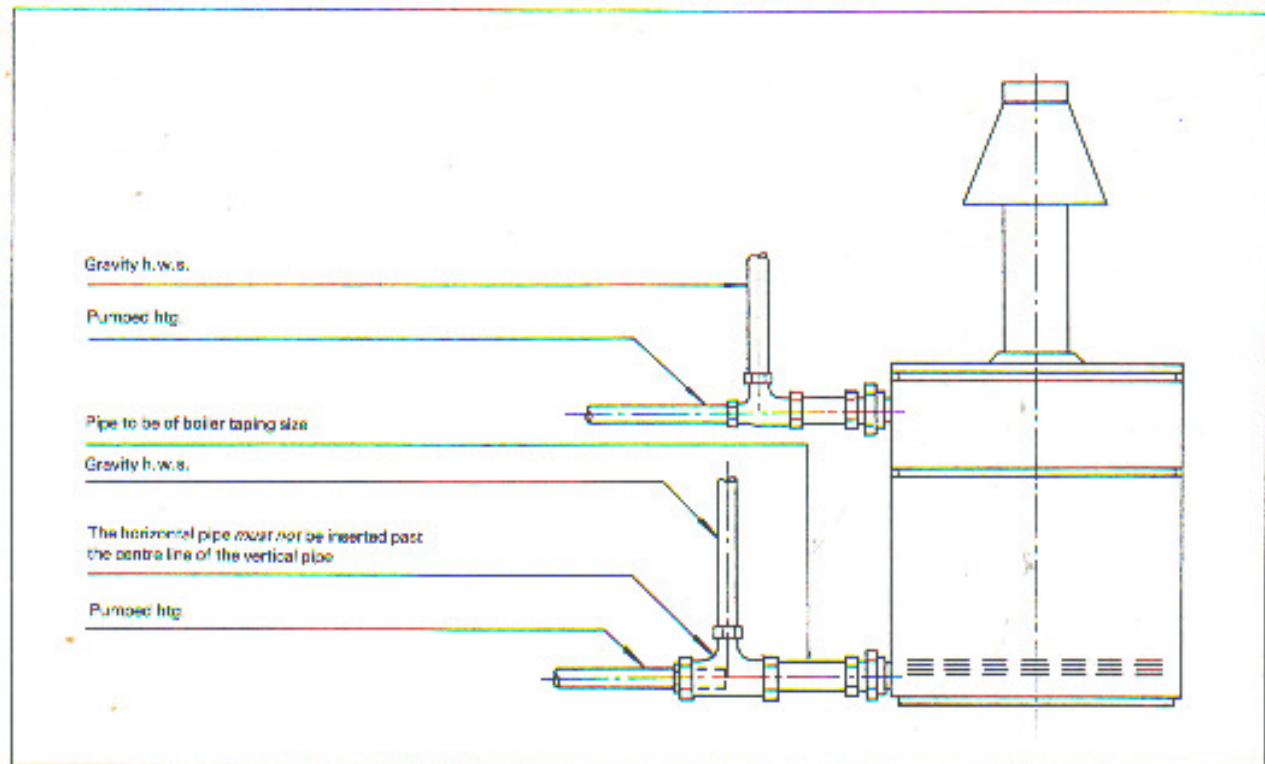
The draining cock is normally fitted to the bottom tapping fig. 1 (R) on the right hand side. Both flow and return connections can be displaced on the opposite side; in this case the water distributor, flanged on the bottom tapping to the left hand side will be displaced to the right hand side; and the bottom tapping from 1½" to ¾" with the drain cock will be displaced to the right hand side.

If an external pump is used the pumped and gravity connections should be made into the side connections using an injector type tee on the return as shown in Fig. 3.

Note

It is recommended that the water connections to the boiler, particularly when the boiler is to be situated in a confined space, are made using union fittings to facilitate ease of installation and future servicing.

Fig. 3 External Water Pump Connections



5 Water Circulation System

5.1 General

It is essential that the water circulation system incorporates a pump.

To avoid the possible cut-off of the high limit stat, due to the thermal inertia, it is recommended to keep the pump in operation at all times when the boiler is in use.

A flow switch should be fitted in order to shut off the boiler on loss of circulation.

The use of horizontal pipe runs should be avoided where ever possible in order to prevent air collecting in the systems. If horizontal runs are unavoidable the pipes should rise upwards in the direction away from the boiler.

The boiler thermostat is designed to give a maximum nominal 90°C (194°F) flow temperature and is adjustable.

5.2 Pressure Relief Valve

See BS 6644 clause 9

5.3 Open Vent Pipe

See BS 6644 clause 10

5.4 Cold Feed Pipe

See BS 6644 clause 10

5.5 Water Pressure Gauge (Head Gauge)

See BS 6644 clause 12

5.6 Thermometer

The thermometer is supplied with the boiler.

5.7 Draining tap

A ¼" BSP draining tap conforming to the requirements of BS 2879 must be fitted to the tapping at the bottom of the right hand side of the boiler.

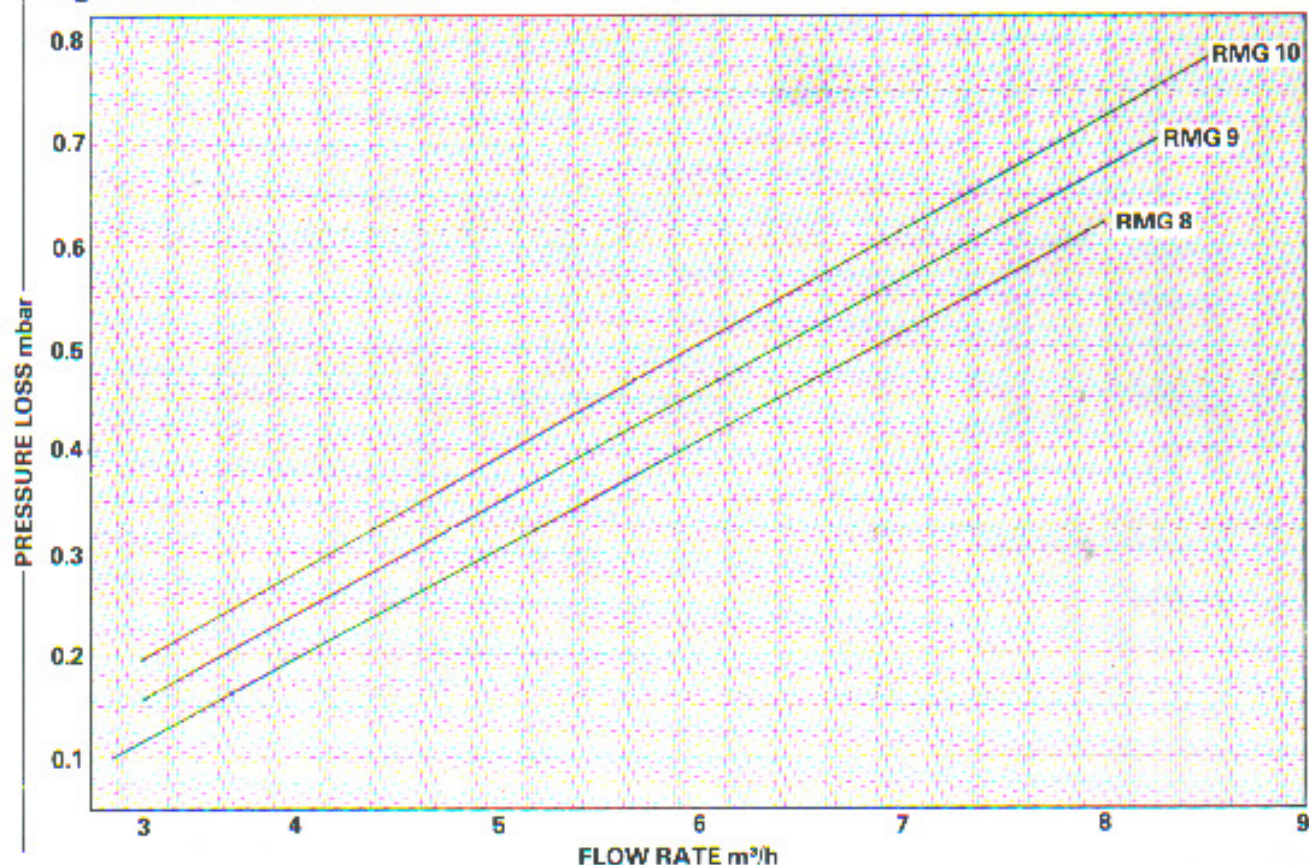
5.8 Circulation Pump

The head of the circulation pump must be chosen according to the C.H. installation and boiler resistances. The boiler resistance can be seen on the diagram above, Fig. 4. The pump should be accessible for servicing.

5.9 Frost Protection

Consideration should be given to fitting a frost thermostat which should be set to operate at a temperature of approximately 4°C (39°F).

Fig. 4 Boiler Resistance Table



6 Commissioning and Testing

6.1 Electrical Installation

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

In event of any electrical fault after installation of the appliance, preliminary electrical system checks should be carried out. These shall include earth continuity, polarity and resistance to earth checks, as described in the British Gas Multimeter handbook.

6.2 Gas Installation

The whole of the gas installation, including the meter, should be inspected and tested for soundness and purged in accordance with the recommendations of CP331 Part 3. Particular notice should be taken of the pressure test nipple fixed on the burners manifold, the union on the inlet side of the multifunctional control, the inlet and outlet connections to the multifunctional control and at the ends of the supply pipe to the pilot burner.

6.3 Water Circulation System

The whole of the system should be thoroughly flushed out with cold water without the pump in position. Ensure that all valves are open.

Then with the pump fitted, the system should be filled and air locks cleared. Vent all heat emitters check for water soundness.

6.4 Initial Lighting of Boiler

1. Check that the electrical supply to the boiler is off and that the boiler thermostat is at its lowest setting.
2. Ensure that the gas supply is on and that any external controls e.g. room thermostat, are calling for heat.
3. Turn on the gas servicing valve.
4. Fully depress the control button. (Fig. 5.1)
5. Light the pilot flame by pressing the piezo unit button several times.

The pilot flame may be viewed through the viewing port in the heat shield.

NOTE: On initial lighting of the pilot, it may take some time to purge the pilot pipework of air.

6. Ensure that the pilot flame fully envelopes 4 - 8mm (5/32 - 5/16") of the thermocouple tip and, if necessary, adjust the pilot regulating screw. (Fig. 5.4)

7. Once the pilot has been established, continue pressing the control button for approx. 20 seconds and then slowly release. The pilot should remain alight.

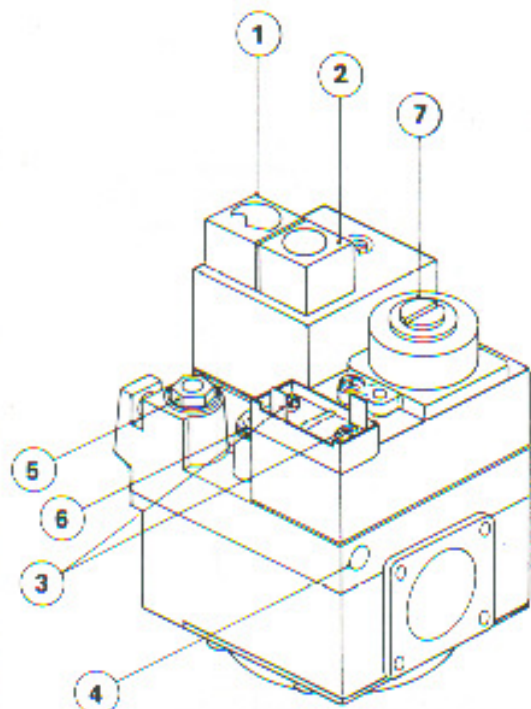
WARNING: Should the pilot be extinguished at any time, either intentionally or unintentionally, wait 3 minutes before attempting to relight the gas, then repeat steps 4 - 6 above.

8. Switch on electricity supply.
9. Turn the boiler thermostat to maximum and the main burner will light.
10. Test the internal pipework of the appliance for gas soundness using a leak detection fluid, e.g., soap solution.

SHUT OFF: To interrupt all gas flow through the Multifunctional control turn the control button clockwise to its stop and release it. (Fig. 5.1) After waiting 3 minutes the appliance may be relit by following the previous instructions.

Fig. 5
Honeywell V4400C Multifunctional Control

1. START button
2. OFF button
3. Electrical terminals 240V, 50 Hz
4. Pilot gas pipe connection
5. Thermocouple connection
6. Pilot adjustment screw (under the cover screw) turn clockwise — to decrease pilot turn anti-clockwise to increase pilot.
7. Pressure regulator main gas (under the plastic plug) turn clockwise — to increase pressure turn anticlockwise to decrease pressure.



6.5 Adjustments

6.5.1 Burner gas pressure

This is set for the nominal output and should be checked accordingly in the following manner:

1. Turn the boiler thermostat to OFF to turn off the main burner and connect a pressure gauge to the burner pressure test point, Fig. 6 — (7).
2. Turn the boiler thermostat to maximum to turn on the main burner.

3. Adjust the burner pressure by turning the regulator, Fig. 5 — (2) anti-clockwise to decrease the gas pressure, or clockwise to increase the pressure, if any adjustment is required.

4. In addition it is advisable to check the gas rate using the gas meter dial pointer. Ensure that no other appliances supplied through the meter are in operation.

5. Disconnect pressure gauge and test for gas soundness around pressure test point.

6.5.2 Down draught diverter and combustion air

1. Check that there is no spillage of products of combustion from the boiler, down draught diverter by carrying out a spillage test, as detailed in BS 5440, Part I.

2. Check the appearance of the flames to establish that there is sufficient air for combustion available.

6.5.3 Water circulation system

1. Allow the water system to warm up and then set the pump adjuster to a position which gives a temperature difference between the flow and return of 15°C (59°F).

2. Check that there are no water leaks when the system is at its operating temperature.

3. Turn off the boiler and rapidly drain the system while still hot. It should be re-filled and cleared of air locks.

4. Re-light the boiler as detailed in Section 6.4. and allow the system to again reach its operating temperature. The system should be balanced by regulating the water flow through individual heat emitters to ensure a satisfactory water temperature at each emitter.

6.5.4 Boiler controls

1. Check that the flame failure device will shut off the gas to the main burner within 60 seconds by turning off the gas supply at the gas service cock. A distinct click will be heard when the thermocouple current is no longer sufficient to hold in the magnetic unit.

Range of thermocouple output is as follows:

Open Circuit	15 — 20mV
Closed Circuit	5 — 10mV

2. Check that the boiler thermostat and all automatic controls are operating satisfactorily.

6.6 Handing Over the Boiler

Hand the User's Instructions to the user or purchaser for retention and instruct in the efficient and safe operation of the boiler and associated controls.

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

Adjust the boiler controls, time clock, etc., to those values required by the user.

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 annually.

7 Servicing

WARNING: Always switch off and disconnect electricity supply and close the gas service cock before carrying out service work or replacement of failed components.

7.1 General

Full maintenance should be undertaken not less than once per year. After servicing work has been completed or any component replaced the boiler must be fully commissioned and tested for soundness as described in Section 6.

7.2 Main Burner Removal

1. Remove the front door of the casing Fig. 2 - (F).
2. Ensure gas service cock is turned off and then unscrew the union nut situated immediately up stream of the gas control.
3. Slacken the grommet securing the electrical lead to the multifunctional control. Disconnect the electrical leads from the multifunctional control Fig. 6 - (1), noting the positions.
4. Remove securing clip holding the overheat cut-off device phial into pocket and withdrawn phial from pocket.
5. Remove the four bolts holding the burner manifold plate to the boiler end Section Fig. 7 and remove the complete burner assembly from the boiler.
6. Before dismantling the burner bars, remove the pilot assembly and piezo igniter, as detailed in Sections 7.3. and 7.6.4. respectively.
7. Unscrew the two screws on the clamp securing burner bars to the manifold and remove the burners.
8. Using compressed air and/or a stiff brush, not a wire brush, brush the burners outside to dislodge any

accumulated deposits. Inspect the burners both internally and externally to ensure that they are clean.

9. Examine the injectors and if damaged or deteriorated, replace with new ones of the correct size and marking (See Table 1). If deemed necessary, clean the injectors. Do not broach out with wire.

10. Re-assemble the injectors and burners etc., in the reverse order to that above. Do not replace the pilot assembly if this is to be serviced and do not replace the burner assembly into the boiler if the heat exchanger flueways are to be cleaned.

7.3 Pilot Burner Assembly Removal

The pilot assembly may be removed either whilst the main burner is in the boiler or after the main burner has been removed, as previously described in Section 7.2.

1. To remove the pilot assembly, release thermocouple and pilot tube at the multifunctional control, detach the ignition lead from the electrode. Remove the two screws securing the pilot assembly to its mounting plate Fig. 7 - (3).

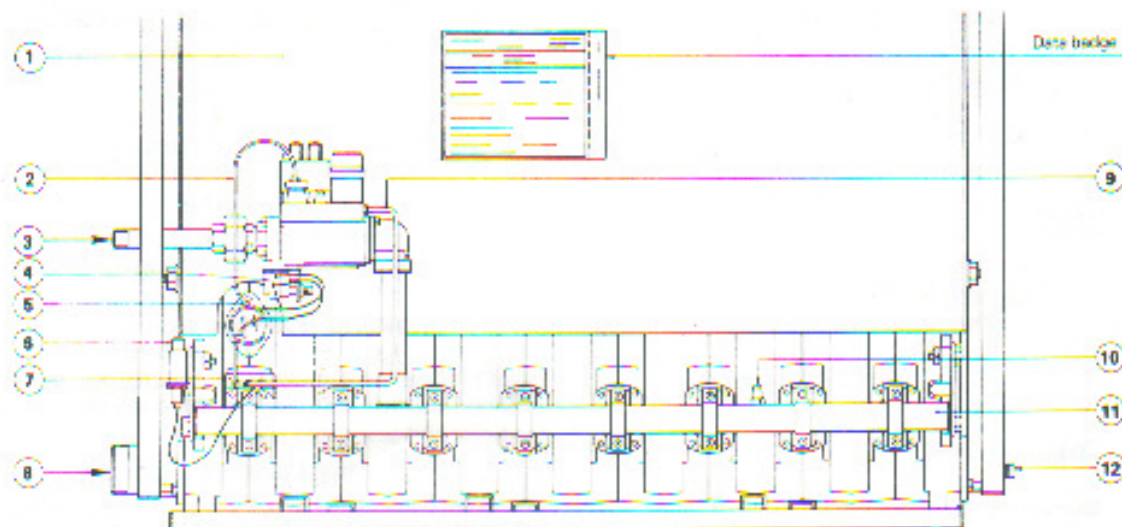
2. Inspect pilot burner, thermocouple and electrode, making sure that they are in a sound and clean condition. In particular check that:

- ignition electrode is clean and undamaged, and that the spark gap is 3-4mm.
- ignition lead is not broken, chafed or burnt.
- pilot observation window is clean and undamaged.

Clean the pilot injector, do not broach out with wire.

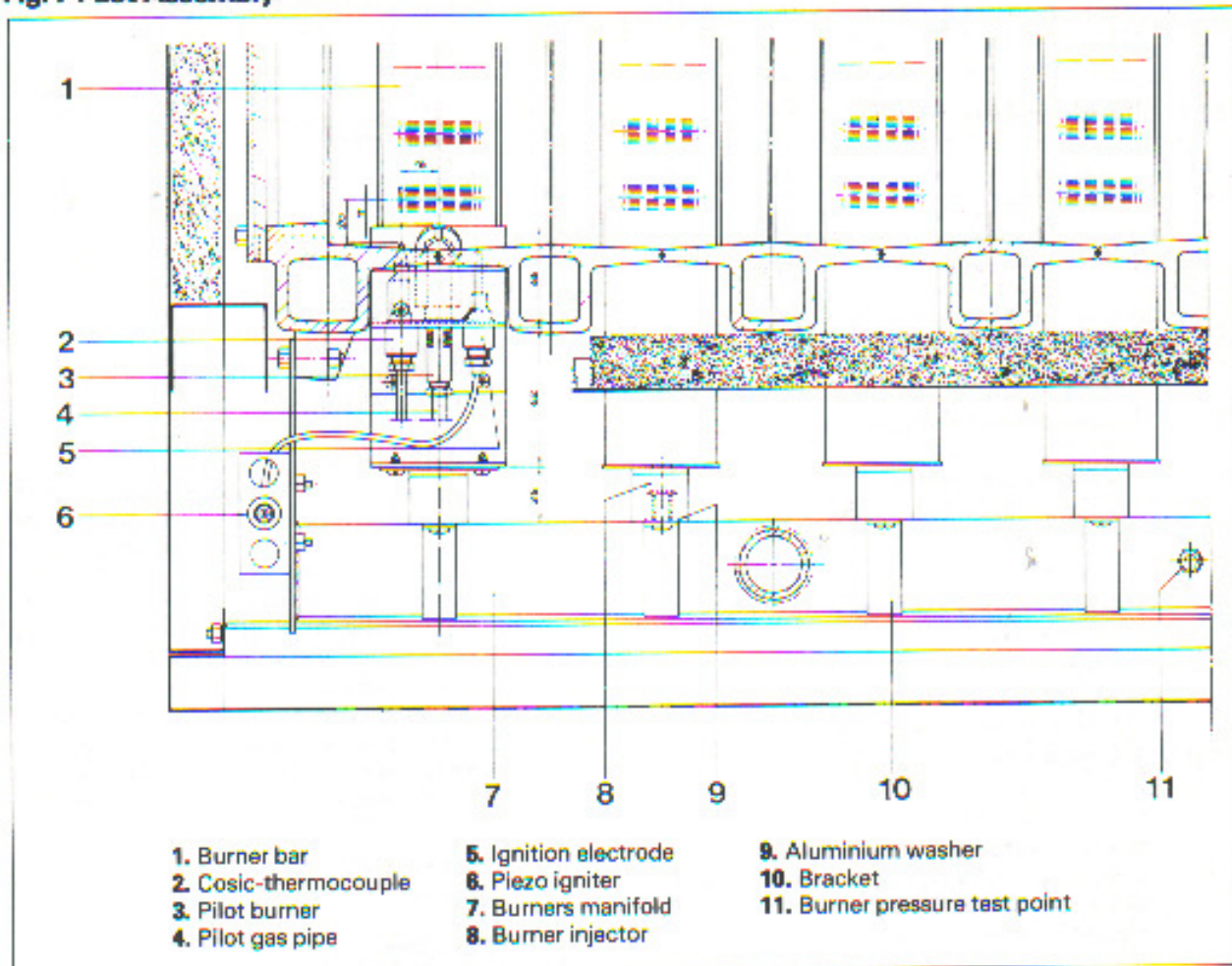
3. Re-assemble the pilot and refit to the burner assembly. Ensure that the thermocouple nut at the multifunctional control is secure, but not over-tightened. Tighten by hand, then tighten by spanner 1/6th of a turn. The terminal must be clean to ensure a good electrical connection.

Fig. 6 Main Burner Assembly



- | | | |
|----------------------------|----------------------|------------------------------|
| 1. Multifunctional control | 5. Glass sight | 9. Pilot gas pipe |
| 2. Cosic-thermocouple | 6. Piezo igniter | 10. Burner press. test point |
| 3. Gas connection | 7. Pilot burner | 11. Burners manifold |
| 4. Overheat cut-off device | 8. Return connection | 12. Drain cock |

Fig. 7 Pilot Assembly



7.4 Flueways

Whilst the main burner assembly is removed from the appliance the flueways should be cleaned.

1. Remove the flue pipe from the draught diverter, then remove the draught diverter from the spigot of the smoke chamber.

Note: For easy access it is necessary to remove all casing panels.

2. Remove the casing top panel by pulling upwards (Fig. 2.e).

3. Remove upper front panel by pulling forward from the front locating studs (Fig. 2.d.) and at the same time removing the thermostat and operating stat sensors from the stat pocket.

4. Remove inner front panel (Fig. 2.g.) by removing the outer nuts on the front tie bars.

5. the two side panels (Fig. 2.b & c) can now be removed by pulling off of the locating studs on the rear panel.

6. a) Unscrew a few turns the three nuts which clamp the smoke chamber to the boiler body.

b) Remove the smoke chamber by pulling upwards to get access to the heat exchanger.

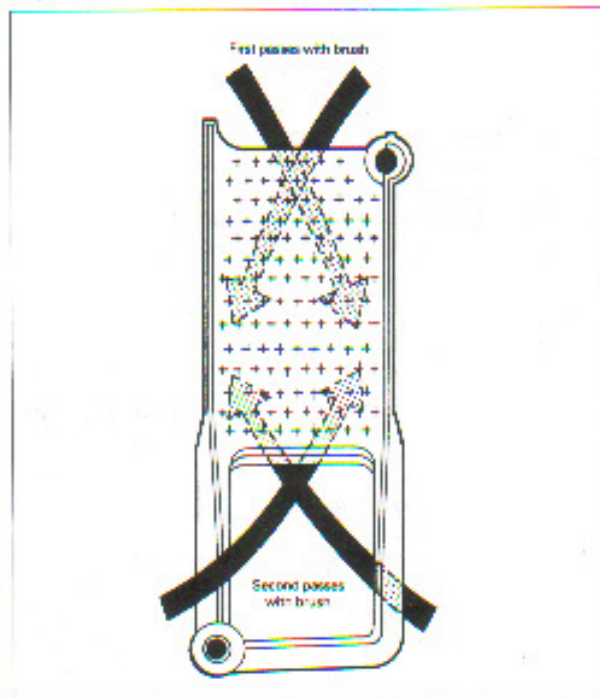
c) Place a sheet of paper or card etc., on the bottom of the combustion chamber.

d) With a flexible brush begin to clean the heat exchanger by brushing through diagonally — stopping each time resistance is felt as the brush meets the side of the heat exchanger. See Fig. 8. Note that it is necessary to pass down each side of each

baffle, i.e. 4 passes in total.

e) Completing the above will leave a small triangular area at the base of each heat exchanger section that has not been brushed. These areas may be cleaned by brushing upwards from within the combustion

Fig. 8 Brushing Through Heat Exchanger



chamber, access being made by removal of clean-out doors on either end section of boiler heat exchanger, (See Fig. 8) which are held in place by two retaining screws.

7.5 Re-assembly of Boiler

1. Refit the main burner assembly to the boiler in the reverse order to that described in Section 7.2.
2. Re-commission the boiler as described in Section 6. Ensure that the pilot flame envelopes the thermocouple tip by 4-8mm. If adjustment is required, remove the cover cap of the pilot pressure adjustment screw Fig. 5 — (6) and turn the screw clockwise to decrease or anti-clockwise to increase the pilot flame.

7.6 Replacement of Faulty Components

7.6.1 Multifunctional control

1. Unscrew union nut up stream of the multifunctional control Fig. 6 (1).
2. Disconnect the electrical leads, noting the positions, thermocouple and pilot gas pipe from the multifunctional control.
3. Remove the two bolts holding the over-heat cut-off device mounting bracket. Allow bracket and device to fall away.
4. Unscrew the four bolts retaining the multifunctional control to the flanged elbows on the inlet and outlet.
5. Reconnect the new valve in the reverse order to that above ensuring that the valve is correctly orientated and the 'O' rings are in place when the flanged elbows are refitted.

7.6.2 Burners bar

1. Remove the burner assembly from the boiler

and then remove the appropriate burner as previously described in Section 7.2.

2. Fit new burner bar in reverse order and re-commission appliance as described in Section 6.

7.6.3 Pilot assembly

Remove assembly as detailed in Section 7.3. and fit new item in reverse order.

N.B. If only the spark electrode, f.f.d. sensor or pilot injector require replacing they may be with the pilot assembly in situ.

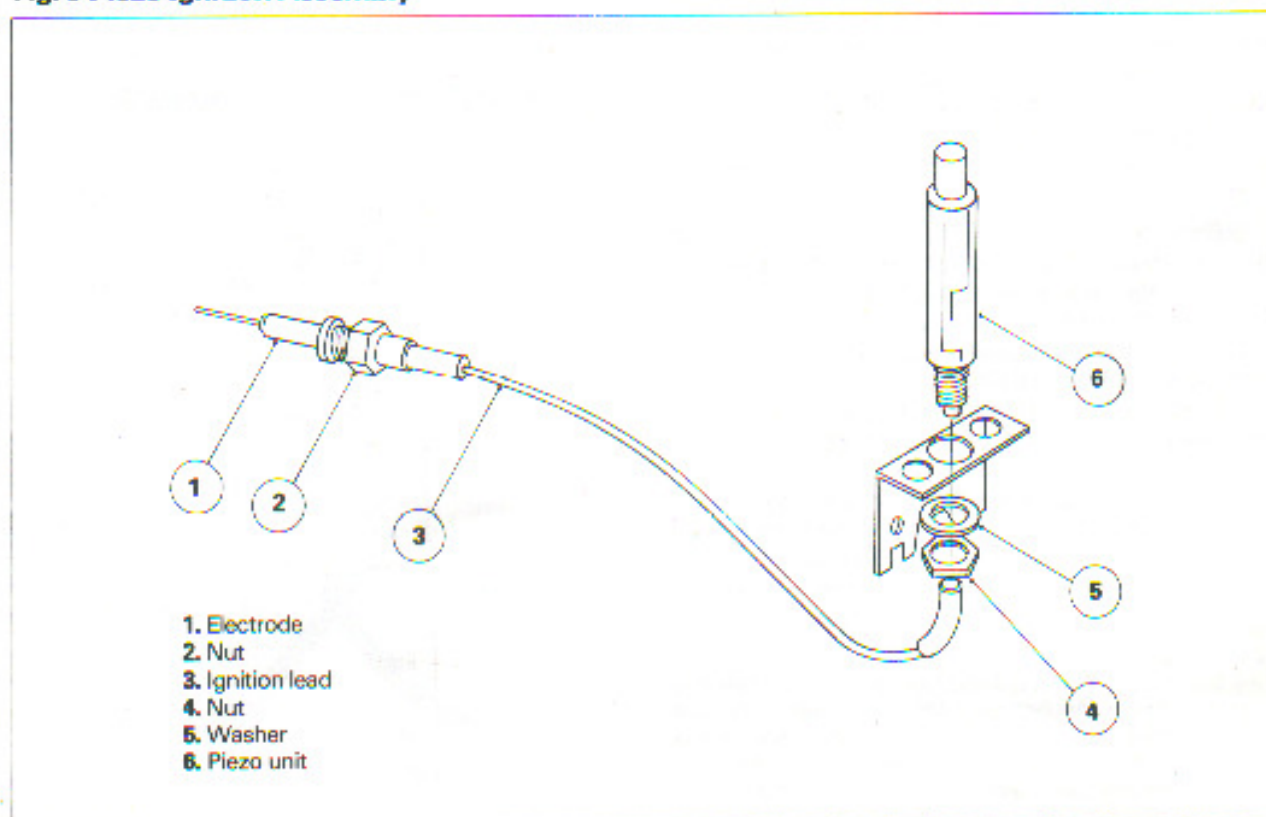
1. Spark electrode Fig. 7 — (5)
Pull off the spark lead from the electrode, remove the electrode lock nut. Fit new items in reverse order.
2. F.F.D. sensor Fig. 7 — (2)
Disconnect the thermocouple lead from the multifunctional control and release the thermocouple from the pilot assembly. Undo the F.F.D. sensor locking nut and remove from bracket. Fit new items in reverse order ensuring that the sensor is pushed fully home before the lock nut is tightened.
3. Pilot injector
Remove the spark electrode as detailed in 7.6.3.1. to avoid possible damage. Release the pilot tubing nut and carefully withdraw the pilot tube. Remove the pilot injector and fit new item. Replace components in reverse order.

Recommission appliance as described in Section 6.

7.6.4 Piezo Unit

Pull off ignition lead. Remove the nut under the piezo unit. Replace with new unit, ensuring the nut is not over tightened, and refit lead Fig. 9.

Fig. 9 Piezo Ignition Assembly



7.6.5 Thermostat

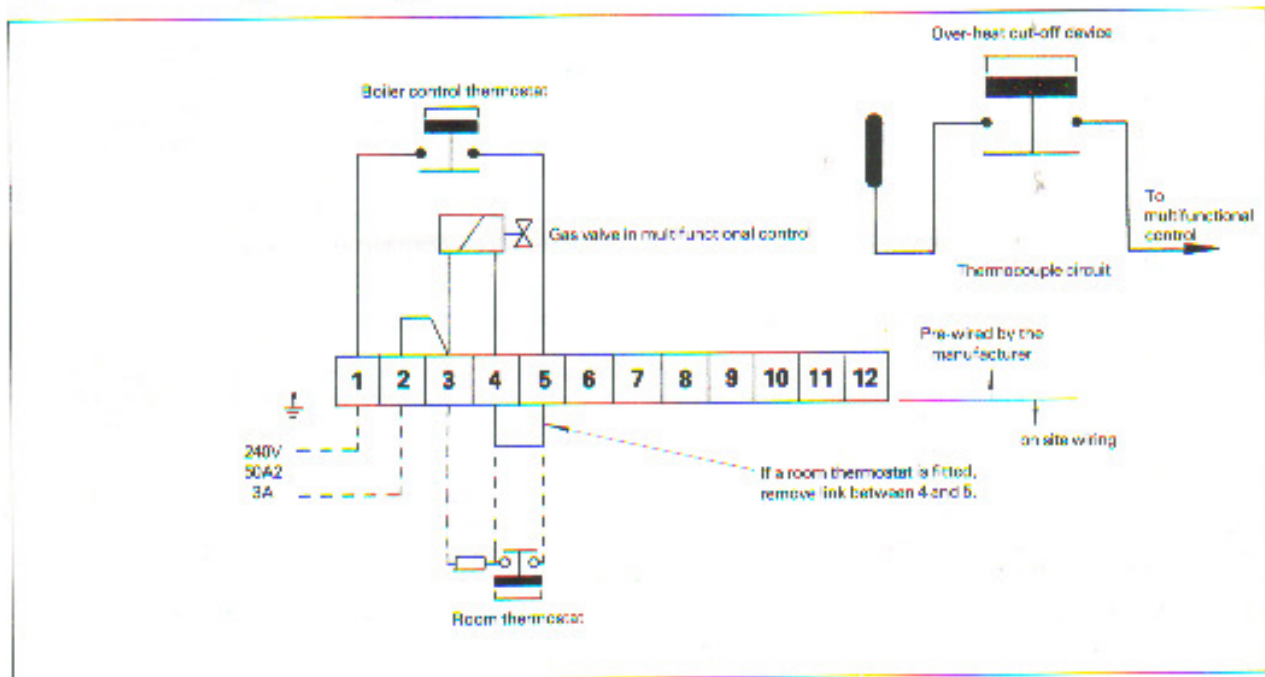
1. Remove the front upper panel of the casing and the cover of the electrical connections box.
2. Remove operating dial and then remove the two screws retaining the thermostat in place.
3. Remove the spring retaining the thermostat stem in the pocket and withdraw thermostat.
4. Disconnect electrical leads.

5. Fit replacement thermostat in reverse order ensuring that retaining spring is in place. Connect electrical leads and cover.

7.6.6 Boiler Sections

In the unlikely event that a boiler section should require replacement, the manufacturer should be contacted for guidance.

8 Wiring Diagram



9 Short List of Parts

Main Burner Bars	Polidoro Type 928/9	145074105
Injector (Main Burner)	3.0mm (0.118") dia.	Refer Powrmatic
Pilot Assembly	Polidoro Type 487	145124147
Injector (Pilot)	0.29mm (0.0114") dia. x 2	145122084
Gas Control	Honeywell, V4400C 1211	142400425
Piezo Ignitor	Cosic 1862/78 or Vernitron	Refer Powrmatic
Thermostat	Honeywell L4189A	145034245
Thermocouple	Cosic	Refer Powrmatic
Operating Stat.	IMIT TR2	145034089
Overheat cut-off device	IMIT LS1	145034001

10 Fault Finding

FAULTS	CAUSE	ACTION
Pilot: failure to light	No gas	<ol style="list-style-type: none">1. Check pilot burner piping and injector.2. Adjust pilot flame regulating screw.
Pilot: failure to remain alight	Thermocouple	<ol style="list-style-type: none">1. Check thermocouple connection to gas valve. This is an electrical connection and must be kept clean and dry; tighten only 1/8th of turn by spanner beyond finger tight.2. Check Cosic-Thermocouple connection to the high limit stat; clean any oxidation from the terminals of the high limit stat and of the Cosic-Connector.3. Check pilot flame size, make sure that it envelopes the thermocouple, adjust pilot flame regulating screw if necessary.
Main burner: failure to light	Electrical	<ol style="list-style-type: none">1. Check that clock, programmer or any other ancillary control is "ON".2. Check thermostats calling for heat.3. Check main fuse at wall supply.
	Gas valve	<ol style="list-style-type: none">4. Use a Multimeter to determine if the solenoid valve has failed.5. Check any ancillary control fitted, e.g. room thermostat for possible switching faults.

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