

**Burner
Supplement**

**“Do business in the
right atmosphere”**

**Model PC/GS2 fully automatic gas
burner**

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 powrmatic

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Commissioning Sheet

The details below are to be completed by the Commissioning Engineer.

Installers Name: _____

Address: _____

Site Address: _____

Appliance: Type _____ Size _____ Serial No. _____

Burner: Type _____ Size _____ Serial No. _____

Commissioning Date: _____

Guarantee Expiry Date: _____

Gas Type: _____

Gas Pressure upstream of main gas governor:-

a) Standing _____ mbar b) Running _____ mbar

Gas pressure at burner head _____ mbar _____ in. w. g.

Gas rate _____ m³/h _____ ft³/h

Heat input _____ MJ/h _____ Btu/h

CO _____ % _____ %

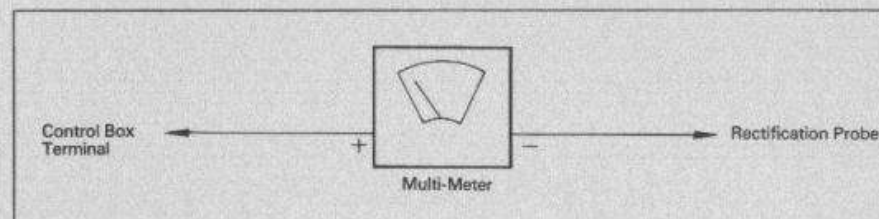
CO₂ _____ % _____ %

Gross Flue Gas Temperature _____ °C _____ °F

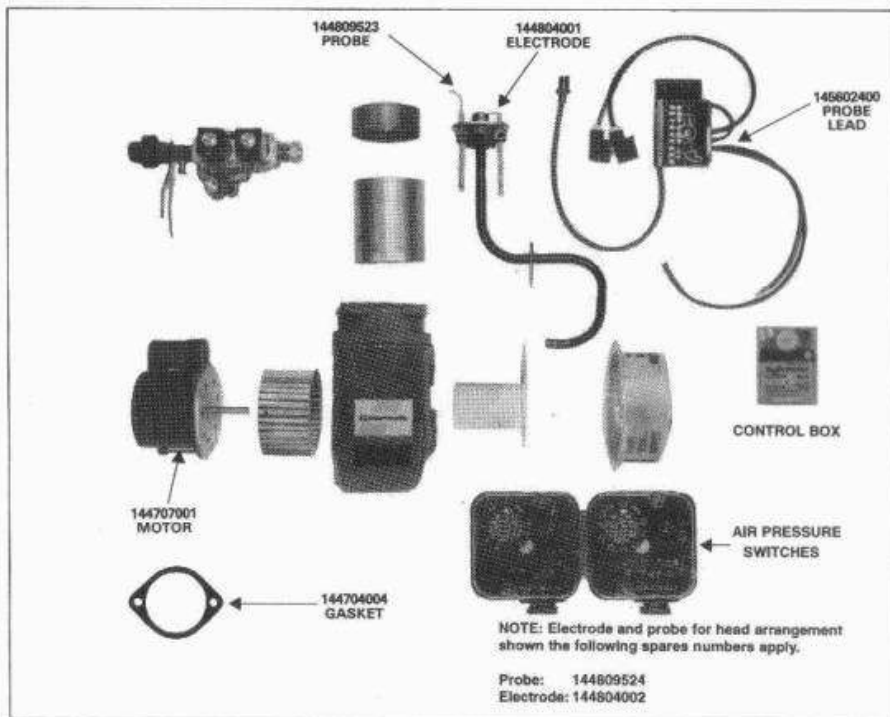
Ambient Temperature _____ °C _____ °F

Nett Flue Gas Temperature _____ °C _____ °F

Efficiency _____ % _____ %



Short List of Parts



Fault Finding

Symptom	Check that:-
Burner will not start	<ul style="list-style-type: none"> - External controls are calling for heat. - Limit thermostat has not tripped. - Burner is not at lockout. - Electrical supply fuse is intact - Burner fan motor is operative - Air pressure switch is operative
Burner goes through pre-purge period, but fails to establish flame	<ul style="list-style-type: none"> - Gas supply is present - Live and neutral leads are not inverted - Earth connection is sound - The air over pressure switch is operative ie. not too low - The ignition spark is present at the required time

Symptom	Check that:-
Burner goes through pre-purge period, but start gas fails to establish	<ul style="list-style-type: none"> - Electrodes are in good condition - Flame signal is present (see below) - The burner head is correctly set

To check the Flame Current:

1. Remove the control box as detailed (page 7)
2. Release the screw of terminal 2 in control box base and remove the rectification cable to outside of the base. Connect the negative lead of a multimeter to this cable.
3. Using a short length of insulated wire (0.5mm²) connect the positive probe of the multimeter to terminal 2 and replace the control box.
4. Set the meter to d.c. micro-amps.
5. Start the burner and read the flame current obtained. A value of 1µA or over is sufficient to energise the control box.
6. Remove the meter and additional lead, replace rectification cable to terminal 2 and replace control box.

Introduction

PC/GS2

The Powmatic PC/GS2 is a compact, fully automatic forced draught burner with ON/OFF gas control. The burner is supplied with a gas train assembly to the latest specification which provides for complete control of the gas supply through a main gas governor and safety shut-off valves.

A separate pilot is not fitted, the flame being established on ignition. Flame safeguard, based on a rectification system is provided by the integral full-sequence control box and in the event of flame failure the safety shut-off valve is de-energised and the gas supply is cut off within one second.

The burner as supplied by Powmatic will perform the following functions:

- a) Providing that air flow is available there will be a pre purge period
- b) At the end of this time the ignition transformer and gas valves will be simultaneously energised and the flame established. Failure to establish a flame in (b) or loss of flame signal thereafter will result in the burner going to lockout. This state requires a manual reset to once again initiate the start sequence.

Technical Data/Components

Burner

Type No: PC/GS2
Output Range: kW 27-60
Btu 91,000-204,000

Voltage: 230V
Ph: Single
Frequency: 50Hz
Current Consumption—
Motor: 75W 2750rpm 0.7amps
Ignition Ignitor 50VA

Gas Controls Assembly

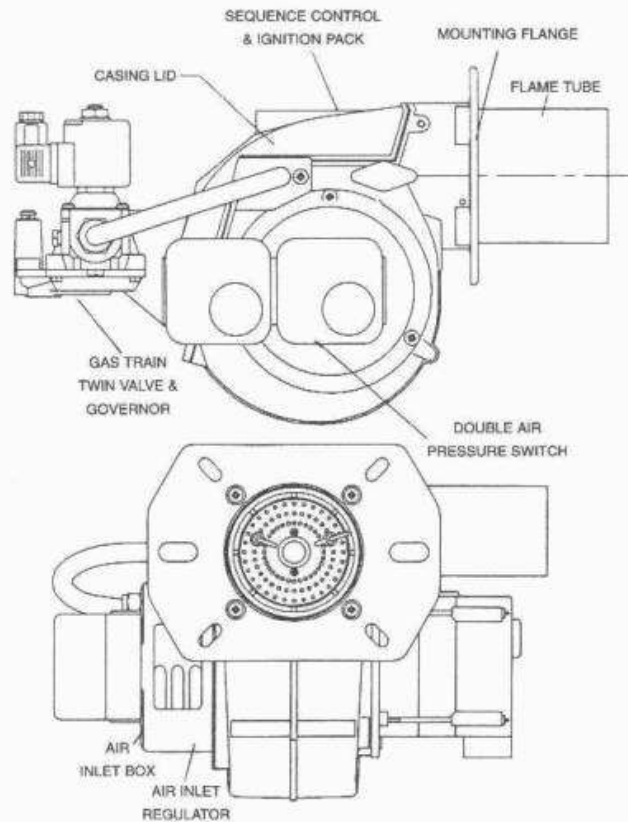
Part Number 141376220

Control Box

Type MMI 810 Mod 35
Electrical Consumption — 5VA
Pre-purge time 20 secs
Start-gas safety time — 5.0 secs. max.
Minimal normal ionisation current — 1.0µA
External fuse — 10A (rapid)/6A (slow)

Principal Components of the PC/GS2

Fig. 1



Ignition Transformer

1. Remove control box.
2. Remove burner casing lid and disconnect ignition lead.
3. Release and remove the two pozidrive screws securing control box and transformer to support bracket.
4. Release transformer from the control box wiring terminals.
5. Pull away transformer together with ignition lead from the inside of the body.

6. Commence fitting replacement transformer by inserting ignition lead through grommet in burner side and then re-assemble in reverse order.

Electrode

To replace a faulty electrode (ignition or rectification) follow instructions given on page 6 (Firing Head Assembly).

Safety shut off Valve

1. Isolate gas by closing gas isolating valve.
2. Release the central retaining screw and remove the burner casing lid.
3. Undo the retaining screw and pull-off the control box. Release the wiring from the safety shut-off valve at terminals and the earthing block. Slacken the appropriate cable securing clip.
4. Undo the union situated downstream of the gas isolating valve and remove the gas controls assembly.
5. Disconnect pipework as appropriate to allow exchange of the faulty valve noting the orientation of fittings and components.
6. Fit replacement valve and re-assemble in reverse order.

Wiring Diagram

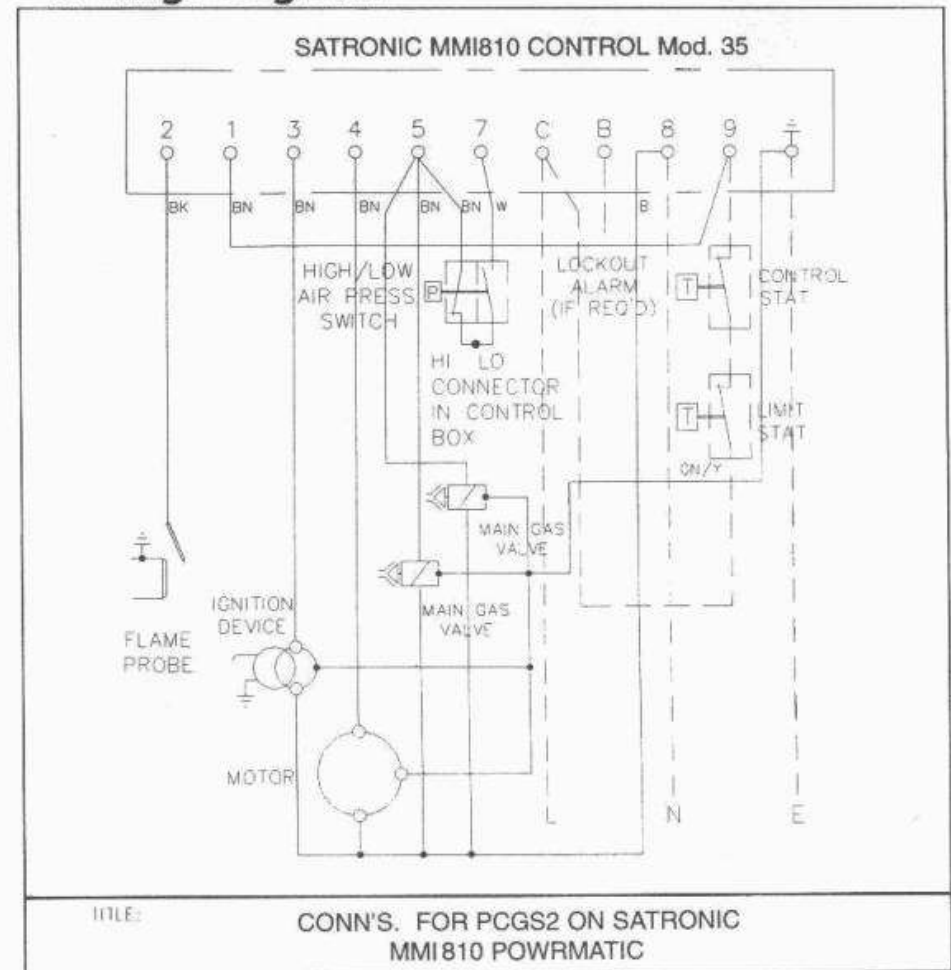
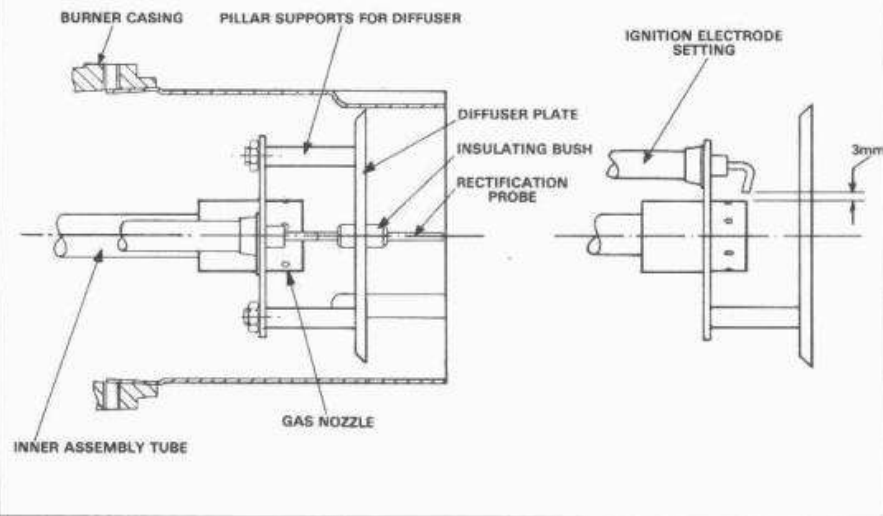


Fig. 4 Firing Head Components



Replacement of Faulty Components

WARNING: inadvertent substitution or replacement of similar components, particularly those with plug in bases could cause a hazard. Always switch off and disconnect electricity supply and close the gas service valve before carrying out servicing work or replacement of failed components.

Firing Head

1. Gain access to and remove the firing head as described
2. Replace with new assembly and re-connect electrode leads.
3. Test-fire the burner and fine-tune air regulation (via adjustment screw) as necessary.

Control Box

1. Undo the central retaining screw and pull-off the faulty control box.
2. Re-assemble in reverse order.

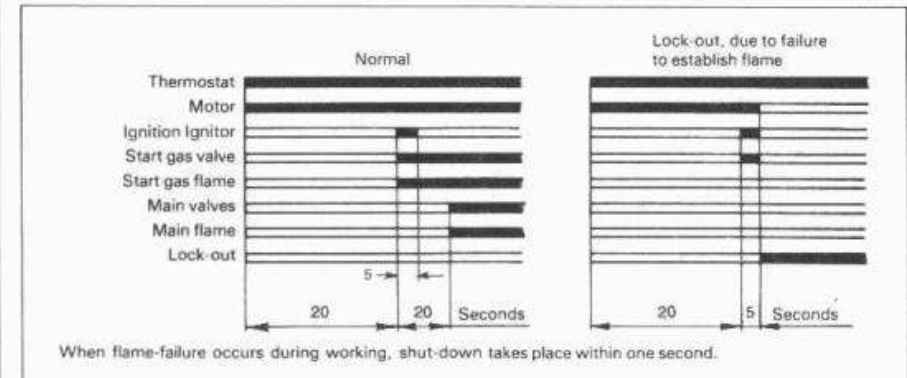
Burner Fan

1. Release and remove the three pozidrive screws, holding motor to burner casing to allow fan to be withdrawn with motor.
2. To remove fan from motor insert 4mm allen key through appropriate fan blade and remove fan.
3. Replace fan and re-assemble in reverse order.

Burner Fan Motor

1. Undo central retaining screw and unplug control box. Release the motor leads at terminals and separate motor leads from wiring sheath.
2. Remove burner fan and motor as described.
3. Replace motor and re-assemble in reverse order.

Burner Start-up Cycle



Mounting the Burner

NOTE: The following procedures only apply when the burner has not been fitted to the appliance in the factory.

Burner with fitted gas controls assembly

1. Remove the nuts and washers from the burner mounting studs on the appliance.
2. Fit mounting flange gasket over mounting studs on the appliance.

3. Offer the complete burner and gas controls assembly up to the appliance and locate the blast tube in the burner port at the same time engaging the burner flange over the studs.
4. Push fully home and secure with the nuts and washers.

Commissioning and Testing

Electrical Installations

Checks to ensure electrical safety should be carried out by a competent person. In the event of any electrical fault after installation of the appliance, preliminary electrical systems checks shall be carried out. These shall include earth continuity, polarity and resistance to earth checks, as described in the British Gas Multimeter handbook.

Gas Installations

The whole of the gas installation including the meter should be inspected, tested for soundness and purged in accordance with the recommendations of CP 331/Part 3.

Gas Controls Assembly – Soundness Test

1. Check that the gas service valve is closed.
2. Remove the sealing screw from the pressure test point situated upstream (i.e. PTP1) of the multibloc valve and attach manometer or pressure gauge.
3. Open the gas service valve and then close.
4. Leave to equalise for 60 seconds and then observe the pressure gauge. The liquid level should not fall.
5. If a pressure drop is observed locate leak using leak detection fluid and rectify.

Sequence Check

1. Ensure that the gas service valve is closed and that the main electricity is switched off.
2. Check that:-
 - i. the room thermostat is turned to 'ON' or 'Maximum'
 - ii. the time clock (if fitted) is in an 'ON' period
 - iii. the appliance control thermostat is turned to its maximum setting.
3. Turn 'ON' the main electricity supply and check that the following sequence of events occurs.
 - i. Burner Fan runs
 - ii. Ignition spark is heard
 - iii. Burner goes to lock out as there is no gas supply
4. Reset the control box by pressing the reset button.
5. Switch OFF main electricity supply.

Start Up and Final Adjustment

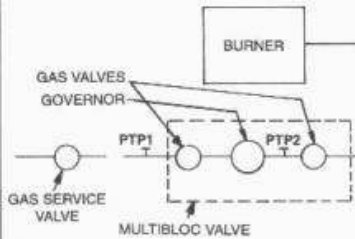
1. Ensure that the gas service valve is open.
2. Ensure that the checks have been completed.
3. Slacken the sealing screw of the pressure test point 2 (ref. Fig. 2) and attach a manometer or pressure gauge.
4. Switch on the main electricity supply and the burner will run through its ignition sequence.

NOTES: 1. First attempts to light may result in the burner going to lockout, owing to air in the gas controls assembly, this being indicated by the orange re-set button in the burner control box being illuminated. Press this button to re-start the burner sequence.

2. The burner has been test fired and adjusted in the factory. The following references to checking pressures are to ensure that settings have not been disturbed in transit.

5. Once the gas flame is established check that the pressure indicated by the pressure gauge is as stated in the Appliance Installation, Commissioning and Service Instructions. If necessary adjust the gas pressure by removing the cover cap of the governor and screwing the adjustment screw clockwise to increase pressure or anticlockwise to decrease pressure.

Fig. 2
Gas Controls – Soundness Test



Soundness Test – Final

After setting final gas rate, all joints on the gas controls assembly must be tested for leaks using leak detection fluid.

Flame Safeguard

Whilst burner is still in operation the flame failure safeguard should be checked as follows:-

1. Close the gas service valve.
2. The burner should go to lockout within 1 second.
3. Reset the control box by pressing the reset button.

NOTE:

Please refer to the following for setting pressure switches:-

Combustion Air Pressure Switch (GW3 A4 0.4 - 3.0mbar)

The combustion air pressure switch is set after all other adjustments have been made. Set the dial to 0.4mbar and then with the burner working at the minimum rated output of the heater adjust the dial clockwise increasing its value until the burner locks out. Now reduce the value by one set point turning the dial anti-clockwise. Restart burner. If burner does not light reduce value by a further set point and repeat.

Over Pressure Switch (GW10A4 1.0 - 10.0mbar)

The over pressure switch is set after the combustion air pressure switch. Its purpose is to shut down the burner if the combustion chamber pressure increases significantly. Turn the dial to 10.0mbar and then with the burner working at the maximum rated output of the heater adjust the dial anti-clockwise decreasing its value until the burner locks out. Increase value by 1 point and restart the burner. If the burner shuts down due to the slight pressure surge in the combustion chamber during burner ignition increase the value on the over pressure switch by a further set point and repeat.

Complete the commissioning sheet at the rear of this booklet.

Handing Over To The User

Refer to the appliance Installation, Commissioning and Servicing Instructions.

Burner Servicing

WARNING: ALWAYS switch off and disconnect electricity supply and close the gas service valve before carrying out any servicing work or replacement of failed Components.

General

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

Firing Head Assembly

1. Release the central retaining screw and remove burner casing lid.
2. Disconnect the ignition and rectification leads from the electrodes.
3. Slacken and remove the two pozidrive screws clamping the gas inner assembly pipe to the burner casing. Also disconnect gas inner assembly from multibloc valve via the valve coupling.
4. Carefully withdraw the firing head assembly from the draught tube.
5. Using a stiff brush clean-off any accumulated deposits from the firing head, paying particular attention to the nozzle ports and the diffuser plate.

6. Before the firing head is re-assembled into the burner check that the electrode is not damaged eroded or dirty.

If either the electrode or rectification probe requires replacing slacken the single retaining screw and remove same.

NOTE:

When removing the rectification electrode from the diffuser plate take care not to misplace the small insulating bush and washer. Replace with the new electrode ensuring that the end is in position correctly relative to the firing head as indicated.

7. Re-assemble in reverse order.

Burner Fan and Motor

1. Release the central retaining screw and remove the burner casing lid.
2. Withdraw inner assembly.
3. Clean the fan blades with a brush to remove any accumulated deposits.
4. Check that the impeller is rigidly fixed to the motor shaft and that the assembly turns freely.

Re - assemble in reverse order.

Fig. 3 Firing Head Components

