

**Burner  
Supplement**

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

**Models PC/GS7 & PC/GS8  
PC/GS fully automatic gas burners**

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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 \_\_\_\_\_ m<sup>3</sup>      \_\_\_\_\_ ft<sup>3</sup>/h

Heat input \_\_\_\_\_ MJ/h      \_\_\_\_\_ Btu/h

CO \_\_\_\_\_ %      \_\_\_\_\_ %

CO<sub>2</sub> \_\_\_\_\_ %      \_\_\_\_\_ %

Gross Flue Gas Temperature \_\_\_\_\_ °C      \_\_\_\_\_ °F

Ambient Temperature \_\_\_\_\_ °C      \_\_\_\_\_ °F

Nett Flue Gas Temperature \_\_\_\_\_ °C      \_\_\_\_\_ °F

Efficiency \_\_\_\_\_ %      \_\_\_\_\_ %

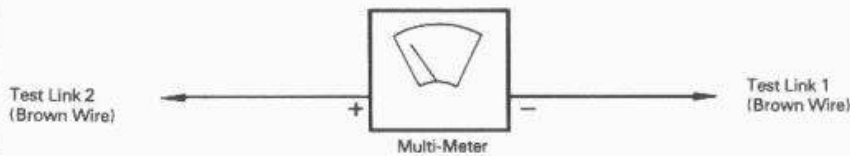
# Fault Finding

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

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

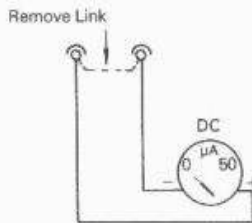
### To check the Flame Current:

1. Remove the terminal box lid via the two positive screws.
2. Remove flame signal link.
3. Fit multi-meter into Test Link terminals.
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, working in reverse order to that above and replace terminal box.



All Current ratings relate to 230v. All main fuses must be to BS.88

Minimum Flame Signal: 1µA  
 Typical Signal: Probe 10µA  
 U.V.25µA



Detector Current Measuring Circuits

# Introduction

## PC/GS 7 & 8

The Powmatic PC/GS7 & 8 fully automatic draught burners with ON/OFF gas control. The burners are supplied complete with a gas control assembly to the latest specification which provides for control of both the start gas and main gas supply through a main gas governor and safety shut-off valve. The start gas expands to the main gas rate after the start gas flame is established.

Flame safeguard, based on a rectification system, is provided by the integral full-sequence control box:- in the event of flame failure the safety shut-off valves are de-energised and the gas supply is cut-off within one second.

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

- a) Providing that the air-pressure switch is proved in the 'no-air' position prior to start-up, the combustion air fan will run.
- b) Providing that adequate air flow is proved there will be a pre-purge period.
- c) At the end of this time;

The ignition transformer and start-gas valves will be simultaneously energised and the start-gas flame established. Providing that the start-gas flame presence is proved within seconds the main gas safety shut-off valve will be energised and the main gas flame will be established. Failure to establish a flame, 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 Burner	PC/GS7	PC/GS8
Output Range kW Btu/h		
Voltage	230V	230V
Phase		
Frequency	50Hz	50Hz
Current Consumption		
- Motor	1.7A	1.7A
- Ignition Transformer	1.1A	1.1A
Single Stage, On/Off	PC/GS7S PC/GS8S	
Two Stage, High/Low	PC/GS7T PC/GS8T	
Modulating	PC/GS7M PC/GS8M	

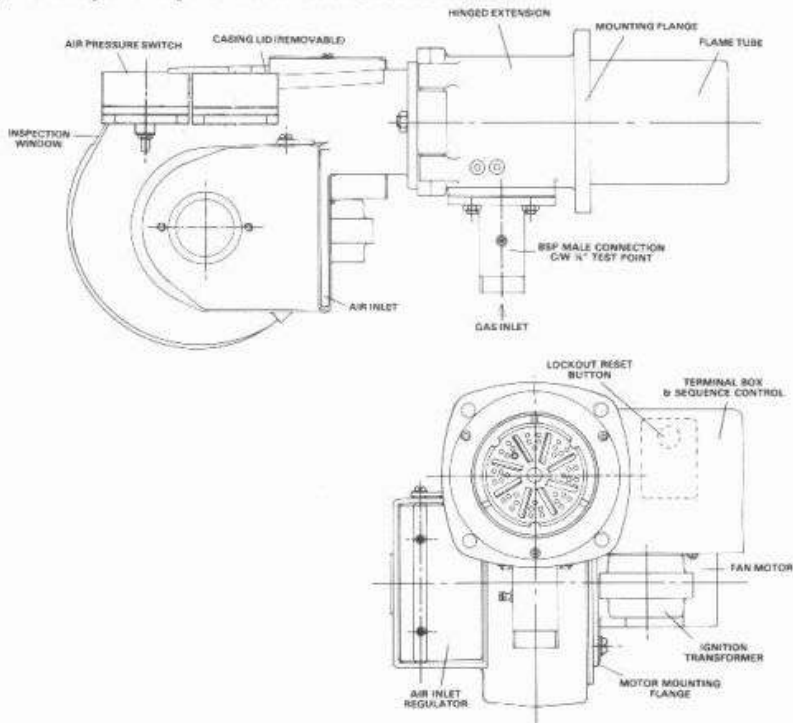
Gas Controls Assembly - 3/4" or 1 1/2" B.S.P.

## Control Box

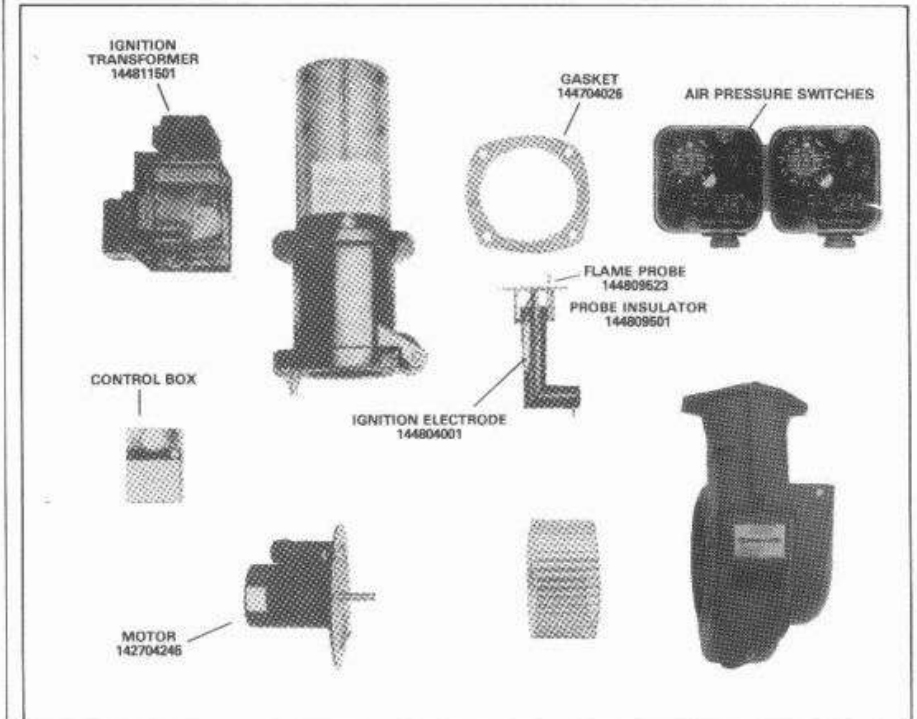
Type	Satronic
Type	MMI 810 mod 43
Electrical Consumption	10 va
Pre-purge Time	40 secs
Pre-ignition time	Nil
Start Gas Safety Time	3 secs
Total Start-up Cycle	50 secs
Minimum Normal Ionisation	1.0 µA
Current	
External Fuse	10A (rapid)    6A (slow)

PC/GS8 (Complete Assembly) Part No. 141376345

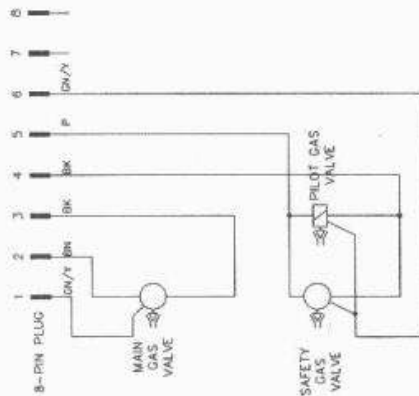
Fig. 1 Principal Components of the PC/GS7 & PC/GS8



# Parts List



# Wiring Diagram



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

WE-0065

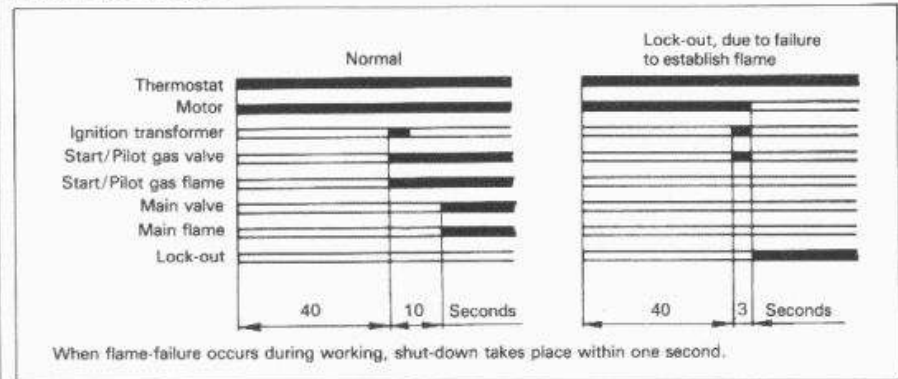
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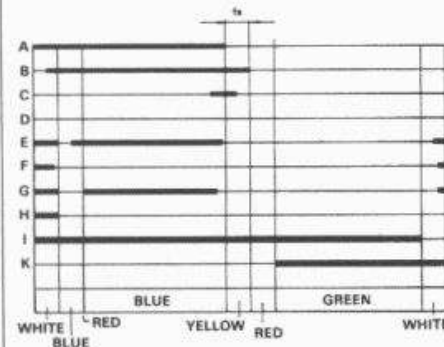
DRAWING No.

see drawings for conditions of use

## Burner Start-up Cycle



## Control Box Cam Function MM1 810



### Coloured Programme Indicator

#### CAM SWITCHES

- A Initial fuel release, start of ignition safety time
- B Air proving period, and termination on safety time
- C Ignition
- E Start of flame simulation, whilst 'B' is on
- F Contact position proving at start of programme
- G Lockout, during pre-purge
- H Programme "start"
- I Programme "stop"
- K Main Gas Valve V2

Note: 1. Cam switches are shown on the diagram in their relaxed position, indicated by the thin line on cam development sketch above.

#### COLOURED PROGRAMME INDICATOR

A coloured programme indicator is incorporated on the cam assembly, and the approximate colour positions indicate the following steps in the sequence.

- Blue line on White — Start position
- Start of Blue sector — Start of pre-purge
- Line in Blue sector — Air supply proved.
- Blue sector — Pre-purge
- End of Blue — End of pre-purge
- End of Blue/Start of Yellow — Start of ignition safety time, and initial fuel release
- End of Yellow/Start of Red — Lockout position, due to ignition or detection failure
- Red sector — Start flame proving period
- End of Red/Start of Yellow — Main flame stage
- End of Yellow/Start of Green — End of main flame establishment
- End of Green/Start of White — Run position

## 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. 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.

3. Push fully home and secure with the nuts and washers.

## Electrical Connections

The electrical connection to the burner (i.e. positive, neutral and earth) is wired direct to the burner terminal strip as shown on wiring diagram.

## Handing Over To The User

Refer to 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.

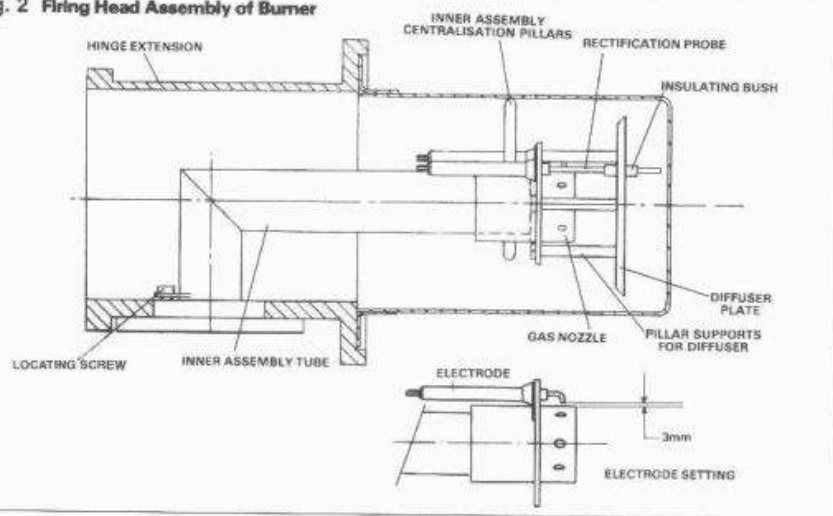
### General

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.

### Burner Fan and Motor

1. Release and remove the single fastening screw and remove the cover plate from the top of the burner casing.
2. Clean the fan blades (as required) with a brush to remove any accumulated deposits.
3. Check that the impeller is rigidly fixed to the motor shaft and that the assembly turns freely.
4. Check that the air pressure switch impulse pipe (situated immediately above the impeller) is not blocked.
5. Re-assemble in reverse order remembering to re-connect the electrode leads before closing the burner body onto the burner tube.

Fig. 2 Firing Head Assembly of Burner



### Firing Head Assembly

1. Using a 16mm spanner release the nuts securing the burner body to the burner hinge extension so that the burner body may be swung aside to reveal the electrode connections and firing head assembly.
2. Disconnect electrode leads and with a 6mm allen key remove the locating screw of the burner tube at the gas entry point. The firing head assembly can now be withdrawn.
3. Using a stiff brush clean-off any accumulated deposits from the firing head, paying particular attention to the nozzle ports.
4. Before the firing head is re-assembled into the burner tube check that the electrodes are not damaged, eroded or dirty. If either electrode requires replacing slacken the 3mm clamping screw and slide out the electrode. Replace with the new electrode ensuring that it is repositioned correctly.

**NOTE:** The rectification electrode has a flanged insulating bush where it passes through the diffuser plate. When replacing the rectification electrode ensure that the insulating bush locates in the diffuser plate from the burner port side.

5. Re-assemble in reverse order.

### Note

Please refer to the following for setting pressure switches:-

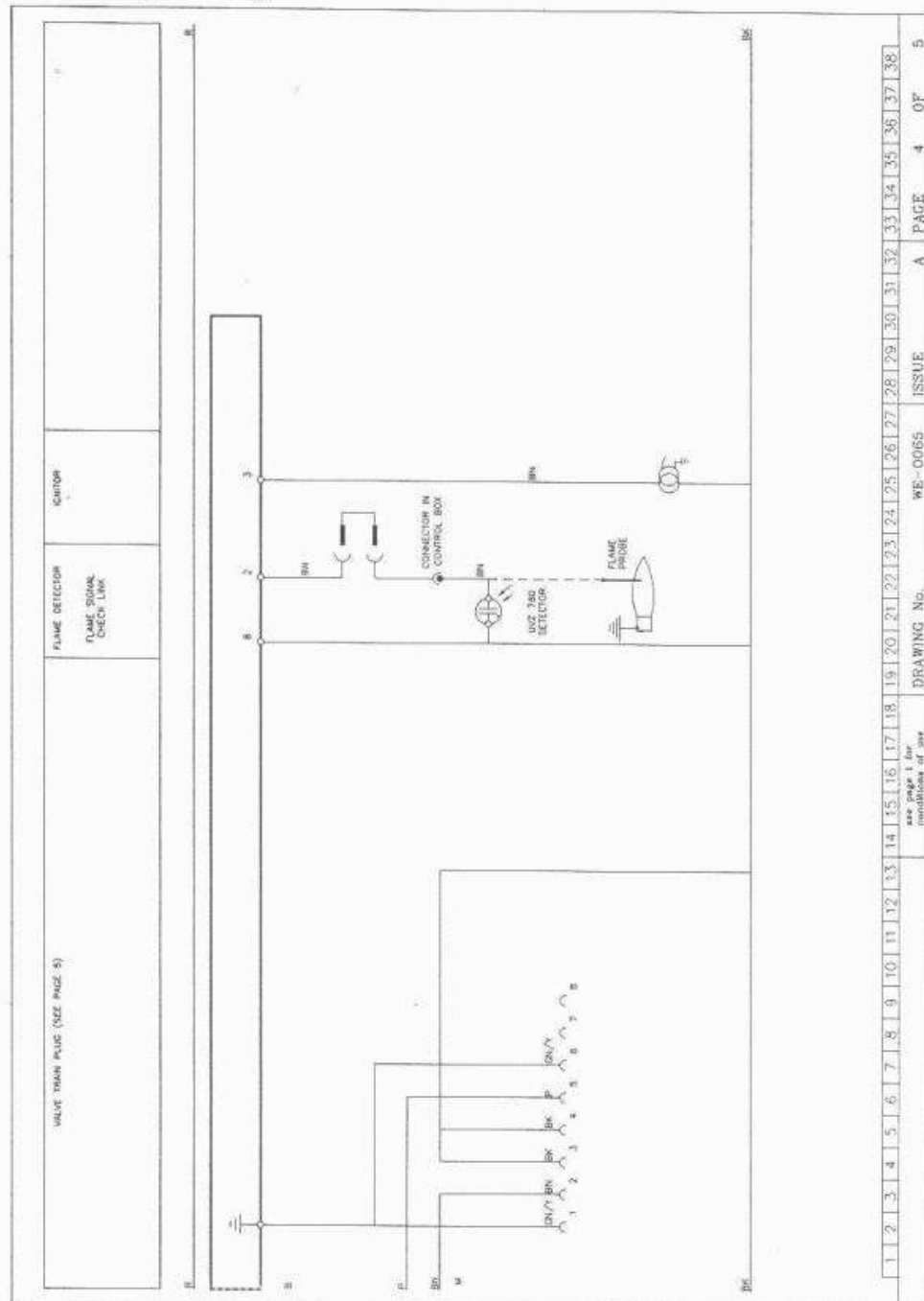
#### Combustion Air Pressure Switch (GW3 A4 0.4 - 3.0mbar)

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. Re-start burner, if burner does not light reduce the 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.

## Wiring Diagram



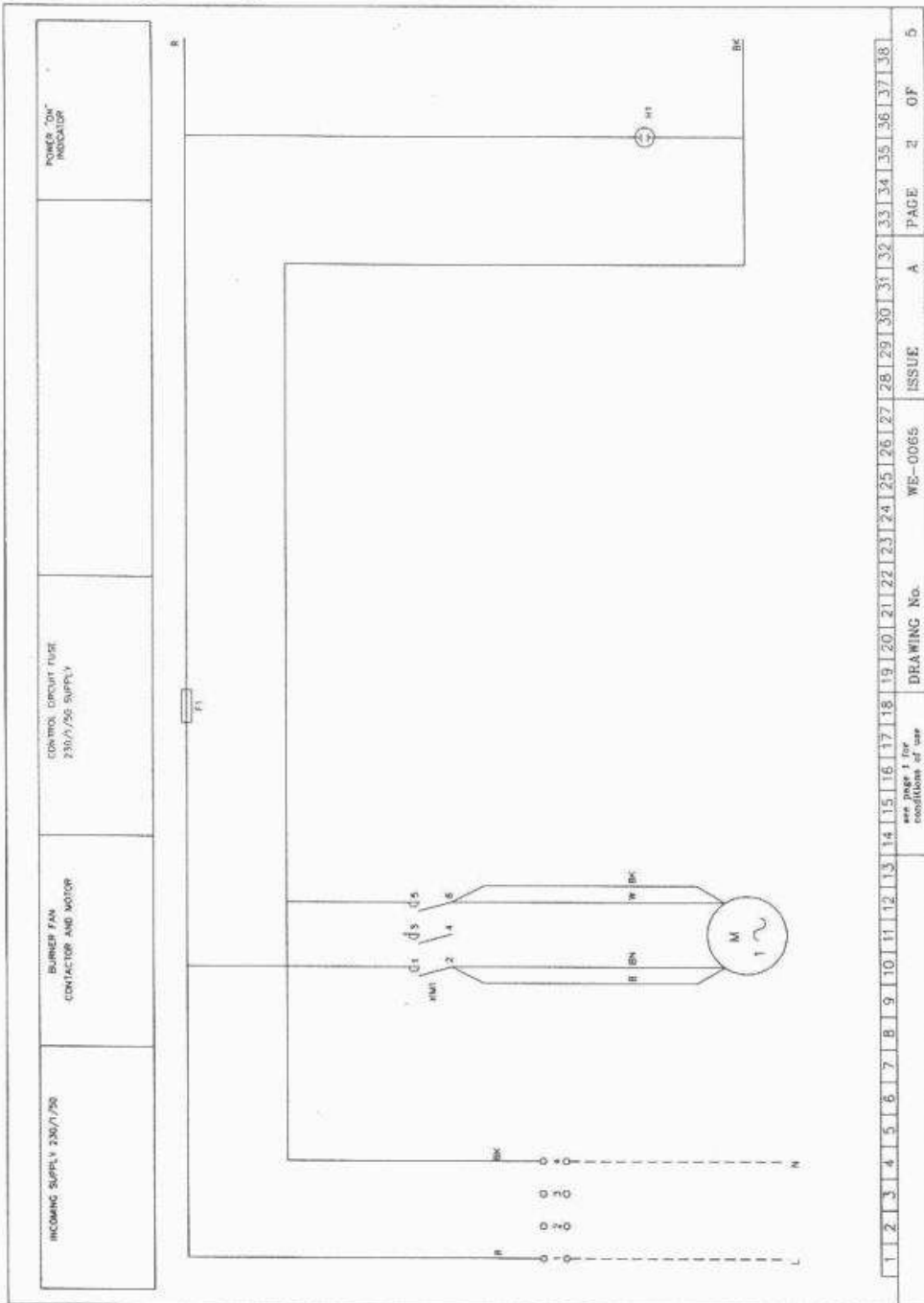


# Wiring Diagram

REVISIONS		CONDITIONS OF USE		NOTES																			
REF	DATE	ACTION	USE																				
			<p>READ FROM LEFT TO RIGHT ALL WIRING 16/20 UNLESS OTHERWISE STATED.</p> <p>PANEL WIRING _____ EXTERNAL WIRING - - - - -</p>	<p>1. ANY INTERLOCK DESIGNED TO SWITCH GAS CONTROL VALVE SHOULD BE WIRING TO COMMONS OF LID FAN INTERLOCK TO BE WIRED IN SERIES WITH CONTROL AND LIMIT INSTRUMENTS.</p> <p>2. IF BURNER IS USED ON STEAM BOILER, WATER LEVEL INTERLOCKS SHOULD BE WIRED BETWEEN 13 &amp; 17. (REMOVE LINK) IF AOTC PANEL IS USED (SEE WA3-7095 FOR STANDARD ARRANGEMENT) TERMINALS R2 &amp; R3 REFER.</p> <p>3. ON BOOSTED GAS SUPPLY WIRE INLET GAS PRESSURE INTERLOCK TO TERMINALS 17 &amp; 18 AND OUTLET GAS PRESSURE INTERLOCK TO TERMINALS 15 &amp; 16. IF NO BOOSTER IS USED LINK TERMINALS 15, 16 AND 17 - 18.</p> <p>4. REMOTE 'BURNER RUN' INDICATION FROM TERMINAL 9.</p> <p>5. REMOTE 'EXCESS TEMPERATURE OR PRESSURE' ALARM FROM TERMINAL 10.</p> <p>6. REMOTE 'BURNER LOCKOUT ALARM' FROM TERMINAL 11.</p>																			
			<table border="1"> <thead> <tr> <th>MODEL</th> <th>MOTOR KW</th> <th>OVERLOAD</th> <th>CABLE SIZE</th> </tr> </thead> <tbody> <tr> <td>PC/GS7</td> <td>0.25</td> <td></td> <td>1.00mm</td> </tr> <tr> <td>PC/GS8</td> <td>0.25</td> <td></td> <td>1.00mm</td> </tr> <tr> <td>PC/GS9</td> <td>0.25</td> <td></td> <td>1.00mm</td> </tr> <tr> <td>PC/GS13</td> <td>0.25</td> <td></td> <td>1.00mm</td> </tr> </tbody> </table>		MODEL	MOTOR KW	OVERLOAD	CABLE SIZE	PC/GS7	0.25		1.00mm	PC/GS8	0.25		1.00mm	PC/GS9	0.25		1.00mm	PC/GS13	0.25	
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FUSE REF	AMPAGE	PROTECTING																					
F1	3	CONTROL CIRCUIT																					
		DRAWING No. WE-0065	ISSUE	A PAGE 1 OF 5																			

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# Wiring Diagram



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