

**NU-WAY**

**Handbook**

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**NG15 – NG25**

**Automatic Gas Burner**

**Installation / Maintenance  
Handbook**

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## GENERAL

1. The NG15-NG25 burner is supplied for modulation operation and for use with single phase or three phase electrical supply.

This manual is structured to enable the user to proceed from the delivery of the burner to its commissioning and use.

The conditions to be fulfilled and the controls and adjustments to be used are dealt with in the sequence that should be followed for the correct assembly installation and use. Pre-commissioning (Dry Run) and Live Run are described and the location of necessary controls and adjustments to undertake these runs are illustrated and supported by appropriate tabular matter and graphs.

Routine Maintenance, Fault Finding, Spare Parts identification and Wiring Diagrams complete the manual; literature on proprietary components is available on request.

### 1.1 SAFETY

BEFORE ATTEMPTING TO ASSEMBLE, INSTALL OR COMMISSION THE BURNER, IT IS ESSENTIAL THAT THE FOLLOWING INSTRUCTIONS ARE CAREFULLY READ AND UNDERSTOOD. IT IS ALSO ESSENTIAL THAT SUCH WORK IS CARRIED OUT ONLY BY EXPERIENCED AND QUALIFIED GAS BURNER COMMISSIONING ENGINEERS.

THE MANUFACTURER CANNOT BE HELD RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGE, LOSS OR PERSONAL INJURY AS A RESULT OF CUSTOMERS FAILING TO FOLLOW THESE INSTRUCTIONS, OR AS A RESULT OF MIS-USE.

### 1.2 FLUE AND CHIMNEY REQUIREMENTS

The top of the Chimney/Flue should be above all roofs within a radius of 10 metres.

Check that it is suitable for use with gas fired appliances.

Reference should be made to Local Authority and other regulations governing such installations.

Ensure that the flue pipe from the appliance does not protrude into the chimney beyond the wall thickness and is sealed throughout its run.

If more than one appliance is connected to a common flue/chimney, ensure that the cross section of the flue/chimney is adequate for the total volume of flue gases from all the appliances.

### 1.3 PLANT ROOM VENTILATION

An adequate dust free supply of fresh air is required for the burner at both high and low level in accordance with the appropriate standards.

#### **1.4 EXISTING APPLIANCES**

In preparing the appliance to receive the NG15-25 gas burner a careful inspection should be made of its condition. If in doubt as to its suitability for gas firing refer to the appliance manufacturer. In preparing the appliance for gas firing it should be cleaned thoroughly removing all adhering Tars, Scale and Dirt.

#### **1.5 COMBUSTION CHAMBER CONDITIONS**

When the burner is fitted to an appliance designed to work under balanced or negative combustion chamber conditions, the over-fire draught must not exceed 0.025 kPa (0.1 inches Wg 0.25 mBar, 2.5 mm Wg).

Should the over-fire draught exceed this figure, then steps should be taken to reduce it to this level.

### **2. SERVICES**

#### **2.1 GAS SUPPLY**

The piped gas supply to the burner must be constructed and installed to comply with local conditions and appropriate Codes and Standards. It should be of sufficient size to satisfy the pressure/volume requirements of the burner to ensure its operation. It is recommended that a 90° manual shut-off is fitted upstream of the burner gas train for the isolation of the burner during servicing and maintenance. The valve size must not be less than the NG burner valve train or create restriction to gas flow.

### **3. DESPATCH**

To safeguard against transit damage and for Export shipment, the burner may be despatched in partly assembled form in one of two modes.

**MODE ONE** : Comprising Three Units.

- (a) Burner Body, complete with Control Package, Hinged Extension and Flame Tube Assembly.
- (b) Gas train complete.
- (c) Separate wall mounted Control Panel

**MODE TWO** : Comprising Four Units

- (a) Burner Body complete with Control Package.
- (b) Gas Train Complete.
- (c) Hinged Extension and Flame Tube Assembly.
- (d) Separate wall mounted Control Panel.

**3.1 ASSEMBLY**

**MODE ONE** : Fit the Gas Valve Train to the Burner body using the Gasket provided. Ensure that the Gasket is fitted correctly with all holes corresponding with those on the Burner flange. Connect the air inlet/impulse pipe from SKP70 gas valve to left hand side of the hinged extension.

**MODE TWO** : Fit the Hinged Extension and Flame Tube Assembly to the Burner body with the eight studs provided. Ensure the gas inlet flange is at the bottom.

Fit the gas Valve Train to the Burner body with the four studs and using the gasket provided. Ensure that the gasket is fitted correctly with all holes corresponding with those on the Burner flange. Connect the air impulse pipe from SKP70 gas valve to left hand side of the hinged extension (two stage).

**MODES ONE AND TWO**

Insert the Ignition Electrode cable, probe and earth leads into the aperture on the right hand side of the hinged extension, fitting the sealing grommet around the cables.

Open hinged extension. Connect the earth lead (Green and Yellow striped) under the fixing screw for the inner assembly, probe lead (Brown) to the flame probe and connect the Ignition cable to the Electrode. Close hinged extension.

Connect the multi-pin plug from the gas Valve Train to the socket located on the rear of the Control Package on the left of the Burner body.

The burner is now completely assembled and ready for fitting to the Appliance.

Contractor/Installer to inter-connect wiring between panel and burner.

CHECK THAT BURNER IS APPROPRIATE FOR APPLIANCE RATING BY REFERENCE TO DATA SHEET OR APPLIANCE MANUFACTURERS MANUAL. Refer to Fig. 1.

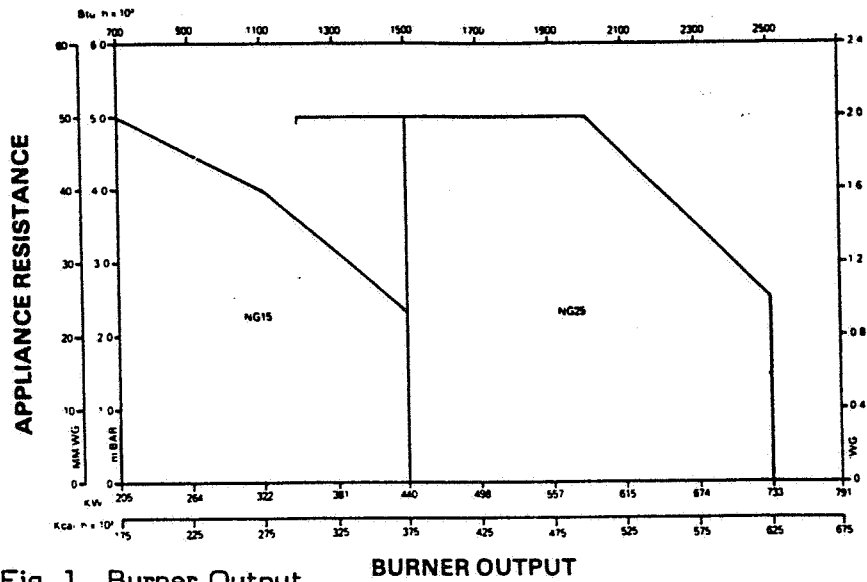


Fig. 1. Burner Output.

### 3.2 FITTING TO THE APPLIANCE

If the burner is to be fitted to a new packaged unit, refer to the manufacturers recommendations.

If the Burner is to be used with an existing Appliance prepare the mounting Flange as Fig. 2. Ensure the joint between Appliance and Burner is effectively sealed with the Gasket provided.

The Flame Tube should not generally extend beyond the inner face of the Appliance combustion chamber except where extensions are specified by the Appliance manufacturer.

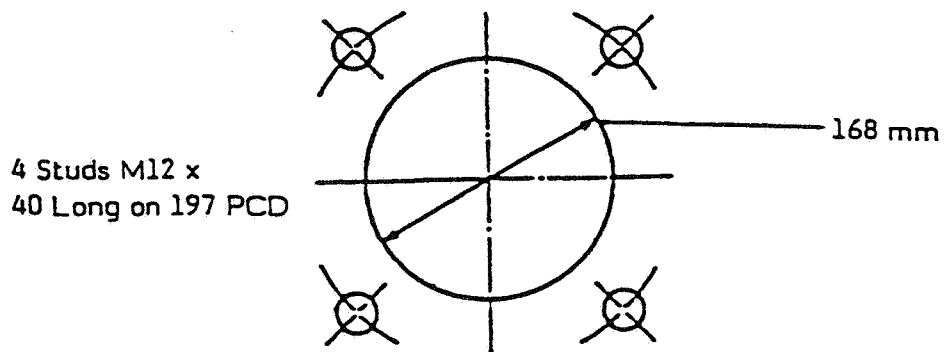


Fig. 2. Boiler Frontplate Drilling.

**3.3 ELECTRICAL POWER SUPPLY**

		1 Phase	3 Phase
Mains Supply	(V) (+ 10% - 15%)	220-240	380-415
Frequency	(Hz)	50	50
Burner Motor	(W)	750	750
Start Current	(A)	30	11
Main Fuse	(A)	20	10

Fig. 3. Electrical Data.

Connect a Single or Three Phase 50 Hz electrical supply to the Burner observing all applicable Codes and Standards. Refer to the specific wiring diagram in this Manual or Instruction Pack attached to the Burners.

If supplied as a Packaged Appliance/Burner unit refer to the Manufacturers Instructions.

Connect external auxiliary controls by reference to the appropriate wiring diagram in this Manual.

**4. BURNER AIR CONTROLS**

4.1 The air for combustion is controlled by an adjustable Air Flap located inside the Air Inlet on the right hand side of the Burner viewed from the rear.

Its purpose is to regulate and control the volume of combustion air flowing through the Burner.

**4.2.2 MODULATING BURNERS WITH FULLY CLOSING AIR DAMPER**

A capacitor start and run Motor driving a three cam stack is located on the Air Inlet casing. Cam No 1 drives the Air Control to the Fully Closed position when the Appliance temperature/pressure is satisfied and is factory set.

Cam No 2 is used to set the High Flame combustion air requirements.  
Cam No 3 is used to set Low Flame combustion air requirements.  
Refer to Fig. 10.



### 4.3 AIR DIFFUSER

The Air Diffuser is fitted to the front end of the Inner Assembly and located within the Flame Tube. (Fig. 5).

Its function is to control the volume of combustion air and create a pressure drop over the Burner Head to ensure good fuel/air mixing and flame stability.

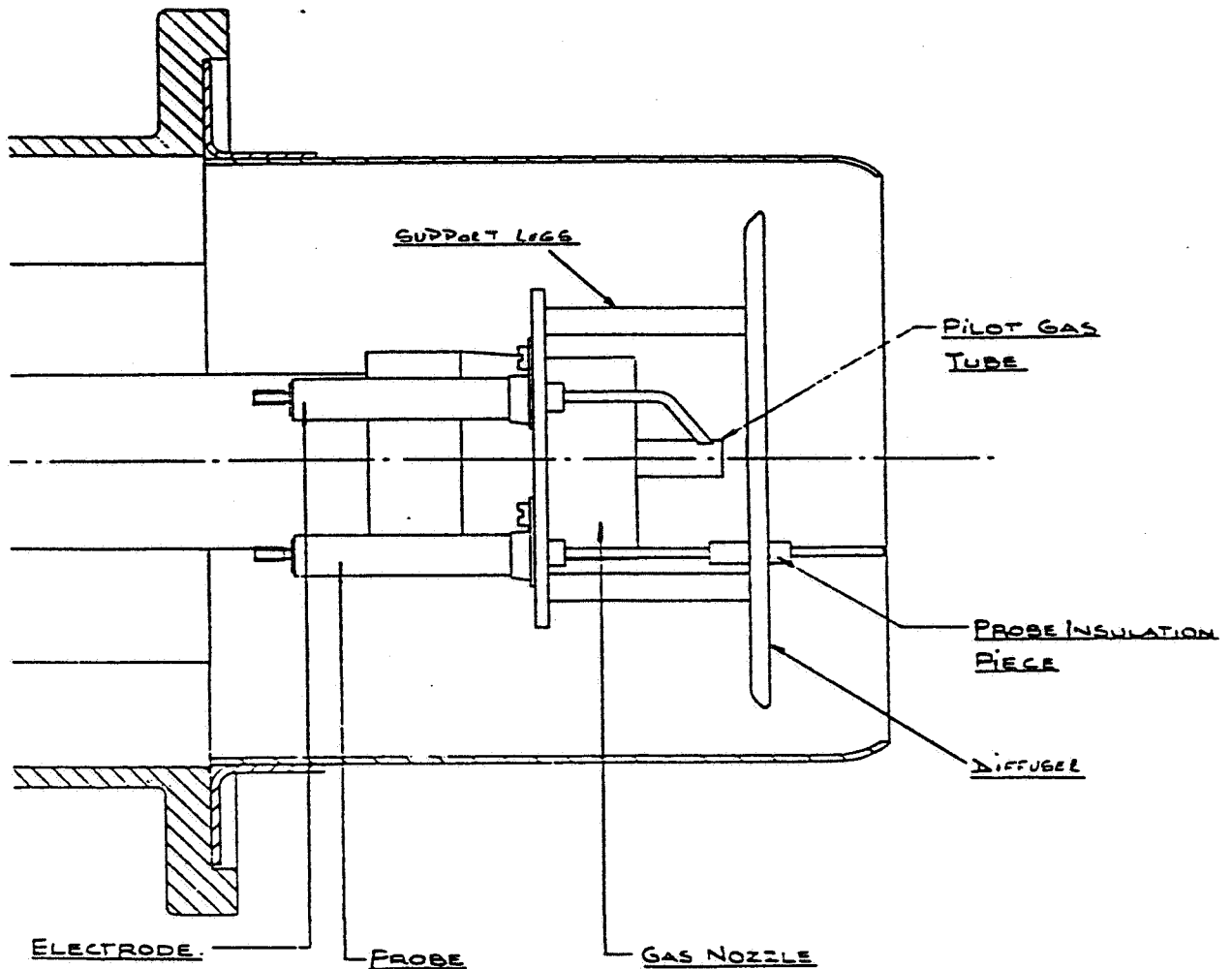


Fig. 5. Burner Head Arrangement.

### 4.4 AIR PRESSURE SWITCH

The Air Pressure Switch is located on the right side of the Burner Casing viewed from the rear. It is required to prove adequate air flow throughout the Burner operating cycle.

Air flow failure at any stage will result in safety shut down.

### 4.5 HIGH GAS PRESSURE SWITCH - HAND RESET

This is fitted to the Gas Train and is fitted to protect the SKP 70 gas valve. Should the gas head pressure increase above high fire pressure, then this will shut the burner down - thus indicating fault. Switch should be set at approximately 20% above head pressure on high fire.

5. BURNER GAS COMPONENTS

5.1 GAS NOZZLE

The Gas Nozzle is fitted to the front of the Inner Assembly and located in the Flame Tube (Fig. 5). The holes in the Gas Nozzle are of a size to suit the output of a particular Burner Model depending on the type of fuel used and its pressure. (See Fig.6).

GAS NOZZLE				AIR DIFFUSER	
BURNER TYPE	FUEL	SIDE HOLES	END HOLES	O/DIA	CONTROL HOLE I/D
NG15	Natural	8 x 8.0mm	8 x 4.0mm	133mm	28mm
NG25	Natural	8 x 10.0mm	8 x 6.0mm	133mm	38mm

Fig. 4. Gas Nozzle & Diffuser Details.

5.2 GAS VALVE TRAIN

The Gas Valve Train is illustrated in Fig. 4. The system includes an Air/Gas Ratio Controller, Safety Shut-Off Valves, Manual Shut-Off Valves and Regulator in both the Main and Start Rate Gas Lines.

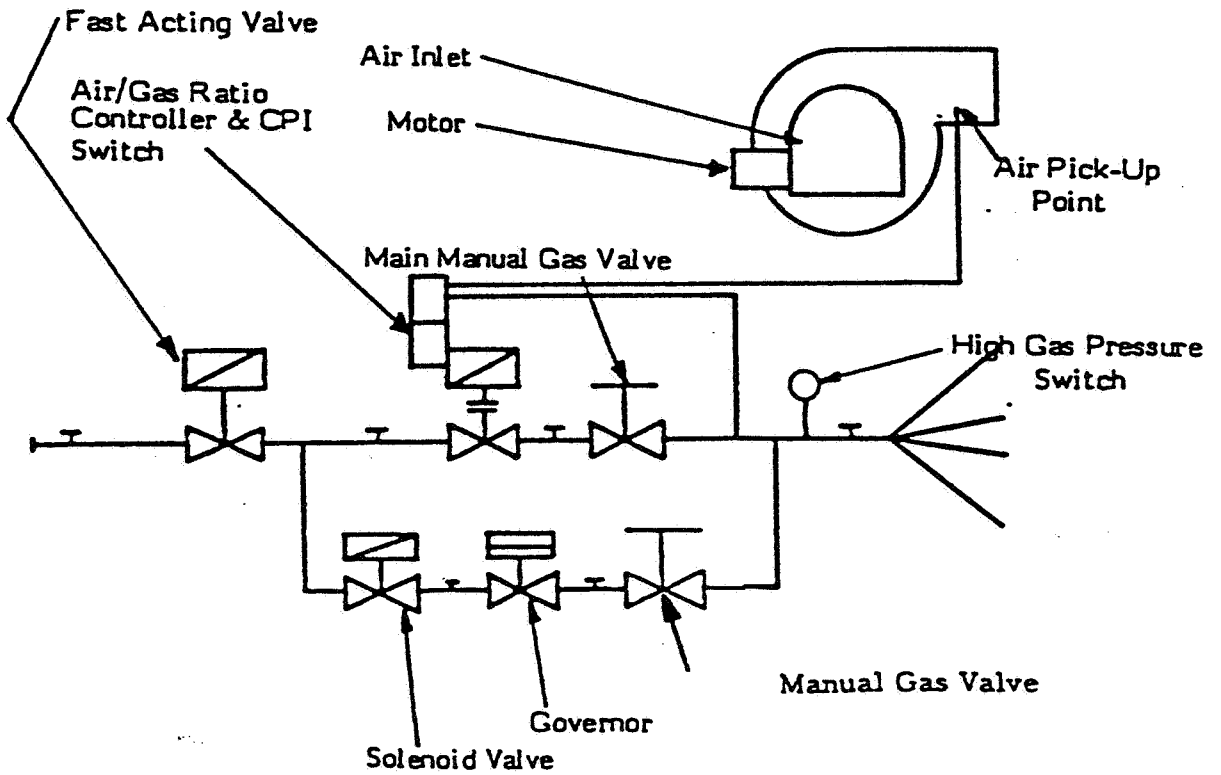
Closed Position Indicator switches (CPI) are fitted as standard to all downstream Safety Shut-Off Valves.

Two Impulse Pipes are connected to the Air/Gas Ratio Controller. All are factory fitted.

One pipe is connected to the Burner Hinged extension and supplies a stream of air to the Ratio Controller.

A second pipe is connected on the inlet side of the downstream S.S.O.V and supplies a stream of gas to the ratio controller.

STANDARD GAS TRAIN NG15-25 MODULATING BURNER



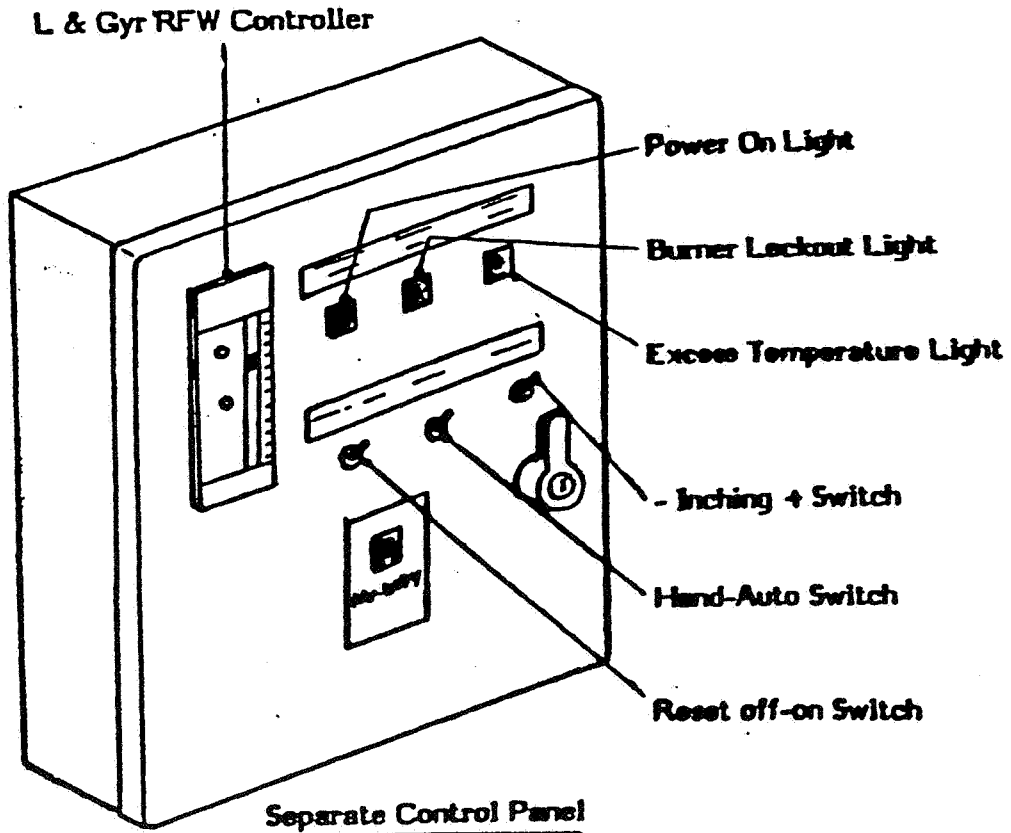
**6.0 BURNER CONTROLS**

The Burner Panel is located on the right hand side of the burner viewed from the rear. This contains burner ignition transformer, inter-connecting terminal strip, gas train and pin socket.

**6.1 SEPARATE CONTROL PANEL**

It includes the Temperature/Pressure Controller. The Burner Sequence Control. Motor Contactors and Overload. High/Low Switch. Hand-Auto Switch and Inching Switch. Electrical terminals and multi-pin socket.

External Indicator Lights include the Burner On/Off switch, Lockout Warning and Excess Temperature/Pressure Warning. Fig. 7. (Typical).



**7.0 TEMPERATURE/PRESSURE DETECTOR**

A Temperature or Pressure Detector for installation in the appliance is supplied as a loose item with the burner.

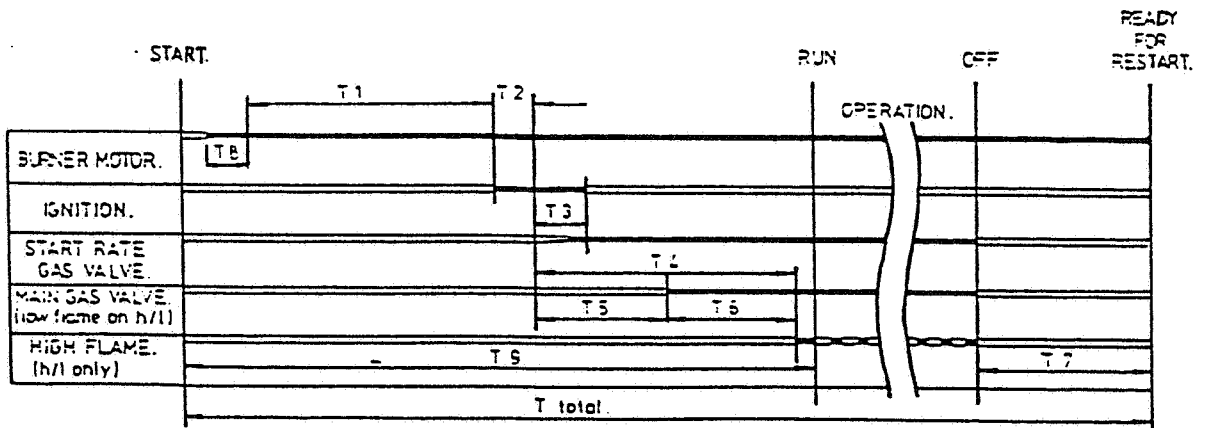
When the NG Modulating Burner is supplied as an appliance package the Temperature or Pressure Detector may be fitted and electrically connected.

If the burner is a conversion or replacement the Temperature or Pressure Detector must be fitted and wired in accordance with the manufacturers recommendations and wiring diagrams included in this manual.

The Ultra Violet (UV) flame monitor is located on the burner body and is required to supervise the safe operation of the burner under all working conditions. Alternatively a probe may be fitted to the burner head to monitor the flame.

**8.0 BURNER OPERATING SEQUENCE**

The NG Modulating Burner sequence begins with an air pre-purge followed by start rate gas flame which when proved allows the Burner to operate on the modulating principal determined by the pressure/temperature requirements of the appliance.



TIME (SECS)	CONTROL TYPE		DESIGNATION
	LFL 1.335	LFL 1.635	
T1	32.5	62.5	Pre-Purge.
T2	5	5	Pre-Ignition.
T3	2.5	2.5	Safety Lockout Time.
T4	30	30	Delay Start Rate to Main Flame.
T5	-	-	Delay Start Rate to Main Flame.
T6	-	-	Delay Low Flame to Modulation.
T7	15	15	Post-Purge.
T8	10	10	Air Pressure Switch Interlock.
T9	78	105	Total Start Time.
Total	93	120	Total Cycle Time of Controller.

Fig. 8. Timing Chart (Control Box Only).

8.1 The pre-purge times shown above refers to the Control Box only. The Air Damper Control will extend the total Burner purge time up to a maximum of 127 seconds depending upon the firing rate and air requirements of the Appliance.

9.0 COMMISSIONING

Re-Check Electrical Wiring is complete and complies with all Codes and Standards.

Re-check Gas pipework is correctly installed and leakproof.

Check the Appliance is in a proper and safe state to be fired. (For instance is there water in the Boiler).

Set Appliance controls to call for heat.

Momentarily switch on power to the burner and check the motor rotation which should be anti-clockwise viewed from the motor end.

9.1 INITIAL BURNER SETTING

The following settings are suggested for initial firing. Further adjustments will be necessary before commissioning is complete.

9.1.1 Set the pressure/temperature set point on the RFW31 controller from which burner will modulate.

9.2 GAS

(a) Combined Governor/Safety Shut-Off Valve (S.S.O.V Fig.9).

Remove the small plate on top of the Regulator and keep it in a safe place.

Set the Air to Gas ratio at 0.8 on the visual scale by adjusting the screw (1). Anticlockwise to increase. Clockwise to decrease.

Set the Air Gas ratio on the visual scale (2) to half a division on the '+' side of "0". Turn the adjusting screw clockwise to decrease. Anti-Clockwise to increase.

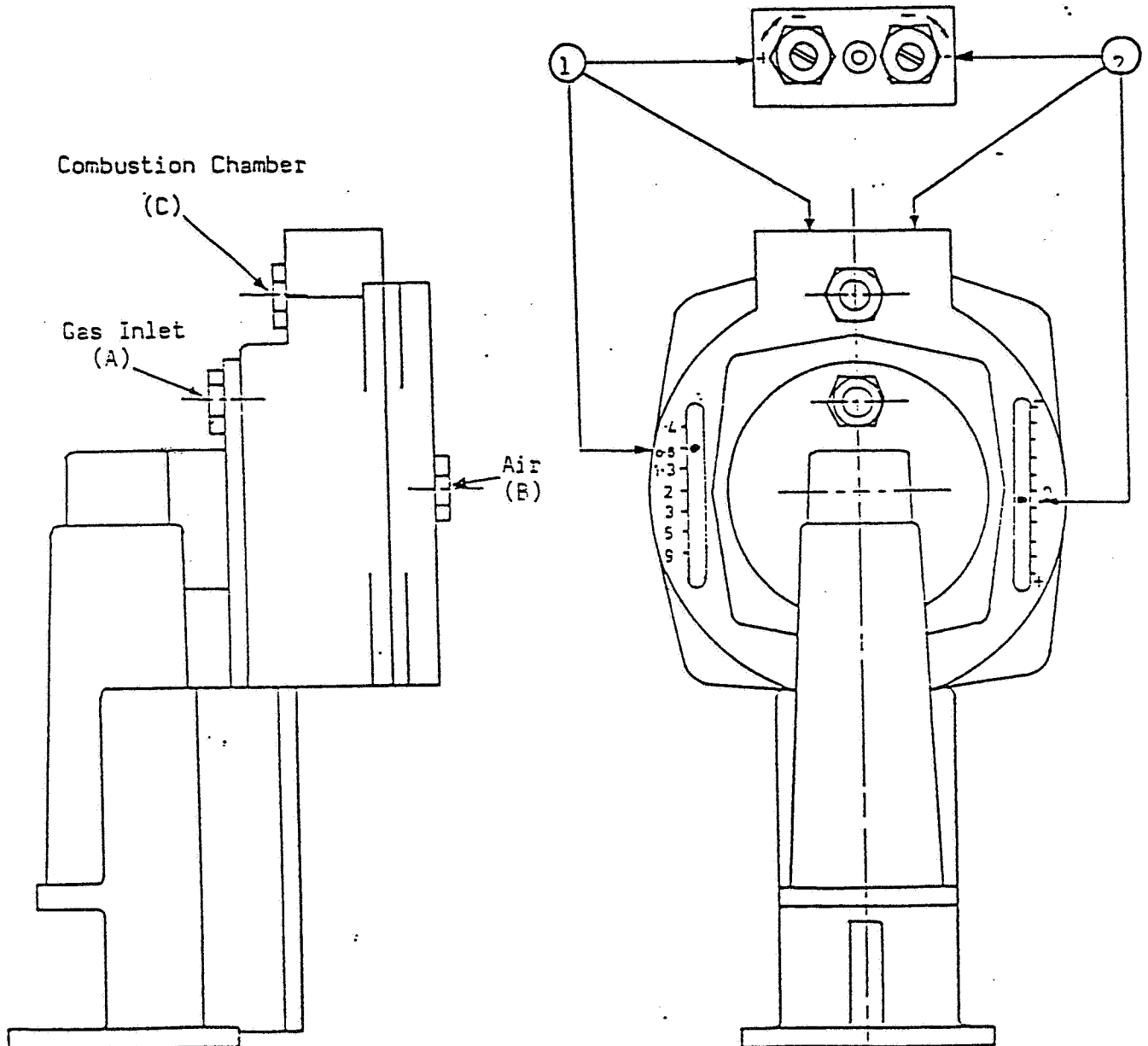


Fig. 9. Combined Governor/Safety Shut-Off Valve.

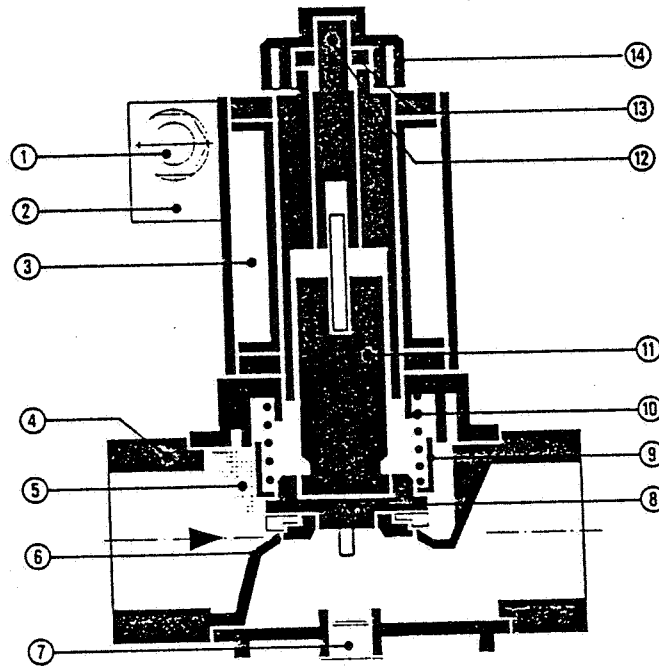
(b) Start Rate Gas Governor.

Remove the metal cap from the top and turn the adjusting screw until it is approximately halfway between maximum and minimum setting. Clockwise to increase. Anti-clockwise to decrease. Never adjust to its maximum limit.

(c) Up Stream Safety Shut Off Valve.

The opening speed is not adjustable, fast acting solenoid.

(d) Up Stream S.S.O.V.



- |                                   |                           |
|-----------------------------------|---------------------------|
| 1 = Screw cable coupling          | 8 = Valve head            |
| 2 = Terminal box                  | 9 = Dirt shield           |
| 3 = Coil unit                     | 10 = Closing spring       |
| 4 = Housing                       | 11 = Armature             |
| 5 = Filter                        | 12 = Main flow adjustment |
| 6 = Valve seat                    | 13 = Locknut              |
| 7 = Connection for CPI switch K01 | 14 = Cap                  |

Fig. 10. Second Safety Shut-Off Valve.

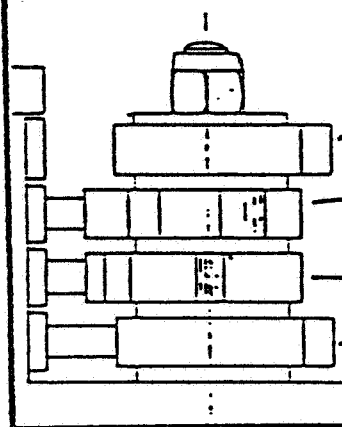


10.0 AIR

Remove the Air Control driving motor.

Check the settings and positions of the cams as illustrated. Adjust as necessary.

CAM ARRANGEMENT AND SETTINGS		
FRICITION CAMS	SINGLE STAGE	TWO STAGE
NATURAL CAM	DUMMY CAM	DUMMY CAM
BLACK CAM	—	LOW FLAME
WHITE CAM	MAIN FLAME	HIGH FLAME
NATURAL CAM	FULL AIR SHUT-OFF	FULL AIR SHUT OFF



Cam 1. Air Control Damper Fully Closed.

Cam 2. Low Flame Air.

Cam 3. High Flame Air.  
(Pre-Purge).

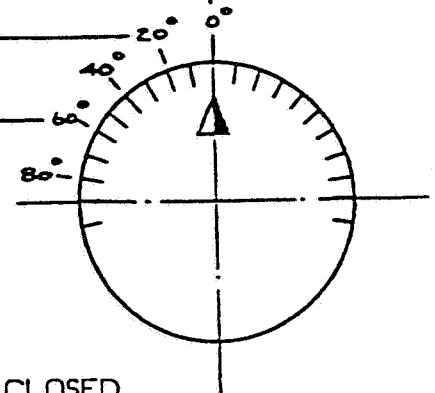


Fig. 11. Air Damper Cam Arrangement.

11.0 BURNER DRY RUN

Check gas supply to the burner is TURNED OFF.

Check both Manual Gas Valves on the burner are CLOSED.

Open the Control Panel and turn the HAND-AUTO switch to HAND.

Set the High/Low flame switch to the Low Flame position.

Close the Control Panel.

Switch on the power supply to the burner.

Switch on the burner.

Depending on the type of control box fitted the burner will go through its operating sequence.

- (a) Immediately if it has previously been working but switched off during a normal operating cycle.
- (b) On pressing the reset button on the control box inside the control panel.

Burner motor will run.

Check that ignition spark is present. For actual timing refer to Sequence Diagram Fig. 8.

If at this stage there is no ignition spark and the burner goes to lockout the air pressure switch may require adjustment. See Para.18 ignition spark ceases and burner goes to lockout.

SAFETY SYSTEM PROVED. BURNER COMMISSIONING CAN PROCEED.

SWITCH OFF POWER TO THE BURNER.

## 12.0 BURNER LIVE RUN

### 12.1 GAS SUPPLY PRESSURES

A supply pressure of not less than 20 mBar (2.0 Kgs, 178 mm Wg, 8" Wg) and not more than 300 mBar (30 kpa, 3048 mm Wg, 120" Wg) is required at the inlet to the burner combined Governor/S.S.O.V.

- 12.2 When a Gas Booster is required certain regulations and recommendations must be followed (see Para 2.2). A low gas pressure switch must be fitted on the upstream side of the Booster to prevent it starting unless there is adequate pressure.

A further pressure switch is fitted on the delivery side of the booster to monitor the gas pressure. The pressure switch is wired into the burner control system and prevents high flame operation in the event of low gas pressure.

- 12.3 Turn the Main Gas Valve downstream of the second S.S.O.V to the CLOSED position. Fit a manometer or other approved pressure measuring instrument at the test point on the upstream side of the Governor (Regulator) on the combined Governor/S.S.O.V.

Open the Manual gas valve upstream of the Combined Governor/S.S.O.V.

Check there is sufficient static gas pressure to enable commissioning to proceed.

## 13.0 ESTABLISHING START RATE GAS FLAME

Open Start Rate Manual Gas Valve.

Set auto switch to 'Auto'.

Switch on the power supply to the Burner.

Switch on the Burner.

Burner motor will run - ignition spark will be established - Start Rate Gas Valve will open.

With the Start Rate Flame established the UV cell monitor or probe will take over. The Burner will now operate continuously on Start Rate Flame. For timing see Sequence Diagram Fig. 8.

Switch off the Burner.

#### 14.0 ESTABLISHING MAIN FLAME

Set Hand Auto Switch in the Control Panel set at 'Auto'.

Open Main Manual Gas Valve.

Switch on the burner.

Burner will operate to Start Gas Rate (See Para 13). Switch hand auto switch to Hand (inch to "-" for minimum fire). Flame is establishment.

Move the inching switch to the "+" position and allow burner to establish high fire rate. It may be necessary to adjust Cam 3 (Fig. 11) to establish the correct rate, and adjust SKP70 valve (Fig. 9).

Important with SKP70 system any increase in air setting (i.e. giving high static pressure) will result in increase gas rate.

Check the gas flow rate. Main flame now established.

#### 15.0 SETTING LOW FLAME

Leave HAND-AUTO Switch in the Control Panel set at HAND.

Move the Inching Switch to the position marked '-' and hold until the burner is in the Low Flame position.

Release the Inching Switch and allow it to return to the neutral position.

The burner will remain on Low Flame until switched off manually or by the Appliance Control instruments.

Check the gas flow rate. If adjustments are required they can be made on the Adjustment Screw marked (2) on the top of the Governor.

Turn Adjusting Screw (2) anti-clockwise to increase and clockwise to decrease.

Following adjustments to the gas rate it may be necessary to increase or decrease the air flow through the Burner. This can be done by adjusting Cam No 2 on the Air Control driving motor. When increase Low Flame air the Air Control driving motor will automatically follow the Adjustment Flame position and back to Low Flame on the Inching Switch.

After each adjustment to gas or air a further check on combustion conditions should be carried out.

#### 16.0 FINAL COMBUSTION CHECKS

Using the inching Switch operate the burner to both High and Low Flame and check the combustion performance.

The final setting of Air/Gas ratios may now be made on the Adjusting Screws (1) and (2). Fig. 9. Adjustments between High and Low Fire are unnecessary due to the compensating operation of the Gas/Air Ratio Control on receiving signals from the three Impulse Pipes.

## 17.0 START RATE GAS

Set Hand/Auto Switch in the Control Panel set at 'Auto'.

Close the Main Manual Gas Valve.

Switch on the Burner and allow it to run to Start Gas Flame with Low Flame air.

Switch Hand/Auto switch in the panel to Hand.

Adjust to the required volume on the Start Gas Governor. A maximum start rate of not more than 15% of Main Flame flow rate is adequate.

To increase rate turn Adjusting Screw clockwise and anti-clockwise to decrease.

NEVER adjust the start rate Gas Governor to its maximum setting.

- 17.1 Maximum start gas rate is determined as "flow measured to a maximum of 25% Stoichiometric gas rate for the proved air flow at the time of ignition". See Fig. 13.

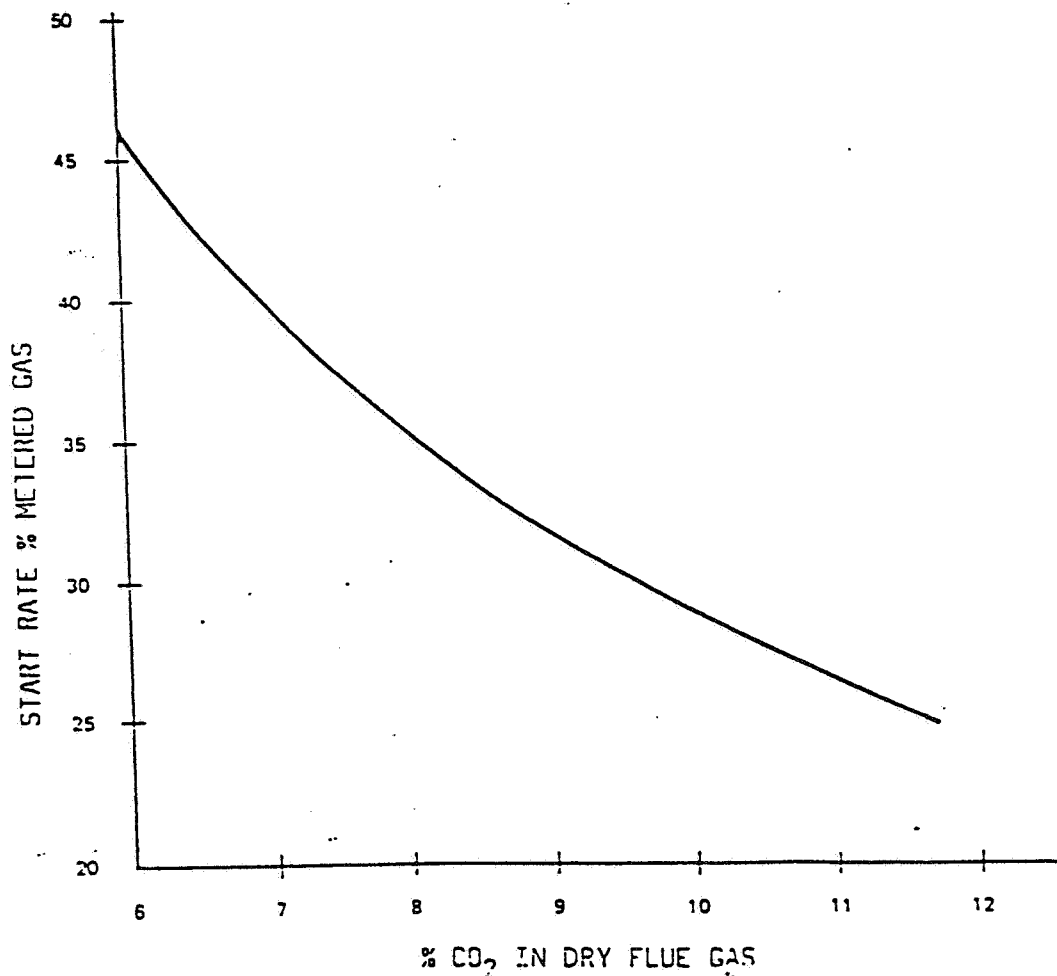


Fig. 13. Maximum Start Rate Graph.

Applying the Low fire CO<sub>2</sub> content to Fig 13 will establish maximum permissible start rate, eg at 10% CO<sub>2</sub> a metered start gas rate of 29% of the Low Flame gas rate is permissible.

### AIR PRESSURE SWITCH

Switch off the Burner.

Open Main Manual Gas Valve.

Leave Hand/Auto Switch set to HAND.

Remove the Air Pressure Switch Cover.

Switch on the Burner and allow it to operate continuously on Low Flame.

Slowly turn the adjustment dial on the Air Pressure Switch anti-clockwise until the flame is extinguished and the Burner LOCKS OUT.

Turn the dial one division and reset the Burner Control.

The burner will restart and continue its cycle to the Low Flame condition or Locks Out. If the burner Locks Out repeat the adjustment procedure once per burner cycle until the Low Flame condition is established.

Recheck the performance then turn the adjustment dial a further two divisions clockwise.

Switch off the burner and replace the Air Pressure Switch cover.

## 19.0

### FLAME SIGNAL STRENGTH

Open the Control Panel.

Connect a D.C. micro-ammeter (0-500  $\mu$ A) as shown on the appropriate wiring diagram in this manual.

Switch on the burner.

Once a flame is established the micro-ammeter will record the signal strength. Check both High and Low Flame. A minimum reading of about 7  $\mu$ a will give reliable operating conditions.

Readings below this figure may arise from poor burner adjustment. Check and reset if found to be necessary or refer to section on Fault Finding.

Switch off Power to the burner, and remove micro-ammeter.

Reconnect UV Detector.

**20.0 TEMPERATURE/PRESSURE CONTROLLER (SEE FIG. 7)**

The unit is factory set according to the operating Temperature or Pressure requirements of the customer.

Changes to the Temperature or Pressure response time can be made using the Setpoint Adjustment (Item A) shown on Page 6 of the enclosed leaflet illustrating the RWF31 Controller.

Light signals marked Y1 and Y2 indicate the operating condition of the burner. Y1 indicates the burner is modulating towards maximum. Y2 indicates the burner is modulating towards minimum.

**21.0 FINAL CHECK**

Check that all covers to components have been replaced and locking devices are properly secured (check particularly the small cover plate from the top of the combined Regulator/Safety Shut-Off Valve).

Check that Appliance Control Instruments are set to safe limits.

**COMMISSIONING IS NOW COMPLETE.**

Switch on Power to the Burner.

Set the High/Low Switch to High.

Set the Hand/Auto Switch to Auto.

Switch on the Burner.

The Burner will now operate until switched off.

- (a) By controlling instruments of the appliance.
- (b) Manually.
- (c) By Power Failure. Upon restoration of power, burner will re-start automatically and follow sequence.

**22.0 ROUTINE SAFETY CHECKS**

TO BE CARRIED OUT ONLY BY QUALIFIED AND EXPERIENCED PERSONNEL.

Check that the Plant Room is well ventilated at all times.

Frequently inspect air inlet of the burner and ensure there are no obstructions to air flow.

**23.0 FLAME DETECTION SYSTEM**

UV (Ultra Violet) Cell.

Switch off the Power supply to the Burner. Remove UV Cell from the Burner casing and cover the quartz glass envelope to exclude any light. Do not touch the quartz glass with fingers.

Switch on the Power supply. Check that the Burner locks out at the end of the ignition cycle.

Switch off the Power supply. Replace UV Cell switch on the Power supply. Reset lockout.

**24.0 ROUTINE MAINTENANCE**

Switch off Power supply and gas supply to the Burner.

**24.1 COMBUSTION AIR FAN**

Clean blades regularly with stiff brush. Access is obtained through the Burner top cover. Care should be taken to avoid damaging fan blades. Check that the air inlet into the fan is clean.

**24.2 INNER ASSEMBLY****NOTE:**

TO OPEN THE HINGED EXTENSION FIRST REMOVE THE GAS TRAIN MULTI PIN PLUG FROM ITS SOCKET ON THE CONTROL PACKAGE.

REMOVE THE LOCKING NUT SECURING THE HINGED EXTENSION.

Open hinged extension, disconnect ignition electrode lead.

Remove cap head screw securing the inner assembly gas pipe to the inside of the hinged extension. Carefully withdraw the inner assembly from the hinged extension.

**24.3 AIR DIFFUSER AND GAS NOZZLE**

Clean using a stiff brush.

**24.4 IGNITION ELECTRODE**

Clean and check the electrode is not cracked or worn. Renew if necessary.

Check settings of ignition electrode, reset if necessary. Refer to Fig.2.

**24.5 UV (ULTRA VIOLET) CELL**

Clean UV Cell with a clean dry cloth. Do not touch the glass envelope of the cell with fingers. Replace the UV cell making sure the glass envelope faces direction of flame.

Replace all components and covers, secure all fittings.

Burner is now ready for operation.

Switch on the Power and gas supply to the Burner.

**25.0 FAULT FINDING**

Any modifications to the installation or component settings resulting from actions suggested below may require the re-establishment of the various settings as indicated earlier in this manual.

**25.1 BURNER MOTOR FAILS TO START**

Check electrical supply is available and burner is correctly wired.

Check all fuses for continuity and size.

Check that all control instruments are 'calling for heat'.

Check that gas train is electrically connected i.e. plugged in correctly.

Check that the control box is not locked out (e.g. signal lamp may be faulty). If the control box is locked out press reset button.

Check the motor capacitor.

Check that the CPI switches are in the 'start' position. (Check wiring).

Check leak detection system (if fitted) is not locked out. If the leak detection system is locked out press reset button.

Check high gas pressure switch is not locked out.

**25.2 Check that the air pressure switch is in the 'start' position.**

The following procedures will assist in this check. Switch off Power supply.



25.2.1 Remove the plug-in assembly from control box base.

Using a suitable instrument, check for open circuit (no continuity) between the following terminals:

Landis & Gyr LFL1.335 Terminals 24 & 14  
 Landis & Gyr LFL635 Terminals

If the is not in the start position, turn the setting dial fully clockwise to minimum setting. Check again betwee appropriate terminals for continuity. If this condition is fulfilled the air pressure switch is in order.

However, if no continuity is obtained, the air pressure switch is faulty and must be renewed.

25.3 FAN STARTS AND BURNER GOES TO LOCKOUT

SYMPTOM	POSSIBLE REASON	REMEDY
No Ignition	Air Pressure Switch Electrode Setting Incorrect Cracked Electrode Porcelain HT Lead disconnected/damaged Transformer Faulty Control Box Faulty	See Para 18. Reset Re-New Re-Connect/Re-New Re-New
No Flame	Gas Supply Interrupted ) Gas Pressure too Low ) Valves Fail to Open  Manual Shut-Off Valve Closed	See 2:1  Check Coils and Associated Wiring Open

25.4 STARTING FLAME FAILURE

If the start rate flame is not properly established, the safety circuit of the Sequence Controller will cause lockout in one second.

The cause may be insufficient signal to the flame detection device which is the U V Cell. Alternatively the flame signal check link has been removed.

TYPE OF DEVICE	POSSIBLE REASONS	REMEDY
UV Cell	Glass Envelope Dirty, cell wrongly positioned.  Faulty UV Cell. Faulty Wiring.	Clean the glass - should face towards the flame. Re-New Re-Wire.



27.0 NOTE Should the motor or combustion air fan need replacing the following procedure can be followed.

Disconnect the Gas Valve Train multi-pin plug from the socket on the control package.

Remove the retaining screw securing the Control Package to its mounting bracket.

Lift the complete Control Package from the mounting bracket and rest it on the Gas Valve Train.

All securing studs and fixing nuts and bolts on the motor mounting flange are readily and easily accessible.

APPENDIX 1

MODULATION CONTROLLED BY BURNER MANAGEMENT SYSTEMS

When the NGN15-25 burner is operated by the above, usually this is via either an 0-10 Volt DC signal or 4-20 ma input. Should this be the case then the setting of the burner is the same as if with the RWF31 system.

However, the air control would be driven by the Landis & Gyr SQM motor and is adjusted as shown below.

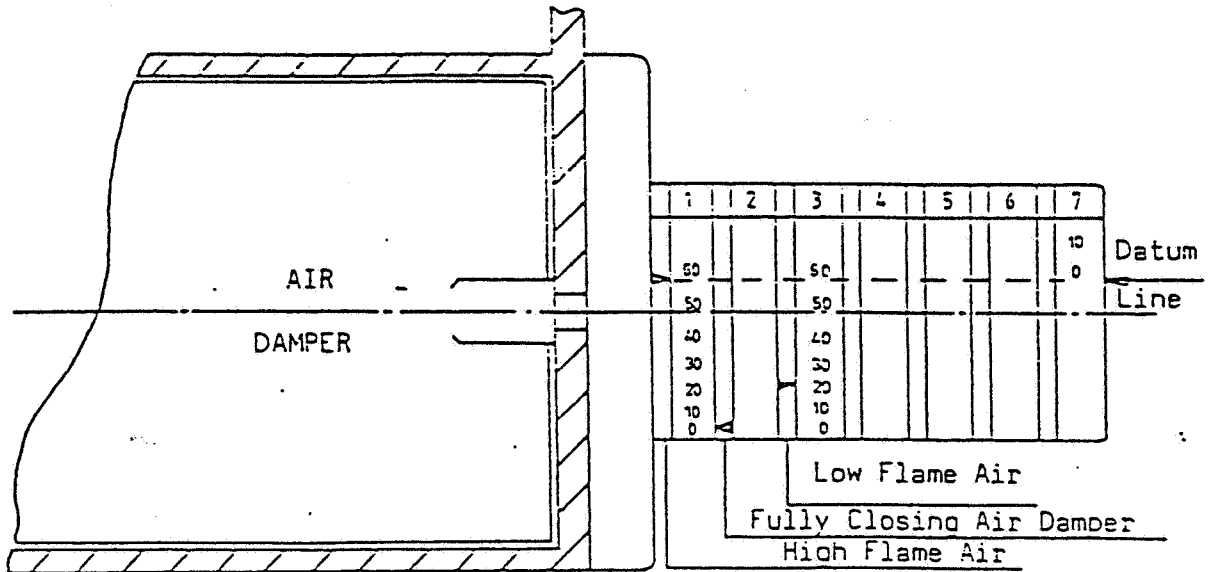


Fig. 11.

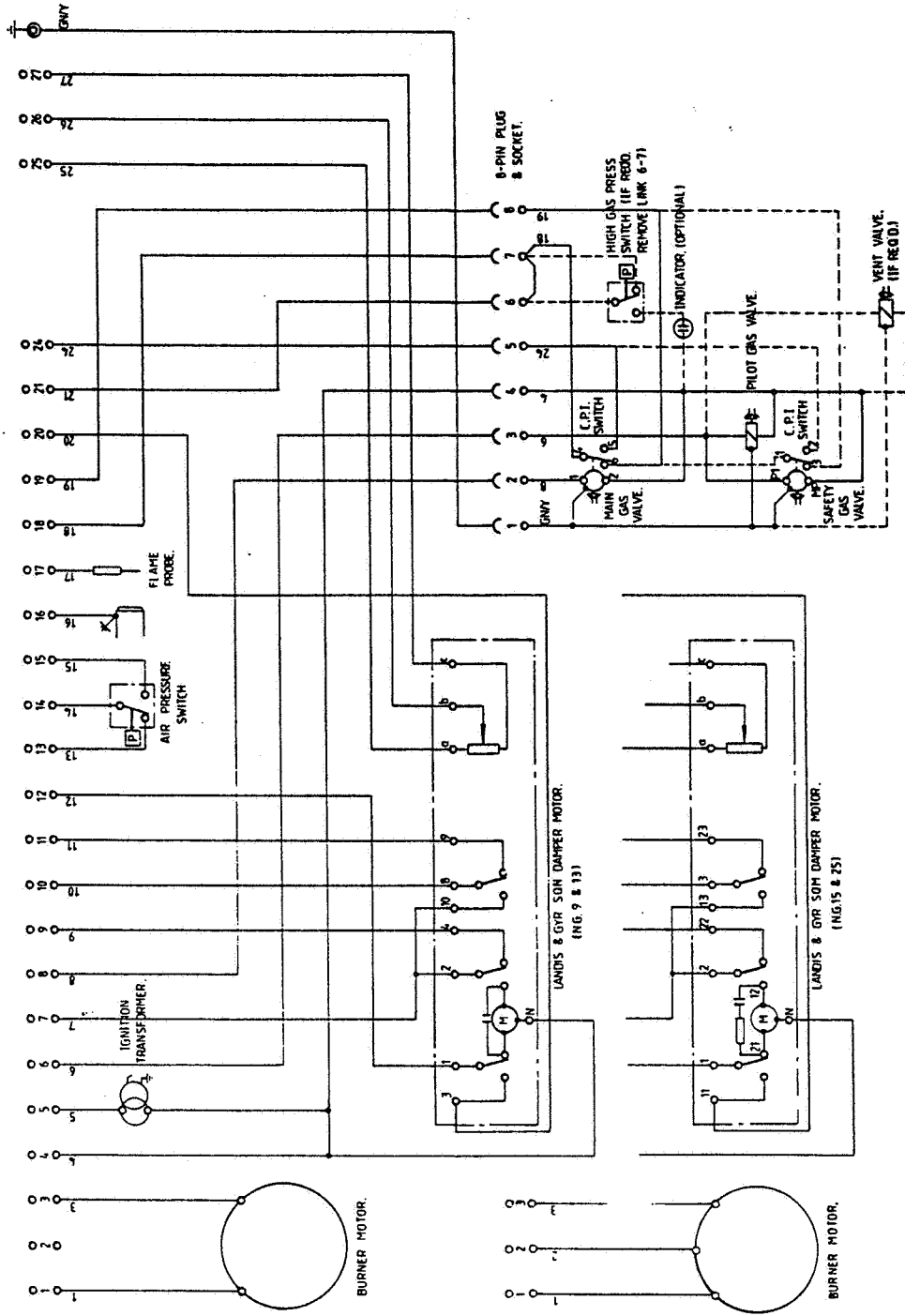
The appropriate wiring diagrams and specific technical data sheets of the system supplied is attached to this Appendix 1.

# THIRD ANGLE PROJECTION

DRG No. WA2-7690

ISSUE	0	1	2	3	4	5
	6	7	8	9	10	11

MODS.



FIN. CODE	
MATL. CODE	
DRG. No.	WA2-7690

TITLE  
 CONN'S. FOR NG.9, 13, 15 & 25 MODULATING.  
 NO CONTROLS WITH FEEDBACK POTENTIOMETER.

**NU-WAY LIMITED**  
 DROITWICH - WORCS  
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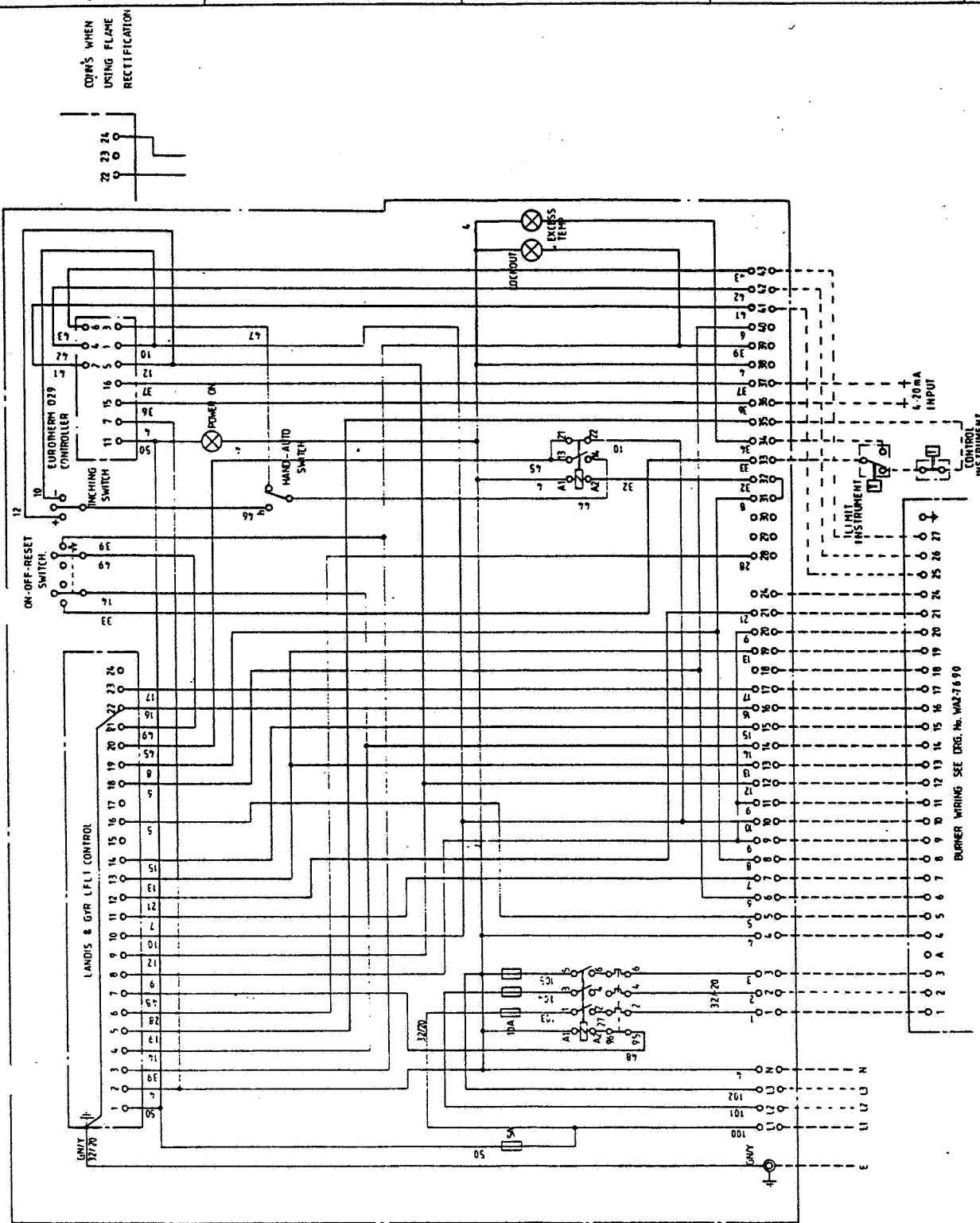
TOLERANCES	ONE PLACE DECIMAL 1.0mm TWO PLACE DECIMAL 0.1mm DRILLED HOLES 0.1mm SPECIAL LIMITS AS STATED
	DECIMAL 0.05 SPECIAL LIMITS AS STATED
	SCREW THREADS UNFINISHED TO BS 1590 CLASS 2 BSP TAPER TO BS 2185 PARALLEL TO BS 2779 ISO METRIC TO BS 3643 MED 1:1

DRAWN T.H.	PROTECTIVE FINISH
DATE 4-5-88	ROUGH FINISH
	MACHINE FINISH
	FINE FINISH

DRG No WAZ 7689					
ISSUE					
0	1	2	3	4	5
6	7	8	9	10	11
MODS					

**NOTES:**

- 1 ANY INTERLOCK DESIGNED TO SWITCH OR CONTROL BURNER SUCH AS TIME-SWITCH, DAMPER OR FAN OVERLOCK ETC MUST BE VOLTAGE FREE AND WIRED IN SERIES WITH CONTROL AND LIMIT INSTRUMENTS
- 2 OR-WIRE "BURN" INDICATION FROM TERMINAL 40
- 3 REMOVE PRESSURE TEMPERATURE OR PRESSURE ALARM FROM TERM 1L
- 4 REMOVE LOCKOUT ALARM FROM TERMINAL 39



FIN CODE
MATL CODE
DRG. No. WAZ-7689

**TITLE**  
 PANEL AND EXTERNAL WIRING FOR NG.25  
 MODULATING WITH LANDIS & GYR LFLI CONTROL.  
 (3PH)

**NU-WAY LIMITED**  
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<b>PROTECTIVE FINISH</b>	ROUGH
	FINISHED
<b>MACHINE FINISH</b>	ROUGH
	FINISHED
<b>CHECKED</b>	ROUGH
	FINISHED

<b>DRAWN T.H.</b>	
<b>DATE</b>	4.5.88
<b>CHECKED</b>	



**Nu-way Limited** is the largest manufacturer of oil, gas and dual fuel burners in the United Kingdom and has a range of burners with outputs from 15 kW to 20 MW. Products are exported to over 70 countries.

Nu-way is a BSI registered firm, manufacturing and testing to BS EN ISO 9001 procedures.

#### **Environmental Products Division**

- Fully automatic packaged oil, gas and dual fuel burners
- On/Off, High/Low, Modulation and Speed Control operation
- Low NOx
- Gas boosters, electrical panels, acoustic covers
- Training School

#### **Process Heating Division**

- Combustion systems for industrial process heating
- High and low temperature recuperative systems
- Dual fuel systems

#### **Selectos Burner Division**

- Fully automatic packaged oil and gas burners
- Class C2 and D distillate oils
- Towns, Natural and LP gas

#### **Parts and Components Division**

- First line spare parts
- Combustion test kits

#### **Service Division**

- Commissioning / Warranty / Technical Support

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