

HANDBOOK

Series SG Fully Automatic Gas Burners Models SG 11/FD36, SG 11/FD60

BURNER CAPACITY

SG11 FD36

17Kw to 36 Kw

SG11 FD60

36Kw to 58 Kw

(Based on a gross C.V. for
Natural Gas 38.56 MJ/ Cu M.)

THE SELECTOS RANGE

The Selectos SG 11 range of fully automatic gas burners are designed to meet the requirements of BS 5885. The range is suitable for modern boilers, air heaters and process applications.

CONSTRUCTION

A monobloc metric design, the burners are suitable for flange mounting to the boiler/air heater frontplate. The burners are delivered with a pre-wired packaged control system and an assembled, pre-wired gas train.

AIR REGULATION

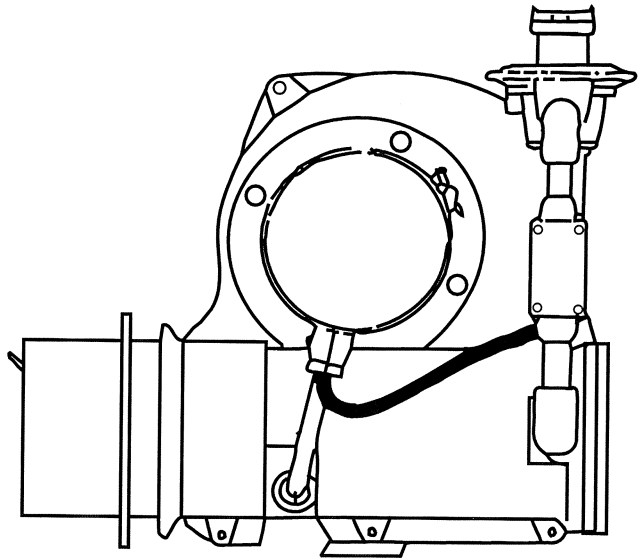
Air for combustion can be adjusted to give maximum efficiency.

CONTROLS

Flame supervision is by ionisation probe and automatic sequence control.

OPERATION

Single Stage (On/Off).



FUEL

Natural Gas at 17.5 mbar.
Special requirements on
request – ie. Liquid Petroleum
Gas / Town Gas.

OPTIONAL EXTRAS

U.V. Flame supervision.

INTRODUCTION

The SG11 is a fully automatic gas burner, designed to meet the requirements of prEN676 and to be suitable for modern boilers, air heaters and process applications. The burner should be installed and commissioned in accordance with these instructions by an experienced qualified engineer. Attention is also drawn to the Gas Safety Regulations. These instructions cover standard burners and general applications. Where the burner is supplied as part of a matched tested unit the appliance manufacturers recommendations, regarding any specific combustion head settings, etc, should be followed.

The burner is supplied complete with pre-wired controls and an assembled and pre-wired gas line. Electrical connections to the burner should be carried out in accordance with the wiring diagram supplied with the burner.

TECHNICAL DATA

CAPACITY		
Firing Rate	kW	Btu/h
SG11/FD36		
Min.	17	58,000
Max.	36	122,800
SG11/FD60		
Min.	36	122,800
Max.	58	197,900

Fuel: Natural gas or L.P.G.

Burner Inlet Pressure:

mbar (in w.g.) min. 17.5 (7.0)
max 40.0 (16.0)

Electricity Supply

230V (+10% -15%) 50Hz single phase a.c.
(max power demand during ignition, approx 400 VA)

Ambient Temperature

Maximum 60 Deg C.

Inlet Gas Connection

SG11/FD36 = 1/2" BSP.
SG11/FD60 = 1/2" BSP.

INSTALLATION

IMPORTANT - SAFETY It is essential that the following instructions and adjustments are carried out by CORGI registered engineers who are qualified and experienced in blown gas burner commissioning. 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.

EMERGENCY INSTRUCTIONS:

This product has been designed and constructed to meet all of the essential requirements of the GAS APPLIANCE DIRECTIVE 90/396/EEC and under normal circumstances should not give occasion to any hazardous conditions.

If such a condition should occur during commissioning or subsequent use of this product, be it a fault of the burner, the appliance or of any instrument, machine or service in the proximity of the burner, then the GAS and ELECTRICITY supply to the burner should be IMMEDIATELY ISOLATED until such time that the fault has been investigated and rectified.

BURNER MOUNTING

The burner should be securely mounted on the appliance by means of the fixing flange, and using the gasket provided.

The size of the burner entry hole, and location of the studs or bolts required is shown on the back cover of this handbook.

GAS SUPPLY

The gas supply pipe must be of adequate size to meet the pressure requirements specified in the technical data section.

The supply should have a mains service cock fitted as close to the burner as possible and be adequately supported to avoid undue strain on the burner gas line.

Electrical Supply

An isolating switch should be fitted as close as possible to the appliance, and the supply protected by a fuse as specified in the Technical Data section. At least the last 450mm (18") of the supply to the burner, and also any connections to a thermostat should be run in flexible conduit to permit burner removal.

The supply must be properly earthed and wired to the diagram provided.

Air Supply

To ensure an adequate supply of air for combustion, the room in which the burner is installed must be permanently ventilated from a fresh air inlet at least 40 sq.mm per Kw (1 sq.in. per 5000 btu/h). This in addition to any air requirements for other appliances.

Combustion Chamber Pressure

Check that the operating combustion chamber pressure is within the range for the burner, see burner selection chart.

COMMISSIONING

Test Safety Shut Off Valves.

Using a 0-30 mbar (0-12in w.g.) manometer, and referring to Fig.2, carry out the following sequence.

Check that the electrical isolation switch is **OFF**.

Close gas cock

Connect manometer to inlet test point

Open inlet gas cock for a few seconds until the manometer reading is steady.

Close inlet gas cock, and observe any drop in pressure. A drop of less than 0.5mbar in 'one minute indicates no significant let through the gas valve.

On completion of these checks disconnect the manometer from the test point and replace screw.

Calculate Gas Rate

If the required gas rate is not specified it may be calculated approximately from the following formula, which assumes a typical calorific value of 34.7 MJ/m³ and an efficiency of 86% nett:

$$\text{Gas Rate (dm}^3\text{/S)} = \frac{\text{Appliance Output (kW)}}{30}$$

or

$$\text{GasRate(ft}^3\text{/h)} = 17 \frac{\text{Appliance Output (kW)}}{4}$$

It should be noted that gas rates are quoted in this document at standard conditions of 15°C and 1013 mbar. If the temperature and pressure differ significantly from these figures, it will be necessary to make corrections to obtain the actual gas rate to be set.

Start Up

With the air intake damper still fully open the procedure for starting up should be as follows.

Check Lockout Function

With the inlet cock closed switch on the electricity. After about 10 seconds delay the burner should start and run for about 45 seconds then lockout as indicated by illumination of the re-set button on the control box.

Set Start Gas Rate

Open the inlet gas cock and press the re-set button to restart the burner. This time, after 45 seconds, the burner should ignite and run.

Check the start gas rate on the gas meter. As a guide, the rate can be estimated by measuring the start gas governor outlet pressure at test nipple E. and referring to Fig. 1.

If necessary alter the rate by removing the start gas governor cap and adjusting the exposed screw; clockwise to increase and anticlockwise to decrease .

Check Combustion

Using recognised testing instruments check the CO² (carbon dioxide) and O² (oxygen) percentage in the flue gases at the appliance flue outlet.

To increase or reduce the CO² adjust the air inlet band accordingly.

Figures of 9 - 10% CO² / 3 - 5% O² are acceptable. For reasons of safety the CO (carbon monoxide) should be checked and should not exceed 93 ppm.

To achieve good combustion efficiency or if the CO / CO² ratio is exceeded, adjustments to air and gas can now be made while the burner is running on main flame.

Low Gas Pressure Switch Setting.

The low gas pressure switch is wired in series with the appliance controlling instruments and will cause the burner to effect a 'safety shut down' if a loss of inlet gas pressure is detected. Isolate the burner and remove the gas pressure switch cover.

Switch on the electrical supply and allow the burner to establish main flame.

Slowly turn the adjustment dial on the gas pressure switch anticlockwise until the flame is extinguished and the burner SHUTS DOWN. Turn the dial slowly clockwise one division at a time until the burner restarts and establishes main flame.

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

Switch off the burner and replace the gas pressure switch cover.

Set Air Proving Switch

Remove the cover from the pressure switch (taking care to avoid touching live terminals) and turn the dial to increase the reading on the scale until the burner stops. Reverse the rotation of the dial by 3 stops and the burner should restart.

Check Ancillary Controls

Before leaving the site check that any thermostats or other safety limit controls are working correctly and are capable of switching the burner off.

Advice to User

Make sure that the user knows how to switch the burner off and where to close the main gas supply in the event of an emergency.

SERVICING

Very little attention is required except for cleaning any deposits from the burner fan and combustion head. The interval between service depends on the frequency of use but it is recommended that the burner should be checked two or three times a year.

Clean Burner

Switch off electricity and close the service cock. Undo union on gas cock. Remove burner by removing the nuts which secure the flange to the boiler (**Do Not** loosen the set screws which secure the flange to the draught tube).

Undo screws and remove the plastic inspection window from the rear of the draught tube.

Undo the motor fixing screws and withdraw the motor sufficiently to clean the fan and brush out any deposits from the housing.

Undo draught tube clamp screw on the underside of the housing and remove the draught tube together with the fixing flange. Clean exposed flame disc and electrodes, taking care that corrosion deposits do not penetrate the nozzle holes. If necessary the holes should be cleaned.

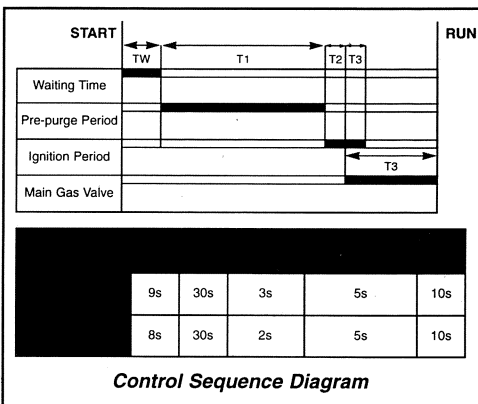
Re-assemble and re-install the burner.

Re-operating the Burner

Test the shut off valves for leakage. Check the lockout function and when the burner has operated for at least ten minutes, check the combustion as detailed in the Commissioning section.

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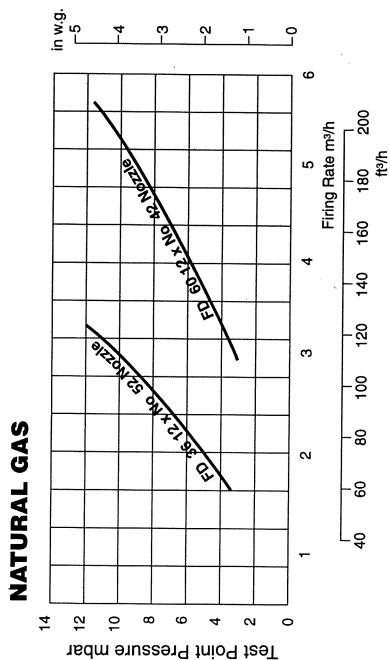
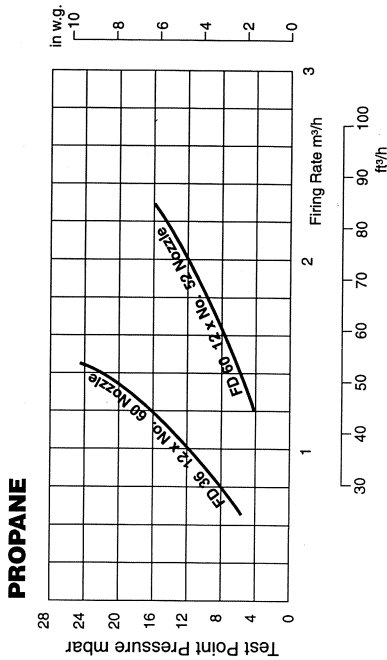


FAULT FINDING

The burner incorporates well tried and tested components but faults do sometimes arise and this simple guide covers the more likely eventualities.

SYMPTOM & POSSIBLE CAUSE	REMEDY
Does not start No electricity	Check that thermostats and time switches are in the energised position. Check that there is a live supply to the appropriate terminal(s) of the control box. Check fuses.
Flame detector electrode or lead shorting to earth	Switch off and inspect leads and electrodes and check for open or short circuits.
Air pressure switch	Check that the pressure switch has been set correctly. (see Commissioning Instructions). Check for blockage of the ports and tube. Check that the switch contacts have returned to the 'No Air' state.
Starts and Locks Out No gas	Check that all gas cocks are open. Check that the gas valve leads are correctly plugged into the junction box. Check presence of gas with a manometer on the test point on the outlet of the start gas governor.
Air pressure switch	Check that the air pressure switch is not set too high. Adjust if necessary.
No ignition	Switch off and check the ignition lead and electrode for open or short circuit.
Start gas rate	Increase start gas rate governor pressure and adjust to the correct rate.
Flame signal	Check that the burner is properly earthed. Check flame signal with micrometer. If less than 5 (A), check location and condition of the flame detection probe. Check polarity of the transformer leads. If necessary, reverse live and neutral connections of the transformer at the control box.
Main gas rate	This may be too high. Adjust the main governor to a lower setting. When the burner operates, set it to give the correct input.
Combustion head	Check settings and adjust if necessary.
Air/Fuel ratio	Check combustion.

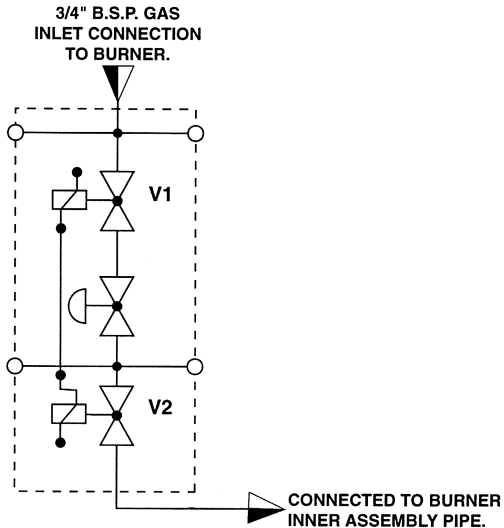
FIG. 1 PRESSURE AND GAS RATE SETTINGS



DRG No:

SGL 653

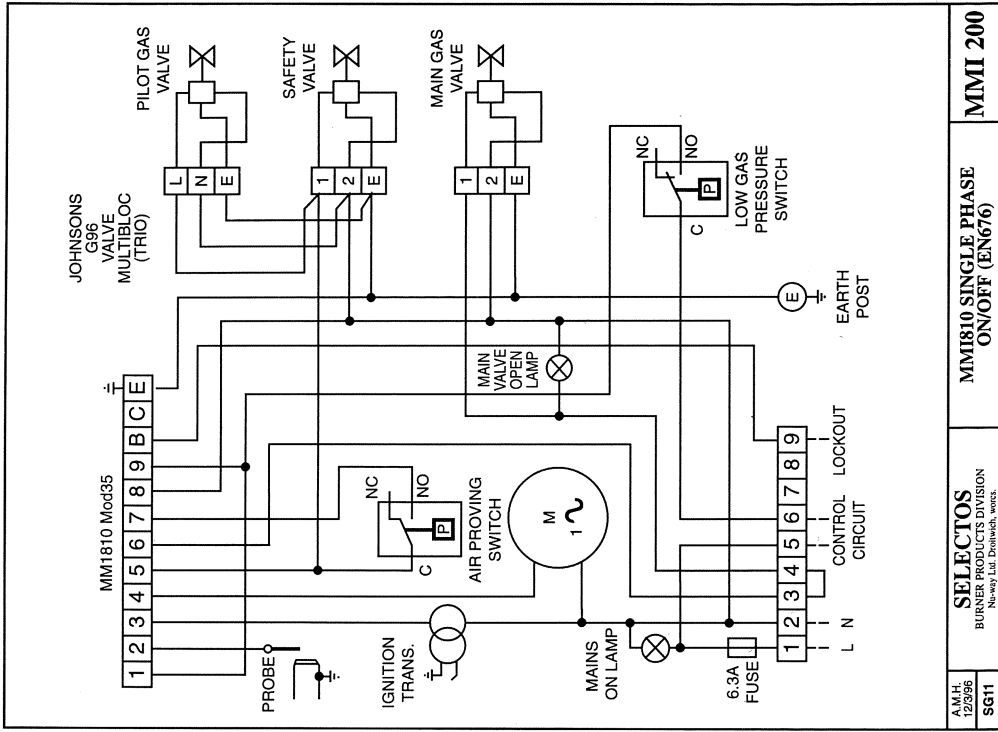
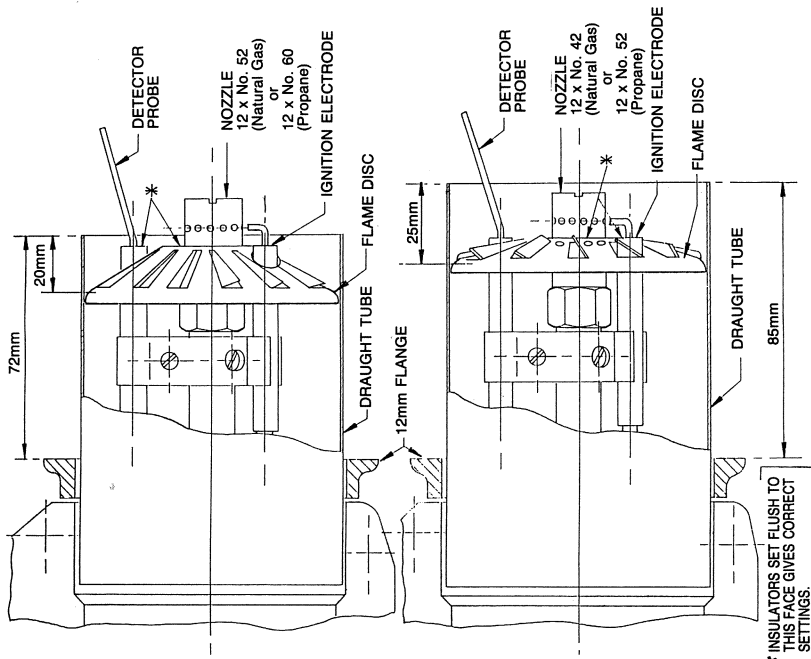
THIRD ANGLE PROJECTION



NOTES:
 IMPORTANT 'V2' MUST BE SLOW OPENING TYPE

DRG No: J. IRELAND	PROTECTIVE FINISH	TOLERANCES 0-150mm ±0.5mm 150mm & OVER ± 1.0mm	NU - WAY LIMITED DROITWICH ENGLAND	ISSUED TO: _____ DATE: _____	MATL. CODE
DATE: 15.09.95	M/C FINISH	DRILLED HOLES ± 0.1mm THREAD: BSP TAPER TO BS.21 BSP PARALLEL TO BS.2779 CLASS B ISO METRIC TO BS. 3643 MED FIT SPECIAL LIMITS AS STATED	TITLE	THIS DRAWING IS A COPY. IT WILL NOT BE KEPT UP TO DATE AND SHOULD BE RETURNED TO:- NU-WAY DRAWING OFFICE.	FIN. CODE
SCALE: 1:1	ROUGH FINISHED FINE FINISHED				

FIG. 4 SG11 COMBUSTION HEAD DETAILS



MMI 200
122956
SG11

SELECTOS
BURNER PRODUCTS DIVISION
No-way Ltd, Donwicks, wares.

MM1810 SINGLE PHASE
ON/OFF (EN616)

MMI 200

SELECTOS TUBE FIRED BURNERS

Selectos Tube Fired Gas Burners are designed for firing long, single or multi-pass immersion tubes. Applications cover all immersion heating processes including cleaning tanks, spray washers, salt baths, quenching and tempering tanks, up to a rate of 318kW.

Immersion tubes may be fitted with sweep or mitre bends without affecting the burner operation.

RECOMMENDED TUBE LENGTH

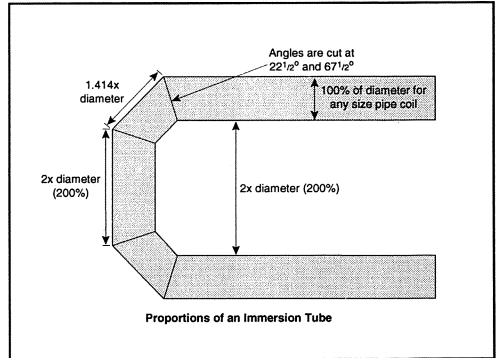
For systems with more than five 90° bends, a high pressure burner head is to be fitted. The immersion tube must be of an adequate length to permit completion of combustion before fluing to stack. The first elbow must be a minimum of ten tube diameters from the burner face.

The tube size and number of bends in the system must be sent, with the site data, to Nu-Way for matching of the burner.

MOUNTING THE BURNER

Each burner includes a mounting flange as part of the burner. A flange gasket is supplied with the burner.

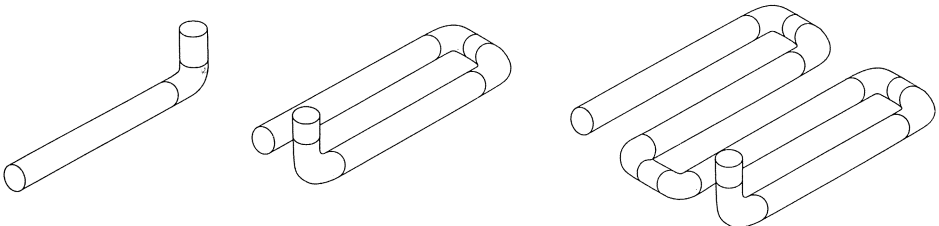
A companion flange must be welded to the immersion tube. Place the flange gasket between the mounting flanges, bolting the burner to the tank, to give an airtight seal.



GAS PRESSURE TO BURNER

The burner should have a steady gas pressure of 178mm to the gas line.

A Single -Pass, Double Pass and Multi-Pass Immersion Tube



TANK

For maximum rated input, the firing tube discharge end must be under neutral pressure.

BURNER CONSTRUCTION

The burner is a monobloc metric design. It is suitable for flange mounting. The burners are delivered with a prewired packaged control system and plug-in gas line arrangement. The burner control is on/off or high/low, gas only, i.e. it has a constant start rate for holding temperature.

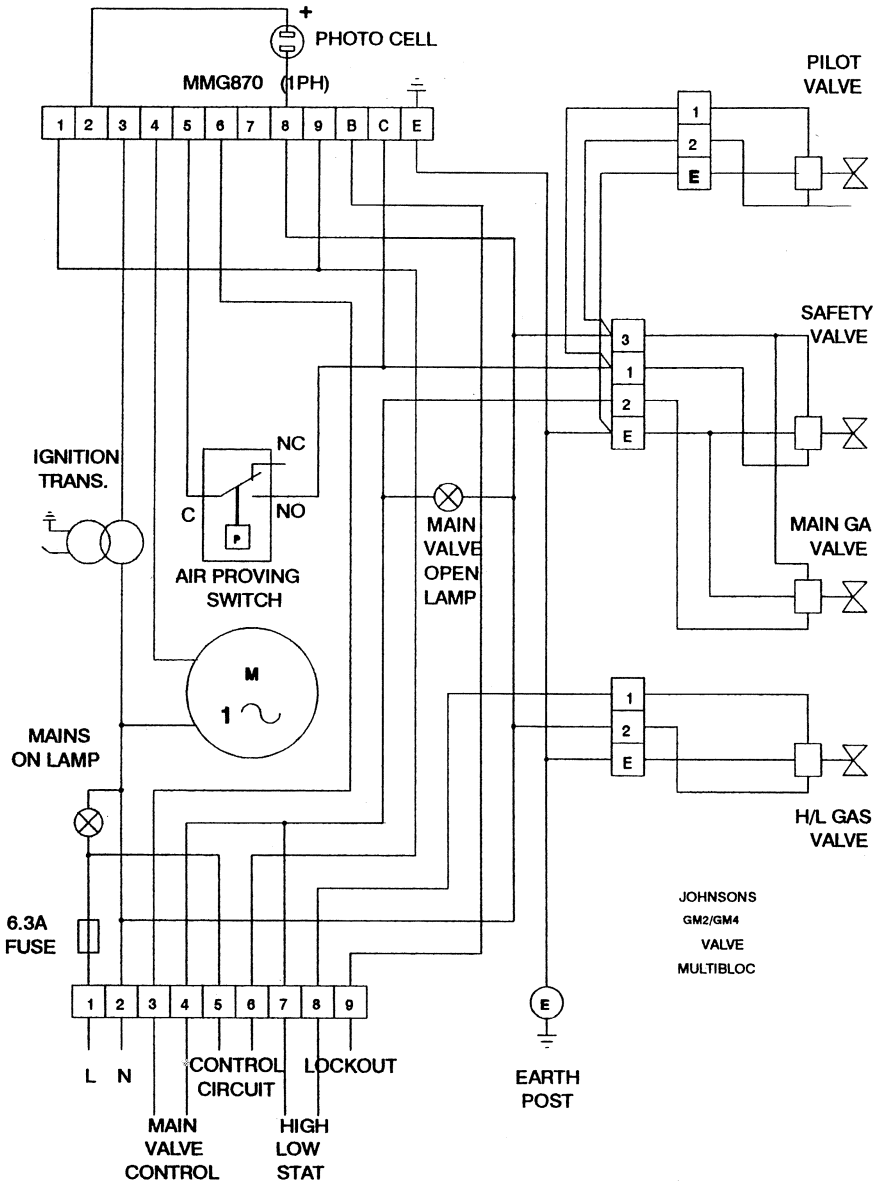
Burner Type	D/Tube O/Diameter	Rating (min/max, kW)	Minimum Tube Diameter (mm)
SG11 FD 36	95	13	100
		28	100
SG11 FD 60	95	27	100
		47	100
SG13 A	98.5	60	100
		120	100
SG13 B	98.5	114	100
		183	100
SG16 A	98.5	117	100
		249	100
SG16 B	98.5	176	100
		293	100
SG16 CB	98.5	220	100
		293	100
SG16 C	98.5	264	100
		381	100
SG18 A	98.5	190	100
		293	100
SG18 C	150	278	165
		425	165

Suggested Tube Diameter for Selectos Gas Burners on Tube Firing Applications

GENERAL WIRING DIAGRAM

Please Note:

This is a General Wiring Diagram, and may not be totally representative of any one burner.



NOTE1 AUTOCAD REF rmmg034

DRG No: **621761**

THIRD ANGLE PROJECTION

MODS:

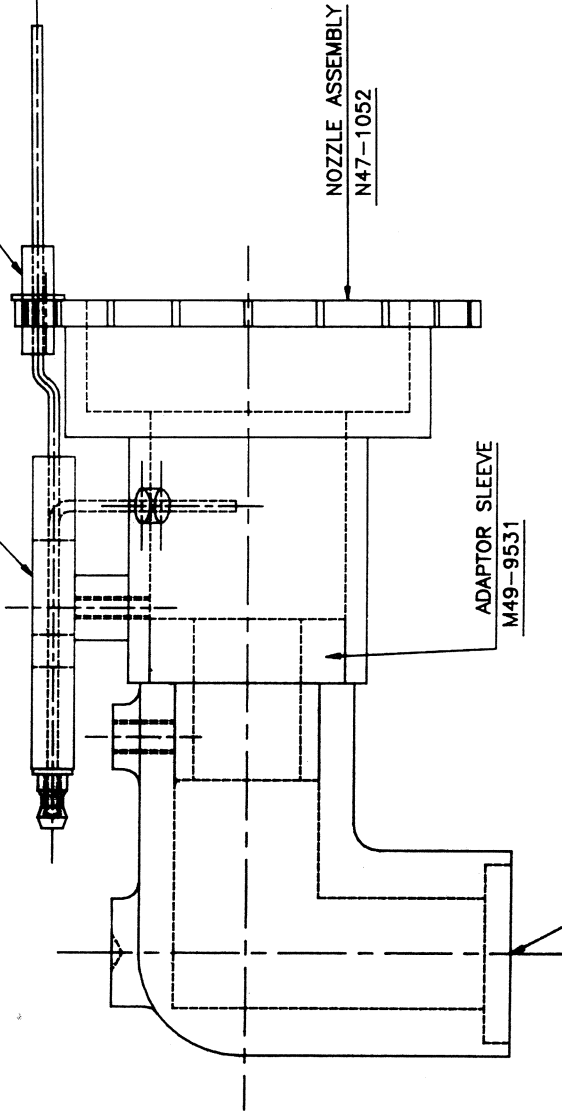
INSULATION PIECE
G06-022X

TWIN ELECTRODE
G05-0067

NOZZLE ASSEMBLY
N47-1052

ADAPTOR SLEEVE
M49-9531

SG13 ELBOW
N39-9051



DRG No: M.C.	PROTECTIVE FINISH M/C FINISH ROUGH FINISHED FINE FINISHED	TOLERANCES 0.15mm OVER 150mm & OVER ± 1.0mm DRILLED HOLES ± 0.1mm THREAD, BSP TAPER TO BS.21 PARTS TO BE CLASS B ISO METRIC TO BS.671/ACD PT. SPECIAL LIMITS AS STATED	ISSUED TO: _____ DATE: _____	MATL. CODE
DATE: 22.10.96			THIS DRAWING IS A COPY, IT SHOULD BE RETURNED TO: NU-WAY DRAWING OFFICE.	FIN. CODE N62 - 1761
SCALE: 1:1				
TITLE INNER GAS LINE ASSEMBLY SG13 TUBEFIRE		NU - WAY LIMITED DROITWICH ENGLAND		

Commissioning Sheet

The details below are to be completed by the Commissioning Engineer

Installer's Name: _____

Address: _____

Site Address: _____

Appliance: Type: _____ Size: _____ Serial No: _____

Burner: Type: _____ Size: _____ Serial No: _____

Commissioning Date: _____

Guaranteed 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 ³	_____ ft ³ /ht
Heat Input	_____ MJ/hr	_____ Btu/h
CO	_____ %	_____ %
CO ₂	_____ %	_____ %
Gross Flue Gas Temperature	_____ °C	_____ °F
Ambient Temperature	_____ °C	_____ °F
Nett Flue Gas Temperature	_____ °C	_____ °F
Efficiency	_____ %	_____ %

MODELS

SG 11/FD36

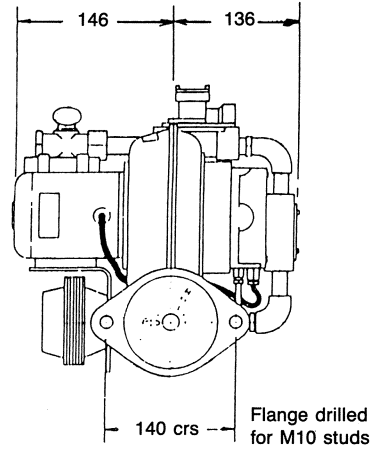
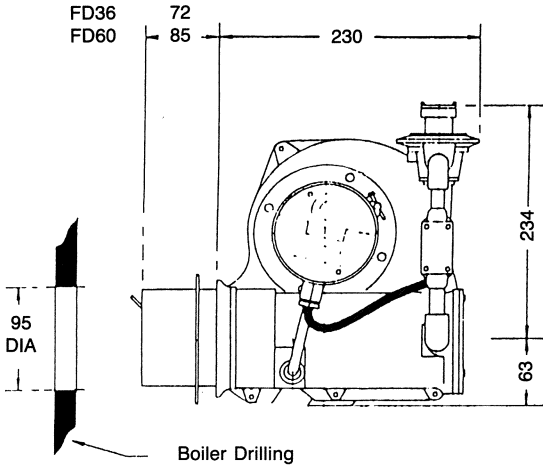
SG 11/FD60

ELECTRICAL DATA

230v (+10% - 15%) 50Hz single phase a.c.(max. power demand, during ignition, approx 400 VA).

DIMENSIONS

All dimensions are in mm's



BURNER SELECTION CHART

