
MULTIPLEX series hot air gas burner

SERIES MPHA

The MPHA hot air burner has been designed to achieve a high degree of stability over a wide turndown range from relatively low service inlet pressures.

The control system and components used in conjunction with the MULTIPLEX burner should be in accordance with BS5885 and recommendations and codes of practice set out by BRITISH GAS where the equipment is for use in the UK, and to the relevant authority in other countries.

The instructions given by NU-WAY assume that these conditions have been met by the plant manufacturers and/or installers. For general data see Multiplex Data Sheet.



BURNER MOUNTING AND COMBUSTION TUNNEL RECOMMENDATIONS

The MPHA is offered with and without a refractory quarl, mounting requirements will depend on the option selected. The internal requirements will vary according to the application. Nu-way will advise on any mounting problems you may have and make recommendations on choice of tunnel materials if required.

EXTERNAL MOUNTINGS

All burners are provided with a mounting flange which is pre-drilled to dimensions given on the data sheet.

Screwed studs or alternative fixings should be provided on burner flange holes centres.

Burner may be mounted to chamber in any one of the four available mounting positions provided by the mounting flange.

When the burner is mounted to the furnace front withdrawal distance equal to the overall length of the burner including combustion tunnel should always be allowed at the rear of the burner unit.

Gas pipework into the burner should be such as to include an elbow and union connection to ensure freedom of removal of internal parts of the burner for service. Care should be exercised in assembly of the gas pipework to ensure electrode extensions are not damaged. Care should be taken to ensure that it seats evenly and squarely to the chamber. A gasket, gasket rope or furnace cement should be used to prevent leakage.

DUAL FUEL BURNERS

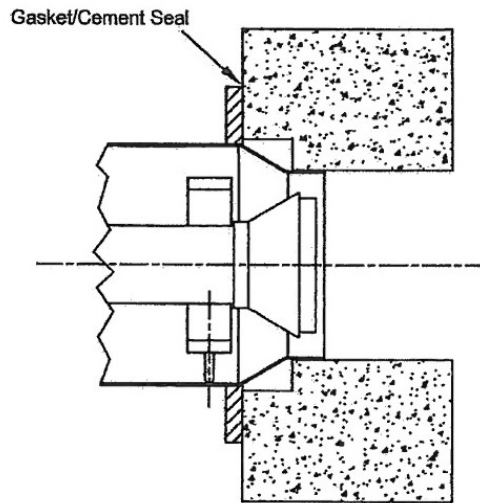
If a burner has been supplied for dual fuel it will be supplied with a separate oil burner head and oil lance. To convert the burner to oil firing the gas burner head will need to be removed and replaced with the oil burner head and lance.

NO QUARL SUPPLIED

Customer will provide burner combustion zone in the wall of the combustion chamber. The dimensions of this zone to be in line with the dimensions provided by Nu-way.

Care must be taken to ensure that the zone is cut or formed perpendicular to the burner mounting flange and is concentric.

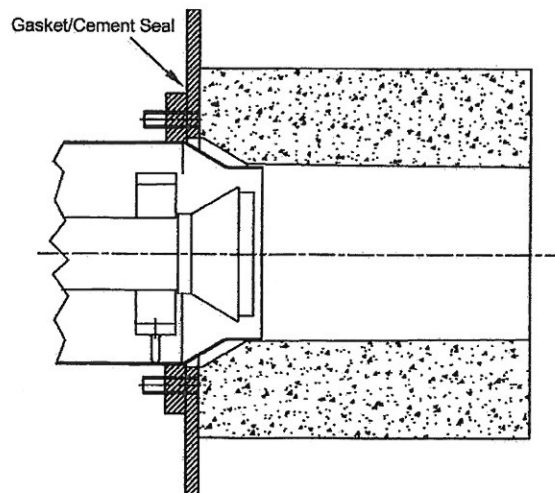
A shoulder must be cut/formed to allow for the protruding section of the burner to fit inside the chamber.



REFRACTORY QUARL

Burners with refractory quarls and holders would normally be provided for high temperature applications and in particular where existing heavy refractory installation is built into the combustion chamber.

The Nu-way combustion quarl and holder would normally be fitted into the combustion chamber before the burner is fitted.



IMPORTANT - SAFETY

It is essential that the following instructions and adjustments are carried out by qualified engineers that are experienced in forced draught gas burner commissioning.

In the UK is it a legal requirement that anyone working on gas installation, as defined in the “Gas Safety (Installation and Use) Regulations 1998”, is GAS SAFE registered.

The manufacturer cannot be held responsible for any consequential damage, loss or personal injury as a result of failure to follow these instructions, or as a result of misuse.

GAS AND ELECTRICAL CONNECTIONS

When connecting a gas supply it is desirable to install a manual isolation valve together with a suitable pipe union at or near the burner. The burner assembly should not be used to support the incoming gas supply, suitable brackets or hangers should be used for this purpose.

Care should be taken to ensure that the incoming gas piping is sized correctly to prevent excessive drops, also that gas connections are pressure tight and gas line purged and pressure tested in accordance with local gas authority requirements or legislation.

Wiring of the burner should be in accordance with the wiring standards. A suitable mains isolator should be placed in a convenient location, and the final electrical connections to the burner should be with flexible conduits.

It is vital that the live and neutral wires are connected to their appropriate terminal as reversal could present a hazard, also the earth bonding must be checked to ensure a good earth connection (poor earth connections are often the cause of faulty burner operation when using the flame probe detection).

Note: Gas piping must not be used for earthing.

The burners are all of the ‘expanding flame’ type pilot system and can use ‘intermittent’, interrupted’, or ‘semi-automatic’ flame failure control boxes.

FIRST START-UP

The procedure given below is only a guide to commissioning which should be undertaken by a trained and experienced combustion engineer.

Close main cock.

Check electricity supply is off.

Check gas and electric connections are sound.

Purge air from gas supply pipe to burner according to standard purge procedure.

Establish correct blower direction of rotation of fan or air blower.

Momentarily energise starter and observe direction of rotation of motor or impeller. If not rotating toward blower discharge electrically reverse motor rotation and re-check.

Disconnect Automatic Control Motor Linkage or if fitted turn Auto/Manual control switch to Manual.

Disconnect linkages between control motor and control valves so that the latter are free to be operated manually.

Air purge combustion chamber (with gas cocks still closed).

Start all system/process circulating and exhaust fans and move burner firing rate control valve to fully open position so that air only will be flowing through burners and combustion chamber, purging any explosive vapours that may have accumulated prior to initial start-up or during a periodic shutdown.

When it is certain that the system is completely free of explosive vapours, return burner control valve to low fire position. (Length of purge required will usually be specified by insurance or approval agency having jurisdiction), but will normally be not less than 30 seconds at full air flow or five volume changes of all combustion chamber and gas passages up to the flue exit from the plant.

Ensure sequence control system is operating and automatic gas control valve are operating and spark is present and that control goes to 'flame failure'. (This test with main gas cock in Off position).

LOW FIRE (PILOT START GAS AND AIR SETTINGS)

(Minimum Input Rate)

Set air butterfly valve to give approximately 15mm (0.6") wg air pressure at inlet to burner (above combustion chamber pressure/suction).

Slightly 'crack' open gas flow control valve.

Initiate start sequence, if burner fails to ignite, slightly increase gas flow at butterfly valve and reset sequence controller and initiate a new start sequence repeating as many items as necessary to give a smooth start. (The burner should not light with an ignition shock or noise – if this is the case the gas flow rate is generally too high for a safe start-up).

NB: It is recommended that the start gas rate should never exceed 10% of burner rating or 25,000 kcal/h (100,000 Btu/h) whichever is the lower.

FULL FIRE

With servomotor linkages disconnected and flame established manually increase flow rate of air and gas to achieve required output. This will be FULL FIRE position.

N.B: Always move air valve first on increasing flame and gas valve on decreasing flame size. It is dangerous to produce gas rich flames.

Reconnect control linkages and drive motor and ensure they are free to travel over full firing range.

Check firing range and if necessary adjust characterisation of control valve system for best operation and turndown required.

With burner firing ensure normal pressure connected air pressure switch is correctly set for burner operation. It should be set to break electrical continuity if the air pressure setting fails.

Observe flame at different firing rates and re-check allied safety control and all process interlocks and controls.

OPERATING INSTRUCTIONS

TO START THE BURNER

FULLY AUTOMATIC - (Previously Commissioned System)

1. Open **PILOT GAS COCK** and **MAIN GAS COCK**.
2. Press **START** or **IGNITION BUTTON**.

MANUAL - (Previously Commissioned System)

1. Make sure **MAIN GAS COCK** is closed.
2. Make sure the burner firing rate is at predetermined low fire position.
3. Start any process circulating and exhaust fans.
4. Energise system control panel (if applicable).
5. Start **BURNER FAN BLOWER MOTOR**.
6. Press **IGNITION BUTTON** or apply external ignition source.
7. Open **MAIN GAS COCK** slowly until burner ignites.

TO STOP THE BURNER - (Either Manual or Automatic System)

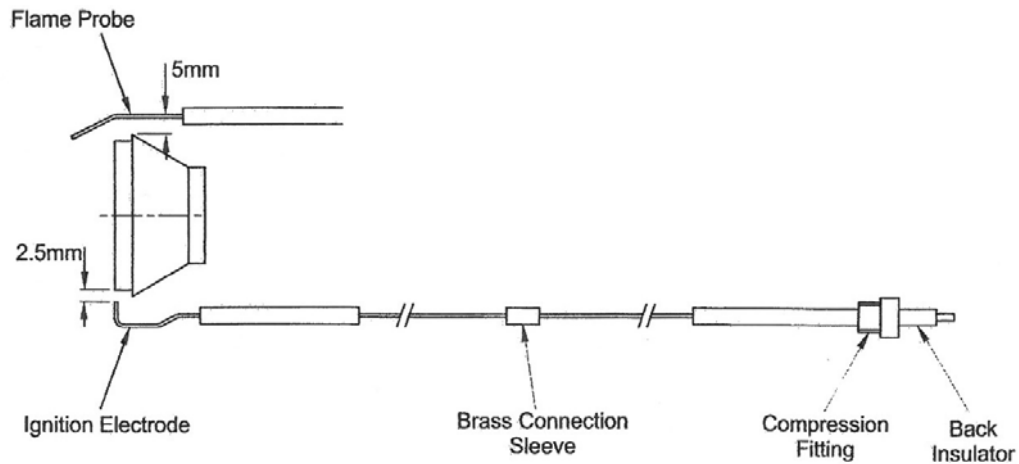
1. Close **MAIN** and **PILOT GAS COCK**.
2. Allow burner to continue operating until flame goes out (as seen through observation port on rear of burner).
3. De-energise system control panel and **BURNER FAN BLOWER MOTOR**.
4. If the combustion chamber is under positive pressure allow **BURNER BLOWER** to run while cooling down system.

ELECTRODE GAPS

Spark Electrode

These are pre-bent at the factory and should be set with the internal components removed (withdraw the burner by removing four or eight screws in the back plate casting), after disconnecting the gas supply at the burner union. Gap should be nominally 2.5mm.

Spark and flame failure electrodes are built up as follows:-

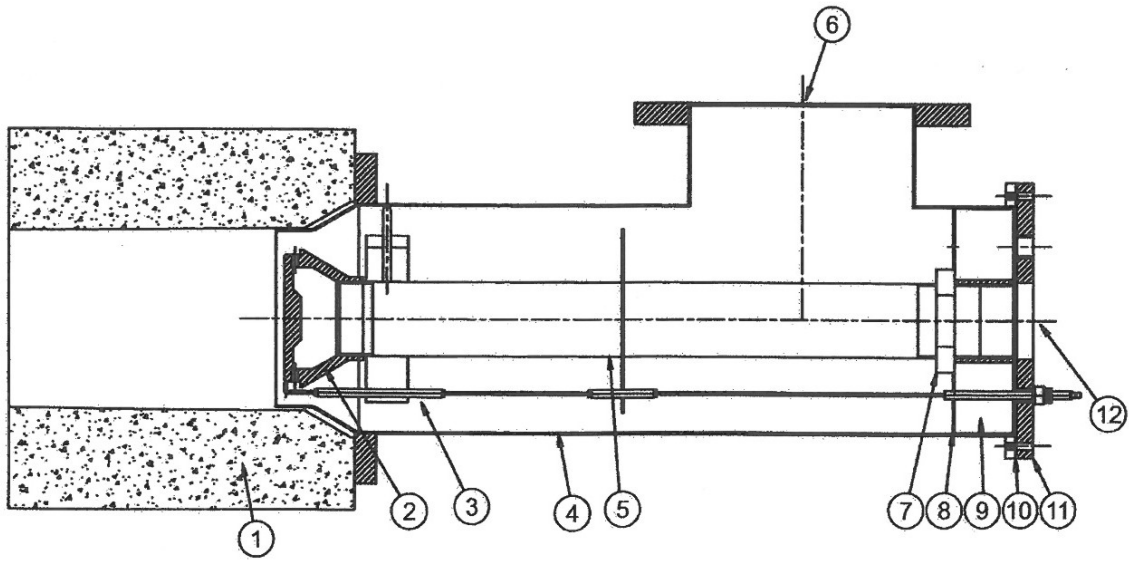


MAINTENANCE AND SPARES

The following should be carried six-monthly or every 1000 hours, whichever is the shorter:-

- Turn off gas and electricity supplies.
- Clean the burner, a clean burner looks better and works better.
- Check the electrodes, make sure they are clean and set correctly.
- Check gas pipes and electrical connections. Bearings of electric motors provided with oilers should be lubricated with six drops of light machine oil. Ball bearing motors are normally grease packed for life.
- Connect a manometer to the test point between the manual gas cock and the safety shut-off valve. Turn the manual gas cock on and then off. Mains gas pressure is then between the valves and this pressure will be indicated on the manometer. Any leakage of gas past the main or pilot safety shut-off valves, or from a pipe joint will reduce the pressure. If this pressure remains constant over a period of not less than one minute, no leakage is taking place. Should gas pressure not remain constant – please call a Service Engineer to properly check, clean and test the gas valve system.
- Turn on the gas and electricity and start the burner.
- Check the flame signal.
- Restrict the air inlet to the combustion air fan. The burner should shut down under the action of the air pressure switch.
- The burner running, close the manual gas cock. The burner will go to lockout and any alarms fitted should operate. Reset the control box.

COMPONENT IDENTIFICATION



Item	Description	Item	Description
1	Quarl	7	Locknut
2	Gas Nozzle	8	Insulation Retainer
3	Spark Electrode	9	Internal Insulation
4	Burner Body Assembly	10	Gasket
5	Gas Tube Assembly	11	Rear Connecting Plate
6	Air Inlet	12	Gas Inlet

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