Power Flame Incorporated

SUGGESTED SPECIFICATION
FOR MODEL
NPM
LOW NOx
GAS BURNERS
SUB 30 PPM NOx

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Suggested Specifications for Model NPM
Low NOx Gas Burners

Table of Contents

Section **Page(s)**

Suggested Specification for Model
NPM LOW NOx GAS BURNERS

GENERAL BURNER DESCRIPTION

Furnish and install _____ Power Flame Model _____ forced draft, fully premixed, flame retention **(natural gas) or (propane gas)** burners. Each burner shall be capable of burning _____ CFH of _____ BTU/CU.FT. **(natural gas) or (propane gas**), with a specific gravity of _____. Gas pressure supplied to the burner gas train supply connection shall be a minimum of _____ **(In. w.c.) (PSIG)** at full high rate and a maximum of _____ **(In. w.c.) (PSIG)** at static conditions.

Each burner shall be listed by Underwriters laboratories and shall bear the appropriate UL label. (In addition to the UL requirements, all equipment and installation procedures will meet the requirements of (IRI), (FM), (Other) _____ codes). Each burner shall be designed and constructed as an integrated combustion system package - and shall be factory fire tested.

Each burner shall be of welded steel construction and have a baked on powder coat finish. The firing head shall be of the full premix design and incorporate a stainless steel high swirl stabilized combustion flame retention diffusor. Mixing of the fuel and air must take place on the discharge side of the blower wheel to insure safe combustion. Units that mix fuel and air prior to the blower inlet will not be accepted. The integral blower assembly will supply all the required air for combustion. The blower wheel shall be of a forward curved "Squirrel Cage" design and shall be directly driven by a _____HP, 3450 RPM _____ Volt, 60 Hertz _____ phase motor. A combustion air damper assembly shall meter the combustion airflow.

The burner ignition system shall be **(natural gas) or (propane gas)**. The pilot system components shall include spark ignited pilot assembly, 6000 Volt ignition transformer, pilot solenoid valve, pilot pressure regulator and manual gas shutoff cock. The flame proving system shall incorporate a flame rod sensor.

BURNER CONTROL PANEL

All control components shall be mounted and wired within an integral burner mounted control panel. The panel shall incorporate a Main Fuel indicating light and an On/Off control switch.

Fuel/Air Control System

(Spec writer - select one of the following described systems 1 through 4).

1. On-Off Gas
   The main gas supply shall be controlled by a **SELECT ONE (single valve body with dual shutoff gas valves and regulator) or (motorized main gas valve, combination auxiliary solenoid valve and gas regulator) or (single motorized gas valve with proof of closure, separate gas regulator)** The air inlet control dampers shall be fixed at the optimum fuel/air ratio at the high fire position.

2. Low-High-Off Gas
   The main gas supply shall be controlled by a motorized gas valve mechanically linked to air inlet control dampers which will provide a reduced fuel/air volume for low fire start and then mechanically open to the high fire run position. **SELECT ONE (auxiliary solenoid gas valve) or (combination auxiliary diaphragm gas valve and gas regulator) or (provide main motorized gas valve with proof of closure switch and separate gas regulator**). When the operating control is satisfied the burner will shutoff and return to the low fire start position.

3. Low-High-Low Gas

The main gas on-off supply shall be controlled by a **SELECT ONE (motorized main gas valve, auxiliary solenoid valve and separate gas regulator) or (single motorized gas valve with proof of closure and separate gas regulator).** Direct drive motor mechanically linked to the air inlet control damper will provide a reduced air volume for low fire start and then mechanically open to the high fire run position. Butterfly type gas proportioning valve will control the fuel supply between the low and high fire positions.

A Low-High-Low, two position, **(temperature) (pressure)** control shall electrically switch the burner to low or high fire position to best meet varying system load conditions. When the operating control is satisfied the burner shall shutoff and return to the low fire start position.

4. Modulation

The main On-Off gas supply shall be controlled by a **SELECT ONE (single valve body with dual shutoff gas valves and regulator) or (motorized main gas valve, combination auxiliary solenoid valve and gas regulator) or (single motorized gas valve with proof of closure, separate gas regulator)** A modulating motor shall control the modulated positioning of the air inlet dampers, butterfly type gas proportioning valve to best meet varying system load conditions.

The positioning of the modulating motor shall be controlled by **(135 Ohm), (4-20 mA), (0-10 VDC)** modulating type **(temperature), (pressure)** controller. When the operating control is satisfied the burner will shutoff and return to the low fire start position. The modulating motor shall provide electrical interlock to insure a guaranteed low fire start position prior to the pilot trial for ignition sequence

EMISSIONS REQUIREMENTS

The burner will produce less than 30 parts per million NOx and less than 50 parts per million CO without the use of flue gas recirculation. The burner will operate with uniform heat flux and flame stability. Burners requiring flue gas recirculation will not be accepted.

PRODUCT LIABILITY INSURANCE

The burner manufacturer will provide an insurance certificate documenting his current coverage of Product Liability Insurance with minimum coverage of $10,000,000.

BURNER START UP INFORMATION AND TEST DATA

On completion of the burner system start up - the installing contractor will complete the attached “Burner Start Up and Test Data” form and deliver to the Specifying Engineer.

BURNER START UP INFORMATION & TEST DATA

The following information shall be recorded for each burner start up:

Power Flame Model _____ Invoice No. _____ Serial No. _____

Installation Name _____ Start Up Date _____

Start Up Contractors Name _____ Phone _____

Name of Technician doing Start Up _____

Type of Gas: Nat. ☐ LP ☐ Other ☐

Gas Firing

Gas Pressure at Train Inlet
Burner in Off Position _____

Gas Pressure at Train Inlet
Low Fire _____ " W.C.
High Fire _____ " W.C.

Gas Pressure at Firing Head
Low Fire _____ " W.C.
High Fire _____ " W.C.

Gas Pressure at Pilot Test Tee
_____ " W.C.

Power Supply
Volts _____ Ph _____ Hz _____
Control Circuit Volts _____
Blower Motor amps at high fire _____

Flame Signal Readings
Pilot _____ D.C. Volts
Low Fire _____ D.C. Volts
High Fire _____ D.C. Volts

CO_2 or O_2 (Specify)
Low Fire _____ %
High Fire _____ %

CO
Low Fire _____ %
High Fire _____ %

Input Rate BTU/HR
Low Fire _____
High Fire _____

Over Fire Draft
Low Fire _____ " W.C.
High Fire _____ " W.C.

Stack Outlet Test Draft
Low Fire _____ " W.C.
High Fire _____ " W.C.

Net Stack Temperature
Low Fire _____ °F
High Fire _____ °F

Combustion Efficiency
Low Fire _____ %
High Fire _____ %

Air Inlet Damper Opening High Fire
Top _____ in.
Bottom _____ in.

Control Settings

General

Operating control cut out setting _____
Operating control cut in setting _____

Limit control cut out setting _____
Limit control cut in setting _____

Low gas pressure switch _____ in.
High gas pressure switch _____ in.

Operation Checklist

Checked For Proper Operation Of:	Yes	No		Yes	No
Low water cut off			Barometric damper		
High water cut off			Boiler room combustion air &		
Flame safeguard control ignition failure			ventilation provision correct		
Flame safeguard control main flame failure					
Burner air flow switch					
Induced draft fan controls			All gas lines checked for leaks		
Over fire draft controls			Gas lines & controls properly vented		
Fresh air damper end switch			Other system components (specify)		

Notified _____ of the following system deficiencies: _____