Power Flame Incorporated

SUGGESTED SPECIFICATION
FOR
MODEL C(R) G HIGH TURNDOWN (HTD)
GAS BURNERS

THE POWER TO MANAGE ENERGY

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Suggested Specifications for Model C(R) G HTD
Gas Burners

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Suggested Specification for Model
C(R)G HIGH TURNDOWN (HTD) GAS BURNERS

(Note to specification writer - The below specification provides basic spec information for a typical U.L. code requirement. We recommend that you refer to the PFI "Suggested Specification for Model CGO Combination Gas/Light Oil Burners" (CGOSP1294) for options and additional codes.

A. GENERAL BURNER DESCRIPTION

1. Furnish and install _____ Power Flame Model _____ forced draft High Turndown flame retention natural gas burners. Each burner shall be capable of burning _____ CFH of _____ BTU/CU.FT Natural 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.

2. The burners will operate reliably with clean and stable combustion at a high fire to low fire turndown ratio of _____ to 1 and will comply with U.L. requirements.

B. APPROVAL CODES

1. Each burner shall be listed by Underwriters Laboratories and shall bear the appropriate U.L. label (in addition to the U.L. 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.

C. COMBUSTION HEAD DESIGN

1. Each burner shall be of welded steel construction. The combustion head shall incorporate a multi blade, stainless steel, flame retention diffuser. The gas firing head shall be of the multi-port type and constructed such as to place annular gas distribution opening between two parallel air flow streams to achieve maximum fuel/air mixing. The burner combustion head will carry full five (5) year replacement warranty. Burners with cast alloy blower housings will not be accepted.

2. (Spec writers - add the following for Scotch Marine boilers and/or very low gas pressure supply). The design shall also include a (fixed) (adjustable) primary air/gas mix chamber constructed such that a mixture of primary air and gas will be introduced into the combustion area, upstream of the secondary combustion air and ignition introduction zone. The burner combustion head will carry full five (5) year replacement warranty.

3. All air required for combustion shall be supplied by a blower mounted integral to the burner. The blower wheel shall be of the forward curved centrifugal design and shall be directly driven by a _____ HP 3450 RPM _____ volt, 60 Hertz _____ phase motor. A dual blade damper assembly located on the inlet side of the blower wheel shall meter the combustion airflow.

D. IGNITION SYSTEM

1. The burner ignition system shall be natural gas. The gas pilot system components shall include spark ignited pilot assembly, 6000 Volt ignition transformer, pilot solenoid valve, pilot gas pressure regulator and manual gas shutoff cock. The flame proving system shall incorporate an Ultra-Violet flame detector, which will monitor both the pilot and main flames. The pilot assembly shall fit within the confines of the blast tube - avoiding special burner front plate pilot cut outs.

E. BURNER CONTROL PANEL

1. All control components shall be mounted and wired within an integral burner mounted control panel. The panel shall incorporate an "Easy Access" (lift off) cover, and will include Power On and Main Fuel indicating lights and an On/Off control switch.

F. GAS TRAIN (U.L.)

1. The gas valve train shall contain the following:

   a. Manual Shutoff cock

   b. Main gas pressure regulator (Spec writer - Specify "tight shutoff type" if gas supply pressure exceeds 1 PSIG).

   c. Automatically operated main motorized gas valve (specify for inputs at 5.0 MBH and below).

   d. Automatically operated main motorized gas valve with proof of closure interlock switch (specify as standard above 5.0 MBTU/HR - option at or below 5.0 MBTU/HR).

   e. Automatically operated auxiliary gas valve.

   f. Manual reset Low and High Gas Pressure switches (specify as standard above 2500 MBH - option at 2500 MBH and below).

   g. Manual leak test cock.

   h. Burner manifold gas pressure gauge.

   i. Automatically operated Normally Open Vent Valve (specify as standard above 12,500 MBH), Optional at12,500 and below.

G. FUEL/AIR CONTROL SYSTEM (MODULATION)

1. The main On/Off gas supply shall be controlled by a motorized gas valve. A modulating motor shall control the modulated positioning of the air inlet damper and butterfly type gas-proportioning valve to best meet varying system load conditions.

2. The fuel/air control linkage between the modulating motor, air inlet control dampers and the gas butterfly valve shall employ the use of a quadrant linkage adjustment mechanism. The quadrant design incorporates the use of adjustable high and low fire butterfly valve stops with a spring loaded over-travel mechanism for ease of linkage adjustment.

3. A 135-Ohm or 4-20 milliamp, or 0-10 VDC, modulating type (temperature) (pressure) controller shall control the positioning of the modulating motor. When the operating control is satisfied the burner shall 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 trail for ignition sequence.

H. PRODUCT LIABILITY INSURANCE

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

I. BURNER START UP INFORMATION AND TEST DATE

1. 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 ☐ Fuel Oil Grade No. _____

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 _____

Limit control cut out setting _____

Limit control cut in setting _____

Operating 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			Oil tank vent system correct		
Burner air flow switch			All oil lines checked for leaks		
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: _____