



Suggested Specification
For
Model CG15, CG25 & CG50
Beckett Gas Burners

General Burner Description:

Install _____ Beckett Model _____ Gas Burner forced draft flame retention power gas burners. Burners shall be capable of burning _____ BTUs (natural gas or propane) with a specific gravity of _____ (0.64 or 1.56) Gas Pressure supplied to the burner gas train connection shall be a minimum of _____ inches W.C. (PSIG) at full high rate and a maximum of _____ inches W.C. 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 CSD-1 (FM, Swiss RE). Each burner shall be designed and constructed as an integrated combustion system package.

Burner Construction:

Burner housing shall be of cast aluminum construction. The burner mounting flange must support the burner weight on the appliance independent of any support and shall be seal welded to air tube. Burners shall be furnished with a stainless steel flame retention head, capable of withstanding temperatures up to 1400 degrees F. The combustion head assembly shall incorporate an air diffuser, gas spuds downstream of air diffuser and direct ignition electrodes. The combustion gun assembly shall be removable and have the ability to be set or replaced. Full access to the burner combustion gun assembly shall be available without removing the burner chassis from the appliance. Air required for combustion shall be supplied by a blower, mounted integral to the burner. The blower wheel shall be of a forward curved "squirrel Cage" design and shall be directly driven by a _____ HP, 3450rpm, _____ volt, 60Hertz, _____ Phase motor. Combustion air shall be controlled by a damper actuator directly coupled to the damper shaft, linkage coupling is not acceptable. High fire and low fire air settings are to be set by the limit stops of the damper actuator. Burner shall have a flame inspection window positioned at the rear center of the burner housing. Flame shall be viewed without removing any covers.

Ignition:

The burner ignition system shall utilize natural gas or propane as the fuel source. The ignition spark shall be generated by a 6000 volt electronic igniter, and directed by porcelain insulated electrodes located on the combustion head assembly. Ignition shall occur only at the low fire rate, and only after the flame is proven shall the high fire rate be enabled.

Gas Train:

The gas train shall consist of either a manual shutoff cock, redundant gas valve and regulating gas valve or alternatively a manual shutoff cock, gas pressure regulator, redundant gas valve and a two position fluid motorized valve. The gas train shall meet CSD-1 and include a manual reset low gas pressure switch and manual reset high gas pressure switch.

Mode of Operation:

(Spec writer –select one of the following)

- Low-High-Off
Fuel gas flow rate shall be controlled by a diaphragm regulating gas valve or a gas pressure regulator and a two position fluid motorized valve. Combustion air flow rate for both Low and High fire shall be controlled with a linkage less damper motor and will be set for the optimum fuel/air ratio for both low fire and high fire. The transition from low fire to high fire will be complete within 4 seconds without any

high CO condition. When the operating control is satisfied the the fuel gas flow will be stopped but airflow will be maintained for the post/purge interval at the low fire air setting.

- Low-High-Low

Fuel gas flow rate shall be controlled by a diaphragm regulating gas valve or a gas pressure regulator and a two position fluid motorized valve. Combustion air flow rate for both Low and High fire shall be controlled with a linkage less damper motor and will be set for the optimum fuel/air ratio for both low fire and high fire.

A Low-High-Low temperature or Pressure control shall electrically switch the burner to low or high fire position to meet the system load requirements. The transition from low fire to high fire will be complete within 4 seconds without any High CO condition. When the operating control is satisfied fuel gas flow will be stopped but airflow will be maintained for the post/purge interval at the low fire air setting.

- Full Modulation

The main on-off gas supply shall be controlled by either redundant solenoid valves or fluid motorized valves. The inlet air damper motor shall control the modulated positioning of the air and with a single linkage to a butterfly type gas proportioning valve to meet varying system load conditions.

The system shall be capable of providing a constant fuel/air ratio, or a linearly adjusted fuel/air ratio, in order to satisfy individual burner application requirements.

The positioning of the modulating motor shall be controlled by a 135 ohm, or 4-20 milliamps, or 0-10 VDC, modulating type temperature or pressure controller.

- Full Modulation w/RWF40

The main on-off gas supply shall be controlled by either redundant solenoid valves or fluid motorized valves. The inlet air damper motor shall control the modulated positioning of the air and with a single linkage to a butterfly type gas proportioning valve to meet varying system load conditions.

System response to load shall be controlled by a pressure or temperature controller incorporating PID logic for optimum system response. The controller shall display the system set point and the current operating point, and include manual controls for set-up adjustments. The appropriate pressure or temperature sensor shall be provided with the control.

Burner Control Panel:

(Spec writer –select one of the following)

- All control components shall be mounted and wired on a control box that is mounted on the burner housing. The control box shall incorporate an Easy Access cover and Power On and Fuel On indicator lights. All wiring within the control box shall be factory prewired to a terminal strip. The control box shall have an illuminated rocker switch that will limit the burner to its low fire rate for set-up adjustments.

- Burner shall be equipped with a burner-mounted 12 x 16 control panel consisting of all required operating electrical components. All wiring within the panel shall be factory prewired to a terminal strip. The panel shall have an illuminated rocker switch that will limit the burner to its low fire rate for set-up adjustments. The control panel shall be furnished with the following:
 - Power On Light/Switch
 - Fuel On Light
 - 120V Alarm (24V alarm)
 - Flame Fail Light
 - Low Water Cutoff Light
 - High Limit Light
 - Call for Heat Light
 - Ignition Light
 - Control Transformer

- Burner shall be equipped with a 12 x 16 remote control panel consisting of all required operating electrical components. All wiring within the panel shall be factory prewired to a terminal strip. A junction box pre-wired to the burner components shall be mounted on the burner. It shall have a terminal strip which will match a terminal strip in the remote panel. Field wiring will be required between the burner mounted junction box and the remote panel. The panel shall have an illuminated rocker switch that will limit the burner to its low fire rate for set-up adjustments. The control panel shall be furnished with the following:
 - Power On Light/Switch
 - Fuel On Light
 - 120V Alarm (24V alarm)
 - Flame Fail Light
 - Low Water Cutoff Light
 - High Limit Light
 - Call for Heat Light
 - Ignition Light
 - Control Transformer

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

Beckett Model _____ Serial Number _____

Job Location _____

Start Up Date _____ Company Name _____ Technician Name _____

Type of Gas: NAT _____ Propane _____

Gas Pressure at Train Inlet

Burner off position _____ w.c

Flame Signal Readings

Low Fire _____ DC volts

High Fire _____ DC volts

Draft @ Breech

Low Fire _____ w.c

High Fire _____ w.c

Gas Pressure Train Inlet

Low Fire _____ w.c

High Fire _____ w.c

O₂

Low Fire _____ %

High Fire _____ %

Net Stack Temperature

Low Fire _____ degrees

High Fire _____ degrees

Gas Pressure at Burner

Low Fire _____ w.c

High Fire _____ w.c

CO₂

Low Fire _____ %

High Fire _____ %

Combustion Efficiency

Low Fire _____ %

High Fire _____ %

Power Supply

Volts _____ PH _____ Hz _____

Input Rate BTU/HR

Low Fire _____

High Fire _____

Air Damper Settings

Low Fire _____

High Fire _____

Control Settings:

Operating Control Cut/Out _____

Limit Control Cut/Out Setting _____

Low/High Gas Pressure _____ / _____

Operating Control Cut/In Setting _____

Limit control Cut/In Setting _____

Checked for Proper Operation	YES	NO	Checked for Proper Operation	YES	NO
Low water cut off			Barometric Damper		
High water cut off			Boiler Room combustion air		
Flame Safeguard control ignition failure			All gas lines checked for leaks		
Flame Safeguard control main flame failure			Gas lines and controls properly vented		
Burner air flow switch			Other system components specify		

Notified _____ of the following system deficiencies _____
