

# **Guide Specification for Eclipse Hermetically Sealed HB Series Gas Booster Systems Con Edison Requirements**

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## **I. Centrifugal Gas Booster System**

As indicated on the drawings, the contractor shall furnish and install a complete U.L. Listed gas booster system which shall be capable of delivering a volume of natural gas while providing a constant elevated gas pressure adequate to operate the gas fired equipment to 100 percent of its rated capacity. The system shall contain all the required system components in order to provide a completely automatic operating system in full accordance with the latest requirements of Con Edison specification G2040 Revision 7

The system shall include an appropriately sized gas booster pump, air to gas heat exchanger when required, check valves, control system, gas pressure switches, isolating valves, flexible steel connectors, pressure gauges, field support services and other system components as specified hereafter.

## **II. Hermetically Sealed Gas Booster Pump**

The gas booster pump shall be U.L. listed and be of the hermetically sealed centrifugal type. The design of the booster shall completely enclose the direct coupled explosion proof motor and fan in an air tight welded steel housing without the requirement for external shaft seals. The fan shall be manufactured of spark resistant aluminum and shall be accessed through a fully gasketed cover plate assembly, which shall allow for easy replacement of the motor without disassembly of field piping or wiring or removal of the gas booster.

The gas booster shall be designed to operate with at least a maximum turndown ratio of 10:1 without the need for external cooling and without operating in a unstable or surge condition.

For ease of installation the booster design shall provide (4) different discharge mounting configurations, which shall be determined and coordinated by the booster manufacturer at the time of system design. These configuration options shall position the booster outlet in such a way as to facilitate piping connections and eliminate excessive piping pressure loss.

The booster shall include a Class 1, Group D, 3450 Rpm explosion proof motor which shall be capable of operating on 208/230/460 volt 3 phase power. For external power connections to the booster pump a factory mounted U.L. listed explosion proof junction box with sealing unilet shall be provided.

The gas booster shall be equivalent to series HB as manufactured by Eclipse Combustion.

### **III. Check Valves**

The contractor shall install a horizontally mounted F.M. approved disk type check valve on the inlet of the gas booster and in the recirculation loop for the heat exchanger when required.

Check valves shall be constructed of heavy duty cast iron with a light weight aluminum disk and fully gasketed removable top for ease of inspection and service. Valves shall be designed to withstand a back pressure differential of a minimum of 10 psig across the valve seat and shall have no more than a .5" w.c. pressure drop at its maximum flow rating.

Valves sized up to and including 3" shall be screwed connection. Sizes 4" and larger shall be flanged.

Check valves shall be approved by Con Edison for gas booster installation and shall be Eclipse series 1000.

### **IV. Recirculation Loop and Heat Exchanger**

The contractor shall install when required by the booster manufacturer, a recirculation cooling loop which shall be used to provide adequate cooling of the gas booster motor during excessive low gas flow conditions

As an integral part of the recirculation loop an air to gas heat exchanger shall be installed in the loop piping. The heat exchanger shall be of the single pass modular type and shall be constructed of corrosion resistant aluminum.

The heat exchanger shall have a self contained, temperature controlled fan and motor assembly which shall be controlled by the gas booster control system. The heat exchanger fan shall be operated when the temperature of discharge gas is above the setpoint recommended by the booster manufacturer. Heat exchanger shall be similar to DB308 as manufactured by Eclipse Combustion.

In the discharge of the heat exchanger the contractor shall install an additional disk type check valve sized in accordance with the gas

booster manufacturer's recommendations. Check valve shall be similar in design to that previously specified.

## V. Gas Booster Control System

The contractor shall install a completely factory built gas booster control system to provide safe, proper automatic operation of the gas booster pump and recirculation heat exchanger.

The control system shall be furnished by a single source vendor who shall be responsible for all aspects of design, coordination and operation of all components of the entire gas booster system. The control system shall be a standard cataloged item which has been particularly designed for this application and shall have had field usage for at least (5) years and which shall be approved for use by Con Edison. Non standard controllers or controls not furnished by the booster vendor will not be acceptable.

The control system shall include as a minimum the following features:

1. Nema 4 wall mounted enclosure
2. Fusible disconnect switch with external handle
3. Nema rated magnetic motor starters with overloads for all motors
4. Indicating lights for: Power On, Booster On, Heat Exchanger On & Low Gas Pressure
5. Digital temperature control with remote sensor (when required)
6. Booster On/Off switch
7. 4" Alarm bell and silencing switch: to ring on low gas pressure
8. Inlet low gas pressure switch (manual reset)
9. Discharge low gas pressure switch
10. Start circuit interlocks
11. Photo etched wiring schematic on inside of panel door
12. Engraved nameplates for all components
13. Numbered terminal strip

Booster control system shall be equivalent to series HBP.

Wired to the gas booster control system shall be a U.L. and F.M. listed low inlet gas pressure switch which shall be set to open when the booster inlet pressure falls below 3" w.c.

When the switch opens it shall de-energize the booster motor control circuit disabling the gas booster. The switch shall contain no mercury and be of the manual reset type similar to Dungs GML series.

Also wired to the gas booster control system shall be a low discharge gas pressure switch similar to that specified above which shall be set to close at a pressure at least 3-6" w.c. below that of the gas booster. When the switch closes it shall activate both an audible and visual alarm on the gas booster control panel.

Gas pressure switches shall be designed as to not require venting and shall be approved by Con Edison for gas booster installation.

## **V. Isolating Valves, Pipe Couplings and Gauges**

In order to facilitate proper system operation and service the contractor shall furnish as directed by the manufacturer the appropriately sized piping specialties including isolating valves, flexible pipe connectors and gas pressure gauges for both the inlet and discharge of the gas booster.

## **VI. Design, Coordination, Field Support and Quality Assurance**

In order to provide a properly operating gas booster system the manufacturer shall review all aspects of the installation in advance including gas piping layout, gas pressure requirements, and total load requirements for the project. Upon verification of this information the manufacturer shall furnish a job specific gas booster piping layout drawing and a system design data sheet outlining the parameters for system design including model and sizes of all components to Con Edison for approval as outlined in Con Edison specification G2040 -7.

The booster manufacturer shall provide all required field service assistance to the contractor for installation supervision and equipment start up.

After successful system start up the gas booster manufacturer shall provide (1) one year field warranty service for all system components. In order to eliminate unnecessary system down time, all service as it relates to the gas booster system shall be done locally or at the job site by factory authorized personnel without the need to return the booster to the facility of the original manufacturer.

In addition and at the owner's option a five year service agreement will be available from the booster manufacturer in order to provide reliable future operation of the gas booster system.