

American Society of Plumbing Engineers

Technical Presentation

April 19, 2007

# ***Hermetically Sealed Gas Booster Systems***



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## **Hermetically Sealed Gas Booster Systems**

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### **TOPICS FOR DISCUSSION**

- **WHAT IS A GAS BOOSTER**
- **TYPES OF GAS BOOSTERS**
- **WHY USE A GAS BOOSTER**
- **SYSTEM CONSIDERATIONS**
- **NYCSCA GAS BOOSTER USAGE**
- **BOOSTER SELECTION**
- **ANCILLARY DEVICES**
- **COMPLETE U.L. PACKAGES**

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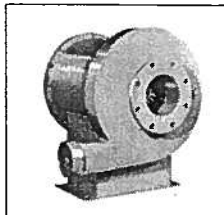
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### **WHAT IS A GAS BOOSTER ?**

*Centrifugal Blower Designed to Compress a Variable Volume of Natural Gas (CFH) Depending on Consumption*

*While Elevating the Operating Pressure of That Volume to a Relatively Constant Pressure*



*0 to 100% Of Flow Capacity The Outlet Pressure Shall Remain The Same*

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**WHY USE A GAS BOOSTER?**

**New High Efficiency Boilers, Heaters, Chillers, Furnaces, Generators & Commercial Cooking Equipment Often Require Pressures Higher than that Available by Local Utility Company**  
Minimum Guaranteed Pressure = 4" w.c.



**When Gas Piping Sizes Can be Dramatically Reduced by Increasing the Amount of Inlet Gas Service Pressure Available**

**Eliminate The Need For Welded Piping**

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**SYSTEM CONSIDERATIONS (CHECK LIST)**

- CODE REQUIREMENTS**
  - Local Building Code Requirements
  - NFPA 54
  - Con Edison / Keyspan
- PERFORMANCE REQUIREMENTS**
  - Flow & Pressure
  - Turndown
- PIPING CONSIDERATIONS**
  - Riser Layout
  - Cooling Loop
  - Pressure Regulation
- EQUIPMENT SELECTION**
  - Single or Multiple Boosters
  - Specific Model Choice
  - Fully Assembled or Knocked Down
- LOCATION SELECTION**
  - Indoor or Outdoor
  - Hazardous or Non Hazardous
- CONTROL CONSIDERATIONS**
  - NEMA Rating
  - Proper Start/ Stop

**OVERALL SYSTEM EVALUATION TO DETERMINE EQUIPMENT SELECTION**

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**UTILITY COMPANY REQUIREMENTS**

- **KEYSPAN/ TC2003**
- **CON EDISON SPECIFICATION G2040-7**

**Both Utility Company Guidelines Outline Approved Usages, Protective Devices & Design Responsibility in the installation of Gas Booster Systems**

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**PACKAGED SYSTEMS & ANCILLARY DEVICES**

In order to ensure total system integration, we provide complete gas booster packages including all the required accessory devices to complete the installation.

Isolating valves, flexible connectors, pressure gauges, pressure regulators and external cooling devices are available.

Specially designed control systems which incorporate microprocessor devices can be built to meet any customized requirements.

All systems can be provided knocked down for field assembly and installation or as a completely factory assembled package unit ready for field gas and electrical connections.



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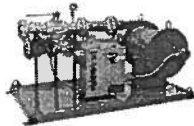
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**Complete U.L. Listed Gas Booster Systems**

- All Systems are Available Fully Assembled or Knocked Down
- Fully Engineered and Completely Integrated
- Certified & Tested Design
- Single Source Responsibility
- Flow Rates from 2 to 100,000 CFH
- Differential Pressures to 3 PSI standard
- Single and Multiple Pump Systems



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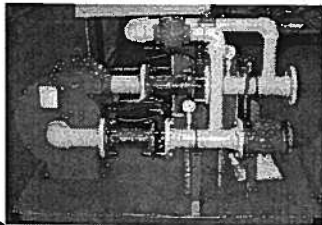
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**Complete U.L. Listed Gas Booster Systems**

**Booster System with Simple Recirculation Loop**

½ HP 5,400 CFH 9" W.C.



**Pre Assembled,  
Mounted and  
Wired  
Performance &  
Leak Tested**

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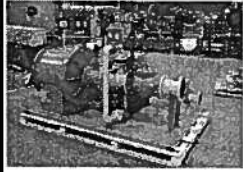
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**Complete U.L. Listed Gas Booster Systems**



**Booster System with Recirculation Loop & Air to Gas Heat Exchanger**

5 HP 25,000 CFH 34" W.C.




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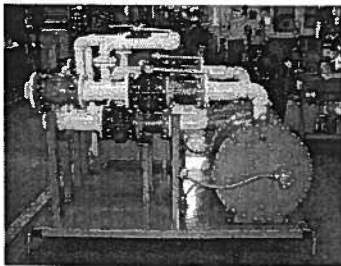
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**Complete U.L. Listed Gas Booster Systems (Duplex)**



**Redundant Operation**

**Staging to Match Loads More Closely**

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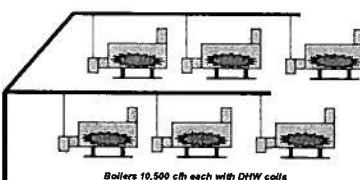
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**Complete U.L. Listed Gas Booster Systems (Duplex)**



*Boilers 10,500 cfm each with DHW coils*

(6) Boilers Total Heating Load 63,000 Cfm

(1) Boiler Total DHW Load 2500 Cfm (4:1)

(3) Pumps 33% capacity for staging (4th Standby) for redundancy

One large pump 100% capacity

(2) Pumps 100% capacity for redundancy

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**Installation Environment**

**LOCATION!  
LOCATION!  
LOCATION!**



There is no specific code requirement for the location of a hermetically sealed gas booster. It may be installed in any room, ceiling area or closet without special requirements. (Not Applicable for Non Hermetics)

**However,** if a gas booster is installed in a dedicated gas meter room or a hazardous area (NFPA 70) be aware that accessory controls such as control panels, other motors and pressure switches may need to be explosion proof.

The gas booster may also be installed outdoors with additional protection against corrosion and the proper weather resistant controls. (Outdoor Enclosures)

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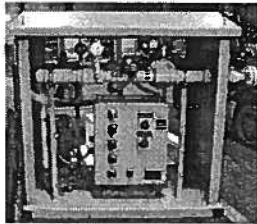
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**OUTDOOR ENCLOSURES**

**All Fully Assembled Gas  
Booster Systems Are  
Available With Factory  
Fabricated Outdoor  
Enclosures**

- Epoxy Coated
- Completely Lockable
- Fully Gasketed
- Removable Side Panels
- Sealed Piping Connections
- Fully Vented



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**CONTROL CONSIDERATIONS**

**Nema Rating:**

Once you have established the location for the gas booster the Nema rating of the control system can be coordinated. Standard is Nema 4 optionally available Nema 7 (explosion proof)

**Single or Multiple Units:**

Determine the number of boosters in the system and then consider control strategies which address issues of staging, sequencing, back up operation on failure and alarm indication. Interface to remote automation systems requiring additional inputs or outputs must be considered separately.

**Start/Stop:**

Much consideration must be given to how to start and stop the gas booster pump. The pump should only operate when the gas fired equipment is operating therefore, hard wired interlocks with that equipment are the most reliable method of providing start/stop signals.

If wiring interlocks are not a practical choice due to distance or number of wiring points, our FCM series flow module or pressure charging is a viable alternative.

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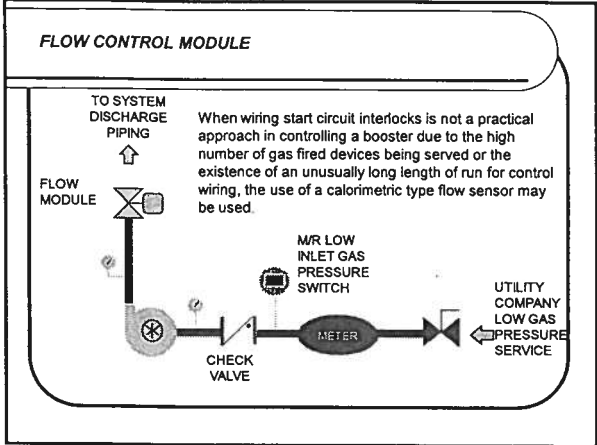
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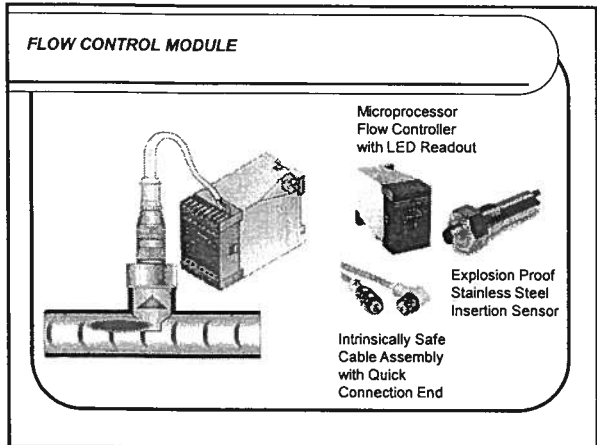
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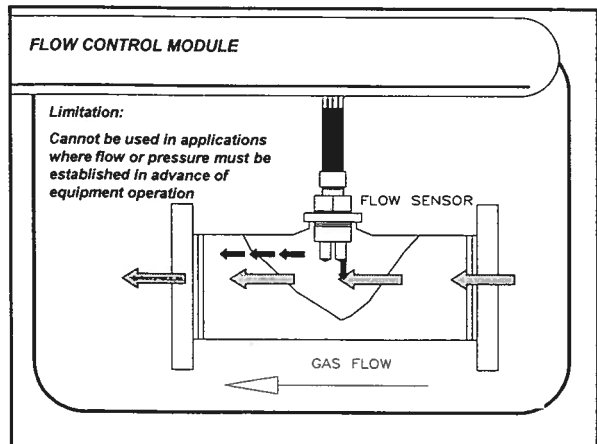
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**Alternate Methods of Gas Booster Control**

- **Manual On/Off Selection**
- **Automatic Time of Day Selection**
- **Pressure / Flow Compensation with Minimum Run Time Cycle**
- **Automatic enable/disable on:**
  - *Minimum inlet pressure*
  - *Space or outdoor temperature*
  - *Building automation system signals*
- **Many other custom concepts**

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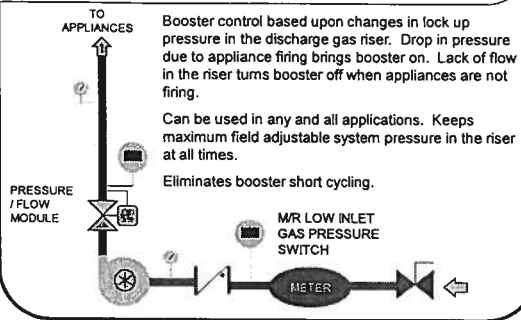
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**PRESSURE / FLOW  
COMPENSATION MODULE**



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**OTHER CONSIDERATIONS**

**MOTOR VOLTAGE:**

Standard voltages 115/230V single phase or 208 or 480V three phase.

Emergency generator applications require additional power planning such as the potential use of a UPS or battery back up power

**ADDITIONAL SYSTEM FEATURES:**

Communication to other building systems (BAS)

Equipment status, alarms, flows, pressures and temperatures

Integrated natural gas leak detection (single/multi)

**EASY TO INSTALL TURNKEY SOLUTIONS:**

All systems are designed to be compact, completely automatic, self contained and fully integrated.

All standard system components *Do Not* require venting to the atmosphere.

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**Gas Booster Systems**



**Questions ?**

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**Thank You For Your Time**



**ACCARDI** COMPANIES  
INNOVATIVE COMBUSTION SOLUTIONS

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