

Specifications for
Synergy[®] High-Intensity Systems

PART 1 - GENERAL

It is the intent of this specification to identify design requirements and minimum standards for the quality, construction, delivery, installation, and operation of gas fired infrared heating equipment. Minor variations, in accordance with standard practice, shall be indicated on the shop drawings and submitted for approval.

1.1 - CODES AND STANDARDS

- 1.1.1 The entire heating system shall be designed certified to:
- a) American Gas Association "Gas-Fired High-Intensity Infrared Heaters" conforming to the ANSI Z83.19- (Current Standard).
 - b) Canadian Gas Association Certified "Gas-Fired High-Intensity Infrared Heaters" conforming to CSA 2.35 – (Current Standard)..
- 1.1.2 Installation shall conform to local codes and local gas authorities including the National Electrical Code, National Fuel Gas Code, and applicable ANSI, NFPA & CAN/CGA & CSA codes.

1.2 - QUALITY ASSURANCE

- 1.2.1 The material construction and operation of the infrared heating equipment shall conform to the performance specifications contained herein. Approved manufacturer is: Combustion Research Corporation, 2516 Leach Rd., Rochester Hills, MI, 48309; Tel. No. 248.852.3611, Fax. No. 248.852.9165.
- 1.2.2 Manufacturer shall warrant mechanical and electrical components for a period of one year from original invoice date.
- 1.2.3 Manufacturer shall warrant ceramic combustion head assembly for a period of ten (10) years.
- 1.2.4 Burner unit shall be furnished completely assembled.

1.3 - MANUFACTURER AND INSTALLER QUALIFICATIONS

- 1.3.1 The gas fired infrared heating system shall be a product of a manufacturer who has had experience in design and fabrication and who is regularly engaged in the manufacture of infrared heating equipment. Only manufactures who can submit evidence of actual installations of comparable designed construction, and that the products have proven practical, durable, and require a minimum of maintenance, will be qualified under this specification.
- 1.3.2 Installation of the gas fired high-intensity infrared heating equipment shall be by supervised by an authorized representative of the heater manufacturer and shall be installed in accordance with approved installation drawings. Mechanics shall be skilled and experienced in the erection of the low intensity infrared heating equipment of the type specified herein.

1.4 - DELIVERY AND STORAGE

- 1.4.1 Materials shall be shipped in the manufacturers standard protective packaging to the designated site.
- 1.4.2 The installing contractor is responsible for receiving, unloading and storage of materials. Storage shall be in dry locations free from dust and water and available for inspection and handling. Handle equipment carefully to prevent damage. Remove damaged items that cannot be restored to like new condition and replace with new items.

PART 2 - PRODUCT

2.1 – DESCRIPTION

- 2.1.1 Gas-Fired High-Intensity Infrared Heaters shall comply with ANSI Z83.19, section 2.10 Radiant coefficient, without the use of a secondary re-radiating surface of either rods or screen.
- 2.1.2 The ceramic radiant surface shall be horizontal when heater is installed at 0 degrees.

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- 2.1.3 Heaters shall be capable of angle mounting from 5 to 30 degrees, without the use of an additional reflector.
- 2.1.4 Heaters shall be fully tested and ready to install, pipe and wire for operation on Natural or LP/Propane gas.
- 2.1.5 Heaters shall be designed to satisfactorily operate at a minimum supply inlet gas pressure of 7 inches water column (W.C.) when specified for natural gas or 11 inches W.C. when specified for LP/propane gas and at a maximum supply inlet gas pressure of 14 inches W.C.
- 2.1.6 Heaters shall be designed to operate without adjustments when burning natural gas having a heat value of 1000 BTU per cubic foot with a specific gravity of .65, or when burning LP/propane gas having a heat value of 2500 BTU per cubic foot with a specific gravity of 1.53.
- 2.1.7 Heaters shall have a gas inlet of 1/2" FPT.
- 2.1.8 *When *HL-SERIES 2-stage heaters are specified, heaters shall provide 2-stage control of Both Gas and Air to provide the most efficient and complete combustion at both high and low fire rates.*

2.2 - BURNERS

- 2.2.1 Burners shall be capable of firing at Inputs of 30,000 BTU/hr (8.78 kW) to 200,00 BTU/hr (58.56 kWh), with natural gas and LP gas.
- 2.2.2 Burner electrical power requirements: 115 volt, 24 volt, 60 Hz AC, and Millivolt self-energizing.
- 2.2.3 Burners shall include the following features:
 - a) The heater shall be of modular design employing multiple burners to achieve the specified input.
 - b) The combustion surface shall be a cordierite-based grooved ceramic of an exclusive permeable design whereby alternate rows of 230 perforations per square inch terminate at the bottom of slots making one half of the flame below the top surface of the ceramic and creating a more intimate contact between flame and surface. This design increases the ceramic surface temperature and the radiant output while maintaining a lower gas input and achieving greater resistance to drafts. Regulator to be factory set at 6.0" W.C. (11.21 mm/Hg) for natural gas and 10.0" W.C. (18.68 mm/Hg) for propane gas.
 - c) The burner's plenum chamber shall be of 20 ga. (0.035") corrosion-free aluminized steel, one-piece fabrication and seamless no-weld construction. The plenum chamber shall utilize a one-piece stainless steel retainer to hold the ceramic surface in place around its entire perimeter and a 14 ga. (0.083") aluminized steel back bracket for holding the burner assembly in place to achieve proper alignment of the surface, venturi and orifice. The venturi shall be made of aluminized steel.
 - d) The burner(s) shall include a ceramic combustion surface, a plenum chamber and a venturi mixer and shall be removable with a single screw for cleaning or replacement without disconnecting any gas, electrical or hanging device.
 - e) The heater's main frame shall be 16 ga. (.065") corrosion-free aluminized steel and of no-weld construction. The main frame shall have a double turned upper edge and two (2) corner reinforcement brackets for rigidity. The side frames shall have four (4) 3/8" diameter holes for easy mounting with S-hooks and chain.
 - f) Gas valve is to fitted with union for easy servicing and removal.
 - g) Reflectors shall be of 21 ga. (.032") highly polished Mirror Brite aluminum with a reflectivity of not less than 98%. Standard reflector design (shape) shall have 0.352 square feet of reflective area per linear foot, with a double turned edge for rigidity and be mounted to the heater at the factory.

2.3 - SYSTEM CONTROLS

- 2.3.1 Thermostat to be provided by equipment manufacturer.

PART 3 - EXECUTION

3.1 - INSTALLATION

- 3.1.1 Power Requirements: It is the installers' responsibility to verify the correct power requirements for the project.

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3.1.2 Fuel Supply and Distribution:

- a) A suitably designed gas distribution system shall be installed per shop drawings.
- b) Each burner assembly shall be fitted with a stainless steel gas connector with manual shut off valve.

3.1.3 Assembly: Assemble and install the heating system in accordance with the installation manual and shop drawings.

3.1.4 Cleaning: Clean reflectors as may be required.

3.1.5 Testing: Upon completion of installation, including work by other trades, adjust and test the heating system in accordance to the manufacturer's owners manual. Adjust and re-test heating system until entire installation is fully operable and acceptable.

END OF SECTION