

Specifications for
Omega II® UNITARY P.E.P. 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 the low intensity, power vented, 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) United States - "Gas-Fired Low-Intensity Infrared Heaters" conforming to the ANSI Z83.20- (Current Standard).
 - b) Canada - "Gas-Fired Low-Intensity Infrared Heaters" conforming to CSA 2.34 – (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 three (3) years from original invoice date.
- 1.2.3 Manufacturer shall warrant radiant tube for a period of ten (10) years (against internally created corrosion) from the original invoice date provided system is installed and maintained in accordance with the owner's manual - see warranty statement for details.
- 1.2.4 System shall be furnished complete with Burner(s), Tubular infrared emitters, Fittings, Reflector Shields, Hangers, and System Controls.

1.3 - MANUFACTURER AND INSTALLER QUALIFICATIONS

- 1.3.1 The low intensity, gas fired infrared heating system shall be a product of a manufacturer who has had at least ten years' experience in design and fabrication and who is regularly engaged in the manufacture of the type of gas fired low intensity infrared heating equipment specified herein. Only manufacturers 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 low intensity infrared heating equipment shall be supervised by an authorized representative of the heater manufacturer and shall be 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 manufacturer's 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 - BURNER

- 2.1.1 Burner shall be capable of firing at high fire inputs of 30,000 BTU/hr (8.78 kW/hr) up to and including 220,000 BTU/hr (64.4 kW/hr) at 5,000 BTU/hr (1.46 kW/hr) increments with natural gas or LP gas.
- 2.1.2 Burner power requirements 120 Volt, 60 Hz AC, 2.2 amp.
- 2.1.3 Burner shall include the following features:
- a) Fitted with a 4" (102 mm) combustion air inlet with a fixed combustion air-metering plate(s).
 - b) The heaters shall provide Two-Stage Control of Both Gas and Air to provide precise air to gas ratios for efficient and complete combustion at both high and low fire rates.
 - c) Burners shall be fitted with two differential air pressure switches so as to prove adequate combustion air is present before burner fires at low or high fire.
 - a) Burners shall be fitted with solid state electronic controls with spark ignition & 100% lockout in event of flame failure.
 - b) High Fire gas regulator setting to be factory set at 3.5" W.C. (6.54 mm/Hg) for natural gas and 10.0" W.C. (18.68 mm/Hg) for propane gas. Low Fire gas regulator setting to be factory set at 2.0" W.C. (3.73 mm/Hg) for natural gas and 4.5" W.C. (8.4 mm/Hg) for propane gas
 - c) Gas valve, ignition controls, and differential pressure switch shall be enclosed within the burner compartment and SEGREGATED from the combustion air supply.
 - d) Burner nozzle pre-mix combustion system - minimum 0.055" (1.39 mm) thickness with **10 year warranty**.
 - e) Electrode and flame rod to be made of NiChrome.
 - f) Burner shall have a minimum 15-second pre-purge, 30 second post purge with a three try ignition and a one hour reset feature after a lockout.
 - g) Burner casing to be constructed of minimum 18 Ga. (1.22 mm) aluminized steel, powder coated.
 - h) Indicator lights to indicate "Low Fire" and "High Fire".
 - i) Burner shall be fitted with an inspection window for visual inspection of spark and flame.
 - j) ½" NPT gas inlet on the back of the burner assembly.
- 2.1.4 Burners venting into common stack shall be operated with one thermostat.

2.2 - SYSTEM CONTROLS

- 2.2.1 Shall be supplied with:
- a) Supplied with pre-wired controls. 120V, 2.2 amp, 60 Hz.
 - b) 24 V thermostat operation
 - c) Solid state spark ignition (24 VAC, 22 VA) and flame rectification (separate probe) with 100% flame lockout with minimum 15 second pre-purge and 30 second post purge..
 - d) Thermostat provided by equipment manufacturer, two stage 24V rating.

2.3 - RADIANT TUBE HEAT EXCHANGING NETWORK

- 2.3.1 All radiant tubing (including combustion tube) shall be factory "heat treated" for high emissivity (exceeding 0.90) finish inside and outside. Painted and non-heat treated radiant tubes shall not be allowed.
- 2.3.2 Combustion tube shall be 10' long, 16 gauge (1.587mm) aluminized steel swaged one end for BTU inputs up to and including high fir input of 175 MBH. For BTU inputs of 180 MBH up to and including 220 MBH the combustion tube shall be 10' long, 16 gauge (1.587mm) alumatherm BHT steel with second tube a 10' long, 16 gauge (1.587mm) aluminized steel swaged one end.
- 2.3.3 Balance of radiant tubing shall be constructed of patented, high strength, long life, spiral wound 22 gauge heat treated aluminized steel.
- 2.3.4 Assembly: Assemble and install the heating system in accordance with the installation manual and shop drawings.
- 2.3.5 "U" bends, elbows and tube couplers to be made of min. 18 gauge (1.32 mm) aluminized steel, swaged at both ends so as to fit into 4" (102 mm) spiral tube
- 2.3.6 Reflectors to be made of minimum 0.025 (0.635 mm) bright aluminum.

- 2.3.7 Tubing and reflector hangers to be made of minimum 0.25" (6.35 mm) Dia. Zinc plated CRS.
- 2.3.8 All joints to be sealed and mechanically fastened with self drilling and tapping screws.
- 2.3.9 All radiant tubing to be continuously covered by the reflector -- NO GAPS BETWEEN REFLECTORS. Reflectors are to be overlapped a minimum of one-inch (1" / 25.4 mm) and secured together with sheet metal screws allowing for one unsecured overlap joint for expansion on each straight run exceeding ten feet (10' / 3,048 mm).

2.5 - COMBUSTION AIR

- 2.5.1 Outside combustion air (if used) is to be provided without the use of supplementary supply blowers or fans.
- 2.5.2 Outside combustion air ducting to be minimum of 4" (102 mm) OD (S&D PVC or galvanized stovepipe). Refer to IOM for installation details and sizes.

2.6 - SYSTEM PERFORMANCE

- 2.6.1 System shall attain a net exhaust temperature of not less than 200° F (92.5° C) in a 15 min. run cycle and shall not exceed a maximum net temperature of 480° F (204.2° C) five feet downstream from the end of the heater.
- 2.6.2 System STEADY STATE EFFICIENCY shall be a minimum of 77%, maximum 87%.
- 2.6.3 System shall be a non-condensing dry tube system i.e. - After a minimum run time of 8 minutes all condensation will cease, and moisture will exit the system in a vapor state.

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.
- 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 furnished 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 and touch up painted surfaces as may be needed.
- 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 owner's manual. Adjust and re-test heating system until entire installation is fully operable and acceptable.

END OF SECTION