

**SECTION 15542 - FUEL-FIRED RADIANT HEATERS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes gas-fired infrared radiant heaters.

**1.3 SUBMITTALS**

- A. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.
  - 1. Wiring Diagrams: Power, signal, and control wiring.
- B. Operation and Maintenance Data: For fuel-fired radiant heaters to include in emergency, operation, and maintenance manuals.
- C. Warranties: Special warranties specified in this Section.

**1.4 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- B. Source Limitations: Obtain fuel-fired radiant heaters through one source from a single manufacturer.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of fuel-fired radiant heaters and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

**1.5 WARRANTY**

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace heat exchanger of fuel-fired radiant heater that fails in materials or workmanship within specified warranty period.
- B. Warranty Period: Three years from date of Substantial Completion.

**1.6 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

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1. Burner Igniters: One hot-surface burner igniter[s] for each style of gas-fired radiant heater furnished.

**PART 2 - PRODUCTS****2.1 MANUFACTURERS**

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
  2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

**2.2 TUBULAR INFRARED HEATERS**

- A. Manufacturers:
  1. Roberts-Gordon, Inc.
    - a) Model – Vantage HE-150
  2. Reznor/Thomas & Betts.
- B. Burner:
  1. Natural Gas model, moisture-resistant design, stainless steel burner cup, outside air adapter, hot surface ignition, three try ignition module, door interlock safety switch, all components easily accessed, durable spot welded construction, mica flame observation window, balanced air rotor, gas and electric controls are separated from the combustion air stream, and IAS approved. Stainless steel vinyl-coated flexible gas line and high pressure gas cock assembly included.
  2. Heater shall be equipped with totally enclosed, permanently lubricated motors with thermal overload protection.
  3. Burner capacities shall be 150,000 BTU/HR input
- C. Radiant Piping:
  1. Heat Exchanger: Radiant Tube shall be 4 inch Heat Treated Aluminized tube X 16 gauge wall with an emissivity factor of 0.80 or greater. Aluminized tubing will be supplied on the first 10 ft. of each radiant heater.
  2. Fittings for radiant piping shall be as described in the installation manual.
  3. Hanging Materials: All systems pipe must be supported in accordance with acceptable practices, local codes, seismic requirements, applicable standards and as shown on plans. Heat exchanger tubing shall pitch down at least 1/2 inch in 20 ft. on radiant lines, away from burner box.
- D. Reflectors:
  1. Provide stainless steel reflectors, installed over all heat exchangers. Provide reflector joint pieces over heat exchanger fittings such as elbows so reflector covers heat exchanger continuously. In order to maximise radiant output and minimise convection losses, reflectors are to protrude past the bottom of the heat exchanger pipe.

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2. Reflector Extension Shields: Same material as reflectors, arranged for fixed connection to lower reflector lip and rigid support to provide 100 percent cutoff of direct radiation from tubing at angles greater than 30 degrees from vertical.
  3. Include hanger kit.
- E. Outside Air Intakes:
1. Provide fresh outside air to supply each burner for the support of combustion air.
- F. Burner Safety Controls:
1. Burner Controls: Factory Wired: All burners shall be factory wired for 120 volts AC, HSI operation and supplied with a grounded three wire pigtail located at rear of burner.
  2. Fail-Safe Controls: To assure a high degree of fail-safe operation, the design shall include an air proving safety pressure switch to verify blower operation before gas valve opens.
  3. All gas vacuum-firing burner units shall be equipped with a Hot Surface Ignition Module (HSI). The HSI module shall have a 15 second flame response time per ignition trial before lockout occurs with 1-Hour Re-set. In addition, the HSI module shall be capable of a minimum of 4 trials (Smart valve with module) with four try ignition to provide maximum reliability.
- G. Vent Piping:
1. Vent piping shall be an approved type B vent assembly supplied by the heater manufacturer.

**2.3 TEMPERATURE CONTROL**

- A. Thermostat: Single-stage, 24-V ac, wall-mounting type with 50 to 90 deg F° operating range and fan on switch.
1. Control Transformer: Integrally mounted, 120 to 24 V ac.

**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine roughing-in for radiant heater piping systems to verify actual locations of piping connections before equipment installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 INSTALLATION**

- A. Install radiant heaters level and plumb.
- B. Install and connect gas-fired radiant heaters and associated fuel and vent features and systems according to NFPA 54, applicable local codes and regulations, and manufacturer's written installation instructions.
- C. Suspended Units: Suspend from substrate using chain hanger kits and building attachments.
1. Restrain the unit to resist code-required horizontal acceleration.

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- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to machine to allow service and maintenance.
- C. Gas Piping: Comply with applicable requirements in Division 15 Section "Fuel Gas Piping." Connect gas piping to gas train inlet; provide union with enough clearance for burner removal and service. Provide AGA-approved flexible units.
- D. Suspend heat exchangers, burners, gas piping, conduit, and reflectors from building substrate as indicated, or if not indicated, in manner to provide durable and safe installation; and in accordance with manufacturer's installation instructions.
- E. Connect vents according to Division 15 Section "Breechings, Chimneys, and Stacks."
- F. Electrical: Comply with applicable requirements in Division 16 Sections.
  - 1. Install electrical devices furnished with heaters but not specified to be factory mounted.
- G. Ground equipment according to Division 16 Section "Grounding and Bonding."
- H. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

**3.4 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections.
  - 1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - 2. Verify bearing lubrication.
  - 3. Verify proper motor rotation.

**3.5 ADJUSTING**

- A. Adjust initial temperature set points.
- B. Adjust burner and other unit components for optimum heating performance and efficiency.

**3.6 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fuel-fired radiant heaters.

END OF SECTION 15542