

## GUIDE SPECIFICATION SRP KMI HIGH EFFICIENCY INFRARED HEATERS

SECTION 15540 – FUEL- FIRED HEATERS

(Alternate - SECTION 235523 - GAS-FIRED RADIANT HEATERS)

This section is based on the products of Superior Radiant Products, located at:

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| <ul style="list-style-type: none"><li>• <u>Canadian Location:</u><br/>563 Barton St.<br/>Stoney Creek, ON, Canada L8E 5S1</li></ul> | <ul style="list-style-type: none"><li>• <u>United States Location:</u><br/>980 Cobb Place Blvd. NW Unit 100<br/>Kennesaw, GA 30144</li></ul> |
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Superior Radiant Products manufactures a full range of gas fired, high and low intensity infrared space heating equipment.

### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. High intensity heaters.

#### 1.2 RELATED SECTIONS

- A. Section 15050 – Basic Mechanical Materials and Methods: Fuel service, safety valves and connections.
- B. Section 16050 – Basic Electrical Materials and Methods: Power service and connections.

#### 1.3 REFERENCES

- A. CSA – CSA Group. Canadian Standards Association (CSA).

#### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  1. Rated capacities, operating characteristics and accessories for each type of gas-fired radiant heater.
  2. Preparation instructions and recommendations.
  3. Storage and handling requirements and recommendations.
  4. Installation methods.

5. Shop Drawings: Submit complete shop drawings indicating system components, control diagrams and load calculations.
6. Field quality-control test reports.
7. Installation, Operation and Maintenance Data: Provide copy of IO&M document.
8. Warranty: Provide copy of manufacturer's warranty statement.

## 1.5 QUALITY ASSURANCE

- A. Assemblies: Assemblies shall be CSA approved.
  1. High intensity heaters to ANS1 Z83.19 (latest revision) and CSA 2.35 (latest revision).
- B. Approval shall include components of the complete heater, including burners, reflectors, accessories, thermostats and associated controls, and/or other accessories as noted in Contract Document plans and specifications.
- C. Code Compliance: Installations of units shall comply with local building codes, or in their absence, the latest edition of the national regulations and procedures listed below:
  1. Electrical: Heaters shall be electrically grounded in accordance with the National Electric Code, ANSI/NFPA 70 in the US, and the Canadian Electric Code, CSA C22.1 in Canada, and shall comply with all local requirements.
  2. General Installation and Gas Codes: Heaters shall be installed only for use with the type of gas appearing on the rating plate, and the installation shall conform to the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) in the US and the Natural Gas and Propane Installation Code, CAN/CGA B 149.1 & B149.2 in Canada.
  3. Aircraft Hangar Installation: Installation in aircraft hangars shall conform to the Standard for Aircraft Hangars, ANSI/NFPA 409 in the US and CAN/CGA B149.1 & B149.2 in Canada.
  4. Public Garage Installation: Installation in public garages shall conform to the Standard for Parking Structures, NFPA-88A or Standard for Repair Garages, NFPA 88B, in the US and CAN/CGA B149.1 & B149.2 in Canada.
  5. Parking Structures: Technical requirements are outlined in the Standard for Parking Structures, ANSI/NFPA 88a, in the US and CAN/CGA B149.1 & B149.2 in Canada.
  6. Gas Supply Lines:
    - a. Gas supply pipe sizing shall be in accordance with the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) in the US and the Natural Gas and Propane Installation Code, CAN/CGA B149.1 & B149.2 in Canada.
    - b. A 1/8 inch (3 mm) NPT plugged tap shall be installed in the gas line connection immediately upstream of the burner farthest from the gas supply meter to allow checking of system gas pressure.
  7. Venting: Refer to the National Fuel Gas Code, ANSI Z223.1 (NFPA 54) in the US and the Natural Gas and Propane Installation Code, CAN/CGA B149.1 and B149.2 in Canada for proper location, sizing and installation of ventilation as required for unvented heaters.

- D. Manufacturer Qualifications: Successfully completed and passed the auditing requirements for ISO 9001 - Quality Management System (QMS).
- E. Installer Qualifications: Authorized distributor of products and systems.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

## 1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

## 1.8 WARRANTY

- A. Manufacturer's standard warranty agrees to provide parts to repair or replace components of gas-fired radiant heater that fails in materials or workmanship within specified warranty period.
  1. The Manufacturer warrants to the original owner that the product will be free of defects in material and workmanship. For the Series KMI, the warranty for all components except for the ceramic burner head assembly is limited to 24 months from the date of installation.
  2. The ceramic burner head assembly shall be warranted for an additional 8 years for units which are proven to the satisfaction of the manufacturer to be inoperative due to defects in material or workmanship.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Superior Radiant Products.

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- Canadian Location:  
563 Barton St.  
Stoney Creek, ON, Canada L8E 5S1

- United States Location:  
980 Cobb Place Blvd. NW Unit 100  
Kennesaw, GA 30144

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- B. Substitutions: Not permitted.

### 2.2 HIGH INTENSITY HEATERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Superior Radiant Products Model KMI high efficiency high intensity type gas-fired radiant infrared



heaters. Heater shall have radiant efficiency of minimum 81% as determined by independent testing to EN419-2. Test reports shall be available on request.

B. Products.

1. Product shall be high efficiency, high intensity heater Model KMI as manufactured by Superior Radiant Products Ltd. Product firing rates as called for in the Contract documents within the range of 21 MBH to 125 MBH.

2. Service:

- a. Electrical Rating: 24VAC.
- b. Gas Connection: 1/2 inch (13 mm) NPT.
- c. Minimum Gas Inlet: Natural gas 6.5 inches (165 mm) W.C. LPG 12.0 inches (305 mm) W.C.
- d. Manifold Pressure: Natural gas 5 inches (127 mm) W.C. LPG 11 inches (279 mm) W.C.

3. Construction:

- a. 100% insulated reflectors prevents convective heat loss.
- b. 'High-grid' technology improves heat yield.
- c. Increased efficiency through maximum preheating of the mixture.
- d. Innovative injector burner works almost pollutant-free and guarantees optimum combustion.
- e. Adjustable reflector panels direct the heat straight to the point required.
- f. Reduced maintenance costs with easy removal of combustion chamber.
- g. High output delivery from ceilings up to 200 feet (60960 mm) high.

C. General: High intensity radiant heater (Model KMI only).

1. Complete with single body burner head, ignition control, valve & gas pressure switch.
2. Provide radiant factor of at least 81% as tested to EN 419-2 standard and provide documentation upon request.
3. Shall cover entire infrared spectrum – from short to long wavelengths.
4. Clearance to combustibles shall comply with those in the Installation and Operations Manual for the firing rate specified.
5. Approved flexible connectors shall be provided.
6. The heater unit shall operate at a minimum gas inlet pressure of 6.5 inches W.C. for NG and 12 inches for propane; maximum inlet pressure for both fuel types shall be 14 inches WC.
7. Electrical loads: Unit shall draw no more than 0.6A, 120VAC, 60Hz.
8. Unit shall be subjected to a function test before it leaves the factory and is preset to the relevant gas type.

D. Performance:

1. The heater shall perform a controlled and clean surface combustion
2. The resultant quantity of noxious components CO and NOx shall be very low (CO: 20 – 200 ppm; NOx: 4 – 10 ppm).

E. Heater Body:

1. Heater body shall comprise of Burner-head (mixing chamber, ceramic emitter tiles and steel mesh), insulated double wall parabolic outer body and reflector assemblies.
2. Burner head shall be stainless steel with single venturi and shall be placed in the insulated reflector housing in such a way that all the 3 sides are heated by warm air from products of combustion in turn the three sides shall pre-heat the air-fuel mixture to achieve higher efficiency.
3. Burner head shall be independently placed in the reflector assembly to minimize expansion stress and for ease of serviceability.
4. Hood shall be hot-dip aluminized steel with high temperature resistant ceramic fiber insulation and shall be fastened to the combustion chamber to expand without damaging the unit.
5. Reflectors shall be FERAN.
6. Directing of radiant pattern shall be accomplished through use of adjustable reflectors and rotating the heater around long axis.
7. The rotation shall be in both the directions around horizontal mounting and shall not have the limitation to rotate in only one direction.
8. Chromium-Nickel Stainless steel mesh shall be in close proximity of emitter tiles to maximize radiant performance.

F. Equipment Controls:

1. Ignition shall be solid-state direct spark.
2. Ignition control shall:
  - a. Make 3 ignition attempts before lockout.
  - b. Recycle again in one hour with 3 ignition attempts.
  - c. Ignition module will check for false flame condition, i.e. shorted sensor to ground.
3. Have openly accessible sense current contacts.
4. Gas valve shall include a manual valve, two magnetic operators and a standard gas pressure regulator.
5. Gas valve shall have pressure taps to measure inlet and manifold pressures.
6. Control shall incorporate a gas pressure switch capable of shutting off power to the ignition module in case of inlet gas pressure drops below the minimum requirement.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until services and supports have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 INSTALLATION

- A. Installation shall comply with manufacturer supplied Instruction manual, approved drawings and applicable local codes and/or gas utility requirements. In the absence of any of the former, reference should be made to CAN 1-B149.1 and B149.2 Installation Codes and/or National Fuel Gas Code ANSI Z223.1 (NFPA54). Comply with manufacturer's recommendations including the following:

1. Clearance to combustibles shall comply with those in the I/O manual for the firing rate specified.
  2. Provide approved flexible connectors.
  3. Wire heaters in accordance with the National Electrical Code ANSI/NFPA 70 and local ordinances and/or Canadian Electrical Code.
  4. Suspend heater units in accordance with manufacturer's instruction with chain and turnbuckles exceeding 540 lb (245 kg) pull test. 4 inch (102 mm) turnbuckles and 2/0 chain.
  5. Install and connect gas-fired radiant heaters and associated fuel and vent features and systems according to either NFPA 54 or CAN/CSA B149.1 as applicable for local codes and regulations.
  6. Install products in accordance to manufacturer's written installation instructions.
  7. Hang suspended units from substrate using chain hanger kits and building attachments as required for safe installation and to meet all seismic requirements for specific building location.
- B. Connections: Provide all electrical connections required for complete installation including installation of electrical devices furnished with heaters but not specified to be factory mounted
1. Install piping to gas-fired radiant heaters to allow service and maintenance as required.
  2. Connect gas piping to gas train inlet; provide union with enough clearance for burner removal and service.
  3. Connect vent connections as required.

### 3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test and adjust components, assemblies, and equipment installations, including connections, and to assist in testing. Testing shall include the following:
1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  2. Test Reports: Prepare a written report to record the following:
    - a. Test procedures used.
    - b. Test results that comply with requirements.
    - c. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- B. Remove and replace malfunctioning units and retest until satisfactory results are obtained.

### 3.4 DEMONSTRATION

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

### 3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION