

REZNOR VZH INFRARED RADIANT HEATER

PRODUCT SPECIFICATION

SYSTEM

A. General

1. Mechanical General Requirements

B. Codes and Standards

1. American National Standard / CSA Standard Gas-Fired Low Intensity Infrared Heaters: Construct and certify gas-fired infrared heaters approved for indoor and outdoor use in accordance with latest edition ANSI Z83.20 / CSA 2.34, 2.17, 2.20 "Gas-Fired Low-Intensity Infrared Heaters" including all current supplements.
2. Installation Compliance: United States: Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest revision. Canada: Refer to Natural Gas and Propane Installation Code CSA B149.1 - latest revision.
3. CSA Compliance: Provide CSA Seal affixed to each burner name plate and provide CSA Certification of heater design as vented or unvented infrared heater for indoor or outdoor installation.
4. National Standard Gas Piping Compliance: Install and connect gas piping to gas fired infrared heaters in accordance with United States: Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest revision. Canada: Refer to Natural Gas and Propane Installation Code CSA B149.1 - latest revision.
5. National Electrical Code Compliance: Install and connect electrical wiring to gas fired infrared heaters in accordance with: 1.) United States: Refer to National Electrical Code®, NFPA 70 - latest revision. Wiring must conform to the most current National Electrical Code®, local ordinances and any special diagrams furnished. 2.) Canada: Refer to Canadian Electrical Code, CSA C22.1 Part 1 - latest revision.

EQUIPMENT

A. Burner Box

1. Natural or Propane models, moisture-resistant design including fully gasketed burner doors, nickel plated steel burner cup, outside air adapter, one (1) fresh air inlet weather vent cap (for wind and rain protection) supplied as standard equipment, direct spark ignition, three try ignition module, all components easily accessed, durable spot welded construction, internal connection for control and power to 24 volts AC thermostat, external mica flame observation window, external LED burner status light, balanced air rotor, gas and electrical controls are housed in a separate compartment from the combustion air stream and burner cup, and CSA certified for indoor or outdoor use.
2. Heater shall be equipped with the following moisture-resistant design standard features, including:
 - a. Two fully-gasketed burner access doors.
 - b. Each burner access door shall be secured with no less than four screws to completely engage the entire seal and create a watertight barrier. All burner door-securing screws shall be stainless steel self-sealing securing screws. Each screw shall have a rubber o-ring to provide a watertight seal at all points of entry into the doors.
 - c. Each screw penetrating the top surface of the burner box shall use nylon washers to prevent entry of standing water into any internal compartment.
 - d. Internal power connection coupled with burner electrical connection for use with liquid tight electrical conduit.
 - e. Flexible gas line provided with burner, for U.S. models only. Flexible gas line shall be $\frac{3}{4}$ " ID and at least 36" in length. Flexible gas line shall be corrugated Type 304 stainless steel with exterior PVC coating for added moisture resistance. High-pressure gas shut off cock shall be supplied as part of the flexible gas line assembly.
 - f. Liquid tight grommet shall be supplied with burner to prevent moisture from entering burner enclosure through electrical connections.
 - g. Stainless Steel Burner box for toughness, chemical and corrosion resistance.
 - h. Heater shall be equipped with totally enclosed, permanently lubricated combustion blower with thermal overload protection.

B. Burner Controls

1. Factory Wired: All burners shall be factory wired for 120 volts AC with transformer for 24 volts AC DSI 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. In the event of a power failure the gas valve in burners close in safe position.
3. Ignition Controls: All gas firing burner units shall be equipped with a Direct Spark Ignition Module (DSI) fully automatic. The DSI module shall have a 15-second flame response time per ignition trial before lockout occurs. In addition, the DSI module shall be capable of a minimum of 3 trials for ignition to provide maximum reliability.

C. Reflectors - Standard

Provide high radiant reflective (aluminum) (stainless steel) reflectors installed over all heat exchangers. Provide reflector joint pieces over each exchanger fittings such as elbows so reflector covers heat exchanger continuously. To maximize radiant output and reduce convective heat losses, reflectors are to extend below the bottom of the heat exchanger tube.

1. Over all fittings: All reflectors at termination of the heat exchanger pipe and any elbows shall have end caps to prevent convective heat from escaping.
2. Side Reflectors: System to have (aluminum) (stainless steel) perimeter side extension reflector in certain areas of layout as shown on plan where specified. Side reflectors permanently attach to side to top reflector and are secured to the pipe by side reflector supports and two "Z" clips for each 8' (2.44 m) section of side reflector. To prevent convection losses, tilting of reflectors will not be acceptable.

D. Outside Air

Provide fresh outside air to supply each burner for the support of combustion air. (optional but recommended)

E. Thermostats

Provide where indicated, moisture resistant line voltage thermostat connected to radiant heater. Mount thermostat 5 ft. - 6 ft. (1.5 - 2 m) above finish floor or otherwise as noted on the drawing.

F. Radiant Piping - Heat Exchanger

1. Radiant Tube: Shall be new 4 in. (10 cm) O.D. Heat Treated Aluminized steel tube X 16-gauge wall with an emissivity factor of 0.80 or greater. ALUMITHERM® steel (aluminized steel/titanium alloy) tubing will be supplied on the first 10 ft. of each radiant heater.
2. Fittings: Shall be 4 in. (10 cm) O.D. Aluminized steel X 16-gauge wall. Tubes shall be as described in the installation, operation, and service manual.
3. Hanging Materials: All system's tube must be supported in accordance with acceptable practices, local codes, seismic requirements, and applicable standards and as shown on plans. Heat exchanger tube shall pitch down at least .5 in. per 20' (1.27 cm per 6.1 m) away from burner box.

INSTALLATION OF GAS FIRED RADIANT HEATERS

A. General

Install gas fired infrared heaters as indicated, in accordance with manufacturer's installation operation and service manual and in compliance with applicable codes and approvals. Allow adequate space for servicing or removal of the unit without disturbing other piping or equipment.

B. Support

Suspend heat exchanger, burner, 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 operation and service manual. Mounting height to be a minimum ____ foot (____ m) from floor level.

C. Clearance to Combustibles

Always maintain clearance to combustibles as outlined and printed on burner nameplate and in manufacturer's product data. Measure clearance distance from surface of heat exchanger or as indicated by approval agency's listing.

D. Venting

Install vent piping as indicated on plans. Terminate where indicated on the drawings with a vent terminal assembly as supplied by the manufacturer. The venting must be installed in accordance with the requirements within the installation operation and service manual and the following codes: United States: Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest revision. Canada: Refer to Natural Gas and Propane Installation Code CSA B149.1 - latest revision.

E. Gas Piping

Install gas piping as indicated and in accordance and in compliance with applicable codes and approval: United States: Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 - latest revision. Canada: Refer to Natural Gas and Propane Installation Code CSA B149.1 - latest revision.

1. Required Gas Supply Inlet Pressures:

Natural Gas Units	Required Minimum Gas Pressure	Maximum Gas Pressure
40,000-150,000 Btu/h	4.6" wc	14" wc
175,000 Btu/h	5.0" wc	14" wc
Propane Gas Units	Required Minimum Gas Pressure	Maximum Gas Pressure
40,000-175,000 Btu/h	11" wc	14" wc

2. Local Codes: Gas supply piping must meet local requirements and be sized in accordance with Btu/h demand, available pressure and total length of supply line required for the installation. Connection from supply line to burner unit must be made in accordance with installation operation and service manual. Gas shut-off cock, as supplied with unit, and controls in unit must not be subjected to more than 1/2 lb. or 14" wc pressure.

3. Drip Legs: Provide drip legs at all gas risers.

F. Electrical Wiring

Install electrical wiring as indicated. Connect power wiring to burners and control wiring between burners and thermostats in accordance with manufacturer's wiring diagrams.

1. Provide liquid tight flexible conduits for all applications.

G. Thermostats

Mount thermostats 5 ft. - 6 ft. above finished floor, if not otherwise indicated. Moisture resistant thermostats to be used in vehicle wash bay areas.

H. Thermostat Guards

All thermostats to be covered with a locking thermostat cover.

FIELD QUALITY CONTROL

A. Start-Up

Start-up, test, and adjust gas fired infrared heaters in accordance with manufacturer's start-up instructions in the installation operation and service manual, and Utility Company's requirements. Check and calibrate controls, adjust burners if applicable according to manufacturer's installation operation and service manual instructions for maximum efficiency.

CLOSEOUT PROCEDURES

A. Training

Provide services of manufacturer's technical representative to instruct operating personnel in operation and maintenance of gas fired radiant heaters.

1. Schedule instruction with operating building owner, provide at least 7 days notice.

WARRANTY

Provide written warranty, by manufacturer, agreeing to replace/repair, within warranty period, components of gas fired infrared systems furnished by manufacturer, which are defective in either material or workmanship, provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty periods follows:

A. Three (3) year warranty on the burner system from the date of final acceptance of the infrared heaters

QUALITY ASSURANCE

B. Manufacturer's Qualifications

Firms regularly engaged in manufacture of gas fired radiant systems with characteristics, sizes, and capacities required,

whose products have been in satisfactory use in similar service for not less than 15 years.

C. Alternate Manufacturers

1. Other low intensity infrared heaters and with the same or lower burner firing rate capacity, and with the infrared distribution pattern shown on drawing may be acceptable provided they meet the intent of these specifications and prior approval in writing is obtained from the engineer at least twenty (20) days before the bid date. If such systems are approved, the contractor assumes responsibility for the design, performance, and expense of same. The redesigned system, gas piping, and electric wiring shall be done by a registered mechanical engineer. Shop drawings of the entire new system shall be provided by this contractor. The contractor should state the amount to be credited to the owner due to this substitution.

2. Where approved substitutes are used, the contractor assumes all responsibility for physical dimensions and all other resulting changes. This responsibility extends to cover all extra work as necessitated by other trades as a result of the substitutions.

3. The engineer reserves the right to require the contractor to remove and replace any material or equipment which does not meet specifications or does not have any prior approval as a substitute item. Work shall be completed immediately without cost or inconvenience to the owner.

PERFORMANCE SCHEVULE

A. Equipment

1. Provide gas fired infrared radiant heaters to deliver the following performance capacities.

<u>Manufacturer</u>	<u>Model</u>	<u>Input</u> (Btu/h)	<u>Overall Length</u> <u>Minimum</u> (Ft. – In.)
Reznor	VZH-40	40,000	10'-11 ½"
Reznor	VZH-60	60,000	20'-11 ½"
Reznor	VZH-80	80,000	20'-11 ½"
Reznor	VZH-100	100,000	30'-11 ½"
Reznor	VZH-125	125,000	30'-11 ½"
Reznor	VZH-150	150,000	40'-11 ½"
Reznor	VZH-175	175,000	50'-11 ½"

END OF SECTION