

<sup>®</sup>**REZTOR**

# **RADIANT HEATER CATALOG**

## **COMMERCIAL/INDUSTRIAL RADIANT HEATERS**

**Heats Objects and People, Not the Air**

### **STYLES**

**Low Intensity Tubular Radiant**

**- Single-Stage**

**- Two-Stage**

**- Harsh Environment**

**High Intensity Radiant**

### **CAPACITIES**

**30 - 200 MBH**

### **FUEL**

**Natural Gas**

**Propane**

**Visit [ReznorHVAC.com](http://ReznorHVAC.com) for more  
information.**

**178F-0419 (Replaces 178F-1118)**

## BACKGROUND

The first Reznor "Reflector Type" residential gas space heater was invented in 1888 by George Reznor. This technological breakthrough was an immediate success and hastened the expansion of gas heating in residential and commercial applications. Technological development and innovation have been the hallmark of Reznor products through the years. From the development of the forced air gas unit heater, to the modular Thermocore® heat exchanger, through the high-efficiency, sealed-draft Venturion® unit heater, to today's very high efficiency V3® and Tcore3® heat exchangers, have kept Reznor products at the forefront of technological advances in commercial and industrial gas heating.

In the modern world air conditioning is almost a necessity. Reznor commercial/industrial air conditioning equipment provides fuel efficient cooling for recirculated or up to 100% outside air. Reznor products include evaporative cooling units, chilled water coils and DX coils (with ozone-friendly R410A refrigerant).

As a result of this pioneering role in the heating, makeup air, and ventilating equipment field, the products offered today are the most advanced in engineering design to satisfy a wide variety of applications.

## FACILITIES

Reznor heaters were first manufactured and sold in Mercer, Pennsylvania (70 miles north of Pittsburgh) in 1888. Over the years, the company has grown and expanded. Today, with sales worldwide, Reznor products are being manufactured in facilities throughout North America and Europe.

## PRODUCT SCOPE

Well-equipped engineering laboratories for both product development and testing can be found at many of the manufacturing sites. All domestic lab sites are agency approved.

Reznor Products include a complete line of heating, makeup air and ventilating systems, using gas, oil, hot water/steam, or electric heat sources. Reznor heater catalogs are designed to aid the engineer, architect or contractor in specifying the correct equipment for all standard and special applications. Technical data is presented on unit heaters, duct furnaces, infrared heaters, makeup air systems, pre-engineered custom-designed systems, energy recovery units, packaged cooling, and evaporative cooling modules. Consult your local Reznor Sales Representative for further assistance in specifying Reznor Equipment for your specific application.

## SERVICES

Product service requirements are handled through contractors and/or distributors, with backup from local representatives and factory-based service team. Replacement parts inventories for both warranty and non-warranty requirements are maintained at service centers throughout the country and at the manufacturing facilities.

For the Reznor Representative in your area call 800-695-1901 or go to our website [ReznorHVAC.com](http://ReznorHVAC.com).

# REZNOR®

# Infrared Heating Catalog

## Low-Intensity Infrared VP Series & VC Series



## High-Intensity Infrared Model RIHN/RIHVN/RIHL/RIHVL - Surface Combustion Radiant Heaters



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**NOTE:** Due to continuing design improvements, all specifications in this catalog are subject to change without notification. These heaters are not approved for residential use.

**WARNING:** Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation operation and service/maintenance manual thoroughly before installing or servicing this equipment.

Gas-fired appliances are not designed for hazardous atmospheres containing flammable vapors or combustible dust, or atmospheres containing chlorinated or halogenated hydrocarbons.

**For your safety:** The use and storage of gasoline or other flammable vapors and liquids in the vicinity of this appliance is hazardous.

Installations must be in accordance with enforcing authorities, the National Fuel Gas Code NFPA 54/ANSI Z223.1 (latest edition) in the United States, and the Natural Gas and Propane Installation Code CAN/CSA-B149.1 (latest edition) in Canada. In addition installations must meet NFPA 88A (latest edition) for parking structures, NFPA 88B (latest edition) for repair garages, and NFPA 409 (latest edition) for aircraft hangars.

**NOTE:** Reznor infrared heaters are not approved for residential use.

**IMPORTANT:** Specifications are subject to change without notice. This guide is intended to provide specifications and technical information only.

This guide is not intended to be an instruction manual. When installing heating and ventilating equipment, you must check and conform to all local and national building codes. Improper installation of heating and ventilating equipment could be dangerous. Consult manufacturer's installation manual for instructions and important warnings.

# Low Intensity Radiant Heaters



**Models VPS & VPT**  
**Gas-Fired Tubular Radiant,**  
**Low Intensity Heater**  
**for Indoor Commercial-Industrial Use**



ANSI  
Z83.20b-2011

CSA  
2.34b-2011

**DESCRIPTION**

The VP series of tubular radiant heaters are available in BTUH inputs ranging from 60,000 to 200,000 and in system lengths from 20 to 80 feet (see the following pages for BTUH/system length combinations). Heaters are available for use with natural gas or optional propane gas. Tubular radiant heaters are engineered to provide quiet, reliable, energy-efficient, comfort level heating for both spot and space applications.

These radiant heaters are ready for use for elevations up to 2,000 ft. (610 M) above sea level. For installations in the U.S. above 2,000 ft., a high elevation adapter kit is available. Units can also be installed above 2,000 ft. elevation in Canada - see the installation manual for details.

The VP series is designed with a burner/control box housing a power burner that fires into a combustion chamber and heat exchanger tubes, 20 to 80 feet in length. The burner is equipped with a positive pressure blower for supplying combustion air and a multi-try direct spark ignition with soft lockout. Controls include a single-stage (Model VPS) or two-stage (Model VPT) gas valve and a pressure switch to verify combustion air flow.

The Calcoat™ and rolled steel tubes are in 10-foot sections with each section having an aluminized steel reflector. Optional stainless steel (400 series grade) reflectors are also available. Additional “L” and “U” shaped tubes as well as 5 ft. (1.5 M) tubes are available in rolled or stainless steel. These accessories allow the radiant tube system configuration to adapt to various applications. A tubular system including an optional “U” tube provides the best balance of radiant emission over the length of any system.

Combustion air can either come from the heated space or be piped from the outside. An outside combustion air inlet kit should be used (1) if the building atmosphere has negative pressure; (2) if the building atmosphere is mildly dirty or dusty; (3) if the heater is being installed in a tightly closed room that does not provide required air for combustion. Warranty will be void for heaters installed in mildly dirty or dusty environment without outside combustion air inlet kit. *(For harsh environments select Models VCS or VCT.)*

Venting may be either vertical or horizontal. Some applications allow for VP series to be installed unvented.

VP Series tubular heater systems are shipped in modular packages requiring field assembly and installation. Standard features, such as wire form hangers for chain suspension, compression coupling tube connections, and terminal board thermostat connection, are designed to facilitate installation.

These heaters are approved for use in the United States and Canada by the Canadian Standards Association (CSA). A five-year limited warranty is provided on the burner and a ten-year limited warranty on all tubes.

### STANDARD FEATURES

- Natural gas operation
- Full input rate for elevations up to 2,000 ft.
- 115/1/60 supply voltage
- Multi-try direct ignition with soft lockout
- Single-stage combination gas valve (Model VPS)
- Two-stage combination gas valve (Model VPT)
- Pre-purge and post-purge
- Differential air pressure switch to verify combustion air flow
- Diagnostic indicator lights (ignition circuit board)
- Operation indicator lights
  - Red light - power on
  - One amber light - burner on (Model VPS)
  - Two amber lights - burner on hi/lo (Model VPT)
- Calcoat™ combustion chamber and rolled steel heat exchanger tubes (10 ft. length)
- Compression coupling tube connections
- Wire form hangers
- Aluminized steel reflectors (10 ft. lengths) that overlap for continuous reflector system
- Horizontal or vertical venting
- Painted Cabinet
- 24-volt controls

### OPTIONAL FEATURES - Factory Installed

- 208/1/60 supply voltage (Contact your Factory Agent for availability and lead time)
- 230/1/60 supply voltage (Contact your Factory Agent for availability and lead time)
- 220/240/1/50 supply voltage (Contact your Factory Agent for availability and lead time)

### OPTIONAL FEATURES - Field Installed

- Stainless steel (400 series grade) reflectors
- "U" Heat exchanger tube with reflector (standard or stainless steel)
- "L" Heat exchanger tube(s) with reflector (standard or stainless steel)
- 5-ft. Heat exchanger tube(s) with reflector (standard or stainless steel)
- Reflector end caps (aluminized or stainless steel [400 series grade])
- Hanger kit - chains and "S" hooks (standard or stainless steel)
- Turnbuckle kits (standard or stainless steel)
- Outdoor combustion air inlet kit
- Stainless steel flexible gas connector (U.S. only)
- High elevation conversion kit (for installations in the U.S. above 2,000 ft.)
- Propane conversion kits
- Vent Cap (standard or stainless steel)
- Manual shutoff valve & union
- Single-stage thermostat (VPS)
- Two-stage thermostat (VPT)

### TECHNICAL DATA

| Size                               |                             |                          | 60           | 80           | 100          | 125          | 150           | 170           | 200           |
|------------------------------------|-----------------------------|--------------------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| Heating Capacity                   | High <sup>A</sup>           | MBH                      | 60           | 80           | 100          | 125          | 150           | 170           | 200           |
|                                    |                             | (kW)                     | (18)         | (23)         | (29)         | (37)         | (44)          | (50)          | (59)          |
|                                    | Low <sup>B</sup>            | MBH                      | 45           | 60           | 65           | 95           | 100           | 125           | 150           |
|                                    |                             | (kW)                     | (13)         | (18)         | (19)         | (28)         | (29)          | (37)          | (44)          |
| Length Range                       | Model VPS                   | ft                       | 20 - 40      | 30 - 40      | 30 - 50      | 30 - 60      | 40 - 70       | 50 - 80       | 50 - 80       |
|                                    |                             | (M)                      | (6.1 - 12.1) | (6.1 - 12.1) | (9.1 - 15.2) | (9.1 - 18.3) | (12.1 - 21.3) | (15.2 - 24.4) | (15.2 - 24.4) |
|                                    | Model VPT                   | ft                       | 30 - 40      | 30 - 40      | 30 - 40      | 30 - 50      | 40 - 60       | 50 - 70       | 50 - 70       |
|                                    |                             | (M)                      | (9.1 - 12.1) | (9.1 - 12.1) | (9.1 - 12.1) | (9.1 - 15.2) | (12.1 - 18.3) | (15.2 - 21.3) | (15.2 - 21.3) |
| Minimum Gas Pressure (inches w.c.) |                             | Natural Gas <sup>C</sup> | 5.0          | 5.0          | 5.0          | 5.0          | 5.0           | 7.0           | 7.0           |
|                                    |                             | Propane                  | 11.0         | 11.0         | 11.0         | 11.0         | 11.0          | 11.0          | ■             |
| Max. Supply Pressure (inches w.c.) |                             | Natural Gas              | 14.0         | 14.0         | 14.0         | 14.0         | 14.0          | 14.0          | 14.0          |
|                                    |                             | Propane                  | 14.0         | 14.0         | 14.0         | 14.0         | 14.0          | 14.0          | ■             |
| Ship Weight                        | Model VPS (Burner Box only) | lbs.                     | 29           | 29           | 29           | 29           | 29            | 29            | 29            |
|                                    |                             | (kg)                     | (13.1)       | (13.1)       | (13.1)       | (13.1)       | (13.1)        | (13.1)        | (13.1)        |
|                                    | Model VPT (Burner Box only) | lbs.                     | 34           | 34           | 34           | 34           | 34            | 34            | 34            |
|                                    |                             | (kg)                     | (15.3)       | (15.3)       | (15.3)       | (15.3)       | (15.3)        | (15.3)        | (15.3)        |

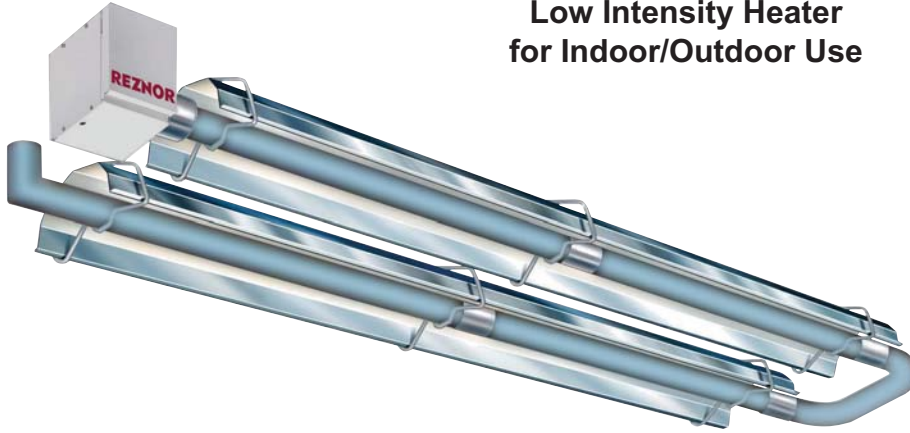
<sup>A</sup> High capacity heating applies to Model VPS (single-stage heater). It also applies to Model VPT (two-stage heater) when fired at high capacity.

<sup>B</sup> Low capacity heating applies to Model VPT when fired at low capacity.

<sup>C</sup> Minimum natural gas pressure shown for Model VPS. Model VPT (two-stage heater) requires 7 in. w.c. minimum gas pressure for all sizes when used with natural gas.



**Model VCS & VCT**  
**Harsh Environment**  
**Gas-Fired Tubular Radiant,**  
**Low Intensity Heater**  
**for Indoor/Outdoor Use**



NOTE: Models VCS and VCT are approved for commercial/industrial use for both indoor or outdoor installation.

These heaters are also approved for residential outdoor installations such as patios, gazebos or pool areas.



NOTE: Models VCS and VCT are known as "The Car Wash" heaters. They are waterproof and designed for harsh environments such as a car washes, outdoor patios, greenhouses, etc.

A harsh environment is defined as wet or mildly corrosive. The VC series is NOT intended for heavy chemical laden environment or areas where halogenated hydrocarbons may be present. Ducted clean, fresh air for combustion is required for mildly corrosive environments for the warranty to remain valid. For outdoor installation a wind and rain hood is required.

The VC Series has an IPX5 Rating. <sup>B</sup>

**DESCRIPTION**

The VC series of tubular radiant heaters are available in BTUH inputs ranging from 60,000 to 200,000 and in system lengths from 20 to 80 feet (see the following pages for BTUH/system length combinations). All sizes are available for use with natural gas or optional propane gas. Tubular radiant heaters are engineered to provide quiet, reliable, energy-efficient, comfort level heating for both spot and space applications.

These radiant heaters are ready for use for elevations up to 2,000 ft. (610 M) above sea level. For installations in the U.S. above 2,000 ft., a high elevation adapter kit is available. Units can also be installed above 2,000 ft. elevation in Canada - see the installation manual for details.

The VC series is designed with a (300 series grade) stainless steel burner/control box housing a power burner that fires into a combustion chamber and heat exchanger tubes, 20 to 80 feet in length. The burner is equipped with a positive pressure blower for supplying combustion air and a multi-try direct spark ignition with soft lockout. Controls include a single-stage (Model VCS) or two-stage (Model VCT) gas valve and a pressure switch to verify combustion air flow.

The Calcoat™ tubes are in 10-foot sections with each section having an aluminized steel reflector. Optional stainless steel (400 series grade) reflectors are also available. Optional stainless steel "L" and "U" shaped tubes as well as 5 ft. (1.5 M) tube sections are also available. These accessories allow the radiant tube system configuration to adapt to various applications. A tubular system including an optional "U" tube provides the best balance of radiant emission over the length of any system.

Combustion air can either come from the heated space or be piped from the outside. A fresh, combustion air inlet adapter is standard, and must be used (1) if the building atmosphere has negative pressure; (2) if the building atmosphere is mildly dirty or dusty; (3) if the heater is being installed in a tightly closed room that does not provide required air for combustion. Failure to use combustion air inlet kit for units installed in mildly dirty or dusty environments will void the warranty. For outdoor installation, or indoor installation in damp environments, an optional wind and rain hood must be used.

Venting may be either vertical or horizontal. Some applications allow for VC series to be installed unvented; however a rain vent hood is required on wet environments such as car washes.

VC Series tubular heater systems are shipped in modular packages requiring field assembly and installation. Standard features, such as wire form hangers for chain suspension, compression coupling tube connections, and terminal board thermostat connection, are designed to facilitate installation.

These heaters are approved for use in the United States and Canada by the Canadian Standards Association (CSA).

<sup>B</sup> IP is the Ingress Protection Rating or International Protection Rating. This is a standard rating intended to quantify the amount of protection. Each number following the "IP" indicates a level of protection.

The first number represents the size of solid particles from which the system is protected. This does not apply to the VC series, so an "X" replaces the number value.

The second number indicates the level of protection of the enclosed system from the ingress of water. A "5" level rating states the system is protected against water jets.

Several websites offer more detailed description. For more information run a search for "Ingress Protection Rating."

### STANDARD FEATURES

- Natural gas operation
- Stainless steel (300 series grade) burner box
- Full input rate for elevations up to 2,000 ft.
- 115/1/60 supply voltage
- Multi-try direct ignition with soft lockout
- Single-stage combination gas valve (Model VCS)
- Two-stage combination gas valve (Model VCT)
- Pre-purge and post-purge
- Differential air pressure switch to verify combustion air flow
- Diagnostic indicator lights (ignition circuit board)
- Operation indicator lights
  - Red light - power on
  - One amber light - burner on (Model VCS)
  - Two amber lights - burner on hi/lo (Model VCT)
- Calcoat combustion chamber and heat exchanger tubes (10 ft. length)
- Stainless steel (300 series grade) compression coupling tube connections
- Stainless steel (400 series grade) wire form hangers
- Stainless steel (400 series grade) reflectors (10 ft. lengths) that overlap for continuous reflector system
- Horizontal or vertical venting
- 24-volt controls
- Fresh, combustion air inlet adapter

### OPTIONAL FEATURES - Factory Installed

- 208/1/60 supply voltage (Contact your Factory Agent for availability and lead time)
- 230/1/60 supply voltage (Contact your Factory Agent for availability and lead time)
- 220/240/1/50 supply voltage (Contact your Factory Agent for availability and lead time)

### OPTIONAL FEATURES - Field Installed

- Stainless steel "U" heat exchanger tube with reflector
- Stainless steel "L" heat exchanger tube(s) with reflector(s)
- Stainless steel 5-ft. heat exchanger tube(s) with reflector
- Stainless steel (400 series grade) reflector end caps
- Stainless steel hanger kit - chains and "S" hooks
- Stainless steel turnbuckle kits
- Stainless steel wind and rain hood
- Stainless steel flexible gas connector (U.S. only)
- High elevation conversion kit (for installations in the U.S. above 2,000 ft.)
- Propane conversion kits
- Stainless steel vent cap
- Manual shutoff valve & union
- Single-stage thermostat (VCS)
- Two-stage thermostat (VCT)

### TECHNICAL DATA

| Size                               |                   |                          | 60           | 80           | 100          | 125          | 150           | 170           | 200           |
|------------------------------------|-------------------|--------------------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| Heating Capacity                   | High <sup>A</sup> | MBH                      | 60           | 80           | 100          | 125          | 150           | 170           | 200           |
|                                    |                   | (kW)                     | (18)         | (23)         | (29)         | (37)         | (44)          | (50)          | (59)          |
|                                    | Low <sup>B</sup>  | MBH                      | 45           | 60           | 65           | 95           | 100           | 125           | 150           |
|                                    |                   | (kW)                     | (13)         | (18)         | (19)         | (28)         | (29)          | (37)          | (44)          |
| Length Range                       | Model VCS         | ft                       | 20 - 40      | 30 - 40      | 30 - 50      | 30 - 60      | 40 - 70       | 50 - 80       | 50 - 80       |
|                                    |                   | (M)                      | (6.1 - 12.1) | (6.1 - 12.1) | (9.1 - 15.2) | (9.1 - 18.3) | (12.1 - 21.3) | (15.2 - 24.4) | (15.2 - 24.4) |
|                                    | Model VCT         | ft                       | 30 - 40      | 30 - 40      | 30 - 40      | 30 - 50      | 40 - 60       | 50 - 70       | 50 - 70       |
|                                    |                   | (M)                      | (9.1 - 12.1) | (9.1 - 12.1) | (9.1 - 12.1) | (9.1 - 15.2) | (12.1 - 18.3) | (15.2 - 21.3) | (15.2 - 21.3) |
| Minimum Gas Pressure (inches w.c.) |                   | Natural Gas <sup>C</sup> | 5.0          | 5.0          | 5.0          | 5.0          | 5.0           | 7.0           | 7.0           |
|                                    |                   | Propane                  | 11.0         | 11.0         | 11.0         | 11.0         | 11.0          | 11.0          | ■             |
| Max. Supply Pressure (inches w.c.) |                   | Natural Gas              | 14.0         | 14.0         | 14.0         | 14.0         | 14.0          | 14.0          | 14.0          |
|                                    |                   | Propane                  | 14.0         | 14.0         | 14.0         | 14.0         | 14.0          | 14.0          | ■             |
| Ship Weight (Burner Box only)      |                   | lbs.                     | 38           | 38           | 38           | 38           | 38            | 38            | 38            |
|                                    |                   | (kg)                     | (17.3)       | (17.3)       | (17.3)       | (17.3)       | (17.3)        | (17.3)        | (17.3)        |

<sup>A</sup> High capacity heating applies to Model VCS (single-stage heater). It also applies to Model VCT (two-stage heater) when fired at high capacity.

<sup>B</sup> Low capacity heating applies to Model VCT when fired at low capacity.

<sup>C</sup> Minimum natural gas pressure shown for Model VCS. Model VCT (two-stage heater) requires 7 in. w.c. minimum gas pressure for all sizes when used with natural gas.



### Basic Model Selection

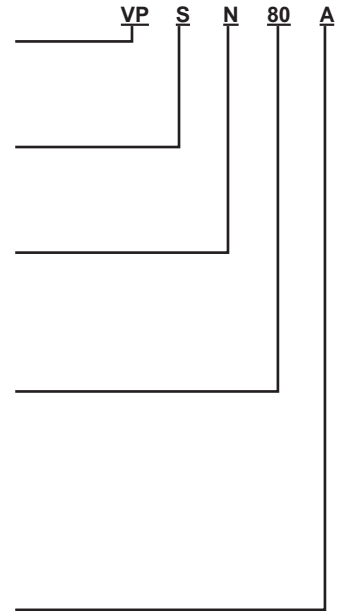
| Description  | Model |
|--|-------|
| Positive Pressure Radiant Heater                   | VP    |
| Harsh Environment Positive Pressure Radiant Heater | VC    |

| Description  | Type |
|--------------|------|
| Single Stage | S    |
| Two-Stage    | T    |

| Description | Gas Type |
|-------------|----------|
| Natural Gas | N        |
| Propane     | P        |

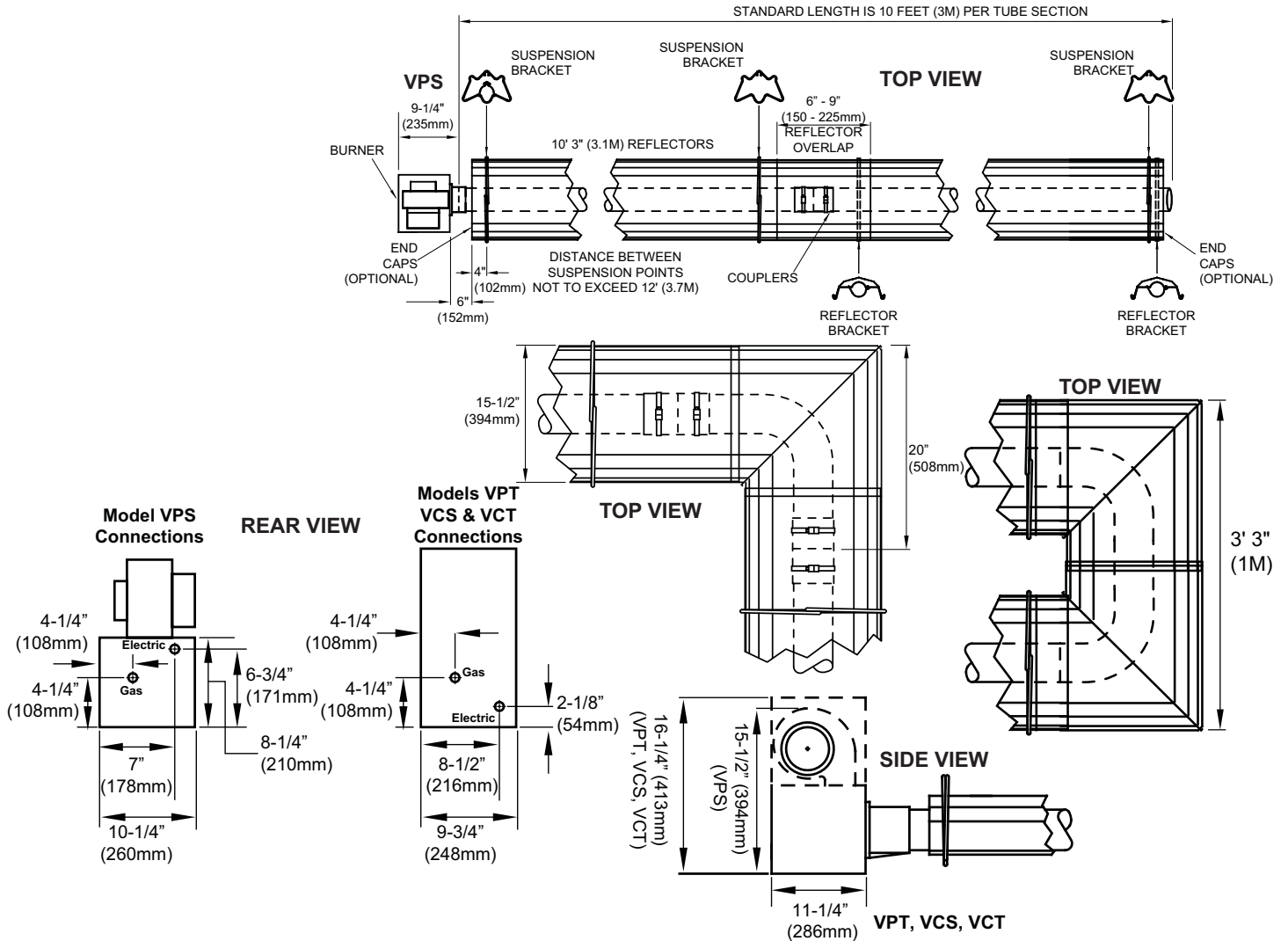
| MBH Input | Size |
|-----------|------|
| 60        | 60   |
| 80        | 80   |
| 100       | 100  |
| 125       | 125  |
| 150       | 150  |
| 170       | 170  |
| 200       | 200  |

| Electrical Supply |   |
|-------------------|---|
| 120/24V           | A |
| 208/24V           | B |
| 240/24V           | C |
| 120/120V          | D |
| 208/120V          | E |
| 240/120V          | F |



### DIMENSIONS

The following illustrations will help to determine the overall dimensions of a complete infrared, tube heating system. Due to overlapping reflectors, etc., some dimensions are subject to change. For more detailed layout designs and dimensions, please refer to the installation manual.



### NET WEIGHTS

Use the following tables to determine the installed weight of the radiant tube system. Simply add the weights for the different components. The formula to use is the weight of the Burner Box (B) plus the number of ten foot tube and reflector sections (we'll call it N - for a twenty foot long system use "2") times the 10 ft. tube sections (T) plus any other sections - 5 foot section (F), "U" tube section (U) plus "L" tube section (L).

The formula would be

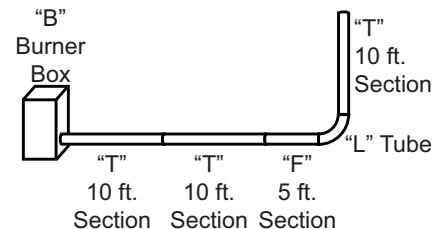
$$\text{Installed Weight} = B + (N \times T) + F + U + L$$

For the example installation below for a Model VCS, there would be a burner box, 3 - ten foot sections, a 5 foot section and an "L" tube. U would equal zero (0) since no "U" tube is installed.

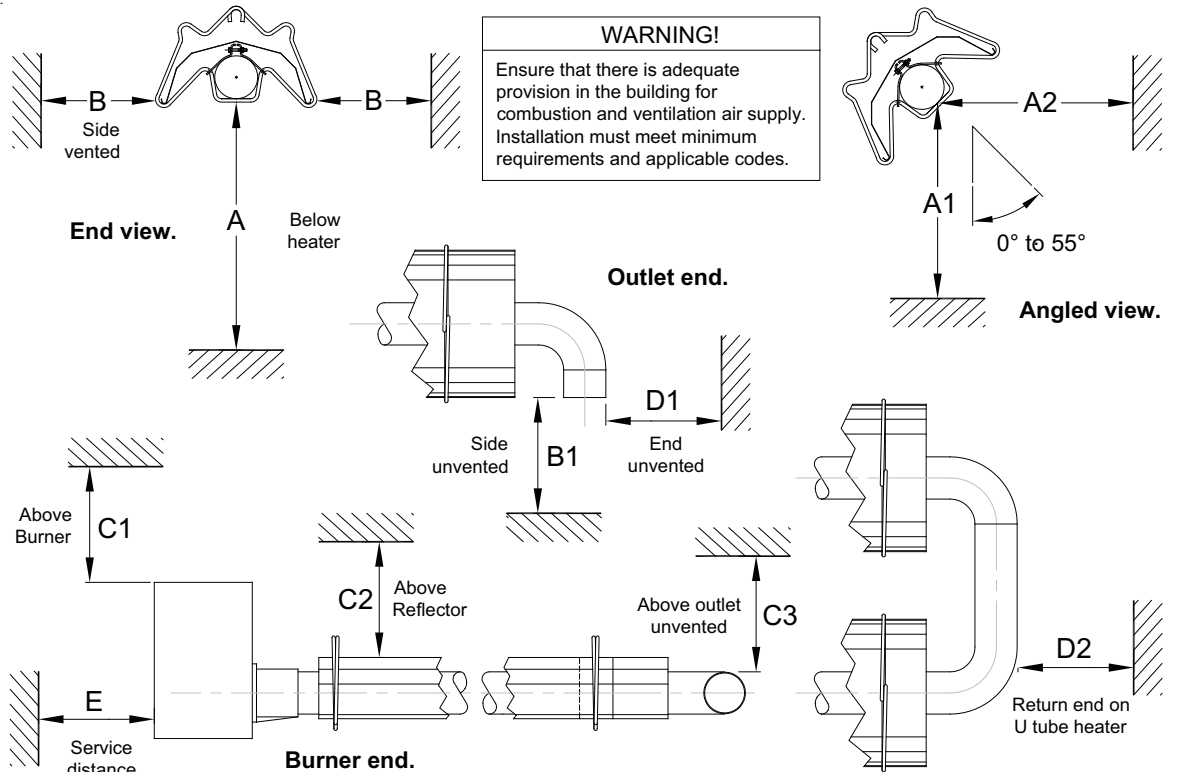
$$\text{Installed Weight} = 34 + (3 \times 14.5) + 10 + 0 + 10$$

The total installed weight would be 97.5 lbs. or 44.2 kg.

| Model | B<br>Burner Box |        |
|-------|-----------------|--------|
|       | lb.             | (kg)   |
| VPS   | 25              | (11.5) |
| VPT   | 29              | (13.3) |
| VCS   | 34              | (15.3) |
| VCT   | 38              | (17.2) |

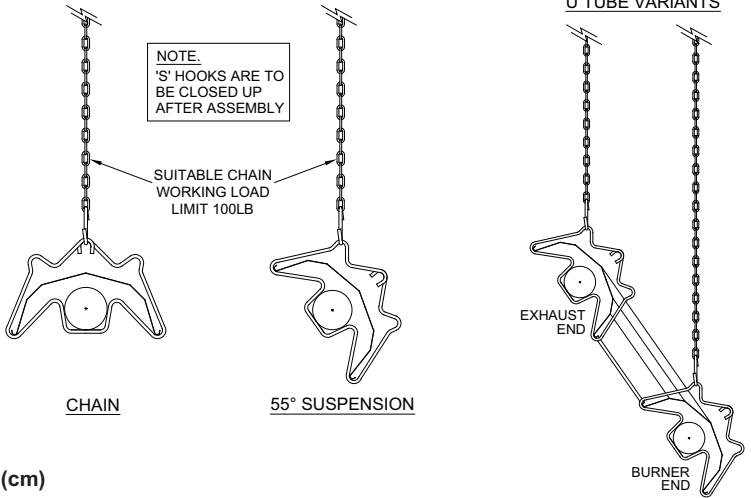


|                                    | T                         |       | F                 |       | U                |       | L                |       |
|------------------------------------|---------------------------|-------|-------------------|-------|------------------|-------|------------------|-------|
|                                    | 10 Ft Tube and Reflectors |       | 5 Ft Tube Section |       | "U" Tube Section |       | "L" Tube Section |       |
| Tube Material                      | lb.                       | (kg)  | lb.               | (kg)  | lb.              | (kg)  | lb.              | (kg)  |
| <b>Rolled Steel and/or Calcoat</b> | 13                        | (5.9) | 7                 | (3.2) | 13               | (5.9) | 10               | (4.5) |



**NOTE:** The minimum clearances to combustible materials are given in the table below. These minimum distances **MUST** be adhered to at all times.

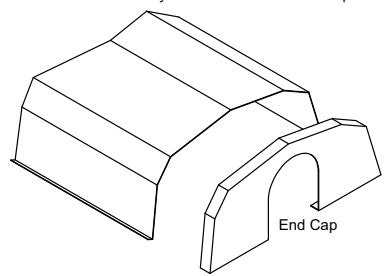
**NOTE:** 'S' HOOKS ARE TO BE CLOSED UP AFTER ASSEMBLY



### Minimum and Recommended Mounting Heights Feet (Meters)

| Size | Standard   |                    | Angled     |                    |
|------|------------|--------------------|------------|--------------------|
|      | min ft (M) | recommended ft (M) | min ft (M) | recommended ft (M) |
| 60   | 12 (3.7)   | 14 (4.3)           | 10 (3.0)   | 11 (3.4)           |
| 80   | 12 (3.7)   | 14 (4.3)           | 10 (3.0)   | 11 (3.4)           |
| 100  | 14 (4.3)   | 16 (4.9)           | 12 (3.7)   | 13 (4.0)           |
| 125  | 14 (4.3)   | 16 (4.9)           | 12 (3.7)   | 13 (4.0)           |
| 150  | 16 (4.9)   | 18 (5.5)           | 14 (4.3)   | 15 (4.6)           |
| 170  | 16 (4.9)   | 18 (5.5)           | 14 (4.3)   | 15 (4.6)           |
| 200  | 18 (5.5)   | 20 (6.1)           | 16 (4.9)   | 17 (5.2)           |

<sup>A</sup> Clearances when system is fitted with end caps.



inches (cm)

| Model          | A              | A1/A2          | B              | B1          | C1          | C1 <sup>A</sup> | C2         | C3         | D1         | D2         | E          |
|----------------|----------------|----------------|----------------|-------------|-------------|-----------------|------------|------------|------------|------------|------------|
| 60             | 74<br>(188)    |                | 29<br>(74)     | 41<br>(105) | 20<br>(51)  | 10<br>(26)      | 8<br>(21)  | 22<br>(56) | 8<br>(21)  | 12<br>(31) | 12<br>(31) |
|                | 80             |                | 15° = 72 (183) | 29<br>(74)  | 41<br>(105) | 20<br>(51)      | 10<br>(26) | 8<br>(21)  | 22<br>(56) | 8<br>(21)  | 12<br>(31) |
| 25° = 68 (173) |                | 32<br>(82)     | 41<br>(105)    | 20<br>(51)  | 10<br>(26)  | 8<br>(21)       | 22<br>(56) | 8<br>(21)  | 16<br>(41) | 12<br>(31) |            |
| 35° = 61 (155) |                |                |                |             |             |                 |            |            |            |            |            |
| 45° = 53 (135) |                | 74<br>(188)    | 39<br>(99)     | 47<br>(120) | 20<br>(51)  | 10<br>(26)      | 8<br>(21)  | 22<br>(56) | 20<br>(51) | 18<br>(46) | 12<br>(31) |
| 55° = 42 (110) |                |                |                |             |             |                 |            |            |            |            |            |
| 125            | 74<br>(188)    |                | 39<br>(99)     | 47<br>(120) | 20<br>(51)  | 10<br>(26)      | 8<br>(21)  | 22<br>(56) | 20<br>(51) | 18<br>(46) | 12<br>(31) |
|                | 150            |                | 74<br>(188)    | 39<br>(99)  | 48<br>(122) | 20<br>(51)      | 10<br>(26) | 8<br>(21)  | 22<br>(56) | 20<br>(51) | 18<br>(46) |
| 170            |                | 86<br>(219)    | 15° = 82 (209) | 48<br>(122) | 48<br>(122) | 20<br>(51)      | 10<br>(26) | 11<br>(28) | 22<br>(56) | 20<br>(51) | 20<br>(51) |
|                | 25° = 78 (199) |                | 48<br>(122)    | 48<br>(122) | 20<br>(51)  | 10<br>(26)      | 11<br>(28) | 22<br>(56) | 20<br>(51) | 20<br>(51) | 12<br>(31) |
|                | 35° = 71 (181) |                |                |             |             |                 |            |            |            |            |            |
|                | 45° = 61 (155) |                |                |             |             |                 |            |            |            |            |            |
| 200            | 86<br>(219)    | 55° = 50 (127) | 48<br>(122)    | 48<br>(122) | 20<br>(51)  | 10<br>(26)      | 11<br>(28) | 22<br>(56) | 20<br>(51) | 20<br>(51) | 12<br>(31) |

### Single-Stage Heaters

| Models<br>VPS, VCS | U Tube |     |     |     | Straight Tube |     |     |     |     |     |     |  | 1 or 2 "L"<br>Tube Kits |
|--------------------|--------|-----|-----|-----|---------------|-----|-----|-----|-----|-----|-----|--|-------------------------|
|                    | U20    | U40 | U60 | U80 | S20           | S30 | S40 | S50 | S60 | S70 | S80 |  |                         |
| 60                 | ✓      | ✓   |     |     | ✓             | ✓   | ✓   |     |     |     |     |  | ✓                       |
| 80                 |        | ✓   |     |     |               | ✓   | ✓   |     |     |     |     |  | ✓                       |
| 100                |        | ✓   |     |     |               | ✓   | ✓   | ✓   |     |     |     |  | ✓                       |
| 125                |        | ✓   | ✓   |     |               | ✓   | ✓   | ✓   | ✓   |     |     |  | ✓                       |
| 150                |        | ✓   | ✓   |     |               |     | ✓   | ✓   | ✓   | ✓   |     |  | ✓                       |
| 170                |        |     | ✓   | ✓   |               |     |     | ✓   | ✓   | ✓   | ✓   |  | ✓                       |
| 200                |        |     | ✓   | ✓   |               |     |     | ✓   | ✓   | ✓   | ✓   |  | ✓                       |

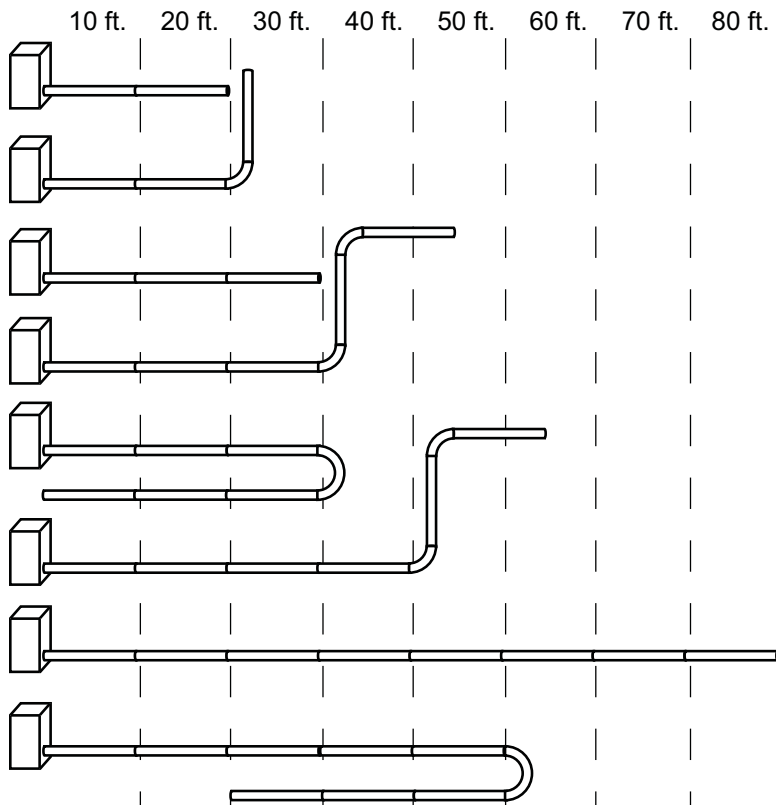
### Two-Stage Heaters

| Models<br>VPT, VCT | U Tube |     |     |     | Straight Tube |     |     |     |     |     |     |  | 1 or 2 "L"<br>Tube Kits |
|--------------------|--------|-----|-----|-----|---------------|-----|-----|-----|-----|-----|-----|--|-------------------------|
|                    | U20    | U40 | U60 | U80 | S20           | S30 | S40 | S50 | S60 | S70 | S80 |  |                         |
| 60                 | ✓      | ✓   |     |     | ✓             | ✓   | ✓   |     |     |     |     |  | ✓                       |
| 80                 |        | ✓   |     |     |               | ✓   | ✓   |     |     |     |     |  | ✓                       |
| 100                |        | ✓   |     |     |               | ✓   | ✓   |     |     |     |     |  | ✓                       |
| 125                |        | ✓   |     |     |               | ✓   | ✓   | ✓   |     |     |     |  | ✓                       |
| 150                |        | ✓   | ✓   |     |               |     | ✓   | ✓   | ✓   |     |     |  | ✓                       |
| 170                |        |     | ✓   |     |               |     |     | ✓   | ✓   | ✓   |     |  | ✓                       |
| 200                |        |     | ✓   |     |               |     |     | ✓   | ✓   | ✓   |     |  | ✓                       |

<sup>A</sup> For use with natural gas only

### TYPICAL HEATER CONFIGURATIONS

The following sketches are representative of various ways the tubular, radiant heaters can be configured. It is important to follow the limitations listed in the note section below and the table above. Alternate configurations are available. Some configurations are limited to single stage heaters (Models VPS or VCS) only.



**NOTE:**  
 The minimum and maximum length are shown for each burner box. A five foot tube section (package -HS) can be added for system lengths between the minimum and maximum length.  
 Example:  
 VCS-30 can be used with 35 or 45 ft. tube system lengths. It can NOT be used for 25 or 55 ft. lengths.

#### NOTE:

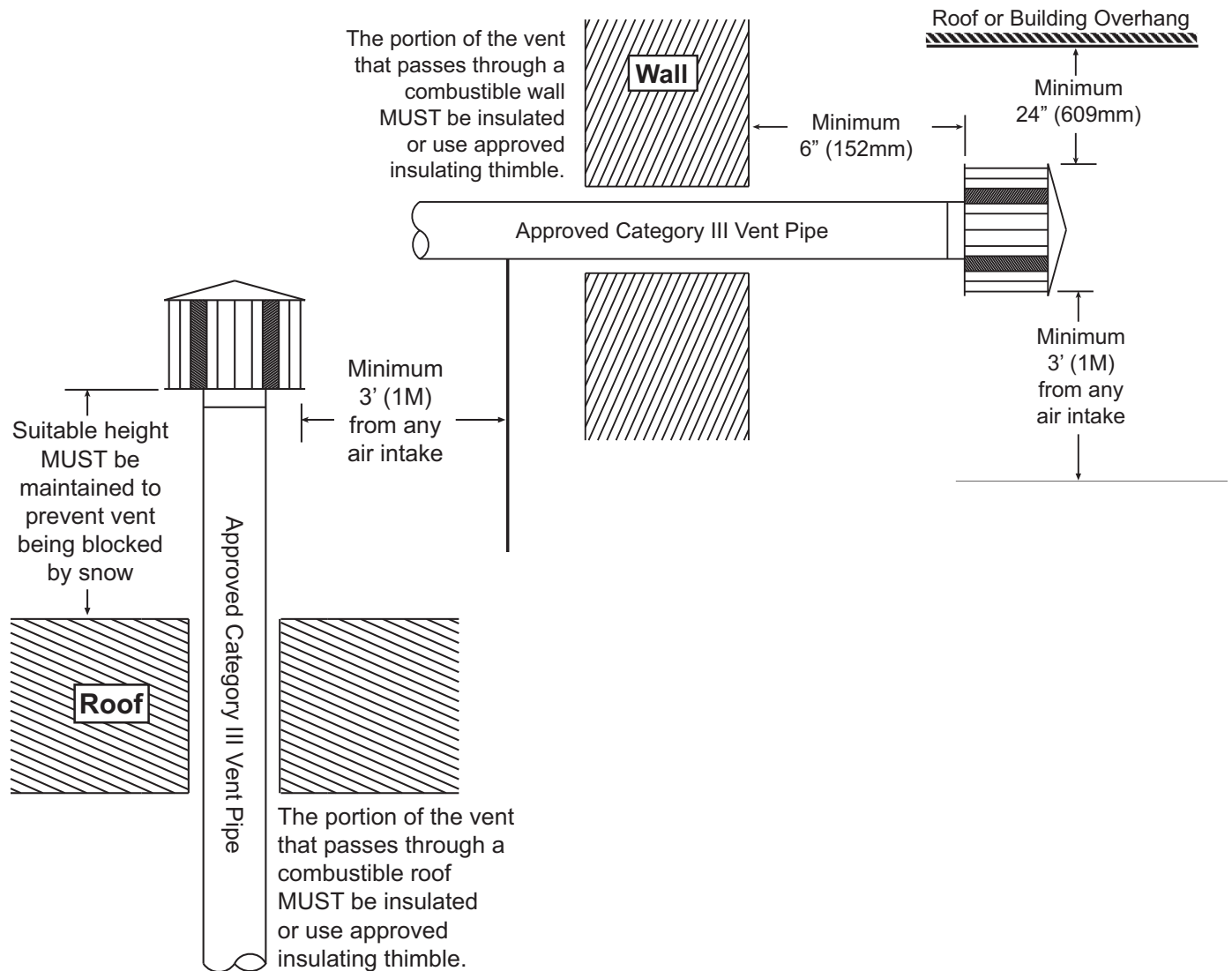
- The minimum length allowed is 20 ft. The maximum length allowed is 80 ft. A five foot tube section (package -H or -HS) can be added for lengths between 25 and 75 ft. Total tube system lengths of 15 ft and 85 ft. are NOT allowed.
- "U" and "L" tubes must be installed AT or AFTER the halfway length of the tube system. For example: on a 60 ft. system, the "U" or "L" tube must be installed at least 30 ft. from the burner box.
- Limited number of bends
  - » Maximum two "L" tubes may be used in a single system
  - » Maximum one "U" tube may be used in a single system
  - » Maximum one "U" tube AND one "L" tube may be used ONLY if the "L" tube is the last section in the system

### HORIZONTAL OR VERTICAL VENTING

Heaters may vented vertically or horizontally using approved category B vent cap. Distances from adjacent public walkways, adjacent buildings, openable windows and other building openings, must be consistent with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the Natural Gas and Propane Installation Code, CSA B149.1.

See maximum vent length tabel (right). The exhaust vent may include up to two (2) 90° radius elbows. For complete venting instructions see the installation manual.

| Vent Diameter |       | Maximum Vent Lengths |       |
|---------------|-------|----------------------|-------|
| in.           | (mm)  | ft.                  | (M)   |
| 4             | (102) | 12                   | (3.7) |
| 6             | (152) | 25                   | (7.6) |



### UNVENTED UNITS

Heaters may be installed without a vent providing the applicable building codes are met and consideration is properly given to condensation on cold surfaces. Installation shall meet the following requirements when unvented:

- Internal volume of the heated room must be greater than 214cu.ft. per 100 BTU/HR of heaters installed.
- OR
- Natural or mechanical means shall be provided to supply and exhaust at least 4 CFM per 1000 BTU per hour input of installed heaters.
  - Combustion gasses shall not impinge on combustible materials with a temperature in excess of 150°F.

### TUBE PACKAGE ASSEMBLY CONTENTS

When ordering a tube package for Model VPS or VPT, specify complete model: i.e. VP-A for a 20 foot long section of tubes (one Calcoat and one rolled steel). For humid environments, specify Model VC-.

| Model VP-                               | A         | B         | C         | D         | E         | H        | U         | L         |
|---|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|
| Part Number                             | 270270    | 270271    | 270272    | 270273    | 270274    | 270275   | 270276    | 270277    |
| <b>Ship Weight (lbs.)</b>               | <b>26</b> | <b>39</b> | <b>39</b> | <b>26</b> | <b>39</b> | <b>7</b> | <b>13</b> | <b>10</b> |
| 10 foot Calcoat™ combustion chamber     | 1         | 1         | 2         | -         | -         | -        | -         | -         |
| 10 foot rolled steel heat exchanger(s)  | 1         | 2         | 1         | 2         | 3         | -        | -         | -         |
| 5 foot rolled steel heat exchanger      | -         | -         | -         | -         | -         | 1        | -         | -         |
| Rolled steel "u" tube                   | -         | -         | -         | -         | -         | -        | 1         | -         |
| Rolled steel "l" tube                   | -         | -         | -         | -         | -         | -        | -         | 1         |
| 10 foot reflectors                      | 2         | 3         | 3         | 2         | 3         | -        | -         | -         |
| 5 foot reflector                        | -         | -         | -         | -         | -         | 1        | -         | -         |
| Corner reflector(s)                     | -         | -         | -         | -         | -         | -        | 2         | 1         |
| Tube coupler(s)                         | 1         | 2         | 2         | 2         | 3         | 1        | 1         | 1         |
| Suspension bracket(s)                   | 2         | 3         | 3         | 2         | 3         | 1        | 1         | 1         |
| Reflector support bracket assembly(ies) | 2         | 3         | 3         | 2         | 3         | 1        | 1         | -         |
| Turbulators                             | 3         | 5         | -         | 4         | -         | -        | -         | -         |

| Model VC-   | AS        | BS        | HS        | US        | LS        |
|---|-----------|-----------|-----------|-----------|-----------|
| Part Number   | 270280    | 270281    | 270282    | 270283    | 270284    |
| <b>Ship Weight (lbs.)</b>                               | <b>29</b> | <b>44</b> | <b>10</b> | <b>17</b> | <b>10</b> |
| 10 foot Calcoat tubes                                   | 2         | 3         | -         | -         | -         |
| 5 foot stainless steel heat exchanger                   | -         | -         | 1         | -         | -         |
| Stainless steel "u" tube                                | -         | -         | -         | 1         | -         |
| Stainless steel "l" tube                                | -         | -         | -         | -         | 1         |
| 10 foot stainless steel reflectors                      | 2         | 3         | -         | -         | -         |
| 5 stainless steel foot reflector                        | -         | -         | 1         | -         | -         |
| Stainless steel corner reflector(s)                     | -         | -         | -         | 2         | 1         |
| Stainless steel tube coupler(s)                         | 2         | 3         | 1         | 1         | 1         |
| Stainless steel suspension bracket(s)                   | 2         | 3         | 1         | 1         | 1         |
| Stainless steel reflector support bracket assembly(ies) | 2         | 3         | 1         | 1         | -         |
| Turbulators   | 3         | 5         | -         | -         | -         |

### TUBE PACKAGE SELECTION MATRIX

To order modular components for easy stocking or replacement of lost/damaged components select burner boxes and tube packages individually. Tube packages can be ordered by model numbers.

The table below shows which tube packages, and burner inserts, should be ordered for various system lengths. Burner insert option codes and quantity (in parenthesis) shown on rows marked "Inserts." in the table below. Please contact your Factory Representative for assistance.

NOTE: When using a "U" or "L" bend tube, refer to the installation manual to determine whether a burner insert is required.

#### VP Series Tube Package Matrix

|                    |             | Natural Gas | 60         | 80         | 100                     | 125                         | 150                         | 170                         | 200        |
|--------------------|-------------|-------------|------------|------------|-------------------------|-----------------------------|-----------------------------|-----------------------------|------------|
| System Length (ft) | 20          | Tube Pkg(s) | VP-A       | ■          | ■                       | ■                           | ■                           | ■                           | ■          |
|                    |             | Inserts     | TB1        |            |                         |                             |                             |                             |            |
|                    | 30          | Tube Pkg(s) | VP-b       | VP-b       | VP-b                    | VP-b                        | ■                           | ■                           | ■          |
|                    |             | Inserts     | TB1        | TB1        | TB1                     | TB2                         |                             |                             |            |
|                    | 40          | Tube Pkg(s) | VP-A, VP-d | VP-A, VP-d | VP-A, VP-d              | VP-A, VP-d                  | VP-A, VP-d                  | ■                           | ■          |
|                    |             | Inserts     | TB1        | TB1        |                         | TB2                         | -                           |                             |            |
|                    | 50          | Tube Pkg(s) | ■          | ■          | VP-A, VP-E <sup>#</sup> | VP-A, VP-E                  | VP-A, VP-E                  | VP-C, VP-d                  | VP-C, VP-d |
|                    |             | Inserts     |            |            | TB1                     | TB2                         | -                           | -                           | -          |
| 60                 | Tube Pkg(s) | ■           | ■          | ■          | VP-C, VP-E <sup>#</sup> | VP-C, VP-E                  | VP-C, VP-E                  | VP-C, VP-E                  |            |
|                    | Inserts     |             |            |            | TB2                     | -                           | -                           | -                           |            |
| 70                 | Tube Pkg(s) | ■           | ■          | ■          | ■                       | VP-C, (2) VP-d <sup>#</sup> | VP-C, (2) VP-d              | VP-C, (2) VP-d              |            |
|                    | Inserts     |             |            |            |                         | -                           | -                           | -                           |            |
| 80                 | Tube Pkg(s) | ■           | ■          | ■          | ■                       | ■                           | VP-A, (2) VP-b <sup>#</sup> | VP-A, (2) VP-b <sup>#</sup> |            |
|                    | Inserts     |             |            |            |                         |                             | -                           | -                           |            |

|                    |             | Propane     | 60         | 80         | 100                     | 125                         | 150                         | 170        | 200 |
|--------------------|-------------|-------------|------------|------------|-------------------------|-----------------------------|-----------------------------|------------|-----|
| System Length (ft) | 20          | Tube Pkg(s) | VP-A       | ■          | ■                       | ■                           | ■                           | ■          | ■   |
|                    |             | Inserts     | -          |            |                         |                             |                             |            |     |
|                    | 30          | Tube Pkg(s) | VP-b       | VP-b       | VP-b                    | VP-b                        | ■                           | ■          | ■   |
|                    |             | Inserts     | -          | -          | -                       | -                           |                             |            |     |
|                    | 40          | Tube Pkg(s) | VP-A, VP-d | VP-A, VP-d | VP-A, VP-d              | VP-A, VP-d                  | VP-A, VP-d                  | ■          | ■   |
|                    |             | Inserts     | -          | -          | -                       | -                           | -                           |            |     |
|                    | 50          | Tube Pkg(s) | ■          | ■          | VP-A, VP-E <sup>#</sup> | VP-A, VP-E                  | VP-A, VP-E                  | VP-C, VP-d | ■   |
|                    |             | Inserts     |            |            | -                       | -                           | -                           | -          | -   |
| 60                 | Tube Pkg(s) | ■           | ■          | ■          | VP-C, VP-E <sup>#</sup> | VP-C, VP-E                  | VP-C, VP-E                  | ■          |     |
|                    | Inserts     |             |            |            | -                       | -                           | -                           | -          |     |
| 70                 | Tube Pkg(s) | ■           | ■          | ■          | ■                       | VP-C, (2) VP-d <sup>#</sup> | VP-C, (2) VP-d              | ■          |     |
|                    | Inserts     |             |            |            |                         | -                           | -                           | -          |     |
| 80                 | Tube Pkg(s) | ■           | ■          | ■          | ■                       | ■                           | VP-A, (2) VP-b <sup>#</sup> | ■          |     |
|                    | Inserts     |             |            |            |                         |                             | -                           | -          |     |

<sup>#</sup> Not available in two-stage (Model VCT or VPT).

### VC Series Tube Package Matrix

| Natural Gas        |    | 60          | 80        | 100       | 125            | 150          | 170                | 200                |
|--------------------|----|-------------|-----------|-----------|----------------|--------------|--------------------|--------------------|
| System Length (ft) | 20 | Tube Pkg(s) | VC-AS     | ■         | ■              | ■            | ■                  | ■                  |
|                    |    | Inserts     | TB1       |           |                |              |                    |                    |
|                    | 30 | Tube Pkg(s) | VC-bS     | VC-bS     | VC-bS          | VC-bS        | ■                  | ■                  |
|                    |    | Inserts     | TB1       | TB1       | TB1            | TB2          |                    |                    |
|                    | 40 | Tube Pkg(s) | (2) VC-AS | (2) VC-AS | (2) VC-AS      | (2) VC-AS    | (2) VC-AS          | ■                  |
|                    |    | Inserts     | TB1       | TB1       | TB1            | TB2          | -                  |                    |
|                    | 50 | Tube Pkg(s) | ■         | ■         | VC-AS, VC-bS # | VC-AS, VC-bS | VC-AS, VC-bS       | VC-AS, VC-bS       |
|                    |    | Inserts     |           |           | TB1            | TB2          | -                  | -                  |
|                    | 60 | Tube Pkg(s) | ■         | ■         | ■              | (2) VC-bS #  | (2) VC-bS          | (2) VC-bS          |
|                    |    | Inserts     |           |           |                | TB2          | -                  | -                  |
|                    | 70 | Tube Pkg(s) | ■         | ■         | ■              | ■            | (2) VC-AS, VC-bS # | (2) VC-AS, VC-bS   |
|                    |    | Inserts     |           |           |                |              | -                  | -                  |
|                    | 80 | Tube Pkg(s) | ■         | ■         | ■              | ■            | ■                  | VC-AS, (2) VCS-b # |
|                    |    | Inserts     |           |           |                |              |                    | -                  |

| Propane            |    | 60          | 80        | 100       | 125            | 150          | 170                | 200                |
|--------------------|----|-------------|-----------|-----------|----------------|--------------|--------------------|--------------------|
| System Length (ft) | 20 | Tube Pkg(s) | VC-AS     | ■         | ■              | ■            | ■                  | ■                  |
|                    |    | Inserts     | -         |           |                |              |                    |                    |
|                    | 30 | Tube Pkg(s) | VC-bS     | VC-bS     | VC-bS          | VC-bS        | ■                  | ■                  |
|                    |    | Inserts     | -         | -         | -              | -            |                    |                    |
|                    | 40 | Tube Pkg(s) | (2) VC-AS | (2) VC-AS | (2) VC-AS      | (2) VC-AS    | (2) VC-AS          | ■                  |
|                    |    | Inserts     | -         | -         | -              | -            | -                  |                    |
|                    | 50 | Tube Pkg(s) | ■         | ■         | VC-AS, VC-bS # | VC-AS, VC-bS | VC-AS, VC-bS       | VC-AS, VC-bS       |
|                    |    | Inserts     |           |           | -              | -            | -                  | -                  |
|                    | 60 | Tube Pkg(s) | ■         | ■         | ■              | (2) VC-bS #  | (2) VC-bS          | (2) VC-bS          |
|                    |    | Inserts     |           |           |                | -            | -                  | -                  |
|                    | 70 | Tube Pkg(s) | ■         | ■         | ■              | ■            | (2) VC-AS, VC-bS # | (2) VC-AS, VC-bS   |
|                    |    | Inserts     |           |           |                |              | -                  | -                  |
|                    | 80 | Tube Pkg(s) | ■         | ■         | ■              | ■            | ■                  | VC-AS, (2) VCS-b # |
|                    |    | Inserts     |           |           |                |              |                    | -                  |

# Not available in two-stage (Model VCT or VPT).

**NOTE:**

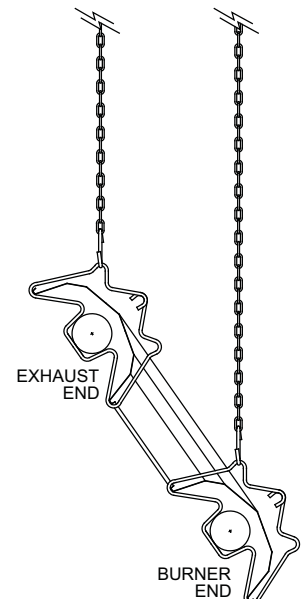
The minimum and maximum length are shown for each burner box. A 5-ft. tube section (package -H or -HS) can be added for system lengths between the minimum and maximum length.

**Example:**

Model VPS-30 can be used with 35 or 45 ft. tube system lengths. It can NOT be used for 25 or 55 ft. lengths.

When using a 5-ft. section, "U," or "L" bend tube, refer to the installation manual to determine whether a burner insert is required.

*NOTE: On "U" tube installation when the heater is installed at an angle, it should slope UPWARDS towards the EXHAUST END.*



### VP SERIES - POSITIVE PRESSURE RADIANT HEATERS

#### HEATING SPECIFICATIONS

Provide Model VP\_ gas-fired tubular radiant heaters. The heaters shall be Model VPS/VPT, radiant tubular heating system with a power burner housed (on [Model VPS]) (in [Model VPT]) a burner/control box firing into a 4" diameter combustion chamber tube. The burner/control box and tubular system shall be designed for horizontal suspension.

Units shall be (60) (80) (100) (125) (150) (170) (200) MBH capacity, and shall be equipped for use with natural gas (supplied with propane conversion kit) with 115/1/60 (208/1/60) (230/1/60) (220-240/1/50) supply voltage. Units shall be approved for installation (up to 2,000 ft. above sea level [U.S.]) (over 2,000 ft. above sea level with a high elevation adapter [U.S.]) (up to 4,500 feet above sea level [Canada]).

Unit shall include a (single-stage [VPS]) (two-stage [VPT]) gas valve and a single-speed [VPS] (two-speed [VPT]) combustion fan. The burner control system shall have a 24-volt transformer; a multi-try direct spark ignition with soft lockout; (single-stage combination gas valve [Model VPS]) (two-stage gas valve [Model VPT]); LED diagnostic light; power "ON" indicator light; burner "ON" indicator light; (burner "HI/LOW" indicator light [Model VPT]); a power burner with pre-purge and post purge; and a differential air pressure switch to monitor combustion air. Gas connection to the unit must be with approved flexible connector.

#### TUBE SECTION

The tubular system shall include (Calcoat™ and rolled steel) (Calcoat™) tubes. Tube length shall be (20 ft.) (25 ft.) (30 ft.) (35 ft.) (40 ft.) (45 ft.) (50 ft.) (55 ft.) (60 ft.) (65 ft.) (70 ft.) (75 ft.) (80 ft.) and include (a "U" shaped tube) ([one] [two] "L" shaped tubes) (with a [burner insert] [turbulator strip]). Tubes will be connected to each other with (rolled steel) (stainless steel) couplings.

System shall also include aluminized steel (400 series stainless steel) overlapping reflectors with reflector retainers, (and end covers).

The entire system will be suspended with (aluminized steel) (stainless steel) suspension hangers, (standard [stainless steel] chain and "S" hooks). (System will be leveled by use of standard [stainless steel] turnbuckle kits.)

Heater may be vented horizontally or vertically and may operate on (inside) (outside) combustion air. Reflectors may be positioned from horizontal to 55° angle.

(Additional optional features to include flexible gas connector.)

#### CERTIFICATIONS

These units must be approved for use in the United States and Canada by the Canadian Standards Association (CSA). The manufacturer shall provide a 5-year limited warranty on the burner and all electrical and mechanical operating components and a 10-year limited warranty on the tubes.

(Capacities, lengths, illustrations, and additional field-installed options as described in catalog.)

### VC SERIES - HARSH ENVIRONMENT RADIANT HEATERS

#### HEATING SPECIFICATIONS

Provide Model VC\_ gas-fired tubular radiant heaters. The heaters shall be Model VCS/VCT, radiant tubular heating system with a power burner housed in a stainless steel burner/control box firing into a 4" diameter combustion chamber tube. The burner/control box and tubular system shall be designed for horizontal suspension.

Units shall be (60) (80) (100) (125) (150) (170) (200) MBH capacity, and shall be equipped for use with natural gas (supplied with propane conversion kit) with 115/1/60 (208/1/60) (230/1/60) (220-240/1/50) supply voltage. Units shall be approved for installation (up to 2,000 ft. above sea level [U.S.]) (over 2,000 ft. above sea level with a high elevation adapter [U.S.]) (up to 4,500 feet above sea level [Canada]).

Unit shall include a (single-stage [VCS]) (two-stage [VCT]) gas valve and a single-speed [VCS] (two-speed [VCT]) combustion fan. The burner control system shall have a 24-volt transformer; a multi-try direct spark ignition with soft lockout; (single-stage combination gas valve [Model VCS]) (two-stage gas valve [Model VCT]); LED diagnostic light; power "ON" indicator light; burner "ON" indicator light; (burner "HI/LOW" indicator light [Model VCT]); a power burner with pre-purge and post purge; and a differential air pressure switch to monitor combustion air. Gas connection to the unit must be with approved flexible connector.

#### TUBE SECTION

The tubular system shall include (Calcoat™ and rolled steel) (Calcoat™) tubes. Tube length shall be (20 ft.) (25 ft.) (30 ft.) (35 ft.) (40 ft.) (45 ft.) (50 ft.) (55 ft.) (60 ft.) (65 ft.) (70 ft.) (75 ft.) (80 ft.) and include (a "U" shaped tube) ([one] [two] "L" shaped tubes) (with a [burner insert] [turbulator strip]). Tubes will be connected to each other with stainless steel couplings.

System shall also include 400 series stainless steel overlapping reflectors with reflector retainers, (and end covers).

(The entire system will be suspended with stainless steel suspension hangers, stainless steel chain and "S" hooks). (System will be leveled by use of stainless steel turnbuckle kits.)

Heater may be vented horizontally or vertically and may operate on (inside) (outside) combustion air. Reflectors may be positioned from horizontal to 55° angle.

(Additional optional features to include wind and rain hood, flexible gas connector.)

#### CERTIFICATIONS

These units must be approved for use in the United States and Canada by the Canadian Standards Association (CSA). Unit shall have an IPX5 rating.

Units shall be approved for (indoor/outdoor commercial/industrial) (outdoor residential) applications.

(Capacities, lengths, illustrations, and additional field-installed options as described in catalog.)



## Limited Warranty Tubular Radiant Heaters

Nortek Global HVAC, LLC (manufacturer) warrants to the original owner-user that this product will be free from defects in material or workmanship. This warranty is limited to twelve (12) months from the date of original installation, whether or not actual use begins on that date, or eighteen (18) months from date of shipment, whichever occurs first.

### Extended Limited Warranty

**Models VCS, VCT, VPS, VPT,** - Extended nine (9)-year, non-prorated, limited warranty on all tubes. Extended four (4)-year, non-prorated, limited warranty on the burner and all electrical and mechanical operating components.

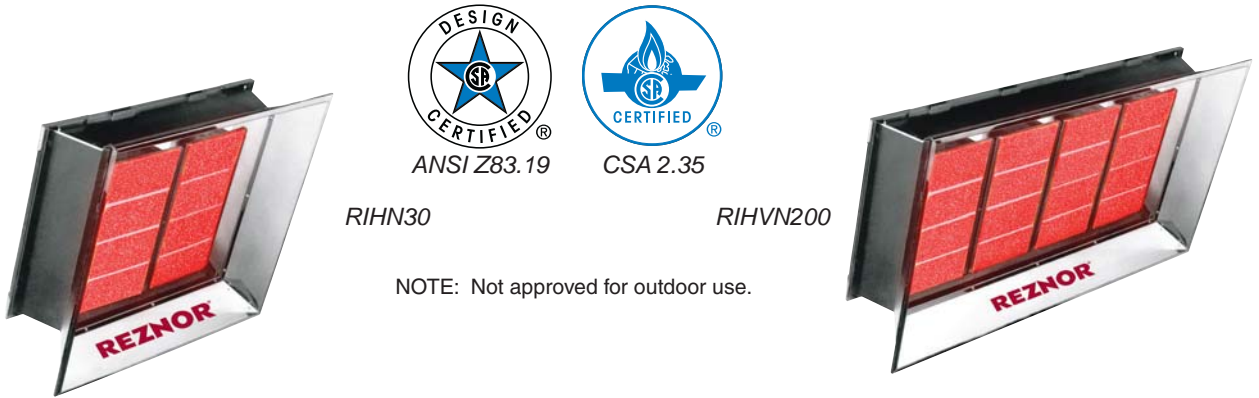
### Limitations and Exclusions

Manufacturer obligations under this warranty and the sole remedy for its breach are limited to repair, at its manufacturing facility, of any part or parts of its products which prove to be defective; or, in its sole discretion, replacement of such products. All returns of defective parts or products must include the product model number and serial number, and must be made through an authorized distributor or arranged through Customer Service. Authorized returns must be shipped prepaid. Repaired or replacement parts will be shipped F.O.B. shipping point.

1. The warranty provided herein does not cover charges for labor or other costs incurred in the troubleshooting, repair, removal, installation, service or handling of parts or complete products.
2. All claims under the warranty provided herein must be made within ninety (90) days from the date of discovery of the defect. Failure to notify manufacturer of a warranted defect within ninety (90) days of its discovery voids manufacturer obligations hereunder.
3. The warranty provided herein shall be void and of no effect in the event that (a) the product has been operated outside its designed output capacity (heating, cooling, airflow); (b) the product has been subjected to misuse, neglect, accident, improper or inadequate maintenance, corrosive environments, environments containing airborne contaminants (silicone, aluminum oxide, etc.), or excessive thermal shock; (c) unauthorized modifications are made to the product; (d) the product is not installed or operated in compliance with the manufacturer's printed instructions; (e) the product is not installed and operated in compliance with applicable building, mechanical, plumbing and electrical codes; or (f) the serial number of the product has been altered, defaced or removed.
4. The warranty provided herein is for repair or replacement only. Manufacturer shall not be liable for any loss, cost, damage, or expense of any kind arising out of a breach of the warranty. Further, manufacturer shall not be liable for any incidental, consequential, exemplary, special, or punitive damages, nor for any loss of revenue, profit or use, arising out of a breach of this warranty or in connection with the sale, maintenance, use, operation or repair of any product. In no event will manufacturer be liable for any amount greater than the purchase price of a defective product. The disclaimers of liability included in this paragraph 4 shall remain in effect and shall continue to be enforceable in the event that any remedy herein shall fail of its essential purpose.
5. THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY FOR MANUFACTURER'S PRODUCTS, AND IS IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES. MANUFACTURER SPECIFICALLY DISCLAIMS ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. No person or entity is authorized to bind manufacturer to any other warranty, obligation or liability for any product. Installation, operation or use of the product for which this warranty is issued shall constitute acceptance of the terms hereof.

# High Intensity Radiant Heaters

## MODEL RIH Gas Fired High Intensity Infrared Heaters for Indoor Commercial-Industrial Use



NOTE: Not approved for outdoor use.

### DESCRIPTION

High Intensity Infrared Models RIH, RIHV are designed to provide personal comfort heating with reduced energy cost. Units are available in sizes from 30,000 through 200,000 BTUH gas input for use with natural gas and sizes from 50,000 through 120,000 BTUH gas input for use with propane.

Infrared heaters can best be compared to the sun in how they heat. On a bright sunny day, you can feel the infrared rays of the sun heating your skin surface. The same infrared rays are also heating the concrete sidewalks and buildings. Infrared heating equipment works the same way - it warms people, heats floors, walls, machinery and other surfaces, without heating the air between. The "infrared heated" objects in turn warm the surrounding air. Eliminated are the costly ceiling heat losses and discomforts of cold air stratification that are so familiar with conventional forced air heating systems. Infrared heat assures floor level comfort with fuel savings up to 50%. Electrical energy is also saved because there is no need for a fan or blower.

In addition to the gas and electric energy savings, infrared heaters have other economical installation and operational features. Model RIH, RIHV heaters can be suspended by chains from a joist or mounted to a wall, making them well suited for space or spot heating. Direct venting is not required. Operational service and maintenance requirements are minimal due to the absence of moving parts.

Some sizes can be ordered with optional 2-stage heating. The first stage will fire at 1/2 or 2/3 of total capacity. If more heat is required second stage will fire for full capacity. A 2-stage thermostat **must** be used with 2-stage heaters. Two-stage operation provides fewer on/off cycles for improved comfort and longer life.

Model RIH, RIHV high intensity infrared units are design certified for use in The United States and Canada by the Canadian Standards Association (CSA).

### STANDARD FEATURES

- 115 volt operation for single-stage models, 24 volt operation for 2-stage models
- Direct spark ignition, 100% safety shut-off
- Solenoid gas valve, 1/2" NPT inlet
- Ceramic combustion surface temperature up to 1850°F, capable of reaching full intensity temperature in less than 30 seconds
- Seamless aluminized steel plenum chamber with stainless steel ceramic tile retainer clips
- Venturi mixer of spun metal construction for precision metering of air/gas mixture
- Highly polished aluminum reflector
- Balanced suspension holes, 3/8" diameter

### OPTIONAL FEATURES

- Limited lifetime warranty available on burner
- Parabolic reflector
- Wire grid for increased radiant efficiency
- Protective screens for standard reflector or parabolic reflector
- Heat deflector shield (to reduce required clearance above the heater) only available on 60 and 100 sizes
- 120/24V Thermostat (50° - 90°F)
- 2-Stage heating on sizes 90, 100, 120, 150
- 2-Stage 24V thermostat for use with 2-stage heaters only.
- Stainless steel flexible connector (24") with manual valve
- Chain (50 ft.) with 14 "S" hooks
- Chain mounting kit (pre-assembled for one heater) for mounting heater at a 30° angle

### TECHNICAL DATA

| MODELS                                |         | NATURAL GAS          |                      |                        |                        |             |                       | PROPANE GAS  |                       |                        |    |
|---------------------------------------|---------|----------------------|----------------------|------------------------|------------------------|-------------|-----------------------|--------------|-----------------------|------------------------|----|
|                                       |         | RIHN 30 <sup>A</sup> | RIHN 60 <sup>B</sup> | RIHVN 100 <sup>C</sup> | RIHVN 150 <sup>C</sup> | RIHVN 160   | RIHVN200 <sup>C</sup> | RIHL 50      | RIHVL 90 <sup>C</sup> | RIHVL 120 <sup>C</sup> |    |
| HEATING INPUT                         | MBH     | 30                   | 60                   | 100                    | 150                    | 160         | 200                   | 50           | 90                    | 120                    |    |
|                                       | kW      | 8.8                  | 17.6                 | 29.3                   | 44.0                   | 46.9        | 58.6                  | 14.7         | 26.4                  | 35.2                   |    |
| INLET GAS PRESSURE                    | MINIMUM | " w.c.               | 7                    | 7                      | 7                      | 7           | 7                     | 7            | 11                    | 11                     | 11 |
|                                       |         | mbar                 | 17                   | 17                     | 17                     | 17          | 17                    | 17           | 27                    | 27                     | 27 |
|                                       | MAXIMUM | " w.c.               | 14                   | 14                     | 14                     | 14          | 14                    | 14           | 14                    | 14                     | 14 |
|                                       |         | mbar                 | 35                   | 35                     | 35                     | 35          | 35                    | 35           | 35                    | 35                     | 35 |
| ALLOWABLE MOUNTING ANGLE (in degrees) |         | 0 - 30 deg.          | 0 - 30 deg.          | 5 - 30 deg.            | 0 - 30 deg.            | 5 - 30 deg. | 5 - 30 deg.           | 10 - 30 deg. | 10 - 30 deg.          | 30 deg.                |    |
| GAS CONNECTION                        | in.     | 1/2                  | 1/2                  | 1/2                    | 1/2                    | 1/2         | 1/2                   | 1/2          | 1/2                   | 1/2                    |    |
|                                       | mm      | 13                   | 13                   | 13                     | 13                     | 13          | 13                    | 13           | 13                    | 13                     |    |
| SHIPPING WEIGHT <sup>D</sup>          | Lbs.    | 30                   | 30                   | 36                     | 49                     | 62          | 62                    | 30           | 36                    | 49                     |    |
|                                       | Kg      | 14                   | 14                   | 16                     | 22                     | 28          | 28                    | 14           | 16                    | 22                     |    |

<sup>A</sup> MODEL RIHN30 is not available in Canada.

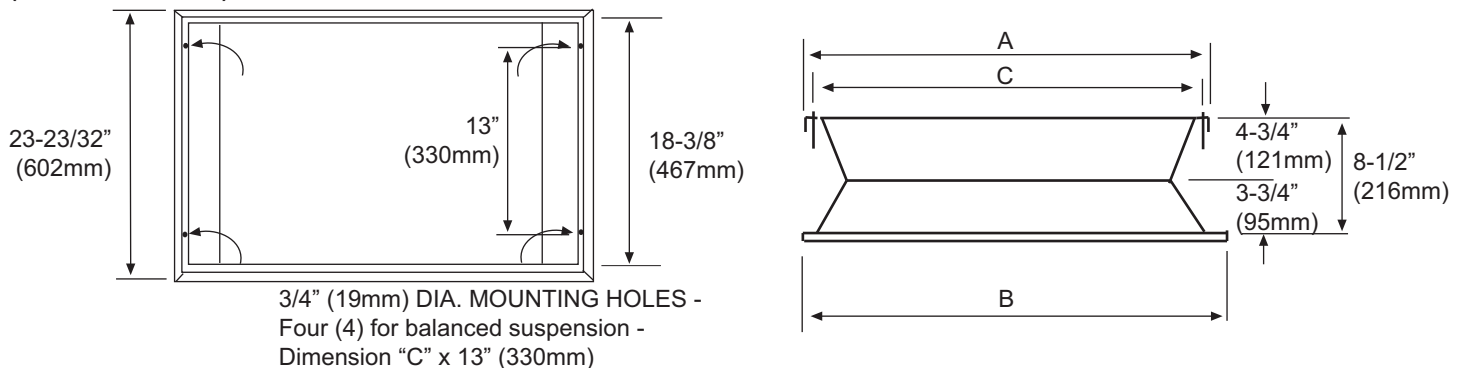
<sup>B</sup> MODEL RIHN60 in Canada requires addition of a wire grid, Option DN2.

<sup>C</sup> These sizes are available in two-stage operation see explanation below.

<sup>D</sup> Weights are for single stage units; add 6 lbs (3 kg) for two-stage units.

### DIMENSIONS

(+ or - 1/8" or 3mm)



TOP VIEW

FRONT VIEW

| SIZE          | A        |         | B      |         | C      |         |
|---------------|----------|---------|--------|---------|--------|---------|
|               | in.      | (mm)    | in.    | (mm)    | in.    | (mm)    |
| 30, 50, 60    | 15 5/16  | (389)   | 16 5/8 | (422)   | 14 5/8 | (371)   |
| 90, 100       | 23 15/16 | (608)   | 25 1/4 | (641)   | 23 1/4 | (591)   |
| 120, 150, 160 | 32 9/16  | (827)   | 33 7/8 | (860)   | 31 7/8 | (810)   |
| 200           | 41 13/16 | (1,062) | 42 1/2 | (1,080) | 40 1/2 | (1,029) |

### 2-STAGE OPERATION

| Model Size | Fuel        | MBH         |               |
|------------|-------------|-------------|---------------|
|            |             | First Stage | Full Capacity |
| RIHVL90    | Propane     | 45          | 90            |
| RIHVN100   | Natural Gas | 50          | 100           |
| RIHVL120   | Propane     | 80          | 120           |
| RIHVN150   | Natural Gas | 100         | 150           |
| RIHVN200   | Natural Gas | 100         | 200           |

### VENTILATION REQUIREMENTS

Every direct gas-fired heater installation requires sufficient fresh air to provide adequate combustion air and removal of products of combustion. In the U.S. the minimum intake and exhaust air opening shall provide for not less than 4 CFM per 1,000 BTUH (0.38 m<sup>3</sup>/minute per kW). Canada requires 3 CFM per 1,000 BTUH (0.29 m<sup>3</sup>/minute per kW) for natural gas, and 4 CFM per 1,000 BTUH (0.38 m<sup>3</sup>/minute per kW) for LP/propane. In the U.S., this may be accomplished by either gravity or mechanical means. In Canada, the Natural Gas and Propane Installation Code CAN/CSA B149.1 (latest edition) requires the use of mechanical ventilation. This may be accomplished by the use of exhaust fans and fresh air intake openings. Both exhaust fans and inlet air openings are required in tight buildings. Exhaust openings for removing flue products shall be above the level of the heater.

When mechanical means are provided to supply and exhaust, a positive interlock with the heater thermostat must be provided by the installer so that the heater cannot operate unless the supply and exhaust system is operating.

### CLEARANCE FROM COMBUSTIBLES (See diagram below)

|  | Model  | Natural Gas Models |                 |                  |         |                  |         | Propane Gas Models |                 |                  |
|--|--------|--------------------|-----------------|------------------|---------|------------------|---------|--------------------|-----------------|------------------|
|  |        | RIHN               |                 | RIHVN            |         |                  |         | RIHL               | RIHVL           |                  |
|  |        | 30 <sup>A</sup>    | 60 <sup>B</sup> | 100 <sup>C</sup> | 150     | 160 <sup>C</sup> | 200     | 50 <sup>C</sup>    | 90 <sup>C</sup> | 120 <sup>C</sup> |
| Side Clearance                                       | inches | 30                 | 30              | 36               | 46      | 48               | 48      | 30                 | 36              | 46               |
|  | (mm)   | (762)              | (762)           | (914)            | (1,168) | (1,219)          | (1,219) | (762)              | (914)           | (1,168)          |
| Back Clearance                                       | inches | 30                 | 30              | 30               | 33      | 33               | 33      | 30                 | 30              | 33               |
|  | (mm)   | (762)              | (762)           | (762)            | (838)   | (838)            | (838)   | (762)              | (762)           | (838)            |
| <b>Top Clearance</b>                                 |        |                    |                 |                  |         |                  |         |                    |                 |                  |
| Mounted 0-29° (no heat deflector)                    | inches | 60                 | 60              | 62               | 64      | 68               | 68      | 60                 | 62              | 62               |
|  | (mm)   | (1,524)            | (1,524)         | (1,575)          | (1,626) | (1,727)          | (1,727) | (1,524)            | (1,575)         | (1,575)          |
| Mounted 30° only (no heat deflector)                 | inches | 48                 | 48              | 50               | 58      | 68               | 68      | 48                 | 50              | 58               |
|  | (mm)   | (1,219)            | (1,219)         | (1,270)          | (1,473) | (1,727)          | (1,727) | (1,219)            | (1,270)         | (1,473)          |
| Mounted 0-30° with Heat Deflector, Option DO2 or DN4 | inches | 34                 | 34              | 38               | N/A     | N/A              | N/A     | 28                 | 38              | N/A              |
|  | (mm)   | (864)              | (864)           | (965)            |         |                  |         | (711)              | (965)           |                  |
| <b>Below Clearance</b>                               |        |                    |                 |                  |         |                  |         |                    |                 |                  |
| Standard Reflector                                   | inches | 80                 | 80              | 105              | 125     | 140              | 140     | 80                 | 105             | 125              |
|  | (mm)   | (2,032)            | (2,032)         | (2,667)          | (3,175) | (3,556)          | (3,556) | (2,032)            | (2,667)         | (3,175)          |
| With Parabolic Reflector, Option DM2 or DN4          | inches | 110                | 110             | 135              | 165     | 180              | 180     | 110                | 135             | 165              |
|  | (mm)   | (2,794)            | (2,794)         | (3,429)          | (4,191) | (4,572)          | (4,572) | (2,794)            | (3,429)         | (4,191)          |

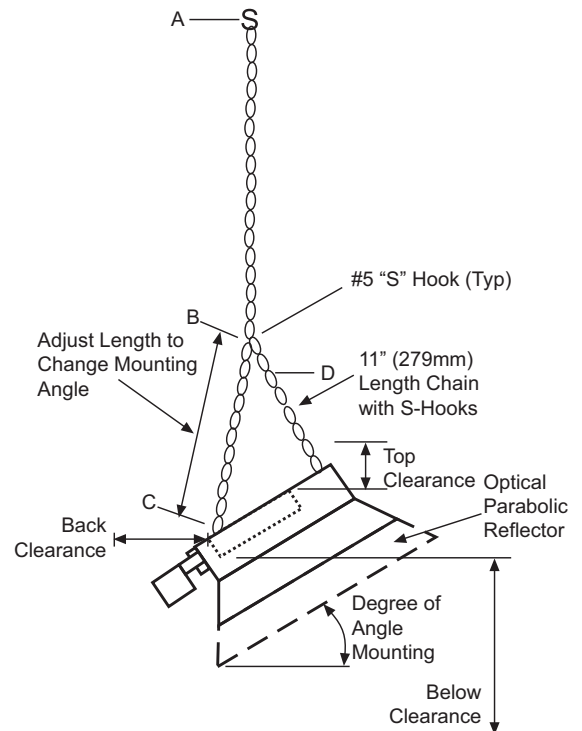
<sup>A</sup> Model RIHN 30 is not available in Canada.

<sup>B</sup> Model RIHN60 in Canada requires addition of wire grid, Option DN2.

<sup>C</sup> See allowable mounting angles on previous page.

#### INSTRUCTIONS:

1. Hang full length chains at desired height and attach to back of heater (C) with S-hooks.
2. Attach one end of the 11" (279mm) length chain with S-hooks to front of heater (D).
3. Place other end of chain with S-hooks in loop (B) on the full length chain.
4. Check degree of angle mounting. Adjust degree of mounting angle by moving "S" hooks at point B.
5. Check to be sure unit is level. Crimp all "S" hooks closed.



**COVERAGE** - For complete space heating coverage, maximum distance between heaters is two times the mounting height.

| Recommended Distances for Units Mounted HORIZONTALLY |                         |   |                                      |
|--|-------------------------|---|--------------------------------------|
| Model  | Distance from the Wall  |   | Maximum Distance Between Heater Rows |
|  | With Standard Reflector | With Parabolic Reflector, Option DM2 or DN4 |                                      |
| RIHN 30  | 8 ft (2.4M)             | 5 ft (1.5M)                                 | 90 ft (27.4M)                        |
| RIHL 50 & RIHN 60                                    | 12 ft (3.7M)            | 9 ft (2.7M)                                 | 100 ft (30.5M)                       |
| RIHVL 90 & RIVN 100                                  | 16 ft (4.9M)            | 12 ft (3.7M)                                | 110 ft (33.5M)                       |
| RIHVL 120  | 18 ft (5.5M)            | 14 ft (4.3M)                                | 115 ft (35.1M)                       |
| RIHVN 150  | 20 ft (6.1M)            | 15 ft (4.6M)                                | 12 ft (36.6M)                        |
| RIHVN 160 & RIHVN 200                                | 24 ft (7.3M)            | 20 ft (6.1M)                                | 130 ft (39.6M)                       |

### MOUNTING ANGLE MUST BE WITHIN THE TOLERANCE ALLOWED

| MODEL     | ALLOWABLE MOUNTING ANGLE RANGE | IMPORTANT   |
|-----------|--------------------------------|---|
| RIHN 30   | HORIZONTAL to 30 deg.          | When angle mounted, all RIHV Models must be installed with the gas manifold on the lower end. |
| RIHL 50   | HORIZONTAL to 30 deg.          |   |
| RIHN 60   | HORIZONTAL to 30 deg.          |   |
| RIHVL 90  | 5 to 29 deg.                   |   |
| RIHVN 100 | 5 to 29 deg.                   | When angle mounted, RIH Models must be installed with the gas valve on the high side.         |
| RIHVL 120 | HORIZONTAL to 30 deg.          |   |
| RIHVN 150 | HORIZONTAL to 30 deg.          | Do not angle heaters more than 30°.   |
| RIHVN 160 | 5 to 29 deg.                   |   |
| RIHVN 200 | HORIZONTAL to 30 deg.          |   |

### MINIMUM MOUNTING HEIGHT

| Model                  | With Standard Reflector |             |             |             | With Parabolic Reflector, Option DM2 or DN4 |             |             |             |
|------------------------|-------------------------|-------------|-------------|-------------|---|-------------|-------------|-------------|
|                        | HORIZONTAL              |             | 30°         |             | HORIZONTAL                                  |             | 30°         |             |
|                        | ft                      | M           | ft          | M           | ft  | M           | ft          | M           |
| RIHN 30                | 11.0 - 13.0             | (3.4 - 4)   | 10.0 -12.0  | (3 - 3.7)   | N/A   |             | N/A         |             |
| RIHL 50 <sup>D</sup>   | 13.5 - 15.5             | (4.1 - 4.7) | 12.5 -14.5  | (3.8 -4.4)  | 15.5 - 18.5                                 | (4.7 - 5.6) | 14.0 -17.0  | (4.3 - 5.2) |
| RIHN 60                | 14.5 - 16.5             | (4.4 -5)    | 13.0 -15.0  | (4 - 4.6)   | 16.0 - 20.0                                 | (4.9 - 6.1) | 15.0 -18.0  | (4.6 - 5.5) |
| RIHVL 90 <sup>D</sup>  | 16.0 - 18.5             | (4.9 - 5.6) | 14.5 -17.0  | (4.4 -5.2)  | 19.5 - 22.5                                 | (5.9 - 6.9) | 17.5 -20.5  | (5.2 - 6.2) |
| RIHVN 100 <sup>D</sup> | 17.0 - 19.5             | (5.2 - 5.9) | 15.0 -17.5  | (4.6 -5.3)  | 20.5 - 23.5                                 | (6.2 - 7.2) | 18.5 -21.5  | (5.6 - 6.6) |
| RIHVL 120 <sup>D</sup> | 17.5 - 21.0             | (5.3 - 6.4) | 15.5 - 18.5 | (4.7 - 5.6) | 21.5 - 25.0                                 | (6.6 - 7.6) | 20.0 - 23.0 | (6.1 - 7)   |
| RIHVN 150              | 18.5 - 22.5             | (5.6 - 6.9) | 16.5 -20.0  | (5.0 -6.1)  | 24.0 - 27.5                                 | (7.3 - 8.4) | 21.5 -24.5  | (6.6 - 7.5) |
| RIHVN 160 <sup>D</sup> | 19.0 - 23.0             | (5.8 - 7.0) | 17.0 -20.5  | (5.2 -6.2)  | 25.0 - 28.5                                 | (7.6 - 8.7) | 22.5 -25.5  | (6.9 - 7.8) |
| RIHVN 200              | 20.5 - 25.0             | (6.2 - 7.6) | 18.5 -22.5  | (5.6 -6.9)  | 27.0 - 31.0                                 | (8.2 - 9.4) | 24.5 -28.0  | (7.5 - 8.5) |

## Sample Specifications Model RIH - High Intensity Infrared Heaters

Provide RIH series gas-fired, high-intensity infrared heaters. The heaters shall be equipped for use with natural (propane) gas to operate on a 115 volt supply voltage [25 volt supply voltage].

The burner control system shall have a direct spark ignition with 100% safety shut-off and a solenoid gas valve with 1/2" NPT inlet. Heater shall have single-stage [two-stage] heating.

Heaters shall be of compact modular design and rugged construction consisting of the controls; a seamless aluminized steel plenum chamber with stainless steel ceramic tile retainer clips; surface combustion ceramic burner capable of full intensity temperature in less than 30 seconds; venturi mixer of spun metal construction for precision metering of air/gas mixture; highly polished aluminum reflector; and balanced suspension holes.

The burner assembly shall be removable with a single screw for cleaning or replacement. The ceramic combustion surface shall reach temperatures up to 1850°F and be of a cordierite-based grooved design with alternating rows of precision perforations producing a shorter stable flame.

These units must be approved for installation in The United States and Canada by the Canadian Standards Association (CSA).

(Capacities, dimensions, and additional field-installed options as described in this catalog.)

### Limited Warranty Model RIH/RIHV Heaters

Nortek Global HVAC, LLC (manufacturer) warrants to the original owner-user that this product will be free from defects in material or workmanship. This warranty is limited to twelve (12) months from the date of original installation, whether or not actual use begins on that date, or eighteen (18) months from date of shipment, whichever occurs first.

#### Limitations and Exclusions

Manufacturer obligations under this warranty and the sole remedy for its breach are limited to repair, at its manufacturing facility, of any part or parts of its products which prove to be defective; or, in its sole discretion, replacement of such products. All returns of defective parts or products must include the product model number and serial number, and must be made through an authorized distributor or arranged through Customer Service. Authorized returns must be shipped prepaid. Repaired or replacement parts will be shipped F.O.B. shipping point.

1. The warranty provided herein does not cover charges for labor or other costs incurred in the troubleshooting, repair, removal, installation, service or handling of parts or complete products.
2. All claims under the warranty provided herein must be made within ninety (90) days from the date of discovery of the defect. Failure to notify manufacturer of a warranted defect within ninety (90) days of its discovery voids manufacturer obligations hereunder.
3. The warranty provided herein shall be void and of no effect in the event that (a) the product has been operated outside its designed output capacity (heating, cooling, airflow); (b) the product has been subjected to misuse, neglect, accident, improper or inadequate maintenance, corrosive environments, environments containing airborne contaminants (silicone, aluminum oxide, etc.), or excessive thermal shock; (c) unauthorized modifications are made to the product; (d) the product is not installed or operated in compliance with the manufacturer's printed instructions; (e) the product is not installed and operated in compliance with applicable building, mechanical, plumbing and electrical codes; or (f) the serial number of the product has been altered, defaced or removed.
4. The warranty provided herein is for repair or replacement only. Manufacturer shall not be liable for any loss, cost, damage, or expense of any kind arising out of a breach of the warranty. Further, manufacturer shall not be liable for any incidental, consequential, exemplary, special, or punitive damages, nor for any loss of revenue, profit or use, arising out of a breach of this warranty or in connection with the sale, maintenance, use, operation or repair of any product. In no event will manufacturer be liable for any amount greater than the purchase price of a defective product. The disclaimers of liability included in this paragraph 4 shall remain in effect and shall continue to be enforceable in the event that any remedy herein shall fail of its essential purpose.
5. THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY FOR MANUFACTURER'S PRODUCTS, AND IS IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES. MANUFACTURER SPECIFICALLY DISCLAIMS ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. No person or entity is authorized to bind manufacturer to any other warranty, obligation or liability for any product. Installation, operation or use of the product for which this warranty is issued shall constitute acceptance of the terms hereof.



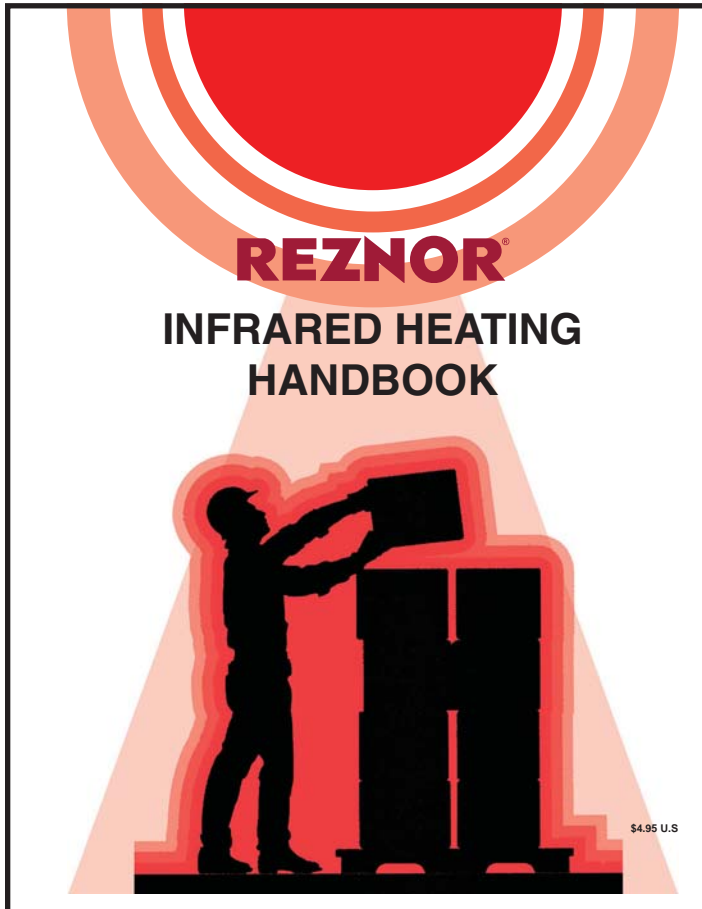








## REZNOR SUPPORTS RADIANT HEATING



### Infrared Heating Handbook

Designed as a reference manual, Reznor's Infrared Heating Handbook begins with general information on radiant heat transfer and the development of radiant heating equipment. The information becomes more specific, explaining procedures for selecting and sizing both low-intensity and high-intensity infrared equipment. Examples illustrate equipment selection for both spot and space heating applications. Currently, this book is only available in PDF format on the Reznor website: [ReznorHVAC.com](http://ReznorHVAC.com).

Contact your Reznor Representative for additional information on the Reznor Radiant Heater line of equipment. To reach your Reznor Representative, call 800-695-1901, then select option "1."

### ADVANTAGES OF HEATING WITH INFRARED

The Reznor commercial/industrial line of infrared heating equipment is designed to provide quiet, energy-efficient, comfort-level temperatures through application of radiant heat transfer. Radiant heat transfer means that heated infrared rays are radiated until those rays are absorbed by objects, such as floors, equipment, or people. Infrared heat rays do not warm the air; the air immediately surrounding the "heated" objects is warmed because of the increase in temperature of those objects. This makes infrared heating ideal for spot heating applications such as garage bays, assembly lines, loading docks, parking ramps, airplane hangars,

and any other indoor location where heat is needed in only a specific area. Since the infrared rays are absorbed by the floor, infrared heating provides warmer floor-level temperatures. Quieter, more energy-efficient operation is achieved because infrared heating equipment does not require fans or blowers. Reznor provides both low-intensity, tubular radiant heaters and high-intensity, surface combustion infrared heaters. For more detailed information on the technical applications of heating with infrared, consult the Infrared Heating Handbook found on the Reznor website at [ReznorHVAC.com](http://ReznorHVAC.com). If unsure of a particular application, consult your Reznor Sales Representatives.

**Reznor® is your global source for heating,  
ventilating and air conditioning equipment.**

# **REZNOR®**

**For more information on Reznor HVAC Equipment,  
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**Or, find us on the internet at  
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