

TECHNICAL SPECIFICATIONS FOR MODEL VCS

**GAS-FIRED, INDOOR/OUTDOOR, COMMERCIAL/INDUSTRIAL,
HARSH ENVIRONMENT, SINGLE-STAGE , LOW-INTENSITY TUBULAR RADIANT HEATER**



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In keeping with our policy of continuous product improvement, we reserve the right to alter, at any time, the design, construction, dimensions, weights, etc., of equipment information shown here.

TECHNICAL SPECIFICATIONS—CONTINUED

Unit Sizes

These heaters are available in seven unit sizes based on 60,000–200,000 BTU_h input.

Features

- 115V/1Ph/60Hz supply
- 300 SST burner cabinet
- SST tube connectors, suspension brackets, and reflectors
- 20- to 80-foot heat exchanger tube assemblies
- Operational and diagnostic indicator lights
- External terminal strip for 24V wiring
- Single-stage combination gas valve
- Natural gas or propane (unit size 200 available for natural gas only)
- Positive-pressure blower for supplying combustion air
- Multi-try direct ignition with soft lockout
- Pre-purge and post-purge
- Vertical or horizontal venting
- Wind and rain hood required for outdoor installation

Factory-Installed Options

Option	Description
AA1	Natural gas
AA2	Propane
AK1	115/1/60 voltage

Field-Installed Options

Systems are shipped disassembled and are comprised of a burner cabinet and tube assemblies.

Option	Description
CC21	SST vent cap
CD37	SST reflector end caps, quantity two (2)
CE1	1/2-inch manual shutoff valve, natural gas or propane
CE2	3/4-inch manual shutoff valve, natural gas or propane
CE4	3/4-inch SST flexible gas connector, 36 inches long
CK31	SST hanger kit, includes chain and S-hooks
CK32	SST turnbuckle kit, 20-foot straight tube
CK33	SST turnbuckle kit, 30-foot straight tube or 20-foot L- or U-tube
CK34	SST turnbuckle kit, 40-foot straight tube or 30-foot L- or U-tube
CK35	SST turnbuckle kit, 50-foot straight tube or 40-foot L- or U-tube
CK36	SST turnbuckle kit, 60-foot straight tube or 50-foot L- or U-tube
CK37	SST turnbuckle kit, 70-foot straight tube or 60-foot L- or U-tube
CK39	SST turnbuckle kit, 80-foot straight tube or 70-foot L- or U-tube
CK40	SST turnbuckle kit, 80-foot L- or U-tube
CL1	Single-stage thermostat
CL5C	Single-stage line voltage thermostat
CM1	Locking cover for CL1 thermostat
DE2	Combustion air inlet
DE5	Wind and rain hood
DJ20	High-elevation conversion
DL2	Propane conversion

Option	Description
NB00*	Straight tube assembly
NB1U*	Tube assembly with one (1) U-tube
NB1L*	Tube assembly with one (1) L-tube
NB2L*	Tube assembly with two (2) L-tubes
NBUL*	Tube assembly with one (1) U-tube and one (1) L-tube
RL20*	20-foot tube assembly
RL25*	25-foot tube assembly
RL30*	30-foot tube assembly
RL35*	35-foot tube assembly
RL40*	40-foot tube assembly
RL45*	45-foot tube assembly
RL50*	50-foot tube assembly
RL45*	55-foot tube assembly
RL60*	60-foot tube assembly
RL65*	65-foot tube assembly
RL70*	70-foot tube assembly
RL75*	75-foot tube assembly
RL80*	80-foot tube assembly
TB1	Burner insert, 5-foot
TB2	Burner insert, 3-foot

*The tube assembly options contain tube kits that accommodate the selected length and configuration of the system. Tube kits consist of reflectors and bracket assemblies, tube assemblies (5- and 10-foot straight tubes, L-tubes, and U-tubes as required), and all necessary couplers, turbulators, and suspension brackets.

Technical Data

Parameter	Unit of Measure	Unit Size						
		060	080	100	125	150	170	200
Heating capacity	BTUh	60,000	80,000	100,000	125,000	150,000	170,000	200,000
	kW	18	23	29	37	44	50	59
Gas connection	inch	1/2						
Vent connection diameter		4						
Minimum gas supply pressure, NG	IN WC	5.0					7.0	
Maximum gas supply pressure, NG		14.0						
Minimum gas supply pressure, LP		11.0						—
Maximum gas supply pressure, LP		14.0						
Pressure drop with gas connector (option CE4)		0.05		0.10	0.15	0.20	0.40	0.50
Required manifold (outlet) gas pressure, NG		3.9	3.5	4.5	4.3	4.0	3.3	3.3
Required manifold (outlet) gas pressure, LP		5.5	5.2	8.0	7.6	7.0	6.1	—
Maximum current rating (inductive)	amp	1.8					1.0	
External fuse		3.0						
Blower motor size	HP	0.16						

Wiring Requirements

- **Supply wiring:** three-wire cable—black (hot), white (neutral), and green (ground) wire having a temperature rating of at least 220°F (105°C).
- **24V control wiring:** 18/4 class 2 thermostat cable—18AWG—100 feet maximum length.

TECHNICAL SPECIFICATIONS—CONTINUED

Certification

These heaters are approved for use in the United States and Canada by the Canadian Standards Association (CSA) for outdoor or non-residential indoor spaces. Standard heaters are approved for installation elevations of 0–2,000 feet (0–610 meters) for the US and 0–4,500 feet (0–1,370 meters) for Canada. Conversion kits are available for installations above these elevations in the US.

Installation Codes

- These units must be installed in accordance with local building codes. In the absence of local codes, in the United States, the unit must be installed in accordance with the *National Fuel Gas Code*, ANSI Z223.1 /NFPA 54. A Canadian installation must be in accordance with the CSA B149 *Natural Gas and Propane Installation Code*. This code is available from CSA Information Services, 1-800-463-6727. Local authorities having jurisdiction should be consulted before installation is made to verify local codes and installation procedure requirements.
- Installations in aircraft hangars should be in accordance with ANSI/NFPA No. 409 (latest edition), *Standard for Aircraft Hangars*. Installations in public garages should be in accordance with ANSI/NFPA No. 88A (latest edition), *Standard for Parking Structures*. Installations in repair garages should be in accordance with ANSI/NFPA No. 88B (latest edition), *Standard for Repair Garages*. In Canada, installations in aircraft hangars should be in accordance with the requirements of the enforcing authorities, and in public garages, in accordance with the CSA B149 code.
- If the heater is being installed in the Commonwealth of Massachusetts, installation must be performed by a licensed plumber or licensed gas fitter.

Heater Location

NOTE: This heater, which has an IPx5 rating, is waterproof and is designed for harsh environments—defined as wet or mildly corrosive—such as car washes, outdoor patios, and greenhouses. This model is NOT intended for heavily chemical-laden environments or areas where halogenated hydrocarbons are present. For mildly-corrosive environments, ducted clean fresh air is required for the warranty to remain valid. A wind/rain hood is required for outdoor installations.

Mounting Height Requirements

WARNING

If touched, the vent pipe and internal heater surfaces that are accessible from outside the heater will cause burns. Suspend the heater a minimum of 12 feet (3.7 meters) above the floor.

NOTE: Suspended heaters are most effective when located as close to the working zone as possible, and this fact should be kept in mind when determining the mounting heights to be used.

Suspension Bracket Configuration	Height	Unit Size			
		060, 080	100, 125	150, 170	200
		Feet (Meters)			
Standard	Minimum	12 (3.7)	14 (4.3)	16 (4.9)	18 (5.5)
	Recommended	14 (4.3)	16 (4.9)	18 (5.5)	20 (6.1)
Angled	Minimum	10 (3.0)	12 (3.7)	14 (4.3)	16 (4.9)
	Recommended	11 (3.4)	13 (4.0)	15 (4.6)	17 (5.2)

Venting Requirements

- Heaters may be installed unvented if governing building codes are met and consideration is properly given to the possibilities of condensation on cold surfaces. The installation shall meet the following requirements when unvented: natural or mechanical means shall be provided to supply and exhaust at least 4 CFM per 1,000 BTUh input and combustion gases shall not impinge on combustible materials.
- Heaters can be installed with either vertical or horizontal vents. Use appropriate venting materials. All connections must be properly sealed. Heaters are certified as Category III for vertical and horizontal vent installations. Refer to the installation manual for approved Category III vent manufacturers and for vent connection instructions.

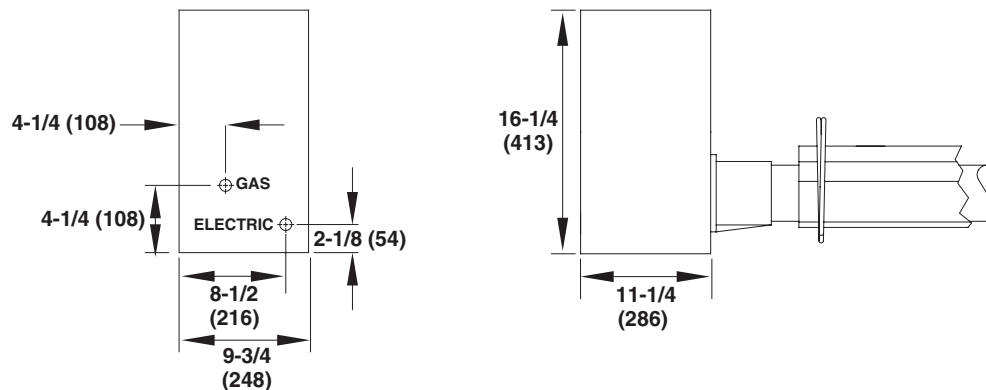
Hazards of Chlorine

NOTE: Remember, chlorine is heavier than air. This fact should be kept in mind when determining the installation location of heaters and building exhaust systems.

The presence of chlorine vapors in the combustion air of heating equipment presents a potential corrosion hazard. Chlorine, found usually in the form of Freon or degreaser vapors, when exposed to flame will precipitate from the compound and form a solution with any condensation present in the heat exchanger or associated parts. The result is hydrochloric acid, which readily attacks all metals, including 300 grade stainless steel. Care should be taken to separate these vapors from the combustion process. This may be done by wise location of the unit with regard to exhausters or prevailing wind directions.

Dimensions

Component	Unit of Measure	Unit Size				
		060, 080	100	125	150	170, 200
Tube assembly (length)	foot	20–40	30–50	30–60	40–70	50–80
	meter	6.1–12.1	9.1–15.2	9.1–18.3	12.1–21.3	15.2–24.4
Burner cabinet	inch	11-1/4 × 16-1/4				
	mm	286 × 413				



Weights

Component	Pounds (kg)
Burner cabinet	34 (15.3)
5-foot emitter tube with reflector	7 (3.2)
10-foot emitter tube with reflector	13 (5.9)
L-tube	10 (4.5)
U-tube	13 (5.9)
Brackets and couplers	@3–10 (@2–5)

TECHNICAL SPECIFICATIONS—CONTINUED

Clearances

⚠ DANGER ⚠

- All listed minimum clearances to combustible materials **MUST** be adhered to at all times. Adequate clearance **MUST** be provided around air openings into the combustion chamber, and there **MUST** be suitable clearance for accessibility and for combustion/ventilation air.
- Minimum clearance from the heater must be maintained from vehicles parked below heater. In all situations, clearances to combustibles must be maintained. Signs should be posted in storage areas to specify maximum stacking height to maintain required clearance to combustibles. Such signs must either be posted adjacent to the heater thermostats or—in the absence of such thermostats—in a conspicuous location.

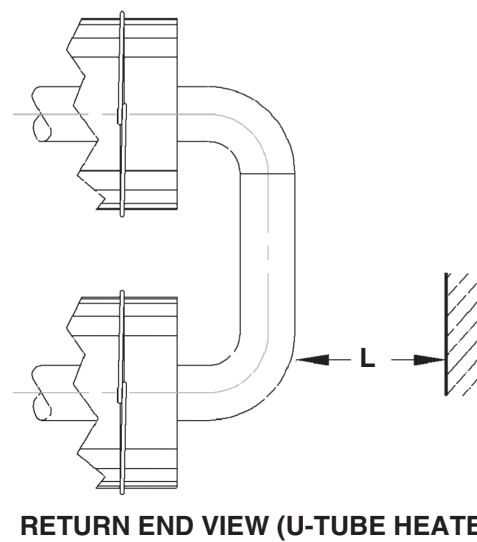
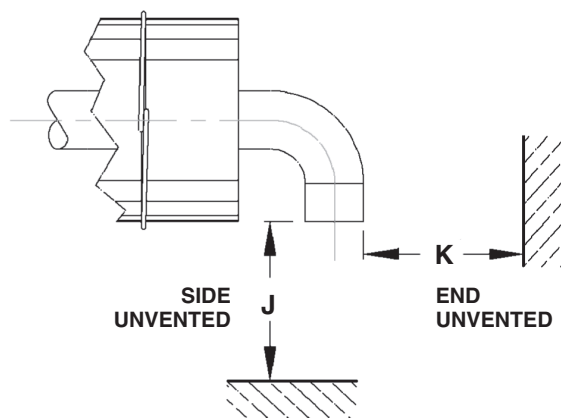
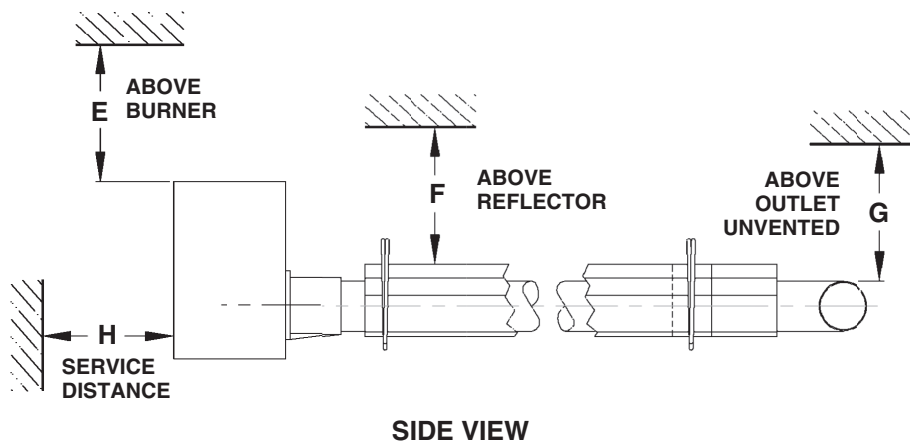
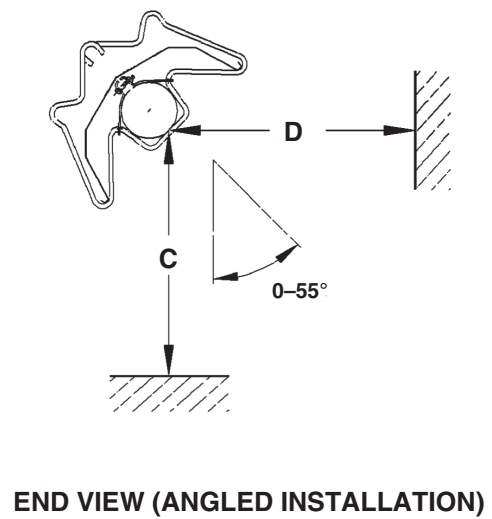
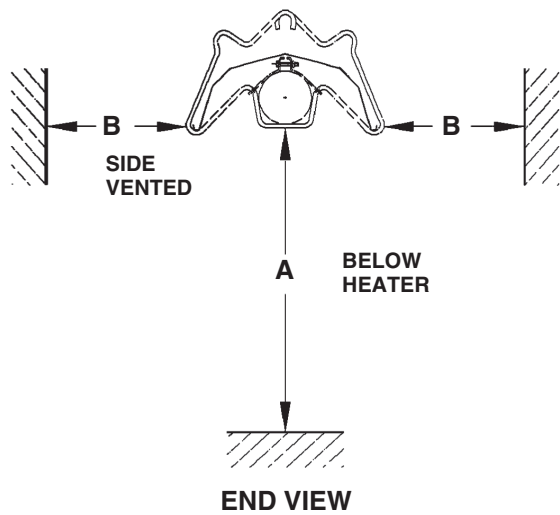
⚠ CAUTION ⚠

Building materials with low heat tolerance (plastics, vinyl siding, canvas, tri-ply, etc.) may be subject to degradation at lower temperatures. It is the installer's responsibility to ensure that adjacent materials are protected from degradation.

Clearance to combustibles is defined as the minimum distance from the heater to a surface or object for which it is necessary to ensure that a surface temperature of 90°F (50°C) above the surrounding ambient temperature is not exceeded. Units must be installed so that clearances are as follows:

Unit Size	Dimension (See Graphic Below)										
	A	B	C	D	E	F	G	H	J	K	L
	Inches (cm)										
060, 080	74 (188)	29 (74)	72 (183) @ 15°	20 (51)	8 (21)	22 (56)	12 (31)	41 (105)	8 (21)	12 (31)	
100		32 (82)	68 (173) @ 25°						16 (41)		
125		39 (99)	61 (155) @ 35°						47 (120)	20 (51)	18 (46)
150			53 (135) @ 45°						48 (122)		
170, 200	86 (219)	48 (122)	82 (209) @ 15° 78 (199) @ 25° 71 (181) @ 35° 61 (155) @ 45° 50 (127) @ 55°	10 (26)*	11 (28)			48 (122)	20 (51)		
*With end caps installed.											

*With end caps installed.



⚠ DANGER ⚠

FIRE OR EXPLOSION HAZARD

- Failure to follow safety warnings exactly could result in serious injury, death, or property damage.
- Improper installation, adjustment, alteration, service, or maintenance can cause serious injury, death, or property damage.
- Installation and service must be performed by a qualified installer, service agency, or the gas supplier.
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Leave the building immediately.
- Immediately call your gas supplier from a phone remote from the building. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

For more information on Reznor HVAC products:

- **Contact your local Reznor representative at 1-800-695-1901**
- **Refer to the manuals and additional consumer materials found at www.reznorhvac.com**

