

INSTALLATION REQUIREMENTS

Duct Furnaces

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

Installations in public garages or airplane hangars are permitted when in accordance with ANSI Z223.1 and NFPA 54 codes or CAN1-B149 and enforcing authorities.

WARNING: Failure to provide proper venting could result in death, serious injury, and/or property damage. Unit must be connected to flue having sufficient draft to ensure safe and proper operation. Unit must be properly vented to the outside of the building. Safe operation of any gravity vented heating equipment requires a properly operating vent system, correct provision for combustion air and regular maintenance and inspection.

WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury, or death. Read the installation operation and maintenance instructions thoroughly before installing or servicing any heating equipment.

FOR YOUR SAFETY

If you smell gas:

1. Open windows.
2. Don't touch electrical switches.
3. Extinguish any open flame.
4. Immediately call your gas supplier.

FOR YOUR SAFETY

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

DANGER: The gas burner in all Reznor gas-fired equipment is designed and equipped to provide safe and economically controlled complete combustion. However, if the installation does not permit the burner to receive the proper supply of combustion air, complete combustion may not occur. The result is incomplete combustion which produces carbon monoxide, a poisonous gas that can cause death. Safe operation of indirect-fired gas burning equipment requires a properly operating vent system which vents all flue products to the outside atmosphere. Failure to provide proper venting will result in a health hazard which could cause serious personal injury or death.

Always comply with the combustion air requirements in the installation codes and instructions. Combustion air at the burner should be regulated only by manufacturer-provided equipment. **NEVER RESTRICT OR OTHERWISE ALTER THE SUPPLY OF COMBUSTION AIR TO ANY HEATER.** Indoor units installed in a confined space must be supplied with air for combustion as required by code and in the installation manual. **INSTALL AND MAINTAIN THE VENT SYSTEM TO CONTINUALLY VENT ALL FLUE PRODUCTS SAFELY TO THE OUTSIDE ATMOSPHERE.**

CODE REQUIREMENTS

The unit shall be installed by a qualified agency in accordance with the standards of the National Fire Protection Association and the national Fuel Gas Code for gas-fired duct furnaces. These standards should be followed carefully. Authorities having jurisdiction should be consulted prior to installation to verify local codes. The unit shall be installed in accordance with the National Fuel Gas Code ANSI Z223.1 (latest edition).

In Canada, the installation of these appliances is to be in accordance with CAN/C.G.A.-B149.1 and B149.2, Installation Code for Gas Burning Appliances and Equipment, and local codes.

Installation in aircraft hangars should be made in accordance with ANSI/NFPA No. 409 (latest edition), standard for aircraft hangars, and in public garages in accordance with NFPA No. 88A (latest edition), standard for parking structures, and NFPA No. 88B for repair garages. In Canada, installation in aircraft hangars should be in accordance with the requirements of the enforcing authorities and in public garages in accordance with CAN1-B149 codes.

CONDENSATION

When air inlet temperatures are below 40°F or temperature rise is less than 40°F, condensation on the heat exchanger is possible. The resulting steel corrosion will shorten the heat exchanger life expectancy. Use E-3 (409) or 321 stainless steel for heat exchanger material to inhibit corrosion.

If there is a possibility of condensation of flue products, E-3 (409) stainless steel should be used for burner material.

CHLORINES

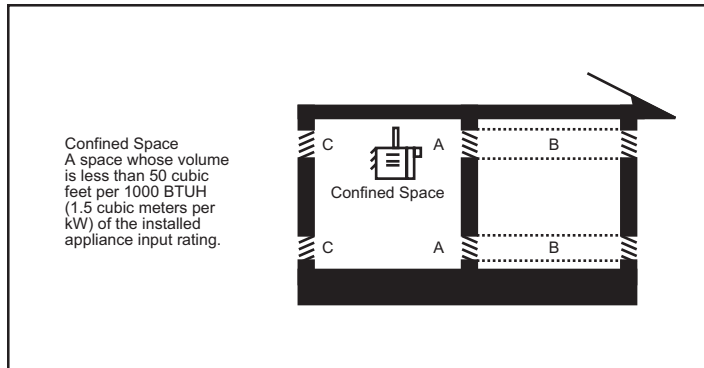
The presence of chlorine vapors in the combustion air of gas-fired heating equipment presents a potential corrosive hazard. Chlorine will, when exposed to flame, precipitate from the compound, usually freon or degreaser vapors, and to into solution with any condensation that is present in the heat exchanger 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 units with regard to exhausters or prevailing wind directions. Remember, chlorine is heavier than air. This fact should be kept in mind when determining installation locations of heaters and building exhaust systems.

CLEARANCE AND COMBUSTION AIR

Units must be installed so that clearances are provided for combustion air space, service and inspection, and for proper spacing from combustible construction.

All fuel-burning equipment must be supplied with the air that enters into the combustion process and is then vented to the outdoors. Sufficient air must enter the equipment location to replace that exhausted through the vent system. Modern construction methods involve the greater use of insulation, improved vapor barriers and weather-stripping, with the result that buildings generally are much tighter structurally that they have been in the past. Combustion air supply for gas-fired equipment can be affected by these construction conditions because infiltration that would have existed in the past may not be adequate. Extensive use of exhaust fans aggravates the situation. In the past, the infiltration of outside air assumed in heat loss calculations (one air change per hour) was assumed to be sufficient. However, current construction methods using more insulation and vapor barriers, tighter fitting and gasketed doors and windows or weather-stripping, and mechanical exhaust fans may now require the introduction of outside air through wall openings or ducts.

HEATERS LOCATED IN CONFINED SPACES



Do not install unit in confined space without providing wall openings leading to and from this space. Provide adequate openings near floor and ceiling for ventilation and air for combustion, as shown above, depending on combustion air source as noted below.

Add total BTUH of all appliances in the confined space and divide by figures below for square inch free area size of each (top and bottom) opening.

- Air from inside building** - openings 1 square inch free area per 1,000 BTUH. Never less than 100 square inches free area for each opening. See "A" in illustration.
- Air from outside through duct** - openings 1 square inch free area per 2,000 BTUH. See "B" in illustration.
- Air direct from outside** - openings 1 square inch free area per 4,000 BTUH. See "C" in illustration.

NOTE: For further details on supplying combustion air to confined space see: National Fuel Gas Code ANSI Z223.1 - (latest edition) 5.3.3.

GAS PIPING AND PRESSURES

To provide adequate gas pressure at the furnace, refer to pipe sizing tables. The unit is equipped for a maximum gas supply pressure of 1/2 pound or 8 ounces. An additional service regulator external to the unit is required to reduce higher supply pressures to the 1/2 pound maximum.

WARNING: Never expose gas control on unit to greater than 1/2 pound pressure! Pressure testing of the gas supply piping system must be carried out before connecting the furnace. A pipe cap or field-supplied high pressure gas cock must be used during proof testing of the system.

For Natural Gas

Manifold pressure is regulated by the combination valve to 3.5" water column. Line pressure upstream of the controls must be a minimum of 5" water column or as noted on unit rating plate.

For Propane Gas

Manifold pressure is regulated by the combination valve to 10" water column. Line pressure upstream of controls must be 11" water column minimum and 14" maximum.

NOTE: Gas supply pressures higher than 14" w.c. or 1/2 pound require an additional service regulator to be added to the unit or supply system.

All piping must be in accordance with requirements outlined in the National Fuel Gas Code ANSI Z223.1-(latest edition) or CAN/C.G.A.-B149 (.1 or .2).

When regulations require and for ease of servicing, install a ground joint union and manual shut-off valve upstream of unit control system.

WARNING: All components of gas supply system must be leak tested prior to placing equipment in service. NEVER TEST FOR LEAKS WITH AN OPEN FLAME.

SIZING GAS SUPPLY LINES

CAPACITY OF PIPING												
Cubic Feet Per Hour Based on 0.3" w.c. Pressure Drop												
Specific Gravity for Natural Gas - 0.6 (1000BTU/CU Foot) • Specific Gravity for Propane Gas - 1.6 (2550 BTU/CU Foot)												
Length of Pipe	Diameter of Pipe											
	1/2"		3/4"		1"		1-1/4"		1-1/2"		2"	
	Natural	Propane	Natural	Propane	Natural	Propane	Natural	Propane	Natural	Propane	Natural	Propane
20'	92	56	190	116	350	214	730	445	1100	671	2100	1281
30'	73	45	152	93	285	174	590	360	890	543	1650	1007
40'	63	38	130	79	245	149	500	305	760	464	1450	885
50'	56	34	115	70	215	131	440	268	670	409	1270	775
60'	50	31	105	64	195	119	400	244	610	372	1105	674
70'	46	28	96	59	180	110	370	226	560	342	1050	641
80'	43	26	90	55	170	104	350	214	530	323	990	604
90'	40	24	84	51	160	98	320	195	490	299	930	567
100'	38	23	79	48	150	92	305	186	460	281	870	531
125'	34	21	72	44	130	79	275	168	410	250	780	476
150'	31	19	64	39	120	73	250	153	380	232	710	433
175'	28	17	59	36	110	67	225	137	350	214	650	397
200'	26	16	55	34	100	61	210	128	320	195	610	372

Note: When sizing supply lines, consider possibilities of future expansion and increased heating requirements. Refer to National Fuel Gas Code for additional information on sizing.

ELECTRICAL SUPPLY AND CONNECTIONS

All electrical wiring and connections including electrical grounding should be made in accordance with the National Electric Code ANSI/NFPA No. 70-(latest edition) or, in Canada, the Canadian Electrical Code, Part I-C.S.A. Standard C22.1. Check any local ordinance or gas company requirements that apply

A separate line voltage supply should be run directly from the main panel to a fused disconnect switch, at the unit, and then making connection to leads in the unit junction box. All external wiring must be made within approved conduit and have a minimum temperature rise rating of 60°C.

The unit must be electrically grounded in accordance with the National Electrical Code, ANSI/NFPA No. 70-(latest edition) or C.S.A. Standard C22.1 when installed, if an external electrical source is used.

DUCT FURNACE BLOWER ARRANGEMENTS

Proper arrangement of blower and duct furnace with respect to angle of approach of duct connection and the arrangement of the discharge opening of the blower are shown. Blowers should be bottom horizontal discharge when coupled to the duct furnace. When a top horizontal discharge blower is connected to the duct furnace, be sure that sufficient length of duct is provided to permit even flow of air at the end of the duct. Or, baffles may be inserted between the blower and the heater to assure an even flow or air across the heat exchanger.

STRAIGHT THROUGH AIR

Suggested blower connections for straight through air flow.

Use either method for good air coverage and efficient operation.

WITH ELBOWS UP OR DOWN

NOTE: DIMENSION "X" SHOULD NEVER BE LESS THAN 1/2 "Y"

NOTE: DIMENSION "X" SHOULD NEVER BE LESS THAN 1/2 "Y"

NOTE: ANGLE "Z" SHOULD NEVER BE MORE THAN 15°

WITH ELBOWS RIGHT OR LEFT

NOTE: ANGLE "Z" SHOULD NEVER BE MORE THAN 15°

CAUTION: Duct connections exposed to weather must be water-tight. High temperature (250°F - 121°C) caulking or sheet metal flashing should be used.

Abrupt angle approaches, such as illustrated above, can be detrimental to unit life. Be certain that ample air is directed at the base of the tube section by using turning vanes as shown.