

Installation

80+

Single Stage

Instructions

NTC7/GNL

NDC7/GDL

SAFETY REQUIREMENTS

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the furnace and in instructions manuals be alert to the potential for personal injury.

Understand the signal words **DANGER**, **WARNING**, or **CAUTION**. These words are used with the safety-alert symbol. **DANGER** identifies the most serious hazards, those that **will** result in severe personal injury or death. **WARNING** signifies a hazard that **could** result in personal injury or death. **CAUTION** is used to identify unsafe practices that **could** result in minor personal injury or product and property damage.

Installing and servicing heating equipment can be hazardous due to gas and electrical components. Only trained and qualified personnel should install, repair, or service heating equipment.

Untrained service personnel can perform basic maintenance functions such as cleaning and replacing air filters. All other operations must be performed by trained service personnel. When working on heating equipment, observe precautions in the literature, on tags, and on labels attached to or shipped with the unit and other safety precautions that may apply.

Follow all safety codes. In the United States, follow all safety codes including the current edition National Fuel Gas Code (NFPA) No. 54/ANSI Z223.1. In Canada, refer to the current edition of the National Standard Canada CAN/CGA-B149.1 and .2-M91 Natural Gas and Propane Installation Codes (NSCNGPIC). Wear safety glasses and work gloves. Have fire extinguisher available during start-up and adjustment procedures and service calls.

These instructions cover minimum requirements and conform to existing national standards and safety codes. In some instances, these instructions exceed certain local codes and ordinances, especially those that may not have kept up with changing residential construction practices. We require these instructions as a minimum for a safe installation.



Manufactured by:
International Comfort Products Corporation (USA)
Lewisburg, TN USA 37091

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WARNING

Electric Shock Hazard

**Turn Off All Power
Before Servicing.**

**Failure to do so can result
in death, personal injury
and/or property damage.**



WARNING

Fire or Explosion hazard.

**This furnace is not designed for use in mobile
homes, trailers or recreational vehicles.**

**Such use could result in death, bodily injury
and/or property damage.**

1. Installation

⚠ WARNING

Installation or repairs made by unqualified persons can result in hazards to you and others. Installation **MUST** conform with local codes or, in the absence of local codes, with codes of all governmental authorities having jurisdiction.

The information contained in this manual is intended for use by a qualified service technician who is experienced in such work, who is familiar with all precautions and safety procedures required in such work, and is equipped with the proper tools and test instruments.

Failure to carefully read and follow all instructions in this manual can result in furnace malfunction, death, personal injury and/or property damage.

NOTE: This furnace is design certified by the American Gas Association and the Canadian Gas Association for installation in the United States and Canada. Refer to the appropriate codes, along with this manual, for proper installation.

- This furnace is **NOT** approved for installation in mobile homes, trailers or recreation vehicles.
- Do **NOT** use this furnace as a construction heater or to heat a building that is under construction.
- Use only the Type of gas approved for this furnace (see **Rating Plate** on unit). Overfiring will result in failure of heat exchanger and cause dangerous operation. (Furnace can be converted to L.P. gas with approved kit.)
- Do **NOT** use open flame to test for gas leak.
- Ensure adequate combustion and ventilation air is provided to the furnace.
- Seal supply and return air ducts.
- The vent system **MUST** be checked to determine that it is the correct type and size.
- Install correct filter type and size.
- Unit **MUST** be installed so electrical components are protected from direct contact with water.

Dual Certified Furnace

This furnace is dual certified. This means that the **INLET** pipe is optional. See **Figure 1** or **Figure 2** for identification of **INLET** and **OUTLET** pipe. Combustion air can be drawn from outside the structure or inside the structure.

Safety Rules

Your unit is built to provide many years of safe and dependable service providing it is properly installed and maintained. However, abuse and/or improper use can shorten the life of the unit and create hazards for you, the owner.

- A. The U.S. Consumer Product Safety Commission recommends that users of gas-burning appliances install carbon monoxide detectors. There can be various sources of carbon monoxide in a building or dwelling. The sources could be gas-fired clothes dryers, gas cooking stoves, water

heaters, furnaces, gas-fired fireplaces, wood fireplaces, and several other items. Carbon monoxide can cause serious bodily injury and/or death. Therefore, to help alert people of potentially dangerous carbon monoxide levels, you should have carbon monoxide detectors listed by a nationally recognized agency (e.g. Underwriters Laboratories or International Approval Services) installed and maintained in the building or dwelling (see Note below).

- B. There can be numerous sources of fire or smoke in a building or dwelling. Fire or smoke can cause serious bodily injury, death, and/or property damage. Therefore, in order to alert people of potentially dangerous fire or smoke, you should have fire extinguisher and smoke detectors listed by Underwriters Laboratories installed and maintained in the building or dwelling (see Note below).

Note: The manufacturer of your furnace does not test any detectors and makes no representations regarding any brand or type of detector.

- C. To ensure safe and efficient operation of your unit, you should do the the following:
 1. **Thoroughly read this manual and labels on the unit.** This will help you understand how your unit operates and the hazards involved with gas and electricity.
 2. **Do not use this unit if any part has been under water.** Immediately call a qualified service technician to inspect the unit and to replace any part of the control system and any gas control which has been under water.
 3. **Never obstruct the vent grilles, or any ducts that provide air to the unit.** Air must be provided for proper combustion and ventilation of flue gases. Carbon monoxide or "CO" is a colorless and odorless gas produced when fuel is not burned completely or when the flame does not receive sufficient oxygen.

Freezing Temperatures and Your Structure

⚠ WARNING

Freeze warning.

Turn off water system.

If your unit remains shut off during cold weather the water pipes could freeze and burst, resulting in serious water damage.

Your unit is equipped with safety devices that may keep it from operating if sensors detect abnormal conditions such as clogged exhaust flues.

If the structure will be unattended during cold weather you should take these precautions.

1. Turn off main supply water into the structure and drain the water lines if possible. Open faucets in appropriate areas.
2. Have someone check the structure frequently during cold weather to make sure it is warm enough to prevent pipes from freezing. Suggest they call a qualified service agency, if required.

⚠ WARNING

Poison carbon monoxide gas hazard.

If this furnace is replacing a previously common-vented furnace, it may be necessary to resize the existing vent line and chimney to prevent oversizing problems for the other remaining appliances(s). See applicable codes and *Venting and Combustion Air Check* in *Gas Vent Installation* section.

Failure to properly vent this furnace or other appliances can result in death, personal injury and/or property damage.

Location and Clearances

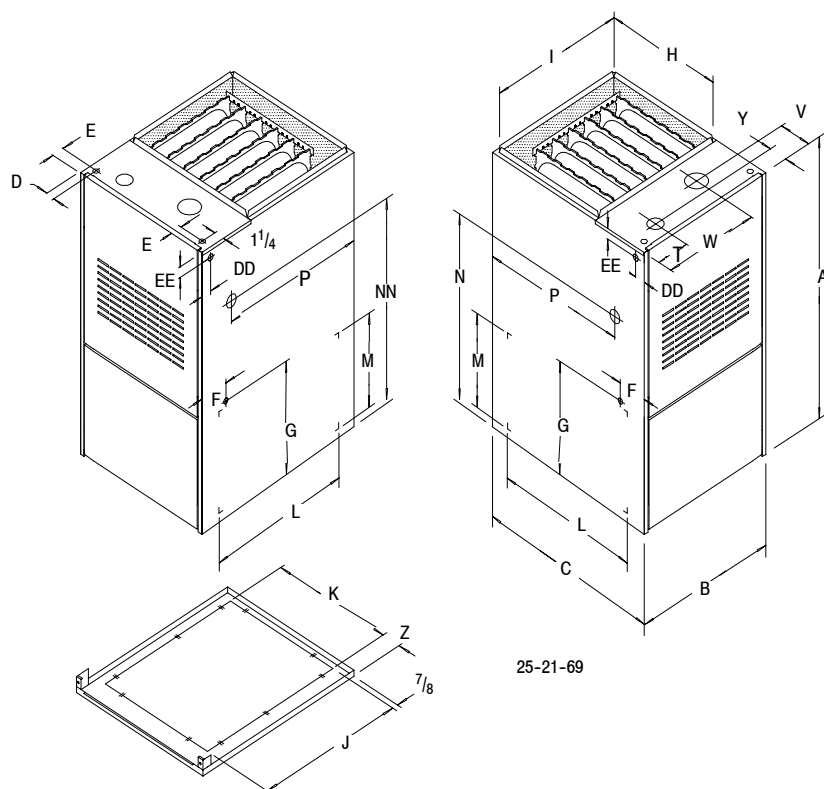
If furnace is a replacement, it is usually best to install the furnace where the old one was. Choose the location or evaluate the existing location based upon the minimum clearance and furnace dimensions (**Figure 1** and **Figure 2**).

CAUTION

Do NOT operate furnace in a corrosive atmosphere containing chlorine, fluorine or any other damaging chemicals. Refer to *Combustion & Ventilation Air* section, *Contaminated Combustion Air*.

Figure 1

Upflow/Horizontal Dimensions and Clearances (NTC7/GNL)



MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS FOR ALL UNITS	
REAR	0
FRONT	3" (75mm)
Recommended For Service	30" (760mm)
ALL SIDES OF SUPPLY PLENUM	1" (25mm)
SIDES	0
VENT	
Single Wall Vent	6" (150mm)
Type B-1 Double Wall Vent	1" (25mm)
TOP OF FURNACE	6" (150mm)

* 6" with accessory Masonry Chimney draft hood kit installed.

DIMENSIONAL INFORMATION

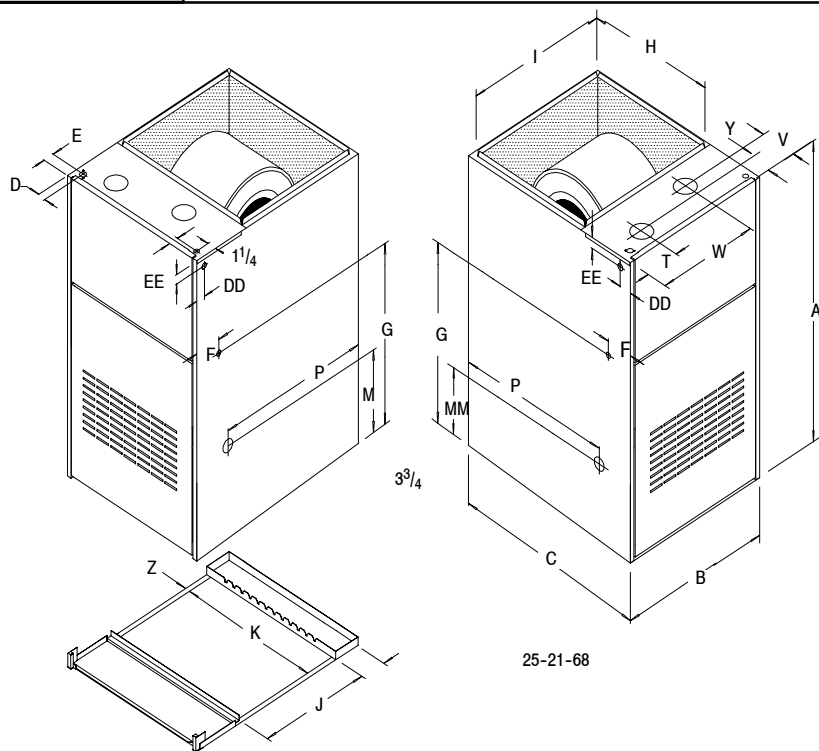
ALL DIMENSIONS IN INCHES

Unit Capacity	Cabinet			Electrical Connections						Supply Air		Return Air				
				Top		Side		Low Volt				Bottom			Side	
	A	B	C	D	E	DD	EE	F	G	H	I	J	K	Z	L	M
50 - 75,000	40	19 ¹ / ₈	28 ¹ / ₂	1 ⁵ / ₈	1 ⁵ / ₈	1 ⁵ / ₈	1 ¹ / ₂	4 ¹ / ₂	16 ⁵ / ₈	18 ¹ / ₂	17 ¹ / ₂	23 ⁵ / ₃₂	14 ³ / ₄	2 ⁵ / ₃₂	22 ⁷ / ₁₆	14 ³ / ₈
100 - 125,000	40	22 ³ / ₄	28 ¹ / ₂	1 ⁵ / ₈	1 ⁵ / ₈	1 ⁵ / ₈	1 ¹ / ₂	4 ¹ / ₂	16 ⁵ / ₈	18 ¹ / ₂	21 ¹ / ₄	23 ⁵ / ₃₂	18 ³ / ₄	1 ⁷ / ₈	22 ⁷ / ₁₆	14 ³ / ₈

Unit Capacity	Gas Connections				Air Inlet		Flue Outlet	
	Right Side		Left Side					
	NN	P	N	P	T	Y	W	V
50 - 75,000	30 ⁷ / ₁₆	23	28 ³ / ₁₆	23	5 ⁵ / ₃₂	3 ¹ / ₁₆	12 ¹ / ₂	5 ⁵ / ₁₆
100 - 125,000	30 ⁷ / ₁₆	23	28 ³ / ₁₆	23	6 ⁵ / ₈	3 ¹ / ₁₆	15 ¹ / ₈	5 ⁵ / ₁₆

Figure 2

Dimensions and Clearances - Downflow Models



Minimum Cabinet Clearances to Combustible Materials for all Units

TOP	BOT	RH	LH	BACK	FRNT	FLUE
6"	* 0"	0"	0"	0"	3"	6"

* Can not be installed directly on combustible flooring. Supply plenum must have 1" clearance for first 6' from furnace.

ALL DIMENSIONS IN INCHES

DIMENSIONAL INFORMATION

Unit Capacity	Cabinet			Electrical Connections						Return Air Top		Supply Air		
				Top		Side		Low Volt				Bottom		
	A	B	C	D	E	DD	EE	F	G	H	I	J	K	Z
50 - 75,000	40	19 ¹ / ₈	28 ¹ / ₂	1 ⁵ / ₈	1 ⁵ / ₈	1 ⁵ / ₈	1 ¹ / ₂	3 ⁷ / ₈	25 ³ / ₄	18 ¹ / ₂	17 ⁵ / ₈	16 ⁵ / ₈	17 ⁵ / ₈	5 ⁵ / ₈
100 - 125,000	40	22 ³ / ₄	28 ¹ / ₂	1 ⁵ / ₈	1 ⁵ / ₈	1 ⁵ / ₈	1 ¹ / ₂	3 ⁷ / ₈	25 ³ / ₄	18 ¹ / ₂	21 ¹ / ₄	16 ⁵ / ₈	21 ³ / ₈	5 ⁵ / ₈

Unit Capacity	Gas Connections				Air Inlet		Flue Outlet	
	Right Side		Left Side					
	M	P	MM	P	T	Y	W	V
50 - 75,000	12 ⁵ / ₈	24	10 ³ / ₈	24	5 ⁵ / ₃₂	3 ¹ / ₄	12 ¹ / ₂	5 ⁵ / ₁₆
100 - 125,00	12 ⁵ / ₈	24	10 ³ / ₈	24	6 ⁵ / ₈	3 ¹ / ₄	15 ¹ / ₈	5 ⁵ / ₁₆

Installation Requirements

1. Install furnace level.
2. This furnace is **NOT** to be used for temporary heat of buildings or structures under construction.
3. Install the vent pipes as short as practical. (See **Gas Vent Installation** section).
4. Do **NOT** install furnace directly on carpeting, tile or other combustible material other than wood flooring.
5. For downflow installations, do **NOT** install furnace directly on combustible floors unless using a special noncombustible subbase. See **Ductwork and Filter** section later in this manual.
6. Maintain clearance for fire safety and servicing. A front clearance of 30" is minimum for access to the burner, controls and filter.

⚠ WARNING

Fire Hazard.

If installing horizontally, place furnace on noncombustible cement board or sheet metal.

For counterflow furnaces place furnace on noncombustible cement board or sheet metal.

Failure to install unit on noncombustible cement board or sheet metal can result in property damage, personal injury and/or death.

7. Use a raised base if the floor is damp or wet at times.
8. Residential garage installations require:
 - Burners and ignition sources installed at least 18" (457mm) above the floor.
 - Furnace must be located or physically protected from possible damage by a vehicle.

Horizontal Furnace Installation

WARNING

Poison carbon monoxide gas, fire, and/or explosion hazard.

Make certain model installed is certified for use in multiple configurations.

Failure to install unit in configuration for which it is certified can result in property damage, personal injury and/or death.

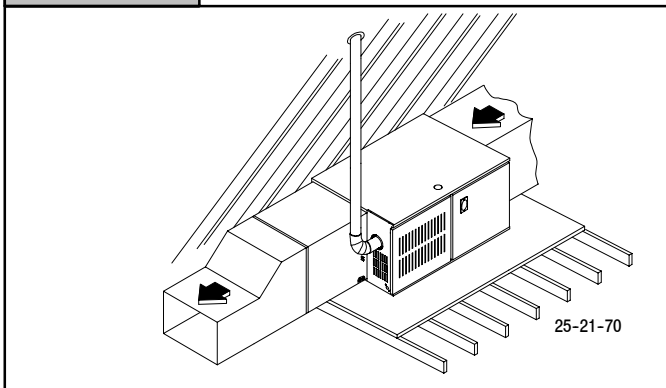
IMPORTANT

NOTE: Inspect unit rating plate to be certain model number begins with “**NTC7**” or “**GNL**”. This identifies unit as horizontally mountable. If unit does **NOT** bear this designation, you may **NOT** mount this unit horizontally. **Horizontal furnace must not be mounted on its back.**

If you purchased a horizontally mountable furnace, it can be installed horizontally in an attic, basement, crawl space, alcove, or suspended from a ceiling in a basement or utility room in either a right-to-left or left-to-right airflow position. See **Figure 3**.

Figure 3

Typical Horizontal Installation



If the furnace is to be suspended from the floor joists in a crawl space or the rafters in an attic, it is necessary to use steel pipe straps or an angle iron frame to attach the furnace. These straps should be attached to the furnace with sheet metal screws and to the rafters or joists with bolts. The preferred method is to use an angle iron frame bolted to the rafters or joists.

If the furnace is to be installed in a crawl space, consult local codes. A concrete pad 1" to 2" thick is recommended for crawl space installation on the ground.

Thirty inches (30") between the front of the furnace and adjacent construction or other appliances **MUST** be maintained for service clearance.

Keep all insulating materials clear from louvered door. Insulating materials may be combustible.

The horizontal furnaces may be installed directly on combustible wood flooring or supports for added fire protection it is recommended that cement board or sheet metal is placed between the furnace and the combustible wood floor and extend 12" beyond the front of the furnace louver door.

It is recommended for further fire protection that cement board or sheet metal is placed between the furnace and the combustible wood floor and extend 12" beyond the front of the furnace louver door. (This is a recommendation only, not a requirement).

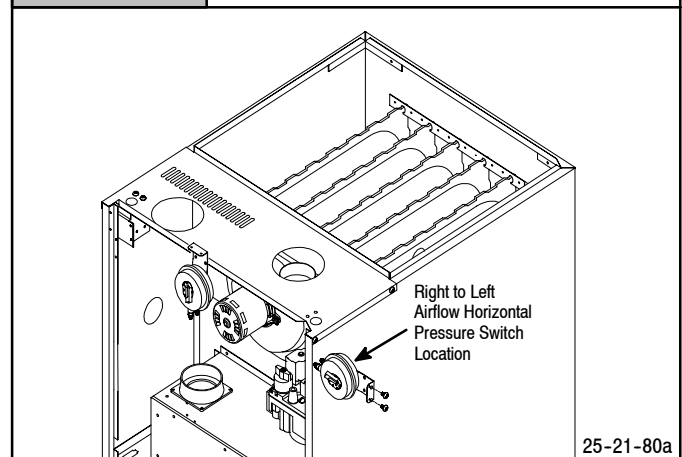
This furnace **MUST NOT** be installed directly on carpeting or tile or other combustible material other than wood flooring or supports.

Pressure Switch Relocation

If the furnace is installed in a left to right airflow position (right side of furnace facing down), the pressure switch will remain in the same position as installed by the factory (see **Figure 5**). If the furnace is installed in a right to left airflow position (left side of furnace facing down), the pressure switch **MUST** be relocated to the right side of the furnace using the holes provided on the side of the furnace. Position the pressure switch in the same orientation as the original location.

Figure 4

Pressure Switch Relocation



To reposition switch, remove the two screws that secure the pressure switch to the blower partition. Attach the pressure switch in the location shown. It may be necessary to shorten the tube length. To prevent possible kinking of the pressure switch hose, trim the hose to remove excess.

Note: Care **MUST** be taken not to cut the tube too short.

2. Combustion & Ventilation Air

⚠ WARNING

Poison carbon monoxide gas hazard.

Use methods described here to provide combustion and ventilation air.

Failure to provide adequate combustion and ventilation air can result in death and/or personal injury.

Furnaces require ventilation openings to provide sufficient air for proper combustion and ventilation of flue gases. All duct or openings for supplying combustion and ventilation air must comply with the gas codes, or in the absence of local codes, the applicable national codes.

When the installation is complete, check that all appliances have adequate combustion air and are venting properly. See *Venting And Combustion Air Check* in "Gas Vent Installation" Section in this manual.

Contaminated Combustion Air

Installations in certain areas or types of structures will increase the exposure to chemicals or halogens that may harm the furnace. These instances must use only outside air for combustion.

The following areas or types of structures may contain or have exposure to the substances listed below. The installation must be evaluated carefully as it may be necessary to provide outside air for combustion.

- Commercial buildings.
- Buildings with indoor pools.
- Furnaces installed in laundry rooms.
- Furnaces installed in hobby or craft rooms.
- Furnaces installed near chemical storage areas.
- Permanent wave solutions for hair.
- Chlorinated waxes and cleaners.
- Chlorine based swimming pool chemicals.
- Water softening chemicals.
- De-icing salts or chemicals.
- Carbon tetrachloride.
- Halogen type refrigerants.
- Cleaning solvents (such as perchloroethylene).
- Printing inks, paint removers, varnishes, etc..
- Hydrochloric acid.
- Sulfuric Acid.
- Solvent cements and glues.
- Antistatic fabric softeners for clothes dryers.
- Masonry acid washing materials.

Confined Space Installation

NOTE: A confined space is defined as an area with less than 50 cubic feet(1.4m³) per 1,000 BTUH input rating for all gas appliances installed in the area.

Requirements

1. Provide confined space with sufficient air for proper combustion and ventilation of flue gases using horizontal or vertical ducts or openings.

2. **Figure 5** illustrates how to provide combustion and ventilation air. A minimum of two permanent openings, one inlet and one outlet, are required.
3. One opening **MUST** be within 12" (300mm) of the floor and the second opening within 12" (300mm) of the ceiling.
4. Size openings and ducts per **Table 1**.
5. Horizontal duct openings require 1 square inch(25sq. mm) of free area per 2,000 BTUH of combined input for all gas appliances in area (see **Table 1**).
6. Vertical duct openings or openings directly to outside require 1 square inch(6.5mm³) of free area per 4,000 BTUH for combined input of all gas appliances in area (see **Table 1**).

Table 1		Free Area	
BTUH Input Rating	Minimum Free Area Required for Each Opening		
	Horizontal Duct (sq. in./2,000 BTUH)	Vertical Duct or openings to outside (sq. in./4,000 BTUH)	Rd Duct (sq. in. /4,000 BTUH)
50,000	25 sq. in. (161 cm ²)	12.5 sq. in. (81 cm ²)	4"
75,000	35.5 sq. in. (242 cm ²)	18.75 sq. in. (121 cm ²)	5"
100,000	50 sq. in. (323 cm ²)	25 sq. in. (161 cm ²)	6"
125,000	62.5 sq. in. (403 cm ²)	31.25 sq. in. (202 cm ²)	7"
EXAMPLE: Determining Free Area			
Furnace Water Heater Total Input			
100,000 + 30,000 = (130,000 ÷ 4,000) = 32.5 Sq. In. Vertical (210 cm ²)			
Furnace Water Heater Total Input			
100,000 + 30,000 = (130,000 ÷ 2,000) = 65 Sq. In. Horizontal (419 cm ²)			

Air Openings and Connecting Ducts

1. Total input rating for all gas appliances **MUST** be considered when determining free area of openings.
2. Connect ducts or openings directly to outside.
3. When screens are used to cover openings, the openings **MUST** be no smaller than 1/4" (6mm) mesh.
4. The minimum dimension of rectangular air ducts **MUST NOT** be less than 3" (75mm).
5. When sizing grille or louver, use the free area of opening. If free area is **NOT** stamped or marked on grill or louver, assume a 20% free area for wood and 60% for metal.

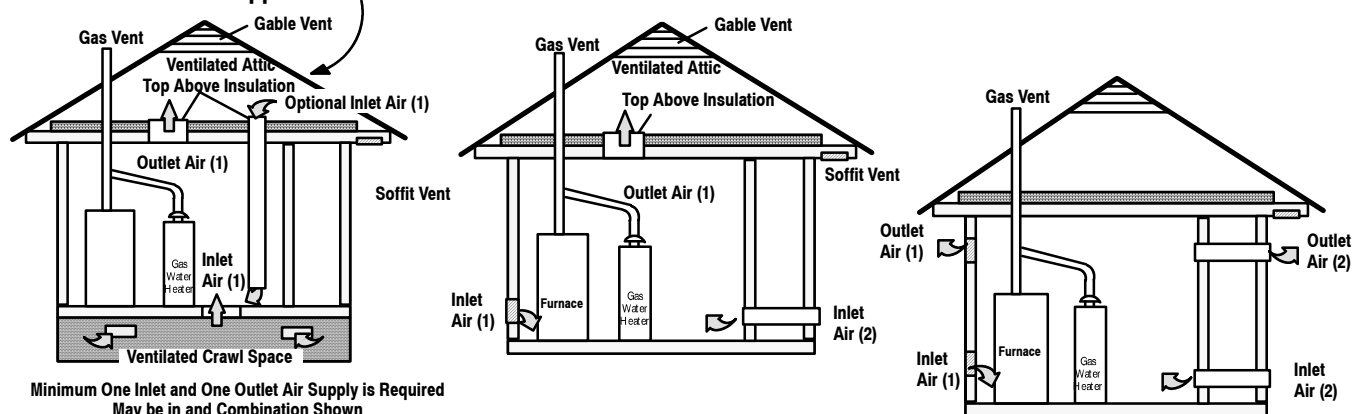
One permanent opening, commencing within 12" (30 cm) of the top of the enclosure, shall be permitted where the equipment has clearances of at least 1" (2.5 cm) from the sides and back and 6" (16 cm) from the front of the appliance. The opening shall directly communicate with the outdoors or shall communicate through a vertical or horizontal duct to the outdoors or spaces (crawl or attic) that freely communicate with the outdoors, and shall have a minimum free area of:

- 1 sq. in per 3000 Btu per hr (7cm² per kW) of the total input rating of all equipment located in the enclosure, and
- Not less than the sum of the areas of all vent connectors in the confined space.

Figure 5

Outside Air (This is ONLY a guide. Subject to codes of country having jurisdiction.)

This installation NOT approved in Canada



Minimum One Inlet and One Outlet Air Supply is Required
May be in and Combination Shown

Inlet Air Opening Must be Within 12" (300mm) of floor

Outlet Air Opening Must be Within 12" (300mm) of ceiling

(1) 1 Square Inch (6cm²) per 4000 BTUH(2) 1 Square Inch (6cm²) per 2000 BTUH

Unconfined Space Installation

⚠ WARNING

Poison carbon monoxide gas hazard.

Most homes will require additional air.

An unconfined space or homes with tight construction may not have adequate air infiltration for proper combustion and ventilation of flue gases.

Failure to supply additional air by means of ventilation grilles or ducts could result in death and/or personal injury.

An unconfined space is defined as an area having a minimum volume of 50 cubic feet per 1,000 Btuh total input rating for all gas appliances in area.

Adjoining rooms can be considered part of an unconfined area if there are no doors between rooms.

An attic or crawl space may be considered an unconfined space provided there are adequate ventilation openings directly to outdoors. Openings **MUST** remain open and **NOT** have any means of being closed off. Ventilation openings to outdoors **MUST** be at least 1 square inch of free area per 4,000 BTUH of total input rating for all gas appliances in area.

In unconfined spaces, infiltration should be adequate to provide air for combustion, ventilation and dilution of flue gases. However, in buildings with unusually tight construction, additional air **MUST** be provided using the methods described in section titled *Confined Space Installation*:

Unusually tight construction is defined as: Construction with

- 1 Walls and ceilings exposed to the outside have a continuous, sealed vapor barrier. Openings are gasketed or sealed and
- 2 Doors and openable windows are weather stripped and
- 3 Other openings are caulked or sealed. These include joints around window and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, etc.

Ventilation Air

Some provincial codes and local municipalities require ventilation or make-up air be brought into the conditioned space as replacement air. Whichever method is used, the mixed return air temperature across the heat exchanger **MUST** not fall below 60°F or flue gases will condense in the heat exchanger. This will shorten the life of the heat exchanger and possibly void your warranty.

Direct Vent Installations

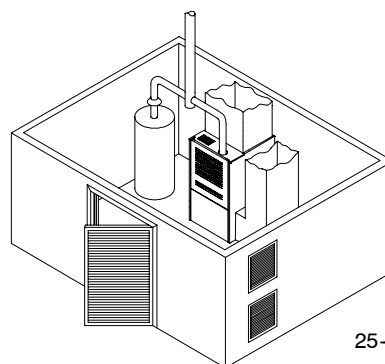
Combustion air is obtained from outside the structure. Ventilation air must be obtained from the following:

In a closet or utility room installation, it will be necessary to provide ventilation air from an area of adequate air supply.

Any restricted installation requires two openings in the door or single wall of the closet or utility room. One opening should be located within 12" of the top and the other within 12" of the bottom of the enclosure. (see **Figure 6**).

Figure 6

Closet or Utility Room Installation



The following minimum free area is required for these openings:

- a. Openings to interior space—Each opening to interior space must have a free area at least 1 square inch per 1,000 BTU per hour input rating, but not less than 100 square inches.
- b. Openings to outdoors—Each opening to the outdoors must have a free area at least 1 square inch per 2,000 BTU per hour input rating if horizontal air ducts are used.

Air openings in the casing front, return air grilles, and warm air registers must not be obstructed.

In all instructions provisions for adequate combustion air must be

made in accordance with Section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1 – 1988, or applicable provisions of the local building codes.

3. Gas Vent Installation

⚠ WARNING

Poison carbon monoxide gas, fire and explosion hazard.

Read and follow all instructions in this section.

Failure to properly vent this furnace can result in death, personal injury and/or property damage.

Dual Certified Furnace

This furnace is dual certified as a direct vent furnace using outside air for combustion or it can use air from inside the structure for combustion. The **INLET** air pipe is optional.

Install the vent in compliance with codes of the country having jurisdiction, local codes or ordinances and these instructions.

This Category I furnace has a natural draft vent system and **MUST NOT** be connected into any portion of a mechanical draft system operating under positive pressure.

These fan assisted combustion furnaces have been classified as Category I appliances which means that they **MUST** operate with a negative vent pressure.

Category I Safe Venting Requirements

NOTE: The following instructions comply with the United States National Fuel Gas Code. Based on the highest input rate on the furnace rating plate.

1. If a Category I vent passes through an attic, any concealed space or floor, use **ONLY** Type B or Type L double wall vent pipe. If vent pipe passes through interior wall, use type B vent pipe with ventilated thimble **ONLY**.
2. Do **NOT** vent furnace into any chimney serving an open fireplace or solid fuel burning appliance.
3. Use the same diameter Category I connector or pipe as permitted by the **United States National Fuel Gas Code** venting tables.
4. Keep vertical Category I vent pipe or vent connector runs as short and direct as possible.
5. Vertical outdoor runs of type B or **ANY** single wall vent pipe below the roof line are **NOT** permitted.
6. Slope all horizontal runs up away from furnace a minimum of $\frac{1}{4}$ " per foot.
7. Support all horizontal vent pipe every 6' using proper clamps and metal straps.
8. Check existing gas vent or chimney to ensure they meet clearances and local codes.
9. The furnace **MUST** be connected to a factory built chimney or vent complying with a recognized standard. **Venting into a masonry or concrete chimney is only permitted as outlined in the United States National Fuel Gas Code venting tables or Masonry Chimney section in these instructions.**

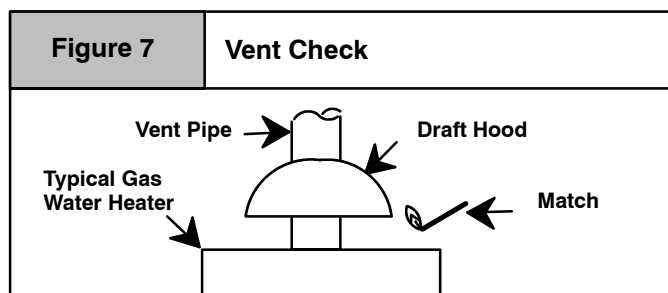
10. All Category I vent piping **MUST** be attached directly to the combustion blower flange.

On downflow units, Category I pipe **MUST** be attached to the factory provided 3" vent pipe where it exits the furnace. Do **NOT** remove the factory installed 3" vent pipe from vent enclosure. Inspect connection to ensure connection is tight and all screws are in place.

Venting and Combustion Air Check

NOTE: If this installation removes an existing furnace from a venting system serving one or more other appliances, and to make sure there is adequate combustion air for all appliances, **MAKE THE FOLLOWING CHECK.**

1. Seal any unused openings in the venting system.
2. Visually inspect the venting system for proper size and horizontal pitch to ensure there is no blockage or restriction, leakage, corrosion or other deficiencies which could cause an unsafe condition.
3. Insofar as is practical, close all doors and windows and all doors between the space in which the appliance(s) remaining connected to the venting system are located and other spaces of the building.
4. Turn on clothes dryers and any appliance not connected to the venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
5. Follow the lighting instructions for each appliance being inspected. Adjust thermostat so appliance(s) will operate continuously.
6. Allow 5 minutes of main burner operation, then check for spillage at the draft hood relief opening of each appliance. Use the flame of a match or candle (**Figure 7**).



7. After it has been determined that each appliance vents properly, return doors, windows, appliances etc. to their normal condition.
8. If improper venting is observed, the cause **MUST** be corrected.

NOTE: If flame pulls towards draft hood, this indicates sufficient infiltration air.

NOTE: Non-direct vent appliances occupying same enclosed space as furnace **MUST** have enough air for proper combustion and ventilation. All duct or openings for supplying combustion and ventilation air must comply with the gas codes, in the absence of local codes, the applicable national codes.

When the installation is complete, check that all appliances have adequate combustion air and are venting properly. See *Venting And Combustion Air Check* in this manual.



WARNING

Poison carbon monoxide gas hazard.

If this furnace is replacing a previously common-vented furnace, it may be necessary to resize the existing chimney liner or vent to prevent over sizing problems for the other remaining appliances(s). See codes of country having jurisdiction.

Failure to properly vent this furnace or other appliances can result in property damage, personal injury and/or death.

Venting to Existing Masonry Chimney

NOTE: The tables and notes referred to below are found in the most recent printing of the **United States National Fuel Gas Code** venting tables.

Use the United States National Fuel Gas Code or NFGC Tables to size the chimney or vent. **Dedicated venting of one fan assisted furnace into any masonry chimney is restricted.** The chimney must first be lined with either type B vent sized in accordance with tables 1 or 2 or a listed single wall, metal lining system, sized in accordance with the vent tables.

Listed, corrugated metallic chimney liner systems in masonry chimneys shall be sized by using **United States National Fuel Gas Code** tables for dedicated venting and **United States National Fuel Gas Code** tables for common venting with the maximum capacity reduced by 20% (0.80 X maximum capacity) and the minimum capacity as shown in the applicable table. Corrugated metal vent systems installed with bends or offsets require additional reduction of 10% of the vent capacity for each 90° elbow.

NOTE: Two(2) 45° elbows are equivalent to one (1) 90° elbow.

Combined Venting into a Masonry Chimney

Venting into a masonry or concrete chimney is only permitted as outlined in the **United States National Fuel Gas Code** venting tables. Follow all safe venting requirements.

Note: See section “Masonry Chimney Venting”.

Optional Fresh Air Inlet

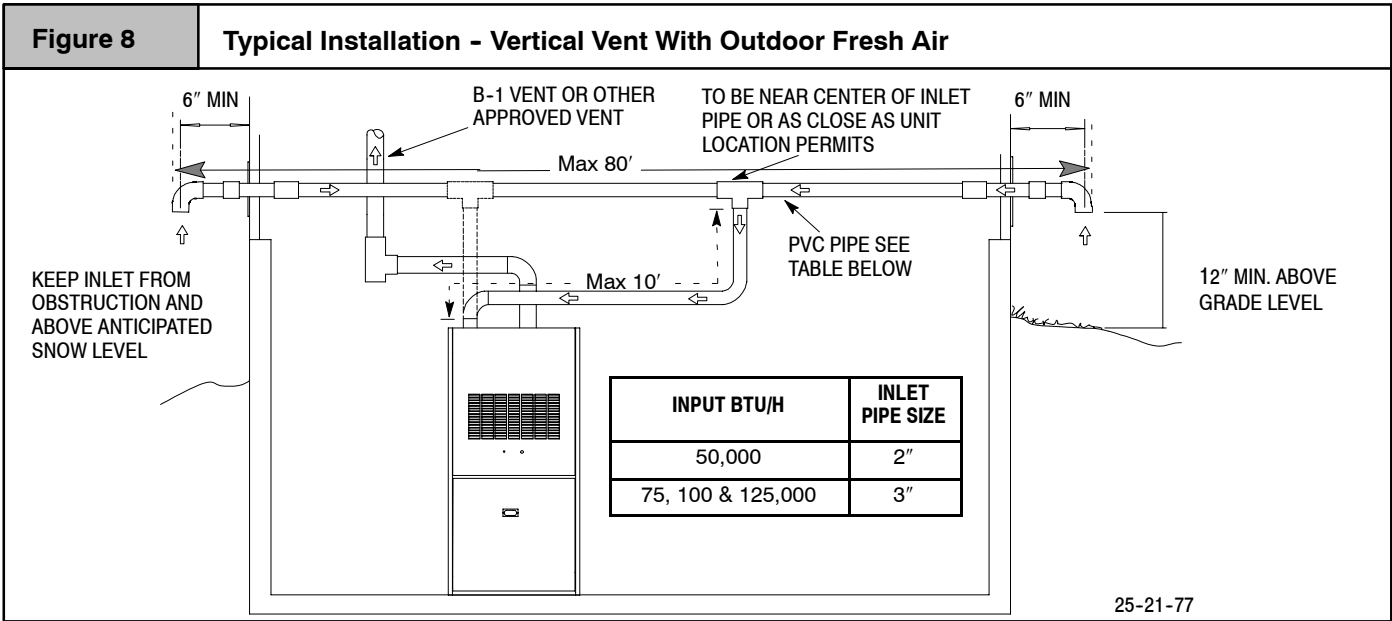
Consult local codes for any requirements for a fresh air inlet to the furnace. For additional information on the provisions of fresh air to the furnace refer to the current edition of the “National Fuel Gas Code” ANSI-Z223.1.

This installation, for providing fresh air to the furnace, is not considered as complying with the requirements for a Direct Vent Furnace. It is a means of supplying fresh air for combustion to those furnaces that are vented vertically. It is for those locations where a direct vent furnace cannot be installed but the surrounding air may contain products that could be harmful to the heat exchanger material.

It should be noted that adequate quantities of air must reach the furnace to provide for proper and safe operation for the furnace. Any obstruction to this air flow can cause an unsafe condition which may result in unit failure or personal injury.

The following methods for bringing in outside air are listed below.

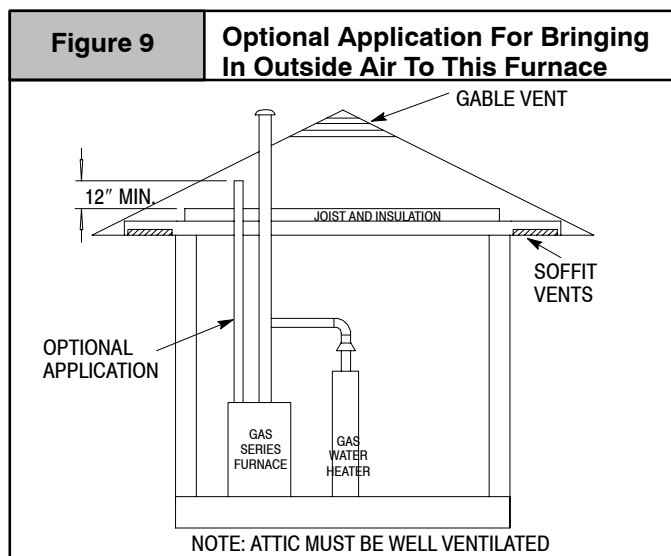
1. The vertically vented furnace may have outside air brought directly to it by means of 2" or 3" plastic (PVC) drain pipe, schedule 40 PVC, single wall galvanized or single wall stainless steel pipe as shown in **Figure 8**. Any one of the listed pipe materials are recommended. This configuration, for the inlet air, may require some modifications to accommodate for unit location, inlet pipe, and building structure. The two inlets that are installed, with the “Tee” near the furnace may be located on opposite sides or adjacent sides of the building. Because of the possibility of wind outage, the use of only one air inlet is not permitted. The air movement through the pipe must not be blocked or restricted, therefore, the inlet fittings must be located above any obstructions or expected snow level.



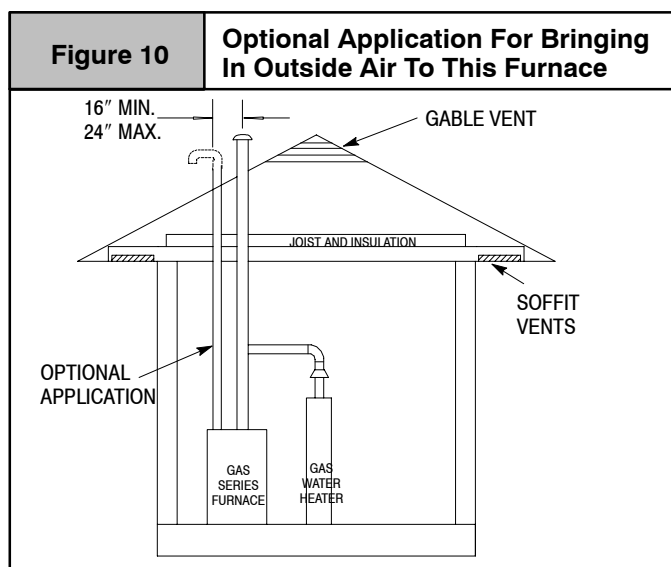
2. Outside air may be brought directly to the intake of a vertically vented furnace from a well ventilated attic as shown in **Figure 9**. The material for the intake pipe can be of 2 or 3"

plastic (PVC) drain pipe, schedule 40 PVC, single wall galvanized or single wall stainless steel pipe. Any one of the listed pipe materials are recommended. The intake pipe should ter

minate in the attic 12" above the ceiling joist or the insulation which ever is the highest. Also the vents in the attic should be checked so proper ventilation air can be supplied. If proper ventilation is not provided, the furnace may not operate properly.



3. An additional option for bringing in outside air directly to the intake of a vertically vented furnace is also shown in **Figure 10**. The intake pipe can be run from the furnace through the roof terminating at the same height as the vent. These pipes should be installed with a minimum of 16" and a maximum of 24" apart. A 180° elbow should be installed on the intake to prevent rain water or snow from draining down the intake. Also when bringing fresh air in for combustion from the roof the actual height for terminating the intake above the roof should take into consideration snow accumulation and be terminated 12" above the highest recorded snowfall.



If the furnace, with fresh air inlet, is connected to an approved vent or the common vent, with any other appliance, the system should be checked for venting in accordance with the instructions found under **Combustion and Ventilation Air** in this booklet.

Vertical Termination

Figure 11 shows the proper installation and clearances for vertical vent termination. The vertical roof termination should be sealed with a plumbing roof boot or equivalent flashing. The inlet

of the intake pipe and end of the exhaust vent must be terminated no less than 12" above the roof or snow accumulation level, and 12" away from a vertical wall or other protrusion.

Optional Inlet Pipe Screens

To prevent unwanted pests or foreign material from entering terminated pipes, plastic vent screens are available from distributor in 2" and 3" sizes. Use of these screens is recommended except in cold climate areas where ice is likely to form on them. Glue the screen inside the termination elbow using pipe cement. Screens should be inspected monthly for blockage and cleaned yearly prior to startup.

Horizontal Termination Shielding (external power venter)

Under certain wind conditions some building materials may be affected by flue products expelled in close proximity to unprotected surfaces. Sealing or shielding of the exposed surfaces with a corrosion resistant material (such as aluminum sheeting) may be required to prevent staining or deterioration. The protective material should be attached and sealed (if necessary) to the building before attaching the vent terminal.

A metal shield is recommended 18" x 18" min. or 18" min. diameter around the vent termination at the exterior wall to protect the house exterior materials from flue product or condensation (freezing) damage.

Venting Through a Non-Combustible and Combustible Wall

Consult External Power Venter manufacturer instructions.

Air Inlet Pipe Connection

NOTE: The 50,000 and 75,000 BTU furnaces require the use of the 2" diameter offset pipe provided. The 100,000 BTU furnace requires a 2" diameter pipe to clear the top of the furnace before increasing size to 3" diameter. The 125,000 BTU furnace may have 3" diameter pipe attached directly to the air inlet collar on the burner box. Air Inlet Collar is sized for 3" PVC pipe. If 2" or 2 1/2" combustion air piping is used, a 3" to 2" or 3" to 2 1/2" reducer fitting is required. The reducing section can be before the 90° elbow in a horizontal section.

1. Install pipe section or pipe/reducer fitting (as required) to the inlet collar using RTV sealant **ONLY** to provide for future serviceability.

NOTE: On single pipe installation, using combustion air from inside the structure, it is recommended that a screen be placed inside the Combustion Air Inlet. A 3" plastic screen is available for this purpose. It will prevent small objects from falling into the combustion chamber. Use RTV sealant **ONLY** to provide for future serviceability.

Joining Pipe and Fittings

⚠ WARNING

Fire hazard.

Provide adequate ventilation and do NOT assemble near heat source or open flame. Do NOT smoke while using solvent cements and avoid contact with skin or eyes.

Observe all cautions and warnings printed on material containers to prevent possible personal injury and/or death.

NOTE: All PVC pipe fittings, solvent cement, primers and procedures **MUST** conform to American National Standard Institute

and American Society for Testing and Materials (ANSI/ASTM) standards. Schedule 40 is the **ONLY** approved wall thickness.

- *Pipe and Fittings* – ASTM D1785, D2466, D2661, D2665, F-891
- *PVC Primer and Solvent Cement* – ASTM D2564
- *Procedure for Cementing Joints* – Ref ASTM D2855

NOTE: In order to create a seal that allows future removal of pipe, RTV sealant **MUST** be used on the inlet pipe where it joins to the furnace. PVC cement may be used on all other joints.

CAUTION

Do NOT use solvent cement that has become curdled, lumpy or thickened and do NOT thin. Observe precautions printed on containers. For applications below 32° F., use only low temperature type solvent cement.

1. Cut pipe end square, remove ragged edges and burrs. Chamfer end of pipe, then clean fitting, socket and pipe joint of all dirt, grease, or moisture.

NOTE: Stir the solvent cement frequently while using. Use a natural bristle brush or the dauber supplied with the cement. The proper brush size is one inch.

2. After checking pipe and socket for proper fit, wipe socket and pipe with cleaner-primer. Apply a liberal coat of primer to inside surface of socket and outside of pipe. Do **NOT** allow primer to dry before applying cement.
3. Apply a thin coat of cement evenly in the socket. Quickly apply a heavy coat of cement to the pipe end and insert pipe into fittings with a slight twisting movement until it bottoms out.

NOTE: Cement **MUST** be fluid while inserting pipe. If **NOT**, recoat pipe.

4. Hold the pipe in the fitting for 30 seconds to prevent the tapered socket from pushing the pipe out of the fitting.
5. Wipe all excess cement from the joint with a rag. Allow 15 minutes before handling. Cure time varies according to fit, temperature and humidity.

Connecting Vent Pipes and Termination

CAUTION

4. Horizontal Venting

Category I Furnaces With External Power Venters

In order to maintain a Category I classification of fan assisted furnaces when vented horizontally with sidewall termination, a power venter is **REQUIRED** to maintain a negative pressure in the venting system. Please consult the Fields Controls Co. or Tjernlund Products, Inc. for power venters certified for use with our furnaces.

5. Masonry Chimney Venting with Optional Kit (Upflow/Horizontal ONLY) (USA ONLY)

Not for use on downflow furnaces

Chimney Inspection

All masonry chimney construction must conform to Standard ANSI/NFPA211 and to any state or local codes applicable. The chimney must be in good condition and a complete investigation must be conducted prior to installation. If the inspection reveals damage or abnormal conditions, make necessary repairs or seek

Maintain a minimum of 36" (1m) between combustion air inlet and clothes dryer vent. Terminate the combustion air intake as far as possible from any air conditioner, heat pump, swimming pool, swimming pool pumping, chlorinator or filtration unit.

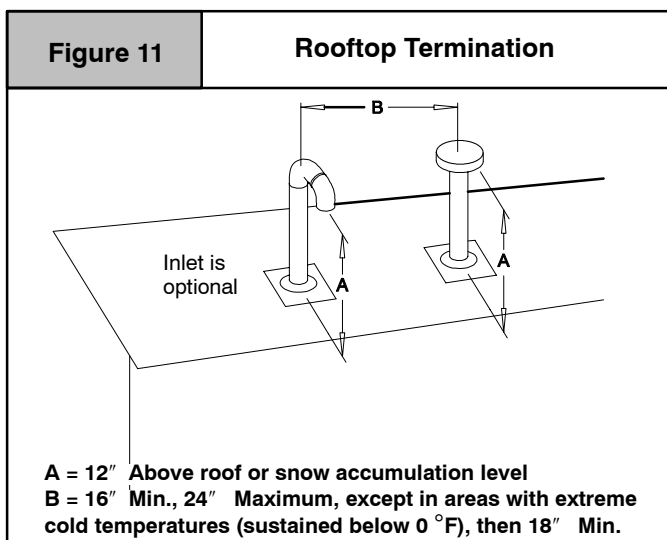
! WARNING

Carbon monoxide poisoning, fire and explosion hazard.

Inlet and outlet pipes may NOT be vented directly above each other.

Failure to properly vent this furnace can result in property damage, personal injury and/or death.

1. Install all couplings, nipples and elbows using proper procedures for **Joining Pipe and Fittings** and maintain spacing between vent and combustion air piping as indicated in **Figure 11.**



Vent Termination

Venting Through a Non-Combustible and Combustible Wall

Consult External Power Venter manufacturer instructions.

CAUTION

It is the responsibility of the installer to properly terminate the vent and provide adequate shielding. This is essential in order to avoid water/ice damage to building, shrubs and walk-ways.

expert help. Measure area of tile-liner and exact height of chimney.

Connector Type

To reduce flue gas heat loss and the chance of condensate problems, the vent connector must be double wall Type B vent.

Venting Restrictions for Chimney Types

Interior Chimney – has no sides exposed to the outside ambient below the roofline. All installations can be single furnace using linerless chimney kit or common vented with another draft hood equipped Category I appliance.

Exterior Chimney – has one or more sides exposed to the outside below the roof line. All installations must be common vented only with another draft hood equipped Category I appliance.

⚠ Caution – failure to follow these guidelines may cause property damage.

NOTE: These instructions apply to the NTC7/GNL series furnaces only.

NOTE: Furnaces **MUST** use combustion air from same atmospheric zone as dilution air. (One Pipe ONLY)

Draft Hood Assy. Installation (See Figure 12)

1. Disconnect power and gas supply to furnace.
2. Remove louvered door.
 - a. Remove logo from louvered door. Discard logo. Set aside louvered door.
3. NTC7/GNL may be installed upflow or horizontal position per furnace application.

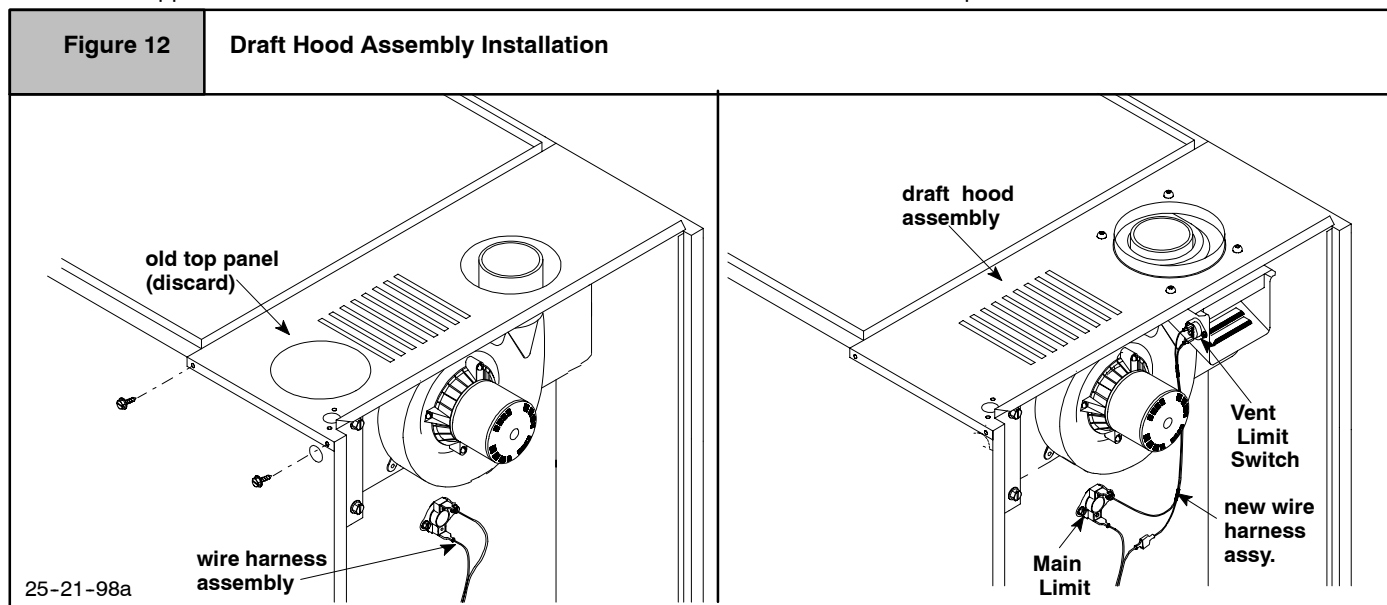
4. Detach field connect box from top panel by removing two screws. Set aside screws.
5. Remove four screws holding top panel to casing. Remove top panel. Discard top panel. Set screws aside.
6. Install draft hood assy. to casing using four screws previously set aside.
7. Attach field connect box to draft hood assy. using two screws previously set aside.

Vent Limit Switch Wiring (See Figure 12)

1. Locate wire harness assy. which is supplied with kit. Attach terminals on one end of wire harness assy. to vent limit switch located on draft hood assy.
2. Locate furnace's main limit. Detach wire with insulated terminal from one side of main limit.
3. Route wire harness assy. from vent limit switch to main limit. Attach female terminal of wire harness assy. to vacated main limit terminal. Attach male terminal of wire harness assy. to insulated terminal of wire previously detached from main limit.

Completion of Installation

1. NTC7/GNL Series furnaces – locate louvered door previously set aside. Install on furnace.
3. Refer to installation instructions provided with furnace to put the furnace into operation.



Masonry chimney venting shall be approached as follows: Using **Tables 1** and **2** in the masonry chimney draft hood kit instructions.

6. Gas Supply and Piping

⚠ WARNING

Poison carbon monoxide gas, fire and explosion hazard.

Models designated for Natural Gas are to be used with Natural Gas ONLY, unless properly converted to use with LP gas.

Failure to follow these instructions can result in death, personal injury and/or property damage.

Gas Supply Requirements

- Use only the Type of gas approved for this furnace. See rating plate for approved gas type.
- Gas input must not exceed the rated input shown on the rating plate. Overfiring will result in failure of heat exchanger and cause dangerous operation.
- Do not allow minimum supply pressure to vary downward. Doing so will decrease input to furnace. Refer to **Table 2** for Gas supply and manifold pressures.

Table 2		Gas Pressures		
Gas Type	Supply Pressure			Manifold Pressure
	Recommended	Max.	Min.	
Natural	7"	14"	4.5"	3.5"
Propane	11"	14"	11"	10"

Natural Gas Input Rating Check

The gas meter can be used to measure input to furnace. Rating is based on a natural gas BTU content of 1,000 BTU's per cubic foot. Check with gas supplier for actual BTU content.

1. Turn **OFF** gas supply to all appliances other than furnace and start furnace.
2. Time how many seconds it takes the smallest dial on the gas meter to make one complete revolution. Refer to **Example**.
Note: If meter uses a 2 cubic foot dial, divide results (seconds) by two.

Example			
Natural Gas BTU Content	No. of Seconds Per Hour	Time Per Cubic Foot in Seconds	BTU Per Hour
1,000	3,600	48	75,000
$1,000 \times 3,600 \div 48 = 75,000 \text{ BTUH}$			

3. Relight all appliances and ensure all pilots are operating.

Orifice Sizing

NOTE: Factory sized orifices for natural and LP gas are listed in the furnace Technical Support manual.

Ensure furnace is equipped with the correct main burner orifices. Refer to **Table 3** for correct orifice size for a given heating value and specific gravity for natural and propane gas. Note that this chart is **ONLY** for installations *below* 2000' in altitude.

Table 3		Orifice Sizes (below 2000')		
Gas Type	Manifold Pressure	Specific Gravity	Heating Value (BTU per Cubic Ft.)	Orifice Size (Drill #)
Natural	3.5" w.c.	0.6	800	40
			900	41
			1000	42
			1100	43
Propane	10" w.c.	1.53	2500	54

Operation Above 2000' Altitude

WARNING

Fire, Explosion, Poison carbon monoxide gas hazard.

This conversion shall be done by a qualified service agency in accordance with the Manufacturer's instructions and all applicable codes and requirements, or in the absence of local codes, the applicable national codes.

Failure to follow these instructions exactly can result in death, personal injury and/or property damage.

These units may be used at full input rating when installed at altitudes up to 2000'. When installed above 2000', the input must be decreased 4% for each 1000' above sea level. This may be accomplished by a simple adjustment of manifold pressure or an orifice change, or a combination of a pressure adjustment and an orifice change. The changes required depend on the installation altitude and the heating value of the fuel. **Table 4 & Table 5** show the proper furnace manifold pressure and gas orifice size to achieve proper performance based on elevation above sea level for both natural gas and propane.

To use the natural gas table, first consult your local gas utility for the heating value of the gas supply. Select the heating value on the vertical border and follow across the table until the appropriate elevation for the installation is reached. The first value in the box at the intersection of the heating value and elevation will be the manifold pressure required. If a gas orifice change is also required, the box is shaded. The required orifice size is shown at the bottom of the table.

Sea Level
High Altitude Input Rate = Nameplate x (Multiplier)
Input Rate

Elevation	High Altitude Multiplier	
	Natural	LP Gas
2000' - 2999'	0.96	0.92
3000' - 3999'	0.94	0.88
4000' - 4999'	0.92	0.84
5000' - 5999'	0.90	0.80
6000' - 6999'	0.88	0.76
7000' - 7999'	0.86	0.72

MANIFOLD PRESSURE AND ORIFICE SIZE FOR HIGH ALTITUDE APPLICATIONS

Table 4	NATURAL GAS						
HEATING VALUE BTU/CU. FT.	MEAN ELEVATION FEET ABOVE SEA LEVEL						
	0 to 1999	2000 to 2999	3000 to 3999	4000 to 4999	5000 to 5999	6000 to 6999	7000 to 8000
800	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.5" wc
850	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.5" wc
900	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.4" wc
950	3.5" wc	3.5" wc	3.5" wc	3.5" wc	3.3" wc	3.2" wc	3.1" wc
1000	3.5" wc	3.4" wc	3.3" wc	3.2" wc	3.0" wc	2.9" wc	2.8" wc
1050	3.2" wc	3.1" wc	3.0" wc	2.9" wc	2.7" wc	2.6" wc	2.5" wc
1100	2.9" wc	2.8" wc	2.7" wc	2.6" wc	2.5" wc	2.4" wc	2.3" wc
Orifice Size	#42	#42	#42	#42	#42	#42	#42

MANIFOLD PRESSURE CHANGE ONLY.

Table 5	PROPANE						
HEATING VALUE BTU/CU. FT.	MEAN ELEVATION FEET ABOVE SEA LEVEL						
	0 to 1999	2000 to 2999	3000 to 3999	4000 to 4999	5000 to 5999	6000 to 6999	7000 to 8000
2500	10.0" wc	10.0" wc	9.4" wc	10.0" wc	9.8" wc	8.8" wc	7.9" wc
Orifice Size	#54	#54	#54	#55	#55	#55	#55

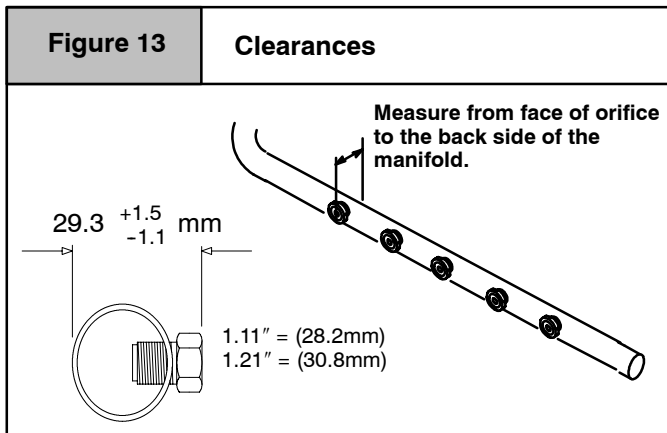
NOTE: NATURAL GAS DATA BASED ON 0.60 SPECIFIC GRAVITY. PROPANE DATA BASED ON 1.53 SPECIFIC GRAVITY. FOR FUELS WITH DIFFERENT SPECIFIC GRAVITY CONSULT THE LATEST EDITION OF THE NATIONAL FUEL GAS CODE ANSI Z223.1 and CAN B149.

High Altitude Air Pressure Switch

Altitudes over 6,000' require a different air pressure switch than the one installed at the factory. Consult your distributor or furnace *Parts List* for part number and availability. In Canada, provincial codes may govern installation of switch. Check with governing authorities.

Changing Orifices

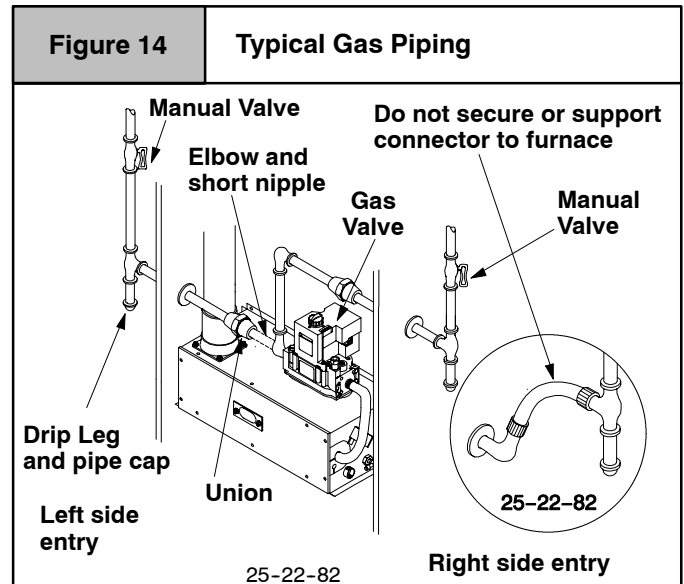
1. After disconnecting power and gas supply to the furnace, remove the access door, exposing the burner compartment.
2. Disconnect gas line and pilot tubing from gas valve so manifold can be removed.
3. Disconnect wiring at gas valve. Be sure to note the proper location of any and all electrical wiring disconnected.
4. Carefully remove the manifold assembly.
5. Remove the orifices from the manifold and replace them with proper sized orifices. See **Figure 13**.
6. Tighten orifices so it is seated and gas tight. See **Figure 13**.



7. Reassemble all parts in reverse order as removed. Be sure to engage the main burner orifices in the proper opening in the burners.
8. After reassembling, turn gas on and check all joints for gas leaks using a soapy solution. All leaks must be repaired immediately.

Gas Piping Requirements

1. Install gas piping in accordance with local codes, or in the absence of local codes, the applicable national codes.
2. It is recommended that a manual shutoff valve be installed in the gas supply line outside the unit. Locate valve as close to the furnace as possible where it is readily accessible. Refer to **Figure 14**.



3. Use black iron or steel pipe and fittings or other pipe approved by local code.
4. Use pipe thread compound which is resistant to natural and LP gases.
5. Install a drip leg no less than 3" long to trap dirt and moisture before it can enter gas valve.
6. Provide a 1/8" inch plug for test gauge connection immediately up stream of gas supply connection to furnace.
7. Use two pipe wrenches when making connections to prevent gas valve from turning.
8. Flexible corrugated metal gas connector may **NOT** be used inside the furnace or be secured or supported by the furnace or ductwork.
9. Properly size gas pipe to handle combined appliance load or run gas pipe directly from gas meter or LP gas regulator.
10. Install correct pipe size for run length and furnace rating.
11. Measure pipe length from gas meter or LP second stage regulator.

⚠ WARNING

Fire or explosion hazard.

The flexible corrugated metal gas connector must be properly installed, cannot go through the side of the furnace, and can not be used inside the furnace.

Failure to properly install metal gas connector can result in death, bodily injury and/or property damage.

Additional LP Piping Requirements

- Have a licensed LP gas dealer make all connections at storage tank and check all connections from tank to furnace.

- If copper tubing is used, it **MUST** comply with limitation set in Local Codes, or in the absence of local codes, the gas codes of the country having jurisdiction.
- Two-stage regulation of LP gas is recommended.

Final Check

- Test all pipe for leaks.
- If orifices were changed, make sure they are checked for leaks.
- During pressure testing of gas piping system, observe the following:
 - a. If test pressure does not exceed $\frac{1}{2}$ " PSIG, isolate the furnace by closing its individual manual shutoff valve.
 - b. If test pressure exceeds $\frac{1}{2}$ " PSIG, the furnace and its individual shutoff valve must be disconnected from the gas supply system.

- To check for leaks apply soap suds or a liquid detergent to each joint. Bubbles forming indicate a leak.
- Do not use an open flame to test for gas leaks. Fire or explosion could occur.
- Correct even the smallest leak at once.

⚠ WARNING

Fire or explosion hazard.

Liquid petroleum (LP) gas is heavier than air and will settle and remain in low areas and open depressions.

Thoroughly ventilate area and dissipate gas. Do NOT use a match or open flame to test for leaks, or attempt to start up furnace before thoroughly ventilating area.

An open flame or spark can result in death, personal injury and/or property damage.

7. Electrical Wiring

Power Supply Wiring

The furnace **MUST** be electrically wired and grounded in accordance with local codes, or in the absence of local codes, the applicable national codes.

Field wiring connections must be made inside the furnace connection box. A suitable strain relief should be used at the point the wires exit the furnace casing.

Copper conductors shall be used. Line voltage wires should be sized for the input amps stated on the rating plate. Furnace must be connected to its own separate circuit.

Thermostat

Thermostat location has an important effect on the operation of the unit. Follow instructions included with thermostat for correct mounting and wiring.

Low voltage connections to furnace must be made on terminal board to fan control.

If cooling is used, the **Y** from the thermostat must be connected to the control board **Y** to energize cooling blower speed.*

Set thermostat heat anticipator in accordance with the *Technical Support Manual*.

*"Y" terminal on thermostat sub-base must be connected to "Y" terminal on furnace fan timer for proper fan speed during operation in air conditioning mode.

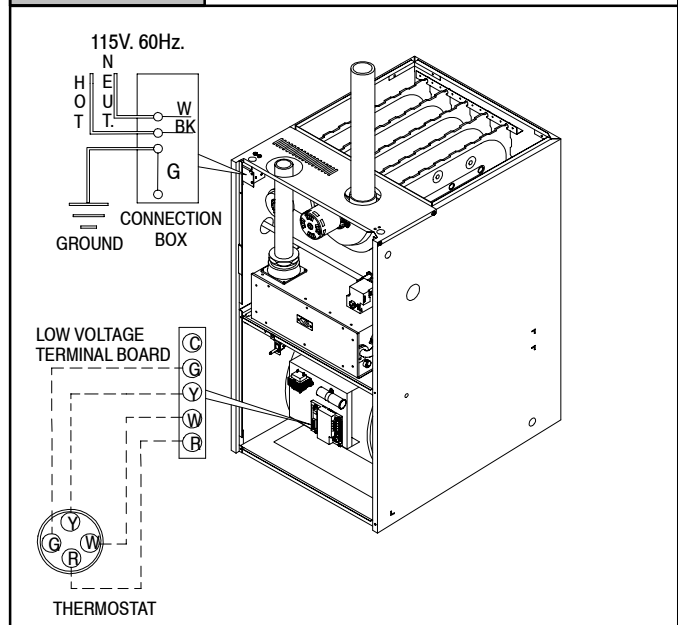
Optional Equipment

All wiring from furnace to optional equipment **MUST** conform to local codes or, in the absence of local codes, the applicable national codes. Install wiring in accordance with manufacturer's instructions.

Humidifier/Electronic Air Cleaner

The furnace is wired for humidifier and/or electronic air cleaner connection.

Figure 15 Electrical Connections



CAUTION

Do NOT exceed 115V/0.8 amp. maximum current load for both the EAC terminal and the HUM terminal combined.

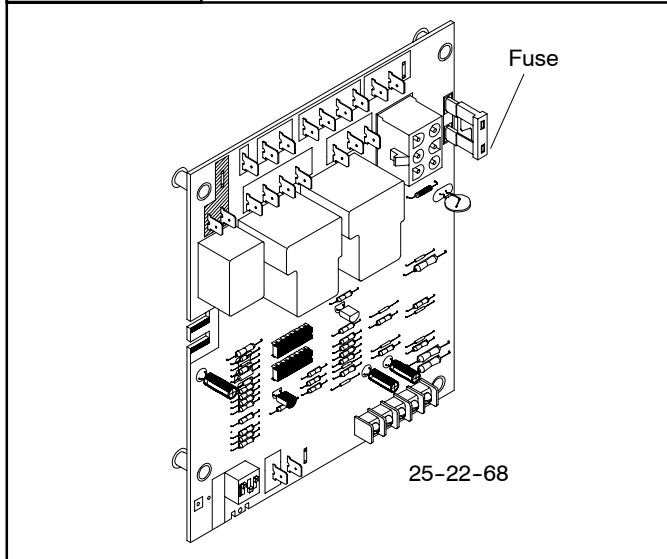
NOTE: The humidifier will be powered when the furnace is fired and the circulating air blower comes on. The electronic air cleaner will be powered anytime the thermostat calls for air movement. However, the electronic air cleaner is **NOT** energized during continuous fan operation controlled by the electronic fan control.

Control Center Fuse

The 24V circuit contains a 5-amp, automotive-type fuse located on control center. (See **Figure 16**) Any electrical shorts of 24V wiring during installation, service, or maintenance may cause fuse to blow. If fuse replacement is required, use only a fuse of identical size (5 amp.)

Figure 16

Fan Timer Connections



8. Ductwork and Filter (Upflow/Horizontal)(NTC7/GNL)



WARNING

Poison carbon monoxide gas hazard.

Do **NOT** draw return air from inside a closet or utility room where furnace is located. Return air duct **MUST** be sealed to furnace casing.

Failure to properly seal duct can result in death and/or personal injury.

Duct Connections

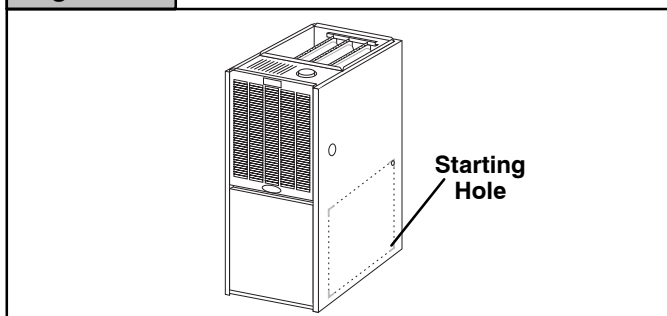
This furnace may be installed in only a bottom or side return application. Return air through the back of the unit is **NOT** allowed.

Side connections can be made by cutting out the embossed area shown in **Figure 17**.

Bottom returns can be made by removing the knockout panel in the furnace base. Do **NOT** remove knock-out except for a bottom return.

Figure 17

Cutting Side Return Air Opening



Duct Design

Design and install air distribution system to comply with Air Conditioning Contractors of America manuals or other approved methods that conform to local codes and good trade practices.

When the furnace is located in an area near or adjacent to the living area, the system should be carefully designed with returns to minimize noise transmission through the return air grille. Any blower moving a high volume of air will produce audible noise which could be objectionable when the unit is located very close to a living area. It is often advisable to route the return air ducts under the floor or through the attic.

- Refer to furnace **Technical Support Manual** (Blower Data) for air flow information.
- Size ductwork to handle air flow for heating and air conditioning if used.

Duct Installation Requirements

- When furnace supply ducts carry air outside furnace area, seal return air duct to furnace casing and terminate duct outside furnace space.
- When a refrigeration coil is used in conjunction with this unit, it must be installed on the discharge side of the unit to avoid condensation on the heat exchanger.
- Installation of locking-type dampers are recommended in all branches, or in individual ducts to balance system's air flow.
- If air return grille is located close to the fan inlet, install at least one, 90° air turn between fan and inlet grille to reduce noise.
- Ductwork installed in attic, or exposed to outside temperatures requires a minimum of 2" of insulation with outdoor type vapor barrier.
- Ductwork installed in an indoor unconditioned space requires a minimum of 1" of insulation with indoor type vapor barrier.

Inspection Panel

A removable access panel should be provided in the outlet duct when the furnace is installed without a cooling coil. This will allow smoke or reflected light to be observable inside the casing to indicate the presence of leaks in the heat exchanger. This access cover shall be attached in such a manner as to prevent air leaks.

Filters

A filter **MUST** be used:

Filters are not supplied with these furnaces, but can be purchased from your dealer.

Use either filter type:

- Washable, high velocity filters are based on a maximum air flow rating of 600 FPM.
- Disposable, low velocity filters are based on a maximum air flow of 300 FPM when used with filter grille.
- The furnaces, with 1600 or less CFM rating use a 16" x 25" high velocity filter. On these models the filter may be

mounted internally for bottom return using factory kit or externally for side return.

- The furnaces with greater than 1600 CFM requires that both left and right side returns are used in side return applications. Filters must be mounted externally. If return air must be on one side only, an optional 20" x 25" filter standoff rack kit can be used. For bottom return an optional 20" x 25" filter rack kit can be used.

NOTE: Disposable, low velocity filters may be replaced with washable, high velocity filter providing they meet the minimum size areas. Washable, high velocity filters can be replaced **ONLY** with same type and size.

9. Ductwork and Filter (Downflow)(NDC7/GDL)

Subbase for Combustible Floors - Downflow Furnace Only

The Subbase for Combustible Floors **MUST** be used when a downflow furnace is set on combustible material even when the furnace is installed on a coil box.

1. Cut the opening in the floor according to **Table 6**. The hole in the floor must be cut to the dimensions listed in **Table 6** since the base is equipped with locating tabs that center the base over the opening. See **Figure 17**.

The opening in the base is 1¹/₄" shorter and 1¹/₈" narrower than the recommended size of the opening in the floor. This is done to maintain a 1" clearance between the floor and the plenum.

2. Fabricate the plenum to the dimensions given in **Table 6**. Note that the dimensions given are outside dimensions.

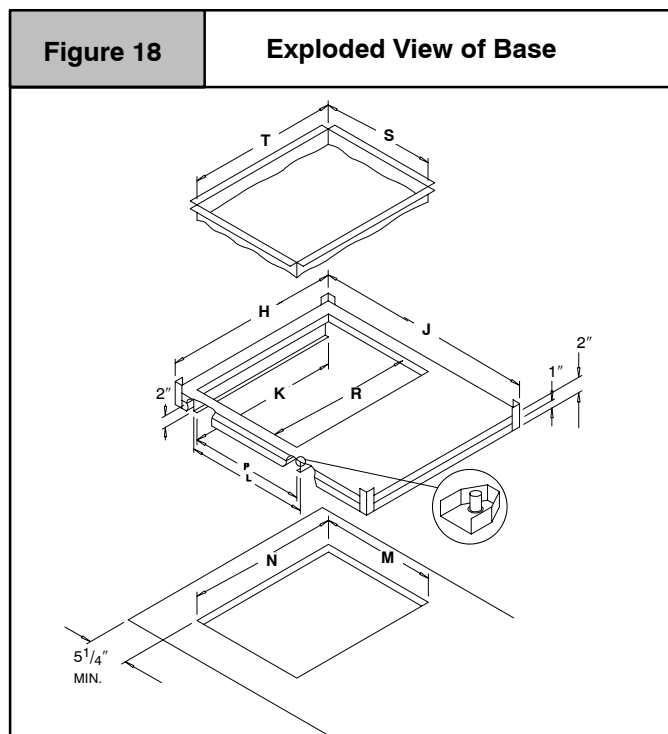
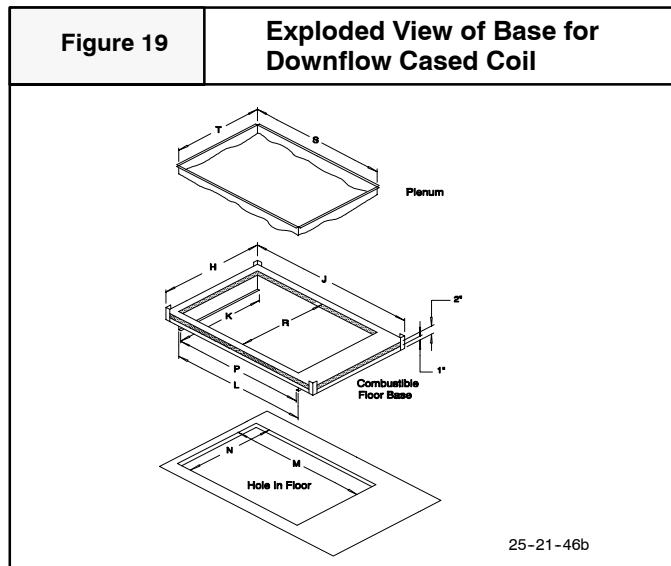


Table 6 Subbases for Combustible Floors Dimensions										
sub-base for Combustible Floors Part Number	sub-base for Combustible Floor Dimensions				Opening In Floor		Opening In Base For Plenum		Typical Plenum Dimensions	
	H*	J*	K**	L	M	N	P	R	S	T
(Furnace Only)										
NAHH001SB	15 ¹¹ / ₁₆	28 ³ / ₄	14 ⁹ / ₁₆	16	16 ¹ / ₄	14 ⁵ / ₈	15	13 ¹ / ₂	15	13 ¹ / ₂
NAHH002SB	19 ⁵ / ₁₆	28 ³ / ₄	18 ³ / ₁₆	16	16 ¹ / ₄	18 ¹ / ₄	15	17 ¹ / ₈	15	17 ¹ / ₈
NAHH003SB	22 ¹⁵ / ₁₆	28 ³ / ₄	21 ¹³ / ₁₆	16	16 ¹ / ₄	21 ⁷ / ₈	15	19 ³ / ₄	15	19 ³ / ₄
sub-base for Cased Coil										
NAHH004SB	15 ¹¹ / ₁₆	20 ⁹ / ₁₆	14 ⁹ / ₁₆	16	16 ¹ / ₄	14 ⁵ / ₈	15	13 ¹ / ₂	15	13 ¹ / ₂
NAHH005SB	19 ⁵ / ₁₆	20 ⁹ / ₁₆	18 ³ / ₁₆	16	16 ¹ / ₄	18 ¹ / ₄	15	17 ¹ / ₈	15	17 ¹ / ₈
NAHH006SB	22 ¹⁵ / ₁₆	20 ⁹ / ₁₆	21 ¹³ / ₁₆	16	16 ¹ / ₄	21 ⁷ / ₈	15	19 ³ / ₄	15	19 ³ / ₄
* Outside Dimension										
** Base Spacer Side To Side										

- Set the base over the opening in the floor, centering the opening in the base over the opening in the floor. Fasten the base to the floor with screws or nails. See **Figure 19**.

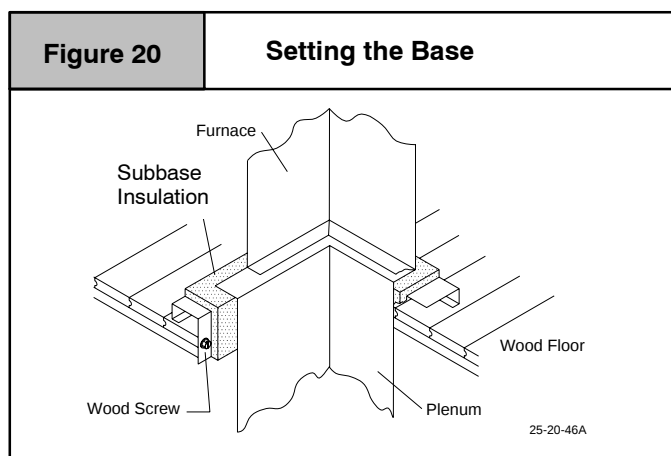


Non-Combustible Floor:

Set the furnace over the opening in the floor. If necessary, grout around the base to seal air leaks between the base and the floor.

- Drop the plenum through the opening in the base. The flange of the plenum should rest on top of the combustible floor base.

This subbase for combustible floors has been designed so that the height of the sub-base raises the downflow coil off the floor to allow easy installation of the condensate drain. See **Figure 20**.



Return Air Duct

- Non-combustible, flexible duct connectors are recommended for return and supply connections to furnace.
- If air return grille is located close to the fan inlet, install at least one, 90° air turn between fan and inlet grille to reduce noise.

NOTE: To further reduce noise, install acoustical air turning vanes and/or line inside of duct with acoustical material.

Filters:

NOTE: The size and type(s) of filter supplied with the furnace will handle the airflow required if central air conditioning is used with the furnace.

Use either filter type:

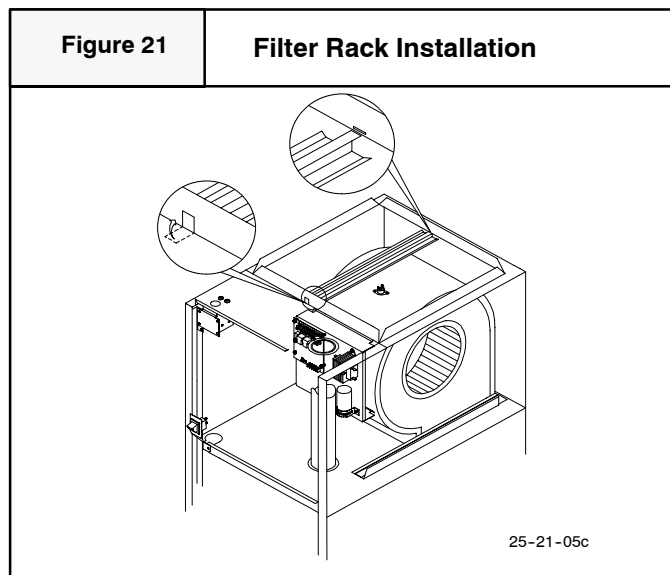
- Washable, high velocity filters are based on a maximum air flow rating of 600 FPM.
- Disposable, low velocity filters are based on a maximum air flow of 300 FPM when used with filter grille.

Filters and racks are supplied with unit.

NOTE: Disposable, low velocity filters may be replaced with washable, high velocity filter providing they meet the minimum size areas. Washable, high velocity filters can be replaced **ONLY** with same type and size.

NOTE: The return air plenum **MUST** extend a sufficient height above dimension "A" (**Figure 22**) to provide for the attachment of a return air duct or grille above the filters.

- Insert end of filter rack with $\frac{3}{4}$ " flange into slot in the back of the unit. See **Figure 21**.
- With filter rack pushed back, insert front end with $\frac{1}{4}$ " flange into position and push into front slot. With filter rack pushed as far forward as it will go, bend $\frac{1}{4}$ " flange and $\frac{3}{4}$ " flange up 90°. See **Figure 21**.



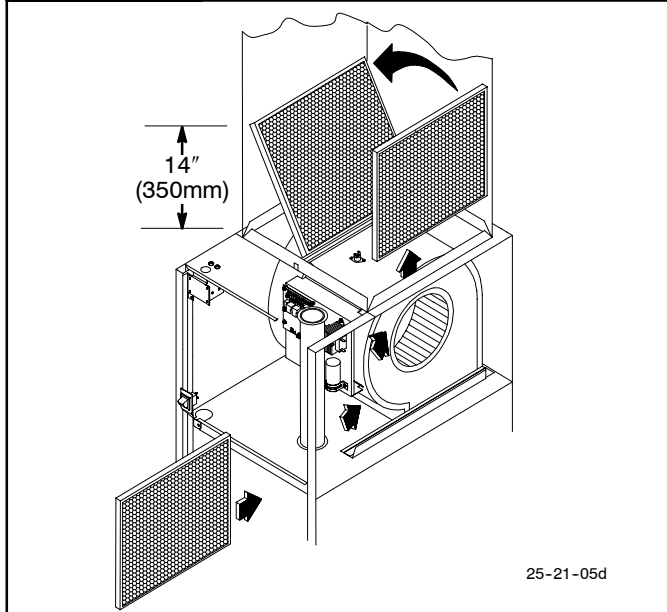
NOTE: Plenum must be fitted as close to the return air flange of the unit as possible to eliminate any air bypassing the filters.

- Filters can only be installed through the right hand side of the unit blower opening. Slide filter into unit until it is in position to be pushed up and over into place on the left hand side of unit. See **Figure 22**.
- Slide remaining filter into unit and up into place on left hand side of unit. See **Figure 22**.

If there is insufficient plenum height for this type of installation, filters may be installed in any accessible location in the return air system. In such a case, the filters should be of equivalent size and style as originally supplied with the furnace.

Figure 22

Filter Installation



CAUTION

If filters are only suitable for heating application, advise homeowner that filter size may need to be increased if air conditioning is added.

Addition Of Air Conditioning

When a refrigeration coil is used in conjunction with this unit, it must be installed on the discharge side of the unit to avoid condensation on the heat exchanger. The coil installation instructions must be consulted for proper coil location and installation procedures. With a parallel flow arrangement, dampers must be installed to prevent chilled air from entering the furnace. If manually operated dampers are used, they must be equipped with a means to prevent operation of either unit unless the damper is in full heat or full cool position.

A 3" (75mm) clearance is required on the right side of the furnace in order to run the condensate drain line. Copper, iron or plastic tubing may be used for the condensate drain line.

10. Checks and Adjustments

Startup

NOTE: Refer to startup procedures in the *Users Information Manual*.

CAUTION

If any sparks, odors or unusual noises occur, immediately shut OFF power to furnace. Check for wiring errors or obstruction to blower.

Gas Supply Pressure

Gas supply pressure should be within minimum and maximum values listed on rating plate. Pressures are usually set by gas suppliers.

(See L.P. Kit instruction manual for furnaces converted to L.P. gas)

Manifold Gas Pressure Adjustment

NOTE: Make adjustment to manifold pressure with burners operating.

WARNING

Fire or explosion hazard.

Turn OFF gas at shut off before connecting manometer.

Failure to turn OFF gas at shut off before connecting manometer can result in death and/or personal injury.

1. With gas **OFF**, Connect manometer to gas valve or manifold tap. Use manometer with a 0 to min. 12" water column range.
2. Turn gas **ON** and remove adjustment screw cover on gas valve. Turn counterclockwise to decrease pressure and clockwise to increase.

NOTE: Adjustment screw cover **MUST** be placed on gas valve before reading manifold pressure and operating furnace.

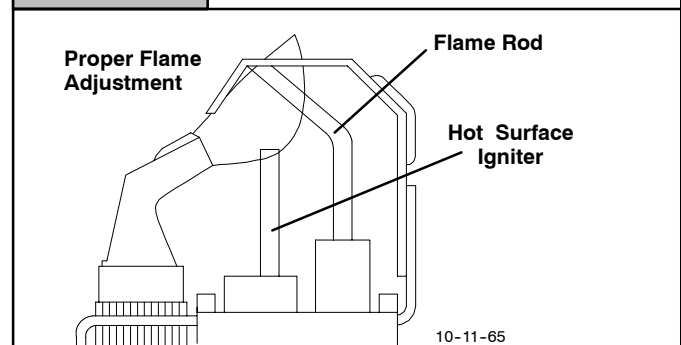
3. For altitudes up to 2000', set pressure to value shown in **Table 3**. For altitudes between 2000' to 8000', see Section 6. "Gas Supply and Piping" for correct pressure value.

Adjust Pilot Burner

The furnace has a pilot flame to light the main burner. The flame should surround $\frac{3}{8}$ " to $\frac{1}{2}$ " of the thermocouple. See **Figure 23**. To adjust, remove cap from pilot adjusting screw on gas valve. Turn screw counterclockwise to increase or clockwise to decrease flame as required. Replace cap for adjusting screw.

Figure 23

Pilot Burner



Main Burner Flame Check

Allow the furnace to run approximately 10 minutes then inspect the main burner and pilot flames. See **Figure 24**.

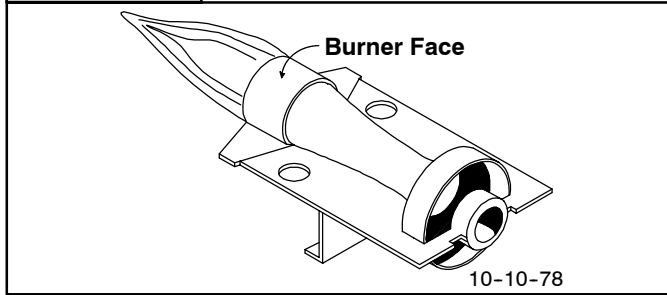
Check for the following (**Figure 24**):

- Stable and blue flames. Dust may cause orange tips or wisps of yellow, but flames **MUST NOT** have solid, yellow tips.
- Flames extending directly from burner into heat exchanger.
- Flames do **NOT** touch sides of heat exchanger

If any problems with main burner flames are noted, it may be necessary to adjust gas pressures, or check for drafts.

Figure 24

Main Burner



Temperature Rise Check

The blower speed **MUST** be set to give the correct air temperature rise through the furnace as marked on the rating plate. Temperature rise is the difference between supply and return air temperatures.

To check temperature rise, use the following procedure:

1. Place thermometers in supply and return air registers as close to furnace as possible, avoiding direct radiant heat from heat exchangers.
2. Take readings and compare with range specified on rating plate.
3. If the temperature rise is not in the correct range, the blower speed must be changed. A higher blower speed will lower the temperature rise. A lower blower speed will increase the temperature rise.

Changing Blower Speed

⚠ WARNING

Electrical shock hazard.

Turn OFF power to furnace before changing speed taps.

Failure to do so can result in death, personal injury and/or property damage.

NOTE: The speed taps that the manufacture sets from the factory for this product are based on a nominal 400 CFM per ton cooling and the basic mid range on the temperature rise for heating.

Since the manufacturer cannot establish the static pressure that will be applied to the unit, it is the responsibility of the installer dealer/contractor to select the proper speed taps for the application when the unit is installed.

If it is necessary to change speeds, refer to steps below.

1. Refer to *Furnace Wiring Diagram* for location of the heating and cooling speed taps located on the electronic fan control as well as location of unused blower motor speed leads. Use the chart (**Table 7**) to determine the blower motor speed settings.

11. Furnace Maintenance

CAUTION

It is recommended that the furnace be inspected and serviced on an annual basis (before the heating season) by a qualified service technician.

Table 7

Blower Speed Chart

Wire Color	Motor Speed
Black	High
Orange*	Med-High
Blue	Medium
Red	Low
* Med-High speed may not be provided on all models.	

2. Change the heat or cool blower motor speed by removing the motor lead from the "Heat" or "Cool" terminal and replace it with the desired motor speed lead from the "Unused Motor Lead" location. Connect the wire previously removed from the "Heat" or "Cool" terminal to the vacated "Unused Motor Lead" terminal.
3. If the same speed must be used for both heating and cooling, remove the undesired motor speed lead from the "Heat" or "Cool" terminal and connect that lead to the open terminal at "Unused Motor Lead" location or tape off. Attach a jumper between the "Heat" and "Cool" terminals and the remaining motor speed lead.

Note: When using the same speed on motors with (4) speed leads, it will be necessary to tape off the terminal of the motor speed lead removed from the "Heat" or "Cool" terminal with electrical tape since an open terminal will not be available at the "Unused Motor Lead" location.

Continuous Fan Operation

A terminal is provided on the electronic fan control located in the circulating blower compartment for operation of the continuous fan option. This connection is intended for the low speed motor tap, and has a lower contact rating (8 amps) than the heat and cool taps. When the low speed blower lead is connected to this terminal, this will provide low speed blower operation whenever the other two speeds (Heat or Cool) are not energized.

Thoroughly check the system after modification to ensure the proper operation of the circulating air blower in all modes of operation.

Separate speed selections for Heat, Cool, and Continuous Fan

Connect low speed lead from circulating motor to the "Cont" terminal at the electronic fan control. The appropriate motor leads should already be connected to the "Heat" and "Cool" terminals.

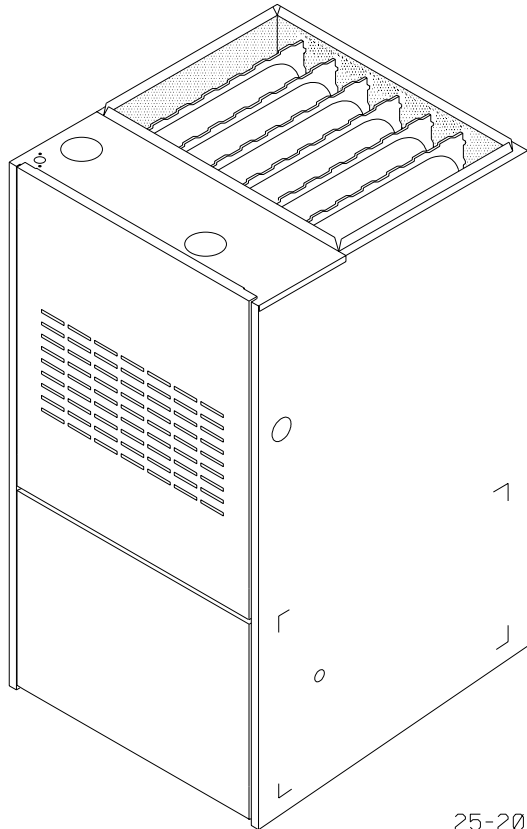
Heating and Continuous Blower Speed the Same

If it is necessary to operate the heating speed and continuous blower speed using the same blower speed, connect a jumper between the "Heat" and "Cont" terminals on the electronic fan control.

Note: There should be only **ONE** motor lead going to the "Heat" and "Cont" terminals.

See "User's Information Manual".

Technical Support Manual



25-20-66

Models

NTC7050BFG1 / GNL050N12G1
NTC7075BFG1 / GNL075N12G1
NTC7100BHG1 / GNL100N16G1
NTC7125BKG1 / GNL125N20G1

NDC7050BFG1 / GDL050N12G1
NDC7075BFG1 / GDL075N12G1
NDC7100BHG1 / GDL100N16G1
NDC7125BKG1 / GDL125N20G1

Manufactured by:
International Comfort Products Corporation (USA)
Lewisburg, TN USA 37091

DIRECT VENT GAS FURNACE



Save This Manual For Future Reference

Manufacturers Number (Mfr No -See Rating Plate) ALL Models		
Specifications		
General		
Gas Type	Nat	LP
Transformer Size (VA)	40	40
T'stat Heat Anticipator	.30	.30
Gas & Ignition		
Gas Valve	HW SV9504	HW SV9504
Regulation Type	SNAP	SNAP
Manifold Press. (" WC)	3.5	10.0
Pilot Orifice Size	.018	.011
Ignition Type/Series	HW HSP	HW HSP
Combustion		
Flue Outlet Size (Inches)	3	3
Std. Outlet Temp (°F)	<480	<480
Limits & Controls		
Fan Control (Type)	HW ST9120	HW ST9120
Fan Control On	30/60	30/60
(Timed-secs) Off	60,100,140,180	60,100,140,180
Gas Conversion Kits		
Conversion Kit Natural to LP *1160991		
Conversion Kit LP to Nat *1009510		
Conversion Kit Nat High Altitude *1160993		
Conversion Kit LP High Altitude *1160992		
*Must be ordered from Service Parts		

Specifications									
	NTC7050BFG GNL050N12G			NTC7075BFG GNL075N12G			NTC7100BHG GNL100N16G		
General									
Input (Btuh)	50,000			75,000			100,000		
Output (Btuh)	40,000			60,000			80,000		
Temp. Rise (°F)	35-65			35-65			35-65		
Electrical (Volts/Hz/FLA)	115/60/5.3			115/60/7.5			115/60/9.2		
Gas & Ignition									
Gas Type	Nat	LP		Nat	LP		Nat	LP	
Std. Main Orifices (No/Size)	2/#42	2/#54		3/#42	3/#54		4/#42	4/#54	
Combustion	@	@		@	@		@	@	
Std. Pressure (" of WC)	Blower	Burner Box	Differential	Blower	Burner Box	Differential	Blower	Burner Box	Differential
5' No Elbows	0.78	0.06	0.72	0.88	0.10	0.78	0.92	0.20	0.72
40' +5-90' Elbows	0.74	0.12	0.62	0.76	0.14	0.62	0.88	0.24	0.64
Limits & Controls									
Thermal Sensor (°F)	250			200			200		
Limit Control Setting (°F)	160			180			180		
Auxiliary Limit (°F)	130			130			130		
Std. Pressure Sw. (Part No)	1010644			1010645			1010645		
Press (Close)	0.39			0.47			0.47		
Press (Open)	0.29			0.37			0.37		
High Alt. Restrictor (Part No.)				1010644			1010644		
Press Differential (Close)	Not Required			0.39			0.39		
Press Differential (Open)				0.29			0.29		
Blower Data									
Type & Size	10-8			10-8			10-10		
Motor Amps/Rpm	4.6/1050			4.6/1050			8.5/1050		
Motor Type/H.p.	PSC/1/3			PSC/1/3			PSC/1/2		
Cap. Mfd/Volts	5/370			5/370			10/370		
Filter Type	Washable			Washable			Washable		
Filter Size (")	14x25x1			16x25x1			16x25x1		
Min. Cool Cap. (Tons)	1.5			1.5			2		
Max. Cool Cap. (Tons)	3			3			4		

Specifications									
	NTC7125BKG GNL125N20G			NDC7050BFG GDL050N12G			NDC7075BFG GDL075N12G		
General									
Input (Btuh)	125,000			50,000			75,000		
Output (Btuh)	100,000			40,000			60,000		
Temp. Rise (°F)	45-75			35-65			35-65		
Electrical (Volts/Hz/FLA)	115/60/10.5			115/60/5.3			115/60/7.5		
Gas & Ignition									
Gas Type	Nat	LP		Nat	LP		Nat	LP	
Std. Main Orifices (No/Size)	5/#42	5/#54		2/#42	2/#54		3/#42	3/#54	
Combustion	@	@		@	@		@	@	
Std. Pressure (" of WC)	Blower	Burner Box	Differential	Blower	Burner Box	Differential	Blower	Burner Box	Differential
5' No Elbows	0.99	0.16	0.88	0.90	0.02	0.92	0.87	0.14	0.73
40' +5-90° Elbows	0.89	0.22	0.66	0.85	0.17	0.65	0.75	0.16	0.59
Limits & Controls									
Thermal Sensor (°F)	250			250			200		
Limit Control Setting (°F)	165			160			150		
Auxiliary Limit (°F)	130			110			110		
Std. Pressure Sw. (Part No)	1010646			1010644			1010645		
Press (Close)	0.55			0.39			0.47		
Press (Open)	0.45			0.29			0.37		
High Alt. Restrictor (Part No.)	1010645			Not Required			1010644		
Press Differential (Close)	0.47						0.39		
Press Differential (Open)	0.37						0.29		
Blower Data									
Type & Size	11.8-10.6			10-8			10-8		
Motor Amps/Rpm	9.8/900			4.6/1050			6.8/1050		
Motor Type/H.p.	PSC ³ / ₄			PSC ¹ / ₃			PSC ¹ / ₂		
Cap. Mfd/Volts	10/370			5/370			7.5/370		
Filter Type	Washable			Washable			Washable		
Filter Size (")	16x25x1 (2)			16x18x1 (2)			16x18x1 (2)		
Min. Cool Cap. (Tons)	3.5			1.5			2		
Max. Cool Cap. (Tons)	5			3			3.5		

Specifications						
	NDC7100BHG GDL100N16G			NDC7125BKG GDL125N20G		
General						
Input (Btuh)	100,000			125,000		
Output (Btuh)	80,000			100,000		
Temp. Rise (°F)	35-65			45-75		
Electrical (Volts/Hz/FLA)	115/60/9.2			115/60/10.5		
Gas & Ignition						
Gas Type	Nat	LP		Nat	LP	
Std. Main Orifices (No/Size)	4/#42	4/#54		5/#42	5/#54	
Combustion	@	@		@	@	
Std. Pressure (" of WC)	Blower	Burner Box	Differential	Blower	Burner Box	Differential
5' No Elbows	0.95	0.19	0.76	0.99	0.16	0.88
40' +5-90° Elbows	0.94	0.27	0.67	0.89	0.22	0.66
Limits & Controls						
Thermal Sensor (°F)	200			250		
Limit Control Setting (°F)	190			170		
Auxiliary Limit (°F)	110			130		
Std. Pressure Sw. (Part No)	1010645			1010646		
Press (Close)	0.47			0.55		
Press (Open)	0.37			0.45		
High Alt. Restrictor (Part No.)	1010644			1010645		
Press Differential (Close)	0.39			0.47		
Press Differential (Open)	0.29			0.37		
Blower Data						
Type & Size	10-10			11.8-10.6		
Motor Amps/Rpm	8.5/1050			9.8/900		
Motor Type/H.p.	PSC/1/2			PSC/3/4		
Cap. Mfd/Volts	10/370			10/370		
Filter Type	Washable			Washable		
Filter Size (")	16x18x1 (2)			16x18x1 (2)		
Min. Cool Cap. (Tons)	2			3.5		
Max. Cool Cap. (Tons)	4			5		

CIRCULATION AIR BLOWER DATA

NTC7050BFG/GNL050N12C & NDC7050BFG/GDL050N12G

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5" WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	718	840	--	1109	1473
	.20	719	838	--	1094	1431
	.30	714	837	--	1086	1396
	.40	692	819	--	1063	1349
	.50	660	791	--	1027	1291
	.60	615	752	--	986	1222
	.70	563	683	--	934	1141

External Static Pressure Inches of W.C.	Air Delivery in Liters Per Second (L/S) (Furnace Rated @0.5" WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	339	396	--	523	695
	.20	339	395	--	516	675
	.30	337	395	--	513	659
	.40	327	387	--	502	637
	.50	311	373	--	485	609
	.60	290	355	--	465	577
	.70	266	322	--	441	538

NTC7075BFG/GNL075N12G & NDC7075BFG/GDL075N12G

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5" WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	778	984	--	1263	1576
	.20	786	1003	--	1249	1532
	.30	790	1003	--	1244	1489
	.40	788	1001	--	1215	1432
	.50	781	982	--	1186	1371
	.60	765	962	--	1146	1308
	.70	743	923	--	1094	1229

External Static Pressure Inches of W.C.	Air Delivery in Liters Per Second (L/S) (Furnace Rated @0.5" WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	367	464	--	596	744
	.20	371	473	--	589	723
	.30	373	473	--	587	703
	.40	372	472	--	573	676
	.50	369	463	--	560	647
	.60	361	454	--	541	617
	.70	351	436	--	516	580

NTC7100BHG/GNL100N16G & NDC7100BHG/GDL100N16G

External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5" WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	954	1312	--	1698	1925
	.20	950	1292	--	1645	1853
	.30	946	1265	--	1596	1780
	.40	915	1231	--	1530	1708
	.50	878	1175	--	1455	1638
	.60	830	1118	--	1362	1546
	.70	778	1020	--	1241	1435

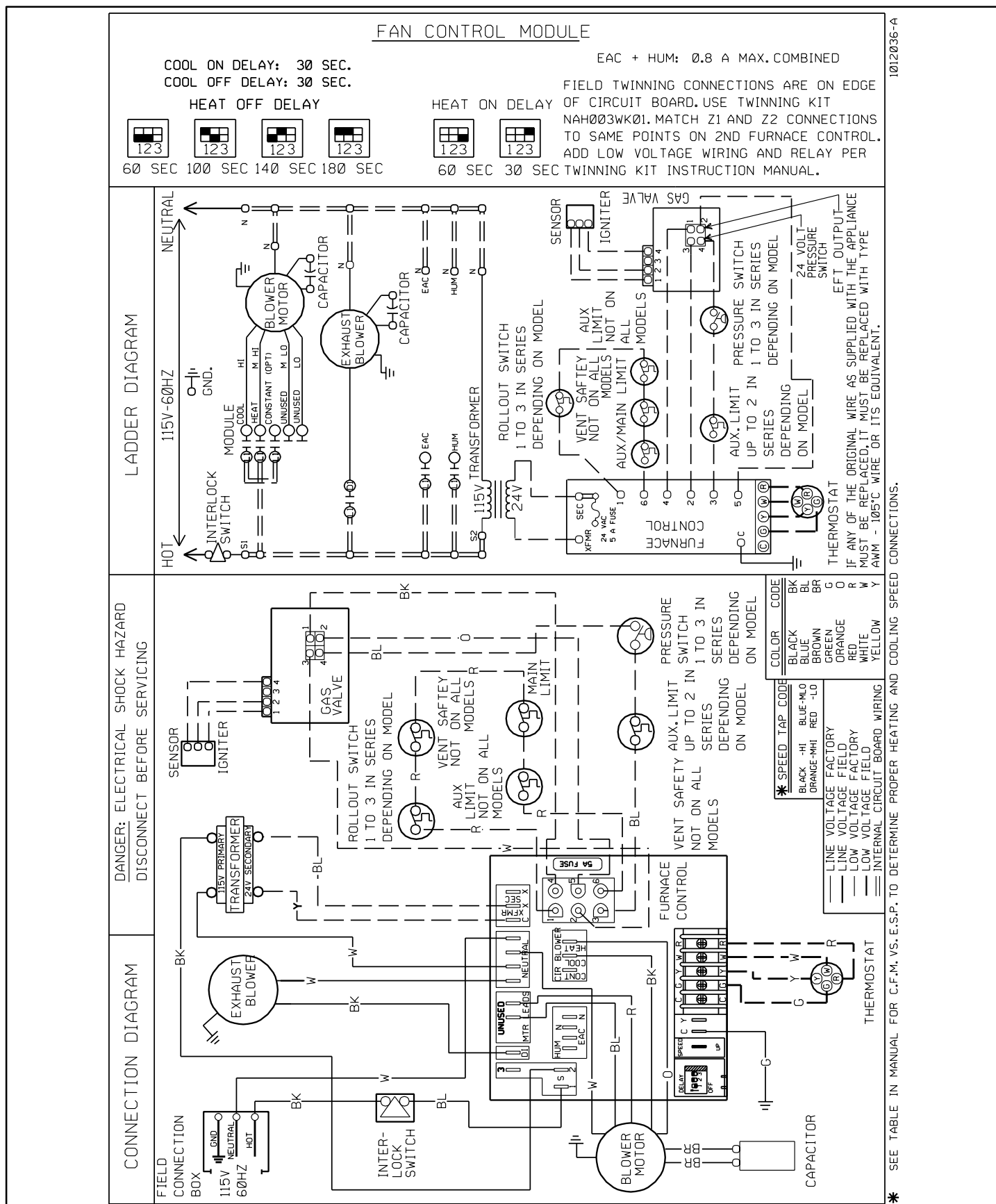
External Static Pressure Inches of W.C.	Air Delivery in Liters Per Second (L/S) (Furnace Rated @0.5" WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	450	619	--	801	908
	.20	448	610	--	776	874
	.30	446	597	--	753	840
	.40	432	581	--	722	806
	.50	414	555	--	687	773
	.60	392	528	--	643	730
	.70	367	481	--	586	677

NTC7125BKG/GNL125N20G & NDC7125BKG/GDL125N20G

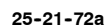
External Static Pressure Inches of W.C.	Air Delivery in Cubic Feet per Minute (C.F.M.) (Furnace Rated @0.5" WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	1463	1650	--	1879	2214
	.20	1429	1635	--	1859	2154
	.30	1417	1614	--	1838	2152
	.40	1389	1579	--	1806	2106
	.50	1364	1556	--	1773	2049
	.60	1339	1513	--	1725	1981
	.70	1299	1470	--	1668	1903

External Static Pressure Inches of W.C.	Air Delivery in Liters Per Second (L/S) (Furnace Rated @0.5" WC ESP)					
	TAP	LOW	MED L	MED	MED H	HIGH
	.10	690	779	--	887	1045
	.20	674	772	--	877	1017
	.30	669	762	--	867	1016
	.40	656	745	--	852	994
	.50	644	734	--	837	967
	.60	632	714	--	814	935
	.70	613	694	--	787	898

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NTC7 / GNL MODELS



Replacement Parts - NTC7/GNL

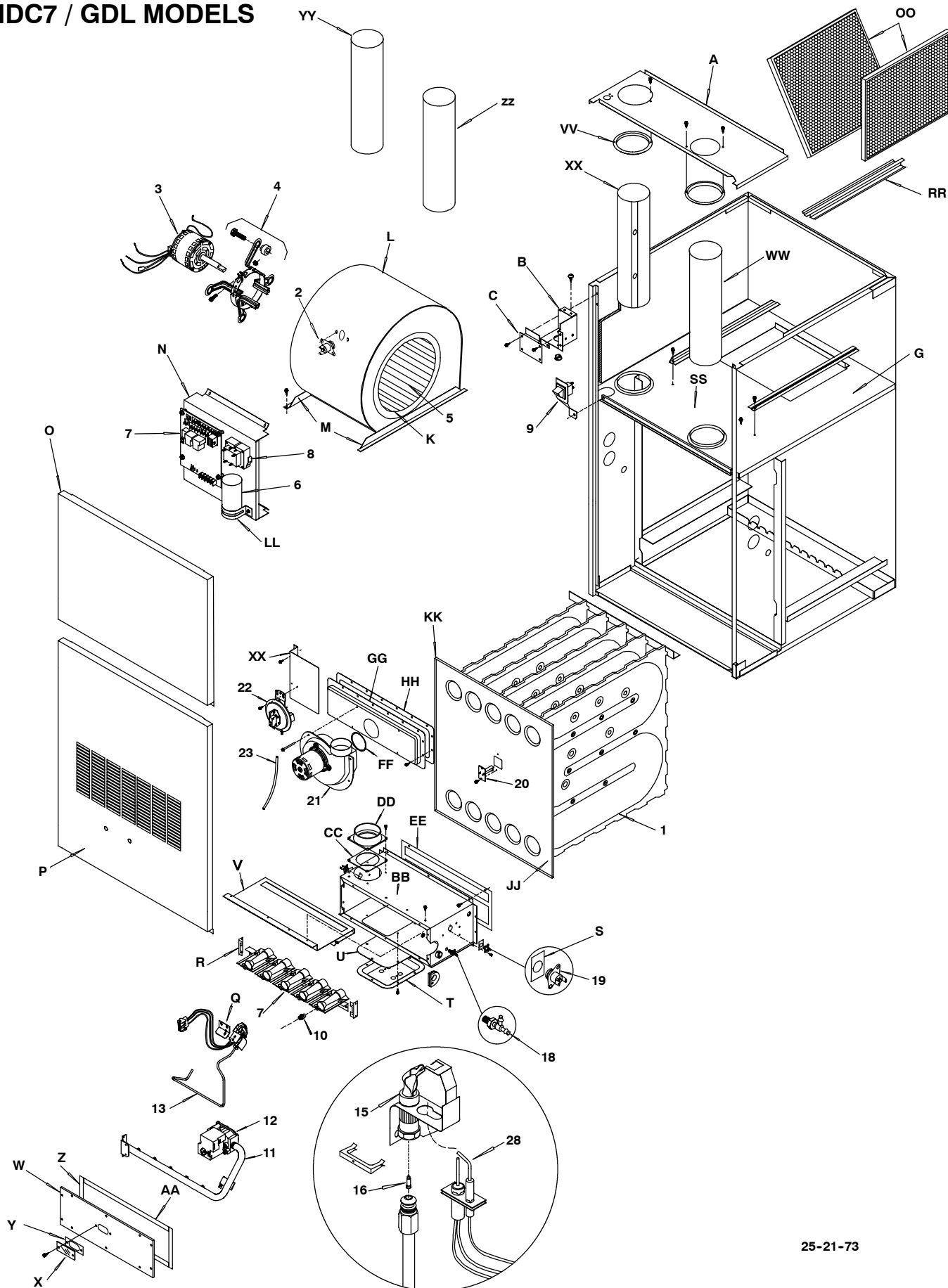
Models - NTC7050BFG1/GNL050N12G1, NTC7075BFG1/GNL075N12G1, NTC7100BHG1/GNL100N16G1, NTC7125BKG1/GNL125N20G1

Replacement part supplied will be current active part. For parts not listed, consult place of purchase.

Key No.	Functional Parts Description	Part Number	NTC7/GNL			
			050	075	100	125
1	Heat Exchanger	1011357	1	-	-	-
		1011369	-	1	-	-
		1011370	-	-	1	-
		1011371	-	-	-	1
2	Switch Limit, Auxiliary	1000735	2	2	2	2
3	Motor Blower 115V-1/3HP	1012514	1	-	-	-
	115V-1/2HP	1013341	-	1	-	-
	115V-1/2HP	1009052	-	-	1	-
	115V-3/4HP	1011420	-	-	-	1
4	Mount Motor Kit	609227	1	1	1	-
		522020024	-	-	-	1
5	Wheel Blower 10-8DD	600587	1	1	-	-
	10-10DD	601210	-	-	1	-
	11-10DD	1011420	-	-	-	1
6	Capacitor 5/370V	1094954	1	-	-	-
	10/370V	1094956	-	-	1	1
	7.5/370V	1094239	-	1	-	-
7	Timer Fan	1011927	1	1	1	1
8	Transformer	1012722	1	1	1	1
9	Switch Door Interlock	1010886	1	1	1	1
10	Orifice Burner Nat #42	1011351	2	3	4	5
11	Manifold Gas	1010203	1	-	-	-
		1010204	-	1	-	-
		1010205	-	-	1	-
		1010206	-	-	-	1
12	Valve Gas Nat & LP	1010988	1	1	1	1
13	Tube Pilot	1010343	1	-	-	-
		1010344	-	1	1	-
		1010345	-	-	-	1
15	Pilot/Igniter	1008731	1	1	1	1
16	Orifice Pilot Nat (.018)	503211	1	1	1	1
17	Burner Asy	1012382	1	-	-	-
		1012383	-	1	-	-
		1012384	-	-	1	-
		1012385	-	-	-	1
18	Pressure Tap	1005606	1	1	1	1
19	Switch Limit, Rollout	1005548	2	-	-	2
		1010575	-	2	2	-
20	Switch Limit (Main)	1010647	1	-	-	-
		1320547	-	1	1	-
		34332904	-	-	-	1
21	Blower, Combustion	1011899	1	1	1	1
22	Switch Pressure	1010942	1	-	-	-
		1010943	-	1	1	-
		1010944	-	-	-	1
23	Tubing, Silicone Sensor	2971255	1	1	1	1
28	Ignitor/Sensor with Clip	1009524	1	1	1	1
(	PART NOT ILLUSTRATED					
(	Harness, Wire	1011862	1	1	1	1
(	Reducer, 3" to 2"	1005779	1	1	-	-
(	Fuse (5-Amp)	1083348	1	1	1	1
(	Manual Install & Tech	44101200801	1	1	1	1
(	Manual Homeowners	44102200106	1	1	1	1

Key No.	Non-Functional Parts Description	Part Number	NTC7/GNL			
			050	075	100	125
A	Panel Top	1013436	1	1	-	-
		1013437	-	-	1	-
		1013438	-	-	-	1
B	Box Field Connect	1011941	1	1	1	1
C	Cover Field Connect	1010360	1	1	1	1
G	Blower Partition	1013459	1	1	-	-
		1013460	-	-	1	1
H	Rail Blower Slide	57059	2	2	2	2
K	Panel Cutoff Blw	721020013	1	1	-	-
		721020008	-	-	1	1
L	Housing Blower	1013131	1	1	-	-
		1013132	-	-	1	-
		1013128	-	-	-	1
M	Hanger Blower	1010690	2	2	2	2
N	Bracket Ctrl Board	1012321	1	1	1	1
O	Door Blower	1013439	1	1	-	-
		1013440	-	-	1	1
P	Door Louvered (NTC7 ONLY)	1013441	1	1	-	-
	(NTC7 ONLY)	1013442	-	-	1	1
	(GNL ONLY)	1013454	1	1	-	-
	(GNL ONLY)	1013455	-	-	1	1
Q	Bracket Pilot	1010901	1	1	1	1
R	Bracket Burner Box	1008722	2	2	2	2
S	Gasket Limit Switch	1008778	2	2	2	2
T	Cover Diaphragm	1068036	1	1	1	1
U	Diaphragm Silicone	1008763	1	1	1	1
V	Baffle Burner Box	1008709	1	1	-	-
		1008710	-	-	1	-
		1008711	-	-	-	1
W	Cover Burner Box	1008748	1	1	-	-
		1008749	-	-	1	-
		1008750	-	-	-	1
X	Viewport Cover Lexan	2480678	1	1	1	1
Y	Gasket Viewport	1093666	1	1	1	1
Z	Gasket Cover Sides	1008755	2	2	2	2
AA	Gasket Cover Top & Bottom	1008762	2	2	-	-
		1009243	-	-	2	-
		1009244	-	-	-	2
BB	Burner Box Asy	1010231	1	1	-	-
		1010240	-	-	1	-
		1010241	-	-	-	1
CC	Gasket Air Intake	1008746	1	1	1	1
DD	Coupling Air Intake	1008744	1	1	1	1
EE	Gasket Burner Box	1008759	1	1	-	-
		1008760	-	-	1	-
		1008761	-	-	-	1
FF	Gasket, Comb. Blower	1011379	1	1	1	1
GG	Collector Box	1011051	1	1	-	-
		1011054	-	-	1	-
		1011058	-	-	-	1
HH	Gasket Collector Box	1093661	1	1	-	-
		1093662	-	-	1	-
		1093663	-	-	-	1
JJ	Partition Front	1010289	1	-	-	-
		1010290	-	1	-	-
		1010291	-	-	1	-
		1010292	-	-	-	1
KK	Gasket, Heat Exchanger	2480904	2	-	-	-
		2480905	-	2	-	-
		2480906	-	-	2	-
		2480907	-	-	-	2
LL	Clamp, Capacitor	1095020	1	1	1	1
XX	Shield, Heat Intake	1010573	-	-	-	1
YY	Inlet Pipe	1010309	1	1	-	-

NDC7 / GDL MODELS



25-21-73

Replacement Parts - NDC7/GDL

Models - NDC7050BFG1/GDL050N12G1, NDC7075BFG1/GDL075N12G1, NDC7100BHG1/GDL100N16G1, NDC7125BKG1/GDL125N20G1 (Natural Gas)

Replacement part supplied will be current active part. For parts not listed, consult place of purchase.

Key No.	Functional Parts Description	Part Number	NDC7/GDL			
			050	075	100	125
1	Heat Exchanger	1011372	1	-	-	-
		1011373	-	1	-	-
		1011374	-	-	1	-
		1011375	-	-	-	1
2	Switch Limit, Auxiliary	1320368	1	1	1	1
3	Motor Blower 115V- ¹ / ₃ HP	1012514	1	-	-	-
	115V- ¹ / ₂ HP	1013341	-	1	-	-
	115V- ¹ / ₂ HP	1009052	-	-	1	-
	115V- ³ / ₄ HP	1011420	-	-	-	1
4	Mount Motor Kit	609227	1	1	1	-
		522020024	-	-	-	1
5	Wheel Blower 10-8DD	600587	1	1	-	-
	10-10DD	601210	-	-	1	-
	11-10DD	1011420	-	-	-	1
6	Capacitor 5/370V	1094954	1	-	-	-
	10/370V	1094956	-	-	1	1
	7.5/370V	1094239	-	1	-	-
7	Control, Timer Fan	1011927	1	1	1	1
8	Transformer	1012722	1	1	1	1
9	Switch, Interlock	1010886	1	1	1	1
10	Orifice Burner Nat #42	1011351	2	3	4	5
11	Manifold, Gas	1010203	1	-	-	-
		1010204	-	1	-	-
		1010205	-	-	1	-
		1010206	-	-	-	1
12	Valve, Gas Nat	1010988	1	1	1	1
13	Tube Pilot	1010343	1	-	-	-
		1010344	-	1	1	-
		1010345	-	-	-	1
15	Pilot /Igniter	1008731	1	1	1	1
16	Orifice Pilot Nat (.018)	503211	1	1	1	1
17	Burner Asy	1012382	1	-	-	-
		1012383	-	1	-	-
		1012384	-	-	1	-
		1012385	-	-	-	1
18	Pressure Tap	1005606	1	1	1	1
19	Switch Limit, Rollout	1005548	2	-	-	2
		1010575	-	2	2	-
20	Switch Limit (Main)	1010648	1	-	-	-
		1009774	-	1	-	-
		34332903	-	-	1	-
		1010652	-	-	-	1
21	Blower Exhaust	1011899	1	1	1	1
22	Switch Pressure	1010942	1	-	-	-
		1010943	-	1	1	-
		1010944	-	-	-	1
23	Tube Sensor	2971255	1	1	1	1
28	Igniter/Sensor with Clip	1009524	1	1	1	1

Key No.	Non-Functional Parts Description	Part Number	NDC7/GDL			
			050	075	100	125
A	Panel Top	1013447	1	1	-	-
		1013448	-	-	1	-
		1013449	-	-	-	1
B	Box Field Connect	1011941	1	1	1	1
C	Cover Field Connect	1010360	1	1	1	1
G	Blower Partition	1013462	1	1	-	-
		1013463	-	-	1	-
		1013464	-	-	-	1
H	Rail Blower Slide	33406100	2	2	2	2
J	Casing Base	1013338	-	-	-	-
		1013339	-	-	-	-
K	Panel Cutoff Blw	721020013	1	1	-	-
		721020008	-	-	1	1
L	Housing Blower	1010579	1	1	-	-
		1010580	-	-	1	-
		1010716	-	-	-	1
M	Hanger Blower	33403100	2	2	2	2
N	Bracket Ctrl Board	1011178	1	1	1	1
O	Door Blower	1013450	1	1	-	-
		1013451	-	-	1	1
P	Door Louvered (NDC7/GDL) (NDC7/GDL)	1013443	1	1	-	-
		1013444	-	-	1	1
Q	Bracket Pilot	1010901	1	1	1	1
R	Bracket Burner Box	1008722	2	2	2	2
S	Gasket Limit (Rollout)	1008778	2	2	2	2
T	Cover Diaphragm	1068036	1	1	1	1
U	Diaphragm Silicone	1008763	1	1	1	1
V	Baffle Burner Box	1008709	1	1	-	-
		1008710	-	-	1	-
		1008711	-	-	-	1
W	Cover Burner Box	1008748	1	1	-	-
		1008749	-	-	1	-
		1008750	-	-	-	1
X	Viewport Cover Lexan	2480678	1	1	1	1
Y	Gasket Viewport	1093666	1	1	1	1
Z	Gasket Cover Sides	1008755	2	2	2	2
AA	Gasket Cover Top & Bottom	1008762	2	2	-	-
		1009243	-	-	2	-
		1009244	-	-	-	2
BB	Burner Box Asy	1010231	1	1	-	-
		1010240	-	-	1	-
		1010241	-	-	-	1
CC	Gasket Air Intake	1008746	1	1	1	1
DD	Coupling Air Intake	1008744	1	1	1	1
EE	Gasket Burner Box	1008759	1	1	-	-
		1008760	-	-	1	-
		1008761	-	-	-	1
FF	Gasket, Comb. Blower	1011379	1	1	1	1
GG	Collector Box	1011051	1	1	-	-
		1011054	-	-	1	-
		1011058	-	-	-	1
HH	Gasket Collector Box	1093661	1	1	-	-
		1093662	-	-	1	-
		1093663	-	-	-	1
JJ	Partition Front	1010700	1	-	-	-
		1010701	-	1	-	-
		1010702	-	-	1	-
		1010703	-	-	-	1
KK	Gasket, Heat Exchanger	2480904	2	-	-	-
		2480905	-	2	-	-
		2480906	-	-	2	-
		2480907	-	-	-	2

Replacement Parts - NDC7/GDL

Models - NDC7050BFG1/GDL050N12G1, NDC7075BFG1/GDL075N12G1, NDC7100BHG1/GDL100N16G1, NDC7125BKG1/GDL125N20G1 (Natural Gas)

Replacement part supplied will be current active part. For parts not listed, consult place of purchase.

Key No.	Non-Functional Parts Description	Part Number	NDC7/GDL			
			050	075	100	125
LL	Clamp, Capacitor	1095020	1	1	1	1
OO	Filter, Air 16" x 19" x 1"	1009750	2	2	2	2
RR	Holder, Filter	33411100	1	1	1	1
SS	Plate, Fill In	1011072	1	1	-	-
		1011073	-	-	1	1
VV	End Plate, Vent Shield	57083	4	4	4	4
WW	Shield, Vent Pipe	2311159	2	2	2	2
XX	Shield, Heat Intake	1010573	-	-	-	1
YY	Inlet Pipe 2" Dia.	1010309	1	1	-	-
ZZ	Pipe Flue 3" Dia.	1010956	1	1	1	1
J(	PART NOT ILLUSTRATED					
J(	Harness, Wire	102201	1	1	1	1
J(	Reducer, 3" to 2"	1005779	1	1	-	-
J(	Fuse (5-Amp)	1083348	1	1	1	1
J(	Manual Install & Tech	44101200801	1	1	1	1
J(	Manual Homeowners	44102200106	1	1	1	1

Gas Conversion Kits - All models

(NTC7/GNL & NDC7/GDL)

Nat to LP NAHF002LP *1009509 or

NAHL002LP *1160991

LP to Nat *1009510

*Must be ordered from Service Parts