



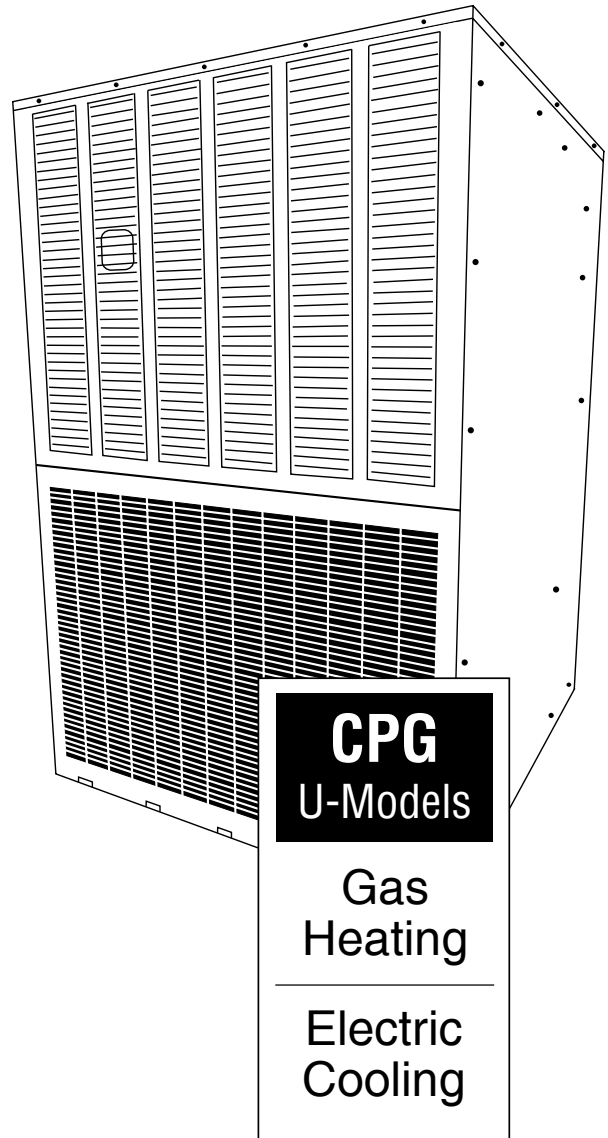
## Thru-the-Wall Packaged Heating & Cooling

# Installation Guide

## Comfort Pack Universal Series

**80% THERMAL EFFICIENCY**

This unit should be installed in an  
**OUTSIDE WALL** for **THRU-THE-WALL  
INSTALLATION ONLY!**



*Read Installation Guide prior to starting the installation.*

**National Comfort Products®**

A Division of National Refrigeration & Air Conditioning Products, Inc.

539 Dunksferry Road | Bensalem, PA 19020 | (215) 244-1400 | 1-800-523-7138 | Fax: (215) 639-1674



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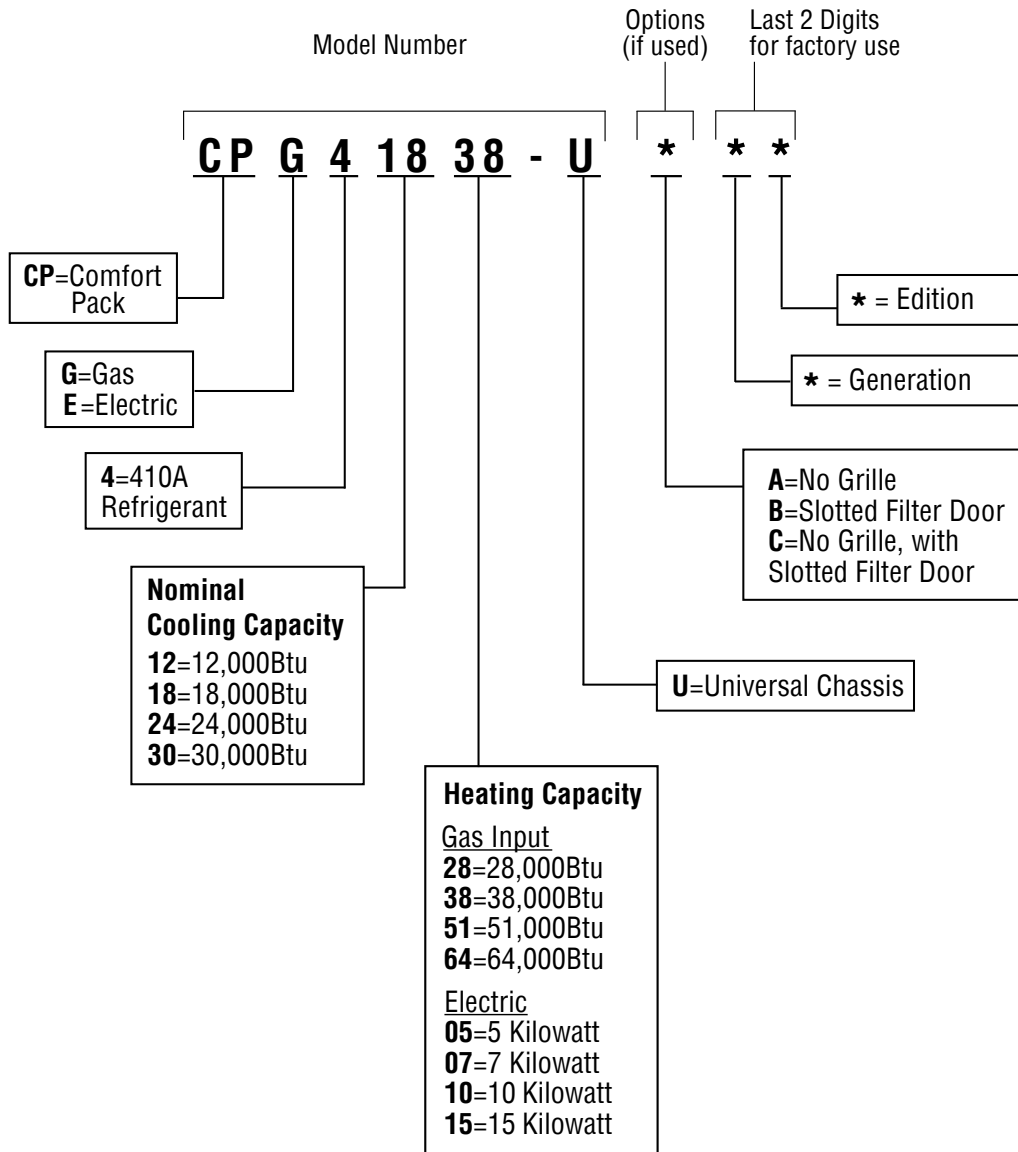
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**IMPORTANT NOTE: DO NOT DESTROY OR THROW AWAY THIS MANUAL.  
IT SHOULD BE KEPT IN A SAFE PLACE FOR FUTURE REFERENCE.**

# Installation Guide for Comfort Pack (CPG) Units

## Comfort Pack Nomenclature

**Note:** Standard units (with no options) will have no letter after the “U” in the name. **Example:** CPG41838-U



# Installation Guide for Comfort Pack (CPG) Units

## Safety First!

### HAZARD INTENSITY LEVELS

1. **DANGER:** FAILURE TO COMPLY WITH WILL RESULT IN SEVERE PERSONAL INJURY OR DEATH AND/ OR PROPERTY DAMAGE.
2. **WARNING:** FAILURE TO COMPLY COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH AND/ OR PROPERTY DAMAGE.
3. **CAUTION:** FAILURE TO COMPLY COULD RESULT IN MINOR PERSONAL INJURY AND/OR PROPERTY DAMAGE.

### WARNING

FOR YOUR SAFETY, DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE. SUCH ACTIONS COULD RESULT IN PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH.

### CAUTION

SHOULD OVERHEATING OCCUR, OR THE GAS SUPPLY FAIL TO SHUT OFF, SHUT OFF THE MANUAL GAS VALVE TO THE APPLIANCE BEFORE SHUTTING OFF THE ELECTRICAL SUPPLY.

### WARNING

WARNING: DO NOT USE THIS APPLIANCE IF ANY PART HAS BEEN UNDER WATER. IMMEDIATELY CALL A QUALIFIED SERVICE TECHNICIAN TO INSPECT THE APPLIANCE AND REPLACE ANY GAS CONTROL THAT HAS BEEN UNDER WATER.

### WARNING

INSTALLATION AND REPAIR OF THIS UNIT SHOULD BE PERFORMED ONLY BY INDIVIDUALS MEETING THE REQUIREMENTS OF AN "ENTRY LEVEL TECHNICIAN" AS SPECIFIED BY NATIONAL CODES. ATTEMPTING TO INSTALL OR REPAIR THIS UNIT WITHOUT SUCH BACKGROUND MAY RESULT IN PRODUCT DAMAGE, PERSONAL INJURY OR DEATH.



### WARNING

HIGH VOLTAGE!  
DISCONNECT ALL POWER BEFORE SERVING. FAILURE TO DO SO MAY RESULT IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

### CAUTION

USE CARE WHEN HANDLING SCROLL COMPRESSORS. SOME TEMPERATURES COULD BE HOT!

### CAUTION

SCROLL COMPRESSORS SHOULD NEVER BE USED TO EVACUATE THE AIR CONDITIONING SYSTEM. VACUUMS THIS LOW CAN CAUSE INTERNAL ELECTRICAL ARCING RESULTING IN A DAMAGED OR FAILED COMPRESSOR.

### WARNING

THE UNIT MUST BE PERMANENTLY GROUNDED. FAILURE TO DO SO CAN CAUSE ELECTRICAL SHOCK RESULTING IN SEVERE PERSONAL INJURY OR DEATH.

**"USE COPPER SUPPLY WIRES ONLY"**

### WARNING

IF THE INFORMATION IN THIS MANUAL IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

Do **NOT** store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

#### **WHAT TO DO IF YOU SMELL GAS:**

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

Installation and service **must** be performed by a qualified installer, service agency or the gas supplier.

### WARNING

IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE, OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE. REFER TO THE USER'S INFORMATION MANUAL PROVIDED WITH THIS FURNACE. INSTALLATION AND MATERIALS, SERVICE MUST BE PERFORMED BY A QUALIFIED INSTALLER, SERVICE AGENCY OR THE GAS SUPPLIER.

This furnace must be installed in accordance with the manufacturer's instructions and local codes. In the absence of local codes, follow the National Fuel Gas Code, ANSI Z223.1 or the CAN/CGA-B149 Installation Codes.

**To be installed without alteration.**

# Installation Guide for Comfort Pack (CPG) Units

## Safety First!

### WARNING

IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE FURNACE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 90°C.

THIS FURNACE MUST BE INSTALLED SO THERE ARE PROVISIONS FOR VENTILATING AIR.

SHOULD OVERHEATING OCCUR, OR THE GAS SUPPLY FAIL TO SHUT OFF, SHUT OFF THE MANUAL GAS VALVE TO THE FURNACE BEFORE SHUTTING OFF THE ELECTRICAL SUPPLY.

### CAUTION

THESE UNITS ARE NOT APPROVED FOR MOBILE HOME APPLICATIONS. SUCH USE COULD RESULT IN PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH.

### WARNING

THESE INSTRUCTIONS ARE INTENDED AS AN AID TO QUALIFIED, LICENSED SERVICE PERSONNEL FOR PROPER INSTALLATION, ADJUSTMENT AND OPERATION OF THIS UNIT. READ THESE INSTRUCTIONS THOROUGHLY BEFORE ATTEMPTING INSTALLATION OR OPERATION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN IMPROPER INSTALLATION, ADJUSTMENT, SERVICE OR MAINTENANCE POSSIBLY RESULTING IN FIRE, ELECTRICAL SHOCK, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

### WARNING

DO NOT USE OXYGEN TO PURGE LINES OR PRESSURIZE SYSTEM FOR LEAK TEST. OXYGEN REACTS VIOLENTLY WITH OIL, WHICH CAN CAUSE AN EXPLOSION RESULTING IN SEVERE PERSONAL INJURY OR DEATH.

### WARNING

GAS-FIRED APPLIANCES ARE NOT DESIGNED FOR USE IN HAZARDOUS ATMOSPHERES CONTAINING FLAMMABLE VAPORS OR COMBUSTIBLE DUST, IN ATMOSPHERES CONTAINING CHLORINATED OR HALOGENATED HYDROCARBONS, OR IN APPLICATIONS WITH AIRBORNE SILICONE SUBSTANCES. SEE HAZARD LEVELS BELOW.

## Before You Start

This unit is shipped with a cooling chassis installed in the cabinet. Prior to installing the unit in the wall opening, the shipping bolts located at the bottom on both sides of the cabinet must be removed to allow for removal of the cooling chassis. 1/4" hole plugs provided with the unit should be installed in the holes to prevent air leakage. Shipping bolts are located on both sides below this sticker:

**THE SHIPPING BOLTS MUST BE REMOVED PRIOR TO INSTALLATION OF THE CABINET TO PERMIT REMOVAL OF THE CHASSIS. INSTALL THE HOLE PLUGS PROVIDED.**



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This unit is designed and approved for through-the-wall installation only. The unit must be installed a minimum of 8" above finish floor. If this unit is installed in a residential garage, it must be installed so that the ignition source and burners are located not less than 18 inches (457 mm) above the floor, and it must be located or protected to avoid physical damage by vehicles. The entire unit must not be installed outside. The grille side of the unit should extend 3/4" beyond the exterior wall to allow moisture that may enter the outdoor section to drain. The pitch of the internal drain pans toward the outside will assure proper drainage when the cabinet is installed level. **Masonry walls must have a lintel to support the wall.**

The interior of the unit may be installed with zero clearances to adjacent combustible surfaces. **The unit shall not be installed directly on carpeting, tile or other combustible material, except wood flooring.** In order to be able to remove the chassis, 29" of open area must be left unobstructed in front of the access panels. The 3/4" O.D. drain pan connection should be connected to the building drain using the flexible tubing included and a trap. The secondary drain offers protection from overflow. The secondary drain feature is piped into the base of the unit and drains through the weep holes outside. Reconnect 3" piece of clear flexible tubing to secondary drain on drain pan. Position secondary drain through grommet of chassis and connect to flexible tubing (prime trap prior to operating).

The grille side must be kept free of any obstructions that will reduce or alter the air flow pattern. **The unit must be installed at least 4 feet (1.22 m) from electric meters, gas meters, regulators, and relief equipment.** The vent of the unit is located at the front grille. Distances from adjacent public walkways, adjacent buildings, openable windows, and building openings must be consistent with the National Fuel Gas Code ANSI Z223.1 and/or CAN/CGA-B149 installation codes, as well as local codes.

If an optional architectural grille is to be used on standard units, the stamped and louvered grille provided **must** be removed. Consult the factory prior to ordering product(s) that require an optional architectural grille.



### CAUTION

THE INSTALLATION OF THIS APPLIANCE MUST CONFORM TO THE REQUIREMENTS OF THE NATIONAL FIRE PROTECTION ASSOCIATION; THE NATIONAL ELECTRIC CODE, ANSI/NFPA NO. 70 (LATEST EDITION) IN THE UNITED STATES; THE CANADIAN ELECTRICAL CODE PART 1, CSA 22.1 (LATEST EDITION) IN CANADA; AND ANY STATE OR PROVINCIAL LAWS OR LOCAL ORDINANCES. LOCAL AUTHORITIES HAVING JURISDICTION SHOULD BE CONSULTED BEFORE INSTALLATION IS MADE. SUCH APPLICABLE REGULATIONS OR REQUIREMENTS TAKE PRECEDENCE OVER THE GENERAL INSTRUCTIONS IN THE MANUAL.

#### **TO REMOVE THE CHASSIS FROM THE CABINET:**

**TURN OFF POWER TO THE UNIT.** REMOVE THE LOWER ACCESS PANEL FROM THE CABINET. DISCONNECT THE DRAIN LINE FROM THE EVAPORATOR COIL DRAIN CONNECTION. DISCONNECT THE SECONDARY DRAIN FLEXIBLE TUBING & TRAP TO AVOID DAMAGE (PRIME TRAP WHEN REINSTALLING). DEPRESS AND HOLD THE RELEASE LATCH ON THE CHASSIS POWER WIRING CONNECTOR AND UNPLUG IT FROM THE CABINET POWER WIRING CONNECTOR. DEPRESS AND HOLD THE RELEASE LATCH ON THE CONTROL WIRING CONNECTOR AND UNPLUG IT FROM THE CABINET CONTROL WIRING CONNECTOR.

REMOVE THE SCREWS ATTACHING THE CONTROLS ENCLOSURE TO THE INDOOR COIL COVER. REMOVE THE SCREWS FROM THE INDOOR BLOWER COVER PLATE. REMOVE THE PLATE FROM THE UNIT. TEMPORARILY SECURE THE CHASSIS POWER AND CONTROL WIRING AND CONNECTORS TO THE TOP OF THE INDOOR COIL COVER TO PREVENT DAMAGE DURING CHASSIS REMOVAL.

CAREFULLY SLIDE THE CHASSIS OUT OF THE CABINET BY GRASPING BOTH SIDES OF THE EVAPORATOR COIL DRAIN PAN AND PULLING TOWARD YOU WHILE KEEPING THE CHASSIS CENTERED IN THE CABINET. AS THE CHASSIS IS REMOVED, KEEP THE CHASSIS LEVEL UNTIL THE OUTDOOR FAN COVER PASSES THE CABINET SEALS. **DAMAGE TO THE CABINET SEALS WILL RESULT IF THE CHASSIS IS NOT KEPT LEVEL UNTIL THE OUTDOOR FAN COVER HAS PASSED THE CABINET SEALS.** AFTER THE CHASSIS IS REMOVED, IT SHOULD BE HANDLED USING

THE CHASSIS BASE AND EVAPORATOR DRAIN PAN, NOT BY USING REFRIGERANT PIPING OR THE OUTDOOR FAN MOUNT. THE BOTTOM OF THE CHASSIS IS NOT SMOOTH AND WILL DAMAGE FLOORS IF SLID.

#### **TO INSTALL THE CHASSIS INTO THE CABINET:**

**TURN OFF POWER TO THE UNIT.** TEMPORARILY SECURE THE CHASSIS POWER AND CONTROL WIRING AND TURN OFF POWER TO THE UNIT. TEMPORARILY SECURE THE CHASSIS POWER AND CONTROL WIRING AND CONNECTORS TO THE TOP OF THE INDOOR COIL COVER TO PREVENT DAMAGE DURING CHASSIS INSTALLATION. PLACE THE OUTDOOR COIL SECTION OF THE CHASSIS ONTO THE CABINET RAILS. LIFT THE REAR OF THE CHASSIS USING THE EVAPORATOR COIL DRAIN PAN SO THAT THE CHASSIS IS LEVEL AND CENTERED AS IT IS PUSHED IN THE CABINET. **DAMAGE TO THE CABINET SEALS WILL RESULT IF THE CHASSIS IS NOT KEPT LEVEL UNTIL THE OUTDOOR FAN COVER HAS PASSED THE CABINET SEALS, AND THE CHASSIS KEPT CENTERED IN THE CABINET.** AFTER THE CHASSIS IS ALL THE WAY IN THE CABINET, CHECK THAT THE CHASSIS IS CENTERED IN THE CABINET BY VERIFYING THAT IT IS IN CONTACT WITH THE CABINET SEALS ON BOTH SIDES.

INSTALL THE INDOOR BLOWER COVER PLATE AND SECURE IT WITH SCREWS. INSTALL THE CHASSIS POWER WIRE CONNECTOR AND THE CONTROL WIRING CONNECTOR INTO THEIR RESPECTIVE CABINET WIRING CONNECTORS SO THAT THE CONNECTORS LATCH. POSITION THE CONTROLS ENCLOSURE AND SECURE IT TO THE INDOOR COIL COVER WITH SCREWS. CONNECT THE DRAIN LINE TO THE EVAPORATOR COIL DRAIN CONNECTION. RECONNECT 3" PIECE OF CLEAR FLEXIBLE TUBING TO SECONDARY DRAIN ON DRAIN PAN. POSITION SECONDARY DRAIN THROUGH GROMMET OF CHASSIS AND CONNECT TO FLEXIBLE TUBING (PRIME TRAP PRIOR TO OPERATING). INSTALL THE LOWER ACCESS PANEL ON THE CABINET. TURN ON POWER TO THE UNIT.

**ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES. The manufacturer assumes no responsibility for equipment installed in violation of any code requirements.**

**Be sure that the electrical data specified on the unit rating plate corresponds to what is available at the installation site and NEC for installation requirements.**

**This unit MUST be installed in an outside wall for thru-the-wall installation ONLY.**

# Installation Guide for Comfort Pack (CPG) Units

Be sure that the electrical service provided to the building can handle the load imposed by the unit.

**IMPORTANT** — This Document is customer property and is to remain with this unit. Please refer to service information pack upon completion of work to register the unit's warranty. These instructions do not cover all variations in systems or provide for every possible contingency to be met in connection with the installation. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your installing dealer or local distributor before contacting the manufacture.

**NOTE: THE UNIT MUST NEVER BE PLACED ON ITS SIDE OR UPSIDE DOWN AS THE COMPRESSOR OIL WILL RUN IN THE COOLING CIRCUIT AND SERIOUSLY DAMAGE THE UNIT.**

## Installation

**NOTE: THESE INSTALLATION AND MAINTENANCE INSTRUCTIONS SHOULD BE LEFT WITH THE UNIT FOR FUTURE REFERENCE.**

This unit must be installed in accordance with all applicable codes. This unit is not to be used for temporary heating of buildings or structures under construction.

**FOR MAXIMUM PERFORMANCE, IT IS IMPERATIVE THAT THE COOLING CHASSIS AIR DIVIDER BE SEALED TO THE CABINET AIR SEAL. ANY LEAKAGE WILL ALLOW OUTSIDE UNCONDITIONED AIR TO INFILTRATE AND MIX WITH THE CONDITIONED AIR. THIS CONDITION WILL DEGRADE UNIT PERFORMANCE. ALL UNITS SHOULD BE INSPECTED FOR THIS CONDITION, AS DURING TRANSPORTATION AND INSTALLATION THE SEALS CAN BE DISTURBED. IF REQUIRED, A LIGHT BEAD OF CAULKING IS RECOMMENDED TO SEAL THE CHASSIS, TO THE AIR SEAL TO ELIMINATE LEAKAGE.**

**OUTSIDE/UNCONDITIONED AIR MUST NOT BE INTRODUCED INTO THE RETURN AIR STREAM OF THIS UNIT. THIS CONDITION WILL ALSO DEGRADE THE PERFORMANCE OF THE UNIT AND MAY VOID EQUIPMENT WARRANTY.**

The unit should be provided with support inside the building in the area of the return air opening. The support should be high enough to allow for return air provisions to the unit. To reduce

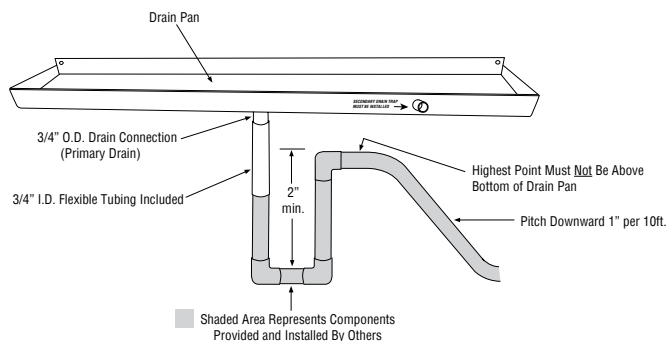
the possible transmission of sound and vibration, a resilient material such as rubber or cork should be installed between the support and the base of the unit. All spaces around the top, sides and bottom of the exterior grille area should be caulked and sealed to the wall, making sure that the openings for drainage in the bottom edge are not blocked.

If the optional wall sleeve is used, caulk the spaces between the sleeve and the wall. Completely fill the clearance on all sides between the unit and the wall sleeve with a polyurethane foam sealant (follow manufacturer's suggested application manual). Provide the unit with support inside the building in the area of the return air opening. Slide the unit into the wall sleeve and fasten the unit to the sleeve with the five screws provided with the sleeve.

**NOTE: FOR EASE OF INSTALLATION, INSTALL THE CABINET INTO THE WALL SLEEVE FIRST WITHOUT THE COOLING CHASSIS. THEN SLIDE COOLING CHASSIS IN AFTER CABINET IS IN PLACE.**

## Drainage

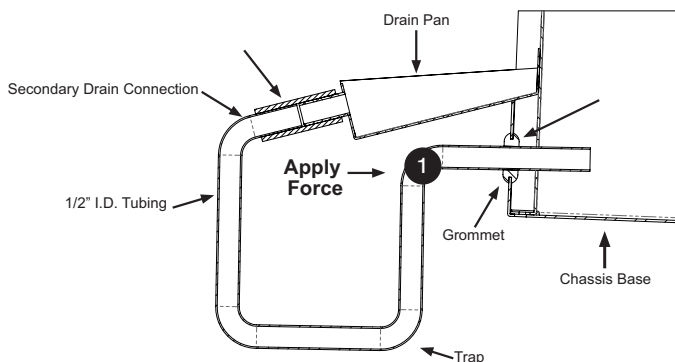
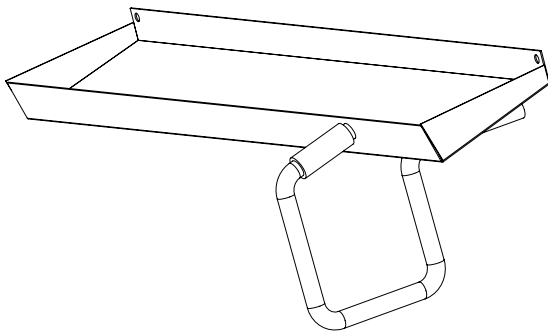
The 3/4" I.D. flexible tubing included should be connected to the Comfort Pack primary drain connection so that it can easily be disconnected if the cooling chassis must be removed. A trap at least 2" deep should be provided close to the drain pan. The tubing should not be higher than the bottom of the unit drain pan at any point to assure proper drainage and allow chassis removal. The drain line should pitch downward at least 1" per 10 ft. to an open building drain trap.



# Installation Guide for Comfort Pack (CPG) Units

## Secondary Drain Trap Install Instructions:

1. The trap and 2" piece of clear flexible 1/2" ID tubing are shipped loose to prevent damage. They should be installed after the Comfort Pack unit is installed and the return air connection completed.
2. The trap must be primed (filled with water) for proper operation of the secondary drain system. This may be done prior to installation of the trap or after.
3. Insert trap into the grommet located in chassis base pan.
  - a. Apply force to section 1 (refer to drawing below)
  - b. Ensure at least .5" - 0.75" of tubing is inserted into the grommet
  - c. PVC should be flush with drain pan connection

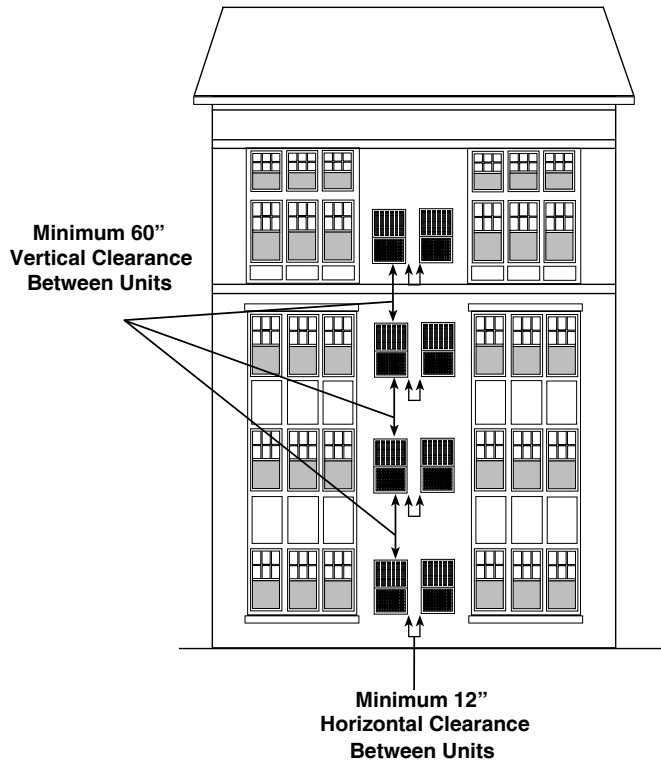


4. Position the trap as shown and slide the 2" piece of clear flexible tubing about 1" onto the top end of the trap. Slide the top of the flexible tube on the trap onto the bottom of the 1/2" OD secondary drain connection and push the top of the trap up. The trap should be positioned so that there is only a small gap between the top of the trap and the bottom of the secondary drain connection.

5. To avoid damage whenever the slide-out chassis has to be removed from the cabinet, remove the secondary drain trap before sliding the chassis out. After the chassis is reinstalled in the cabinet, prime the trap with water before reinstalling it.

## Clearances

For proper unit performance and maximum operating life please maintain the following minimum installation clearances.



*\*Less than 12" Call National Comfort Products*

**Comfort Pack** units must be installed through an outside wall. Confined spaces and/or covered areas should be avoided. Consult the factory if unclear of clearances required. Units must be installed a minimum of **12"** apart when two units are side by side. If three or more units are to operate next to one another, allow a minimum of **60"** between units or pairs of units. Also, a vertical clearance of **60"** should be maintained between units. Units installed on the bottom floor should be mounted at least **8"** off of the ground.

The unit is designed and approved for thru the wall installation only. The unit must be installed a minimum of **8"** above a finished floor. If the unit is installed in a residential garage, it must be installed so that the ignition source and burners are located not less than **18"** above the floor, and it must be located or protected to avoid physical damage by vehicles.

## Unit Location Considerations

In thru-the-wall installation, due to the various types of wall construction, it is not possible to provide detailed instructions. The following is a list of general requirements and cautions for installing these units.

**The unit must be installed level, both - top front to back and left to right.**

1. Masonry walls must have a lintel to support the wall.
2. Extend the unit approximately 3/4" beyond outside surface of the wall. Optional mounting angles can be purchased from the factory or field fabricated for locating and mounting the unit in the wall.
3. The wall opening across the top and bottom must be flashed.
  - a. During periods of rain and wind the primary drainage path may not be adequate to handle the load. Secondary precautions may also be required but not limited to the following:
    - Seal flashing to unit
    - Floor drain
    - Additional field sealing of sheet metal joints
    - Sealing of unused access opening
4. Clearances to air inlets and outlets must be adequate to ensure no air flow obstructions or recirculation of condenser air flow.
5. Some architectural designs of buildings will require the unit to be mounted behind a decorative grille. The performance (capacity and efficiency) of the unit may be reduced with the use of these decorative grilles. The less resistive these grilles are to air flow, the better the units performance will be. Outdoor louvers provided by others must be approved by NCP to maintain unit performance and warranty. **Care must be taken to locate the condenser coil away from loose debris that may clog intake.**

6. If the unit is mounted behind a decorative grille, one or both of the following items must be done to eliminate recirculation of air to the unit:

- a. The front of the unit must be mounted tight to the inside of the architectural grille
- b. A barrier must be provided to prevent recirculation of air to the unit (mixing of inlet and outlet air) when the front of the unit is mounted back from the inside of the architectural grille

7. The unit must not be mounted in dead-end hallways or areas where there is no fresh outside air circulation. Cool fresh outside air must be provided for best unit operation. Thru-the-wall units may not be located where hot exhausts from clothes dryer vents, kitchen vents, steam vents or corrosive fumes could come in contact with coil side of unit.

8. 29" clearance is required for service accessibility on the inside service panel.

9. If more than one unit is to be installed in the same area a min. of 60" vertical must be maintained between units to minimize recirculation of condenser exhaust air.

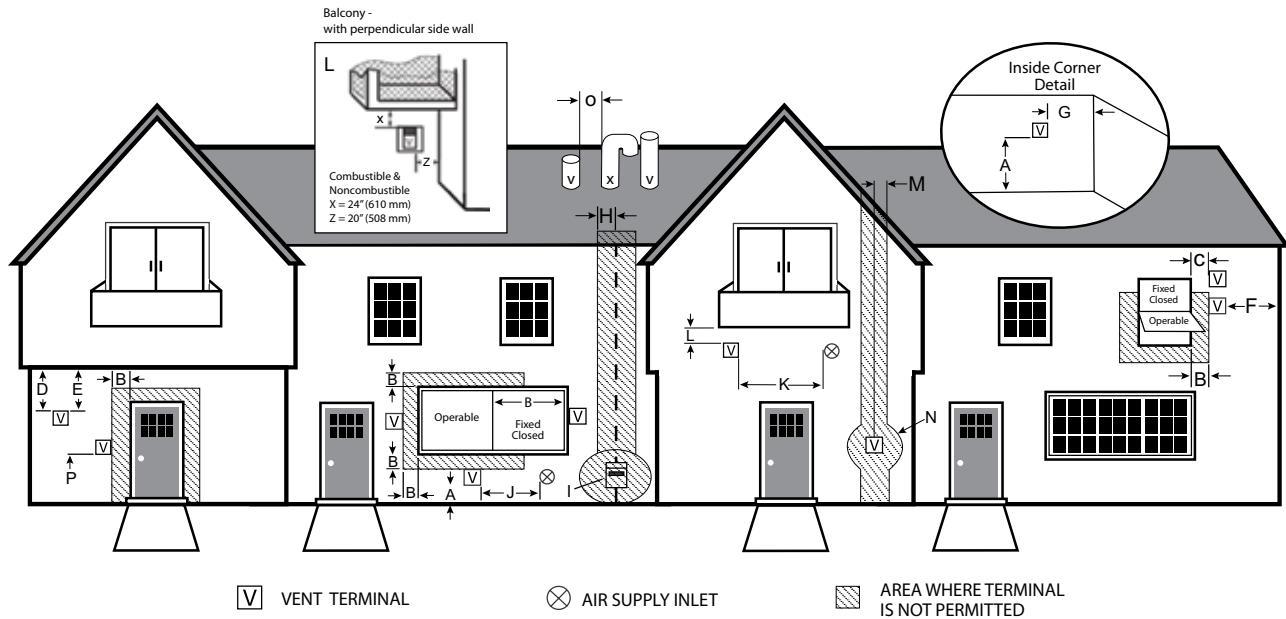
10. Care must be taken when locating the unit. Locate away from bedrooms as operational sounds may be objectionable.

\*For other clearance information see page 19.

# Installation Guide for Comfort Pack (CPG) Units

## Vent Termination Clearances for Direct Vented Installations in the USA

For other gas venting information see page 19.



| Item | Clearance Description                                                                                                                                                       | US Installations (per ANSI Z223.1/NFPA 54)                                                                                                                                                                      |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A    | Clearance above grade, veranda, porch, balcony or anticipated snow level                                                                                                    | 12 in.                                                                                                                                                                                                          |
| B    | Clearance to a window or door that may be opened                                                                                                                            | 9 in. for appliances > 10,000 Btuh (3 kW)<br>and ≤ 50,000 Btuh (15 kW),<br>12in. for appliances > 50,000 Btuh (15 kW)                                                                                           |
| C    | Clearance to a permanently closed window                                                                                                                                    | For clearances not specified in ANSI Z223.1/NFPA 54, clearances shall be in accordance with local installation codes and the requirements of the gas supplier and the manufacturer's installation instructions. |
| D    | Vertical clearance to a ventilated soffit located above the terminal within a horizontal distance of 2 feet from the center line of the terminal                            |                                                                                                                                                                                                                 |
| E    | Clearance to an unventilated soffit                                                                                                                                         |                                                                                                                                                                                                                 |
| F    | Clearance to an outside corner                                                                                                                                              |                                                                                                                                                                                                                 |
| G    | Clearance to an inside corner                                                                                                                                               | See Note 1                                                                                                                                                                                                      |
| H    | Clearance to each side of the center line extended above electrical meter or gas service regulator assembly                                                                 | 3 feet within 15 feet<br>above the meter/regulator assembly.                                                                                                                                                    |
| I    | Clearance to service regulator vent outlet                                                                                                                                  | See Note 2                                                                                                                                                                                                      |
| J    | Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance                                                                 | 9 in. for appliances > 10,000 Btuh (3 kW)<br>and ≤ 50,000 Btuh (15 kW),<br>12in. for appliances > 50,000 Btuh (15 kW)                                                                                           |
| K    | Clearance to a mechanical air supply inlet                                                                                                                                  | 3 feet                                                                                                                                                                                                          |
| L    | Clearance under a veranda, porch, deck, or balcony                                                                                                                          | Note 1 & 2                                                                                                                                                                                                      |
| M    | Clearance to each side of the center line extended above or below vent terminal of the furnace to a dryer or water heater vent, or other appliance's vent intake or exhaust | 12in.                                                                                                                                                                                                           |
| N    | Furnace combustion air intake clearance to a water heater vent, dryer or other types of appliance exhausts                                                                  | 3 feet                                                                                                                                                                                                          |
| O    | Clearance from a plumbing vent stack                                                                                                                                        | 3 feet                                                                                                                                                                                                          |
| P    | Clearance above paved sidewalk or paved driveway located on public property                                                                                                 | See Note 1 & 2.                                                                                                                                                                                                 |

**Note:** This table is based upon National codes for gas appliances, and are provided as a reference. Refer to Local codes which may supersede the standards and/or recommendations.

**Note 1:** Avoid venting under a deck or large overhang. Recirculation could occur and cause performance or system problems. Ice build-up may occur.

**Note 2:** For clearances note specified in ANSI Z223.1/NFPA 54, clearances shall be in accordance with local installation codes and the requirements of the gas supplier and the manufacturer's installation instructions.

The vent for this appliance shall not terminate. a. Near the soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or property damage; or b. Where condensate vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.

Specifications for venting subject to change without notice.

# Installation Guide for Comfort Pack (CPG) Units

## Electrical

**All wiring must be installed in accordance with applicable codes.**

The unit is factory wired for 230/1/60 power. For 208/1/60 power systems, the wiring to the primary side of the control transformer should be changed from the 240-volt connection to the 208-volt connection to provide proper operation of the control system.

**The operating voltage of the unit is from 197 to 253 volts. Operating the equipment outside of these limits will void the warranty.**

## Electrical Supply and Connections

All electrical wiring and connections, including electrical grounding must be made in accordance with the National Electric Code ANSI/NFPA No. 70 (latest edition) or, in Canada, the Canadian Electrical Code, Part I-C.S.A. Standard C22.1. In addition, the installer should be aware of any local ordinances or utility company requirements that might apply.

Check the rating plate for the supply voltage and current requirements. A dedicated line voltage supply with fused disconnect switch should be run directly from the main electrical panel to the unit. All external wiring must be within approved conduit and have a minimum temperature rise rating of 60°C. Conduit from the disconnect switch must be run so as not to interfere with the service panels.

## Controls

Field wiring between the unit and the wall thermostat (by others) may be low voltage for Class 2 systems. The location of the wall thermostat should be 4 to 5 feet above the floor and carefully selected so that the thermostat senses the temperature of the largest conditioned area, without being influenced by drafts, sun exposure or outside temperature.

## Electrical Connections

**NOTE:** Make certain that the volts, hertz, and phase correspond to that specified on the unit rating plate, and that the service provided by the utility is sufficient to handle the additional load imposed by this equipment.

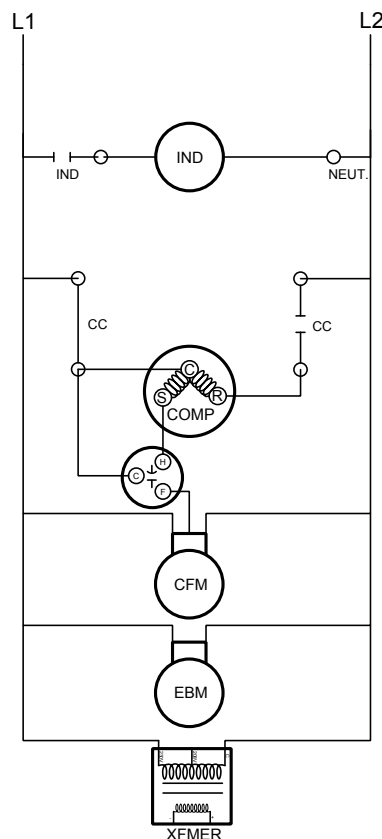
Make all electrical connections in accordance with the National Electrical Code and any pertinent local codes or ordinances. Use a separate branch electrical circuit for this unit. Locate a disconnecting means within sight of and readily accessible to the unit.

- Line Voltage Connections
- Connect the single phase power supply to unit fuse blower terminal L1 and L2
- Connect ground wire to lug
- Low Voltage Connections

When locating the room thermostat, it should be in the natural circulating path of room air. Avoid locations where the thermostat would be exposed to cold air infiltration; drafts from windows, doors or other openings leading to the outside; exposure to air currents from warm-or-cold air registers or to exposure where the natural circulation of the air is cut off, such as behind doors, above or below mantels, shelves, etc.

## Electrical - High Voltage

| NOMINAL VOLTAGE | MINIMUM VOLTAGE | MAXIMUM VOLTAGE |
|-----------------|-----------------|-----------------|
| 208-230         | 197             | 253             |



# Installation Guide for Comfort Pack (CPG) Units

## High Voltage Power Supply



### WARNING

#### LIVE ELECTRICAL COMPONENTS!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

The high voltage power supply must agree with the equipment nameplate.

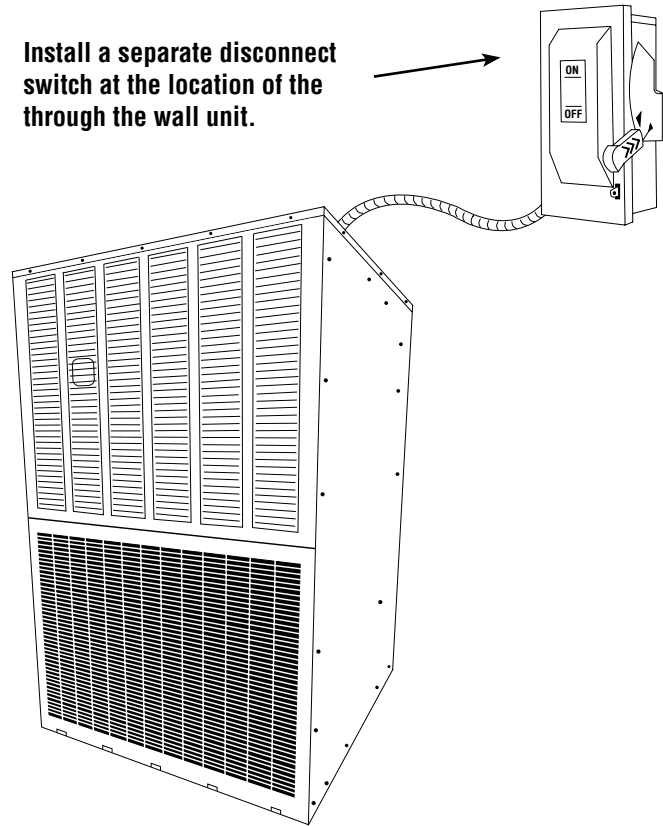
*OR*

Make certain that the volts, hertz, and phase correspond to that specified on the unit rating plate, and that the service provided by the utility is sufficient to handle the additional load imposed by this equipment.

Power wiring must comply with national, state, and local codes.

Follow instructions on unit wiring diagram located on the inside of the access door, or cabinet and in the wiring diagrams included with the unit.

Install a separate disconnect switch at the location of the thru the wall unit.



**Thru-the-Wall  
Comfort Pack (CPG) Unit**

## Electrical - Low Voltage

### Low Voltage Maximum Wire Length

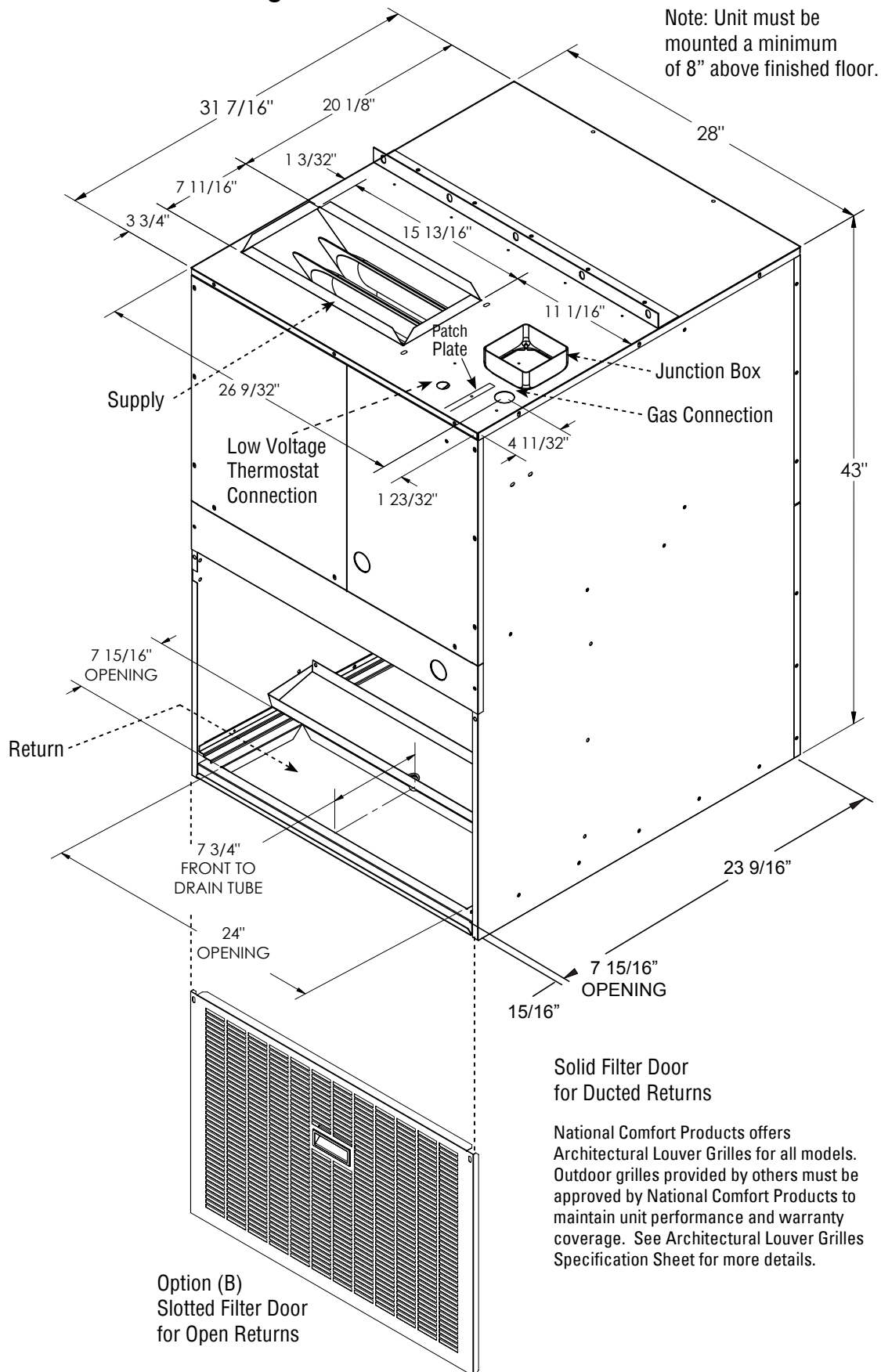
Table defines the maximum total length of low voltage wiring from the outdoor unit, to the indoor unit and to the thermostat.

| 24 VOLTS  |                  |
|-----------|------------------|
| WIRE SIZE | MAX. WIRE LENGTH |
| 18 AWG    | 150 Ft.          |
| 16 AWG    | 225 Ft.          |
| 14 AWG    | 300 Ft.          |



# Installation Guide for Comfort Pack (CPG) Units

## Comfort Pack Dimension Drawing



# Installation Guide for Comfort Pack (CPG) Units

## Gas Furnace Specifications

**Gas Heat** – The cabinet includes a gas furnace with integral flue duct, direct spark ignition, safety controls, and operating controls. The installation of the unit and gas piping must be in accordance with local codes.

### Gas Valve Setting 3.5" w.c.

| HEAT MODULE                                                                                                                                                                                                                                                         | 14208378        | 14208379            | 14208380              | 14208381      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------|-----------------------|---------------|
| INPUT BTUH                                                                                                                                                                                                                                                          | 28,000          | 38,000              | 51,000                | 64,000        |
| OUTPUT BTUH                                                                                                                                                                                                                                                         | 22,400          | 30,400              | 40,800                | 51,200        |
| MAXIMUM EXTERNAL STATIC PRESSURE                                                                                                                                                                                                                                    | .5" W.C.        | .5" W.C.            | .5" W.C.              | .5" W.C.      |
| DISCHARGE TEMPERATURE RISE RANGE                                                                                                                                                                                                                                    | 45°F to 60°F    | 45°F to 60°F        | 45°F to 65°F          | 60°F to 80°F  |
| BLOWER SPEED SETTING                                                                                                                                                                                                                                                | Low* (5-Orange) | Med. Low* (4-Black) | Med. High* (2-Yellow) | High* (1-Red) |
| * See Wiring Diagrams on Page 36-38.                                                                                                                                                                                                                                |                 |                     |                       |               |
| To ensure safe operation and long life of the heat exchanger, the maximum static pressure and/or maximum temperature rise must not be exceeded. Operation of the heater at conditions that exceed the heater's specifications will void the heat exchanger warranty |                 |                     |                       |               |
| MODEL SIZE                                                                                                                                                                                                                                                          | 28              | 38                  | 51                    | 64            |
| ORIFICE SIZE N.G.                                                                                                                                                                                                                                                   | #39             | #31                 | #28                   | #22           |
| ORIFICE SIZE L.P.                                                                                                                                                                                                                                                   | #53             | #49                 | 2.1 mm                | #41           |
| NOMINAL TEMPERATURE RISE                                                                                                                                                                                                                                            | 52.5°F          | 52.5°F              | 55°F                  | 67°F          |
| ALLOWABLE AIR TEMPERATURE RANGE                                                                                                                                                                                                                                     | 145-160         | 140-160             | 140-160               | 135-160       |
| CO <sup>2</sup> %- ACCEPTABLE RANGE                                                                                                                                                                                                                                 | 3.2 to 3.6      | 4.5 to 5.2          | 4.8 to 5.8            | 4.5 to 5.5    |
| CO AIR FREE - PPM                                                                                                                                                                                                                                                   | 0 - 200         | 0 - 200             | 0 - 200               | 0 - 200       |
| SENSING COLD                                                                                                                                                                                                                                                        | 1.3+/- .1       | 1.05 +/- .1         | 1.05 +/- .1           | 1.05 +/- .1   |
| PRESSURE HOT                                                                                                                                                                                                                                                        | .95+/- .05      | .8+/- .05           | .8+/- .05             | .8+/- .05     |
| EFFICIENCY RANGE                                                                                                                                                                                                                                                    | 80.5% - 81.5%   | 81.5% - 82.5%       | 81.5% - 82.5%         | 80.1% - 81.1% |
| STACK TEMPERATURE                                                                                                                                                                                                                                                   | 210°F- 260°F    | 245°F- 300°F        | 245°F- 300°F          | 270°F- 330°F  |

Temperature Rise Range Based On Return Air Temperature

## Sequence of Operations (Gas Heat)

**1. Call for Heat** – The thermostat sends a call for heat therefore energizing the “white” wire to the control board. The control checks to see that the limit switch is closed and the pressure switch is open. If the limit switch is open, the control responds as defined in the “Limit Switch Operation - page 21”. If the pressure switch is closed, the control will do four flashes on the green LED and wait indefinitely for the pressure switch to open. If the pressure switch is open, the control proceeds to **(2.) Pre-purge**.

**2. Pre-purge** – The control energizes the venter motor and waits for the pressure switch to close. If the pressure switch does not close within 240 seconds of the venter motor energizing, on 3 attempts, the control green LED will flash two times and will enter a soft lock out. When the pressure switch is proven closed, the control begins the pre-purge time. If flame is present any time while in pre-purge, the pre-purge time is restarted. If flame is present long enough to cause lockout, the control responds as defined in “Undesired Flame - page 17”. The control runs the venter motor for a 30 second pre-purge time, then proceeds to the **(3.) Ignition Trial Period**.

**3. Ignition Trial Period** – The control energizes the spark and main gas valve. The venter remains energized. If flame is sensed during the first 16 seconds, the spark is de-energized and the control proceeds to **(4.) Heat Blower On Delay**. If flame has not been sensed during the first 16 seconds, the control de-energizes the spark output and keeps the gas valve energized for an additional one second flame proving period. If flame is not present after the flame proving period, the control de-energizes the gas valve and proceeds with ignition re-tries as specified in “Ignition Retry - page 17”. If flame is present, the control proceeds to the **(4.) Heat Blower On Delay**.

**4. Heat Blower On Delay** – The control waits for 20 seconds from the time the gas valve opened and then energizes the blower motor. The gas valve and venter motor remain energized. The control proceeds to **(5.) Steady Heat**.

**5. Steady Heat** – The control continuously monitors to the safeties (high limit, roll-out, and pressure) for open switches, flame sensor for proving, and the thermostat for a call for heat. When the thermostat call for heat is removed, the control de-energizes the gas valve and begins **(6.) Post-purge** and **(7.) Blower Off Delay**.

**6. Post-purge** – The venter motor output remains on for a 30-second post-purge period after the thermostat is satisfied.

**7. Blower Off Delay** – The blower motor is de-energized after a blower off delay 90 seconds factory setting (field adjustable, see page 14 or 39). Timing begins when the thermostat is satisfied.

## Abnormal Functions

- **Interrupted Thermostat Call for Heat** – If the thermostat demand for heat is removed before the flame is recognized, the control will run the venter motor for the post purge period and de-energize all outputs. If the thermostat demand for heat is removed after successful ignition, the control will de-energize the gas valve, run the venter motor through post purge, and run the blower motor on heat speed for the selected delay off time.

- **Soft Lockout** – The control shall not initiate a call for heat or call for continuous fan while in lockout. The control will still respond to an open limit and undesired flame. Lockout shall automatically reset after one hour. Lockout may be manually reset by removing power from the control for more than one second or removing the thermostat call for heat for more than one and less than 20 seconds.

- **Hard Lockout** – If the control detects a fault on the control board, the status LED will be de-energized, and the control will lockout as long as the fault remains. A hard lockout will automatically reset if the hardware fault clears.

- **Power Interruption** – During a momentary power interruption or at voltage levels below the minimum operating voltage for line voltage the system will self-recover without lockout when voltage returns to the operating range. During a momentary power interruption of low voltage the board will enter a soft lockout. Power interruptions of less than 80mS shall not cause the control to change operating states. Power interruptions greater than 80mS may cause the control to interrupt the current operating cycle and re-start.

- **Ignition Retry** – If flame is not established on the first trial for ignition, the control de-energizes the gas valve and the venter motor remains energized for an inter-purge period of 30 seconds. The spark and gas valve are then re-energized, and the control initiates another trial for ignition. If flame is not established on the second trial for ignition, the control de-energizes the gas valve, energizes the blower motor on heat speed, and venter motor remains energized. The blower motor is shut off after a short period. When the blower motor de-energizes, the spark and gas valve are re-energized and the control initiates another trial for ignition. (This blower delay is a self-healing feature for an open auxiliary limit switch). If flame is not established on the third trial for ignition, the control de-energizes the gas valve, and the venter motor remains energized for an inter-purge period of 30 seconds. The control then re-energizes the gas valve and spark and initiates another trial for ignition. If flame is not established on the fourth trial for ignition (initial try plus 3 re-tries), the control de-energizes the gas valve and goes into lockout. The control goes to one flash on the green LED to indicate ignition failure lockout.

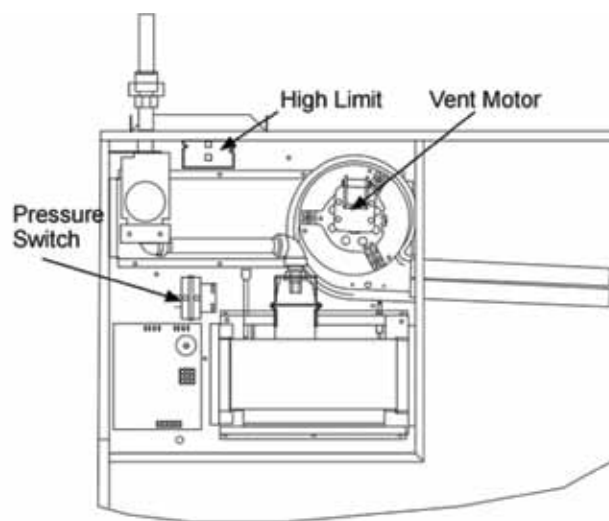
## Installation Codes

These units must be installed in accordance with local building codes. In the absence of local codes, in the United States, the unit must be installed in accordance with the National Fuel Gas Code (latest edition). A Canadian installation must be in accordance with the CAN/CGA-B149.1 and B149.2 Installation Code for Gas Burning Appliances and Equipment. These codes are available from CSA Information Services, 1-800-463-6727. Local authorities having jurisdiction should be considered before installation is made to verify local codes and installation procedure requirements.

## High Altitude Operation

If the heater is being installed at an elevation above 2000 ft. (610M), the input rate will have to be derated. This is done by adjusting the valve outlet pressure (See page 24). In addition, if the heater is being installed at an altitude above 6000 ft. (1830M), the pressure switch will have to be changed. Adjusting the valve outlet pressure is done after the heater is in operation; follow the instructions below. If the pressure switch needs changed, do that before the heater is operated (see Figure 1).

Figure 1



## Heat Section Burner/Control Compartment

(Note: Unit side panel is removed for clarity; side panel is not removable. Access to the burner/control compartment is through the small rear access panel.)

# Installation Guide for Comfort Pack (CPG) Units

## Instructions for Changing Pressure Switch

1. Open the burner/control compartment access panel. Locate the pressure switch.
2. Mark and disconnect the two wires attached to the pressure switch.
3. Disconnect the flow sensing tubing from the pressure switch.
4. Locate the two screws holding the switch mounting bracket. Remove the screws (save screws) and the pressure switch.
5. Install the high altitude pressure switch. Attach the sensing tube and wires. Replace access panel.

| SIZE | P/N      | DESCRIPTION                                    |
|------|----------|------------------------------------------------|
| ALL  | 14208325 | Set to break on pressure increase @ -0.5" w.c. |

**NOTE: THIS ADJUSTMENT CAN ONLY BE DONE AFTER THE HEATER IS IN OPERATION. IT IS INCLUDED IN THE STARTUP PROCEDURES**

## VALVE OUTLET PRESSURE SETTINGS BY ELEVATION

| ALTITUDE  | NATURAL GAS   | PROPANE GAS   |
|-----------|---------------|---------------|
| Feet      | (Inches w.c.) | (Inches w.c.) |
| 0-2000    | 3.5           | 10.0          |
| 2001-3000 | 2.8           | 7.7           |
| 3001-4000 | 2.5           | 7.1           |
| 4001-5000 | 2.3           | 6.4           |
| 5001-6000 | 2.1           | 5.8           |
| 6001-7000 | 1.9           | 5.2           |
| 7001-8000 | 1.7           | 4.6           |
| 8001-9000 | 1.5           | 4.1           |

## Derating by Valve Outlet Pressure Adjustment for High Altitude Operation

### Instructions

1. Determine the required valve outlet pressure for the elevation where the heater will be operating. If unsure of the elevation, contact the local gas supplier.

| METER TIME IN MINUTES AND SECONDS FOR NORMAL INPUT RATING OF FURNACES EQUIPPED FOR NATURAL OR LP GAS |                    |                                      |       |      |       |      |       |      |       |      |       |
|------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------|-------|------|-------|------|-------|------|-------|------|-------|
| INPUT BTU/HR                                                                                         | METER SIZE CU. FT. | HEATING VALUE OF GAS BTU PER CU. FT. |       |      |       |      |       |      |       |      |       |
|                                                                                                      |                    | 900                                  |       | 1000 |       | 1040 |       | 1100 |       | 2500 |       |
|                                                                                                      |                    | MIN.                                 | SEC.  | MIN. | SEC.  | MIN. | SEC.  | MIN. | SEC.  | MIN. | SEC.  |
| 50,000                                                                                               | ONE TEN            | 1 10                                 | 5 50  | 1 12 | 12 00 | 1 12 | 15 30 | 1 13 | 18 12 | 3 30 | 20 00 |
| 75,000                                                                                               | ONE TEN            | 0 7                                  | 44 12 | 0 8  | 48 0  | 0 8  | 50 19 | 0 8  | 53 48 | 2 20 | 0 0   |
| 100,000                                                                                              | ONE TEN            | 0 5                                  | 33 24 | 0 6  | 36 0  | 0 6  | 38 15 | 0 6  | 40 36 | 1 15 | 30 0  |
| 125,000                                                                                              | ONE TEN            | 0 4                                  | 26 19 | 0 4  | 29 48 | 0 5  | 30 0  | 0 5  | 32 17 | 1 12 | 12 0  |
| 150,000                                                                                              | ONE TEN            | 0 3                                  | 31 36 | 0 4  | 24 0  | 0 4  | 25 10 | 0 4  | 26 20 | 1 10 | 0 0   |

$$\text{Input BTU/HR} = \frac{\text{Heating Value of Gas (BTU/Ft}^3\text{)} \times 3600 \times \text{correction factor}}{\text{Time in Seconds (for 1 cu.ft.) of Gas}}$$

2. With the manual valve positioned to prevent flow to the main burner, connect a manometer to the 1/8" pipe outlet pressure tap in the valve. Use a water column manometer that is readable to the nearest tenth of an inch.
3. Remove the cap from the pressure adjusting screw and adjust the valve outlet pressure to the pressure setting selected from the table. Cycle the main burner once or twice to properly seat the adjustment spring in the valve. Re-check the pressure. If necessary, re-adjust the pressure. When the pressure is correct, remove the manometer and replace the cap. Check for leaks at the pressure tap fitting.
4. With the heater operating determine that the inlet pressure to the heater for natural gas is between 5 and 13.5 inches w.c., and for propane between 10 and 13.5 inches w.c. Take this reading as close as possible to the heater (heaters are equipped with gas valves that have an inlet pressure tap.) If the inlet is not within the specified range, the inlet pressure must be corrected and Steps 3 and 4 repeated.
5. Find the Valve Outlet Pressure Adjustment label in the plastic bag that contained these instructions. Using a permanent marker, fill in the pressure setting. Adhere the label on the heater near the gas valve so that it is conspicuous to someone serving the valve.

# Installation Guide for Comfort Pack (CPG) Units

## Clearances

Clearance to combustibles is defined as the minimum distance from a heater to a surface or object that is necessary to ensure that a surface temperature of 90°F above the surrounding ambient temperature is not exceeded. Minimum clearance to combustibles from all sides of this properly installed unit is zero inches. Adequate clearances must be provided to allow installation of the union and shutoff valve, as well as accessibility to wiring and control compartments. If this unit is installed in an attic or other insulated space, it must be kept free and clear of insulating material. The area must be inspected when the unit is installed or insulation is added. Some insulating materials may be combustible. (See page 11 for other clearances)

## Venting

The venting system is an integral part of the heater as shipped to you. Do not modify or add to the vent system. The heat section includes an exhaust blower. The blower draws the combustion products out of the heat exchanger, mixes combustion products with dilution air and forces the mixture to the outside. A chimney is not required. No special provisions are required for supplying air for combustion. Do not alter or extend the vent outlet. The venting system is designed for proper operation under all weather conditions and for winds up to 40 mph. (See page 11 for locating vent)

## Gas Piping and Pressures



### WARNING

**THIS HEATER IS EQUIPPED FOR A MAXIMUM GAS SUPPLY PRESSURE OF 1/2 POUND, 8 OUNCES OR 14 INCHES WATER COLUMN. SUPPLY PRESSURE HIGHER THAN 1/2 POUND REQUIRES INSTALLATION OF AN ADDITIONAL LOCKUP-TYPE SERVICE REGULATOR EXTERNAL TO THE UNIT.**

Gas piping external to the unit must include: a manual shutoff valve with 1/8" NPT plugged tapping (for test gauge connection), drip leg and ground union fitting.

If the supply air from the unit is ducted to space(s) outside the space containing the unit, the return air must be ducted from outside the space containing the unit and sealed to the unit cabinet return air opening.

## Pressure Testing Supply Piping

**Test Pressures Above 1/2 PSI:** Disconnect the heat manual valve from the gas supply line that is to be tested. Cap or plug the supply line.

**Test Pressures Below 1/2 PSI:** Before testing, close the manual valve on the heater.

All piping must be in accordance with requirements outlined in the National Fuel Gas Code ANSI/Z223.1a (latest edition) or CAN/ CGA-B149.1 and B149.2. Gas supply piping installation should conform with good practice and the local codes. Support gas piping with pipe hangers, metal strapping or other suitable material; do not rely on the heater to support the gas pipe.

| <b>CAPACITY OF PIPING</b>                                                  |                  |         |         |         |         |         |         |         |         |         |         |         |
|----------------------------------------------------------------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Cubic Feet Per hour Based on 0.3" w.c. Pressure Drop                       |                  |         |         |         |         |         |         |         |         |         |         |         |
| Specific Gravity for Natural Gas - 0.6 (Natural Gas - 1000 BTU/Cubic Feet) |                  |         |         |         |         |         |         |         |         |         |         |         |
| Specific Gravity for Propane Gas - 1.6 (Propane Gas - 2550 BTU/Cubic Feet) |                  |         |         |         |         |         |         |         |         |         |         |         |
| LENGTH OF PIPE                                                             | DIAMETER OF PIPE |         |         |         |         |         |         |         |         |         |         |         |
|                                                                            | 1/2"             |         | 3/4"    |         | 1"      |         | 1 1/4"  |         | 1 1/2"  |         | 2"      |         |
|                                                                            | NATURAL          | PROPANE | NATURAL | PROPANE | NATURAL | PROPANE | NATURAL | PROPANE | NATURAL | PROPANE | NATURAL | PROPANE |
| 20'                                                                        | 92               | 107     | 190     | 116     | 350     | 214     | 730     | 445     | 1100    | 671     | 2100    | 1281    |
| 30'                                                                        | 73               | 85      | 152     | 93      | 285     | 174     | 590     | 360     | 890     | 543     | 1650    | 1007    |
| 40'                                                                        | 63               | 73      | 130     | 79      | 245     | 149     | 500     | 305     | 760     | 464     | 1450    | 885     |
| 50'                                                                        | 56               | 64      | 115     | 70      | 215     | 131     | 440     | 268     | 670     | 409     | 1270    | 775     |
| 60'                                                                        | 50               | 57      | 105     | 64      | 195     | 119     | 400     | 244     | 610     | 372     | 1105    | 674     |
| 70'                                                                        | 46               | 52      | 96      | 59      | 180     | 110     | 370     | 226     | 560     | 342     | 1050    | 641     |
| 80'                                                                        | 43               | 49      | 90      | 55      | 170     | 104     | 350     | 214     | 530     | 323     | 990     | 604     |
| 90'                                                                        | 40               | 46      | 84      | 51      | 160     | 98      | 320     | 195     | 490     | 299     | 930     | 567     |
| 100'                                                                       | 38               | 43      | 79      | 48      | 150     | 92      | 305     | 186     | 460     | 281     | 870     | 531     |
| 125'                                                                       | 34               | 39      | 72      | 44      | 130     | 79      | 275     | 168     | 410     | 250     | 780     | 476     |
| 150'                                                                       | 31               | 35      | 64      | 39      | 120     | 73      | 250     | 153     | 380     | 232     | 710     | 433     |
| 160'                                                                       | 28               | 32      | 59      | 36      | 110     | 67      | 225     | 137     | 350     | 214     | 650     | 397     |
| 170'                                                                       | 26               | 30      | 55      | 34      | 100     | 61      | 210     | 128     | 320     | 195     | 610     | 372     |

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

The heater is orificed for operation with natural gas having a heating value of 1000 (+/-50) BTUH per cubic feet or propane gas with a heating value of 2500 (+/-100) BTUH per cubic feet. If the gas at the installation does not meet these specifications, consult the factory for proper orificing. **Pipe joint compounds (pipe dope) shall be resistant to the action of liquefied petroleum gas or any other chemical constituents of the gas being supplied.**

Install a ground joint union and manual shut off valve upstream of the unit control system, as shown in Figure 2. The 1/8" plugged tapping in the shut off valve provides connection for a supply line pressure test gauge\*\*. The National Fuel Gas Code requires the installation of a trap with a minimum 3" drip leg. Local codes may require a minimum drip leg longer than 3" (typically 6"). Gas connection is 1/2". Leak-test all connections by brushing on a leak-detecting solution.



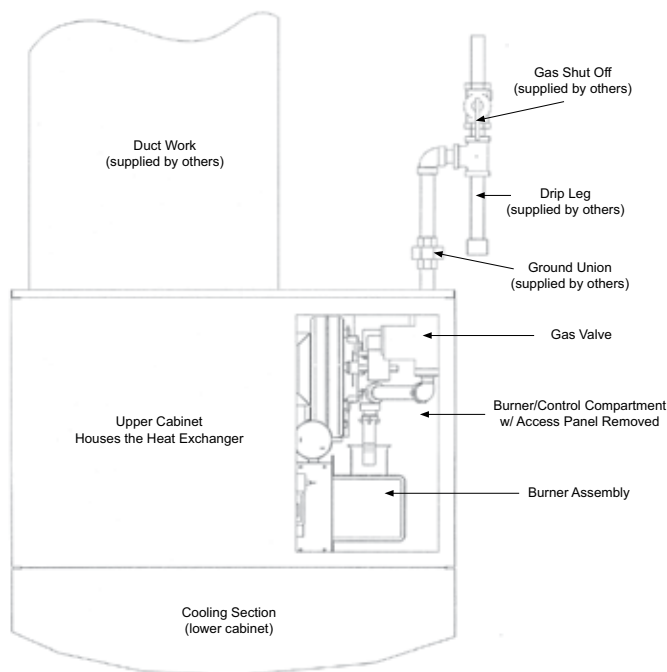
## WARNING

**ALL COMPONENTS OF A GAS SUPPLY SYSTEM MUST BE LEAK TESTED PRIOR TO PLACING EQUIPMENT IN SERVICE. NEVER TEST FOR LEAKS WITH AN OPEN FLAME. FAILURE TO COMPLY COULD RESULT IN PERSONAL INJURY, PROPERTY DAMAGE OR DEATH.**

## Gas Connection and View

Figure 2

Access Panels and Heat Exchanger Inspection Panel



\*Install the heat exchanger inspection panel in the ductwork in such a manner that will prevent air leaks.

\*\*1/8" NPT plugged tapping for test gauge not permitted in the Massachusetts.

## Valve Outlet Gas Pressure Setting

Measuring valve outlet gas pressure cannot be done until the heater is in operation. Normally adjustments should not be necessary to the factory preset regulator (also, see paragraph on high altitude operation). If adjustment is necessary, the following warnings and instructions apply.



## WARNING

**VALVE OUTLET GAS PRESSURE MUST NEVER EXCEED 3.5" W.C. FOR NATURAL GAS AND 10" W.C. FOR PROPANE GAS.**

**For Natural Gas:** When the heater leaves the factory, the combination gas valve is set so that the valve outlet gas pressure is regulated to 3.5" w.c. Inlet supply pressure to the valve for natural gas must be a minimum of 5" w.c. and a maximum of 14" w.c. Normally, field adjustment should not be required.

**For Propane Gas:** When the heater leaves the factory, the combination gas valve is set so that the valve outlet gas pressure is regulated to 10" w.c. Inlet supply pressure to the valve for propane gas must be a minimum of 11" w.c. and a maximum of 14" w.c. Normally, field adjustment should not be required.

Before attempting to measure or adjust valve outlet gas pressure, the inlet supply pressure **must** be within the specified range both when the heater is in operation and on standby.

Incorrect inlet pressure could cause excessive valve outlet gas pressure immediately or at some future time. If natural gas supply pressure is too high, install a regulator in the supply line before it reaches the heater. If natural gas supply pressure is too low, contract your gas supplier.

## Instructions on How to Check Valve Outlet Pressure

**(Can only be done after heater is installed):**

1. With the manual valve positioned to prevent flow to the main burner, connect a manometer to the 1/8" pipe outlet pressure tap in the valve. NOTE: A manometer (fluid-field gauge) is recommended rather than a spring type gauge due to the difficulty of maintaining calibration of a spring type gauge.
2. Open the valve and operate the heater. Measure the gas pressure at the outlet of the automatic gas valve. Normally adjustments should not be necessary to the factory-preset regulator. If adjustment is necessary, set pressure to correct settings

# Installation Guide for Comfort Pack (CPG) Units

by turning the regulator screw IN (clockwise) to increase pressure. Turn regulator screws OUT (counterclockwise) to decrease pressure. (See Figure 4 on Page 24)



## CAUTION

**ROUTE THE WIRES SO THAT THEY DO NOT CONTACT THE FLUE GAS COLLECTION BOX OR VENTER HOUSING. CONSULT THE WIRING DIAGRAM SUPPLIED WITH YOUR HEATER.**

**IF ANY OF THE ORIGINAL WIRES AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 105°C, EXCEPT FOR LIMIT CONTROL, FLAME ROLLOUT SWITCH AND SENSOR LEAD WIRES, WHICH MUST BE 150°C. PLEASE SEE “HAZARD INTENSITY LEVELS”.**

## Ignition System

This heater is equipped with a direct spark integrated control system. The system monitors the safety devices and controls the operation of the blower and venter motors and the gas valve between heat cycles. It also controls the blower for cooling.

## Ignition System Operating Sequence

– On a call for heat from the thermostat, the system energizes the venter motor and goes through a 30-second prepurge. The system verifies that the pressure switch, the high limit and the flame rollout switch are in the closed state. The gas valve is then energized and the ignition system provides the high voltage spark to the electrode to ignite the main burner gas. Burner flame is electronically sensed by the control upon carry over of flame. (A separate solid metal probe is used as the flame sensing function. A low voltage electrical signal is imposed on the metal probe that is electrically isolated from ground. When the flame impinges on the flame sensing probe, the flame acts as a conduction path to ground. The flame rectifies and completes the DC circuit and the ignition system acknowledges the flame.) The fan motor is energized by the system after 20 seconds of flame sensing. After the thermostat has been satisfied, the system de-energizes the gas valve, the venter motor goes through a 30-second post-purge and the fan motor remains energized for an additional time.

**NOTE: This is a three trial system. Should the unit not sense burner flame, two additional tries will be made. If the unit does not sense flame in three tries, it will lockout for one hour before initiating another 3-sequence trial for ignition. To initiate another trial for ignition before the one hour elapses requires that either the thermostat be reset or the power to the unit be interrupted for 30 seconds. The user should not continue to try resetting the system. Contact a qualified service agency.**

## Combustion Air Proving Switch

The combustion air proving switch is a pressure sensitive switch that monitors air pressure to ensure that proper combustion air flow is available. The switch is a single pole/normally open device that closes when a decreasing pressure is sensed in the venter housing.

On start-up when the heater is cold, the sensing pressure is at the most negative level, and as the heater warms up, the sensing pressure becomes less negative. After the system has reached equilibrium (about 10 minutes), the sensing pressure levels off.

If a restriction causes the sensing pressure to be outside the switch setpoint, the pressure switch will function to shut off the main burner. The main burner will remain off until the system has cooled and/or the resistance is reduced. The Table below lists the approximate water column negative pressure readings and switch setpoints for sea level operating conditions.

|                       |             |
|-----------------------|-------------|
| <b>START-UP COLD</b>  | 1.0 +/- .1  |
| <b>EQUILIBRIUM</b>    | .72 +/- .05 |
| <b>SETPOINT “OFF”</b> | .55         |
| <b>SETPOINT “ON”</b>  | .65         |

## Limit Switch

All units are equipped with a temperature activated auto reset limit control. The control is factory set and is non-adjustable. If the setpoint is reached, the limit control acts to interrupt the electric supply to the gas valve. This safety device provides protection in the case of motor failure or lack of airflow due to a restriction at the inlet or outlet.

## Flame Rollout Switch

All units are equipped with a temperature activated manually reset switch. The flame rollout switch is located centrally on the top of the burner assembly. It is factory set and is non-adjustable. If the setpoint is reached, the flame rollout acts to interrupt the electric supply to the gas valve. If the flame rollout switch activates, identify and correct the cause before resetting the switch. Refer to the Maintenance Section for information on probable causes and instructions on resetting the flame rollout switch.

## Burner

The heater has a one-piece burner designed to provide controlled flame stability without lifting or flashback with either natural or propane gas. The burner can be removed as a unit for inspection or service the flame rollout acts to interrupt the electric.

## Gas Valve

The heater has a one-piece burner designed to provide controlled flame stability without lifting or flashback with either natural or propane gas. The burner can be removed as a unit for inspection or service. the flame rollout acts



### WARNING

**THE OPERATING VALVE IS THE PRIME SAFETY SHUTOFF. ALL GAS SUPPLY LINES MUST BE FREE OF DIRT OR SCALE BEFORE CONNECTING THE UNIT TO ENSURE POSITIVE CLOSURE. SEE HAZARD INTENSITY LEVELS, PAGE 5.**

## Start Up

**Check Installation** - Check the installation prior to start-up:

1. Unit must be secure and level.
2. Verify proper clearances from combustibles.
3. Check vent and combustion air systems to be sure that they are not blocked.
4. Check piping for leaks and proper gas line pressure. Bleed gas lines of trapped air.
5. Check electrical wiring. Be sure all wire gauges are as recommended. A service disconnect switch should be used. Verify that fusing or circuit breakers are adequate for the load use.

6. Verify that the return air duct connection is physically sound, sealed to the unit cabinet and terminates outside of the space containing the furnace.
7. Check that the vent connector is in place and is physically sound without holes or excessive corrosion.
8. Check that flue product carrying areas external to the furnace are clear and free of obstructions.
9. Check that there are no obvious signs of deterioration of the furnace.
10. Check that the physical support of the unit and furnace are sound without sagging, cracks, gaps, etc., around the base so as to provide a seal between the support and the base

These examinations should be done by qualified service personnel prior to initial start-up, and then at least on a yearly basis.

## Heater Start-Up

### SAFETY WARNINGS

**WARNINGS: FOR YOUR SAFETY, READ BEFORE OPERATING. IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.**

- This appliance does not have a pilot. It is equipped with an ignition device that automatically lights the burner. Do not try to light the burner by hand.
- Before operating, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

#### WHAT TO DO IF YOU SMELL GAS?

(See next page)

## WHAT TO DO IF YOU SMELL GAS.

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions..
- If you cannot reach your gas supplier, call the fire department
- Do not touch any electrical switch; do not use any phone in your building.
- Use only your hand to turn the gas control ON/OFF knob on the gas valve. Never use tools. If the valve ON/OFF knob will not turn by hand, do not try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- Should overheating occur, or the gas supply fail to shut off, turn off the manual gas valve to the appliance before shutting of the electrical supply.
- Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control that has been under water

## Operating Instructions and Operating Sequence

1. Set thermostat at lowest setting.
2. Turn off all electric power to the appliance.
3. This appliance is equipped with an ignition device that automatically lights the burner. Do not try to light the burner by hand. Open the access door and locate the gas control (ON/OFF) knob on the gas valve.
4. Turn the gas control knob clockwise to "OFF."
5. Wait five (5) minutes to clear for any gas. Then smell for gas, including near the floor. If you smell gas, STOP! and follow the steps in the WARNINGS above or on the Operating Label on the heater. If you do not smell gas, proceed to the next step.
6. Turn the gas control knob counterclockwise to "ON." Close the access door.

7. Turn on the electric power to the heater.
8. Set the thermostat to the desired setting.
  - Thermostat calls for heat, energizes venter motor.
  - Venter pressure switch closes, firing the unit.
  - Burner flame is sensed and in 30 seconds, the fan motor is energized.
  - If the flame is extinguished during the main burner operation, the integrated control system closed the main valve and must be reset by interrupting power to the control circuit (see lighting instructions on the heater).

**NOTE: IF THE APPLIANCE DOES NOT OPERATE, FOLLOW THE INSTRUCTIONS "TO TURN OFF GAS TO APPLIANCE" (BELOW) AND CALL YOUR SERVICE TECHNICIAN.**

## To Turn Off Gas To The Appliance

1. Set thermostat to lowest setting.
2. If service is to be performed, turn off all electrical power to the appliance.
3. Open the access door.
4. Turn the gas control knob clockwise to "OFF."  
Do not force.
5. Close the access door.

## Check Installation After Start-Up

- ☐ If the heater is being derated for high altitude operation, follow the instructions to adjust the valve outlet pressure. Be sure to complete the "change pressure" tag and adhere it to the heater close to the gas valve.
- ☐ If unit is not being derated, measure to verify valve outlet gas pressure.
- ☐ Inspect the venting system. Determine that there is no blockage or restriction or leakage.
- ☐ Turn the unit off and on, pausing two minutes between each cycle. Observe for smooth ignition.

## Special Notes for Extremely Cold Weather Areas (below - 20°F/-29°C)

In areas where extremely cold outdoor temperatures can be expected, some additional installation and operating precautions

# Installation Guide for Comfort Pack (CPG) Units

should be taken to prevent possible vent system ice blockage that could result in safety shutdown of the burners:

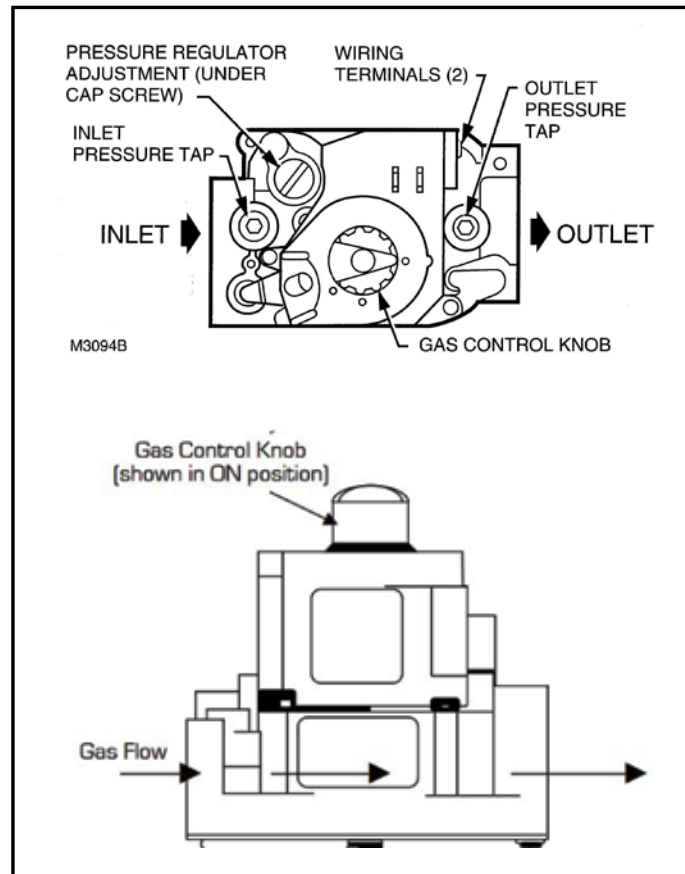
1. Adjust to the highest achievable temperature rise within the rise and static pressure ranges specified on the rating plate.
2. Make sure there are no leaks of outside air into the return air system.
3. Keep the outside louver grill as free as possible of any ice that may form and obstruct the flue outlet.



## DANGER

THE GAS BURNER IN THIS GAS-FIRED EQUIPMENT IS DESIGNED AND EQUIPPED TO PROVIDE SAFE AND COMPLETE COMBUSTION. HOWEVER, IF THE INSTALLATION DOES NOT PERMIT THE BURNER TO RECEIVE THE PROPER SUPPLY OF COMBUSTION AIR, COMPLETE COMBUSTION MAY NOT OCCUR. THE RESULT IS INCOMPLETE COMBUSTION THAT PRODUCES CARBON MONOXIDE, A POISONOUS GAS THAT CAN CAUSE DEATH. SAFE OPERATION OF DIRECT-FIRED GAS BURNING EQUIPMENT REQUIRES A PROPERLY OPERATING VENT SYSTEM THAT VENTS ALL FLUE PRODUCTS TO THE OUTSIDE ATMOSPHERE. FAILURE TO PROVIDE VENTING WILL RESULT IN A HEALTH HAZARD WHICH COULD CAUSE SERIOUS PERSONAL INJURY OR DEATH. ALWAYS COMPLY WITH THE COMBUSTION AIR REQUIREMENTS IN THE INSTALLATION CODES. COMBUSTION AIR AT THE BURNER SHOULD BE REGULATED ONLY BY MANUFACTURER-PROVIDED EQUIPMENT. NEVER RESTRICT OR OTHERWISE ALTER THE SUPPLY OF COMBUSTION AIR TO ANY HEATER.

Figure 4: Gas Control



## Maintenance and Service

The 16" x 25" x 1" filter on the cooling chassis must be maintained regularly to assure that the unit provides optimal performance and energy efficiency. The intervals between replacing depends entirely on the cleanliness of the return air to the unit and the time that the indoor blower operates. The air filter is accessible by removing the lower access panel. The filter should be inspected and replaced as needed and is not washable. Substituting the air filter with media other than the type provided with the unit is not recommended, since other materials may cause additional static pressure, which could reduce the air delivery of the unit. **The unit should never be operated without the air filter and access panels in place.**

### Cooling Chassis

The cooling chassis contains all items related to the cooling functions of the unit, and also contains the indoor blower and motor for the heating function. For extensive servicing, qualified personnel may choose to remove the cooling chassis from the unit and take it to a work area. Spare chassis are recommended so that extensive servicing can be performed outside the living space. This will prevent introducing dirt or doing damage in the living area, and could help to eliminate significant disruption of the air conditioning and heating functions in the living areas.

# Installation Guide for Comfort Pack (CPG) Units

The indoor blower motor and the outdoor fan motor have permanently lubricated bearings and do not require routine service. The refrigeration system is sealed and factory charged with R-410A so that routine maintenance is not required. Cleaning of the outdoor coil, indoor coil, drain pan, and inside the bottom of the chassis are recommended at least once a year, and more often if the equipment is operated in a dusty or hostile environment. The electrical controls do not require routine service.

**Power to the unit should always be turned off before performing service or removing the cooling chassis from the unit.** One power connector and one control circuit connector are provided for easy disconnecting and re-connecting of the wires between the cooling chassis and cabinet. The controls enclosure cover must be removed to allow access to the screws holding the indoor blower cover plate to the cooling chassis and cabinet. **After reinstalling the cooling chassis, the indoor blower cover plate and controls enclosure cover must be reinstalled.**



## WARNING

IF YOU TURN OFF POWER SUPPLY, TURN OFF THE GAS. SEE HAZARD LEVELS, PAGE 3. THE MATERIAL CONTAINED IN THE MAINTENANCE AND SERVICE SECTION OF THIS MANUAL IS DESIGNED TO AID A QUALIFIED SERVICE PERSON IN MAINTAINING AND SERVICING THIS EQUIPMENT. THIS UNIT WILL OPERATE WITH MINIMUM MAINTENANCE. TO ENSURE LONG LIFE AND SATISFACTORY PERFORMANCE, A HEATER THAT IS OPERATED UNDER NORMAL CONDITIONS SHOULD BE INSPECTED AND CLEANED AT THE START OF EACH HEATING SEASON. IF THE HEATER IS OPERATING IN AN AREA WHERE AN UNUSUAL AMOUNT OF DUST, SOOT OR OTHER IMPURITIES ARE PRESENT IN THE AIR, MORE FREQUENT MAINTENANCE IS RECOMMENDED. WHEN ANY SERVICE IS COMPLETE, BE CAREFUL TO REASSEMBLE CORRECTLY TO ENSURE THAT NO UNSAFE CONDITIONS ARE CREATED. WHEN RELIGHTING, ALWAYS FOLLOW THE LIGHTING INSTRUCTIONS ON THE HEATER.

## Maintenance Schedule

At least every six weeks check the filter. Clean or replace as necessary. A clean filter in addition to providing a comfortable

environment ensures fuel-efficient operation and long heat exchanger life. Do the following procedures at least annually.

- Clean all dirt, lint, and grease from the combustion air openings and venter motor.
- Inspect the heat exchanger. Clean if needed.
- Check the burner for scale, dust, or lint accumulation. Clean if needed.
- Check the vent system for soundness. Replace any parts that do not appear sound.
- Check the wiring for any damaged wire. Replace damaged wiring.

**NOTE: USE ONLY FACTORY-AUTHORIZED REPLACEMENT PARTS.**

## Burner/Control Compartment

### Heat Section Burner/Control Compartment

Showing Locations of Burner Assembly and Controls

**NOTE:** Unit side panel is removed for clarity; side panel is not removable. Access to the burner/control compartment is through the small rear access panel as illustrated below.

Figure 5

