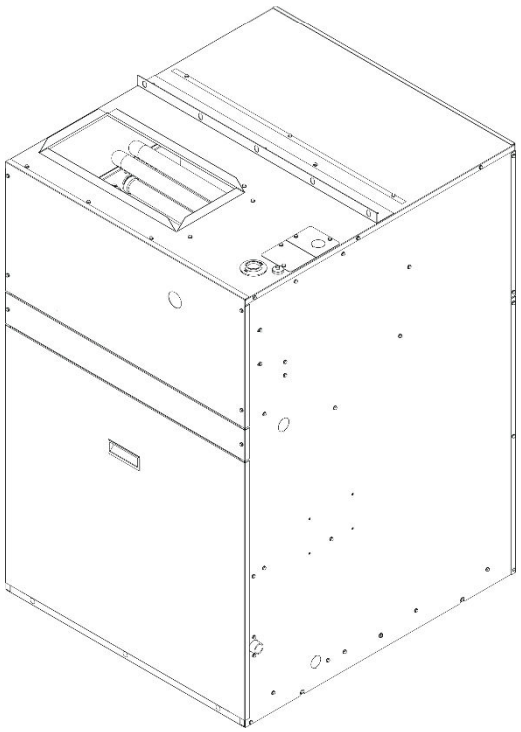
Installation, Operation, & Maintenance Manual

IOM 8405
Rev. C 3/24

FPG SERIES
Vertical Packaged Gas Heat / Electric Cooling Unit
Category IV Type MSP Up to 96% AFUE

FIRST-PAK GAS



ATTENTION:

Installer
Affix these instructions on or adjacent to the furnace.

Consumer
Read these instructions thoroughly and retain all manuals for future reference.

WARNING

FIRE OR EXPLOSION HAZARD
Failure to follow safety warning exactly could result in serious injury, death or property damage.

– Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
– WHAT TO DO IF YOU SMELL GAS
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Leave the building immediately.
- Immediately call your gas supplier from a 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.

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Unitary Small AC
AHRI Standard 210/240
Certification applies only when the complete system is listed with AHRI.

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First Co. / AE-Air works to continuously improve its products and as a result, it reserves the right to change design and specifications without notice.

The warranty may be void unless the Startup & Performance Checklist is completed and returned to the warrantor. If the FIRST-PAK Gas Furnace unit is not installed properly, the warranty will be void, as the manufacturer cannot be held accountable for problems that stem from improper installation.

******WARNING TO INSTALLER, SERVICE PERSONNEL AND OWNER******

Altering the product or replacing parts with non-authorized factory parts voids all warranty or implied warranty and may result in adverse operational performance and/or a possible hazardous condition to service personnel and occupants. Company employees and/or contractors are not authorized to waive this warning.

TABLE OF CONTENTS

SAFETY CONSIDERATIONS

1. READ THE ENTIRE MANUAL BEFORE STARTING THE INSTALLATION.
2. These instructions are intended as a general guide and do not supersede national, state, or local codes in any way.
3. Altering the product, improper installation, or the use of unauthorized factory parts voids all warranty or implied warranty and may result in adverse operation and/or performance or may result in hazardous conditions to service personnel and occupants. Company employees or contractors are not authorized to waive this warning.

1. This product should only be installed and serviced by a qualified, licensed installer or service agency.
2. Only use First Co. approved kits and accessories when modifying this product. Refer and follow instructions packaged with the kits or accessories when installing.

RECOGNIZE THE FOLLOWING SAFETY NOTATIONS THROUGHOUT THIS MANUAL AND POSTED ON THE EQUIPMENT:

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation or unsafe practices that could result in severe personal injury or death and/or damage to property.

WARNING

ELECTRIC SHOCK HAZARD

This warning signifies potential electrical shock hazards that could result in personal injury or death.

CAUTION

The CAUTION symbol indicates a potentially hazardous situation that may result in minor or moderate injury.

IMPORTANT

Suggests important procedure steps to insure proper installation, reliability, or operation.

NOTE

Used to highlight suggestions, which may result in enhanced installation, reliability or operation.

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage.

Improper servicing could result in dangerous operation, serious injury, death or property damage.

- Before servicing, disconnect all electrical power to furnace.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.

Verify proper operation after servicing.

SAFETY CONSIDERATIONS CONTINUED

SAFETY RULES:

1. This furnace is approved for use with Natural Gas only. Refer to the FURNACE RATING PLATE.
2. Install this furnace ONLY in a location and position as specified in the INSTALLATION LOCATION section of this manual.
3. Provide adequate combustion and ventilation air to the furnace space as specified in the COMBUSTION AIR section of this manual.
4. Products of combustion must be discharged outdoors, refer to the PRODUCTS OF COMBUSTION section of this manual.
5. Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections as specified in the GAS CONNECTION section of this manual.
6. Always install this furnace to operate within the furnace's intended temperature rise range with a duct system which has an external static pressure within the allowable range, as specified on the unit rating plate and in the GAS HEAT START UP section of this manual.
7. When this furnace is installed so that the supply air duct supplies air to areas outside the space containing the furnace, the return air duct must be sealed to the furnace casing and terminate outside the space containing the furnace as specified in the DUCT CONNECTIONS section of this manual.

WARNING

For your safety, do not store or use any combustible materials, gasoline, and other flammable vapors and liquids in the vicinity of this or any other appliance as described in the COMBUSTION AIR section of this manual. The material may ignite by spontaneous combustion creating a fire hazard resulting in property damage, personal injury, or death.

8. If installed in a residential garage, this furnace must be installed as specified in the INSTALLATION LOCATION section of this manual.

WARNING

For your safety, do not store or use any insulating material in the vicinity of this or any other appliance as specified in the COMBUSTION AIR section of this manual. Such actions could result in property damage, personal injury, or death.

Inspect the furnace area after the furnace is installed and after anytime insulation has been added to the structure.

9. For proper and safe operation, the furnace needs air for combustion and ventilation. Do not block or obstruct air openings on the furnace, air openings to the area in which the furnace is installed, and the spacing around the furnace.
10. This furnace is equipped with a blocked vent shut-off system. If the furnace fails to operate, contact a qualified service agency for repair.

Should the gas supply fail to shut off or if overheating occurs, shut off the gas valve to the furnace before shutting off the electrical supply see

11. FIGURE 29 – Manual Gas Shutoff Valve.

WARNING

DO NOT use this furnace if any part has been under water. A flood-damaged furnace is extremely dangerous. Attempts to use the furnace can result in fire or explosion. A qualified service agency should be contacted to inspect the furnace and to replace all gas controls, control system parts, electrical parts that have been wet or the entire furnace if deemed necessary.

12. The user shall annually inspect the furnace installation to verify the following safety related items:
    a. All flue-gas carrying areas external to the furnace are clear and free of obstructions.
    b. The flue pipe is in place and physically sound without holes or other damage.
    c. The return-air duct connection is physically sound, is sealed to the furnace casing, and terminates outside the space containing the furnace.
    d. The physical support of the furnace is sound without sagging, cracks, gaps, etc., around the base so as to provide a seal between the support and the base.
    e. There are no obvious signs of deterioration of the furnace.
    f. The burner flames are stable and uniform, refer to FIGURE 41 - Burner Flames illustrating proper flame appearance for comparison.

WARNING

CARBON MONOXIDE POISONING HAZARD

Failure to follow instructions could result in severe personal injury or death due to carbon-monoxide poisoning, if combustion products infiltrate into the building.

Check that all openings in the outside wall around the vent (and air intake) pipe(s) are sealed to prevent infiltration of combustion products into the building.

Check that furnace vent (and air intake) terminal(s) are not obstructed in any way during all seasons.

WARNING

DO NOT USE FOR HEATING AND COOLING BUILDINGS OR STRUCTURE UNDER CONSTRUCTION!

SAFETY CONSIDERATIONS CONTINUED

13. The following items should be inspected annually (minimum) before each heating season by a qualified service agency:
    a. HEAT EXCHANGER TUBES: make sure they are free from blockages, signs of carbon buildup or heavy corrosion.
    b. GAS BURNERS: make sure they are free of blockages, signs of carbon buildup or heavy corrosion. The burner carry-over slots should be clean and of uniform size.
    c. FLUE PIPE: is in place is physically sound without holes or any damage.
    d. FLUE TERMINAL: check that it is free from blockages and restrictions.
    e. COMBUSTION AIR OPENINGS: check that they are clean & free from debris or blockages of any kind.
    f. INDOOR AIR: the blower wheel and blower housing must be free from debris. Check that supply and return air registers, grilles, and dampers are positioned properly, filters are in place and clean.
    g. INSPECT & WASH THE CONDENSER AND EVAPORATOR COILS: do not use high pressure as damage to the finned surfaces may occur.

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

WARNING

Installation and service must be performed by a licensed professional installer (or equivalent), service agency or the gas supplier. Attempting to install or repair this unit without such background may result in product 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

HIGH VOLTAGE!

Disconnect all power before servicing. Failure to do so may result in property damage, personal injury, or death.

CAUTION

Use care when handling compressors. Some surfaces could be hot!

CAUTION

Compressors should NOT 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.

WARNING

"USE COPPER SUPPLY WIRES ONLY!"

14. 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.
    a. This furnace must be installed so there are provisions for ventilating air.
    b. 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.
15. Do not attempt to light this furnace manually. Refer to the GAS HEAT STARTUP section for instructions on lighting and shutting down the furnace.
16. In regions where snow and ice accumulation is possible, check the outdoor grilled areas, it must be kept free from any obstructions to air flow. The flue vent must be free from snow and ice or any obstruction to assure the products of combustion are safely discharged out of doors.

MODEL NOMENCLATURE

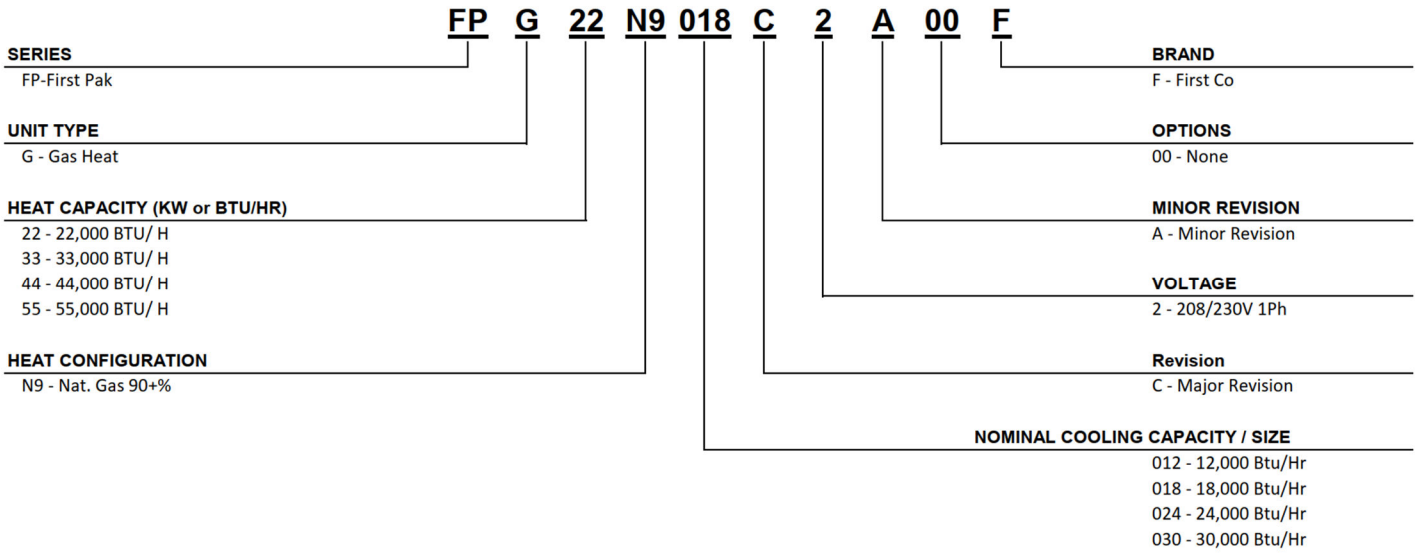


FIGURE 1 - MODEL NOMENCLATURE

GENERAL INFORMATION

CAUTION

DO NOT operate this unit during the construction process. Mechanical components and filters can become clogged with dirt and debris, which can cause damage to the system.

The manufacture does not warrant equipment subjected to abuse.

WARNING

ELECTRIC SHOCK HAZARD

Before servicing equipment, ALWAYS turn off all power to the unit. There may be more than one disconnect switch. Electrical shock can cause injury or death.

Clear surrounding area of all tools, equipment, and debris before operating this unit.

These instructions are provided for the installation of the FIRST-PAK gas furnace specifically. For any other related equipment, refer to the appropriate manufacturer's instructions.

WARNING

This furnace is certified for through-the-wall indoor installation only. This furnace is NOT approved for mobile homes, recreational vehicles or outdoor applications. Such use could result in property damage, personal injury, or death.

CAUTION

This furnace must never be operated under any circumstances without an air filter in place.

NOTE

Material in this shipment has been inspected at the factory and released to the transportation agency in good condition. When received, a visual inspection of all cartons should be made immediately. Any evidence of rough handling or apparent damage should be noted on the delivery receipt in the presence of the carrier's representative. If damage is found, a claim should be immediately filed against the carrier.

This furnace is designed for through-the-wall indoor installation only. Installation of this equipment, wiring, ducts, and any related components must conform to current agency codes, state laws, and local codes. Such regulations take precedence over general instructions contained in this manual.

CAUTION

Extreme caution must be taken that no internal damage will result from screws that are drilled into the cabinet.

INTRODUCTION

FIRST-PAK FPG series are packaged gas heat / electric cooling units. The unit design has been certified by Intertek Testing Services for compliance with the latest edition of the American National Standard – ANSI Z21.47/National Standard of Canada – CAN/CGA-2.3 for direct vent central furnaces. The FPG models are certified to comply with the latest edition of AHRI Standard 210/240. All models are design certified for heating operation when fired with natural gas.

These installation instructions are intended as a general guide only, for use by an experienced, qualified contractor.

STORAGE

Equipment should be stored in a clean dry, conditioned area with maximum temperatures up to 120°F [48.89°C] and minimum temperatures to 32°F [0°C]. Units should be stored upright and in an indoor environment. It is recommended to leave packaging on the unit until the installation is to begin.

WARNING

DO NOT stack more than **FOUR** units for storage purposes. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance, property damage, personal injury or death.

SHIPPING & PACKAGE LIST

NOTE

Material in this shipment has been inspected at the factory and released to the transportation agency in good condition. When received, a visual inspection of all cartons should be made immediately. Any evidence of rough handling or apparent damage should be noted on the delivery receipt in the presence of the carrier's representative. If damage is found, a claim should be immediately filed against the carrier.

SHIPPING INSTRUCTIONS

FPG units must remain in the upright position throughout the shipping and handling process to maintain a proper level of oil in the compressor.

WARNING

Shrink-wrap is located around the unit for protection. Remove before installation.

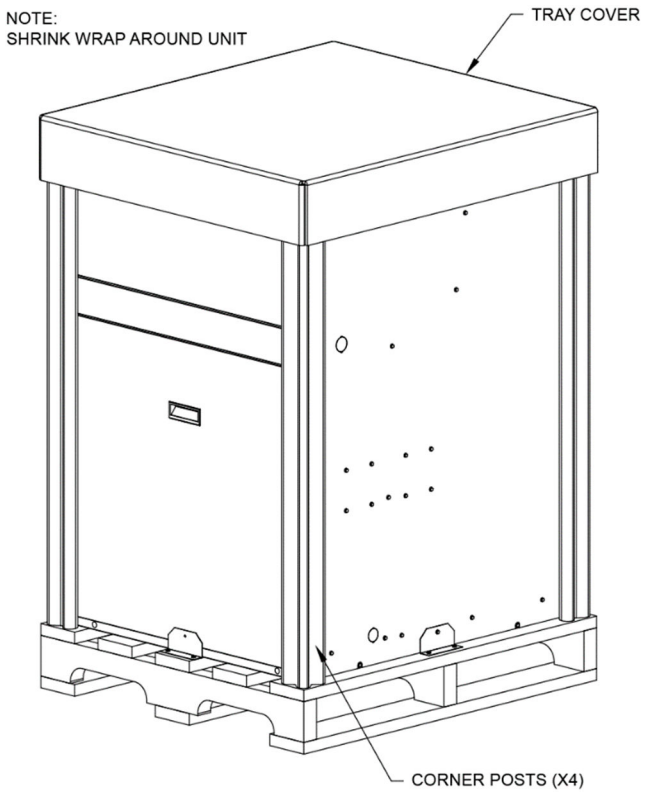


FIGURE 2 – Standard Packaging

PACKAGE LIST

The units will be shipped with the following items:

1- FPG (FIRST-PAK) package gas heat/dx cooling unit:
   A- Shipping bracket
      a. Screws
   B- Top mounting bracket
      a. Screws
2- Literature package
   A- IOM - Installation & Operations Manual

Check the unit for shipping damage; if found, immediately contact the last carrier.

UNIT INSPECTION CHECKLIST

Complete the inspection procedures below before preparing unit for installation:

1) Visually inspect unit for any shipping damage. Damage must be reported immediately to the shipping company to make a claim.
2) Ensure that the carrier makes proper notation of any shortages or damage on all copies of the freight bill and completes a common carrier inspection report.
3) Verify that unit nameplates on the data label match the sales order or bill of lading (including, unit configuration, size and voltage).
4) Ensure that the shipping brackets and screws are removed from the chassis section. Refer to FIGURE 3- Standard Packaging with Brackets – Front View & FIGURE 4 – Standard Packaging with Brackets – Back View for more information.
5) Immediately before installation, remove unit front panel and verify that all electrical connections are tight and that there are no loose wires.
6) Check to make sure that the refrigerant piping is free from any kinks and there is no interference between unit piping and sheet metal or electrical wires.
7) Check that the blower spins freely within the housing and that there are no obstructions between the wheel and housing. The wheel can sometimes come loose in shipping.
8) Ensure that the evaporator distributor tubes are not touching one in another and that they are over the drain pan.
9) Check the air-coil fins for any damage during shipping.
10) Inspect the gas heat section:
    a. Check that the gas manifold is firmly in place on the burner box and secured with the provided screws (4).
    b. Check that burners are securely in place on each gas orifice and properly aligned with each heat exchanger tube.
    c. Check that the vent pipe is attached and secured to the draft inducer housing.
    d. Check that wiring connections are in place on rollout switches, limit switch, pressure switch, gas valve, draft inducer, ignitor, and flame sensor.

NOTE

Check the unit nameplate for correct voltage with the plans before installing the equipment. Also, make sure all electrical ground connections are made in accordance with local code.

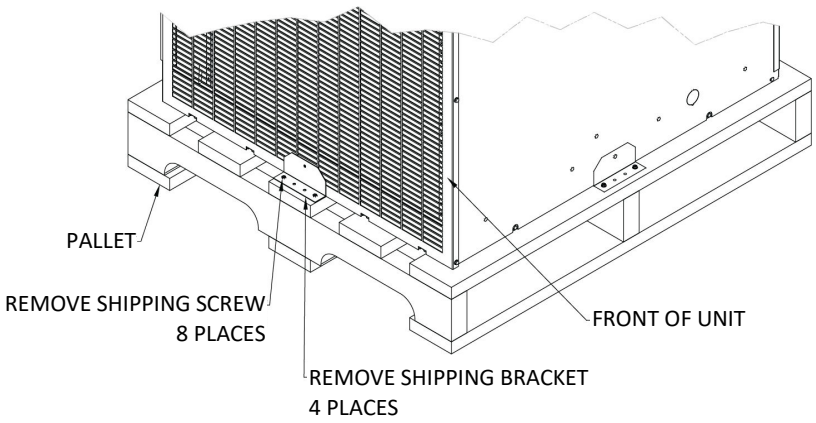


FIGURE 3 - Standard Packaging with Brackets - Front View

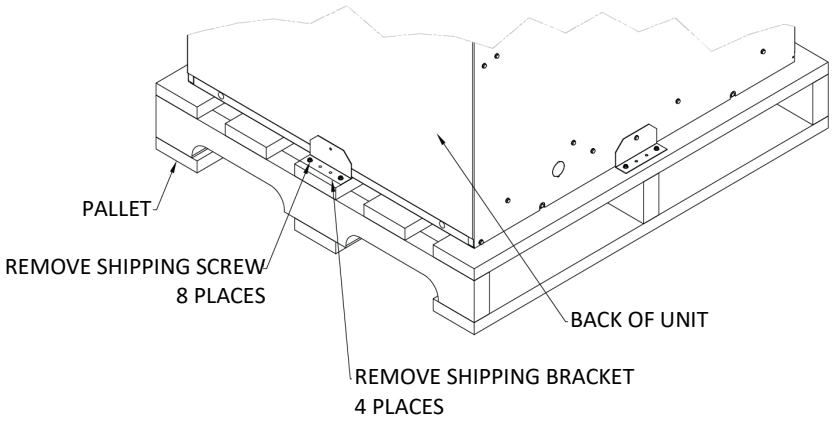


FIGURE 4 – Standard Packaging with Brackets - Back View

UNIT DIMENSIONAL DATA

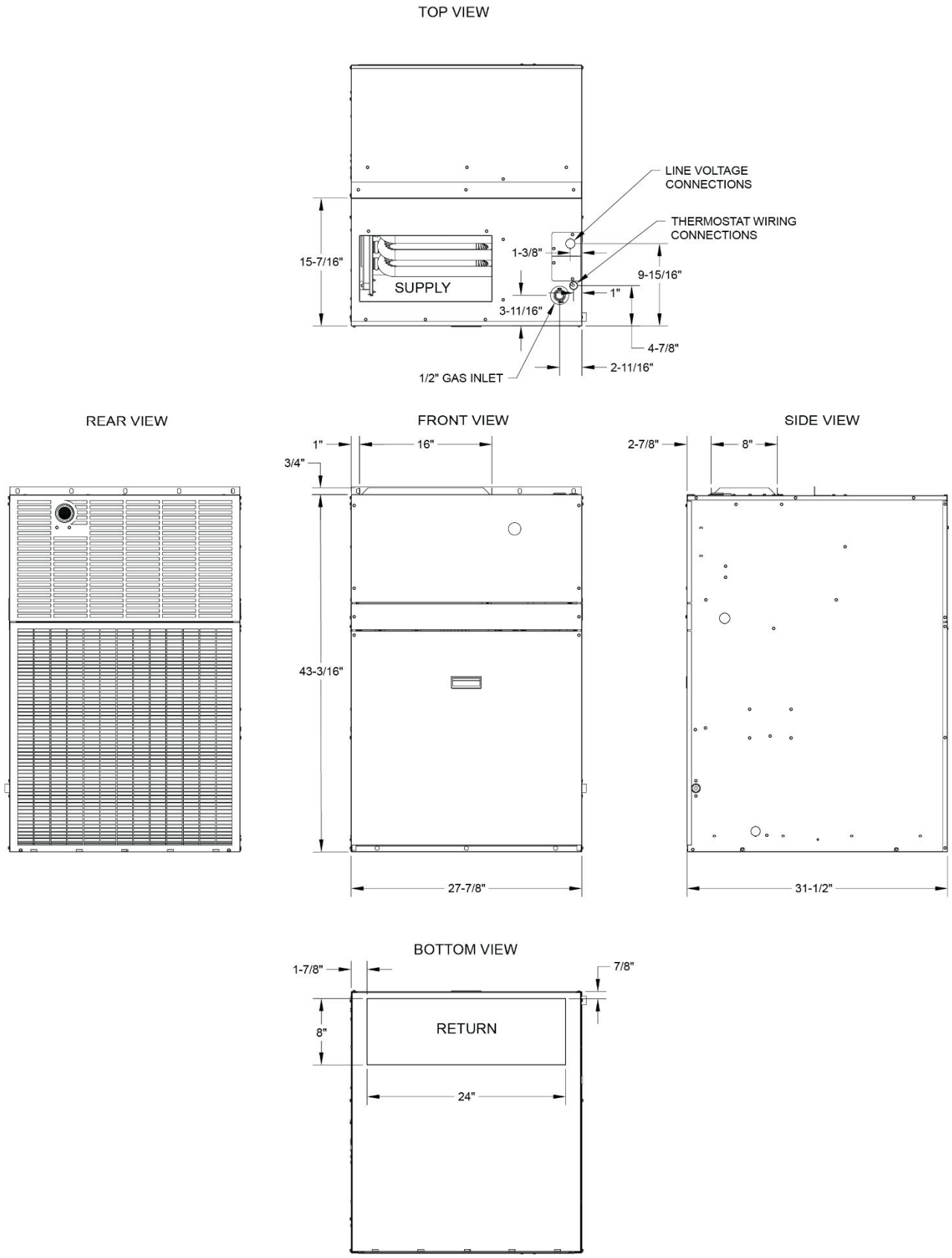


FIGURE 5 - Unit Dimensions

UNIT PHYSICAL DATA

PHYSICAL DATA							
FPG MODELS	22N9012C	33N9012C	44N9012C	22N9018C	33N9018C	44N9018C	55N9018C
UNIT INFORMATION							
Compressor Type (Qty)	Rotary (1)	Rotary (1)	Rotary (1)	Rotary (1)	Rotary (1)	Rotary (1)	Rotary (1)
Compressor Capacitor	40MFD/370V	40MFD/370V	40MFD/370V	35MFD/370V	35MFD/370V	35MFD/370V	35MFD/370V
Condenser Fan HP [kW]	1/5 [.15]	1/5 [.15]	1/5 [.15]	1/5 [.15]	1/5 [.15]	1/5 [.15]	1/5 [.15]
Indoor Fan HP [kW]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/2 [.37]	1/2 [.37]
Blower Size (D x W) in. [cm]	10 x 6 [25.4 x 15.24]						
Condenser Dimension (H x W) in. [cm]	26.5 x 22.25 [67.3 x 56.5]						
Evaporator Dimension (H x W) in. [cm]	23.1 x 22.25 [58.7 x 56.5]						
Filter Size (H x W) in. [cm]	24 x 24 [60.96 x 60.96]						
Input BTU/h [kW]	22000 [6.4]	33000 [9.7]	44000 [12.9]	22000 [6.4]	33000 [9.7]	44000 [12.9]	55000 [16.1]
Output BTU/h [kW]	21120 [6.2]	31350 [9.2]	41360 [12.1]	21120 [6.2]	31350 [9.2]	41360 [12.1]	51150 [15]
AFUE	96	95	94	96	95	94	93
No. of Burners	2	3	4	2	3	4	5
Orifice Size (Natural/Propane) in. [cm]	.0635 [1.61]						
Max. Outlet Air Temp. °F [°C]	170 [94]	160 [89]	180 [100]	170 [94]	160 [89]	180 [100]	185 [103]
Max. Static Pressure IWC [pa]	0.5 [125]						
Gas Piping Connection in. [cm]	1/2" [1.27]						
Operating Weight lb. [kg]	271 [123]	273 [124]	275 [125]	300 [136]	302 [137]	304 [138]	306 [139]
Shipping Weight lb. [kg]	298 [135]	300 [136]	302 [137]	327 [148]	329 [149]	331 [150]	333 [151]
Notes:							

Table 1 - Physical Data

PHYSICAL DATA					
FPG MODELS	33N9024C	44N9024C	55N9024C	40N9030C	50N9030C
UNIT INFORMATION					
Compressor Type (Qty)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)
Compressor Capacitor	35MFD/370V	35MFD/370V	35MFD/370V	30MFD/370V	30MFD/370V
Condenser Fan HP [kW]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/3 [.25]
Indoor Fan HP [kW]	1/3 [.25]	1/2 [.37]	1/2 [.37]	1/2 [.37]	1/2 [.37]
Blower Size (D x W) in. [cm]	10 x 6 [25.4 x 15.24]				
Condenser Dimension (H x W) in. [cm]	26.5 x 22.25 [67.3 x 56.5]				
Evaporator Dimension (H x W) in. [cm]	23.1 x 22.25 [58.7 x 56.5]				
Filter Size (H x W) in. [cm]	24 x 24 [60.96 x 60.96]				
Input BTU/h [kW]	33000 [9.7]	44000 [12.9]	55000 [16.1]	44000 [12.9]	55000 [16.1]
Output BTU/h [kW]	31350 [9.2]	41360 [12.1]	51150 [15]	41360 [12.1]	51150 [15]
AFUE	95	94	93	94	93
No. of Burners	3	4	5	4	5
Orifice Size (Natural/Propane) in. [cm]	.0635 [1.61]				
Max. Outlet Air Temp. °F [°C]	160 [89]	180 [100]	185 [103]	180 [100]	185 [103]
Max. Static Pressure IWC [pa]	0.5 [125]				
Gas Piping Connection in. [cm]	1/2" [1.27]				
Operating Weight lb. [kg]	322 [146]	324 [146]	326 [148]	338 [153]	340 [154]
Shipping Weight lb. [kg]	349 [158]	351 [159]	353 [160]	365 [165]	367 [166]
Notes:					
FPT = Female Pipe Thread					

Table 2 - Physical Data Continued

ELECTRICAL DATA

ELECTRICAL DATA											
MODEL NUMBER	VOLTAGE-PH-HZ	COMPRESSOR		CONDENSOR MOTOR		INDOOR MOTOR		MIN. CIRCUIT AMPACITY	MAX. CIRCUIT PROTECTION	MIN. VOLTAGE	MAX. VOLTAGE
		RLA	LRA	FLA	HP	FLA	HP				
FPG22N9012C*	208/230-1-60	5.5	26	1.9	1/5	2.8	1/3	12	15	197	253
FPG33N9012C*	208/230-1-60	5.5	26	1.9	1/5	2.8	1/3	12	15	197	253
FPG44N9012C*	208/230-1-60	5.5	26	1.9	1/5	4.1	1/2	12	15	197	253
FPG22N9018C*	208/230-1-60	7.2	38	1.9	1/5	2.8	1/3	14	20	197	253
FPG33N9018C*	208/230-1-60	7.2	38	1.9	1/5	2.8	1/3	14	20	197	253
FPG44N9018C*	208/230-1-60	7.2	38	1.9	1/5	4.1	1/2	14	20	197	253
FPG55N9018C*	208/230-1-60	7.2	38	1.9	1/5	4.1	1/2	14	20	197	253
FPG33N9024C*	208/230-1-60	10.7	55	2.8	1/3	2.8	1/3	19	30	197	253
FPG44N9024C*	208/230-1-60	10.7	55	2.8	1/3	4.1	1/2	19	30	197	253
FPG55N9024C*	208/230-1-60	10.7	55	2.8	1/3	4.1	1/2	19	30	197	253
FPG44N9030C*	208/230-1-60	13.5	87	2.8	1/3	4.1	1/2	25	35	197	253
FPG55N9030C*	208/230-1-60	13.5	87	2.8	1/3	4.1	1/2	25	35	197	253

Table 3 - Electrical Data

INSTALLATION

REQUIREMENTS

Follow manufacturer's installation instructions, as well as local and municipal building codes. In addition, the installation shall conform to the following Fire Protection Association (NFPA) Standards:

- NFPA No. 90A – Standard for Installation of Air Conditioning and Ventilation Systems
- NFPA No. 90B – Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems.

This unit is approved for installation clearance to combustible material as stated on the unit rating plate. However, stated minimum clearances to combustibles may be inadequate for future accessibility and service needs which must be considered when planning of the installation.

INSTALLATION PRECAUTIONS

CAUTION

Always wear all appropriate Personal Protection Equipment (PPE) when installing and servicing these units.

WARNING

Use multiple people when moving and installing these units. Failure to do so could result in injury or death.

CAUTION

Contact with metal edges and corners can result injury. Protective gloves should be worn when handling. Exercise caution when installing and servicing unit.

Observe the following precautions for typical installation:

- Always use proper tools and equipment
- No wiring or any work should be attempted without first ensuring the unit is completely disconnected from the power source and locked out. Also, verify that a proper permanent and uninterrupted, ground connection exists prior to energizing power to the unit.
- Review unit nameplate and wiring diagram for proper voltage and control configurations. This information may vary from unit to unit.

INSTALLATION CONTINUED

INSTALLATION PRECAUTIONS CONTINUED

CAUTION

When the unit is in operation components are rotating at high speeds and caution should be taken.

WARNING

When soldering and brazing, it is recommended to have a fire extinguisher readily available. When soldering and brazing close to valves or sensitive components, heat shields or wet rags are required to prevent damage to the valves or components.

NOTE

Insulation is installed in the unit to provide a barrier between varying atmospheres outside and within the unit. If insulation is damaged condensation can occur and can lead to corrosion, component failure, and possible property damage. Damaged insulation must be repaired prior to the operation of the unit. Insulation will lose its effectiveness and value when wet, torn, separated, and/or damaged.

CAUTION

When servicing this equipment, because of high pressures, make sure the reversing valve, expansion device, filter drier and other components are specifically designed for R-410A refrigerant.

ONLY USE service equipment specifically designated for use with R-410A.

WARNING

R-410A can become combustible if mixed with air at elevated temperature and/or pressure. Failure to follow this warning could result in property damage and personal injury or death.

UNIT LOCATION

This furnace is certified for through-the-wall, indoor, up-flow vertical position installation only. This appliance is not design certified for installation in mobile homes, recreational vehicles, or outdoors. A First Co. approved wall sleeve must be used to install the FPG unit.

This is a direct vent appliance which uses outside air for combustion and discharges the products of combustion to the outdoors. Do not install this unit in close proximity to hot exhaust from clothes dryer vents, kitchen vents, corrosive fumes or steam vents.

Do not install directly on carpeting, tile, or other combustible material other than wood flooring. Proper distances must be maintained between the appliance vent pipe and operable windows, building openings, public walkways, electric meters, gas meters, gas regulators and gas relief equipment. Flue products must not be permitted to damage building surfaces.

The Installation must conform to local building codes or, in the absence of local codes, to the *National Fuel Gas Code,* ANSI Z223.1/NFPA 54, and/or the *Natural Gas and Propane Installation Code,* CSA B149.1

If installed in a garage, this unit must be installed so the burner(s) and the ignition source are located not less than 18" [45.72 cm] above the floor. The FPG unit must be located so that it is protected from physical damage by vehicles.

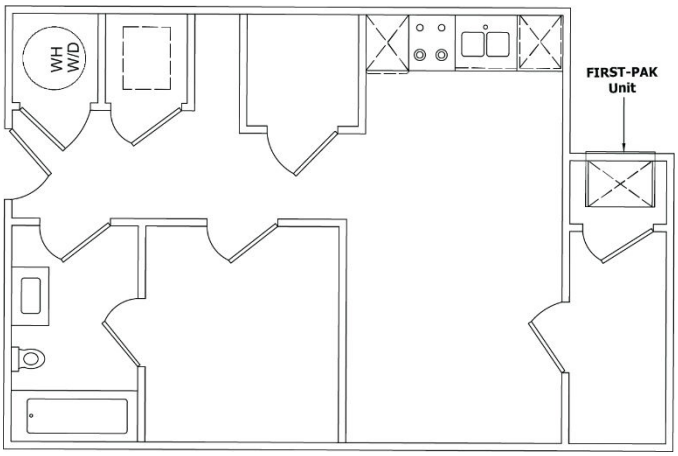


FIGURE 6 – Typical Floorplan with FIRST-PAK on Exterior Wall

INSTALLATION CONTINUED

UNIT CLEARANCE REQUIREMENTS

The unit may be installed with zero clearances to adjacent combustible surfaces. This furnace shall not be installed directly on carpeting, tile, or other combustible material, other than wood flooring.

Service clearance must be provided for future maintenance and service. A minimum of 32” [81.28 cm] open area must be left unobstructed in front of the access panels.

The grille must be kept free from any obstructions to air flow. The unit must be installed at least 4 feet [1.2192 m] from electric meters, gas meters, regulators, and relief equipment. Products of combustion are discharged outside from the vent outlet located at the front grille; therefore, all distances from adjacent public walkways, adjacent buildings, openable windows, and building openings must be compliant with those called for in the National Fuel Gas Code ANSI Z223.1 and/or CAN/CGA-B149 installation codes, as well as local codes.

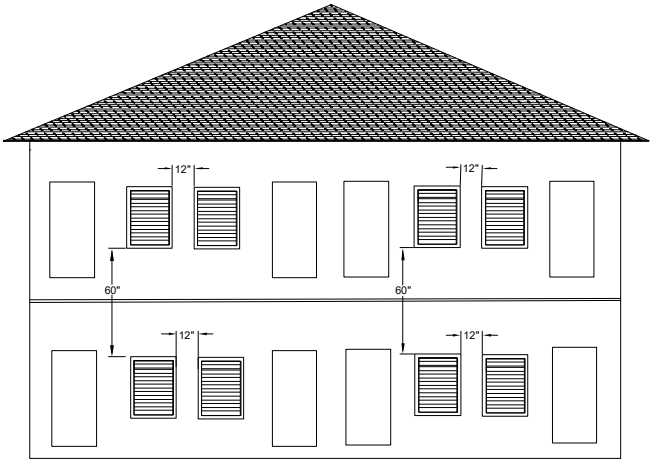


FIGURE 7 – Required Exterior Building Clearance

CLEARANCE REQUIREMENTS		
MINIMUM CLEARANCE	IN	CM
Horizontal distance between units	12	30
Vertical distance between units	60	152
Distance above ground level	6	15
Distance above finished floor	6	15
Distance above a garage floor	18	46
Distance to Corner	2	5

Table 4 - Clearance Requirements/Dimensions

A furnace installed in a garage must also be protected from damage by vehicles.

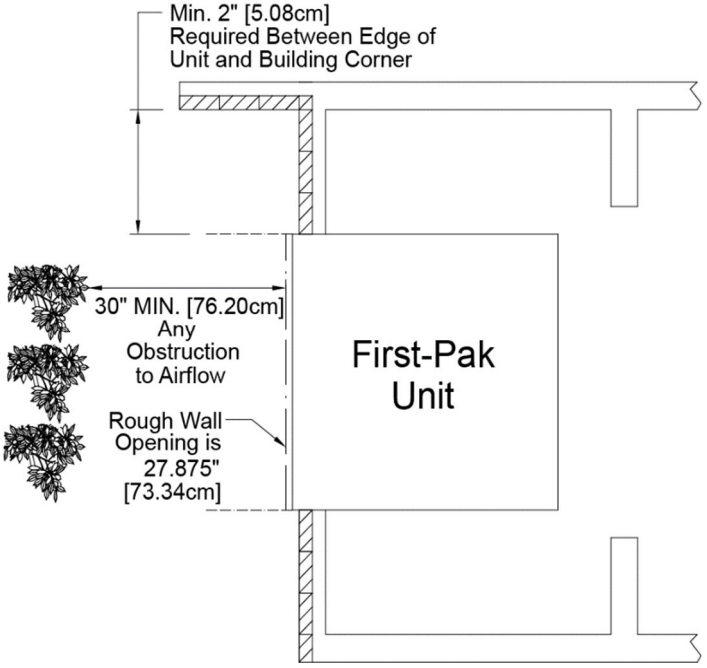


FIGURE 8 – Clearance Requirements

WARNING

CARBON MONOXIDE POISONING HAZARD

Failure to follow instructions could result in severe personal injury or death due to carbon-monoxide poisoning, if combustion products infiltrate into the building.

Check that all openings in the outside wall around the vent (and air intake) pipe(s) are sealed to prevent infiltration of combustion products into the building.

Check that furnace vent (and air intake) terminal(s) are not obstructed in any way during all seasons.

CAUTION

A masonry wall opening must be properly constructed with a lintel for wall support. Wall openings must be flashed and sealed. The unit must be level, front to back, side to side.

Refer to **VENTING** section and **CLEARANCE REQUIREMENTS** section in this manual for more information.

INSTALLATION CONTINUED

VENT CLEARANCES

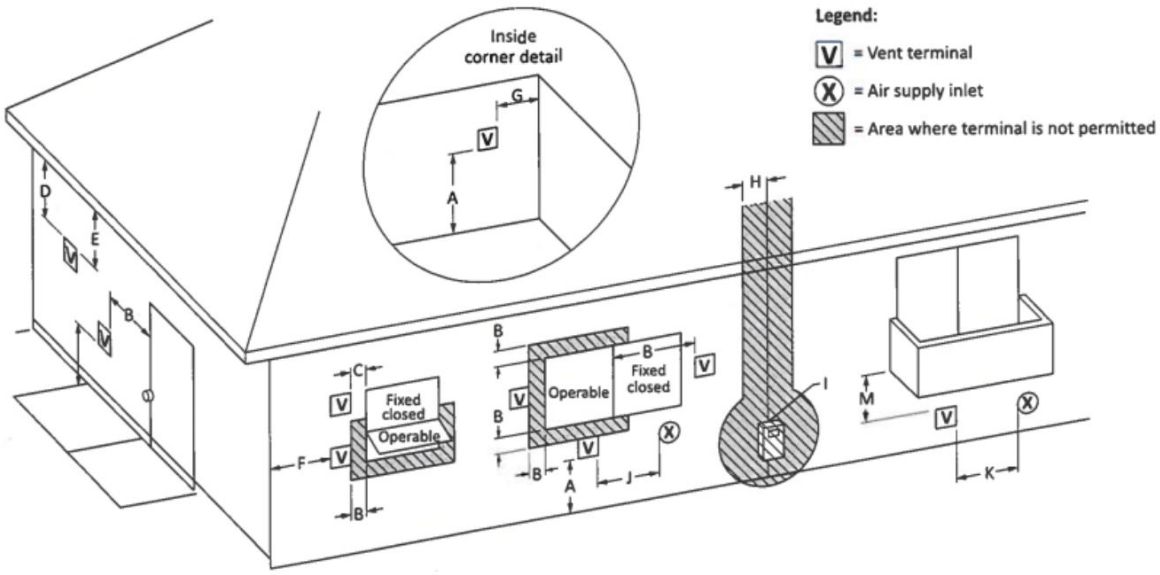


FIGURE 9 - Location of Vent Termination Clearances

VENT TERMINATION CLEARANCES			
	CLEARANCE	CANADIAN INSTALLATIONS[1]	US INSTALLATIONS[2]
A =	Clearance above grade, veranda, porch, deck, or balcony (see 1.23.5-i(9)b.)	12 in (30 cm)	12 in (30 cm)
B =	Clearance to window or door that may be opened	6 in (15 cm) for appliances 10,000 Btuh (3 kW) 12 in (30cm) for appliances >10,000 Btuh(3 kW) & 100,000 Btuh (30 kW) 36 in (91 cm) for appliances >100,000 Btuh (30kW)	4 ft. (1.2 m) below or to the side of opening 1 foot (300 m) above opening
C =	Clearance to permanently closed window	*	*
D =	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 ft. (61 cm) from the center line of the terminal	*	*
E =	Clearance to unventilated soffit	*	*
F =	Clearance to outside corner	*	*
G =	Clearance to inside corner	*	*
H =	Clearance to each side of center line	3 ft. (91 cm) within a height 15 ft. (4.5 m) above the meter/regulator assembly	*
I =	Clearance to service regulator vent outlet	3 ft. (91 cm)	*
J =	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 in (15 cm) for appliances 10,000 Btuh (3 kW) 12 in (30cm) for appliances >10,000 Btuh (3 kW) & 100,000 Btuh (30 kW) 36 in (91 cm) for appliances >100,000 Btuh (30kW)	4 ft. (1.2 m) below or to the side of opening 1 ft. (300 m) above opening
K =	Clearance to a mechanical air supply inlet	6 ft. (1.83 m)	3 ft. (91 cm) above if within 10 ft. (3 m) horizontally
L =	Clearance above paved sidewalk or paved driveway located on public property	7 ft. (2.13 m) †	7 ft. (2.13 m)
M =	Clearance under veranda, porch, deck, or balcony	12 in (30 cm) ‡	*

NOTES:

1) *In accordance with the current* CSA B149.1, Natural Gas and Propane Installation Code.
2) *In accordance with the current* ANSI Z223.1/NFPA 54, National Fuel Gas Code.

**Clearance in accordance with local installation codes and the requirements of the gas supplier and the manufacturer's installation instructions.*

† *A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single-family dwellings and serves both dwellings.*

‡ *Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.*

Table 5– Vent Termination Clearances Dimensions

INSTALLATION CONTINUED

REMOVAL OF A UNIT FROM A COMMON VENTING SYSTEM

When an existing furnace is removed from a common venting system serving other appliances, the venting system is likely to be too large to properly vent the remaining attached appliances. The following test shall be conducted with each appliance while the other appliances connected to the common venting system are not in operation. An improperly sized venting system may cause condensation or flue gas spillage to occur.

1. Seal any unused openings in the common venting system.
2. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion, or other deficiencies which could cause an unsafe condition.
3. Insofar as is practical, close all building doors and windows between the space in which the appliances remaining connected to the common venting system are located and other spaces in the building. Turn on clothes dryers and any appliance not connected to the common venting system. Turn on 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.
4. Following the lighting instructions, place the unit being inspected into operation. Adjust the thermostat so the appliance will operate continuously.
5. Test for spillage at the draft control relief opening after 5 minutes of main burner operation. Use the flame of a match or candle.
6. Follow the preceding steps for each appliance connected to the common venting system.
7. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers, and any other fuel burning appliance to their previous condition of use.

If improper venting is observed during any of the above tests, the common venting system must be corrected. See National Fuel Gas Code, ANSI Z223.1 (latest edition) to correct improper operation of common venting system.

WARNING

ELECTRIC SHOCK HAZARD

Disconnect all power supplies before servicing. Lock out/tag out to prevent accidental electrical shock.

NOTE

There may be multiple power sources supplying the unit.

INSTALLATION CONTINUED

WALL SLEEVE INSTALLATION

Refer to installation instruction packed with the wall sleeve to assemble and mount into the wall. Before unit installation, make sure sleeve components are not damaged; drain line is not obstructed and is leak free.

Check all seals to ensure that they are in position and un-damaged. Ensure that the wall sleeve is level, front to back and side to side (FIGURE 10 - Wall Sleeve Mounting). Securely fasten the Architectural grille to the front of the sleeve using the supplied hardware.

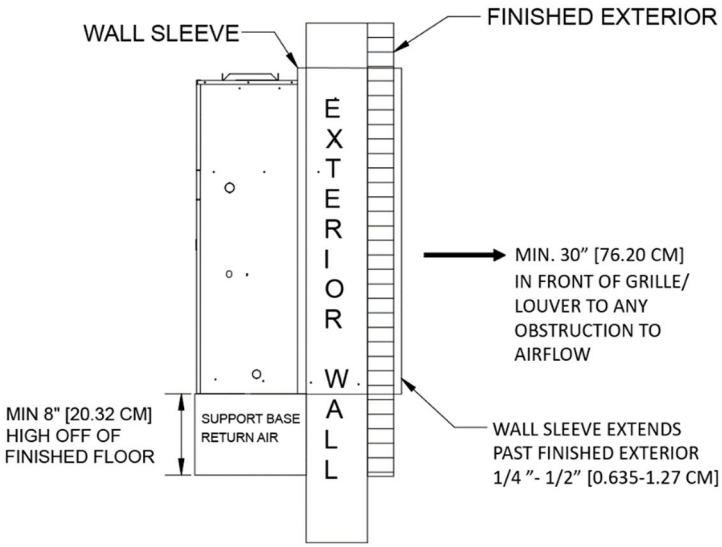


FIGURE 10 - Wall Sleeve Mounting

IMPORTANT

After sleeve installation, ensure that the gap in-between the wall and seal is insulated and is in contact with the sleeve sides.

IMPORTANT

Make sure a high grade non-hardening sealant approved for exterior use has been applied between edge of the sleeve and the structure, on the inside and outside walls, to prevent air and water from migrating inside (FIGURE 10 - Wall Sleeve Mounting).

REAR INSTALLATION & DIMENSIONS

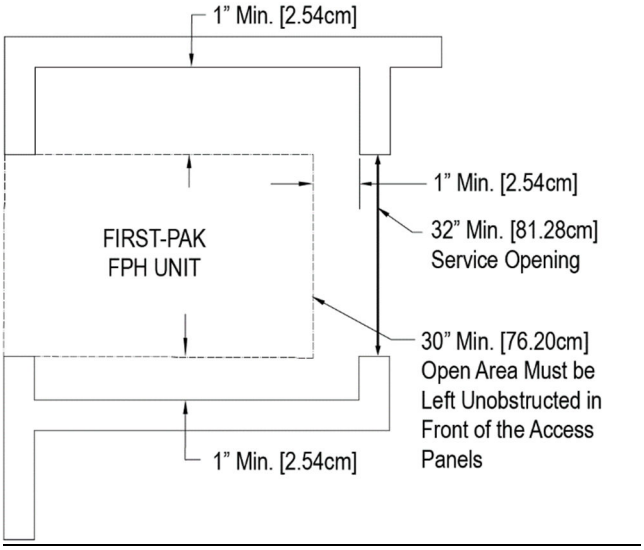


FIGURE 11 - Rear Installation Dimensions

The FPG unit may be installed in an enclosure provided the following minimum clearances to combustibles are maintained; 1" clearance on the sides, 2" [5.08 cm] clearance from the top, and 1" [2.54 cm] from the front and the plenum. Adequate clearance should be provided to install gas line and manual shutoff valve while also providing access for installing field wiring. Do not install directly on any combustible material (such as carpet, tile, etc.) other than wood flooring.

INSTALLATION CONTINUED

UNIT SUPPORT

The FIRST-PAK wall sleeve is not intended or designed to provide complete support for the FIRST-PAK unit. Additional support is required. A field constructed platform may be used for this purpose and may also be constructed to provide a means of attaching the return air duct.

PLYWOOD INSTALLATION

Support base construction should be built as below in **FIGURE 12 - Unit Support & Alignment.** It must be fabricated with plywood, framing lumber and/or any pre-approved sheet metal construction material. **FIGURE 12 - Unit Support & Alignment** is showing alignment of the platform top with the base panel of the wall sleeve.

- Minimum height of platform = 8” [20.32 cm]
- Recommended platform width = 29” [73.66 cm]
- Recommended platform depth = 16” [40.64 cm]
  Refer to **FIGURE 12 - Unit Support & Alignment**.

Things to consider prior to build the support structure:

1. Accurately measure the unit and choose a strong building material for the support structure.
2. If additional vibration isolation material is required, non-combustible material **MUST** be used.
3. Ensure that the platform connection to FIRST-PAK Return Air Opening can fit an 8” x 24” [20.32 cm x 60.96 cm] duct. The FIRST-PAK unit must be aligned with return air opening on the unit base.
4. Ensure the support structure and the Wall Sleeve provide a secure, fixed, and leveled position.

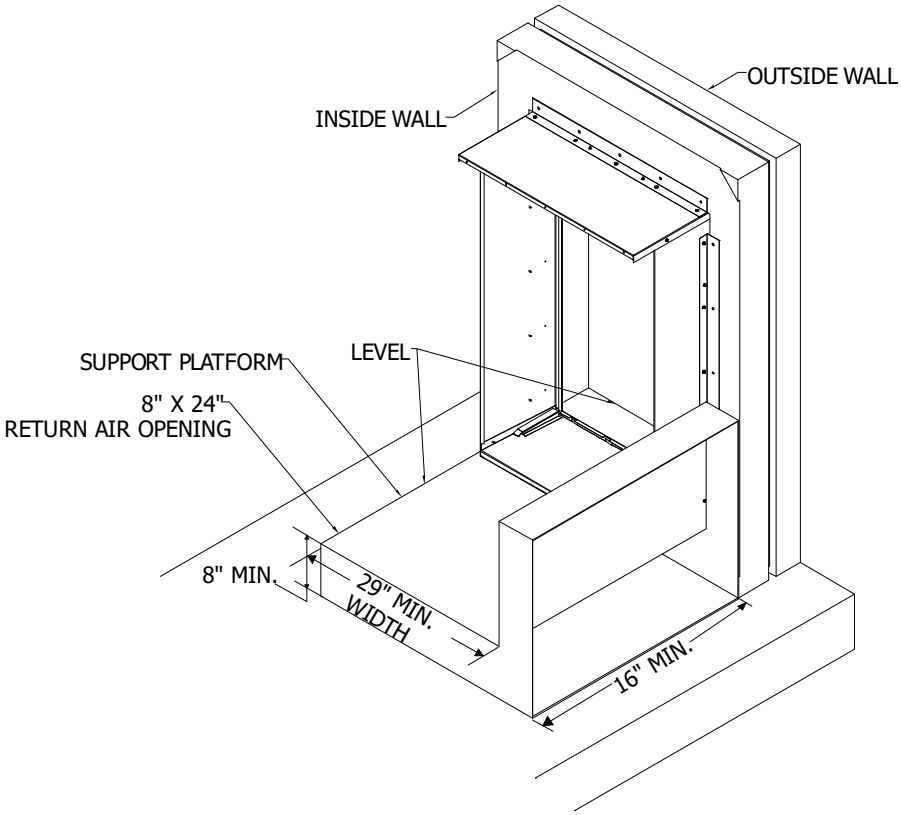


FIGURE 12 - Unit Support & Alignment

CAUTION

The sleeve is not intended as the sole support for the unit. An additional support must be provided near the return opening on the unit for adequate support. The use of vibration isolation material between the unit and the support is recommended.

INSTALLATION CONTINUED

PACKAGED UNIT INSTALLATION

NOTE

Locate the unit in an area that meets minimum clearance requirements for all service access panels Consider all additional clearances needed for water connections, electrical connections, duct connections and sufficient return airflow.

IMPORTANT

These units are for indoor installation ONLY!

NOTE

DO NOT locate unit in areas subject to freezing temperatures or where high humidity levels could cause cabinet condensation.

Insulation is used in indoor equipment to provide a barrier between outside air conditions surrounding the unit and the varying conditions inside the unit. If the insulating barrier is damaged, the surrounding ambient air will affect the inside surface temperature of the cabinet; this may lead to sheet metal corrosion and subsequently, component failure.

IMPORTANT

Damaged insulation must be repaired or replaced before the unit is placed back into operation. Insulation loses its insulating properties when wet, damaged, separated or torn.

The installer must adhere strictly to all local and national code requirements pertaining to the installation of this equipment including the cabinet, discharge plenum and connecting ducts. All units are designed for indoor use only, and are agency listed for installation with clearances specified in on the furnace rating plate.

INSTALLATION CONTINUED

PACKAGED UNIT INSTALLATION

NOTE

Check nameplate voltage, amperage and fuse size for proper power supply.

1. Remove the four shipping brackets holding the unit to the shipping pallet and remove unit from the shipping pallet.

NOTE

The top mounting bracket must be attached to the FIRST-PAK unit.

2. Attach the bracket to the FIRST-PAK unit and the wall sleeve using the screws supplied with the wall sleeve. Refer to **FIGURE 13 –** below.

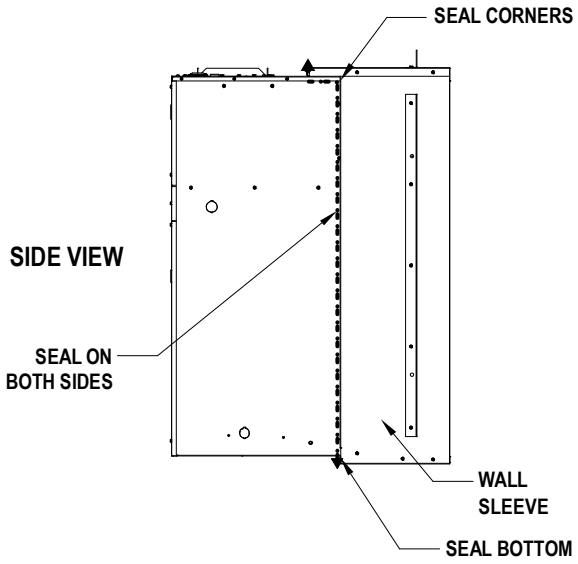


FIGURE 13 – Wall Sleeve Seal

3. Ensure that properly sized ductwork is in place to mate to the connections on the FIRST-PAK.
4. Remove front access panel and verify all electrical connections are secure and check the condenser fan to see it turns freely.

NOTE

For shipping purposes, the supply flanges are shipped flat. The supply duct flanges must be bent up at a 90° angle.

5. If an air filter is to be applied to the unit remove lower front access panel to replace filter. (**FIGURE 18 –Air Filter Location**). Place the filter into the filter bracket.
6. Ensure that the wall sleeve is installed squarely and is secured before installing the unit.
7. Inspect the sleeve seal, which is supplied with the sleeve, to ensure that it is properly secured and aligned (see **FIGURE 13 – Wall Sleeve Seal**).
8. Slide the FIRST-PAK unit toward the sleeve seal until the sleeve and cabinet brackets are nested and almost making contact.
9. Center the FIRST-PAK unit in the sleeve.
10. Use screw fasteners to attach the cabinet bracket to wall sleeve.

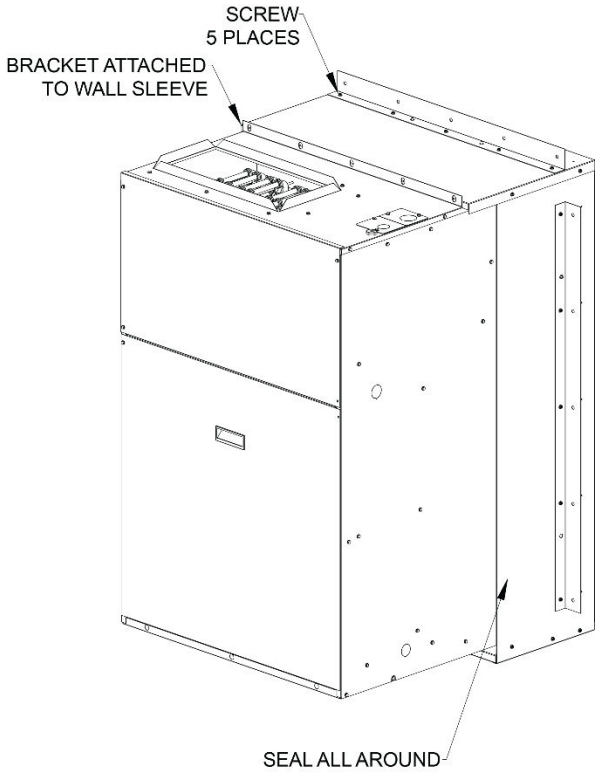


FIGURE 14 – Top Bracket Installation on Sleeve

11. Use a high-grade non-hardening sealant to close any gaps that may exist between the seal and the wall of the sleeve.
12. Check that the unit is completely sealed on all four sides against the wall sleeve seals.

CAUTION

If unit is not sealed properly, water and/or outside air will infiltrate into the closet, and can cause improper unit operation and may cause damage to the unit and/or property.

INSTALLATION CONTINUED

DUCTWORK AND DUCT CONNECTIONS

IMPORTANT

Both supply and return air ducts must be attached to the unit.

IMPORTANT

The supply duct connection must be sized to a minimum of the same size as the unit discharge air opening.

IMPORTANT

All ductwork must be installed in accordance with National Fire Protection Assoc. Codes 90A and 90B.

DISCHARGE DUCTING

Discharge ductwork should be sized and constructed in accordance with industry best practices and standards.

Discharge (supply) air ductwork must be adequately sized to provide airflow within the specified total external static pressure (0.5" W.C.). Ductwork should be adequately insulated to prevent condensation and loss of efficiency. Flexible duct connections may be used.

RETURN AIR DUCTING

Return air ductwork must be adequately sized to provide airflow within the specified total external static pressure (0.5" W.C.). Ductwork should be adequately insulated to prevent loss of efficiency. Flexible duct connections may be used. When this furnace is installed so that the supply air duct supplies air to areas outside the space containing the furnace, the return air ducts must be sealed to the furnace casing and terminate outside the space containing the furnace.

WARNING

Never allow the products of combustion from the flue pipe to enter the supply or return ducts.

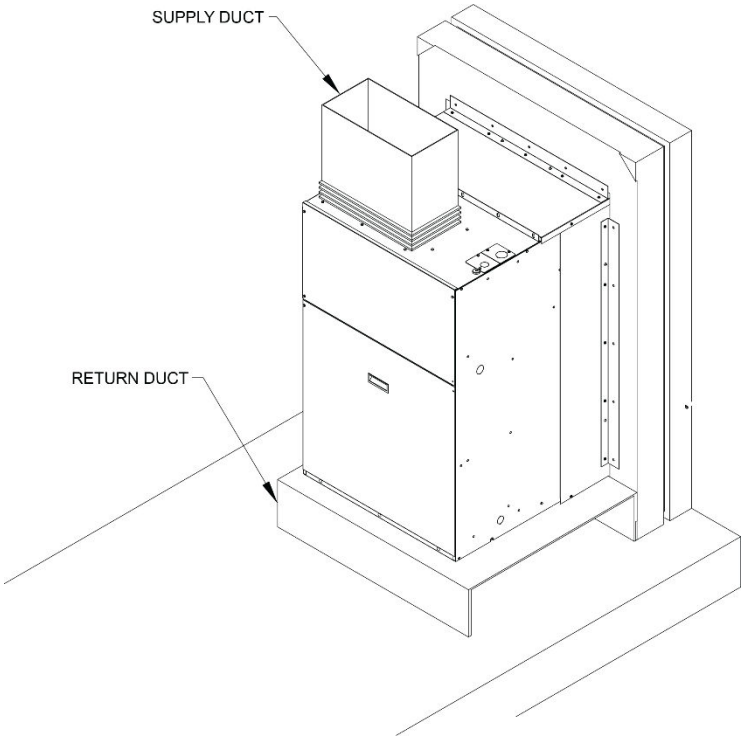


FIGURE 15 – Unit Ducting

CONDENSATE DRAINAGE

Condensate drain lines must be properly installed with adequate slope away from unit to ensure proper drainage. A minimum trap of 1.5 inches [3.81cm] must be installed to isolate the negative pressures of the drain pan from the drain line. Refer to for schematic information on the condensate drain lines.

CAUTION

On units with plastic drain pans, the drain connection must be made hand tight only.

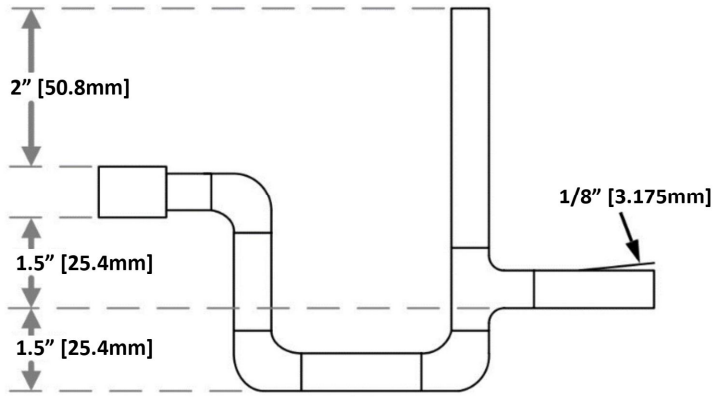


FIGURE 16 - Condensate Drain Layout

INSTALLATION CONTINUED

GAS HEAT CONDENSATE DRAINAGE

In addition to air conditioning condensation, the FPG**N9 unit will produce condensation during the combustion process. The installer must make a field connection to dispose of this condensate. Condensation produced by combustion must not be routed to the unit air conditioning drain pan. Condensation produced by combustion must be disposed of in a manner compliant with all local and National Codes. A 1/2" NPT Female fitting is on the lower right side of the cabinet to make this connection. The gas heat condensate drain is internally trapped, do not double trap. The field connection should be free draining into a condensate pump or other acceptable method of disposal. A take apart fitting is preferable for this connection to simplify future service.

VENTING PRODUCTS OF COMBUSTION

The venting system exhausts the products of combustion to the outdoors. The venting system is an integral part of the furnace and must not be altered. Follow all local & national codes when selecting an installation location. Observe all clearance requirements pertaining to vent termination. Perform regularly scheduled maintenance checks to assure venting of flue products to the outdoors is unobstructed.

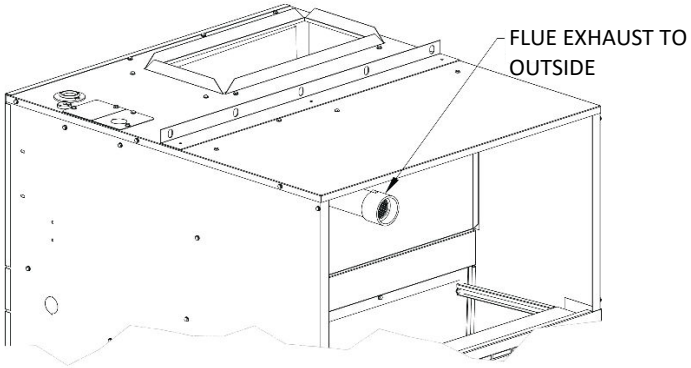


FIGURE 17 - Venting / Flue Location

NOTE

These units are direct vent appliances.

OUTDOOR AIR SEAL

Before operation ensure that the OD air-seal is intact and there are no gaps between in the indoor and outdoor side. If there are gaps, seal as required for optimal performance.

AIR FILTER

The FIRST-PAK unit must not be operated without an air filter in place. The unit is equipped with a factory installed 1" filter rack and a disposable filter. A permanent washable filter may also be used provided it has the same or greater surface area as the original filter. As an alternative to the factory provided filter location, a filter rack may be field installed elsewhere in the return duct system. Do not use filters which are highly restrictive to air flow.

NOTE

The total external static pressure, including ducts, grilles, registers, and filters must not exceed 0.5" W.C.

AIR FILTER MINIMUM DIMENSIONS	
Model Series	Minimum Area
FPG**N9	576 sq. inches [0.3716 sq. meter]

Table 6 - Air Filter Minimum Dimensions

CAUTION

DO NOT operate this equipment without an air filter.

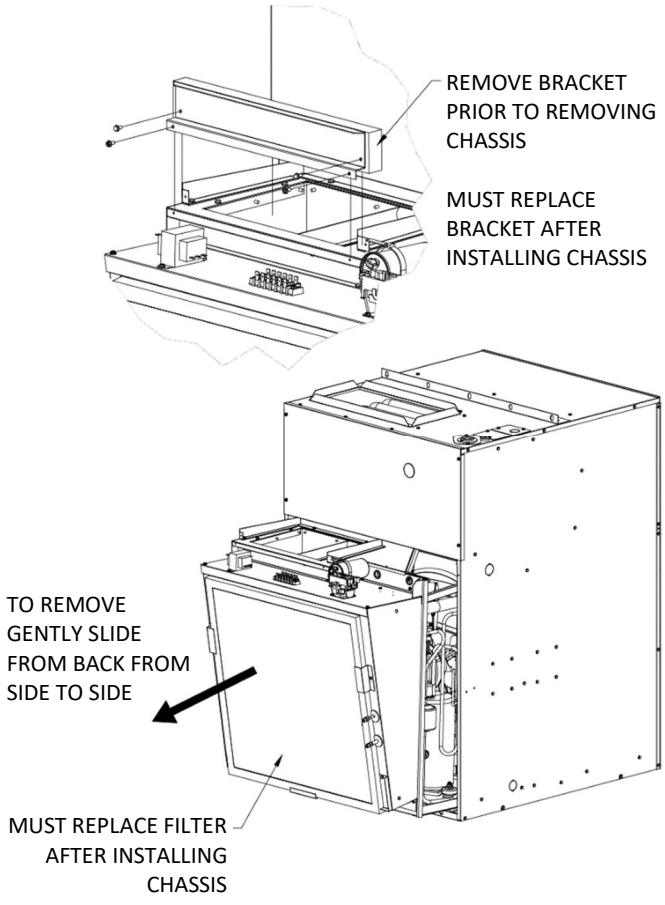


FIGURE 18 –Air Filter Location

INSTALLATION CONTINUED

COMBUSTION AIR

This is a direct vent furnace, which receives its combustion air from outside and discharges the products of combustion outside. Do not restrict air openings on the FPG unit or any other appliances. Do not store any insulating material in the vicinity of the FPG unit or any other appliances.

WARNING

DO NOT block any louvered sections of the furnace, inside or outside. Inadequate combustion air will cause improper combustion and lead to the production of carbon monoxide.

WARNING

The area surrounding the furnace must be kept free of all combustible materials, gasoline, insulating materials and other flammable materials.

Inspect the furnace area after the furnace is installed and after anytime insulation has been added to the structure.

CAUTION

Avoid contamination of the furnace area and the combustion air supply, exposure to the following substances may cause premature heat exchanger failure:

- Permanent wave solutions
- Chlorinated waxes and cleaners
- Chlorine based swimming pool chemicals
- Water softening chemicals
- Deicing salts or chemicals
- Carbon tetrachloride
- Halogen type refrigerants
- Cleaning solvents
- Printing inks
- Paint removers
- Varnishes, etc.
- Hydrochloric acid
- Antistatic fabric softeners for clothes dryers
- Masonry acid washing materials

GAS PIPING & CONNECTION

All gas piping and connections to this furnace must be performed by a qualified installer. Installation methods and materials must comply with local building codes or, in the absence of local codes, to the *National Fuel Gas Code,* ANSI Z223.1/NFPA 54, and/or the *Natural Gas and Propane Installation Code,* CSA B149.1.

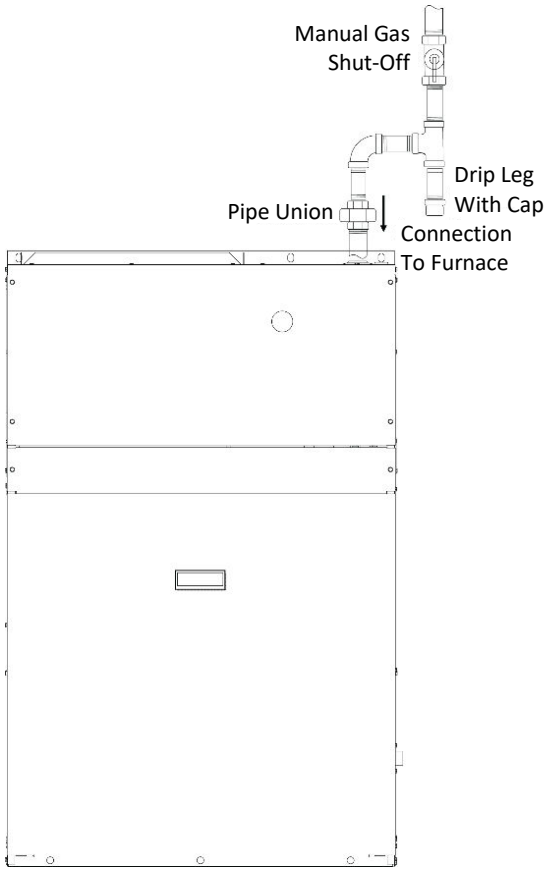


FIGURE 19 - Gas Supply Piping

Use 1/2" N.P.T. gas piping to make field installed connections to the furnace gas valve. A manual gas shut-off valve must be provided and installed external to the furnace casing. A ground joint union and a drip leg must also be provided. A field provided gas supply pressure 1/8" N.P.T. test port must be installed. Use a high quality approved pipe thread compound on all pipe thread joints. A flexible gas connector may be used to connect the furnace, if permitted by local codes. If a flexible connector is used, it must be a listed connector in new condition. Do not use a connector that has been previously used to service another appliance. A flexible connector must not pass through the furnace cabinet; Black steel gas piping must be used between the gas valve and a location outside the furnace cabinet to connect the flexible gas connector.

INSTALLATION CONTINUED

GAS PIPING & CONNECTION CONTINUED

WARNING

In the State of Massachusetts:

This product must be installed by a licensed Plumber or Gas Fitter. When flexible connectors are used, the maximum length shall not exceed 36" [91.44 cm]. When lever type gas shutoffs are used, they shall be T-handle type.

Gas piping must connect to the furnace through the top of the cabinet. Gas piping must be adequately supported external to the furnace cabinet. The furnace gas valve, manifold, and burner assembly are not designed or intended to support the weight of the gas line external to the furnace cabinet. The gas piping connecting the furnace must be properly aligned with the gas valve to prevent binding and distortion of the gas manifold and burner assembly.

The furnace and its external gas shutoff valve must be disconnected from the piping system before any gas line pressure test exceeding 1/2 PSI (14" [35.56 cm] W.C.) is performed.

Do not expose the gas valve to any pressure higher than 14" [35.56 cm] W.C. or gas valve failure may occur.

The gas valve is equipped with 1/8" N.P.T. pressure test ports for measuring gas supply pressure and gas manifold pressure. Refer to

FIGURE 28 – Gas Valve regarding locations of pressure test ports. Refer to **Table 11 - Gas Pressure Table** for proper gas supply and manifold pressures.

LEAK TESTING

Gas piping must be thoroughly checked and proven to be leak free before placing the furnace in operation. Follow all local code requirements in place or *National Fuel Gas Code,* ANSI Z223.1/NFPA 54 requirements for leak checking.

Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks.

Use proper procedures for leak testing the furnace prior to placing it into service. The furnace and its equipment shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at pressures in excess of 1/2 psi (3.5 kPa).

WARNING

FIRE OR EXPLOSION HAZARD

Failure to follow the safety warnings exactly could result in serious injury, death or property damage.

Never test for leaks with an open flame.

Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

ELECTRICAL

HIGH VOLTAGE

WARNING

ELECTRIC SHOCK HAZARD

Disconnect all power supplies before servicing. Lock out/tag out to prevent accidental electrical shock.

NOTE

There may be multiple power sources supplying the unit.

WARNING

Use copper conductors only. Install all parts and panels before operation of unit. Failure to follow these warnings can result in injury or death.

All wiring must comply with local and national code requirements. Refer to figures 35-38 wiring diagrams and nameplate data for necessary field wiring information.

These units are provided with a class 2 transformer for 24VAC control circuits. Should any add on accessory or component also have a class 2 transformer furnished, care must be taken to prevent interconnecting outputs of the two transformers by using a thermostat with isolating contacts.

WARNING

Connect ground wire to ground terminal marked "GND". Failure to do so can result in injury or death.

CAUTION

Any device that has been furnished by the factory for field installation must be wired in strict accordance with the associated wiring diagram. Failure to do so could damage components and void warranties.

208-230 VOLT OPERATION

All units are factory wired for 230 volt operation. For 208 volt operation, move the line voltage tap on the 24 volt control transformer. Refer to figures 36-39 note 5.

LOW VOLTAGE

THERMOSTAT

A standard 24 VAC single stage heating and cooling thermostat is required to control this unit. For FPG**N9030C units, a dual stage thermostat must be used in order to reach rated system performance. A thermostat with a "C" common terminal is preferred. Thermostat connections and their functions are below in FIGURE 21 - Thermostat Connections as follows:

THERMOSTAT CONNECTIONS KEY		
Abbr.	Color	Function
Y –	Yellow	Compressor Contactor
C –	Brown	Transformer 24VAC Common
W –	White	Call for Heating
G –	Green	Evaporator Blower
R –	Red	Transformer 24VAC Hot

Table 7 - Thermostat Connections Key

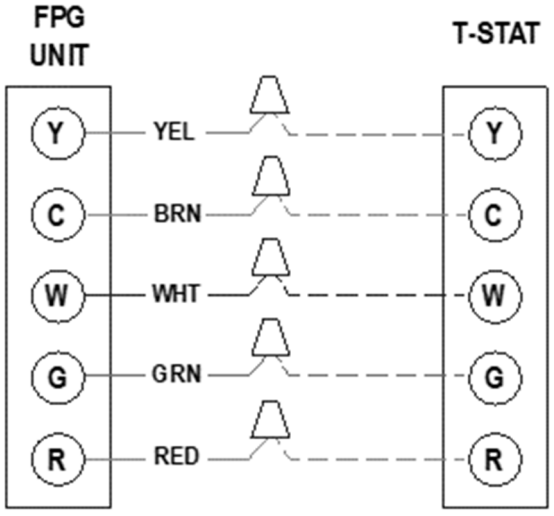


FIGURE 21 - Thermostat Connections

THERMOSTAT INSTALLATION

The Thermostat should be located on an interior wall in a larger room, away from supply duct draft. Position the thermostat back plate level against the wall and the thermostat wires protrude through the middle of the back plate mounting holes and drill holes with a 3/16" [5 mm] bit. Install supplied anchors and secure plate to the wall. Thermostat wire must be 18 AWG wire.

CONTROLS

CONTROL BOARD

SIGNAL	PROBLEM	POSSIBLE CAUSE	CHECKS & CORRECTIONS
SLOW FLASH	Stand-by mode, awaiting call from room thermostat	Status = Stand-by mode; does not indicate fault condition	Status of stand-by mode displayed no fault indicated
RAPID FLASH	Room thermostat is requesting heat	Status = Thermostat requesting heat; does not indicate fault condition	Status of call for heat displayed, no fault indicated
CONSTANT OFF	Internal fault or No power	Main power is off or control has failed	Check circuit breaker / circuit fuse, external power switch.
CONSTANT ON	No Operation	Defective Control Board	Replace Control
2 FLASHES	Control is locked out from failed ignition or loss of flame	No gas pressure, low gas pressure, dirty, non-conductive flame rod, disconnected flame rod conductor	Check system gas pressure, check manifold gas pressure, check flame rod condition & conductor
3 FLASHES	Unexpected pressure switch condition. NOTE: There are two normally open pressure switches wired in series. Switch #1 proves adequate draft through heat exchanger. Switch #2 proves adequate condensate drainage from the collector box.	Pressure switch contacts are closed when they should be open (draft inducer not running)	Check that the two Blue wires from the control board are not shorted together
		Pressure switch contacts are open when they should be closed (draft inducer running)	Check pressure switch #1 tubing - connected to draft inducer. Check pressure switch #2 tubing - connected to collector box. Check that a Blue wire from control board is connected to each pressure switch. Check that pressure switches are connected together by a wire. Check that condensate water is not flooding the collector box. Check that flue termination is not covered with snow or other blockage. Check that flue pipe is not blocked by insects or nests.
4 FLASHES	Limit switch or rollout switch is open	Gas pressure too high, delayed ignition, restrictive air filter, blower motor providing low / no air flow	Check supply and manifold gas pressure, check that all burners are in proper position, all burners are lighting, blower motor fan wheel dirty or motor not operating or on incorrect speed, air leaking from blower compartment into combustion section
5 FLASHES	Flame sensed while gas valve is off	Cracked flame rod insulator, gas valve stuck open	Check flame rod circuit for short to ground. Check wiring between gas valve wiring and control for proper circuitry, check that gas valve closes when 24 volts is removed
6 FLASHES	On-Board microprocessor conflict	Redundant safety feature of microprocessors detecting possible internal control issue	Reset power, replace control if fault is still present

Table 8 – Control Board L.E.D. Table

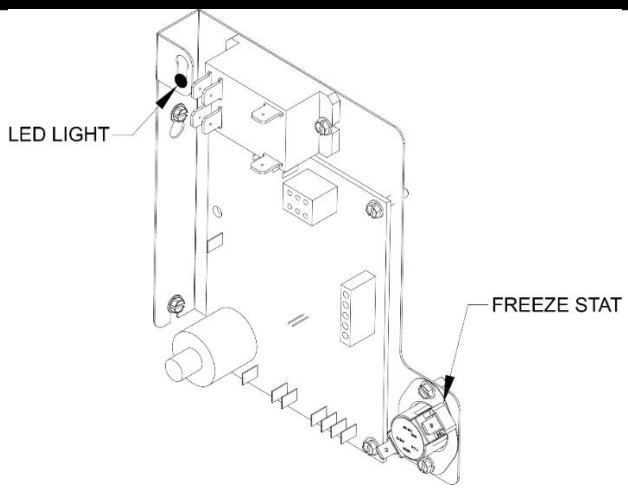


FIGURE 23 - Control Board

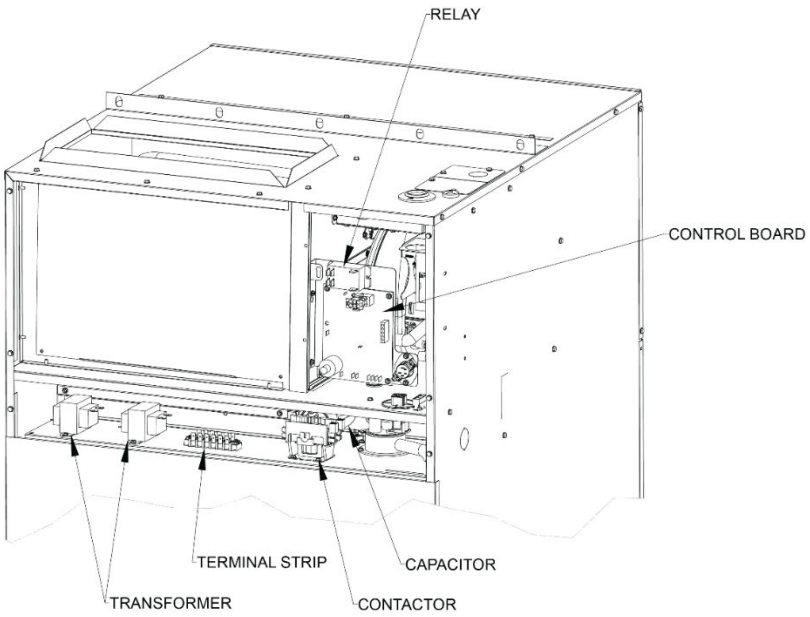


FIGURE 24 – Electrical Component

COOLING OPERATION

When the unit is given a "Y" input the unit will operate in steady state cooling mode. The compressor will immediately come on after a "Y" input. After a 5s time delay the indoor fan will be energized. The system will remain in steady state operation as long as the "Y" input is provided to the unit. The "Y" signal has priority over the both the "W" and "G" signals. If both "Y" and "W" are called, the call for cooling has priority. The heat cycle is interrupted as if the call for heat had terminated and the call for cooling proceeds as normal. When the "Y" input is removed the control will immediately de-energize the compressor contactor. The indoor blower de-energizes after a cooling off delay period of 90s.

CONTINUOUS FAN OPERATION

When the unit is given a "G" input, without an additional "Y" or "W" call, the unit will operate in continuous fan operation mode. The fan remains energized as long as the "G" input is provided to the unit without a "Y" or "W".

FREEZE PROTECTION

FIRST – PAK contains thermostatically controlled low wattage electric heaters that activate when necessary to guard against freezing condensate. Each FPG88N9 unit has two non-adjustable freeze protection thermostatic controls. One thermostatic control is mounted next to the control board and controls two heaters; one applied to the collector box and one applied to the drain tube. A second thermostatic control is mounted on top of the cooling chassis and controls a heater applied to the top of the drain trap. This control also energizes the indoor blower to circulate indoor air to provide drain trap freeze protection. All field installed condensate drain lines and connections are the responsibility of the installer. The installer must protect field installed drain components subjected to freezing temperatures by adding supplemental heat and / or insulation.

CONTROLS CONTINUED

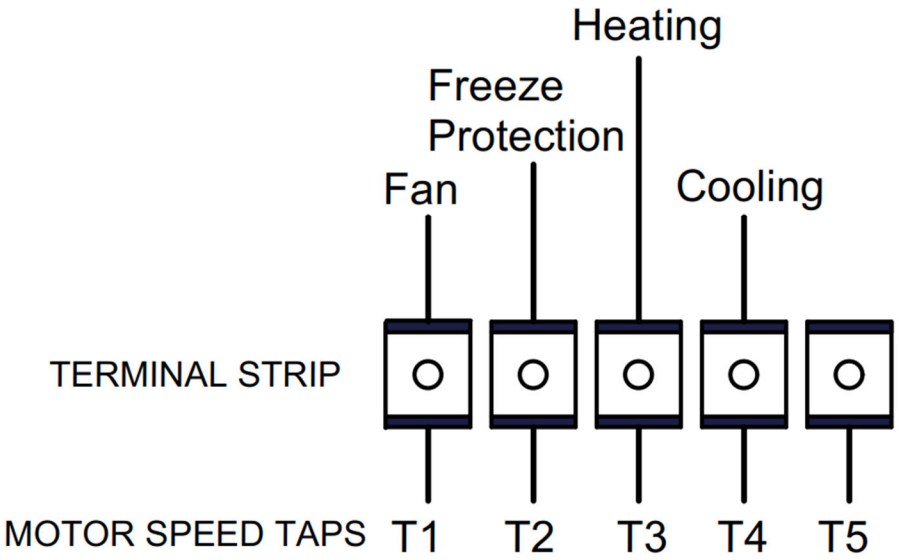
BLOWER CONTROL

FPG gas heat units are equipped with a direct drive indoor blower motor.

- All models have 5 fan speeds:
  - T1 is the constant fan speed.
  - T2 is used for freeze protection.
  - T3 may be used for heating mode providing the speed selection allows the unit to operate within specified temperature rise range.
  - T4 or T5 may be used for cooling mode.
    - See wiring diagram located on the unit.

- **FPG**N9030C* units use a dual stage compressor and have 2 cooling fan speeds. T4 for low speed and T5 for high speed**

Refer to **Table 9 - FPG AIRFLOW PERFORMANCE DATA** & **Table 10 - FPG AIRFLOW PERFORMANCE DATA CONTINUED** for information on the select speed changes for heat and cool mode.



Factory Position	
Fan	T1
*Fan (Freeze Protection)	T2
Heating	T3
Cooling	T4

*Position must not be shared with other terminal strip inputs

INDOOR BLOWER SPEED TAP CONNECTIONS

FIGURE 25 - Blower Control Tap

CAUTION

In heating mode, the unit must operate within its rated temperature rise range and static range. Refer to **Tables 9 & 10 FPG AIRFLOW PERFORMANCE DATA** below. Failure to operate within the designed temperature rise range will cause unreliable operation and damage to the heat exchanger may occur.

NOTE

High efficiency brushless DC motors are wired with power applied at all times, see illustration above.
Low voltage thermostat demand and board algorithms will control its use.

PERFORMANCE DATA

FPG AIRFLOW PERFORMANCE DATA													
MODEL	MOTOR SPEED	MID RISE °F	RISE RANGE °F	IWC STATIC PRESSURE									
				0.1		0.2		0.3		0.4		0.5	
				SCFM	TEMP RISE °F	SCFM	TEMP RISE °F	SCFM	TEMP RISE °F	SCFM	TEMP RISE °F	SCFM	TEMP RISE °F
FPG22N9012C*	T1	40.0	25-55	337	58	301		266		233		203	
	T2		25-55	337	58	301		266		233		203	
	T3 H		25-55	561	35	525	37	490	40	458	43	427	46
	T4C		25-55	531	37	494	40	460	43	427	46	396	49
	T5		25-55	606	32	569	34	534	37	502	39	471	42
FPG33N9012C*	T1	45.0	30-60	325		287		253		221		189	
	T2		30-60	325		287		253		221		189	
	T3 H		30-60	786	37	748	39	714	41	682	43	650	45
	T4C		30-60	530	55	492	59	458		426		393	
	T5		30-60	607	48	569	51	535	54	503	58	471	
FPG44N9012C*	T1	45.0	30-60	405		374		341		311		283	
	T2		30-60	405		374		341		311		283	
	T3 H		30-60	972	39	941	41	908	42	878	44	850	45
	T4C		30-60	527		495		463		432		404	
	T5		30-60	593		561		529		499		470	
FPG22N9018C*	T1	40.0	25-55	337	58	301		266		233		203	
	T2		25-55	337	58	301		266		233		203	
	T3 H		25-55	561	35	525	37	490	40	458	43	427	46
	T4C		25-55	708	28	671	29	637	31	604	32	573	34
	T5		25-55	1015	19	978	20	944	21	911	21	880	22
FPG33N89018C*	T1	45.0	30-60	325		287		253		221		189	
	T2		30-60	325		287		253		221		189	
	T3 H		30-60	786	37	748	39	714	41	682	43	650	45
	T4C		30-60	708	41	670	43	636	46	604	48	572	51
	T5		30-60	1008	29	971	30	937	31	904	32	872	33
FPG44N9018C*	T1	45.0	30-60	405		374		341		311		283	
	T2		30-60	405		374		341		311		283	
	T3 H		30-60	972	39	941	41	908	42	878	44	850	45
	T4C		30-60	700	55	668	57	636		605		577	
	T5		30-60	972	39	941	41	908	42	878	44	850	45
FPG55N9018C*	T1	50.0	35-65	403		373		342		312		283	
	T2		35-65	403		373		342		312		283	
	T3 H		35-65	1104	43	1074	44	1042	45	1012	47	984	48
	T4C		35-65	698		668		637		607		578	
	T5		35-65	965	49	935	51	904	52	874	54	845	56

NOTE:

- Airflow data shown is with a dry coil at 70°DB EAT with Standard 1" filter.
- For models with five speed taps, tap T1 is for ventilation. T2 is for freeze protection. T3 is for heating operation. T4-t5 is for cooling operation.
- Superscript C indicates factory-set default cooling tap. Superscript H indicates factory-set default heating tap.

Table 9 - FPG AIRFLOW PERFORMANCE DATA

PERFORMANCE DATA

FPG AIRFLOW PERFORMANCE DATA													
MODEL	MOTOR SPEED	MID RISE °F	RISE RANGE °F	IWC STATIC PRESSURE									
				0.1		0.2		0.3		0.4		0.5	
				SCFM	TEMP RISE °F	SCFM	TEMP RISE °F	SCFM	TEMP RISE °F	SCFM	TEMP RISE °F	SCFM	TEMP RISE °F
FPG33N9024C*	T1	45.0	35-65	392		339		305		273		241	
	T2		35-65	377		339		305		273		241	
	T3 H		35-65	722	40	684	42	650	45	618	47	586	50
	T4C		35-65	863	34	825	35	791	37	758	38	726	40
	T5		35-65	1008	29	971	30	937	31	904	32	872	33
FPG44N9024C*	T1	45.0	30-60	405		373		338		304		271	
	T2		30-60	405		373		338		304		271	
	T3 H		30-60	912	42	880	44	845	45	810	47	778	49
	T4C		30-60	863	44	831	46	796	48	761	50	728	53
	T5		30-60	1012	38	980	39	945	41	910	42	877	44
FPG55N9024C*	T1	50.0	30-60	404		375		342		310		279	
	T2		30-60	404		375		342		310		279	
	T3 H		30-60	1040	46	1011	47	978	48	946	50	915	52
	T4C		30-60	863	55	834	57	801	59	768	62	738	64
	T5		30-60	1013	47	985	48	952	50	919	52	889	53
FPG44N9030C*	T1	45.0	35-65	649	59	617	62	582		547		515	
	T2		35-65	649	59	617	62	582		547		515	
	T3 H		35-65	912	42	880	44	845	45	810	47	778	49
	T4C		35-65	797	48	765	50	730	52	695	55	663	58
	T5		35-65	991	39	959	40	924	41	889	43	857	45
FPG55N9030C*	T1	50.0	35-65	646		617		584		552		521	
	T2		35-65	646		617		584		552		521	
	T3 H		35-65	1040	46	1011	47	978	48	946	50	915	52
	T4C		35-65	788	60	759	62	727		694		663	
	T5		35-65	988	48	959	49	926	51	893	53	863	55

NOTE:

- Airflow data shown is with a dry coil at 70°DB EAT with Standard 1" filter
- For models with five speed taps, tap T1 is for ventilation. T2 is for freeze protection. T3 is for heating operation. T4-t5 is for cooling operation.
- Superscript C indicates factory-set default cooling tap. Superscript H indicates factory-set default heating tap.

Table 10 - FPG AIRFLOW PERFORMANCE DATA CONTINUED

HEATING OPERATIONS

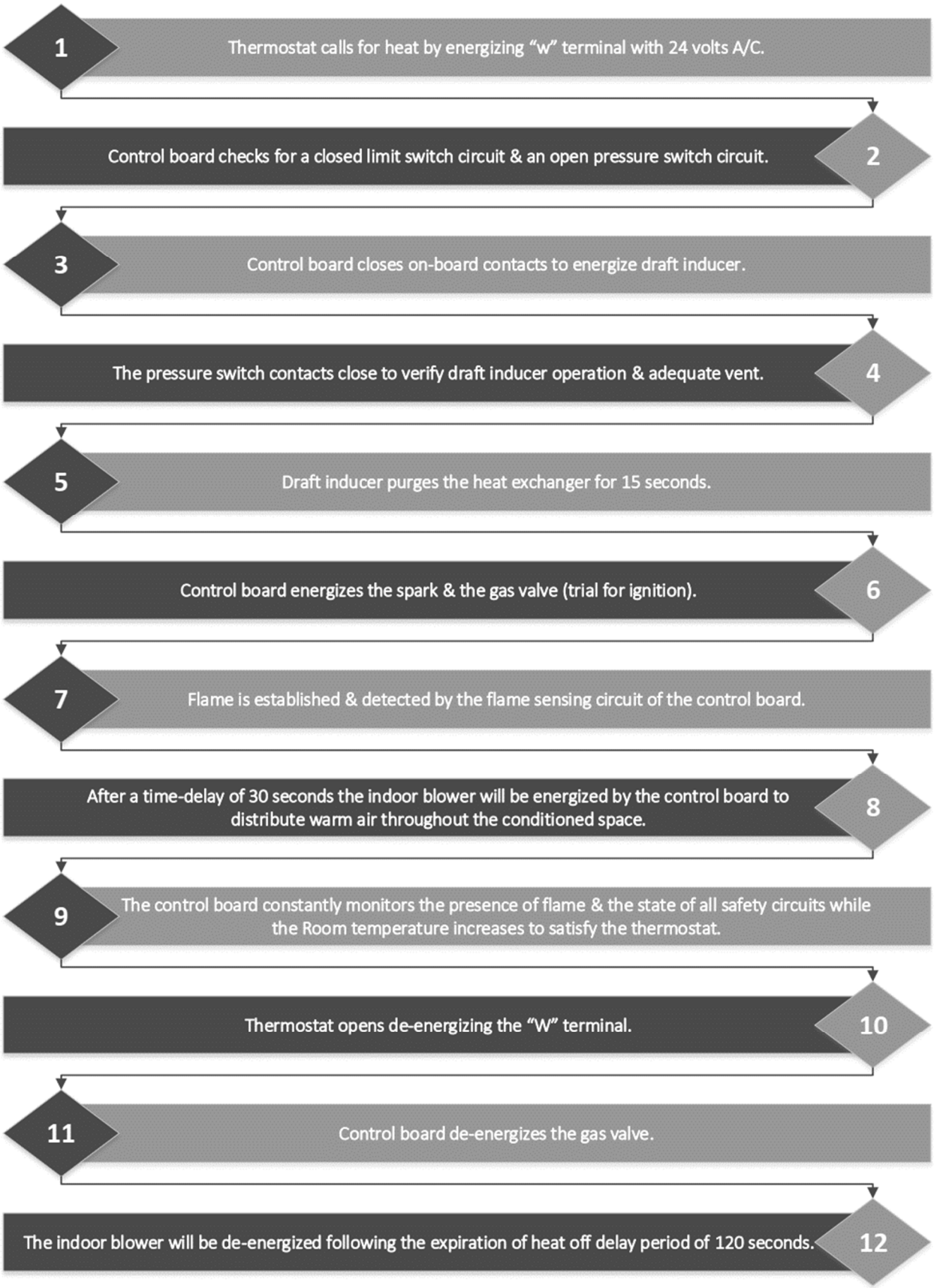
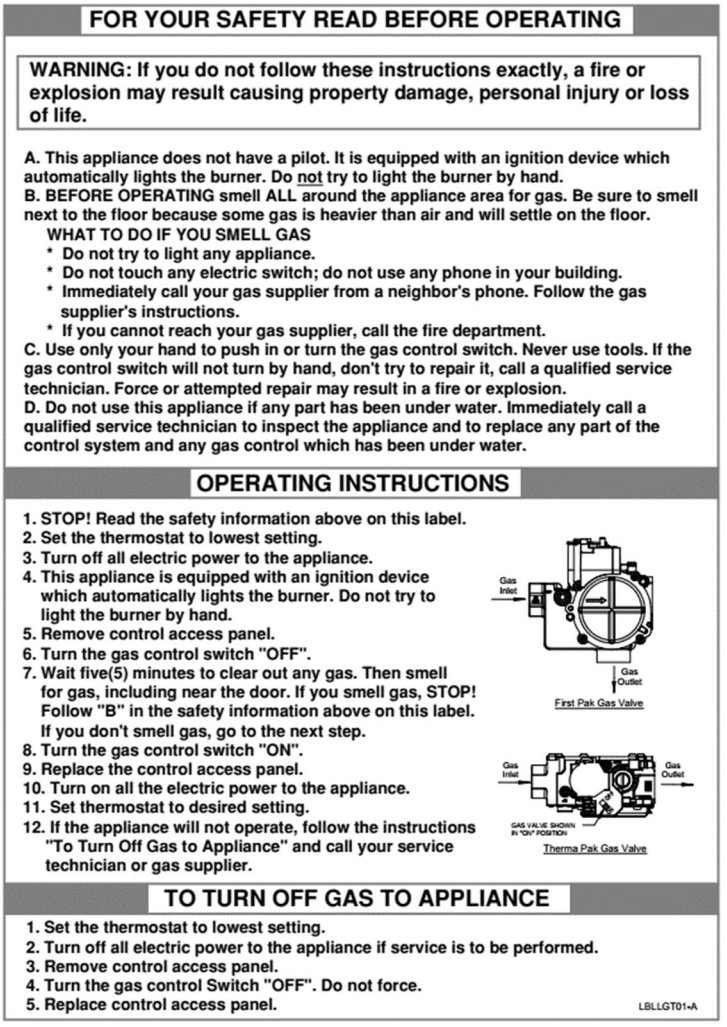


FIGURE 26 - Heating Sequence of Operations

HEATING OPERATIONS CONTINUED



FOR YOUR SAFETY READ BEFORE OPERATING

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
B. 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
* Do not try to light any appliance.
* Do not touch any electric 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.
C. Use only your hand to push in or turn the gas control switch. Never use tools. If the gas control switch will not turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
D. 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 which has been under water.

OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Remove control access panel.
6. Turn the gas control switch "OFF".
7. Wait five(5) minutes to clear out any gas. Then smell for gas, including near the door. If you smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
8. Turn the gas control switch "ON".
9. Replace the control access panel.
10. Turn on all the electric power to the appliance.
11. Set thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas to Appliance" and call your service technician or gas supplier.

Gas Inlet
Gas Outlet
First Pak Gas Valve

Gas Inlet
Gas Outlet
GAS VALVE SHOWN IN "ON" POSITION
Therma Pak Gas Valve

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control access panel.
4. Turn the gas control Switch "OFF". Do not force.
5. Replace control access panel.

LBLLGT01-A

FIGURE 27 – Lighting Instructions Label

TO LIGHT BURNERS

1. Turn off electrical power to the unit.
2. Turn the room thermostat to the lowest setting.
3. Check that the position of the gas valve switch is in the "on" position (see
4. FIGURE 28 – Gas Valve).

Check that the position of the manual gas shut-off valve is in the "on" position (see

5. FIGURE 29 – Manual Gas Shutoff Valve).
6. Turn on electrical power to the unit.
7. With the room thermostat to heat mode, set the temperature above the current room temperature.

SHUTTING DOWN BURNERS

1. Turn off electrical power to the unit.

Move the gas valve switch to the "off" position (see

2. FIGURE 29 – Manual Gas Shutoff Valve).
3. Turn the manual gas shut-off valve to the "off" position.

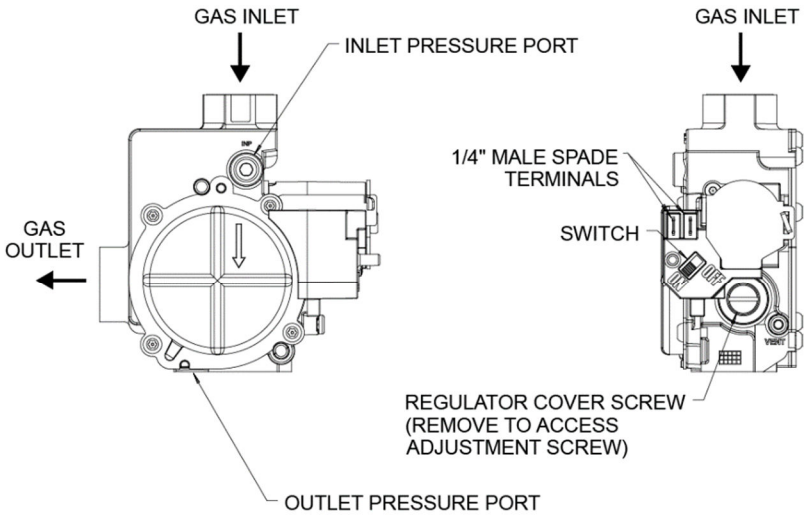


FIGURE 28 – Gas Valve

HEATING OPERATIONS CONTINUED

GAS SUPPLY PRESSURE

1. Turn “off” the gas supply to the furnace using the manual gas valve.
2. Remove the inlet pressure port plug using a 3/16” hex wrench. (refer to Figure 28)
3. Install a 1/8”- 27 N.P.T. x 1/4” hose barb connector into the inlet pressure port.
4. Connect tubing and a manometer to the 1/4” hose barb connector.
5. Turn “on” the gas supply to the furnace using the manual gas valve.
6. Leak check the manometer connections using soap solution made specifically for the detection of leaks. If a leak is present, shut off the manual valve and repair the leak. Proceed when no leaks are present.
7. Note the gas supply pressure measured on the manometer. With the burners not operating, the pressure should be 4.5” WC minimum and not exceed 10.5” WC maximum.
8. Set the room thermostat to call for heat.
9. Note the gas supply pressure measured on the manometer, with the burners operating the gas pressure must maintain 4.5” WC minimum and not exceed 10.5” WC maximum. ***NOTE:*** If the gas supply pressure is not within the min-max specified, contact the gas utility to correct this issue before placing this equipment in operation.
10. Terminate the call for heat at the thermostat.
11. Turn “off” the manual gas valve.
12. Remove the manometer and tubing from the 1/8”- 27 N.P.T. x 1/4” hose adaptor
13. Remove the 1/8”- 27 N.P.T. x 1/4” hose barb connector from the inlet pressure port and install the inlet pressure port plug removed in step 2. Check for leaks using soap solution made specifically for the detection of leaks. Do not leave the gas supply “on” until it is leak free.

GAS PRESSURE TABLE			
Natural Gas Pressure (inches W.C.)	Min.	Max.	Nominal
Supply Pressure	4.5	10.5	7
Manifold Pressure	3.2	3.8	3.5

Table 11 - Gas Pressure Table

GAS MANIFOLD PRESSURE

1. Turn “off” the gas supply to the furnace using the manual gas valve.
2. Remove the outlet pressure port plug using a 3/16” hex wrench. (refer to Figure 28)
3. Install a 1/8”- 27 N.P.T. x 1/4” hose barb connector into the outlet pressure port
4. Connect tubing and a manometer to the 1/4” hose barb connector.

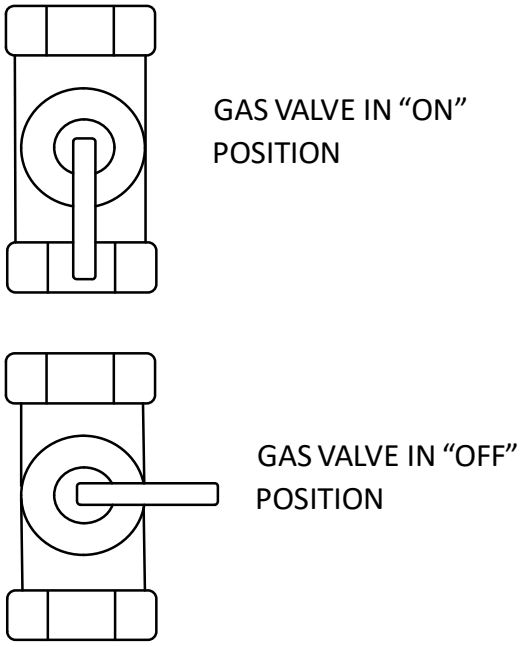


FIGURE 29 – Manual Gas Shutoff Valve

5. Turn “on” the gas supply to the furnace using the manual gas valve.
6. Set the room thermostat to call for heat. Check for leaks on the manometer connections using soap solution made specifically for the detection of leaks. If a leak is present, immediately shut off the manual valve and repair leak. Proceed when no leaks are present.
7. Note the gas manifold pressure measured on the manometer, with the burners operating, the gas pressure must maintain 3.2” WC minimum and not exceed 3.8” WC maximum.
8. To increase gas manifold pressure, remove the regulator cap and turn the adjustment screw clockwise. To decrease the pressure, turn the adjustment screw counter-clockwise.
9. Terminate the call for heat at the thermostat.
10. Turn “off” the manual gas valve.
11. Remove the manometer and tubing from the 1/8”- 27 N.P.T. x 1/4” hose barb connector
12. Remove the 1/8”- 27 N.P.T. x 1/4” hose barb connector from the outlet pressure port and install the outlet pressure port plug removed in step 2.
13. Turn “on” the manual gas valve.
14. Run the furnace in heat mode by setting the room thermostat to call for heat. Check for leaks using soap solution made specifically for the detection of leaks. Do not leave the gas supply “on” until it is leak free.

HEATING OPERATIONS CONTINUED

TEMPERATURE RISE

This gas furnace is designed to operate within a specific range of temperatures while in heating mode. The "Temperature Rise" range is shown on the rating plate. Temperature rise is defined as the temperature difference between the air entering the furnace and the air leaving the furnace. Avoid measuring supply air temperature directly above the heat exchanger as radiant heat will affect the measurement. The actual temperature rise measured must be within the range shown on the rating plate. The volume of air (CFM) moved by the indoor blower may be changed to decrease the actual temperature rise (increase indoor blower CFM) or increase the actual temperature rise (decrease the indoor blower CFM) See blower speed section in controls (**FIGURE 25 - Blower Control Tap**) page 29 of this manual for information on changing indoor blower speed.

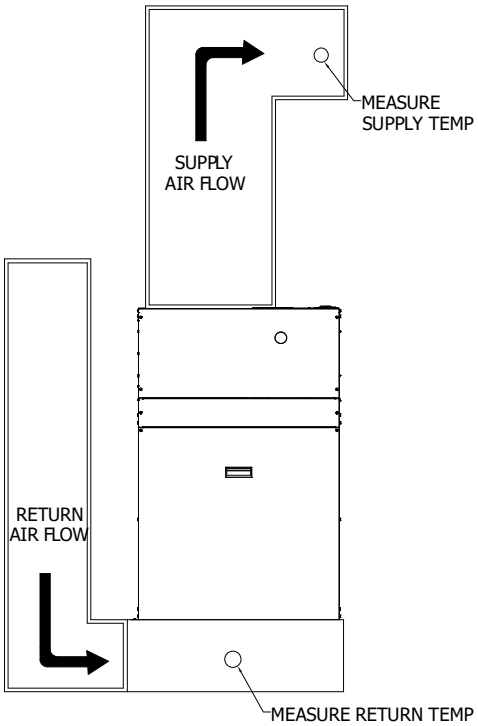


FIGURE 30 - Temperature Rise

COOLING OPERATIONS

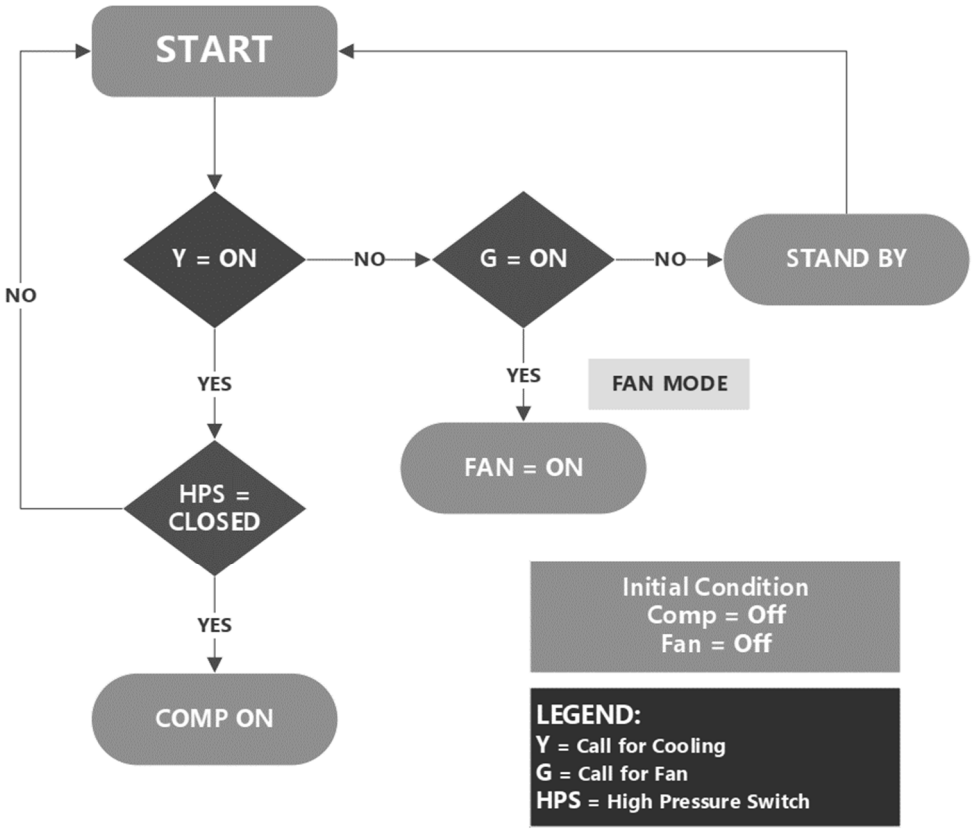


FIGURE 31 - Cooling Sequence of Operations

LOCATION OF MAJOR COMPONENTS

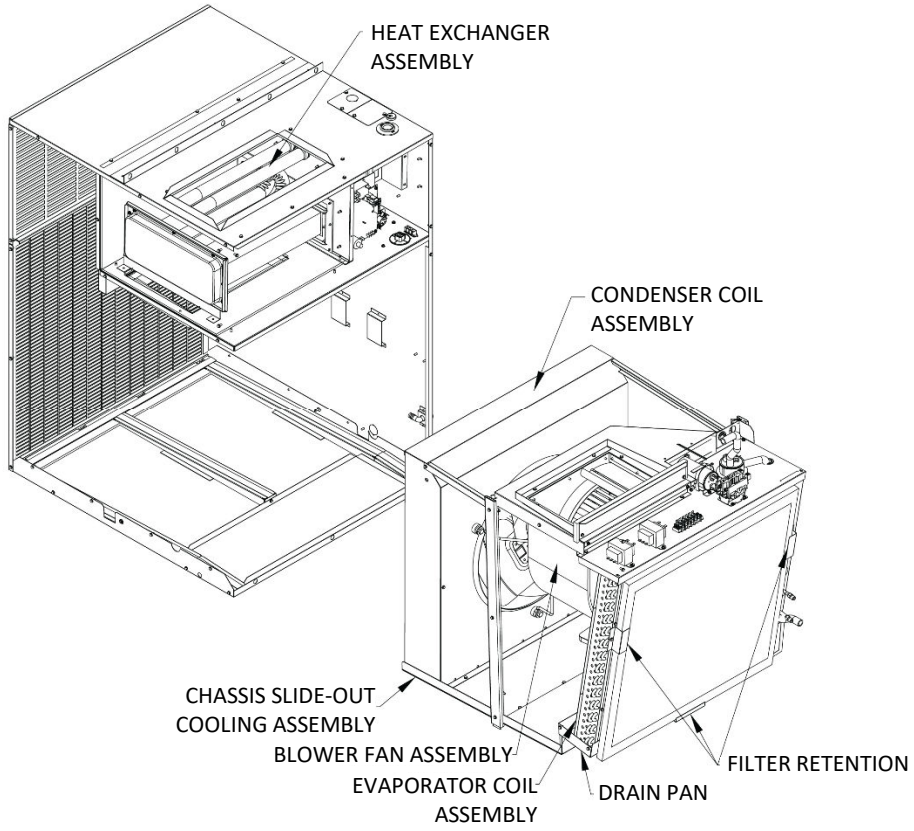


FIGURE 32 – Slide Out Chassis Assembly

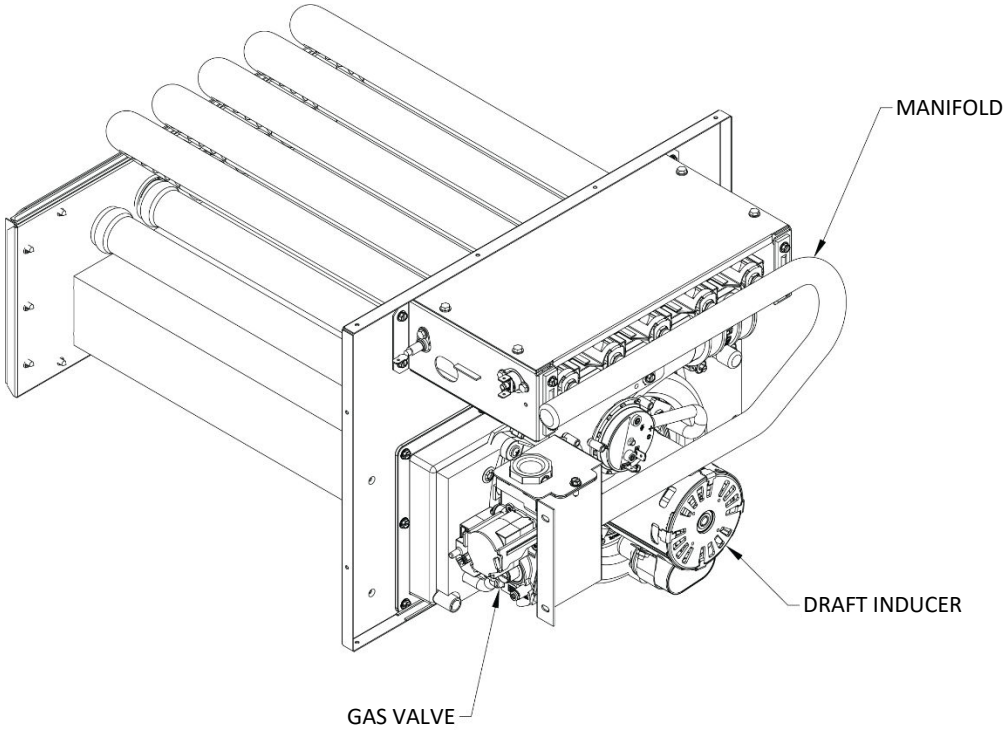


FIGURE 33 – Heating Assembly

LOCATION OF MAJOR COMPONENTS CONTINUED

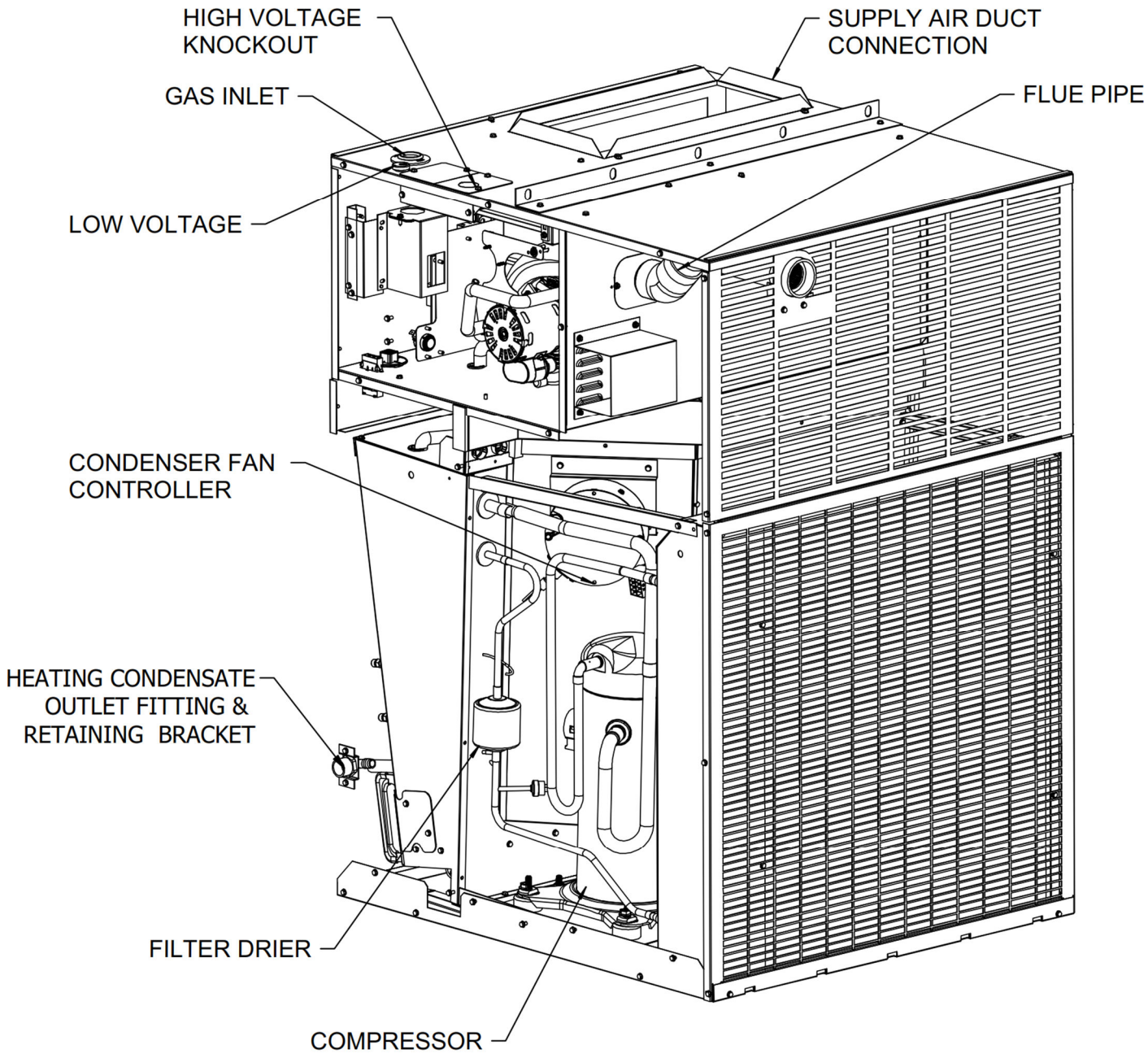


FIGURE 34 – Cabinet Components

WIRING DIAGRAMS

FIRST-PAK 12K ROTARTY ALL BURNERS-WIRING DIAGRAM (208-230V)

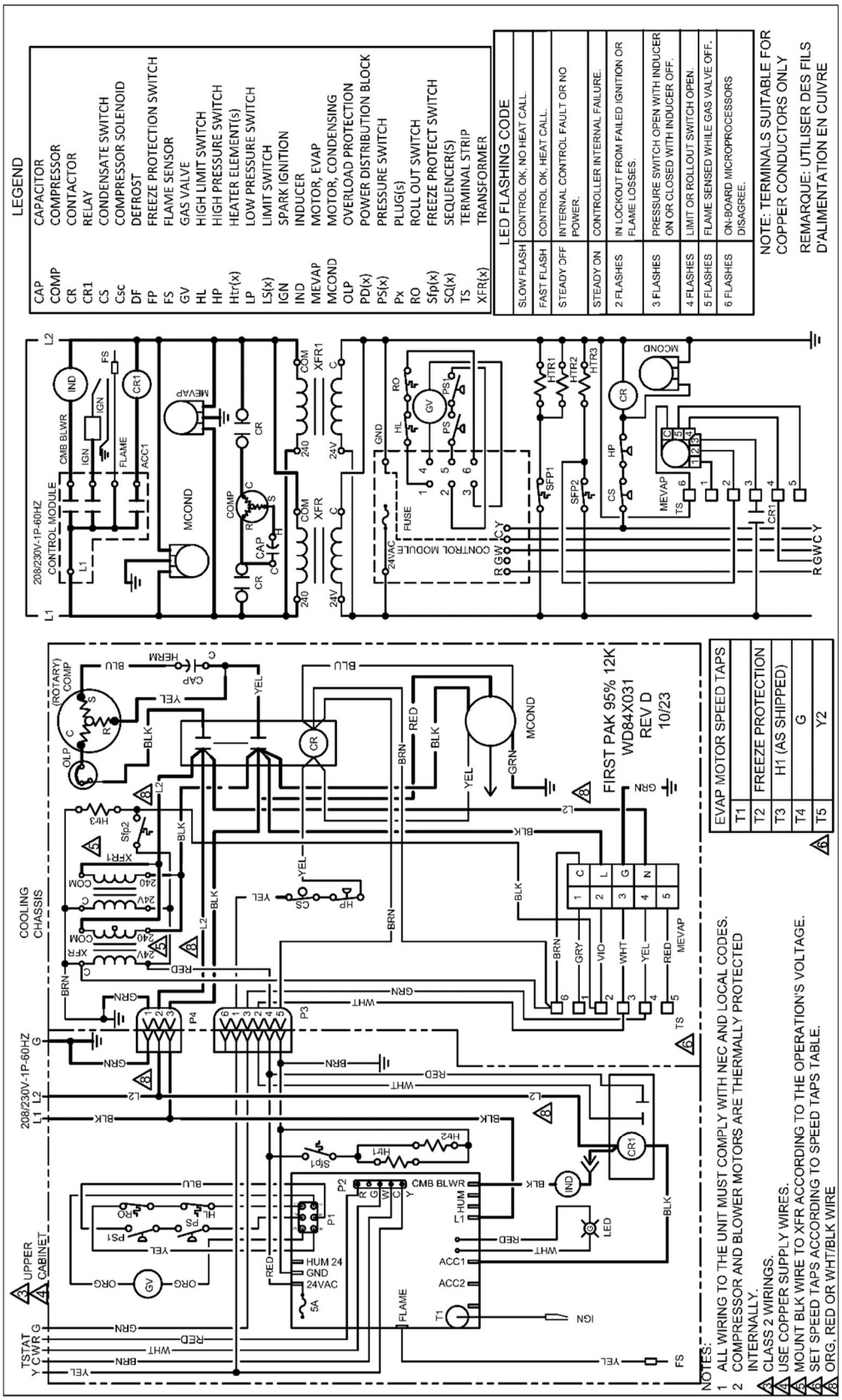


FIGURE 35 – FIRST-PAK Wiring Diagram (WD84X031)

WIRING DIAGRAMS

FIRST-PAK 18K SCROLL ALL BURNERS-WIRING DIAGRAM (208-230V)

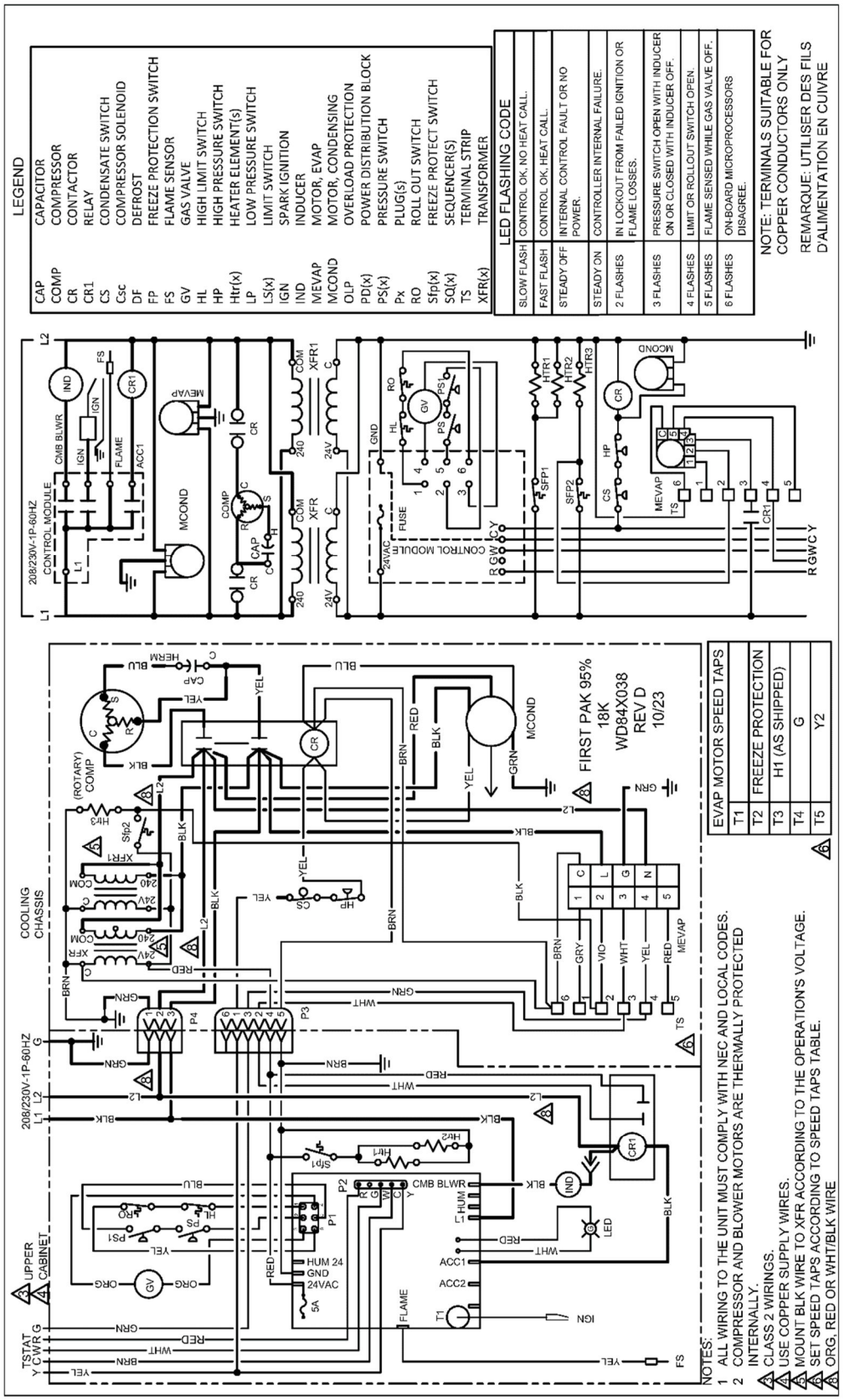


FIGURE 35 – FIRST-PAK Wiring Diagram (WD84X038)

WIRING DIAGRAMS

FIRST-PAK 24K SCROLL ALL BURNERS-WIRING DIAGRAM (208-230V)

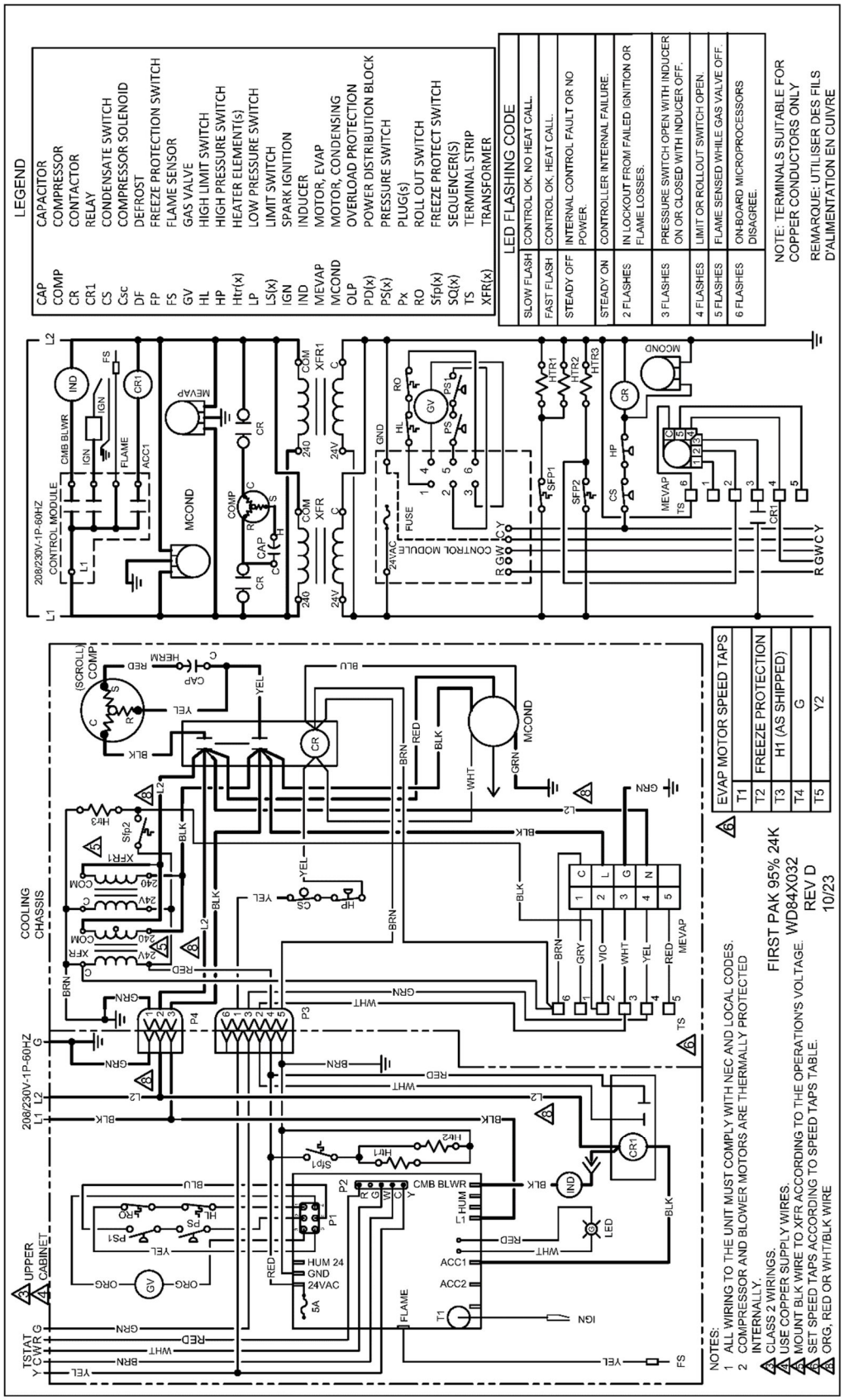


FIGURE 37 – FIRST-PAK Wiring Diagram (WD84X032)

WIRING DIAGRAMS

FIRST-PAK 30K SCROLL ALL BURNERS-WIRING DIAGRAM (208-230V)

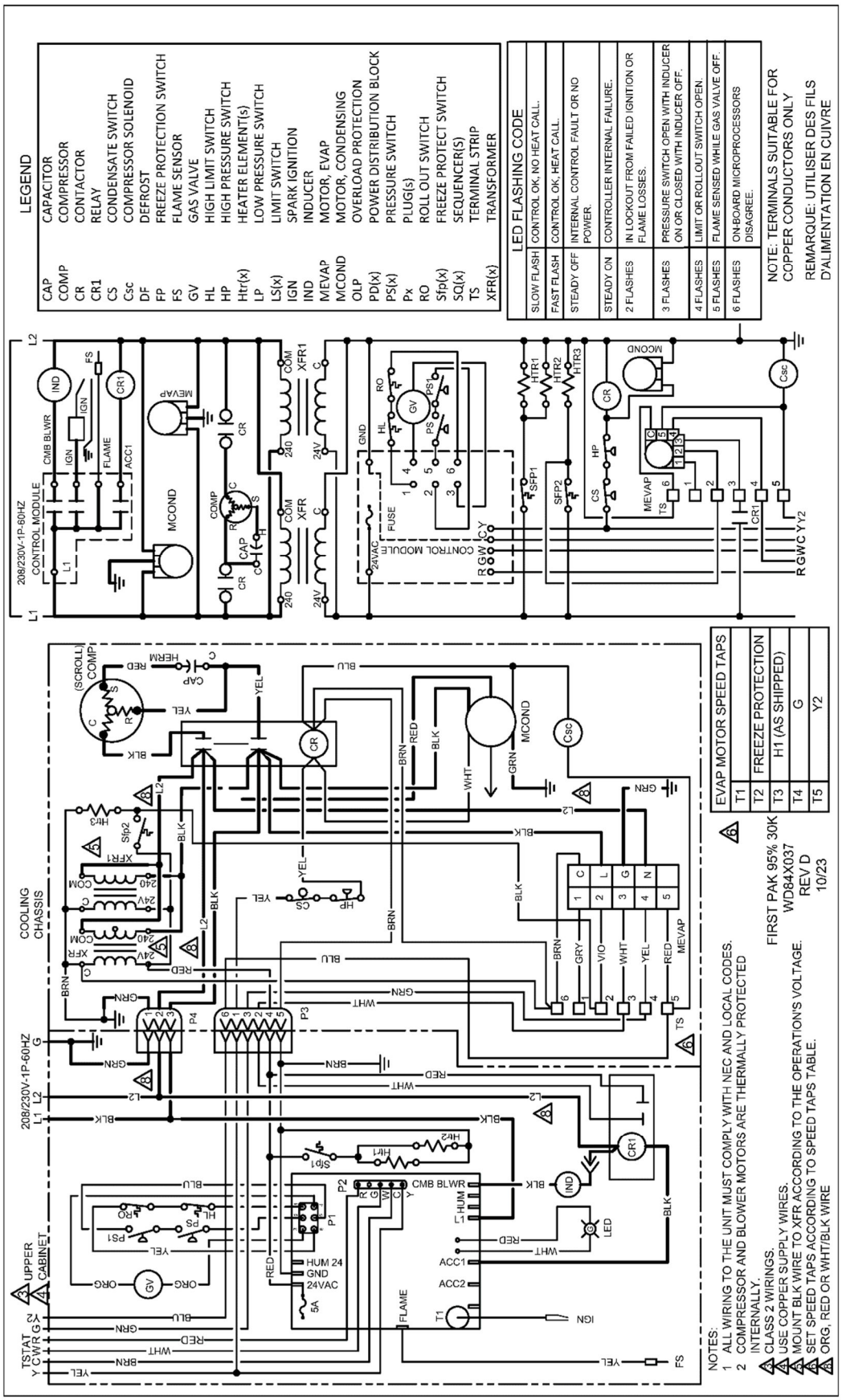


FIGURE 38 – FIRST-PAK Wiring Diagram (WD84X037)

CIRCUIT SCHEMATIC

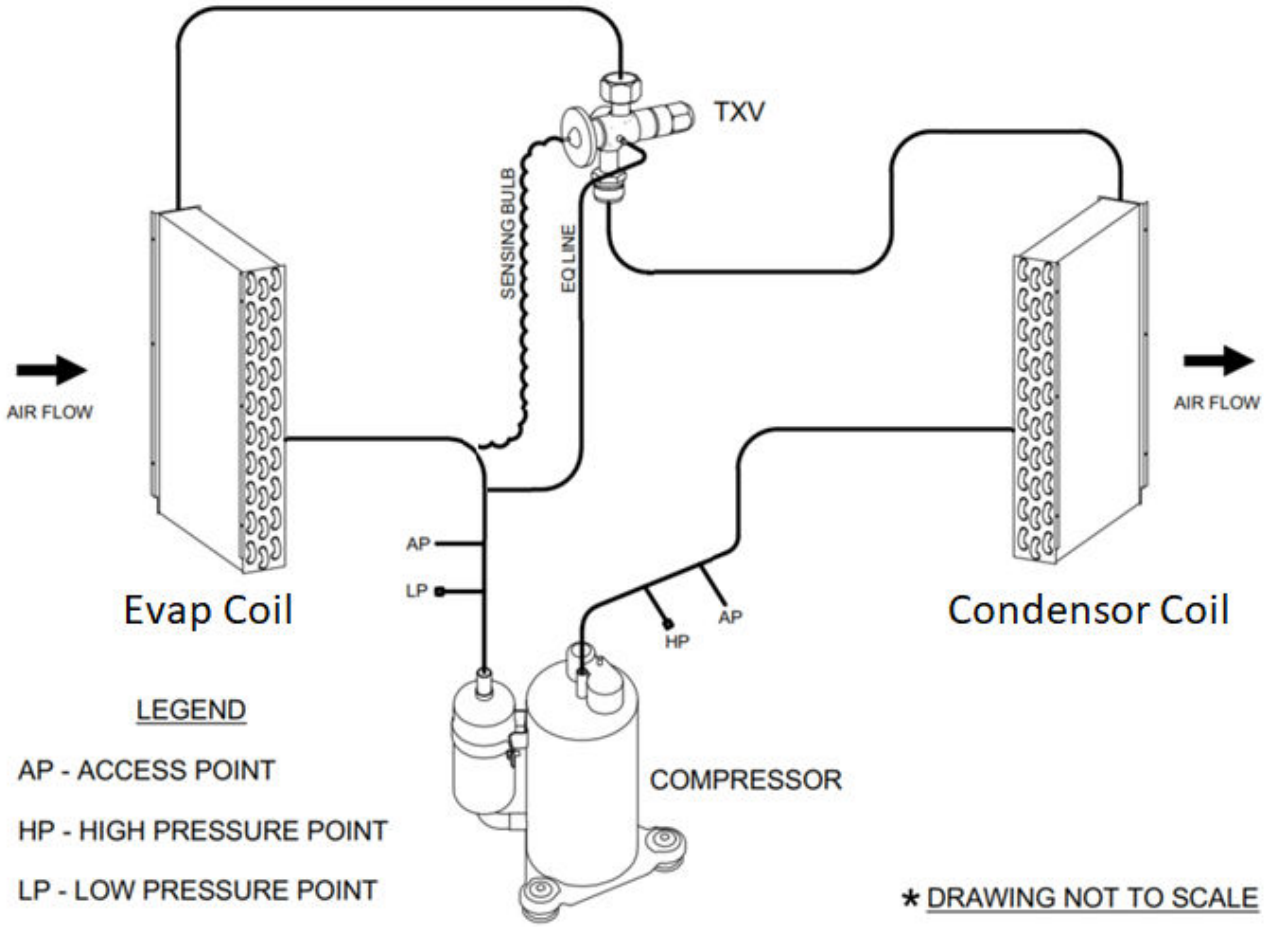


FIGURE 39 - Circuit Diagram

STARTUP INSTRUCTIONS

PRE-STARTUP CHECKS:

WARNING

Electrically ground the unit. Connect ground wire to ground lug. Failure to do so can result in injury or death.

CAUTION

Wire any field installed device such as a fan switch or thermostat furnished by the factory in strict accordance with the wiring diagram supplied with the unit. Failure to do so could result in damage to components and will void all warranties.

Before start-up, thoroughly check all the components. Optimal operation of equipment requires cleanliness. Often after installation of the equipment, additional construction activities occur. Protect the equipment from debris during these construction phases.

PRIOR TO THE STARTUP OF THE UNIT:

1. Ensure supply voltage matches nameplate data.
2. Ensure the unit is properly grounded.
3. With the power off, check blower wheel set screws for proper tightness and that the blower wheel rotates freely.
4. Ensure unit will be accessible for servicing.
5. Ensure all condensate lines are properly sized, run, trapped, pitched and tested.
6. Ensure all cabinet openings and wiring connections have been sealed.
7. Ensure clean filters are in place.
8. Ensure all access panels are in place and secured.
9. Make sure that all electrical connection are tight and secure.
10. Check the electrical overcurrent protection and wiring for the correct size.
11. Verify that the low voltage wiring between the thermostat and the unit matches the wiring diagram.

STARTUP INSTRUCTIONS CONTINUED

UNIT STARTUP:

1. Ensure that power is connected to the unit and the local disconnect is switched to ON position.
2. Check that there is 24V from the control transformer. The controller module LED should flash slowly.
3. Set the thermostat to the lowest position. Turn the thermostat system switch to "COOL" and the fan switch to "AUTO" position. The compressor, outdoor fan should come on within 5 seconds.

CHECKING GAS INPUT RATE:

The gas input rate of a furnace is expressed in BTU per hour (BTUH). Upon installation and startup, the gas input rate of each FPG unit must be measured and must not exceed the input rate listed on the furnace rating plate.

To measure the natural gas input rate;

1. The FPG unit must be the only appliance consuming gas during this measurement, other gas consuming appliances must be turned OFF.
2. Set the room thermostat to call for heat. When the burners are operating, use a stopwatch and record the number of seconds it takes to complete one revolution of the 0.5 cu/ft., 1 cu/ft or the 2 cu/ft. dial at the gas meter.
3. The heating value may be obtained from the utility company, if unknown use the typical heating value of 1,000 BTU per cu/ft.

Refer **Table 12 - Gas Meter Clocking Table** or see example calculation below

GAS METER CLOCKING CHART			
MODEL	SECONDS FOR ONE REVOLUTION		
	0.5 CU/FT	1 CU/FT	2 CU/FT
FPG22---	82	164	328
FPG33---	55	109	218
FPG44---	41	82	164
FPG55---	33	65	130

Table 12 - Gas Meter Clocking Table

Example of input rate calculation using the typical heating valve of Natural Gas of 1,000 BTU cu/ft, and 90 seconds time to complete one revolution of the 1 cu/ft dial on the gas meter.

- **Heating value** = 1,000 BTU per cu/ft.
- **Convert hours to seconds** (60 minutes per hour x 60 seconds per minute) = 3600 seconds in one hour.
- **Example time for one revolution of the 1 cu/ft dial** = 90 seconds
- **Input** = Heating Value (1,000) x seconds per hour (3,600) divided by the time to consume 1 cu/ft of gas (90 secs) = 40,000 BTUH.

NOTE

In the calculation example above, If the 0.5 cu/ft dial was used, you must multiply the number of seconds recorded for one revolution by two before using the formula. If the 2 cu/ft dial was used, you must divide the number of seconds recorded for one revolution by two before using the formula.

STARTUP & PERFORMANCE CHECKLIST INSTRUCTIONS

The warranty may be void unless the **FIGURE 49 - Startup and Performance Checklist** & **FIGURE 50 – Startup and Performance Checklist** is completed and returned to the warrantor. If the FPG unit is not installed properly the warranty will be void as the manufacturer can't be held accountable for problems that stem from improper installation.

TROUBLESHOOTING

HEATING

PROBLEM	POSSIBLE CAUSE	CHECKS & CORRECTIONS
NO OPERATION	Open Circuit Fuse (Electrical Panel)	Replace fuse
	Open Circuit Breaker (Electrical Panel)	Re-set circuit breaker / fuse
	Open Unit Power Switch (External disconnect, adjacent to unit)	Check position / electrical state of switch
NO HEAT	Active fault locking out heat operation	Refer to LED & legend for state of unit / fault code. Correct condition & re-set power
	No power to room thermostat (24 VAC between P1 terminals 2 & 5)	Improper field wiring
		Faulty Transformer
		No transformer ground
	No request from room thermostat (24 VAC between P1 terminals 2 & 3)	Improper field wiring
		Faulty thermostat / thermostat wiring
	No draft inducer operation	Control board relay not closing contact to draft inducer
		Remove obstruction preventing inducer wheel from turning
		Electrically open inducer motor winding or thermal protector - replace inducer
	Weak Spark / No spark	Correct poor chassis to earth ground / transformer to chassis ground / control board to chassis ground
		Correct Improper gap on spark electrode
		Clean Insulating carbon buildup from spark electrode & determine cause of poor combustion
		Replace spark electrode assembly for faulty - leaking insulator
		Faulty ignition wire leaking voltage - replace ignitor & wire
		Ignition wire not connected / poorly connected to control or spark electrode
	Open limit from no indoor blower operation	Remove obstruction preventing indoor blower wheel from turning
		Control board relay contact not energizing line voltage to blower motor - replace control
		Speed tap not energized at low voltage terminal strip by thermostat wire, repair connection to thermostat wire or motor speed terminal
		Over-heated blower motor with open winding or open thermal protection, correct restriction causing over-heating condition, replace motor if winding is open
	Furnace cycling on pressure switch	Correct inadequate venting, plugged inducer pressure switch port,
	Gas valve not opening	Check wiring connections to gas valve & control board (P2 terminals 3 & 4)
		Check control board output 24 VAC to gas valve (P2 terminals 3 & 4) - control must energize gas valve and spark electrode for 4 seconds minimum at trial for ignition.
	No or inadequate flame signal	Correct low gas pressure, clean or replace flame rod
INADEQUATE HEAT	Furnace cycling on limit switch	Restricted air flow caused by plugged filter, closed registers / grilles
	Gas pressure too low	Correct gas supply line pressure to 4.5" - 10" range while furnace operating in heat mode
		Correct gas manifold pressure to 3.2" to 3.8" range

Table 13 - Gas Heat Troubleshooting Table

TROUBLESHOOTING CONTINUED

HEATING

Step 1	Thermostat calls for heat by energizing "W" terminal with 24 volts a/c
Expected Operation	The room thermostat R terminal is constantly powered with 24 volts a/c by its connection to the control board R terminal and the unit transformer. A request for heat will energize the "W" terminal of the thermostat and the control board.

Possible Causes of failure:

1. Thermostat mode switch is not set to heat
2. Broken wire between control board & thermostat
3. Broken wire at thermostat terminal
4. Improperly connected thermostat wire (W at control is not connected to W at thermostat)
5. Defective thermostat
    a. The control board LED will display a slow flash – no call for heat

Step 2	Control board checks for a closed limit switch circuit & an open pressure switch circuit
Expected Operation	Upon receiving a request for heat, the control board must verify a safe condition exists before attempting ignition. The high temperature limit & rollout switches must be electrically closed. The pressure switch must be electrically open.

Possible Causes of failure:

1. Draft inducer relay on control board stuck closed keeping the draft inducer running & the pressure switch closed
    a. The control board L.E.D. will flash 3 times
2. The high limit switch or rollout switch is electrically open. A wire or connector is broken or improperly connected
    a. The control Board L.E.D. will flash 4 times
    b. The room thermostat will lose power as an open limit or rollout switch breaks 24 volts a/c to the R terminal

Step 3	Control board closes on-board contacts to energize draft inducer
Expected Operation	The control board relay coil is energized & relay contacts close to power the draft inducer. The draft inducer must function to draw the gas flames into the heat exchanger tubes & expel the products of combustion outdoors.

Possible Causes of failure:

1. No power to draft inducer due to control board inducer relay contracts failing open
    a. The control board L.E.D. will flash 3 times
2. The draft inducer motor is powered but not operating due to an open winding or thermal protector
    a. The control board L.E.D. will flash 3 times

Step 4	Draft inducer runs causing pressure switch contacts to close
Expected Operation	The pressure switch must prove that the draft inducer is running & that adequate negative pressure is present in the heat exchanger.

Possible Causes of failure:

1. The draft inducer motor is running but the pressure switch is not closing due to lack of negative pressure caused by
    a. Blocked flue
    b. Tubing disconnected from the draft inducer or pressure switch
    c. Tubing leaking
    d. Blocked pressure switch port on draft inducer housing
        i. The control board L.E.D. will flash 3 times

Step 5	Draft inducer purges the heat exchanger for 15 seconds
Expected Operation	Before trial for ignition, the draft inducer runs to purge the heat exchanger of any combustible mixture of gas & air which may be present

Possible Causes of failure:

1. Power Failure
2. Draft Inducer Failure
3. Control Board Relay Failure

TROUBLESHOOTING CONTINUED

HEATING

Step 6	Control board energizes the spark ignitor & the gas valve (trial for ignition)
Expected Operation	During trial for ignition, the draft inducer, & gas valve are energized. After 10 seconds, the spark ignitor is de-energized & the control checks for the presence of flame. If flame is not present, the control will de-energize the gas valve.

Possible Causes of failure:

1. Internal or external gas valve in off position
2. Inadequate ground causing no spark or poor spark
3. Inadequate gas supply to furnace
4. Manifold gas pressure too high or too low causing improper gas / air mixture
5. Improper spark electrode gap
    a. The control board L.E.D. will display 2 flashes if locked out from failed ignition or flame loss.

Step 7	Control board senses flame within 10 seconds of trial for ignition
Expected Operation	Flame must be sensed by the control board flame rectification system to maintain gas valve operations

Possible Causes of failure:

1. Inadequate flame
2. Inadequate control ground
3. Flame sensor dirty / coated with non-conductive buildup
4. Flame sensor insulator is cracked
    a. The control board L.E.D. will display 2 flashes if locked out from failed ignition or flame loss.

Step 8	Control board energizes indoor blower motor after 30 seconds
Expected Operation	After 30 seconds of burner operation the control board energizes the indoor blower motor

Possible Causes of failure:

1. Control board relay fails to energize blower
2. Indoor blower not connected to line voltage 240 volt supply
3. Indoor blower speed tap not connected to low voltage 24 volt supply
4. Indoor blower fan wheel blocked or restricted
    a. The control board L.E.D. will display 4 flashes due to open limit switch if indoor airflow is inadequate

Step 9	Room temperature increases to satisfy the thermostat
Expected Operation	Heat cycle continues until the room thermostat temperature set point is met

Possible Causes of failure:

1. Room thermostat request for heat interrupted ending call for heat
2. Furnace burners cycling on / off due to
    a. Open limit switch
    b. Restricted airflow
    c. Dirty filter
        i. The control board L.E.D. will display 4 flashes due to open limit switch if indoor airflow is inadequate

Step 10	Thermostat opens de-energizing the “W” terminal
Expected Operation	The room thermostat will end the request for heat & de-energize the “W” terminal of the control board

Possible Causes of failure:

1. Room thermostat contracts staying closed not ending the request for heat
2. Thermostat wires shorted together keeping “W” terminal energized

Step 11 Control board de-energizes the gas valve

1. The control board L.E.D. will display 5 flashes if gas flame is detected when it is not expected. Draft inducer will continue to run.

Step 12 Control board continues to energize the indoor blower motor for 2 minutes

1. The control board time delay blower relay stuck closed causing blower to stay onto cool down heat exchanger runs in excess of 2 minutes

TROUBLESHOOTING CONTINUED

COOLING

PROBLEM	POSSIBLE CAUSE	CHECKS & CORRECTIONS
ENTIRE UNIT DOES NOT RUN	Power supply off	Apply power; close disconnect.
	Blown Fuse	Replace fuse or reset circuit breaker. Check for correct fuses.
	Voltage supply low	If voltage is below minimum voltage specified on unit data plate, contact power company.
	Thermostat	Set the fan to "ON", the fan should run. Set thermostat to "COOL" and lowest temperature setting, the unit should run in the cooling mode. If neither the blower nor compressor run with the thermostat set to "COOL", check that the unit is wired correctly.
BLOWER OPERATES BUT COMPRESSOR DOES NOT RUN	Thermostat	Check setting, calibration and wiring.
	Wiring	Check for loose or broken wires at compressor, capacitor or contractor.
	Safety Controls	Check control board fault LED for fault code.
	Compressor overload open	If the compressor is cool and the overload will not reset, replace the compressor.
	Compressor motor grounded	Internal wiring grounded to the compressor shell. Replace compressor. If compressor burnout, install new filter dryer.
	Compressor windings open	After compressor has cooled, check continually of compressor windings. If the windings are open, replace the compressor.
UNIT OFF ON HIGH PRESSURE CONTROL FAULT CODE 12	Discharge pressure too high	In "COOLING" mode: Lack of adequate airflow rate. Air temperature too warm. Scaled or restricted condenser coil.
	Refrigerant charge	The unit is overcharged with refrigerant. Reclaim refrigerant, evacuate and recharge with factory recommended charge.
	High pressure switch	Check for defective or improperly calibrated high-pressure switch.

Table 14 – Cooling Troubleshooting Table

MAINTENANCE & SERVICE - HEATING

To ensure maximum performance and service life of equipment, a formal schedule of regular preventative maintenance must be established and adhered to.
Failure to establish and perform preventative maintenance program can void the manufactures warranty.

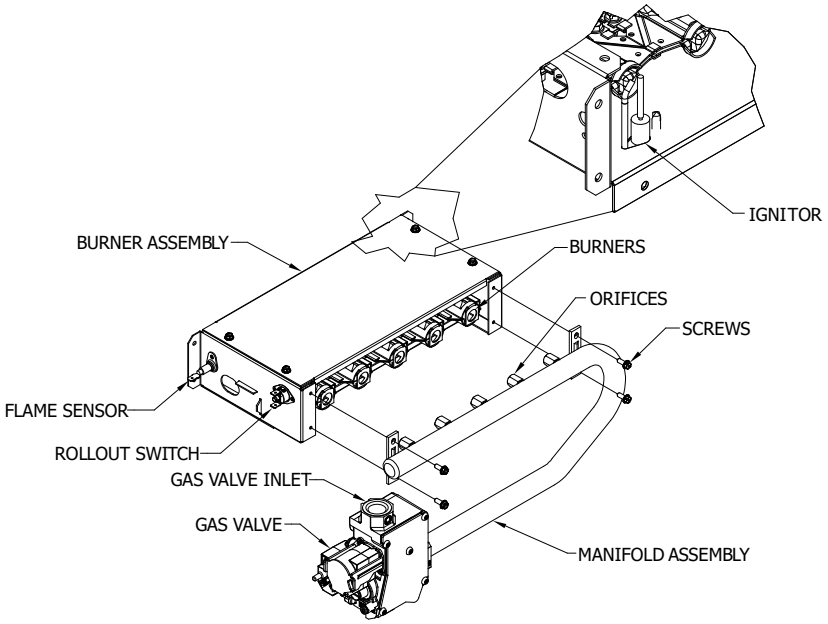


FIGURE 40 - Burner Components

MAINTENANCE & SERVICE - HEATING

AIR FILTER(S)

Furnace filters should be checked monthly and replaced as necessary. Do not operate the furnace without filters in place. The Interval of filter replacement will vary with environmental factors and the size and type of filters used. It is extremely important to replace filters before they become a restriction to air flow.

Examine the furnace after installation and periodically thereafter to determine that:

1. The furnace flue is in place and free from obstructions.
2. The return-air duct connection(s) is physically sound, is sealed to the furnace casing, and terminates outside the space containing the furnace.
3. The physical support of the furnace is sound without sagging, cracks, or gaps.
4. There are no obvious signs of deterioration of the furnace.
5. The burner flames are proper; being drawn into the heat exchanger tubes, not lifting, blue in color, or not being distorted by fan operations (see FIGURE 41 - Burner Flames below).

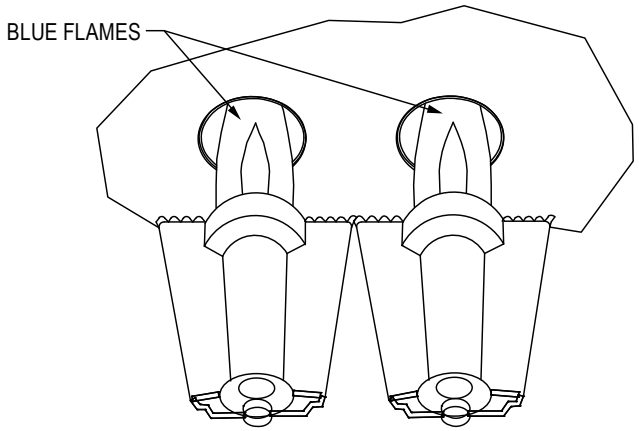


FIGURE 41 - Burner Flames

COMBUSTION AIR BLOWER

The combustion air blower creates a negative pressure condition in the gas heat exchanger and vents the products of combustion out of doors. Check the ventilation openings on the end of the combustion air blower to make sure they are not blocked and free from debris. Check for any leaks in the heat exchanger. The draft inducer motor contains permanently sealed ball bearings and requires no lubrication.

COMBUSTION AIR PROVING SWITCH

The combustion air-proving switch is a safety device which verifies operation of the combustion blower and that the products of combustion are being vented out of doors. The combustion air proving switch is wired in series with the drain proving switch. Check electrical and tubing connections annually.

DRAIN PROVING SWITCH

The drain proving switch verifies draining of condensation produced by the combustion process. The drain proving switch is wired in series with the combustion air proving switch. Check electrical connections annually.

FLAME ROLLOUT SWITCHES

Flame roll out switches are normally closed safety switches that assures burner flames are drawn properly into the heat exchanger tubes. In the event of improper burner flames or overheating of the burner section, the flame roll out switch opens the electrical circuit shutting off the flow of gas to the burners. Check electrical connections annually.

FLAME SENSOR ASSEMBLY

The flame sensor assembly consists of a conductive rod surrounded by an insulator attached to a mounting plate. The flame sensor may be cleaned as needed with steel wool. A slight coating developing on the flame sensor over time is normal and to be expected, however; the presence of heavy black carbon is an indication of improper combustion and requires immediate attention to determine the cause and to correct. Exercise care when handling to protect the insulator from damage.

GAS HEAT CONDENSATE DRAIN &TRAP

The heating condensate drain trap receives the water created by the combustion process. Water is carried to the trap by a drain tube which runs from the heat exchanger collector box to the drain trap located in the cooling chassis behind the evaporator coil. The trap outlet tube runs along the evaporator coil to a fitting on the right side of the cabinet where a field drain connection disposes of the water gas burners. The drain tubing and the trap should be flushed annually with clear water.

GAS VALVE

The gas valve is an integral part of unit safety. Never use a gas valve that has been under water. The gas valve is energized by the control board to establish the flow of natural gas to the burners when heat is requested by the thermostat and all safety devices are satisfied. Check electrical connections annually.

HIGH TEMPERATURE LIMIT SWITCH

The high temperature limit switch is a normally closed safety that assures proper temperature within the furnace. If heating mode airflow through the furnace becomes inadequate, the high temperature limit switch will open, shutting off the flow of gas to the burners. Check electrical connections annually.

MAINTENANCE & SERVICE – HEATING CONTINUED

INDOOR BLOWER MOTOR

Check the openings on the end of the indoor blower motor to make sure they are not blocked and free from debris. The indoor blower motor contains permanently sealed ball bearings and requires no lubrication.

INTEGRATED CONTROL

The integrated control handles inputs from the room thermostat, spark ignition & flame sensing functions, controlling power to the gas valve, fan timing and speed functions, and monitors all safety circuits of the furnace. There are no serviceable parts in the integrated control module other than a 5-amp fuse. Do not handle the integrated control module unless necessary, before touching the integrated control module, touch the unit frame to discharge any static electricity which could damage the integrated control.

SPARK IGNITOR ASSEMBLY

The spark ignitor assembly consists of a spark electrode with insulator and a ground electrode attached to a mounting plate. Take care not to damage the insulator. The spark and ground electrodes may be cleaned as needed with steel wool.

WARNING

ELECTRIC SHOCK, FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings operation, serious injury, death or property damage.

Improper servicing could result in dangerous operation death or property damage.

- **Before servicing, disconnect all electrical power to furnace.**
- **When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.**
- **Verify proper operation after servicing.**

PERIODIC INSPECTIONS

The following items should be inspected annually (minimum) before each heating season by a qualified service agency:

HEAT EXCHANGER TUBES

Make sure they are free from blockages, signs of carbon buildup, heavy corrosion or cracks.

GAS BURNERS

Make sure they are free of blockages, signs of carbon buildup or heavy corrosion. The burner carry-over slots should be clean and of uniform size.

FLUE PIPE

Check that flue is in place, unobstructed, free from leaks, termination screen is in place and unobstructed.

COMBUSTION AIR OPENINGS

Check that they are clean & free from debris or blockages of any kind.

INDOOR AIR

The blower wheel and blower housing must be free from debris. Check that supply and return air registers, grilles, and dampers are positioned properly, filters are in place and clean.

CONDENSER AND EVAPORATOR COILS

Inspect and wash the condenser and evaporator coils – do not use high pressure as damage to the finned surfaces may occur.

HIGH ALTITUDE OPERATIONS

As shipped, FPG*9* units may be installed at altitudes up to 4,500 ft.

For applications with altitudes between 4,501 – 10,000 reference IOM 8408 and KIT no. 9KHiAlt95.

SPECIAL NOTES FOR EXTREMELY COLD WEATHER AREAS

Periodically check the unit exterior grille for ice that may form and obstruct the flue and combustion air inlet.

MAINTENANCE & SERVICE – HEATING CONTINUED

HEATING MODULE REMOVAL

The entire gas heat section may be removed as a unit for service if required.

1) Turn off electrical power to furnace and disconnect low and high voltage field wiring at unit.
2) Remove outer and inner heating access panels and the control access panel
3) FIGURE 43 – Heating Access Panel Removal
4) Remove gas valve bracket. See **FIGURE 42- Removal of Gas Valve Bracket**
5) Unplug mating harness connectors for low voltage and high voltage in the control section FIGURE 47- Line Voltage Connector, FIGURE 48- Low Voltage Connector.
6) Release the low and high voltage connector housings from the cabinet.
7) Remove screws from Green and Brown Chassis ground wires.
8) Disconnect gas union and necessary piping to allow heat section module to slide out of cabinet.
9) Loosen thumb screw gear clamp connection of flue pipe in vent-drain coupling.
10) Remove drain tube connection from bottom of collector box. Gently pull & twist the drain tube away from the collector box. Slide the freeze protection heater off of the drain tube.
11) Remove the drain tube connection from the top of the drain trap by gently pulling up with a twisting motion.

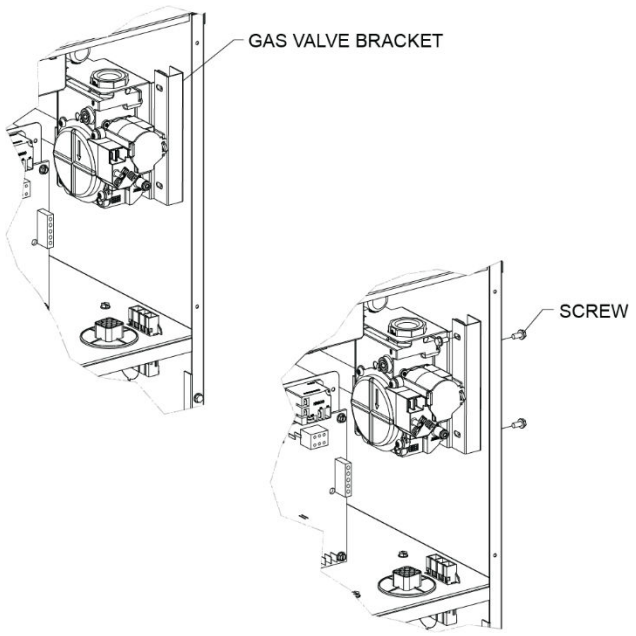


FIGURE 42- Removal of Gas Valve Bracket

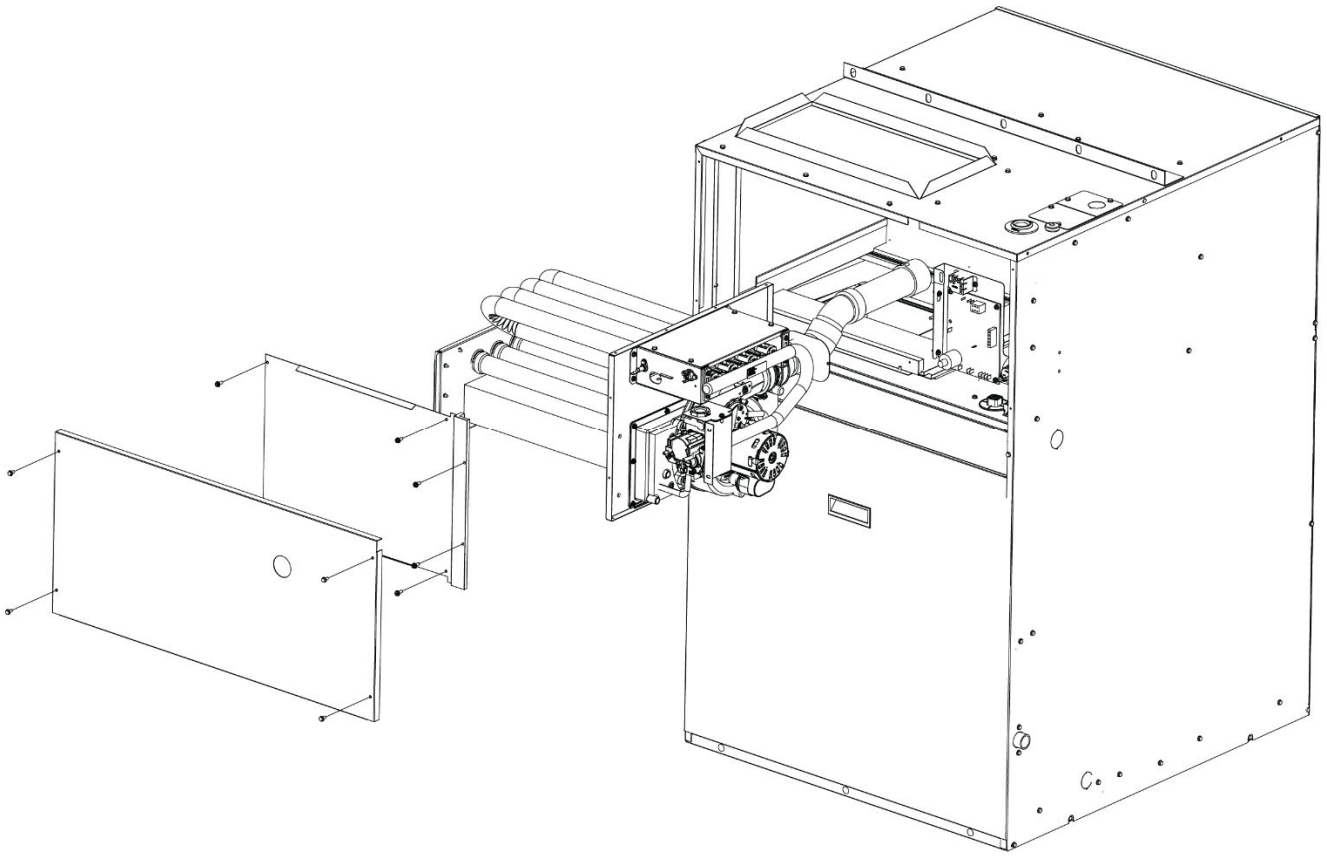


FIGURE 43 – Heating Access Panel Removal

MAINTENANCE & SERVICE – COOLING

AIR CONDITIONER MODULE REMOVAL

The air-conditioning chassis may be removed as a unit for service if required. Turn off electrical power to refrigeration chassis.

1) Remove screws (2) from controls cover and remove panel. See FIGURE 44 – Removal of Control Cover.
2) Remove power from unit.

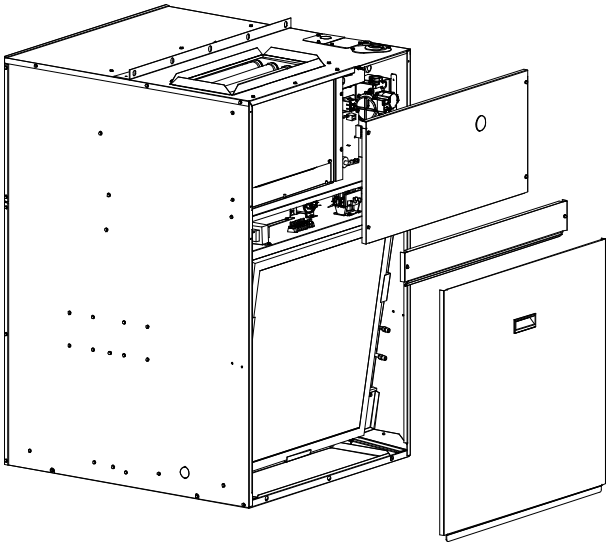


FIGURE 44 – Removal of Control Cover

3) Disconnect low voltage (6 pin) & line voltage (3 pin) harness connectors by pressing on the release tabs and using a downward motion (FIGURE 46 - Line Voltage Connector (3 Pin) & FIGURE 48 – Low Voltage Connector (6 pin)).
4) Disconnect drain tubes from the top of heating condensate trap with long nose pliers (FIGURE 49 – Drain Tube Disconnection)
5) Disconnect the heating condensate drain from the side of the cabinet by removing screws from the bracket and separating from the field installed drain if necessary.

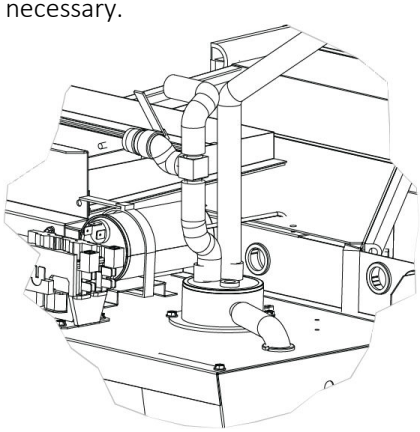


FIGURE 49 – Drain Tube Disconnection

FIGURE 49 – Drain Tube Disconnection

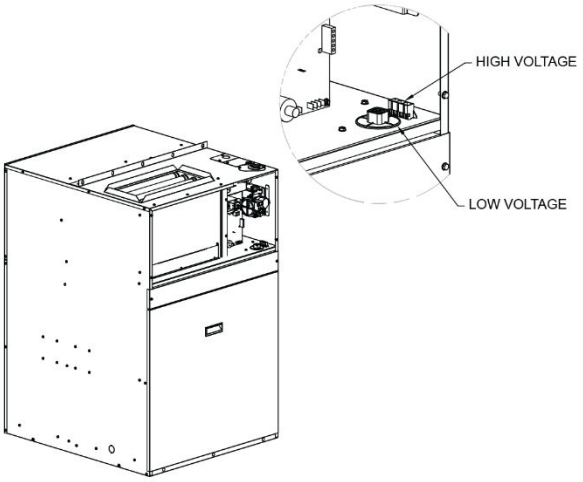


FIGURE 45 – Electrical Power Disconnection

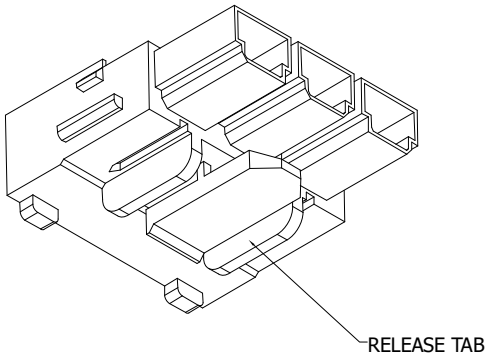


FIGURE 46 - Line Voltage Connector (3 Pin)

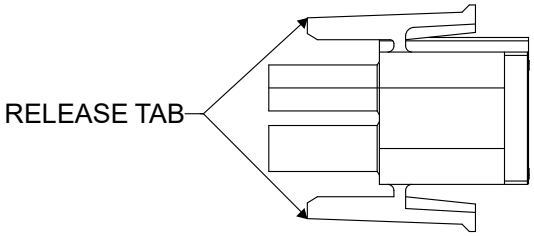


FIGURE 47 - Low Voltage Connector (6 Pin)

MAINTENANCE & SERVICE – COOLING CONTINUED

6) Slide-out refrigeration chassis FIGURE 48 – Slide Out Chassis
7) Side panel can be removed from the evaporator section to service the TXV.

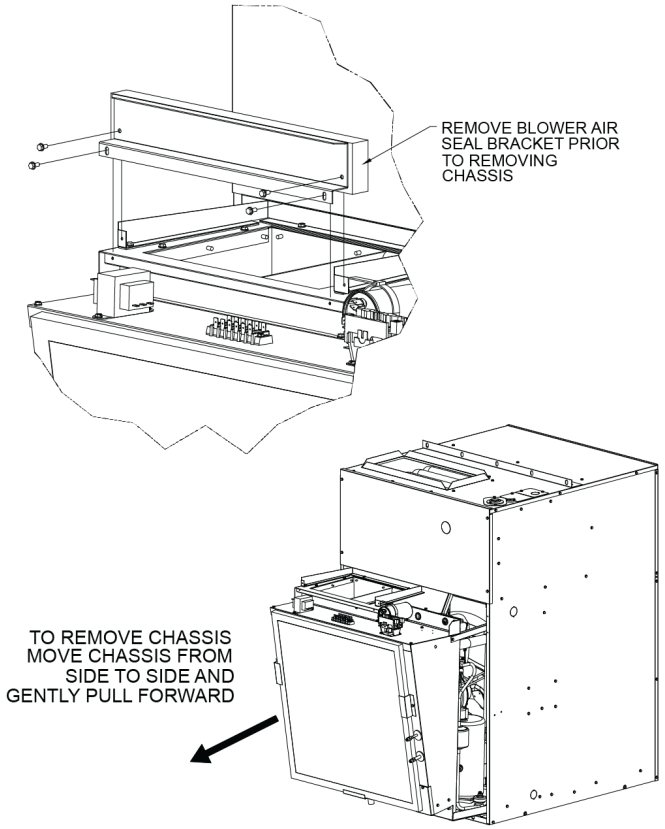


FIGURE 48 – Slide Out Chassis

NOTE

All refrigeration components can be serviced in the chassis.

AIR CONDITIONER MODULE REASSEMBLY

1) To put-back the chassis, make sure all the refrigerant lines are in place and there are no leaks.
2) Slide chassis back into the unit.
3) Connect the electrical connection back as they previously were.
4) Reconnect heating condensate drain tubes to trap inlet
5) Reconnect heating condensate drain to the side of the cabinet. Reconnect / repair any connections necessary external to the cabinet

PREVENTIVE MAINTENANCE

To achieve maximum performance and service life of equipment, a formal schedule of regular maintenance should be established and followed.

WARNING

It is illegal to discharge refrigerant into the atmosphere. Use proper reclaiming methods and equipment when installing or servicing this unit. Service should be performed by a QUALIFIED service agency. The refrigerant system contained in the unit normally requires no maintenance since it is a closed, self-contained system.

CAUTION

All appropriate personal protection equipment should be worn when servicing or maintaining this unit.

Personal injury can result from sharp metal edges, moving parts, and hot or cold surfaces.

FAN

For any other refrigeration servicing, the refrigeration chassis can be removed as explained in the **AIR CONDITIONER MODULE REMOVAL** Section

WARNING

ELECTRIC SHOCK HAZARD

Check motor connections to ensure they are secure and in accordance with the unit wiring diagram.

ECM motors have line voltage power applied at all times.

MAKE SURE POWER IS DISCONNECTED BEFORE SERVICING.

FILTER

The air filter should be cleaned or replaced every 30 days or more frequently if severe operating conditions exist. Always replace the filter with the same type and size as originally furnished.

COIL

Clean all heat transfer surfaces and remove all dirt, dust, and contaminates that potentially impairs air flow using industry accepted practices. Care should be taken not to bend coil fin material.

CONDENSATE DRAIN PAN AND PIPE

Check and clean all dirt and debris from pan. Ensure drain line is free flowing and unobstructed.

UNIT PERFORMANCE

Record performance measurements of volts, amps, and air temperature differences. A comparison of logged data with start-up and other annual data is useful as an indicator of general equipment condition.

LABORATORY TESTING

When the unit has less than 100 operational hours and the coils have not had sufficient time to be “seasoned”, it is necessary to clean the coils with mild surfactant such as Calgon to remove the oils left by manufacturing processes.

REPLACEMENT PARTS

Part Name	Part Number	Model Use
Igniter	GS-IG-1	All First Pak Models
Flame Sensor	GS-FS-1	All First Pak Models
Gas Valve	GS-V-1	All First Pak Models
Burner	GS-B-1	All First Pak Models
Manifold - 2 Burner	GS-MBO-2	FPG22N9012C FPG22N9018C
Manifold - 3 Burner	GS-MBO-3	FPG33N9012C FPG33N9018C FPG33N9024C
Manifold - 4 Burner	GS-MBO-4	FPG44N9012C FPG44N9018C FPG44N9024C FPG44N9030C
Manifold - 5 Burner	GS-MBO-5	FPG55N9018C FPG55N9024C FPG55N9030C
Foil Face Insulation - 1/2"	I1F	All First Pak Models
View Port	EW11171500	All First Pak Models
Grommet - Gas Inlet	F129	All First Pak Models
Remote LED - C Cabinet	SSLED-C	All First Pak Models
Blower Terminal Strip	E1620	All First Pak Models
Indoor Blower Wheel	W39	All First Pak Models
Pressure Switch (Collector Box)	GS-PS-6	All First Pak Models
Pressure Switch (Main)	GS-PS-7	FPG22N9012C FPG22N9018C
Pressure Switch (Main)	GS-PS-8	FPG33N9012C FPG33N9018C FPG33N9024C FPG44N9012C FPG44N9018C FPG44N9024C FPG44N9030C FPG55N9018C FPG55N9024C FPG55N9030C

Part Name	Part Number	Model Use
Freeze Protection Heater - Collector Box	GS-H1	All First Pak Models
Freeze Protection Heater - Upper Drain Tube	GS-H2	All First Pak Models
Freeze Protection Heater - Trap	GS-H3	All First Pak Models
Freeze Protection Thermostat	E197	All First Pak Models
Drain Tube-Trap to Outlet Fitting	DT95-01	All First Pak Models
Drain Tube - Collector Box to Trap	DT95-02	All First Pak Models
Drain Tube-Vent Drain Coupling to Collector Box	DT95-03	All First Pak Models

Part Name	Part Number	Model Use
Condenser Fan	FB2030	All First Pak Models
Control Board	CB8600	All First Pak Models
Contactor	E1323777	All First Pak Models
Transformer	E1372	All First Pak Models
Expansion Valve	CP8308	FPG20N9012C FPG30N9012C FPG40N9012C
Expansion Valve	CP8309	FPG20N9018C FPG30N9018C FPG40N9018C FPG50N9018C
Expansion Valve	CP7325	FPG30N9024C FPG40N9024C FPG50N9024C FPG40N9030C FPG50N9030C
Filter Drier	CP20053	All First Pak Models
Compressor	CO120KAB	FPG22N9012C FPG33N9012C FPG44N9012C
Compressor	CO151GJS	FPG22N9018C FPG33N9018C FPG44N9018C FPG55N9018C
Compressor	CO21K	FPG33N9024C FPG44N9024C FPG55N9024C
Compressor	CO26KAPM	FPG44N9030C FPG55N9030C

Part Name	Part Number	Model Use
Screws-Draft Inducer	F6516	All First Pak Models
Flue Screen	MESH-01	All First Pak Models
Gasket Set - Front Collector Box, Sec H/E, Draft Inducer, Air Orifice Plate	GS-G10	All First Pak Models
Heat Exch. Gasket Back plate	GS-G7	All First Pak Models
Combustion Draft Inducer	DRAFT-IND95	All First Pak Models
Indoor Blower Motor	MDX033240	First Pak Models (12-18K Cooling)
Indoor Blower Motor	MDX050240	First Pak Models (24-30K Cooling)
Pressure Switch Tubing	CP98PSH1	All First Pak Models

Part Name	Part Number	Model Use
Roll Out Switch	GS-ROS-1	FPG22N9012C FPG22N9018C FPG44N9012C FPG44N9018C FPG44N9024C FPG44N9030C
Roll Out Switch	GS-ROS-4	FPG33N9012C FPG33N9018C FPG33N9024C
Roll Out Switch	GS-ROS-5	FPG55N9018C FPG55N9024C FPG55N9030C
Condenser Fan Motor	MDR020240	First Pak Models (12-18K Cooling)
Condenser Fan Motor	MDR033240R	First Pak Models (24-30K Cooling)
Limit Switch	E198	All First Pak Models
Combustion Air Orifice	GS-OA-2	FPG22N9012C FPG22N9018C
Combustion Air Orifice	GS-OA-3	FPG33N9012C FPG33N9018C FPG33N9024C
Combustion Air Orifice	GS-OA-4	FPG44N9012C FPG44N9018C FPG44N9024C FPG44N9030C
Combustion Air Orifice	GS-OA-5	FPG55N9018C FPG55N9024C FPG55N9030C
Collector Box	PL848601	All First Pak Models
Drain Trap	PTRAP01	All First Pak Models
Vent Drain Coupling	GS-CPL-1	All First Pak Models
Drain Outlet Coupling	PD1	All First Pak Models
Plastic Cap 1/4"	PCAP01	All First Pak Models
Plastic Cap 1/2"	PCAP02	All First Pak Models

Table 15 – Replacement Part

For service part inquiries, please contact
8273 Moberly Lane
Dallas, TX 75227
214-388-5751

STARTUP & PERFORMANCE CHECKLIST

FIRST-PAK

CUSTOMER _____ STARTUP DATE _____ JOB # _____

ADDRESS _____ SERVICING COMPANY _____

_____ TECHNICIAN _____

MODEL # _____ SERIAL # _____ PHONE # _____

INSTALLATION CHECK LIST

- ☐ Inspect the unit for transit damage and report any damage on the carrier's freight bill.
- ☐ Check model number to insure it matches the job requirements.
- ☐ Install field accessories and unit adapter panels as required. Follow accessory and unit installation manuals.
- ☐ Verify field wiring, including the wiring to any accessories.
- ☐ Check all multi-tap transformers, to insure they are set to the proper incoming voltage.
- ☐ Prior to energizing the unit, inspect all the electrical connections.
- ☐ Power the unit. Bump the motor contractor to check rotation. Three phase motors are synchronized at the factory. If the blower fans are running backwards, de-energize power to the unit, then swap two of the three incoming electrical lines to obtain proper phasing. Re-check.
- ☐ Perform all start up procedures outline in the installation manual shipped with the unit.
- ☐ Fill in the Start Up Information as outlined below and on the following page.
- ☐ Provide owner with information packet. Explain the thermostat and unit operation.

START UP INFORMATION SHEET

ELECTRICAL

Supply Voltage L1-L2 _____ Compressor Amps _____

Running Voltage L1-L2 _____ Blower Amps _____

Secondary Voltage _____ Condenser Fan Amps _____

C (black) to G (green) Volts* _____

C (black) t W (white) Volts* _____

*With thermostat calling.

AMPERAGE – ERV MOTORS

Intake Motor: Nominal HP

Rated Amps _____

Running Amps _____

Exhaust Motor: Nominal HP

Rated Amps _____

Running Amps _____

AIRFLOW

Intake Design CFM	**Exhaust Design CFM**
Pressure Drop _____	Pressure Drop _____
Calculated CFM _____	Calculated CFM _____
Amb db Temp _____	Amb db Temp _____
Return Air db Temp* _____	Return Air db Temp* _____
Tempered Air db Temp*	Tempered Air db Temp*

*Measure after 15 minutes of run time

TEMPERATURES

Outdoor Air Temperature _____ DB _____ WB

Return Air Temperature _____ DB _____ WB

Cooling Supply Air Temperature _____ DB _____ WB

Heating Supply Air Temperature _____ DB _____ WB

The warranty may be void unless the Startup & Performance Checklist is completed and returned to the warrantor. If the HVAC unit is not installed properly the warranty will be void as the manufacturer can't be held accountable for problems that stem from improper installation.

FIGURE 49 - Startup and Performance Checklist (1 of 2)

STARTUP & PERFORMANCE CHECKLIST CONTINUED

FIRST-PAK

UNIT OPERATION

HEATING MODE

1 GAS INLET PRESSURE _____ IN. W.C.

2 GAS MANIFOLD PRESSURE _____ IN. W.C.

3 INDOOR BLOWER AMPS _____

4 TEMPERATURE RISE

Supply Duct Temperature _____

Return Duct Temperature – _____

Temperature Rise = _____

5 TOTAL EXTERNAL STATIC

Supply External Static _____

Return External Static + _____

Total External Static = _____

6 CONDENSATE LINE

☐ Leak Free

COOLING MODE

3 INDOOR BLOWER AMPS _____

4 TEMPERATURE DROP

Return Duct Temperature _____

Supply Duct Temperature – _____

Temperature Drop = _____

5 TOTAL EXTERNAL STATIC (dry coil)

Supply External Static _____

Return External Static + _____

Total External Static = _____

8 DRAIN LINE

☐ Leak Free

9 THERMOSTAT

☐ Adjusted & Programmed

☐ Explained Operation to Owner

FIGURE 50 - Startup and Performance Checklist (2 of 2)

NOTES

P.O. Box 270969 Dallas, TX 75227
www.firstco.com or www.ae-air.com