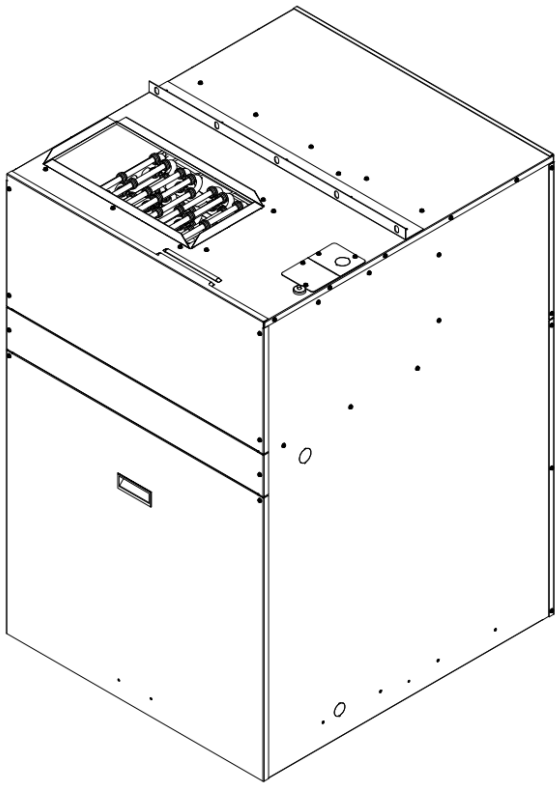
Installation, Operation, & Maintenance Manual

IOM8402
Rev. A 03/22

FPE SERIES
Vertical Packaged Electric Heat / Electric Cooling Unit

FIRST-PAK AC



Intertek

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

COPYRIGHT

First Co. 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 air conditioner 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 safety 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.
4. This product should only be installed and serviced by a qualified, licensed, and factory authorized installer or service agency.
5. All "kits" and "accessories" used must be factory authorized 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 the unit.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.

Verify proper operation after servicing.

SAFETY CONSIDERATIONS CONTINUED

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 unit. Installation and materials, service must be performed by a qualified installer, service agency.

WARNING

Installation and service must be performed by a licensed professional installer (or equivalent), service agency. 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 temperatures 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!"

MODEL NOMENCLATURE

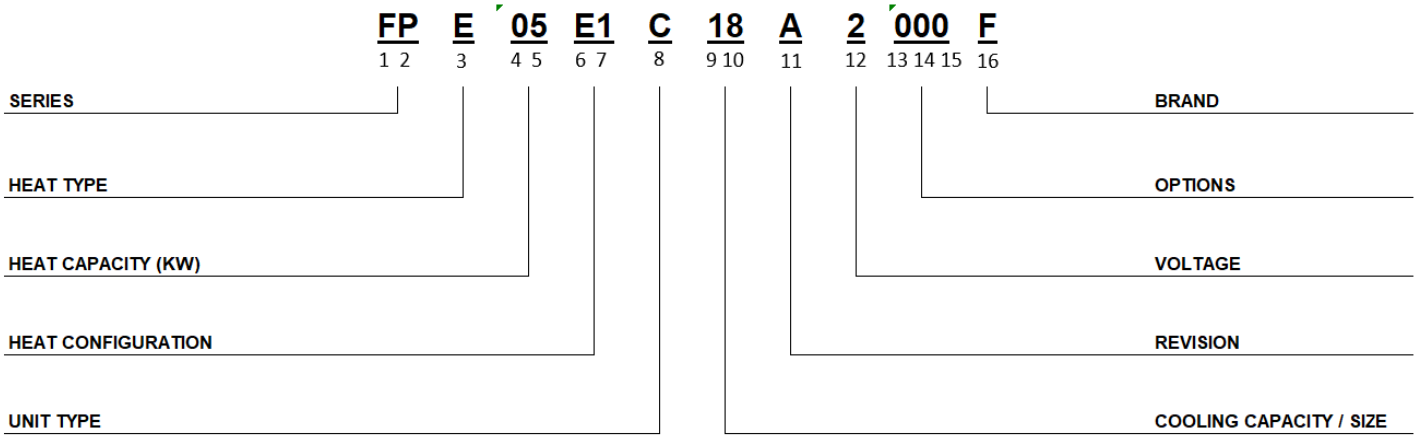


FIGURE 1 - MODEL NOMENCLATURE

MODEL NUMBER DESCRIPTION

DIGITS 1-2 – SERIES
FP – FIRST-PAK

DIGIT 2 – HEAT TYPE
E – Electrical Heat

DIGITS 4-5 – HEAT CAPACITY (KW OR BTU/HR)
00 – No Heat
05 – 5kw
07 – 7kw
10 – 10kw
15 – 15kw

DIGITS 6-7 – HEAT CONFIGURATION
00 – No Heat
E1 – Single Stage Elec Heat

DIGIT 8 – UNIT TYPE
C – Cooling Only
H – Heat Pump

DIGITS 9-10 – CAPACITY
09 – 9,000 Btu/Hr
12 – 12,000 Btu/Hr
18 – 18,000 Btu/Hr
24 – 24,000 Btu/Hr
30 – 30,000 Btu/Hr

DIGIT 11 – REVISION LEVEL
A -

DIGIT 12 – VOLTAGE
2 – 208/230v 1Ph

DIGITS 13-15 – OPTIONS
000 – NONE

DIGIT 16 – BRAND
F – First Co.

GENERAL INFORMATION

CAUTION

DO NOT use these units as a source of heating or cooling 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 air conditioner specifically. For any other related equipment, refer to the appropriate manufacturer's instructions.

WARNING

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

CAUTION

This air conditioner 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 air conditioner 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

The FIRST-PAK FPE series air conditioners are self-contained, electric heating with electric cooling models. The unit design has been certified by Intertek Testing Services for compliance with the Standard of UL 1995 for Safety for Heating and Cooling Equipment. The FPE models are certified to be in compliance with the latest edition of AHRI Standard 210/240.

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

CAUTION

Do not use this air conditioner during any phase of construction.

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.

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

The manufacture does not warrant equipment subjected to abuse.

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

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

NOTE

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

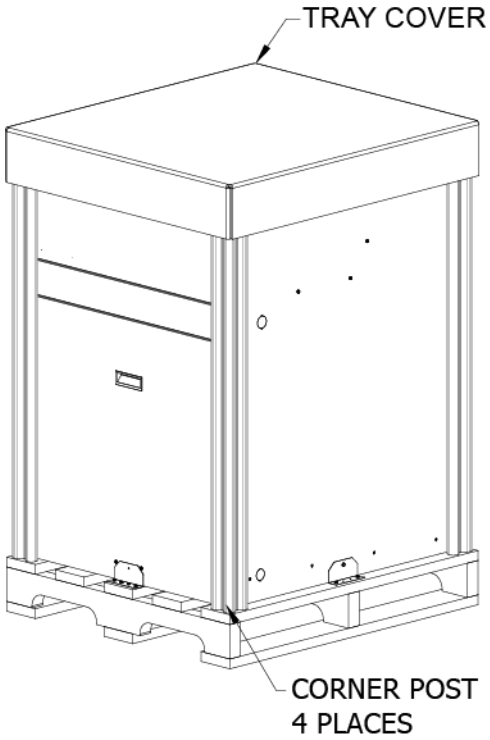


FIGURE 2 – Standard Packaging

PACKAGE LIST

The units will be shipped with the following items:

1- FPE (FIRST-PAK) package electric heat/dx cooling unit:
   - A- Shipping bracket
   - B- Screws (4)
   - C- Top mounting bracket
   - D- Screws (4)

2- Literature package
   - A- IOM - Installation & Operations Manual
   - B- Wall sleeve assembly & installation instructions
   - C- Warranty certificate

3- Bushing #WE1063
   - A- Screw (1)

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) Immediately before installation, remove unit front panel and verify that all electrical connections are tight and that there are no loose wires.
5) Check to make sure that the refrigerant piping is free from any kinks, no visible refrigerant leak and there is no interference between unit piping and sheet metal or electrical wires.
6) 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.
7) Check to make sure compressor mounting bolts and nuts are not loose.
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) Ensure that the shipping brackets and screws are removed from the chassis section. Refer to **FIGURE 3 - Standard Packaging with Shipping Brackets - Front *View*** & **FIGURE 4 – Standard Packaging with Shipping Brackets - Back *View*** for more information.
11) Inspect the electric heater section:
    a. Check if there's any part damaged or loose.
    b. Check to make sure all wiring connections are tight and there are no loose or broken wires.
    c. Check if the insulation peel off.

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.

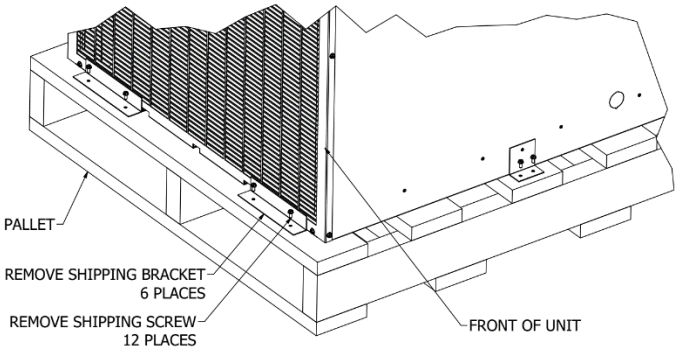


FIGURE 3 - Standard Packaging with Shipping Brackets - Front View

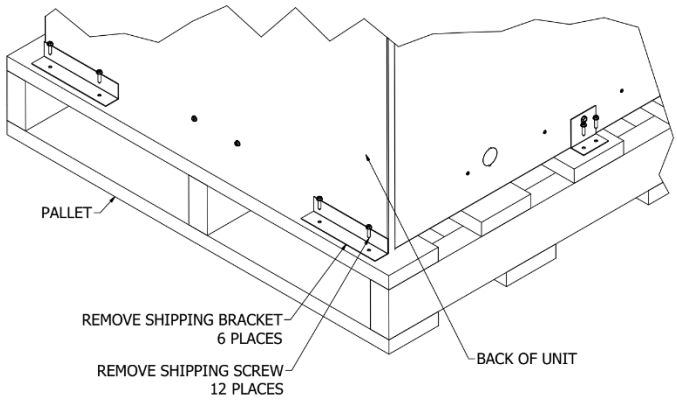


FIGURE 4 – Standard Packaging with Shipping Brackets - Back View

UNIT DIMENSIONAL DATA

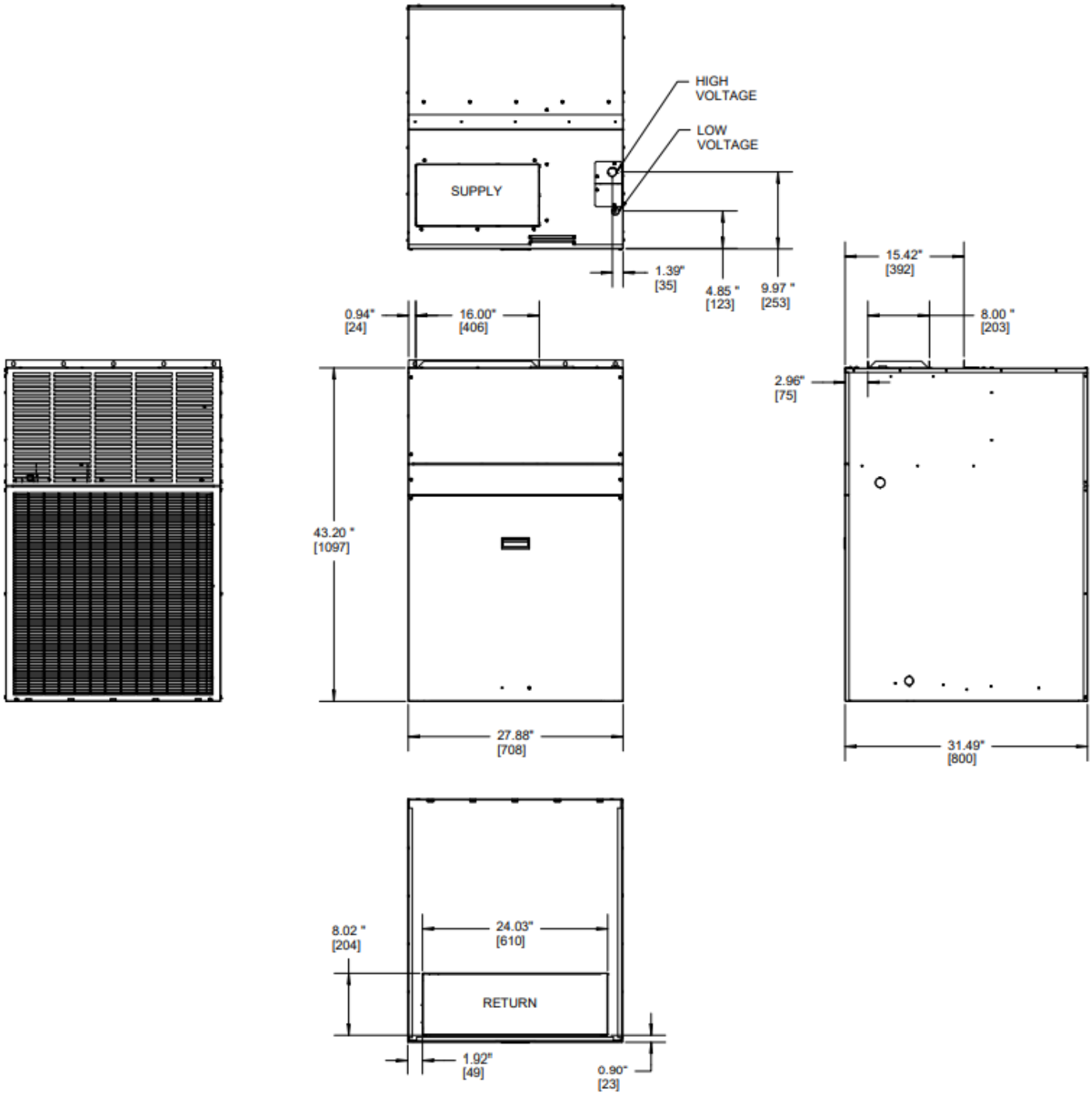


FIGURE 5 - Unit Dimensions

UNIT PHYSICAL DATA

PHYSICAL DATA							
FPE MODELS	05E1C09A	05E1C12A	07E1C12A	10E1C12A	05E1C18A	07E1C18A	10E1C18A
UNIT INFORMATION							
Compressor Qty/Type	Rotary (1)	Rotary (1)	Rotary (1)	Rotary (1)	Rotary (1)	Rotary (1)	Rotary (1)
Factory Charge (R410A) lbs. [kg]	3.7 [1.7]	3.9 [1.8]	3.9 [1.8]	3.9 [1.8]	5.7 [2.6]	5.7 [2.6]	5.7 [2.6]
Compressor Capacitor	40MFD/370V	40MFD/370V	40MFD/370V	40MFD/370V	35MFD/370V	35MFD/370V	35MFD/370V
Condenser Fan HP [kW]	1/5 [.15]	1/5 [.15]	1/5 [.15]	1/5 [.15]	1/3 [.25]	1/3 [.25]	1/3 [.25]
Indoor Fan HP [kW]	1/4 [.17]	1/4 [.17]	1/4 [.17]	1/4 [.17]	1/3 [.25]	1/3 [.25]	1/3 [.25]
Blower Size (D x W) in. [cm]	10 x 6 [25.4 x 15.24]						
Condenser Dimension (H x W) in. [cm]	26 x 23 [66.04 x 58.42]						
Evaporator Dimension (H x W) in. [cm]	24 x 22 [60.96 x 55.88]						
Filter Size (H x W) in. [cm]	24 x 24 [60.96 x 60.96]						
Electric Heater [kW] @240V	5	5	7(2x3.5kW)	10(2x5kW)	5	7(2x3.5kW)	10(2x5kW)
Max. Static Pressure IWC [pa]	0.5 [125]						
Operating Weight lb. [kg]	273	273	275	275	334	336	336
Shipping Weight lb. [kg]	293	293	295	295	354	356	356

Table 1 - Physical Data

PHYSICAL DATA								
FPE MODELS	05E1C24A	07E1C24A	10E1C24A	15E1C24A	05E1C30A	07E1C30A	10E1C30A	15E1C30A
UNIT INFORMATION								
Compressor Qty/Type	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)
Factory Charge (R410A) lbs. [kg]	5.7 [2.6]	5.7 [2.6]	5.7 [2.6]	5.7 [2.6]	5.8 [2.63]	5.8 [2.63]	5.8 [2.63]	5.8 [2.63]
Compressor Capacitor	35MFD/370V	35MFD/370V	35MFD/370V	35MFD/370V	40MFD/370V	40MFD/370V	40MFD/370V	40MFD/370V
Condenser Fan HP [kW]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/3 [.25]	1/3 [.25]
Indoor Fan HP [kW]	1/2 [.37]	1/2 [.37]	1/2 [.37]	1/2 [.37]	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 x 23 [66.04 x 58.42]						
Evaporator Dimension (H x W) in. [cm]		24 x 22 [60.96 x 55.88]						
Filter Size (H x W) in. [cm]		24 x 24 [60.96 x 60.96]						
Electric Heater [kW] @240V	5	7(2x3.5kW)	10(2x5kW)	15(3x5kW)	5	7(2x3.5kW)	10(2x5kW)	15(3x5kW)
Max. Static Pressure IWC [pa]		0.5 [125]						
Operating Weight lb. [kg]	345	346	346	349	346	347	347	350
Shipping Weight lb. [kg]	365	366	366	369	366	367	367	370

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
								CKT1		CKT2		CKT1		CKT2			
		RLA	LRA	FLA	HP	FLA	HP	230V	208V	230V	208V	230V	208V	230V	208V		
FPE05E1C09A	208/230-1-60	4.7	26	1.9	1/5	2.3	1/4	27.8	25.4	N/A	N/A	30	30	N/A	N/A	197	252
FPE05E1C12A	208/230-1-60	5.5	26	1.9	1/5	2.3	1/4	27.8	25.4	N/A	N/A	30	30	N/A	N/A	197	252
FPE07E1C12A	208/230-1-60	5.5	26	1.9	1/5	2.3	1/4	37.8	34.4	N/A	N/A	40	35	N/A	N/A	197	252
FPE10E1C12A	208/230-1-60	5.5	26	1.9	1/5	2.3	1/4	52.7	48.0	N/A	N/A	60	50	N/A	N/A	197	252
FPE05E1C18A	208/230-1-60	7.2	38	2.8	1/3	2.8	1/3	28.4	26.0	N/A	N/A	30	30	N/A	N/A	197	252
FPE07E1C18A	208/230-1-60	7.2	38	2.8	1/3	2.8	1/3	38.4	35.0	N/A	N/A	40	40	N/A	N/A	197	252
FPE10E1C18A	208/230-1-60	7.2	38	2.8	1/3	2.8	1/3	53.4	48.6	N/A	N/A	60	50	N/A	N/A	197	252
FPE05E1C24A	208/230-1-60	10.7	55	2.8	1/3	4.1	1/2	30.0	27.6	N/A	N/A	35	30	N/A	N/A	197	252
FPE07E1C24A	208/230-1-60	10.7	55	2.8	1/3	4.1	1/2	40.0	36.7	N/A	N/A	45	40	N/A	N/A	197	252
FPE10E1C24A	208/230-1-60	10.7	55	2.8	1/3	4.1	1/2	55.0	50.2	N/A	N/A	60	60	N/A	N/A	197	252
FPE15E1C24A	208/230-1-60	10.7	55	2.8	1/3	4.1	1/2	55.0	50.2	25.0	22.6	60	60	25	25	197	252
FPE05E1C30A	208/230-1-60	14.1	65	2.8	1/3	4.1	1/2	30.0	27.6	N/A	N/A	35	30	N/A	N/A	197	252
FPE07E1C30A	208/230-1-60	14.1	65	2.8	1/3	4.1	1/2	40.0	36.7	N/A	N/A	45	40	N/A	N/A	197	252
FPE10E1C30A	208/230-1-60	14.1	65	2.8	1/3	4.1	1/2	55.0	50.2	N/A	N/A	60	60	N/A	N/A	197	252
FPE15E1C30A	208/230-1-60	14.1	65	2.8	1/3	4.1	1/2	55.0	50.2	25.0	22.6	60	60	25	25	197	252

Table 3 - Electrical Data

PERFORMANCE

	COOLING				HEATING			
FPE MODELS	CFM	Btu/h	SEER	S/T	240V		208V	
					KW	Btu/h	KW	Btu/h
FPE05E1C09A	350	9500	12.5	0.78	5	17060	3.8	12814
FPE05E1C12A	460	12000	13.0	0.75	5	17060	3.8	12814
FPE07E1C12A					7	23884	5.3	17940
FPE10E1C12A					10	34120	7.5	25628
FPE05E1C18A	630	17500	13.0	0.74	5	17060	3.8	12814
FPE07E1C18A					7	23884	5.3	17940
FPE10E1C18A					10	34120	7.5	25628
FPE05E1C24A	740	22200	13.0	0.82	5	17060	3.8	12814
FPE07E1C24A					7	23884	5.3	17940
FPE10E1C24A					10	34120	7.5	25628
FPE15E1C24A					15	51180	11.3	38442
FPE05E1C30A	940	27000	12.0	0.75	5	17060	3.8	12814
FPE07E1C30A					7	23884	5.3	17940
FPE10E1C30A					10	34120	7.5	25628
FPE15E1C30A					15	51180	11.3	38442

Table 4 - Performance

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 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.

UNIT LOCATION

This product 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 Company approved wall sleeve must be used to install the unit.

Do not install directly on carpeting, tile, or other combustible material other than wood flooring.

The Installation must conform with local building codes or, in the absence of local codes, to the Protection Association Standards NEPA. No. 90A and NEPA. No. 90B.

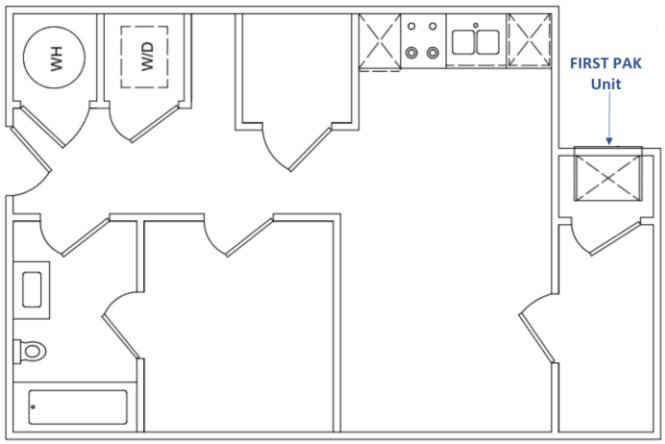


FIGURE 6 – Typical Floorplan with FIRST-PAK on Exterior Wall

INSTALLATION CONTINUED

UNIT CLEARANCE REQUIREMENTS

The interior of the unit may be installed with zero clearances to adjacent combustible surfaces. This unit 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” [81.28cm] open area must be left unobstructed in front of the access panels.

The grille side must be kept free from any obstructions to air flow. The unit must be installed at least 4 feet [1.2192m] from electric meters, gas meters, regulators, and relief equipment.

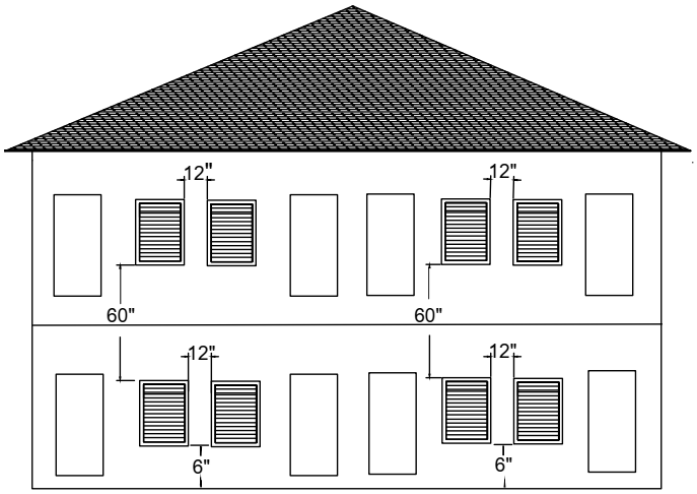


FIGURE 7 – Required Exterior Building Clearance

An air conditioner installed in a garage must also be protected from damage by vehicles.

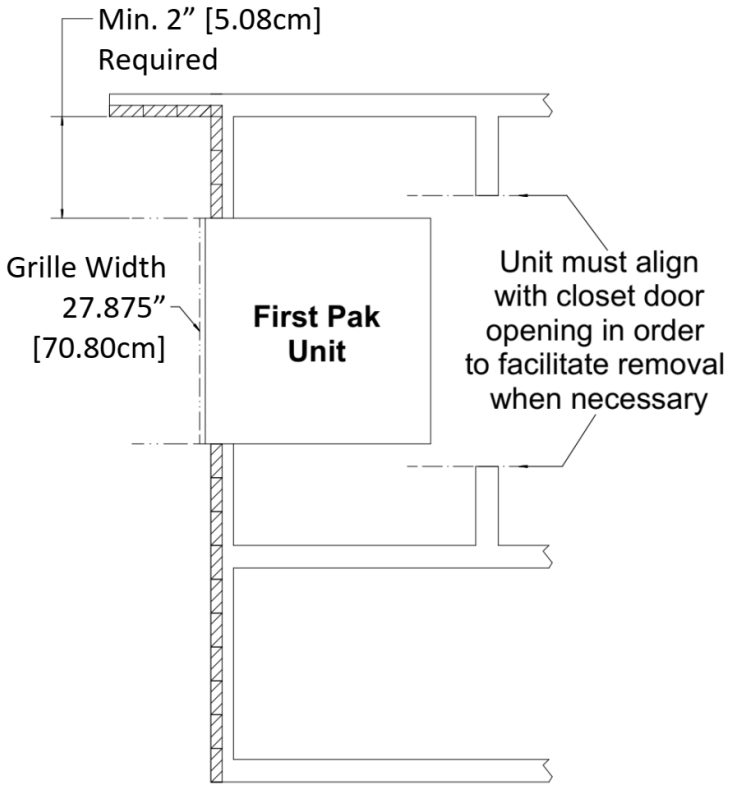


FIGURE 8 – Interior Clearance Requirements

CLEARANCE REQUIREMENTS		
MINIMUM CLEARANCE	INCHES	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

Table 5- Clearance Requirements/Dimensions

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 **CLEARANCE REQUIREMENTS** section in this manual for more information.

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 sloped toward the exterior of the building (FIGURE 9 - Wall Sleeve Mounting). Securely fasten the Architectural grille to the front of the sleeve using the supplied hardware.

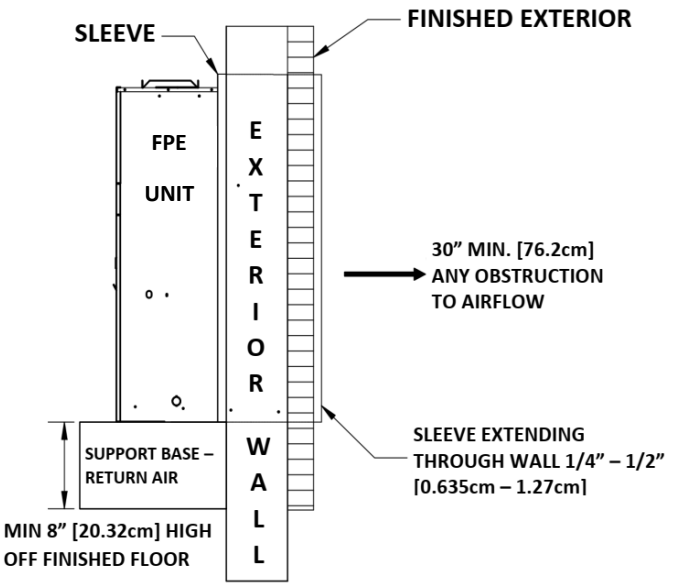


FIGURE 9 - Wall Sleeve Mounting

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 9 - Wall Sleeve Mounting).

REAR INSTALLATION & DIMENSIONS

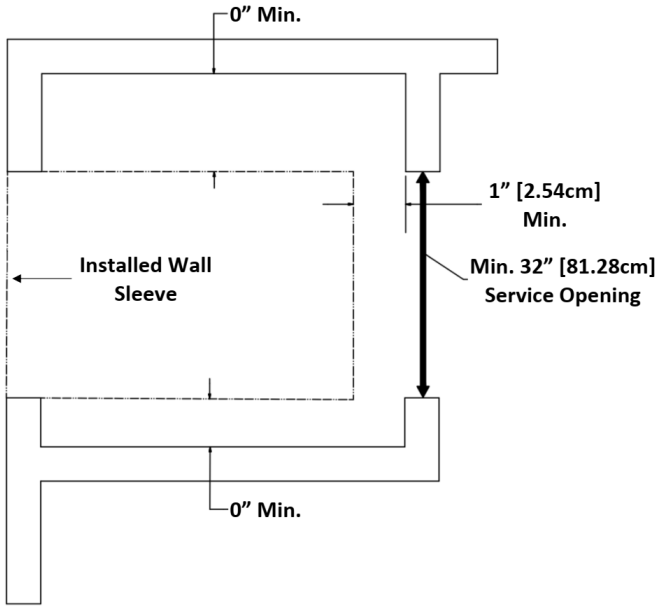


FIGURE 10 - Rear Installation Dimensions

NOTE

Sleeve dimensions vary based on model purchased.

The inside of the unit can be surrounded by a closet with minimum clearance to heater section match to 0" clearance on the sides, 2" [5.08cm] clearance from the top, and 1" [2.54cm] from the front and the plenum. Enough clearance should be provided 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 11 - Unit Support & Alignment. It must be fabricated with plywood, framing lumber and/or any pre-approved sheet metal construction material. FIGURE 11 - Unit Support & Alignment is showing alignment of the platform top with the base panel of the wall sleeve.

- Minimum height of platform = 8” [20.32cm]
- Recommended platform width = 29” [73.66cm]
- Recommended platform depth = 16” [40.64cm]

Refer to FIGURE 11 - 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. It is recommended that for leveling purposes the unit should be well supported.
3. If additional vibration isolation material is required, non-combustible material MUST be used.
4. Ensure that the platform connection to FIRST-PAK Return Air Opening can fit an 8” x 24” [20.32cm x 60.96cm] duct. The FIRST-PAK unit must be aligned with return air opening on the unit base.
5. Ensure the support structure and the Wall Sleeve provide a secure, fixed, and leveled position. This allows a provision of bringing return air via ducting to the space under the unit.

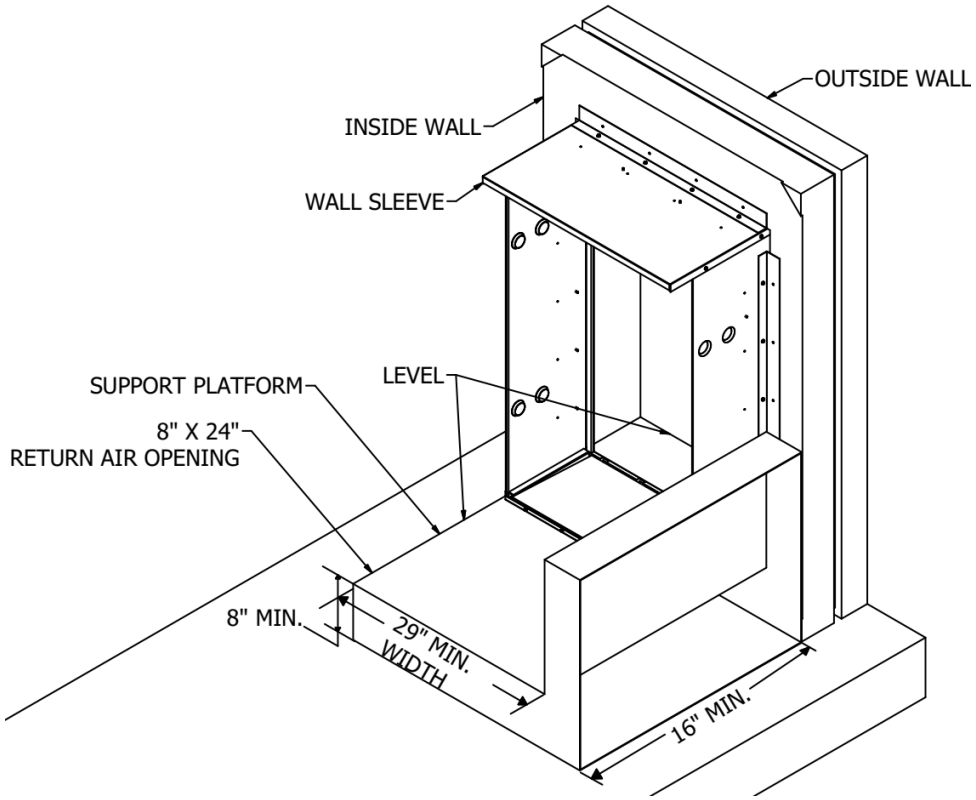


FIGURE 11 - Unit Support & Alignment

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

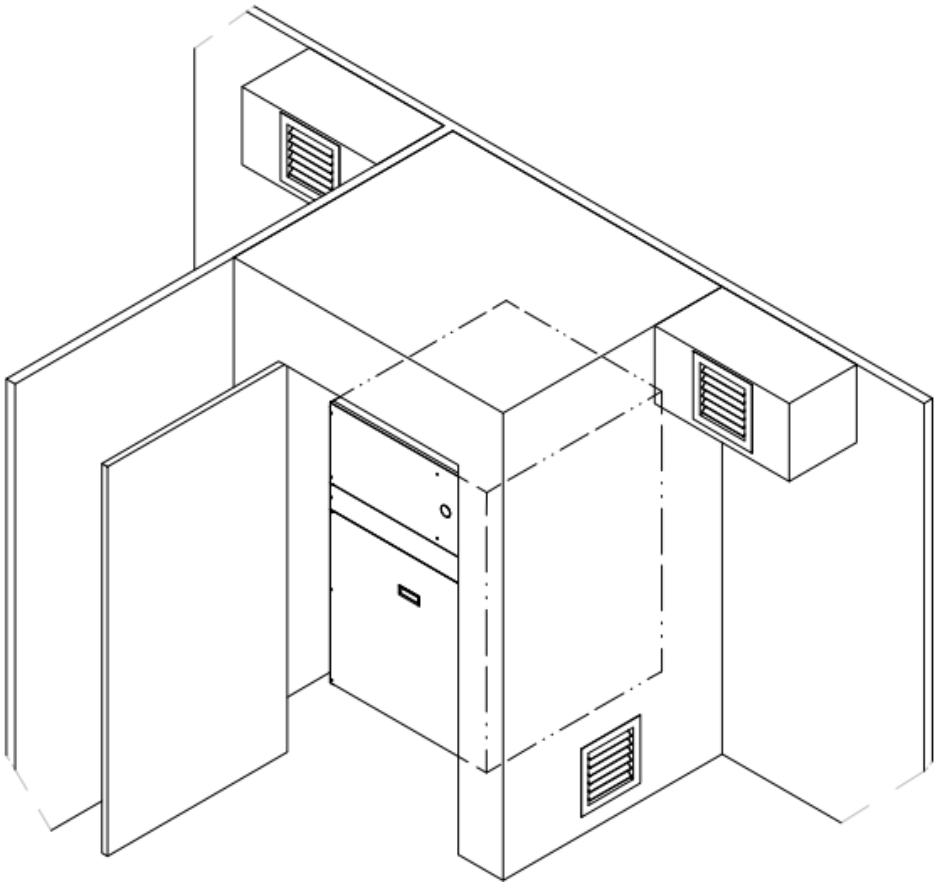


FIGURE 12 - FIRST-PAK Unit Installation

NOTE

Locate the unit in an area that provides minimum clearance to 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. FIRST-PAK units are available in right and left hand configurations. Units should be mounted on the sleeve with a pitch to the outside of the building.

Insulation is installed 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 on the product 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.

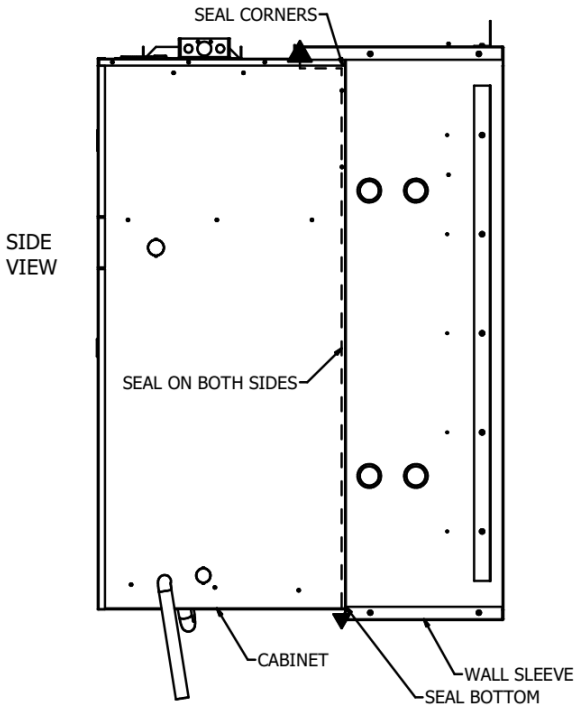


FIGURE 13 – Wall Sleeve Seal

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 discharge 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 17 –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.

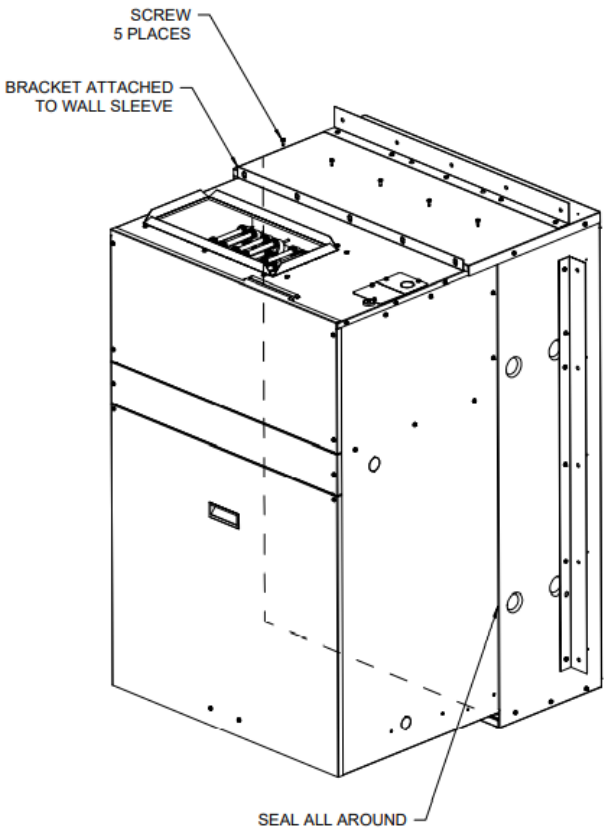


FIGURE 14 – Top Bracket Installation on Sleeve

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 settled 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

IMPORTANT

Both supply and return air ducts must be ducted 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.

Insufficiently sized ductwork will cause low supply airflow, which could cause low cooling performance, liquid flood back to compressor and condensate in the cabinet. In heating operation, low airflow could cause the heater auto-reset limit switch cycle on and off, which would reduce the longevity of heating element. Excessive airflow may result in a noisy duct system and could lower heating supply temps to an uncomfortable level. Unit external static cannot be more than 0.5 in. w.c.

Ductwork should be adequately insulated to prevent condensation and to minimize heat loss within the duct system. A flexible connector is recommended for supply air connections on metal duct systems to limit noise.

RETURN AIR DUCTING

Return air ducting can be brought in through a wall grille or opening and then to the unit. The return duct should be sealed to the return air opening on the bottom of the unit and must terminate inside of the indoor space. It is recommended to use duct material with acoustically lined insulation for sound attenuation. The return duct must be sized for a 24”x 8” [60.96cm x 20.32cm] opening and it is recommended to use sheet metal screws

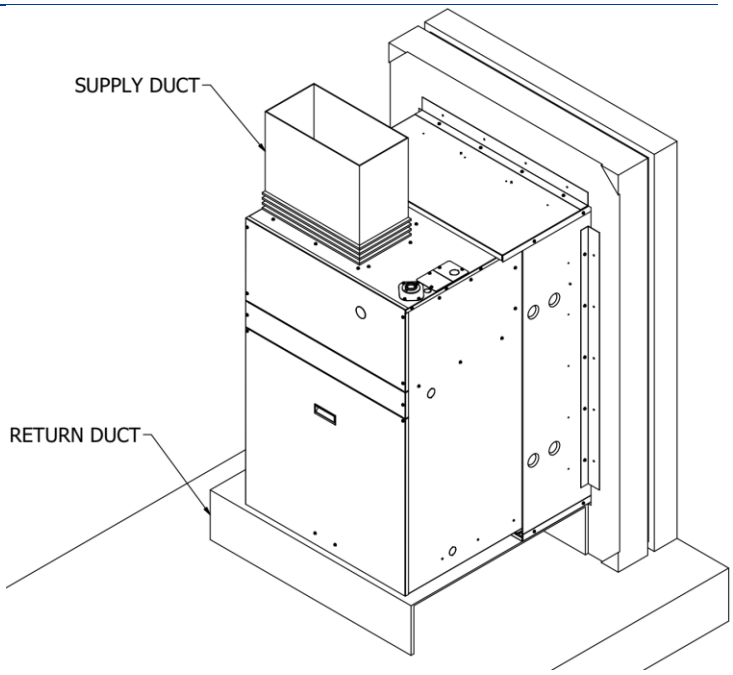


FIGURE 15 – Unit Return Ducting

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. Drain line should be insulated to prevent condensate dropping to the ground and duct.

CAUTION

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

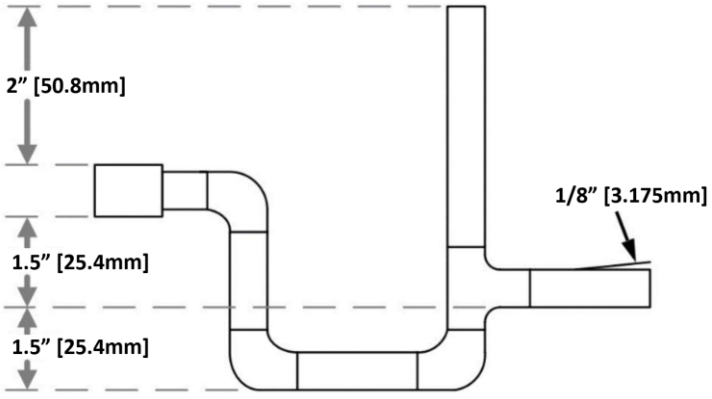


FIGURE 16 - Condensate Drain Layout

INSTALLATION CONTINUED

AIR FILTER

All indoor return air must be filtered. The preferred methods are:

1. Use the factory supplied filter kit which attaches to the inlet of the evaporator.
2. Use the filter kit supplied with the access panel which accepts an 24 inch x 24 inch x 1 inch [60.96cm x 60.96cm x 2.54cm] throwaway type of filter.
3. Install a filter in the return grille mounted in the wall. Any field installation of an air filter, means must be provided, for us of a disposable filter which is no smaller than the face area of the evaporator coil.
4. Located in the return air opening, all indoor return air must be filtered.
5. A filter of same size or a filter with equivalent pressure drop must be used at all time.
6. A washable filter is provided with the unit and can be easily removed by the consumer.
7. If a return duct is installed, provisions must be to accommodate filter servicing.
8. It's recommended to clean filter at least 3 times in summer and winter season or more if needed.
9. Filter can be cleaned by dusting the filter by shaking or vacuuming, this filter can also be washed with some soap and water and replace once it's dry is recommended.
10. The washable filter can be used or replaced with a disposable filter of the same size as mentioned in the table provided to size the filter.

AIR FILTER MINIMUM DIMENSIONS	
Model Series	Minimum Area
FPE**E1*****	576 sq. inches [0.3716 sq. meter]

Table 6 - Air Filter Minimum Dimensions

CAUTION

Do not operate this equipment without an air filter.

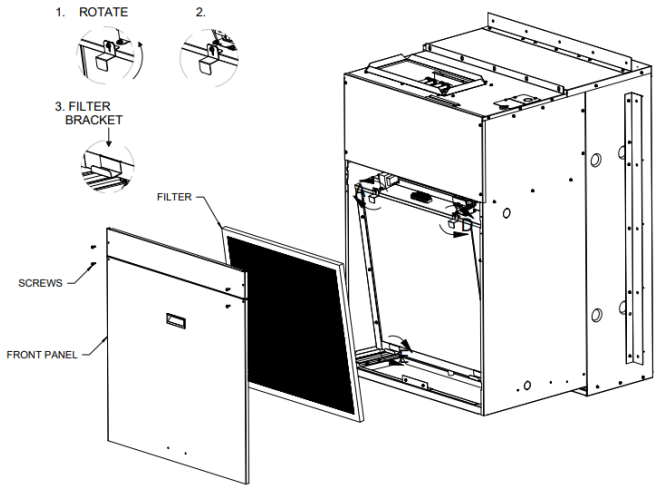


FIGURE 17 –Air Filter Location

ELECTRICAL

HIGH VOLTAGE

WARNING

ELECTRIC SHOCK HAZARD

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

NOTE

FPE15E1C24A *** model requires two separated power resource 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. Units are provided with wiring diagrams and nameplate data to provide information required for necessary field wiring.

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.

Unit with 5kW, 7kW or 10kW heaters has a knockout hole on the top panel for field line voltage connection. Unit with 15kW heater has two knockout holes for field line voltage connection. The bigger one is for power supply connected to the 60A circuit breaker in the unit. The smaller knockout hole is for power supply connected to the 30A circuit breaker in the unit. See FIGURE 18, FIGURE 19 and FIGURE 20. The ground wire must be connected to the ground screws with gold disk.

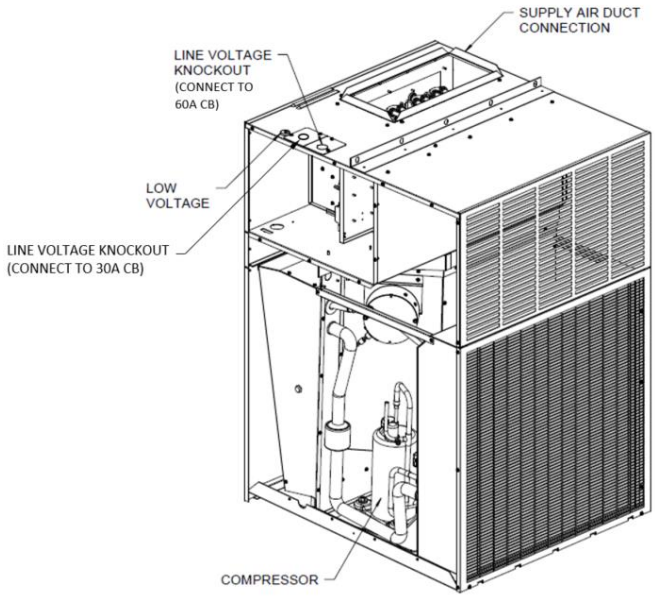


FIGURE 19 – Cabinet with 15kW Heater

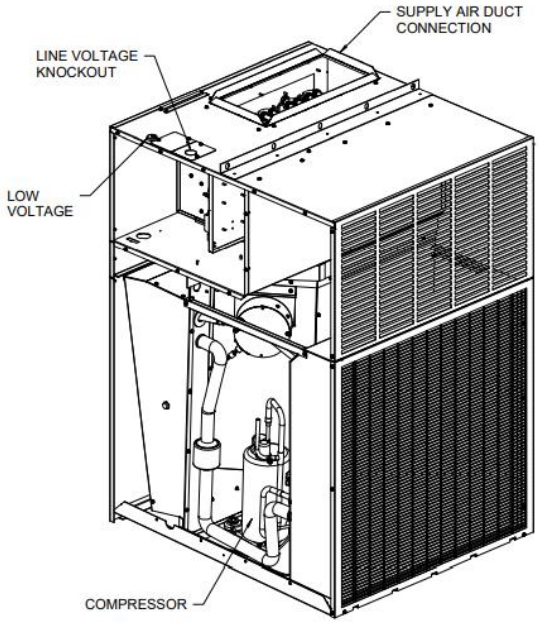


FIGURE 18 – Cabinet with 5KW, 7KW, 10KW Heaters

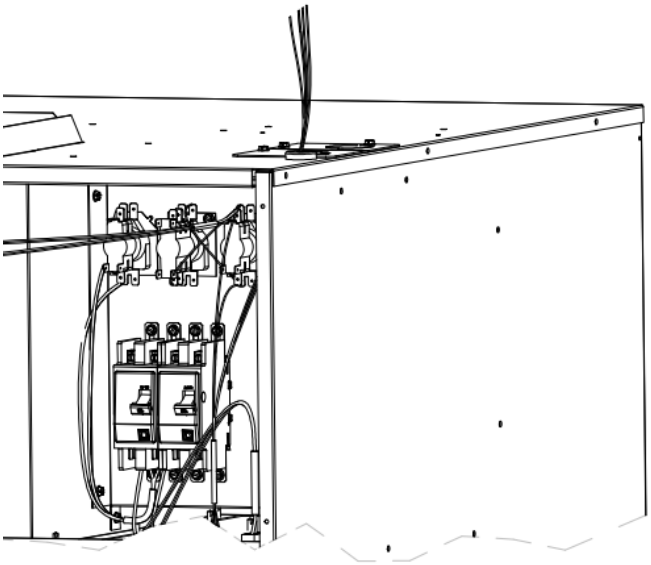


FIGURE 20– Heater Electric Panel Layout

208-230 VOLT OPERATION

All 208-230 Volt units are factory wired for 230 Volt operation. For 208 Volt operation, moving/changing/rewiring the line voltage tap on the 24 Volt control transformer is required. See note 3 on the wiring diagram for instruction.

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 against the wall so that it appears level and so the thermostat wires protrude through the middle of the back plate mounting holes and drill holes with a 3/16" [5mm] bit. Install supplied anchors and secure plate to the wall. Thermostat wire must be 18 AWG wire.

LOW VOLTAGE

THERMOSTAT

A standard 24 VAC single state heating and cooling thermostat is required to control this unit. A thermostat with a "C" common terminal is preferred. Thermostat should be connectted to the control wire through the LOW VOLTAGE hole on the top panel shown in FIGURE 18 and FIGURE 19. 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 –	Red	Evaporator Blower
R –	Green	Transformer 24VAC Hot

Table 7 - Thermostat Connections Key

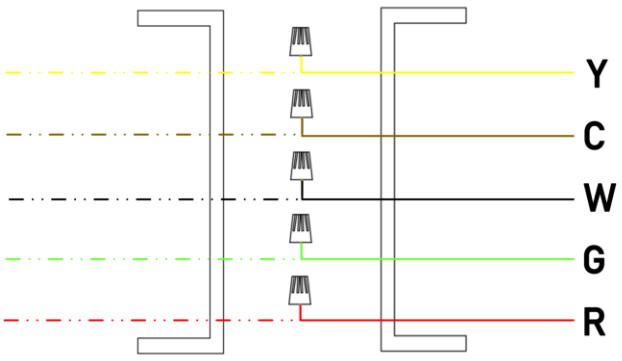


FIGURE 21 - Thermostat Connections

CONTROLS

COOLING OPERATION

STEADY STATE COOLING

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 from the system the control immediately energizing 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 indoor fan is energized with the "G" call after a .25s delay. The fan remains energized as long as the "G" input is provided to the unit without a "Y" or "W".

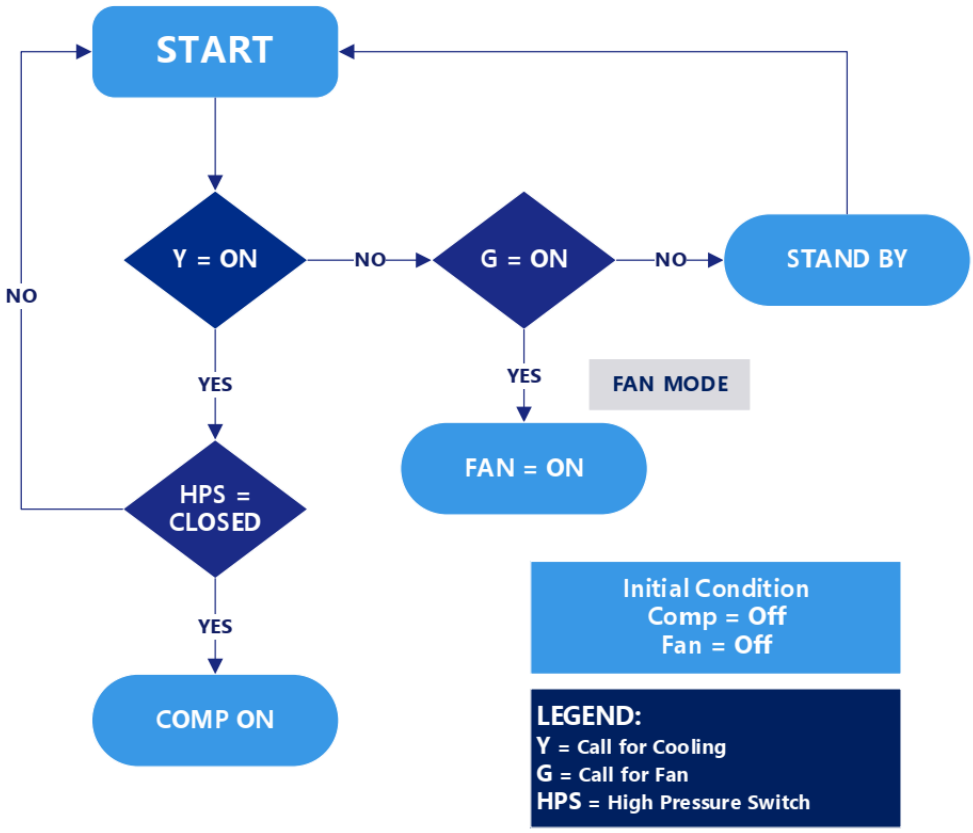


FIGURE 22 - Cooling Sequence of Operations

LOW AMBIENT COOLING OPERATION

The unit is designed to operate down to 35°F outside air ambient. For cooling operation at below 35°F outside air ambient, low ambient kit is required.

CONTROLS CONTINUED

BLOWER CONTROL

The FPE units are equipped with a direct drive indoor blower motor. FPE**E1C09A and FPE**E1C12A have a blower motor with 4 speeds. 2 speeds reserved for heating, 1 tap reserved for cooling, and 1 speed reserved for ventilation. All other models have 5 fan speeds, with 2 fan speeds reserved for heating, 2 fan speeds reserved for cooling, and 1 speed reserved for ventilation. The cooling fan speed selection wire and heating fan speed selection wires are located on separate wires. **In order to change the fan speed setting, move the fan speed selection wire to the desired tap. See wiring diagram located on the unit.**

Refer to **Table 7 – BLOWER PERFORMANCE DATA and Table 8 – BLOWER PERFORMANCE DATA – CONTINUED** for information on the select speed changes for heat and cool mode.

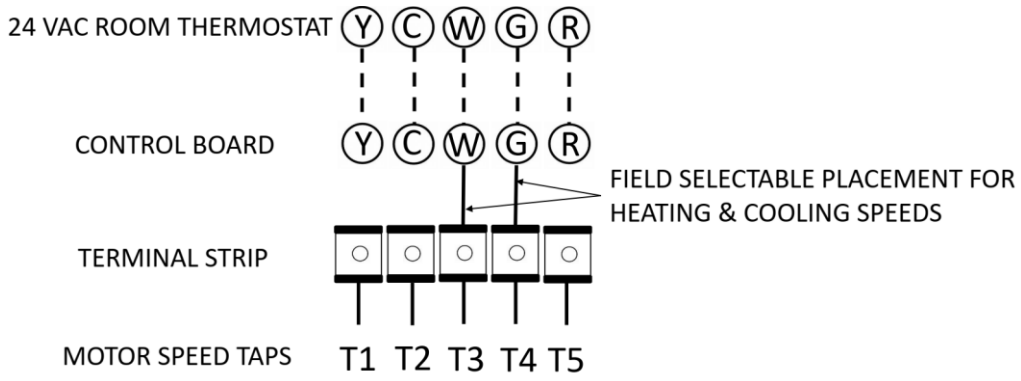


FIGURE 23 - Blower Control Tap

WARNING

The unit is designed to operate at maximum 0.5 in.w.c external static pressure. Running at more than 0.5 in.w.c E.S.P may cause unit not working properly and even damage the unit. For applications requiring higher static operation, please contact factory or the manufacture's sales reps.

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.

CONTROLS CONTINUED

BLOWER PERFORMANCE						
Unit Model	Blower Speed Tap	SCFM @ External Static Pressure (in.w.c)				
		0.1	0.2	0.3	0.4	0.5
FPE05E1C09A	T1	278	207	168	87	
	T2[H]	541	500	466	428	386
	T3	630	591	557	529	496
	T4[C]	374	331	285	221	
FPE05E1C12A	T1	317	259	214	140	98
	T2[H]	541	500	466	428	386
	T3	630	591	557	529	496
	T4[C]	466	450	408	363	323
FPE07E1C12A	T1	321	260	197	149	108
	T2[H]	614	577	542	521	488
	T3	691	656	624	595	567
	T4[C]	486	445	401	354	314
FPE10E1C12A	T1	321	260	197	149	108
	T2[H]	691	656	624	595	567
	T3	614	577	542	521	488
	T4[C]	486	445	401	354	314
FPE05E1C18A	T1	442	328	263	233	204
	T2[H]	747	722	688	665	639
	T3	876	851	822	798	770
	T4[C]	667	648	618	580	552
	T5	713	695	666	632	606
FPE07E1C18A	T1	436	323	257	231	201
	T2[H]	741	715	682	659	639
	T3	869	846	815	793	763
	T4[C]	662	642	609	575	552
	T5	707	689	657	628	606
FPE10E1C18A	T1	436	323	257	231	201
	T2[H]	929	897	865	841	803
	T3	807	785	753	733	709
	T4[C]	662	642	609	575	552
	T5	707	689	657	628	606
FPE05E1C24A	T1	559	482	425	387	325
	T2[H]	820	772	741	702	674
	T3	978	947	916	879	855
	T4[C]	766	715	677	637	611
	T5	919	882	853	816	791

Table 8 BLOWER PERFORMANCE DATA

CONTROLS CONTINUED

BLOWER PERFORMANCE						
Unit Model	Blower Speed Tap	SCFM @ External Static Pressure (in.w.c)				
		0.1	0.2	0.3	0.4	0.5
FPE07E1C24A	T1	543	477	424	384	325
	T2[H]	808	765	738	694	664
	T3	973	937	906	870	844
	T4[C]	768	720	688	647	620
	T5	908	871	843	804	780
FPE10E1C24A	T1	543	477	424	384	325
	T2[H]	840	798	768	729	705
	T3	973	937	906	870	844
	T4[C]	768	720	688	647	620
	T5	908	871	843	804	780
FPE15E1C24A	T1	517	472	422	387	336
	T2[H]	1050	1003	958	906	848
	T3	931	899	877	846	823
	T4[C]	773	742	713	690	666
	T5	889	858	831	802	779
FPE05E1C30A	T1	559	482	425	387	325
	T2[H]	820	772	741	702	674
	T3	978	947	916	879	855
	T4[C]	941	906	878	840	814
	T5	978	947	916	879	855
FPE07E1C30A	T1	543	477	424	384	325
	T2[H]	808	765	738	694	664
	T3	973	937	906	870	844
	T4[C]	941	906	878	839	814
	T5	973	937	906	870	844
FPE10E1C30A	T1	543	477	424	384	325
	T2[H]	840	798	768	729	705
	T3	973	937	906	870	844
	T4[C]	941	906	878	839	814
	T5	973	937	906	870	844
FPE15E1C30A	T1	517	472	422	387	336
	T2[H]	1050	1003	958	906	848
	T3	931	899	877	846	823
	T4[C]	948	913	883	847	826
	T5	1050	1003	958	906	848

NOTE:

. Airflow data shown is with dry coil at 70°F DB EAT with standard 1" air filter.
. Unit is not recommended in the shaded area.
. For models with four speed taps, tap T1 is for ventilation. T2 and T3 are for heating operation. T4 is for cooling operation.
. For models with five speed taps, tap T1 is for ventilation. T2 and T3 are for heating operation. T4 and T5 are for cooling operation.
. Superscript C indicates factory-set default cooling tap. Superscript H indicates factory-set default heating tap.

Table 9 BLOWER PERFORMANCE DATA -CONTINUED

CONTROLS CONTINUED

HEATING OPERATION

When the thermostat calls for heating, the “W” signal is energized. The evaporator coil blower starts operation immediately. The heater would not start until 1 to 10 seconds delay.

TEMPERATURE LIMIT CONTROL

The electric heater is equipped with auto-reset temperature limit switch and non-resettable fuse link. In the case of supply temperature too high caused by abnormal situations such as low airflow due to dirty clogged air filter or air leak or no airflow due to failed motor, the auto-reset limit switch will interrupt the power to the heating elements. Once the heating elements cool down, the limit switch will close and the power to the heating elements will be restored. The heater will resume the operation. If the auto-reset switch is permanently closed, the non-resettable fuse link will activate to cut off the power to the heating elements permanently. The heater will stop working until the fuse link is replaced by a certified technician or agency.

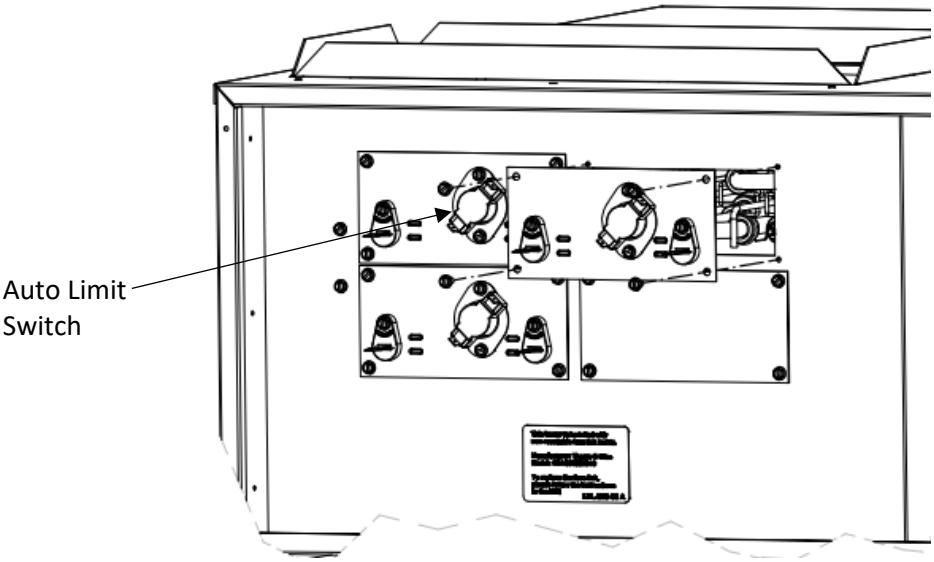


FIGURE 24 – Auto-Reset Temperature Limit Switch

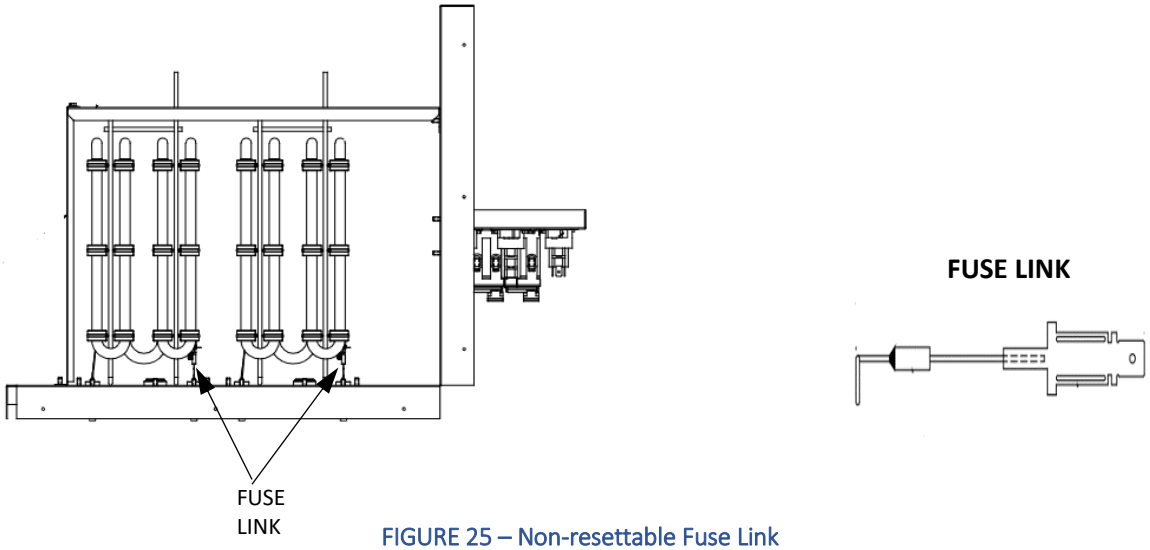


FIGURE 25 – Non-resettable Fuse Link

LOCATION OF MAJOR COMPONENTS

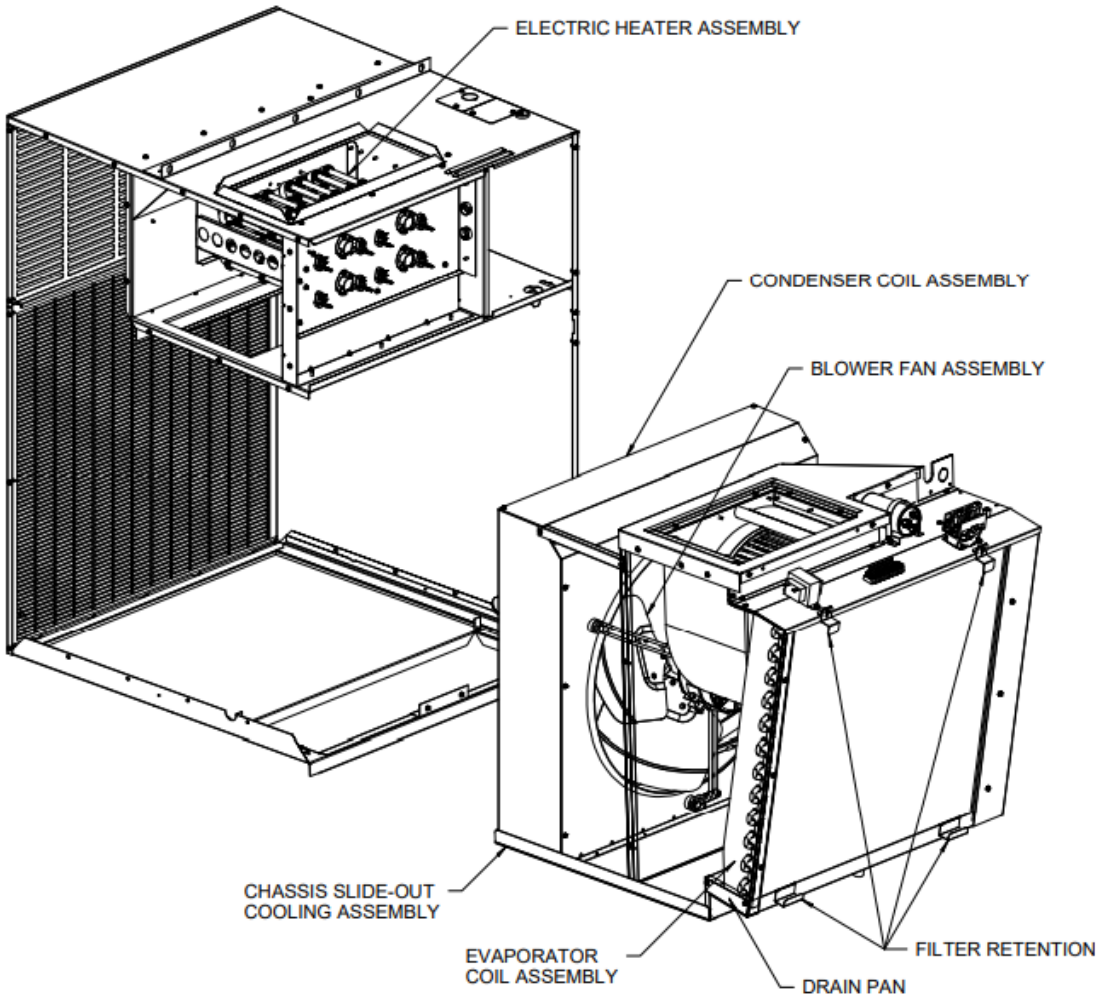


FIGURE 26 – Slide-Out Chassis Assembly

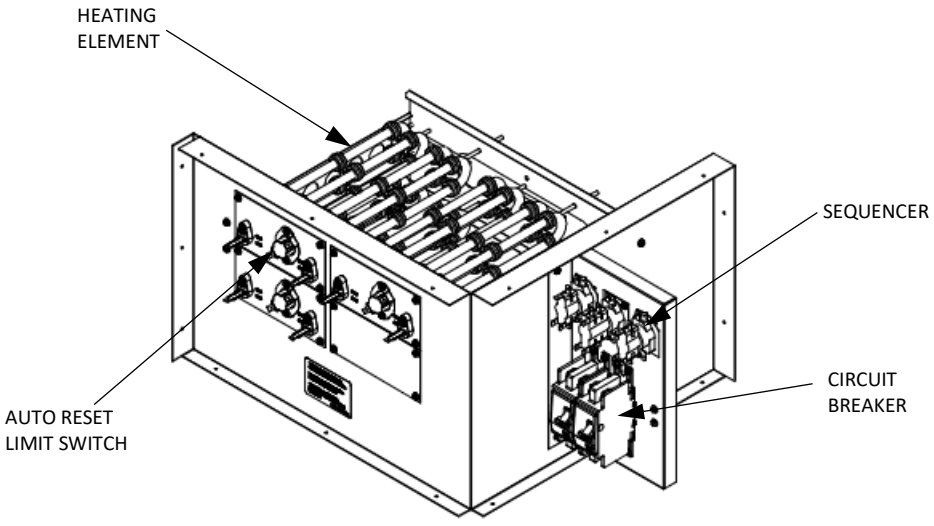


FIGURE 27 – Electric Heater Assembly (15KW)

REPLACEMENT PARTS

PART NAME	PART #	MODEL USE
Compressor	CO102GKS	FPE05E1C09A
Compressor	CO120KAB	FPE05E1C12A FPE10E1C12A FPE07E1C12A
Compressor	CO151GJS	FPE05E1C18A FPE10E1C18A FPE07E1C18A
Compressor	CO21K	FPE05E1C24A FPE10E1C24A FPE07E1C24A FPE15E1C24A
Compressor	CO297	FPE05E1C30A FPE15E1C30A FPE07E1C30A FPE10E1C30A
Condenser Fan Motor	MDR033240A	FPE05E1C18A FPE07E1C24A FPE07E1C18A FPE10E1C24A FPE10E1C18A FPE15E1C24A FPE05E1C24A
Condenser Fan Motor	MDR033240RA	FPE05E1C30A FPE10E1C30A FPE07E1C30A FPE15E1C30A
Condenser Fan Motor	MDR020240R	FPE05E1C09A FPE07E1C12A FPE05E1C12A FPE10E1C12A
Evaporator Blower Motor	MDP025115	FPE05E1C09A FPE07E1C12A FPE05E1C12A FPE10E1C12A
Evaporator Blower Motor	MDX033240	FPE05E1C18A FPE10E1C18A FPE07E1C18A
Evaporator Blower Motor	MDX050240	FPE05E1C24A FPE10E1C24A FPE07E1C24A FPE15E1C24A FPE05E1C30A FPE10E1C30A FPE07E1C30A FPE15E1C30A
Fan Blade	FB20305	FPE05E1C09A FPE05E1C24A FPE05E1C12A FPE07E1C24A FPE07E1C12A FPE10E1C24A FPE10E1C12A FPE15E1C24A FPE05E1C18A FPE07E1C18A FPE10E1C18A
High Pressure Switch	E2125	All FIRST-PAK Models
Filter Drier	CP20053	All FIRST-PAK Models
Evaporator Coil Assembly	321-363	FPE05E1C09A FPE07E1C12A FPE05E1C12A FPE10E1C12A
Evaporator Coil Assembly	321-361	FPE05E1C18A FPE15E1C24A FPE07E1C18A FPE05E1C30A FPE10E1C18A FPE07E1C30A FPE05E1C24A FPE10E1C30A FPE07E1C24A FPE15E1C30A FPE10E1C24A
Condenser Coil Assembly	321-364	FPE05E1C09A FPE07E1C12A FPE005E1C12A FPE10E1C12A

PART NAME	PART #	MODEL USE
Condenser Coil Assembly	321-362	FPE05E1C18A FPE15E1C24A FPE07E1C18A FPE05E1C30A FPE10E1C18A FPE07E1C30A FPE05E1C24A FPE10E1C30A FPE07E1C24A FPE15E1C30A FPE10E1C24A
Expansion Valve	CP8312	FPE05E1C09A
Expansion Valve	CP8308	FPE05E1C12A FPE10E1C12A FPE07E1C12A
Expansion Valve	CP8309	FPE05E1C18A FPE10E1C18A FPE07E1C18A
Expansion Valve	CP8310	FPE05E1C24A FPE10E1C24A FPE07E1C24A FPE15E1C24A
Expansion Valve	CP8311	FPE05E1C30A FPE10E1C30A FPE07E1C30A FPE15E1C30A
Air Filter	AF2424	All FIRST-PAK Models
5kW Heater Assembly	310-641-1	FPE05E1C**A
7kW Heater Assembly	310-641-2	FPE07E1C**A
10kW Heater Assembly	310-641-3	FPE10E1C**A
15kW Heater Assembly	310-641-4	FPE15E1C**A
Heating Element Assembly 5kW	115-3-2	FPE05E1C**A FPE10E1C**A FPE15E1C**A
Heating Element Assembly 3.75kW	115-3-10	FPE07E1C**A
Auto-Reset Limit Switch	E144	All FIRST-PAK w/Electric Heat Models
Non-resettable Fuse Link	115-38-1	All FIRST-PAK w/Electric Heat Models
Contactor	E1323777	All FIRST-PAK Models
Transformer	E1372	All FIRST-PAK Models
30A Circuit Breaker	E1771	FPE15E1C24A FPE15E1C30A
60A Circuit Breaker	E1801	FPE15E1C24A FPE15E1C30A
Sequencer	E142	FPE05E1C**A FPE07E1C**A FPE10E1C**A FPE15E1C**A
Sequencer	E143	FPE07E1C**A FPE10E1C**A
Sequencer	E1433	FPE15E1C24A FPE15E1C30A
Capacitor	E1502	FPE**E1C18A FPE**E1C24A
Capacitor	E1508	FPE**E1C09A FPE**E1C12A FPE**E1C30A

Table 10 – Replacement Parts

WIRING DIAGRAMS

FPE05E1C09A, FPE05E1C12A ROTARY 208-230V ECM

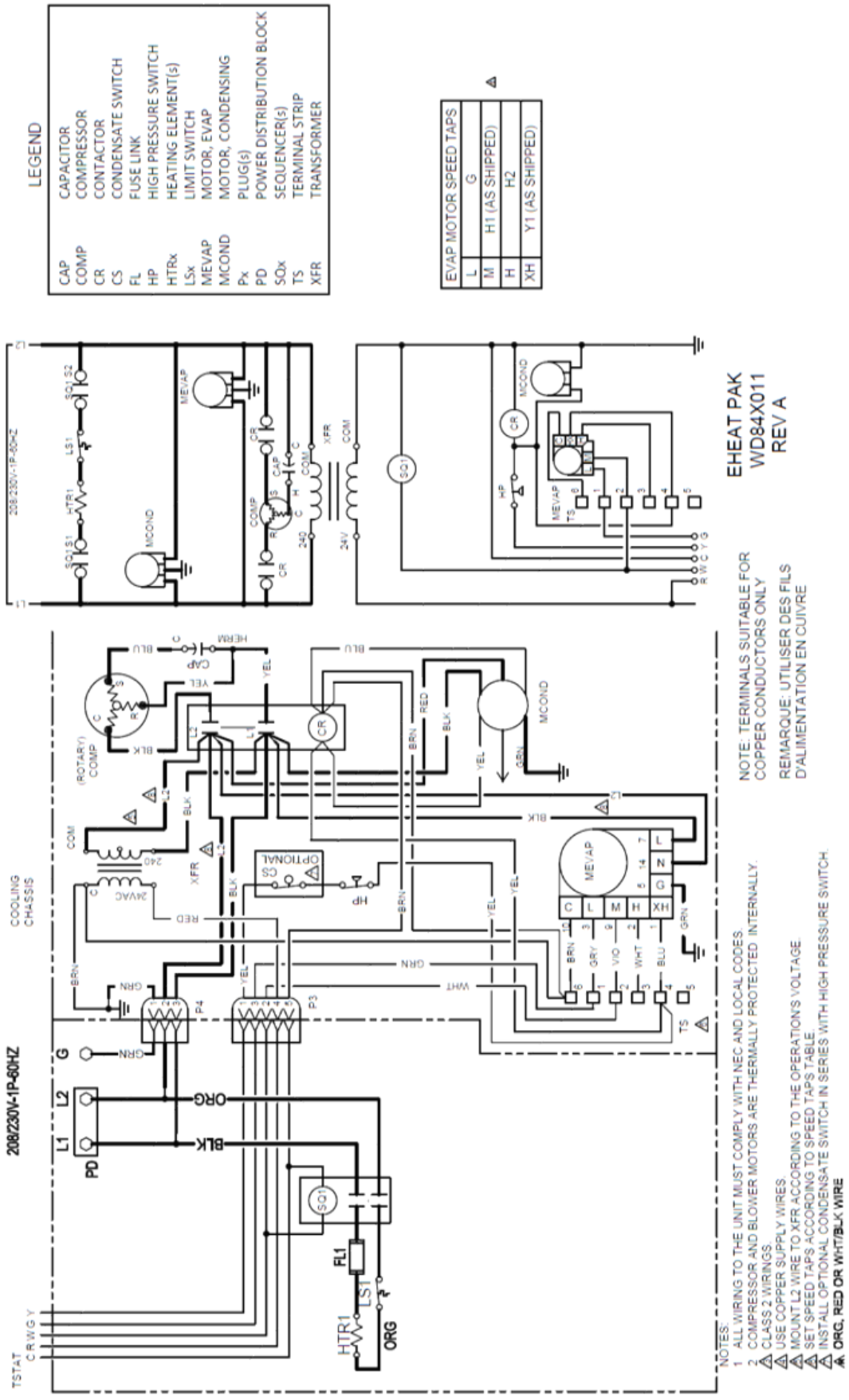


FIGURE 28– FPE05E1C09A, FPE05E1C12A 208-230V ECM Wiring Diagram

WIRING DIAGRAMS

FPE07E1C12A, FPE10E1C12A ROTARY 208-230V ECM

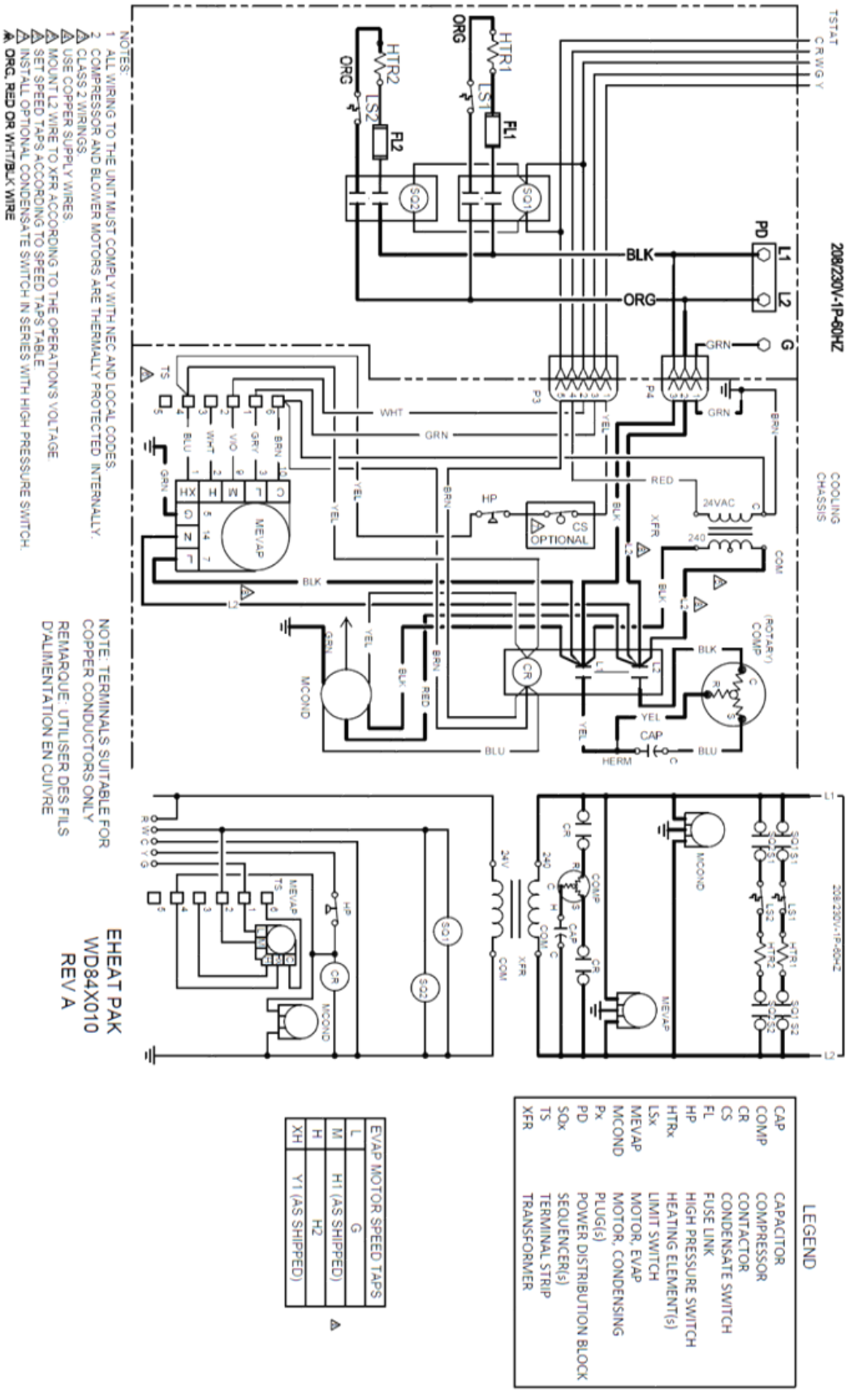


FIGURE 29 – FPE07E1C12A, FPE10E1C12A ROTARY 208-230V ECM Wiring Diagram

WIRING DIAGRAMS

FPE05E1C18A ROTARY 208-230V ECM

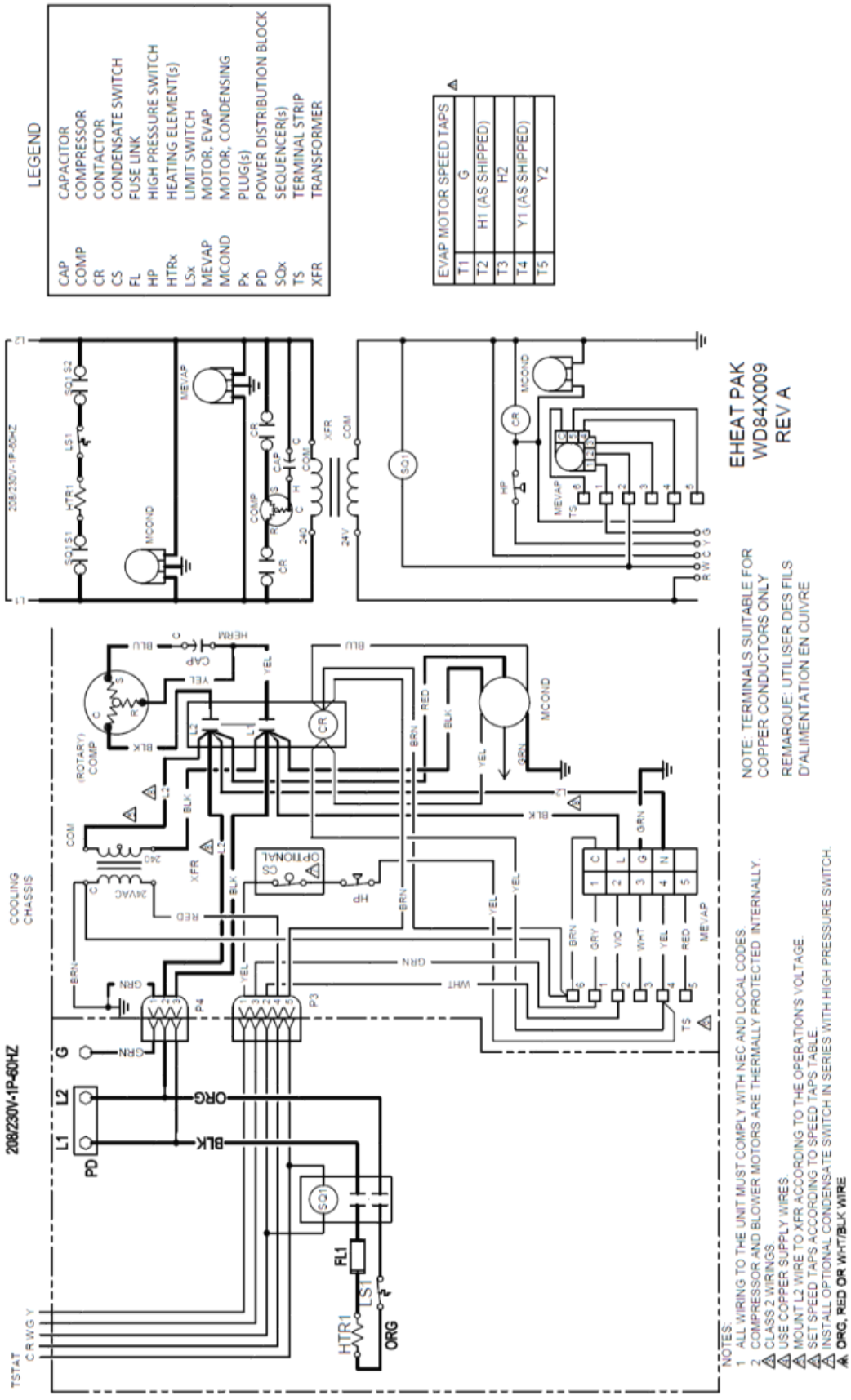


FIGURE 30 – FPE05E1C18A ROTARY 208-230V ECM Wiring Diagram

WIRING DIAGRAMS

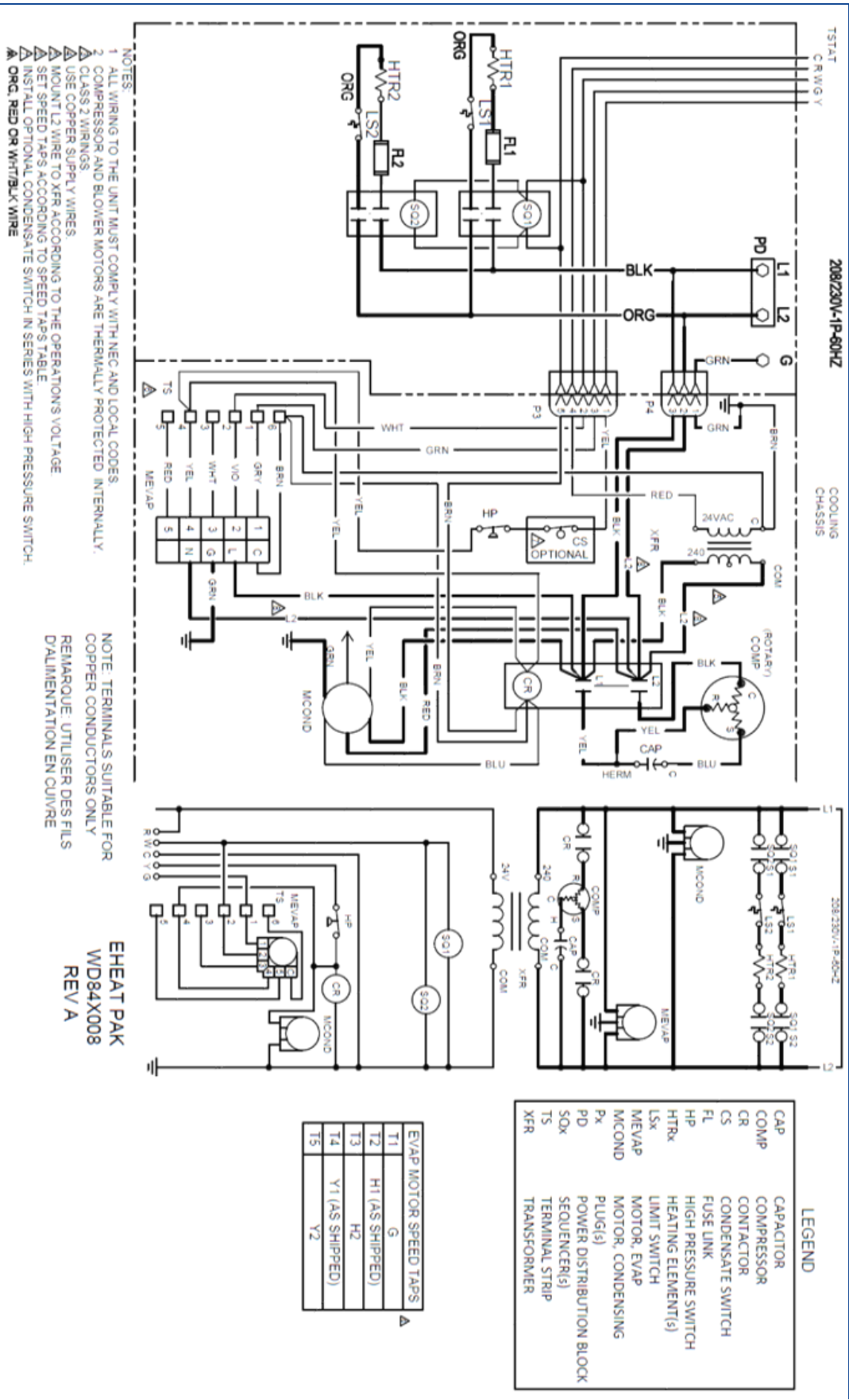


FIGURE 31 – FPE07E1C18A, FPE10E1C18A 208-230V ECM Wiring Diagram

WIRING DIAGRAMS

FPE05E1C24A SCROLL 208-230V ECM

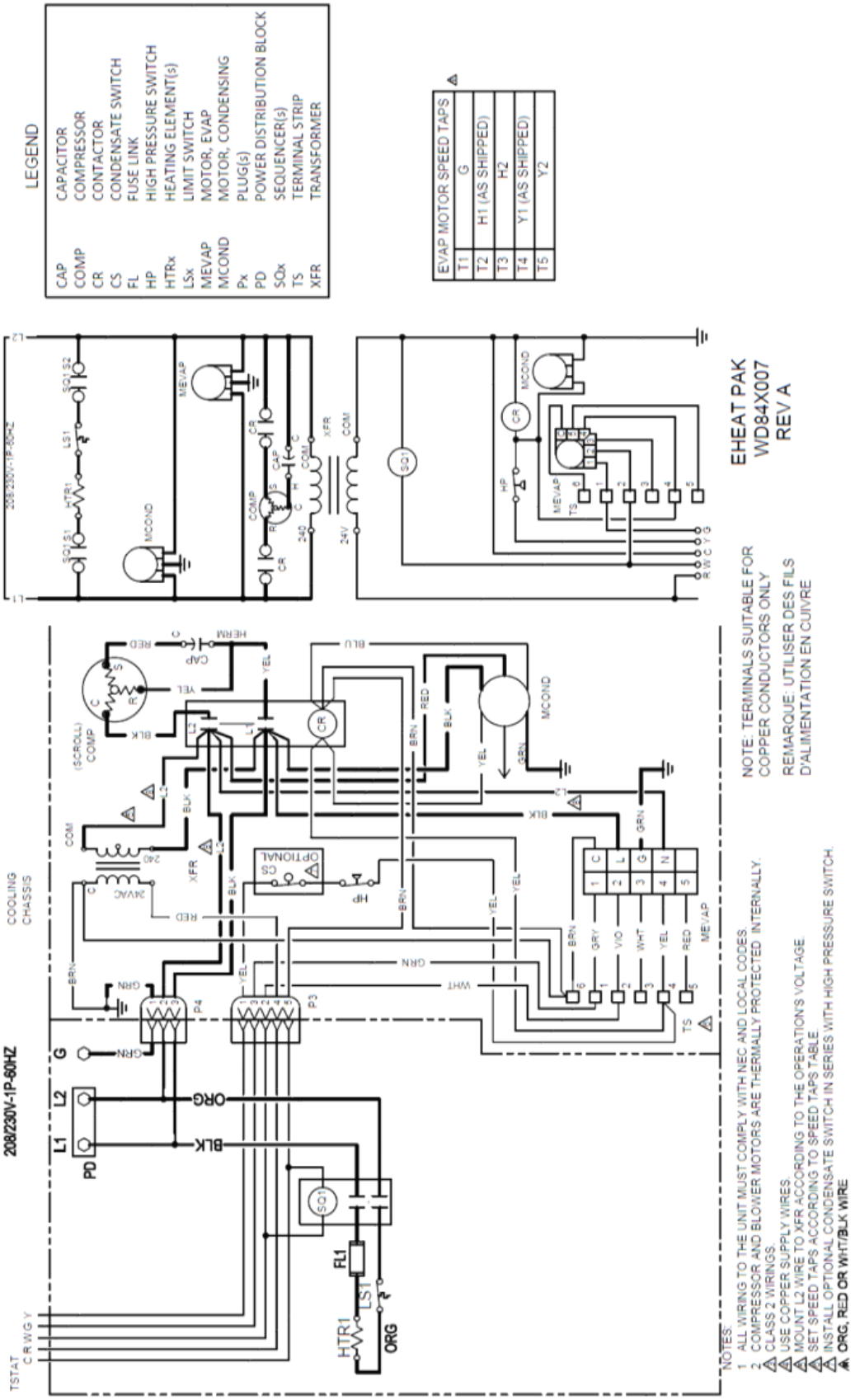


FIGURE 32– FPE05E1C24A SCROLL 208-230V ECM Wiring Diagram

WIRING DIAGRAMS

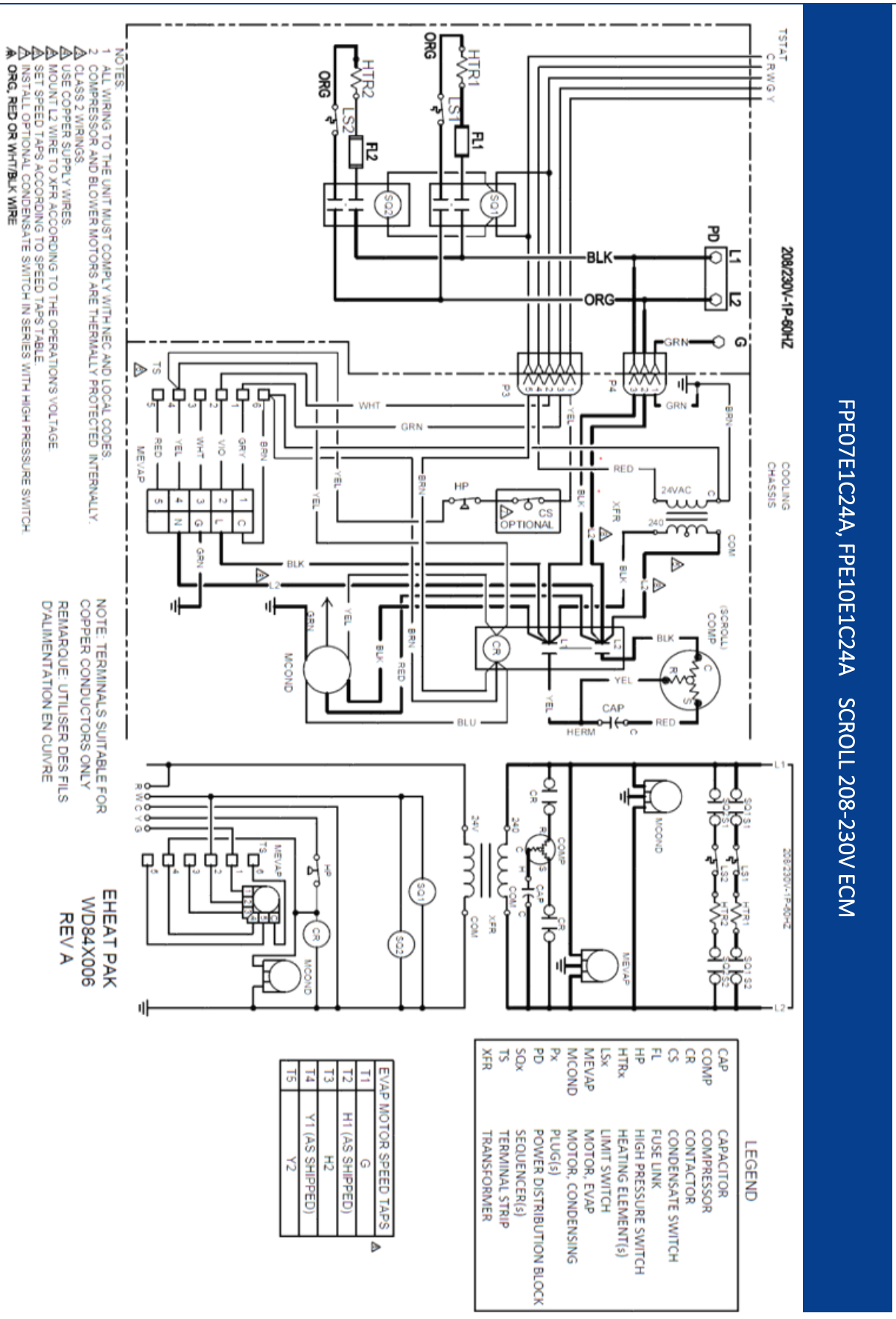


FIGURE 33– FPE07E1C24A, FPE10E1C24A 208-230V ECM Wiring Diagram

WIRING DIAGRAMS

FPE15E1C24A SCROLL 208-230V ECM

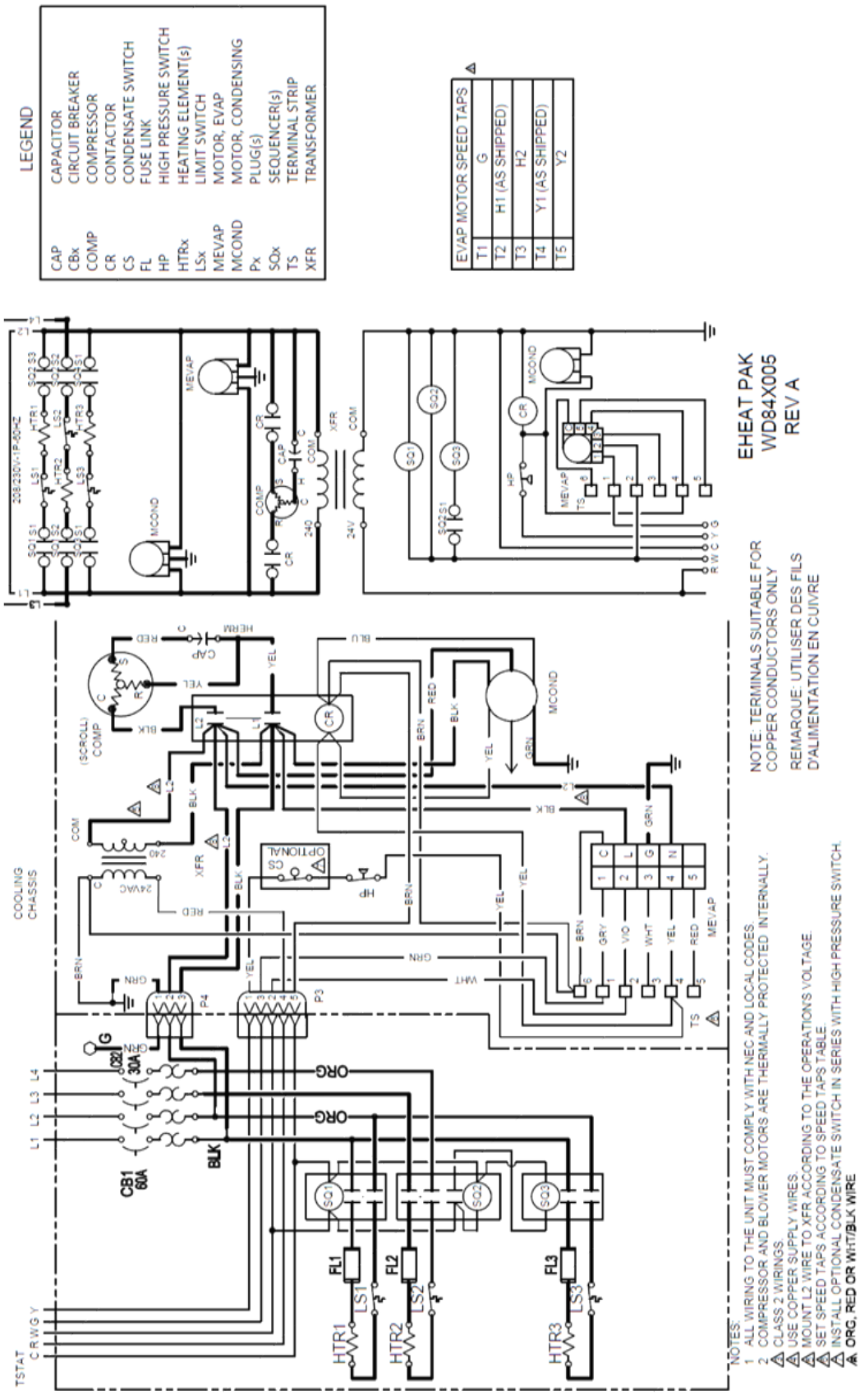


FIGURE 34 – FPE15E1C24A SCROLL 208-230V ECM Wiring Diagram

WIRING DIAGRAMS

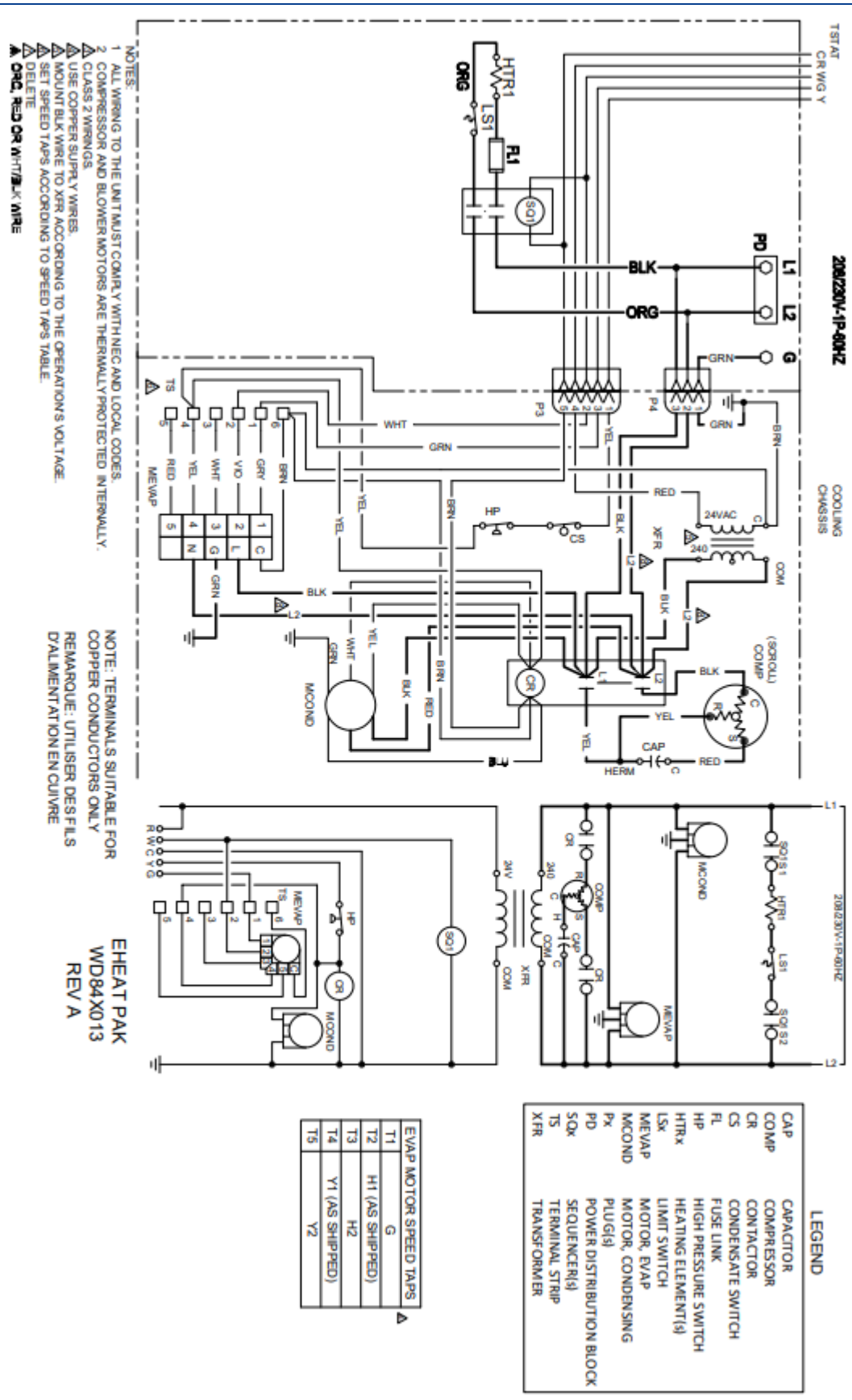


FIGURE 35– FPE05E1C30A 208-230V ECM Wiring Diagram

WIRING DIAGRAMS

FPE07E1C30A, FPE10E1C30A SCROLL 208-230V ECM

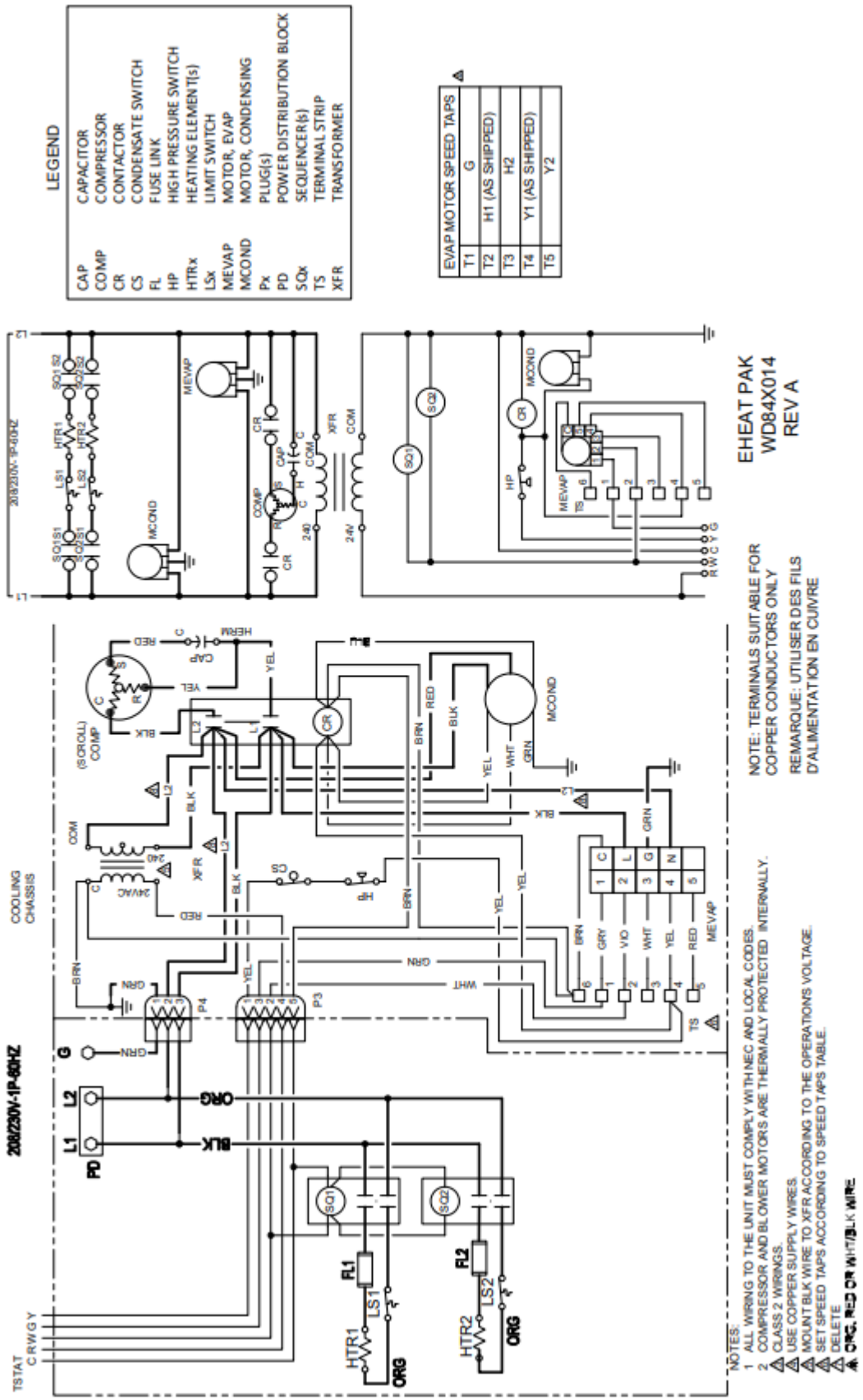


FIGURE 36 – FPE07E1C30A , FPE10E1C30A SCROLL 208-230V ECM Wiring Diagram

WIRING DIAGRAMS

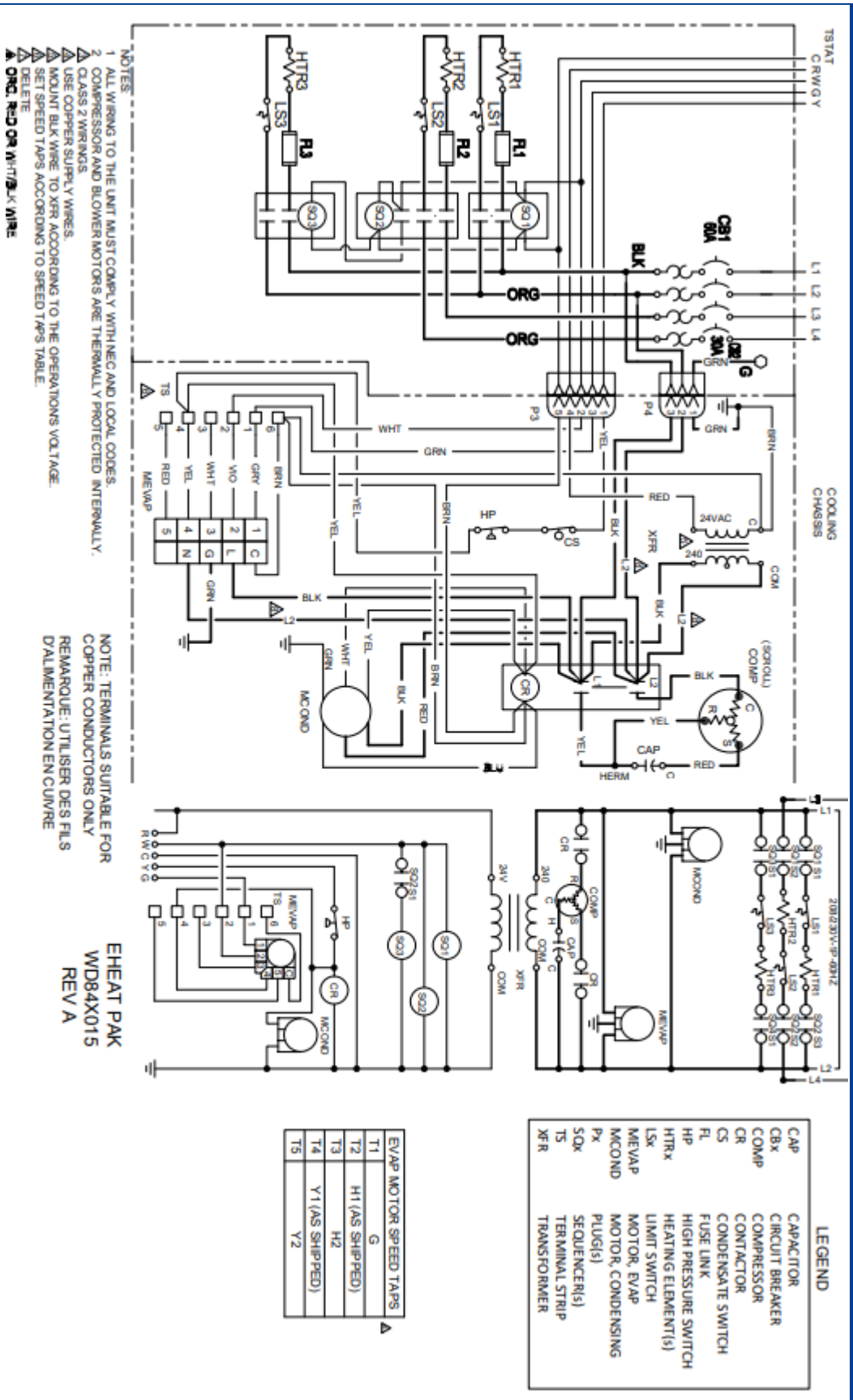


FIGURE 37– FPE15E1C30A 208-230V ECM Wiring Diagram

CIRCUIT SCHEMATIC

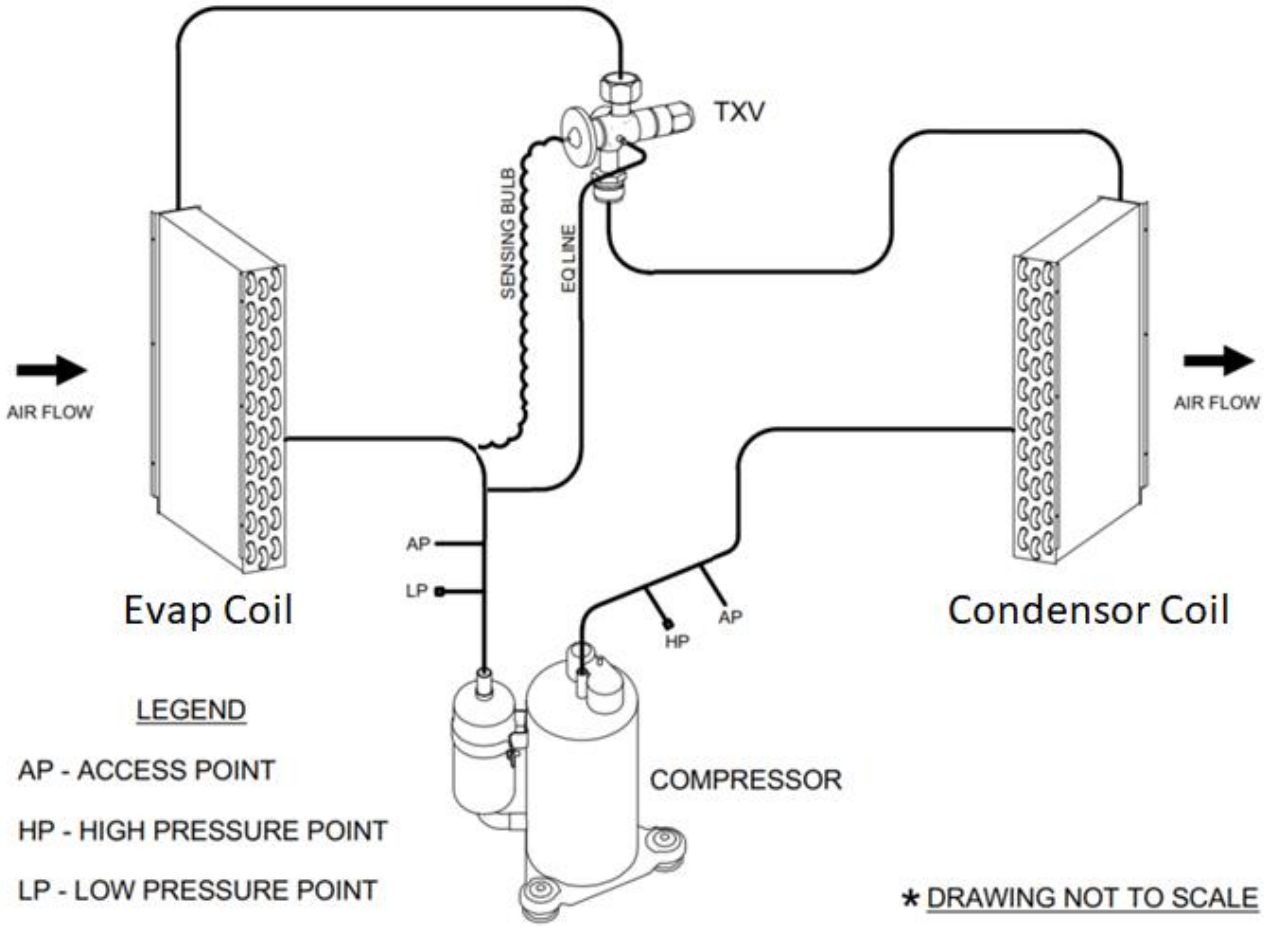


FIGURE 38 - Circuit Diagram

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 power cable is connected to the unit and the ground cable is connected to the ground lug of heater.
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 condensate line is 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.

STARTUP INSTRUCTIONS CONTINUED

11. For 208 voltage power, make sure the line voltage tap on the 24 Volt control transformer has been moved and rewired.
12. Verify that the low voltage wiring between the thermostat and the unit matches the wiring diagram.
13. Make sure the supply duct and return duct have been installed properly and sealed well.
14. **Models with 15kw heater (FPE15EC***) should have two separate power supplies connecting to the unit. Make sure each line voltage is connected to the correct circuit breaker in the unit.**

UNIT STARTUP:

1. Ensure that power is connected to the unit and the local disconnect is switched to ON position.
2. Turn on the power.
3. Check that there is 24V from the control transformer. The controller module LED should light up.

COOLING

1. Turn the thermostat system switch to “COOL” and the fan switch to “AUTO” position.
2. Set the temperature below room temperature.

HEATING

3. Turn the thermostat system switch to “HEAT” and the fan switch to “AUTO” position.
4. Set the temperature above current room temperature.

STARTUP & PERFORMANCE CHECKLIST INSTRUCTIONS

Follow the Startup and Performance Checklist in Figure 50 and Figure 51 to check if the temperature and refrigerant pressure are normal, and if compressor and fan are running properly without abnormal sound. The warranty may be void unless the checklist is completed and returned to the warrantor. If the 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 HEAT	Power is not turned on	Turn on the power
	Wiring is incorret or loose	Check the wiring with wiring diagram and check if the wiring connection is loose
	Thermostat setpoint is too low	Set the temperature higher than currrent room temperature
	Fuse is broken	Replace fuse
	No airflow	Check if the blower is on or if there's any obstruction in the duct
	Heater fuse link is broken	Replace fuse link
TEMPERATURE IS TOO HIGH	Thermostat setpoint too high caused feeling hot in room	Set the temperature lower
	Low airflow caused by dirty or clogged air filter	Clean or replace air filter
	Low airflow caused by too high external static	Check if supply duct and return duct are sized properly or if there's any obstruction in the duct
	Power voltage is too high	Max. voltage for operation is 252V
	Current speed tap is not high enough	Change heating speed tap to the optional heating tap with higher torque value
HEATER TURNED ON BUT STOP WORKING QUICKLY	Fuse broken	Check if fuse is sized correctly or power cable loose
NOT ENOUGH HEAT, AIR NOT WARM	Heating elements are not all on (for 7kW, 10kW and 15kW heaters)	Check if the protection devices (auto-reset switch and nonresetable fuse link) of heating element activated
	Power voltage is too low	Min. voltage for operation is 187V
	Air leak in the unit or in duct	Check If the ducts are sealed well
	Thermostat setpoint is too low	Set the temperature higher

Table 11 Heating Troubleshooting Table

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 lower power company.
	Wiring	Check if there's any wire loose or broken
	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.
	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	Condenser has no airflow	Condenser fan motor bad or wire loose.
	Condenser coil too dirty	Clean condenser coil
	Outside ambient temperature is too high	Unit is designed to run up to 115°F outside ambient temperature. Consult factory for application with higher ambient temperature.
	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 12 – Cooling Troubleshooting Table

MAINTENANCE & SERVICE - HEATING

The heating module is a single assembly composed of heating elements, first protection device (auto-reset temperature switch), second protection device (non-resettable fuse link), sequencers and power distribution block (unit with 15kW heaters has two circuit breakers instead of power distribution block). See **Figure 23 Electric Heater Assembly**.

The heating module should be inspected annually (minimum) before heating season starts by a qualified technician or agency. Power to the unit MUST be turned off and disconnected before serving.

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 the unit.**
- **When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.**
- **Verify proper operation after servicing.**

MAINTENANCE & SERVICE – HEATING CONTINUED

FUSE LINK REPLACEMENT

5kW heater has one heating element. 7kW and 10kW heaters have two heating elements. 15kW heater has three 5kW heating elements. Each heating element is installed with one non-resettable fuse link (see page 26). If the fuse link is broken, order the replacement part from company (see Table 9 in page 28), and follow below procedures to replace it.

1) Turn off electrical power to the unit
2) Remove front top panel from the unit. See FIGURE 36 – Front Top Panel Removal.

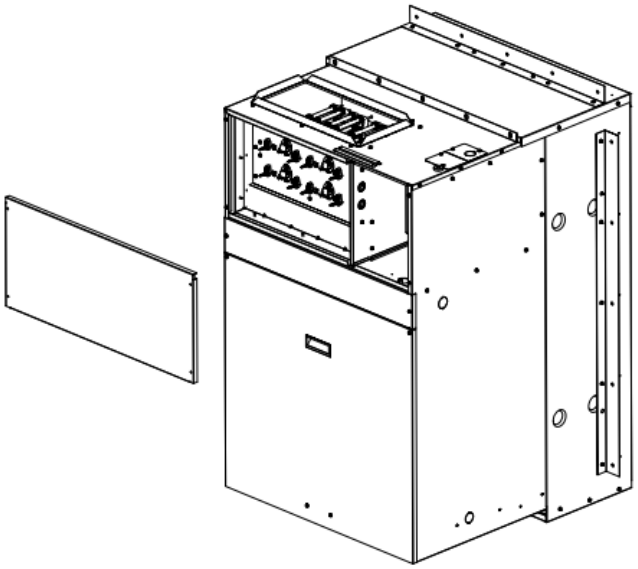
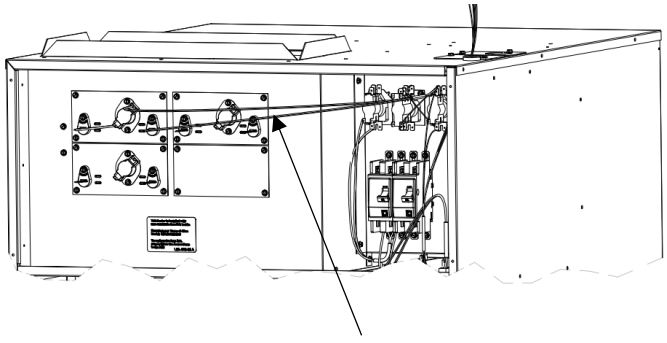
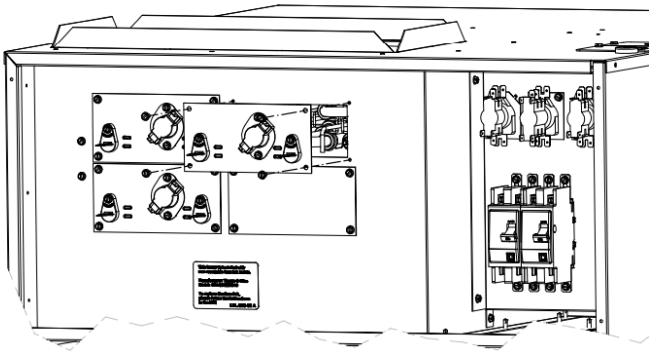


FIGURE 39 – Front Top Panel Removal

3) Disconnect wires from the heating element whose fuse link is broken. And remove screws from the mounting plate.



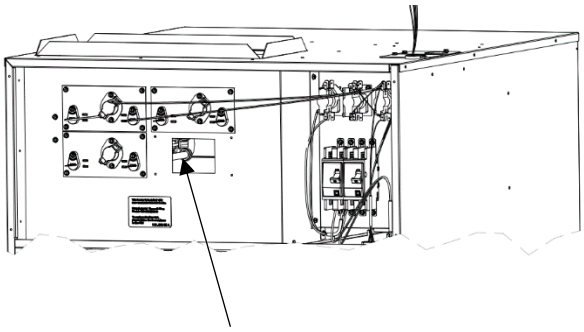
4) Take out the mounting plate with heating element. Replace the broken fuse link.



MAINTENANCE & SERVICE – HEATING CONTINUED

5. Put the heating element back to the unit, install the screws and connect the wires.

NOTE: When putting the heating element back to the unit, make sure the rod is inserted into the hole on the heater support panel. The window covered by the blank mounting plate is to help to locate the hole when interesting the heating element.



VIEW PORT (THIS WINDOW IS USED TO HELP LOCATE THE HOLE WHEN INSERTING THE HEATING ELEMENT)

MAINTENANCE & SERVICE – COOLING

REFRIGERATION SYSTEM TROUBLESHOOTING

There are two refrigerant pressure ports installed in the return air section of the unit which could be used to dialogue the refrigeration system, vacuum and add refrigerant without removing the whole air conditioner module.

To access these two pressure ports, the air filter access panel must be removed.

The pressure ports extend out of the coil block-off panel for about 2 inch which enables people to measure the suction temperature and liquid temperature besides the suction pressure and liquid pressure. With these four measured numbers, suction superheat and sub-cooling could be calculated.

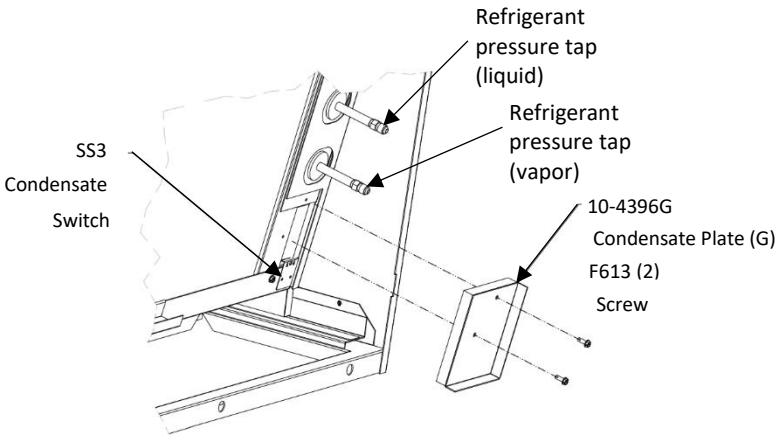


FIGURE 40 – Refrigeration Pressure Ports

AIR CONDITIONER MODULE REMOVAL

To fix refrigerant leak or replace refrigeration components (compressor, TXV, filter drier, etc.), the whole air conditioner module must be removed. Following the below procedure to remove the air conditioner module from the cabinet for service if required. Electrical power to refrigeration chassis MUST be turned off.

1) Remove screws(8) from top front panel, control cover panel and air filter access panel, then remove all these three panel from the cabinet. See FIGURE 41 – Removal of Front Panels.
DON'T REMOVE THE BOTTOM TWO SCREWS ON THE AIR FILTER ACCESS PANEL.

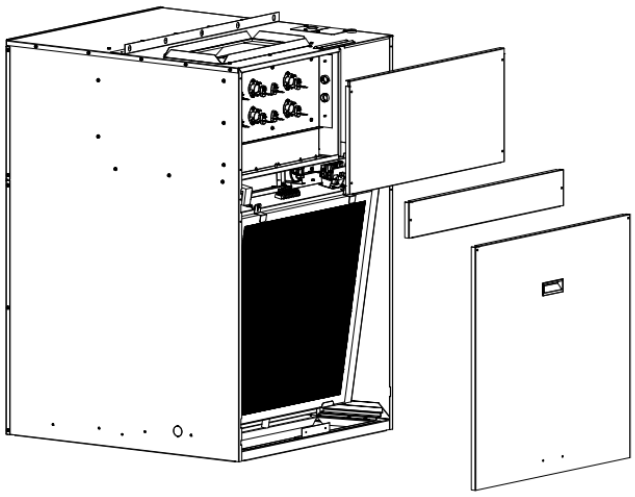


FIGURE 41 – Removal of Front Panels

2) Remove power cable from unit.
3) Disconnect low voltage (6 pin) & line voltage (3 pin) harness connectors by pressing on the release tabs and using a downward motion (FIGURE 43 - Line Voltage Connector (3 Pin) & FIGURE 44 - Low Voltage Connector (6 Pin).

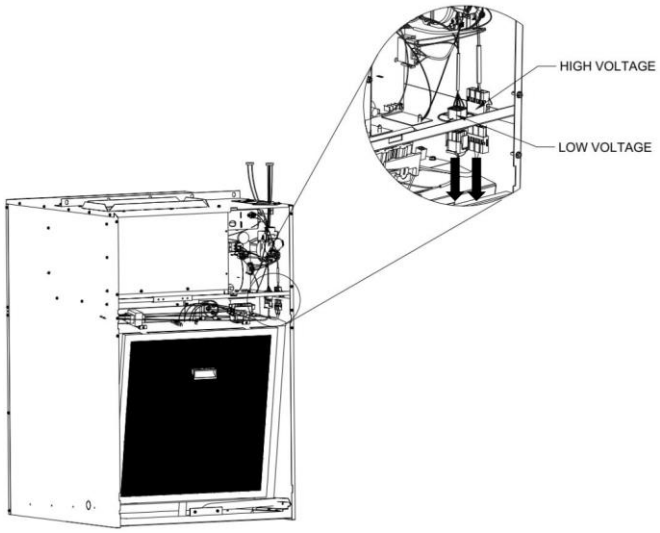


FIGURE 42 – Electrical Power Disconnection

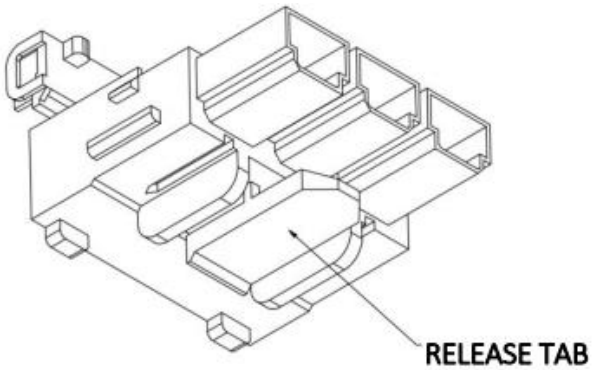


FIGURE 43 - Line Voltage Connector (3 Pin)

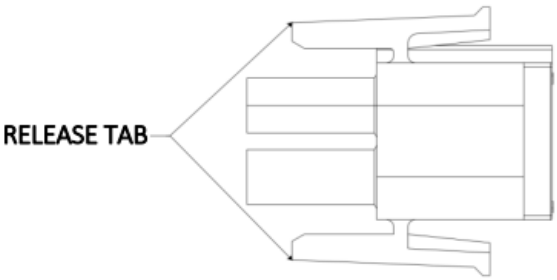


FIGURE 44 - Low Voltage Connector (6 Pin)

4) Remove gaskets before removing chassis.

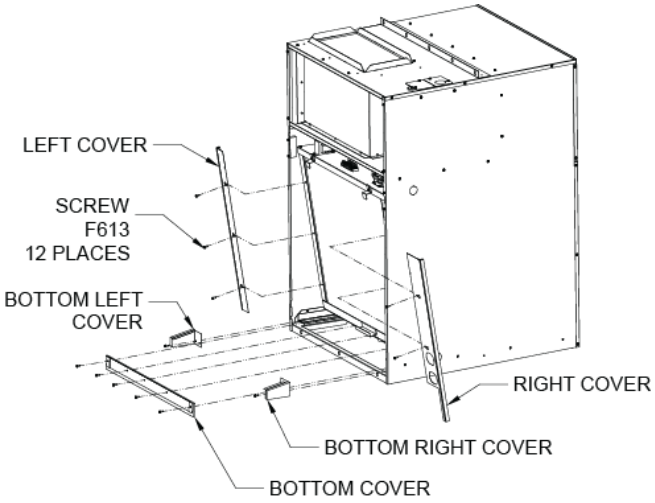


FIGURE 47— Gasket Removal

5) Slide-out air conditioner module as shown in *Conditioner Module*

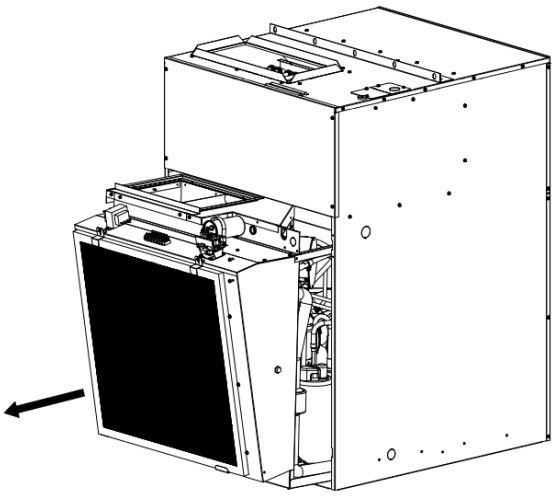


FIGURE 45 – Slide Out Air Conditioner Module

6) Side panel can be removed from the evaporator section to service the TXV.

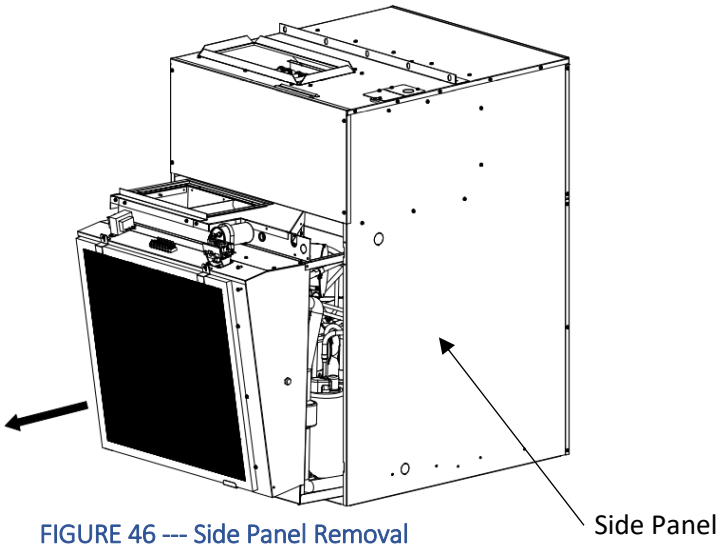


FIGURE 46 --- Side Panel Removal

NOTE

All refrigeration components can be serviced in the chassis.

MAINTENANCE & SERVICE – COOLING CONTINUED

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.

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 REMOVAL OF AC Section

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.

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.

STARTUP & PERFORMANCE CHECKLIST

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** _____ **L3-L4** _____ Compressor Amps _____

Running Voltage **L1-L2** _____ **L3-L4** _____ Blower Amps _____

Secondary Voltage _____ Condenser Fan Amps _____

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

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

*With thermostat calling.

TEMPERATURES

Outdoor Air Temperature _____ DB _____ WB

Return Air Temperature _____ DB _____ WB

Cooling Supply Air Temperature _____ DB _____ WB

Heating Supply Air Temperature _____ DB _____ WB

REFRIGERATION

Suction Pressure (Prior to Startup) _____Psig

Liquid Pressure (Prior to Startup) _____Psig

STARTUP & PERFORMANCE CHECKLIST CONTINUED

UNIT OPERATION

HEATING MODE

1 ELECTRIC HEATER AMPS _____

2 INDOOR BLOWER AMPS _____

3 TEMPERATURE RISE

Supply Duct Temperature _____

Return Duct Temperature − _____

Temperature Rise = _____

4 TOTAL EXTERNAL STATIC

Supply Duct Temperature _____

Return Duct Temperature + _____

Temperature Rise = _____

COOLING MODE

5 INDOOR BLOWER AMPS _____

6 TEMPERATURE DROP

Return Duct Temperature _____

Supply Duct Temperature − _____

Temperature Drop = _____

7 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

10 REFRIGERATION

Suction Pressure _____ Psig

Liquid Pressure _____ Psig

Suction Temperature _____ °F

Liquid Temperature _____ °F

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.

INDEX OF FIGURES

INDEX OF FIGURES CONTINUED

INDEX OF TABLES

NOTES

Manufactured by:

8273 Moberly Lane
Dallas, TX 75227
www.firstco.com

The manufacturer works to continually improve its products and as a result, it reserves the right to change design and specifications without notice.