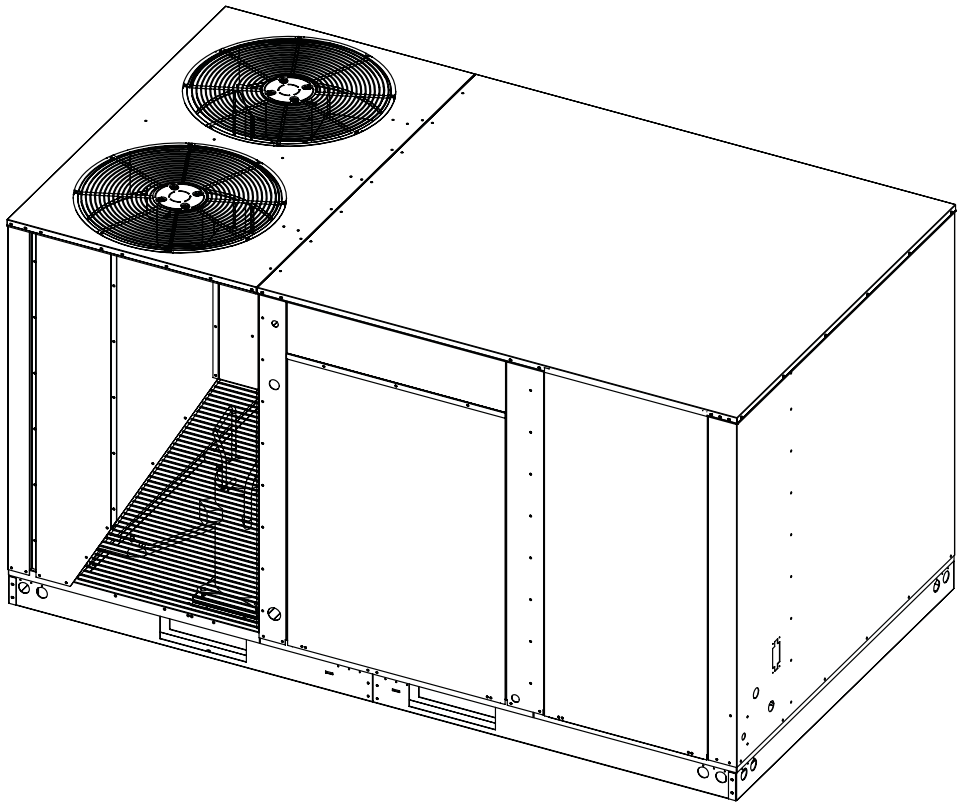
P6SP - 072 / 090 / 120 Series

Installation Instructions

Single Package Electric Heating / Electric Cooling Rooftop Unit



10T Unit Shown

⚠ WARNING:

These instructions are intended primarily to assist qualified individuals experienced in the proper installation of this appliance. Some local codes require licensed installation/service personnel for this type of equipment. Read all instructions carefully before starting the installation.

Read these instructions thoroughly before starting the installation. Follow all precautions and warnings contained within these instructions and on the unit.

Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer or service agency.

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

DO NOT DESTROY. PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

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SAFETY INFORMATION

Safety markings are used frequently throughout this manual to designate a degree or level of seriousness and should not be ignored. **WARNING** indicates a potentially hazardous situation that if not avoided, could result in personal injury or death. **CAUTION** indicates a potentially hazardous situation that if not avoided, may result in minor or moderate injury or property damage.

It is the responsibility of the installer to ensure that the installation is made in accordance with all applicable local and national codes.

⚠ WARNING!

Improper installation, service, adjustment, or maintenance may cause explosion, fire, electrical shock or other hazardous conditions which may result in personal injury or property damage. Unless otherwise noted in these instructions, only factory authorized kits or accessories may be used with this product. Non compliance may void the units warranty.

Literature, Labels, and Tags
When working with this equipment, follow all precautions in the literature, on tags, and on labels provided with the unit and/or approved field installed kits. The type of hazard and severity are described on each label or tag.

Pressures Within The System
This equipment contains liquid and gaseous refrigerant under high pressure. Installation or servicing should only be performed by qualified trained personnel thoroughly familiar with this type equipment.

INSTALLATION REQUIREMENTS

Additional codes listed below are for reference purposes only and do not necessarily have jurisdiction over local or state codes. Local codes and regulations take precedence over any recommendations contained in these instructions. Always consult with local authorities before installing any appliance.

Duct Systems
- US and CANADA: Air Conditioning Contractors Association (ACCA) Manual Q, Sheet Metal and Air Conditioning Contractors National Association (SMACNA), or American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Fundamentals Handbook

Electrical Connections
- US: National Electrical Code (NEC) ANSI/NFPA 70
- CANADA: Canadian Electrical Code CSA C22.1

General Installation
- US: Current edition of the NFGC and the NFPA 90B. For copies, contact the National Fire Protection Association Inc., Batterymarch Park, Quincy, MA 02269; or American Gas Association, 400 N. Capitol, N.W., Washington DC 20001 or www.NFPA.org.
- CANADA: NSCNGPIC. For a copy, contact Standard Sales, CSA International, 178 Rexdale Boulevard, Etobicoke (Toronto), Ontario, M9W 1R3 Canada

Safety
- US: (NFGC) NFPA 54–1999/ANSI Z223.1 and the Installation Standards, Warm Air Heating and Air Conditioning Systems ANSI/NFPA 90B.
- CANADA: CAN/CGA-B149.1–and .2–M00 National Standard of Canada. (NSCNGPIC)

NFPA publications are available by writing:
National Fire Protection Association
Batterymarch Park
Quincy, ME 02269

GENERAL INFORMATION

Single Package Electric Heating/Electric Cooling units are designed for outdoor rooftop or ground level slab installations. The units are shipped ready for downflow duct connections and are easily converted for horizontal flow connections with an accessory kit. All models are shipped from the factory with the following:
- R-410a Refrigerant
- Adjustable belt drive blower system
- Downflow duct connections
- 24V circuit breaker protection
- Factory wired accessory plugs for economizers and electric Heat Kits.

Unit dimensions are shown on the Physical Data pages. Optional field installed 3 phase electric heater kits are available in 9, 18, 30 and 35KW capacities for P6SP models. Use only NORDYNE heater kits listed in the technical service literature for these units. A single stage heat / two stage cool 24VAC thermostat is required when electric heat kits are installed.

Equipment Application
Before beginning the installation, verify that the unit model is correct for the job. The unit model number is printed on the data label. This unit is **NOT** to be used for temporary heating of buildings or structures under construction.

Equipment Check
All units have been securely packaged at the point of shipment. After unpacking the unit, carefully inspect it for apparent and concealed damage. Claims for damage should be filed with the carrier by the consignee. Refer to page 4 for packaging removal instructions.

Unit Location
The electric unit is designed only for outdoor installations. Choosing the location of the unit should be based on minimizing the length of the supply and return ducts. Consideration should also be given to availability of electric power, service access, noise, and shade. The unit installation shall avoid areas where condensate drainage may cause problems.

Clearances to Combustible Materials
See Figure 1 (page 4) for required clearances to combustible materials. Refer to the unit data label for the model number.

⚠ WARNING!

Rooftop installations with vertical ducts must be provided with a 90-degree elbow installed in the supply duct to comply with U.L. (Underwriters Laboratories) codes for use with electric heat so the elements are not directly over a supply grille.

The electric unit is suitable for installation on combustible flooring or class A, B, or C roofing materials. A clearance of at least 36 inches to combustibles from all sides of the

unit is required. **Where accessibility to combustibles clearances are greater than minimum unit clearances, accessibility clearances must take preference.** Sufficient clearance for unobstructed airflow through the outdoor coil must be maintained in order to achieve rated performance.

Thermostat
A 2 stage cooling 24VAC thermostat is required for these units. **NOTE:** If "optional" electric heat is added, a 1 Stage Heat / 2 Stage Cool 24VAC electric heating/electric cooling thermostat must be used.

Air Filter Requirements
A suitable air filter must be installed in the unit or in the return air system. Refer to Specification & Electrical Data Table for recommended filter sizes. Air filter pressure drop must not exceed 0.08 inches WC.

This unit is supplied with air filters. Air filter(s) must be installed ahead of the evaporator coil of this unit. All return air to this unit must pass through the filters before entering this unit.

⚠ WARNING!

Never operate unit without a filter. A failure to follow this warning could result in a fire, personal injury, or death.

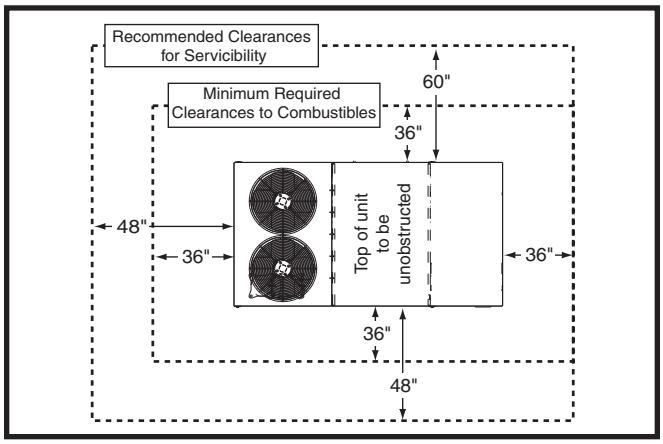


Figure 1. Minimum Clearances to Combustibles

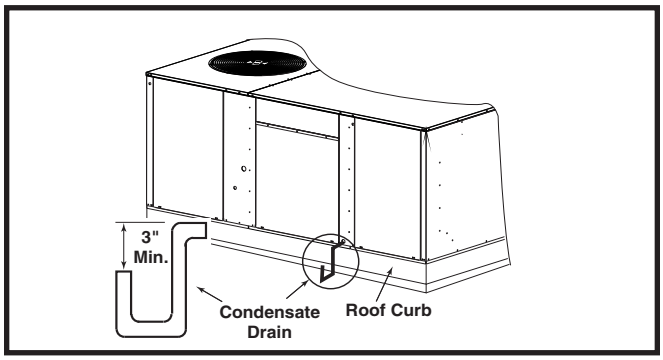


Figure 2. Condensate Drain

Condensate Drain
Condensate is removed from the unit through the 3/4" (19mm) PVC pipe located on the front side of the unit. Install a 3" (8 cm) Min. trap between the drain line and an open vent of the same size for proper condensate removal. (See Figure 2) Refer to local codes and restrictions for proper condensate disposal requirements.

When connecting rigid drain line, hold any fittings with a wrench to prevent twisting. **Do not overtighten!**

UNIT INSTALLATION

Minimum Clearance Requirements
Units are certified as combination Heating and Cooling equipment for outdoor installation only at the minimum clearances to combustible materials shown. Clearances shown in Figure 1 are for both Downflow and Horizontal discharge.

Packaging Removal
1. Remove top crate brackets and wooden cap assembly from top of unit (Figure 3, page 5).
2. Remove lower crate brackets, 4 side skids, and 2 end skids from each side of unit. **DO NOT remove base rails from unit.**
3. Rig unit and raise up approximately 4 feet off the ground. (Also see Rigging and Hoisting section).
4. Remove crate brackets (Figure 4, page 5) securing long and short bottom boards to underside of unit. **NOTE: Some screws are located in fork slots.**
5. Remove long & short bottom boards from beneath unit.
6. Inspect unit thoroughly for shipping damage.
7. Carefully lower and position unit to it's permanent location.

Rigging and Hoisting

⚠ WARNING:

To avoid the risk of property damage, personal injury, or death, it is the rigger's responsibility to ensure that whatever means are used to hoist the unit are safe and adequate:

- **The lifting equipment must be adequate for the load. See Table 1 (page 18) for unit weights.**
- **The unit must be lifted from the holes in the base rails using cables or chains as shown in Figure 5 (page 4).**
- **Spreader bars (Figure 5) are required to protect the unit and ensure even loading.**
- **Keep the unit in an upright position at all times. The rigging must be located outside the units center of gravity. Refer to Physical Data info (pages 13 - 18) for center of gravity locations.**
- **All panels must be securedly in place during rigging and hoisting.**

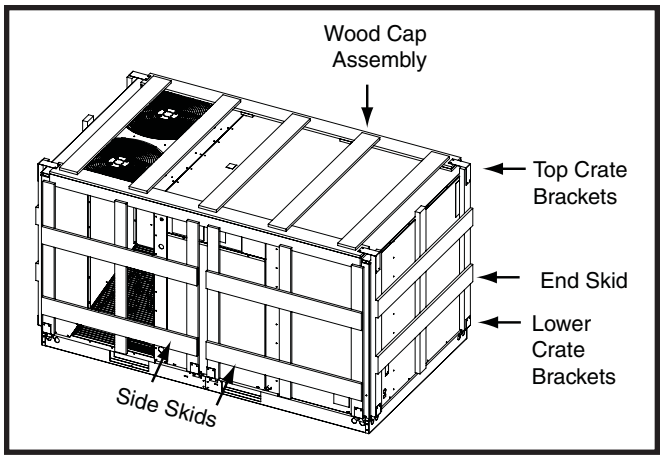


Figure 3. Side View

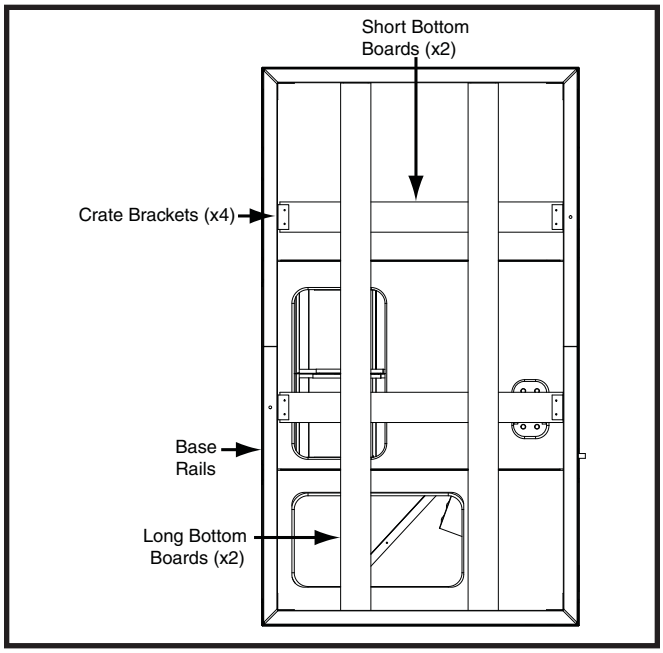


Figure 4. Bottom View

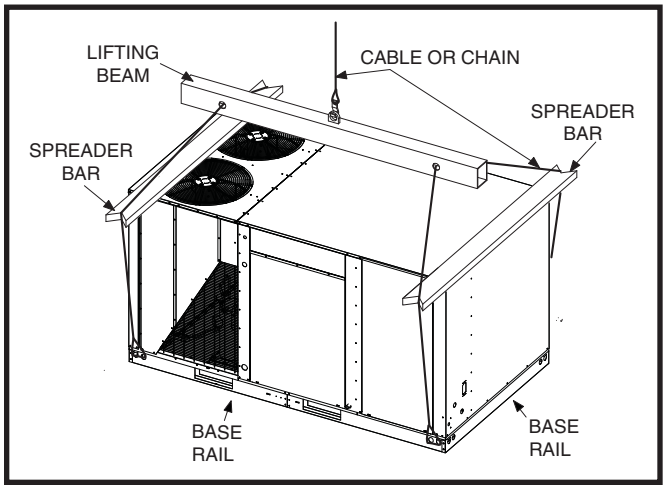


Figure 5. Rigging and Hoisting

⚠ WARNING:

PROPOSITION 65 WARNING: This product contains fiberglass wool, a product known to the state of California to cause cancer.

- **Disturbing the insulation of this product during installation, maintenance, or repair will expose you to fiberglass wool.**
- **Breathing this material may cause respiratory irritations or may cause lung cancer.**
- **Fiberglass wool may also cause eye irritation, skin sensitization, or other allergic responses in susceptible individuals.**

Units may be installed on wood flooring or on Class A, B, or C roof covering material when used with side supply and return air ducts. (Horizontal Discharge Kit required.) Units may be installed on wood flooring or on Class A, B, or C roof covering material when used with bottom discharge and return air ducts in conjunction with a roof curb. **If installing units on a combustible floor with downflow discharge, a roof curb is required.**

Units may be installed on non- combustible flooring when used with bottom supply and return air ducts.

Rooftop Mounting

For rooftop installations use the appropriate accessory roof curb (Figure 6, page 6) and follow all instructions included with it. Locate the unit according to local building codes and ordinances. The roof curb must be square and level to ensure proper condensate drainage and unit operation.

- On bottom discharge applications, supply and return air ducts must be attached to the roof curb duct supports, not the unit. Install all ductwork before setting unit to curb or frame. **NOTE:** For downflow applications never drill or punch holes in unit base. Leakage may occur if unit bottom pan is punctured.
- If any brand other than a NORDYNE Roof Curb is to be used the frame support must be constructed using non-combustible materials.
- Units require full perimeter support under the unit. Supports must be made of steel or suitably treated wood materials. The unit must be square and level to ensure proper condensate drainage.
- The roof must be capable of handling the weight of the unit. See Table 1 (page 18) for unit weights. Reinforce the roof if required.
- Frame must be high enough to ensure prevention of any moisture from entering the unit. Recommended height to unit base is 8" (20cm) for both Downflow and Horizontal applications.
- Secure roof curb or frame to roof using acceptable mechanical methods per local codes.

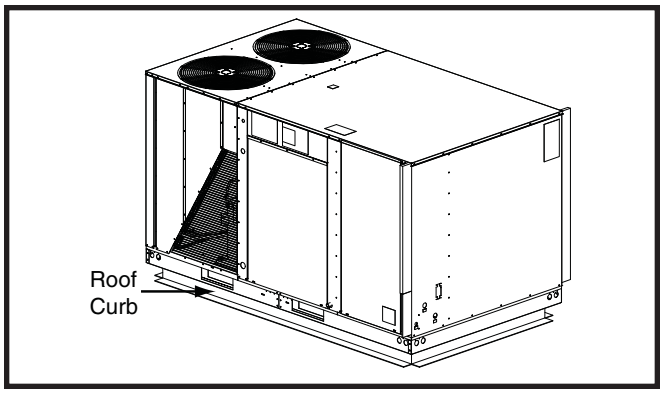


Figure 6. Roof Curb Installations

⚠ WARNING!

Do not place combustible material on or against the unit cabinet. Do not place combustible materials, including gasoline and any other flammable vapors and liquids, in the vicinity of the unit.

Ground Level

If installing the unit at ground level, provide a concrete mounting pad (Figure 7) separate from the building foundation. The pad must be level to ensure proper condensate disposal and strong enough to support the unit's weight. Make sure the slab is a minimum of 3" (8cm) above grade and in an area that drains well.

Ductwork should be attached directly to flanges on panels supplied in horizontal duct conversion kits. Unit Base Rails provide full perimeter support under the unit. The unit must be square and level to ensure proper condensate drainage. Unit clearances must be in accordance with those shown in Figure 1 (page 4).

Unconditioned Spaces

All ductwork passing through unconditioned spaces must be properly insulated to minimize duct losses and prevent condensation. Use insulation with an outer vapor barrier. Refer to local codes for any insulation material requirements.

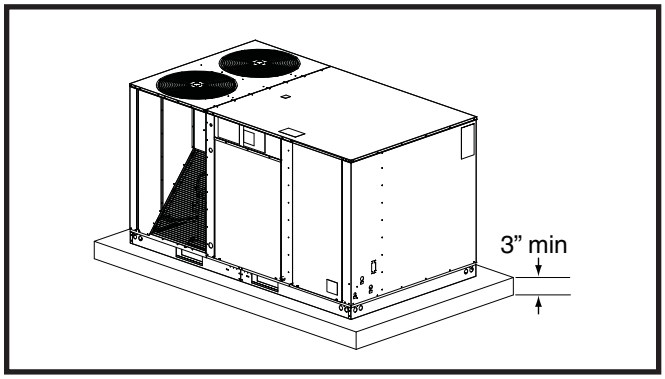


Figure 7. Concrete Pad Installations

CIRCULATING AIR SUPPLY

⚠ WARNING:

Do not allow combustion products to enter the return air ductwork or the circulating air supply. Failure to prevent the circulation of combustion products into the occupied space can create potentially hazardous conditions including carbon monoxide poisoning that could result in personal injury or death.

All return ductwork must be secured to the unit with sheet metal screws. All joints must be taped and adequately sealed. When return air is provided through the bottom of the unit, the joint between the unit and the return air plenum must be air tight.

The roof curb or framing must provide sound physical support of the unit with no gaps, cracks, or sagging between the unit and the curb or frame.

Return air and circulating air ductwork must not be connected to any other heat producing device such as a fireplace insert, stove, etc. This may result in fire, explosion, property damage, personal injury, or death from carbon monoxide poisoning.

- This unit is designed only for use with a supply and return duct. Any exterior ducts, joints, or openings in the building roof or walls must be weatherized with conventional flashing and sealing compounds.
- Air ducts should be installed in accordance with all applicable local codes and the standards of the National Fire Protection Association "Standard for Installation of Air Conditioning Systems" (NFPA 90A).
- Design the ductwork according to methods described by the Air Conditioning Contractors of America (ACCA) Manual Q.
- It is recommended that the outlet duct be equipped with a removable access panel. This opening should be accessible when the unit is installed in service and shall be of a size such that the smoke or reflected light may be observed inside the casing to indicate the presence of leaks in the heat exchanger. The cover for the opening shall be attached in such a manner as to prevent leaks.
- If outside air is used as return air for ventilation or to improve indoor air quality, the system must be designed so that the return air to the unit is not less than 50° F (10° C) during heating operation. If a combination of indoor and outdoor air is used, the ducts and damper system must be designed so that the return air supply to the unit is equal to the return air supply under normal, indoor return air applications.

Unconditioned Spaces
All ductwork passing through unconditioned space must be properly insulated to prevent condensation and minimize duct losses. Use insulation with an outer vapor barrier. Refer to local codes for insulation material requirements.

Acoustical Ductwork
Certain installations may require acoustical lining inside the supply ductwork. Acoustical insulation must be in accordance with the current revision of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) application standard for duct liners. Duct lining must be UL classified batts or blankets with a fire hazard classification of FHC-25/50 or less.

Fiber ductwork may be used in place of internal duct liners if the fiber ductwork is in accordance with the current revision of the SMACNA construction standard on fibrous glass ducts.

Fibrous ductwork and internal acoustical lining must be NFPA Class 1 air ducts when tested per UL Standard 181 for Class 1 ducts.

Downflow to Horizontal Conversion
The unit is shipped ready for downflow duct connections. If horizontal ducts are required, the unit must be converted according to the directions in the conversion kit for both the supply and return ducts.

ELECTRICAL WIRING

⚠ WARNING!

To avoid the risk of electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical power supply.

- Electrical connections must be in compliance with all applicable local codes and ordinances, and with the current revision of the National Electric Code (ANSI/NFPA 70).
- For Canadian installations the electrical connections and grounding shall comply with the current Canadian Electrical Code (CSA C22.1 and/or local codes).

Pre-Electrical Checklist:
√ Verify that the voltage, frequency, and phase of the supply source match the specifications on the unit rating plate.
√ Verify that the service provided by the utility is sufficient to handle the additional load imposed by this equipment. See Table 2 (page 19) or the unit wiring label for proper high and low voltage wiring.
√ Verify factory wiring is in accordance with the unit wiring diagram. Inspect for loose connections.
√ For 3 phase units always check the phase balance.

Line Voltage
It is recommended that the line voltage to the unit be supplied from a dedicated branch circuit containing the correct fuse or circuit breaker for the unit.

IMPORTANT NOTE: An electrical disconnect must be installed readily accessible from and located within sight of the unit. (See unit data label for proper incoming field wiring). Any other wiring methods must be acceptable to authority having jurisdiction.

The power supply for the unit must be in accordance with the unit wiring diagram, and the unit rating plate. Connect the line-voltage leads to the corresponding terminals on the terminal block inside the Element access compartment. Refer to physical data drawings for compartment location. Use only copper wire for the line voltage power supply to this unit. Use proper code agency listed conduit and connector for connecting the supply wires.

All P6SP model units are shipped factory ready for Single Circuit Electrical Supply connections. See Table 2 or unit rating label for proper high voltage wiring requirements. For Dual Electrical Supply connections see unit rating plate or heater kit installation instructions for proper high voltage wiring requirements. Use NORDYNE P/N-917468 Pole Dual Circuit Adaptor for converting to dual supply connections.

⚠ CAUTION:

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

Units are shipped from the factory wired for 230 or 460 volt operation. On 208-230V units being placed into 208 volt operation, remove the lead from the transformer terminal marked 240V and connect it to the terminal marked 208V.

Overcurrent protection must be provided at the branch circuit distribution panel and sized as shown on the unit rating label and according to the National Electric Code and applicable local codes. **NOTE:** See the unit rating plate for maximum circuit ampacity and maximum overcurrent protection limits.

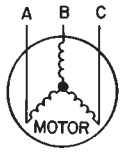
NOTE: 1-3/8" conduit openings are supplied for high voltage field wiring entrance. If smaller openings are required use suitable (field supplied) reducers to meet specific conduit size requirements.

Unbalanced 3-Phase Supply Voltage
Voltage unbalance occurs when the voltages of all phases of a 3-phase power supply are no longer equal. This unbalance reduces motor efficiency and performance. Some underlying causes of voltage unbalance may include:

Lack of symmetry in transmission lines, large single-phase loads, and unbalanced or overloaded transformers. A motor should never be operated when a phase imbalance in supply is greater than 2%. Perform the following steps to determine the percentage of voltage imbalance:

1. Measure the line voltages of your 3-phase power supply where it enters the building and at a location that will only be dedicated to the unit installation. (at the units circuit protection or disconnect).

Example:



AB = 451V
BC = 460V
AC = 453V

2. Determine the average voltage in the power supply.

In this example, the measured line voltages were 451, 460, and 453. The average would be 454 volts (451 + 460 + 453 = 1,364 / 3 = 454).

3. Determine the maximum deviation: See example.

Example:
From the values given in step 1, the BC voltage (460V) is the greatest difference in value from the average:
460 - 454 = 6 ← Highest Value
454 - 451 = 3
454 - 453 = 1

4. Determine percent of voltage imbalance by using the results from steps 2 & 3 in the following equation.

Example:

$$100 \times \frac{6}{454} = 1.32\%$$

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

The amount of phase imbalance (1.32%) is satisfactory since the amount is lower than the maximum allowable 2%. Please contact your local electric utility company if your voltage imbalance is more than 2%.

Grounding

⚠ WARNING:

The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. Do not use gas piping as an electrical ground!

This unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code (ANSI/NFPA 70) or the CSA C22.1 Electrical Code. Use the grounding lug provided in the element access compartment for grounding the unit.

Line Voltage Connections

Provide power supply for the unit in accordance with the unit wiring diagram, and the unit rating plate. Connect the line-voltage leads to the corresponding terminals on the terminal block inside the control compartment. Use only copper wire for the line voltage power supply to this unit. Use proper code agency listed conduit and a conduit connector for connecting the supply wires to the unit and for obtaining proper grounding. Grounding may also be accomplished by using the grounding lug provided in the control box.

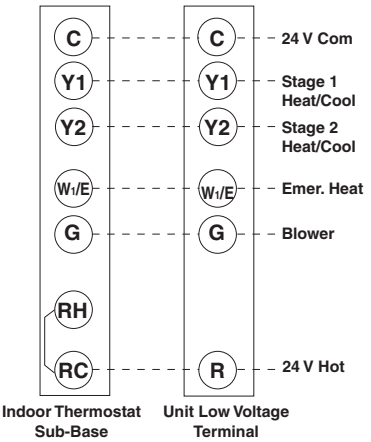
Low Voltage Connections - Thermostat

A two stage cooling 24 VAC thermostat is required for these units. Several options are available for a room thermostat depending on the accessories installed with the unit. Select a thermostat which operates in conjunction with the installed accessories. The thermostat should be mounted about five feet above the floor on an inside wall. The thermostat should be kept away from drafts, slamming doors, lamps, direct sunlight and the supply air flow.

To install the thermostat:

1. Position the subbase on an inside wall and mark the mounting holes and thermostat cable openings.
2. Cut out the cable opening and route the thermostat cable from the unit's low voltage compartment to the thermostat location. The thermostat cable is supplied by the installer. See Figure 8 for recommended wire size.
3. Connect the cable leads to the subbase or thermostat terminals and to the unit's low voltage terminal block as shown in Figure 8. System wiring diagrams are also provided on the inside of the control access panel and in Figures 13 - 16 (pages 20 - 23).

T'Stat Wire Gauge	Recommended T'Stat Wire Length - Ft. (Unit to T'Stat)
18 Ga.	0 - 60
16 Ga.	61 - 130
Field Supplied Wiring - - - - - Use Solid Class II Copper Wire	



NOTE: If thermostat has one combined "O/B" Terminal and an Economizer is installed, see Economizer Installation Instructions for unit wiring change for proper operation.

Figure 8. Typical Connections - 2 Stage Cool / 1 Stage Heat T-Stat

4. Secure the subbase or thermostat to the wall using screws provided with the thermostat.
5. Install the correct thermostat housing to subbase.
6. Refer to thermostat instruction sheet for complete detailed mounting and operating information.

Blower Speed

The blower speed is preset at the factory. For optimum system performance and comfort, it may be necessary to change the factory set speed. Refer to Blower Performance Data (Tables 3 - 8, pages 24 - 29) for the allowable operating range and adjustments.

⚠ WARNING!

To avoid personal injury or property damage, make certain that the motor leads cannot come into contact with any uninsulated metal components of the unit.

To change the blower speed:

1. Disconnect all electrical power to the unit and remove the blower access panel.
2. Loosen the motor tension bars to allow removal of the blower belt from the motor sheave.
3. Loosen top set screw on motor sheave and turn clockwise to close (increases blower speed), or counterclockwise to open (decreases blower speed).
4. Replace belt on pulleys and position motor mounting plate to correct position for proper belt tension.
5. Tighten tension bar bolts.

Check all factory wiring per the unit wiring diagram and inspect the factory wiring connections to be sure none loosened during shipping or installation.

STARTUP AND ADJUSTMENTS

Pre-Start Check List

- Verify that the unit is level to allow proper condensate drainage.
- Verify that there is free airflow to and from the outdoor coil and that all clearance requirements are met.
- Verify that the ductwork is sealed to prevent air leakage.
- Verify that the line voltage power leads are securely connected and the unit is properly grounded.
- Verify that low voltage wires are securely connected to correct leads in the low voltage area of the control box.
- Verify that all exterior panels are replaced and securely fastened.
- Verify that the outdoor fan turns freely.
- Verify that the power supply branch circuit overcurrent protection is sized properly.
- Verify that the thermostat is wired correctly. The thermostat function switch should be set to **Off** and the thermostat fan switch should be set to **Auto**.

Start-Up Procedure

⚠ WARNING!

The unit is equipped with crankcase heaters. Allow 24 hours prior to continuing the start up procedures to allow for heating of the refrigerant compressor crankcase. Failure to comply may result in damage and could cause premature failure of the system. This warning should be followed at initial start up and any time the power has been removed for 12 hours or longer.

- Check unit for return air filters and condensate trap.
- Check all electrical wiring for loose connections and tighten as required.
- Close all electrical disconnects to energize the system.

Air Circulation

Leave the thermostat system switch set to **Off** and set the thermostat fan switch to **On**. The blower motor should run continuously. Check for air delivery at the register(s). Ensure that there are no obstructions at the registers or in the ductwork. Set thermostat fan switch to **Auto**, the blower will shut down immediately. **Note:** If blower is turning opposite of arrow direction, shut off main power to the unit and switch any two field wires at the disconnect. **DO NOT** alter unit wiring.

System Cooling

1. Set the thermostat system switch to **Cool** and the thermostat fan switch to **Auto**. Lower the thermostat temperature switch below room temperature and observe that the blower, both compressors and fan(s) energize. Check that air cooler than room temperature is being discharged at the register. Ensure unit refrigerant pressures are in order. Blower should be turning in direction indicated by arrow. **NOTE:** If refrigerant pressures are abnormal and blower is rotating in the opposite direction of the arrow, shut off main power to the unit and switch any two field wires at the disconnect. Ensure proper rotation of both compressors. **DO NOT** alter unit wiring. Listen for any unusual noises. Locate the source and correct as needed.
2. After allowing the unit to run for several minutes, set the temperature selector above room temperature, verify that the fan, blower, and compressors cycle off with the thermostat.

System Heating - Field Installed Electric Heat

This packaged air conditioner is designed to allow an optional electric heat kit to be field installed as required by the building's particular heating load. The options available for each unit are shown in the heater kit installation instructions or unit technical service literature. Install the heater kits as directed by the instruction sheet that comes as part of the heater kit. Follow all cautions and warnings as directed.

1. Set the thermostat to above room temperature.
2. Verify that the compressor and outdoor fan motor are not energized and the electric heat is energized.
3. After the unit has run for approximately five minutes, set the thermostat below room temperature and verify that the electric heat has de-energized.

⚠ WARNING!

Uninsulated live components are exposed when control access panel is removed.

Verify Operation of Over-Temperature Limit Control
To verify operation of the over-temperature limit control, make sure that all access panels are in place and that there is power to the unit. Block the return airflow to the unit by installing a close-off plate in place of or upstream of the filter. Set the thermostat to a temperature above room temperature and verify the unit operates with the correct operating sequence (see Operating Sequence). The over-temperature limit control should function to turn off the electric strip heat within approximately four minutes **NOTE:** the exact time depending on the efficiency of the close-off in blocking the return air to the unit.

The circulating air blower should continue to run when the over-temperature limit control switch opens. Remove the close-off immediately after the over-temperature limit control opens. If the unit operates for more than four minutes with no return air, set the thermostat to a temperature below room temperature, shut off the power to the unit, and replace the over-temperature limit control.

OPERATING SEQUENCE

The operating sequences for the heating, cooling, and fan modes are described below. Refer to the wiring diagrams for the unit. See pages 20 - 23

Cooling mode:
1. On a call for cooling the thermostat closes, applying 24 Vac to **Y1**, **G**, and **Y2** if stage 2 cooling is required.
2. **G** applies 24vac to the main circulating blower circuit.
3. **Y1** and **Y2** apply 24vac through all safety switches Before energizing their respective contactors.
4. When the thermostat is satisfied the contactors are De-energized.
5. The circulating blower motor is de-energized Immediately.

Blower mode:
1. On a call for fan operation, the thermostat applies 24 Vac directly to the blower contactor.
2. The circulating blower is energized immediately.

Heating mode:
1. On a call for heat the thermostat closes, applying 24 Vac to the **W1** terminal.

Unit Fails to Operate
If the unit does not operate properly in either the heating or cooling mode, be certain to check the following:
1. The thermostat is operating properly.
2. Electrical power to the unit is turned on.
3. All safety switches are closed.
4. The service doors are in place.
5. Transformer circuit breaker is reset.

UNIT MAINTENANCE

⚠ WARNING!

To avoid risk of electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical supply.

⚠ CAUTION:

Use care when removing parts from this unit. Personal injury can result from sharp metal edges present in all equipment of sheet metal construction.

Refrigerant Charging
Packaged electric units are fully charged at the factory. The system refrigerant charge can be checked and adjusted through the service ports provided behind the compressor service panel. Use only gauge lines which have a “Schrader” depression device present to actuate the valve. Draw a vacuum on gauge lines to remove air or moisture before attaching them to the service ports on the unit. Refrigerant charging must be done by qualified personnel familiar with safe and environmentally responsible refrigerant handling procedures. See Unit Rating Plate for proper amount of charge.

⚠ WARNING!

The units are shipped fully charged and ready for installation. When a system is installed according to these instructions, no refrigerant charging is required. If repairs make it necessary for evacuation and charging, it should only be done by qualified, trained personnel thoroughly familiar with this equipment. Some local codes require licensed installation/service personnel to service this type of equipment. Under no circumstances should the owner attempt to install and/or service this equipment. Failure to comply with this warning could result in property damage, personal injury, or death.

Routine Maintenance
Proper maintenance is important to achieve optimum performance from the air conditioner. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. If you do not possess these skills, contact your dealer for maintenance. Consult your local dealer about the availability of maintenance contracts. At a minimum, routine maintenance should include the following:

Air Filters
It is recommended that you inspect and clean or replace the air filters every three to four weeks. Units are equipped with 2" pleated disposable filters. Filter rack is adjustable for 1" permanent type filters. Do not use 1" disposable filters. Replace using filters of like size and kind rated for 500 feet per minute.

⚠ WARNING!

Never operate the unit without a filter in place. Dust and lint in the return air can build up on internal components, resulting in loss of efficiency, equipment damage, and possible fire risk.

Condensate Drain and Outdoor Coil
Inspect the condensate drain and outdoor coil at the beginning of each cooling season. Remove any debris. Clean the outdoor coil and hail guard louvers (optional) as necessary using a mild detergent and water. Rinse thoroughly with water.

Electrical
Inspect the electrical connections for tightness at the beginning of each heating and cooling season. Service as necessary.

⚠ CAUTION:

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

Motor Lubrication
The motors for the circulating air blower and outdoor fans, are pre-lubricated at the factory. No further oiling is required for the life of this product.

⚠ WARNING!

Lubrication of the motors in this unit is not required. Do not lubricate any motor in this product.

Blower Compartment
The blower compartment should be cleaned monthly during the heating and cooling seasons to remove any dirt and lint that may have accumulated in the compartment or on the blower and motor. Buildup of dirt and lint on the blower and motor can create excessive loads on the motor resulting in higher than normal operating temperatures and possible shortened service life.

⚠ CAUTION:

Verify proper operation after servicing.

REPLACEMENT PARTS

Replacement parts are available through all NORDYNE distributors. When ordering, remember to have the complete Model and Serial number of the unit.

ELECTRICAL		
Transformers	Contactors	Temperature Limit Switches
Thermostats	Capacitors	Pressure Switches
Relays	Defrost Boards	
MOTORS		
Fan Motor	Blower Motor	Compressors
COMPONENTS		
Expansion Valves	Cabinet Panels	Filter Driers
Blower Assembly	Fan Grille	Filters
Gaskets	Reversing Valves	

COMPONENT FUNCTIONS

High Pressure switch (HPS)
Prevents compressors from operating at elevated pressures. High pressure switches are located on both compressor hot gas lines and are fitted with shrader cores. The switch is non-adjustable set to open at 650 PSIG and must be manually reset.

Low Pressure switch (LPS)
Prevents compressors from operating at sufficiently low pressures due loss of charge. Low pressure switches are located on both compressor return gas lines and are fitted with shrader cores. The switch is non-adjustable set to open at 5 PSIG and close at 20 PSIG.

Freezestat
Prevents evaporator coils from freeze-ups due to lack of airflow or below normal return air temperatures. The switch is a non-adjustable, sealed, bi-metal sensor set to open at 28° F and closes at 57° F

Over-Temperature Limit Control*
The over-temperature limit control acts to prevent the air temperature leaving the unit from exceeding the maximum outlet air temperature. If the limit opens, electric heat will shut off. Provide w/ electric heat kits.

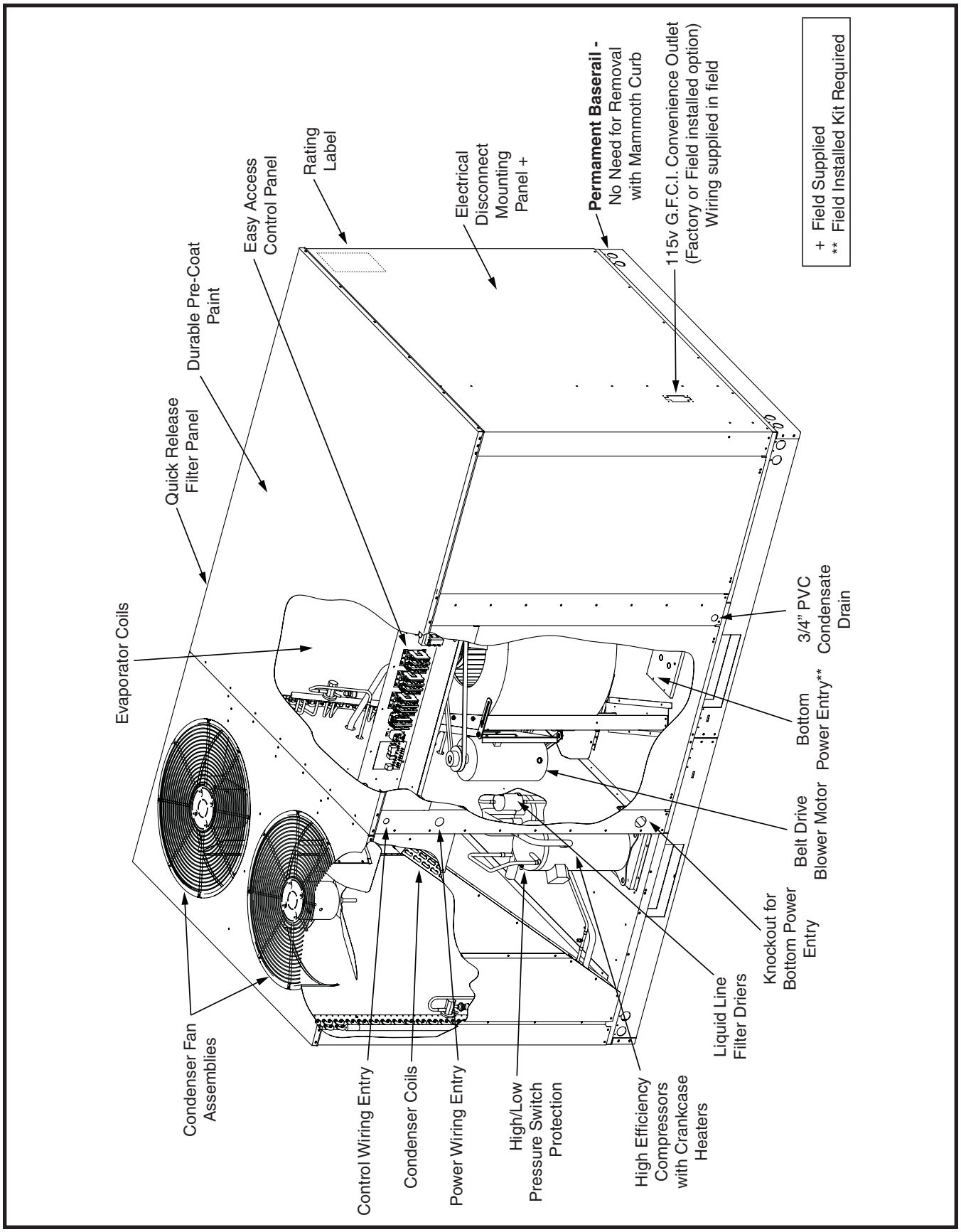


Figure 9. P6SP Components

PHYSICAL DATA

Dimensions shown in inches (mm)

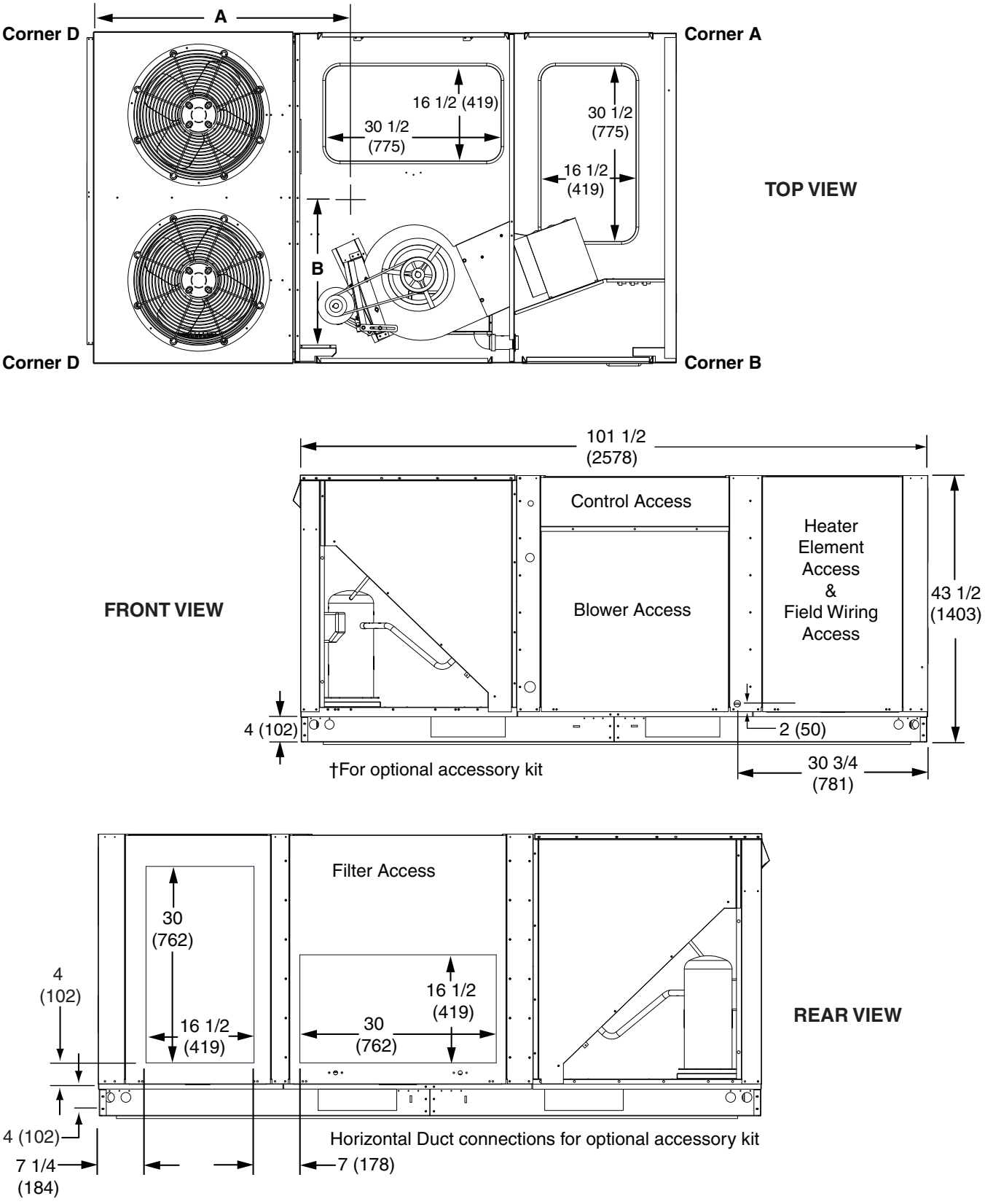


Figure 10. Physical Data - P6SP - 072 Series

PHYSICAL DATA - continued
Dimensions shown in inches (mm)

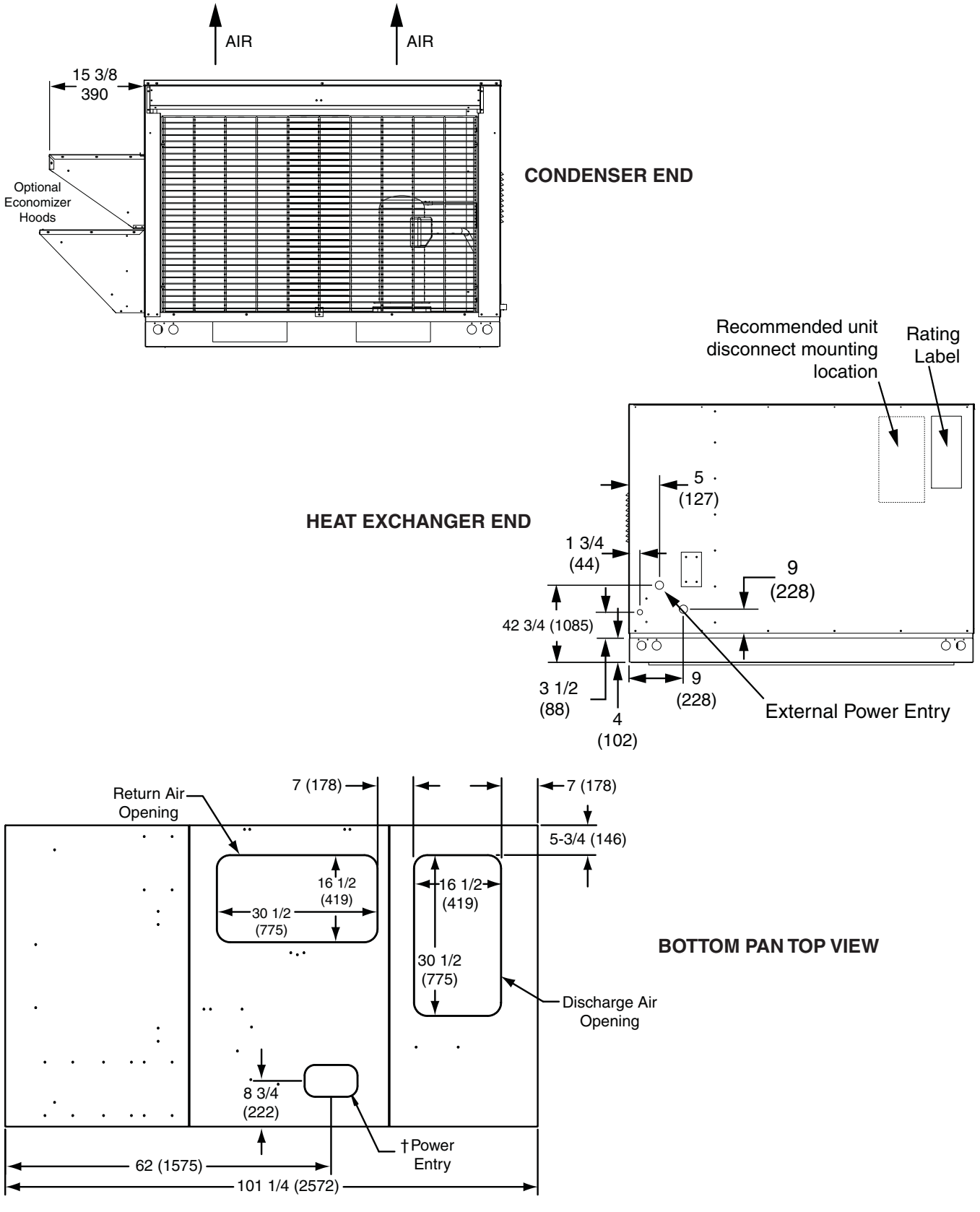


Figure 10. P6SP - 072 Series (Continued)

PHYSICAL DATA - continued
Dimensions shown in inches (mm)

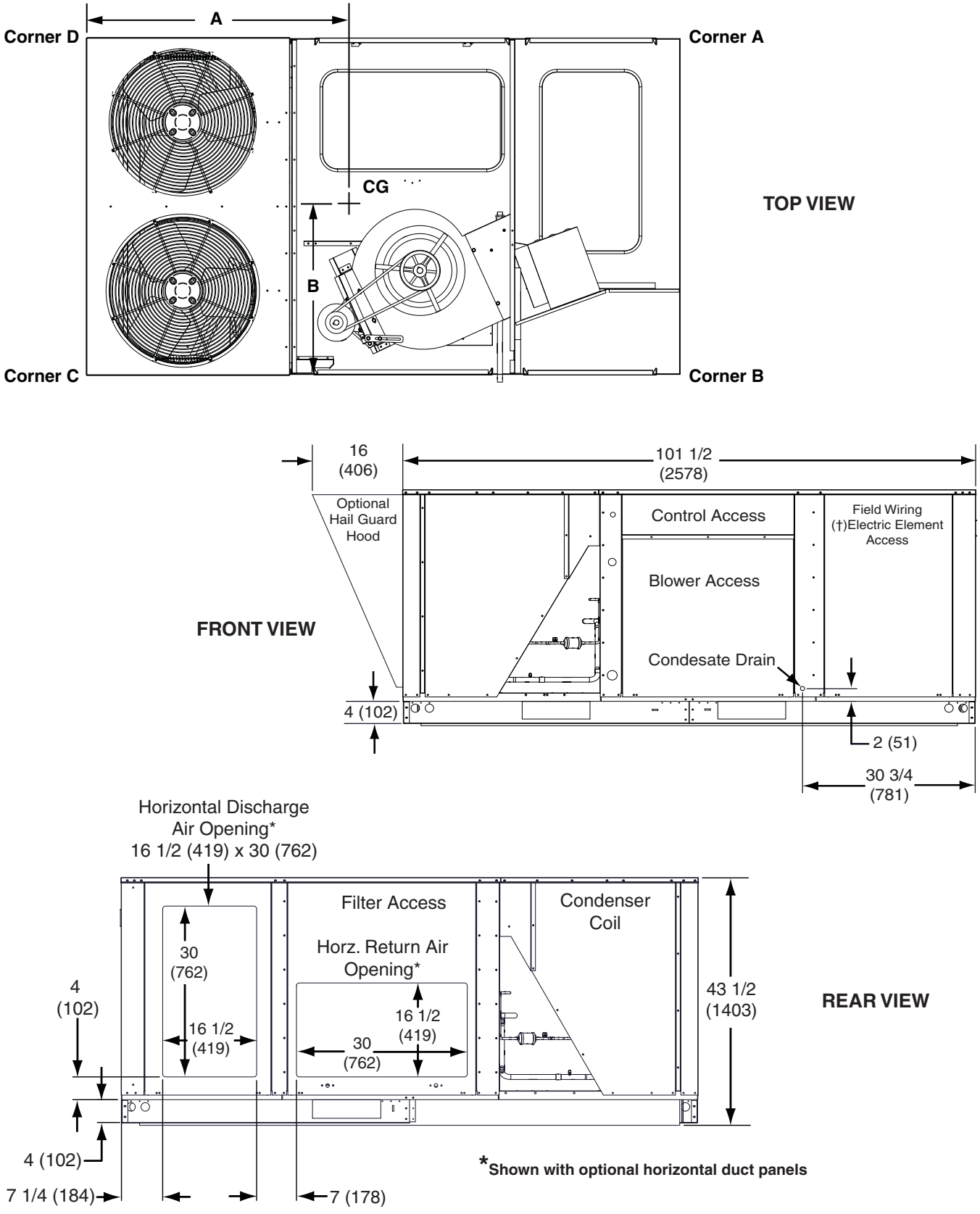


Figure 11. Physical Data - P6SP - 090 Series

PHYSICAL DATA - continued
Dimensions shown in inches (mm)

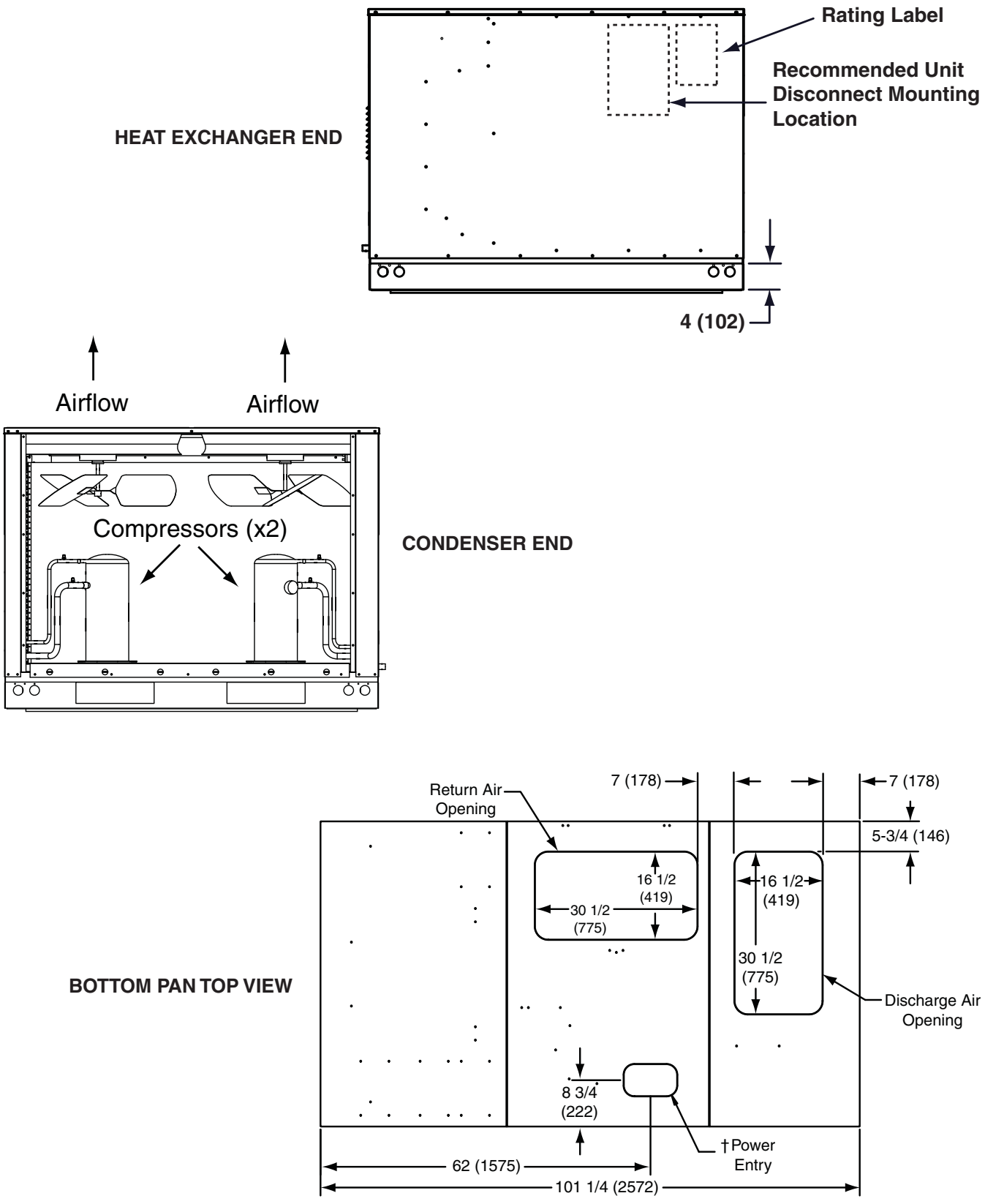
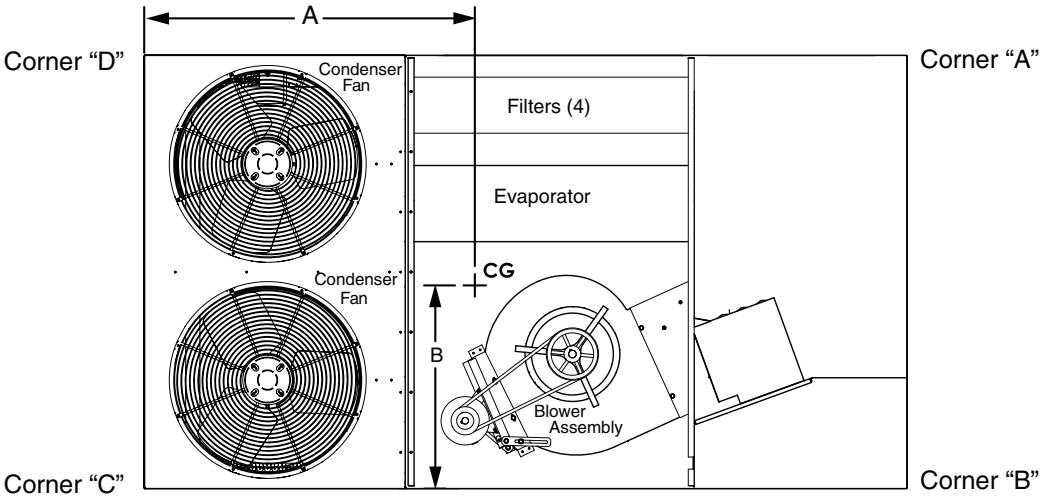
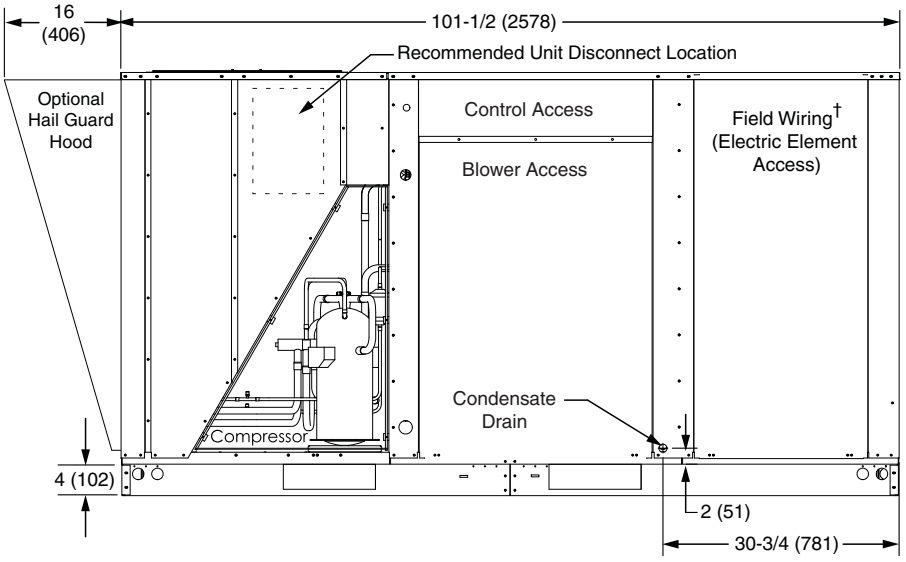


Figure 11. P6SP - 090 Series (Continued)

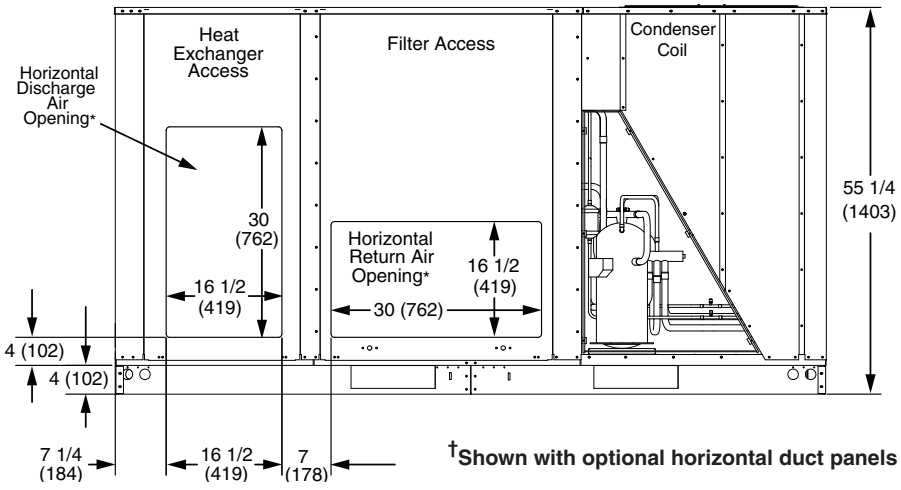
PHYSICAL DATA - continued
Dimensions shown in inches (mm)



TOP VIEW



FRONT VIEW

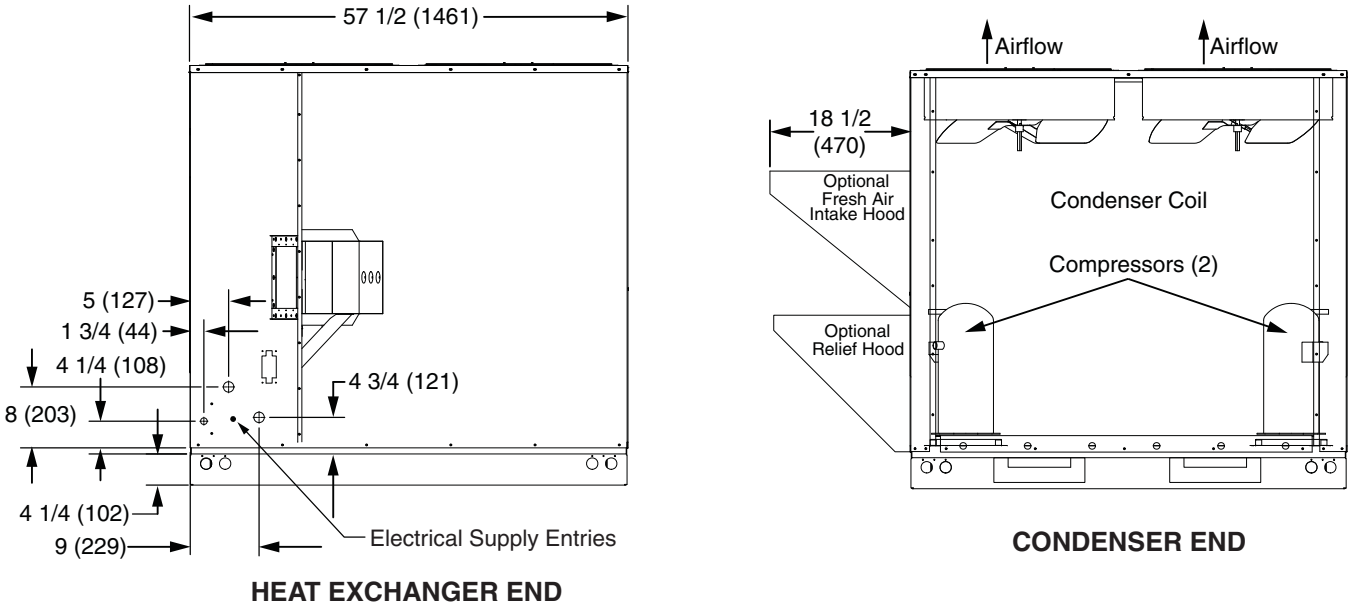


REAR VIEW

†**Shown with optional horizontal duct panels**

Figure 12. Physical Data - P6SP - 120 Series

PHYSICAL DATA - continued
Dimensions shown in inches (mm)



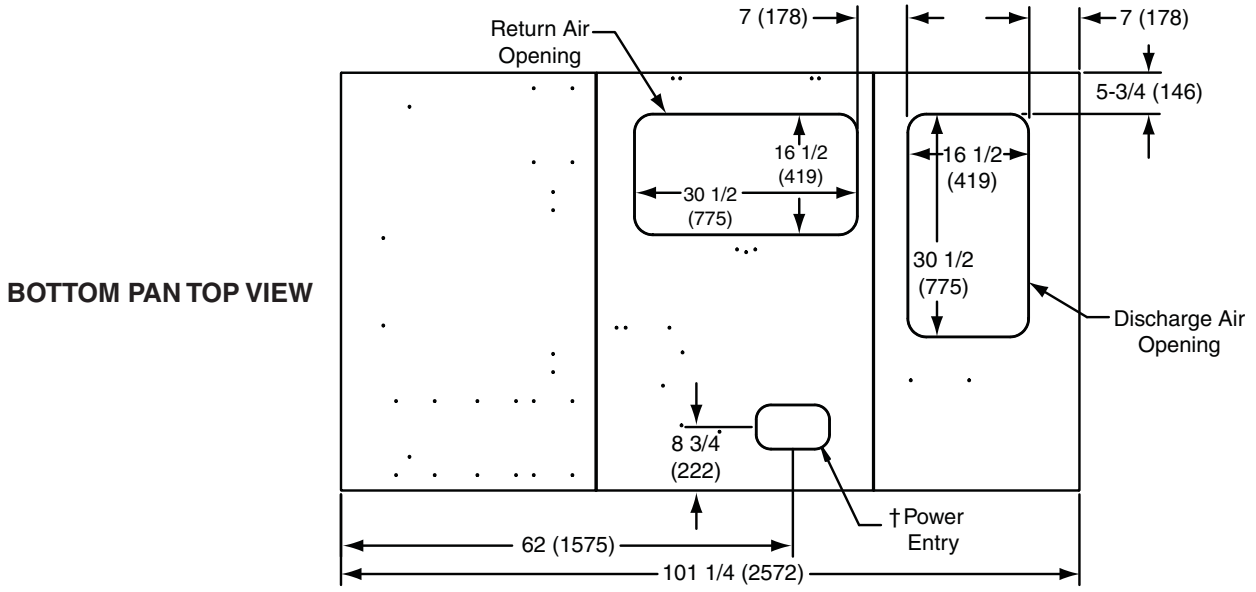


Figure 12. P6SP - 120 Series (Continued)

Model No.	Unit Weight ‡		Shipping Weight		Center of Gravity Inches (mm)		Corner Weights								Unit Height*	
							A		B		C		D		Horizontal Duct Applications	Vertical Duct Applications
	Lbs.	Kg.	Lbs.	Kg	A	B	Lbs.	Kg.	Lbs.	Kg	Lbs.	Kg.	Lbs.	Kg		
P6SP-072(C,D)	845	384	980	445	43-1/2 (1105)	32-1/4 (819)	159	72	204	93	270	123	211	96	43-1/2 (1105)	38-1/4 (972)
P6SP-090(C,D)	856	388	991	450	50-1/2 (1283)	28 (714)	209	95	218	99	219	99	210	95	43-1/2 (1105)	38-1/4 (972)
P6SP-120(C,D)	1130	514	1270	577	44 (1118)	27 (686)	226	103	264	120	345	157	295	134	55-1/4 (1403)	50 (1270)

* Baserails are not intended to be removed. Information provided is total unit height for Horizontal duct applications or height dimension added to selected roof curb height for Vertical duct applications.

‡ Unit weight without packaging or field installed accessories.

† Field Installed Kit

Table1. Center of Gravity and Unit Weight

Table 2. Electrical Data with Electric Heat

Model Number (P6SP-)	Nominal Electric Supply	Voltage Range		Compressors			Outdoor motors (2) ea.	Indoor Motor	Single Circuit									
									MCA					MOP				
		Min	Max	Qty	RLA	LRA	FLA	FLA	0 kW	9 kW	18 kW	30 kW	35 kW	0 kW	9 kW	18 kW	30 kW	35 kW
Factory Drive Data:																		
-072C	208 - 230/60/3	187	253	1 ea.	19	123	1.5	3.2 - 3.1	30 - 30	30 - 31	50 - 57	80 - 91	- n/a -	45 - 45	45 - 45	55 - 60	90 - 100	- n/a -
-072D	460/60/3	414	506	1 ea.	9.7	62	0.8	1.5	16	17	29	46	- n/a -	20	20	30	50	- n/a -
-090C	208 - 230/60/3	187	253	2 ea.	13.1	83.1	2.3	6.2 - 5.8	41 - 40	41 - 40	54 - 60	83 - 94	99 - 112	50 - 50	50 - 50	55 - 70	90 - 100	100 - 125
-090D	460/60/3	414	506	2 ea.	6.1	41	1.2	2.9	19	19	31	47	56	25	25	35	50	60
-120C	208 - 230/60/3	187	253	2 ea.	16.0	110	2.3	6.2 - 5.8	47 - 47	47 - 47	54 - 60	83 - 94	99 - 112	60 - 60	60 - 60	60 - 70	90 - 100	100 - 125
-120D	460/60/3	414	506	2 ea.	7.8	52	1.2	2.9	23	23	31	47	56	30	30	35	50	60
Medium Static Drive Data:																		
-072C	208 - 230/60/3	187	253	1 ea.	19	123	1.5	4.4 - 4.2	32 - 31	32 - 33	51 - 58	81 - 92	- n/a -	50 - 45	50 - 45	60 - 60	90 - 100	- n/a -
-072D	460/60/3	414	506	1 ea.	9.7	62	0.8	2.1	16	18	30	46	- n/a -	25	25	35	50	- n/a -
-090C	208 - 230/60/3	187	253	2 ea.	13.1	83.1	2.3	9.1 - 8.9	44 - 43	44 - 43	57 - 64	87 - 98	103 - 116	55 - 55	55 - 55	60 - 70	90 - 100	100 - 125
-090D	460/60/3	414	506	2 ea.	6.1	41	1.2	4.4	21	21	33	49	58	25	25	35	50	60
-120C	208 - 230/60/3	Not Applicable																
-120D	460/60/3																	
High Static Drive Data:																		
-072C	208 - 230/60/3	Not Applicable																
-072D	460/60/3																	
-090C	208 - 230/60/3	187	253	2 ea.	13.1	83.1	2.3	9.1 - 8.9	44 - 43	44 - 43	57 - 64	87 - 98	103 - 116	55 - 55	55 - 55	60 - 70	90 - 100	100 - 125
-090D	460/60/3	414	506	2 ea.	6.1	41	1.2	4.4	21	21	33	49	58	25	25	35	50	60
-120C	208 - 230/60/3	187	253	2 ea.	16.0	110	2.3	9.1 - 8.9	50 - 50	50 - 50	57 - 64	87 - 98	103 - 116	60 - 60	60 - 60	60 - 70	90 - 100	100 - 125
-120D	460/60/3	414	506	2 ea.	7.8	52	1.2	4.4	25	25	33	49	58	30	30	35	50	60

Notes:
FLA = Full Load Amps
RLA = Rated Load Amps
MCA = Minimum Circuit Ampacity
MOP = Maximum Over-Current Protection
C Series, Electrical unit data shown for 208V - 230V
D Series, Electrical unit data shown for 460V

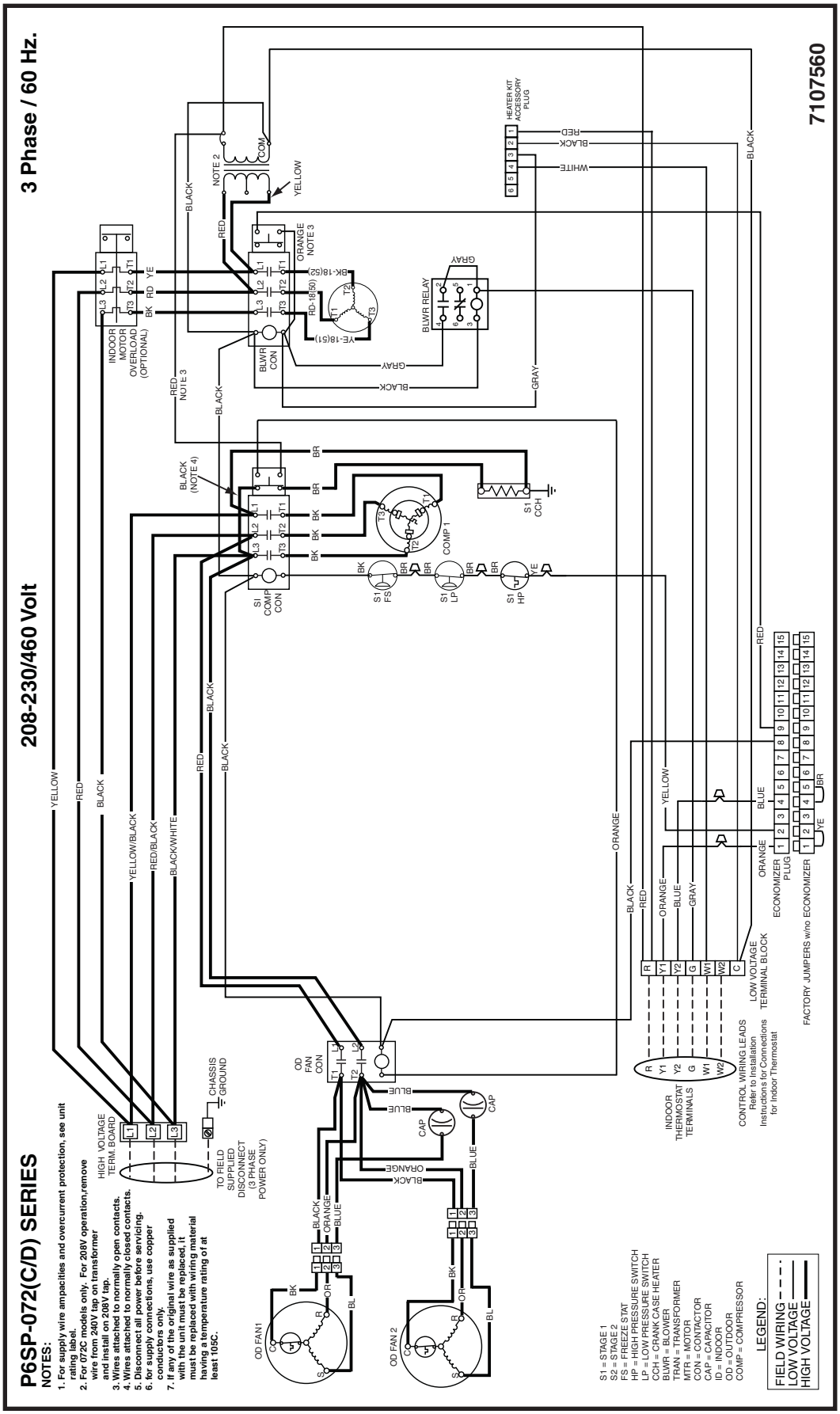


Figure 13. P6SP-072 Series

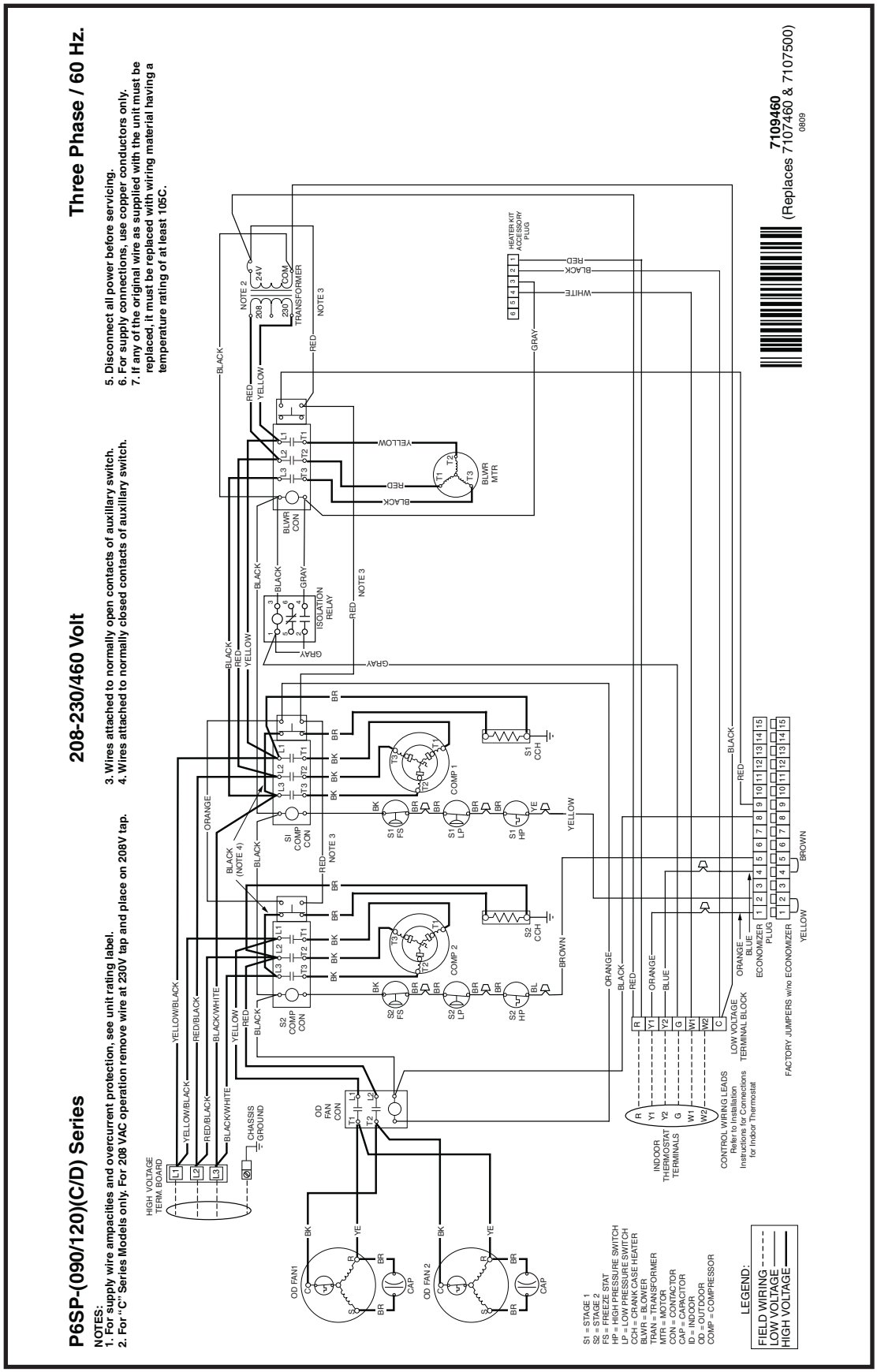


Figure 14. P6SP-090 / 120 Series

NOTE: This wiring Diagram is for 7 1/2 & 10 ton units produced after September 10, 2009

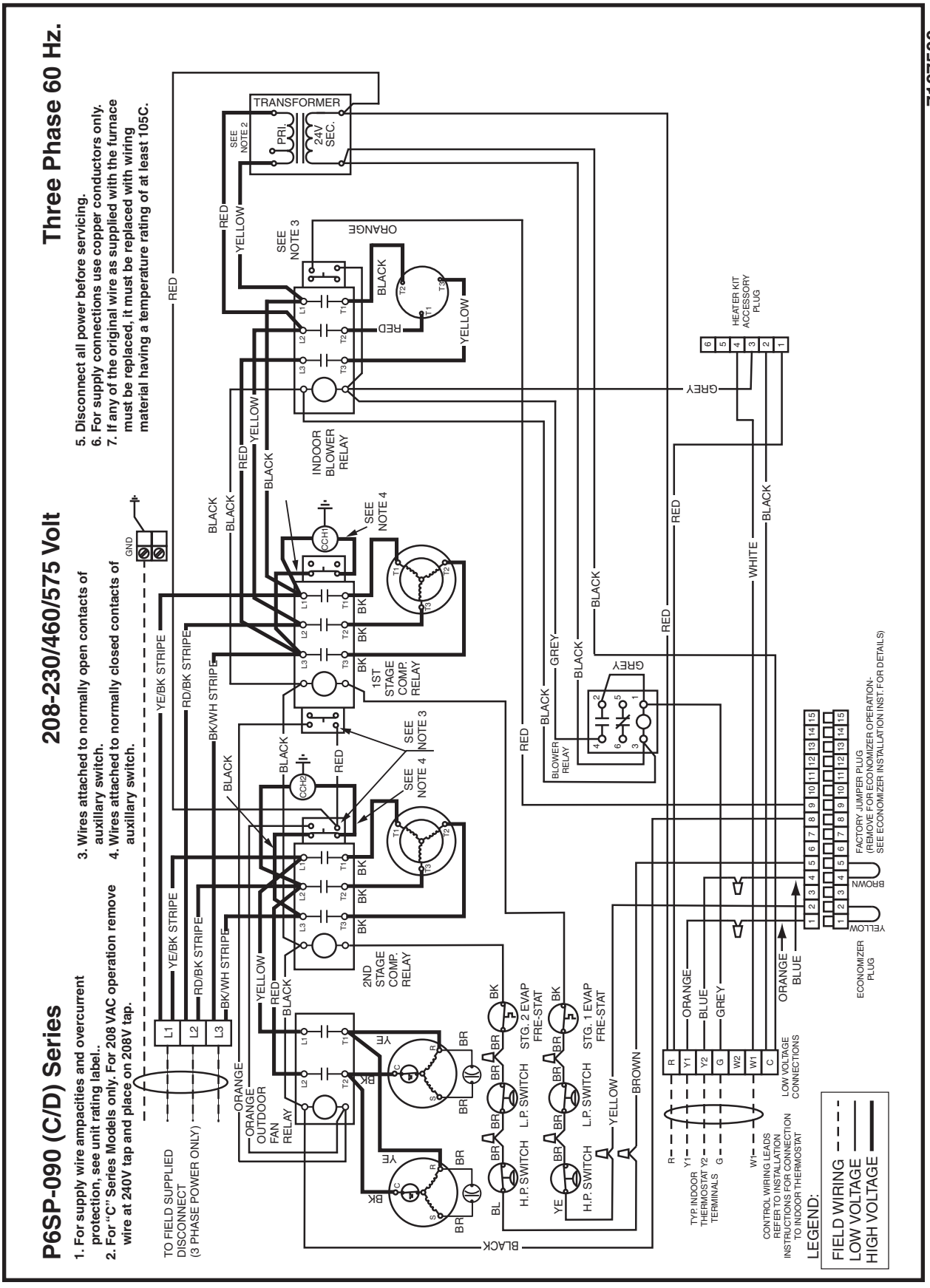


Figure 15. P6SP-090 Series

NOTE: This wiring Diagram is for 7 1/2 ton units produced before September 10, 2009

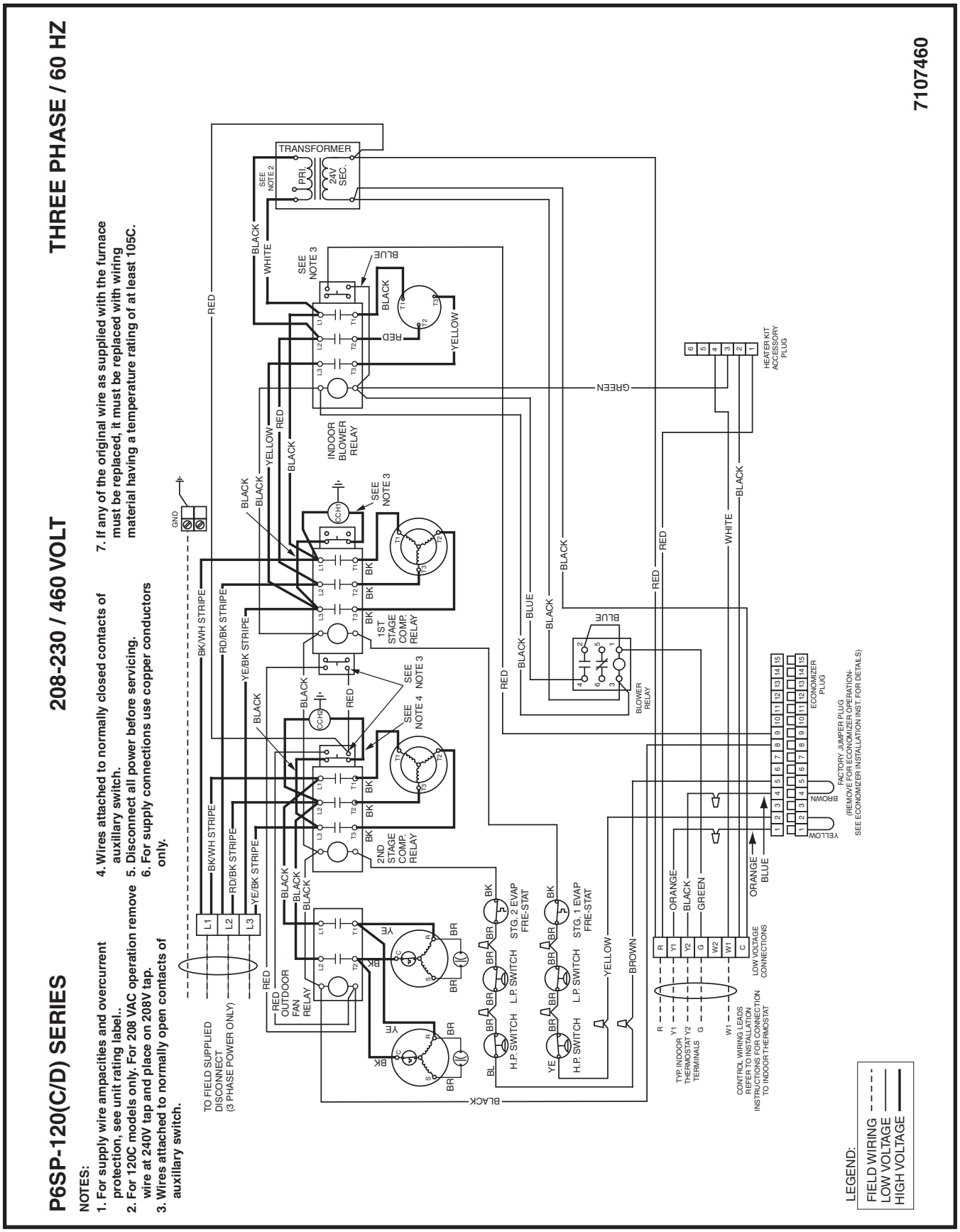


Figure 16. P6SP-120 Series

NOTE: This wiring Diagram for 10 ton units produced before September 10, 2009

Table 3. P6SP-072 Series

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																							
		0.2			0.3			0.4			0.5			0.6			0.7			0.8			0.9		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(1 HP) Low Static Drive Kit	Fully Closed																								
	1/2 Turn Open																			2403	981	1.00	2230	984	0.94
	1 Turn Open																2509	956	1.01	2318	959	0.92	2112	962	0.83
	1.5 Turns Open																2362	930	0.91	2158	933	0.82	1960	936	0.75
	2 Turns Open										2593	897	0.96	2395	901	0.87	2214	904	0.81	1998	907	0.72	*1807*	*910*	*0.68*
	2.5 Turns Open							2680	874	0.95	2458	876	0.88	2255	880	0.79	2042	883	0.72						
	3 Turns Open				*2751*	*850*	*0.94*	2559	852	0.86	2322	855	0.80	2115	858	0.71	1870	861	0.63						
	3.5 Turns Open				2617	826	0.85	2405	829	0.76	2181	831	0.71	1960	834	0.63									
	4 Turns Open	2656	797	0.81	2483	801	0.76	2251	805	0.66	2040	807	0.62	*1805*	*809*	*0.55*									
	4.5 Turns Open	2539	771	0.73	2334	774	0.67	2098	778	0.59	1870	780	0.54												
	*5 Turns Open	2422	744	0.66	2185	747	0.58	1945	750	0.52															

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																							
		0.9			1.0			1.1			1.2			1.3			1.4			1.5			1.6		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(1.5 HP) Medium Static Drive Kit	Fully Closed																								
	1/2 Turn Open																			2455	1185	1.45	2241	1189	1.40
	1 Turn Open													2557	1155	1.47	2357	1157	1.40	2267	1160	1.35			
	1.5 Turns Open							*2770*	*1123*	*1.55*	2563	1127	1.41	2402	1129	1.33	2182	1131	1.25						
	2 Turns Open							2558	1098	1.36	2401	1102	1.25	2246	1103	1.19	2006	1105	1.09						
	2.5 Turns Open				2595	1066	1.29	2392	1071	1.20	2222	1076	1.13												
	3 Turns Open	2598	1039	1.23	2405	1040	1.13	2225	1044	1.04	2043	1049	1.00												
	3.5 Turns Open	2437	1014	1.10	2232	1016	1.01																		
	4 Turns Open	2275	988	0.97	2059	991	0.89																		
	4.5 Turns Open	2097	960	0.87																					
	*5 Turns Open	1919	931	0.77																					

NOTES:

*Denotes factory sheave setting.
All performance curve data collected at 230V.
Boldface type indicates factory recommended blower operating range.
Values include losses for air filters, unit casing, and dry evaporator coil.
See Accessory Performance Data table for additional static pressure information.

Low Static Drive Consists of: 1 Hp Motor; 1VP40 Motor Sheave; AK 95 Blower Pulley & B-52 belt
High Static Drive Consists of: 3 Hp Motor; 1VP44 Motor Sheave; BK 72 Blower Pulley & B-51 belt

Table 4. P6SP-072 Series

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																							
		0.2			0.3			0.4			0.5			0.6			0.7			0.8			0.9		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(1 HP) Low Static Drive Kit	Fully Closed																								
	1/2 Turn Open																								
	1 Turn Open																			2572	937	1.04	2325	940	0.93
	1.5 Turns Open																			2383	915	0.93	2137	919	0.82
	2 Turns Open													2687	885	0.98	2460	889	0.90	2193	892	0.82	1948	898	0.72
	2.5 Turns Open													2518	862	0.88	2276	865	0.80	2007	869	0.73			
	3 Turns Open										2591	836	0.88	2349	838	0.79	2092	841	0.70	*1821*	*846*	*0.63*			
	3.5 Turns Open							2654	808	0.85	2425	812	0.77	2177	815	0.69									
	4 Turns Open				2720	781	0.82	2504	784	0.74	2258	788	0.67	2005	791	0.59									
	4.5 Turns Open				2584	755	0.75	2346	757	0.67	2081	760	0.60												
	*5 Turns Open	2665	727	0.74	2447	729	0.67	2188	730	0.60	1904	731	0.54												

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																							
		0.9			1.0			1.1			1.2			1.3			1.4			1.5			1.6		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(1.5 HP) Medium Static Drive Kit	Fully Closed																								
	1/2 Turn Open																								
	1 Turn Open																						2558	1159	1.48
	1.5 Turns Open																2675	1126	1.47	2487	1133	1.37	2208	1137	1.20
	2 Turns Open													2710	1096	1.45	2492	1100	1.33	2195	1109	1.17			
	2.5 Turns Open										2663	1067	1.35	2465	1071	1.26									
	3 Turns Open							2682	1039	1.26	2452	1041	1.18	2219	1046	1.07									
	3.5 Turns Open				2677	1012	1.23	2469	1015	1.13															
	4 Turns Open	2716	985	1.17	2491	987	1.09	2255	990	0.98															
	4.5 Turns Open	2500	956	1.05	2250	959	0.94																		
	*5 Turns Open	2284	926	0.93																					

*Denotes factory sheave setting.
All performance curve data collected at 230V.

NOTES: Boldface type indicates factory recommended blower operating range.
Values include losses for air filters, unit casing, and dry evaporator coil.
See Accessory Performance Data table for additional static pressure information.

Low Static Drive Consists of: 1 Hp Motor; 1VP40 Motor Sheave; AK 95 Blower Pulley & B-52 belt
High Static Drive Consists of: 3 Hp Motor; 1VP44 Motor Sheave; BK 72 Blower Pulley & B-51 belt

Table 5. P6SP-090C Series

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																								
		0.1			0.2			0.3			0.4			0.5			0.6			0.7			0.8			0.9		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(2 HP) Low Static Drive Kit	Fully Closed																											
	1/2 Turn Open																						3092	1102	1.66	2904	1107	1.59
	1 Turn Open																			3310	1069	1.78	3135	1074	1.69	2972	1076	1.53
	1.5 Turns Open																			3139	1038	1.63	2938	1042	1.54	2737	1045	1.40
	2.0 Turns Open										*3395*	*1001*	*1.71*	3265	1002	1.67	3134	1003	1.57	2968	1007	1.48	2741	1010	1.39	2501	1013	1.27
	2.5 Turns Open										3281	979	1.58	3139	980	1.51	2985	982	1.39	2799	985	1.31	2569	988	1.21			
	3.0 Turns Open				*3442*	*953*	*1.67*	3296	952	1.57	3166	956	1.45	3012	957	1.34	2836	960	1.22	2629	962	1.15	*2396*	*965*	*1.04*			
	3.5 Turns Open	*3445*	*923*	*1.63*	3309	925	1.52	3162	925	1.43	3019	928	1.33	2850	930	1.25	2664	933	1.15	2424	934	1.06						
	4.0 Turns Open	3330	895	1.50	3176	897	1.36	3028	898	1.29	2871	900	1.21	2688	902	1.15	2492	905	1.08									
	***4.5 Turns** Open	3187	866	1.42	3048	868	1.30	2886	870	1.24	2716	871	1.13	2512	873	1.03												
	5.0 Turns Open	3044	837	1.34	2919	838	1.23	2744	841	1.19	2561	842	1.06	*2336*	*843*	*0.91*												

Model	Motor Sheave Position	0.8			0.9			1			1.1			1.2			1.3			1.40			1.50			1.60		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(3 HP) Medium Static Drive Kit	Fully Closed																									3323	1340	2.54
	1 Turn Open																			3365	1277	2.32	3127	1283	2.15	2978	1286	2.05
	1.5 Turns Open																3320	1248	2.22	3126	1251	2.09	2911	1255	1.94	2751	1259	1.80
	2.0 Turns Open													3326	1215	2.20	3064	1221	1.92	2887	1224	1.86	2695	1227	1.73			
	2.5 Turns Open							*3447*	*1181*	*2.11*	3286	1185	2.00	3074	1189	1.92	2856	1192	1.72	2643	1197	1.57						
	3.0 Turns Open				*3442*	*1150*	*2.03*	3256	1153	1.85	3077	1157	1.75	2822	1162	1.64	2647	1163	1.51									
	3.5 Turns Open	*3415*	*1119*	*1.92*	3247	1121	1.82	3072	1124	1.66	2849	1127	1.57	2598	1133	1.42												
	4.0 Turns Open	3252	1088	1.73	3052	1092	1.62	2887	1095	1.47	2621	1097	1.39															
	***4.5 Turns** Open	3042	1059	1.62	2834	1063	1.53	2658	1065	1.39																		
	5.0 Turns Open	2831	1030	1.50	2615	1033	1.43	2428	1035	1.31																		

Model	Motor Sheave Position	1.2			1.3			1.4			1.5			1.6			1.7			1.80			1.90			2.00		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(3 HP) High Static Drive Kit	Fully Closed																											
	1 Turn Open																						*3356*	*1417*	*2.84*	3201	1422	2.77
	1.5 Turns Open																			3343	1388	2.78	3163	1392	2.58			
	2.0 Turns Open																3278	1360	2.60	3140	1363	2.49	2970	1367	2.32			
	2.5 Turns Open										*3459*	*1324*	*2.68*	3267	1328	2.50	3081	1333	2.36	2916	1339	2.20	2764	1343	2.06			
	3.0 Turns Open										3218	1300	2.36	3044	1303	2.22	2884	1306	2.11									
	3.5 Turns Open							3291	1269	2.29	3024	1274	2.11	2853	1276	1.96	2685	1279	1.84									
	4.0 Turns Open	*3451*	*1235*	*2.28*	3292	1238	2.11	3073	1243	1.99	2829	1247	1.85	2662	1249	1.71												
	***4.5 Turns Open**	3232	1207	2.04	3043	1210	1.87	2828	1214	1.76	2624	1219	1.63															
	5.0 Turns Open	3012	1178	1.81	2794	1182	1.63	2583	1184	1.54																		

NOTES:

* Denotes Factory sheave setting.
Boldface type indicates factory recommended blower operating range.
Values include losses for air filters, unit casing, and dry evaporator coil.
See Accessory Performance Data table for additional static pressure information.

Low Static Drive Consists of: 2 Hp Motor; 1VP40 Motor Sheave; AK59 Blower Pulley & A-43 belt
Med Static Drive Consists of: 3 Hp Motor; 1VP44 Motor Sheave; AK 54 Blower Pulley & A-42 belt
High Static Drive Consists of: 3 Hp Motor; 1VP50 Motor Sheave; AK 56 Blower Pulley & A-43 belt
All Performance Curve data collected at 230V

Table 6. P6SP-090C Series

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																											
		0.1			0.2			0.3			0.4			0.5			0.6			0.7			0.8			0.9		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(2 HP) Low Static Drive Kit	Fully Closed																												
	1/2 Turn Open																												
	1 Turn Open																									3316	1065	1.82
	1.5 Turns Open																						3319	1036	1.73	3125	1039	1.64
	2.0 Turns Open																			3338	1007	1.66	3146	1008	1.53	2933	1012	1.46
	2.5 Turns Open													3464	970	1.68	3300	973	1.55	3121	977	1.49	2921	979	1.39	2700	983	1.28
	3.0 Turns Open										3442	937	1.59	3272	941	1.51	3110	944	1.39	2903	947	1.32	2695	950	1.25	2466	953	1.10
	3.5 Turns Open							3455	909	1.51	3293	912	1.46	3120	915	1.38	2932	917	1.28	2716	920	1.19	2484	923	1.12			
	4.0 Turns Open							3323	883	1.40	3143	886	1.33	2967	888	1.24	2753	890	1.16	2529	892	1.06						
	*4.5 Turns Open	3433	846	1.37	3321	849	1.33	3155	853	1.27	2972	856	1.20	2774	858	1.11	2550	861	1.04									
	5.0 Turns Open	3331	817	1.23	3161	819	1.20	2986	822	1.13	2800	826	1.06	2580	828	0.97	2347	831	0.92									

Model	Motor Sheave Position	0.8			0.9			1			1.1			1.2			1.3			1.40			1.50			1.60		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(3 HP) Medium Static Drive Kit	Fully Closed																											
	1 Turn Open																											
	1.5 Turns Open																						*3399*	*1231*	*2.37*	3235	1236	2.23
	2.0 Turns Open																			3347	1203	2.26	3174	1206	2.08	2993	1210	1.98
	2.5 Turns Open													*3423*	*1162*	*2.17*	3268	1169	2.12	3106	1174	2.01	2924	1178	1.86			
	3.0 Turns Open							*3410*	*1110*	*2.07*	3321	1122	2.03	3198	1132	1.91	3033	1140	1.84	2864	1145	1.75	2673	1149	1.63			
	3.5 Turns Open	*3411*	*1053*	*1.98*	3309	1065	1.94	3221	1083	1.89	3114	1096	1.84	2964	1103	1.56	2783	1110	1.63	2590	1115	1.56						
	4.0 Turns Open	3228	1025	1.78	3131	1039	1.75	3031	1055	1.70	2906	1070	1.64	2729	1074	1.20	2533	1080	1.41	*2315*	*1085*	*1.36*						
	*4.5 Turns Open	3136	1013	1.68	3005	1022	1.59	2851	1032	1.54	2681	1043	1.46	2492	1046	1.20												
	5.0 Turns Open	3043	1000	1.58	2878	1005	1.43	2670	1009	1.38	2455	1015	1.27															

Model	Motor Sheave Position	1.2			1.3			1.4			1.5			1.6			1.7			1.80			1.90			2.00		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(3 HP) High Static Drive Kit	Fully Closed																											
	1 Turn Open																											
	1.5 Turns Open																											
	2.0 Turns Open																									*3435*	*1347*	*2.73*
	2.5 Turns Open																						3334	1316	2.56	3178	1321	2.44
	3.0 Turns Open																*3406*	*1278*	*2.52*	3240	1285	2.41	3088	1289	2.25	2921	1294	2.15
	3.5 Turns Open										*3434*	*1233*	*2.44*	3296	1241	2.33	3168	1252	2.27	3000	1258	2.14	2869	1266	2.00			
	4.0 Turns Open				*3397*	*1178*	*2.34*	3303	1192	2.24	3214	1205	2.15	3098	1217	2.11	2929	1226	2.01	2759	1231	1.87						
	*4.5 Turns Open				3341	1171	2.20	3210	1181	2.10	3065	1189	2.00	2911	1197	1.90	2717	1204	1.79									
	5.0 Turns Open				3284	1163	2.06	3117	1169	1.96	2916	1173	1.85	2723	1177	1.68	2505	1181	1.57									

NOTES:

* Denotes Factory sheave setting.
Boldface type indicates factory recommended blower operating range.
Values include losses for air filters, unit casing, and dry evaporator coil.
See Accessory Performance Data table for additional static pressure information.

Low Static Drive Consists of: 2 Hp Motor; 1VP40 Motor Sheave; AK59 Blower Pulley & A-43 belt
Med Static Drive Consists of: 3 Hp Motor; 1VP44 Motor Sheave; AK 54 Blower Pulley & A-42 belt
High Static Drive Consists of: 3 Hp Motor; 1VP50 Motor Sheave; AK 56 Blower Pulley & A-43 belt
All Performance Curve data collected at 230V

Blower Performance - Downflow Configuration

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																	
		0.1			0.2			0.3			0.4			0.5			0.6		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(2 HP) Low Static Drive Kit	1.5 Turns Open																		
	2.0 Turns Open													**4436**	**869**	**2.09**	**4274**	**873**	**2.03**
	2.5 Turns Open							**4633**	**845**	**2.08**	**4457**	**848**	**2.01**	**4281**	**851**	**1.94**	**4105**	**854**	**1.86**
	3.0 Turns Open	*4791*	*820*	*2.14*	**4667**	**823**	**2.04**	**4490**	**826**	**1.98**	**4317**	**830**	**1.88**	**4127**	**833**	**1.79**	**3936**	**835**	**1.70**
	3.5 Turns Open	*4658*	*800*	*1.98*	**4518**	**803**	**1.90**	**4337**	**805**	**1.83**	**4146**	**809**	**1.75**	**3956**	**811**	**1.66**	**3765**	**814**	**1.57**
	4.0 Turns Open	**4525**	**780**	**1.82**	**4368**	**783**	**1.76**	**4183**	**785**	**1.68**	**3975**	**788**	**1.61**	**3785**	**790**	**1.52**	**3594**	**792**	**1.44**
	4.5 Turns Open	**4380**	**760**	**1.67**	**4201**	**762**	**1.61**	**4015**	**764**	**1.54**	**3810**	**767**	**1.47**	**3600**	**768**	**1.38**	*3389*	*770*	*1.29*
	5.0 Turns Open	**4235**	**739**	**1.53**	**4034**	**741**	**1.46**	**3847**	**743**	**1.39**	**3645**	**745**	**1.32**	*3415*	*747*	*1.23*			

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																	
		0.7			0.8			0.9			1.00			1.10			1.20		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(2 HP) Low Static Drive Kit	Fully Closed													**3863**	**948**	**2.11**	**3658**	**951**	**1.95**
	1/2 Turn Open							*4128*	*927*	*2.15*	**3945**	**931**	**2.03**	**3722**	**936**	**1.91**	*3499*	*941*	*1.79*
	1 Turn Open				**4208**	**911**	**2.13**	**4021**	**915**	**2.05**	**3833**	**919**	**1.96**	**3646**	**923**	**1.88**	*3458*	*927*	*1.79*
	1.5 Turns Open	**4223**	**892**	**2.07**	**4050**	**895**	**1.98**	**3844**	**899**	**1.89**	**3639**	**903**	**1.81**	**3433**	**907**	**1.73**			
	2.0 Turns Open	**4083**	**876**	**1.93**	**3891**	**879**	**1.82**	**3668**	**883**	**1.74**	*3444*	*886*	*1.66*						
	2.5 Turns Open	**3902**	**856**	**1.75**	**3699**	**858**	**1.64**	**3455**	**862**	**1.56**									
	3.0 Turns Open	**3722**	**837**	**1.58**	*3507*	*838*	*1.47*												
	3.5 Turns Open	**3534**	**816**	**1.46**															
	4.0 Turns Open																		

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																	
		0.9			1.00			1.10			1.20			1.30			1.40		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(3 HP) High Static Drive Kit	2.5 Turns Open																		
	3.0 Turns Open													*4571*	*1068*	*3.01*	**4387**	**1071**	**2.87**
	3.5 Turns Open										**4562**	**1047**	**2.92**	**4366**	**1050**	**2.78**	**4171**	**1053**	**2.64**
	4.0 Turns Open	*4903*	*1020*	*3.01*	*4724*	*1023*	*2.90*	**4583**	**1026**	**2.80**	**4368**	**1029**	**2.69**	**4161**	**1032**	**2.56**	**3954**	**1035**	**2.42**
	4.5 Turns Open	**4734**	**1001**	**2.82**	**4561**	**1005**	**2.72**	**4385**	**1007**	**2.60**	**4169**	**1010**	**2.49**	**3942**	**1012**	**2.35**	**3715**	**1015**	**2.20**
	5.0 Turns Open	**4565**	**982**	**2.62**	**4397**	**986**	**2.54**	**4186**	**988**	**2.40**	**3969**	**990**	**2.29**	**3723**	**993**	**2.14**	*3476*	*995*	*1.99*

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																	
		1.50			1.60			1.70			1.80			1.90			2.00		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(3 HP) High Static Drive Kit	Fully Closed																		
	1 Turn Open																**3862**	**1159**	**3.03**
	1.5 Turns Open										**4102**	**1136**	**3.00**	**3886**	**1140**	**2.89**	**3762**	**1142**	**2.82**
	2.0 Turns Open							**4119**	**1117**	**2.96**	**3891**	**1121**	**2.80**	**3766**	**1123**	**2.74**	**3534**	**1126**	**2.58**
	2.5 Turns Open	**4354**	**1092**	**3.00**	**4144**	**1096**	**2.86**	**3934**	**1099**	**2.72**	**3724**	**1103**	**2.59**	**3565**	**1105**	**2.50**			
	3.0 Turns Open	**4164**	**1075**	**2.74**	**3941**	**1078**	**2.61**	**3749**	**1081**	**2.49**	**3556**	**1084**	**2.37**						
	3.5 Turns Open	**3960**	**1056**	**252**	**3750**	**1059**	**2.40**	**3555**	**1061**	**2.28**									
	4.0 Turns Open	**3757**	**1037**	**2.30**	**3559**	**1039**	**2.18**												
	4.5 Turns Open	*3493*	*1017*	*2.07*															
	5.0 Turns Open																		

* Denotes Factory sheave setting.
Low Static Drive Consists of: 2 Hp Motor; 1VP40 Motor Sheave; BK 75 Blower Pulley & B-49 belt
High Static Drive Consists of: 3 Hp Motor; 1VP50 Motor Sheave; BK 75 Blower Pulley & B-51 belt

NOTES:
Boldface type indicates factory recommended blower operating range.
Values include losses for air filters, unit casing, and dry evaporator coil.
See Accessory Performance Data table for additional static pressure information.

Table 7. P6SP-120C Series

Blower Performance - Horizontal Configuration

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																	
		0.1			0.2			0.3			0.4			0.5			0.6		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(2 HP) Low Static Drive Kit	1.5 Turns Open																		
	2.0 Turns Open																*4521*	*870*	*2.17*
	2.5 Turns Open													**4549**	**850**	**2.09**	**4347**	**849**	**2.01**
	3.0 Turns Open										**4537**	**822**	**2.06**	**4355**	**825**	**1.95**	**4172**	**827**	**1.84**
	3.5 Turns Open				*4767*	*797*	*2.12*	**4575**	**799**	**2.02**	**4383**	**802**	**1.92**	**4190**	**804**	**1.82**	**3998**	**806**	**1.73**
	4.0 Turns Open	**4745**	**774**	**2.03**	**4584**	**776**	**1.93**	**4406**	**779**	**1.86**	**4228**	**781**	**1.78**	**4026**	**783**	**1.70**	**3824**	**785**	**1.61**
	4.5 Turns Open	**4609**	**753**	**1.85**	**4445**	**755**	**1.77**	**4244**	**757**	**1.68**	**4048**	**759**	**1.62**	**3848**	**762**	**1.52**	**3619**	**764**	**1.43**
	5.0 Turns Open	**4473**	**732**	**1.66**	**4305**	**734**	**1.61**	**4081**	**735**	**1.51**	**3868**	**737**	**1.45**	**3669**	**740**	**1.35**	*3413*	*743*	*1.26*

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																	
		0.7			0.8			0.9			1.00			1.10			1.20		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(2 HP) Low Static Drive Kit	Fully Closed																		
	1/2 Turn Open													**4044**	**927**	**2.12**	**3845**	**933**	**2.03**
	1 Turn Open										*4095*	*908*	*2.15*	**3895**	**913**	**2.06**	**3670**	**918**	**1.91**
	1.5 Turns Open							**4120**	**890**	**2.07**	**3921**	**894**	**1.96**	**3701**	**898**	**1.86**	**3457**	**903**	**1.73**
	2.0 Turns Open	**4331**	**869**	**2.08**	**4142**	**873**	**1.96**	**3945**	**876**	**1.86**	**3747**	**879**	**1.76**	**3507**	**883**	**1.65**	*3244*	*887*	*1.54*
	2.5 Turns Open	**4145**	**847**	**1.92**	**3946**	**854**	**1.81**	**3740**	**857**	**1.70**	**3535**	**860**	**1.59**	*3329*	*863*	*1.48*			
	3.0 Turns Open	**3958**	**825**	**1.76**	**3750**	**834**	**1.65**	**3536**	**837**	**1.53**	*3322*	*840*	*1.41*						
	3.5 Turns Open	**3769**	**806**	**1.64**	**3543**	**812**	**1.54**	*3317*	*818*	*1.43*									
	4.0 Turns Open	**3580**	**788**	**1.52**	*3336*	*790*	*1.42*												
	4.5 Turns Open	*3369*	*766*	*1.34*															
	5.0 Turns Open																		

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																	
		0.9			1.00			1.10			1.20			1.30			1.40		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(3 HP) High Static Drive Kit	3.0 Turns Open																		
	3.5 Turns Open																		
	4.0 Turns Open																**4558**	**1027**	**2.90**
	4.5 Turns Open										**4784**	**1003**	**2.94**	**4568**	**1006**	**2.79**	**4352**	**1009**	**2.65**
	5.0 Turns Open				*4914*	*980*	*2.94*	**4738**	**982**	**2.80**	**4561**	**984**	**2.66**	**4378**	**987**	**2.53**	**4147**	**990**	**2.40**

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																	
		1.50			1.60			1.70			1.80			1.90			2.00		
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw
(3 HP) High Static Drive Kit	1.5 Turns Open																		
	2.0 Turns Open																**4083**	**1118**	**2.93**
	2.5 Turns Open													**4068**	**1096**	**2.87**	**3797**	**1099**	**2.68**
	3.0 Turns Open							*4327*	*1072*	*2.96*	**4137**	**1074**	**2.78**	**3824**	**1077**	**2.60**	**3511**	**1080**	**2.42**
	3.5 Turns Open				**4326**	**1052**	**2.87**	**4120**	**1054**	**2.71**	**3889**	**1057**	**2.54**	*3313*	*1063*	*2.26*			
	4.0 Turns Open	**4358**	**1030**	**2.74**	**4135**	**1033**	**2.60**	**3912**	**1036**	**2.46**	**3640**	**1040**	**2.29**						
	4.5 Turns Open	**4137**	**1012**	**2.50**	**3749**	**1016**	**2.35**	*3361*	*1020*	*2.20*									
	5.0 Turns Open	**3915**	**993**	**2.26**	*3363*	*999*	*2.10*												

* Denotes Factory sheave setting.

NOTES:
Low Static Drive Consists of: 2 Hp Motor; 1VP40 Motor Sheave; BK 75 Blower Pulley & B-49 belt
High Static Drive Consists of: 3 Hp Motor; 1VP50 Motor Sheave; BK 75 Blower Pulley & B-51 belt
Boldface type indicates factory recommended blower operating range.
Values include losses for air filters, unit casing, and dry evaporator coil.
See Accessory Performance Data table for additional static pressure information.

Table 8. P6SP-120C Series / 208-230V

P6SP Charging Charts, Cooling Only

APPLICATION NOTES ON THE USE OF CHARGING CHARTS

This equipments cooling systems contain refrigerant under high pressure, always use safe practices when servicing the unit. Always review the factory literature and safety warnings prior to servicing.

All P6SP-072/090/120 units are shipped from the factory with the proper amount and type of refrigerant. Always inspect the unit rating label to determine the units information prior to working on the system. Do not mix different refrigerants or charge the unit with a refrigerant not listed on the unit rating label.

The charging charts below are valid for a variety of indoor, return air conditions and are most highly influenced by the outdoor ambient temperature, outdoor fan operation and the unit operating voltage. Before referencing the charts below, always ensure that all compressor circuits are energized and have stable operation. As can be seen in the charging charts, the ideal system sub-cooling can vary over the range of operation. Always reference the charts to determine the ideal amount of sub-cooling for a given liquid pressure. Units charged to other values will not perform at the rated unit efficiency (EER).

To inspect a systems operation, using quality instruments, match the measured liquid temperature to the units chart. The measured liquid pressure reading should be within 3% of the value shown for most installations. For two stage systems, the charts are valid for both compressor stages.

DO NOT utilize the charts for two stage systems operating only under a single stage call for cooling.

DO NOT utilize the charts in systems that do not have all the outdoor fans energized, or have the fans cycling under a low-ambient control. Refer to the low-ambient kit instructions for more information, if applicable.

For systems that are operating with more then a 5% deviation, inspect the unit for leaks. Always use safe and environmentally sound methods for refrigerant handling. When repairing system leakages, always utilize a nitrogen (inert) gas to protect the refrigerant system and pressure check the repair before re-charging. Always replace the filter-dryers when performing any repair to the refrigeration system. After completing the repairs, evacuate the system to 350-500 microns and *weight in* the refrigerant to the amount specified on the unit rating label.

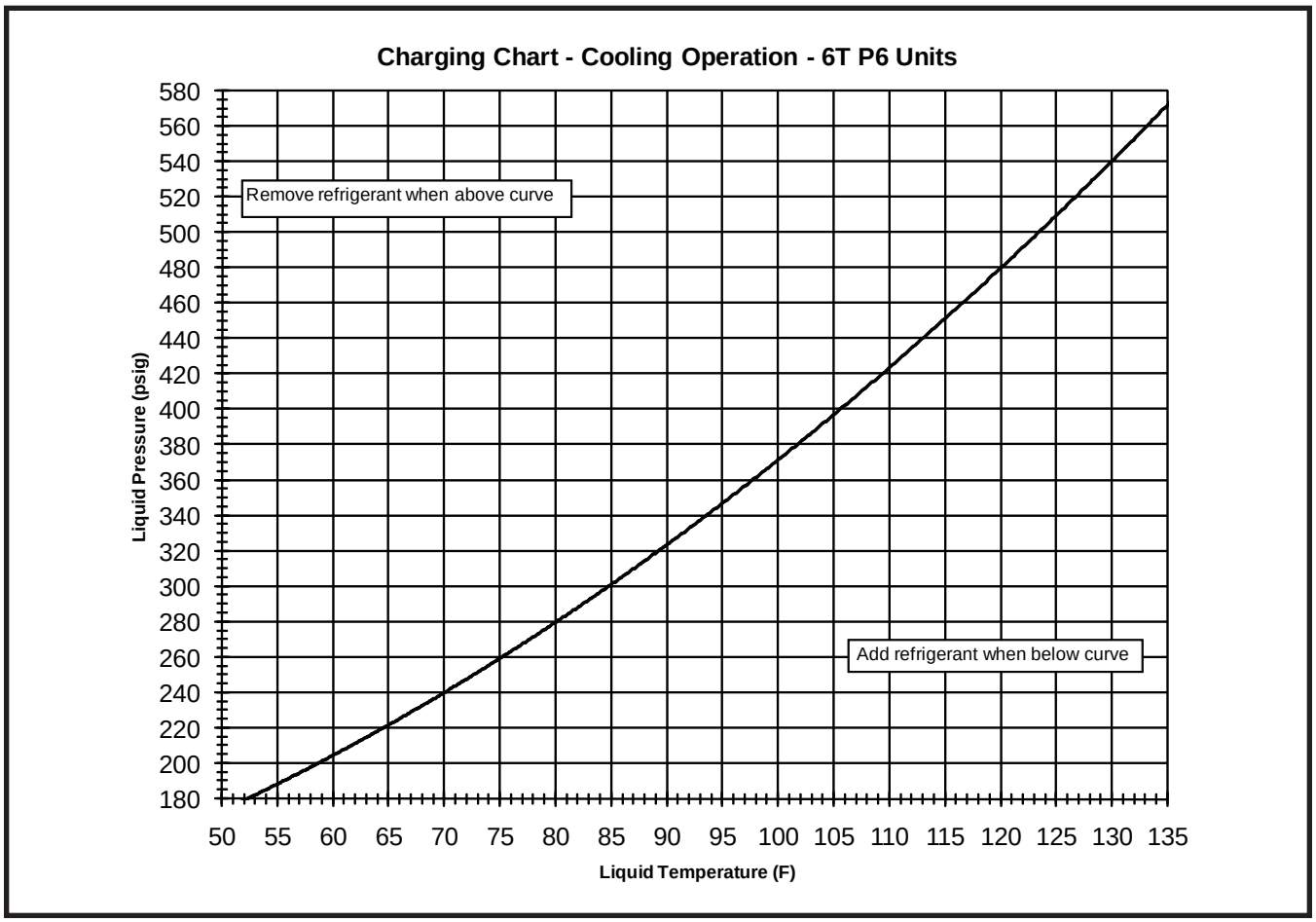


Figure 17. Charging Chart for Single Stage Cooling Systems - 6 Ton units

P6SP Charging Charts (continued)

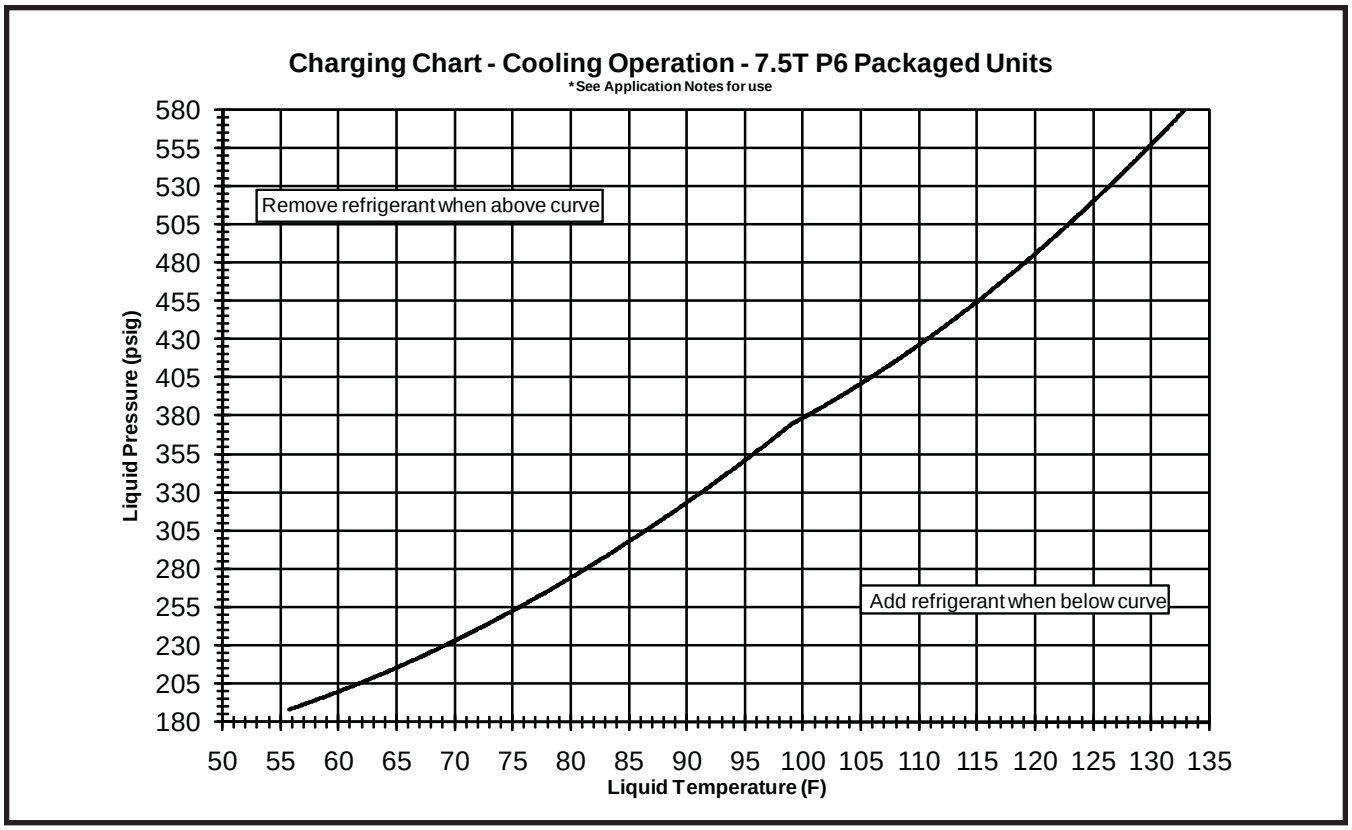


Figure 18. Charging Chart for - 7.5 Ton Units

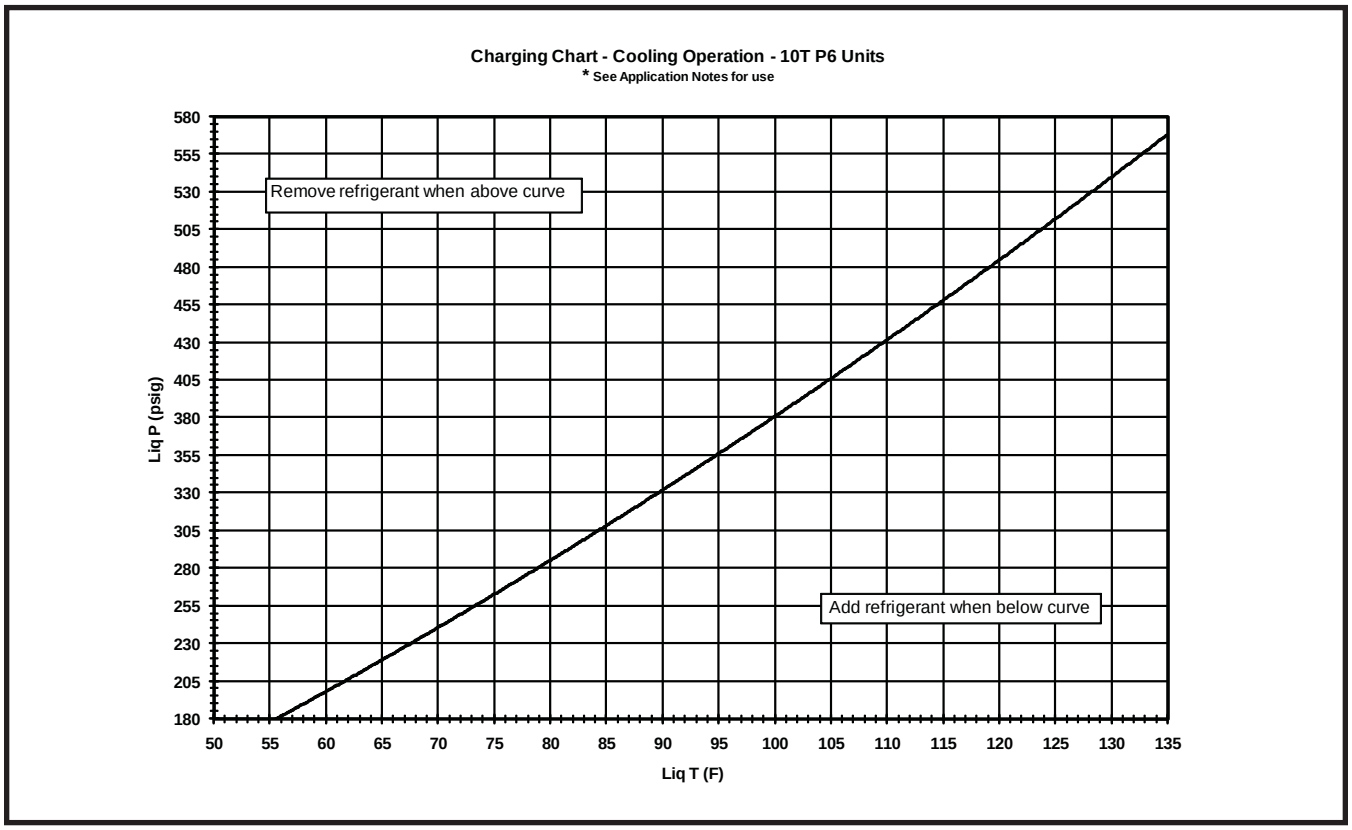


Figure 19. Charging Chart for - 10 Ton Units

INSTALLATION/PERFORMANCE CHECK LIST

INSTALLATION ADDRESS:		
CITY _____	STATE _____	
UNIT MODEL # _____		
UNIT SERIAL # _____		
Unit Installed Minimum clearances per Figure 1 (page 4)?	YES	NO

ELECTRICAL SYSTEM:		
Electrical connections tight?	YES	NO
Line voltage polarity correct?	YES	NO
Rated Voltage: _____ VOLTS		
L1-L2 Volts: _____ VOLTS		
L1-L3 Volts: _____ VOLTS		
L2-L3 Volts: _____ VOLTS		
Avg. Volts: _____ VOLTS		
Max. deviation of voltage from avg. volts:_____ VOLTS		
% Volt imbalance: _____ VOLTS		

GENERAL:		
Has the thermostat been calibrated?	YES	NO
Is the thermostat level?	YES	NO
Is the heat anticipator setting correct?	YES	NO
Has the owner's information been reviewed with the customer?	YES	NO
Has the Literature Package been left with the unit?	YES	NO
Date Installed: _____		
Installation Type: Horizontal / Downflow		

INSTALLER NAME:	
CITY _____	STATE _____

REFRIGERATION SYSTEM:		
Was unit given 24 hr warm up period for crankcase heaters?	YES	NO
Ambient Temperature _____ °F		
Return Air Temperature _____ °F		
Stage-1 Liquid Pressure (high side) _____		
Stage-1 Liquid Temperature _____ °F		
Stage-1 Suction Pressure (low side) _____		
Stage-2 Liquid Pressure (high side) _____		
Stage-2 Liquid Temperature _____ °F		
Stage-2 Suction Pressure (low side) _____		

BLOWER SYSTEM:
Blower Motor HP:_____
Sheave Setting: _____turns open
System Static:_____E.S.P. (in -Wg)

ELECTRIC HEAT:		
Heater Kit installed?	YES	NO
Heater Kit Model #: _____		
Return Air Temp: _____(°F)		
Supply Air Temp: _____(°F)		
Temperature Rise: _____(°F)		

ARI PERFORMANCE CERTIFIED ™ ARI Standard 340/360 Unitary Large HP. Certification applies only when the complete system is listed with ARI. www.aridirectory.org

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INSTALLER: PLEASE LEAVE THESE INSTALLATION INSTRUCTIONS WITH THE OWNER.

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