

P6SP - 072 / 090 / 120 Series, A Revision

INSTALLATION INSTRUCTIONS

Single Package Electric Heating / Electric Cooling Rooftop Unit



10T Unit Shown

IMPORTANT


ATTENTION INSTALLERS:

It is your responsibility to know this product better than your customer. This includes being able to install the product according to strict safety guidelines and instructing the customer on how to operate and maintain the equipment for the life of the product. Safety should always be the deciding factor when installing this product and using common sense plays an important role as well. Pay attention to all safety warnings and any other special notes highlighted in the manual. Improper installation of the furnace or failure to follow safety warnings could result in serious injury, death, or property damage.

These instructions are primarily intended 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. Please read all instructions carefully before starting the installation. Return these instructions to the customer's package for future reference.

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

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⚠ 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.

⚠ 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.**
 - **Always wear goggles, disposable gloves, long sleeved shirt, and appropriate breathing protection when working near this insulation. If contact with skin occurs, wash immediately with soap and water. In case of contact with eyes, flush immediately with water for at least 15 minutes. Contact a physician if needed.**
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⚠ WARNING:

The information listed below and on the next page must be followed during the installation, service, and operation of this unit. Unqualified individuals should not attempt to interpret these instructions or install this equipment. Failure to follow safety recommendations could result in possible damage to the equipment, serious personal injury or death.

- 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.
- 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.
- The installer should become familiar with the units wiring diagram before making any electrical connections to the unit. See the unit wiring label or Figures 13 & 14 (pages 21 & 22).

- Follow all precautions in the literature, on tags, and on labels provided with the equipment. Read and thoroughly understand the instructions provided with the equipment prior to performing the installation and operational checkout of the equipment.
- Use caution when handling this appliance or removing components. Personal injury can occur from sharp metal edges present in all sheet metal constructed equipment.

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 in Figures 10 & 11 (pages 13 - 17). 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 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.

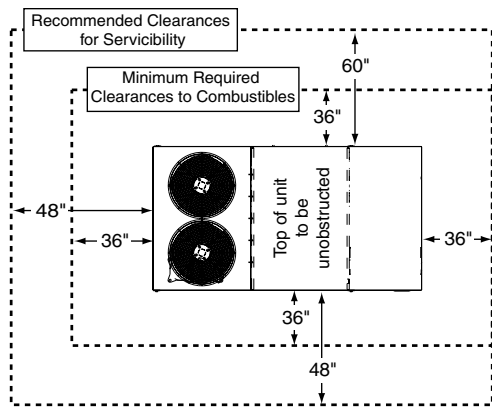


Figure 1. Minimum Clearances to Combustibles

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.

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!**

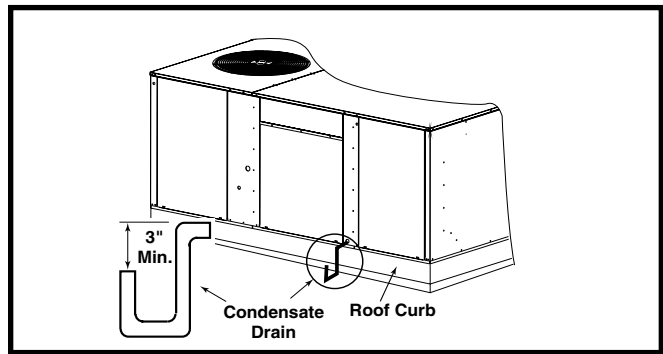


Figure 2. Condensate Drain

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 its permanent location.

Rigging & 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 securely in place during rigging and hoisting.

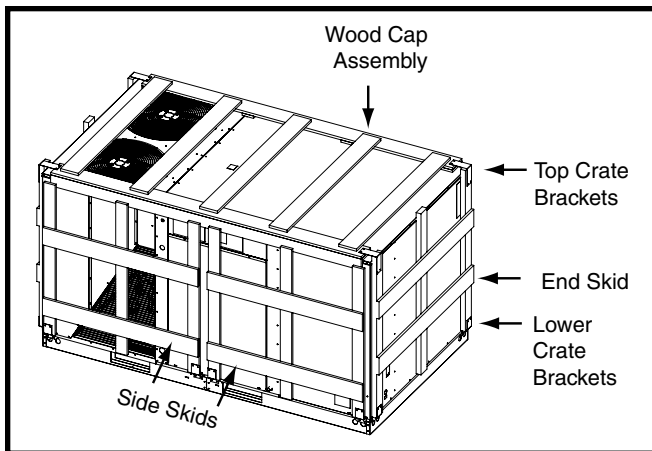


Figure 3. Side View

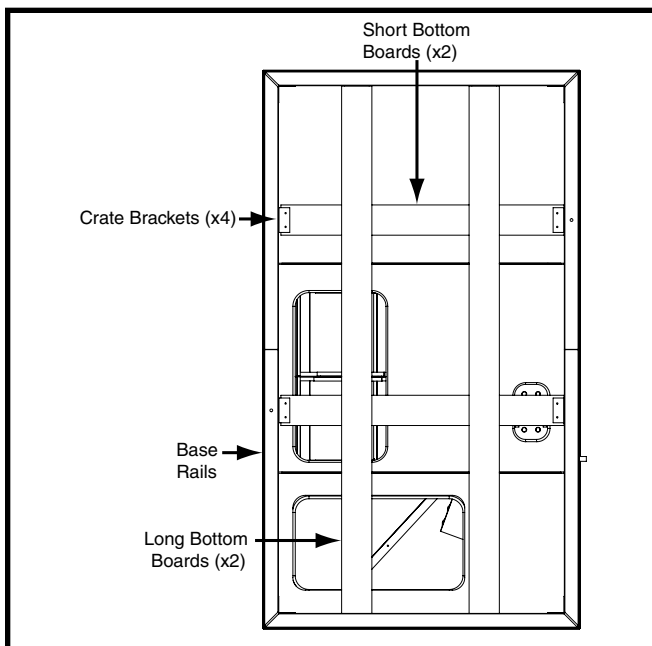


Figure 4. Bottom View

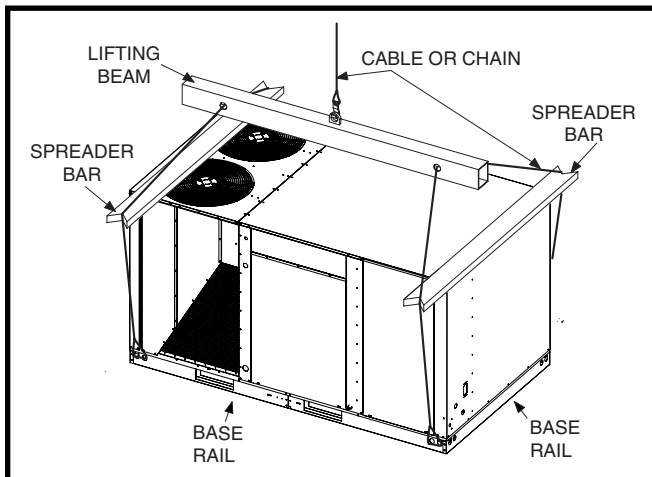


Figure 5. Rigging & Hoisting

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.

⚠ 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.

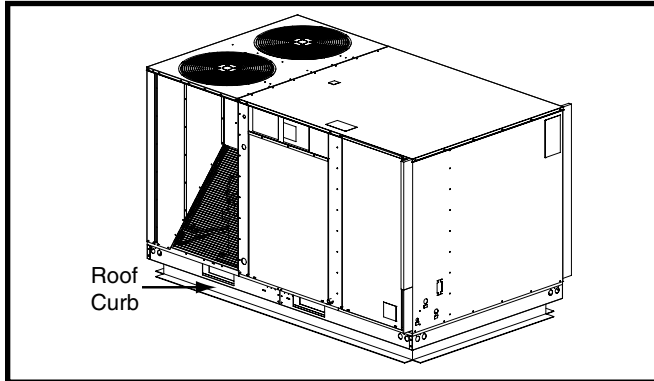


Figure 6. Roof Curb Installations

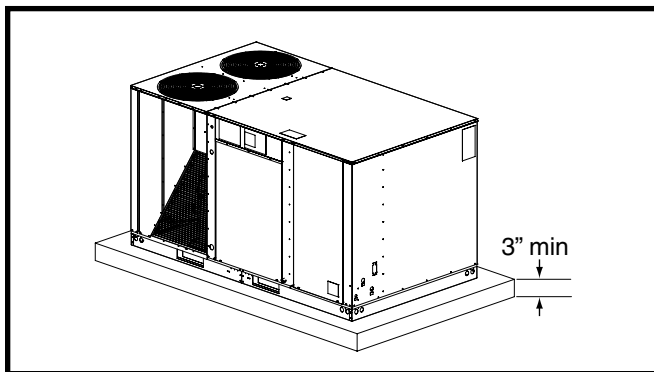


Figure 7. Concrete Pad Installations

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 U.L. 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 U.L. 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 Tables 2a-2b (page 19), Table 3 (page 20) 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 3-Pole Dual Circuit Adaptor (P/N-917468) 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.

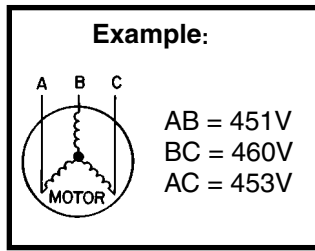
Overcurrent protection must be provided at the branch circuit distribution panel and sized as shown on the unit rating label and according to the National Electric Code and applicable local codes. **NOTE:** See the unit rating plate for maximum circuit ampacity and maximum overcurrent protection limits.

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).



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 21 - 22).
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.

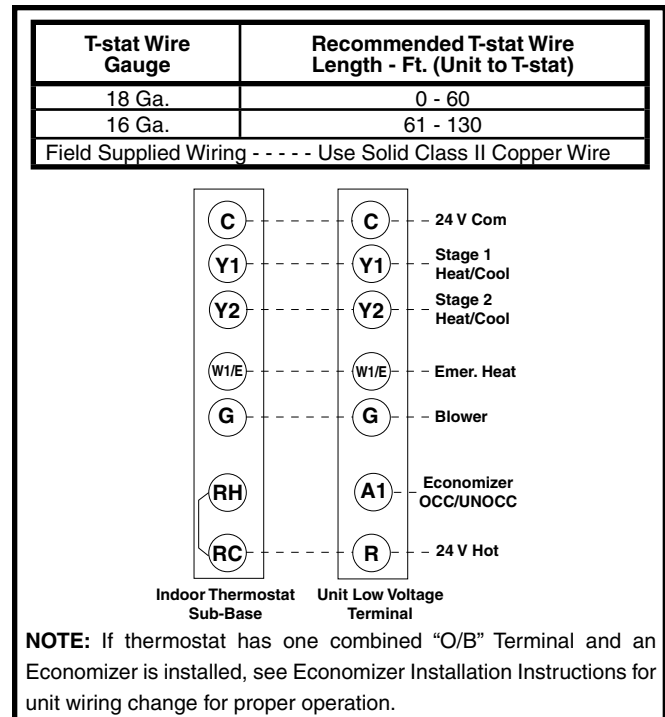


Figure 8. Typical Connections - 2 Stage Cool / 1 Stage Heat T-Stat

Blower Speed

The blower speed is preset at the factory for an external static pressure of 0.2-0.3 in-Wg. For optimum system performance and comfort, it may be necessary to change the factory set speed. Refer to Blower Performance Data (Tables 5 - 10, 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 & 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. Use only NORDYNE manufactured heater kits.

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 21 - 22

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.

⚠ CAUTION:

Verify proper operation after servicing.

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. See page 30.

⚠ 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.

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.

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	Hail Guards

COMPONENT FUNCTIONS

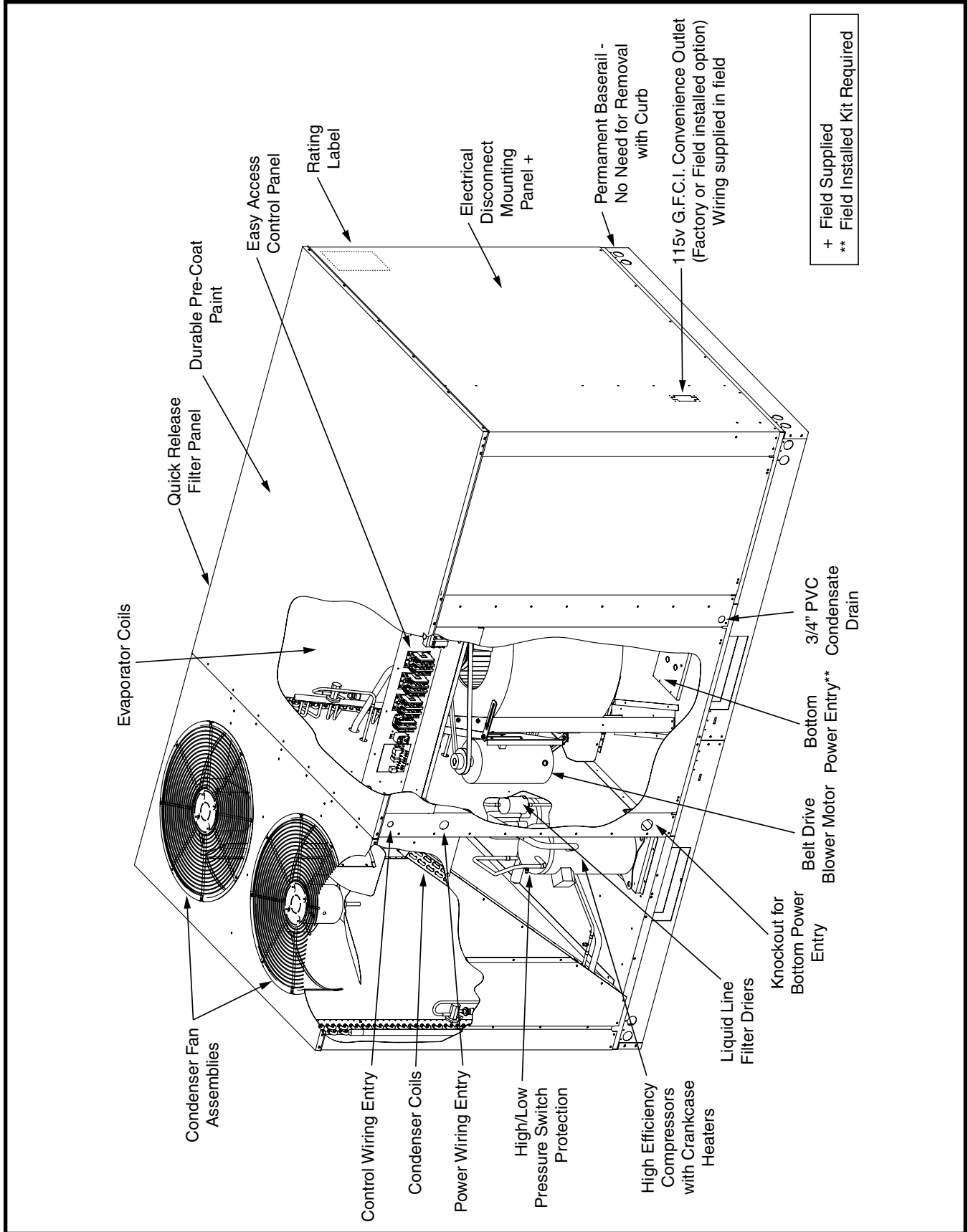
High Pressure switch (HPS) - Prevents compressors from operating at elevated pressures. High pressure switches are located on both compressor hot gas lines and are fitted with schrader cores. The switch is non-adjustable set to open at 650 PSIG and must be manually reset.

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 schrader 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. Provided w/ electric heat kits.

FIGURES & TABLES



+ Field Supplied
 ** Field Installed Kit Required

Figure 9. P6SP Components

PHYSICAL DATA
Dimensions shown in inches (mm)

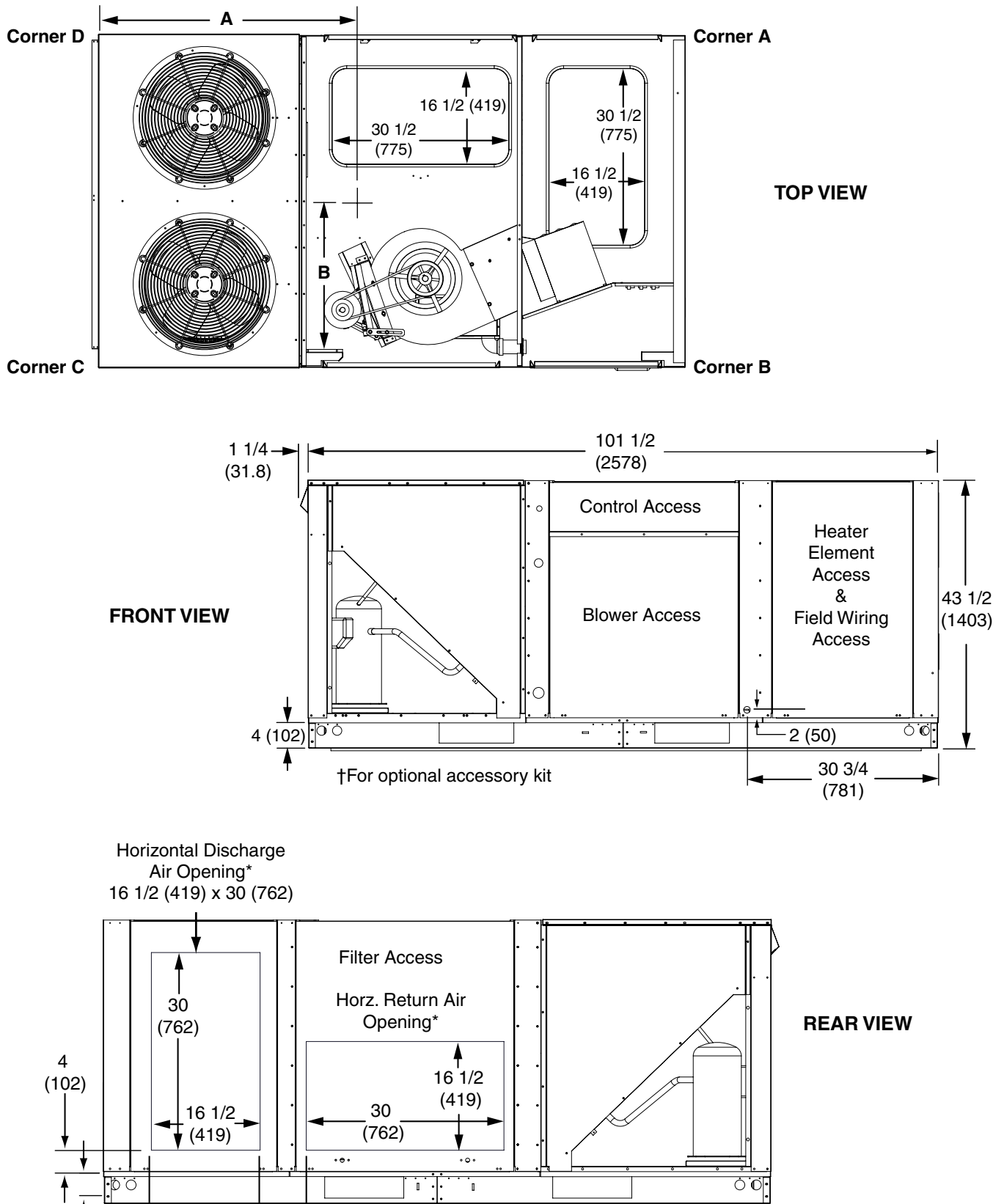


Figure 10. Physical Data - P6SP - 072 Series

PHYSICAL DATA - continued
Dimensions shown in inches (mm)

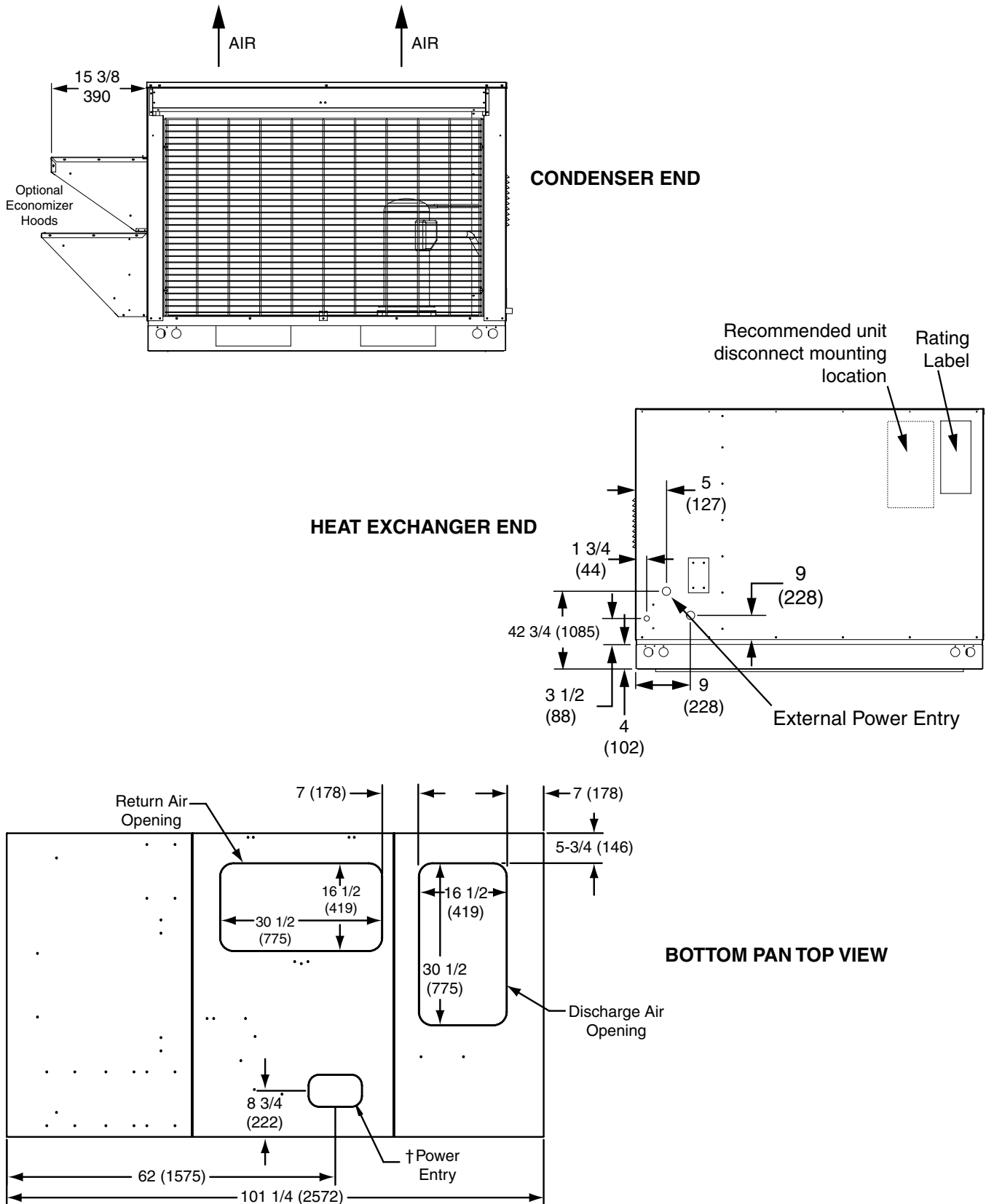


Figure 10. P6SP - 072 Series (Continued)

PHYSICAL DATA - continued
Dimensions shown in inches (mm)

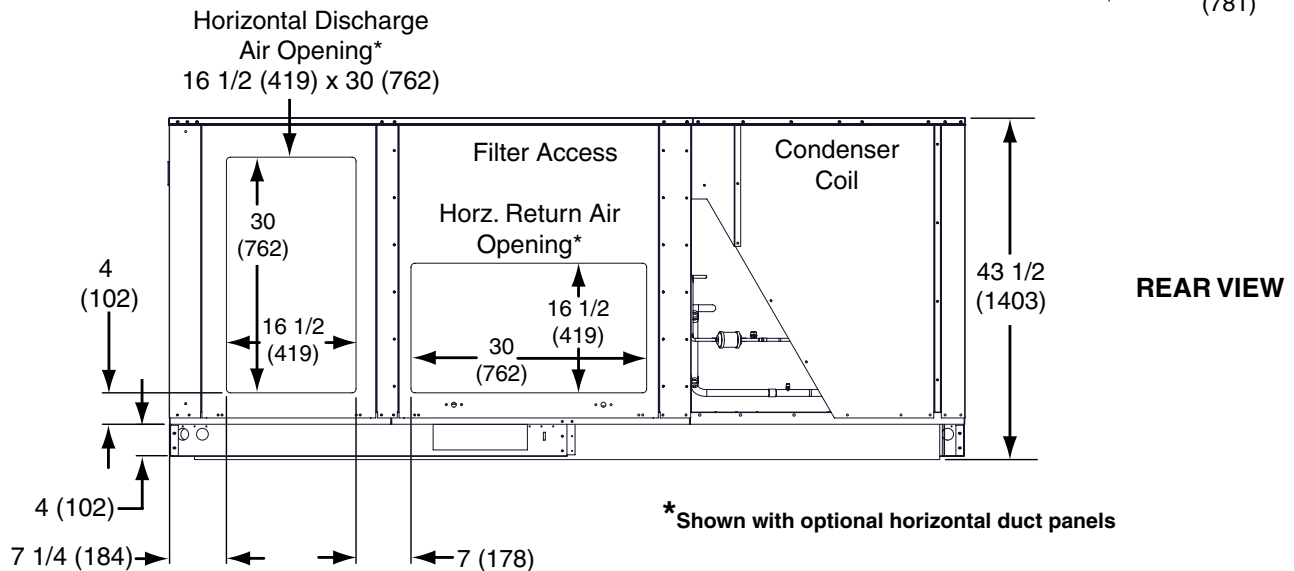
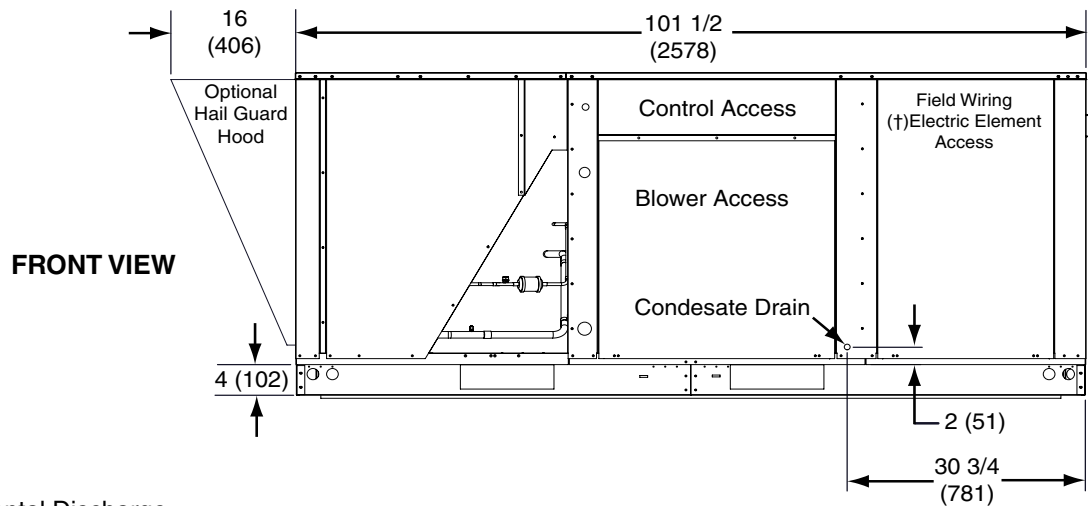
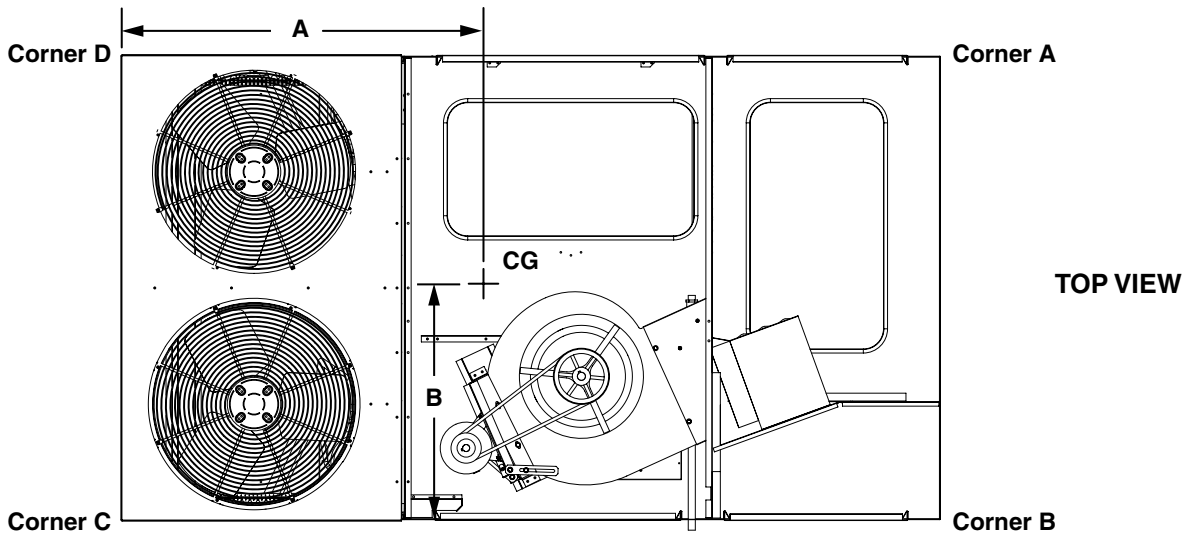


Figure 11. Physical Data - P6SP - 090 Series

PHYSICAL DATA - continued
Dimensions shown in inches (mm)

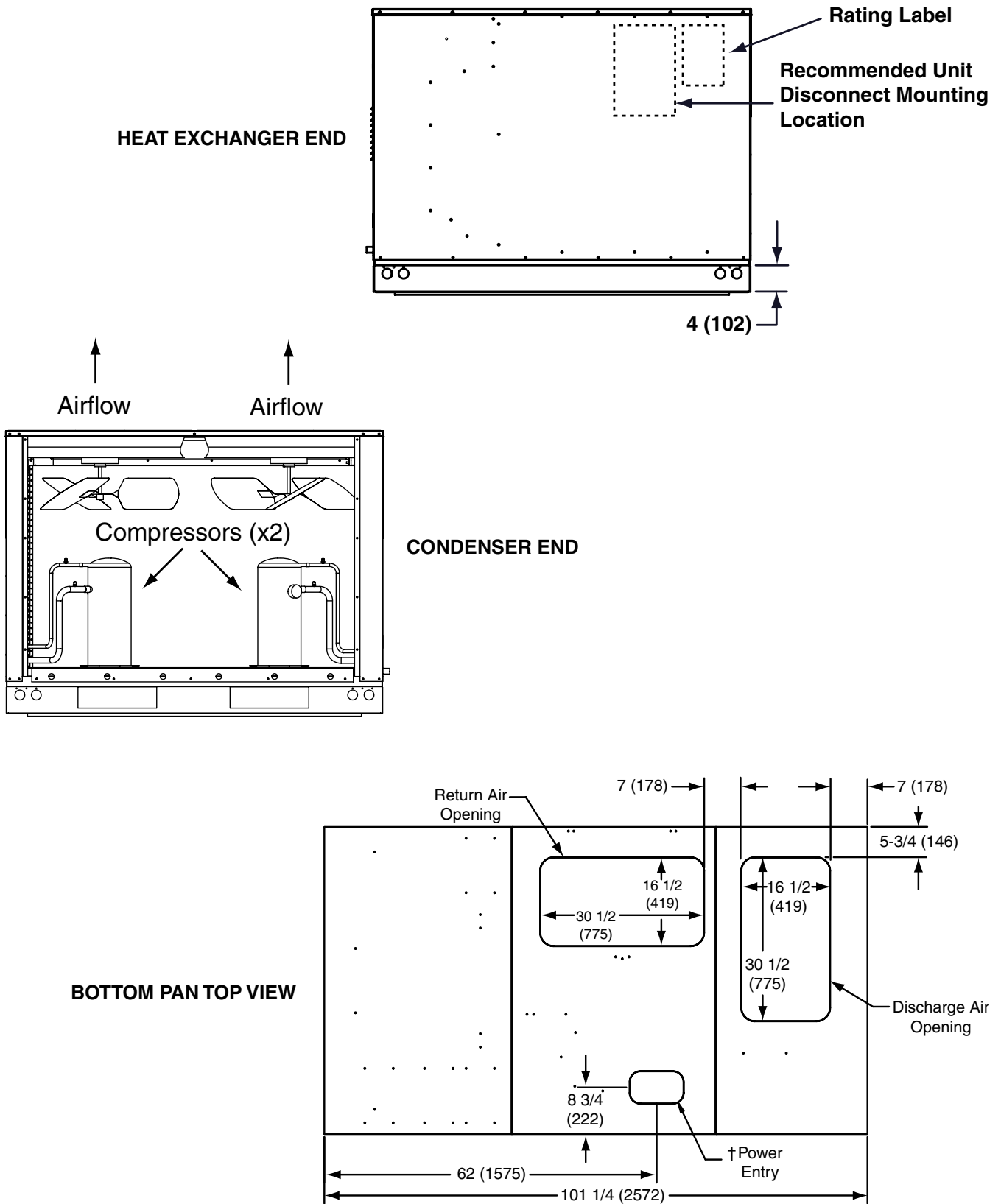


Figure 11. P6SP - 090 Series (Continued)

PHYSICAL DATA - continued
Dimensions shown in inches (mm)

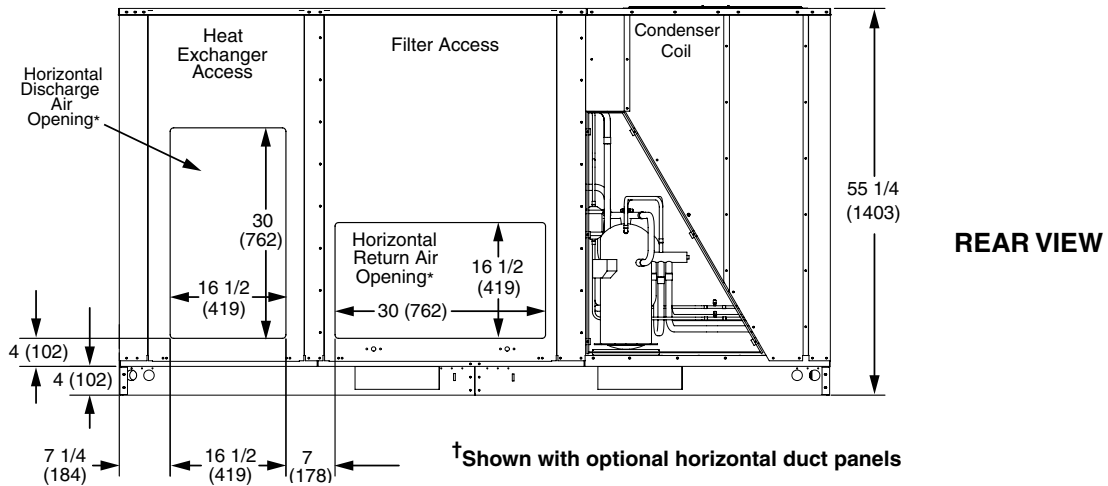
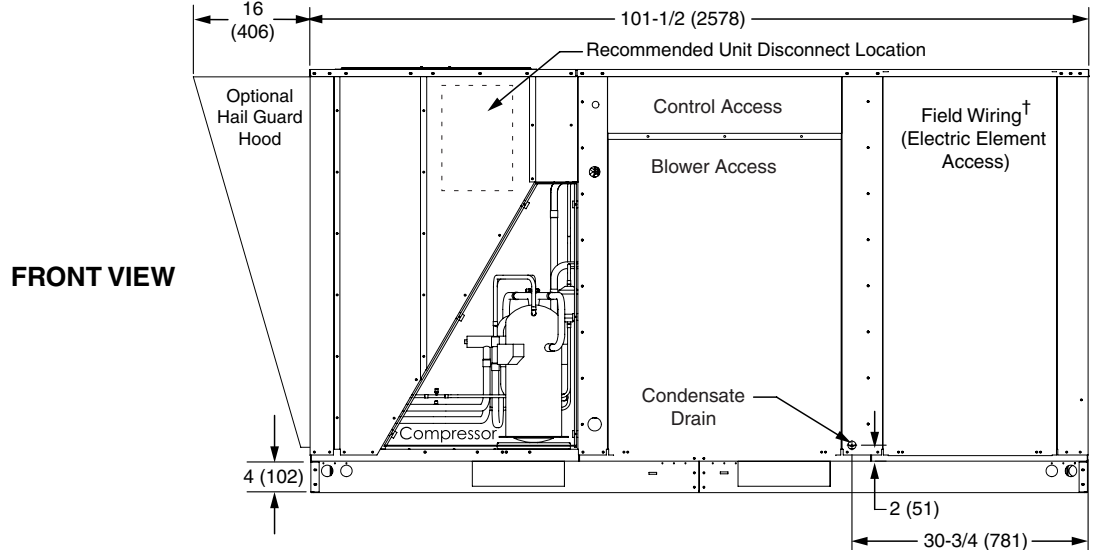
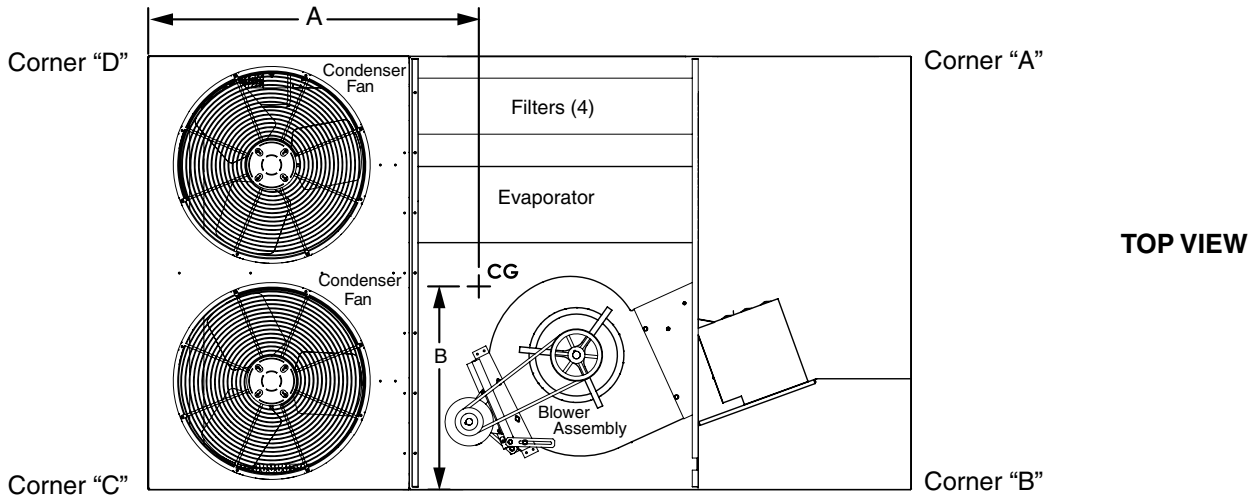


Figure 12. Physical Data - P6SP - 120 Series

PHYSICAL DATA - continued
Dimensions shown in inches (mm)

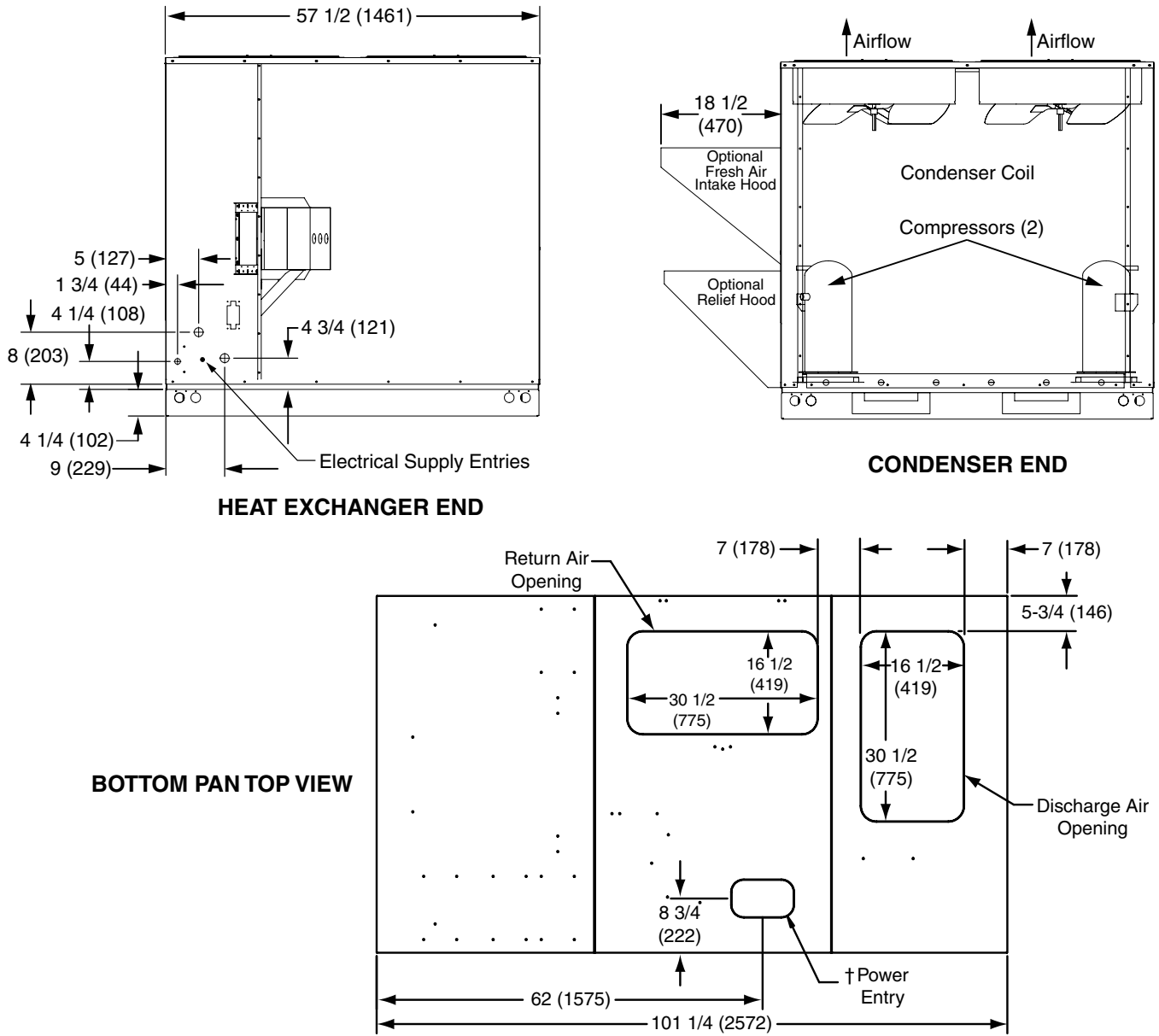


Figure 12. P6SP - 120 Series (Continued)

Model No.	Unit Weight ‡		Shipping Weight		Center of Gravity Inches (mm)		Corner Weights								Unit Height*	
	Lbs.	Kg.	Lbs.	Kg.	A	B	A		B		C		D		Horizontal Duct Applications	Vertical Duct Applications
							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

Table 1. Unit Weights & Center of Gravity

ELECTRICAL INFORMATION

Model Number P6SP- (See Notes 2 & 3)	Nominal Unit Voltage (See Note 1)	High Static Kit#	Compressors			Outdoor Motors (2) ea.	Indoor Motor (See Note 4)	Total Unit RLA	Unit Only Circuit		
Factory Unit Electrical Data:											
			Qty	RLA	LRA	FLA	Hp	FLA	RLA	MCA	MOP
-072C	208 - 230 V	Factory Std.	1 ea.	19	123	1.5	1	3.2 - 3.1	25.2	30 - 30	45 - 45
-072D	460 V		1 ea.	9.7	62	0.8		1.5	12.8	16	20
-090Ca	208 - 230 V	Factory Std.	2 ea.	13.1	83.1	2.3	1.5	4.4 - 4.2	35.2	39 - 39	50 - 50
-090Da	460 V		2 ea.	6.1	41	1.2		2.1	16.7	19	20
-120Ca	208 - 230 V	Factory Std.	2 ea.	16.0	110	2.3	1.5	4.4 - 4.2	41.0	45 - 45	60 - 60
-120Da	460 V		2 ea.	7.8	52	1.2		2.1	20.1	22	25
Medium & High Static Drive Electrical Data: (See Note 5)											
-072C	208 - 230 V	920609	1 ea.	19	123	1.5	1.5	4.4 - 4.2	26.4	32 - 31	50 - 45
-072D	460 V	920560	1 ea.	9.7	62	0.8		2.1	13.4	16	25
-090Ca	208 - 230 V	921481	2 ea.	13.1	83.1	2.3	2	6.0 - 5.8	36.8	40 - 40	50 - 50
-090Da	460 V		2 ea.	6.1	41	1.2		2.9	17.5	19	25
-120Ca	208 - 230 V	921645	2 ea.	16.0	110	2.3	2	6.0 - 5.8	42.6	47 - 47	60 - 60
-120Da	460 V		2 ea.	7.8	52	1.2		2.9	20.9	23	30

Table 2a. P6SP Electrical Data - Multiple Supply Circuits / Unit Only

H5HK Heater Kit Model # (See Note 6)	Electric Heat Kit (Field Installed with Multiple Circuit Kit # 917468) Electrical Data Table - Heater ONLY					
	Nominal Heater kW	Line Voltage	Actual Heater kW	Heater Amps (Line)	Heater Only Circuit	
					MCA	MOP
009Q-01	9	208 / 240	6.76 / 9.0	18.76 / 21.65	23.5 / 27.1	25 / 30
018Q-11	18	208 / 240	13.07 / 17.4	36.28 / 41.86	45.3 / 52.3	50 / 60
030Q-22	30	208 / 240	21.63 / 28.80	60.0 / 69.3	75.1 / 86.6	80 / 90
035Q-22	35	208 / 240	26.1 / 34.8	72.55 / 83.72	90.7 / 104.6	100 / 110
009S-01	9	480	9.9	11.91	14.9	15
018S-01	18	480	18	21.65	27.1	30
030S-01	30	480	28.8	34.64	43.3	45
035S-01	35	480	34.8	41.86	52.3	60

Table 2b. H5HK Electrical Data - Multiple Supply Circuits

NOTES:

- 1) To achieve the rated unit performance, unit voltage should be within 2% of nominal.
- 2) For C series units:
Nominal Unit Input Voltage = 208-230 Volt, 60 Hertz, 3 Phase
Minimum allowed unit voltage = 187V
Maximum allowed voltage = 253V
- 3) For D series units:
Nominal Unit Input Voltage = 460 Volt, 60 Hertz, 3 Phase
Minimum allowed unit voltage = 414V
Maximum allowed voltage = 506V
- 4) Indoor Motors meet 2010 DOE requirements (Premium Efficient)
- 5) Refer to High Static Drive Kit Installation Instructions for additional information
- 6) Refer to H5HK Kit Installation Instructions for additional information
- 7) FLA = Full Load Amps
MCA = Minimum Circuit Ampacity
RLA = Rated Load Amps
MOP = Maximum Over-Current Protection
LRA = Locked Rotor Amps
- 8) Refer to table 3 for single circuit MCA/MOP data

Model Number P6SP-	Nominal Unit Voltage	High Static Kit #	Single Circuit (Unit + Heater Kit) See Note							
			MCA				MOP			
Factory Unit Electrical Data:										
			9 kW	18 kW	30 kW	35 kW	9 kW	18 kW	30 kW	35 kW
-072C	208 - 230 V	Factory Std.	30 - 31	50 - 57	80 - 91	- N/A -	45 - 45	50 - 60	80 - 100	- N/A -
-072D	460 V		17	29	46	- N/A -	20	30	50	- N/A -
-090Ca	208 - 230 V	Factory Std.	39 - 39	51 - 58	81 - 92	97 - 110	50 - 50	60 - 60	90 - 100	100 - 110
-090Da	460 V		19	30	46	55	20	30	50	60
-120Ca	208 - 230 V	Factory Std.	45 - 45	51 - 58	81 - 92	97 - 110	60 - 60	60 - 60	90 - 100	100 - 110
-120Da	460 V		22	30	46	55	25	30	50	60
Medium & High Static Drive Electrical Data:										
-072C	208 - 230 V	920609	32 - 33	51 - 58	81 - 92	- N/A -	50 - 45	60 - 60	90 - 100	- N/A -
-072D	460 V	920560	18	30	46	- N/A -	25	30	50	- N/A -
-090Ca	208 - 230 V	921481	40 - 40	53 - 60	83 - 94	99 - 112	50 - 50	60 - 60	90 - 100	100 - 125
-090Da	460 V		19	31	47	56	25	35	50	60
-120Ca	208 - 230 V	921645	47 - 47	53 - 60	83 - 94	99 - 112	60 - 60	60 - 60	90 - 100	100 - 125
-120Da	460 V		23	31	47	56	30	35	50	60

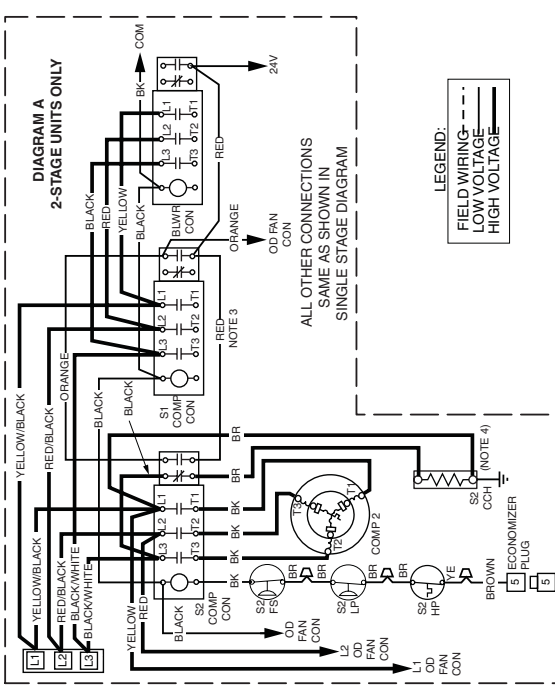
NOTE: Nordyne specifically recommends the use of the 917468 Dual Circuit adapter kit for all applications of H5HK 30kW & 35kW Electric Heat Kits.

Table 3. P6SP Electrical Data - Single Supply Circuits

WIRING DIAGRAM

P6SP-072/090/120 (C/D) Series

- NOTES:**
1. Replaced when a subtransformer is used.
 2. For 072 only. For 090/120, remove wire from 240V tap on transformer and install on 208V tap.
 3. Wires attached to normally open contacts.
 4. Wires attached to normally closed contacts.
 5. Disconnect all power before servicing.



208-230/460 VOLT

Three Phase / 60HZ.

- NOTES:**
6. For supply connections, use copper conductors only.
 7. If a fuse is used, it must be replaced with a fuse having a temperature rating of at least 105C.
 8. For supply wire ampacities and overcurrent protection, see unit rating label.
 9. These wires replaced when ID motor overload present.

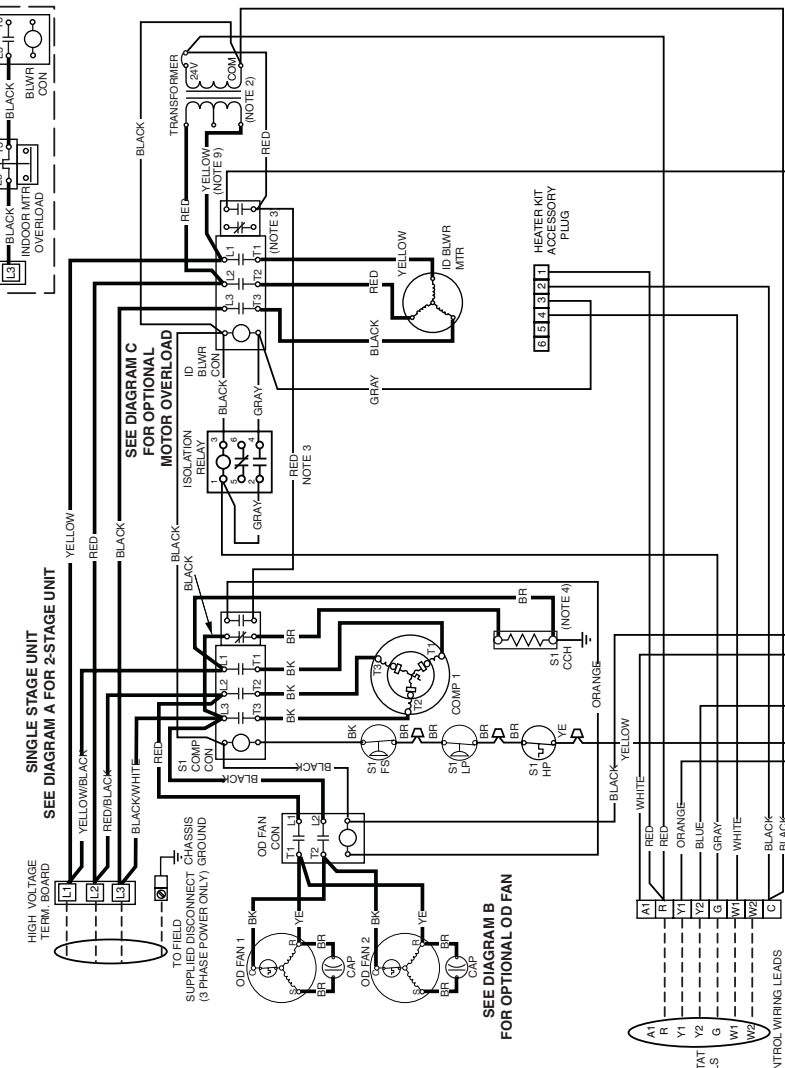


DIAGRAM C OPTIONAL INDOOR MOTOR OVERLOAD CONNECTIONS

DIAGRAM B FOR OPTIONAL OD FAN

DIAGRAM A FOR 2-STAGE UNIT

INDOOR THERMOSTAT TERMINALS

CONTROL WIRING LEADS

LEGEND:
 FIELD WIRING - - -
 LOW VOLTAGE - - -
 HIGH VOLTAGE ———

BLWIR = BLOWER
 CAP = CAPACITOR
 CCH = CRANKCASE HEATER
 CEN = CENTRIFUGAL SWITCH
 COMP = COMPRESSOR
 CON = CONTACTOR
 FS = FREEZESTAT
 FR = FLAME BOLL-OUT SWITCH
 HP = HIGH PRESSURE SWITCH
 ID = INDOOR
 IND = EXHAUST INDUCER
 LP = LOW PRESSURE SWITCH
 MTR = MOTOR
 OD = OD
 S1 = STAGE 1
 S2 = STAGE 2
 S3 = SPACE HEATER
 TRAN = TRANSFORMER
 UL = UPPER LIMIT (AFR)

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TO JADE C7250A MIXED AIR SENSOR VIOLET

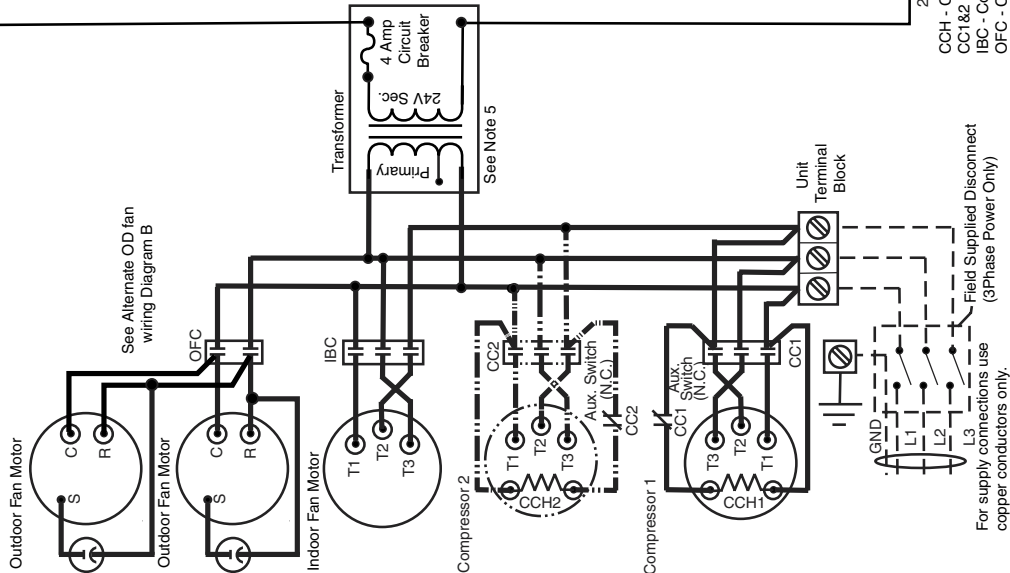
HEATER KIT ACCESSORY PLUG
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711150A
 08/14
 (Replaces 7111500)

WIRING DIAGRAM

P6SP Series 6-10T

- NOTES:**
1. Disconnect all power before servicing.
 2. For supply connections use copper conductors only.
 3. If any of the original wire as supplied with the furnace must be replaced, it must be replaced with wiring material having a temperature rating of at least 105C and 600V.

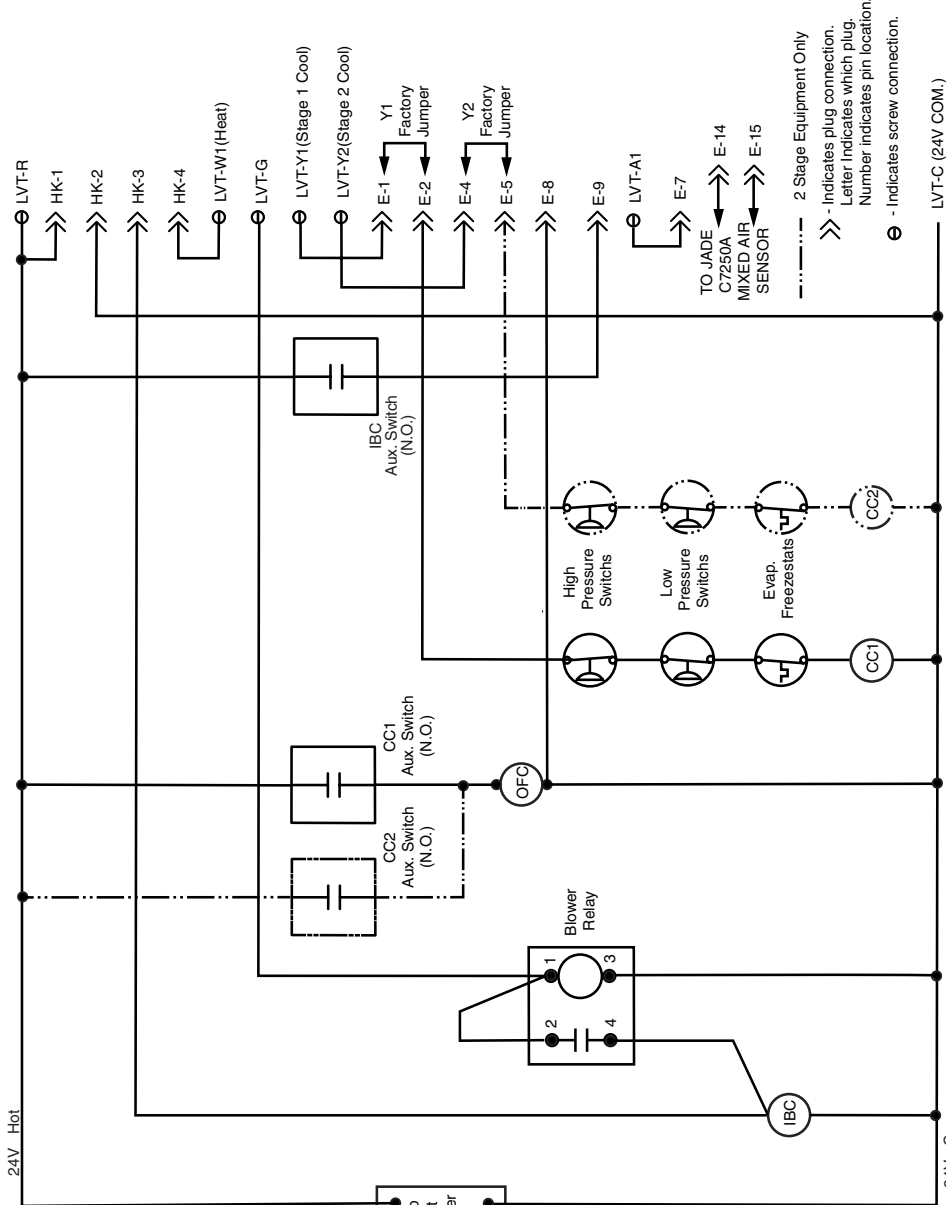


208-230/460 Volt

4. For supply wire ampacities and overcurrent protection, see unit rating label.
5. On "C" Series Models only. For 208V operation remove wire from 230V tap and place on 208V tap.

Three Phase 60 Hz.

1. Couper le courant avant de faire leretien.
2. Employez uniquement des conducteurs en cuivre.



24V Hot
24V Common

IBC - Crankcase Heaters, Stage 1&2 Compressor
CC1&2 - Contactor, Stage 1&2 Compressor
IBC - Contactor, Indoor Blower Motor
OFC - Contactor, Outdoor Fan

LVT - Low Voltage Terminal
HK - Heater Kit
E - Economizer

711152B
(Replaces 711152A)
08/14

Figure 14. Ladder Diagram for P6SP-072/090/120 (C/D) Series

Blower Performance Tables

This equipment is outfitted with a belt driven blower assembly in order to accommodate a large variety of duct configurations and airflow selections. The blower has been factory inspected for proper alignment, operation and rotational direction prior to the drive motor being situated in the shipping position. The blower drive belt is located with these instructions and must be installed by the service technician. For a more detailed explanation of belt driven blower drives and the operation of their components please refer to any of the installation instructions listed below for the high static drive kits.

The factory standard drive installed in these units has been set to deliver 400 Cfm/ton at an External Static Pressure (ESP) of 0.25-0.30 in-Wg. Tables 5-10 show the full blower curves of these drive configurations and can be utilized to easily set the adjustable motor sheave for alternate configurations. Refer to the Legend below for a description of the table information. Once a sheave setting has been made, always inspect the blower amp draw to ensure that it is less then the service factor amps listed on the motor. For systems that include a large number of accessories or have very restrictive duct systems, alternate drive kits are available – refer to table 4 below for the applicable kits. The full blower curves for the HSD kits can be found in the applicable kit installation instructions or in the unit technical service literature.

Table Legend

3862
1159
3.03

Indicates a recommended unit operational point

3493
1017
2.07

Indicates an allowable setting that is not recommended for unit operation[†]

† These operational points should be carefully examined by the installer for proper unit setup and heater operation if used.



Indicates a setting that is not permitted for unit operation

Unit Model #	Motor Hp	E.S.P. Range (in-Wg)	Blower Rpm Range (DF)	Down-flow Kit	Blower Rpm Range (HF)	Horizontal Kit
-072C	1.5 Hp	0.8 - 1.6	931 - 1189	920609	926 - 1159	920609
-072D				920560		920560
-090(C/D)a	2 Hp	0.1 - 1.7	884 - 1216	921481	874 - 1209	921481
-120(C/D)a	2 Hp	0.1 - 1.4	650 - 911	921645	659 - 919	921645

NOTE: Refer to the P6SP TSL or Accessory Kit Installation Instructions for actual blower charts

Table 4. P6SP Series Alternate Accessory Blower Drives

P6SP-072(C/D)

Factory Standard: 1Hp Down-flow Performance Chart

‡ Indicates Factory Sheave Setting

External Unit Static (in-Wg)	Operating @ 230 or 460 Volts	Adjustable Motor Sheave Setting													
		Fully Closed	1/2 Turn Open	1 Turn Open	1.5 Turns Open	2.0 Turns Open	2.5 Turns Open	3.0 Turns Open	3.5 Turns Open	4.0 Turns Open	4.5 Turns Open	5.0 Turns Open ‡	5.5 Turns Open	6.0 Turns Open	
0.2	CFM										2656	2539	2422		
	RPM										797	771	744		
	kW										0.81	0.73	0.66		
0.3	CFM							2751	2617	2483	2334	2185			
	RPM							850	826	801	774	747			
	kW							0.94	0.85	0.76	0.67	0.58			
0.4	CFM						2680	2559	2405	2251	2098	1945			
	RPM						874	852	829	805	778	750			
	kW						0.95	0.86	0.76	0.66	0.59	0.52			
0.5	CFM					2593	2458	2322	2181	2040	1870				
	RPM					897	876	855	831	807	780				
	kW					0.96	0.88	0.80	0.71	0.62	0.54				
0.6	CFM					2395	2255	2115	1960	1805					
	RPM					901	880	858	834	809					
	kW					0.87	0.79	0.71	0.63	0.55					
0.7	CFM			2509	2362	2214	2042	1870							
	RPM			956	930	904	883	861							
	kW			1.01	0.91	0.81	0.72	0.63							
0.8	CFM		2403	2318	2158	1998									
	RPM		981	959	933	907									
	kW		1.00	0.92	0.82	0.72									
0.9	CFM		2230	2112	1960	1807									
	RPM		984	962	936	910									
	kW		0.94	0.83	0.75	0.68									
1.0	CFM														
	RPM														
	kW														

Values includes losses for: Unit Casing, 2" Disposable (Pleated) Filters & Dry Evaporator Coil
 When used with H5HK Heater kits, not all operational points shown may be available for use. Refer to the H5HK Installation Instructions to determine the minimum airflow requirements of the applicable heater assembly.
 Deduct 250 Cfm for electric heater kits

Table 5. Blower Performance for P6SP-072(C,D) Series (6 Ton Downflow Models Only)

P6SP-072(C/D)

Factory Standard: 1.5Hp Horizontal Performance Chart

‡ Indicates Factory Sheave Setting for Pre-configured Units

External Unit Static (in-Wg)	Operating @ 230 or 460 Volts	Adjustable Motor Sheave Setting												
		Fully Closed	1/2 Turn Open	1 Turn Open	1.5 Turns Open ‡	2.0 Turns Open	2.5 Turns Open	3.0 Turns Open	3.5 Turns Open	4.0 Turns Open	4.5 Turns Open	5.0 Turns Open	5.5 Turns Open	6.0 Turns Open
0.2	CFM													
	RPM													
	kW													
0.3	CFM													
	RPM													
	kW													
0.4	CFM													
	RPM													
	kW													
0.5	CFM													
	RPM													
	kW													
0.6	CFM													
	RPM													
	kW													
0.7	CFM													
	RPM													
	kW													
0.8	CFM													
	RPM													
	kW													
0.9	CFM													
	RPM													
	kW													
1.0	CFM													
	RPM													
	kW													

Values includes losses for: Unit Casing, 2" Disposable (Pleated) Filters & Dry Evaporator Coil
 When utilized with H5HK Heater kits, not all operational points shown may be available for use. Refer to the H5HK Installation Instructions to determine the minimum airflow requirements of the applicable heater assembly.
 Deduct 250 Cfm for electric heater kits

**Table 6. Blower Performance for P6SP-072(C,D) Series
 (6 Ton Horizontal Models Only)**

P6SP-090(C/D)a

Factory Standard: 1.5Hp Downflow Performance Chart

‡ Indicates Factory Sheave Setting

External Unit Static (in-Wg)	Operating @ 230 or 460 Volts	Adjustable Motor Sheave Setting													
		Fully Closed	1/2 Turn Open	1 Turn Open	1.5 Turns Open	2 Turns Open	2.5 Turns Open	3 Turns Open	3.5 Turns Open	4 Turns Open	4.5 Turns Open ‡	5 Turns Open	5.5 Turns Open	6 Turns Open	
0.1	CFM								3620	3515	3400	3285	3187	3089	
	RPM								893	870	847	823	803	783	
	kW								1.47	1.35	1.25	1.15	1.06	0.98	
0.2	CFM							3590	3477	3363	3248	3132	3031	2930	
	RPM							918	895	872	848	825	805	785	
	kW							1.50	1.39	1.28	1.18	1.08	1.00	0.92	
0.3	CFM						3549	3441	3331	3220	3097	2973	2864	2755	
	RPM						941	920	897	873	850	827	807	786	
	kW						1.55	1.44	1.33	1.22	1.12	1.02	0.94	0.86	
0.4	CFM					3532	3419	3306	3185	3063	2932	2800	2687	2574	
	RPM					965	944	923	899	876	853	830	809	788	
	kW					1.58	1.47	1.36	1.25	1.14	1.05	0.95	0.87	0.80	
0.5	CFM						3382	3267	3152	3021	2889	2750	2611	2484	2357
	RPM						968	947	925	902	878	855	832	811	790
	kW						1.50	1.39	1.28	1.17	1.07	0.97	0.87	0.80	0.72
0.6	CFM						3339	3239	3115	2991	2846	2700	2549	2398	2257
	RPM						990	972	950	928	904	881	857	833	813
	kW						1.52	1.41	1.30	1.20	1.09	0.99	0.89	0.80	0.72
0.7	CFM														
	RPM														
	kW														
0.8	CFM														
	RPM														
	kW														
0.9	CFM														
	RPM														
	kW														
1.0	CFM														
	RPM														
	kW														
1.1	CFM														
	RPM														
	kW														
1.2	CFM														
	RPM														
	kW														
1.3	CFM														
	RPM														
	kW														

Values includes losses for: Unit Casing, 2" Disposable (Pleated) Filters & Dry Evaporator Coil
 When utilized with H5HK Heater kits, not all operational points shown may be available for use. Refer to the H5HK Installation Instructions to determine the minimum airflow requirements of the applicable heater assembly.
 Deduct 250 Cfm for electric heater kits

Table 7. Blower Performance for P6SP-090(C,D)a Series (7.5 Ton Downflow Models Only)

P6SP-090(C/D)a

Factory Standard: 1.5Hp Horizontal Performance Chart

‡ Indicates Factory Sheave Setting for Pre-configured Units

External Unit Static (in-Wg)	Operating @ 230 or 460 Volts	Adjustable Motor Sheave Setting													
		Fully Closed	1/2 Turn Open	1 Turn Open	1.5 Turns Open	2 Turns Open	2.5 Turns Open	3 Turns Open	3.5 Turns Open	4 Turns Open	4.5 Turns Open ‡	5 Turns Open	5.5 Turns Open	6 Turns Open	
0.1	CFM								3722	3610	3496	3382	3263	3143	
	RPM								889	864	844	824	799	773	
	kW								1.52	1.39	1.29	1.19	1.09	0.99	
0.2	CFM							3695	3577	3458	3338	3217	3094	2970	
	RPM							917	893	869	847	825	800	775	
	kW							1.57	1.45	1.32	1.23	1.13	1.03	0.93	
0.3	CFM							3552	3429		3306	3173	3039	2912	2785
	RPM							920	897		873	850	826	801	776
	kW							1.48	1.37		1.25	1.15	1.05	0.96	0.86
0.4	CFM						3498	3387	3266	3144	3004	2863	2728	2592	
	RPM						943	923	899	875	851	828	804	779	
	kW						1.51	1.41	1.29	1.17	1.08	0.98	0.89	0.80	
0.5	CFM					3471	3353	3234	3100	2966	2820	2673	2523	2372	
	RPM					965	945	925	901	876	853	830	806	782	
	kW					1.54	1.43	1.32	1.21	1.09	1.00	0.91	0.82	0.73	
0.6	CFM				3415	3309	3186	3062	2919	2776	2616	2455	2282		
	RPM				986	966	947	928	904	879	856	833	809		
	kW				1.57	1.46	1.34	1.23	1.12	1.01	0.92	0.83	0.74		
0.7	CFM					3360	3251	3142	3012	2881	2722	2563	2388	2212	
	RPM					1010	990	971	951	931	907	882	859	835	
	kW					1.58	1.47	1.35	1.25	1.15	1.04	0.92	0.83	0.74	
0.8	CFM						3211	3091	2970	2828	2686	2505	2323		
	RPM						1014	994	975	954	934	910	886		
	kW						1.50	1.38	1.26	1.16	1.05	0.94	0.83		
0.9	CFM						3140	3032	2902	2771	2610	2449	2245		
	RPM						1031	1017	998	978	957	936	913		
	kW						1.50	1.39	1.28	1.16	1.06	0.96	0.85		
1.0	CFM	3069	2954	2842	2700	2557	2369								
	RPM	1049	1034	1021	1001	981	960								
	kW	1.52	1.39	1.29	1.17	1.06	0.96								
1.1	CFM	2875	2762	2630	2473	2316									
	RPM	1053	1039	1024	1004	985									
	kW	1.41	1.29	1.18	1.07	0.96									
1.2	CFM	2673	2546	2395											
	RPM	1058	1044	1028											
	kW	1.29	1.18	1.06											
1.3	CFM	2451	2296												
	RPM	1062	1048												
	kW	1.19	1.06												

Values includes losses for: Unit Casing, 2" Disposable (Pleated) Filters & Dry Evaporator Coil
 When utilized with H5HK Heater kits, not all operational points shown may be available for use. Refer to the H5HK Installation Instructions to determine the minimum airflow requirements of the applicable heater assembly.
 Deduct 250 Cfm for electric heater kits

**Table 8. Blower Performance for P6SP-090(C,D)a Series
 (7.5 Ton Horizontal Models Only)**

P6SP-120(C/D)a & Q6SP-120(C/D)a

Factory Standard: 1.5Hp Down-flow Performance Chart

‡ Indicates Factory Sheave Setting

External Unit Static (in-Wg)	Operating @ 230 or 460 Volts	Adjustable Motor Sheave Setting													
		Fully Closed	1/2 Turn Open	1 Turn Open	1.5 Turns Open	2 Turns Open	2.5 Turns Open ‡	3 Turns Open	3.5 Turns Open	4 Turns Open	4.5 Turns Open	5 Turns Open	5.5 Turns Open	6 Turns Open	
0.1	CFM							4468	4349	4230	4086	3942	3804	3665	
	RPM							706	689	672	653	633	616	599	
	kW							1.54	1.43	1.32	1.23	1.14	1.04	0.93	
0.2	CFM							4412	4244	4124	4003	3847	3690	3546	3402
	RPM							725	708	691	674	655	635	618	601
	kW							1.58	1.44	1.34	1.24	1.15	1.06	0.96	0.86
0.3	CFM							4192	4042	3888	3733	3589	3445	3287	3129
	RPM							727	710	693	676	657	637	620	603
	kW							1.49	1.36	1.26	1.15	1.07	0.99	0.89	0.78
0.4	CFM						4106	3951	3796	3631	3466	3316	3165	2993	
	RPM						745	729	712	695	678	659	639	623	
	kW						1.51	1.39	1.27	1.17	1.08	0.99	0.91	0.81	
0.5	CFM					3998	3871	3706	3540	3368	3196	3017			
	RPM					761	747	731	714	697	680	661			
	kW					1.51	1.42	1.30	1.18	1.09	0.99	0.90			
0.6	CFM		4016	3903	3760	3616	3428	3240	3052						
	RPM		791	777	763	749	733	716	700						
	kW		1.59	1.49	1.41	1.32	1.20	1.09	0.98						
0.7	CFM	3903	3801	3693	3512	3330	3118								
	RPM	806	793	779	766	752	736								
	kW	1.59	1.48	1.39	1.31	1.23	1.10								
0.8	CFM	3654	3542	3406	3214	3022									
	RPM	808	795	781	768	754									
	kW	1.49	1.38	1.27	1.19	1.11									
0.9	CFM	3356	3232	3074											
	RPM	810	797	783											
	kW	1.36	1.26	1.15											
1.0	CFM	3013													
	RPM	812													
	kW	1.21													

Values includes losses for: Unit Casing, 2" Disposable (Pleated) Filters & Dry Evaporator Coil
 When utilized with H5HK Heater kits, not all operational points shown may be available for use. Refer to the H5HK Installation Instructions to determine the minimum airflow requirements of the applicable heater assembly.
 Deduct 250 Cfm for electric heater kits

Table 9. Blower Performance for P6SP-120(C,D)a & Q6SP-120(C,D)a Series (10 Ton Downflow Models Only)

P6SP-120(C/D)a & Q6SP-120(C/D)a

Factory Standard: 1.5Hp Horizontal Performance Chart

‡ Indicates Factory Sheave Setting for Pre-configured Units

External Unit Static (in-Wg)	Operating @ 230 or 460 Volts	Adjustable Motor Sheave Setting													
		Fully Closed	1/2 Turn Open	1 Turn Open	1.5 Turns Open	2 Turns Open	2.5 Turns Open ‡	3 Turns Open	3.5 Turns Open	4 Turns Open	4.5 Turns Open	5 Turns Open	5.5 Turns Open	6 Turns Open	
0.1	CFM								4425	4303	4157	4011	3878	3745	
	RPM								688	671	653	635	617	599	
	kW								1.44	1.33	1.23	1.12	1.04	0.95	
0.2	CFM							4366	4227	4087	3951	3815	3665	3515	
	RPM							707	690	672	655	637	619	601	
	kW							1.48	1.36	1.25	1.15	1.05	0.97	0.88	
0.3	CFM							4278	4137	3994	3850	3694	3537	<i>3369</i>	<i>3201</i>
	RPM							725	709	692	674	656	638	<i>620</i>	<i>602</i>
	kW							1.50	1.39	1.28	1.17	1.07	0.98	<i>0.89</i>	<i>0.80</i>
0.4	CFM						4198	4061	3923	3763	3602	<i>3425</i>	<i>3248</i>	<i>3071</i>	
	RPM						743	727	711	694	676	<i>658</i>	<i>640</i>	<i>623</i>	
	kW						1.52	1.41	1.30	1.19	1.09	<i>0.99</i>	<i>0.89</i>	<i>0.81</i>	
0.5	CFM						3969	3816	3662	3490	<i>3318</i>	<i>3127</i>			
	RPM						746	729	712	695	<i>677</i>	<i>660</i>			
	kW						1.44	1.32	1.20	1.10	<i>0.99</i>	<i>0.89</i>			
0.6	CFM				3851	3719	3543	<i>3366</i>	<i>3181</i>	<i>2996</i>					
	RPM				764	749	732	<i>714</i>	<i>698</i>	<i>681</i>					
	kW				1.44	1.33	1.22	<i>1.11</i>	<i>1.00</i>	<i>0.90</i>					
0.7	CFM			3749	3594	<i>3438</i>	<i>3232</i>	<i>3026</i>							
	RPM			781	767	<i>752</i>	<i>734</i>	<i>716</i>							
	kW			1.44	1.33	<i>1.22</i>	<i>1.11</i>	<i>1.00</i>							
0.8	CFM		3614	<i>3487</i>	<i>3298</i>	<i>3109</i>									
	RPM		795	<i>785</i>	<i>771</i>	<i>756</i>									
	kW		1.44	<i>1.34</i>	<i>1.22</i>	<i>1.10</i>									
0.9	CFM	3515	<i>3352</i>	<i>3184</i>	<i>2946</i>										
	RPM	813	<i>801</i>	<i>789</i>	<i>773</i>										
	kW	1.43	<i>1.32</i>	<i>1.21</i>	<i>1.09</i>										
1.0	CFM	<i>3218</i>	<i>2993</i>												
	RPM	<i>816</i>	<i>805</i>												
	kW	<i>1.31</i>	<i>1.18</i>												

Values includes losses for: Unit Casing, 2" Disposable (Pleated) Filters & Dry Evaporator Coil
 When utilized with H5HK Heater kits, not all operational points shown may be available for use. Refer to the H5HK Installation Instructions to determine the minimum airflow requirements of the applicable heater assembly.
 Deduct 250 Cfm for electric heater kits

**Table 10. Blower Performance for P6SP-120(C,D)a & Q6SP-120(C,D)a Series
 (10 Ton Horizontal Models Only)**

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.

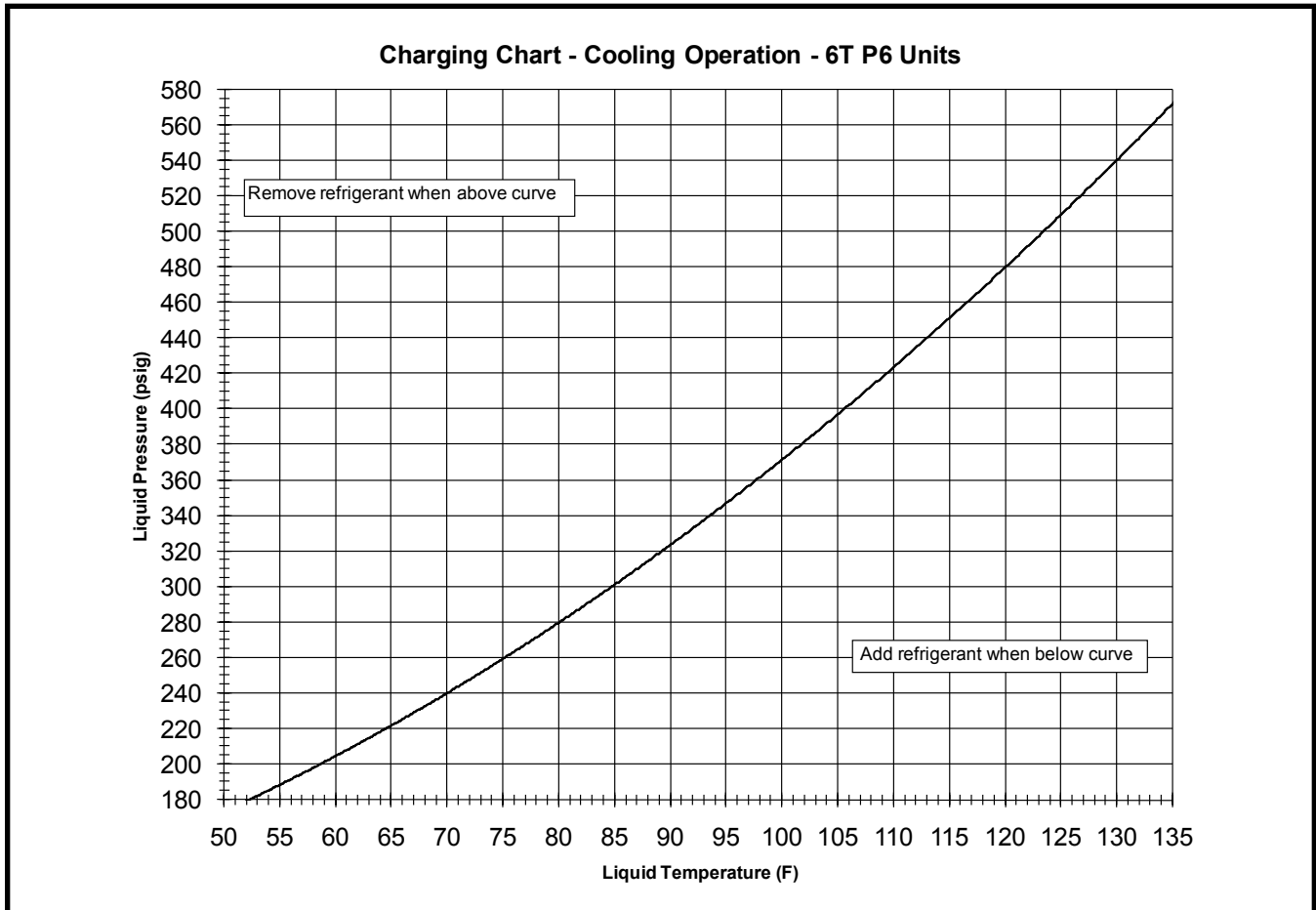


Figure 15. Charging Chart for Single Stage Cooling Systems - 6 Ton units

P6SP CHARGING CHARTS (CONTINUED)

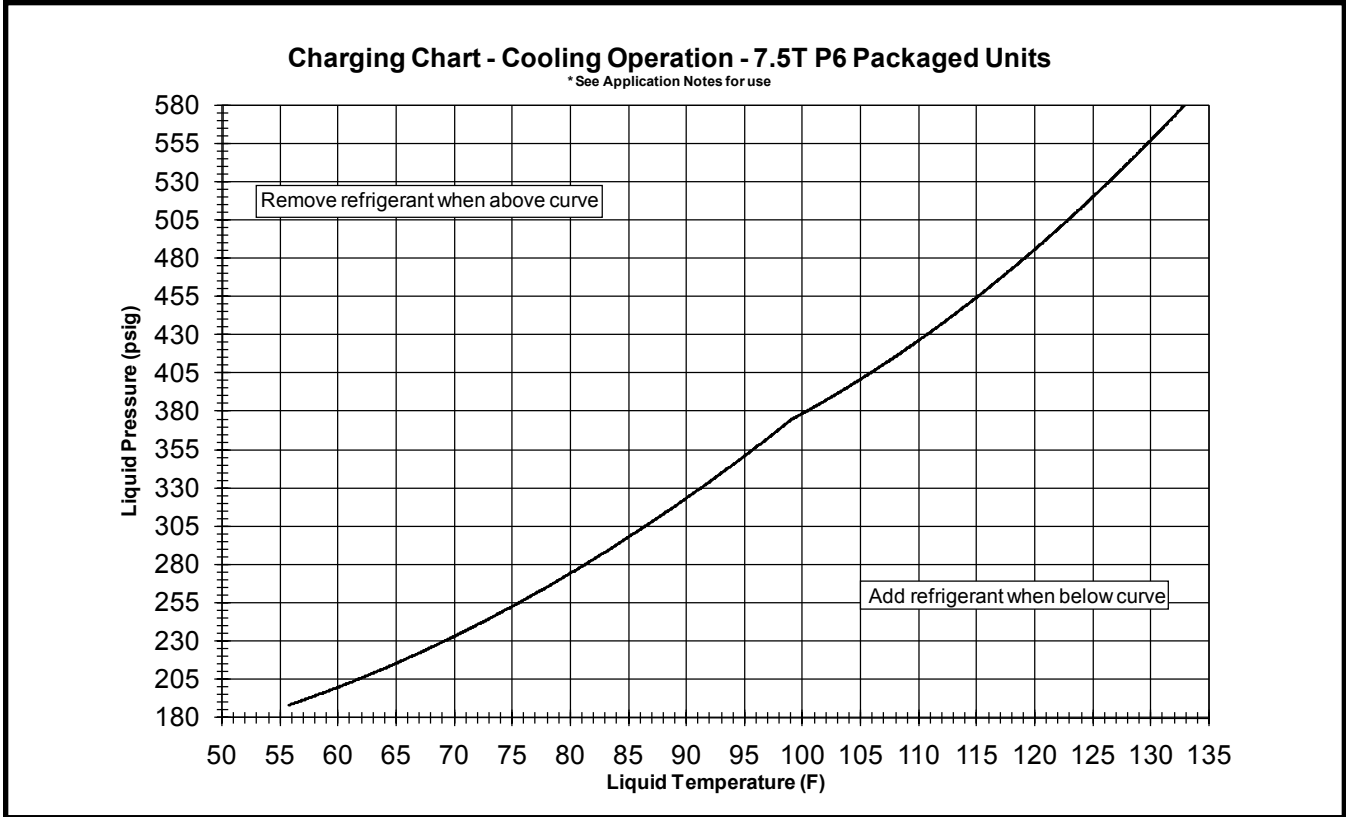


Figure 16. Charging Chart for - 7.5 Ton Units

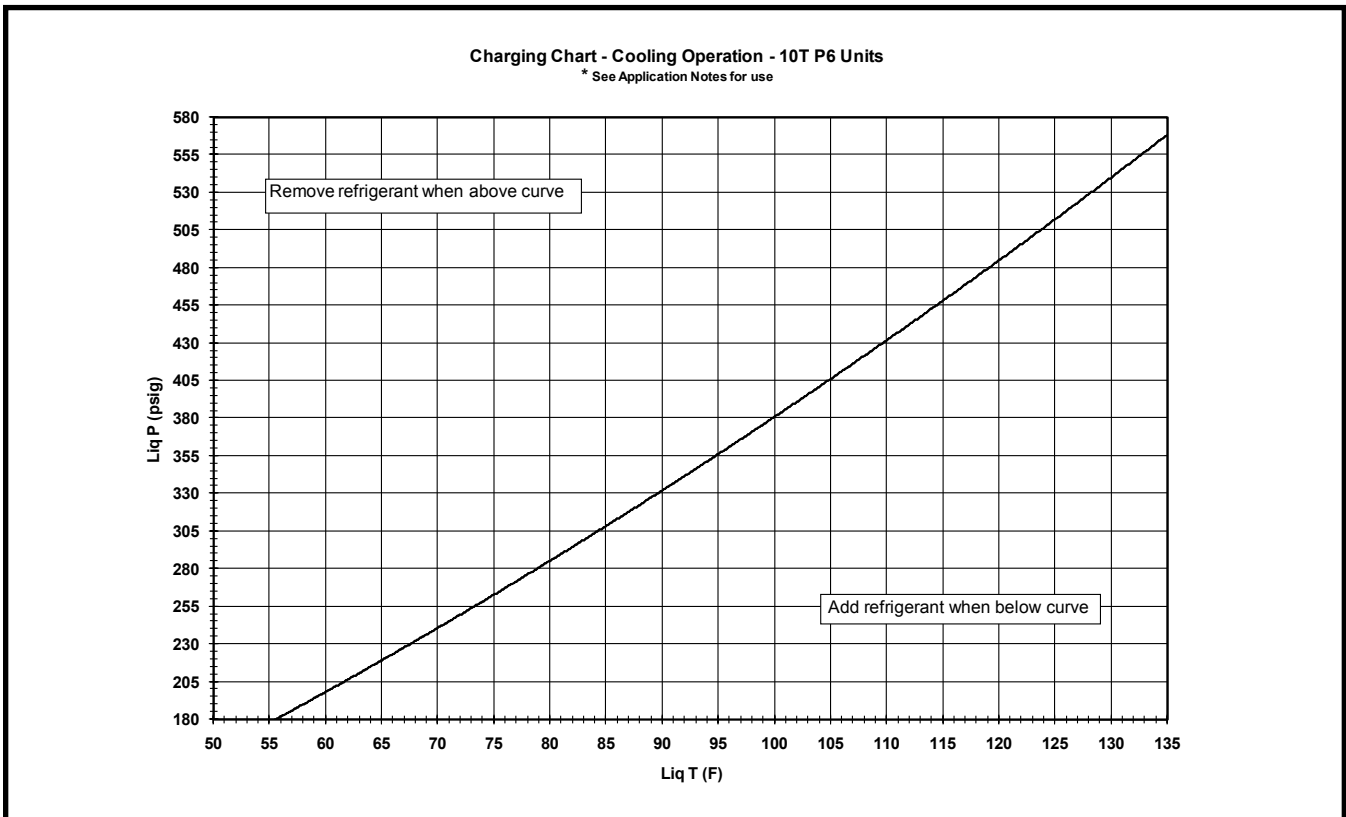


Figure 17. Charging Chart for - 10 Ton Units

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: PLEASE LEAVE THESE INSTRUCTIONS WITH THE OWNER.

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)		

