

# INSTALLATION INSTRUCTIONS

## SINGLE PACKAGE CONVERTIBLE AIR CONDITIONER



Premium Model 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 & KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.**

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## IMPORTANT SAFETY INFORMATION

**IMPORTANT:** 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.

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### **WARNING:**

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#### **ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD**

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

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

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

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### **WARNING:**

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These units are fully charged with R-410A refrigerant 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 attempted 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 homeowner attempt to install and/or service this equipment. Failure to comply with this warning could result in equipment damage, personal injury, or death.

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### **WARNING:**

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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.

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### **CAUTION:**

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**This unit uses refrigerant R-410A. DO NOT use any other refrigerant in this unit. Use of another refrigerant may damage the unit.**

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### **WARNING:**

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The safety information listed below 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.

- The installer must comply with all local codes and regulations which govern the installation of this type of equipment. Local codes and regulations take precedence over any recommendations contained in these instructions. Consult local building codes and the National Electrical Code (ANSI C1) for special installation requirements.
- 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.
- All electrical wiring must be completed in accordance with local, state and national codes and regulations and with the National Electric Code (ANSI/NFPA 70) or in Canada the Canadian Electric Code Part 1 CSA C.22.1.
- Installation of equipment may require brazing operations. Installer must comply with safety codes and wear appropriate safety equipment (safety glasses, work gloves, fire extinguisher, etc.) when performing brazing operations.
- Install this unit only in a location and position as specified on [page 4](#). This unit is designed only for outdoor installations and should be located with consideration of minimizing the length of the supply and return ducts. Consideration should also be given to the accessibility of fuel, electric power, service access, noise, and shade.
- 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.

## GENERAL INFORMATION

Packaged air conditioner units are ready for easy and immediate installation on rooftops or ground level slabs. Units are shipped for horizontal duct connections and can be easily converted for downflow applications. This air conditioner is designed only for outdoor installations.

This unit has been designed and tested for capacity and efficiency in accordance with AHRI Standards. This unit will provide many years of safe and dependable comfort, providing it is properly installed and maintained. With regular maintenance, this unit will operate reliably year after year. Abuse, improper use, and/or improper maintenance can shorten the life of the appliance and create unsafe hazards.

### Before You Install this Unit

- ✓ The cooling load of the area to be conditioned must be calculated and a system of the proper capacity selected. It is recommended that the area to be conditioned be completely insulated and vapor sealed.
- ✓ Check the electrical supply and verify the power supply is adequate for unit operation. If there is any question concerning the power supply, contact the local power company.
- ✓ All units are securely packed at the time of shipment and upon arrival should be carefully inspected for damage prior to installing the equipment at the job site. Verify coil fins are straight. If necessary, comb fins to remove flattened or bent fins. Claims for damage (apparent or concealed) should be filed immediately with the carrier.
- ✓ Please consult your dealer for maintenance information and availability of maintenance contracts. Please read all instructions before installing the unit.

### Locating the Air Conditioner

- Survey the job site to determine the best location for mounting the outdoor unit. Select a solid, level position, preferably on a concrete slab, slightly above the grade level, and parallel to the home. If possible, select a site for the unit that is as close as possible to the proposed return grille location. **DO NOT PLACE UNIT UNDER THE HOME.**

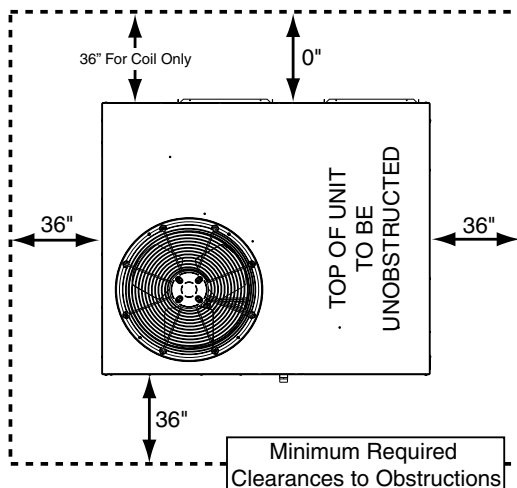


Figure 1. Clearance Requirements

- The unit should be located with consideration of minimizing the length of the supply and return ducts. If practical, place the air conditioner and its ducts in an area where they will be shaded from the afternoon sun, when the heat load is greatest.
- The length of the supply and return ducts should be kept to a minimum with no sharp radius bends.
- Overhead obstructions, poorly ventilated areas, and areas subject to accumulation of debris should be avoided. The hot condenser air must be discharged up and away from the home, and if possible, in a direction with the prevailing wind. Do not place the unit in a confined space. See Figure 9, (page 14) for unit dimensions.
- Sufficient clearance for unobstructed airflow through the outdoor coil must be maintained in order to achieve rated performance.
- Consideration should also be given to availability of electric power, service access, noise, and shade.

### Minimum Clearance Requirements

P8SE units are certified as cooling equipment for outdoor installation only. Figure 1 displays the minimum clearances to obstructions for downflow and Horizontal discharge.

Units may be installed on Class A, B, or C roof covering material when used with bottom supply and return air ducts. If using bottom discharge with return air ducts, a roof curb must be installed prior to unit installation. See Rigging and Hoisting section for setting of the unit.

Sufficient clearance for unobstructed airflow through the outdoor coil must be maintained in order to provide room for proper servicing and achieve rated performance. See Figure 1 for minimum clearances to obstructions.

### Service Access Clearances

Blower access panel side.....	36"
Electrical compartment access panel side.....	36"
Clearance between overhang & top of unit.....	72"
Clearance around condenser coil area to wall or shrubs (excludes duct panel side).....	36"

### Duct Clearances

Supply and return air ducts .....	0"
Duct connection side.....	0"

### Air Ducts

This unit is designed only for use with a supply and return duct. Air ducts should be installed in accordance with the standards of the National Fire Protection Association Standard for Installation of Air Conditioning Systems (NFPA 90A), Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems (NFPA 90B), and all applicable local codes. NFPA publications are available by writing to: National Fire Protection Association, Batterymarch Park, Quincy, ME 02269 or visit [www.NFPA.org](http://www.NFPA.org) on the web.

- Design the duct work according to methods described by the Air Conditioning Contractors of America (ACCA).
- The ducts must be properly sized and not exceed .2" W.C. pressure drop at 400 scfm per nominal ton of cooling capacity.

- Duct work should be attached directly to the unit flanges for horizontal applications.
- If roof curb is installed, the ducts must be attached to the curb hangers, not the unit.

### Unconditioned Spaces

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

### Acoustical Duct Work

Certain installations may require the use of acoustical lining inside the supply duct work.

- 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 duct work may be used in place of internal duct liners if the fiber duct work is in accordance with the current revision of the SMACNA construction standard on fibrous glass ducts. Fibrous duct work and internal acoustical lining must be NFPA Class 1 air ducts when tested per UL Standard 181 for Class 1 ducts.

### Air Filter Requirements

## WARNING:

**Never operate the unit without a filter in place. Dust and lint could accumulate on internal parts, resulting in loss of efficiency, equipment damage and possible fire. Replace disposable filters with the same type and size.**

- Air filter(s) are not supplied and must be installed in the unit or in the return air system by the installer. Only three phase units are equipped with an internal filter rack assembly.
- If using an economizer or fresh air equipment, the factory installed filter rack must be removed prior to installation. See [page 6](#) for removal instructions.
- All return air must pass through the filters before entering the unit. Recommended filter sizes are listed in [Table 1](#). **NOTE:** It is important that all filters be kept clean and replaced frequently to ensure proper operation of unit. Dirty or clogged filters will reduce the efficiency of the unit and result in unit shutdowns.
- Air filter pressure drop must not exceed 0.08 inches WC. When replacing the air filters, a suitable air filter must be installed upstream of the evaporator coil of the return air system.
- Downflow Installations require an internal filter accessory kit to be installed.
- Horizontal Installations require the air filter system be installed in the return air ductwork.

UNIT SIZE	INTERNAL FILTER SIZE
P8SE-X36 P8SE-X48	(2) 14" x 25" or (2) 14" x 25"
P8SE-X60	(2) 18" x 25" or (2) 18" x 25"

**Table 1. Internal Filter Size Requirements.**

## AIR CONDITIONER INSTALLATION

### Packaging Removal

Remove the shipping carton and User's Manual from the equipment. Take care not to damage the tubing connections when removing the carton. For rooftop installations, remove and discard the two supports attached beneath the unit.

### 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. Refer to [Table 5, \(page 9\)](#) for unit weights.
- The unit must be lifted from the holes in the base rails using cables or chains.
- Spreader bars 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 [Figure 9, \(page 14\)](#) for locating the center of gravity.
- All panels must be securely in place during rigging and hoisting.

### Ground Level

Ground level installations must be located according to local building codes or ordinances and these requirements:

- Clearances must be in accordance with those shown in [Figure 1, \(page 4\)](#).
- A suitable mounting pad must be provided and separate from the building foundation. The pad must be level to ensure proper condensate disposal and strong enough to support the unit's weight. The slab height must be a minimum of 2" (5cm) above grade and with adequate drainage. See [Figure 2, \(page 6\)](#).
- Allow sufficient clearances for access to the internal filter rack.

### Rooftop

Rooftop installations must be located according to local building codes or ordinances and these requirements:

- The roof must be capable of handling the weight of the unit. For unit weights, see [Table 5, \(page 9\)](#). Reinforce the roof if necessary.



- The appropriate accessory roof curb (Figure 4) must be installed prior to unit installation. The roof curb must be square and level to ensure proper condensate drainage. **Please follow all instructions provided with the kit.**
- Secure roof curb or frame to roof using acceptable mechanical methods per local codes. **NOTE:** Make sure the two supports beneath the unit have been removed.

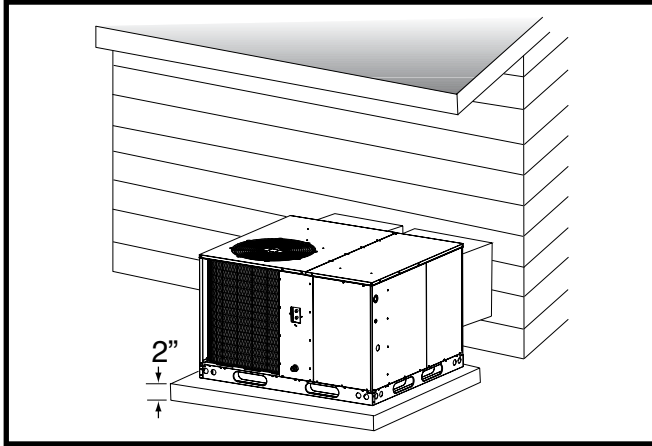


Figure 2. Ground Level Installation

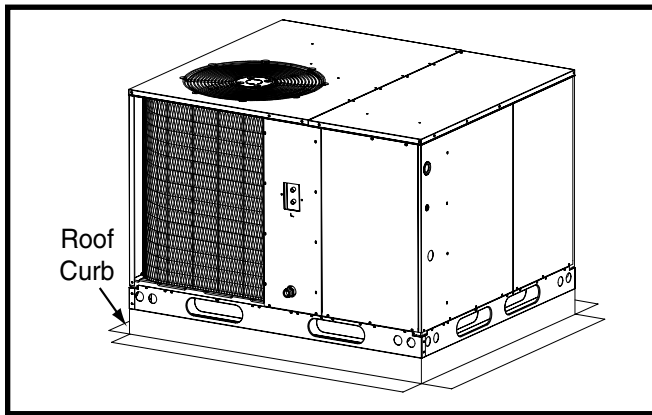


Figure 3. Roof Top Installation

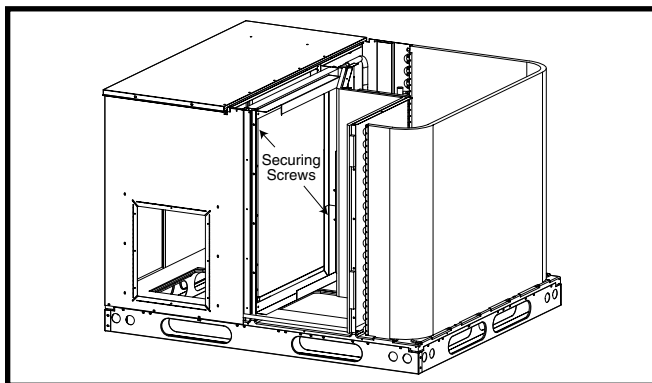


Figure 4. Internal Filter Rack Location

### Horizontal to Downflow Conversion

The unit is shipped ready for horizontal duct connections. If down flow ducts are required, the unit must be converted following the steps below for the supply and return ducts.

1. Locate the duct cap inside the duct openings and remove the screw holding it in place.
2. Lift the cap out of the unit. (**Hint:** The cap can be pushed up from the bottom by reaching through the fork slot).
3. Cover the horizontal duct opening with the horizontal duct cap. The insulation will be on the indoor side.
4. Fasten the cover with screws to seal.

### Removal of Internal Filter Rack (3 Phase Only)

1. Remove the return air panel from the unit.
2. Remove the height adjustment screw from the inside of the rack.
3. Remove (1) screw securing the assembly to the coil located on the left leg of the rack. **NOTE:** The assembly can now be easily collapsed and removed from the unit. See [Figure 4](#) for filter rack securing screw locations.

### Installing Filters in the Filter Rack (3 Phase Only)

1. Remove access panel screws from return air panel. (**Hint:** Loosen the unit's top panel screws near the top edge of the access panel. The access panel was designed to be captured underneath the top panel.)
2. Slide the first filter between both guide channels of filter rack and allow the filter to drop easily into place.
3. Verify the bottom of the filter is within the channels of the rack.
4. Slide the 2nd filter between both guide channels of filter rack.
5. Verify the bottom of the filter is within the channels of the rack.
6. Replace access cover by sliding the top edge of panel under the lip of the unit's top panel. Secure access panel by replacing the screws.

### Removing Filters from Filter Rack (3 Phase Only)

1. Remove access panel screws from return air panel. (**Hint:** Loosen the unit's top panel screws near the top edge of the access panel. The access panel was designed to be captured underneath the top panel.)
2. Remove upper filter by gently pulling filter through the access panel opening.
3. Remove lower filter by lifting media to top of filter rack. Remove in the same manner as described in step 2.
4. Install new filter in the filter rack as described in the previous section.

### Condensate Drain

Condensate is removed from the unit through the 3/4" female pipe fitting located on the front side of the unit. Install a 2 inch condensate trap in the drain line of the same size and prime with water. When connecting rigid drain line, hold the female fitting with a wrench to prevent twisting. **Do not over tighten!** Refer to local codes and restrictions for proper condensate disposal requirements. See [Figure 5](#), (page 7).

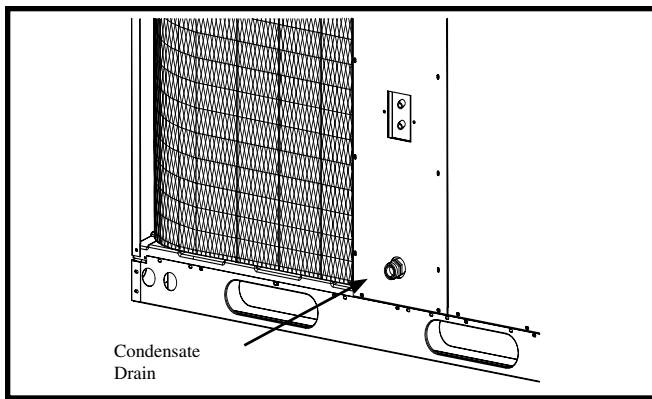


Figure 5. Condensate Drain Location

## ELECTRICAL WIRING

### ⚠ WARNING:

**ELECTRICAL SHOCK OR FIRE HAZARD**  
Failure to follow safety warnings exactly could result in serious injury or property damage.

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

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

### ⚠ AVERTISSEMENT :

#### RISQUE DE DÉCHARGE ÉLECTRIQUE OU D'INCENDIE

Le non-respect des avertissements de sécurité pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels.

Un entretien incorrect pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels

- Couper toute alimentation électrique au générateur d'air chaud avant de procéder aux travaux d'entretien.
- Au moment de l'entretien des commandes, étiqueter tous les fils avant de les débrancher. S'assurer de les raccorder correctement.
- S'assurer que l'appareil fonctionne adéquatement après l'entretien.

- 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. refer to the unit wiring label for proper high and low voltage wiring.
- ✓ Verify factory wiring is in accordance with the unit wiring diagram. See [Figure 11, \(page 16\)](#). Inspect for loose connections.
- ✓ Phase balance on 3 phase units must always be checked. See Unbalanced 3-Phase Supply Voltage section on [page 8](#).

### 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.
- **An electrical disconnect must be located within sight of and readily accessible to the unit.** This switch shall be capable of electrically de-energizing the outdoor unit. See unit data label for proper incoming field wiring. Any other wiring methods must be acceptable to authority having jurisdiction.
- The minimum size of electrical conductors and circuit protection must be in compliance with information listed on the outdoor unit data label.
- 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. See [Table 2, \(page 8\)](#) Use of rain tight conduit is recommended.
- See the unit wiring label for proper high and low voltage wiring. Make all electrical connections in accordance with all applicable codes and ordinances.
- Overcurrent protection must be provided at the branch circuit distribution panel and sized as shown on the unit rating label and according to applicable local codes. See the unit rating plate for maximum circuit ampacity and maximum overcurrent protection limits.
- Check all factory wiring to the wiring diagrams. Verify none of the connections loosened during shipping or installation.
- A wiring diagram/schematic is located on the inside cover of the electrical box of the outdoor unit. The installer should become familiar with the wiring diagram/schematic before making any electrical connections to the outdoor unit. See [Figure 11](#).
- Provide power supply for the unit in accordance with the unit wiring diagram, and the unit rating plate.
- Units are shipped from the factory wired for 240 volt transformer operation. For 208V operation, remove the

lead from the transformer terminal marked 240V and connect it to the terminal marked 208V.

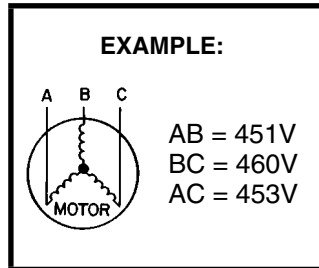
- Internally mounted circuit breakers are available as field installed options. These circuit breakers can be used as an electrical disconnect.
- Connect the line-voltage leads to the terminals on the contactor inside the control compartment.

### 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:

**EXAMPLE**

From the values given in step 1, the BC voltage (460V) is the greatest difference in value from the average:

460 - 454 = 6  
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%.

COPPER WIRE SIZE — AWG (1% VOLTAGE DROP)				
SUPPLY WIRE LENGTH-FEET				SUPPLY CIRCUIT AMPACITY
200	150	100	50	
6	8	10	14	15
4	6	8	12	20
4	6	8	10	25
4	4	6	10	30
3	4	6	8	35
3	4	6	8	40
2	3	4	6	45
2	3	4	6	50
2	3	4	6	55
1	2	3	4	60

Wire Size based on N.E.C. for 60° type copper conductors.

**Table 2. Copper Wire Size**

## 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 control box for grounding the unit.

### Thermostat Connections

- The unit is designed to operate from a 24 VAC Class II control circuit. The control circuit wiring must comply with the current provisions of the NEC (ANSI/NFPA 70) and with applicable local codes having jurisdiction. Thermostat connections should be made in accordance with the instructions supplied with the thermostat and the indoor equipment.
- The low voltage wires must be properly connected. See [Figure 10, \(page 15\)](#). Route 24V control wires through the sealing grommet near the power entrance. Recommended wire gauge and wire lengths for typical thermostat connections are listed in [Table 3, \(page 9\)](#).
- Single stage or two-stage heating thermostats can be used with this equipment depending on optional accessories installed with the unit. Select a thermostat that operates in conjunction with the installed accessories.
- The thermostat should be mounted about 5 feet above the floor on an inside wall. DO NOT install the thermostat on an outside wall or any other location where its operation may be adversely affected by radiant heat from fireplaces, sunlight, lighting fixtures or convective heat from warm air registers or electrical appliances. Refer to the thermostat manufacturer's instruction sheet for detailed mounting information.



THERMOSTAT WIRE GAUGE	RECOMMENDED T-STAT WIRE LENGTH (UNIT TO T-STAT)	
	2-WIRE (HEATING)	5-WIRE (HEATING/COOLING)
24	55	25
22	90	45
20	140	70
18	225	110

**Table 3. Thermostat Wire Gauge**

KW/H	BTU/H
5	17,060
8	27,297
9	30,709
10	34,121
15	51,182
20	68,242

**Table 4. kW & Btu/h Ratings**

## Blower Speed

### CAUTION:

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.

The blower speed is preset at the factory for operation at the same speed for heating and cooling. These factory settings are listed in Table 5. For optimum system performance and comfort, it may be necessary to change the factory set speed.

#### Fixed Torque ECM Motor

1. Shut off all electrical power to the unit and remove the blower panel. Locate the orange and red wires terminated to the blower motor. **NOTE:** The orange wire controls cooling operation while the red wire controls heating operation.
2. Verify the required speed from the airflow data found in Table 5. Place appropriate wire on the correct motor speed tap for the required airflow point.

MODEL NUMBER P8SE -		EXTERNAL STATIC PRESSURE DROP - INCHES WATER COLUMN															
		0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8	
X36	Tap T1**	1091	28.96	1031	30.64	995	31.75	929	34.01	871	36.27	774	41	704	45	629	50
	Tap T2*	1296	24.38	1244	25.40	1169	27.03	1153	27.40	1089	29.01	1030	30.67	961	32.88	863	36.61
	Tap T3	1525	20.72	1499	21.08	1448	21.82	1391	22.71	1338	23.61	1264	25.00	1221	25.88	1159	27.26
	Tap T4	1641	19.25	1590	19.87	1543	20.48	1489	21.22	1444	21.88	1386	22.80	1345	23.49	1285	24.59
	Tap T5	1791	17.64	1740	18.16	1659	19.04	1610	19.62	1555	20.32	1521	20.77	1467	21.54	1414	22.34
X48	Tap T1**	1264	25.00	1183	26.71	1126	28.06	1051	30.06	954	33.12	848	37.26	774	40.82	716	44.13
	Tap T2	1462	21.61	1397	22.62	1322	23.90	1240	25.48	1181	26.75	1133	27.89	1006	31.41	888	35.58
	Tap T3*	1776	17.79	1717	18.40	1654	19.10	1573	20.09	1533	20.61	1484	21.29	1422	22.22	1369	23.08
	Tap T4	2127	14.85	2037	15.51	2008	15.73	1957	16.14	1865	16.94	1801	17.54	1743	18.13	1690	18.69
	Tap T5	2419	13.06	2355	13.42	2311	13.67	2267	13.94	2194	14.40	2150	14.69	2085	15.15	2027	15.59
X60	Tap T1**	1209	26.13	1145	27.59	1106	28.57	1020	30.97	928	34.05	843	37.48	776	40.71	709	44.56
	Tap T2	1629	19.39	1550	20.38	1479	21.36	1435	22.02	1369	23.08	1300	24.30	1244	25.40	1139	27.74
	Tap T3*	1847	17.11	1800	17.55	1718	18.39	1668	18.94	1611	19.61	1556	20.30	1497	21.10	1449	21.80
	Tap T4	2128	14.85	2059	15.34	1992	15.86	1961	16.11	1887	16.74	1828	17.28	1779	17.76	1718	18.39
	Tap T5	2500	12.64	2444	12.93	2417	13.07	2345	13.47	2285	13.83	2228	14.18	2172	14.55	2109	14.98

**NOTES:**

- \* Denotes factory set cooling speed
  - \*\* Denotes factory set electric heating speed
- Calculations made using 10kW heater kit.

**Table 5. P86E Series Blower Curves**

### Optional Outdoor Thermostat

An outdoor thermostat can be installed in the field with 2-stage electric heat. To install the outdoor thermostat, remove the orange wire from the **W1** terminal on the terminal block, and connect to the outdoor thermostat. Connect the other side of the outdoor thermostat to **W2** from the thermostat.

### Optional Electric Heater Kits

This packaged air conditioner is designed to allow optional electric heat to be field installed as required by the building's particular heating load. Optional field-installed electric heater kits are available in 5 kw to 20 kw heating capacities for single phase, and 9 kw to 15 kw heating capacities for three phase. Installation instructions for the electric heaters and their application are shipped separately with the heater kits. Part numbers for available heater kits are listed in the installation instructions supplied with the heater kit.

**NOTE:** All temperature rise data shown in [Table 5, \(page 9\)](#) was calculated using 10kW heaters. For other sized heater kits, use the following steps to determine the heat rise for your particular heater kit.

1. Determine the CFM by locating your blower motor tap settings in [Table 5](#).
2. Locate your heater kits kW value and Btu/h in [Table 4](#).
3. Input the values into the following equation:

$$\text{Temp Rise: } \Delta T = (\text{Btu/h}) / (\text{CFM} * 1.08)$$

**NOTE:** Generally the heat rise should be 30 - 40 degrees. Anything above 40 degrees should be avoided.

If electric heat is installed, a single-stage or two-stage heating thermostat will be required depending on the heater kit. Install the heater kits as directed by the instructions supplied with the heater kit. Follow all cautions and warnings as directed.

## START UP & SYSTEM CHECK

### Pre-Start Check List

- ✓ Verify the unit is level and allows condensate to drain.
- ✓ Verify the outdoor coil and top of the unit are free from obstructions and debris, and all equipment access/control panels are in place.
- ✓ Verify that the duct work is sealed to prevent air leakage.
- ✓ Verify that the line voltage power leads are securely connected and the unit is properly grounded.
- ✓ Verify that the low voltage wires are securely connected to the correct leads on the low voltage terminal strip.
- ✓ 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 system mode should be set to OFF and the thermostat fan mode should be set to AUTO.

## Start-Up Procedure

### **WARNING:**

**If the unit is equipped with a crankcase heater, 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.**

### Air Circulation

Leave the thermostat system mode on OFF, and set the fan mode to ON. Blower should run continuously. Check the air delivery at the supply registers and adjust register openings for balanced air distribution. Examine ductwork for leaks or obstruction if insufficient air is detected. Set the thermostat fan mode to AUTO. The blower should stop running.

### System Cooling

1. Set the thermostat's system mode to COOL and the fan mode to AUTO. Gradually lower the thermostats setpoint below room temperature and verify the outdoor unit and indoor blower energize.
2. Feel the air being circulated by the indoor blower and verify that it is cooler than ambient temperature. Listen for any unusual noises. If unusual sounds occur, determine the source of the noise and correct as necessary.
3. Allow the cooling system to operate for several minutes and then set the temperature selector above room temperature. Verify the fan and compressor cycle off with the thermostat. **NOTE:** The blower should also stop unless fan mode is set to ON.

### System Heating

If the unit has been equipped with optional electric heater kits, set the thermostat's system mode to HEAT and the fan mode to AUTO. Verify the compressor and outdoor fan are not energized but that the blower and heaters are. Feel the air being circulated by the indoor blower and verify that it is warmer than ambient temperature. Listen for any unusual noises. If unusual sounds occur, determine the source of the noise and correct as necessary.

## AIR CONDITIONER MAINTENANCE

### **WARNING:**

**ELECTRICAL SHOCK OR FIRE HAZARD**  
Failure to follow safety warnings exactly could result in serious injury or property damage.

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

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

### **AVERTISSEMENT :**

#### **RISQUE DE DÉCHARGE ÉLECTRIQUE OU D'INCENDIE**

Le non-respect des avertissements de sécurité pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels.

Un entretien incorrect pourrait entraîner un fonctionnement dangereux de l'appareil, des blessures graves, la mort ou des dommages matériels

- Couper toute alimentation électrique au générateur d'air chaud avant de procéder aux travaux d'entretien.
- Au moment de l'entretien des commandes, étiqueter tous les fils avant de les débrancher. S'assurer de les raccorder correctement.
- S'assurer que l'appareil fonctionne adéquatement après l'entretien.

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. Routine maintenance should include the following:

- Inspect the condensate drain and outdoor coil at the beginning of each cooling season. Remove any debris. Clean the outdoor coil and louvers as necessary using a mild detergent and water. Rinse thoroughly with water.
- Inspect the electrical connections for tightness at the beginning of each heating and cooling season. Service as necessary.
- Inspect and clean or replace air filters at the beginning of each heating and cooling season, or more frequently if required.

### **CAUTION:**

The unit should never be operated without a filter in the return air system. Replace disposable filters with the same type and size.

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

## REFRIGERANT CHARGING

### **WARNING:**

Single Packaged Air Conditioners are shipped fully charged with R-410A refrigerant 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.

The system refrigerant charge can be checked and adjusted through the service ports provided at the front panel. Use only gauge lines which have a Schrader depression device present to actuate the valve. After refrigerant line connections are completed, leak check and evacuate the indoor section and all line connections (using proper methods) before finalizing the full system refrigerant charge.

- P8SE outdoor units with non-AHRI listed indoor coils are not recommended. Deviations from rated airflows or non-listed combinations may require modification to the expansion device and refrigerant charging procedures for proper and efficient system operation.
- The refrigerant charge can be checked and adjusted through the service ports provided external to the outdoor unit. Use only gage line sets which have a "Schrader" depression device present to actuate the valve.
- A high-pressure switch is factory-installed and located in the liquid line internal to the outdoor unit. The switch is designed to protect the system when very high pressures occur during abnormal conditions. Under normal conditions, the switch is closed. If the liquid pressure rises above 650 psig, then the switch will open and de-energize the outdoor unit. The switch will close again once the liquid pressure decreases to 460 psig. Please note that the switch interrupts the thermostat inputs to the unit. Thus, when the switch opens and then closes, there may be a 5 minute short cycling delay before the outdoor unit will energize.

- A low-pressure switch is factory-installed and located in the suction line internal to the outdoor unit. The switch is designed to protect the compressor from a loss of charge. Under normal conditions, the switch is closed. If the suction pressure falls below 5 psig, then the switch will open and de-energize the outdoor unit. The switch will close again once the suction pressure increases above 20 psig. Please note that the switch interrupts the thermostat inputs to the unit. When the switch opens and then closes, there will be a 5 minute short cycling delay before the outdoor unit will energize.
- To achieve rated capacity and efficiency the compressor must be exposed to refrigerant for at least 24 hours prior to running and then must be run for a minimum of 12 hours.

### Charging the Unit in AC mode

#### At outdoor temperatures above 65° F

1. With the system operating at steady-state, measure the liquid refrigerant pressure (in psig) at the outdoor unit service valve.
2. Measure the liquid refrigerant temperature (in Fahrenheit) at the service valve.
3. Determine the required liquid refrigerant pressure from Figure 6, Figure 7, (page 13), or Figure 8, (page 13).
  - If the pressure measured in Step 1 is greater than the required liquid refrigerant pressure determined in Step 3, then there is too much charge in the system. Remove refrigerant and repeat Steps 1 through 3 until the system is correctly charged.
  - If the pressure measured in Step 1 is less than the required liquid refrigerant pressure determined in Step 3, there is too little charge in the system. Add refrigerant and repeat Steps 1 through 3 until the system is correctly charged.

### Charging Charts & Application Notes

- This equipment's cooling system contains refrigerant under high pressure. Always use safe and environmentally sound methods when handling refrigerant handling or servicing the unit. Review the factory literature and safety warnings prior to servicing.
- When repairing system leaks, always use 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 with one capable of acid removal. After completing the repairs, evacuate the system to 350 - 500 microns and weigh in the refrigerant to the amount specified on the unit rating label.
- The refrigerant charging charts, Figure 6, Figure 7, or Figure 8 are applicable only to matched assemblies of NORDYNE equipment and listed airflows for the indoor coil. NOTE: Before using these charts, make sure the unit is in a stable operating mode. As shown in the charts, the ideal system sub-cooling can vary over the range of operation. 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).
- For systems that are operating with more than a 5% deviation, inspect the unit for the proper voltage and phase balance and the refrigeration system for leaks.
- Units that are operating at less than 95% of the nominal voltage or with a 2% phase imbalance may see a more significant deviation than the amount stated above.
- **DO NOT** use the charts in systems that have a fan cycling under low-ambient control. Refer to the low-ambient kit instructions for more information (If applicable).

P8SE-X36 Charging Chart - Cooling

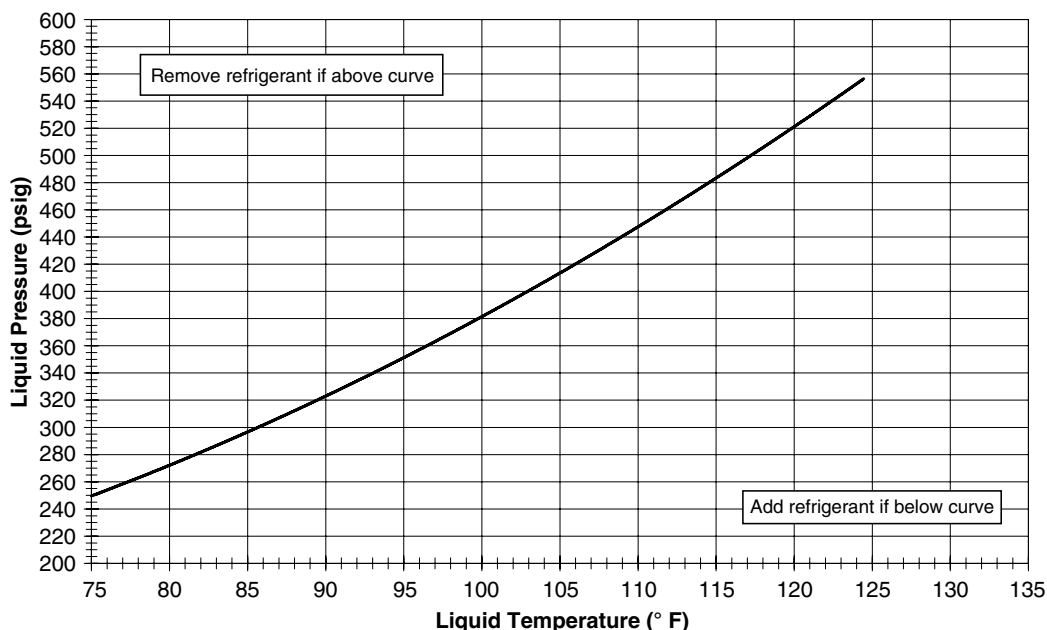
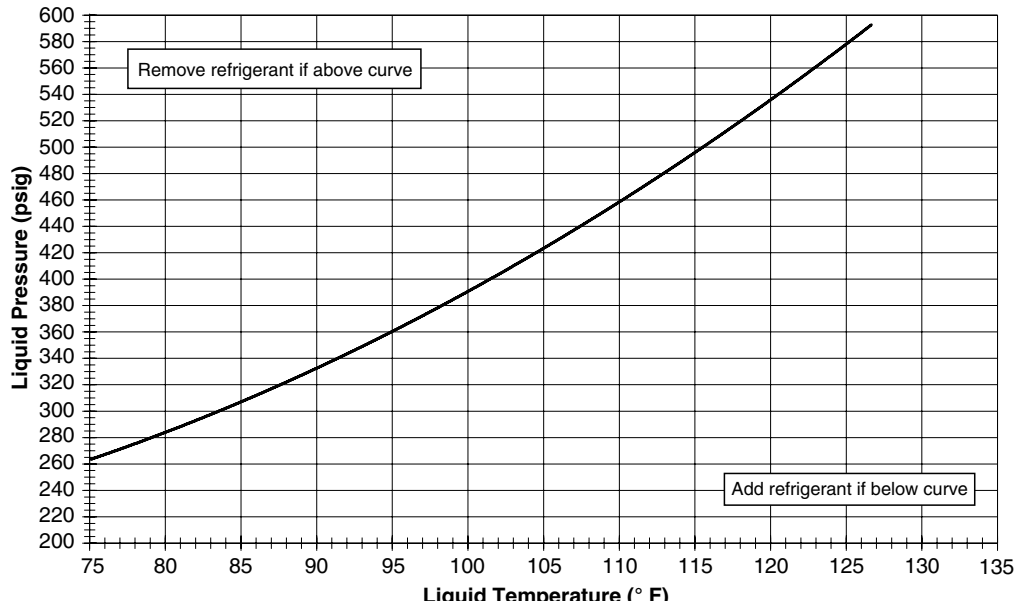


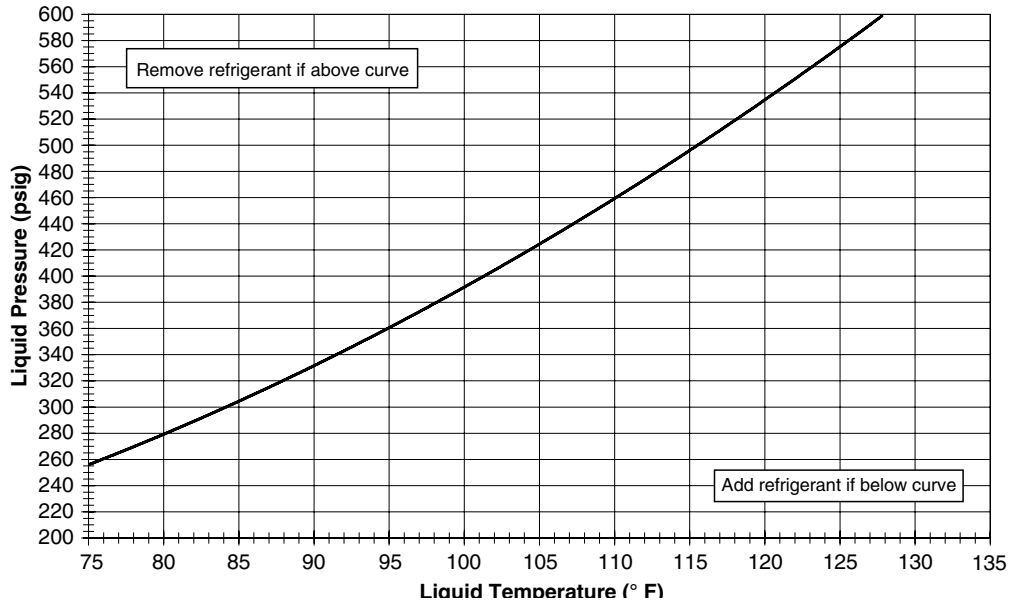
Figure 6. Charging Chart for 3 Ton Units

**P8SE-X48 Charging Chart - Cooling**



**Figure 7. Charging Chart for 4 Ton Units**

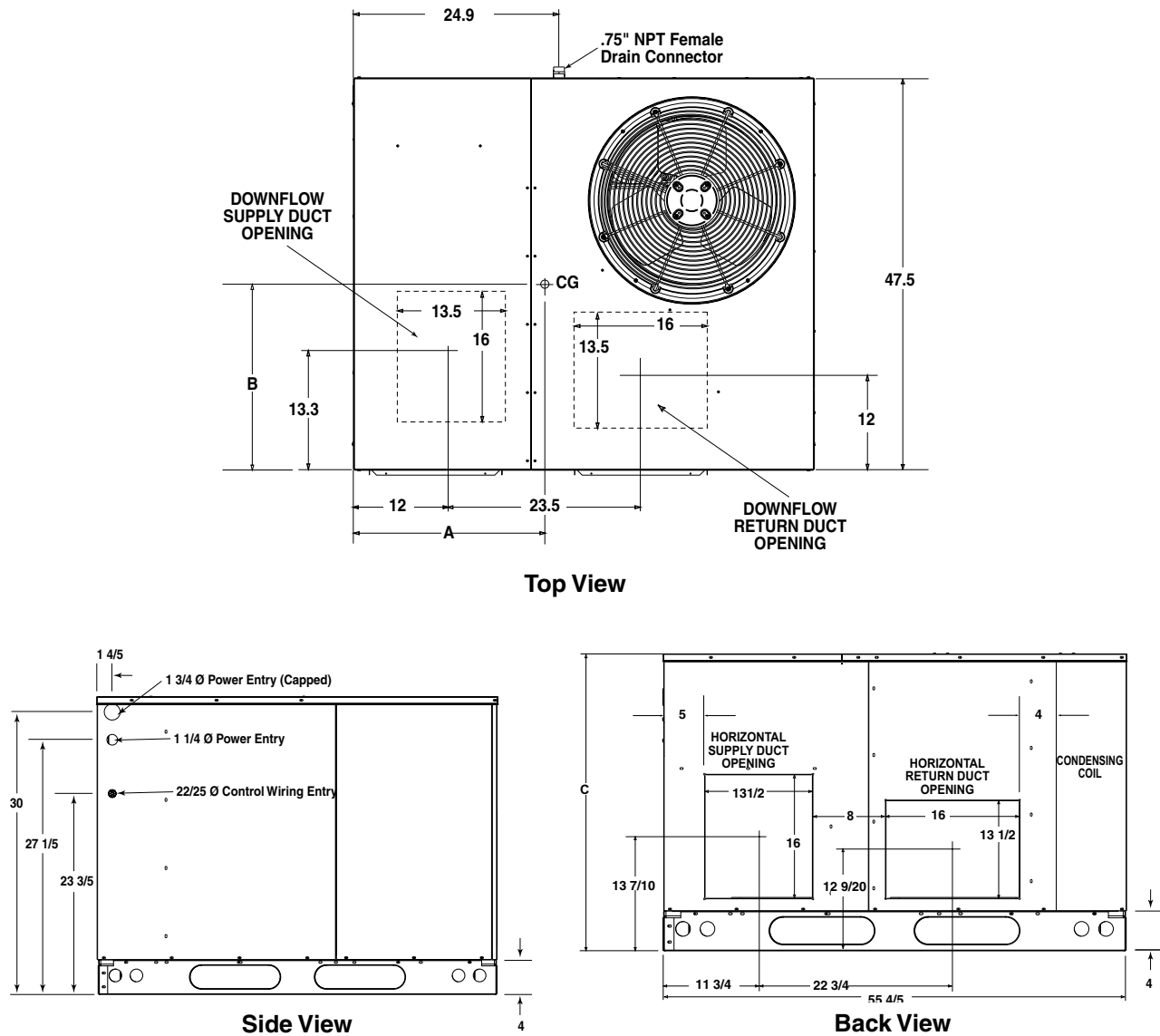
**P8SE-X60 Charging Chart - Cooling**



**Figure 8. Charging Chart for 5 Ton Units**



## P8SE PHYSICAL & ELECTRICAL DATA

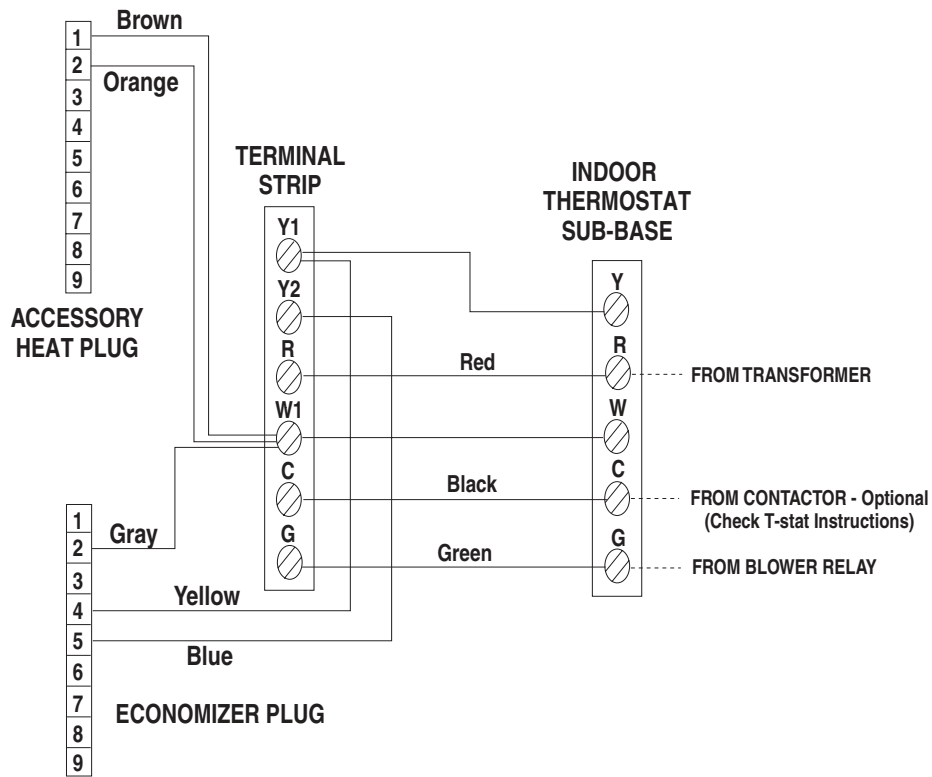


**Figure 9. P8SE Air Conditioner Dimensions**

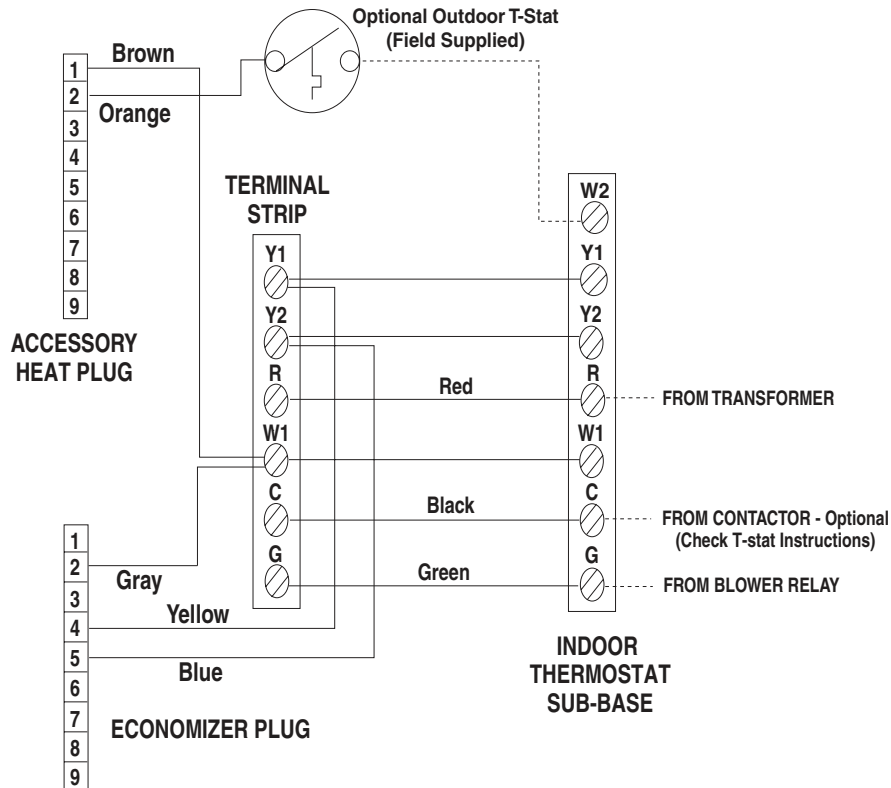
MODEL NUMBER P8SE -	UNIT SHIPPING WEIGHT	CENTER OF GRAVITY		HEIGHT -C- (IN INCHES)	
		-A-	-B-	WITH BASE RAILS	WITHOUT BASE RAILS
X36	375	29	20.5	35.0	30.76
X48	398	29	20.5	35.0	30.76
X60	437	27.25	23.5	43.0	39.3

**NOTE:** To determine unit weight, subtract 21lbs from unit shipping weight.

**Table 6. P8SE Shipping Weight Info**



Typical Wiring (Field Supplied) for 1-Stage Cool, 1-Stage Heat



Typical Wiring (Field Supplied) for 2-Stage Cool, 1-Stage Heat with an Optional Outdoor Thermostat

Figure 10. Typical Air Conditioner Thermostat Connections (208/230V)

# WIRING DIAGRAM

## Convertible Packaged Air Conditioner

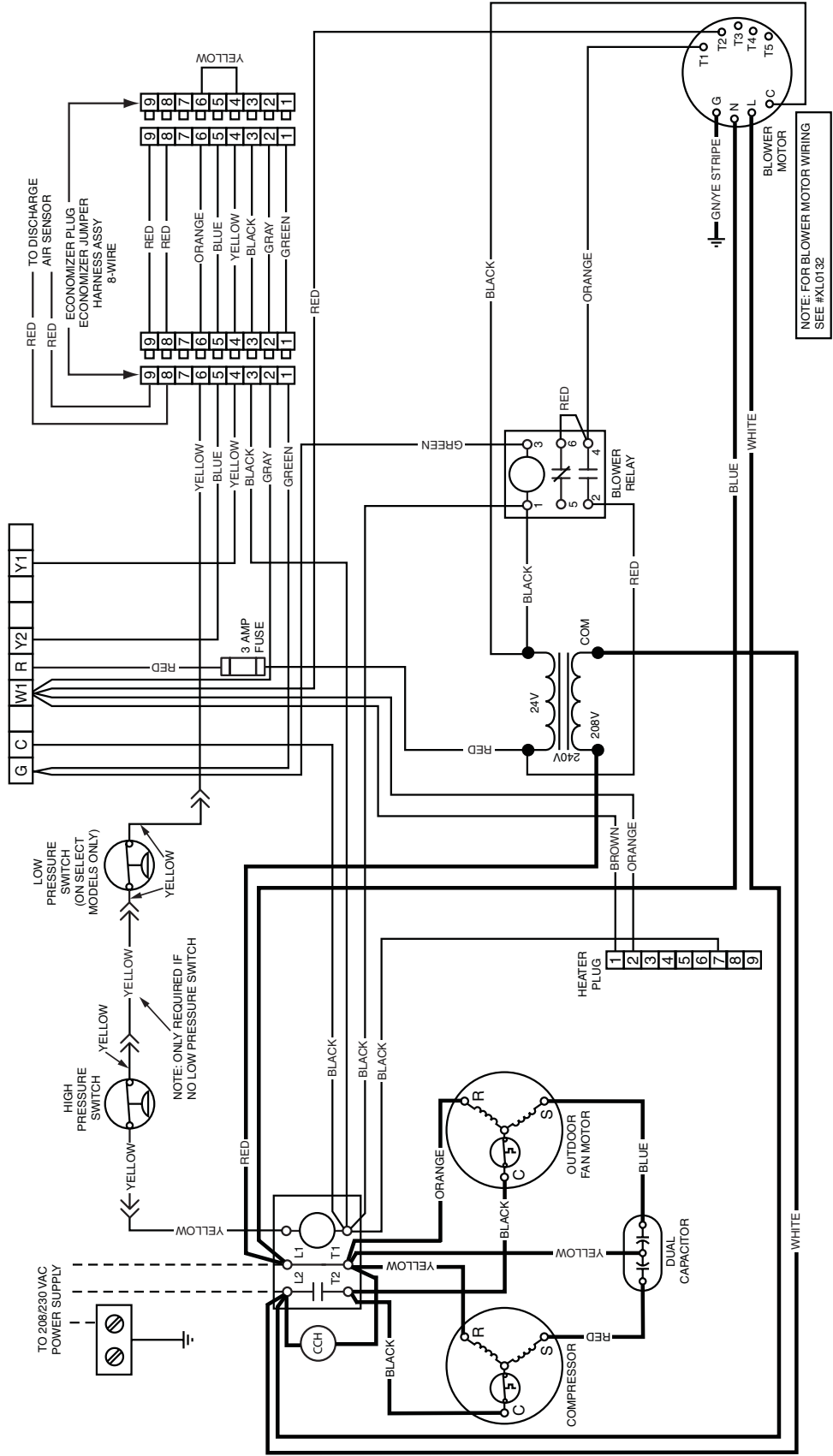
208/230 Volt

Single Phase / 60Hz

**NOTES:**

1. Disconnect all power before servicing.
2. For supply connections use copper conductors only.
3. Not suitable on systems that exceed 150V to ground.
4. 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 105°C.
5. For supply wire ampacities and overcurrent protection, see unit rating plate.

1. Couper le courant avant de faire leretien.
2. Employez uniquement des conducteurs en cuivre.
3. Ne convient pas aux installations de plus de 150V a la terre.



**LEGEND:**



NOTE: FOR BLOWER MOTOR WIRING SEE #XL0132



7110340  
1289

Figure 11. Wiring Diagram-Fixed Torque Motor, Single Phase









## INSTALLATION / PERFORMANCE CHECKLIST

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		
Blower Motor HP: _____ Sheave Setting _____ # Turns		
Has the thermostat been calibrated?	YES	NO
Is the thermostat level?	YES	NO
Is the heat anticipator setting correct? (If Applicable)	YES	NO

INSTALLATION ADDRESS:		
CITY _____	STATE _____	
UNIT MODEL # _____		
UNIT SERIAL # _____		
INSTALLER NAME:		
CITY _____	STATE _____	
Unit Installed Minimum clearances shown on <a href="#">page 4</a> ?	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

REFRIGERATION SYSTEM		
Was unit given 24 hr warm up period for crankcase heaters?	YES	NO
Stage-1 Liquid Pressure (high side) _____		
Stage-1 Suction Pressure (low side) _____		

PROPOSITION 65 WARNING:
<b>WARNING: This product contains chemicals known to the state of California to cause cancer.</b>
<b>WARNING: This product contains chemicals known to the state of California to cause birth defects or other reproductive harm.</b>

### REPLACEMENT PARTS

Replacement parts are available through all Nordyne distributors. Please have the complete model and serial number of the unit when ordering replacement parts.

**Electrical:**

- Capacitors
- Compressors
- Contactors
- Pressure Switches
- Relays
- Temperature Limit Switches
- Thermostats
- Time Delay Relays
- Transformers

**Motors:**

- Blower Motor
- Fan Motor

**Components:**

- Blower Assembly
- Cabinet Panels
- Expansion Valves
- Fan Grille
- Filter/Driers



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Specifications & illustrations subject to change without notice or incurring obligations (11/14).



7097160 (NEW)