

INSTALLATION INSTRUCTIONS

SINGLE PACKAGE AIR CONDITIONER - 2 STAGE, R410A



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.

TABLE OF CONTENTS

IMPORTANT SAFETY INFORMATION	2
GENERAL INFORMATION	3
Before You Install this Unit.....	3
Locating the Air Conditioner.....	3
Minimum Clearance Requirements.....	3
Service Access Clearance.....	3
Clearances to Combustible Materials.....	3
Air Duct System.....	3
AIR CONDITIONER INSTALLATION	4
Unpacking the Unit.....	4
Installing Return & Supply Air Collars.....	4
Supply Duct.....	4
Return Duct.....	4
Connecting the Return & Supply Air Flexible Ducts.....	4
Locating & Installing the Return Air Assembly.....	5
Locating & Installing the Supply Damper(s).....	5
Condensate Drainage.....	5
ELECTRICAL CONNECTIONS	6
Pre-Electrical Checklist.....	6
Line Voltage.....	6
Grounding.....	7
Overcurrent Protection.....	7
Thermostat / Low Voltage Connections.....	7
Heat / Cool Thermostat.....	7
Cooling Mode.....	8
Electric Heat Package (optional).....	8
Blower Speed.....	8
Outdoor Motor - 4 & 5 Ton Models Only.....	8
START UP & ADJUSTMENTS	8
Pre-Start Checklist.....	8
Start-Up Procedure.....	8
Air Circulation.....	9
System Cooling.....	9
System Heating.....	9
AIR CONDITIONER MAINTENANCE	9
COMPONENT FUNCTIONS	9
REFRIGERANT CHARGING	9
Charging an R-410A Unit in AC Mode.....	9
FIGURES & TABLES	12
Figure 12. Unit Dimensions.....	12
Table 4. Physical Data.....	12
Electrical Information.....	13
Figure 13. Typical Wiring (Field Supplied) for 2-Stage Cool & 1 or 2-Stage Electric Heat.....	13
Figure 14. Wiring Diagram for 2 & 3 Ton Units.....	14
Figure 15. Wiring Diagram for 4 Ton Units.....	15
Figure 16. Wiring Diagram for 5 Ton Units.....	16
INSTALLATION CHECK LIST	20
REPLACEMENT PARTS	20

IMPORTANT SAFETY INFORMATION

Please read all instructions before servicing this equipment. Pay attention to all safety warnings and any other special notes highlighted in the manual. 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.

WARNING:

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

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

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

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

WARNING:

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 equipment owner attempt to install and/or service this equipment. Failure to comply with this warning could result in equipment damage, personal injury, or death.

CAUTION:

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

WARNING:

The 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. If you do not possess mechanical skills or tools, call your local dealer for assistance. 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.
- 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.
- This equipment contains liquid and gaseous refrigerant under high pressure. **DO NOT USE ANY PORTION OF THE CHARGE FOR PURGING OR LEAK TESTING.** Installation or servicing should only be performed by qualified trained personnel thoroughly familiar with this type 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.
- This unit is designed for outdoor installations only and should be located in a position as shown on [page 3](#).
- 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.
- The installer should become familiar with the units wiring diagram before making any electrical connections to the unit. See the unit wiring label or [Figure 14 \(page 14\)](#), [Figure 15 \(page 15\)](#), or [Figure 16 \(page 16\)](#).

GENERAL INFORMATION

This air conditioner is designed only for outdoor ground level installations and can be readily connected to the high static duct system of a home. This unit has been tested for capacity and efficiency in accordance with AHRI Standards and will provide many years of safe and dependable comfort, providing it is properly installed and maintained. 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 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.**
- 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.
- Consideration should also be given to availability of electric power, service access, noise, and shade.

Minimum Clearance Requirements

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 \(page 3\)](#) for minimum clearances to obstructions.

Service Access Clearance

Blower and electrical control access panels.....	24"
Clearance between overhang and top of unit.....	72"
Clearance around condenser coil area to wall or shrubs (excludes duct panel side).....	12"

Clearances to Combustible Materials

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

Air Duct System

Air ducts must be installed in accordance with the standards of the National Fire Protection Association "Standard for Installation of Air Conditioning and Ventilation Systems" (NFPA 90A), "Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems" (NFPA 90B), these instructions, and all applicable codes. NFPA publications are available by writing to: National Fire Protection Association, Batterymarch Park, Quincy, ME 02269 or visit www.NFPA.org on the web.

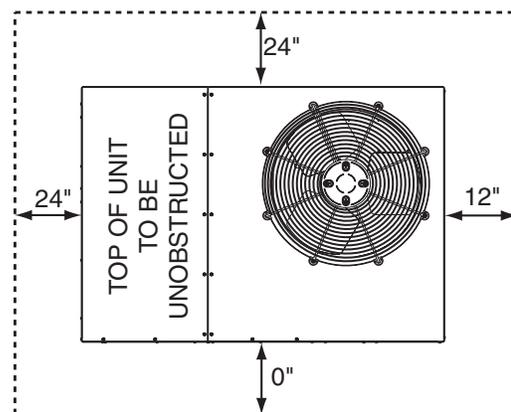


Figure 1. Minimum Unit Clearances

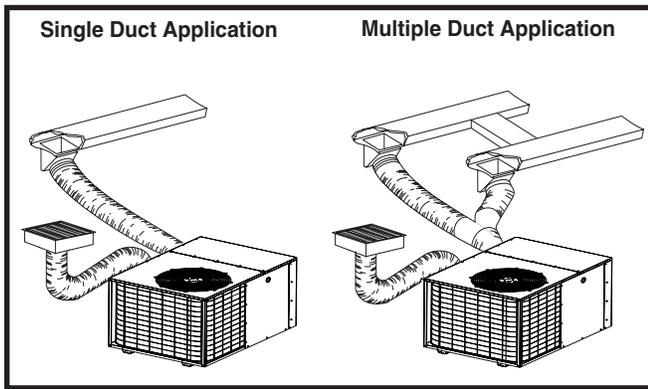


Figure 2. Single & Multiple Duct Applications

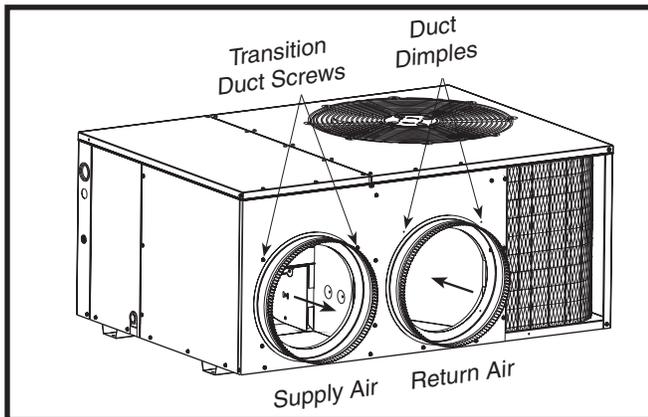


Figure 3. Return & Supply Air Collars

- Design the duct work according to methods described by the Air Conditioning Contractors of America (ACCA).
- The supply duct system, including the number and type of registers, will have much more effect on the performance of the system than any other factor. The duct must be sufficiently large to conduct an adequate amount of air to each register. See [Figure 2](#).
- Duct work should be attached directly to the unit flanges for horizontal applications.
- For highly resistive duct systems it may be necessary to add an additional return air duct and or supply to achieve maximum performance and prevent coil icing and refrigerant flood back.
- **The air conditioning output of the system will not cool the home if air is lost to the outside through leaks in the duct system. Ducts that are collapsed or restricted by foreign objects will also prevent adequate air flow.**
- 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.

AIR CONDITIONER INSTALLATION

Unpacking the Unit

It is recommended that the unit be unpacked at the installation site to minimize damage due to handling.

CAUTION:

Do not tip the unit on its side. Oil may enter the compressor cylinders and cause starting trouble. If unit has been set on its side, restore to upright position and do not run for several hours. Then run unit for a few seconds. Do this three or four times with five minutes between runs.

1. Remove the bands from around the unit.
2. Unfold the top and bottom cap flanges.
3. Carefully remove the top cap and tube.

Installing Return & Supply Air Collars

If the supply and return collars are supplied with the unit, they will be located in the supply duct. They can be easily positioned over the unit openings and secured with sheet metal screws. See [Figure 3](#).

- The diameter of the return duct collar is 14”.
- The diameter of the supply duct collar is 12”.
- Before permanently installing the collars, it is recommended you pre-fit them over the openings first to determine best fit and alignment.

Supply Duct

1. Position the supply duct collar so the edge of the unit opening fits between the flange and the bead.
2. Overlap the collar ends keeping the small screw holes underneath.
3. Align the holes in the crimped area and install one screw.
NOTE: It may be necessary to loosen the four screws that hold the transition duct in order to install the supply fitting. Re-tighten when installation is complete.
4. Tap collar (if necessary) to ensure engagement with unit opening and install second screw.
5. Tighten first screw and rotate collar clockwise so joint is near three o'clock position.

Return Duct

1. Assemble the collar by overlapping the two ends.
NOTE: One end of the collar is slotted and the opposite end has two small holes. Position the end with small screw holes underneath the slotted end.
2. Fasten the collar ends with two self drilling sheet metal screws.
3. Position the collar over the unit opening. Align the four holes in the collar with the four dimples or holes (depending on unit model) in the panel.
4. Secure the collar to the rear panel using self drilling screws (10-16x.5).

Connecting the Return & Supply Air Flexible Ducts

- Flexible ducts may be cut to the required length and spliced with sheet metal sleeves and clamps. **Keep all ducts as short and straight as possible. Avoid sharp bends.** Please follow all instructions packed with duct.
- Flexible ducts can be secured to the corresponding fittings with the clamps provided with the ducts. **NOTE:** To prevent a loss in cooling capacity, make sure all connections are tight.
- Ducts may be spliced with sheet metal sleeves and clamps.
- After the inner duct is connected to the proper fitting, the insulation and plastic sleeve should be pulled over the connection and clamped.

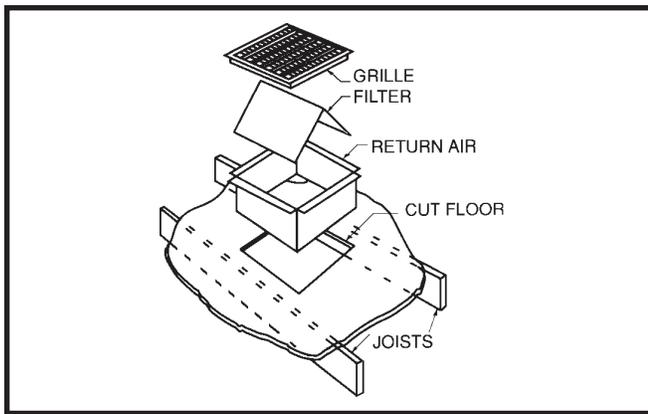


Figure 4. Typical Return Air Assembly

- Homes with multiple supply ducts (or special applications), a Y fitting is available to divide the supply air so it can be ducted to different areas of the home for more efficient cooling.
NOTE: For maximum performance, insulate the Y fitting.

Locating & Installing the Return Air Assembly

To simplify installation, locate and install the return air assembly first. If desired, the return opening can be located inside a closet with louvered doors that has an open area equal to or greater than a 12" x 20" grille. The return air grille can be placed in the wall of a closet and the air ducted into the filter box through a boxed-in area at the closet floor level (Figure 4). **Verify the filter is readily accessible.**

NOTE: The return air box with grille and filter should not be located in heavy traffic areas like hallways or center of rooms. A good spot is in a corner or under a table, if a minimum two inch clearance is available.

1. Start the installation from under the home by cutting a small hole in the subfloor. Determine how the floor joist location will affect cutting the opening needed for the return air box.
NOTE: Floor joists are generally located on 16" centers, leaving 14-3/8" between joists.
2. After measuring the return air box (approximately 12-1/4" x 20-1/4"), cut the hole through the floor so that the box will fit between the floor joists. Care should be taken when cutting through carpeting to avoid snags. **NOTE:** In most installations it will be necessary to cut a similar hole in the fiberboard directly under the hole in the floor. However, if the floor is more than ten inches deep, it will only be necessary to cut a hole for the collar on the return air box or for the insulated duct.
3. Set the box into the opening and fasten with screws or nails.
4. Install the filter and return air grille in the air box.

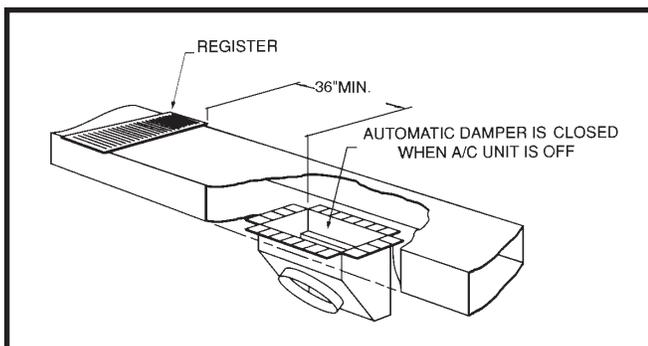


Figure 5. Typical Supply Damper

Locating & Installing the Supply Damper(s)

⚠ CAUTION:

If installing this air conditioning system in conjunction with a furnace, a damper must be installed in the furnace base assembly to prevent cold air from being discharged around the heat exchanger. Damage to the heat exchanger and asphyxiation may occur if a damper is not installed.

Check with the furnace manufacturer for damper requirements. Failure to install the required furnace damper may invalidate code agency listing and limited warranty on the furnace.

When locating the supply damper(s), carefully check floor joists and frame members that could interfere with the installation of the damper or flexible duct. Ideally, the damper should be located in the bottom of the main duct, forward of center of the home, at least three feet from the nearest register. See Figure 5. The round supply opening in the slanted side of the damper should face the side of the home where the air conditioner is located.

1. Locate the center of the heat duct by cutting a small hole in the fiberboard below the duct at the desired location.
2. Cut a hole approximately 3/4" larger than the damper opening in the fiberboard.
3. Cut a 9-1/8" x 13-1/8" hole in the duct and bend over all tabs flat on the inside of the heat duct.
4. Insert the damper into the duct and bend over all tabs flat on the inside of the heat duct.
5. Seal the opening between the fiberboard and damper or flexible duct.

Condensate Drainage

A 3/4" condensate fitting extends out of the side of the unit as shown in Figure 6. The drain trap (shipped in the electrical compartment), must be installed to prevent water from collecting inside the unit.

1. Thread the elbow provided with the unit into the drain connection until hand tight.
2. Connect the condensate tubing onto the fitting, forming a trap near the drain connection.
3. Route the condensate tube from the trap to a suitable drain.
NOTE: For proper drainage, make sure the trap is level to the ground and tubing outlet is below trap level.

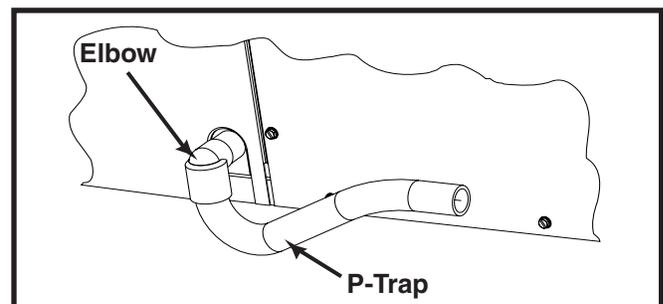


Figure 6. Drain Trap

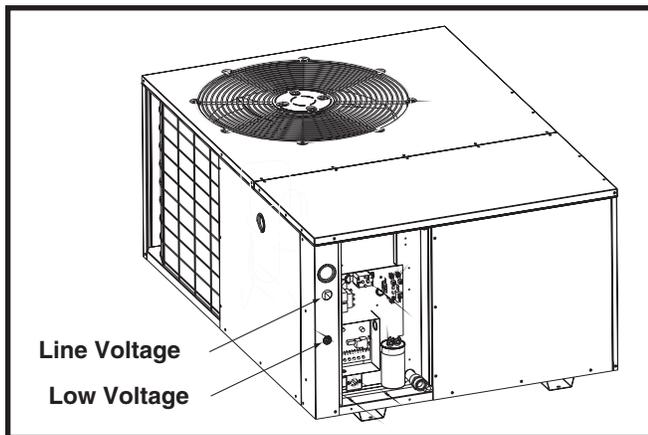


Figure 7. Power Entry Locations

ELECTRICAL CONNECTIONS

⚠ WARNING:

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

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

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

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

- All 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 diagrams: [Figure 14 \(page 14\)](#), [Figure 15 \(page 15\)](#), or [Figure 16 \(page 16\)](#). Inspect for loose connections.

Line Voltage

- A wiring diagram is located on the inside cover of the electrical box of the unit. The installer should become familiar with the wiring diagram before making any electrical connections to 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 unit.
- Line voltage to the unit should be supplied from a dedicated branch circuit containing the correct fuse or circuit breaker for the unit. Incoming field wiring and minimum size of electrical

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 1. Copper Wire Size

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 2. Thermostat Wire Gauge

- conductors and circuit protection must be in compliance with information listed on the unit data label. Any other wiring methods must be acceptable to authority having jurisdiction.
- 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 terminals on the contactor inside the control compartment. Extend leads through power wiring hole. Connect **L1** & **L2** directly to the contactor. See [Figure 7 \(page 6\)](#) for power entry locations.
- The unit requires both power and control circuit electrical connections. Refer to the wiring diagram for identification and location of unit field wiring interfaces. Make all electrical connections in accordance with all applicable codes and ordinances. [Figure 14](#), [Figure 15](#), or [Figure 16](#).
- 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 minimum circuit ampacity and maximum overcurrent protection limits.
- 208/230 Volt units are shipped from the factory wired for 230 volt operation. For 208V operation, remove the lead from the transformer terminal marked 240V and connect it to the terminal marked 208V.
- Use only copper wire for the line voltage power supply to this unit as listed in [Table 1](#). Use proper code agency listed conduit and a conduit connector for connecting the supply wires to the unit. Use of rain tight conduit is recommended.
- Optional equipment requiring connection to the power or control circuits must be wired in strict accordance of the NEC (ANSI/NFPA 70), applicable local codes, and the instructions provided with the equipment.

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 CSA C22.1 Electrical Code. Ground the air conditioning unit using the green grounding screw provided in the control panel.

Overcurrent Protection

Generally, the best fuse or breaker for any air conditioner is the smallest size that will permit the equipment to run under normal usage and provide maximum equipment protection. Properly sized fuses and breakers also prevent nuisance trips during unit startup. **If a fuse blows or a breaker trips, always determine the reason. Do not arbitrarily install a larger fuse or breaker and do not, in any case, exceed the maximum size listed on the data label of the unit.**

Thermostat / Low Voltage Connections

- These units are designed to operate with 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. Route 24V control wires through the sealing grommet near the power entrance. See [Figure 7 \(page 6\)](#). Connect the control wires to the defrost board and blower relay wire. Recommended wire gauge and wire lengths for typical thermostat connections are listed in [Table 2](#).
- 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, or lighting fixtures, and convective heat from warm air registers or electrical appliances. Refer to the thermostat manufacturer's instruction sheet for detailed mounting information.
- The 16 SEER air conditioner uses a special two speed compressor to achieve a high level of efficiency in a compact frame. For the highest efficiency, the use of a 2-stage Heat / Cool thermostat should be used with this unit. The heat / cool thermostat prevents simultaneous operation of the heating and cooling units and is equipped with an ON-AUTO fan mode that allows the home owner to operate the indoor blower when only air circulation is desired.

Heat / Cool Thermostat

A 2 stage Cooling thermostat is recommended for this product. A single or two stage heating thermostat may be used depending on the optional accessories installed with the unit. Install a thermostat that operates in conjunction with the installed accessories. See [Figure 13 \(page 13\)](#) for Heat / Cool applications

HEAT RISE DATA (BASED ON NOMINAL 10KW ELECTRIC HEAT KIT)																	
MODEL P7RF-	BLOWER SETTING	EXTERNAL STATIC PRESSURE DROP - INCHES WATER COLUMN															
		0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8	
		CFM	HEAT RISE	CFM	HEAT RISE	CFM	HEAT RISE	CFM	HEAT RISE	CFM	HEAT RISE	CFM	HEAT RISE	CFM	HEAT RISE	CFM	HEAT RISE
X24K	Tap T1*	467	68	443	71	417	76	343	92	272	116	—	—	—	—	—	—
	Tap T2**	872	36	828	38	795	40	740	43	689	46	628	50	580	54	534	59
	Tap T3***	1115	28	1079	29	1043	30	1006	31	964	33	916	34	866	36	819	39
	Tap T4	1244	25	1207	26	1173	27	1136	28	1102	29	1064	30	1011	31	965	33
	Tap T5	1496	21	1465	22	1437	22	1407	22	1370	23	1331	24	1295	24	1257	25
X36K	Tap T1*	900	35	865	37	818	39	767	41	696	45	646	49	592	53	547	58
	Tap T2***	1131	28	1096	29	1058	30	1021	31	968	33	916	34	858	37	792	40
	Tap T3**	1344	24	1313	24	1270	25	1231	26	1197	26	1156	27	1106	29	1046	30
	Tap T4	1507	21	1475	21	1441	22	1401	23	1362	23	1326	24	1281	25	1230	26
	Tap T5	1602	20	1570	20	1533	21	1501	21	1463	22	1418	22	1383	23	1336	24
X48K	Tap T1*	1062	30	1023	31	985	32	956	33	921	34	860	37	813	39	766	41
	Tap T2***	1079	29	1039	30	1006	31	969	33	927	34	870	36	842	38	777	41
	Tap T3	1398	23	1356	23	1317	24	1277	25	1238	26	1200	26	1160	27	1115	28
	Tap T4**	1654	19	1623	19	1572	20	1542	20	1509	21	1468	22	1428	22	1394	23
	Tap T5	1982	16	1955	16	1921	16	1881	17	1851	17	1812	17	1782	18	1741	18
X60KA	Tap T1***	1079	29	1039	30	1006	31	969	33	927	34	870	36	842	38	777	41
	Tap T2*	1238	26	1216	26	1181	27	1135	28	1099	29	1057	30	1023	31	964	33
	Tap T3	1610	20	1582	20	1551	20	1514	21	1475	21	1449	22	1412	22	1372	23
	Tap T4**	1827	17	1794	18	1773	18	1741	18	1694	19	1657	19	1624	19	1583	20
	Tap T5	2059	15	2026	16	1998	16	1960	16	1933	16	1901	17	1856	17	1827	17

- * Denotes factory set Low COOL speed
- ** Denotes factory set High COOL speed
- *** Denotes factory set electric HEAT speed

NOTE: Temperature rises shaded grey are for reference only. These conditions are not recommended.

Table 3. CFM & Heat Rise Data

2 Stage Heat with Single Stage Heating Thermostat - If a single stage heat thermostat is used and 2 stage heat is desired, an optional outdoor thermostat may be installed. Connect the optional outdoor thermostat between the **W1 (BROWN)** connection and **ORANGE** wire in the outdoor unit. See [Figure 13](#). Refer to the installation Instructions supplied with the outdoor thermostat for setup details.

Cooling Mode

1. On a call for cooling, the thermostat closes, and applies 24VAC to the **G & Y1** terminals of the control. The compressor contactor closes and operates the compressor in 1st stage.
2. If the thermostat is not satisfied in the required time (based on the operation of the 2-stage cooling thermostat), **Y2** will energize and the compressor will run at 2nd stage. Refer to the thermostat's Installation Instructions for the cooling profile.
3. When the thermostat is satisfied, the **G & Y** terminals on the control board de-energized and open the compressor contactor.

Electric Heat Package (optional)

This air conditioner is shipped without an auxiliary electric heat kit installed. If electric heat is desired, an accessory heater kit must be field installed.

- Select the correct size heat package for the installation. See specifications sheet for available kits and application. Install the heater kit according to the to the installation instructions provided with the kit.
- Installation is most easily accomplished before making duct or electrical connections.
- The blower must be set at the correct speed for the installed electric heat kit. For airflow data, refer to [Table 3](#) and the installation instructions provided with the kit.

Blower Speed

For optimum system performance and comfort, it may be necessary to change the factory speed setting. See [Table 3](#) for factory settings. **NOTE:** This model has a high efficiency ECM motor with 5 speed taps.

WARNING:

To avoid electric shock, personal injury, or death, turn off the electric power at the disconnect or the main service panel before making any electrical connections.

To Change the blower speed of the high efficiency motor:

1. Disconnect all electrical power to the unit and remove the service panel.

CAUTION:

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

2. Locate the **RED, BLUE** and **ORANGE** wires terminated to the blower motor. The **RED** wire controls the low speed cooling and heating operations, the **BLUE** wire controls high speed cooling and heating operations, and the **ORANGE** wire controls the electric heating operation.

CAUTION:

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

3. Verify the required speed from the airflow data found in [Table 3 \(page 7\)](#). Place appropriate wire on the appropriate motor speed tap for the required airflow.
4. Check all factory wiring per the unit wiring diagram and inspect the factory wiring connections to be sure none loosened during shipping or installation.

Outdoor Motor - 4 & 5 Ton Models Only

The outdoor motor has variable speeds which adjust in conjunction with the compressor and indoor blower motor. The outdoor motor is preset at the factory and wired as shown:

- 4 Ton Model: **YELLOW** wire is connected to **Y1** and the **WHITE** wire is connected to **Y2**. **NOTE:** For 2nd stage, both **Y1 & Y2 (YELLOW & WHITE)** should be energized.
- 5 Ton Model: **WHITE** is connected to **NC** on blower relay. **YELLOW** is connected to **Y2**. For 1st stage only **WHITE** should be energized. **NOTE:** For 2nd stage, only **YELLOW** should be energized.

NOTE: The **BLUE** wire from the outdoor ECM motor is always common for either speed setting.

START UP & ADJUSTMENTS

Pre-Start Checklist

The following check list should be observed prior to starting the unit.

- ✓ Verify the unit is level and allows proper condensate drainage.
- ✓ Verify the outdoor coil and top of the unit are free from obstructions and debris, and all equipment access/control panels are in place. Unit must be installed with the proper clearances as listed in [Figure 1 \(page 3\)](#).
- ✓ 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. Check the condenser fan to make sure it turns freely.
- ✓ Verify the thermostat is wired correctly and installed in a proper location. Make sure the low voltage wires are securely connected to the correct leads on the low voltage terminal strip.
- ✓ Verify that the power supply branch circuit overcurrent protection is sized properly.

Start-Up Procedure

NOTE: The control circuit thermostat may consist of an anti-short cycle timer that will not let the compressor re-start before 3 - 5 minutes have elapsed.

1. Set the system mode to OFF and the temperature mode to its highest setting.
2. Turn power on at the disconnect switch.
3. Set the system mode to ON or COOL.
4. Set the temperature mode below room temperature. Verify that the indoor blower, outdoor fan, and compressor energize and the cooling function starts.
5. Verify the discharge air grilles are adjusted and the system air is balanced.
6. Verify the duct work has no air leaks.
7. Verify the condensate drain is installed correctly and functions properly.
8. Set the temperature mode above room temperature. The unit should stop.

9. Instruct the homeowner on unit and thermostat operation and filter servicing.

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. If air is insufficient, examine the ductwork for leaks or obstructions. Set the thermostat fan mode to AUTO. The blower should stop running.

System Cooling

Change the thermostat's system mode to COOL and the fan mode to AUTO. Set the thermostat temperature selector below the existing room temperature. Allow the cooling system to operate for several minutes and check for the discharge of cool air at the supply registers.

System Heating

(Available only when Electric heat is supplied)

1. Set the thermostat's system mode to HEAT and the fan mode to either AUTO (intermittent air) or to ON (continuous air).
2. Set the thermostat's temperature selector above existing room temperature.
3. Allow the system to operate for several minutes and check the supply registers for warm air.
4. Verify the outdoor AC compressor and fan are not running.
NOTE: The indoor blower will run according to the thermostat's fan mode setting.

CAUTION:

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

- Do not attempt to add additional oil to motors unequipped with oil tubes. The compressor is hermetically sealed at the factory and does not require lubrication.

AIR CONDITIONER MAINTENANCE

WARNING:

To prevent 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.

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 and clean or replace air filters at the beginning of each heating and cooling season, or more frequently if required.
- 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.

COMPONENT FUNCTIONS

High Pressure Switch (HPS) - A high-pressure switch is factory-installed and located in the liquid line internal to the 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, the switch will open and de-energize the unit. The switch will close again when the liquid pressure decreases to 460 psig.

Low Pressure Switch (LPS) - A low-pressure switch is factory-installed and located in the suction line internal to the 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, the switch will open and de-energize the unit. The switch will close again when the suction pressure increases above 20 psig.

REFRIGERANT CHARGING

CAUTION:

Packaged AC units contain liquid and gaseous refrigerant under pressure. Adjustment of refrigerant charge should only be attempted by qualified, trained personnel thoroughly familiar with the equipment and safe responsible refrigerant handling procedures. 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.

- To achieve rated capacity and efficiency the compressor must be exposed to refrigerant for at least 24 hours prior to running. After unit startup, the compressor must run for a minimum of 12 hours.
- The refrigerant charge can be checked and adjusted through the service ports provided external to the unit. Use only gage line sets which have a "Schradler" depression device present to actuate the valve.

Charging an R-410A Unit in AC Mode

(with Outdoor Temperatures Above 55° F)

1. With the system operating in a steady-state, measure the liquid refrigerant pressure (in psig) at the service valve.
 2. Measure the liquid refrigerant temperature (° F) at the service valve.
 3. For the temperature measured, determine the required liquid refrigerant pressure from your units label or charging charts: [Figure 8 \(page 10\)](#), [Figure 9 \(page 10\)](#), [Figure 10 \(page 11\)](#), and [Figure 11 \(page 11\)](#).
- If the pressure measured in step 1 is greater than the required liquid refrigerant pressure determined in step 3, there is too much charge in the system. Remove refrigerant and repeat steps 1 - 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 - 3 until the system is correctly charged.

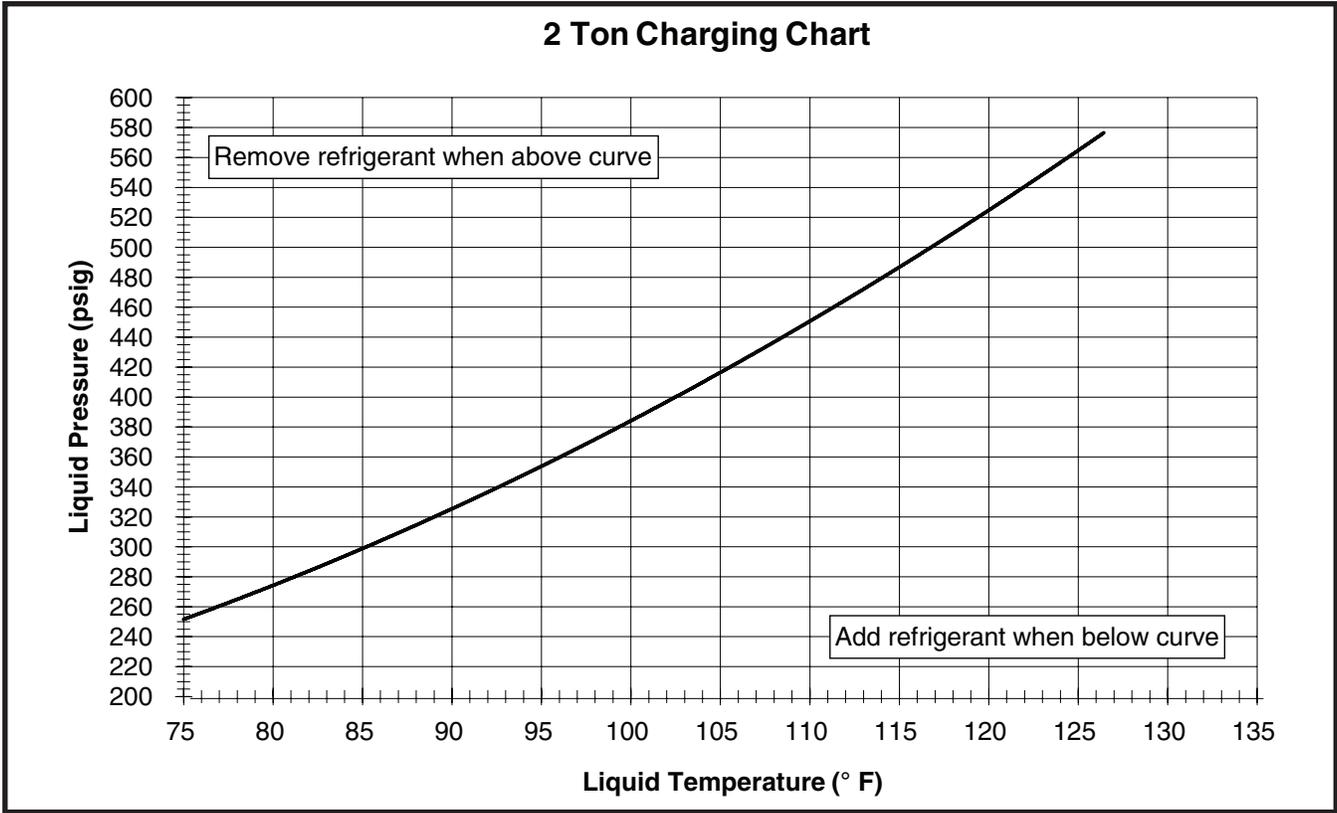


Figure 8. Charging Chart for 2 ton Units

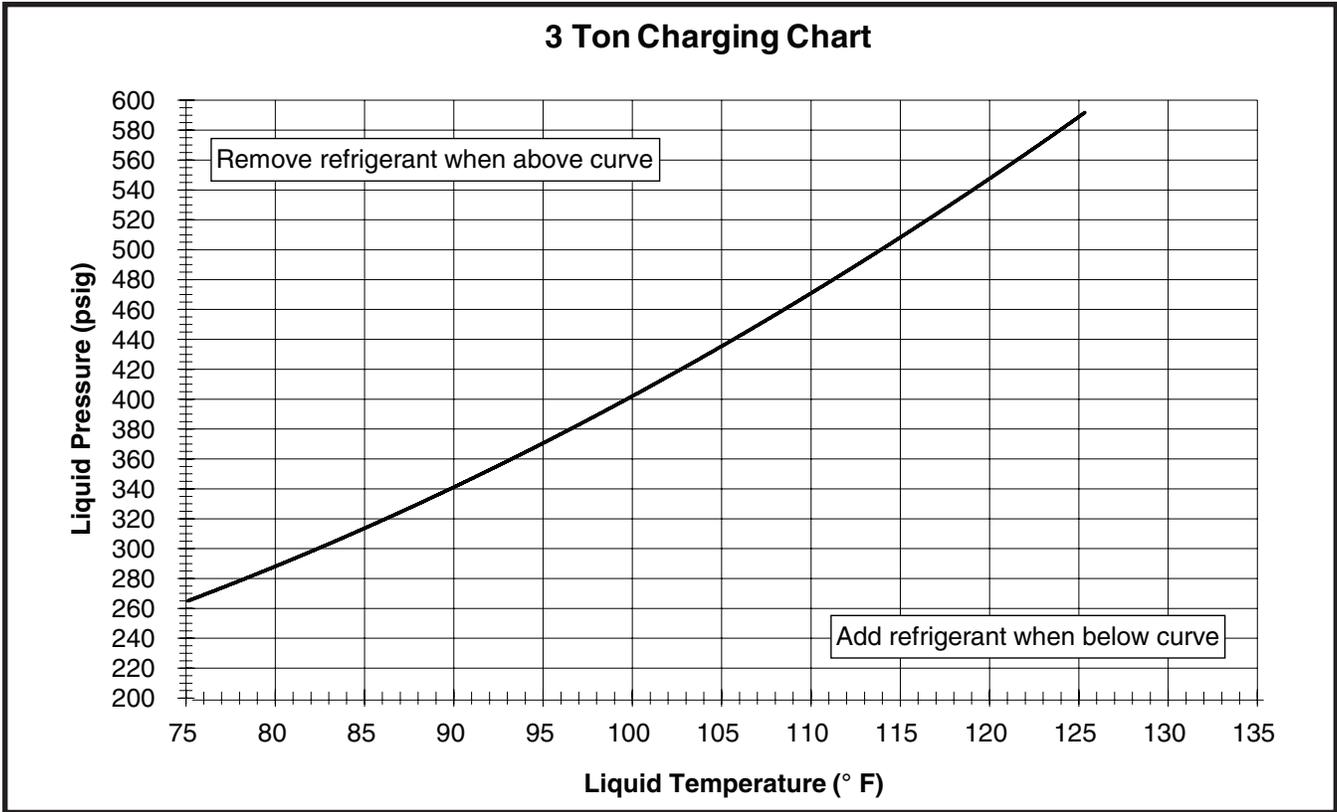


Figure 9. Charging Chart for 3 ton Units

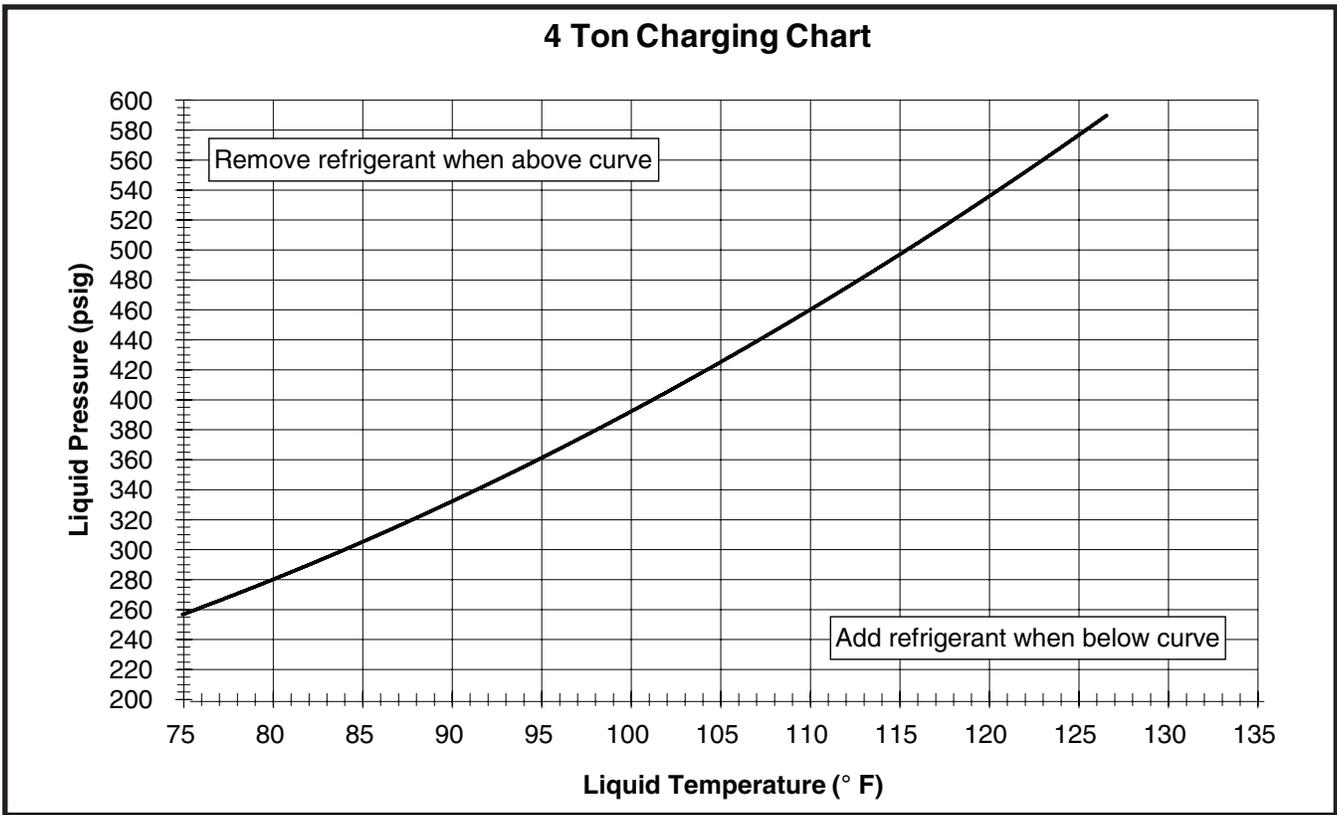


Figure 10. Charging Chart for 4 ton Units

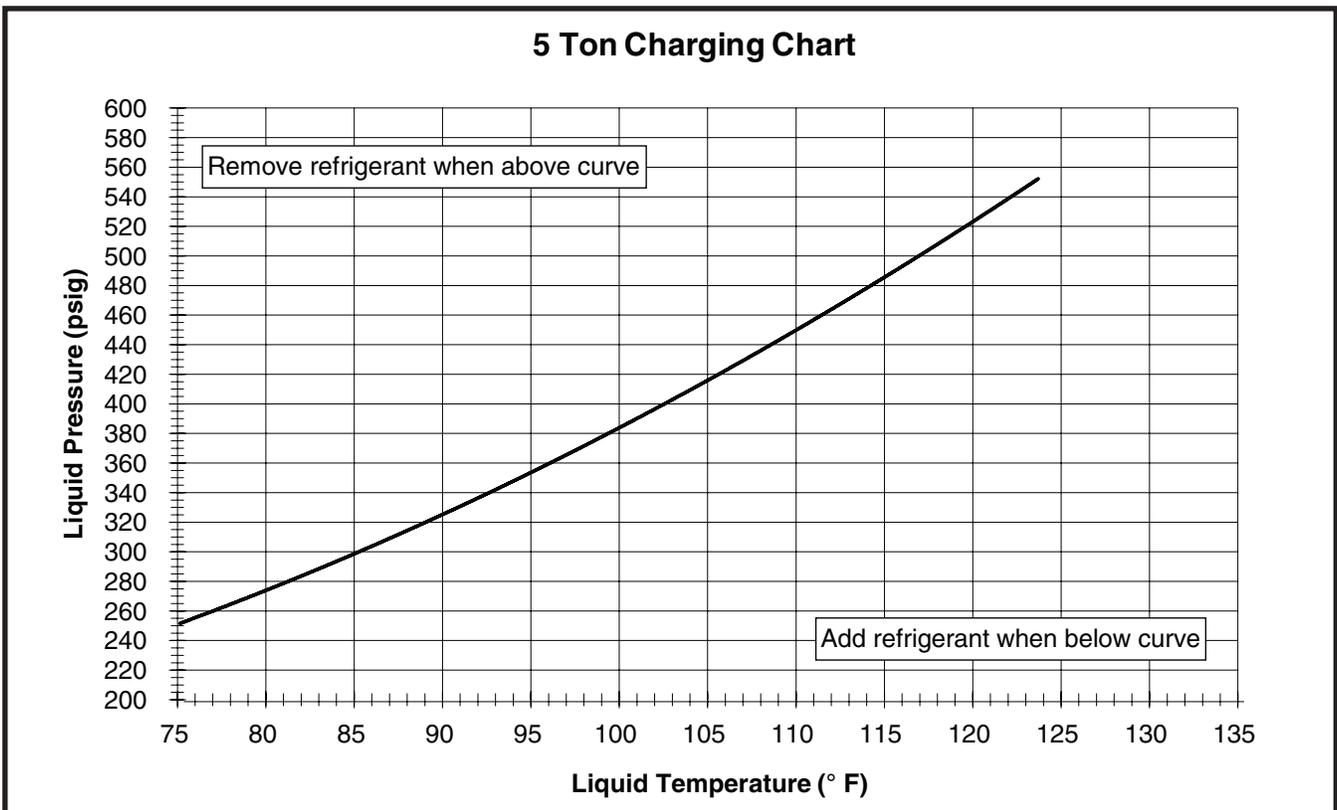


Figure 11. Charging Chart for 5 ton Units

FIGURES & TABLES

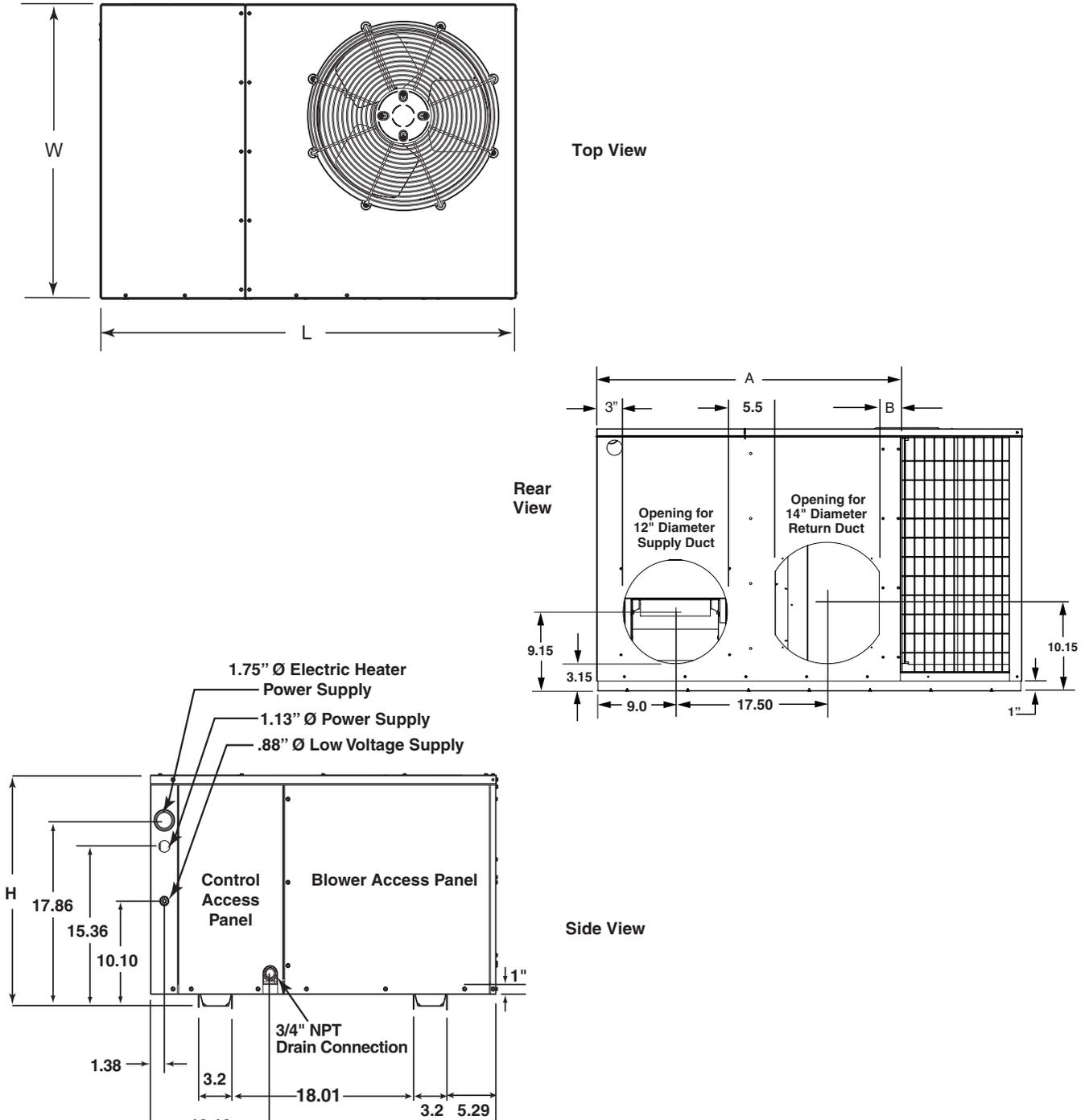


Figure 12. Unit Dimensions

Model Number	(L) Length	(W) Width	(H) Height	A	B
X24K	49	35	30.2	35.02	2.48
X36K	49	35	30.2	35.02	2.48
X48K	49	35	38.2	35.02	2.48
X60KA	63	35	38.2	35.02	2.48

Table 4. Physical Data

Electrical Information

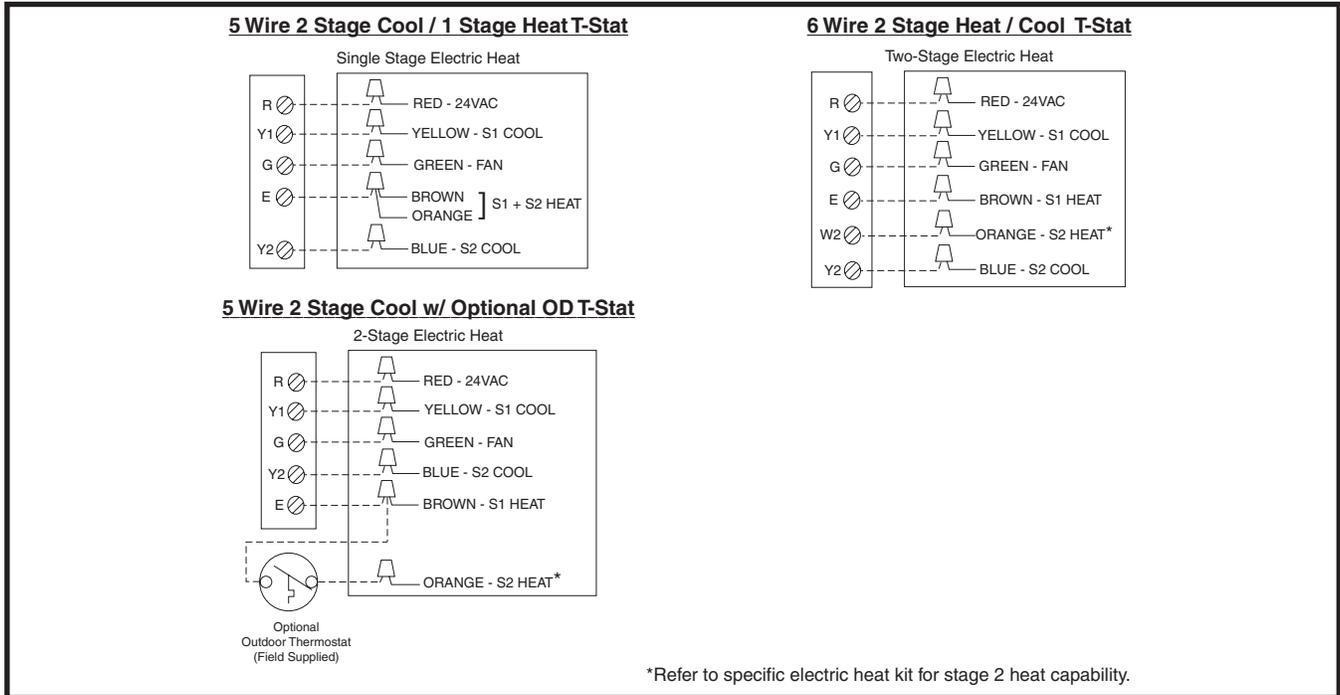


Figure 13. Typical Wiring (Field Supplied) for 2-Stage Cool & 1 or 2-Stage Electric Heat

WIRING DIAGRAM

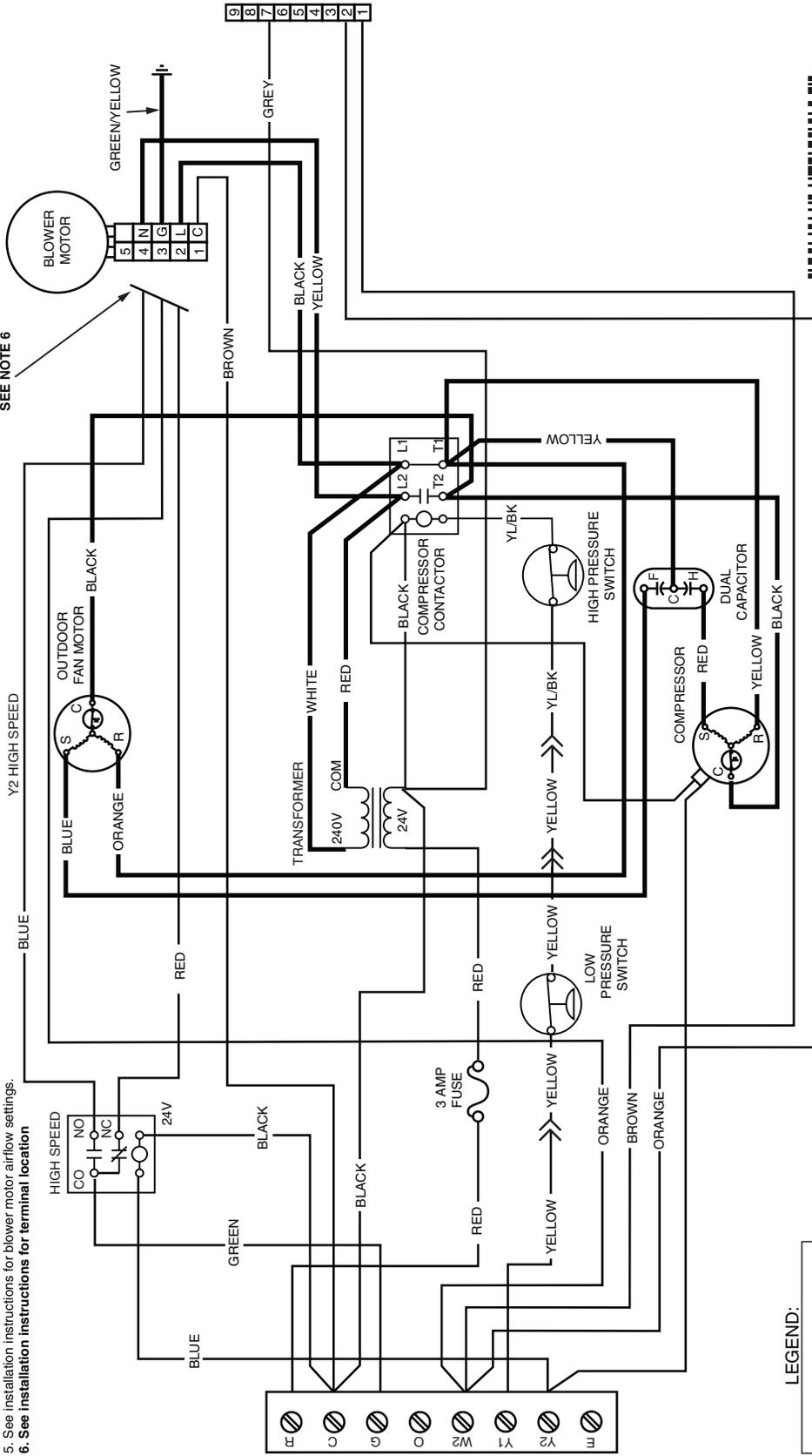
Packaged Air Conditioner - Single Phase

NOTES:

1. Disconnect all power before servicing.
2. For supply connections use copper conductors only.
3. Not suitable on systems that exceed 150 V to ground.
4. For replacement wires use conductors suitable for 105° C.
5. See installation instructions for blower motor airflow settings.
6. See installation instructions for terminal location

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

SEE NOTE 6



10107010
10/16

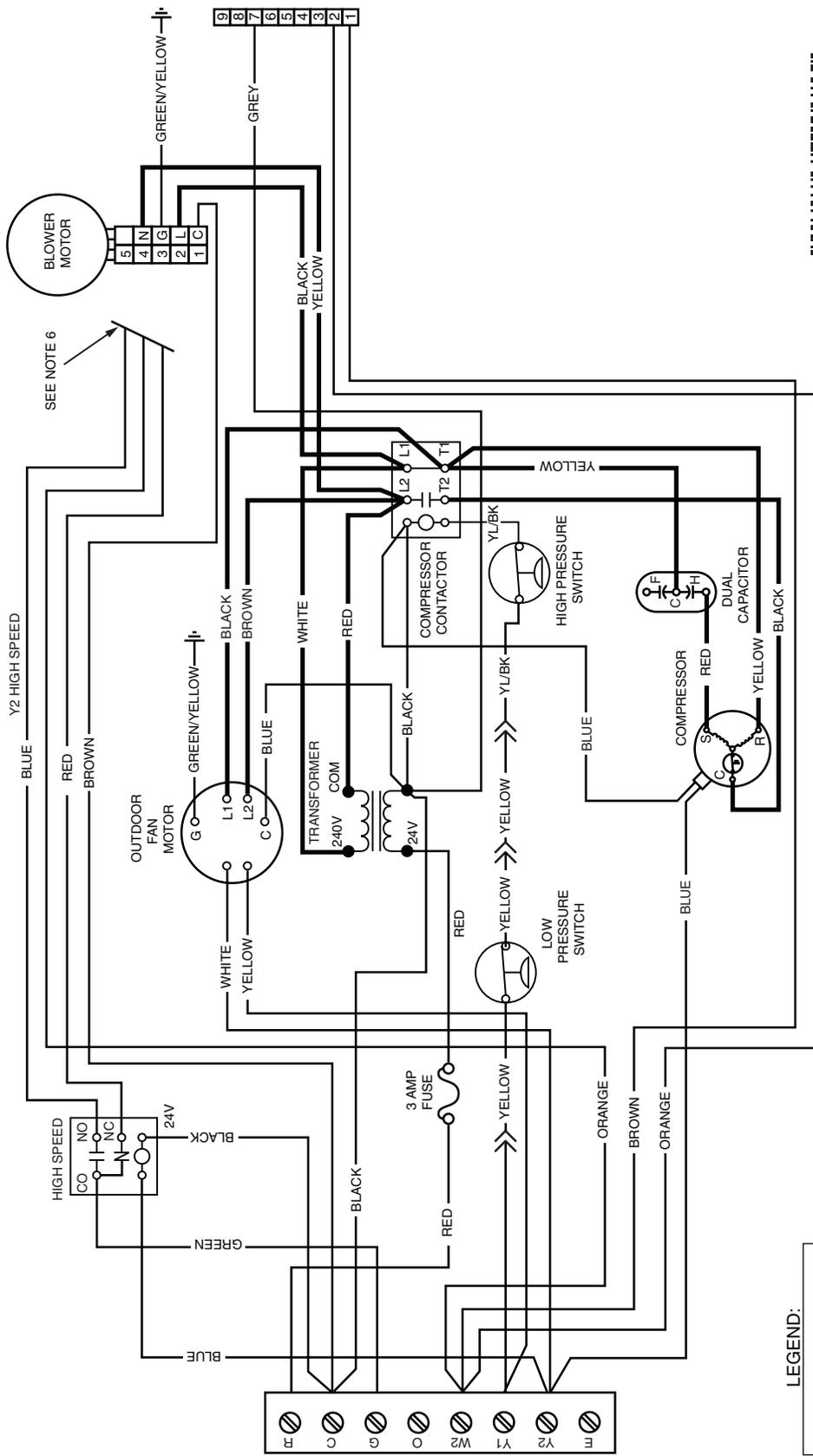
Figure 14. Wiring Diagram for 2 & 3 Ton Units

WIRING DIAGRAM

Packaged Air Conditioner - Single Phase

NOTES:

1. Disconnect all power before servicing.
2. For supply connections use copper conductors only.
3. Not suitable on systems that exceed 150 V to ground.
4. For replacement wires use conductors suitable for 105° C.
5. See installation instructions for blower motor airflow settings.
6. See installation instructions for termination locations.



LEGEND:

- FIELD WIRING
- LOW VOLTAGE
- HIGH VOLTAGE



10107020

10/16

Figure 15. Wiring Diagram for 4 Ton Units

WIRING DIAGRAM

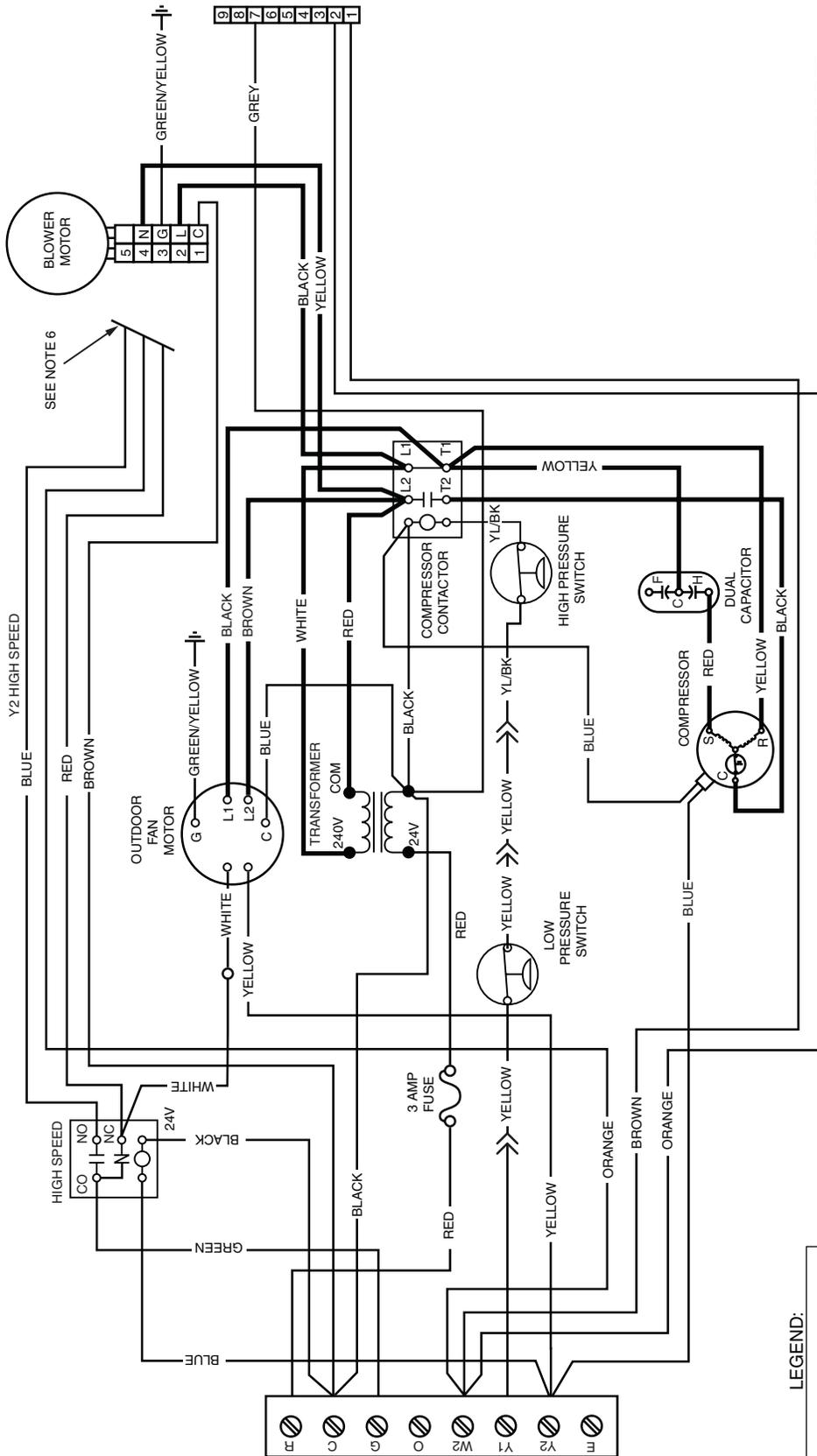
Packaged Air Conditioner - Single Phase

NOTES:

1. Disconnect all power before servicing.
2. For supply connections use copper conductors only.
3. Not suitable on systems that exceed 150 V to ground.
4. For replacement wires use conductors suitable for 105° C.

5. See installation instructions for blower motor airflow settings.
6. See installation instructions for termination locations.

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



LEGEND:

- FIELD WIRING - - - - -
- LOW VOLTAGE —————
- HIGH VOLTAGE —————



10162990

10/16

Figure 16. Wiring Diagram for 5 Ton Units

INSTALLATION CHECK LIST

INSTALLATION ADDRESS:		
CITY:	STATE:	
UNIT MODEL #:		
UNIT SERIAL #:		
Unit Installed Minimum clearances per Figure 1 (page 3) ?	YES	NO
INSTALLER NAME:		
CITY:	STATE:	



IMPORTANT - This product has been designed and manufactured to meet ENERGY STAR criteria for energy efficiency. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow the manufacturer's refrigerant charging and air flow instructions. Failure to confirm proper charge and airflow may reduce energy efficiency and shorten equipment life.



ELECTRICAL SYSTEM		
Rated Voltage (Volts):		
L1-L2 Voltsage (Volts):		
Has the thermostat been calibrated?	YES	NO
Is the thermostat level?	YES	NO
Is the heat anticipator setting correct? (If Applicable)	YES	NO

REFRIGERATION SYSTEM		
Was unit given 24 hr warm up period for crankcase heaters (if applicable)?	YES	NO
Stage-1 Liquid Pressure (high side):		
Stage-1 Suction Pressure (low side):		
Has the owner's information been reviewed with the customer?	YES	NO
Has the Literature Package been left with the unit?	YES	NO

REPLACEMENT PARTS

Replacement parts are available through your distributor. 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

