

# INSTALLATION INSTRUCTIONS

\*SA1BE4M1SN - 18K, 24K, 30K, 36K, 42K, 48K, & 60K (1.5, 2, 2.5, 3, 3.5, 4, & 5 TON) SERIES

## 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 unit 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.**

- IMPORTANT SAFETY INFORMATION..... 2**
- AIR CONDITIONER INSTALLATION..... 3**
  - General Information ..... 3
  - Before You Install this Unit..... 3
  - Locating the Air Conditioner..... 3
  - Packaging Removal ..... 3
  - Ground Level ..... 3
  - Roof Mount ..... 3
  - Connecting Refrigerant Tubing Between the Indoor & Outdoor Unit ..... 3
- ELECTRICAL WIRING ..... 4**
  - Pre-Electrical Checklist ..... 4
  - Line Voltage ..... 4
  - Grounding ..... 5
  - CoreSense™ Diagnostics Module..... 5
    - Compressor Protection ..... 5
    - Resetting Alert Codes..... 5
  - Thermostat Connections..... 5
- START UP & ADJUSTMENTS ..... 5**
  - Pre-Start Check List..... 5
  - Start-Up Procedures ..... 6
    - Air Circulation - Indoor Blower ..... 6
    - System Cooling..... 6
    - System Heating (optional) ..... 6
- AIR CONDITIONER MAINTENANCE..... 6**
  - Panel Removal..... 6
  - Panel Installation..... 6
- REFRIGERANT CHARGING ..... 8**
  - Charging the Unit in AC mode ..... 8
  - Application Notes & Charging Info ..... 8
    - Table 4. Charging Table for 1.5 Ton Models ..... 9
    - Table 3. Charging Table for 2 Ton Models ..... 9
    - Table 5. Charging Table for 2.5 Ton Models ..... 10
    - Table 6. Charging Table for 3 Ton Models ..... 10
    - Table 8. Charging Table for 3.5 Ton Models ..... 11
    - Table 7. Charging Table for 4 Ton Models ..... 11
    - Table 9. Charging Table for 5 Ton Models ..... 12
- ELECTRICAL INFORMATION ..... 13**
  - Table 10. CoreSense™ LED Diagnostics ..... 13
  - Figure 6. Wiring Diagram for 1.5 - 4 Ton Models (without CoreSense™) ..... 13
- INSTALLATION CHECKLIST..... 20**
- REPLACEMENT PARTS..... 20**

## IMPORTANT SAFETY INFORMATION

**INSTALLER:** 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:**

**Shut off all electrical power to the unit before performing any maintenance or service on the system. Failure to comply may result in personal injury or death.**

---

### **WARNING:**

**Unless noted otherwise in these instructions, only factory authorized parts or accessory kits may be used with this product. 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**

---

### **WARNING:**

**\*SA1BE4M1SN split system air conditioners are shipped charged with R410A refrigerant and ready for installation. If repairs make it necessary for evacuation and charging, it should only be attempted by qualified trained personnel thoroughly familiar with this 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.**

---

### **WARNING:**

**The information listed in this manual 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.**

---

### **CAUTION:**

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

- 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.
- Fully annealed, refrigerant grade copper tubing should be used when installing the system. Refrigerant suction line tubing should be fully insulated.
- 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.
- 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.
- Refrigerant and electrical line should be routed through suitably waterproofed openings to prevent water from leaking into the structure.
- This unit is designed for outdoor installations only and should be positioned as shown on [page 3](#).

## AIR CONDITIONER INSTALLATION

### General Information

The \*SA1BE4M1SN series air conditioner is designed only for outdoor rooftop or ground level installations. 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.

To achieve optimum performance and minimize equipment failure, it is recommended that periodic maintenance be performed on this unit. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools.

### 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. The system must be wired and provided with circuit protection in accordance with local building codes. If there is any question concerning the power supply, contact the local power company.
- ✓ The indoor section (air handler, furnace, etc) should be installed before routing the refrigerant tubing. Refer to the

- indoor unit's installation instructions for installation details.
- ✓ 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.
- Sufficient clearance for unobstructed airflow through the outdoor coil must be maintained in order to achieve rated performance. See [Figure 1](#) for minimum clearances to obstructions.
- Overhead obstructions ([Figure 1](#)), poorly ventilated areas, and areas subject to accumulation of debris should be avoided.
- Consideration should be given to availability of electric power, service access, noise, and shade.

### Packaging Removal

**NOTE:** To prevent damage to the tubing connections, carefully remove the carton and user's manual from the equipment. Discard the shipping carton.

### 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](#).
- A suitable mounting pad ([Figure 1](#)) must be provided and separate from the building foundation. The pad must be level and strong enough to support the weight of the unit. The slab height must be a minimum of 2" (5 cm) above grade and with adequate drainage.

### Roof Mount

- The method of mounting should be designed so that it does not overload roof structures or transmit noise to the interior of the structure. The roof must be structurally capable of handling the weight of the unit.
- Full perimeter support is required under the unit. Support must be made of weather resistant materials and installed prior to unit installation.
- The support must be built to raise the unit 6" above the roof.

### Connecting Refrigerant Tubing Between the Indoor & Outdoor Unit

#### CAUTION:

**When servicing, cover or seal openings to minimize the exposure of the refrigerant system to air to prevent accumulation of moisture and other contaminants.**

After outdoor and indoor unit placement has been determined, route refrigerant tubing between the equipment in accordance with sound installation practices.

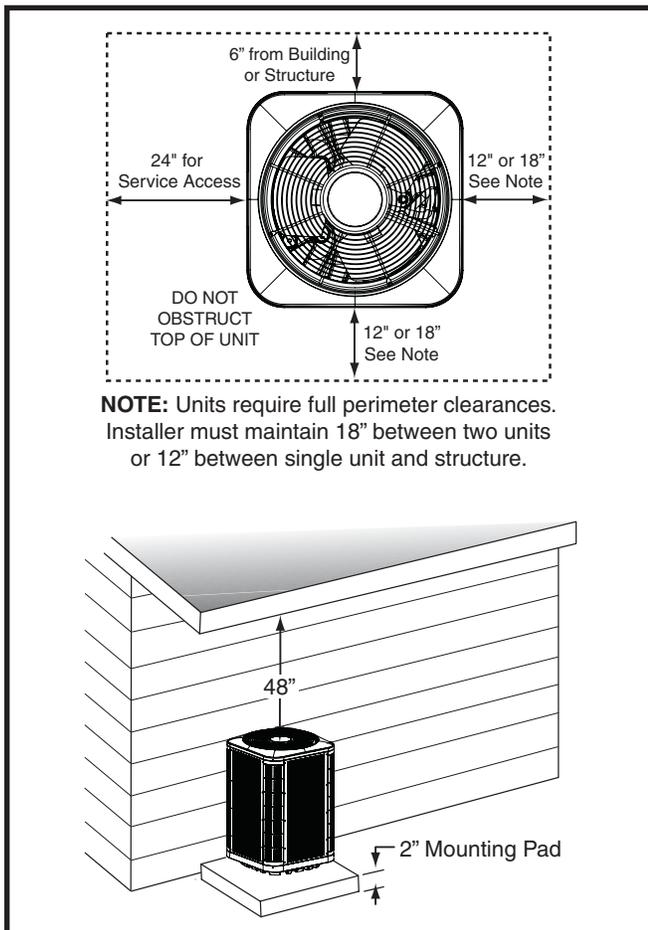


Figure 1. Clearance Requirements

- When connecting refrigerant linesets together, it is recommended that dry nitrogen be flowing through the joints during brazing to prevent internal oxidation and scaling.
- Refrigerant tubing should be routed in a manner that minimizes the length of tubing and the number of bends in the tubing. If precise forming of refrigerant lines is required, a copper tubing bender is recommended. Avoid sharp bends and contact of the refrigerant lines with metal surfaces.
- Refrigerant tubing should be supported in a manner that the tubing will not vibrate or abrade during system operation.
- Tubing should be kept clean of foreign debris during installation.
- Every effort should be made by the installer to ensure that the field installed refrigerant containing components of the system have been installed in accordance with these instructions and sound installation practices to insure reliable system operation and longevity.
- The maximum recommended interconnecting refrigerant line lengths is 75 ft. and the vertical elevation difference between the indoor and outdoor sections should not exceed 20 ft.
- A filter dryer is provided with the unit and must be installed in the liquid line of the system. If the installation replaces a system with a filter dryer already present in the liquid line, the filter dryer must be replaced with the one supplied with the unit. The filter dryer must be installed in strict accordance with the manufacturer's installation instructions.
- Optional equipment such as liquid line solenoid valves, low ambient, etc., should be installed in strict accordance with the manufacturer's installation instructions.

for loose connections.

## Line Voltage

- A wiring diagram is located on the inside cover of the electrical box of the outdoor unit. The installer should become familiar with the wiring diagram before making any electrical connections to the outdoor 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.
- 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 conductors and circuit protection must be in compliance with information listed on the outdoor unit data label. Any other wiring methods must be acceptable to authority having jurisdiction.
- The outdoor unit requires both power and control circuit electrical connections. Refer to the wiring diagram / schematic for identification and location of outdoor unit field wiring interfaces. See [Figure 6](#), [Figure 7](#), [Figure 8](#), & [Figure 9](#). 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 minimum circuit ampacity and maximum overcurrent protection limits.
- 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.
- 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.
- 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.
- 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.

## ELECTRICAL WIRING

### **WARNING:**

#### **ELECTRICAL SHOCK OR FIRE HAZARD**

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

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

- 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 voltage wiring.
- ✓ Verify factory wiring is in accordance with the unit wiring diagram. See [Figure 6](#), (page 13), [Figure 7](#), (page 14), [Figure 8](#), (page 15), & [Figure 9](#), (page 16). Inspect

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**

## 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.

### **CoreSense™ Diagnostics Module (Select Models Only)**

The CoreSense™ Diagnostics Module (Figure 2) is a breakthrough innovation for troubleshooting heat pump and air conditioning system failures. The module installs easily in the electrical box of the outdoor unit near the compressor contactor. By using the compressor as a sensor, CoreSense Diagnostics helps the service technician more accurately troubleshoot system and compressor fault conditions.

A flashing LED indicator communicates the ALERT code and a diagnostic key is also imprinted on the side of the module to quickly direct the technician to the root cause of a problem. Alert identification codes are also listed in Table 10, (page 13).

### Compressor Protection

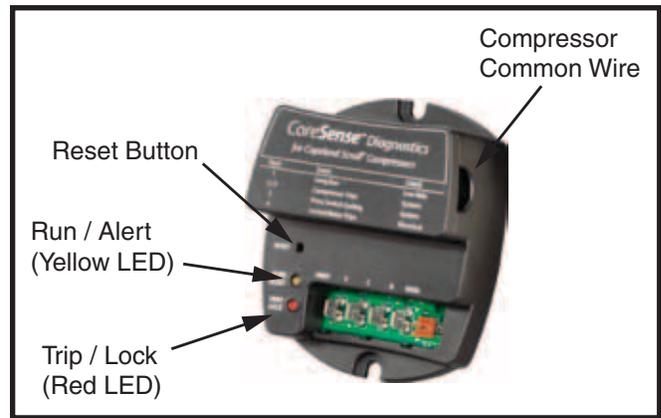
The CoreSense™ Diagnostics module utilizes proprietary algorithms to protect the compressor and system from repeated trips of system pressure controls and the compressor internal overload. The protection terminal of the module should be wired in series with the system low pressure and high pressure cutouts, as well as the compressor contactor. When the module detects a series of trips as described below, it will activate a lockout feature that opens the normally closed protection contacts in the module, thereby cutting power to the contactor and shutting off the compressor.

### Resetting Alert Codes

When the CoreSense™ Diagnostics module has detected a series of adverse conditions that have caused it to lockout the compressor, and after the issue has been resolved, it is necessary to manually reset the module in order to clear the present alert code.

The primary way of clearing the code and resetting the alert is to press the reset button located on the module.

**NOTE:** Pressing the reset will require a pin or a mini electronics screwdriver. This button must be pressed and held for a minimum of one second for the module to be reset. Pressing the reset button clears the immediate lock code and the seven day operating history. It will not clear the permanent module history. In the case of the three-wire module, the codes can be reset or cleared by cycling power to the module. This can be done by disengaging the Common (C) terminal. This will not clear the seven day operating history.



**Figure 2. CoreSense™ Diagnostics Module**

THERMOSTAT WIRE GAUGE	MAXIMUM RECOMMENDED THERMOSTAT WIRE LENGTH (FT)
24	25
22	45
20	70
18	110

**Table 2. Thermostat Wire Gauge**

### **Thermostat Connections**

- Thermostat connections should be made in accordance with the instructions supplied with the thermostat and the indoor equipment.
- The outdoor 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.
- The low voltage wires must be properly connected to the units low voltage terminal block. Recommended wire gauge and wire lengths for typical thermostat connections are listed in Table 2.
- 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 and installation information.

## **START UP & ADJUSTMENTS**

### **Pre-Start Check List**

- ✓ Verify the indoor 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.
- ✓ Verify air filters are cleaned and properly installed.
- ✓ Verify duct work is sealed to prevent air leakage.
- ✓ Verify line voltage power leads are securely connected and the unit is properly grounded.
- ✓ Verify low voltage wires are securely connected to the correct leads on the low voltage terminal strip.
- ✓ Verify power supply branch circuit overcurrent protection is sized properly.
- ✓ Verify the thermostat is wired correctly.

## Start-Up Procedures

The thermostat's function mode should be set to OFF and the fan mode should be set to AUTO. Close all electrical disconnects to energize the system.

### Air Circulation - Indoor Blower

1. Set the thermostat system mode on OFF and the fan mode to ON.
2. Verify the blower runs continuously. Check the air delivery at the supply registers and adjust register openings for balanced air distribution. If insufficient air is detected, examine ductwork for leaks or obstructions.
3. Set the thermostat fan mode to AUTO and verify the blower stops running.

### System Cooling

1. Set the thermostat's system mode to COOL and the fan mode to AUTO. Gradually lower the thermostat temperature setpoint below room temperature and verify the outdoor unit and indoor blower energize.
2. Verify blower wheel is spinning in direction indicated by arrow. 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. Verify HI and LO refrigerant pressures.
4. Allow the 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 the ON position.

### System Heating (optional)

1. Set the thermostat's system mode to HEAT and the temperature mode above room temperature.
2. Verify the optional heating equipment (furnace or electric heat) and indoor blower energize. 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:

**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.

### CAUTION:

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

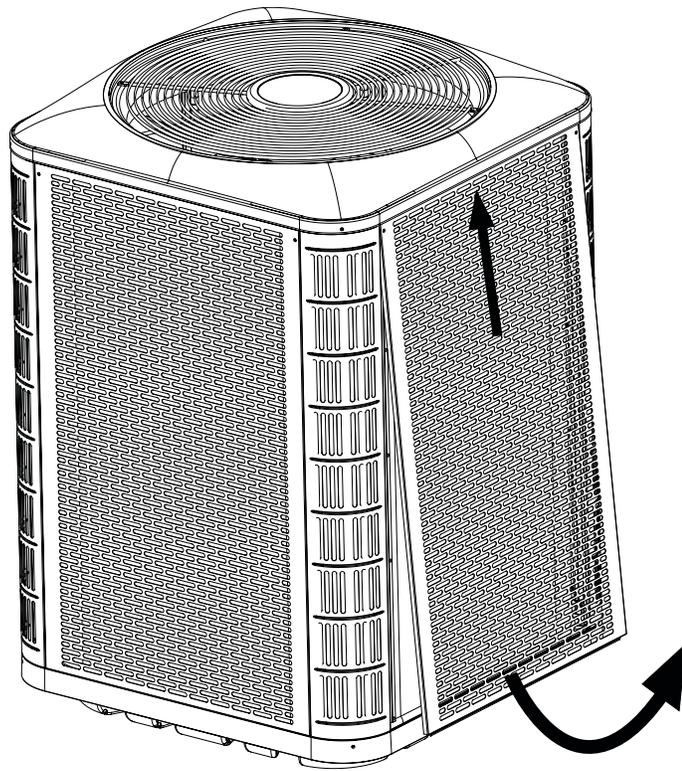
- Do not attempt to add additional oil to motors unequipped with oil tubes. The compressor is hermetically sealed at the factory and does not require lubrication.
- To access the internal components of the unit, refer to [Figure 3, \(page 7\)](#) for panel removal and [Figure 4, \(page 7\)](#) for panel installation.

### Panel Removal

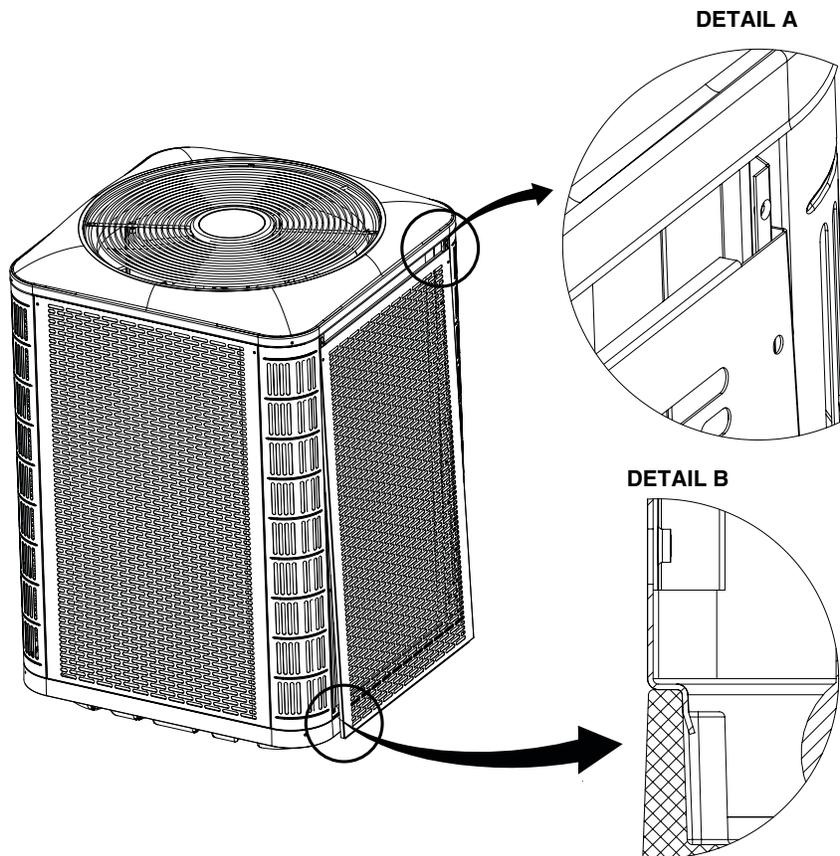
1. Remove screws securing the panel.
2. Slide the panel up towards the top pan in order to clear the bottom flange from the base pan. See [Figure 3](#).
3. Swing the bottom of the panel out and pull the panel down to remove it from the unit.

### Panel Installation

1. Insert the top corners of side panel flanges into the corner post channels as shown in Detail A in [Figure 4](#).
2. Slide the panel up into the top pan. (You may need to push on the center of the panel at the top in order to clear the top pan edge).
3. Swing the panel in and push down until the panel is resting on the top edge of the base pan wall as shown in Detail B.
4. Insert screws into the panel to secure it to the unit.



**Figure 3. Panel Removal**



**Figure 4. Panel Installation**

## REFRIGERANT CHARGING

### **WARNING:**

**\*SA1BE4M1SN Split System Air Conditioners are shipped charged with R410A refrigerant and ready for installation. If repairs make it necessary for evacuation and charging, it should only be attempted by qualified trained personnel thoroughly familiar with this 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.**

After refrigerant line connections are completed, it is required that you leak check and evacuate the indoor section and all line connections (using proper methods) before finalizing the full system refrigerant charge.

- Cooling mode charging charts and tables are applicable only to matched assemblies of this equipment and listed airflows for the indoor coil. Refer to the Quick Reference Data sheet for additional charging information. Outdoor units with non-AHRI listed indoor coils are not recommended and 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. For correct system charging, refer to [Table 3, \(page 9\)](#), [Table 4, \(page 9\)](#), [Table 5, \(page 10\)](#), [Table 6, \(page 10\)](#), [Table 7, \(page 11\)](#), [Table 8, \(page 11\)](#), & [Table 9, \(page 12\)](#) and [Figure 5, \(page 12\)](#).
- \*SA1BE4M1SN 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 575 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 (select models only) 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.

## Charging the Unit in AC mode

*(With 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 5, \(page 12\)](#).
  - 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.

## Application Notes & Charging Info (Cooling Mode Only)

- **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-driers 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 chart is valid for a variety of indoor, return air conditions and are most influenced by the outdoor ambient temperature, outdoor fan operation and the unit operating voltage.  
**NOTE:** Before using [Figure 5, \(page 12\)](#), make sure the unit is in a stable operating mode. As shown in the chart, the ideal system sub-cooling can vary over the range of operation. Reference the chart 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) or rated Coefficient of Performance (COP) in heating mode.
- To inspect a systems operation using quality instruments, match the measured liquid temperature to the units table. The measured liquid pressure reading should be within 3% of the table value for most installations.
- 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 then 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).

■ Shaded boxes indicate flooded conditions.

□ Rated design values. The suction pressure will vary from design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.

1. All pressures are listed in psig and all temperatures in ° F
2. Discharge temperatures greater than charted values indicate an undercharged system.
3. In Cooling Mode, suction pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.
4. In Heating Mode, charge should be weighed in. It is strongly recommended to verify charge in cooling mode at ambient above 70°F.

<b>*SA1BE4M1SN18K SERIES</b>																
<b>SUCT. PRESS.</b>	<b>OUTDOOR TEMPERATURE (°F)</b>															
	<b>70</b>		<b>75</b>		<b>80</b>		<b>85</b>		<b>90</b>		<b>95</b>		<b>100</b>		<b>105</b>	
	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>
135	239	119														
137	240	122	262	122												
139	241	126	263	125	285	125										
141	243	129	264	129	286	128	308	129								
143	244	133	266	132	287	132	309	132	330	132						
145			267	135	288	135	310	135	331	135	353	135				
147					289	138	311	138	332	138	354	138	376	138		
149							312	140	333	140	355	141	377	141	399	142
151							313	143	334	143	356	143	378	144	400	144
153									335	146	357	146	379	146	401	147
155											358	149	380	149	401	149
157													381	152	402	152
159															403	155
161																

**Table 4. Charging Table for 1.5 Ton Models**

<b>*SA1BE4M1SN24K SERIES</b>																
<b>SUCT. PRESS.</b>	<b>OUTDOOR TEMPERATURE (°F)</b>															
	<b>70</b>		<b>75</b>		<b>80</b>		<b>85</b>		<b>90</b>		<b>95</b>		<b>100</b>		<b>105</b>	
	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>
134	248	119														
136	249	122	272	123												
138	250	125	273	126	295	127										
140	251	129	273	129	296	130	319	131								
142	252	132	274	132	297	133	319	134	342	135						
144			275	135	298	136	320	137	343	138	365	140				
146					299	139	321	140	344	141	366	142	389	144		
148							322	143	345	144	367	145	390	146	412	148
150							323	146	345	147	368	148	391	149	413	150
152									346	149	369	150	391	152	414	153
154											370	153	392	154	415	156
156													393	157	416	158
158															416	161
160																

**Table 3. Charging Table for 2 Ton Models**

■ Shaded boxes indicate flooded conditions.

□ Rated design values. The suction pressure will vary from design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.

1. All pressures are listed in psig and all temperatures in ° F
2. Discharge temperatures greater than charted values indicate an undercharged system.
3. In Cooling Mode, suction pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.
4. In Heating Mode, charge should be weighed in. It is strongly recommended to verify charge in cooling mode at ambient above 70°F.

<b>*SA1BE4M1SN30K SERIES</b>																
<b>SUCT. PRESS.</b>	<b>OUTDOOR TEMPERATURE (°F)</b>															
	<b>70</b>		<b>75</b>		<b>80</b>		<b>85</b>		<b>90</b>		<b>95</b>		<b>100</b>		<b>105</b>	
	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>
128	244	121														
130	245	124	267	125												
132	245	128	268	128	290	128										
134	246	132	269	132	291	132	313	132								
136	247	136	269	136	292	135	314	136	337	136						
138			270	139	293	139	315	139	337	139	360	139				
140					293	143	316	142	338	142	360	142	383	143		
142							317	146	339	146	361	146	384	146	406	146
144							317	149	340	149	362	149	384	149	407	149
146									341	152	363	152	385	152	407	152
148											364	155	386	155	408	155
150													387	158	409	158
152															410	161
154																

**Table 5. Charging Table for 2.5 Ton Models**

<b>*SA1BE4M1SN36K SERIES</b>																
<b>SUCT. PRESS.</b>	<b>OUTDOOR TEMPERATURE (°F)</b>															
	<b>70</b>		<b>75</b>		<b>80</b>		<b>85</b>		<b>90</b>		<b>95</b>		<b>100</b>		<b>105</b>	
	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>
129	232	124														
131	233	127	255	125												
133	233	131	255	129	278	127										
135	234	135	256	132	278	131	300	129								
137	234	140	257	136	279	134	301	132	323	131						
139			257	141	279	138	302	135	324	134	346	132				
141					280	142	302	139	324	137	347	135	369	134		
143							303	143	325	140	347	139	369	137	392	135
145							303	146	326	144	348	142	370	140	392	138
147									326	147	348	145	371	143	393	142
149											349	148	371	146	393	144
151													372	149	394	147
153															395	149
155																

**Table 6. Charging Table for 3 Ton Models**

■ Shaded boxes indicate flooded conditions.

□ Rated design values. The suction pressure will vary from design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.

1. All pressures are listed in psig and all temperatures in ° F
2. Discharge temperatures greater than charted values indicate an undercharged system.
3. In Cooling Mode, suction pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.
4. In Heating Mode, charge should be weighed in. It is strongly recommended to verify charge in cooling mode at ambient above 70°F.

<b>*SA1BE4M1SN42K SERIES</b>																
<b>SUCT. PRESS.</b>	<b>OUTDOOR TEMPERATURE (°F)</b>															
	<b>70</b>		<b>75</b>		<b>80</b>		<b>85</b>		<b>90</b>		<b>95</b>		<b>100</b>		<b>105</b>	
	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>
128	238	120														
130	239	125	260	124												
132	239	129	261	128	282	127										
134	240	133	261	132	282	131	304	130								
136	240	137	262	136	283	135	304	134	326	134						
138			262	140	284	139	305	138	326	137	348	137				
140					284	143	306	142	327	141	348	141	370	140		
142							306	145	327	144	349	144	370	144	392	144
144							307	149	328	148	349	147	371	147	392	147
146									329	151	350	151	371	150	393	150
148											350	154	372	154	393	153
150													372	157	394	156
152															394	160
154																

**Table 8. Charging Table for 3.5 Ton Models**

<b>*SA1BE4M1SN48K SERIES</b>																
<b>SUCT. PRESS.</b>	<b>OUTDOOR TEMPERATURE (°F)</b>															
	<b>70</b>		<b>75</b>		<b>80</b>		<b>85</b>		<b>90</b>		<b>95</b>		<b>100</b>		<b>105</b>	
	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>	<b>LIQ. PRESS.</b>	<b>DIS. TEMP.</b>
128	241	136														
130	241	139	264	137												
132	242	143	264	141	287	139										
134	243	147	265	145	287	143	310	141								
136	245	151	266	149	288	147	310	145	333	143						
138			267	152	289	150	311	148	333	146	356	144				
140					290	154	312	152	334	150	356	148	379	146		
142							312	155	334	153	357	151	379	150	402	148
144							313	159	335	157	357	155	380	153	402	151
146									335	160	358	158	380	156	403	155
148											358	162	380	160	403	158
150													381	163	403	161
152															403	165
154																

**Table 7. Charging Table for 4 Ton Models**

*SA1BE4M1SN60K SERIES																
SUCT. PRESS.	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
	LIQ. PRESS.	DIS. TEMP.	LIQ. PRESS.	DIS. TEMP.	LIQ. PRESS.	DIS. TEMP.	LIQ. PRESS.	DIS. TEMP.	LIQ. PRESS.	DIS. TEMP.	LIQ. PRESS.	DIS. TEMP.	LIQ. PRESS.	DIS. TEMP.	LIQ. PRESS.	DIS. TEMP.
122	243	133														
124	244	136	267	136												
126	245	140	268	140	291	139										
128	246	143	269	143	292	143	315	143								
130	247	147	270	147	293	146	315	146	338	146						
132			270	150	293	150	316	150	339	150	362	150				
134					294	153	317	153	340	153	363	153	386	153		
136							318	156	341	156	364	157	387	157	410	157
138							319	160	341	160	364	160	387	160	410	160
140									342	163	365	163	388	163	411	163
142											366	166	389	166	412	166
144													390	169	412	169
146															413	172
148																

Table 9. Charging Table for 5 Ton Models

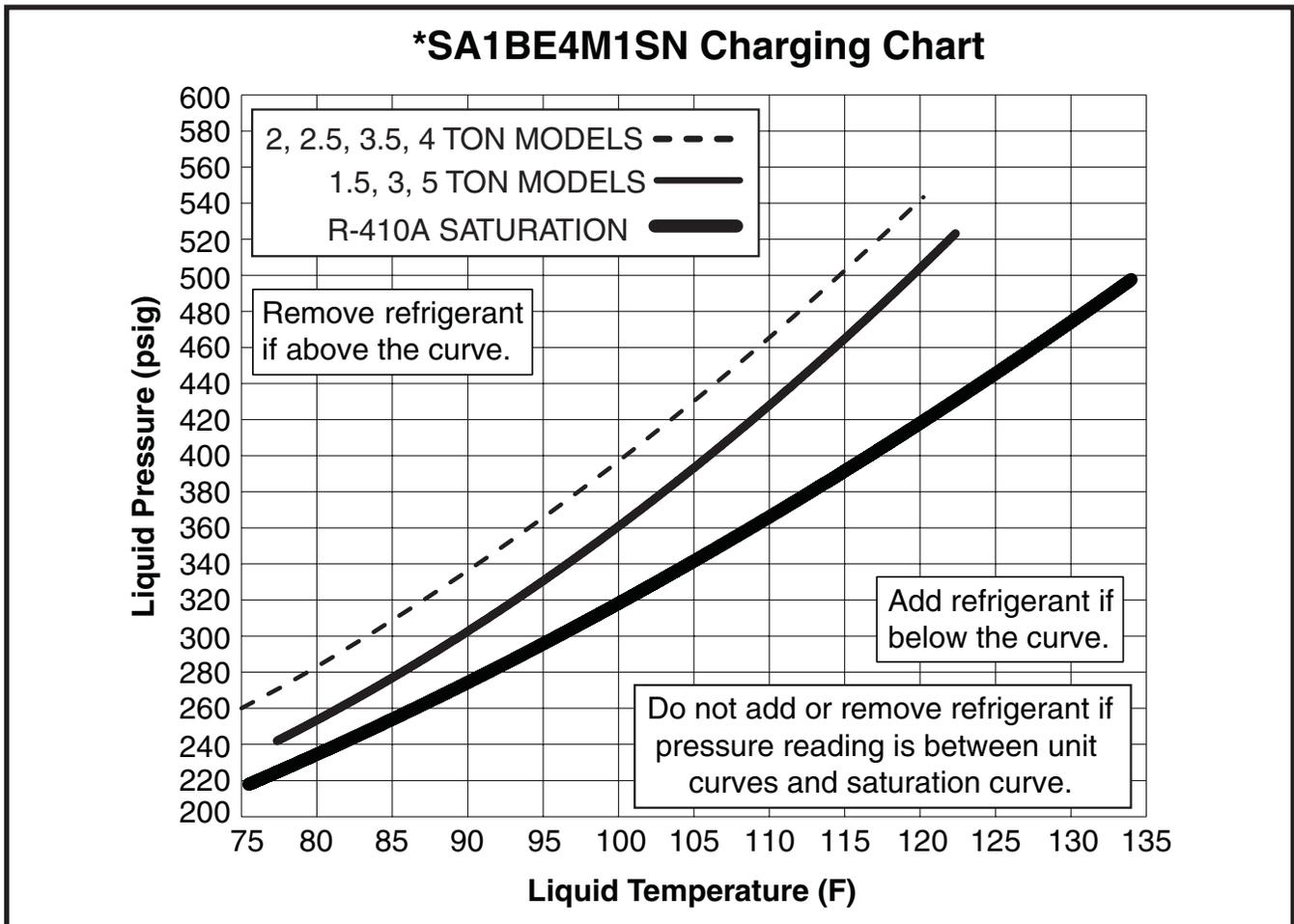


Figure 5. Charging Chart for 2 Through 5 Ton Units

## ELECTRICAL INFORMATION

ALERT CODE	ALERT CONDITION	LOCK LEVEL	LOCK INDICATION
<b>Normal Run</b> Solid Yellow	Normal operation, no trip	N/A	N/A
<b>Code 1</b> Yellow Flash 1	Long run time. Compressor is on running for more than 18 hours. (Code1 is disabled in Heat Pump Mode)	N/A	N/A
<b>Code 2</b> Yellow Flash 2	Compressor (pressure) trip. Compressor runs for 12 sec to 15 min followed by a compressor trip condition lasting for more than 7 min.	4x consecutive	Red: Flash2 Yellow: Off
<b>Code 3</b> Yellow Flash 3	Pressure switch cycling. Compressor runs for 12 sec to 15 min followed by a compressor trip lasting between 35 sec to 7 min.	4x consecutive or 10x total	Red: Flash3 Yellow: Off
<b>Code 4</b> Yellow Flash 4	Locked rotor. Compressor trips within a compressor run time of 12 sec and does not start within 35 sec.	10x consecutive	Red: Flash4 Yellow: Off
<b>Code 5</b> Yellow Flash 5	Compressor (moderate run) trip. Compressor runs for 15 min to 18 hrs followed by a compressor trip lasting longer than 7 min.	4x consecutive or 10x total	Red: Flash5 Yellow: Off
<b>Code 9</b> Red Flash 9	The current to the PROT terminal is greater than 2A.	Current >2A for 40ms	Red: Flash9 Yellow: Off
<b>Trip</b> Solid Red	Demand is present, but compressor is not running.	N/A	N/A

Table 10. CoreSense™ LED Diagnostics

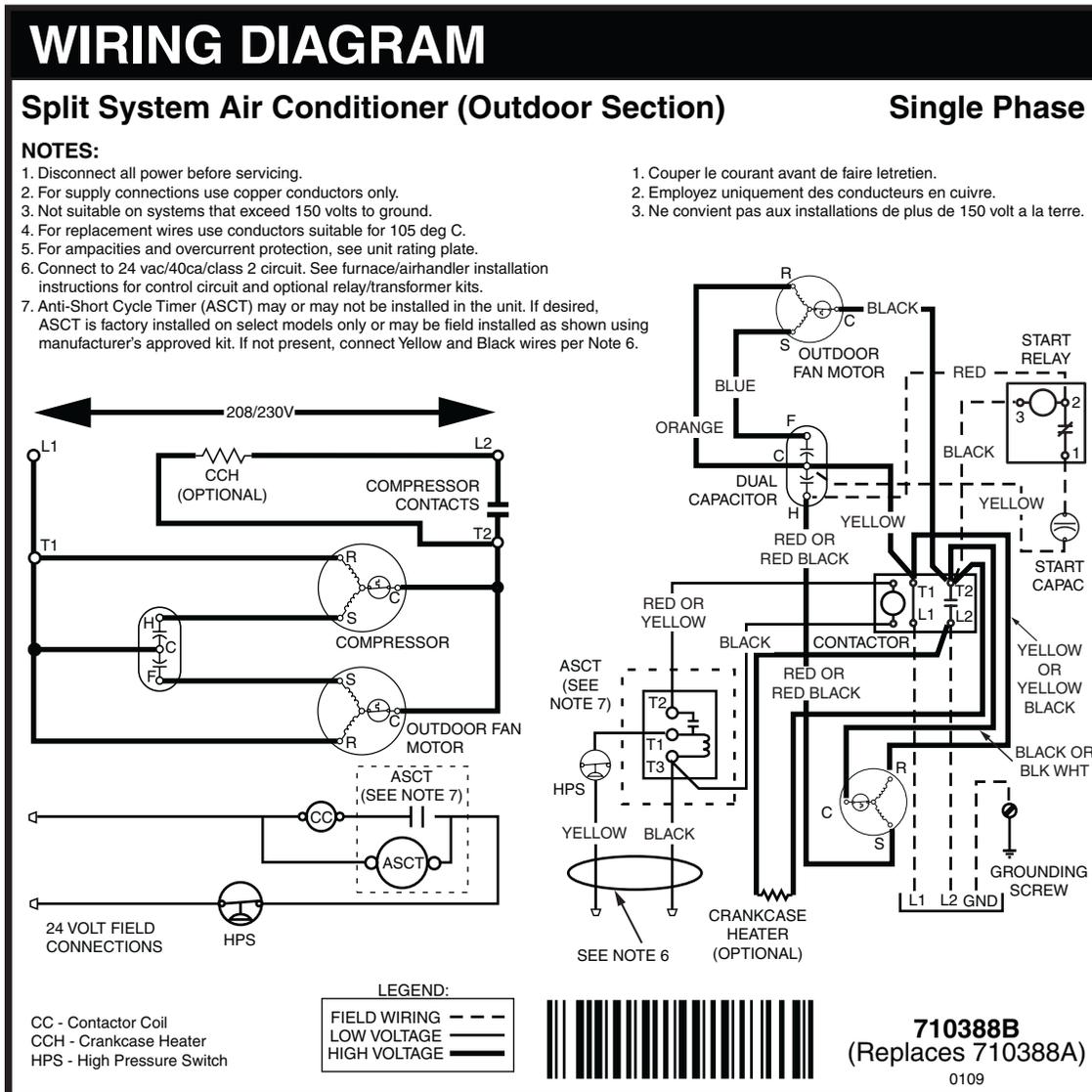


Figure 6. Wiring Diagram for 1.5 - 4 Ton Models (without CoreSense™)



# WIRING DIAGRAM

## Split System Air Conditioner (Outdoor Section) With ECM Outdoor Motor

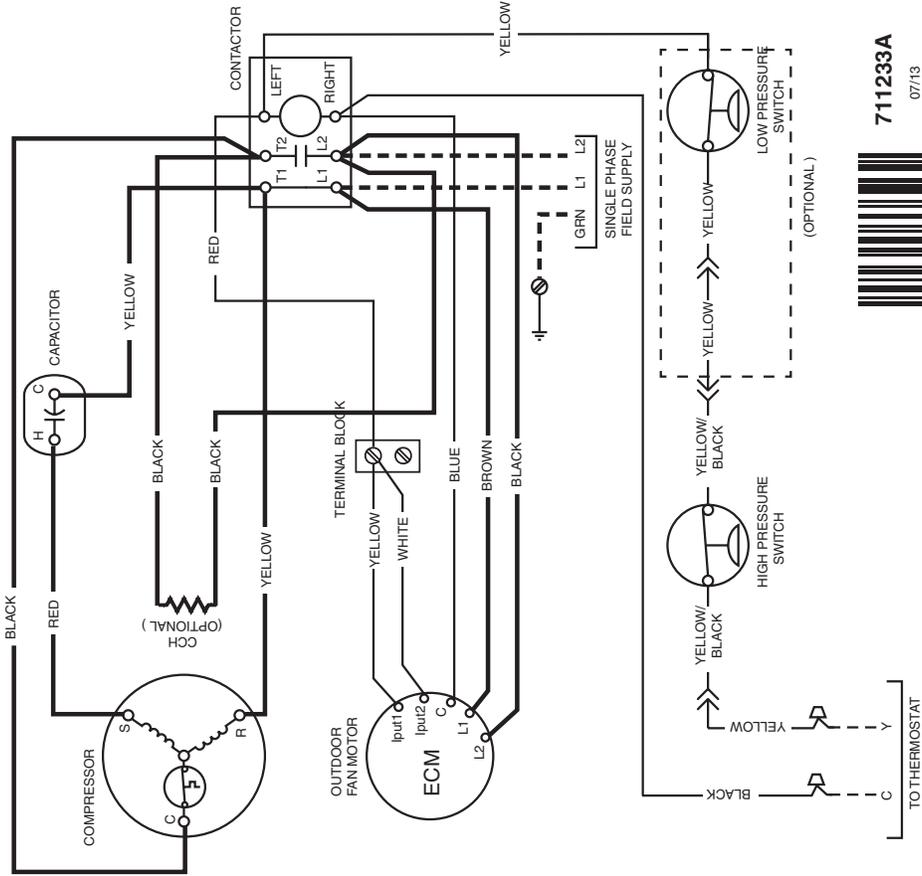
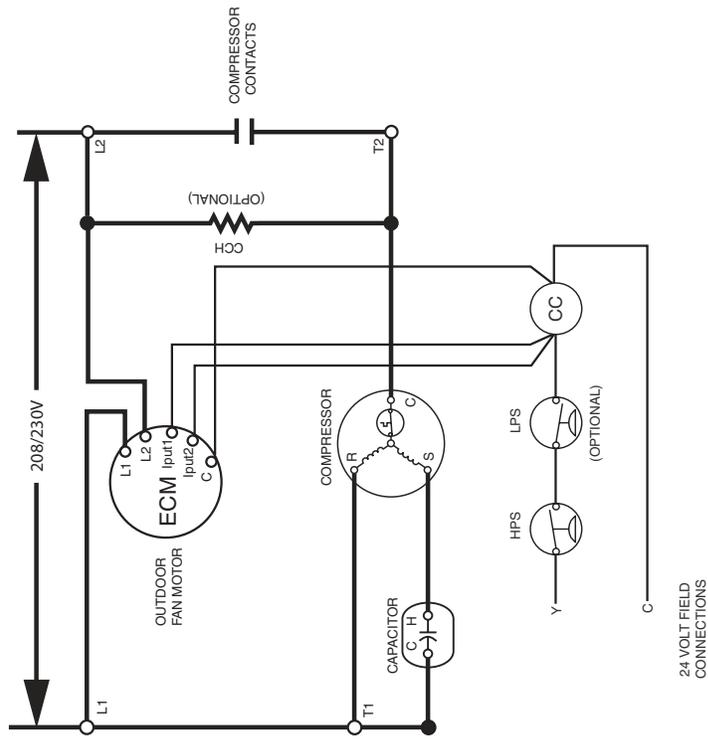
208/230V

Single Phase / 60 Hz.

**NOTES:**

1. Disconnect all power before servicing.
2. For supply connections use copper conductors only.
3. Not suitable on systems that exceed 150 volts to ground.
4. For replacement wires use conductors suitable for 105.
5. For ampacities and overcurrent protection, see unit rating plate.
6. Connect to 24 vac/40vac class 2 circuit. See furnace/air handler installation instructions for control circuit and optional relay/transformer kits.
7. Anti-Short Cycle Timer (ASCT) may or may not be installed in the unit. If desired, ASCT is factory installed on select models only or may be field installed as shown using manufacturer's approved kit. If not present, connect Yellow and Black wires per Note 6.

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



- CC - CONTACTOR COIL
- CCH - CRANKSENSE HEATER
- LPS - LOW PRESSURE SWITCH
- HPS - HIGH PRESSURE SWITCH

**LEGEND:**

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



711233A

07/13

Figure 8. Wiring Diagram for 5 Ton Models (without CoreSense™)

# WIRING DIAGRAM

## Split System Air Conditioner (Outdoor Section) With ECM Outdoor Motor

208/230V

Single Phase / 60 Hz.

Status LED	Status LED Description	Lockout Level	Lockout Indication
Normal Run, Solid Yellow	Normal Operation, no trip	N/A	N/A
Code 1, Yellow Flash 1	Compressor running extremely long run cycle. (disabled in HP mode.)	N/A	N/A
Code 2, Yellow Flash 2	Compressor Pressure Trip. Disch. or suct. pressure out of limits or compressor overloaded.	4 cons., 10x total	Red: Flash 2
Code 3, Yellow Flash 3	Short Cycling. Compressor is running only briefly.	4 cons., 10x total	Red: Flash 3
Code 4, Yellow Flash 4	Locked Rotor.	10 consecutive	Red: Flash 4
Code 5, Yellow Flash 5	Compressor Moderate Run. Compressor runs >15min, then trips >7min.	4 cons., 10x total	Red: Flash 5
Code 8, Red Flash 19	Over Current Protection. PRCOT terminal has >2A input for more than 40ms	1 Occurrence	Red: Flash 9
Trip, Solid Red	Demand but compressor is not running	N/A	N/A

- NOTES:
1. Disconnect all power before servicing.
  2. For supply connections use copper conductors only.
  3. Not suitable on systems that exceed 150 volts to ground.
  4. For replacement wires use conductors suitable for 105 °C.
  5. For ampacities and overcurrent protection, see unit rating plate.
  6. Connect to 24 vac/40va/class 2 circuit. See furnace/air handler installation instructions for control circuit and optional relay/transformer kits.

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

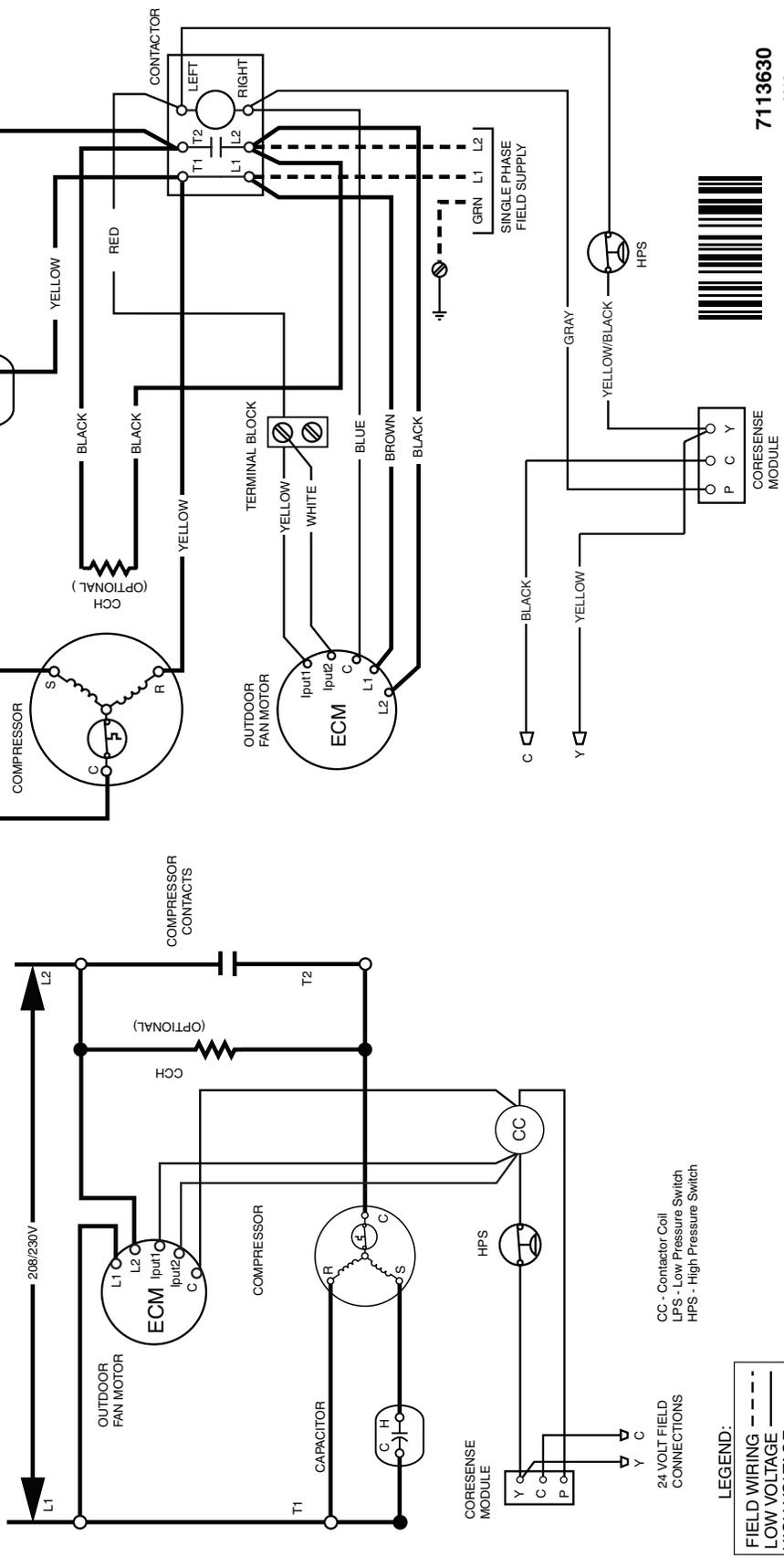


Figure 9. Wiring Diagram for 5 Ton Models (with CoreSense™)







## INSTALLATION CHECKLIST

<b>INSTALLATION ADDRESS:</b>		
CITY _____	STATE _____	
UNIT MODEL # _____		
UNIT SERIAL # _____		
<b>INSTALLER NAME:</b>		
CITY _____	STATE _____	
Unit Installed Minimum clearances shown on <a href="#">page 3?</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) _____		

<b>PROPOSITION 65 WARNING:</b>
<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>

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

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

#### MOTORS:

- Blower Motor
- Fan Motor

#### COMPONENTS:

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

