

INSTALLATION INSTRUCTIONS

T4BD - 042, 048, & 060 (3.5, 4, & 5 TON) SERIES SINGLE PHASE MODELS

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IMPORTANT

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.

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:

ELECTRICAL SHOCK, FIRE OR EXPLOSION HAZARD

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

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

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

WARNING:

This split system heat pumps is 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.

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:

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.

- 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.
- Use caution when handling this appliance or removing components. Personal injury can occur from sharp metal edges present in all sheet metal constructed equipment.

WARNING:

The information listed below and the next page must be followed during the installation, service, and operation of this furnace. 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.
- Fully annealed, refrigerant grade copper tubing should be used when installing the system. Refrigerant suction line tubing should be fully insulated.
- This unit is designed for outdoor installations only and should be positioned as described on [page 3](#).

HEAT PUMP INSTALLATION

General Information

Split system heat pumps are 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.

Refer to the Quick Reference Data sheet for additional electrical, charging and unit information.

Before You Install the Heat Pump

- ✓ 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 Heat Pump

- Survey the job site to determine the best location for mounting the outdoor unit.
- Overhead obstructions (Figure 1), poorly ventilated areas, and areas subject to accumulation of debris should be avoided.
- 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.
- Consideration should be given to availability of electric power, service access, noise, and shade.

Packaging Removal

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 must be provided and be separate from the building foundation. The pad must be level and strong enough to support the unit's weight. The slab height must be a minimum of 2" (5 cm) above grade and with adequate drainage. See Figure 1.

Rooftop

- 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.

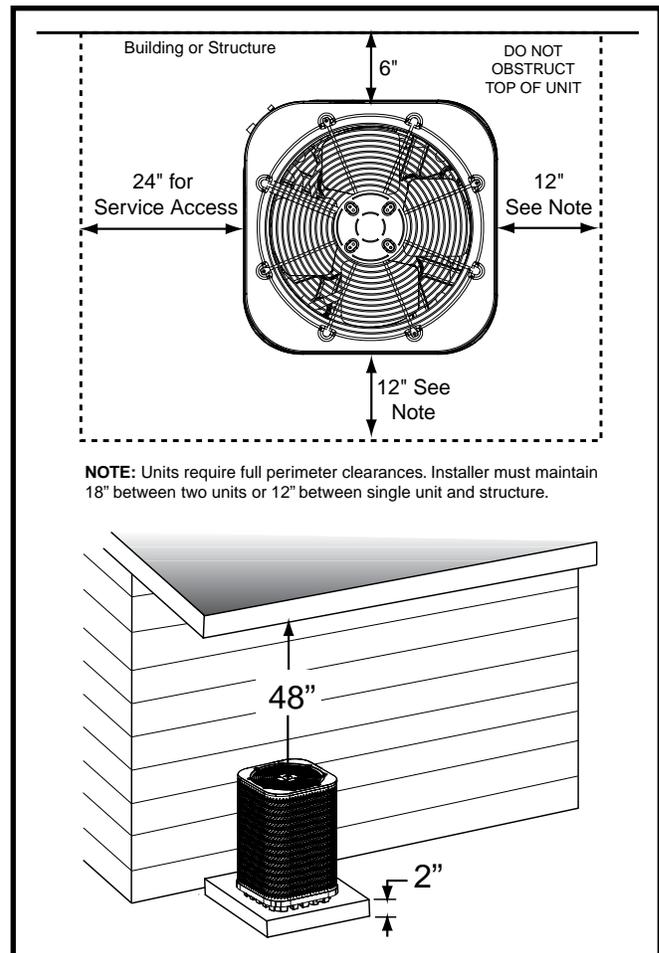


Figure 1. Clearance Requirements

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.

- When connecting refrigerant linesets together, it is recommended that dry nitrogen be flowing through the joints during brazing. This will prevent internal oxidation and scaling from occurring.
- Refrigerant tubing should be routed in a manner that minimizes the length of tubing and the number of bends in the tubing.
- 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 length is 75 feet, and the vertical elevation difference between the indoor and outdoor sections should not exceed 20 feet.
- 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.
- 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.

Outdoor Orifice Removal & Installation

The orifice installed in the outdoor unit has been sized for use with the most popularly matched indoor units. Depending on the indoor coil that the unit is being matched with, the outdoor restrictor may need to be changed. Please refer to the Quick Reference Data sheet that is supplied with the outdoor unit for more information.

If the outdoor unit has the liquid valve shown in [Figure 2](#) then the restrictor is located inside the swivel nut

connection of the liquid valve and not inside the outdoor unit's distributor. Perform steps 1 - 5 if the outdoor restrictor needs to be changed.

⚠ 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.

⚠ CAUTION:

To prevent damage to the unit or internal components, it is recommended that two wrenches be used when loosening or tightening nuts. Do not over tighten!

1. Using two wrenches loosen the nut and liquid valve. Turn the assembly nut counter-clockwise until the orifice body halves are separated.

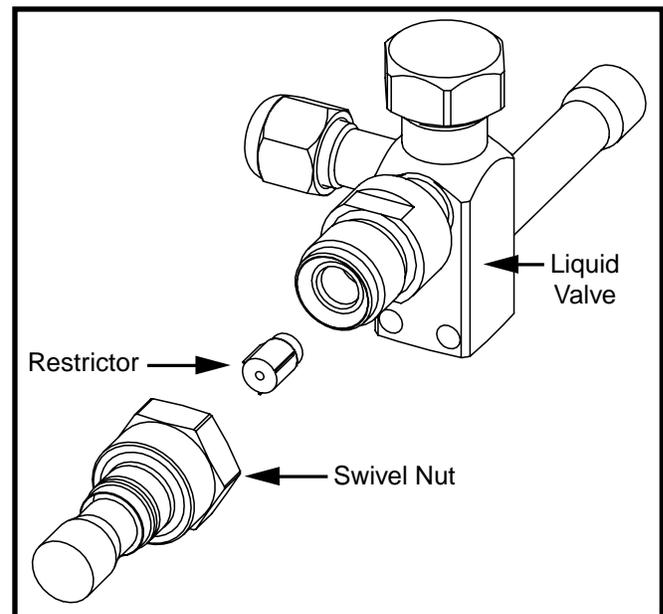


Figure 2. Liquid Valve, Restrictor, & Swivel Nut Adapter

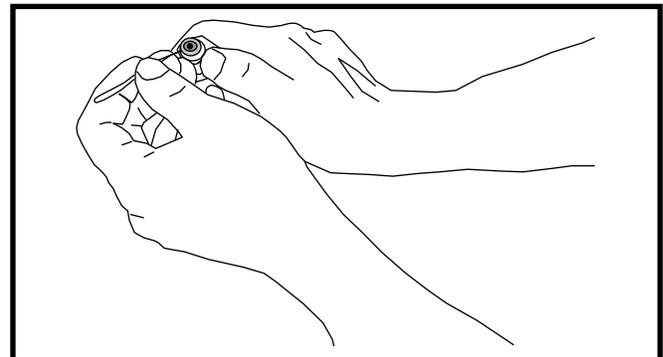


Figure 3. Removal of Orifice

2. Insert a light-gauge wire hook between the valve body and the restrictor orifice while being careful not to scratch either part. Carefully remove the restrictor orifice from the valve body. See [Figure 3, \(page 4\)](#).
3. Check the actual size of the new orifice. **NOTE:** The size is stamped on its side. Do not use pin gauges to measure the orifice diameter.
4. Insert the new orifice into the valve body, with the rounded end facing into the valve. See [Figure 2, \(page 4\)](#).

⚠ CAUTION:

To prevent damage to the unit or internal components, it is recommended that two wrenches be used when loosening or tightening nuts. Do not over tighten!

5. Realign the assembly nut on the valve body and hand tighten both components. Mark a line on both bodies and then tighten an additional ¼ turn using two wrenches. The movement of the two lines will show how much the nut is tightened.

ELECTRICAL WIRING

⚠ WARNING:

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

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 high and low voltage wiring.
- ✓ Verify factory wiring is in accordance with the units wiring diagram ([Figure 9, \(page 16\)](#), [Figure 10, \(page 17\)](#), & [Figure 11, \(page 18\)](#)). Inspect 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 diagrams ([Figure 9, \(page 16\)](#), [Figure 10, \(page 17\)](#), & [Figure 11, \(page 18\)](#)) for identification and location of outdoor unit field wiring interfaces. 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.

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

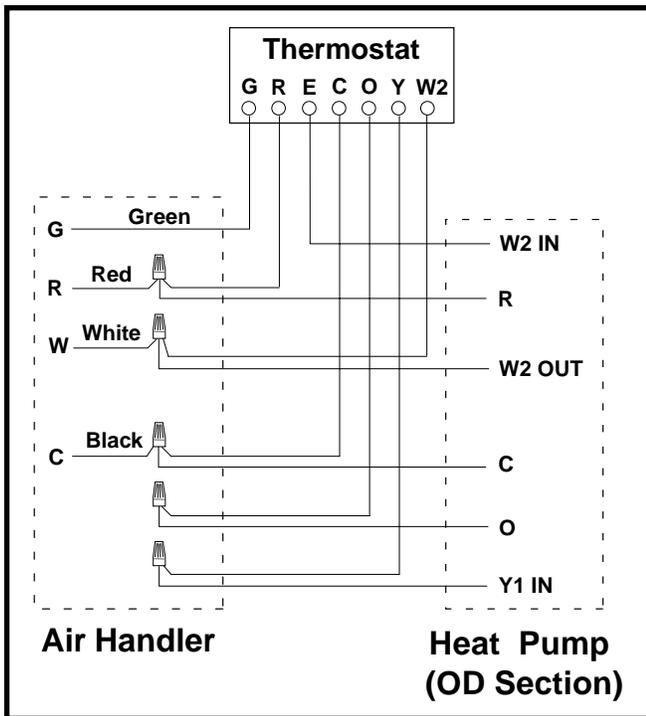


Figure 4. Typical Thermostat Connections

- 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 the CSA C22.1 Electrical Code. Use the grounding lug provided in the control box for grounding the unit.

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

Table 2. Thermostat Wire

Thermostat / Low Voltage Connections

- Thermostat connections should be made in accordance with the instructions supplied with the thermostat and the indoor equipment. A typical installation with a heat pump thermostat and air handler is shown in [Figure 4](#).
- 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.

CoreSense™ Diagnostics Module

(Select Models Only)

The CoreSense™ Diagnostics Module ([Figure 5, \(page 7\)](#)) 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 3, \(page 8\)](#).

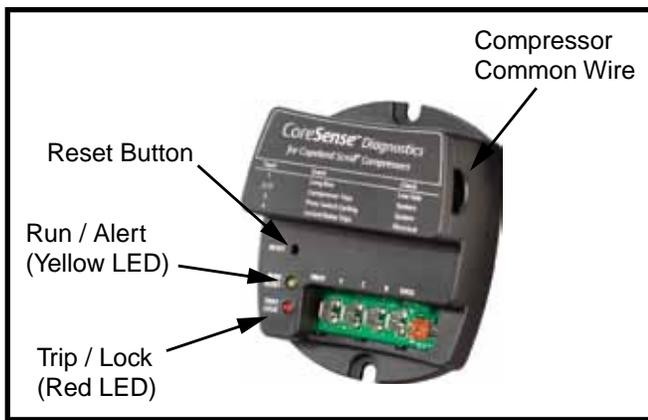


Figure 5. CoreSense™ Diagnostics Module

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.

START UP & ADJUSTMENTS

Pre-Start Check List

- ✓ Verify the unit is level and has sufficient clearances for unobstructed airflow.
- ✓ Verify the outdoor coil and top of the unit are free from obstructions and debris, and all equipment access/control panels are in place.
- ✓ Verify that the line voltage power leads are securely connected and the unit is properly grounded.
- ✓ Verify that the low voltage wires are securely connected to the correct leads on the low voltage terminal strip.
- ✓ Verify that the power supply branch circuit overcurrent protection is sized properly.
- ✓ Verify that the thermostat is wired correctly.

Start-Up Procedures

⚠ WARNING:

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

Air Circulation - 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.

Short Cycle Protection

1. Set the thermostat system mode to COOL. Observe the temperature setting of the thermostat and gradually raise the set-point temperature until the unit de-energizes.
2. Immediately lower the set point temperature of the thermostat to its original setting and verify that the indoor blower is energized and outdoor unit remains de-energized.
3. After approximately 5 minutes, verify the outdoor unit energizes and the temperature of the discharge air is cooler than the room temperature.

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.
NOTE: If refrigerant pressures are abnormal and the compressor is rotating backwards, shut off main power to the unit and switch any two field wires at the disconnect.
DO NOT alter unit wiring.
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 switch is set to the ON position.

System Heating

1. Set the thermostat's system mode to HEAT and the temperature mode to below room temperature.
2. Verify the outdoor unit and indoor fan stop running. After 5 minutes, increase the temperature on the thermostat to it's maximum setting.
3. Verify the outdoor unit 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.

Defrost Control Board Test Pins

- Placing a jumper between the test pins for less than 1 second will bypass the Anti-Short Cycle Timer.
- Placing a jumper between the test pins for more than 1 second will force the unit into a defrost cycle. As soon as the jumper is removed, the defrost cycle will end as determined by the typical criteria.
- To determine operating status or fault conditions, refer to [Table 4](#) for diagnostic description.

ALERT CODE	ALERT CONDITION	LOCK LEVEL	LOCK INDICATION
Normal Run Solid Yellow	Normal operation, no trip	N/A	N/A
Code1 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
Code2 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
Code3 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
Code4 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
Code5 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
Code9 Red Flash 9	The current to the PROT terminal is greater than 2A.	Current >2A for 40ms	Red: Flash9 Yellow: Off
Trip Solid Red	Demand is present, but compressor is not running.	N/A	N/A

Table 3. LED Diagnostics for CoreSense™ Diagnostics Module

STATUS INDICATOR	STATUS TYPE	DIAGNOSTIC DESCRIPTION
C 1	Operating Status	Cooling, 1st Stage
H 1	Operating Status	Heating, 1st Stage
SC	Operating Status	Anti Short Cycle Timer
dF	Operating Status	Defrost
—	Operating Status	Power on, no call for operation
01	Fault	Pressure switch, low
02	Fault	Pressure switch, high
03	Fault	Temperature Sensor, Ambient
04	Fault	Temperature Sensor, Coil
05	Fault	Board
dF (FLASHING)	Input Error	Forced defrost - test short applied longer than 11 minutes

Table 4. Status Indicators for Defrost Control Board

HEAT PUMP 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 heat pump. 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 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 add additional oil to motors unequipped with oil tubes. The compressor is hermetically sealed at the factory and does not require lubrication.
-

REFRIGERANT CHARGING

WARNING:

This split system heat pump is 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.

- To achieve rated capacity and efficiency, the compressor must be exposed to refrigerant for at least 24 hours prior to running and then the compressor must be run for a minimum of 12 hours.

- Cooling mode charging charts 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. Refer to [Figure 6, \(page 10\)](#), [Figure 7, \(page 11\)](#), & [Figure 8, \(page 11\)](#) and [Table 5, \(page 12\)](#), [Table 6, \(page 12\)](#), & [Table 7, \(page 13\)](#) for correct system charging.
- 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 common suction port for heating mode charging is included and located on the compressor access panel above the outdoor unit service valves.
- Heat mode tables ([Table 8, \(page 15\)](#), [Table 9, \(page 15\)](#), & [Table 10, \(page 15\)](#)) are provided for quick reference when the unit is in heating mode and for the inspection of the liquid line pressures and temperatures.
- A high-pressure switch is factory-installed and located in the compressor discharge line internal to the outdoor unit. The switch is designed to de-energize the system when very high pressures occur during abnormal conditions. Under normal conditions, the switch is closed. If the discharge 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. 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

(At outdoor temperatures above 55° F for optimized sub-cooling of 10° F - 12° F.)

1. With the system operating at steady-state, measure the liquid refrigerant pressure (in psig) at the outdoor unit service valve.
2. Measure the liquid refrigerant temperature (in Fahrenheit) at the service valve.
3. Determine the required liquid refrigerant pressure from [Figure 6, \(page 10\)](#), [Figure 7, \(page 11\)](#), & [Figure 8, \(page 11\)](#).
 - If the pressure measured in Step 1 is greater than the required liquid refrigerant pressure determined in Step 3, then there is too much charge in the system. Remove refrigerant and repeat Steps 1 through 3 until the system is correctly charged.
 - If the pressure measured in Step 1 is less than the required liquid refrigerant pressure determined in Step 3, there is too little charge in the system. Add refrigerant and repeat Steps 1 through 3 until the system is correctly charged.

Charging Charts & Application Notes - (Cooling 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-dryers when performing any repair to the refrigeration system with one capable of acid removal. After completing the repairs, evacuate the system to 350 - 500 microns and weigh in the refrigerant to the amount specified on the unit rating label.
- The charging charts below (Figure 6, Figure 7, & Figure 8) are 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. Before using these charts, make sure the unit is in a stable operating mode. As shown in the charts, the ideal system sub-cooling can vary over the range of operation. Reference the charts to determine the ideal amount of sub-cooling for a given liquid pressure. Units charged to other values will not perform at the rated unit efficiency (EER) 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 chart. The measured liquid pressure reading should be within 3% of the charts 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)

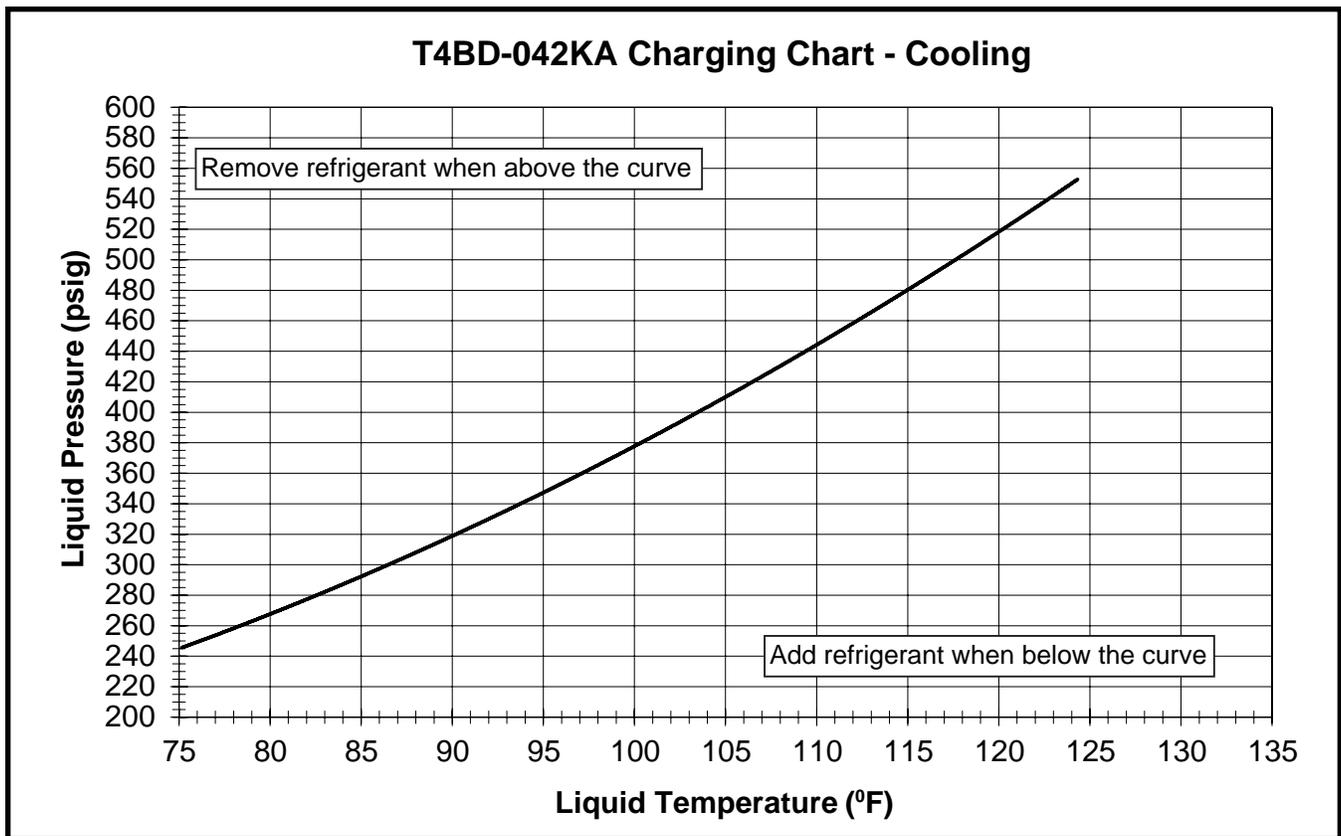


Figure 6. Charging Chart for 3.5 Ton Units (TXV Matches)

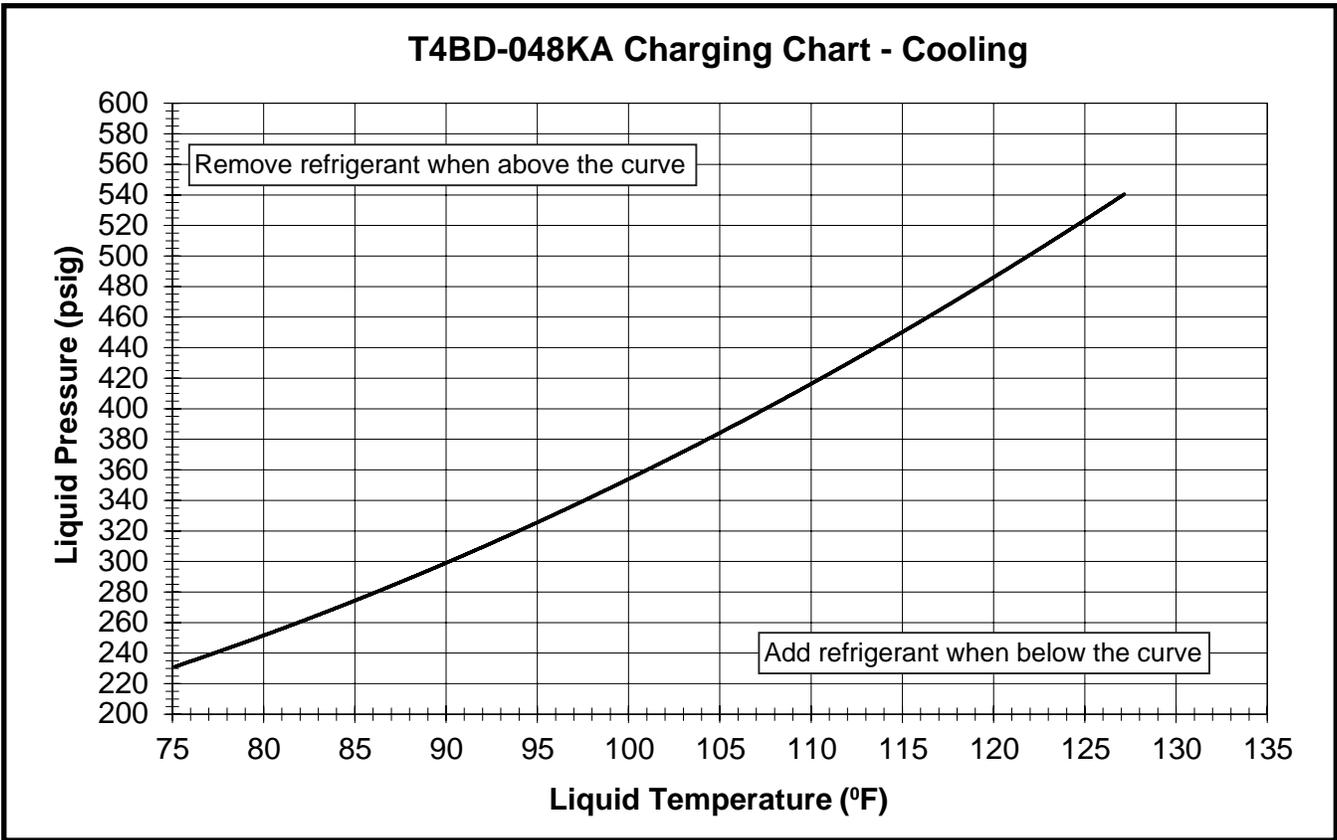


Figure 7. Charging Chart for 4 Ton Units (TXV Matches)

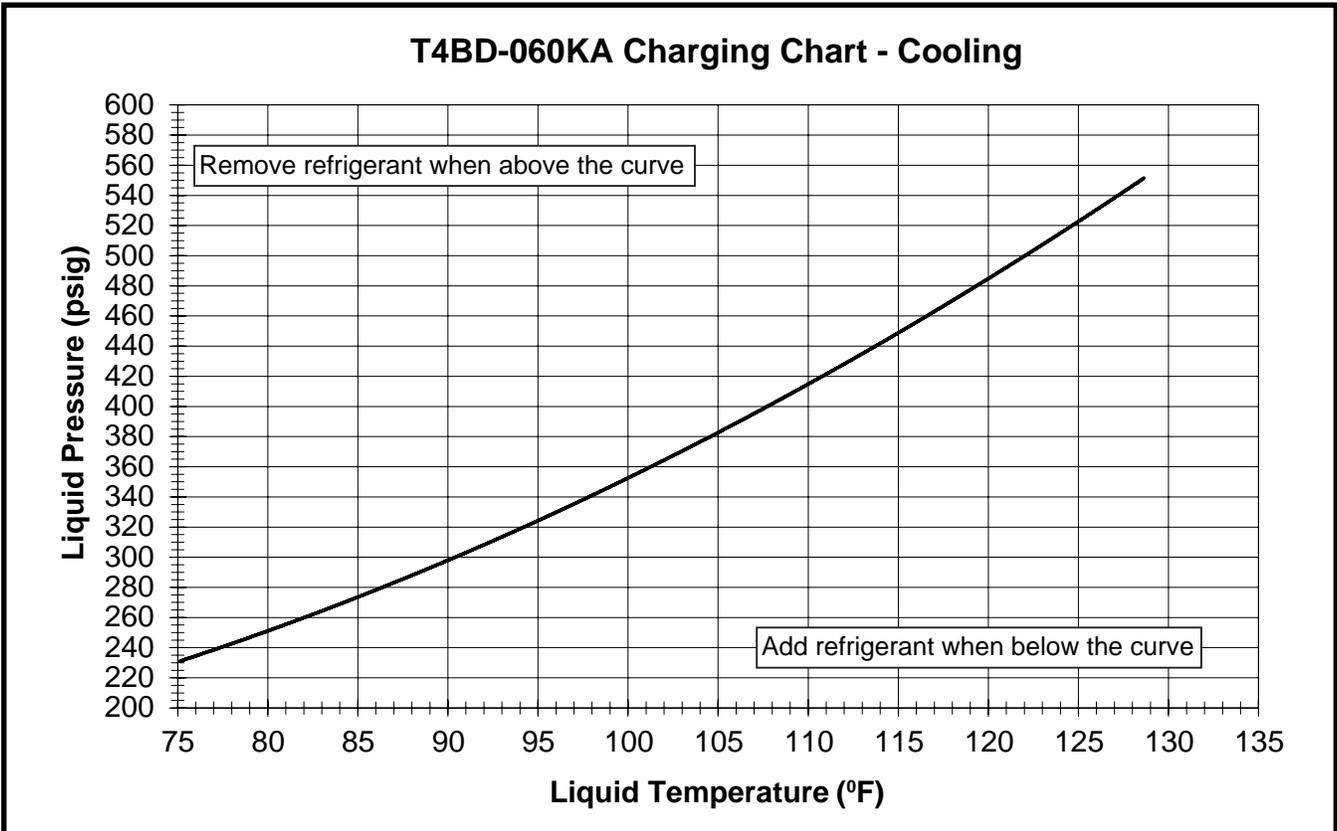


Figure 8. Charging Chart for 5 Ton Units (TXV Matches)

Charging Tables & Application Notes - (Cooling Only)

■ Shaded boxes indicate flooded conditions.

□ Rated design values. The suction pressure will be lower than 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. Discharge temperatures **less** than charted values indicate an **overcharged** system.
4. 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.
5. In Heating Mode, charge should be weighed in. It is strongly recommended to verify charge in Cooling Mode at ambient above 70°F.

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.
130	238	132														
132	240	133	260	136												
134	243	134	263	137	283	140										
136	245	134	265	138	285	141	305	144								
138	247	135	268	138	288	141	308	145	328	148						
140			270	139	291	142	311	145	331	149	350	152				
142					293	143	313	146	333	149	353	153	373	156		
144							316	147	336	150	356	153	376	156	396	160
146							319	147	339	151	359	154	379	157	399	160
148									342	151	362	154	382	158	402	161
150											365	155	385	158	405	162
152													388	159	408	162
154															411	163
156																

Table 5. Charging Table for T4BE-042KA Series (3.5 Ton Models) – Restrictor Matches

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.
132	248	128														
134	248	128	269	133												
136	248	128	269	133	290	137										
138	248	128	269	133	290	137	310	141								
140	249	129	269	133	290	137	311	141	331	146						
142			270	133	290	137	311	141	332	146	352	150				
144					291	137	311	141	332	146	353	150	373	155		
146							312	141	332	146	353	150	373	154	394	159
148							312	141	332	145	353	150	374	154	394	159
150									333	145	353	150	374	154	395	158
152											354	150	374	154	395	158
154													375	154	395	158
156															396	158
158																

Table 6. Charging Table for T4BE-048KA Series (4 Ton Models) – Restrictor Matches

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.
121	244	135														
123	245	135	267	141												
125	246	135	268	141	290	147										
127	247	136	269	142	291	147	313	154								
129	248	136	270	142	292	148	314	154	336	160						
131			271	142	293	148	315	154	337	160	359	166				
133					295	148	317	154	338	160	360	166	382	172		
135							318	154	340	160	362	166	383	172	405	178
137							319	154	341	160	363	166	385	172	406	178
139									342	160	364	166	386	172	408	178
141											365	166	387	172	409	178
143													388	172	410	178
145															411	178
147																

Table 7. Charging Table for T4BE-060KA Series (5 Ton Models) – Restrictor Matches

Heat Mode Tables & Application Notes - (Heating Only)

 Shaded boxes indicate flooded conditions.

 Rated design values. The suction pressure will be lower than 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. Discharge temperatures **less** than charted values indicate an **overcharged** system.
4. In Heating Mode, charge should be weighed in. It is strongly recommended to verify charge in Cooling Mode at ambient above 70°F.

- **Read all notes and warnings for the Cooling-mode charging charts prior to using these Heating-mode charging charts. Always use safe and environmentally sound methods when handling refrigerant handling or servicing the unit. Review the factory literature and safety warnings prior to servicing.**
- When repairing system leaks, always use a nitrogen (inert) gas to protect the refrigerant system and pressure check the repair before re-charging. Always replace the filter-dryers when performing any repair to the refrigeration system with one capable of acid removal. After completing the repairs, evacuate the system to 350 - 500 microns and weigh in the refrigerant to the amount specified on the unit rating label.
- Before using [Table 8](#), [Table 9](#), & [Table 10](#), determine the outdoor ambient temperature and the return air temperature to the unit. Locate the appropriate location on the units verification chart based on those measurements to determine the ideal discharge pressure and temperature. Verify the outdoor fan and compressor are running and the outdoor coil is free from frost accumulation. Also verify the system is not operating in defrost mode before inspecting the system.
- Always use quality instruments that are in good working order to measure the actual operating point of the refrigeration system. The discharge temperature should be within 2 degrees of the ideal value and the pressure should be within 2%.
- The most reliable way of verifying the system is at the correct charge is to evacuate the system and weigh in the charge to the amount shown on the rating label. However, if an inspection with these verification charts does not line up with the values shown and the ambient temperature is above 50° F, then a more accurate way to inspect the system for proper charge is with the cooling mode charging charts. Switch the unit into cooling mode and allow it to operate and stabilize for a few minutes then inspect the unit operation with the cooling mode charts and procedures.

Before changing the unit charge, always inspect the following items first:

1. Inspect the liquid line temperature on the inlet and outlet of the filter dryers. If it is the factory dryer and in good condition there should be no temperature difference. If the temperature difference is larger than 5°, replace the filter dryer with one that is bi-directional and has acid removal capability. Refer to the unit RPL for the recommended part number and size.
2. Inspect the units input voltage. Units operating at less than 95% of the nominal voltage may deviate more from the chart than previously stated.
3. Inspect the input voltage for a phase imbalance. Units with greater than a 2% disparity will not operate at the rated performance.
4. Verify that the unit filters are installed and are clean. The pressure drop across the filters should not exceed 0.08 in-W.C.
5. Inspect the indoor coil, indoor blower and blower motor for cleanliness, clogging, and proper operation.
6. Inspect the system for leaks. If any leaks are detected, repair them immediately. Re-inspect the return air and ambient temperatures and verify that the correct system point on the verification chart was selected.

DO NOT use the charts in systems that have the fan cycling under a low-ambient control. Low-ambient controls are for cooling operation. In heating mode, the low ambient control should be disabled. Unless the unit is in defrost mode, the outdoor fan should always operate in conjunction with the compressor.

IMPORTANT NOTE: If the unit is equipped with a liquid valve with an outdoor restrictor (Figure 2 page 4), then it is not possible to measure the liquid pressure. To approximate the liquid pressure, subtract 7 psig from the discharge pressure.

OUTDOOR TEMPERATURE (° F)																																		
SUC. PRESS.	0				SUC. PRESS.	10				SUC. PRESS.	20				SUC. PRESS.	30				SUC. PRESS.	40				SUC. PRESS.	50				SUC. PRESS.	60			
	LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.
33	209	216	123	123	45	232	239	127	127	57	255	262	130	130	69	278	285	133	133	84	294	301	143	143	102	325	333	160	160	119	357	364	178	178
34	216	223	121	121	46	238	245	125	125	58	260	267	128	128	70	282	289	131	131	85	301	308	140	140	103	332	340	156	156	120	364	371	171	171
35	223	230	119	119	47	244	251	123	123	59	265	272	126	126	71	285	293	129	129	86	308	315	137	137	104	339	347	151	151	121	371	378	165	165
36	230	237	117	117	48	250	257	121	121	60	269	277	124	124	72	289	296	127	127	87	315	322	134	134	105	346	354	147	147	122	378	385	159	159
37	237	244	115	115	49	255	263	119	119	61	274	281	122	122	73	293	300	125	125	88	322	329	132	132	106	353	361	142	142	123	385	392	153	153
38	244	251	113	113	50	261	269	117	117	62	279	286	120	120	74	296	304	123	123	89	329	336	129	129	107	360	368	138	138	124	392	399	147	147
39	251	258	111	111	51	267	275	115	115	63	284	291	118	118	75	300	307	121	121	90	336	343	126	126	108	367	375	133	133	125	399	406	141	141

Table 8. Heat Mode Table for 3.5 Ton Models

OUTDOOR TEMPERATURE (° F)																																		
SUC. PRESS.	0				SUC. PRESS.	10				SUC. PRESS.	20				SUC. PRESS.	30				SUC. PRESS.	40				SUC. PRESS.	50				SUC. PRESS.	60			
	LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.
29	214	225	107	107	44	233	244	114	114	59	252	263	122	122	74	271	282	129	129	89	281	292	139	139	104	307	318	150	150	120	332	343	161	161
30	221	232	105	105	45	239	250	112	112	60	257	268	120	120	75	275	286	127	127	90	288	299	136	136	105	314	325	146	146	121	339	350	155	155
31	228	239	103	103	46	245	256	110	110	61	261	272	118	118	76	278	289	125	125	91	295	306	133	133	106	321	332	141	141	122	346	357	149	149
32	235	246	101	101	47	251	261	108	108	62	266	277	116	116	77	282	293	123	123	92	302	313	130	130	107	328	339	137	137	123	353	364	143	143
33	242	253	99	99	48	256	267	106	106	63	271	282	114	114	78	286	297	121	121	93	309	320	127	127	108	335	346	132	132	124	360	371	137	137
34	249	260	97	97	49	262	273	104	104	64	276	287	112	112	79	289	300	119	119	94	316	327	124	124	109	342	353	128	128	125	367	378	131	131
35	256	267	95	95	50	268	279	102	102	65	281	292	110	110	80	293	304	117	117	95	323	334	122	122	110	349	360	123	123	126	374	385	124	124

Table 9. Heat Mode Table for 4 Ton Models

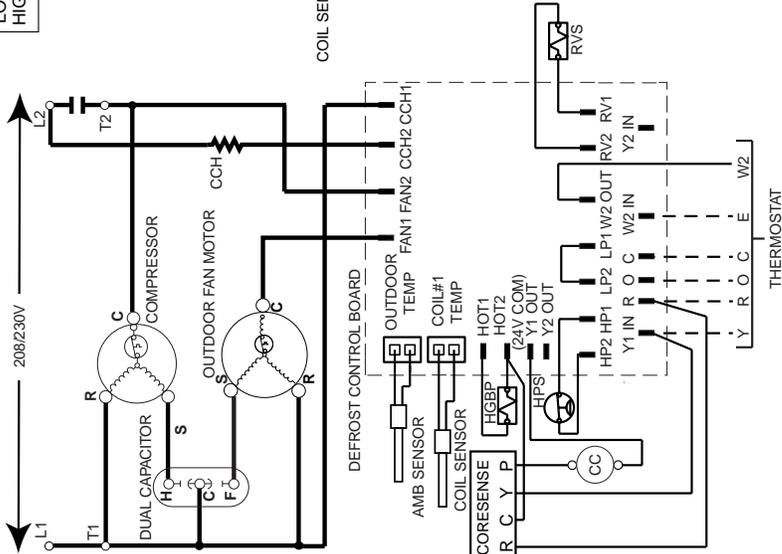
OUTDOOR TEMPERATURE (° F)																																		
SUC. PRESS.	0				SUC. PRESS.	10				SUC. PRESS.	20				SUC. PRESS.	30				SUC. PRESS.	40				SUC. PRESS.	50				SUC. PRESS.	60			
	LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.		LIQUID PRESS.	DISCH. PRESS.	DISCH. TEMP.	DISCH. TEMP.
26	239	259	148	148	40	254	273	147	147	53	269	288	146	146	67	283	303	145	145	81	297	316	151	151	97	332	352	165	165	112	368	388	180	180
27	246	266	146	146	41	260	279	145	145	54	273	293	144	144	68	287	307	143	143	82	304	323	148	148	98	339	359	161	161	113	375	395	173	173
28	253	273	144	144	42	266	285	143	143	55	278	298	142	142	69	291	310	141	141	83	311	330	146	146	99	346	366	156	156	114	382	402	167	167
29	260	280	142	142	43	272	291	141	141	56	283	302	140	140	70	294	314	139	139	84	318	337	143	143	100	353	373	152	152	115	389	409	161	161
30	267	287	140	140	44	278	297	139	139	57	288	307	138	138	71	298	318	137	137	85	325	344	140	140	101	360	380	147	147	116	396	416	155	155
31	274	294	138	138	45	283	303	137	137	58	293	312	136	136	72	302	321	135	135	86	332	351	137	137	102	367	387	143	143	117	403	423	149	149
32	281	301	136	136	46	289	309	135	135	59	297	317	134	134	73	305	325	133	133	87	339	358	134	134	103	374	394	138	138	118	410	430	143	143

Table 10. Heat Mode Table for 5 Ton Models

WIRING DIAGRAM

Split System Heat Pump (Outdoor Section)

- 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.

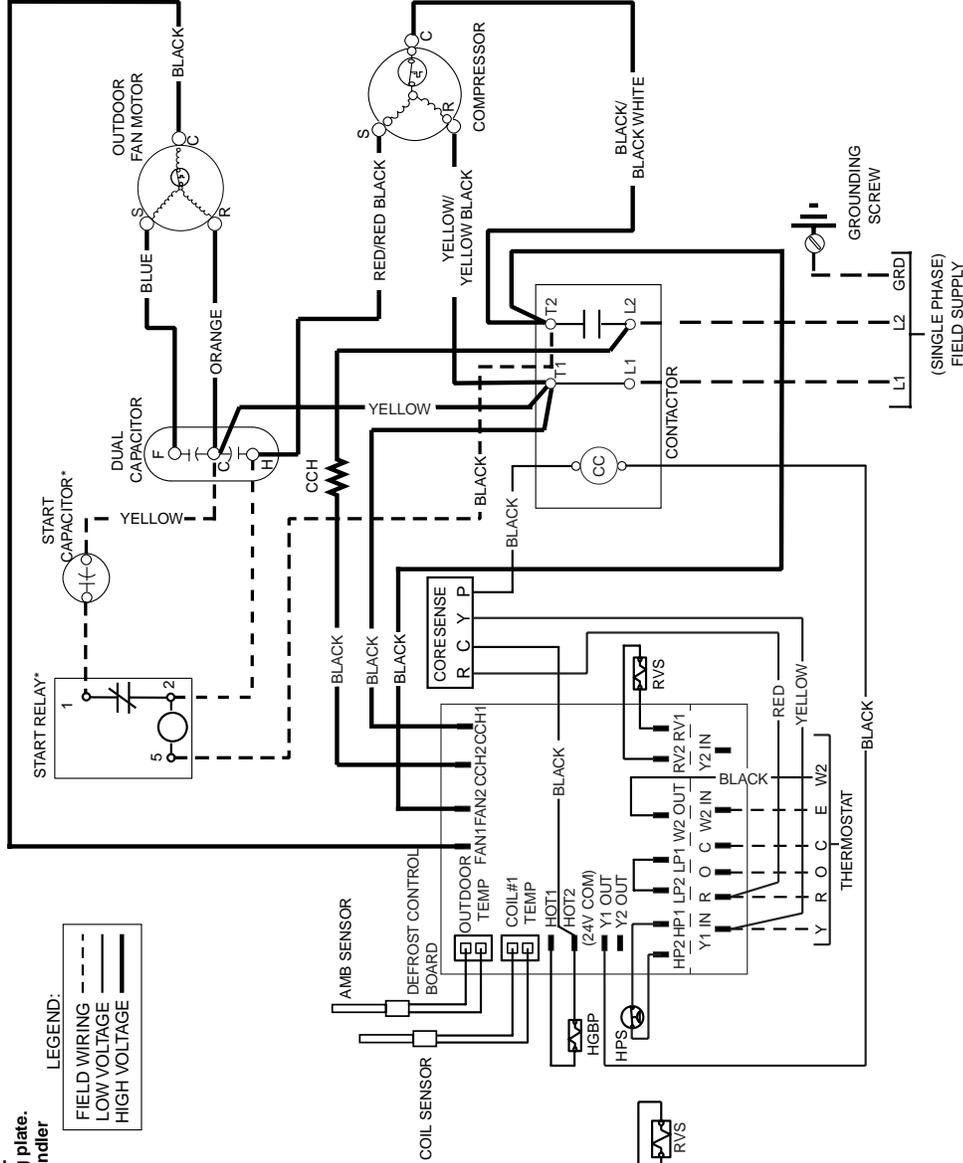


- AMB SENSOR - Ambient Sensor
- CC - Contactor Coil
- CCH - Crankcase Heater
- HGPS - High Pressure Switch
- HGBP - Hot Gas By Pass Valve
- RVS - Reversing Valve Solenoid
- * HARD START KIT (OPTIONAL)

WIRING DIAGRAMS

Single Phase

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



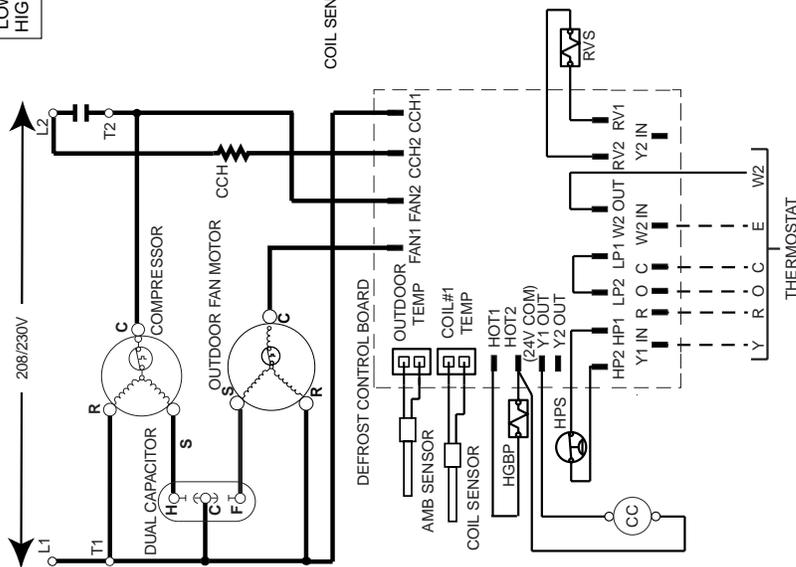
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Figure 9. Wiring Diagram for 3.5 - 5 Ton Models Equipped With CoreSense™ Diagnostic Module

WIRING DIAGRAM

Split System Heat Pump (Outdoor Section)

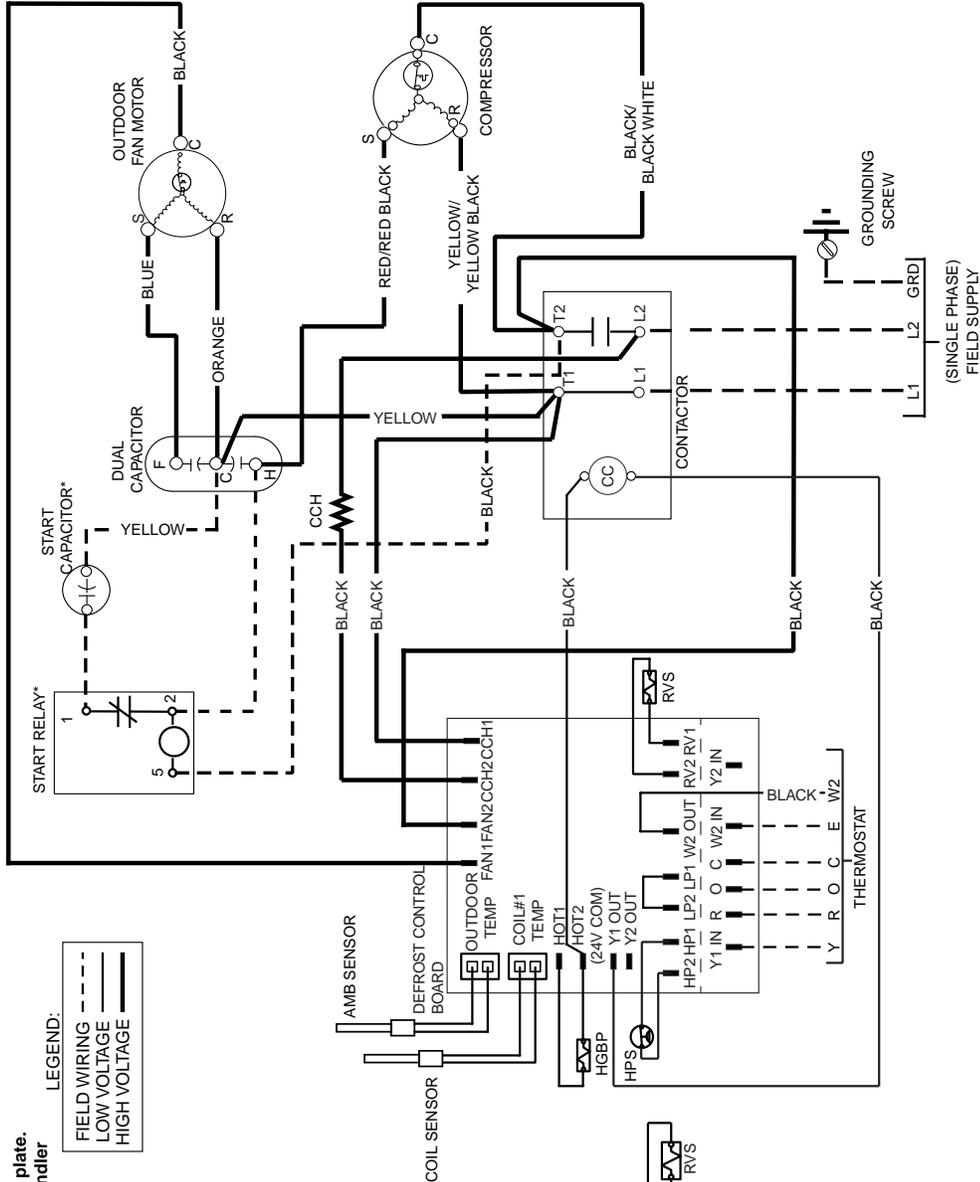
- NOTES:**
1. Disconnect all power before servicing.
 2. For supply connections use copper conductors only.
 3. Not suitable on systems that exceed 150 volts to ground.
 4. For replacement wires use conductors suitable for 105° C.
 5. For ampacities and overcurrent protection, see unit rating plate.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



- AMB SENSOR - Ambient Sensor
- CC - Contactor Coil
- CCH - Crankcase Heater
- HPS - High Pressure Switch
- HGBP - Hot Gas By Pass Valve
- RVS - Reversing Valve Solenoid
- * HARD START KIT (OPTIONAL)

Single Phase

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.



(SINGLE PHASE)
FIELD SUPPLY



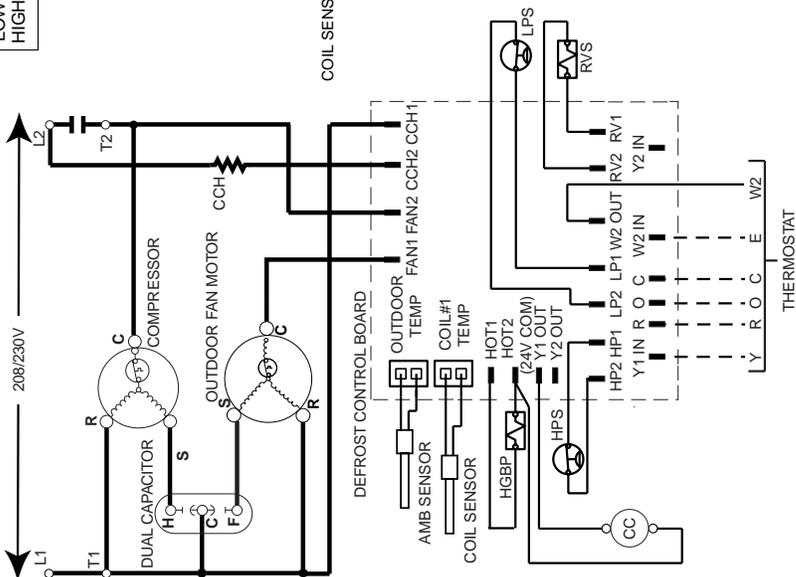
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Figure 10. Wiring Diagram for 3.5 - 5 Ton Models
NOT Equipped With CoreSense™ Diagnostic Module

WIRING DIAGRAM

Split System Heat Pump (Outdoor Section)

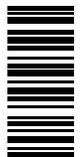
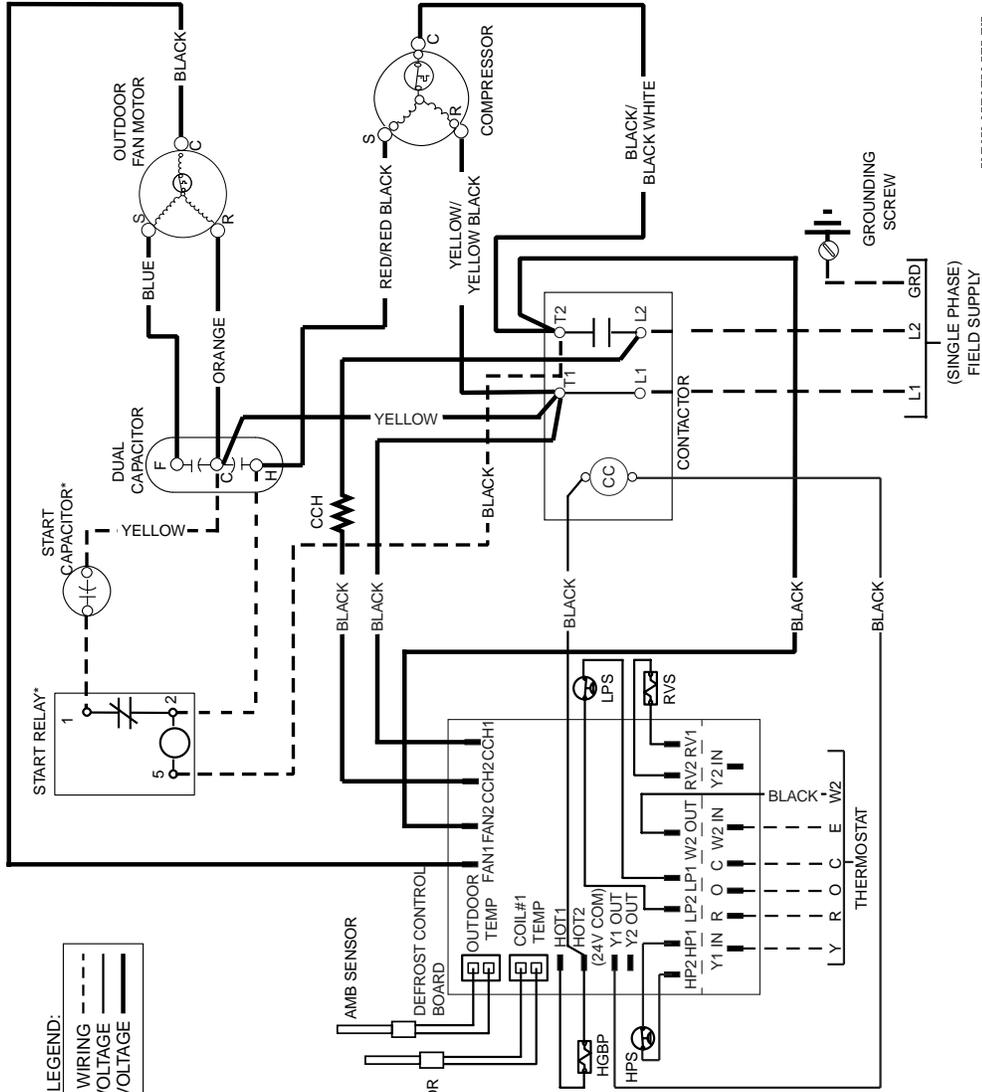
- NOTES:**
1. Disconnect all power before servicing.
 2. For supply connections use copper conductors only.
 3. Not suitable on systems that exceed 150 volts to ground
 4. For replacement wires use conductors suitable for 105° C.
 5. For ampacities and overcurrent protection, see unit rating plate.
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



- AMB SENSOR - Ambient Sensor
- CC - Contactor Coil
- CCH - Crankcase Heater
- HPS - High Pressure Switch
- HGBP - Hot Gas By Pass Valve
- LPS - Low Pressure Switch
- RVS - Reversing Valve Solenoid
- * HARD START KIT (OPTIONAL)

Single Phase

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 volt a la terre.



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Figure 11. Wiring Diagram for 3.5 - 5 Ton Models Equipped with Low Pressure Switch

INSTALLATION / PERFORMANCE CHECKLIST

INSTALLATION ADDRESS:		
CITY _____	STATE _____	
UNIT MODEL # _____		
UNIT SERIAL # _____		
Unit Installed Minimum clearances per Figure 1, (page 3)?	YES	NO
INSTALLER NAME:		
CITY _____	STATE _____	
Has the owner's information been reviewed with the customer?	YES	NO
Has the Literature Package been left with the unit?	YES	NO

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

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

ELECTRICAL SYSTEM		
Electrical connections tight?	YES	NO
Line voltage polarity correct?	YES	NO
Rated Voltage: _____ VOLTS		
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 all Nordyne distributors. Please have the complete model and serial number of the unit when ordering replacement parts.

Electrical:

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

Motors:

- Blower Motor
- Fan Motor

Components:

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



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COMPLETE COMFORT. GENUINE VALUE.

Specifications & illustrations subject to change without notice or incurring obligations (01/14).

