

Outdoor Heat Pump

User's Information/Installation Instructions

14 SEER R-410A High Efficiency Split System

These units have been designed and tested for capacity and efficiency in accordance with A.R.I. Standards. Split System Heat Pump units are designed for use with a wide variety of fossil fuel furnaces, electric furnaces, air handlers, and evaporator coil combinations.

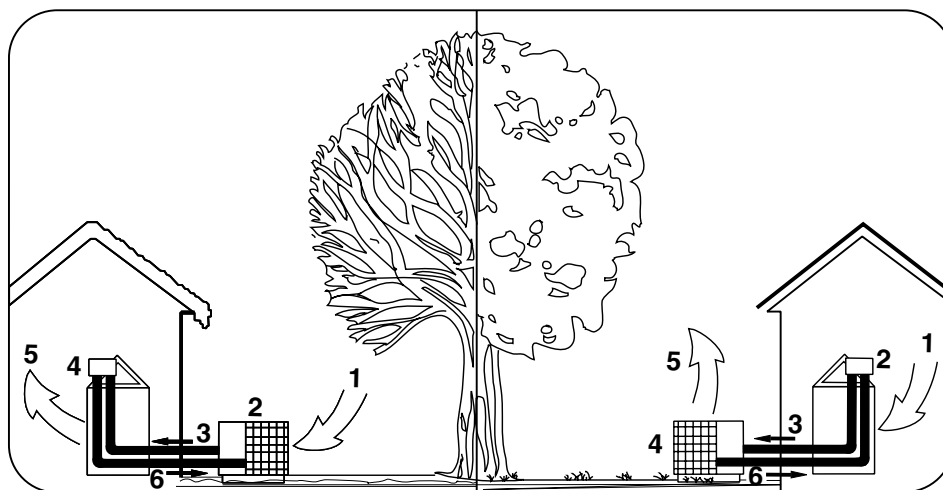
These instructions are primarily intended to assist qualified individuals experienced in the proper installation of heating and/or air conditioning appliances. Some local codes require licensed installation/service personnel for this type of equipment. Read all instructions carefully before starting the installation.

USER'S INFORMATION

IMPORTANT

Read this owner information to become familiar with the capabilities and use of your appliance. Keep this with literature on other appliances where you have easy access to it in the future. If a problem occurs, check the instructions and follow recommendations given. If these suggestions don't eliminate your problem, call your servicing contractor.

Heat Pump Principle of Operation



WINTER HEATING

1. Outdoor air enters heat pump.
2. Cold, heat-transfer section (outdoor coil) extracts heat from outdoor air as refrigerant evaporates from a liquid to a gas.
3. Refrigerant, compressed to a hot gas by heat pump, carries the heat to the hot heat-transfer section (indoor coil).
4. Hot, heat-transfer section (indoor coil) releases the heat to indoor air as refrigerant condenses from a gas to a liquid.
5. Air handler circulates the heat throughout the home.
6. Refrigerant returns to outdoor coil and evaporates once again to absorb more heat.

SUMMER COOLING

1. Indoor air enters the air handler section.
2. Cold, heat-transfer section (indoor coil) extracts heat from indoor air as refrigerant evaporates from a liquid to a cold gas.
3. Refrigerant, drawn to heat pump and compressed to a hot gas by heat pump, carries the heat outdoors.
4. Hot, heat-transfer section (outdoor coil) releases the heat as refrigerant condenses from a gas to a liquid.
5. Heat pump (outdoor fan) discharges the heat to outside air.
6. Refrigerant returns to indoor coil and evaporates once again to absorb more heat.

OPERATING INSTRUCTIONS

TO OPERATE YOUR HEAT PUMP FOR COOLING —

1. Set the thermostat system switch to COOL and the thermostat fan switch to AUTO. (See Figure 1)
2. Set the thermostat temperature to the desired temperature level using the temperature selector. Please refer to the separate detailed thermostat user's manual for complete instructions regarding thermostat programming. The outdoor unit and indoor blower will both cycle on and off to maintain the indoor temperature at the desired cooling level.

NOTE: If the thermostat temperature level is re-adjusted, or the thermostat system switch is repositioned, the outdoor unit may not start immediately. The outdoor unit contains a protective timer circuit which holds the unit off for approximately five minutes following a previous operation, or the interruption of the main electrical power.

TO OPERATE YOUR HEAT PUMP FOR HEATING —

1. Set the thermostat system switch to HEAT and the thermostat fan switch to AUTO. (See Figure 1)

2. Set the thermostat temperature to the desired temperature level using the temperature selector. Please refer to the separate detailed thermostat user's manual for complete instructions regarding thermostat programming. The outdoor unit and indoor blower will both cycle on and off to maintain the indoor temperature at the desired heating level.

NOTE: If the thermostat temperature level is re-adjusted, or the thermostat system switch is repositioned, the outdoor unit may not start immediately. The outdoor unit contains a protective timer circuit which holds the unit off for approximately five minutes following a previous operation, or the interruption of the main electrical power.

Emergency Heat:

The thermostat includes a system switch position termed EM. HT. This is a back-up heating mode to be used only if there is a suspected problem with the outdoor unit. With the system switch set to EM. HT. the outdoor unit will be locked off, and supplemental heat (typically electric resistance heating) will be used as a source of heat. Sustained use of electric resistance heat in place of the heat pump will result in an increase in electric utility costs.

Defrost:

During cold weather heating operation, the outdoor unit will develop a coating

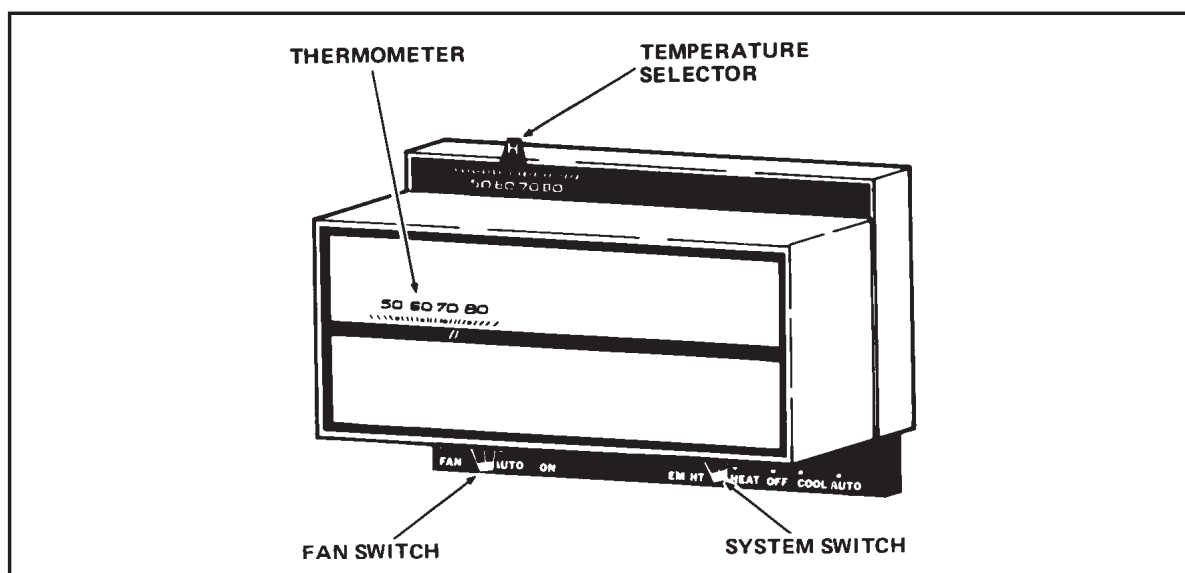


Figure 1. Typical Thermostat

of snow and ice on the heat transfer coil. This is normal, and the unit will periodically defrost itself. During the defrost cycle, the outdoor fan will stop, and the compressor will continue to run and heat the outdoor coil, causing the snow and ice to melt. After the snow and ice have melted, some steam may rise from the outdoor unit as the warm coil causes some melted frost to evaporate.

TO OPERATE YOUR HEAT PUMP FOR AUTOMATIC COOLING AND HEATING —

1. Set the thermostat system switch to AUTO and the thermostat fan switch to AUTO. (See Figure 1)

Note: Thermostats will vary. Some models will not include the AUTO mode, and others will have the AUTO in place of the HEAT and COOL, and some will include all three.

2. Set the thermostat temperature to the desired heating and cooling temperature level(s). The outdoor unit and the indoor blower will then cycle on and off in either the heating or cooling mode of operation as required to automatically maintain the indoor temperature within the desired limits.

TO SHUT OFF YOUR HEAT PUMP —

Set the thermostat system switch to OFF and the thermostat fan switch to AUTO. (See Figure 1) The system will not operate, regardless of the thermostat temperature selector(s) setting.

TO OPERATE THE INDOOR BLOWER CONTINUOUSLY —

Set the thermostat fan switch to ON (See Figure 1). The indoor blower will start immediately, and will run continually until the fan switch is reset to AUTO.

The continuous indoor blower operation can be obtained with the thermostat system switch set in any position, including OFF.

The continuous indoor blower operation is typically used to circulate the indoor air to

equalize a temperature unbalance due to a sun load, cooking, or fireplace operation.

TO MAINTAIN YOUR HEAT PUMP —



CAUTION:

Be certain the electrical power to the outdoor unit and the furnace/air handler is disconnected before doing the following recommended maintenance.

1. Regularly:

- a. Clean or replace the indoor air filter at the start of each heating and cooling season, and when an accumulation of dust and dirt is visible on the air filter. Inspect the filter monthly.
- b. Remove any leaves and grass clippings from the coil in the outdoor unit, being careful not to damage the aluminum fins.
- c. Check for any obstruction such as twigs, sticks, etc.



CAUTION:

Do not over-oil, or oil motors not factory-equipped with oil tubes. The compressor is hermetically “sealed” and does not require lubrication.

2. Before Calling a Service Technician, Be Certain:

- a. The unit thermostat is properly set — see “To Operate Your Heat Pump for Cooling” and “To Operate Your Heat Pump for Heating.”
- b. The unit disconnect fuses are in good condition, and the electrical power to the unit is turned on.

Read Your Warranty

Please read the separate warranty document completely. It contains valuable information about your system.

GENERAL INFORMATION

Read the following instructions completely before performing the installation.



CAUTION:

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

Outdoor Unit Section — Each outdoor unit is shipped with a refrigerant charge adequate to operate the outdoor section with an indoor matching coil or air handler. Units with brazed connections include the proper amount of refrigerant for an additional 15 ft. of refrigerant lines the same size as the valve fittings.

NOTE: DO NOT USE ANY PORTION OF THE CHARGE FOR PURGING OR LEAK TESTING.

Matching coils and air handlers may be shipped with a small holding charge to pressurize them to keep out contaminants. To release the pressure, read the indoor section installation instructions carefully.

Liquid and Suction Lines — Fully annealed, refrigerant grade copper tubing should be used when installing the system. Refrigerant suction line tubing should be fully insulated.

Field Connections for Electrical Power Supply — All wiring must comply with current provisions of the “National Electrical Code” (ANSI/NFPA 70) and with applicable local codes having jurisdiction. The minimum size of electrical conductors and circuit protection must be in compliance with information listed on the outdoor unit data label.

NOTICE:

Certain models have external panels fabricated from a premium grade of stainless steel designed to inhibit corrosion. For such units, if the unit is located in a coastal region or other area subjected to high concentrations of salt, then the unit should be hosed off after storms and monthly otherwise to maintain its new appearance.

SAFETY CONSIDERATIONS

Pressures within the System — Split system heat pump equipment contains liquid and gaseous refrigerant under pressure. Installation and servicing of this equipment should be accomplished by qualified, trained personnel thoroughly familiar with this type of equipment. Under no circumstances should the Homeowner attempt to install and/or service the equipment.

Labels, Tags, Precautions — When working with this equipment, 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.

Brazing Operations — Installation of equipment may require brazing operations. Safety codes must be complied with. Safety equipment (e.g.; safety glasses, work gloves, fire extinguisher, etc.) must be used when performing brazing operations.



WARNING:

Ensure all electrical power to the unit is off prior to installing or servicing the equipment. Failure to do so may cause personal injury or death.

SITE PREPARATION

Unpacking Equipment — Remove the cardboard carton and User's Manual from the equipment. Take care to not damage tubing connections when removing from the carton.

Inspect for Damage — Inspect the equipment for damage prior to installing the equipment at the job site. Ensure coil fins are straight and, if necessary, comb fins to remove flattened and bent fins.

Preferred Location of the Outdoor Unit at the Job Site — Conduct a survey of the job site to determine the optimum location for mounting the outdoor unit. Overhead obstructions, poorly ventilated areas, and areas subject to accumulation of debris should be avoided. The

outdoor unit must be installed in such a manner that airflow through the coil is not obstructed and that the unit can be serviced.

Facility Prerequisites — Electrical power supplied must be adequate for proper operation of the equipment. The system must be wired and provided with circuit protection in accordance with local building codes and the National Electrical Code.

INSTALLING THE OUTDOOR UNIT

Slab Mount — The site selected for a slab mount installation requires a stable foundation and one not subject to erosion. The slab should be level and anchored (if necessary) prior to placing the equipment on the slab.

Cantilever Mount — The cantilever mount should be designed with adequate safety factor to support the weight of the equipment, and for loads subjected to the mount during operation. Installed equipment should be adequately secured to the cantilever mount and levelled prior to operation of the equipment.

Roof Mount — The method of mounting should be designed so as not to overload roof structures nor transmit noise to the interior of the structure. Refrigerant and electrical line should be routed through suitably waterproofed openings to prevent water leaking into the structure.

INSTALLING THE INDOOR UNIT

The indoor section should be installed before proceeding with routing of refrigerant piping. Consult the Installation Instructions of the indoor unit (i.e.: air handler, furnace, etc.) for details regarding installation.

CONNECTING REFRIGERANT TUBING BETWEEN THE INDOOR AND OUTDOOR UNIT



CAUTION:

This system utilizes R-410A refrigerant with POE oil. When servicing, cover or seal openings to minimize the exposure of the refrigerant system to air to prevent accumulation of moisture and other contaminants.

General — Once outdoor and indoor unit placement has been determined, route refrigerant tubing between the equipment in accordance with sound installation practices. 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 and installation of a liquid line filter drier is recommended if cleanliness or adequacy of system evacuation is unknown or compromised. 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 so as 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. Consult long line application guide for installations in excess of these limits.

Filter Dryer Installation — 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 — Optional equipment (e.g.: liquid line solenoid valves, etc.) should be installed in strict accordance with the manufacturer's installation instructions.

ELECTRICAL CONNECTIONS



WARNING:

Turn off all electrical power at the main circuit box before wiring electrical power to the outdoor unit. Failure to comply may cause severe personnel injury or death.

Wiring Diagram/Schematic — A wiring diagram/schematic is located on the inside cover of the electrical box of the outdoor unit. The installer should become familiar with the wiring diagram/schematic before making any electrical connections to the outdoor unit.

Outdoor Unit Connections — The outdoor unit requires both power and control circuit electrical connections. Refer to the unit wiring diagram/schematic for identification and location of outdoor unit field wiring interfaces.

Control Circuit Wiring — The outdoor unit is designed to operate from a 24 VAC Class II control circuit. Control circuit wiring must comply with the current provisions of the “National Electrical Code” (ANSI/NFPA 70) and with applicable local codes having jurisdiction.

Thermostat connections should be made in accordance with the instructions supplied with the thermostat, and with the instructions supplied with the indoor equipment. A typical residential installation with a heat pump thermostat and air handler are shown below.

Electrical Power Wiring — Electrical power wiring must comply with the current provisions of the “National Electrical Code” (ANSI/NFPA 70) and with applicable local codes having jurisdiction. Use of rain tight conduit is recommended. Electrical conductors shall have minimum circuit ampacity in compliance with the outdoor unit rating label. The facility shall employ electrical circuit protection at a current rating no greater than that indicated on the outdoor unit rating label. Refer to the unit wiring diagram for connection details.

Minimum Circuit Ampacity — Electrical wiring to the equipment must be compatible and in compliance with the minimum circuit ampacity listed on the outdoor unit data label.

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

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

Maximum Fuse/Circuit Breaker Size — Circuit protection for the outdoor unit must be compatible with the maximum fuse/circuit breaker size listed on the outdoor unit data label.

Disconnect Switch — An electrically compatible disconnect switch must be within line of sight of the outdoor unit. This switch shall be capable of electrically de-energizing the outdoor unit.

Optional Equipment — Optional equipment requiring connection to the power or control circuits must be wired in strict accordance with current provisions of the “National Electrical Code” (ANSI/NFPA 70), with applicable local codes having jurisdiction, and the installation instructions provided with the equipment. Optional Equipment (e.g.: liquid line solenoid valves, hard start kits, low suction pressure cutout switch kit, high pressure cutout switch kit, refrigerant compressor crankcase heater, etc.) should be installed in strict accordance with the manufacturer’s installation instructions.

STARTUP AND CHECKOUT



WARNING:

Ensure electrical power to the unit is off prior to performing the following steps. Failure to do so may cause personal injury or death.

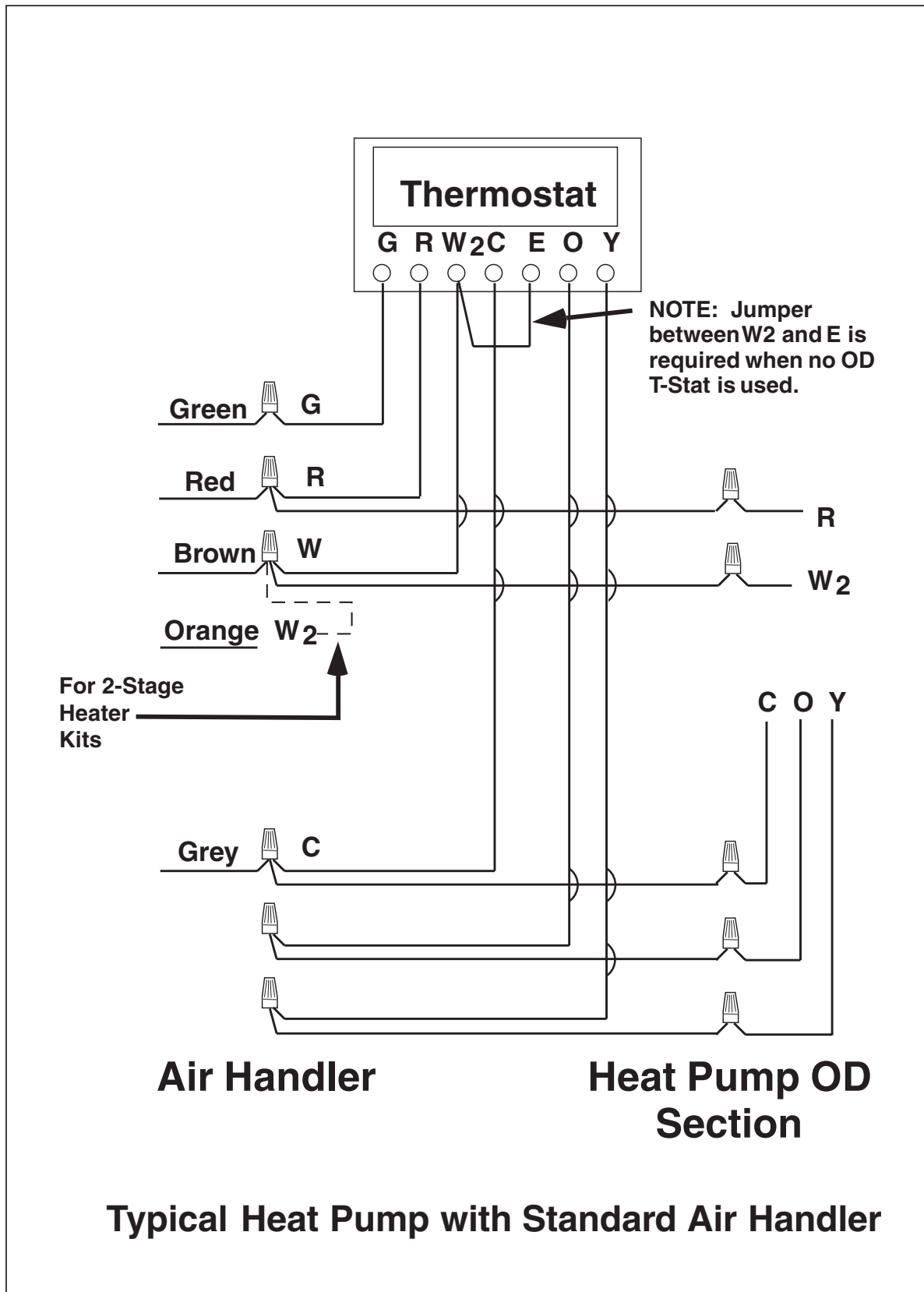
Air Filters — Ensure air filters are clean and in place prior to operating the equipment.

Thermostat — Set the room thermostat function switch to OFF, fan switch to AUTO, and adjust the temperature setpoint to its highest setting.

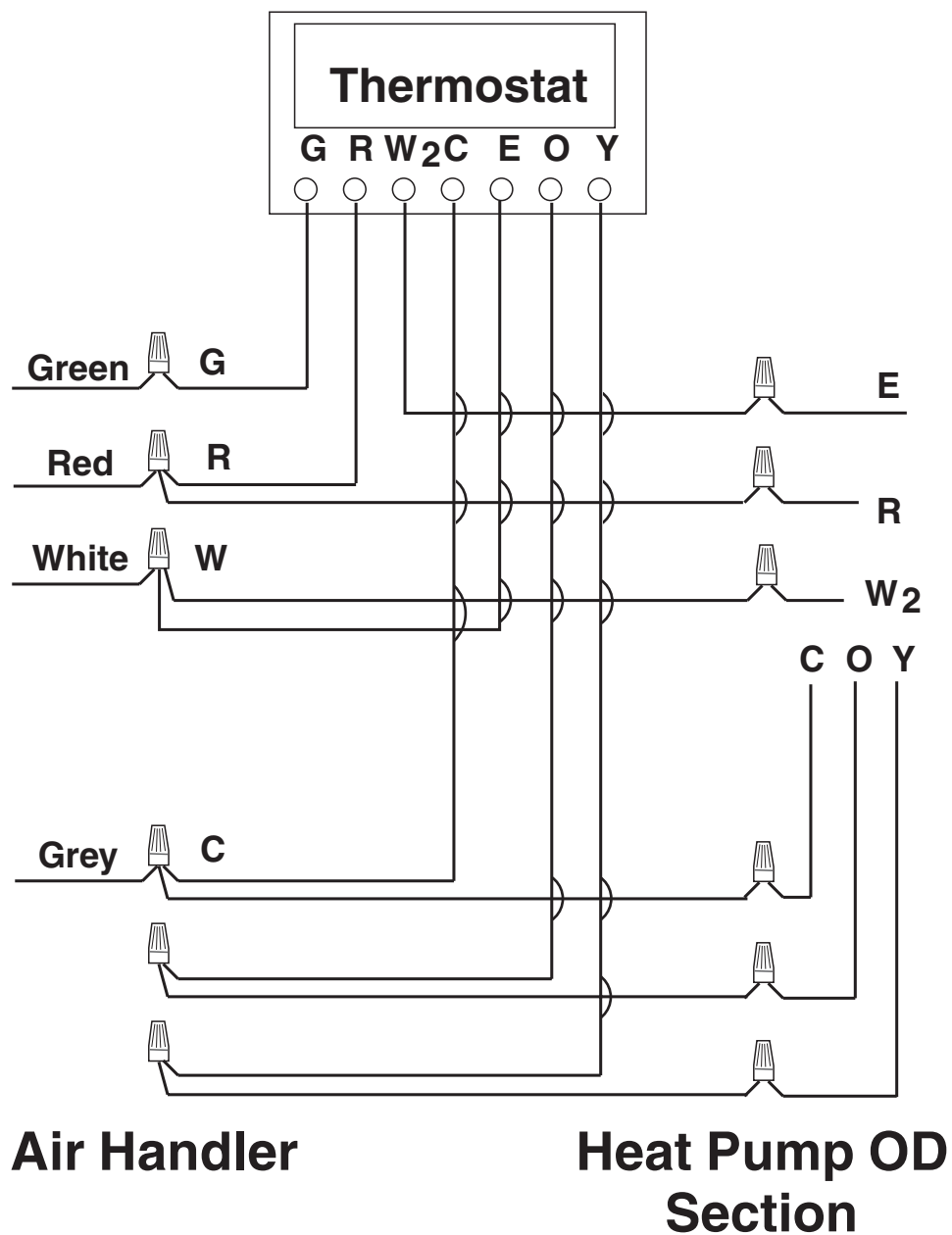
Prior to applying electrical power to the outdoor unit, ensure that the unit has been properly and securely grounded, and that power supply connections have been made at both the facility power interface and outdoor unit.

Outdoor Unit — Ensure the outdoor coil and top of the unit are free from obstructions and debris, and all equipment access/control panels are in place.

Using extreme caution, apply power to the unit and inspect the wiring for evidence of open, shorted, and/or improperly wired circuits.



A typical installation with a heat pump thermostat, air handler, and heat pump with an outdoor thermostat.



**Typical Heat Pump with
Outdoor Thermostat and Air Handler**

Functional Checkout:



CAUTION:

If equipped with a compressor crankcase heater, wait 24 hours prior to performing a function checkout to allow for heating of the compressor crankcase. Failure to comply may result in damage and could cause premature failure of the system.

Indoor Blower — Set the thermostat function switch to COOLING and the fan switch to ON. Verify that the indoor blower is operating and that airflow is not restricted. Set the fan switch back to AUTO.

Blower Time Delay Relay (Select Models): A time delay relay may be provided with the unit and must be installed in the indoor section. The relay will keep the indoor blower running an additional 40 seconds for increased cooling efficiency after the outdoor unit shuts off. The relay has four terminals and one mounting hole.

Connect terminal “1” to load side of blower relay. Connect terminal: “2” to terminal “R” of T’sat. Connect terminal “3” to common terminal at blower relay or transformer. Connect terminal “4” to terminal “G” on T’sat.

Low-Pressure Switch (Select Models) — A low-pressure switch is factory-installed in select models only. If provided, this switch is 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. Thus, when the switch opens and then closes, there will be a 5 minute short cycling delay before the outdoor unit will energize.

High-Pressure Switch — 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 discharge 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 will be a 5 minute short cycling delay before the outdoor unit will energize.

Short Cycle Protection — With the system operating in COOLING mode, note the setpoint temperature setting of the thermostat, and gradually raise the setpoint temperature until the outdoor unit and indoor blower de-energize. Immediately lower the setpoint temperature of the thermostat to its original setting and verify that the indoor blower is energized and that the outdoor unit remains de-energized. Verify that, after approximately 5 minutes, the outdoor unit energizes and that the temperature of the air supplied to the facility is cooler than ambient temperature.

Comfort Alert™ Diagnostics (Select Models)

— The Comfort Alert™ diagnostics module facilitates troubleshooting heat pump and air conditioning system failures. This Comfort Alert™ module is designed only for single-phase systems with scroll compressors that have internal overload protection. By monitoring and analyzing data from the compressor and the thermostat demand, the module can detect the cause of electrical and system related failures without any sensors. A flashing LED indicator communicates the ALERT code and guides the service technician more quickly and accurately to the root cause of a problem.

NOTE: This module does not provide safety protection! The Comfort Alert™ module is a monitoring device and cannot control or shut down other devices.

LED Description (See Figure 2)

POWERLED (Green): indicates voltage is present at the power connection of the module.

ALERT LED (Yellow): communicates an abnormal system condition through a unique flash code. The ALERT LED will flash a number of times consecutively, pause and then repeat the process. The number of consecutive flashes, defined as the Flash Code, correlates to a particular abnormal condition. Detailed descriptions of specific ALERT Flash Codes are shown in Table 1 of this manual.

TRIP LED (Red): indicates there is a demand signal from the thermostat but no current to the compressor is detected by the module. The TRIP LED typically indicates the compressor protector is open or may indicate missing supply power to the compressor.

The scroll compressor's run (R), common (C) and start (S) wires are routed through the holes in the Comfort Alert™ module marked "R," "C" and "S."

24 VAC Power Wiring — The Comfort Alert™ module requires a constant nominal 24 VAC power supply. The wiring to the module's R and C terminals must be directly from the indoor unit or thermostat.

The Comfort Alert™ module requires a thermostat demand signal to operate properly.

NOTE: After the thermostat demand signal is connected, verify that 24 VAC across Y and C when demand is present.

TROUBLESHOOTING

Interpreting The Diagnostic LEDs – When an abnormal system condition occurs, the Comfort Alert™ module displays the appropriate ALERT and/or TRIP LED will flash a number of

times consecutively, pause and then repeat the process. To identify a Flash Code number, count the number of consecutive flashes.

Every time the module powers up, the last ALERT Flash Code that occurred prior to shut down is displayed for one minute. The module will continue to display the LED until the condition returns to normal or if 24 VAC power is removed from the module.

Cooling — Gradually lower the thermostat temperature setpoint below the actual room temperature and observe that the outdoor unit and indoor blower energize. Feel the air being circulated by the indoor blower and verify that it is cooler than ambient temperature. Listen for any unusual noises. If present, locate and determine the source of the noise and correct as necessary.

Heating — Lower the thermostat setpoint temperature to the lowest obtainable setting and set the thermostat function switch to HEATING. The indoor blower and outdoor unit should stop running. After a minimum of five minutes, increase the setpoint temperature of the thermostat to the maximum setting. Verify that the outdoor unit and indoor blower have energized. Feel the air being circulated by the indoor blower and verify that it is warmer than ambient temperature. Listen

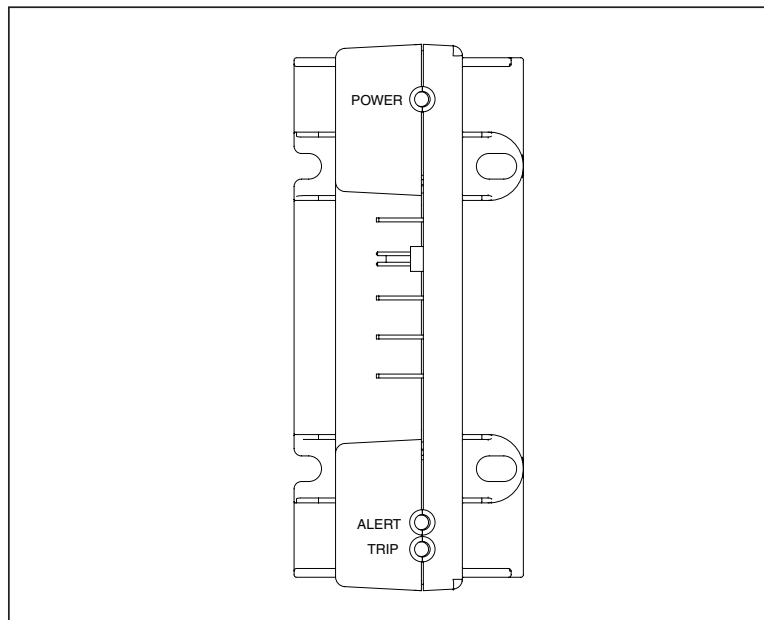


Figure 2. Comfort Alert™ Diagnostics Module

Status LED	Status LED Description	Status LED Troubleshooting Information
Green "POWER"	Module has power	Supply voltage is present at module terminals
Red "TRIP"	Thermostat demand signal Y is present, but the compressor is not running	1. Compressor protector is open 2. Outdoor unit power disconnect is open 3. Compressor circuit breaker or fuse(s) is open 4. Broken wire or connector is not making contact 5. Low pressure switch open if present in system 6. Compressor contactor has failed open
Yellow "ALERT" Flash Code 1	Long Run Time Compressor is running extremely long run cycles	1. Low refrigerant charge 2. Evaporator blower is not running 3. Evaporator coil is frozen 4. Faulty metering device 5. Condenser coil is dirty 6. Liquid line restriction (filter drier blocked if present in system) 7. Thermostat is malfunctioning 8. Comfort Alert Failure
Yellow "ALERT" Flash Code 2	System Pressure Trip Discharge or suction pressure out of limits or compressor overloaded	1. High head pressure 2. Condenser coil poor air circulation (dirty, blocked, damaged) 3. Condenser fan is not running 4. Return air duct has substantial leakage 5. If low pressure switch present in system, check Flash Code 1 information
Yellow "ALERT" Flash Code 3	Short Cycling Compressor is running only briefly	1. Thermostat demand signal is intermittent 2. Time delay relay or control board defective 3. If high pressure switch present go to Flash Code 2 information 4. If low pressure switch present go to Flash Code 1 information
Yellow "ALERT" Flash Code 4	Locked Rotor	1. Run capacitor has failed 2. Low line voltage (contact utility if voltage at disconnect is low) • Check wiring connections 3. Excessive liquid refrigerant in compressor 4. Compressor bearings are seized • Measure compressor oil level
Yellow "ALERT" Flash Code 5	Open Circuit	1. Outdoor unit power disconnect is open 2. Compressor circuit breaker or fuse(s) is open 3. Compressor contactor has failed open • Check compressor contactor wiring and connectors • Check for compressor contactor failure (burned, pitted or open) • Check wiring and connectors between supply and compressor • Check for low pilot voltage at compressor contactor coil 4. High pressure switch is open and requires manual reset 5. Open circuit in compressor supply wiring or connections 6. Unusually long compressor protector reset time due to extreme ambient temperature 7. Compressor windings are damaged • Check compressor motor winding resistance
Yellow "ALERT" Flash Code 6	Open Start Circuit Current only in run circuit	1. Run capacitor has failed 2. Open circuit in compressor start wiring or connections • Check wiring and connectors between supply and the compressor "S" terminal 3. Compressor start winding is damaged • Check compressor motor winding resistance
Yellow "ALERT" Flash Code 7	Open Run Circuit Current only in start circuit	1. Open circuit in compressor run wiring or connections • Check wiring and connectors between supply and the compressor "R" terminal 2. Compressor run winding is damaged • Check compressor motor winding resistance
Yellow "ALERT" Flash Code 8	Welded Contactor Compressor always runs	1. Compressor contactor has failed closed 2. Thermostat demand signal not connected to module
Yellow "ALERT" Flash Code 9	Low Voltage Control circuit < 17VAC	1. Control circuit transformer is overloaded 2. Low line voltage (contact utility if voltage at disconnect is low) • Check wiring connections

- Flash Code number corresponds to a number of LED flashes, followed by a pause and then repeated.
- TRIP and ALERT LEDs flashing at same time means control circuit voltage is too low for operation.

Table 1. Interpreting the Diagnostic LEDS

Miswired Module Indication	Recommended Troubleshooting Action
Green LED is not on, module does not power up	Determine if both R and C module terminals are connected. Verify voltage is present at module's R and C terminals. Review 24VAC Power Wiring (page 4) for R and C wiring.
Green LED intermittent, module powers up only when compressor runs	Determine if R and Y terminals are wired in reverse. Verify module's R and C terminals have a constant source. Review 24VAC Power Wiring (page 4) for R and C wiring.
TRIP LED is on but system and compressor check OK	Verify Y terminal is connected to 24VAC at contactor coil. Verify voltage at contactor coil falls below 0.5VAC when off. Verify 24 VAC is present across Y and C when thermostat demand signal is present. If not, R and C are reverse wired.
TRIP LED and ALERT LED flashing together	Verify R and C terminals are supplied with 19-28VAC.
ALERT Flash Code 3 (Compressor Short Cycling) displayed incorrectly	Verify Y terminal is connected to 24VAC at contactor coil. Verify voltage at contactor coil falls below 0.5VAC when off.
ALERT Flash Code 5, 6 or 7 (Open Circuit, Open Start Circuit or Open Run Circuit) displayed incorrectly	Check that compressor run and start wires are through module's current sensing holes. Verify Y terminal is connected to 24VAC at contactor coil. Verify voltage at contactor coil falls below 0.5VAC when off.
ALERT Flash Code 6 (Open Start Circuit) displayed for Code 7 (Open Run Circuit) or vice versa	Check that compressor run and start wires are routed through the correct module sensing holes.
ALERT Flash Code 8 (Welded Contactor) displayed incorrectly	Determine if module's Y terminal is connected. Verify Y terminal is connected to 24VAC at contactor coil. Verify 24VAC is present across Y and C when thermostat demand signal is present. If not, R and C are reverse wired. Verify voltage at contactor coil falls below 0.5VAC when off. Review Thermostat Demand Wiring (page 4) for Y and C wiring.

Table 2. Module Wiring Troubleshooting

for any unusual noises. If present, locate and determine the source of the noise and correct as necessary.

OUTDOOR THERMOSTAT (if supplied)

The outdoor thermostat prevents the electrical auxiliary heat (if used) from operating above a desired set point. Selection of the set point is determined from the building design heat load.

The thermostat is adjustable from 45°F to 0°F. The factory temperature setting is at 40°F.

Defrost Cycle Timer — The defrost cycle timer controls the time interval of the hot gas defrost after the defrost sensor closes. It is located in the lower left corner of the defrost control board. Three interval settings are available: 30 minutes, 60 minutes, and 90 minutes. Time setting selection is dependent on the climate where the unit is being installed.

Example 1. Dry climate of Southern Arizona. A 90 minute setting is recommended.

Example 2. Moist climate of Seattle, Washington. A 30 minute setting is recommended.

To set the cycle timer, place the timing pin on the defrost control board to the desired time interval post.

Note: All units are shipped from the factory with the default time setting of 30 minutes. Maximum heating performance can be achieved by setting the time to 90 minutes.

Defrost Test Procedure

1. Terminals "R"- "C" must have 18-30v present between them in order for time delay and defrost sequences to be initiated.

2. With compressor running in heat mode, first jump the “T2”-“DFT” test pins. This will indicate to board that defrost T-stat is closed. Defrost T-stat closes at 32°, opens at 68°.
3. Next jump the “Test” pin to “C” on terminal strip. This will initiate defrost test in 5, 10 or 15 seconds (This is determined by 30, 60 or 90 minutes defrost pin settings). Factory setting will be 30 minutes.
4. When the reversing valve shifts to the defrost mode, quickly remove jumper from “Test”-“C”. If the jumper is not removed within a 5 second period, the defrost test will terminate. Unit will continue to stay in defrost mode Until :
 - A) Board recognizes that defrost sensor has reached 68° and opened or
 - B) “T2”-“DFT” jumper is removed or
 - C) 10 minutes have elapsed (board override)

If the above steps will not initiate a defrost, replace the defrost board.

Anti Short Cycle Timer Test

The 5 minute time delay feature can be bypassed or shortened to 1 second by jumping the “Test” to “C” terminal.

Note: If jumper is left on the “Test” to “common” pins permanently, the defrost cycle will become inoperable.

Optional Equipment — A functional checkout should be performed in accordance with the checkout procedures supplied with the equipment.

Adjustment of Refrigerant Charge:



CAUTION:

Split system heat pump equipment contains liquid and gaseous refrigerant under pressure. Adjustment of refrigerant charge should only be attempted by qualified, trained personnel thoroughly familiar with the equipment. Under no circumstances should the homeowner attempt to install and/or service this equipment. Failure to comply with this warning could result in equipment damage, personal injury, or death.

NOTE: The following Refrigerant Charging Charts are applicable to listed assemblies of equipment and at listed airflows for the indoor coil. Assemblies of indoor coils and outdoor units not listed are not recommended.

14 SEER SPLIT SYSTEM HEAT PUMP ORIFICE USAGE

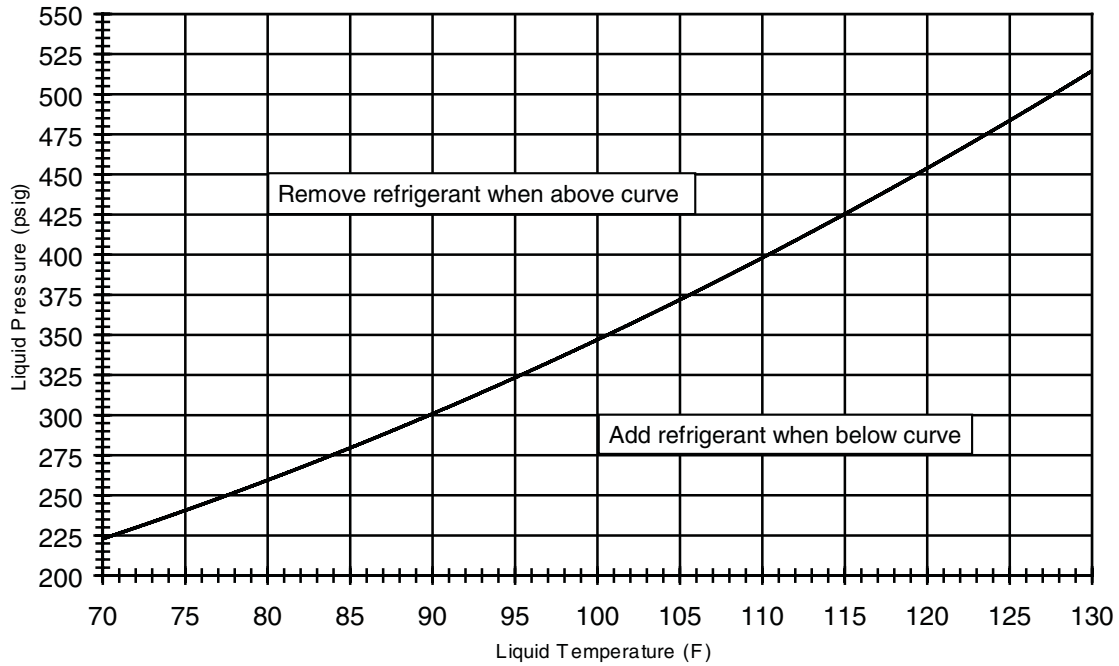
Model Number *T4BE	Restrictor Bore Size (in.)	System Charge R-410A (oz.)
	Outdoor	
018K	.037	166
024K	.041	166
030K	.041	168
036K	.055	174
042K	.055	256
048K	.062	246
060K	.067	230

NOTE: Indoor refrigerant metering device is TXV for all models.

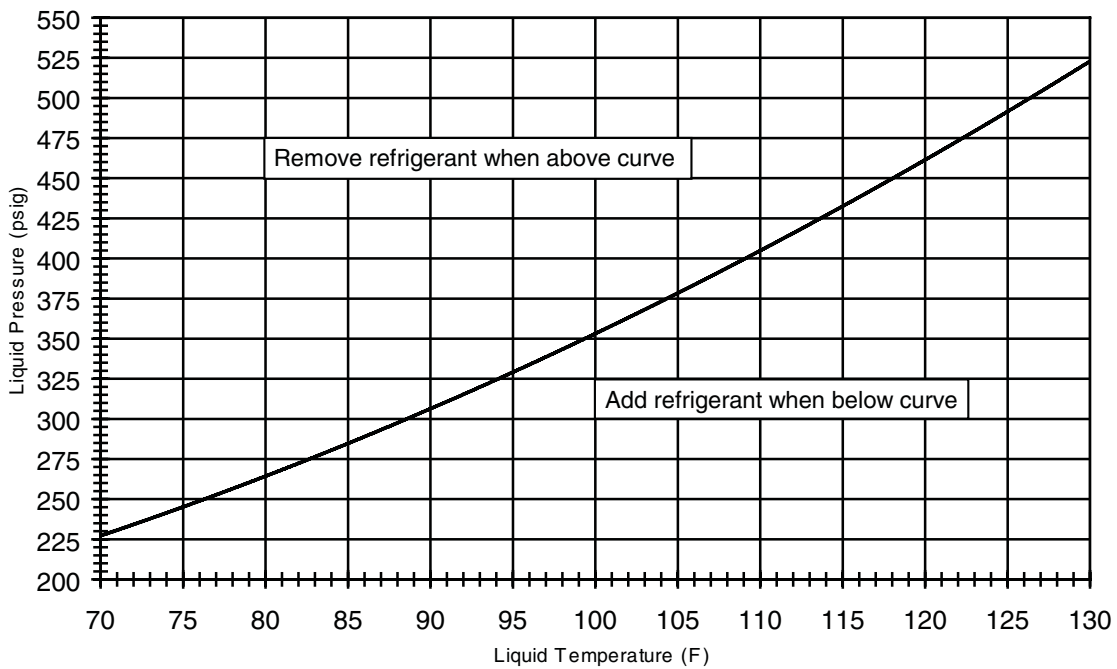
Refrigerant Charging Charts for Cooling Mode of Operation

14 SEER Split System Cooling Charts

1.5 Ton Heat Pump TXV Cooling Charging Chart



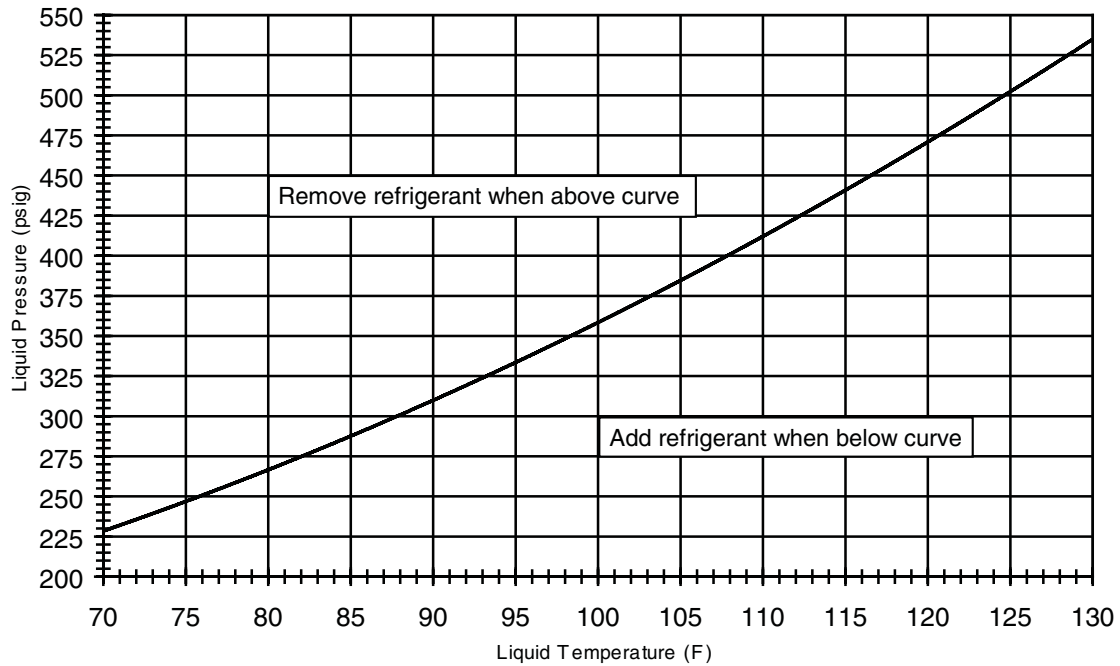
2 Ton Heat Pump TXV Cooling Charging Chart



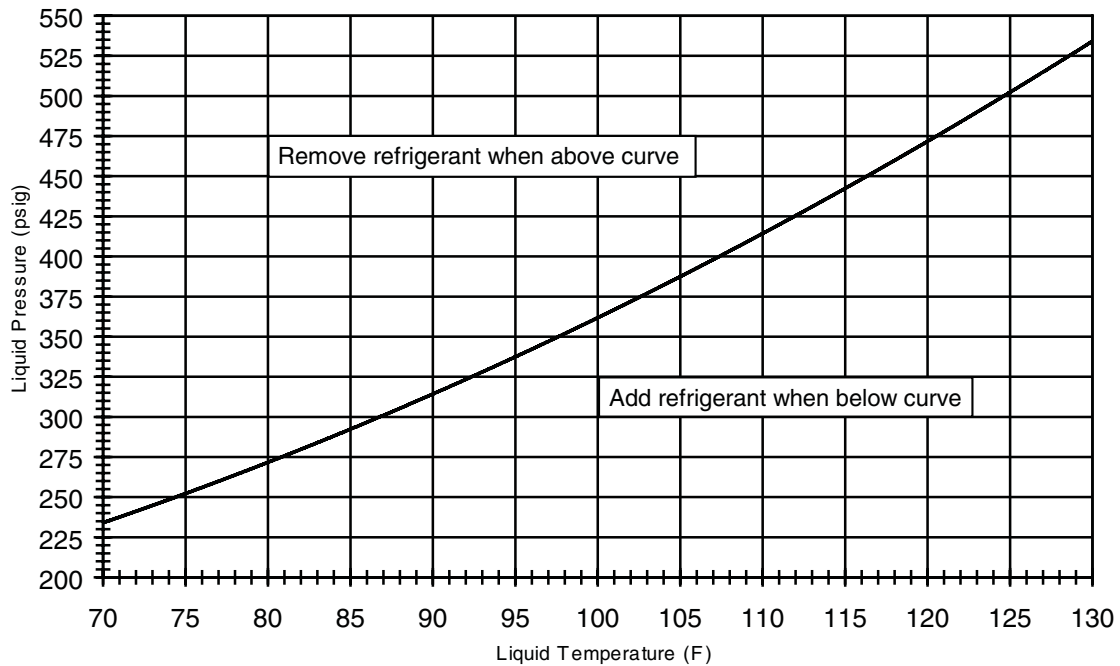
Refrigerant Charging Charts for Cooling Mode of Operation

14 SEER Split System Cooling Charts

2.5 Ton Heat Pump TXV Cooling Charging Chart



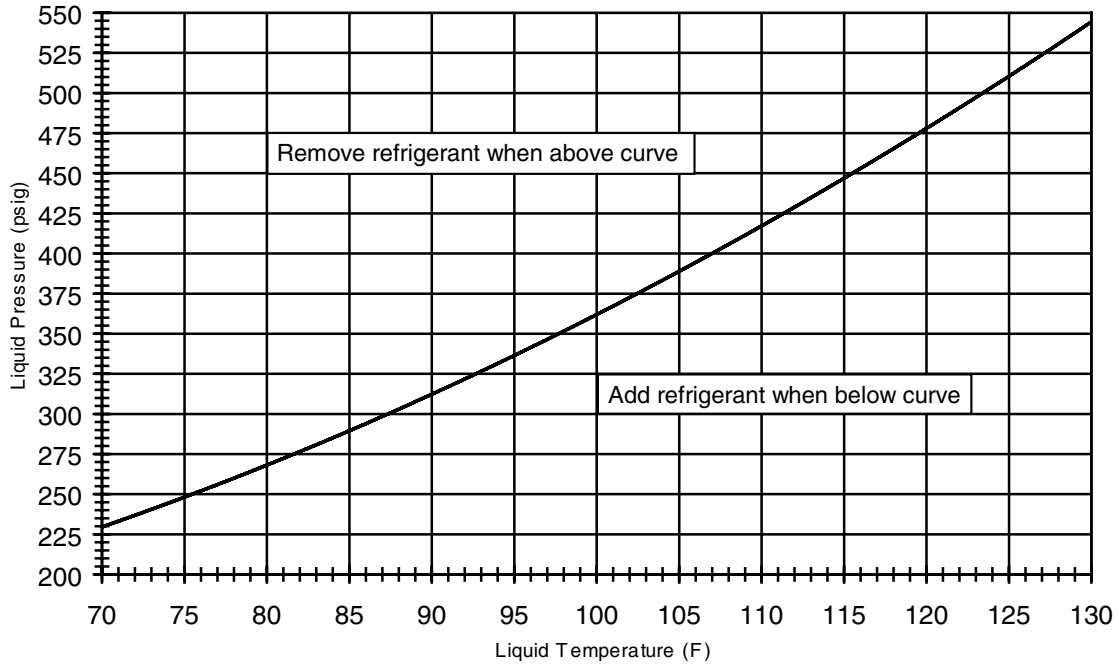
3 Ton Heat Pump TXV Cooling Charging Chart



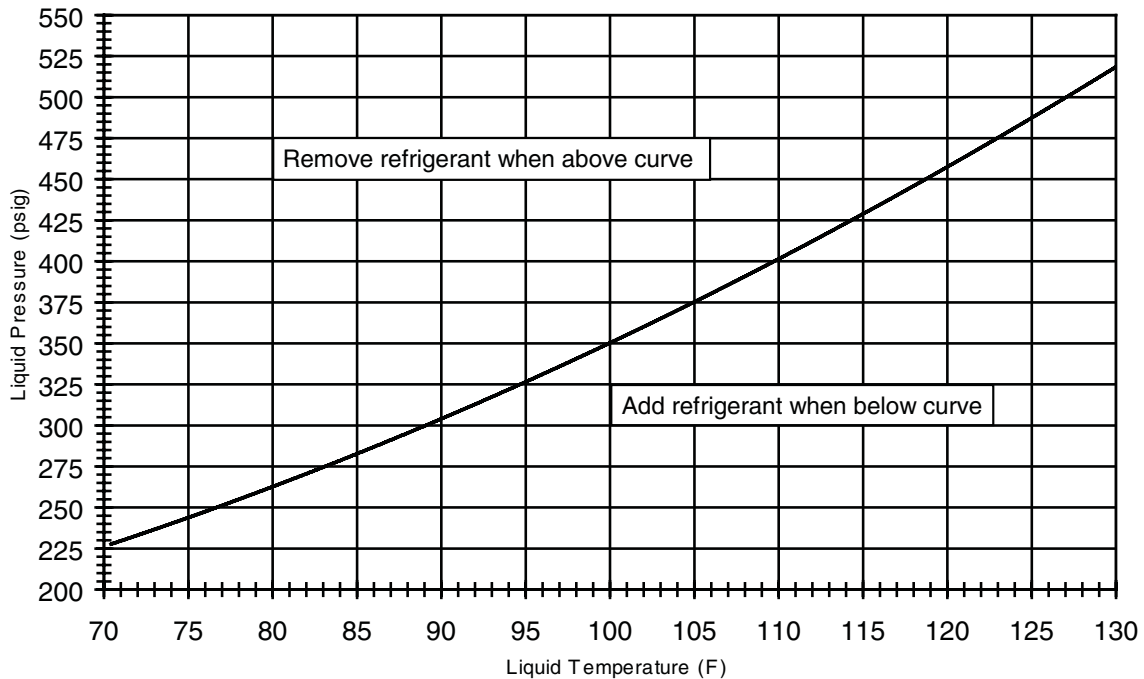
Refrigerant Charging Charts for Cooling Mode of Operation

14 SEER Split System Cooling Charts

3.5 Ton Heat Pump TXV Cooling Charging Chart



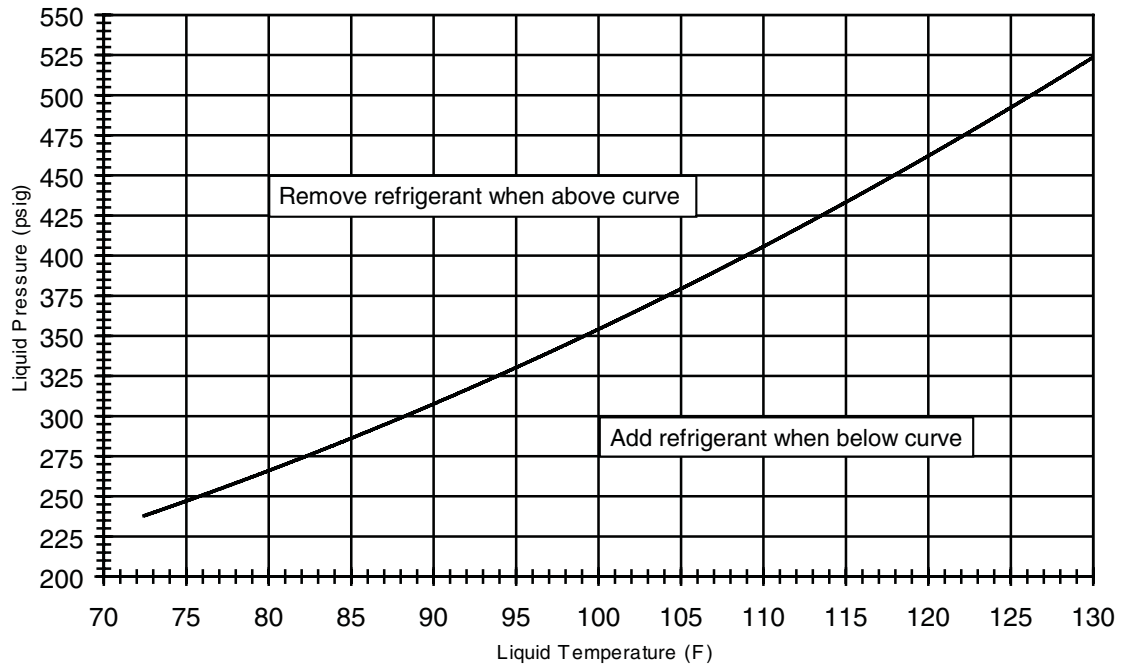
4 Ton Heat Pump TXV Cooling Charging Chart



Refrigerant Charging Charts for Cooling Mode of Operation

14 SEER Split System Cooling Charts

5 Ton Heat Pump TXV Cooling Charging Chart



Refrigerant Charging Charts for Heating Mode of Operation

REFRIGERANT CHARGING CHARTS LEGEND FOR HEATING MODES OF OPERATION

*Note: All pressures are listed in psig. and all temperatures in deg. F.

- Shaded boxes indicate flooded conditions

_____ - Rated design values. Suction Pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.

- Discharge temperatures greater than charted values indicates a refrigerant undercharge.

018K																								OUTDOOR TEMPERATURE (DEG. F)																	
0						10						20						30						40						50						60					
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.												
39	199	106	55	229	116	70	259	126	85	290	135	101	309	151	118	341	172	135	373	193																					
40	206	104	56	235	114	71	264	124	86	293	133	102	316	148	119	348	167	136	380	187																					
41	213	102	57	241	112	72	269	122	87	297	131	103	323	145	120	355	163	137	387	181																					
42	220	100	58	247	110	73	274	120	88	301	129	104	330	142	121	362	158	138	394	175																					
43	227	98	59	253	108	74	278	118	89	304	127	105	337	139	122	369	154	139	401	168																					
44	234	96	60	258	106	75	283	116	90	308	125	106	344	136	123	376	149	140	408	162																					
45	241	94	61	264	104	76	288	114	91	312	123	107	351	134	124	383	145	141	415	156																					

Refrigerant Charging Charts for Heating Mode of Operation

14 SEER Split System Heating Charts

OUTDOOR TEMPERATURE (DEG. F)														
0			10			20			30			40		
Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
39	209	117	53	242	124	68	276	132	82	309	139	98	333	155
40	216	115	54	248	122	69	280	130	83	312	137	99	340	153
41	223	113	55	254	120	70	285	128	84	316	135	100	347	150
42	230	111	56	260	118	71	290	126	85	320	133	101	354	147
43	237	109	57	266	116	72	295	124	86	323	131	102	361	144
44	244	107	58	272	114	73	299	122	87	327	129	103	368	141
45	251	105	59	278	112	74	304	120	88	331	127	104	375	138
50			60			70			80			90		
Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
126	371	180	135	408	204	136	415	198	137	422	192	138	429	186
139	392	166	141	436	180	142	443	174	143	450	167	144	457	161

OUTDOOR TEMPERATURE (DEG. F)														
0			10			20			30			40		
Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
36	198	114	51	237	124	65	276	135	80	315	145	95	343	162
37	205	112	52	243	122	66	281	133	81	319	143	96	350	159
38	212	110	53	249	120	67	286	131	82	322	141	97	357	156
39	219	108	54	255	118	68	290	129	83	326	139	98	364	153
40	226	106	55	261	116	69	295	127	84	330	137	99	371	150
41	233	104	56	266	114	70	300	125	85	333	135	100	378	147
42	240	102	57	272	112	71	305	123	86	337	133	101	385	145
50			60			70			80			90		
Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
126	382	183	126	422	205	127	429	199	128	436	193	129	443	187
139	399	165	131	450	181	140	457	174	141	464	168	142	471	161

Refrigerant Charging Charts for Heating Mode of Operation

14 SEER Split System Heating Charts

OUTDOOR TEMPERATURE (DEG. F)														
0			10			20			30			40		
Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
35	199	116	50	227	123	65	255	129	80	283	136	95	299	150
36	206	114	51	233	121	66	260	127	81	287	134	96	306	147
37	213	112	52	239	119	67	265	125	82	290	132	97	313	144
38	220	110	53	245	117	68	269	123	83	294	130	98	320	141
39	227	108	54	251	115	69	274	121	84	298	128	99	327	139
40	234	106	55	256	113	70	279	119	85	301	126	100	334	136
41	241	104	56	262	111	71	284	117	86	305	124	101	341	133
50			60			70			80			90		
Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
111	325	171	112	332	166	113	339	162	114	346	157	115	353	153
127	351	191	128	358	185	129	365	179	130	372	173	131	379	167
128	358	185	129	365	179	130	372	173	131	379	167	132	386	160
133	393	154	133	393	154	133	393	154	133	393	154	133	393	154

OUTDOOR TEMPERATURE (DEG. F)														
0			10			20			30			40		
Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
35	208	111	49	234	124	63	261	137	76	288	150	90	304	163
36	215	109	50	240	122	64	266	135	77	292	148	91	311	160
37	222	107	51	246	120	65	271	133	78	295	146	92	318	157
38	229	105	52	252	118	66	276	131	79	299	144	93	325	154
39	236	103	53	258	116	67	280	129	80	303	142	94	332	151
40	243	101	54	264	114	68	285	127	81	306	140	95	339	148
41	250	99	55	270	112	69	290	125	82	310	138	96	346	146
50			60			70			80			90		
Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
103	331	174	104	338	170	105	345	165	106	352	161	107	359	156
116	358	186	117	365	180	118	372	174	119	379	168	120	386	162
117	365	180	118	372	174	119	379	168	120	386	162	121	393	155
122	400	149	122	400	149	122	400	149	122	400	149	122	400	149

Refrigerant Charging Charts for Heating Mode of Operation

14 SEER Split System Heating Charts

048K																				
OUTDOOR TEMPERATURE (DEG. F)																				
0			10			20			30			40			50			60		
Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
37	217	126	50	237	133	62	256	141	75	276	148	88	283	158	101	302	170	114	322	183
38	224	124	51	243	131	63	261	139	76	279	146	89	290	155	102	309	166	115	329	177
39	231	122	52	248	129	64	266	137	77	283	144	90	297	152	103	316	161	116	336	170
40	238	120	53	254	127	65	270	135	78	287	142	91	304	149	104	323	157	117	343	164
41	245	118	54	260	125	66	275	133	79	290	140	92	311	146	105	330	152	118	350	158
42	252	116	55	266	123	67	280	131	80	294	138	93	318	143	106	337	148	119	357	152
43	259	114	56	272	121	68	285	129	81	298	136	94	325	141	107	344	143	120	364	146

060K																				
OUTDOOR TEMPERATURE (DEG. F)																				
0			10			20			30			40			50			60		
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
35	227	152	46	249	159	57	272	166	68	294	173	79	304	182	88	324	192	97	345	202
36	234	150	47	255	157	58	276	164	69	298	171	80	311	179	89	331	187	98	352	195
37	241	148	48	261	155	59	281	162	70	301	169	81	318	176	90	338	183	99	359	189
38	248	146	49	267	153	60	286	160	71	305	167	82	325	173	91	345	178	100	366	183
39	255	144	50	273	151	61	291	158	72	309	165	83	332	170	92	352	174	101	373	177
40	262	142	51	279	149	62	296	156	73	312	163	84	339	168	93	359	169	102	380	171
41	269	140	52	285	147	63	300	154	74	316	161	85	346	165	94	366	165	103	387	165

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