

# USER'S MANUAL / INSTALLATION INSTRUCTIONS

<b>USER INFORMATION</b>		<b>STARTUP &amp; ADJUSTMENTS</b> ..... 6
<b>IMPORTANT SAFETY INFORMATION</b> ..... 2		Pre - Start Checklist ..... 6
<b>OPERATING INSTRUCTIONS</b> ..... 2		Start-up Procedures..... 6
Cooling Operation ..... 2		Air Circulation - Indoor Blower ..... 9
Heating Operation ..... 2		System Cooling ..... 7
Operating the Air Conditioner for Automatic		System Heating..... 7
Cooling & Heating ..... 2		<b>REFRIGERANT CHARGING</b> ..... 7
Operating the Indoor Blower Continuously ..... 2		Charging R-22 Units in AC Mode with
Turning the Air Conditioner Off..... 2		Outdoor Temperatures Above 55° F..... 7
<b>AIR CONDITIONER MAINTENANCE</b> ..... 2		<b>AIR CONDITIONER MAINTENANCE</b> ..... 8
<b>TROUBLESHOOTING</b> ..... 2		<b>REPLACEMENT PARTS</b> ..... 8
<b>INSTALLER INFORMATION</b>		<b>FIGURES &amp; TABLES</b> ..... 9
<b>IMPORTANT SAFETY INFORMATION</b> ..... 3		Figure 3. Unit Dimensions ..... 9
<b>AIR CONDITIONER INSTALLATION</b> ..... 4		Refrigerant Charging Charts ..... 9
General Information ..... 4		Figure 4. Charging Chart for 1.5 Ton Units..... 9
Before You Install this Unit..... 4		Figure 5. Charging Chart for 2 Ton Units ..... 10
Locating the Air Conditioner..... 4		Figure 6. Charging Chart for 2.5 Ton Units ..... 10
Packaging Removal ..... 4		Figure 7. Charging Chart for 3 Ton Units ..... 11
Ground Level..... 4		Figure 8. Charging Chart for 3.5 Ton Units..... 11
Connecting Refrigerant Tubing between the		Figure 9. Charging Chart for 4 Ton Units..... 12
Indoor & Outdoor Unit ..... 5		Figure 10. Charging Chart for 5 Ton Units..... 12
<b>ELECTRICAL WIRING</b> ..... 5		Refrigerant Charging Tables..... 13
Pre - Electrical Checklist ..... 5		Table 4. Charging Table for 1.5 Ton Units ..... 13
Line Voltage..... 5		Table 5. Charging Table for 2 Ton Units ..... 13
Grounding ..... 6		Table 6. Charging Table for 2.5 Ton Units ..... 14
Thermostat Connections..... 6		Table 7. Charging Table for 3 Ton Units ..... 14
Positive Temp. Coefficient Resistor (PTCR) ..... 6		Table 8. Charging Table for 3.5 Ton Units ..... 15
		Table 9. Charging Table for 4 Ton Units ..... 15
		Table 10. Charging Table for 5 Ton Units ..... 16
		Electrical Information ..... 16
		Table 18. Electrical Specs & Physical Data ..... 16
		Figure 11. Wiring Diagram..... 17
		<b>INSTALL. / PERFORMANCE CHECKLIST</b> ..... 20

## IMPORTANT

### ATTENTION INSTALLERS:

It is your responsibility to know this product better than your customer. This includes being able to install the product according to strict safety guidelines and instructing the customer on how to operate and maintain the equipment for the life of the product. Safety should always be the deciding factor when installing this product and using common sense plays an important role as well. Pay attention to all safety warnings and any other special notes highlighted in the manual. Improper installation of the furnace or failure to follow safety warnings could result in serious injury, death, or property damage.

These instructions are primarily intended to assist qualified individuals experienced in the proper installation of this appliance. Some local codes require licensed installation/service personnel for this type of equipment. Please read all instructions carefully before starting the installation. Return these instructions to the customer's package for future reference.

**DO NOT DESTROY. PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.**

# USER INFORMATION

## IMPORTANT SAFETY INFORMATION

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.

## OPERATING INSTRUCTIONS

**NOTE:** Thermostat styles vary. Some models may not include the AUTO mode and others will have the AUTO in place of the HEAT and COOL. Others may include all three. Please refer to the thermostat manufacturer's User manual for detailed programming instructions.

### Cooling Operation

1. Set the thermostat's system mode to COOL or AUTO and change the fan mode to AUTO. See Figure 1.
2. Set the temperature selector to the desired temperature level. The outdoor fan, compressor, and blower motor will all cycle on and off to maintain the indoor temperature at the desired cooling level.

**NOTE:** If the temperature level is re-adjusted, or the system mode is reset, the fan and compressor in the outdoor unit may not start immediately. A protective timer circuit holds the compressor and the outdoor fan off for approximately 5 minutes following a previous operation or the interruption of the main electrical power (if applicable).

### Heating Operation

1. Set the thermostat's system mode to HEAT or AUTO and change the fan mode to AUTO. See Figure 1.
2. Set the temperature selector to the desired temperature level. The optional heating equipment (furnace or electric heat) will cycle on & off to maintain the indoor temperature at the desired temperature level.

### Operating the AC for Automatic Cooling & Heating

1. Set the thermostat system mode to AUTO and the thermostat fan mode to AUTO. See Figure 1.
2. Set the thermostat temperature selector to the desired temperature level. The thermostat will maintain the desired temperature level by switching between either the outdoor cooling unit or the indoor heating unit (furnace or electric heat) automatically.

### Operating the Indoor Blower Continuously

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

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

### Turning the Air Conditioner OFF

Change the thermostat's system mode to OFF and the fan mode to AUTO (See Figure 1). **NOTE:** The system will not operate, regardless of the temperature selector setting.

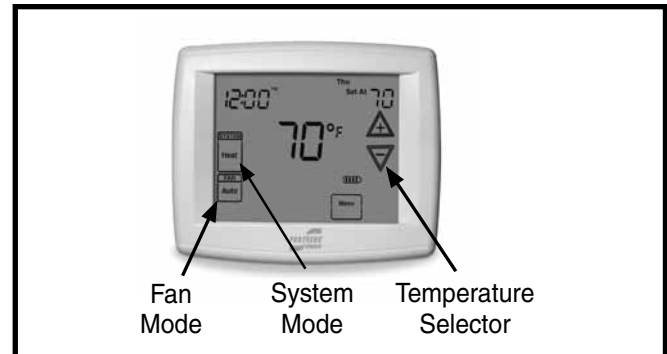


Figure 1. Digital Thermostat

## AIR CONDITIONER MAINTENANCE

Proper maintenance is most important to achieve the best performance from the appliance and should be performed frequently at the beginning of each air conditioning season.

## **WARNING:**

**Your air conditioner contains liquid and gaseous refrigerant under pressure. Installation and servicing should only be attempted by qualified, trained personnel thoroughly familiar with the equipment and safe responsible refrigerant handling procedures. Failure to comply with this warning could result in equipment damage, personal injury, or death.**

- Keep the outdoor unit clean. Hose off periodically and keep unit fins clear of leaves and grass clippings.
- Keep the outdoor unit clear of obstructions. DO NOT obstruct airflow with tall plants or shrubs. DO NOT store gasoline or other flammable materials on or near the outdoor unit.
- Never operate the appliance without a filter installed in the return air duct. Inspect filters frequently and replace when necessary with filter of same dimensional size.

## TROUBLESHOOTING

- Check the thermostat setting. Make sure the system mode and temperature settings are correct.
- Check the electrical panel for tripped circuit breakers.
- Check the filters for dust accumulation.
- Check the outdoor unit and make sure it is clean and not covered with grass or leaves.

# INSTALLER INFORMATION

## IMPORTANT SAFETY INFORMATION

INSTALLER: Please read all instructions before servicing this equipment. Pay attention to all safety warnings and any other special notes highlighted in the manual. Safety markings are used frequently throughout this manual to designate a degree or level of seriousness and should not be ignored. **WARNING** indicates a potentially hazardous situation that if not avoided, could result in personal injury or death. **CAUTION** indicates a potentially hazardous situation that if not avoided, may result in minor or moderate injury or property damage.

### **WARNING:**

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

### **WARNING:**

Unless noted otherwise in these instructions, only factory authorized parts or accessory kits may be used with this product. Improper installation, service, adjustment, or maintenance may cause explosion, fire, electrical shock or other hazardous conditions which may result in personal injury or property damage

### **WARNING:**

This split system air conditioner left the factory with a nitrogen holding charge. Follow all charging instructions for maximum unit performance and efficiency. Some local codes require licensed installation/service personnel to service this type of equipment. Refrigerant charging must be done by qualified personnel familiar with safe and environmentally responsible refrigerant handling procedures. 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-22 refrigerant. DO NOT use any other refrigerant in this unit. Use of another refrigerant will damage the unit.

### **WARNING:**

The information listed below must be followed during the installation, service, and operation of this unit. Unqualified individuals should not attempt to interpret these instructions or install this equipment. 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 CI) for special installation requirements.
- All electrical wiring must be completed in accordance with local, state and national codes and regulations and with the National Electric Code (ANSI/NFPA 70) or in Canada the Canadian Electric Code Part 1 CSA C.22.1.
- This equipment contains liquid and gaseous refrigerant under high pressure. DO NOT USE ANY PORTION OF THE CHARGE FOR PURGING OR LEAK TESTING. Installation or servicing should only be performed by qualified trained personnel thoroughly familiar with this type equipment.
- Fully annealed, refrigerant grade copper tubing should be used when installing the system. Refrigerant suction line tubing should be fully insulated.
- Installation of equipment may require brazing operations. Installer must comply with safety codes and wear appropriate safety equipment (safety glasses, work gloves, fire extinguisher, etc.) when performing brazing operations.
- Follow all precautions in the literature, on tags, and on labels provided with the equipment. Read and thoroughly understand the instructions provided with the equipment prior to performing the installation and operational checkout of the equipment.

## AIR CONDITIONER INSTALLATION

### General Information

Split system air conditioners 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.

### Before You Install this Unit

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

### Locating the Air Conditioner

- Survey the job site to determine the best location for mounting the outdoor unit. See Figure 3 (page 9) for unit dimensions.
- Overhead obstructions (Figure 2), 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 2 for minimum clearances to obstructions.
- Consideration should be given to availability of electric power, service access, noise, and shade.

### Packaging Removal

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

### Ground Level

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

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

### Roof Mount

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

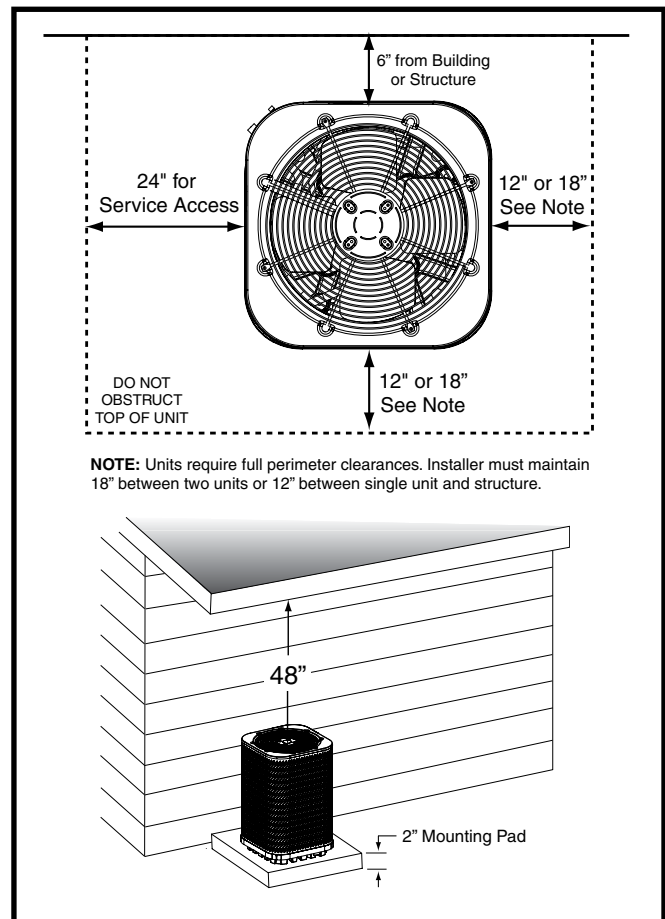


Figure 2. Clearance Requirements

## Connecting Refrigerant Tubing Between the Indoor & Outdoor Unit

### **CAUTION:**

**This system uses R-22 refrigerant which may contain 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. See page 8 for additional info.**

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 to prevent internal oxidation and scaling.
- Refrigerant tubing should be routed in a manner that minimizes the length of tubing and the number of bends in the tubing. If precise forming of refrigerant lines is required, a copper tubing bender is recommended. Avoid sharp bends and contact of the refrigerant lines with metal surfaces.
- Refrigerant tubing should be supported in a manner that the tubing will not vibrate or abrade during system operation.
- Tubing should be kept clean of foreign debris during installation.
- Every effort should be made by the installer to ensure that the field installed refrigerant containing components of the system have been installed in accordance with these instructions and sound installation practices to insure reliable system operation and longevity.
- The maximum recommended interconnecting refrigerant line lengths is 75 ft. and the vertical elevation difference between the indoor and outdoor sections should not exceed 20 ft.

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

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

**Table 1. Copper Wire Size**

- To maintain the unit's warranty, it is required that a filter drier be installed when the system is open to the atmosphere. This includes, but is not limited to, replacing the evaporator and/or condenser of a system. The filter drier 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.

## 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. See Table 11 (page 16).
- ✓ Verify that the service provided by the utility is sufficient to handle the additional load imposed by this equipment. Refer to the unit wiring label for proper voltage wiring.
- ✓ Verify factory wiring is in accordance with the unit wiring diagram (Figure 11, page 17). 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 diagram / schematic for identification and location of outdoor unit field wiring interfaces (Figure 11, page 17). 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 (page 5). Use proper code agency listed conduit and a conduit connector for connecting the supply wires to the unit. Use of rain tight conduit is recommended.
- 208/230 Volt units are shipped from the factory wired for 230 volt operation. For 208V operation, remove the lead from the transformer terminal marked 240V and connect it to the terminal marked 208V.
- Optional equipment requiring connection to the power or control circuits must be wired in strict accordance of the NEC (ANSI/NFPA 70), applicable local codes, and the instructions provided with the equipment.

### 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	Recommended T-Stat Wire Unit to T-Stat (Length in FT)	
	2-Wire (Heating)	5-Wire (Heating/Cooling)
24	55	25
22	90	45
20	140	70
18	225	110

**Table 2. Thermostat Wire Gauge**

### Thermostat Connections

- Thermostat connections should be made in accordance with the instructions supplied with the thermostat and the indoor equipment.
- The outdoor unit is designed to operate from a 24 VAC Class II control circuit. The control circuit wiring must comply with the current provisions of the NEC (ANSI/NFPA 70) and with applicable local codes having jurisdiction.
- The low voltage wires must be properly connected to the units low voltage terminal block. Recommended wire gauge and wire lengths for typical thermostat connections are listed in Table 2.
- The thermostat should be mounted about 5 feet above the floor on an inside wall. DO NOT install the thermostat on an outside wall or any other location where its operation may be adversely affected by radiant heat from fireplaces, sunlight, or lighting fixtures, and convective heat from warm air registers or electrical appliances. Refer to the thermostat manufacturer's instruction sheet for detailed mounting and installation information.

## START UP & ADJUSTMENTS

### Pre-Start Check List

- ✓ Verify the indoor unit is level and allows proper condensate drainage.
- ✓ Verify the outdoor coil and top of the unit are free from obstructions and debris, and all equipment access/control panels are in place.
- ✓ Verify air filters are cleaned and properly installed.
- ✓ Verify duct work is sealed to prevent air leakage.
- ✓ Verify line voltage power leads are securely connected and the unit is properly grounded.
- ✓ Verify low voltage wires are securely connected to the correct leads on the low voltage terminal strip.
- ✓ Verify power supply branch circuit overcurrent protection is sized properly.
- ✓ Verify the thermostat is wired correctly.

### Start-Up Procedures

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

### Air Circulation - Indoor Blower

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

### System Cooling

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

### System Heating (optional)

1. Set the thermostat's system mode to HEAT and the temperature mode above room temperature.
2. Verify the optional heating equipment (furnace or electric heat) and indoor blower energize. Feel the air being circulated by the indoor blower and verify that it is warmer than ambient temperature. Listen for any unusual noises. If unusual sounds occur, determine the source of the noise and correct as necessary.

### Refrigerant Charging

## **WARNING:**

**This split system air conditioner left the factory with a nitrogen holding charge. DO NOT operate any unit while it contains a Nitrogen holding charge. Doing so may damage the units compressor. Follow these charging instructions for maximum unit performance and efficiency. Some local codes require licensed installation/service personnel to service this type of equipment. Refrigerant charging must be done by qualified personnel familiar with safe and environmentally responsible refrigerant handling procedures. 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.**

This unit may contain a compressor with POE oil. If the compressor model contains an E before the first hyphen, then it is a POE oil compressor. If it does not then it is a mineral oil compressor. (Example: ZR42K5E-PFV-130 is a POE oil compressor, while ZR42K5-PFV-130 is a mineral oil compressor).

To properly charge these units:

1. Read all Installation Instructions first.
2. Complete any brazing operations. (e.g. Split system line-sets)

3. Leak check and evacuate the whole system using proper methods.
  4. Purge the nitrogen holding charge.
  5. Evacuate the unit to 350-500 microns.
  6. Allow the unit to remain under vacuum for at least 30 min.
  7. Weigh-In the proper amount of new (or reclaimed) R-22 refrigerant. Refer to Table 3 or the units rating label to determine the correct amount of charge.
- Refrigerant charging charts are applicable only to matched assemblies of this equipment and listed airflows for the indoor coil. Refer to Figures 4 - 10 (Pages 9 - 12) for correct system charging.
  - Outdoor units with indoor coils not listed are not recommended. Deviations from rated airflows or non-listed combinations may require modification to the expansion device and refrigerant charging procedures for proper and efficient system operation.
  - The refrigerant charge can be checked and adjusted through the service ports provided external to the outdoor unit. Use only gage line sets which have a "Schrader" depression device present to actuate the valve.

### Charging an R-22 system 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. Refer to Tables 4 - 10 (pages 13 - 16) for correct system charging.
- 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.

Model Number	Restrictor Bore Size (inches)	System charge R-22 (oz.)
018KA	0.053	78
024KB	0.060	53
030KB	0.065	56
036KB	0.075	68
042KA	0.078	122
048KA	0.089	126
060KA	0.099	160

**Table 3. Refrigerant Metering Device for 13 SEER Split System Air Conditioner**

## AIR CONDITIONER MAINTENANCE

### **WARNING:**

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

Proper maintenance is important to achieve optimum performance from the air conditioner. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. If you do not possess these skills, contact your dealer for maintenance. Consult your local dealer about the availability of maintenance contracts. Routine maintenance should include the following:

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

### **CAUTION:**

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

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

### **REPLACEMENT PARTS**

Replacement parts are available through your distributor. Please have the complete model and serial number of the unit when ordering replacement parts.

#### **ELECTRICAL:**

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

#### **MOTORS:**

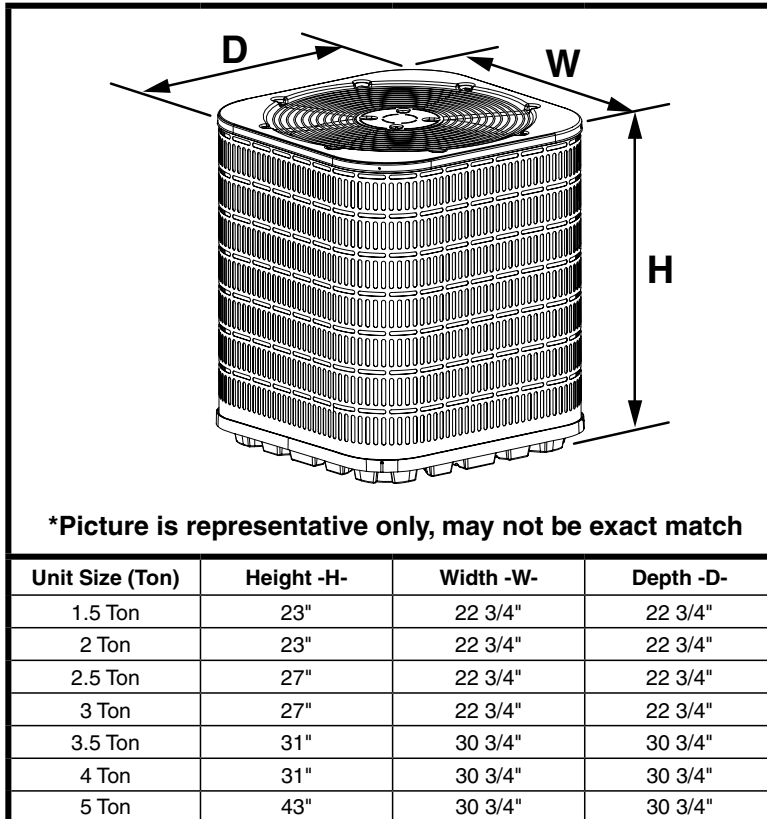
Blower Motor	Fan Motor
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#### **COMPONENTS:**

Blower Assembly	Fan Grille
Cabinet Panels	Filter/Driers
Expansion Valves	

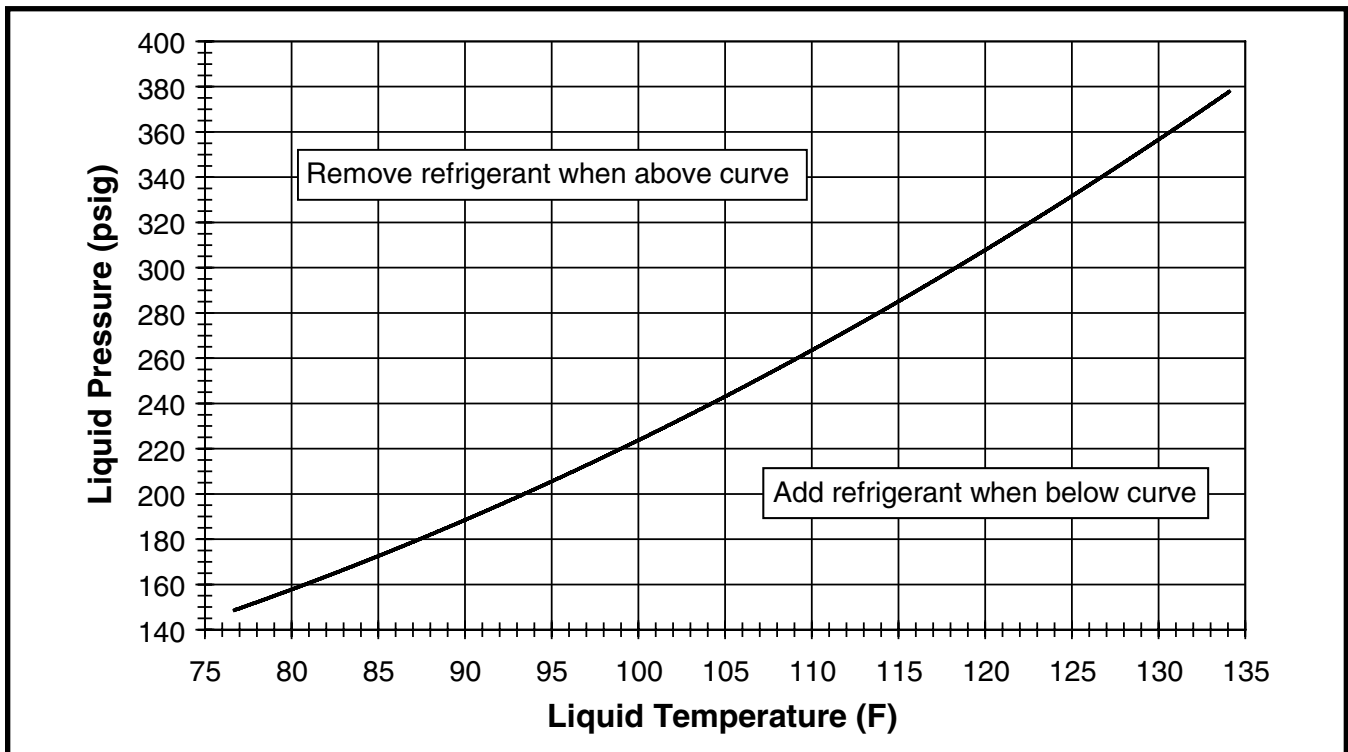


## FIGURES & TABLES



**Figure 3. Unit Dimensions**

## TXV COOLING CHARGING CHARTS



**Figure 4. Charging Chart for 1.5 Ton Units**

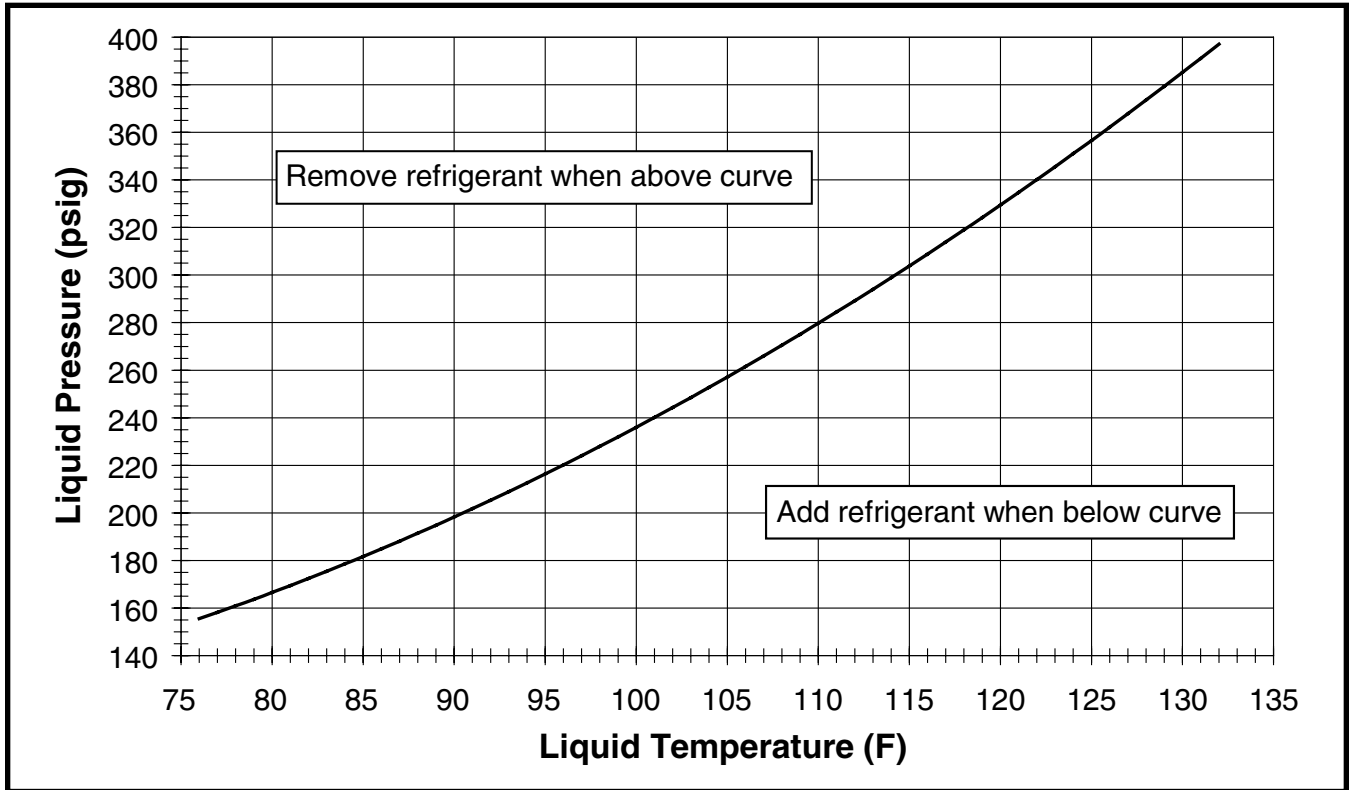


Figure 5. Charging Chart for 2 Ton Units (with Microchannel Coil)

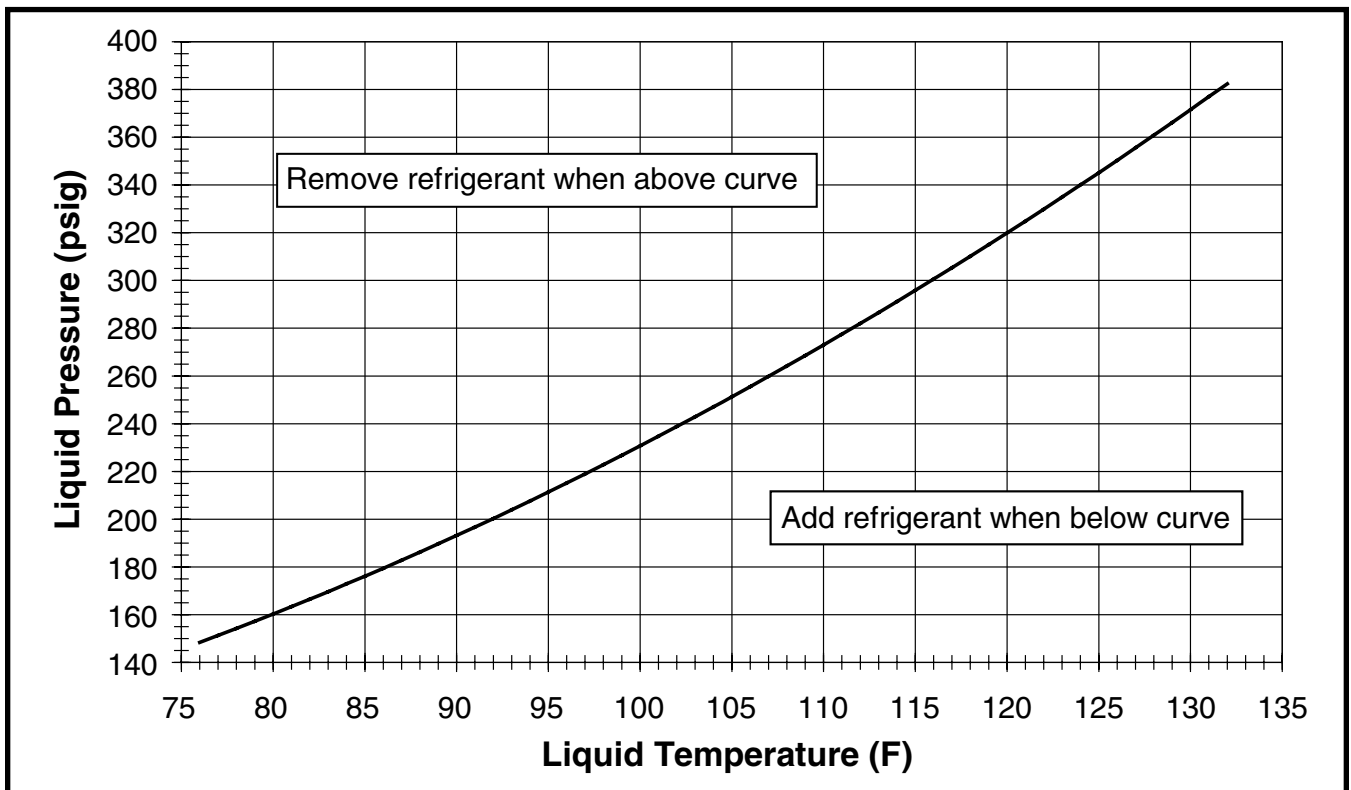


Figure 6. Charging Chart for 2.5 Ton Units (with Microchannel Coil)

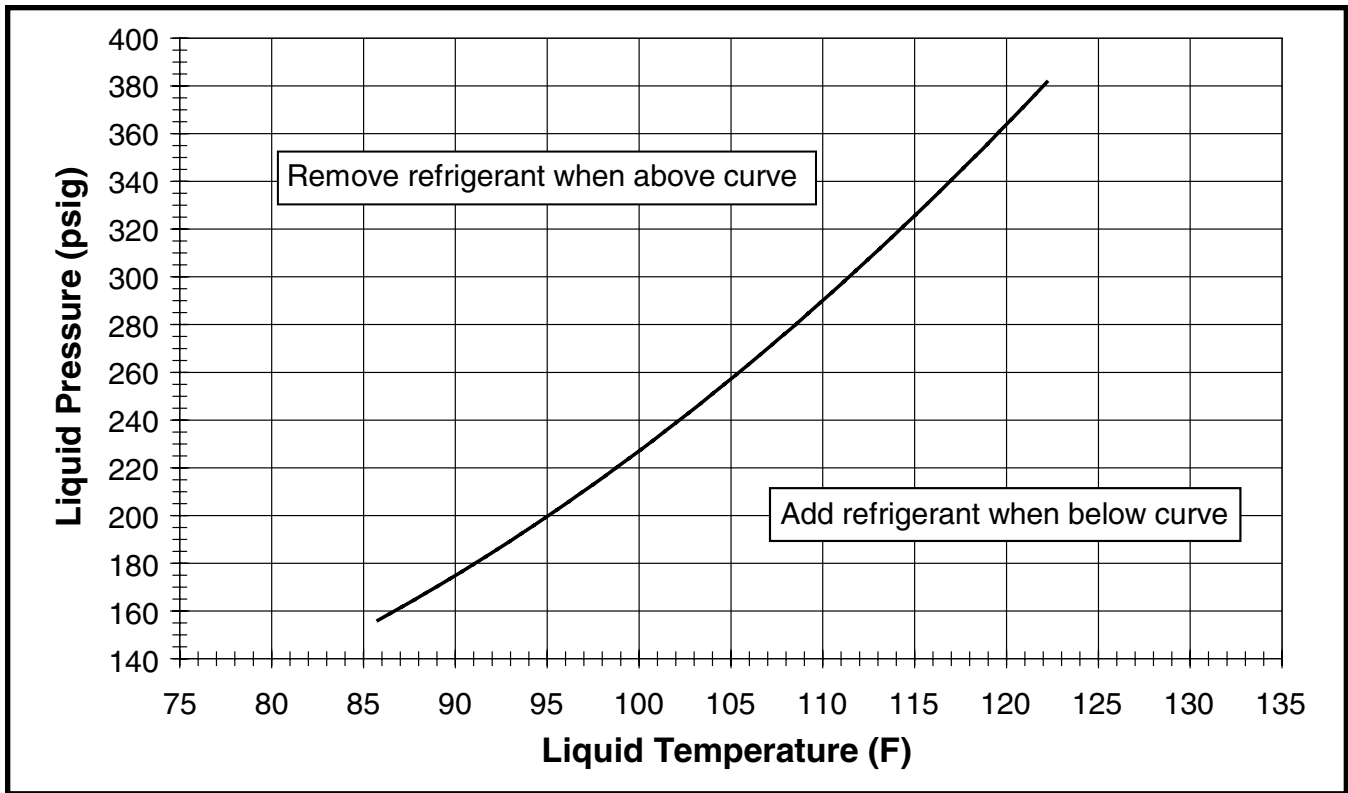


Figure 7. Charging Chart for 3 Ton Units (with Microchannel Coil)

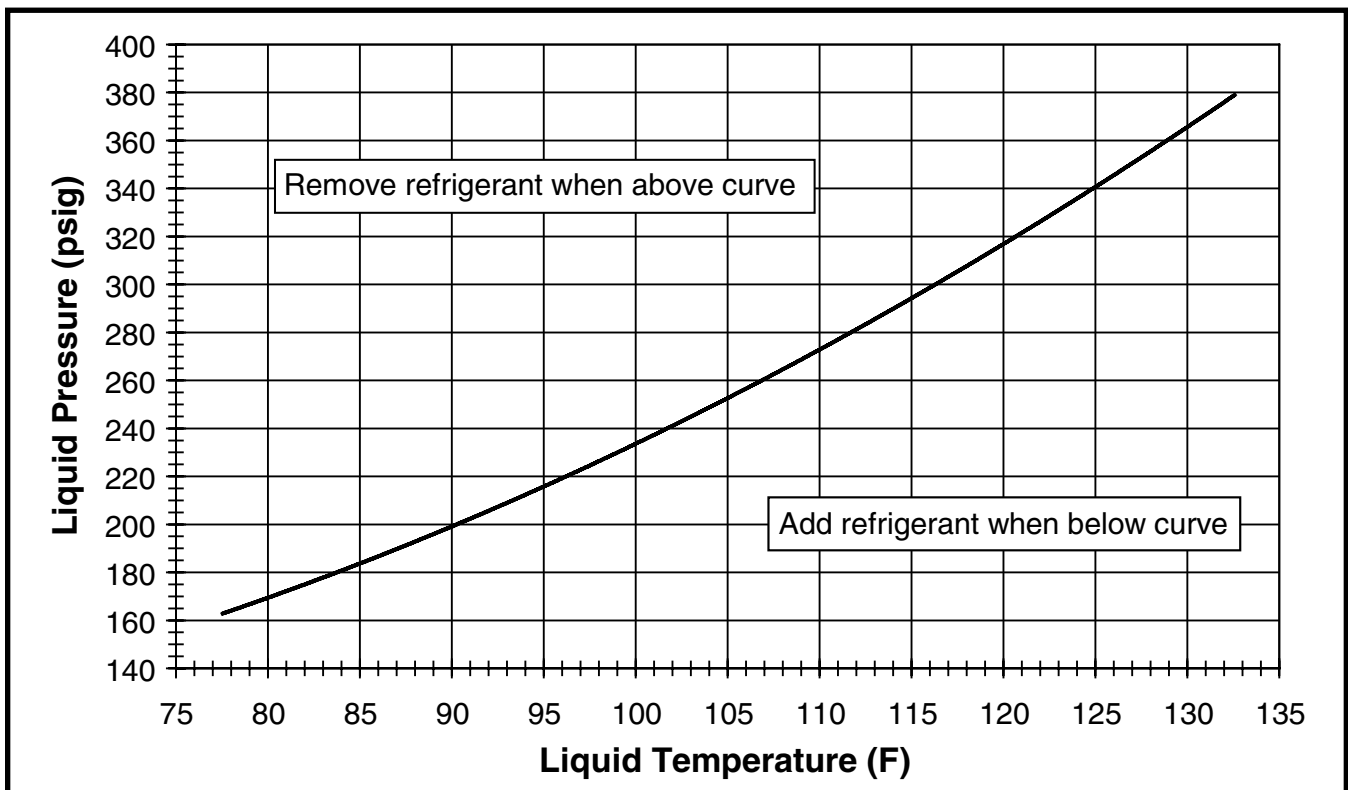


Figure 8. Charging Chart for 3.5 Ton Units

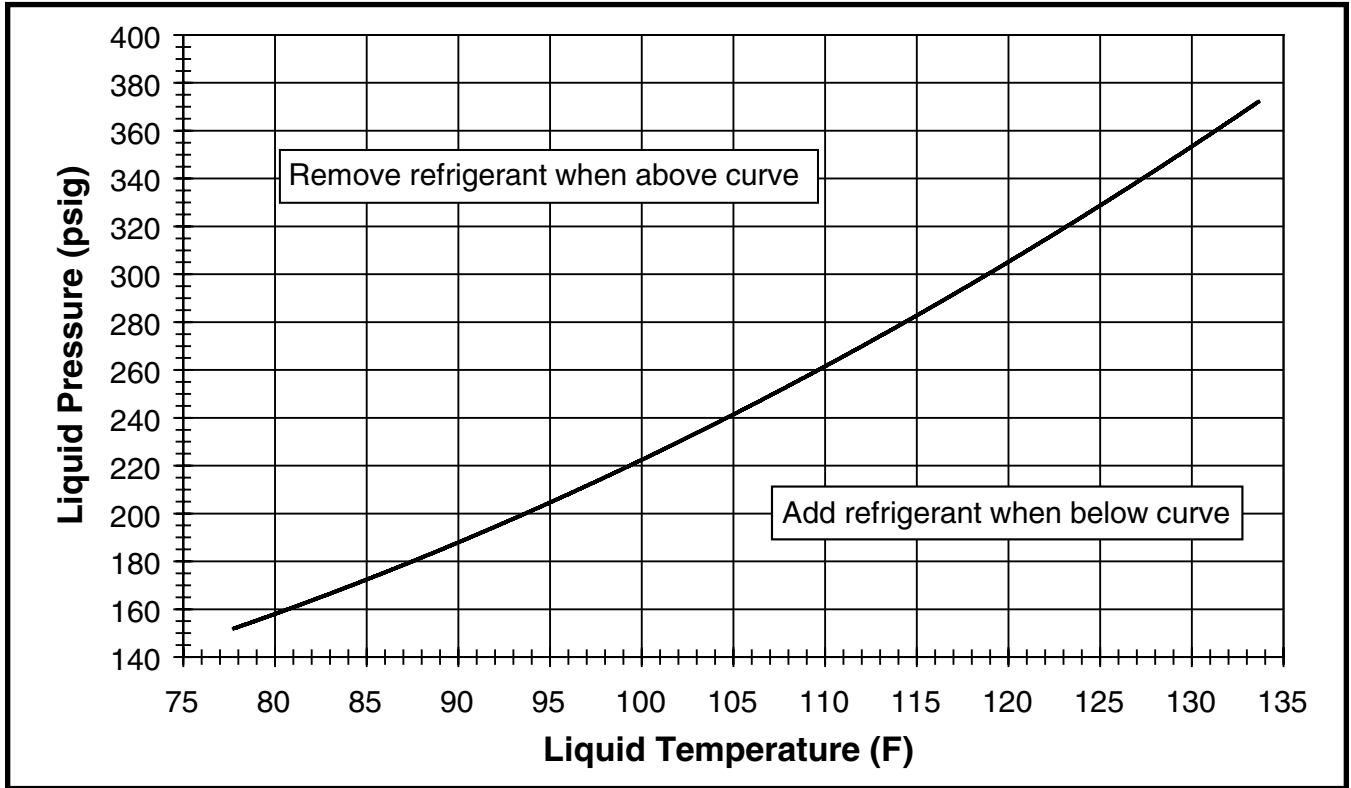


Figure 9. Charging Chart for 4 Ton Units

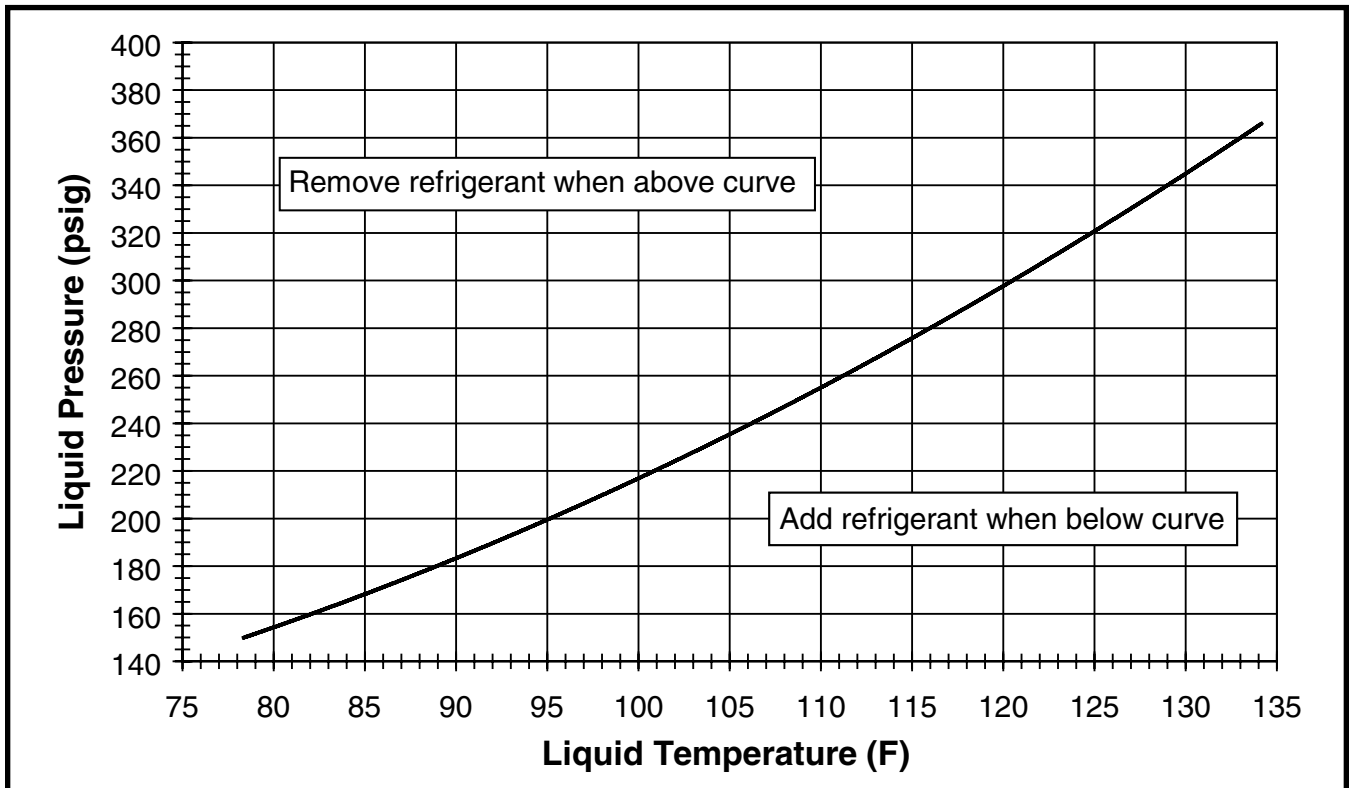


Figure 10. Charging Chart for 5 Ton Units

## FIGURES & TABLES

### REFRIGERANT CHARGING TABLES

Shaded boxes indicate flooded conditions.

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

1. All pressures are listed in psig and all temperatures in ° F
2. Discharge temperatures greater than charted values indicate an undercharged system.

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.
74	156	119														
76	159	124	173	126												
78	161	130	175	131	190	133										
80	161	139	177	136	192	138	206	139								
82	165	142	178	143	194	142	208	144	223	145						
84			182	146	195	148	211	148	225	150	239	151				
86					199	151	213	153	227	154	241	156	256	157		
88							216	157	230	158	243	160	258	161	272	163
90							220	160	233	162	247	164	260	165	274	166
92									237	166	250	168	264	169	276	170
94											254	172	267	174	281	175
96													271	178	284	180
98															288	184
100																

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

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.
71	149	103														
73	152	109	167	115												
75	154	114	170	120	185	126										
77	154	124	172	125	187	131	203	137								
79	157	126	172	132	190	135	205	141	221	147						
81			176	135	191	141	207	146	223	151	239	157				
83					194	145	209	150	225	156	241	162	257	167		
85							213	154	228	160	243	166	259	171	274	177
87							216	158	231	164	246	170	261	175	276	181
89									235	168	250	174	265	180	278	185
91											253	178	268	184	283	190
93													272	188	287	194
95															290	199
97																

**Table 5. Charging Table for 2 Ton Units (with Microchannel Coil)**

## REFRIGERANT CHARGING TABLES

■ ■ Shaded boxes indicate flooded conditions.

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

1. All pressures are listed in psig and all temperatures in ° F
2. Discharge temperatures greater than charted values indicate an undercharged system.

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.
68	139	94														
70	142	100	158	108												
72	144	105	160	113	176	120										
74	142	118	162	118	178	125	194	133								
76	145	121	161	127	180	130	196	137	212	144						
78			165	130	180	137	198	142	214	149	230	156				
80					184	140	199	147	216	153	232	160	248	167		
82							203	151	218	158	234	164	250	171	266	178
84							206	154	222	161	237	168	252	175	268	182
86									225	165	241	173	256	180	270	186
88											244	177	260	184	275	191
90													263	188	279	196
92															282	200
94																

**Table 6. Charging Table for 2.5 Ton Units (with Microchannel Coil)**

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.
69	147	99														
71	150	105	167	113												
73	152	110	169	118	186	126										
75	150	124	171	123	188	131	205	139								
77	153	126	170	133	190	136	207	144	224	151						
79			174	136	190	143	209	148	226	156	243	163				
81					194	146	210	153	228	160	245	168	262	175		
83							214	157	230	164	247	172	264	179	281	186
85							217	161	234	168	251	176	266	183	283	190
87									237	172	254	180	271	187	285	194
89											257	184	274	192	291	199
91													277	196	294	204
93															297	208
95																

**Table 7. Charging Table for 3 Ton Units (with Microchannel Coil)**

## REFRIGERANT CHARGING TABLES

■ ■ Shaded boxes indicate flooded conditions.

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

1. All pressures are listed in psig and all temperatures in ° F
2. Discharge temperatures greater than charted values indicate an undercharged system.

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.
73	174	138														
75	176	143	186	142												
77	178	149	188	147	198	146										
79	181	153	190	152	200	151	210	150								
81	185	156	193	156	202	156	212	155	222	154						
83			197	159	205	160	214	159	224	158	234	158				
85					209	163	217	163	226	163	236	162	246	162		
87							221	167	229	167	238	166	248	166	258	165
89							224	170	233	171	242	170	250	170	260	169
91									236	174	245	174	254	174	262	173
93											248	178	257	178	266	177
95													260	182	269	182
97															272	186
99																

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

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.
72	150	125														
74	153	130	167	131												
76	155	135	169	136	184	138										
78	155	144	171	141	186	143	200	144								
80	159	147	172	148	188	148	202	149	217	151						
82			176	151	190	153	204	154	219	155	233	157				
84					193	156	207	158	221	159	235	161	249	162		
86							210	162	224	164	237	165	251	166	266	168
88							213	165	227	167	241	169	253	170	268	172
90									230	171	244	173	257	175	270	176
92											247	177	261	179	274	181
94													264	183	278	185
96															281	190
98																

**Table 9. Charging Table for 4 Ton Units**

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.
68	149	141														
70	151	146	166	146												
72	154	151	168	151	183	151										
74	154	160	171	156	185	156	200	156								
76	158	163	172	163	187	161	202	160	217	160						
78			175	166	189	166	204	165	219	165	234	165				
80					193	169	207	170	221	169	236	169	251	169		
82							210	173	224	173	238	173	253	173	267	173
84							213	177	227	177	241	177	255	177	269	177
86									231	181	245	181	259	181	271	180
88											248	185	262	186	276	185
90													265	190	279	190
92															283	194
94																

Table 10. Charging Table for 5 Ton Units

### ELECTRICAL DIAGRAMS & TABLES

Units Size (Tons)		1.5 Ton	2 Ton	2.5 Ton	3 Ton	3.5 Ton	4 Ton	5 Ton	
Electrical Data	Volts-Cycles-Phase (1)	208/230-60-1							
	Total Amps	8.7	11.5	14.1	16.8	16.2	21.3	26.7	
	Delay Fuse Max. (2)	15	20	30	35	30	45	50	
	Min. Circuit Ampacity	10.8	14.1	17.5	20.6	19.9	26.3	33.1	
Component Data	Coil	Area	8.2	9.9	9.9	9.9	17.7	17.7	25.4
		Rows-FPI	1 - 22	1 - 18	1 - 18	1 - 18	1 - 22	1 - 22	1 - 22
		Tube Dia	3/8" O.D.	MC	MC	MC	3/8" O.D.	3/8" O.D.	3/8" O.D.
	Fan Motor	Type	PSC						
		Amps	0.3	0.7	0.7	1.20	1.40	1.40	1.40
		HP	1/20	1/10	1/10	1/4	1/4	1/4	1/4
	Fan Blade	Dia - Blades	18" - 3	18" - 3	18" - 3	18" - 3	24" - 3	24" - 3	24" - 3
		SCFM	1410	1985	3000	3000	4000	4000	4000
	Compressor Data	RLA	8.3	10.8	13.4	15.4	14.7	19.8	25.3
		LRA	40.3	56.0	68.0	87.0	77.0	104.0	146.0
Refrigerant suction line: Length/O.D. Liquid Line: All lengths - 3/8" O.D.	0-24 ft.	3/4"	3/4"	3/4"	3/4"	7/8"	7/8"	7/8"	
	25-39 ft.	3/4"	3/4"	7/8" (3)	7/8" (3)	7/8"	7/8"	1-1/8" (4)	
	40-75 ft.	3/4"	3/4"	7/8" (3)	7/8" (3)	1-1/8" (4)	1-1/8" (4)	1-1/8" (4)	
R-22 Refrigerant charge (in Ounces): (Outdoor unit, Indoor Unit 15' Line Set)		78	53	56	68	122	126	160	
Approximate Weight (lbs.)	Net	103	112	105	105	176	176	229	
	Ship	107	117	109	109	183	183	238	

Table 11. Electrical Specifications & Physical Data



# WIRING DIAGRAM

## Split System Air Conditioner (Outdoor Section)

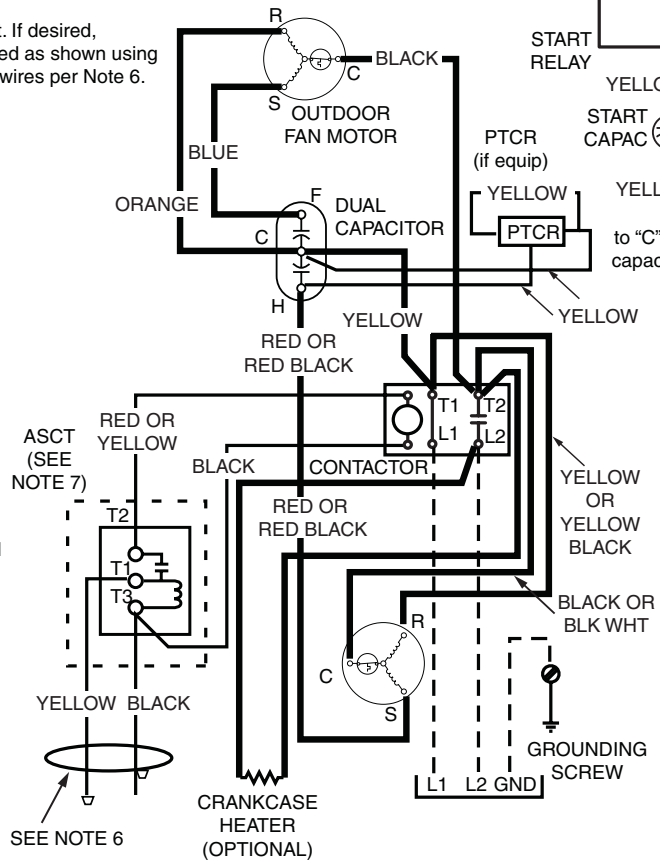
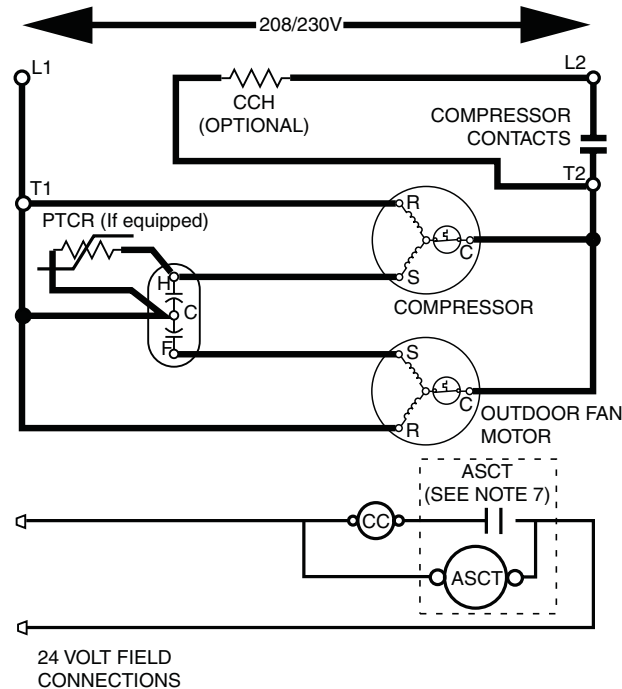
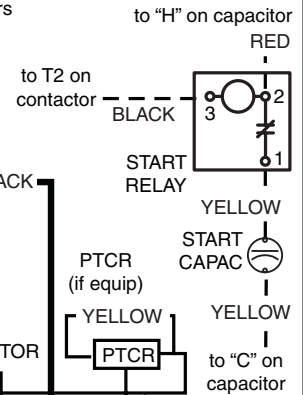
## Single Phase

### NOTES:

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

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

### Optional Hard Start Kit



### LEGEND:

- CC - Contactor Coil
- CCH - Crankcase Heater
- HPS - High Pressure Switch

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



**710570B**  
(Replaces 710570A)

0109

Figure 11. Wiring Diagram





## INSTALLATION / PERFORMANCE CHECK LIST

<b>INSTALLATION ADDRESS:</b>		
CITY _____	STATE _____	
UNIT MODEL # _____		
UNIT SERIAL # _____		
Unit Installed Minimum clearances per Figure 1 (page 5)?	YES	NO
<b>INSTALLER NAME:</b>		
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) _____		

ELECTRICAL SYSTEM		
Electrical connections tight?	YES	NO
Line voltage polarity correct?	YES	NO
Rated Voltage: _____ VOLTS		
L1-L2 Volts: _____ VOLTS		
L1-L3 Volts: _____ VOLTS		
L2-L3 Volts: _____ VOLTS		
Avg. Volts: _____ VOLTS		
Max. deviation of voltage from avg. volts: _____ VOLTS		
% Volt imbalance: _____ VOLTS		
Blower Motor HP: _____ Sheave Setting _____ # Turns		
Has the thermostat been calibrated?	YES	NO
Is the thermostat level?	YES	NO
Is the heat anticipator setting correct? (If Applicable)	YES	NO

### WARRANTY INFORMATION

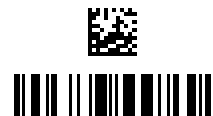
A warranty certificate with full details is included with the air conditioner. Carefully review these responsibilities with your dealer or service company. The manufacturer will not be responsible for any costs found necessary to correct problems due to improper setup, improper installation, adjustments, improper operating procedure on the part of the user, etc. Some specific examples of service calls which are not included in the limited warranty are:

- Correcting wiring problems in the electrical circuit supplying the air conditioner.
- Resetting circuit breakers or other switches.
- Adjusting or calibrating of thermostat.



# HEAT CONTROLLER, INC.

Specifications & illustrations subject to change without notice or incurring obligations.  
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**709480A** (Replaces 7094800)