

# Outdoor Air Conditioner

## User's Information and Installation Instructions

### 13 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 Air Conditioning 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 .

## OPERATING INSTRUCTIONS

### To Operate Your Air Conditioner for Cooling —

1. Set the thermostat system switch to COOL or AUTO and the thermostat fan switch to AUTO. (See Figure 1)
2. Set the thermostat temperature to the desired temperature level by pressing the WARMER or COOLER button. 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.

### To Operate Your Furnace for Heating —

1. Set the thermostat system switch to HEAT or AUTO and the thermostat fan switch to AUTO. (See Figure 1)
2. Set the thermostat temperature to the desired temperature level by pressing the WARMER or COOLER button. Please refer to the separate detailed user's manual for complete thermostat programming instructions. The furnace and indoor blower will cycle on and off to maintain the indoor temperature at the desired heating level.

### To Shut Off Your Air Conditioner —

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 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.

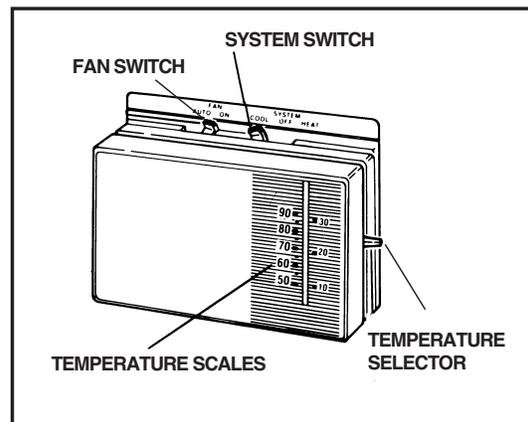


Figure 1. Typical Thermostat

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 Air Conditioner —

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 **CAUTION:**

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

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#### 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.
- 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.

#### 2. Before Each Cooling Season:

If the furnace/air handler blower motor and the outdoor unit fan motor(s) have oil tubes at the motor bearings, apply 10 drops of SAE No. 20 motor oil to each oil tube.

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 **CAUTION:**

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

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#### 3. Before Calling a Service Technician, Be Certain:

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

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## 1. GENERAL INFORMATION

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Read the following instructions completely before performing the installation.

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 **CAUTION:**

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**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.**

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**Condensing Unit Section** — Each condensing unit is shipped with a refrigerant charge adequate to operate the outdoor section with an indoor matching coil or air handler, and 15 feet of refrigeration line.

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

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

**Liquid and Suction Lines** — 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 C1.) 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.

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### NOTICE:

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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.

## 2. SAFETY CONSIDERATIONS

**Pressures within the System** — Split system air conditioning 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.

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**WARNING:**

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**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.**

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### 3. SITE PREPARATION

**Unpacking Equipment** — Remove the cardboard carton and User's Manual from the equipment. Take care not to damage the tubing connections when removing 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 should be installed no closer than 18 inches from the outside walls of the facility and in an area free from overhead obstructions to ensure unrestricted airflow through the outdoor unit.

**Facility Prerequisites** — Electrical power must be supplied to the equipment. 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.

### 4. 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.

### 5. 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.

### 6. CONNECTING REFRIGERANT TUBING BETWEEN THE INDOOR AND OUTDOOR UNIT

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**CAUTION:**

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**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.**

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**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. The filter dryer must be installed in strict accordance with the manufacturer’s installation instructions.

**Optional Equipment** — Optional equipment (e.g.: filter/driers, liquid line solenoid valves, etc.) should be installed in strict accordance with the manufacturer’s installation instructions.

## 7. MAKING 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 C1.) and with applicable local codes having jurisdiction.

**Thermostat Connections** — Thermostat connections should be made in accordance with the instructions supplied with the thermostat, and with the instructions supplied with the indoor equipment.

**Electrical Power Wiring** — Electrical power wiring shall comply with the current provisions of the “National Electrical Code” (ANSI C1.) 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.

**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.

**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.

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.

**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 C1.), 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.

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.

## 8. STARTUP AND CHECKOUT

### Functional Checkout:

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#### **WARNING:**

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#### **CAUTION:**

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

**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.**

**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 move temperature setpoint to its highest setting. Prior to applying electrical power to the outdoor unit, ensure that the unit has been properly and

**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.

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### Orifice Usage

#### 13 SEER Split System Air Conditioner

Model Number	Restrictor Size (inches)	System Charge R-410A oz.
1-1/2 Ton	0.049	83
2 Ton	0.055	96
2-1/2 Ton	0.062	117
3 Ton	0.069	125
3-1/2 Ton	0.073	144
4 Ton	0.082	149
5 Ton	0.087	248

**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'stat. Connect terminal "3" to common terminal at blower relay or transformer. Connect terminal "4" to terminal "G" on T'stat.

**Low-Pressure Switch**—(Select Models) A low-pressure switch is factory-installed and located in the suction line internal to the outdoor unit. The switch is designed to protect the compressor from a loss of charge. Under normal conditions, the switch is closed. If the suction pressure falls below 5 psig, then the switch will open and de-energize the outdoor unit. The switch will close again once the suction pressure increases above 20 psig. Please note that the switch interrupts the thermostat inputs to the unit. 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.

**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)**

**POWER LED (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 ComfortAlert™ 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 ComfortAlert™ module displays the appropriate ALERT and/or TRIP LED will flash a number of

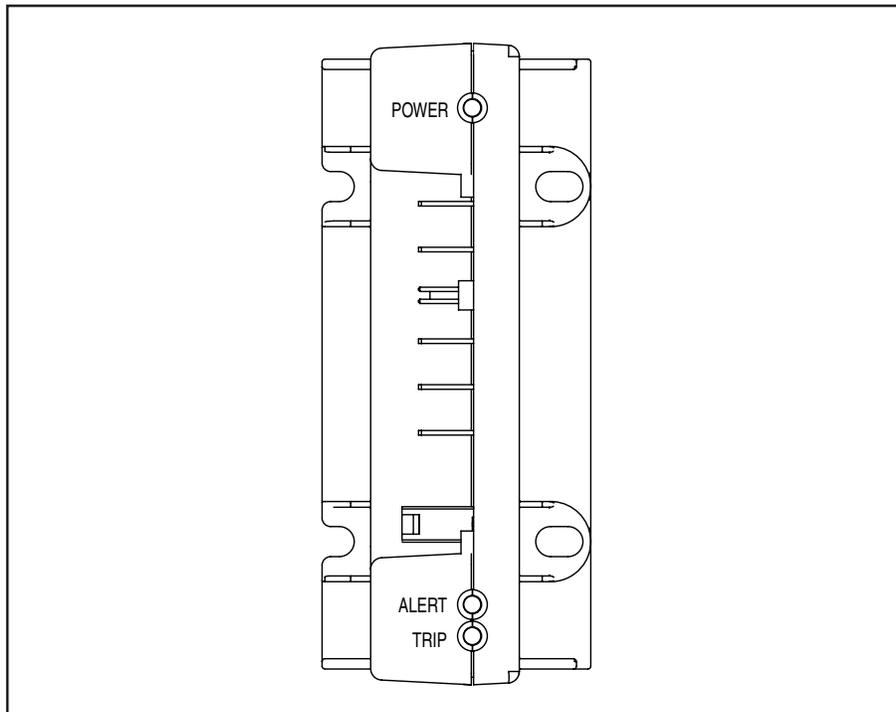
times consecutively, pause and then repeat the process. To identify a Flash Code number, count the number of consecutive flashes.

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** — If provided with heating equipment, 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. Increase the setpoint temperature of the thermostat to the maximum setting. Verify that the heating equipment has been energized (i.e., fossil fuel burner operating, etc.) and that the indoor blower energizes after a short period of time. Feel the air being circulated by the indoor blower and verify that it is warmer than ambient temperature. Listen for any unusual noises. If present, locate and determine the source of the noise and correct as necessary.

**NOTE:** Other sources for heating (i.e.: electric furnace, fossil fuel furnace, air handler with electric heat options, etc.) that interface with the unit should be functionally checked to verify system operation and compatibility. Refer to the installation instructions for this equipment and perform a functional checkout in accordance with the manufacturer's instructions.



**Figure 2. Comfort Alert™ Diagnostics Module**

Status LED	Status LED Description	Status LED Troubleshooting Information
<b>Green "POWER"</b>	Module has power	Supply voltage is present at module terminals
<b>Red "TRIP"</b>	Thermostat demand signal Y is present, but the compressor is not running	<ol style="list-style-type: none"> <li>1. Compressor protector is open</li> <li>2. Outdoor unit power disconnect is open</li> <li>3. Compressor circuit breaker or fuse(s) is open</li> <li>4. Broken wire or connector is not making contact</li> <li>5. Low pressure switch open if present in system</li> <li>6. Compressor contactor has failed open</li> </ol>
<b>Yellow "ALERT" Flash Code 1</b>	<b>Long Run Time</b> Compressor is running extremely long run cycles	<ol style="list-style-type: none"> <li>1. Low refrigerant charge</li> <li>2. Evaporator blower is not running</li> <li>3. Evaporator coil is frozen</li> <li>4. Faulty metering device</li> <li>5. Condenser coil is dirty</li> <li>6. Liquid line restriction (filter drier blocked if present in system)</li> <li>7. Thermostat is malfunctioning</li> <li>8. Comfort Alert Failure</li> </ol>
<b>Yellow "ALERT" Flash Code 2</b>	<b>System Pressure Trip</b> Discharge or suction pressure out of limits or compressor overloaded	<ol style="list-style-type: none"> <li>1. High head pressure</li> <li>2. Condenser coil poor air circulation (dirty, blocked, damaged)</li> <li>3. Condenser fan is not running</li> <li>4. Return air duct has substantial leakage</li> <li>5. If low pressure switch present in system, check Flash Code 1 information</li> </ol>
<b>Yellow "ALERT" Flash Code 3</b>	<b>Short Cycling</b> Compressor is running only briefly	<ol style="list-style-type: none"> <li>1. Thermostat demand signal is intermittent</li> <li>2. Time delay relay or control board defective</li> <li>3. If high pressure switch present go to Flash Code 2 information</li> <li>4. If low pressure switch present go to Flash Code 1 information</li> </ol>
<b>Yellow "ALERT" Flash Code 4</b>	<b>Locked Rotor</b>	<ol style="list-style-type: none"> <li>1. Run capacitor has failed</li> <li>2. Low line voltage (contact utility if voltage at disconnect is low) <ul style="list-style-type: none"> <li>• Check wiring connections</li> </ul> </li> <li>3. Excessive liquid refrigerant in compressor</li> <li>4. Compressor bearings are seized <ul style="list-style-type: none"> <li>• Measure compressor oil level</li> </ul> </li> </ol>
<b>Yellow "ALERT" Flash Code 5</b>	<b>Open Circuit</b>	<ol style="list-style-type: none"> <li>1. Outdoor unit power disconnect is open</li> <li>2. Compressor circuit breaker or fuse(s) is open</li> <li>3. Compressor contactor has failed open <ul style="list-style-type: none"> <li>• Check compressor contactor wiring and connectors</li> <li>• Check for compressor contactor failure (burned, pitted or open)</li> <li>• Check wiring and connectors between supply and compressor</li> <li>• Check for low pilot voltage at compressor contactor coil</li> </ul> </li> <li>4. High pressure switch is open and requires manual reset</li> <li>5. Open circuit in compressor supply wiring or connections</li> <li>6. Unusually long compressor protector reset time due to extreme ambient temperature</li> <li>7. Compressor windings are damaged <ul style="list-style-type: none"> <li>• Check compressor motor winding resistance</li> </ul> </li> </ol>
<b>Yellow "ALERT" Flash Code 6</b>	<b>Open Start Circuit</b> Current only in run circuit	<ol style="list-style-type: none"> <li>1. Run capacitor has failed</li> <li>2. Open circuit in compressor start wiring or connections <ul style="list-style-type: none"> <li>• Check wiring and connectors between supply and the compressor "S" terminal</li> </ul> </li> <li>3. Compressor start winding is damaged <ul style="list-style-type: none"> <li>• Check compressor motor winding resistance</li> </ul> </li> </ol>
<b>Yellow "ALERT" Flash Code 7</b>	<b>Open Run Circuit</b> Current only in start circuit	<ol style="list-style-type: none"> <li>1. Open circuit in compressor run wiring or connections <ul style="list-style-type: none"> <li>• Check wiring and connectors between supply and the compressor "R" terminal</li> </ul> </li> <li>2. Compressor run winding is damaged <ul style="list-style-type: none"> <li>• Check compressor motor winding resistance</li> </ul> </li> </ol>
<b>Yellow "ALERT" Flash Code 8</b>	<b>Welded Contactor</b> Compressor always runs	<ol style="list-style-type: none"> <li>1. Compressor contactor has failed closed</li> <li>2. Thermostat demand signal not connected to module</li> </ol>
<b>Yellow "ALERT" Flash Code 9</b>	<b>Low Voltage</b> Control circuit < 17VAC	<ol style="list-style-type: none"> <li>1. Control circuit transformer is overloaded</li> <li>2. Low line voltage (contact utility if voltage at disconnect is low) <ul style="list-style-type: none"> <li>• Check wiring connections</li> </ul> </li> </ol>

- 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 <b>24VAC Power Wiring</b> (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 <b>24VAC Power Wiring</b> (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.
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.

**Table 2. Module Wiring Troubleshooting**

### **Adjustment of Refrigerant Charge:**



**Split system air conditioner 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 matched assemblies of our equipment and at listed airflows for the indoor coil. Assemblies of indoor coils and outdoor units not listed are not recommended and deviations from rated airflows or non-listed equipment combinations may require modifications to the expansion device(s) and refrigerant charging procedures for proper and efficient system operation.

**Refrigerant Charging Chart** — Refer to Refrigerant Charging Charts for correct system charging, and to Orifice Usage Chart for correct restrictor sizes.

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

## Refrigerant Charging Charts Legend For Cooling Mode 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.

## Refrigerant Charging Charts For Cooling Mode of Operation

	OUTDOOR TEMPERATURE ( deg. F )															
	70	75	80	85	90	95	100	105								
Suc. Press.	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.
133																
135	260	121														
137	261	132	283	127												
139	262	144	285	137												
141	262	168	287	147												
143	263	185	287	168	330	138	350	138	373	142						
145			288	182	333	144	353	145	377	149						
147					334	156	357	153	381	156	396	147				
149					336	169	358	166	382	168	401	153	420	152		
151					338	183	360	174	384	178	405	159	425	157		
153							362	185	386	188	405	172	429	163		
155											408	181	429	176		
157											410	191	432	185		
159													434	194		

## Refrigerant Charging Charts For Cooling Mode of Operation

Suc. Press.	OUTDOOR TEMPERATURE ( deg. 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.
133																
135	244	139														
137	246	150	267	140												
139	247	162	269	150	289	141										
141	246	192	271	160	292	150	311	144	330	141						
143	246	209	270	185	292	166	314	150	333	148	351	143				
145			271	199	294	180	315	164	337	156	355	149	373	145		
147					295	194	317	176	337	170	359	156	377	151	394	147
149							318	191	339	178	360	169	381	157	399	153
151									341	189	362	178	382	170	404	159
153											364	188	384	179	404	171
155													387	188	407	180
157															409	189
159																

Suc. Press.	OUTDOOR TEMPERATURE ( deg. 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.
129																
131	257	107														
133	258	119	278	113												
135	260	130	280	123	299	117										
137	261	147	282	133	302	126	321	124	338	123						
139	261	164	284	147	305	133	324	129	342	130	360	127				
141			285	161	307	147	328	134	346	139	364	134	381	131		
143					309	160	330	147	350	143	368	141	386	138	403	136
145							332	161	353	152	373	145	390	144	407	142
147									355	163	375	154	395	148	412	148
149											378	164	398	157	418	151
151													400	167	421	160
153															423	169
155																

## Refrigerant Charging Charts For Cooling Mode of Operation

		OUTDOOR TEMPERATURE ( deg. F )														
		70		75		80		85		90		95		100		105
Suc. Press.	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.
128																
130	259	114														
132	261	125	280	118												
134	262	137	282	128	300	121										
136	263	152	284	138	303	130	126	124	338	124						
138	264	169	286	151	306	136	132	131	341	131						
140			287	165	308	150	136	140	345	140	358	127				
142					309	163	148	143	350	143	362	134	378	130		
144							163	152	352	152	366	140	383	136	399	133
146								163	354	163	372	143	387	142	404	139
148											374	153	394	145	408	145
150											376	163	396	154	415	147
152													398	164	418	156
154															420	165

## Refrigerant Charging Charts For Cooling Mode of Operation

		OUTDOOR TEMPERATURE ( deg. F )															
		70		75		80		85		90		95		100		105	
Suc. Press.		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.
126																	
128	98	236															
130	110	238	103														
132	121	239	113	106													
134	129	241	123	115	106	274	111	109									
136	146	242	129	114	117	277	117	117	309	109							
138			143	128	113	283	113	125	313	117	328	113					
140				141	126	284	126	121	317	125	332	120	347	116			
142					140	286	140	130	325	121	336	126	352	122	366	120	
144							308	140	327	130	347	120	356	128	371	126	
146								140	330	140	349	130	368	122	376	132	
148											351	140	370	131	389	123	
150													373	141	392	132	
152															394	141	

## Refrigerant Charging Charts For Cooling Mode of Operation

		OUTDOOR TEMPERATURE ( deg. F )																					
		70			75			80			85			90			95			100			105
Suc. Press.	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.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	
131																							
133	263	153																					
135	264	164	286	153																			
137	266	176	288	163	309	154																	
139	264	210	291	173	312	163	332	157	351	153													
141	264	227	289	200	312	181	335	162	355	161	373	155											
143			290	215	313	195	335	178	358	169	377	162	395	157									
145					315	208	337	190	358	183	381	169	400	164									
147							339	204	360	192	381	182	404	170									
149									363	202	384	192	404	183									
151											386	202	406	192									
153													409	202									
155																							
157																							

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## Refrigerant Charging Charts For Cooling Mode of Operation

Suc. Press.	OUTDOOR TEMPERATURE ( deg. 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.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.	Liq. Press.	Dis. Temp.						
131																																
133	277	195																														
135	279	207		189																												
137	280	218		199	328	184																										
139	276	268		209	308	193	352	183	372	176																						
141	276	285		247	304	219	356	189	376	183	395	175																				
143				261	305	233	353	210	380	192	399	182	417	175																		
145						247	355	222	377	211	403	189	421	181	439	176																
147						331	357	237	379	220	401	206	426	187	444	182																
149									381	230	403	216	424	203	448	188																
151											405	226	427	213	447	202																
153													429	222	450	211																
155															452	220																
157																																

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WITH THE HOMEOWNER**



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