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SECTION I: GENERAL

The outdoor units are designed to be connected to a matching indoor coil with sweat connect lines. Sweat connect units are factory charged with refrigerant for a matching indoor coil plus 15 feet of field supplied lines.

Matching indoor coils are available with a thermal expansion valve or an orifice liquid feed sized for the most common usage. The orifice size and/or refrigerant charge may need to be changed for some indoor-outdoor unit combinations, elevation differences, or total line lengths. Refer to Application Data covering “General Piping Recommendations and Refrigerant Line Length” (Part Number 247077).

SECTION II: SAFETY

This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.

Understand and pay particular attention to the signal words DANGER, WARNING, or CAUTION.

DANGER indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

CAUTION indicates a potentially hazardous situation, which, if not avoided may result in minor or moderate injury. It is also used to alert against unsafe practices and hazards involving only property damage.

CAUTION

This product must be installed in strict compliance with the enclosed installation instructions and any applicable local, state, and national codes including, but not limited to building, electrical, and mechanical codes.

WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage.

Inspection

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier’s delivery receipt. A separate request for inspection by the carrier’s agent should be made in writing. See the instruction manual for assistance or for additional information, consult a qualified contractor, installer, or service agency.

Requirements For Installing/Servicing R-410A Equipment

• Gauge sets, hoses, refrigerant containers, and recovery system must be designed to handle the POE type oils, and the higher pressures of R-410A.
• Manifold sets should be 800 psig high side and 250 psig low side with 550 psig low side restart.
• All hoses must have a 700 psig service pressure rating.
• Leak detectors should be designed to detect HFC refrigerant.
• Recovery equipment (including refrigerant recovery containers) must be specifically designed to handle R-410A.
• Do not use an R-22 TXV.
• A liquid-line filter drier is required on every unit.
LIMITATIONS
The unit should be installed in accordance with all National, State, and Local Safety Codes and the limitations listed below:

1. Limitations for the indoor unit, coil, and appropriate accessories must also be observed.
2. The outdoor unit must not be installed with any duct work in the air stream. The outdoor fan is the propeller type and is not designed to operate against any additional external static pressure.
3. The maximum and minimum conditions for operation must be observed to assure a system that will give maximum performance with minimum service.
4. The maximum allowable line length for this product is 75 feet.

SECTION III: UNIT INSTALLATION
LOCATION
Before starting the installation, select and check the suitability of the location for both the indoor and outdoor unit. Observe all limitations and clearance requirements.

The outdoor unit must have sufficient clearance for air entrance to the condenser coil, for air discharge, and for service access. See Figure 1.

NOTICE
For multiple unit installations, units must be spaced a minimum of 24 inches apart (coil face to coil face).

If the unit is to be installed on a hot sun exposed roof or a black-topped ground area, the unit should be raised sufficiently above the roof or ground to avoid taking the accumulated layer of hot air into the outdoor unit.

Provide an adequate structural support.

<table>
<thead>
<tr>
<th>AIR TEMPERATURE AT OUTDOOR COIL, °F</th>
<th>AIR TEMPERATURE AT INDOOR COIL, °F</th>
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<tbody>
<tr>
<td>Min.</td>
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<td>-10</td>
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<tr>
<td>Max.</td>
<td>Min.</td>
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<td>WB</td>
<td>DB</td>
</tr>
<tr>
<td>72</td>
<td>80</td>
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</table>

1. Operation below this temperature is permissible for a short period of time, during morning warm-up.

ADD-ON REPLACEMENT/RETROFIT
When this unit is being used as a replacement for an R-22 unit, it is required that the outdoor unit, indoor coil, and metering device all be replaced. The following steps should be performed in order to insure proper system operation and performance. Line-set change out is also recommended.

1. Change-out of the indoor coil to an approved R-410A coil/condensing unit combination with the appropriate metering device.
2. Change-out of the line-set when replacing an R-22 unit with an R410-A unit is highly recommended to reduce cross-contamination of oils and refrigerants.
3. If change-out of the line set is not practical, then the following precautions should be taken.
   • Inspect the line set for kinks, sharp bends, or other restrictions, and for corrosion.
   • Determine if there are any low spots which might be serving as oil traps.
   • Flush the line set with a commercially available flush kit to remove as much of the existing oil and contaminants as possible.
   • Install a suction line filter-drier to trap any remaining contaminants, and remove after 50 hours of operation.
4. If the outdoor unit is being replaced due to a compressor burnout, then installation of a 100% activated alumina suction-line filter drier in the suction-line is required, in addition to the factory installed liquid-line drier. Operate the system for 10 hours. Monitor the suction drier pressure drop. If the pressure drop exceeds 3 psig, replace both the suction-line and liquid-line driers. After a total of 10 hours run time where the suction-line pressure drop has not exceeded 3 psig, replace the liquid line drier, and remove the suction-line drier. Never leave a suction-line drier in the system longer than 50 hours of run time.

NOTES:
ALL OUTDOOR WIRING MUST BE WEATHERPROOF. MINIMUM 24" UNIT TO UNIT CLEARANCE.

FIGURE 1: Typical Installation with Required Clearances
GROUND INSTALLATION
The unit may be installed at ground level on a solid base that will not shift or settle, causing strain on the refrigerant lines and possible leaks. Maintain the clearances shown in Figure 1 and install the unit in a level position.

Normal operating sound levels may be objectionable if the unit is placed directly under windows of certain rooms (bedrooms, study, etc.). Condensate will drain from beneath the coil of the outdoor unit during the defrost cycle. Normally this condensate may be allowed to drain directly on the ground.

Elevate the unit sufficiently to prevent any blockage of the air entrances by snow in areas where there will be snow accumulation. Check the local weather bureau for the expected snow accumulation in your area.

Isolate the unit from rain gutters to avoid any possible wash out of the foundation.

**WARNING**

The outdoor unit should not be installed in an area where mud or ice could cause personal injury. Remember that condensate will drip from the unit coil during heat and defrost cycles and that this condensate will freeze when the temperature of the outdoor air is below 32°F.

ROOF INSTALLATION
When installing units on a roof, the structure must be capable of supporting the total weight of the unit, including a pad, lintels, rails, etc., which should be used to minimize the transmission of sound or vibration into the conditioned space.

UNIT PLACEMENT
1. Provide a base in the pre-determined location.
2. Remove the shipping carton and inspect for possible damage.
3. Compressor tie-down bolts should remain tightened.
4. Position the unit on the base provided.

**NOTICE**

Heat pumps will defrost periodically resulting in water drainage. The unit should not be located where water drainage may freeze and create a hazardous condition - such as sidewalks and steps.

LIQUID LINE FILTER-DRIER
The heat pumps have a solid core bi-flow filter/drier located on the liquid line.

**NOTICE**

Replacements for the liquid line drier must be exactly the same as marked on the original factory drier. See Source 1 for O.E.M. replacement driers.

**CAUTION**

Failure to do so or using a substitute drier or a granular type may result in damage to the equipment.

Filter-Drier
Source 1 Part No. | Apply with Models
--- | ---
S1-52636219000 | All

*As listed on the "Energy Guide yellow sticker on the unit.

TOP CAP INSTALLATION/REMOVAL
The top cap can be found nested between the base valves and blockoff panel of this unit (if not already installed to the fan grill hub). The top cap should be removed from the bag and attached to the center hub of the fan grill.

**NOTICE**

Using a larger than specified line size could result in oil return problems. Using too small a line will result in loss of capacity and other problems caused by insufficient refrigerant flow. Slope horizontal vapor lines at least 1" every 20 feet toward the outdoor unit to facilitate proper oil return.

PIPING CONNECTIONS
The outdoor unit must be connected to the indoor coil using field supplied refrigerant grade copper tubing that is internally clean and dry. Units should be installed only with the tubing sizes for approved system combinations as specified in Tabular Data Sheet. The charge given is applicable for total tubing lengths up to 15 feet. See Application Data Part Number 247077 for installing tubing of longer lengths and elevation differences.

PRECAUTIONS DURING LINE INSTALLATION
1. Install the lines with as few bends as possible. Care must be taken not to damage the couplings or kink the tubing. Use clean hard drawn copper tubing where no appreciable amount of bending around obstruction is necessary. If soft copper must be used, care must be taken to avoid sharp bends which may cause a restriction.
2. The lines should be installed so that they will not obstruct service access to the coil, air handling system, or filter.
3. Care must also be taken to isolate the refrigerant lines to minimize noise transmission from the equipment to the structure.
4. The vapor line must be insulated with a minimum of 1/2” foam rubber insulation (Armaflex or equivalent). Liquid lines that will be exposed to direct sunlight and/or high temperatures must also be insulated.

5. Tape and suspend the refrigerant lines as shown. DO NOT allow tube metal-to-metal contact. See Figure 3.

6. Use PVC piping as a conduit for all underground installations as shown in Figure 4. Buried lines should be kept as short as possible to minimize the build up of liquid refrigerant in the vapor line during long periods of shutdown.

7. Pack fiberglass insulation and a sealing material such as permagum around refrigerant lines where they penetrate a wall to reduce vibration and to retain some flexibility.

8. See Form 247077 for additional piping information.

PRECAUTIONS DURING BRAZING OF LINES

All outdoor unit and evaporator coil connections are copper-to-copper and should be brazed with a phosphorous-copper alloy material such as Silfus-5 or equivalent. DO NOT use soft solder. The outdoor units have reusable service valves on both the liquid and vapor connections. The total system refrigerant charge is retained within the outdoor unit during shipping and installation. The reusable service valves are provided to evacuate and charge per this instruction.

Serious service problems can be avoided by taking adequate precautions to assure an internally clean and dry system.

PRECAUTIONS DURING BRAZING SERVICE VALVE

Precautions should be taken to prevent heat damage to service valve by wrapping a wet rag around it as shown in Figure 5. Also, protect all painted surfaces, insulation, and plastic base during brazing. After brazing cool joint with wet rag.

Dry nitrogen should always be supplied through the tubing while it is being brazed, because the temperature is high enough to cause oxidation of the copper unless an inert atmosphere is provided. The flow of dry nitrogen should continue until the joint has cooled. Always use a pressure regulator and safety valve to insure that only low pressure dry nitrogen is introduced into the tubing. Only a small flow is necessary to displace air and prevent oxidation.

Do not install any coil in a furnace which is to be operated during the heating season without attaching the refrigerant lines to the coil. The coil is under 30 to 35 psig inert gas pressure which must be released to prevent excessive pressure build-up and possible coil damage.

4. Braze the liquid line to the evaporator liquid connection. Nitrogen should be flowing through the evaporator coil.

5. Slide the grommet away from the vapor connection at the indoor coil. Braze the vapor line to the evaporator vapor connection. After the connection has cooled, slide the grommet back into original position. Refer to the Tabular Data Sheet for proper vapor line sizing.

6. Protect the vapor valve with a wet rag and braze the vapor line connection to the outdoor unit. The nitrogen flow should be exiting the system from the vapor service port connection. After this connection has cooled, remove the nitrogen source from the liquid fitting service port.

7. Replace the Schrader core in the liquid and vapor valves.

8. Leak test all refrigerant piping connections including the service port flare caps to be sure they are leak tight. DO NOT OVER-TIGHTEN (between 40 and 60 inch - lbs. maximum).

9. Evacuate the vapor line, evaporator, and the liquid line to 500 microns or less.
10. Replace cap on service ports. Do not remove the flare caps from the service ports except when necessary for servicing the system.

11. Release the refrigerant charge into the system. Open both the liquid and vapor valves by removing the plunger cap and with an allen wrench back out counter-clockwise until valve stem just touches the chamfered retaining wall. If the service valve is a ball valve, use a crescent wrench to turn valve stem one-quarter turn counterclockwise to open. Do not overturn or the valve stem may break or become damaged. See “PRECAUTIONS DURING BRAZING SERVICE VALVE”.

12. Replace plunger cap finger tight, then tighten an additional 1/12 turn (1/2 hex flat). Cap must be replaced to prevent leaks.

SECTION IV: ORIFICE INSTALLATION

Install Schrader Valve Core and Orifice as follows:

1. Relieve the holding charge by depressing the Schrader valve stem located in the end of the liquid line. Cut the spundown copper to allow installation of the suction line.

2. Slide indoor coil out of cabinet far enough to gain access to equalizer fitting on the suction line.

3. After holding charge is completely discharged remove black plastic cap on equalizer fitting.

4. Install Schrader Valve Core supplied with the outdoor unit into equalizer fitting using a valve core tool.

5. Loosen and remove the liquid line fitting from the orifice distributor assembly. Note that the fitting has right hand threads.

6. Install proper size orifice supplied with outdoor unit. Refer to supplied Tabular Data Sheet for specific orifice size and indoor coil match up.

7. After orifice is installed reinstall the liquid line to the top of the orifice distributor assembly. Hand tighten and turn an additional 1/8 turn to seal. Do not overtighten fittings.

8. Leak test system.

9. Replace black plastic cap on equalizer fitting.

10. Slide indoor coil back into cabinet.

SECTION V: TXV INSTALLATIONS

For installations requiring a TXV, the following are the basic steps for installation. For detailed instructions, refer to the Installation Instructions accompanying the TXV kit.

Install TXV kit as follows:

1. Relieve the holding charge by depressing the Schrader valve stem located in the end of the liquid line. Cut the spundown copper to allow installation of the suction line.

2. After holding charge is completely discharged, loosen and remove the Schrader cap seal.

3. Loosen and remove distributor cap seal.

4. Install the thermal expansion valve to the orifice distributor assembly with supplied fittings. Hand tighten and turn an additional 1/4 turn to seal. Do not overtighten fittings.

5. Install the liquid line to the top of the thermal expansion valve with fitting supplied with the liquid line. Hand modify the liquid line to align with casing opening. Hand tighten the liquid line and an additional 1/4 turn to seal.

6. Install the TXV equalizer line into the vapor line as follows:
   a. Hand tighten the 1/4" SAE nut to the Schrader fitting and an additional 1/3 turn to seal.

7. Install the TXV bulb to the vapor line near the equalizer line, using the bulb clamp(s) furnished with the TXV assembly. Ensure the bulb is making maximum contact.
   a. Bulb should be installed on a horizontal run of the vapor line if possible. On lines under 7/8" O.D. the bulb may be installed on top of the line. With 7/8" O.D. and over, the bulb should be installed at the position of about 2 or 10 o'clock.
   b. If bulb installation is made on a vertical run, the bulb should be located at least 16" (40.6 cm) from any bend, and on the tubing sides opposite the plane of the bend. The bulb should be positioned with the bulb tail at the top, so that the bulb acts as a reservoir.
   c. Bulb should be insulated using thermal insulation provided to protect it from the effect of the surrounding ambient temperature. Cover completely to insulate from air-stream.

In all cases, mount the TXV bulb after vapor line is brazed and has had sufficient time to cool.

SECTION V: TXV INSTALLATIONS

NOTICE

Line set and indoor coil can be pressurized to 250 psig with dry nitrogen and leak tested with a bubble type leak detector. Then release the nitrogen charge.

Do not use the system refrigerant in the outdoor unit to purge or leak test.

CAUTION

Do not connect manifold gauges unless trouble is suspected. Approximately 3/4 ounce of refrigerant will be lost each time a standard manifold gauge is connected.

Never attempt to repair any brazed connections while the system is under pressure. Personal injury could result.

Failure to install Schrader Valve Core on orifice applications could result in total refrigerant loss of the system!

Schrader valve core MUST NOT be installed with TXV installation. Poor system performance or system failure could result.

LIQUID LINE

SWIVEL COUPLING

(This fitting is a right-hand thread, turn counter-clockwise to remove)

ORIFICE

DISTRIBUTOR

FIGURE 6: Orifice Installation
Charging the Unit:
The factory charge in the outdoor unit includes enough charge for the unit, a 15 ft. (4.6 m) line set, and the smallest indoor coil/air handler match-up. Some indoor coil/air handler matches may require additional charge. See Tabular Data Sheet provided in unit Customer Booklet for charge requirements.
The "TOTAL SYSTEM CHARGE" must be permanently marked on the unit data plate.

Total system charge is determined as follows:
1. Determine outdoor unit factory charge from Tabular Data Sheet.
2. Determine indoor coil adjustment (if any) from Tabular Data Sheet.
3. Calculate the additional charge for lineset using the Tabular Data Sheet if line length is greater than 15 feet (4.6 m).
4. Total system charge = item 1 + item 2 + item 3.
5. Permanently mark the unit data plate with the total amount of refrigerant in the system.

Using the charging charts:
The unit includes heating charging charts and cooling charging charts. All units include a subcooling charging chart for cooling. If the unit can be used with an indoor orifice, then a cooling superheat chart is also included. If a charging chart is not on the unit, then it can be obtained at www.upgnet.com.

These charts should not be used to charge the unit. They are reference charts for servicing the unit. After the unit has been serviced, collect the charge and weigh it back in according to the directions.
Charging by only one method (cooling or heating), as well as charging to a superheating or subcooling value is not acceptable. Most heat pumps are sensitive to charge in one mode, so charging by only one mode can cause it under perform in the other.

Before confirming system performance against the charging charts, you should first confirm that your gauges are accurate by either comparing your gauges against a calibrated pressure gauge that has been calibrated against a national standard, or if that is not available, then place a R-410A virgin refrigerant container in a conditioned space long enough to come to temperature equilibrium with the surroundings. Then measure the temperature of the air and the pressure of the refrigerant and compare it to the following table:
If the gauges are correct, then measure the pressures using both the cooling and heating charts.

### CAUTION

Refrigerant charging should only be carried out by a qualified air conditioning contractor.

### CAUTION

Compressor damage will occur if system is improperly charged. On new system installations, charge system per tabular data sheet for the matched coil and follow guidelines in this instruction.

### CAUTION

IT IS UNLAWFUL TO KNOWINGLY VENT, RELEASE OR DISCHARGE REFRIGERANT INTO THE OPEN AIR DURING REPAIR, SERVICE, MAINTENANCE OR THE FINAL DISPOSAL OF THIS UNIT.

## SECTION VIII: ELECTRICAL CONNECTIONS

### GENERAL INFORMATION & GROUNDING

Check the electrical supply to be sure that it meets the values specified on the unit nameplate and wiring label.

### FIELD CONNECTIONS POWER WIRING

1. Install the proper size weatherproof disconnect switch outdoors and within sight of the unit.
2. Remove the screws from the control box cover and remove from unit.
3. Run power wiring from the disconnect switch to the unit.
4. Route wires from disconnect through power wiring opening provided and into the unit control box as shown in Figures 7 or 8.
5. Install the proper size time-delay fuses or circuit breaker, and make the power supply connections.

### FIELD CONNECTIONS CONTROL WIRING

1. Route low voltage wiring into bottom of control box as shown in Figures 7 or 8. Make low voltage wiring connections inside the low voltage box per Figures 9 or 10.
2. The complete connection diagram and schematic wiring label is located on the inside surface of the unit service access panel.
3. Replace the control box cover removed in Step 2.
4. All field wiring to be in accordance with national electrical codes (NEC) and/or local-city codes.
5. Mount the thermostat about 5 ft. above the floor, where it will be exposed to normal room air circulation. Do not place it on an outside wall or where it is exposed to the radiant effect from exposed glass or appliances, drafts from outside doors or supply air grilles.
6. Route the 24-volt control wiring (NEC Class 2) from the outdoor unit to the indoor unit and thermostat.

### NOTICE

To eliminate erratic operation, seal the hole in the wall at the thermostat with permagum or equivalent to prevent air drafts affecting the operation of in the thermostat. A Start Assist Kit is available and recommended for long line set applications or in areas of known low voltage problems.

### TABLE

<table>
<thead>
<tr>
<th>Temp (°F)</th>
<th>Pressure (Psig)</th>
<th>Temp (°F)</th>
<th>Pressure (Psig)</th>
<th>Temp (°F)</th>
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</table>
A dehumidification control accessory 2HU06700124 may be used with variable speed air handlers or furnaces in high humidity areas. This control works with the variable speed indoor unit to provide cooling at a reduced air flow, lowering evaporator temperature and increasing latent capacity. The humidistat in this control opens the humidistat contacts on humidity rise. To install, refer to instructions packaged with the accessory. Prior to the installation of the dehumidification control, the jumper across the HUMIDISTAT terminals on the indoor variable speed air handler or furnace CFM selection board must be removed.

During cooling, if the relative humidity in the space is higher than the desired set point of the dehumidification control, the variable speed blower motor will operate at lower speed until the dehumidification control is satisfied. A 40-60% relative humidity level is recommended to achieve optimum comfort.

If a dehumidification control is installed, it is recommended that a minimum air flow of 325 cfm/ton be supplied at all times.

For connection diagrams for all UPG equipment refer to “Low Voltage System Wiring” document available online at www.upgnet.com in the Product Catalog Section.

CFM SELECTION BOARD SETTINGS
For proper system operation the CFM Selection control jumpers must be set properly.
Refer to the Tabular Data Sheet for the recommended airflow settings for each size condensing unit.
Set the cooling speed per the instructions for the air handler or furnace by selecting the correct COOL and ADJ taps. Verify the airflow using the LED display on the CFM selection board.
SECTION IX: SYSTEM START-UP
ENERGIZE CRANKCASE HEATER

If this unit is equipped with a crankcase heater for the compressor, a warning label with an adhesive back is supplied in the unit installation instruction packet. This label should be attached to the field supplied disconnect switch where it will be easily seen.

In order to energize the crankcase heater, set the indoor cooling thermostat to the OFF position. Close the line power disconnect to the unit.

**IMPORTANT**
An attempt to start the compressor without at least 8 hours of crankcase heat will damage the compressor.

TABLE 1: R-410A Saturation Properties

<table>
<thead>
<tr>
<th>Temp °F</th>
<th>Pressure PSIG</th>
<th>Temp °F</th>
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<td>99</td>
<td>313</td>
<td>114</td>
<td>385</td>
</tr>
<tr>
<td>55</td>
<td>156</td>
<td>70</td>
<td>201</td>
<td>85</td>
<td>254</td>
<td>100</td>
<td>317</td>
<td>115</td>
<td>391</td>
</tr>
<tr>
<td>56</td>
<td>158</td>
<td>71</td>
<td>204</td>
<td>86</td>
<td>258</td>
<td>101</td>
<td>322</td>
<td>116</td>
<td>396</td>
</tr>
<tr>
<td>57</td>
<td>161</td>
<td>72</td>
<td>207</td>
<td>87</td>
<td>262</td>
<td>102</td>
<td>326.117</td>
<td>401</td>
<td>407</td>
</tr>
<tr>
<td>58</td>
<td>164</td>
<td>73</td>
<td>211</td>
<td>88</td>
<td>266</td>
<td>103</td>
<td>331</td>
<td>118</td>
<td>407</td>
</tr>
<tr>
<td>59</td>
<td>167</td>
<td>74</td>
<td>214</td>
<td>89</td>
<td>270</td>
<td>104</td>
<td>336</td>
<td>119</td>
<td>412</td>
</tr>
</tbody>
</table>

WITH POWER TO UNIT AND THERMOSTAT IN COOLING POSITION:

1. In the cooling cycle, discharge gas is pumped to the outdoor coil which is the condenser. The indoor coil is the evaporator.
2. If fan switch is in ON position, a circuit is made through blower relay to provide continuous blower operation.
3. With fan switch in AUTO position, a circuit is made from thermostat cooling contact through blower relay to provide blower operation.
4. System will cycle with thermostat demand to provide cooling as needed.

**FIGURE 11:** Heat Pump Flow Diagram

**NOTE:** The indoor coil is shipped with an orifice. The orifice must be replaced with a TXV Kit.
SECTION V: SYSTEM OPERATION
ANTI-SHORT CYCLE DELAY
The control includes a five-minute anti-short cycle delay (ASCD) timer to prevent the compressor from short cycling after a power or thermostat signal interruption. The ASCD timer is applied when the control is first powered from the indoor unit thermostat and immediately following the completion of a compressor run cycle. The compressor and the outdoor fan will not operate during the five minutes that the timer is active. The ASCD timer can be bypassed by connecting the TEST terminals for three seconds while the thermostat is calling for compressor operation (Y input signal energized).

LOW VOLTAGE DETECTION
The control monitors the transformer secondary (24 VAC) voltage and provides low voltage protection for the heat pump and its components. In particular, the control prevents contactor chatter during low voltage conditions. If the voltage drops below approximately 19 VAC, the control will continue to energize any relays that are already energized but will not energize any additional relays until the voltage level increases. If the voltage drops below approximately 16 VAC, the control will immediately de-energize the relay outputs and will not energize any relays until the voltage level increases.

TEST INPUT
The control includes a TEST input connector that can be used for various testing functions during installation and service. The TEST input connector is shown in Figures 12 & 13. The following table summarizes the behavior of the control when the two TEST pins are connected. More detailed descriptions of the various functions are included in other sections of this document.

TABLE 2: TEST Input Functionality

<table>
<thead>
<tr>
<th>Duration of Connection (seconds)</th>
<th>Control Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Time-Temp</td>
<td>Demand Defrost</td>
</tr>
<tr>
<td>Less than 2</td>
<td>Less than 2</td>
</tr>
<tr>
<td>Bypass ASCD. If Y is present and pressure switch is closed, contactors will be energized.</td>
<td></td>
</tr>
<tr>
<td>2-9</td>
<td>2-6</td>
</tr>
<tr>
<td>Clear lockout</td>
<td></td>
</tr>
<tr>
<td>More than 9</td>
<td>More than 6</td>
</tr>
<tr>
<td>Initiate defrost cycle. (Demand only: Energize X/L with active defrost curve flash code)</td>
<td></td>
</tr>
<tr>
<td>Connection removed</td>
<td>Terminate defrost as normal</td>
</tr>
<tr>
<td>Connection not removed</td>
<td>Continue defrost cycle (Demand only: and X/L flash code) until TEST connection removed.</td>
</tr>
</tbody>
</table>

FAULT CODE DISPLAY
X/L Output
The X/L terminal of the heat pump control is typically connected to the X/L input of the room thermostat. The thermostat uses this signal to notify the homeowner of a problem with the heat pump using an LED or LCD display. When the control energizes the X/L terminal, the thermostat displays the flash code so the homeowner can see it.

TABLE 3: X/L Output Categories

<table>
<thead>
<tr>
<th>Condition</th>
<th>X/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Switch lockout - last mode of operation was heating</td>
<td>2 flashes</td>
</tr>
<tr>
<td>Pressure Switch lockout - last mode of operation was defrost</td>
<td>3 flashes</td>
</tr>
<tr>
<td>Incorrect Defrost Curve - jumper selection</td>
<td>On</td>
</tr>
</tbody>
</table>

When the control locks out the compressor because of a pressure switch lockout, it will energize the X/L output as shown in Table 3. The control has a three second delay between fault code flashes. If the conditions above exist during cooling mode, the system could be in the loss of charge condition.

DEFROST OPERATION
Time/Temperature Defrost (13 Seer 2-5 Ton)
The defrost control is a time/temperature control which includes a field-selectable (tap located at board edge) time period between defrost cycle (30, 60, and 90 minutes). The jumper is factory set at 60 minutes. See Figure 14.
The electronic timer and the defrost cycle will start only when the contactor is energized and the defrost thermostat is closed. The defrost thermostat is closed when the liquid temperature falls below approximately 31° F.
The defrost mode is identical to the cooling mode except that the outdoor fan motor stops and the first stage of heat is turned on through W1 / 66 to continue warming the conditioned space.
The defrost cycle will be terminated when the defrost thermostat is opened at 55° F or 10 minutes of compressor accumulated run time, whichever comes first.

NOTICE
The defrost thermostat delay will make the coil temperature about 75-80° F. Please note that the timer will stop the circuit when R to Y is disconnected.
Demand Defrost (13 Seer 1.5 ton, 14.5 Seer 1.5-4 Ton)
The control maintains proper airflow through the outdoor coil during heating operation by melting frost and ice that may form on the coil. Frost may accumulate unevenly in different sections of the coil because of the arrangement of the refrigeration circuit within the coil. The control may initiate a defrost cycle even when the coil is not completely covered with frost. This is normal operation.
The control regulates the defrost operation of the heat pump based on accumulated compressor run time, outdoor coil temperature, and outdoor ambient temperature. The control will cause the unit to operate in the normal heating mode until it determines that a defrost cycle is needed. All defrost timings are based on accumulated compressor run time.

Operation
The defrost mode is equivalent to the cooling mode except that the outdoor fan motor is de-energized. The control shall do the following to initiate a defrost cycle:

- De-energize the outdoor fan.
- Energize the reversing valve.
- Energize the auxiliary heat output through the W1/66 terminal.
- Begin the maximum defrost cycle length timer.

If the call for heating (Y) is removed from the control during the defrost cycle, it will terminate the defrost cycle and de-energize the compressor. The control will also stop the defrost cycle length timer but not reset it. When the control receives another call for heating, it will restart the defrost cycle and the timer at the point at which the call for heating was removed. This will happen only if the liquid line temperature conditions allow defrost to occur.

Defrost Curves
The control uses a set of defrost curve parameters that are selected using the defrost curve selection jumper. The location of the defrost curve selection jumper is shown in Figure 14. Table 4 shows the jumper position that is appropriate for each heat pump model. Jumper position 4 is not used and the control will not allow the compressor to operate when the jumper is in this position.

Defrost Curve Selection
The factory will place the defrost curve selection jumper in the P position or in a numbered position appropriate for the specific heat pump model. You should not have to change the defrost curve selection jumper during initial installation.

If the jumper is inadvertently moved, it should be placed in the appropriate numbered location based on the model number and Table 4. The control will also not energize the compressor if the defrost curve selection jumper is in a numbered position that is not described in Table 4 or if the defrost curve selection jumper is missing. The control will display the proper fault code when a defrost curve jumper error is present. The control will display the active defrost curve using the X/L terminal when the heat pump is operating in a defrost cycle that has been forced using the TEST inputs.

For instance, the X/L output will be energized with two flashes when defrost curve 2 is active. The control only reads the jumper input when the Y and W thermostat inputs are de-energized. If a jumper position is changed while either of these inputs is energized, the control will not act upon the jumper changes until the thermostat calls are de-energized or power (24 VAC) to the control is cycled.

Defrost Initiate Curves
The control will allow the heat pump to operate in the heating mode until the combination of outdoor ambient and outdoor coil temperatures indicate that a defrost cycle is necessary.

The control will initiate a defrost cycle when the liquid line temperature is below the initiate point for the measured ambient temperature (See Figure 14) continuously for 4-1/2 minutes. This delay eliminates unnecessary defrost cycles caused by refrigeration surges such as those that occur at the start of a heating cycle.

The control will initiate a defrost cycle every 6 hours (accumulated compressor run time) to recirculate refrigerant lubricants. This forced defrost timer will be reset and restarted following the completion or termination of a defrost cycle.

The control will also initiate a defrost cycle when the TEST terminals are shorted. This feature allows an installer or service technician to start a defrost cycle immediately as required. When the TEST terminals are shorted for more than six seconds with a Y input energized and the pressure switch input is closed, the ASCD will be bypassed and the compressor and the W1/66 terminal to auxiliary heat will be energized. When the TEST inputs are used to force a defrost cycle, the control will ignore the state of the liquid line temperature and outdoor ambient temperature inputs. The coil does not have to be cold and the outdoor temperature does not have to be within a certain range for the heat pump to be forced into a defrost cycle. After the TEST input jumper is removed, the defrost mode will be terminated as normal. The defrost cycle length timer will not be started until the TEST input is removed. If the TEST terminals remain shorted, the control will keep the unit in defrost mode.

Defrost Inhibition
The control will not initiate a defrost cycle if the liquid line temperature is above 40°F unless the defrost cycle is forced using the TEST input. The control will also prevent a defrost cycle from being initiated too soon after the initiation of the previous defrost cycle. When power is applied to the control and after the completion or termination of each defrost cycle, the control will start a 40-minute timer. When this timer expires, the control will allow another defrost cycle when needed. The timer is based on accumulated compressor run time.

Defrost Termination
The control will terminate the defrost cycle immediately after the liquid line temperature reaches 80°F or after eight minutes of defrost operation.

The control will do the following to terminate a defrost cycle:

- Energize the outdoor fan.
- De-energize the reversing valve.
- De-energize the auxiliary heat output through the W1/66 terminal.
- Reset and restart the 40-minute defrost inhibit timer.

Compressor Delay
When Defrost Jumper Position #2 is selected the compressor is shut down for 30 seconds entering and exiting defrost mode. This delay is present in normal operation but is not present when the TEST pins are shorted to force a defrost cycle. Position #1 is recommended for reciprocating compressors, and Position #2 is recommended for scroll compressors.

Compressor Delay
When Defrost Jumper Position #2 is selected the compressor is shut down for 30 seconds entering and exiting defrost mode. This delay is present in normal operation but is not present when the TEST pins are shorted to force a defrost cycle. Position #1 is recommended for reciprocating compressors, and Position #2 is recommended for scroll compressors.

Table 4: Defrost Initiate Curves

<table>
<thead>
<tr>
<th>Defrost Curve Selection Jumper Position</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Other Models</td>
<td>RHP13R</td>
<td>RHP13J, RHP14J</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Jumper settings 1-3 are different defrost curve settings. 4 & P will not work in application.
FIGURE 14: Defrost Operation Curves

COOLING OPERATION
During cooling operation, the control will receive thermostat signals at the Y and O input terminals. The control will energize the M compressor output terminal. This signal energizes the coil of the compressor contactor causing the compressor to run. The control also delivers power to the COND FAN terminals causing the outdoor fan to operate. The control energizes the REV VALVE terminal with 24VAC to switch the reversing valve.

HEATING OPERATION
During normal heating mode, the control will receive a thermostat signal at the Y input terminal. The control will energize the M compressor output terminal. This signal energizes the coil of the compressor contactor causing the compressor to run. The control also delivers power to the COND FAN terminals causing the outdoor fan to operate. The reversing valve is not energized in heating mode.

EMERGENCY HEAT
When the thermostat calls for emergency heat operation (W signal without a Y signal), the control will de-energize the compressor and energize the W1/66 terminal immediately.

PRESSURE SWITCH FAULT & LOCKOUT
The heat pump is equipped with a pressure switch, loss of charge switch and an over temp switch (units equipped with scroll compressor) that are connected to the control at the pressure switch terminals. If one of these switches input opens for more than 40 milliseconds, the control will de-energize the compressor. If the switch closes and a thermostat call for compressor operation is present, the control will apply the five-minute anti-short cycle delay timer and start the compressor when the timer expires.

When the compressor is started following a switch fault, the control will start a six-hour timer based on accumulated compressor run time. If the control senses another opening of the switch before the timer expires, it will cause a soft lockout condition. The second opening of the switch must be greater than 160 milliseconds for the lockout to occur. If the second opening is between 40 and 160 milliseconds, the control will de-energize the compressor but not cause a soft lockout condition. If the control does not sense a second switch opening before the six-hour timer expires, the timer and counter will be reset.

During the soft lockout mode, the control will de-energize the compressor and energize the XIL output with the appropriate flash code. The control will reset the soft lockout condition when any of the following occur following removal of the fault condition.

1. Power is cycled to the R or Y inputs of the control. This will cause the soft lockout condition to be reset when the thermostat is satisfied or when the thermostat is set to SYSTEM OFF and back to HEAT or COOL mode.

2. The TEST terminals are shorted for more than two seconds. When the soft lockout condition is reset, the control will stop displaying the fault code and will respond to thermostat inputs normally.

SECTION VI: INSTRUCTING THE OWNER
Assist owner with processing warranty cards and/or online registration. Review Owners Guide and provide a copy to the owner and guidance on proper operation and maintenance. Instruct the owner how to start, stop and adjust temperature setting.

When applicable, instruct the owner that the compressor is equipped with a crankcase heater to prevent the migration of refrigerant to the compressor during the OFF cycle. The heater is energized only when the unit is not running. If the main switch is disconnected for long periods of shut down, do not attempt to start the unit until 8 hours after the switch has been connected. This will allow sufficient time for all liquid refrigerant to be driven out of the compressor.

The installer should also instruct the owner on proper operation and maintenance of all other system components.

MAINTENANCE
1. Dirt should not be allowed to accumulate on the outdoor coils or other parts in the air circuit. Clean as often as necessary to keep the unit clean. Use a brush, vacuum cleaner attachment, or other suitable means.

2. The outdoor fan motor is permanently lubricated and does not require periodic oiling.

3. If the coil needs to be cleaned, it should be washed with Calgon Coliclean (mix one part Coliclean to seven parts water). Allow solution to remain on coil for 30 minutes before rinsing with clean water. Solution should not be permitted to come in contact with painted surfaces.

4. Refer to the furnace or air handler instructions for filter and blower motor maintenance.

5. The indoor coil and drain pan should be inspected and cleaned regularly to prevent odors and assure proper drainage.

CAUTION

IT IS UNLAWFUL TO KNOWINGLY VENT, RELEASE OR DISCHARGE REFRIGERANT INTO THE OPEN AIR DURING REPAIR, SERVICE, MAINTENANCE OR THE FINAL DISPOSAL OF THIS UNIT.

SUBCOOLING CHARGE TABLE IS ON THE UNIT RATING PLATE.
SECTION VII: WIRING DIAGRAM

FIGURE 15: Wiring Diagram - Single Phase (Demand Defrost)
FIGURE 16: Wiring Diagram - Single Phase (Time-Temp)

DANGER - SHOCK HAZARD
TURN OFF ELECTRICAL POWER BEFORE SERVICING
TO PREVENT POSSIBLE DAMAGE TO THE EQUIPMENT
AND POSSIBLE PERSONAL INJURY.

CAUTION
TO PREVENT ELECTRICAL SHOCK OPEN REMOTE
DISCONNECT SO ELECTRICAL SUPPLY TO HEAT
PUMP IS SHUT OFF.

1. COMPONENTS SHOWN IN DASH LINES
   ARE OPTIONAL.
2. DUAL CAPACITOR SHOWN. SEPARATE
   CAPACITORS MAY BE USED ON ACTUAL
   UNIT.
3. WIRING MUST CONFORM TO
   NATIONAL AND LOCAL CODES.
   IF ANY OF THE ORIGINAL WIRE SUPPLIED
   WITH THIS UNIT MUST BE REPLACED, IT
   MUST BE REPLACED WITH 105° C
   THERMOPLASTIC OR ITS EQUIVALENT.
   WHERE POWER SUPPLY HAS ONE (1) 240
   VOLT CONDUCTOR AND ONE (1) NEUTRAL
   CONDUCTOR, CONNECT L2 OF CONTACTOR
   TO NEUTRAL.

LEGEND
CAP - CAPACITOR
CC - CONTACTOR COIL
CCM - CRANKCASE HEATER
HPS - HIGH PRESS SWITCH
HS - HEATER SWITCH
HTS - HIGH TEMP SWITCH
LS - LIQUID SENSOR
LPS - LOW PRESS SWITCH
RV - REVERSING VALVE
SC - START CAPACITOR
SR - START RELAY

COLOR CODE
BLK - BLACK
BLU - BLUE
BRN - BROWN
GRN - GREEN
GRY - GREY
ORG - ORANGE
PNK - PINK
PUR - PURPLE
RED - RED
WHT - WHITE
YEL - YELLOW

FAN MOTOR
RED - RED
GRN - GND
BRN - S

COMPRESSOR
RED - RED
BRN - P
C - C
S - S

CONTACTOR
RED - RED
BRN - BLK
C - C
S - S

DEFOST CONTROL
T2 - T2
T1 - T1
L2 - L2
L1 - L1

SEE UNIT INSTALLATION INSTRUCTIONS
FOR LOW VOLTAGE TERMINATIONS

208-230 VAC 60 Hz
1 PHASE SUPPLY

544123-UWD-B-0412
**FIGURE 17:** Wiring Diagram - Three Phase (Demand Defrost)

**COLOR CODE**
- BLK - Black
- BLU - Blue
- BRN - Brown
- BR/WH - Brown/White
- GRN - Green
- GRY - Grey
- ORG - Orange
- PUR - Purple
- RED - Red
- WHT - White
- YEL - Yellow

**DANGER - SHOCK HAZARD**

**Turn off electrical power before servicing**

TO PREVENT POSSIBLE DAMAGE TO THE EQUIPMENT

AND POSSIBLE PERSONAL INJURY.

**CAUTION**

TO PREVENT ELECTRICAL SHOCK OPEN REMOTE

DISCONNECT 3D ELECTRICAL SUPPLY TO HEAT

PUMP IS SHUT OFF.

1. COMPONENTS SHOWN IN DASH LINES ARE OPTIONAL.
2. WIRING MUST CONFORM TO
   - NATIONAL AND LOCAL CODES.

3. IF ANY OF THE ORIGINAL WIRE SUPPLIED
   - WITH THIS UNIT MUST BE REPLACED, IT
   MUS ST BE REPLACED WITH 105°C
   THERMOPLASTIC OR ITS EQUIVALENT.

4. WHERE POWER SUPPLY HAS ONE (1) 240
   VOLT CONDUCTOR AND ONE (1) NEUTRAL
   CONDUCTOR, CONNECT L2 OF CONTACTOR
   TO NEUTRAL

5. FAN RELAY AND WIRES LABELED 460V
   ONLY USED ON 380/415V OR 460V

**LEGEND**
- AS - Ambient Sensor
- CAP - Capacitor
- CC - Contactor Coil
- CCH - Crankcase Heater
- HS - Heater Switch
- LS - Liquid Sensor
- LPS - Low Press Switch
- RV - Reversing Valve
- SC - Start Capacitor
- SR - Start Relay

**COLOR CODE**
- BLK - Black
- BLU - Blue
- BRN - Brown
- BR/WH - Brown/White
- GRN - Green
- GRY - Grey
- ORG - Orange
- PUR - Purple
- RED - Red
- WHT - White
- YEL - Yellow

**WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES.**

**IF ANY OF THE ORIGINAL WIRE SUPPLIED WITH THIS UNIT MUST BE REPLACED, IT MUST BE REPLACED WITH 105°C THERMOPLASTIC OR ITS EQUIVALENT.**

**WHERE POWER SUPPLY HAS ONE (1) 240 VOLT CONDUCTOR AND ONE (1) NEUTRAL CONDUCTOR, CONNECT L2 OF CONTACTOR TO NEUTRAL.**

**FAN RELAY AND WIRES LABELED 460V ONLY USED ON 380/415V OR 460V.**
FIGURE 18: Wiring Diagram - Three Phase (Time-Temp)
### SECTION VIII: START UP SHEET

**Heat Pump and Supplementary Heat Start-Up Sheet**
Proper start-up is critical to customer comfort and equipment longevity

<table>
<thead>
<tr>
<th>Start-Up Date</th>
<th>Technician Performing Start-Up</th>
<th>Installing Contractor Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Owner Information

- **Name:**
- **Address:**
- **City:**
- **State or Province:**
- **Zip or Postal Code:**

### Equipment Data

<table>
<thead>
<tr>
<th>Indoor Unit Model #</th>
<th>Indoor Unit Serial #</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indoor Coil Model #</th>
<th>Indoor Coil Serial #</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outdoor Unit Model #</th>
<th>Outdoor Unit Serial #</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Filter, Thermostat, Accessories

- **Filter Type:**
- **Filter Size:**
- **Filter Location(s):**
- **Thermostat Type:**

### Connections -- Per Installation Instructions and Local Codes

- **Unit is level**
- **Supply plenum and return ducts are connected and sealed**
- **Gas piping is connected (if applicable)**
- **Condensate drain for indoor coil properly connected**
- **Refrigerant piping complete and leak tested**
- **Vent system is connected (if applicable)**
- **Condensate drain for furnace (if applicable)**

### Electrical: Line Voltage

<table>
<thead>
<tr>
<th>Indoor unit (volts AC)</th>
<th>Outdoor unit (volts AC)</th>
<th>Overcurrent Protection Breaker / Fuses Amperes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Ground wire is connected**
- **Polarity is correct (120vac indoor units) black is L1 (hot), white is N (neutral)**

### Electrical: Low Voltage

- **Heat anticipator is set to the recommended value listed in the Installation Instructions**
- **Heath anticipator recommended value**

<table>
<thead>
<tr>
<th>Low voltage values: “R” and “C” at Indoor unit control board (volts AC)</th>
<th>“R” and “C” Outdoor unit control board (volts AC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Supplementary Heating Set-Up

- **Heating Type:**
  - Electric Air Handler
  - Natural Gas
  - LP Gas (Requires LP Conversion Kit)

<table>
<thead>
<tr>
<th>Inlet Gas Pressure (in. w.c.)</th>
<th>Manifold Gas Pressure (in. w.c.)</th>
<th>LP Gas Conversion Kit Part # Used</th>
<th>LP Kit Installed By</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Calculated input in btuh - clock the gas meter (Nat Gas Only)**
- **Electric Heat Kit Part # (if applicable)**
  - KW installed
  - Rated BTU/H (furnaces)

### Venting (if applicable)

- **Venting system properly sized, within the limitations of the charts in the installation instructions.**

<table>
<thead>
<tr>
<th>Intake Size</th>
<th># of 90 Degree Ells</th>
<th># of 45 Degree Ells</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exhaust Size</th>
<th># of 90 Degree Ells</th>
<th># of 45 Degree Ells</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued on next Page
### Air Side: System Total External Static Pressure

| Supply static before indoor coil (in w.c.) | Supply static after indoor coil (in w.c.) |
| Return Static (in w.c.) before filter | Return Static (in w.c.) after filter (furnace side) |
| Total External Static Pressure | Maximum Rated ESP (in w.c.) |

### Cooling & Heat Pump Indoor Blower Set-Up

<table>
<thead>
<tr>
<th>COOL</th>
<th>ECM</th>
<th>ADJUST</th>
<th>DELAY</th>
<th>X-13</th>
<th>PSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>1</td>
<td>Low</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>2</td>
<td>Medium Low</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>3</td>
<td>Medium</td>
</tr>
<tr>
<td>D</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>4</td>
<td>Medium High</td>
</tr>
</tbody>
</table>

### Supplementary Heating Indoor Blower Set-Up

<table>
<thead>
<tr>
<th>HEAT</th>
<th>ECM</th>
<th>X-13</th>
<th>PSC</th>
<th>Medium Low</th>
<th>Medium</th>
<th>Medium High</th>
<th>High</th>
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<tbody>
<tr>
<td>A</td>
<td>A</td>
<td>1</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Medium High</td>
<td>High</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>2</td>
<td></td>
<td>Medium Low</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>3</td>
<td></td>
<td></td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>D</td>
<td>4</td>
<td></td>
<td></td>
<td>Medium High</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td>High</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Defrost Control Board

Fill in the information i.e., "ON", "OFF" or the appropriate "Value" for the fields that apply to the defrost control board installed.

- YorkGuard VI
- Demand Defrost
- Time and Temperature
- Part Number
- Version Number
- Low Temp Cut Out
- Balance Point
- Defrost Curve
- Y2 Lock
- FFUEL
- Switch Point
- Run Time: Time and Temperature board only 30, 60 or 90 minutes

### Refrigerant Charge and Metering Device

- R-22
- R-410A
- TXV
- Fixed Orifice
- Additional Linetset Length
- Adder per foot - lbs.
- Oz.
- # Elbows
- # 45s
- Total Added - lbs.
- Oz.

### Cycle Test

- Operate the unit through several heating cycles from the thermostat, noting and correcting any problems
- Operate the unit through continuous fan cycles from the thermostat, noting and correcting any problems
- Operate the unit through a cooling cycles, noting and correcting any problems
- Operate the unit through an emergency heating cycles, noting and correcting any problems

### Clean Up

- Installation debris disposed of and indoor and outdoor areas cleaned up?

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Continued on next Page
<table>
<thead>
<tr>
<th>Owner Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Provide owner with the owner’s manual</td>
</tr>
<tr>
<td>☐ Explain operation of system to equipment owner</td>
</tr>
<tr>
<td>☐ Explain thermostat use and programming (if applicable) to owner</td>
</tr>
<tr>
<td>☐ Explain the importance of regular filter replacement and equipment maintenance</td>
</tr>
</tbody>
</table>

**Comments Section**