INSTALLATION MANUAL

R-410A OUTDOOR SPLIT-SYSTEM HEAT PUMP

MODELS: 13 SEER & 14.5 SEER - THG(D,F)/GHGD/THJ(D,F)/YHJ(D,F)/YHJR/THJR SERIES

1.5 TO 5 TONS – 1 & 3 PHASE

AHRI CERTIFIED

ISO 9000 REGISTRATION

ISO 9001 Certified Quality Management System

LIST OF SECTIONS

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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.

⚠WARNING

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

Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual for assistance or for additional information, consult a qualified contractor, installer, or service agency.

⚠ 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.

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 Local Distributor for more information.

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.

AIR TEMPERATURE AT OUTDOOR COIL, °F				AIR TEMPERATURE AT INDOOR COIL, °F			
Min.		Max.		Min.		Max.	
DB Cool	DB Heat	DB Cool	DB Heat	WB Cool	DB Heat	WB Cool	DB Heat
50	-10	115	75	57	50[1]	72	80

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

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.

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.

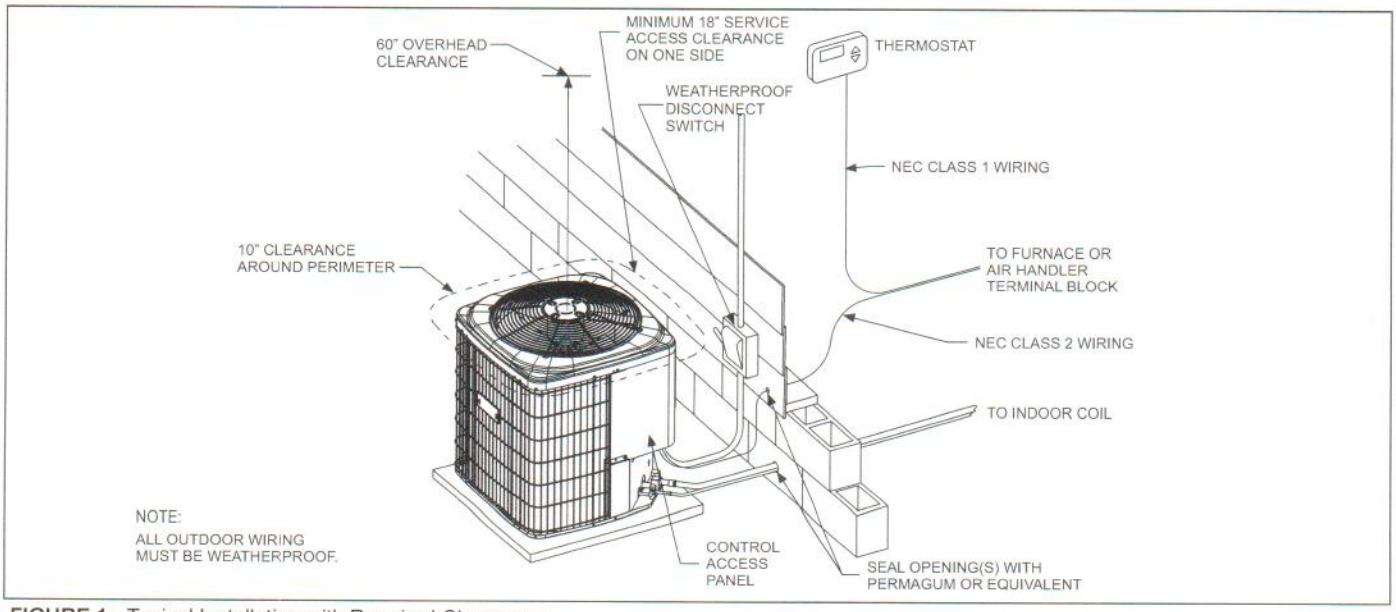

FIGURE 1: Typical Installation with Required Clearances

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.

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.

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.

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 2.
6. Use PVC piping as a conduit for all underground installations as shown in Figure 3. 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.

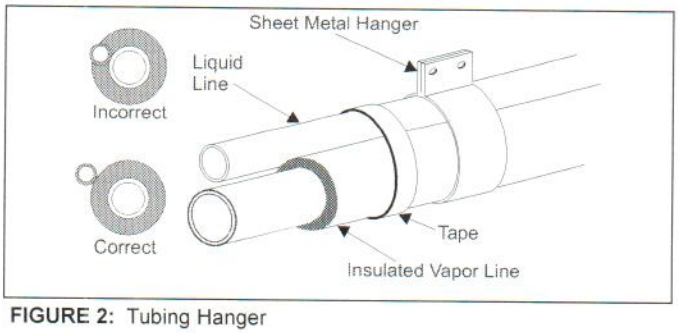

FIGURE 2: Tubing Hanger

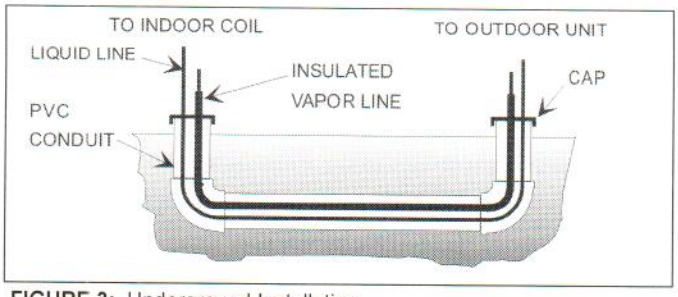

FIGURE 3: Underground Installation

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 Silfos-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.

⚠ CAUTION

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.

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 4. Also, protect all painted surfaces, insulation, and plastic base during brazing. After brazing cool joint with wet rag.

⚠WARNING

This is not a backseating valve. The service access port has a valve core. Opening or closing valve does not close service access port.

If the valve stem is backed out past the chamfered retaining wall, the O-ring can be damaged causing leakage or system pressure could force the valve stem out of the valve body possibly causing personal injury.

Valve can be opened by removing the plunger cap and fully inserting a hex wrench into the stem and backing out counter-clockwise until valve stem just touches the chamfered retaining wall.

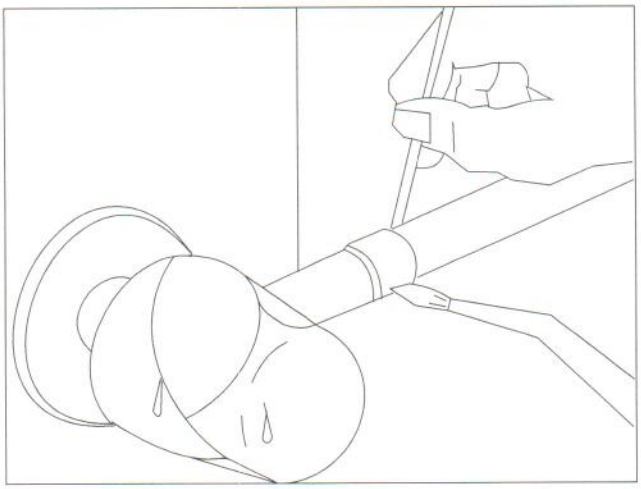

FIGURE 4: Heat Protection

Connect the refrigerant lines using the following procedure:

1. Remove the cap and Schrader core from both the liquid and vapor service valve service ports at the outdoor unit. Connect low pressure nitrogen to the liquid line service port.
2. Braze the liquid line to the liquid valve at the outdoor unit. Be sure to wrap the valve body with a wet rag. Allow the nitrogen to continue flowing. Refer to the Tabular Data Sheet for proper liquid line sizing.
3. Go to "SECTION IV" or "SECTION V" for orifice or TXV Installation depending on application.

⚠ CAUTION

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 OVERTIGHTEN (between 40 and 60 inch - lbs. maximum).
9. Evacuate the vapor line, evaporator, and the liquid line to 500 microns or less.

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.

10. Replace cap on service ports. Do not remove the flare caps from the service ports except when necessary for servicing the system.

⚠ 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.

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 cresent 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.

⚠WARNING

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

See "System Charge" section for checking and recording system charge.

SECTION IV: ORIFICE INSTALLATION

⚠WARNING

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

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 over tighten fittings.
8. Leak test system.
9. Replace black plastic cap on equalizer fitting.
10. Slide indoor coil back into cabinet.

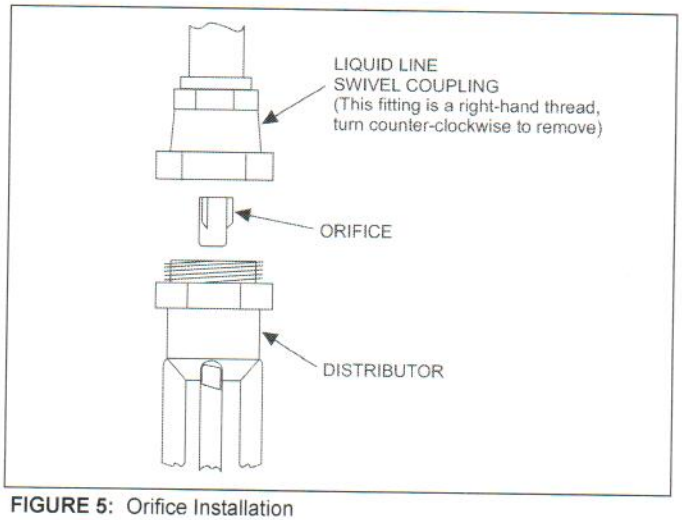

FIGURE 5: Orifice Installation

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.

⚠ CAUTION

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

⚠WARNING

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

⚠ CAUTION

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.

All connections to be brazed are copper-to-copper and should be brazed with a phosphorous-copper alloy material such as Silfos-5 or equivalent. DO NOT use soft solder.

Install the TXV bulb to the vapor line near the equalizer line, using the two bulb clamps furnished with the TXV assembly. Ensure the bulb is making maximum contact. Refer to TXV installation instruction for view of bulb location.

⚠ CAUTION

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

SECTION VI: EVACUATION

It will be necessary to evacuate the system to 500 microns or less. If a leak is suspected, leak test with dry nitrogen to locate the leak. Repair the leak and test again.

To verify that the system has no leaks, simply close the valve to the vacuum pump suction to isolate the pump and hold the system under vacuum. Watch the micron gauge for a few minutes. If the micron gauge indicates a steady and continuous rise, it's an indication of a leak. If the gauge shows a rise, then levels off after a few minutes and remains fairly constant, its an indication that the system is leak free but still contains moisture and may require further evacuation if the reading is above 500 microns.

SECTION VII: SYSTEM CHARGE

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 match-up. Some indoor coil matches may require additional charge. See tabular data sheet provided in unit literature packet for charge requirements.

⚠ CAUTION

Do not leave the system open to the atmosphere.

The "TOTAL SYSTEM CHARGE" must be permanently stamped on the unit data plate.

Total system charge is determined as follows:

1. Determine outdoor unit charge from tabular data sheet.
2. Determine indoor coil adjustment from tabular data sheet.
3. Calculate the line charge 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 stamp the unit data plate with the total amount of refrigerant in the system.

Use the following charging method whenever additional refrigerant is required for the system charge.

If a calibrated charging cylinder or accurate weighing device is available, add refrigerant accordingly. Otherwise, model-specific charging charts are provided on the access panel of the unit.

⚠WARNING

DO NOT attempt to pump "Total System Charge" into outdoor unit for maintenance, service, etc. This may cause damage to the compressor and/or other components. the outdoor unit only has enough volume for the factory charge, not the "Total System Charge".

⚠ 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.

Power wiring, control (low voltage) wiring, disconnect switches and over current protection must be supplied by the installer. Wire size should be sized per NEC requirements.

⚠ CAUTION

All field wiring must USE COPPER CONDUCTORS ONLY and be in accordance with Local, National, Fire, Safety & Electrical Codes. This unit must be grounded with a separate ground wire in accordance with the above codes.

The complete connection diagram and schematic wiring label is located on the inside surface of the unit service access panel.

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 6 or 7.
5. Install the proper size time-delay fuses or circuit breaker, and make the power supply connections.

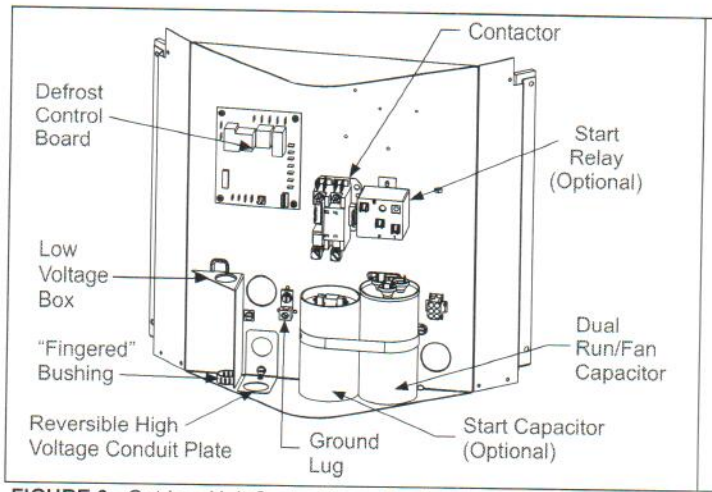

FIGURE 6: Outdoor Unit Control Box - Single Phase

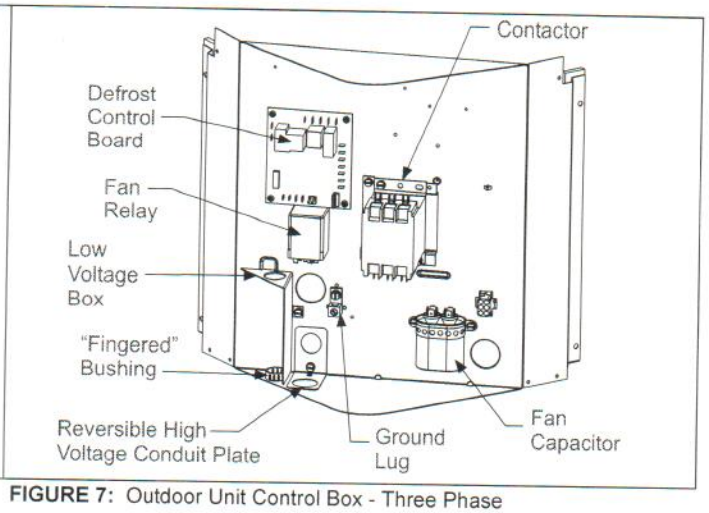

FIGURE 7: Outdoor Unit Control Box - Three Phase

FIELD CONNECTIONS CONTROL WIRING

1. Route low voltage wiring into bottom of control box as shown in Figures 6 or 7. Make low voltage wiring connections inside the low voltage box per Figures 8-9.
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.

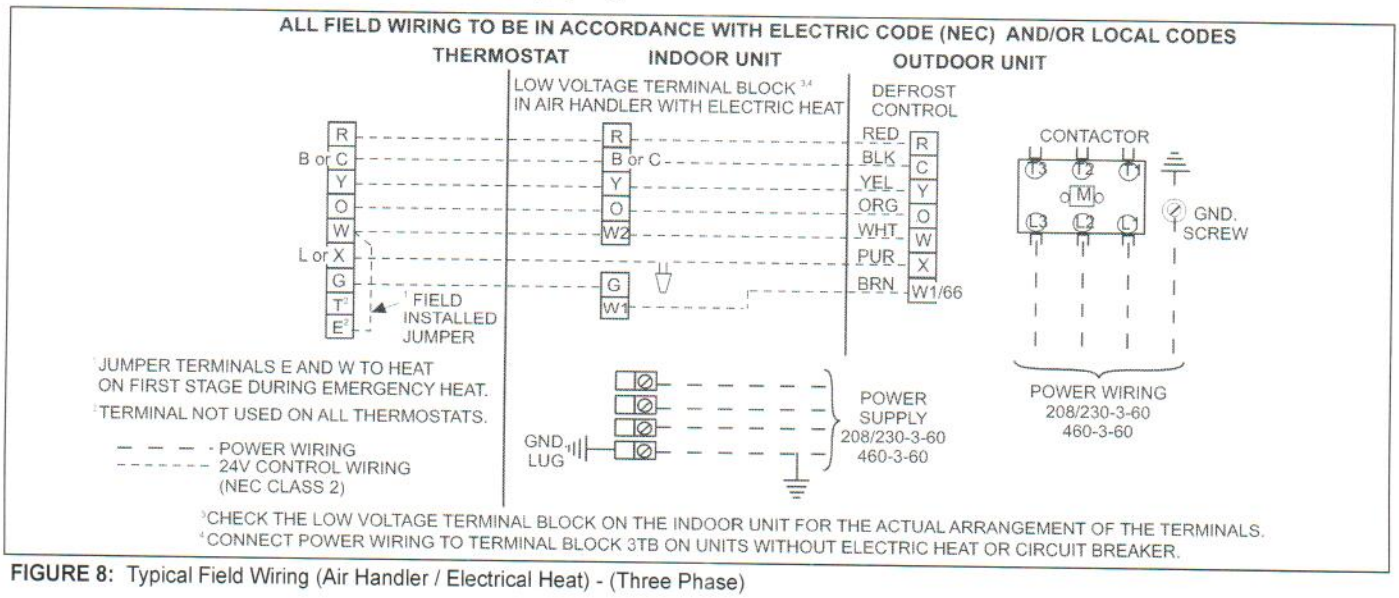

FIGURE 8: Typical Field Wiring (Air Handler / Electrical Heat) - (Three Phase)

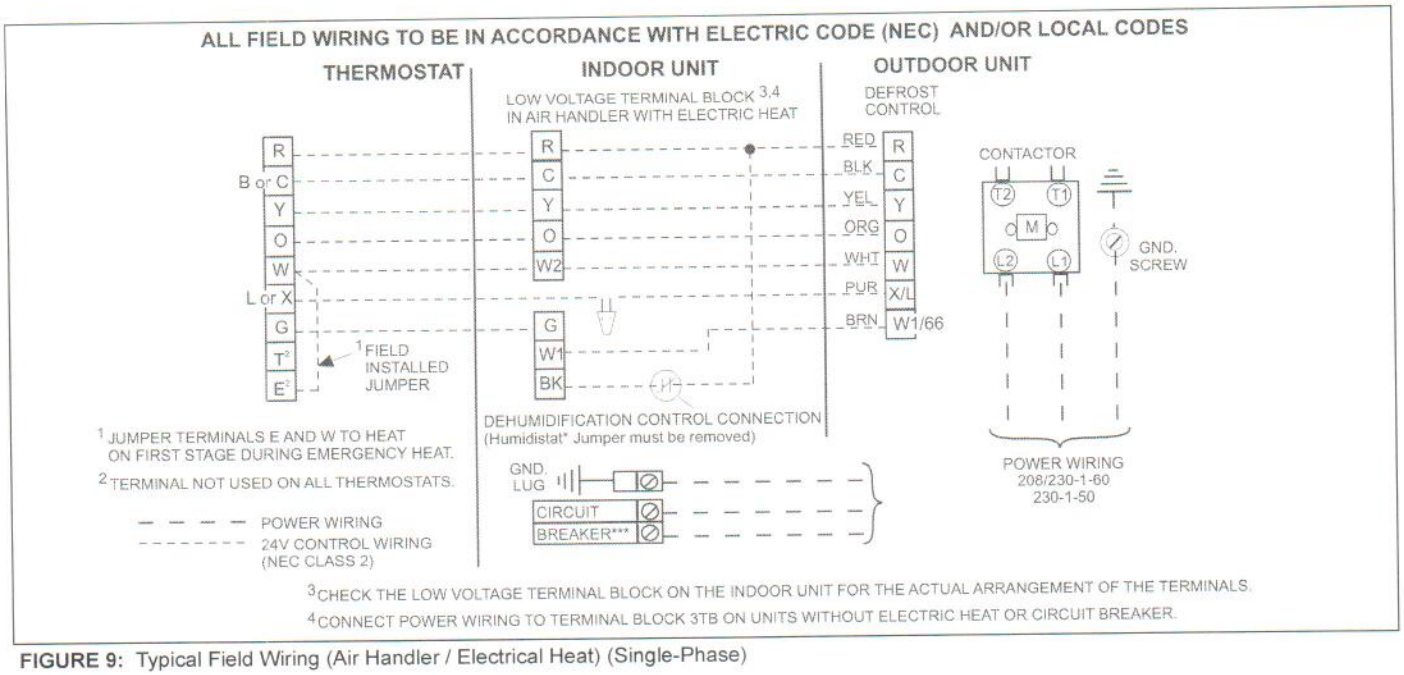

FIGURE 9: Typical Field Wiring (Air Handler / Electrical Heat) (Single-Phase)

DEHUMIDIFICATION CONTROL

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 air flow 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.

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.

TABLE 1: R-410A Saturation Properties

Temp °F	Pressure PSIG	Temp °F	Pressure PSIG	Temp °F	Pressure PSIG	Temp °F	Pressure PSIG	Temp °F	Pressure PSIG
45	130	60	170	75	217	90	274	105	341
46	132	61	173	76	221	91	278	106	345
47	135	62	176	77	224	92	282	107	350
48	137	63	179	78	228	93	287	108	355
49	140	64	182	79	232	94	291	109	360
50	142	65	185	80	235	95	295	110	365
51	145	66	188	81	239	96	299	111	370
52	147	67	191	82	243	97	304	112	375
53	150	68	194	83	247	98	308	113	380
54	153	69	197	84	250	99	313	114	385
55	156	70	201	85	254	100	317	115	391
56	158	71	204	86	258	101	322	116	396
57	161	72	207	87	262	102	326.	117	401
58	164	73	211	88	266	103	331	118	407
59	167	74	214	89	270	104	336	119	412

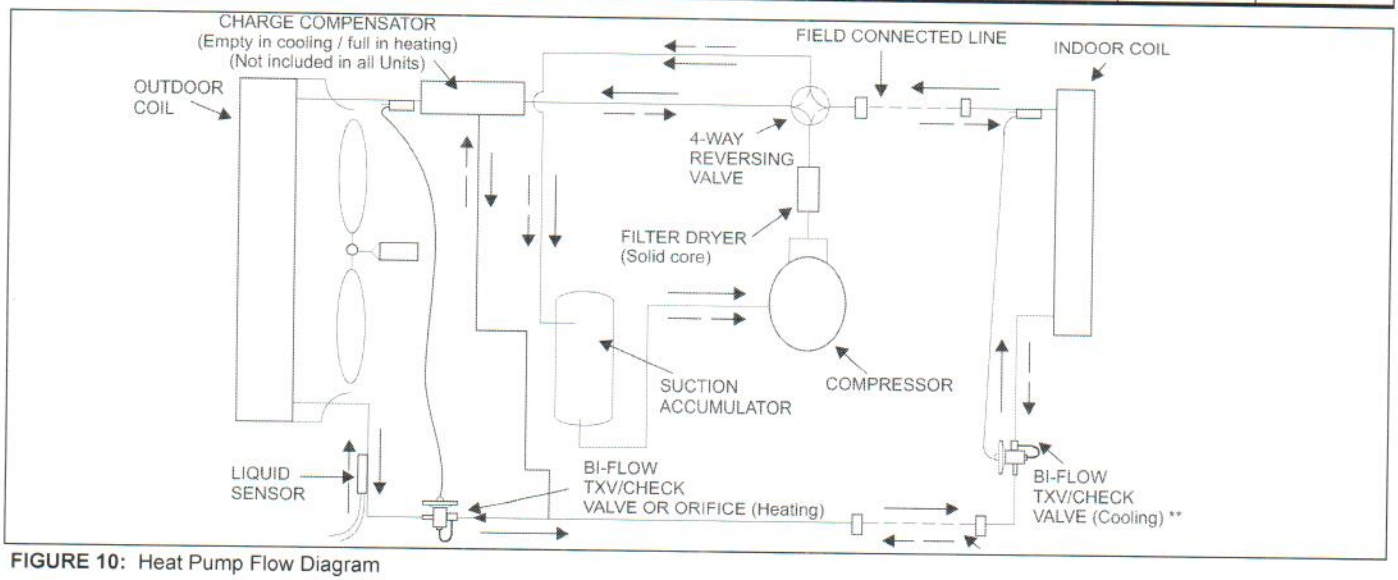

FIGURE 10: Heat Pump Flow Diagram

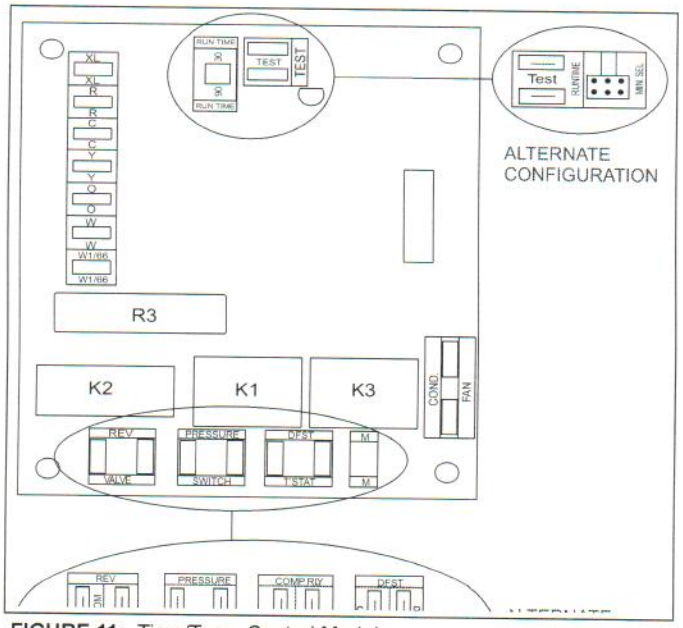

FIGURE 11: Time/Temp Control Module

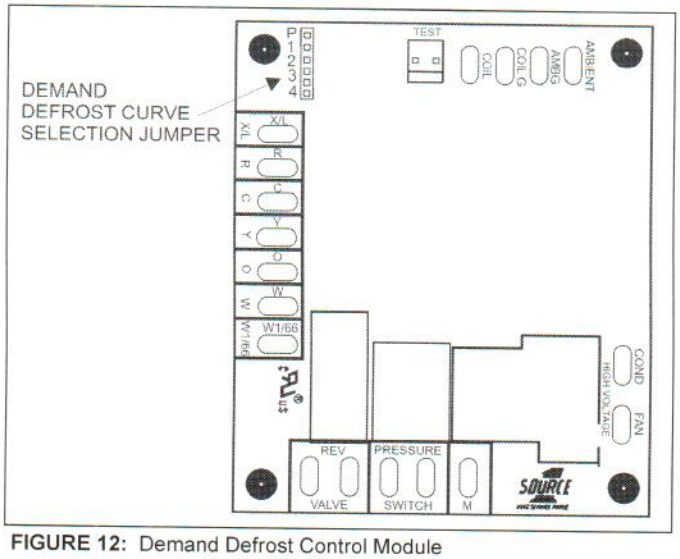

FIGURE 12: Demand Defrost Control Module

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 11 & 12. 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

Duration of Connection (seconds)		Control Behavior
Time-Temp	Demand Defrost	
Less than 2	Less than 2	No response
2-9	2-6	Bypass ASCD. If Y is present and pressure switch is closed, contactors will be energized.
		Clear lockout
More than 9	More than 6	Initiate defrost cycle. (Demand only: Energize X/L with active defrost curve flash code)
Connection removed		Terminate defrost as normal
Connection not removed		Continue defrost cycle (Demand only: and X/L flash code) until TEST connection removed.

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

Condition	X/L
Pressure Switch lockout - last mode of operation was heating	2 flashes
Pressure Switch lockout - last mode of operation was defrost	3 flashes
Incorrect Defrost Curve - jumper selection	On

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/temp. 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 13.

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 13. 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 Cycle Initiation

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 13) 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.

TABLE 4: Defrost Initiate Curves

Defrost Curve Selection Jumper Position	1	2	3	4
All Other Models	YHJR, THJR,THRD, GHRD	YHJD, YHJF, THJD, THJF, CHJD, CHJF, LHJD, LHJF THGD, GHGD	None	None

Jumper settings 1-3 are different defrost curve settings. 4 & P will not work in application.

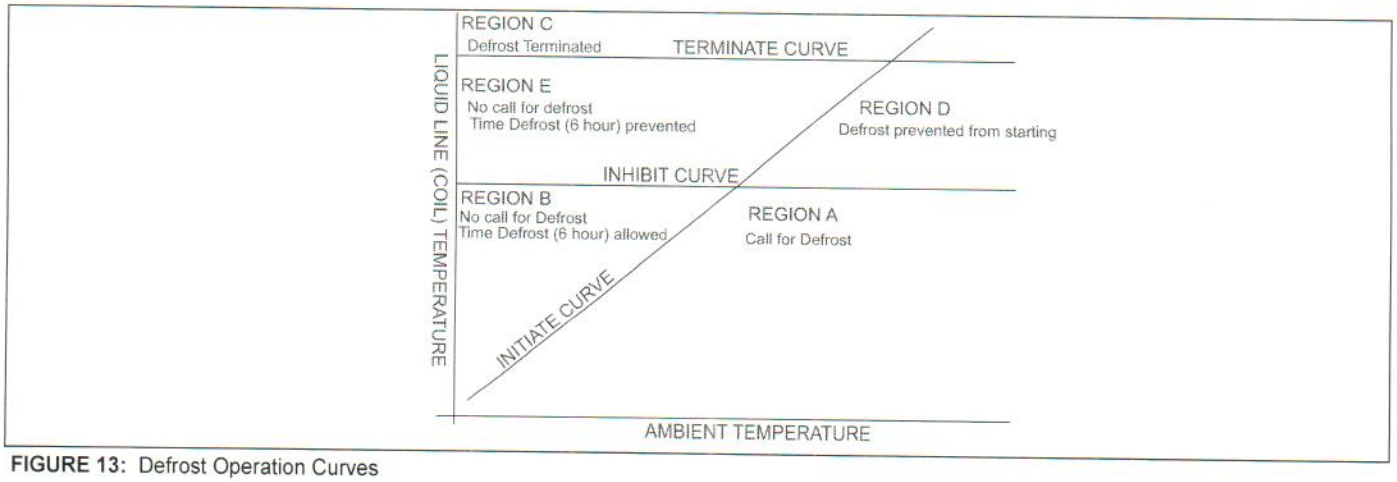

FIGURE 13: Defrost Operation Curves

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 X/L 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 or the operator 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 Coilclean (mix one part Coilclean 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

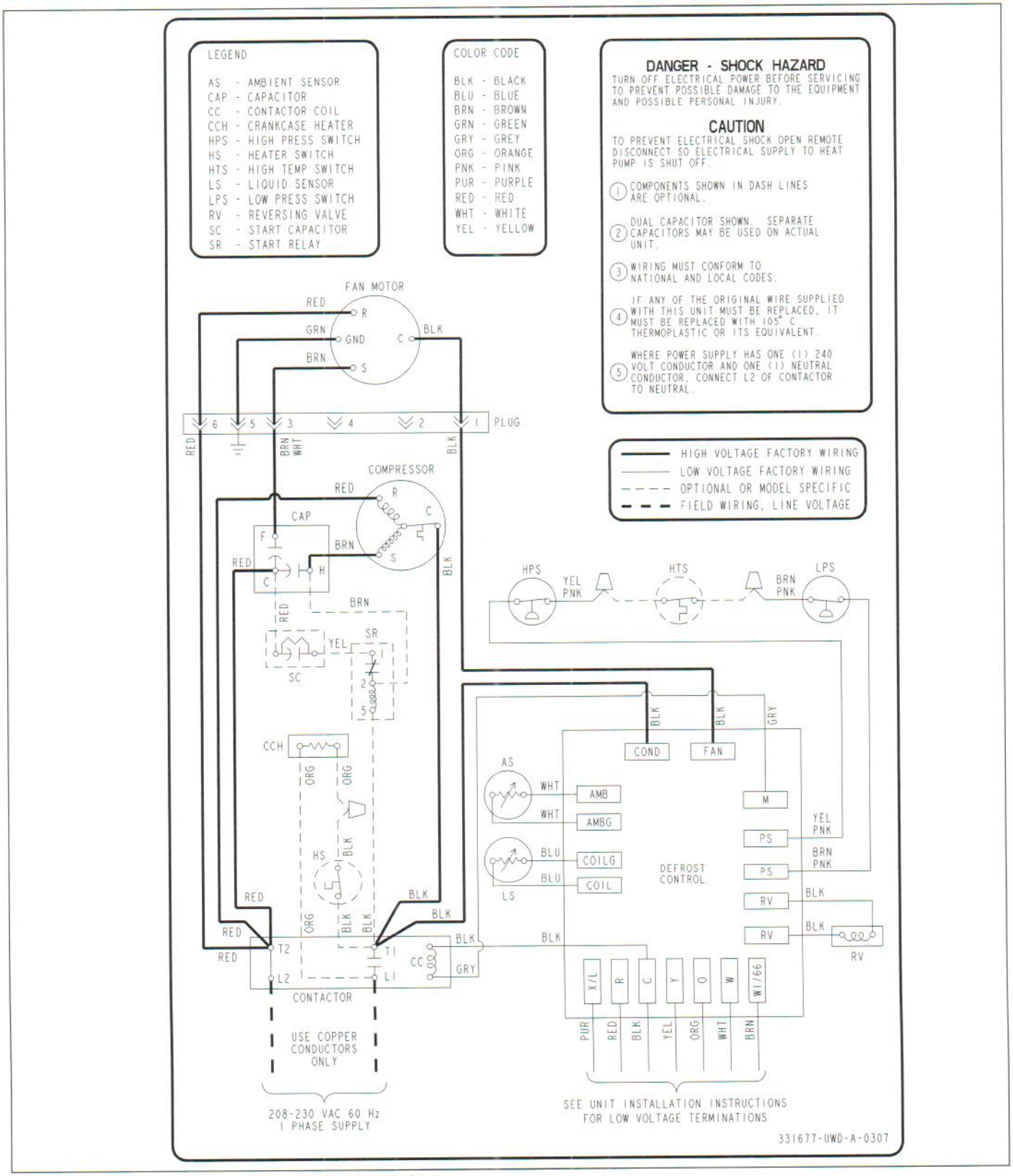

FIGURE 14: Wiring Diagram - Single Phase (Demand Defrost)

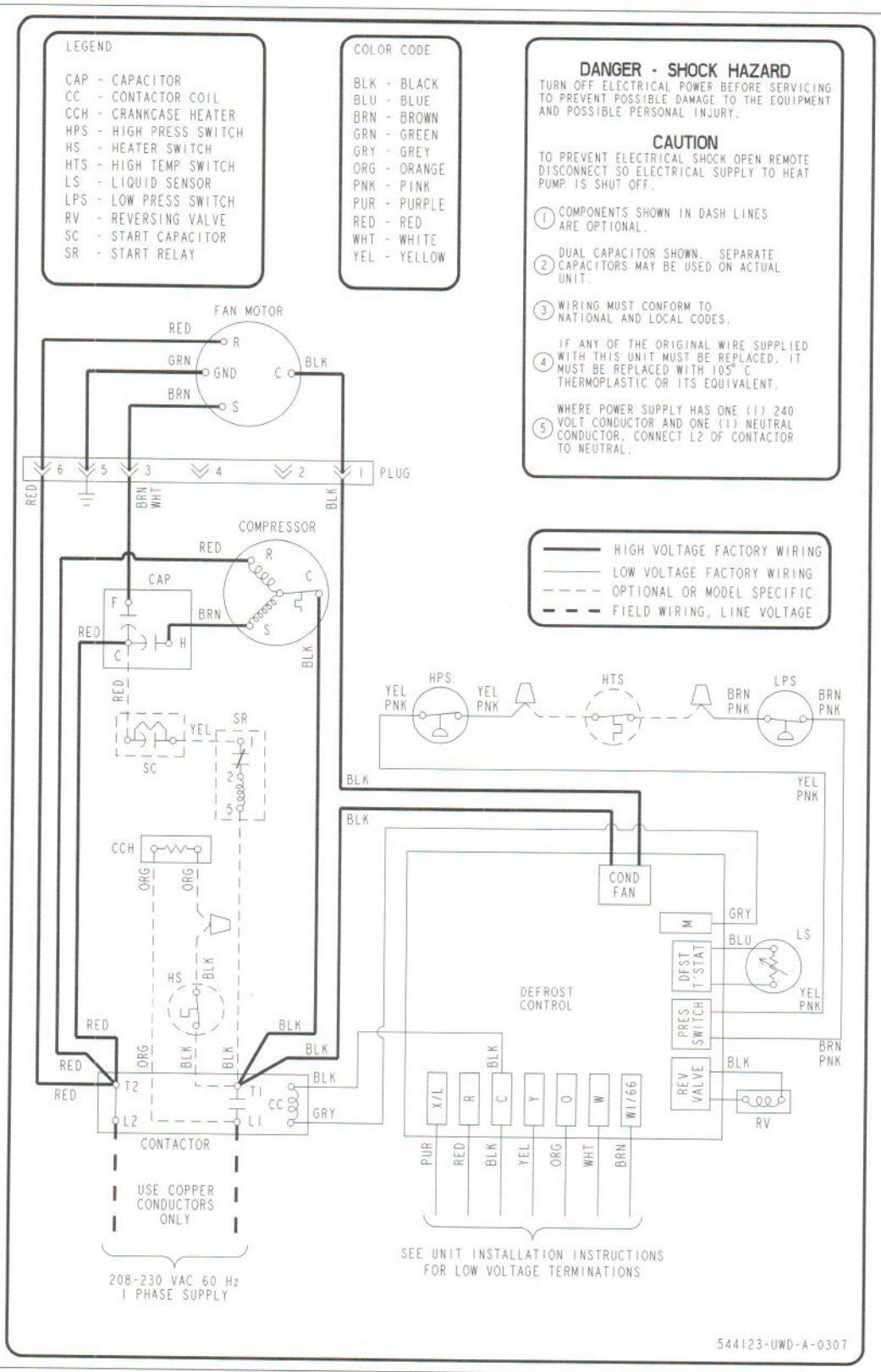

FIGURE 15: Wiring Diagram - Single Phase (Time-Temp)

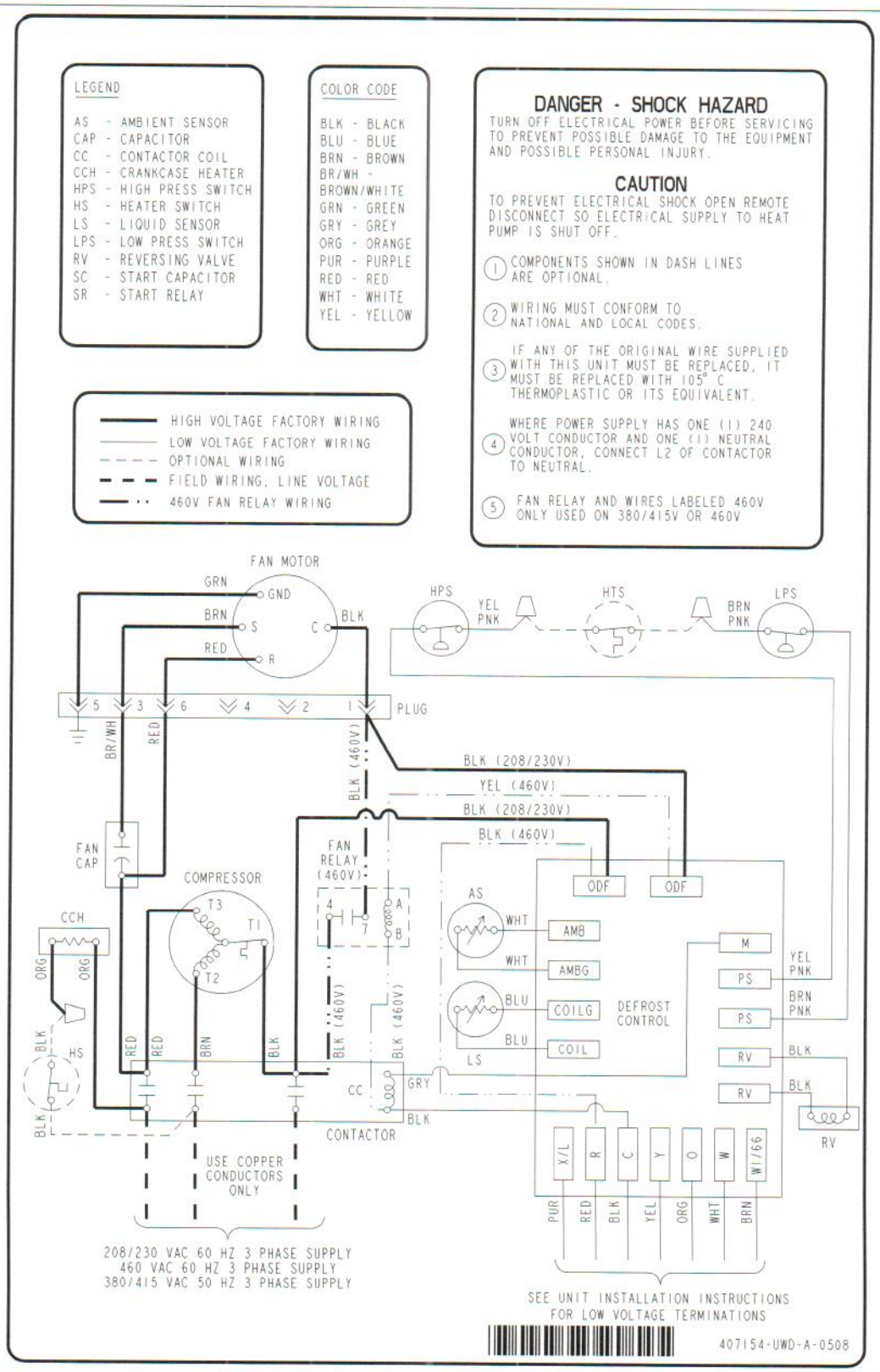

FIGURE 16: Wiring Diagram - Three Phase (Demand Defrost)

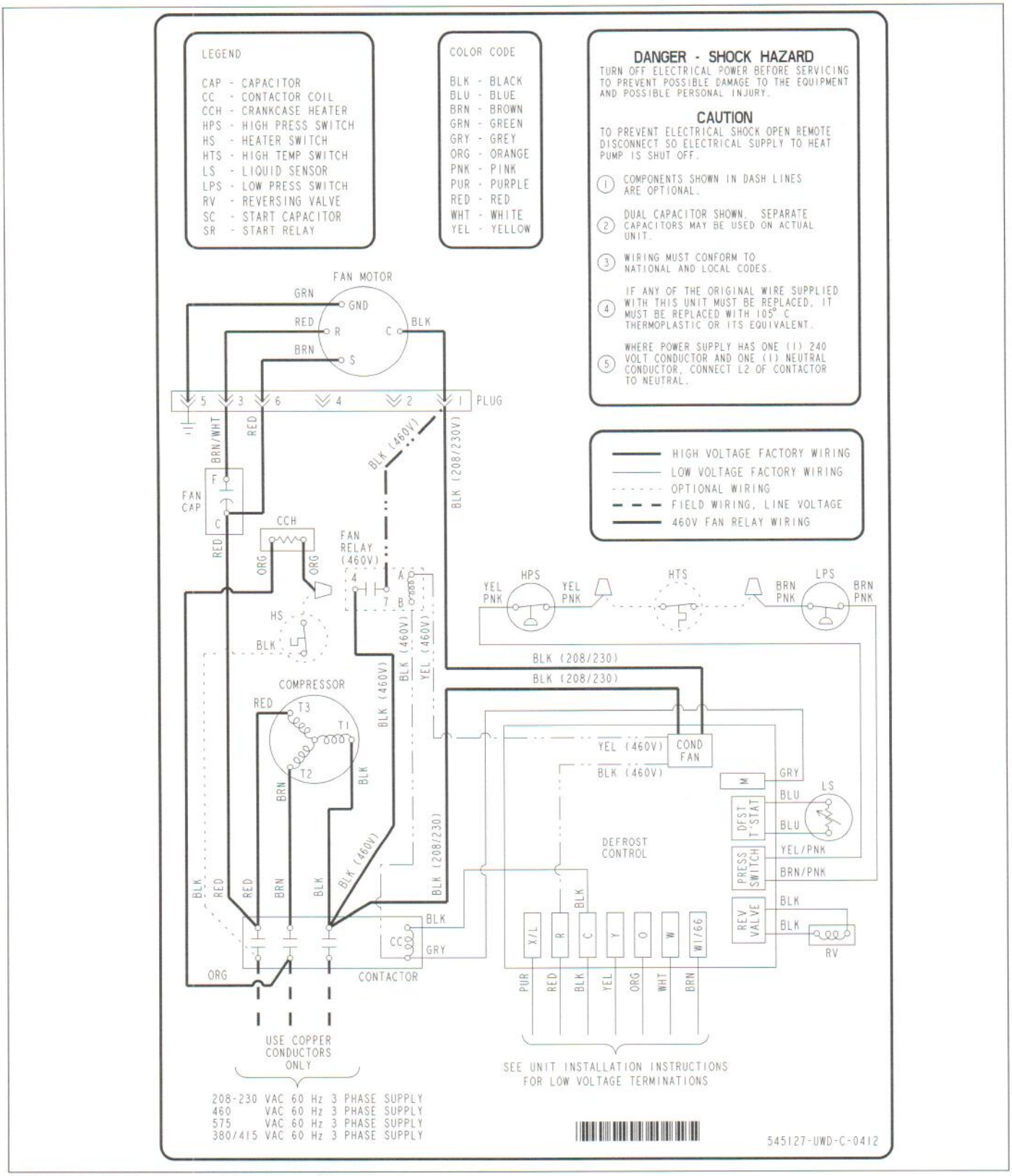

FIGURE 17: Wiring Diagram - Three Phase (Time-Temp)

835961-UIM-B-0412
Supersedes: 835961-UIM-A-0112

Johnson Controls Unitary Products
5005 York Drive
Norman, OK 73069

USER'S INFORMATION MANUAL

OUTDOOR SPLIT-SYSTEM AIR CONDITIONING OR HEAT PUMP

MODELS: SINGLE PHASE & THREE PHASE

ISO 9001 Certified Quality Management System

TABLE OF CONTENTS

CONTACT INFORMATION

- Go to website at www.york.com, then click on "Contact Us" and follow the instructions.
- Contact us by mail:

Johnson Controls Unitary Products
Consumer Relations
5005 York Drive
Norman, OK 73069

The manufacturer recommends that the user read this manual and keep the manual for future reference.

SAFETY

⚠WARNING

This product must be installed and serviced by a qualified installer or service agency. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage.

HOW YOUR SYSTEM WORKS

COOLING CYCLE

If your hand is wet and you blow on it, it feels cool because some of the moisture is evaporating and becoming a vapor. This process requires heat. The heat is being taken from your hand, so your hand feels cool.

That's what happens with an air conditioner. During the cooling cycle, your system will remove heat and humidity from your home and will transfer this heat to the outdoor air.

HEATING CYCLE (HEAT PUMPS)

During the heating cycle, your system will remove heat and humidity from the outdoor air and will transfer this heat to your home. This is possible because even 0°F outdoor air contains a great deal of heat. Remember that your heat pump doesn't generate much heat, it merely transfers it from one place to another.

System Operation

Your thermostat puts full control of the comfort level in your home at your fingertips. DO NOT switch your thermostat rapidly ON and OFF or between HEAT to COOL. This could damage your equipment. Always allow at least 5 minutes between changes.

SETTING THE THERMOSTAT

⚠CAUTION

The main power to the system must be kept ON at all times to prevent damage to the outdoor unit compressor. If necessary, the thermostat control switch should be used to turn the system OFF. Should the main power be disconnected or interrupted for 8 hours or longer, DO NOT attempt to start the system for 8 hours after the power has been restored to the outdoor unit. If heat is needed during this 8 hour period, use emergency heat.

THERMOSTATS

YOUR KEY TO COMFORT

Although thermostats may vary widely in appearance, they are all designed to perform the same basic function: to control the operation of your air conditioning or heat pump system. Regardless of size or shape, each thermostat will feature a temperature indicator; a dial, arm, or push button for selection of the desired temperature; a fan switch to choose the indoor fan operation; and a comfort switch for you to select the system mode of operation.

Only approved thermostats have been tested and are fully compatible with this equipment. *Please be aware that many different thermostats operate on batteries or "power stealing" principals. These types of thermostats can not be supported as trouble free when used with this product.*

If your system has been designed to allow both cooling and heating operation, you may have either a manual change-over type, or a programmable electronic type thermostat.

Manual change-over simply means that the comfort switch must be manually positioned every time you wish to switch from the cooling to heating or heating to cooling modes of operation.

A complete operating instruction is provided by the manufacturer for each thermostat. Familiarize yourself with its proper operation to obtain the maximum comfort with minimum energy consumption.

The computerized electronic thermostat is actually a sophisticated electronic version of a manual change-over type. This thermostat includes features which allow "set-back" temperature variations for periods of sleep, or while you are away during the day, and means energy savings for you. The thermostat also features a digital clock.

COOLING ONLY

If your air conditioning system is designed to provide cooling only (AC), with no capability for heating operation (heat pump), a two-stage cooling only thermostat, with a manual, one-position "Cool" and "Off" comfort switch is all that is required for system operation.

COOLING AND HEATING (HEAT PUMP)

If your system has been designed to allow both cooling and heating operation, you may have either a manual change-over type, or a programmable electronic type thermostat with 2-stages of cooling and 2-stages of heat.

MANUAL CHANGE-OVER

Manual change-over simply means that the comfort switch must be manually positioned every time you wish to switch from the cooling to heating or heating to cooling modes of operation.

PROGRAMMABLE ELECTRONIC THERMOSTATS

The computerized electronic thermostat is actually a sophisticated electronic version of a manual change-over type. This thermostat includes features which allow "set-back" temperature variations for periods of sleep, or while you are away during the day, and means energy savings for you. The thermostat also features a digital clock.

FAN OPERATION SELECTION

A multi-position fan switch allows you to choose the type of fan operation of the indoor fan.

AUTO

With the thermostat fan switch set to "AUTO", the fan will run intermittently as required for either heating or cooling. This position will provide the lowest operating cost. If you purchased one of our thermostats, they have an Intelligent fan mode which continually circulates the air during occupied modes or when you are at home, and can cycle the fan during unoccupied mode or during the night while you sleep to further conserve energy.

ON

CONTINUOUS FAN OPERATION: With the thermostat fan switch set to "ON", the indoor fan will not shut off. However, the cooling (AC) or heating (heat pump) systems will still operate as required by room temperatures. This provides continuous air filtering and more even temperature distribution to all conditioned spaces.

FAN ONLY OPERATION: On moderate days, usually during spring and fall, when neither heating nor cooling is required, you may want to run only the fan to ventilate, circulate and filter the air in your home or building. Set the comfort control switch to "OFF" and the fan switch to "ON". Be sure to return the switches to their original positions for normal operation.

START-UP

The maximum and minimum conditions for operation must be observed to assure a system that will give maximum performance with minimum service.

TABLE 1: Application Limitations

Air Temperature at Outdoor Coil, °F				Air Temperature at Indoor Coil, °F			
Min.		Max.		Min.		Max.	
DB Cool	DB Heat	DB Cool	DB Heat	WB Cool	DB Heat	WB Cool	DB Heat
60	-10	115	75	57	50[1]	72	80

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

The comfort control switch is assumed to be in the "OFF" position. If the main power supply to the outdoor and indoor units is off, turn the appropriate disconnects to the "ON" position. Place the system into operation as follows:

1. Set temperature adjustment to the desired temperature on your thermostat.

COOLING - The higher the setting, the lower the amount of energy consumed. Federal Guidelines recommend a setting of 78 °F.

HEATING - The lower the setting, the lower the amount of energy consumed. Federal guidelines recommend a setting of 65 °F or lower.

NOTICE

If your cooling and heating temperature adjustments are separate, be sure to set both.

2. After considering "Fan Operation Selection" above, select and set the fan operation mode you desire.
3. Move the comfort control switch to the desired mode of operation (Cooling or Heating) found on your particular thermostat.

POWER FAILURE

When accidents, wind storms, etc. disrupt electrical power supply to your house, switch thermostat to "OFF" position.

SYSTEM OPERATION

MANUAL CHANGE-OVER THERMOSTAT

COOLING YOUR HOME: With the comfort control switch in the "COOL" position, the system will operate as follows: When the indoor temperature rises above the level indicated by the temperature adjustment setting, the system will start. The outdoor unit will operate and the indoor fan will circulate the cooled, filtered air. When the room temperature is lowered to the setting selected, the system will shut off.

HEATING YOUR HOME: If your system includes a heating unit and the comfort control switch is in the "HEAT" position, the system will operate as follows: When the indoor temperature drops below the level indicated by the temperature adjustment setting, the system will start. The heating system will operate and the indoor fan will circulate the filtered air. When the room temperature rises to the setting selected, the system will shut off. Whether heating or cooling, the fan will continue to operate if the fan switch was set in the "ON or Intelligent" position. The "AUTO" setting on the fan switch will allow the fan to shut off when your system does.

ELECTRONIC THERMOSTAT

The computerized electronic thermostat, when programmed, will function automatically to operate the system as follows: When the indoor temperature rises above the higher (COOL) setting, the outdoor unit will operate and the indoor fan will circulate the cooled, filtered air. When the room temperature is lowered to the selected level, the system will shut off. The indoor fan will either shut off or run continuously, depending upon your choice of fan switch setting. When the indoor temperature drops below the lower (HEAT) setting, the heating system will operate, and the indoor fan will circulate the heated, filtered air. When the indoor temperature rises to the selected setting, the system will shut off. The indoor fan will either shut off or run continuously, depending upon your choice of fan switch setting.

TO MAXIMIZE OPERATING EFFICIENCY

HEATING CONSERVATION

For the most efficient operation, keep storm windows and doors closed all year long. They not only help insulate against heat and cold, but they also keep out dirt, pollen, and noise.

Closing drapes at night, keeping fireplace dampers closed when not in use, and running exhaust fans only when necessary will help you to retain the air you have already paid to heat.

Keep lamps, televisions, or other heat producing sources away from the thermostat. The thermostat will sense this extra heat and will not be able to maintain the inside temperature to the desired comfort level.

COOLING CONSERVATION

To comfortably cool your home, your air conditioner must remove both heat and humidity. Don't turn your system off even though you will be away all day. On a hot day, your system may have to operate between 8 to 12 hours to reduce the temperature in your home to a normal comfort level.

Keep windows closed after sundown. While the outdoor temperature at night may be lower than indoors, the air is generally loaded with moisture which is soaked up by furniture, carpets, and fabrics. This moisture must be removed when you restart your system.

The hotter the outside temperature, the greater the load on your system. Therefore do not be alarmed when your system continues to run after the sun has set on a hot day. Heat is stored in your outside walls during the day and will continue to flow into your home for several hours after sunset.

Use your kitchen exhaust fan when cooking. One surface burner on "HIGH" requires one ton of cooling. Turn on your bathroom exhaust fan while showering to remove humidity. However, exhaust fans should not be run excessively. It would decrease efficiency by removing conditioned air.

You can also help your system in the summer by closing drapes or blinds and by lowering awnings on windows that get direct sunlight.

CARE OF SYSTEM

It is strongly recommended that regular periodic preventative maintenance be performed on this equipment. The person most familiar with the equipment in your H.V.A.C. system is a dealer. The dealer can ensure your maintenance program meets the conditions of the Warranty", maximize the efficiency of the equipment, and service your unit within the federally mandated guidelines with regard to unlawful discharge of refrigerants into the atmosphere.

COIL CARE

Keep the outdoor unit free of foliage, grass clippings, leaves, paper, and any other material which could restrict the proper air flow in and out of the unit. The coil may be vacuumed to remove any debris from between the fins. If the coil becomes excessively dirty, turn the main disconnect switch to "Off" and wash the coil with your garden hose. Avoid getting water into the fan motor and control box. Flush dirt from base pan after cleaning the coil.

SERVICE CALLS

There are a few instances where the user can avoid unnecessary service calls. If unit stops functioning properly check the following items before calling your servicing dealer:

1. Indoor section for dirty filter.
2. Outdoor section for leaf or debris blockage. Eliminate problem, turn off the thermostat for 10 seconds and attempt start. Wait 5 minutes. If system does not start, call your servicing dealer.

⚠WARNING

Your system contains environmentally friendly refrigerant R-410A, which operates at high pressures. You may be in danger if you try to make an attempt to repair your unit. Please contact your local dealer.

FILTER CARE

Inspect the air filter(s) at least once a month. If they are dirty, wash reusable filters with a mild detergent per manufacturer's recommendations. Replace disposable filters with new filters. Install the clean filters with "air flow" arrow in the same direction as the air flow in your duct. Filters should be clean to assure maximum efficiency and adequate air circulation.

CLEARANCES

The minimum clearances shown below must be maintained should any patio or yard improvements be done around the outdoor unit.

- 10" Clearance Coil Area
- 60" Overhead Clearance
- 18" to 24" is the minimum service panel access depending on model. Refer to the installation manual for details.
- 24" Unit to Unit Distance

PARTS INFORMATION

Replacement parts are available from local contractor/dealer.

EXTENDED WARRANTY

Special warranty packages (called York Care Performance Promise) are available through your contractor. These packages reduce the potential cost of service calls following the first year of operation on your cooling (or heating/cooling) system.

SOME EFFICIENCY DO'S & DON'TS

DON'T heat or cool unused household area. Reduce supply and return air flow to a minimum in areas which are not living spaces (storage rooms, garages, basements, etc).

DON'T be a "thermostat jiggler". Moving your thermostat setting will not make your system heat or cool any faster. Adjust your thermostat to a comfortable setting and leave it there.

DON'T restrict air circulation. Placing furniture, rugs, etc. in such a way that they interfere with air vents will make your system work harder to achieve a comfortable temperature level. This requires more energy, which means greater cost to you.

DON'T locate lamps or other heat-producing appliances (radios, TV's, heaters, etc.) near your thermostat. The heat from these items will give your thermostat "false information" about the temperature in the room.

DO select a comfortable thermostat setting, but keep in mind that moderation in temperature selection will save energy.

DO turn on your kitchen exhaust fan when cooking and your bathroom exhaust fan when showering. Also, make sure your clothes dryer is properly vented. If these items are neglected, an excess heat and humidity condition may be created, causing your air conditioning system to run longer.

DO set your thermostat a few degrees lower than normal several hours before entertaining a large group of people in a relatively small area. People give off a considerable amount of heat and moisture in a closed area.

DO keep drapes and venetian blinds closed when practical. These items provide insulation against heat loss/gain.

DO contact a qualified service person to make repairs or adjustments to your system. He has been trained to perform this service.

Limited Warranty

Johnson Controls Unitary Products (hereinafter "Company") warrants this product to be free from defects in factory workmanship and material under normal use and service and will, at its option, repair or replace any parts, without charge, subject to the exclusions below, that prove to have such defects according to the terms outlined on this warranty. This warranty covers only the equipment described by the Product Model Number and Serial Number on the equipment or listed on the Warranty Registration Card and applies only to products installed in the United States or Canada.

FOR WARRANTY SERVICE OR REPAIR: Contact the installer or a Company dealer. You may find the installer's name on this page or on the equipment. For help finding a servicing dealer, contact: Johnson Controls Unitary Products, Consumer Relations, 5005 York Drive, Norman, OK 73069. Or, by phone 877-874-7378. All warranty service or repair will be performed during regular business hours, Monday through Friday 9:00am-5:00pm.

Product Model Number: _____ Installation Date: _____

Unit Serial Number: _____ Installing Dealer: _____

FOR PRODUCT REGISTRATION: For your benefit and protection, return the Warranty Registration Card to Company promptly after installation. This will initiate the warranty period and allow us to contact you, should it become necessary. This warranty extends only to the original consumer purchaser and is nontransferable. For this warranty to apply, the product must be installed according to Company recommendations and specifications, and in accordance with all local, state, and national codes; and the product must not be removed from its place of original installation. The warranty period for repair or replacement parts provided hereunder shall not extend beyond the warranty period stated below. In the absence of a recorded Warranty Registration Card, the warranty period will begin upon product shipment from Company. If you are unaware of the date the warranty became effective, contact Company at 877-874-7378 or visit www.upgproductregistration.com. You can register your product online at www.upgproductregistration.com or by returning the Warranty Registration Card on the back page of this packet. The warranty period in years, depending on the part and the claimant, is as shown in the chart below.

CONDENSING UNITS			
CONDENSING UNITS	**COMPRESSOR**	**PARTS**	**CONDENSER COIL**
R-410A Models: GCGD, GHGD R-22 Dry Ship Models: GCGD, GHGD	5	5	5 #
R-410A Models: T(C,H)GD	5 or 10††	5 or 10†	5 #
R-410A Models: T(C,H)JD*, Y(C,H)JD*, (Y,T)HJR, T(C,H)GF, T(C,H)JF, Y(C,H)JF, TCHD*	10	5 or 10†	5 # (Except TCHD models which are NA)
R-410A Models: (C,Y)ZF (C,Y)ZH, AC(6,8)B, AL(6,8)B, HC(6,8)B, HL(6,8)B	10	5 or 10†	NA
R-410A Models: (C,Y)ZF (C,Y)ZH, AC(6,8)B, AL(6,8)B, HC(6,8)B, HL(6,8)B Premium System Warranty [1]	Lifetime	10	NA

* All 3 phase models (with 43/44 voltage codes) have 5-year compressor and 1-year parts warranty and are not eligible for 10-year parts warranty.

To qualify for the E-Coat Coil warranty the homeowner must register online at www.upgproductregistration.com within 90 days of installation for replacement units or within 90 days of closing for new home construction. In some states, registration is not required, but proof of installation is required. The warranty for models equipped with E-Coat Coil option only covers condenser coil failures due to corrosion. The warranty provides the homeowner with the option of replacement of either a) the condenser coil, or b) the condensing unit, at the discretion of the servicing dealer.

† To qualify for extended 10-year parts and compressor warranty††, the unit must be registered online at www.upgproductregistration.com within 90 days of installation for replacement or 90 days of closing for new home construction. In some states, registration is not required, but proof of installation is required to qualify for 10 year parts warranty. Guardian Brand products have 5-year compressor and 5-year parts warranty and are not eligible for10-year parts warranty.

1. **Premium System Warranty requires the following:** Proof of a qualified factory matched system, including a Johnson Controls premium furnace and coil or air handler, is required before Premium System Warranty becomes valid. Unit registration must occur within 90 days of installation date on www.upg productregistration.com website. The Premium System warranty is non-transferrable and is limited to the original owner. Company strongly recommends regular periodic preventative maintenance on this equipment. The person most familiar with the equipment in your HVAC system is a Company dealer. The Company dealer can ensure your maintenance program meets the "Company Warranty" conditions, maximize the equipment efficiency, and service your unit within the mandated guidelines with regard to unlawful discharge of refrigerants into the atmosphere.

EXCLUSIONS

This warranty does not cover any:

1. Shipping, labor, or material charges or damages resulting from transportation, installation, or servicing.
2. Damages resulting from accident, abuse, fire, flood, alteration, or acts of God. Tampering, altering, defacing or removing the product serial number will serve to void this warranty.
3. Damages resulting from use of the product in a corrosive atmosphere.
4. Damages resulting from inadequacy or interruption of electrical service or fuel supply, improper voltage conditions, blown fuses, or other like damages.
5. Cleaning or replacement of filters or damages resulting from operation with inadequate supply of air or water.
6. Damages resulting from failure to properly and regularly clean air and/or water side of condenser and evaporator.
7. Damages resulting from: (I) freezing of condenser water or condensate; (II) inadequate or interrupted water supply; (III) use of corrosive water; (IV) fouling or restriction of the water circuit by foreign material or like causes.
8. Damages resulting from use of components or accessories not approved by Company (vent dampers, etc.).
9. Increase in fuel or electric cost.

This warranty is in lieu of all other warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Some states do not allow the disclaimer of implied warranty, so that the above disclaimer may not apply to you. Some states only allow a partial limitation on implied warranties to limit the duration of implied warranties to the duration of the express warranty. In such states, the duration of implied warranties is hereby expressly limited to the duration of the express warranty on the face hereof. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. In no event, whether as a result of breach of warranty or contract, tort (including negligence), strict liability, or otherwise, shall Company be liable for special, incidental, or consequential damages, including but not limited to loss of use of the equipment or associated equipment, lost revenues or profits, cost of substitute equipment or cost of fuel or electricity.

The above limitations shall inure to the benefit of Company's suppliers and subcontractors. The above limitation on consequential damages shall not apply to injuries to persons in the case of consumer goods. Company does not assume, or authorize any other person to assume for Company, any other liability for the sale of this product. Some states do not allow the exclusion or limitation of incidental or consequently damages, so the above limitation may not apply to you. This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

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