# Important Safety Instructions

The following symbols and labels are used throughout this manual to indicate immediate or potential safety hazards. It is the owner’s and installer’s responsibility to read and comply with all safety information and instructions accompanying these symbols. Failure to heed safety information increases the risk of personal injury, property damage, and/or product damage.

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## ATTENTION INSTALLING PERSONNEL

Prior to installation, thoroughly familiarize yourself with this Installation Manual. Observe all safety warnings. During installation or repair, caution is to be observed. It is your responsibility to install the product safely and to educate the customer on its safe use.
2 Shipping Inspection
Always transport the unit upright; laying the unit on its side or top during transit may cause equipment damage. The installer should inspect the product upon receipt for shipping damage and subsequent investigation is the responsibility of the carrier. The installer must verify the model number, specifications, electrical characteristics, and accessories are correct prior to installation. The distributor or manufacturer will not accept claims from dealers for transportation damage or installation of incorrectly shipped units.

2.1 Parts
Also inspect the unit to verify all required components are present and intact. Report any missing components immediately to Goodman® or to the distributor. Use only factory authorized replacement parts (see Section 5). Make sure to include the full product model number and serial number when reporting and/or obtaining service parts.
2.2 Handling

Use caution when transporting/carrying the unit. Do not move unit using shipping straps. Do not carry unit with hooks or sharp objects. The preferred method of carrying the unit after arrival at the job site is to carry via a two-wheel hand truck from the back or sides or via hand by carrying at the cabinet corners.

3 Codes & Regulations

This product is designed and manufactured to comply with applicable national codes. Installation in accordance with such codes and/or prevailing local codes/regulations is the responsibility of the installer. The manufacturer assumes no responsibility for equipment installed in violation of any codes or regulations.

The United States Environmental Protection Agency (EPA) has issued various regulations regarding the introduction and disposal of refrigerants. Failure to follow these regulations may harm the environment and can lead to the imposition of substantial fines. Should you have any questions please contact the local office of the EPA and/or refer to EPA’s website www.epa.gov.

4 Replacement Parts

When reporting shortages or damages, or ordering repair parts, give the complete product model and serial numbers as stamped on the product. Replacement parts for this product are available through your contractor or local distributor. For the location of your nearest distributor consult the white business pages, the yellow page section of the local telephone book or contact:

CONSUMER AFFAIRS
GOODMAN MANUFACTURING COMPANY, L.P.
7401 SECURITY WAY
HOUSTON, TEXAS 77040
(877) 254-4729

5 Pre-Installation Considerations

5.1 Preparation

Keep this document with the unit. Carefully read all instructions for the installation prior to installing product. Make sure each step or procedure is understood and any special considerations are taken into account before starting installation. Assemble all tools, hardware and supplies needed to complete the installation. Some items may need to be purchased locally. Make sure everything needed to install the product is on hand before starting.

5.2 System Matches

The entire system (combination of indoor and outdoor sections) must be manufacturer approved and Air-Conditioning, Heating, and Refrigeration Institute (AHRI) listed.

NOTE: Installation of unmatched systems is not permitted and will void the product warranty.

5.3 Interconnecting Tubing

Give special consideration to minimize the length of refrigerant tubing when installing air handlers. Refer to Remote Cooling/Heat Pump Service Manual RS6200006, and TP-107 Long Line Set Application R-410A for tubing guidelines. If possible, allow adequate length of tubing such that the coil may be removed (for inspection or cleaning services) from the cabinet without disconnecting the tubing.

5.4 Clearances

The unit clearance from a combustible surface may be 0”. However, service clearance must take precedence. A minimum of 24” in front of the unit for service clearance is required. Additional clearance on one side or top will be required for electrical wiring connections. Consult all appropriate regulatory codes prior to determining final clearances. When installing this unit in an area that may become wet (such as crawl spaces), elevate the unit with a sturdy, non-porous material. In installations that may lead to physical damage (i.e. a garage) it is advised to install a protective barrier to prevent such damage. Always install units such that a positive slope in condensate line (1/4” per foot) is allowed.

5.5 Horizontal Applications

If installed above a finished living space, a secondary drain pan (as required by many building codes), must be installed under the entire unit and its condensate drain line must be routed to a location such that the user will see the condensate discharge.

6 Installation Location

NOTE: These air handlers are designed for indoor installation only.

The AVPTC**14** product line may be installed in one of the upflow, downflow, horizontal left or horizontal right orientations as shown in Figures 2, 3, 4 and 5. The unit may be installed in upflow or horizontal left orientation as shipped (refer to specific sections for more information). Minor field modifications are necessary to convert to downflow or horizontal right as indicated in below sections.

6.1 Upflow Installation

No field modifications are mandatory however to obtain maximum efficiency, the horizontal drip shield must be removed.

Drip Shield Removal: Refer to Figure 1, remove the two (2) screws that secure the drip shield support brackets to the condensate collectors (one screw per side). Remove the two (2) screws that secure the drip shield to the drain
The bottom left drain connection is the primary drain for this application and condensate drain line must be attached to this drain connection. The top connection of the three drain connections on the drain pan must remain plugged for this application. The bottom left drain connection is for the secondary drain line (if used).

6.2 Horizontal Left Installation

No field modifications are permissible for this application. The bottom right drain connection is the primary drain for this application and condensate drain line must be attached to this drain connection. The top connection of the three drain connections on the drain pan must remain plugged for this application. The bottom left drain connection is for the secondary drain line (if used).

6.3 Downflow/Horizontal Right Installation

IMPORTANT NOTE: In the downflow application, to prevent coil pan “sweating”, a downflow kit (DFK) is available through your local Goodman distributor. The DFK is not supplied with the air handler and is required by Goodman on all downflow installations. See Table 1 for the correct DFK and follow the instructions provided for installation.

MODEL LIST FOR DOWNFLOW KITS

<table>
<thead>
<tr>
<th>DFK-B Downflow Kit</th>
<th>DFK-C Downflow Kit</th>
<th>DFK-D Downflow Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVPTC24B14**</td>
<td>AVPTC30C14**</td>
<td>AVPTC42D14**</td>
</tr>
<tr>
<td>AVPTC36C14**</td>
<td>AVPTC48D14**</td>
<td>AVPTC60D14**</td>
</tr>
</tbody>
</table>

DOWNFLOW KIT

Table 1

Refer to Figure 6 and 7 for the location of the components referenced in the following steps.

1. Before inverting the air handler, remove blower access panel and coil access panel. The coil access panel and tubing panel may remain screwed together during this procedure. Remove and retain the seven (7) screws securing the coil access panel to the cabinet and the six (6) screws securing the blower access panel to the cabinet.

2. Slide the coil assembly out using the drain pan to pull the assembly from the cabinet.

NOTE: DO NOT USE MANIFOLDS OR FLOWRATOR TO PULL THE COIL ASSEMBLY OUT. FAILURE TO DO SO MAY RESULT IN BRAZE JOINT DAMAGE AND LEAKS.

3. Removal of the center support is required on units with 21" wide cabinet. Remove and retain the two (2) screws that secure the center support to the cabinet. Remove the center support.

4. Using the drain pan to hold the coil assembly, slide the coil assembly back into the cabinet on the downflow brackets as shown in Figure 8.

5. Re-install the center support (if removed) using the two (2) screws removed in Step 4.

6. Re-install the access panels removed in Step 1 as shown in Figure 9.

7. The bottom left drain connection is the primary drain for this application and condensate drain line must be attached to this drain connection. The top connection of the three drain connections on the drain pan must remain plugged for this application. The bottom left drain connection is for the secondary drain line (if used).
NOTE: If removing only the coil access panel from the unit, the filter access panel must be removed first. Failure to do so may result in panel damage.
IMPORTANT NOTE:
Ensure coil slides on the rails along the groove provided on the drain pan side walls. Failure to do so will result in improper condensate drainage.

**WARNING**
This product is factory-shipped with R410A and dry nitrogen mixture gas under pressure. Use appropriate service tools and follow these instructions to prevent injury.

**WARNING**
A quenching cloth is strongly recommended to prevent scorching or maring of the equipment finish when brazing close to the painted surfaces. Use brazing alloy of 5% minimum silver content.

NOTE: Refrigerant tubing must be routed to allow adequate access for servicing and maintenance of the unit. Do not install the air handler in a location that violates the instructions provided with the condenser. If the unit is located in an unconditioned area with high ambient temperature and/or high humidity, the air handler may be subject to nuisance sweating of the casing. On these installations, a wrap of 2" fiberglass insulation with a vapor barrier is recommended.

### 7.1 Tubing Size
For the correct tubing size, follow the specification for the condenser/heat pump.

### 7.2 Tubing Preparation
All cut ends are to be round, burr free, and clean. Failure to follow this practice increases the chances for refrigerant leaks. The suction line is spun closed and requires tubing cutters to remove the closed end.

NOTE: To prevent possible damage to the tubing joints, do not handle coil assembly with manifold or flowrator tubes. Always use clean gloves when handling coil assemblies.

**CAUTION**
Applying too much heat to any tube can melt the tube. Torch heat required to braze tubes of various sizes must be proportional to the size of the tube. Service personnel must use the appropriate heat level for the size of the tube being brazed.

NOTE: The use of a heat shield is strongly recommended when brazing to avoid burning the serial plate or the finish of the unit. Heat trap or wet rags must be used to protect heat sensitive components such as service valves and TXV valves sensing bulb.

### 7.3 Tubing Connections for TXV Models
TXV models come with factory installed TXV with the bulb pre-installed on the vapor tube.
1. Remove refrigerant tubing panel or coil (lower) access panel.
2. Remove access valve fitting cap and depress the valve stem in access fitting to release pressure. No pressure indicates possible leak.
3. Replace the refrigerant tubing panel.
4. Remove the spin closure on both the liquid and suction tubes using a tubing cutter.
5. Insert liquid line set into liquid tube expansion and slide grommet about 18" away from braze joint.
6. Insert suction line set into suction tube expansion and slide insulation and grommet about 18" away from braze joint.
7. Brake joints. Quench all brazed joints with water or a wet rag upon completion of brazing.

![Figure 10](image)

NOTE: The sensing bulb must be permanently located. A heat shield, heat trap, or wet rag must be used during brazing to prevent damage to the TXV valve.

8. Replace access panels, suction line grommet, insulation and all screws.

![Figure 11](image)

8 Condensate Drain Lines
The coil drain pan has a primary and a secondary drain with 3/4" NPT female connections. The connectors required are 3/4" NPT male, either PVC or metal pipe, and should be hand tightened to a torque of no more than 37 in-lbs. to prevent damage to the drain pan connection. An insertion depth of approximately 3/8" to 1/2" (3-5 turns) should be expected at this torque.

1. Ensure drain pan hole is not obstructed.
2. To prevent potential sweating and dripping on to finished space, it may be necessary to insulate the condensate drain line located inside the building. Use Armaflex® or similar material.

A secondary condensate drain connection has been provided for areas where the building codes require it. Pitch all drain lines a minimum of 1/4" per foot to provide free drainage. Provide required support to the drain line to prevent bowing. If the secondary drain line is required, run the line separately from the primary drain and end it where condensate discharge can be easily seen.

NOTE: Water coming from secondary line means the coil primary drain is plugged and needs immediate attention.

Insulate drain lines located inside the building or above a finished living space to prevent sweating. Install a condensate trap to ensure proper drainage.

NOTE: When units are installed above ceilings, or in other locations where damage from condensate overflow may occur, it is MANDATORY to install a field fabricated auxiliary drain pan under the coil cabinet enclosure.

![CAUTION](image)

If secondary drain is not installed, the secondary access must be plugged.

The installation must include a "P" style trap that is located as close as is practical to the evaporator coil. See Figure 12 for details of a typical condensate line "P" trap.

NOTE: Trapped lines are required by many local codes. In the absence of any prevailing local codes, please refer to the requirements listed in the Uniform Mechanical Building Code.

A drain trap in a draw-through application prevents air from being drawn back through the drain line during fan operation thus preventing condensate from draining, and if connected to a sewer line to prevent sewer gases from being drawn into the airstream during blower operation.

Field experience has shown condensate drain traps with an open vertical Tee between the air handler and the condensate drain trap can improve condensate drainage in some applications, but may cause excessive air discharge out of the open Tee. Goodman® does not prohibit this type of drain but we also do not recommend it due to the resulting air leakage. Regardless of the condensate drain design used, it is the installer's responsibility to ensure the condensate drain system is of sufficient design to ensure proper condensate removal from the coil drain pan.
Use of a condensate removal pump is permitted when necessary. This condensate pump should have provisions for shutting off the control voltage should a blocked drain occur. A trap must be installed between the unit and the condensate pump.

**IMPORTANT NOTE:** The evaporator coil is fabricated with oils that may dissolve styrofoam and certain types of plastics. Therefore, a removal pump or float switch must not contain any of these materials.

**Tip:** Priming the “P” trap may avoid improper draining at the initial installation and at the beginning of the cooling season.

### 9 Ductwork

This air handler is designed for a complete supply and return ductwork system.

To ensure correct system performance, the ductwork is to be sized to accommodate 350-450 CFM per ton of cooling with the static pressure not to exceed 0.5" in w.c. Refer to ACCA Manual D, Manual S and Manual RS for information on duct sizing and application. Flame retardant ductwork is to be used and sealed to the unit in a manner that will prevent leakage.

**NOTE:** A downflow application with electric heat must have an L-shaped sheet metal supply duct without any outlets or registers located directly below the heater.

#### 9.1 Return Ductwork

**DO NOT LOCATE THE RETURN DUCTWORK IN AN AREA THAT CAN INTRODUCE TOXIC, OR OBJECTIONABLE FUMES/ODORS INTO THE DUCTWORK.**

The return ductwork is to be connected to the air handler bottom (upflow configuration).

**CAUTION**

Do not operate this product without all the ductwork attached.

### 10 Return Air Filters

Each installation must include a return air filter. This filtering may be performed at the air handler using the factory filter rails or externally such as a return air filter grille. When using the factory filter rails, a nominal 16x20x1", 20x20x1" or 24x20x1" (actual dimension must be less than 23-½"x20") filter can be installed on a B, C and D cabinet respectively (the cabinet size is the seventh letter of the model number).

### 11 Electric Heat

Refer to the installation manual provided with the electric heat kit for the correct installation procedure. All electric heat must be field installed. If installing this option, the ONLY heat kits that are permitted to be used are the HKS series. Refer to the air handler unit’s Serial and Rating plate or the HKS specification sheets to determine the heat kits compatible with a given air handler. No other accessory heat kit besides the HKS series may be installed in these air handlers.

The heating mode temperature rise is dependent upon the system airflow, the supply voltage, and the heat kit size (kW) selected. Use data provided in Tables 2, 3 and 4 to determine the temperature rise (°F).

**NOTE:** For installations not indicated above the following formula is to be used:

\[
TR = \frac{(kW \times 3412) \times (\text{Voltage Correction}) \times 1.08}{\text{CFM}}
\]

Where:
- \(TR\) = Temperature Rise
- \(kW\) = Heater Kit Actual kW
- 3412 = Btu per kW
- \(VC^*\) = .96 (230 Supply Volts)
  = .92 (220 Supply Volts)
  = .87 (208 Supply Volts)
- 1.08 = Constant
- CFM = Measured Airflow

**NOTE:** The Temperature Rise Tables can also be used to estimate the air handler airflow delivery. When using these tables for this purpose set the room thermostat to maximum heat and allow the system to reach steady state conditions. Insert two thermometers, one in the return air and one in the supply air. The temperature rise is the supply air temperature minus the return air temperature. Using the temperature rise calculated, CFM can be estimated from the TR formula above. See Technical Manual and/or Service Manual for more information.
11.1 No Electric Heat Installed

If no electric heat accessory kit is installed, a cover plate must be installed over the opening for electric heat. This cover plate kit is available from Goodman® and Amana® brand distributors.

<table>
<thead>
<tr>
<th>CFM</th>
<th>HEAT KIT NOMINAL kW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>800</td>
<td>12</td>
</tr>
<tr>
<td>1000</td>
<td>9</td>
</tr>
<tr>
<td>1200</td>
<td>8</td>
</tr>
<tr>
<td>1400</td>
<td>7</td>
</tr>
<tr>
<td>1600</td>
<td>6</td>
</tr>
<tr>
<td>1800</td>
<td>5</td>
</tr>
<tr>
<td>2000</td>
<td>5</td>
</tr>
</tbody>
</table>

230/1/60 SUPPLY VOLTAGE - TEMP. RISE °F

Table 2

12 Electrical and Control Wiring

IMPORTANT: All routing of electrical wiring must be made through provided electrical knockouts. Do not cut, puncture or alter the cabinet for electrical wiring.

12.1 Building Electrical Service Inspection

This unit is designed for single-phase electrical supply only. DO NOT OPERATE ON A THREE-PHASE POWER SUPPLY. Measure the power supply to the unit. The supply voltage must be measured and be in agreement with the unit nameplate power requirements and within the range shown.

<table>
<thead>
<tr>
<th>Nominal Input</th>
<th>Minimum Voltage</th>
<th>Maximum Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>208 - 240</td>
<td>197</td>
<td>253</td>
</tr>
</tbody>
</table>

ELECTRICAL VOLTAGE

Table 6

12.2 Wire Sizing

Wire size is important to the operation of your equipment. Use the following check list when selecting the appropriate wire size for your unit.

**CAUTION**

FIRE HAZARD!
To avoid the risk of property damage, personal injury or fire, use only copper conductors.

**WARNING**

HIGH VOLTAGE!
Disconnect ALL power before servicing. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

**WARNING**

HIGH VOLTAGE!
To avoid property damage, personal injury or death due to electrical shock, this unit MUST have an uninterrupted, unbroken electrical ground. The electrical ground circuit may consist of an appropriately sized electrical wire connecting the ground lug in the unit control box to the building electrical service panel. Other methods of grounding are permitted if performed in accordance with the National Electric Code (NEC)/American National Standards Institute (ANSI)/National Fire Protection Association (NFPA) 70 and local/state codes. In Canada, electrical grounding is to be in accordance with the Canadian Electric Code (CSA) C22.1.

MINIMUM CFM REQUIRED FOR HEATER KITS

Table 5

Please refer to page 16 for specific heater kit application guidelines.
• Wire used must carry the Minimum Circuit Amperage (MCA) listed on the unit’s Series and Rating Plate.
• Refer to the NEC (USA) or CSA (Canada) for wire sizing. The unit MCA for the air handler and the optional electric heat kit can be found on the unit Series and Rating Plate.
• Wire must be sized to allow no more than a 2% voltage drop from the building breaker/fuse panel to the unit.
• Wires with different insulation temperature rating have varying amperages - be sure to check the temperature rating used.

Refer to the latest edition of the National Electric Code or in Canada the Canadian Electric Code when determining the correct wire size.

12.3 Maximum Overcurrent Protection (MOP)
Every installation must include an NEC (USA) or CEC (Canada) approved overcurrent protection device. Also, check with local or state codes for any special regional requirements.

Protection can be in the form of fusing or HACR style circuit breakers. The Series and Rating Plate provides the maximum overcurrent device permissible.

NOTE: Fuses or circuit breakers are to be sized larger than the equipment MCA but not to exceed the MOP.

12.4 Electrical Connections – Supply Voltage

IMPORTANT NOTE: USE COPPER CONDUCTORS ONLY.

Knockouts are provided on the air handler top panel and sides of the cabinet to allow for the entry of the supply voltage conductors, as shown in Figure 13. If the knockouts on the cabinet sides are used for electrical conduit, an adapter ring must be used in order to meet UL1995 safety requirements. An NEC or CEC approved strain relief is to be used at this entry point. Some codes/municipalities require the supply wire to be enclosed in conduit. Consult your local codes.

12.4.1 Air Handler Only (Non-Heat Kit Models)
The power supply connects to the stripped black and red wires contained in the air handler electrical compartment. Attach the supply wires to the air handler conductors as shown in the unit wiring diagram using appropriately sized solderless connectors or other NEC or CEC approved means. A ground lug is also provided in the electrical compartment. The ground wire from the power supply must be connected to this ground lug.

12.4.2 Air Handler - Non-Circuit Breaker Heat Kits
A terminal block is provided with the HKS kit to attach the power supply and air handler connections. Follow the HKS Installation Manual and wiring diagram for complete wiring details.

12.4.3 Air Handler With Circuit Breaker Heat Kit
The air handler has a plastic cover on the upper access panel that will require either one or both sections to be removed to allow the heat kit circuit breaker(s) to be installed. The circuit breakers have lugs for power supply connection. See the HKS Installation Instructions for further details.

12.5 Low Voltage Connections
Several combinations of low voltage schemes are possible, depending on the presence of a heat kit and whether the heat kit is single-stage or multi-stage, whether the outdoor section is an air conditioner or heat pump, and whether the system is setup with a communicating or traditional thermostat. The 24V-control voltage connects the air handler to the room thermostat and condenser. Low voltage wiring must be copper conductors. A minimum of 18AWG must be used for installations up to 50’ and 16AWG for installations over 50’. Low voltage wiring must be connected through the top of the cabinet or either side. See the “Thermostat Wiring” section of this manual for typical low voltage wiring connections.

13 Achieving 2% Low Leakage Rate
Ensure all the gaskets remain intact on all surfaces as shipped with the unit. These surfaces are areas between the upper tie plate and coil access panel, blower access and coil access panels, and between the coil access and filter access panels. Ensure upon installation, that the plastic breaker cover is sitting flush on the blower access panel and all access panels are flush with each other and the cabinet. With these requirements satisfied, the unit achieves less than 2% airflow leakage when tested in accordance with ASHRAE Standard 193.
14 Start-Up Procedure

- Prior to start-up, ensure that all electrical wires are properly sized and all connections are properly tightened.
- All panels must be in place and secured. For Air Tight application, gasket must be positioned at prescribed locations to achieve 2% leakage.
- Tubing must be leak free.
- Condensate line must be trapped and pitched to allow for drainage.
- Low voltage wiring is properly connected.
- Auxiliary drain is installed when necessary and pitched to allow for drainage.
- Unit is protected from vehicular or other physical damage.
- Return air is not obtained from, nor are there any return air duct joints that are unsealed in, areas where there may be objectionable odors, flammable vapors or products of combustion such as carbon monoxide (CO), which may cause serious personal injury or death.

15 Regular Maintenance

**WARNING**

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

The only item required to be maintained on a regular basis by the user is the circulating air filter(s). Filter should be cleaned or replaced regularly, typically once per month. A certified service technician must perform all other services.

**IMPORTANT NOTE:** If thumb screws are used to access the filter, ensure the washer installed on the screw behind the access panel remains in place after re-installation.

**24 VOLT THERMOSTAT WIRING - NON-COMMUNICATING THERMOSTAT CONNECTIONS**

**NOTE:** Wire routing must not interfere with the circulator blower operation or routine maintenance.

The air handler’s integrated control module provides terminals for “Y1” and “Y2” and “W1” and “W2” thermostat connections. This allows the air handler to support the systems shown in the following table. Refer to the following figures for typical connections to the integrated control module. Thermostat wiring entrance holes are located in the top of the blower. Wire routing must not interfere with circulator blower operation or routine maintenance.

<table>
<thead>
<tr>
<th>COOLING</th>
<th>HEAT PUMP HEATING</th>
<th>ELECTRIC HEATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-STAGE</td>
<td>-----</td>
<td>1- or 2-STAGE</td>
</tr>
<tr>
<td>2-STAGE</td>
<td>-----</td>
<td>1- or 2-STAGE</td>
</tr>
<tr>
<td>1-STAGE</td>
<td>1-STAGE</td>
<td>-----</td>
</tr>
<tr>
<td>2-STAGE</td>
<td>2-STAGE</td>
<td>-----</td>
</tr>
<tr>
<td>1-STAGE</td>
<td>1-STAGE</td>
<td>1- or 2-STAGE</td>
</tr>
<tr>
<td>2-STAGE</td>
<td>2-STAGE</td>
<td>1- or 2-STAGE</td>
</tr>
</tbody>
</table>

**NOTE:** A removable plug connector is provided with the control to make thermostat wire connections. This plug may be removed, wire connections made to the plug, and replaced. It is **STRONGLY** recommended that you do not connect multiple wires into a single terminal. Wire nuts are recommended to ensure one wire is used for each terminal. Failure to do so may result in intermittent operation.
24 Volt Dehumidistat Wiring - Non-Communicating Thermostat Connections

The optional usage of a dehumidistat allows the air handler's circulator blower to operate at a slightly lower speed during a combined thermostat call for cooling and dehumidistat call for dehumidification. This lower blower speed enhances dehumidification of the conditioned air as it passes through the AC coil. For proper function, a dehumidistat applied to this air handler must operate on 24 VAC and utilize a switch which opens on humidity rise.

To install/connect a dehumidistat:

1. Turn OFF power to air handler.
2. Secure the dehumidistat neutral wire (typically the white lead) to the screw terminal marked “DEHUM” on the air handler’s integrated control module.
3. Secure the dehumidistat hot wire (typically the black lead) to the screw terminal marked “R” on the air handler’s integrated control module.
4. Secure the dehumidistat ground wire (typically the green lead) to the ground screw on the air handler.
5. To enable the dehumidification function, move the dehumidification dip switch (S7) from OFF to ON. See following figure.
6. Turn ON power to air handler.

AUXILIARY ALARM SWITCH

The control is equipped with two Auxiliary Alarm terminals labeled CAS which can be utilized with communicating mode setups (typically used for condensate switch wiring but could be used with compatible CO₂ sensors or fire alarms).

Legacy mode use
In a legacy system (Non-communicating), this feature is not operational. Any auxiliary alarm switch must be used to interrupt the Y1 signal either to the indoor or outdoor unit.

Communication mode use
This feature can be activated or deactivated through the thermostat user menus. An auxiliary alarm switch must be normally closed and open when the base pan’s water level in the evaporator coil reaches a particular level. The control will respond by turning off the outdoor compressor and display the proper fault codes. If the switch is detected closed for 30 seconds, normal operation resumes and the error message will be removed.

AVPTC MOTOR ORIENTATION

If the unit is in the upflow position, there is no need to rotate the motor. If the unit is in the downflow position, loosen motor mount and rotate motor as shown in the AVPTC Motor Orientation figure below. Be sure motor is oriented with the female connections on the casing down. If the motor is not oriented with the connections down, water could collect in the motor and may cause premature failure.
**Circulator Blower**

This air handler is equipped with a multi-speed circulator blower. This blower provides ease in adjusting blower speeds. The Specification Sheet applicable to your model provides an airflow table, showing the relationship between airflow (CFM) and external static pressure (E.S.P.), for the proper selection of heating and cooling speeds. The heating blower speed is shipped set at 21kW or 25kW, and the cooling blower speed is set at “D”. These blower speeds should be adjusted by the installer to match the installation requirements so as to provide the correct electric heating CFM and correct cooling CFM. Use the CFM LED (green) to obtain an approximate airflow quantity. The green CFM LED blinks once for each 100 CFM of airflow.

1. Determine the tonnage of the cooling system installed with the air handler. If the cooling capacity is in BTU/hr divide it by 12,000 to convert capacity to TONs.

   **Example:** Cooling Capacity of 30,000 BTU/hr.
   
   \[
   \frac{30,000}{12,000} = 2.5 \text{ Tons}
   \]

2. Determine the proper airflow for the cooling system. Most cooling systems are designed to work with airflows between 350 and 450 CFM per ton. Most manufacturers recommend an airflow of about 400 CFM per ton.

   **Example:** 2.5 tons \( \times \) 400 CFM per ton = 1000 CFM

   The cooling system manufacturer’s instructions must be checked for required airflow. Any electronic air cleaners or other devices may require a specific airflow; consult installation instructions of those devices for requirements.

3. Knowing the air handler model, locate the high stage cooling airflow charts in the Specification Sheet applicable to your model. Look up the cooling airflow determined in step 2 and find the required cooling speed and adjustment setting.

   **Example:** An AVPTC30C14 air handler installed with a 2.5 ton air conditioning system. The airflow needed is 1000 CFM. Looking at the cooling speed chart for AVPTC30C14, find the airflow closest to 1000 CFM. A cooling airflow of 1000 CFM can be attained by setting the cooling speed to “C” and the adjustment to “0” (no adjustment).
4. Locate the blower speed selection DIP switches on the integrated control module. Select the desired “cooling” speed tap by positioning switches 1 and 2 appropriately. If airflow adjustment is required, set dip switch S8 (trim enable) to ON (trim enable default is off). Then select the desired “adjust” tap by positioning switches S3 and S4 appropriately. Refer to the following Airflow Adjust Taps figure for switch positions and their corresponding taps. Verify CFM by counting the number of times the green CFM LED blinks.

5. Continuous fan speeds that provide 25, 50, 75, and 100% of the air handler’s maximum airflow capability are selectable via dip switches S12 and S13. If the air handler’s maximum airflow capability is 2000 CFM and 25% continuous fan speed is selected, the continuous fan speed will be 0.25 x 2000 CFM = 500 CFM.

6. The multi-speed circulator blower also offers several custom ON/OFF ramping profiles. These profiles may be used to enhance cooling performance and increase comfort level. The ramping profiles are selected using DIP switches 5 and 6. Refer to the following Dip Switches - Cooling Airflow Ramping Profiles figure for switch positions and their corresponding taps. Refer to the bullet points below for a description of each ramping profile. Verify profile selection by counting the green CFM LED blinks and timing each step of the ramping profile.

**NOTE:** Upon start up in communicating mode the circuit board may display an “Ec” error. This is an indication that the dip switches on the control board need to be configured in accordance with the Electric Heating Airflow Table. Configuring the dip switches and resetting power to the unit will clear the error code.

Within the thermostat user menu, CTK0* communicating thermostat will display 20 kW for OFF-OFF-ON dip switch selection and 21 kW for OFF-OFF-OFF dip switch selection.
• Profile A provides only an OFF delay of one (1) minute at 100% of the cooling demand airflow.

• Profile B ramps up to full cooling demand airflow by first stepping up to 50% of the full demand for 30 seconds. The motor then ramps to 100% of the required airflow. A one (1) minute OFF delay at 100% of the cooling airflow.

• Profile C ramps up to 82% of the full cooling demand airflow and operates there for approximately 7 1/2 minutes. The motor then steps up to the full demand airflow. Profile C also has a one (1) minute 100% OFF delay.

• Profile D ramps up to 50% of the demand for 1/2 minute, then ramps to 82% of the full cooling demand airflow and operates there for approximately 7 1/2 minutes. The motor then steps up to the full demand airflow. Profile D has a 1/2 minute at 50% airflow OFF delay.

7. If an electric heater kit has been installed, determine the heater kilowatt (kW) rating. Using the Electric Heat Airflow table on page 16, set dip switches 9, 10, and 11 for the installed heater. The adjust setting (already established by the cooling speed selection) also applies to the electric heater kit airflow. Thus, the electric heater airflow is adjusted by the same amount. This does not apply to systems setup with a communicating thermostat. See Set-Up section in the AIR HANDLER ADVANCED FEATURES MENU on page 22. Verify selected CFM by counting the green CFM LED blinks.

If an electric heater kit has not been installed, set dip switches 9, 10, and 11 to any valid heater kit setting (see airflow table for valid settings). This will prevent an Ec Error code from being displayed.

NOTE: For installations not indicated in the preceding Temperature Rise Tables, the following formula is to be used:

\[
TR = (kW \times 3412) \times (Voltage\ Correction) \times (1.08 \times CFM)
\]

Where:  
TR = Temperature Rise  
kW = Heater Kit Actual kW  
3412 = Btu per kW  
Voltage Correction = .96 (230 Supply Volts) = .92 (220 Supply Volts) = .87 (208 Supply Volts)  
1.08 = Constant  
CFM = Measured Airflow

NOTE: The Temperature Rise Tables can also be used to determine the air handler airflow delivery. When using these tables for this purpose set the room thermostat to maximum heat and allow the system to reach steady state conditions. Insert two thermometers, one in the return air and one in the supply air. The temperature rise is the supply air temperature minus the room air temperature. Use HKR specification sheets to determine the HKR available for a given air handler.
**Speed Selection Dip Switches**

<table>
<thead>
<tr>
<th>TAP</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
<th>S12</th>
<th>S13</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>C</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>D</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

**To set Airflow:** (1) Select model and desired High Stage Cooling Airflow. Determine the corresponding tap (A, B, C, D). Set dip switches S1 and S2 to the appropriate ON / OFF positions. (2) Select model and installed electric heater size. Set dip switches S9, S10, and S11 to the appropriate ON / OFF positions. (3) If airflow adjustment is required set Trim Enable Switch S8 to ON (OFF = 0% Trim) and set S3 and S4 to appropriate ON / OFF positions. Tap A is +5%, Tap B is -5%, Tap C is +10%, Tap D is -10%.

**To Set Comfort mode:** Select desired Comfort Mode Profile (see profiles above). Set dip switches S5 and S6 to appropriate ON / OFF positions.

**Dehumidification:** To enable, set dip switch S7 to ON. Cooling airflow will be reduced to 85% of nominal value during cool call when Dehum command is present. To disable, set S7 to OFF.

**Continuous Fan Speed:** Use dip switches S12 and S13 to select one of 4 continuous fan speeds, Tap A is 25%. Tap B is 50%, Tap C is 75%, Tap D is 100%.

**Notes:**
1. Airflow data shown applies to legacy mode operation only. For a fully communicating system, please see the outdoor unit’s installation instructions for cooling and heat pump airflow data. See ComfortNet System-Airflow Consideration section for details.
2. Airflow blink codes are approximations of actual airflow.

### ELECTRIC HEAT AIRFLOW TABLE

<table>
<thead>
<tr>
<th>HTR kW</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>AVPTC24B14A</th>
<th>AVPTC30C14A</th>
<th>AVPTC36C14A</th>
<th>AVPTC42D14A†</th>
<th>AVPTC48D14A††</th>
<th>AVPTC60D14A†††</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>730</td>
<td>730</td>
<td>NR</td>
<td>850**</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>5</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
<td>780</td>
<td>780</td>
<td>1200</td>
<td>1400</td>
<td>1400</td>
<td>1620</td>
</tr>
<tr>
<td>6</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>850</td>
<td>850</td>
<td>1260</td>
<td>1630</td>
<td>1630</td>
<td>1670</td>
</tr>
<tr>
<td>8</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>950</td>
<td>950</td>
<td>1320</td>
<td>1630</td>
<td>1630</td>
<td>1720</td>
</tr>
<tr>
<td>10</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>1025</td>
<td>1025</td>
<td>1380</td>
<td>1670</td>
<td>1670</td>
<td>1750</td>
</tr>
<tr>
<td>15</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>NR</td>
<td>NR</td>
<td>1440</td>
<td>1720</td>
<td>1720</td>
<td>1780</td>
</tr>
<tr>
<td>19†</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>NR</td>
<td>NR</td>
<td>1500</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>20</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>NR</td>
<td>NR</td>
<td>1800</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>21 or 25*</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>1850</td>
<td>NR</td>
<td>NR</td>
</tr>
</tbody>
</table>

Note: Airflow data shown applies to the electric heat only in either legacy mode or communicating mode operation

* Within thermostat user menu, CTK0* communicating thermostat will display 20 kW for OFF-OFF-ON dip switch selection and 21 kW for OFF-OFF-OFF dip switch selection.

NR - Not rated
† For match up with a 2 ton outdoor unit: Heater kit application shall not exceed 10 kW.
Airflow for 5 kW up to 10 kW heater kits shall be set to 850 cfm speed tap of ON-ON-ON.

‡‡‡ For match up with a 3.5 ton outdoor unit: Heater kit application shall not exceed 20 kW.
Airflow for 5 kW up to 20 kW heater kits shall be set to 1620 cfm speed tap of ON-ON-ON.

** 3 kW heater kit is not applicable for this indoor application.
**Troubleshooting**

**Electrostatic Discharge (ESD) Precautions**

**NOTE:** Discharge body’s static electricity before touching unit. An electrostatic discharge can adversely affect electrical components.

Use the following precautions during air handler installation and servicing to protect the integrated control module from damage. By putting the air handler, the control, and the person at the same electrostatic potential, these steps will help avoid exposing the integrated control module to electrostatic discharge. This procedure is applicable to both installed and uninstalled (ungrounded) blowers.

1. **Discharge your body to ground before removing a new control from its container.** Follow steps 1 through 3 if installing the control on a blower. Return any old or new controls to their containers before touching any ungrounded object.

2. **HIGH VOLTAGE!** To avoid personal injury or death due to electrical shock, disconnect electrical power before performing any service or maintenance.

Refer to the Troubleshooting Chart at the end of this manual for assistance in determining the source of unit operational problems. The 7 segment LED display will provide any active fault codes. An arrow printed next to the display indicates proper orientation (arrow points to top of display). See following image.

<table>
<thead>
<tr>
<th>Model</th>
<th>HKSX 03XC</th>
<th>HKSX 05XC</th>
<th>HKSX 06XC</th>
<th>HKSX 08XC</th>
<th>HKSX 10XC</th>
<th>HKSX 05XC</th>
<th>HKSX 10XC</th>
<th>HKSC 15XA</th>
<th>HKSC 15XB</th>
<th>HKSC 15XF</th>
<th>HKSC 19CA</th>
<th>HKSC 19CB</th>
<th>HKSC 20DA</th>
<th>HKSC 20DB</th>
<th>HKSC 20XF</th>
<th>HKSC 25DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVPTC24B14</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVPTC30C14</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVPTC36C14</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVPTC42D14</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVPTC48D14</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVPTC60D14</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C Circuit breaker option
**Fault Recall**

The integrated control module is equipped with a momentary push-button switch that can be used to display the last six faults on the 7 segment LED display. The control must be in Standby Mode (no thermostat inputs) to use the feature. Depress the push-button for approximately two seconds and less than five seconds. The LED display will then display the six most recent faults beginning with the most recent fault and decrementing to the least recent fault. The faults may be cleared by depressing the button for greater than five seconds.

**NOTE:** Consecutively repeated faults are displayed a maximum of three times. Example: A clogged return air filter causes the air handler’s motor to repeatedly enter a limiting condition. The control will only store this fault the first three consecutive times the fault occurs.

**ComfortNet™ System**

**Overview**

The ComfortNet system is a system that includes a ComfortNet compatible air handler and air conditioner or heat pump with a CTK0* thermostat. Any other system configurations are considered invalid ComfortNet systems and must be connected as a traditional (or non-communicating) system (see the 24 Volt Thermostat Wiring - Non-Communicating Thermostat Connections section for details).

A ComfortNet heating/air conditioning system differs from a non-communicating/traditional system in the manner in which the indoor unit, outdoor unit and thermostat interact with one another. In a traditional system, the thermostat sends commands to the indoor and outdoor units via analog 24 VAC signals. It is a one-way communication path in that the indoor and outdoor units typically do not return information to the thermostat.

On the other hand, the indoor unit, outdoor unit, and thermostat comprising a ComfortNet system “communicate” digitally with one another. It is now a two-way communications path. The thermostat still sends commands to the indoor and outdoor units. However, the thermostat may also request and receive information from both the indoor and outdoor units. This information may be displayed on the ComfortNet thermostat. The indoor and outdoor units also interact with one another. The outdoor unit may send commands to or request information from the indoor unit. This two-way digital communications between the thermostat and subsystems (indoor/outdoor unit) and between subsystems is the key to unlocking the benefits and features of the ComfortNet system.

Two-way digital communications is accomplished using only two wires. The thermostat and subsystem controls are powered with 24 VAC. Thus, a maximum of 4 wires between the equipment and thermostat is all that is required to operate the system.

**Airflow Consideration**

Airflow demands are managed differently in a fully communicating system than they are in a non-communicating wired system. The system operating mode (as determined by the thermostat) determines which unit calculates the system airflow demand. If the indoor unit is responsible for determining the airflow demand, it calculates the demand and sends it to the ECM motor. If the outdoor unit or thermostat is responsible for determining the demand, it calculates the demand and transmits the demand along with a fan request to the indoor unit. The indoor unit then sends the demand to the ECM motor. The table below lists the various ComfortNet systems, the operating mode, and airflow demand source.

<table>
<thead>
<tr>
<th>System</th>
<th>System Operating Mode</th>
<th>Airflow Demand Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Conditioner + Air Handler</td>
<td>Cooling</td>
<td>Air Conditioner</td>
</tr>
<tr>
<td></td>
<td>Heating</td>
<td>Air Handler</td>
</tr>
<tr>
<td></td>
<td>Continuous Fan</td>
<td>Thermostat</td>
</tr>
<tr>
<td>Heat Pump + Air Handler</td>
<td>Cooling</td>
<td>Heat Pump</td>
</tr>
<tr>
<td></td>
<td>Heat Pump Heating Only</td>
<td>Heat Pump</td>
</tr>
<tr>
<td></td>
<td>HP + Electric Heat Strips</td>
<td>&gt; of Heat Pump or Air Handler Demand</td>
</tr>
<tr>
<td></td>
<td>Electric Heat Strips Only</td>
<td>Air Handler</td>
</tr>
<tr>
<td></td>
<td>Continuous Fan</td>
<td>Thermostat</td>
</tr>
</tbody>
</table>

For example, assume the system is a heat pump matched with an air handler. With a call for low stage cooling, the heat pump will calculate the system’s low stage cooling airflow demand. The heat pump will then send a fan request along with the low stage cooling airflow demand to the air handler. Once received, the air handler will send the low stage cooling airflow demand to the ECM motor. The ECM motor then delivers the low stage cooling airflow. See the applicable ComfortNet air conditioner or heat pump installation manual for the airflow delivered during cooling or heat pump heating.

In continuous fan mode, the CTK0* thermostat provides the airflow demand. Depending on which CTK0* thermostat has been installed three or four continuous fan speeds may be available. If the thermostat provides three speeds (low, medium, high) they correspond to 25%, 50% and 75%, respectively, of the air handlers’ maximum airflow capability. If the thermostat provides four continuous fan speeds then a 100% airflow option is added. During continuous fan operation, the thermostat sends a fan request along with the continuous fan demand to the air handler. The air handler, in turn, sends the demand to the ECM motor. The ECM motor delivers the requested continuous fan airflow.
**CTK0* THERMOSTAT WIRING**

**NOTE:** Refer to section Electrical Connections for 208/230 volt line connections to the air handler.

**NOTE:** A removable plug connector is provided with the control to make thermostat wire connections. This plug may be removed, wire connections made to the plug, and replaced. **It is STRONGLY recommended that you do not connect multiple wires into a single terminal. Wire nuts are recommended to ensure one wire is used for each terminal.** Failure to do so may result in intermittent operation.

Typical 18 AWG thermostat wire may be used to wire the system components. One hundred (100) feet is the maximum length of wire between indoor unit and outdoor unit, or between indoor unit and thermostat.

**FOUR-WIRE INDOOR AND OUTDOOR WIRING**

Typical wiring will consist of four wires between the indoor unit and outdoor unit and between the indoor unit and thermostat. The required wires are: (a) data lines, 1 and 2; (b) thermostat “R” (24 VAC hot) and “C” (24 VAC common).

**SYSTEM WIRING USING FOUR-WIRES**

**TWO-WIRE OUTDOOR, FOUR-WIRE INDOOR WIRING**

Two wires only may be utilized between the indoor and outdoor units. For this wiring scheme, only the data lines, 1 and 2, are required between the indoor and outdoor units. A 40VA, 208/230 VAC to 24 VAC transformer must be installed in the outdoor unit to provide 24 VAC power to the outdoor unit’s electronic control. See kit instructions for mounting and wiring instructions. Four wires are required between the indoor unit and thermostat.

**SYSTEM TROUBLESHOOTING**

**NOTE:** Refer to the instructions accompanying the ComfortNet compatible outdoor AC/HP unit for troubleshooting information. Refer to the Troubleshooting Chart at the end of this manual for a listing of possible air handler error codes, possible causes and corrective actions.
**START-UP PROCEDURE**

- Prior to start-up, ensure that all electrical connections are properly sized and tightened.
- All panels must be in place and secured. For Air Tight application, neoprene gasket must be positioned at prescribed locations to achieve 2% leakage.
- Tubing must be leak free.
- Unit should be elevated, trapped and pitched to allow for drainage.
- Low voltage wiring is connected.
- Auxiliary drain is installed when necessary and pitched to allow for drainage.
- Drain pan and drain tubing has been leak checked.
- Return and supply ducts are sealed.
- Unit is elevated when installed in a garage or where flammable vapors may be present.
- Unit is protected from vehicular or other physical damage.
- Return air is not obtained from any areas where there may be objectionable odors, flammable vapors or products of combustion such as carbon monoxide (CO), which may cause serious personal injury or death.

**REGULAR MAINTENANCE**

**WARNING**

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

The only item to be maintained on a regular basis by the user is the circulating air filter(s). Filter should be cleaned or replaced regularly. A certified service technician must perform all other services.

**NOTE:** THESE INSTRUCTIONS ARE SPECIFICALLY FOR AVPTC MODELS. DO NOT USE THESE DIAGRAMS FOR ANY OTHER MODELS. SEE SEPARATE INSTALLATION AND OPERATING INSTRUCTIONS FOR ATUF, ARUF, ARPT, ADPF, AND ASPF MODELS.

**NOTICE:** THIS PRODUCT CONTAINS ELECTRONIC COMPONENTS WHICH REQUIRE A DEFINITE GROUND. PROVISIONS ARE MADE FOR CONNECTION OF THE GROUND. A DEDICATED GROUND FROM THE MAIN POWER SUPPLY OR AN EARTH GROUND MUST BE PROVIDED.
<table>
<thead>
<tr>
<th>LED</th>
<th>Status</th>
<th>Indication</th>
<th>Possible Causes</th>
<th>Corrective Action(s)</th>
<th>Notes &amp; Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED Status</td>
<td>Off</td>
<td>Normal condition</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Red Communications LED</td>
<td>1 Flash</td>
<td>Communications Failure</td>
<td>Communications Failure</td>
<td>• Depress Learn Button &lt;br&gt; • Verify that bus BIAS and TERM dipswitches are in the ON position.</td>
<td>• Depress once quickly for a power-up reset &lt;br&gt; • Depress and hold for 2 seconds for an out-of-box reset</td>
</tr>
<tr>
<td>2 Flashes</td>
<td>Out-of-box reset</td>
<td>Control power up</td>
<td>• None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Green Receive LED</td>
<td>Off</td>
<td>No power</td>
<td>• No power to air handler &lt;br&gt; • Open fuse &lt;br&gt; • Communications error</td>
<td>• Check fuses and circuit breakers; replace/reset &lt;br&gt; • Replace blown fuse &lt;br&gt; • Check for shorts in low voltage wiring in air handler/system &lt;br&gt; • Reset network by depressing learn button &lt;br&gt; • Check data 1/ data 2 voltages</td>
<td>• Turn power OFF prior to repair</td>
</tr>
<tr>
<td>1 Steady Flash</td>
<td>No network found</td>
<td>Broken/ disconnected data wire(s)</td>
<td>• Air handler is installed as a non-communicating/ traditional system</td>
<td>• Check communications wiring (data 1/ data 2 wires) &lt;br&gt; • Check wire connections at terminal block &lt;br&gt; • Verify air handler installation type (non-communicating/ traditional or communicating) &lt;br&gt; • Check data 1/ data 2 voltages</td>
<td>• Turn power OFF prior to repair &lt;br&gt; • Verify wires at terminal blocks are securely twisted together prior to inserting into terminal block &lt;br&gt; • Verify data1 and data voltages as described above</td>
</tr>
<tr>
<td>Rapid Flashing</td>
<td>Normal network traffic</td>
<td>Control is “talking” on network as expected</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>On Solid</td>
<td>Data 1/ Data 2 miss-wire</td>
<td>Data 1 and data 2 wires reversed at air handler, thermostat, or ComfortNet™ compatible outdoor AC/HP</td>
<td>• Check communications wiring (data 1/ data 2 wires) &lt;br&gt; • Check wire connections at terminal block</td>
<td>• Check data 1/ data 2 voltages</td>
<td>• Turn power OFF prior to repair &lt;br&gt; • Verify wires at terminal blocks are securely twisted together prior to inserting into terminal block &lt;br&gt; • Verify data1 and data voltages as described above</td>
</tr>
</tbody>
</table>
## AIR HANDLER ADVANCED FEATURES MENU

### CONFIGURATION

<table>
<thead>
<tr>
<th>Submenu Item</th>
<th>Indication (for Display Only; not User Modifiable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Heat Size (HTR KW)</td>
<td>Displays the size in kW of the selected electric heaters.</td>
</tr>
<tr>
<td>Motor HP (1/2, 3/4, or 1 MTR HP)</td>
<td>Displays the air handler indoor blower motor horsepower.</td>
</tr>
<tr>
<td>Heat ON Delay (HT ON)</td>
<td>Displays the electric heat indoor blower ON delay.</td>
</tr>
<tr>
<td>Heat OFF Delay (HT OFF)</td>
<td>Displays the electric heat indoor blower OFF delay.</td>
</tr>
</tbody>
</table>

### DIAGNOSTICS

<table>
<thead>
<tr>
<th>Submenu Item</th>
<th>Indication/User Modifiable Options</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault 1 (FAULT #1)</td>
<td>Most recent fault</td>
<td>For display only</td>
</tr>
<tr>
<td>Fault 2 (FAULT #2)</td>
<td>Next most recent fault</td>
<td>For display only</td>
</tr>
<tr>
<td>Fault 3 (FAULT #3)</td>
<td>Next most recent fault</td>
<td>For display only</td>
</tr>
<tr>
<td>Fault 4 (FAULT #4)</td>
<td>Next most recent fault</td>
<td>For display only</td>
</tr>
<tr>
<td>Fault 5 (FAULT #5)</td>
<td>Next most recent fault</td>
<td>For display only</td>
</tr>
<tr>
<td>Fault 6 (FAULT #6)</td>
<td>Least recent fault</td>
<td>For display only</td>
</tr>
<tr>
<td>Clear Fault History (CLEAR)</td>
<td>NO or YES</td>
<td>Selecting “YES” clears the fault history</td>
</tr>
</tbody>
</table>

**NOTE:** Consecutively repeated faults are shown a maximum of 3 times

### IDENTIFICATION

<table>
<thead>
<tr>
<th>Submenu Item</th>
<th>Indication (for Display Only; not User Modifiable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Number (MOD NUM)</td>
<td>Displays the air handler model number</td>
</tr>
<tr>
<td>Serial Number (SER NUM)</td>
<td>Displays the air handler serial number (Optional)</td>
</tr>
<tr>
<td>Software (SOFTWARE)</td>
<td>Displays the application software revision</td>
</tr>
</tbody>
</table>

### SET-UP

<table>
<thead>
<tr>
<th>Submenu Item</th>
<th>User Modifiable Options</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Airflow Trim (HT TRM)</td>
<td>-10% to +10% in 2% increments, default is 0%</td>
<td>Trims the heating airflow by the selected amount.</td>
</tr>
<tr>
<td>Auxiliary Alarm</td>
<td>ON / OFF</td>
<td>Enable or disable Auxiliary Alarm input</td>
</tr>
</tbody>
</table>

### STATUS

<table>
<thead>
<tr>
<th>Submenu Item</th>
<th>Indication (for Display Only; not User Modifiable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode (MODE)</td>
<td>Displays the current air handler operating mode</td>
</tr>
<tr>
<td>CFM (CFM)</td>
<td>Displays the airflow for the current operating mode</td>
</tr>
<tr>
<td>Symptoms of Abnormal Operation (Legacy &amp; ComfortNet™ Thermostat)</td>
<td>7-Digit LED Code Characters Will Alternating</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>• LED display is ON continuously</td>
<td>ON</td>
</tr>
<tr>
<td>• Electric heaters fail to energize on a call for W1 or Auxiliary/Emergency heat</td>
<td>EC</td>
</tr>
<tr>
<td>• Integrated control module LED display provides the indicated error code.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat “Call for Service” icon illuminated</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat scrolls “Check Air Handler” message</td>
<td></td>
</tr>
<tr>
<td>• Electric heat airflow is higher than expected on a call for W1 or Auxiliary/Emergency heat</td>
<td>EC</td>
</tr>
<tr>
<td>• Integrated control module LED display provides the indicated error code.</td>
<td></td>
</tr>
<tr>
<td>• Electric heat airflow is higher than expected on a call for W1 or Auxiliary/Emergency heat</td>
<td>EC</td>
</tr>
<tr>
<td>• Integrated control module LED display provides the indicated error code.</td>
<td></td>
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<tr>
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<td>EC</td>
</tr>
<tr>
<td>• Integrated control module LED display provides the indicated error code.</td>
<td></td>
</tr>
<tr>
<td>• Electric heat airflow is higher than expected on a call for W1 or Auxiliary/Emergency heat</td>
<td>EC</td>
</tr>
<tr>
<td>• Integrated control module LED display provides the indicated error code.</td>
<td></td>
</tr>
<tr>
<td>• High water level in the evaporation coil.</td>
<td>EF</td>
</tr>
<tr>
<td>Symptoms of Abnormal Operation (Legacy &amp; ComfortNet™ Thermostat)</td>
<td>7-Segment LED Codes Characters Will Alternate</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>• Air handler blower fails to operate.</td>
<td>d0</td>
</tr>
<tr>
<td>• Integrated control module LED display provides no signal.</td>
<td>d1</td>
</tr>
<tr>
<td>• ComfortNet™ thermostat “Call for Service” icon illuminated.</td>
<td>d4</td>
</tr>
<tr>
<td>• ComfortNet™ thermostat scrolls “Check Air Handler” message.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat scrolls “Check Air Handler” message.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat scrolls “Check Air Handler” message.</td>
<td></td>
</tr>
<tr>
<td>• Operation different than expected or no operation.</td>
<td></td>
</tr>
<tr>
<td>• Integrated control module LED display provides indicated error code.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat “Call for Service” icon illuminated.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat scrolls “Check Air Handler” message.</td>
<td></td>
</tr>
<tr>
<td>Symptoms of Abnormal Operation (Legacy &amp; ComfortNet™ Thermostat)</td>
<td>7-Segment LED Codes</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>• Air handler blower fails to operate.</td>
<td></td>
</tr>
<tr>
<td>• Integrated control module LED display provides indicated error code.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat “Call for Service” icon illuminated.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat scrolls “Check Air Handler” message.</td>
<td></td>
</tr>
<tr>
<td>• Air handler blower fails to operate.</td>
<td></td>
</tr>
<tr>
<td>• Integrated control module LED display provides indicated error code.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat “Call for Service” icon illuminated.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat scrolls “Check Air Handler” message.</td>
<td></td>
</tr>
<tr>
<td>Air handler blower operates at reduced performance.</td>
<td></td>
</tr>
<tr>
<td>Airflow delivered is less than expected.</td>
<td></td>
</tr>
<tr>
<td>Integrated control module LED display provides b3 error code.</td>
<td></td>
</tr>
<tr>
<td>• Air handler blower fails to operate.</td>
<td></td>
</tr>
<tr>
<td>• Integrated control module LED display provides indicated error code.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat “Call for Service” icon illuminated.</td>
<td></td>
</tr>
<tr>
<td>• ComfortNet™ thermostat scrolls “Check Air Handler” message.</td>
<td></td>
</tr>
</tbody>
</table>

**b0**
- **Symptoms of Abnormal Operation**
  - Motor NOT RUN
- **Possible Causes**
  - Loose wiring connection at circulator motor power leads or circulator motor power leads disconnected.
  - Failed circulator blower motor.
- **Corrective Actions**
  - Tighten or correct wiring connection.
  - Check circulator motor power leads or circulator motor power leads disconnected.
  - Replace circulator motor.
  - Replace if necessary.
- **Notes & Cautions**
  - Turn power OFF prior to repair.
  - Replace circulator motor with correct replacement part.

**b1**
- **Symptoms of Abnormal Operation**
  - Motor COMM
- **Possible Causes**
  - Loose wiring connection at circulator motor control leads.
  - Failed circulator blower motor.
  - Failed integrated control module.
- **Corrective Actions**
  - Tighten or correct wiring connection.
  - Check circulator blower motor. Replace if necessary.
  - Check integrated control module. Replace if necessary.
- **Notes & Cautions**
  - Turn power OFF prior to repair.
  - Replace circulator motor with correct replacement part.
  - Replace integrated control module with correct replacement part.

**b2**
- **Symptoms of Abnormal Operation**
  - Motor MISMATCH
- **Possible Causes**
  - Incorrect circulator blower motor in air handler blower.
  - Incorrect shared data set in integrated control module.
- **Corrective Actions**
  - Verify circulator blower motor horse power is the same specified for the specific air handler blower model.
  - Replace is necessary.
  - Verify shared data set is correct for the specific model.
  - Re-populate data using correct memory card if required.
- **Notes & Cautions**
  - Turn power OFF prior to repair.
  - Replace motor with correct replacement part.
  - Use memory card for the specific model.
  - Insert memory card BEFORE turning power ON. Memory card may be removed after data is loaded.
  - Error code will be cleared once shared data and motor horse power match.
  - Turn power off before removing memory card.

**b3**
- **Symptoms of Abnormal Operation**
  - Motor LIMITS
- **Possible Causes**
  - Blocked filters.
  - Restrictive ductwork.
  - Undersized ductwork.
  - High ambient temperatures.
- **Corrective Actions**
  - Check filters for blockage. Clean filters or remove obstruction.
  - Check ductwork for blockage. Remove obstruction. Verify air handler is fully open.
  - Verify ductwork is appropriately sized for system. Resize/replace ductwork if necessary.
  - See “Installation Instructions” for installation requirements.
- **Notes & Cautions**
  - Turn power OFF prior to repair.
<table>
<thead>
<tr>
<th>Symptoms of Abnormal Operation</th>
<th>7-Segment LED Codes Characters Will Alternate</th>
<th>Fault Description</th>
<th>ComfortNet™ Thermostat Only Message Code</th>
<th>Possible Causes</th>
<th>Corrective Actions</th>
<th>Notes &amp; Cautions</th>
</tr>
</thead>
</table>
| Air handler blower fails to operate. | | Circulator blower motor fails to start 10 consecutive times. | MTR LCKD Rotor b5 | - Obstruction in circulator blower housing.  
- Seized circulator blower motor bearings.  
- Failed circulator blower motor. | - Check circulator blower for obstructions. Remove and repair/replace wheel/motor if necessary.  
- Check circulator blower motor shaft rotation and motor. Replace motor if necessary. | - Turn power OFF prior to repair  
- Replace motor with correct replacement part.  
- Replace wheel with correct replacement part. |
| Air handler blower fails to operate. | | Circulator blower motor shuts down for over or under voltage condition.  
Circulator blower motor shuts down due to over temperature condition on power module. | MOTOR VOLTS b6 | - High AC line voltage to air handler blower.  
- Low AC line voltage to air handler blower.  
- High ambient temperatures. | - Check power to air handler blower. Verify line voltage to blower is within the range specified on the air handler blower rating plate.  
- See "Installation Instructions" for installation requirements. | - Turn power OFF prior to repair. |
| Air handler blower fails to operate. | | Circulator blower motor does not have enough information to operate properly. Motor fails to start 40 consecutive times. | MOTOR PARAMS b7 | - Error with integrated control module.  
- Motor has a locked rotor condition. | - Check integrated control module. Verify control is populated with correct shared data set. See data errors above for details.  
- Check for locked rotor condition (see error code above for details). | - Turn power OFF prior to repair.  
- Replace with correct replacement part(s).  
- Use memory card for the specific model.  
- Insert memory card BEFORE turning power ON.  
- Memory card may be removed after data is loaded  
- Turn power off before removing memory card. |
| Air handler blower operates at reduced performance or operates on low stage when high stage is expected. | | Airflow is lower than demanded. | LOW ID AIRFLOW b9 | - Blocked filters.  
- Restrictive ductwork.  
- Undersized ductwork. | - Check filters for blockage. Clean filters or remove obstruction.  
- Check ductwork for blockage. Remove obstruction. Verify all registers are fully open.  
- Verify ductwork is appropriately sized for system. Resize/replace ductwork if necessary. | - Turn power OFF prior to repair. |
<table>
<thead>
<tr>
<th>7 SEGMENT LED (characters will alternate)</th>
<th>DESCRIPTION OF CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(no display)</td>
<td>INTERNAL CONTROL FAULT / NO POWER</td>
</tr>
<tr>
<td>O</td>
<td>STANDBY, WAITING FOR INPUTS</td>
</tr>
<tr>
<td>Ed</td>
<td>HEATER KIT DIP Switches NOT SET PROPERLY</td>
</tr>
<tr>
<td>Eb</td>
<td>NO HTR KIT INSTALLED - SYSTEM CALLING FOR AUXILIARY HEAT</td>
</tr>
<tr>
<td>E5</td>
<td>FUSE OPEN</td>
</tr>
<tr>
<td>EF</td>
<td>AUXILIARY SWITCH OPEN</td>
</tr>
<tr>
<td>d0</td>
<td>DATA NOT ON NETWORK</td>
</tr>
<tr>
<td>d1</td>
<td>INVALID DATA ON NETWORK</td>
</tr>
<tr>
<td>d4</td>
<td>INVALID MEMORY CARD DATA</td>
</tr>
<tr>
<td>b0</td>
<td>BLOWER MOTOR NOT RUNNING</td>
</tr>
<tr>
<td>b1</td>
<td>BLOWER MOTOR COMMUNICATION ERROR</td>
</tr>
<tr>
<td>b2</td>
<td>BLOWER MOTOR HP MISMATCH</td>
</tr>
<tr>
<td>b3</td>
<td>BLOWER MOTOR OPERATING IN POWER, TEMP., OR SPEED LIMIT</td>
</tr>
<tr>
<td>b4</td>
<td>BLOWER MOTOR CURRENT TRIP OR LOST ROTOR</td>
</tr>
<tr>
<td>b5</td>
<td>BLOWER MOTOR ROTOR LOCKED</td>
</tr>
<tr>
<td>b6</td>
<td>OVER/UNDER VOLTAGE TRIP OR OVER TEMPERATURE TRIP</td>
</tr>
<tr>
<td>b7</td>
<td>INCOMPLETE PARAMETER SENT TO MOTOR</td>
</tr>
<tr>
<td>b9</td>
<td>LOW INDOOR AIRFLOW</td>
</tr>
<tr>
<td>C1</td>
<td>LOW STAGE COOL - LEGACY MODE ONLY</td>
</tr>
<tr>
<td>C2</td>
<td>HIGH STAGE COOL - LEGACY MODE ONLY</td>
</tr>
<tr>
<td>P1</td>
<td>LOW STAGE HEAT PUMP HEAT - LEGACY MODE ONLY</td>
</tr>
<tr>
<td>P2</td>
<td>HIGH STAGE HEAT PUMP HEAT - LEGACY MODE ONLY</td>
</tr>
<tr>
<td>h1</td>
<td>EMERGENCY HEAT LOW - COMMUNICATING MODE ONLY</td>
</tr>
<tr>
<td>h2</td>
<td>EMERGENCY HEAT HIGH - COMMUNICATING MODE ONLY</td>
</tr>
<tr>
<td>FC</td>
<td>FAN COOL - COMMUNICATING MODE ONLY</td>
</tr>
<tr>
<td>FH</td>
<td>FAN HEAT - COMMUNICATING MODE ONLY</td>
</tr>
<tr>
<td>F</td>
<td>FAN ONLY</td>
</tr>
<tr>
<td>H1</td>
<td>ELECTRIC HEAT LOW</td>
</tr>
<tr>
<td>H2</td>
<td>ELECTRIC HEAT HIGH</td>
</tr>
<tr>
<td>dF</td>
<td>DEFROST - COMMUNICATING MODE ONLY (note: defrost is displayed as H1 in a legacy setup)</td>
</tr>
</tbody>
</table>

GREEN CFM LED - EACH FLASH REPRESENTS 100CFM (USE FOR AIRFLOW APPROXIMATION ONLY) - EXAMPLE: 8 FLASHES = 800CFM
When installing heater kit, ensure speed tap does not exceed minimum blower speed (MBS) specified for the air handler/heater kit combination on this unit’s S&R plate. After installing optional heat kit, mark an “X” in the provided above. Mark according to number of heater element rows installed. No mark indicates no heat kit installed.

Low voltage (24V) - Low voltage field junction terminal to integrated control module.
Hi voltage (230V) - Hi voltage field junction terminal.

NOTE:
1. Place red wires on transformer terminal 2 for 208 VAC operation.
2. Manufacturer's specified replacement parts must be used when servicing.
3. If any of the original wires as supplied with this unit must be replaced, it must be replaced with wiring material having a temperature rating of at least 105°C. Use copper conductors only.
4. Unit must be permanently grounded and conform to N.E.C. and local codes.
5. To recall the last 6 faults, most recent to least recent, depress and hold while in standby (no thermostat inputs).
6. Red status LED provides network status. Green RX LED indicates network traffic. Use learn button to reset network.
7. Discard connector PL1 when installing optional heat kit.
8. The Condensate Alarm Switch (CAS) terminals can only be utilized with communication node setups. This feature is not operational with legacy systems.

Color codes:
PK ---- PINK
BR ---- BROWN
WH ---- WHITE
BL ---- BLUE
GY ---- GRAY
RD ---- RED
YL ---- YELLOW
OR ---- ORANGE
PU ---- PURPLE
GN ---- GREEN
BK ---- BLACK

Low voltage (24V) - Low voltage field junction terminal to integrated control module.
Hi voltage (230V) - Hi voltage field junction terminal.

Notes:
- 1. Place red wires on transformer terminal 2 for 208 VAC operation.
- 2. Manufacturer's specified replacement parts must be used when servicing.
- 3. If any of the original wires as supplied with this unit must be replaced, it must be replaced with wiring material having a temperature rating of at least 105°C. Use copper conductors only.
- 4. Unit must be permanently grounded and conform to N.E.C. and local codes.
- 5. To recall the last 6 faults, most recent to least recent, depress and hold while in standby (no thermostat inputs).
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- 7. Discard connector PL1 when installing optional heat kit.
- 8. The Condensate Alarm Switch (CAS) terminals can only be utilized with communication node setups. This feature is not operational with legacy systems.

Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.
3-Phase Heat Kit

Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.
25kW Heat Kit

COMPONENT CODE
PC = 9 PIN CONNECTOR
HTR = HEATER ELEMENT
TL = THERMAL LMT
RS = RELAY/SEQUENCER
TB = TERMINAL BLOCK
CB = CIRCUIT BREAKER
CC = CONTACTOR
FL = FUSE LINK
EM = EVAPORATOR MOTOR
EBTDR = ELEC. BLOWER TIME DELAY
RC = RUN CAPACITOR
TR = TRANSFORMER
SR = STRAIN RELIEF
WIRING CODE:
HIGH VOLTAGE
LOW VOLTAGE

COLOR CODE
BK = BLACK
BL = BLUE
BR = BROWN
GR = GREEN
OR = ORANGE
PK = PINK
PU = PURPLE
RD = RED
WH = WHITE
YL = YELLOW

NOTE: WHEN INSTALLING HEATER KIT, ENSURE SPEED TAP MUST EXCEED OR EQUAL THE MINIMUM BLOWER SPEED (MBS) SPECIFIED FOR THE AIRHANDLER / HEATER KIT COMBINATION ON THIS UNIT’S SERIAL PLATE.

Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.
We strongly recommend a bi-annual maintenance checkup be performed before the heating and cooling seasons begin by a qualified servicer.

Replace or Clean Filter

**IMPORTANT NOTE:** Never operate unit without a filter installed as dust and lint will build up on internal parts resulting in loss of efficiency, equipment damage and possible fire. An indoor air filter must be used with your comfort system. A properly maintained filter will keep the indoor coil of your comfort system clean. A dirty coil could cause poor operation and/or severe equipment damage.

Your air filter or filters could be located in your furnace, in a blower unit, or in “filter grilles” in your ceiling or walls. The installer of your air conditioner or heat pump can tell you where your filter(s) are, and how to clean or replace them. Check your filter(s) at least once a month. When they are dirty, replace or clean as required. Disposable type filters should be replaced. Reusable type filters may be cleaned.

You may want to ask your dealer about high efficiency filters. High efficiency filters are available in both electronic and non-electronic types. These filters can do a better job of catching small airborne particles.

Compressor

The compressor motor is hermetically sealed and does not require additional oiling.

Motors

Indoor and outdoor fan motors are permanently lubricated and do not require additional oiling.

Clean Outside Coil (Qualified Servicer Only)

**WARNING**

HIGH VOLTAGE!

**DISCONNECT ALL POWER BEFORE SERVICING.**

**MULTIPLE POWER SOURCES MAY BE PRESENT.**

**FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.**

Air must be able to flow through the outdoor unit of your comfort system. Do not construct a fence near the unit or build a deck or patio over the unit without first discussing your plans with your dealer or other qualified servicer. Restricted airflow could lead to poor operation and/or severe equipment damage.

Likewise, it is important to keep the outdoor coil clean. Dirt, leaves, or debris could also restrict the airflow. If cleaning of the outdoor coil becomes necessary, hire a qualified servicer. Inexperienced people could easily puncture the tubing in the coil. Even a small hole in the tubing could eventually cause a large loss of refrigerant. Loss of refrigerant can cause poor operation and/or severe equipment damage.

Do not use a condensing unit cover to “protect” the outdoor unit during the winter, unless you first discuss it with your dealer. Any cover used must include “breathable” fabric to avoid moisture buildup.

**BEFORE CALLING YOUR SERVICER**

- **Check the thermostat** to confirm that it is properly set.
- **Wait 15 minutes.** Some devices in the outdoor unit or in programmable thermostats will prevent compressor operation for awhile, and then reset automatically. Also, some power companies will install devices which shut off air conditioners for several minutes on hot days. If you wait several minutes, the unit may begin operation on its own.

**CAUTION**

**TO AVOID THE RISK OF EQUIPMENT DAMAGE OR FIRE, INSTALL THE SAME AMPERAGE BREAKER OR FUSE AS YOU ARE REPLACING. IF THE CIRCUIT BREAKER OR FUSE SHOULD OPEN AGAIN WITHIN THIRTY DAYS, CONTACT A QUALIFIED SERVICER TO CORRECT THE PROBLEM.**

**IF YOU REPEATEDLY RESET THE BREAKER OR REPLACE THE FUSE WITHOUT HAVING THE PROBLEM CORRECTED, YOU RUN THE RISK OF SEvere EQUIPMENT DAMAGE.**

- **Check the electrical panel** for tripped circuit breakers or failed fuses. Reset the circuit breakers or replace fuses as necessary.
- **Check the disconnect switch** near the indoor furnace or blower to confirm that it is closed.
- **Check for obstructions on the outdoor unit.** Confirm that it has not been covered on the sides or the top. Remove any obstruction that can be safely removed. If the unit is covered with dirt or debris, call a qualified servicer to clean it.
- **Check for blockage of the indoor air inlets and outlets.** Confirm that they are open and have not been blocked by objects (rugs, curtains or furniture).
- **Check the filter.** If it is dirty, clean or replace it.
- **Listen for any unusual noise(s), other than normal operating noise, that might be coming from the outdoor unit.** If you hear unusual noise(s) coming from the unit, call a qualified servicer.