

# WALL MOUNT AIR HANDLERS

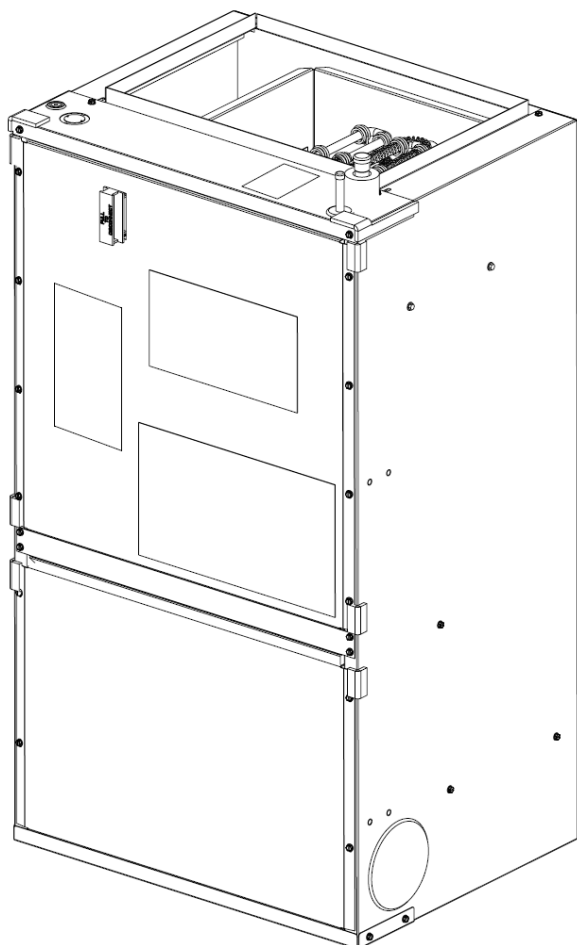
## INSTALLATION INSTRUCTIONS & OPERATING INSTRUCTIONS

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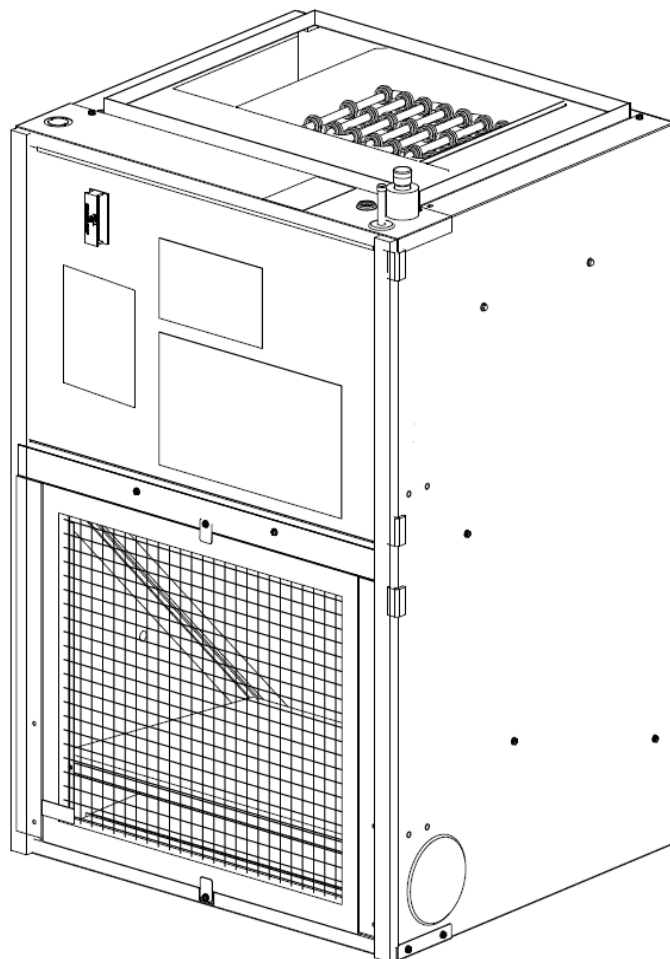
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P/N: IO-4009A Date: February 2023



**AWSF/AWST 18-24**



**AWSF/AWST 30-36**



### WARNING

ONLY PERSONNEL THAT HAVE BEEN TRAINED TO INSTALL, ADJUST, SERVICE, MAINTENANCE OR REPAIR (HEREINAFTER, "SERVICE") THE EQUIPMENT SPECIFIED IN THIS MANUAL SHOULD SERVICE THE EQUIPMENT. THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR ANY INJURY OR PROPERTY DAMAGE ARISING FROM IMPROPER SERVICE OR SERVICE PROCEDURES. IF YOU SERVICE THIS UNIT, YOU ASSUME RESPONSIBILITY FOR ANY INJURY OR PROPERTY DAMAGE WHICH MAY RESULT. IN ADDITION, IN JURISDICTIONS THAT REQUIRE ONE OR MORE LICENSES TO SERVICE THE EQUIPMENT SPECIFIED IN THIS MANUAL, ONLY LICENSED PERSONNEL SHOULD SERVICE THE EQUIPMENT. IMPROPER INSTALLATION, ADJUSTMENT, SERVICING, MAINTENANCE OR REPAIR OF THE EQUIPMENT SPECIFIED IN THIS MANUAL, OR ATTEMPTING TO INSTALL, ADJUST, SERVICE OR REPAIR THE EQUIPMENT SPECIFIED IN THIS MANUAL WITHOUT PROPER TRAINING MAY RESULT IN PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



### WARNING

DO NOT BYPASS SAFETY DEVICES



RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION.

**NOTE: SPECIFICATIONS AND PERFORMANCE DATA LISTED HEREIN ARE SUBJECT TO CHANGE WITHOUT NOTICE.**

**NOTE: NEVER OPERATE THE UNIT WITHOUT THE RECOMMENDED FILTER OR THE OUTER PANEL INSTALLED.**



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### 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.



### WARNING

TO PREVENT THE RISK OF PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH, DO NOT STORE COMBUSTIBLE MATERIALS OR USE GASOLINE OR OTHER FLAMABLE LIQUIDS OR VAPORS IN THE VICINITY OF THIS APPLIANCE.



### CAUTION

HAVE YOUR CONTRACTOR IDENTIFY ALL THE VARIOUS CUT OFF SWITCHES AND DEVICES THAT SERVICE THIS UNIT. KNOW WHERE THE SWITCH IS THAT WILL CUT OFF ENERGY TO THE HEATING SYSTEM IN THE EVENT OF OVERHEATING.



### CAUTION

THIS APPLIANCE IS NOT INTENDED FOR THE USE BY PERSONS (INCLUDING CHILDREN) WITH THE REDUCED PHYSICAL, SENSORY OR MENTAL CAPABILITIES, OR LACK OF EXPERIENCE AND KNOWLEDGE, UNLESS THEY HAVE BEEN GIVEN SUPERVISION OR INSTRUCTION CONCERNING USE OF THE APPLIANCE BY A PERSON RESPONSIBLE FOR THEIR SAFETY. CHILDREN SHOULD BE SUPERVISED TO ENSURE THAT THEY DO NOT PLAY WITH THE APPLIANCE. APPLIANCE NOT ACCESSIBLE TO THE GENERAL PUBLIC.



### WARNING

THIS UNIT SHOULD NOT BE CONNECTED TO, OR USED IN CONJUNCTION WITH, ANY DEVICES THAT ARE NOT DESIGN CERTIFIED FOR USE WITH THIS UNIT OR HAVE NOT BEEN TESTED AND APPROVED BY THE MANUFACTURER. SERIOUS PROPERTY DAMAGE OR PERSONAL INJURY, REDUCED UNIT PERFORMANCE AND/OR HAZARDOUS CONDITIONS MAY RESULT FROM THE USE OF DEVICES THAT HAVE NOT BEEN APPROVED OR CERTIFIED BY THE MANUFACTURER.

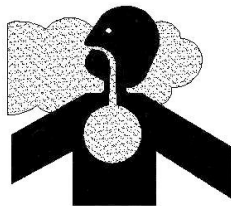


### WARNING

PARTIAL UNITS SHALL ONLY BE CONNECTED TO AN APPLIANCE SUITABLE FOR THE SAME REFRIGERANT. THIS UNIT IS A PARTIAL UNIT AIR CONDITIONER, COMPLYING WITH PARTIAL UNIT REQUIREMENTS OF THIS INTERNATIONAL STANDARD, AND MUST ONLY BE CONNECTED TO OTHER UNITS THAT HAVE BEEN CONFIRMED AS COMPLYING TO CORRESPONDING PARTIAL UNIT REQUIREMENTS OF THIS INTERNATIONAL STANDARD.



**DANGER**  
**PELIGRO**



#### **CARBON MONOXIDE POISONING HAZARD**

**Special Warning for Installation of Furnace or Air Handling Units in Enclosed Areas such as Garages, Utility Rooms or Parking Areas**

Carbon monoxide producing devices (such as automobiles, space heater, gas water heater, etc.) should not be operated in enclosed areas such as unventilated garages, utility rooms or parking areas because of the danger of carbon monoxide (CO) poisoning resulting from the exhaust emissions. If a furnace or air handler is installed in an enclosed area such as a garage, utility room or parking area and a carbon monoxide producing device is operated therein, there must be adequate, direct outside ventilation.

This ventilation is necessary to avoid the danger of CO poisoning which can occur if a carbon monoxide producing device continues to operate in the enclosed area. Carbon monoxide emissions can be (re)circulated throughout the structure if the furnace or air handler is operating in any mode.

CO can cause serious illness including permanent brain damage or death.

B10259-216

#### **RIESGO DE INTOXICACIÓN POR MONÓXIDO DE CARBONO**

**Advertencia especial para la instalación de calentadores ó manejadoras de aire en áreas cerradas como estacionamientos ó cuartos de servicio.**

Los equipos ó aparatos que producen monóxido de carbono (tal como automóvil, calentador de gas, calentador de agua por medio de gas, etc) no deben ser operados en áreas cerradas debido al riesgo de envenenamiento por monóxido de carbono (CO) que resulta de las emisiones de gases de combustión. Si el equipo ó aparato se opera en dichas áreas, debe existir una adecuada ventilación directa al exterior.

Esta ventilación es necesaria para evitar el peligro de envenenamiento por CO, que puede ocurrir si un dispositivo que produce monóxido de carbono sigue operando en el lugar cerrado.

Las emisiones de monóxido de carbono pueden circular a través del aparato cuando se opera en cualquier modo.

El monóxido de carbono puede causar enfermedades severas como daño cerebral permanente ó muerte.

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#### **RISQUE D'EMPOISONNEMENT AU MONOXYDE DE CARBONE**

**Avertissement special au sujet de l'installation d'appareils de chauffage ou de traitement d'air dans des endroits clos, tels les garages, les locaux d'entretien et les stationnements.**

Evitez de mettre en marche les appareils produisant du monoxyde de carbone (tels que les automobile, les appareils de chauffage autonome, etc.) dans des endroits non ventilés tels que les d'empoisonnement au monoxyde de carbone. Si vous devez faire fonctionner ces appareils dans un endroit clos, assurez-vous qu'il y ait une ventilation directe provenant de l'exterieur.

Cette ventilation est nécessaire pour éviter le danger d'intoxication au CO pouvant survenir si un appareil produisant du monoxyde de carbone continue de fonctionner au sein de la zone confinée.

Les émissions de monoxyde de carbone peuvent étre recirculés dans les endroits clos, si l'appareil de chauffage ou de traitement d'air sont en marche.

Le monoxyde de carbone peut causer des maladies graves telles que des dommages permanents au cerveau et meme la mort.

B10259-216

## **1 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.

## **2 SHIPPING INSPECTION**

Upon receiving the product, inspect it for damage from shipment. Shipping damage, and subsequent investigation is the responsibility of the carrier. 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**

Inspect the unit to verify all required components are present and intact. Report any missing components immediately to the manufacturer 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.

### **2.3 SHIPPING MATERIAL REMOVAL**

**IMPORTANT: ALL SHIPPING MATERIAL USED TO PROTECT THE EQUIPMENT, AND THE EQUIPMENT'S COMPONENTS, DURING TRANSIT SHOULD BE REMOVED BEFORE FINAL INSTALLATION.**

## **3 CODES & REGULATIONS**

This product is designed and manufactured to comply with 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 standard test ambient operating conditions for cooling and heating mode are 80°F and 70°F, respectively.

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. These regulations may vary by jurisdiction. A certified technician must perform the installation and service of this product. Should you have any questions please contact the local office of the EPA and/or refer to the EPA's website [www.epa.gov](http://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. Your nearest distributor can be located online at <https://partner.goodmanmfg.com/> or by contacting:

HOMEOWNER SUPPORT  
19001 KERMIER ROAD  
WALLER, TEXAS 77484  
(855) 770-5678

### Installer's Note:

Replacement air filters can be ordered directly from the supplier:

United Air Filter  
Charlotte, NC  
Phone: **704-334-5311**

AWSF/AWST 18-24 - Part #BT1369604, 14" x 18" x 1"  
AWSF/AWST 30-36 - Part #BT1369608, 18" x 20" x 1"

## 5 PRE-INSTALLATION INSTRUCTIONS

### 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 manufacture approved and Air-conditioning, Heating, and Refrigeration Institute (AHRI) listed.

**NOTE: Installation of unmatched systems is not permitted. Damage or repairs due to installation of unmatched systems is not covered under the 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.

**Note:** These air handlers are designed for indoor installation only at a max altitude of 10,500 feet above sea level or a min altitude of -184 feet below sea level.

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. A secondary drain pan below the unit is also recommended to protect the installation site.

### 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.

## 6 APPLICATION INFORMATION

The unit is designed to be installed in conditioned space, either recessed into a wall or hanging in a vertical "upflow" position. If units are recessed in a wall, use the holes along the inside of the front flange to attach units to the framing studs. The vertical air handler comes equipped with an offset hanging bracket attached to the rear of the cabinet for hanging applications.

**IMPORTANT: Unit must be installed level or slightly tilted back to ensure proper drainage of condensate.**

The air handler also has a bottom and front return. **Large chassis installations should be installed as front return only.** If the small chassis air handler is to be installed in a bottom return application, discard the drain access panel in the bottom of the unit. If the air handler is to be installed in a front return application, remove and discard the front access panel with insulation. The unit is shipped with a filter rack and filter. Remember to inspect, clean and/or replace the filter monthly.



Units are equipped with both a bottom primary and secondary drain. Both drains must be trapped, unless emergency condensate switch is install in the secondary drain. Failure to install a trap could result in condensation overflowing the drain pan resulting in substantial water damage to the nearby area.


The connectors required are 3/4" NPT male, either PVC or metal pipe, CPVC piping is not approved, and should be hand tightened to a torque of no more than 37 in-lbs. to prevent damage to the drain pan connection.

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.


**NOTE: If you intend to install this unit with a "WAD" door it must be mounted 1/4" behind front edge of stud.**


## 7 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.**


**WARNING**

**HIGH VOLTAGE**  
TO AVOID THE RISK OF FIRE OR EQUIPMENT DAMAGE, USE ONLY COPPER CONDUCTORS. DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT. MULTIPLE POWER SOURCES MAYBE PRESENT. THE ELECTRICAL POWER TO THIS UNIT MUST BE IN THE OFF POSITION AND ALL POWER SUPPLIES DISCONNECTED. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.




**WARNING**

THE UNIT MUST HAVE AN UNINTERRUPTED, UNBROKEN ELECTRICAL GROUND TO MINIMIZE THE POSSIBILITY OF PERSONAL INJURY IF AN ELECTRICAL FAULT SHOULD OC-CUR. THE ELECTRICAL GROUND CIRCUIT MAY CONSIST OF AN APPROPRIATELY SIZED ELECTRICAL WIRE CONNECTING THE GROUND LUG IN THE UNIT AND CONTROL BOX WIRE TO THE BUILDING'S ELECTRICAL SERVICE PANEL. OTHER METHODS OF GROUNDING ARE PERMITTED IF PERFORMED IN ACCORDANCE WITH THE "NATIONAL ELECTRIC CODE" (NEC)/"AMERICAN NATIONAL STANDARDS INSTI-TUTE" (ANSI)/"NATIONAL FIRE PROTECTION ASSOCIATION" (NFPA) 70 AND LOCAL/STATE CODES.

IN CANADA, ELECTRICAL GROUNDING IS TO BE IN ACCOR-DANCE WITH THE CANADIAN ELECTRIC CODE CSA C22.1. FAILURE TO OBSERVE THIS WARNING CAN RESULT IN ELECTRICAL SHOCK THAT CAN CAUSE PERSONAL INJURY OR DEATH.

### 7.1 BUILDING ELECTRICAL SERVICE INSPECTION

This unit is designed for single-phase electrical supply.

**NOTE: DO NOT OPERATE ON A THREE-PHASE POWER SUPPLY.**

Measure the power supply to the unit. The supply voltage must be in agreement with the unit name plate power requirements and within the range shown in Table 1.

Nominal Input	Minimum Voltage	Maximum Voltage
208/230	187	253

**ELECTRICAL VOLTAGE**  
**Table1**

### 7.2 WIRE SIZING

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

- Wire used must carry the Minimum circuit Ampacity (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 ampacities - 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.

### 7.3 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 can be used as a guide for selecting the MAXIMUM overcurrent device.

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

**IMPORTANT NOTE: Torch heat required to braze tubes of various sizes is proportional to the size of the tube. Tubes of smaller size require less heat to bring the tube to brazing temperature before adding brazing alloy. Applying too much heat to any tube can melt the tube. Service personnel must use the appropriate heat level for the size of the tube being brazed.**

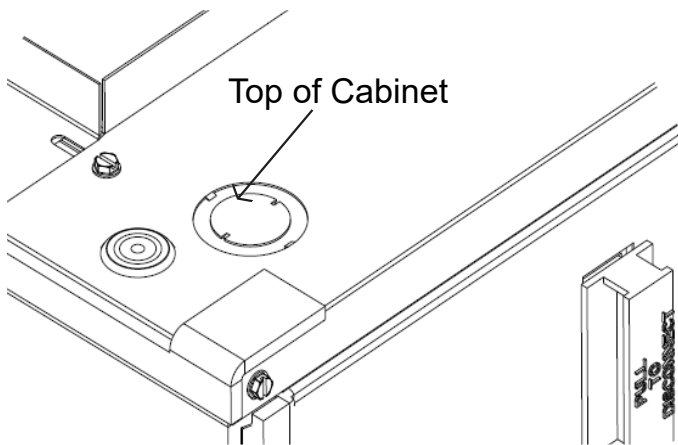
**NOTE:** The use of a heat shield when brazing is recommended to avoid burning the serial plate or the finish on the unit. Heat trap or wet rags should be used to protect heat sensitive components such as service valves and TXV valves.

#### 7.4 ELECTRICAL CONNECTIONS – SUPPLY VOLTAGE

 <b>CAUTION</b>
<b>FIRE HAZARD!</b> TO AVOID THE RISK OF PROPERTY DAMAGE, PERSONAL INJURY OR FIRE, USE ONLY COPPER CONDUCTORS.

**IMPORTANT NOTE:** Use copper conductors only from disconnect or electrical panel to the air handler.

A knockout is provided on the air handler top panel or side to allow for the entry of the supply voltage conductors. If the knockouts on the cabinet sides are used for electrical conduit, an adapter ring must be used in order to meet safety requirements. An NEC or CEC approved strain relief is to be used at this entry point. The wire is to be sized in accordance with the “Electrical Wire and MOP” section of this manual. Some areas require the supply wire to be enclosed in conduit. Consult your local codes.



**Knock-out for Electrical Connections**  
**Figure 1**

#### 7.5 FRESH AIR OPENINGS

All AWSF/AWST models include 4” fresh air knockouts on both sides of the cabinet. To utilize, simply remove the appropriate knockout and connect fresh air inlet venting directly to cabinet. Ensure the unit mounting system does not block the fresh air inlet holes.



**NOTE:** The installing contractor must take into account any lost capacity due to the the fresh air openings when sizing the equipment.

### 8 ACHIEVING LOW AIR LEAKAGE RATE

Ensure all the gaskets remain intact on surfaces as shipped with the unit. When these requirements are satisfied, the unit achieves the following airflow leakage when tested in accordance with ASHRAE Standard 193:

- Cabinet air leakage less than 2% at 1.0 inch H2O
- Cabinet air leakage less than 1.4% at 0.5 inch H2O

### 9 START-UP PROCEDURE

 <b>WARNING</b>	
<b>HIGH VOLTAGE!</b> <b>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.</b>	

- Prior to start-up, ensure that all electrical wires are properly sized and all connections are properly tightened.
- All panels must be place and secured. For Air Tight application, gasket must be positioned at prescribed locations to achieve 1.4% leakage.
- Tubing must be leak free.
- Condensate line must be trapped and pitched to allow for drainage.
- Low voltage wiring is properly connected.
- Unit is protected from vehicular or other physical damage.
- Return air is not obtained from 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.

### 10 AWST-FACTORY INSTALLED TXV MODELS

AWST air handlers come equipped with a factory installed fully adjustable TXV, follow instruction below for installation procedure.

#### 10.1 TUBING SIZE

For the correct tubing size, follow the specification for the condenser/heat pump.

#### 10.2 TUBING CONNECTIONS

An adjustable TXV with bulb is installed on the vapor tube from the factory.

**Note:** The TXV must be adjustable to meet the outdoor unit’s target superheat value. During the superheat adjustment on the TXV, the torque applied on the nut cannot exceed 25 in-lbs. Refer to the **EXPANSION VALVE TROUBLESHOOTING** section of this manual for assistance with the adjustable TXV.

For air handler installation, follow the installation procedure below.

1. Remove the front access panel.
2. Remove access valve fitting cap and depress the valve system to release pressure. No pressure indicates possible leak.
3. Replace the fitting cap.
4. Remove the copper cap on both the liquid line and suction line. The copper caps caused by the refrigerant lines. **DO NOT USE ANY FORM OF CUTTING METHOD. CUTTING THE CAPS MAY RESULT IN THE GENERATION OF COPPER SHAVINGS OR COPPER DUST.**
5. Insert liquid line into liquid tube expansion and slide grommet about 18" away from braze joint.
6. Braze suction line set into suction tube expansion and slide insulation about 18" away from braze joint.
7. Braze joints and quench all brazed joints with water or wet rag upon completion of brazing.

### 10.3 THERMAL EXPANSION VALVE SYSTEM ADJUSTMENT

The following information for the indoor unit should be verified before attempting to charge system or adjust TXV if necessary.

1. Total static pressure is .3" WC or less.
2. Airflow is correct for installed unit.
3. Airflow tables are in the installation manual and Spec Sheet for Indoor Unit.
4. Complete airflow tables and charging information are in Service Manual RS6200006.
5. The outdoor temperature must be 60°F or higher.
6. Set the room thermostat to COOL, fan switch to AUTO
7. Set temperature control well below room temperature.

Superheat adjustments should not be made until indoor ambient conditions have stabilized. This could take up to 24 hours depending on the indoor temperature and humidity. Before checking superheat run the unit in cooling for 10 minutes or until refrigerant pressures stabilize. Use the following guidelines and methods to check unit operation and ensure that the refrigerant charge is within limits.

1. Purge gauge lines. Connect service gauge manifold to base-valve service ports.
2. Temporarily install a thermometer on the liquid line at the liquid line service valve and 4-6" from the compressor on the suction line. Ensure the thermometer makes adequate contact and is insulated for best possible readings. Use liquid line temperature to determine subcooling and vapor temperature to determine superheat.

3. Check subcooling and superheat. The system should have a subcooling of 8°F +/- 1°F and superheat of 8°F +/- 1°F. If subcooling and superheat are low, adjust TXV to 8°F +/- 1°F superheat, then check subcooling.
  - A. If subcooling is low and superheat is high, add charge to raise subcooling to 8°F +/- 1°F, then check superheat.
  - B. If subcooling and superheat are high, adjust TXV valve to 8°F +/- 1°F superheat, then check subcooling.

### Superheat Adjustments (Only if necessary)

1. Attach a pipe clamp thermometer near the suction line service valve at the outdoor unit.
  - A. Ensure the thermometer makes adequate contact for the best possible readings.
2. TXV-based systems should have a Superheat value of 8°F +/- 1°F.
3. Adjust Superheat by turning the TXV valve stem clockwise to **increase** and **counterclockwise** to **decrease**. Adjustments should be made opening or closing the valve by no more than 1/4 turn at a time. Allow the system to stabilize to 15 to 20 minutes before making additional adjustments if necessary.
4. After adjustments are complete, replace cap on adjustment stem and tighten 1/6 turn.
5. Remove gauges and check the Schrader ports for leaks and tighten valve cores if necessary. Install caps finger tight.



### WARNING

THIS PRODUCT IS FACTORY-SHIPED WITH R410A/R22 AND DRY NITROGEN MIXTURE GAS UNDER PRESSURE. USE APPROPRIATE SERVICE TOOLS AND FOLLOW THESE INSTRUCTIONS TO PREVENT INJURY.

## 11 MAINTENANCE

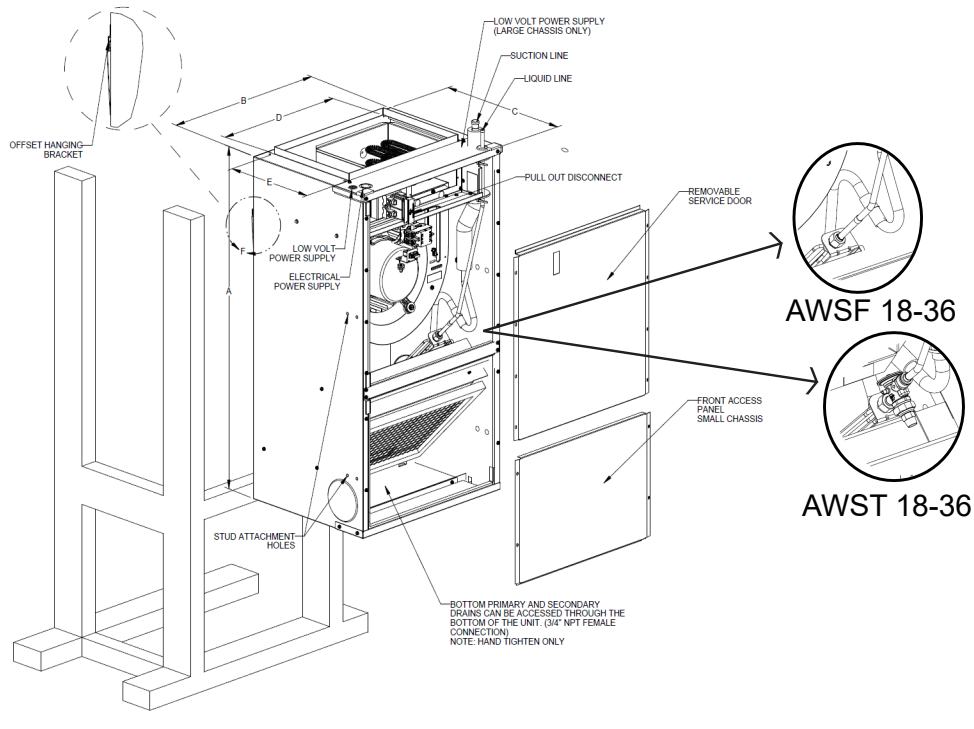
### *Periodic Checkup and Service*

This unit is designed to provide many years of dependable, trouble-free comfort when properly maintained. Proper maintenance will consist of annual checkups and cleaning of the internal electrical and heat transfer components by a qualified service technician. Failure to provide periodic checkup and cleaning can result in excessive operating cost and/or equipment malfunction.

### *Heater Kit Service*

This comfort equipment comes pre-installed with a UL 2-40 certified heater kit. In times of replacement, please ensure that only a UL 2-40 certified kit is utilized.

## 12 AIR FLOW DATA & WIRING DIAGRAMS



CABINET DIMENSIONS		
	LARGE CHASSIS	SMALL CHASSIS
	2.5 & 3.0 TON	1.5 & 2.0 TON
A	36	36
B	24	20 3/16
C	21	16 1/8
D	19 7/8	16
E	15 7/8	11

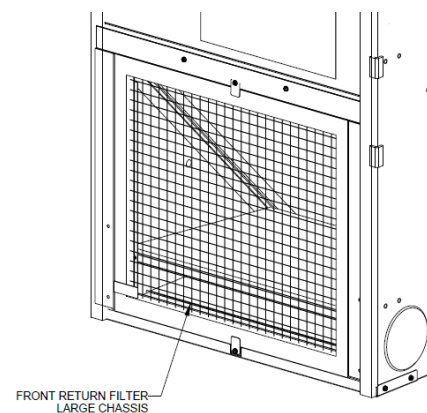


FIGURE 2

NOTE: SPECIFICATIONS & PERFORMANCE DATA LISTED HEREIN ARE SUBJECT TO CHANGE WITHOUT NOTICE.

### AWSF/AWST 18, 24, 30, 36

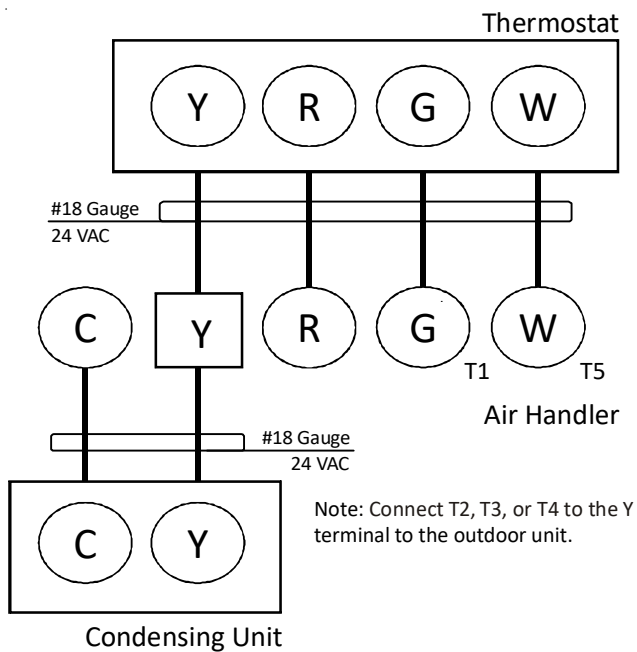


Figure 3

Model	TAP	COLOR
AWSF18SU16**	T1	GREEN
AWST18SU14**	T2	PURPLE
AWSF24SU16**	T3	PINK
AWST24SU14**	T4	*
	T5	WHITE

Table 2

\*NOTE: For units using 3KW and 5KW heaters, White wire will be connected to terminal 4.

Model	TAP	COLOR
AWSF30LU16**	T1	GREEN
AWST30LU14**	T2	PURPLE
AWSF36LU16**	T3	PINK
AWST36LU14**	T4	YELLOW
	T5	WHITE

Table 3

NOTE: Connect appropriate speed tap (Pink/Purple/Yellow) to Y. Refer to Table 2 & 3 for speed tap selection.



## 12.1 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 outdoor section is single-stage or two stage. The 24V-control voltage connects the air handle to the room thermostat and condenser. Low voltage wiring must be copper conductors. A minimum of 18AWG must be used for installations. Low voltage wiring must be connected through the top of the cabinet or either side.

Model	Speed Tap	CFM @ STATIC PRESSURE (IN W.C.)		
		0.1	0.2	0.3
AWSF18SU16** AA AWST18SU14** AA	T1	630	602	576
	T2	630	602	576
	T3	637	609	586
	T4	630	602	576
	T5	846	824	800
AWSF24SU16** AA AWST24SU14** AA	T1	630	602	576
	T2	630	602	576
	T3	784	763	742
	T4	630	602	576
	T5	846	823	800
AWSF30LU16** AA AWST30LU14** AA	T1	683	604	525
	T2	900	856	803
	T3	1079	1025	989
	T4	944	897	848
	T5	1168	1127	1083
AWSF36LU16** AA AWST36LU14** AA	T1	1114	1072	1031
	T2	1114	1072	1031
	T3	1225	1191	1152
	T4	1287	1255	1219
	T5	1360	1329	1299

**Table 4**

### NOTE:

1. Airflow data indicated is at 230V without air filter in place.
2. Select a speed tap that provides a minimum 300 CFM per outdoor ton. For satisfactory operation, external static pressure must not exceed 0.3" WC (for electric heater only).

## 13 EXPANSION VALVE TROUBLESHOOTING

Before replacing an expansion valve, check the following items:


1. Bulb location: Must be tightly secured to the suction line upstream of the equalizer connection.
2. Insulation: Bulb must be properly insulated.
3. Equalizer: Must be connected to the 1/4" SAE connection on the suction line.
4. Charge: Ensure the system is properly charged. There MUST be a minimum of 10°F Sub-Cooled liquid at the valve inlet.

If the system appears to be "starving" (low suction pressure but insufficient cooling):

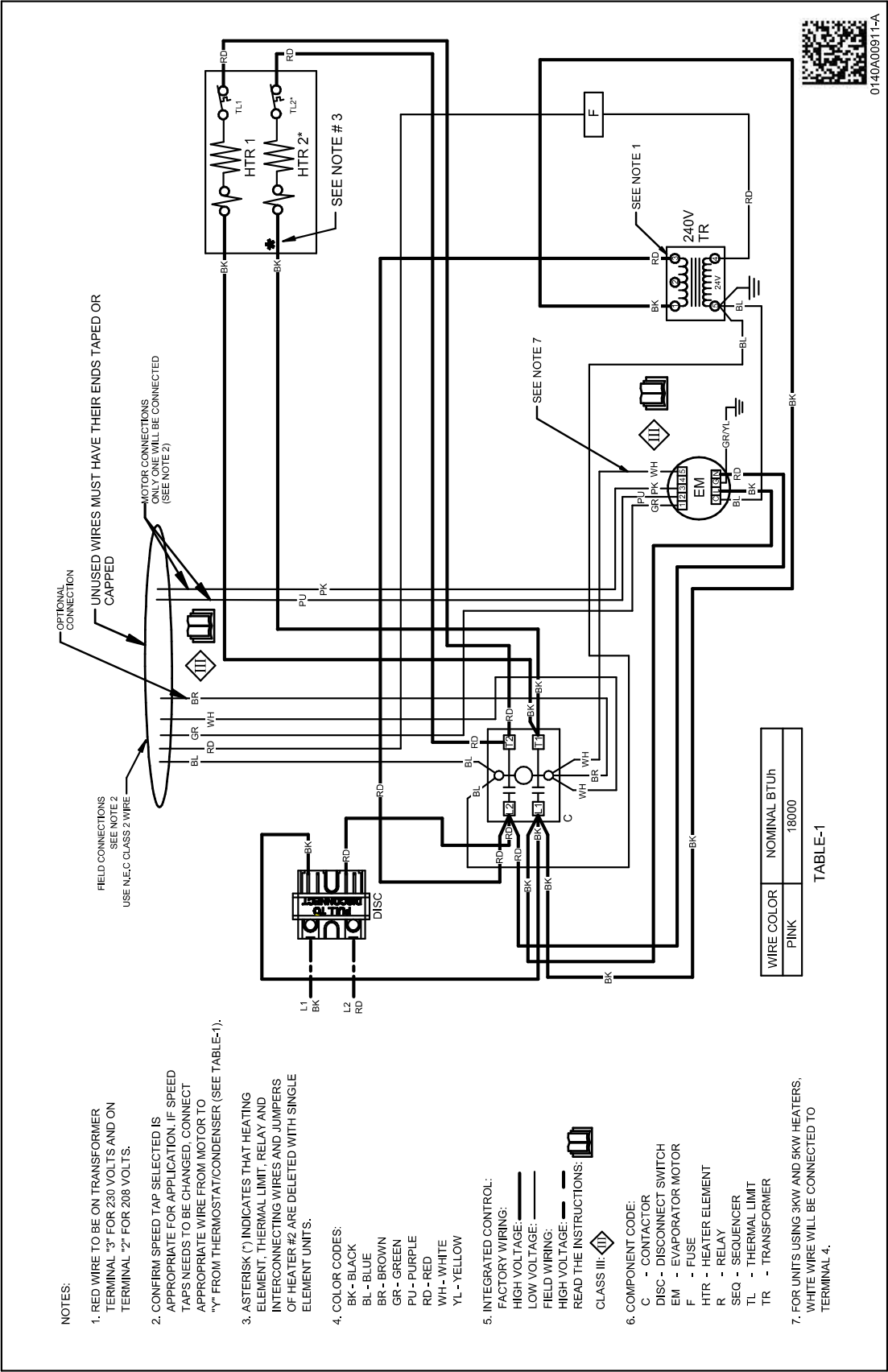
1. Check the Superheat (SH) at the evaporator outlet. If SH is between 5°F - 12°F, the TXV is controlling properly.
  - Verify that there is proper airflow to the evaporator (fan is operating and filter is unrestricted).
2. If SH is above 12°F, the setting of the TXV may be too high.
  - Adjust the SH by turning counter-clockwise to decrease SH.
  - Wait 20 minutes for the system to balance and adjust again, as required.
  - If adjusting the valve has no effect on the SH, the valve may be stuck because of dirt or debris or it may have lost the Power Element charge.
3. After properly reclaiming the refrigerant, remove the TXV and check for dirt and debris. Clean, if possible, or replace the TXV and filter/drier.

If the system appears to be "flooding" (compressor frosting or moisture is condensing at the suction connection):


1. Check the SH at the evaporator outlet. If SH is between 5°F - 12°F, the TXV is controlling properly.
2. If SH is less than 5°F, the SH adjustment may be too low.
  - Adjust the SH by turning the adjustment stem clockwise to increase the SH.
  - Wait 20 minutes for the system to balance and adjust again as required.
  - If adjusting the valve has no effect on the SH, the valve may be stuck open because of dirt or debris or moisture in the refrigerant.
3. After properly reclaiming the refrigerant, remove the TXV and check for dirt and debris. Clean, if possible, or replace the TXV and filter/drier. Add a moisture indicator to allow checking of moisture if this is believed to be a probable cause.


**WARNING**

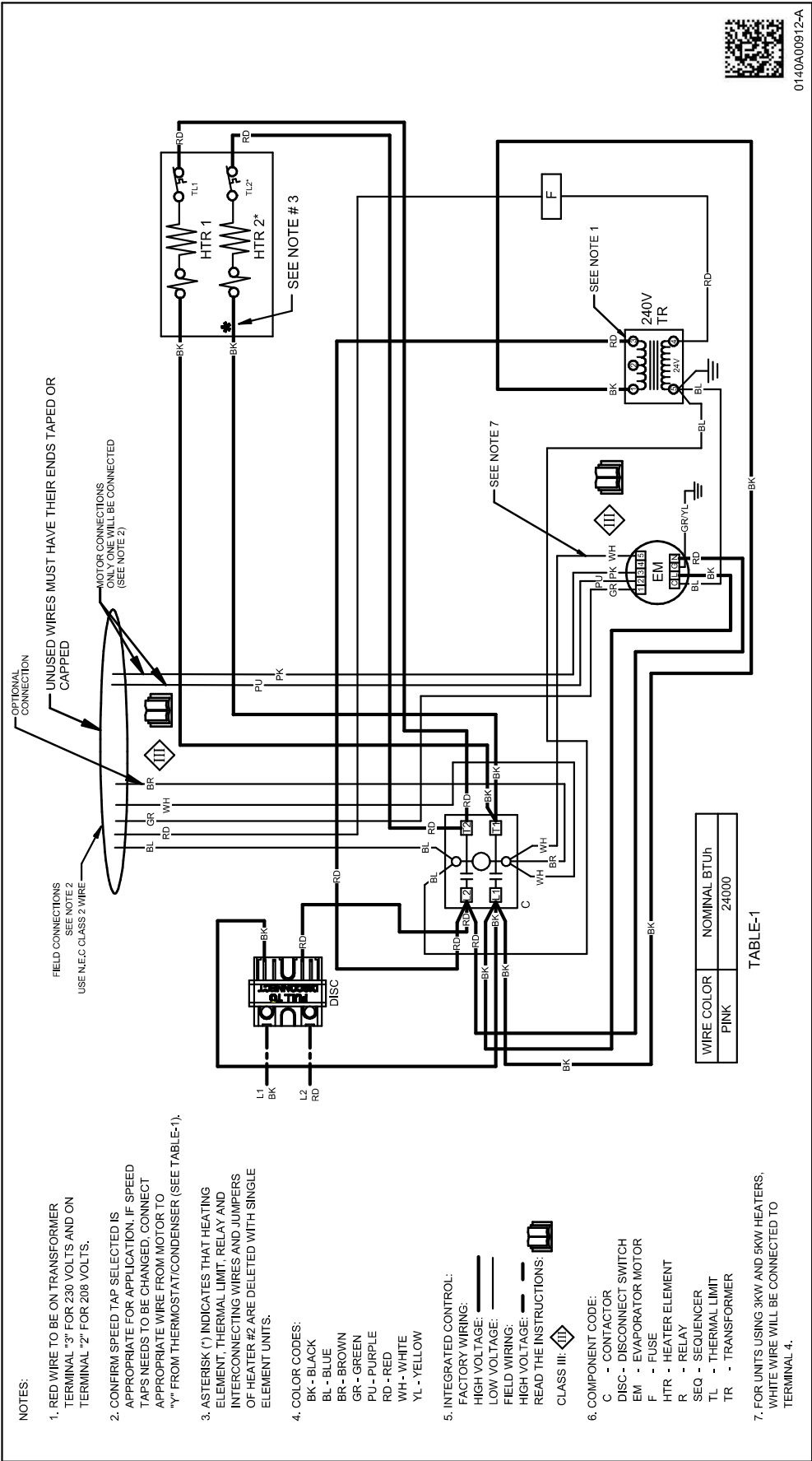
**HIGH VOLTAGE!**  
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT.  
MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY  
CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.




Wiring is subject to change. Always refer to the Wiring Diagram on the unit for the most up-to-date wiring.


**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.

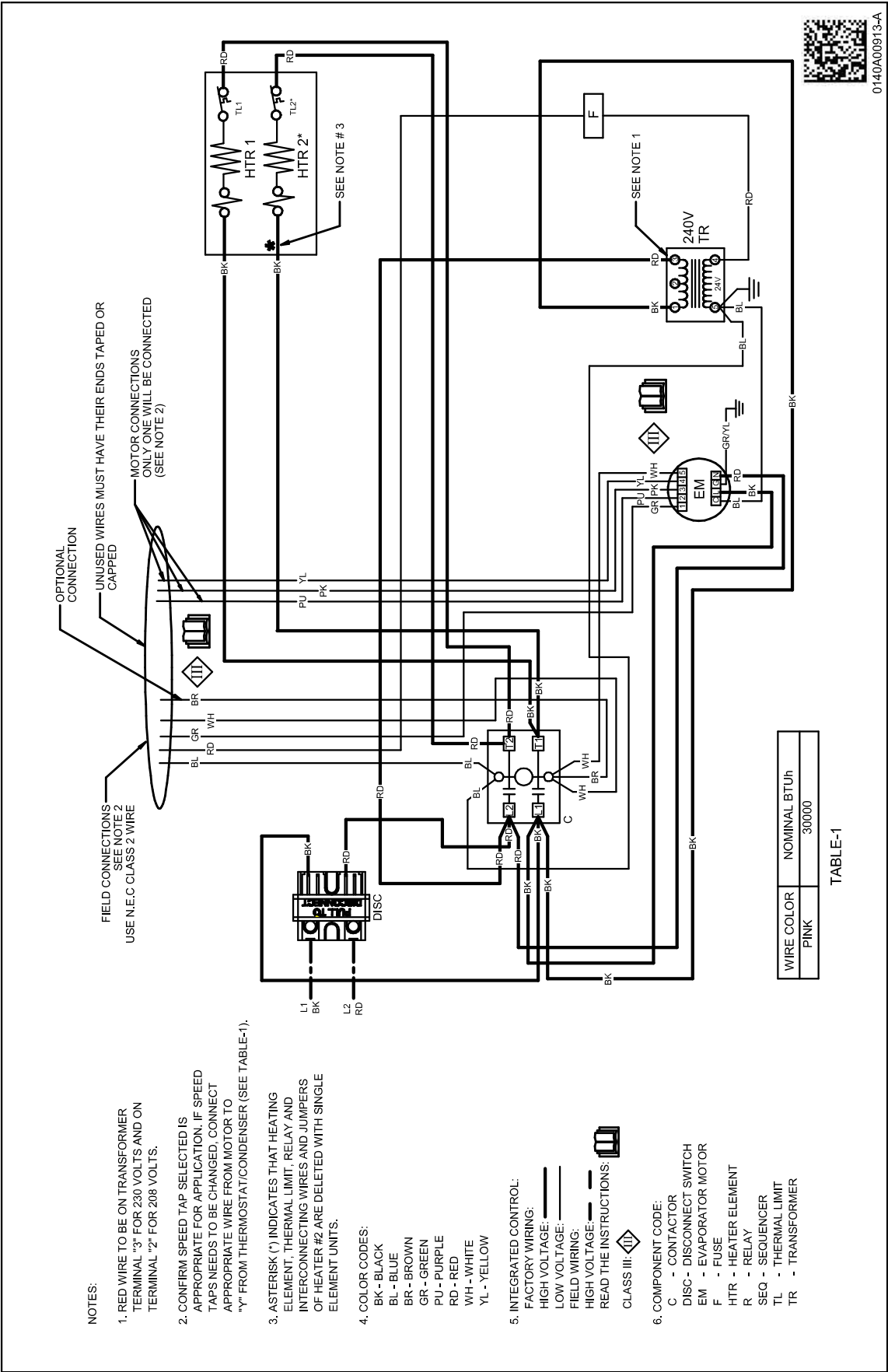


Wiring is subject to change. Always refer to the Wiring Diagram on the unit for the most up-to-date wiring.


**WARNING**

**HIGH VOLTAGE!**

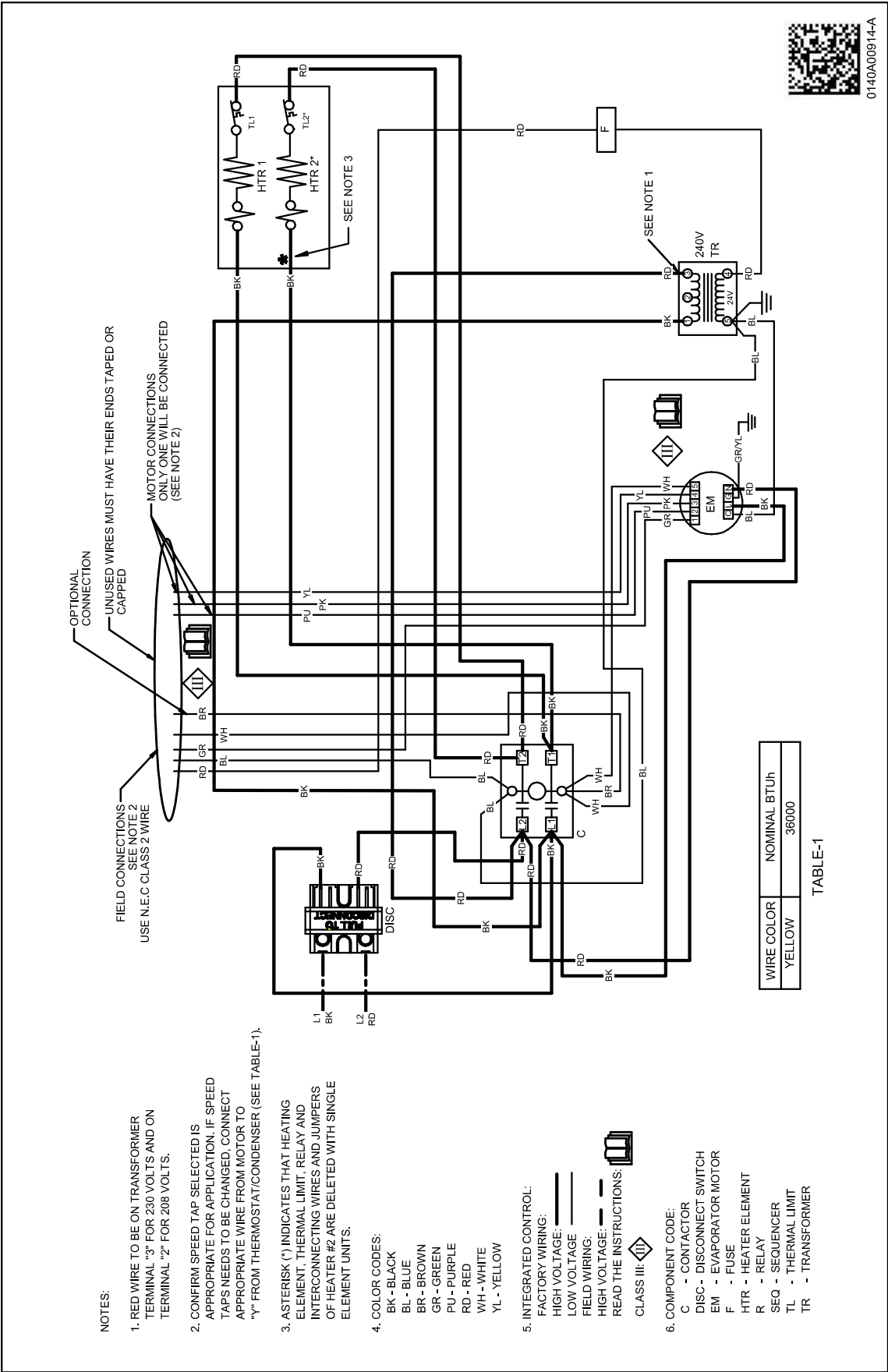
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



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Wiring is subject to change. Always refer to the Wiring Diagram on the unit for the most up-to-date wiring.



## SPLIT SYSTEMS

### AIR CONDITIONING AND HEAT PUMP HOMEOWNER'S ROUTINE MAINTENANCE RECOMMENDATIONS

We strongly recommend a biannual 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.

#### Aluminum Indoor Coil Cleaning (Qualified Servicer Only)

This unit is equipped with an aluminum tube evaporator coil. The safest way to clean the evaporator coil is to simply flush the coil with water. This cleaning practice remains as the recommended cleaning method for both copper tube and aluminum tube residential cooling coils.

An alternate cleaning method is to use one of the products listed in the technical publication **TP-109\*** (shipped in the literature bag with the unit) to clean the coils. The cleaners listed are the only agents deemed safe and approved for use to clean round tube aluminum coils. TP-109 is available on the web site in Partner Link > Service Toolkit.

**NOTE:** Ensure coils are rinsed well after use of any chemical cleaners.

#### Clean Outside Coil (Qualified Servicer Only)

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.
- 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.



#### 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.



#### 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.

## 14 START-UP CHECKLIST

Air Handler / Coil			
		Model Number	_____
		Serial Number	_____
<b>ELECTRICAL</b>			
Line Voltage (Measure L1 and L2 Voltage)	L1 - L2	_____	
Secondary Voltage (Measure Transformer Output Voltage)	R - C	_____	
Blower Amps		_____	
Heat Strip 1 - Amps		_____	
Heat Strip 2 - Amps		_____	
<b>BLOWER EXTERNAL STATIC PRESSURE</b>			
Return Air Static Pressure		_____	IN. W.C.
Supply Air Static Pressure		_____	IN. W.C.
Total External Static Pressure (Ignoring +/- from the reading above, add total here)		_____	IN. W.C.
<b>TEMPERATURES</b>			
Return Air Temperature (Dry bulb / Wet bulb)		_____ DB °F	_____ WB °F
Cooling Supply Air Temperature (Dry bulb / Wet bulb)		_____ DB °F	_____ WB °F
Heating Supply Air Temperature		_____ DB °F	
Temperature Rise		_____ DB °F	
Delta T (Difference between Supply and Return Temperatures)		_____ DB °F	
Air Handler / Coil - (Inverter Matched)			
<b>INVERTER AH / COIL ONLY</b>			
Check EEV and EEV wiring is secure (no adjustment required)		_____	
Additional Checks			
Check wire routings for any rubbing		_____	
Check product for proper draining		_____	
Check screw tightness on blower wheel		_____	
Check factory wiring and wire connections		_____	
Check product for proper clearances as noted by installation instructions		_____	
°F to °C formula: (°F - 32) divided by 1.8 = °C      °C to °F formula: (°C multiplied by 1.8) + 32 = °F			

## CUSTOMER FEEDBACK

We are very interested in all product comments.

Please fill out the feedback form on one of the following links:

Daikin Products: (<https://daikincomfort.com/contact-us>)

Goodman® Brand Products: (<http://www.goodmanmfg.com/about/contact-us>).

Amana® Brand Products: (<http://www.amana-hac.com/about-us/contact-us>).

You can also scan the QR code on the right for the product brand you purchased to be directed to the feedback page.



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## PRODUCT REGISTRATION

Thank you for your recent purchase. Though not required to get the protection of the standard warranty, registering your product is a relatively short process, and entitles you to additional warranty protection, except that failure by California and Quebec residents to register their product does not diminish their warranty rights. The duration of warranty coverages in Texas differs in some cases.

For Product Registration, please register as follows:

Daikin Products: (<https://daikincomfort.com/owner-support/product-registration>).

Goodman® Brand products: (<https://www.goodmanmfg.com/product-registration>).

Amana® Brand products: (<http://www.amana-hac.com/product-registration>).

You can also scan the QR code on the right for the product brand you purchased to be directed to the Product Registration page.



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Visit our website at [www.daikincomfort.com](http://www.daikincomfort.com), [www.goodmanmfg.com](http://www.goodmanmfg.com) or [www.amana-hac.com](http://www.amana-hac.com) for information on:

- |                     |                                    |
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