



*Mr. Cool*



MULTI-POSITION AIR HANDLER FOR  
MAC16\*A AND MHP15\*A CONDENSERS

# AIR HANDLER with TXV MAHM\*TA



- ✓ Mobile Home Approved
- ✓ Energy Efficient
- ✓ Durable Build & Finish
- ✓ R-410A Refrigerant
- ✓ Multi-Position Application
- ✓ CoolGuard™ Corrosion Resistant Coil
- ✓ Superior Performance
- ✓ Compact Design

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Hickory, KY 42051  
270.366.0457

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# Multi-Position Air Handler

for **MAC\*16A** and **MHP15\*A** Condensers

## AIR HANDLER with TXV<sup>‡</sup>

**MAHM\*TA**

MAHM\*CTA is up to 14.5 SEER (PSC motor)  
MAHM\*ETA is up to 16 SEER (ECM motor)

The MRCOOL® Multi-Position Air Handler's design delivers dependable comfort and is built for reliability. The electronically commutated motor (ECM) delivers consistent airflow throughout the seasons, allowing you to remain relaxed at all times. When choosing a MRCOOL® Multi-Position Air Handler, you can rest assured your choice is energy-efficient.

- Available in 1.5, 2, 2.5, 3, 3.5, 4, and 5 ton capacities.
- 10-Year Parts Limited Warranty.†

†Warranty provides for a total of 10 years of limited warranty coverage (Standard 5-year limited parts warranty plus an additional 5-year limited extended parts warranty; 15-year for heat exchanger where specified). Warranty must be registered online within 60 days of installation to qualify for extended coverage. Unregistered equipment defaults to 5-year coverage.

## SPECIFICATIONS

MODEL NO.	Unit	MAHM018CTA	MAHM024CTA	MAHM030CTA	MAHM036CTA	MAHM042CTA	MAHM048CTA	MAHM060CTA	
Power Supply	Ph-V-Hz	1-208/230 - 60	1-208/230 - 60	1-208/230 - 60	1-208/230 - 60	1-208/230 - 60	1-208/230 - 60	1-208/230 - 60	
Blower Motor	Type	PSC	PSC	PSC	PSC	PSC	PSC	PSC	
	Rated HP	HP	1/5	1/3	1/2	1/3	1/2	1	
	Size	inch	9 x 6	9 x 6	10 x 8	10 x 8	10 x 8	12 x 10	12 x 10
Filter Size	inch	15 x 20	15 x 20	15 x 20	18 x 20	18 x 20	18 x 20	18 x 20	
Max Elec. Heat Available	kW	7.5	10	15	15	15	20	20	
Indoor Unit	Dimension (WxHxD)	inch	18.5 x 43.5 x 16.5	18.5 x 45.5 x 16.5	18.5 x 47 x 16.5	21.25 x 53.63 x 19.5	21.25 x 53.63 x 19.5	21.25 x 55 x 19.5	21.25 x 59.75 x 19.5
	Packing (WxHxD)	inch	27 x 47 x 22.8	27 x 49 x 22.8	27 x 50.5 x 22.8	27 x 57.5 x 25.5	27 x 57.5 x 25.5	27 x 58.5 x 25.5	27 x 59.75 x 25.5
	Weight	lbs	109	127	133	163	168	186	186
Connection Liq./Suct.	inch	3/8"-3/4"	3/8"-3/4"	3/8"-3/4"	3/8"-7/8"	3/8"-7/8"	3/8"-7/8"	3/8"-7/8"	

MODEL NO.	Unit	MAHM024ETA	MAHM030ETA	MAHM036ETA	MAHM042ETA	MAHM048ETA	MAHM060ETA	
Power Supply	Ph-V-Hz	1-208/230 - 60	1-208/230 - 60	1-208/230 - 60	1-208/230 - 60	1-208/230 - 60	1-208/230 - 60	
Blower Motor	Type	ECM	ECM	ECM	ECM	ECM	ECM	
	Rated HP	HP	1/2	1/2	1/2	3/4	1	
	Size	inch	10 x 8	10 x 8	10 x 8	12 x 10	12 x 10	12 x 10
Filter Size	inch	15 x 20	15 x 20	15 x 20	18 x 20	18 x 20	18 x 20	
Max Elec. Heat Available	kW	10	15	15	15	20	20	
Indoor Unit	Dimension (WxHxD)	inch	18.5 x 45.5 x 16.5	18.5 x 47 x 16.5	21.5 x 53.63 x 19.5	21.5 x 53.63 x 19.5	21.5 x 55 x 19.5	21.5 x 59.75 x 19.5
	Packing (WxHxD)	inch	27 x 49 x 22.8	27 x 50.5 x 22.8	27 x 57.5 x 25.5	27 x 57.5 x 25.5	27 x 58.5 x 25.5	27 x 63.3 x 25.5
	Weight	lbs	127	133	163	168	186	186
Connection Liq./Suct.	inch	3/8"-3/4"	3/8"-3/4"	3/8"-7/8"	3/8"-7/8"	3/8"-7/8"	3/8"-7/8"	



The Signature Series is **NOT** designed for amateur installation. Installation **SHOULD** be performed by an authorized technician. Please read this manual carefully before installation and keep it for future reference.

# Owner & Installation Manual



**MRCOOL®**

**COMFORT MADE SIMPLE**

## Signature Series

**MAHM\*CTA** AIR Handler

The Signature Series is **NOT** designed for amateur installation. Installation **SHOULD** be performed by an authorized technician. Please read this manual carefully before installation and keep it for future reference.

# INSTALLATION INSTRUCTIONS

## MAHM\*CTA Series Air Handler

This manual must be left with the homeowner for future reference.



This is a safety alert symbol and should never be ignored. When you see this symbol on labels or in manuals, be alert to the potential for personal injury or death.

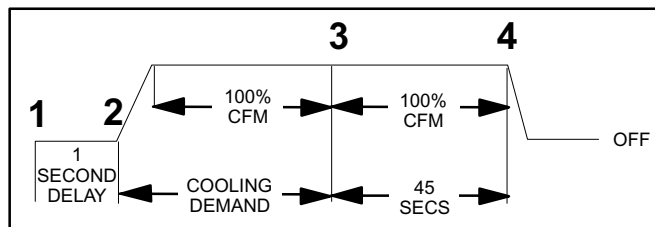


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### IMPORTANT INFORMATION FOR INSTALLER

This unit has a delay relay that delays the supply blower “ON” for 1 second and keeps the blower “ON” for 45 seconds on all fan and cooling demands. For more details, refer to page 18 for unit sequence of operation.

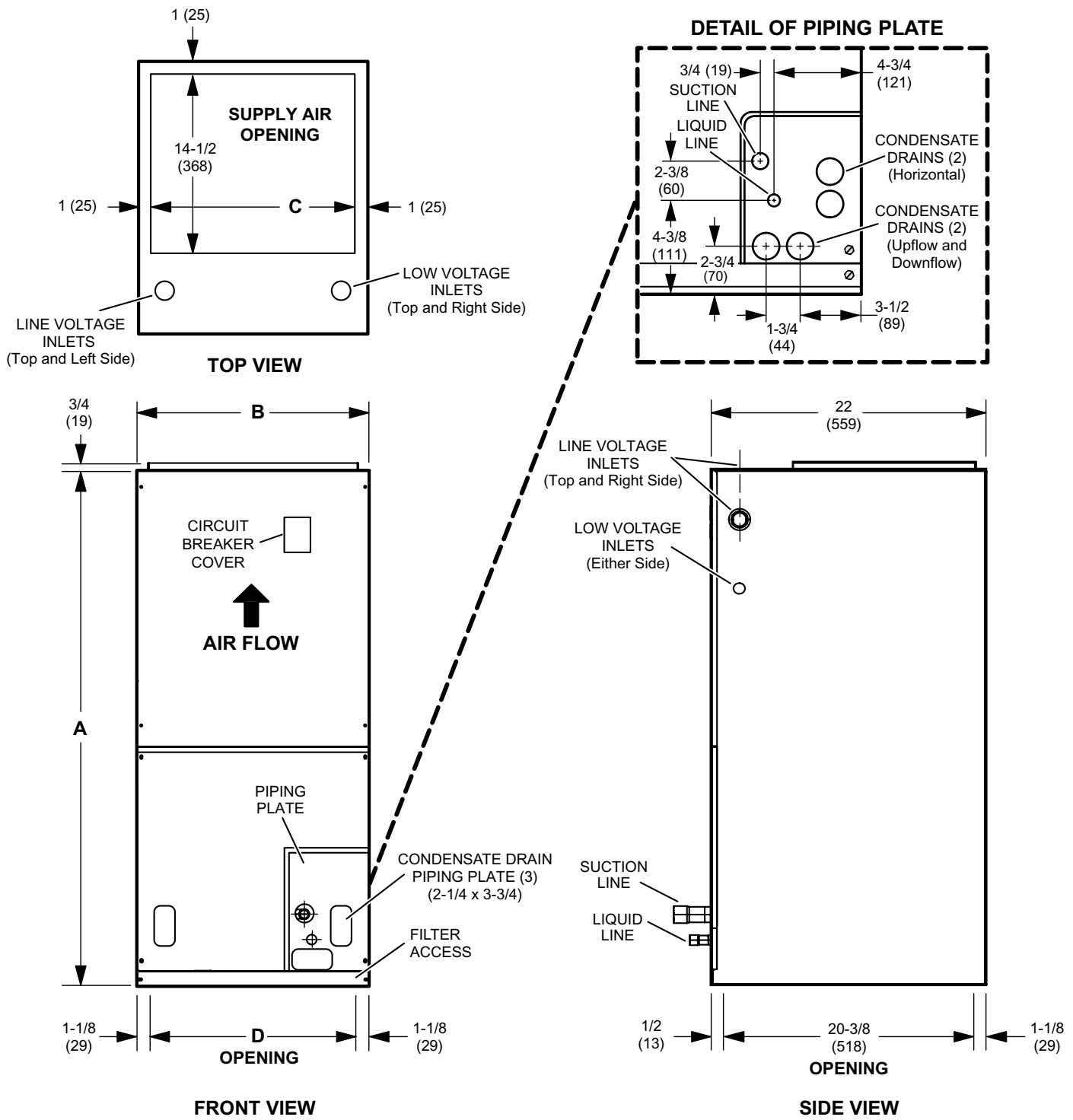


Manufactured By  
**MRCOOL LLC**  
Hickory, KY 42051

**\*P507787-C\*1**  
(P) 507787-01C

**Save these instructions for future reference**

# MAHM\*CTA Unit Dimensions – Upflow – Inches (mm)



Dimensions	018		024		030		036 / 042		048		060	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
<b>A</b>	43-1/2	1105	45-1/2	1156	47	1194	53-5/8	1362	55	1397	59-3/4	1518
<b>B</b>	18-1/2	470	18-1/2	470	18-1/2	470	21-1/2	546	21-1/2	546	21-1/2	546
<b>C</b>	16-1/2	419	16-1/2	419	16-1/2	419	19-1/2	495	19-1/2	495	19-1/2	495
<b>D</b>	16-1/4	413	16-1/4	413	16-1/4	413	19-1/4	489	19-1/4	489	19-1/4	489

## Shipping and Packing List

Package 1 of 1 contains:

- 1 – Assembled air handler unit factory-equipped for upflow or horizontal air discharge application (includes upflow and horizontal drain pans and pre-installed air filter)

Check the air handler for shipping damage; if found, immediately contact the last carrier. Check the unit rating plate to confirm that delivered unit matches order.

**NOTE:** *Special procedures are required for cleaning the all-aluminum coil in this unit. See Page 20 in this instruction for information.*

### WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier.

### IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs and HFCs) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for noncompliance.

## General

The **MAHM\*CTA series air handler with all-aluminum coil** is designed for indoor installation only. As shipped, the unit is ready for installation in either upflow, horizontal left-hand or right-hand air discharge applications. Electric heat, downflow air discharge kits, air filters and other accessories are available and listed in the Product Specification for ordering.

This instruction is intended as a general guide and does not supersede local or national codes in any way. Consult authorities having jurisdiction before installation.

### CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

## Requirements

### WARNING

Excessive Weight Hazard - Use two or more people when moving and installing the unit. Failure to do so can result in back or other type of injury.

### IMPORTANT

**MAHM\*CTA** units include a factory-installed check/expansion valve will provide optimal refrigerant control and system performance with outdoor units of varying capacities. These units must be installed as a part of a matched system as outlined in the MAHM\*CTA Product Specification.

These instructions are intended as a general guide and do not supersede local or national codes in any way. Consult authorities having jurisdiction before installation.

Compliance with all local, state, or national codes pertaining to this type of equipment should be determined prior to installation. Read this instruction manual, as well as the instructions supplied in separate equipment, before starting the installation.

In addition to conforming to manufacturer's installation instructions and local municipal building codes, installation of air handler units (with or without optional electric heat), MUST conform with National Fire Protection Association (NFPA) standards: "Standard for Installation of Air Conditioning and Ventilation Systems" (NFPA No. 90A) and "Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems" (NFPA No. 90B).

All models are designed for indoor installation only. The installation of the air handler, field wiring, duct system, etc. must conform to the requirements of the National Electrical Code, ANSI/NFPA No. 70 (latest edition) in the United States, and any state laws, and local ordinances (including plumbing or waste water codes).


Local authorities having jurisdiction should be consulted before installation is made. Such applicable regulations or requirements take precedence over the general instructions in this manual.


Install the conditioned air plenum, ducts and air filters (provided) in accordance with NFPA 90B Standard for the Installation of Warm Air Heating and Air-Conditioning Systems (latest edition).


The air handler is shipped from the factory completely assembled. The unit is provided with flanges for the connection of the duct system.

Do not remove the cabinet knockouts until it has been determined which knockouts will need to be removed for the installation.

Select the air discharge position which best suits the site conditions. Consider required clearances, space, routing requirements for refrigerant line, condensate disposal, filters, duct system, wiring, and accessibility for service. Refer to the rating plate on the air handler for specific information.


 **WARNING**

 Danger of explosion. Keep flammable materials and vapors, such as gasoline, away from air handler. Place air handler so that heating elements are at least 18 inches (46 cm) above the floor for a garage installation. Failure to follow these instructions can result in death, explosion, or fire.

 **IMPORTANT**

Excessive condensation may occur if the unit is installed in a warm, humid place. When the unit is installed in an unconditioned space, apply sealant around electrical wires, refrigerant piping and condensate lines at the point where they enter the cabinet.

Apply sealant on the inside of the cabinet at the point where the electrical wires exit through the conduit opening. This will also keep warm and moist unconditioned air out of the air handler cabinet where it will form condensate on the cooler control box and electrical controls.

 **IMPORTANT**

This unit is approved for installation clearance to combustible material as stated on the unit rating plate. Accessibility and service clearances must take precedence over combustible material clearances.

The air handler must be installed so that free access is allowed to the coil/filter compartment and blower/control compartment.

- During cooling operation, excessive sweating may occur if the air handler is installed in a warm and humid space.
- If installed in an unconditioned space, sealant should be applied around the electrical wires, refrigerant tubing, and condensate lines where they enter the cabinet.

- Electrical wires should be sealed on the inside where they exit the conduit opening. Sealant is required to prevent air leakage into, and condensate from forming inside of, the air handler, the control box, and on the electrical controls.
- This unit is approved for installation clearance to combustible material as stated on the unit rating plate. Accessibility and service clearances must take precedence over combustible material clearances.
- The air handler must be installed so that free access is allowed to the coil/filter compartment and blower/control compartment.

### Installation Clearances

#### **Non-Ducted Return Closet Installation**

The air handler can be installed in a closet with a false bottom to form a return air plenum. It may also be installed with a return air plenum under the air handler.

Louvers or return air grilles are field-supplied. Local codes may limit application of systems without a ducted return to single-story buildings.

When a **MAHMCCTA** unit is installed in a closet with a louvered return opening, the minimum open area for the louvers will be:

- 320 square inches for -018 and -024 models;
- 360 square inches for -030 and -036 models;
- 450 square inches for -042 thru -060 models

If the free area is not known, assume a 25% free area for wood or a 75% free area for metal louvers or grilles. Using the louver dimensions and the 25% or 75% assumption, determine if the open area meets the minimum open area listed above.

If a return air plenum is used, the return air grille should be immediately in front of the opening in the plenum to allow for the free flow of return air. When not installed in front of the opening, there must be adequate clearance around the air handler to allow for the free flow of return air.

### Installation

Each unit consists of a blower assembly, refrigerant coil, and controls in an insulated galvanized steel factory-finished enclosure. Knockouts are provided for electrical wiring entrance.

For ease in installation, it is best to make any necessary coil configuration changes before setting air handler in place.

#### **Refrigerant Metering Device**

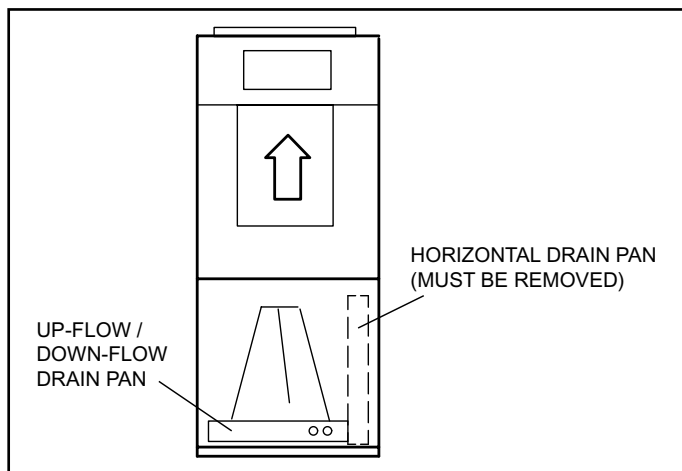
**MAHMCCTA** units are equipped with a factory-installed check/expansion valve or an RFC device.

## Upflow Application

1. The air handler must be supported on the bottom only and set on solid floor or field-supplied support frame. Securely attach the air handler to the floor or support frame.
2. If installing a unit in an upflow application, remove the horizontal drain pan.

**NOTE:** The horizontal drain pan is not required in upflow air discharge installations; its removal provides the best efficiency and air flow.

3. Place the unit in the desired location and slope unit. Connect return and supply air plenums as required using sheet metal screws.
4. Install units that have no return air plenum on a stand that is at least 14" from the floor. This will allow proper air return.



**Figure 1. Upflow Configuration**

## Horizontal Applications

### **⚠ IMPORTANT**

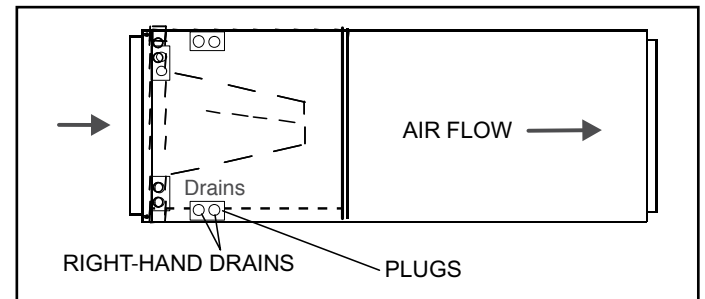
When removing the coil, there is a possibility of danger of equipment damage and personal injury. Be careful when removing the coil assembly from a unit installed in right- or left-hand applications. The coil may tip into the drain pan once it is clear of the cabinet. Support the coil when removing it.

**NOTE:** When the unit is installed in horizontal applications, a secondary drain pan is recommended. Refer to local codes.

**NOTE:** This unit may be installed in left-hand or right-hand air discharge horizontal applications. Adequate support must be provided to ensure cabinet integrity. Ensure that there is adequate room to remove service and access panels if installing in the horizontal position.

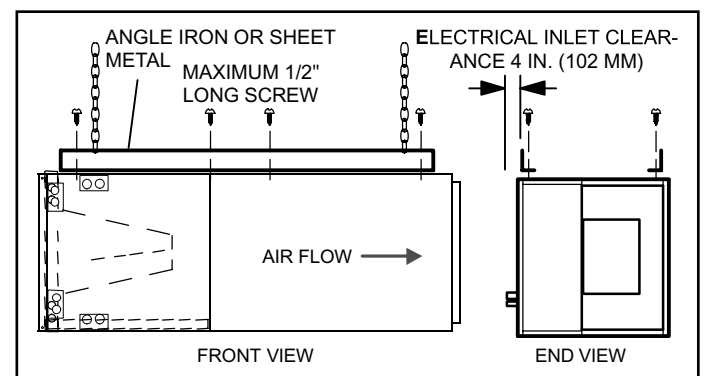
## Right-Hand Discharge

1. Determine which plugs are required for drain line connections.
2. With access door removed, remove drain line plugs to install drain lines.
3. Set unit so that it is sloped toward the upflow drain pan end of the unit and level from front to back of unit (see Figure 6).
4. The horizontal configuration is shown in Figure 2.



**Figure 2. Right-Hand Discharge Configuration**

5. If the unit is suspended, the entire length of the cabinet must be supported. If you use a chain or strap, use a piece of angle iron or sheet metal attached to the unit (either above or below) to support the length of the cabinet. Use securing screws no longer than 1/2 inch to avoid damaging the coil or filter. See Figure 3. Use sheet metal screws to connect the return and supply air plenums as required.



**Figure 3. Suspending Horizontal Unit**

## Left-Hand Air Discharge

For horizontal left-hand air discharge, the following field modifications are required.

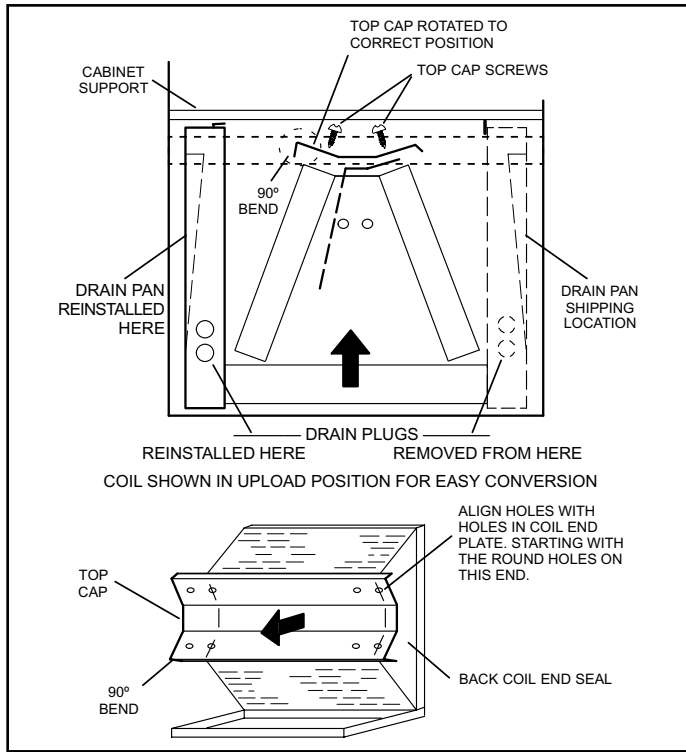
1. Remove access panels and the corrugated padding between the blower and coil assembly. Discard the corrugated padding.
2. Pull the coil assembly from unit. Pull off the horizontal drain pan.
3. Remove the drain plugs from back drain holes on horizontal drain pan and reinstall them on front holes.



## ⚠ IMPORTANT

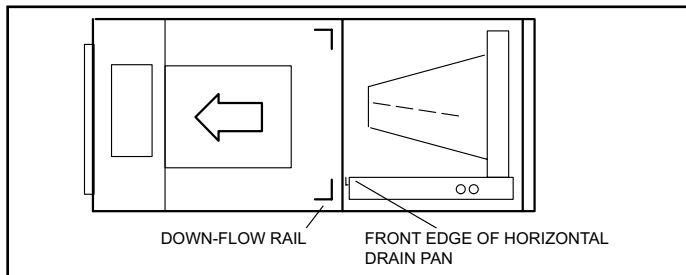
After removal of drain pan plug(s), check drain hole(s) to verify that drain opening is fully open and free of any debris. Also check to make sure that no debris has fallen into the drain pan during installation that may plug up the drain opening.

4. Rotate drain pan 180° front-to-back and install it on the opposite side of the coil.
5. Remove screws from top cap.
6. Remove plastic plug from left hole on coil front end seal and reinstall plug in back hole.



**Figure 4. Field Modification for Left-Hand Discharge**

7. Rotate top cap 180° front-to-back and align with unused screw holes. Holes must align with front and back coil end plates. The top cap has a 45° bend on one side and a 90° bend on the other. **The 90° bend must be on the same side as the horizontal drain pan** as illustrated in Figure 4.



**Figure 5. Left-Hand Discharge Configuration**

**NOTE:** Be very careful when reinstalling the screws into the coil end plate engaging holes. Misaligned screws may damage the coil.

8. From the upflow position, flip cabinet 90° to the left and set into place. Replace blower assembly. Secure coil in place by bending down the tab on the cabinet support rail as illustrated.
9. Install the horizontal shield (-060 model) on the front edge of the horizontal drain pan as illustrated in Figure 5.

**NOTE:** For horizontal applications in high humidity areas, remove the downflow rail closest to the drain pan. To remove rail, remove screw from rail at back of unit and at cabinet support rail. Remove downflow rail then replace screws. Also, seal around the exiting drain pipe, liquid and suction lines to prevent infiltration of humid air.

10. Knock out drain seal plate from access door. Secure plate to cabinet front flange with screw provided.
11. Flip access door and replace it on the unit.
12. Set unit so that it is sloped 1/4" toward the drain pan end of the unit. Connect return and supply air plenums as required using sheet metal screws.
13. If suspending the unit, it must be supported along the entire length of the cabinet. If using chain or strap, use a piece of angle iron or sheet metal attached to the unit (either above or below) so that the full length of the cabinet is supported. Use securing screws no longer than 1/2" to avoid damage to coil or filter, as illustrated in Figure 3. Connect return and supply air plenums as required using sheet metal screws.

### Downflow Application

**NOTE:** If downflow application is required, separately order kit number 83M57 and install per kit's instructions. Also use metal or class I supply and return air plenums. Use the installation instruction provided with the downflow kit.

## ⚠ IMPORTANT

If electric heat section with circuit breakers (ECBA25) is installed in a MAHM\*CTA unit in a downflow application, the circuit breakers must be rotated 180° to the UP position. See ECBA25 installation instructions for more details.

## Condensate Drain

### ⚠ IMPORTANT

On units of this type, where the blower “draws” rather than “blows” air through the coil, traps must be installed in the condensate drain lines (primary and auxiliary, if used). Traps prevent the blower from drawing air through the drain lines into the air supply.

### ⚠ IMPORTANT

A field-fabricated secondary drain pan, with a drain pipe to the outside of the building, is required in all installations over a finished living space or in any area that may be damaged by overflow from the main drain pan. In some localities, local codes may require a secondary drain pan for any horizontal installation.

## Sloping The Unit

Make sure the unit is sloped (similar to the slope shown in Figure 6) so that the drain pan will empty completely without water standing in the pan.

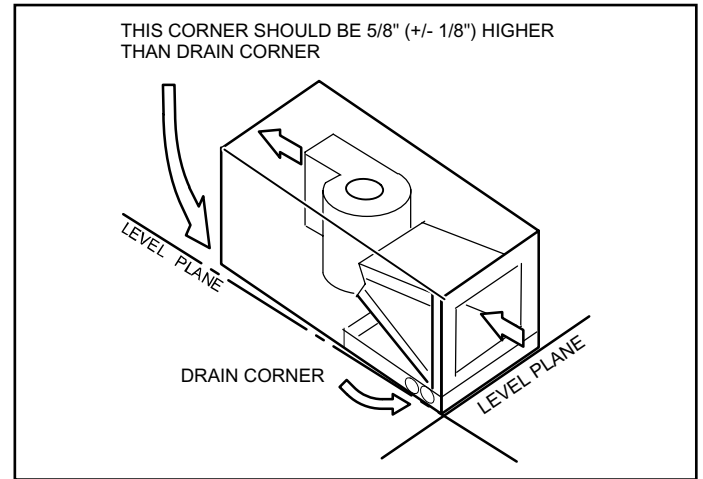


Figure 6. Sloping the Unit for Proper Drainage

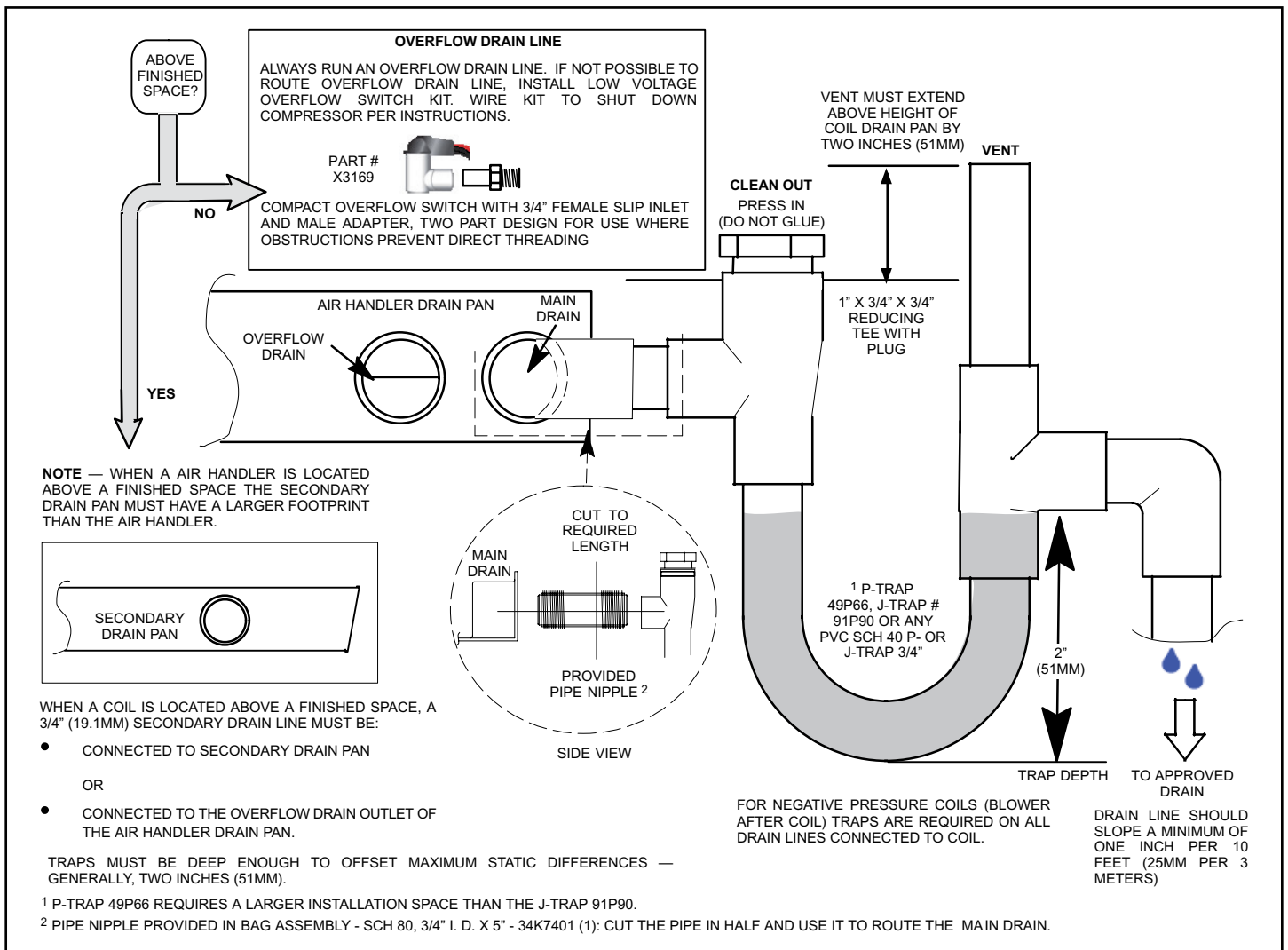


Figure 7. Typical Main and Overflow Drain

## Install Condensate Drain

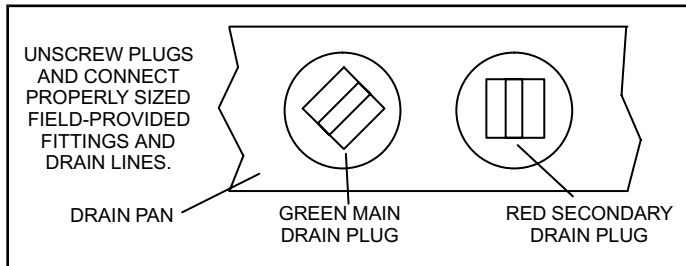
The air handler is provided with 3/4" NPT condensate drain connections.

### **⚠ IMPORTANT**

On some pans, the primary and secondary drain holes have knockouts.

Confirm primary and secondary drains are open.

1. MAHM\*CTA units are equipped with a drain pan, which includes green (main drain) and red (secondary drain) plugs. Unscrew the plugs to remove them before inserting condensate drain fittings.



**Figure 8. Drain Line Connections**

2. Install properly sized, field-provided connection fittings and connect primary drain line to the main drain pan connection.

**NOTE:** When installing drain line connection fittings to the drain pan, hand tighten the fitting and use a thread sealant. Over-tightening the fittings can split connections on the drain pan.

3. If the secondary drain line is to be used, remove the plug or the knockout and route the drain line so that water draining from the outlet will be easily noticed by the homeowner. Refer to local codes for drain trap requirements on the secondary drain line.
4. Check again to ensure drain ports and drain pan are free of all debris.
5. Plug and check any unused drain pan openings for tightness. Torque plugs to 30 in. lb. to prevent water leaks or seepage from the drain pan.
6. Install a 2" trap in the main (primary) drain lines as close to the unit as practical (see Figure 7). Make sure the top of the trap is below the connection to the drain pan to allow complete drainage of the pan.

**NOTE:** Horizontal runs must have an anti-siphon air vent (standpipe) installed ahead of the horizontal run. See Figure 7. An extremely long horizontal run may require an oversized drain line to eliminate air traps.

**NOTE:** Do not operate air handler without a trap in the main (primary) drain. The condensate drain is on the negative pressure side of the blower; therefore, air being pulled through the condensate line will not allow positive drainage without a proper trap.

7. Route the drain line to the outside or to an appropriate drain. Drain lines must be installed so they do not block service access to the front of the air handler. A 24" clearance is required for filter, coil, or blower removal and service access.

**NOTE:** Check local codes before connecting the drain line to an existing drainage system. Insulate the drain lines where sweating could cause water damage.

## Test Condensate Drain

Test the drain pan and drain line after installation:

1. Pour several quarts of water into drain pan. Use enough water to fill both the drain trap and the line.
2. Check the installed drain pan. Drain pan must be draining completely. Drain line fittings must not be leaking. Water must be draining from the end of the primary drain line.
3. Correct any leaks found.

## Duct System and Filters

### Duct System

The air handler is provided with flanges for the connection of the supply plenum.

Supply and return duct system must be adequately sized to meet the system's air requirements and static pressure capabilities. The duct system should be insulated with a minimum of 1" thick insulation with a vapor barrier in conditioned areas or 2" minimum in unconditioned areas.

Supply plenum should be the same size as the flanged opening provided around the blower outlet and should extend at least 3 ft. from the air handler before turning or branching off plenum into duct runs. The plenum forms an extension of the blower housing and minimizes air expansion losses from the blower.

### Filters

A filter is provided. Table 1 lists the filter size for each unit.

Model	Filter Size – in.
-018, -024, -030	15" x 20" x 1"
-036, -042, -048, -060	18" x 20" x 1"

**Table 1. Unit Air Filter Size Chart**

**⚠ IMPORTANT**

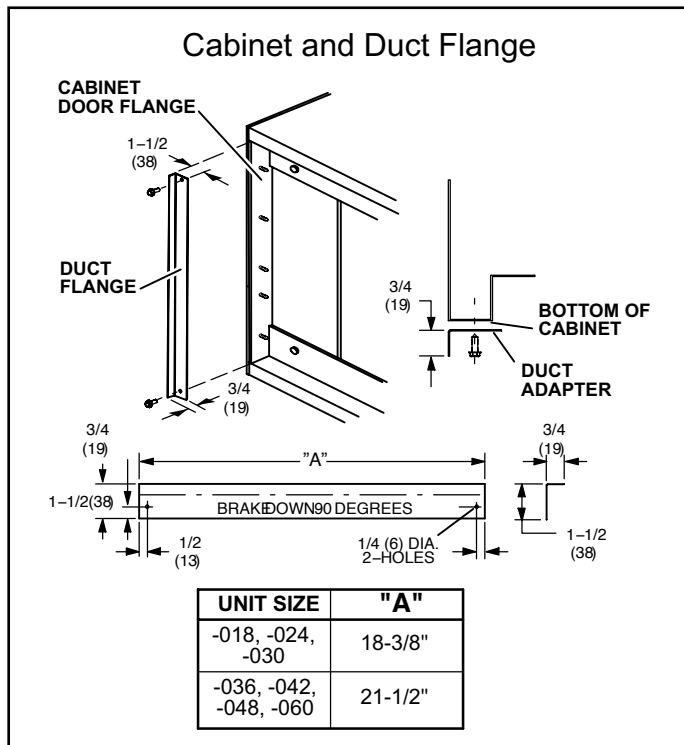
If a high efficiency filter is being installed as part of this system to ensure better indoor air quality, the filter must be properly sized. High efficiency filters have a higher static pressure drop than standard efficiency glass/foam filters. If the pressure drop is too great, system capacity and performance may be reduced. The pressure drop may also cause the limit to trip more frequently during the winter and the indoor coil to freeze in the summer, resulting in an increase in the number of service calls. Before using any filter with this system, check the specifications provided by the filter manufacturer against the data given in the appropriate Product Specifications. Additional information is provided in Service and Application Note ACC002 (August 2000).

**Installing Duct System**

Connect supply air duct to the flange on top of the air handler. If an isolation connector is used, it must be nonflammable.

**Field-Fabricated Return Air Duct Flange for Horizontal Applications**

A return air duct system is recommended, but not factory-provided. If the unit is installed in a confined space or closet, run a full-size return connection to a location outside the closet.



**Figure 9. Cabinet and Duct Flange**

**Brazing Refrigerant Lines**

Refrigerant lines must be connected by a qualified technician in accordance with established procedures.

**⚠ IMPORTANT**

Refrigerant lines must be clean, dry, refrigerant-grade copper lines. Air handler coils should be installed only with specified line sizes for approved system combinations.

Handle the refrigerant lines gently during the installation process. Sharp bends or kinks in the lines will cause a restriction.

Do not remove the caps from the lines or system connection points until connections are ready to be completed.

**⚠ WARNING**

Polyol ester (POE) oils used with HFC-410A refrigerant absorb moisture very quickly. It is very important that the refrigerant system be kept closed as much as possible. DO NOT remove line set caps or service valve stub caps until you are ready to make connections.

**⚠ WARNING**



Danger of fire. Bleeding the refrigerant charge from only the high side may result in pressurization of the low side shell and suction tubing. Application of a brazing torch to a pressurized system may result in ignition of the refrigerant and oil mixture. Check the high and low pressures before applying heat.

**⚠ WARNING**



When using a high pressure gas such as nitrogen to pressurize a refrigeration or air conditioning system, use a regulator that can control the pressure down to 1 or 2 psig (6.9 to 13.8 kPa).

 **CAUTION**

Brazing alloys and flux contain materials which are hazardous to your health.

Avoid breathing vapors or fumes from brazing operations. Perform operations only in well-ventilated areas.

Wear gloves and protective goggles or face shield to protect against burns.

Wash hands with soap and water after handling brazing alloys and flux.

 **IMPORTANT**

To prevent the build-up of high levels of nitrogen when purging, it must be done in a well-ventilated area. Purge low-pressure nitrogen (1 to 2 psig) through the refrigerant piping during brazing. This will help to prevent oxidation and the introduction of moisture into the system.

**NOTE:** Recommended line length is 50' or less. If more than 50' line set is required, contact MRCOOL.

1. Route the suction and liquid lines from the fittings on the indoor coil to the fittings on the outdoor unit. Run the lines in a direct path, avoiding unnecessary turns and bends.
2. Make sure that the suction line is insulated over the entire exposed length and that neither suction nor liquid lines are in direct contact with floors, walls, duct system, floor joists, or other piping.
3. To avoid damaging the rubber grommets in the cabinet while brazing, slide the rubber grommets over the refrigerant lines until they are away from the heat source.

**NOTE:** Place wet rags against piping plate and around suction line connections.

4. Connect the suction and liquid lines to the evaporator coil. Take care to protect the cabinet and internal components as detailed in Figure 10.
5. Braze using an alloy of silver or copper and phosphorus with a melting point above 1,100°F (593°C).

**NOTE:** Do not use soft solder.

6. Allow refrigerant pipes to cool to room temperature.  
**NOTE:** Make sure to route copper refrigerant tubing away from sharp edges and make sure that it does not touch other metal surfaces. This prevents damage caused by vibration or metal-on-metal contact.
7. Reinstall the rubber grommets into the refrigerant piping panel.

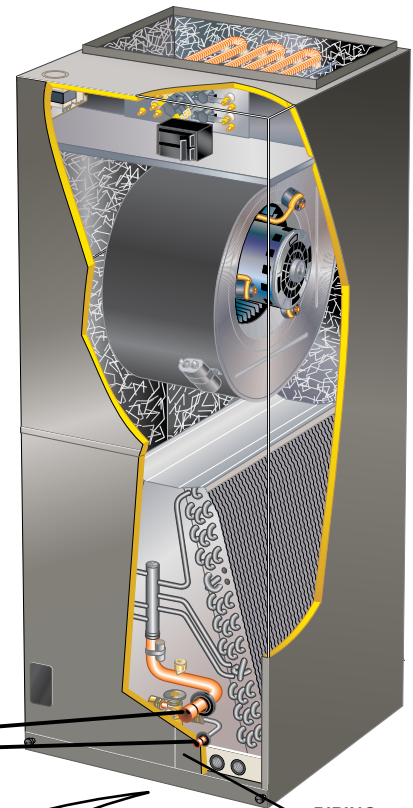
**NOTE:** Make sure expansion valve capillary tube is not touching metal edges or copper tubing.

8. Make sure outdoor unit has been placed according to the Installation Instructions and is connected to the refrigerant lines

**PLEASE READ IMPORTANT ISSUES CONCERNING BRAZING OPERATIONS IN THE BRAZING REFRIGERANT LINES SECTION BEFORE PROCEEDING.**

**NOTE - REFER TO OUTDOOR UNIT INSTALLATION INSTRUCTIONS FOR REFRIGERANT PIPING SIZE REQUIREMENTS.**

**NOTE - Use silver alloy brazing rods with five or six percent minimum silver alloy for copper-to-copper brazing, 45 percent alloy for copper-to-brass and copper-to-steel brazing.**



**A REMOVE ACCESS PANEL**

**B REMOVE RUBBER PLUG FROM BOTH LIQUID AND SUCTION LINES**

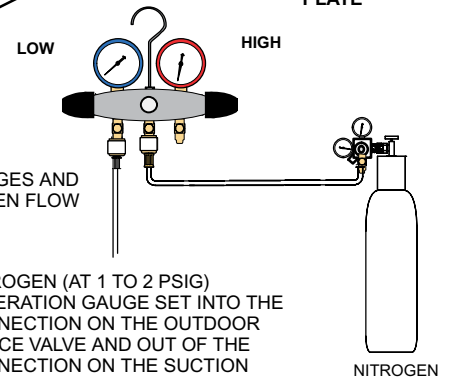
**NOTE - MAHM\*CTA SERIES UNITS USE NITROGEN OR DRY AIR AS A HOLDING CHARGE. IF THERE IS NO PRESSURE WHEN THE RUBBER PLUGS ARE REMOVED, CHECK THE COIL FOR LEAKS BEFORE INSTALLING.**

**C EITHER REMOVE OR PUSH PIPE WRAPPING BACK THROUGH HOLE IN PIPING PLATE BEFORE LINE SET CONNECTION AND BRAZING.**

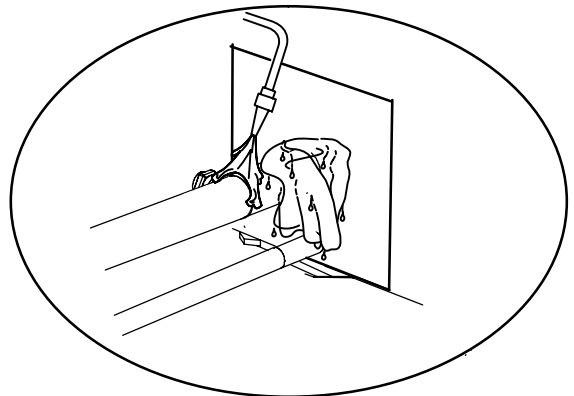
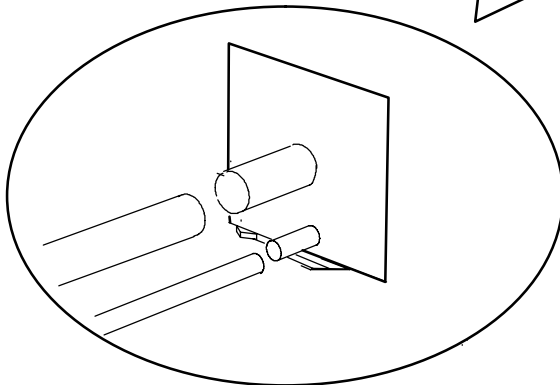
**D CONNECT PIPES**

**NOTE - REFRIGERANT LINE SETS SHOULD BE ROUTED TO ALLOW FILTER ACCESSIBILITY.**

**E CONNECT GAUGES AND START NITROGEN FLOW**



FLOW REGULATED NITROGEN (AT 1 TO 2 PSIG) THROUGH THE REFRIGERATION GAUGE SET INTO THE VALVE STEM PORT CONNECTION ON THE OUTDOOR UNIT LIQUID LINE SERVICE VALVE AND OUT OF THE VALVE STEM PORT CONNECTION ON THE SUCTION SERVICE VALVE.



**F PLACE A WET RAG AGAINST PIPING PLATE AND AROUND THE SUCTION LINE CONNECTION.**

**G BRAZE CONNECTION. ALLOW PIPE TO COOL BEFORE REMOVING WET RAG FROM CTXV SENSING BULB AND PIPING PANEL AREA.**

**H REPEAT PREVIOUS PROCEDURE FOR LIQUID LINE.**

REFER TO INSTRUCTIONS PROVIDED WITH OUTDOOR UNIT FOR LEAK TESTING, EVACUATING AND CHARGING PROCEDURES

**Figure 10. Brazing Connections**

## Sealing the Unit

Seal the unit so that warm air is not allowed into the cabinet. Warm air introduces moisture, which results in water blow-off problems. This is especially important when the unit is installed in an unconditioned area.

If installed in an unconditioned space, sealant should be applied around the electrical wires, refrigerant tubing, and condensate lines where they enter the cabinet.

### WARNING

There must be an airtight seal between the bottom of the air handler and the return air plenum. Use fiberglass sealing strips, caulking, or equivalent sealing method between the plenum and the air handler cabinet to ensure a tight seal. Return air must not be drawn from a room where this air handler or any gas-fueled appliance (i.e., water heater), or carbon monoxide-producing device (i.e., wood fireplace) is installed.

### IMPORTANT

Use duct tape and/ or Permagem to seal closed any space around the holes where the drain lines exit the cabinet. Warm air must not be allowed to enter through any gaps or holes in the cabinet.

## Electrical Connections

### WARNING



Electric shock hazard! - Disconnect all power supplies before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

### WARNING

Run 24V Class II wiring only through specified low voltage opening. Run line voltage wiring only through specified high voltage opening. Do not combine voltage in one opening.

### WARNING



Electric Shock Hazard. Can cause injury or death. Unit must be properly grounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation on units with single-pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies.

### WARNING



Electric Shock Hazard.

Can cause injury or death.

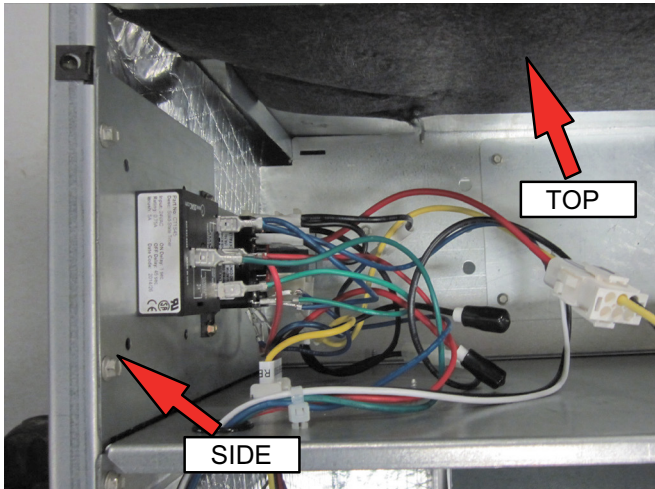
Foil-faced insulation has conductive characteristics similar to metal. Be sure there are no electrical connections within 1/2" of the insulation. If the foil-faced insulation comes in contact with electrical voltage, the foil could provide a path for current to pass through to the outer metal cabinet. While the current produced may not be enough to trip existing electrical safety devices (e.g., fuses or circuit breakers), the current can be enough to cause an electrical shock hazard that could cause personal injury or death.

- Wiring must conform to the current National Electric Code ANSI/NFPA No. 70, or Canadian Electric Code Part I, CSA Standard C22.1, and local building codes. Refer to following wiring diagrams. See unit nameplate for minimum circuit ampacity and maximum over-current protection size.
- Electrical wiring, disconnect means and over-current protection are to be supplied by the installer. Refer to the air handler rating plate for maximum over-current protection, minimum circuit ampacity, as well as operating voltage. Select the proper supply circuit conductors in accordance with tables 310-16 and 310-17 in the National Electric Code, ANSI/NFPA No. 70 or tables 1 through 4 in the Canadian Electric Code, Part I, CSA Standard C22.1.
- The power supply must be sized and protected according to the specifications supplied on the product.
- This air handler is factory-configured for 240 volt, single phase, 60 cycles. For 208-volt applications, see "208 Volt Conversion" later in this section.

- Separate openings have been provided for 24V low voltage and line voltage. Refer to the dimension illustration of specific location.
- This unit is provided with holes for conduit. Use provided caps to seal holes not used.
- Typical unit wiring (as well as wiring of optional field-installed electric heat) is given in Figure 14. Refer to the instructions provided with the electric heat section for proper installation.

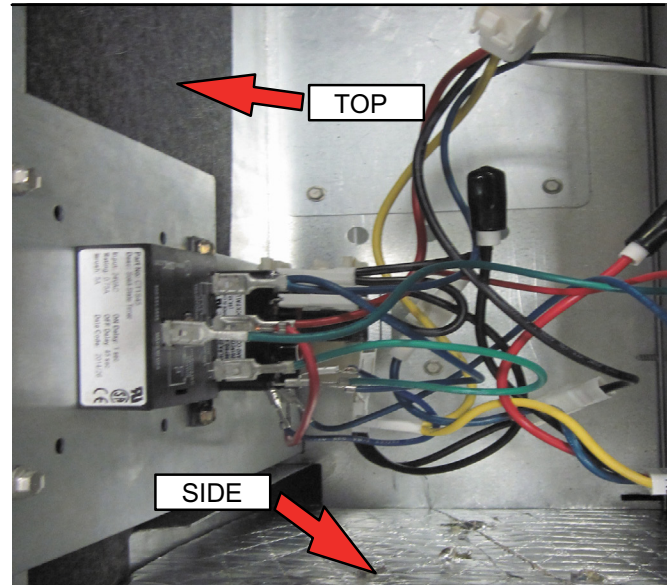
**⚠ WARNING**  
**USE COPPER CONDUCTORS ONLY**

1. Disconnect all power supplies.
2. Remove the air handler access panel.
3. Route the field supply wires to the air handler electrical connection box.
4. Use UL-listed wire nuts to connect the field supply conductors to the unit black and yellow leads, and the ground wire to ground terminal marked GND.
5. Replace the air handler access panel.



**Figure 11. Electrical Connections (Upflow Configuration)**

**NOTE:** To avoid the possibility of moisture damage to the control in some right-hand discharge configurations, the control panel can be relocated to the end panel as shown in Figure 12.




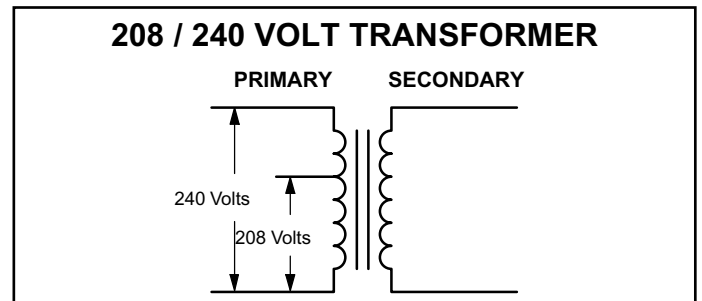
**Figure 12. Control Panel Relocated to End Panel (Left-Hand Horizontal Configuration)**

### 208 Volt Conversion

1. Disconnect all power supplies.
2. Remove the air handler access panel.
3. Using the wiring diagram located on the unit access panel as a reference, move the 2 connected black transformer leads from the 240 volt terminal on the transformer to the 208 volt terminal on the transformer.

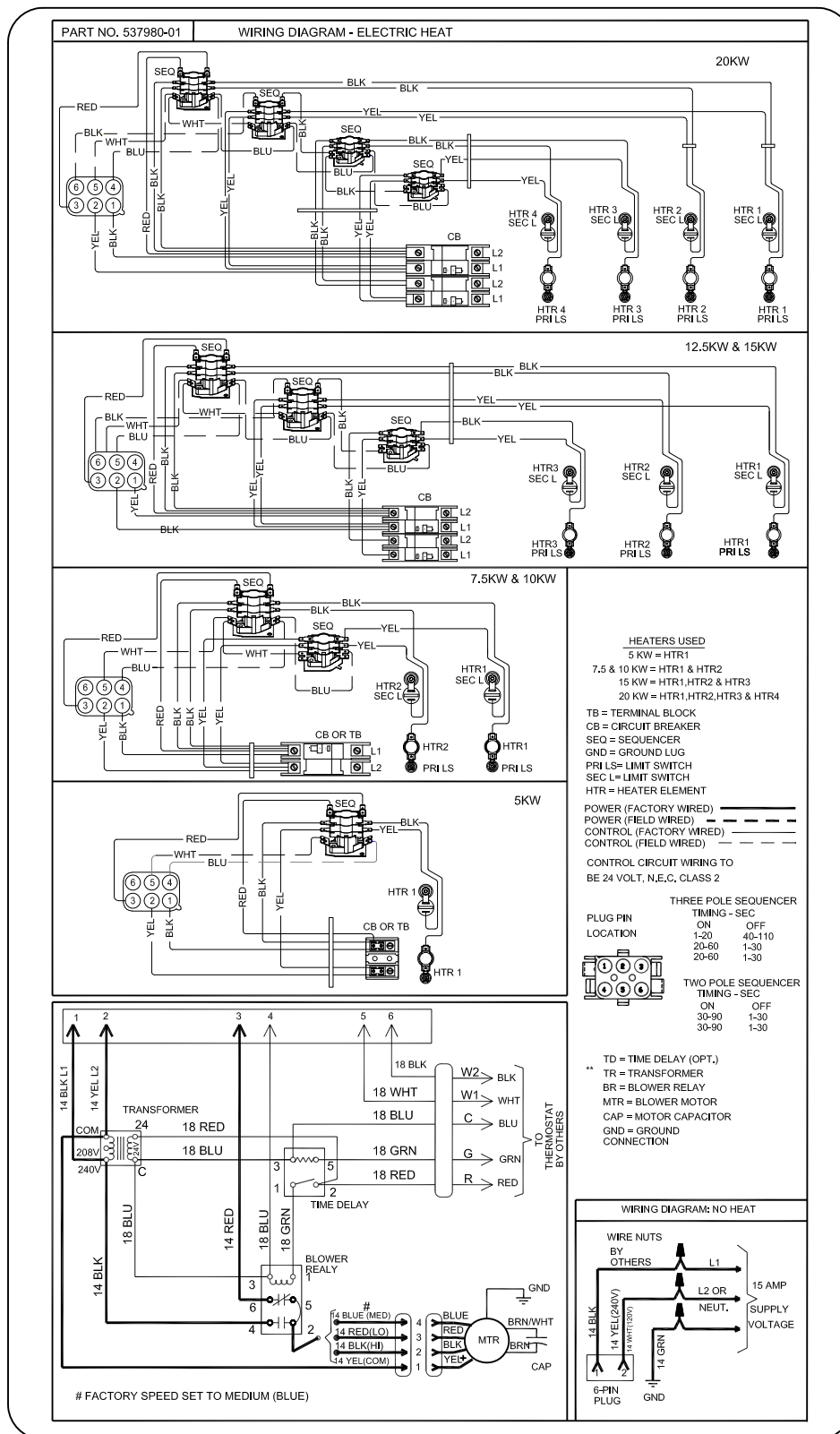
**⚠ WARNING**

 Electrically ground air handler. Connect ground wire to ground terminal marked "GND". Failure to do so can result in death or electrical shock.

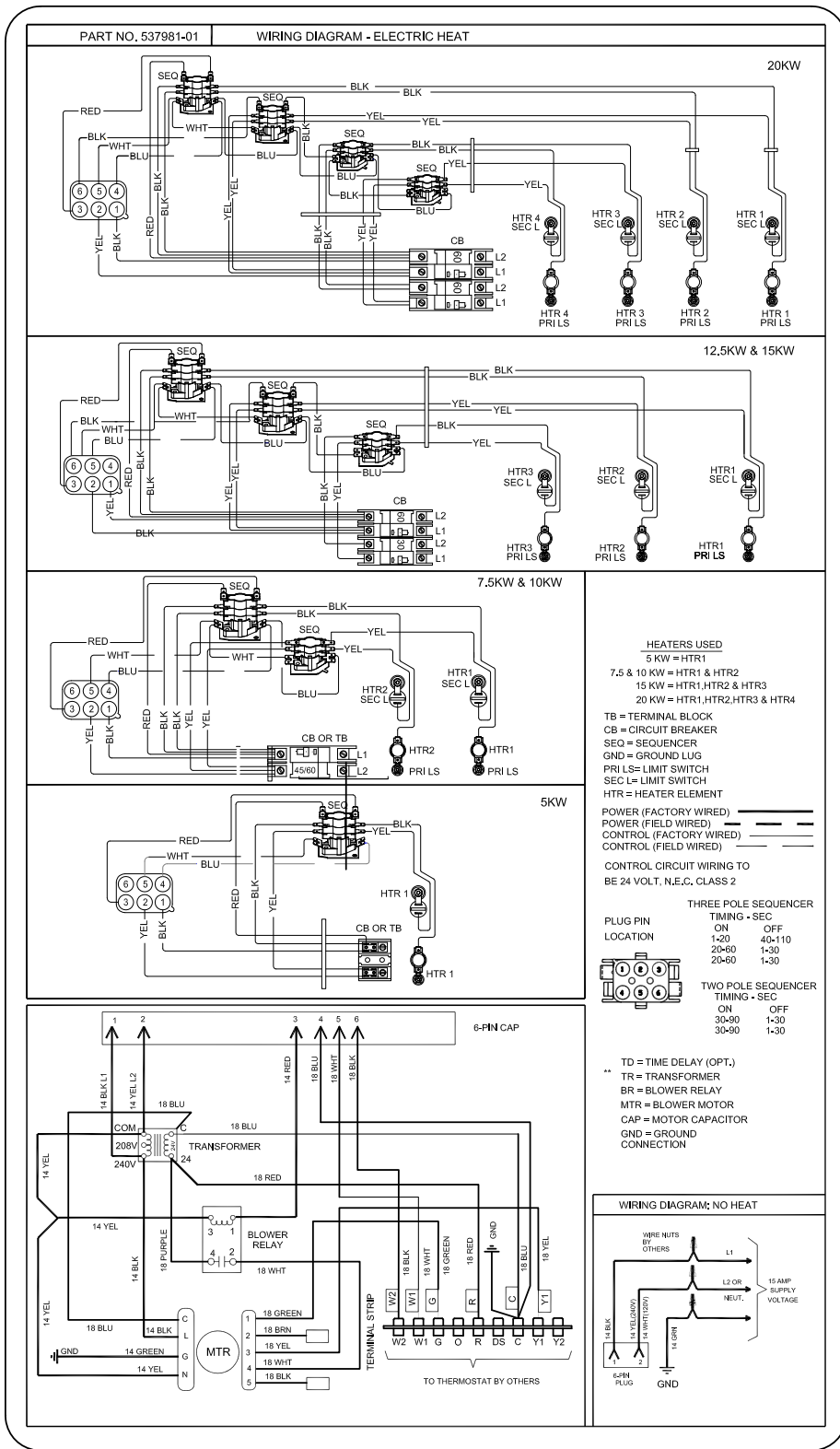


**Figure 13. Converting Unit from 240VAC to 208VAC**





**Figure 14. Typical Wiring Diagram MAHM\*CTA Air Handler with Electric Heat – PSC (018, 024, 030, 036, 042 models)**



**ELECTRIC HEAT**

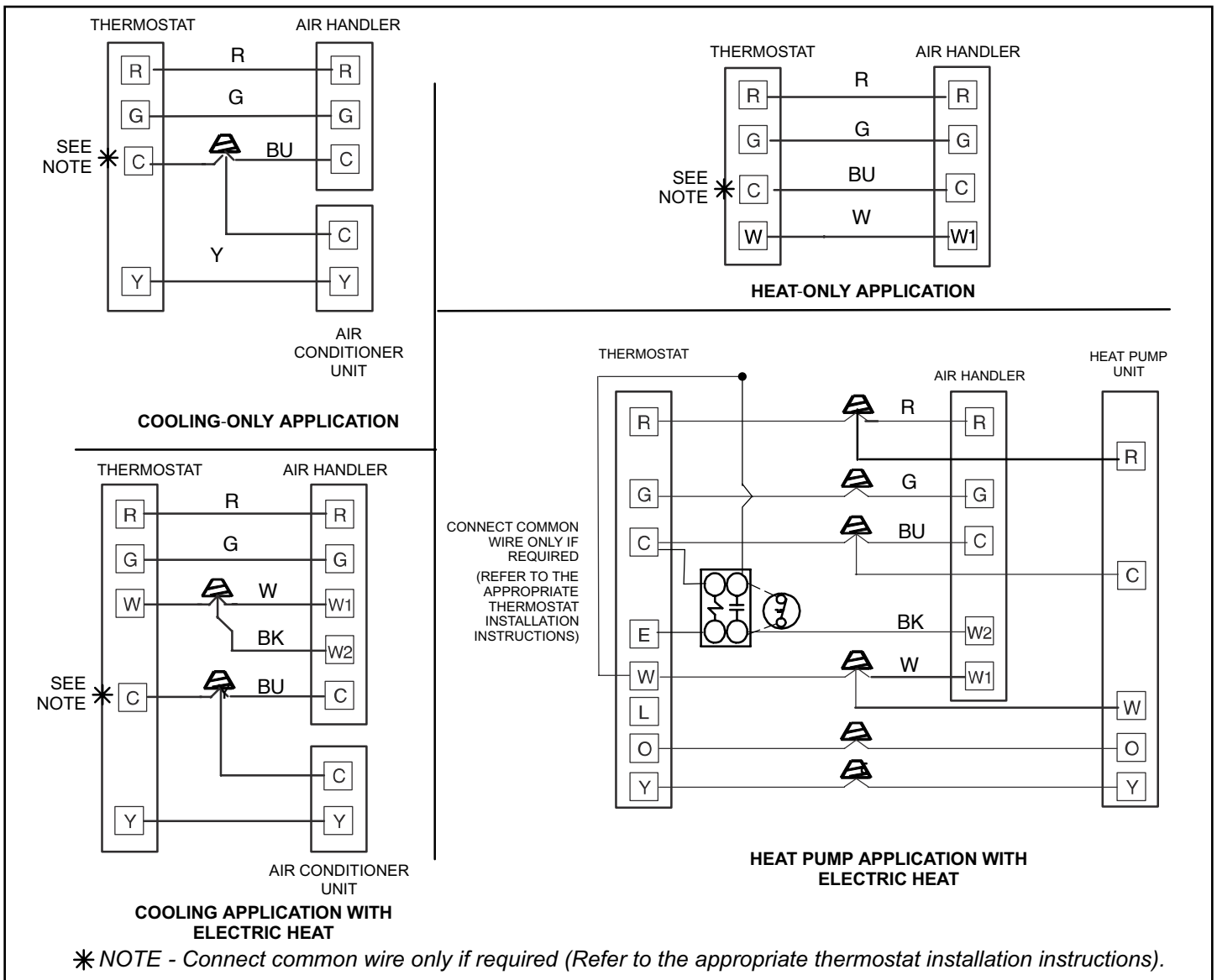
**CONSTANT TORQUE LABEL WIRING DIAGRAM**

Supersedes

0418
**Form No.**  
**537981-01**

Litho U.S.A.

**Figure 15. Typical Wiring Diagram MAHM\*CTA Air Handler with Electric Heat – CT (048 and 060 models)**



**Figure 16. Low Voltage Connections (3-Speed PSC Motor) – Field Wiring**

**Air Flow – Cooling Blower Speed**

The cooling blower speed is factory configured to provide correct air flow for an outdoor unit that matches the cooling capacity rating of the air handler.

If the outdoor unit is smaller than the maximum cooling capacity rating for the air handler, the cooling blower speed may need to be changed. Refer to blower performance chart in Table 2.

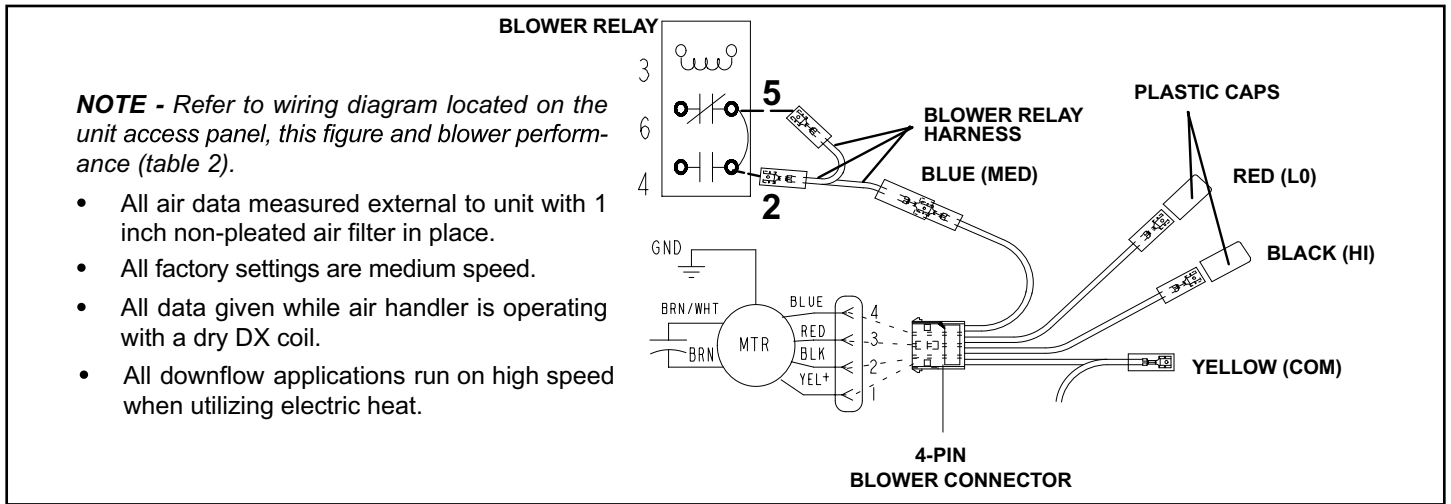
**⚠ WARNING**

Electric shock hazard! - Disconnect all power supplies before servicing.  
Replace all parts and panels before operating.  
Failure to do so can result in death or electrical shock.

**Change Blower Speed**

1. Disconnect all power supplies.
2. Remove the air handler access panel.
3. Locate pin number 2 on the blower relay. Two black wires are connected to this terminal pin. One connects to pin number 5 on the blower relay, one connects to an in-line splice connecting to a blue wire.
4. Select the required blower motor speed. Connect red-LO or black-HI and plug it into the 4-pin blower relay harness connector.
5. Replace all panels.
6. Reconnect power.

**NOTE:** Reuse the factory-installed wire nut on the unused wires.



**Figure 17. Changing Blower Speed**

**NOTE:** To change blower speed on Constant Torque -048 and -060 units, remove the wire from terminal Y1 on the strip and install on either of the speeds not being used (Brown TAP 2 or Black TAP 5).

Air Handler Model	Blower Speed	.10" WC	.20" WC	.30" WC	.40" WC	.50" WC
-018	LOW	538	525	503	471	418
	MED	688	670	639	603	548
	HIGH	919	881	855	788	710
-024	LOW	677	673	657	629	592
	MED	1011	979	942	803	742
	HIGH	1106	1045	999	917	857
-030	LOW	871	870	853	812	769
	MED	1078	1057	1024	987	936
	HIGH	1311	1261	1214	1154	1086
-036	LOW	1020	972	956	909	806
	MED	1276	1240	1191	1148	1086
	HIGH	1559	1521	1446	1395	1327
-042	LOW	1300	1273	1250	1211	1155
	MED	1527	1493	1452	1390	1345
	HIGH	1816	1756	1693	1605	1528
-048	LOW	1257	1212	1157	1116	1053
	MED LOW	1486	1448	1411	1364	1330
	MED	1721	1675	1630	1594	1553
	MED HIGH	1721	1675	1630	1594	1553
	HIGH	1840	1794	1754	1721	1681
-060	LOW	1098	1049	1001	926	831
	MED LOW	1624	1594	1565	1520	1492
	MED	1815	1783	1758	1730	1685
	MED HIGH	1903	1869	1837	1809	1764
	HIGH	1981	1957	1923	1893	1861

Blower Performance (CFM vs. ESP inches H20)

- Cooling speeds should not be reduced below factory setting.
- All units with electric heat approved at 0.5" maximum and medium blower speed minimum.
- All downflow applications run on high speed when utilizing electric heat.

**Table 2. MAHM\*CTA Blower Performance (3-Speed PSC) – 240V (CFM @ ESP. – in. W. C.)**

## Check-Out Procedures

**NOTE:** Refer to outdoor unit installation instructions for system start-up instructions and refrigerant charging instructions.

### Pre-Start-Up Checks

- Is the air handler properly and securely installed?
- If horizontally configured, is the unit sloped up to 5/8 inch toward drain lines?
- Will the unit be accessible for servicing?
- Has an auxiliary pan been provided under the unit with separate drain for units installed above a finished ceiling or in any installation where condensate overflow could cause damage?
- Have ALL unused drain pan ports been properly plugged?
- Has the condensate line been properly sized, run, trapped, pitched, and tested?
- Is the duct system correctly sized, run, sealed, and insulated?
- Have all cabinet openings and wiring been sealed?
- Is the indoor coil factory-installed TXV or RFC properly sized for the outdoor unit being used?
- Have all unused parts and packaging been disposed of?
- Is the filter clean, in place, and of adequate size?
- Is the wiring neat, correct, and in accordance with the wiring diagram?
- Is the unit properly grounded and protected (fused)?
- Is the thermostat correctly wired and in a good location?
- Are all access panels in place and secure?

### Check Blower Operation

1. Set thermostat to FAN ON. The indoor blower should come on.

### Check Cooling Operation

1. Set thermostat to force a call for cooling (approximately 5°F lower than the indoor ambient temperature).
2. The outdoor unit should come on immediately and the indoor blower should start between 30 - 60 seconds later.
3. Check the air flow from a register to confirm that the system is moving cooled air.
4. Set the thermostat 5°F higher than the indoor temperature. The indoor blower and outdoor unit should cycle off.

### Check Electric Heat (If Used)

1. Set thermostat to call for auxiliary heat (approximately 5°F above ambient temperature). The indoor blower and auxiliary heat should come on together. Allow a minimum of 3 minutes for all sequencers to cycle on.
2. Set the thermostat so that it does not call for heat. Allow up to 5 minutes for all sequencers to cycle off.

## Operation

### Time Delay Relay

Blower time delay operation:

1. When cooling demand is initiated, there is a 1 second motor-on delay.
2. After the motor-on delay expires, motor ramps up to 100% and runs at 100% until cooling demand is satisfied.
3. Once demand is met, motor runs at 100% for 45 seconds.
4. Motor ramps down to stop.

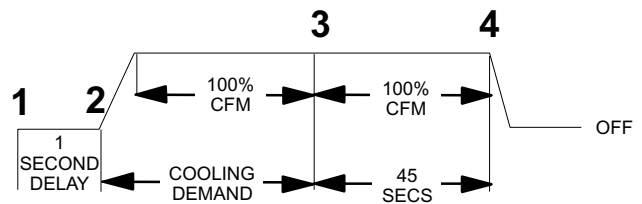


Figure 18. Blower Time Delay

### Cooling (Cooling Only or Heat Pump)

When the thermostat calls for cooling, 24 volts is put on the blower time-delay relay coil and then the indoor blower relay energizes. The normally open contacts close, causing the indoor blower motor to operate. The circuit between R and Y is completed, closing the circuit to the contactor in the outdoor unit, starting the compressor and outdoor fan motor.

On heat pumps, circuit R and O energizes the reversing valve, switching the valve to the cooling position. (The reversing valve remains energized as long as the thermostat selector switch is in the COOL position.)

At the completion of the cooling demand the indoor blower and outdoor unit should cycle off. Air handler should cycle off 45 seconds after the outdoor unit shuts off.

### Heating (Electric Heat Only)

When the thermostat calls for heat, the circuit between R and W is completed, and the heat sequencer is energized. A time delay follows before the heating elements and the indoor blower motor come on. Units with a second heat sequencer can be connected with the first sequencer to W on the thermostat sub-base, or they may also be connected to a second stage on the sub-base.

## Heating (Heat Pump)

When the thermostat calls for heating, 24 volts is applied to the blower time-delay relay coil. Then, normally open contacts close, causing the indoor blower motor to operate. The circuit between R and Y is completed, closing the circuit to the contactor in the outdoor unit, starting the compressor and outdoor fan motor.

If the room temperature continues to decrease, the circuit between R and W1 is completed by the second-stage heat room thermostat. Circuit R-W1 energizes a heat sequencer. The completed circuit will energize supplemental electric heat (if applicable). Units with a second heat sequencer can be connected with the first sequencer to W1 on the thermostat. They may also be connected to a second heating stage W2 on the thermostat sub-base.

## Emergency Heat (Heating Heat Pump)

If the selector switch on the thermostat is set to the emergency heat position, the heat pump will be locked out of the heating circuit, and all heating will be electric heat (if applicable). A jumper should be placed between W2 and E on the thermostat sub-base so that the electric heat control will transfer to the first-stage heat on the thermostat. This will allow the indoor blower to cycle on and off with the electric heat when the fan switch is in the AUTO position.

## Homeowner Maintenance

### **⚠ IMPORTANT**

Do not operate system without a filter. A filter is required to protect the coil, blower, and internal parts from excessive dirt and dust. The filter is placed in the return duct by the installer.

- Inspect air filters at least once a month and replace or clean as required. Dirty filters are the most common cause of inadequate heating or cooling performance.
- Replace disposable filters. Cleanable filters can be cleaned by soaking in mild detergent and rinsing with cold water.
- Install new/clean filters with the arrows on the side pointing in the direction of air flow. Do not replace a cleanable (high velocity) filter with a disposable (low velocity) filter unless return air system is properly sized for it.
- If water should start coming from the secondary drain line, a problem exists which should be investigated and corrected. Contact a qualified service technician.

## Repairing or Replacing Cabinet Insulation

### **⚠ IMPORTANT**

**DAMAGED INSULATION MUST BE REPAIRED OR REPLACED** before the unit is put back into operation. Insulation loses its insulating value when wet, damaged, separated or torn.

Matte- or foil-faced insulation is installed in indoor equipment to provide a barrier between outside air conditions (surrounding ambient temperature and humidity) and the varying conditions inside the unit. If the insulation barrier is damaged (wet, ripped, torn or separated from the cabinet walls), the surrounding ambient air will affect the inside surface temperature of the cabinet.

The temperature/humidity difference between the inside and outside of the cabinet can cause condensation on the inside or outside of the cabinet which leads to sheet metal corrosion and, subsequently, component failure.

## Repairing Damaged Insulation

Areas of condensation on the cabinet surface are an indication that the insulation is in need of repair.

If the insulation in need of repair is otherwise in good condition, the insulation should be cut in an X pattern, peeled open, glued with an appropriate all-purpose glue and placed back against the cabinet surface, being careful to not overly compress the insulation so the insulation can retain its original thickness. If such repair is not possible, replace the insulation. If using foil-faced insulation, any cut, tear, or separations in the insulation surface must be taped with a similar foil-faced tape.

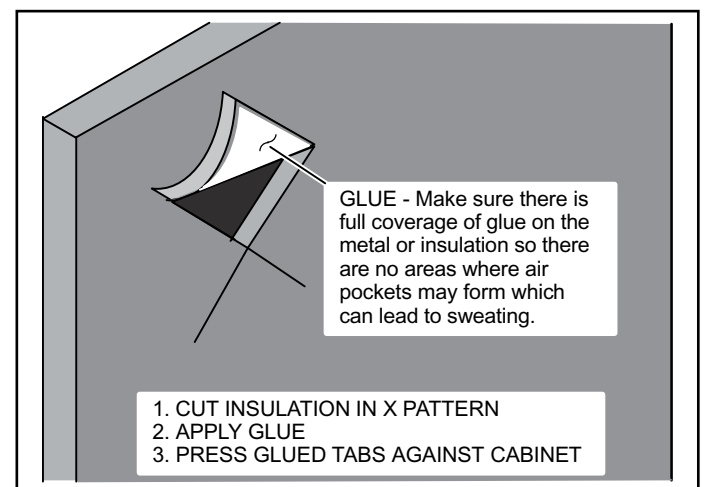


Figure 19. Repairing Insulation

## Professional Maintenance

### NOTICE

Failure to follow instructions will cause damage to the unit.

This unit is equipped with an aluminum coil. Aluminum coils may be damaged by exposure to solutions with a pH below 5 or above 9. The aluminum coil should be cleaned using potable water at a moderate pressure (less than 50psi). If the coil cannot be cleaned using water alone, it is recommended to use a coil cleaner with a pH in the range of 5 to 9. The coil must be rinsed thoroughly after cleaning.

In coastal areas, the coil should be cleaned with potable water several times per year to avoid corrosive buildup (salt).

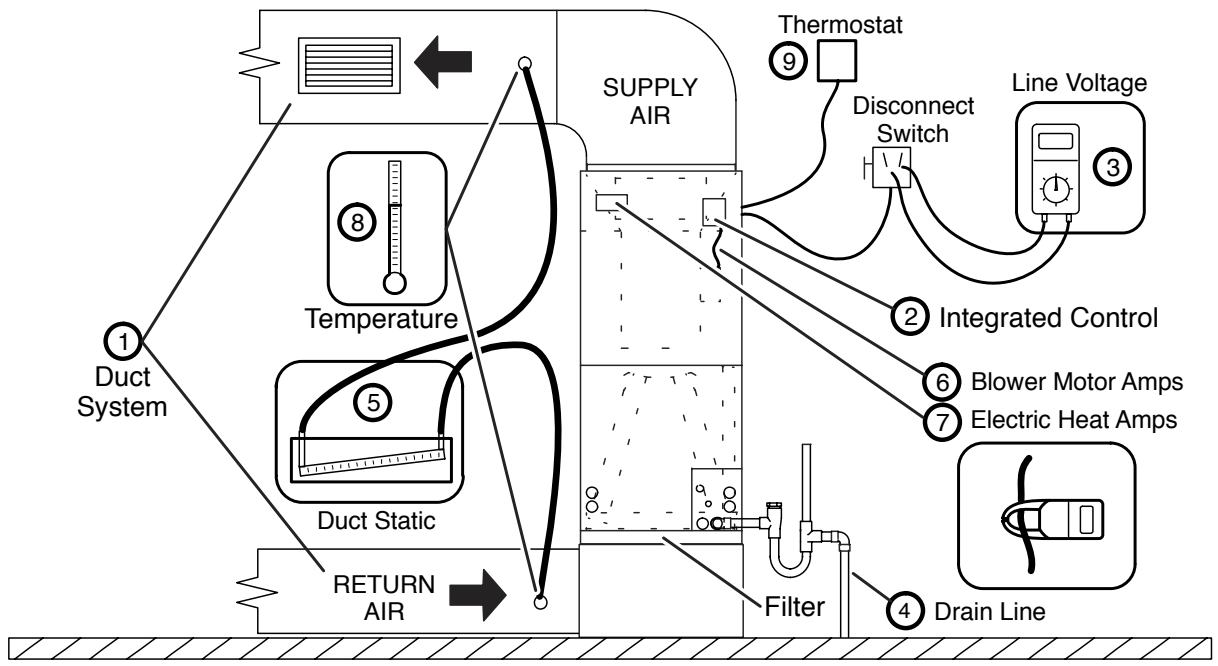
## Use of Air Handler During Construction

It is not recommended to use this air handler unit during any phase of construction. Very low return air temperatures, harmful vapors and operation of the unit with clogged or misplaced filters will damage the unit.

Air handler units may be used for heating (heat pumps) or cooling of buildings under construction, if the following conditions are met:

- A room thermostat must control the air handler. The use of fixed jumpers is not allowed.
- Air filter must be installed in the system and must be maintained during construction.
- Air filter must be replaced upon construction completion.
- The air handler evaporator coil, supply fan assembly and duct system must be thoroughly cleaned following final construction clean-up.
- All air handler operating conditions must be verified according to these installation instructions.

Installing Contractor's Name \_\_\_\_\_ Installing Date \_\_\_\_\_  
 Installing Contractor's Phone \_\_\_\_\_ Air Handler Model # \_\_\_\_\_  
 Job Address \_\_\_\_\_



- |  |  |          |          |          |                        |       |       |                        |       |       |                         |       |       |
|--|--|----------|----------|----------|------------------------|-------|-------|------------------------|-------|-------|-------------------------|-------|-------|
| <p><b>① DUCT SYSTEM</b><br/>       SUPPLY AIR DUCT</p> <p><input type="checkbox"/> Sealed<br/> <input type="checkbox"/> Insulated (if necessary)<br/> <input type="checkbox"/> Registers Open and Unobstructed</p> <p>RETURN AIR DUCT</p> <p><input type="checkbox"/> Sealed<br/> <input type="checkbox"/> Filter Installed and Clean<br/> <input type="checkbox"/> Registers Open and Unobstructed</p> <p><b>② INTEGRATED CONTROL</b></p> <p><input type="checkbox"/> Jumpers Configured Correctly (if applicable)<br/> <input type="checkbox"/> Appropriate Links in Place (if applicable)</p> <p><b>③ VOLTAGE CHECK</b></p> <p><input type="checkbox"/> Supply Voltage _____<br/> <input type="checkbox"/> Low Voltage _____<br/> <input type="checkbox"/> Electrical Connections Tight</p> <p><b>④ DRAIN LINE</b></p> <p><input type="checkbox"/> Leak Free</p> <p><input type="checkbox"/> Explained Operation of System to Homeowner</p> | <p><b>⑤ TOTAL EXTERNAL STATIC (dry coil)</b></p> <table border="0"> <tr> <td></td> <td style="text-align: right;">dry coil</td> <td style="text-align: right;">wet coil</td> </tr> <tr> <td>Supply External Static</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Return External Static</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Total External Static =</td> <td>_____</td> <td>_____</td> </tr> </table> <p><b>⑥ ELECTRIC HEAT AMPS</b> _____</p> <p><b>⑦ INDOOR BLOWER AMPS</b> _____</p> <p>INDOOR BLOWER CFM _____</p> <p><b>⑧ TEMPERATURE DROP (Cooling Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature - _____</p> <p>Temperature Drop = _____</p> <p><b>⑧ TEMPERATURE RISE (Heating Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature - _____</p> <p>Temperature Rise = _____</p> <p><b>⑨ THERMOSTAT</b></p> <p><input type="checkbox"/> Adjusted and Programmed<br/> <input type="checkbox"/> Operation Explained to Owner</p> |          | dry coil | wet coil | Supply External Static | _____ | _____ | Return External Static | _____ | _____ | Total External Static = | _____ | _____ |
|  | dry coil   | wet coil |          |          |                        |       |       |                        |       |       |                         |       |       |
| Supply External Static   | _____  | _____    |          |          |                        |       |       |                        |       |       |                         |       |       |
| Return External Static   | _____  | _____    |          |          |                        |       |       |                        |       |       |                         |       |       |
| Total External Static =  | _____  | _____    |          |          |                        |       |       |                        |       |       |                         |       |       |

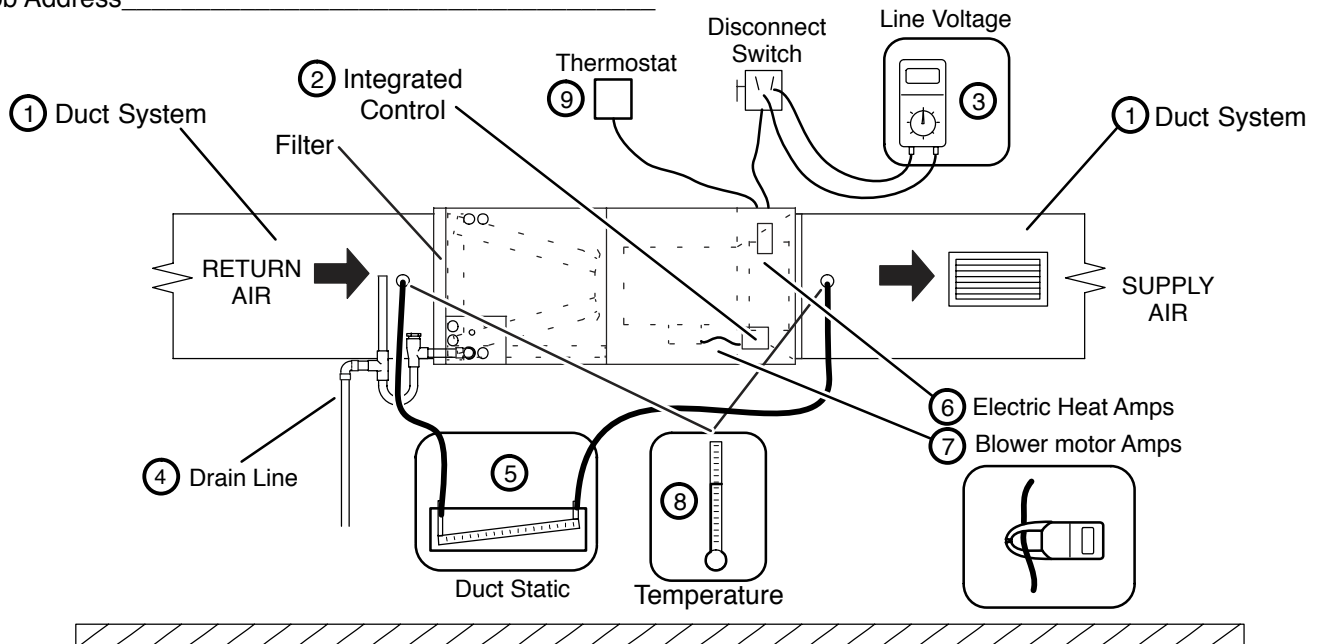
Technician's Name: \_\_\_\_\_ Date Start-Up & Performance Check Completed \_\_\_\_\_

**Figure 20. Start-Up and Performance Checklist (Upflow Configuration)**



Installing Contractor's Name \_\_\_\_\_  
 Installing Contractor's Phone \_\_\_\_\_  
 Job Address \_\_\_\_\_

Installing Date \_\_\_\_\_  
 Air Handler Model # \_\_\_\_\_

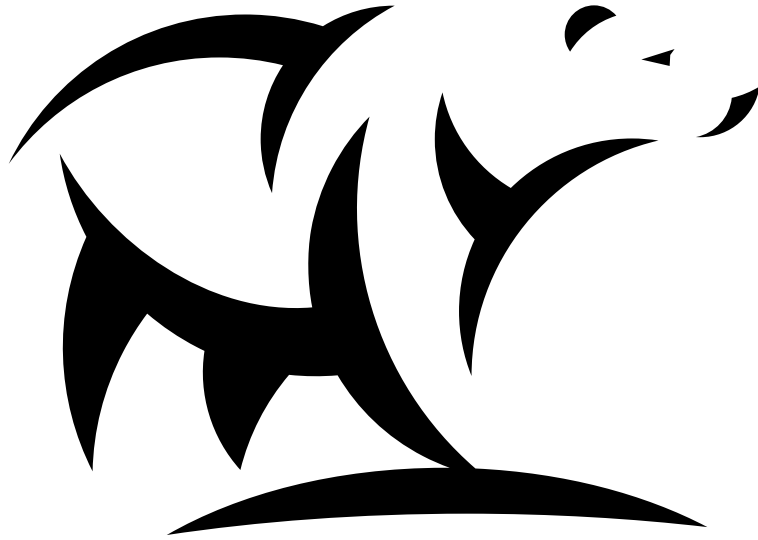


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|---|--|
| <p><b>① DUCT SYSTEM</b><br/>         SUPPLY AIR DUCT</p> <p><input type="checkbox"/> Sealed<br/> <input type="checkbox"/> Insulated (if necessary)<br/> <input type="checkbox"/> Registers Open and Unobstructed</p> <p>RETURN AIR DUCT</p> <p><input type="checkbox"/> Sealed<br/> <input type="checkbox"/> Filter Installed and Clean<br/> <input type="checkbox"/> Registers Open and Unobstructed</p> <p><b>② INTEGRATED CONTROL</b></p> <p><input type="checkbox"/> Jumpers Configured Correctly (if applicable)<br/> <input type="checkbox"/> Appropriate Links in Place (if applicable)</p> <p><b>③ VOLTAGE CHECK</b></p> <p><input type="checkbox"/> Supply Voltage _____<br/> <input type="checkbox"/> Low Voltage _____<br/> <input type="checkbox"/> Electrical Connections Tight</p> <p><b>④ DRAIN LINE</b></p> <p><input type="checkbox"/> Leak Free</p> | <p><b>⑤ TOTAL EXTERNAL STATIC (dry coil)</b><br/>         dry coil    wet coil</p> <p>Supply External Static _____</p> <p>Return External Static _____</p> <p>Total External Static = _____</p> <p><b>⑥ ELECTRIC HEAT AMPS</b> _____</p> <p><b>⑦ INDOOR BLOWER AMPS</b> _____<br/>         INDOOR BLOWER CFM _____</p> <p><b>⑧ TEMPERATURE DROP (Cooling Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Drop = _____</p> <p><b>⑧ TEMPERATURE RISE (Heating Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Rise = _____</p> <p><b>⑨ THERMOSTAT</b></p> <p><input type="checkbox"/> Adjusted and Programmed<br/> <input type="checkbox"/> Operation Explained to Owner</p> |
|---|--|

Explained Operation of System to Homeowner

Technician's Name: \_\_\_\_\_ Date Start-Up & Performance Check Completed \_\_\_\_\_

**Figure 21. Start-Up and Performance Checklist (Horizontal Configuration)**



**MIRCOOL<sup>®</sup>**

**COMFORT MADE SIMPLE**

Signature Series

**MAHM\*CTA** Air Handler

ELECTRICIAN and/or HVAC TECHNICIAN:

LICENSE #:

INSTALLATION DATE:

INSTALLATION LOCATION:

SERIAL NUMBER:

The design and specifications of this product and/or manual are subject to change without prior notice. Consult with the sales agency or manufacturer for details.

The Signature Series is **NOT** designed for amateur installation. Installation **SHOULD** be performed by an authorized technician. Please read this manual carefully before installation and keep it for future reference.

# Owner & Installation Manual



**MRCOOL®**

COMFORT MADE SIMPLE

## Signature Series

**MAHM\*CTA** AIR Handler

The Signature Series is **NOT** designed for amateur installation. Installation **SHOULD** be performed by an authorized technician. Please read this manual carefully before installation and keep it for future reference.

# INSTALLATION INSTRUCTIONS

## MAHM\*CTA Series Air Handler

This manual must be left with the homeowner for future reference.



This is a safety alert symbol and should never be ignored. When you see this symbol on labels or in manuals, be alert to the potential for personal injury or death.

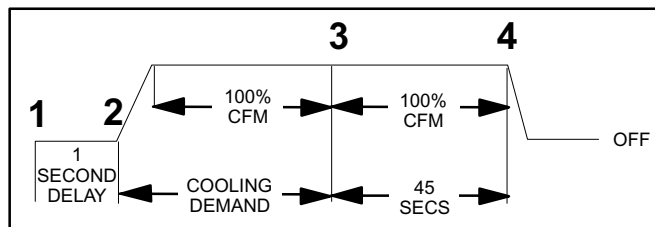


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### IMPORTANT INFORMATION FOR INSTALLER

This unit has a delay relay that delays the supply blower “ON” for 1 second and keeps the blower “ON” for 45 seconds on all fan and cooling demands. For more details, refer to page 18 for unit sequence of operation.

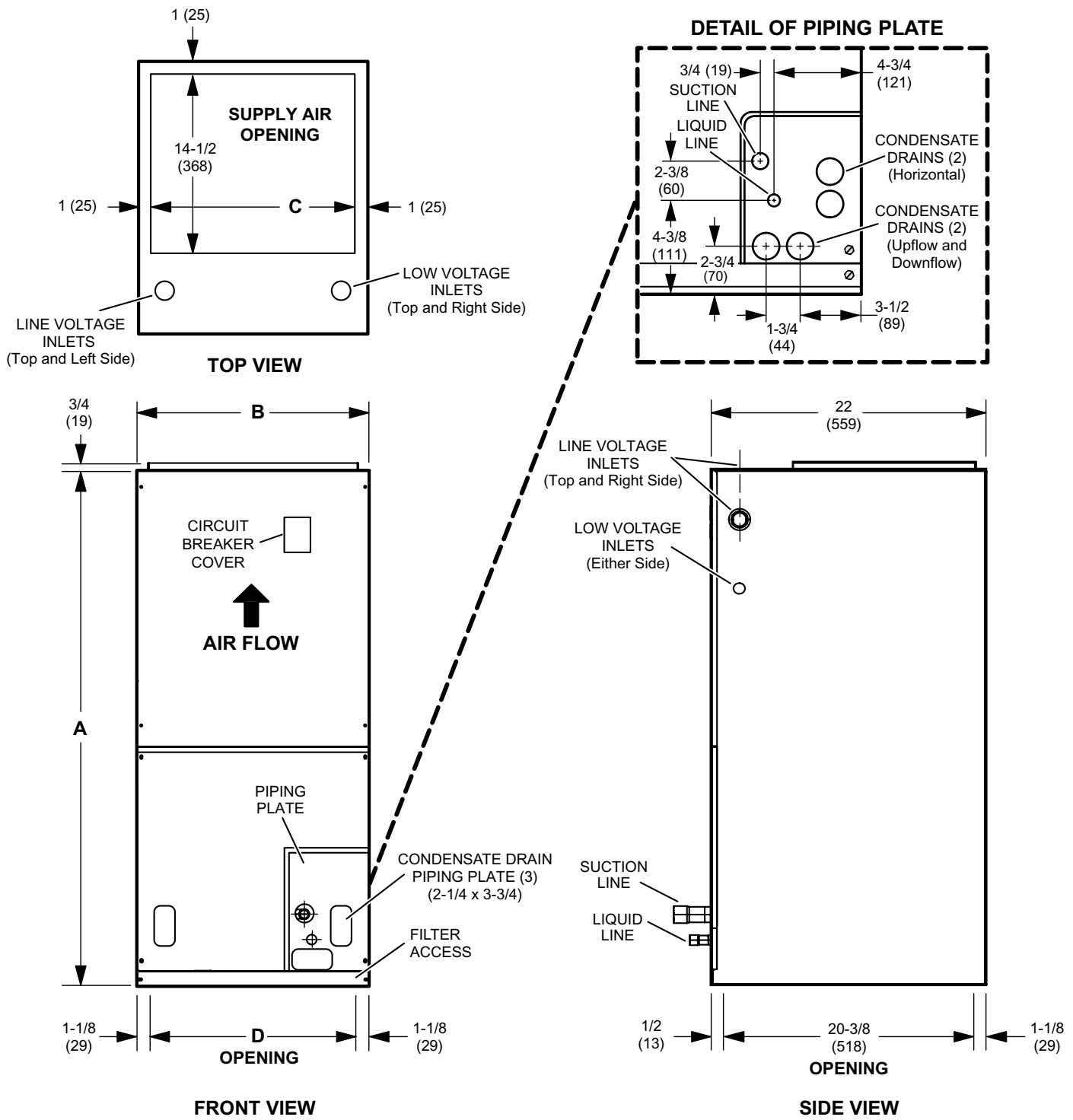


Manufactured By  
**MRCOOL LLC**  
Hickory, KY 42051

**\*P507787-C\*1**  
(P) 507787-01C

**Save these instructions for future reference**

# MAHM\*CTA Unit Dimensions – Upflow – Inches (mm)



Dimensions	018		024		030		036 / 042		048		060	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
<b>A</b>	43-1/2	1105	45-1/2	1156	47	1194	53-5/8	1362	55	1397	59-3/4	1518
<b>B</b>	18-1/2	470	18-1/2	470	18-1/2	470	21-1/2	546	21-1/2	546	21-1/2	546
<b>C</b>	16-1/2	419	16-1/2	419	16-1/2	419	19-1/2	495	19-1/2	495	19-1/2	495
<b>D</b>	16-1/4	413	16-1/4	413	16-1/4	413	19-1/4	489	19-1/4	489	19-1/4	489

## Shipping and Packing List

Package 1 of 1 contains:

- 1 – Assembled air handler unit factory-equipped for upflow or horizontal air discharge application (includes upflow and horizontal drain pans and pre-installed air filter)

Check the air handler for shipping damage; if found, immediately contact the last carrier. Check the unit rating plate to confirm that delivered unit matches order.

**NOTE:** *Special procedures are required for cleaning the all-aluminum coil in this unit. See Page 20 in this instruction for information.*

### WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier.

### IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs and HFCs) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for noncompliance.

## General

The **MAHM\*CTA series air handler with all-aluminum coil** is designed for indoor installation only. As shipped, the unit is ready for installation in either upflow, horizontal left-hand or right-hand air discharge applications. Electric heat, downflow air discharge kits, air filters and other accessories are available and listed in the Product Specification for ordering.

This instruction is intended as a general guide and does not supersede local or national codes in any way. Consult authorities having jurisdiction before installation.

### CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

## Requirements

### WARNING

Excessive Weight Hazard - Use two or more people when moving and installing the unit. Failure to do so can result in back or other type of injury.

### IMPORTANT

**MAHM\*CTA** units include a factory-installed check/expansion valve will provide optimal refrigerant control and system performance with outdoor units of varying capacities. These units must be installed as a part of a matched system as outlined in the MAHM\*CTA Product Specification.

These instructions are intended as a general guide and do not supersede local or national codes in any way. Consult authorities having jurisdiction before installation.

Compliance with all local, state, or national codes pertaining to this type of equipment should be determined prior to installation. Read this instruction manual, as well as the instructions supplied in separate equipment, before starting the installation.

In addition to conforming to manufacturer's installation instructions and local municipal building codes, installation of air handler units (with or without optional electric heat), MUST conform with National Fire Protection Association (NFPA) standards: "Standard for Installation of Air Conditioning and Ventilation Systems" (NFPA No. 90A) and "Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems" (NFPA No. 90B).

All models are designed for indoor installation only. The installation of the air handler, field wiring, duct system, etc. must conform to the requirements of the National Electrical Code, ANSI/NFPA No. 70 (latest edition) in the United States, and any state laws, and local ordinances (including plumbing or waste water codes).


Local authorities having jurisdiction should be consulted before installation is made. Such applicable regulations or requirements take precedence over the general instructions in this manual.


Install the conditioned air plenum, ducts and air filters (provided) in accordance with NFPA 90B Standard for the Installation of Warm Air Heating and Air-Conditioning Systems (latest edition).


The air handler is shipped from the factory completely assembled. The unit is provided with flanges for the connection of the duct system.

Do not remove the cabinet knockouts until it has been determined which knockouts will need to be removed for the installation.

Select the air discharge position which best suits the site conditions. Consider required clearances, space, routing requirements for refrigerant line, condensate disposal, filters, duct system, wiring, and accessibility for service. Refer to the rating plate on the air handler for specific information.


 **WARNING**

 Danger of explosion. Keep flammable materials and vapors, such as gasoline, away from air handler. Place air handler so that heating elements are at least 18 inches (46 cm) above the floor for a garage installation. Failure to follow these instructions can result in death, explosion, or fire.

 **IMPORTANT**

Excessive condensation may occur if the unit is installed in a warm, humid place. When the unit is installed in an unconditioned space, apply sealant around electrical wires, refrigerant piping and condensate lines at the point where they enter the cabinet.

Apply sealant on the inside of the cabinet at the point where the electrical wires exit through the conduit opening. This will also keep warm and moist unconditioned air out of the air handler cabinet where it will form condensate on the cooler control box and electrical controls.

 **IMPORTANT**

This unit is approved for installation clearance to combustible material as stated on the unit rating plate. Accessibility and service clearances must take precedence over combustible material clearances.

The air handler must be installed so that free access is allowed to the coil/filter compartment and blower/control compartment.

- During cooling operation, excessive sweating may occur if the air handler is installed in a warm and humid space.
- If installed in an unconditioned space, sealant should be applied around the electrical wires, refrigerant tubing, and condensate lines where they enter the cabinet.

- Electrical wires should be sealed on the inside where they exit the conduit opening. Sealant is required to prevent air leakage into, and condensate from forming inside of, the air handler, the control box, and on the electrical controls.
- This unit is approved for installation clearance to combustible material as stated on the unit rating plate. Accessibility and service clearances must take precedence over combustible material clearances.
- The air handler must be installed so that free access is allowed to the coil/filter compartment and blower/control compartment.

### Installation Clearances

#### **Non-Ducted Return Closet Installation**

The air handler can be installed in a closet with a false bottom to form a return air plenum. It may also be installed with a return air plenum under the air handler.

Louvers or return air grilles are field-supplied. Local codes may limit application of systems without a ducted return to single-story buildings.

When a **MAHMCCTA** unit is installed in a closet with a louvered return opening, the minimum open area for the louvers will be:

- 320 square inches for -018 and -024 models;
- 360 square inches for -030 and -036 models;
- 450 square inches for -042 thru -060 models

If the free area is not known, assume a 25% free area for wood or a 75% free area for metal louvers or grilles. Using the louver dimensions and the 25% or 75% assumption, determine if the open area meets the minimum open area listed above.

If a return air plenum is used, the return air grille should be immediately in front of the opening in the plenum to allow for the free flow of return air. When not installed in front of the opening, there must be adequate clearance around the air handler to allow for the free flow of return air.

### Installation

Each unit consists of a blower assembly, refrigerant coil, and controls in an insulated galvanized steel factory-finished enclosure. Knockouts are provided for electrical wiring entrance.

For ease in installation, it is best to make any necessary coil configuration changes before setting air handler in place.

#### **Refrigerant Metering Device**

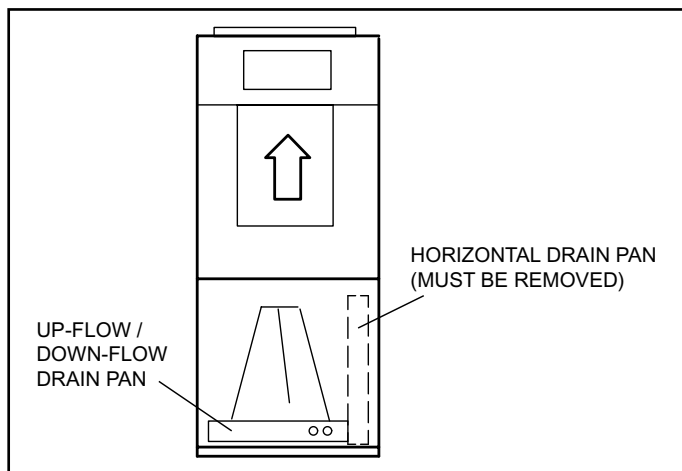
**MAHMCCTA** units are equipped with a factory-installed check/expansion valve or an RFC device.

## Upflow Application

1. The air handler must be supported on the bottom only and set on solid floor or field-supplied support frame. Securely attach the air handler to the floor or support frame.
2. If installing a unit in an upflow application, remove the horizontal drain pan.

**NOTE:** The horizontal drain pan is not required in upflow air discharge installations; its removal provides the best efficiency and air flow.

3. Place the unit in the desired location and slope unit. Connect return and supply air plenums as required using sheet metal screws.
4. Install units that have no return air plenum on a stand that is at least 14" from the floor. This will allow proper air return.



**Figure 1. Upflow Configuration**

## Horizontal Applications

### **⚠ IMPORTANT**

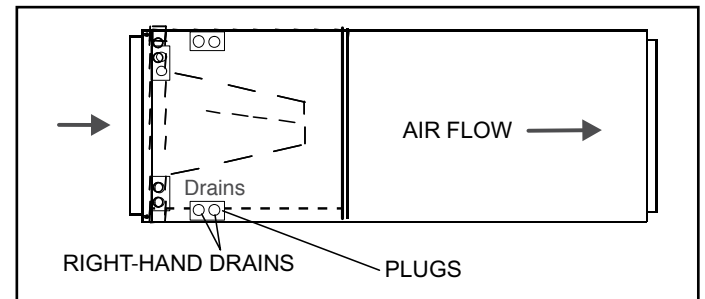
When removing the coil, there is a possibility of danger of equipment damage and personal injury. Be careful when removing the coil assembly from a unit installed in right- or left-hand applications. The coil may tip into the drain pan once it is clear of the cabinet. Support the coil when removing it.

**NOTE:** When the unit is installed in horizontal applications, a secondary drain pan is recommended. Refer to local codes.

**NOTE:** This unit may be installed in left-hand or right-hand air discharge horizontal applications. Adequate support must be provided to ensure cabinet integrity. Ensure that there is adequate room to remove service and access panels if installing in the horizontal position.

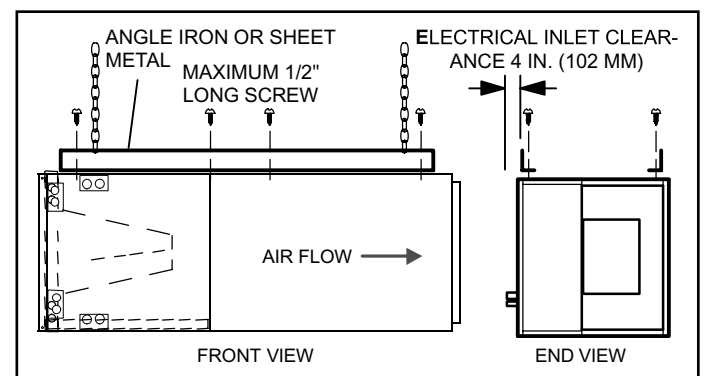
## Right-Hand Discharge

1. Determine which plugs are required for drain line connections.
2. With access door removed, remove drain line plugs to install drain lines.
3. Set unit so that it is sloped toward the upflow drain pan end of the unit and level from front to back of unit (see Figure 6).
4. The horizontal configuration is shown in Figure 2.



**Figure 2. Right-Hand Discharge Configuration**

5. If the unit is suspended, the entire length of the cabinet must be supported. If you use a chain or strap, use a piece of angle iron or sheet metal attached to the unit (either above or below) to support the length of the cabinet. Use securing screws no longer than 1/2 inch to avoid damaging the coil or filter. See Figure 3. Use sheet metal screws to connect the return and supply air plenums as required.



**Figure 3. Suspending Horizontal Unit**

## Left-Hand Air Discharge

For horizontal left-hand air discharge, the following field modifications are required.

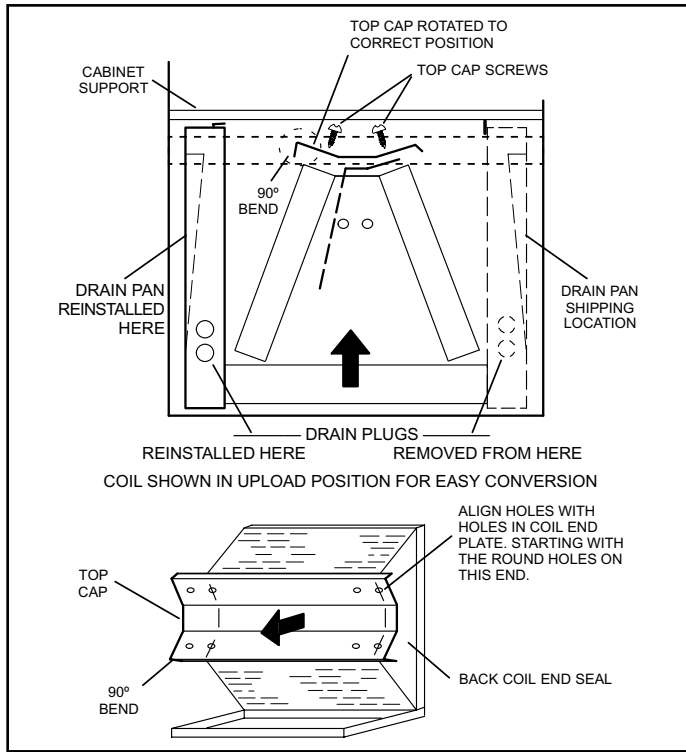
1. Remove access panels and the corrugated padding between the blower and coil assembly. Discard the corrugated padding.
2. Pull the coil assembly from unit. Pull off the horizontal drain pan.
3. Remove the drain plugs from back drain holes on horizontal drain pan and reinstall them on front holes.



## ⚠ IMPORTANT

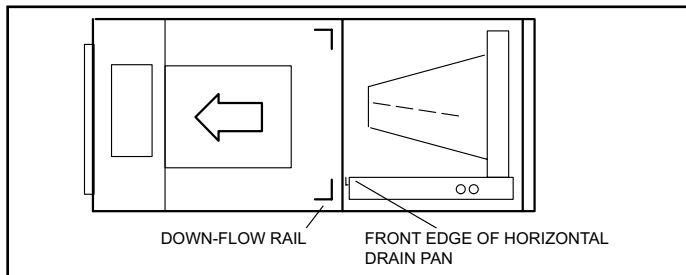
After removal of drain pan plug(s), check drain hole(s) to verify that drain opening is fully open and free of any debris. Also check to make sure that no debris has fallen into the drain pan during installation that may plug up the drain opening.

4. Rotate drain pan 180° front-to-back and install it on the opposite side of the coil.
5. Remove screws from top cap.
6. Remove plastic plug from left hole on coil front end seal and reinstall plug in back hole.



**Figure 4. Field Modification for Left-Hand Discharge**

7. Rotate top cap 180° front-to-back and align with unused screw holes. Holes must align with front and back coil end plates. The top cap has a 45° bend on one side and a 90° bend on the other. **The 90° bend must be on the same side as the horizontal drain pan** as illustrated in Figure 4.



**Figure 5. Left-Hand Discharge Configuration**

**NOTE:** Be very careful when reinstalling the screws into the coil end plate engaging holes. Misaligned screws may damage the coil.

8. From the upflow position, flip cabinet 90° to the left and set into place. Replace blower assembly. Secure coil in place by bending down the tab on the cabinet support rail as illustrated.
9. Install the horizontal shield (-060 model) on the front edge of the horizontal drain pan as illustrated in Figure 5.

**NOTE:** For horizontal applications in high humidity areas, remove the downflow rail closest to the drain pan. To remove rail, remove screw from rail at back of unit and at cabinet support rail. Remove downflow rail then replace screws. Also, seal around the exiting drain pipe, liquid and suction lines to prevent infiltration of humid air.

10. Knock out drain seal plate from access door. Secure plate to cabinet front flange with screw provided.
11. Flip access door and replace it on the unit.
12. Set unit so that it is sloped 1/4" toward the drain pan end of the unit. Connect return and supply air plenums as required using sheet metal screws.
13. If suspending the unit, it must be supported along the entire length of the cabinet. If using chain or strap, use a piece of angle iron or sheet metal attached to the unit (either above or below) so that the full length of the cabinet is supported. Use securing screws no longer than 1/2" to avoid damage to coil or filter, as illustrated in Figure 3. Connect return and supply air plenums as required using sheet metal screws.

### Downflow Application

**NOTE:** If downflow application is required, separately order kit number 83M57 and install per kit's instructions. Also use metal or class I supply and return air plenums. Use the installation instruction provided with the downflow kit.

## ⚠ IMPORTANT

If electric heat section with circuit breakers (ECBA25) is installed in a MAHM\*CTA unit in a downflow application, the circuit breakers must be rotated 180° to the UP position. See ECBA25 installation instructions for more details.

## Condensate Drain

### ⚠ IMPORTANT

On units of this type, where the blower “draws” rather than “blows” air through the coil, traps must be installed in the condensate drain lines (primary and auxiliary, if used). Traps prevent the blower from drawing air through the drain lines into the air supply.

### ⚠ IMPORTANT

A field-fabricated secondary drain pan, with a drain pipe to the outside of the building, is required in all installations over a finished living space or in any area that may be damaged by overflow from the main drain pan. In some localities, local codes may require a secondary drain pan for any horizontal installation.

## Sloping The Unit

Make sure the unit is sloped (similar to the slope shown in Figure 6) so that the drain pan will empty completely without water standing in the pan.

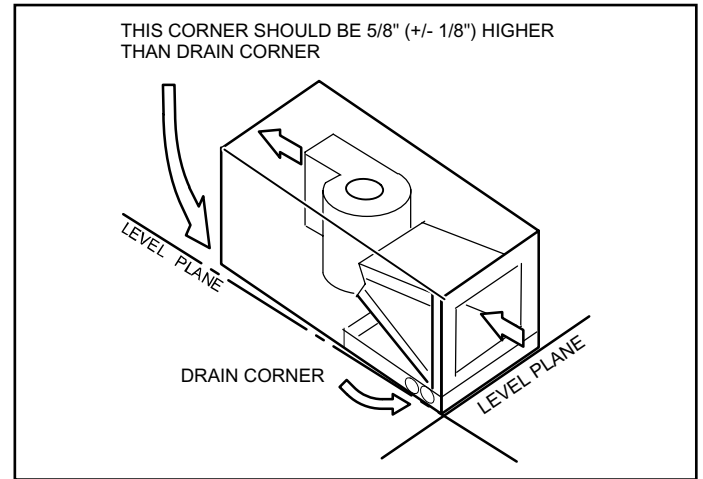


Figure 6. Sloping the Unit for Proper Drainage

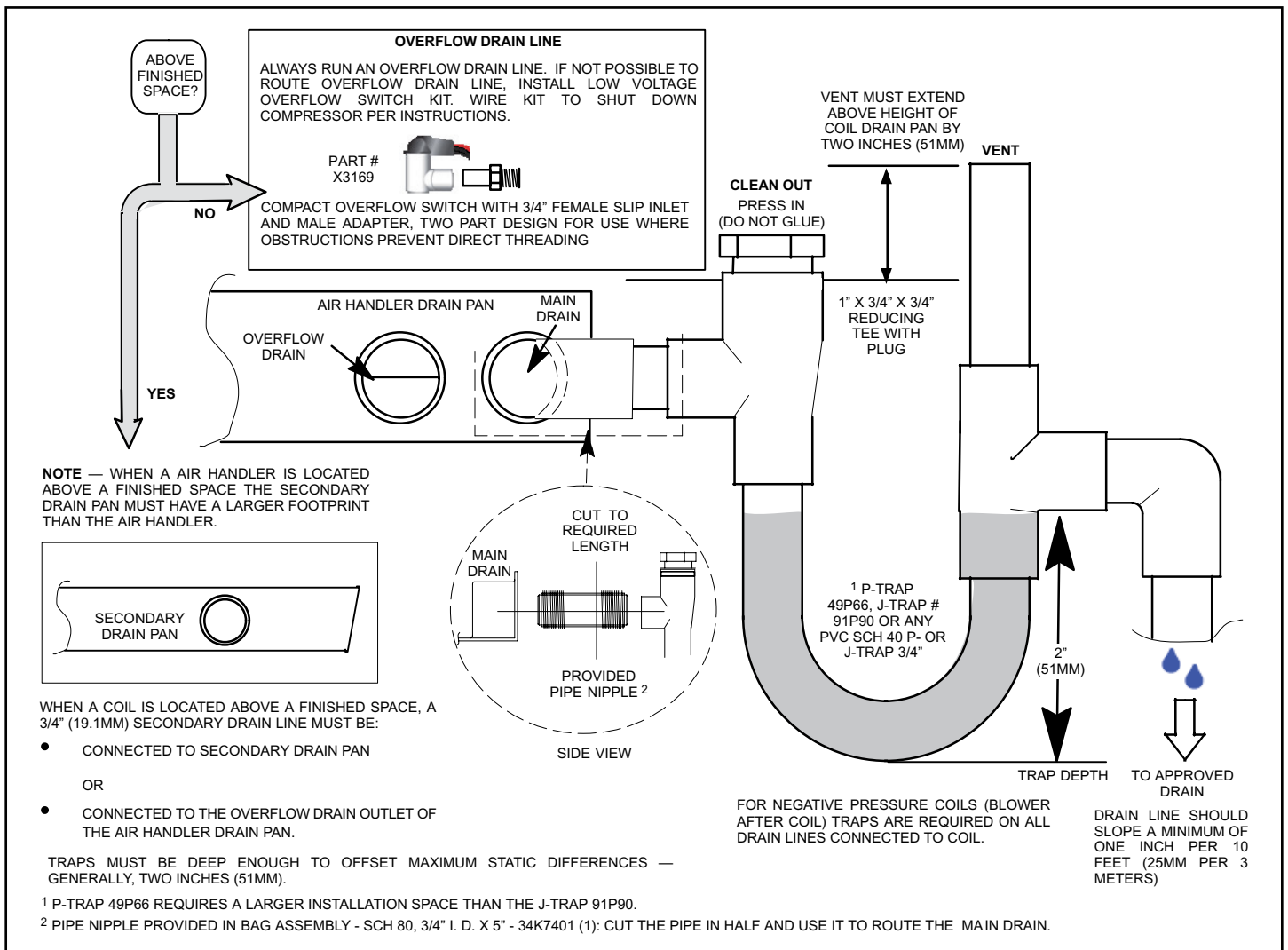


Figure 7. Typical Main and Overflow Drain

## Install Condensate Drain

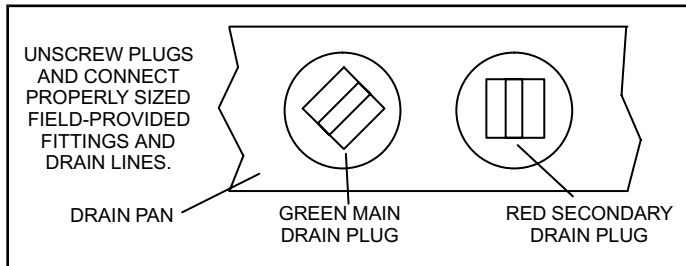
The air handler is provided with 3/4" NPT condensate drain connections.

### **! IMPORTANT**

On some pans, the primary and secondary drain holes have knockouts.

Confirm primary and secondary drains are open.

1. MAHM\*CTA units are equipped with a drain pan, which includes green (main drain) and red (secondary drain) plugs. Unscrew the plugs to remove them before inserting condensate drain fittings.



**Figure 8. Drain Line Connections**

2. Install properly sized, field-provided connection fittings and connect primary drain line to the main drain pan connection.

**NOTE:** When installing drain line connection fittings to the drain pan, hand tighten the fitting and use a thread sealant. Over-tightening the fittings can split connections on the drain pan.

3. If the secondary drain line is to be used, remove the plug or the knockout and route the drain line so that water draining from the outlet will be easily noticed by the homeowner. Refer to local codes for drain trap requirements on the secondary drain line.
4. Check again to ensure drain ports and drain pan are free of all debris.
5. Plug and check any unused drain pan openings for tightness. Torque plugs to 30 in. lb. to prevent water leaks or seepage from the drain pan.
6. Install a 2" trap in the main (primary) drain lines as close to the unit as practical (see Figure 7). Make sure the top of the trap is below the connection to the drain pan to allow complete drainage of the pan.

**NOTE:** Horizontal runs must have an anti-siphon air vent (standpipe) installed ahead of the horizontal run. See Figure 7. An extremely long horizontal run may require an oversized drain line to eliminate air traps.

**NOTE:** Do not operate air handler without a trap in the main (primary) drain. The condensate drain is on the negative pressure side of the blower; therefore, air being pulled through the condensate line will not allow positive drainage without a proper trap.

7. Route the drain line to the outside or to an appropriate drain. Drain lines must be installed so they do not block service access to the front of the air handler. A 24" clearance is required for filter, coil, or blower removal and service access.

**NOTE:** Check local codes before connecting the drain line to an existing drainage system. Insulate the drain lines where sweating could cause water damage.

## Test Condensate Drain

Test the drain pan and drain line after installation:

1. Pour several quarts of water into drain pan. Use enough water to fill both the drain trap and the line.
2. Check the installed drain pan. Drain pan must be draining completely. Drain line fittings must not be leaking. Water must be draining from the end of the primary drain line.
3. Correct any leaks found.

## Duct System and Filters

### Duct System

The air handler is provided with flanges for the connection of the supply plenum.

Supply and return duct system must be adequately sized to meet the system's air requirements and static pressure capabilities. The duct system should be insulated with a minimum of 1" thick insulation with a vapor barrier in conditioned areas or 2" minimum in unconditioned areas.

Supply plenum should be the same size as the flanged opening provided around the blower outlet and should extend at least 3 ft. from the air handler before turning or branching off plenum into duct runs. The plenum forms an extension of the blower housing and minimizes air expansion losses from the blower.

### Filters

A filter is provided. Table 1 lists the filter size for each unit.

Model	Filter Size – in.
-018, -024, -030	15" x 20" x 1"
-036, -042, -048, -060	18" x 20" x 1"

**Table 1. Unit Air Filter Size Chart**

**⚠ IMPORTANT**

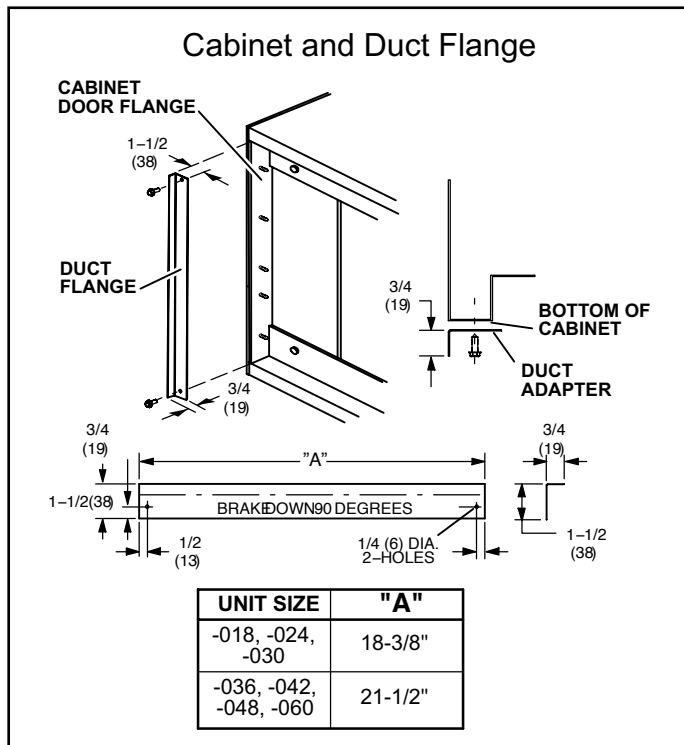
If a high efficiency filter is being installed as part of this system to ensure better indoor air quality, the filter must be properly sized. High efficiency filters have a higher static pressure drop than standard efficiency glass/foam filters. If the pressure drop is too great, system capacity and performance may be reduced. The pressure drop may also cause the limit to trip more frequently during the winter and the indoor coil to freeze in the summer, resulting in an increase in the number of service calls. Before using any filter with this system, check the specifications provided by the filter manufacturer against the data given in the appropriate Product Specifications. Additional information is provided in Service and Application Note ACC002 (August 2000).

**Installing Duct System**

Connect supply air duct to the flange on top of the air handler. If an isolation connector is used, it must be nonflammable.

**Field-Fabricated Return Air Duct Flange for Horizontal Applications**

A return air duct system is recommended, but not factory-provided. If the unit is installed in a confined space or closet, run a full-size return connection to a location outside the closet.



**Figure 9. Cabinet and Duct Flange**

**Brazing Refrigerant Lines**

Refrigerant lines must be connected by a qualified technician in accordance with established procedures.

**⚠ IMPORTANT**

Refrigerant lines must be clean, dry, refrigerant-grade copper lines. Air handler coils should be installed only with specified line sizes for approved system combinations.

Handle the refrigerant lines gently during the installation process. Sharp bends or kinks in the lines will cause a restriction.

Do not remove the caps from the lines or system connection points until connections are ready to be completed.

**⚠ WARNING**

Polyol ester (POE) oils used with HFC-410A refrigerant absorb moisture very quickly. It is very important that the refrigerant system be kept closed as much as possible. DO NOT remove line set caps or service valve stub caps until you are ready to make connections.

**⚠ WARNING**



Danger of fire. Bleeding the refrigerant charge from only the high side may result in pressurization of the low side shell and suction tubing. Application of a brazing torch to a pressurized system may result in ignition of the refrigerant and oil mixture. Check the high and low pressures before applying heat.

**⚠ WARNING**



When using a high pressure gas such as nitrogen to pressurize a refrigeration or air conditioning system, use a regulator that can control the pressure down to 1 or 2 psig (6.9 to 13.8 kPa).

 **CAUTION**

Brazing alloys and flux contain materials which are hazardous to your health.

Avoid breathing vapors or fumes from brazing operations. Perform operations only in well-ventilated areas.

Wear gloves and protective goggles or face shield to protect against burns.

Wash hands with soap and water after handling brazing alloys and flux.

 **IMPORTANT**

To prevent the build-up of high levels of nitrogen when purging, it must be done in a well-ventilated area. Purge low-pressure nitrogen (1 to 2 psig) through the refrigerant piping during brazing. This will help to prevent oxidation and the introduction of moisture into the system.

**NOTE:** Recommended line length is 50' or less. If more than 50' line set is required, contact MRCOOL.

1. Route the suction and liquid lines from the fittings on the indoor coil to the fittings on the outdoor unit. Run the lines in a direct path, avoiding unnecessary turns and bends.
2. Make sure that the suction line is insulated over the entire exposed length and that neither suction nor liquid lines are in direct contact with floors, walls, duct system, floor joists, or other piping.
3. To avoid damaging the rubber grommets in the cabinet while brazing, slide the rubber grommets over the refrigerant lines until they are away from the heat source.

**NOTE:** Place wet rags against piping plate and around suction line connections.

4. Connect the suction and liquid lines to the evaporator coil. Take care to protect the cabinet and internal components as detailed in Figure 10.
5. Braze using an alloy of silver or copper and phosphorus with a melting point above 1,100°F (593°C).

**NOTE:** Do not use soft solder.

6. Allow refrigerant pipes to cool to room temperature.  
**NOTE:** Make sure to route copper refrigerant tubing away from sharp edges and make sure that it does not touch other metal surfaces. This prevents damage caused by vibration or metal-on-metal contact.
7. Reinstall the rubber grommets into the refrigerant piping panel.

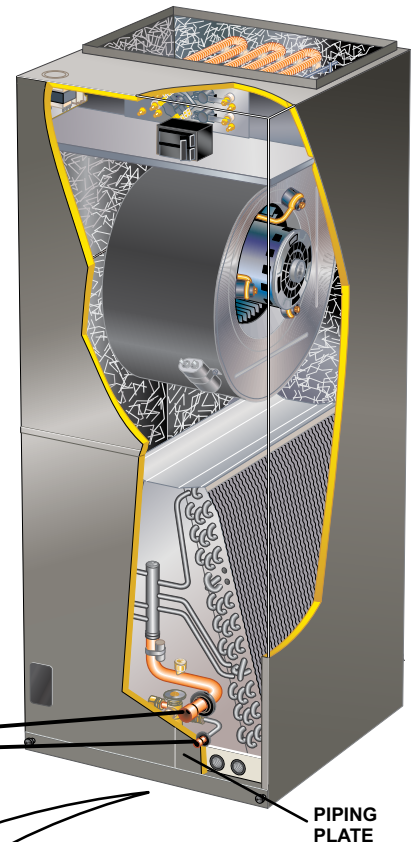
**NOTE:** Make sure expansion valve capillary tube is not touching metal edges or copper tubing.

8. Make sure outdoor unit has been placed according to the Installation Instructions and is connected to the refrigerant lines

**PLEASE READ IMPORTANT ISSUES CONCERNING BRAZING OPERATIONS IN THE BRAZING REFRIGERANT LINES SECTION BEFORE PROCEEDING.**

**NOTE - REFER TO OUTDOOR UNIT INSTALLATION INSTRUCTIONS FOR REFRIGERANT PIPING SIZE REQUIREMENTS.**

**NOTE - Use silver alloy brazing rods with five or six percent minimum silver alloy for copper-to-copper brazing, 45 percent alloy for copper-to-brass and copper-to-steel brazing.**



**A REMOVE ACCESS PANEL**

**B REMOVE RUBBER PLUG FROM BOTH LIQUID AND SUCTION LINES**

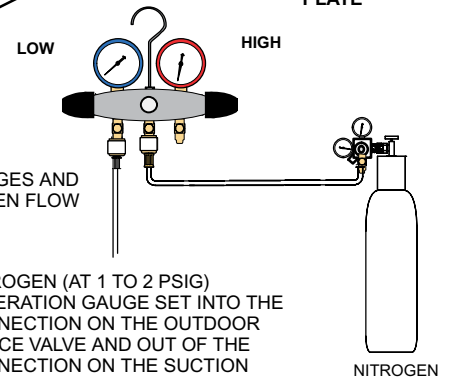
**NOTE - MAHM\*CTA SERIES UNITS USE NITROGEN OR DRY AIR AS A HOLDING CHARGE. IF THERE IS NO PRESSURE WHEN THE RUBBER PLUGS ARE REMOVED, CHECK THE COIL FOR LEAKS BEFORE INSTALLING.**

**C EITHER REMOVE OR PUSH PIPE WRAPPING BACK THROUGH HOLE IN PIPING PLATE BEFORE LINE SET CONNECTION AND BRAZING.**

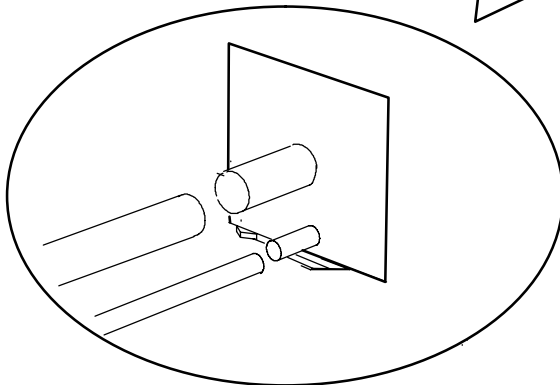
**D CONNECT PIPES**

**NOTE - REFRIGERANT LINE SETS SHOULD BE ROUTED TO ALLOW FILTER ACCESSIBILITY.**

**E CONNECT GAUGES AND START NITROGEN FLOW**



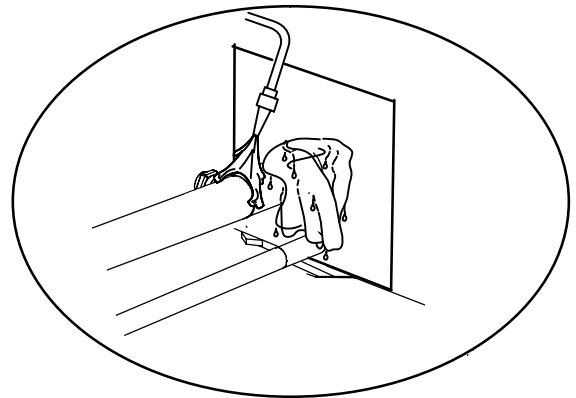
FLOW REGULATED NITROGEN (AT 1 TO 2 PSIG) THROUGH THE REFRIGERATION GAUGE SET INTO THE VALVE STEM PORT CONNECTION ON THE OUTDOOR UNIT LIQUID LINE SERVICE VALVE AND OUT OF THE VALVE STEM PORT CONNECTION ON THE SUCTION SERVICE VALVE.



**F PLACE A WET RAG AGAINST PIPING PLATE AND AROUND THE SUCTION LINE CONNECTION.**

**G BRAZE CONNECTION. ALLOW PIPE TO COOL BEFORE REMOVING WET RAG FROM CTXV SENSING BULB AND PIPING PANEL AREA.**

**H REPEAT PREVIOUS PROCEDURE FOR LIQUID LINE.**



REFER TO INSTRUCTIONS PROVIDED WITH OUTDOOR UNIT FOR LEAK TESTING, EVACUATING AND CHARGING PROCEDURES

**Figure 10. Brazing Connections**

## Sealing the Unit

Seal the unit so that warm air is not allowed into the cabinet. Warm air introduces moisture, which results in water blow-off problems. This is especially important when the unit is installed in an unconditioned area.

If installed in an unconditioned space, sealant should be applied around the electrical wires, refrigerant tubing, and condensate lines where they enter the cabinet.

### WARNING

There must be an airtight seal between the bottom of the air handler and the return air plenum. Use fiberglass sealing strips, caulking, or equivalent sealing method between the plenum and the air handler cabinet to ensure a tight seal. Return air must not be drawn from a room where this air handler or any gas-fueled appliance (i.e., water heater), or carbon monoxide-producing device (i.e., wood fireplace) is installed.

### IMPORTANT

Use duct tape and/ or Permagem to seal closed any space around the holes where the drain lines exit the cabinet. Warm air must not be allowed to enter through any gaps or holes in the cabinet.

## Electrical Connections

### WARNING



Electric shock hazard! - Disconnect all power supplies before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

### WARNING

Run 24V Class II wiring only through specified low voltage opening. Run line voltage wiring only through specified high voltage opening. Do not combine voltage in one opening.

### WARNING



Electric Shock Hazard. Can cause injury or death. Unit must be properly grounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation on units with single-pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies.

### WARNING

Electric Shock Hazard.

Can cause injury or death.



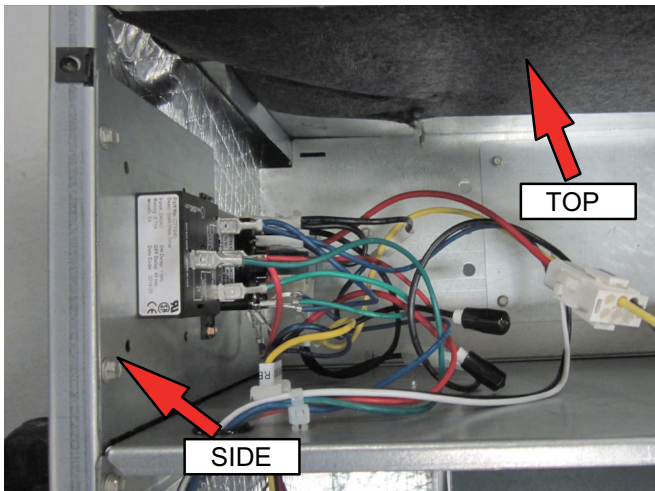
Foil-faced insulation has conductive characteristics similar to metal. Be sure there are no electrical connections within 1/2" of the insulation. If the foil-faced insulation comes in contact with electrical voltage, the foil could provide a path for current to pass through to the outer metal cabinet. While the current produced may not be enough to trip existing electrical safety devices (e.g., fuses or circuit breakers), the current can be enough to cause an electrical shock hazard that could cause personal injury or death.

- Wiring must conform to the current National Electric Code ANSI/NFPA No. 70, or Canadian Electric Code Part I, CSA Standard C22.1, and local building codes. Refer to following wiring diagrams. See unit nameplate for minimum circuit ampacity and maximum over-current protection size.
- Electrical wiring, disconnect means and over-current protection are to be supplied by the installer. Refer to the air handler rating plate for maximum over-current protection, minimum circuit ampacity, as well as operating voltage. Select the proper supply circuit conductors in accordance with tables 310-16 and 310-17 in the National Electric Code, ANSI/NFPA No. 70 or tables 1 through 4 in the Canadian Electric Code, Part I, CSA Standard C22.1.
- The power supply must be sized and protected according to the specifications supplied on the product.
- This air handler is factory-configured for 240 volt, single phase, 60 cycles. For 208-volt applications, see "208 Volt Conversion" later in this section.

- Separate openings have been provided for 24V low voltage and line voltage. Refer to the dimension illustration of specific location.
- This unit is provided with holes for conduit. Use provided caps to seal holes not used.
- Typical unit wiring (as well as wiring of optional field-installed electric heat) is given in Figure 14. Refer to the instructions provided with the electric heat section for proper installation.

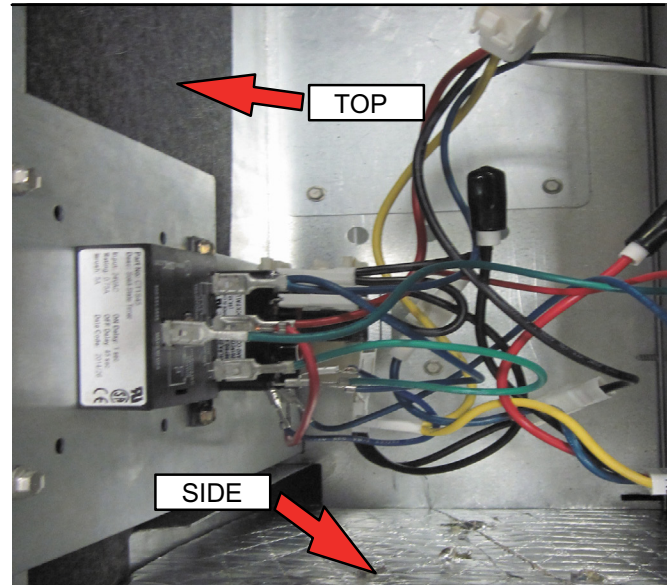
**⚠ WARNING**  
**USE COPPER CONDUCTORS ONLY**

1. Disconnect all power supplies.
2. Remove the air handler access panel.
3. Route the field supply wires to the air handler electrical connection box.
4. Use UL-listed wire nuts to connect the field supply conductors to the unit black and yellow leads, and the ground wire to ground terminal marked GND.
5. Replace the air handler access panel.



**Figure 11. Electrical Connections (Upflow Configuration)**

**NOTE:** To avoid the possibility of moisture damage to the control in some right-hand discharge configurations, the control panel can be relocated to the end panel as shown in Figure 12.




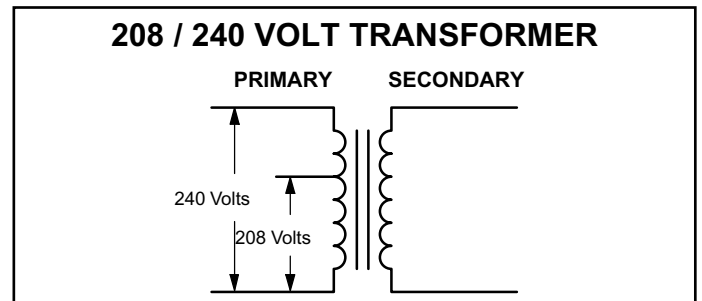
**Figure 12. Control Panel Relocated to End Panel (Left-Hand Horizontal Configuration)**

### 208 Volt Conversion

1. Disconnect all power supplies.
2. Remove the air handler access panel.
3. Using the wiring diagram located on the unit access panel as a reference, move the 2 connected black transformer leads from the 240 volt terminal on the transformer to the 208 volt terminal on the transformer.

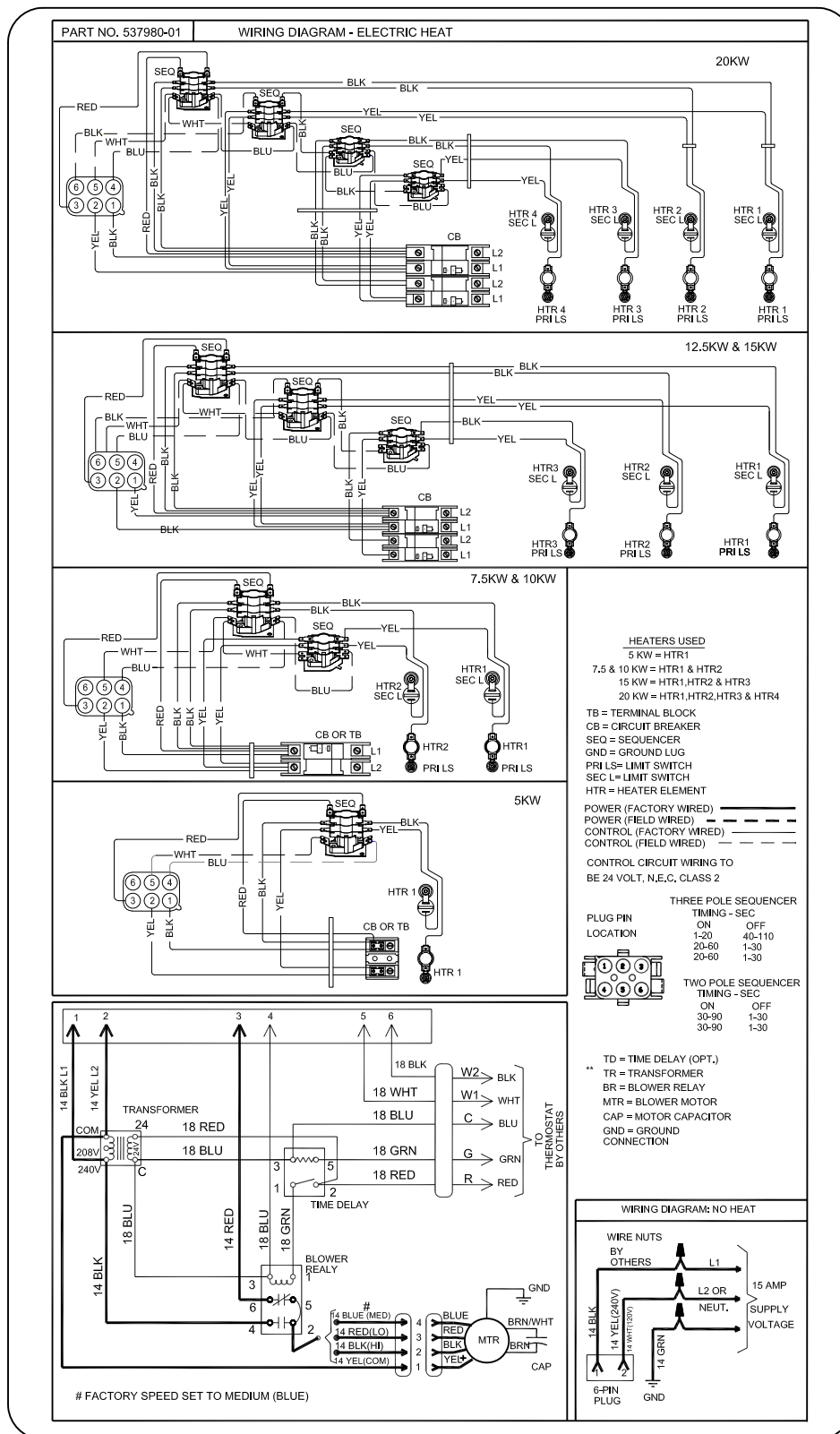
**⚠ WARNING**

 Electrically ground air handler. Connect ground wire to ground terminal marked "GND". Failure to do so can result in death or electrical shock.



**Figure 13. Converting Unit from 240VAC to 208VAC**





**ELECTRIC HEAT**

**PSC LABEL WIRING DIAGRAM**

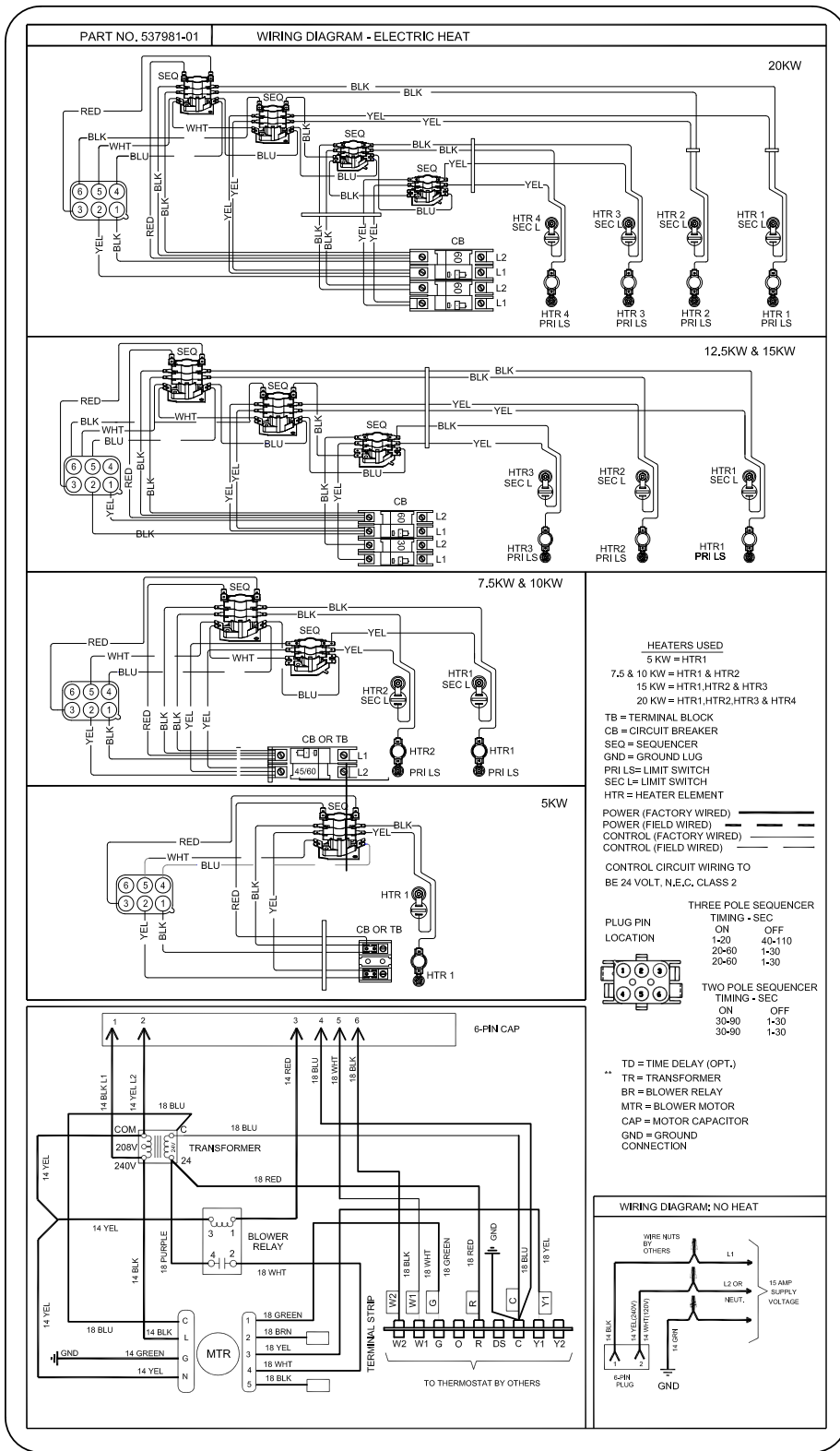
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Form No.  
**537980-01**

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**Figure 14. Typical Wiring Diagram MAHM\*CTA Air Handler with Electric Heat – PSC (018, 024, 030, 036, 042 models)**



**ELECTRIC HEAT**

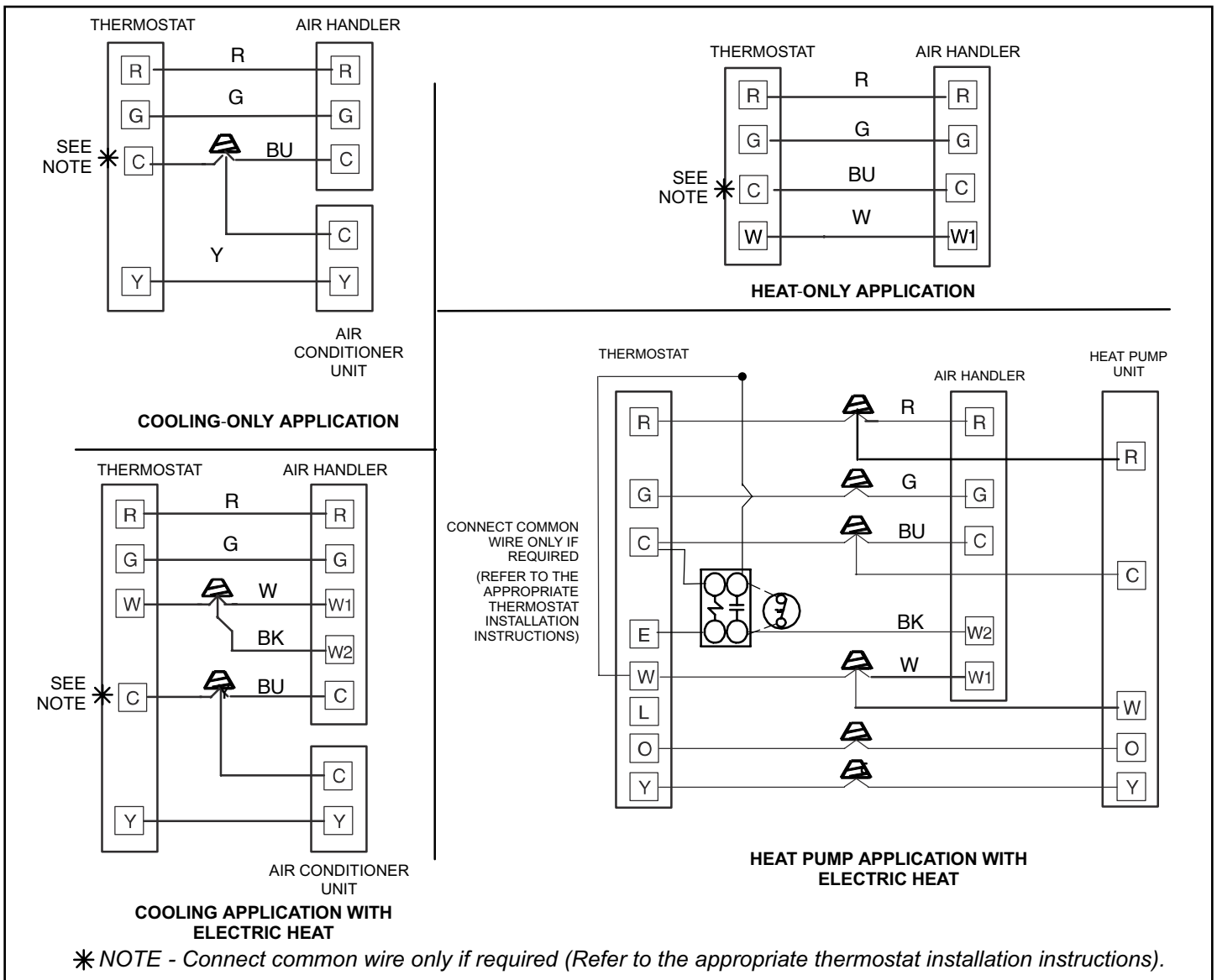
**CONSTANT TORQUE LABEL WIRING DIAGRAM**

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Form No.  
537981-01

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Figure 15. Typical Wiring Diagram MAHM\*CTA Air Handler with Electric Heat – CT (048 and 060 models)



**Figure 16. Low Voltage Connections (3-Speed PSC Motor) – Field Wiring**

**Air Flow – Cooling Blower Speed**

The cooling blower speed is factory configured to provide correct air flow for an outdoor unit that matches the cooling capacity rating of the air handler.

If the outdoor unit is smaller than the maximum cooling capacity rating for the air handler, the cooling blower speed may need to be changed. Refer to blower performance chart in Table 2.

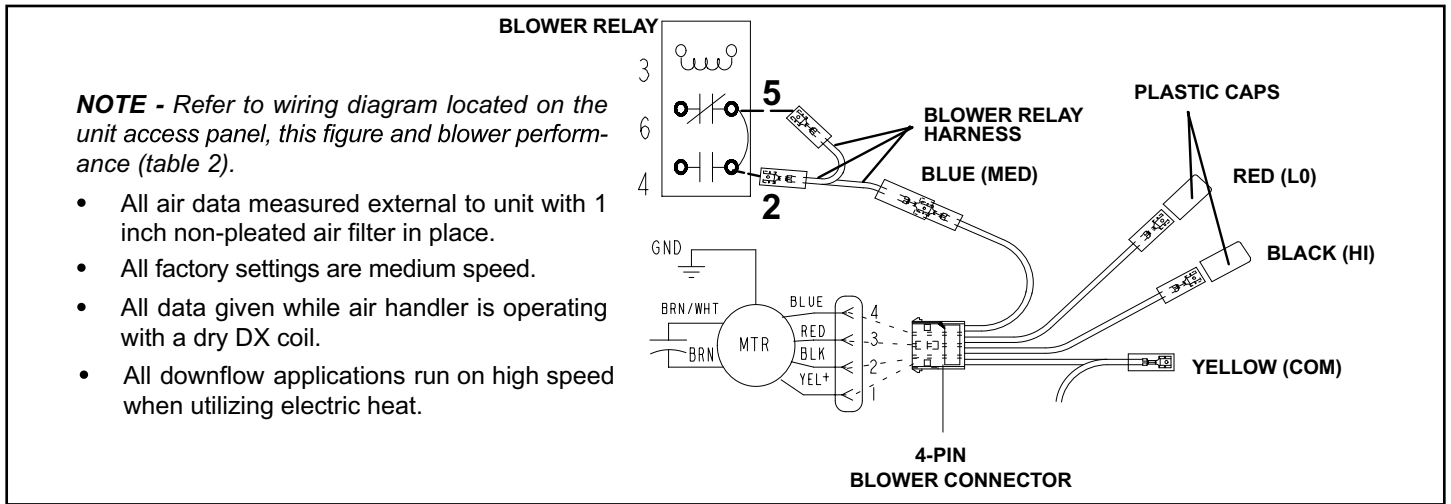
**⚠ WARNING**

Electric shock hazard! - Disconnect all power supplies before servicing.  
Replace all parts and panels before operating.  
Failure to do so can result in death or electrical shock.

**Change Blower Speed**

1. Disconnect all power supplies.
2. Remove the air handler access panel.
3. Locate pin number 2 on the blower relay. Two black wires are connected to this terminal pin. One connects to pin number 5 on the blower relay, one connects to an in-line splice connecting to a blue wire.
4. Select the required blower motor speed. Connect red-LO or black-HI and plug it into the 4-pin blower relay harness connector.
5. Replace all panels.
6. Reconnect power.

**NOTE:** Reuse the factory-installed wire nut on the unused wires.



**Figure 17. Changing Blower Speed**

**NOTE:** To change blower speed on Constant Torque -048 and -060 units, remove the wire from terminal Y1 on the strip and install on either of the speeds not being used (Brown TAP 2 or Black TAP 5).

Air Handler Model	Blower Speed	.10" WC	.20" WC	.30" WC	.40" WC	.50" WC
-018	LOW	538	525	503	471	418
	MED	688	670	639	603	548
	HIGH	919	881	855	788	710
-024	LOW	677	673	657	629	592
	MED	1011	979	942	803	742
	HIGH	1106	1045	999	917	857
-030	LOW	871	870	853	812	769
	MED	1078	1057	1024	987	936
	HIGH	1311	1261	1214	1154	1086
-036	LOW	1020	972	956	909	806
	MED	1276	1240	1191	1148	1086
	HIGH	1559	1521	1446	1395	1327
-042	LOW	1300	1273	1250	1211	1155
	MED	1527	1493	1452	1390	1345
	HIGH	1816	1756	1693	1605	1528
-048	LOW	1257	1212	1157	1116	1053
	MED LOW	1486	1448	1411	1364	1330
	MED	1721	1675	1630	1594	1553
	MED HIGH	1721	1675	1630	1594	1553
	HIGH	1840	1794	1754	1721	1681
-060	LOW	1098	1049	1001	926	831
	MED LOW	1624	1594	1565	1520	1492
	MED	1815	1783	1758	1730	1685
	MED HIGH	1903	1869	1837	1809	1764
	HIGH	1981	1957	1923	1893	1861

Blower Performance (CFM vs. ESP inches H20)

- Cooling speeds should not be reduced below factory setting.
- All units with electric heat approved at 0.5" maximum and medium blower speed minimum.
- All downflow applications run on high speed when utilizing electric heat.

**Table 2. MAHM\*CTA Blower Performance (3-Speed PSC) – 240V (CFM @ ESP. – in. W. C.)**

## Check-Out Procedures

**NOTE:** Refer to outdoor unit installation instructions for system start-up instructions and refrigerant charging instructions.

### Pre-Start-Up Checks

- Is the air handler properly and securely installed?
- If horizontally configured, is the unit sloped up to 5/8 inch toward drain lines?
- Will the unit be accessible for servicing?
- Has an auxiliary pan been provided under the unit with separate drain for units installed above a finished ceiling or in any installation where condensate overflow could cause damage?
- Have ALL unused drain pan ports been properly plugged?
- Has the condensate line been properly sized, run, trapped, pitched, and tested?
- Is the duct system correctly sized, run, sealed, and insulated?
- Have all cabinet openings and wiring been sealed?
- Is the indoor coil factory-installed TXV or RFC properly sized for the outdoor unit being used?
- Have all unused parts and packaging been disposed of?
- Is the filter clean, in place, and of adequate size?
- Is the wiring neat, correct, and in accordance with the wiring diagram?
- Is the unit properly grounded and protected (fused)?
- Is the thermostat correctly wired and in a good location?
- Are all access panels in place and secure?

### Check Blower Operation

1. Set thermostat to FAN ON. The indoor blower should come on.

### Check Cooling Operation

1. Set thermostat to force a call for cooling (approximately 5°F lower than the indoor ambient temperature).
2. The outdoor unit should come on immediately and the indoor blower should start between 30 - 60 seconds later.
3. Check the air flow from a register to confirm that the system is moving cooled air.
4. Set the thermostat 5°F higher than the indoor temperature. The indoor blower and outdoor unit should cycle off.

### Check Electric Heat (If Used)

1. Set thermostat to call for auxiliary heat (approximately 5°F above ambient temperature). The indoor blower and auxiliary heat should come on together. Allow a minimum of 3 minutes for all sequencers to cycle on.
2. Set the thermostat so that it does not call for heat. Allow up to 5 minutes for all sequencers to cycle off.

## Operation

### Time Delay Relay

Blower time delay operation:

1. When cooling demand is initiated, there is a 1 second motor-on delay.
2. After the motor-on delay expires, motor ramps up to 100% and runs at 100% until cooling demand is satisfied.
3. Once demand is met, motor runs at 100% for 45 seconds.
4. Motor ramps down to stop.

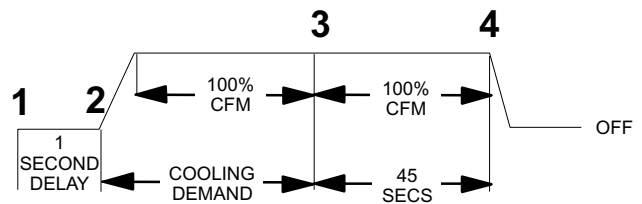


Figure 18. Blower Time Delay

### Cooling (Cooling Only or Heat Pump)

When the thermostat calls for cooling, 24 volts is put on the blower time-delay relay coil and then the indoor blower relay energizes. The normally open contacts close, causing the indoor blower motor to operate. The circuit between R and Y is completed, closing the circuit to the contactor in the outdoor unit, starting the compressor and outdoor fan motor.

On heat pumps, circuit R and O energizes the reversing valve, switching the valve to the cooling position. (The reversing valve remains energized as long as the thermostat selector switch is in the COOL position.)

At the completion of the cooling demand the indoor blower and outdoor unit should cycle off. Air handler should cycle off 45 seconds after the outdoor unit shuts off.

### Heating (Electric Heat Only)

When the thermostat calls for heat, the circuit between R and W is completed, and the heat sequencer is energized. A time delay follows before the heating elements and the indoor blower motor come on. Units with a second heat sequencer can be connected with the first sequencer to W on the thermostat sub-base, or they may also be connected to a second stage on the sub-base.

## Heating (Heat Pump)

When the thermostat calls for heating, 24 volts is applied to the blower time-delay relay coil. Then, normally open contacts close, causing the indoor blower motor to operate. The circuit between R and Y is completed, closing the circuit to the contactor in the outdoor unit, starting the compressor and outdoor fan motor.

If the room temperature continues to decrease, the circuit between R and W1 is completed by the second-stage heat room thermostat. Circuit R-W1 energizes a heat sequencer. The completed circuit will energize supplemental electric heat (if applicable). Units with a second heat sequencer can be connected with the first sequencer to W1 on the thermostat. They may also be connected to a second heating stage W2 on the thermostat sub-base.

## Emergency Heat (Heating Heat Pump)

If the selector switch on the thermostat is set to the emergency heat position, the heat pump will be locked out of the heating circuit, and all heating will be electric heat (if applicable). A jumper should be placed between W2 and E on the thermostat sub-base so that the electric heat control will transfer to the first-stage heat on the thermostat. This will allow the indoor blower to cycle on and off with the electric heat when the fan switch is in the AUTO position.

## Homeowner Maintenance

### **⚠ IMPORTANT**

Do not operate system without a filter. A filter is required to protect the coil, blower, and internal parts from excessive dirt and dust. The filter is placed in the return duct by the installer.

- Inspect air filters at least once a month and replace or clean as required. Dirty filters are the most common cause of inadequate heating or cooling performance.
- Replace disposable filters. Cleanable filters can be cleaned by soaking in mild detergent and rinsing with cold water.
- Install new/clean filters with the arrows on the side pointing in the direction of air flow. Do not replace a cleanable (high velocity) filter with a disposable (low velocity) filter unless return air system is properly sized for it.
- If water should start coming from the secondary drain line, a problem exists which should be investigated and corrected. Contact a qualified service technician.

## Repairing or Replacing Cabinet Insulation

### **⚠ IMPORTANT**

**DAMAGED INSULATION MUST BE REPAIRED OR REPLACED** before the unit is put back into operation. Insulation loses its insulating value when wet, damaged, separated or torn.

Matte- or foil-faced insulation is installed in indoor equipment to provide a barrier between outside air conditions (surrounding ambient temperature and humidity) and the varying conditions inside the unit. If the insulation barrier is damaged (wet, ripped, torn or separated from the cabinet walls), the surrounding ambient air will affect the inside surface temperature of the cabinet.

The temperature/humidity difference between the inside and outside of the cabinet can cause condensation on the inside or outside of the cabinet which leads to sheet metal corrosion and, subsequently, component failure.

## Repairing Damaged Insulation

Areas of condensation on the cabinet surface are an indication that the insulation is in need of repair.

If the insulation in need of repair is otherwise in good condition, the insulation should be cut in an X pattern, peeled open, glued with an appropriate all-purpose glue and placed back against the cabinet surface, being careful to not overly compress the insulation so the insulation can retain its original thickness. If such repair is not possible, replace the insulation. If using foil-faced insulation, any cut, tear, or separations in the insulation surface must be taped with a similar foil-faced tape.

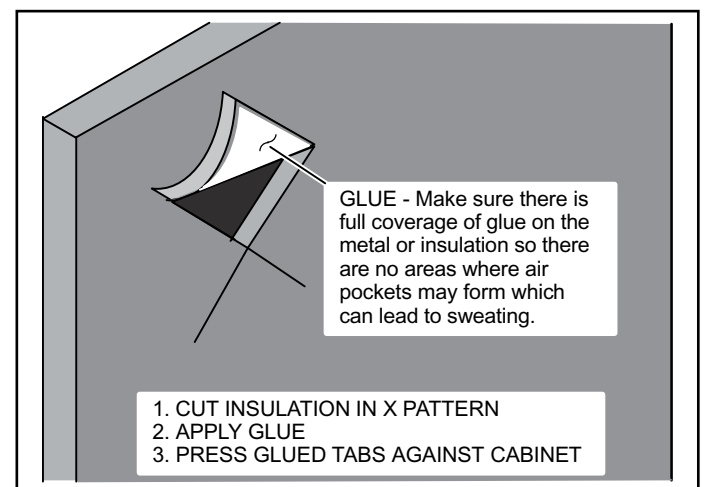


Figure 19. Repairing Insulation

## Professional Maintenance

### NOTICE

Failure to follow instructions will cause damage to the unit.

This unit is equipped with an aluminum coil. Aluminum coils may be damaged by exposure to solutions with a pH below 5 or above 9. The aluminum coil should be cleaned using potable water at a moderate pressure (less than 50psi). If the coil cannot be cleaned using water alone, it is recommended to use a coil cleaner with a pH in the range of 5 to 9. The coil must be rinsed thoroughly after cleaning.

In coastal areas, the coil should be cleaned with potable water several times per year to avoid corrosive buildup (salt).

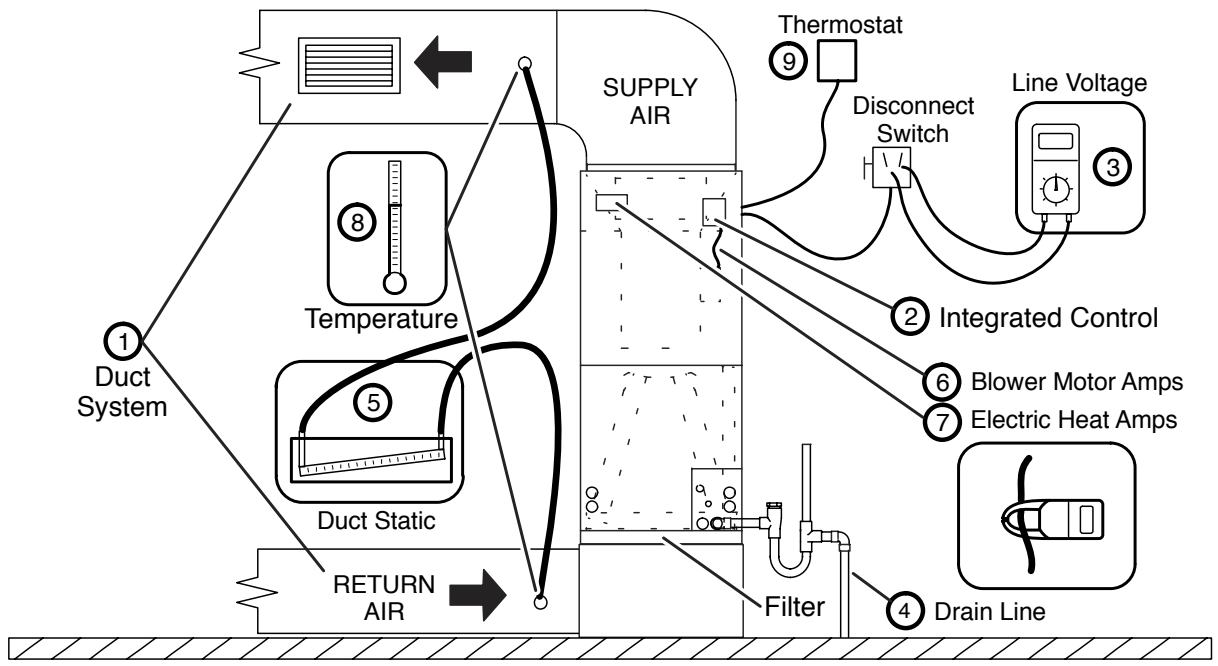
## Use of Air Handler During Construction

It is not recommended to use this air handler unit during any phase of construction. Very low return air temperatures, harmful vapors and operation of the unit with clogged or misplaced filters will damage the unit.

Air handler units may be used for heating (heat pumps) or cooling of buildings under construction, if the following conditions are met:

- A room thermostat must control the air handler. The use of fixed jumpers is not allowed.
- Air filter must be installed in the system and must be maintained during construction.
- Air filter must be replaced upon construction completion.
- The air handler evaporator coil, supply fan assembly and duct system must be thoroughly cleaned following final construction clean-up.
- All air handler operating conditions must be verified according to these installation instructions.

Installing Contractor's Name \_\_\_\_\_ Installing Date \_\_\_\_\_  
 Installing Contractor's Phone \_\_\_\_\_ Air Handler Model # \_\_\_\_\_  
 Job Address \_\_\_\_\_



- |  |   |
|--|---|
| <p><b>① DUCT SYSTEM</b></p> <p>SUPPLY AIR DUCT</p> <p><input type="checkbox"/> Sealed</p> <p><input type="checkbox"/> Insulated (if necessary)</p> <p><input type="checkbox"/> Registers Open and Unobstructed</p> <p>RETURN AIR DUCT</p> <p><input type="checkbox"/> Sealed</p> <p><input type="checkbox"/> Filter Installed and Clean</p> <p><input type="checkbox"/> Registers Open and Unobstructed</p> <p><b>② INTEGRATED CONTROL</b></p> <p><input type="checkbox"/> Jumpers Configured Correctly (if applicable)</p> <p><input type="checkbox"/> Appropriate Links in Place (if applicable)</p> <p><b>③ VOLTAGE CHECK</b></p> <p><input type="checkbox"/> Supply Voltage _____</p> <p><input type="checkbox"/> Low Voltage _____</p> <p><input type="checkbox"/> Electrical Connections Tight</p> <p><b>④ DRAIN LINE</b></p> <p><input type="checkbox"/> Leak Free</p> <p><input type="checkbox"/> Explained Operation of System to Homeowner</p> | <p><b>⑤ TOTAL EXTERNAL STATIC (dry coil)</b></p> <p style="text-align: right;">dry coil    wet coil</p> <p>Supply External Static _____</p> <p>Return External Static _____</p> <p>Total External Static = _____</p> <p><b>⑥ ELECTRIC HEAT AMPS</b> _____</p> <p><b>⑦ INDOOR BLOWER AMPS</b> _____</p> <p>INDOOR BLOWER CFM _____</p> <p><b>⑧ TEMPERATURE DROP (Cooling Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Drop = _____</p> <p><b>⑧ TEMPERATURE RISE (Heating Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Rise = _____</p> <p><b>⑨ THERMOSTAT</b></p> <p><input type="checkbox"/> Adjusted and Programmed</p> <p><input type="checkbox"/> Operation Explained to Owner</p> |
|--|---|

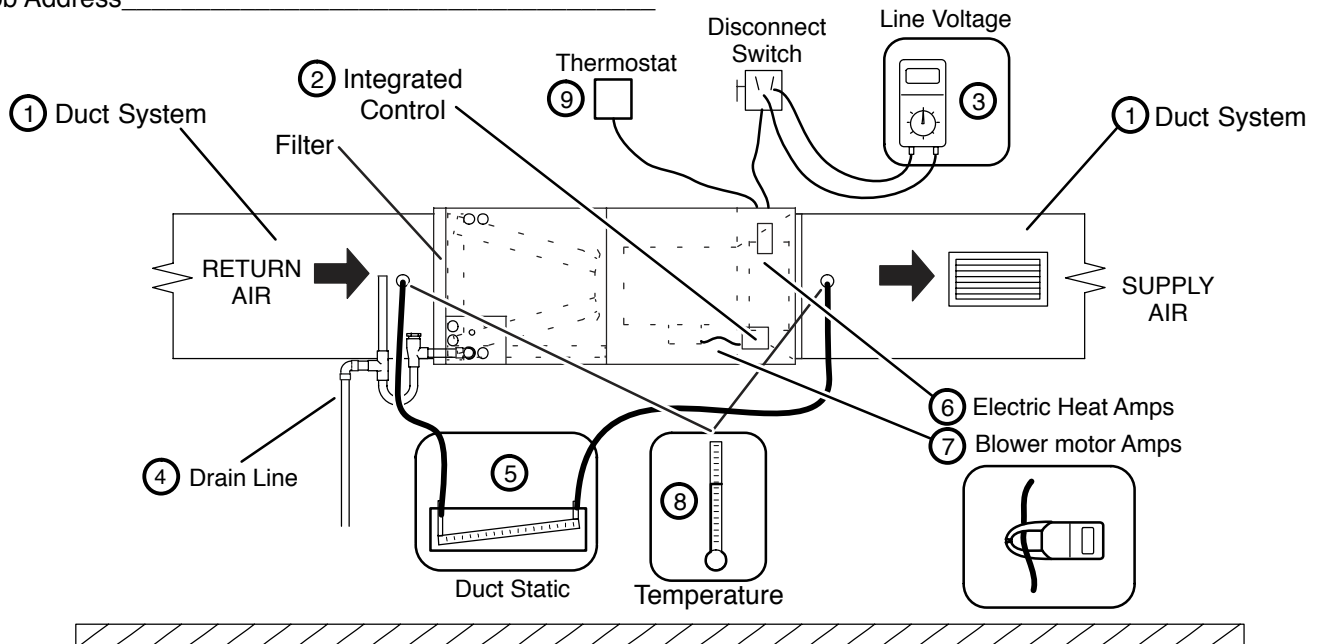
Technician's Name: \_\_\_\_\_ Date Start-Up & Performance Check Completed \_\_\_\_\_

**Figure 20. Start-Up and Performance Checklist (Upflow Configuration)**



Installing Contractor's Name \_\_\_\_\_  
 Installing Contractor's Phone \_\_\_\_\_  
 Job Address \_\_\_\_\_

Installing Date \_\_\_\_\_  
 Air Handler Model # \_\_\_\_\_

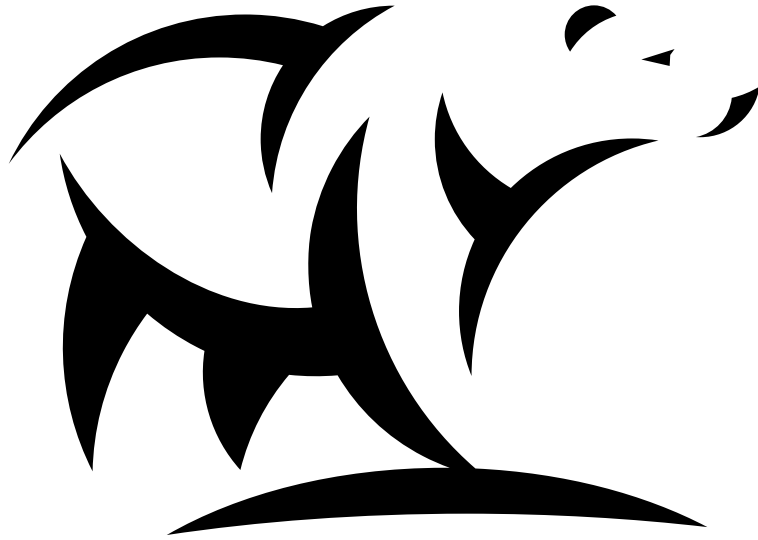


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|---|---|
| <p><b>① DUCT SYSTEM</b><br/>         SUPPLY AIR DUCT</p> <p><input type="checkbox"/> Sealed</p> <p><input type="checkbox"/> Insulated (if necessary)</p> <p><input type="checkbox"/> Registers Open and Unobstructed</p> <p>RETURN AIR DUCT</p> <p><input type="checkbox"/> Sealed</p> <p><input type="checkbox"/> Filter Installed and Clean</p> <p><input type="checkbox"/> Registers Open and Unobstructed</p> <p><b>② INTEGRATED CONTROL</b></p> <p><input type="checkbox"/> Jumpers Configured Correctly (if applicable)</p> <p><input type="checkbox"/> Appropriate Links in Place (if applicable)</p> <p><b>③ VOLTAGE CHECK</b></p> <p><input type="checkbox"/> Supply Voltage _____</p> <p><input type="checkbox"/> Low Voltage _____</p> <p><input type="checkbox"/> Electrical Connections Tight</p> <p><b>④ DRAIN LINE</b></p> <p><input type="checkbox"/> Leak Free</p> | <p><b>⑤ TOTAL EXTERNAL STATIC (dry coil)</b></p> <p style="text-align: right;">dry coil    wet coil</p> <p>Supply External Static _____</p> <p>Return External Static _____</p> <p>Total External Static = _____</p> <p><b>⑥ ELECTRIC HEAT AMPS</b> _____</p> <p><b>⑦ INDOOR BLOWER AMPS</b> _____</p> <p>INDOOR BLOWER CFM _____</p> <p><b>⑧ TEMPERATURE DROP (Cooling Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Drop = _____</p> <p><b>⑧ TEMPERATURE RISE (Heating Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Rise = _____</p> <p><b>⑨ THERMOSTAT</b></p> <p><input type="checkbox"/> Adjusted and Programmed</p> <p><input type="checkbox"/> Operation Explained to Owner</p> |
|---|---|

Explained Operation of System to Homeowner

Technician's Name: \_\_\_\_\_ Date Start-Up & Performance Check Completed \_\_\_\_\_

**Figure 21. Start-Up and Performance Checklist (Horizontal Configuration)**



**MIRCOOL<sup>®</sup>**

**COMFORT MADE SIMPLE**

Signature Series

**MAHM\*CTA** Air Handler

**ELECTRICIAN and/or HVAC TECHNICIAN:**

**LICENSE #:**

**INSTALLATION DATE:**

**INSTALLATION LOCATION:**

**SERIAL NUMBER:**

The design and specifications of this product and/or manual are subject to change without prior notice. Consult with the sales agency or manufacturer for details.

# MAHM\*TA

## PRODUCT SPECIFICATIONS

## ENHANCED AIR HANDLER



### APPLICATION

- 2 - 5 ton systems
- Sequenced for demand management
- External access to heater circuit breakers

### INSTALLATION

- One piece design
- Smaller profile for closet applications
- Multi-position = Upflow/ Horizontal Left/ Horizontal Right/ Counter Flow (with kit)
- Approved for installation in manufactured housing and mobile homes

### CABINET

- Foil faced insulation for enhanced indoor air quality
- Double hemmed technology for increased structural rigidity
- Improved gasketing on doors to reduce air leakage
- Filter rack with thumb screws for easy access and removal
- Polymer plugs on drain locations for easy installation
- Baked polyester paint finished over galvanized steel for maximum durability
- High strength/heat resistant/corrosion resistance SMC drain pans
- Antimicrobial treated drain pan to resist mold and mildew growth
- Meets 2 % or less air leakage

### COILS

- Coolguard™ total corrosion protection technology designed coil
- Enhanced tube-and-fin coil design featuring MHT™ Technology
- Lanced fins for maximum heat transfer
- Factory tested for leakproof construction

### COMPONENTS

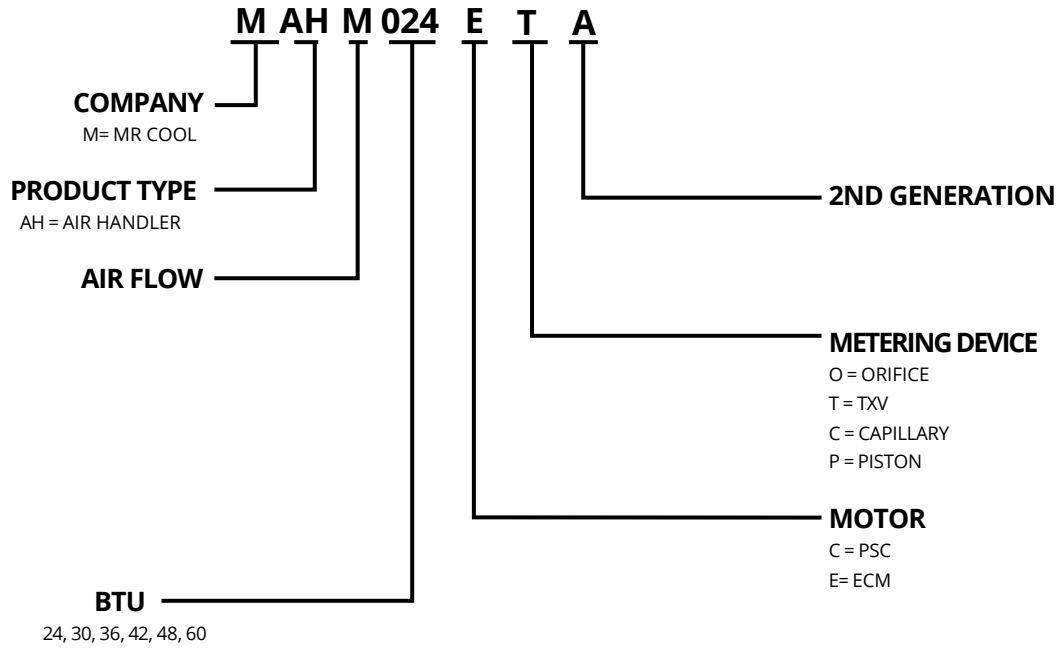
- Efficient Constant Torque blower motors
- Standard transformer and blower relay
- Field installed 2.5, 5, 7.5, 10, 12.5, 15, and 20 kW electric heat kits with ease of assembly quick wire connectors
- Built-in indoor time delay for increased efficiency and comfort

### WARRANTY

10-year limited warranty on all parts, extended warranty available.



**MODEL NUMBER GUIDE**



**PHYSICAL**

Model	Volts/Hz/Phase	Max. Elec. Heat (kW)	Transformer Size & Type	Filter Size (inches)	Refrigerant Connection		Installed TXV Size	Weight (lbs.)
					Suction (in.)	Liquid (in.)		
MAHM024ETA	208-230/60/1	10	40 VA Class 2	15 x 20	3/4	3/8	H4TXV01	127
MAHM030ETA	208-230/60/1	15	40 VA Class 2	15 x 20	3/4	3/8	H4TXV01	133
MAHM036ETA	208-230/60/1	15	40 VA Class 2	18 x 20	7/8	3/8	H4TXV02	163
MAHM042ETA	208-230/60/1	15	40 VA Class 2	18 x 20	7/8	3/8	H4TXV02	168
MAHM048ETA	208-230/60/1	20	40 VA Class 2	18 x 20	7/8	3/8	H4TXV02	186
MAHM060ETA	208-230/60/1	20	40 VA Class 2	18 x 20	7/8	3/8	H4TXV03	186

**ACCESSORIES**

DESCRIPTION	WHERE USED	KIT NUMBER
Down-flow Kit	24, 30	MSHDK1830
	36, 42, 48, 60	MSHDK3660

**ELECTRIC HEAT**

Electric Heat Kits with Circuit Breaker			
5 kW	MHK05H	30A	18, 24, 30, 36, 42, 48, 60
7.5 kW	MHK07H	45A	18, 24, 30, 36, 42, 48, 60
10 kW	MHK10H	60A	24, 30, 36, 42, 48, 60
15 kW	MHK15H	60A + 25A	30, 36, 42, 48, 60
20 kW	MHK20H	60A + 50A	48, 60

\* Circuit breaker must match rated "Max C/B Size"; replace breaker as necessary.

**ELECTRICAL**

Model	Heating Capacity (240V)			Blower Amps	Min. Circuit Ampacity				Max. Circuit Breaker Size				Single Point Power Supply					
	Nominal Heater Size kW	kW	Btuh		208V		240V		208V		240V		208V		240V			
					1	2	1	2	1	2	1	2	Amps	Fuse	Amps	Fuse		
MAHM24ETA	0	0	0	4.1	5.1		5.1		15		15							
	5	4.8	16400		27		30		30		30							
	7.5	7.5	25600		39		44		40		45							
	10	9.6	32700		48		55		50		60							
MAHM30ETA	0	0	0	4.1	5.1		5.1		15		15							
	5	4.8	16400		27		30		30		30							
	7.5	7.5	25600		39		44		40		45							
	10	9.6	32700		48		55		50		60							
	12.5	12.5	42600		43	19	48	22	45	20	50	25	62	70	70	70	70	
	15	14.4	49100		48	22	55	25	50	25	60	25	70	70	80	80	80	80
MAHM36ETA	0	0	0	4.1	5.1		5.1		15		15							
	5	4.8	16400		27		30		30		30							
	7.5	7.5	25600		39		44		40		45							
	10	9.6	32700		48		55		50		60							
	12.5	12.5	42600		43	19	48	22	45	20	50	25	62	70	70	70	70	
	15	14.4	49100		48	22	55	25	50	25	60	25	70	70	80	80	80	80
MAHM42ETA	0	0	0	6.0	7.5		7.5		15		15							
	5	4.8	16400		29		33		30		35							
	7.5	7.5	25600		41		47		45		50							
	10	9.6	32700		51		58		60		60							
	12.5	12.5	42600		45	19	51	22	45	20	60	25	64	70	73	80	80	
	15	14.4	49100		51	22	58	25	60	25	60	25	73	80	83	90	90	
MAHM48ETA	0	0	0	7.6	9.5		9.5		15		15							
	5	4.8	16400		31		35		35		35							
	7.5	7.5	25600		43		49		45		50							
	10	9.6	32700		53		60		60		60							
	12.5	12.5	42600		47	19	53	22	50	20	60	25	66	70	75	80	80	
	15	14.4	49100		53	22	60	25	60	25	60	25	75	80	85	90	90	
	20	19.2	65500		53	43	60	50	60	45	60	50	96	100	110	110	110	
MAHM60ETA	0	0	0	7.6	9.5		9.5		15		15							
	5	4.8	16400		31		35		35		35							
	7.5	7.5	25600		43		49		45		50							
	10	9.6	32700		53		60		60		60							
	12.5	12.5	42600		47	19	53	22	50	20	60	25	66	70	75	80	80	
	15	14.4	49100		53	22	60	25	60	25	60	25	75	80	85	90	90	
	20	19.2	65500		53	43	60	50	60	45	60	50	96	100	110	110	110	

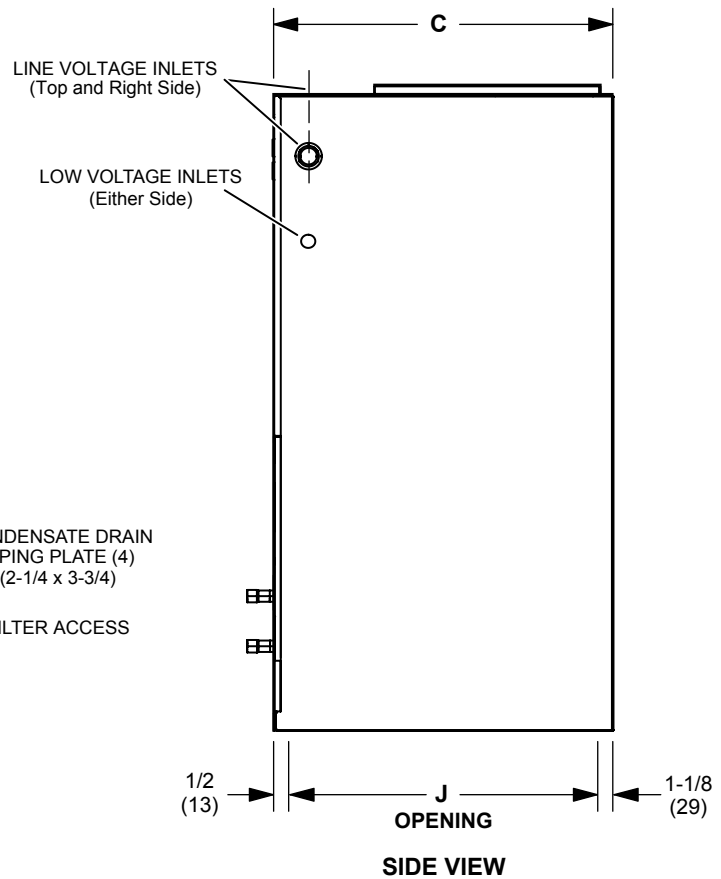
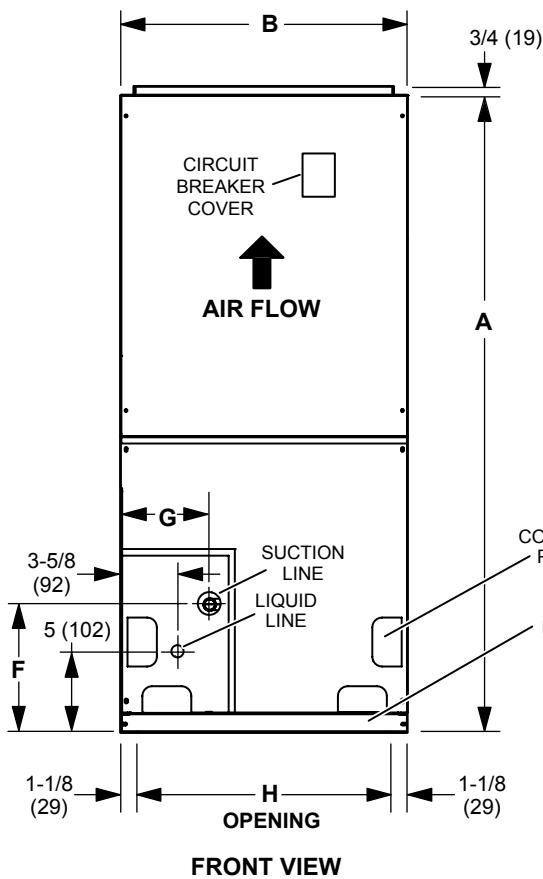
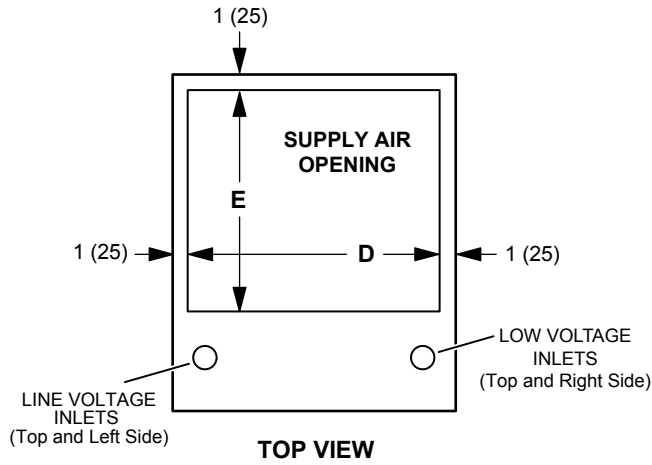
1. For 208 volt use .751 correction factor for kW and Btuh
2. 12.5kW, 15 and 20kW (2 stage models) require 2 supply circuits
3. Circuit #1 includes blower motor amps except 20kW models

**BLOWER**

Model	Motor Size (hp)	Blower Size (in.)	Speed Tap	Application	CFM @ ESP - in. W.C.				
					0.1	0.2	0.3	0.4	0.5
MAHM24ETA	1/2	10 x 8	1	Fan Only	590	575	530	480	430
			2	Matched with 1.5 ton condensing unit	750	650	610	550	480
			3	Nominal 2 ton match without electric heat	950	825	785	740	690
			4	Nominal 2 ton match with electric heat	1040	1020	985	940	920
			5	High static application	1160	1140	1120	1080	1050
MAHM30ETA	1/2	10 x 8	1	Fan Only	700	665	625	565	490
			2	Matched with 2 ton condensing unit	860	810	770	715	665
			3	Nominal 2.5 ton match without electric heat	1040	1010	980	940	890
			4	Nominal 2.5 ton match with electric heat	1140	1100	1045	1015	980
			5	High static application	1390	1375	1340	1285	1245
MAHM36ETA	1/2	10 x 8	1	Fan Only	850	800	750	665	600
			2	Matched with 2.5 ton condensing unit	1080	950	910	850	775
			3	Nominal 3 ton match without electric heat	1270	1230	1170	1120	1060
			4	Nominal 3 ton match with electric heat	1440	1400	1330	1280	1240
			5	High static application	1540	1475	1430	1380	1300
MAHM42ETA	3/4	12 x 10	1	Fan Only	990	915	860	810	725
			2	Matched with 3 ton condensing unit	1190	1150	1100	1060	1020
			3	Nominal 3.5 ton match without electric heat	1390	1350	1315	1280	1230
			4	Nominal 3.5 ton match with electric heat	1665	1625	1585	1550	1510
			5	High static application	1750	1710	1675	1640	1600
MAHM48ETA	1	12 x 10	1	Fan Only	1250	1210	1185	1130	1110
			2	Matched with 3.5 ton condensing unit	1500	1465	1435	1400	1360
			3	Nominal 4 ton match without electric heat	1715	1670	1635	1615	1575
			4	Nominal 4 ton match with electric heat	1770	1735	1700	1670	1650
			5	High static application	1895	1860	1835	1795	1760
MAHM60ETA	1	12 x 10	1	Fan Only	1100	1050	1000	925	830
			2	Matched with 4 ton condensing unit	1625	1595	1565	1520	1490
			3	Nominal 5 ton match without electric heat	1815	1785	1760	1730	1685
			4	Nominal 5 ton match with electric heat	1905	1870	1835	1810	1765
			5	High static application	1980	1955	1925	1895	1860

All data given while air handler is operating with a wet coil and without air filter installed.  
 Speed tap 1 to be used for continuous fan operation.  
 Speed tap 2 to be used for cooling speed of 1/2 ton smaller outdoor unit match. Speed tap 3 to be used for cooling speed of nominal tonnage match.  
 Speed tap 4 to be used for heating speed for units with electric heat. This is the minimum speed for heating. Speed tap 5 to be used for high static applications.

**DIMENSIONS (IN.)**



Dimension	18		24		30		36-42		48		60	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
A	43.5	1105	45.5	1156	47	1194	53.63	1362	55	1397	59.75	1518
B	18.5	470	18.5	470	18.5	470	21.5	546	21.5	546	21.5	546
C	16.5	419	16.5	419	16.5	419	19.5	495	19.5	495	19.5	495
D	16.25	413	16.25	413	16.25	413	19.25	489	19.25	489	19.25	489

All specifications and illustrations subject to change without notice and without incurring obligations.



**MRCOOL**  
**EQUIPMENT LIMITED WARRANTY**  
APPLIES IN U.S.A. AND CANADA ONLY  
FAILURE TO MAINTAIN YOUR EQUIPMENT WILL VOID THIS WARRANTY

**COVERED EQUIPMENT**

The following heating and cooling equipment is covered by the Limited Warranty,

- Condensing Units: MAC16
- Heat Pumps: MHP15
- Gas Furnaces: MGM95, MGD95, MGM80, MGD80
- Electric Furnace: MMBV
- Evaporator Coils: MCH, MCV
- Air Handlers: MAH
- Package Equipment: MPG, MPC, MPH

**PARTS and COMPRESSOR COVERAGE**

The covered equipment and covered parts and compressor are warranted by MRCOOL for a period of five (5) years from the date of the original installation, when installed in a residential application (which includes homes, duplexes, apartments and condominiums). The covered equipment and covered parts are warranted for a period of one (1) year and compressor is warranted for five (5) years by MRCOOL from the date of the original installation, when installed in non-residential applications. If, during this period, a covered component fails because of a manufacturing defect, MRCOOL will provide a free replacement part to the owner through a licensed service contractor utilizing an MRCOOL distributor. You must pay shipping charges and all other costs of warranty service. MRCOOL will not pay labor involved in diagnostic calls or in removing, repairing, servicing or replacing parts. Such cost may be covered by a separate warranty provided by the installer.

**HEAT EXCHANGER COVERAGE**

All covered heat exchangers are warranted by MRCOOL for a period of twenty (20) years from the date of original installation in a residential application. Heat exchangers in all non-residential applications are warranted for a period of ten (10) years.

NOTE: In the event that a component covered by this warranty is no longer available, MRCOOL, at its option, through a established MRCOOL distributor, will provide a free suitable substitute component or will allow a credit toward the purchase of an equivalent new MRCOOL product (at the current suggested distributor's cost).

If the date of original installation cannot be verified, the warranty period will be deemed to begin six (6) months after the date of manufacture.

**EXCLUDED COMPONENTS**

The following components are not covered by this warranty: cabinets, cabinet pieces, air filters, driers, refrigerant, refrigerant line sets, belts, wiring, fuses, oil nozzles, unit accessories and any parts not affecting unit operation.

**CARE OF EQUIPMENT**

Your new MRCOOL unit must be properly installed, operated and maintained in accordance with the unit installation, operation and maintenance instructions provided with each MRCOOL unit. Failure to provide maintenance per MRCOOL instructions will void this warranty.

**WARRANTY PROCEDURE**

When service or warranty parts are required:

1. Call your local licensed service dealer or contractor
2. If the installing dealer is unable to provide warranty service, check online at <https://mrcool.com/warranty>.
3. Be prepared to furnish the following information:
  - a. Complete model and serial number
  - b. Proof of required periodic maintenance, installation date and location.
  - c. An accurate description of the problem

**WARRANTY LIMITATIONS**

1. All installation must be in compliance with applicable laws, regulations, codes, and ordinances.
2. Products purchased over the internet or through other electronic means must be installed by a qualified installer and the installation must adhere to the Quality Installation protocols of the Air Conditioning Contractors of America (ACCA), and these products must be registered with the manufacturer within 60 days of installation for the warranty to be in place.
3. This warranty is void if the covered equipment is removed from the original installation site.
4. This warranty does not cover damage or defect resulting from:
  - a. Flood, wind, fire, lightning, mold, or installation and operation in a corrosive atmosphere, or otherwise in contact with corrosive materials (chlorine, fluorine, salt, recycled waste water, urine, fertilizers, or other damaging substances or chemicals). Accident, or neglect or unreasonable use or operation of the equipment including operation of electrical equipment at voltages other than the range specified on the unit nameplate (includes damages caused by brownouts).
  - b. Modification, change or alteration of the equipment, except as directed in writing by MRCOOL.
  - c. Operation with system components (indoor unit, outdoor unit and refrigerant control devices) which are not an AHRI match or meet the specifications recommended by MRCOOL.
  - d. Operation of furnaces with return air temperatures of less than 60°F (16°C) or operation of a furnace field installed downstream from a cooling coil.
  - e. Use of contaminated or refrigerant not compatible with the unit.

The installation of replacement parts under the terms of this warranty does not extend the original warranty period.

MRCOOL makes no express warranties other than the warranty specified above. All implied warranties, including the implied warranties of merchantability and fitness for a particular purpose, are excluded to the extent to a period legally permissible. Should such exclusion or limitation of the warranty be unenforceable, such implied warranties are in any event limited to a period of one (1) year. Liability for incidental and consequential damages is excluded. Some states do not allow limitation of incidental damages, so the limitations or exclusions may not apply to you. MRCOOL will not pay electricity or fuel costs, or increases in electricity or fuel costs, for any reason whatsoever, including additional or unusual use of supplemental electric heat. This warranty does not cover lodging expenses or labor charges.

MRCOOL shall not be liable for any default or delay in performance under this warranty caused by any contingency beyond its control.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**NOTE TO CUSTOMER**

Please complete information below and retain this warranty for your records and future reference.

Outside Unit Model Number: \_\_\_\_\_ Serial Number: \_\_\_\_\_ Installed Date: \_\_\_\_\_

Furnace / Air Handler: \_\_\_\_\_ Serial Number: \_\_\_\_\_ Installed Date: \_\_\_\_\_

Indoor Coil Model Number: \_\_\_\_\_ Serial Number: \_\_\_\_\_ Installed Date: \_\_\_\_\_

Installing Company Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Installing Company Address: \_\_\_\_\_ State/Province: \_\_\_\_\_ Zip/Postal Code: \_\_\_\_\_



## **LIMITED EXTENDED PARTS WARRANTY**

MRCOOL LLC ("MRCOOL") provides its air conditioning and heating products with a standard five-year parts warranty. This limited extended parts warranty is in addition to and is intended to supplement MRCOOL's standard 5-year parts warranty. As such, this limited extended warranty provides for a total of 10 years of limited warranty coverage (Standard 5-Year Limited Parts Warranty plus Additional 5-Year Limited Extended Parts warranty).

### **EXTENDED COVERAGE -**

#### **PARTS/COMPRESSORS**

The covered equipment and parts are warranted by MRCOOL for a total of 10 YEARS (standard 5 Year Limited Parts Warranty) from installation, except as provided below.

#### **HEAT EXCHANGERS**

The covered residential heating equipment's heat exchanger is warranted by MRCOOL for a Limited Lifetime (standard 20 Year Limited Warranty) from date of original installation, except as provided below.

This warranty applies only to the original purchaser of the unit and cannot be transferred. If during this period, a covered part fails because of a defect in materials or workmanship under normal use and maintenance, MRCOOL will provide a free replacement part to the purchaser through a MRCOOL dealer or other licensed service contractor through an authorized MRCOOL distributor. The purchaser must pay shipping costs, including labor, of the warranty service.

### **EXCLUDED COMPONENTS -**

The following components are expressly not covered by this limited warranty: cabinets, cabinet pieces, air filters, driers, refrigerant, refrigerant line sets, belts, wiring, fuses, oil nozzles, and unit accessories, R-22 compressors, and any parts not affecting unit operation.

### **COVERAGE REQUIREMENTS -**

1. The unit is a MRCOOL branded unit;
2. The unit is installed in a residential application, which is an owner-occupied single-family residence. No commercial applications are allowed;
3. The unit is properly registered at <https://mrcool.com/warranty> with MRCOOL within 60-days after the original date of installation or occupancy. To register, follow the directions and complete the online warranty registration at <https://mrcool.com/warranty>. For customer inquiries, contact MRCOOL at 270-366-0457 ext. 301 or <https://mrcool.com/contact>.
4. The unit is part of a complete AHRI matched system and installed by a state certified or licensed contractor in accordance with the unit installation, operation, and maintenance instructions provided with the unit.
5. Coils and air handlers are covered only when they are branded MRCOOL and are purchased and installed as a system along with a qualifying unit. (Third party coils are not covered).
6. Installation takes place on or after October 3, 2008.
7. Installation is in compliance with applicable laws, regulations, codes, and ordinances.

If this extended warranty does not apply, then parts are warranted for the standard warranty period of 5 YEARS and all heat exchangers for 20 YEARS. If the standard warranty periods differ from the original warranty certificate, the periods stated on the original warranty certificate apply.

This limited extended warranty does not apply to, and no warranty is offered by MRCOOL, on any unit ordered over the internet. Proof of purchase may be required.

Any part replaced pursuant to this limited extended warranty is warranted only for the unexpired portion of the limited extended warranty term applying to the original part. The installation of replacement parts under the terms of this limited extended warranty does not extend the warranty period.

This limited extended warranty is an extension of MRCOOL's standard warranty. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE TERM OF THIS LIMITED EXTENDED WARRANTY. Some states and provinces do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

MRCOOL SHALL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO EXTRA UTILITY EXPENSES OR DAMAGES TO PROPERTY. Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

MRCOOL is not responsible for:

1. Damage or repairs required as a result of flood, fire, wind, lightning strike (to the home or unit), corrosive atmosphere, contact with corrosive material (chlorine, fluorine, salt, recycled waste water, fertilizers or other damaging substances) or other conditions beyond the control of MRCOOL;
2. Use of parts, accessories, or refrigerant not compatible with the unit;
3. Modification, change or alteration of the unit, except as expressly directed in writing by MRCOOL;
4. Improper use, accident, neglect or unreasonable use or operation of the unit, including operation of electrical equipment at voltages other than the range specified on the unit nameplate;
5. Operation with system parts (indoor unit, outdoor unit and refrigerant control devices) which are not AHRI matched or do not meet the specifications recommended by MRCOOL;
6. Damage or repairs required as a consequence of faulty or installation or application;
7. Normal maintenance as described in the installation and operating manual, such as cleaning of coils, filter cleaning and/or replacement and lubrication; and
8. Changes in the appearance or sound of the unit that do not affect its performance.

The parties intend this writing as a final expression of their agreement with respect to warranties. MRCOOL makes no other warranty beyond that which is expressly contained in this writing.

MRCOOL shall not be liable for any default or delay in performance under this warranty caused by any contingency beyond its control, including the unavailability of replacement parts.

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state or province to province.

Steps for getting replacement parts under this limited extended warranty:

If you suspect a defect in your equipment, please contact the installer of the unit to obtain assistance. If unsuccessful, please contact a MRCOOL dealer or distributor in your area. If unable to obtain local assistance, refer to MRCOOL's website (<https://mrcool.com/warranty>) or contact MRCOOL at 270-366-0457 ext. 301 or <https://mrcool.com/contact>.

1 Excludes residents of states or provinces where registration requirements are prohibited, such as California and Quebec. Residents of these states or provinces may either register as noted above or provide proof of when the unit was purchased and installed, such as an original invoice from the contractor with the Owner's name, address, purchase date, serial and model number.