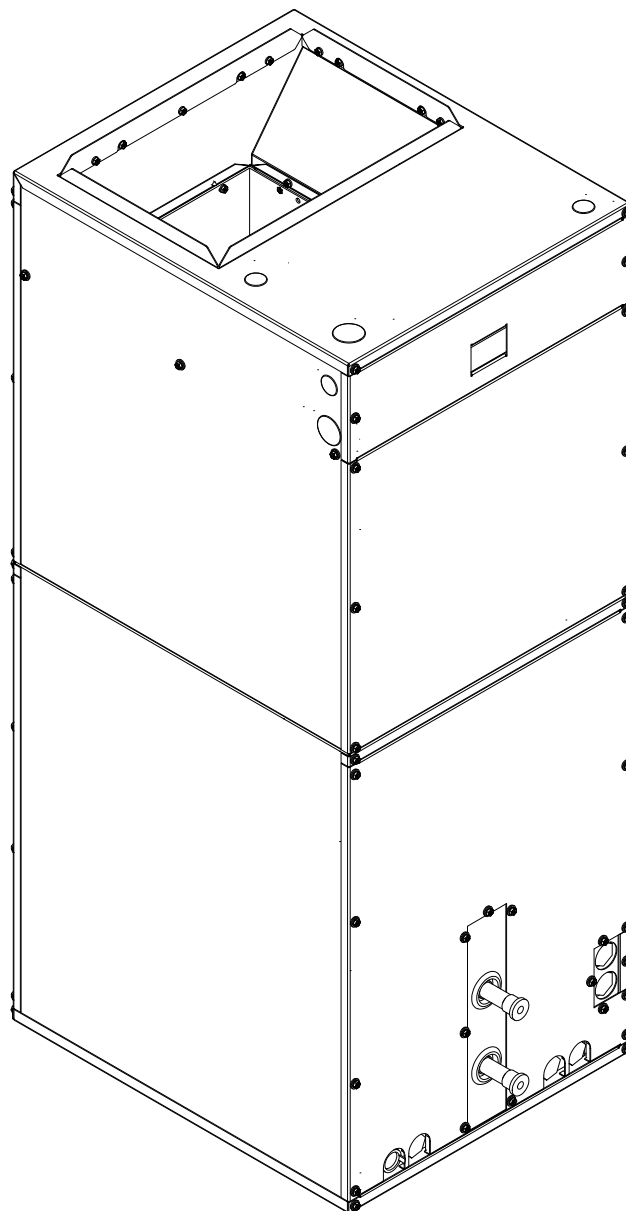


Installation, Operations, & Maintenance Manual

EAH MULTI-POSITION HYDRONIC AIR HANDLERS & EEH CASED HYDRONIC "A" COILS



20D850-21NN

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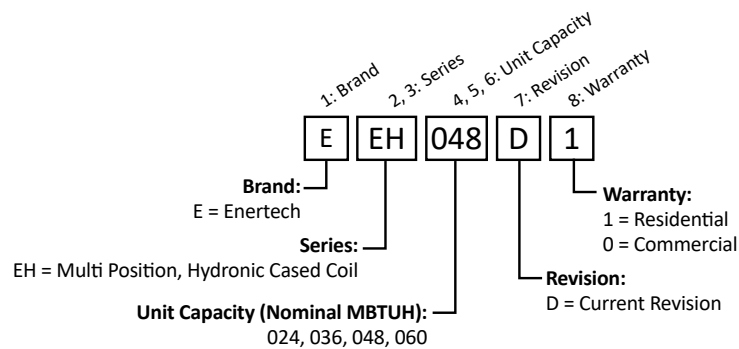
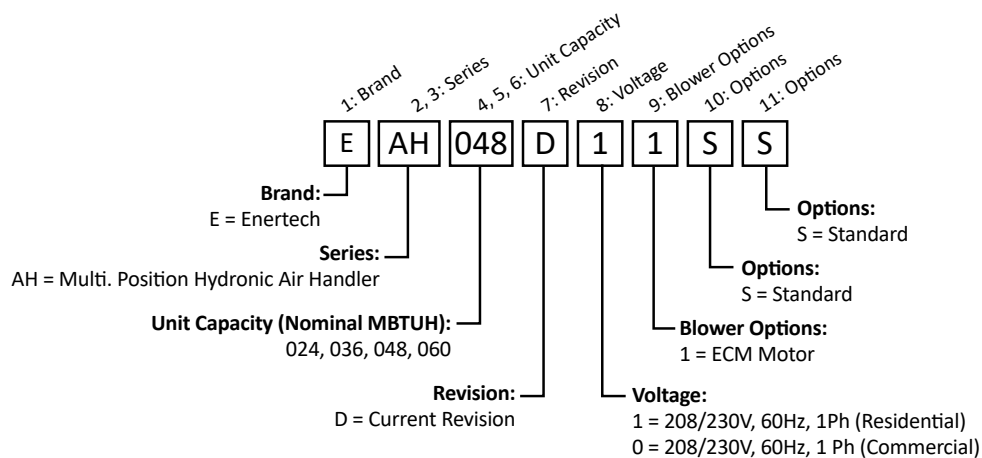
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Section 1: Model Nomenclature

Nomenclature Decoder



Section 2: Introduction & Installation Considerations

Introduction

Engineering and quality control is built into every hydronic air handler. Good performance depends on proper application and correct installation.

Notices, Cautions, Warnings, & Dangers:

“NOTICE” Notification of installation, operation or maintenance information which is important, but which is NOT hazard related.

“CAUTION” Indicates a potentially hazardous situation or an unsafe practice which, if not avoided, COULD result in minor or moderate injury, product or property damage.

“WARNING” Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

“DANGER” Indicates an immediate hazardous situation which, if not avoided, WILL result in death or serious injury.

“Note” Used to highlight suggestions which will result in enhanced installation, reliability, or operation.

Inspection

Upon receipt of equipment, carefully check the shipment against the packing slip and the freight company bill of lading. Verify that all units and packages have been received. Inspect the packaging of each unit for damages. Ensure that the carrier makes proper notation of all damages and shortage on all bill of lading papers. Concealed damage should be reported to the freight company within 15 days. If not filed within 5 days, the freight company can deny all claims.

Note: Notify the Enertech Global LLC shipping department of all damages within 5 days. It is the responsibility of the purchaser to file all necessary claims with the freight company.

Unit Protection

Protect units from damage and contamination due to plastering (spraying), painting and all other foreign materials that may be used at the job site. Keep all units covered on the job site with either the original packaging or equivalent protective covering. Cap or recap all unit connections and all piping until the unit is installed. Precautions must be taken to avoid physical damage and contamination which may prevent proper start up and may result in costly equipment repair.

Units should be stored in an upright position at all times and should not be stacked unless specifically noted on the packaging.

Consumer Instructions

The dealer should instruct the consumer in the proper operation, maintenance, filter replacements, thermostat and indicator lights.

Enertech Global D-I-Y Policy

Enertech Global's system installations may include electrical, refrigerant and/or water connections. Federal, state and local codes and regulations apply to various aspects of the installation. Improperly installed equipment can lead to equipment failure and health/safety concerns. For these reasons, only qualified technicians should install an Enertech Global built geothermal system.

Due to the importance of proper installation, Enertech Global does not sell equipment direct to homeowners. Internet websites and HVAC outlets may allow for purchases directly by homeowners and Do-It-Yourselfers, but Enertech Global offers no warranty on equipment that is purchased via the internet or installed by persons without proper training.

Enertech Global has set forth this policy to ensure that installations of Enertech Global systems are done safely and properly. The use of well-trained, qualified technicians helps ensure that your system provides many years of comfort and savings.



Pre-Installation Steps

1. Compare the model number on the unit nameplate with packing slip and ordering information to verify that the correct unit has been shipped.
2. The installer must verify that all applicable wiring, piping, and accessories are correct and on the job site. All wiring, line and low voltage, should comply with the manufacturer's recommendations, The National Electrical Code, and all local codes and ordinances.
3. Inspect all electrical connections and wires. Connections must be clean and tight at the terminals, and wires should not touch any sharp edges or copper pipe.
4. Before unit start-up, read all manuals and become familiar with unit components and operation. Thoroughly check the unit before operating.
5. For A-Coil installations, it is recommended that coil be sprayed with liquid detergent thoroughly and rinsed thoroughly before installation to ensure proper drainage of condensate from the coil fins to eliminate water blow off and to assure maximum coil performance. If not sprayed, approximately 50 hours of break in time is required to achieve the same results.

Section 2: Introduction & Installation Considerations

Unit Orientation

EEH Series Cased “A” Coil

The EEH Series cased “A” coils may be used in up-flow, down-flow, and horizontal applications.

EAH Series Air Handler

The air handler should be configured prior to installation. Begin with the unit in the vertical, upright position. Do not connect drains or refrigerant lines, until optimal orientation has been determined.

Up-Flow Application

In an up-flow installation the discharge outlet is at the top of the unit. Care should be taken to ensure the unit is level to permit proper condensate drainage. Normal up flow installation would typically be in a basement or closet.

If installed in a closet, the closet should have a platform framed in, with an opening on top of the platform centered in the closet. Connect the supply air outlet to a warm air plenum. Install return air grilles from outside the closet to a space below the platform. The platform must be at least 10” above the floor. If installed in a basement, run supply and return ductwork in accordance with local codes.

Horizontal Application

Horizontal applications will normally be used in an attic or crawl space. This type of installation requires that a return air duct be attached to the unit inlet. The opposite end of the return air duct is attached to a return air filter grill through the ceiling or wall. Remove the filter from the unit if the filter grill is used.

Down-Flow Application

Air handlers can be converted to a down flow application. See Section 5 for details on conversion.

Note: If the unit is configured in the down-flow orientation or horizontal left to right configuration, it is recommended to trap the primary and secondary drain lines in order to prevent condensate from being sucked in to the blower.

⚠ CAUTION ⚠

IF USING A DUEL FUEL APPLICATION, THE CASED “A” COIL MUST BE INSTALLED ON THE OUTLET OF THE FURNACE. INSTALLATION ON THE RETURN COULD CAUSE FURNACE HEAT EXCHANGER FAILURE, AND MAY VOID FURNACE WARRANTY.

⚠ WARNING ⚠

IF UNIT IS BEING INSTALLED ON COMBUSTIBLE FLOORING, A NON-COMBUSTIBLE BASE MUST BE USED. UNIT CANNOT BE INSTALLED ON CARPETING.

Unit Placement

When installing a hydronic heating and cooling unit, there are several items the installer should consider before placing the equipment.

Make sure to provide enough clearance for service access. There needs to be enough space to service the control box, coil, blower, and electric elements (if equipped).

The unit should be located in a way that piping and ductwork, or other permanently installed fixtures, do not have to be removed for servicing or filter replacement. These air handling units have a 0” minimum clearance to combustible materials rating from all cabinet surfaces.

If an electric heater is installed, there is a 1” clearance on the supply plenum and duct. The unit should be installed with serviceability clearance of 30” from the front of the unit. The unit can be serviced entirely from the front, including replacing the filter. Be sure to route primary and secondary drain connections in a way that will not obstruct replacement of the filter. The unit is shipped from the factory arranged to be installed in a vertical up-flow, or horizontal right to left airflow position (standard). It can be field converted to a horizontal left to right airflow position or down-flow position.

All units should be located in an indoor area where the ambient temperature will remain between 55°F and 105°F. All air handling equipment should be placed on either a formed plastic air pad, or a high density, closed cell, polyethylene pad. Down-flow units should be placed on a non-combustible base. This helps eliminate vibration/noise that could be transmitted through the floor. The use of corner pads alone, is not recommended.

The EEH Series cased “A” coils are designed to be installed on new and existing indoor furnaces.

Electrical

All wiring, line and low voltage, should comply with the manufacturer’s recommendations, The National Electrical Code, and all local codes and ordinances. The equipment main disconnect must be incorporated in the field wiring in accordance with NEC code.

Section 2: Introduction & Installation Considerations

Ductwork

All new ductwork shall be designed as outlined in the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) or Air Conditioning Contractors of America (ACCA) or American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) handbooks.

All supply/return plenums should be isolated from the unit by a flexible connector (canvas or equivalent) to prevent transfer of vibration noise to the ductwork. The flex connector should be designed so as not to restrict airflow. Turning vanes should be used on any transition with airflow over 500 CFM.

Note: All metal ductwork should be insulated on the inside to prevent heat loss/gain, condensation, and to absorb air noise.

If the unit is being installed with existing ductwork, the ductwork must be designed to handle the air volume required by the unit being installed. When running a cooling or heating load on a building; size ductwork accordingly to the building design load and air handling CFM.

Ductwork Industry Standard

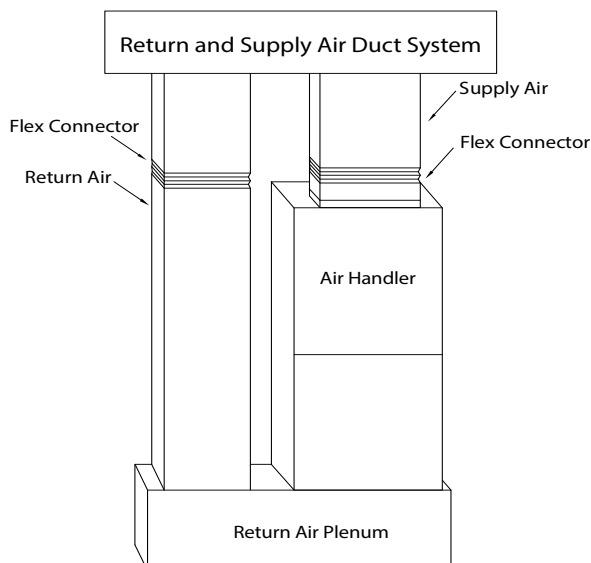
When sizing ductwork use 400 CFM per Ton. As a general rule, maximum recommended face velocity for a supply outlet used in a residential application is 750 FPM; maximum recommended return grille velocity is 600 FPM. Systems with higher velocities are likely to have noise problems. Table 2 shows maximum air velocities. In buildings where ceilings are 8 feet or more, at least 50% of the return air should be taken back to the air handler from the ceiling or high sidewall location and not more than 50% from the floor or low sidewall location.

The air handling unit comes with an ECM blower motor. For maximum performance, the blower speed should be set to maintain between 350 and 450 CFM/ton. See ECM Fan Performance Data Table.

Table 2: Maximum Air Velocities

Location	Supply	Return
Main Duct	900 FPM	600 FPM
Branch Ducts	700 FPM	600 FPM
Grills, Registers, Diffusers	750 FPM	600 FPM

Typical Supply and Return Ductwork Connections



EAH/EEH Piping

EAH air handlers and EEH cased "A" coils require the installation of supply and return piping from the unit to the compressor section.

Note: Supply and Return piping must be sized big enough to move the required flow rates of the units. It may be the same size or bigger than the fittings on the Heat Pump (larger on long runs).

These units are equipped with sweat copper adaptors.

Once piping is complete, it will be critical for the installer to insulate both the supply and return line to avoid condensate issues. Armaflex (or equivalent type/brand) of at least a 3/8" wall thickness is recommended.

If a residential water heater is used for space heating water, do not exceed a distance of 70 feet between the air handler and the water heater.

NOTICE: Connect the drain through the trap to the condensation drain system in conformance to local plumbing codes.

Water Quality

The quality of the water used in the system is very important. Water quality is not only important for the source side of the system, but even more so for the load side of the system. Due to use of dissimilar metals throughout the system (i.e. stainless braze plates, cast iron pump volutes, etc.) certain minerals or chemicals may build up and become detrimental to system operation and longevity. Filling the system with good quality water is critical.

In closed loop systems the dilution water (water mixed with antifreeze) must be of high quality to ensure adequate corrosion protection. Water of poor quality contains ions that make the fluid "hard" and corrosive. Calcium and magnesium hardness ions build up as scale on the walls of the system and reduce heat transfer. These ions may also react with the corrosion inhibitors in glycol based heat transfer fluids, causing them to precipitate out of solution and rendering the inhibitors ineffective in protecting against corrosion. In addition, high concentrations of corrosive ions, such as chloride and sulfate, will eat through any protective layer that the corrosion inhibitors form on the walls of the system.

Note: Once the system has been flushed and filled, Enertech recommends the use of Fernox F1 (Enertech P/N: F-57880) water treatment products in order to keep the system clean and running smooth for years to come.

Recommended Operating Parameters

Cooling Minimum Entering Water Temperature: 42°F
Cooling Maximum Entering Water Temperature: 50°F
Heating Minimum Entering Water Temperature: 100°F
Heating Maximum Entering Water Temperature: 120°F

Note: The maximum operating pressure for the air handler coil is 145 PSI.

Figure 1

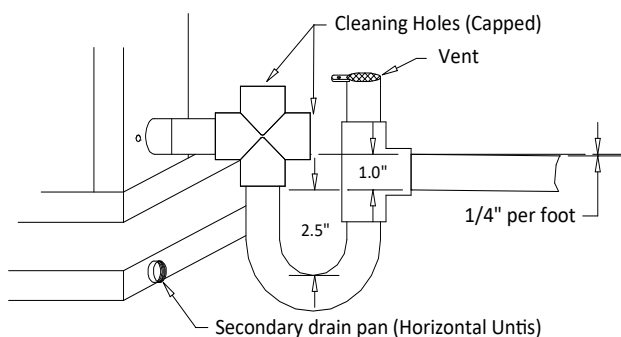


Table 3: EZ-Trap Kits

Part Number	Description
ACDT1A	EZ-Trap 3/4" Kit
ACDT2A	EZ-Trap 1" Kit (3/4" MPT x 1" FPT adapter required)

Condensate Drain Connection

Connect the EZ-Trap to the 3/4" equipment condensate drain connection as shown in Figure 1. The condensate line must be trapped a minimum of 1.0" as shown. The condensate line should be pitched away from the unit a minimum of 1/4" per foot. The condensate line from the unit drain connection to the p-trap should be sloped downward. For more information on installing EZ-Trap, see installation sheet that comes with the EZ-Trap Kit. Available kits are shown in Table 3. Always install the air vent after the trap.

NOTICE: Connect the drain through the trap to the condensation drain system in conformance to local plumbing codes.

Components

Transformer: Converts incoming (source) voltage to 24VAC.

Low Voltage Breaker: 3 Amp breaker attached directly to transformer, protects the transformer and low voltage circuit.

Low Voltage Fuse: 3 Amp fuse attached directly to ECM board, protects the transformer and low voltage circuit.

Terminal Strip: Provides connection to the thermostat or other accessories to the low voltage circuit on the thermostat board.

ECM Board: Operates the ECM blower motor and allows for airflow adjustment with DIP switches.

Note: If installing a 24V electronic air cleaner supplied by Enertech as an accessory, the air cleaner must connect to the 24V supply from R and C on the geothermal unit's thermostat terminal strip. In the event there is a leak or airflow falls too low, R and C will be de-energized.

Blower Motor (ECM): ECM (Electronically Commutated Motor) for variable fan speeds.

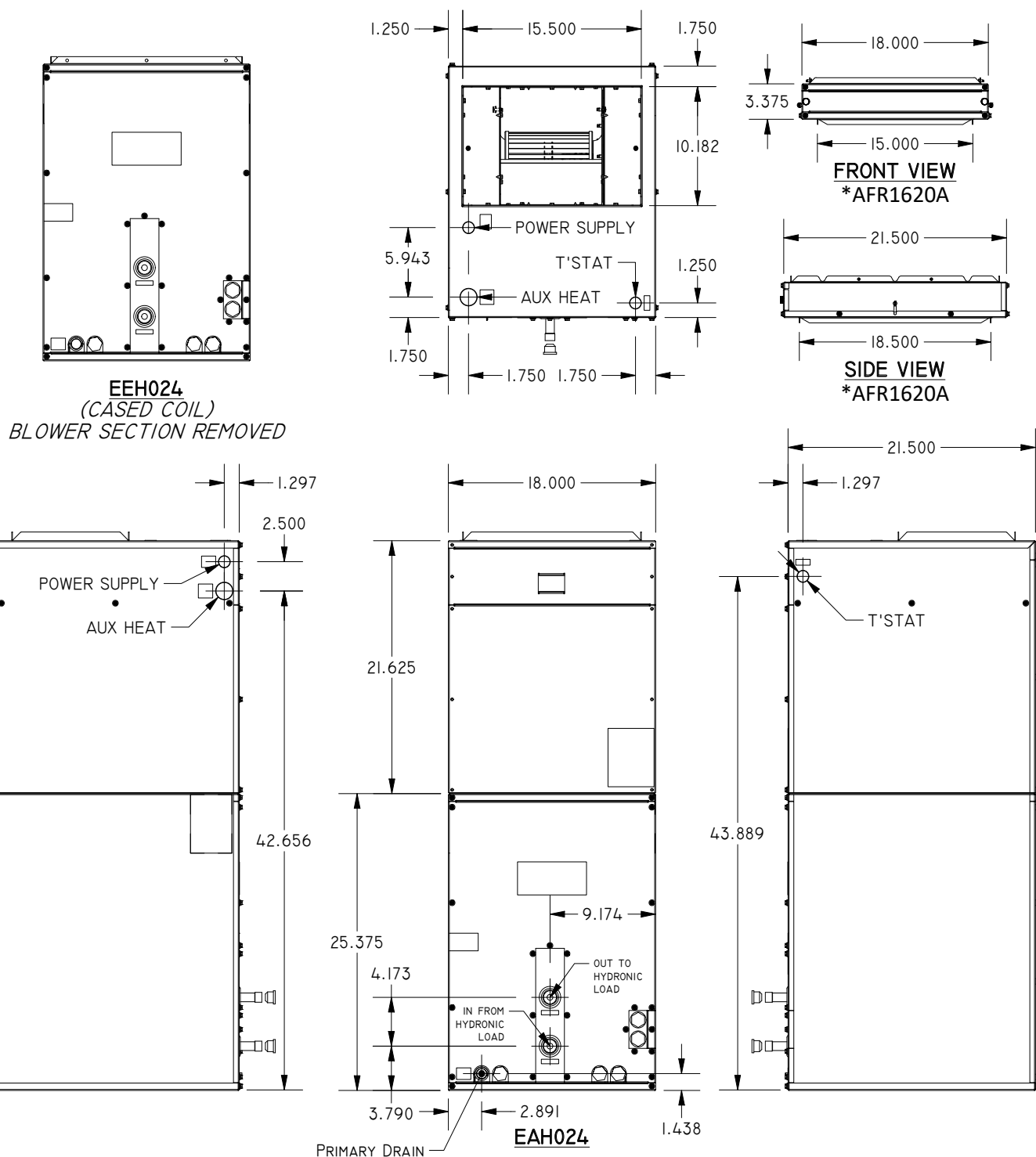
Electric Heater: Provides auxiliary heat during cold temperatures and provides electric backup if unit malfunctions.

⚠ CAUTION ⚠

IF THE UNIT IS INSTALLED IN NON-CONDITIONED SPACE, SUCH AS AN ATTIC OR GARAGE, THE INSTALLER MUST PROVIDE A FULL SIZE AUXILIARY DRAIN PAN TO PREVENT DAMAGE FROM CONDENSATE RUN-OFF.

Section 3: Unit Data

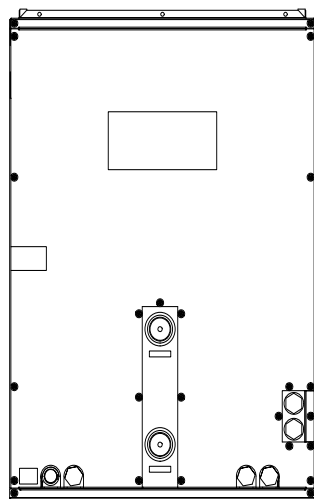
Dimensional Data : EAH/EEH 024



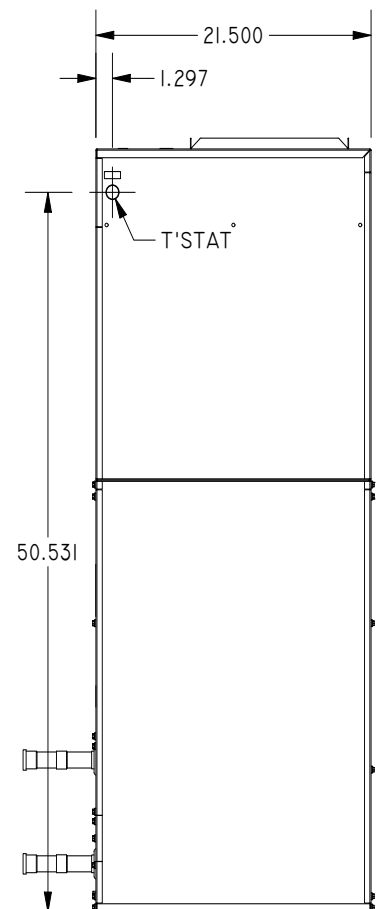
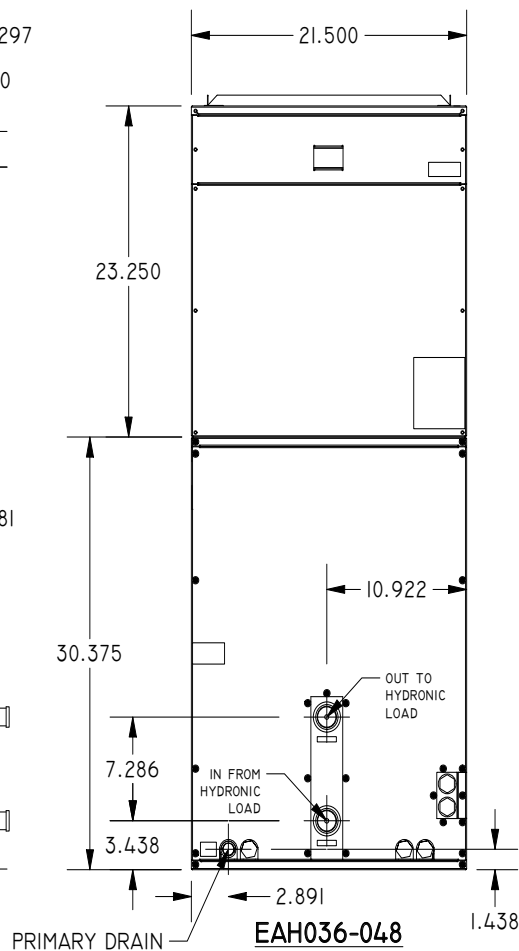
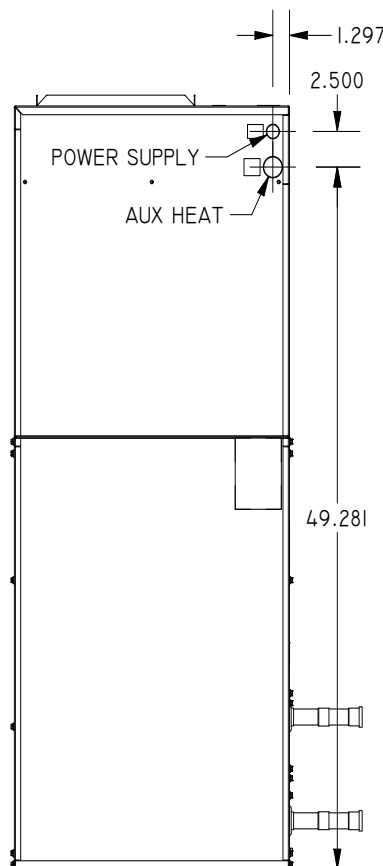
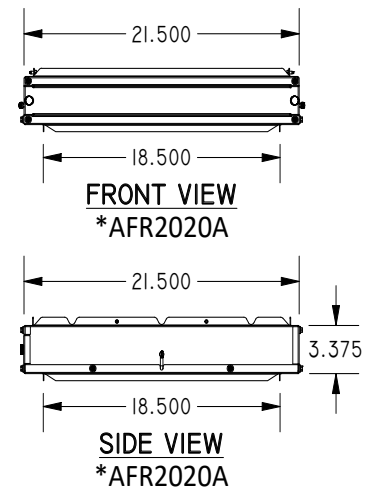
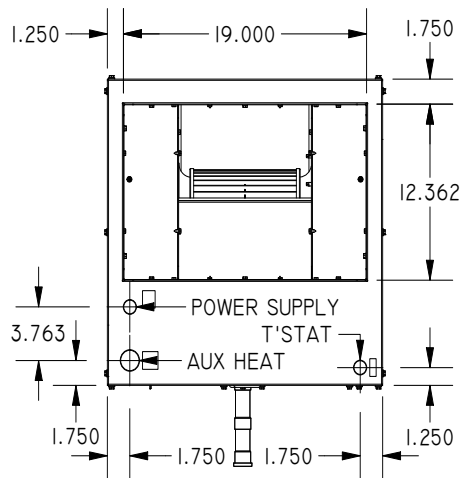
(EAH) AIR HANDLER & (EEH) CASED COIL			AH SHIP WEIGHT	EH SHIP WEIGHT	*ACCESSORY FILTER RACK
MODEL	HYDRONIC LOAD CONN.	ELECTRICAL KNOCKOUTS			
024	7/8 O.D.	SIZED FOR 1/2" OR 1" CONDUIT	155 LBS	80 LBS	AFR1620A
036-048	1-1/8" O.D.		190 LBS	95 LBS	AFR2020A
060	1-1/8" O.D.		210 LBS	100 LBS	AFR2320A

Section 3: Unit Data

Dimensional Data : EAH/EEH 036-048

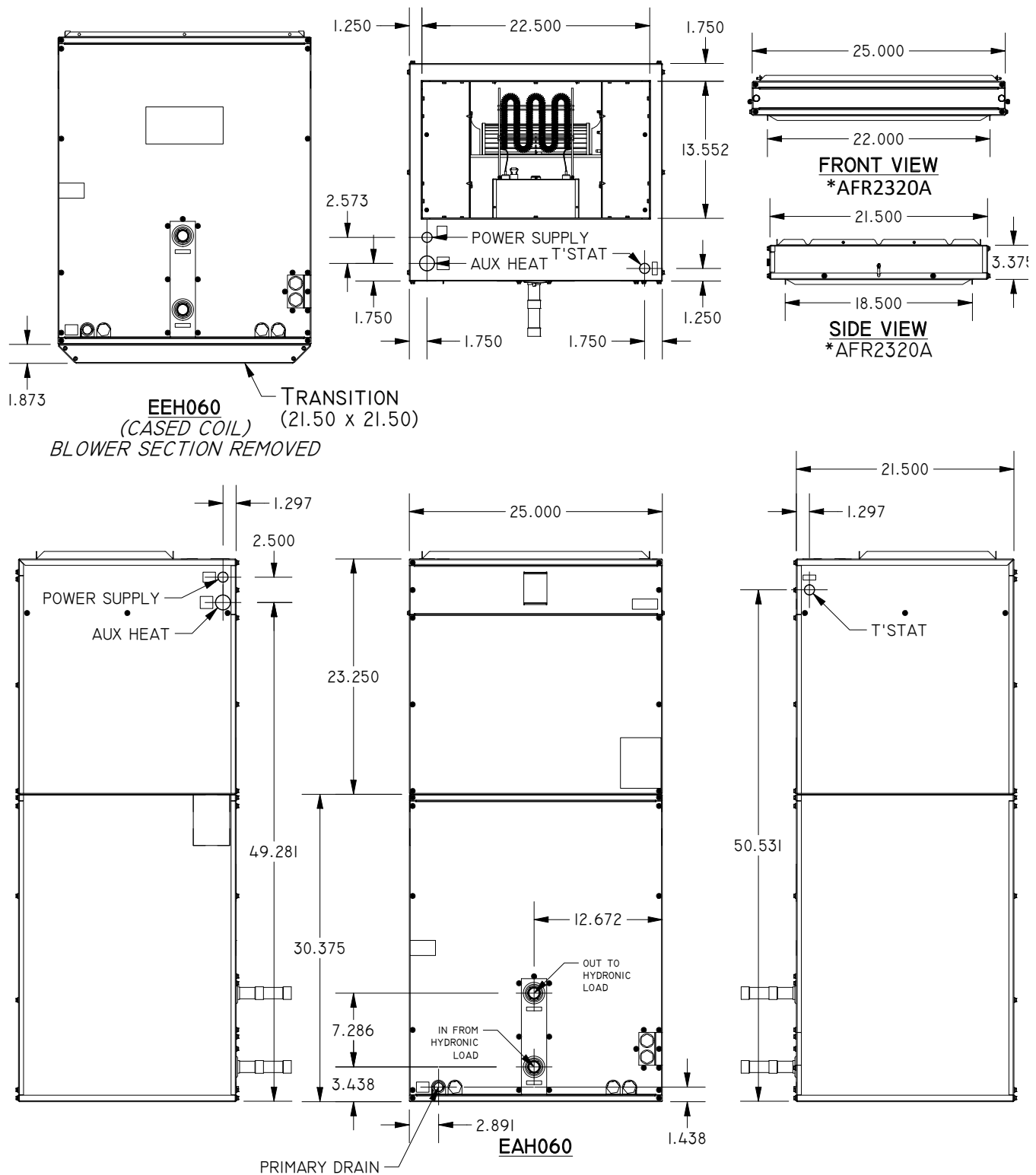


EEH036-048
(CASED COIL)
BLOWER SECTION REMOVED



Section 3: Unit Data

Dimensional Data : EAH/EEH 060



Section 3: Unit Data

EAH Electrical Data

Model	Voltage Code	60 Hz Power		Fan Motor FLA	Total Unit FLA	Min Circuit AMPS	Max Brkr HACR
		Volts	Phase				
EAH024	01/11	208/230	1	3.9/ 3.8	3.9/ 3.8	4.9/ 4.8	15/ 15
EAH036	01/11	208/230	1	5.9/ 5.8	5.9/ 5.8	7.4/ 7.3	15/ 15
EAH048	01/11	208/230	1	5.9/ 5.8	5.9/ 5.8	7.4/ 7.3	15/ 15
EAH060	01/11	208/230	1	7.4/ 6.9	7.4/ 6.9	9.3/ 8.6	15/ 15

Notes:

1. All line and low voltage wiring must adhere to the National Electrical Code and local codes, whichever is the most stringent.
2. In determining the correct supply wire size and maximum length, reference NFPA 70, Section 310. If the calculation is close to the maximum allowable ampacity of a particular wire size, use the next size up. This will ensure that no adverse effects occur, such as light dimming and/or shortened compressor life.
3. Min/Max Voltage: 208/230/60 = 187-252
4. Units rated at 208/230V are factory wired for 230V. To change to 208V, the red transformer wire (with wire nut) will need to be hooked to the power block in the position the current orange (230V) wire is. The orange wire will need to be capped off. Refer to wire diagram for details.

AHA Electric Heater Electrical Data

Technical Data 60Hz, Single Phase, w/ Circuit Breaker (*Single Point Connection)																
Unit Model	Heater Model	Supply Circuit Number	Heat kW		Heater kW Per Circuit/ Stage		Heater FLA Total AMPS		Blower/ Motor FLA Total AMPS		Unit (Heater & Motor) FLA Total AMPS		MCA- Minimum Circuit Ampacity (Heater & Motor)		MOCP Maximum Overcurrent Protective Device (Heater & Motor)	
			208	240	208	240	208	240	208	230	208	230	208	230	208	230
AD018 AD/AH024	AHA051SB	Single	3.75	5			18.0	20.8	3.9	3.8	21.9	24.6	27.4	30.8	30	35
AD036 AD048	AHA051MB	Single	3.75	5			18.0	20.8	5.9	5.8	23.9	26.6	29.9	33.3	30	35
AD060 AD072	AHA051LB	Single	3.75	5			18.0	20.8	7.4	6.9	25.4	27.7	31.8	34.6	30	35
AD/AH036 AD/AH048	AHA101MB	Single	7.5	10	3.75	5	36.1	41.7	5.9	5.8	42.0	47.5	52.5	59.4	60	60
AD/AH060 AD072	AHA151LB*	Single	11.25	15	3.75	5	54.1	62.5	7.4	6.9	61.5	69.4	76.9	86.8	80	95
					7.50	10										
Technical Data (US Customers ONLY!!) 60Hz, Single Phase, w/ Circuit Breaker- (Single Point Connection Removed)																
Unit Model	Heater Model	Supply Circuit Number	Heat kW		Heater kW Per Circuit/ Stage		Heater FLA Total AMPS		Blower/ Motor FLA Total AMPS		Unit (Heater & Motor) FLA Total AMPS		MCA- Minimum Circuit Ampacity		MOCP Maximum Overcurrent Protective Device (Heater & Motor)	
			208	240	208	240	208	240	208	230	208	230	208	230	208	230
AD/AH060 AD072	AHA151LB	L1/L2			3.75	5	18.0	20.8	7.4	6.9	25.4	27.7	31.8	34.6	30	35
		L3/L4	11.25	15	7.50	10	36.1	41.7			36.1	41.7	45.1	52.1	50	60

*Additional information regarding installation of the AHA Electric Heaters can be found in Electric Heater IOM, 20D370-01NN.

Available Options		
Electric Heat Model	Description	EAH Models
AHA051SB	5kW, 208/230V, 60HZ, 1 Phase, with Circuit Breaker	024
AHA101MB	10kW, 208/230V, 60HZ, 1 Phase, with Circuit Breaker	036-048
AHA151LB	15kW, 208/230V, 60HZ, 1 Phase, with Circuit Breaker and Single Point Connection Note: Comes with single point connection jumper bar assembly factory installed.	060

Section 3: Unit Data

ECM Fan Performance Data

EAH Series ECM Fan Performance Data: One & Two-Stage Compressor Units																		
Model	Max ESP in. w.c. ²	Program ³	Heating Mode		Cooling Mode		Dehumidification Mode		Fan Only	AUX/E MG Heat ⁴	DIP Switch Settings							
			1st	2nd	1st	2nd	1st	2nd			S1	S2	S3	S4	S5	S6	S7	S8
024	1.1	A	750	950	770	980	650	830	490	900	Off	Off	Off	Off	Off	Off	Off	Off
		B	720	860	730	890	620	760	445	810	Off	Off	Off	On	Off	Off	Off	Off
		C	600	740	620	770	530	650	385	675	On	Off	Off	Off	On	Off	Off	Off
		D	500	650	500	680			340	550	Off	On	On	Off	Off	On	Off	Off
036	1.2	A	1300	1700	1150	1450	980	1230	725	1650	On	Off	Off	Off	On	Off	Off	Off
		B	1120	1440	1000	1270	850	1080	635	1410	Off	On	Off	Off	Off	On	Off	Off
		C	1000	1250	850	1100	720	940	550	1270	Off	On	Off	On	Off	On	Off	Off
		D	850	1050	700	950			475	1050	On	On	Off	Off	On	On	Off	Off
048	1.0	A	1500	1900	1300	1700	1110	1450	850	1925	Off	Off	On	Off	Off	Off	Off	Off
		B	1400	1820	1230	1590	1050	1350	795	1750	Off	Off	Off	Off	Off	Off	Off	Off
		C	1200	1550	1100	1400	940	1190	700	1575	Off	Off	Off	On	Off	Off	Off	Off
		D	1150	1450	1000	1300			650	1485	On	Off	Off	On	On	Off	Off	Off
060	1.2	A	1600	1900	1700	2000	1450	1700	1000	1900	Off	Off	Off	On	Off	Off	Off	Off
		B	1480	1750	1540	1830	1310	1560	915	1705	Off	On	On	Off	Off	On	Off	Off
		C	1300	1550	1400	1650			825	1550	Off	On	Off	Off	Off	On	Off	Off
		D	1200	1400	1250	1500			750	1395	Off	On	Off	On	Off	On	Off	Off

Notes:

1. Program **B (Bold Type)** is factory settings and rated CFM. CFM is controlled within 5% up to the Max ESP.

2. Max ESP testing was done with dry coil.

3. Max ESP for AH024 through AH060 models with external electric heat is 0.8 in. w.c. Exceeding the Max ESP may result in nuisance trips of the electric heat. Thermal limits are rated at 100,000 cycles.

EAH Series Dehumidification Mode Options

DIP Switch		Mode	Operation
S9	S10		
ON	OFF	Normal	Dehumidification mode disabled (Normal Htg/Clg CFM)-- Factory setting.
OFF	ON	ODD	On Demand Dehumidification mode (humidistat input at terminal ODD)-- Humidistat
OFF	OFF	Constant Dehum	Constant Dehumidification mode (always uses dehum CFM for cooling and normal CFM)
ON	ON	Not Used	Not an applicable selection.

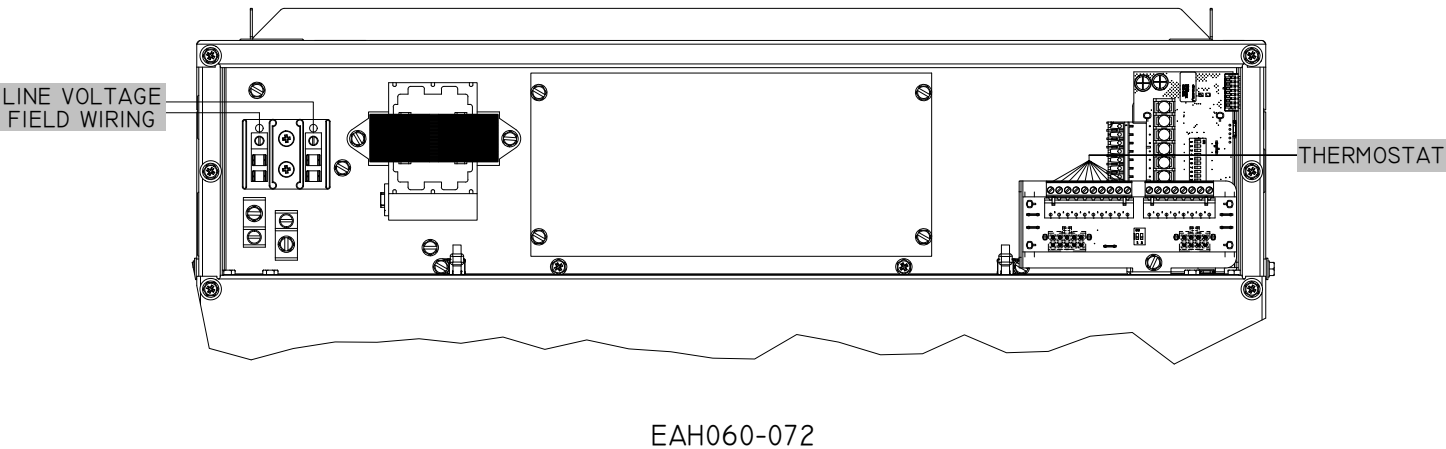
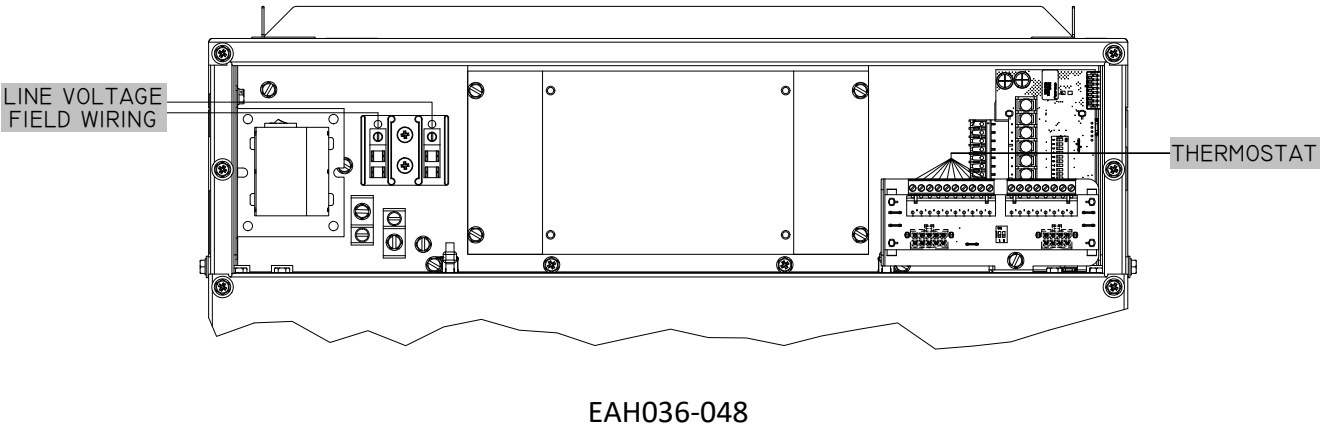
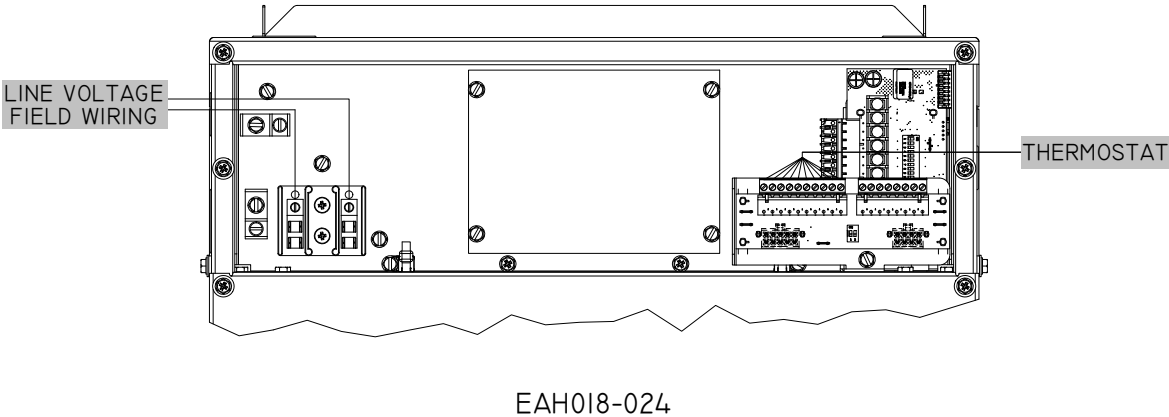
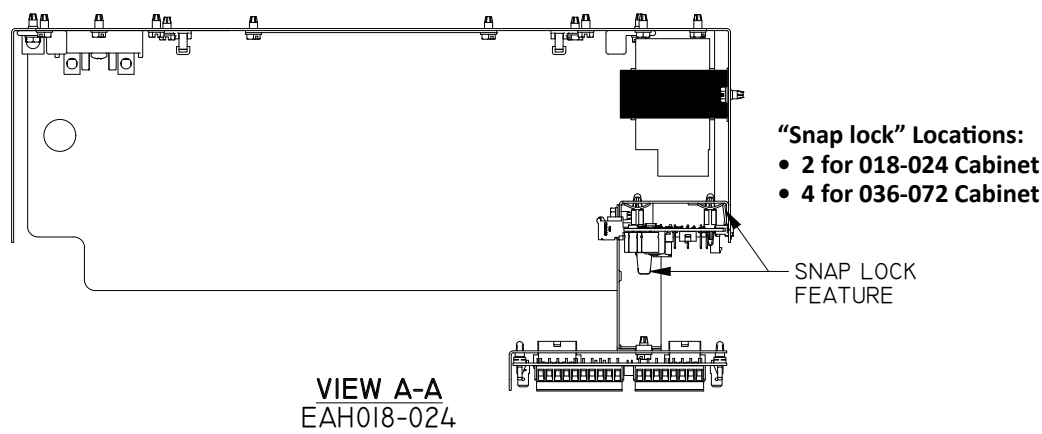
Notes:

1. To enter dehumidification mode, ODD input should be 0 VAC; for normal cooling CFM, ODD input should be 24 VAC.

2. Heating CFM is not affected by dehumidification mode. When in dehumidification mode, cooling CFM is 85% of normal CFM.

Section 4: Controls

Electrical Connections



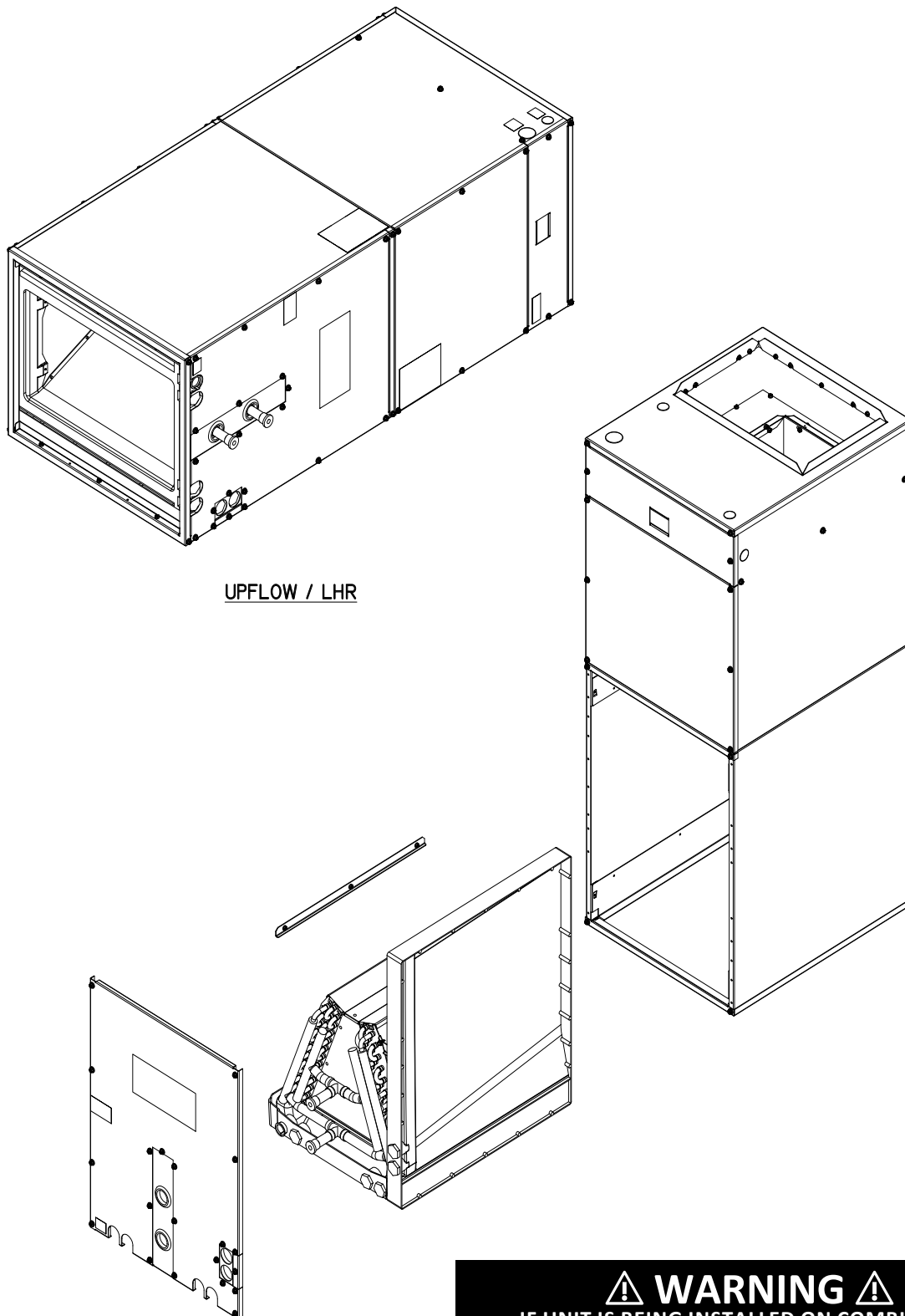
Wiring Diagram

EAH/EEH - Rev. D Models
Installation and Operations Manual

Section 5: General Unit Assembly

Disassembly

1. Remove the evaporator coil door panel. Set the door and screws aside, as they will be re-used.
2. Remove the evaporator coil assembly with the drain pan, by sliding it out of the front of the unit.
3. Remove the (3) screws securing the drain pan rail. Set the rail and screws aside, as they will be re-used.



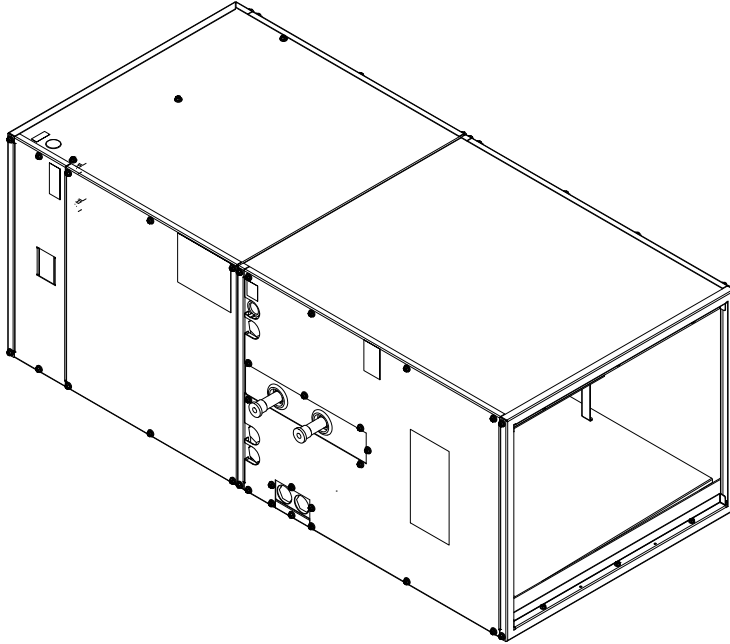
⚠ WARNING ⚠

IF UNIT IS BEING INSTALLED ON COMBUSTIBLE FLOORING, A NON-COMBUSTIBLE BASE MUST BE USED. UNIT CANNOT BE INSTALLED ON CARPETING.

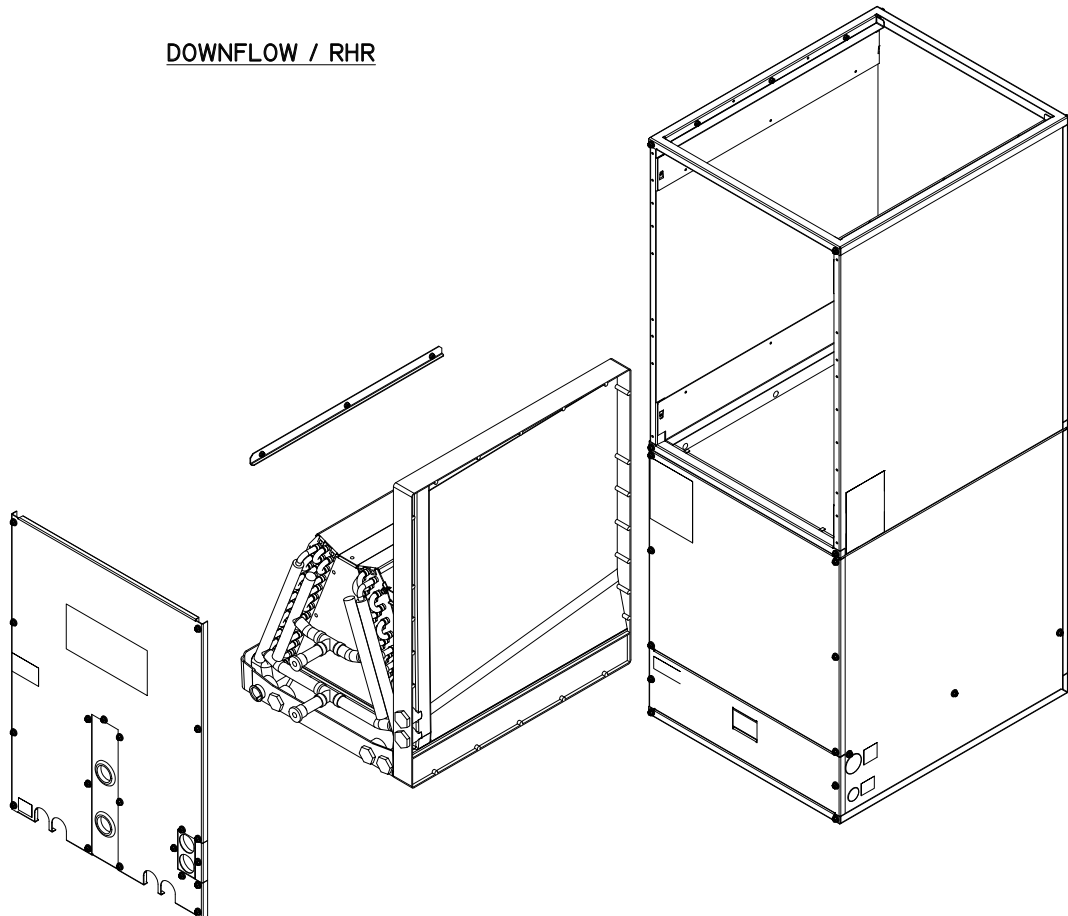
Section 5: General Unit Assembly

Assembly

4. Invert the air handler 180°, and reinstall the drain pan rail just above the blower. Use the (3) screws that were taken out in Step #3.
5. Slide the evaporator assembly back into the coils section. Evaporator must be installed so it is configured in the "A" position.
6. Re-install the evaporator door panel using parts from Step #1.



DOWNFLOW / RHR

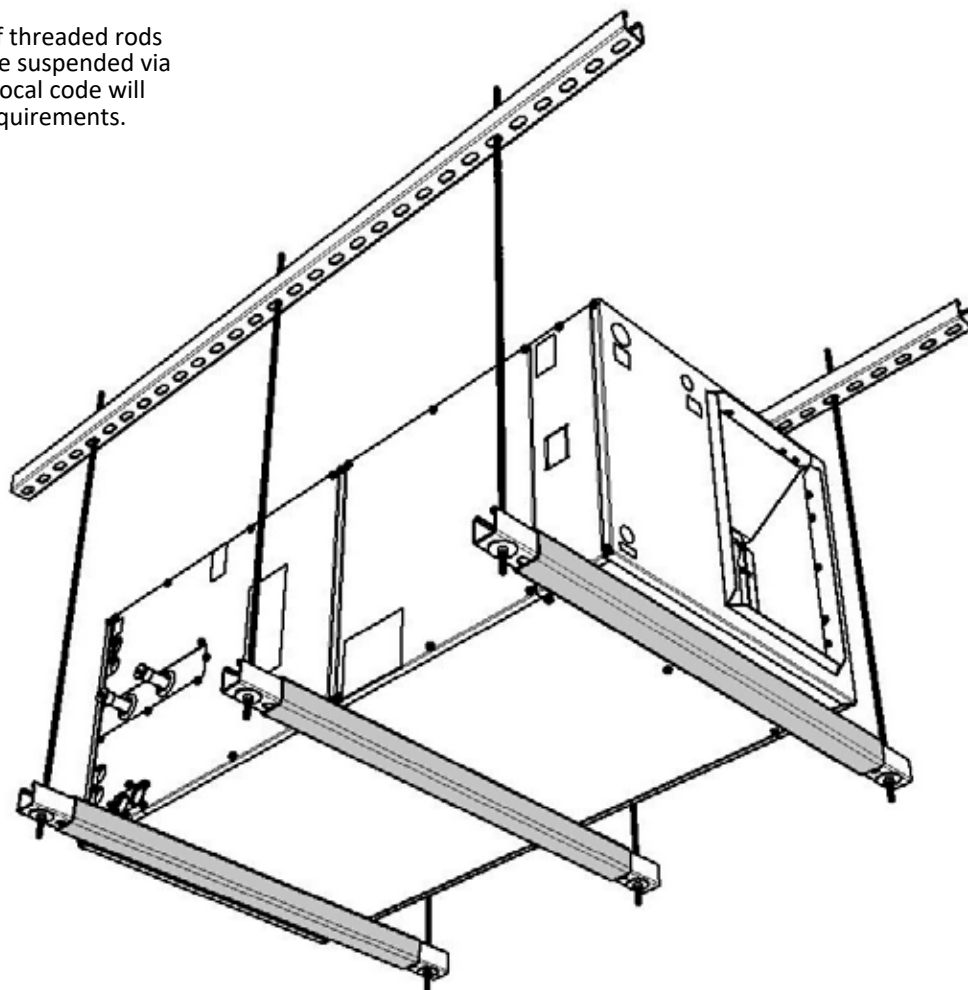


Section 5: General Unit Assembly

Horizontal Applications

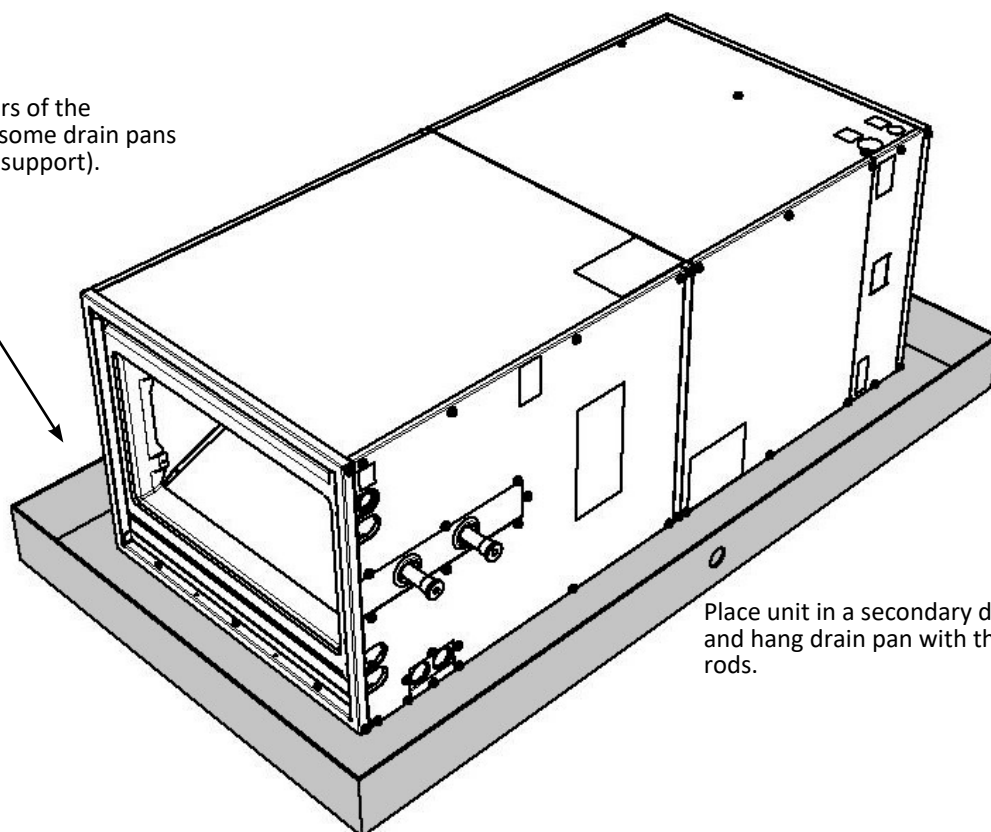
Require support from three sets of threaded rods (Figure 3) or the air handler may be suspended via a secondary drain pan (Figure 4). Local code will determine secondary drain pan requirements.

Figure 3:



Support all four corners of the secondary drain pan (some drain pans may require a middle support).

Figure 4:



Place unit in a secondary drain pan and hang drain pan with threaded rods.

Revision Table

Date	Description of Revision	Page
21SEP2023	Document created	All



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