

Installation, Operations, & Maintenance Manual

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

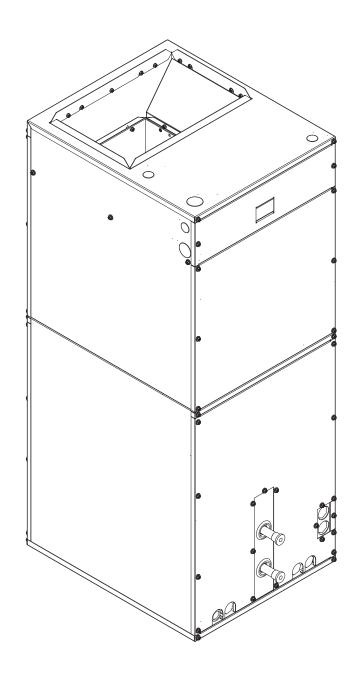
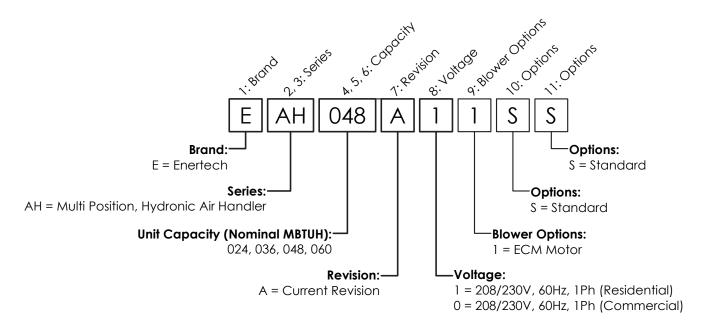
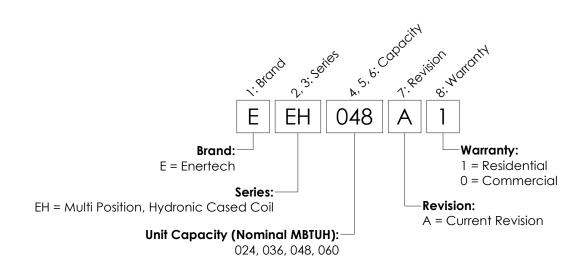




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Section 2: Introduction & Installation Considerations

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.

⚠ CAUTION **⚠**

ALL EQUIPMENT IS DESIGNED FOR INDOOR INSTALLATION ONLY. DO NOT INSTALL OR STORE UNIT IN A CORROSIVE ENVIRONMENT OR IN A LOCATION WHERE SUBJECT TO EXTREME TEMPERATURE AND HUMIDITY. IF INSTALLED OUTDOORS OR IN EXTREME CONDITIONS, ALL WARRANTIES WILL BE VOID.

Pre-Installation Steps

- Compare the model number on the unit nameplate with packing slip and ordering information to verify that the correct unit has been shipped.
- 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.
- 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.
- 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, downflow, 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.

$oldsymbol{\Lambda}$ CAUTION $oldsymbol{\Lambda}$

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.

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.

riangle CAUTION riangle

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.

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.

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.

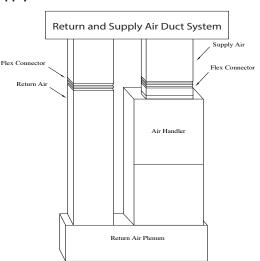
Table 2: Maximum Air Velocities

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

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 Fan Speed in Section 6 for details.

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 that the fittings on the Heat Pump (larger on long runs).

These units are equipped with sweat copper adaptors.

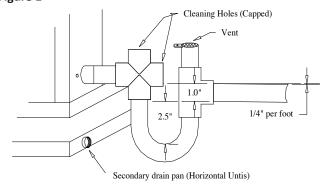
Once piping is complete, it will be critical for the installer to insulate both the supply and return line to avoid condensate issues. Armaflex (or equivalent type/brand) of at least a 3/8" wall thickness is recommended.

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.

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 slopped 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.

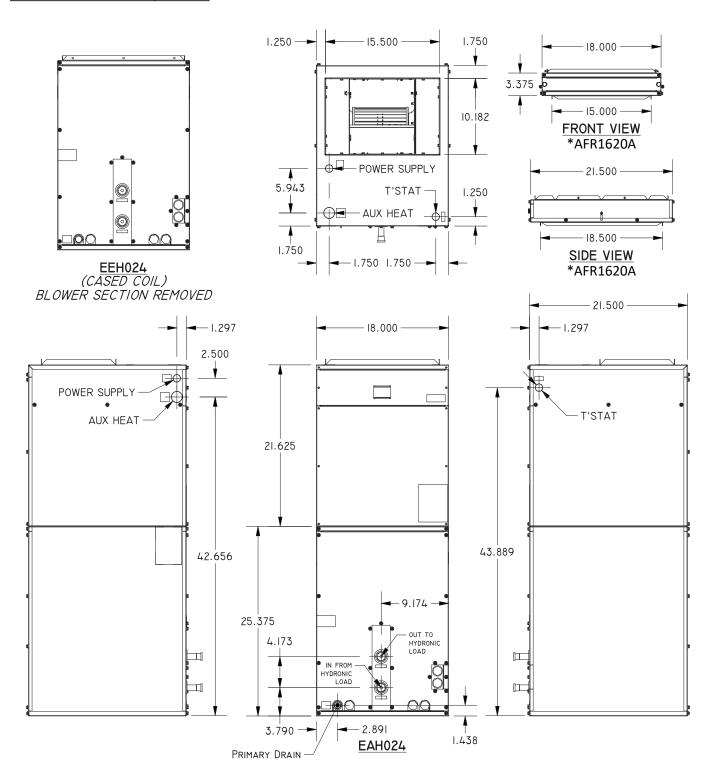
Figure 1



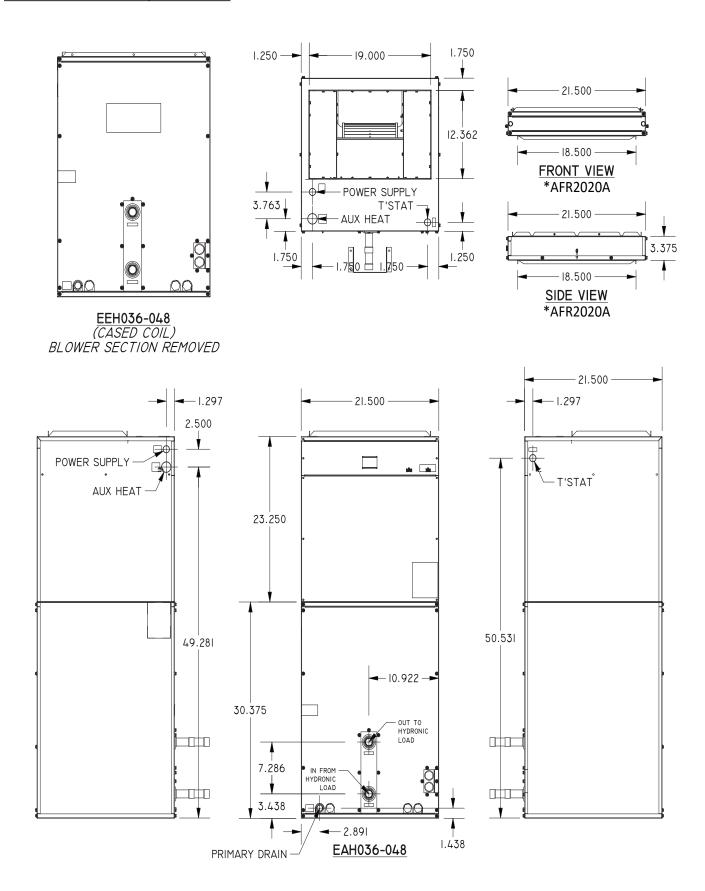
NOTICE: Connect the drain through the trap to the condensation drain system in conformance to local plumbing codes.

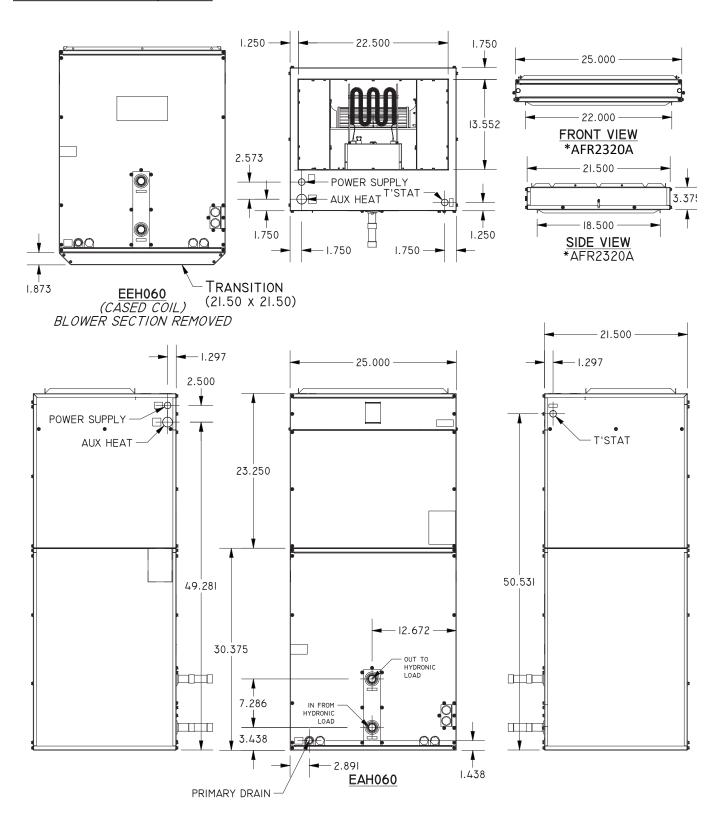
Table 3: EZ-Trap Kits

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



	(EAH) AIR HANDLER & (EEH	AH SHIP	EH SHIP	*ACCESSORY	
MODEL	HYDRONIC LOAD CONN.	ELECTRICAL KNOCKOUTS	WEIGHT	WEIGHT	FILTER RACK
024	3/4" O.D.	,	155 LBS	80 LBS	AFR1620A
036-048	1-1/8" O.D.	SIZED FOR 1/2" OR 1" CONDUIT	190 LBS	95 LBS	AFR2020A
060	1-1/8" O.D.	30,12 011	210 LBS	100 LBS	AFR2320A





Section 3: Unit Data

EAH Electrical Data

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

AHA Electric Heater Electrical Data

	Technical Da	ta 60Hz, 🤄	Single Ph	nase, w/ C	Circuit Br	eaker (*S	ingle Poi	nt Conne	ction)		
Heater Model	Supply Circuit Number	Heat kW		Heater kW Per Circuit		FLA Total AMPS			linimum Ampacity	MOCP Maximum Overcurrent Protective Device (AMPS) NEC 240.4(B)	
		240	208	240	208	240	208	240	208	240	208
AHA051SA AHA051MA AHA051LA	Single	5	3.75	2.5	1.875	20.8	18.0	26.0	22.5	30	25
AHA101MA	Single	10	7.5	5 5	3.75 3.75	41.7	36.1	52.1	45.1	60	50
AHA151LA*	Single	15	11.25	5 10	3.75 7.50	62.5	54.1	78.1	67.6	80	70
Technical Da	ta <u>(US Customer</u> s	ONLY!!	60Hz, Si	ingle Pha	se, w/ Ci	rcuit Brea	aker- (Sir	ngle Poin	t Connec	tion Rem	oved)
Heater Model	Supply Circuit Number	Hea	t kW	Heater kW Per Circuit		To	TLA MCA- Minimu Circuit Ampac			Overc Prote Device	laximum urrent ective (AMPS) 40.4(B)
		240	208	240	208	240	208	240	208	240	208
AHA151LA	L1/L2	15	11.25	5	3.75	20.8	18.0	26.0	22.5	30	25
	L3/L4		•	10	7.50	41.7	36.1	52.1	45.1	60	50

^{*}Additional information regarding installation of the AHA Electric Heaters can be found in Electric Heater IOM, 20D319-01NN.

Available Options								
Electric Heat Model	Description	EAH Models						
AHA051SA	5kW, 208/230V, 60HZ, 1 Phase, with Circuit Breaker	024						
AHA101MA	10kW, 208/230V, 60HZ, 1 Phase, with Circuit Breaker	036-048						
AHA151LA	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 Sei	AH Series ECM Fan Performance Data: One & Two-Stage Compressor Units																		
Model	Max Model ESP	Program ³	Heating Mode		Cooling Mode			Dehumidification Mode		AUX/E MG			DIP	Switc	h Sett	ings			
	in. w.c. ²		1st	2nd	1st	2nd	1st	2nd	Only	Heat⁴	S1	S2	S3	S4	S5	S6	S7	S8	
		Α	750	950	770	980	650	830	490	900	Off	Off	Off	Off	Off	Off	Off	Off	
024	1.1	В	720	860	730	890	620	760	445	810	Off	Off	Off	On	Off	Off	Off	Off	
024	1.1	С	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
		Α	1300	1700	1150	1450	980	1230	725	1650	On	Off	Off	Off	On	Off	Off	Off	
036	1.2	1.2	В	1120	1440	1000	1270	850	1080	635	1410	Off	On	Off	Off	Off	On	Off	Off
036	1.2	С	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	
		Α	1500	1900	1300	1700	1110	1450	850	1925	Off	Off	On	Off	Off	Off	Off	Off	
048	1.0	В	1400	1820	1230	1590	1050	1350	795	1750	Off	Off	Off	Off	Off	Off	Off	Off	
048	1.0	С	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	
		Α	1600	1900	1700	2000	1450	1700	1000	1900	Off	Off	Off	On	Off	Off	Off	Off	
060	1.2	В	1480	1750	1540	1830	1310	1560	915	1705	Off	On	On	Off	Off	On	Off	Off	
000	1.2	С	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

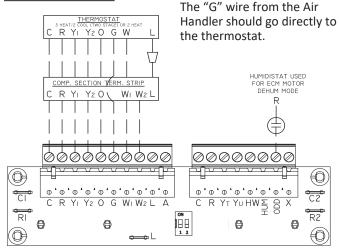
DIP S	witch	Mode	Operation
S9	S10	ivioue	Operation
ON	OFF	Normal	Dehumidification mode disabled (Normal Htg/Clg CFM) Factory setting.
OFF	ON	ODD	On Demand Dehumidification mode (humidistat input at terminal ODD) Humidistat
OFF	OFF	Constant Dehum	Constant Dehumidification mode (always uses dehum CFM for 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

Thermostat Board



The Enertech thermostat board is designed to eliminate jumpers and spade connectors and is equipped with two DIP switches for flexibility of applications.

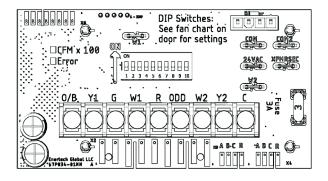
Verify that the switches are set correctly prior to starting the unit with the following options:

DIP #1 - Single Speed or Two Stage ON = Single Stage (BS018) OFF = Two Stage (BT024 to 72)

Note: Setting this DIP switch ON connects Y1 to Y2 and provides full stage airflow for single speed systems.

DIP #2 - Water Valve End Switch (terminals YT & YU)
ON = No end switch (YT is jumpered to YU)
OFF = Water valve has end switch (see wiring diagram)

ECM Motor Controller



Fan Speed

The air handler units is equipped with a variable speed ECM motor. **See blower CFM chart for DIP switch settings.**

If a different speed is desired:

- Shut OFF electrical power at the unit disconnect switch or service panel.
- 2. Remove blower access door, and confirm circuit breakers (if equipped with electric heat) are in the OFF position.
- The speed can be changed for both heating and cooling modes.
- 4. DIP switches are provided to change blower CFM settings.

Airflow Monitor

An LED on the ECM fan control board flashes one time per 100 CFM when the unit's fan is operating to indicate airflow.

Modes of Operation Heating 1st Stage (Y1, G)

The ECM fan immediately ramps up to 75% of 1st stage airflow (CFM) level (based on DIP switch settings), The ECM fan adjusts to 100% (of 1st stage operation) CFM level 90 seconds after the "Y1" input.

Heating 2nd Stage (Y1, Y2, G)

The ECM fan adjusts to 2nd stage airflow (CFM) level (based on DIP switch settings).

Heating 3rd Stage (Y1, Y2, W1, G)

The ECM fan remains at 100% of 2nd stage airflow (CFM) level (based on DIP switch settings), and the first stage of electric resistance heat is energized. Second stage of electric resistance heat (W2) is energized ten minutes after first stage electric resistance heat (W1) is energized. (W2 is only available with 10kW and 15kW electric heaters)

Emergency Heat (W1, G)

The fan is started immediately at 2nd stage airflow (CFM) level (based on DIP switch settings), and the electric resistance heat is energized. Second stage of electric heat (W2) is energized ten minutes after first stage electric heat (W1) is energized. (W2 is only available with 10kW and 15kW electric heaters).

Cooling 1st Stage (Y1, O, G)

Terminal "O" from the thermostat is energized for cooling operation. The ECM fan immediately ramps up to 75% of 1st stage airflow (CFM) level (based on DIP switch settings). The ECM fan adjusts to 100% (of 1st stage operation) CFM level 90 seconds after the "Y1" input.

Cooling 2nd Stage (Y1, Y2, O, G)

The ECM fan adjusts to 2nd stage airflow (CFM) level (based on DIP switch settings).

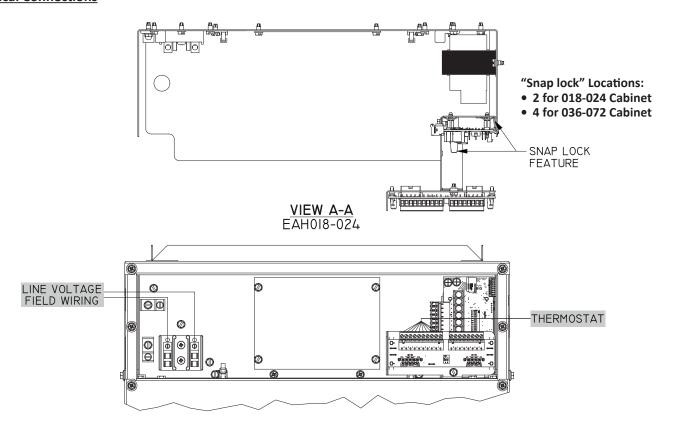
Dehumidification

The ECM fan control board includes two types of dehumidification modes, Constant Dehumidification mode, and On Demand Dehumidification (ODD). If the ECM control board is set to Constant Dehumidification mode, the ECM fan runs at normal airflow (CFM) in all heating stages, but all cooling operation will be 85% of the current stage airflow (CFM) level (based on DIP switch settings). The dehumidification mode lowers the airflow (CFM) through the evaporator coil, to improve latent (dehumidification) capacity. In ODD mode, a humidistat or a thermostat with a dehumidification output (output must be reverse logic -- i.e. it must operate like a humidistat) is connected to the ODD terminal. When the control receives a call for dehumidification, the fan runs at 85% of the current stage airflow (CFM) in the cooling mode. Otherwise, the airflow is at the normal airflow (CFM) level. The signal is ignored in the heating mode.

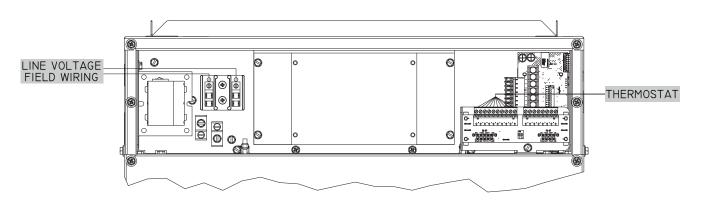
Fan Only

When the ECM control module receives a "G" call without a call for heating or cooling, the fan operates at 50% of the full load airflow (CFM) level (based on DIP switch settings).

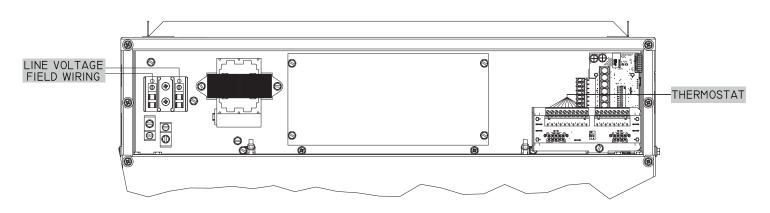
Electrical Connections

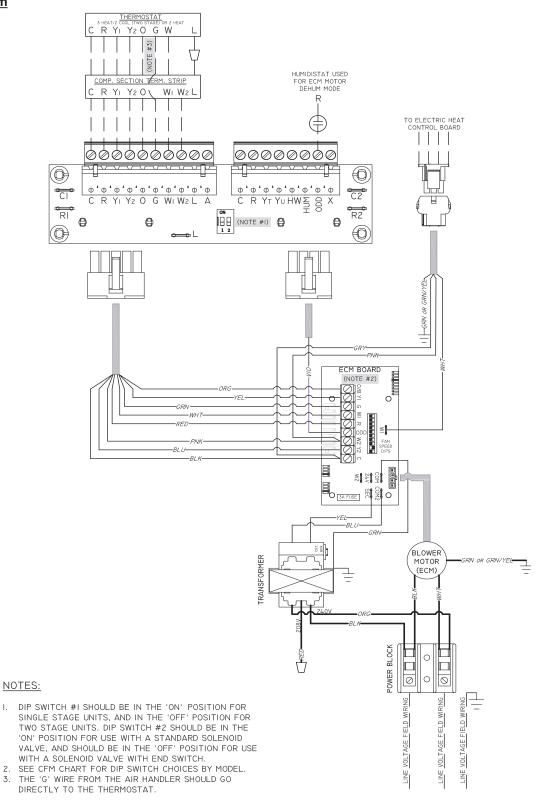


EAH018-024



EAH036-048





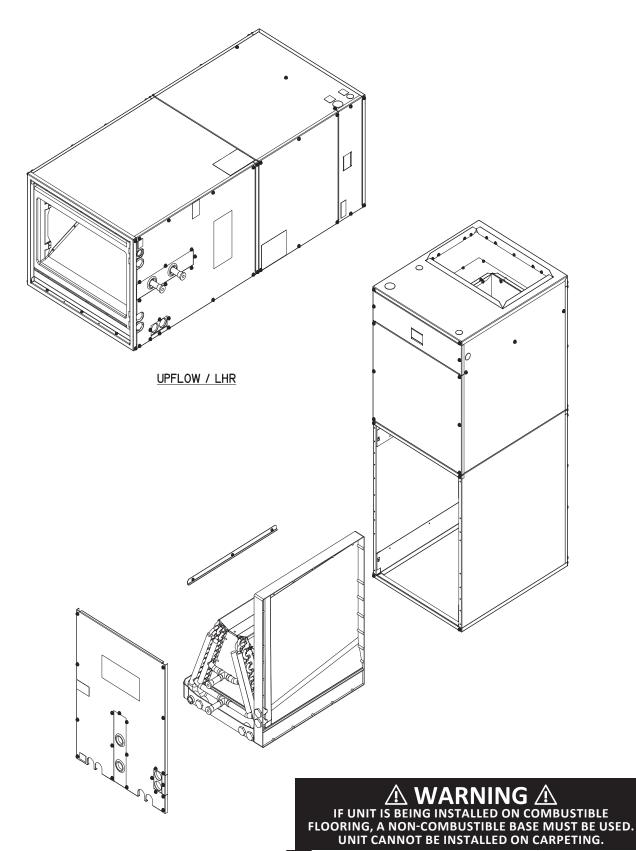
NOTICE

To make servicing the ECM board and Thermostat control strip easier, they are mounted to a single bracket. Before removing, disconnected the existing wire harness and gently pull the from back of the ECM Board. The ECM Board and Thermostat Control strip will pop/slide out together from the "snap locks".

Section 5: General Unit Assembly

Disassembly

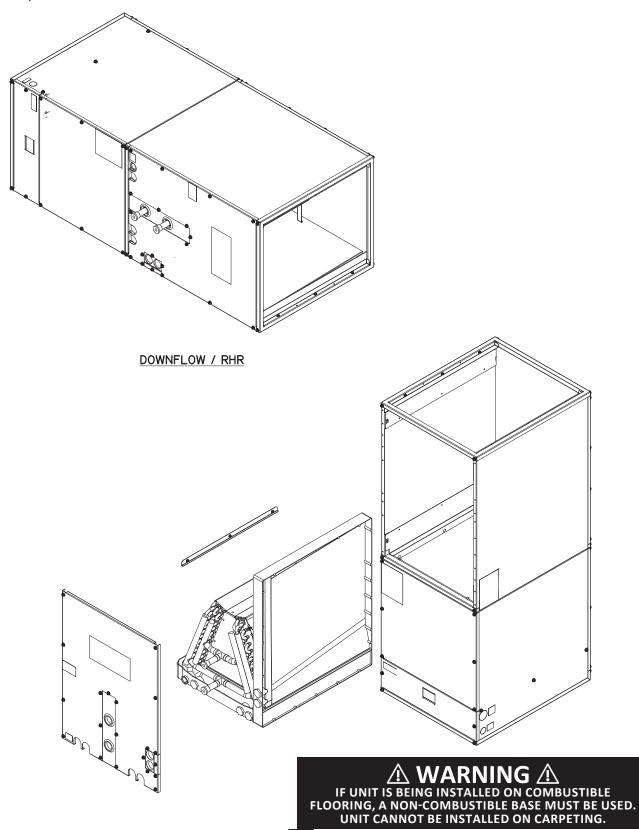
- Remove the evaporator coil door panel. Set the door and screws aside, as they will be re-used.
- 2. Remove the evaporator coil assembly with the drain pan, by sliding it out of the front of the unit.
- 3. Remove the (3) screws securing the drain pan rail. Set the rail and screws aside, as they will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



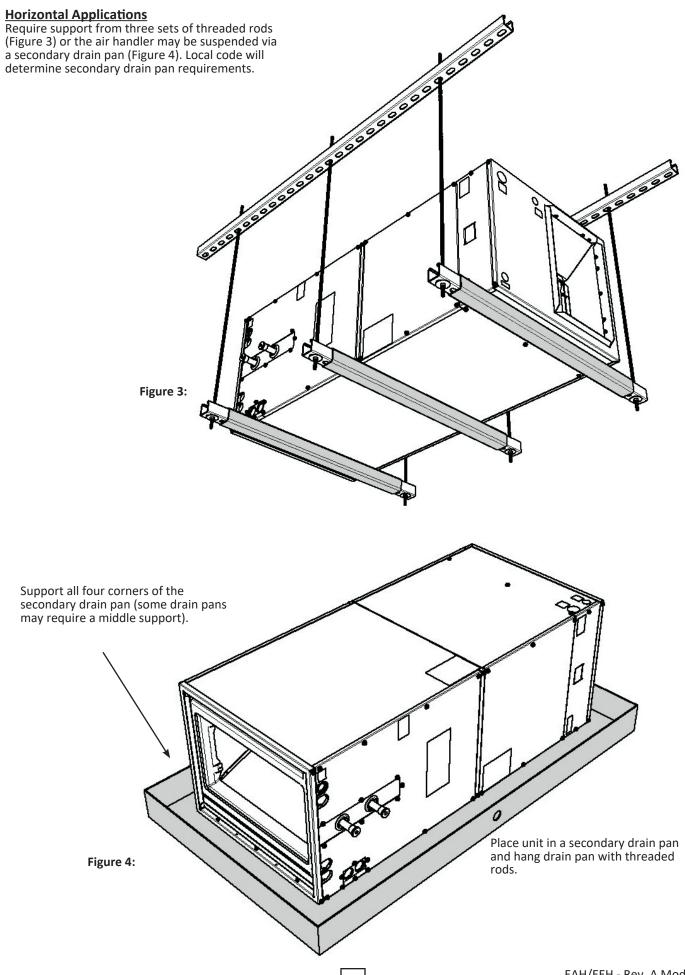
Section 5: General Unit Assembly

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.



Section 5: General Unit Assembly



Revision Table

Date	Description of Revision	Page
01MAY2023	Fixed LHR unit orientation	16
16MAR2023	Document created	All



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Enertech Global is continually working to improve its products. As a result, the pricing, design and specifications of each product may change without notice and may not be as described herein. For the most up-to-date information, please visit our website, or contact our Customer Service department at info@enertechgeo.com. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely Enertech Global's opinion or commendation of its products.