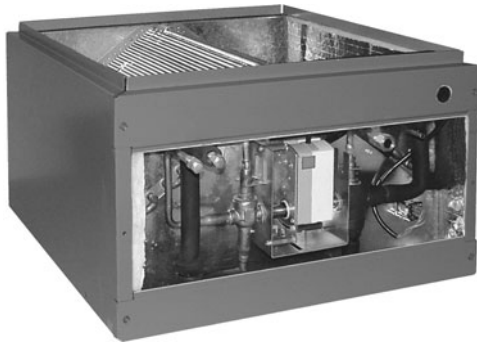




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INSTALLATION/ SERVICE INSTRUCTIONS

Humiditrol® Enhanced Dehumidification Accessory (EDA) Units

ACCESSORIES
505,021M
02/06
Supersedes 01/06

Technical
Publications
Litho U.S.A.

**RETAIN THESE INSTRUCTIONS
FOR FUTURE REFERENCE**

Humiditrol® EDA Series Unit

The Dave Lennox Signature™ Collection Humiditrol® Enhanced Dehumidification Accessory (EDA) is designed for installation with a Lennox R-410A split-system outdoor unit and an air handler or a furnace with a variable speed blower. This accessory is designed for indoor installations in either upflow or horizontal air discharge applications. **This unit is for use only on R-410A systems with thermal expansion valves.**

Prior to installation, study the decision tree on page 16 to confirm that all application requirements for EDA installation are met.

NOTE - For downflow application, refer to Installation Instruction Supplement, Installing EDA Unit in Downflow Configuration 505,134M.

Shipping & Packing List

- 1 - Assembled EDA indoor unit
- 1 - Bag assembly (includes check/flow restrictor for use on EDA coil, EDA notification label).
- 1 - Outdoor fan relay and wiring harness (used only with outdoor units equipped with variable speed fan motors)

Check the components for shipping damage. If any damage is found, immediately contact the last carrier.

Other Required Components

Separately-ordered components are restricted to those listed in the Engineering Handbook and the price book:

- SignatureStat™ thermostat [Outdoor Sensor (46M98) included],
 - Single-stage (81M26)
 - Multi-stage (81M27)
 - Multi-stage heat-pump (81M28)
- Twisted Pair Wire (84X49) for outdoor sensor to thermostat - Required for use with SignatureStat™.
- 75VA 24VAC indoor unit transformer (12P61) - Required when EDA unit is installed with a two-stage heat pump system.
- Humiditrol® EDA Insulation and Piping Kit (refer to applications information in Lennox Engineering Handbook)

02/06



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General Information

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

The Humiditrol® EDA unit will operate to dehumidify, as required, when ambient temperatures are below 95°F. When temperatures reach 95°F, the cooling and dehumidification requirements will both be satisfied by the increased system runtime. In applications that include a Humiditrol® EDA unit, a call to activate the dehumidification mode at or above 95°F is unnecessary and would not be issued or allowed by the SignatureStat™ room thermostat.

Prior to system checkout, consider the outdoor ambient temperature. **REMEMBER, the EDA unit does NOT function in temperatures at or above 95°F.** Plan testing to be conducted when temperatures are between 65°F and 95°F to ensure proper EDA set up and checkout operation.

IMPORTANT

The approved application for the EDA Series unit is restricted to those listed in the Engineering Handbook and price book.

505,021M



⚠ WARNING

This cased product contains fiberglass wool. Disturbing the insulation during installation, maintenance, or repair will expose you to fiberglass wool dust. Breathing this may cause lung cancer. (Fiberglass wool is known to the State of California to cause cancer.)

Fiberglass wool may also cause respiratory, skin, and eye irritation.

To reduce exposure to this substance or for further information, consult material safety data sheets available from address shown below, or contact your supervisor.

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P.O. Box 799900
Dallas, TX 75379-9900

⚠ WARNING



Risk of explosion or fire. Can cause injury or death. Recover all refrigerant to relieve pressure before opening the system.

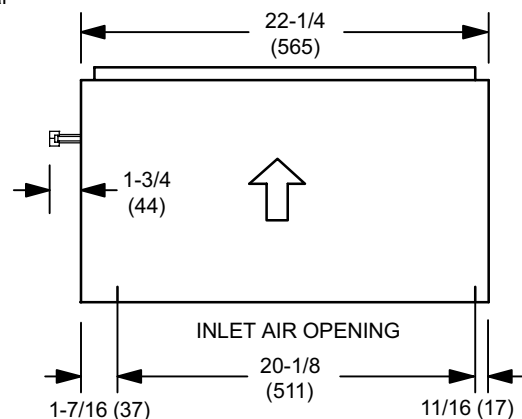
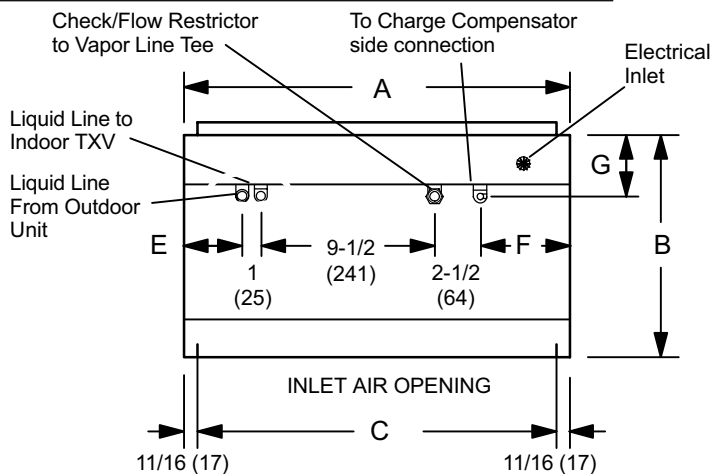
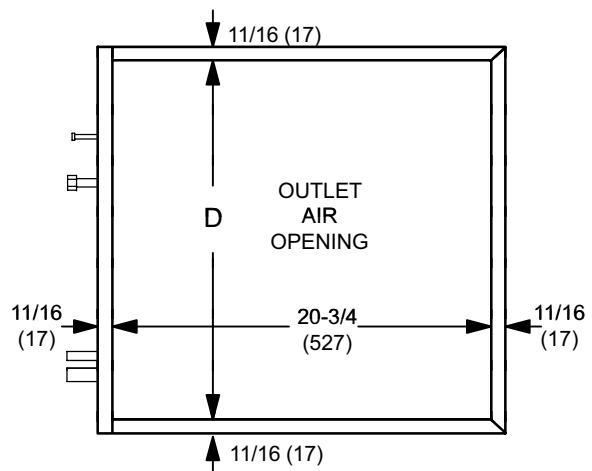
⚠ IMPORTANT

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

Unit Dimensions

EDA Model Dimensions - Inches (mm)

Dimension	EDA-024B	EDA-036C	EDA-060D
A	17-1/2 (445)	21 (533)	24-1/2 (622)
B	12-1/4 (311)	12-1/4 (311)	14 (356)
C	16-1/8 (422)	19-5/8 (498)	23-1/8 (587)
D	16-1/8 (422)	19-5/8 (498)	23-1/8 (587)
E	1-3/8 (35)	3-1/8 (79)	4-7/8 (124)
F	3-1/8 (79)	4-7/8 (124)	6-5/8 (168)
G	3 (76)	3-1/4 (83)	4-3/4 (121)



Installation Dimensions and Arrangement

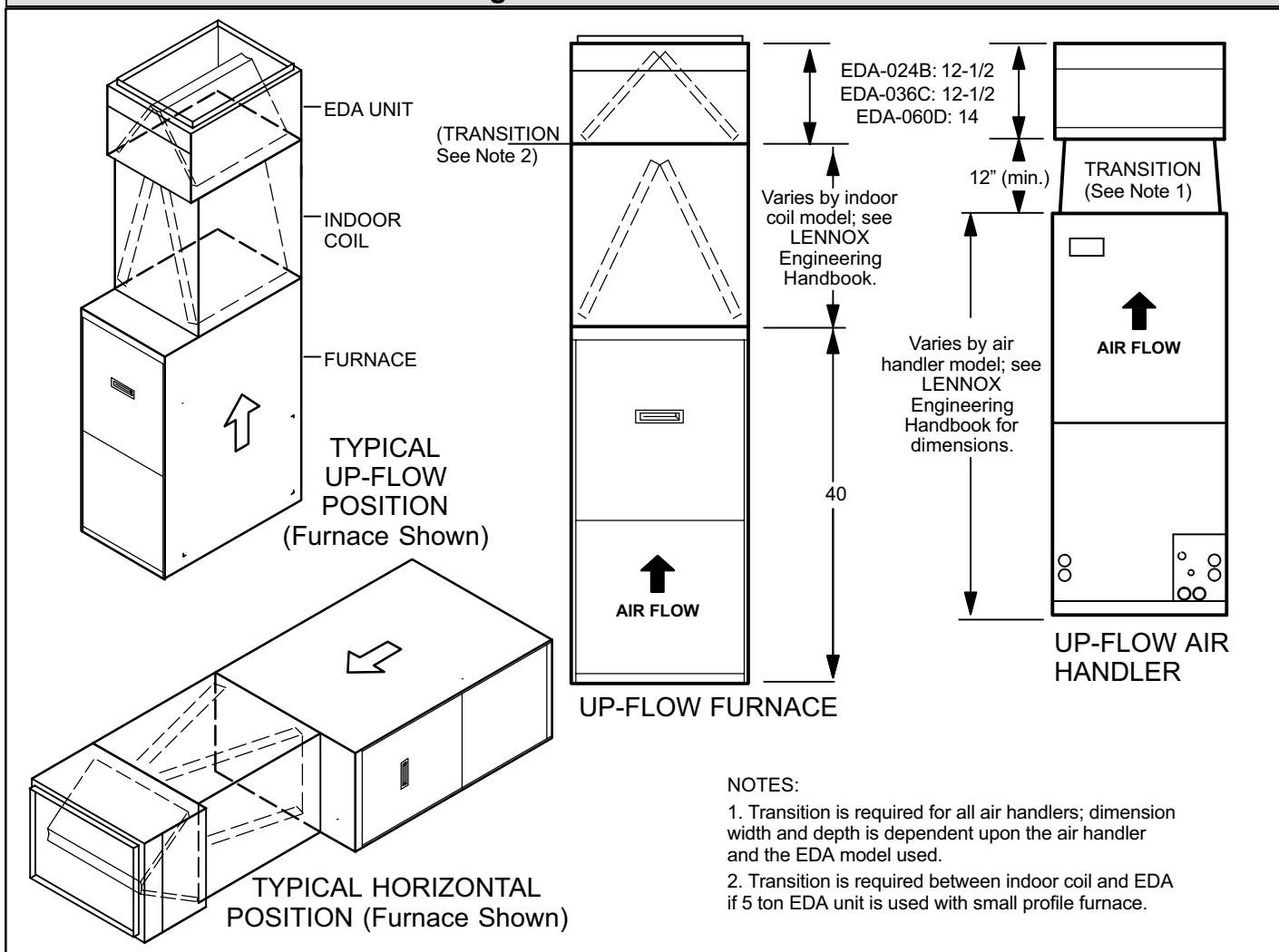


Figure 1

Component Functions

Charge Compensator—The charge compensator (shown in figure 5) serves to maintain the proper amount of refrigerant circulating in larger systems. [Some systems do not require a charge compensator, but do require a similar kit to connect into the system (see Engineering Handbook)]

The charge compensator stores excess refrigerant when the EDA coil is active and returns it to the system during normal cooling or heating operations. When the EDA coil is active, less charge is required to obtain the proper amount of subcooling because of the additional coil surface and the cooler air which passes over the EDA coil.

Check/Flow Restrictor—The check function of the check/flow restrictor (shown in figure 2) prevents refrigerant from flowing into the inactive components during times when the EDA coil is inactive. The flow restrictor controls the rate of return of charge to the system from the charge compensator and the EDA coil when the system changes from "EDA coil active" to "EDA coil inactive."

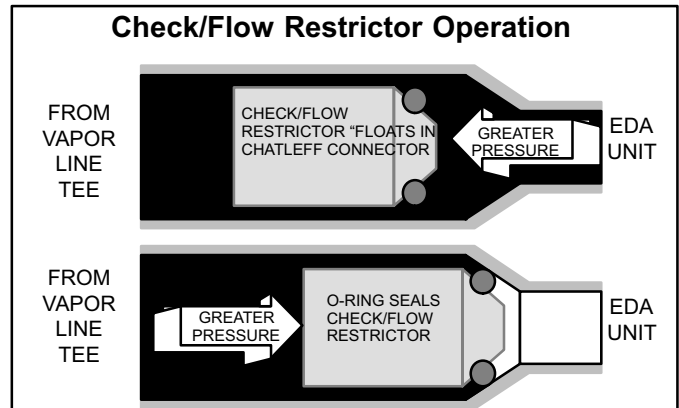


Figure 2

Valve Assembly—The first valve of the diverting valve assembly (figure 3, E) directs the flow of refrigerant to either bypass the EDA coil (EDA coil is inactive) or pass through the EDA coil (EDA coil is active). The second valve (figure 3 F) directs the flow of refrigerant back to the liquid line when the first valve (E) allows flow through the EDA coil. When the EDA coil is inactive, the second valve (F) provides a vent path to the suction line, draining the EDA coil and charge compensator of liquid refrigerant.

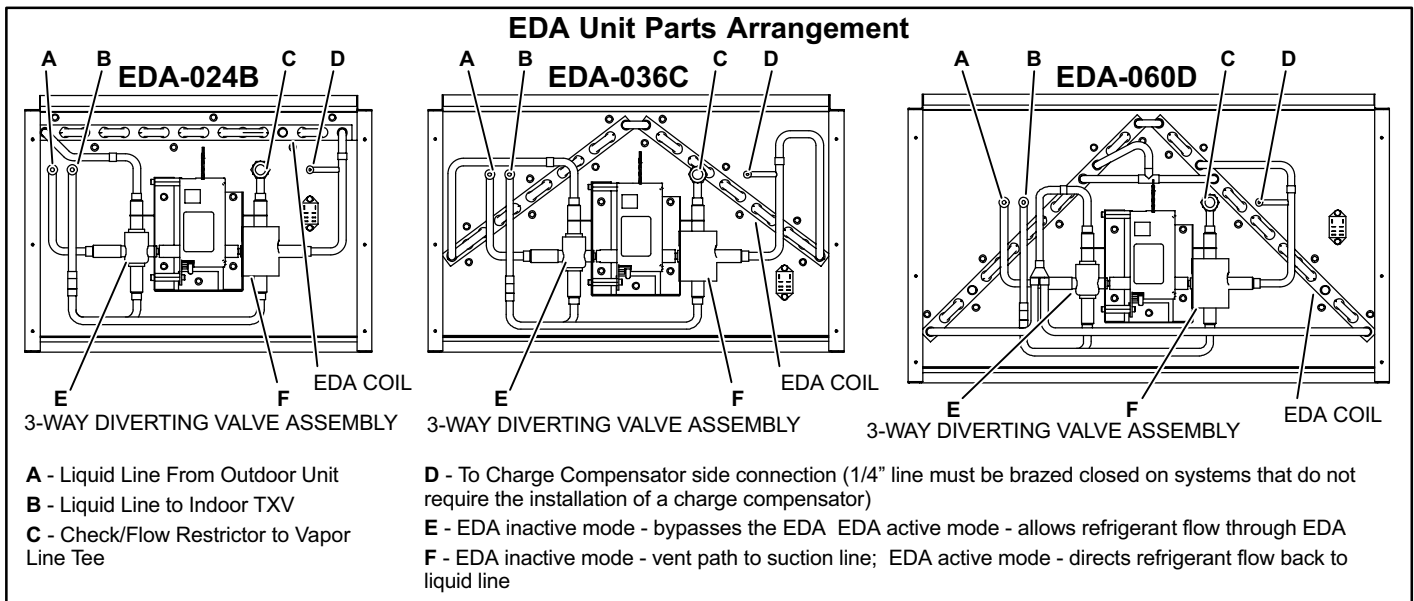


Figure 3

General Installation Information

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause personal injury, loss of life, or damage to property.

Installation and service must be performed by a qualified installer or service agency.

The EDA unit may be used in upflow or horizontal discharge installations. Slots around the inlet end of the EDA cabinet are provided to secure the EDA unit to the duct flanges of indoor coil/air handler cabinets. Use field-provided #8 x 1" long SDST screw (usually 6 required).

CAUTION

Physical contact with metal edges and corners while applying excessive force or rapid motion can result in personal injury. Be aware of, and use caution when working nearby these areas during installation or while servicing this equipment.

Refrigeration

All EDA coils are shipped with a combination check/flow restrictor. **The restrictor is provided in the bag assembly and must be installed.** Refer to the appropriate high and/or low side installation instructions for information on the appropriate line sets. Refer to Lennox Refrigerant Piping guide (Corp. 9351-L9) for proper size, type, and application of field-fabricated lines.

Releasing Air Charge

NOTE - EDA units use dry air as a holding charge.

CAUTION

The EDA coil is shipped from the factory pressurized with dry air. Pierce a hole in the coil's rubber plug vapor line seal to relieve the pressure before removing the seals.

Ensure that the coil is void of pressure. Remove the rubber plug from the lines.

NOTE - If there is no pressure when the plugs are pierced, check the unit for leaks before continuing with the installation.

Refrigerant Line Connections

NOTE - When connecting lines, be careful to avoid damaging the 3-way diverting valve access panel. Place a wet rag against the piping plate and around the EDA unit line connections. A wet rag heat shield must be in place during brazing to guard against damage to the paint.

Electrical Wiring

Electrical wiring diagrams are provided in figures 12 and 13 (see pages 14 and 15). Some modifications to certain units may be necessary. Review the diagrams before installation to ensure all necessary components are on hand at time of installation.

EDA Installation and Checkout Flow Chart

Follow the procedures in the flow chart in figure 4 while referring to the illustration in figure 5 to install the EDA: and associated components.

EDA Installation & Checkout Flow Chart

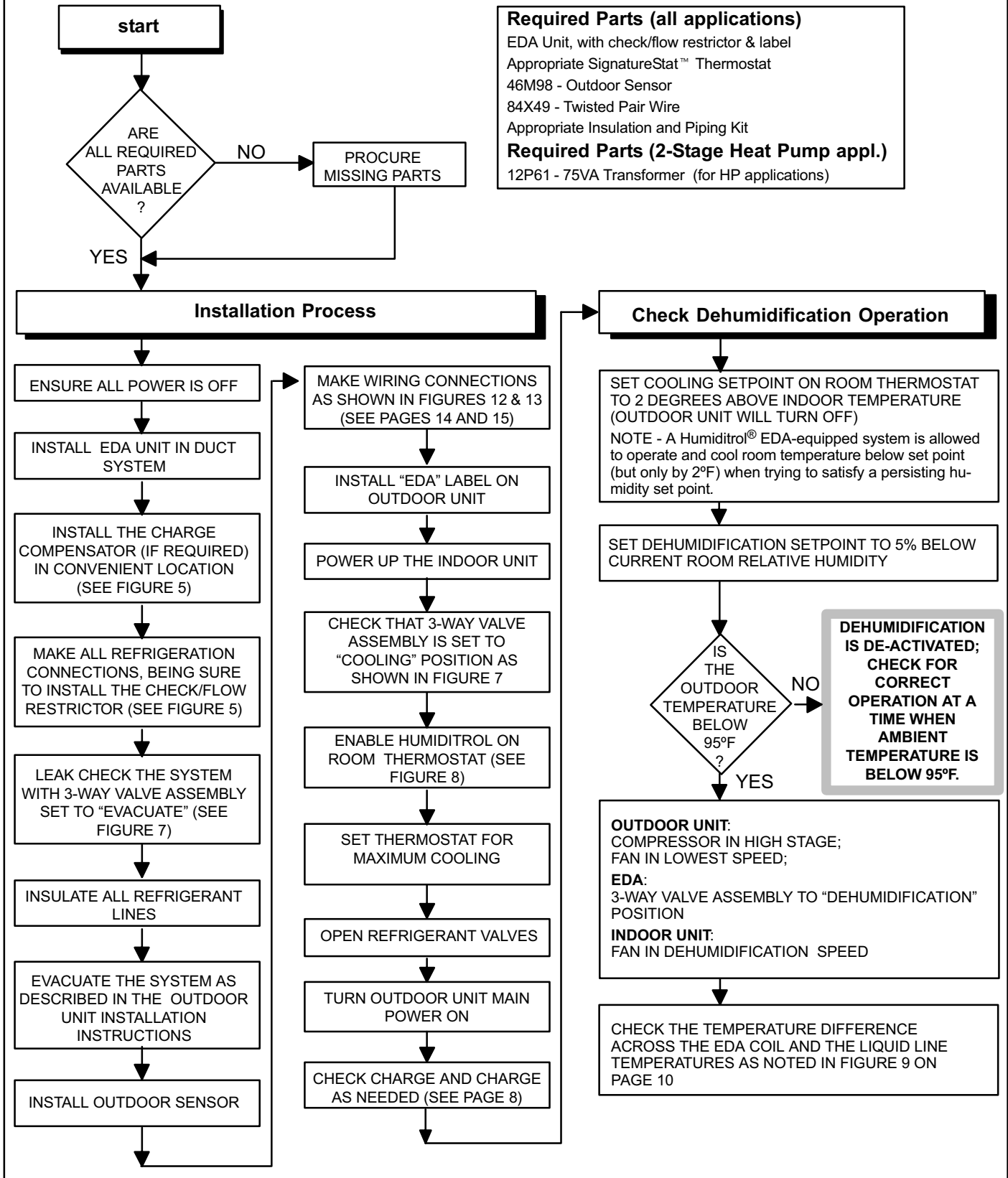


Figure 4

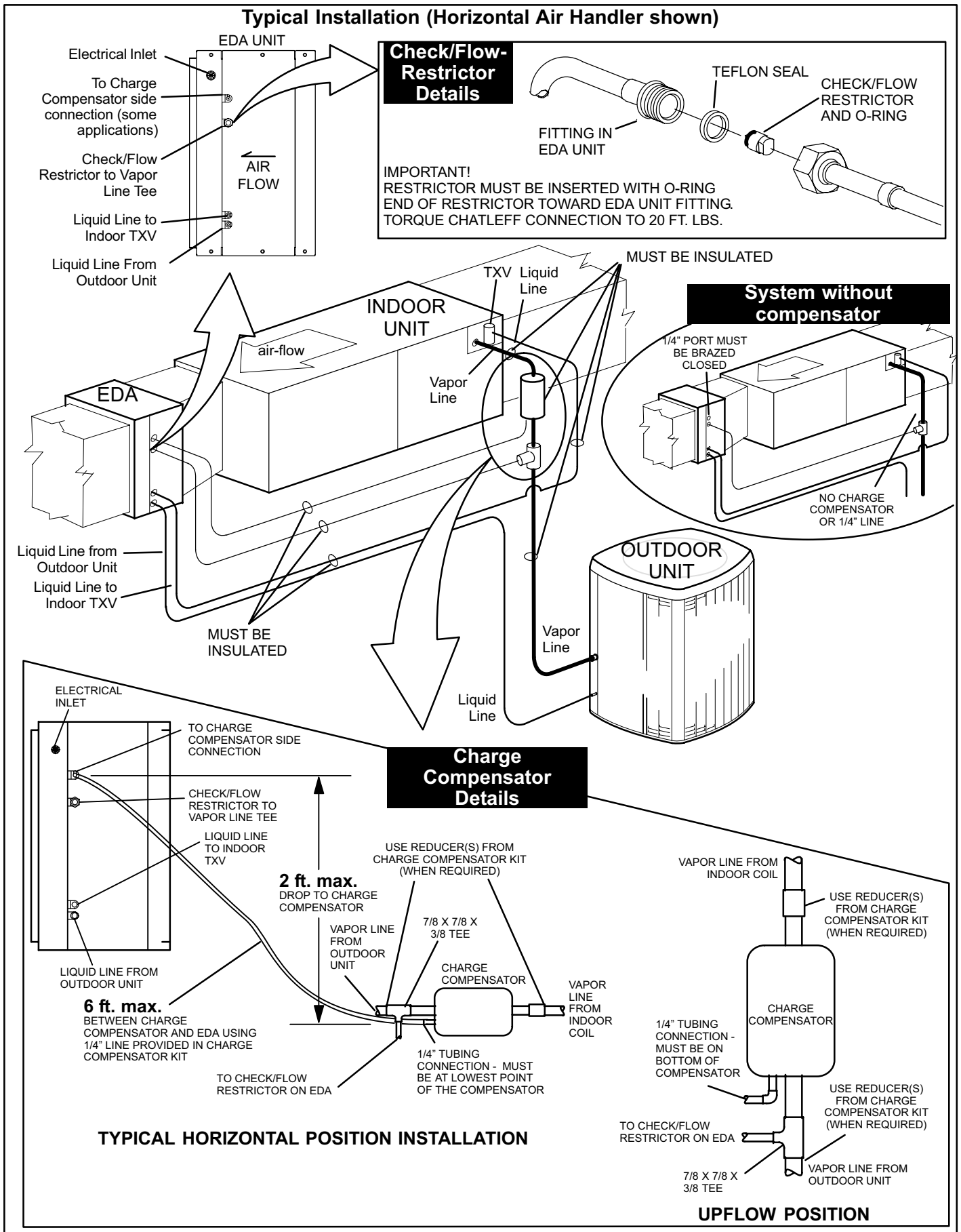


Figure 5

Leak Testing, Evacuating, Charging

⚠ IMPORTANT

The 3-way diverting valve actuator shaft setscrew (see figure 7) is factory set and is not to be adjusted.

3-way Diverting Valve Operation

NOTE - During system operation, the 3-way valve requires 24-volt power to drive between cooling and dehumidification.

The 3-way diverting valve is actually two valves connected by a common shaft, designed to open one valve while closing the other, and vice versa. For evacuating (with power off), the diverting valve can be REPOSITIONED using its actuator lever, a long setscrew that has been factory-set to a precise point on the common shaft. Do not loosen (unscrew) the setscrew. **Should the setscrew become loose, carefully follow the note in figure 6 to position and tighten it.**

Re-aligning Setscrew

NOTE - Actuator shaft setscrew is factory set and must not be adjusted. If the set screw should become loose, use a pliers to grip the shaft where shown (1) and rotate the shaft (in direction of the black arrow) until the pin stops (inset shows pin and stops). Press the red button (2) in the direction of the white arrow and move the lever (3) to the forward position and tighten setscrew to 60 in-lbs torque.

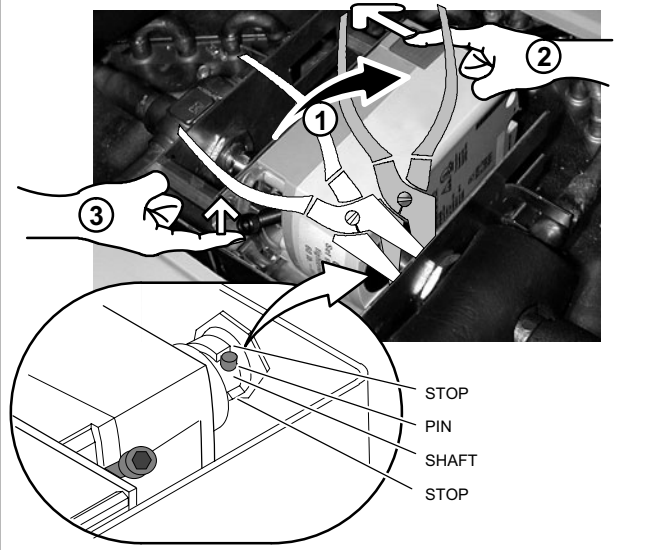


Figure 6

Leak Testing, Evacuating, Charging

1. Set the 3-way diverting valve actuator shaft to the center (evacuate) position for leak testing and evacuation (see figure 7). **IMPORTANT! The actuator shaft must be set as described to allow the EDA to evacuate more quickly.**
2. Refer to instructions provided with the outdoor unit for leak testing, evacuating and charging procedures.

⚠ IMPORTANT

Prior to starting the outdoor unit for charging, be sure the 3-way valve is energized and in the “cooling” (forward) position (see figure 7).

3. Very little charge is required for the additional volume of the EDA unit. When in normal cooling, the components will all be occupied by vapor that has very little weight. At most (depending on the model) an additional 1/4 pound of refrigerant may be required.
4. When shifting from dehumidify mode to cooling, or vice versa, wait at least 10 minutes for the system to reach stable operating pressure before checking temperatures and pressures, or adjusting refrigerant charge.

NOTE - Prior to starting the outdoor unit for charging, set the thermostat to call for cooling (dehumidification OFF). It will take about 90 seconds for the 3-way diverting valve to energize and shift to the cooling position. To ensure that the 3-way diverting valve is energized and in the “cooling” (forward) position, observe the position of the 3-way diverting valve actuator shaft setscrew in figure 7; if properly shifted, the setscrew will be in the forward position.

Setting 3-Way Diverting Valve to Evacuate Position

1. PUSH RED TAB IN DIRECTION INDICATED.
2. PUSH ACTUATOR SHAFT DOWN TOWARD THE CENTER-OF-TRAVEL POSITION

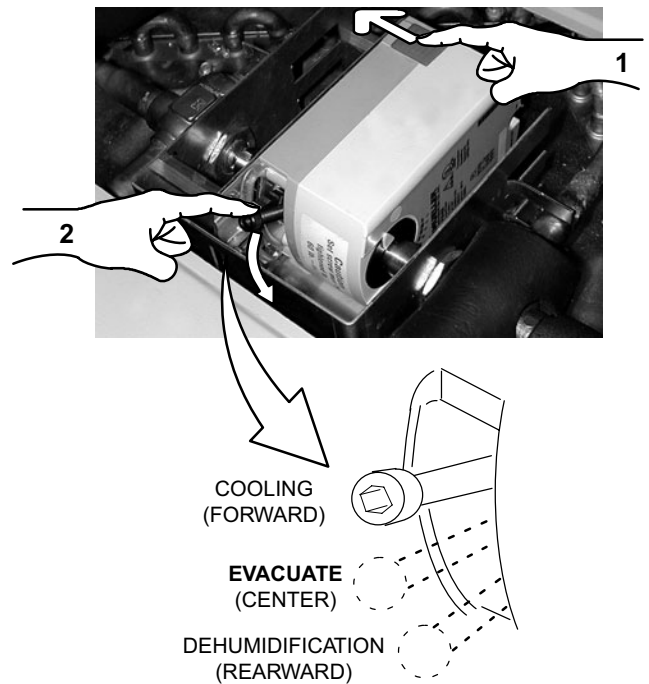


Figure 7

5. The charge must be checked with the system in cooling operation (dehumidification OFF). After testing and charging as required, set the thermostat to force a demand for dehumidification.

Insulating and Sealing the Unit

⚠ IMPORTANT

All piping, metering devices, and connections must be insulated to prevent moisture damage caused by sweating.

Seal the unit so that warm air is not allowed into the cabinet. This is especially important when the unit is installed in an unconditioned area. Make sure the liquid line entry points are sealed with either refrigerant tube insulating material or with Permagum (see figure 5 on page 7).

Other System Components

Blower Control

EDA units are to be applied with an indoor unit that has a variable speed motor (VSM). Refer to the indoor unit installation instruction for setting blower speed.

Thermostat and Sensor

⚠ IMPORTANT

A SignatureStat™ thermostat and properly-connected outdoor sensor is REQUIRED for the EDA unit to function properly. Twisted pair wire (84X49 or equivalent) is REQUIRED between the SignatureStat and the outdoor sensor.

Install the remote sensor on the outside of a northern wall of the home, away from direct sunlight or other heat sources that may affect its sensitivity.

Refer to the SignatureStat™ thermostat Installation Instructions for installation, wiring, and setup. Also refer to the SignatureStat™ Thermostat Programming Guide for programming and settings.

To configure the thermostat for operation with a Humiditrol® system, first enable HUMIDITROL in the thermostat's installer settings (follow the path: MENU -> INSTALLER SETTINGS -> HUMIDITROL - see figure 8, A and B).

Then, select HUMIDITROL mode from the DEHUMIDIFY menu (follow the path: MENU -> DEHUMIDIFY). The user control sequence is also shown in figure 8, C through H; specifically:

- Turn on Humiditrol - D & E
- Set level of dehumidification - F through H (adjustment range is from 45% to 60% and is factory set to 50%)

If HUMIDITROL is enabled and the outdoor sensor is disconnected, operation is NOT allowed in dehumidification mode. This is indicated by the display of "OUTSIDE ERR" on the SignatureStat™ thermostat Home screen.

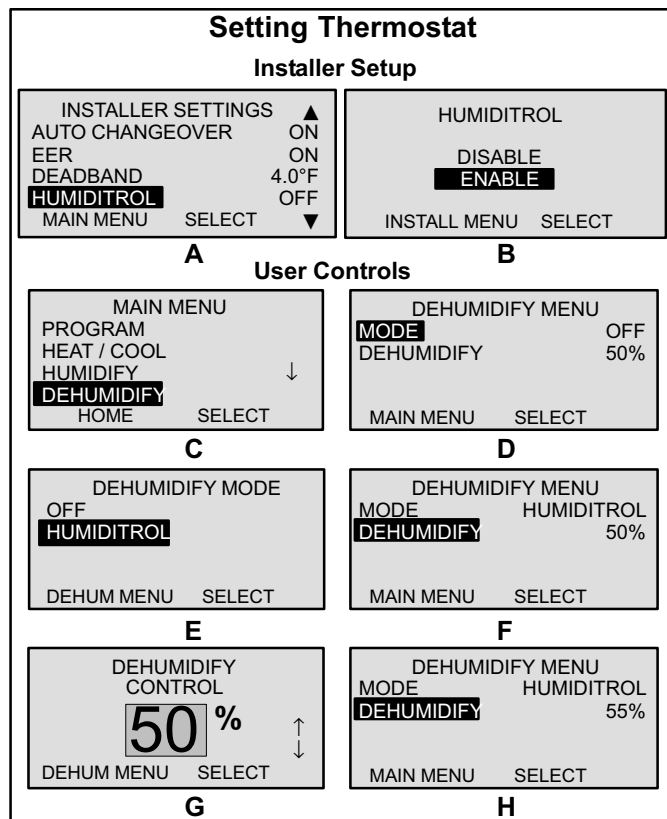


Figure 8

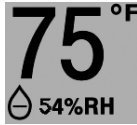
EDA Unit Operation

The EDA coil is added to an HVAC system downstream of the indoor coil. In dehumidification mode, the coil becomes an extension of the condenser coil and injects heat into the indoor air stream.

This dehumidification mode allows significantly improved control of the humidity in the conditioned space without overcooling the space. The assembly includes a set of 3-way diverting valves which will either route refrigerant through the EDA coil, or cause the refrigerant to bypass the EDA coil, depending on the mode of operation.

Operation Notes

- IMPORTANT REMINDER!** Dehumidification will not occur when the outside temperature is **at or above 95°F**.
- When operating in cooling (or heat pump heating) mode, all temperatures and pressures will be as in a normal system.
- When the thermostat is in HUMIDITROL mode, and after a cooling demand has been satisfied but a dehumidification demand persists and the room temperature is not more than 2°F below the setpoint, the air handlers will operate at reduced airflow with the compressor at high speed.
- When the unit is in the dehumidification mode, the display will show a “raindrop” icon with an imbedded negative sign and the current relative humidity to its right.



Cooling Mode (Dehumidification ON)

If the room thermostat's cooling demand has been satisfied but the dehumidification setting has not been satisfied, the unit continues to run in dehumidification mode. The room thermostat sends a signal to the EDA unit's 3-way diverting valve assembly to begin operating in the dehumidification mode.

Figure 9 shows refrigerant flowing from the outdoor unit, entering the EDA, passing through the first 3-way diverting valve, then entering the EDA coil. There, heat from the warm refrigerant is transferred into the indoor air stream. The refrigerant exits the coil through the second 3-way diverting valve and into the indoor coil expansion valve.

During dehumidification, the indoor air blower (and outdoor fan, if an outdoor relay is used) operates at a lower air volume. The cool, dehumidified air leaving the indoor coil is warmed as it passes over the EDA coil. Air temperature rise across the EDA coil can be from 10° to 25°F, depending on the operating ambient and air-conditioned space conditions.

The warm vapor-liquid-refrigerant mixture entering the EDA unit from the outdoor unit will be subcooled in the EDA unit and enter the expansion valve at a lower-than-normal temperature. Liquid temperatures can be in the 65° to 70°F range, with a 10° to 40°F temperature change across the EDA.

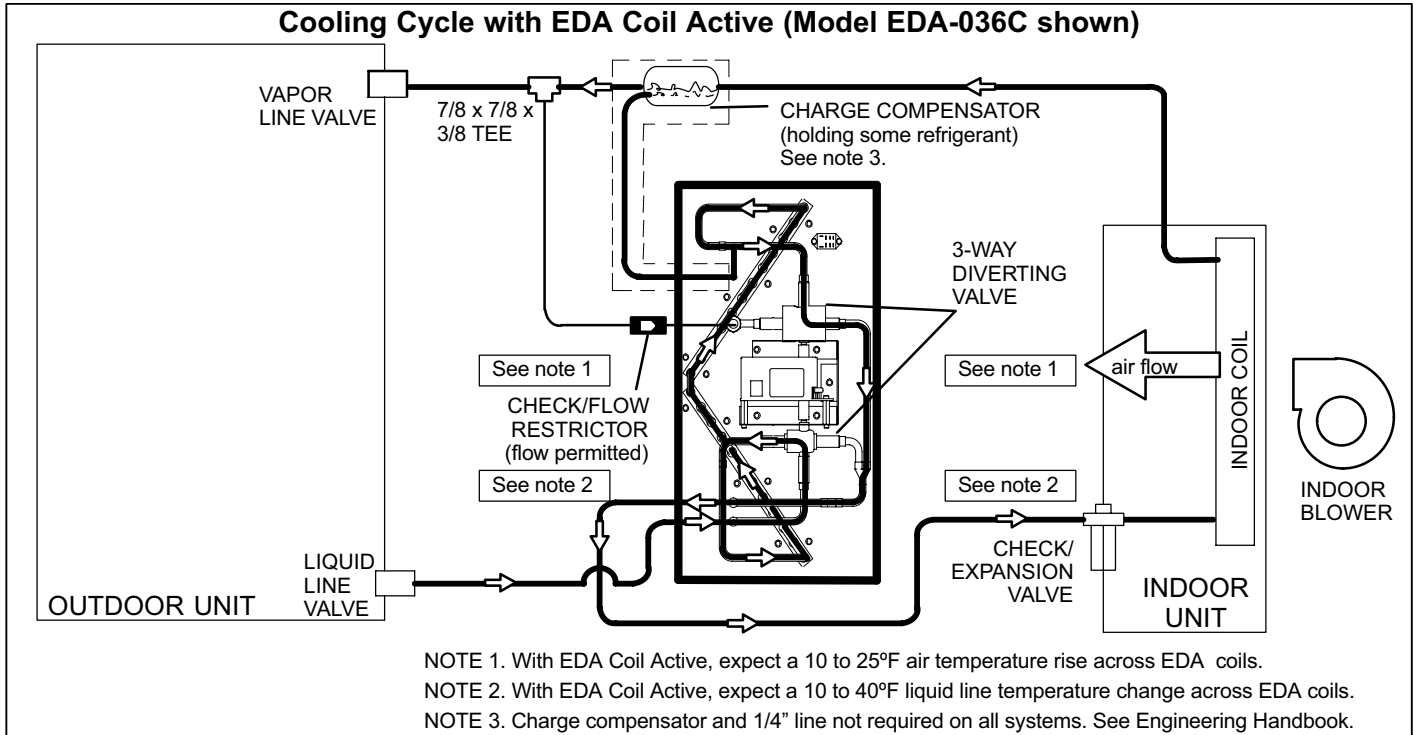


Figure 9

Cooling Mode (Dehumidification OFF)

Figure 10 illustrates refrigerant flow in cooling mode (dehumidification mode OFF),

The liquid refrigerant from the outdoor unit enters the EDA module. Since there is no demand for dehumidification, the 3-way diverting valve assembly directs the flow back out of the EDA module to the indoor unit expansion valve.

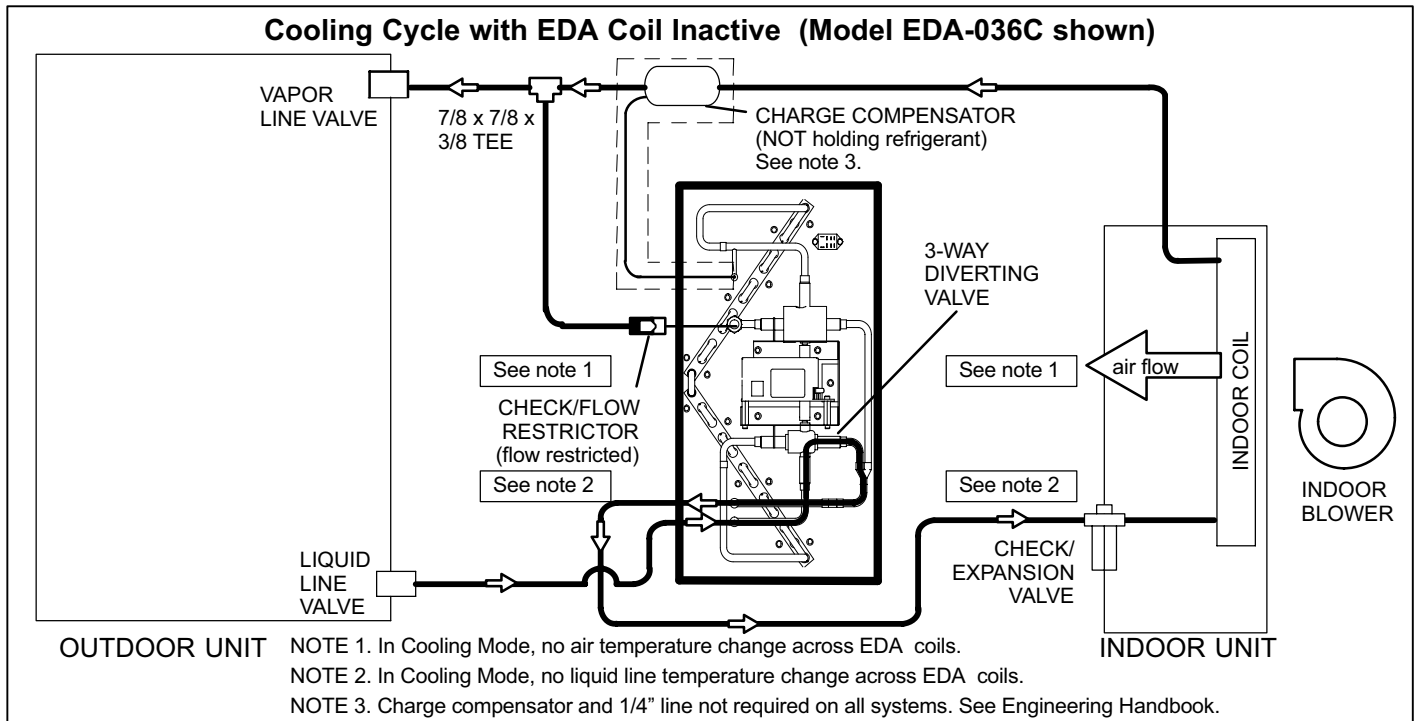


Figure 10

Heating Mode (Heat Pump Applications)

Figure 11 illustrates refrigerant flow in the heating mode.

In heat pump application heating mode, a system that includes an EDA unit will operate as a conventional heat pump. The EDA unit does not operate in this mode.

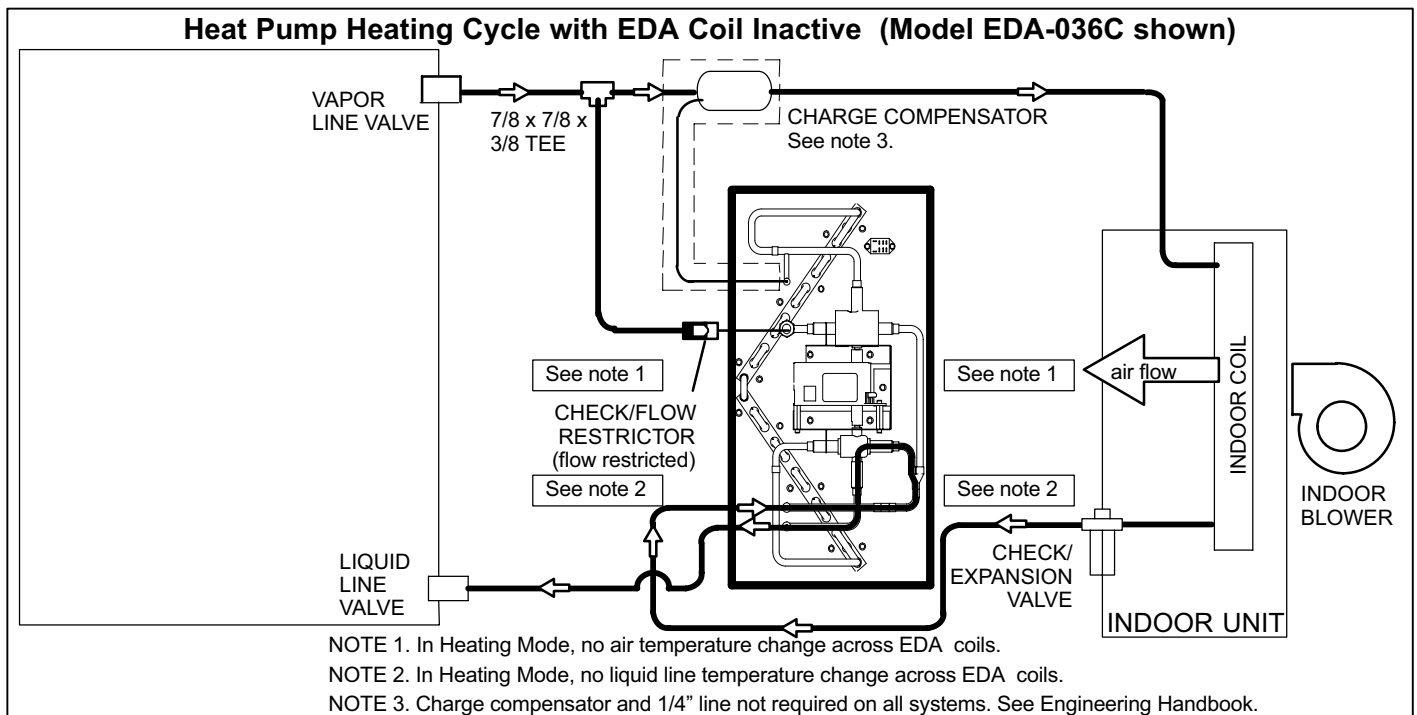


Figure 11

Check List			
✓	Checkpoint	What to Check	Action
	Thermostat and Sensor	Wiring	Confirm Sensor connected to SignatureStat™ using twisted pair wire (see wiring diagram figure 13)
	Thermostat	Humiditrol® Installer Settings	Confirm HUMIDITROL is enabled (see figure 8)
	Thermostat	Humiditrol® User Settings	Confirm HUMIDITROL - Dehumidify - ON is selected (see figure 8)
	Thermostat	Humiditrol® User Settings	Confirm Relative Humidity setting (see figure 8)
	Indoor Unit	Variable-Speed Blower Settings	Confirm Settings for "D": CFM = 60% to 65% of 2nd-stage cool (see indoor unit installation instructions and table 1, below)
	Insulation	Charge Compensator	Confirm insulation is properly installed (see charge compensator kit instructions; also, see figure 5)
	Insulation	Liquid Line	
	Insulation	Vent Line to Suction Line	
	Charge Compensator	1/4" Line	Confirm 1/4" port oriented downward (see charge compensator details, figure 5)
	Check/Flow Restrictor	3/8" Line	Confirm restrictor installed/oriented properly (see check/flow restrictor details figure 5)
	System Charge	Refrigerant	With unit running in cooling mode, check and confirm system is properly charged (see outdoor unit installation instructions).
	Outdoor Unit	Fan Relay	Confirm (if unit has variable speed outdoor fan) relay is installed properly (see wiring diagram figures 12 and 13)
	Outdoor Unit	EDA Label	Confirm label is installed in prominent location and will be easily visible during servicing.
NOTE - System will NOT operate in dehumidification mode with outdoor temperature at or above 95°F.			
	Operational Status	Dehumidification Mode	Record supply air temperature and confirm temperature that it is higher than in cooling mode.
	Operational Status	Dehumidification Mode	On units with variable speed outdoor fan, check that fan operates at approximately 250 rpm (lowest speed).

Table 1

Demand Signals - Humiditrol® EDA Enabled											
Operating Sequence		System Demand						System Response			Comments
System Type	Step	Thermostat Demand				Relative Humidity		Compressor	Blower CFM (Cool) %		
		Y1	Y2	O	G	Status	D				
Cooling Operation - No call for dehumidification											
Single-stage outdoor unit	1	ON	(na)	ON	ON	Acceptable	24 VAC	High	100	Compressor and indoor blower follow thermostat demand	
Two-stage outdoor unit Y1	1	ON	-	ON	ON	Acceptable	24 VAC	Low	70		
Two-stage outdoor unit Y2	2	ON	ON	ON	ON	Acceptable	24 VAC	High	100		
Demand for Dehumidification and Cooling											
Single-stage outdoor unit	1	ON	(na)	ON	ON	Demand	24 VAC	High	100	Cooling operation has priority	
Two-stage outdoor unit Y1	1	ON	-	ON	ON	Demand	24 VAC	Low	70		
Two-stage outdoor unit Y2	2	ON	ON	ON	ON	Demand	24 VAC	High	100		
Dehumidification Mode Only - No Cooling Demand											
Single-stage outdoor unit	1	ON	(na)	ON	ON	Demand	0 VAC	High	50 - 70*	A Humiditrol® EDA-equipped system is allowed to operate and cool room temperature below set point (but only by 2°F) when trying to satisfy a persisting humidity set point; it is not allowed to operate at all when outdoor temperature is ≥95°F.	
Two-stage outdoor unit Y2	2	ON	ON	ON	ON	Demand	0 VAC	High	50 - 70*		

* NOTE - Blower CFM speed (percentage) will vary depending on selected indoor equipment (furnace, coil blower, etc.).

Air Resistance

Table 2 shows air volume and total air resistance for the available EDA models.

Table 2

Air Resistance				
Model No.	Air Volume		Total Air Resistance	
	cfm	L/s	in. w.g.	Pa
EDA-024B	400	190	0.05	12
	600	285	0.10	25
	800	380	0.15	37
	1000	470	0.22	55
EDA-036C	600	285	0.05	12
	800	380	0.08	20
	1000	470	0.11	27
	1200	565	0.15	37
	1400	660	0.20	50
EDA-060DB	1000	470	0.05	12
	1200	565	0.06	15
	1400	660	0.08	20
	1600	755	0.10	25
	1800	850	0.11	27
	2000	945	0.13	32
	2200	1040	0.15	37

Repair Parts

- 3-way diverting valve assembly
- Check/flow restrictor
- EDA Relay
- Outdoor unit relay
- Teflon seals

Wiring Diagrams

Typical condensing unit and heat pump wiring diagrams are provided in figures 12 and 13. Some modifications to certain units may be necessary.

Connect the EDA unit with the indoor and outdoor units, and to the thermostat. Be sure the outdoor sensor is installed and connected to the SignatureStat™ thermostat's outdoor sensor terminal block. Table 3 shows the requirements for control wiring.

Table 3

Control Wiring Requirements						
Units:	(all)	(with LSOM)	(without LSOM)			
System type	SignatureStat™ to Sensor	Humidicontrol® EDA	Indoor unit to:			
			SignatureStat™	Outdoor unit	SignatureStat™	Outdoor unit
2 stage AC	2 (twisted pair)	3	9*	6	8*	4
1 stage AC			8*	5	7*	3
2 stage HP			10*	8	9*	7
1 stage HP			9*	7	8*	6
*Includes conductor for 2-stage heat						

Typical EDA/Condensing Unit Wiring Diagram

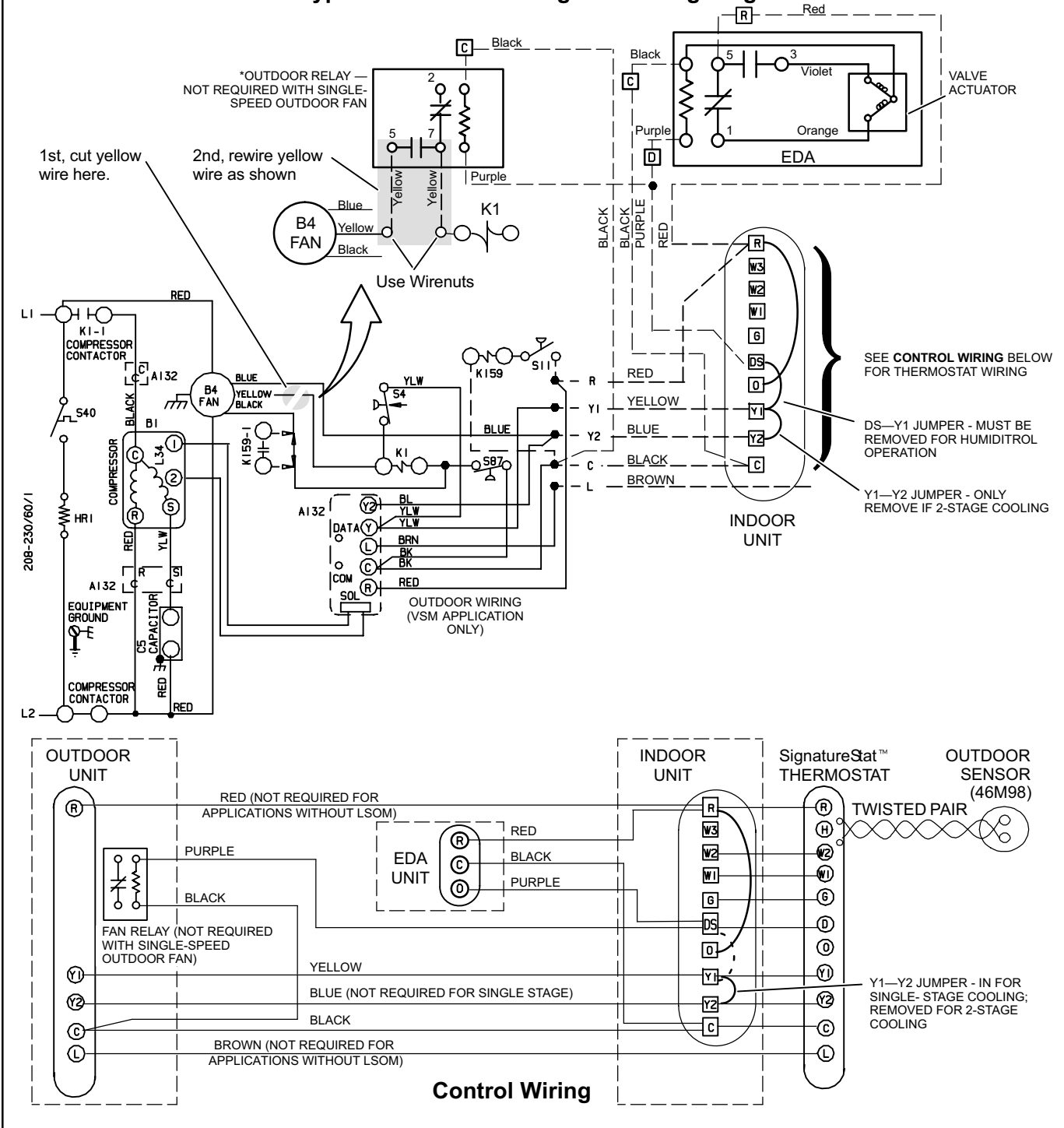


Figure 12

Typical EDA/Heat Pump Wiring Diagram

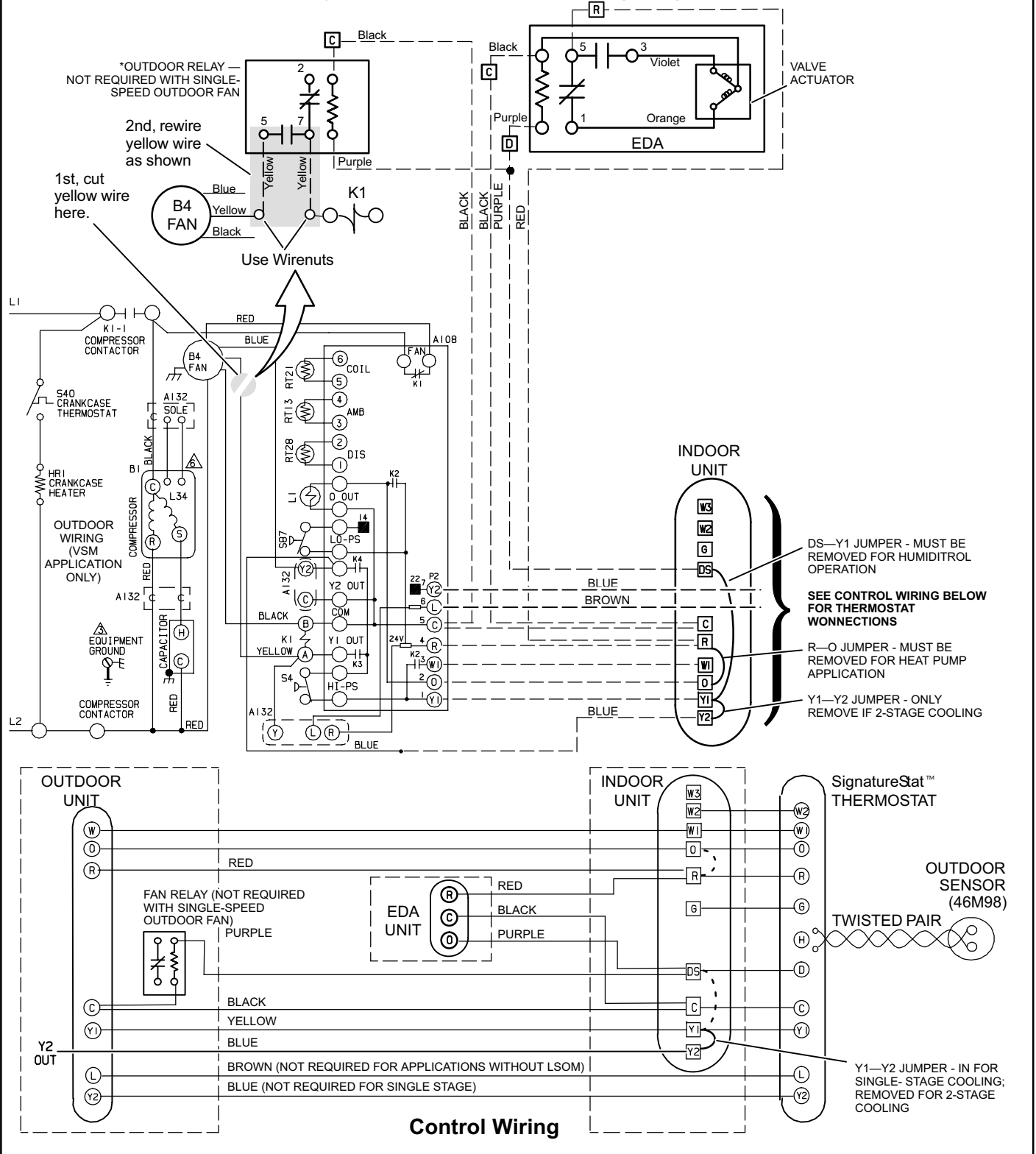


Figure 13

Humiditrol® Enhanced Dehumidification Accessory (EDA) Decision Tree

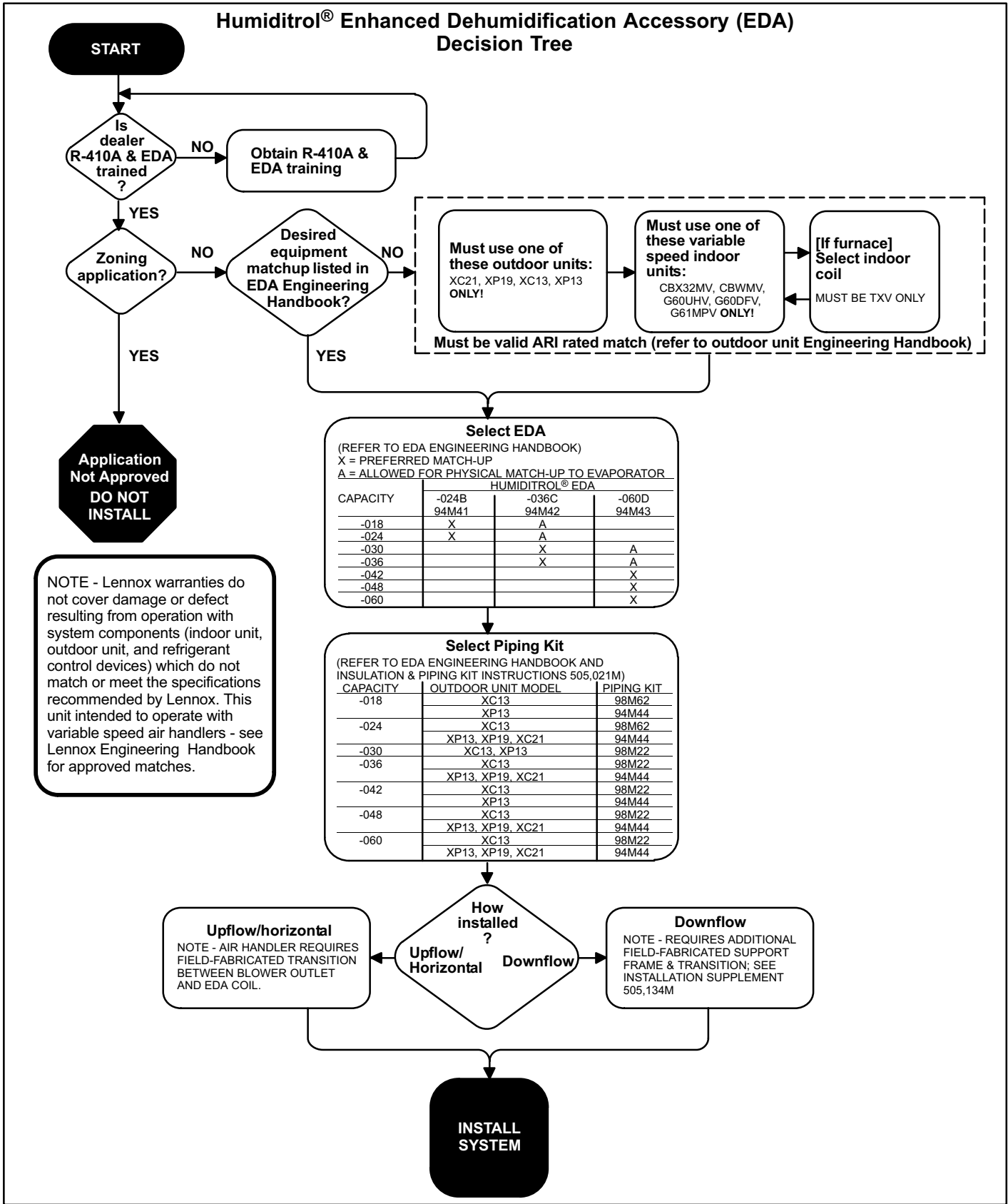


Figure 14