

NOTE - EDA is not applicable to variable-capacity outdoor units!

Humiditrol

2025 COMPLIANT REFRIGERANT

Humiditrol Enhanced Dehumidification Accessory (EDA) Units

User, Installation and Setup Guide

508782-02
12/2026
Supersedes 508782-01
2026© Lennox Industries Inc.
Dallas, Texas, USA

Table of Contents

1. GENERAL 5

1.1. Shipping and Packing List 5

1.2. Additional Parts Required 6

1.3. Introduction 6

1.3.1. CS7500 Commercial and E40 Thermostat 6

1.3.2. Operation Overview 6

1.3.3. Operation Notes 6

1.4. Wiring Diagram Locator 7

1.5. Decision Tree 8

1.6. Unit Dimensions 9

1.7. Installation Configuration 10

1.7.1. Horizontal and Upflow for Air Handlers 10

1.7.2. Downflow 12

1.8. Component Functions 14

1.8.1. Check/Flow Restrictor 14

1.8.2 Valve Assembly 14

2. INSTALLATION 15

2.1. Information 15

2.1.1. Refrigeration 15

2.1.2. Releasing Air Charge 15

2.1.3. Refrigerant Line Connections 15

2.2. Electrical Wiring 15

2.3. Humiditrol Installation and Checkout Flow Chart 17

2.4. Leak Testing, Evacuating, Charging 19

2.4.1. Three-Way Diverting Valve Operation 19

2.4.2. Leak Testing, Evacuating, Charging 20

2.5. Insulating and Sealing the Unit 20

2.6. Other System Components 20

2.6.1. Blower Control 20

2.6.2. Thermostat and Sensor 20

2.7. Using Humiditrol Comfort Adjust 21

2.8. Dehumidification Requirements 21

2.9. Refrigerant Leak Detection System 23

2.9.1. Modes Of Operation 23

2.9.2. Diagnostic Codes / Troubleshooting 23

2.9.3. RDS Sensors 25

2.9.4. Blower Control Board with Second RDS Input 25

2.9.5. Location of RDS Sensor in EDA 25

2.9.6. Sensor Maintenance 29

3. ENABLING THERMOSTATS FOR HUMIDITROL 30

3.1. Lennox® E40 Smart Thermostat 30

3.2. Lennox® CS7500 Thermostat 30

4. MODES OF OPERATION 30

4.1. Dehumidification Mode (Cooling ON) 30

4.2. Cooling Mode (Dehumidification OFF) 32

4.3. Heating Mode (Heat Pump Applications) 33

5. AIR RESISTANCE 34

6. THERMOSTAT DEMAND SIGNAL 35

7. CHECKLIST 36

8. DECOMMISSIONING 37

⚠ 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.

⚠ 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.

⚠ WARNING

To prevent serious injury or death:

1. Lock-out/tag-out before performing maintenance.
2. If system power is required (e.g., smoke detector maintenance), disable power to blower, remove fan belt where applicable, and ensure all controllers and thermostats are set to the “OFF” position before performing maintenance.
3. Always keep hands, hair, clothing, jewelry, tools, etc. away from moving parts.

⚠ CAUTION

Servicing shall be performed only as recommended by the manufacturer.

⚠ WARNING

Ducts connected to an appliance shall not contain a potential ignition source

⚠ WARNING

If this appliance is conditioning a space with an area smaller than TA_{min}, then that space must be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (e.g. an operating electric heater or similar hot surface). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest system.

⚠ WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odor.

⚠ CAUTION

Leak Detection System installed. Unit must be powered except for service.

⚠ WARNING

Auxiliary devices which may be a potential ignition source shall not be installed in the duct work. Examples of such potential ignition sources are hot surfaces with a temperature exceeding 700°C and electric switching devices.

⚠ WARNING

For appliances using A2L refrigerants connected via an air duct system to one or more rooms, only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork.

⚠ WARNING

For duct connected appliances, false ceilings or drop ceilings may be used as a return air plenum if a REFRIGERANT DETECTION SYSTEM is provided in the appliance and any external connections are also provided with a sensor immediately below the return air plenum duct joint.

⚠ WARNING

Every working procedure that affects safety means shall only be carried out by competent persons. This appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure they do not play with the appliance.

NOTE: *This EDA unit is a PARTIAL UNIT AIR CONDITIONER, complying with PARTIAL UNIT requirements of this Standard, and must only be connected to Lennox outdoor units with air handlers or direct vent furnaces approved for use with the EDA that use R-454B. These must also comply with the corresponding PARTIAL UNIT requirements of Standard UL 60335-2-40/ CSA C22.2 No. 60335-2-40 or UL 1995/ CSA C22.2 No 236.*

Every working procedure that affects safety means shall only be carried out by competent persons. This appliance is not accessible to the general public and is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Examples of such working procedures are breaking into the refrigerating circuit, opening of sealed components, and opening of ventilated enclosures.

- Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

• All maintenance staff and others working in the local area shall be instructed on the nature of the work being carried out. Work in confined spaces shall be avoided.

- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i. e. non-sparking, adequately sealed or intrinsically safe.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, the appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.
- No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere. A degree of ventilation shall continue during the period that the work is carried out.
- Pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards.
- All field joints shall be accessible for inspection prior to being covered or enclosed.
- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer’s maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer’s technical department for assistance. The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS as applicable:

1. The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
2. The ventilation machinery and outlets are operating adequately and are not obstructed.
3. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
4. Markings on the equipment should be visible and legible. Markings and signs that are illegible shall be corrected.
5. Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

- For systems containing refrigerant, all repair and maintenance to electrical components shall include initial safety checks and component inspection procedures such as that capacitors are discharged in a safe manner to avoid possibility of sparking, that no live electrical components and wiring are exposed while charging, recovering, or purging the system, and that there is continuity of earth bonding. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used that is reported to the owner of the equipment, so all parties are advised.

NOTE: *Sealed electrical components shall be replaced, not repaired.*

NOTE: *Intrinsically safe components must be replaced, not repaired.*

NOTE: *All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out with work in confined spaces being avoided.*

- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by

means of shut off valves) in a part of the system remote from the leak.

- When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed and, since flammability is a consideration, procedures such as safely removing refrigerant following local and national regulations, purging the circuit with inert gas, evacuating (optional for A2L), purging with inert gas (optional for A2L), or opening the circuit by cutting or brazing be adhered to. The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

Altitude Adjustment Factor

Altitude (m)	0	200	400	600	800	1000	1200	1400	1600
Altitude (ft)	0	660	1310	1970	2620	3280	3940	4590	5250
Adj. Factor	1	1	1	1	1.02	1.05	1.04	1.1	1.12
Altitude (m)	1600	1800	2000	2200	2400	2600	2800	3000	3200
Altitude (ft)	5250	5910	6560	7220	7870	8530	9190	9840	10500
Adj. Factor	1.12	1.15	1.18	1.21	1.25	1.28	1.32	1.36	1.4

NOTE: *Multiply values in TAmin table by the Altitude Adjustment Factors to correct TAmin based on installed altitude.*

TAmin Table

Charge (lb)	10	15	20	25	30
Charge (kg)	4.5	6.8	9.1	11.3	13.6
Minimum Conditioned Area (ft^2)	149.9	224.9	299.9	374.8	449.8
Minimum Conditioned Area (m^2)	13.9	20.9	27.9	34.8	41.8

1. GENERAL

1.1. Shipping and Packing List

Table 1. Packing List

Quantity	Description
1	Humiditrol® Enhanced Dehumidification Accessory (EDA), EDA-024BK (94M41), EDA-036/060CK (94M42) or EDA-060DK (94M43)
1	Bag assembly (includes check/flow restrictor for use on Humiditrol coil, and Humiditrol EDA notification label).
1	Set of copper fittings for installing EDA in liquid and suction lines
1	Indoor blower relay (not needed for CBK45UTVT)
3	Sets of tubing insulation
1	Mounting bracket for downflow/horizontal
1	Control board
1	Installation Instruction

1.2. Additional Parts Required

Separately-ordered components are restricted to those listed in the Product Specifications and the price book

Humiditrol is compatible with the following Lennox thermostats:

Table 2. Compatible Lennox Thermostats

Description
Lennox® M40 Smart Thermostat (30L27)
Lennox® E40 Smart Thermostat (30L26)

NOTE: *Due to Lennox' ongoing commitment to quality, features and options are subject to change without notice and without incurring liability. Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury. Installation and service must be performed by a qualified installer and servicing agency.*

1.3. Introduction

Humiditrol® is designed for installation with a Lennox R-454B split-system outdoor unit and an air handler or direct vent furnace. It is designed for indoor installations in up-flow, downflow, or horizontal air discharge applications.

NOTE: *Humiditrol is not compatible with variable-capacity outdoor units!*

- Humiditrol is for use only on R-454B systems with thermal expansion valve installed.
- Prior to installation, study the decision tree (see "FIGURE 1. Decision Tree" on page 8) to confirm that all application requirements for Humiditrol installation are met.
- Low ambient pressure switch type control option can be applied to this type of system down to 30ºF. For low ambient kit part numbers, refer to the Product Specifications accessories section.

NOTE: *The low ambient control option (down to 0ºF) is not compatible with Humiditrol.*

One of the following thermostats are required for the Humiditrol system:

1.3.1. CS7500 Commercial and E40 Thermostat

NOTE: *When wiring the thermostat into the system, be sure these requirements are met:*

- Minimum 18 gauge thermostat wire is used.
- Maximum thermostat wire run length does not exceed 300 feet (90 m).
- Total load from any thermostat connection is less than 1 amp.
- See the Lennox® CS7500 Installation and Setup Guide (507504) for the EDA wiring instructions.
- See the Lennox® E40 Smart Thermostat Wiring Diagrams (538656) for the EDA wiring instructions.

1.3.2. Operation Overview

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 unit operates to dehumidify, as required, when ambient temperatures are below 95ºF.
- However, when temperatures reach 95ºF, cooling and dehumidification demands are both serviced by increased cooling system run-time and does not use Humiditrol.
- Prior to system checkout, consider the outdoor ambient temperature since the Humiditrol will not operate above 95ºF.
- Plan testing to be conducted when temperatures are between 65ºF and 95ºF to ensure proper Humiditrol set up and checkout operation.
- Humiditrol removes moisture from the indoor air at a greater rate than cooling alone. On a call for dehumidification, the indoor blower is slowed down by the blower relay that is added to the CBK45UHET and CBK47UHET or automatically in the CBK45UHVT and direct vent furnaces. The compressor is upstaged to high-stage operation (two-stage units). At the same time, the Humiditrol three-way valves reposition themselves and the Humiditrol coil becomes active. The liquid refrigerant going through the EDA coil is subcooled to a few degrees above the supply air temperature, which along with the lower airflow causes the evaporator coil to become colder and remove more moisture from the indoor air. At the same time, the liquid refrigerant warms up the supply air temperature to decrease the amount of sensible cooling, which allows the system to run longer without over-cooling the space. During cooling only (no Humiditrol operation) the Humiditrol coil is inactive.
- The Humiditrol coil is added to an HVAC system downstream of the indoor coil. In dehumidification mode, the coil becomes an extension of the outdoor coil and injects heat into the indoor air stream.
- This dehumidification mode allows significantly improved control of the humidity in the conditioned space with less chance of overcooling the space.
- The assembly includes a set of 3-way diverting valves which will either route refrigerant through the Humiditrol coil, or cause the refrigerant to bypass the coil, depending on the mode of operation.

1.3.3. Operation Notes

- Dehumidification will not occur when the outdoor temperature is at or above 95ºF or indoor temperature is at or below 65ºF.
- 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 within the MIN, MID, MAX parameters described in Using Humiditrol Comfort

Adjust (see “2.7. Using Humiditrol Comfort Adjust” on page 21), the air handlers will operate at reduced airflow with the compressor at high speed.

- When the unit is in the dehumidification mode, the thermostat will display “dehumidify or an icon” on the home screen.

IMPORTANT

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

⚠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) or a service agency.

⚠WARNING

Risk of explosion or fire.

Can cause injury or death.

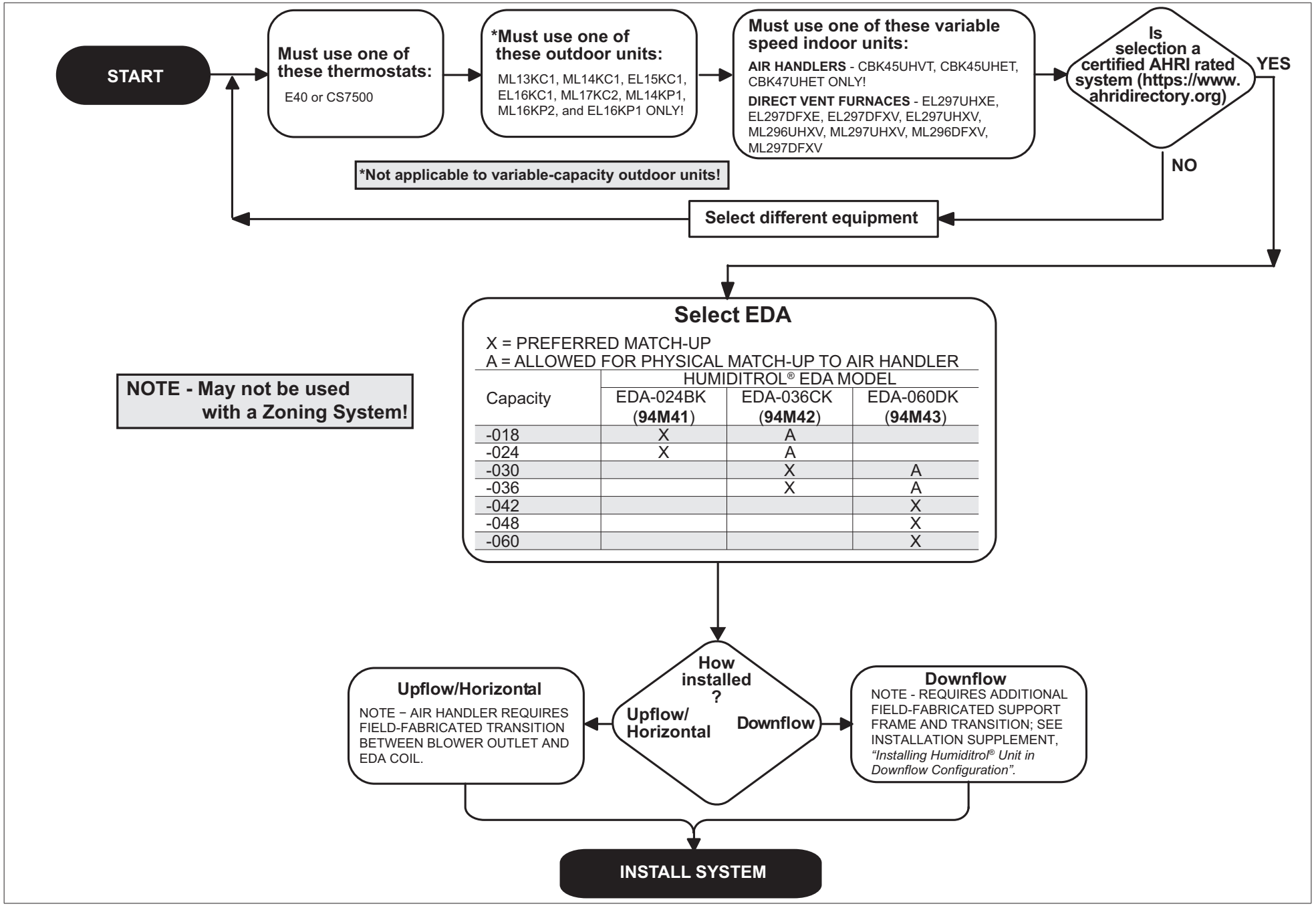
Recover all refrigerant to relieve pressure before opening the system.

1.4. Wiring Diagram Locator

Table 3. Wiring Diagram Locater

Thermostat	Wiring Diagram
CS7500	ComfortSense® 7500 Installation and Setup Guide (507504; page 10)
E40	Lennox® E40 Smart Thermostat Wiring Diagrams (538656)

1.5. Decision Tree



Capacity	HUMIDITROL® EDA MODEL		
	EDA-024BK (**94M41**)	EDA-036CK (**94M42**)	EDA-060DK (**94M43**)
-018	X	A	
-024	X	A	
-030		X	A
-036		X	A
-042			X
-048			X
-060			X

FIGURE 1. Decision Tree

1.6. Unit Dimensions

EDA Model Dimensions - Inches (mm)

Dimension	EDA-024BK	EDA-036/060CK	EDA-060DK
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 (76)	3-1/4 (83)	4-3/4 (121)

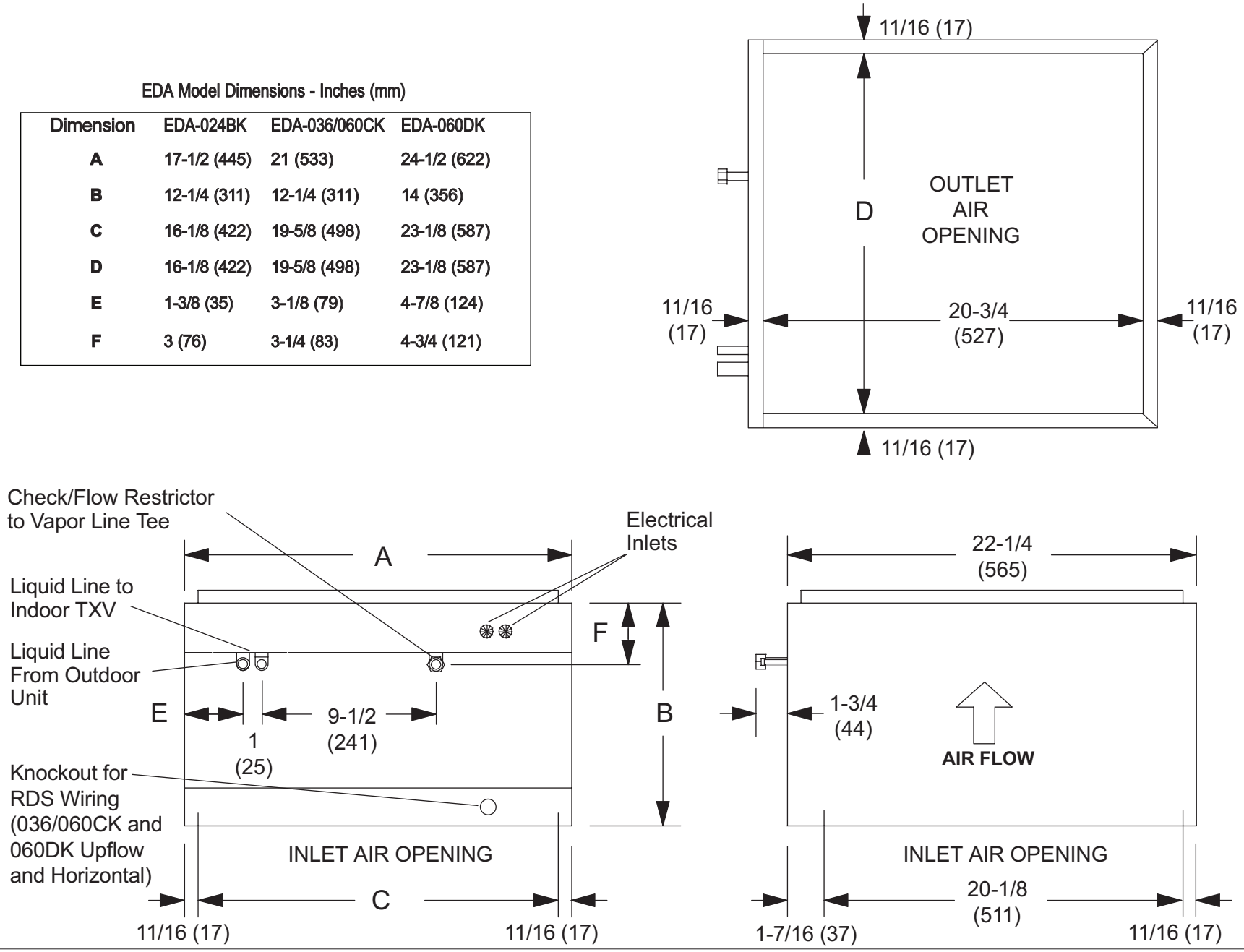
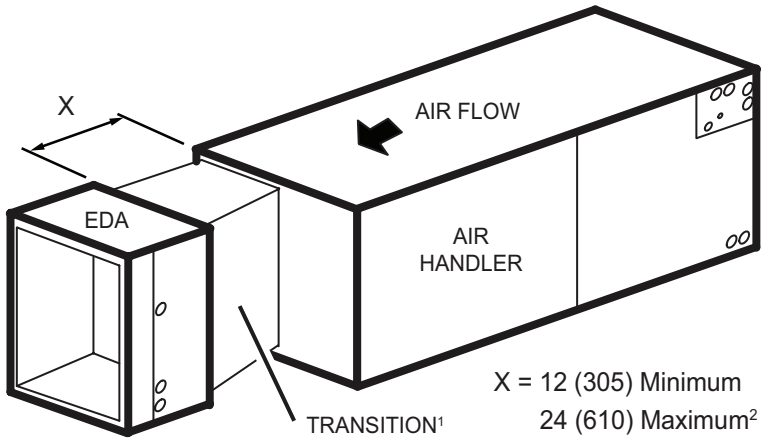


FIGURE 2. Unit Dimensions

1.7. Installation Configuration

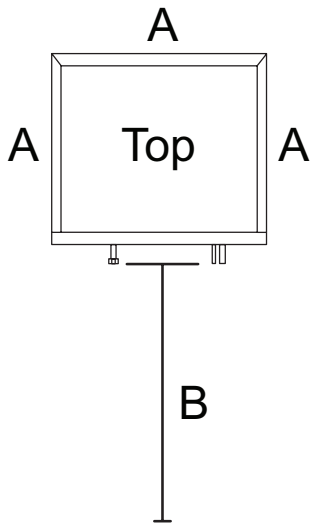
1.7.1. Horizontal and Upflow for Air Handlers



HORIZONTAL POSITION

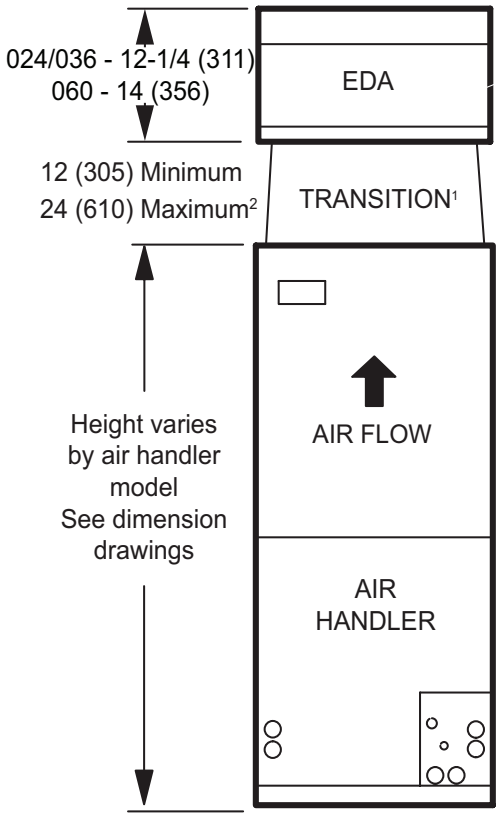
Clearances

The following clearances must be maintained for safe functioning.



Clearances Key

A	None
B	12” (304.8 mm)



UPFLOW POSITION

NOTES:

[1] Transition is required for all air handlers; dimension width and depth is dependent upon the air handler and the Humiditrol model used.

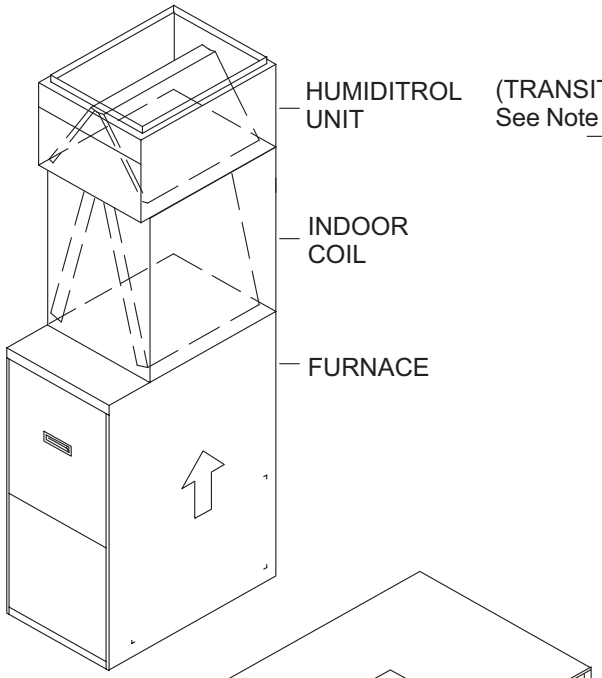
Alternate installation position information - The Humiditrol coil is not position sensitive as long as the correct air flow direction through the coil is maintained. See Unit Dimensions drawing on page 3 for correct air flow.

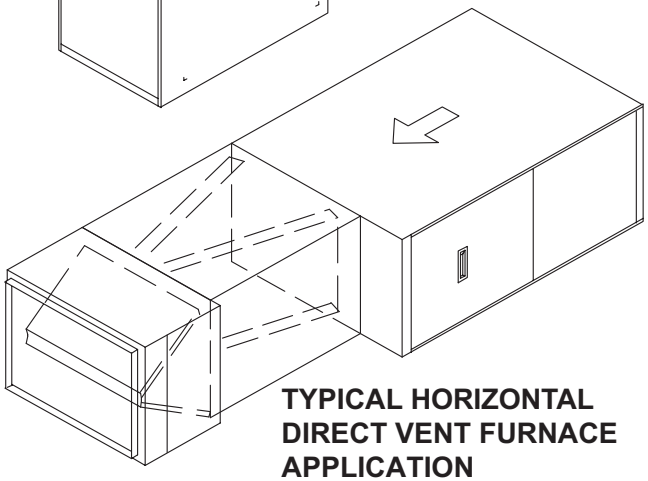
Access panel must be installed in the transition duct or supply air duct from the EDA (depending on the application) for service access to the RDS Sensor.

[2] When more distance is needed (maximum of 48”) between the air handler and EDA, the RDS harness can be routed out through the knockout in the bottom panel. Insert the bushing provided in the bag assembly into the knockout to protect the wire harness from the sheet metal edges in the knockout hole.

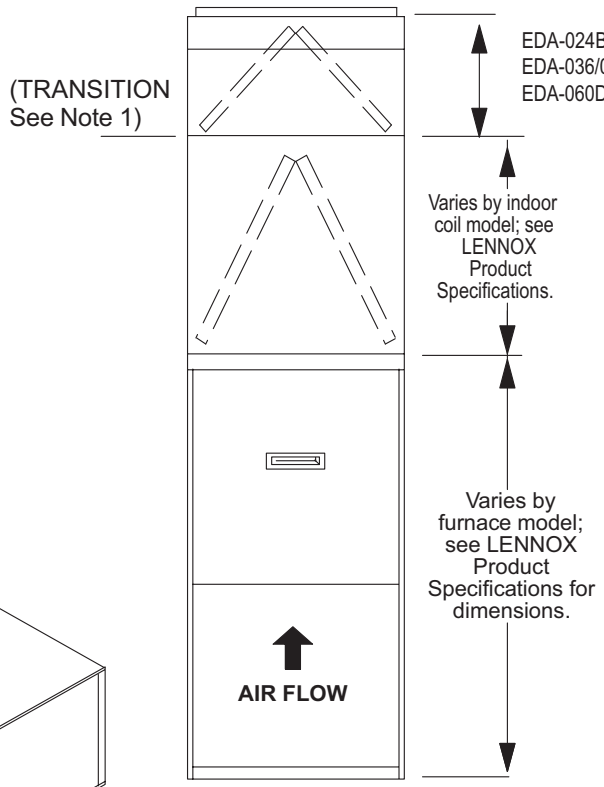
FIGURE 3. Installation Arrangements (Horizontal and Upflow Air Handler)

TYPICAL UP-FLOW DIRECT VENT FURNACE APPLICATION (Furnace Shown)





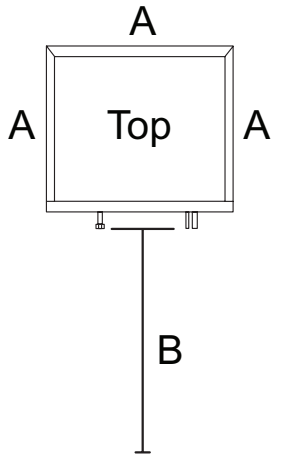
TYPICAL HORIZONTAL DIRECT VENT FURNACE APPLICATION (Furnace Shown)



UP-FLOW FURNACE

Clearances

The following clearances must be maintained for safe functioning.



Clearances Key

A	None
B	12" (304.8 mm)

NOTES:

1. Field-Fabricated transition is required between indoor coil and EDA when EDA cabinet is wider than furnace cabinet. On the larger coils, an extension harness may be needed for the RDS sensor if transition is too long.

Alternate installation position information - The Humiditrol coil is not position sensitive as long as the correct air flow direction through the coil is maintained. See FIGURE 2 on page 9 for correct airflow direction.

FIGURE 4. Installation Arrangements (Horizontal and Upflow Furnace)

1.7.2. Downflow

This accessory is designed for indoor installations in either up-flow or horizontal air discharge applications, however, the unit will function in the down-flow configuration, provided the instructions contained herein are followed.

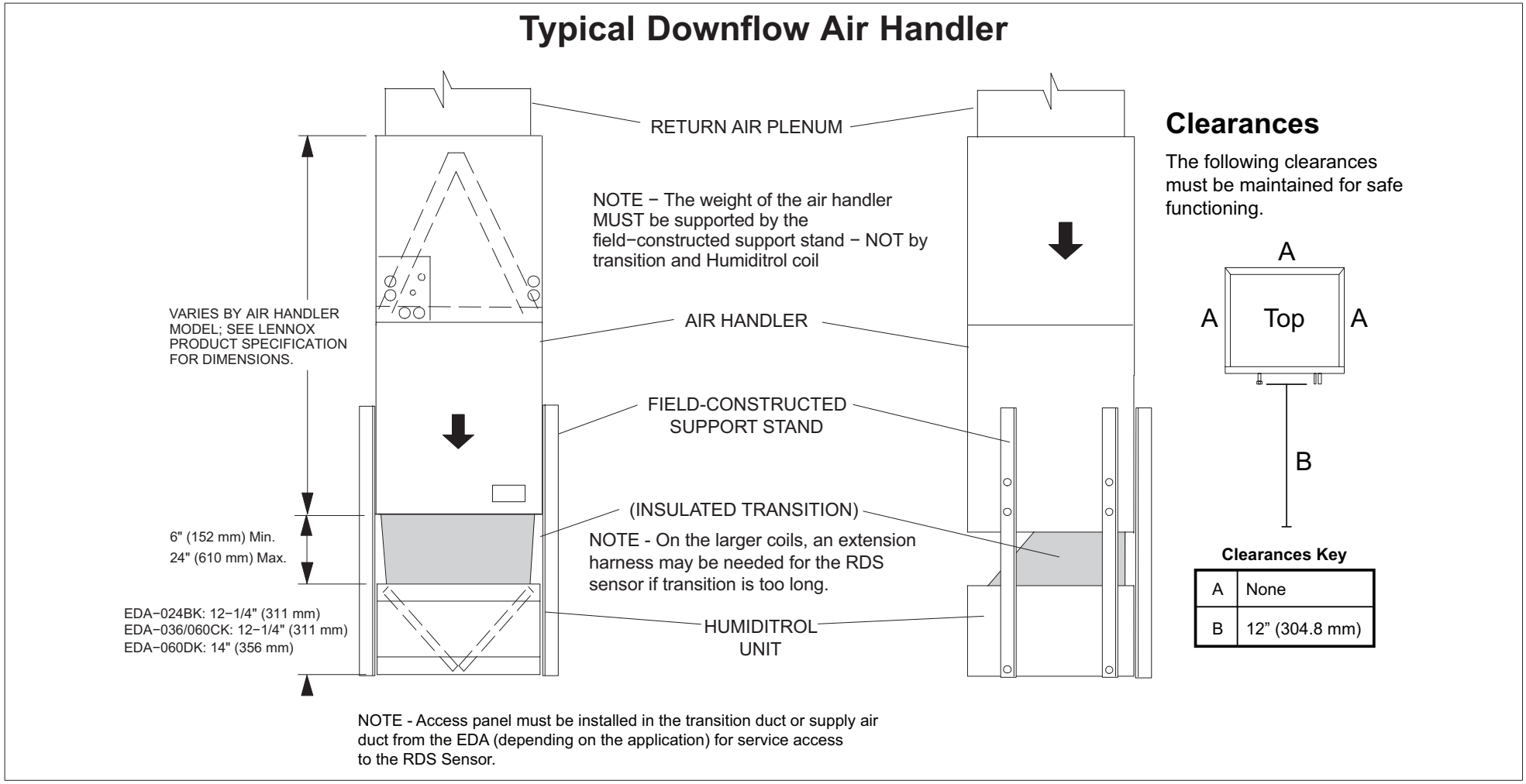
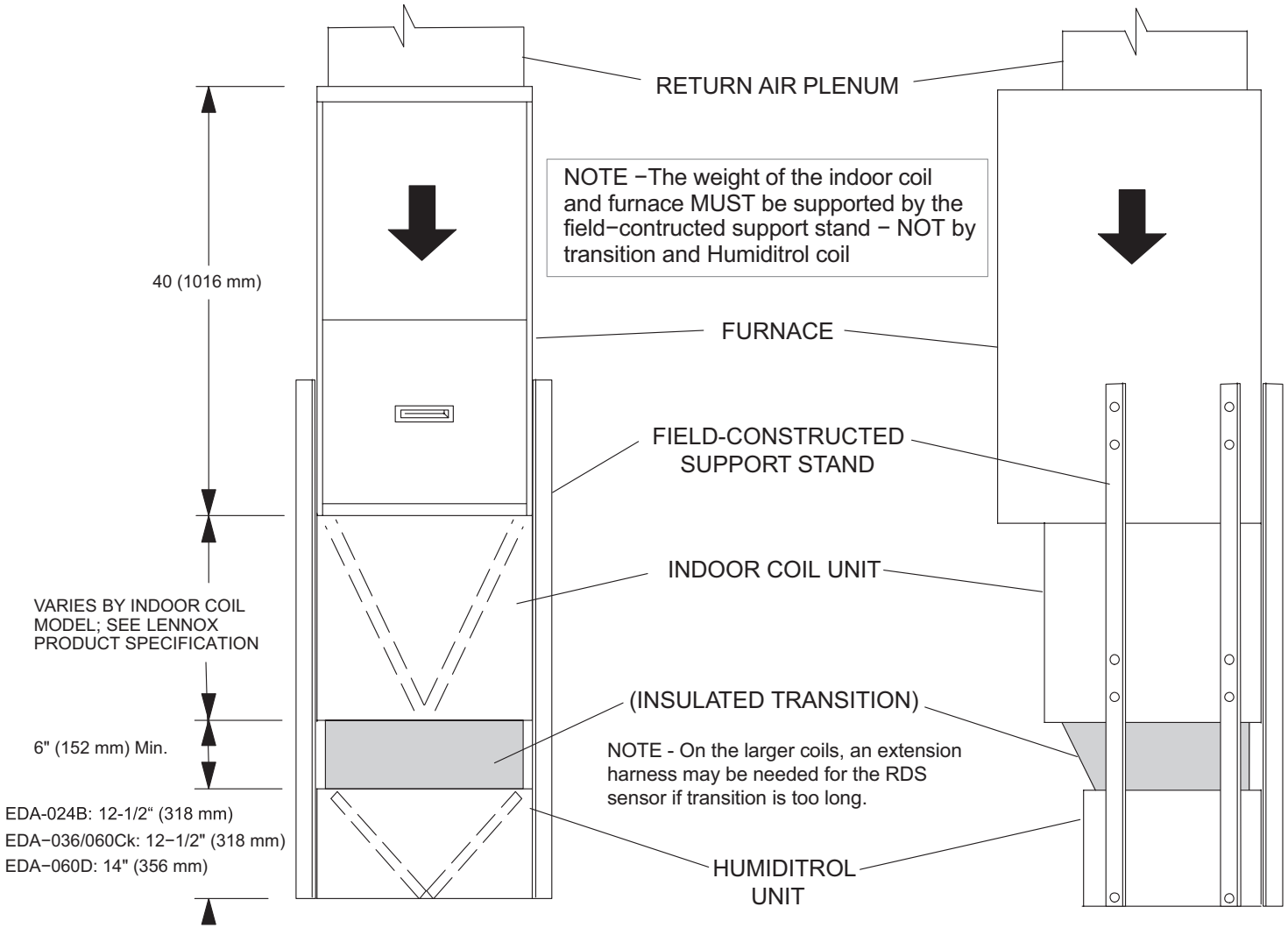


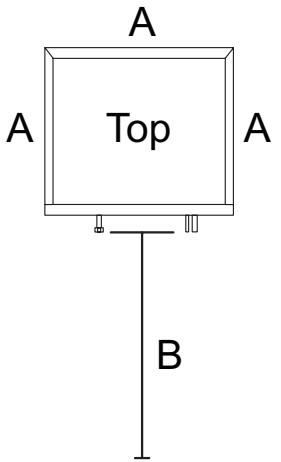
FIGURE 5. Typical Downflow Configurations for Air Handler

Typical Downflow Furnace



Clearances

The following clearances must be maintained for safe functioning.



Clearances Key

A	None
B	12” (304.8 mm)

FIGURE 6. Typical Downflow Configurations for Furnace

1.8. Component Functions

1.8.1. Check/Flow Restrictor

The check function of the check/flow restrictor (shown in FIGURE 7) prevents refrigerant from flowing into the inactive components during times when the Humiditrol coil is inactive. The flow restrictor controls the rate of return of charge to the system from the Humiditrol coil when the system changes from ”Humiditrol coil active” to ”Humiditrol coil inactive.”

1.8.2 Valve Assembly

The first valve of the diverting valve assembly (FIGURE 8, D) directs the flow of refrigerant to either bypass the Humiditrol coil (Humiditrol coil is inactive) or pass through the Humiditrol coil (Humiditrol coil is active).The second valve (FIGURE 8 E) directs the flow of refrigerant back to the liquid line when the first valve (D) allows flow through the Humiditrol coil. When the Humiditrol coil is inactive, the second valve (E) provides a vent path to the suction line, draining the Humiditrol coil of liquid refrigerant.

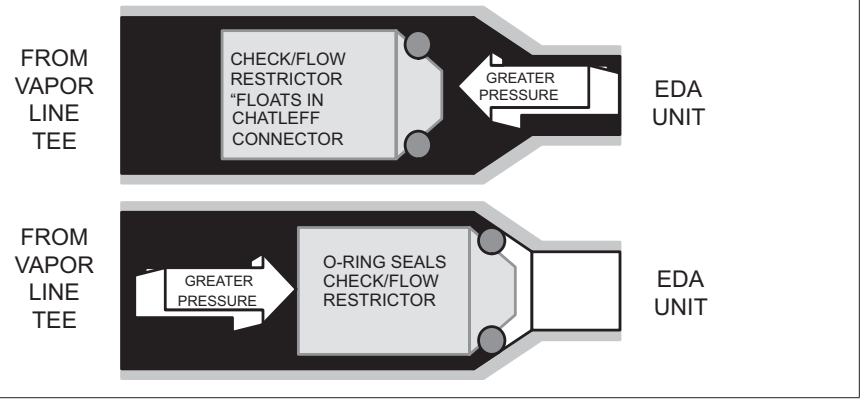
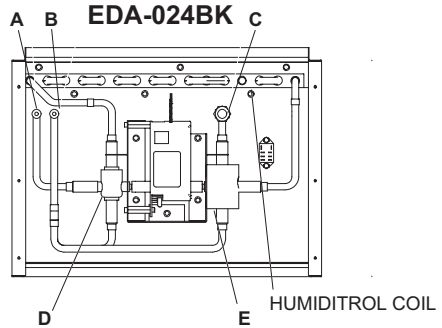
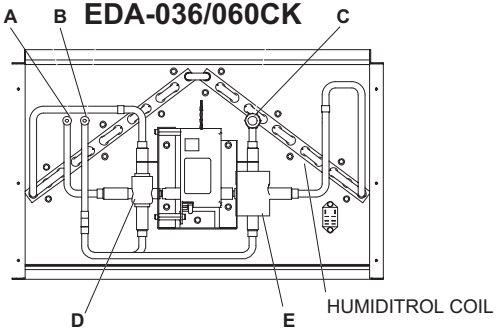


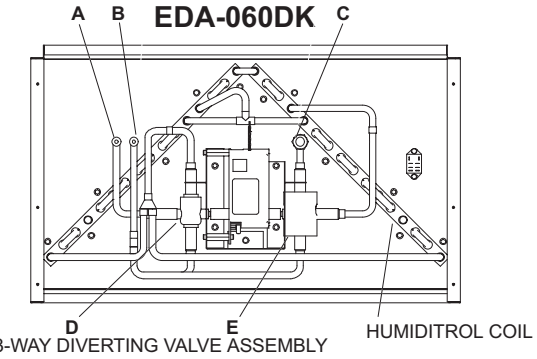
FIGURE 7. Check/Flow Restrictor Operation



3-WAY DIVERTING VALVE ASSEMBLY



3-WAY DIVERTING VALVE ASSEMBLY



3-WAY DIVERTING VALVE ASSEMBLY

A - Liquid Line From Outdoor Unit
B - Liquid Line to Indoor TXV
C - Check/Flow Restrictor to Vapor Line Tee
D - HUMIDITROL inactive mode - bypasses the HUMIDITROL HUMIDITROL active mode - allows refrigerant flow through HUMIDITROL
E - HUMIDITROL inactive mode - vent path to suction line; EDA active mode - directs refrigerant flow back to liquid line.

FIGURE 8. Humiditrol Unit Parts Arrangement

2. INSTALLATION

2.1. Information

⚠WARNING

Risk of property damage, injury, or death.

Installation, adjustments, alterations, service, and maintenance must be performed by a licensed professional service technician (or equivalent).

⚠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.

⚠CAUTION

The Humiditrol 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.

2.1.1. Refrigeration

NOTE: *The maximum allowable pressure in all EDA applications is 640 psig (4413 KPA).*

All Humiditrol 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.

2.1.2. Releasing Air Charge

NOTE: *Humiditrol units are shipped from the factory with dry air as a holding charge.*

1. Ensure that the coil is void of pressure.
2. Remove the rubber plug from the lines.
3. If there is no pressure when the plugs are pierced, check the unit for leaks before continuing with the installation.

2.1.3. Refrigerant Line Connections

NOTE: *After completion of field piping, the field pipework shall be pressure tested at 640 psi with an inert gas and then vacuum tested prior to refrigerant charging.*

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 Humiditrol unit line connections. A wet rag heat shield must be in place during brazing to guard against damage to the paint.

2.2. Electrical Wiring

Review the diagrams before installation to ensure all necessary components are on hand at time of installation.

On air handlers only, remove and mark all the wires to the unit control board. Then remove the unit control board and replace it with the new unit control board supplied with the EDA that has two RDS sensor inputs. Replace all wires that were taken off the old unit control board onto the new control board at the same locations.

For CBK45UHET and CBK47UHET units, install the blower relay shipped with the EDA onto the blower deck to the left of unit control board by drilling two .116 diameter holes, 1 1/2 inches apart. See FIGURE 9. Secure the blower relay into the .116 holes with the two screws provided. Use the wiring diagram on the next page to connect all the wires from the relay to the unit control board.

Connect the red, purple and black wires in the EDA to field provided 18 gauge wire and connect them to the unit controller in the air handler or direct vent furnace as shown on the wiring diagram.

INSTALL INDOOR BLOWER RELAY

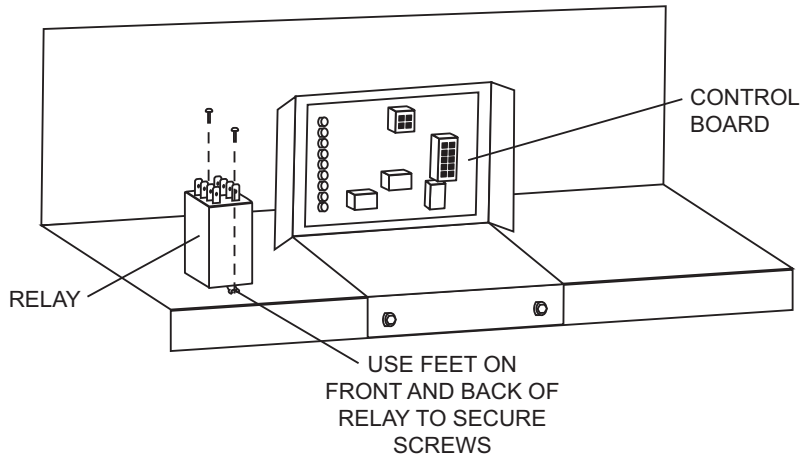
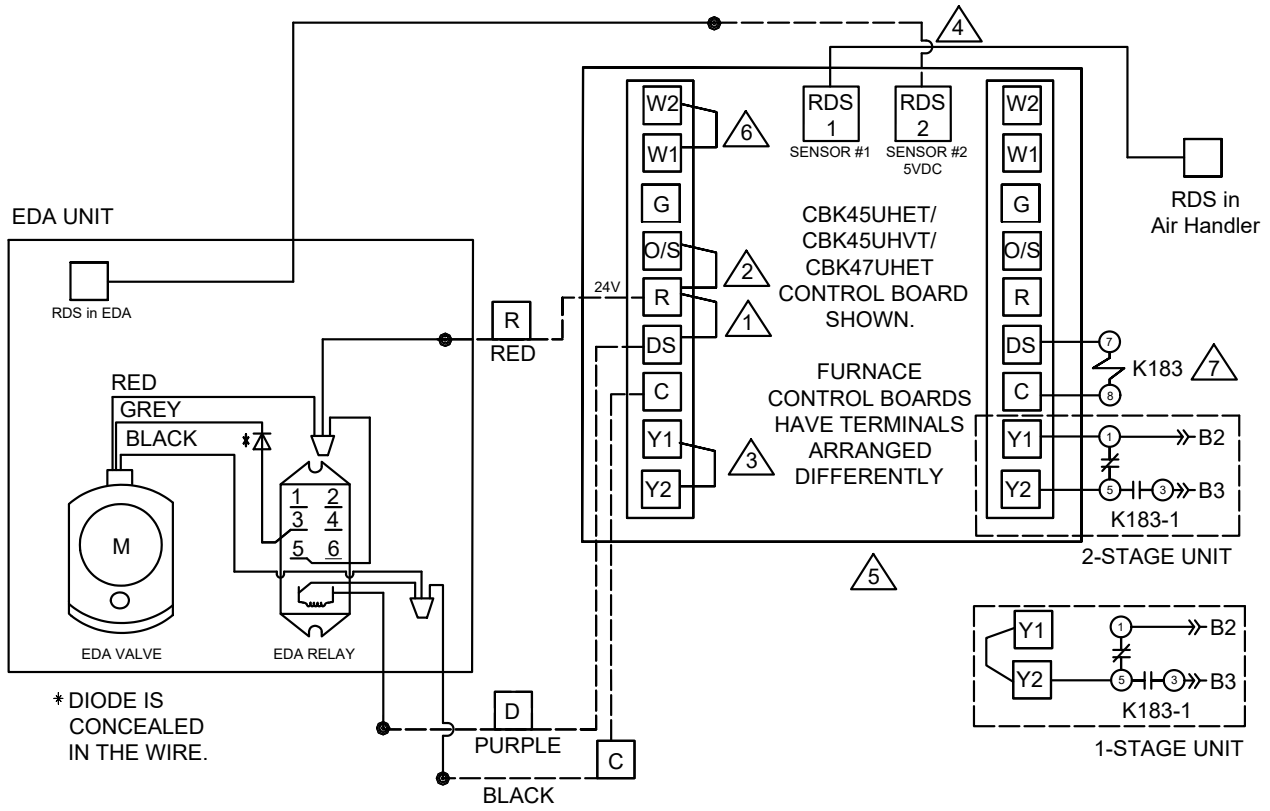


FIGURE 9



DESCRIPTION	
KEY	COMPONENT
RDS	A2L LEAK SENSOR
K183	INDOOR BLOWER RELAY

NOTE: IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING, INSULATION THICKNESS AND TERMINATION.

1. DS-R JUMPER - MUST BE REMOVED FOR HUMIDITROL OPERATION
2. O/S-R JUMPER - MUST BE REMOVED FOR HEAT PUMP APPLICATION
3. Y1-Y2 JUMPER - ONLY REMOVE IF 2-STAGE COOLING
4. RDS SENSOR in EDA UNIT MUST BE INSTALLED IN SENSOR #2 LOCATION
5. FOR AIR HANDLER UNITS ONLY, REFER TO EDA INSTALLATION INSTRUCTION, REPLACE THE CONTROL BOARD IN AIR HANDLER (1 RDS INPUT) WITH CONTROL BOARD SHIPPED WITH THE EDA (2 RDS INPUT) FOR HUMIDITROL OPERATION
6. W1-W2 JUMPER - ONLY REMOVE IF 2-STAGE HEATING
7. INDOOR BLOWER RELAY K183 IS NOT NEEDED FOR CBK45UHVT OR FURNACES

CONNECT LOW VOLTAGE EDA HARNESS TO CONTROL BOARD IN AIR HANDLER FOR HUMIDITROL OPERATION

EDA 024BK, 036CK, 060DK
WIRING DIAGRAM

2025/10

Form No.
538621-01

Litho U.S.A.

FIGURE 10. CS7500 or E40 with any Non-Communicating Indoor and Outdoor Units

2.3. Humiditrol Installation and Checkout Flow Chart

Follow the procedures referenced in this section when installing the Humiditrol and associated components.

Table 4. Required Parts for Specific Applications

Required Parts	Application	
NOTE: *After confirming that all required parts in this table are available, proceed with installation.*		
	Any non-zoning AC or Single Stage HP	**Non-Zoning Two Stage HP**
Humiditrol Unit with check/flow restrictor and label	Yes	Yes
Thermostat: Lennox® M40 and E40 Smart Thermostats	Yes	Yes
Blower Relay (CBK45UHET and CBK47UHET only)	Yes	Yes
Outdoor Sensor (X2658, for non-communicating outdoor units)	Yes	Yes
Tubing Insulation and Piping Fittings	Yes	Yes
RDS Sensor mounted in EDA	Yes	Yes
New Control Board with Two RDS Sensor Inputs (For Air Handlers Only)	Yes	Yes
75VA Transformer (12P61)	—	Yes

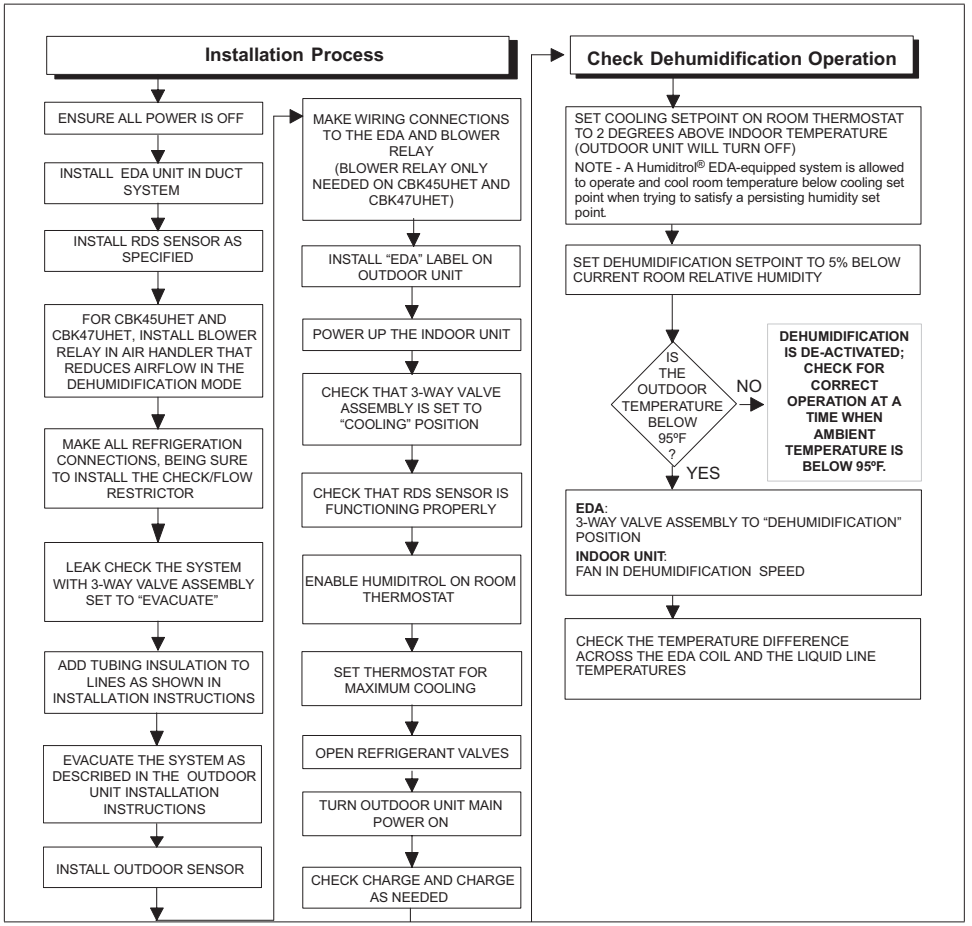


FIGURE 11. Humiditrol Installation and Checkout Flow Chart

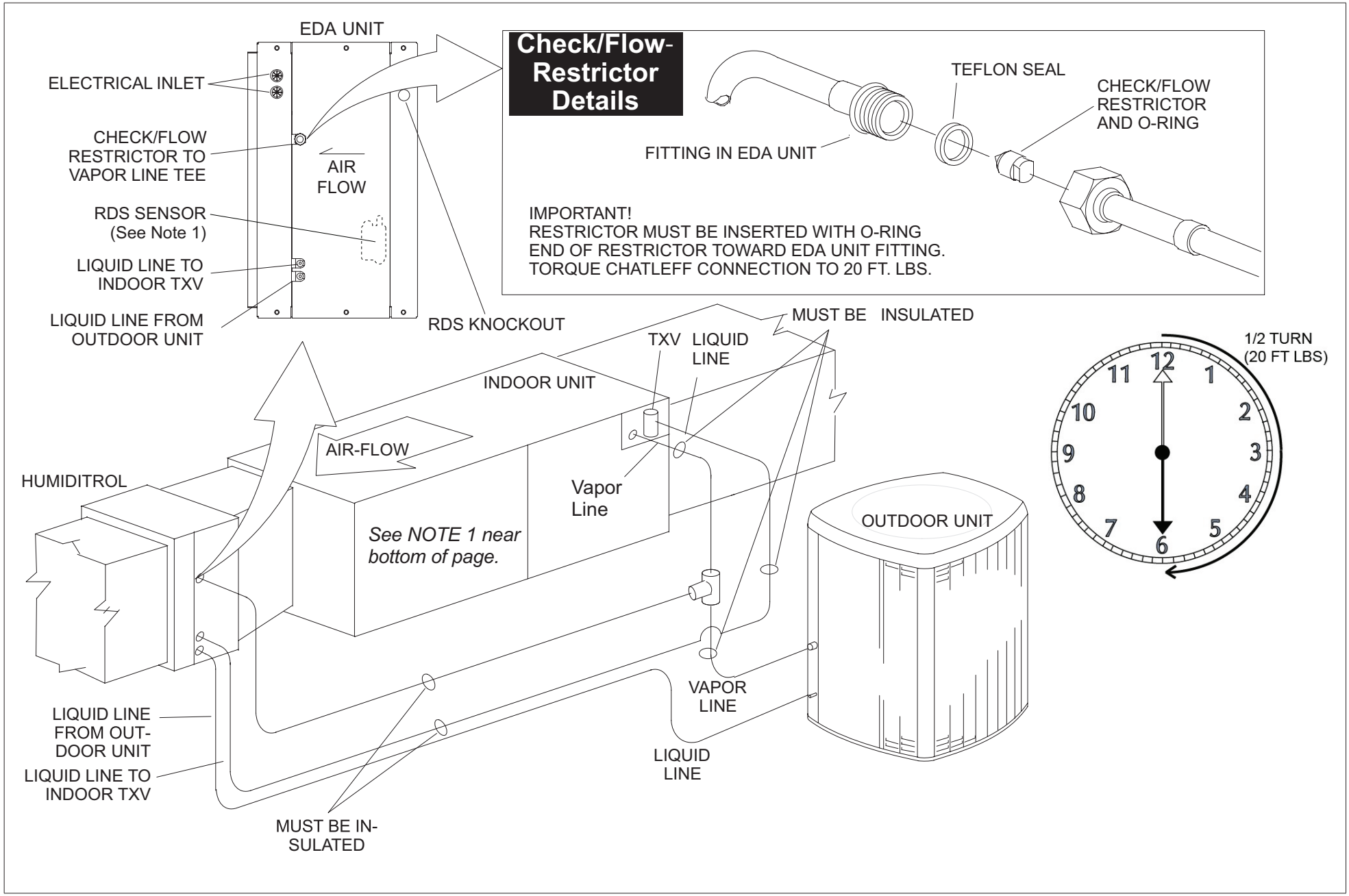


FIGURE 12. Typical Installation (Horizontal Air Handler Shown)

2.4. Leak Testing, Evacuating, Charging

IMPORTANT

The 3-way diverting valve actuator shaft pinch bolt (see “FIGURE 14. Setting 3-Way Diverting Valve to Evacuate Position” on page 20) is factory set and is not to be adjusted.

IMPORTANT

Braze-free fittings must conform with UL207 of ISO14903 (latest edition).

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 14.

2.4.1. Three-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 pinch bolt that has been factory-set to a precise point on the common shaft. Do not loosen (unscrew) the pinch bolt. Should the pinch bolt become loose, carefully follow the note in FIGURE 13 to position and tighten it.

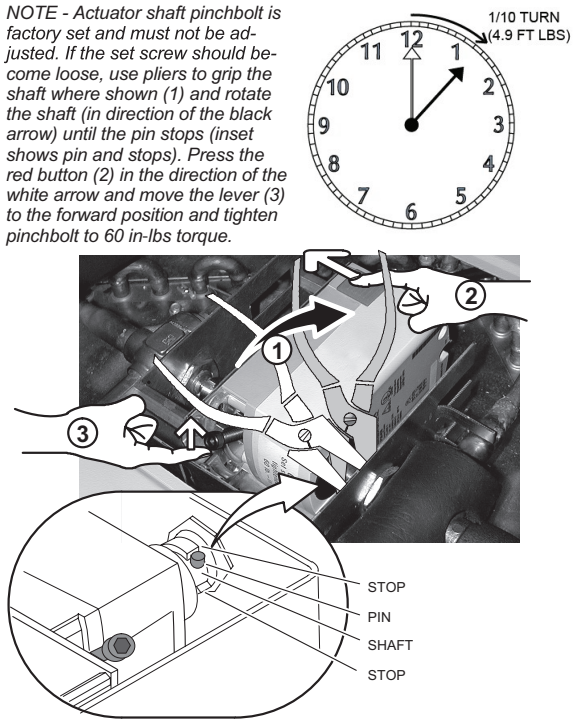


FIGURE 13. Re-Aligning Pinch Bolt

2.4.2. Leak Testing, Evacuating, Charging

1. Set the 3-way diverting valve actuator shaft to the center (evacuate) position for leak testing and evacuation as illustrated in FIGURE 14.

IMPORTANT! *The actuator shaft must be set as described to allow the Humiditrol to evacuate more quickly.*

2. Refer to instructions provided with the outdoor unit for leak testing, evacuating and charging procedures

3. Very little charge is required for the additional volume of the Humiditrol 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 pinch bolt in the following figure; if properly shifted, the pinch bolt will be in the forward position.*

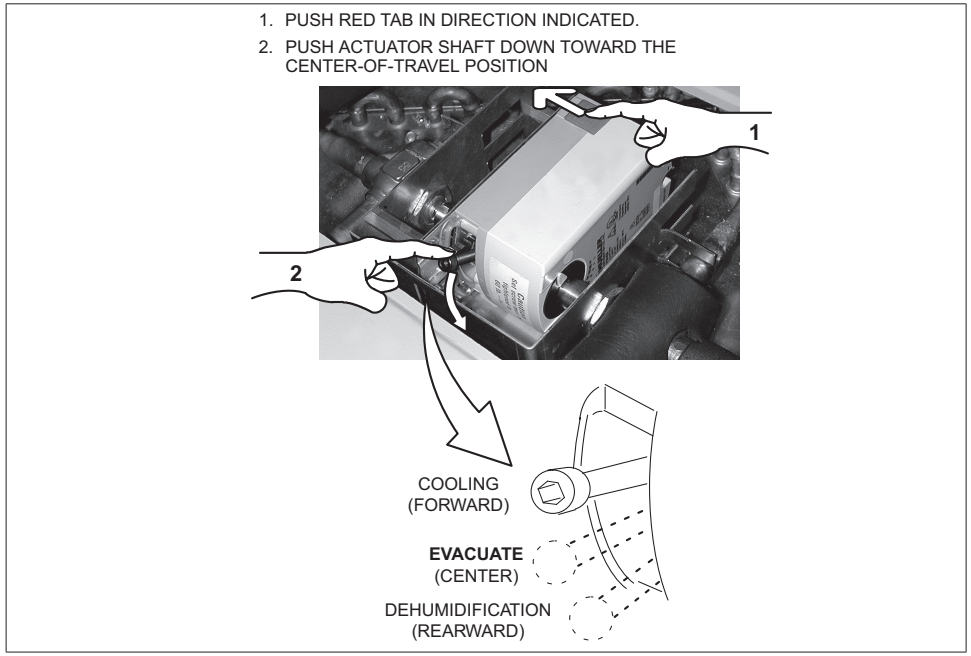


FIGURE 14. Setting 3-Way Diverting Valve to Evacuate Position

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.

2.5. 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.

2.6. Other System Components

2.6.1. Blower Control

When Humiditrol units are to be applied with an indoor unit that has a variable speed motor (VSM), then refer to the indoor unit installation instruction for setting blower speed.

2.6.2. Thermostat and Sensor

Refer to the E40 and M40 Thermostat Installation and Setup Guides for non-communicating installation, wiring, and setup.

IMPORTANT

The E40 and CS7500 thermostats and a properly connected outdoor temperature sensor are required for the Humiditrol unit to function properly.

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 ability to accurately sense outdoor temperature.

2.7. Using Humiditrol Comfort Adjust

If Humiditrol is enabled in the installer settings, then the Humiditrol Adjustment in the User Settings affects overcooling operation (“Table 5. Humiditrol Comfort Adjust Parameters” on page 21 and “FIGURE 15. Thermostat Operation with Humiditrol Enabled” on page 22 describe the parameters and illustrate Humiditrol operation under typical settings). Overcooling ranges from 2ºF below the cooling setpoint (MIN setting) down to 2ºF above the heating setpoint (MAX setting). Halfway between the two settings is the MID setting.

Table 5. Humiditrol Comfort Adjust Parameters

Humiditrol Comfort Adjust parameters	Indoor temperature is greater than:
Maximum overcooling	2°F above heating setpoint
Midpoint overcooling	$\frac{\text{Heat Setpoint+Cool Setpoint}}{2}$
Minimum overcooling	2°F below cooling set point

2.8. Dehumidification Requirements

Humiditrol can only operate when the thermostat is set to COOL or AUTO and meets the parameters described in the following table. If the thermostat is set to HEAT mode, no dehumidification will occur! Thermostat cycles heating ON and OFF to maintain heating setpoint.

Table 6. Thermostat Operation with Humiditrol Enabled

Thermostat set to COOL mode- Dehumidification will only occur if:	Thermostat set to AUTO changeover- Dehumidification will only occur if:
• Outdoor sensor on room thermostat installed and setup • Dehumidification enabled on installer settings • Dehumidification demand is present • Cooling demand is not present • Outdoor temperature is less then 95ºF • Indoor temperature is not cooler than 65ºF	• Outdoor sensor on room thermostat installed and setup • Dehumidification enabled on installer settings • Dehumidification demand is present • Cooling demand is not present • Outdoor temperature is less then 95ºF • Indoor temperature is not cooler than 65ºF • Indoor temperature is not cooler than 2ºF above heating setpoint.
If the conditions above are met, 24VAC is removed from the Humiditrol ”D” terminal and cooling begins (Indoor variable speed motor runs at dehumidification speed and outdoor unit begins the cooling cycle). Cooling calls have priority over Humiditrol calls.	In this case, 24VAC is removed from the Humiditrol ”D” terminal and cooling begins (Indoor variable speed motor runs at dehumidification speed and outdoor unit begins the cooling cycle). Cooling calls have priority over Humiditrol calls. Humiditrol mode overcooling is user adjustable and is described in Using Humiditrol Comfort Adjust.
Humiditrol mode overcooling is user adjustable and is described in Using Humiditrol Comfort Adjust.	

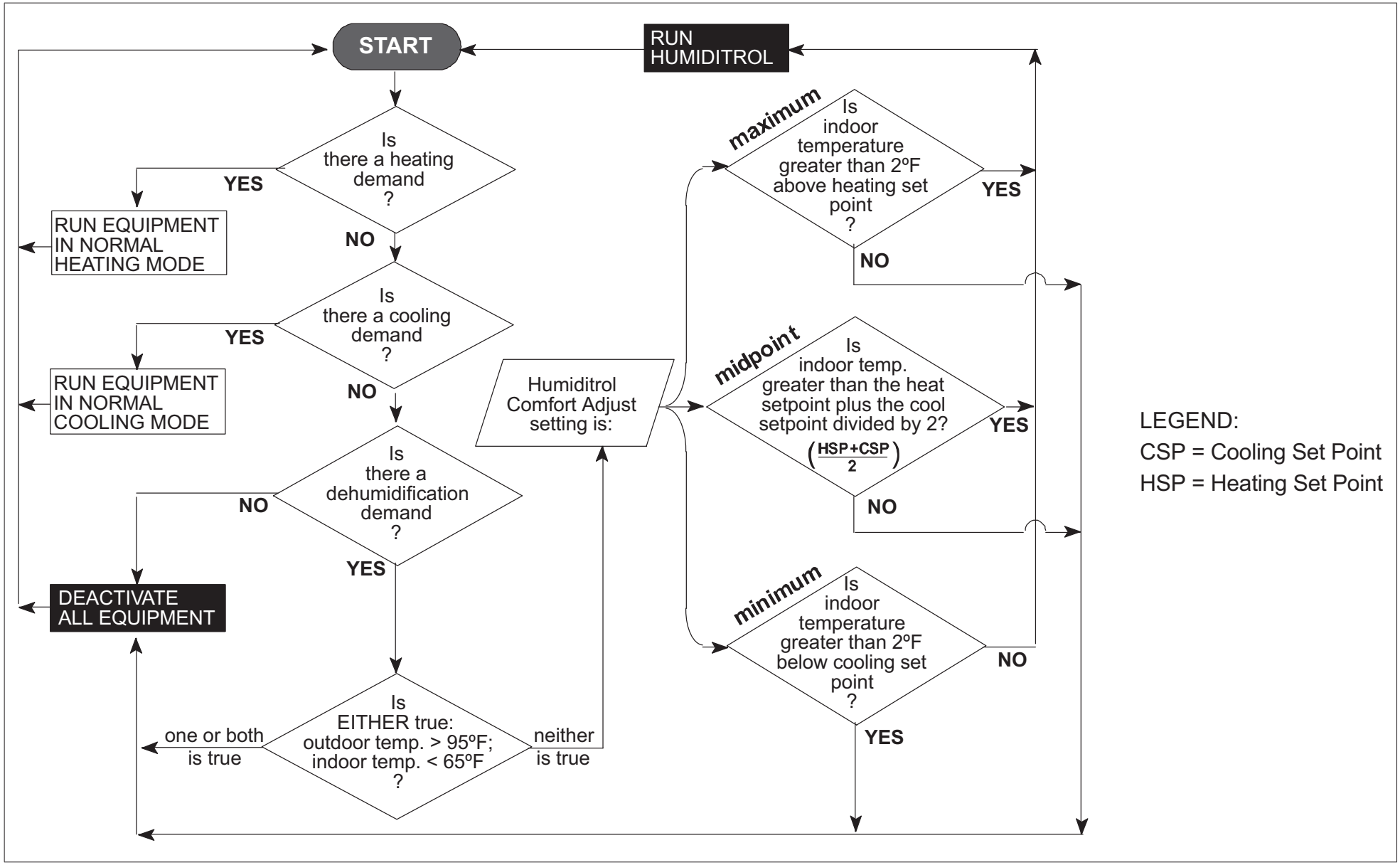


FIGURE 15. Thermostat Operation with Humiditrol Enabled

2.9. Refrigerant Leak Detection System

This unit is equipped with a Refrigerant Leak Detection System. The system consists of the RDS Non-Communicating Blower Control Board (RDSC) in the control compartment of the air handler, an R454B Refrigerant Sensor near the air handler and an R454B Refrigerant Sensor in the EDA coil. The Modes of Operation for the RDS Non-Communicating Blower Control Board are Initializing, Normal, Leak Detected, and Fault.

2.9.1. Modes Of Operation

Initializing

The RDS Non-Communicating Blower Control Board is establishing connection with the refrigerant detection sensor and sensor is “warming up”.

Normal

The HVAC system is functioning normally, i.e., responding to thermostat demand signals. The RDS Non-Communicating Blower Control Board has not detected a refrigerant leak.

Leak Detected (Mitigation)

When the RDS Non-Communicating Blower Control Board detects a refrigerant leak:

1 - The RDS Non-Communicating Blower Control Board shuts off the (R) output (24VAC power) to the thermostat, which de-energizes the outdoor unit compressor and heat sources, such as gas and/or electric strip heat. No heating or cooling demands will be met.

2 - The RDS Non-Communicating Blower Control Board activates the blower ventilation speed (G). The blower purges refrigerant from the cabinet, plenum, and ductwork.

3 - After the RDS Non-Communicating Blower Control Board determines the refrigerant levels are below the safety threshold, the blower will continue to function for an additional seven (7) minutes.

4 - After the blower sequence is complete, the HVAC system resumes normal operation.

NOTE: *The HVAC system may not maintain a cooling or heating setpoint if a significant leak exists. Any refrigerant leaks that remain unaddressed for an extended time may cause the HVAC system to shut down on a low refrigerant pressure limit condition.*

Fault/Service

When a fault is detected within the RDS Non-Communicating Blower Control Board, the indoor blower engages and remains engaged at a constant output until the fault is cleared.

2.9.2. Diagnostic Codes / Troubleshooting

The RDS Non-Communicating Blower Control Board is equipped with a multicolor LED. The LED signals the operational state of the RDS Non-Communicating Blower Control Board. To review the operational states, refer to TABLE 1, LED Operational Modes / Troubleshooting, for details.

Red diagnostic codes indicate a specific RDS Non-Communicating Blower Control Board issue. To determine the issue and possible troubleshooting actions, refer to TABLE 2, Red LED Diagnostic Codes / Troubleshooting.

The RDS Non-Communicating Blower Control Board is equipped with a Test/Reset button. The Test button can be used to complete several functions, depending on the mode of operation of the RDS Non-Communicating Blower Control Board. TABLE 3 lists the functions of the Test button during each mode of operation.

TABLE 1

LED Operational Modes / Troubleshooting

Operating Mode	LED Status	Action
Initializing	Flashing green	None
Monitoring	Solid green*	None
Mitigation (Leak Detected)	Flashing blue	Since the leak could be in the EDA coil or in the air handler coil, check both coils for possible leaks. Repair the issue and restart the equipment.
Fault / Service	Solid blue, interrupted by red flash code	Refer to TABLE 2 below for troubleshooting guidance.

*Solid green interrupted by a blue flash indicates the mitigation process has previously occurred.

TABLE 2

Red LED Diagnostic Codes / Troubleshooting

Red Wink	Applies to Individual Sensor(s)	Issue	Action
1	Yes	RDS Sensor Fault	Replace sensor
3	Yes	Incompatible sensor installed	Replace sensor
4	Yes	Sensor communication issue	Check sensor connection. Ensure connection is clean and tight
5	No	R-input not available	Check for 24VAC power connected to thermostat R terminal on the RDSC. 24VAC power should only be provided at A194-R quick connection for the RDSC to function.

TABLE 3

Test Button Functions

Operation Mode	Press the Test button to...	Press	Action
Monitoring	Trigger a leak detection response. Verify all equipment is wired correctly into the RDSC (after installation).	Short	Clear purge-counter if prior mitigation has occured; test mitigation.
		Long	Reset control.
Mitigating (Leak Detected)	Reset the RDSC to a normal mode of operation after a previous leak has been detected and purged from the HVAC system.	Short	If testing mitigation, end test.
Fault/Service	Reset the RDSC after troubleshooting and resolving a fault condition. If the fault is not resolved, the RDSC will enter the Fault mode again.	Short	Reevaluate fault condition - if cleared, return to monitoring, otherwise update indicator.
		Long	Reset control.

2.9.3. RDS Sensors

Units are equipped with a factory-installed RDS Sensor located in the unit. The RDS sensors provide the Unit Controller with continuous readings for leaked refrigerant concentration levels and sensor health status (Good or Fault). These readings are used to modify unit operation to disperse the leaked refrigerant and to remove possible ignition sources. In addition, the Unit Controller uses these readings to initiate alarms to alert the operator of a refrigerant leak or faulty sensor(s).

Each sensor must be specifically placed for proper unit operation and to initiate valid alarms. To identify sensor locations see TABLE 5. See TABLE 4 for a list of alarms.

NOTE: *The RDS sensor in the EDA unit is used in conjunction with the RDS Sensor furnished in the air handler.*

TABLE 4 - RDS Alarms

Alarm	Alarm description	RDS Sensor Location
257	Refrigerant leak sensor fault in the Indoor section (sensor #1)	Indoor compartment
258	Refrigerant leak sensor fault in the EDA coil (sensor #2)	EDA coil

2.9.4. Blower Control Board with Second RDS Input

In EDA applications, the control board in the air handler must have two RDS sensor inputs. One is for the RDS Sensor in the EDA, and the other is for the RDS Sensor in the evaporator coil in the air handler. The control board in the air handler shipped from the factory has only one RDS input. So it must be replaced with the control board shipped with the EDA that has two RDS inputs. Follow these steps to remove the control board in the air handler and replace it with the new control board.

1 - Remove RDS wire and all other wires from control board in air handler unit. Tape and mark each wire so it can be replaced later on the new control board.

2 - Remove the original control board in the air handler with one RDS sensor input and replace it with the control board furnished with the EDA with two sensor inputs.

3 - Reconnect all the wires that were connected to the original Control Board to the same connection points on the new control board, including the RDS wire into one of the two RDS inputs on the new control board.

NOTE: *For direct vent furnaces, a second sensor is already available for the EDA on the control board in the direct vent furnace because a second RDS sensor is not needed in the utility room for direct vent furnace applications.*

2.9.5. Location of RDS Sensor in EDA

The EDA is shipped from the factory with the RDS sensor in the proper location for upflow applications. The RDS sensor wiring can be routed out of the EDA to the air handler and connected to the control board to the open RDS sensor input. The RDS sensor in the EDA unit must be repositioned in the proper location for downflow, horizontal, and inverted horizontal applications for proper functioning. If the application is downflow, follow the “Downflow Application” instructions. If the application is horizontal or inverted horizontal, follow the “Horizontal Application” instructions.

Downflow Application

1 - Push the RDS wiring harness through wiring plug into piping section.

2 - Leave RDS in same location in the collection pan.

3 - Remove the screws securing the refrigerant collection pan, and reinstall it on the downflow side of the coil. See FIGURE 19 through FIGURE 21 for proper locations.

4 - Route the RDS wiring harness through wiring plug in the panel closest to the new RDS sensor location.

Horizontal Application

EDA-036CK and EDA-060DK

1 - Move the RDS sensor and mounting bracket to the bottom of the collection pan as shown in FIGURE 23 and FIGURE 24 for horizontal applications or FIGURE 26 and FIGURE 27 for inverted horizontal applications.

EDA-024BK

2 - Push the RDS wiring harness through wiring plug into piping section.

3 - Remove the RDS from the bracket holding it in the refrigerant collection pan.

4 - Mount the RDS sensor as shown in FIGURE 22 for horizontal or FIGURE 25 for inverted horizontal application.

5 - Mount the collection pan on the opposite side of the EDA (same as downflow application).

6 - Route the RDS wiring harness through wiring plug in the panel closest to the new RDS sensor location.

All Applications

1 - Pull the RDS wiring in the piping section out through the wiring inlet/outlet hole in the EDA. In all direct vent furnace applications and if the EDA is more than 24 inches from the air handler in upflow or horizontal applications, remove the knockout in the bottom panel, insert the bushing provided in one of the bag assemblies into the hole, and route the EDA harness through the bushing.

2 - Route and secure the RDS wiring harness to the air handler or direct vent furnace and through the wiring inlet in the air handler or direct vent furnace where the control board is located.

3 - Connect the RDS wiring harness connecter into the second RDS input on the new control board in the air handler or on the existing control board in direct vent furnaces.

4 - Follow check out procedure to ensure RDS sensor is connected correctly and working.

See TABLE 5 for a list of figures displaying the required location of the RDS sensor.

TABLE 5. RDS Sensor Locations

Orientation	Model	Figure
Upflow	24BK	FIGURE 16
	36/60CK	FIGURE 17
	60DK	FIGURE 18
Downflow	24BK	FIGURE 19
	36/60CK	FIGURE 20
	60DK	FIGURE 21
Horizontal	24BK	FIGURE 22
	36/60CK	FIGURE 23
	60DK	FIGURE 24
Inverted Horizontal	24BK	FIGURE 25
	36/60CK	FIGURE 26
	60DK	FIGURE 27

24BK UPFLOW - RDS SENSOR LOCATION

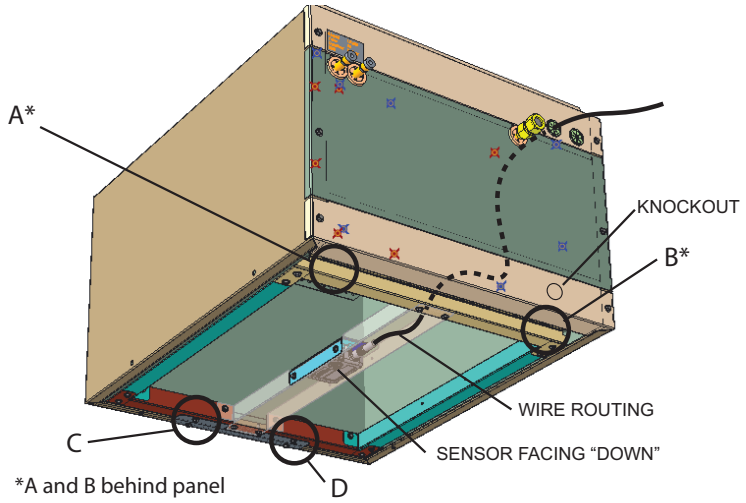


FIGURE 16

NOTE: *Remove screw A, B, C, and D (6x) to detach the collection pan assembly including the A2L sensor and reposition for downflow and horizontal applications. Refer to FIGURE 19, FIGURE 22, and FIGURE 25.*

36/60CK UPFLOW - RDS SENSOR LOCATION

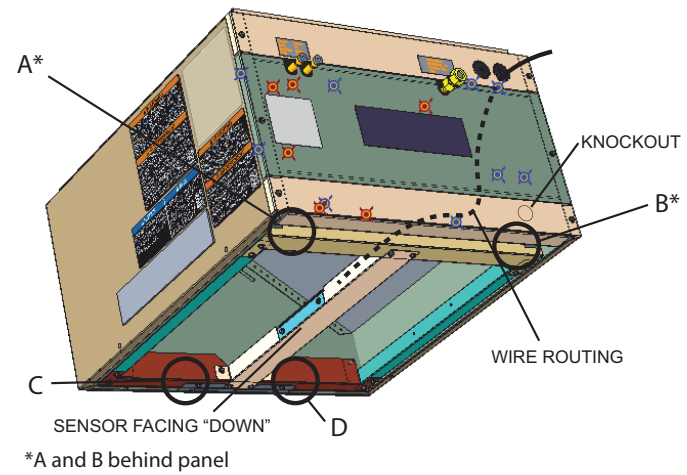


FIGURE 17

NOTE: *Remove screw A, B, C, and D (6x) to detach the collection pan assembly including the A2L sensor and reposition for downflow and horizontal applications. Refer to FIGURE 20, FIGURE 23, and FIGURE 26.*

60DK UPFLOW - RDS SENSOR LOCATION

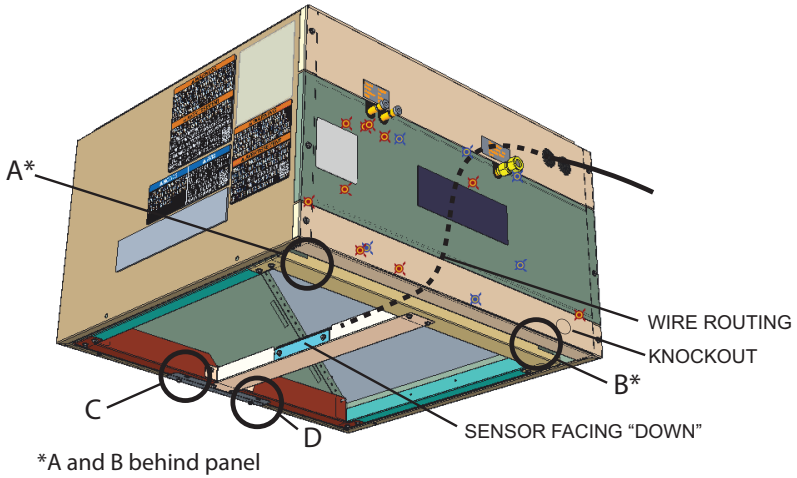


FIGURE 18

NOTE: *Remove screw A, B, C, and D (6x) to detach the collection pan assembly including the A2L sensor and reposition for downflow and horizontal applications. Refer to FIGURE 21, FIGURE 24, and FIGURE 27.*

36/60CK DOWNFLOW - RDS SENSOR LOCATION

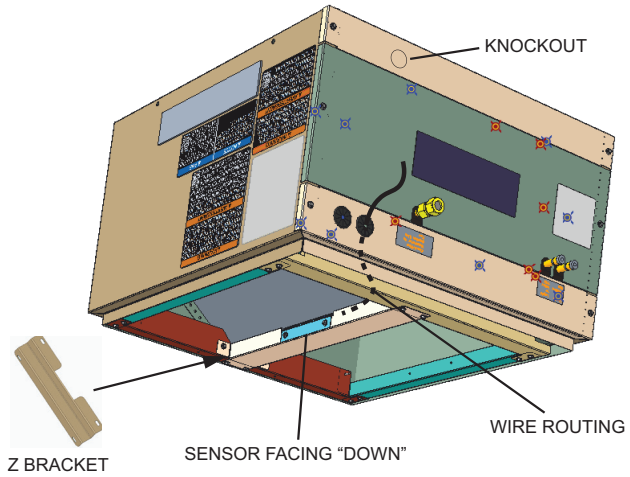


FIGURE 20

NOTE: *Mount the collection pan assembly using the supplied Z bracket and screws (6x). Leave the A2L sensor in place. See FIGURE 17 to reference upflow positioning if needed.*

24BK DOWNFLOW - RDS SENSOR LOCATION

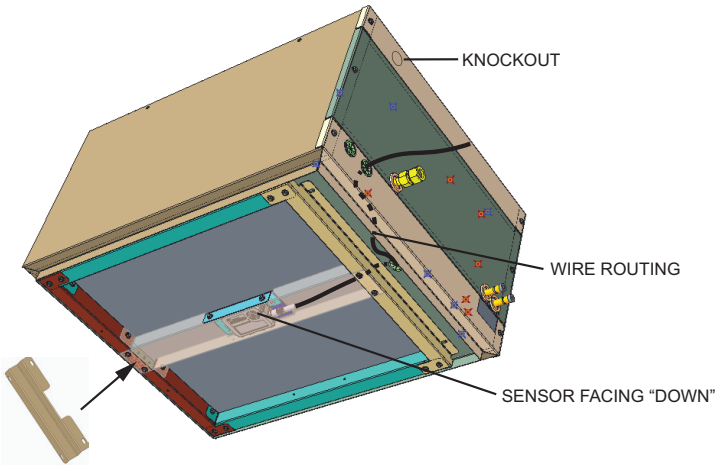


FIGURE 19

NOTE: *Mount the collection pan assembly using the supplied Z bracket and screws (6x). Leave the A2L sensor in place. See FIGURE 16 to reference upflow positioning if needed.*

60DK DOWNFLOW - RDS SENSOR LOCATION

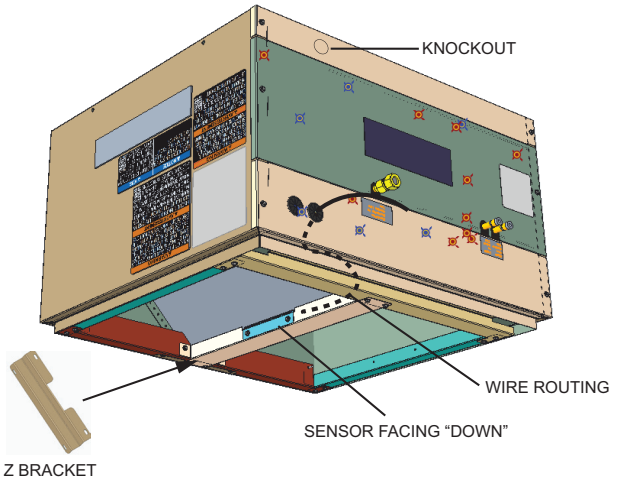


FIGURE 21

NOTE: *Mount the collection pan assembly using the supplied Z bracket and screws (6x). Leave the A2L sensor in place. See FIGURE 18 to reference upflow positioning if needed.*

24BK HORIZONTAL - RDS SENSOR LOCATION

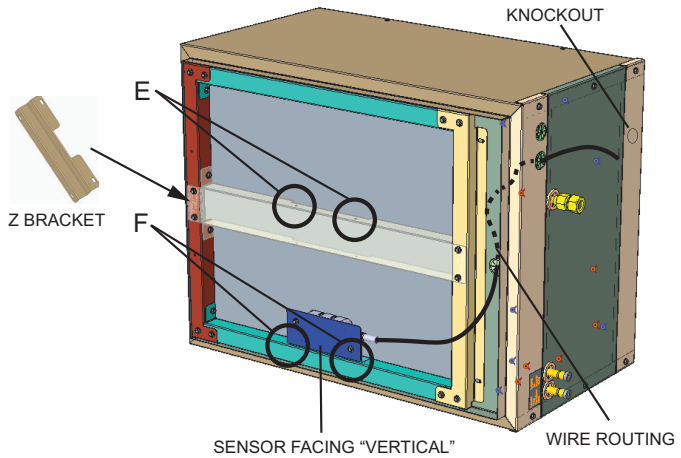


FIGURE 22

NOTE: *Unscrew screws in position E (x2), reposition sensor to location shown above, and mount screws at position F. Mount the collection pan assembly using the supplied Z bracket and screws (6x). See FIGURE 16 to reference upflow positioning if needed.*

36/60CK HORIZONTAL - RDS SENSOR LOCATION

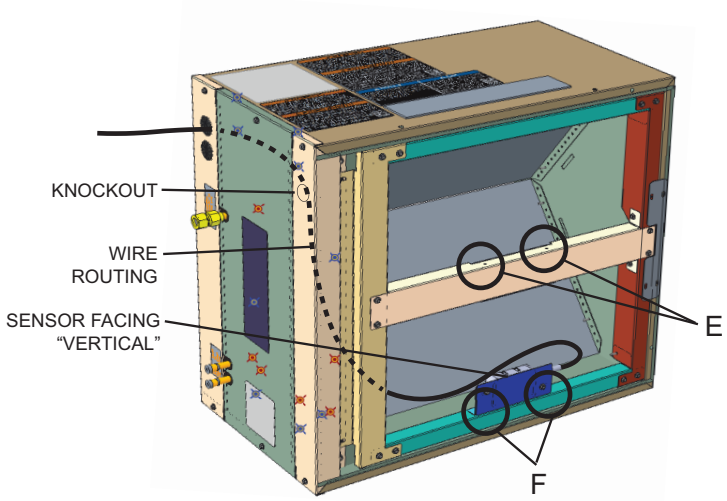


FIGURE 23

NOTE: *Unscrew screws in position E (x2), reposition sensor to location shown above, and mount screws at position F. See FIGURE 17 to reference upflow positioning if needed.*

60DK HORIZONTAL - RDS SENSOR LOCATION

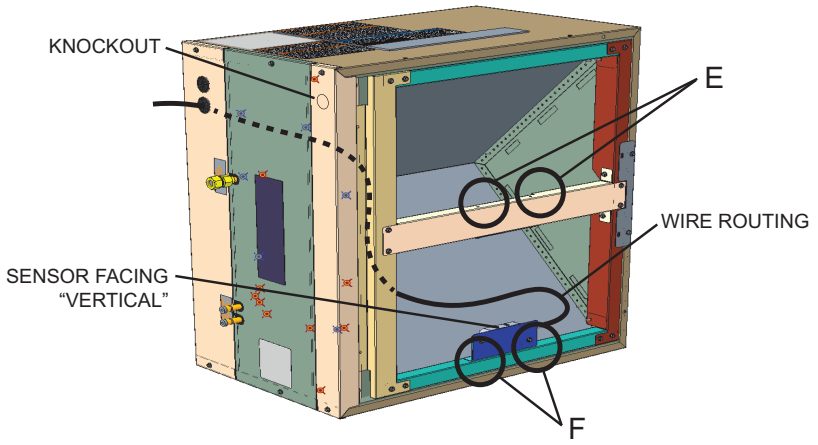


FIGURE 24

NOTE: *Unscrew screws in position E (x2), reposition sensor to location shown above, and mount screws at position F. See FIGURE 18 to reference upflow positioning if needed.*

24BK INVERTED HORIZONTAL - RDS SENSOR LOCATION

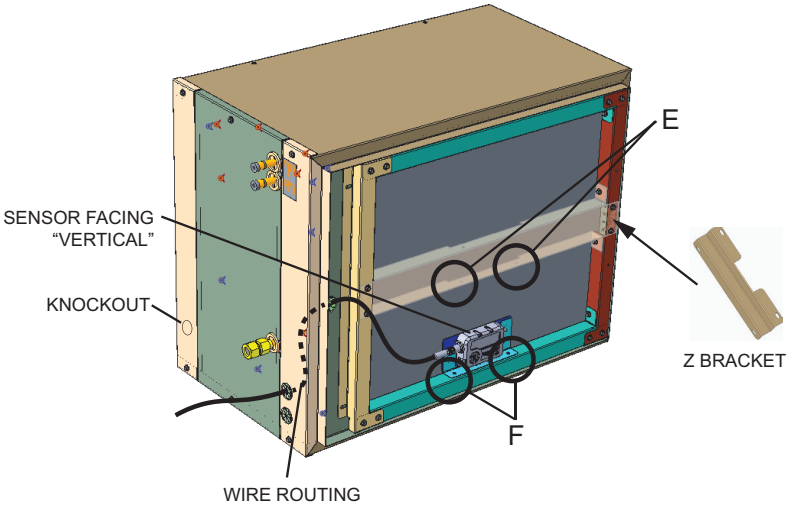


FIGURE 25

NOTE: *Unscrew screws in position E (x2), reposition sensor to location shown above, and mount screws at position F. Mount the collection pan assembly using the supplied Z bracket and screws (6x). See FIGURE 16 to reference upflow positioning if needed.*

36/60CK INVERTED HORIZONTAL - RDS SENSOR LOCATION

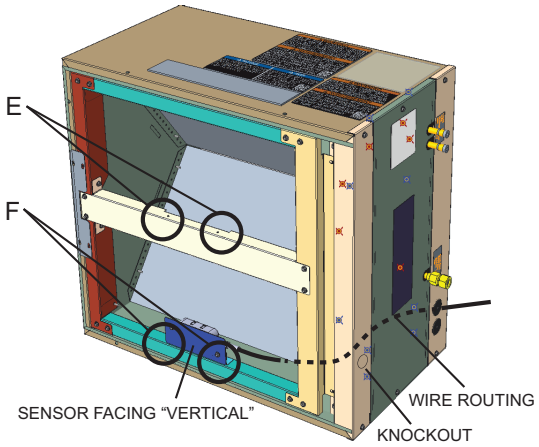


FIGURE 26

NOTE: *Unscrew screws in position E (x2), reposition sensor to location shown above, and mount screws at position F. See FIGURE 17 to reference upflow positioning if needed.*

60DK INVERTED HORIZONTAL - RDS SENSOR LOCATION

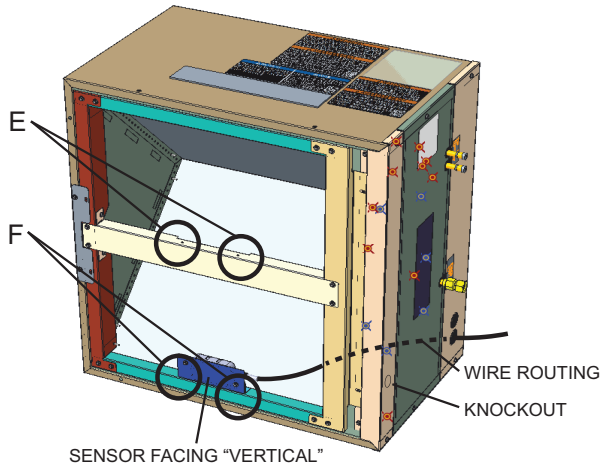


FIGURE 27

NOTE: *Unscrew screws in position E (x2), reposition sensor to location shown above, and mount screws at position F. See FIGURE 18 to reference upflow positioning if needed.*

2.9.6. Sensor Maintenance

It is recommended to check the state of the sensors every 6 months, at the beginning of each cooling and heating season.

- Check that the sensor cable is in good condition.
- Ensure that the sensor opening is clear and free of debris.
  - DO NOT use abrasive cleaning solutions or detergents to clean sensor opening.
  - DO NOT use flammable compressed air solutions to clean the sensor opening.
  - DO NOT vacuum sensor inlet opening, as this could cause damage to the sensor internal components.
- Replace sensor if the opening is not clean or free of debris.

NOTE: *Sensor must be replaced with the same sensor that was supplied with the unit from Lennox any time the sensor is replaced.*

NOTE: *When cleaning the evaporator coil, remove the sensor from the coil. Recommended method is removal of bracket with sensor attached.*

See FIGURE 28 for an example of a clear, unobstructed sensor inlet.



FIGURE 28. RDS Sensor Inlet

3. ENABLING THERMOSTATS FOR HUMIDITROL

3.1. Lennox® E40 Smart Thermostat

Reference the Lennox® E40 Smart Wi-Fi Thermostat System Wiring document (538656) for wiring diagrams related to Humiditrol.

To configure the Lennox® E40 Smart Thermostat to communicate with the enhanced dehumidification accessory:

1. Press **Menu**, **Settings**.
2. Press **Humidity**.
3. Verify **Dehumidify** is selected.
4. Adjust the Dehumidification SetPoint by using the slidebar.
5. Press **Back** to return to the System Settings screen.
6. Scroll down to the **Advanced Settings** section.
7. Press **Advanced Settings**.
   The *Advanced Settings* screen displays.
8. Press **View Support Service Control Center**.
   The *Support Service Control Center* screen displays.
9. Press **OK**.
10. Press **Equipment Settings**.
11. Press **Dehumidifier**.
    The *Dehumidifer* screen displays.
12. Press **Dehumidifier**.
13. Press **Back**.
14. Press **Humiditrol**.
15. Press **Humiditrol Comfort Adjust**.
    The *Humiditrol Comfort Adjust* screen displays.
16. Press or verify that **Maximum Overcooling** is selected.
17. Press **Back**.
18. Find and press Thermostat under Communicating Equipment.
    The *Thermostat* screen displays.
19. Press **Outdoor Sensor**.
    The *Outdoor Sensor* screen displays.
20. Verify **Installed** is selected.

3.2. Lennox® CS7500 Thermostat

To configure the Lennox® CS7500 Thermostat to communicate with the enhanced dehumidification accessory:

1. Select or tap **Menu**, from the thermostat home screen.
2. Touch and hold **Settings**.
   A dialog displays that warns the user that the installer settings must be set by qualified technicians.
3. Tap **Confirm**.
4. Scroll to **Humidity Settings**.
5. Select **Dehumidify**, **Dehumidify Mode**.
6. Verify **Humiditrol** is selected.

NOTE: *Humiditrol requires an outdoor temperature sensor. If the sensor isn't installed and enabled, the CS7500 will display Outdoor Sensor require and the Humiditrol feature will not work. See the Comfort Sense® and Setup Guide for further details.*

4. MODES OF OPERATION

4.1. Dehumidification Mode (Cooling 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 Humiditrol unit's 3-way diverting valve assembly to begin operating in the dehumidification mode.

FIGURE 29 shows refrigerant flowing from the outdoor unit, entering the Humiditrol, passing through the first 3-way diverting valve, then entering the Humiditrol coil. The 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 operates at a lower air volume. The cool, dehumidified air leaving the indoor coil is warmed as it passes over the Humiditrol coil. Air temperature rise across the Humiditrol coil can be from 5° to 15°F, depending on the operating ambient and air-conditioned space conditions.

The warm vapor-liquid-refrigerant mixture entering the Humiditrol unit from the outdoor unit will be sub-cooled in the Humiditrol unit and enter the expansion valve at a lower than normal temperature. Liquid temperatures can be in the 55° to 60°F range, with a 25° to 35°F temperature change through the EDA coil.

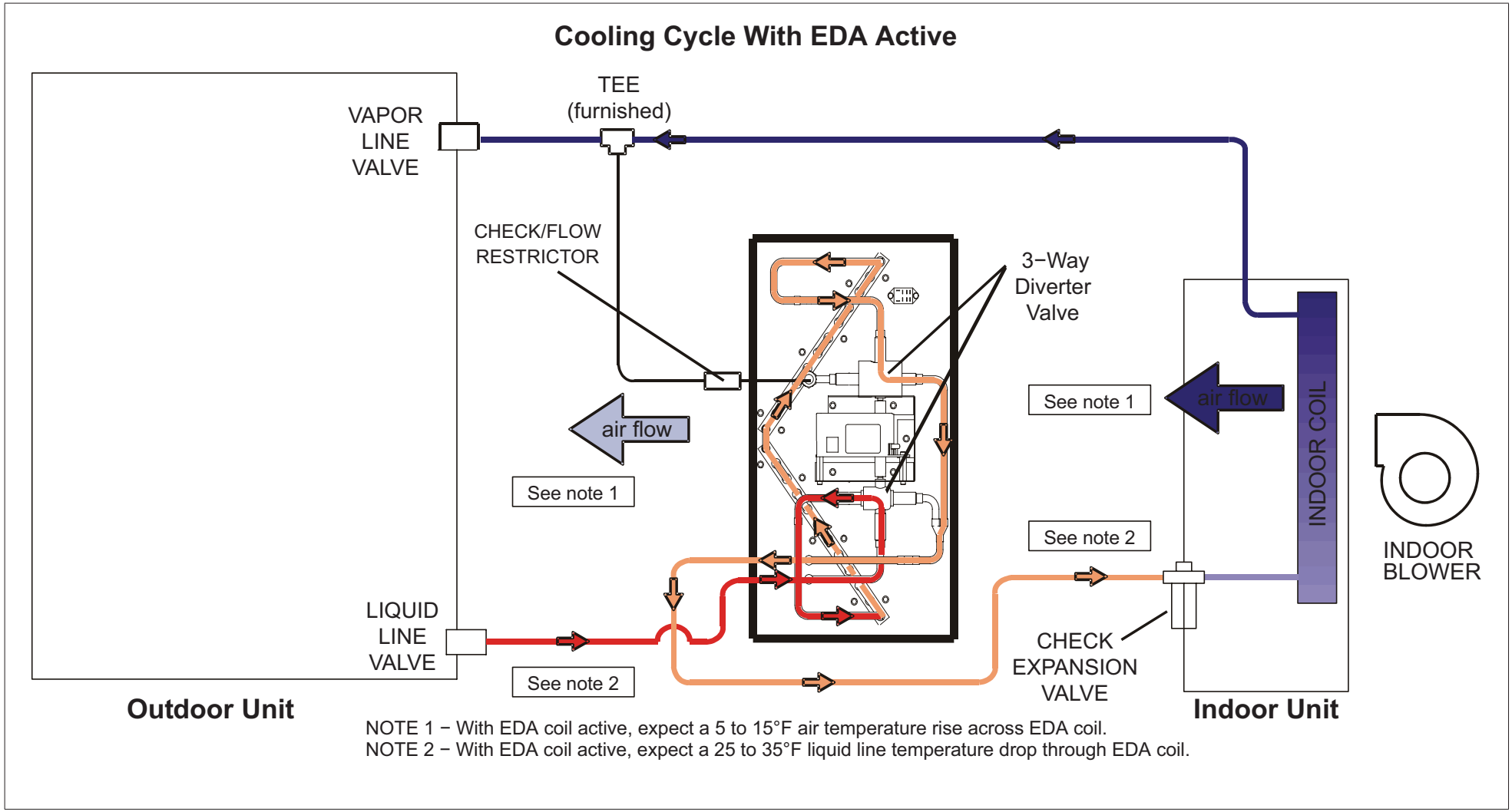


FIGURE 29. Dehumidification Cycle with Humiditrol Coil Active (Model EDA-036/060CK Shown)

4.2. Cooling Mode (Dehumidification OFF)

The following figure illustrates refrigerant flow in cooling mode (dehumidification mode OFF), The liquid refrigerant from the outdoor unit enters the Humiditrol module. Since there is no demand for dehumidification, the 3-way diverting valve assembly directs the flow back out of the Humiditrol module to the indoor unit expansion valve.

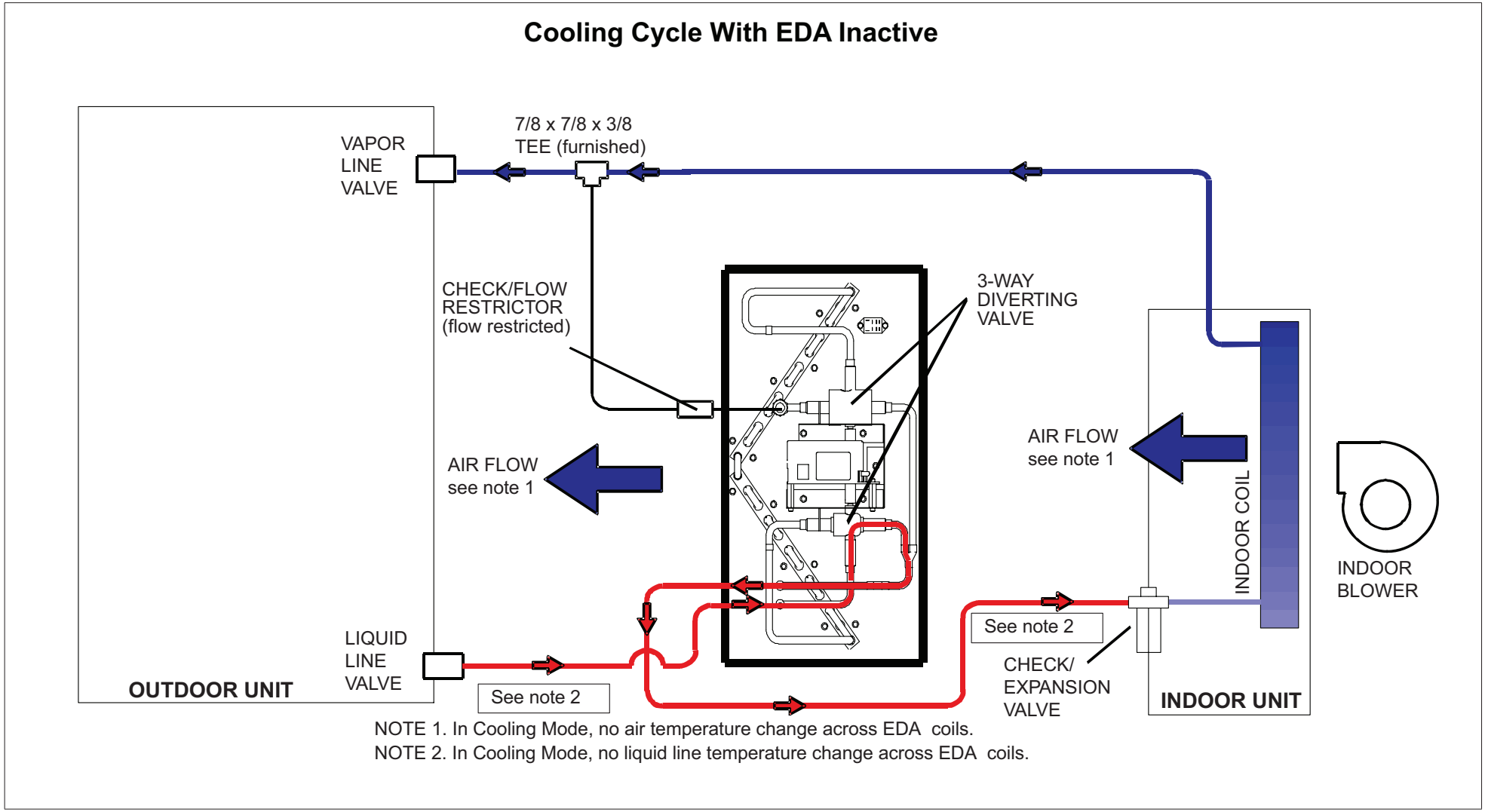


FIGURE 30. Cooling Cycle with Humiditrol Coil Inactive (Model EDA-036/060CK Shown)

4.3. Heating Mode (Heat Pump Applications)

The following figure illustrates refrigerant flow in the heating mode. In heat pump application heating mode, a system that includes an Humiditrol unit will operate as a conventional heat pump. The Humiditrol unit does not operate in this mode.

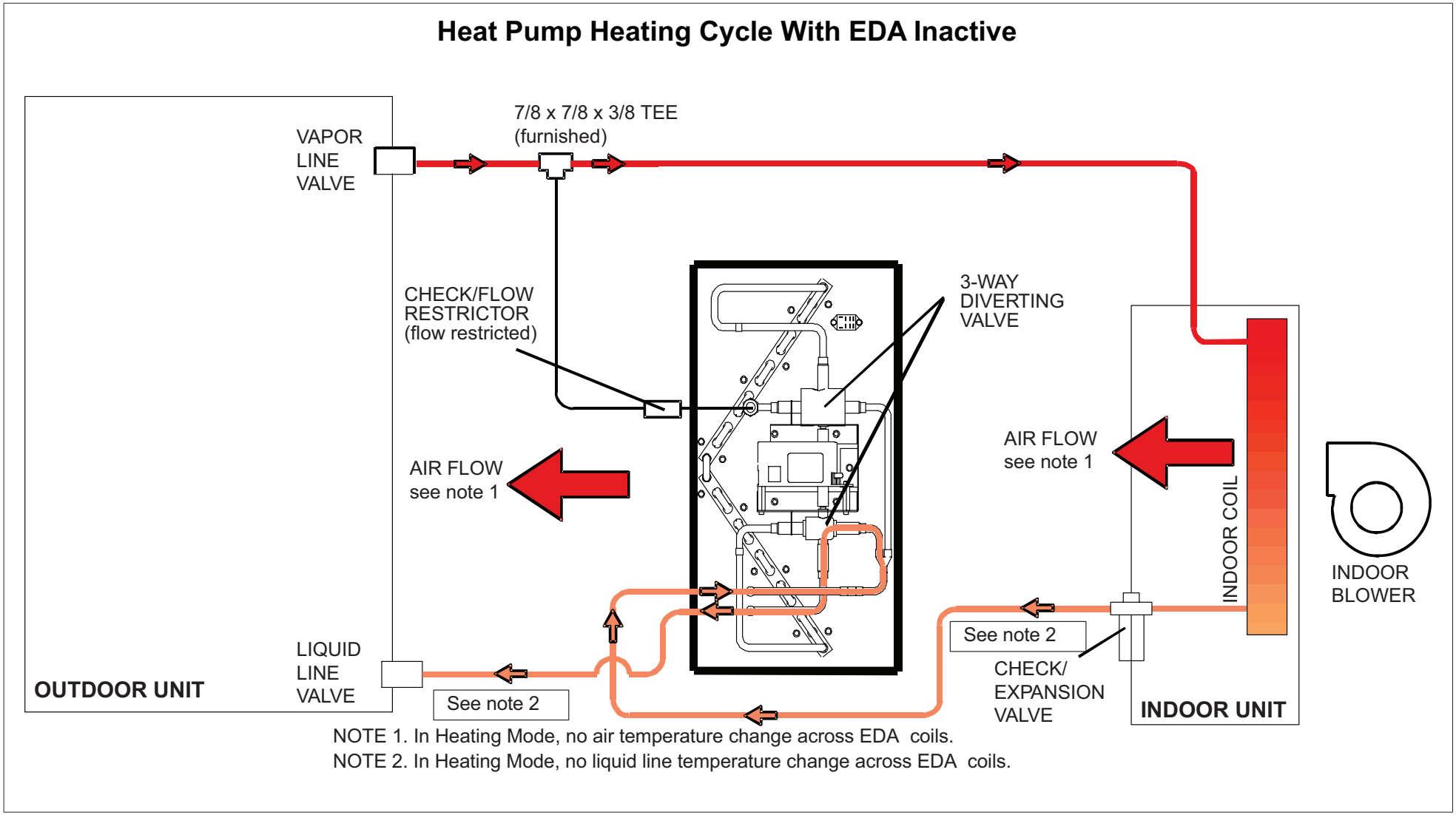


FIGURE 31. Heat Pump Heating Cycle with Humiditrol Coil Inactive (Model EDA-036/060CK Shown)

5. AIR RESISTANCE

The following table shows air volume and total air resistance for the available Humiditrol models.

Table 7. Air Resistance

Model	Air Volume (cfm)	Total Static (in. w.g.)	
		Upflow/Horizontal Position	Downflow Position
EDA-024BK	400	0.06	0.07
	600	0.11	0.13
	800	0.17	0.20
	1000	0.24	0.29
EDA-036/060CK	600	0.06	0.07
	800	0.09	0.1
	1000	0.12	0.14
	1200	0.16	0.19
	1400	0.21	0.25
	1600	0.26	0.31
	1800	0.32	0.37
	2000	0.39	0.44
EDA-060DK	1000	0.06	0.07
	1200	0.08	0.09
	1400	0.10	0.12
	1600	0.13	0.15
	1800	0.16	0.18
	2000	0.2	0.22
	2200	0.24	0.26

6. THERMOSTAT DEMAND SIGNAL

Table 8. Demand Signals - Humiditrol

Operating Sequence		System Demand						System Response		
		Thermostat Demand				Relative Humidity		Compr	Blower CFM (Cool) %	
System Type	Step	Y1	Y2	O	G	Status	D			Comments
Cooling Demand - No Dehumidification Demand										
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	
Cooling Demand - Dehumidification Demand										
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	
No Cooling Demand - Dehumidification Demand										
Single-stage outdoor unit	1	ON	(na)	ON	ON	Demand	0 VAC	High	60 - 82*	A Humiditrol Humiditrol equipped system is allowed to operate and cool room temperature below set point when trying to satisfy a persisting humidity set point (see User Humiditrol Adjust on page 21); it is not allowed to operate at all when outdoor temperature is >95ºF or when the indoor temperature is <65ºF.
Two-stage outdoor unit Y2	2	ON	ON	ON	ON	Demand	0 VAC	High	60 - 82*	

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

7. CHECKLIST

Table 9. Checklist

Checkpoint	What to Check	Action
Outdoor Temperature Sensor	Wiring	Confirm outdoor temperature sensor is connected (connects directly to CS7500; in communicating systems, sensor is in outdoor unit and must be connected to indoor unit. See wiring diagram.
Lennox® E40 & CS7500 Smart Thermostats	Humiditrol Installer Settings	Confirm HUMIDITROL is enabled (see “3. ENABLING THERMOSTATS FOR HUMIDITROL” on page 30).
	Humiditrol User Settings	Confirm HUMIDITROL - Dehumidify - ON is selected (see “3. ENABLING THERMOSTATS FOR HUMIDITROL” on page 30).
		Confirm Relative Humidity setting (see “3. ENABLING THERMOSTATS FOR HUMIDITROL” on page 30).
Indoor Unit	Variable-Speed Blower Settings	Confirm Settings for “D”: CFM = 60% to 82% of second-stage cool.
Insulation	Liquid Line	Confirm insulation is properly installed.
Insulation	Vent Line to Suction Line	
Check/Flow Restrictor	3/8” Line	Confirm restrictor installed/oriented properly.
RDS Sensor	LED Light	Confirm LED light is solid green. This indicates that the sensor is functioning properly and there are no leaks detected.
System Charge	Refrigerant	With unit running in cooling mode, check and confirm system is properly charged (see outdoor unit installation instructions).
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 95ºF.*		
Operational Status	Dehumidification Mode	Record supply air temperature and confirm that temperature is higher than in cooling mode.

8. DECOMMISSIONING

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely.

Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before starting decommissioning.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically.

c) Before attempting the procedure, ensure that:

- mechanical handling equipment is available, if required, for handling refrigerant cylinders;
- all personal protective equipment is available and being used correctly;
- the recovery process is supervised at all times by a competent person;
- recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system, if possible.

e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

f) Make sure that cylinder is situated on the scales before recovery takes place.

g) Start the recovery machine and operate in accordance with instructions.

h) Do not overfill cylinders (no more than 80% volume liquid charge).

i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

⚠ IMPORTANT

Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be signed and dated. Ensure that there are labels on the equipment that state the flammability of the refrigerant used.

