



## THIS MANUAL MUST BE LEFT WITH THE OWNER FOR FUTURE REFERENCE

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

### **⚠ 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, service agency or the gas supplier.

Failure to follow safety warnings and these instructions exactly could result in property damage, dangerous operation, serious injury, or death.

Any additions, changes, or conversions required in order for the appliance to satisfactorily meet the application needs must be made by a licensed professional HVAC installer (or equivalent) using factory-specified parts.

Do not use this system if any part has been under water. A flood-damaged appliance is extremely dangerous. Immediately call a licensed professional HVAC service technician (or equivalent) to inspect the system and to replace all controls and electrical parts that have been wet, or to replace the system, if deemed necessary.

### **⚠ 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.

# INSTALLATION INSTRUCTIONS

## AHU Control Kit

VRF SYSTEMS

507906-04

06/2022

### Shipping and Packing List

Check the components for shipping damage. If you find any damage, immediately contact the last carrier.

#### Package 1 of 1 contains the following:

- 1 - Assembled AHU Control Kit box
- 1 - Receiver/Digital Display wiring harness
- 1 - Receiver/Digital Display box
- 4 - Temperature sensors (T1, T2, T2A, T2B) and connection wiring harnesses
  - T1 - Room return air temperature sensor
  - T2 - Mid-coil sensor
  - T2A - Coil inlet sensor (cooling mode)
  - T2B - Coil outlet sensor (cooling mode)
- 7 - Plastic zip ties for sensor mounting
- 4 - ST3.9x25 mounting screws
- 3 - Temperature sensor mounting sockets
- 3 - Temperature sensor mounting socket clips
- 3 - Temperature sensor insulation sleeve
- 1 - Installation and operation manual
- 2 - Straight pipe/adaptor pipe

### **⚠ 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.

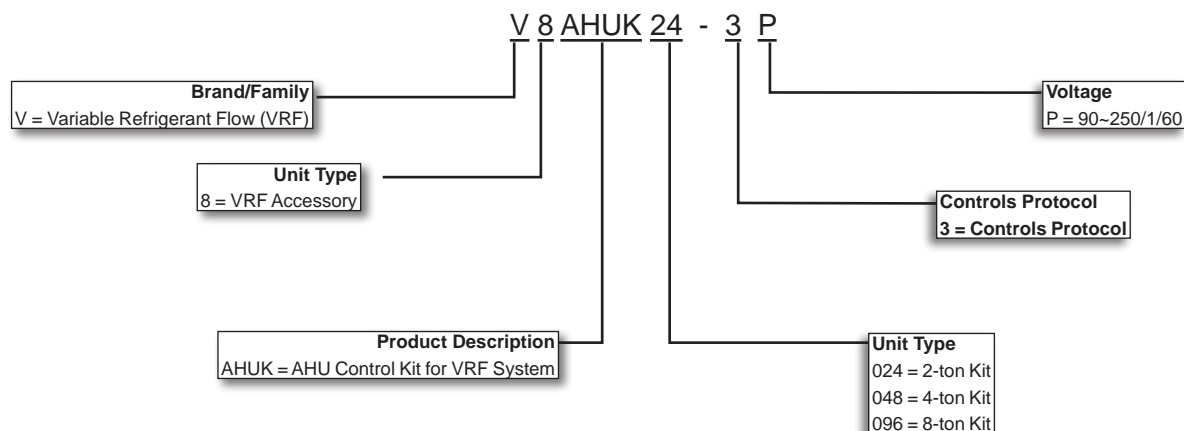
To ensure proper system performance and reliability, Lennox does not recommend operation of VRF systems during any phase of construction. Construction debris, low temperatures, harmful vapors, and operation of the unit with misplaced filters can damage the units. Failure to follow these guidelines will result in the warranty being voided.

### **⚠ IMPORTANT**

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFC'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 non-compliance.

Designs with these kits require approval by the Lennox VRF Applications Team prior to installation.

## Model Number Identification



**NOTE -** Only Lennox VRF indoor units will work with Lennox VRF outdoor units and associated mechanical equipment. Lennox Mini Split indoor units are similar in appearance but must not be connected to a Lennox VRF refrigerant circuit. Please refer to model numbers to confirm compatibility. Model numbers for Lennox VRF units start with a “V” and model numbers for Lennox Mini-Splits start with a “M”.

## System Piping

### ⚠ CAUTION

VRF system piping is customized for each installation. The LVSS (Lennox VRF Selection Software) piping report is an engineered design that must be followed. The piping diagram or diagrams included within the LVSS report have been prepared based on the information provided to the Lennox VRF applications department.

When the indicated lengths change from the figures stated within the report, it is imperative that prior to the commencement of the refrigerant pipe work installation, Lennox VRF applications department are informed of these proposed changes.

Upon receipt of this new information the Lennox VRF applications department will confirm any changes that may be applicable to this installation. If changes are required, a new piping diagram will be produced and will supersede all other previously provided documents.

Failure to provide this information regarding changes to the original design may lead to insufficient capacity, equipment failure, warranty being made void and the refusal to commission the system.

Designs with these kits require approval by the Lennox VRF Applications Team prior to installation.

## Allowed Outdoor Unit Connections

Table 1. Allowed Outdoor Unit Connections

Heat Recovery	Heat Pump
-	VPB036H4M
-	VPB048H4M
-	VPB060H4M
VRB072H4M	VPB072H4M
VRB096H4M	VPB096H4M
VRB120H4M	VPB120H4M
VRB144H4M	VPB144H4M
VRB168H4M	VPB168H4M
VRB192H4M	VPB192H4M
VRB216H4M	VPB216H4M
VRB240H4M	VPB240H4M
VRB264H4M	VPB264H4M
VRB288H4M	VPB288H4M
VRB312H4M	VPB312H4M
VRB336H4M	VPB336H4M
VRB360H4M	VPB360H4M
VRB384H4M	VPB384H4M
VRB408H4M	VPB408H4M
VRB432H4M	VPB432H4M
VRB456H4M	VPB456H4M
VRB480H4M	VPB480H4M
VRB504H4M	-

## Application

V8AHUK024-3P, V8AHUK048-3P and V8AHUK096-3P AHU Control Kits enable Lennox VRF VRB heat recovery and VPB heat pump outdoor units to operate Lennox non-VRF indoor units and 3rd party non-communicating indoor units (coils, air handler units and furnaces) with 1 to 20 tons capacity of each unit. 2, 3 or 4 kits are allowed in parallel to control single large indoor equipment. Air handler units with capacities larger than 20 tons may also be connected to the kits. Contact the Lennox VRF Applications team for design assistance.

Throttling devices (TXV, orifice, piston and cap tube, etc.) in the indoor unit shall be removed, additional modifications may be needed. Only Lennox VRF wired local controller V0STAT51P-3 is allowed with the AHU Control Kit. Two typical application layouts are shown in Figure 1 and Figure 2.

**Designs with these kits require approval by the Lennox VRF Applications Team prior to installation.**

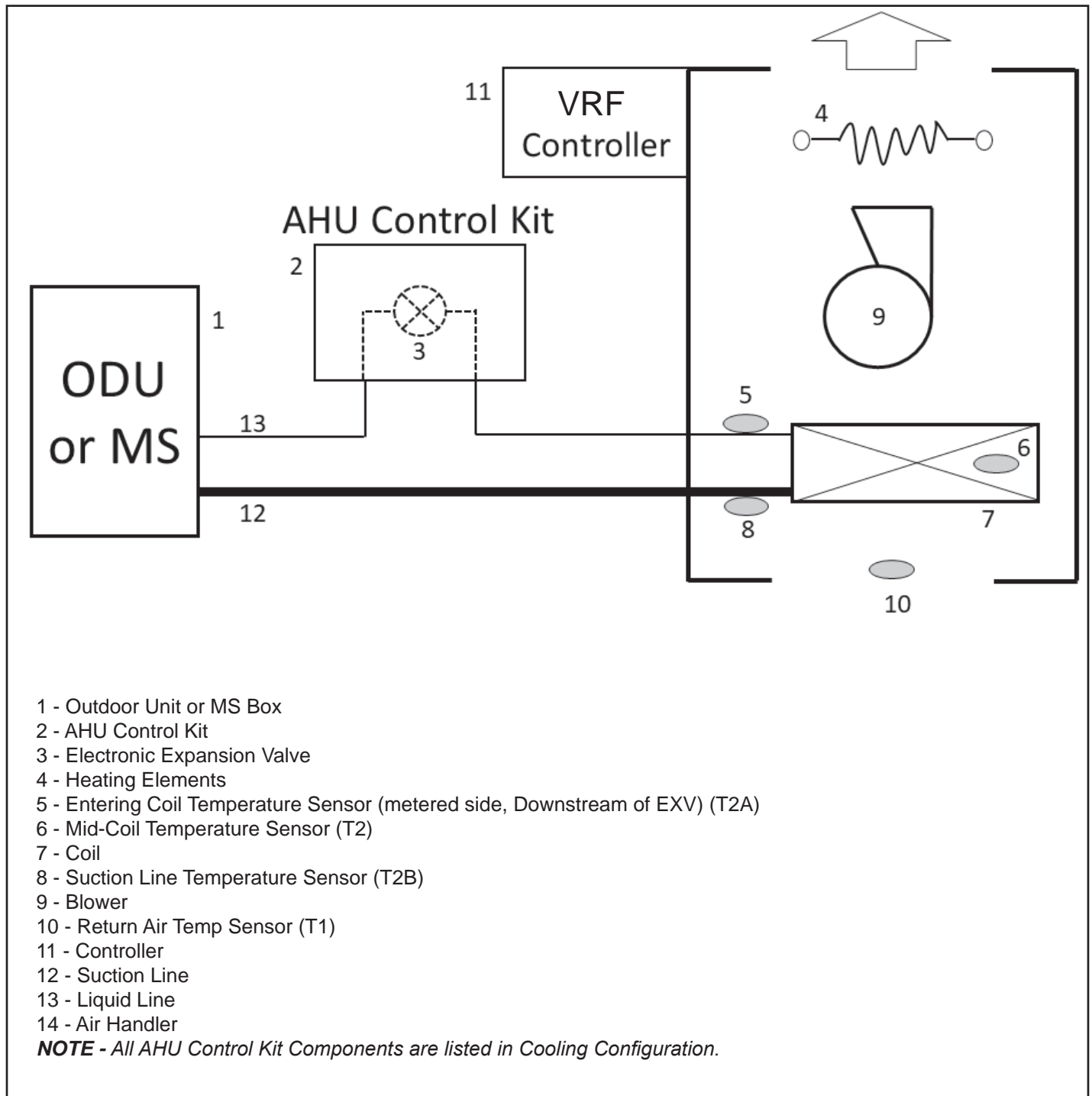


Figure 1. Electric Air Handler with Electric Auxiliary Heat & AHU Control Kit

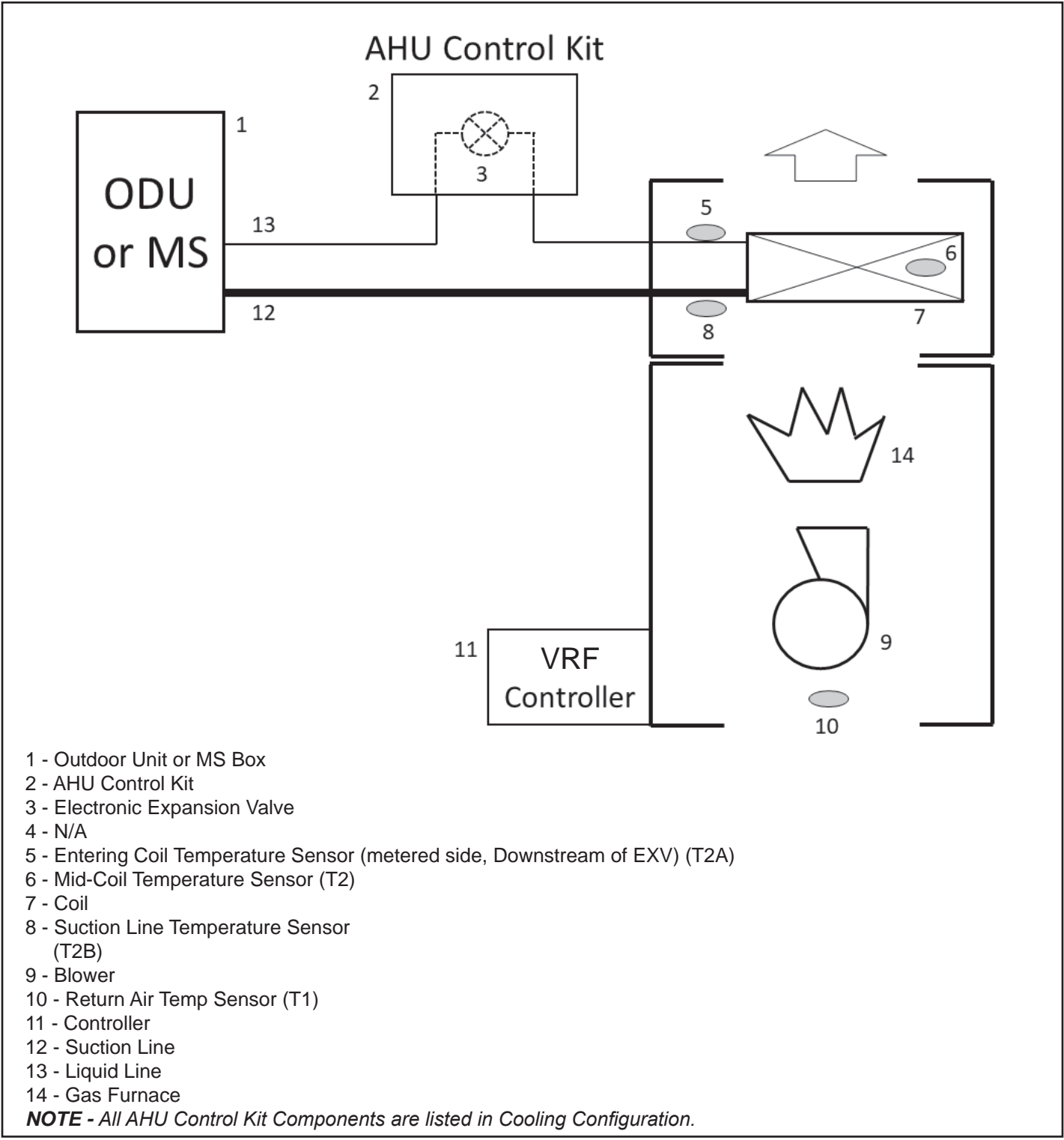
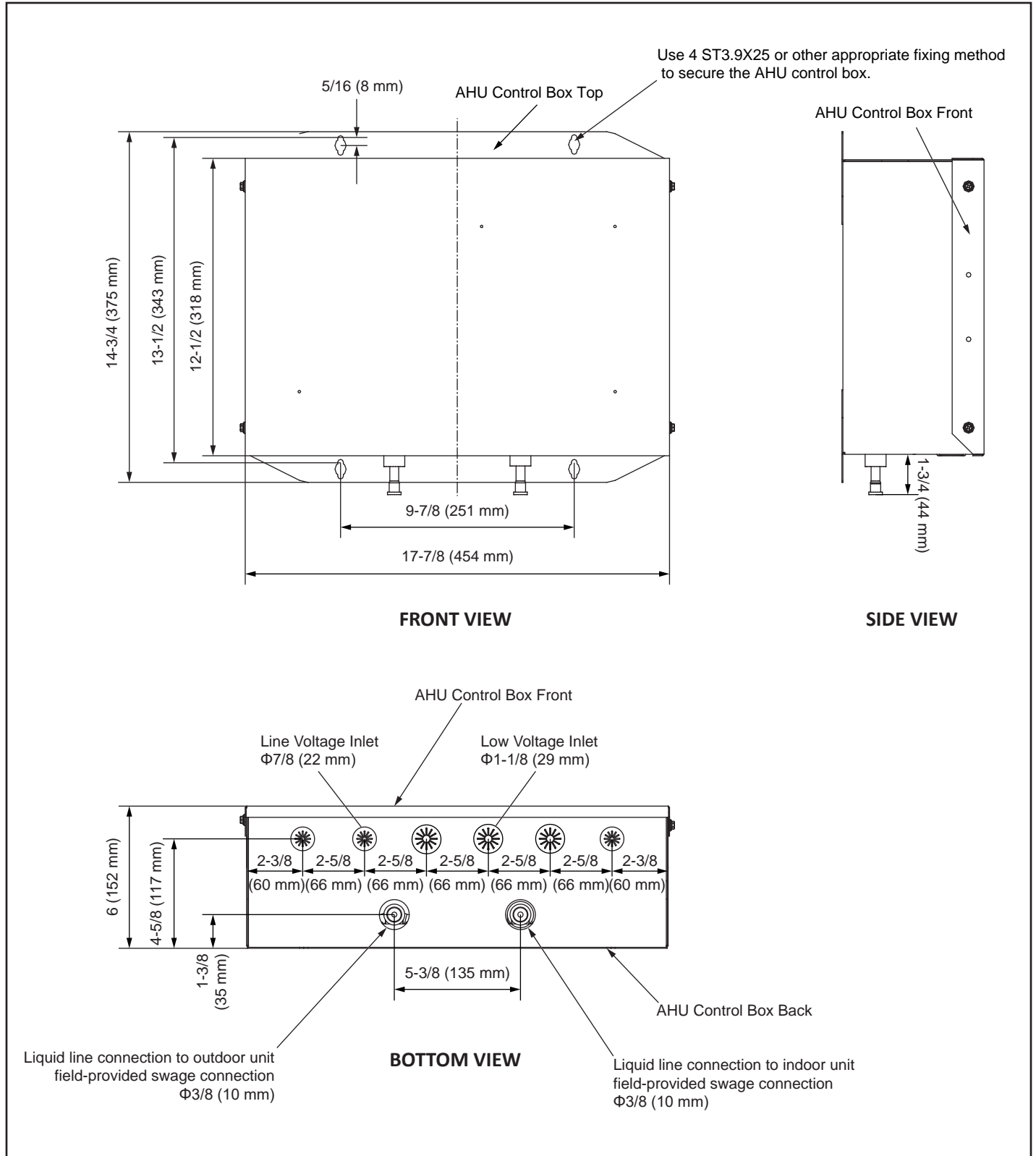


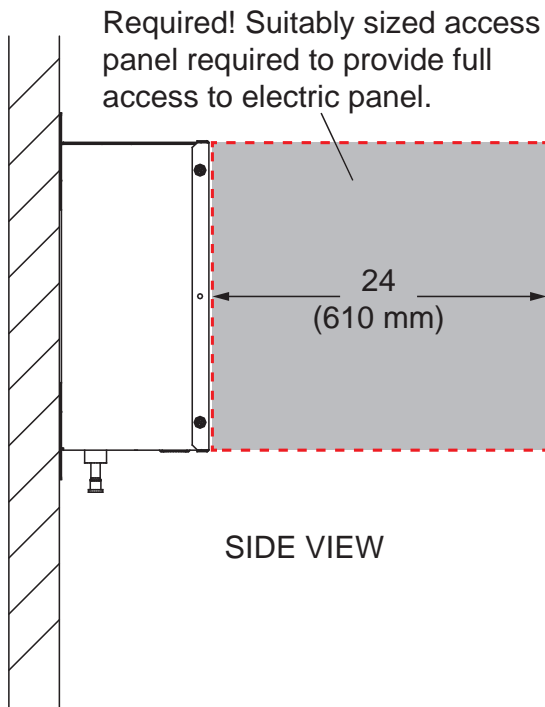
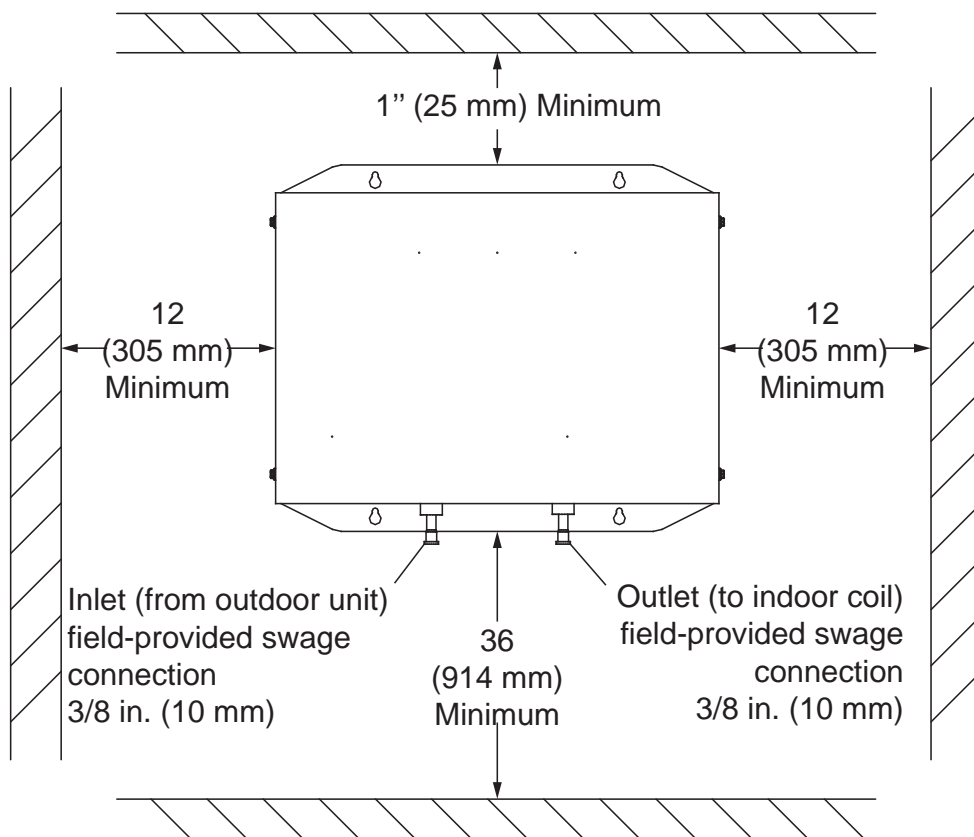
Figure 2. Gas Furnace & AHU Control Kit

**Unit Dimensions - inches (mm)**



**Figure 3. AHU Control Kit Dimensions**

**Installation Clearances - inches (mm)**



Access panels are a requirement for system commissioning and future preventative maintenance.

**Figure 4. AHU Control Kit Clearances**

## Refrigerant Pipe Connections & Electrical Wiring Inlets

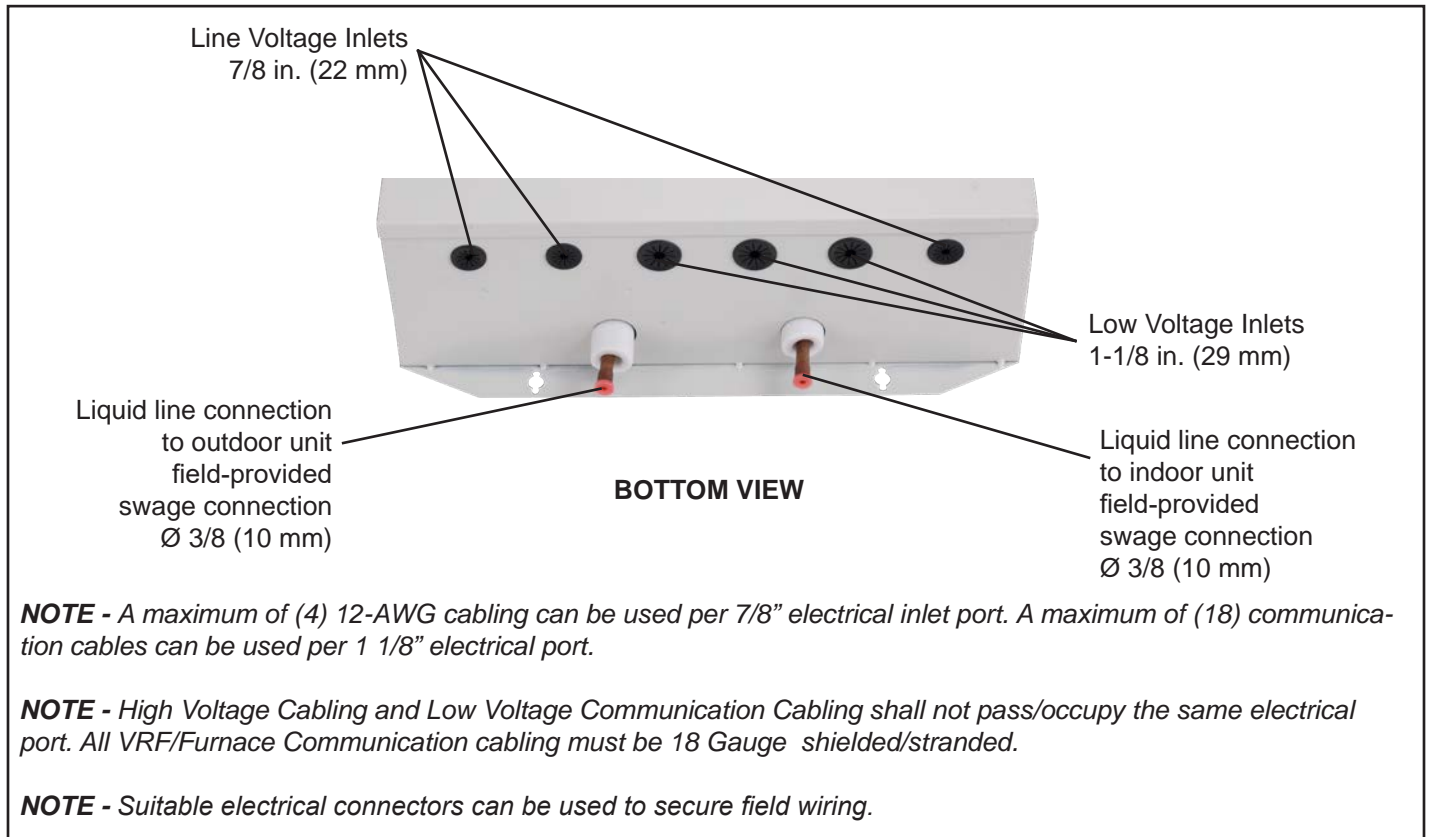


Figure 5. Refrigerant Piping Connections & Electrical Wiring Inlets

## Before Installation

### Select Air Handler Unit and AHU Control Kit Model

- Verify the cooling capacity, internal volume and air flow requirements of each 3rd party indoor unit using Table 2.
- Select the AHU Control kit model(s) by the indoor unit capacity shown in Table 2.
- Failure to adhere to these specifications can cause performance degradation.

- Throttling devices (TXV, orifice, piston and cap tube, etc.) in the indoor unit shall be removed, additional modifications may be needed. Only Lennox VRF wired local controller V0STAT51P-3 is allowed with the AHU Control Kit. Two typical application layouts are shown in Figure 1 and Figure 2.

**Designs with these kits require approval by the Lennox VRF Applications Team prior to installation.**

**Table 2. AHU Control Kit Specifications**

IDU Cool. Cap. (ton)	From (btu/h)	To (btu/h)	Coil Internal Volume (in <sup>3</sup> )				Rec. Air Flow Rate (CFM)	Rec. AHU Kits (Kbtu/h)	Main Kit 00		Sub-kit 01		Sub-kit 02	
			Min.	Rec.	Max (>50% VRF)	Max (>10% VRF)			SW 3-1	ENC 1	SW 3-1	ENC 1	SW 3-1	ENC 1
1.	10,800	12,500	59	69	159	76	367	V8AHUK024-3P	0	2				
1.25	12,501	15,500	59	83	159	91	441	024	0	3				
1.5	15,501	18,500	59	110	159	121	588	024	0	4				
2.	18,501	24,500	59	138	159	152	735	024	0	5				
2.5	24,501	30,500	141	166	283	182	881	048	0	7				
3.	30,501	36,500	141	221	283	243	1,175	048	0	8				
4.	36,501	48,500	141	246	283	271	1,310	048	0	B				
4.5	48,501	54,500	234	276	569		1,469	096	0	C				
5.	54,501	60,500	234	331	569		1,763	096	0	D				
6.	60,501	72,500	234	441	569		2,350	096	0	F				
8.	72,501	96,500	234	495	569		2,633	096	1	0				
10.	96,501	120,500	527	620	776		3,299	096 (main) + 048	0	F	0	B		
12.	120,501	144,500	527	744	776		3,959	096 (main) + 048	1	0	0	B		
14.	144,501	168,500	737	867	1,132		4,619	096 (X2)	1	0	0	F		
16.	168,501	192,500	737	984	1,132		5,240	096 (X2)	1	0	1	0		
18.	192,501	216,500	938	1,104	1,422		5,876	096 (X3)	0	F	0	F	0	C
20.	216,501	242,000	938	1,237	1,422		6,585	096 (X3)	1	0	0	F	0	F

**NOTE** - Cooling capacity is rated at 400 SCFM/ton 95°F ambient 80/67°F return air 43°F evap 9R superheat.

**Table 3. Allowed Indoor Unit & Outdoor Unit Capacity Ratio**

Outdoor Unit	Indoor Units	Indoor Unit Quantity	IDU/ODU Capacity Ratio	Note
All VRF	AHU Control Kit Only	1	50%~100%	
		> 1	50%~130%	
VRF & Mini-VRF (3-42 tons)	AHU Control Kits and VRF Indoor Units	> 1	50%~130%	Capacity of VRF indoor units (AHU kits not included) shall not be less than 50% of outdoor capacity.
Mini-VRF (3-5 tons)	AHU Control Kits and VRF Indoor Units	> 1	50%~100%	Capacity of VRF Indoor Units (AHU kits not included) shall not be less than 10% of outdoor capacity.

**NOTE** - Air flow rate shall not exceed 400 CFM/Ton.

**NOTE** - Designs with these kits require approval by the Lennox VRF Applications Team prior to installation.



**Table 4. Approved Lennox Coils & Air Handlers**

Coil/AHU Model #	Nominal Cooling Capacity (btu/h)	Unit Type	Configuration	Coil Cabinet	Coil/AHU Compatibility with VRF Indoor Units	
					VRF IDUs ≥50% of outdoor capacity	VRF IDUs ≥10% of outdoor capacity
C35-18/24B-2F	24,000	Indoor Coil	Upflow	B	•	•
C35-36B-2F	36,000	Indoor Coil	Upflow	B	•	•
C35-48C-2F	48,000	Indoor Coil	Upflow	C	•	•
C35-60C-2F	60,000	Indoor Coil	Upflow	C	•	
CX35-18/24B-6F	24,000	Indoor Coil	Upflow	B	•	•
CX35-36B-6F	36,000	Indoor Coil	Upflow	B	•	•
CX35-48C-6F	48,000	Indoor Coil	Upflow	C	•	•
CX35-60C-6F	60,000	Indoor Coil	Upflow	C	•	
CH35 -24B-2F	24,000	Indoor Coil	Horizontal	B	•	•
CH35 -48C-2F	48,000	Indoor Coil	Horizontal	C	•	•
CH35 -60D-2F	60,000	Indoor Coil	Horizontal	D	•	
CHX35 -24B-6F	24,000	Indoor Coil	Horizontal	B	•	•
CHX35 -48C-6F	48,000	Indoor Coil	Horizontal	C	•	•
CHX35 -60D-6F	60,000	Indoor Coil	Horizontal	D	•	
CBA25UH-018	18,000	AHU	Multi-position	-	•	
CBA25UH-030	30,000	AHU	Multi-position	-	•	
CBA25UH-036	36,000	AHU	Multi-position	-	•	•
CBA25UH-042	42,000	AHU	Multi-position	-	•	•
CBA25UH-048	48,000	AHU	Multi-position	-	•	•
CBA25UH-060	60,000	AHU	Multi-position	-	•	
CBA25UHV-018	18,000	AHU	Multi-position	-	•	
CBA25UHV-030	30,000	AHU	Multi-position	-	•	
CBA25UHV-036	36,000	AHU	Multi-position	-	•	•
CBA25UHV-042	42,000	AHU	Multi-position	-	•	•
CBA25UHV-048	48,000	AHU	Multi-position	-	•	•
CBA25UHV-060	60,000	AHU	Multi-position	-	•	
CBA27UHE-030	30,000	AHU	Multi-position	-	•	
CBA27UHE-036	36,000	AHU	Multi-position	-	•	•
CBA27UHE-042	42,000	AHU	Multi-position	-	•	
CBA27UHE-048	48,000	AHU	Multi-position	-	•	
CBA27UHE-060	60,000	AHU	Multi-position	-	•	
CBA38MV-030	30,000	AHU	Multi-position	-	•	
CBA38MV-036	36,000	AHU	Multi-position	-	•	•
CBA38MV-042	42,000	AHU	Multi-position	-	•	
CBA38MV-048	48,000	AHU	Multi-position	-	•	
CBA38MV-060	60,000	AHU	Multi-position	-	•	

**NOTE** - The cooling capacities shall be corrected at 400 SCFM/ton and the indoor units shall be commissioned to run at air flows no more than 400 SCFM/ton.

For use with Lennox AHUs, Coils, and Furnaces not listed above, or for use with 3rd party equipment, consult Lennox VRF Applications to determine compatibility

**Table 5. Approved Lennox Furnaces**

<b>Furnace Model #</b>	<b>Nominal Cooling Capacity (btu/h)</b>	<b>Nominal Gas Heating Input (btu/h)</b>	<b>Furnace Cabinet</b>
ML180UH070V36B	36,000	70,000	B
ML180UH090V48B	48,000	90,000	B
ML180UH110V60C	60,000	110,000	C
EL195UH045XE24B	24,000	45,000	B
EL195UH070XE36B	36,000	70,000	B
EL195UH090XE48C	48,000	90,000	C
EL195UH110XE60C	60,000	110,000	C
EL196UH045XE24B	24,000	45,000	B
EL196UH070XE36B	36,000	70,000	B
EL196UH090XE48C	48,000	90,000	C
EL196UH110XE60C	60,000	110,000	C
EL296UH070XE36B	36,000	70,000	B
EL296UH090XE48C	48,000	88,000	C
EL296UH110XE60C	60,000	110,000	C
EL296UH135XE60D	60,000	135,000	D
EL296UH070XV36B	36,000	66,000	B
EL296UH110XV48C	48,000	110,000	C
EL296UH110XV60C	60,000	110,000	C
EL296UH135XV60D	60,000	135,000	D
SL297UH060NV36B	36,000	60,000	B
SL297UH080NV48C	48,000	80,000	C
SL297UH080NV60C	60,000	80,000	C

**NOTE** - For use with Lennox AHUs, Coils, and Furnaces not listed above, or for use with 3rd party equipment, consult Lennox VRF Applications to determine compatibility

## Placement

### **WARNING**

Use the provided and specified components when installing equipment. Failure to do so may result in unit falling, water leaking or electrical shocks, causing personal injury or equipment or property damage.

Check stability of wall, floor, or ceiling and unit support. If support is not capable of carrying weight of the unit, unit may fall causing personal injury or equipment damage.

Consider the possibility of earthquakes in your area when installing the equipment. If the unit is not correctly secured, it may fall, causing personal injury or equipment damage.

Safely dispose of packing materials, which include nails, wood and other sharp objects, as well as plastic wrapping. Children playing with plastic wrap or bags risk the danger of suffocation.

### **CAUTION**

Do not place items which may be damaged by water under or around the indoor unit.

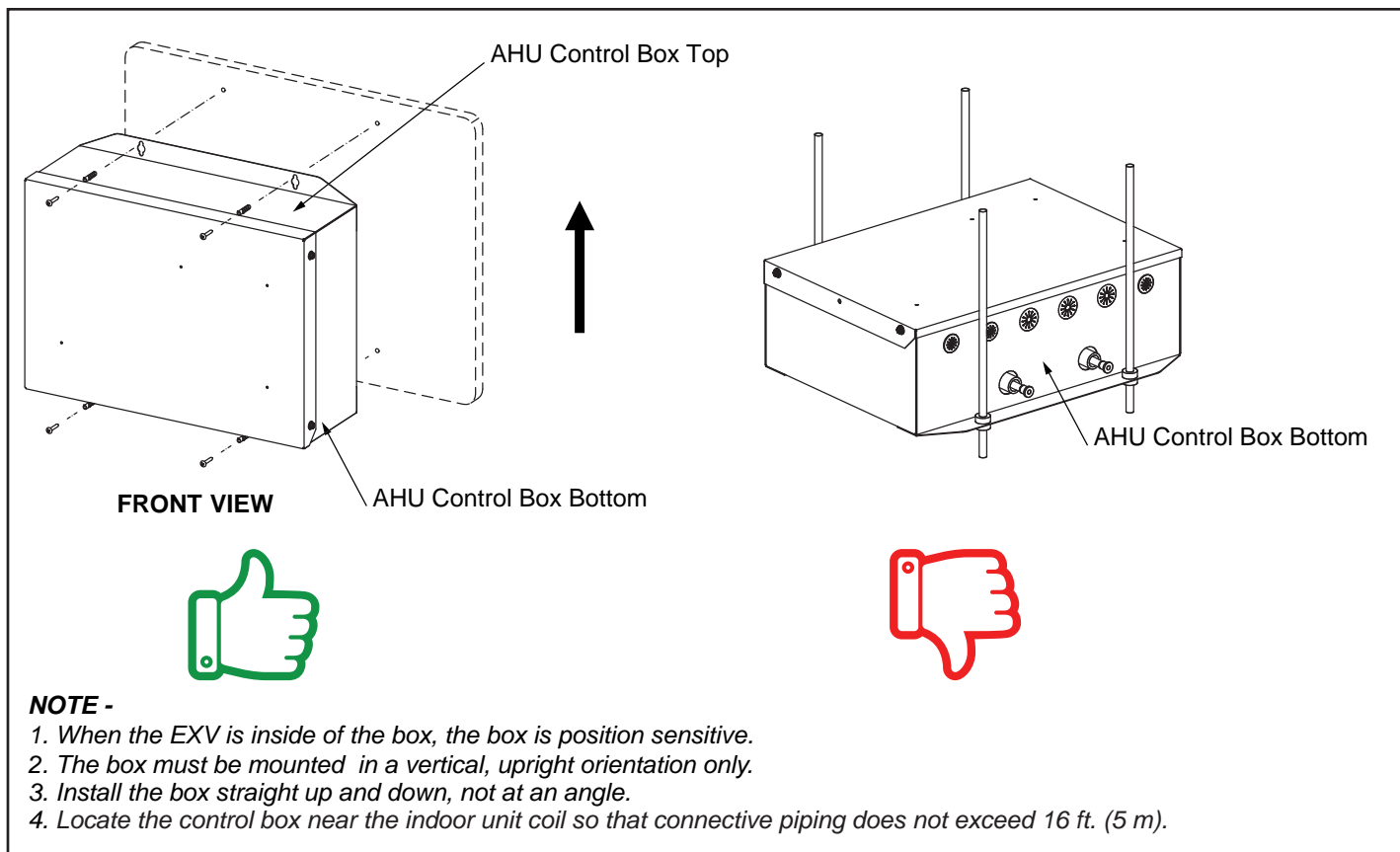
### **AVOID**

Do not install the unit in the following locations:

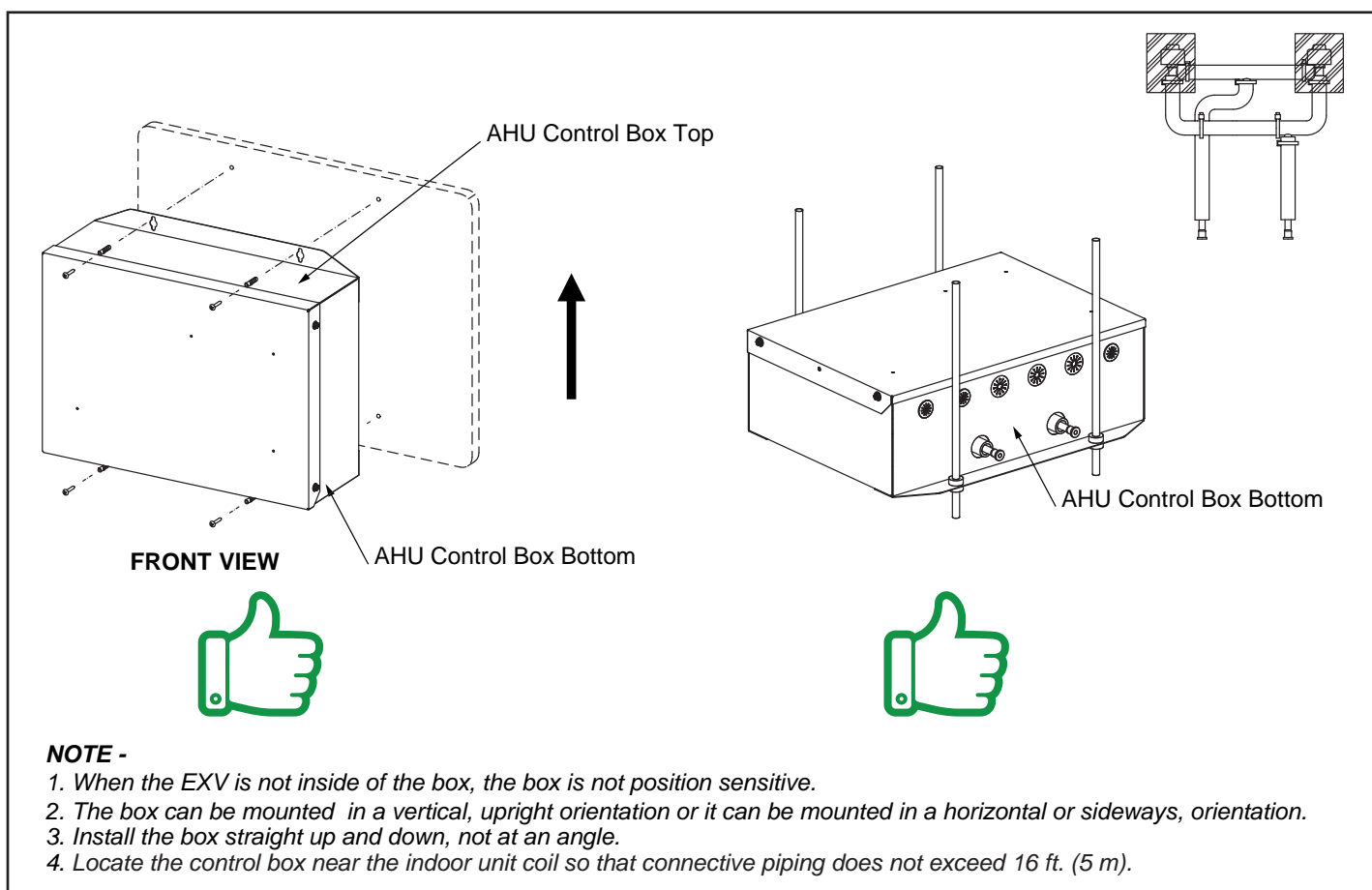
- Do not install this unit so that it impedes the flow of combustion air or exhaust air.
- Do not run fossil fuel lines through control box enclosure.
- Areas exposed to petrochemicals or petrochemical products.
- Areas exposed to salt or other corrosive materials or caustic gasses.
- Areas exposed to extreme voltage variations (such as factories).
- Tightly enclosed areas that may impede service of the unit.
- Areas exposed to fossil fuels (such as oil or gas in kitchens).
- Do not install in confined spaces.
- Areas exposed to strong electromagnetic forces.
- Areas exposed to acids or alkaline detergents (laundry rooms).
- Do not affix any other accessories (other than the receiver) to this box.

### **DO:**

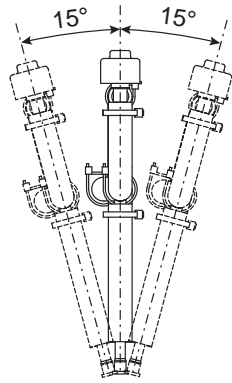
- AHU Control Kit Box is designed for indoor installation only.
- EXV of the kit may be moved out of the box and installed separately close to the 3rd coil. See Figure 6.
- AHU Control Kit Box ambient temperature range is 13°F (-25°C) to 125°F (51.7°C).
- Locate the AHU Control Kit Box so that it is not exposed to direct sunlight or rain.
- AHU Control Kit Box shall be installed vertical when the EXV is inside the box.
- AHU Control Kit Box can be installed vertical or horizontal when the EXV is removed.
- The AHU Control Kit EXV should be installed vertical and level.
- Ensure the structural support for all AHU Control Kit components is sufficient for the weight of the component.
- Allow sufficient space around equipment for proper operation and maintenance.
- Install the control box a minimum of 3 ft. (1 m) away from any antenna, power cord (line) radio, telephone, security system, or intercom. Electrical interference and radio frequencies from any of these sources may affect operation.
- ST3.9x25 screws are provided for installation; however use an appropriate fixing method for your application.
- If the control box is mounted on the coil enclosure, caution must be taken not to pierce coil. Damage to coil may cause refrigerant leaks.
- The AHU Control Kit can only connect to a R-410A refrigerant system.
- The AHU control box can only connect to Lennox VRF VRB heat recovery and VPB heat pump systems as listed in Table 1.
- Install the connecting pipe only after the indoor and outdoor units have been fixed.
- The connecting piping between the control box and the evaporator coil should not exceed 16 ft. (5 m).
- The control box should be installed as close to the evaporator coil as possible, 12 in. (305 mm) preferred.
- All the images in this manual are for illustrative purpose only; your actual control box may differ slightly.



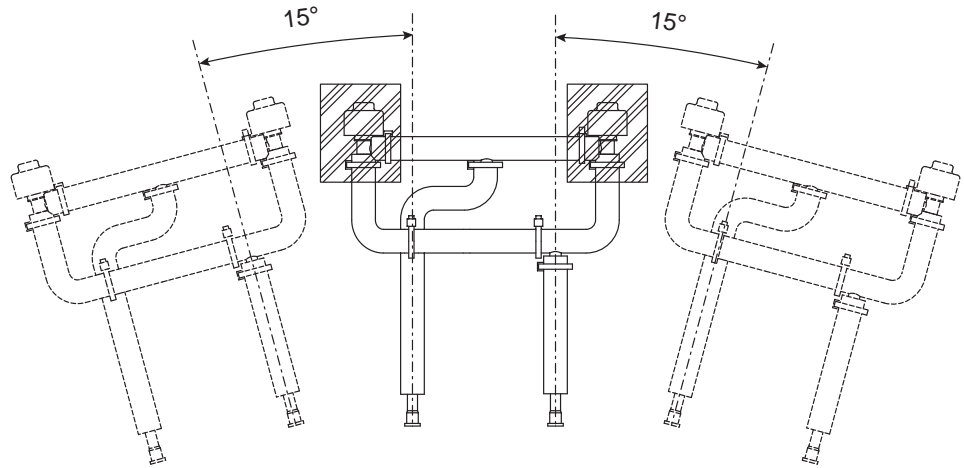
**Figure 6. Position the Control Box Vertically when the EXV is in the Box**



**Figure 7. Position the Control Box Vertically or Horizontally when the EXV is out of the Box**



FRONT VIEW



FRONT VIEW



**NOTE -**

1. The EXV is position sensitive in or out side of the factory enclosure.
2. The EXV must be mounted in a vertical, upright orientation (+/- 15°) only.
3. Locate the EXV near the indoor unit coil so that connective piping does not exceed 16 ft. (5 m).

**Figure 8. Position the EXV Vertically when the EXV is out of the Box**

### **WARNING**

Refrigerant leaks are unlikely; however, if a refrigerant leak occurs, open a door or windows to dilute the refrigerant in the room. Turn off the unit and all other appliances that may cause a spark. Call a licensed professional HVAC technician (or equivalent) to repair the leak.

Use only R410A refrigerant to charge this system. Use of other refrigerant or gas will damage the equipment.

Do not allow air or other contaminants to enter system during installation of refrigerant piping. Contaminants will result in lower system capacity and abnormally high operating pressures and may result in system failure or explosion.

Insulate all refrigerant piping.

Refrigerant pipes may be very hot during unit operation. Do not allow contact between wiring and bare copper pipes.

After refrigerant piping connections have been completed, check the system for leaks per commissioning instructions.

### **WARNING**

Do not install this unit so that it impedes the flow of combustion air or exhaust air.

Do not run fossil fuel lines through control box enclosure.

### Installation Steps

1. Determine best location and set furnace, coil and outdoor unit.
2. Prepare the indoor unit coil for brazing.
3. Run vapor line piping between the outdoor unit and the indoor unit coil.
4. Connect liquid line piping between the outdoor unit and the control box.
5. Connect liquid line piping between the control box and the indoor unit coil.
6. Mount coil sensor sockets to coil at the location shown in Figure 18.
7. Connect the coil and return air sensors.
8. Connect power wiring to outdoor unit, control box and air handler/furnace.
9. Mount the receiver to the outside of the control box and connect the wiring harness to the control box PCB.
10. Connect communication wiring between the outdoor unit and the control box using 18 GA stranded, shielded, two-conductor, polarity sensitive wiring.
11. Connect control wiring between the air handler/furnace control relay and the air handler/furnace PCB using 18 GA stranded, shielded, 4-conductor, polarity-sensitive wiring.
12. Connect control wiring between the control box and the V0STAT51P-3 controller using 18 GA stranded, shielded, 4-conductor, polarity sensitive wiring.
13. Pressure test, evacuate and add additional refrigerant to the system piping.
14. Follow the prescribed system start up processes.

## Refrigerant Piping Connections

Refer to the Calculation and Selection report for all pipe sizes and lengths.

Refer to the outdoor unit manual for outdoor unit piping connections.

The vapor line is run directly from the outdoor unit to the indoor unit coil.

The liquid line is run from the outdoor unit to the AHU Control Box (or EXV if removed from the box) and then from the AHU Control Box (or EXV if removed from the box) to the indoor unit coil.

Piping limitations shall be followed in all applications. Contact VRF Technical Support, 1-844-438-8731, with any questions.

Designs with these kits require approval by the Lennox VRF Applications Team prior to installation.

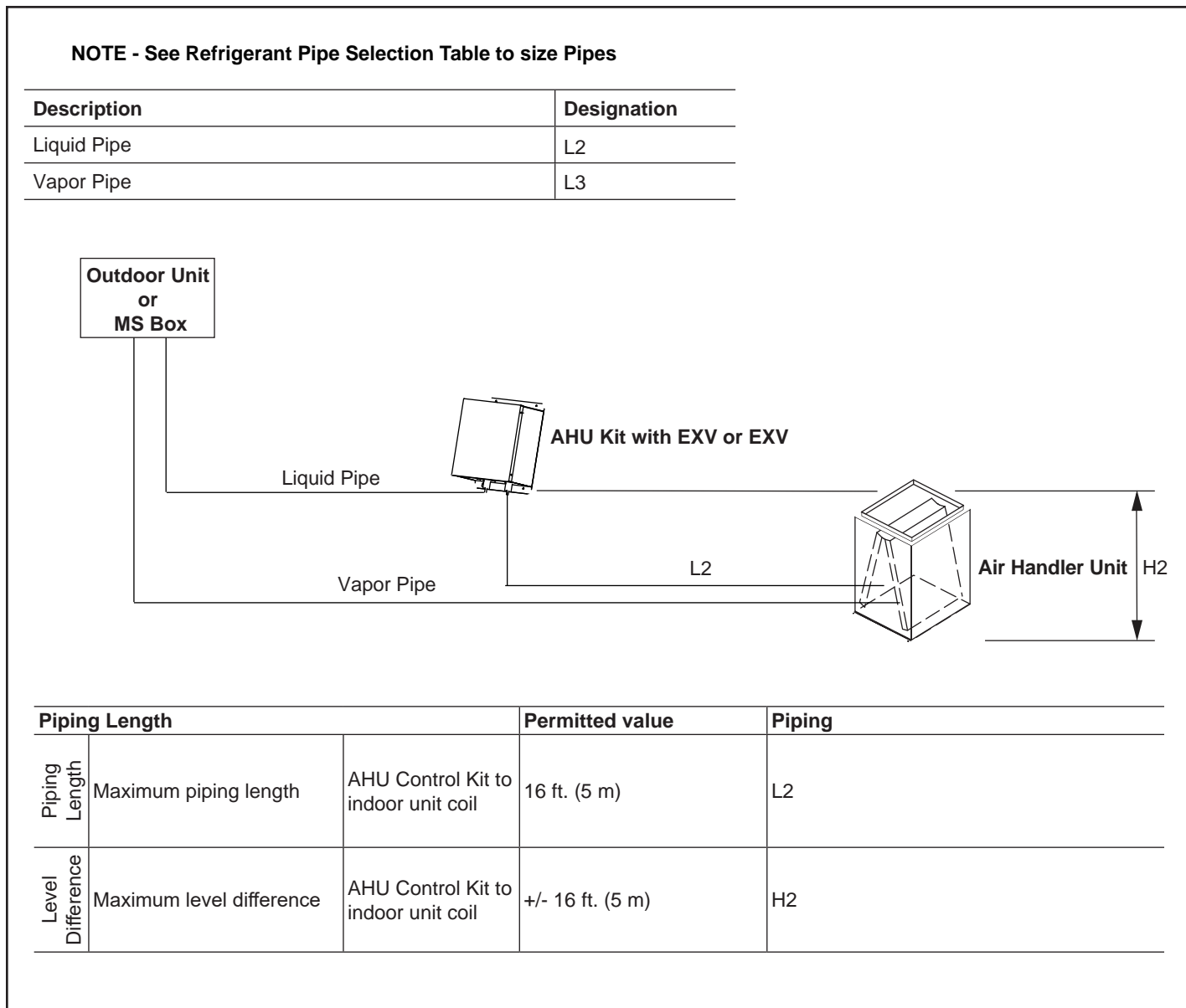


Figure 9. Typical Refrigerant Piping Diagram

## Prepare Indoor Unit Coil

### Prepare Indoor Unit Coil

1. Remove and discard any metering device (TXV, orifice, piston and cap tube, etc.) from the coil; it will not be used. See Figure 10.
2. Remove any rubber rings or seals.
3. Braze the three temperature sensor mounting sockets onto the coil at the locations shown in Figure 18. Make sure the socket opening is downward to avoid condensate accumulation.
4. Braze the liquid line from the AHU control box (or EXV if removed from the box) to the end of the coil.
5. After brazing liquid line and vapor lines, affix coil sensors to the sockets on the indoor unit coil with socket clips. Wrap with insulation and secure with zip ties. See Figure 18.

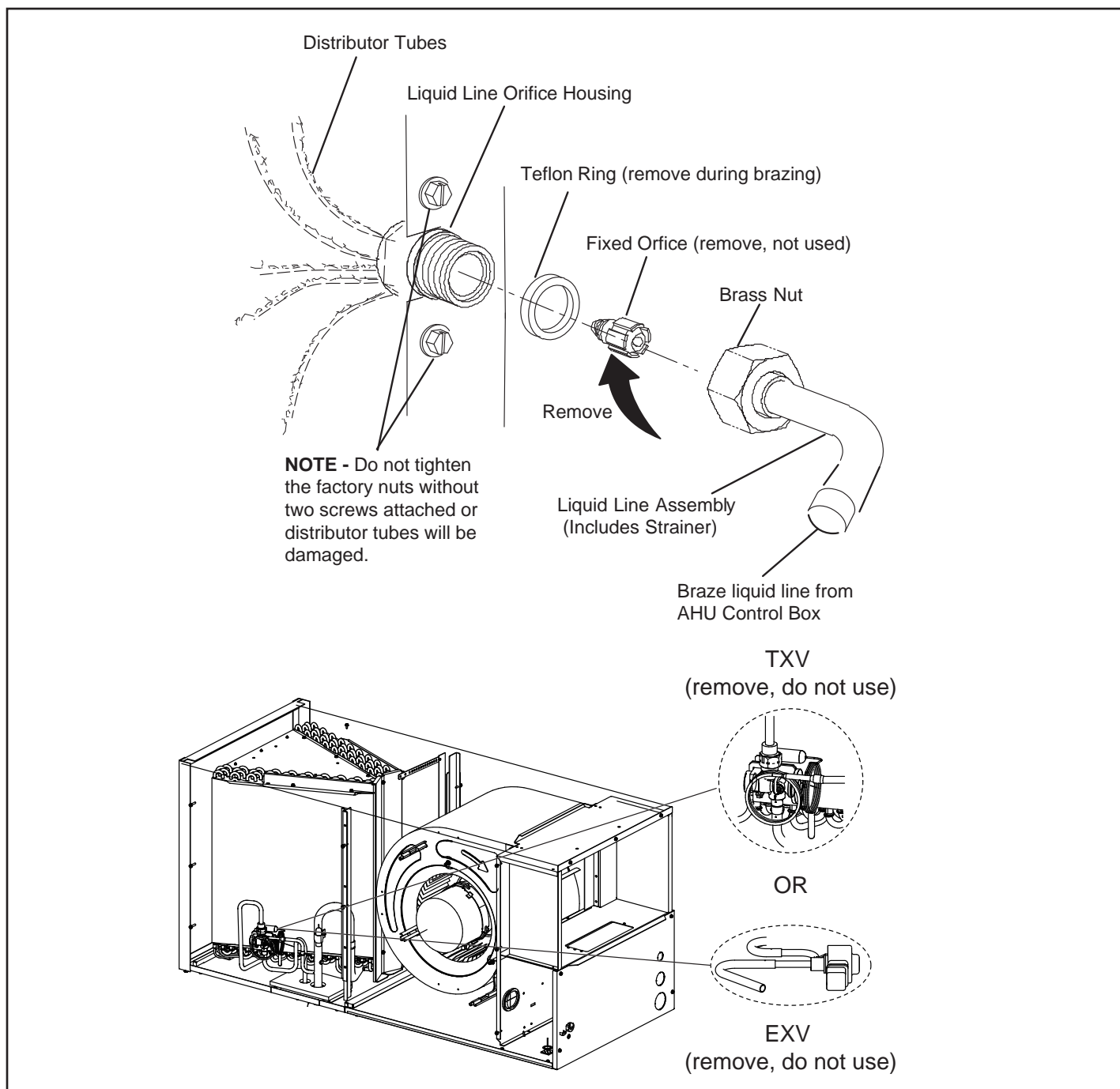


Figure 10. Remove Metering Device from Coil



## Prepare to Braze

### ⚠ CAUTION

Coil sensors shall not be installed prior to brazing as damage to the sensor can occur due to excessive heat.

### ⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFC'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 non-compliance.

#### Prepare AHU Control Box if EXV is Inside the Box

1. The seal on the refrigerant piping connections should remain in place until the last possible moment. This will prevent dust or moisture from getting into the refrigerant piping before it is connected.
2. Remove plastic caps from liquid line connections.
3. Swage field-provided connective piping, do not swage factory pipe stub.

#### Install EXV Outside of the Box

The EXV may be removed from the control box and positioned in an external location. Follow these steps to remove the EXV from the box.

1. Remove the front cover from the box by removing four screws and plastic washers. See Figure 7.

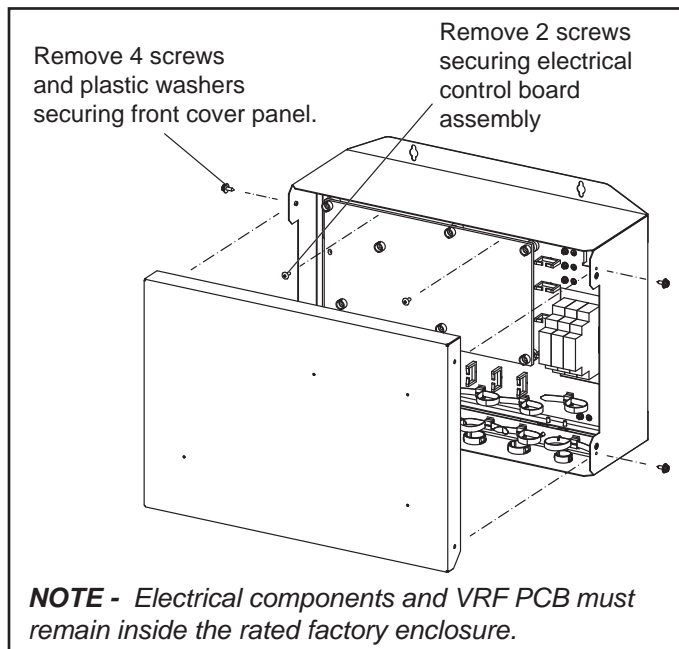


Figure 11. Remove Front Cover

2. Remove the two (2) screws securing the electrical control board assembly. See Figure 12.
3. Flip the electrical control board assembly forward 90° to expose the EXV. See Figure 13.

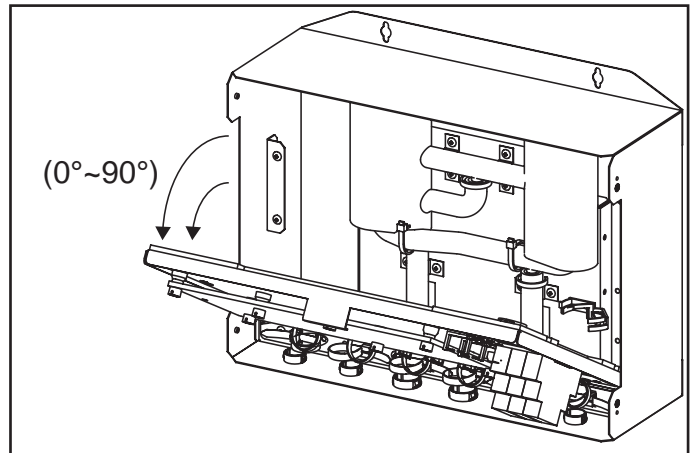


Figure 12. Flip Electrical Control Board Assembly Forward

4. Remove eight (8) screws and four (4) brackets that secure the EXV in the box. See Figure 13.

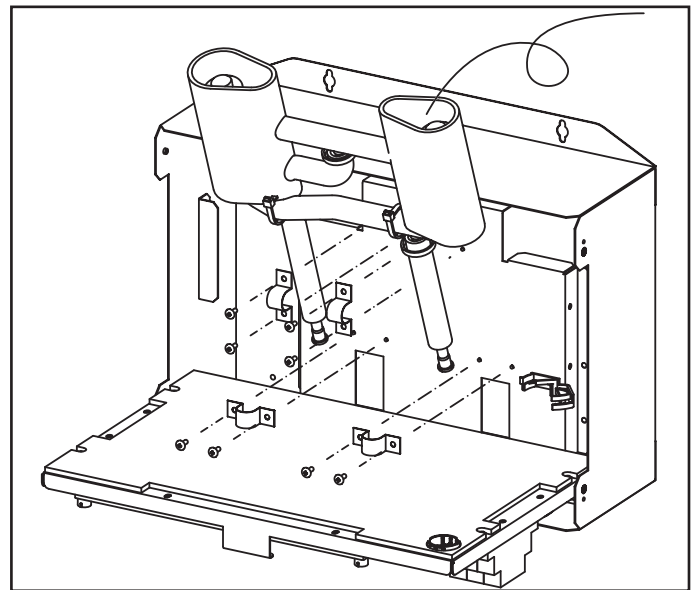


Figure 13. Remove EXV

5. Re-install the front cover on the AHU Control Box.
6. Position the EXV in the desired location and use the screws and clamps removed in step 4 to secure the EXV in place.

## Brazing Refrigerant Lines

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

### WARNING



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

### CAUTION

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

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

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

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

1. Place a wet rag against piping plate and around the line connections. Avoid overheating the control kit cabinet, EXV and other internal components **Take care to protect the Control Box cabinet, EXV or other internal components.**

### CAUTION

Purge low pressure nitrogen [1 to 2 psig (6.0 to 12.8 kPA)] through the refrigerant piping during brazing. This will help to prevent oxidation and the introduction of moisture into a system.

To prevent the build-up of high levels of nitrogen when purging be sure it is done in a well ventilated area.

### IMPORTANT

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

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

### IMPORTANT

Only use brazing rods/sticks which are suitable/recommended for air conditioning pipework installations  
- Do Not Use Soft Solder.

2. Ensure nitrogen is flowing at all times during the brazing process.
3. Braze connections. Allow pipe to cool before removing wet rag.
4. Insulate both pipes individually.

### **WARNING**

Isolate the power supply before accessing unit electrical terminals.

Install unit so that unit disconnect is accessible.

Follow all local and national codes, as well as this installation instruction, during installation. Do NOT overload electrical circuit, as this may lead to failure and possible fire.

Use specified wiring and cable to make electrical connections. Clamp cables securely and make sure that connections are tight to avoid strain on wiring. Insecure wiring connections may result in equipment failure and risk of fire.

Wiring must be installed so that all cover plates can be securely closed.

This unit must be properly grounded and protected by a circuit breaker. The ground wire for the unit must not be connected to a gas or water pipe, a lightning conductor or a telephone ground wire.

Do not connect power wires to the outdoor unit until all other wiring and piping connections have been completed.

In the U.S.A., wiring must conform with current local codes and the current National Electric Code (NEC). In Canada, wiring must conform with current local codes and the current Canadian Electrical Code (CEC).

Refer to unit nameplate for minimum circuit ampacity and maximum overcurrent protection size.

- A dedicated Circuit Breaker and Service Disconnect Switch shall be installed for the indoor equipment. Note - The outdoor unit should have its own dedicated Circuit Breaker and Service Disconnect as well.
- Indoor unit power supply MUST not be taken from the outdoor unit.
- Fit the power supply wiring of each unit with a switch and fuse as shown in the wiring diagram.
- Install an interrupter switch or ground-fault circuit interrupter for the power wiring.
- Make sure the ground resistance is no greater than 100Ω. This value can be as high as 500Ω when using a grounding fault circuit interrupter since the protective ground resistance can be applied.

### System Communication and Control Wiring

**NOTE** - Two-conductor shielded cable must be used for the communication wiring. This is necessary to ensure proper system communication and operation.

**NOTE** - High Voltage Cabling and Low Voltage Communication Cabling shall not pass/occupy the same electrical port. All VRF/Furnace Communication cabling must be 18 Gauge shielded/stranded.

System communication wiring is connected to the P and Q terminals. See the Typical System Communication Wiring diagram. See Figure 16.

Communication wiring between parallel AHU Control Kits is connected to the X and Y terminals. See the Parallel AHU Control Kit Configuration diagram.

Local controller wiring is connected to the HA, HB, COM and 12V terminals to the first indoor unit and HA and HB for all other indoor units connected to the same controller. Reference and adhere to controller installation instructions.

Fan Control wiring is connected to the Li, Mi and Hi terminals (dry contacts) and 0, Vi (0~10V Input) terminals. The input ports are described in the Fan Control Section.

**NOTE** - If multiple AHU Control Kits are connected in parallel, the Main kit will maintain fan control.

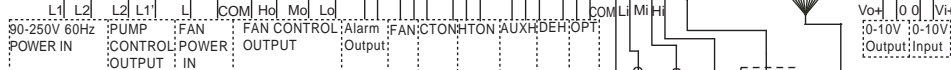
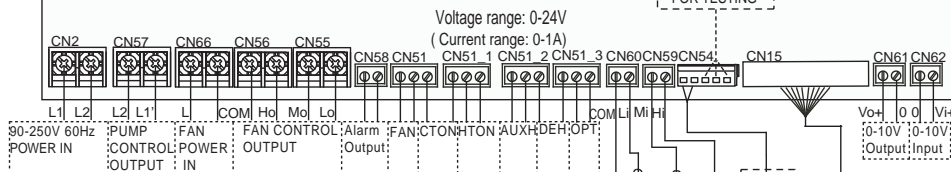
1. Remove the screws that secure the control box cover. Remove the cover and place it to the side where it will not be damaged.
2. Locate the terminal strip in the control box. Connect the power wiring (sized per NEC/CEC and local codes) and communications cable (two-core, shielded cable). Refer to unit nameplate for rated voltage.
3. Use the optional extension cable kit VOCTRL93P-1 (cat # 14R84) to locate the receiver/display a distance from the control box.

Connect properly sized power wiring and two (system communication) or four-conductor (VRF controller) shielded communication and control cables as shown.

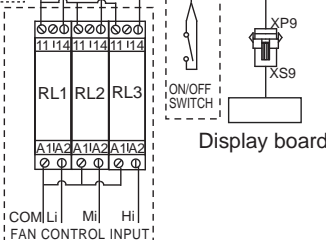
0-10V Output Voltage

ENC2 (2V Factory Default)				ENC3 (7V Factory Default)						ENC4 (10V Factory Default)						
Low speed				Mid. speed						High speed						
Dial code	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Voltage (V)	0.5	1	2	3	4	5	6	7	8	9	10	10	10	10	10	10

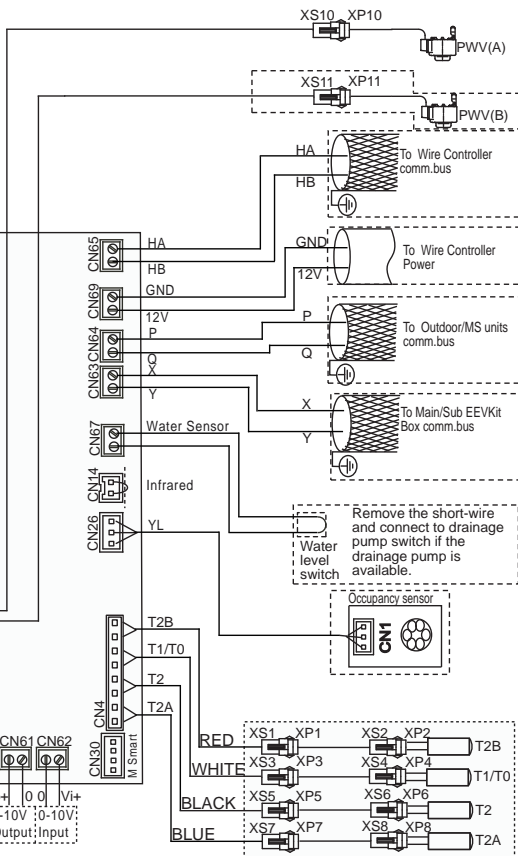
Main board



Code	Name
PWV(A/B)	Electrical Expansion valve
T1/T0	Return air temperature
T2B	Evaporator outlet temperature sensor
T2A	Evaporator inlet temperature sensor
T2	Middle of evaporator temperature sensor
XP1-11	Plug
XS1-11	Jack
RL1-3	Relay



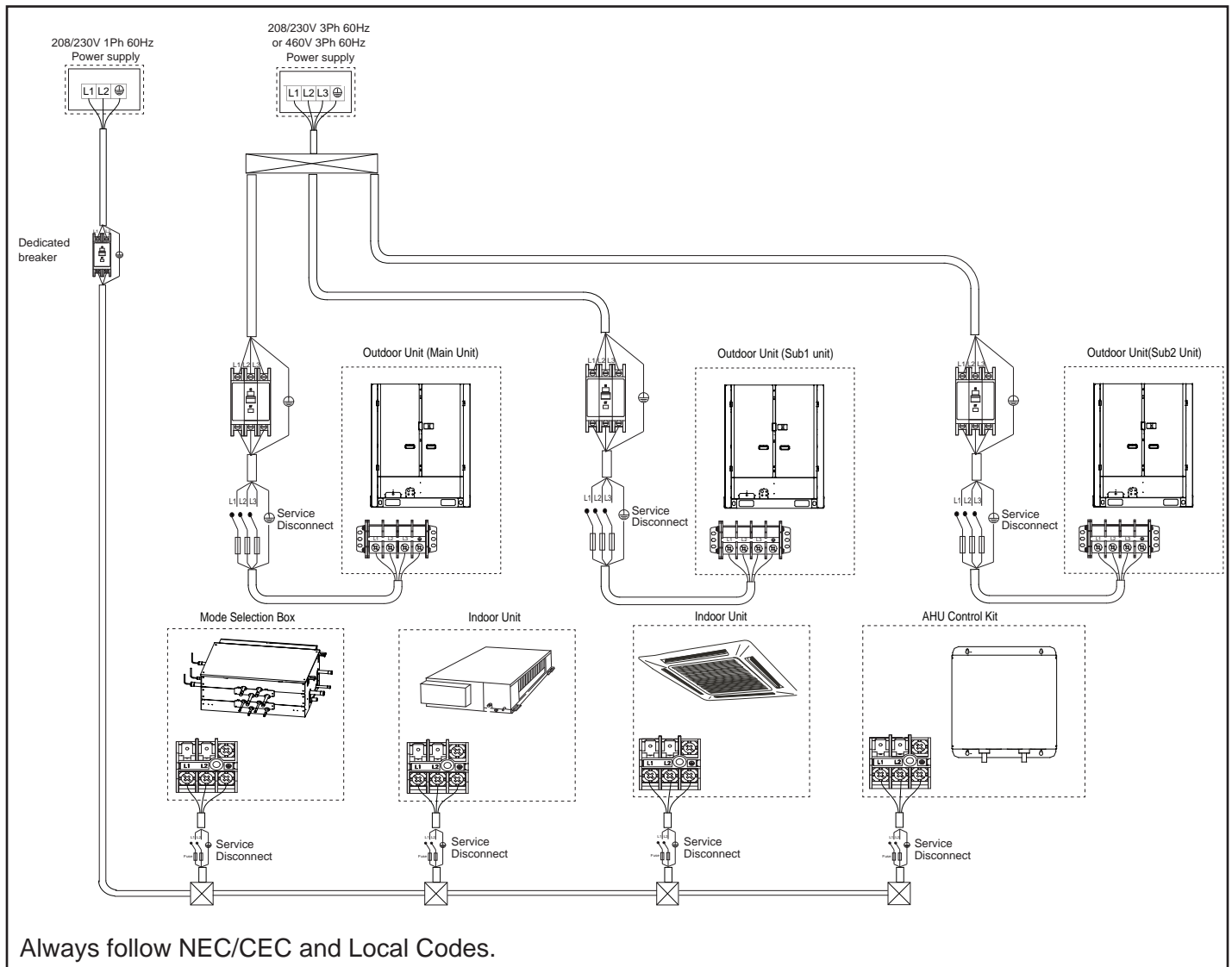
NOTE: Component in dash line is optional or field wiring



NOTE:  
1. Refer to manual for communication wiring  
2. Please use the 2-conductor shielded twisted cable for communication

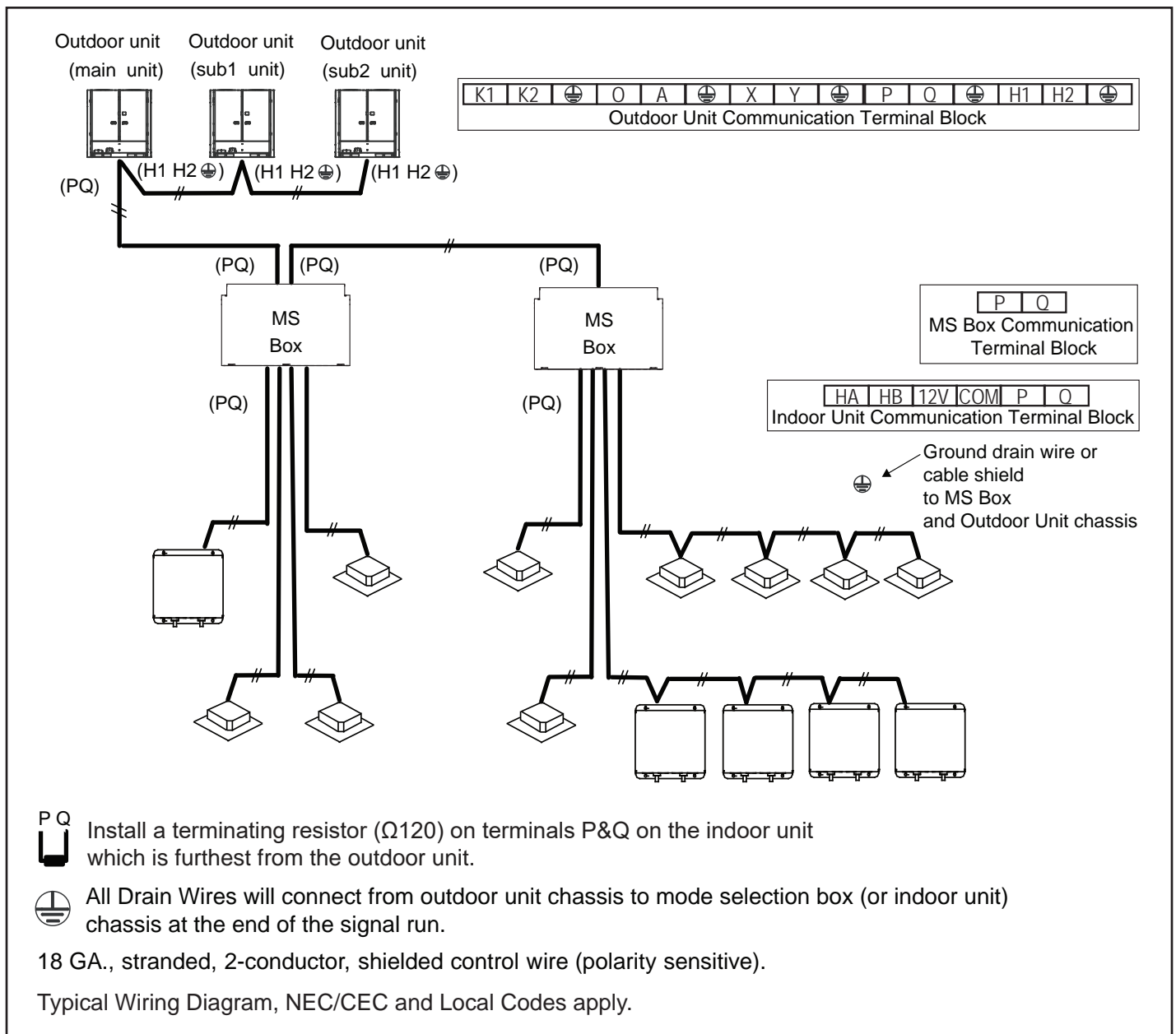
NOTE - Typical wiring diagram. Refer to wiring diagram on the unit for actual wiring.

Figure 14. AHU Control Box Wiring Diagram



Always follow NEC/CEC and Local Codes.

Figure 15. Typical Power Wiring (VRB Heat Recovery System Shown)



**Figure 16. Typical System Communication Wiring (VRB Heat Recovery System Shown)**

## Connect Sensors

### Connect Sensors After Brazing

1. Identify the T1, T2, T2A and T2B sensors in the accessory packet. See Figure 17.
2. Secure the T2 sensor to the air handler unit's coil at the middle of the coil. See Figure 18.
3. Secure the T2A sensor to the air handler unit's coil at the coldest part of the coil. See Figure 18.
4. Insulate the T2A sensor.
5. Secure the T2B sensor to the air handler unit's coil at the outlet of the coil as close as possible to the coil. See Figure 18.
6. Insulate the T2B sensor.
7. Secure the T1 sensor at the air handler unit return air inlet or inside of the zone being served by the air handler. See Figure 18.

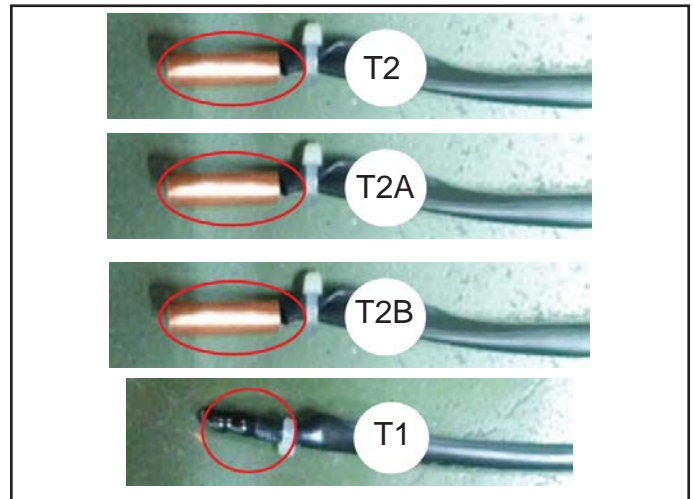


Figure 17. Sensor Identification

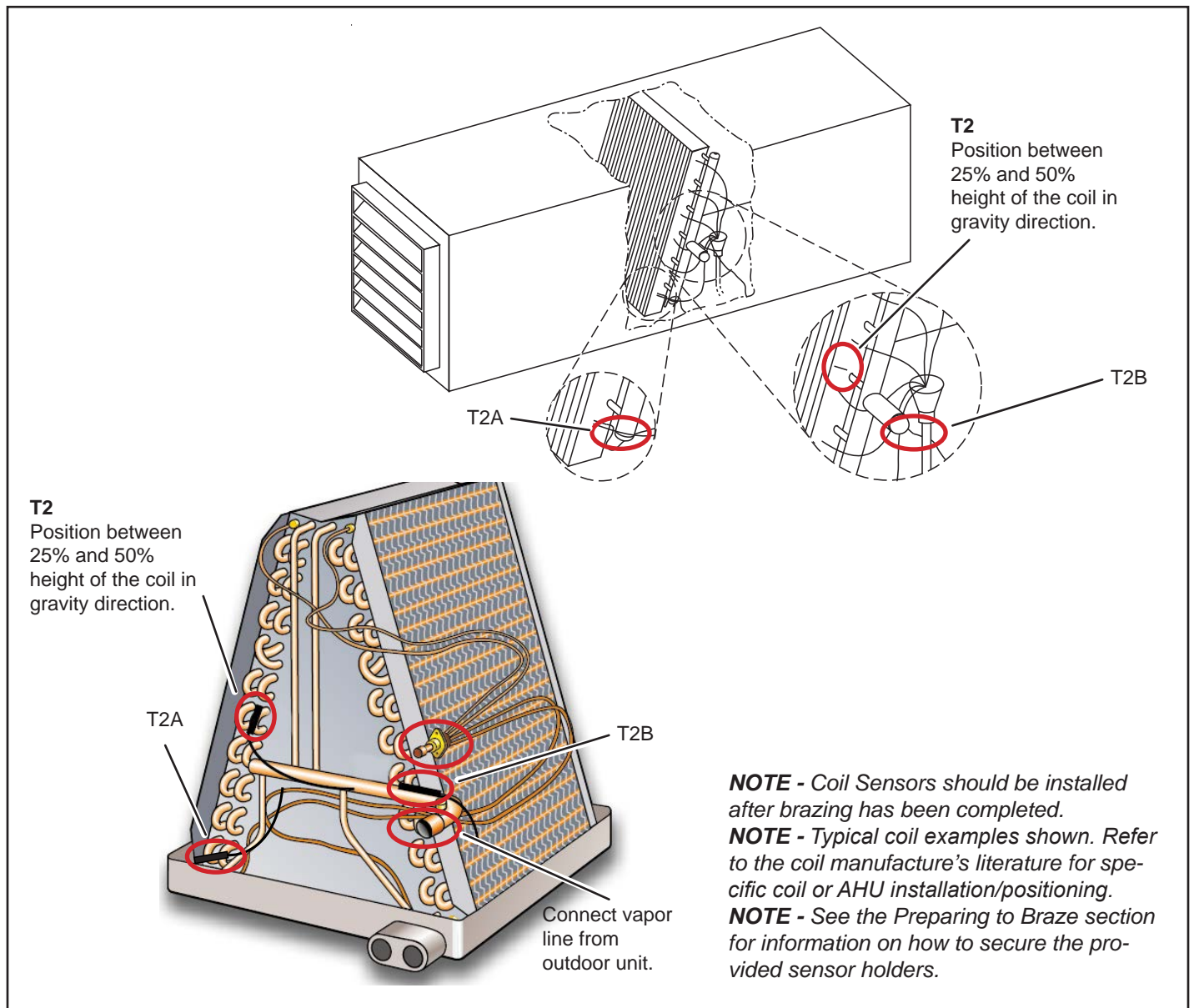


Figure 18. Indoor Unit Coil Component Identification

## Auxiliary Heat & Alternative Heat

- The relay output at terminal AUXH at connector CN51 is set up at DIP switch SW1 to control the optional 2nd heat source (besides the primary heat pump heating) in two operation modes: auxiliary heating (see Figure 1) and alternative heating (see Figure 2).
- In auxiliary heating mode, when room return air temperature T1 drops to 3°F below setpoint Ts (default, options 2, 3, 4, 5, 6 or 7°F), the 2nd heat source (e.g. electric heater, hot water or steam coil, etc.) is turned on in addition to the primary heat pump.
- In alternative heating mode, when ambient temperature T4 drops below the compressor lockout setpoint Ta (See instructions of ODU LCD module and ODU main PCB for both VRF and Mini-VRF), heat pump is turned off and then the 2nd heat source (e.g. gas furnace, or oil burner, etc.) is turned on.
- Some heat sources (e.g. electric heater, hot water or steam coil, etc.) may be set up as either auxiliary heat or alternative heat. The others (e.g. gas furnace, or oil burner, etc.) shall be set up as alternative heat only as they are not intended to work at the same time with refrigerant coil under code restrictions.

**Table 6. Auxiliary Heat & Alternative Heat**

	<b>Auxiliary Heat</b>	<b>Alternative Heat</b>
Type of 2nd heat source	Electric heater, water or steam, etc.	Gas furnace, oil burner or any in auxiliary heat sources
Relay output	AUXH (CN51)	AUXH (CN51)
Illustration	Figure 1	Figure 2
SW1	1	0 (default)
Heating mode	HP with auxiliary heat	HP or alternative heat
Heating control	T4>Ta+2°F, AUXH closed or open by thermostat in addition to HP	T4>Ta+4°F, AUXH open, only HP on or off by thermostat
	T4<Ta, switch to alternative heat	T4<Ta, AUXH closed or open by thermostat, HP off
	When Ta="1 FREE", AUXH closed or open by thermostat in addition to HP	When Ta="1 FREE", AUXH closed or open by thermostat, HP never on
IDU fan speed control	T4>Ta+2°F, speed is determined by kit	T4>Ta+4°F, speed is determined by kit
	T4<Ta, switch to alternative heat	T4<Ta, speed is determined by gas furnace/AHU controller

See the SW1 details in the Configure DIP Switches section for details.

An example for alternative heat is a gas furnace in a heat pump system. When the ambient temperature T4 is lower than the compressor lockout temperature setpoint Ta (e.g. 30°F, set at outdoor unit), the heat pump heating is turned off. Then the relay output AUXH is closed and the gas furnace is turned on (when room temperature T1 is lower than thermostat setpoint Ts). When ambient is higher than 34°F, AUXH is open and the gas furnace is turned off. Then the heat pump is turned on (when room temperature T1 is lower than thermostat setpoint Ts).

An example for auxiliary heat is an electric heater in a heat pump system. Room return air temperature setpoint Ts is 70°F (set at the controller) and auxiliary setpoint is 67°F set at controller). When the room temperature is lower than 70°F, the heat pump is turned on. When the room drops further below 67°F, AUXH is closed and the electric heater is turned on while the heat pump keeps on. When the room temperature is higher than 70°F, both the heat pump and the electric heater are turned off. When T4 is lower than Ta, the electric heater is turned on or off the same as the gas furnace in alternative heating.

By default, Ta is set to "1 FREE" (LCD module) or "1" (no LCD).

When SW1=0, the kit is set in alternative mode. Relay AUXH is open or closed by thermostat Ts to turn off or on gas furnace and HP is never turned on for heating; When SW1=1, the kit is set in auxiliary mode. Relay AUXH is open or closed by thermostat Ts in addition to HP to turn off or on electric heater.



**Table 7. Outdoor Unit Compressor Lockout Setpoint Ta**

<b>Ta Setting in VRF on ODU LCD Module (number and temperature °F)</b>	<b>Ta Setting in Mini-VRF on ODU Control Board (number only)</b>
1 - FREE (default)	1
2 - 7	2
3 - 10	3
4 - 15	4
5 - 20	5
6 - 25	6
7 - 30	7
8 - 35	8
9 - 40	9
10 - 45	10
11 - 50	11
12 - 55	12
13 - 60	13
14 - 65	14
15 - 70	15
16 - 75	16
17 - 80	17

## Fan Speed Control & Setup

The AHU Control Kit has 3 digital inputs, 1 analog input, 3 digital outputs and 1 analog output for fan speed control.

Either analog input or 1 of 3 digital input signals is received. Both analog output and 1 of 3 digital outputs are transmitted.

**Table 8. Fan Speed Control Input and Output Channels**

Fan Signal	Description	Input / Output	Analog / Digital	Signal Type	Signal Spec	Connector
Hi	High Speed Input Signal	input	digital	dry contact	0~24V 0~1A	CN59
Mi	Medium Speed Input Signal	input	digital	dry contact	0~24V 0~1A	CN59
Li	Low Speed Input Signal	input	digital	dry contact	0~24V 0~1A	CN60
Vi+	Variable Speed Input Signal	input	analog	VDC	0~10V	CN62
Ho	High Speed Output Signal	output	digital	dry contact	0~24V 0~1A	CN56
Mo	Medium Speed Output Signal	output	digital	dry contact	0~24V 0~1A	CN55
Lo	Low Speed Output Signal	output	digital	dry contact	0~24V 0~1A	CN55
Vo+	Variable Speed Output Signal	output	analog	VDC	0~10V	CN61

In cooling operation, fan speed is determined by the thermostat fan setting. When set at AUTO, the speed may vary and is determined by AHU control kit. When set at high, medium or low, the speed is fixed. The speed signal is transmitted at Ao AND one of Ho, Mo or Lo.

In heat pump heating operation, fan speed is the same as in cooling operation.

In fan only operation, fan speed is the same as in cooling operation.

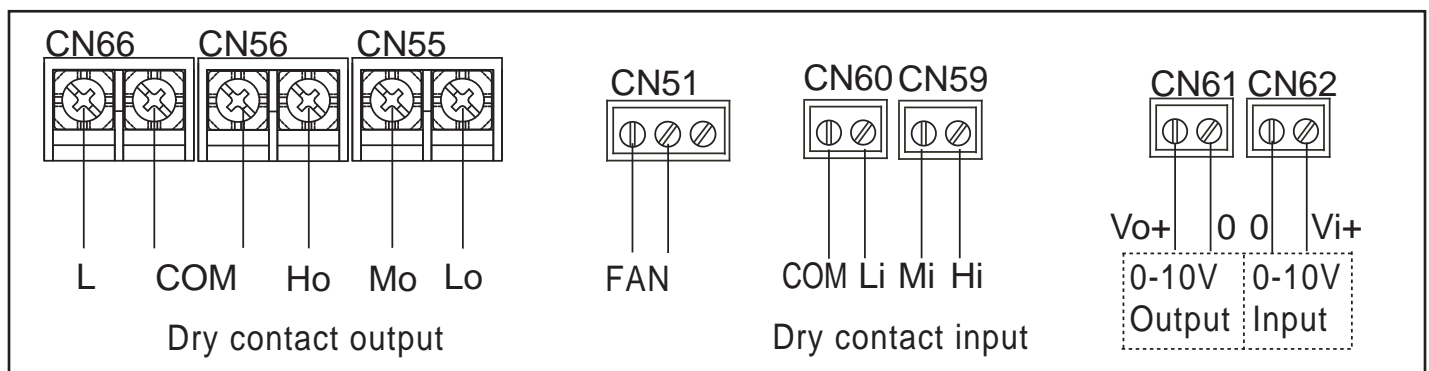
In auxiliary heating operation, fan speed is the same as in cooling operation. See Figure 1.

In alternative heating operation, fan speed is determined by the 3rd party heat source controller (e.g. gas furnace controller, oil burner controller, etc.). The speed signal is received from the 3rd party heat source controller to AHU Control Kit at terminal either Ai OR one of Hi, Mi, or Li.

Then the speed signal is transmitted from AHU Control Kit at terminals both Ao AND one of Ho, Mo, or Lo. See Figure 2.

The correlation between analog and digital signals is set by ENC2, 3 and 4 per Table 8.

**NOTE** - When 2, 3 or 4 kits are connected in parallel to control a large AHU, fan speeds (both inputs and outputs) are set at the main kit (see DIP SW2).

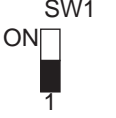
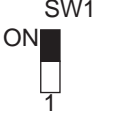


**Figure 19. Fan Speed Control Connections**

## Configure DIP Switches

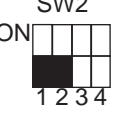
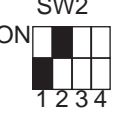
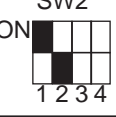
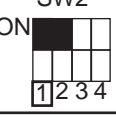
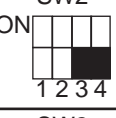



### Alternate and Auxiliary Heat Control Setting

Identify if there is an alternate or auxiliary heat source connected to the air handler unit using SW1 on the Main AHU Control Kit.

	Dry contact AUXH is set to alternative heat ALT (default).
	Dry contact AUXH is set to auxiliary heat AUX.

### AHU Control Kit Quantity & Address Setting

SW2-1 and SW2-2 define the quantity (1~4) of kits connects in parallel to control one large AHU. SW2-3 and SW2-4 define the address of each kit. See Figure 20.

	Main AHU Control Kit Only Main Kit only. (default)
	Main AHU Control Kit Only. Main Kit and one Sub Kit. (2 kits in parallel)
	Main AHU Control Kit Only. Main Kit and two Sub Kits. (3 kits in parallel)
	Main AHU Control Kit Only. Main Kit and three Sub Kits. (4 kits in parallel)
	Main AHU Control Kit address.
	Sub1 AHU Control Kit address.
	Sub2 AHU Control Kit address.
	Sub3 AHU Control Kit address.

### ECN1 and SW3-1 Capacity Setting

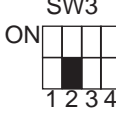
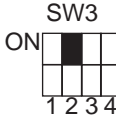
Set the capacity of the AHU Control Kit using SW3-1 and ENC1. Refer to Table 2 for kit specifications and ECN1 and SW3-1 settings.

- The capacity range of 2-Ton kit is from 12 to 24 Kbtu/h
- The capacity range of 4-Ton kit is from 30 to 48 Kbtu/h
- The capacity range of 8-Ton kit is from 60 to 96 Kbtu/h.

When multiple kits are in parallel, the capacity is the total capacity of the kits. Refer to Table 2 for allowed combinations.

### Capacity Correction Factor Setting

SW3-2 defines the indoor unit capacity correction factor (in main kit only if multiple kits are used to control one large AHU)

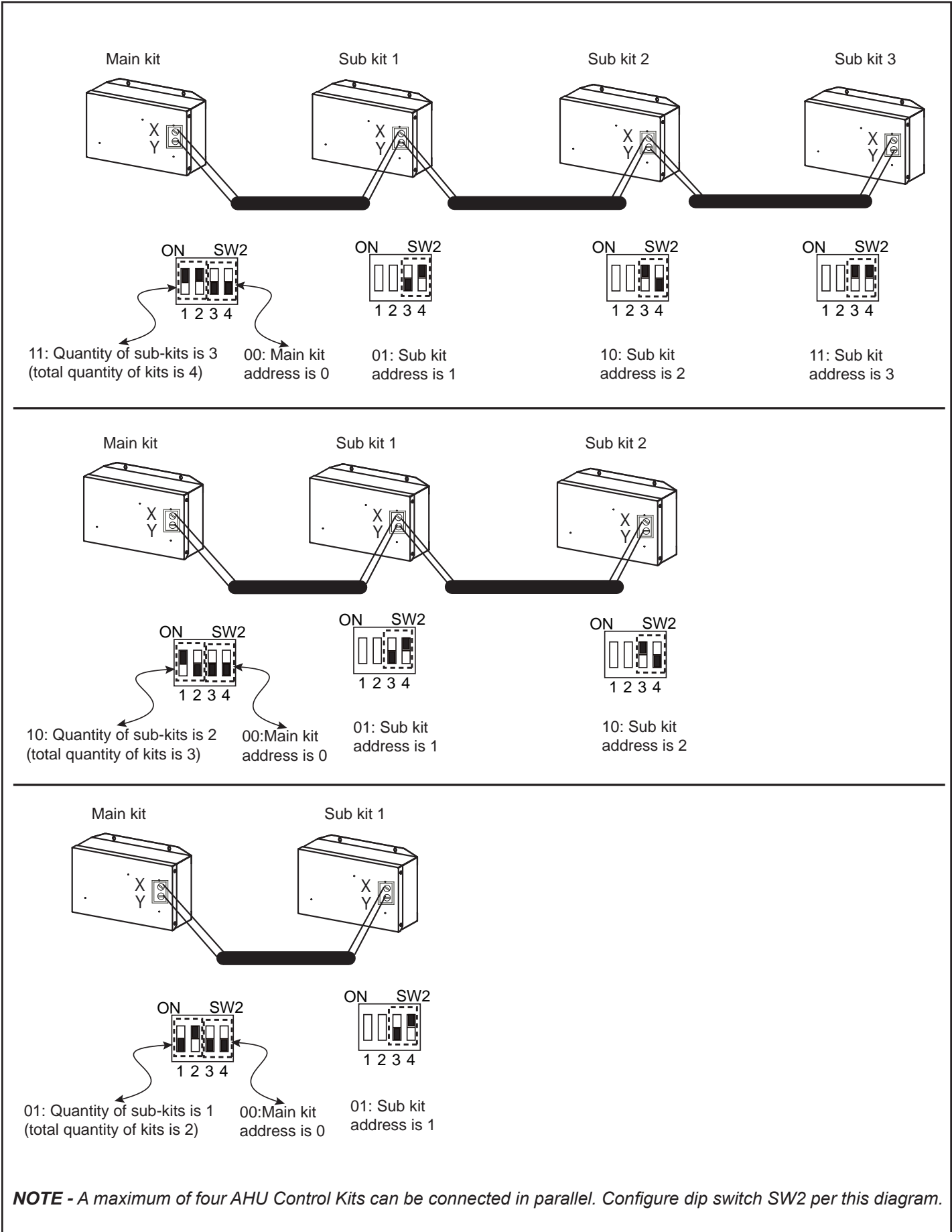
	No capacity correction factor. (default)
	Capacity correction factor is 80%.

**NOTE** - Dip switch handle location is shown as a solid black box in the tables.

0 = OFF (down)

1 = ON (up)

**NOTE** - Turn off power to the unit before setting the dial/dip switch. The function will be available when the unit is powered on again.



**NOTE** - A maximum of four AHU Control Kits can be connected in parallel. Configure dip switch SW2 per this diagram.

**Figure 20. Parallel AHU Control Kit Configurations**

### DEH (Dehumidification) Control Logic Setting

SW3-3 defines the normal open or normal closed status of dehumidification relay output DEH (dry contact 24V 1A max) at terminal CN51.

SW3-3 set at 0 (default) indicates the relay is CLOSED when dehumidification demand is OFF. The relay is OPEN when dehumidification demand is ON.

SW3-3 set at 1 indicates the relay is CLOSED when dehumidification demand is ON. The relay is OPEN when dehumidification demand is OFF.

<p>SW3 ON 1 2 3 4</p>	<p>Indicates that the dry contact "DEH" CLOSED for dehumidification OFF, and "DEH" OPENED for dehumidification ON. (default)</p>
<p>SW3 ON 1 2 3 4</p>	<p>Indicates that the dry contact "DEH" CLOSED for dehumidification ON, and "DEH" OPENED for dehumidification OFF. (default)</p>

SW3-4 is reserved. Do not adjust.

SW4 is reserved. Do not adjust.

### Air Handling Unit Fan Speed Setting

Configure the number of fan speeds using SW5-1 and SW5-2. Main kit only.

The fan control logic is shown in the Fan Control section.

<p>SW5 ON 1 2 3</p>	<p>Main AHU Control Kit Only Indicates that the fan has three speeds: Low, Medium, and High. (default)</p>
<p>SW5 ON 1 2 3</p>	<p>Main AHU Control Kit Only Indicates that the fan has two speeds: Low, and High.</p>
<p>SW5 ON 1 2 3</p>	<p>Main AHU Control Kit Only Indicates that the fan has one speed: High.</p>
<p>SW5 ON 1 2 3</p>	<p>Reserved.</p>

**NOTE** - Dip switch handle location is shown as a solid black box in the tables.

0 = OFF (down)

1 = ON (up)

**NOTE** - Turn off power to the unit before setting the dial/dip switch. The function will be available when the unit is powered on again.

## Parallel Control Setting

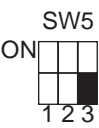
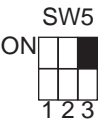
Identify if there is one AHU Control Kit controlling each coil or if there are multiple parallel AHU Control Kits controlling one coil using SW5-3.

There may be single or multiple coils in a large AHU over 8 ton (see Table 2). 2, 3 or 4 kits are wired in parallel as main kit and sub kits. SW5-3 defines whether the parallel kits connect to single coil or each kit of the parallel set connects to a coil.

SW5-3 set at 0 (default) indicates 2, 3 or 4 kits are wired in parallel to regulate the refrigerant flow to single coil. Four (4) temperature sensors T1, T2, T2A and T2B from the main kit are placed in the AHU. Four (4) temperature sensors from each of the sub kits shall be disconnected. Do not discard, save for future use as spare parts.

SW5-3 set at 1 indicates 2, 3 or 4 kits are wired in parallel. Each regulates the refrigerant flow to a coil individually and shares the return air sensor T1 from the main kit. Three (3) temperature sensors T2, T2A and T2B from each kit are placed in a coil respectively. T1 temp sensors from all the sub kits shall be disconnected. Do not discard, save for future use as spare parts.

Set the quantity of parallel kits and assign addresses to each kit using SW2.

	<p>Main AHU Control Kit Only Parallel Control Mode 1. One coil connected to multiple AHU Control Kits. T1, T2, T2A, and T2B should be connected with the Main kit.</p>
	<p>Main AHU Control Kit Only Parallel Control Mode 2. One coil connected to one AHU Control Kit. In the case of multiple coils in one AHU, each coil is connected to one kit individually, T2, T2A, T2B are connected with the corresponding kit, and T1 should be connected with the Main kit.</p>

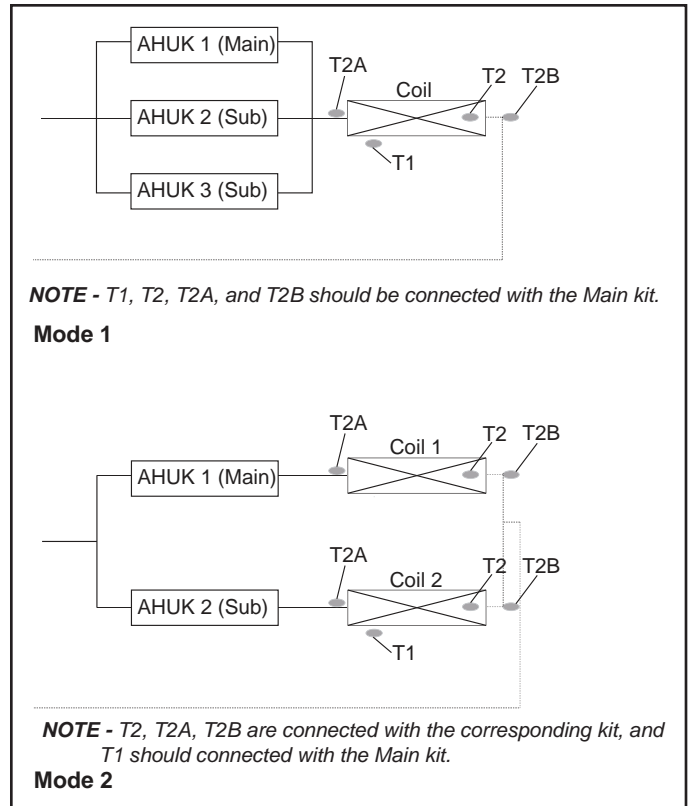




Figure 21. Parallel Control Setting

## Heating Source Configuration and Control

### Alternate and Auxiliary Heat Control Configuration

Identify if there is an alternate or auxiliary heat source connected to the air handler using SW1 on the Main AHU control kit.

#### SW1

	<p>Dry contact AUXH control logic is ALT. (default)</p>
	<p>Dry contact AUXH control logic is AUX.</p>

## Fan Speed Digital & Analog Signals Conversion

ENC2, 3 and 4 define low, medium and high speed between digital and analog signals for both input and output. By default, ENC2 is set at 2V, ENC3 at 7V and ENC4 at A (A means 10V) in factory. Either a digital or analog input is received. Both analog output and a digital output are transmitted.

**NOTE** - ENC2<ENC3<ENC4.

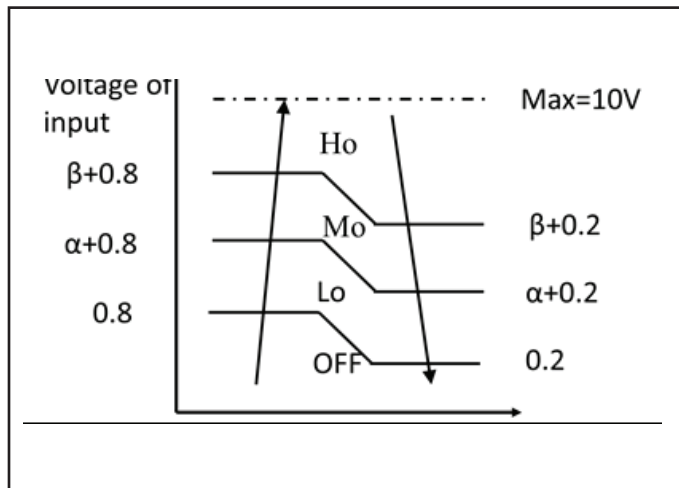


Figure 22. Fan Speed Switching at Ho, Mo & Lo

When digital input is received at Mi, digital output of medium speed Mo is closed and analog output Ao is 7VDC. When analog input is received 8VDC which is between 7V (medium) and 10 V (high), digital output of high speed Ho is closed and analog output Ao is 8VDC which is always the same as analog input Ai.

When the kit receives 2 or 3 digital signals at Hi, Mi and Li at the same time and no analog signal Ai, the highest speed signal overrides the lower ones.

When both digital input and analog input signals are received at the same time, error code H9 shall display and the kit shall be shut down.

Table 8. Digital and Analog Signal Correlation Setting

### 0-10V Output Voltage




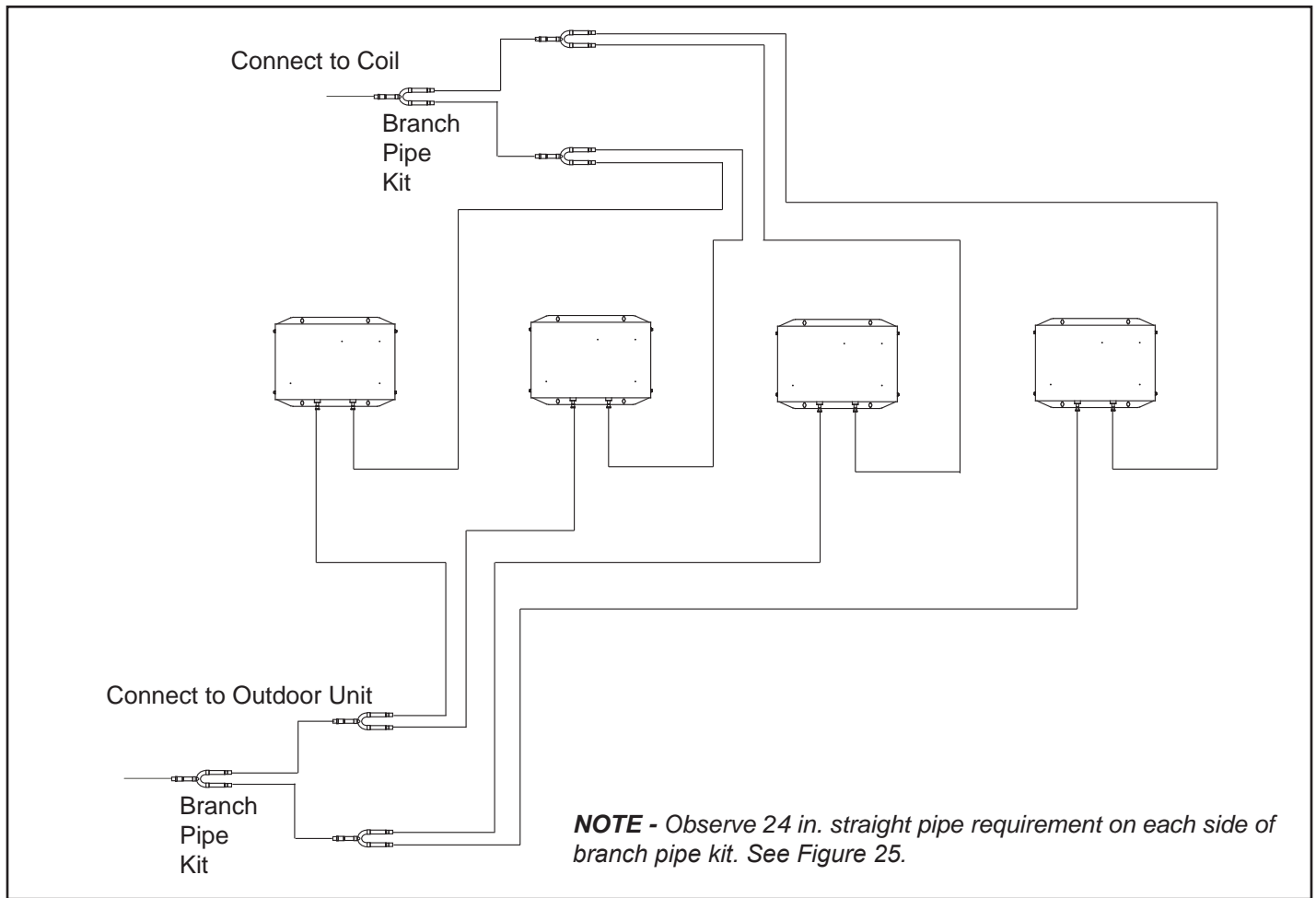
ENC2  (2V Factory Default)				ENC3  (7V Factory Default)						ENC4  (10V Factory Default)						
Low speed				Mid. speed						High speed						
Dial code	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Voltage (V)	1	1	2	3	4	5	6	7	8	9	10	10	10	10	10	10

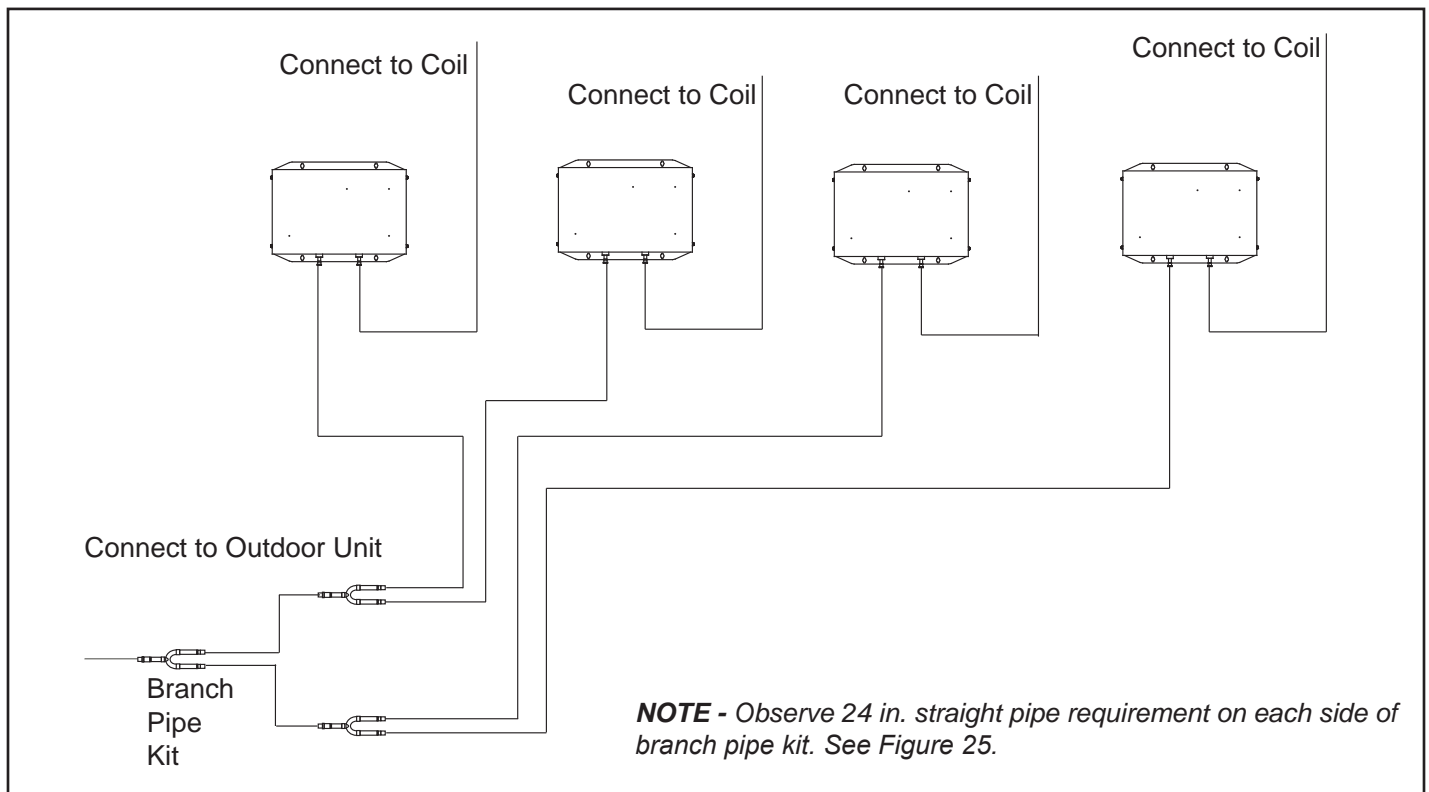
Table 9. Fan Speed Outputs Dependency on One Input

3 Speeds									
Case	Input channel				Output Channel				Note
	Hi	Mi	Li	Ai	Ho	Mo	Lo	Ao	
	1=closed			0~10VDC	1=closed			0~10VDC	1 input
1				0~0.1				0	1 input
2	1			0~0.1	1			10	1 input
3		1		0~0.1		1		7	1 input
4			1	0~0.1			1	2	1 input
5				7.2~10	1			=Ai	1 input
6				2.2~7.1		1		=Ai	1 input
7				0.2~2.1			1	=Ai	1 input
8	1	1	1	0~0.1	1			10	multi inputs
9	1	1	1	0.2~10				0	multi inputs, error H9

**NOTE** - Fan is switched from Mo to Ho when Ai rises to 7.8V and from Ho to Mo when Ai falls to 7.2V. Similar between Mo and Lo.

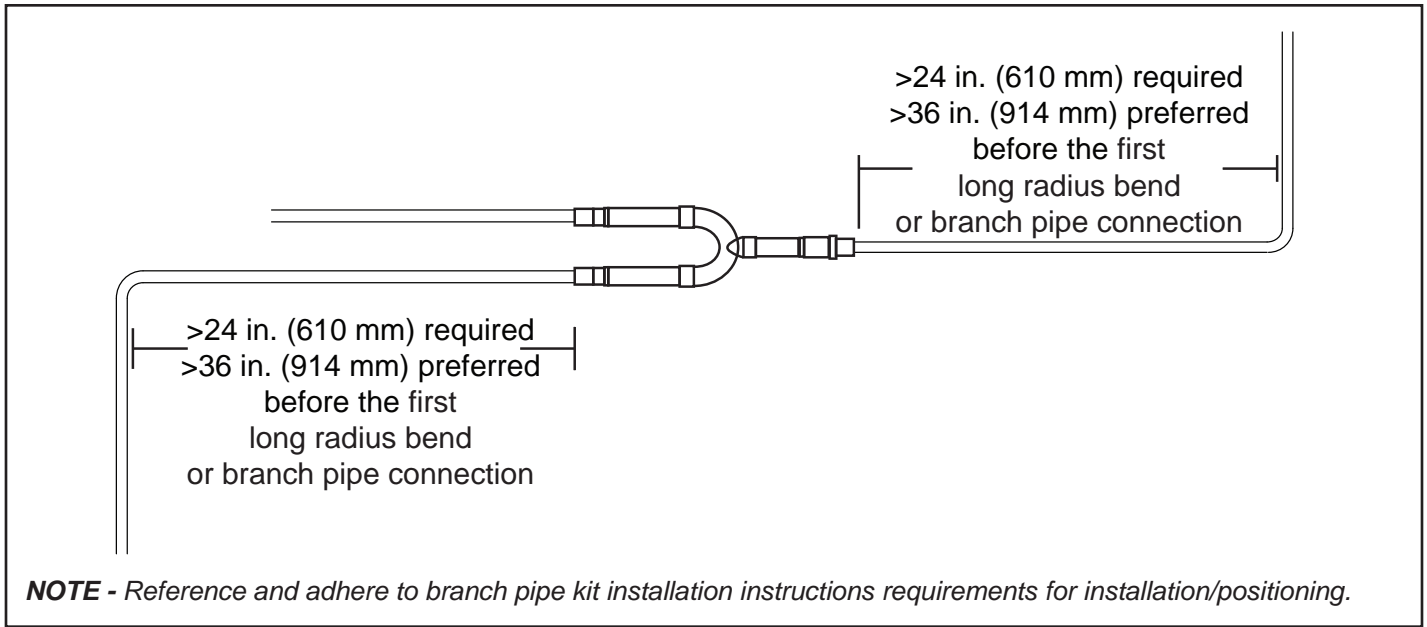


**Figure 23. Four (4) Parallel Kits Connecting One (1) Large Coil**



**Figure 24. Four (4) Parallel Kits Connecting Four (4) Coils Individually**





**Figure 25. 24 to 36 Inches of Straight Pipe Before and After Branch Pipe Kit**

# 1 Speed Blower Wiring

Example Furnace LII ML180UH, EL196UH, EL195UH, EL296UHE, EL296UHV, SL297UHNV  
 1 cooling HP spd, 1 ALT spd (2 of 4 speed choices 1=low=red 2=yellow 3=brown 4=high=black)  
 AHU kit sets ALT for furnace

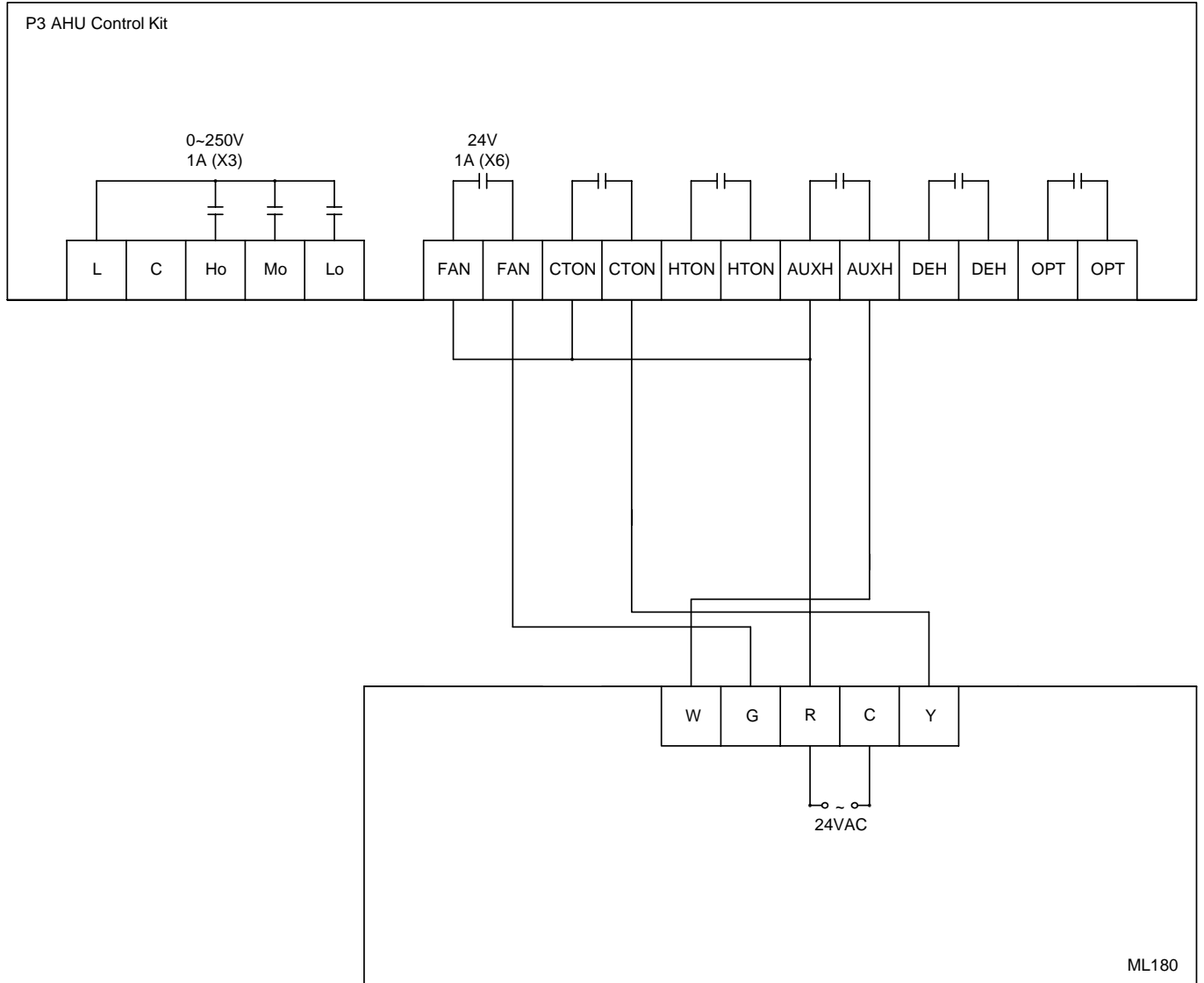
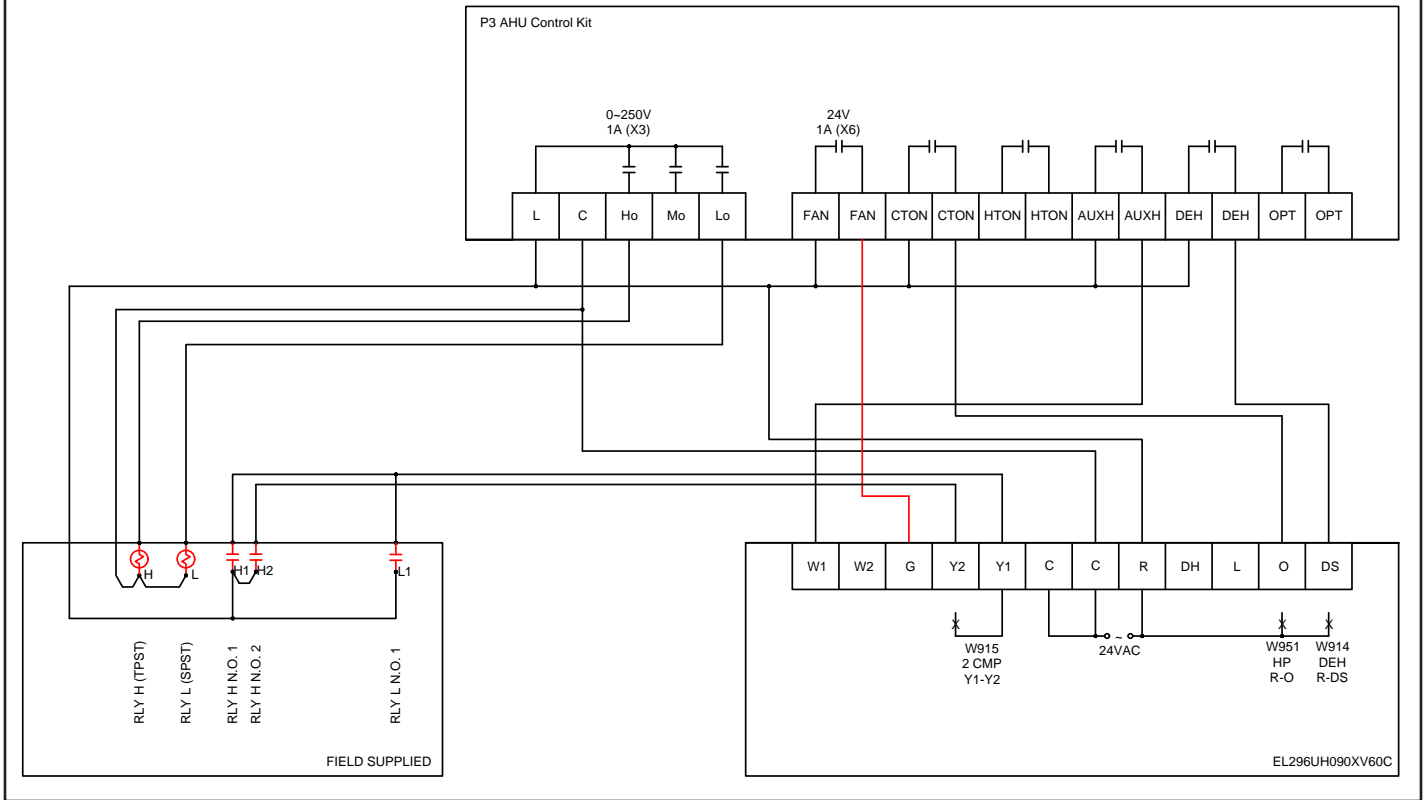


Figure 26. Gas Furnace 1-Speed Blower Wiring Diagram  
 (Lennox Furnace ML180 1-Speed Connection Shown)

## 2 Speed Blower Wiring

Example Furnace LII EL296E  
 2 cooling HP spd  
 use 1 stage thermostat DIP1=1, 2nd stg gas turns on by time 7.5 (0) default or 12 min (1) set at  
 furnace DIP2, ALT spd set by furnace control  
 2 speeds (H, L) set at AHU kit SW5-1 & 2=01

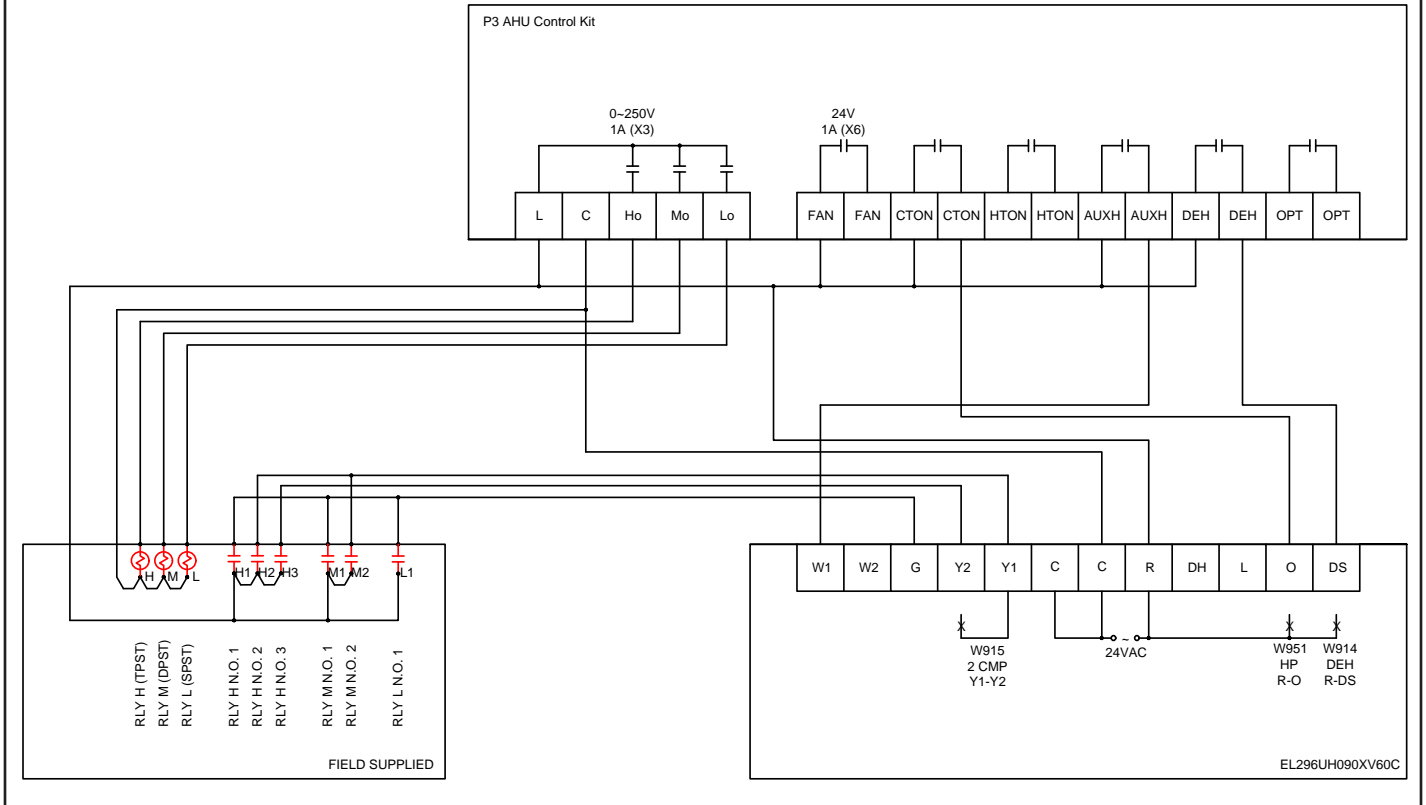


**Figure 27. Gas Furnace 2-Speed Blower Wiring Diagram  
 (Lennox Furnace EL296UH090XV60C 2-Speed Connection Shown)**

### 3 Speed Blower Wiring

Example Furnace LII EL296E (ECM) EL296V (variable)? SL280V? SLP98V?  
3 cooling HP spd

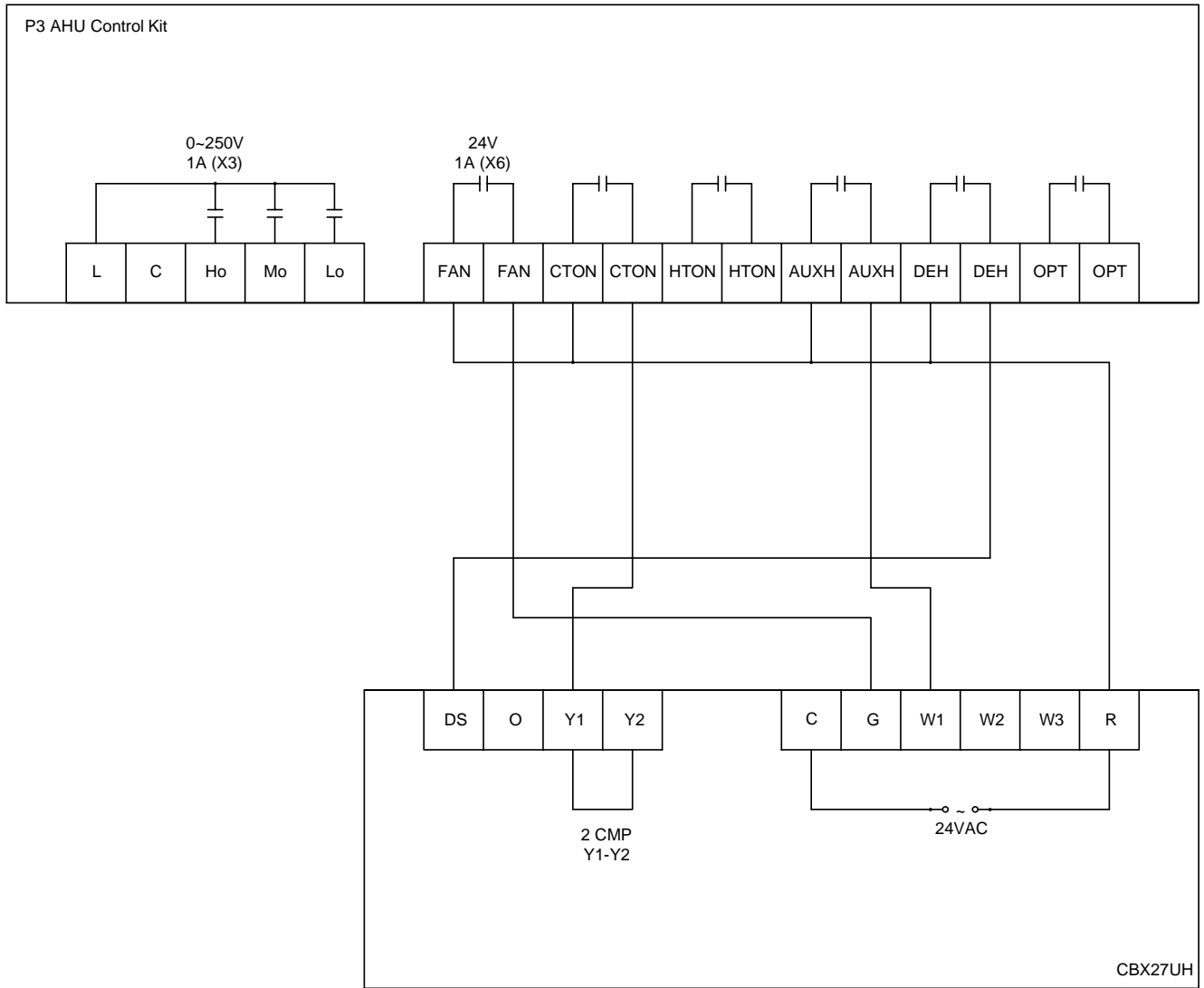
use 1 stage thermostat DIP1=1, 2nd stg gas turns on by time 7.5 (0) default or 12 min (1) set at furnace DIP2, ALT spd set by furnace control  
fan set at 38% (00) default or 28% (01) at DIP14-15



**Figure 28. Gas Furnace 3-Speed Blower Wiring Diagram  
(Lennox Furnace EL296UH090XV60C 3-Speed Connection Shown)**

# 1 Speed Blower Wiring

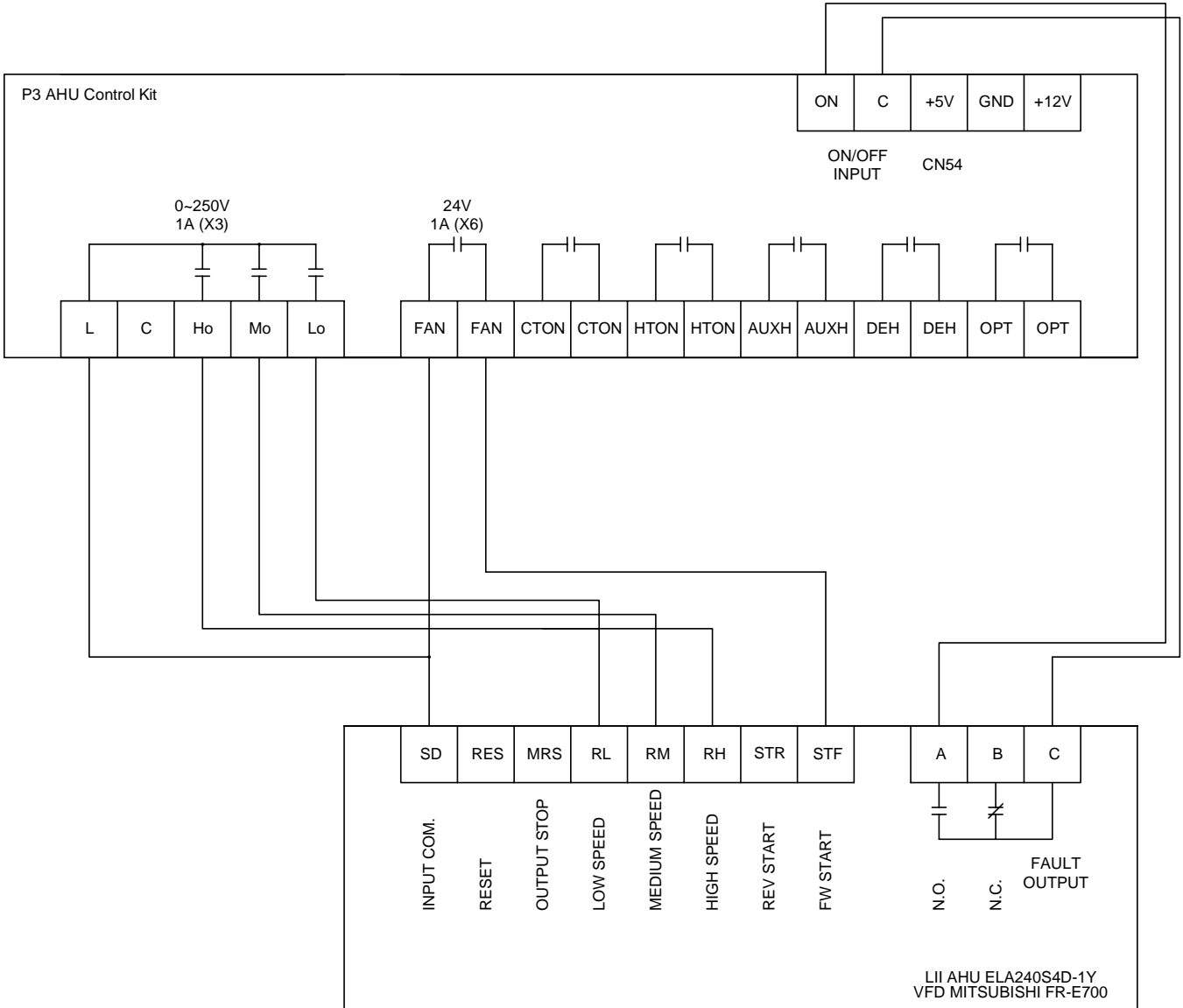
Example AHU LII CBA25UHV, CBA27UHE, CBA38MV, ELA072~240 w/ VFD ID blower  
fan speed set at tap #4



**Figure 29. Electric Air Handler 1-Speed Blower Wiring Diagram  
(Lennox Air Handler 1-Speed Connection Shown)**

# 3 Speed Blower Wiring

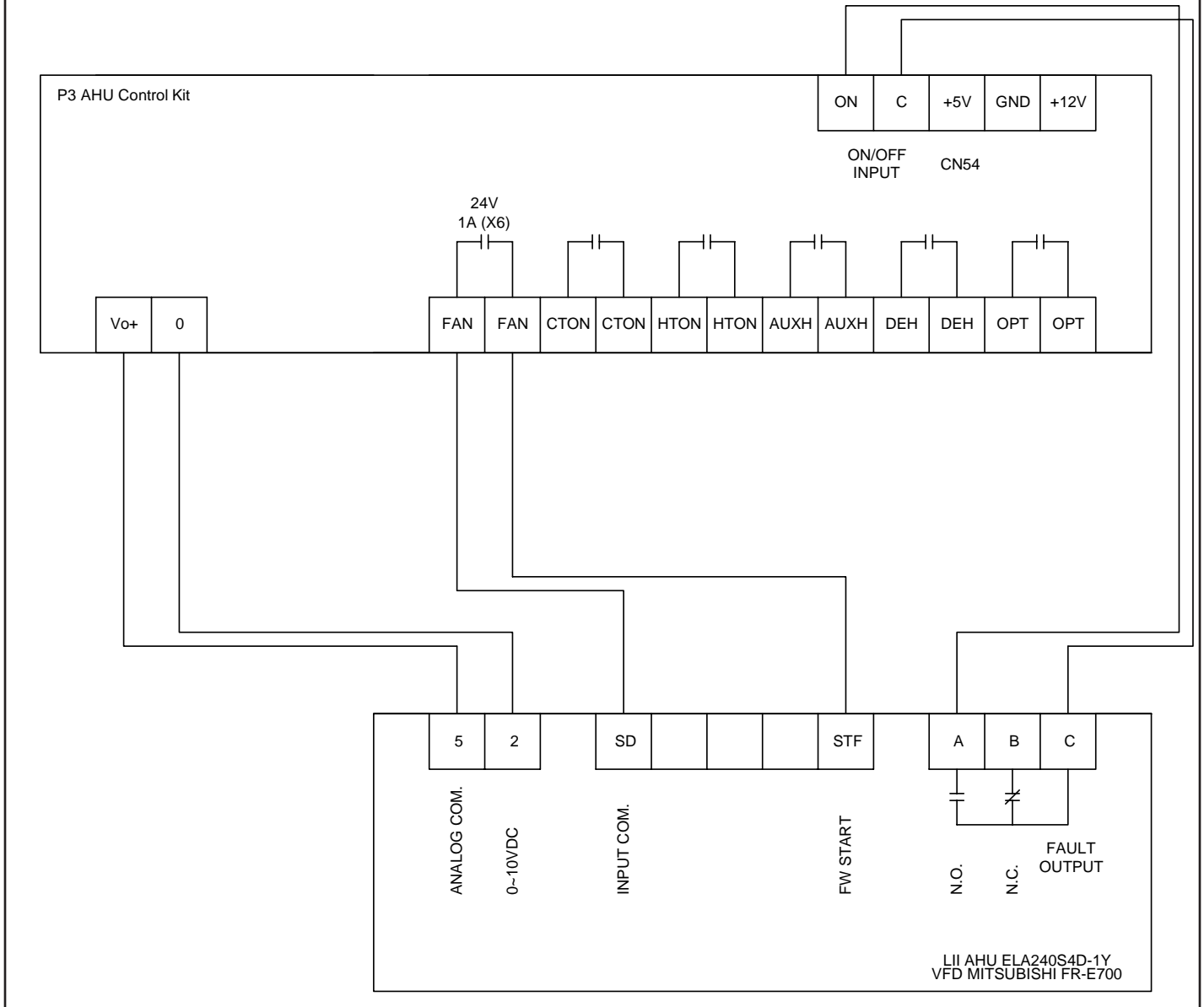
Example AHU LII CBA25UHV, CBA27UHE, CBA38MV, ELA072-240 w/ VFD ID blower



**Figure 30. Electric Air Handler 3-Speed Blower Wiring Diagram  
(Lennox Air Handler 3-Speed Connection Shown)**

# Variable Speed Blower Wiring

Example AHU LII ELA072~240 w/ VFD ID blower



**Figure 31. Electric Air Handler Variable Speed Blower Wiring Diagram  
(Lennox Air Handler Variable Speed Connection Shown)**

## Network Address and Commissioning

After the system has been installed, the AHU Control Board must be assigned an address as part of the commissioning procedure.

**NOTE** - The receiver temperature unit display must be set at the same time as the controller. Receivers default to display temperatures in °F. To change the receiver's temperature unit display, press and hold the Manual button on the unit receiver for 5 to 15 seconds until the display changes to show the desired temperature unit.

## Troubleshooting

### Digital Display

The AHU Control Kit is equipped with a receiver that has a digital display that provides an error code. Refer to Table 10 to view the error codes.

The error code will replace the temperature setting displayed on the receiver. If more than one error has occurred, the codes will alternate so that all codes are shown.

Make note of the code (E1, EE, etc.), then reset the display by pressing the ON/OFF button on the unit controller. Press the ON/OFF button a second time to reapply power to unit. If the code is still displayed, disconnect and restore power at the unit disconnect switch or circuit breaker. If the problem was temporary, the code will not reappear. If the error code reappears after power has been broken and restored at the disconnect switch or circuit breaker, call VRF Technical Support 1-844-438-8731.



Figure 32. Receiver/Display

Table 10. Fault Code Display on Main AHU Control Kit

Error Code	Description
A0	Emergency stop
D8	Remote Off
E0	Mode conflict
E1	Communication error between Main AHU Control Kit and Sub AHU Control Kit(s)
H6	Communication error
E2	T1/T0 Temperature sensor malfunction
E3	T2 (Middle of evaporator sensor) malfunction
E4	T2B (Outlet of evaporator sensor) malfunction
E5	T2A (Inlet of evaporator sensor) malfunction
E6	Reserved
E7	EEPROM failure
E9	Communication error between controller and AHU Control Kit
Eb	EXV malfunction
Ed	Outdoor unit malfunction
EE	High Water Alarm
F8	Mode Selection Box malfunction
FE	No address the first time power is ON
H8	Capacity setting, EXV Kit or Parallel total capacity incompatibility
H9	Fan control input has dry contact and 0~10V input at the same time or ENC2, ENC3, and ENC4 are not set properly.
U4	MS self-inspection error



**Table 11. Fault Code Display on Sub AHU Control Kit**

<b>Error Code</b>	<b>Description</b>
E3	T2 (Middle of evaporator sensor) malfunction
E4	T2B (Outlet of evaporator sensor) malfunction
E5	T2A (Inlet of evaporator sensor) malfunction
E6	Reserved
Eb	EXV malfunction
H8	Capacity setting, EXV Kit or Parallel total capacity incompatibility
H9	Fan control input has dry contact and 0~10V input at the same time or ENC2, ENC3, and ENC4 are not set properly.

**Table 12. Fault Code Display on Controller**

<b>Error Code</b>	<b>Description</b>
F0	Communication/Address error between indoor units and wired controller
F1	Communication/Wiring error between indoor units and wired controller
E2	Controller temperature sensor error

**If the system operates but it does not sufficiently cool/heat**

- Check if the capacity DIP setting is correct.
- Check if the air inlet or outlet of the air handler unit or the outdoor unit is blocked with obstacles. Remove any obstacles.
- Check if the air filter is clogged. Clean or replace the air filter.
- The liquid thermistor (T2A) is not put on the coldest position and part of the air handler unit is freezing up. Thermistor must be put on the coldest position.
- 

**The Fan is not operating continuously**

- Check if the fan control wiring is correct for the device the AHU control kit is connected to.
- Check if the device, which AHU control kit is connected to, is in error.
- Check if the setting of fan control signal ENC2, ENC3, and ENC4 is correct for the device the AHU control kit is connected to.

**The Fan speed in dehumidification mode is unusual**

- Check if the dry contact "DEH" control mode (DIP SW5-3) is set correctly depend on the control logic of the device connected to AHU kit.

## Spot Check Instructions

Use the Spot Check Performance tables below and the Manual button on the unit receiver to view diagnostic

information about the AHU Control Box and the indoor unit coil.

**Table 13. Spot Check Performance Main Kit**

No.	Content	Note
0	Normal display	
1	Communication address of indoor unit	0~63
2	Dial code of indoor unit capacity	
3	Network address of indoor unit	0~63
4	The actual setpoint temperature	
5	The actual indoor temperature T1	
6	The actual evaporator inlet temperature sensor T2	
7	The actual middle evaporator temperature T2A	
8	The actual evaporator outlet temperature T2B	
9	The actual superheat (SH) (Cooling Mode)	
10	The actual subcooling (Heating Mode)	
11	The opening of EXV. (multiply by 8)	
12	Error code	
13	Indoor software version	
14	The quantity of AHU Control kits in parallel	
15	--	

This Spot Check Performance table is located on the unit service panel. The diagnostic information can also be obtained using the wired remote controller.

**Table 14. Spot Check Performance Menu in Parallel Control Mode 1, SW5-3=0**

No.	Content	Note
0	Address of Sub Kit	1~3
1	--	
2	Dial code of indoor unit capacity (Total of AHU Control Kits in parallel)	
3	--	
4	--	
5	--	
6	--	
7	--	
8	--	
9	--	
10	--	
11	The opening of EXV. (multiply by 8)	
12	Error code	
13	Indoor software version	
14	--	
15	--	

This Spot Check Performance table is located on the unit service panel. The diagnostic information can also be obtained using the wired remote controller.

**Table 15. Spot Check Performance Menu in Parallel Control Mode 2, SW5-3=1**

No.	Content	Note
0	Address of Sub Kit	1~3
1	--	
2	Dial code of indoor unit capacity (Total of AHU Control Kits in parallel)	
3	--	
4	--	
5	--	
6	The actual evaporator inlet temperature sensor T2	
7	The actual middle evaporator temperature T2A	
8	The actual evaporator outlet temperature T2B	
9	The actual superheat (SH) (Cooling Mode)	
10	The actual subcooling (Heating Mode)	
11	The opening of EXV. (multiply by 8)	
12	Error code	
13	Indoor software version	
14	--	
15	--	

This Spot Check Performance table is located on the unit service panel. The diagnostic information can also be obtained using the wired remote controller.

**Table 16. Spot Check Performance Tracking Register**

	Check	Value	Date	Initials
0	Normal display			
1	Communication address of indoor unit			
2	Dial code of indoor unit capacity			
3	Network address of indoor unit			
4	The actual setpoint temperature			
5	The actual indoor temperature T1			
6	The actual evaporator inlet temperature sensor T2			
7	The actual middle evaporator temperature T2A			
8	The actual evaporator outlet temperature T2B			
9	The actual superheat (SH) (Cooling Mode)			
10	The actual subcooling (Heating Mode)			
11	The opening of EXV. (multiply by 8)			
12	Error code			
13	Indoor software version			
14	The quantity of AHU Control kits in parallel			

## Technical Support

1-844-GET-VRF1

(1-844-438-8731)

vrftechsupport@lennoxind.com

www.LennoxVRF.com

Reference and adhere to the latest revision of the installation instructions. Installation instructions can be downloaded from [www.lennoxvrf.com](http://www.lennoxvrf.com), [www.lennoxcommercial.com](http://www.lennoxcommercial.com), [www.lennoxpros.com](http://www.lennoxpros.com) and the Lennox VRF and Mini-Splits app.

Download the app  
from the Apple App Store or the Google Play store.

