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**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.**  
**The State of California has determined that this product may contain or produce a chemical or chemicals, in very low doses, which may cause serious illness or death. It may also cause cancer, birth defects, or reproductive harm.**

**⚠ CAUTION**

**As with any mechanical equipment, personal injury can result from contact with sharp sheet metal edges. Be careful when you handle this equipment.**

# INSTALLATION INSTRUCTION

## VWMA Wall-Mounted Units

VRF SYSTEMS -- Indoor Units  
507462-03  
01/2016

**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. These units must be installed as a part of a matched system as specified in the Product Specifications (EHB) bulletin.**

**General**

The VWMA wall-mounted indoor units are matched with an outdoor heat recovery or heat pump unit to create a VRF (variable refrigerant flow) system that uses HFC-410A refrigerant.

Refer to the Product Specification bulletin (EHB) for the proper use of these indoor units with specific heat pumps, heat recovery units, mode switching devices, branch pipes, line sets and controls.

These instructions are intended as a general guide and do not supersede local or national codes in any way.

Authorities having jurisdiction should be consulted before installation.

**Shipping and Packing List**

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

Package 1 of 2 contains the following:

- 1 - Assembled indoor unit with mounting bracket
- 8 - Mounting bracket securing screws
- 8 - Plastic screw anchors
- 1 - Roll tape
- 1 - Flexible condensate drain pipe
- 1 - Wall sleeve
- 1 - Plastic cover for wall sleeve
- 1 - Resistor
- 1 - Brass flare nut
- 1 - Installation manual

**Not for use with V0CTRL90 Auxiliary Heat Relay. See Service and Application Note VRF-15-01.**

## Safety Requirements

### ⚠ WARNING

#### ELECTRICAL SHOCK, FIRE, OR EXPLOSION HAZARD.

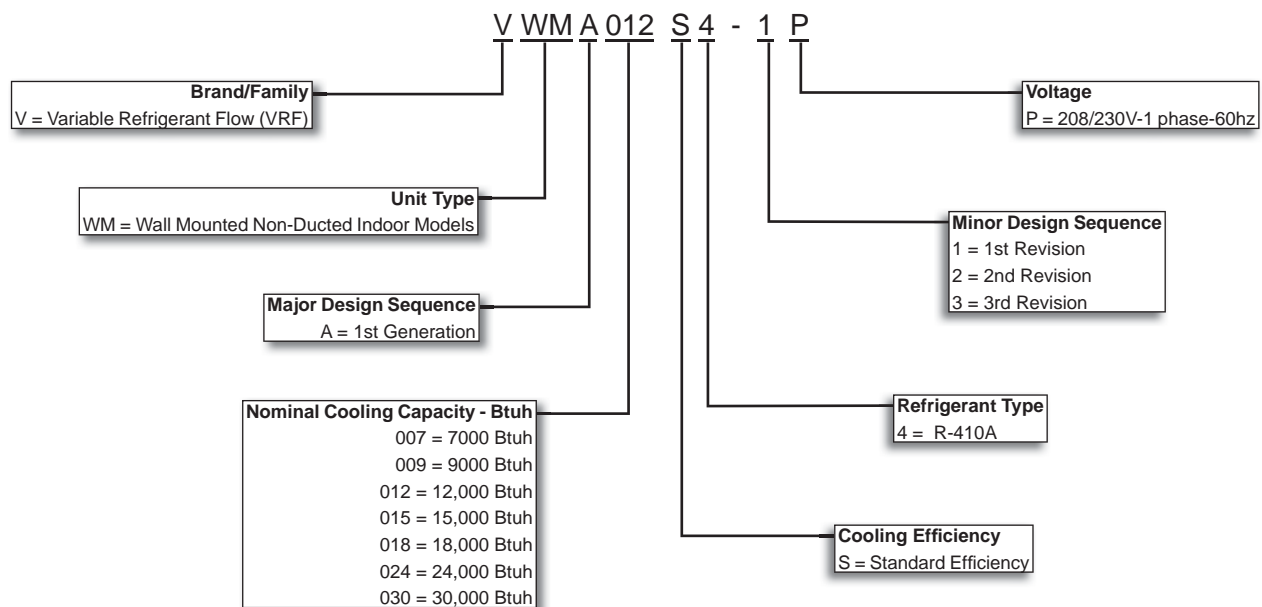
Do not touch the unit or the controller if your hands are wet.

DO NOT spray water on the indoor unit for any reason.

Do not replace a fuse with a fuse of a different rating. Do not use a jumper wire to replace a fuse. Do not insert your hands, tools or any other item into the air intake or air outlet at either the indoor or outdoor unit.

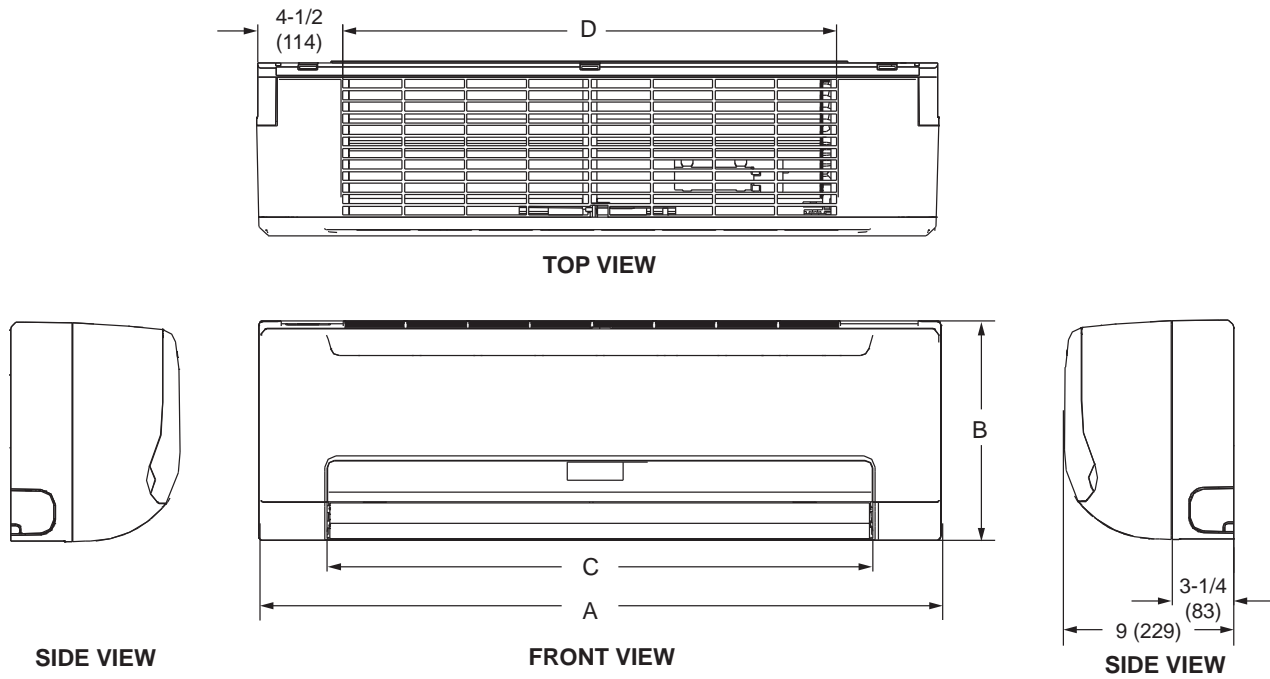
Do not allow children to operate the system.

## Model Number Identification



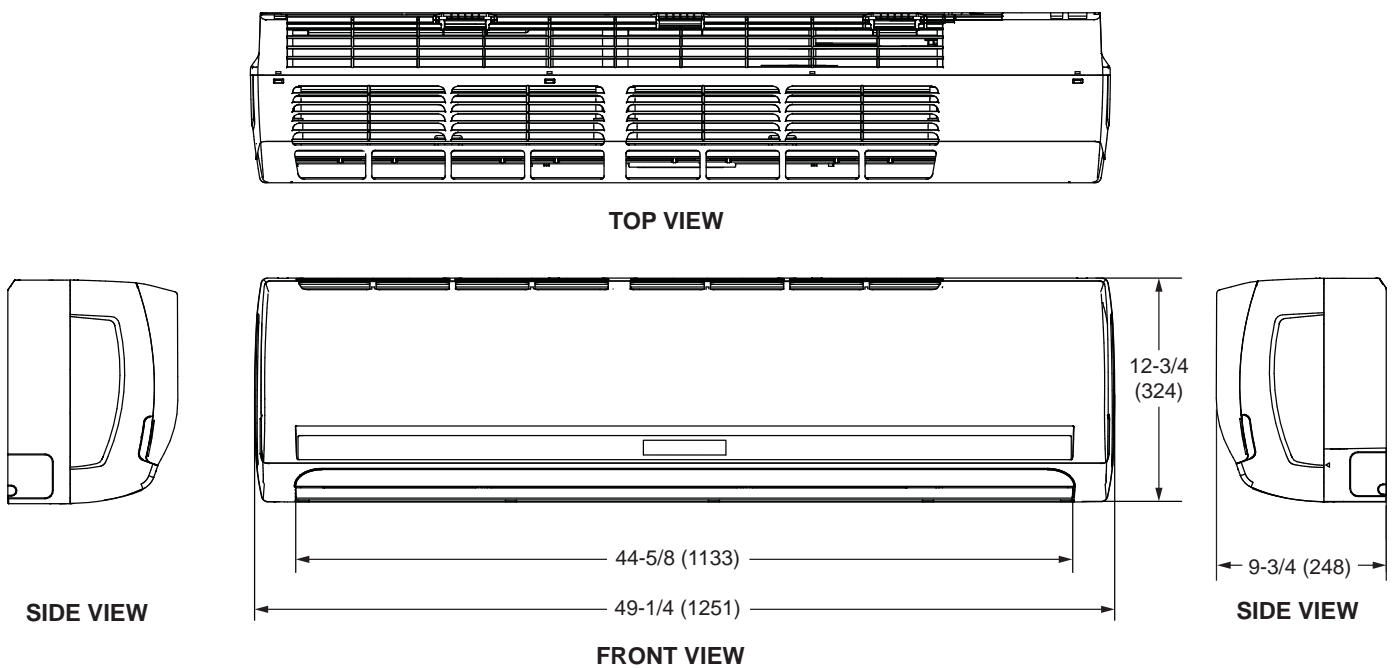
**Unit Dimensions - inches (mm)**

VWMA007S4, VWMA009S4, VWMA012S4, VWMA015S4, VWMA018S4

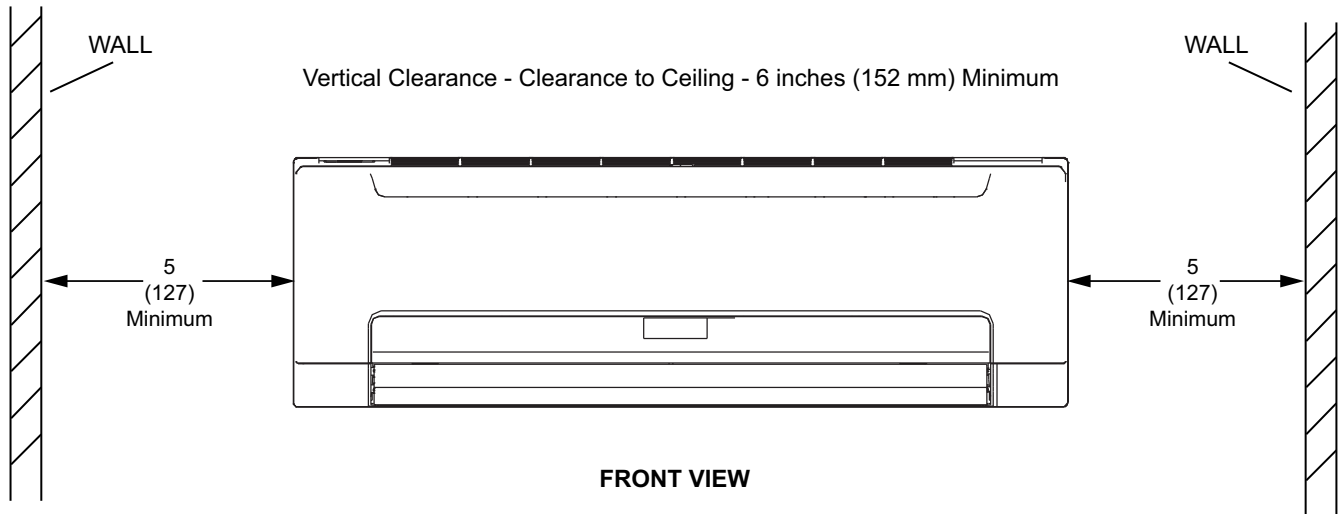


Size	A		B		C		D	
	in.	mm	in.	mm	in.	mm	in.	mm
007, 009, 012	36	914	11-3/8	289	28-7/8	733	27-1/4	692
015, 018	42-1/4	1073	12-3/8	314	35-1/8	892	33-1/8	841

VWMA024S4, VWMA030S4



## Clearances



Vertical Clearance - Clearance to Floor - 72 inches (1829 mm) Minimum  
NOTE - Provide 96 inches (2438) clearance to floor for best performance

## Indoor Unit Placement

### ⚠ WARNING

Do not install the unit in an area where flammable materials are present due to risk of explosion resulting in serious injury or death.

If the basis underneath the unit is not strong enough to support the weight of the unit, the unit could be fall out of place and cause serious injury.

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-mounted 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.

The unit should be installed at least 8 feet above the floor (if possible) to ensure maximum performance and comfort.

### AVOID

Do not install the unit in the following locations:

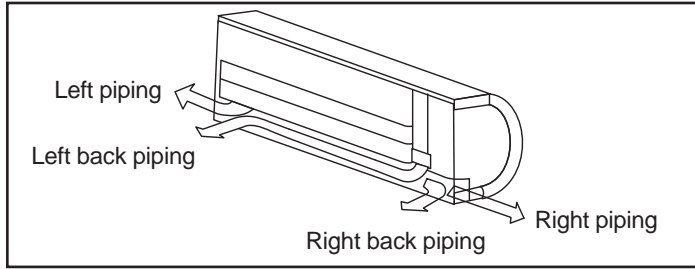
- Areas exposed to salt or other corrosive materials or caustic gases
- Areas exposed to extreme voltage variations (such as factories)
- Tightly enclosed areas that may impede service of the unit.
- Areas exposed to strong electromagnetic forces
- Areas exposed to acids or alkaline detergents (laundry rooms)

### DO:

- Locate the unit so that it is not exposed to direct sunlight.
- Locate the indoor unit so that the room can be uniformly cooled. Install unit as high as possible on the wall (8 feet above floor, if possible) for best performance.
- Select a wall location that can support the weight of the unit.
- Select a location where condensate line will have the shortest run to a suitable drain per local codes.
- Allow sufficient space around unit for proper operation and maintenance (filter must be able to be removed from the top-front of the unit).
- Install the indoor unit a minimum of 3 feet 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.

## DETERMINING WALL MOUNTING PLATE LOCATION

1. Remove the wall mounting plate from the back of the indoor unit.



**Figure 1. Determining Exit Locations**

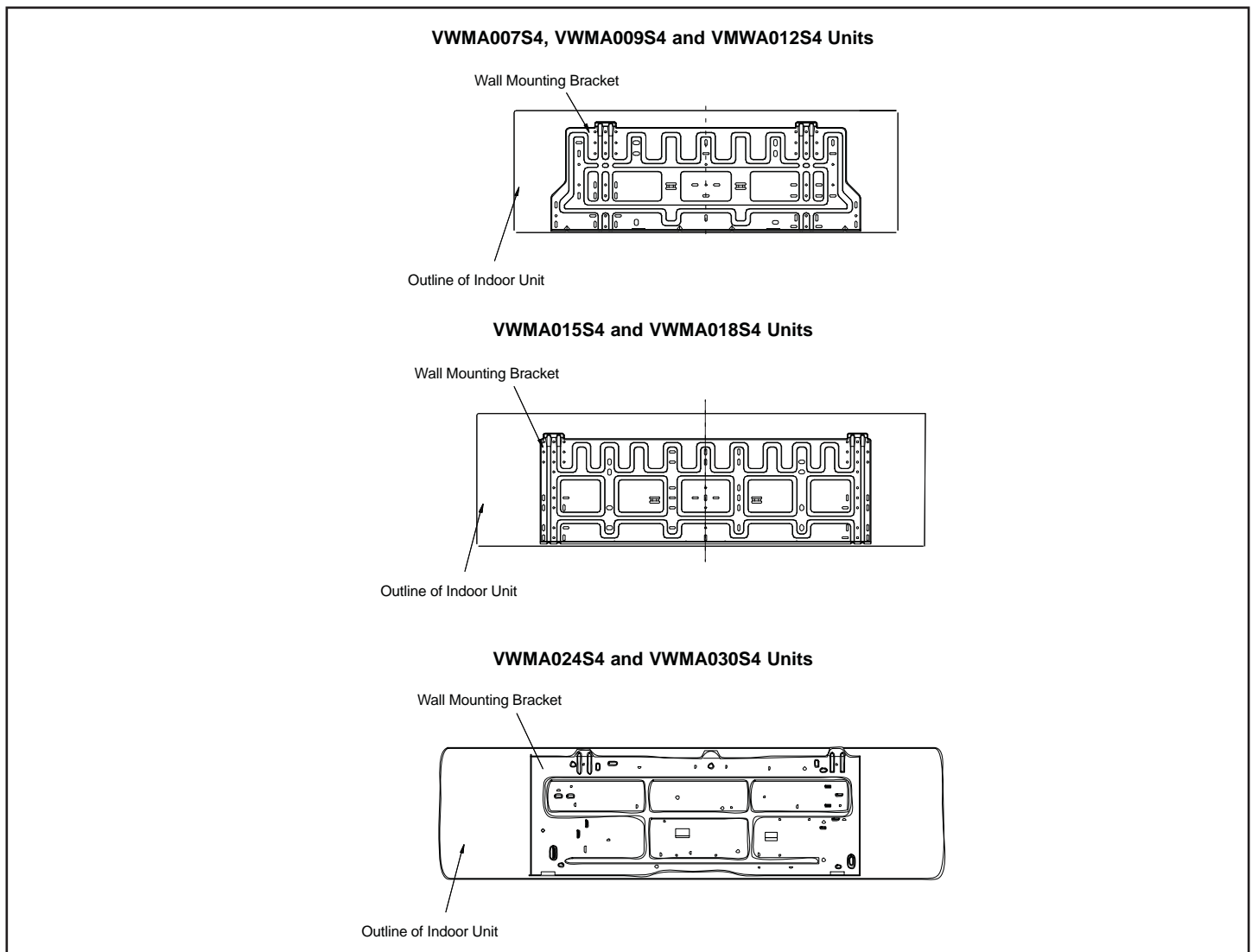
2. Determine the best exit location for utility bundle (line set, condensate line and wiring).
3. Position the wall mounting plate on the wall so that, when installed, the unit will be at least 6 inches (152 mm) from the ceiling and 5 inches (127 mm) from the wall on either side. The wall mounting plate must be level side-to-side.
4. Use the wall mounting plate as a template to determine the exit point for utility bundle. Mark the wall to facilitate drilling hole for utility bundle.

## Installation

### WALL MOUNTING PLATE INSTALLATION

Install the wall mounting plate so that it is correctly positioned horizontally and vertically. The indoor unit must be installed level on the wall to allow proper condensate drainage.

1. Use a carpenter's level or measuring tape to verify the wall mounting plate is horizontally level.
2. Secure the wall mounting plate to the wall using the provided screws and screw anchors. **NOTE** - It is important to use all screws provided to secure the wall mounting plate to the wall. Additional holes may be drilled through the metal wall mounting plate to better secure wall plate. Field-provided anchors/fixings may be required depending on wall construction. Use the appropriate type of anchors for the application.
3. The wall mounting plate must be installed flush against the wall so that the indoor unit will be flush after installation. Any space between the wall and unit will cause noise and vibration.
4. The wall mounting plate must be installed horizontally level on the wall.



**Figure 2. Wall Mounting Brackets**

## WALL SLEEVE INSTALLATION

The utility bundle may be routed out of the back of the unit or out either side. If the bundle is to be routed out the back through an external wall, use a field-provided wall sleeve to protect the utility bundle. **NOTE** - If the utility bundle will be routed out the side of the indoor unit and up the wall above a false ceiling, continue to the next section.

1. Prior to making the hole and installing the wall sleeve for the utility bundle, check to ensure that there are no other utilities located in the wall behind the hole location.

### ⚠WARNING

**Electric Shock Hazard. Can cause injury or death. Avoid location where electric wiring or conduits may be present inside the wall.**

2. Cut a hole in the wall using a suitable hole saw. Hole should be at a slight downward slant - 3/16" to 3/8" toward the outdoor side.

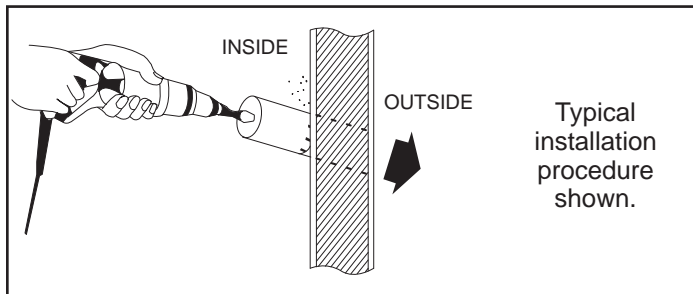


Figure 3. Boring Hole for Wall Sleeve

3. Measure the thickness of the wall from the inside edge to the outside edge and cut the field-provided wall sleeve at a slight angle 1/4" (6 mm) shorter than the thickness of the wall.

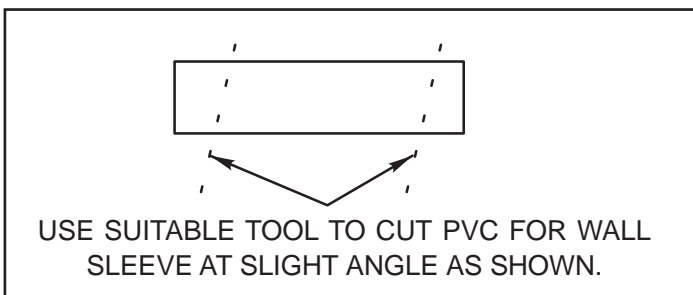


Figure 4. Cutting PVC for Wall Sleeve

4. Place the provided plastic cover over the end of the pipe that will be visible from the inside wall and insert the pipe in the wall.

**NOTE** - When passing bundled services through an exterior brick or concrete wall, protect the copper pipes and wiring from the effects of these construction materials by using a sleeve made of a suitable material. The integrity of copper pipe and wiring can deteriorate when exposed to these construction materials

## INSTALL UNIT ON WALL MOUNTING PLATE

1. A length of field-provided flexible condensate piping should be connected to the drain prior to securing the unit to the wall mounting plate.
2. If the factory-provided refrigerant piping connections and field-provided flexible condensate piping are long enough to enable final field connections after unit is installed on wall mounting plate, use field-provided tape to bundle them together.
3. The utility bundle may be routed out of the back of the unit or out either side. If the bundle is to be routed out the back through an external wall, feed the utility bundle through the wall sleeve. If the utility bundle is to be routed out of the side of the indoor unit and up an inside wall, carefully form the utility bundle so that it makes a gentle 90° turn.
4. Align the back of the indoor unit with the hooks at the top of the wall mounting plate. Move the unit from side to side to make sure that it settles securely.
5. The bottom of the unit can be lifted to facilitate refrigerant piping and condensate drain connections, if necessary. See figure 6.

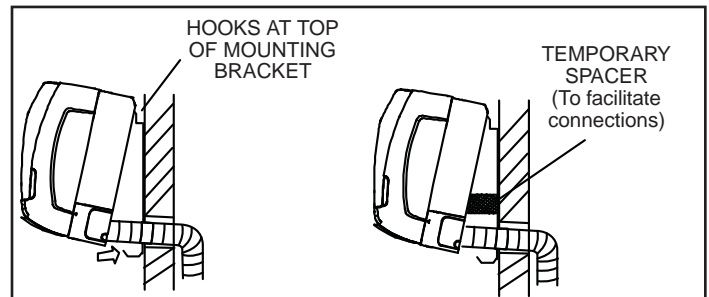


Figure 6. Secure Unit to Wall Mounting Plate

## Refrigerant Piping Connections

### ⚠ 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.

Field piping consists of two copper lines connected to the indoor unit. Table 1 lists the connection sizes at the indoor unit. The connections are made using the provided brass flare nuts at the end of the refrigerant piping connections.

**Both lines must be individually insulated.**

1. The seal on the unit refrigerant piping connections should remain in place until the last possible moment. This will prevent dust or water from getting into the refrigerant piping before it is connected.
2. CAREFULLY adjust refrigerant piping connections to suit the application (straight back, right or left).
3. Slowly loosen one of the flare nuts to release the factory nitrogen charge.
4. Remove the flare nuts from the connections on the unit and discard the seal from each of the piping connections.
5. Slide the flare nuts onto the ends of the field-provided refrigerant piping **before** using a suitable flaring tool to flare the end of the copper pipe.
6. Apply recommended HFC-410A refrigerant lubricant to the outside of the flared refrigerant lines (figure 7-A).

### IMPORTANT!

The compressor in this unit contains PVE oil (Polyvinylether). PVE oil is formulated for hydrofluorocarbon (HFC) refrigerants, such as R-410a, which this system contains. While it may have some miscibility properties with mineral-based oil and POE oil (Polyolester), it is not recommended to mix PVE oil with any other type of refrigerant oil.

Table 1. Refrigerant Piping Connections

Size (Btuh)	Liquid Line in.	Vapor Line in.
7000		
12000	1/4	1/2
15000		
18000		
24000		
30000	3/8	5/8
36000		
48000		

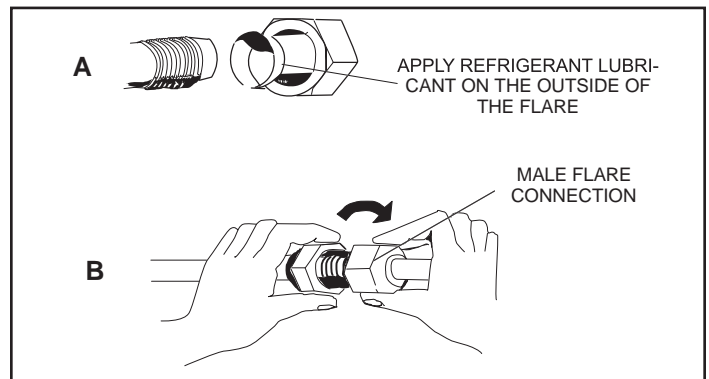


Figure 7. Making Connections (Male to Female Connection)

7. Align the threaded connections with the flared refrigerant lines. Tighten the flare nuts lightly at first to obtain a smooth match (figure 7-B).
8. Once snug, continue another half-turn on each nut which should create a leak-free joint. A torque wrench may be used to tighten flare nuts using table 2 recommendations. See figure 4. **Do not over-tighten a flared joint. Flared connections should always be accessible and must be insulated to prevent condensation.**
9. After refrigerant piping has been installed and checked for leaks, apply insulation over the connector pipe and all flared connections.

### IMPORTANT!

Always use two wrenches when tightening flare nuts to avoid twisting refrigerant piping. **DO NOT over-tighten flare nuts.**

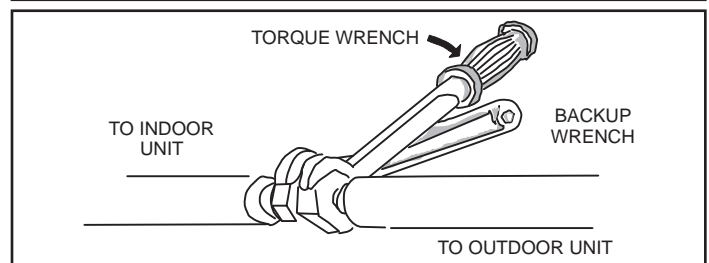


Figure 8. Tighten Flare Nut

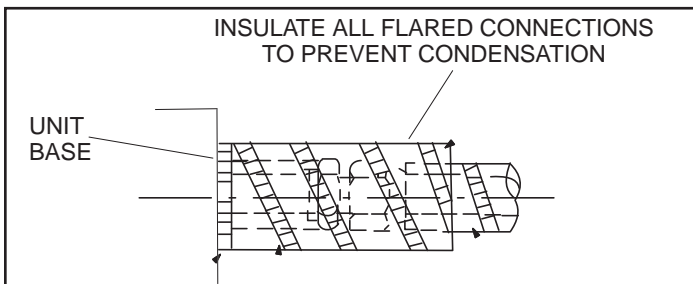


**Table 2. Flare Nut Torque Recommendations**

Outside Diameter	Recommended Torque	No torque wrench available Finger tighten and use an appropriately sized wrench to turn an additional:
Inches	U.S.	
1/4"	15 ft.-lb.	1/4 turn
3/8"	26 ft.-lb.	1/2 turn
1/2"	41 ft.-lb.	7/8 turn
5/8"	48 ft.-lb.	1 full turn

**IMPORTANT!**

**Flared connections should always be accessible and must be insulated to prevent condensation. See figure 9.**



**Figure 9. Insulate Flared Connections**

**Condensate Piping Connections**

**⚠ CAUTION**

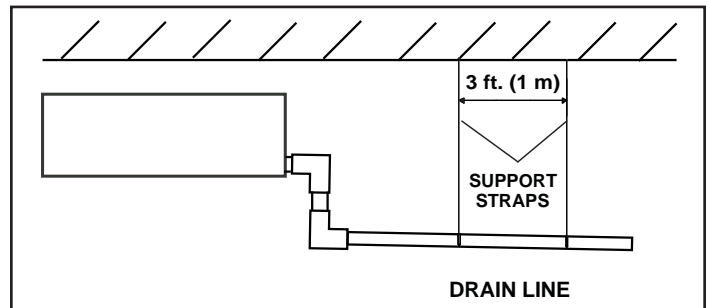
**Make sure that drain piping is properly routed and insulated in order to prevent both leaks and condensation.**

1. Make a water-tight connection between the field-provided condensate drain line and the flexible condensate connector.
2. See figure 10 for applications including a single unit and a single drain. In this case, ensure that the drain line is properly sloped (no less than 1/4 inch per foot) and condensate lines are routed to ensure moisture is drained away from the indoor unit.
3. Drain should be as short as possible and should not have any droops or kinks that would restrict condensate flow and shall be approved resistant pipe. **There must be a 2-inch space between the end of the condensate drain and the final termination point (ground, open drain, etc.) to ensure that the line will drain freely.**
4. After system installation is complete, the condensate drain line must be checked for leaks. This check is part of the commissioning sequence. If a field-provided condensate pump has been installed, it must be checked to ensure proper operation. This check is part of the commissioning sequence.

**IMPORTANT!**

**Drain should have a slope of at least 1/4 inch per foot and should be approved corrosion-resistant pipe.**

**You must confirm operation of every drain and pump in the system as part of the commissioning procedure.**



**Figure 10. Condensate Drain Piping**



## Wiring Connections

### ⚠ 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.

### ⚠ CAUTION

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.

Install all wiring at least 3 feet away from televisions, radios or other electronic devices in order to avoid the possibility of interference with the unit operation. Do not install the unit near a lighting appliance that includes a ballast. The ballast may affect remote control operation.

1. Lift indoor unit front panel to access the control box over. Remove the screw(s) securing the cover. Remove the plate.
2. Locate the terminal strip in the control box. Connect the power wiring (sized per NEC/CEC and local codes) and communications cable (**three-conductor, shielded cable**). Refer to unit nameplate for rated voltage.
3. If the indoor unit is the final unit in a group that is wired in series, install the provided resistor across terminals P and Q.
4. Remove spacer. Secure bottom of unit to wall mounting bracket. Continue with installation of outdoor unit and system commissioning.

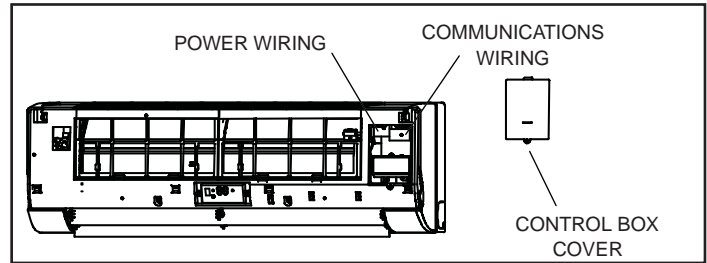


Figure 11. Accessing Control Box

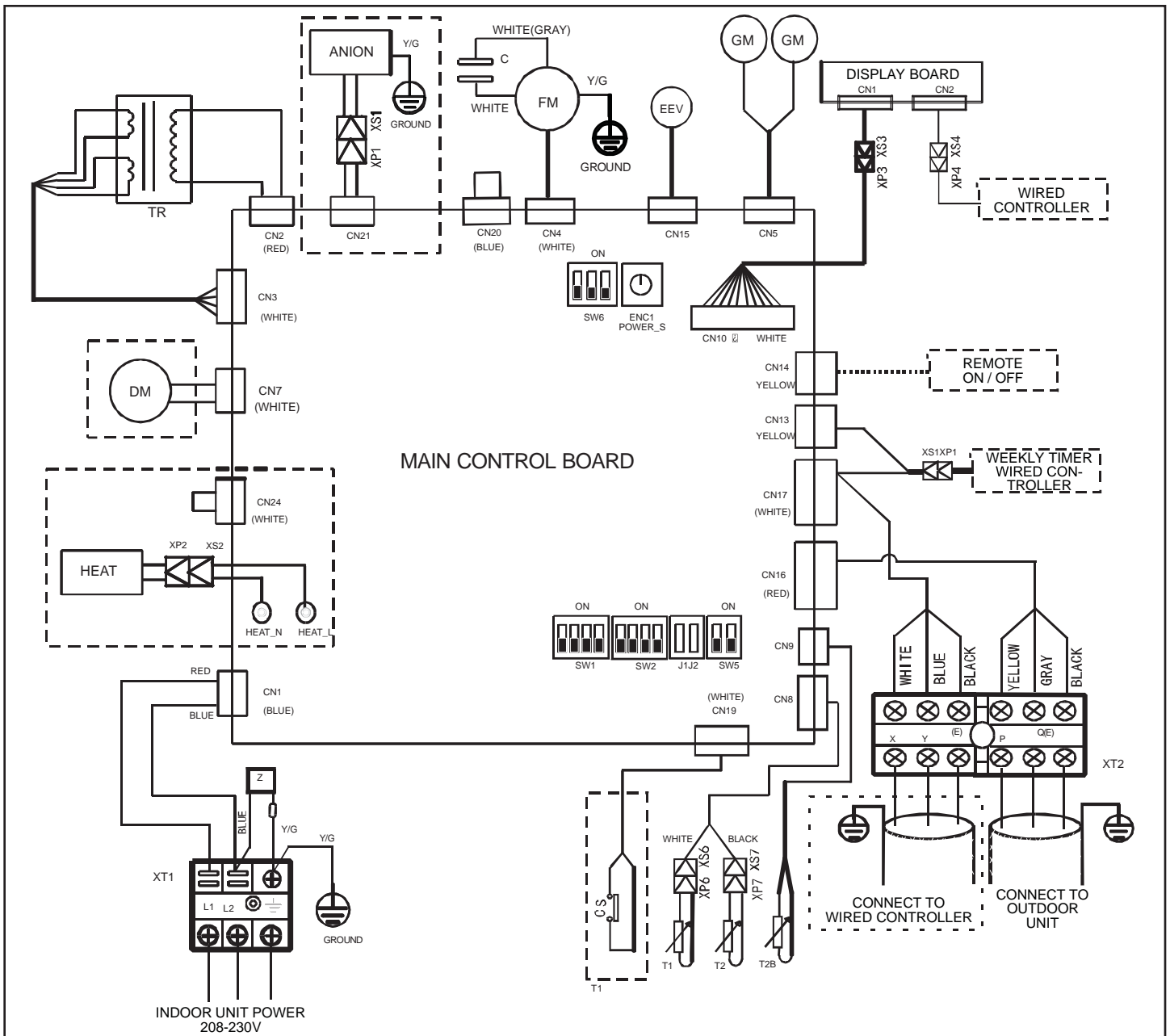
## Network Address and Commissioning

After the system has been installed, each indoor unit must be assigned an address as part of the commissioning procedure.

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.

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



KEY	COMPONENT
FM	INDOOR FAN
EEV	ELECTRONIC EXPANSION VALVE
T1	INLET AIR TEMP.
T2B	EVAP OUTLET TEMP. (COOLING MODE)
T2	COIL TEMP.
XP1-7	PLUG
XS1-7	JACK
TR	TRANSFORMER
XT1-2	TERMINAL BLOCK
CS	WATER LEVEL SWITCH
C	FAN CAPACITOR
GM	SWING MOTOR
DM	PUMP MOTOR
HEAT	AUXILIARY HEATER
ANION	ANION GENERATOR

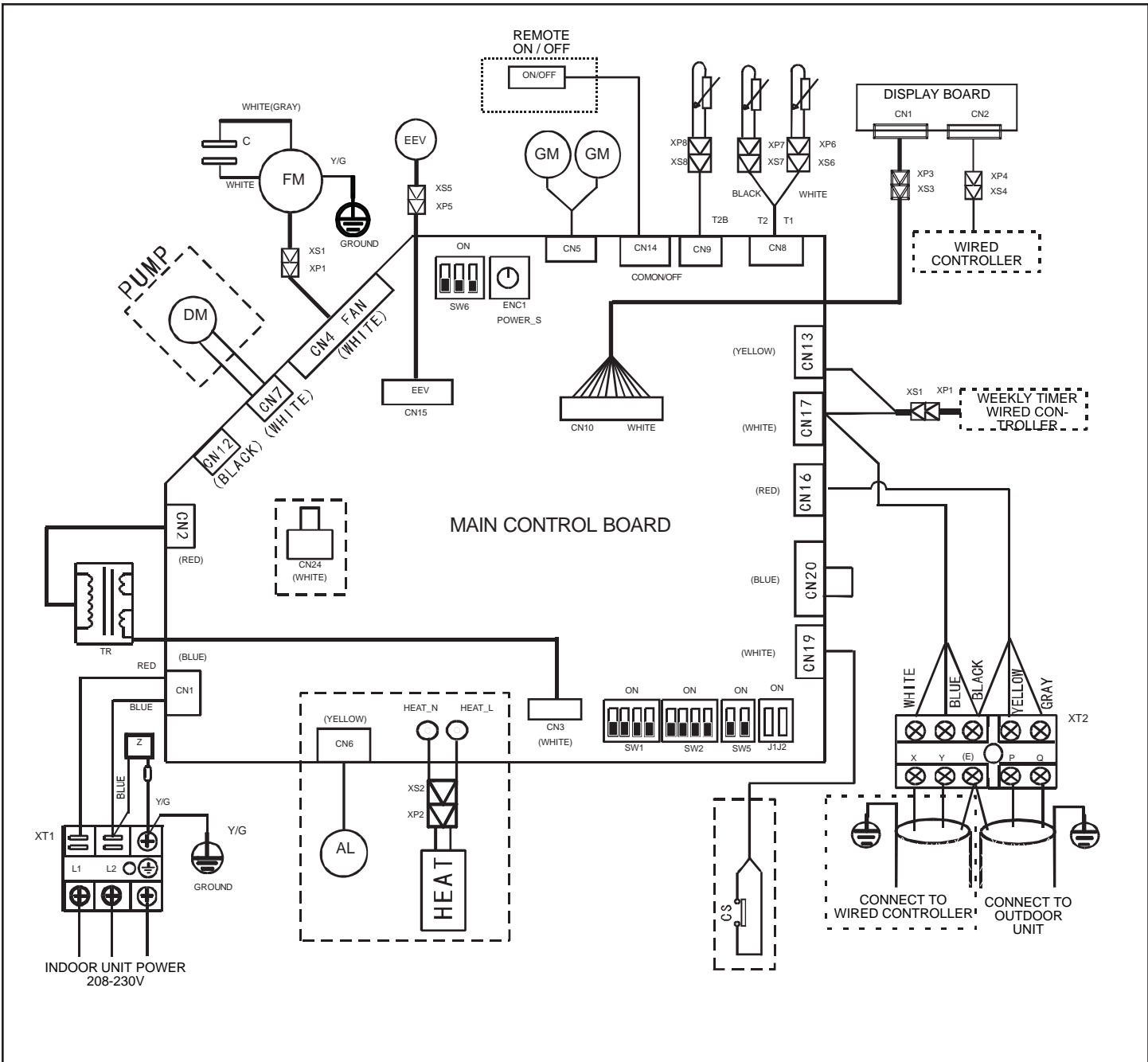
**NOTE** - Dashed line indicates optional or field-wired components.

**NOTE** - If indoor unit is the final unit in a group wired in series, install provided resistor across terminals P and Q.

**NOTE** - Use 3-conductor, shielded cable for communication wiring.

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

Figure 12. Typical VWMA007S4-1 to VWMA018S4-1 Wiring Diagram



KEY	COMPONENT
FM	INDOOR FAN
EEV	ELECTRONIC EXPANSION VALVE
T1	INLET AIR TEMP.
T2B	EVAP OUTLET TEMP. (COOLING MODE)
T2	COIL TEMP.
XP1-7	PLUG
XS1-7	JACK
TR	TRANSFORMER
XT1-2	TERMINAL BLOCK
CS	WATER LEVEL SWITCH
C	FAN CAPACITOR
GM	SWING MOTOR
DM	PUMP MOTOR
HEAT	AUXILIARY HEATER
AL	ALARM

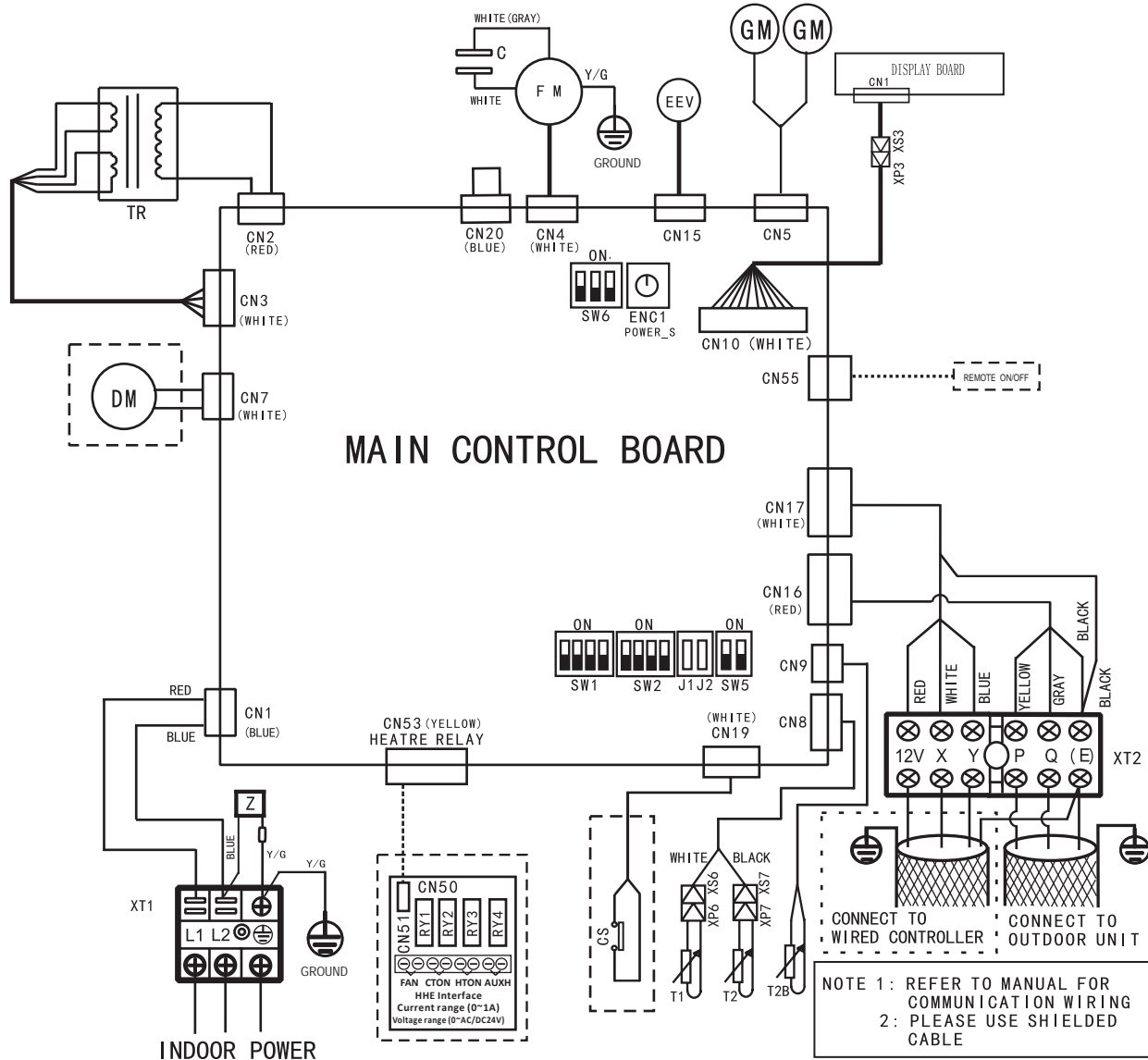
**NOTE** - Dashed line indicates optional or field-wired components.

**NOTE** - If indoor unit is the final unit in a group wired in series, install provided resistor across terminals P and Q.

**NOTE** - Use 3-conductor, shielded cable for communication wiring.

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

Figure 13. Typical VWMA024S4-1 to VWMA030S4-1 Wiring Diagram



KEY	COMPONENT
FM	INDOOR FAN
EEV	ELECTRONIC EXPANSION VALVE
T1	INLET AIR TEMP.
T2B	EVAP OUTLET TEMP IN COOLING MODE
T2	COIL TEMP.
XP1-7	PLUG
XS1-7	JACK
C	FAN CAPACITOR
TR	TRANSFORMER
GM	SWING MOTOR
Z	TRANSIENT VOLTAGE SUPPRESSOR
DM	PUMP MOTOR
CS	WATER LEVEL SWITCH
XT1-2	TERMINAL BLOCK
ANION	ANION GENERATOR

NOTE:  
COMPONENT IN DASH  
LINE IS OPTIONAL  
OR FIELD WIRING

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

Figure 14. Typical VWMA007S4-2 to VWMA018S4-2 Wiring Diagram

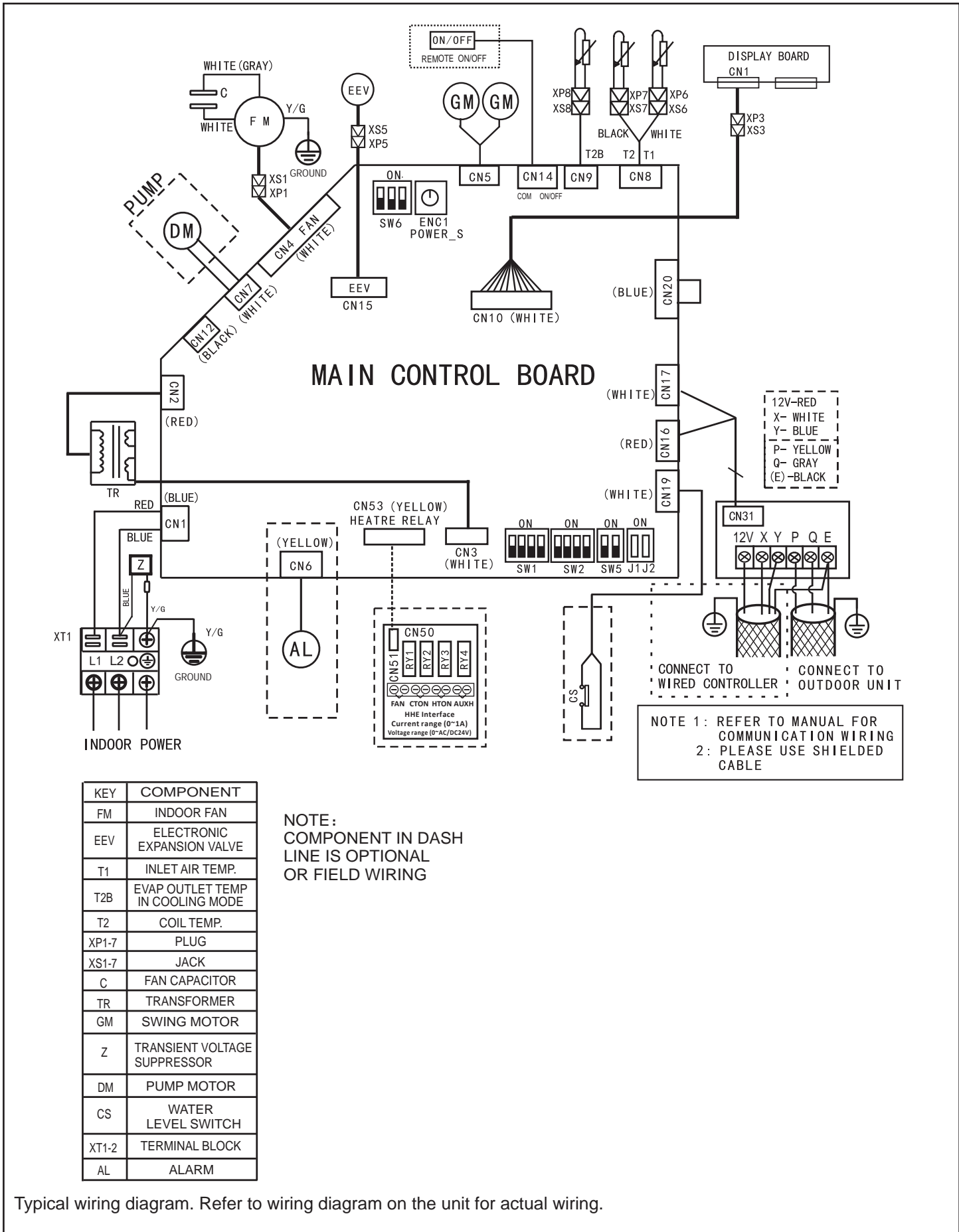
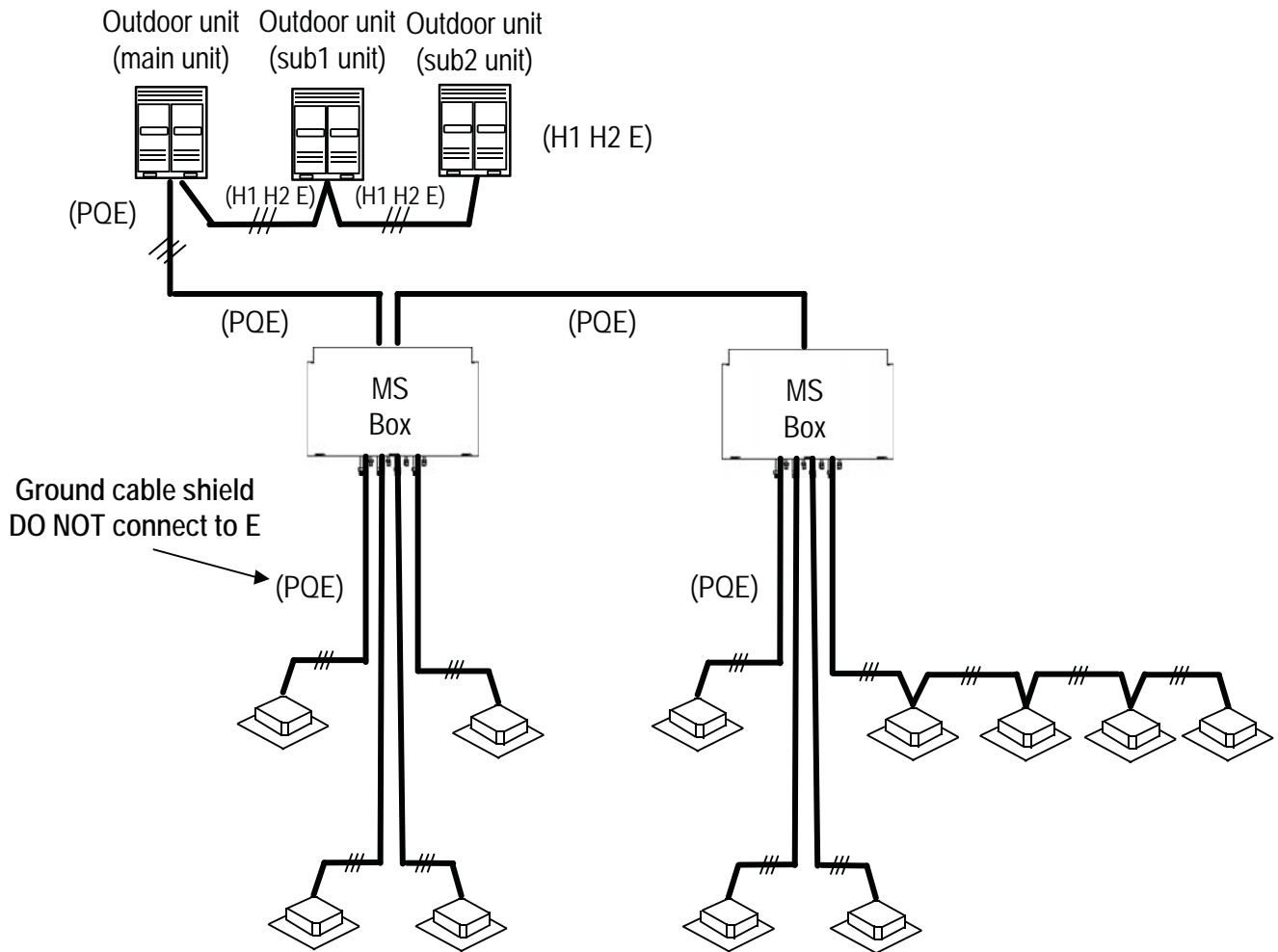




Figure 15. Typical VVMA024S4-2 to VVMA030S4-2 Wiring Diagram



 Install a terminating resistor at the last indoor unit terminals P and Q of the daisy chain and for each individual unit when connected directly to an MS Box port.

 All shields of shielded cable connect to GROUND terminal, **not to terminal E**.

18 GA., stranded, 3-conductor, shielded control wire (polarity sensitive).

Typical Wiring Diagram, NEC/CEC and Local Codes apply.

NOTE - Each communication wire from the MS box should follow the refrigerant piping for that port.

**Figure 16. Typical Communication Wiring Diagram (VRF Heat Recovery System)**