

INSTALLATION MANUAL

PREMIUM DUCTLESS SINGLE-SPLIT AIR CONDITIONERS AND HEAT PUMPS

MODELS: 22 SEER

3/4 to 3 TONS – 1 PHASE



Intertek

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RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE

SECTION I: GENERAL

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

IMPORTANT

These units must be installed as a matched system as specified in the UPG Ductless Technical Guide.

SECTION II: SAFETY



This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.

Understand and pay particular attention to the signal words **DANGER**, **WARNING**, or **CAUTION**.

DANGER indicates an **imminently** hazardous situation, which, if not avoided, **will result in death or serious injury**.

WARNING indicates a **potentially** hazardous situation, which, if not avoided, **could result in death or serious injury**.

CAUTION indicates a **potentially** hazardous situation, which, if not avoided **may result in minor or moderate injury**. It is also used to alert against unsafe practices and hazards involving only property damage.

WARNING

Improper or incomplete installation, adjustment, alteration, service or maintenance could cause personal injury, loss of life, or damage to property. Installation and service must be performed by a licensed professional dealer or contractor.

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

- The unit should be installed by an authorized dealer or contractor according to local codes and in compliance with this manual.
- Follow the instructions detailed in the installation manual.
- Confirm proper insulating, taping and bundling of refrigeration lines, main power lines and drain line (see procedure starting on Page 14).
- Perform electrical work according to the installation manual and local codes. Be sure to use a dedicated circuit (do not connect other electrical appliances to the same circuit).
- Ground the unit correctly - do not connect the ground wire to a gas pipe, lightning rod, telephone ground or water pipe. Defective grounding could cause equipment malfunction and/or electric shock.
- Do not damage the wires.
- Shut off the main power when setting up the indoor P.C. board or wiring.
- Use the specified wires to securely connect the indoor and outdoor units. Attach the wires firmly and avoid applying too much pressure to the terminal block - Stranded wire is highly recommended to connect the outdoor unit to the indoor unit. The stranded wire ensures proper system communication and operation.
- Do not install the unit in a place where flammable gas may leak.
- Do not use intermediate connection of the power cord or a power extension cord.
- The refrigerant temperature tends to get very high. Make sure you keep the electrical wires away from the copper tube.
- Use the parts provided or specified parts for the installation work.
- Securely attach the electrical cover to the indoor unit and the service panel to the outdoor unit.
- When installing or relocating the unit, make sure that no substance other than the specified refrigerant (R410A) enters the refrigerant circuit.
- Do not discharge the refrigerant into the atmosphere. Check that the refrigerant gas does not leak after installation has been completed. If refrigerant leaks during installation, ventilate the room.
- Use appropriate tools and piping materials for installation - the pressure of R410A is 1.6 times higher than R22. Not using the appropriate tools and materials, or improper installation could cause the pipes to burst causing an injury.
- When pumping down the refrigerant, stop the compressor before disconnecting the refrigerant pipes.
- When installing the unit, securely connect the refrigerant pipes before starting the compressor.
- Fasten a flare nut with a torque wrench as specified in this manual.
- Perform the drainage/piping work securely according to the installation manual - If there is defect in the drainage/piping work, water could drip from the unit, and damage household items.
- Do not install the outdoor unit where small animals may live. Keep the area around the unit clean
- The included remote control could be shipped in various locations in the unit packaging. Locate remote control before discarding packaging (i.e. bag assembly, styrofoam, etc.). Unit cannot be properly operated without the included remote control.

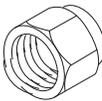
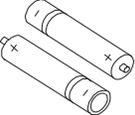
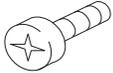
SECTION III: SHIPPING AND PACKAGING LIST

Check the unit components for shipping damage. If you see any damage, contact the carrier immediately.

ASSEMBLED INDOOR UNIT

The assembled indoor unit will include the following items:

TABLE 1: Indoor Parts

Remote Control		1	Flare nut 1/4" for small line on all size units except 30K which uses 5/8".		1
Batteries (AAA)		2	Cable routing guide with mounting hardware (18 - 24 kBtu systems only)		1
Wall mounting bracket screws		09, 12 & 18 kBtu (5) 24K kBtu (10)	Installation Manual		1
Foam tube insulation (for condensate line attached to indoor unit)		1	User's Information Manual		1

ASSEMBLED OUTDOOR UNIT

The assembled outdoor unit will include the following items which are located with the unit:

TABLE 2: Outdoor Parts

Auxiliary drain hole plugs (heat pump only)		1 - 3
Drain plug (heat pump only)		1

2. Select a location where the condensate can be easily drained out.
3. Install in a location where there is enough space to access the unit for routine maintenance (air filter can be removed for cleaning or replacement).
4. Install where airflow is not blocked.
5. Install in a location for optimized cold or warm air distribution.
6. Install in a location that's not exposed to direct sunlight.
7. Install in a location that's at least 3 ft away from a TV and radio to avoid possible interferences with the operation of the air conditioner/heat pump.
8. Install in a location that's at least 3 feet away from fluorescent and incandescent lights to avoid interference with the remote control.

SECTION IV: REQUIRED INSTALLATION TOOLS (NOT SUPPLIED)

1. Gauge manifold
2. Electronic balance for refrigerant charging
3. Phillips head screwdriver
4. Knife or wire stripper
5. Carpenters level
6. Hammer
7. Drill
8. Tube cutter
9. Tube flaring tool
10. Torque wrench
11. Adjustable wrench
12. Reamer (for de-burring)
13. Vacuum pump (For R410A)
14. Gas leakage detector

SECTION V: SELECTING THE INSTALLATION LOCATION

INDOOR UNIT (SEE FIGURE 2 FOR INSTALLATION DIMENSIONS)

1. Install the unit securely in a place that can bear the weight and vibration of the unit.

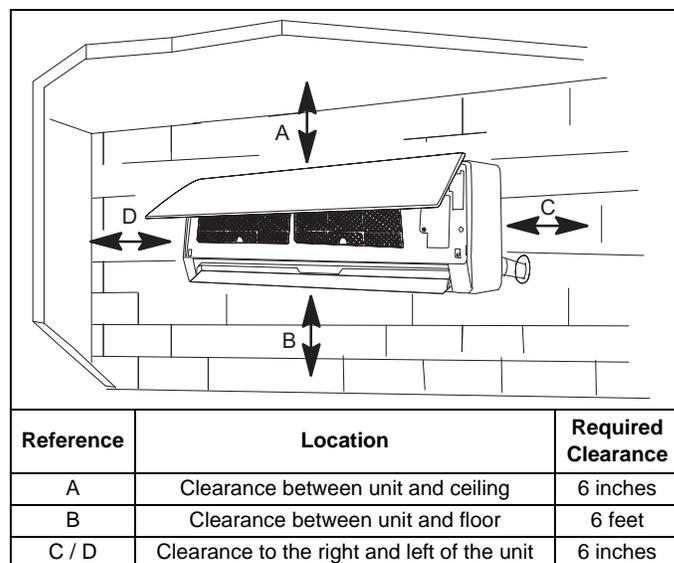


FIGURE 1: Indoor Clearances

REMOTE CONTROL

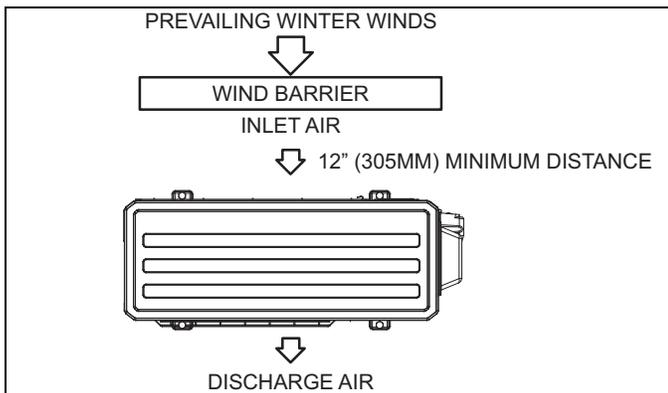
1. Keep the remote control where it is convenient to operate and easily visible.
2. Keep the remote control away from children.
3. When using the I FEEL feature, select a location for the remote control that's about 4 ft. above the floor.

NOTICE

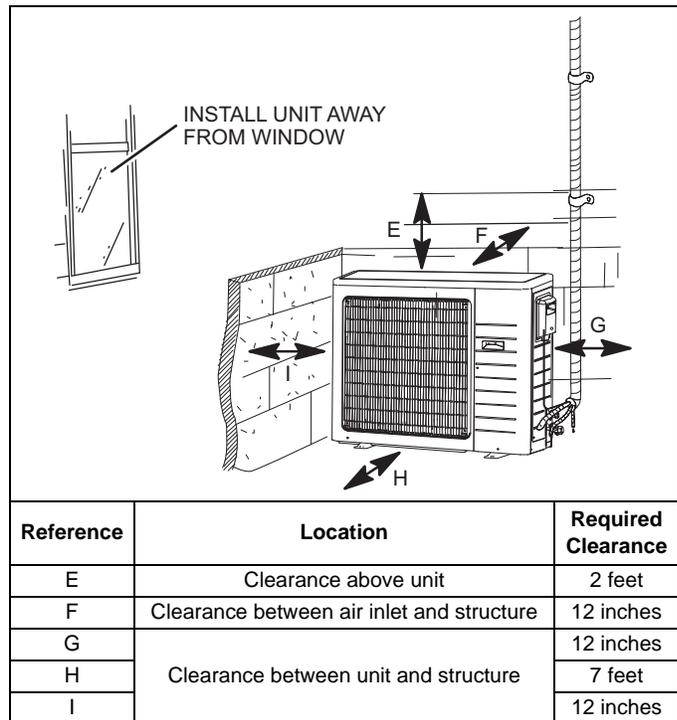
In rooms where inverter type fluorescent lamps are used, the signal from the wireless remote controller may not be received.

OUTDOOR UNIT (SEE FIGURE 3 FOR INSTALLATION DIMENSIONS)

- Some localities are adopting sound ordinances based on the unit's sound level registered from the adjacent property, not from the property where the unit is installed. Install the unit as far as possible from the property line.
- When possible, do not install the unit directly outside a window. Glass has a very high level of sound transmission. For proper placement of unit in relation to a window see Figure 3.
- Install unit level or, if on a slope, maintain slope tolerance of 2 degrees (or 2 inches per 5 feet) away from building structure.
- Install the unit high enough above the ground or roof to allow adequate drainage of defrost water and prevent ice or snow build-up (required for heat pumps).
- In heavy snow areas, do not locate the unit where drifting will occur. The unit base should be elevated above the depth of average snows.
- When installed in areas where low ambient temperatures exist, locate unit so winter prevailing winds do not blow directly onto outdoor unit.
- If unit coil cannot be installed away from prevailing winter winds, a wind barrier should be constructed. Size barrier at least the same height and width as outdoor unit. Install barrier 12 inches minimum from the sides of the unit in the direction of prevailing winds as illustrated in Figure 2.

**FIGURE 2:** Prevailing Wind Barrier

- Locate unit away from overhanging roof lines which would allow water or ice to drop on, or in front of, coil or into unit.
- Install in a location that has good airflow.
- Install in a location that has a rigid wall or support to minimize the sound operation and/or vibration.
- Slab or roof mounting - install the unit a minimum of 4 inches above the roof or ground surface to avoid ice build-up around the unit. Locate the unit above a load bearing wall or area of the roof that can adequately support the unit. Consult local codes for rooftop applications.
- Install in a location that's far away from combustible materials and vapors.
- Install in a location that's at least 10 ft away from a TV and radio antennas to avoid possible interferences with the operation of the air conditioner/heat pump.
- Install the unit horizontally.

**FIGURE 3:** Clearances for Outdoor Unit**NOTICE**

*It is advisable to make a piping loop near outdoor unit so as to reduce vibration.
For increased efficiency, install the outdoor unit in a location where continuous direct sunlight or excessive water can be avoided as much as possible.*

NOTICE

When operating the air conditioner in low outside temperature, be sure to follow the instructions described below.

- Never install the outdoor unit in a place where its air inlet/outlet side may be exposed directly to wind.
- To prevent exposure to wind, install the outdoor unit with its air inlet side facing the wall and a baffle board on the air outlet side.

Avoid the following places for installation where air conditioner trouble is liable to occur.

- Where flammable gas could leak.
- Where there is an excessive amount of machine oil in the air.
- Where sulfide gas is generated such as a hot spring.
- Where there is high-frequency equipment.

CONDENSATE DRAINAGE REQUIREMENT (HEAT PUMP ONLY)

Condensate formed during the heating and defrost processes must be drained from heat pump units. Drain holes are provided in the base of the units to ensure proper drainage. Heat pumps must be raised when installed on a concrete pad or the ground to allow drainage to occur. If the heat pump unit is installed on a wall mounting bracket, insert the provided drain connector into one of the 1 inch drain holes and attached a field-provided insulated drain hose to the connector. Use the provided rubber plugs to cover any unused drain holes. See Figure 4.

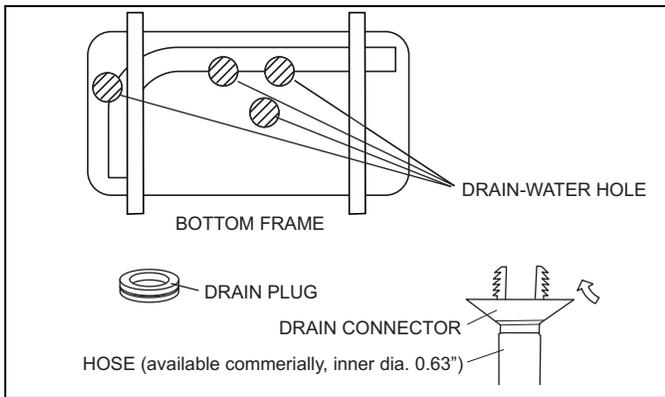


FIGURE 4: Condensate Drainage

SECTION VI: SPECIFICATIONS

POWER SUPPLY AND INDOOR/OUTDOOR WIRE CONNECTION

- The system should be powered from a dedicated circuit.
- Wiring work should be based on applicable technical standards.
- Wiring connections should be made following the provided diagrams.
- Make sure all electrical connections are securely tightened.

Solid conductor AWG14 or stranded conductor AWG14 are the MINIMUM allowable wire sizes. There are some applications that will require larger gauge conductors depending on the voltage and amperage ratings on the data plate and the distance that the conductors will be routed. It is the installing contractor's responsibility to properly size the electrical conductors for the equipment and for the application.

All of the indoor units and outdoor units should have the electrical conductors sized using the National Electrical Code (NEC) and the local authority having jurisdiction whichever is more stringent. If the equipment is installed outside of the United States, all local codes within the country of origin must be followed.

The Ductless indoor units must have a minimum of 14 gauge, 600 volt double insulated copper conductors. The conductors for the indoor unit can be either solid or stranded copper. When possible the indoor unit should have stranded wire for the communication to ensure proper communication between the indoor and outdoor unit(s).

The Ductless outdoor units must have a minimum of 12 gauge, 600 volt double insulated copper conductors with the exception of the following models: DHPM30CSM42Q1, DHPM36CSM42Q1, and DCPM36CSM42Q1, which require 10 gauge wire. The conductors for the outdoor unit should be solid or stranded copper conductors.

NOTICE

The listed wire sizes are only minimum requirements, as previously stated, the conductors for both indoor and outdoor units must be sized using the NEC and local authority having jurisdiction.

TABLE 3: Air Conditioner Electrical Specifications

INDOOR UNIT				
Air Conditioners	DCPM09NWM42Q1	DCPM09NWM41Q1	DCPM12NWM42Q1	DCPM12NWM41Q1
Power Supply (V, Phase, Hz)	208/230V/1	115V/1	208/230V/1	115V/1
Min. Circuit Ampacity	10	16	10	16
Fan Motor (F.L.A)	0.2	0.38	0.2	0.38
INDOOR UNIT				
Air Conditioners	DCPM18NWM42Q1	DCPM24NWM42Q1	DCPM36NWM42Q1	
Power Supply (V, Phase, Hz)	208/230V/1/60HZ	208/230V/1/60HZ	208/230V/1/60HZ	
Min. Circuit Ampacity	16	16	17	
Fan Motor (F.L.A)	0.28	0.24	0.4	
OUTDOOR UNIT				
Air Conditioners	DCPM09CSM42Q1	DCPM09CSM41Q1	DCPM12CSM42Q1	DCPM12CSM41Q1
Power Supply (V, Phase, Hz)	208/230V/1	115V/1	208/230V/1	115V/1
Max. Fuse Size (time delay) (A)	15	25	15	25
Min. Circuit Ampacity	10	16	10	16
Fan Motor (F.L.A)	0.14	0.17	0.14	0.17
Compressor	R.L.A	6.21	12.23	5.34
	L.R.A	13.8	33	13.8
OUTDOOR UNIT				
Air Conditioners	DCPM18CSM42Q1	DCPM24CSM42Q1	DCPM36CSM42Q1	
Power Supply (V, Phase, Hz)	208/230V/1/60HZ	208/230V/1/60HZ	208/230V/1/60HZ	
Max. Fuse Size (time delay) (A)	20	20	25	
Min. Circuit Ampacity	16	16	17	
Fan Motor (F.L.A)	0.32	1.1	0.45	
Compressor	R.L.A	9.35	10.45	12.66
	L.R.A	/	/	/

TABLE 4: Heat Pump Electrical Specifications

INDOOR UNIT				
Heat Pumps	DHPM09NWM42Q1	DHPM09NWM41Q1	DHPM12NWM42Q1	DHPM12NWM41Q1
Power Supply (V, Phase, Hz)	208/230V/1	115V/1	208/230V/1	115V/1
Min. Circuit Ampacity	10	16	10	16
Fan Motor (F.L.A)	0.2	0.38	0.2	0.38
INDOOR UNIT				
Heat Pumps	DHPM18NWM42Q1	DHPM24NWM42Q1	DHPM30NWM42Q1	DHPM36NWM42Q1
Power Supply (V, Phase, Hz)	208/230V/1/60HZ	208/230V/1/60HZ	208/230V/1/60HZ	208/230V/1/60HZ
Min. Circuit Ampacity	16A	16A	15	23
Fan Motor (F.L.A)	0.28A	0.24A	0.4	0.47
OUTDOOR UNIT				
Heat Pumps	DHPM09CSM42Q1	DHPM09CSM41Q1	DHPM12CSM42Q1	DHPM12CSM41Q1
Power Supply (V, Phase, Hz)	208/230V/1	115V/1	208/230V/1	115V/1
Max. Fuse Size (time delay) (A)	15	25	15	25
Min. Circuit Ampacity	10	16	10	16
Fan Motor (F.L.A)	0.14	0.17	0.14	0.17
Compressor	R.L.A	6.21	12.23	5.34
	L.R.A	13.8	33	13.8
33	33	33	33	
OUTDOOR UNIT				
Heat Pumps	DHPM18CSM42Q1	DHPM24CSM42Q1	DHPM30CSM42Q1	DHPM36CSM42Q1
Power Supply (V, Phase, Hz)	208/230V/1/60HZ	208/230V/1/60HZ	208/230V/1/60HZ	208/230V/1/60HZ
Max. Fuse Size (time delay) (A)	20A	20A	25	35
Min. Circuit Ampacity	16A	16A	15	23
Fan Motor (F.L.A)	0.32A	1.1A	0.45	0.73
Compressor	R.L.A	9.35A	10.45A	11.42
	L.R.A	/	/	/

Connecting Wires and the Ground Wire

- Use double insulated copper wire with 600V insulation.
- Use copper conductors only.
- Follow all local electrical codes.

Power Supply Cable and Ground Wire

- Use copper conductors only.
- Follow all local electrical codes.

NOTICE

The the indoor unit is powered from the outdoor unit, depending on local code, a disconnect switch needs to be installed to a power supply circuit.

- To prevent condensation, insulate the two refrigerant pipes.
- Refrigerant pipe bending radius must be 4 in. (100 mm) or more.

CAUTION

Be sure to use the insulation of specified thickness (refer to Table 5). Excessive insulation may cause incorrect installation of the indoor unit, and too little insulation may cause condensate to form.

- The unit has flared connections on both indoor and outdoor sides
- Remove the valve cover from the outdoor unit then connect the pipe
- Refrigerant pipes are used to connect the indoor and outdoor units
- Be careful not to crush or over bend the pipe in pipe bending
- Refrigerant adjustment
- If pipe length exceeds 25 ft. (7.5 m), additional refrigerant (R410A) charge is required (The outdoor unit is charged with refrigerant for pipe length up to 25 ft. [7.5 m]).

SECTION VII: REFRIGERANT LINE SET REQUIREMENTS

TABLE 5: Insulation Thickness & Material Information

Pipe	Outside Diameter	Minimum Wall Thickness	Insulation Thickness	Insulation Material
	Inch (mm)			
Liquid Line	.375 (9.52)	0.0315 (0.8)	0.315 (8)	Heat Resistant Foam Plastic 0.045 Specific Gravity
Gas Line	.625 (15.9)	0.0394 (1.0)	0.315 (8)	

TABLE 6: Refrigerant Line Set Requirements

AC & HP Indoor Units		D(C,H)PM09NWM	D(C,H)PM12NWM	D(C,H)PM18NWM	D(C,H)PM24NWM	DHPM30NWM	D(C,H)PM36NWM
AC & HP Outdoor Units		D(C,H)PM09CSM	D(C,H)PM12CSM	D(C,H)PM18CSM	D(C,H)PM24CSM	DHPM30CSM	D(C,H)PM36CSM
Connection Pipe length	ft.	24.6	24.6	24.6	24.6	24.6	24.6
Connection Pipe Gas Additional Charge	oz/ft.	0.2	0.2	0.2	0.2	0.5	0.5
Outer Diameter Liquid Pipe	Inch	1/4	1/4	1/4	1/4	1/4	1/4
Outer Diameter Gas Pipe	Inch	3/8	3/8	1/2	1/2	5/8	5/8
Max Distance Height	ft.	32.8	32.8	32.8	32.8	32.8	32.8
Max Distance Length	ft.	49.2	49.2	82	82	98.4	98.4
Refrigerant Metering Device Type		Electronic Expansion Valve					

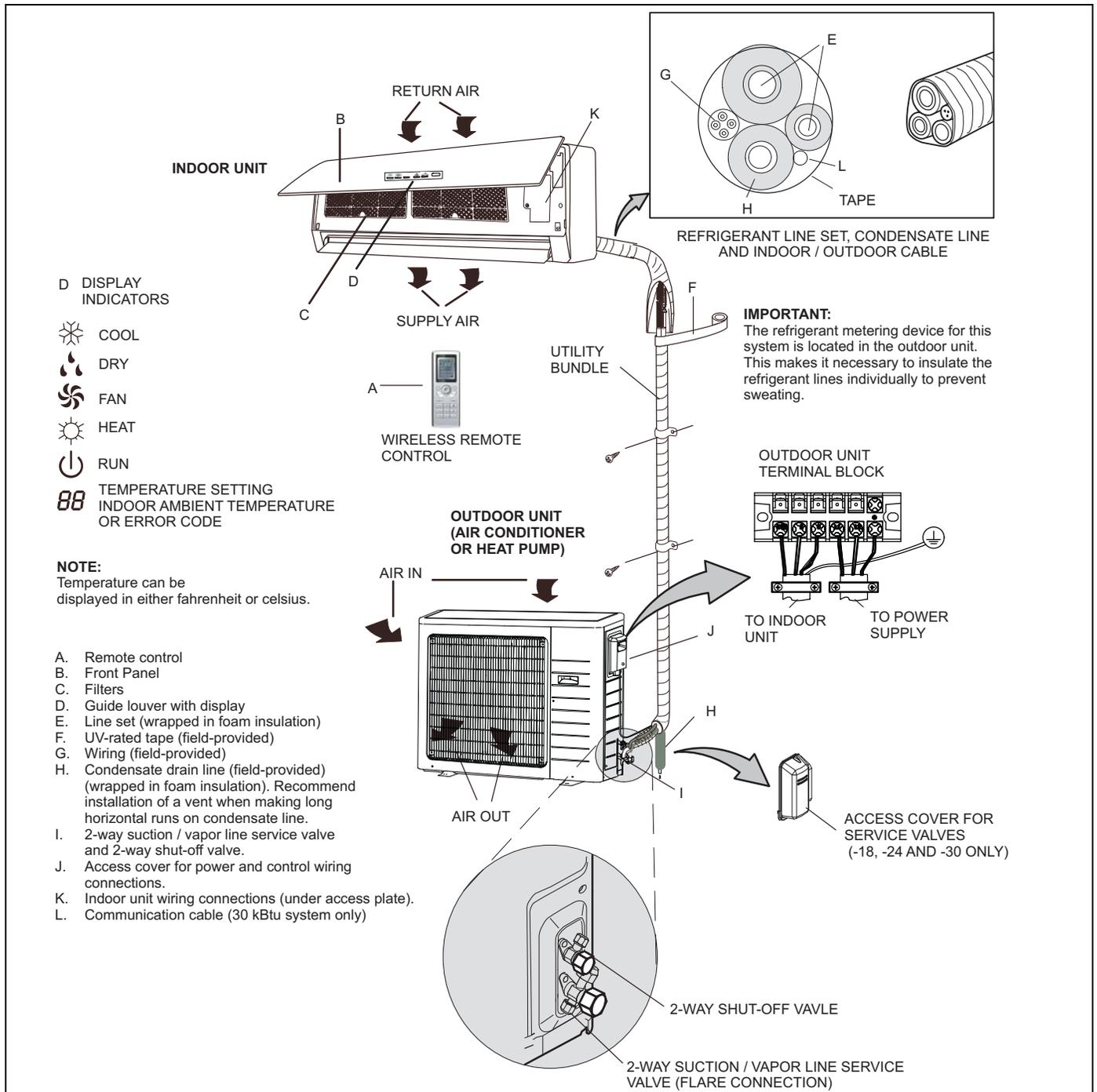


FIGURE 5: Typical System Components

SECTION VIII: UNIT DIMENSIONS

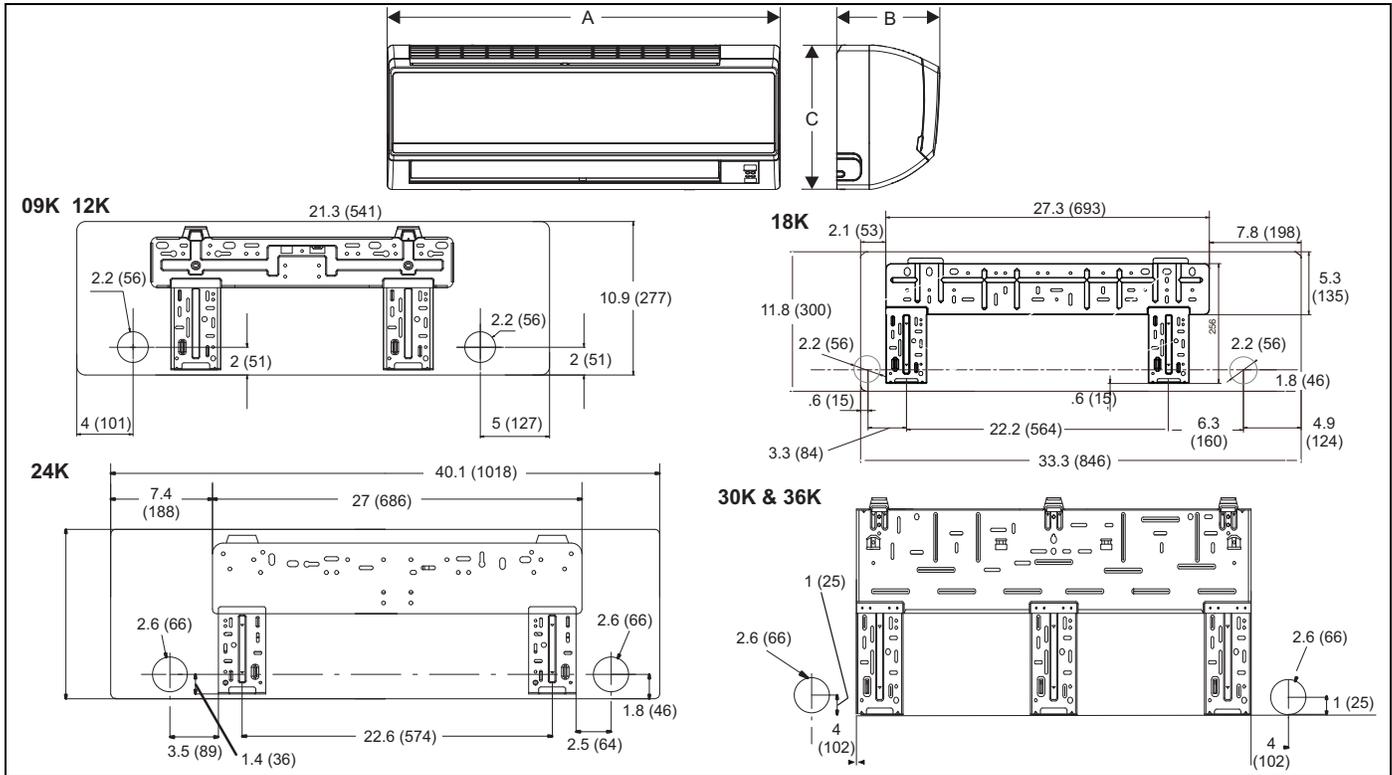


FIGURE 6: Indoor Unit Mounting Brackets with Weights & Dimensions

TABLE 7: Indoor Unit Dimensions

Model Size	A	B	C	Unit Gross Weight	
				Air Conditioner	Heat Pump
09K & 12K	33 (838)	7 (178)	10.9 (277)	31 lbs (14 kg)	37 lbs (17 kg)
18K	37 (940)	8 (203)	12 (305)	31 lbs (14 kg)	46 lbs (21 kg)
24K	39.8 (1011)	8.5 (216)	12.4 (315)	46 lbs (21 kg)	56 lbs (25 kg)
30K & 36KK	53 (1346)	10 (254)	12.9 (328)	NA	60 lbs (27 kg)

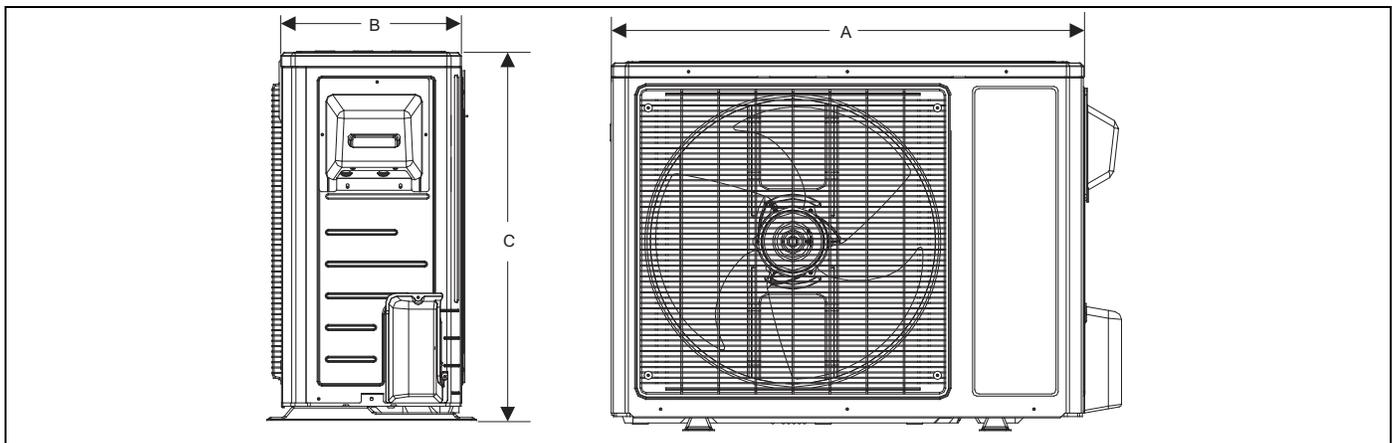


FIGURE 7: Outdoor Unit Weights & Dimensions

TABLE 8: Outdoor Unit Dimensions

Model Size	A	B	C	Unit Gross Weight	
				Air Conditioner	Heat Pump
09K	33 (838)	12.6 (320)	21 (533)	91 lbs (41 kg)	110 lbs (50 kg)
12K	33 (838)	12.6 (320)	21 (533)	97 lbs (44 kg)	119 lbs (54 kg)
18K	35 (889)	13.4 (340)	27.5 (699)	121 lbs (55 kg)	148 lbs (67 kg)
24K	38 (965)	16.9 (429)	31.1 (790)	132 lbs (60 kg)	161 lbs (73 kg)
30K & 36K	38 (965)	16.9 (429)	31.1 (790)	NA	163 lbs (74 kg)

SECTION IX: TORQUE REQUIREMENTS FOR CAPS AND FASTENERS

When servicing or repairing HVAC components, ensure the fasteners are appropriately tightened. The table below provides torque values for fasteners.

TABLE 9: Caps and Fasteners Torque Requirements

Parts	Recommended Torque	
	English (ft. - lb.)	Metric (Newton Meter)
Service valve cap	8 ft. - lb.	11
Sheet metal screws	16 ft. - lb.	2
Machine screws #10	27 ft. - lb.	3
Compressor bolts	7 ft. - lb.	10
Gauge port seal cap	8 ft. - lb.	11

IMPORTANT

Only use Allen wrenches of sufficient hardness (50Rc - Rockwell Harness Scale minimum). Fully insert the wrench into the valve stem recess.

Service valve stems are factory-torqued (from 9 ft-lbs for small valves, to 25 ft-lbs for large valves) to prevent refrigerant loss during shipping and handling. Using an Allen wrench rated at less than 50Rc risks rounding or breaking off the wrench, or stripping the valve stem recess.

SECTION X: INDOOR UNIT INSTALLATION

INSTALLING THE WALL MOUNTING BRACKET

Determine that the wall will support the weight of the indoor unit. Refer to system specifications for indoor unit weight. Install the wall mounting bracket and make sure it's positioned horizontally and vertically. The indoor unit must be installed level on the wall to allow proper condensate drainage.

1. Determine the best exit location for utility bundle (line set, condensate line and wiring).
2. Use the wall mounting bracket as a template to determine the exit point for utility bundle. Use a carpenter's level or tape measure to verify the wall mounting bracket is horizontally level and mark the boring points on the wall. See Figure 11.
3. Prior to making the hole and installing wall sleeve for the utility bundle, check to ensure that neither studs nor plumbing are directly located behind the hole location.
4. Secure the wall mounting bracket to the wall using the provided screws. If possible, align the rear panel screw holes with wall stud locations marked on the wall. Make sure you use as many screws into studs as possible. All other screws must be secured using plastic wall anchors. See Figure 13.
5. If the wall is made of brick, concrete or other similar material, then drill pilot holes in the wall. Insert field-provided anchors for mounting screws. See Figure 13.

NOTICE

It is important to use all screws provided to secure the wall mounting bracket to the wall. Additional holes may be drilled through the metal wall mounting bracket to better secure wall bracket to wall studs.

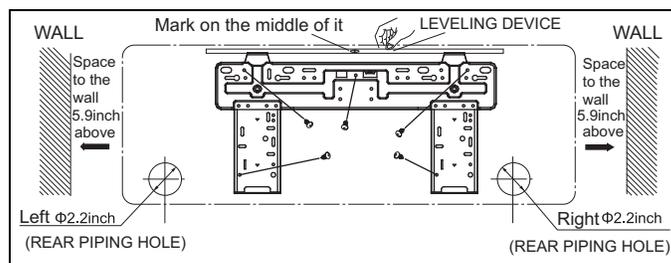


FIGURE 8: Mounting Bracket Spots

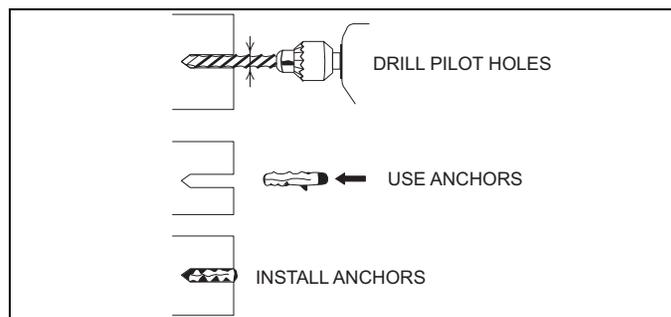


FIGURE 9: Masonry Applications

WALL HOLE DRILLING

Be sure to caulk the gaps around the pipes with caulking material to prevent water leakage.

1. Determine the wall hole position.
2. Drill a 2-1/2 inch diameter hole in the wall. The hole should be slightly downward slant 3/16" to 3/8" (5 to 10 mm) lower than the indoor side.
3. Measure the thickness of the wall from inside to outside edges and cut field-provided PVC pipe at a slight angle 1/4" (6mm) shorter than the thickness of the wall.
4. Place a field-provided plastic cover on the outside end of the PVC pipe and insert the pipe in the wall hole.
5. After completing refrigerant piping, wiring, and drain piping, caulk pipe hole gap with putty.

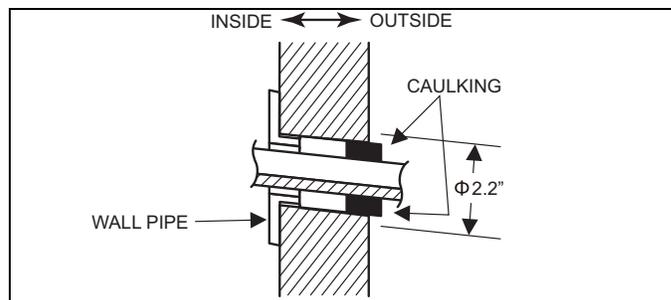


FIGURE 10: PVC Wall Sleeve Installation

SECTION XI: INDOOR UNIT WIRING CONNECTIONS

NOTICE

When the indoor unit is powered from the outdoor unit, a disconnect switch needs to be installed to power supply circuit between indoor and outdoor units depending on local codes.

IMPORTANT

Mis-wiring could damage unit or cause communication errors between indoor and outdoor unit.

1. Remove the front panel.
2. Open the front panel upward and pull it toward you.
3. Remove the terminal cover and cord clamp.
4. Insert the connecting cable (according to local codes) into the pipe hole on the wall. See Figure 11.
5. Pull the connecting cable through the cable slot on the rear case so that it protrudes about 6 inches (~15 cm) out of the front.
6. Connect the ground wire to the ground terminal of electrical box.
7. Insert the connecting cable fully into the terminal block and secure it with screws while making sure no part of its core is visible. Make sure you don't mis-wire the unit. See Figure 12.
8. Firmly tighten the terminal screws to prevent them from getting loose.
9. Secure the connecting cable with the cord clamp.
10. Attach the terminal cover and front panel on the indoor unit.

TABLE 10: Wire Color Reference

Color Code	Color	Color Code or Symbol	Color
WH	White	BN	Brown
YE	Yellow	BU	Blue
RD	Red	BK	Black
YEGN	Yellow Green		

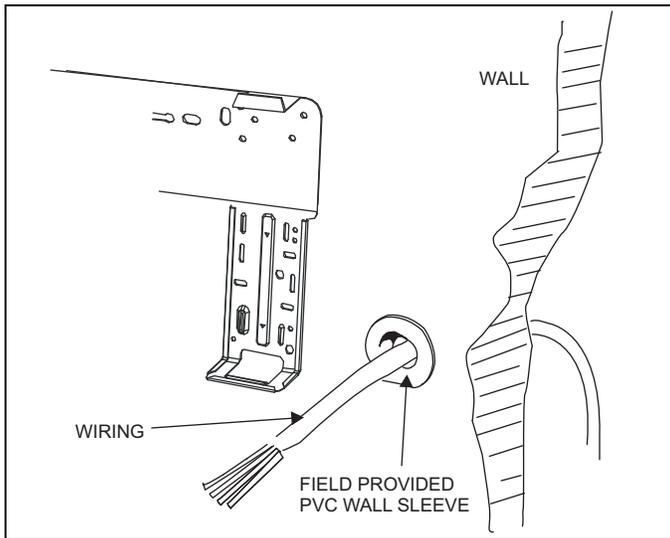


FIGURE 11: Indoor Unit Wall Mounting Bracket

CAUTION

Be sure to refer to the wiring system diagram labeled inside the front panel. Check local electrical regulations for any specific wiring instructions or limitations.

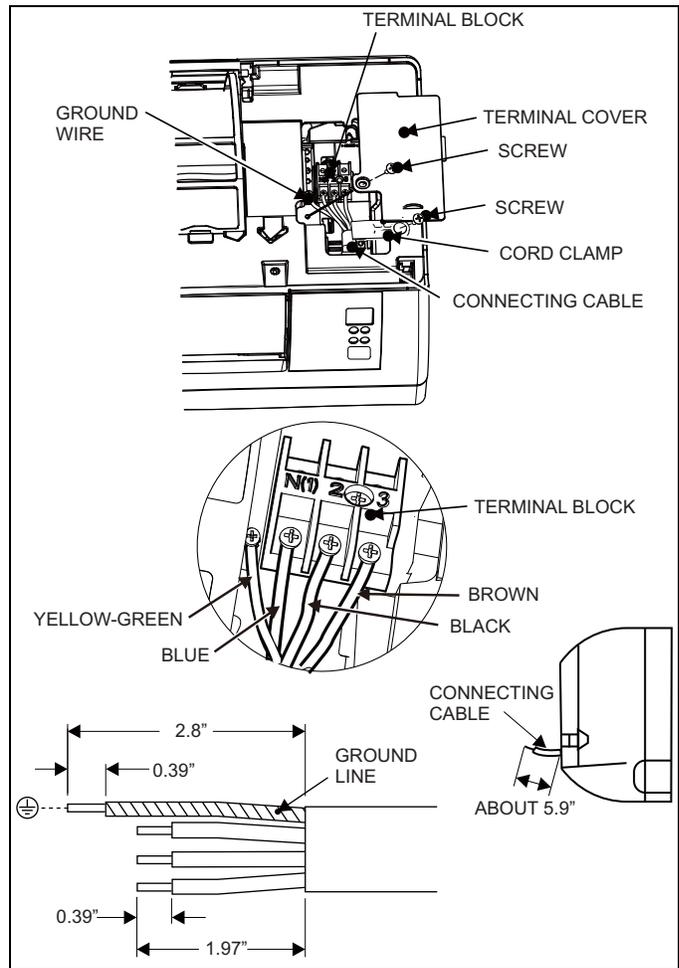


FIGURE 12: Indoor Electrical Wiring Connections

SECTION XII: PIPE FORMING AND DRAIN PIPING

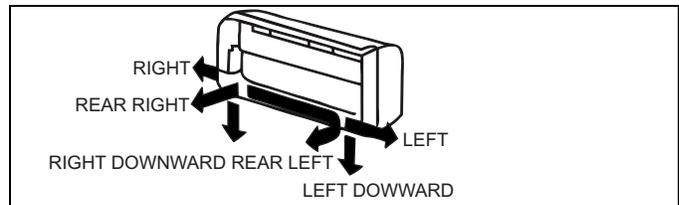


FIGURE 13: Drain Piping Outlets Option

PIPE FORMING

Interchange the drain cap and the drain hose.

1. Place the drain hose below the refrigerant piping.
2. Make sure the drain hose is not bent or kinked.
3. Do not pull the hose when applying the tape.
4. When the drain hose passes the room, be sure to wrap field-provided insulation material around it.
5. In the case of bending refrigerant piping, keep the following precautions in mind to avoid abnormal sounds that may be generated if improper work is conducted.
 - a. Do not press the refrigerant pipes onto the bottom frame.
 - b. Do not press the refrigerant pipes on the front grille.

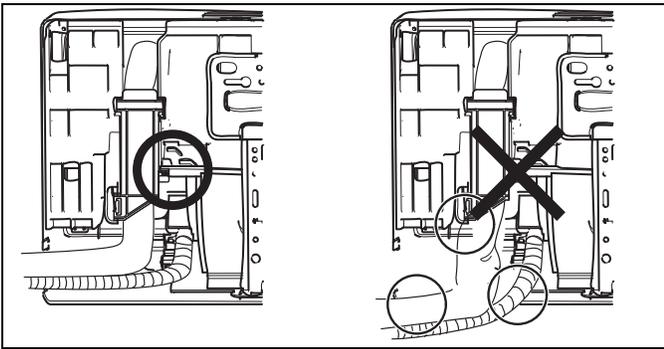


FIGURE 14: Proper and Improper Drain Piping

RIGHT OR RIGHT REAR PIPING

For Right Side Utility Bundle Exit - Cut out the corner of the right/left plastic cabinet with a hacksaw or similar tool. See Figure 15.

1. Put the refrigerant piping and the drain hose together. Position them to the left side and then firmly apply piping tape from the end.
2. Insert the drain hose into field-provided PVC sleeve and hook the upper part of the indoor unit on the wall mounting bracket.
3. Check if the indoor unit is hooked securely on the wall mounting bracket by trying to move the unit left and right.
4. Thrust the lower part of the indoor unit into the wall mounting bracket.

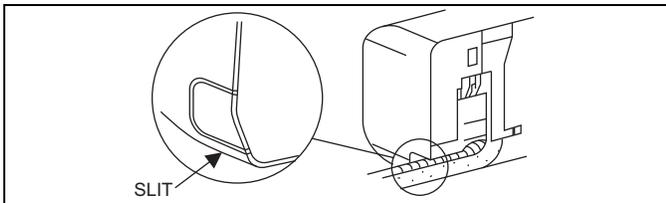


FIGURE 15: Left or Right Side Exits

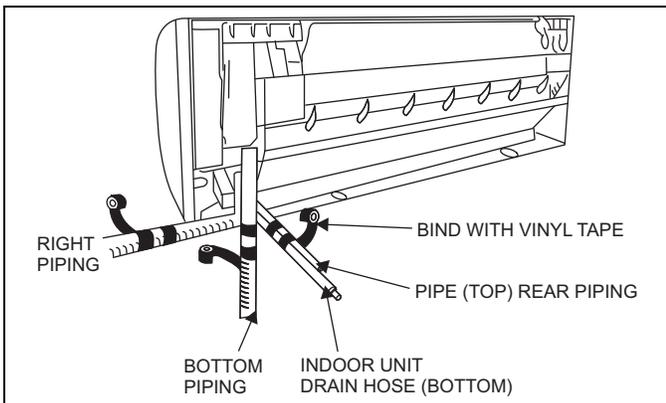


FIGURE 16: Right or Right Rear Piping

LEFT OR LEFT REAR PIPING

For Left Side Utility Bundle Exit - Cut out the corner of the right/left plastic cabinet with a hacksaw or similar tool.

Make sure you reattach the drain hose and the drain cap in case of left or left rear piping. Otherwise, it could cause drops of water to drip from the drain hose.

1. Put the refrigerant piping and the drain hose together then firmly apply felt tape from the end.
2. Pull out the drain cap at the rear right of the indoor unit.
3. Pull out the drain hose at the rear left of the indoor unit.
4. Put the drain cap into the section to which the drain hose is to be attached at the rear of the indoor unit.
5. Insert the drain hose fully into the drain pan at the rear right of the indoor unit.
6. Insert the drain hose into field-provided PVC sleeve and hook the upper part of the indoor unit on the wall mounting bracket.

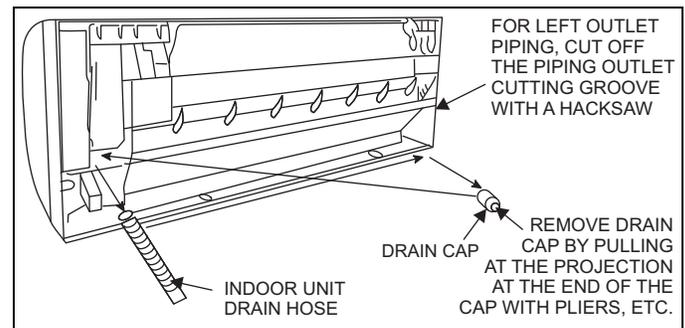


FIGURE 17: Left or Left Rear Piping

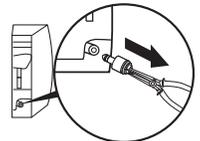
REAR OR DOWNWARD PIPING

1. Put the refrigerant piping and the drain hose together then firmly apply felt tape from the end. Use bandage stopper at the end of felt tape.
2. Insert the drain hose into field-provided PVC sleeve and hook the upper part of the indoor unit on the wall mounting bracket.

How to replace the drain plug and drain hose

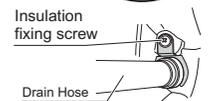
• How to remove the drain cap

Clamp drain cap with needle-nose pliers, and pull out.



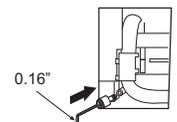
• How to remove the drain hose

The drain hose is secured in place by a screw. Remove the screw securing the drain hose, then pull out the drain hose.



• How to attach the drain cap

1. Insert hexagonal wrench (0.16inch).



2. Firmly insert drain cap.



• How to attach the drain hose

Insert the drain hose firmly until the connector contacts the insulation, then secure it in place using the original screw.

CAUTION

1. In order to align the drain hose and drain cap, be sure to insert securely and vertically. Incline insertion will cause water leakage.
2. After removing drain hose, be sure not to forget mounting drain cap.
3. Be sure to fix the drain hose with tape to the bottom of piping.
4. Prevent drain water from freezing in low temperature environment.

When installing indoor unit's drain hose outdoors, necessary measure for frost protection should be taken to prevent drain water freezing.

- Under low temperature environment (when outdoor temperature under 32 °F), after cooling operation is executed, water in the drain hose could be frozen.
- Once drain water is frozen, the drain hose will be blocked and water leakage may result from indoor unit.

DRAIN PIPING

- If the extension drain hose has to pass through a room, make sure it's wrapped with commercially sold insulation.
- The drain hose should point downward for easy drain flow.
- If the drain hose provided with the indoor unit is too short, make sure you connect it with a field-provided drain hose.
- When connecting the drain hose to the hard vinyl chloride pipe, make sure it's inserted securely into the pipe.

DRAIN HOSE JUNCTION

- If drain hose extension or embedded drain piping is required, use appropriate parts that match the hose front end. See Figure 18.
- Insert drain hose into the handle of drain pan, and join drain hose and connecting hose according to Figure 18.
- Attach the Insulation (Drain hose) to the drain hose. See Figure 19.

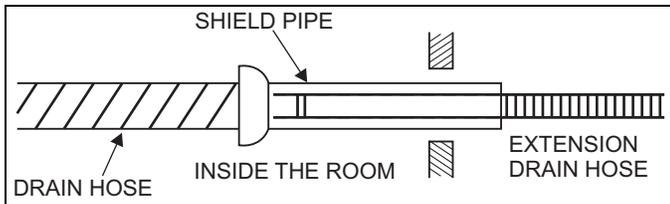


FIGURE 18: Drain Hose Extension

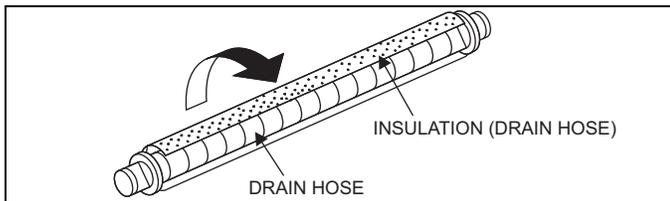


FIGURE 19: Drain Hose Insulation

CAUTION

Insert the drain hose and drain cap into the drain port, making sure that it comes in contact with the back of the drain port, and then mount it. If the drain hose is not connected properly, leaking will occur.

SECTION XIII: FLARING WORK AND PIPING CONNECTIONS

FLARING WORK

Main cause for refrigerant leakage is due to defect in the flaring work. Carry out correct flaring work using the following procedure.

1. Measure the distance between the indoor and outdoor units.
2. Cut the copper pipe about 6 to 8 inches (15 to 20 cm) longer than the measured distance with a pipe cutter.

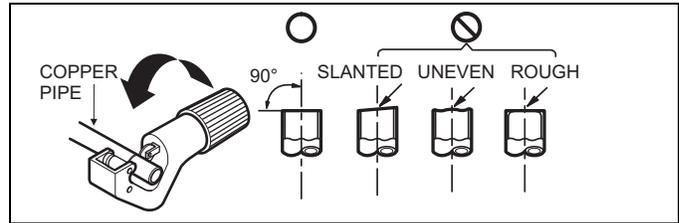


FIGURE 20: Pipe Cutting Approved Method

3. Use a pipe reamer or file to completely remove all burrs from the cut cross section of the pipe.
 - a. Put the end of the copper pipe in a downward direction to avoid having burrs drop in the piping.

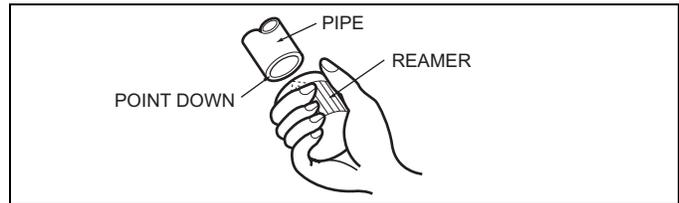


FIGURE 21: Deburring Line Set

4. Remove flare nuts attached to indoor and outdoor units then put them on pipes that have completed burrs removal (not possible to put them on after flaring work).
5. Use a flaring tool to perform flaring work at the end of the copper pipe. Use the table below as a guideline when performing flaring work.

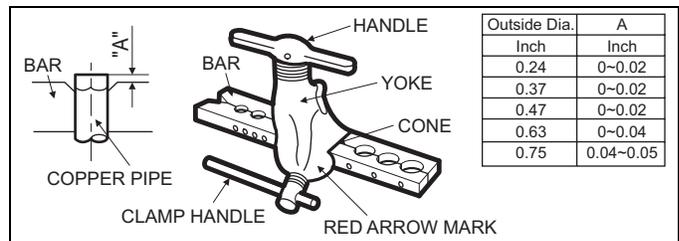


FIGURE 22: Flaring Tools

6. Check your flaring work and if it's found to be defective, cut off the defective flare section and redo number 5.

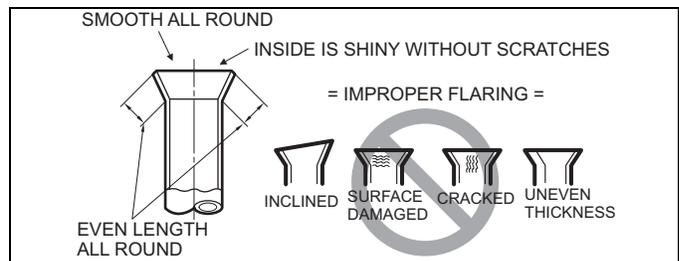


FIGURE 23: Proper and Improper Flaring

7. When flaring is complete, align the center of the pipes and sufficiently tighten the flare nut by hand.

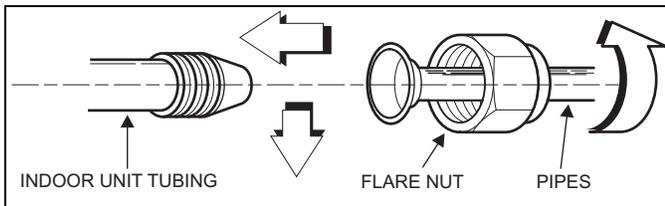


FIGURE 24: Connections at Indoor Unit

8. Tighten the flare nut using a wrench.

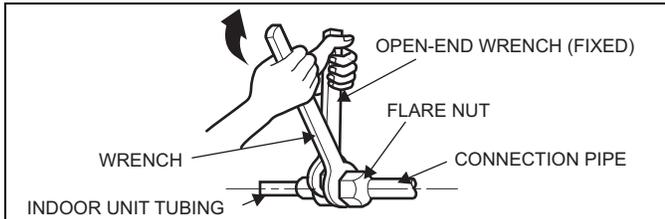


FIGURE 25: Flare Nuts Tightening

TABLE 11: Flare Nut Torque Recommendations

Outside Diameter		Recommended Torque	
Inches	mm	English (ft. - lb.)	Metric (Newton Meter)
1/4"	6.35	15 ft - lb.	20
3/8"	9.52	26 ft - lb.	35
1/2"	12.70	41 ft - lb.	55
5/8"	15.88	48 ft - lb.	65

SECTION XIV: INDOOR UNIT INSTALLATION

1. Shape the refrigerant line set so that it can be guided either out the back of the indoor unit or through either side of the indoor unit frame, then through the wall sleeve to the outside unit.
2. Pass the drain hose and refrigerant pipes through the wall hole then set the indoor unit on the mounting bracket hooks by using the markings at the top of the indoor unit as a guide.

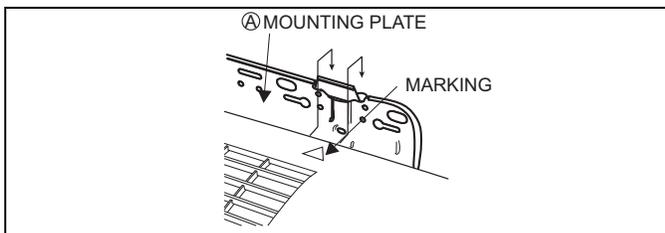


FIGURE 26: Indoor Unit Attachment to Mounting Bracket

3. Try moving the indoor unit to right and left to confirm that it is firmly hooked on the installation plate.
4. While pressing the indoor unit onto the wall, hook it at the lower part on the installation plate.

5. Carefully bend the bundle (line set, condensate line and cable) to run along the outside wall toward the outdoor unit. Downward slope of wall sleeve will ensure proper condensate drainage.

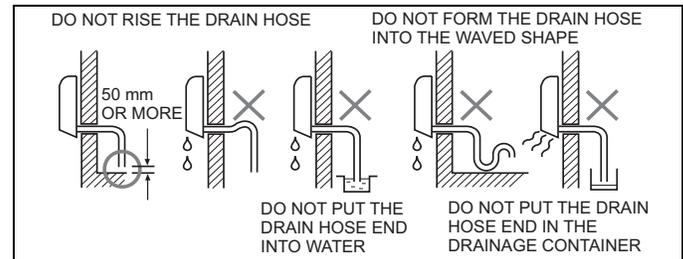


FIGURE 27: Proper and Improper Drain Hose Installation Application

Pull the indoor unit toward you to confirm that it is firmly hooked on the mounting bracket.

For detaching the indoor unit from the installation plate, pull the indoor unit toward you while pushing the bottom up at the specified places.

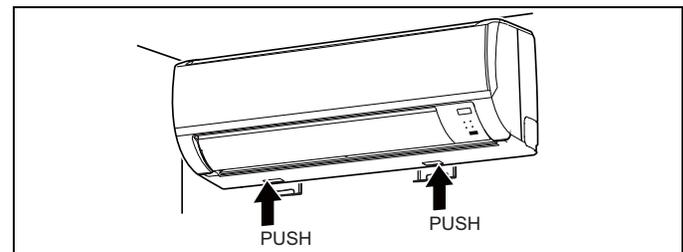


FIGURE 28: Indoor Unit Removal

6. Use the provided foam insulation to wrap the factory installed condensate line.
7. Connect indoor unit factory installed condensate line to field-provided condensate drain pipe.
8. Use tape approved for waterproofing line connections to secure the field-provided pipe to the factory-installed condensate line.
9. Put water in the drain pan and make sure that the water is being drained outside.

CAUTION

Install the drain pipe for proper drainage. Improper drainage can result in water dripping inside the room.

SECTION XV: OUTDOOR UNIT INSTALLATION

Refer to page 4 instructions when considering unit positioning and page 4 for condensate drainage requirements (heat pump).

SLAB OR ROOF MOUNTING

- Install the unit a minimum of 4 inches (102 mm) above the roof or ground surface to avoid ice build-up around the unit.
- Locate the unit above a load bearing wall or area of the roof that can adequately support the unit.
- Consult local codes for rooftop applications.

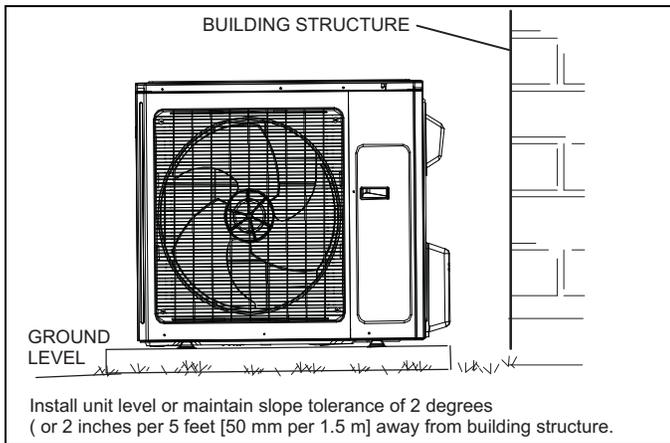


FIGURE 29: Outdoor Unit Installation

NOTICE

This system contains both refrigerant and oil. Some rubber roofing material may absorb oil. This will cause the rubber to swell when it comes into contact with oil. The rubber will then bubble and could cause leaks. Protect the roof surface to avoid exposure to refrigerant and oil during service and installation. Failure to follow this notice could result in damage to roof surface.

SECURING OUTDOOR UNIT TO SLAB OR FRAME

If the outdoor unit is installed on a field-provided slab or frame, use lag bolts or equivalent to secure the outdoor unit to the slab or frame.

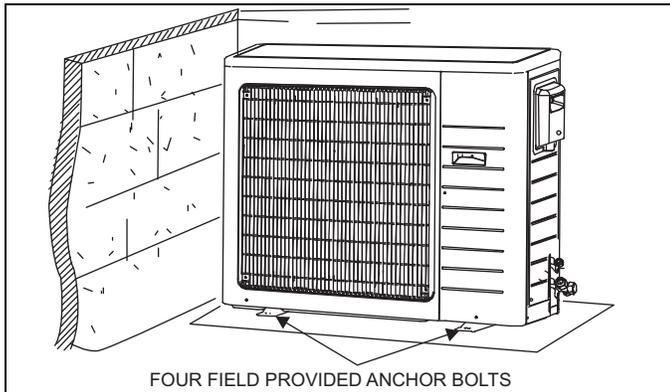


FIGURE 30: Outdoor Unit Slab or Frame Installation

SECTION XVI: OUTDOOR UNIT WIRING CONNECTIONS

IMPORTANT

In the United States, 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).

The main system circuit breaker or disconnect should be sized per unit requirements and should be installed adjacent to outdoor unit.

IMPORTANT

Mis-wiring could damage unit or cause communication errors between indoor and outdoor unit.

NOTICE

- Refer to unit nameplate for minimum circuit ampacity and maximum overcurrent protection size
- Local codes may require a disconnect between the indoor and outdoor units
- The main system circuit breaker and outdoor unit disconnect switch should be sized per local codes and unit requirements
- Stranded wire must be used to connect the outdoor unit to the indoor unit. The stranded wire is necessary to ensure proper system communication and operation.
- Make sure you use an approved circuit breaker or switch

Model	Fuse or Circuit Breaker Capacity
9K & 12K	20A
18K & 24k	25A
30K & 36k	30A

1. Remove outdoor unit access panel.
2. Route all wiring to outdoor unit through the wire routing plate.

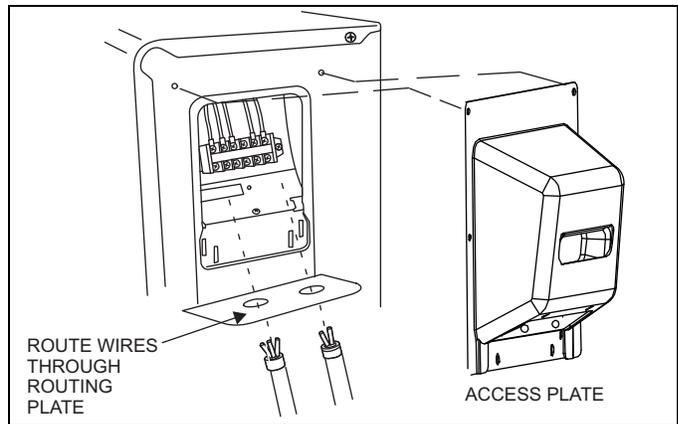


FIGURE 31: Outdoor Unit Electrical Connections

3. Connect the control wiring and power supply wiring to the outdoor unit wiring terminals according to the figures shown in this section.
4. The unit must be grounded according to local codes.
5. Fasten the power supply cord and control wiring with cord clamp.
6. Secure wiring using built-in wire strain relief.
7. Install the outdoor unit access panel back.

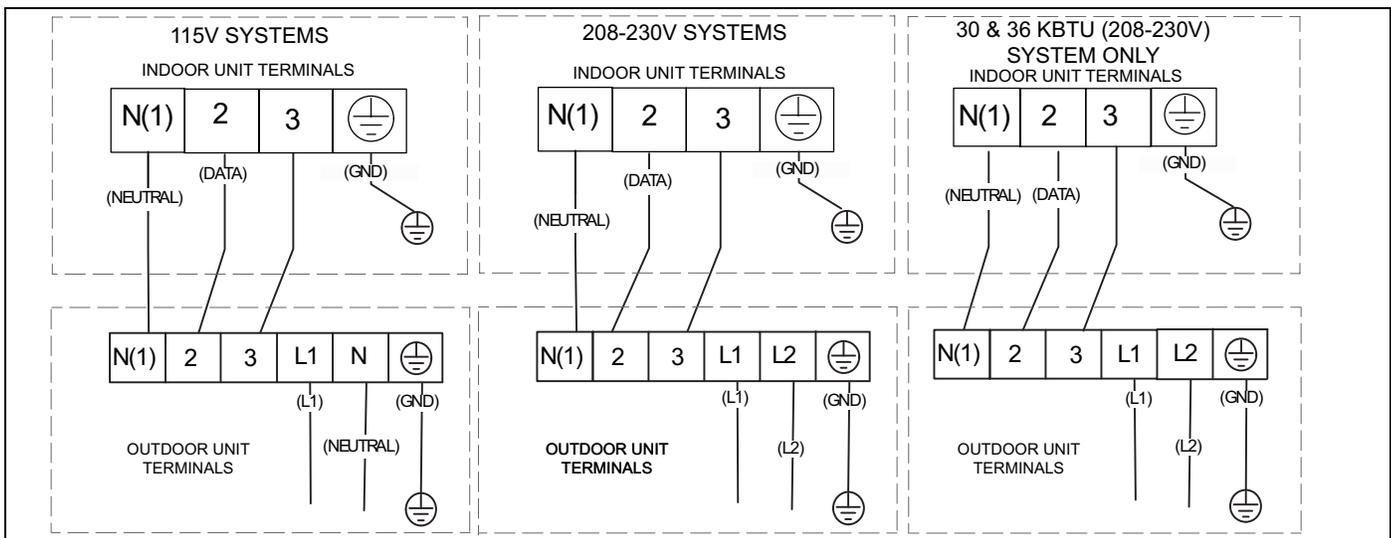


FIGURE 32: Outdoor Unit Wiring Terminal Designations

REFRIGERANT PIPING CONNECTIONS

A Service port cap protects the service port core from contamination and serves as the primary leak seal. To access service port:

1. Remove service port cap with an appropriate sized wrench.
2. Connect gauge set to service port.
3. When testing is complete, replace service port cap and tighten as follows:
 - a. With torque wrench - Finger tighten then torque cap per Table 11 requirements.
 - b. Without torque wrench - Finger tighten then use appropriate sized wrench to turn an additional 1/6 turn clockwise.

Stem cap protects the valve stem from damage and serves as the primary seal. Replace the stem cap and tighten as follow:

1. With torque wrench - Finger tighten and use torque cap per Table 11.
2. Without torque wrench - Finger tighten then use an appropriate sized wrench to turn an additional 1/12 turn clockwise.

NOTICE

- Fasten flare nut with a torque wrench as specified in Table 9.
- When fastened too tight, flare nut may break after a long period and cause refrigerant to leak.

INDOOR UNIT CONNECTION

- Connect both liquid and gas pipes to indoor unit.
- Apply a sealing cap or water-proof tape to prevent dust or water from getting into the refrigerant piping before it is connected.
- Apply a thin coat of refrigerant oil on the seal surface of the pipe.
- For connection, first align the union tube and flared refrigerant line with each other then tighten the flare nuts lightly at first to obtain a smooth match.
- Use tightening torque Table 11 as a guideline for indoor unit side union joint section and tighten using two wrenches. Excessive tightening may damage the flare section.

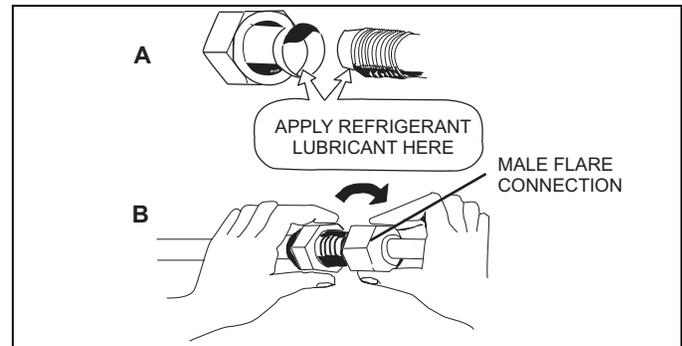


FIGURE 33: Indoor/Outdoor Piping Connections

OUTDOOR UNIT CONNECTION

- Apply a sealing cap or water proof tape to prevent dust or water from getting into the refrigerant piping before it is connected.
- Apply refrigerant lubricant to the matching surfaces of the flared line set and union before connecting them together. This will reduce refrigerant leaks.
- Align the flared refrigerant line with valve connection then tighten the flare nut lightly at first to obtain a smooth match. Use tightening torque Table 11 as a guideline.

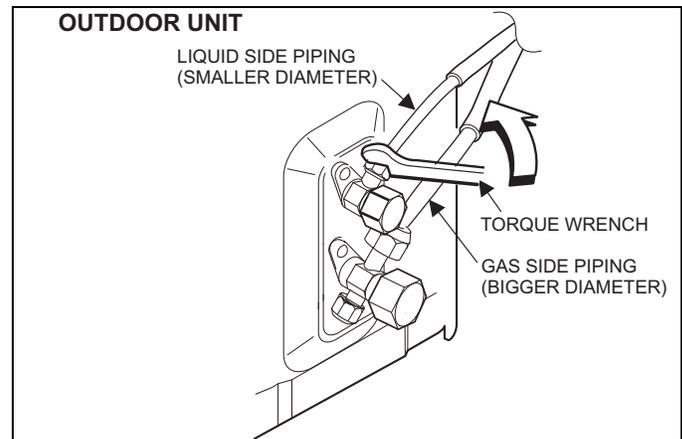


FIGURE 34: Outdoor Line Set Connections

INSULATION AND TAPING

1. Cover piping joints with pipe cover.
2. For outdoor unit, insulate every pipe including all pipe joints.
3. Using piping tape, apply taping starting from entry of outdoor unit.
 - a. Stop the end of piping tape with tape that has an adhesive agent attached.
 - b. When pipes have to be arranged through above ceiling, closet or where temperature and humidity are high, make sure you wind additional commercially sold insulation to prevent sweating.
4. An optional field-provided exterior wall channel may be used in lieu of taping the utility bundle to protect the bundle from UV rays, weather, etc. See Figure 37.

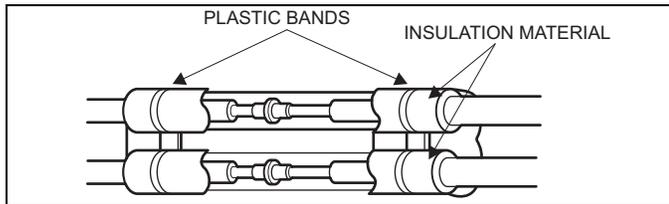


FIGURE 35: Line Set Connection Insulation and Taping

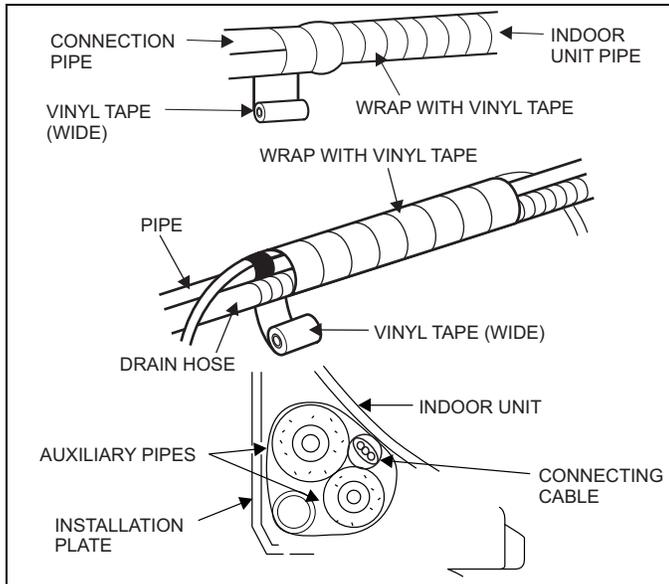


FIGURE 36: Utility Bundle

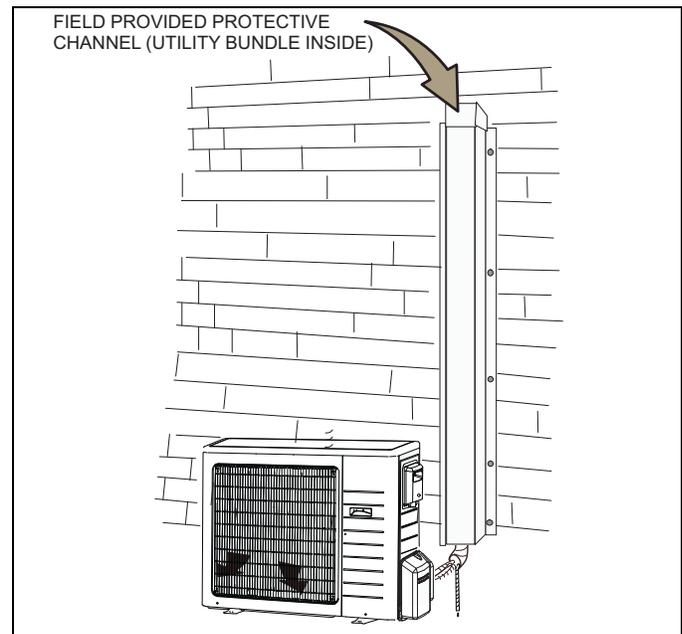


FIGURE 37: Exterior Wall Utility Cover (Optional)

SECTION XVII: PURGING PROCEDURE, LEAK TEST AND TEST RUN

SERVICE VALVES

The outdoor unit suction/vapor 2-way service valve is used to purge air, test for leaks, check operating pressures and add refrigerant to system. This valve is equipped with a service port which has a factory installed valve core. Figure below provides information on how to access and operate the 2-way angle-type service valve and 2-way shut-off valve. After the piping has been connected to the indoor unit, perform the air purge.

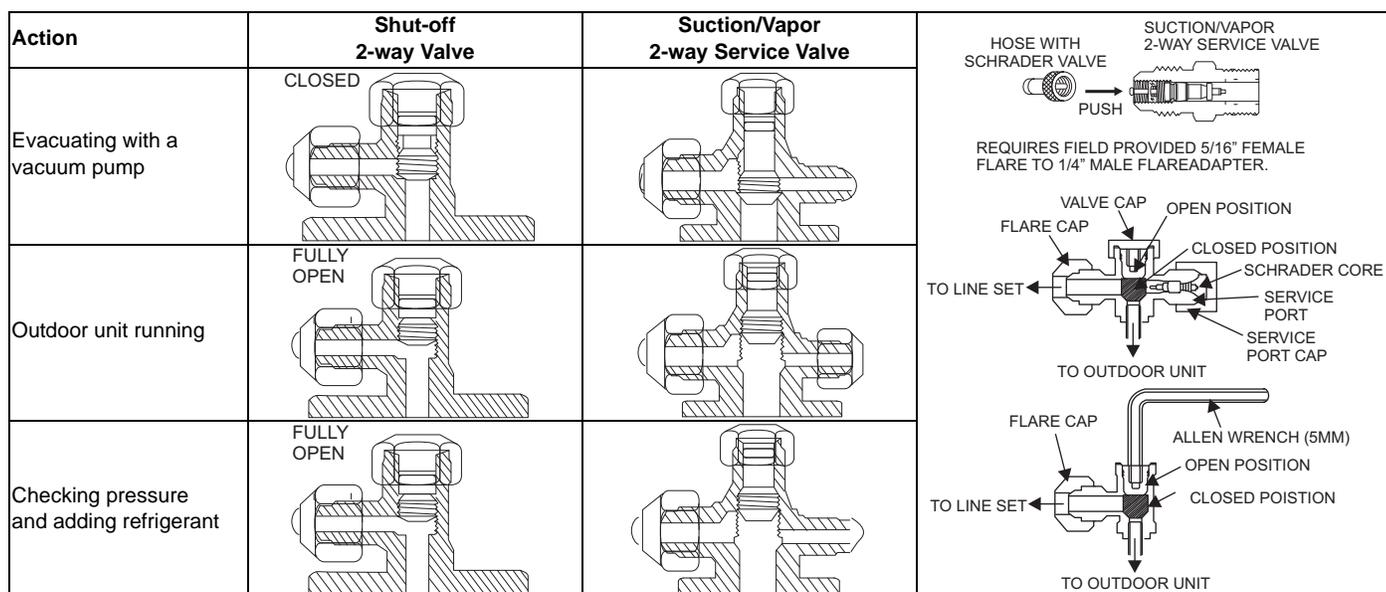


FIGURE 38: Service Valve Operation

LEAK TEST AND EVACUATION

Air and moisture remaining in the refrigerant system will have undesirable effects as indicated below:

1. Pressure in the system rises.
2. Operating current rises.
3. Cooling or heating efficiency drops.
4. Moisture in the refrigerant circuit may freeze and block capillary tubing (30 kBtu size only).
5. Water may lead to corrosion of parts in the refrigeration system.

The line set between the indoor and outdoor units must be leak tested and evacuated to remove any non-condensable and moisture from the system.

AIR PURGING WITH VACUUM PUMP

Be sure to use a vacuum pump with counter-flow prevention function to make oil inside the pump does not flow back into the system pipes when the pump stops.

1. Run the vacuum pump.
2. Connect the charge hose from the manifold valve to the service port of the gas side packed valve.
3. Connect the charge hose to the port of the vacuum pump.
4. Open fully the low pressure side handle of the gauge manifold valve.
5. Operate the vacuum pump to begin evacuating.
6. The operation time for evacuation varies with the lineset length and capacity of the pump. Allow the pump to operate until the system has been evacuated down to 300 microns. Allow the pump to continue running for an additional 15 minutes.
7. Turn off the pump and leave the connection secured to the suction/vapor 2-way service port. After five minutes, if the system fails to hold 500 microns or less, check all connections for tight fit and repeat the evacuation procedure.
8. Close the low pressure valve handle of gauge manifold.
9. Open fully the valve stem of the packed valves (both gas and liquid sides).
10. Remove the charging hose from the service port.
11. Securely tighten the caps on the packed valves.

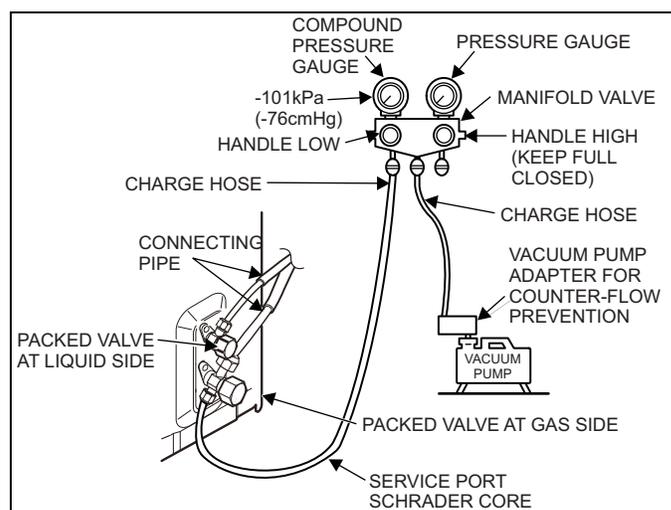


FIGURE 39: Gauge Set Connections for Test Leaks, Evacuation Charging

ADDING REFRIGERANT FOR LONGER LINE SET

1. Open the low side manifold gauge valve and weigh in liquid refrigerant. Use Table 6 to calculate the correct weigh-in charge.
2. Close manifold gauge valves.

LEAK TEST

Use the following procedure to test for system leaks:

1. Connect the manifold gauge set and dry nitrogen gas cylinder to the suction/vapor service port. See Figure 30.
2. Open valve on nitrogen cylinder.
3. Pressurize the system to no more than 150 PSIG with dry nitrogen.
4. Check for leaks using soapy water.
5. After the system is found to be free of leaks:
 - Close valve on nitrogen cylinder
 - Relieve the nitrogen pressure by: loosening the charge hose connector at the nitrogen cylinder.
 - When the system pressure is reduced to normal, disconnect the hose from the cylinder.

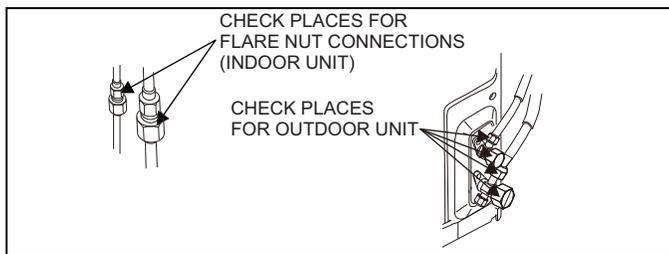


FIGURE 40: Leak Test Line Set Connection

SECTION XVIII: TEST OPERATION

1. Check that all tubing and wiring have been properly connected.
2. Check that the gas and liquid side service valves are fully open.

GAS LEAK TEST

Check the flare nut connections for gas leaks with a gas leak detector and/or soapy water.

RUNNING TEST

1. Turn power on by pressing "ON/OFF" button on the wireless remote control to start system operation.
2. Press MODE button to select COOL, HEAT or FAN to check the system operation.

INDOOR UNIT RUNNING TEST

1. Check if operation of each button on the remote control is working normally and check the corresponding operating indication LED on the indoor unit to make sure they match.
2. Check the operation of indoor unit louver and make you check its swinging function.
3. Check the condensate drain and make sure there are no leaks.

OUTDOOR UNIT RUNNING TEST

1. Make sure there are no abnormal noises or vibration during operation.
2. Make sure you check for gas leaks.

SECTION XIX: EMERGENCY OPERATION

If the wireless remote is lost or damaged, the system can be operated using the manual switch or code switch. The system will run in Auto Run mode, and will not change the temperature setting nor the fan speed.

The manual switch can be operated as follows:

- To operate the unit, press the AUTO/STOP button once and the unit will enter into AUTO RUN mode. The microcomputer will select the (COOL, HEAT, FAN) mode automatically to maintain optimum room comfort.
- To stop the unit from operating, press the AUTO/STOP button once and the unit will shut down.

The code switch can be operated as follows:

- To operate the unit, adjust the code switch to the AUTO position and the unit will enter into AUTO RUN mode. The microcomputer will select the (COOL, HEAT, FAN) mode automatically to maintain optimum room comfort.
- To stop the unit from operating, adjust the code switch to the STOP position and the unit will shut down.

NOTICE

The TEST button is for the technicians' testing, which should not be used by our user.

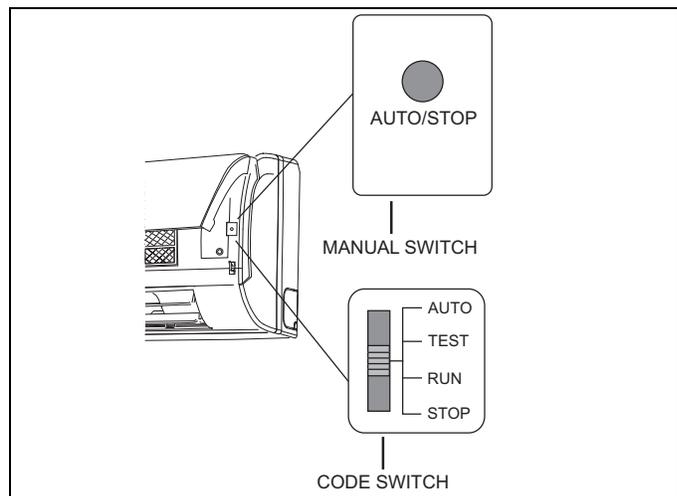


FIGURE 41: Emergency Operation

SECTION XX: MAINTENANCE

OUTDOOR UNIT

1. Ensure power is off before cleaning.
2. It may be necessary to wash the outdoor coil more frequently if it is exposed to substances which are corrosive or which block airflow across the coil (e.g., pet urine, cottonwood seeds, fertilizers, fluids that may contain high levels of corrosive chemicals such as salts).
3. Outdoor Coil (Sea Coast) - Moist air in ocean locations can carry salt, which is corrosive to most metal. Units that are located near the ocean require frequent inspections and maintenance. These inspections will determine the need to wash the unit including the outdoor coil. Consult your installing contractor for proper intervals/procedures for your geographic area or service contract.
4. Outdoor unit fan motor is pre-lubricated and sealed. No further lubrication is needed.
5. Visually inspect all connecting lines, joints and coils for evidence of oil leaks.
6. Check all wiring for loose connections.
7. Check for correct voltage at unit (unit operating).

INDOOR UNIT

1. Clean or change filters.
2. Check all wiring for loose connections.
3. Check for correct voltage at unit (blower operating).
4. Clean coil, if necessary.
5. Check connecting lines and coils for signs of oil leaks.
6. Check condensate line and clean, if necessary.

NOTICE

The filter must be in place and the front panel must be closed any time the unit is in operation.

SECTION XXI: INSTALLATION AND MAINTENANCE OF HEALTHY FILTER (ACCESSORY)

INSTALLATION OF HEALTHY FILTER (ACCESSORY)

1. Lift up the front panel from its two ends and remove the factory supplied air filter as shown in Fig. A.
2. Attach the healthy filter to the air filter as shown below in Fig. B.
3. Install the air filter properly as shown below in Fig. C and then close the panel.

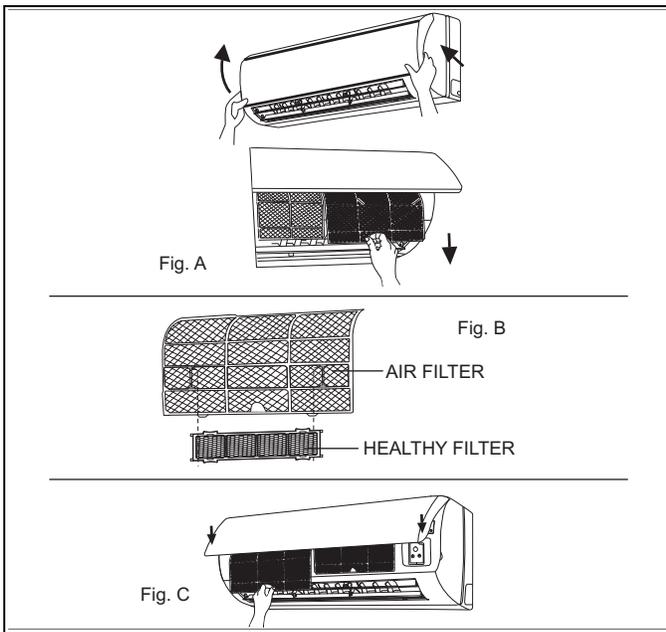


FIGURE 42: Filter Replacement

CLEANING AND MAINTENANCE

1. Remove the healthy filter and clean thoroughly. Make sure you don't use a brush or any hard objects to clean the filter.
2. Make sure you dry the air filter before reinstalling it.

SECTION XXII: TYPICAL UNIT WIRING DIAGRAM

The indoor unit wiring diagram is located on the inside of the cabinet by the terminal block. It is necessary to remove the front panel from the unit to see the diagram. The outdoor unit wiring diagram is located on the underside of the outdoor unit control access cover.

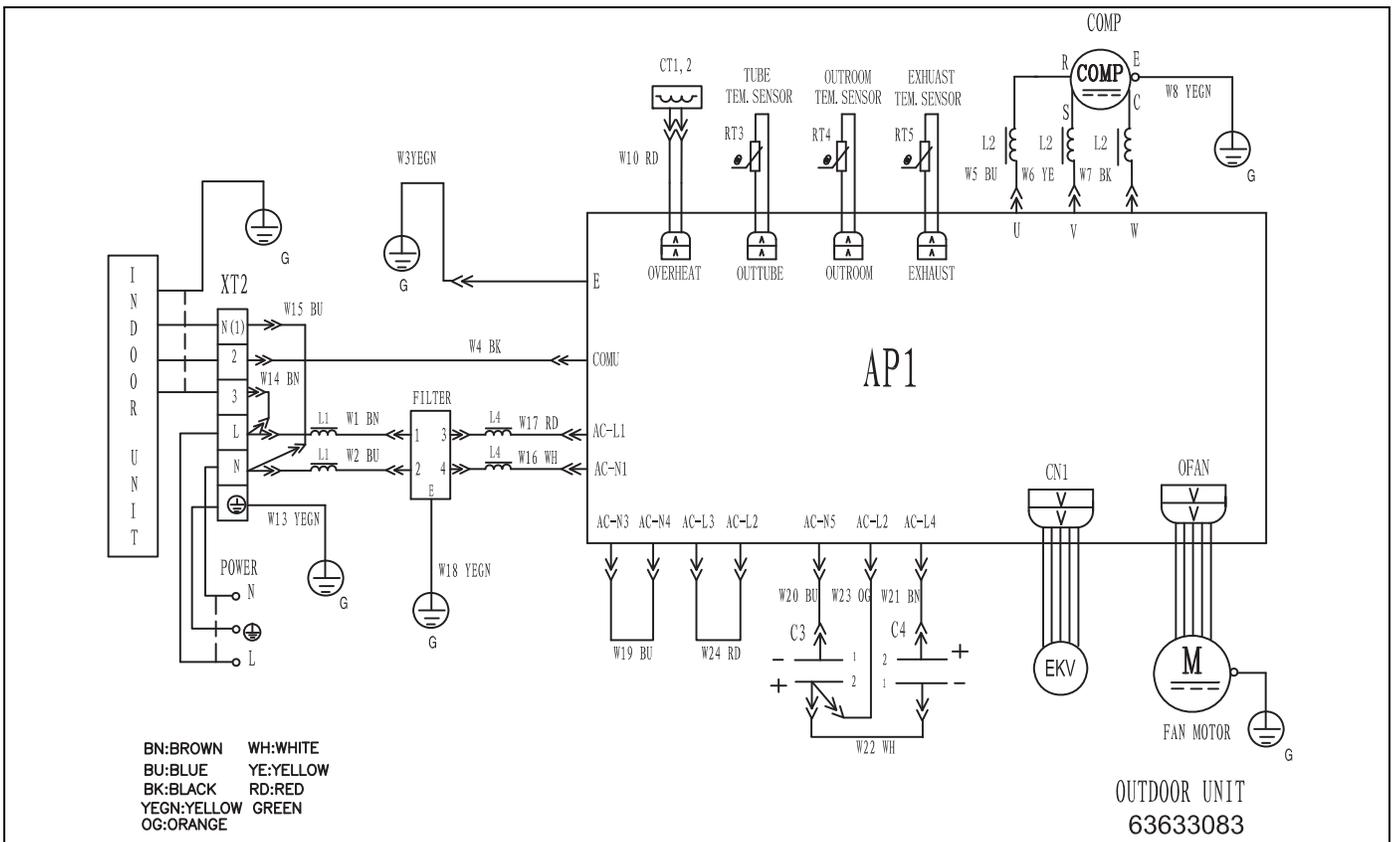


FIGURE 43: 09K & 12K 115V Outdoor Air Conditioners

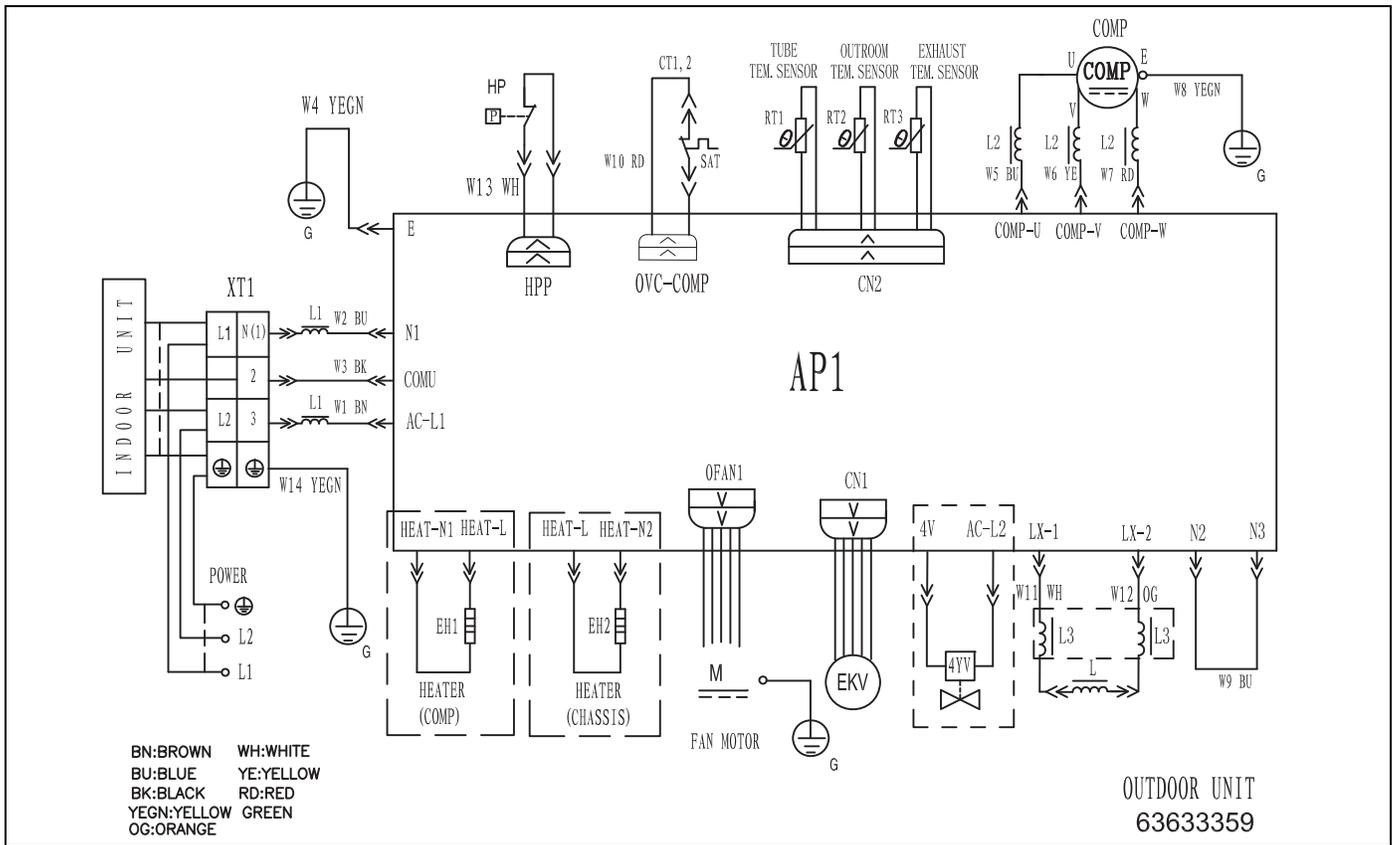


FIGURE 44: 09K & 12K Outdoor Air Conditioners

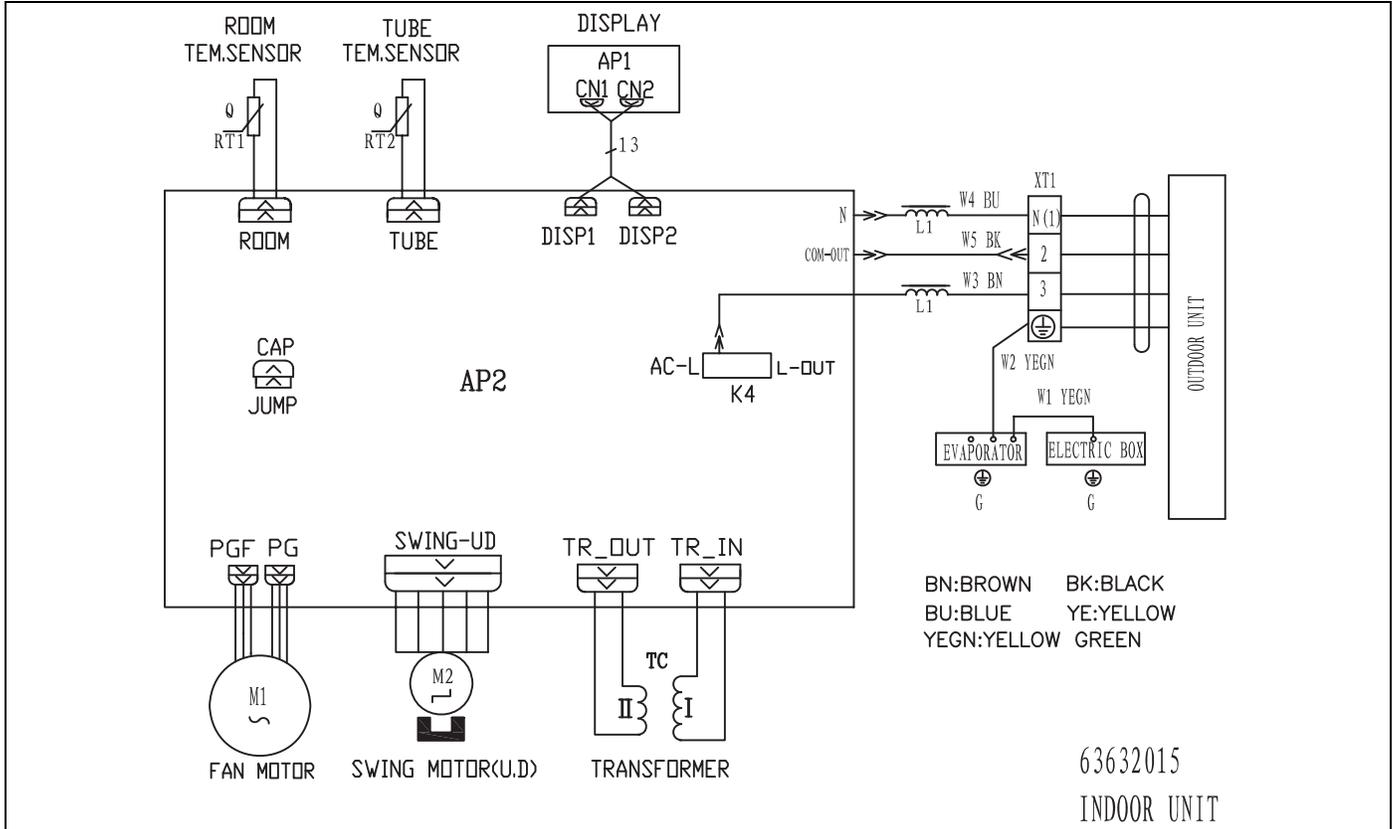


FIGURE 45: 18K & 24K 115V Indoor Air Conditioners

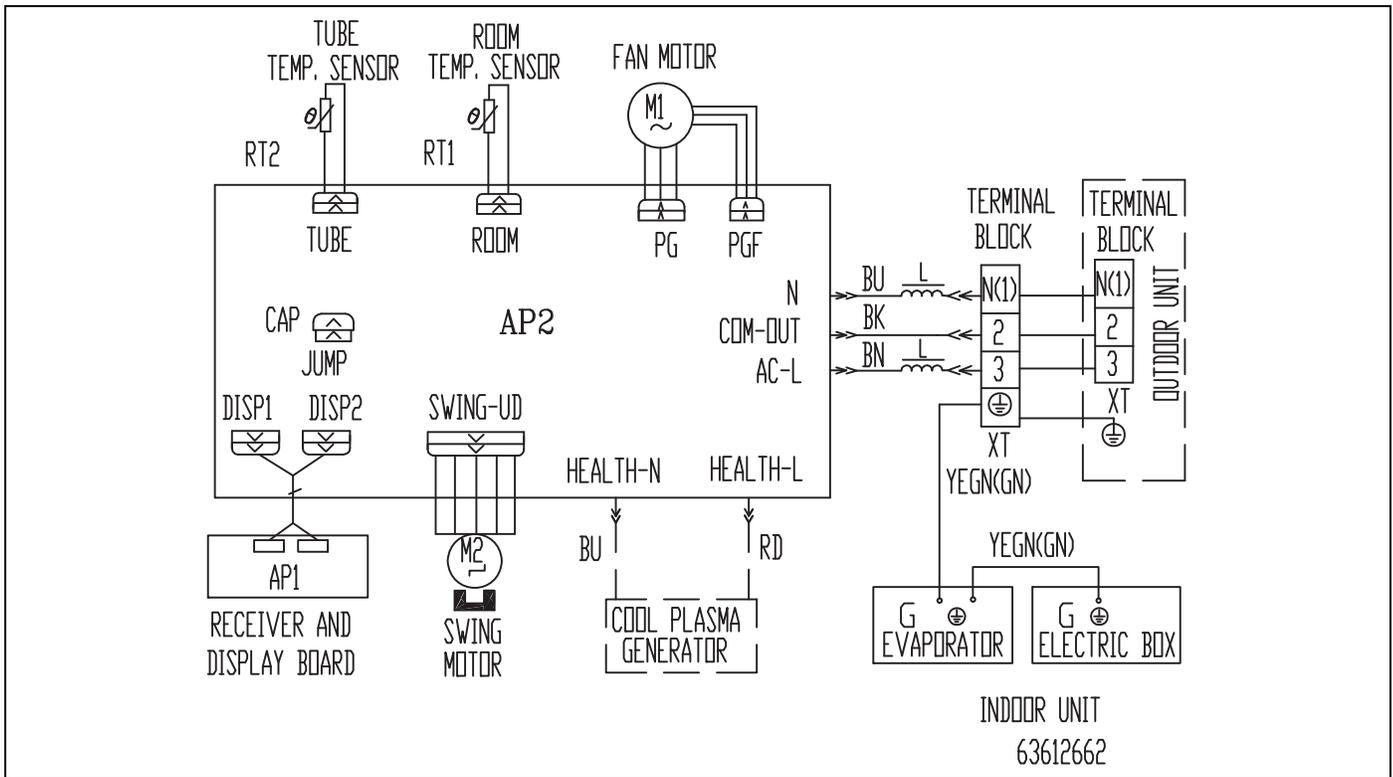


FIGURE 46: 18K & 24K Indoor Air Conditioners

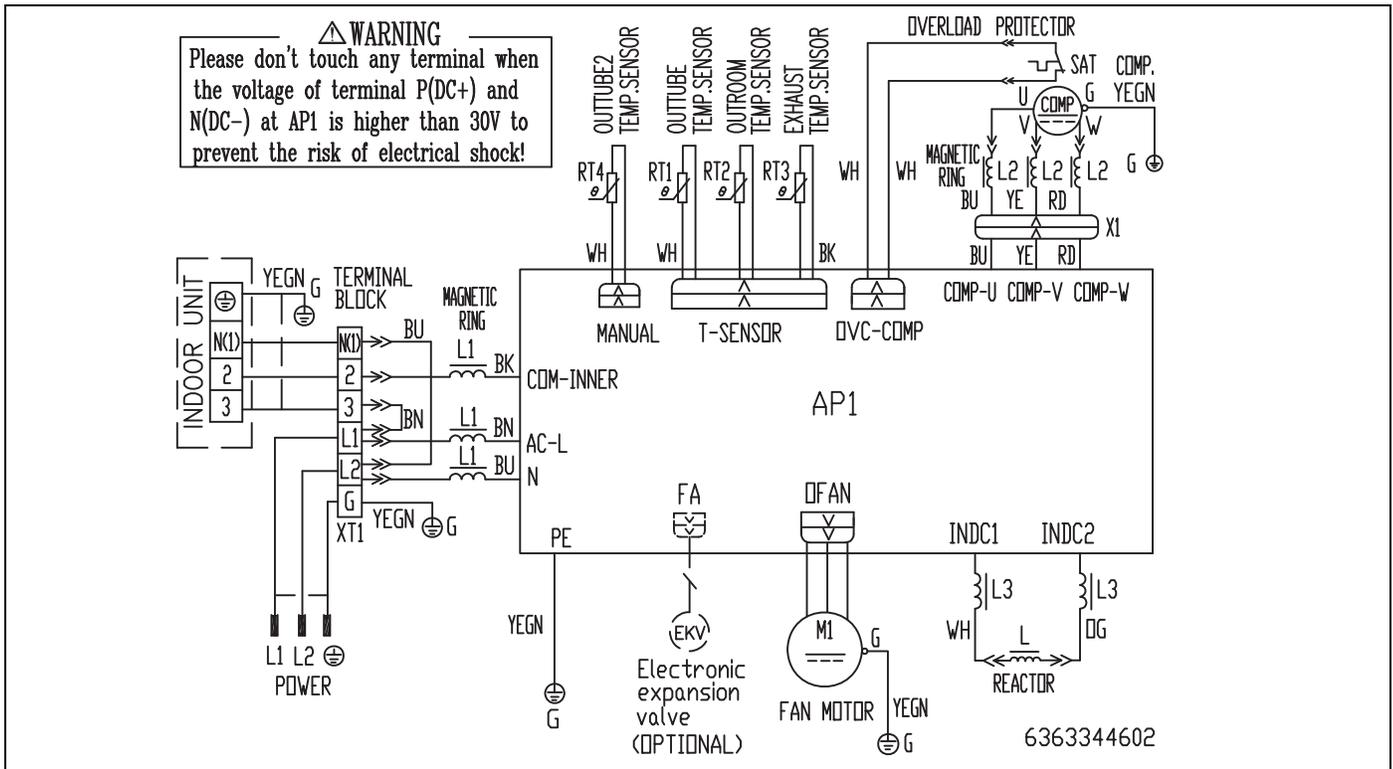


FIGURE 47: 18K Outdoor Air Conditioners

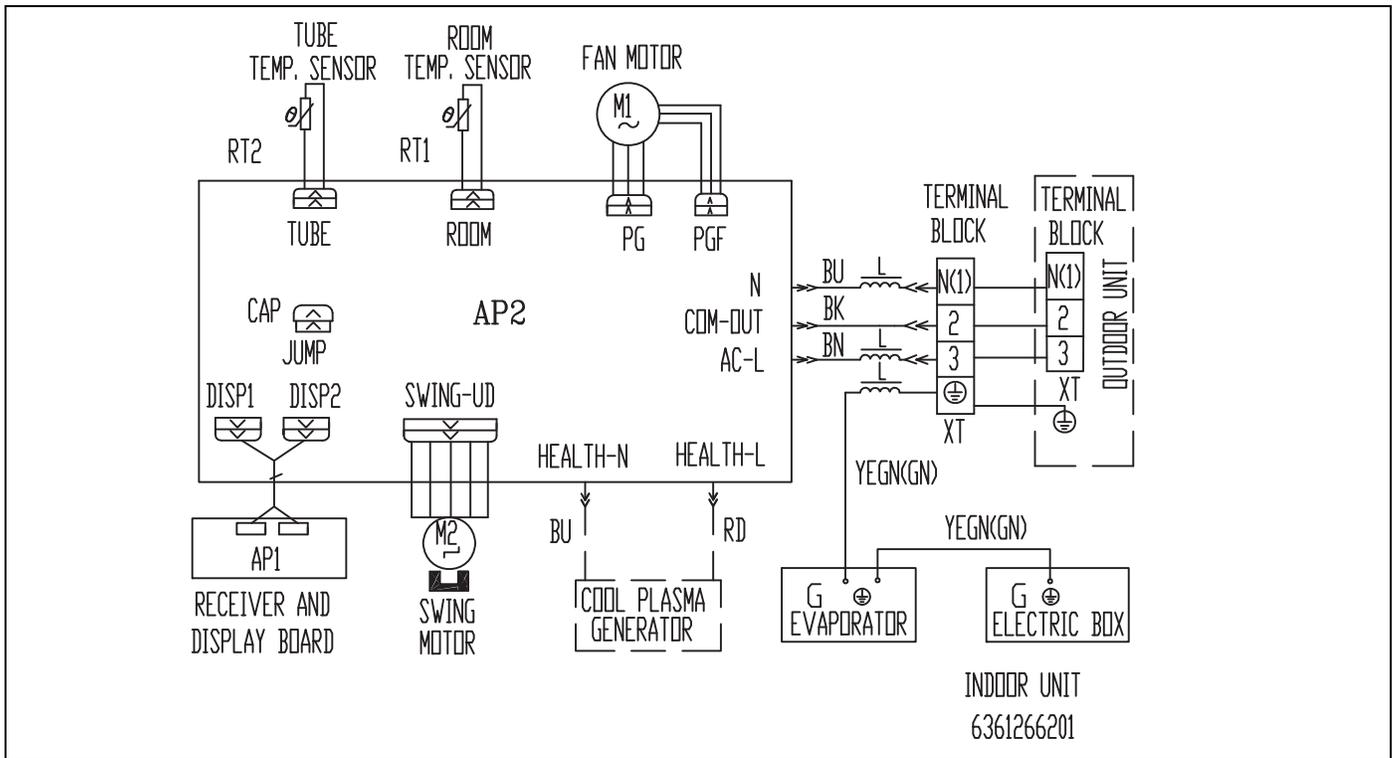


FIGURE 48: 18K Indoor Air Conditioners

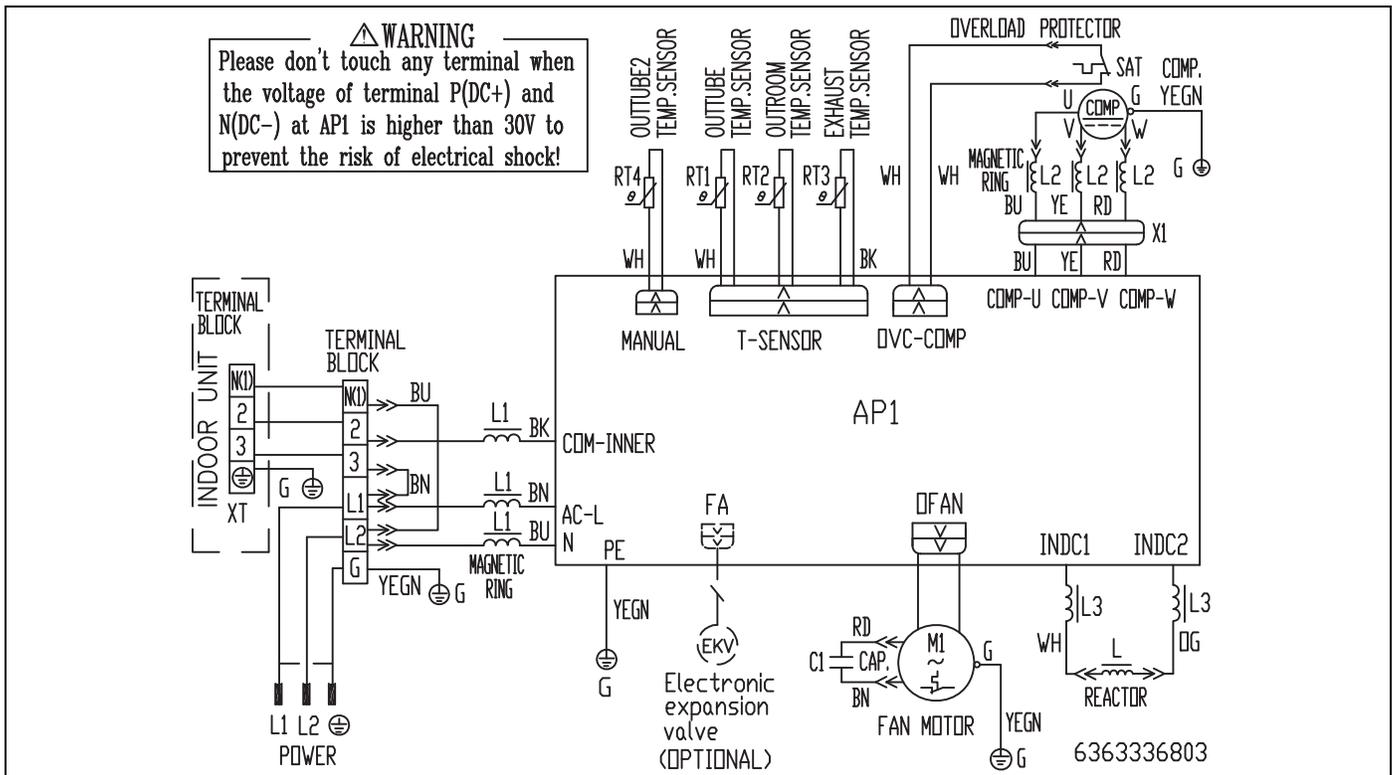


FIGURE 49: 24K Outdoor Air Conditioners

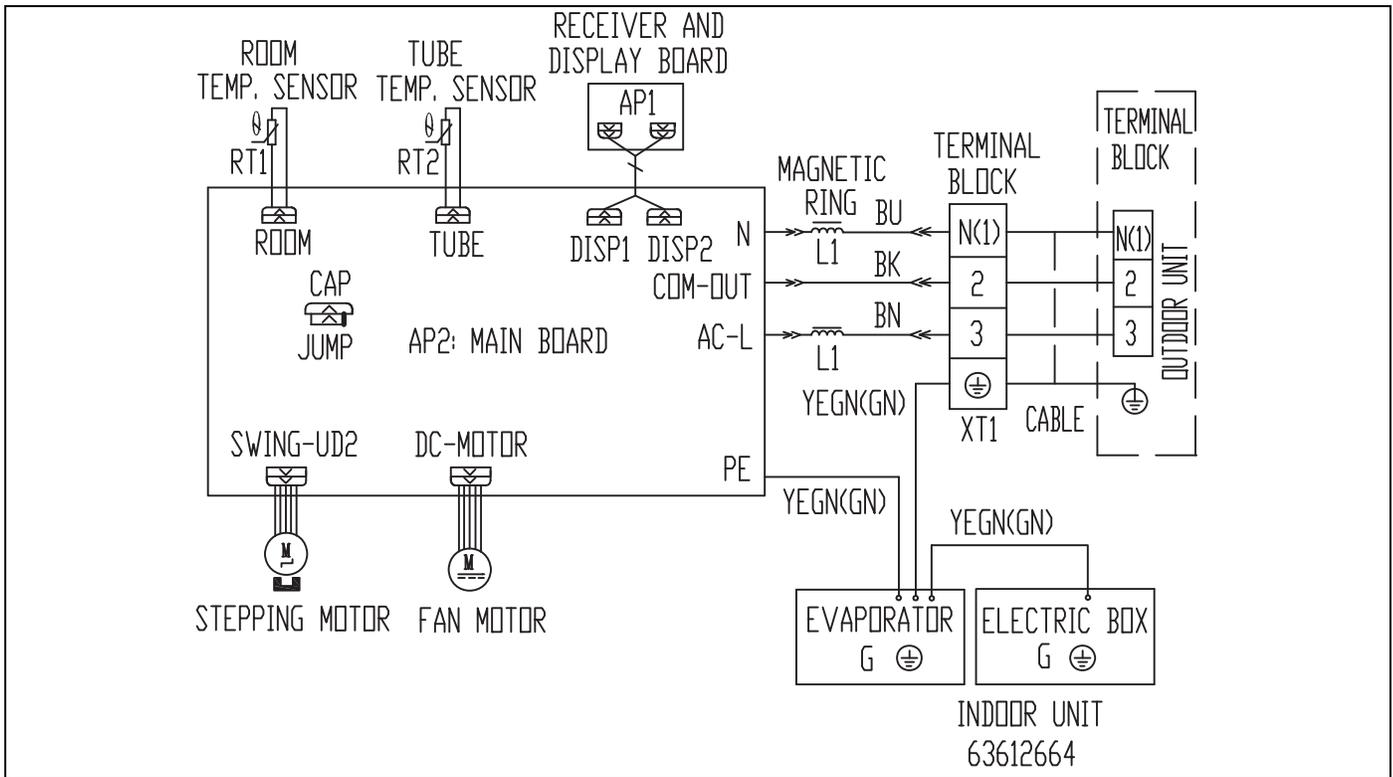


FIGURE 50: 24K Indoor Air Conditioners

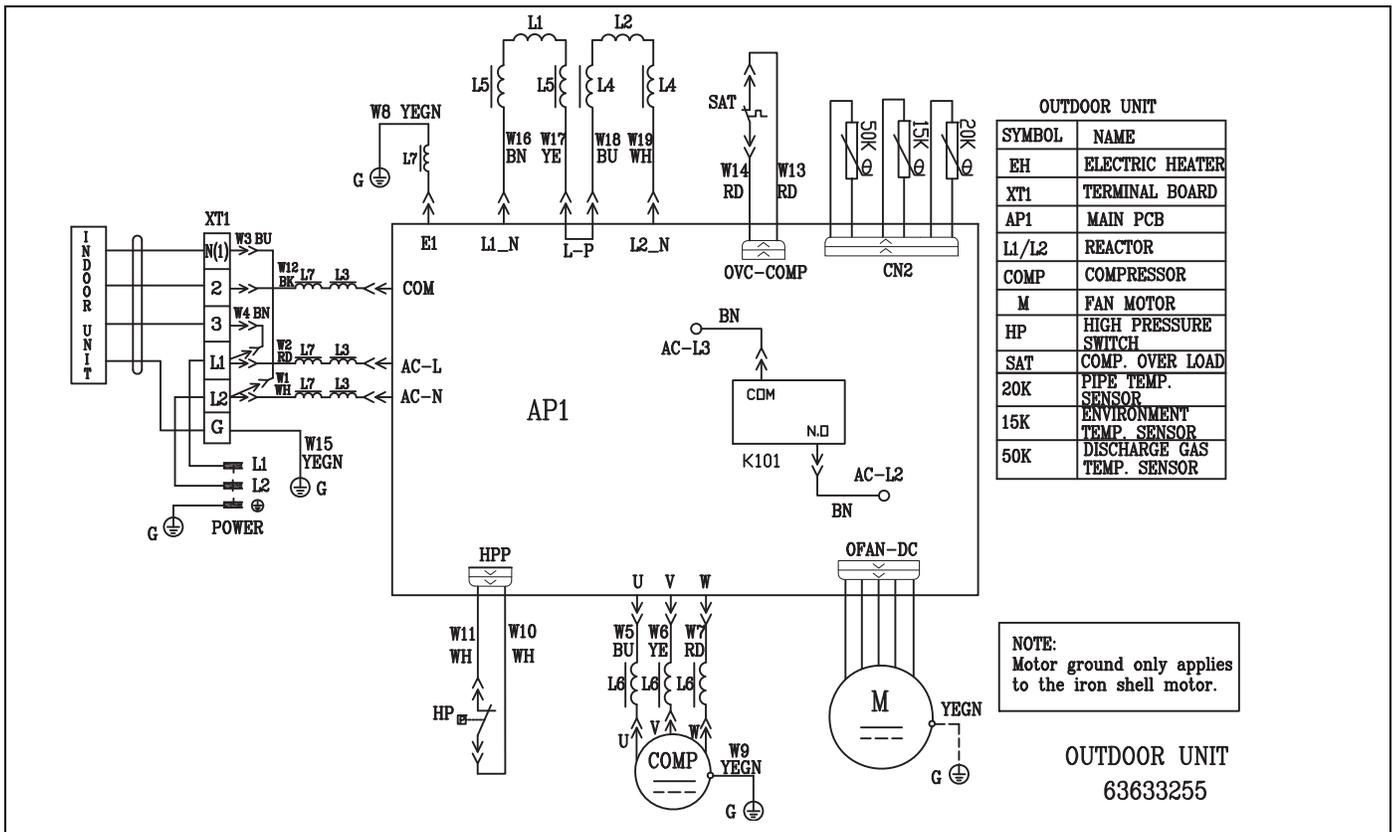


FIGURE 51: 36K Outdoor Air Conditioners

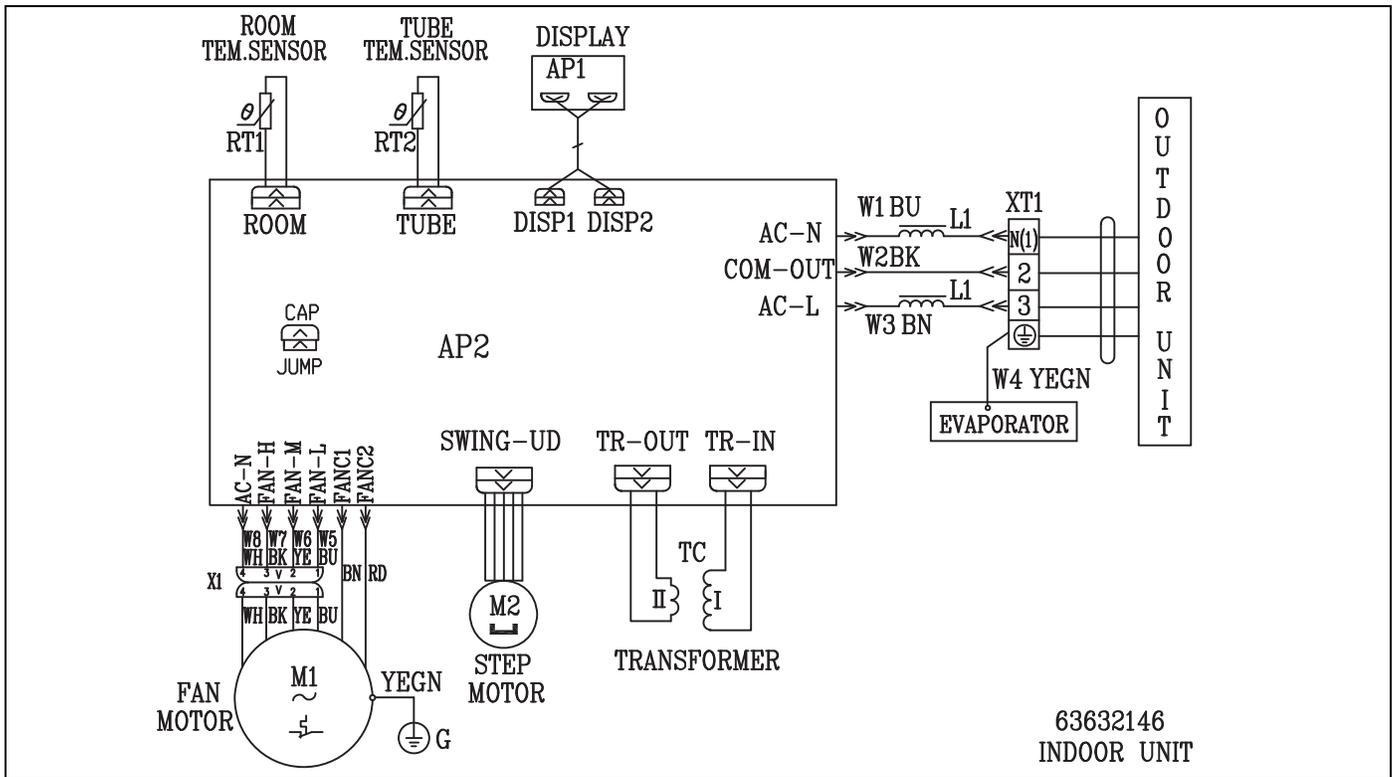


FIGURE 52: 36K Indoor Air Conditioners

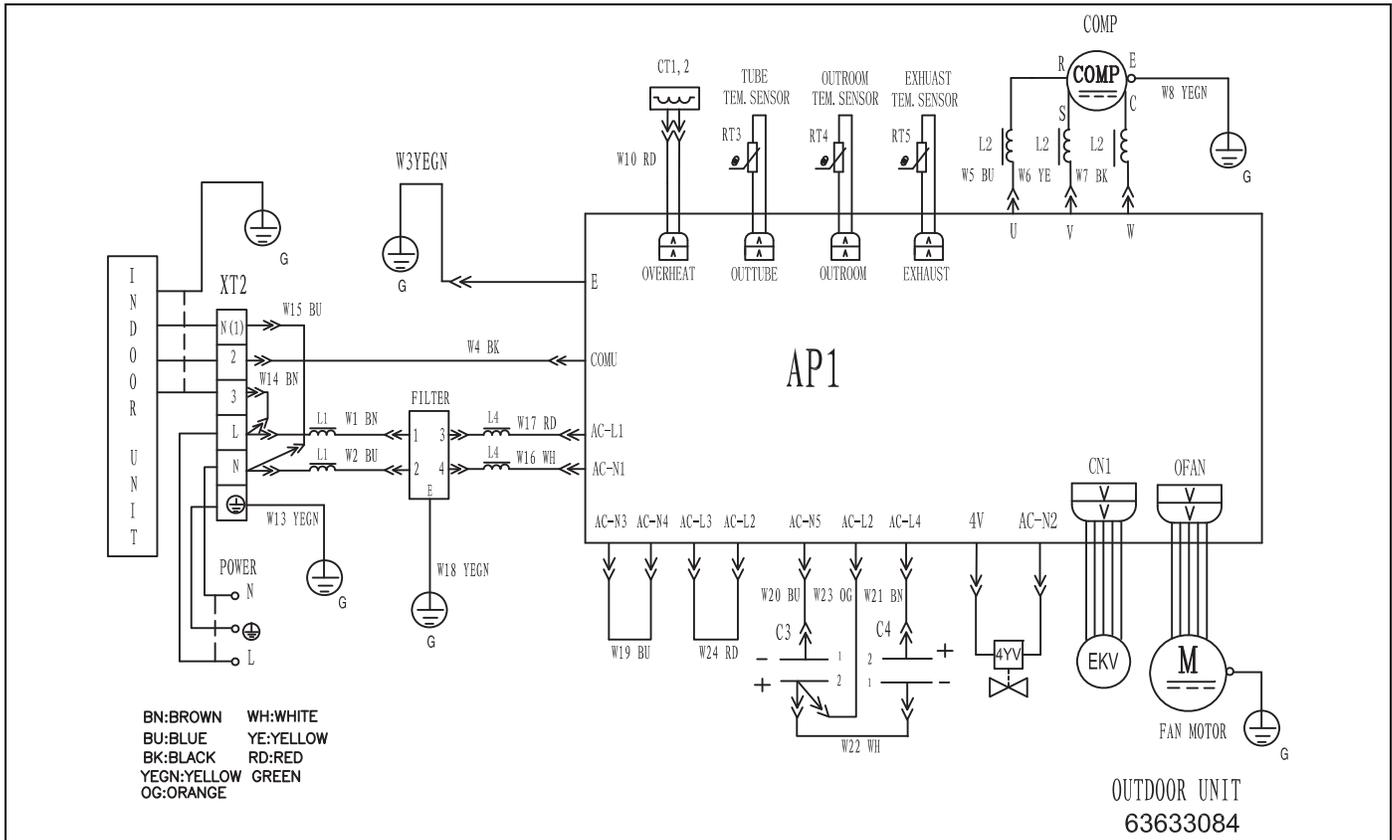


FIGURE 53: 09K & 12K 115V Outdoor Heat Pumps

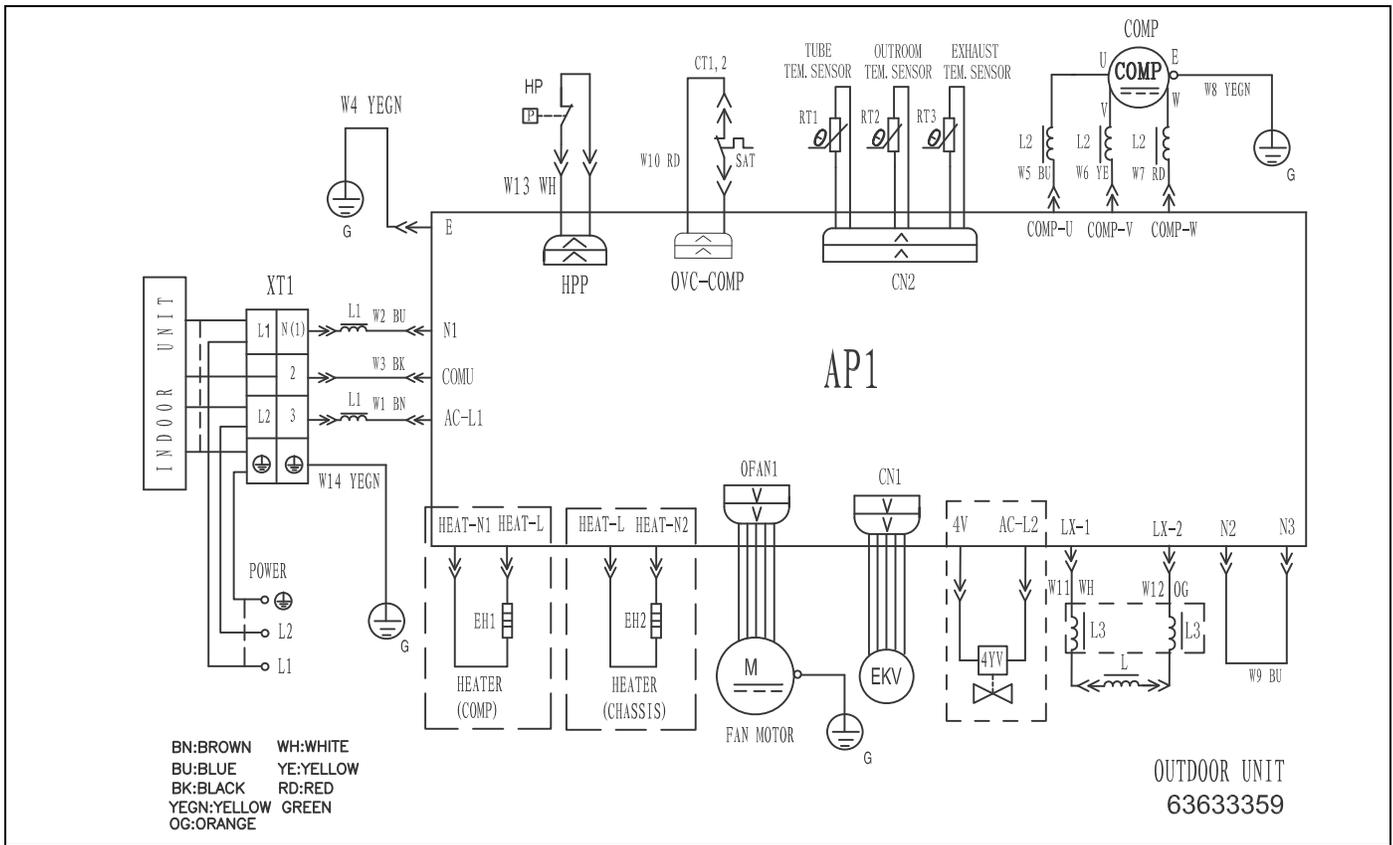


FIGURE 54: 09K & 12K Outdoor Heat Pumps

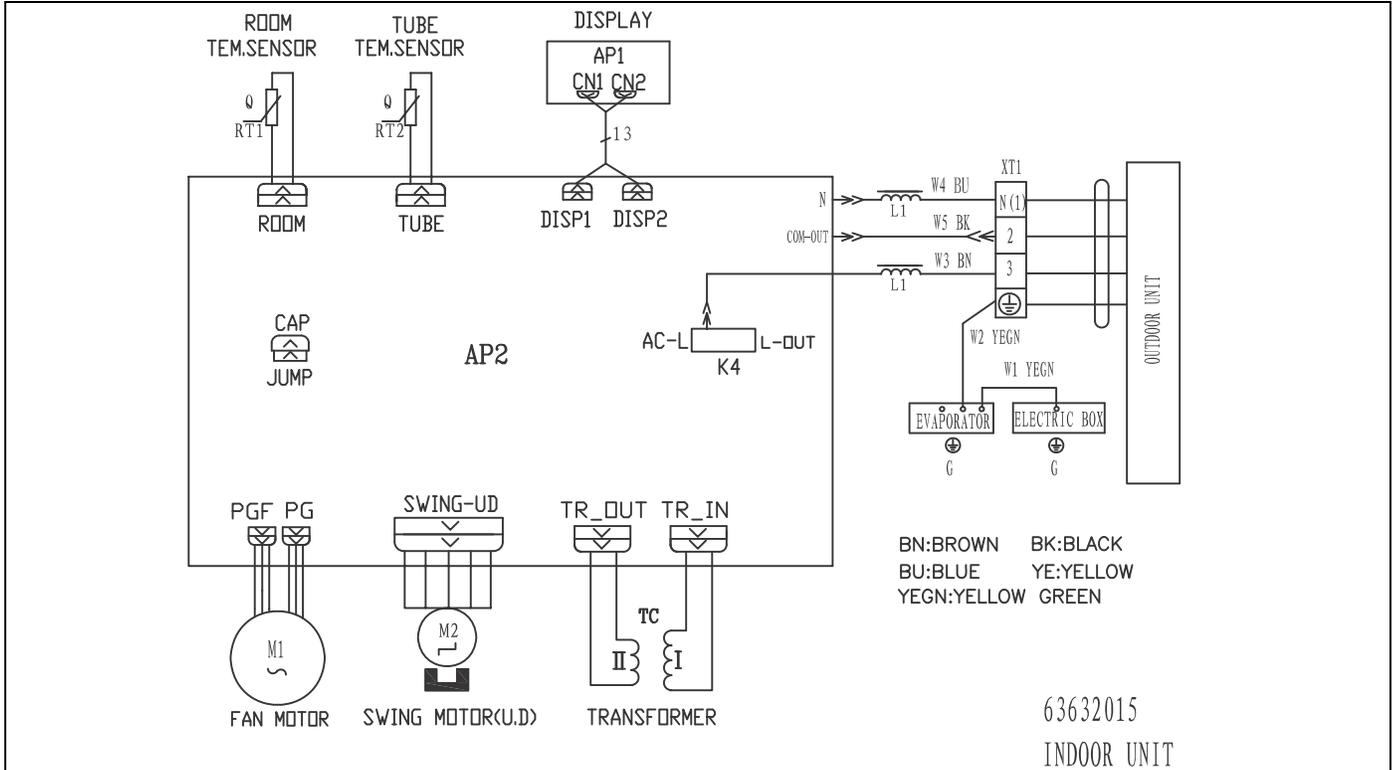


FIGURE 55: 18K & 24K 115V Heat Pumps

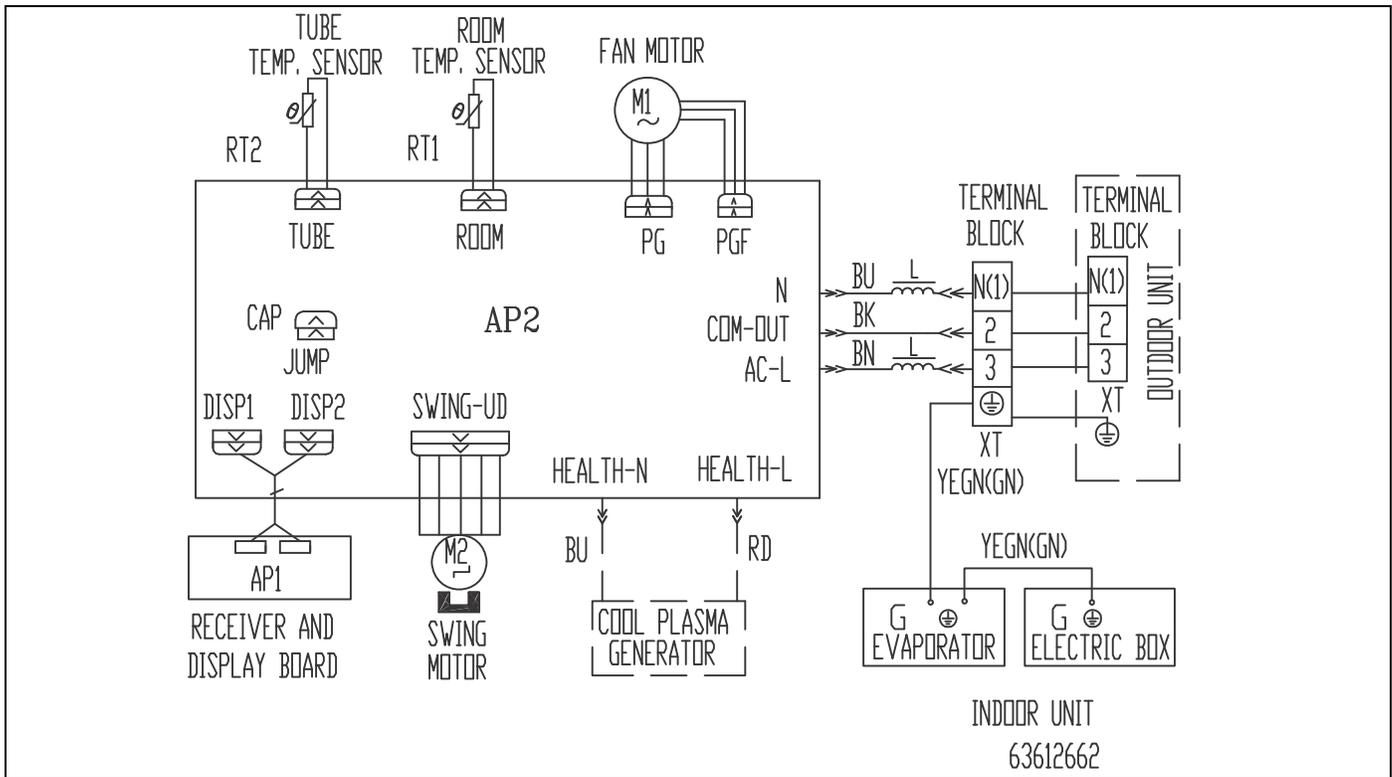


FIGURE 56: 18K & 24K Indoor Heat Pumps

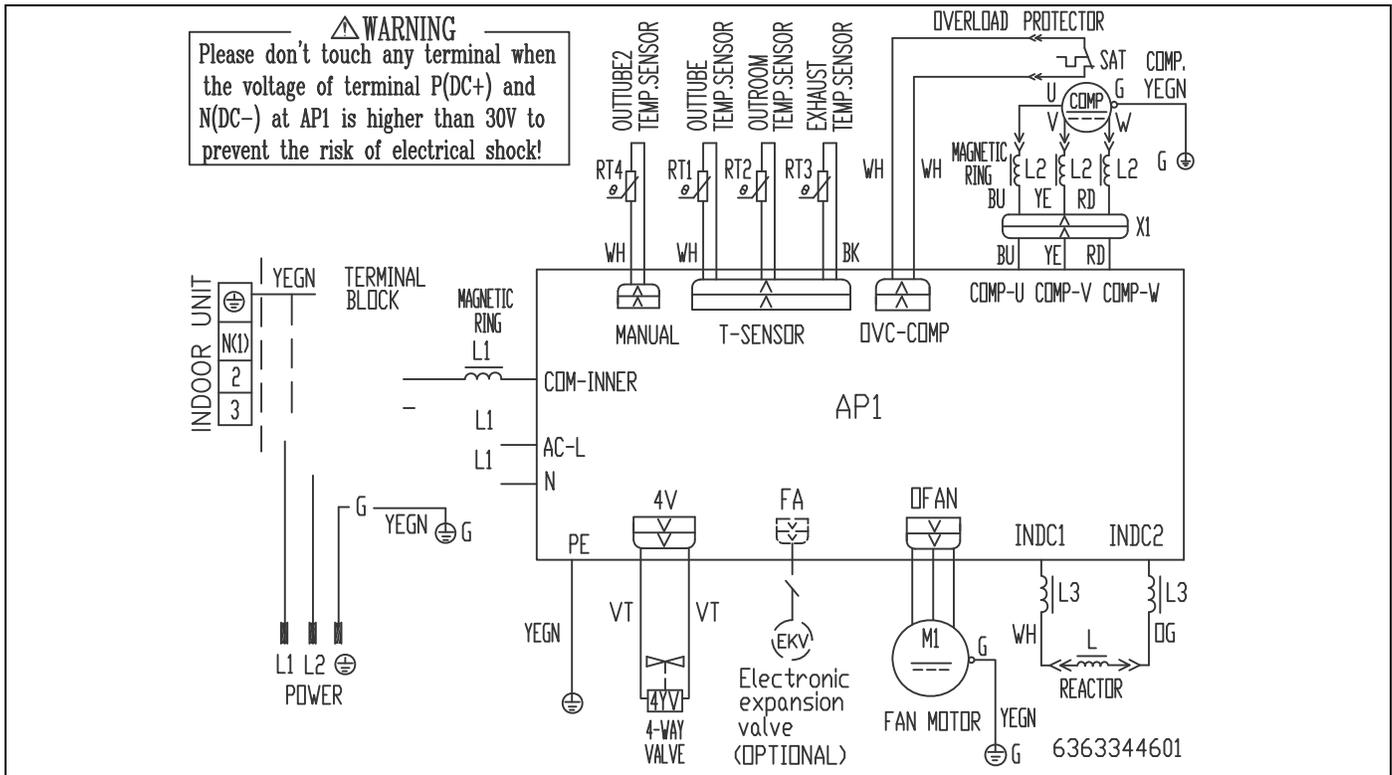


FIGURE 57: 18K Outdoor Heat Pumps

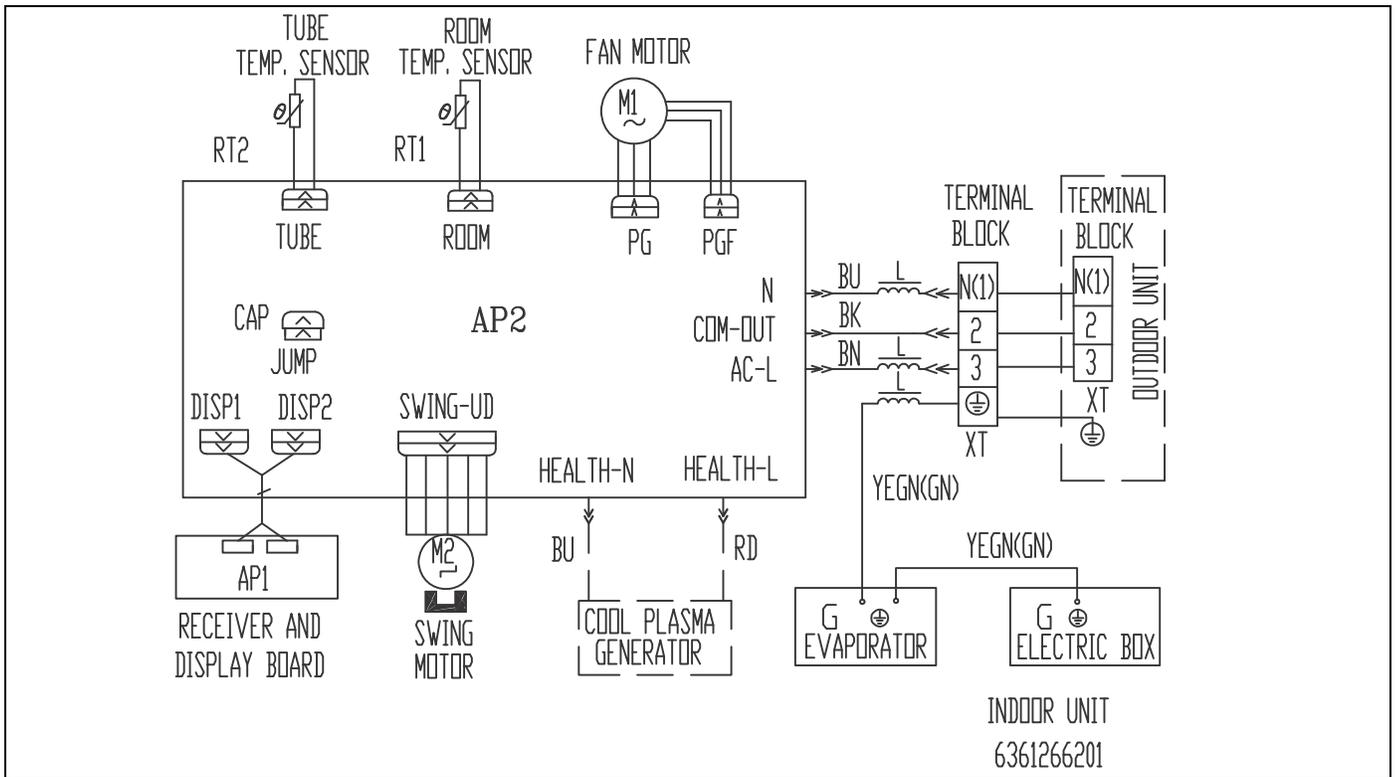


FIGURE 58: 18K Indoor Heat Pumps

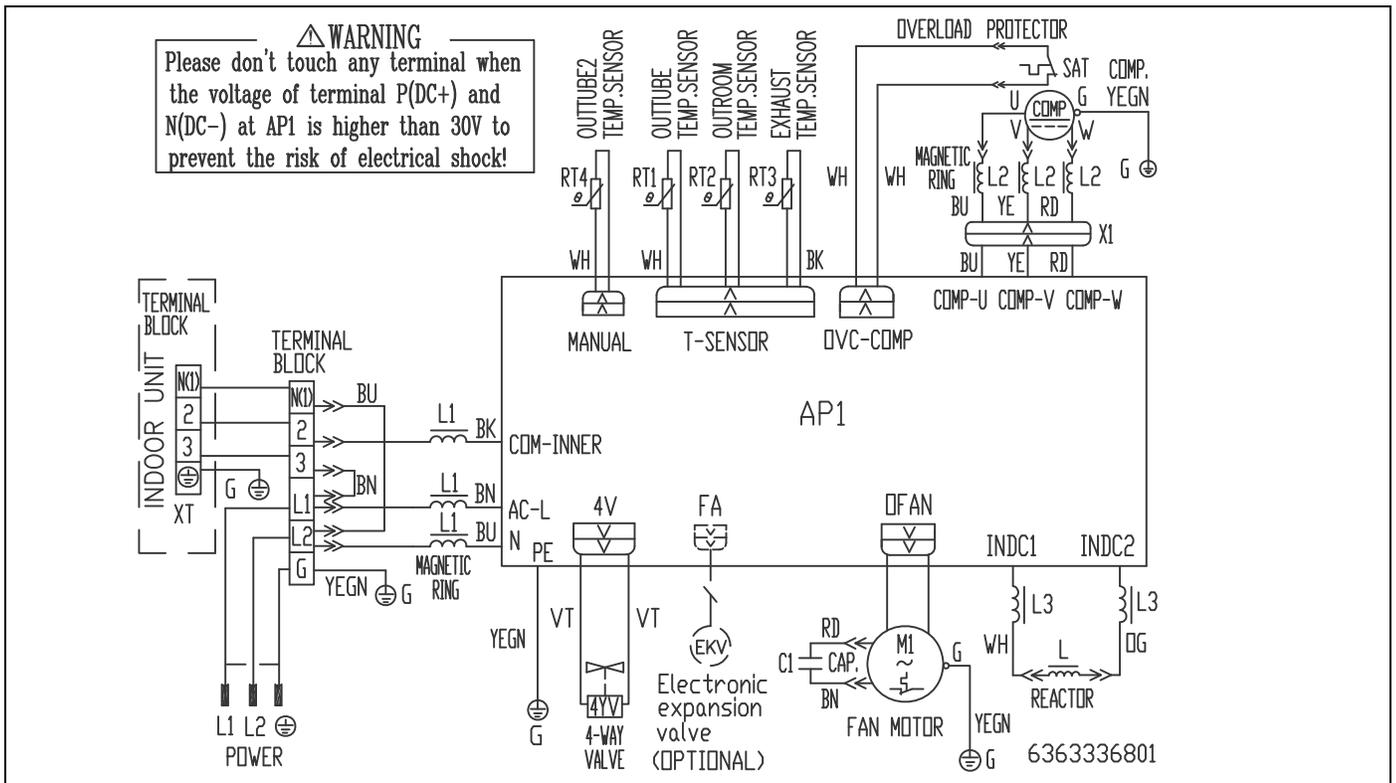


FIGURE 59: 24K Outdoor Heat Pumps

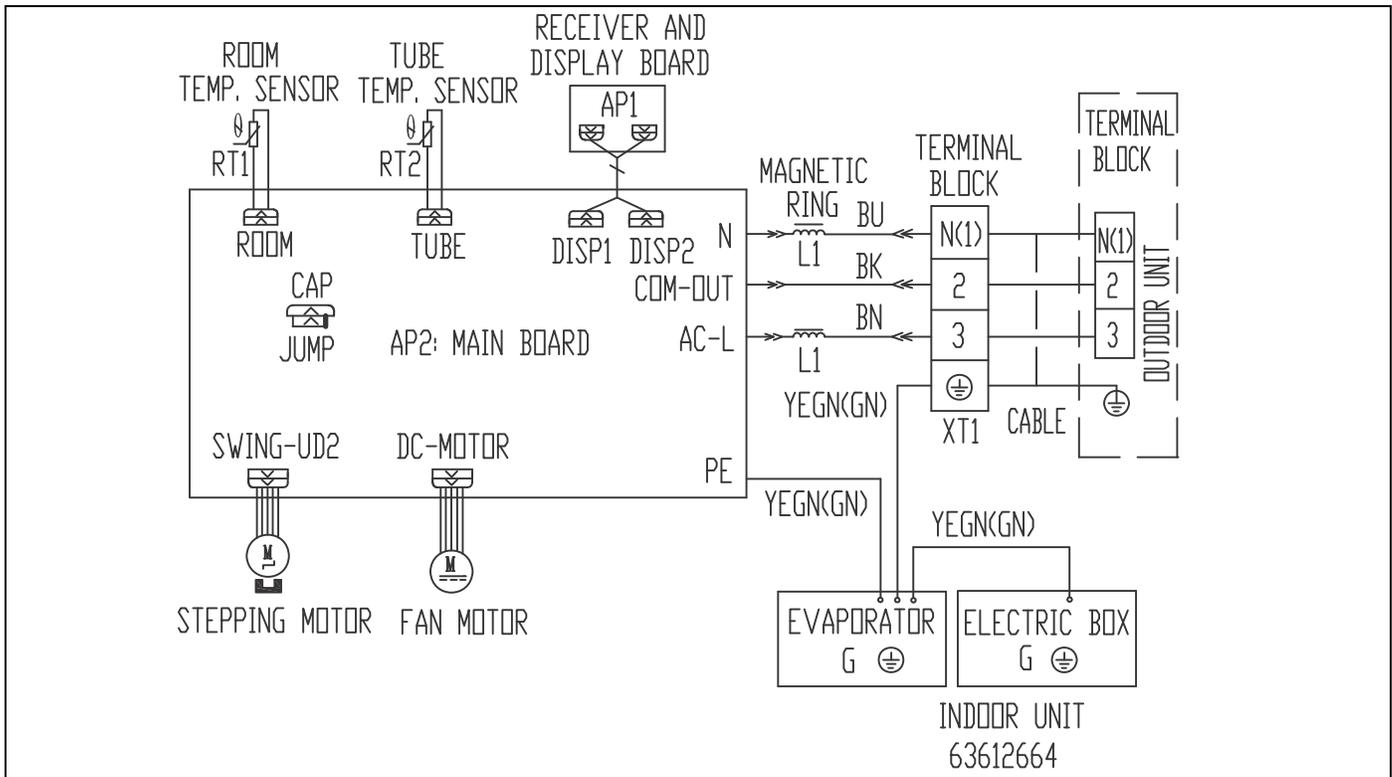


FIGURE 60: 24K Indoor Heat Pumps

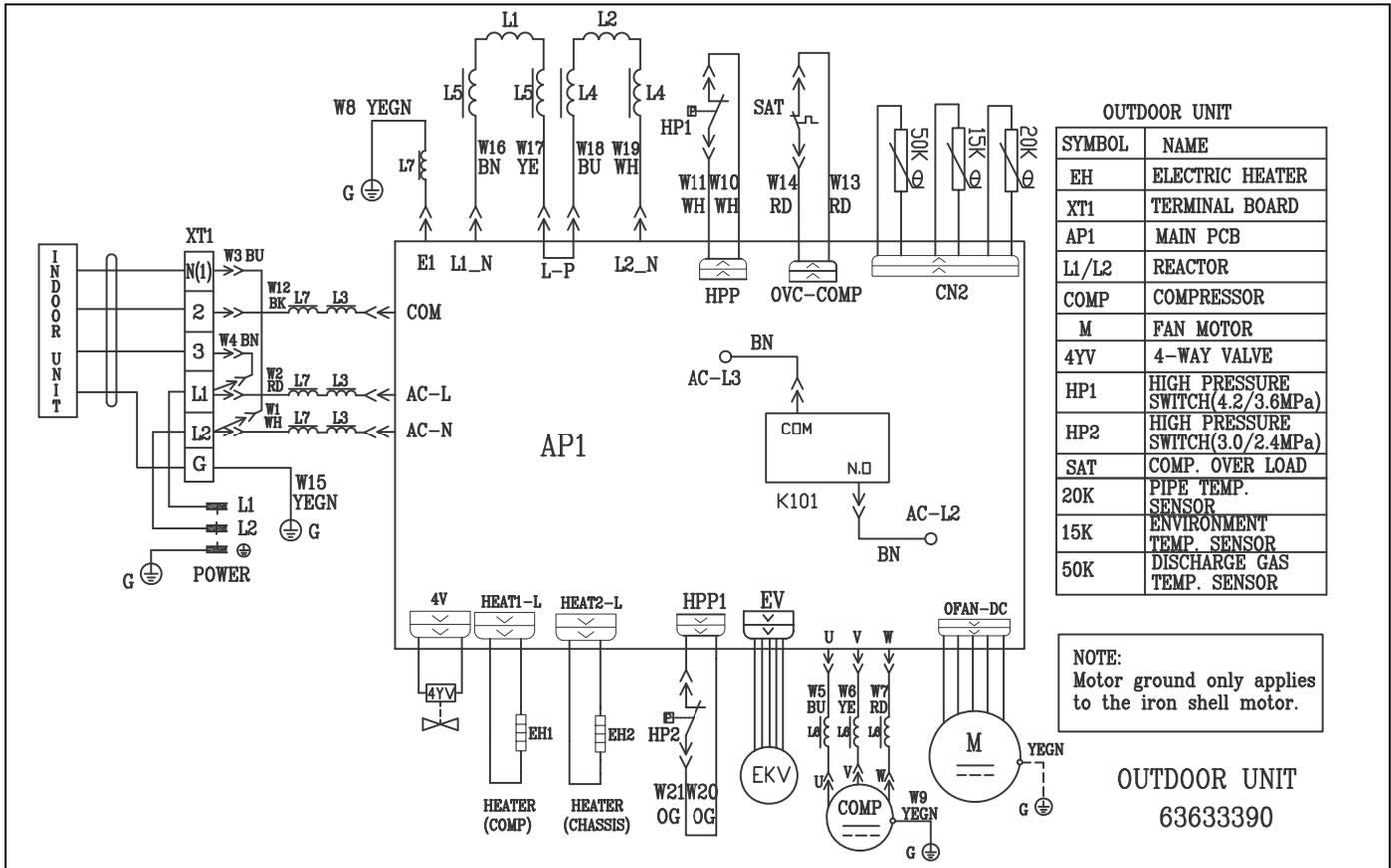


FIGURE 61: 30K Outdoor Heat Pumps

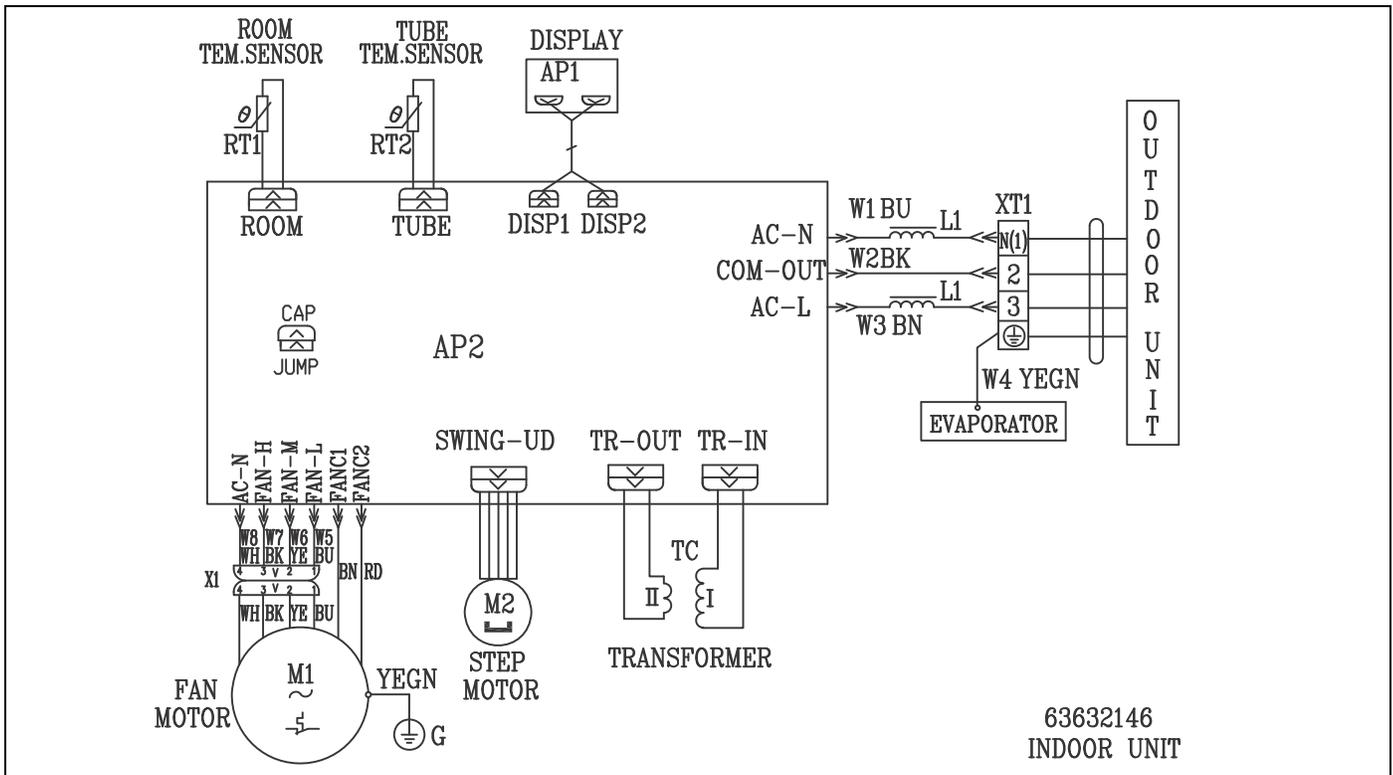


FIGURE 62: 30K Indoor Heat Pumps

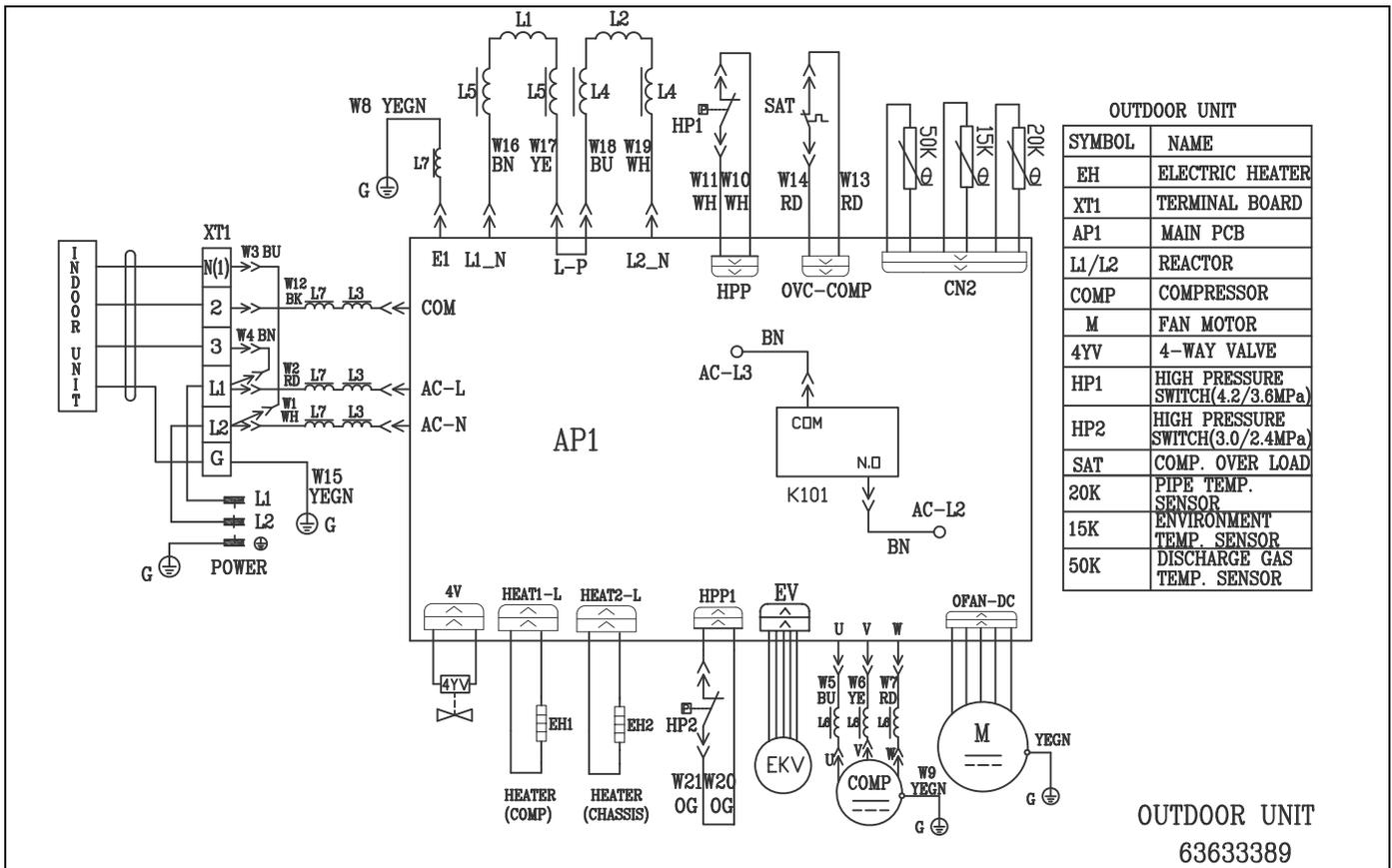


FIGURE 63: 36K Outdoor Heat Pumps

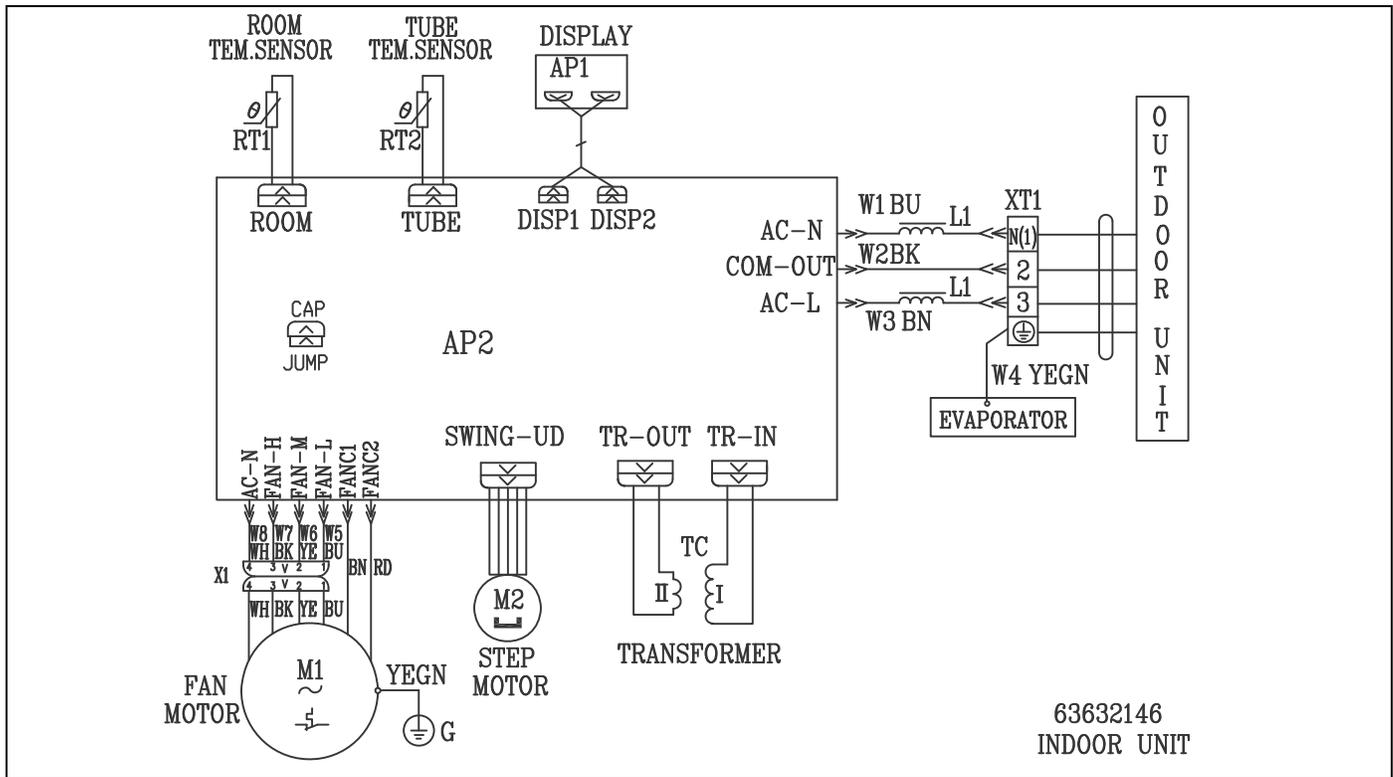


FIGURE 64: 36K Indoor Heat Pumps

SECTION XXIII: INDOOR AND OUTDOOR UNITS ERROR CODES

This section identifies error codes that appear on the front panel of the indoor unit or outdoor unit control. Many of the error codes will automatically clear themselves when the error no longer exists. However some error codes may require disconnecting power to the system at the unit disconnect switch or circuit breaker in order to clear them and to resume normal system operation.

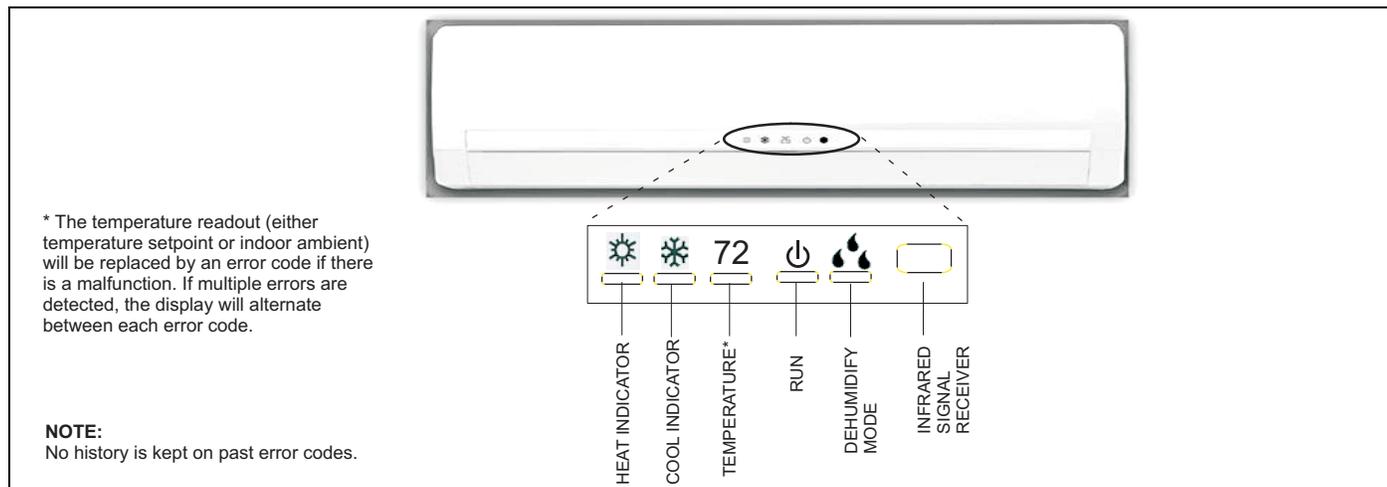


FIGURE 65: Indoor Unit Front Panel Indicators

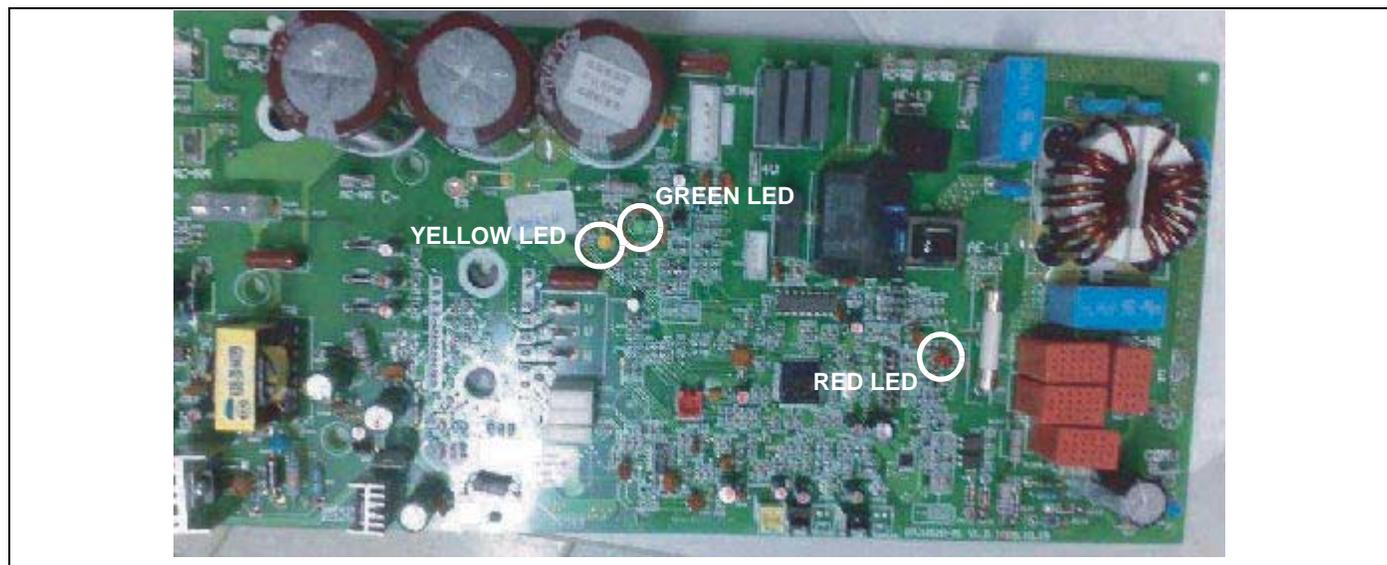


FIGURE 66: Control Board

INDOOR UNIT ERROR CODES

TABLE 12: Error Codes - 09K 12K

No.	Malfunction Name	Display Method of Indoor Unit				Malfunction			A/C Status	Possible Causes
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
1	High pressure protection of system	E1	OFF 3s and blink once						During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1. Refrigerant was super abundant; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	E2	OFF 3S and blink twice				OFF 3S and blink 3 times		During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.
3	System block or refrigerant leakage	E3	OFF 3S and blink 3 times					OFF3S and blink 9 times	The Dual-8 Code Display will show E3 until the low pressure switch stop operation.	1.Low-pressure protection 2.Low-pressure protection of system 3.Low-pressure protection of compressor.
4	High discharge temperature protection of compressor	E4	OFF 3S and blink 4 times				OFF 3S and blink 7 times		During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the ProficientTECH Ductless Splits Technical Training Manual (discharge protection, overload).
5	Overcurrent protection	E5	OFF 3S and blink 5 times				OFF 3S and blink 5 times		During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	1. Supply voltage is unstable; 2. Supply voltage is too low and load is too high; 3. Evaporator is dirty.
6	Communication Malfunction	E6	OFF 3S and blink 6 times					OFF	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the corresponding ProficientTECH Ductless Splits Technical Training Manual.
7	High temperature resistant protection	E8	OFF 3S and blink 8 times				OFF 3S and blink 6 times		During cooling operation: compressor will stop while indoor fan will operate. During heating operation, the complete unit stops.	Refer to the malfunction analysis (overload, high temperature resistant).
8	EEPROM malfunction	EE			OFF 3S and blink 15 times		OFF 3S and blink 11 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Replace outdoor control panel AP1.
9	Limit/ decrease frequency due to high temperature of module	EU		OFF 3S and blink 6 times	OFF 3S and blink 6 times				All loads operate normally, while operation frequency for compressor is decreased	Discharging after the complete unit is de-energized for 20 mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
10	Malfunction protection of jumper cap	C5	OFF 3S and blink 15 times						Wireless remote receiver and button are effective, but cannot dispose the related command.	1. No jumper cap insert on mainboard. 2. Incorrect insert of jumper cap. 3. Jumper cap damaged. 4. Abnormal detecting circuit of mainboard.
11	Gathering refrigerant	F0	OFF 3S and blink 1 times	OFF 3S and blink 1 times					When the outdoor unit receive signal of Gathering refrigerant, the system will be forced to run under cooling mode for gathering refrigerant	Nominal cooling mode

TABLE 12: Error Codes - 09K 12K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit			Malfunction			A/C Status	Possible Causes	
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
12	Indoor ambient temperature sensor is open/short circuited	F1		OFF 3S and blink once					During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	1. Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal. 2. Components in mainboard fell down leads short circuit. 3. Indoor ambient temp. sensor damaged. (check with sensor resistance value chart). 4. Mainboard damaged.
13	Indoor evaporator temperature sensor is open/short circuited	F2		OFF 3S and blink twice					AC stops operation once reaches the setting temperature. Cooling, drying: internal fan motor stops operation while other loads stop operation; heating: AC stop operation	1. Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal. 2. Components on the mainboard fall down leads short circuit. 3. Indoor evaporator temp. sensor damaged. (check temp. sensor value chart for testing). 4. Mainboard damaged.
14	Outdoor ambient temperature sensor is open/short circuited	F3		OFF 3S and blink 3 times			OFF 3S and blink 6 times		During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor).
15	Outdoor condenser temperature sensor is open/short circuited	F4		OFF 3S and blink 4 times			OFF 3S and blink 5 times		During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor).
16	Outdoor discharge temperature sensor is open/short circuited	F5		OFF 3S and blink 5 times			OFF 3S and blink 7 times		During cooling and drying operation, compressor will stop after operating for about 3 mins,while indoor fan will operate;During heating operation, the complete unit will stop after operating for about 3 mins.	1. Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor). 2.The head of temperature sensor hasnt been inserted into the copper tube.
17	Limit/ decrease frequency due to overload	F6		OFF 3S and blink for 6 times			OFF 3S and blink 3 times		All loads operate normally, while operation frequency for compressor is decreased.	Refer to the malfunction analysis (overload, high temperature resistant)
18	Decrease frequency due to overcurrent	F8		OFF 3S and blink 8 times			OFF 3S and blink once		All loads operate normally, while operation frequency for compressor is decreased.	The input supply voltage is too low; System pressure is too high and overload.
19	Decrease frequency due to high air discharge	F9		OFF 3S and blink 9 times			OFF 3S and blink twice		All loads operate normally, while operation frequency for compressor is decreased.	Overload or temperature is too high; Refrigerant is insufficient; Malfunction of electric expansion valve (EKV).
20	Limit/ decrease frequency due to antifreezing	FH		OFF 3S and blink 2 times	OFF 3S and blink 2 times		OFF 3S and blink 4 times		All loads operate normally, while operation frequency for compressor is decreased.	Poor air-return in indoor unit or fan speed is too low.
21	Voltage for DC bus-bar is too high	PH		OFF 3S and blink 11 times			OFF 3S and blink 13 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1).

TABLE 12: Error Codes - 09K 12K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit			Malfunction			A/C Status	Possible Causes	
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
22	Voltage of DC bus-bar is too low	PL			OFF 3S and blink 21 times		OFF 3S and blink 12 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1).
23	Compressor Min frequency in test state	P0								Showing during min. cooling or min. heating test.
24	Compressor rated frequency in test state	P1								Showing during nominal cooling or nominal heating test.
25	Compressor maximum frequency in test state	P2								Showing during max. cooling or max. heating test.
26	Compressor intermediate frequency in test state	P3								Showing during middle cooling or middle heating test.
27	Overcurrent protection of phase current for compressor	P5		OFF 3S and blink 15 times					During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor..
28	Charging malfunction of capacitor	PU			OFF 3S and blink 17 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Refer to the part three-charging ProficienTECH Ductless Splits Technical Training Manual of capacitor.
29	Malfunction of module temperature sensor circuit	P7			OFF 3S and blink 18 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Replace outdoor control panel AP1.
30	Module high temperature protection	P8			OFF 3S and blink 19 times				During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	After the complete unit is de-energized for 20 mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
31	Decrease frequency due to high temperature resistant during heating operation	H0			OFF 3S and blink 10 times				All loads operate normally, while operation frequency for compressor is decreased.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (overload, high temperature resistant).
32	Static dedusting protection	H2			OFF 3S and blink twice					

TABLE 12: Error Codes - 09K 12K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit			Malfunction			A/C Status	Possible Causes	
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
33	Overload protection for compressor	H3			OFF 3S and blink 3 times		OFF 3S and blink 8 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2. Refer to the ProficienTECH Ductless Splits Technical Training Manual (discharge protection, overload).
34	System is abnormal	H4			OFF 3S and blink 4 times		OFF 3S and blink 6 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (overload, high temperature resistant).
35	IPM protection	H5			OFF 3S and blink 5 times		OFF 3S and blink 4 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
36	Module temperature is too high	H5			OFF 3S and blink 5 times		OFF 3S and blink 10 times			
37	Internal motor (fan motor) do not operate	H6	OFF 3S and blink 11 times						Internal fan motor, external fan motor, compressor and electric heater stop operation, guide louver stops at present location.	1. Bad contact of DC motor feedback terminal. 2. Bad contact of DC motor control end. 3. Fan motor is stalling. 4. Motor malfunction. 5. Malfunction of mainboard rev detecting circuit.
38	Desynchronizing of compressor	H7			OFF 3S and blink 7 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
39	PFC protection	HC			OFF 3S and blink 6 times		OFF 3S and blink 14 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual.
40	Outdoor DC fan motor malfunction	L3	OFF 3S and blink 23 times				OFF 3S and blink 14 times		Outdoor DC fan motor malfunction lead to compressor stop operation.	DC fan motor malfunction or system blocked or the connector loosed
41	Power protection	L9	OFF 3S and blink 20 times				OFF 3S and blink 9 times		Compressor stop operation and Outdoor fan motor will stop 30s latter, 3 minutes latter fan motor and compressor will restart.	To protect the electrical components when detect high power.
42	Indoor unit and outdoor unit doesn't match	LP	OFF 3S and blink 19 times				OFF 3S and blink 16 times		compressor and Outdoor fan motor can't work.	Indoor unit and outdoor unit doesn't match.
43	Failure start-up	LC			OFF 3S and blink 11 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual.
44	Malfunction of phase current detection circuit for compressor	U1			OFF 3S and blink 13 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Replace outdoor control panel AP1.

TABLE 12: Error Codes - 09K 12K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit				Malfunction			A/C Status	Possible Causes
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator		
45	Malfunction of voltage dropping for DC bus-bar	U3			OFF 3S and blink 20 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Supply voltage is unstable
46	Malfunction of complete units current detection	U5			OFF 3S and blink 13 times				During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	Theres circuit malfunction on outdoor units control panel AP1, please replace the outdoor units control panel AP1.
47	The four-way valve is abnormal	U7			OFF 3S and blink 20 times				If this malfunction occurs during heating operation, the complete unit will stop operation.	1. Supply voltage is lower than AC175V; 2. Wiring terminal 4V is loosened or broken; 3. 4V is damaged, please replace 4V.
48	Zero-crossing malfunction of outdoor unit	U9	OFF 3S and blink 18 times						During cooling operation, compressor will stop while indoor fan will operate; during heating,the complete unit will stop operation.	Replace outdoor control panel AP1.
49	Frequency limiting (power).						OFF 3S and blink 13 times			
50	Compressor is open-circuited					OFF 3S and blink once				
51	The temperature for turning on the unit is reached						OFF 3S and blink 8 times			
52	Frequency limiting (module temperature)						OFF 3S and blink 11 times			
53	Normal communication							Continuously		
54	Defrosting				OFF 3S and blink once (during blinking, ON 10s and OFF 0.5s)	OFF 3S and blink twice			Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state.

TABLE 13: Error Codes - 18K 24K

No.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit (Indicator has 3 kinds of display status and they will be repeated every 5s.)				A/C status	Possible Reasons	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			<input type="checkbox"/> OFF <input checked="" type="checkbox"/> Illuminated <input checked="" type="checkbox"/> Blink					
			Operation Indicator	Cool Indicator	Heating Indicator	D5 (D40)	D6 (D41)	D16 (D42)			D30 (D43)
1	High pressure protection of system	E1	OFF 3s and blink once			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1. Refrigerant was overcharged; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	E2	OFF 3S and blink twice			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.
3	High discharge temperature protection of compressor	E4	OFF 3S and blink 4 times			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the ProficienTECH Ductless Splits Technical Training Manual (discharge protection, overload).
4	Overcurrent protection	E5	OFF 3S and blink 5 times			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	1. Supply voltage is unstable; 2. Supply voltage is too low an load is too high; 3. Evaporator is dirty.
5	Communication Malfunction	E6	OFF 3S and blink 6 times			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the corresponding ProficienTECH Ductless Splits Technical Training Manual.
6	High temperature resistant protection	E8	OFF 3S and blink 8 times			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	During cooling operation: compressor will stop while indoor fan will operate. During heating operation, the complete unit stops.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (overload, high temperature resistant).
7	Circuit PG motor (indoor fan) has circuit malfunction by zero cross detection	U8	OFF 3S and blink for 17 times							Operation of remote controller or control panel is available, but the unit wont act.	Control board is damaged.
8	PG motor (indoor fan motor) does not operate	H6	OFF 3S and blink 11 times							The complete unit will stop operation.	Poor connection for PGF in circuit diagram; Malfunction of indoor units control panel AP1; Malfunction of indoor units motor M1.
9	Malfunction protection of jumper cap	C5	OFF 3S and blink 15 times							The complete unit will stop operation.	Poor connection for the jumper cap on indoor units control panel AP1; please reinsert or replace the jumper cap;
10	Indoor ambient temperature sensor is open/ short circuited	F1		OFF 3S and blink once						During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	1.Room temperature sensor hasn't been connected well with indoor units control panel AP1 (refer to the wiring diagram for indoor unit); 2.Room temperature sensor is damaged (please refer to the resistance table of temperature sensor)
11	Indoor evaporator temperature sensor is open/ short circuited	F2		OFF 3S and blink twice						During cooling and drying operation, indoor unit will operate while other loads will stop; During heating operation, the complete unit will stop operation.	1.Room temperature sensor hasn't been connected well with indoor units control panel AP1 (refer to the wiring diagram for indoor unit); 2.Room temperature sensor is damaged (please refer to the resistance table of temperature sensor)
12	Outdoor ambient temperature sensor is open/ short circuited	F3		OFF 3S and blink 3 times			<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasn't been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor).

TABLE 13: Error Codes - 18K 24K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit (Indicator has 3 kinds of display status and they will be repeated every 5s.)				A/C status	Possible Reasons	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			<input type="checkbox"/> OFF <input checked="" type="checkbox"/> Illuminated <input checked="" type="checkbox"/> Blink					
			Operation Indicator	Cool Indicator	Heating Indicator	D5 (D40)	D6 (D41)	D16 (D42)			D30 (D43)
13	Outdoor condenser temperature sensor is open/short circuited	F4		OFF 3S and blink 4 times		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation the complete unit will stop operation.	Outdoor temperature sensor hasn't been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor).
14	Outdoor discharge temperature sensor is open/short circuited	F5		OFF 3S and blink 5 times		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	During cooling and drying operation, compressor will stop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.	1.Outdoor temperature sensor hasn't been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor). 2.The head of temperature sensor hasn't been inserted into the copper tube.
15	Limit/ decrease frequency due to overload	F6		OFF 3S and blink for 6 times		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	All loads operate normally, while operation frequency for compressor is decreased.	Refer to the ProficientTECH Ductless Splits Technical Training Manual (overload, high temperature resistant).
16	Decrease frequency due to overcurrent	F8		OFF 3S and blink 8 times		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All loads operate normally, while operation frequency for compressor is decreased.	The input supply voltage is too low; System pressure is too high and overload.
17	Decrease frequency due to high air discharge	F9		OFF 3S and blink 9 times		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All loads operate normally, while operation frequency for compressor is decreased.	Overload or temperature is too high; Refrigerant is insufficient; Malfunction of electric expansion valve (EKV).
18	Voltage for DC bus-bar is too high	PH		OFF 3S and blink 11 times		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2. If the AC input is normal measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, there's malfunction for the circuit, please replace the control panel (AP1).
19	Malfunction of complete units current detection	U5		OFF 3S and blink 13 times		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	There's circuit malfunction on outdoor units control panel AP1, please replace the outdoor units control panel AP1.
20	Overcurrent protection of phase current for compressor	P5		OFF 3S and blink 15 times		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficientTECH Ductless Splits Technical Training Manual (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
21	Defrosting	H1			OFF 3S and blink once					Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state.
22	Static de-dusting protection	H2			OFF 3S and blink twice					/	/
23	Overload protection for compressor	H3			OFF 3S and blink 3 times	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2.Refer to the ProficientTECH Ductless Splits Technical Training Manual (discharge protection, overload).

TABLE 13: Error Codes - 18K 24K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit				Display Method of Outdoor Unit (Indicator has 3 kinds of display status and they will be repeated every 5s.)				A/C status	Possible Reasons
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			<input type="checkbox"/> OFF <input checked="" type="checkbox"/> Illuminated <input checked="" type="checkbox"/> Blink					
			Operation Indicator	Cool Indicator	Heating Indicator	D5 (D40)	D6 (D41)	D16 (D42)	D30 (D43)		
24	System is abnormal	H4			OFF 3S and blink 4 times	■	□	■	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficientTECH Ductless Splits Technical Training Manual (overload, high temperature resistant)
25	IPM protection	H5			OFF 3S and blink 5 times	□	☆	□	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficientTECH Ductless Splits Technical Training Manual (IPM protection, loss of synchronism protection and over-current protection of phase current for compressor.
26	PFC protection	HC			OFF 3S and blink 6 times	□	■	☆	☆	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficientTECH Ductless Splits Technical Training Manual
27	Desynchronizing of compressor	H7			OFF 3S and blink 7 times	□	☆	■	☆	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficientTECH Ductless Splits Technical Training Manual (IPM protection, loss of synchronism protection and over-current protection of phase current for compressor.
28	Decrease frequency due to high temperature resistant during heating operation	H0			OFF 3S and blink 10 times	■	□	☆	☆	All loads operate normally, while operation frequency for compressor is decreased.	Refer to the ProficientTECH Ductless Splits Technical Training Manual (overload, high temperature resistant).
29	Failure startup	LC			OFF 3S and blink 11 times	□	☆	□	☆	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficientTECH Ductless Splits Technical Training Manual.
30	Malfunction of phase current detection circuit for compressor	U1			OFF 3S and blink 13 times	□	☆	■	□	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Replace outdoor control panel AP1.
31	EE PROM malfunction	EE			OFF 3S and blink 15 times	□	□	□	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Replace outdoor control panel AP1.
32	Charging malfunction of capacitor	PU			OFF 3S and blink 17 times	□	■	□	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Refer to the part three charging ProficientTECH Ductless Splits Technical Training Manual of capacitor.
33	Malfunction of module temperature sensor circuit	P7			OFF 3S and blink 18 times	□	□	■	☆	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Replace outdoor control panel AP1.

TABLE 13: Error Codes - 18K 24K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit			Display Method of Outdoor Unit (Indicator has 3 kinds of display status and they will be repeated every 5s.)				A/C status	Possible Reasons	
		Dual-8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			<input type="checkbox"/> OFF <input checked="" type="checkbox"/> Illuminated <input checked="" type="checkbox"/> Blink					
			Operation Indicator	Cool Indicator	Heating Indicator	D5 (D40)	D6 (D41)	D16 (D42)			D30 (D43)
34	Module high temperature protection	P8			OFF 3S and blink 19 times	■	□	☆	■	During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	After the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
35	Malfunction of voltage dropping for DC bus-bar	U3			OFF 3S and blink 20 times	□	■	■	■	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Supply voltage is unstable.
36	Voltage of DC bus-bar is too low	PL			OFF 3S and blink 21 times	□	■	■	□	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, there's malfunction for the circuit, please replace the control panel (AP1).
37	Limit/ decrease frequency due to high temperature of module	EU				■	■	■	☆	All loads operate normally, while operation frequency for compressor is decreased.	Discharging after the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
38	The four-way valve is abnormal	U7				■	□	☆	□	If this malfunction occurs during heating operation, the complete unit will stop operation.	1. Supply voltage is lower than AC175V; 2. Wiring terminal 4V is loosened or broken; 3. 4V is damaged, please replace 4V.
39	Zero crossing malfunction of outdoor unit	U9				■	■	☆	□	During cooling operation, compressor will stop while indoor fan will operate; during heating, the complete unit will stop operation.	Replace outdoor control panel AP1.
40	Limit/ decrease frequency due to antifreezing	FH				■	■	■	□	All loads operate normally, while operation frequency for compressor is decreased.	Poor air-return in indoor unit or fan speed is too low.

TABLE 14: Error Codes - 30K 36K

No.	Malfunction Name	Display Method of Indoor Unit			Malfunction			A/C Status	Possible Causes	
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
1	High pressure protection of system	E1	OFF 3s and blink once						During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1. Refrigerant was super abundant; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	E2	OFF 3S and blink twice				OFF 3S and blink 3 times		During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.
3	System block or refrigerant leakage	E3	OFF 3S and blink 3 times					OFF3S and blink 9 times	The Dual-8 Code Display will show E3 until the low pressure switch stop operation.	1.Low-pressure protection 2.Low-pressure protection of system 3.Low-pressure protection of compressor.
4	High discharge temperature protection of compressor	E4	OFF 3S and blink 4 times				OFF 3S and blink 7 times		During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the ProficienTECH Ductless Splits Technical Training Manual (discharge protection, overload).
5	Overcurrent protection	E5	OFF 3S and blink 5 times				OFF 3S and blink 5 times		During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	1. Supply voltage is unstable; 2. Supply voltage is too low and load is too high; 3. Evaporator is dirty.
6	Communication Malfunction	E6	OFF 3S and blink 6 times					OFF	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the corresponding ProficienTECH Ductless Splits Technical Training Manual.
7	High temperature resistant protection	E8	OFF 3S and blink 8 times				OFF 3S and blink 6 times		During cooling operation: compressor will stop while indoor fan will operate. During heating operation, the complete unit stops.	Refer to the ProficienTECH Ductless/ (overload, high temperature resistant).
8	EEPROM malfunction	EE			OFF 3S and blink 15 times		OFF 3S and blink 11 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Replace outdoor control panel AP1.
9	Limit/ decrease frequency due to high temperature of module	EU		OFF 3S and blink 6 times	OFF 3S and blink 6 times				All loads operate normally, while operation frequency for compressor is decreased	Discharging after the complete unit is de-energized for 20 mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
10	Malfunction protection of jumper cap	C5	OFF 3S and blink 15 times						Wireless remote receiver and button are effective, but cannot dispose the related command.	1. No jumper cap insert on mainboard. 2. Incorrect insert of jumper cap. 3. Jumper cap damaged. 4. Abnormal detecting circuit of mainboard.
11	Gathering refrigerant	F0	OFF 3S and blink 1 times	OFF 3S and blink 1 times					When the outdoor unit receive signal of Gathering refrigerant, the system will be forced to run under cooling mode for gathering refrigerant	Nominal cooling mode

TABLE 14: Error Codes - 30K 36K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit			Malfunction			A/C Status	Possible Causes	
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
12	Indoor ambient temperature sensor is open/short circuited	F1		OFF 3S and blink once					During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	1. Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal. 2. Components in mainboard fell down leads short circuit. 3. Indoor ambient temp. sensor damaged. (check with sensor resistance value chart). 4. Mainboard damaged.
13	Indoor evaporator temperature sensor is open/short circuited	F2		OFF 3S and blink twice					AC stops operation once reaches the setting temperature. Cooling, drying: internal fan motor stops operation while other loads stop operation; heating: AC stop operation	1. Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal. 2. Components on the mainboard fall down leads short circuit. 3. Indoor evaporator temp. sensor damaged. (check temp. sensor value chart for testing). 4. Mainboard damaged.
14	Outdoor ambient temperature sensor is open/short circuited	F3		OFF 3S and blink 3 times			OFF 3S and blink 6 times		During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasn't been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor).
15	Outdoor condenser temperature sensor is open/short circuited	F4		OFF 3S and blink 4 times			OFF 3S and blink 5 times		During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasn't been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor).
16	Outdoor discharge temperature sensor is open/short circuited	F5		OFF 3S and blink 5 times			OFF 3S and blink 7 times		During cooling and drying operation, compressor will stop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.	1. Outdoor temperature sensor hasn't been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor). 2. The head of temperature sensor hasn't been inserted into the copper tube.
17	Limit/ decrease frequency due to overload	F6		OFF 3S and blink for 6 times			OFF 3S and blink 3 times		All loads operate normally, while operation frequency for compressor is decreased.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (overload, high temperature resistant)
18	Decrease frequency due to overcurrent	F8		OFF 3S and blink 8 times			OFF 3S and blink once		All loads operate normally, while operation frequency for compressor is decreased.	The input supply voltage is too low; System pressure is too high and overload.
19	Decrease frequency due to high air discharge	F9		OFF 3S and blink 9 times			OFF 3S and blink twice		All loads operate normally, while operation frequency for compressor is decreased.	Overload or temperature is too high; Refrigerant is insufficient; Malfunction of electric expansion valve (EKV).
20	Limit/ decrease frequency due to antifreezing	FH		OFF 3S and blink 2 times	OFF 3S and blink 2 times		OFF 3S and blink 4 times		All loads operate normally, while operation frequency for compressor is decreased.	Poor air-return in indoor unit or fan speed is too low.
21	Voltage for DC bus-bar is too high	PH		OFF 3S and blink 11 times			OFF 3S and blink 13 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2. If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, there's malfunction for the circuit, please replace the control panel (AP1).

TABLE 14: Error Codes - 30K 36K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit			Malfunction			A/C Status	Possible Causes	
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
22	Voltage of DC bus-bar is too low	PL			OFF 3S and blink 21 times		OFF 3S and blink 12 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2. If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, there's malfunction for the circuit, please replace the control panel (AP1).
23	Compressor Min frequency in test state	P0		Blinking in cool mode, ON 0.25s and OFF 0.25s	Blinking in heat mode, ON 0.25s and OFF 0.25s					Showing during min. cooling or min. heating test.
24	Compressor rated frequency in test state	P1		Blinking in cool mode, ON 0.25s and OFF 0.25s	Blinking in heat mode, ON 0.25s and OFF 0.25s					Showing during nominal cooling or nominal heating test.
25	Compressor maximum frequency in test state	P2		Blinking in cool mode, ON 0.25s and OFF 0.25s	Blinking in heat mode, ON 0.25s and OFF 0.25s					Showing during max. cooling or max. heating test.
26	Compressor intermediate frequency in test state	P3		Blinking in cool mode, ON 0.25s and OFF 0.25s	Blinking in heat mode, ON 0.25s and OFF 0.25s					Showing during middle cooling or middle heating test.
27	Overcurrent protection of phase current for compressor	P5		OFF 3S and blink 15 times					During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor..
28	Charging malfunction of capacitor	PU			OFF 3S and blink 17 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Refer to the part three-charging ProficienTECH Ductless Splits Technical Training Manual of capacitor.
29	Malfunction of module temperature sensor circuit	P7			OFF 3S and blink 18 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Replace outdoor control panel AP1.
30	Module high temperature protection	P8			OFF 3S and blink 19 times				During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	After the complete unit is de-energized for 20 mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
31	Decrease frequency due to high temperature resistant during heating operation	H0			OFF 3S and blink 10 times				All loads operate normally, while operation frequency for compressor is decreased.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (overload, high temperature resistant).
32	Static dedusting protection	H2			OFF 3S and blink twice					

TABLE 14: Error Codes - 30K 36K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit				Malfunction			A/C Status	Possible Causes	
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s					
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator	Green Indicator			
33	Overload protection for compressor	H3			OFF 3S and blink 3 times			OFF 3S and blink 8 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2. Refer to the ProficienTECH Ductless Splits Technical Training Manual (discharge protection, overload).
34	High temperature resistant protection	H4			OFF 3S and blink 4 times			OFF 3S and blink 6 times		During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (overload, high temperature resistant).
35	IPM protection	H5			OFF 3S and blink 5 times			OFF 3S and blink 4 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor).
36	Module temperature is too high	H5			OFF 3S and blink 5 times			OFF 3S and blink 10 times			
37	Internal motor (fan motor) do not operate	H6	OFF 3S and blink 11 times							Internal fan motor, external fan motor, compressor and electric heater stop operation, guide louver stops at present location.	1. Bad contact of DC motor feedback terminal. 2. Bad contact of DC motor control end. 3. Fan motor is stalling. 4. Motor malfunction. 5. Malfunction of mainboard rev detecting circuit.
38	Desynchronizing of compressor	H7			OFF 3S and blink 7 times					During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor).
39	PFC protection	HC			OFF 3S and blink 6 times			OFF 3S and blink 14 times		During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual.
40	Outdoor DC fan motor malfunction	L3	OFF 3S and blink 23 times					OFF 3S and blink 14 times		Outdoor DC fan motor malfunction lead to compressor stop operation.	DC fan motor malfunction or system blocked or the connector loosed
41	Power protection	L9	OFF 3S and blink 20 times					OFF 3S and blink 9 times		Compressor stop operation and Outdoor fan motor will stop 30s latter, 3 minutes latter fan motor and compressor will restart.	To protect the electrical components when detect high power.
42	Indoor unit and outdoor unit doesn't match	LP	OFF 3S and blink 19 times					OFF 3S and blink 16 times		compressor and Outdoor fan motor can't work.	Indoor unit and outdoor unit doesn't match.
43	Failure start-up	LC			OFF 3S and blink 11 times					During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the ProficienTECH Ductless Splits Technical Training Manual.
44	Malfunction of phase current detection circuit for compressor	U1			OFF 3S and blink 13 times					During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop.	Replace outdoor control panel AP1.

TABLE 14: Error Codes - 30K 36K (Continued)

No.	Malfunction Name	Display Method of Indoor Unit			Malfunction			A/C Status	Possible Causes	
		Dual 8 Code Display	Indicator Display (during blinking, ON 0.5s and OFF 0.5s)			Indicator has 3 kinds of display status and during blinking, ON 0.5s and OFF 0.5s				
			Operation Indicator	Cool Indicator	Heating Indicator	Yellow Indicator	Red Indicator			Green Indicator
45	Malfunction of voltage dropping for DC bus-bar	U3			OFF 3S and blink 20 times				During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Supply voltage is unstable
46	Malfunction of complete units current detection	U5			OFF 3S and blink 13 times				During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	Theres circuit malfunction on outdoor units control panel AP1, please replace the outdoor units control panel AP1.
47	The four-way valve is abnormal	U7			OFF 3S and blink 20 times				If this malfunction occurs during heating operation, the complete unit will stop operation.	1. Supply voltage is lower than AC175V; 2. Wiring terminal 4V is loosened or broken; 3. 4V is damaged, please replace 4V.
48	Zero-crossing malfunction of outdoor unit	U9	OFF 3S and blink 18 times						During cooling operation, compressor will stop while indoor fan will operate; during heating,the complete unit will stop operation.	Replace outdoor control panel AP1.
49	Frequency limiting (power).						OFF 3S and blink 13 times			
50	Compressor is open-circuited					OFF 3S and blink once				
51	The temperature for turning on the unit is reached						OFF 3S and blink 8 times			
52	Frequency limiting (module temperature)						OFF 3S and blink 11 times			
53	Normal communication							Continously		
54	Defrosting				OFF 3S and blink once (during blinking, ON 10s and OFF 0.5s)	OFF 3S and blink twice			Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state.

NOTES