Please refer to Corp1908-L5 for indoor and outdoor unit error codes and component diagnostics.
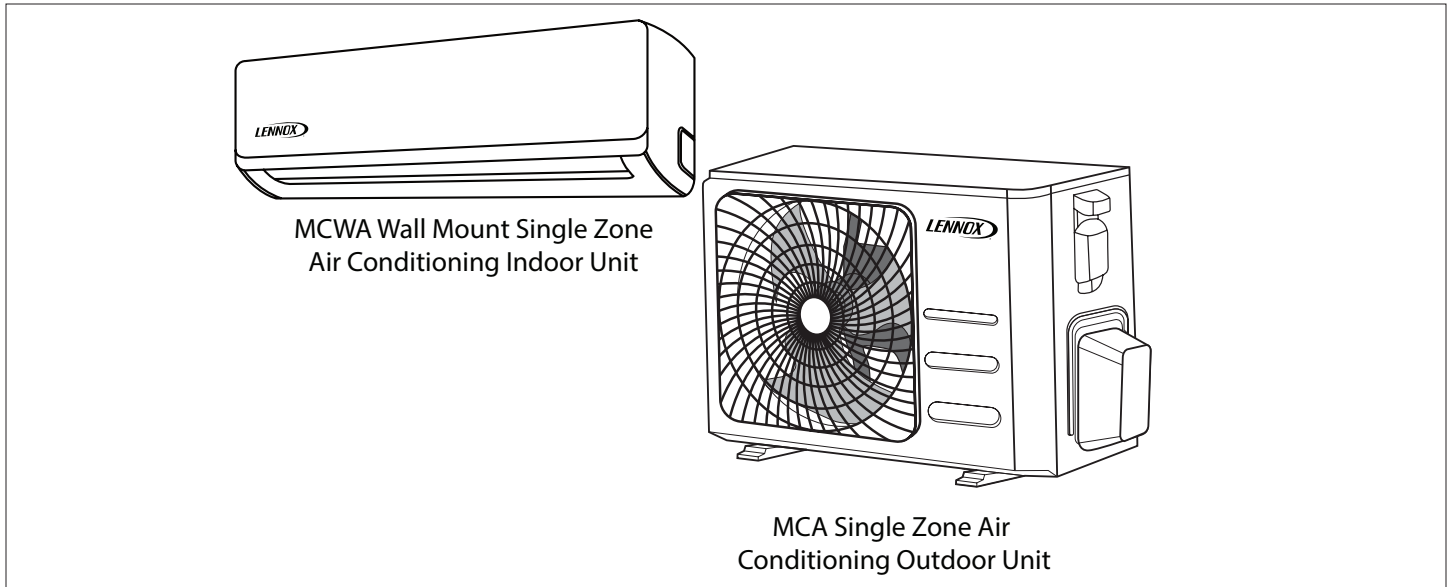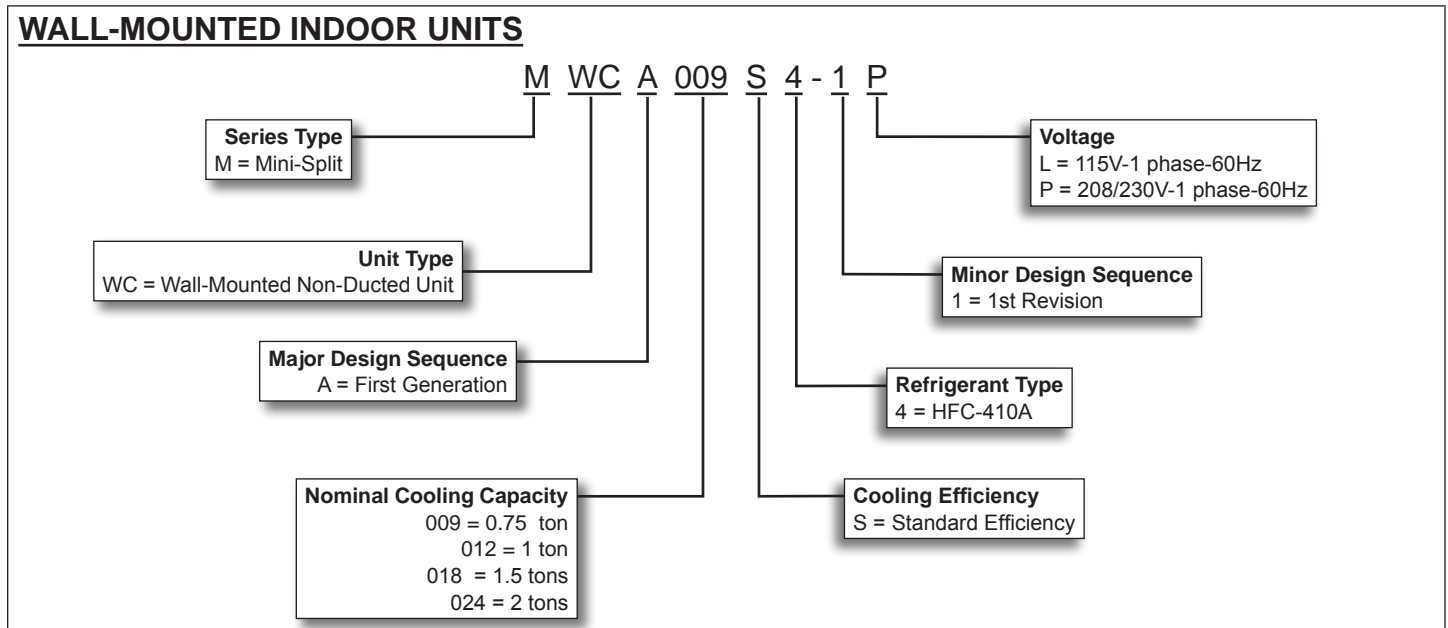
MCWA Wall Mount Single Zone
Air Conditioning Indoor Unit

MCA Single Zone Air
Conditioning Outdoor Unit

Table of Contents

1. Indoor Units

1.1. Model Number Identification

WALL-MOUNTED INDOOR UNITS

M WC A 009 S 4 - 1 P

Series Type
M = Mini-Split

Unit Type
WC = Wall-Mounted Non-Ducted Unit

Major Design Sequence
A = First Generation

Nominal Cooling Capacity
009 = 0.75 ton
012 = 1 ton
018 = 1.5 tons
024 = 2 tons

Cooling Efficiency
S = Standard Efficiency

Refrigerant Type
4 = HFC-410A

Minor Design Sequence
1 = 1st Revision

Voltage
L = 115V-1 phase-60Hz
P = 208/230V-1 phase-60Hz

1.2. Indoor Unit Specifications

Indoor Unit Model No.		MWCA009S4	MWCA012S4		MWCA018S4	MWCA024S4
Nominal Size - Tons		0.75	1		1.5	2
Power Supply - 60 hz - 1 phase		208/230V	115V	208/230V	208/230V	208/230V
Rated load amps		0.22	0.43	0.22	0.40	0.40
Output (W)		47.4	46	47.4	36	89
Room Temperature Range (°F)	Cooling	62 - 90	62 - 90	62 - 90	62 - 90	62 - 90
Air Volume - cfm (High/Medium/Low)		241/206/147	235/206/147	241/194/206	530/441/353	581/456/331
Sound Data (dBA) - Low/Medium/High		26.5/32/38	24.5/33/38.5	24.5/34.5/37.5	30.5/34.5/42	34/40.5/46
Piping Connections - Liquid/Gas - o.d. - flare - in.		1/4 / 3/8	1/4 / 1/2	1/4 / 1/2	1/4 / 1/2	3/8 / 5/8
Drain connection o.d. - in.		1	1	1	1	1
Net/Shipping weights - lbs.		17 / 22	19 / 25	18 / 24	26 / 31	32 / 40

1.3. Indoor Unit Dimensions

TOP VIEW

SIDE VIEW

FRONT VIEW

SIDE VIEW

BOTTOM VIEW
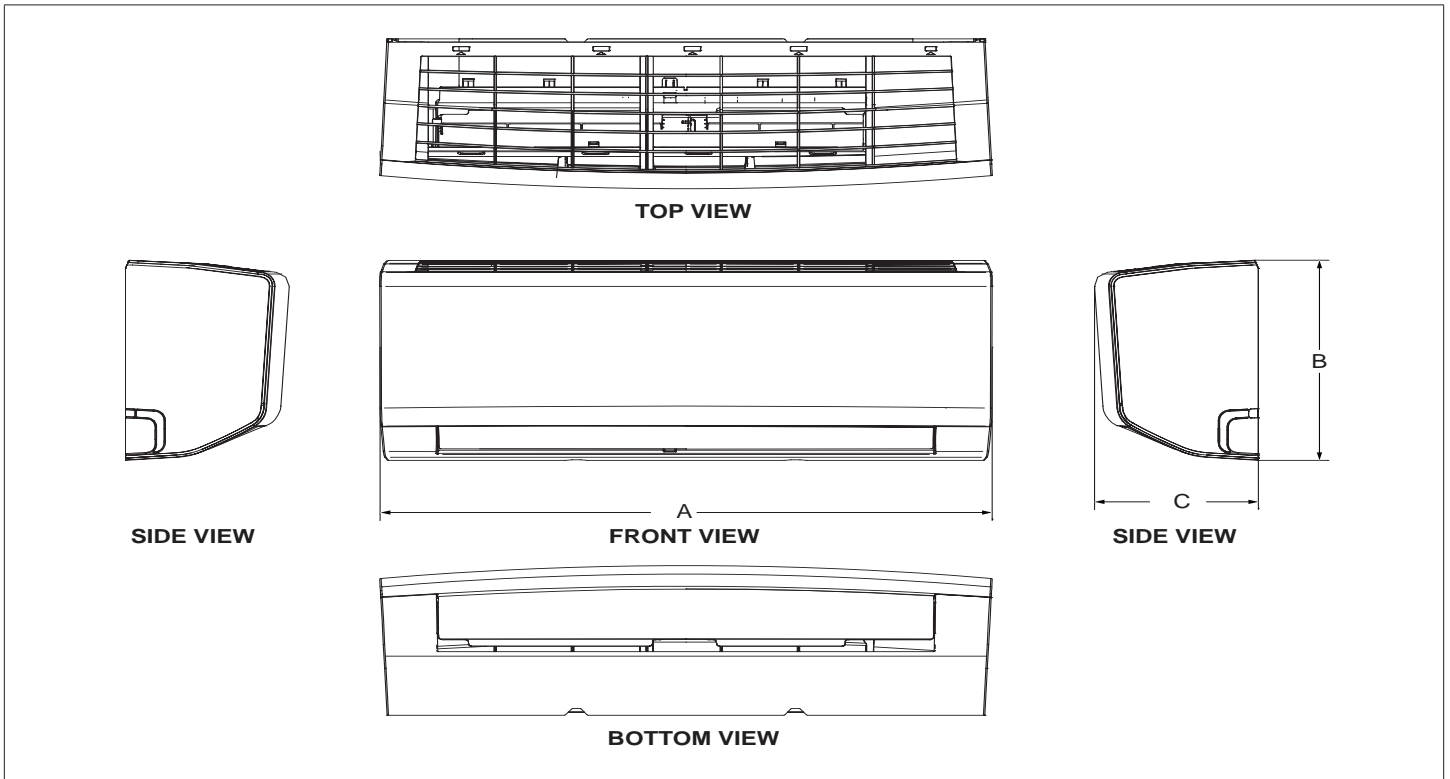
Figure 1.   Indoor Unit Dimensions - Inches (mm)

Size	A		B		C	
	in.	mm	in.	mm	in.	mm
9K	29-5/8	752	11-3/8	289	8-5/8	219
12K	32-3/4	832	11-3/4	298	8-3/4	222
18K	39-1/8	994	12-1/2	318	9-7/8	251
24K	44	1118	13-1/4	337	10-1/4	260

1.4. Indoor Unit Clearances
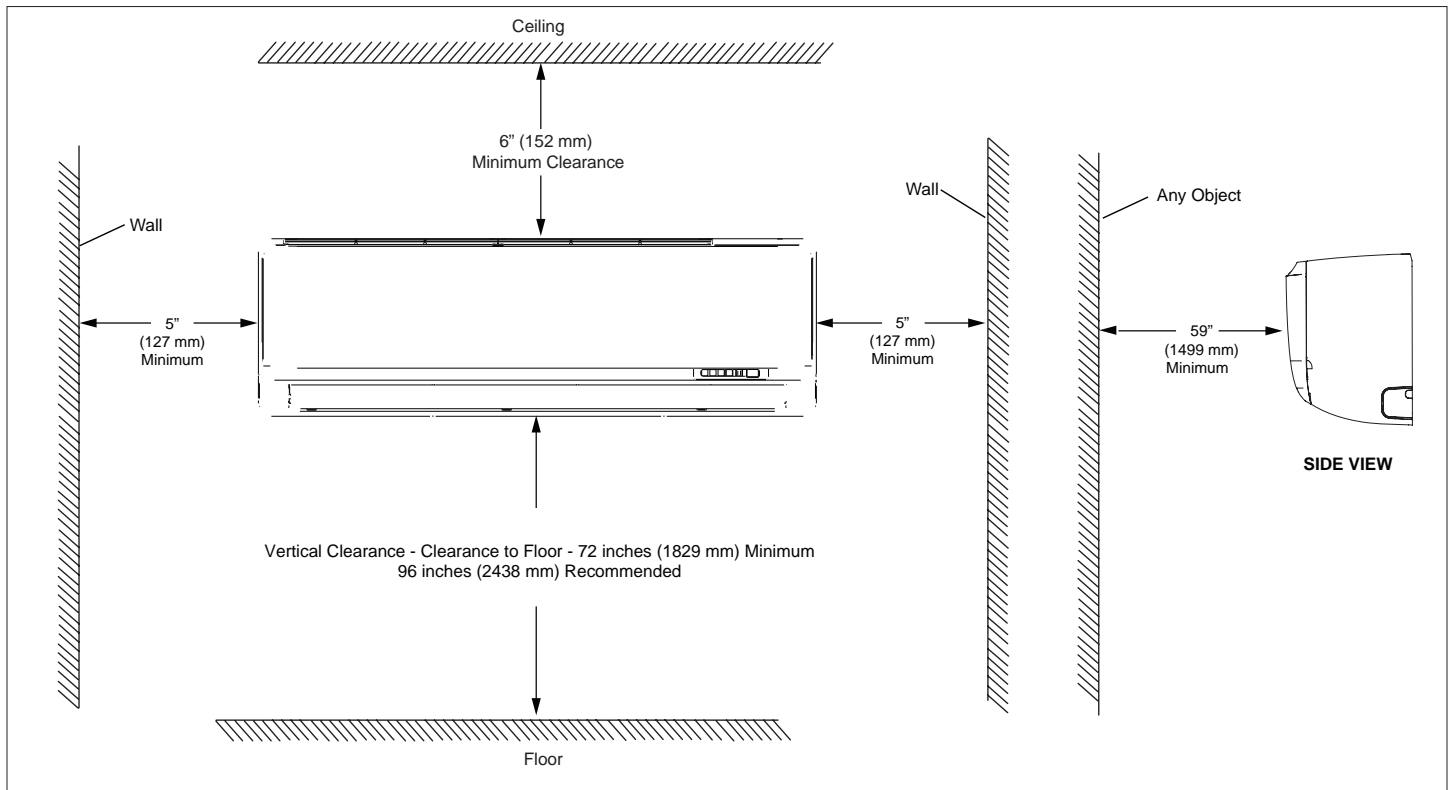
1.5. Indoor Unit Wall Mounts
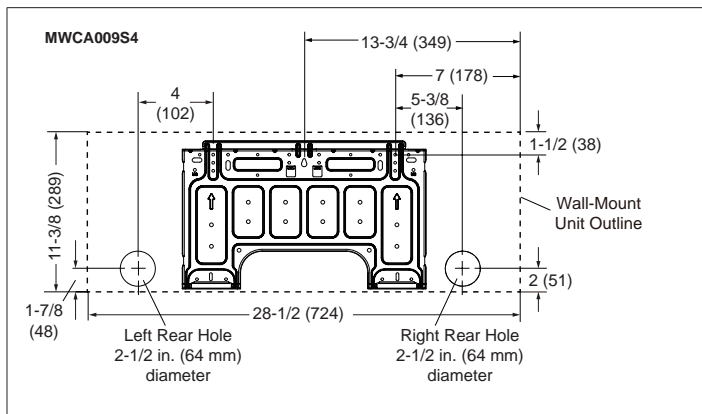
Figure 2. 9K Indoor Unit Wall Plate Dimensions - Inches (mm)

Figure 3. 12K Indoor Unit Wall Plate Dimensions - Inches (mm)

Figure 4. 18K Indoor Unit Wall Plate Dimensions - Inches (mm)
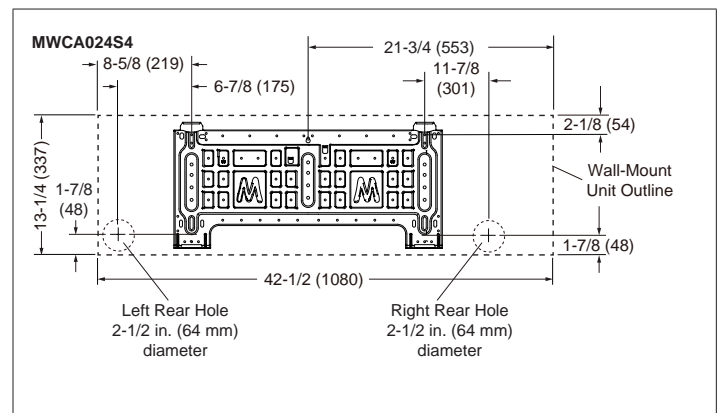
Figure 5. 24K Indoor Unit Wall Plate Dimensions - Inches (mm)

2. Indoor/Outdoor Matches

Indoor Unit Type	Outdoor Unit	Indoor Unit	Cooling Capacity	SEER	EER	AHRI Reference
Wall-Mounted Ductless	MCA009S4S-1P	MWCA009S4-1P	9,000	19.00	11.10	202515503
	MCA012S4S-1L	MWCA012S4-1L	12,000	16.50	10.00	202515502
	MCA012S4S-1P	MWCA012S4-1P	11,500	19.00	11.10	202515504
	MCA018S4S-1P	MWCA018S4-1P	17,000	20.00	10.80	202515505
	MCA024S4S-1P	MWCA024S4-1P	22,000	19.00	10.90	202515506

Ratings are AHRI certified to AHRI Standard 210/240 (with 25 ft. of connecting refrigerant lines); 95°F outdoor air temperature, 80°F db / 67°F wb entering evaporator air.

3. Air Throw Data

4. Power and Communication Wiring for Systems

<table>
<tr><td align="center">⚠ **CAUTION**</td></tr>
<tr><td>This unit must be properly grounded and protected by a circuit breaker. The ground wire for the unit must not be connected to a gas or water pipe, a lightning conductor or a telephone ground wire.

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

Install all wiring at least 3 feet (1 m) away from televisions, radios or other electronic devices in order to avoid the possibility of interference with the unit operation.

Do not install the unit near a lighting appliance that includes a ballast. The ballast may affect remote control operation.</td></tr>
</table>

<table>
<tr><td align="center">⚠ **WARNING**</td></tr>
<tr><td>**Isolate the power supply before accessing unit electrical terminals.**

Install unit so that unit disconnect is accessible.

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

Use specified wiring and cable to make electrical connections. Clamp cables securely and make sure that connections are tight to avoid strain on wiring. Insecure wiring connections may result in equipment failure and risk of fire. Wiring must be installed so that all cover plates can be securely closed.</td></tr>
</table>

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

4.1. Overview

Refer to unit nameplate for minimum circuit ampacity and maximum over-current protection size.

- All indoor units are powered by the outdoor unit.
- Make all electrical power wiring connections at the outdoor unit.
- Size outdoor unit power per local code and power requirements.
- Connect wiring between indoor and outdoor terminals.
- Refer to unit name plate for rated voltage.
- Be sure to reattach all electrical box covers after connections are complete.
- Follow NEC/CEC standards and all local and state codes during wiring installation.

See "Table 1. Single Zone Installation Wiring Requirements" and "Table 2. Specifications" on page 10 for wiring requirements.

4.2. Wire Gauge

Table 1.   Single Zone Installation Wiring Requirements

Systems and Terminal Designations	System Capacity	System Voltage	Number of Conductors	Wire Type	Wire Gauge / MCA
Indoor to Outdoor Wiring (Communication/ Power) 1, 2, 3 and GND	12K	115VAC	4	Stranded and shielded or unshielded	16AWG
Outdoor to Main Power L, N and GND	12K	115VAC	3		14AWG / 15A
Indoor to Outdoor Wiring (Communication/ Power) 1, 2, 3 and GND	09K	208/230VAC	4		16AWG / 10A
Indoor to Outdoor Wiring (Communication/ Power) 1, 2, 3 and GND	12K	208/230VAC	4		16AWG / 11A
Outdoor to Main Power L1, L2 and GND	09K and 12K	208/230VAC	3		16AWG / 9A
Indoor to Outdoor Wiring (Communication/ Power) 1, 2, 3 and GND	18K and 24K	208/230VAC	4		16AWG
Outdoor to Main Power L1, L2 and GND	18K and 24K	208/230VAC	3		14AWG / 18A

MCA = Minimum Circuit Amps
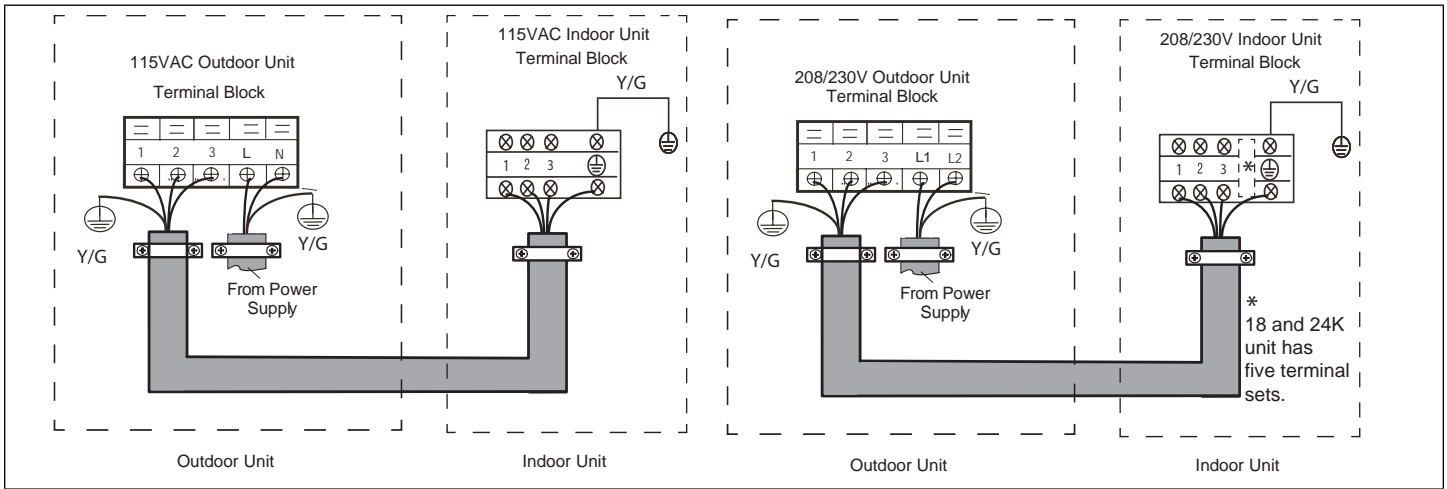
4.3. Terminal Connections

Figure 6.   Single Zone Wiring

5.   Indoor Unit Diagrams
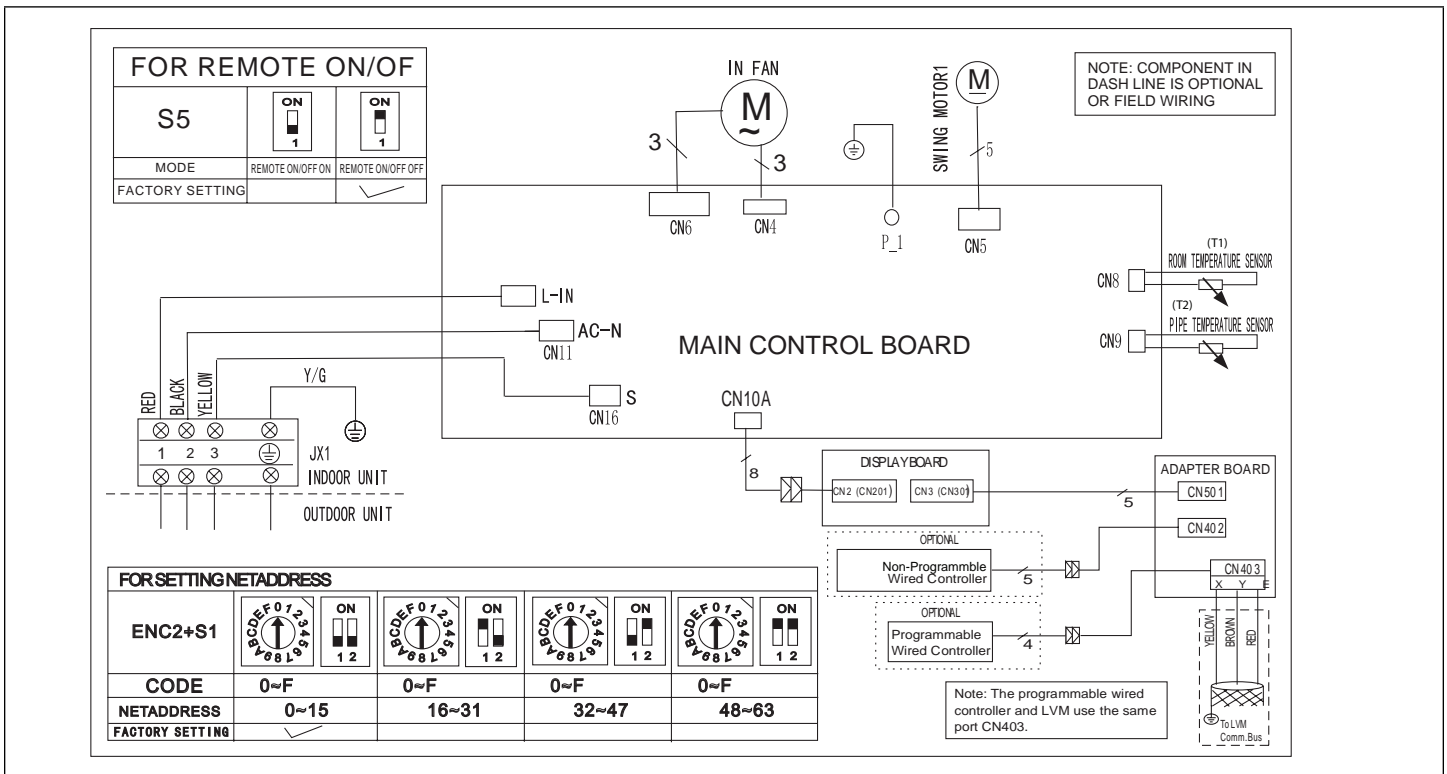

Figure 7.   09K and 12K Indoor Unit Wiring Diagram (115 and 208/230VAC)
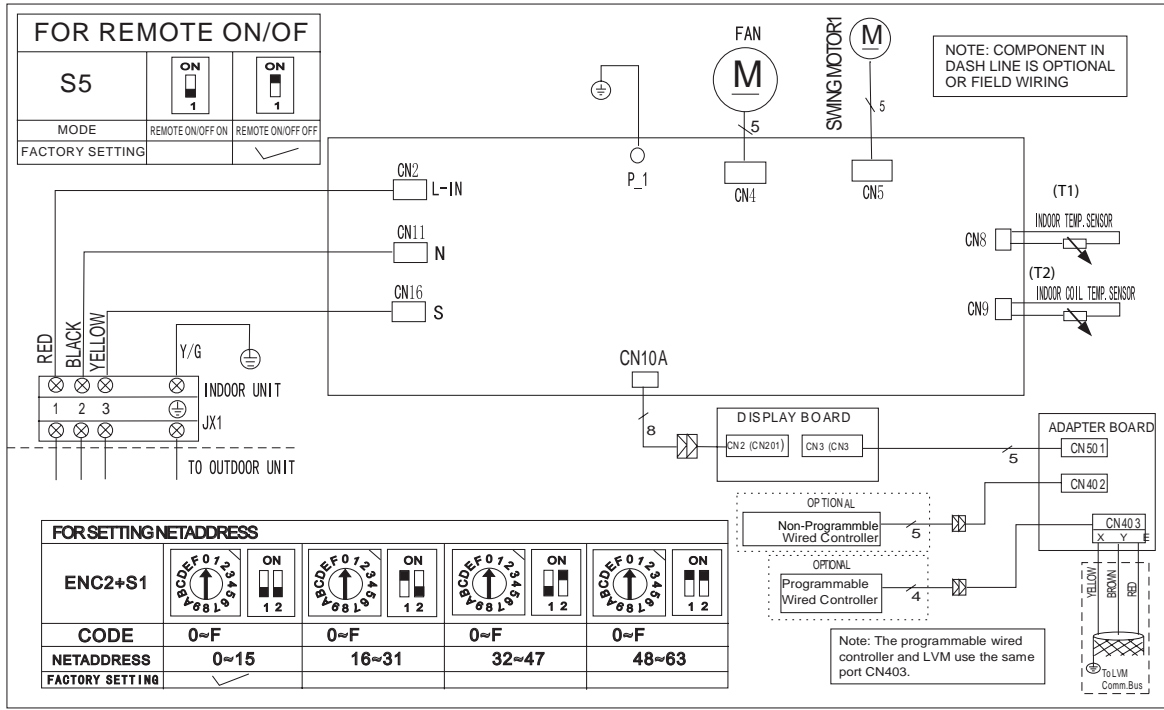
Figure 8.   18K - 208/230VAC Indoor Unit Wiring Diagram
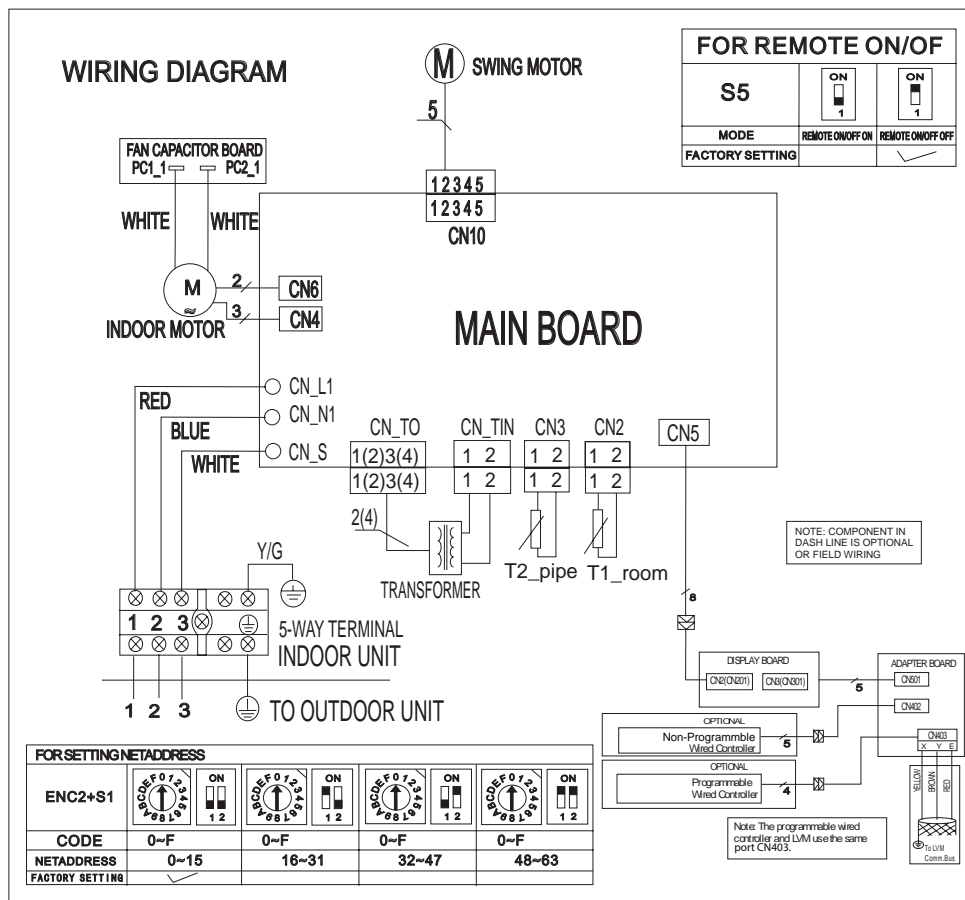
Figure 9.   24K - 208/230VAC Indoor Unit Wiring Diagram

6. Wireless Remote

6.1. Requirements

Using the remote controller

- Point the remote controller directly at the indoor unit.

- Stand within 26 feet (8 meters) of the indoor unit.

- Do not block the signal between the remote controller and indoor unit.

NOTE: *The remote controller will not function without a clear line of sight to the indoor unit.*

- Do not submerge the remote controller in liquid.

- Do not expose to direct sunlight.

- Do not drop or step on remote controller.

- Remote control holder

Use field-provided fasteners to attach the remote controller holder to any suitable vertical surface such as a wall.

6.2. Remote Control Specifications

Table 2. Specifications

Function	Specifications
Rated voltage	3.0 VDC (2 AAA batteries)
Min voltage for sending signal to CPU	2.4 VDC
Effective transmitting distance	26 feet (8 meters)
Operation conditions	23°F to 140°F (-5 to 60°C)

ON/OFF
Turns the system on or off

MODE
Scrolls through operation modes as follows:
**COOL   DRY
FAN**
NOTE - Heat mode is not available on air conditioner models.

FAN
Selects fan speeds in the following order:
**AUTO   LOW   MED
HIGH**
NOTE - Hold button for 2 seconds to activate Silence function.

SLEEP
Saves energy during sleeping hours

TURBO
Enables unit to reach preset temperature in shortest possible time

CLEAN
Starts and stops self clean feature

LED
Turns indoor unit's LED display on and off. If you are sensitive to light when you go to sleep, you can press the LED button to turn off the LED display on the indoor unit. Press the button again to turn it back on.

FP
(Button Disabled)

TEMP
Increases temperature in 1°F increments
(Max. Temperature is 86°F)

TEMP
Decreases temperature in 1°F increments
(Min. Temperature is 62°F)

NOTE - Press and hold   and buttons simultaneously for 3 seconds to switch from °F to °C.

TIMER ON
Sets timer to turn unit on

TIMER OFF
Sets timer to turn unit off

SWING/DIRECT
SWING
Used to start or stop horizontal louver auto-swing feature. Louver will swing up and down automatically when activated.
DIRECT
Used to change the louver movement and set the desired up/down air flow direction. The louver angle changes 6° for each press of the button.

FOLLOW (ME)
Temperature sensing at the remote controller location

Figure 10. Remote Controller Function Buttons

Figure 11. Remote Controller Display

6.3. Function Buttons

See "Figure 10. Remote Controller Function Buttons" on page 10 for illustration for remote function buttons.

- **Up arrow button**. Press to increase the temperature setpoint or to scroll through settings options.

- **On/Off button**. Press to turn the indoor unit on or off.
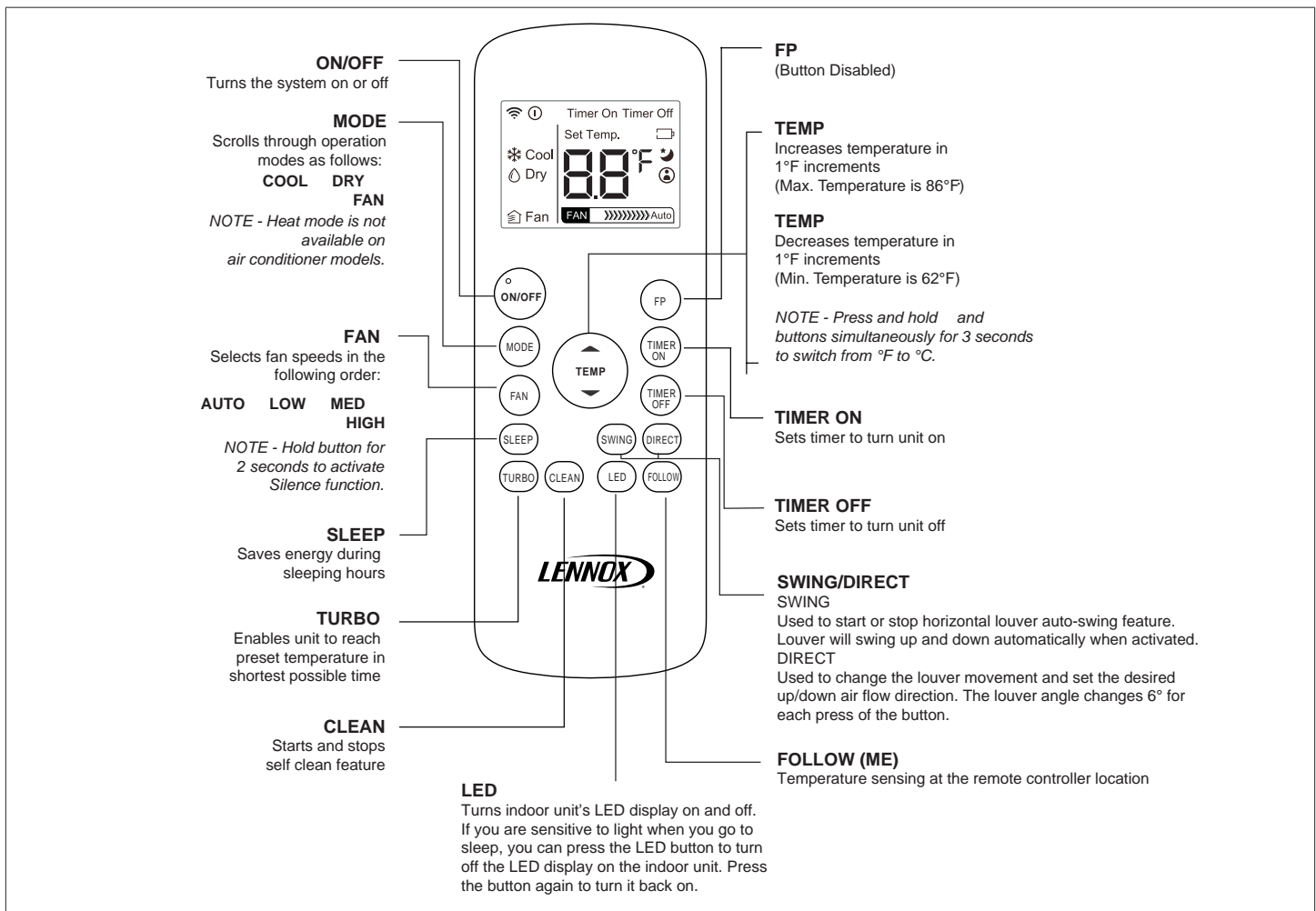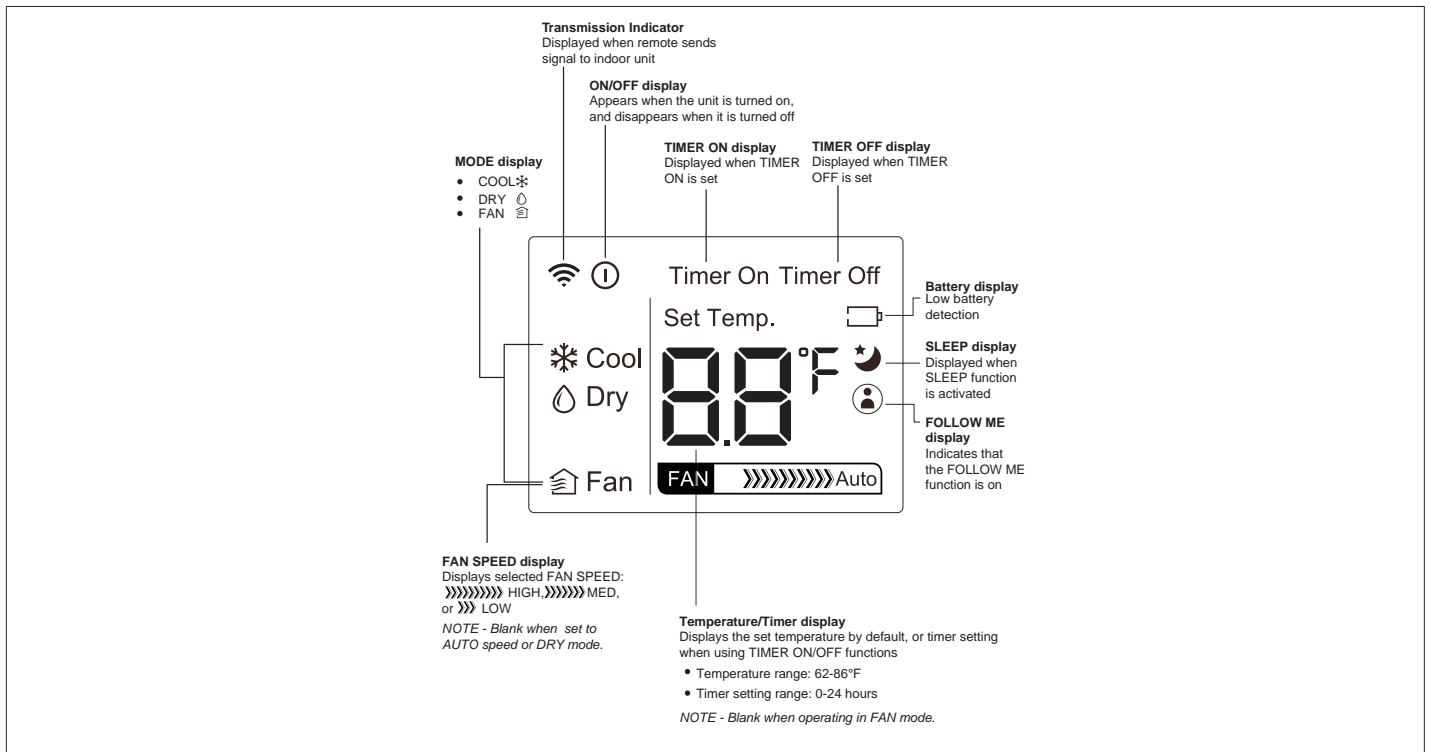
- **Mode button**. Press to scroll through the operation modes: **Cool → Dry → Fan**.

- **Fan speed**. Press to scroll through the fan speeds: **Low → Med → High**.

- **Sleep button**. Press to activate "night-mode". This will automatically increase (cooling) the setpoint 2°F (1°C) per hour for the first two hours. The modified setpoint will be set for five hours. After seven total hours the indoor unit will shut off. Pushing the on button will turn the unit back on.

- **Turbo button**. Press to active turbo mode. The indoor unit will ramp up to reach the setpoint more quickly. After reaching the set point or after 30 minutes, the indoor unit will resume the previous operating conditions.

- **Clean button**. Press to activate self cleaning mode. In cooling or dry mode only, the indoor unit will temporarily change operation to allow condensate on the indoor unit coil to evaporate, and then will return to the previous operating conditions.

NOTE: *Only available in COOL or DRY mode.*

- **Down arrow button**. Press to decrease the temperature setpoint or scroll through settings options.

- **Silence Function.** Hold the fan button for two seconds to activate silence function. This operates the compressor at low frequency and low fan speed to reduce operating sound levels to a minimum.

NOTE: *Silence function may result in insufficient cooling capacity. Hold the fan button for two seconds again to stop the silence function.*

- **Timer ON button**. Press to set the number of hours of delay before the indoor unit begins operation.

- **Timer OFF button**. Press to set the number of hours of delay before the indoor unit stops operation.

- **Swing button**. Press once to initiate louver left and right oscillation. Press again to stop louver oscillation. Louvers remain in place where stopped.

- **Direct** (Direction) **button**. Press to move louvers up and down in six degree increments. Louvers remain in place where stopped.

- **LED** button. Press the **LED** button to turn on the indoor unit display (on units with display). Press the button again to turn off the display.

- **Follow (Follow Me) button**. Press to activate the wireless remote's air temperature sensor. This will also transfer the temperature sensing function from the indoor unit to the remote. The indoor unit's air temperature sensor will be disabled. The indoor unit will regulate the room temperature based on the temperature sensor in the remote controller, rather than the sensor in the indoor unit.

- The remote controller will send the indoor unit a signal every three minutes. If the indoor unit doesn't receive the signal for seven minutes, or if the button is pressed again, the **Follow Me** function will terminate.
  The remote controller must remain pointed toward the indoor unit and must be within 26 feet (8 meters) of the unit. Do not remove the controller from the room or obstruct the signal of the remote controller during **Follow Me** operation.

6.4. Display

See "Figure 11. Remote Controller Display" on page 11 for illustration of remote control.

- **Remote controller On.** Icon displays to indicate that the remote controller is on**.**
- **Transmitting display**. Icon blinks once when a signal is sent from the wireless remote controller.
- **Operation mode**. These icons show the current mode of operation. Press the mode button to scroll through the operation modes:
  Cool → Dry → Fan.
- **Setpoint or Room Temperature**. Displays the setpoint temperature during normal operation. Displays the room temperature when in Follow me mode. Adjust the setpoint with up and down arrow buttons. No display when unit is in fan mode.
- **Timer ON/OFF**. These icons light up to indicate that the indoor unit has a timed auto-start or auto-stop set-up.
- **Battery charge status**. Icon displays charge status of wireless remote controller batteries. Only appears when battery is low.
- **Sleep mode.** Icon displays to indicate that sleep mode operation is on.
- **Follow me.** This icon displays when the air temperature sensor in the wireless remote controller is the sensor being used by the indoor unit. When this function is off, the indoor unit uses a built-in sensor. When the function is set to on, this option may help in maintaining a closer comfort level in most cases.
- **Fan speed**. Displays the current fan speed.

6.5. Operations

6.5.1. Start/Stop Operation

Press the **LED** power button.

- **Controller ON**: LED power button lit brightly.
- **Controller OFF**: LED power button not lit.

6.5.2. Select Fahrenheit or Celsius

Press and hold the **Up** and **Down** buttons at the same time for three seconds to toggle between Fahrenheit and Celsius.

To Set the Operation Mode

Press the **Mode** button to scroll through the mode selections.

- **Cool** – System operates in cooling mode.
- **Dry** – System removes humidity according to preset conditions (fan speed and setpoint temperature). Cannot adjust fan speed.

NOTE: *Temperature will be 6-8 degrees colder if this mode is used.*

- **Fan** – This is for Fan only, no cooling.

To set (or change) the room temperature setting (set point) Press the **up** and **down** arrow buttons to adjust the setpoint.

6.5.3. Cool/Fan mode

1. Press the **Mode** button to select either **Cool** or **Fan**.
2. Adjust the temperature setpoint using up and down arrow buttons (range 62°F – 86°F).
3. Press the **Fan Speed** button to select **Auto**, **Low**, **Med**, or **High** fan speed.

NOTE: *Temperature set point is not displayed in fan mode.*

6.5.4. Dry Mode

1. Press the **Power** button. An LED light on the indoor unit displays.
2. Press the **Mode** button to select Dry.
3. Adjust the temperature setpoint using up and down arrow buttons.

NOTE: *Temperature will be 6-8 degrees colder if this mode is used.*

NOTE: *Fan speed is not adjustable in dry mode.*

6.5.5. Timer Operation

Timer ON and Timer OFF are used to turn on and turn off the indoor unit at selected intervals.

6.5.6. Timer ON Operation

1. Press the **Timer ON** button. The Timer ON icon, the last auto-on time, and "**h**" will display.
2. Press the **Timer ON** button again to set the amount of time before the indoor unit begins operation. Each press will increase the time in half hour increments until 10 hours, then the increment becomes one hour.

6.5.7. Timer OFF Operation

1. Press the **Timer OFF** button. The Timer OFF icon, the last auto-off time, and "**h**" will display.

2. Press the **Timer OFF** button again to set the amount of time before the indoor unit stops operation. Each press will increase the time in half hour increments until 10 hours, then the increment becomes 1 hour.

6.5.8. Modify Timer ON/OFF settings

1. Press either the **Timer ON** button or the **Timer OFF** button to modify that setting.

2. Use the up arrow and down arrow buttons to change the timed operation intervals.

3. Set the timer to 0.0 to turn off timed operation.

7. Connection to Centralized Controller

7.1. Set Indoor Unit Address for Centralized Control (Used with VRF Only)

All indoor units connected to a centralized controller must have a unique address. Use the S1 dip switch and the S2 dial switch to set the address for each indoor unit. The table below shows how to set the unique addresses.

All indoor units are factory set to "0". To change the address to "1", move the dial switch to the 1 position, do not adjust the dip switches. To change the address to "35", move dip switch 1 to the UP position and move the dial switch to the 3 position.
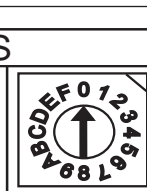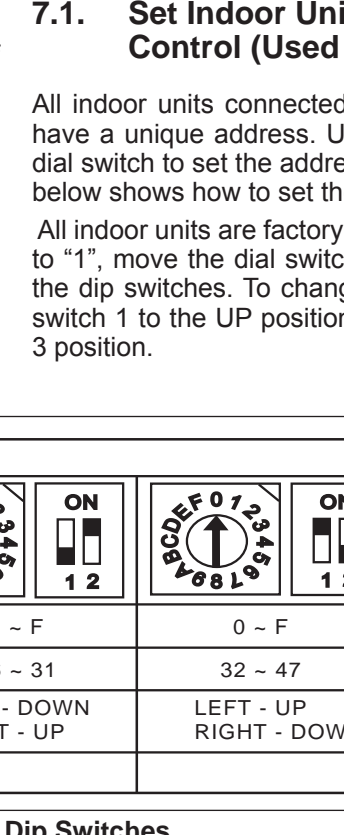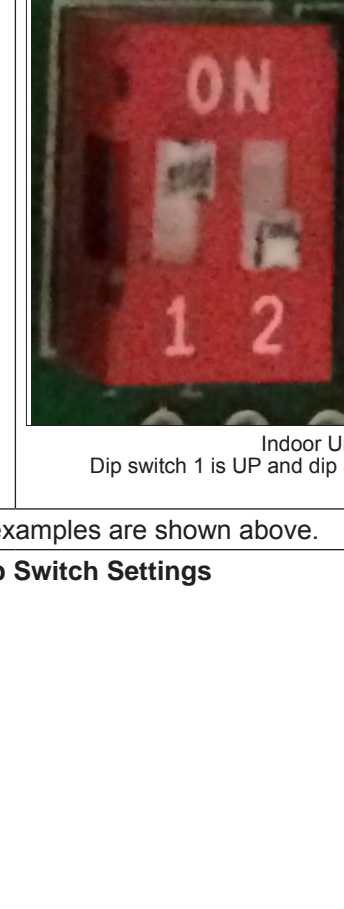
FOR SETTING ADDRESS				
S1+S2				
RANGE	0 ~ F	0 ~ F	0 ~ F	0 ~ F
ADDRESS	0 ~ 15	16 ~ 31	32 ~ 47	48 ~ 63
DIP SWITCH HANDLES	LEFT - DOWN RIGHT - DOWN	LEFT - DOWN RIGHT - UP	LEFT - UP RIGHT - DOWN	LEFT - UP RIGHT - UP
FACTORY SETTING	✓			

Figure 12. Dip Switches

Indoor Unit Address is 0
Both dip switch handles are DOWN, dial points to 0.

Indoor Unit Address is 32
Dip switch 1 is UP and dip switch 2 is DOWN, dial points to 0.

Switch location and color varies for each indoor unit. Two examples are shown above.

Figure 13. Dip Switch Settings

7.2. Indoor Unit Connection Points for Centralized Controller

Mini-split indoor units can be connected to a centralized controller (e.g. Lennox VRF Manager - LVM or Trane Tracer) or a BACnet or LonWorks gateway using the XYE terminals on the indoor unit main board.

Figure 14. Indoor Unit Connection Points (Typical Wiring Diagram)

Figure 15. Typical Indoor Unit Connection Points

7.3. Dry Mode Operation - Indoor Units

7.3.1. Procedure

1. Press the **MODE** button to select **DRY** mode.

2. Press the **UP/ DOWN** button to select the desired temperature. The temperature setting range is from 62°F to 86°F in one degree increments.

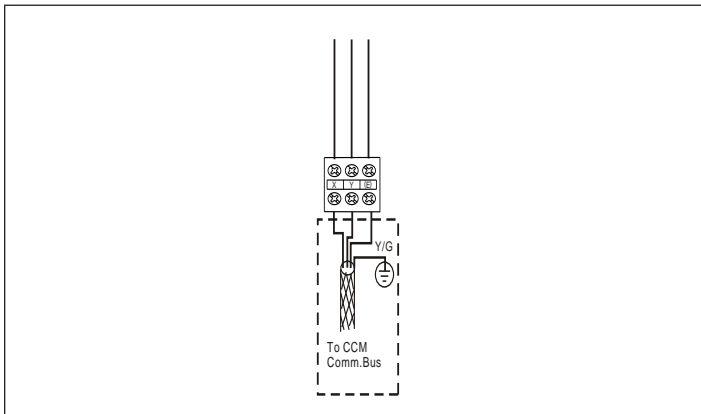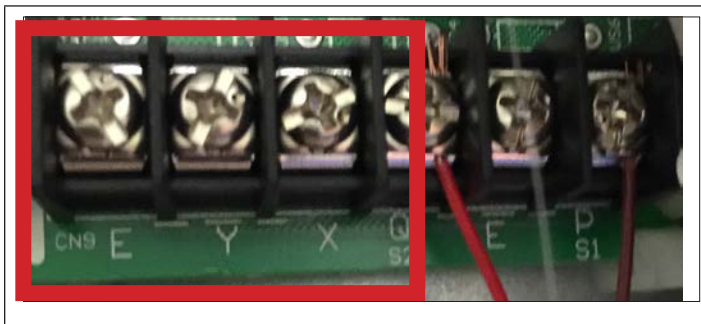*NOTE:* *The blower is preset at a low speed and cannot be changed therefore it will get cold and most likely will over shoot the temperature setting by 6-10 degrees depending on the room size or other various factors. Also the Follow Me mode does not operate in this mode. The Follow Me mode is only available when a return air sensor is utilized. Typically in most cases the Follow Me mode will not be sufficient to remove excessive humidity.*

NOTE: *In addition, the outdoor units do not have a humidistat installed therefore they are unable to determine humidity levels. This product is not recommend as a main source for dehumidification. Note, this well over shoot the temperature by 6-8 degrees below what was set for dry mode.*

NOTE: *Using this mode will over shoot the temp by 6-8 degrees below what was set for dry mode.*

7.3.2. Dry Mode Operation Sequence

When in dry mode operation the unit is actually in cooling mode with a low speed blower operation. The compressor will stop when the room temperature is two degrees Celsius lower than the temperature setting.

However there is a temperature compensation for cooling mode that is two degrees Celsius. So the unit will stop when the temperature is four degrees Celsius lower than the room temperature settings.

NOTE: *Four degrees Celsius is equivalent to 8°F difference.*

7.4. Test Run - Indoor Units

Only perform test run after you have completed the following steps:

• Electrical Safety Checks – Confirm that the unit's electrical system is safe and operating properly

• Gas Leak Checks – Check all flare nut connections and confirm that the system is not leaking

• Confirm that gas and liquid (high and low pressure) valves are fully open.

7.4.1. Test Run Instructions

You should perform the Test Run for at least 30 minutes.

1. Connect power to the unit.

2. Press the ON/OFF button on the remote controller to turn it on.

3. Press the mode button to scroll through the functions, one at a time:

4. Let each function run for five minutes, and perform the following checks:

7.4.2. Before Test Run

Table 3. Test Run Checklist

Checks	Pass	Fail
No electrical leakage		
Unit is properly grounded		
All electrical terminals properly covered		
Indoor and outdoor units are solidly installed		
All pipe connection points do not leak		
Water drains properly from drain hose		
All piping is properly insulated		
Unit performs COOL function properly		
Indoor unit louvers rotate properly		
Indoor unit responds to remote controller		

7.5. Double-Check Pipe Connections

During operation, the pressure of the refrigerant circuit will increase. This may reveal leaks that were not present during your initial leak check. Take time during the Test Run to double-check that all refrigerant pipe connection points do not have leaks.

- Using remote control, return unit to the normal operating temperature.

- Using insulation tape, wrap the indoor refrigerant pipe connections that you left uncovered during the indoor unit installation process.

7.6. Ambient Temperature is Below 63°F (17°C)

You can't use the remote controller to turn on the COOL function when the ambient temperature is below 17°C. In this instance, you can use the MANUAL CONTROL button to test the COOL function.

- Lift the front panel of the indoor unit, and raise it until it clicks in place.

- The MANUAL CONTROL button is located on the right-hand side of the unit. Press it one time to select the COOL function.

- Perform Test Run as normal.

- Push the button once and unit is in auto mode. Temperature is set at 75°F with no changing of set temperature..
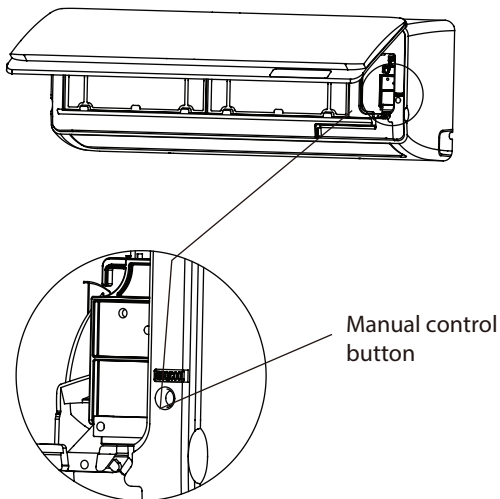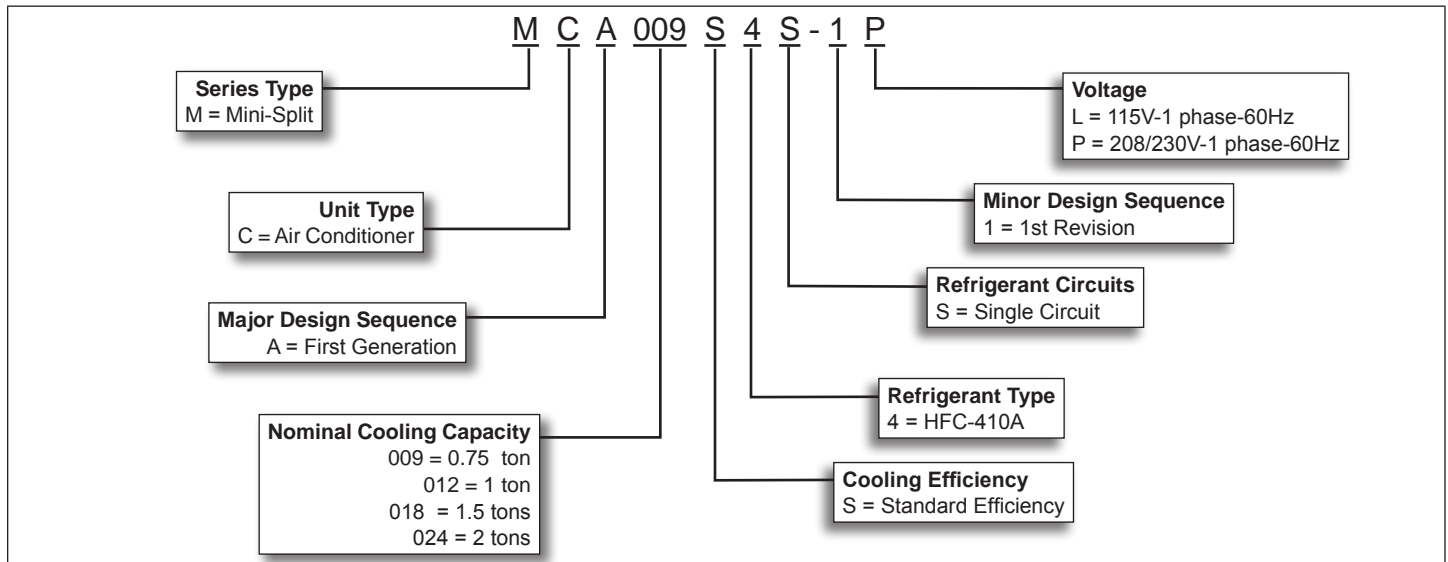

Manual control button

Figure 16. Manual Button Location

8. Single Zone Outdoor Units

NOTE: Outdoor units can only be installed in an unenclosed outdoor environment.

8.1. Model Number Identification

M C A 009 S 4 S - 1 P

Series Type
M = Mini-Split

Unit Type
C = Air Conditioner

Major Design Sequence
A = First Generation

Nominal Cooling Capacity
009 = 0.75 ton
012 = 1 ton
018 = 1.5 tons
024 = 2 tons

Cooling Efficiency
S = Standard Efficiency

Refrigerant Type
4 = HFC-410A

Refrigerant Circuits
S = Single Circuit

Minor Design Sequence
1 = 1st Revision

Voltage
L = 115V-1 phase-60Hz
P = 208/230V-1 phase-60Hz

8.2. Specifications

Outdoor Unit Model No.		MCA009S4S	MCA012S4S	MCA018S4S	MCA024S4S
Nominal Size - Tons		0.75	1	1.5	2
Ambient Temperature Operating Range - °F		5 - 122	5 - 122	5 - 122	5 - 122
Energy Star		Yes	Yes	Yes	Yes
Sound Data (dBA)		51	51.5	53.5	57
Refrigerant (R-410A)	Charge furnished (115V)	- - -	1 lb. 5 oz.	- - -	- - -
	Charge furnished (208/230V)	1 lb. 2 oz.	1 lb. 3 oz.	2 lbs. 0 oz.	2 lbs. 9 oz.
Maximum line length with furnished charge - ft.		20	20	20	30
Additional charge required per ft. - oz.		0.21	0.21	0.21	0.32
Compressor	No. and Type	(1) Rotary	(1) Rotary	(1) Rotary	(1) Rotary
	Refrigerant oil type	VG74	VG74	VG74	VG74
	Refrigerant oil charge - oz.	5.7	12.5 (115V) 5.7 (208/230V	14.9	15.2
Connections - in.	Liquid/Gas pipe (flare)	1/4 / 3/8	1/4 / 1/2	1/4 / 1/2	3/8 / 5/8
Maximum refrigerant pipe length - ft.		82	82	98	98
Max. difference in level of indoor unit - ft.		33	33	66	66
Outdoor Fan	(No.) Diameter - in.	(1) 16-3/4	(1) 16-3/4	(1) 16-3/4	(1) 19-1/4
	Total air volume - cfm	1230	1175 (115V) 1230 (208/230V	1195	1824
	rpm	850/700	850/700	850/700	800/550
Outdoor Coil	Number of rows	1	1	2	2
	Fins per inch	21	21	21	21
	Fin type	Hydrophilic aluminium			
	Tube outside diameter - in.	1/4	1/4	1/4	1/4
	Tube type	Rifled copper tubing			
	Net face area - ft.²	4.15	4.15	4.15	5.48

Application area - ft.²		130 - 195	170 - 250 (115V) 160 - 240 (208/230V)	250 - 355	310 - 460
Design Pressure	PSIG	550/340	550/340	550/340	550/340
Shipping Data	Net/Shipping weight (lbs.) (115V)	- - -	63 / 68	- - -	- - -
	(208/230V)	54 / 59	55 / 60	66 / 73	89 / 96

ELECTRICAL DATA

Electrical Characteristics - 60 Hz - 1 Phase		208/230V	115V	208/230V	208/230V	208/230V
[1] Maximum Overcurrent Protection (amps)		15	20	15	20	25
[2] Minimum circuit ampacity		10	15	11	15	18
Compressor Rated load amps		6.2	5.05	6.8	9.0	12.0
Outdoor Fan Motor	Rated load amps	0.39	0.39	0.39	0.39	0.60
	Output - W	58	58	58	58	115

NOTE - Extremes of operating range are plus and minus 10% of line voltage.

[1] HACR type circuit breaker or fuse.

[2] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

8.3.   Cooling Capacity

8.3.1.   - 009 (208/230V)

Outdoor Temperature - °F (Dry Bulb)	Indoor Temperature - °F (Dry Bulb / Wet Bulb)							
	65°F / 54°F		70°F / 59°F		75°F / 63°F		80°F / 67°F	
	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh
−13	6.80	4.84	7.04	4.98	7.61	5.41	8.05	5.67
−5	7.35	5.26	7.70	5.54	8.31	5.95	8.75	6.24
−4	7.45	5.45	7.90	5.75	8.48	6.20	8.93	6.47
0	7.69	5.40	8.05	5.65	8.84	6.21	9.20	6.45
5	7.96	5.70	8.44	6.12	9.11	6.53	9.59	6.86
15	8.56	6.27	9.18	6.79	9.96	7.29	10.37	7.60
25	9.08	6.18	9.57	6.45	10.33	7.03	10.87	7.33
35	9.45	6.51	9.89	6.79	10.61	7.32	11.17	7.72
45	10.45	7.13	10.89	7.46	11.82	8.07	12.44	8.45
55	10.41	7.58	10.97	7.98	11.97	8.71	12.47	9.03
65	10.45	7.61	11.01	8.02	11.89	8.66	12.51	9.12
75	10.61	7.44	11.11	7.79	11.86	8.32	12.55	8.80
85	9.92	7.06	10.39	7.35	11.22	7.98	11.81	8.32
95	9.24	6.81	9.79	7.21	10.45	7.70	11.06	8.27
105	8.69	6.78	9.16	7.14	9.89	7.71	10.40	8.12
110	8.14	6.92	8.63	7.34	9.22	7.83	9.75	8.29
115	7.37	6.56	7.81	6.95	8.43	7.50	8.87	7.90
122	6.59	6.07	6.99	6.43	7.58	6.98	7.90	7.27

8.3.2.   - 012 (115V)

Outdoor Temperature - °F (Dry Bulb)	Indoor Temperature - °F (Dry Bulb / Wet Bulb)							
	65°F / 54°F		70°F / 59°F		75°F / 63°F		80°F / 67°F	
	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh
−13	6.55	4.64	6.93	4.90	7.27	5.24	7.58	5.46
−5	7.01	4.94	7.41	5.23	7.86	5.73	8.15	5.79
−4	7.23	4.99	7.65	5.27	7.94	5.48	8.31	5.65
0	7.50	5.10	7.84	5.34	8.27	5.62	8.57	5.78
5	7.64	5.28	8.13	5.61	8.44	5.80	8.83	6.09
15	7.93	5.62	8.44	5.98	8.85	6.32	9.22	6.52
25	8.38	5.94	8.77	6.22	9.30	6.62	9.63	6.90
35	8.81	6.18	9.16	6.42	9.61	6.82	10.06	7.10
45	9.00	6.63	9.63	7.09	10.09	7.55	10.46	7.68
55	9.47	7.31	9.96	7.69	10.39	7.87	10.88	7.78
65	9.92	7.01	10.42	7.37	10.93	7.73	11.33	8.01
75	10.15	7.31	10.80	7.77	11.28	8.11	11.81	8.50
85	10.78	7.86	11.28	8.22	11.90	8.67	12.39	9.03
95	11.02	7.73	11.53	8.08	12.16	8.53	12.60	8.84
105	9.81	7.11	10.31	7.48	10.82	7.85	11.33	8.22
110	8.67	6.76	9.17	7.15	9.72	7.58	10.07	7.86
115	7.98	6.78	8.44	7.17	8.76	7.44	9.17	7.79
122	7.14	6.35	7.43	6.61	7.79	6.94	8.16	7.26

8.3.3.   - 012 (208/230V)

Outdoor Temperature - °F (Dry Bulb)	Indoor Temperature - °F (Dry Bulb / Wet Bulb)							
	65°F / 54°F		70°F / 59°F		75°F / 63°F		80°F / 67°F	
	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh
−13	9.00	6.13	9.43	6.42	10.07	6.86	10.78	7.34
−5	9.73	6.72	10.19	7.04	11.01	7.61	11.71	8.10
−4	9.77	6.92	10.23	7.25	11.18	7.92	11.83	8.38
0	10.18	7.22	10.49	7.44	11.47	8.13	12.20	8.65
5	10.44	7.51	11.00	7.92	11.88	8.55	12.58	9.05
15	10.86	7.92	11.46	8.35	12.31	8.97	13.17	9.59
25	11.33	7.95	11.88	8.33	12.91	9.06	13.74	9.63
35	11.95	8.67	12.45	9.03	13.52	9.81	14.31	10.37
45	11.75	8.69	12.25	9.06	13.31	9.84	14.16	10.46
55	11.36	8.26	11.84	8.61	13.01	9.46	13.77	10.01
65	11.12	8.10	11.72	8.54	12.66	9.22	13.40	9.76
75	10.74	7.54	11.33	7.95	12.18	8.54	13.03	9.13
85	10.44	7.38	10.95	7.74	11.90	8.41	12.66	8.95
95	10.13	7.91	10.63	8.29	11.61	9.06	12.29	9.59
105	9.51	7.90	9.91	8.23	10.70	8.89	11.39	9.46
110	8.71	7.40	9.08	7.72	9.92	8.43	10.49	8.92
115	7.88	7.01	8.21	7.31	8.98	7.99	9.55	8.50
122	7.06	6.42	7.35	6.69	8.03	7.31	8.50	7.74

8.3.4.   - 018 (208/230V)

Outdoor Temperature - °F (Dry Bulb)	Indoor Temperature - °F (Dry Bulb / Wet Bulb)							
	65°F / 54°F		70°F / 59°F		75°F / 63°F		80°F / 67°F	
	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh
−13	15.51	10.72	16.41	11.34	16.96	11.71	18.04	12.46
−5	16.76	11.87	17.74	12.57	18.53	13.12	19.61	13.89
−4	16.83	11.39	17.82	12.07	18.81	12.74	19.81	13.41
0	17.43	12.68	18.46	13.43	19.50	14.19	20.63	15.01
5	18.18	13.18	19.25	13.95	20.21	14.64	21.27	15.41
15	17.66	13.24	18.70	14.02	19.63	14.72	20.77	15.58
25	17.49	12.49	18.83	13.45	19.66	14.05	20.69	14.79
35	17.76	12.45	18.69	13.11	19.51	13.69	20.65	14.48
45	17.19	12.51	18.09	13.17	19.10	13.90	20.10	14.63
55	16.64	12.06	17.52	12.70	18.40	13.33	19.57	14.19
65	16.09	11.57	17.23	12.39	18.00	12.94	19.04	13.69
75	15.83	11.53	16.66	12.13	17.59	12.81	18.51	13.48
85	15.29	11.29	16.10	11.89	16.99	12.56	17.98	13.29
95	14.75	11.65	15.80	12.48	16.58	13.10	17.45	13.79
105	14.00	11.34	14.74	11.94	15.48	12.53	16.38	13.26
110	13.00	10.79	13.84	11.49	14.53	12.06	15.30	12.70
115	11.76	10.59	12.53	11.27	13.09	11.78	13.92	12.53
122	10.59	9.85	11.09	10.31	11.71	10.89	12.39	11.52

8.3.5.   - 024 (208/230V)

Outdoor Temperature - °F (Dry Bulb)	Indoor Temperature - °F (Dry Bulb / Wet Bulb)							
	65°F / 54°F		70°F / 59°F		75°F / 63°F		80°F / 67°F	
	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh	Total mBtuh	Sensible mBtuh
−13	16.11	12.07	16.98	12.72	17.95	13.59	19.30	14.76
−5	17.04	12.85	18.17	13.70	19.20	14.27	20.53	15.41
−4	17.11	12.41	18.46	13.39	19.39	14.07	20.74	15.22
0	17.67	12.74	18.94	13.65	19.68	14.20	21.16	15.26
5	17.92	14.25	19.22	15.28	20.19	16.03	21.59	17.03
15	17.95	14.49	19.47	15.72	20.34	16.34	21.75	17.41
25	18.32	14.28	19.31	15.05	20.41	15.85	21.94	16.79
35	18.39	14.32	19.61	15.27	20.72	16.14	22.16	16.99
45	18.47	13.93	19.93	15.03	20.94	15.79	22.39	16.89
55	18.87	13.69	20.22	14.67	21.02	15.25	22.60	16.40
65	18.93	13.65	20.30	14.63	21.33	15.38	22.81	16.44
75	18.99	15.11	20.60	16.39	21.53	17.12	23.02	18.31
85	19.41	15.67	20.46	16.51	21.62	17.45	23.25	18.76
95	19.47	15.17	20.76	16.17	21.93	17.09	23.46	18.28
105	17.81	13.86	19.21	14.96	20.18	15.71	21.59	16.81
110	16.47	13.40	17.65	14.37	18.44	14.93	19.72	15.83
115	14.89	13.73	15.97	14.73	16.69	15.19	17.94	16.27
122	13.17	12.63	14.29	13.70	14.93	14.31	15.97	15.31

8.4.   Outdoor Unit Dimensions

MCA009S4S, MCA012S4S, MCA081S4S

30-5/8 (778)

21-7/8 (556)

11-7/8 (302)

1/2 (13)

SIDE VIEW

2-1/2 (64)

1/2 (13)

19-1/8 (486)

30-3/8 (772)

2-3/4 (70)

FRONT VIEW

DRAIN HOLE (bottom of unit)

11-1/4 (286)

12-5/8 (322)

11-3/4 (298)

2-3/8 (60)

3-5/8 (92)

SIDE VIEW

BOTTOM VIEW
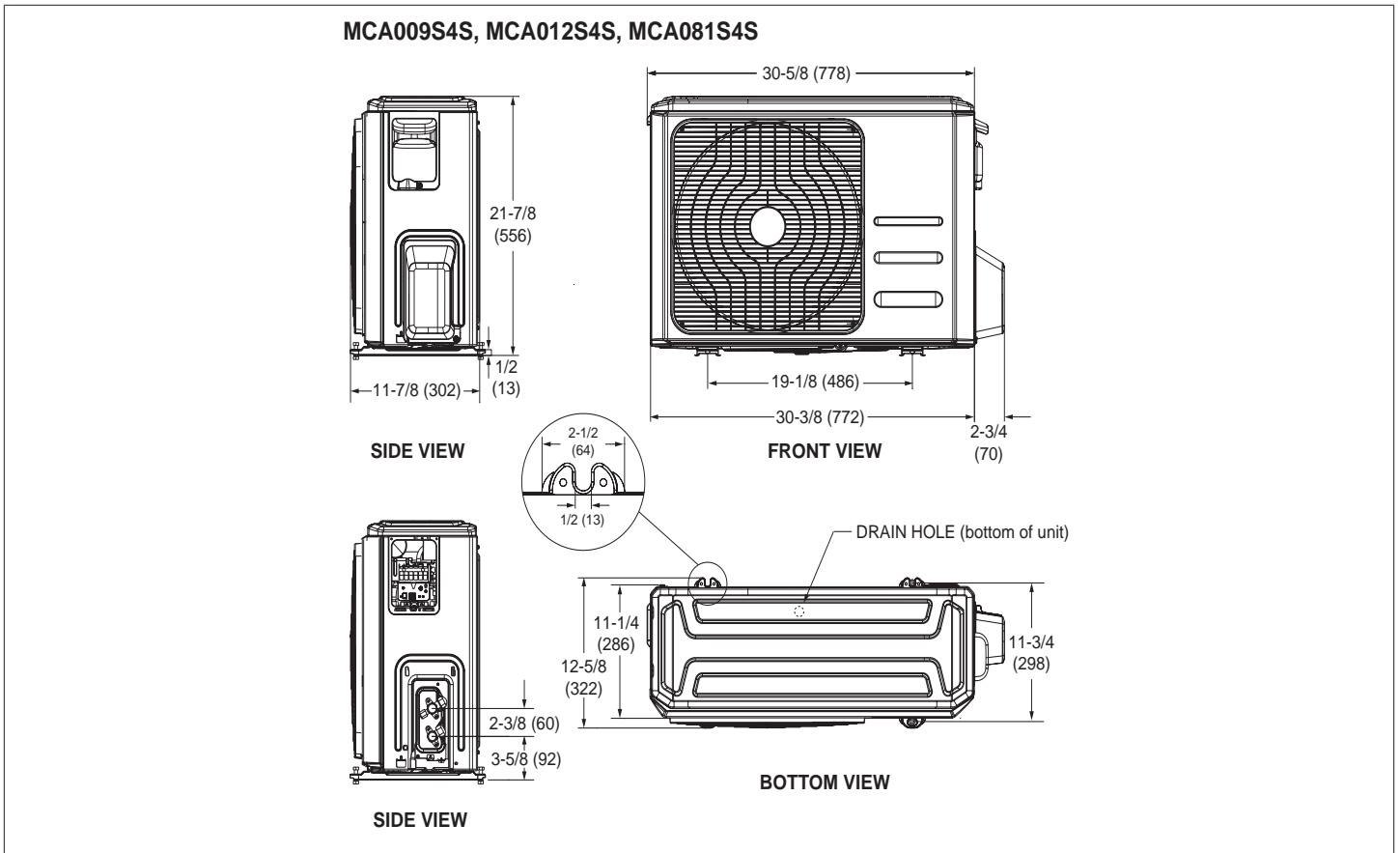
Figure 17.   09, 12K and 18K Outdoor Unit Dimensions - Inches (mm)

MCA024S4S

33-5/8 (854)

27-5/8 (702)

14-1/4 (362)

1/2 (13)

SIDE VIEW

7-7/8 (200)

1-3/8 (35)

21-1/4 (540)

33-1/4 (845)

2-3/4 (70)

FRONT VIEW

13-1/8 (333)

15 (381)

13-3/4 (349)

2-3/8 (60)

3-5/8 (92)

SIDE VIEW

BOTTOM VIEW
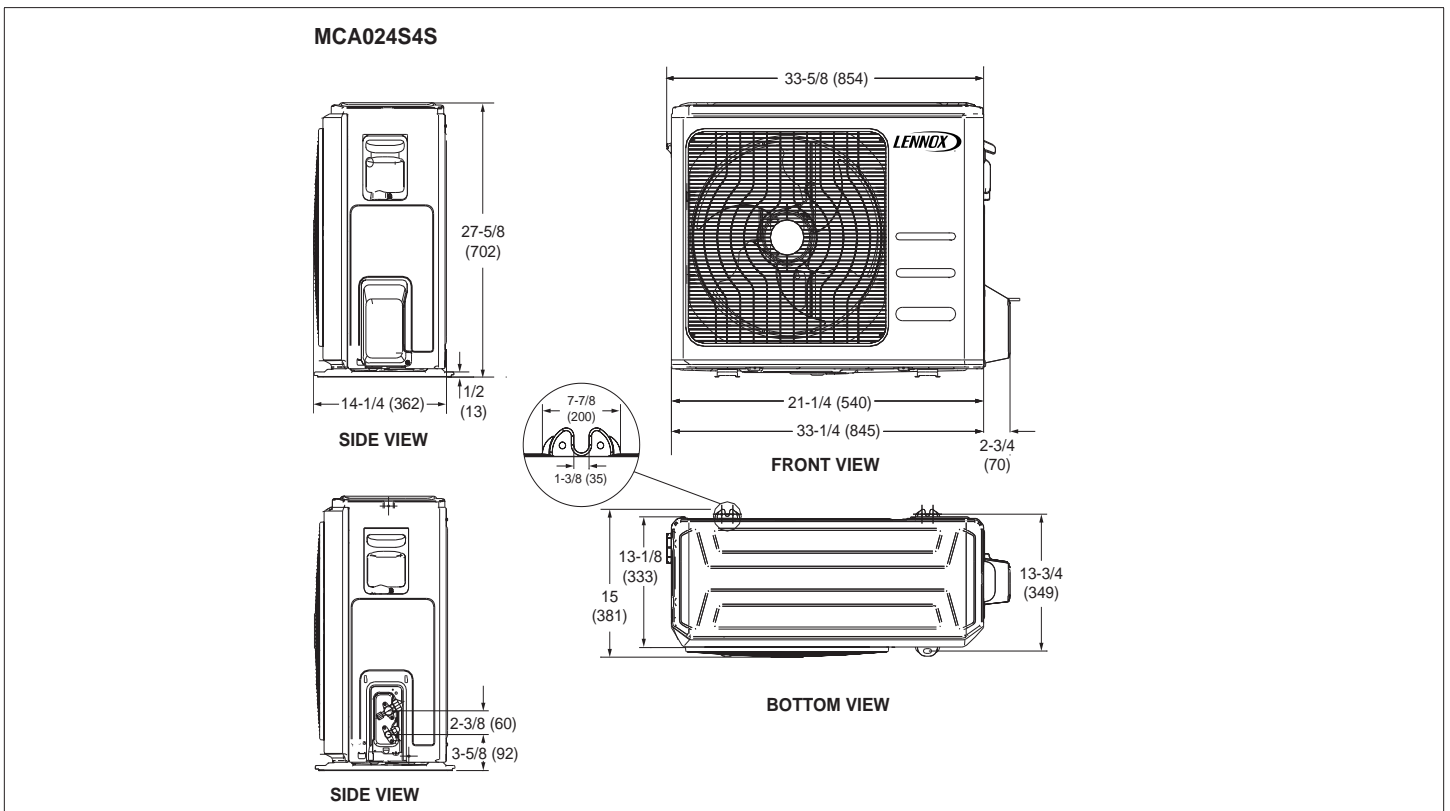
Figure 18.   24K Outdoor Unit Dimensions - Inches (mm)

8.5. Outdoor Unit Clearances

8.5.1. Single Units

24 (610)

12 (305)

24 (610)

Air Inlet

[1] 12 (305)

79 (2007)

Air Outlet

[1] Minimum rear clearance can be 6 inches (152 mm) when mounted on brackets and with no obstructions on the other three sides.
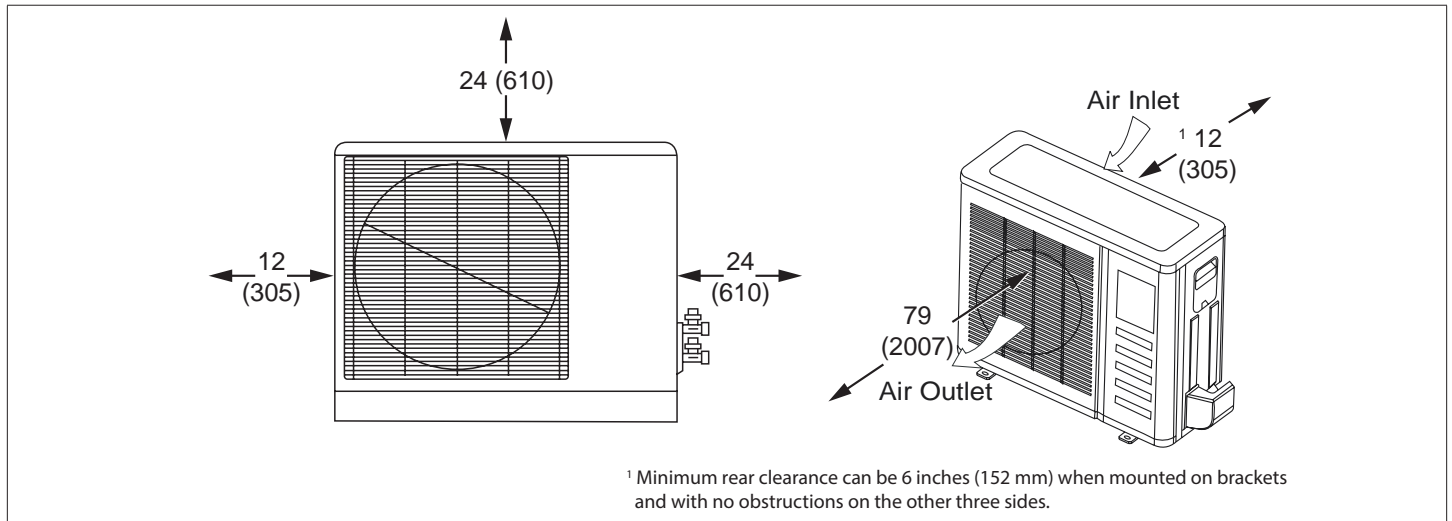
Figure 19. Single Outdoor Unit Clearances - Inches (mm)

8.5.2. Multiple Units

Height of Wall (C)

Unit to Wall (B)

AIR FLOW

118 (2997) (Minimum)

10 (254) (Minimum)

10 (254) (Minimum)

24 (610) (Minimum)

AIR FLOW

Unit Height (A)

60 (1500) (Minimum)

NOTE: It is recommended that the single clearance be followed in a multi-unit applications. If not then these are the maximum and minimum clearances you are allowed.

CLEARANCE NOTES FOR MULTIPLE UNITS:

If the height of the wall (C) is less than or equal to the height of the smallest unit (A), the distance from the unit to the wall (B) must be a minimum of 10 inches (254 mm).

If 1/2 the height of the unit (A) is less than the height of the wall (C), the distance from the unit to the wall (B) must be a minimum of 12 inches (305 mm).

If the height of the wall (C) is greater than the height of the unit (A), the distance from the unit to the wall (B) must be a minimum of 20 inches (508 mm).

Figure 20. Multiple Outdoor Unit Clearances - Inches (mm)

9. Refrigeration Pipe Work

9.1. Single-Zone Refrigerant Cycle Diagram

INDOOR

OUTDOOR

LIQUID SIDE

CAPILIARY TUBE

T5 - Discharge Temp Sensor

(EVAPORATOR)

CN8 (T1) Room temp. sensor

T3 - Condenser Temp Sensor

(CONDENSER)

T4 - Ambient Temp Sensor

CN9 (T2) Evaporator temp. sensor

GAS SIDE

COMPRESSOR
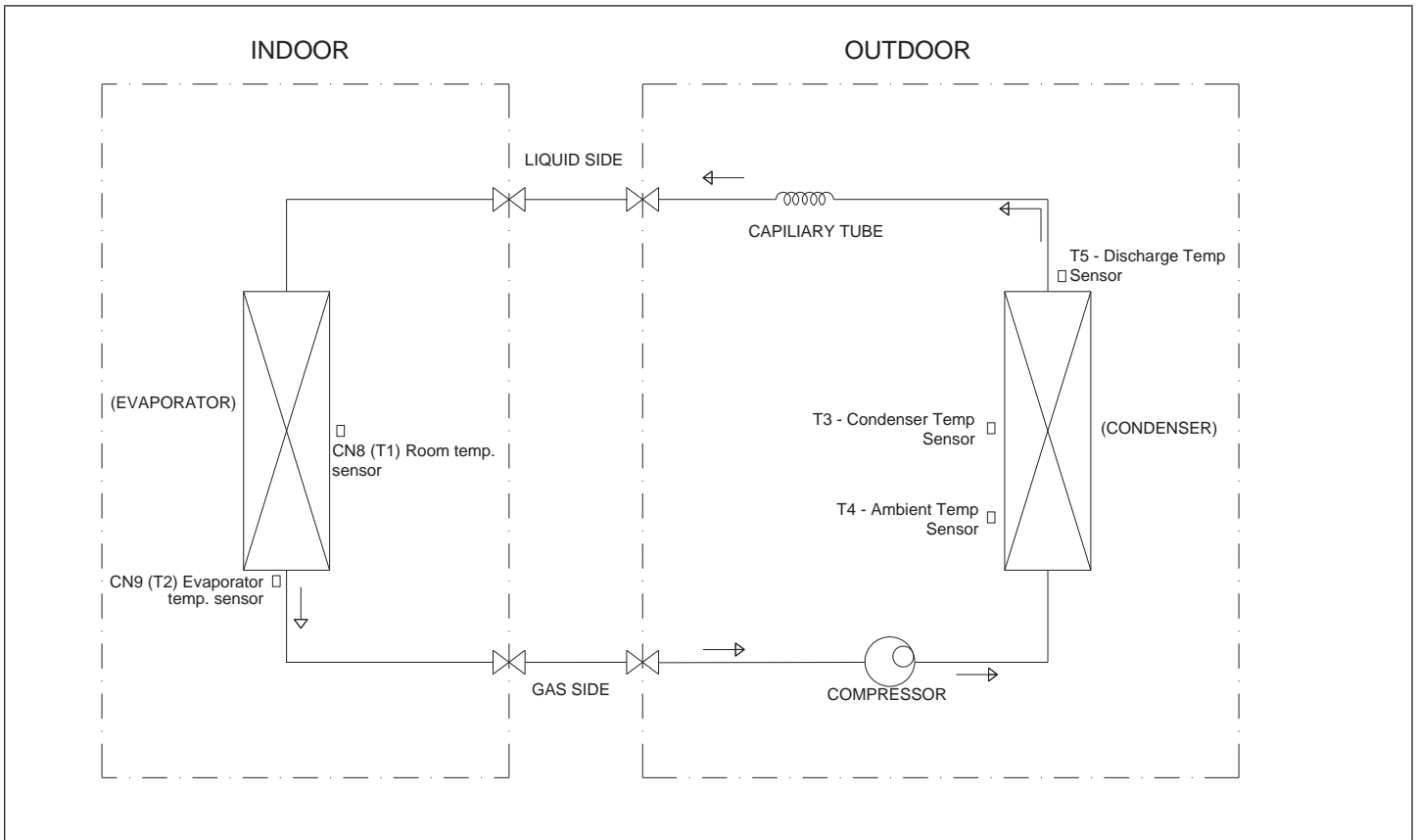
9.2. Single-Zone Piping Limitations

INDOOR UNIT

Maximum Line Set Length

Maximum Elevation - Outdooor Unit BELOW Indoor Unit

OUTDOOR UNIT

Minimum Line Set Length - 10 ft. (3m)

Outside Unit BELOW Indoor Unit

Minimum Line Set Length - 10 ft. (3m)

OUTDOOR UNIT

Maximum Line Set Length

INDOOR UNIT

Maximum Elevation - Outdooor Unit ABOVE Indoor Unit

Outside Unit ABOVE Indoor Unit
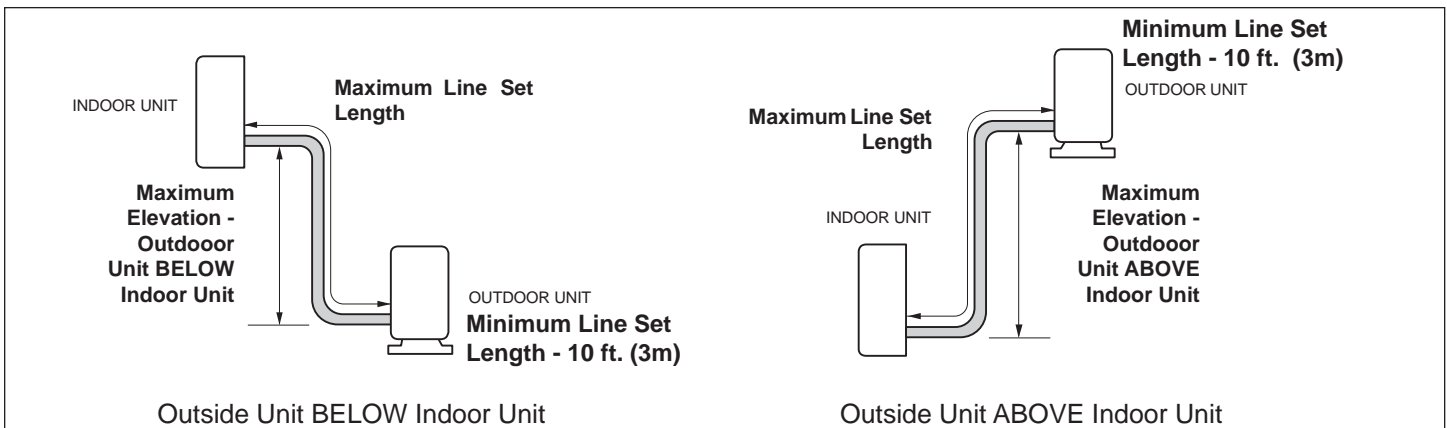
IMPORTANT

Do not allow for excess length of line sets to be left rolled up as part of the required distance, or in general. This will also cause additional performance issues.

Table 4.   Line Set Guide

Each system size has a line set length and vertical elevation parameters.

System Size (KBtu)	Line Set Diameters (in.)		Maximum Elevation Outdoor Unit BELOW Indoor Unit - Feet (Meter)	Maximum Elevation Outdoor Unit ABOVE Indoor Unit - Feet (Meter)	Maximum Line Set Length - Feet (Meters)	Additional Refrigerant for greater than 25 Foot Line Set Length
	Liquid	Gas				
009	1/4	3/8	82 (25)	33 (10)	82 (25)	For the additional charging, we recommend 0.161 oz. for 1/4" liquid line and 0.322 oz. for 3/8" liquid line per foot.
012	1/4	1/2	82 (25)	33 (10)	82 (25)	
018	1/4	1/2	98 (30)	66 (20)	98 (30)	
024	3/8	5/8	98 (30)	66 (20)	98 (30)	

10. Outdoor Unit Connections and Line Set Usage

Description		Catalog No.	Size			
			09	12	18	24
OUTDOOR UNIT						
Line Sets	1/4 in. x 3/8 in. x 25 ft.	**90X53**	•	N/A		
	1/4 in. x 3/8 in. x 50 ft.	**X0258**	•	N/A		
	1/4 in. x 1/2 in. x 25 ft.	**90X52**	N/A	•	•	N/A
	1/4 in. x 1/2 in. x 50 ft.	**X0259**	N/A	•	•	N/A
	3/8 in. x 5/8 in. x 25 ft.	**X8406**	N/A			•
	3/8 in. x 5/8 in. x 50 ft.	**X8407**	N/A			•

10.1. Pipe Length

Maximum piping length and height difference.

Table 5.   Pipe Diameter - MM (Inches)

Indoor Unit			Extension Pipe Diameter (mm/inches)	
Model	Pipe Diameter (mm/inches)			
9K	Liquid	6.35 (1/4)	Liquid	6.35 (1/4)
	Gas	9.52 (3/8)	Gas	9.52 (3/8)
12K and 18K	Liquid	6.35 (1/4)	Liquid	6.35 (1/4)
	Gas	12.7 (1/2)	Gas	12.7 (1/2)
24K	Liquid	9.52 (3/8)	Liquid	9.52 (3/8)
	Gas	15.9 (5/8)	Gas	15.9 (5/8)

10.2. Torque Requirements

CAUTION

Refrigerant pipe diameter is different according to indoor unit to be connected. When using the extension pipe, refer to the tables below.

When refrigerant pipe diameter is different from that of the outdoor unit connector (18K indoor unit) an additional adapter is required.

Table 6.   Torque

Outside Diameter		Torque	Additional Tightening
MM	Inches	v.cm	N.cm
Φ6.35	1/4	1500 (153kgf.cm)	1600 (163kgf.cm)
Φ9.52	3/8	2500 (255kgf.cm)	2600 (265kgf.cm)
Φ12.7	1/2	3500 (357kgf.cm)	3600 (367kgf.cm)

11. Power and Communication Wiring for Systems

⚠CAUTION

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

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

Install all wiring at least 3 feet (1 m) away from televisions, radios or other electronic devices in order to avoid the possibility of interference with the unit operation.

Do not install the unit near a lighting appliance that includes a ballast. The ballast may affect remote control operation.

⚠WARNING

Isolate the power supply before accessing unit electrical terminals.

Install unit so that unit disconnect is accessible.

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

Use specified wiring and cable to make electrical connections. Clamp cables securely and make sure that connections are tight to avoid strain on wiring. Insecure wiring connections may result in equipment failure and risk of fire. Wiring must be installed so that all cover plates can be securely closed.

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

Refer to unit nameplate for minimum circuit ampacity and maximum over-current protection size.

- All indoor units are powered by the outdoor unit.
- Make all electrical power wiring connections at the outdoor unit.
- Size outdoor unit power per local code and power requirements.
- Connect wiring between indoor and outdoor terminals.
- Refer to unit name plate for rated voltage.
- Be sure to reattach all electrical box covers after connections are complete.
- Follow NEC/CEC standards and all local and state codes during wiring installation.

12. Outdoor Unit Diagrams
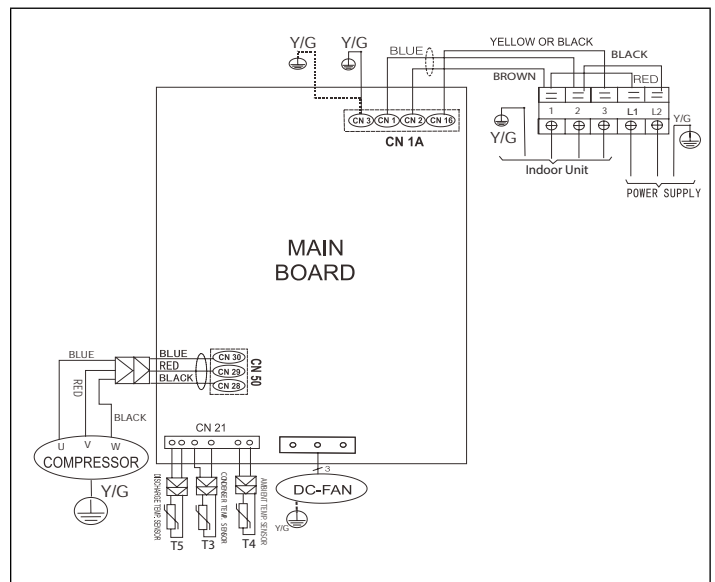
Figure 21. 09 and 12K - 208/230VAC Outdoor Unit Wiring Diagram
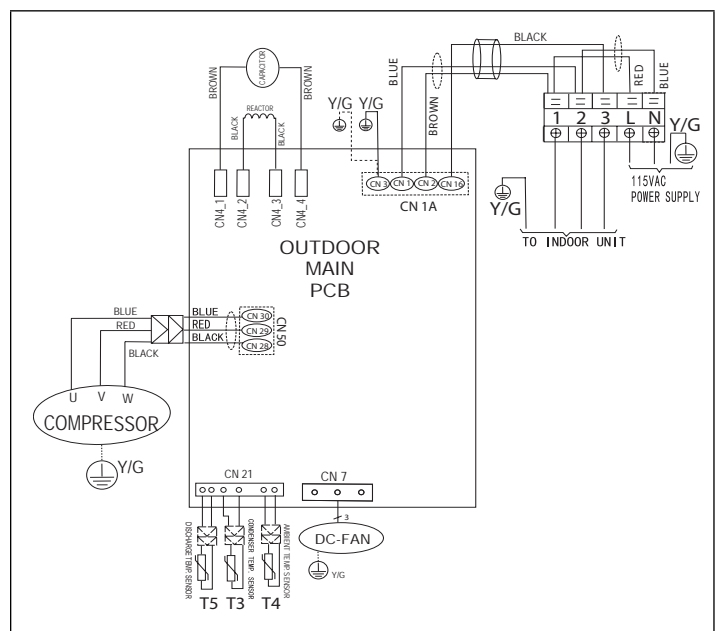
Figure 22. 12K - 115VAC Outdoor Unit Wiring Diagram
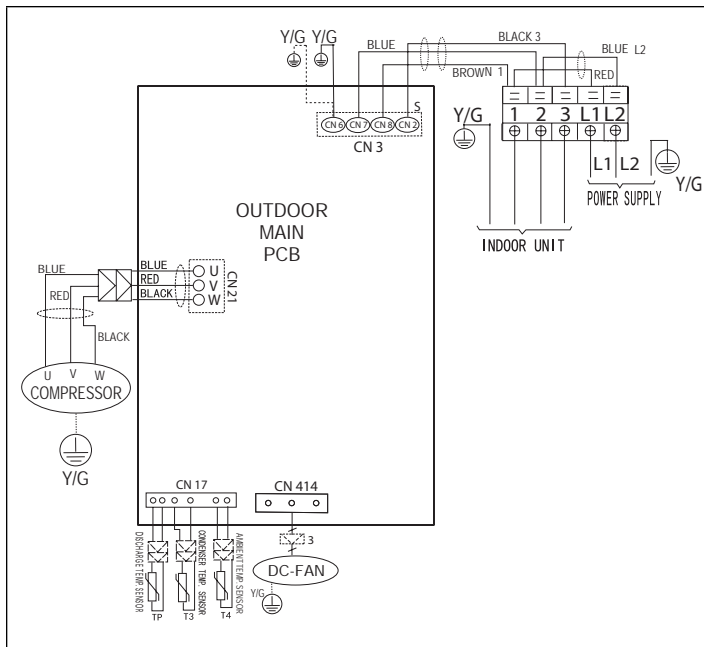
Figure 23. 18K and 24K 208/230VAC Outdoor Unit Wiring Diagram

13. Installation Requirements

13.1. Gas Leak Check with Soap Water:

Apply soap water or a liquid neutral detergent on the connections with a soft brush to check for leakage in the pipe connecting points. If bubbles emerge, the pipes are leaking.

13.2. Air and Moisture

Air and moisture in the refrigerant system cause the following problems:

- Increases in system pressure
- Increases in operating current
- Decreases in cooling and heating efficiency
- Blocks in capillary tubing caused by moisture in the refrigerant circuit freezing
- Corrosion of parts in the refrigerant system caused by water

The indoor units and the pipes between indoor and outdoor units must be tested for leakages and evacuated to remove gas and moisture from the system.

13.3. Air Purging using a Vacuum Pump

- Completely tighten the flare nuts on the indoor and outdoor units. Confirm that both the two-way and three-way valves are set to the closed position.
- Connect the charge hose with the push pin of the Handle Lo to the three-way valve gas service port.
- Connect the charge hose of the Handle Hi to the vacuum pump.
- Fully open the Handle Lo of the manifold valve.
- Turn on the vacuum pump to begin evacuation.

- Conduct a 30-minute evacuation. Check whether the compound meter indicates - 0.1Mpa(14.5Psi). If the meter does not indicate -0.1Mpa (14.5Psi) after 30 minutes has elapsed, continue evacuation for 20 more minutes. If the pressure does not reach - 0.1Mpa (14.5Psi) after 50 minutes has elapsed, check if there are any leaks.
- Fully close the Handle Lo valve of the manifold valve and turn off the vacuum pump. After five minutes, confirm that the gauge needle is not moving.
- Turn the flare nut on the three-way valve 45° counter-clockwise for 6-7 seconds. Once gas begins to come out, tighten the flare nut. Make sure the pressure display on the pressure indicator is higher than atmospheric pressure. Then remove the charge hose from the three-way valve.
- Fully open the two-way and three-way valves and securely tighten the cap on the three-way valve.

13.4. Adding Refrigerant if Pipe Length Exceeds Charge Less Pipe Length

Connect the charge hose to the charging cylinder and open the two-way and three-way valves. With the charge hose you disconnected from the vacuum pump, connect it to the valve at the bottom of the cylinder.

If the refrigerant is R-410A, place the cylinder bottom-up to ensure liquid charging is possible.

- Purge the air from the charge hose.
- Open the valve at the bottom of the cylinder and press the check valve on the charge set (be careful of the liquid refrigerant).
- Place the charging cylinder onto the electronic scale and record the weight.
- Turn on the air conditioner in cooling mode.
- Open the valves (Low side) on the charge set. Charge the system with liquid refrigerant.
- When the electronic scale displays the proper weight (refer to the table), disconnect the charge hose from the three-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.
- Mount the valve stem caps and the service port Use a torque wrench to tighten the service port cap to a torque of 18N.m (13.27 ft·lbs).
- Be sure to check for gas leaks.

13.5. Add Refrigerant after Long-Term System Operation

- Connect the charge hose to the three-way service port and open the two-way and three-way valve.
- Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R-410A, place the cylinder bottom-up to ensure liquid charge.

- Purge the air from the charge hose.
- Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- Place the charging cylinder onto the electronic scale and record the weight.
- Turn on the air conditioner in cooling mode.
- Open the valves (Low side)on the charge set and charge the system with liquid refrigerant.
- When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the three-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.
- Mount the valve stem caps and the service port. Use torque wrench to tighten the service port cap to a torque of 18N.m(13.27 ft·lbs).
- Be sure to check for gas leaks.

13.6. Servicing Indoor Unit Refrigeration Circuit

13.6.1. Collecting Refrigerant into Outdoor Unit

- Confirm that both the two-way and three-way valves are set to the opened position
- Remove the valve stem caps and confirm that the valve stems are in the opened position.
- Be sure to use a hexagonal wrench to operate the valve stems.
- Connect the charge hose with the push pin of handle lo to the three-way valves gas service port.
- Air purging of the charge hose - Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for five seconds and then close it quickly.
- Set the two-way valve to the close position.
- Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa (14 psi).
- Set the three-way valve to the closed position immediately
- Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa (43 - 72 psi).
- Disconnect the charge set, and tighten the two-way and three-way valve's stem nuts.
- Use a torque wrench to tighten the three-way valves service port cap to a torque of 18N.m.
- Be sure to check for gas leakage.

13.6.2. Air Purging with Vacuum Pump

- Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the two-way and three-way valves are set to the closed position.
- Connect the charge hose with the push pin of handle lo to the three-way valves gas service port.
- Connect the charge hose of handle hi connection to the vacuum pump.
- Fully open the handle Lo of the manifold valve.
- Operate the vacuum pump to evacuate.
- Make evacuation for 30 minutes and check whether the compound meter indicates - 0.1Mpa (500 microns). If the meter does not indicate - 0.1Mpa (500 microbars) after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa (500 microbars) after pumping 50 minutes, please check if there are some leakage points.
- Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately five minutes after turning off the vacuum pump).
- Turn the flare nut of the three-way valves about 45° counterclockwise for six or seven seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the three-way valve.
- Fully open the two-way valve and three-way valve and securely tighten the cap of the three-way

13.7. Evacuation after Servicing the Outdoor Unit Refrigeration Circuit

13.7.1. Evacuation of the Complete Refrigeration Circuit, Indoor and Outdoor Unit

- Confirm that both the two-way and three-way valves are set to the opened position.
- Connect the vacuum pump to three-way valve's service port.
- Evacuation for approximately one hour. Confirm that the compound meter indicates - 0.1Mpa (500 Microns / 29.9 in. hg).
- Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- Disconnect the charge hose from the vacuum pump.

13.7.2. Refrigerant Charging

- Connect the charge hose to the charging cylinder, open the two-way valve and the three-way valve.

- Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R-410A, make the cylinder bottom up to ensure liquid charge.

- Purge the air from the charge hose

- Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

- Put the charging cylinder onto the electronic scale and record the weight.

- Open the valves (Low side) on the charge set and charge the system with liquid refrigerant. If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.

- When the electronic scale displays the proper weight, disconnect the charge hose from the 3- way valve's service port immediately

- If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

- Mounted the valve stem caps and the service port. Use torque wrench to tighten the service port cap to a torque of 18N·m (13.27 ft·lbs).

- Always leak check after servicing the refrigerant system.

There are one low-pressure centralized valve and one high-pressure centralized valve, it will be more time saving when vacuum and recycle refrigerant. But refer to the previous instruction when vacuum and recycle refrigerant.

14. Electronic Function

14.1. Abbreviation

- T1: Indoor ambient temperature
- T2: Middle indoor heat exchanger coil temperature
- T3: Outdoor heat exchanger pipe temperature
- T4: Outdoor ambient temperature
- T5: Compressor discharge temperature

14.2. Electric Control Working Environment.

- Input voltage: 230V.
- Input power frequency: 60Hz.

- Indoor fan standard working amp.: <1A
- Outdoor fan standard working amp.: <1.5A.
- Four-way valve standard amp.: <1A

15. Adding Refrigerant - Single-Zone Systems

The outdoor unit is factory-charged with refrigerant. Calculate the additional refrigerant required according to the diameter and the length of the liquid pipe between the outdoor unit and indoor unit connections.

Be sure to add the proper amount of additional refrigerant. Failure to do so may result in reduced performance.

See "Table 4. Line Set Guide" on page 23 for how much refrigerant needs to be added based on pipe length.

NOTE: *Interconnecting pipe work between outdoor and indoor units must be 10 ft. or longer.*

NOTE: *Do not remove refrigerant for line lengths less than 25 ft. R-410A is a blended refrigerant. If you must remove charge, it is necessary to remove the entire charge and weigh in the new charge.*

16. Single-Zone Outdoor Unit LED Locations

Single-zone outdoor units display flash codes on the main board. The main board is accessed through the top of the unit. Indoor units will display more detailed error codes.

These outdoor units do not have a SW1 spot check push button switch. Diagnostic is performed through a series of blue, red and green LEDs.

NOTE: *The control on all single-zone outdoor units is mounted with all LEDs down and cannot be seen unless the control is removed.*
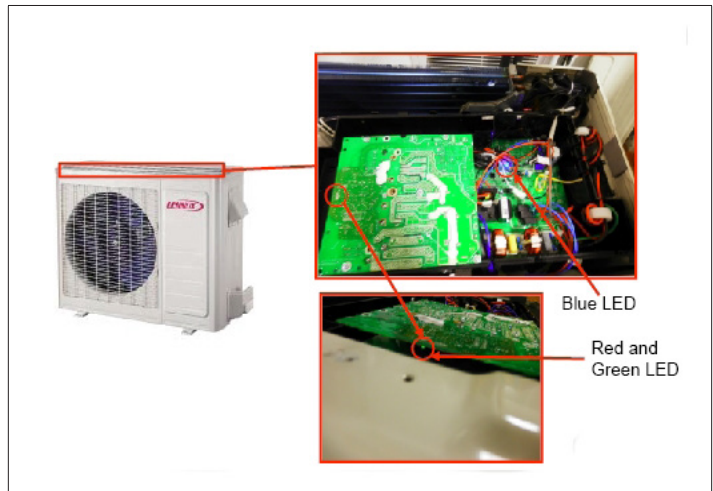
Figure 24. Typical Location of Outdoor Unit LEDs

17. Specifications and Operations

Table 7.   Electronic Functions Abbreviations

CN8	Indoor ambient temperature
CN9	Coil temperature of indoor heat exchanger
T3	Pipe temperature of outdoor heat exchanger
T4	Outdoor ambient temperature
T5	Compressor discharge temperature

Table 8.   Electronic Control Working Environment

Input voltage: 230V
Input power frequency: 60Hz
Indoor fan normal working amp. is less than 1A
Outdoor fan normal working amp is less than 1.5A
Four-way valve normal working amp is less than 1A

Table 9.   Main Protection

Three minutes delay at restart for compressor
One minute delay for the first time start-up and three minutes delay for others
Temperature protection of compressor discharge
When the compressor discharge is getting higher, the running frequency will be limited as below rules:
If 215.6°F (102°C) < T5 < 244.4°F (115°C), decrease the frequency to the lower level every two minutes until to F1.
If T5 < 244.4°F (115°C) for ten seconds, the compressor will stop and restart till T5 < 194°F (90°C)

Table 10.   Indoor/Outdoor Units Communication Protection

If the indoor units cannot receive the feedback signal from the outdoor units for two minutes, the unit will stop and display failure.	
High Condenser Col Temp Protection	When T3>149°F (65°C) for three seconds, the compressor will stop while the indoor fan and outdoor fan will continue.
	When T3<125.6°F (52°C), the protection will release and the compressor will restart after three minutes.
Running Rules	If the compressor frequency keeps lower than RET_OIL_FREQ1_ADD for RET_OIL_TIME1_ADD,the AC will rise the frequency to RET_OIL_FREQ2_ADD for RET_OIL_TIME2_

17.1. Cooling Chart

Table 11. Cooling - Fahrenheit (Celsius)

°F(°C) IDU(DB/WB)	ODU(DB)	0 (-17)	5 (-15)	15 (9.44)	45 (7.22)	75 (23.89)	85 (29.44)	95 (35)	105 (40.56)	115 (46.11)	120 (48.89)
PSI	70/59 (21.11/15)	93	94	106	116	119	113	117	125	147	154
	75/63 (23.89/17.22)	97	99	115	125	124	120	126	132	155	162
	80/67 (26.67/19.44)	103	104	123	138	135	129	132	140	162	173
	90/73 (32.22/22.78)	112	113	139	152	149	138	145	154	180	189
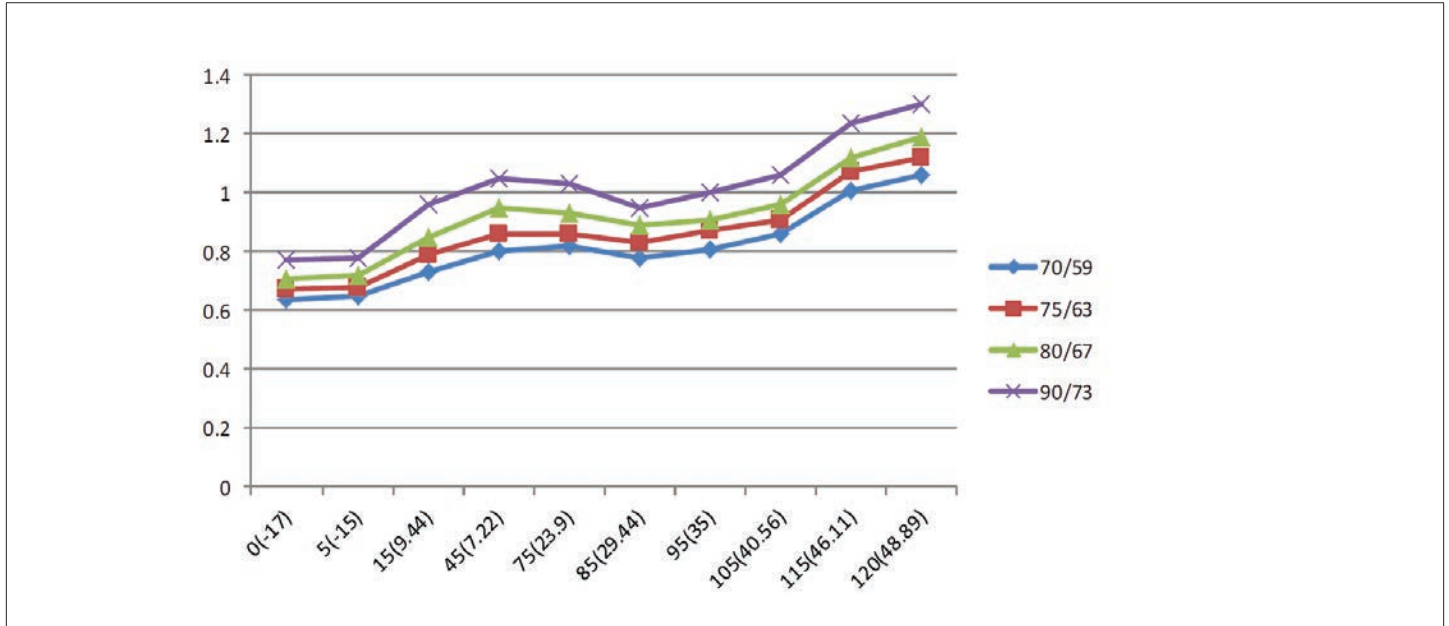
17.2. Capacity Request Calculations

Total capacity Request=Σ(Norm code × HP) /10× modify rate+ correction.
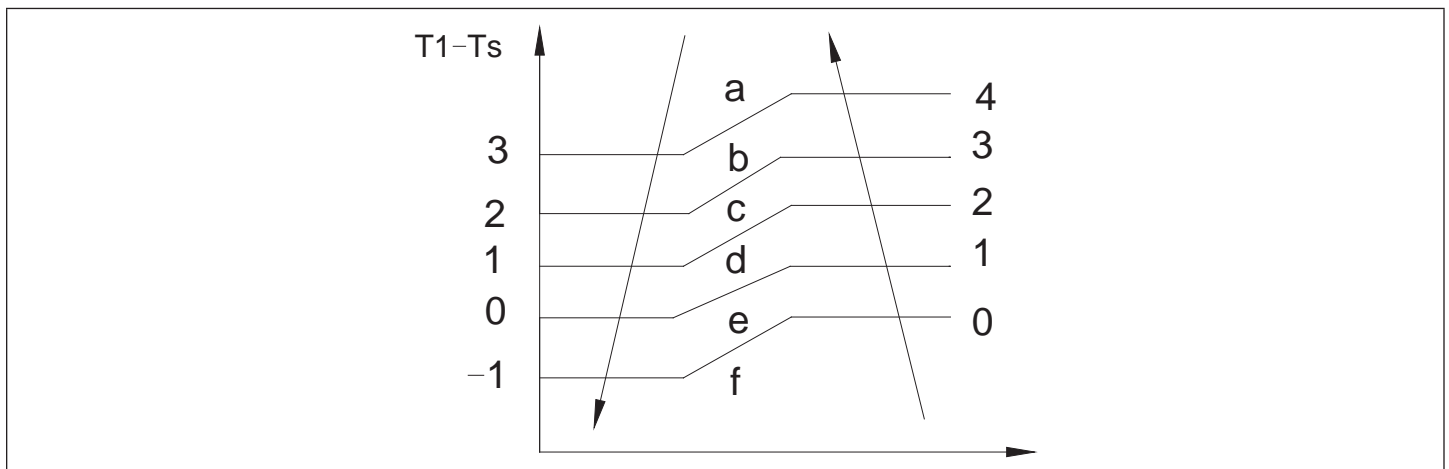
Figure 25. Cooling Mode

Capacity Area	a	b	c	d	e	f
Norm Code (N)	3	2	1.5	1	.5	0

NOTE: *The final result is integer.*

Plus all the indoor capacity request together, then modify it by T4.

When there is only one indoor unit:

	Outdoor Temperature (T4)		
Cooling	>29°C	18°C to 29°C	<17°C
	>84.2°F	64.4°F to 84.2°F	<62.6°F
Modify Rate	100%	60%	40%

When there is more than one indoor unit:

	Outdoor Temperature (T4)		
Cooling	>25°C	17°C - 25°C	<17°C
	>77°F	62.6°F - 77°F	<62.6°F
Modify Rate	100%	80%	40%

NOTE: *The final result is integer.*

In low ambient cooling mode, modify rate is fixed as 40%.

According to the final capacity request to confirm he operating frequency, as following table.

Frequency (Hz)	0	COOL_F1	COOL_F2	... ...	COOL_15	COOL_16
Amendatory capacity demand	0	1	2	... ...	15	16

Meanwhile the maximum running frequency will be adjusted according to the outdoor ambient temp.

17.3. Outdoor Fan Control

17.3.1. Cooling Mode

Normally the system will choose the running fan speed according to ambient temperature:
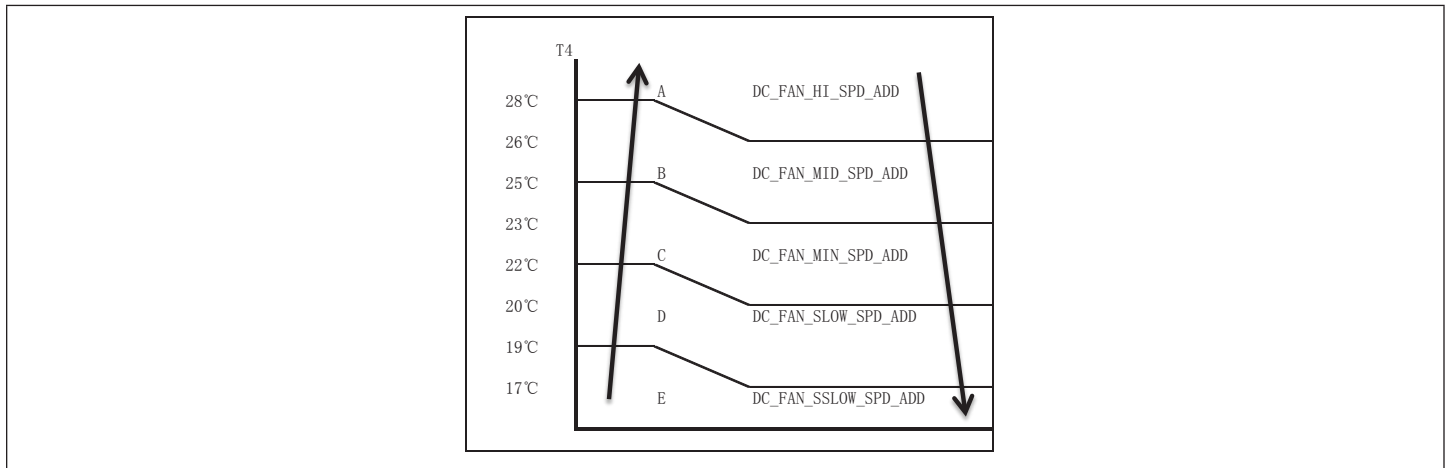
When low ambient cooling is valid:
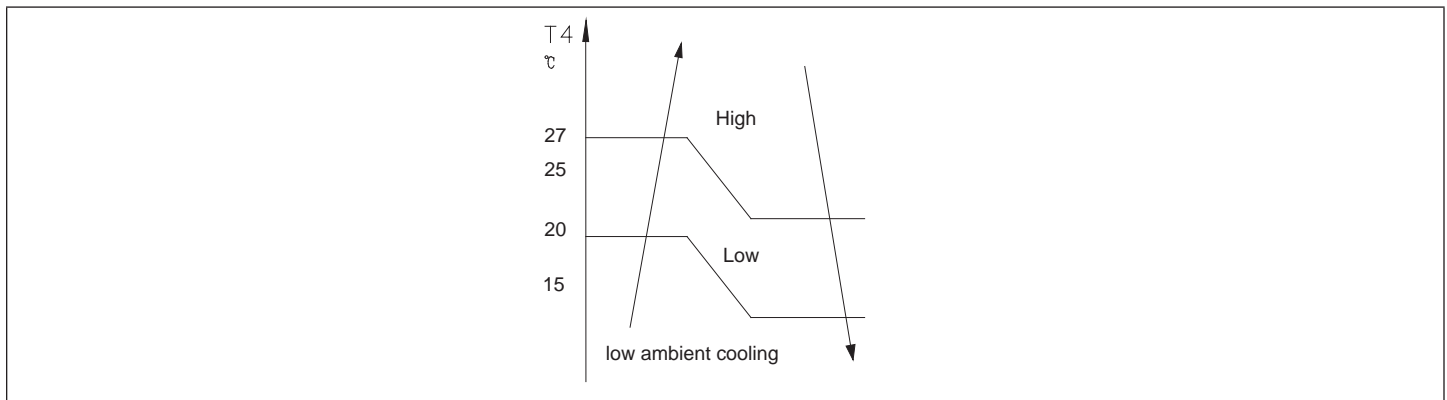
Outdoor fan speed control logical (low ambient cooling).

When T4 <15°C (59°F) and T3 < 30°C (86°F), the unit will enter into low ambient cooling mode. The outdoor fan will choose speed according to T3.

When T3≥38°C (100.4°F) or when T4≥20°C (68°F), the outdoor fan will choose the speed according to T4 again.

T3
℃

38

Exit low ambient cooling
mode, run with high fan
for 1 minute

30

27

Low

23
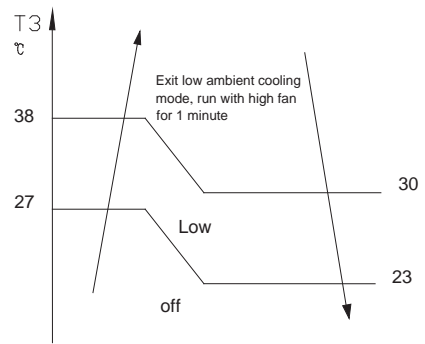
18. Indoor and Outdoor Unit Disassembly

NOTE: *This section is for reference only. Actual unit appearance may vary.*

18.1. Indoor Unit (All Models)

18.1.1. Front Panel

Step 1. Hold the front panel by the tabs on the both sides and lift it.

TAB
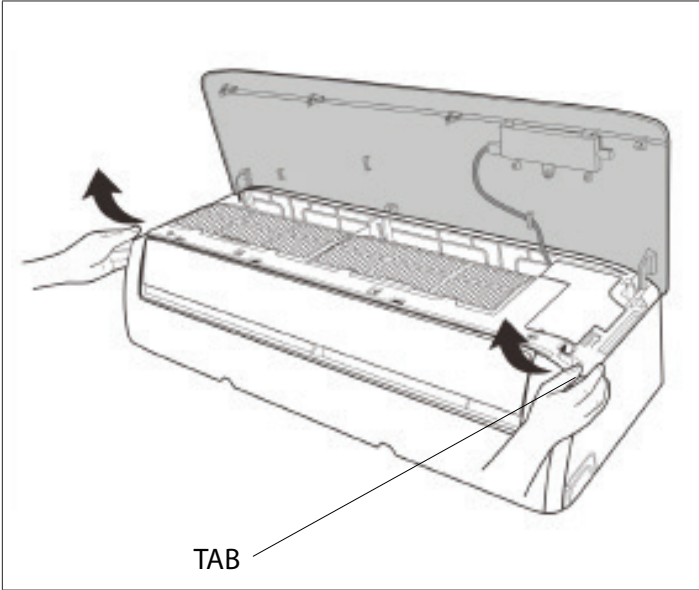
Step 2. Push up the bottom of an air filter (step 1), and then pull it out downwards (step 2).

FILTER
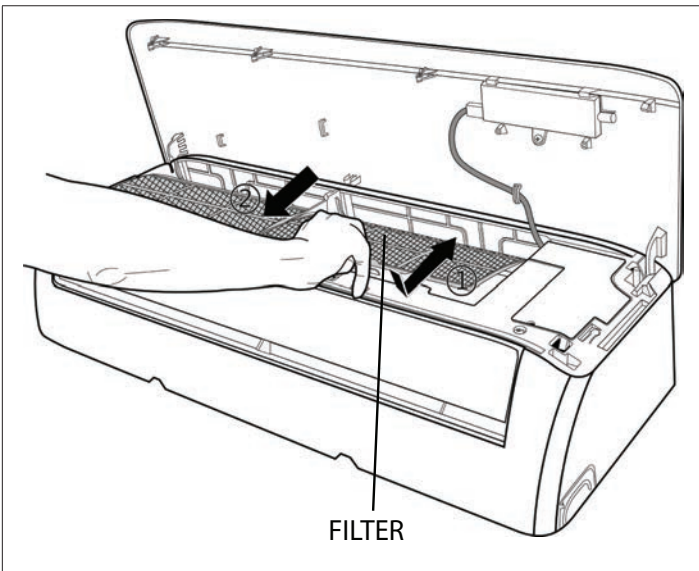
Step 3. Open the horizontal louver and push the hook towards left to open it.

Horizontal Louver
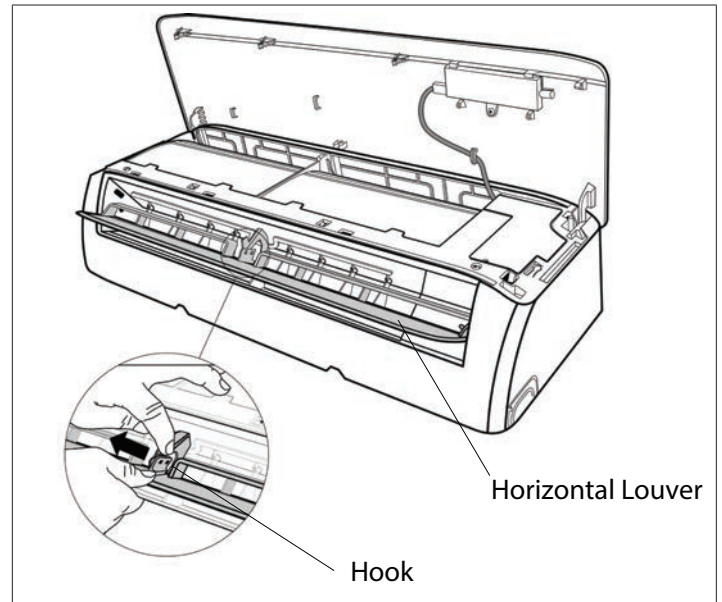
Hook

Step 4. Bend the horizontal louver lightly by both hands to loosen the hooks, then remove the horizontal louver.
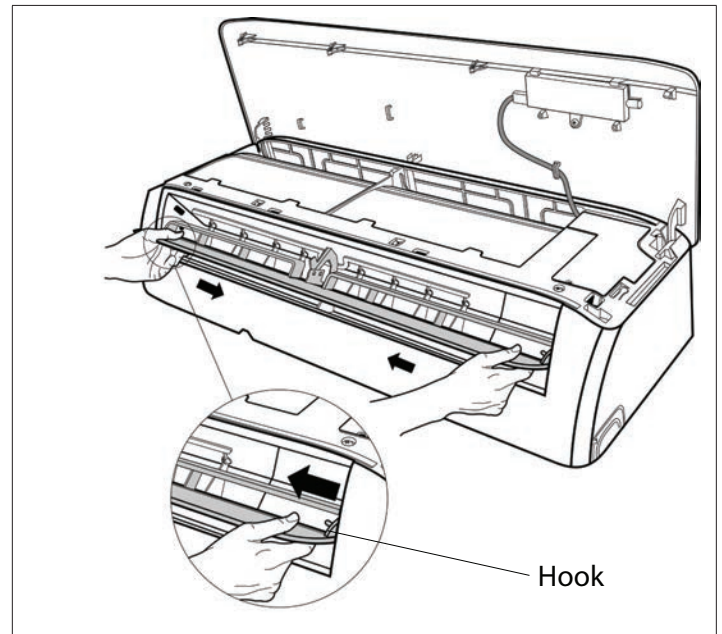
Hook

Step 5. Pry the electrical cover by a screw driver, and rotate it towards left, then remove it.

Step 6. Disconnect the connector for display board.

Step 7. Slide the front panel side to side to release each axis.

Step 8. Open the screw cap and then remove the three screws.

Step 9. Release the hooks with hands.
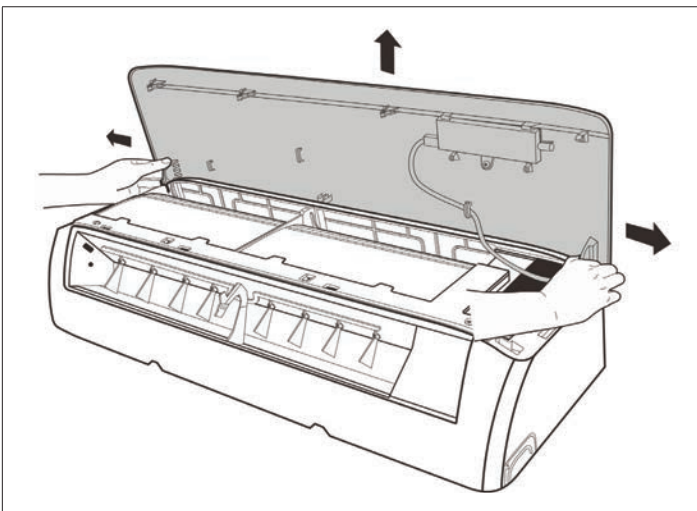
Step 10. Release the five hooks in the back.
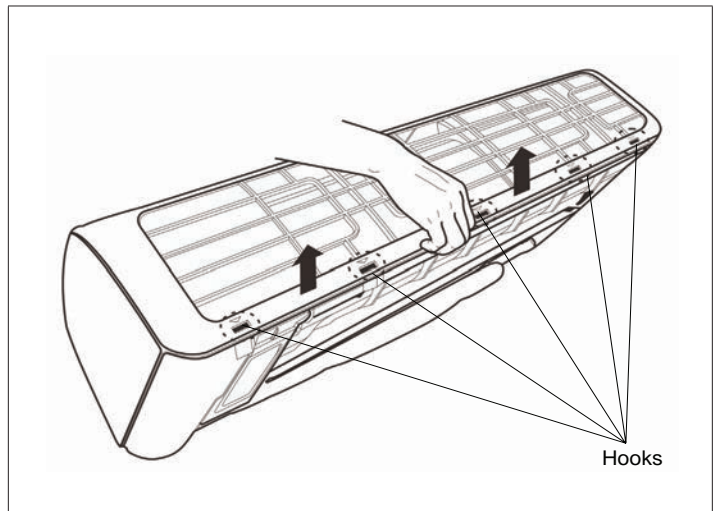
Hooks

Step 11. Pull out the panel frame while pushing the hook through a clearance between the panel frame and the heat exchanger.
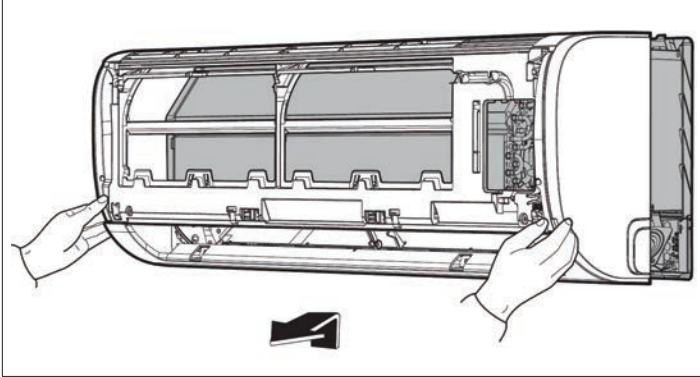
Step 12. Release the 5 hooks of the vertical blades, then pull the vertical blades rightward and remove it.

Hooks
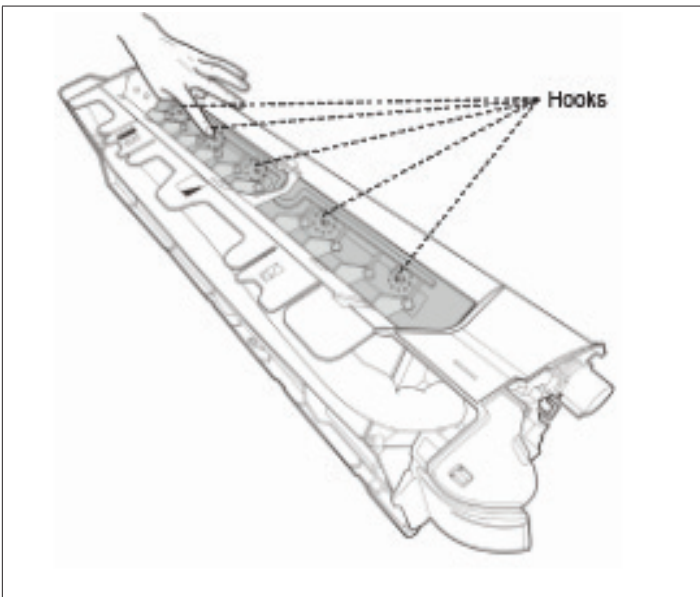
Step 13. Remove 1 screw of the display board.

Step 14. Rotate the display board in the direction shown in the right picture.
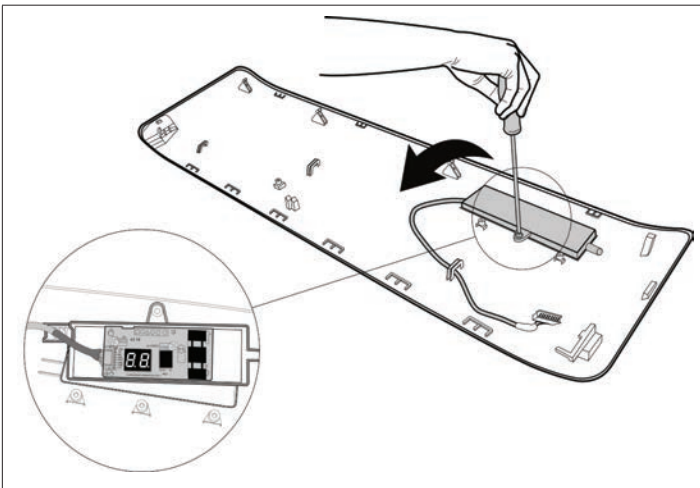
18.1.2. Electrical Parts

NOTE: *When handling electrical parts use anti-static gloves.*

NOTE: *Remove the front panel (see Step 1 on page 32) before disassembling electrical parts.*

Step 1. Cut the ribbon by a shear, then pull out the coil temperature sensor (T2).

Step 2. Remove one fixing screw of the electronic control box and two screws used for the ground connection.

Ribbons   T2 Sensor
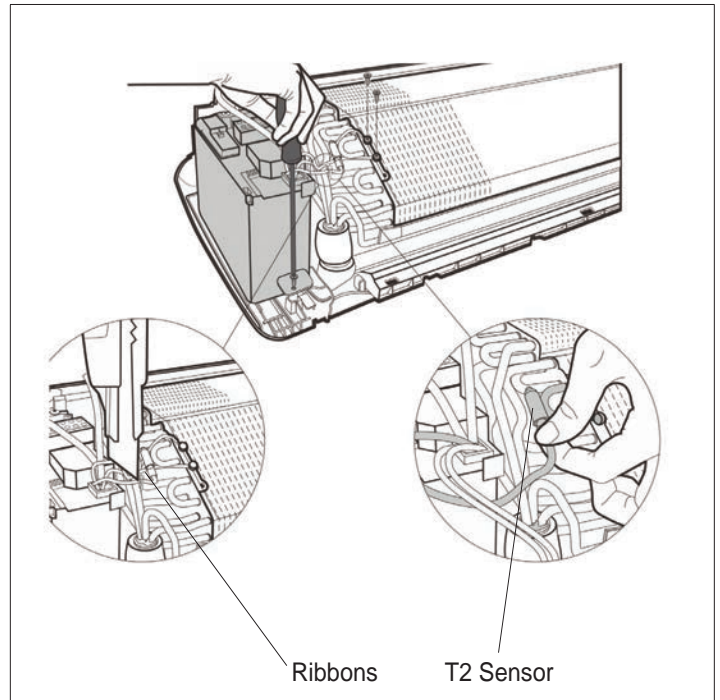
Step 3. An upward force is maintained until the cover of electronic control box is removed.
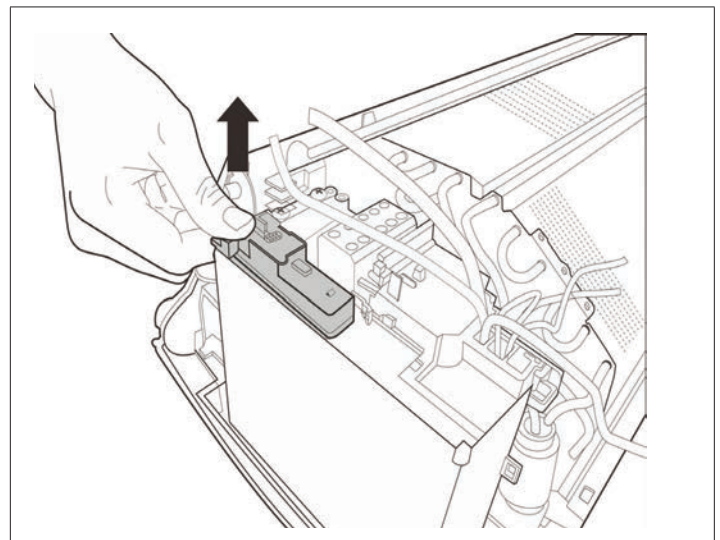
Step 4.   Remove the fixed devices of the connectors.
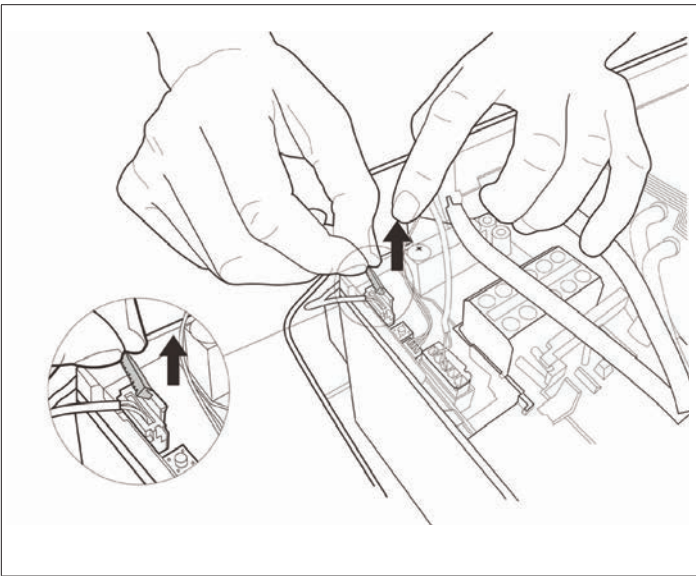
Step 5.   Disconnect the connectors of fan motor, the step motor and the T2 sensor.
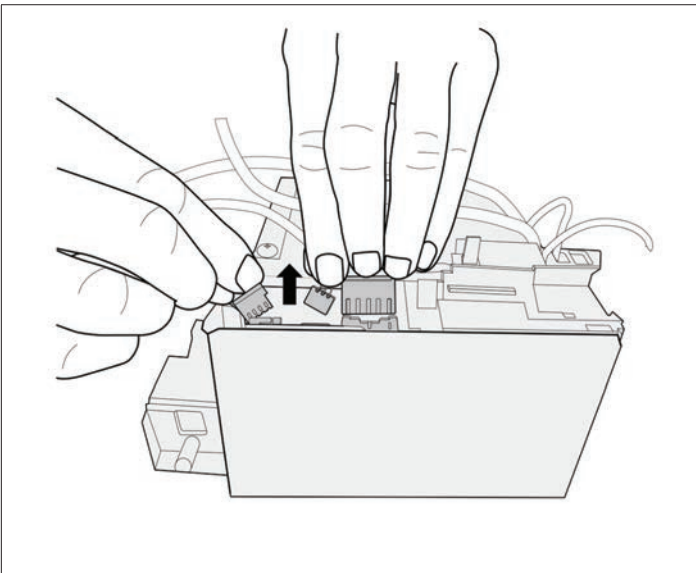
Step 6.   Open the left side plate of electronic control box.
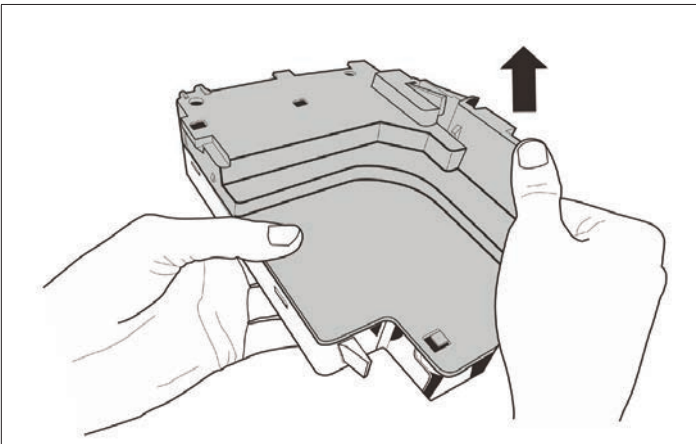
Step 7.   Open the two clips on the front of the electric box.
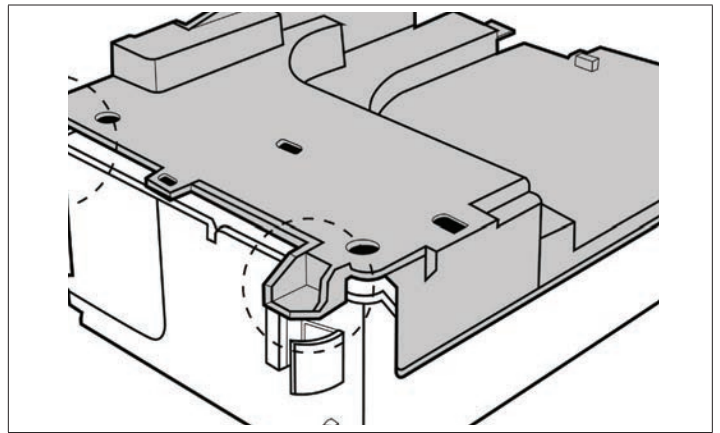
Step 8.   Open the upper cover plate of electronic control box.
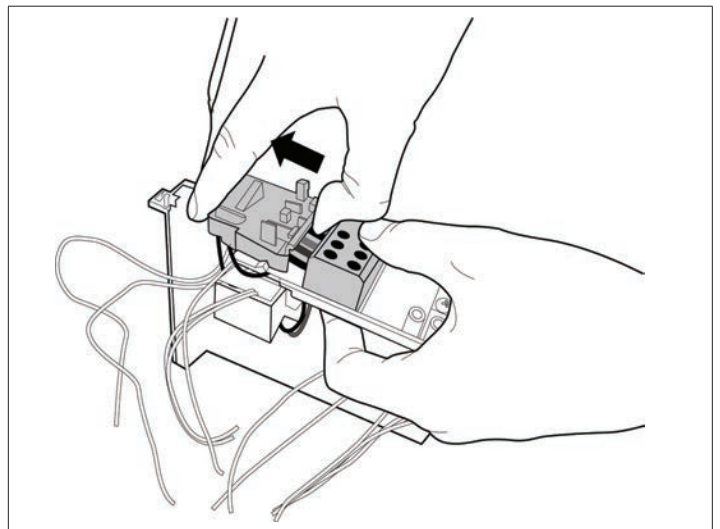
Step 9.   Remove 1 screw and open the 2 clips along the direction indicated in image below.
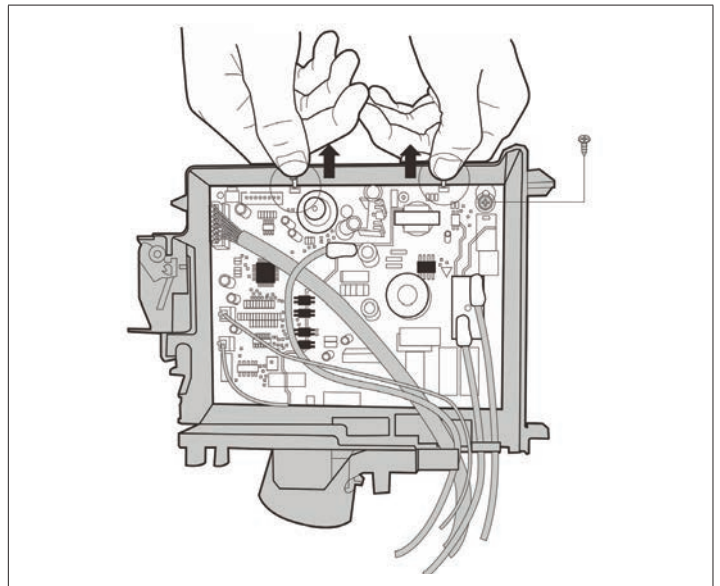
Step 10. Pull out the electrical main board along the direction indicated in right image to remove it.

Terminal S
Display Board
RoomTemp Sensor
Terminal 1L
Terminal W
Pipe Temp Sensor

Screw
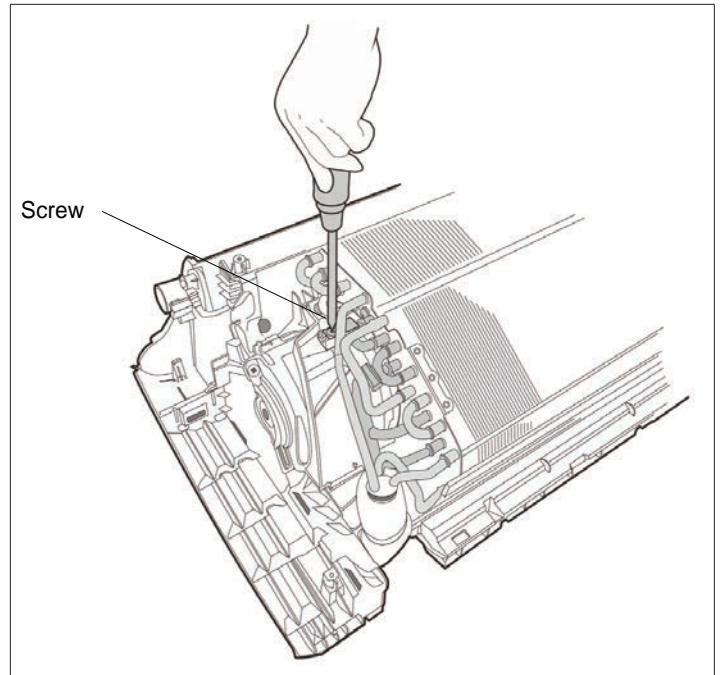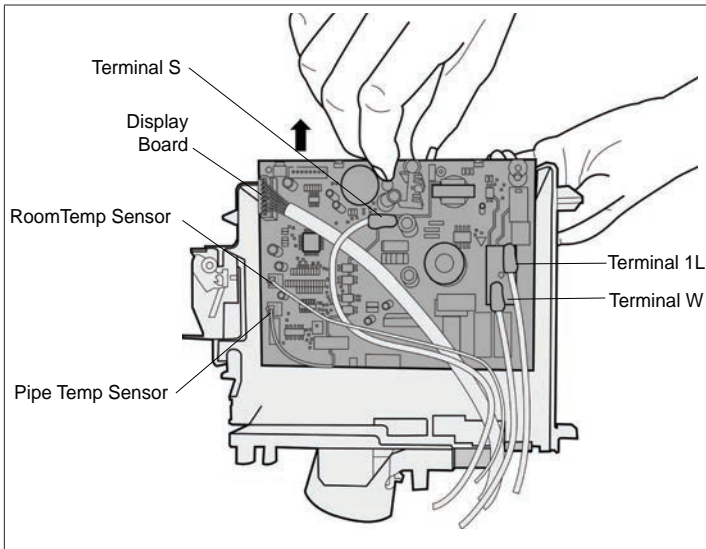
18.1.3. Evaporator

NOTE: *Remove the front panel and electrical parts (see both "Front Panel" on page 32 and "Electrical Parts" on page 34 Electrical parts) before disassembling evaporator.*

Step 1. Disassembly the pip holder located at the rear of the unit.

Pipe Header
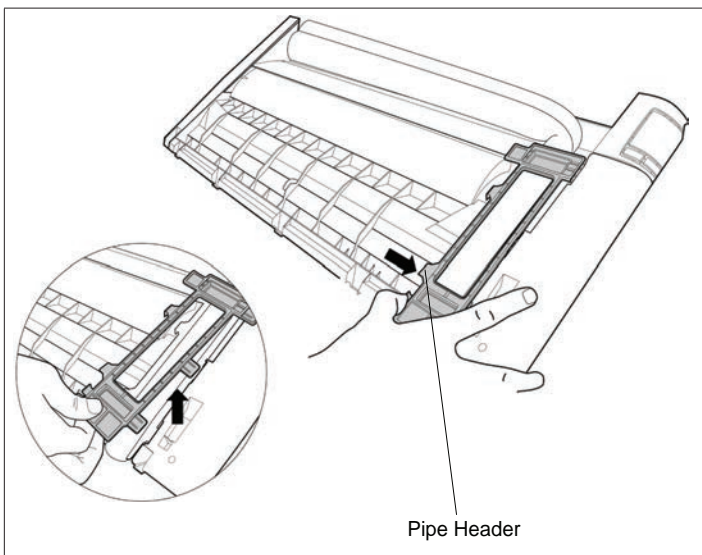
Step 2. Remove the one screw on the evaporator located at the fixed plate.

Step 3. Release the hook on the evaporator.
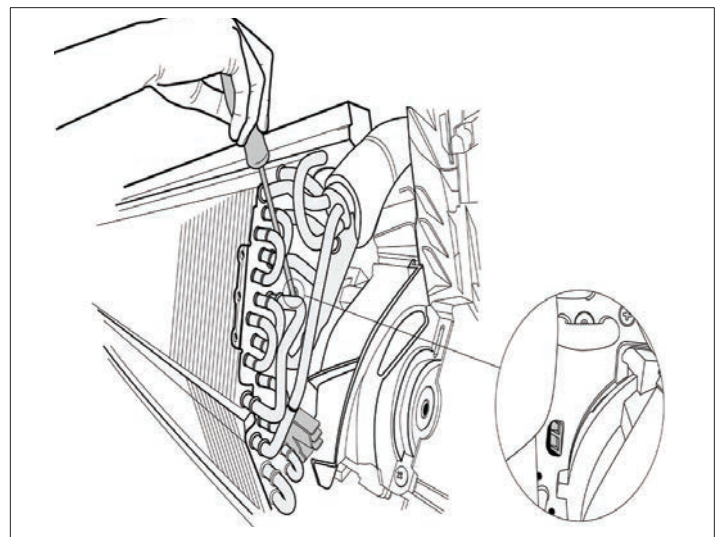
Step 4. Remove the one screw on the evaporator located oat the fixed plate.
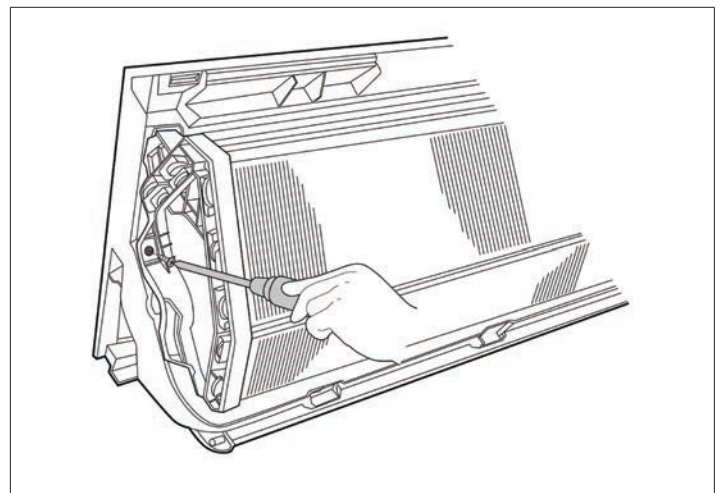
Step 5. Pull out the evaporator.

18.1.4. Fan Motor and Fan

NOTE: *Remove the front panel and electrical parts (see "Front Panel" on page 32, "Electrical Parts" on page 34 Electrical parts and "18.1.3. Evaporator" on page 36) before disassembling fan motor and fan.*

Step 1. Remove the two screws and remove the fixing board of the fan motor.

Screws

Step 2. Remove the bearing sleeve.

Step 3. Remove the fixing screw.

Step 4. Pull out the fan motor and fan assembly from the side.

Fixing Screw

18.1.5. Step Motor

NOTE: *Remove the front panel and electrical parts (see both "Front Panel" on page 32 and "Electrical Parts" on page 34 Electrical parts) before disassembling step motor.*

Step 1. Remove the two screws, then remove the stepping motor.

Stepping Motor
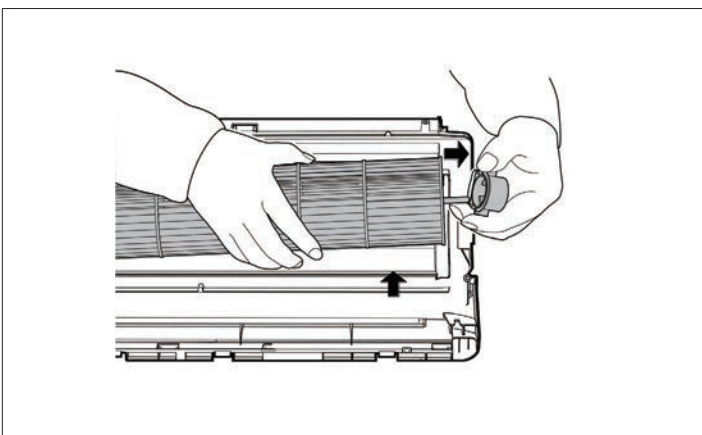
18.1.6. Drain Hose

Step 1. Rotate the fixed wire clockwise indicated in imagine below.

Step 2. Pull up the drain hose to remove it.
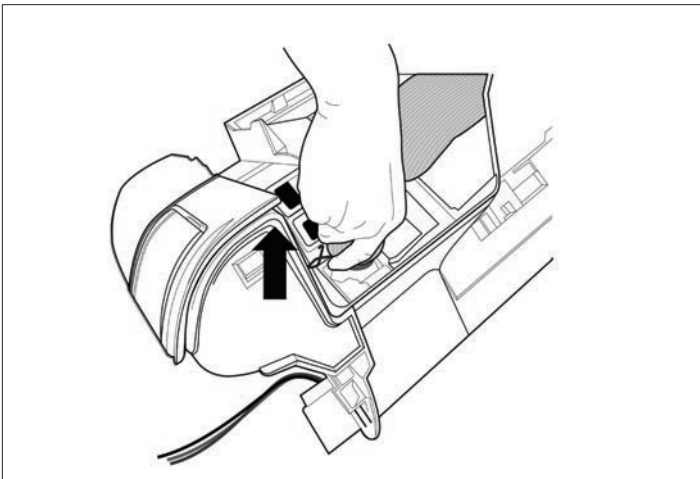
18.2. Outdoor Unit

18.2.1. Panel Plate (MWCA009S4, MWCA012S4 and MWCA018S4)

Step 1. Turn off the air conditioner and the power breaker.

Step 2. Remove the screw of the big handle and then remove the handle.

For US models (3 screws)
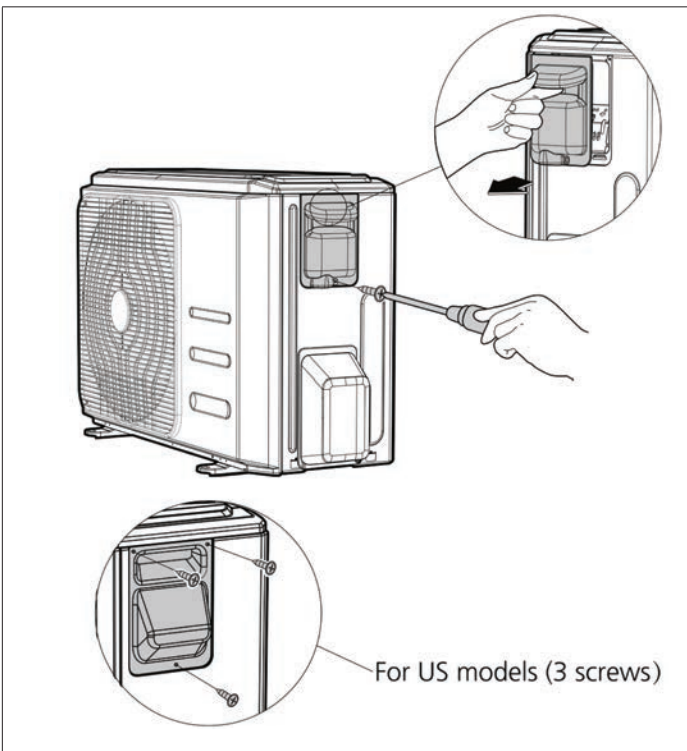
Step 3. Remove the screws of the top cover and then remove top cover. One of the screws is located underneath the big handle.

Top Cover
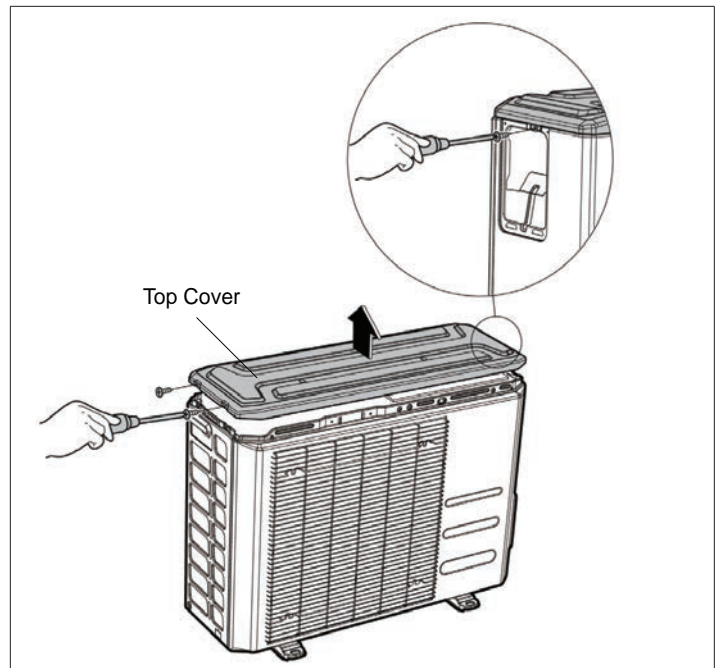
Step 4. Remove the screws of the front panel and then remove the front panel.

Front Panel
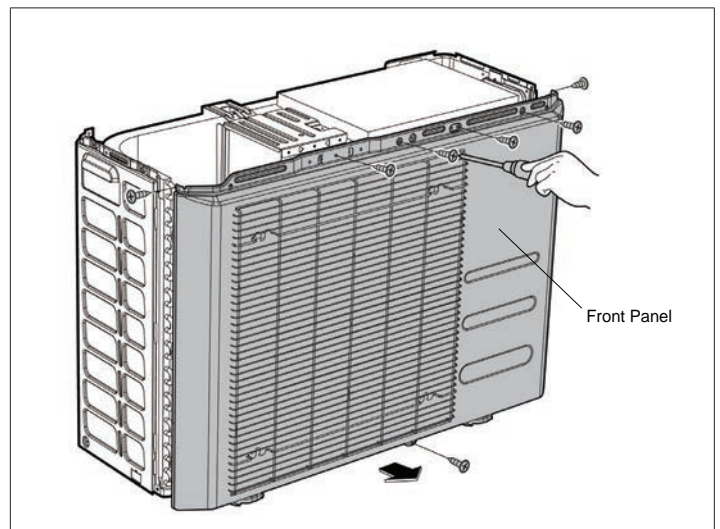
Step 5. Remove the screw from the water collector cover.

Water Collection Cover
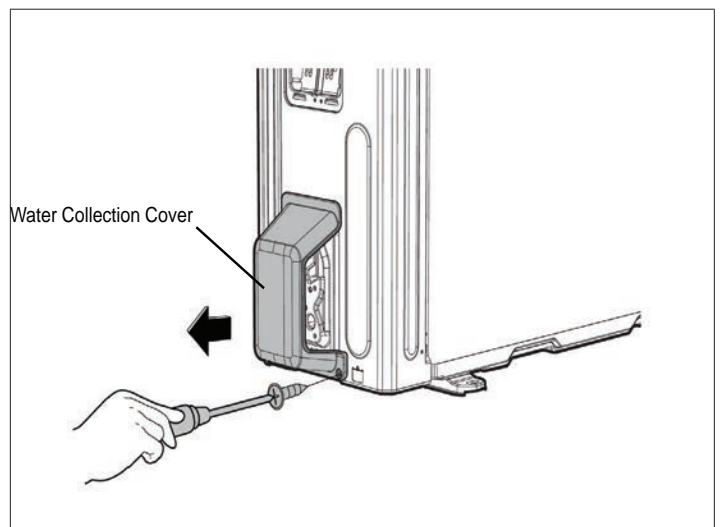
Step 6. Remove the screws on the rear coil guard and then remove the coil guard.

Front Cover
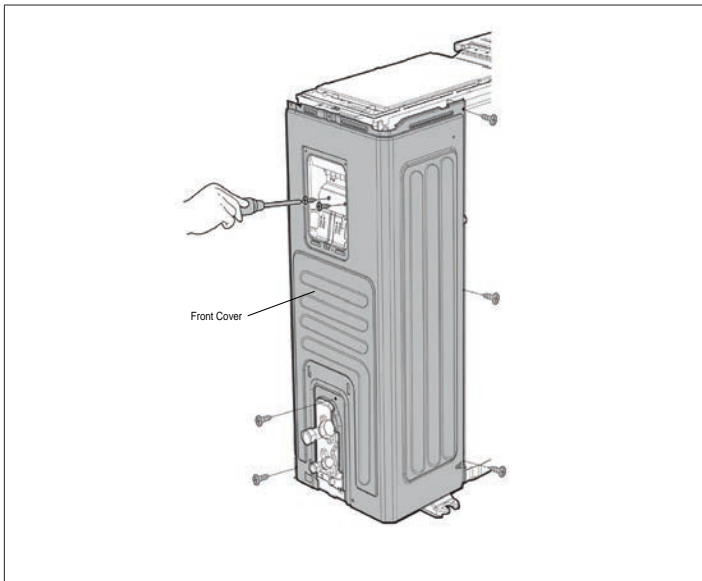
Step 7. Remove the screws from the right panel and then remove panel.

Right Panel
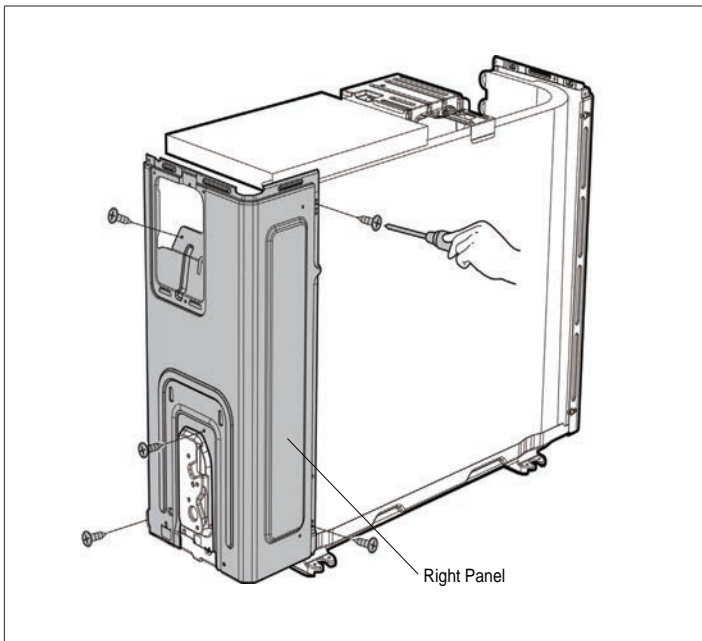
18.2.2. Panel Plate (MWCA024S4)

Step 1. Turn off the air conditioner and the power breaker.

Step 2. Remove the screws that secure the handle and then remove the handle.

For US models (3 screws)
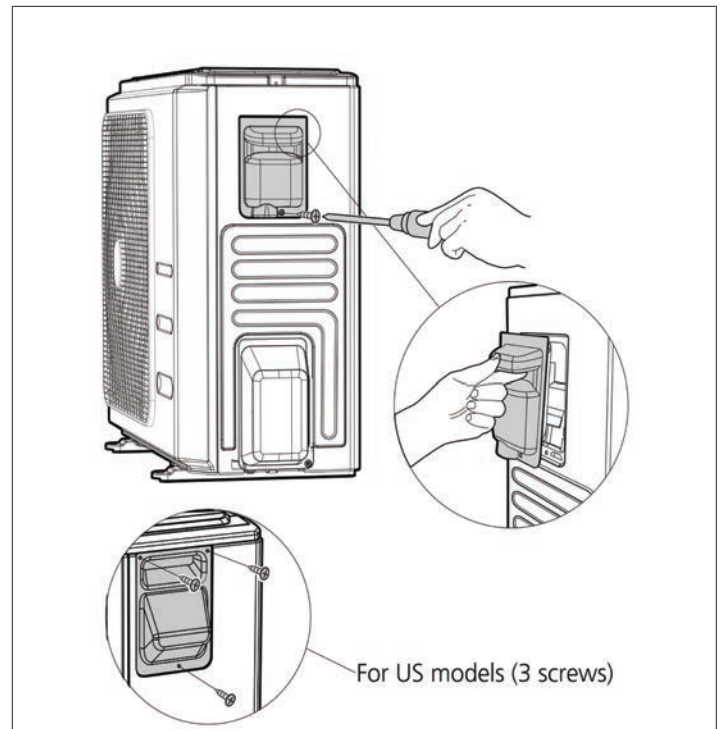
Step 3. Remove the screws from the top cover and then remove. One of the screws is located underneath the handle.

Top Cover
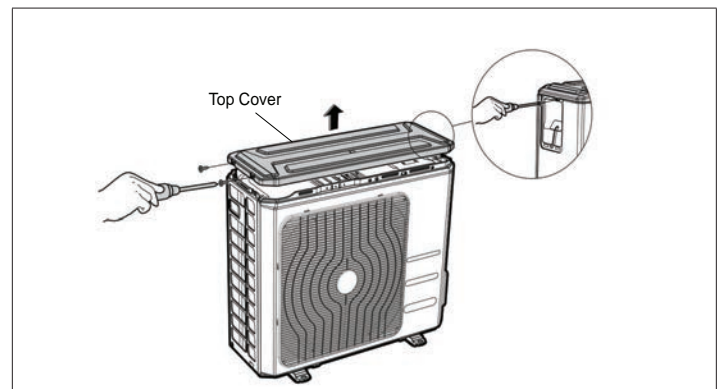
Step 4. Remove the screws from the front panel and then remove panel.

Front Panel
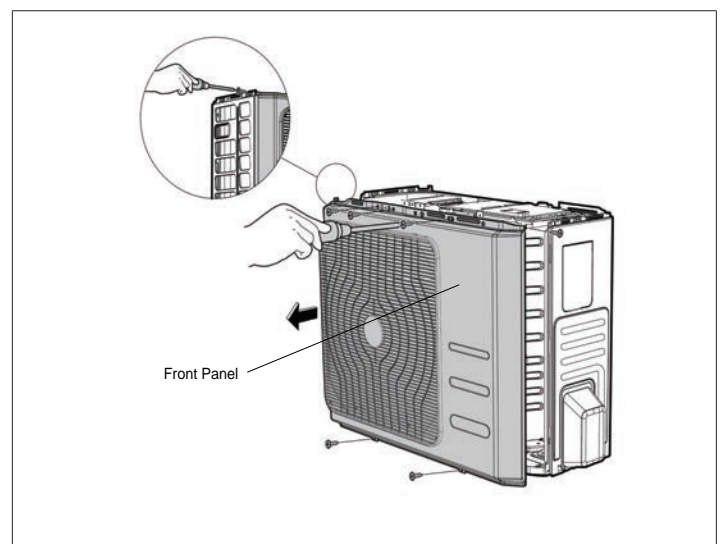
Step 5. Remove the screw securing the service valves cover and then remove.

Service Valves Cover
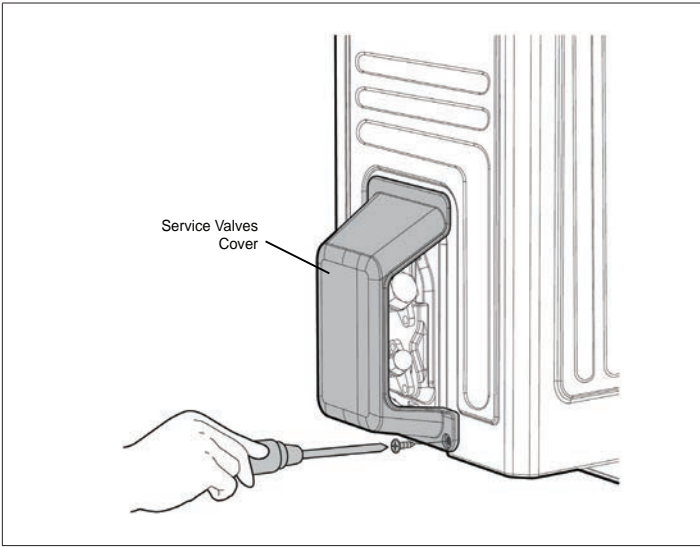
Step 6. Remove the screws securing the right panel cover and remove panel.
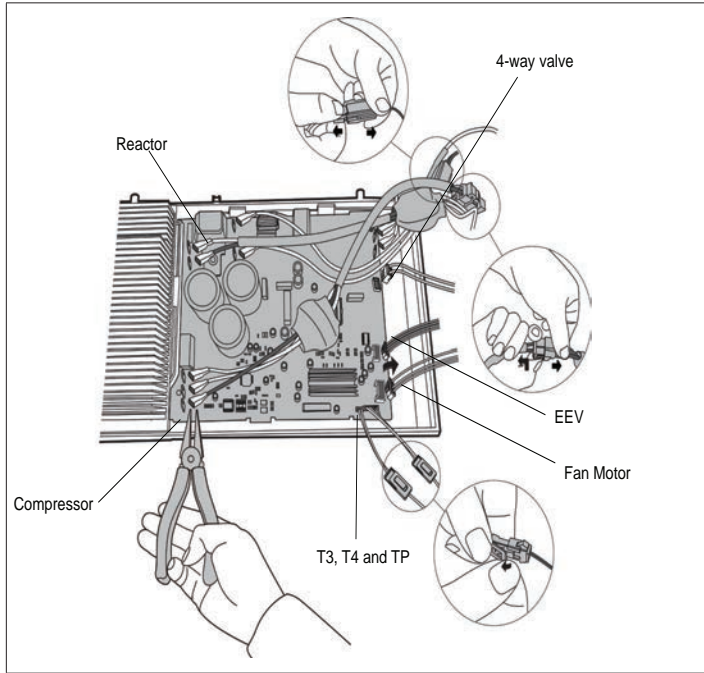

Front Cover
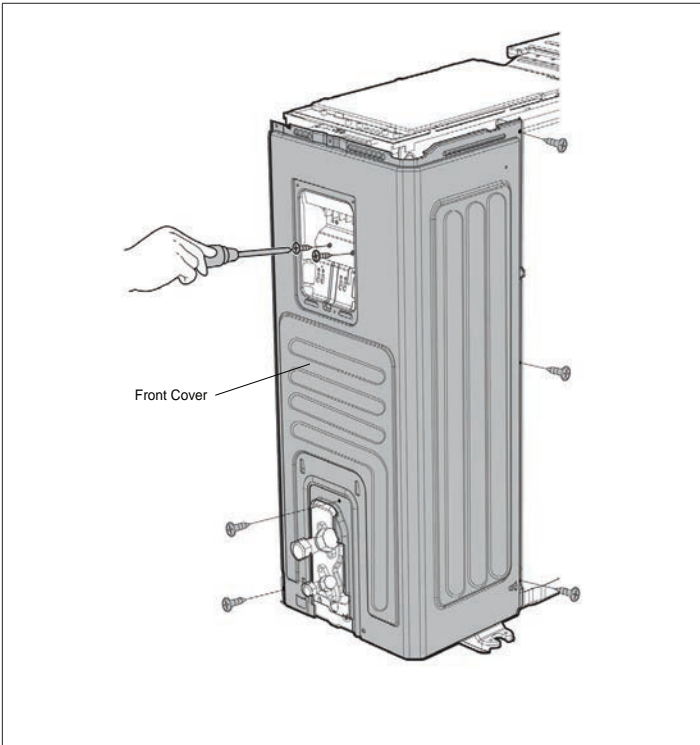
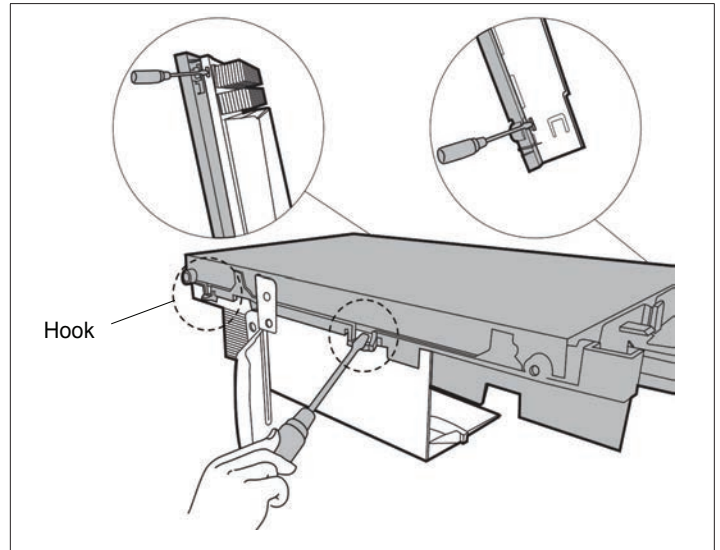### 18.2.3. Electronic Components (MWCA009S4 and MWCA012S4)

NOTE: *Antistatic gloves must be worn when you dissemble the electronic box.*

NOTE: *Remove the panel plate before disassembly the fan.*

Step 1. Remove the connector for the compressor.

Step 2. Pull out the two blue wires connected to the expansion value (not applicable to AC units only)

Step 3. Pull out connectors for the condenser coil temperature sensor (T3), outdoor ambient

temperature sensor (T4) and discharge temperature sensor (TP).

Step 4. Disconnect the expansion valve.

Step 5. Remove electronic control box.

4-way valve (HP only)

Fan Motor

Compressor   T3, T4 and TP   EEV
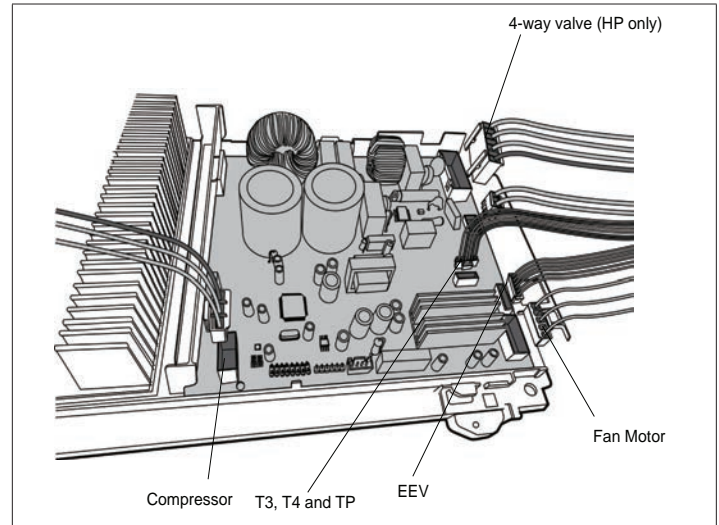
18.2.4. Electronic Components (MWCA018S4)

Step 1. Remove the connector for the compressor.

Step 2. Pull out connectors for the condenser coil temperature sensor (T3), outdoor ambient temperature sensor (T4) and discharge temperature sensor (TP).

Step 3. Disconnect the four-way valve wire.

Step 4. Disconnect the ground wire.

Step 5. Remove the connector for the indoor unit.

Step 6. Remove electronic control box.

Earth Wire
Connection Wires
From Terminal
4-way Valve   T3/T4/TP   DC Fan
AC Fan   Compressor
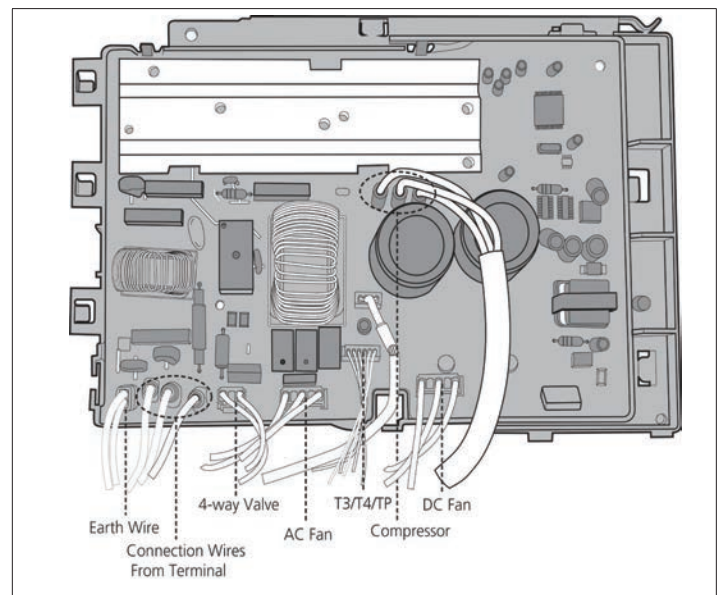
18.2.5. Electronic Components (MWCA024S4)

NOTE: *Antistatic gloves must be worn when you dissemble the electronic box.*

NOTE: *Remove the panel plate before disassembly the fan.*

Step 1. Remove the connector for the compressor.

Step 2. Pull out the two blue wires connected to the expansion value (not applicable to AC units only)

Step 3. Pull out connectors for the condenser coil temperature sensor (T3), outdoor ambient temperature sensor (T4) and discharge temperature sensor (TP).

Step 4. Disconnect the expansion valve.
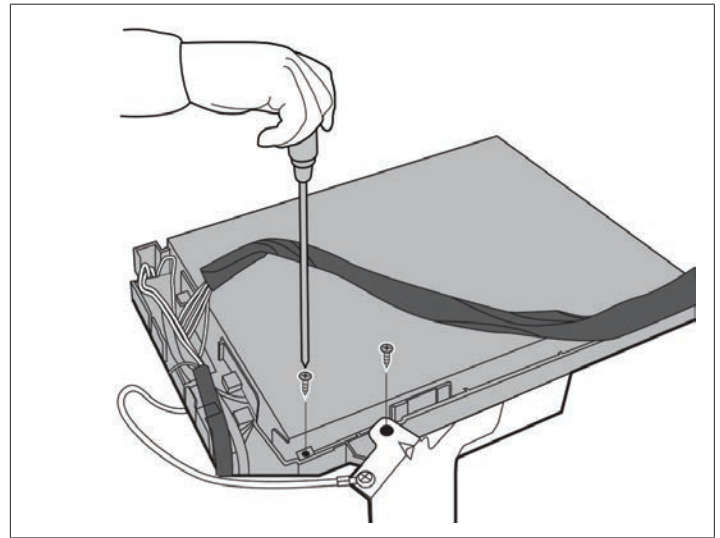
Step 5. Remove electronic control box.

18.2.6. Fan Disassembly (MWCA009S4 and MWCA012S4)

NOTE: *Antistatic gloves must be worn when you dissemble the electronic box.*

NOTE: *Remove the panel plate before disassembly the fan.*

Step 1. Remove nut securing the fan with a spanner.
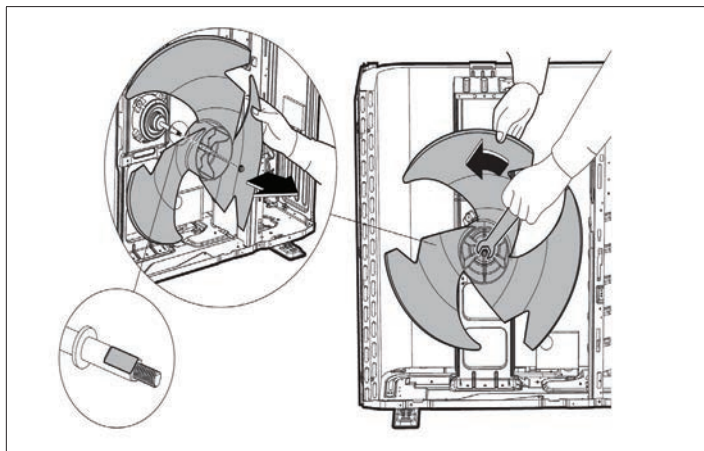
Step 2. Remove the screws securing the top cover.

Step 3. Release the hooks and then open the electronic control box cover.

Step 4. Disconnect the connector from the fan motor from the electronic control board.

Fan Motor Connector
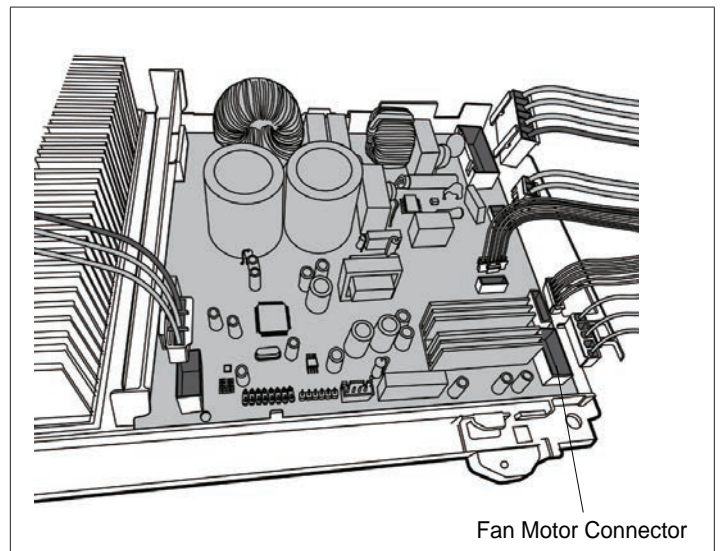
Step 5. Remove the screws securing the fan motor and then remove fan assembly.
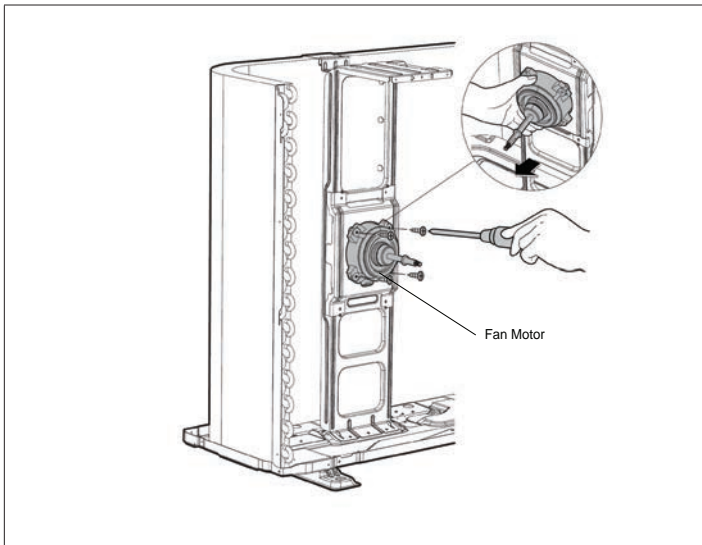
Fan Motor

18.2.7. Fan Disassembly (MWCA018S4)

Step 1. Remove the nut security the fan to the fan motor.
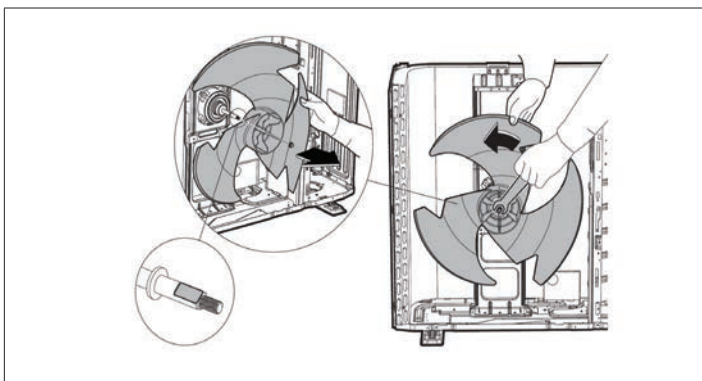
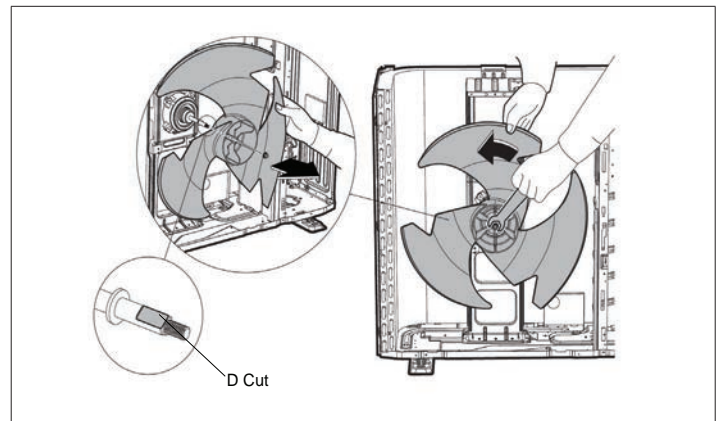**Step 2.** Remove the screws securing the cover of the electronic control box cover.
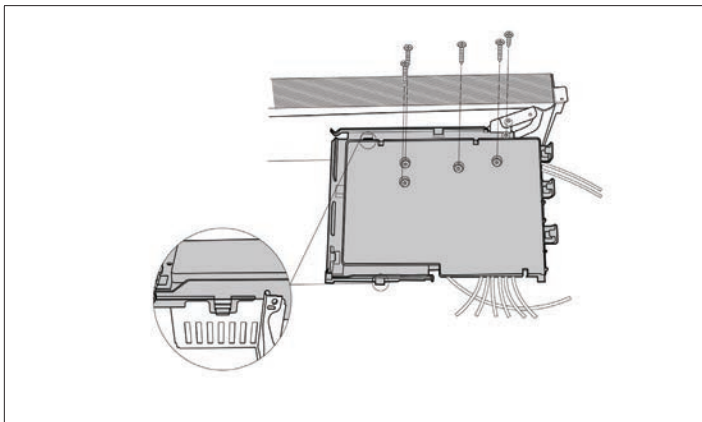
Step 3. Disconnect connector from electronic control board plug.
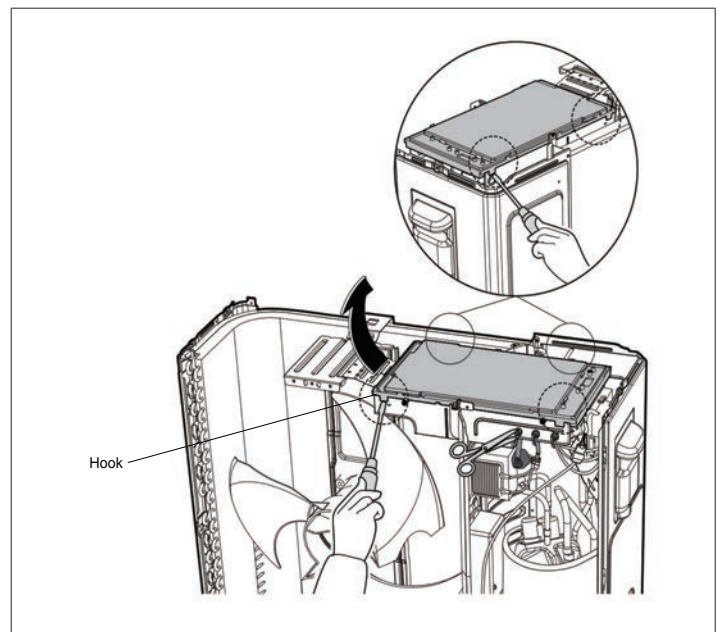

DC Fan

AC Fan
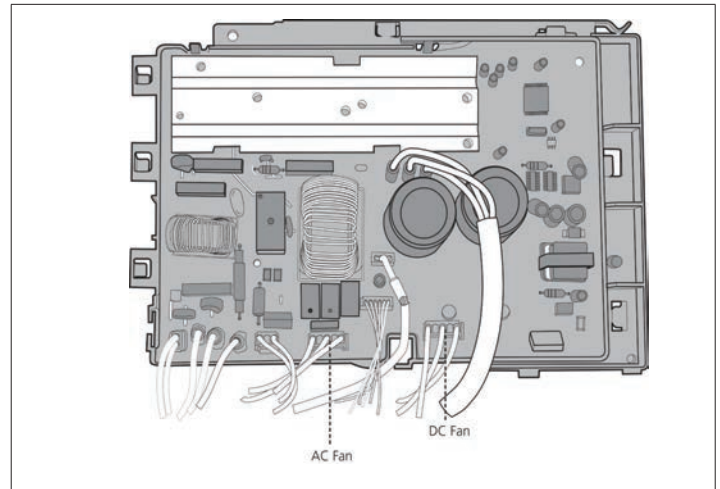
Step 4. Remove the screws securing the fan motor to body. Then remove fan motor.

18.2.8. Fan Disassembly (MWCA024S4)

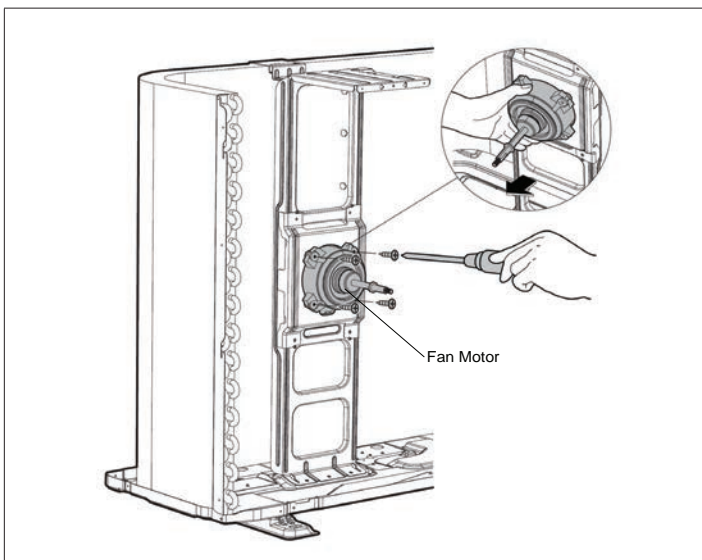**Step 1.** Remove the nut security the fan with a spanner. Then remove the fan.

D Cut

Step 2. Release the hooks and then open the electronic control box cover.

Hook

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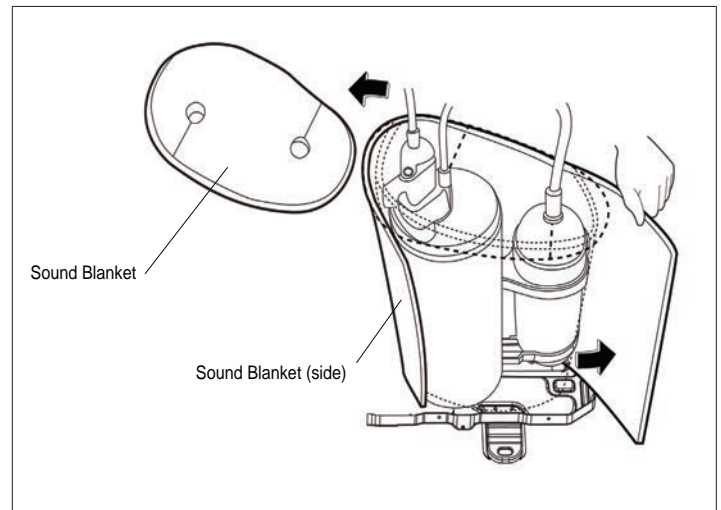**Step 3.** Disconnect the connector for the fan motor from the electronic control board.

Fan Motor Connector
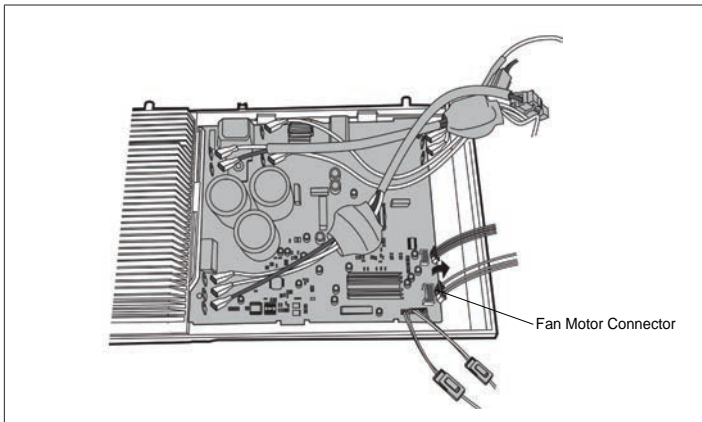
Step 4. Remove the screws securing the fan motor from body. Remove the fan.

Fan Motor
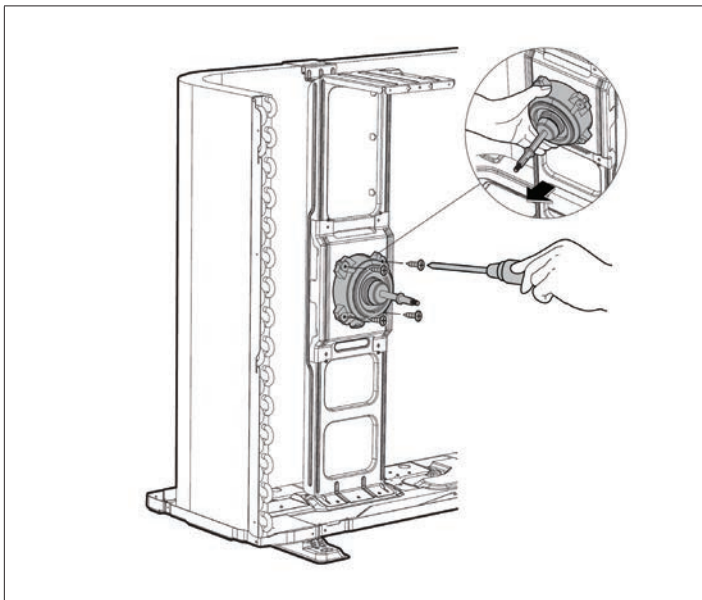
18.2.9. Sound Blanket
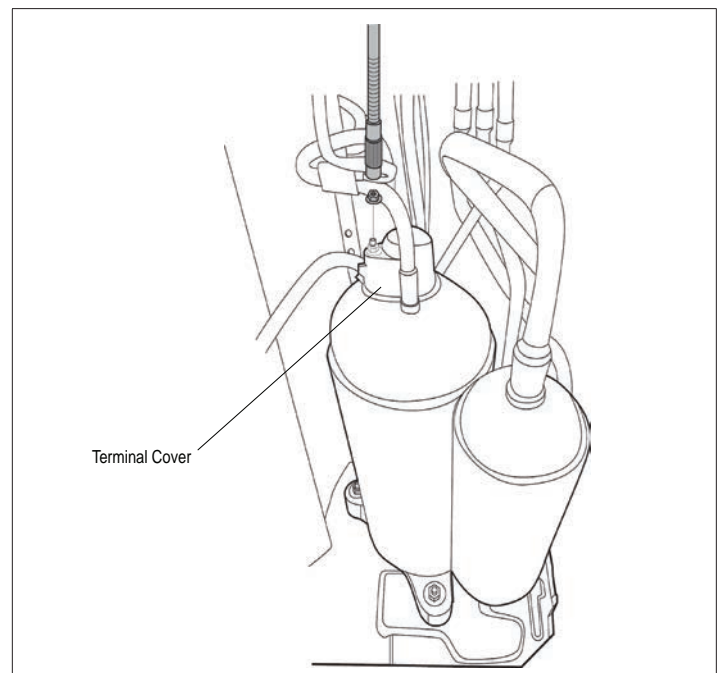
NOTE: Recover refrigerant before removing the compressor.
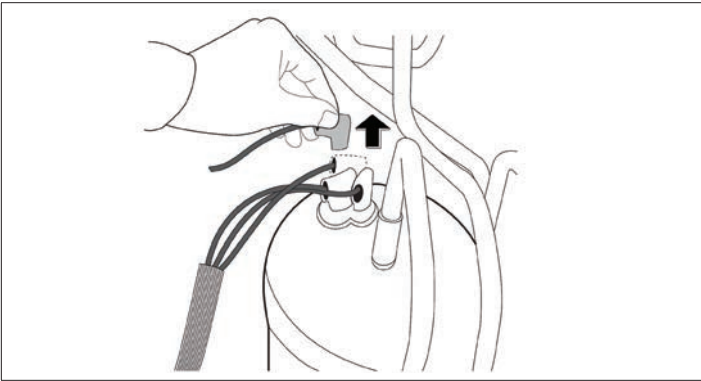

Sound Blanket

Sound Blanket (side)

18.2.10. Compressor

NOTE: Recover refrigerant before removing the compressor.

Step 1. Remove the flange nut of the terminal cover and remove the cover.

Terminal Cover

Step 2. Disconnect all connectors.

Step 3. Remove the hex nuts and washers which are located on the bottom of the plate which are securing the compressor.
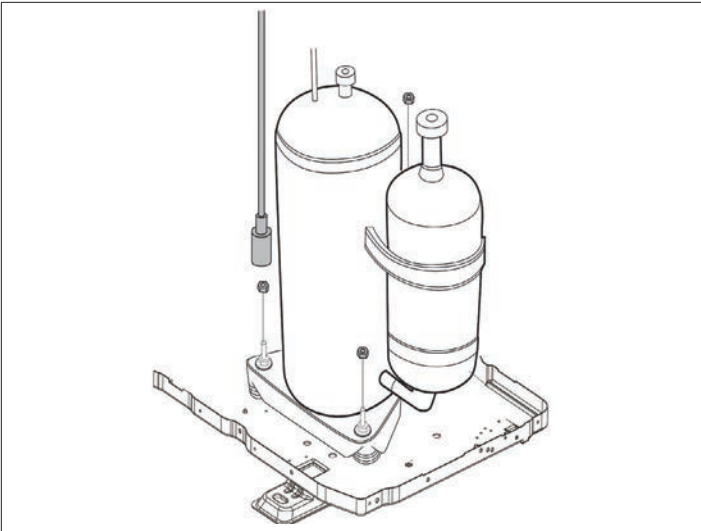
Step 4. Heat up the brazed parts and then remove the discharge and suctions pipes.

Step 5. Lift the compressor from the base pan assembly with pliers.