

DLFEHA

SERVICE MANUAL

High Wall Ductless System – Sizes 09 to 24

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SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc.).

Only trained, qualified installers and service mechanics should install, start-up, and service this equipment.

Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.

When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

Follow all safety codes. Wear safety glasses and work gloves. Keep quenching cloth and fire extinguisher nearby when brazing. Use care in handling, rigging, and setting bulky equipment.

Read this manual thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements. Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words: **DANGER**, **WARNING**, and **CAUTION**.

These words are used with the safety-alert symbol. **DANGER** identifies the most serious hazards which **will** result in severe personal injury or death. **WARNING** signifies hazards which **could** result in personal injury or death. **CAUTION** is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. **NOTE** is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.



WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.



WARNING



EXPLOSION HAZARD

Failure to follow this warning could result in death, serious personal injury, and/or property damage.

Never use air or gases containing oxygen for leak testing or operating refrigerant compressors. Pressurized mixtures of air or gases containing oxygen can lead to an explosion.



CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Do not bury more than 36 in. (914 mm) of refrigerant pipe in the ground. If any section of pipe is buried, there must be a 6 in. (152 mm) vertical rise to the valve connections on the outdoor units. If more than the recommended length is buried, refrigerant may migrate to the cooler buried section during extended periods of system shutdown. This causes refrigerant slugging and could possibly damage the compressor at start-up.

INTRODUCTION

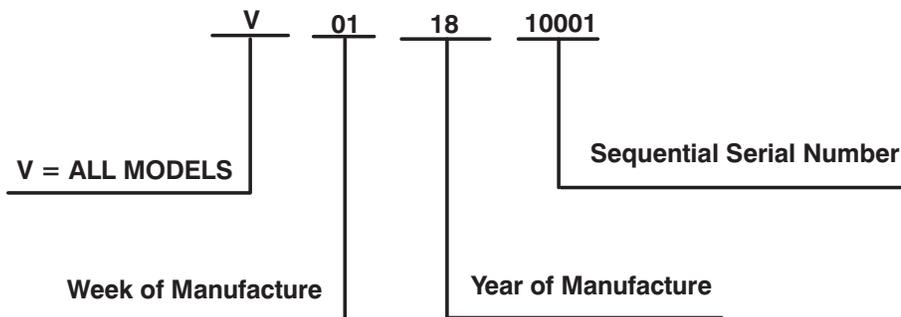
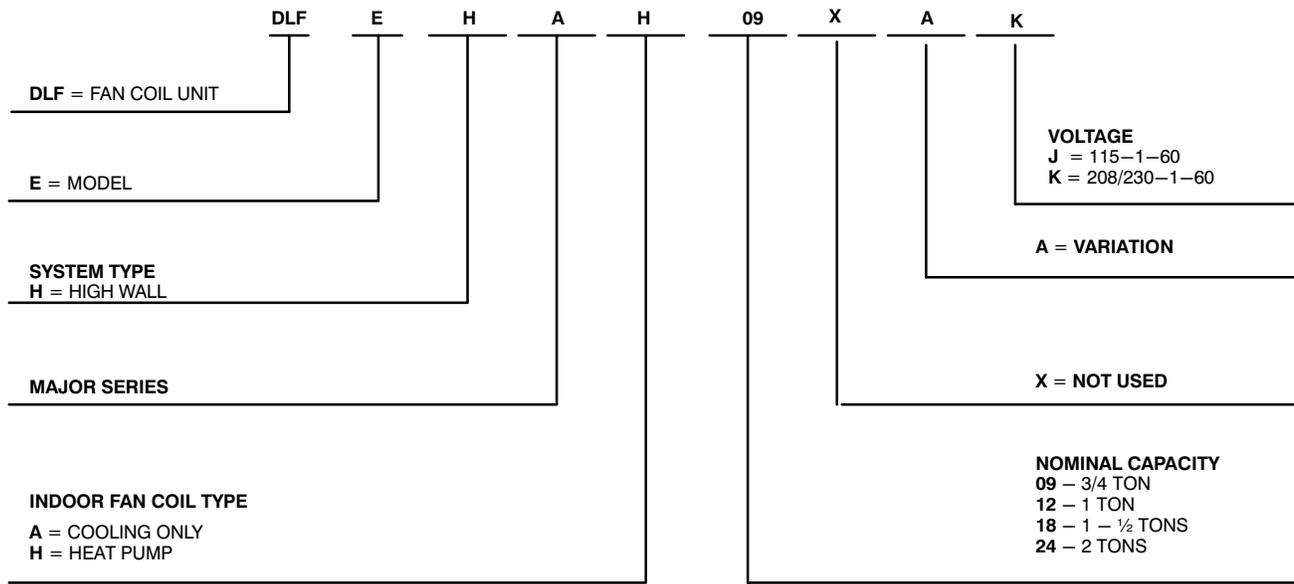
This Service Manual provides the necessary information to service, repair, and maintain the indoor units. Section 2 of this manual has an appendix with data required to perform troubleshooting. Use the Table of Contents to locate a desired topic.

MODEL/SERIAL NUMBER NOMENCLATURES

Table 1—Indoor Units

DESCRIPTION	kBTUh	V-Ph-Hz	ID MODEL No.
High Wall Cooling Only	12	115-1-60	DLFEHAA12XAJ
	12	208/230-1-60	DLFEHAA12XAK
	18		DLFEHAA18XAK
	24		DLFEHAA24XAK
High Wall Heat Pump	12	115-1-60	DLFEHAH12XAJ
	09	208/230-1-60	DLFEHAH09XAK
	12		DLFEHAH12XAK
	18		DLFEHAH18XAK
	24		DLFEHAH24XAK

INDOOR UNIT



Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to www.ahridirectory.org.



SPECIFICATIONS – COOLING ONLY

Table 2—Specifications (Cooling Only)

Cooling Only						
System	Size		12K	12K	18K	24K
	Indoor Model		DLFEHAA12XAJ	DLFEHAA12XAK	DLFEHAA18XAK	DLFEHAA24XAK
Electrical	Voltage, Phase, Cycle	V/Ph/Hz	115–1–60	208/230–1–60	208/230–1–60	208/230–1–60
	Power Supply		Indoor unit powered from outdoor unit			
	MCA	A.	0.3	0.25	0.4	0.45
Controls	Wireless Remote Controller (°F/°C Convertible)		Standard	Standard	Standard	Standard
	Wired Remote Controller (°F/°C Convertible)		Optional	Optional	Optional	Optional
Operating Range	Cooling Indoor DB Min –Max	° F (° C)	63~90 (17~32)	63~90 (17~32)	63~90 (17~32)	63~90 (17~32)
Piping	Pipe Connection Size – Liquid	in (mm)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	3/8 (9.52)
	Pipe Connection Size – Suction	in (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	5/8 (16)
Indoor Coil	Face Area (sq. ft.)	Sq. Ft.	1.48	1.48	2.58	2.59
	No. Rows		2	2	2	2
	Fins per inch		20	20	20	20
	Circuits		2	2	2	2
Indoor	Unit Width	in (mm)	32.00 (813)	32.00 (813)	38.36 (974)	43.83 (1113)
	Unit Height	in (mm)	11.81 (300)	11.81 (300)	12.8 (325)	13.41 (341)
	Unit Depth	in (mm)	7.75 (197)	7.75 (197)	8.87 (225)	9.22 (234)
	Net Weight	lbs (kg)	17.64 (8)	17.64 (8)	23.15 (10.5)	30.86 (14)
	Number of Fan Speeds		4	4	4	4
	Airflow (lowest to highest)	CFM	190/239/301/328	188/238/305	344/422/506/550	420/514/609/640
	Sound Pressure (lowest to highest)	dB(A)	29/36/41/42	28/35/40/42	34/39/43/45	39/44/49/49
	Air throw Data	ft (m)	22 (6.7)	22 (6.7)	24 (7.3)	39.4 (12)
	Moisture removal	Pint/h (L/h)	3.17 (1.50)	3.09 (1.46)	4.61 (2.18)	6.38 (3.02)
	Field Drain Pipe Size O.D.	in (mm)	0.625 (16)	0.625 (16)	0.625 (16)	0.625 (16)

Performance may vary based on the compatible outdoor units. See the respective pages on the outdoor unit's product data for performance data.

COMPATIBILITY

Indoor Unit	DLFEHAA12XAJ	DLFEHAA12XAK	DLFEHAA18XAK	DLFEHAA24XAK
Outdoor Unit Single Zone	DLCERAA12AAJ	DLCERAA12AAK	DLCERAA18AAK	DLCERAA24AAK
Outdoor Unit Multi-zone				

Cooling Only NOT compatible with Multi-zone Outdoor Units.

SPECIFICATIONS – HEAT PUMP

Table 3—Specifications (Heat Pump)

Heat Pump							
System	Size		12K	9K	12K	18K	24K
	Indoor Model		DLFEHAH12XAJ	DLFEHAH09XAK	DLFEHAH12XAK	DLFEHAH18XAK	DLFEHAH24XAK
Electrical	Voltage, Phase, Cycle	V/Ph/Hz	115–1–60	208/230–1–60	208/230–1–60	208/230–1–60	208/230–1–60
	Power Supply		Indoor unit powered from outdoor unit				
	MCA	A.	0.3	0.25	0.25	0.28	0.45
Controls	Wireless Remote Controller (°F/°C Convertible)		Standard	Standard	Standard	Standard	Standard
	Wired Remote Controller (°F/°C Convertible)		Optional	Optional	Optional	Optional	Optional
Operating Range	Cooling Indoor DB Min–Max	° F (° C)	63~90 (17~32)	63~90 (17~32)	63~90 (17~32)	63~90 (17~32)	63~90 (17~32)
	Heating Indoor DB Min–Max	° F (° C)	32~86 (0~30)	32~86 (0~30)	32~86 (0~30)	32~86 (0~30)	32~86 (0~30)
Piping	Pipe Connection Size – Liquid	in (mm)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	3/8 (9.52)
	Pipe Connection Size – Suction	in (mm)	1/2 (12.7)	3/8 (9.52)	1/2 (12.7)	1/2 (12.7)	5/8 (16)
Indoor Coil	Face Area (sq. ft.)	Sq. Ft.	1.48	1.14	1.48	2.58	2.58
	No. Rows		2	2	2	2	2
	Fins per inch		20	20	20	20	20
	Circuits		2	2	2	2	2
Indoor	Unit Width	in (mm)	32.00 (813)	28.53 (725)	32.00 (813)	38.36 (974)	43.83 (1113)
	Unit Height	in (mm)	11.81 (300)	11.81 (300)	11.81 (300)	12.8 (325)	13.41 (341)
	Unit Depth	in (mm)	7.75 (197)	7.75 (197)	7.75 (197)	8.87 (225)	9.22 (234)
	Net Weight	lbs (kg)	22.49(10.2)	21.16 (9.6)	22.49(10.2)	31.97(14.5)	40.12(18.2)
	Number of Fan Speeds		4	4	4	4	4
	Airflow (lowest to highest)	CFM	200/265/306/329	165/229/271/324	212/282/324/353	353/412/529/559	353/483/589/647
	Sound Pressure (lowest to highest)	dB(A)	29/38/42/42	31/36/40/42	34/39/41/43	34/39/44/46	38/42/48/49
	Air Throw Data	ft (m)	22 (6.7)	20.3 (6.2)	22.6 (6.9)	25 (7.6)	37.7 (11.5)
	Moisture Removal	Pint/h (L/h)	3.49 (1.65)	2.05 (0.97)	3.38 (1.6)	4.63 (2.19)	5.73 (2.71)
Field Drain Pipe Size O.D.	in (mm)	0.625 (16)	0.625 (16)	0.625 (16)	0.625 (16)	0.625 (16)	

Performance may vary based on the compatible outdoor units. See respective pages for performance data.

COMPATIBILITY

Indoor Unit	DLFEHAH12XAJ	DLFEHAH09XAK	DLFEHAH12XAK	DLFEHAH18XAK	DLFEHAH24XAK
Outdoor Unit Single Zone	DLCERAH12AAJ	DLCERAH09AAK	DLCERAH12AAK	DLCERAH18AAK	DLCERAH24AAK
Outdoor Unit Multi–zone		DLCMRAH18BAK			
		DLCMRAH27CAK			
		DLCMRAH36DAK			
		DLCMRAH48EAK			

DIMENSIONS

Table 4—Dimensions

HIGH WALL UNIT SIZE		12K	9K	12K	18K	24K
Voltage		(115V)	(208/230V)	(208/230V)	(208/230V)	(20/230V)
Height	In. (mm)	11.81(300)	11.81(300)	11.81(300)	12.8(325)	13.41(341)
Width	In. (mm)	32.00(813)	28.53(725)	32.00(813)	38.36(974)	43.83(1113)
Depth	In. (mm)	7.75(197)	7.75(197)	7.75(197)	8.87(225)	9.22(234)
Weight—Net (Cooling Only)	Lbs (kg)	17.64(8)	N/A	17.64(8)	23.15(10.5)	30.86(14)
Weight—Net (Heat Pump)	Lbs (kg)	22.49(10.2)	21.16 (9.6)	22.49(10.2)	31.97(14.5)	40.12(18.2)

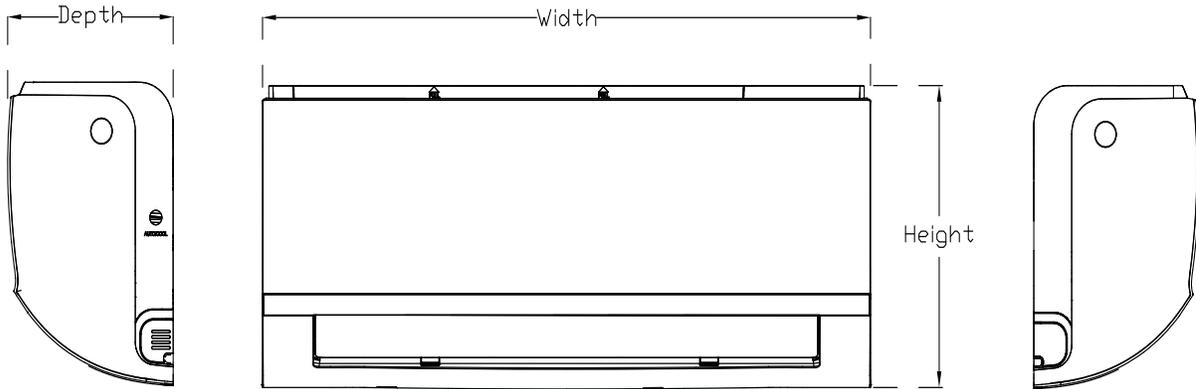


Fig. 1 – Indoor Units

CLEARANCES

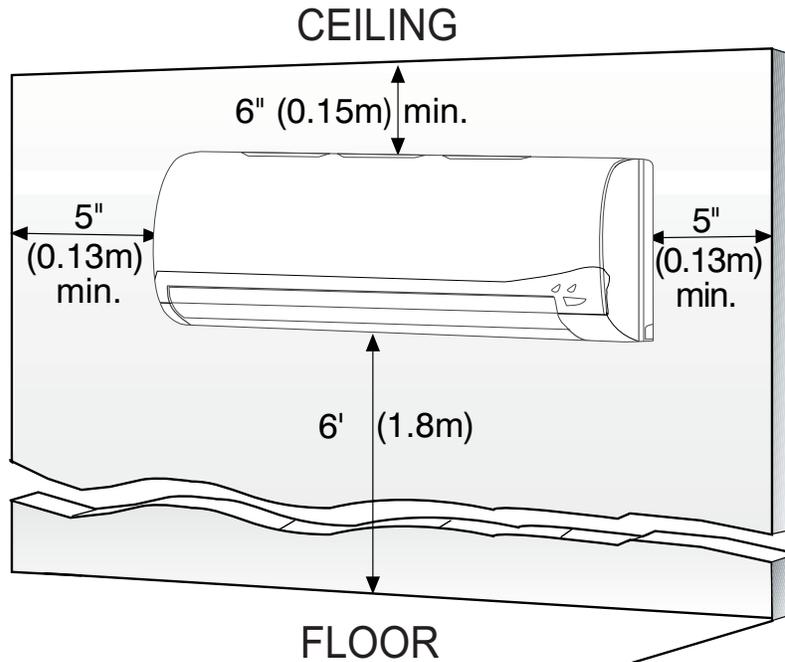


Fig. 2 – Indoor Unit Clearance

NOTE: The top clearance recommended for proper return airflow is 5.9 in (15 cm). Reduction of this clearance may decrease unit performance. This may be reduced to 3.2 in (80 mm) as long as the right and left clearances are achieved.

ELECTRICAL DATA

Table 5—Electrical Data

HIGH WALL UNIT SIZE		INDOOR FAN			MAX FUSE CB AMP
		V-Ph-Hz	FLA	HP	
Cooling Only Models	12K	115-1-60	0.425	0.02	Refer to outdoor unit installation instructions – Indoor unit powered by the outdoor unit
	12K	208/230-1-60	0.235	0.027	
	18K		0.4	0.037	
	24K		0.6	0.061	
Heat Pump Models	12K	115-1-60	0.47	0.027	
	9K	208/230-1-60	0.25	0.027	
	12K		0.34	0.027	
	18K		0.4	0.037	
	24K		0.45	0.078	

LEGEND
FLA – Full Load Amps

WIRING

All wires must be sized per NEC (National Electrical Code) or CEC (Canadian Electrical Code) and local codes. Use Electrical Data table MCA (minimum circuit amps) and MOCP (maximum over current protection) to correctly size the wires and the disconnect fuse or breakers respectively.

Recommended Connection Method for Power and Communication Wiring

The main power is supplied to the outdoor unit. The field supplied 14/3 stranded wire with ground with a 600 volt insulation rating, power/communication wiring from the outdoor unit to indoor unit consists of four wires and provides the power for the indoor unit. Two wires are line voltage AC power, one is communication wiring (S) and the other is a ground wire.

Wiring between indoor and outdoor unit is polarity sensitive.

The use of BX wire is NOT recommended.

If installed in a high Electromagnetic field (EMF) area and communication issues exists, a 14/2 stranded shielded wire can be used to replace L2/N and (S) between outdoor unit and indoor unit landing the shield onto ground in the outdoor unit only.

⚠ **CAUTION**

EQUIPMENT DAMAGE HAZARD
Failure to follow this caution may result in equipment damage or improper operation.
Wires should be sized based on NEC and local codes.

⚠ **CAUTION**

EQUIPMENT DAMAGE HAZARD
Failure to follow this caution may result in equipment damage or improper operation.

- Be sure to comply with local codes while running wire from the indoor unit to the outdoor unit.
- Every wire must be connected firmly. Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Ensure all wiring is tightly connected.
- No wire should be allowed to touch the refrigerant tubing, compressor or any moving parts.
- Disconnecting means must be provided and shall be located within sight and readily accessible from the air conditioner.
- Connecting cable with conduit shall be routed through a hole in the conduit panel.

CONNECTION DIAGRAMS

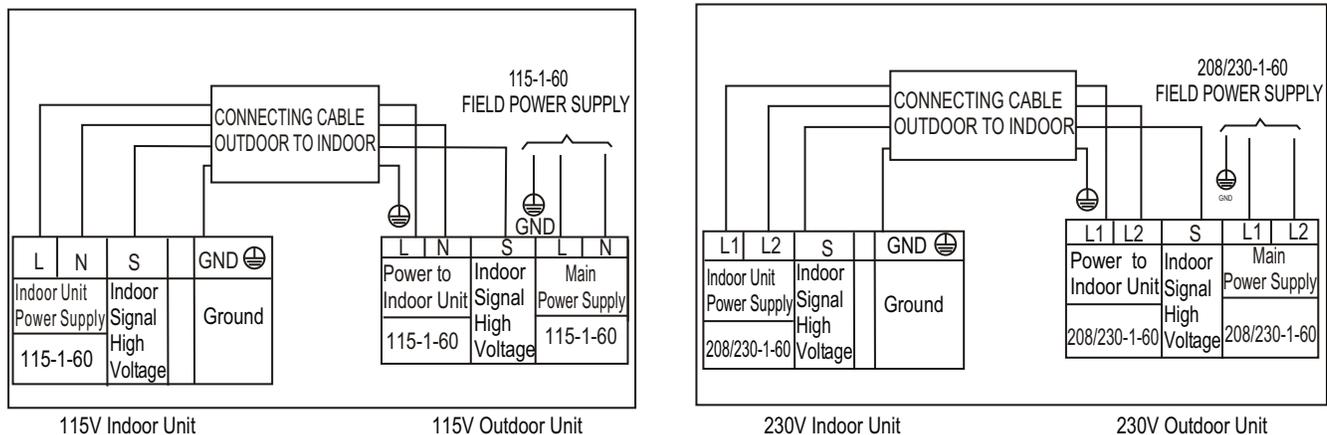


Fig. 3 – Connection Diagrams

- Notes:**
1. Do not use thermostat wire for any connection between indoor and outdoor units.
 2. All connections between indoor and outdoor units must be as shown. **The connections are sensitive to polarity and will result in a fault code.**

WIRING DIAGRAMS

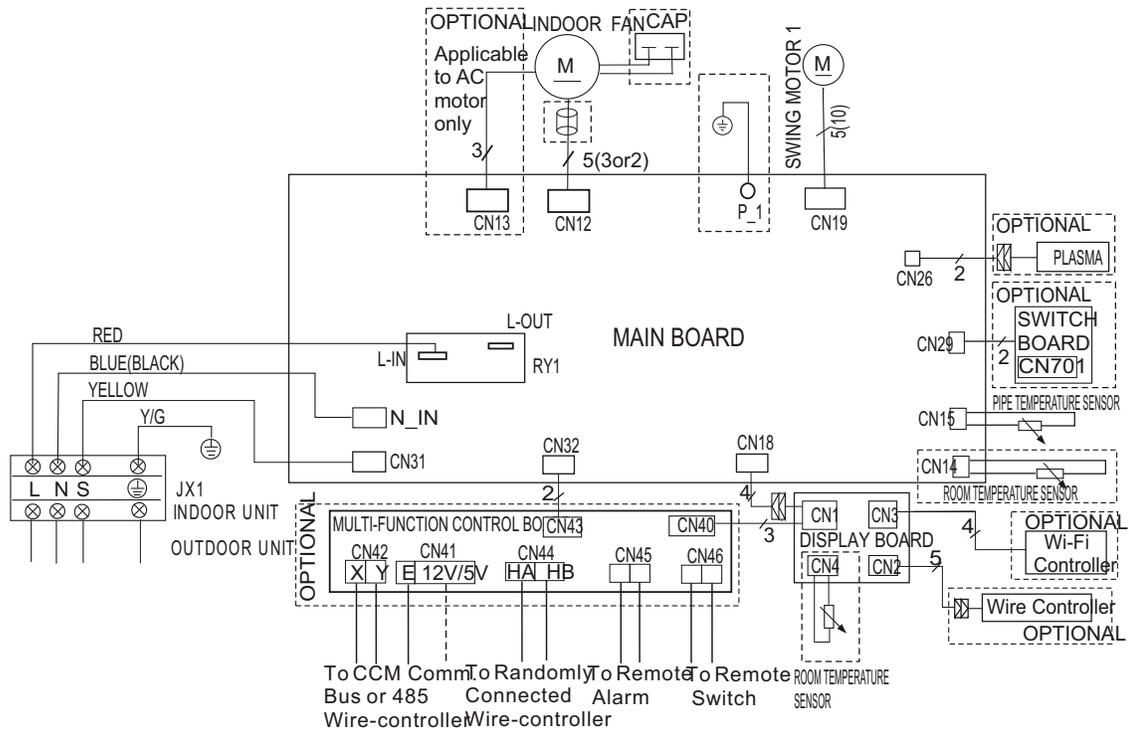
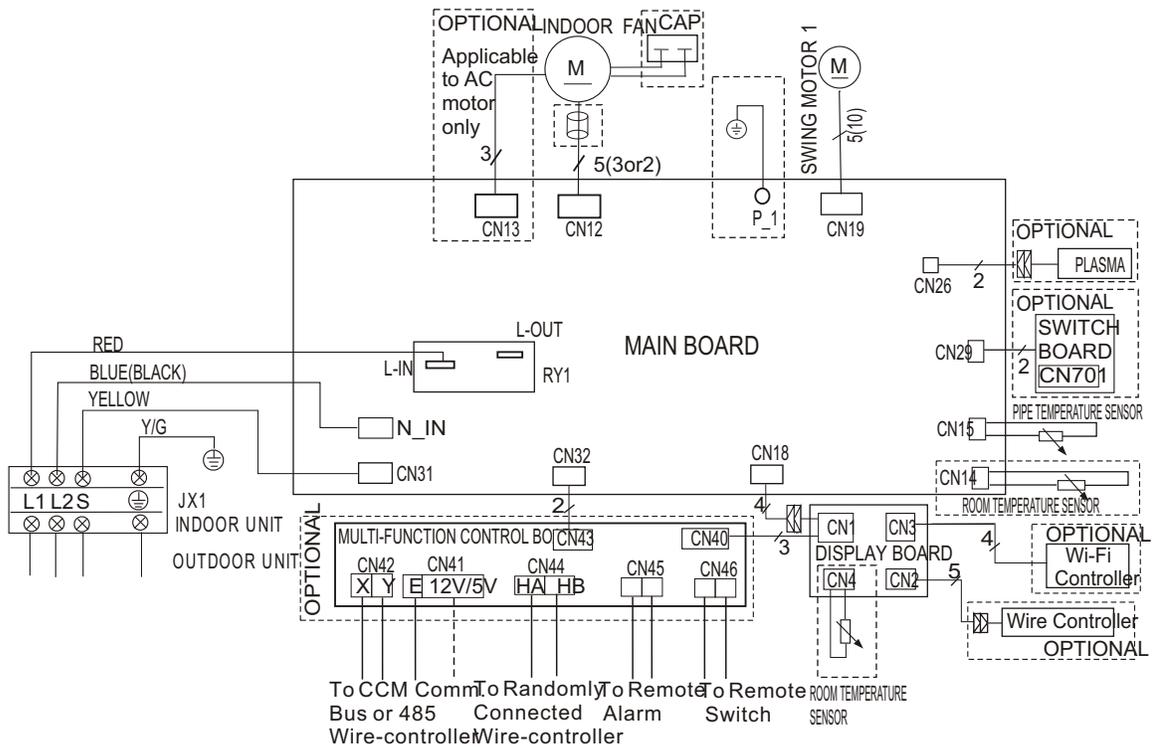


Fig. 4 – Wiring Diagram Sizes (115V)



---- This symbol indicates the element is optional, the actual shape shall prevail.

Fig. 5 – Wiring Diagram Sizes 09–24 (208–230V)

FAN AND MOTOR SPECIFICATIONS

Table 6—Cooling Only

Cooling Only		12K (115V)	12K (208/230V)	18K (208/230V)	24K (208/230V)	
High Wall Fan	Material	Acrylonitrile Styrene +30%GF				
	Type	GL-94*605-N	GL-94*605-N	GL-98*758-I	GL-108*818	
	Diameter	In. (mm)	3.7(94)	3.7(94)	3.86(98)	4.25(108)
	Height	In. (mm)	23.8(605)	23.8(605)	29.8(758)	32.2(818)
High Wall Fan Motor	Model		RPG15A/YKFG-15-4-28-1	RPG20B/YKFG-20-4-10L	YKFG-28-4-6-5	RPG45B/YKFG-45-4-13
	Volts	V	115	220	220	220
	Phase		1	1	1	1
	FLA		0.43	0.235	0.4	0.6
	Type		AC			
	Insulation Class		E	E	E	B
	Safe Class		IPX4	IPX4	IPX4	IPX4
	Input	W	46	47.4	58.5	83.5
	Output	W	15	20	28	45
	Range of Current	Amps	0.425±10%	0.218±10%	0.267±10%	0.38±10%
	Rated Current	Amps	0.3	0.25	0.4	0.45
	Rated HP	HP	0.02	0.027	0.037	0.061
	Speed	Rev/min	1100/900/750	1100/900/750	1150/1000/850	1150/1000/850
	Rated RPM	Rev/min	1100	1100	1150	1150
Max. Input	W	56	50	74.4	129	

Table 7—Heat Pump

Heat Pump		12K (115V)	9K (208/230V)	12K (208/230V)	18K (208/230V)	24K (208/230V)	
High Wall Fan	Material	Acrylonitrile Styrene +30%GF					
	Type	GL-94*605-N	GL-94*605-N	GL-94*605-N	GL-98*758-I	GL-108*818	
	Diameter	In. (mm)	3.7(94)	3.7(94)	3.7(94)	3.86(98)	4.25(108)
	Height	In. (mm)	23.8(605)	23.8(605)	23.8(605)	29.8(758)	32.2(818)
High Wall Fan Motor	Model		ZKFP-20-8-5	ZKFP-20-8-6	ZKFP-20-8-6	YKFG-28-4-6-5	ZKFP-58-8-1
	Volts	V	DC160	DC310	DC310	220	DC310
	Phase		3	3	3	1	3
	FLA		0.47	0.34	0.34	0.4	0.45
	Type		DC	DC	DC	AC	DC
	Insulation Class		E	E	E	E	E
	Safe Class		IPX4	IPX4	IPX4	IPX4	IPX4
	Input	W	25	21	21	58.5	62
	Output	W	20	20	20	28	58
	Range of Current	Amps	0.17±10%	0.067±10%	0.067±10%	0.267±10%	0.19±10%
	Rated Current	Amps	0.3	0.25	0.25	0.28	0.45
	Rated HP	HP	0.027	0.027	0.027	0.037	0.078
	Speed	Rev/min	1250/900/800	1200/1050/800	1100/900/750	1150/900/800	1100/900/700
	Rated RPM	Rev/min	1250	1200	1100	1150	1100
Max. Input	W	25	21	21	74.4	62	

REFRIGERATION CYCLE DIAGRAMS

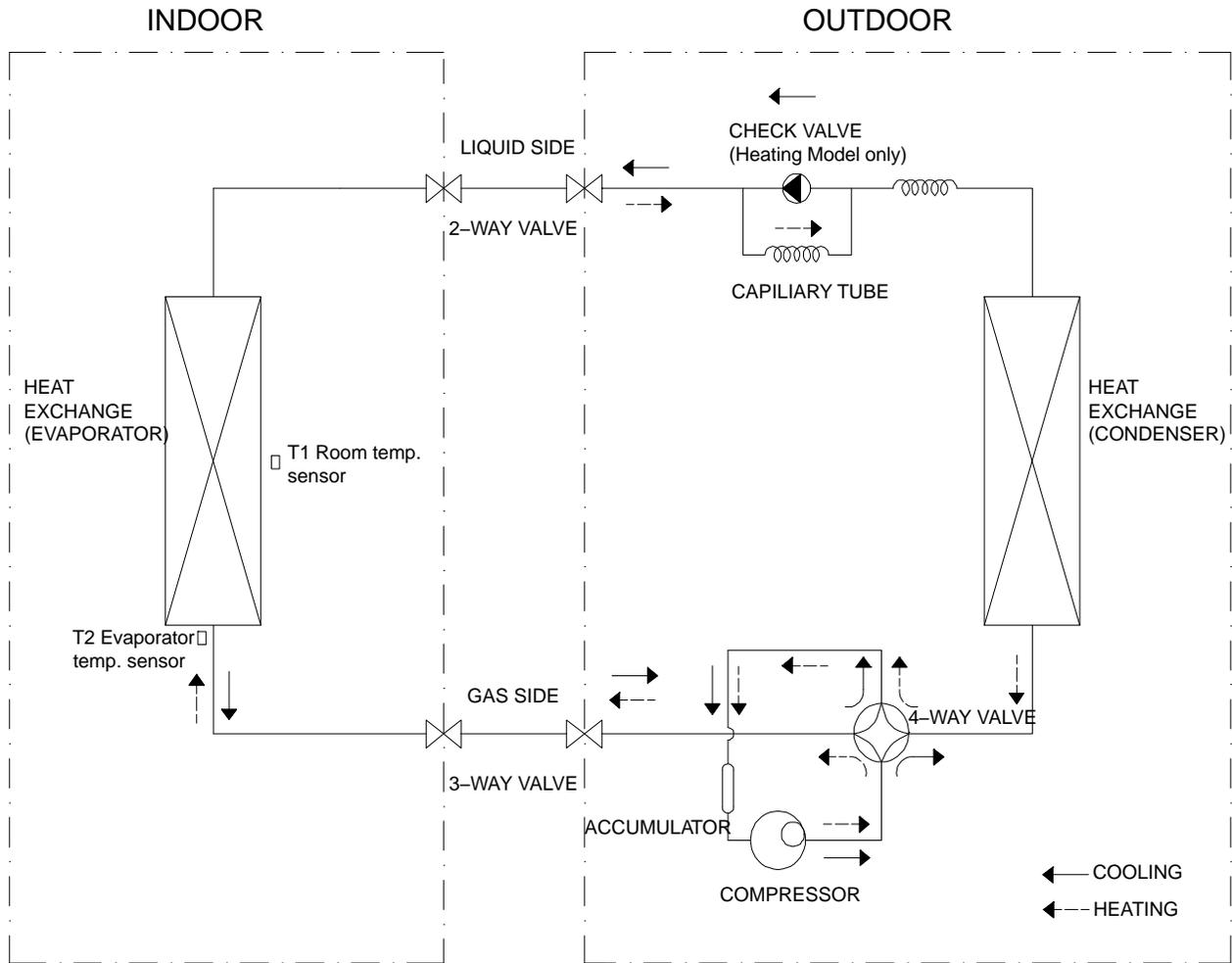


Fig. 6 – Heat Pumps

REFRIGERANT LINES

IMPORTANT: Both refrigerant lines must be insulated separately.

Table 3 lists the pipe sizes for the indoor unit. Refer to outdoor unit installation instructions for allowed piping lengths and refrigerant information.

SYSTEM EVACUATION AND CHARGING

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Never use the system compressor as a vacuum pump.

Refrigerant tubes and indoor coil should be evacuated using the recommended deep vacuum method of 500 microns. The alternate triple evacuation method may be used if the following procedure is followed. Always break a vacuum with dry nitrogen.

System Vacuum and Charge

Using Vacuum Pump

1. Completely tighten flare nuts on the line set at both the indoor and outdoor units. **DO NOT** open the service valves on the outdoor unit for the new installation or the replacement unit. Open the service valves on the outdoor unit if repairs have been made to the refrigerant sealed system. Connect the manifold gauge low pressure hose to the charge port of the gas side service valve (see Fig. 7).
2. Connect the charge hose to the vacuum pump.
3. Fully open the low pressure valve of manifold gage (see Fig. 8).
4. Start the vacuum pump.
5. Evacuate using deep vacuum or triple evacuation method.
6. After evacuation is complete, fully close the pressure valve side of manifold gage and stop the vacuum pump operation.
7. The factory charge contained in the outdoor unit is good for up to 25ft. (8 m) of line length. If vacuum is complete per Fig. 10 or 11, open service valves to release factory charge into the system.
8. Disconnect the charge hose from the charge connection of the gas side service valve.
9. Securely tighten the service valve caps.

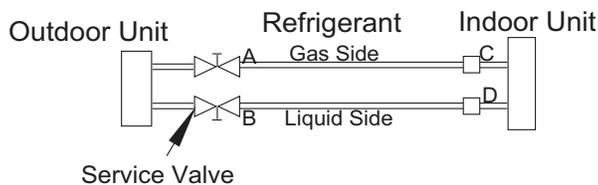


Fig. 7 – Service Valve

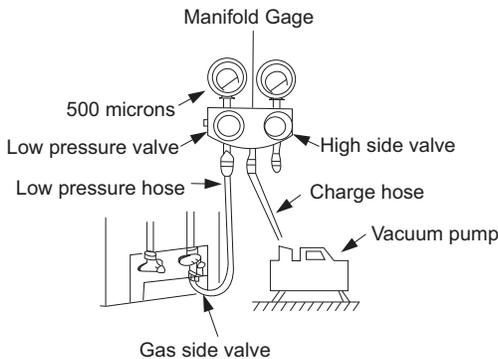


Fig. 8 – Manifold

Deep Vacuum Method

The deep vacuum method requires a vacuum pump capable of pulling a vacuum of 500 microns and a vacuum gage capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of ensuring a system is free of air and liquid water.

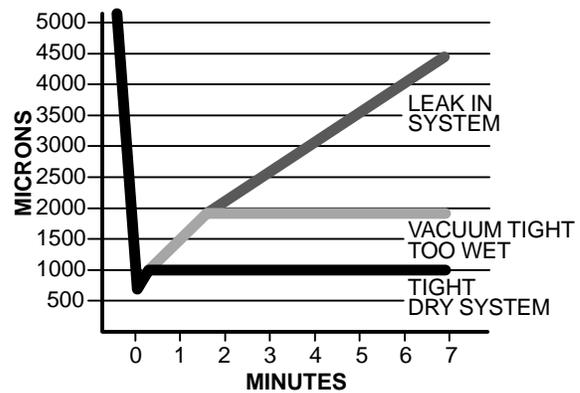


Fig. 9 – Deep Vacuum Graph

Triple Evacuation Method

The triple evacuation method should be used. Refer to Fig. 10 and proceed as follows:

1. Pump the system down to 1500 microns and allow the pump to continue operating for an additional 15 minutes.
2. Close the service valves and shut off the vacuum pump.
3. Connect a dry nitrogen cylinder and regulator to the system and break vacuum until the system reaches 2 psig.
4. Close the service valve and allow the system to stand for 1 hour. During this time, the dry nitrogen can diffuse throughout the system absorbing moisture.
5. Pump the system down to 1000 microns.
6. Break the vacuum with dry nitrogen (2 psig).
7. Pump the system down to 500 microns.
8. Perform the hold test for 30 minutes.

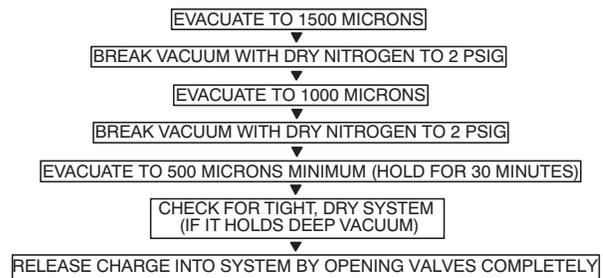


Fig. 10 – Triple Evacuation Method

Final Tubing Check

IMPORTANT: Check to be certain factory tubing on both indoor and outdoor unit has not shifted during shipment. Ensure tubes are not rubbing against each other or any sheet metal. Pay close attention to feeder tubes, making sure wire ties on feeder tubes are secure and tight.

ELECTRONIC FUNCTION

Abbreviation

- T1: Indoor room temperature
- T2: Coil temperature of evaporator
- T3: Coil temperature of condenser
- T4: Outdoor ambient temperature
- T5: Compressor discharge temperature

Display function

Icon explanation on indoor display board



Fig. 11 – Digital display

- Displays the temperature settings when the air conditioner is operational.
- Displays the room temperature in FAN mode.
- Displays the self-diagnostic codes.
- Displays **ON** for three seconds when Timer ON, Fresh, Swing, Turbo or Silence feature is activated.
- Displays **DF** for three seconds when Fresh, Swing, Turbo, or Silence feature is cancelled.
- Displays **dF** under defrosting operation.
- Displays **cF** when anti-cold air feature is activated under heating mode.
- Displays **SC** during self clean operation (if applicable).
- Displays **FP** under 8°C heating operation (if applicable).
- When ECO function (optional) is activated, the **88** illuminates gradually one by one as **E → C → O → set temperature → E ...** in one second intervals.



Fig. 12 – WIFI control display (optional)

Displays when the WIFI control feature is activated (Not available on some units).

NOTE: A guide on using the infrared remote is not included in this literature package.

Main Protection

Fan Speed is Out of Control

When the indoor fan speed remains too low (300 RPM) for a certain length of time, the unit stops and the LED displays the failure.

Indoor Fan Delayed Open Function

When the unit starts up, the louver becomes active immediately and the indoor fan opens 7 seconds later. If the unit runs in the **HEATING** mode, the indoor fan will be controlled by the anti-cold wind function.

Zero Crossing Detection Error Protection

If the system detects that the time interval is not correct for a continuous period of 240 seconds, the unit stops and the LED displays the failure. The correct zero crossing signal time interval should be between 6–13 ms.

Sensor Protection at Open Circuit and Breaking Disconnection

When there is only one malfunctioning temperature sensor, the air conditioner keeps working yet displays the error code in case of any emergency. When there is more than one malfunctioning temperature sensor, the air conditioner stops working.

Operation Modes and Functions

FAN Mode

1. Outdoor fan and compressor stop.
2. Temperature setting function is disabled, and no setting temperature is displayed.
3. Indoor fan can be set to high/med/low/auto.
4. The louver operates the same in the **COOLING** mode.
5. Auto fan.

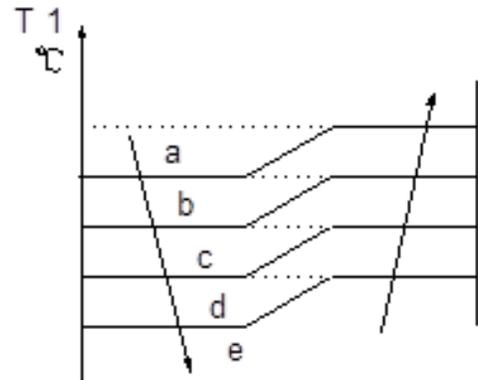


Fig. 13 – Auto Fan

COOLING Mode

Indoor Fan Running Rules

In **COOLING** mode, the indoor fan runs all the time and the speed can be selected as high, medium, low, and auto. When the setting temperature is reached, if the compressor stops running, the indoor fan motor runs at the minimum or setting speed.

The indoor fan is controlled by the rules shown in Fig. 14.

Setting fan speed	T1-Td (°C/°F)	Actual fan speed
H	A	H+ (H+=H+G)
	B	H (=H)
	C	H- (H-=H-G)
M	D	M+ (M+=M+Z)
	E	M (M=M)
	F	M- (M-=M-Z)
L	G	L+ (L+=L+D)
	H	L (L=L)
	I	L- (L-=L-D)

Fig. 14 – Indoor Fan Running Rules

The AUTO fan is controlled by the rules shown in Fig. 15.

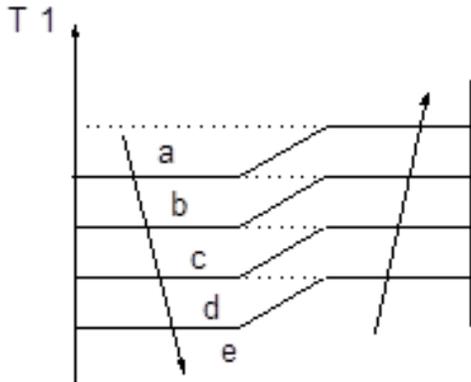


Fig. 15 – Indoor Fan Running Rules

Evaporator Temperature Protection

When the evaporator temperature is less than the setting value, the compressor stops.

HEATING Mode

Indoor Fan Running Rules

When the compressor is on, the indoor fan can be set to high/med/low/auto/mute. When the indoor unit coil temperature is low, the anti-cold air function starts and the indoor fan motor runs at a low speed and the speed cannot be changed. When the temperature is lower than the setting value, the indoor fan motor stops.

When the indoor temp reaches the setting temperature, the compressor stops, the indoor fan motor runs at the minimum speed or setting speed. The anti-cold air function is valid. The indoor fan is controlled as shown in Fig. 16.

Setting fan speed	T1-Td°C	Actual fan speed
H		H- (H-=H-G)
		H (<=H)
		H+(H+=H+G)
M		M-(M=M-Z)
		M(M=M)
		M+(M+=M+Z)
L		L-(L=L-D)
		L(L=L)
		L+(L+=L+D)

Fig. 16 – Indoor Fan Running Rules

Auto Fan Action in HEATING Mode

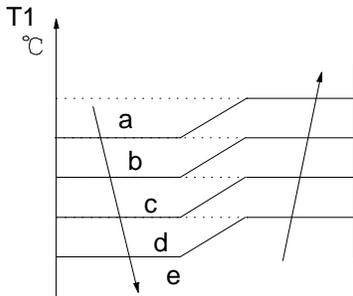


Fig. 17 – Auto Fan Action in HEATING Mode

DEFROST Mode

The air conditioner enters the DEFROST mode according to the T3 temperature value, and the T3 temperature change value range plus the compressor running time.

During the DEFROST mode, the compressor continues to run, the indoor and outdoor motors stop, the indoor unit defrost lamp illuminates, and dF displays.

If any one of the following items is satisfied, the defrosting finishes, and the machine reverts to the normal heating mode:

- T3 rises higher than TCDE1°C.
- T3 stays higher than TCDE2°C for 80 seconds.
- The machine has run for 15 minutes in defrosting mode.

Evaporator Coil Temperature Protection

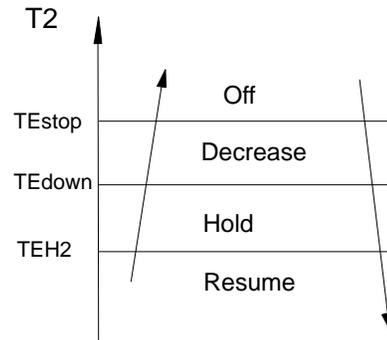


Fig. 18 – Evaporator Coil Temperature Protection

NOTE: The following applies to Fig. 18:

- Off: Compressor stops
- Decrease: Decrease the running frequency to the lower level
- Hold: Keep the current frequency
- Resume: No limitation for frequency

When the evaporator temperature is higher than the setting protection value, the compressor stops.

Auto-Mode

This mode can be chosen with the remote controller and the setting temperature can be changed between 62.6°F (17°C) ~ 86°F (30°C).

In AUTO mode, the unit chooses the COOLING, HEATING, or FAN-ONLY mode according to ΔT (ΔT = T1 – Ts).

Table 8—Auto Mode

ΔT = T1 - Ts	Running mode
ΔT > 2°C	Cooling
-2 ≤ ΔT ≤ 2°C	Fan-only
ΔT < -2°C	Heating

The indoor fan runs under auto fan in the relevant mode. The louver operates the same as in relevant mode. If the unit switches between HEATING and COOLING mode, the compressor stops for 15 minutes, and chooses the mode according to T1-Ts. If the setting temperature is modified, the unit chooses the running function again.

DRY Mode

Indoor Fan Speed is Fixed

Indoor fan speed is fixed at breeze and cannot be changed. The louver angle is the same as in COOLING mode.

Low Indoor Room Temperature Protection

In **DRY** mode, if the room temperature is lower than 50°F (10°C), the compressor stops, and will not resume until the room temperature exceeds 53.6°F (12°C).

Evaporator Anti-Freezing Protection

The evaporator anti-freezing protection condenser high temperature protection and outdoor unit frequency limit are active and the same as in the **COOLING** mode.

Outdoor Fan

The outdoor fan operates the same as in **COOLING** mode.

FORCED OPERATION Function

When the unit is off:

1. Press **TOUCH** to engage the **FORCED AUTO** mode.
 2. Press **TOUCH** again within five seconds to engage the **FORCED COOLING** mode. In the **FORCED AUTO**, **FORCED COOLING**, or any other operation mode, press **TOUCH** to turn the unit OFF.
- **FORCED OPERATION mode:** In the **FORCED OPERATION** mode, all the general protections and remote control are available.

Operation Rules

- **FORCED COOLING mode:** The compressor runs at the F2 frequency and the indoor fan runs in the **BREEZE** mode. After running for 30 minutes, the machine enters **AUTO** mode at the 75.2°F (24°C) setting temperature.
- **FORCED AUTO mode:** The **FORCED AUTO** mode is the same as the normal **AUTO** mode with a 75.2°F (24°C) setting temperature.

Timer Function

Timing range is 24 hours.

Timer on. The unit turns on automatically when the setting time is reached.

Timer off. The machine turns off automatically when the setting time is reached.

Timer on/off. The machine turns on automatically when reaching the setting “on” time, and then turns off automatically when reaching the setting “off” time.

Timer off/on. The machine turns off automatically when reaching the setting “off” time, and then turns on automatically when reaching the setting “on” time.

The timer function will not change the system’s current operation mode. Suppose the system is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer LED will be off and the system’s running mode has not been changed. The setting time is relative time.

The system will exit the timer function when it has malfunction.

Sleep Function

The sleep function is available in cooling, heating, or auto mode.

Operation process in **SLEEP** mode is as follows:

- When cooling, the setting temperature rises 2°F (1°C) to a maximum of 86°F (30°C) every one hour. 2 hours later, the setting temperature stops rising and the indoor fan is fixed at low speed.
- When heating, the setting temperature decreases 2°F (1°C) to a maximum of 62.6°F (17°C) every one hour, 2 hours later the setting temperature stops decreasing and indoor fan is fixed at low speed. (Anti-cold wind function still has priority).

Operation time in **SLEEP** mode is seven hours. After seven hours the system exits this mode and turns off.

AUTO-RESTART Function

The indoor unit is equipped with the **AUTO-RESTART** function, which is carried out through an auto-restart module. In the event of a sudden power failure, the module memorizes the setting conditions prior to the power failure. The unit resumes the previous operation setting (not including the **SWING** function) automatically three minutes after the power returns.

If the memorization condition is the **FORCED COOLING** mode, the unit will run in **COOLING** mode for 30 minutes and turn to the **AUTO** mode at the 75.2°F (24°C) setting temperature.

If the air conditioner is off before the power turns off and the air conditioner is required to start up, the compressor delays start up for one minute before powering on. In other instances, the compressor waits three minutes before restart.

Refrigerant Leak Detection

With this new technology, the display area displays “EC” when the outdoor unit detects a refrigerant leak. This function is only active in cooling mode. It can help prevent the compressor from being damaged by refrigerant leakage or compressor overload.

Open Condition: When the compressor is active, the value of the Coil temperature of evaporator T2 has little or no change.

Louver Position Memory Function

When restarting the unit after shutting down, the louver returns to the angle originally set by the user. However, the precondition is that the angle must be within the allowable range. If it exceeds this range, it will memorize the maximum angle of the louver. During operation, if power fails or the end user shuts down the unit in turbo mode, the louver returns to the default angle.

46°F (8°C) Heating

When the compressor is running, the indoor fan motor runs without the **ANTI-COLD** air function. When the compressor is off, the indoor fan motor is off.

Silence Operation

Press the **SILENCE** button on the remote controller to initiate the **SILENCE** function. When the **SILENCE** function is activated, the compressor running frequency remains lower than F2 and the indoor unit emits a faint breeze, which reduces the noise to the lowest level and creates a quiet and comfortable room for the user.

Self clean

Heat pump models are provided with this function. If the user presses “Self Clean” on the remote controller after running in **COOLING** or **DRYING** mode, the indoor unit runs in **FAN ONLY** mode momentarily. It then runs in the low heat operation and finally runs in **FAN ONLY** again. This function can keep the inside of the indoor unit dry and prevent mold from breeding within the unit.

FOLLOW ME

If the indoor PCB receives the signal resulting from pressing **FOLLOW ME** on the remote controller, the buzzer emits a sound that indicates the **FOLLOW ME** function is initiated. However, when the indoor PCB receives a signal from the remote controller every three minutes, the buzzer will not respond.

When the unit is running with the **FOLLOW ME** function, the PCB controls the unit according to the temperature from the **FOLLOW ME** signal, and the temperature collection function of the room temperature sensor is shielded. However, the error detective function of room temperature sensor remains valid.

When the **FOLLOW ME** function is available, the PCB controls the unit according to the room temperature from the remote controller and the setting temperature.

The PCB will take action to the mode change information from remote controller signal. However, it will not be affected by the setting temperature.

When the unit is in the **FOLLOW ME** mode, if the PCB does not receive a signal from the remote controller for seven minutes or if the

FOLLOW ME button is pressed again, the **FOLLOW ME** function turns off automatically, and the temperature controls the unit according to the room temperature detected from its own room temperature sensor and setting temperature.

Point Check Function

Press the remote controller's **LED DISPLAY** or **LED** or **MUTE** button three times. Then press the **AIR DIRECTION** or **SWING** button three times in ten seconds. The buzzer rings for two seconds. The air conditioner enters the information enquiry status.

Press the **LED DISPLAY** or **AIR DIRECTION** button to check the next or front item's information.

When the air conditioner enters the information enquiry status, it displays the code name in two seconds (see Table 9).

Table 9—Information Enquiry

ENQUIRY INFORMATION	DISPLAYING CODE	MEANING
T1	T1	T1 temperature
T2	T2	T2 temperature
T3	T3	T3 temperature
T4	T4	T4 temperature
T2B	Tb	T2B temperature
TP	TP	TP temperature
TH	TH	TH temperature
Targeted Frequency	FT	Targeted Frequency
Actual Frequency	Fr	Actual Frequency
Indoor Fan Speed	IF	Indoor fan speed
Outdoor Fan Speed	OF	Outdoor fan speed
EXV Opening Angle	LA	EXV opening angle
Compressor continuous running time	CT	Compressor continuous running time
Compressor stop causes	ST	Compressor stop causes
Reserve	A0	
Reserve	A1	
Reserve	b0	
Reserve	b1	
Reserve	b2	
Reserve	b3	
Reserve	b4	
Reserve	b5	
Reserve	b6	
Reserve	dL	
Reserve	Ac	
Reserve	Uo	
Reserve	Td	

When the system enters the information enquiry status, it displays the code value for 25 seconds (see Table 10).

Table 10—Information Enquiry

ENQUIRY INFORMATION	DISPLAY VALUE	MEANING	REMARK
T1,T2,T3,T4, T2B,TP,TH, Targeted Frequency, Actual Frequency	-1F,-1E,-1d,-1c,-1b,-1A	-25,-24,-23,-22,-21,-20	1. The displaying temperature is the actual value. 2. The temperature is °C regardless of the kind of remote controller. 3. T1,T2,T3,T4,T2B display range:-25~70, TP display range:-20~130. 4. Frequency display range: 0~159HZ. 5. If the actual value exceeds the range, it displays the maximum value or minimum value.
	-19-99	-19-99	
	A0,A1,...A9	100,101,...109	
	b0,b1,...b9	110,111,...119	
	c0,c1,...c9	120,121,...129	
	d0,d1,...d9	130,131,...139	
	E0,E1,...E9	140,141,...149	
F0,F1,...F9	150,151,...159		
Indoor fan speed /Outdoor fan speed	0	OFF	For some big capacity motors.
	1,2,3,4	Low speed, Medium speed, High speed, Turbo	
	14-FF	Actual fan speed = Display value turns to decimal value and then multiply 10. The unit is RPM.	
EXV opening angle	0-FF	Actual EXV opening value = Display value turns to decimal value and then multiply 2.	
Compressor continuous running time	0-FF	0-255 minutes	If the actual value exceeds the range, it displays the maximum value or minimum value.
Compressor stop causes	0-99	For the detailed meaning, consult with engineer	Decimal display.
Reserve	0-FF		

MULTI-FUNCTION BOARD INSTRUCTION

Function

The multi-function board receives the 4-cored wired controller signal and the CP remote on-off signal (ON-OFF command signal). The board converts the signal to a communication signal and sends the signal to the main control board. The multi-function board can output the alarm signal.

CP Remote ON-OFF

For the CP command, “Closed” indicates the remote on-off control signal **OFF**. “Disconnected” indicates the remote on-off control signal **ON**. The control requires three seconds to determine the ON/OFF status. The CP command is only delivered once immediately after power on.

The Dip-switch F2 setting status is shown in Table 11.

Table 11—Dip-Switch F2 Setting Status

Dip-switch 2	Dip-switch 1	Remote on-off control status
OFF	OFF	Disconnected send CP, closed cancel CP
ON	OFF	Closed send CP, disconnected cancel CP

ON-OFF Control

The control requires three seconds to determine the ON/OFF status. The ON-OFF command is not delivered after power on, only when the status changes. The control can then send the command. When the ON-OFF control disconnects, it sends the switch-on signal. The unit runs in AUTO mode, AUTO FAN speed (75.2°F (24°C)) setting temperature. When the ON-OFF control is closed, it sends a switch-off signal. The Dip-switch F2 setting status is shown in Table 12.

Table 12—Dip-Switch F2 Setting Status

Dip-switch 2	Dip-switch 1	Remote on-off control status
OFF	ON	Disconnected send ON, closed send OFF
ON	ON	Closed send OFF, disconnected send ON

Alarm Port Output

When the system is **OFF**, the output signal is closed.

When the system is in a malfunction state, the output signal is closed.

When the system is **ON**, the output signal is disconnected.

Wiring Diagram

Connected to 4-cored wired controller

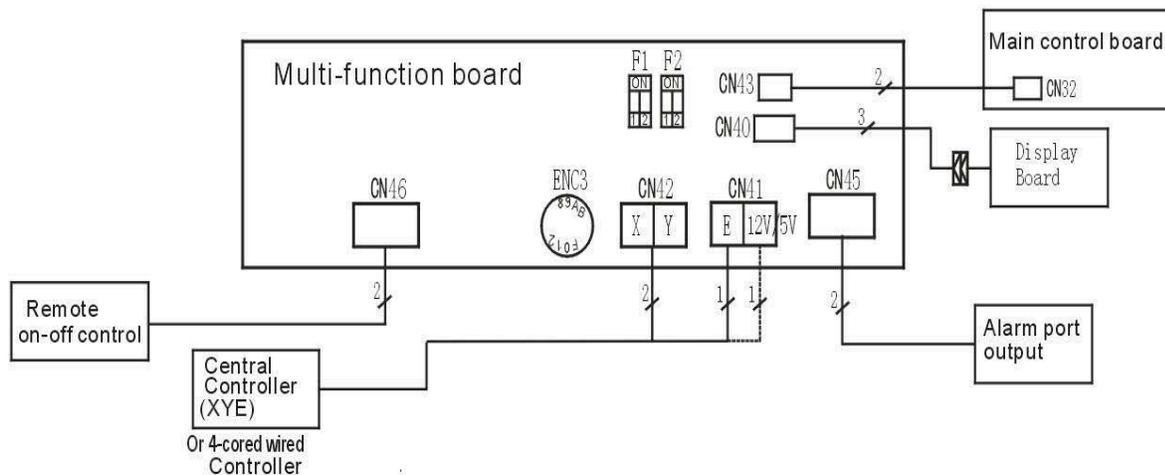


Fig. 19 – Wiring Diagram

NOTE: Use shield cables to connect the 4-cored wired controller. The length should not exceed 164 ft. (50 m).

TROUBLESHOOTING

Safety

Electricity is stored in capacitors even if the power supply is shut off.

NOTE: Remember to discharge the electricity in capacitors.

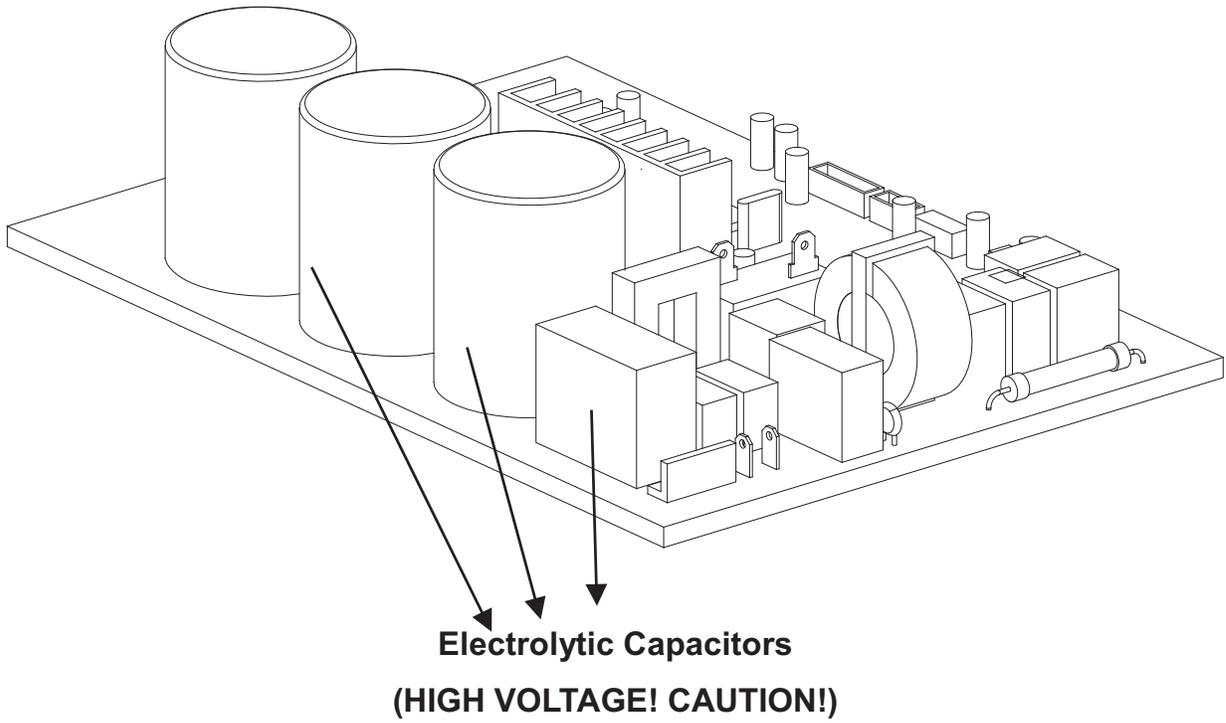


Fig. 20 – Electrolytic Capacitors

INDOOR UNIT DIAGNOSTIC GUIDE

Table 13—Indoor Unit Error Display

OPERATION LAMP	TIMER LAMP	DISPLAY	LED STATUS
★ 1 time	X	E 0	Indoor unit EEPROM parameter error
★ 2 times	X	E 1	Indoor / outdoor units communication error
★ 3 times	X	E 2	Zero-crossing signal detection error
★ 4 times	X	E 3	Indoor fan speed has been out of control
★ 5 times	X	E 4	Indoor room temperature sensor T1 open circuit or short circuit
★ 6 times	X	E 5	Evaporator coil temperature sensor T2 open circuit or short circuit
★ 7 times	X	E C	Refrigerant leakage detection
★ 1 time	O	F 0	Overload current protection
★ 2 times	O	F 1	Outdoor ambient temperature sensor T4 open circuit or short circuit
★ 3 times	O	F 2	Condenser coil temperature sensor T3 open circuit or short circuit
★ 4 times	O	F 3	Compressor discharge temperature sensor T5 open circuit or short circuit
★ 5 times	O	F 4	Outdoor unit EEPROM parameter error
★ 6 times	O	F 5	Outdoor fan speed has been out of control
★ 1 time	★	P 0	IPM malfunction or IGBT over-strong current protection
★ 2 times	★	P 1	Over voltage or over low voltage protection
★ 3 times	★	P 2	High temperature protection of IPM module or compressor top
★ 4 times	★	P 3*	Outdoor ambient temperature too low
★ 5 times	★	P 4	Inverter compressor drive error
★ 6 times	★	P 5	Indoor units mode conflict (multi-zone ONLY)

O(light) X(off) ★(flash)

NOTE: P3

1. In **HEATING** mode, when the outdoor temperature is lower than 77°F (–25°C) for one hour, the indoor unit display error code P3.
2. If the outdoor temperature is higher than 71.6°F (–22°C) for ten minutes and the compressor stop for one hour or outdoor temperature is higher than 23°F (–5°C) for ten minutes, the unit will start working.

Fault Symptoms:

- The display board shows a garbled code
- a code that is not an error code found in the service manual
- a temperature reading

Table 14—Indoor Unit Error Display

No.	Problems	LED3 (Green)	LED2 (Red)	IU display
1	Standby for normal	O	X	
2	Operation normally	X	O	
3	IPM malfunction or IGBT over-strong current protection	★	X	P 0
4	Over voltage or too low voltage protection	O	O	P 1
5	EEPROM parameter error	O	★	E 5
6	Inverter compressor drive error	X	★	P 4
7	Inverter compressor drive error	★	O	P 4
8	Inverter compressor drive error	★	★	P 4

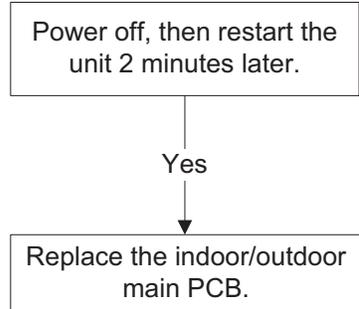
O(light) X(off) ★(2.5Hz flash)

DIAGNOSIS AND SOLUTION

EEPROM Parameter Error Diagnosis and Solution (E0/F4)

Error Code	E0/F4
Malfunction decision conditions	Indoor or outdoor PCB main chip does not receive feedback from the EEPROM chip.
Probable causes	<ul style="list-style-type: none">• Installation mistake• PCB faulty

Troubleshooting



EEPROM: A read-only memory with content that can be erased and reprogrammed using a pulsed voltage. For the EEPROM chip location, refer to Fig 21 and Fig. 22.

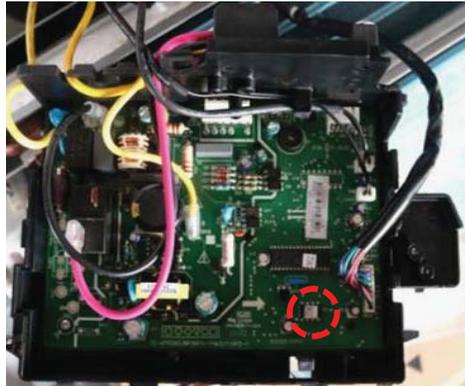


Fig. 21 – Indoor PCB



Fig. 22 – Outdoor PCB (18K Model)

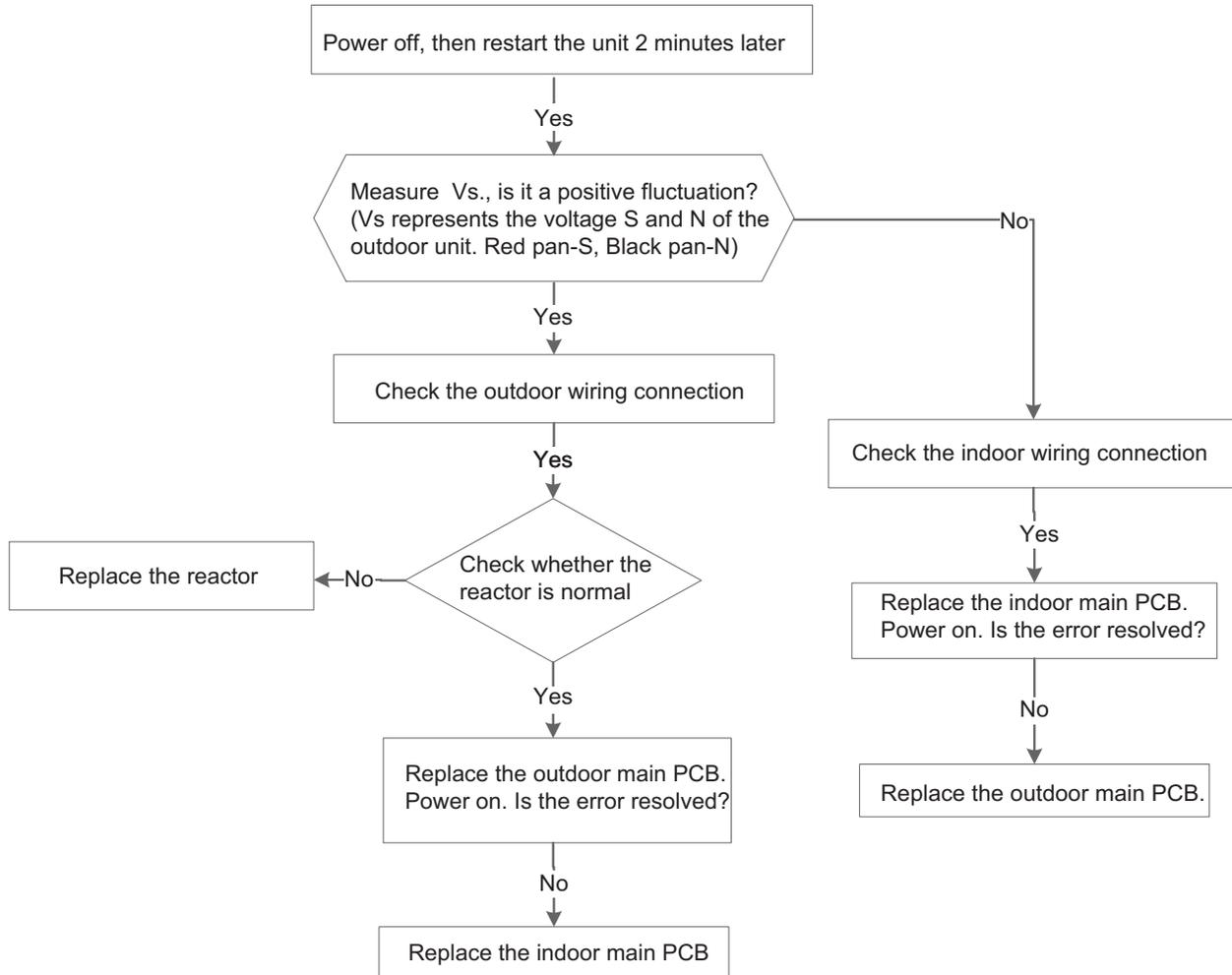
NOTE: The two photos above are for reference only and may differ from the actual unit.

DIAGNOSIS AND SOLUTION (CONT)

Indoor / Outdoor Unit's Communication Diagnosis and Solution (E1)

Error Code	E1
Malfunction Decision Conditions	Indoor unit does not receive the feedback from outdoor unit during 110 seconds, and this condition happens four times continuously.
Supposed Causes	<ul style="list-style-type: none"> • Wiring problem • Indoor or outdoor PCB malfunctioning

Troubleshooting



DIAGNOSIS AND SOLUTION (CONT)

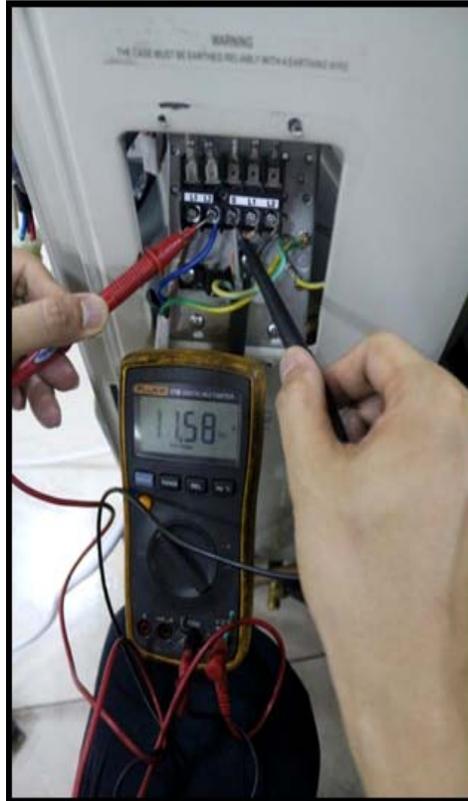


Fig. 23 – Test the DC Voltage

Use a multimeter to test the DC voltage between L2 port and S port of the outdoor unit. The red pin of the multimeter connects with the L2 port while the black pin is for the S port. When the unit is running normally, the voltage alternates between -25V to 25V . If the outdoor unit has a malfunction, the voltage will move alternately with positive value. If the indoor unit has malfunction, the voltage will have a certain value.



Fig. 24 – Test the Reactor Resistance

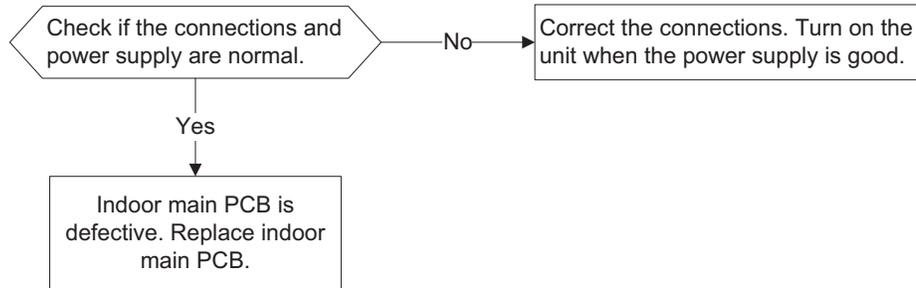
Use a multimeter to test the resistance of the reactor, which does not connect to the capacitor. The normal value should be around zero ohms. Otherwise, the reactor should be replaced.

DIAGNOSIS AND SOLUTION (CONT)

Zero Crossing Detection Error Diagnosis and Solution (E2)

Error Code	E2
Malfunction decision conditions	When the PCB does not receive a zero crossing signal feedback for four minutes or the zero crossing signal time interval is abnormal.
Probable causes	<ul style="list-style-type: none">• Connection mistake• PCB faulty

Troubleshooting

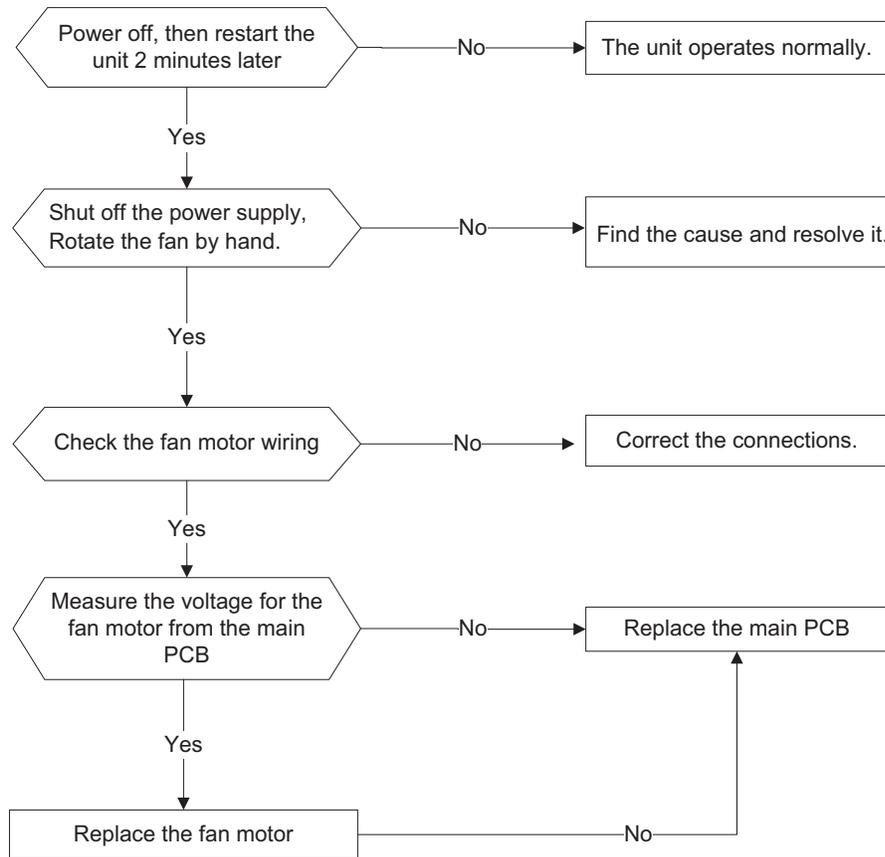


DIAGNOSIS AND SOLUTION (CONT)

Fan Speed has been out of Control Diagnosis and Solution (E3/F5)

Error Code	E3/F5
Malfunction decision conditions	When indoor fan speed remains too low (300RPM) for a certain time, the unit stops and the LED displays the failure.
Probable causes	<ul style="list-style-type: none"> • Wiring problem • Fan assembly malfunction • Fan motor malfunction • PCB malfunction

Troubleshooting



DIAGNOSIS AND SOLUTION (CONT)

Index 1

1. Indoor or Outdoor DC Fan Motor (control chip is in fan motor)

Power on the unit. When the unit is in standby, measure the voltage of pin1–pin3, pin4–pin3 in fan motor connector. If the voltage value is not in the range shown in Table 15 or Table 16, the PCB should be replaced.

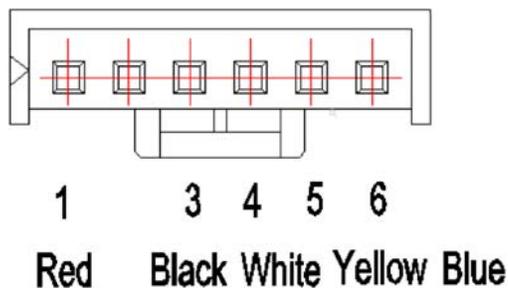


Fig. 25 – Motor Connector

Table 15—DC Motor Voltage Input and Output (Voltage: 220–240V~)

NO.	COLOR	SIGNAL	VOLTAGE
1	Red	Vs/Vm	280V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14~17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14~17.5V

Table 16—DC motor voltage input and output (voltage : 115V~)

NO.	COLOR	SIGNAL	VOLTAGE
1	Red	Vs/Vm	140V~190V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14~17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14~17.5V

2. Outdoor DC Fan Motor (control chip is in the outdoor PCB)

Power on the unit and check if the fan runs normally. If the fan runs normally, the PCB should be replaced. If the fan does not run normally, measure the resistance of each of the two pins. If the resistance of the pins is not equal, the fan motor should be replaced. Otherwise, the PCB should be replaced.

3. Indoor AC Fan Motor

Power on the unit and set the unit in **FAN** mode at the high fan speed. Run for 15 seconds. Measure the voltage of pin1 and pin2. If the voltage value is less than 100V (208~240V power supply) or 50V (115V power supply), the PCB should be replaced.

DIAGNOSIS AND SOLUTION (CONT)

Open Circuit or Short Circuit of Temperature Sensor Diagnosis and Solution (E4/E5/F1/F2/F3)

Error Code	E4/E5/F1/F2/F3
Malfuction decision conditions	If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays the failure.
Probable causes	<ul style="list-style-type: none">• Wiring problem• Sensor malfunction• PCB malfunction

Troubleshooting

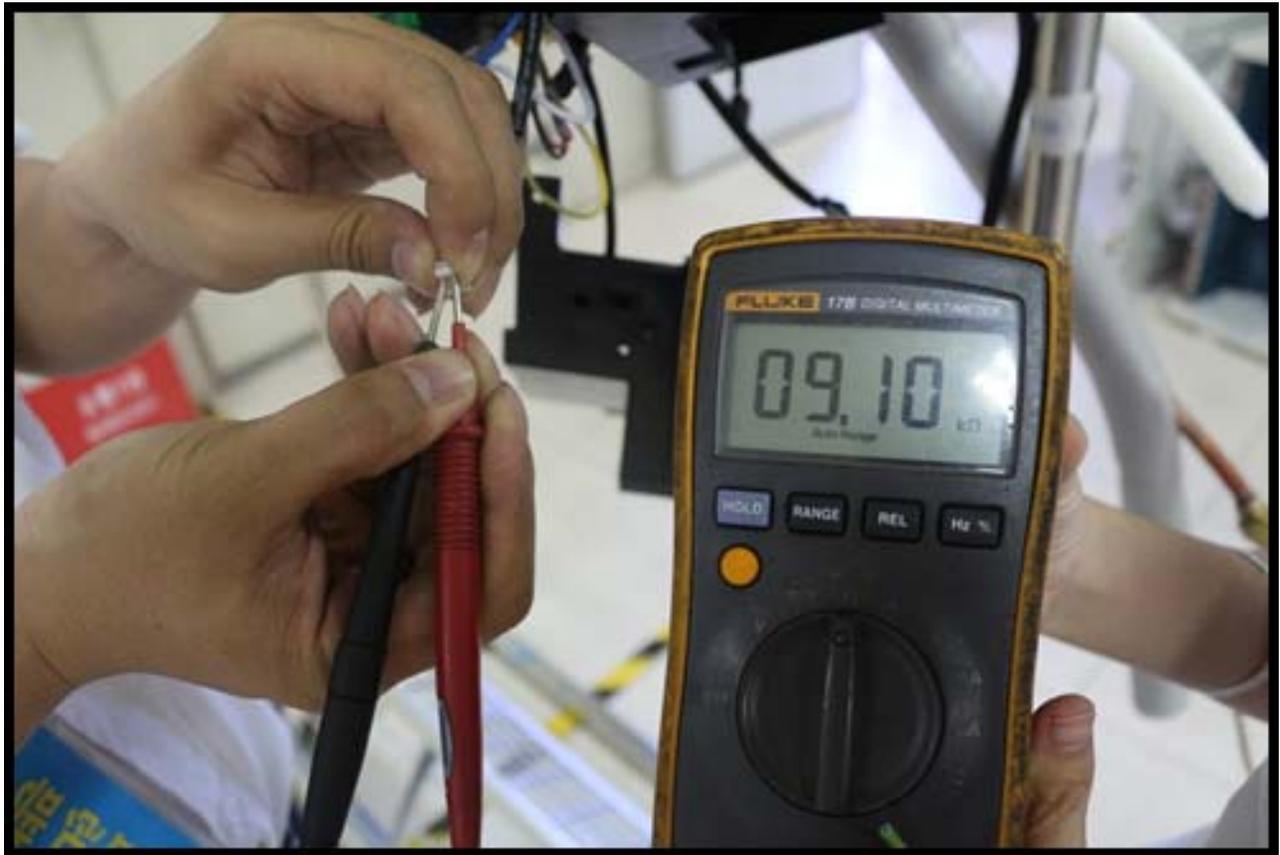
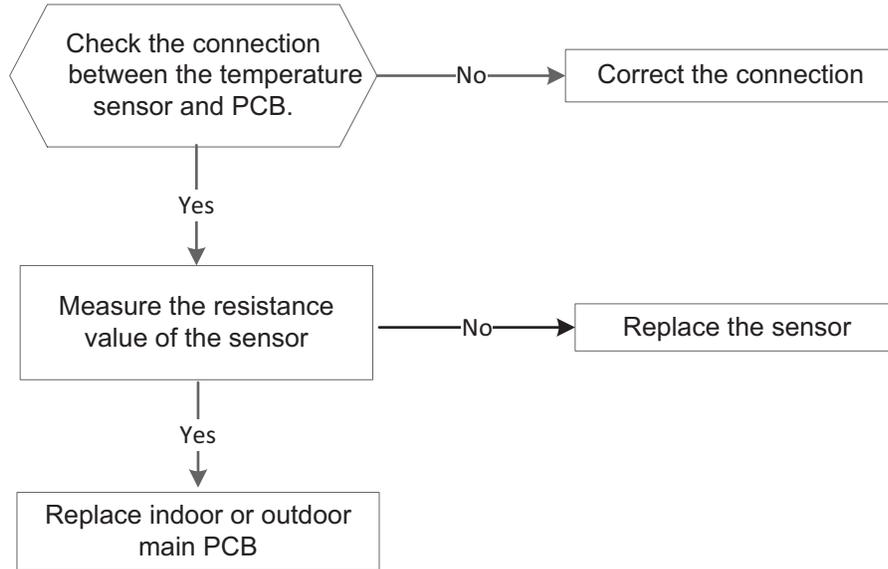


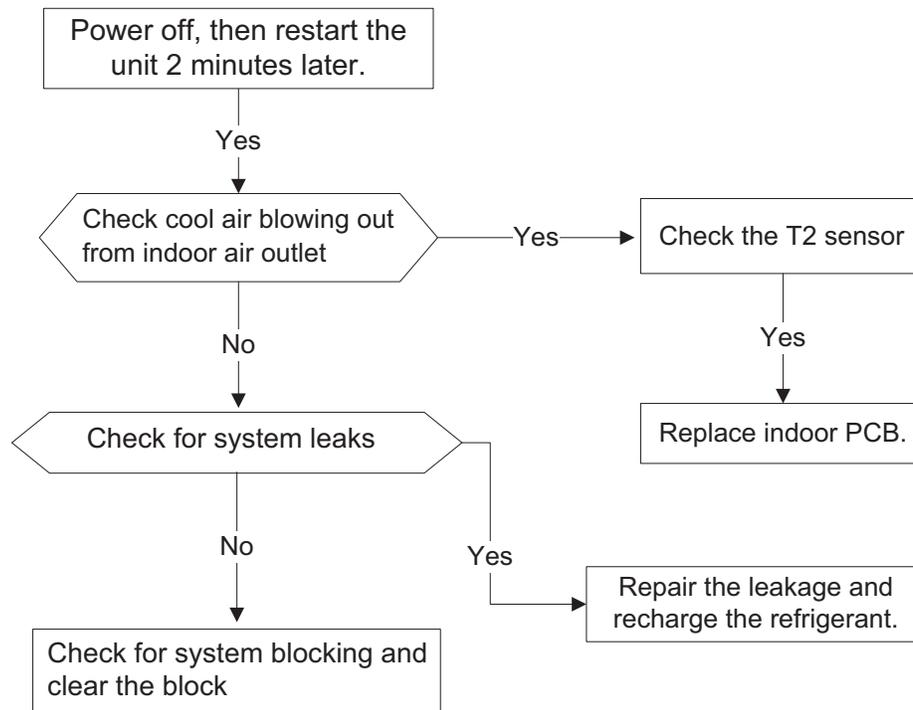
Fig. 26 – Check the Connection

DIAGNOSIS AND SOLUTION (CONT)

Refrigerant Leakage Detection Diagnosis and Solution (EC)

Error Code	EC
Malfunction decision conditions	Define the evaporator coil temp.T2 of the compressor. It starts running in Tcool. Five minutes after the compressor starts up, if $T2 < T_{cool} - 35.6^{\circ}\text{F}$ ($T_{cool} - 2^{\circ}\text{C}$) does not run for four seconds and this situation occurs three times, the display area shows "EC" and the air conditioner turns off.
Probable causes	<ul style="list-style-type: none"> • T2 sensor malfunction • Indoor PCB malfunction • System malfunction, such as leakage or blocking

Troubleshooting

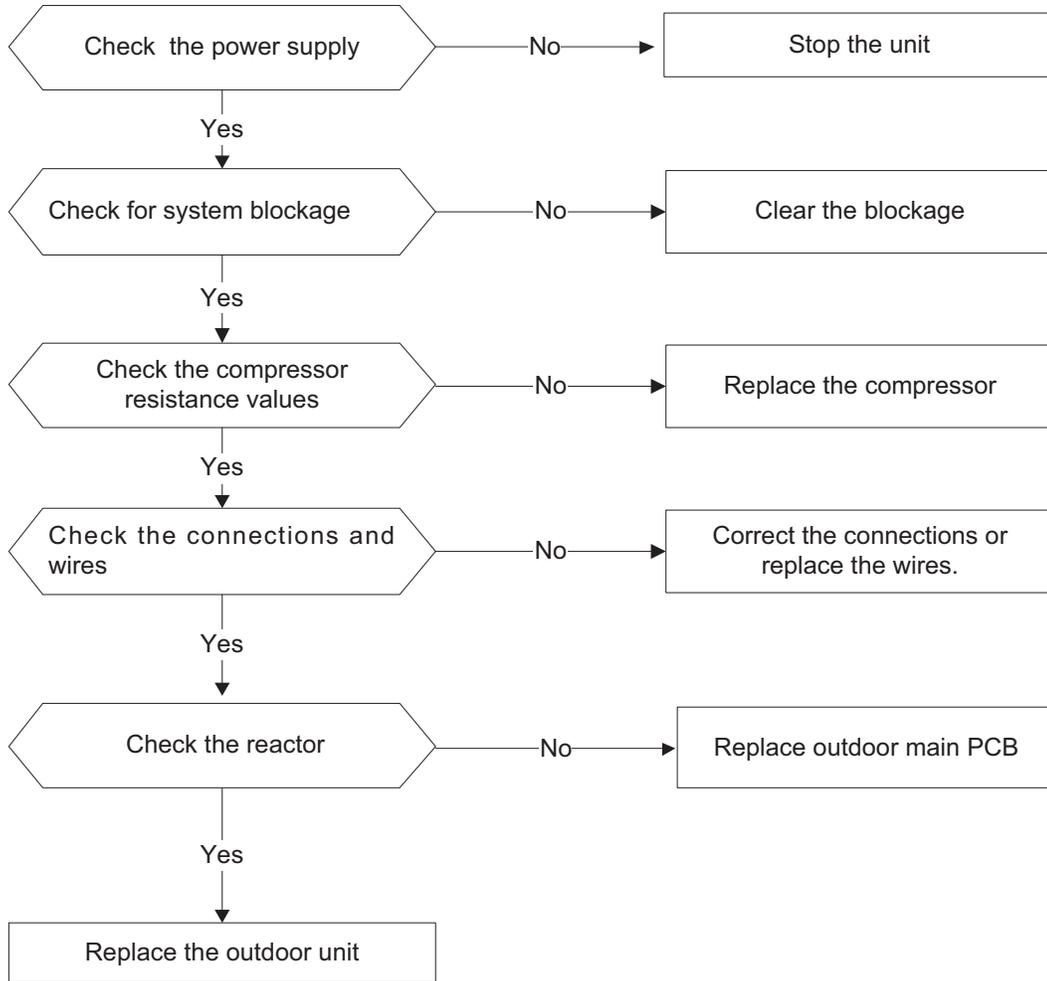


DIAGNOSIS AND SOLUTION (CONT)

Overload Current Protection Diagnosis and Solution (F0)

Error Code	F0
Malfunction decision conditions	An abnormal current rise is detected by checking the specified current detection circuit.
Probable causes	<ul style="list-style-type: none"> • Power supply malfunction • System blockage • PCB malfunction • Wiring problem • Compressor malfunction

Troubleshooting

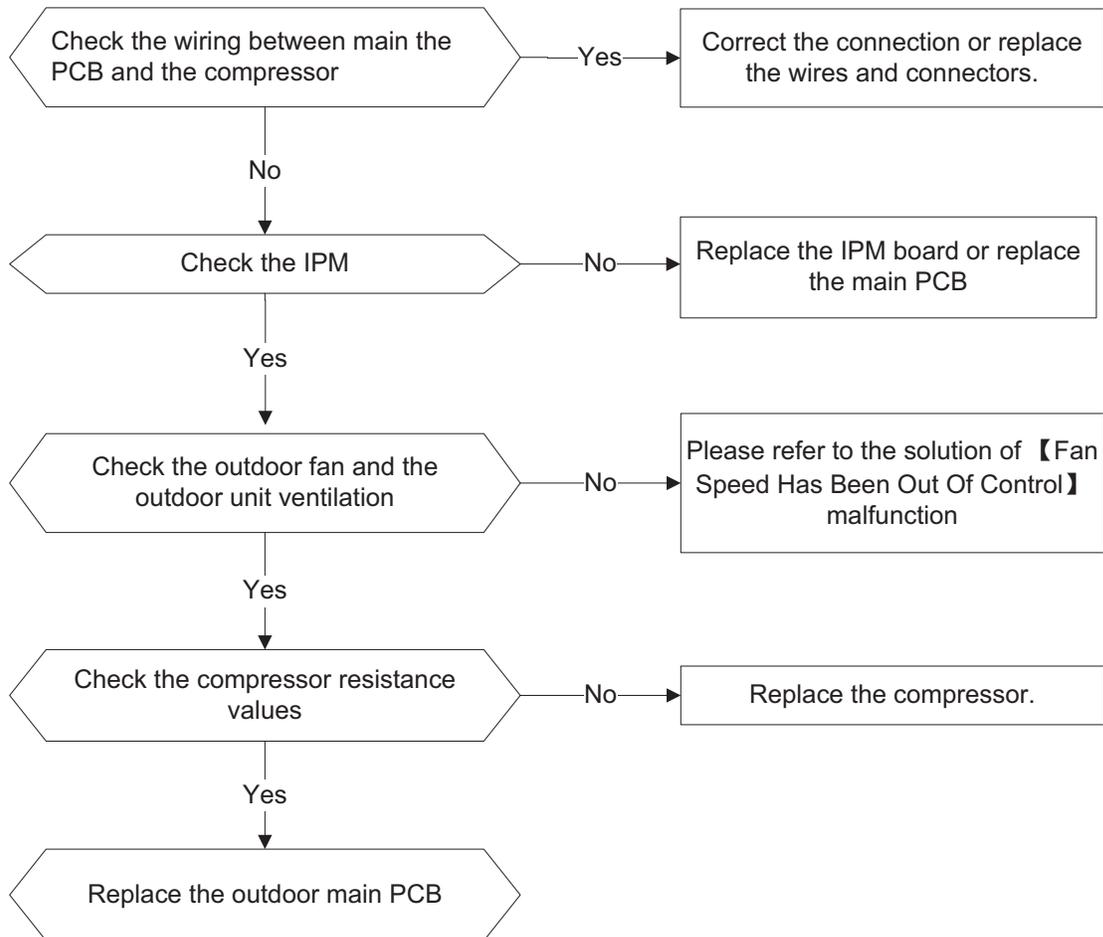


DIAGNOSIS AND SOLUTION (CONT)

IPM Malfunction or IGBT Over-Strong Current Protection Diagnosis and Solution (P0)

Error Code	P0
Malfunction decision conditions	When the voltage signal sent to the compressor drive chip from the IPM is abnormal, the display LED shows P0 and the unit turns off.
Probable causes	<ul style="list-style-type: none"> • Wiring problem • IPM malfunction • Outdoor fan assembly malfunction • Compressor malfunction • Outdoor PCB malfunction

Troubleshooting



DIAGNOSIS AND SOLUTION (CONT)

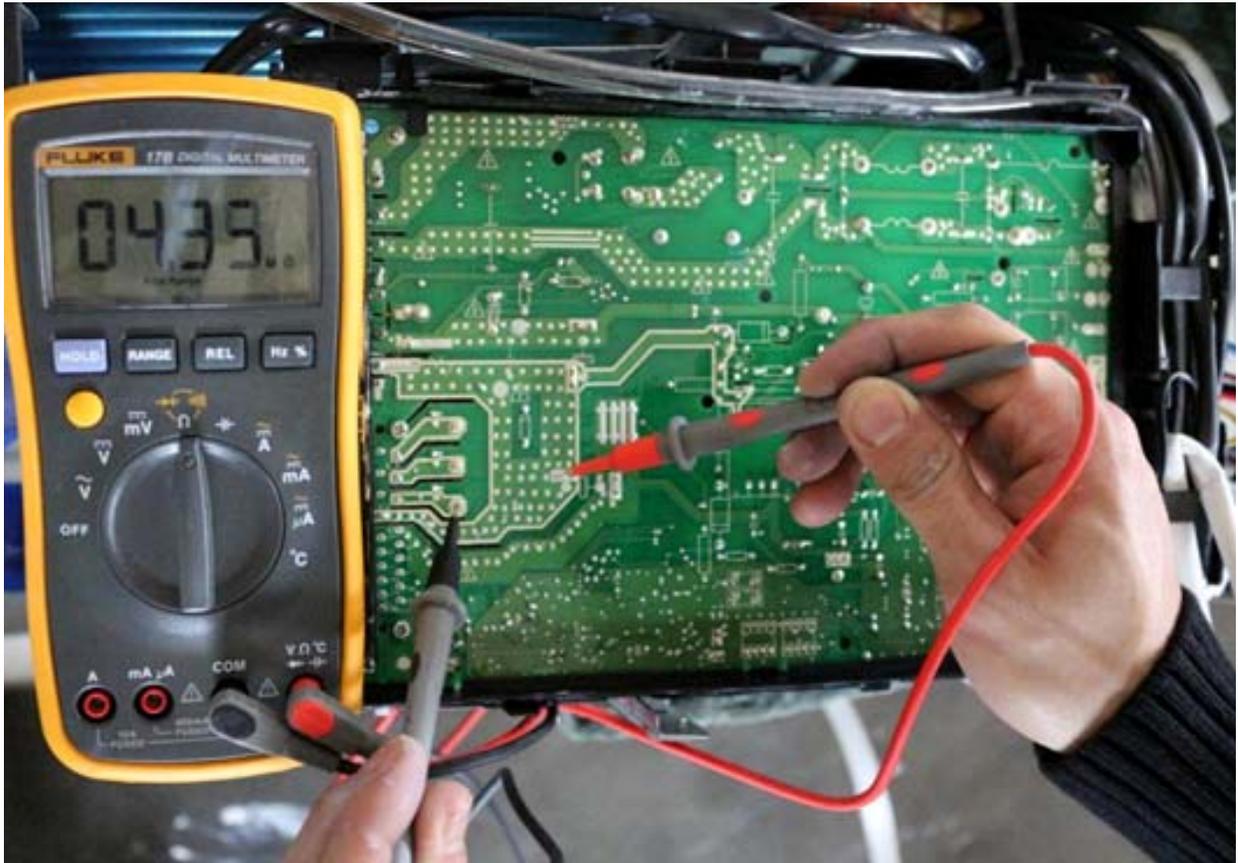


Fig. 27 – P-U

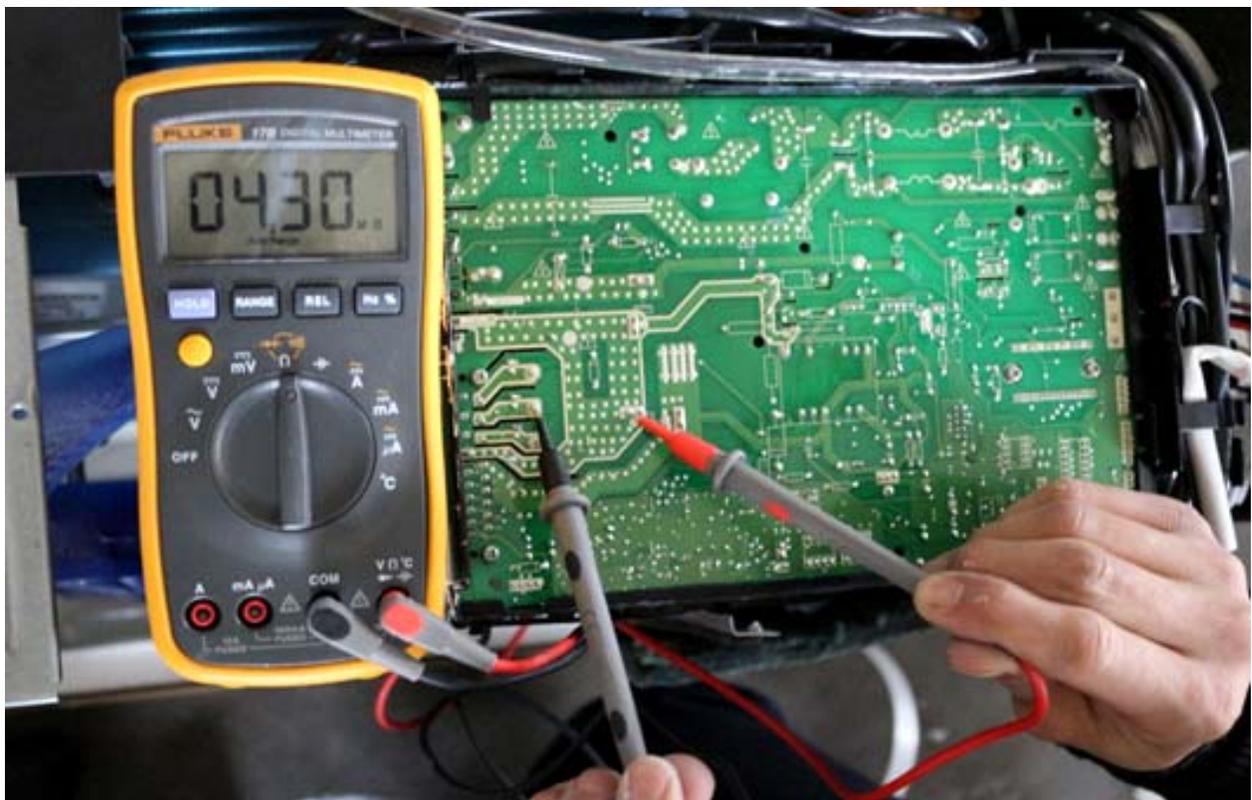


Fig. 28 – P-V

DIAGNOSIS AND SOLUTION (CONT)

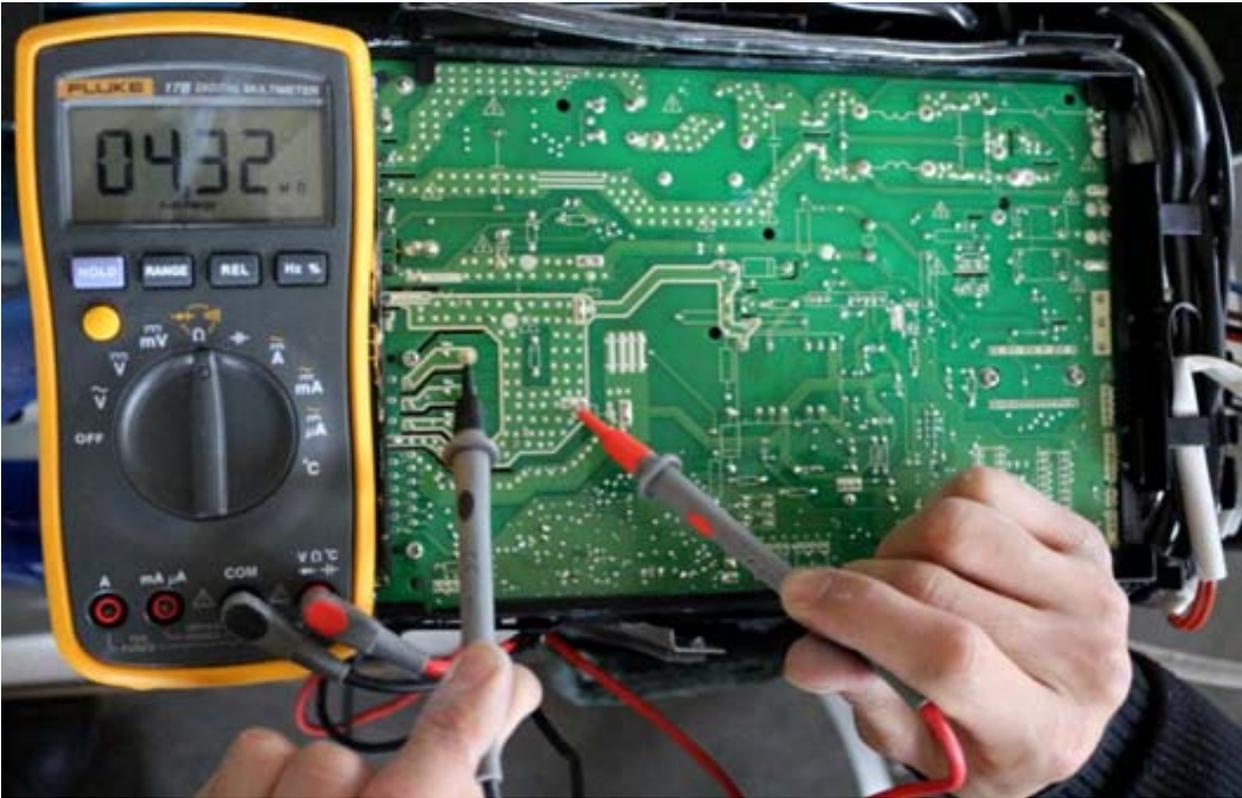


Fig. 29 – P-W

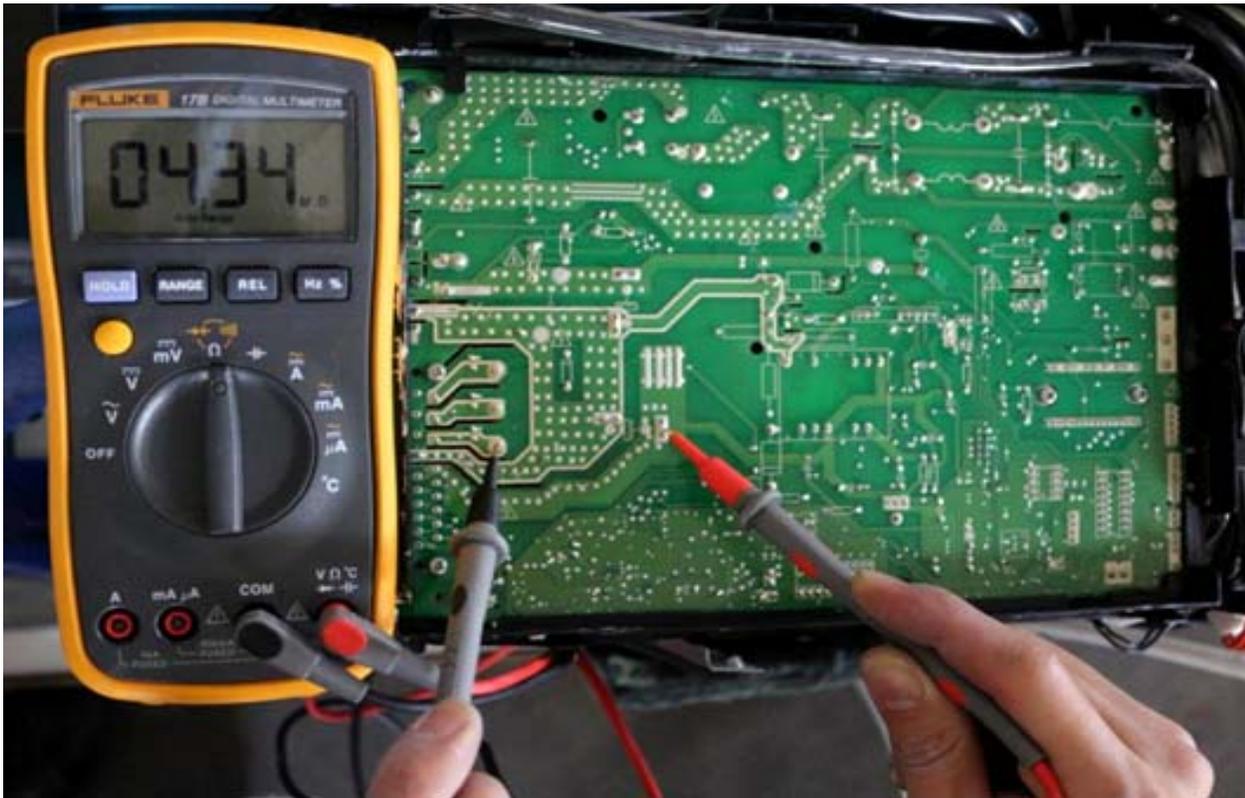


Fig. 30 – N-U

DIAGNOSIS AND SOLUTION (CONT)

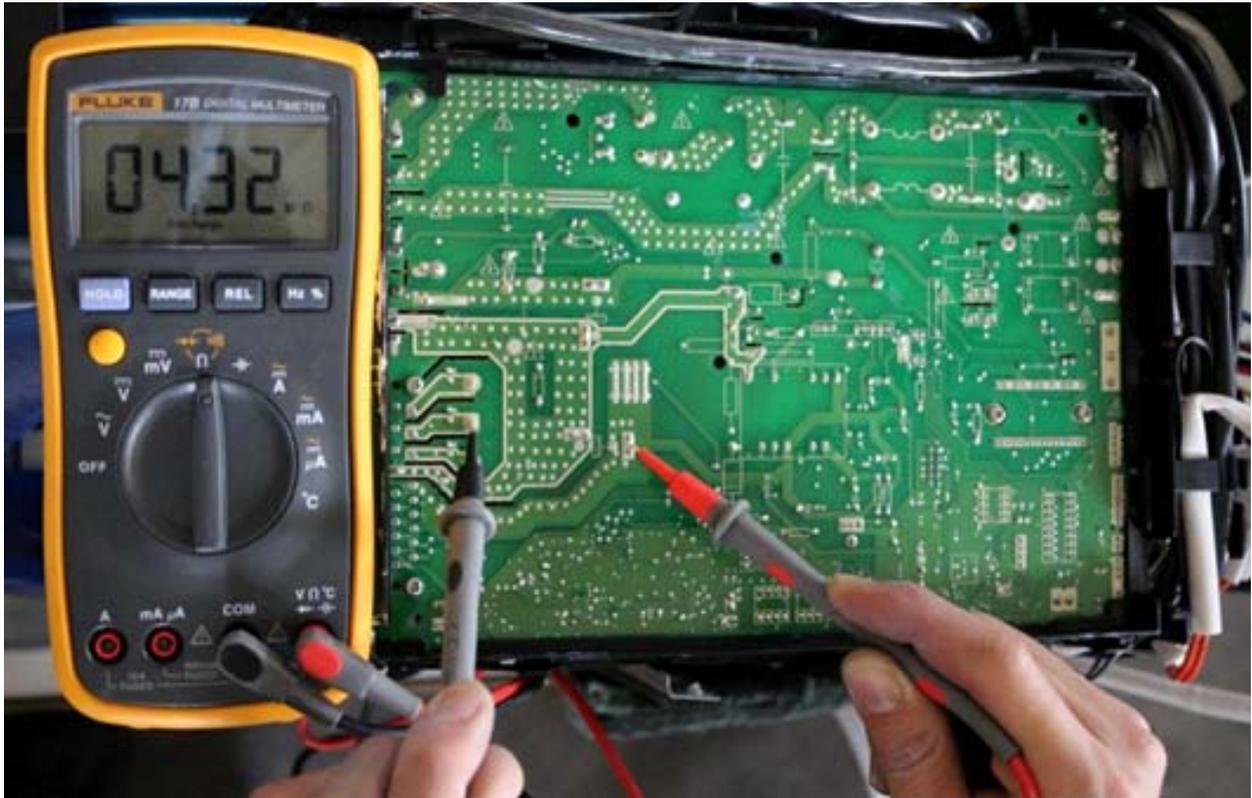


Fig. 31 – N-V

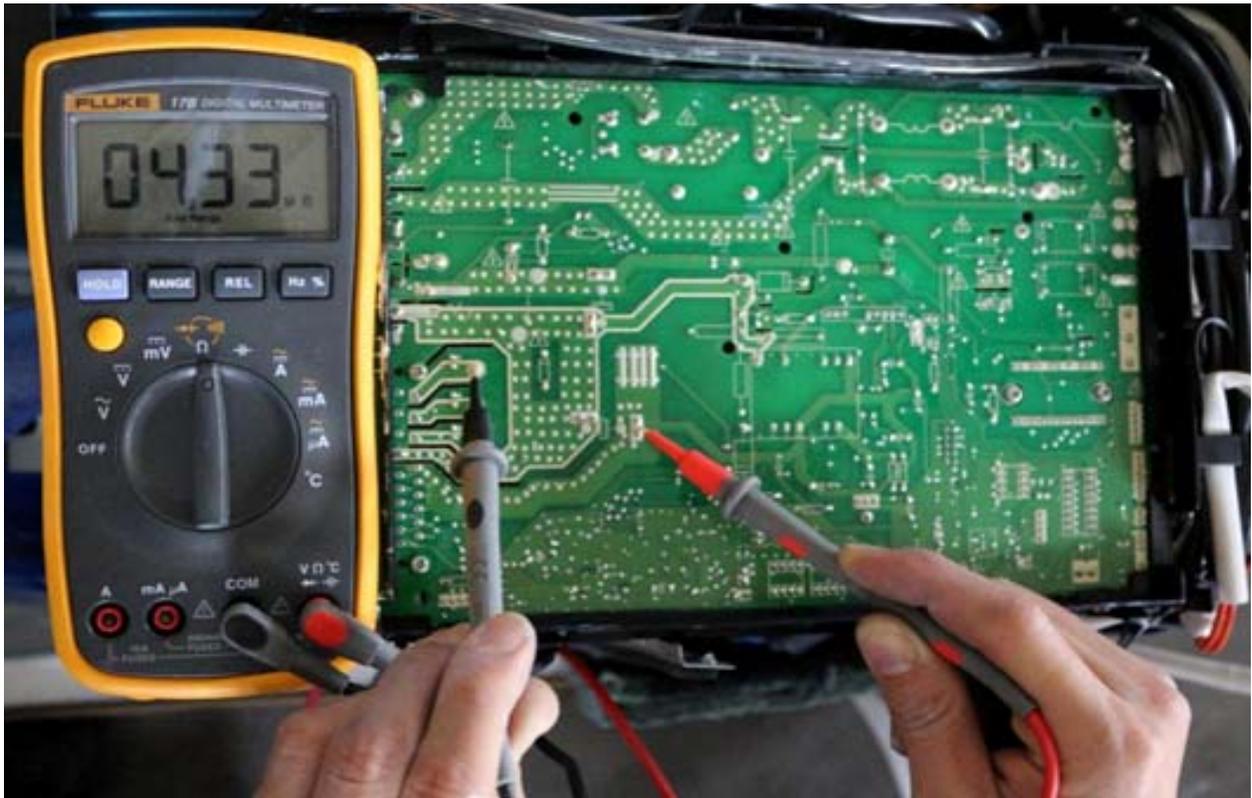


Fig. 32 – N-W

DIAGNOSIS AND SOLUTION (CONT)

Over Voltage or Too Low Voltage Protection Diagnosis and Solution (P1)

Error Code	P1
Malfunction decision conditions	An abnormal voltage rise or drop is detected by checking the specified voltage detection circuit.
Probable causes	<ul style="list-style-type: none">• Power supply malfunction• System leakage or block• PCB Malfunction

Troubleshooting

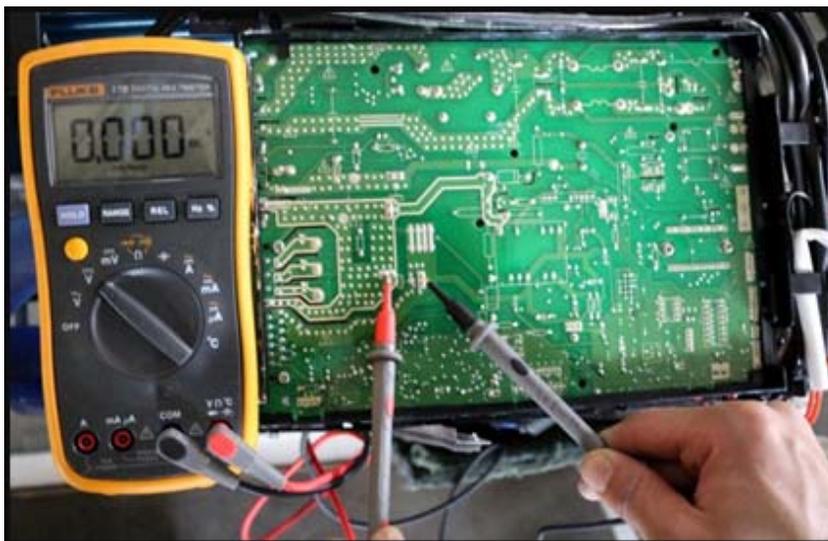
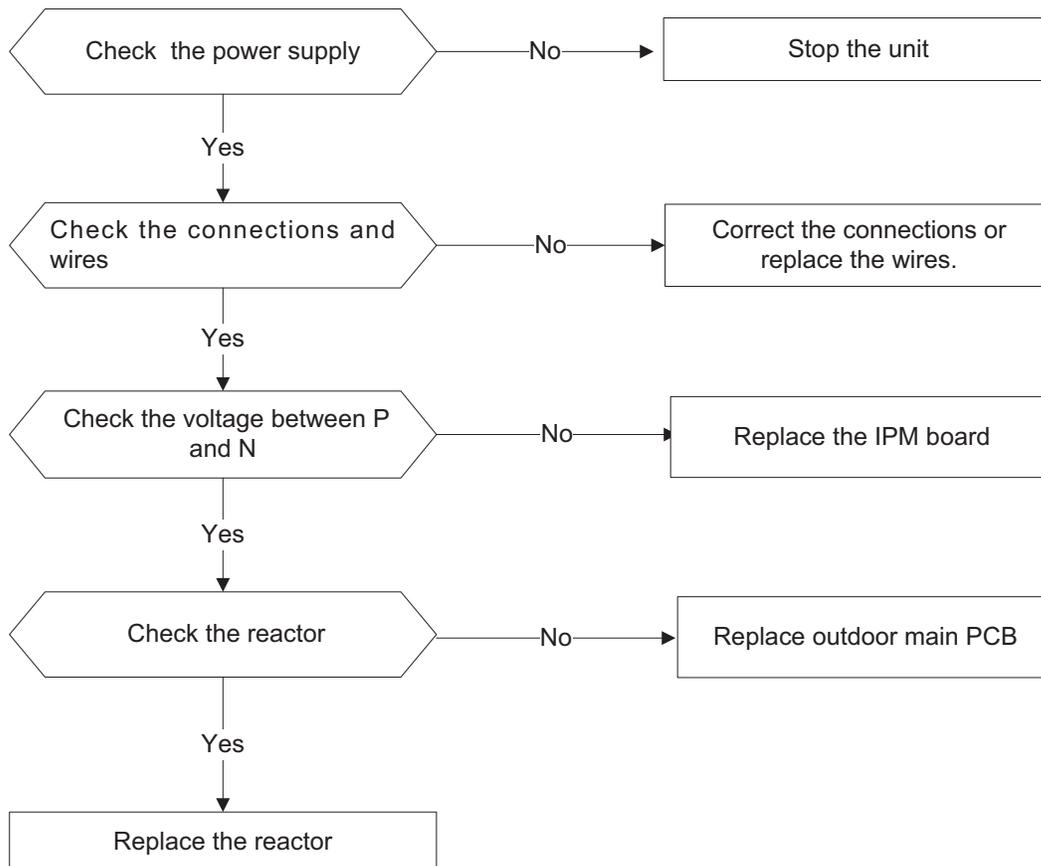


Fig. 33 – Test

NOTE: Measure the DC voltage between the P and N port. The normal value should be around 310V.

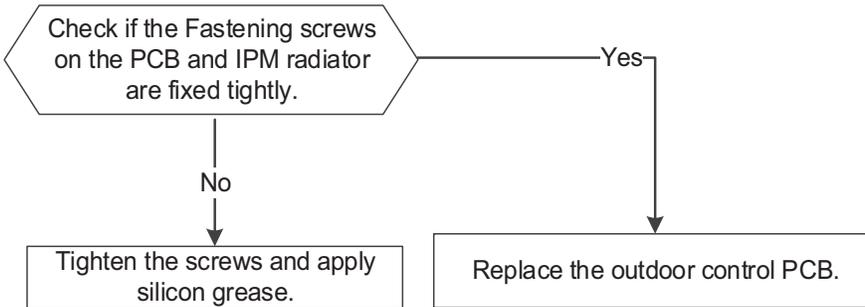
DIAGNOSIS AND SOLUTION (CONT)

High Temperature Protection of Compressor Top Diagnosis and Solution (P2)

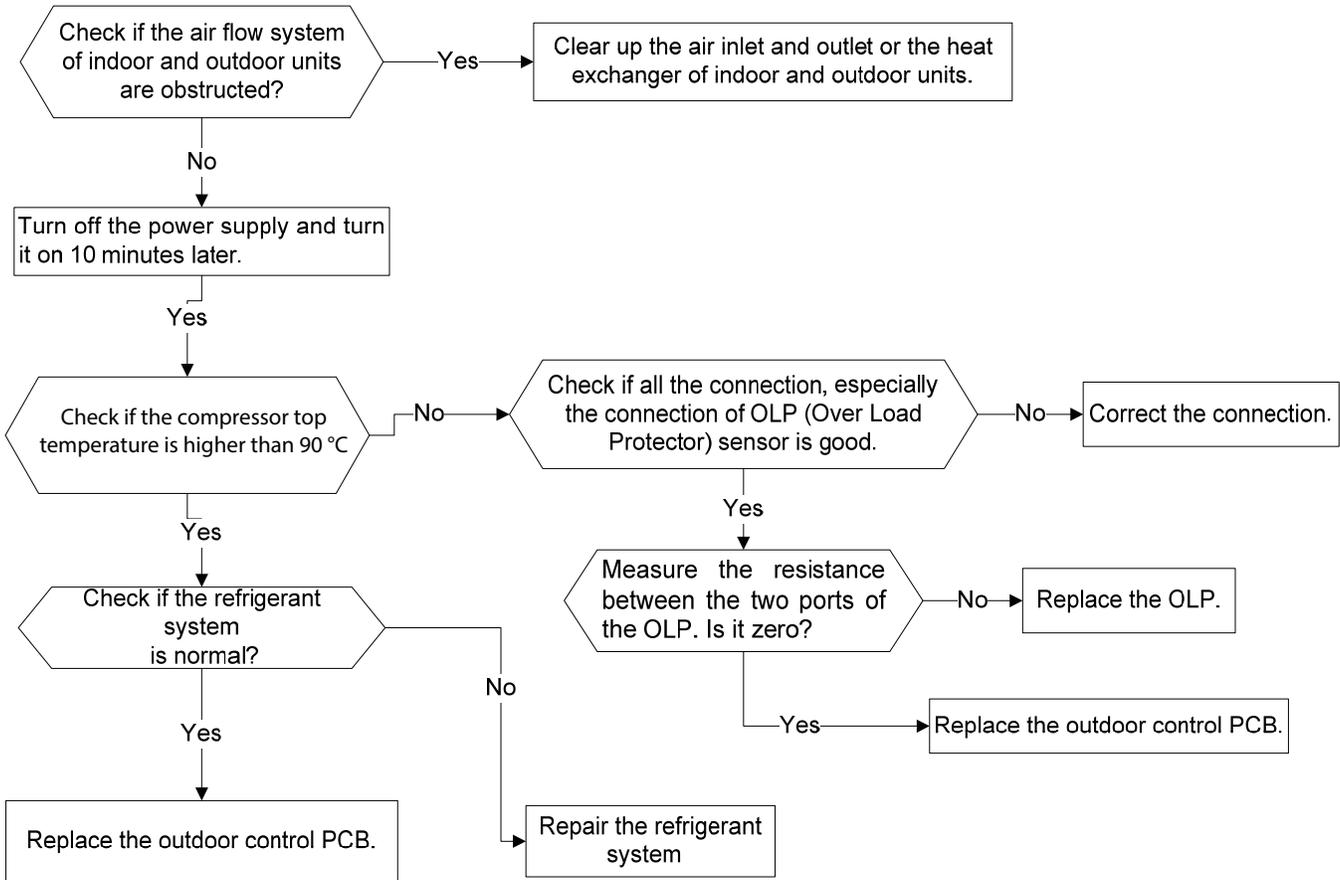
Error Code	P2
Malfunction decision conditions	The LED displays the failure if the sampling voltage is not 5V.
Probable causes	<ul style="list-style-type: none"> • Power supply malfunction • System leakage or block • PCB malfunction

Troubleshooting

For Sizes 18 –24:



For other models:

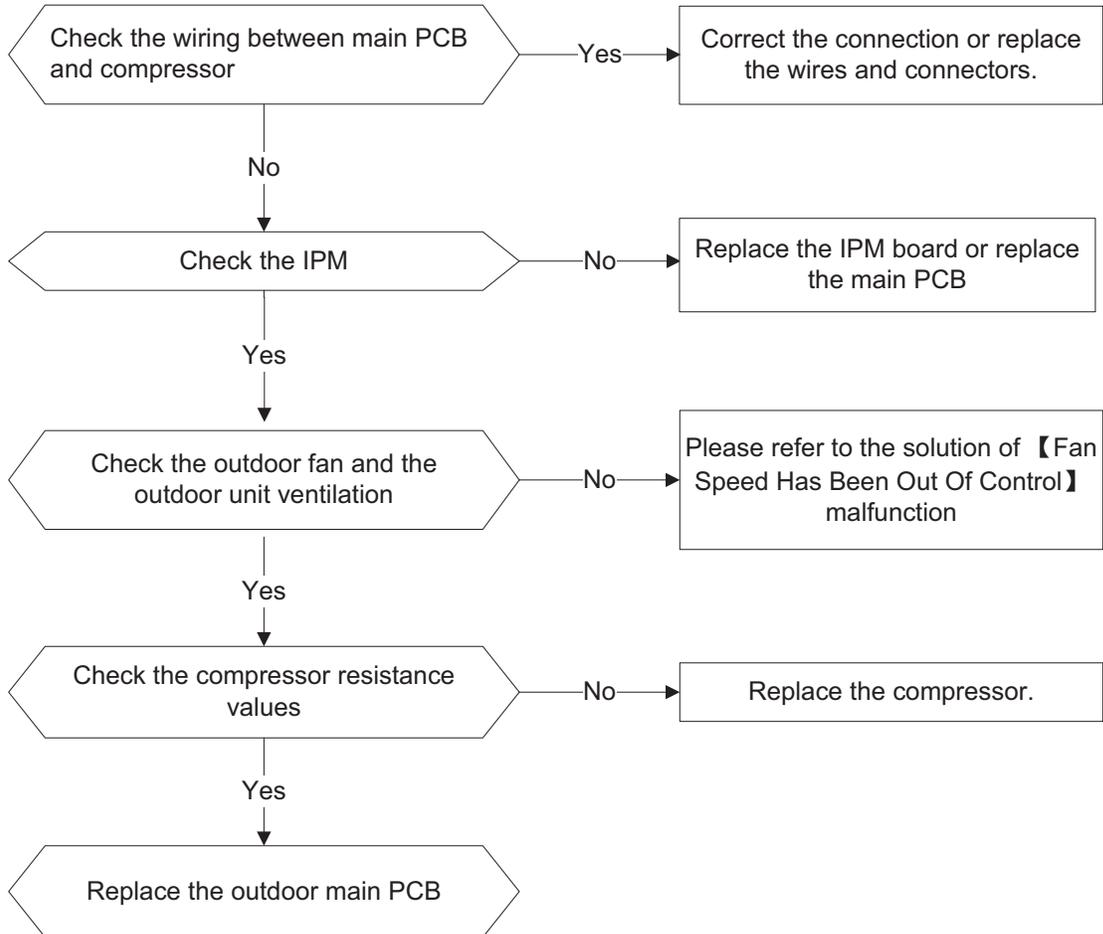


DIAGNOSIS AND SOLUTION (CONT)

Inverter Compressor Drive Error Diagnosis and Solution (P4)

Error Code	P4
Malfunction decision conditions	An abnormal inverter compressor drive is detected by a special detection circuit; including communication signal detection, voltage detection, compressor rotation speed signal detection, etc.
Probable causes	<ul style="list-style-type: none"> • Wiring problem • IPM malfunction • Outdoor fan assembly malfunction • Compressor malfunction • Outdoor PCB malfunction

Troubleshooting



Main Parts Check

Temperature Sensor Checking

Disconnect the temperature sensor from the PCB, and measure the resistance value with a tester.

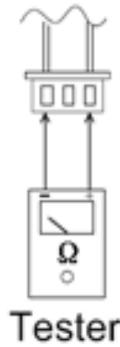


Fig. 34 – Tester

Temperature sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

Use the multi-meter to measure the resistance value of each winding.

Indoor Fan Motor

Measure the resistance value of each winding with the tester.

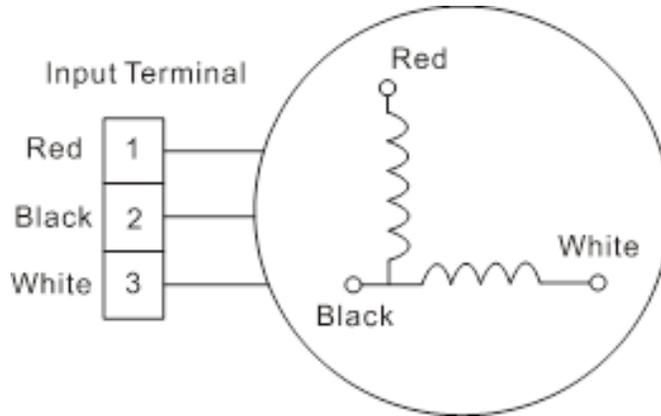


Table 17—Resistance Value

Digital tester		Normal resistance value	Digital tester		Normal resistance value
(+)Red	(-)Black		(+)Red	(-)Black	
P	N	∞ (Several M Ω)	U	N	∞ (Several M Ω)
	U				
	V				
	W				
			(+)Red		

Table 18—Fan Motor

Model	☑	YKT-32-6-202L	YKT-32-6-3L	YKT-48-6-206	YKT-63-6-200L
Brand	☑	Tongde	Welling	Welling	Welling
Black – Red Main	Ω	86	213	152	88.5
Blue – Black AUX	Ω	64	156	142	138

APPENDIX

Table 19—Temperature Sensor Resistance Value Table for T1, T2, T3, T4 (°C—K)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	115.266	20	68	12.6431	60	140	2.35774	100	212	0.62973
-19	-2	108.146	21	70	12.0561	61	142	2.27249	101	214	0.61148
-18	0	101.517	22	72	11.5	62	144	2.19073	102	216	0.59386
-17	1	96.3423	23	73	10.9731	63	145	2.11241	103	217	0.57683
-16	3	89.5865	24	75	10.4736	64	147	2.03732	104	219	0.56038
-15	5	84.219	25	77	10	65	149	1.96532	105	221	0.54448
-14	7	79.311	26	79	9.55074	66	151	1.89627	106	223	0.52912
-13	9	74.536	27	81	9.12445	67	153	1.83003	107	225	0.51426
-12	10	70.1698	28	82	8.71983	68	154	1.76647	108	226	0.49989
-11	12	66.0898	29	84	8.33566	69	156	1.70547	109	228	0.486
-10	14	62.2756	30	86	7.97078	70	158	1.64691	110	230	0.47256
-9	16	58.7079	31	88	7.62411	71	160	1.59068	111	232	0.45957
-8	18	56.3694	32	90	7.29464	72	162	1.53668	112	234	0.44699
-7	19	52.2438	33	91	6.98142	73	163	1.48481	113	235	0.43482
-6	21	49.3161	34	93	6.68355	74	165	1.43498	114	237	0.42304
-5	23	46.5725	35	95	6.40021	75	167	1.38703	115	239	0.41164
-4	25	44	36	97	6.13059	76	169	1.34105	116	241	0.4006
-3	27	41.5878	37	99	5.87359	77	171	1.29078	117	243	0.38991
-2	28	39.8239	38	100	5.62961	78	172	1.25423	118	244	0.37956
-1	30	37.1988	39	102	5.39689	79	174	1.2133	119	246	0.36954
0	32	35.2024	40	104	5.17519	80	176	1.17393	120	248	0.35982
1	34	33.3269	41	106	4.96392	81	178	1.13604	121	250	0.35042
2	36	31.5635	42	108	4.76253	82	180	1.09958	122	252	0.3413
3	37	29.9058	43	109	4.5705	83	181	1.06448	123	253	0.33246
4	39	28.3459	44	111	4.38736	84	183	1.03069	124	255	0.3239
5	41	26.8778	45	113	4.21263	85	185	0.99815	125	257	0.31559
6	43	25.4954	46	115	4.04589	86	187	0.96681	126	259	0.30754
7	45	24.1932	47	117	3.88673	87	189	0.93662	127	261	0.29974
8	46	22.5662	48	118	3.73476	88	190	0.90753	128	262	0.29216
9	48	21.8094	49	120	3.58962	89	192	0.8795	129	264	0.28482
10	50	20.7184	50	122	3.45097	90	194	0.85248	130	266	0.2777
11	52	19.6891	51	124	3.31847	91	196	0.82643	131	268	0.27078
12	54	18.7177	52	126	3.19183	92	198	0.80132	132	270	0.26408
13	55	17.8005	53	127	3.07075	93	199	0.77709	133	271	0.25757
14	57	16.9341	54	129	2.95896	94	201	0.75373	134	273	0.25125
15	59	16.1156	55	131	2.84421	95	203	0.73119	135	275	0.24512
16	61	15.3418	56	133	2.73823	96	205	0.70944	136	277	0.23916
17	63	14.6181	57	135	2.63682	97	207	0.68844	137	279	0.23338
18	64	13.918	58	136	2.53973	98	208	0.66818	138	280	0.22776
19	66	13.2631	59	138	2.44677	99	210	0.64862	139	282	0.22231

APPENDIX (CONT)

Table 20—Temperature Sensor Resistance Value Table for T1, T2, T3, T4 (°C—K)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	542.7	20	68	68.66	60	140	13.59	100	212	3.702
-19	-2	511.9	21	70	65.62	61	142	13.11	101	214	3.595
-18	0	483	22	72	62.73	62	144	12.65	102	216	3.492
-17	1	455.9	23	73	59.98	63	145	12.21	103	217	3.392
-16	3	430.5	24	75	57.37	64	147	11.79	104	219	3.296
-15	5	406.7	25	77	54.89	65	149	11.38	105	221	3.203
-14	7	384.3	26	79	52.53	66	151	10.99	106	223	3.113
-13	9	363.3	27	81	50.28	67	153	10.61	107	225	3.025
-12	10	343.6	28	82	48.14	68	154	10.25	108	226	2.941
-11	12	325.1	29	84	46.11	69	156	9.902	109	228	2.86
-10	14	307.7	30	86	44.17	70	158	9.569	110	230	2.781
-9	16	291.3	31	88	42.33	71	160	9.248	111	232	2.704
-8	18	275.9	32	90	40.57	72	162	8.94	112	234	2.63
-7	19	261.4	33	91	38.89	73	163	8.643	113	235	2.559
-6	21	247.8	34	93	37.3	74	165	8.358	114	237	2.489
-5	23	234.9	35	95	35.78	75	167	8.084	115	239	2.422
-4	25	222.8	36	97	34.32	76	169	7.82	116	241	2.357
-3	27	211.4	37	99	32.94	77	171	7.566	117	243	2.294
-2	28	200.7	38	100	31.62	78	172	7.321	118	244	2.233
-1	30	190.5	39	102	30.36	79	174	7.086	119	246	2.174
0	32	180.9	40	104	29.15	80	176	6.859	120	248	2.117
1	34	171.9	41	106	28	81	178	6.641	121	250	2.061
2	36	163.3	42	108	26.9	82	180	6.43	122	252	2.007
3	37	155.2	43	109	25.86	83	181	6.228	123	253	1.955
4	39	147.6	44	111	24.85	84	183	6.033	124	255	1.905
5	41	140.4	45	113	23.89	85	185	5.844	125	257	1.856
6	43	133.5	46	115	22.89	86	187	5.663	126	259	1.808
7	45	127.1	47	117	22.1	87	189	5.488	127	261	1.762
8	46	121	48	118	21.26	88	190	5.32	128	262	1.717
9	48	115.2	49	120	20.46	89	192	5.157	129	264	1.674
10	50	109.8	50	122	19.69	90	194	5	130	266	1.632
11	52	104.6	51	124	18.96	91	196	4.849			
12	54	99.69	52	126	18.26	92	198	4.703			
13	55	95.05	53	127	17.58	93	199	4.562			
14	57	90.66	54	129	16.94	94	201	4.426			
15	59	86.49	55	131	16.32	95	203	4.294			
16	61	82.54	56	133	15.73	96	205	4.167			
17	63	78.79	57	135	15.16	97	207	4.045			
18	64	75.24	58	136	14.62	98	208	3.927			
19	66	71.86	59	138	14.09	99	210	3.812			

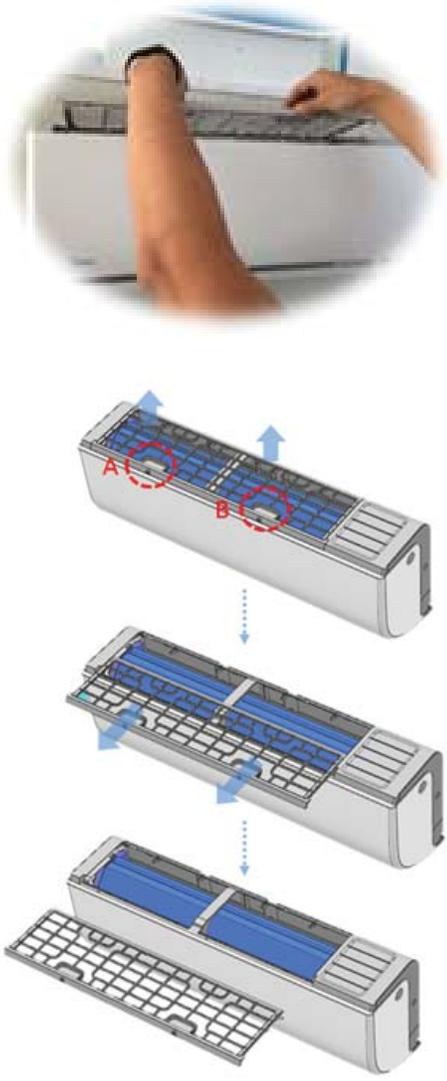
APPENDIX (CONT)

Table 21— $\Delta T (^{\circ}F) = 9 \Delta T (^{\circ}C) / 5$

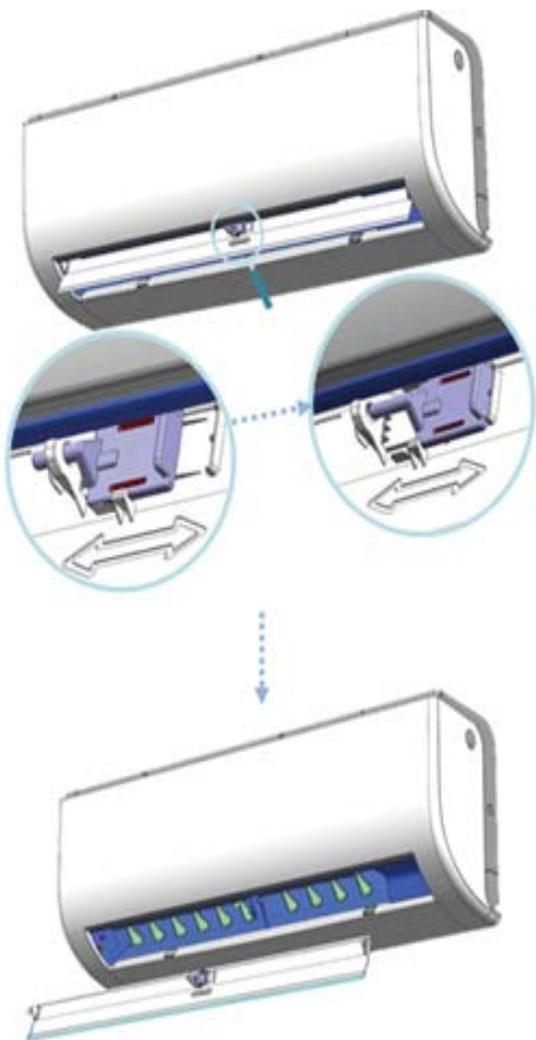
$^{\circ}C$	$^{\circ}F$								
-5	23	21	69.8	51	123.8	82	179.6	113	235.4
-4	24.8	22	71.6	52	125.6	83	181.4	114	237.2
-3	26.6	23	73.4	53	127.4	84	183.2	115	239
-2	28.4	24	75.2	54	129.2	85	185	116	240.8
-1	30.2	25	77	55	131	86	186.8	117	242.6
0	32	25.5	77.9	56	132.8	87	188.6	118	244.4
0.5	32.9	26	78.8	57	134.6	88	190.4	119	246.2
1	33.8	27	80.6	58	136.4	89	192.2	120	248
1.5	34.7	28	82.4	59	138.2	90	194	121	249.8
2	35.6	29	84.2	60	140	91	195.8	122	251.6
2.5	36.5	30	86	61	141.8	92	197.6	123	253.4
3	37.4	31	87.8	62	143.6	93	199.4	124	255.2
3.5	38.3	32	89.6	63	145.4	94	201.2	125	257
4	39.2	33	91.4	64	147.2	95	203	126	258.8
4.5	40.1	34	93.2	65	149	96	204.8	127	260.6
5	41	35	95	66	150.8	97	206.6	128	262.4
6	42.8	36	96.8	67	152.6	98	208.4	129	264.2
7	44.6	37	98.6	68	154.4	99	210.2	130	266
8	46.4	38	100.4	69	156.2	100	212	131	267.8
9	48.2	39	102.2	70	158	101	213.8	132	269.6
10	50	40	104	71	159.8	102	215.6	133	271.4
11	51.8	41	105.8	72	161.6	103	217.4	134	273.2
12	53.6	42	107.6	73	163.4	104	219.2	135	275
13	55.4	43	109.4	74	165.2	105	221	136	276.8
14	57.2	44	111.2	75	167	106	222.8	137	278.6
15	59	45	113	76	168.8	107	224.6	138	280.4
16	60.8	46	114.8	77	170.6	108	226.4	139	282.2
17	62.6	47	116.6	78	172.4	109	228.2	140	284
18	64.4	48	118.4	79	174.2	110	230	141	285.8
19	66.2	49	120.2	80	176	111	231.8	142	287.6
20	68	50	122	81	177.8	112	233.6	143	289.4

DISASSEMBLY INSTRUCTIONS

NOTE: This part is for reference, the photos may have slight difference with your unit.

No.	Parts name	Procedures	Remarks
1	Front panel	<p>How to remove the filter.</p> <ol style="list-style-type: none"><li data-bbox="483 262 800 394">1) Put your hands at A and B, lift the filter slightly to loosen the fastener.<li data-bbox="483 573 800 667">2) Pull the filter gently along the horizontal direction.<li data-bbox="483 825 800 856">3) Pull out the filter.	<p>Overview:</p> 

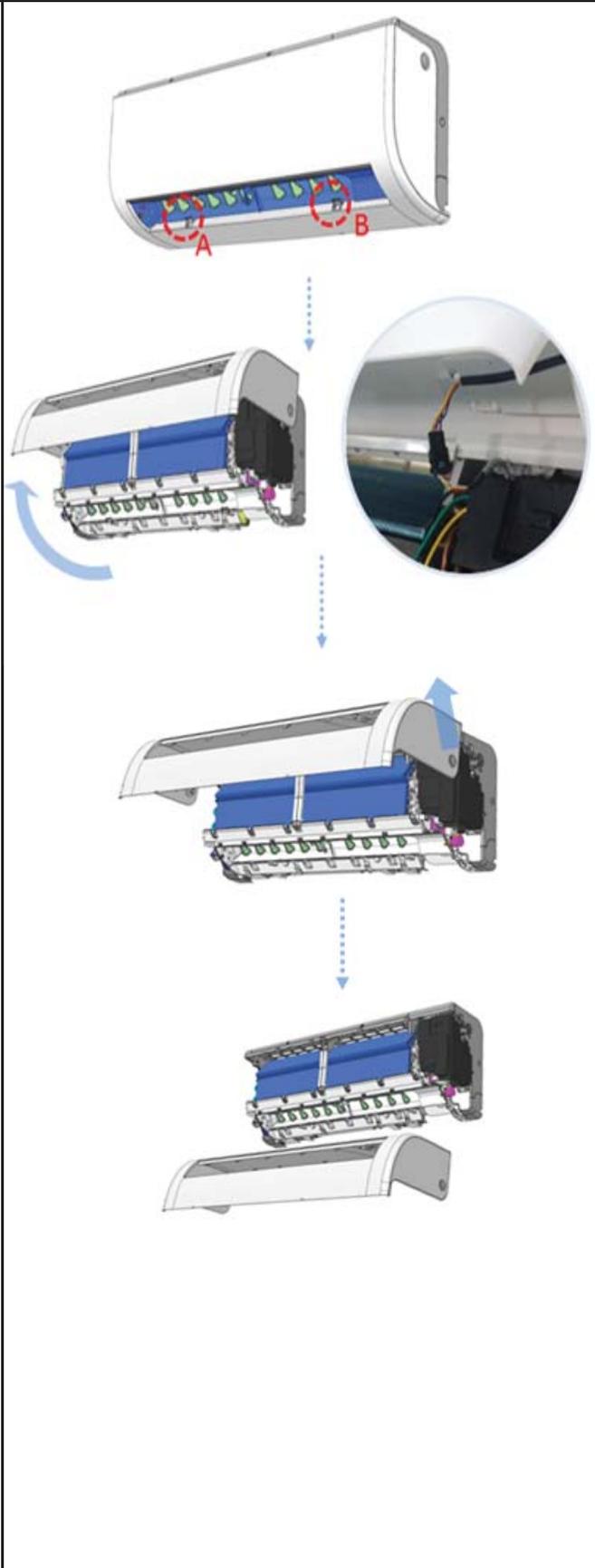
DISASSEMBLY INSTRUCTIONS (CONT)

2	Front panel	<p>How to remove the horizontal louver</p> <ol style="list-style-type: none">1) Open the horizontal louver, push the locker toward the right side to open.2) Bend the horizontal louver gently then remove it from the indoor unit.	 <p>The diagram illustrates the process of removing the horizontal louver from the indoor unit. It is divided into two main stages. The top stage shows the louver being opened, with a blue circle highlighting the locker mechanism. Two circular insets provide a detailed view of the locker, showing it being pushed to the right. The bottom stage shows the louver being bent and removed from the unit, with a blue arrow indicating the direction of removal.</p>
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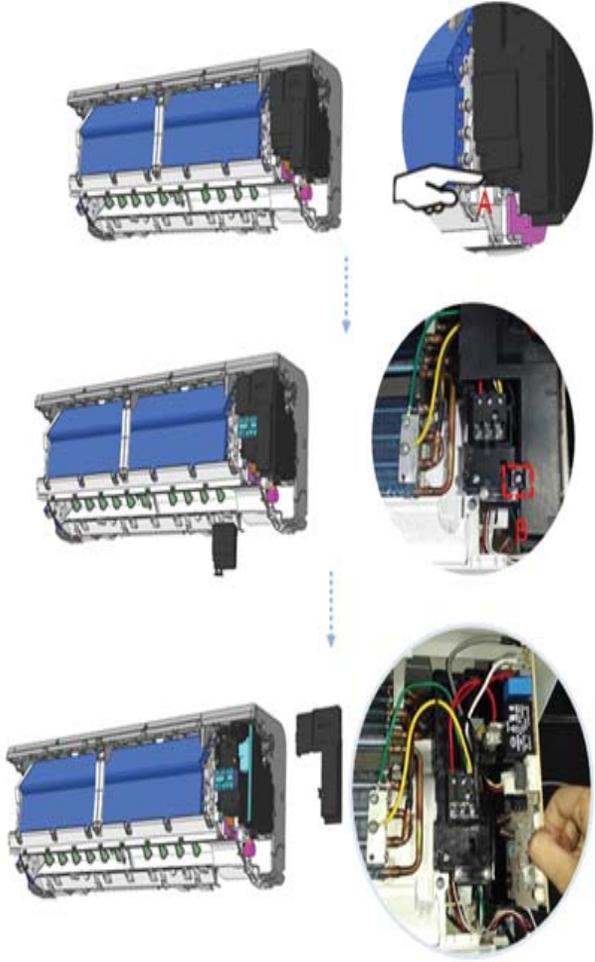
DISASSEMBLY INSTRUCTIONS (CONT)

3	Front panel	<p>How to hold indoor unit for the piping connection</p> <ol style="list-style-type: none">1) Open the screw caps A and B then remove the screws (2).2) Open the panel assembly, move the slider to secure the panel.3) Press locker A and B, to loosen the unit from the installation plate.4) Unfold the installation plate supporter and allow it to hold the indoor unit (this is useful for connecting the pipe in the back of the unit).	
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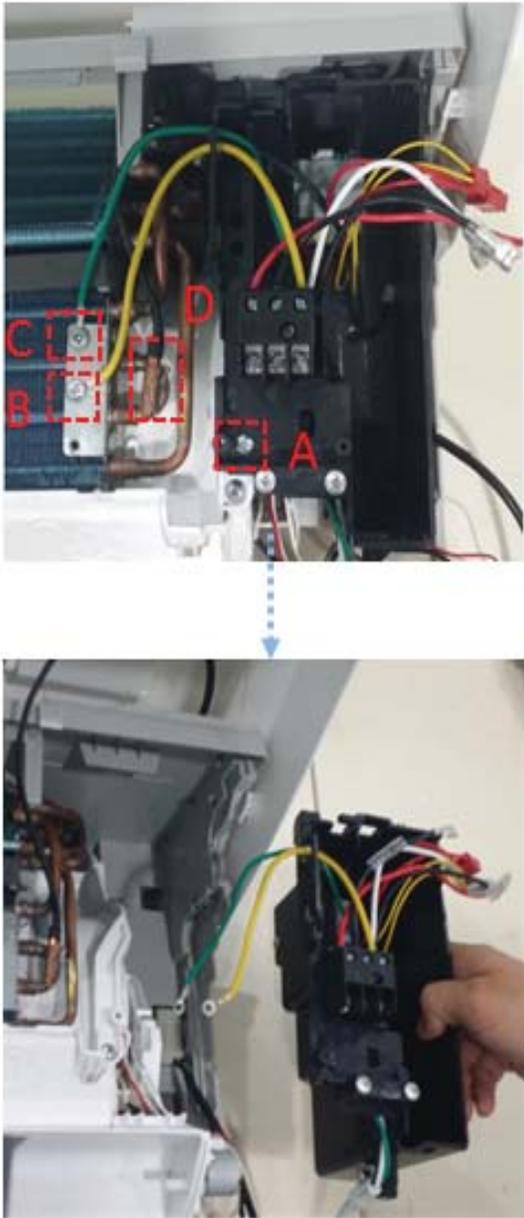
DISASSEMBLY INSTRUCTIONS (CONT)

4	Front panel	<p>How to remove the panel assembly</p> <ol style="list-style-type: none">1) Open the screw caps A and B, remove the two screws.2) Open the panel assembly, loosen the display board connector.3) Pull the panel assembly along the direction indicated in image to remove.	
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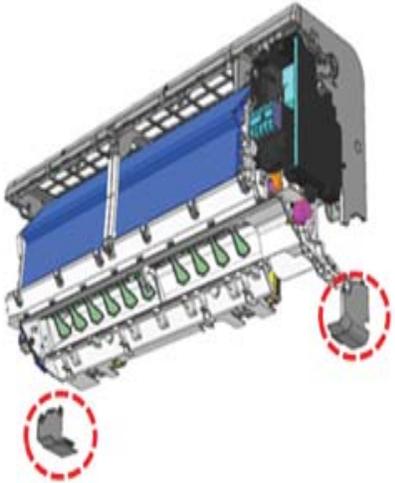
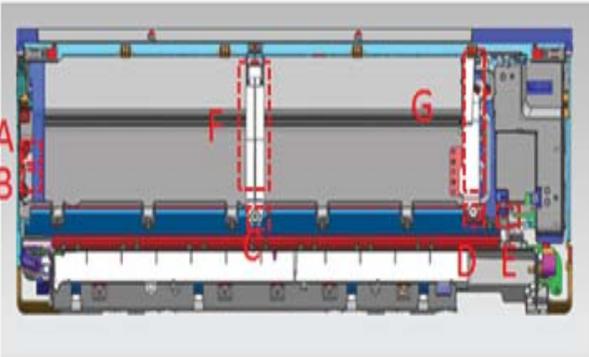
DISASSEMBLY INSTRUCTIONS (CONT)

5	Front panel	<p>How to remove the PCB</p> <ol style="list-style-type: none">1) Press A to remove the terminal cover.2) Remove screw B to remove the cover of the electronic control box3) Remove the PCB. <p>NOTE!! It is not necessary to remove the panel to remove the PCB. The panel was only removed (see images) to make it easier to see inside the unit.</p>	 <p>The image illustrates the three steps of PCB removal. Step 1: A hand presses a tab labeled 'A' on the terminal cover. Step 2: A screw labeled 'B' is removed from the electronic control box. Step 3: The PCB is shown being lifted out of the unit's chassis.</p>
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DISASSEMBLY INSTRUCTIONS (CONT)

6	Front panel	<p>How to remove the electrical control box</p> <ol style="list-style-type: none">1) Remove screws (A,B,C), then pull out the coil temp. sensor D from the sensor holders.2) Pull out the electrical control box. <p>NOTE!! It is not necessary to remove the panel to remove the electronic control box. The panel was only removed (see images) to make it easier to see inside the unit.</p>	
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DISASSEMBLY INSTRUCTIONS (CONT)

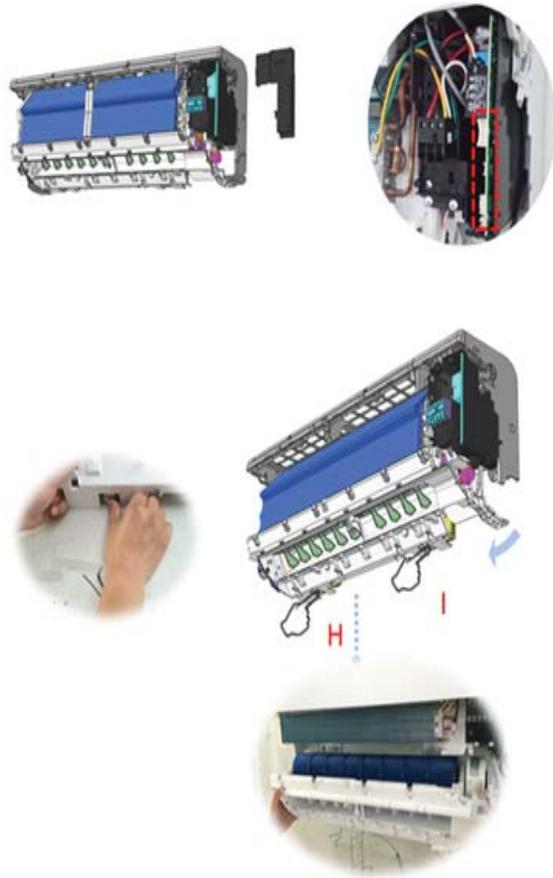
7	Front panel	<p>How to remove the chassis assembly</p> <p>Caution:</p> <p>Because the 24K indoor unit is relatively large and heavy, a minimum of two persons are required to implement the following steps.</p> <ol style="list-style-type: none">1) Remove the left and right pipe cover.2) Remove the 5 screws A,B,C,D,E remove support parts F and G.3) Open the E-box, to unhook the fan motor and louver motor connectors from the PCB.	  
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DISASSEMBLY INSTRUCTIONS (CONT)

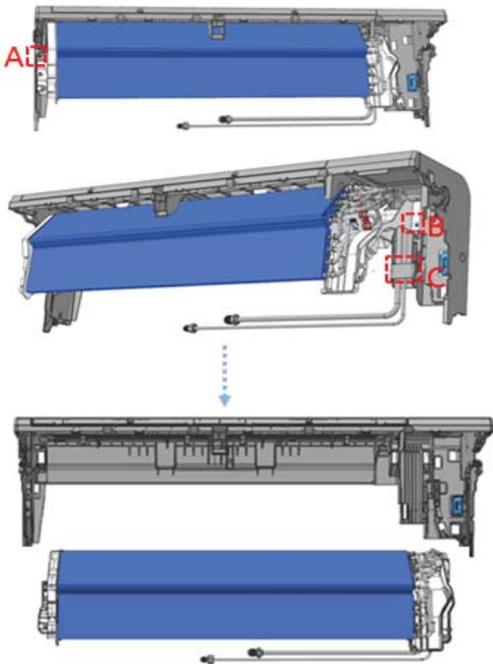
- 4) Press the locker H and I, to remove the indoor unit from the installation plate. Lift the unit slightly and pull it out along the direction indicated in the image.

NOTE!!

It is not necessary to remove the panel to remove the chassis assembly. The panel was removed only (see images) to make it easier to see inside the unit.



DISASSEMBLY INSTRUCTIONS (CONT)

8	Front panel	<p>How to remove the evaporator assembly</p> <p>Caution:</p> <p>Because the 24K indoor unit is relatively large and heavy, a minimum of two persons are required to implement the following steps.</p> <ol style="list-style-type: none">1) Remove the electric control box.2) Remove the chassis assembly.3) Unfold the Pipe clamp board (C), remove screws A and B.4) Pull out the evaporator.	  
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