

Service Manual

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SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to unit 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 coil cleaning. All other operations should be performed by trained service personnel **only**.

When working on the equipment, observe the 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 a quenching cloth and fire extinguisher nearby when brazing. Use care in handling, rigging, and setting bulky equipment.

Read this manual thoroughly and follow all the warnings or cautions included in the literature and attached to the unit. Consult local building codes and the 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 of 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 the unit, the main electrical disconnect switch must be in the **OFF** position. There may be more than 1 disconnect switch. Lock out and tag the 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 the extended periods of unit shutdown. This causes refrigerant slugging and could possibly damage the compressor at start-up.

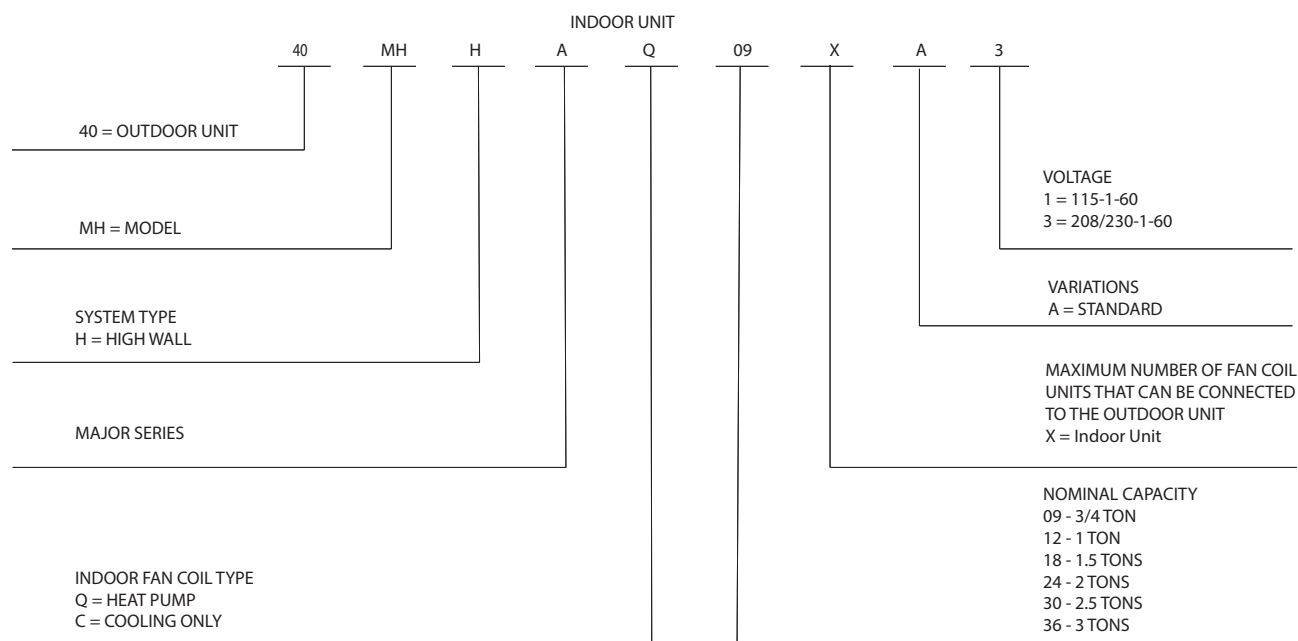
INTRODUCTION

This service manual provides the necessary information to service, repair, and maintain the indoor units. This manual contains **“DISASSEMBLY INSTRUCTIONS (09K-24K)” on page 40** and **“DISASSEMBLY INSTRUCTIONS (30K-36K)” on page 54** with data required to troubleshoot an issue. Use the **“TABLE OF CONTENTS” on page 1** to locate a desired topic.

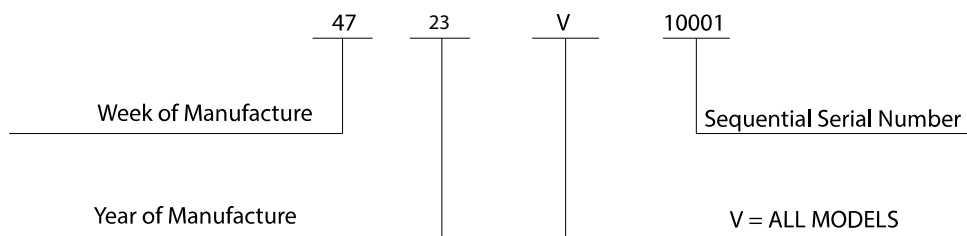
MODEL NUMBER NOMENCLATURE

Table 1 —Indoor Unit Sizes

DESCRIPTION	kBTUh	V-Ph-Hz	ID MODEL No.
High Wall Heat Pump	09	115-1-60	40MHHAQ09XA1
	12	208/230-1-60	40MHHAQ12XA1
	09		40MHHAQ09XA3
	12		40MHHAQ12XA3
	18		40MHHAQ18XA3
	24		40MHHAQ24XA3
	30		40MHHAQ30XA3
	36		40MHHAQ36XA3
High Wall Cooling Only	09	208/230-1-60	40MHHAC09XA3
	12	115-1-60	40MHHAC12XA1
	12	208/230-1-60	40MHHAC12XA3
	18		40MHHAC18XA3
	24		40MHHAC24XA3



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Use of the AHRI Certified
TM Mark indicates a
manufacturer's
participation in the
program For verification
of certification for individual
products, go to
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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 the indoor unit consists of four (4) 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 the indoor and outdoor unit is polarity sensitive. The use of BX wire and solid core wire is NOT recommended.

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

CONNECTION DIAGRAMS

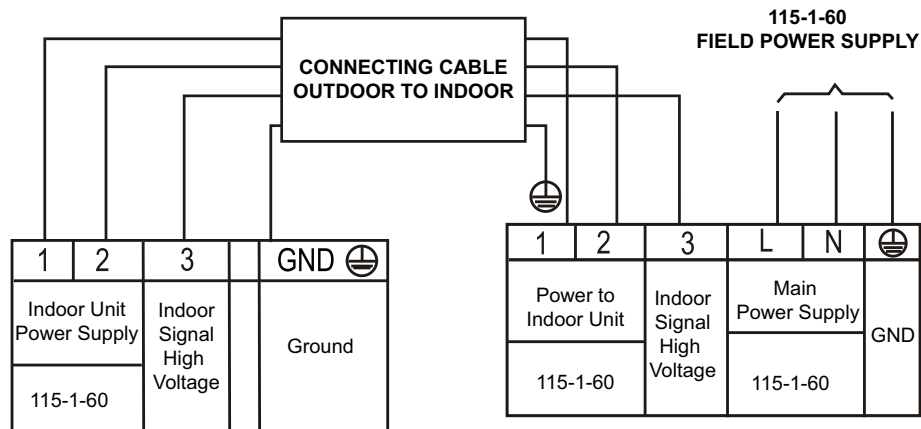


Fig. 1 — Connection Diagram Sizes 09K - 12K (115V)

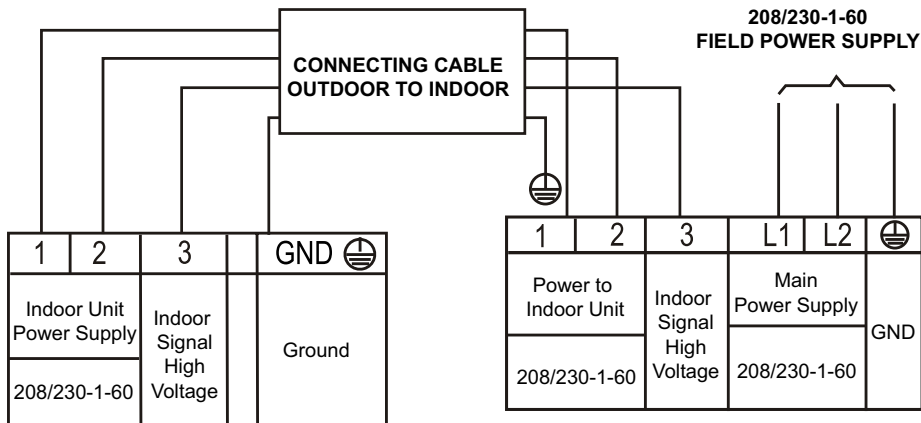


Fig. 2 — Connection Diagram Sizes 09K - 36K (208/230V)

NOTES:

1. Do not use a thermostat wire for any connection between the indoor and outdoor units.
2. All connections between the indoor and outdoor units **must** adhere to the connections shown in Figures 1 and 2. The connections are polarity sensitive and improper wiring **will** result in a fault code.

WIRING DIAGRAMS

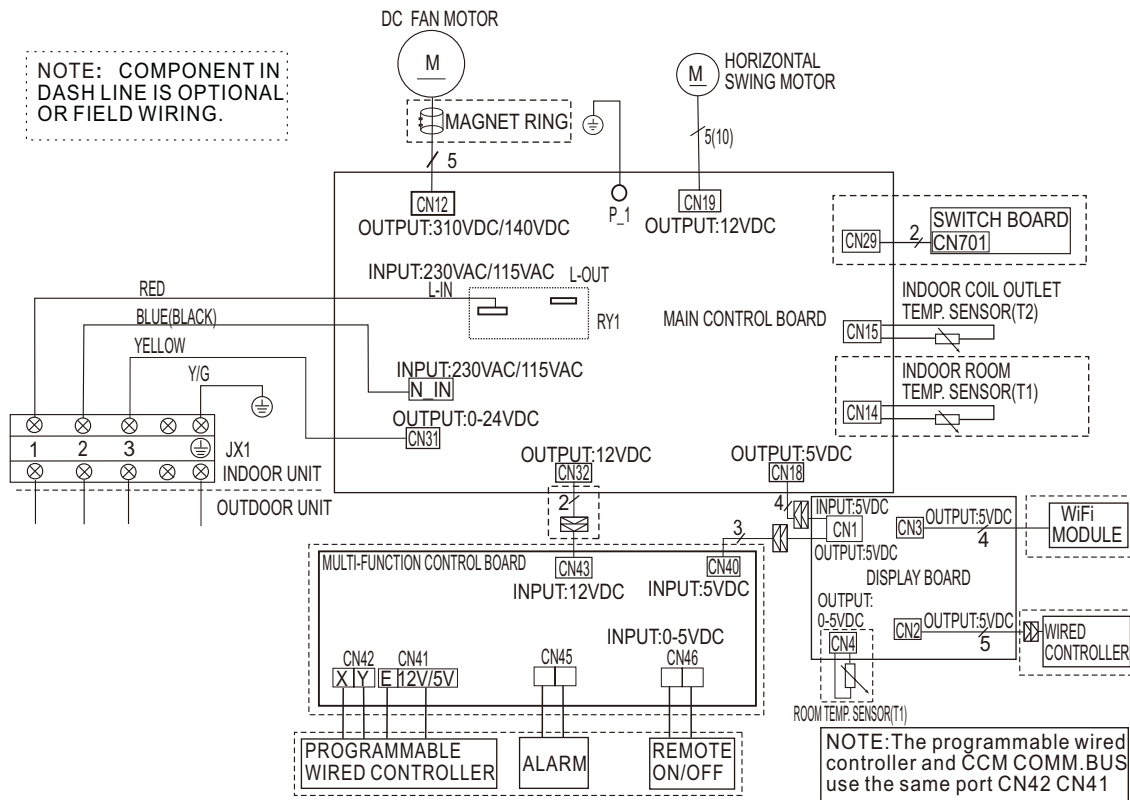


Fig. 3 — Wiring Diagram Sizes 09K and 12K (115V and 208/230V) / 18K (208V/230V)

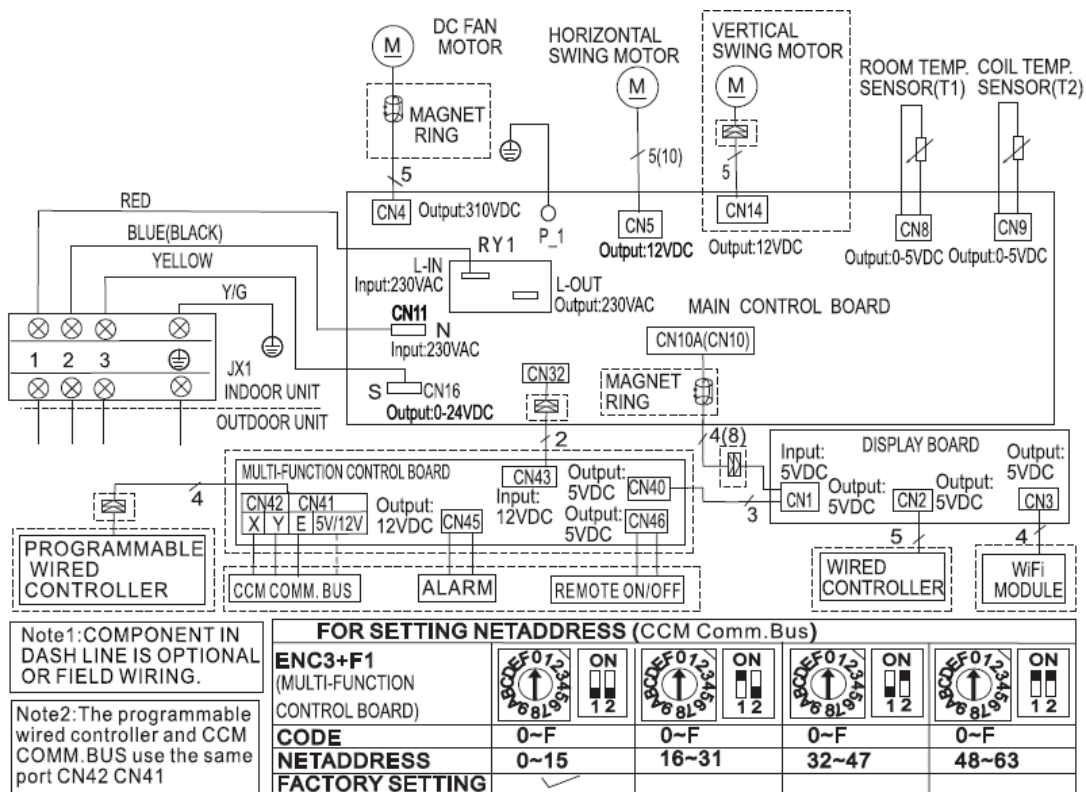


Fig. 4 — Wiring Diagram Sizes 24K (208/230V) through 36K (208/230V)

ELECTRONIC FUNCTIONS

Main Protection

Fan Speed is Out of Control

When the indoor fan speed remains too low (300RPM) for a certain amount 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 falls under the control of the anti-cold wind function.

Zero Crossing Detection Error Protection

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

Sensor Protection at Open Circuit and Breaking Disconnection

When there is only one malfunctioning temperature sensor, the air conditioner keeps working however an error code appears, in the event of emergency use. When there is more than one malfunctioning temperature sensor, the unit stops working.

Operation Modes and Functions

FAN Mode

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

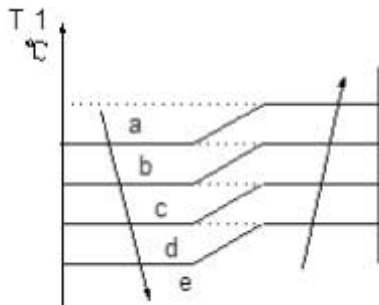


Fig. 5 —Auto Fan

COOLING Mode

Indoor Fan Running Rules

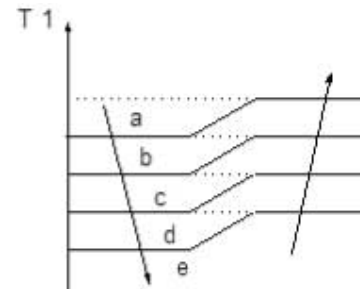
In the **COOLING** mode, the indoor fan runs continually and either speed (**high, medium, low** or **auto**) may be selected. When the setting temperature is reached, if the compressor stops running, the indoor fan motor runs at the minimum or setting speed. The indoor fan is controlled by the rules shown in Fig. 6.

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)

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Fig. 6 — Indoor Fan Running Rules

The **AUTO** fan is controlled by the rules shown in Fig. 7.



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Fig. 7 — Indoor Fan Running Rules

Evaporator Temperature Protection

When the evaporator temperature is lower 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 temperature reaches the setting temperature, the compressor stops and the indoor fan motor runs at the minimum or setting speed (the anti-cold air function is valid). The indoor fan is controlled by the Indoor Fan Running Rules shown in Fig. 8.

Setting fan speed	T1-Td °C	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)

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Fig. 8 — Indoor Fan Running Rules

Auto Fan Action in HEATING Mode

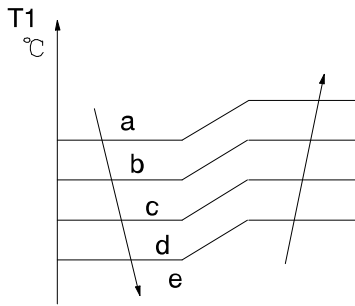


Fig. 9 —Auto Fan Action in HEATING Mode

DEFROST Mode

The unit 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, and the indoor unit displays “df”.

If any one of the following items is satisfied, the defrosting process finishes and the unit reverts to the normal **HEATING** mode.

- T3 rises higher than TCDE1C.
- T3 remains higher than TCDE2C for 80 seconds.
- The unit runs for 15 minutes in **DEFROSTING** mode.

Evaporator Coil Temperature Protection

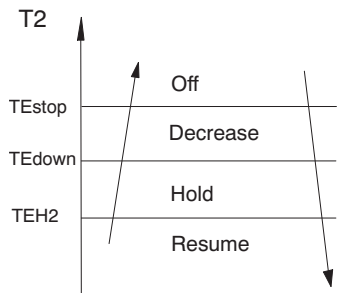


Fig. 10 —Evaporator Coil Temperature Protection

NOTE: The following (bulleted list) applies to Fig. 10:

- **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 selected with the remote control and the setting temperature can be changed between 62°F (17°C)~86°F (30°C).

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

Table 2 — Auto Mode

$\Delta T = T1 - Ts$	Running Mode
$\Delta T > 2^{\circ}\text{C}$	Cooling
$-2 \leq \Delta T \leq 2^{\circ}\text{C}$	Fan-Only
$\Delta T < -2^{\circ}\text{C}$	Heating

The indoor fan runs under **AUTO** fan in the relevant mode. The louver operates the same as in the relevant mode. If the unit switches between the **HEATING** and **COOLING** modes, the compressor stops for 15 minutes and then selects 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 Set

The indoor fan speed is set to **BREEZE** and cannot be changed. The louver angle is the same as in the **COOLING** mode.

Low Indoor Room Temperature Protection

In the **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 both are the same when the unit is in the **COOLING** mode.

Outdoor Fan

The outdoor fan operates the same when the unit is in the **COOLING** mode.

FORCED OPERATION Function

When the unit is off, locate the **FORCED AUTO** button. The button can be accessed by opening the front panel. The button is on the right side inside the terminal cover and can be pressed with a long slender screw driver. Press **FORCED AUTO** to engage the **FORCED AUTO** mode. Press **FORCED AUTO** again within 5 seconds to engage the **FORCED COOLING** mode. In the **FORCED AUTO**, **FORCED COOLING** or any other operation mode, press **FORCED AUTO** to turn the unit off.

- **FORCED OPERATION** mode: In the **FORCED OPERATION** mode, all the general protections and the 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 unit enters the **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 reaching the setting time.

Timer off: The unit turns off automatically when reaching the setting time.

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

Timer off/on: The unit 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 unit’s current operation mode. Suppose the unit is off now; it will not start up first after setting the “timer off” function. When the setting time is reached, the timer **LED** turns off and the unit’s running mode is the same. The setting time is relative time.

The unit exits the timer function if it experiences a malfunction.

Sleep Function

The **SLEEP** function is only available in the **COOLING**, **HEATING** or **AUTO** mode.

The **OPERATION** process in the **SLEEP** mode is as follows:

- When cooling, the setpoint rises 2°F (1°C) (to a maximum of 86°F/30°C) every one hour. Two (2) hours later, the room temperature stops rising and the indoor fan remains at a low speed.
- When heating, setpoint decreases 2°F (1°C) (to a minimum of 62°F/17°C) every one hour. Two (2) hours later, the setpoint stops decreasing and the indoor fan is set at the low speed.

NOTE: Anti-cold wind function has the priority.

Operation time in the **SLEEP** mode is seven (7) hours. After seven (7) hours, the unit exits the **SLEEP** mode and powers off.

AUTO-RESTART Function

The indoor unit is equipped with an **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 (3) minutes after the power returns.

If the memorization condition is the **FORCED COOLING** mode, the unit runs in the **COOLING** mode for 30 minutes and switches to the **AUTO** mode at the 75°F (24°C) setpoint. If the unit is off before the power turns off and the unit is required to start up, the compressor delays the start up for 1 minute before powering on. In other instances, the compressor waits three (3) minutes before restarting.

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 the **COOLING** mode. This function helps to prevent the compressor from being damaged by a refrigerant leak or a compressor overload.

- **Open Condition:** When the compressor is running, the value of the T2 coil temperature sensor has no to very little change.

Louver Position Memory Function

When starting the unit again after powering 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 the angle exceeds the allowable range, it memorizes the maximum angle of the louver. During operation, if the power fails or if the end user shuts down the unit while in the **TURBO** mode, the louver returns to the default angle.

46°F (8°C) Heating

To access 46°F heating, turn the heating temperature down to the lowest setting with the wireless remote. After reaching the lowest setting press the down arrow on the remote two more times then **FP** appears on the indoor unit. 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 **SILENCE** on the remote control 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 space for the user.

Self Clean (For heat pump models which are provided with this function)

After running in the **COOLING** or **DRYING** mode, if the user presses “Self Clean” on the remote control, the indoor unit runs in the **FAN ONLY** mode momentarily, then the low heat operation and finally runs in **FAN ONLY** again. This function can keep the inside of the indoor unit dry and prevents mold from growing within the unit.

FOLLOW ME

To activate **FOLLOW ME** with the remote, press **SET** and scroll to display the **FOLLOW ME** icon then push **OK**. To lock in **FOLLOW ME** after it has been activated, hold **BOOST** down on the remote for 8 seconds. The remote displays the **ON** icon to indicate that **FOLLOW ME** is locked in. Afterwards, the mode of operation can be changed with **FOLLOW ME** still active. If the indoor PCB receives the signal, which results from pressing **FOLLOW ME** on the remote control, the buzzer emits a sound which indicates the **FOLLOW ME** function is initiated. However, when the indoor PCB receives a signal from the remote control every 3 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 room temperature sensor’s error detective function remains valid.

When the **FOLLOW ME** function is available, the PCB controls the unit according to the room temperature from the remote control and the setting temperature. The PCB responds to the mode change information received from the remote control 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 control for 7 minutes or after pressing **FOLLOW ME** 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 setpoint.

INQUIRY MODE

To enter the **Inquiry Mode**:

Press and hold together the **On/Off** and **Fan** buttons   for 8 seconds. The remote control remains in the **Inquiry Mode** for 1 minute if no button is pressed. In the **Inquiry Mode**, the remote display cancels all icons except **AUTO**, **COOL**, **DRY**, **HEAT** and battery strength. The digital display defaults to “0” upon entering the **Inquiry Mode**. In **Inquiry Mode**, each digital code (from 0 to 30) is accessed by pressing the **UP** or **DOWN** arrow.

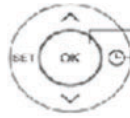


Fig. 11 — Up and Down Arrow

The **Inquiry Information** appears on the high wall indoor unit display in approximately 1 second of accessing the digital code. Press **OK** to send.

Table 3 — Inquiry Codes and Symbols

CODE	INQUIRY SYMBOL	DESCRIPTION
Code 0		None
Code 1	T1	Indoor ambient
Code 2	T2	Indoor pipe
Code 3	T3	Outdoor pipe
Code 4	T4	Outdoor air
Code 5	TP (T5)	Compressor discharge
Code 6	FT	Compressor target frequency
Code 7	Fr	Compressor run frequency
Code 8	dL	Unit amperage
Code 9	Uo	Unit voltage
Code 10	Sn	Capacity test (special usage)
Code 11	----	N/A
Code 12	Pr	Indoor fan speed
Code 13	Lr	Electronic Expansion Valve (EEV) opening
Code 14	ir	Indoor fan speed
Code 15	HU	Humidity
Code 16	TT	Setpoint compensation temperature
Code 17	dT	Dust concentration (not used)
Code 18	WIFI	Wi-Fi signal strength
Code 19	----	N/A
Code 20	oT	Indoor fan target frequency
Code 21	----	N/A
Code 22	----	N/A
Code 23	----	N/A
Code 24	----	N/A
Code 25	----	N/A
Code 26	----	N/A
Code 27	----	N/A
Code 28	----	N/A
Code 29	----	N/A
Code 30	----	N/A

To exit the **Inquiry Mode**:

Press and hold together the **On/Off** and **Fan** buttons   for 2 seconds

MULTI-FUNCTION BOARD INSTRUCTION

Function

The multi-function board receives a 4-cored wired controller signal and the CP remote on-off signal (ON-OFF command signal). Next, 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 is **OFF**. Disconnected indicates the remote on-off control signal is **ON**. The control requires 3 seconds to determine the **ON** or **OFF** status. The CP command is delivered one time (immediately) after powering on. The Dip-switch F2 setting status appears in Table 4.

Table 4 — 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 3 seconds to determine the **ON/OFF** status. The **ON-OFF** command is not sent after powering on. Instead the command is sent only after a change in the status occurs. When the **ON-OFF** control disconnects, it sends the switch-on signal. The unit runs in the **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 appears in Table 5.

Table 5 — 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 unit is **OFF**, the output signal is closed.
- When the unit is in a malfunction state, the output signal is closed.
- When the unit is **ON**, the output signal is disconnected.

WIRING DIAGRAM

Connected to 4-cored wired controller

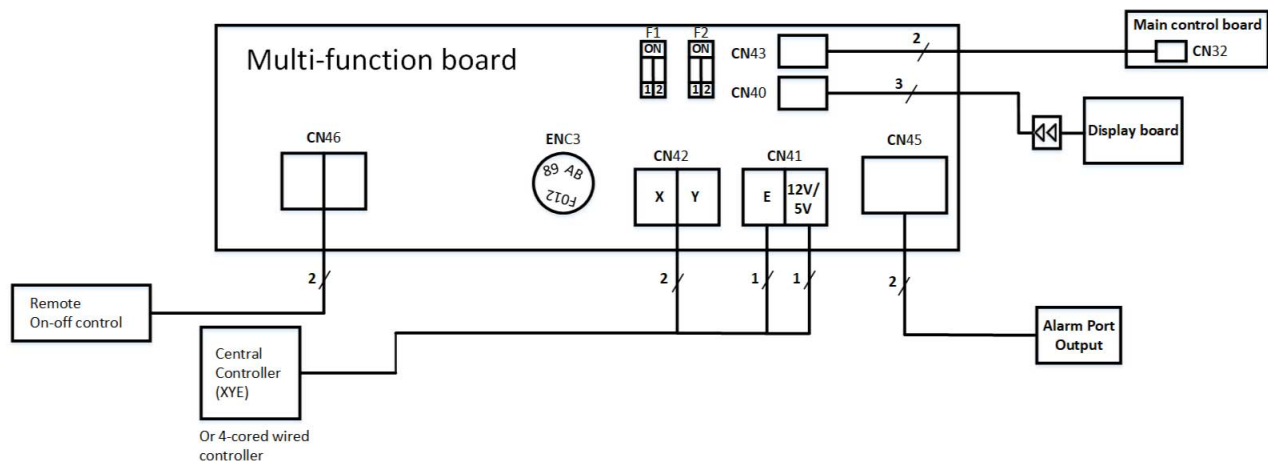
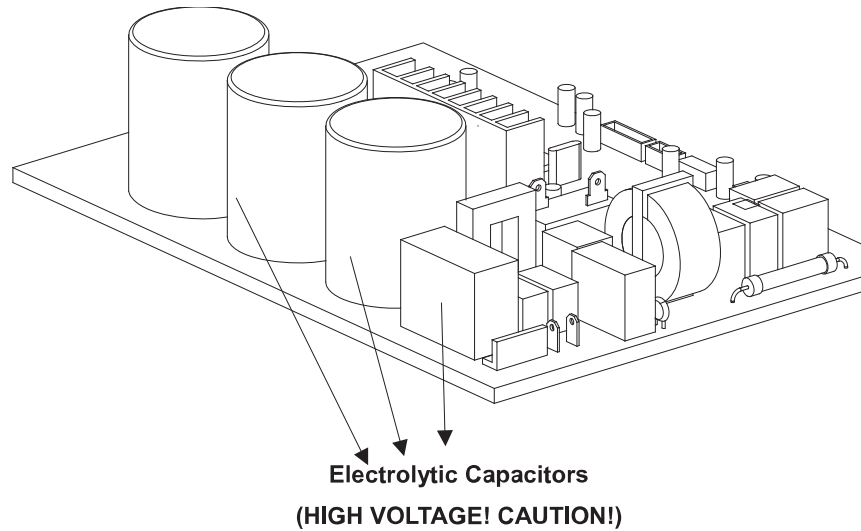


Fig. 12 —Wiring Diagram

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

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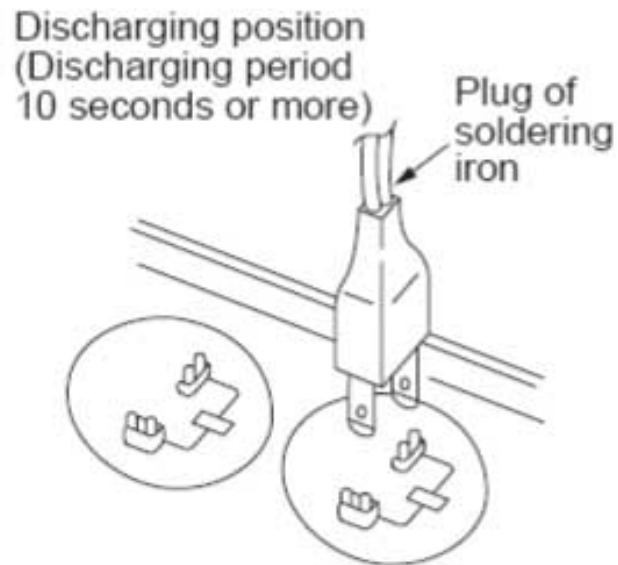
TROUBLESHOOTING



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Fig. 13 —Electrolytic Capacitors

For other models, please connect the discharge resistance (approximately 100W 40W) or a soldering iron (plug) between the +, - terminals of the electrolytic capacitor on the other side of the outdoor PCB.



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Fig. 14 — Discharge Position

NOTE: Fig. 14 is for reference only. Actual appearances may vary.

INDOOR UNIT DIAGNOSTIC GUIDE

Table 6 — Indoor Unit Error Display

DISPLAY	LED STATUS	SOLUTION
EH 00/EH 0A	Indoor unit EEPROM parameter error	Page 13
EL 01	Indoor/outdoor unit communication error	Page 14
EC 51	Outdoor unit EEPROM parameter error	Page 16
EH 02	Zero-crossing signal detection error	Page 17
EH 03/ EC 07	The indoor or outdoor fan speed is operating outside of the normal range	Page 18
EH 61	Open circuit or short circuit of the indoor T2 evaporator sensor	Page 20
EC 53	Outdoor room temperature sensor T4 is in open circuit or has short circuited	Page 20
EL 0C	Refrigerant leakage detection	Page 21
EH 0b	Indoor PCB/Display board communication error	Page 22
PC 08	Current overload protection	Page 23
PC 00	IPM malfunction or IGBT over strong current protection	Page 24
PC 01	Over voltage or over low voltage protection	Page 25
PC 02	Top temperature protection of compressor or high temperature protection of IPM module or high pressure protection	Page 26
PC 03	High pressure protection or low pressure protection	Page 29
PC 04	Inverter compressor drive error	Page 31
PC 40	Communication error between outdoor main chip and compressor driven chip	Page 32
FH 0P	AP mode is active but there is no WIFI kit installed	Page 33

DIAGNOSIS AND SOLUTION

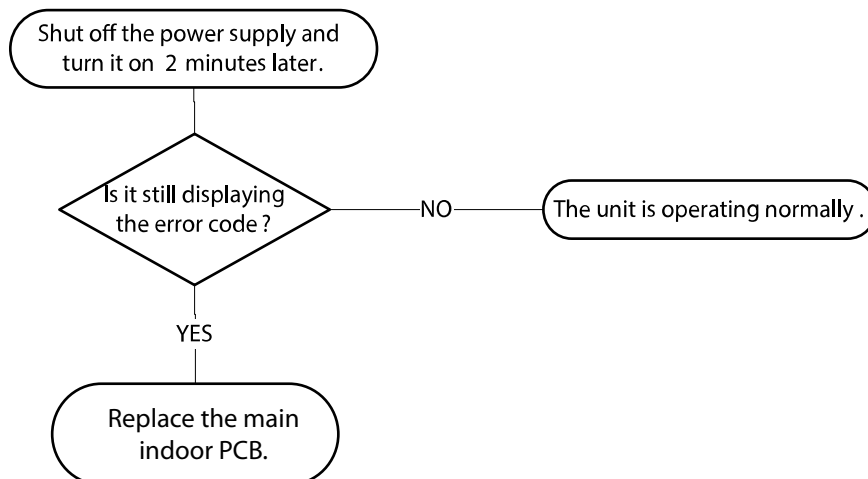
EH 00/EH 0A Indoor EEPROM parameter error diagnosis and solution

Description: Indoor PCB main chip does not receive feedback from the EEPROM chip.

Recommended parts to prepare:

- Indoor PCB

Troubleshooting



A210492

EEPROM: Read-only memory contents can be erased and reprogrammed using pulsed voltage. For the EEPROM chip location, refer to Figure 15.

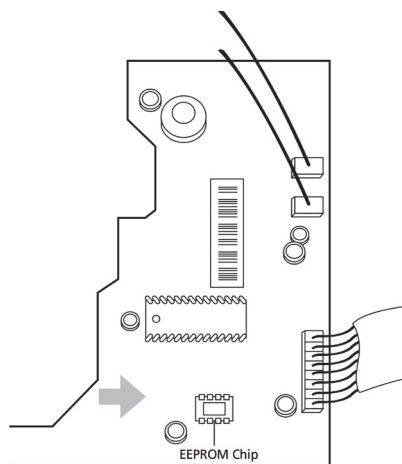


Fig. 15 — Indoor PCB

A210544

NOTE: Figure 15 is for reference only and may differ from your actual unit.

DIAGNOSIS AND SOLUTION (CONT.)

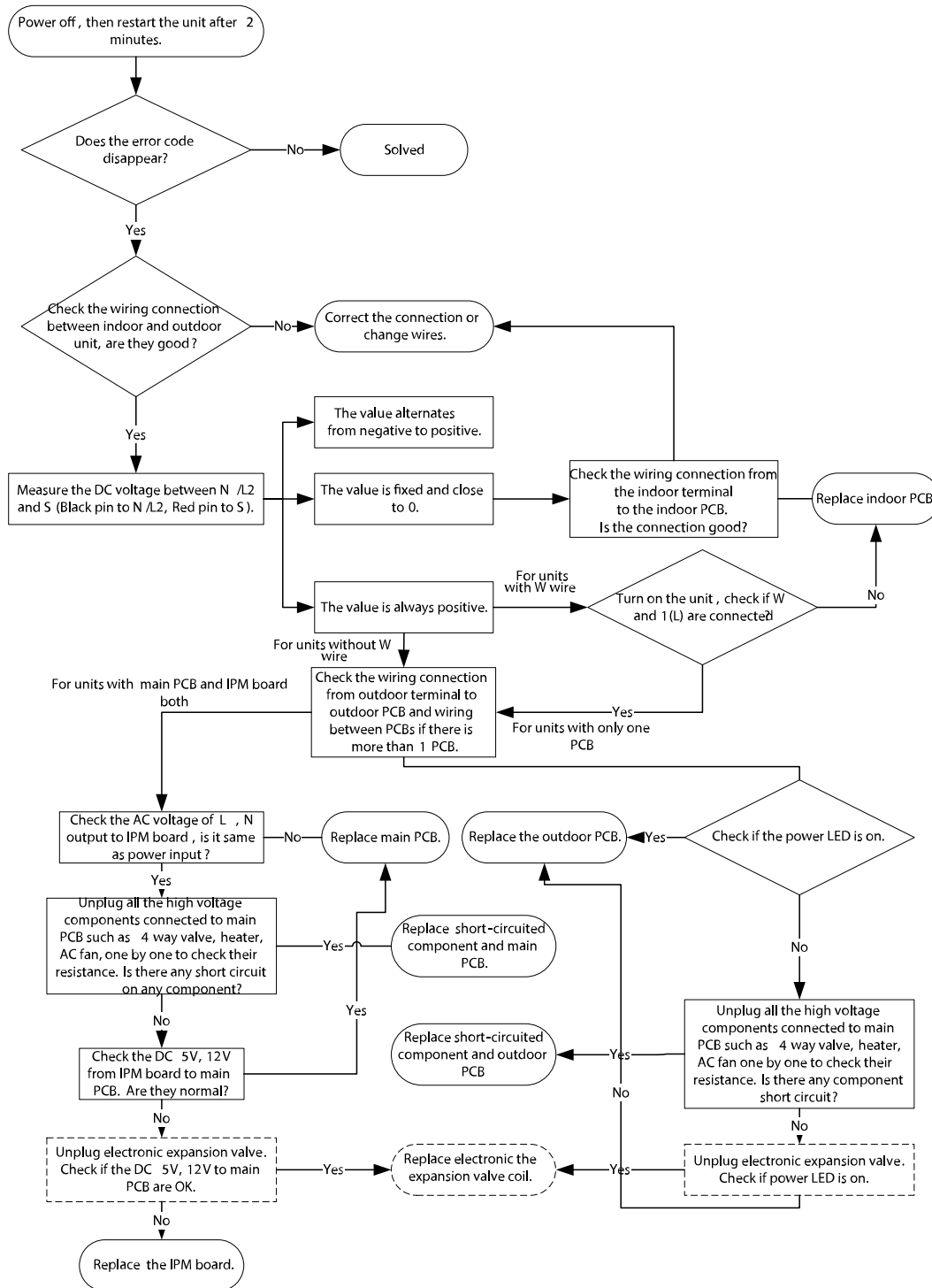
EL 01 Indoor / outdoor unit's communication diagnosis and solution

Description: Indoor unit can not communicate with the outdoor unit

Recommended parts to prepare:

- Indoor PCB
- Outdoor PCB
- Short-circuited component

Troubleshooting



NOTE: For certain models, the outdoor PCB cannot be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

DIAGNOSIS AND SOLUTION (CONT.)

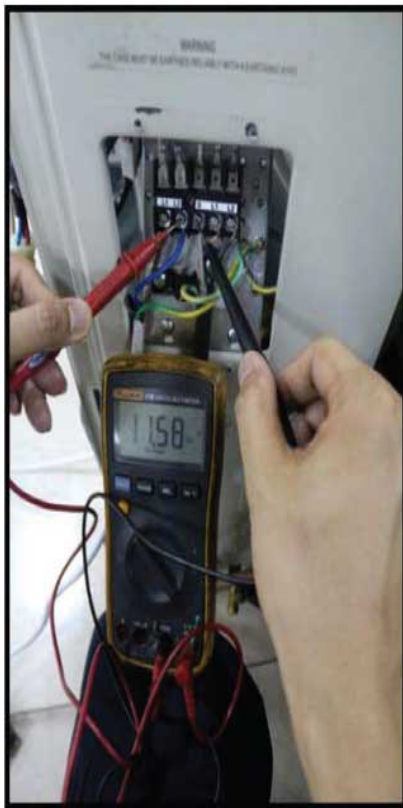


Fig. 16 —Test the DC Voltage

Use a multimeter to test the DC voltage between the outdoor unit's L2 and S ports. The red pin of the multimeter connects with the L2 port while the black pin connects to the S port. When the unit is running normally, the voltage moves alternately between -50V to 50V.

If the outdoor unit malfunctions, the voltage moves alternately with a positive value. If the indoor unit malfunctions, the voltage has a certain value.



Fig. 17 —Test the Reactor Resistance

Use a multimeter to test the resistance of the reactor which does not connect with the capacitor (the normal value should be around zero (0) ohm). Otherwise, the reactor is malfunctioning and should be replaced.

A210547

A210548

DIAGNOSIS AND SOLUTION (CONT.)

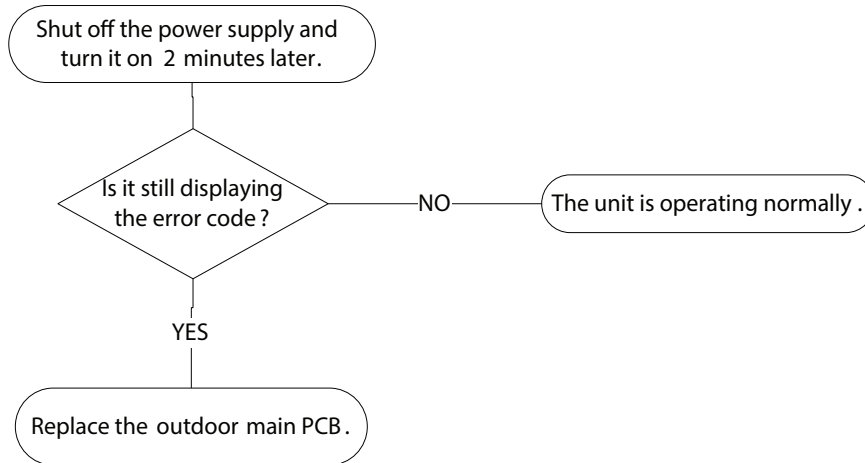
EC 51 Outdoor EEPROM parameter error or communication error between the outdoor main chip and the compressor driven chip diagnosis and solution

Description: The outdoor PCB main chip does not receive feedback from the EEPROM chip or the compressor driven chip.

Recommended parts to prepare:

- Outdoor PCB

Troubleshooting



NOTE: EEPROM: A read-only memory whose contents can be erased and reprogrammed using a pulsed voltage. The location of the EEPROM chip on the outdoor PCB is shown in Figure 18.

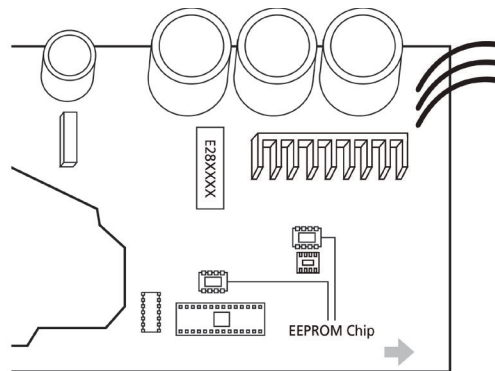


Fig. 18 — Outdoor PCB

NOTE: For certain models, the outdoor PCB could not be removed separately. In this case, the outdoor electric control box should be replaced as a whole. These images are for reference only; the actual appearance may vary.

DIAGNOSIS AND SOLUTION (CONT.)

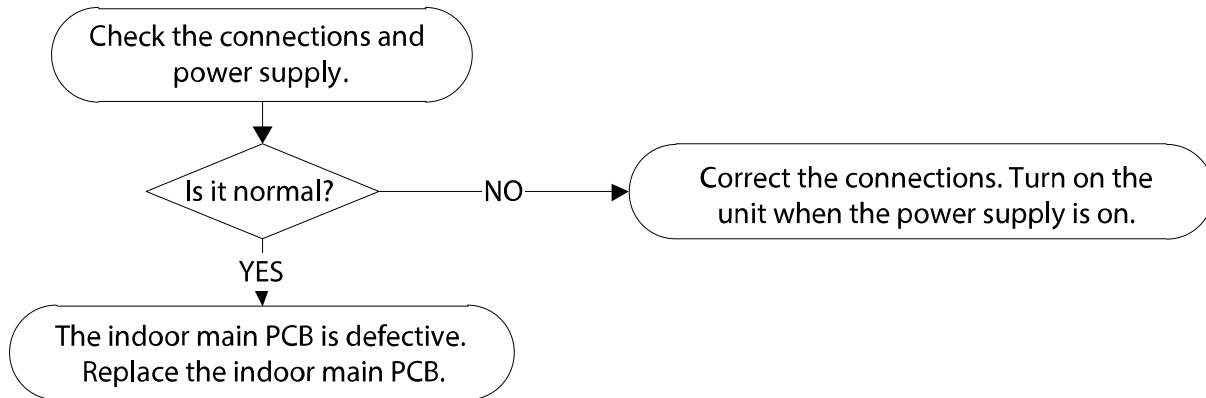
EH 02 Zero crossing detection error diagnosis and solution

Description: When the PCB does not receive a zero crossing signal feedback for four minutes or the zero crossing signal time interval is abnormal.

Recommended parts to prepare:

- Connection Wires
- Indoor Main PCB

Troubleshooting



A210597

DIAGNOSIS AND SOLUTION (CONT.)

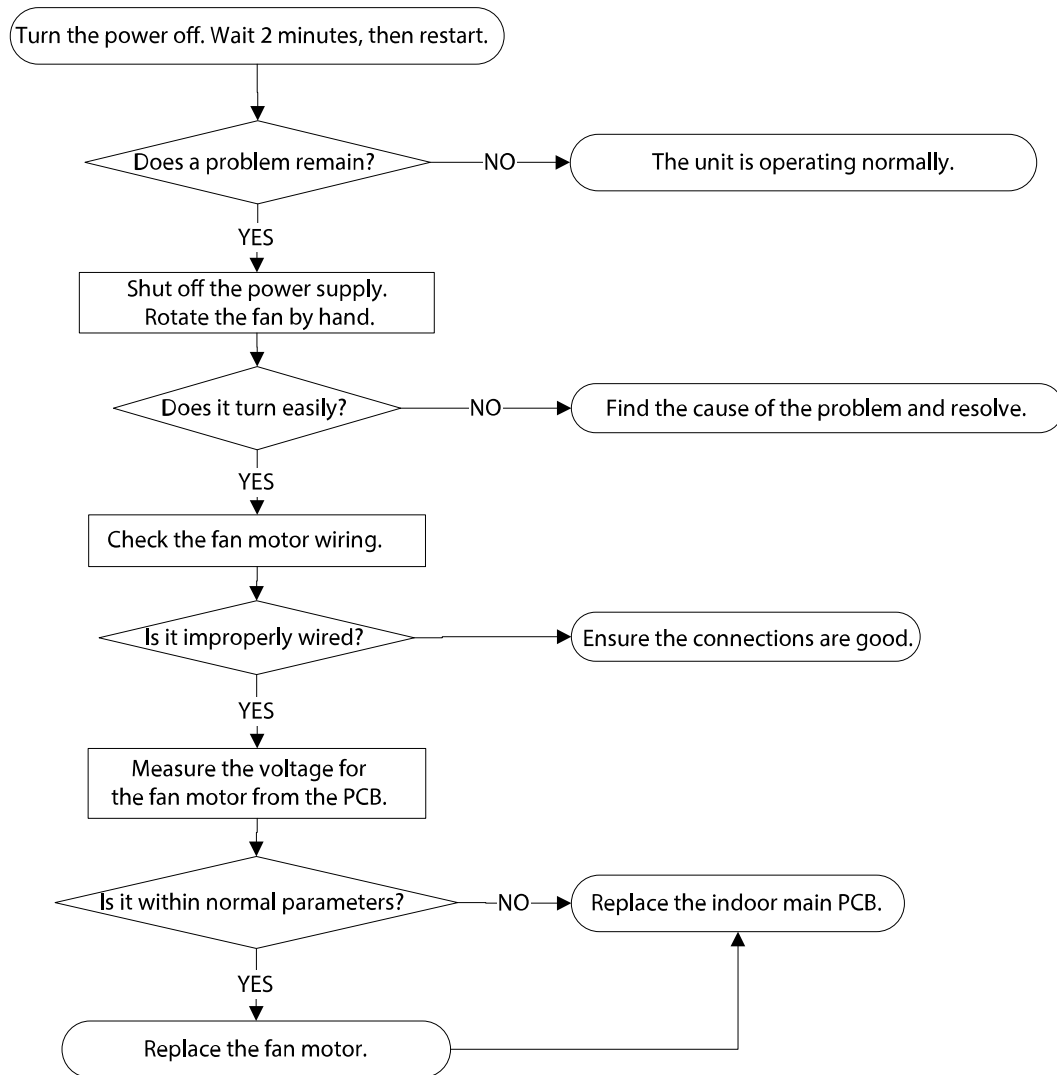
EH 03 / EC 07 Fan speed is operating outside of the Normal Range diagnosis and solution

Description: The indoor or outdoor fan speed maintains a speed which is too slow or too fast for a certain time, the LED displays the failure code and the air conditioning unit turns off.

Recommended parts to prepare:

- Connection wires
- Fan Assembly
- Fan Motor
- Outdoor Main PCB

Troubleshooting



A210598

NOTE: For certain models, the outdoor PCB cannot be removed separately. In this case, the outdoor electric control box should be replaced as a whole.

Index

DC Fan Motor (control chip is in fan motor, single fan)

Power on and when the unit is in standby, measure the pin1-pin3, pin4-pin3 voltage in the fan motor connector. If the voltage value is not in the range (see Tables 7 and 8), the PCB has malfunctioned and needs to be replaced.

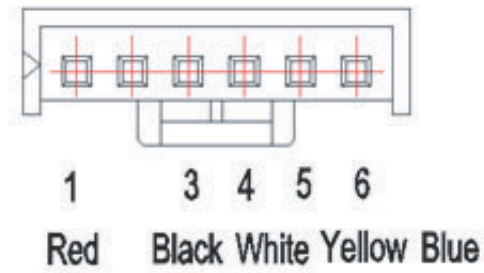


Fig. 19 — DC Fan Motor

Table 7 — DC Fan Motor (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

Table 8 — DC Fan Motor (208/230V)

No.	Color	Signal	Voltage
1	Red	Vs/Vm	192V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5-16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5-16.5V

DIAGNOSIS AND SOLUTION (CONT.)

EH 61 Open circuit or short circuit of the indoor T2 evaporator sensor diagnosis and solution

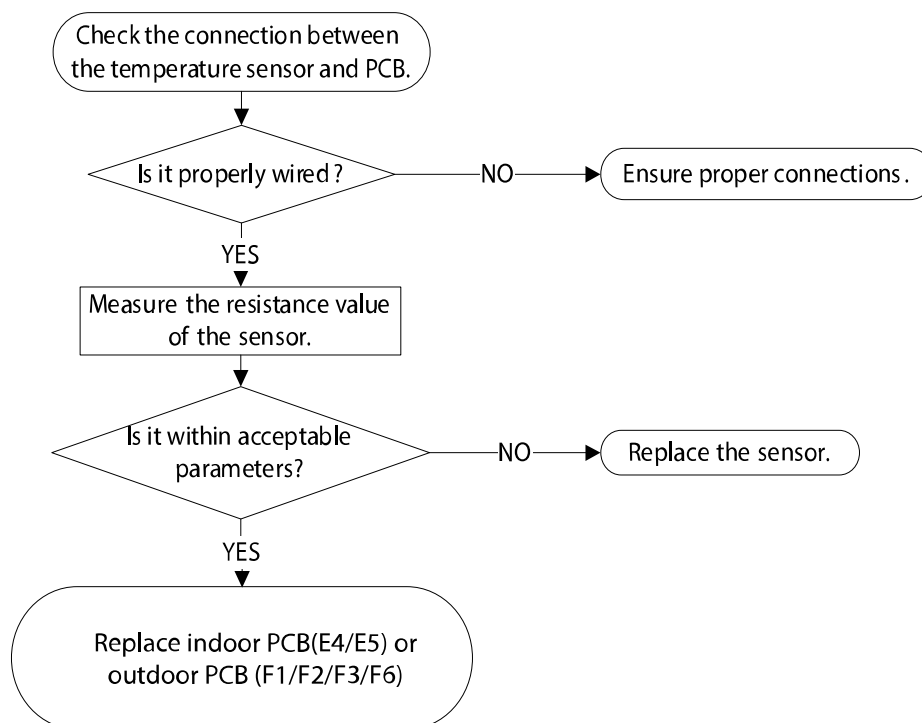
EC 53 Open circuit or short circuit of outdoor temperature sensor (T3, T4, TP, T2B, TH) diagnosis and solution

Description: If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays the failure code.

Recommended parts to repair:

- Connection wires
- Sensors
- Indoor main PCB

Troubleshooting



A210599

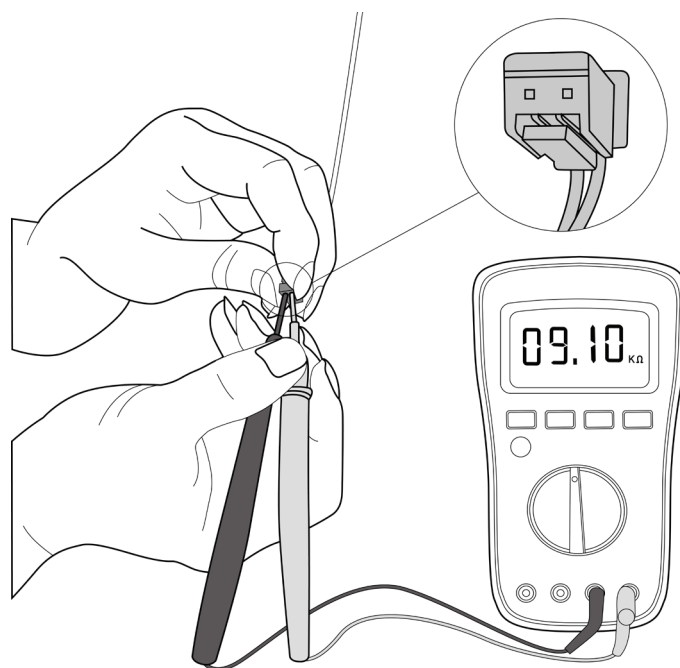


Fig. 20 —Check the connection

DIAGNOSIS AND SOLUTION (CONT.)

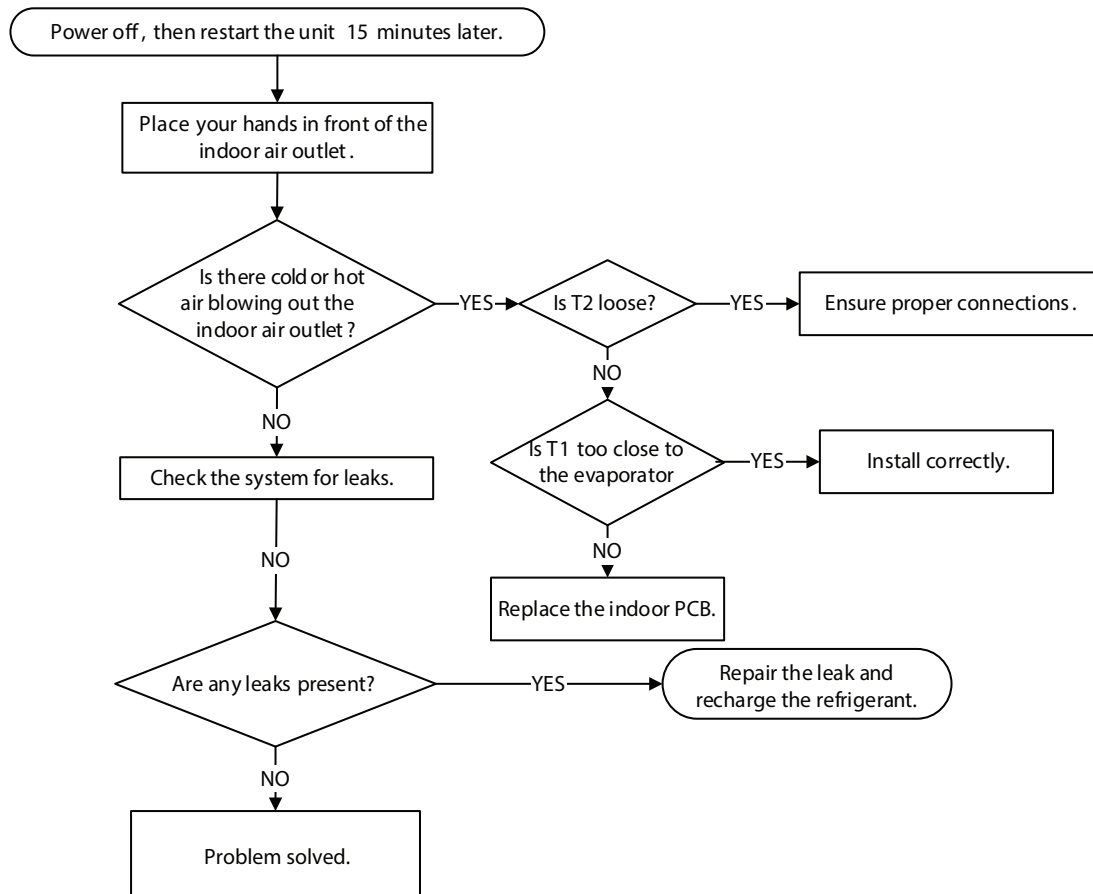
EL 0C Refrigerant Leakage Detection diagnosis and solution

Description: Determine the abnormality of the refrigeration system according to the number of compressor stops and the changes in the operating parameters caused by excessive exhaust temperature.

Recommended parts to repair:

- Indoor PCB
- Additional refrigerant

Troubleshooting



DIAGNOSIS AND SOLUTION (CONT.)

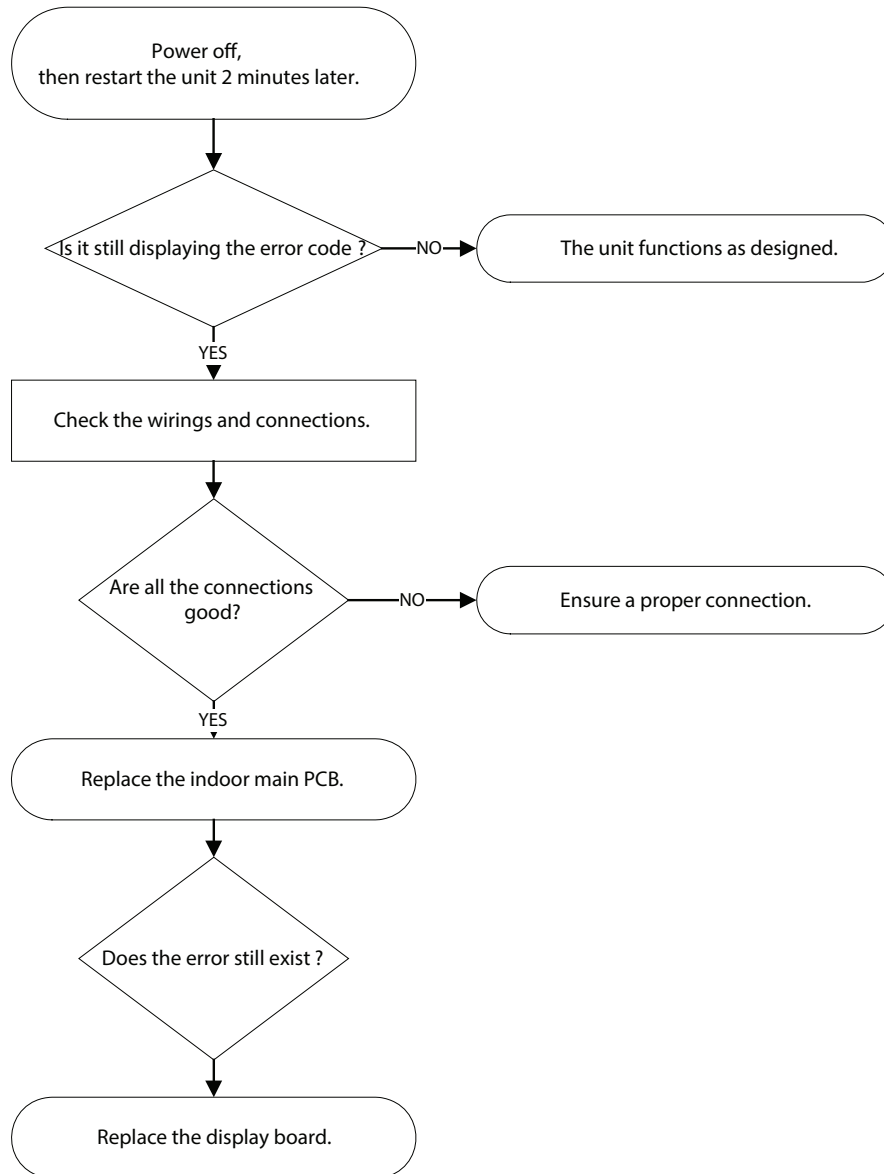
EH 0B Indoor PCB / Display board communication error diagnosis and solution

Description: The indoor PCB does not receive feedback from the display board.

Recommended parts to repair:

- Communication wire
- Indoor PCB
- Display Board

Troubleshooting



DIAGNOSIS AND SOLUTION (CONT.)

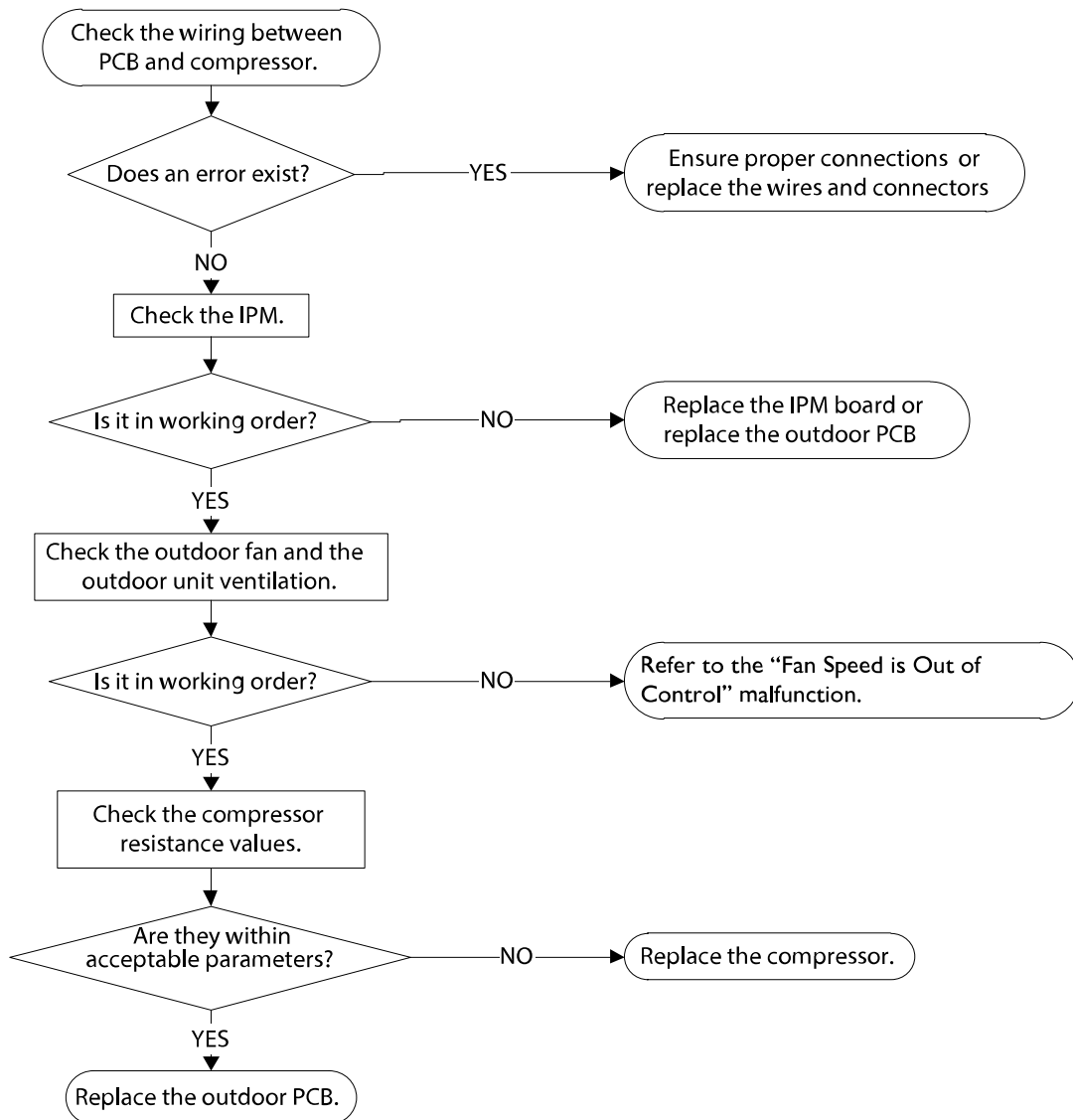
PC 00 IPM malfunction or IGBT over-strong current protection diagnosis and solution

Description: When the voltage signal the IPM sends to the compressor drive chip is abnormal, the LED displays the failure code and the air conditioner turns off.

Recommended parts to repair:

- Connection wires
- IPM Module Board
- Outdoor Fan Assembly
- Compressor
- Outdoor PCB

Troubleshooting



DIAGNOSIS AND SOLUTION (CONT.)

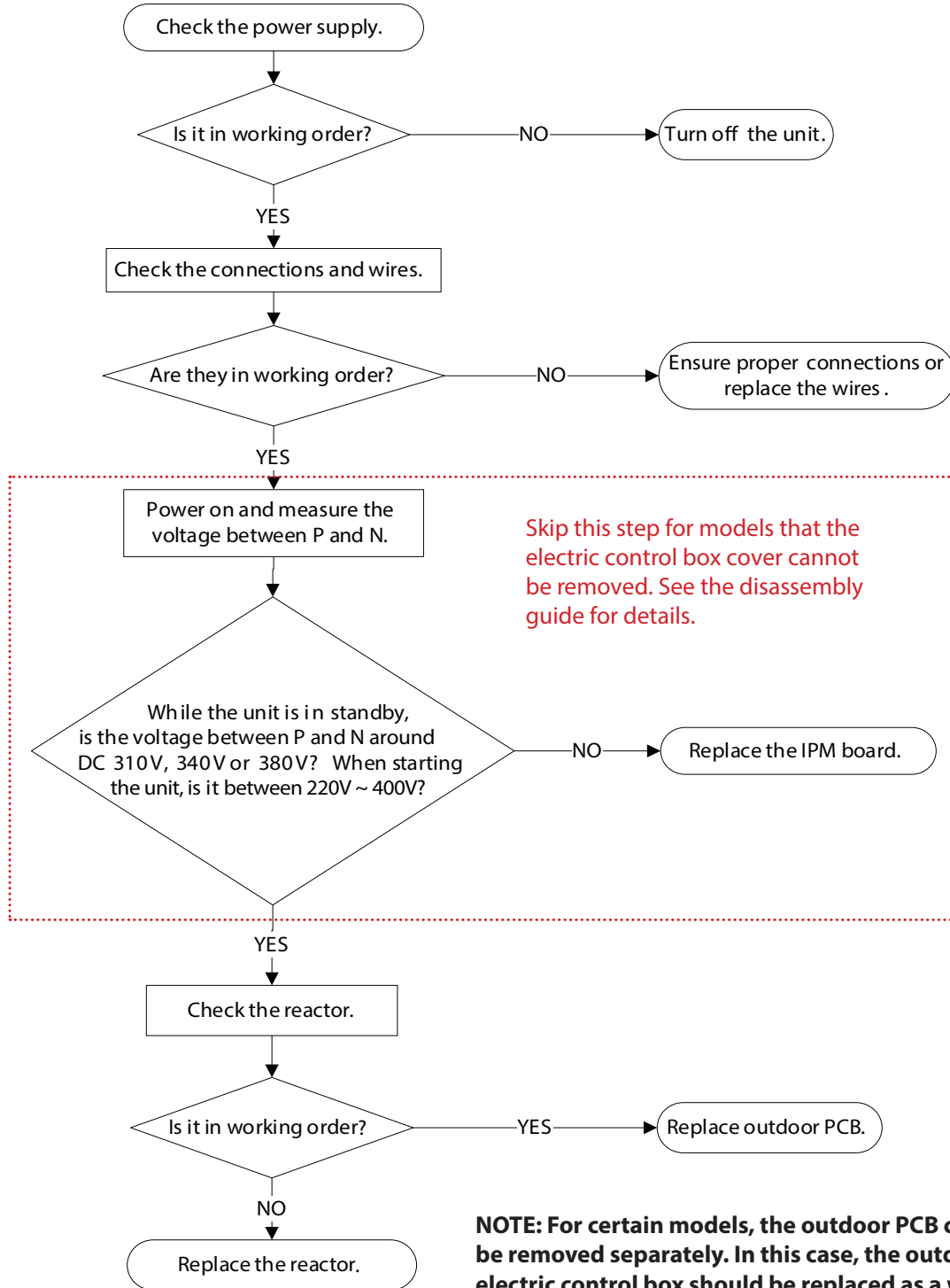
PC 01 Over voltage or too low voltage protection diagnosis and solution

Description: Abnormal increases or decreases in voltage are detected by checking the specified voltage detection circuit.

Recommended parts to repair:

- Power supply wires
- IPM module board
- PCB
- Reactor

Troubleshooting



DIAGNOSIS AND SOLUTION (CONT.)

PC 02 Top temperature protection of compressor or High temperature protection of IPM module or High pressure protection diagnosis and solution

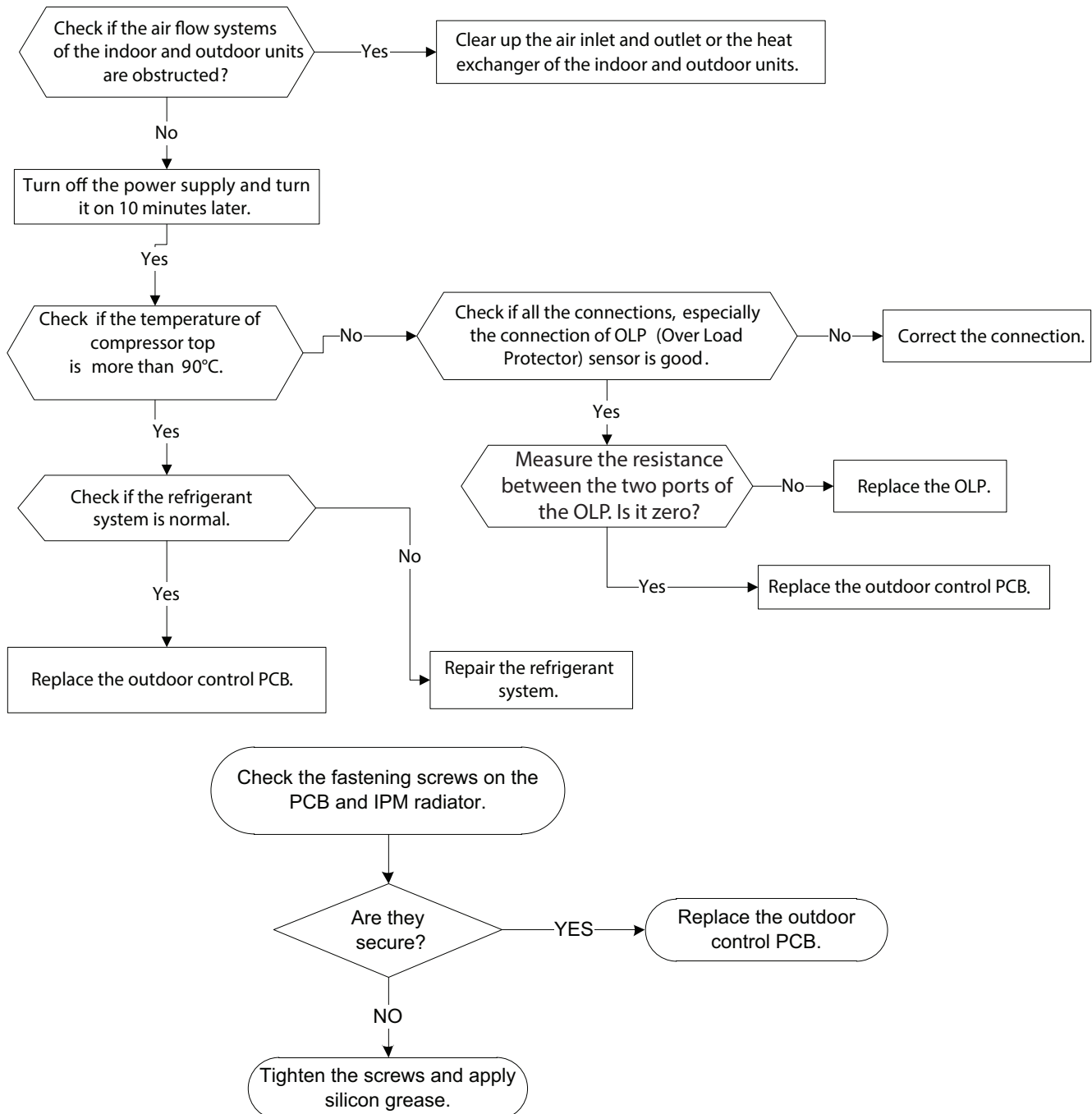
Description: For some models with overload protection, if the sampling voltage is not 5V, the LED displays the failure. If the IPM module temperature is higher than a certain value, the LED displays the failure code.

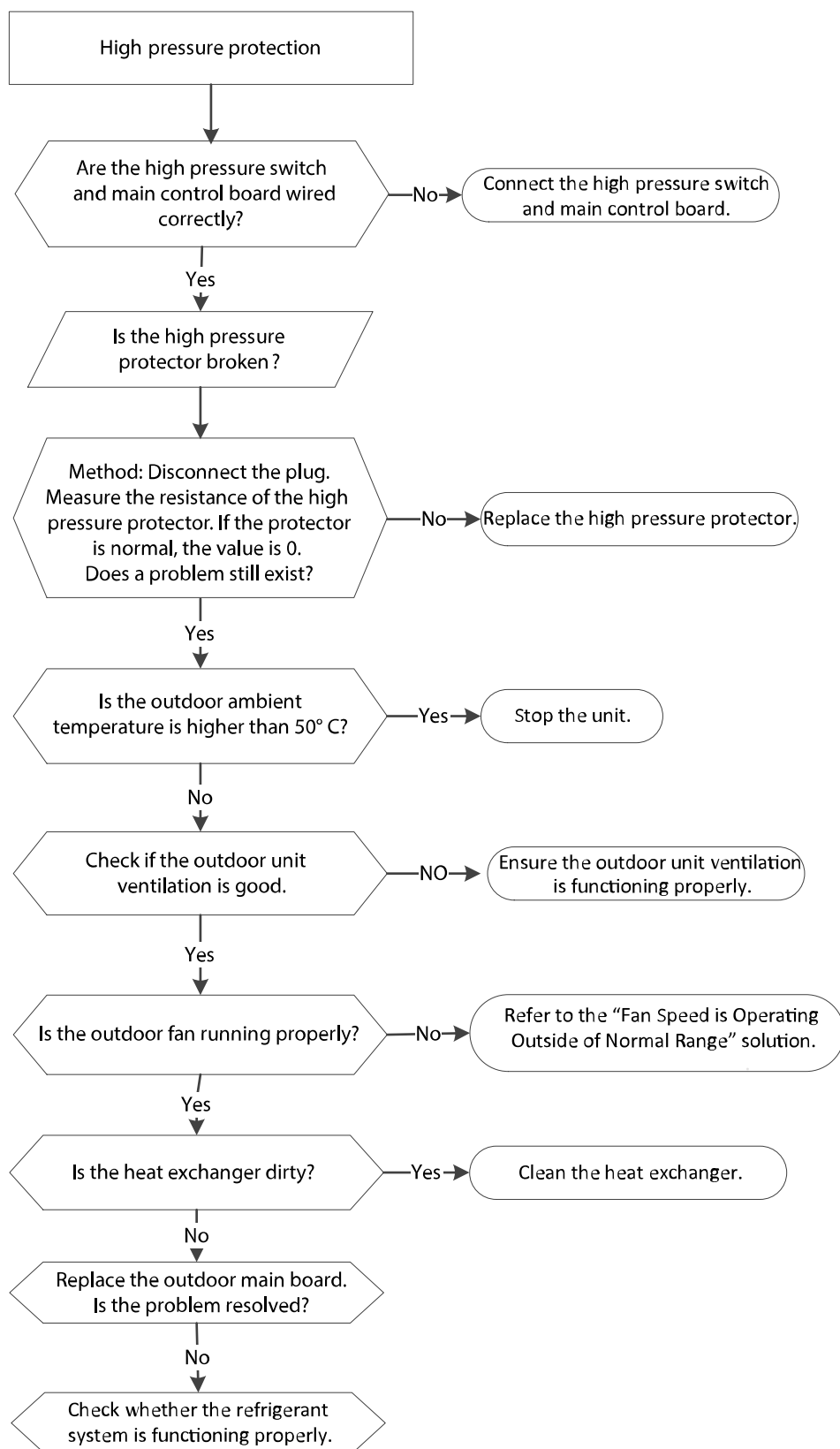
For some models with a high pressure switch, the outdoor pressure switch cuts the system off because the high pressure is higher than 4.4 MPa and the LED displays the failure code.

Recommended parts to repair:

- Connection wires
- Outdoor PCB
- IPM module board
- High pressure protector
- System block

Troubleshooting





DIAGNOSIS AND SOLUTION (CONT.)

Over voltage or excessively low voltage protection diagnosis and solution

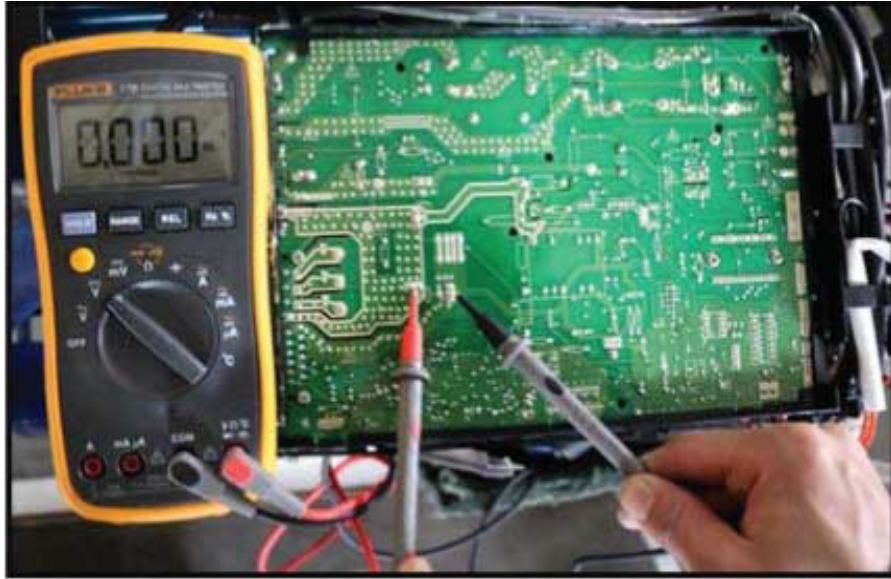


Fig. 21 —Test

A210575

DIAGNOSIS AND SOLUTION (CONT.)

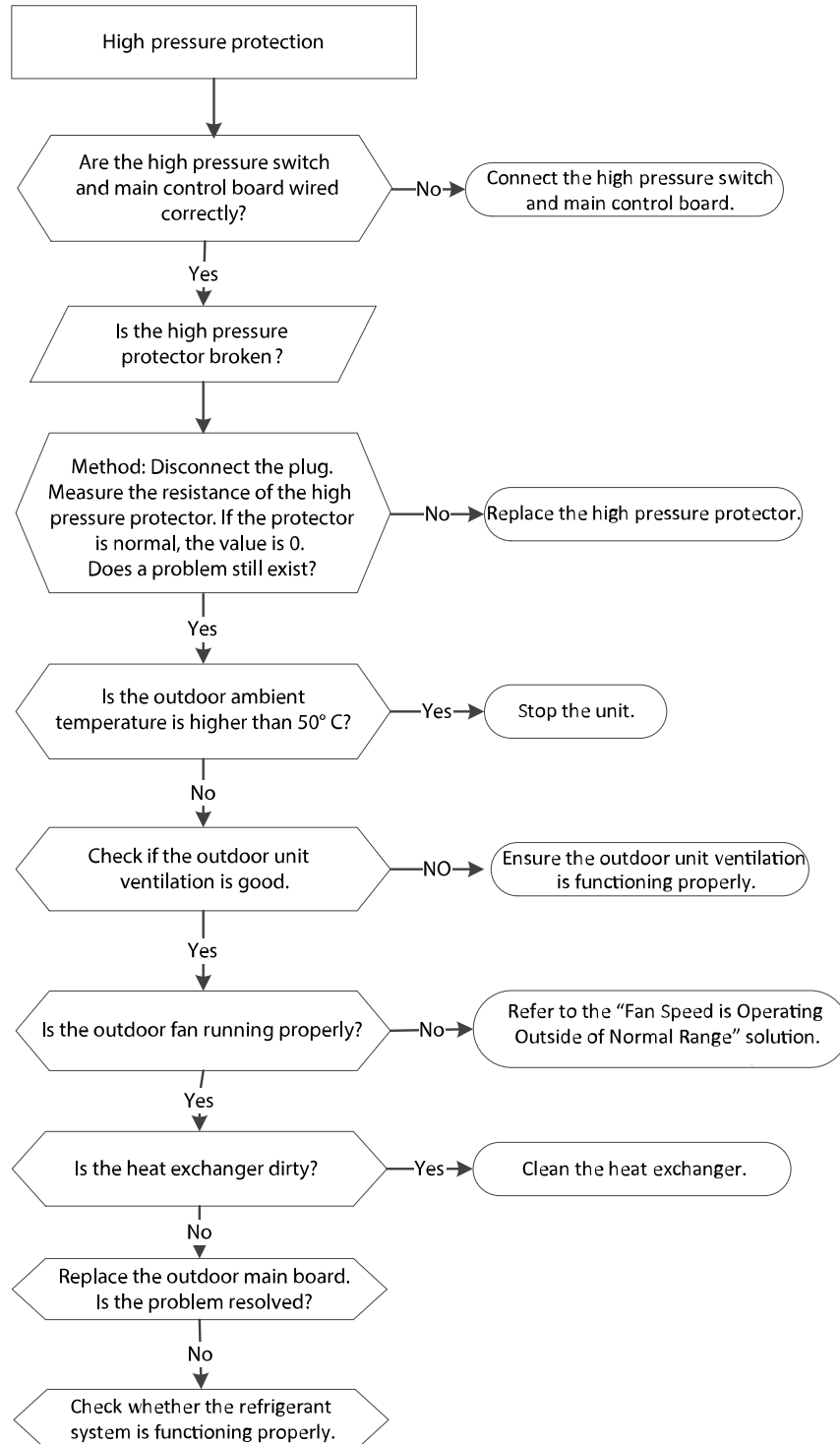
PC 03 High pressure protection or Low pressure protection diagnosis and solution

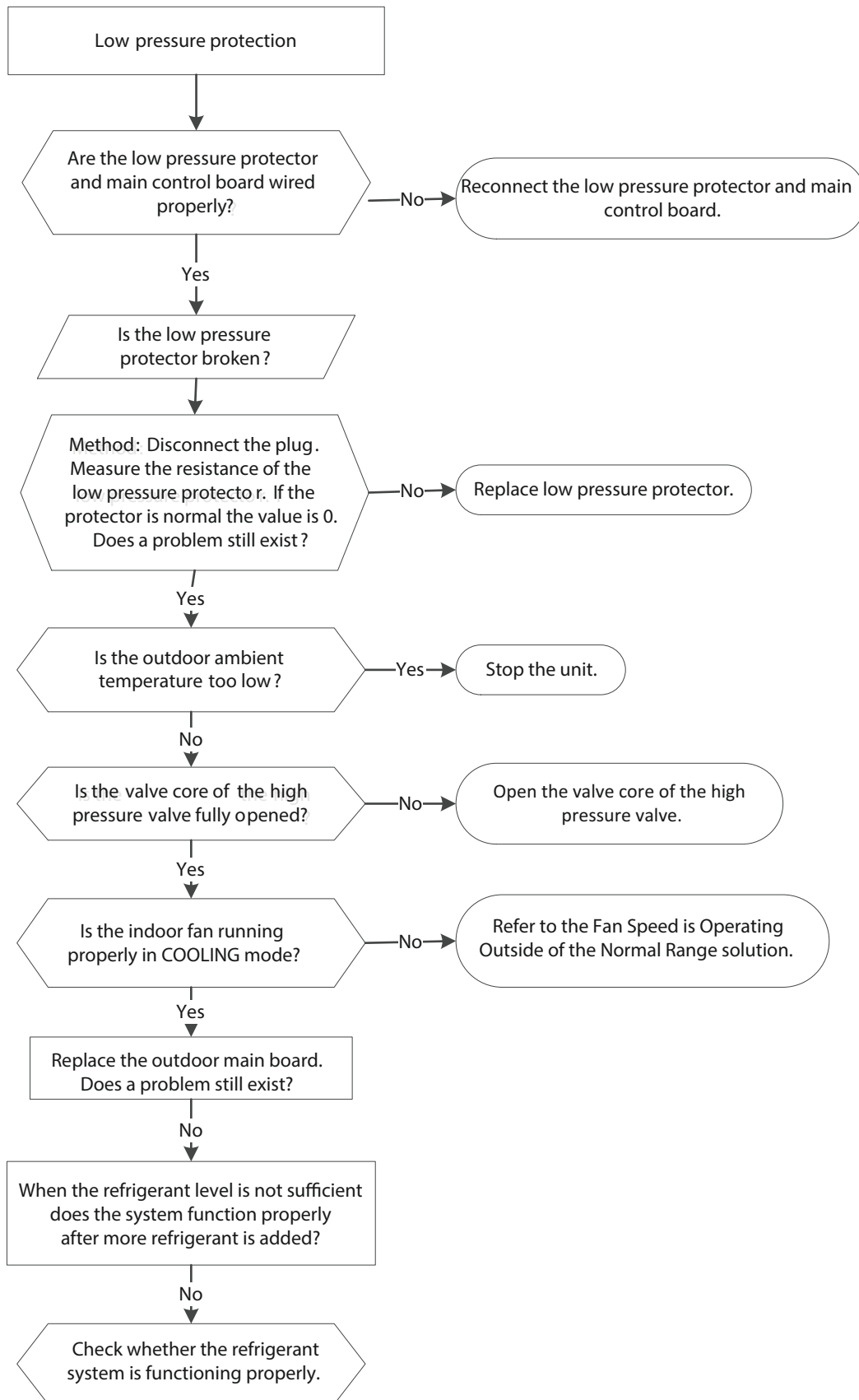
Description: The outdoor pressure switch cuts off the system because the high pressure is higher than 4.4 MPa or the outdoor pressure switch cuts off the system because the low pressure is lower than 0.13 MPa, the LED displays the failure code.

Recommended parts to repair:

- Connection wires
- Outdoor PCB
- Refrigerant
- Pressure switch
- Outdoor fan

Troubleshooting





DIAGNOSIS AND SOLUTION (CONT.)

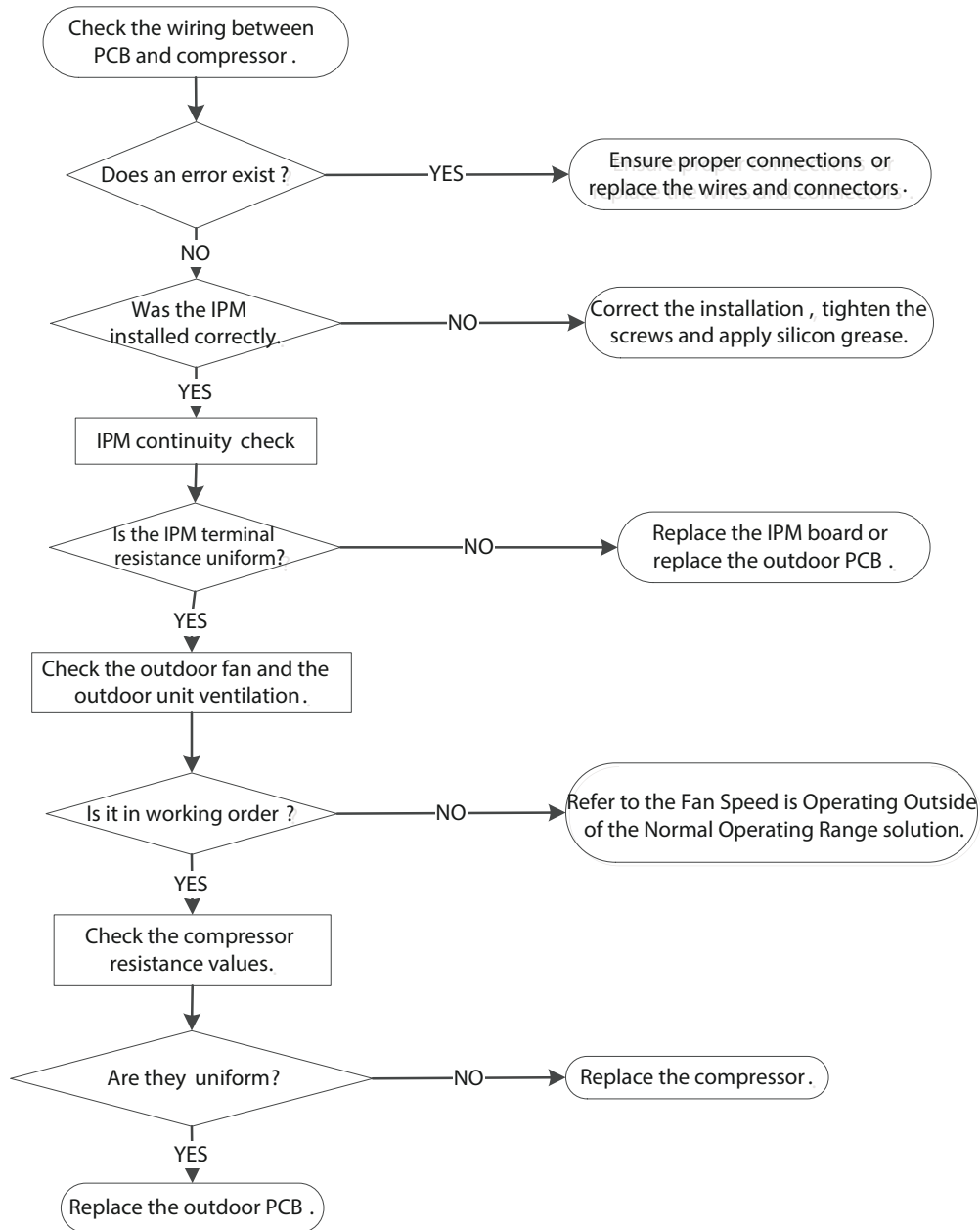
PC 04 Inverter compressor drive error diagnosis and solution

Description: An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection.

Recommended parts to repair:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB

Troubleshooting



DIAGNOSIS AND SOLUTION (CONT.)

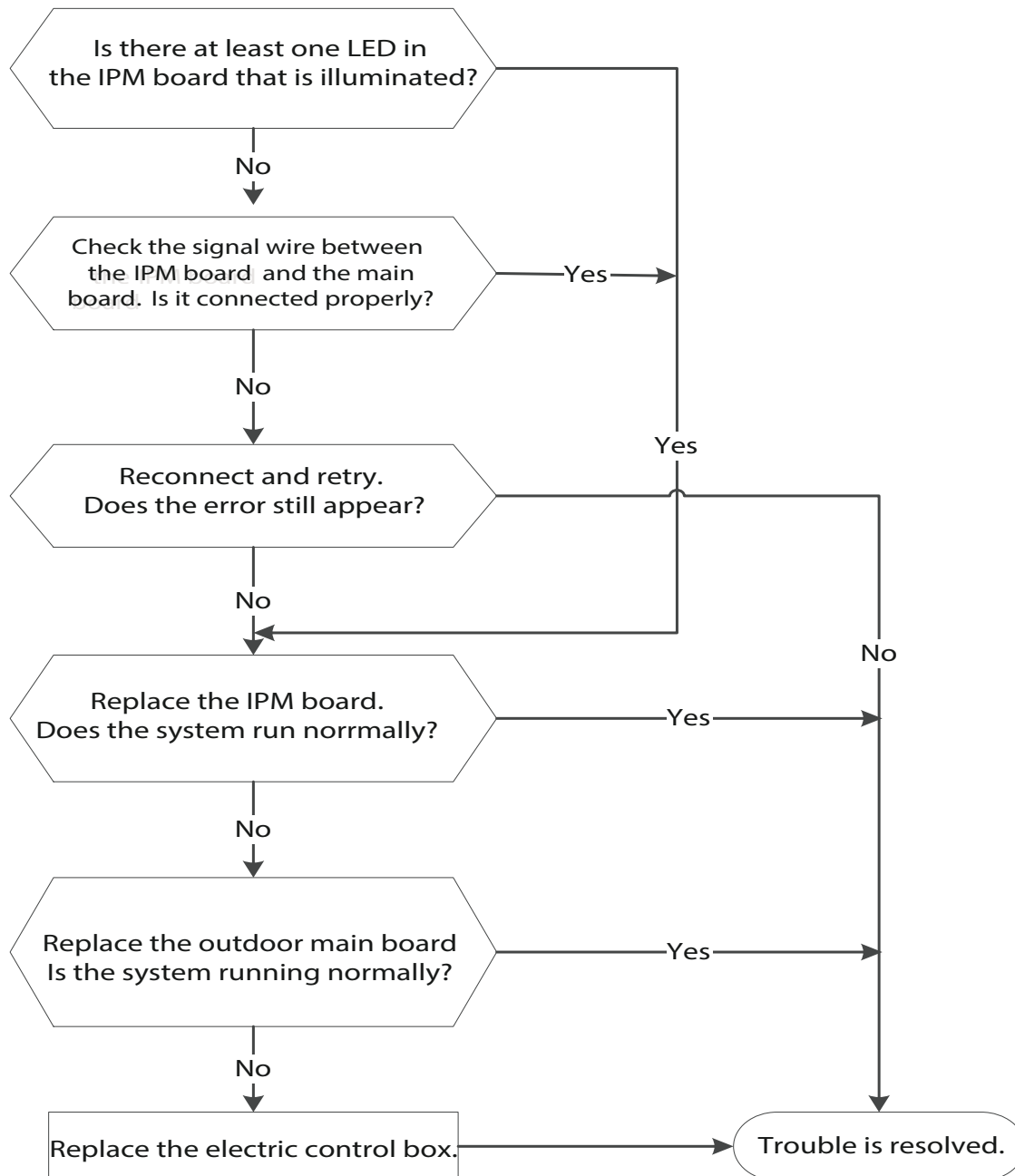
PC 40 Communication error between outdoor main PCB and IPM board diagnosis and solution

Description: The main PCB cannot detect the IPM board.

Recommended parts to repair:

- Connection wires
- IPM board
- Outdoor Main PCB
- Electric Control Box

Troubleshooting



DIAGNOSIS AND SOLUTION (CONT.)

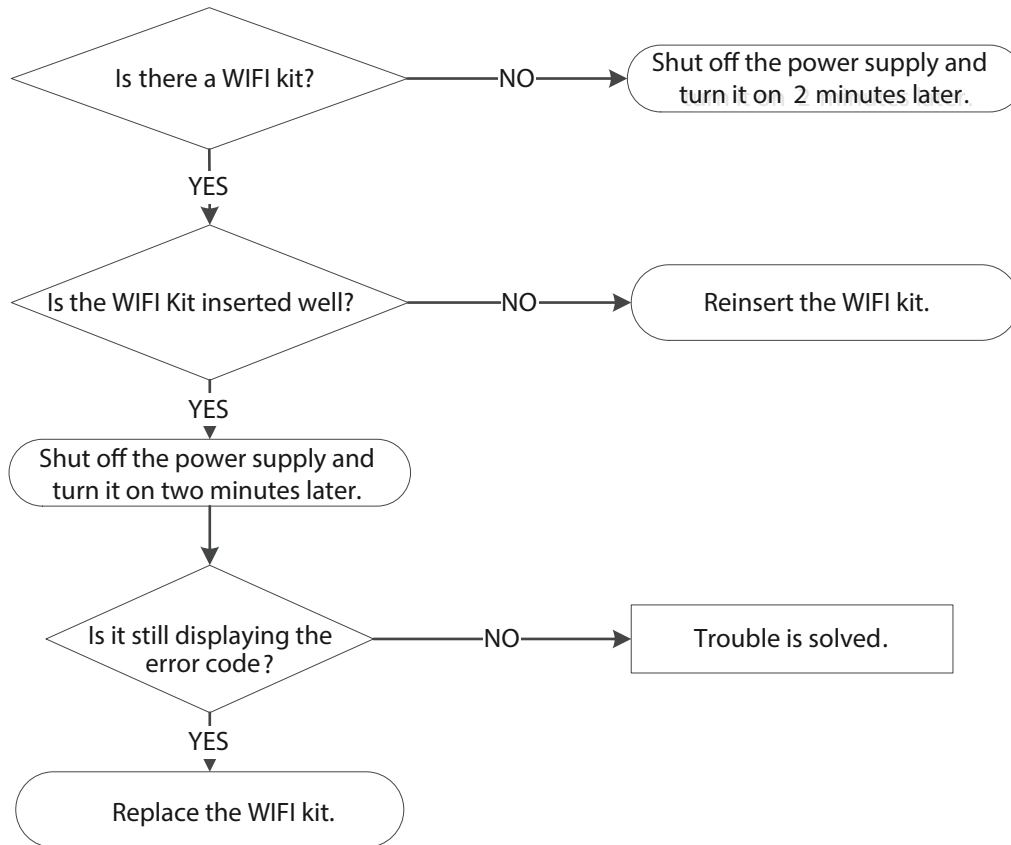
AP mode is active but there is no WIFI kit installed diagnosis and solution

Description: AP mode is active however cannot detect WIFI kit.

Recommended parts to repair:

- Wi-Fi Kit

Troubleshooting



CHECK PROCEDURES

Temperature Sensor Check



WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock.

Operate after compressor and coil have returned to normal temperature in case of injury.

1. Disconnect the temperature sensor from the PCB.
2. Measure the resistance value of the sensor using a multi-meter.
3. Check the corresponding temperature sensor resistance value table (see “APPENDICES” on page 71).

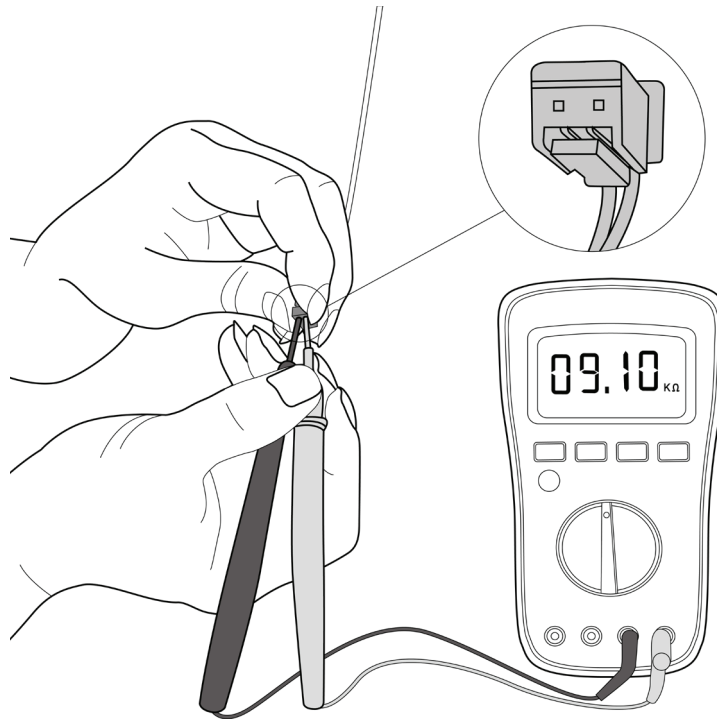


Fig. 22 —Check Procedures

Compressor Check

1. Disconnect the compressor power cord from the outdoor PCB.
2. Measure the resistance value of each winding using a multi-meter.
3. Check the resistance value of each winding (see Tables 9 - 13).

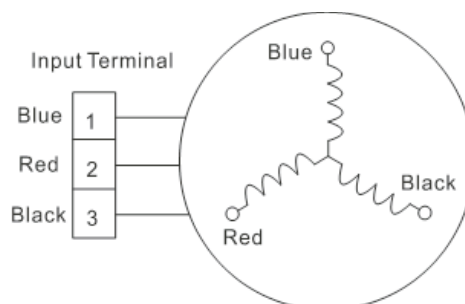


Fig. 23 — Input Terminal

Table 9 — Compressor Check

RESISTANCE VALUE	ASM135D23UFZ	ATQ420D1UMU	ASN98D22UFZ	ATF235D22UMT	ATQ360D1UMU
BLUE-RED	1.75 Ω	0.37 Ω	1.57 Ω	0.75 Ω	0.37 Ω
BLUE-BLACK					
RED-BLACK					

Table 10 — Compressor Check

RESISTANCE VALUE	ATM115D43UFZ2	ATF250D22UMT	ATF310D43UMT	KSK103D33UEZ3(YJ)	ASM98D32UFZ
BLUE-RED	1.87 Ω	0.75 Ω	0.65 Ω	2.13 Ω	2.2 Ω
BLUE-BLACK					
RED-BLACK					

Table 11 — Compressor Check

RESISTANCE VALUE	ASN140D21UFZ	ASK89D29UEZD	KSN140D21UFZ	KTM240D57UMT	KSK103D33UEZ3
BLUE-RED	1.28 Ω	1.99 Ω	1.28 Ω	0.62 Ω	2.13 Ω
BLUE-BLACK					
RED-BLACK					

Table 12 — Compressor Check

RESISTANCE VALUE	KTF310D43UMT	KTQ420D1UMU	ATN150D30UFZA	KTM240D43UKT	KTN110D42UFZ
BLUE-RED	0.65 Ω	0.37 Ω	1.03 Ω	1.03 Ω	1.82 Ω
BLUE-BLACK					
RED-BLACK					

Table 13 — Compressor Check

RESISTANCE VALUE	KTF250D22UMT	KSN140D58UFZ
BLUE-RED	0.75 Ω	1.86 Ω
BLUE-BLACK		
RED-BLACK		

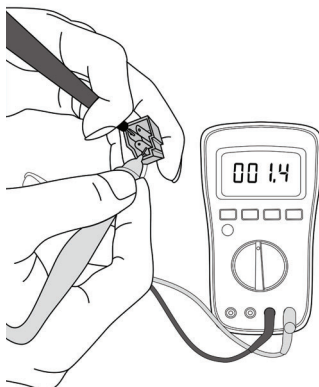


Fig. 24 — Compressor Check

IPM Continuity Check

**WARNING**

Electricity remains in capacitors even when the power supply is off.
Ensure the capacitors are fully discharged before troubleshooting.

- 1. Turn off outdoor unit and disconnect power supply.
- 2. Discharge electrolytic capacitors and ensure all energy-storage unit has been discharged.
- 3. Disassemble outdoor PCB or disassemble IPM board.
- 4. Measure the resistance value between P and U (V, W, N); U (V, W) and N.

Table 14 — IPM Continuity

DIGITAL TESTER		RESISTANCE VALUE	DIGITAL TESTER		RESISTANCE VALUE
(+) Red	(-) Black	∞ (Several M Ω)	(+) Red	(-) Black	∞ (Several M Ω)
P	N		U	N	
	U		V		
	V		W		
	W		-		

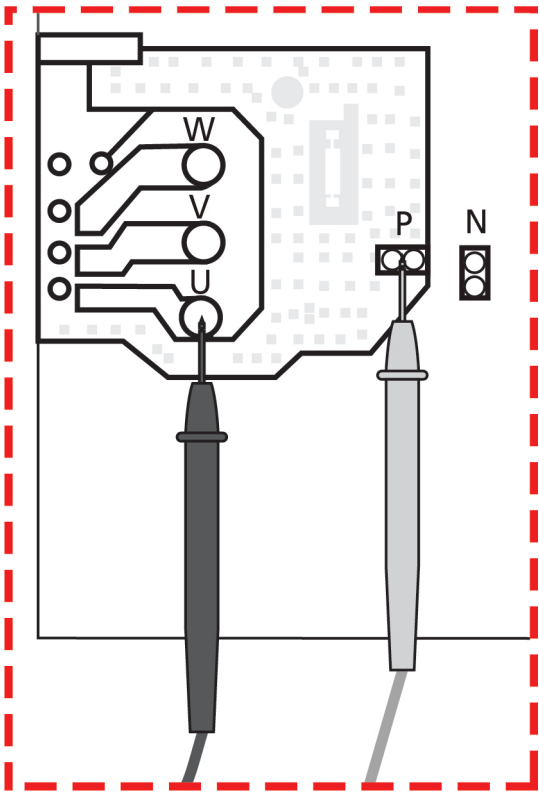


Fig. 25 — IPM Continuity Check

4-Way Valve Check

1. Power on the unit.
2. Use a digital tester to measure the voltage. When the unit operates in the **COOLING** mode, it is **0V**. When the unit operates in the **HEATING** mode, it is about **230VAC**.

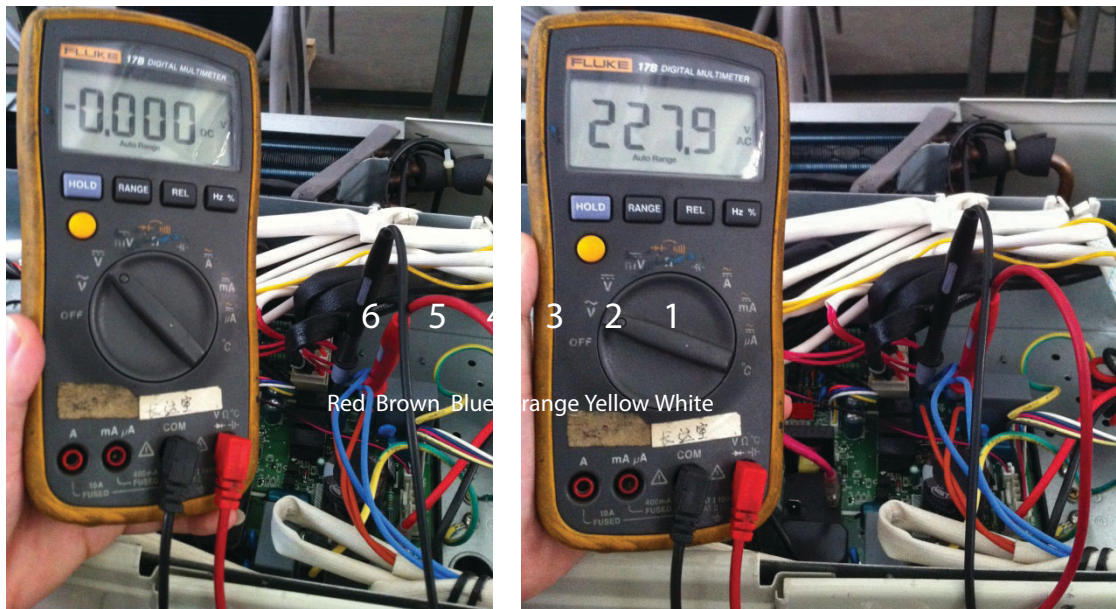


Fig. 26 — Test

3. Turn off the power.
4. Use a digital tester to measure the resistance. The value should be **1.8~2.5 K Ω** .

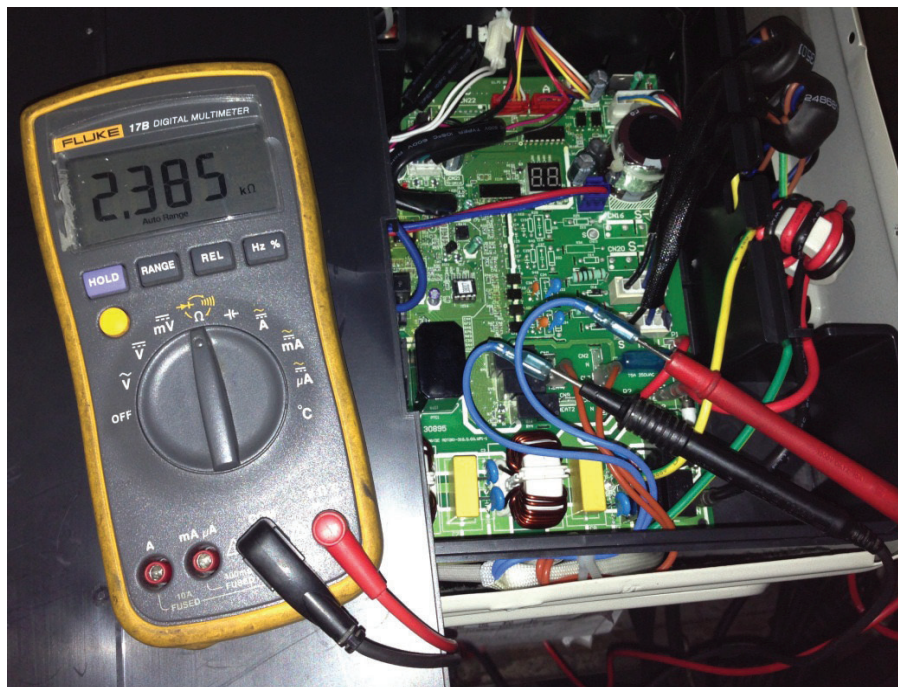
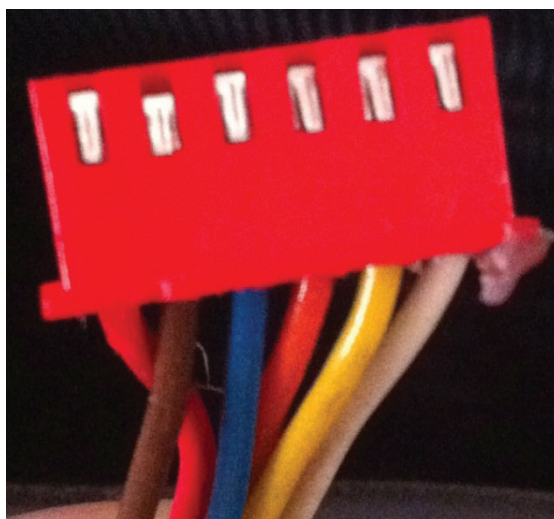


Fig. 27 — Test

EXV Check**WARNING**

Electricity remains in capacitors even when the power supply is off.
Ensure the capacitors are fully discharged before troubleshooting.

1. Disconnect the connector from the outdoor PCB.
2. Measure the resistance value of each winding using a multi-meter.
3. Check the resistance value of each winding in Table 15.

**Fig. 28 — EXV Check****Table 15 — EXV Check**

LEAD WINDING COLOR	NORMAL VALUE
Red - Blue	About 50 Ω
Red - Yellow	
Brown - Orange	
Brown - White	

Main Parts Check

Temperature Sensor Checking

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



Fig. 29 —Tester

Temperature Sensors

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

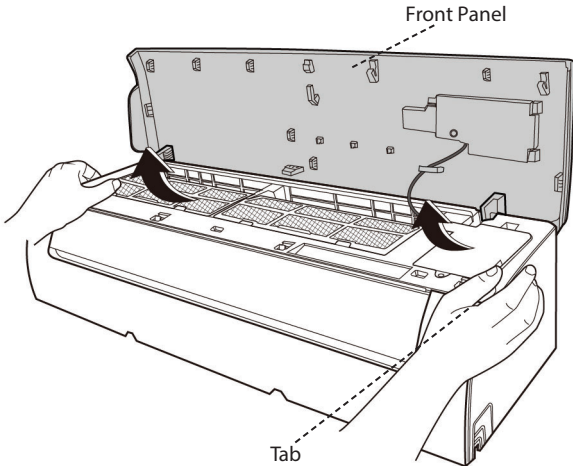
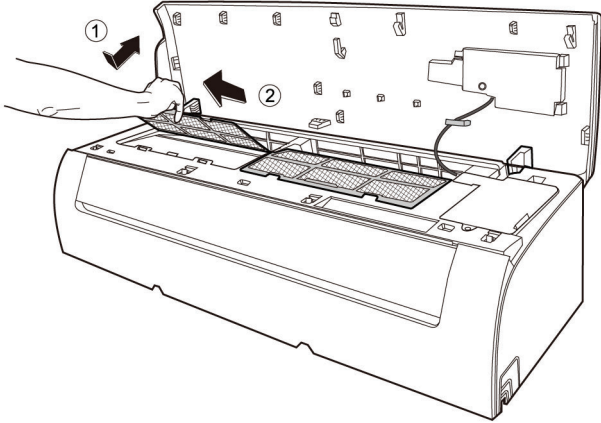
Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(TP) sensor.

Measure the resistance value of each winding by using the multi-meter.

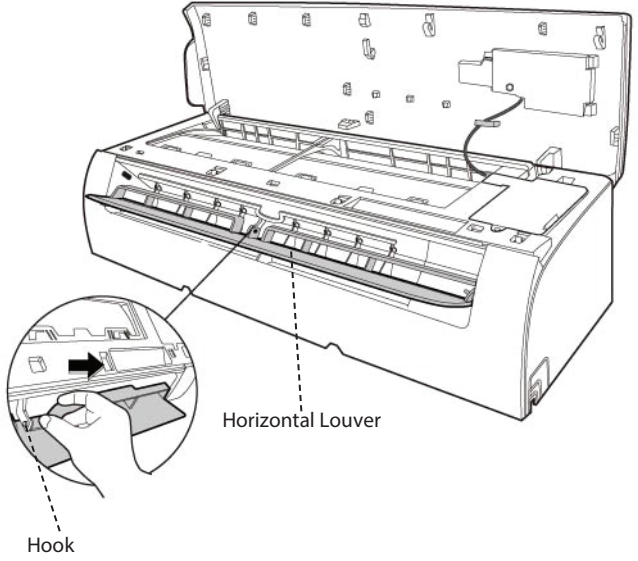
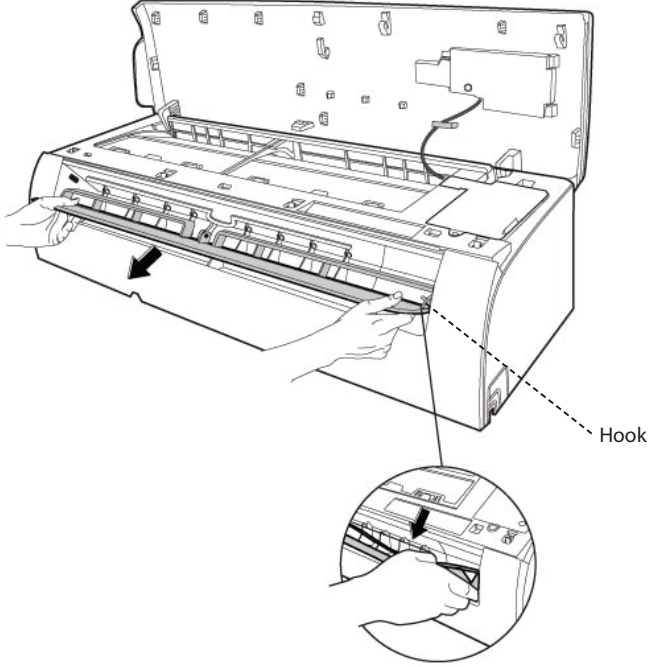
DISASSEMBLY INSTRUCTIONS (09K-24K)

Front Panel

Procedure	Illustration
1) Hold the front panel by the tabs on both sides and lift it.	 The illustration shows the front panel of the device being lifted. Two hands are shown holding the front panel by the tabs on both sides. The front panel is shown in a partially open position, revealing the internal components. A label 'Front Panel' points to the top of the panel, and a label 'Tab' points to the side tabs.
2) Push up the bottom of an air filter (step 1), and then pull it out (downwards).	 The illustration shows the air filter being pushed up and pulled out. A hand is shown pushing up the bottom of the air filter, indicated by arrow 1. Another hand is shown pulling the air filter out downwards, indicated by arrow 2.

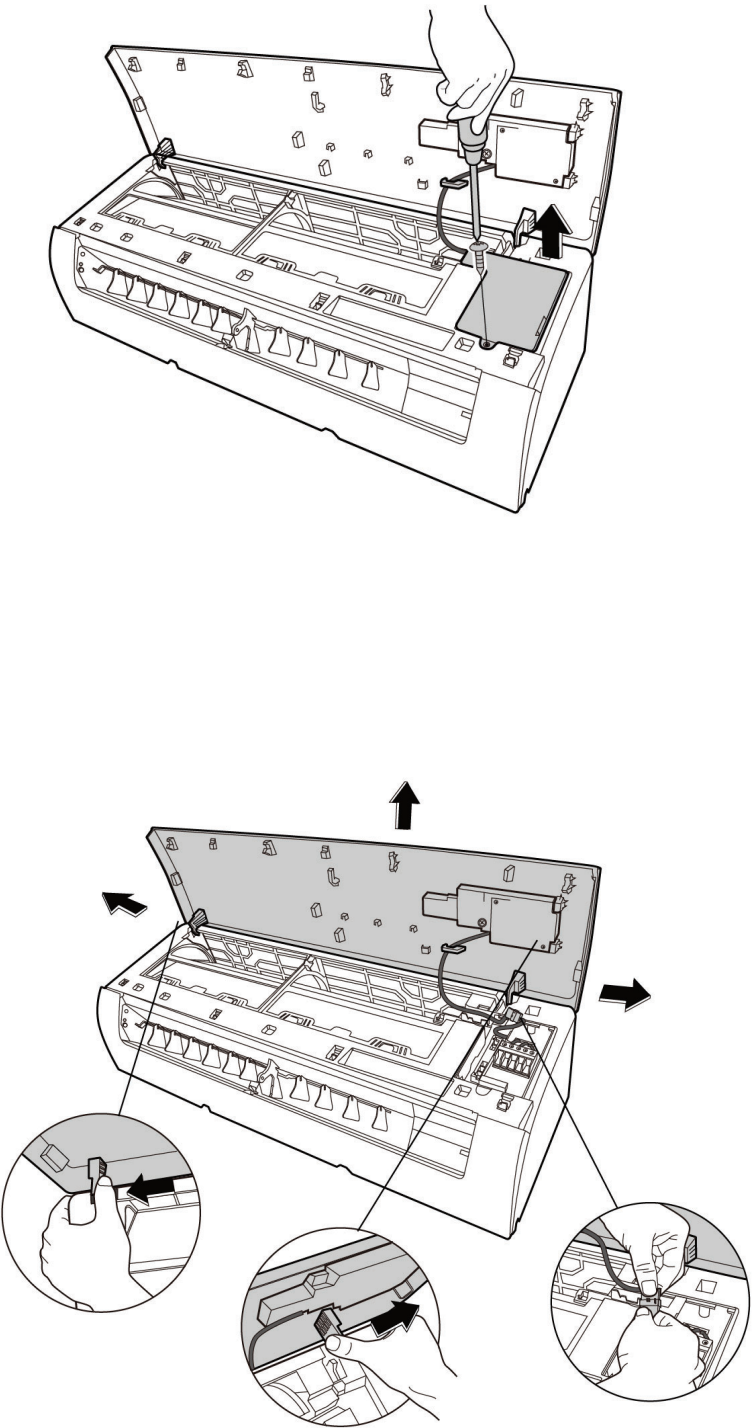
DISASSEMBLY INSTRUCTIONS (09K-24K)

Front Panel

Procedure	Illustration
3) Open the horizontal louver and push the hook towards left to open it.	 The illustration shows the front panel of the device with the horizontal louver open. A circular inset provides a close-up view of a hand pushing a hook to the left, as indicated by a black arrow. Labels with dashed lines point to the 'Horizontal Louver' and the 'Hook'.
4) Bend the horizontal louver lightly with both hands to loosen the hooks, then remove the horizontal louver.	 The illustration shows the front panel with the horizontal louver being bent downwards by two hands, as indicated by a black arrow. A circular inset shows a close-up of a hand bending the louver. A label with a dashed line points to a 'Hook'.

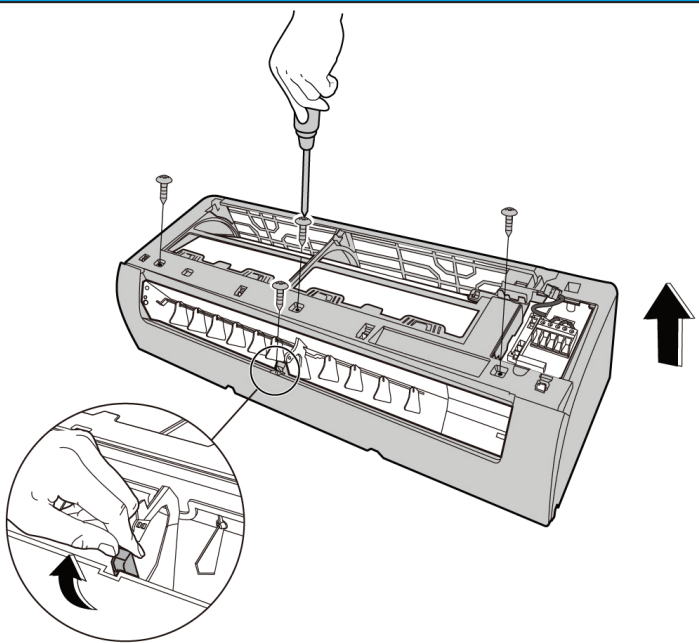
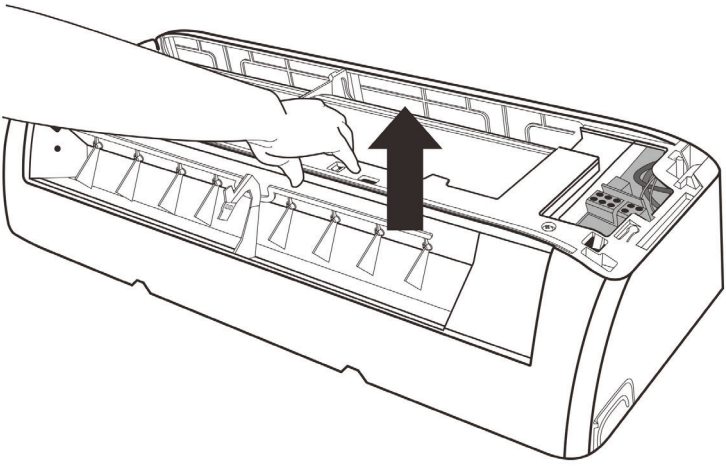
DISASSEMBLY INSTRUCTIONS (09K-24K)

Front Panel

Procedure	Illustration
5) Pry the electrical cover open with a screwdriver, and rotate it leftward, then remove it. 6) Disconnect the display board connector. 7) Slide the front panel side to side to release each axis.	 The illustration shows the disassembly of the front panel in three steps. The top diagram shows a hand using a screwdriver to pry open the electrical cover, with an arrow indicating rotation to the left. The middle diagram shows the cover removed and the display board connector being disconnected, with arrows indicating the cover's removal and the connector's disconnection. The bottom diagram shows the front panel being slid side to side to release each axis, with three circular insets showing close-up views of the panel's movement and the release of the axes.

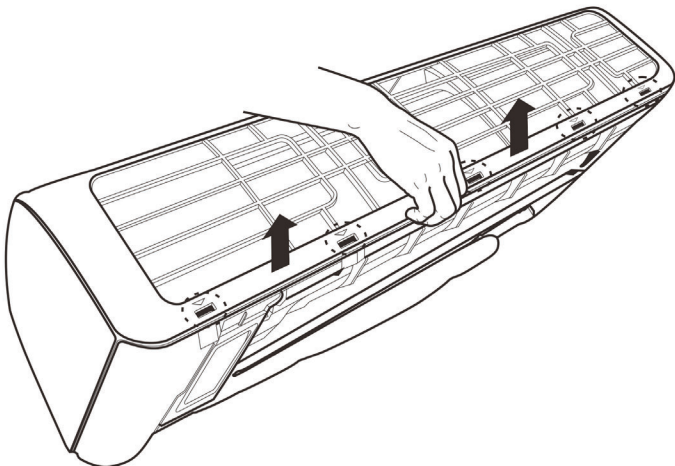
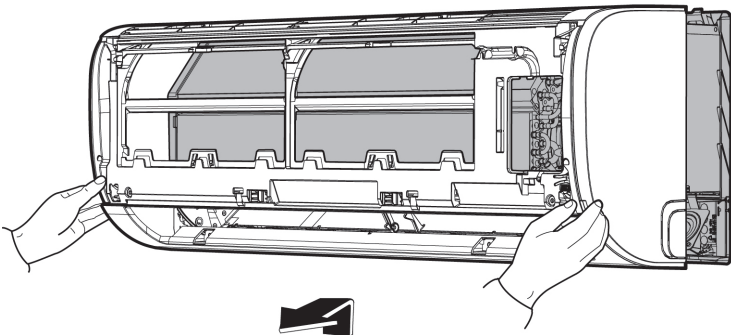
DISASSEMBLY INSTRUCTIONS (09K-24K)

Front Panel

Procedure	Illustration
8) Open the screw cap then remove the 3 screws.	
9) Use your hands to release the hooks.	

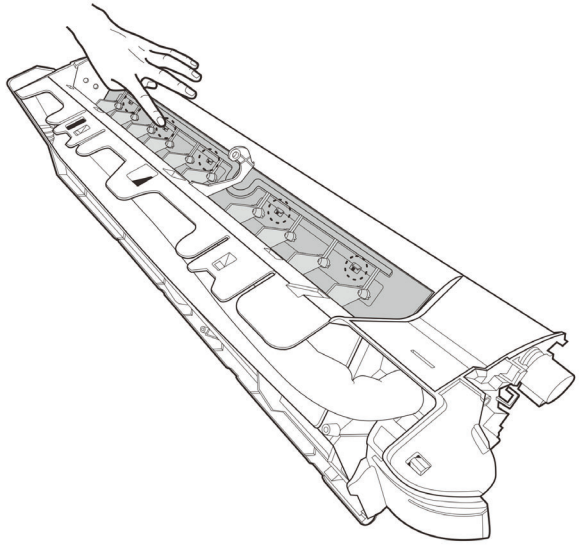
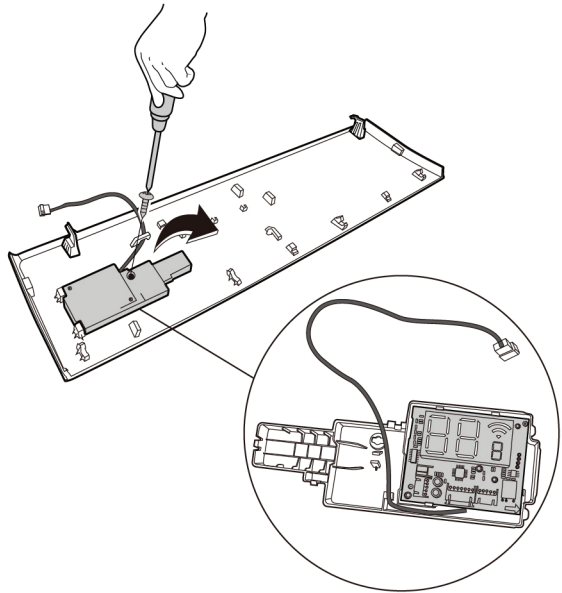
DISASSEMBLY INSTRUCTIONS (09K-24K)

Front Panel

Procedure	Illustration
10) Release the 5 hooks in the back.	 

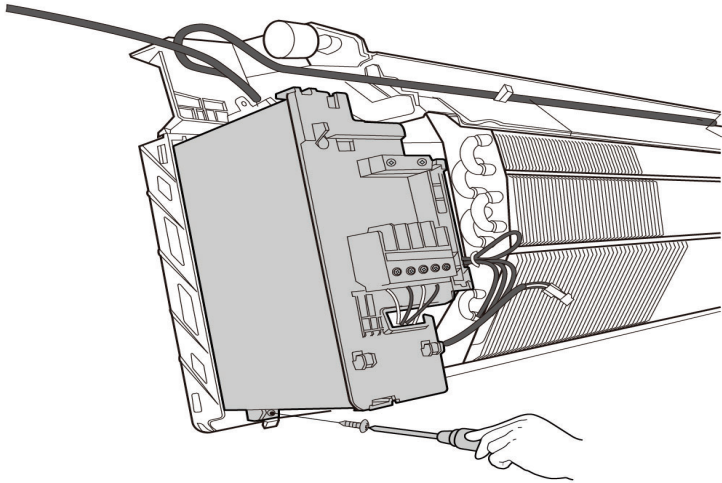
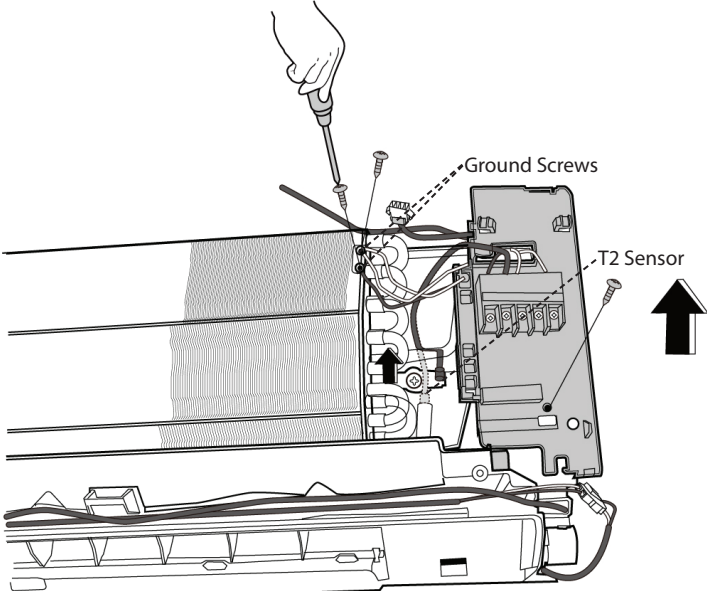
DISASSEMBLY INSTRUCTIONS (09K-24K)

Front Panel

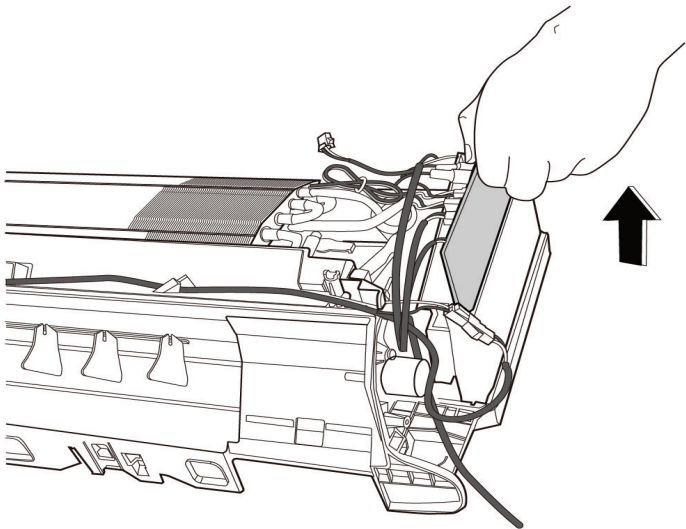
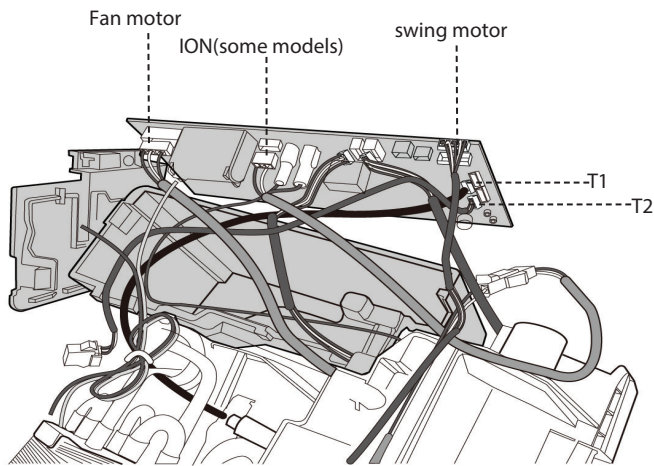
Procedure	Illustration
12) Release the 5 hooks from the vertical blades, then pull the vertical blades rightward and remove it.	 A line drawing showing a hand pulling a vertical blade from the front panel. The blade is being pulled away from the panel, revealing internal components.
13) Remove 1 screw from the display board. 14) Rotate the display board in the direction shown in the picture.	 A line drawing showing a hand using a screwdriver to remove a screw from the display board. An arrow indicates the direction of rotation. A circular inset shows the display board being rotated, revealing its internal components and connectors.

DISASSEMBLY INSTRUCTIONS (09K-24K)

Electrical Parts (Anti-static gloves must be worn)

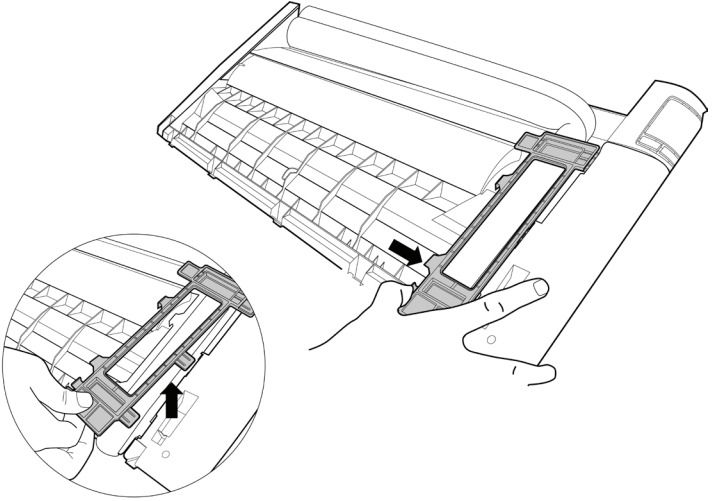
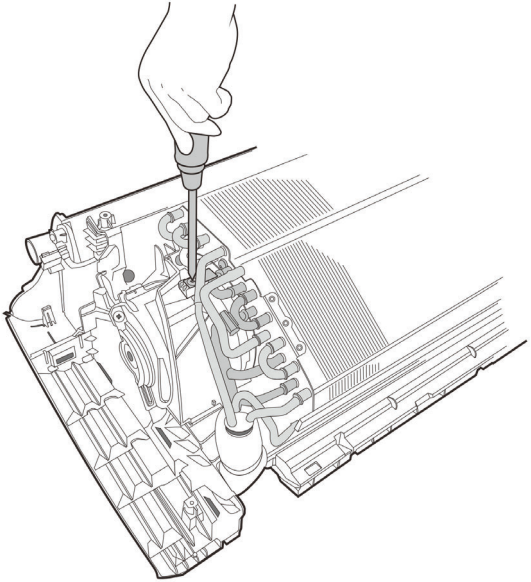
Procedure	Illustration
1) Remove one screw of the electrical control box subassembly. (To repair the electrical control box components, perform the first step. To repair the main control board assembly, perform steps 2 through 5.	 The illustration shows a side view of the electrical control box subassembly. A hand is using a screwdriver to remove a screw from the bottom edge of the box. Wires and other components are visible inside the box.
2) Use a shear to cut the ribbon, then pull out the coil temperature sensor (T2). 3) Remove one screw from the electronic control box and the two screws used for the ground connection.	 The illustration shows a top-down view of the electronic control box. A hand is using a shear to cut a ribbon cable. A coil temperature sensor (T2) is being pulled out. Two ground screws are also being removed. Labels with dashed lines point to the 'Ground Screws' and the 'T2 Sensor'. A large black arrow points upwards, indicating the direction of removal for the T2 sensor.

DISASSEMBLY INSTRUCTIONS (09K-24K)**Electrical Parts (Anti-static gloves must be worn)**

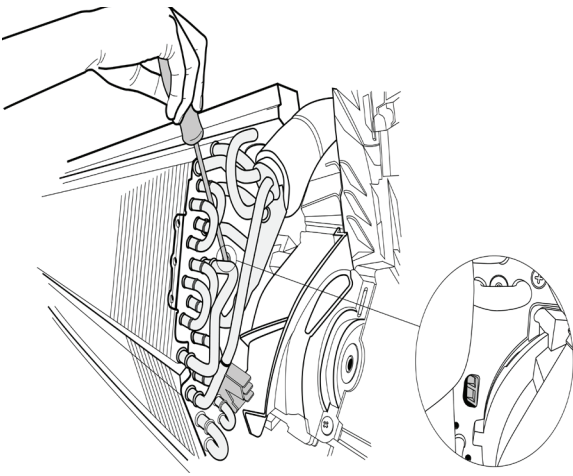
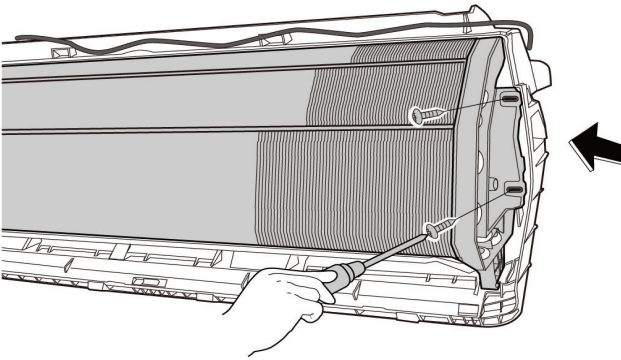
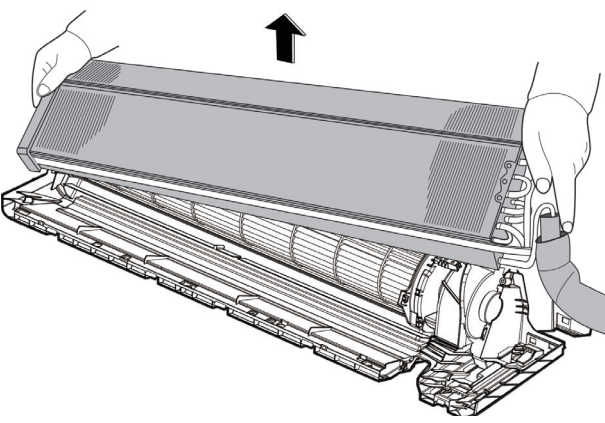
Procedure	Illustration
4) Pull out the electrical main board along the direction shown in the image to the right.	
5) Disconnect the connectors and remove the main control board.	

DISASSEMBLY INSTRUCTIONS) (09K-24K)**Evaporator**

NOTE: Remove the front panel and electrical parts before disassembling the evaporator.

Procedure	Illustration
1) Disassemble the pipe holder located at the rear of the unit.	
2) Remove 1 screw on the evaporator located at the plate.	

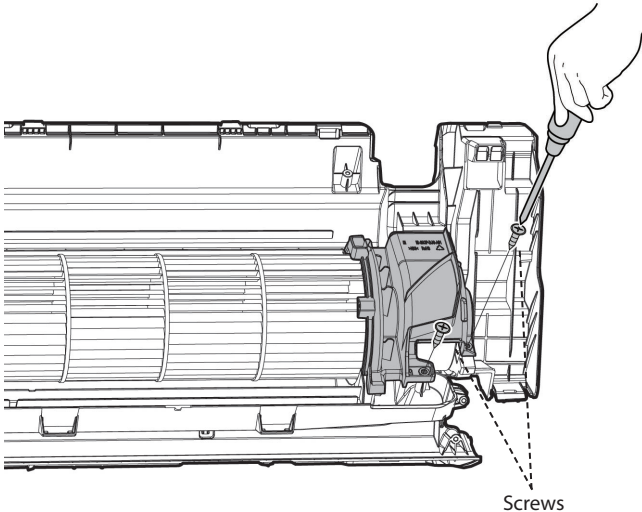
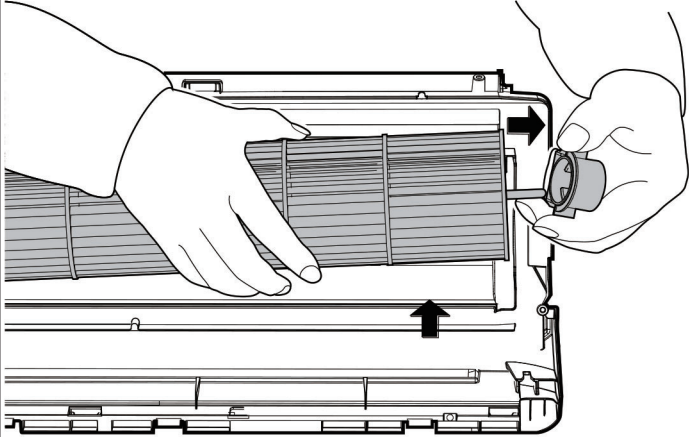
DISASSEMBLY INSTRUCTIONS) (09K-24K)**Evaporator**

Procedure	Illustration
3) Remove 1 screw and release the hook on the evaporator.	 A line drawing showing a hand using a screwdriver to remove a screw from a bracket. A circular inset shows a close-up of a hook being released from a component.
4) Remove the 2 screws on the evaporator located at the fixed plate.	 A line drawing of a long, rectangular evaporator unit. A hand is shown using a screwdriver to remove a screw from the bottom right corner. A black arrow points to the right, indicating the direction of removal.
5) Remove the evaporator.	 A line drawing showing the evaporator unit being lifted out of its housing. A black arrow points upwards, indicating the direction of removal.

DISASSEMBLY INSTRUCTIONS (09K-24K)

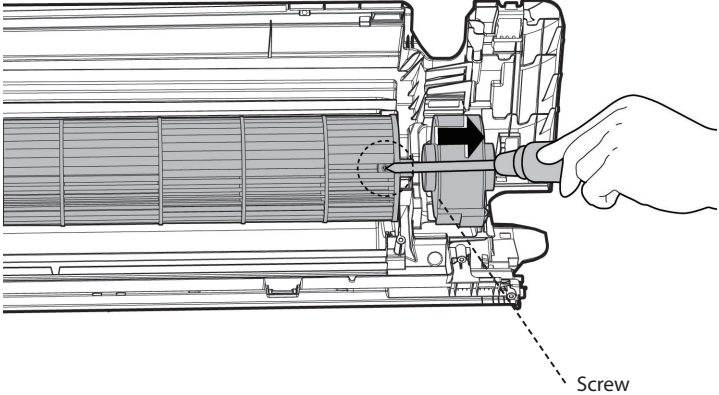
Fan Motor and Fan

NOTE: Remove the front panel, electrical parts and evaporator before disassembling fan motor and fan.

Procedure	Illustration
1) Remove the two screws and remove the fan motor board.	 Screws
2) Remove the bearing sleeve.	

DISASSEMBLY INSTRUCTIONS (09K-24K)

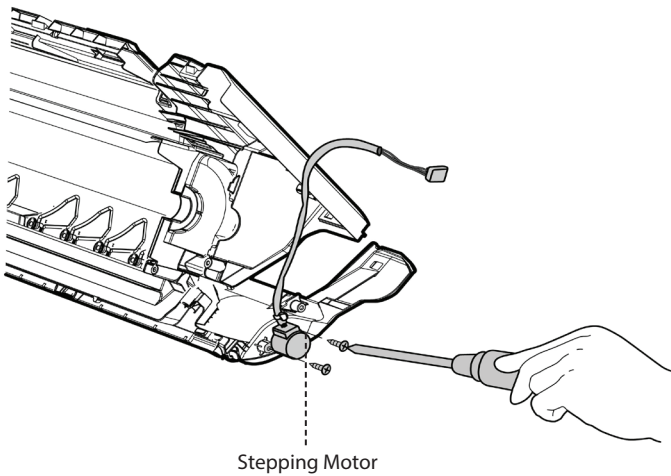
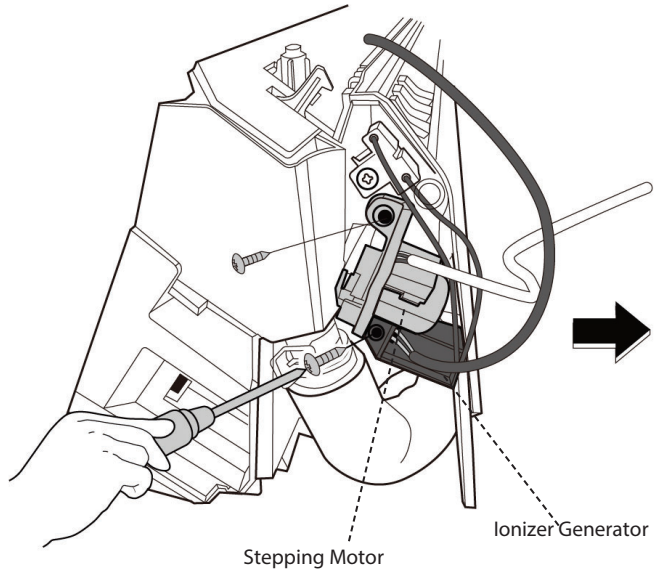
Fan Motor and Fan

Procedure	Illustration
3) Remove the screw. 4) Pull out the fan motor and fan assembly from the side.	

DISASSEMBLY INSTRUCTIONS (09K-24K)

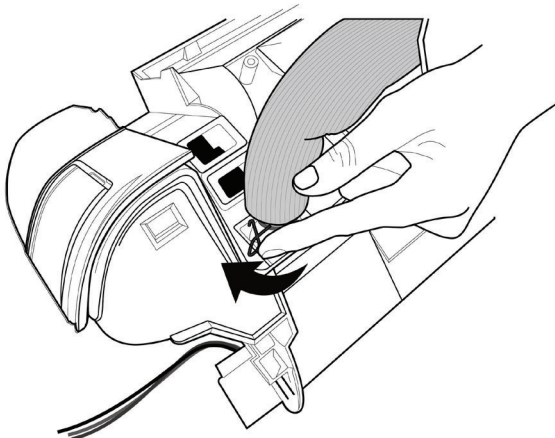
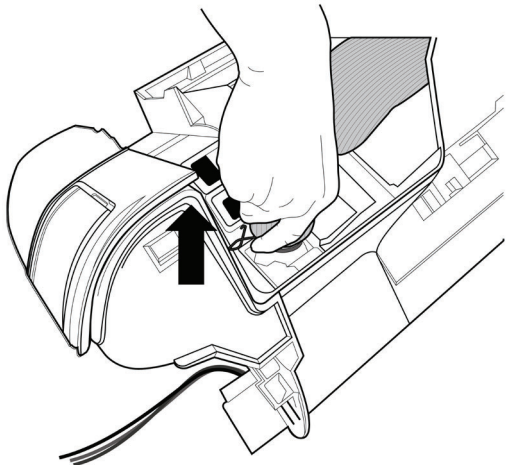
Step Motor

NOTE: Remove the front panel and electrical parts before disassembling the step motor.

Procedure	Illustration
1) Remove the two screws, then remove the horizontal swing motor.	
2) Remove 1 screw, then remove the vertical swing motor.	
3) Remove 1 screw, then remove the ionizer generator.	

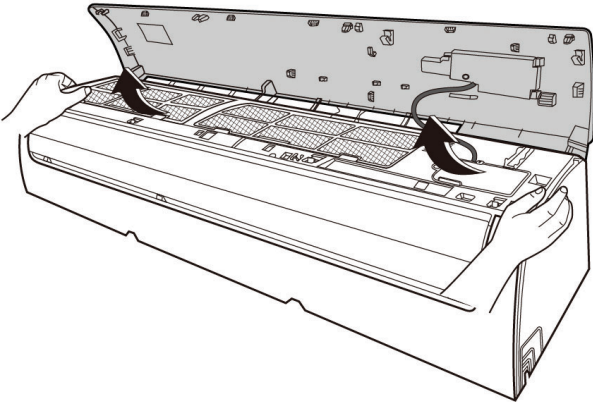
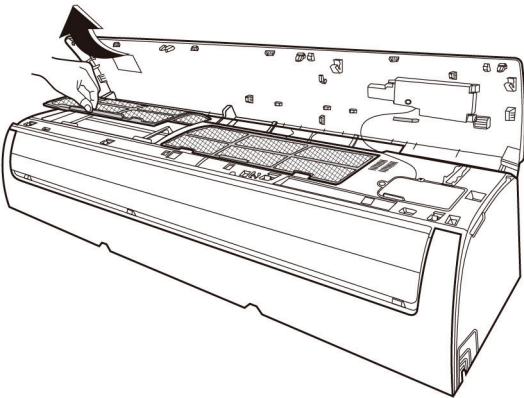
DISASSEMBLY INSTRUCTIONS (09K-24K)

Drain Hose

Procedure	Illustration
1) Rotate the wire clockwise. 2) Pull up the drain hose and remove it.	 

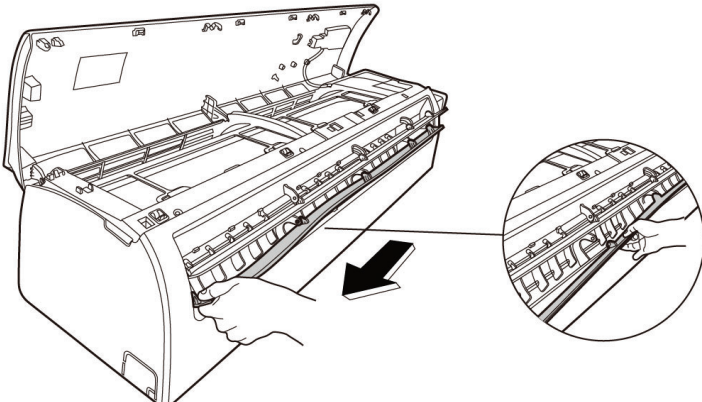
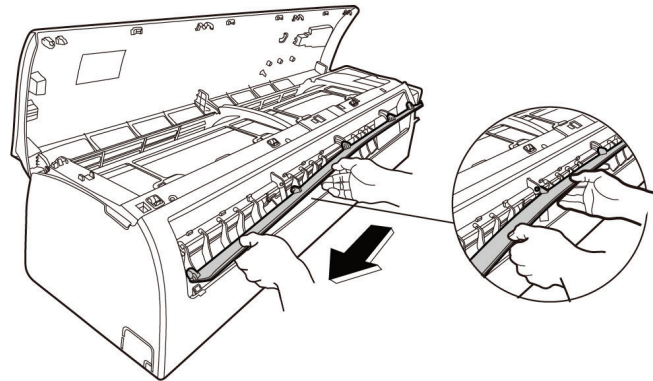
DISASSEMBLY INSTRUCTIONS (30K-36K)

Front Panel

Procedure	Illustration
1) Hold the front panel by the tabs on both sides and lift it. 2) Push up the bottom of the air filter. 3) Pull it downwards to remove .	 

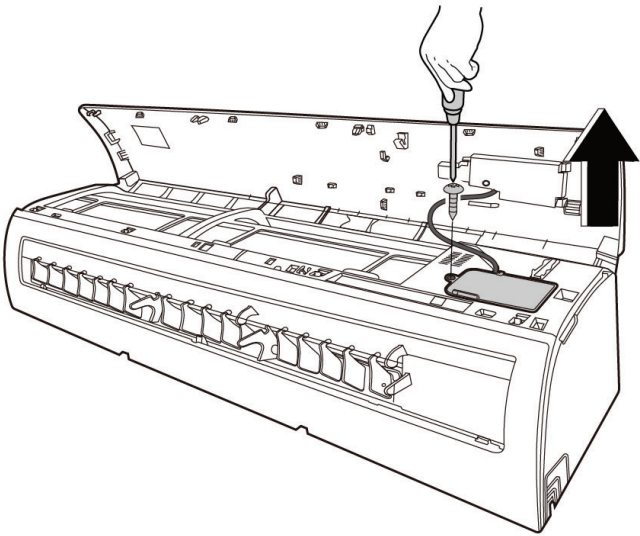
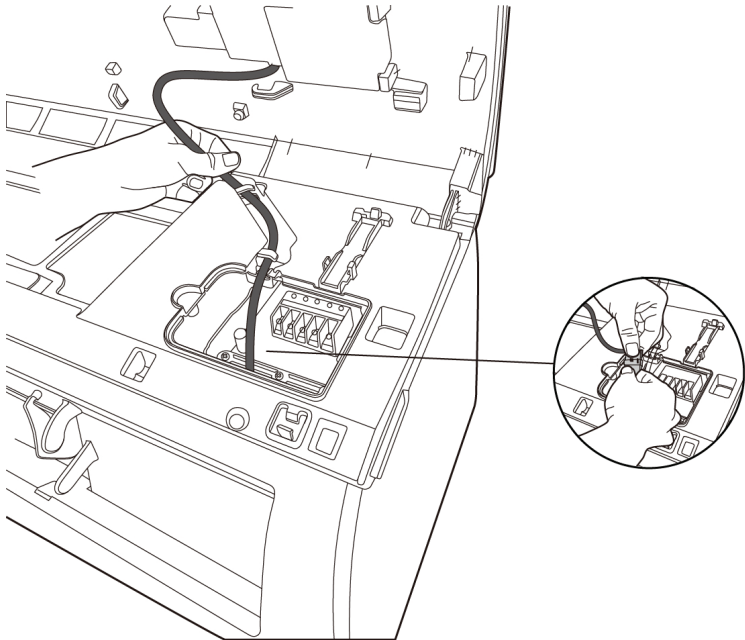
DISASSEMBLY INSTRUCTIONS (30K-36K)

Front Panel

Procedure	Illustration
3) Open the horizontal louver (below) and bend the louver lightly to loosen the left most hook, then push the hook towards the right to loosen the second hook. 4) Remove the horizontal louver (below) towards the left.	 The illustration shows a side view of the front panel of the device with the top cover open. A hand is shown pulling a horizontal louver assembly to the left. A large black arrow points to the left, indicating the direction of movement. A circular inset provides a magnified view of the louver assembly being moved, showing its internal structure and how it is being detached from the main frame.
5) Remove the horizontal louver the same way.	 The illustration shows a side view of the front panel of the device with the top cover open. A hand is shown pulling a horizontal louver assembly to the left. A large black arrow points to the left, indicating the direction of movement. A circular inset provides a magnified view of the louver assembly being moved, showing its internal structure and how it is being detached from the main frame.

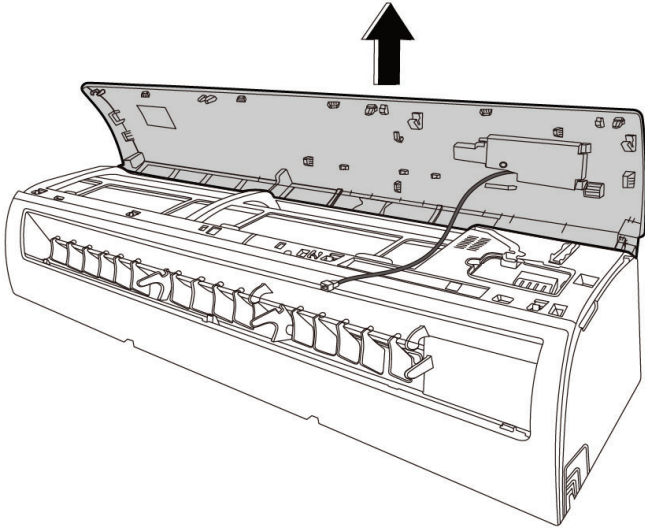
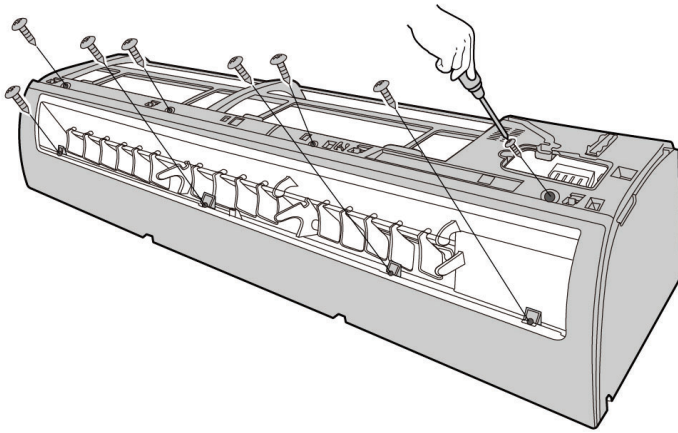
DISASSEMBLY INSTRUCTIONS (30K-36K)

Front Panel

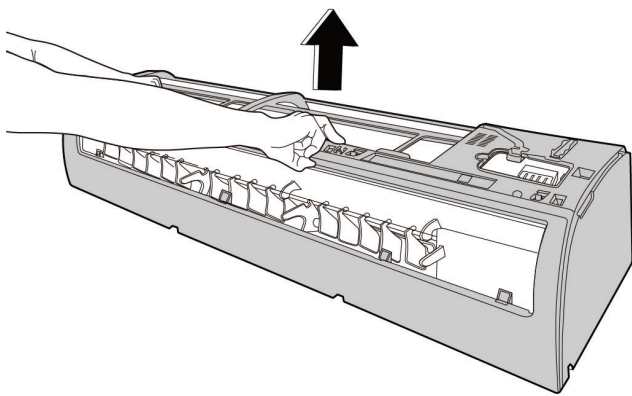
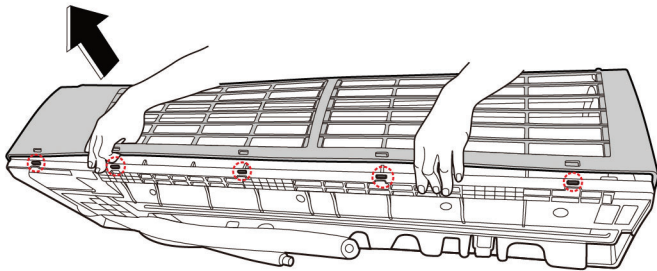
Procedure	Illustration
6) Pry the electrical cover with a screw driver, and rotate it towards the left, then remove it.	
7) Pull out the connector wire, then disconnect the connector from the display board.	

DISASSEMBLY INSTRUCTIONS (30K-36K)

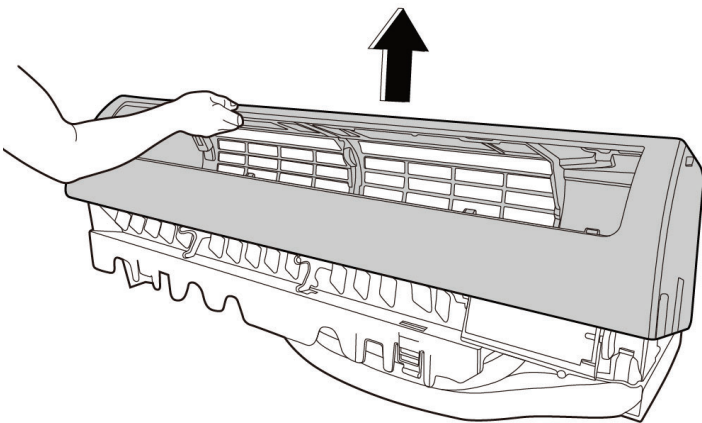
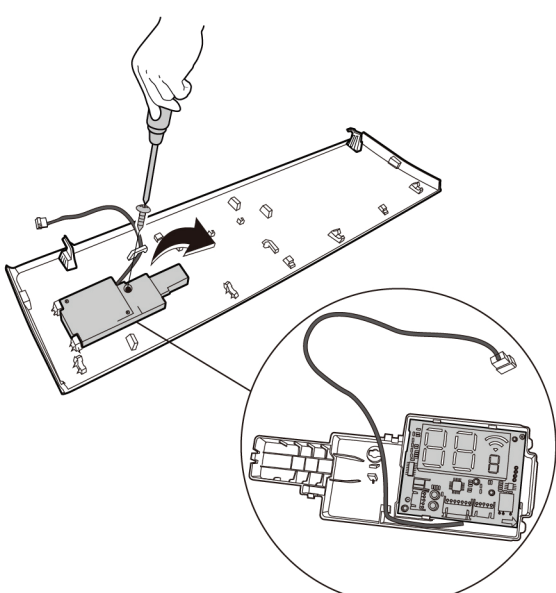
Front Panel

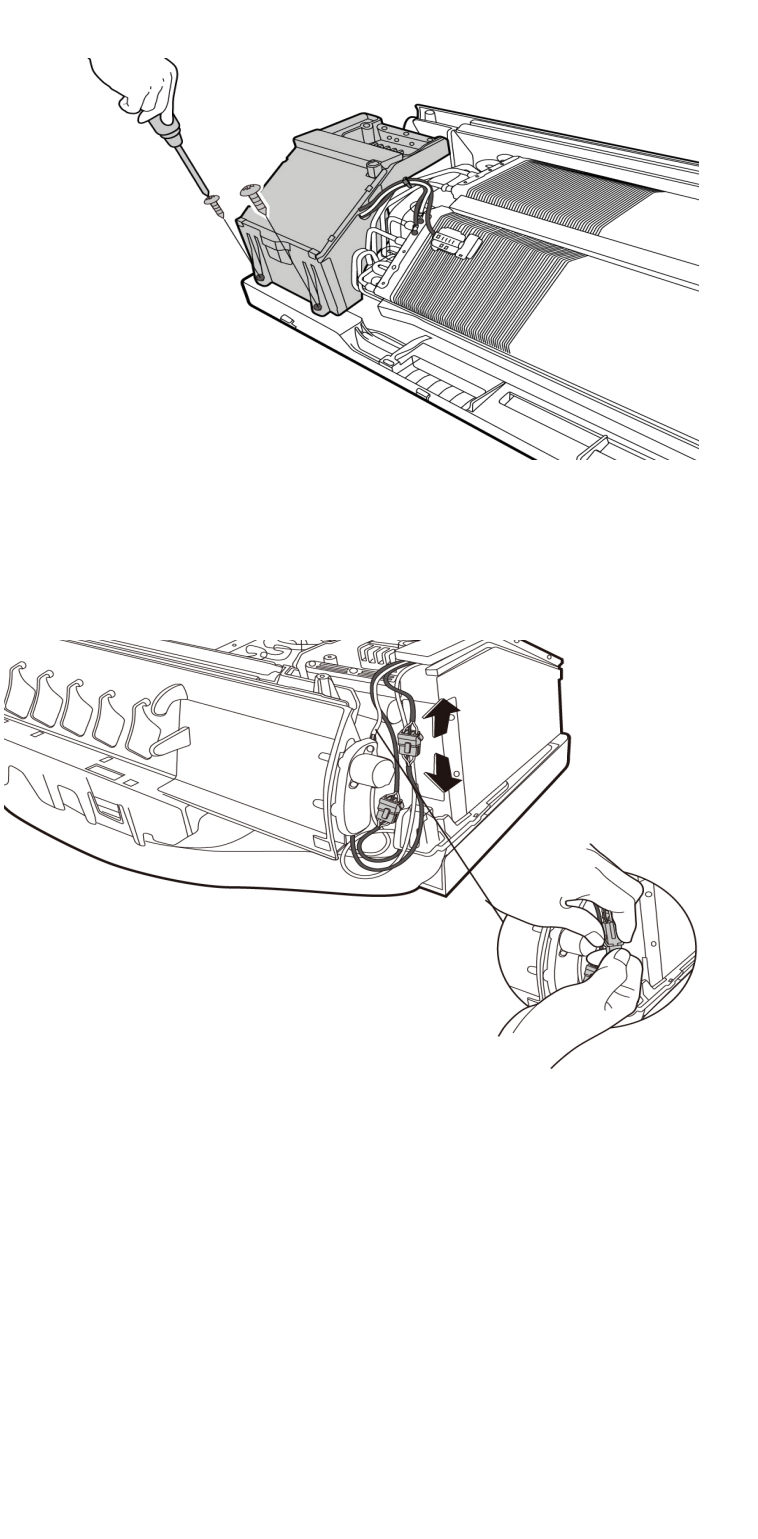
Procedure	Illustration
8) Slide the front panel side to side to release each axis.	 A line drawing of the front panel of a device. The panel is shown being lifted upwards, as indicated by a large black arrow pointing up from the top edge of the panel. The internal components, including a series of vertical sliders or axes, are visible.
9) Open the screw cap then remove the 4 screws. 10) Remove the 4 screws securing the panel frame.	 A line drawing of the front panel of a device. A hand is shown using a screwdriver to remove a screw from the top edge of the panel. Four other screws are shown being removed from the top edge, with lines indicating their removal. The internal components, including a series of vertical sliders or axes, are visible.

DISASSEMBLY INSTRUCTIONS (30K-36K)**Front Panel**

Procedure	Illustration
11) Use your hands to release the hooks.	 A line drawing showing a hand lifting the front panel of a device. The panel is being moved upwards, as indicated by a large black arrow. The panel has a series of hooks along its bottom edge that are being released from the main unit.
12) Release the 5 hooks in the back.	 A line drawing showing the front panel being released from the back of the main unit. The panel is being moved downwards and to the left, as indicated by a large black arrow. The panel has a series of hooks along its top edge that are being released from the main unit. The main unit has a grid-like structure on its back.

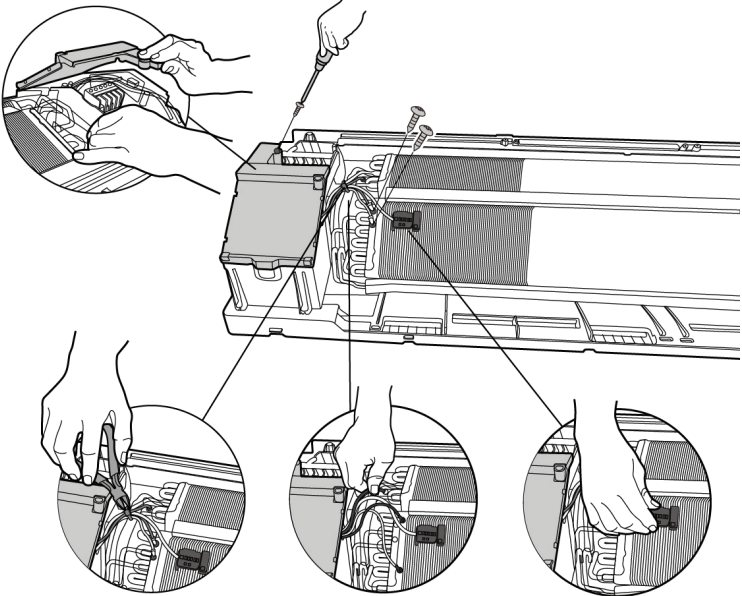
DISASSEMBLY INSTRUCTIONS (30K-36K)**Front Panel**

Procedure	Illustration
13) Pull out the panel frame while pushing the hook through a clearance between the panel frame and the heat exchanger.	
14) Remove 1 screw of the display board. 15) Rotate the display board in the direction shown in the figure to the right.	

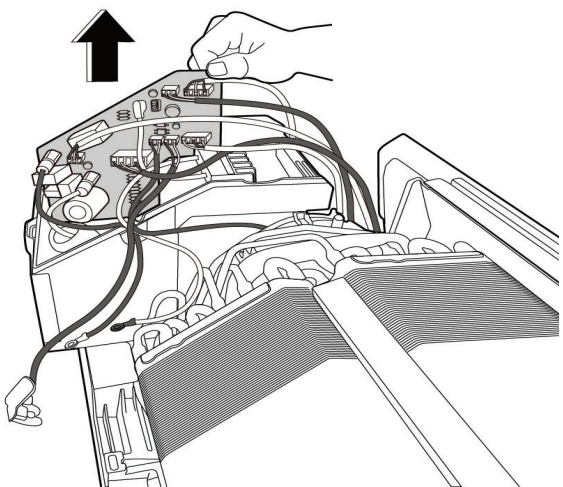
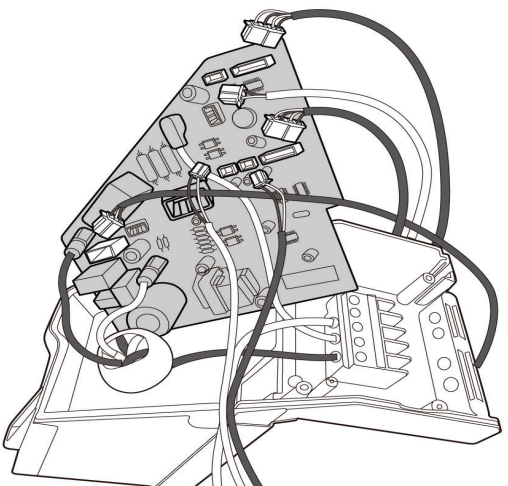
Procedure	Illustration
1) Remove the 2 screws from the electrical control box subassembly.. 2) Disconnect the connectors. To repair the electrical control box components, perform the steps 1 and 2. To repair the main control board assembly, perform steps 3 through 7.	 The top illustration shows a hand using a screwdriver to remove a screw from the electrical control box subassembly. The bottom illustration shows a hand disconnecting a connector from the main control board assembly, with arrows indicating the direction of movement.

DISASSEMBLY INSTRUCTIONS (30K-36K)

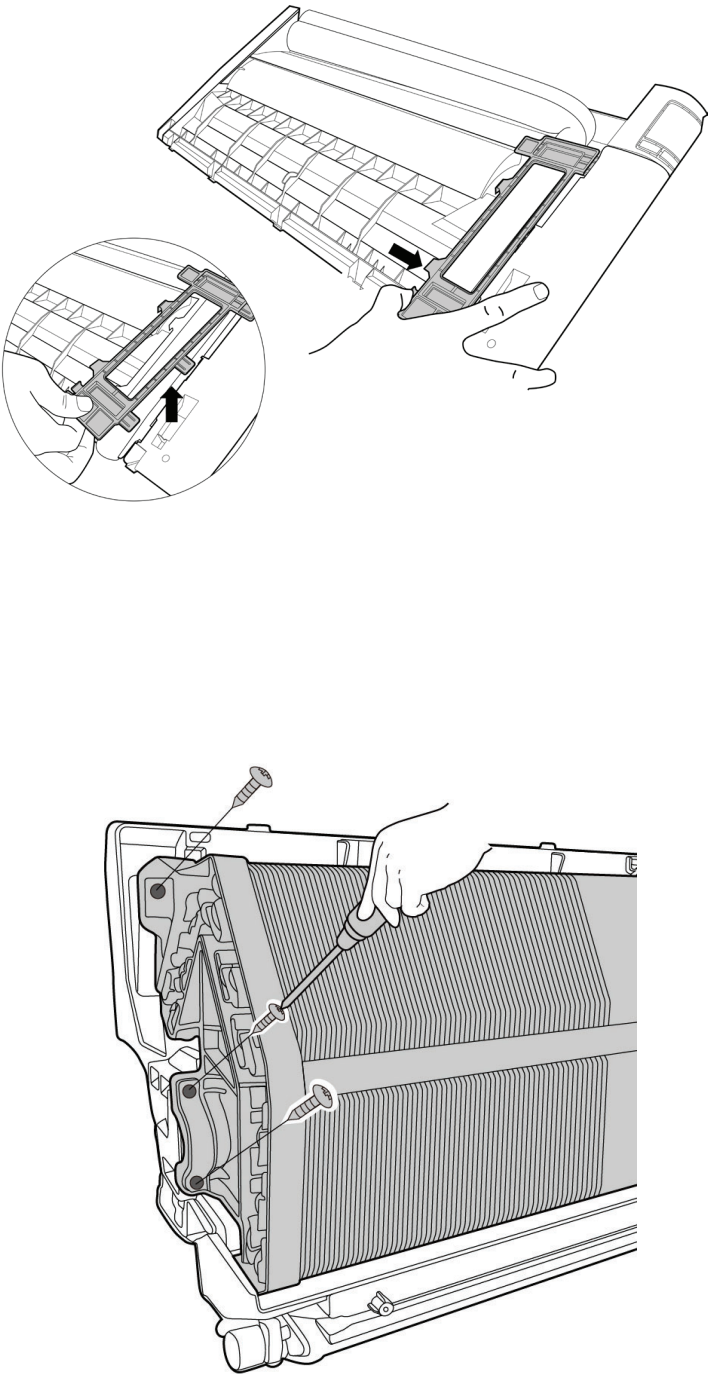
Electrical parts (Anti-static gloves must be worn)

Procedure	Illustration
3) Use a shear to cut the ribbon, then pull out the coil temperature sensor. 4) Remove one screw from the electronic control box and the two screws used for the ground connection. 5) Remove the temperature sensor clamp.	

DISASSEMBLY INSTRUCTIONS (30K-36K)**Electrical parts (Anti-static gloves must be worn)**

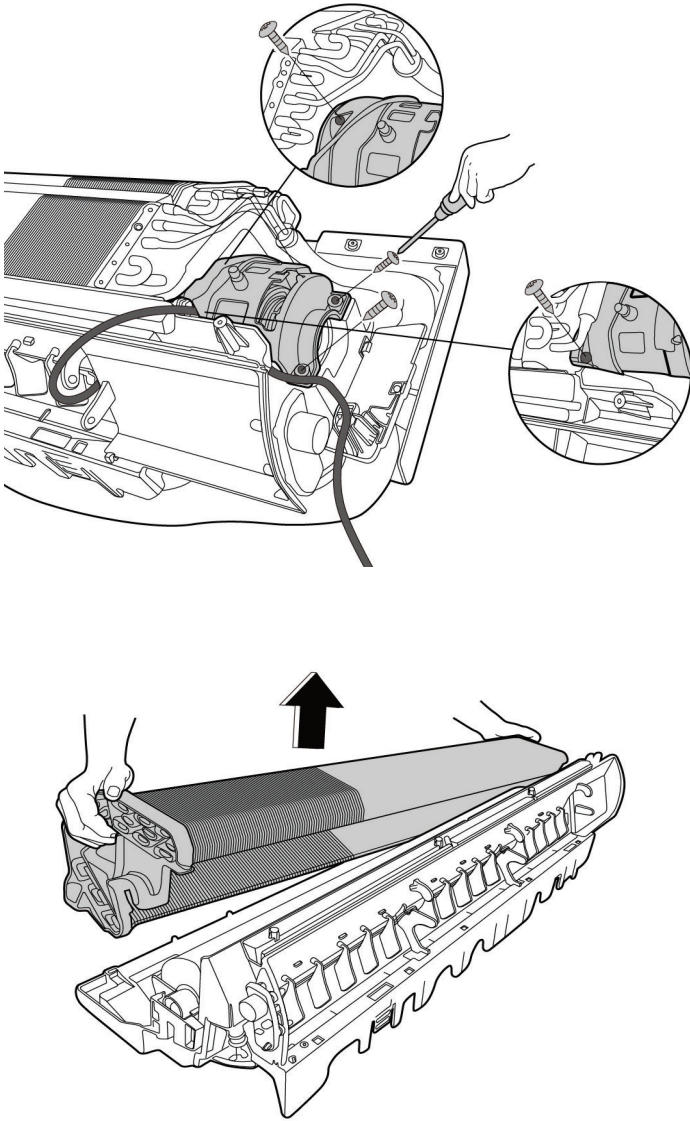
Procedure	Illustration
6) Pull out the electrical main board along the direction shown in the figure to the right.	
7) Disconnect the connectors and remove the main control board.	

DISASSEMBLY INSTRUCTIONS (30K-36K)**Evaporator**

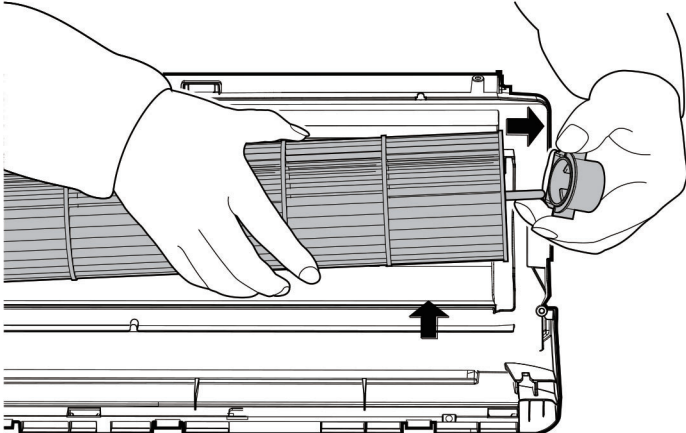
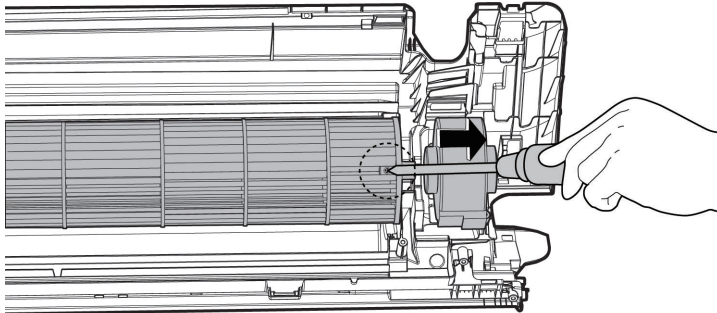
Procedure	Illustration
1) Disassemble the pipe holder located at the rear of the unit.	 The illustration consists of two parts. The top part shows a hand using a screwdriver to remove a screw from a pipe holder. A circular inset provides a magnified view of the pipe holder being removed. The bottom part shows a hand using a screwdriver to remove three screws from the evaporator, which is mounted on a fixed plate.

DISASSEMBLY INSTRUCTIONS (30K-36K)

Evaporator

Procedure	Illustration
3) Remote the 4 screws securing the fan motor cover. 4) Pull out the evaporator.	 The illustration is divided into two parts. The top part shows a hand using a screwdriver to remove one of four screws from the fan motor cover. Two circular insets provide close-up views of the screws being removed. The bottom part shows the evaporator being pulled out of its housing, with a large black arrow pointing upwards to indicate the direction of removal.

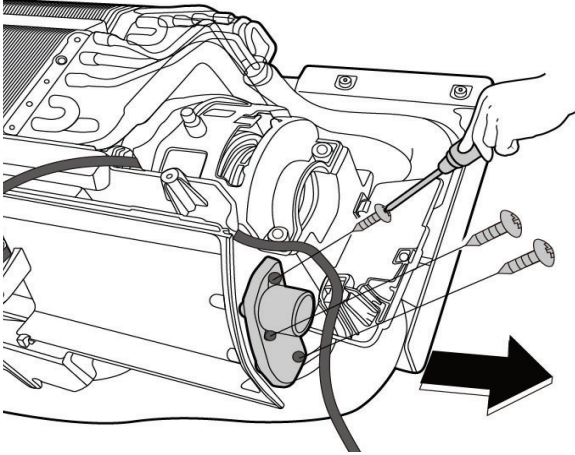
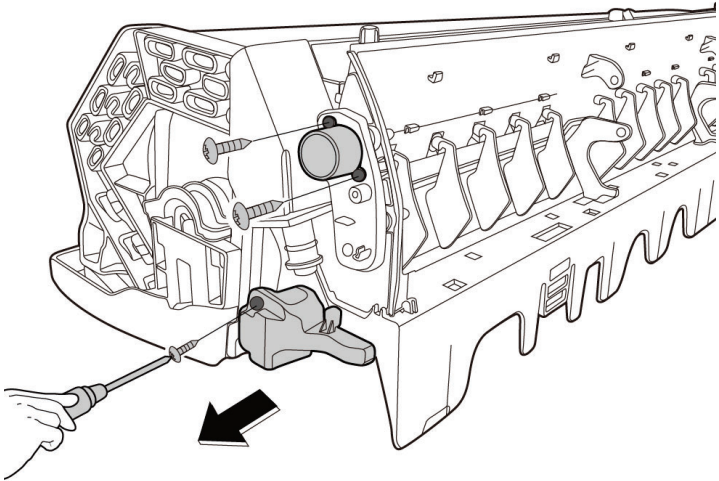
DISASSEMBLY INSTRUCTIONS (30K-36K)**Fan Motor and Fan**

Procedure	Illustration
1) Remove the bearing sleeve.	
2) Remove the screw.	
3) Pull out the fan motor and fan assembly from the side.	

DISASSEMBLY INSTRUCTIONS (30K-36K)

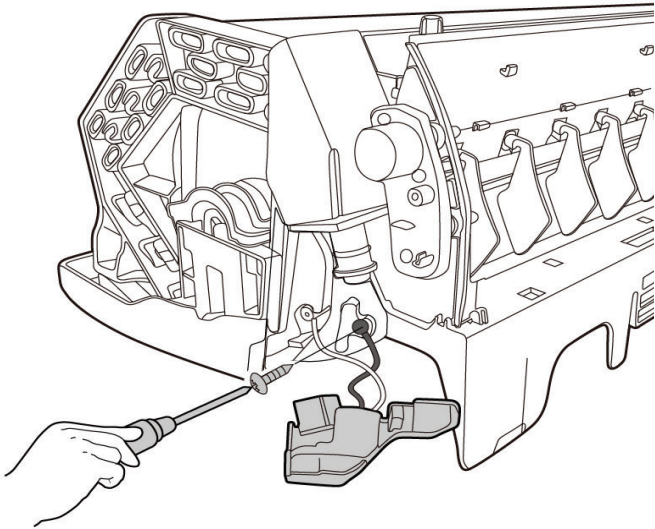
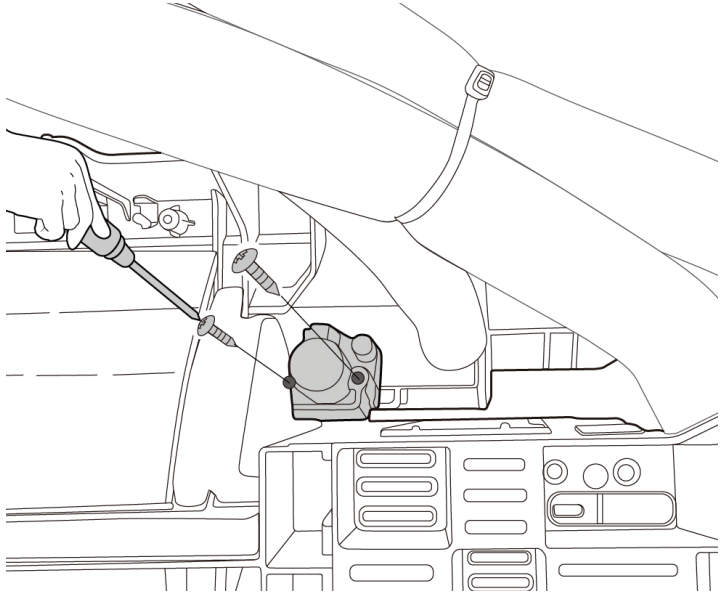
Step Motor

NOTE: Remove the front panel and electrical parts before disassembling the step motor.

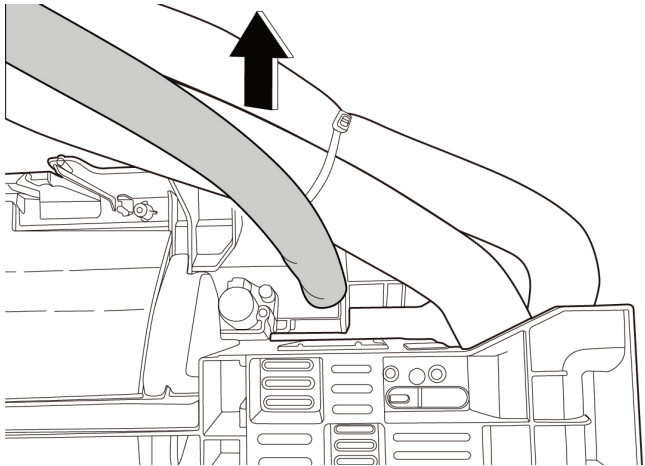
Procedure	Illustration
1) Remove the 3 screws, then remove the horizontal swing motor.	
2) Remove the 2 screws, then remove the horizontal swing motor.	
3) Remove 1 screw, then remove the ionizer generator.	

DISASSEMBLY INSTRUCTIONS (30K-36K)

Step Motor

Procedure	Illustration
4) Remove 1 screw, then remove the positive and negative ion generator.	 A line drawing showing a hand holding a screwdriver, removing a screw from a component labeled 'Positive and Negative Ion Generator'. The component is mounted on a larger assembly with various other parts visible in the background.
5) Remove 2 screws, then remove the vertical swing motor.	 A line drawing showing a hand holding a screwdriver, removing screws from a component labeled 'Vertical Swing Motor'. The motor is mounted on a larger assembly, and the background shows a control panel with various buttons and switches.

DISASSEMBLY INSTRUCTIONS (30K-36K)**Drain Hose**

Procedure	Illustration
1) Pull up the drain hose to remove it.	

Pressure on Service Port

Cooling Chart (R410A)

°F(°C)	ODU(DB) IDU(DB/WB)	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)
BAR	70/59 (21.11/15)	6.4	6.5	7.3	8.0	8.2	7.8	8.1	8.6	10.1	10.6
	75/63 (23.89/17.22)	6.7	6.8	7.9	8.6	8.6	8.3	8.7	9.1	10.7	11.2
	80/67 (26.67/19.44)	7.1	7.2	8.5	9.5	9.3	8.9	9.1	9.6	11.2	11.9
	90/73 (32.22/22.78)	7.7	7.8	9.6	10.5	10.3	9.5	10.0	10.6	12.4	13.0
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
MPa	70/59 (21.11/15)	0.64	0.65	0.73	0.8	0.82	0.78	0.81	0.86	1.01	1.06
	75/63 (23.89/17.22)	0.67	0.68	0.79	0.86	0.86	0.83	0.87	0.91	1.07	1.12
	80/67 (26.67/19.44)	0.71	0.72	0.85	0.95	0.93	0.89	0.91	0.96	1.12	1.19
	90/73 (32.22/22.78)	0.77	0.78	0.96	1.05	1.03	0.95	1	1.06	1.24	1.3

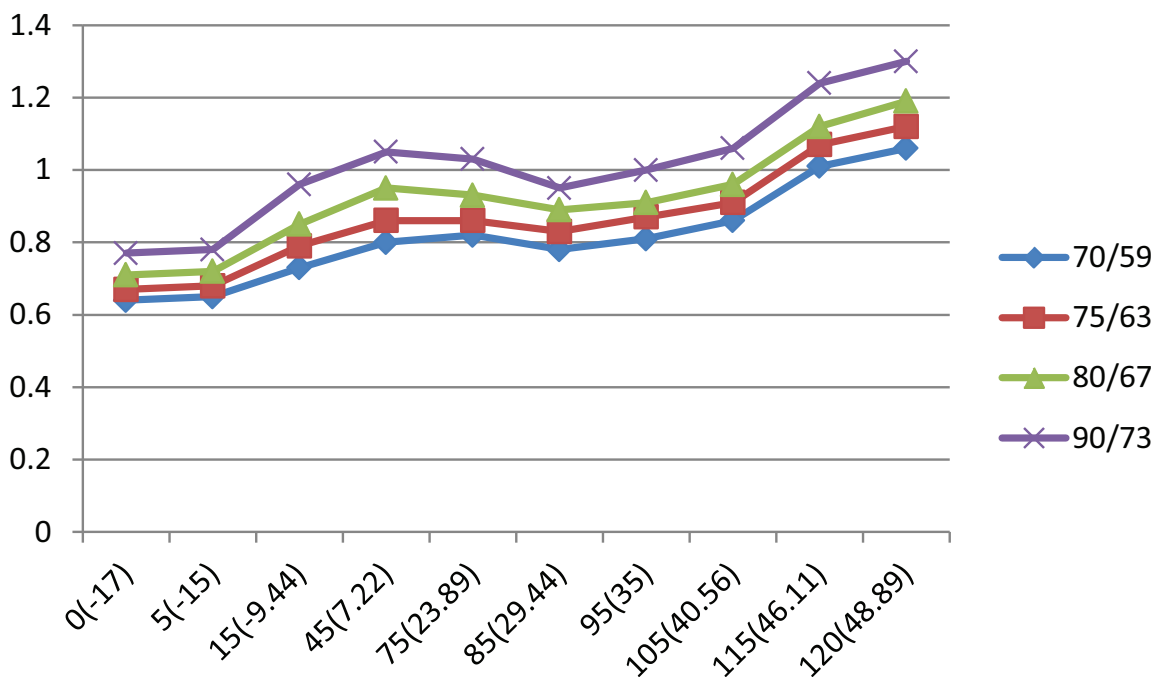
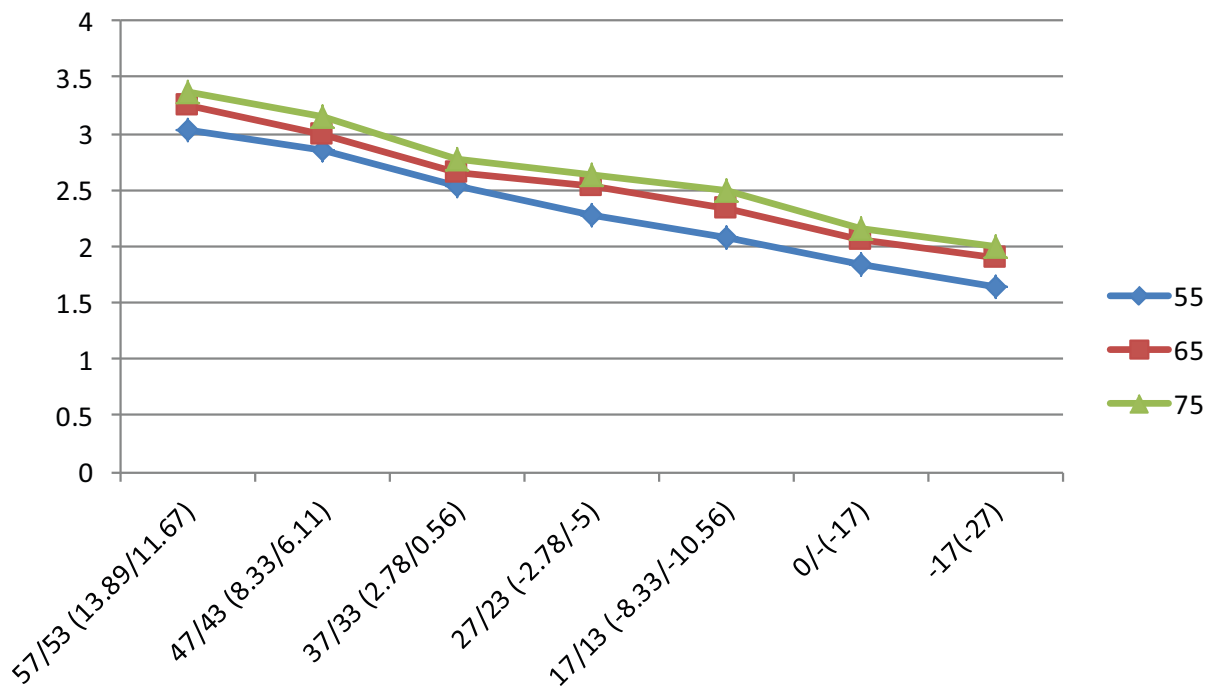


Fig. 30 — Cooling Chart

Pressure on Service Port

Heating Chart (R410A)

°F(°C)	ODU(DB/WB)	57/53 (13.89/11.67)	47/43 (8.33/6.11)	37/33 (2.78/0.56)	27/23 (-2.78/-5)	17/13 (-8.33/-10.56)	0/-2 (-17/-19)	-17/-18 (-27/-28)
	IDU(DB)							
BAR	55(12.78)	30.3	28.5	25.3	22.8	20.8	18.5	16.5
	65(18.33)	32.5	30.0	26.6	25.4	23.3	20.5	19.0
	75(23.89)	33.8	31.5	27.8	26.3	24.9	21.5	20.0
PSI	55(12.78)	439	413	367	330	302	268	239
	65(18.33)	471	435	386	368	339	297	276
	75(23.89)	489	457	403	381	362	312	290
MPa	55(12.78)	3.03	2.85	2.53	2.28	2.08	1.85	1.65
	65(18.33)	3.25	3.00	2.66	2.54	2.33	2.05	1.90
	75(23.89)	3.38	3.15	2.78	2.63	2.49	2.15	2.00



APPENDICES

Appendix 1

Table 16 — Temperature Sensor Resistance Value Table for T1, T2, T3, T4 (°C - K Ohm)

°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 2

Table 17 — Temperature Sensor Resistance Value Table for TP (for some units) (°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			