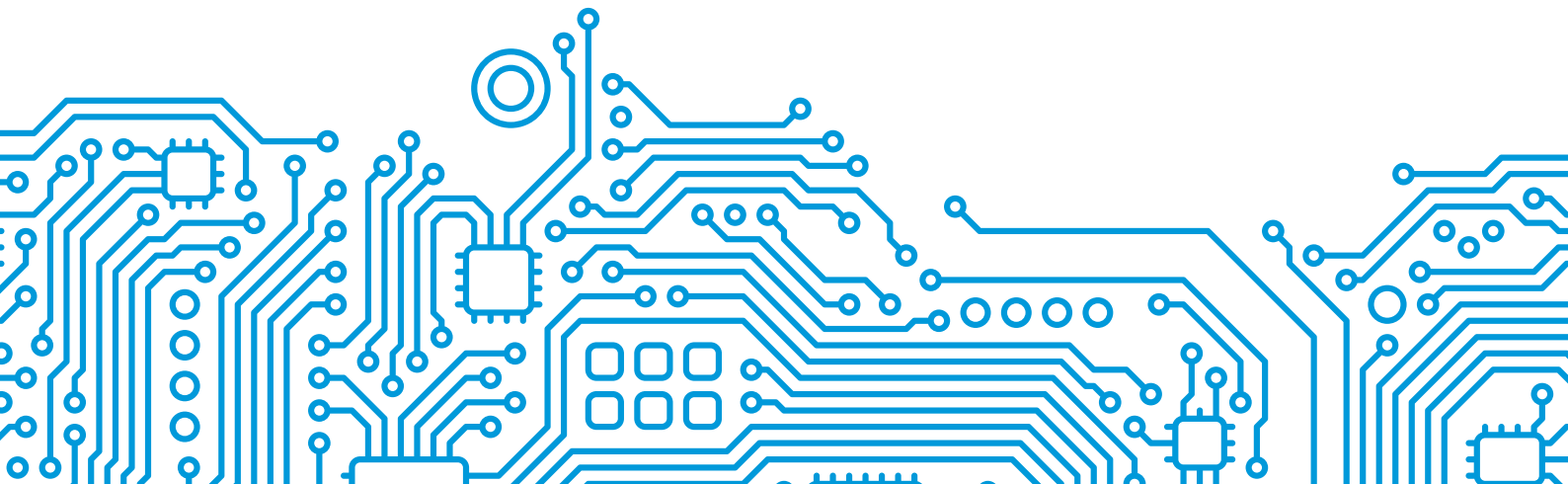
SM_LC_60R410A_ONOFF_T_SA_NB_171201

LIGHT COMMERCIAL ONOFF SERIES

2017 SERVICE MANUAL



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Safety Precautions

Contents

To prevent personal injury, or property or unit damage, adhere to all precautionary measures and instructions outlined in this manual. Before servicing a unit, refer to this service manual and its relevant sections.

Failure to adhere to all precautionary measures listed in this section may result in personal injury, damage to the unit or to property, or in extreme cases, death.

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

CAUTION indicates a potentially hazardous situation which if not avoided could result in minor or moderate personal injury, or unit damage.

1. In case of Accidents or Emergency

WARNING

- If a gas leak is suspected, immediately turn off the gas and ventilate the area if a gas leak is suspected before turning the unit on.
- If strange sounds or smoke is detected from the unit, turn the breaker off and disconnect the power supply cable.
- If the unit comes into contact with liquid, contact an authorized service center.
- If liquid from the batteries makes contact with skin or clothing, immediately rinse or wash the area well with clean water.
- Do not insert hands or other objects into the air inlet or outlet while the unit is plugged in.
- Do not operate the unit with wet hands.
- Do not use a remote controller that has previously been exposed to battery damage or battery leakage.

CAUTION

- Clean and ventilate the unit at regular intervals when operating it near a stove or near similar devices.
- Do not use the unit during severe weather conditions. If possible, remove the product from the window before such occurrences.

2. Pre-Installation and Installation

WARNING

- Use this unit only on a dedicated circuit.
- Damage to the installation area could cause the unit to fall, potentially resulting in personal injury, property damage, or product failure.
- Only qualified personnel should disassemble, install, remove, or repair the unit.
- Only a qualified electrician should perform electrical work. For more information, contact your dealer, seller, or an authorized Midea service center.

CAUTION

- While unpacking be careful of sharp edges around the unit as well as the edges of the fins on the condenser and evaporator.

3. Operation and Maintenance

WARNING

- Do not use defective or under-rated circuit breakers.
- Ensure the unit is properly grounded and that a dedicated circuit and breaker are installed.
- Do not modify or extend the power cable. Ensure the power cable is secure and not damaged during operation.
- Do not unplug the power supply plug during operation.
- Do not store or use flammable materials near the unit.
- Do not open the inlet grill of the unit during operation.
- Do not touch the electrostatic filter if the unit is equipped with one.
- Do not block the inlet or outlet of air flow to the unit.
- Do not use harsh detergents, solvents, or similar items to clean the unit. Use a soft cloth for cleaning.
- Do not touch the metal parts of the unit when removing the air filter as they are very sharp.
- Do not step on or place anything on the unit or outdoor units.
- Do not drink water drained from the unit
- Avoid direct skin contact with water drained from the unit.
- Use a firm stool or step ladder according to manufacturer procedures when cleaning or maintaining the unit.

CAUTION

- Do not install or operate the unit for an extended period of time in areas of high humidity or in an environment directly exposing it to sea wind or salt spray.
- Do not install the unit on a defective or damaged installation stand, or in an unsecure location.
- Ensure the unit is installed at a level position
- Do not install the unit where noise or air discharge created by the outdoor unit will negatively impact the environment or nearby residences.
- Do not expose skin directly to the air discharged by the unit for prolonged periods of time.
- Ensure the unit operates in areas water or other liquids.
- Ensure the drain hose is installed correctly to ensure proper water drainage.
- When lifting or transporting the unit, it is recommended that two or more people are used for this task.
- When the unit is not to be used for an extended time, disconnect the power supply or turn off the breaker.

Specifications

Contents

1. Model Reference

Refer to the following table to determine the specific indoor and outdoor unit model number of your purchased equipment.

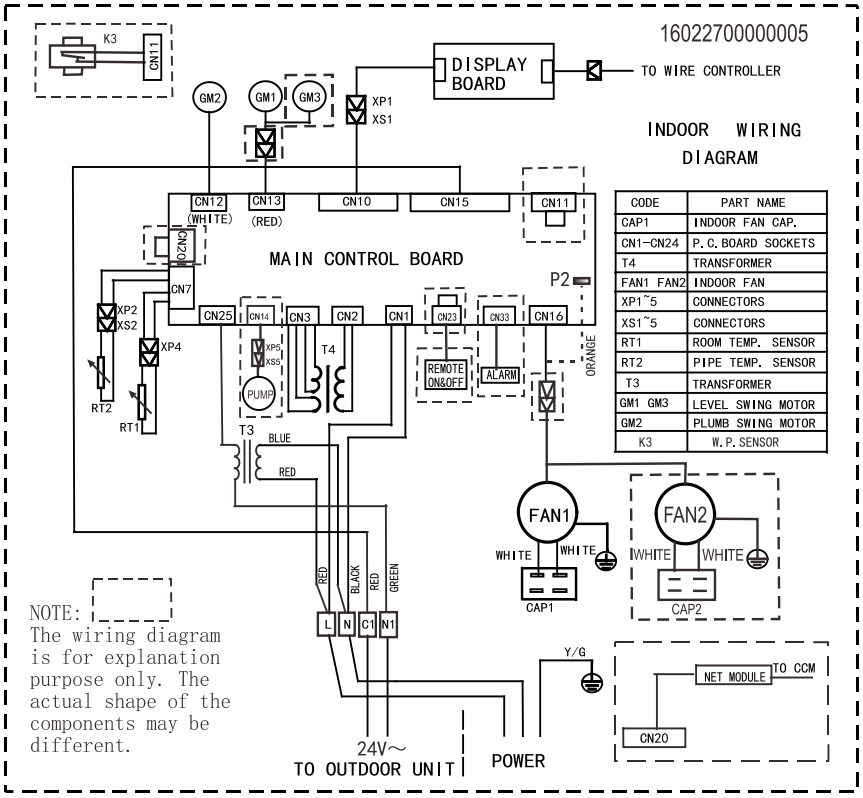
Outdoor Unit Model	indoor Unit Model	Capacity (Btu)	Power Supply
MTVCN036A	MUNT - 36	36k	1ϕ, 220~230V~, 60Hz
	MAHVBNT36		
MTVCN036B	MCACT36CR	36k	3ϕ, 220~230V~, 60Hz
MTVCN048A	MUNT - 48	48k	1ϕ, 220~230V~, 60Hz
	MAHVBNT48		
MTVCN048B	MCACT40CR	48k	3ϕ, 220~230V~, 60Hz
MTVCN060A	MUNT - 60	60k	1ϕ, 220~230V~, 60Hz
	MAHVBNT60		
MTVCN060B	MCACT60CR	60k	3ϕ, 220~230V~, 60Hz

1. Electrical Wiring Diagrams

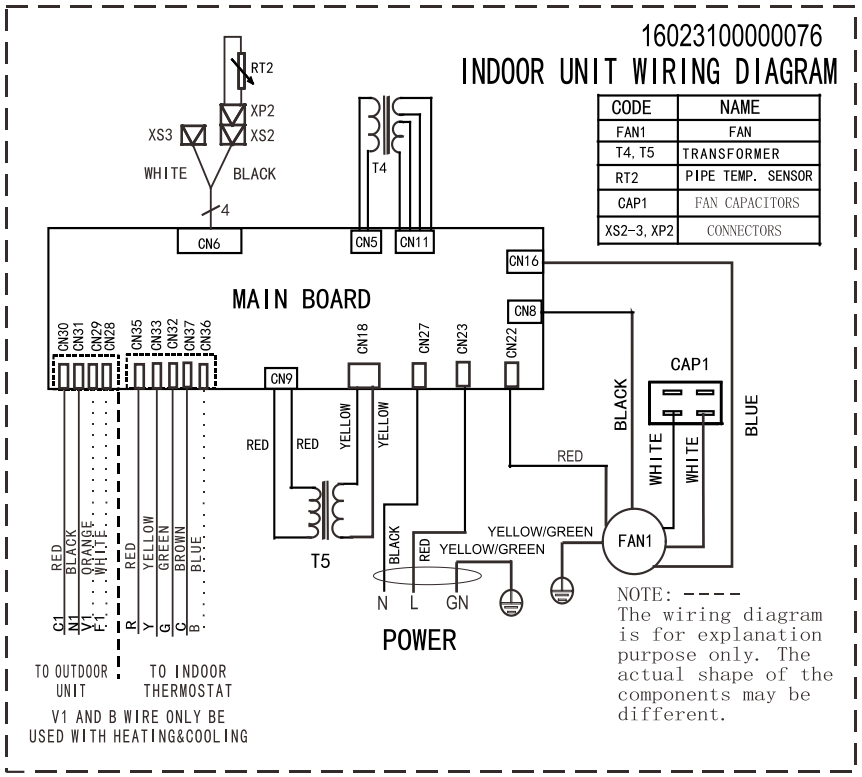
1.1 Indoor unit

Abbreviation	Paraphrase
Y/G	Yellow-Green Conductor
CAP1	Indoor Fan Capacitor
FAN1, FAN2	Indoor Fan
K3	Water Level Switch
M	Swing Motor
PUMP	PUMP
L	LIVE
N	NEUTRAL
TO CCM Comm.Bus	Central Controller
RT1, T1	Indoor Room Temperature
RT2, T2	Coil Temperature of Indoor Heat Exchanger
P1	Super High Speed
P2	High Speed
T3, T4, T5	Transformer
GM1, GM3	Horizontal Swing Motor
GM2	Vertical Swing Motor
AC FAN	Alternating Current Fan
DC FAN	Director Current Fan

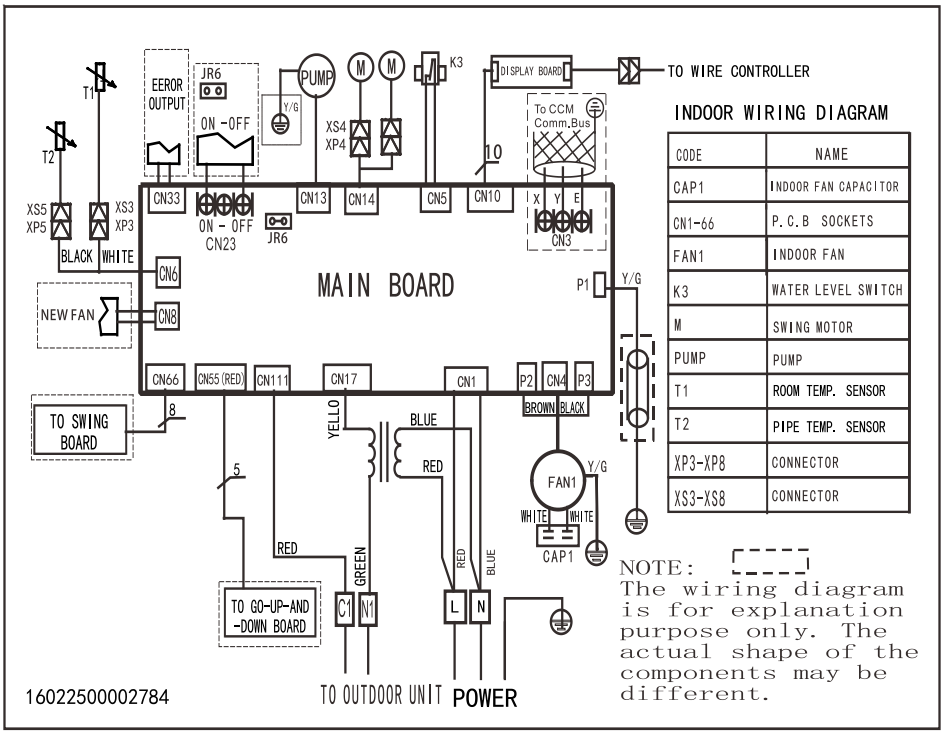
MUNT-36, MUNT-48, MUNT-60



MCACC36CR, MCACC48CR, MCACC40CR

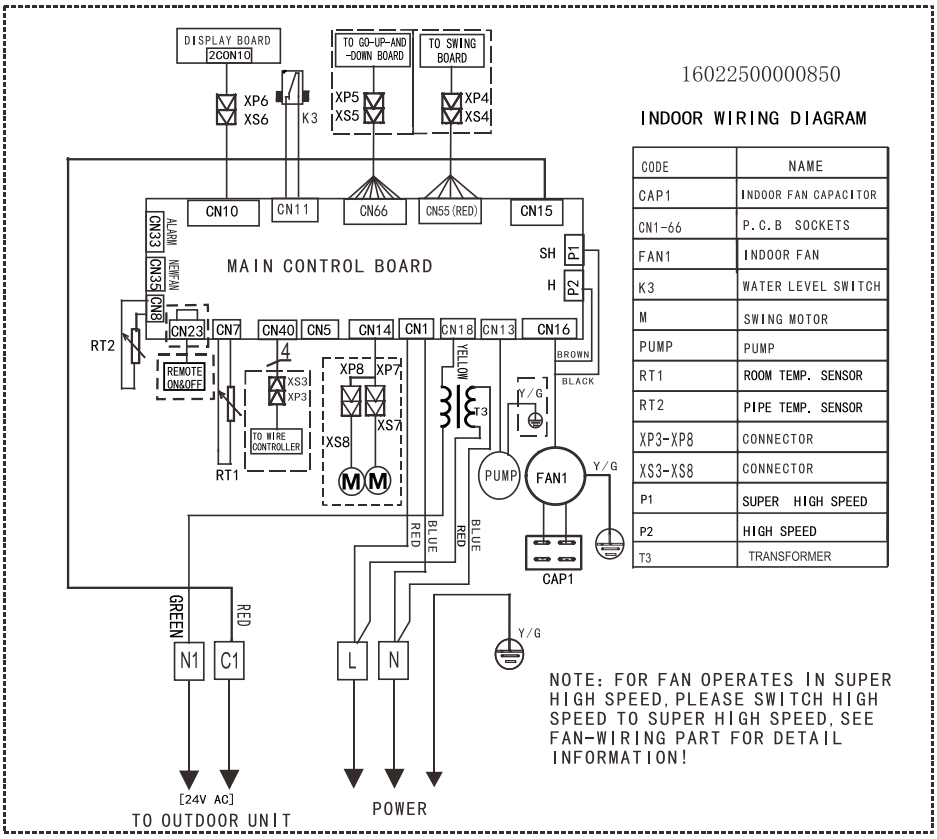


MCACTCR36CR, MCACT48CR

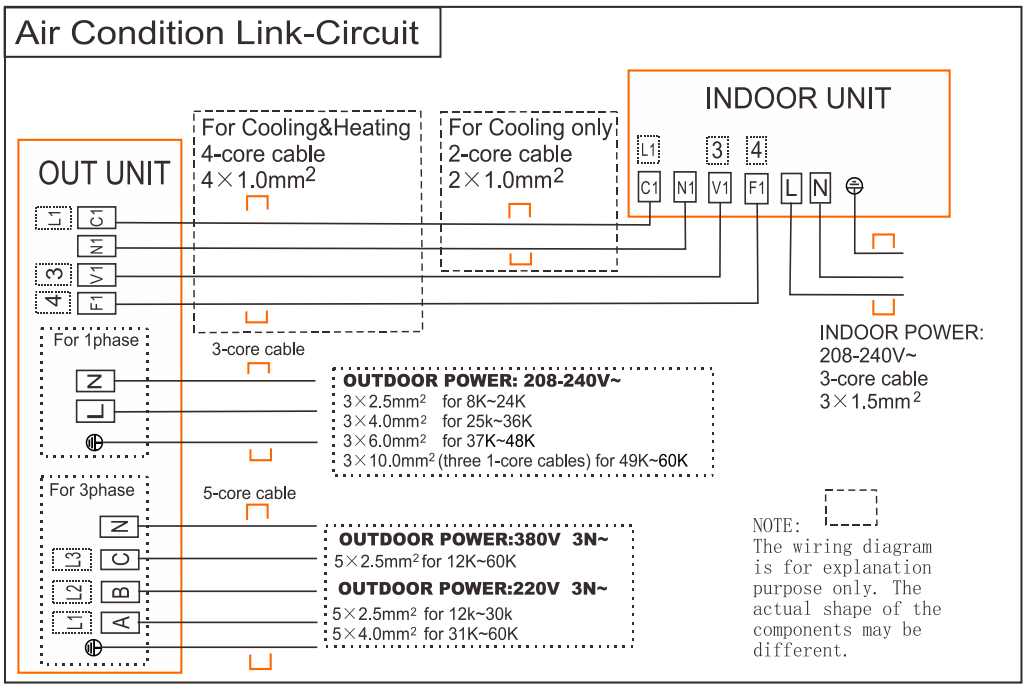


CODE	NAME
CAP1	INDOOR FAN CAPACITOR
CN1-66	P.C.B SOCKETS
FAN1	INDOOR FAN
K3	WATER LEVEL SWITCH
M	SWING MOTOR
PUMP	PUMP
T1	ROOM TEMP. SENSOR
T2	PIPE TEMP. SENSOR
XP3-XP8	CONNECTOR
XS3-XS8	CONNECTOR

MCACT60CR



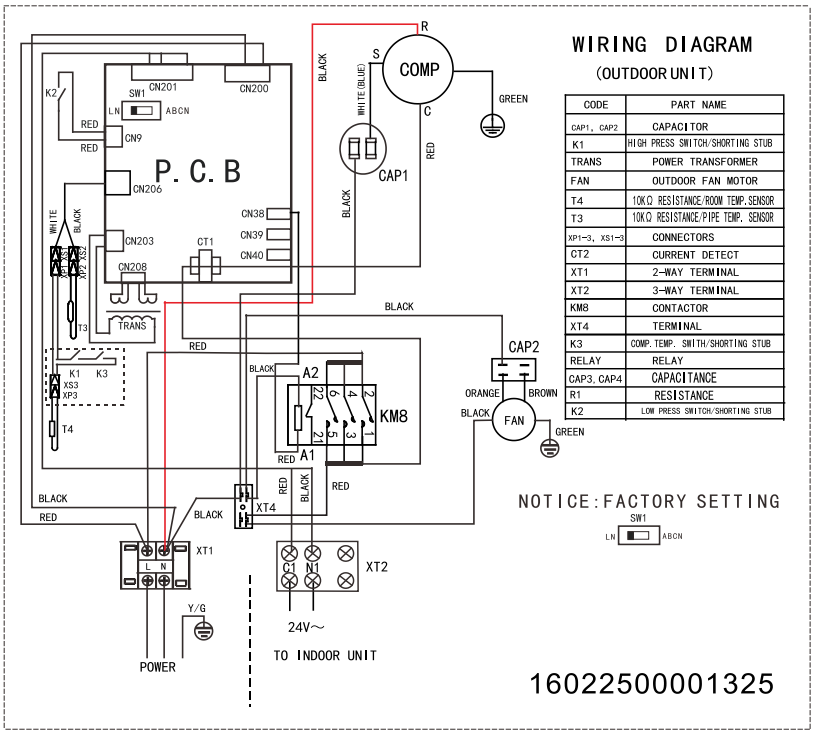
CODE	NAME
CAP1	INDOOR FAN CAPACITOR
CN1-66	P.C.B SOCKETS
FAN1	INDOOR FAN
K3	WATER LEVEL SWITCH
M	SWING MOTOR
PUMP	PUMP
RT1	ROOM TEMP. SENSOR
RT2	PIPE TEMP. SENSOR
XP3-XP8	CONNECTOR
XS3-XS8	CONNECTOR
P1	SUPER HIGH SPEED
P2	HIGH SPEED
T3	TRANSFORMER


Air Condition Link-Circuit
INDOOR UNIT
OUT UNIT
For Cooling&Heating
4-core cable
4×1.0mm2
For Cooling only
2-core cable
2×1.0mm2
L1
3
4
C1
N1
V1
F1
L
N
INDOOR POWER:
208-240V~
3-core cable
3×1.5mm2
For 1phase
3-core cable
OUTDOOR POWER: 208-240V~
3×2.5mm2 for 8K~24K
3×4.0mm2 for 25k~36K
3×6.0mm2 for 37K~48K
3×10.0mm2 (three 1-core cables) for 49K~60K
For 3phase
5-core cable
OUTDOOR POWER:380V 3N~
5×2.5mm2 for 12K~60K
OUTDOOR POWER:220V 3N~
5×2.5mm2 for 12k~30k
5×4.0mm2 for 31K~60K
NOTE:
The wiring diagram is for explanation purpose only. The actual shape of the components may be different.

1.1 Outdoor Unit

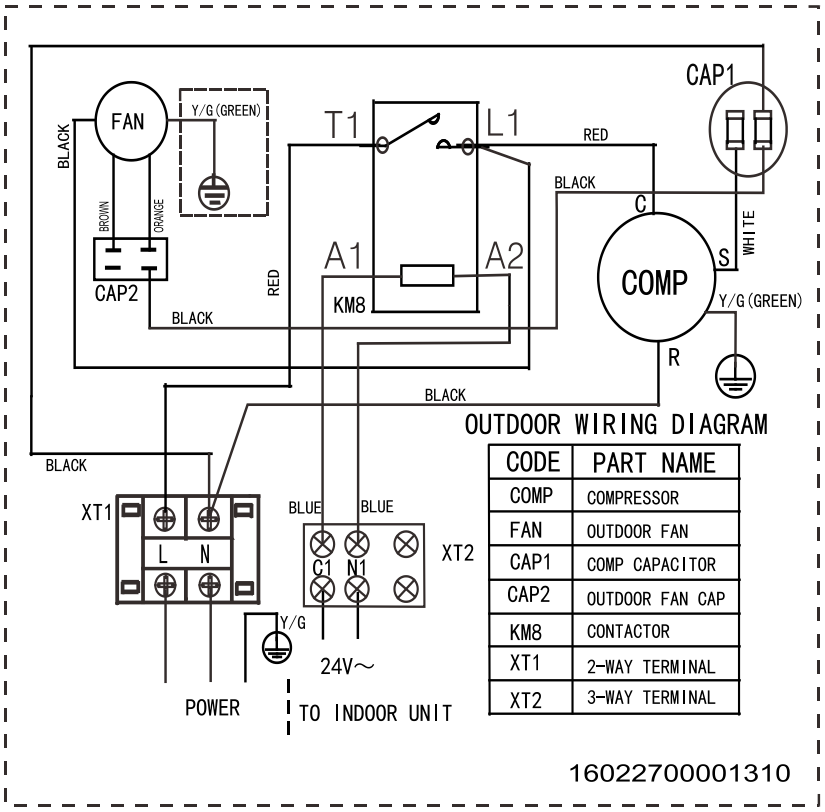
Abbreviation	Paraphrase
CAP1, CAP2, CAP3,CAP4	Capacitor
FAN	Outdoor Fan Motor
KM8	Contactor
CT1, CT2	AC Current Detector
COMP	Compressor
L-PRO, K2	Low Pressure Switch/Shorting Stub
K1	High Pressure Switch/Shorting Stub
TRANS	Power Transformer
T4	10KΩ RESISTANCE/Outdoor Ambient Temperature
T3	10KΩ RESISTANCE/Coil Temperature of Condenser
XT1	2-Way Terminal/4-Way Terminal
XT2	3-Way Terminal
XT4	Terminal
K3	Compressor Discharge Temperature/Shorting Stub
R1	Resistance
XP1~XP5,XS1~XS5	Connectors

MROVT36AS, MROVT60AS



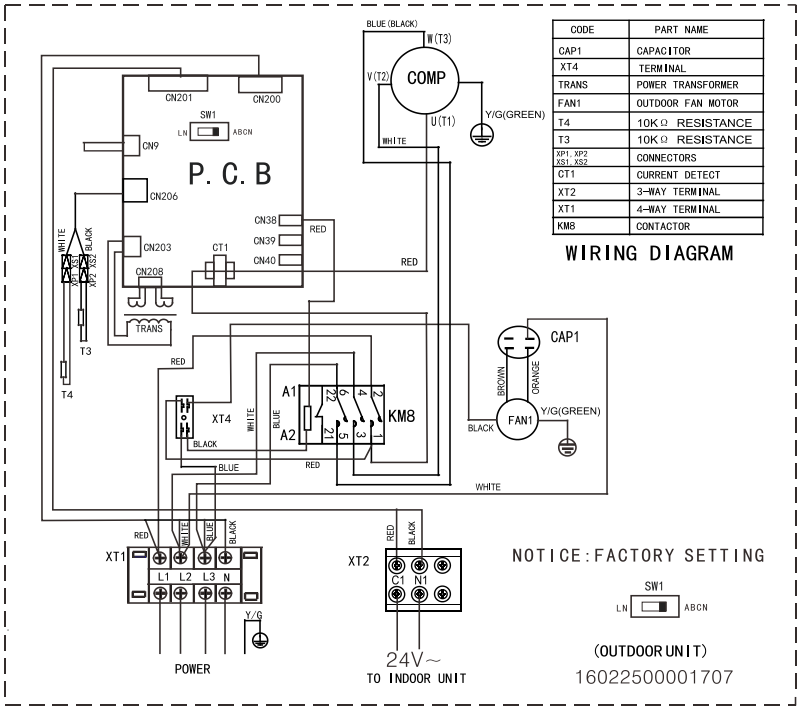
CODE	PART NAME
CAP1, CAP2	CAPACITOR
K1	HIGH PRESS SWITCH/SHORTING STUB
TRANS	POWER TRANSFORMER
FAN	OUTDOOR FAN MOTOR
T4	10KΩ RESISTANCE/ROOM TEMP.SENSOR
T3	10KΩ RESISTANCE/PIPE TEMP. SENSOR
XP1-3, XS1-3	CONNECTORS
CT2	CURRENT DETECT
XT1	2-WAY TERMINAL
XT2	3-WAY TERMINAL
KM8	CONTACTOR
XT4	TERMINAL
K3	COMP. TEMP. SWITH/SHORTING STUB
RELAY	RELAY
CAP3, CAP4	CAPACITANCE
R1	RESISTANCE
K2	LOW PRESS SWITCH/SHORTING STUB

MROVT48AS



CODE	PART NAME
COMP	COMPRESSOR
FAN	OUTDOOR FAN
CAP1	COMP CAPACITOR
CAP2	OUTDOOR FAN CAP
KM8	CONTACTOR
XT1	2-WAY TERMINAL
XT2	3-WAY TERMINAL

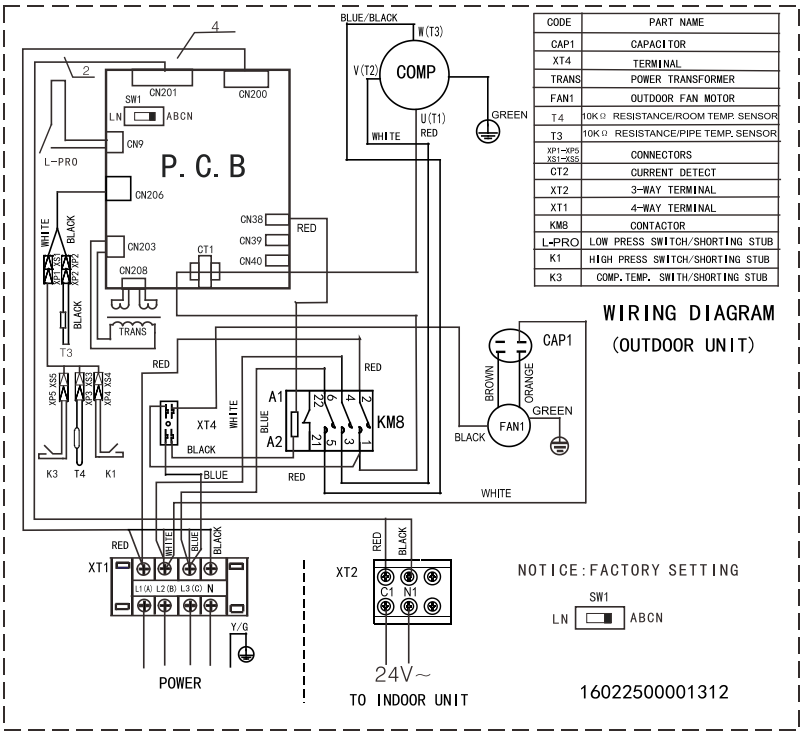
MROVT36AS, MROVT48AS



CODE	PART NAME
CAP1	CAPACITOR
XT4	TERMINAL
TRANS	POWER TRANSFORMER
FAN1	OUTDOOR FAN MOTOR
T4	10KΩ RESISTANCE
T3	10KΩ RESISTANCE
XP1, XP2 XS1, XS2	CONNECTORS
CT1	CURRENT DETECT
XT2	3-WAY TERMINAL
XT1	4-WAY TERMINAL
KM8	CONTACTOR

WIRING DIAGRAM

MROVT60AS



CODE	PART NAME
CAP1	CAPACITOR
XT4	TERMINAL
TRANS	POWER TRANSFORMER
FAN1	OUTDOOR FAN MOTOR
T4	10KΩ RESISTANCE/ROOM TEMP. SENSOR
T3	10KΩ RESISTANCE/PIPE TEMP. SENSOR
XP1~XP5 XS1~XS5	CONNECTORS
CT2	CURRENT DETECT
XT2	3-WAY TERMINAL
XT1	4-WAY TERMINAL
KM8	CONTACTOR
L-PRO	LOW PRESS SWITCH/SHORTING STUB
K1	HIGH PRESS SWITCH/SHORTING STUB
K3	COMP. TEMP. SWITH/SHORTING STUB

WIRING DIAGRAM
(OUTDOOR UNIT)

Product Features

Contents

1. Operation Modes and Functions
(for cassette type, A6 Duct, Ceiling& floor)

1.1 Abbreviation

Unit element abbreviations

Abbreviation	Element
T1	Indoor room temperature
T2	Coil temperature of evaporator
Tp	Compressor discharge temperature
TS	Set temperature

1.2 Safety Features

Compressor Three-minute Delay at Restart

Compressor functions are delayed for up to one minute upon the first startup of the unit, and are delayed for up to three minutes upon subsequent unit restarts.

Phase Check Function(for 3 phase models)

If the phase sequence is detected wrong or lack of 1 or 2 phase, the unit won't start and there is error code displayed on outdoor PCB.

Low Pressure Check Function(for MOV-60CN1-D)

The low pressure switch should be always closed. If it is open, the system will stop until the fault is cleared. During defrosting procedure , 4 minutes after defrosting ends and 5 minutes after compressor is on in heating mode, low pressure switch won't be checked.

Note: The system will not check if the protection could be cleared in 30 seconds after the protection occurs. If this protection occurs 3 times, it won't recover automatically until the main power is cut off.

Over-current Protection

When compressor is running, if the current is over twice of the rated for 3 seconds, the compressor will stop and an error code will be displayed on the outdoor PCB. If the current becomes normal, the compressor will restart after 3 minutes.

Note: The current won't be checked within 3 seconds after the compressor starts. The system will not check if the protection could be cleared in 30 seconds after the protection occurs.

Sensor redundancy and automatic shutoff

- If any one of temperature sensor malfunctions, the air conditioner displays the corresponding error code and ceases operation.

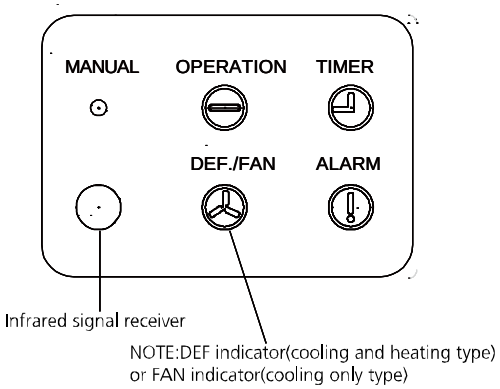
Refrigerant leakage detection

This function is active only when cooling mode is selected. It will detect if the compressor is being damaged by refrigerant leakage or by compressor overload. This is measured using the coil temperature of evaporator T2 when the compressor is in operation.

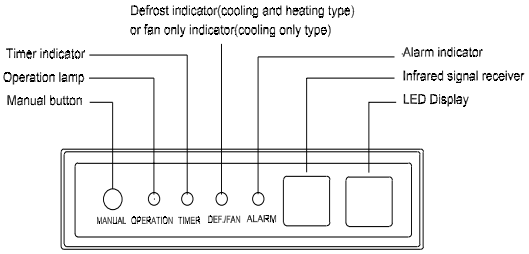
1.3 Display Function

Unit display functions

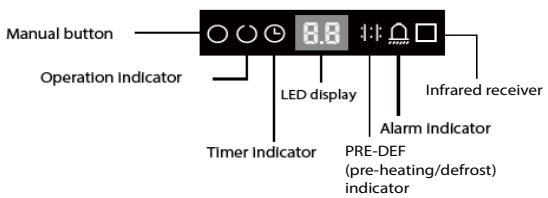
Ceiling&floor



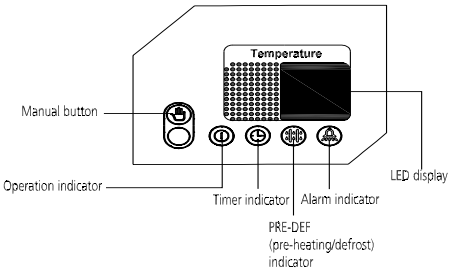
A6 Duct



Super-slim Cassette



Super-slim Cassette(with an auto-lifting panel)



1.4 Fan Mode

When fan mode is activated:

- The outdoor fan and compressor are stopped.
- Temperature control is disabled and no temperature setting is displayed.
- The indoor fan speed can be set to high, medium, low, or auto.
- The louver operations are identical to those in cooling mode.

1.5 Cooling Mode

1.5.1 Compressor Control

When indoor room temperature T1 is lower than setting value, the compressor and outdoor fan cease operation.

1.5.2 Indoor Fan Control

In cooling mode, the indoor fan operates continuously. The fan speed can be set to high, medium, low or auto.

1.5.3 Outdoor Fan Control

The On-off outdoor units have single fan speed. The outdoor fan runs following the compressor except when AC is in evaporator high temperature protection in heating mode, condenser high temperature protection in cooling mode, defrosting mode and the current protection.

1.5.4 Evaporator Temperature Protection

When evaporator temperature drops below a configured value for some time, the compressor and outdoor fan cease operations.

1.6 Auto-mode

- This mode can be selected with the remote controller and the setting temperature can be changed between 17°C~30°C.
- In auto mode, the machine selects cooling, heating, or fan-only mode on the basis of ΔT (ΔT =T1-Ts).

ΔT	Running mode
ΔT>2℃	Cooling
ΔT≤2℃	Fan-only

- The louver operates same as in relevant mode.
- If the machine changes running mode to auto mode, it will choose running mode again.
- If the machine switches mode between heating and cooling, the compressor will keep stopping for certain time and then choose running mode according to T1-Ts.
- If the setting temperature is modified, the machine will choose running mode again.

1.7 Drying mode

- Indoor fan speed is fixed at breeze and can't be changed. The louver angle is the same as in cooling mode.
- All protections are active and the same as that in cooling mode.

1.8 Timer Function

- The timing range is 24 hours.
- Timer On. The machine turns on automatically at the preset time.
- Timer Off. The machine turns off automatically at the preset time.
- Timer On/Off. The machine turns on automatically at the preset On Time, and then turns off automatically at the preset Off Time.
- Timer Off/On. The machine turns on automatically at the preset Off Time and then turns off automatically at the preset On Time.
- The timer does not change the unit operation mode. If the unit is off now, it does not start up immediately after the "timer off" function is set. When the setting time is reached, the timer LED switches off and the unit running mode remains unchanged.
- The timer uses relative time, not clock time

1.9 Sleep function

- The sleep function is available in cooling, heating, or auto mode.
- The operational process for sleep mode is as follows:
  - When cooling, the temperature rises 1°C (to not higher than 30°C) every hour. After 2 hours, the

temperature stops rising and the indoor fan is fixed at low speed.

- When heating, the temperature decreases 1°C(to not lower than 17°C) every hour. After 2 hours, the temperature stops decreasing and the indoor fan is fixed at low speed. Anti-cold wind function takes priority.

- Entering shutdown, changing mode or speed setting cancels sleep mode..
- In this mode, the fan speed is forced into AUTO mode.

1.10 Auto-Restart function

- The indoor unit has an auto-restart module that allows the unit to restart automatically. The module automatically stores the current settings (not including the swing setting) and, in the case of a sudden power failure, will restore those setting automatically within 3 minutes after power returns.
- If the unit was in forced cooling mode, it will run in this mode for 30 minutes and turn to auto mode with temperature set to 24°C.
- If there is a power failure while the unit is running, the compressor starts 3 minutes after the unit restarts. If the unit was already off before the power failure, the compressor starts 1 minute after the unit restarts.

1.11 Refrigerant Leakage Detection

With this new technology, the display area will show "EC" when the outdoor unit detects refrigerant leakage.

1.12 Follow me(Optional)

- If you press "Follow Me" on the remote, the indoor unit will beep. This indicates the follow me function is active.
- Once active, the remote control will send a signal every 3 minutes, with no beeps. The unit automatically sets the temperature according to the measurements from the remote control.
- The unit will only change modes if the information from the remote control makes it necessary, not from the unit's temperature setting.
- If the unit does not receive a signal for 7 minutes, the function turns off. The unit regulates temperature based on its own sensor and settings.
- Wired remote controller is prior to wireless remote controller.

1.13 Drain Pump Control (For Duct and Cassette)

- Use the water-level switch to control drain pump.
- The system checks the water level every 5 seconds.
  - When the A/C operates in cooling (including auto cooling) or forced cooling mode, the pump begins running immediately and continuously until cooling stops.
  - If the water level increases up to the control point, the LED displays an alarm code and the drain pump opens and continually monitors the water level. If the water level falls and LED alarm code is no longer displayed (drain pump close delay is 1 minute), the unit goes back into its last mode. Otherwise, the entire system (including the pump) stops and the LED displays an alarm again after 3 minutes

2. Operation Modes and Functions

(for Air handle type)

2.1 Abbreviation

Unit element abbreviations

Abbreviation	Element
T1	Indoor room temperature
T2	Coil temperature of evaporator
Tp	Compressor discharge temperature
TS	Set temperature

2.2 Safety Features

Compressor Three-minute Delay at Restart

Compressor functions are delayed for up to one minute upon the first startup of the unit, and are delayed for up to three minutes upon subsequent unit restarts.

Phase Check Function(for 3 phase models)

If the phase sequence is detected wrong or lack of 1 or 2 phase, the unit won't start and there is error code displayed on outdoor PCB.

Low Pressure Check Function(for MOV-60CN1-D)

The low pressure switch should be always closed. If it is open, the system will stop until the fault is cleared. During defrosting procedure , 4 minutes after defrosting ends and 5 minutes after compressor is on in heating mode, low pressure switch won't be checked.

Note: The system will not check if the protection could be cleared in 30 seconds after the protection occurs. If this protection occurs 3 times, it won't recover automatically until the main power is cut off.

Sensor redundancy and automatic shutoff

- If temperature sensor malfunctions, the air conditioner displays the corresponding error code and ceases operation.

2.3 Display Function

- There are 3 LEDs on indoor PCB, which can display some information.
- When the unit is powered on, all LED will flash for 1 second. When the unit is standby, LED1 flashes at 0.5 Hz. When the unit is running normally, LED1 will be always on and LED2, LED3 are off.
- When there is an error, LEDs displays as following:

No.	Malfunction	LED1	LED2	LED3
1	Open or short circuit of T2 temperature sensor	Off	flash at 2.5Hz	Off
2	Input signal of wired remote controller	flash at 2.5Hz	Off	flash at 2.5Hz

2.4 Fan Mode

- When AC receives only signal G from wired remote controller, it operates in fan mode.
- When fan mode is activated, the outdoor fan and compressor are stopped, the indoor fan operates continuously

2.5 Cooling Mode

- When AC receives signal G and Y from wired remote controller, it operates in cooling mode.
- When fan mode is activated, the indoor fan operates continuously and compressor is controlled by signal Y.

The outdoor fan runs following the compressor except when AC is in evaporator high temperature protection in heating mode.

2.5.1 Evaporator Temperature Protection

When evaporator temperature drops below a configured value for some time, the compressor and outdoor fan cease operations.

Maintenance and Disassembly

Contents

1. Maintenance

1.1 First Time Installation Check

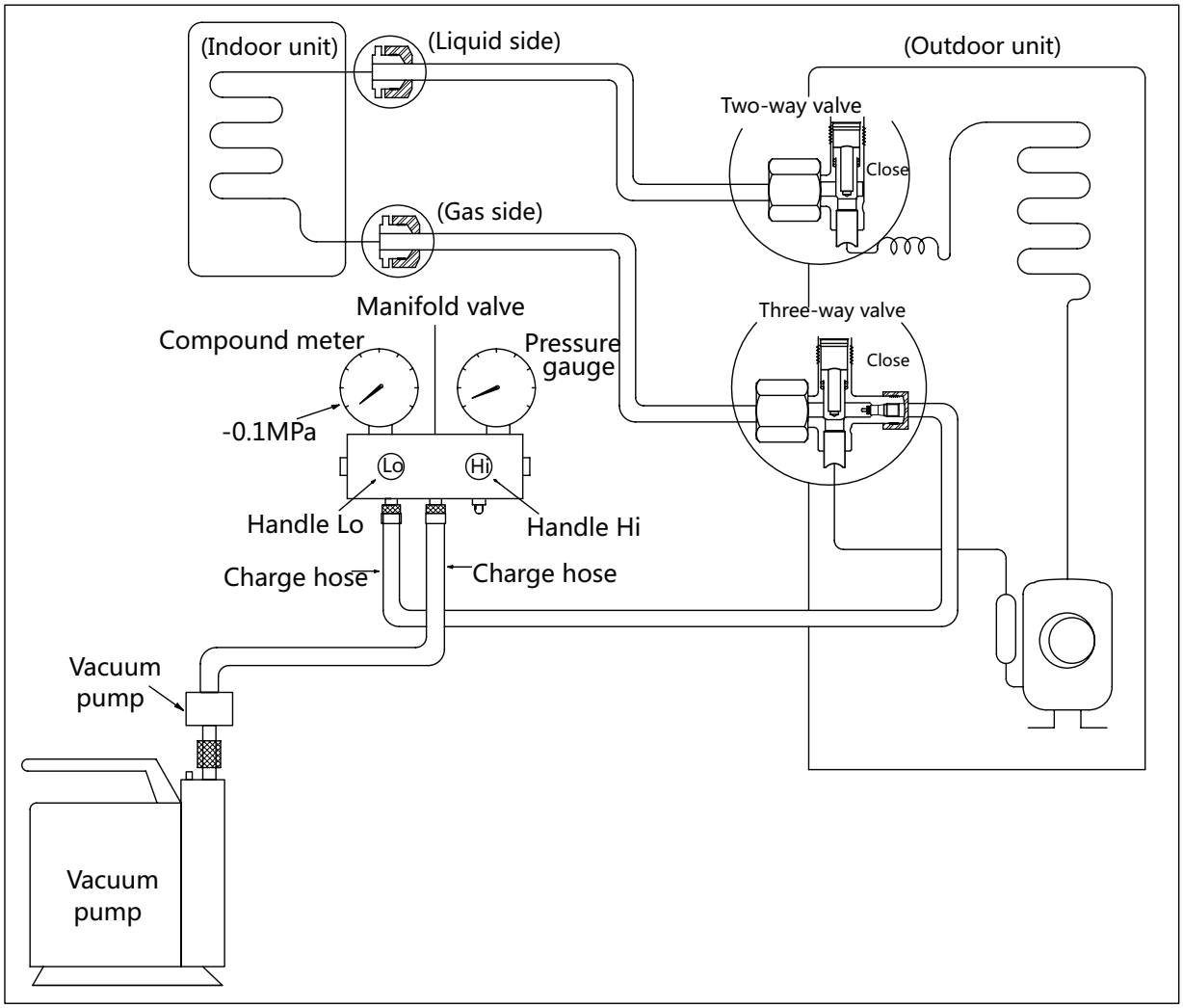
Air and moisture trapped in the refrigerant system affects the performance of the air conditioner by:

- Increasing pressure in the system.
- Increasing the operating current.
- Decreasing the cooling or heating efficiency.
- Congesting the capillary tubing due to ice build-up in the refrigerant circuit.
- Corroding the refrigerant system.

To prevent air and moisture from affecting the air conditioner's performance, the indoor unit, as well as the pipes between the indoor and outdoor unit, must be leak tested and evacuated.

Leak test (soap water method)

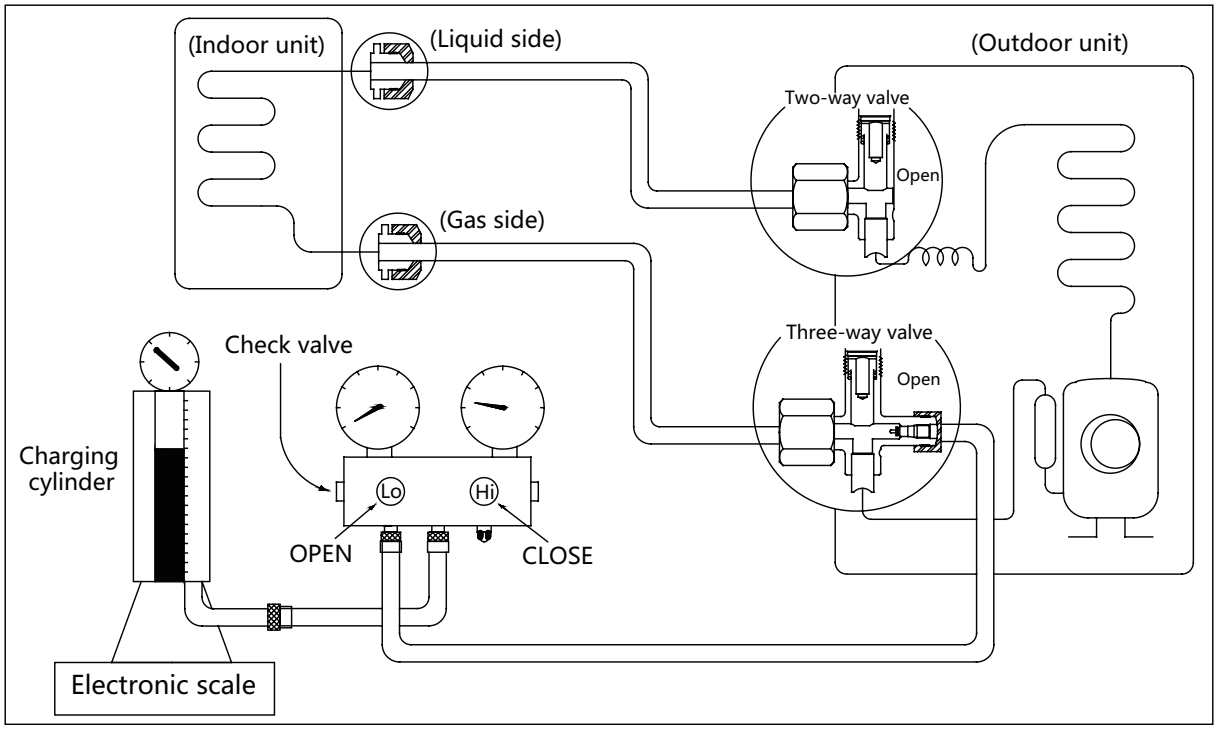
Use a soft brush to apply soapy water or a neutral liquid detergent onto the indoor unit connections and outdoor unit connections. If there is gas leakage, bubbles will form on the connection.



Procedure:

1. Tighten the flare nuts of the indoor and outdoor units, and confirm that both the 2- and 3-way valves are closed.
2. Connect the charge hose with the push pin of Handle Lo to the gas service port of the 3-way valve.
3. Connect another charge hose to the vacuum pump.
4. Fully open the Handle Lo manifold valve.
5. Using the vacuum pump, evacuate the system for 30 minutes.
   a. Check whether the compound meter indicates -0.1 MPa (14.5 Psi).
      - If the meter does not indicate -0.1 MPa (14.5 Psi) after 30 minutes, continue evacuating for an additional 20 minutes.
      - If the pressure does not achieve -0.1 MPa (14.5 Psi) after 50 minutes, check for leakage.
      - If the pressure successfully reaches -0.1 MPa (14.5 Psi), fully close the Handle Lo valve, then cease vacuum pump operations.
   b. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check wether there is gas leakage.
6. Loosen the flare nut of the 3-way valve for 6 or 7 seconds and then tighten the flare nut again.
   a. Confirm the pressure display in the pressure indicator is slightly higher than the atmospheric pressure.
   b. Remove the charge hose from the 3-way valve.
7. Fully open the 2- and 3-way valves and tighten the cap of the 2- and 3-way valves.

1.1 Refrigerant Recharge



Prior to recharging the refrigerant, confirm the additional amount of refrigerant required using the following table:

Models	Standard length	Max. elevation	Max. length	Additional refrigerant
36k	5m (16.4ft)	20m (65.6ft)	30m (98.4ft)	65g/m (0.69oz/ft)
48k~60k	5m (16.4ft)	30m (98.4ft)	50m (164ft)	65g/m (0.69oz/ft)

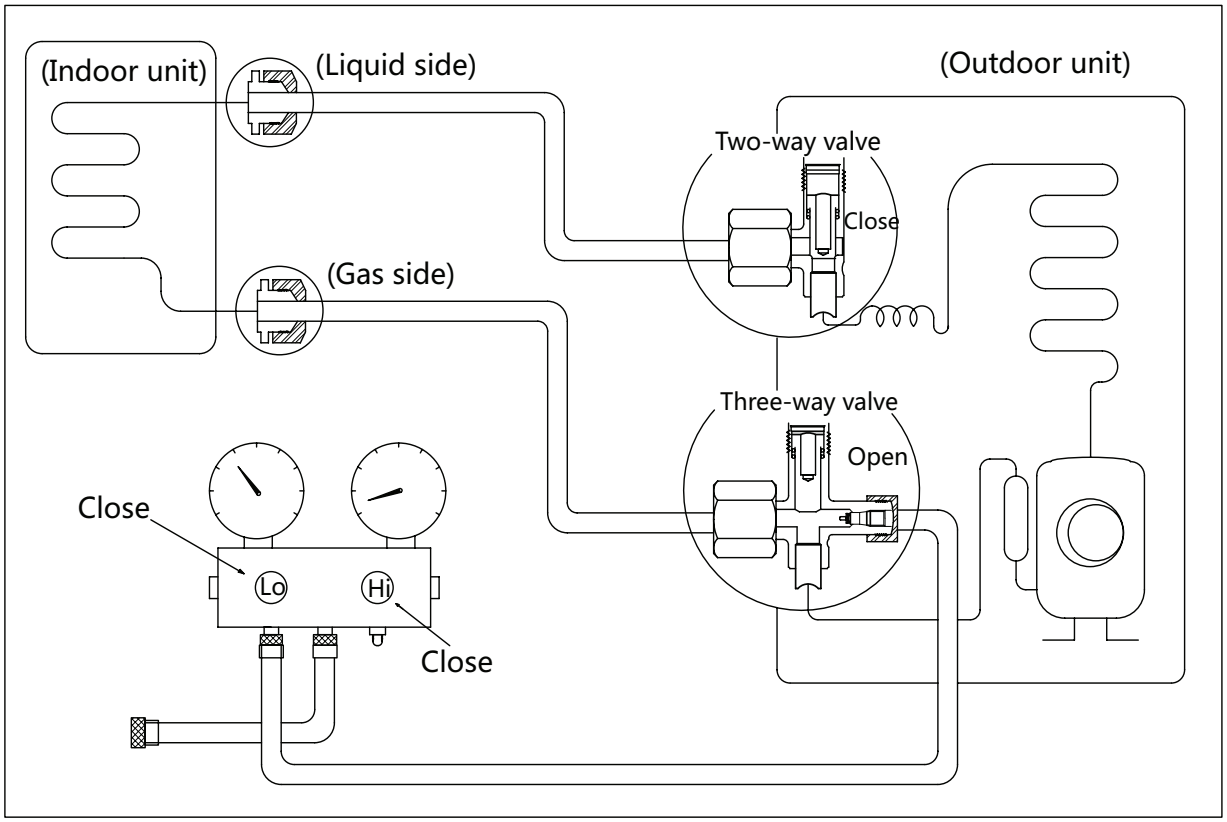
Procedure:

1. Close both 2- and 3-way valves.
2. Slightly connect the Handle Lo charge hose to the 3-way service port.
3. Connect the charge hose to the valve at the bottom of the cylinder.
4. If the refrigerant is R410A, invert the cylinder to ensure a complete liquid charge.
5. Open the valve at the bottom of the cylinder for 5 seconds to purge the air in the charge hose, then fully tighten the charge hose with push pin Handle Lo to the service port of 3-way valve..
6. Place the charging cylinder onto an electronic scale and record the starting weight.
7. Fully open the Handle Lo manifold valve, 2- and 3-way valves.
8. Operate the air conditioner in cooling mode to charge the system with liquid refrigerant.
9. When the electronic scale displays the correct weight (refer to the gauge and the pressure of the low side to confirm), turn off the air conditioner, then disconnect the charge hose from the 3-way service port immediately..
10. Mount the caps of service port and 2- and 3-way valves.
11. Use a torque wrench to tighten the caps to a torque of 18 N.m.
12. Check for gas leakage.

1.14 Re-Installation

1.14.1 Indoor Unit

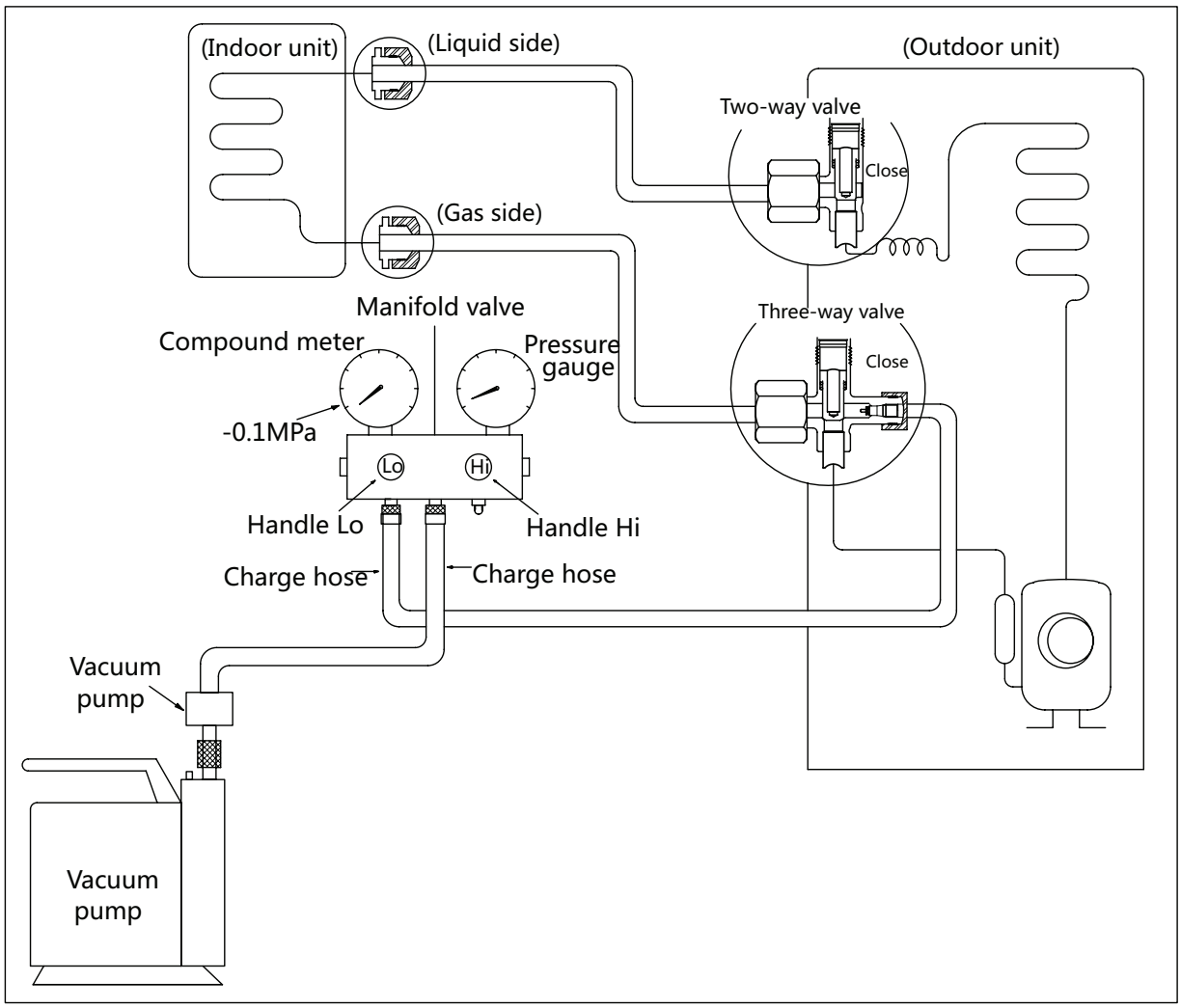
Collecting the refrigerant into the outdoor unit



Procedure:

1. Confirm that the 2- and 3-way valves are opened.
2. Connect the charge hose with the push pin of Handle Lo to the 3-way valve's gas service port.
3. Open the Handle Lo manifold valve to purge air from the charge hose for 5 seconds and then close it quickly.
4. Close the 2-way valve.
5. Operate the air conditioner in cooling mode. Cease operations when the gauge reaches 0.1 MPa (14.5 Psi).
6. Close the 3-way valve so that the gauge rests between 0.3 MPa (43.5 Psi) and 0.5 MPa (72.5 Psi).
7. Disconnect the charge set and mount the caps of service port and 2- and 3-way valves.
8. Use a torque wrench to tighten the caps to a torque of 18 N.m.
9. Check for gas leakage.

Air purging with vacuum pump



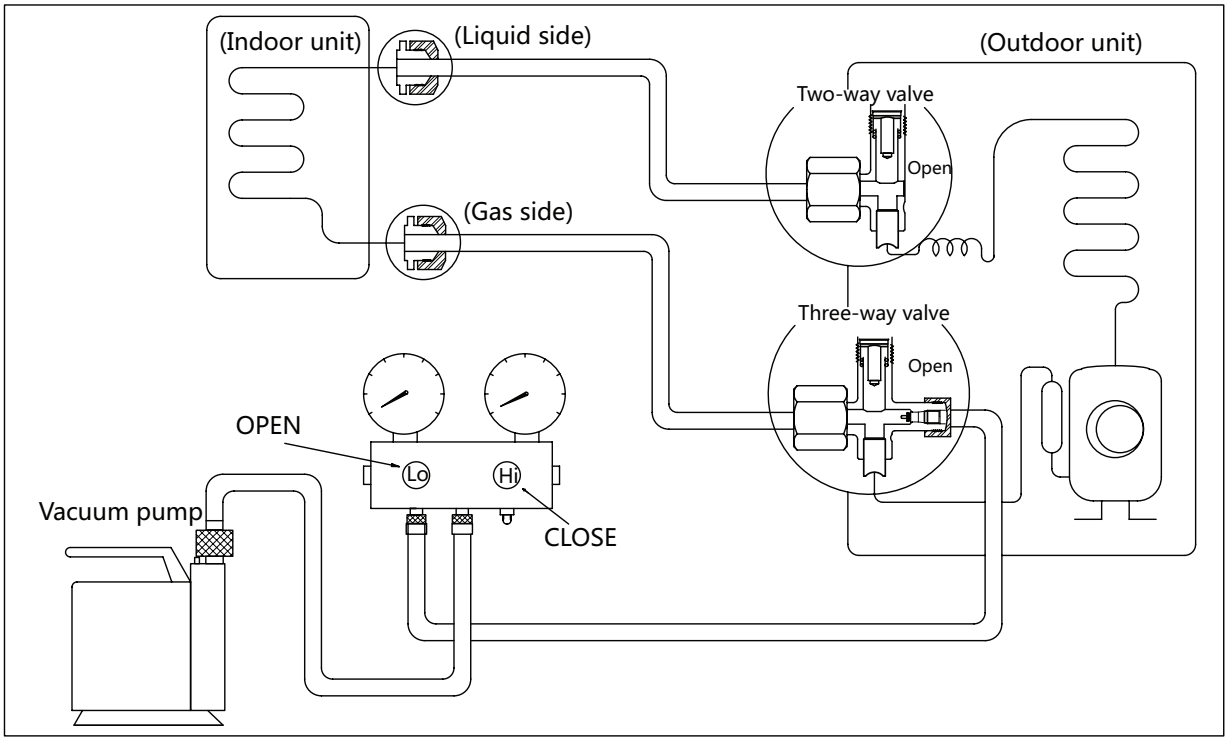
Procedure:

1. Tighten the flare nuts of the indoor and outdoor units, and confirm that both the 2- and 3-way valves are closed.
2. Connect the charge hose with the push pin of Handle Lo to the gas service port of the 3-way valve.
3. Connect another charge hose to the vacuum pump.
4. Fully open the Handle Lo manifold valve.
5. Using the vacuum pump, evacuate the system for 30 minutes.
   a. Check whether the compound meter indicates -0.1 MPa (14.5 Psi).
      - If the meter does not indicate -0.1 MPa (14.5 Psi) after 30 minutes, continue evacuating for an additional 20 minutes.
      - If the pressure does not achieve -0.1 MPa (14.5 Psi) after 50 minutes, check for leakage.
      - If the pressure successfully reaches -0.1 MPa (14.5 Psi), fully close the Handle Lo valve, then cease vacuum pump operations.

   b. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check wether there is gas leakage.
6. Loosen the flare nut of the 3-way valve for 6 or 7 seconds and then tighten the flare nut again.
   a. Confirm the pressure display in the pressure indicator is slightly higher than the atmospheric pressure.
   b. Remove the charge hose from the 3-way valve.
7. Fully open the 2- and 3-way valves and tighten the cap of the 2- and 3-way valves.

1.14.2 Outdoor Unit

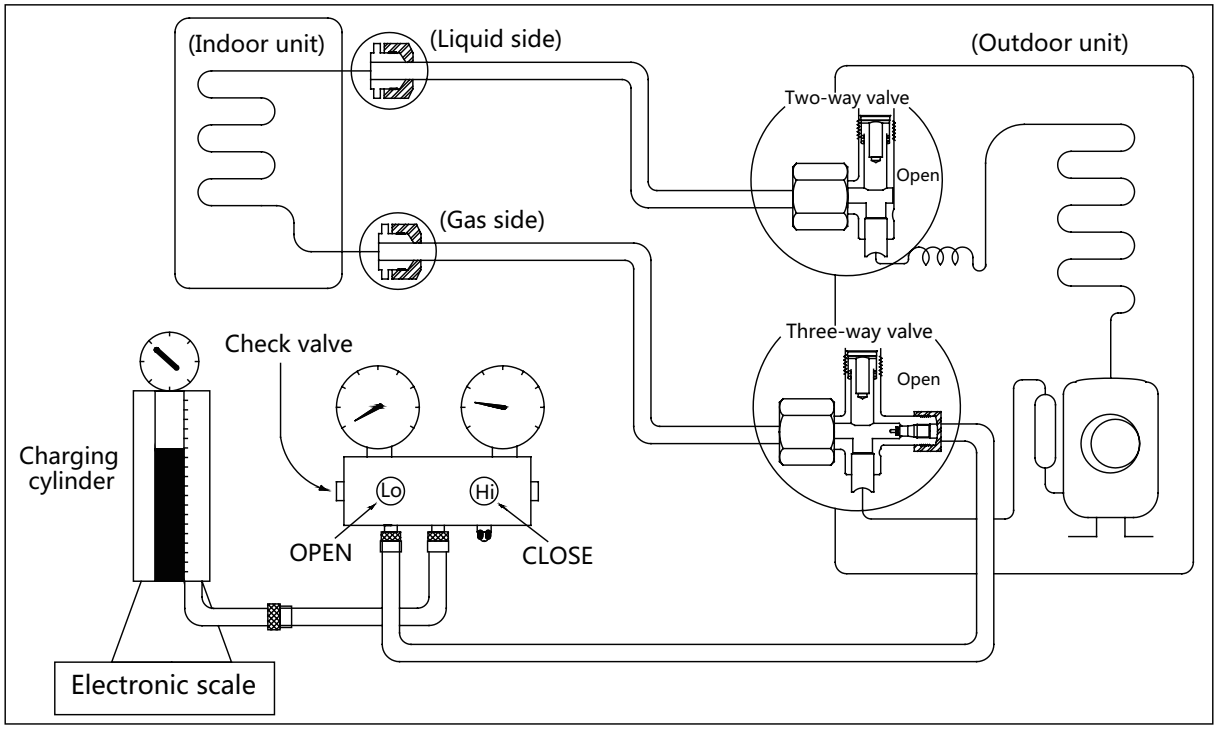
Evacuation for the whole system



Procedure:

1. Confirm that the 2- and 3-way valves are opened.
2. Connect the vacuum pump to the 3-way valve's service port.
3. Evacuate the system for approximately one hour. Confirm that the compound meter indicates -0.1 MPa (14.5Psi).
4. Close the valve (Low side) on the charge set and turn off the vacuum pump.
5. Wait for 5 minutes then check whether the gauge needle moves after turning off the vacuum pump. If the gauge needle moves backward, check whether there is gas leakage.
6. Disconnect the charge hose from the vacuum pump.
7. Mount the caps of service port and 2- and 3-way valves.
8. Use a torque wrench to tighten the caps to a torque of 18 N.m.

Refrigerant charging



Procedure:

1. Close both 2- and 3-way valves.
2. Slightly connect the Handle Lo charge hose to the 3-way service port.
3. Connect the charge hose to the valve at the bottom of the cylinder.
4. If the refrigerant is R410A, invert the cylinder to ensure a complete liquid charge.
5. Open the valve at the bottom of the cylinder for 5 seconds to purge the air in the charge hose, then fully tighten the charge hose with push pin Handle Lo to the service port of 3-way valve..
6. Place the charging cylinder onto an electronic scale and record the starting weight.
7. Fully open the Handle Lo manifold valve, 2- and 3-way valves.
8. Operate the air conditioner in cooling mode to charge the system with liquid refrigerant.
9. When the electronic scale displays the correct weight (refer to the gauge and the pressure of the low side to confirm), turn off the air conditioner, then disconnect the charge hose from the 3-way service port immediately..
10. Mount the caps of service port and 2- and 3-way valves.
11. Use a torque wrench to tighten the caps to a torque of 18 N.m.
12. Check for gas leakage.

Note: 1. Mechanical connectors used indoors shall comply with local regulations.

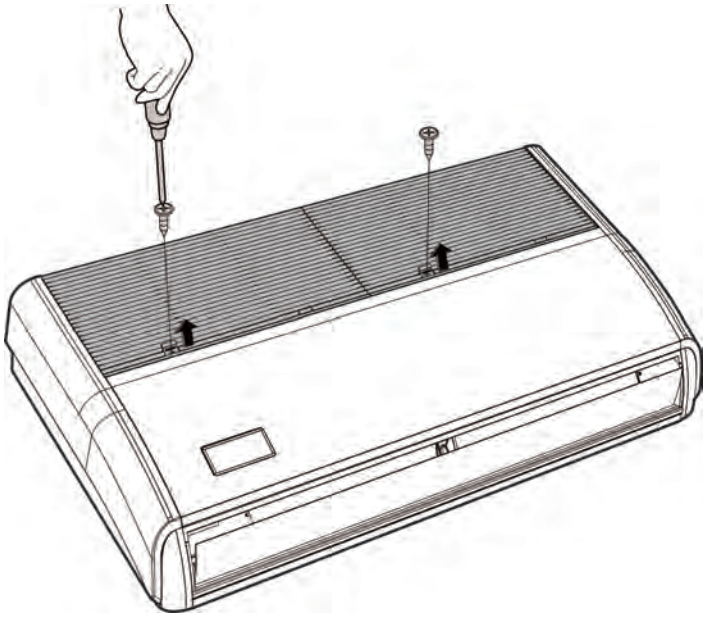
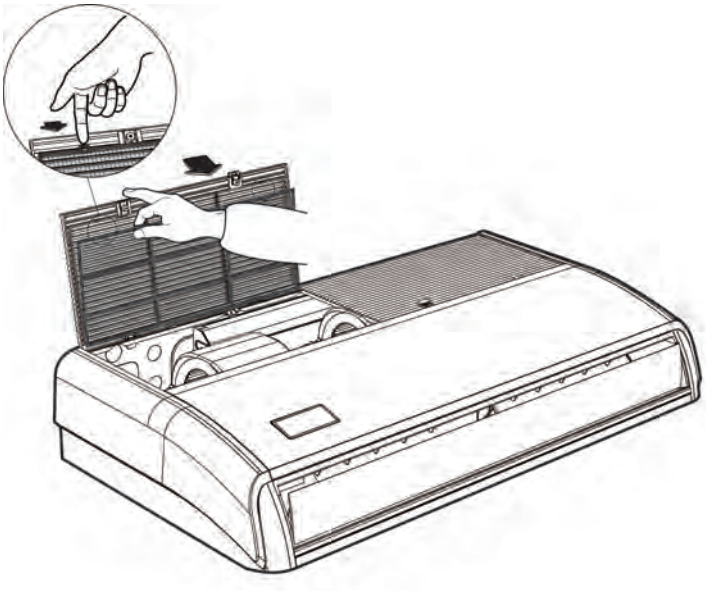
2. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be re-fabricated.

2. Disassembly

2.1 Indoor unit

2.1.1 Ceiling&Floor

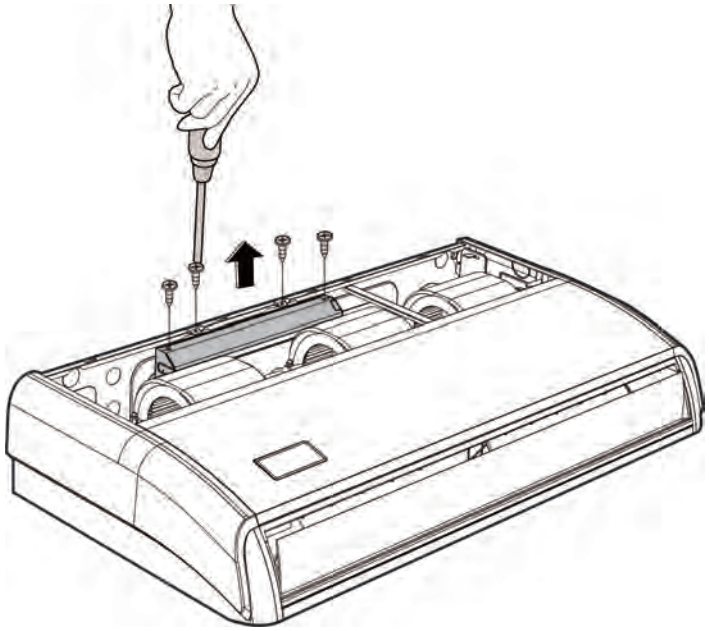
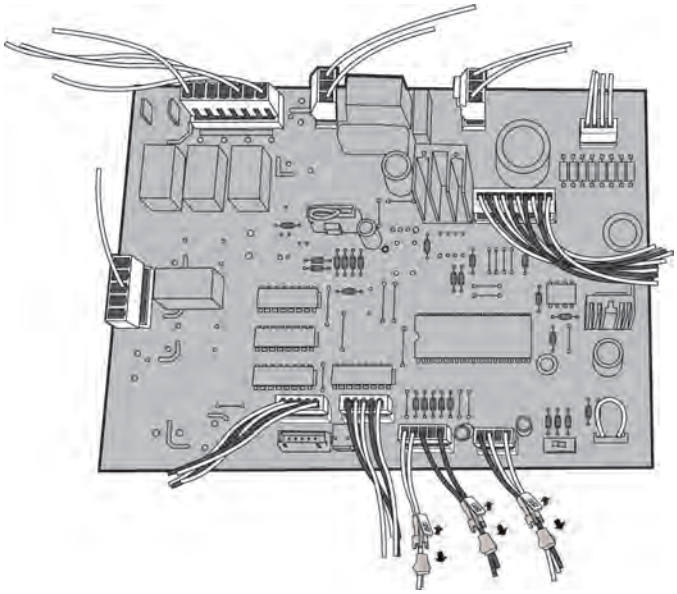
1. Front Panel

Procedure	Illustration
1) Remove 2 screws of return air grille subassembly and release 2 hooks. (see CJ_CF_001)	 CJ_CF_001
2) Release 2 hooks for each filter, and then pull up the filter. (see CJ_CF_002)	 CJ_CF_002

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

2. Electrical parts (Antistatic gloves must be worn.)

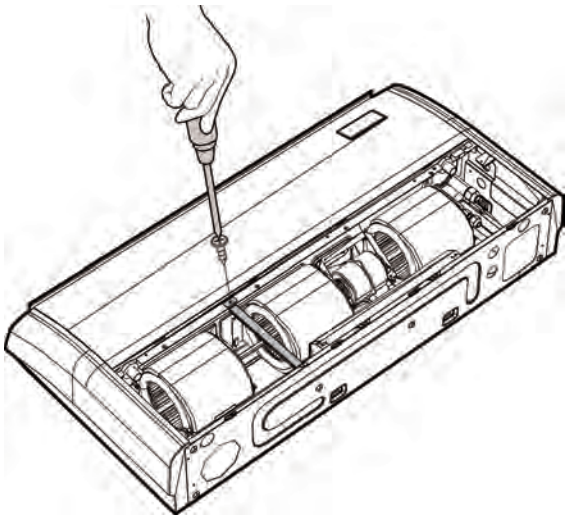
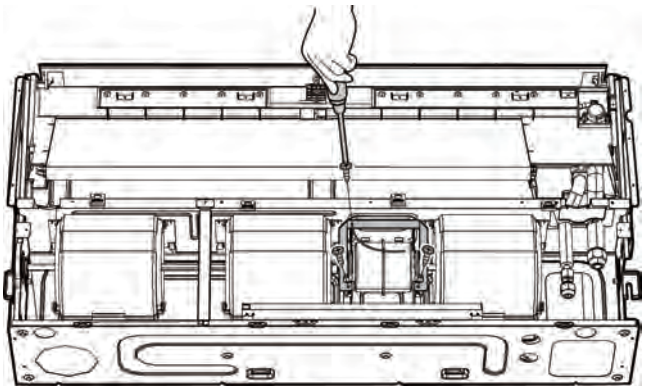
Note: Remove the front panel (refer to 1. front panel) before disassembling electrical part.

Procedure	Illustration
1) Remove 4 screws of the cover of electronic control box and then remove the cover. (see CJ_CF_003)	 CJ_CF_003
2) Disconnect the connectors and then remove the main control board. (see CJ_CF_004)	 CJ_CF_004

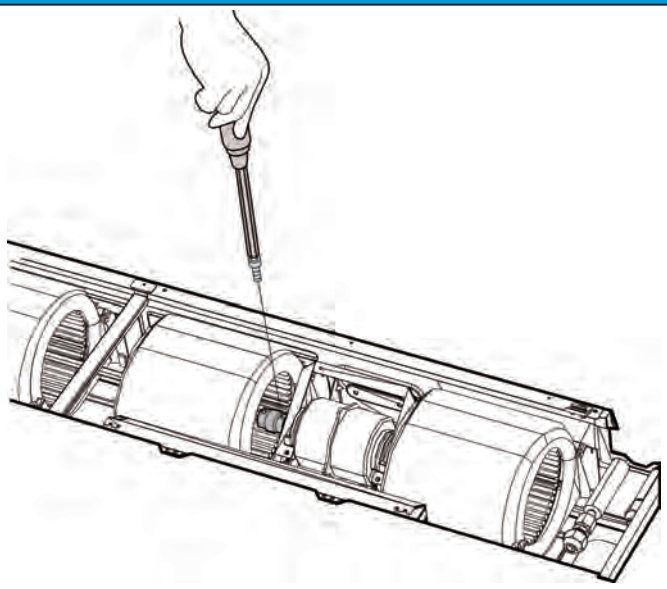
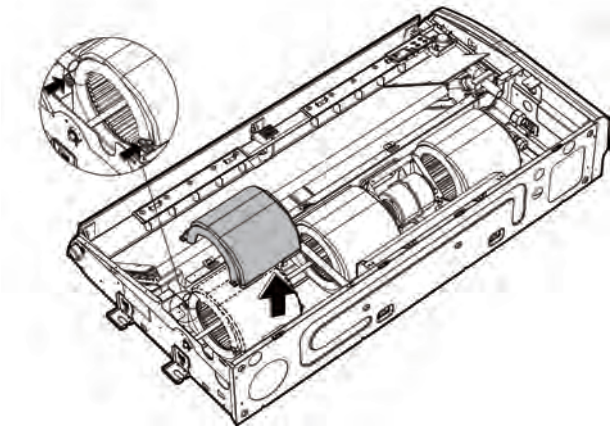
Note: This section is for reference only. Actual unit appearance may vary.

3. Fan motor and fan

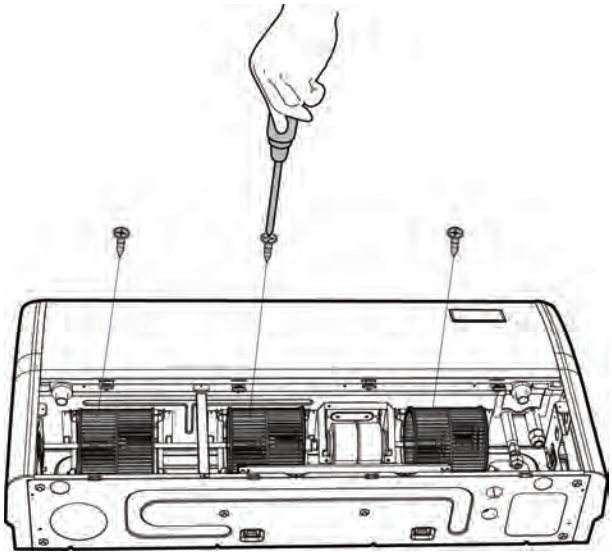
Note: Remove the front panel (refer to 1. front panel) before disassembling fan motor and fan.

Procedure	Illustration
1) Remove the fix screw of supporting board. (see CJ_CF_005)	 CJ_CF_005
2) Remove the screws of fan motor support and then remove the screw of ground wire. (see CJ_CF_006)	 CJ_CF_006

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

Procedure	Illustration
1) Remove the two screws of the fan motor shaft. (see CJ_CF_007)	 CJ_CF_007
2) Release the hooks of the volute shell and then pull up it. (see CJ_CF_008)	 CJ_CF_008

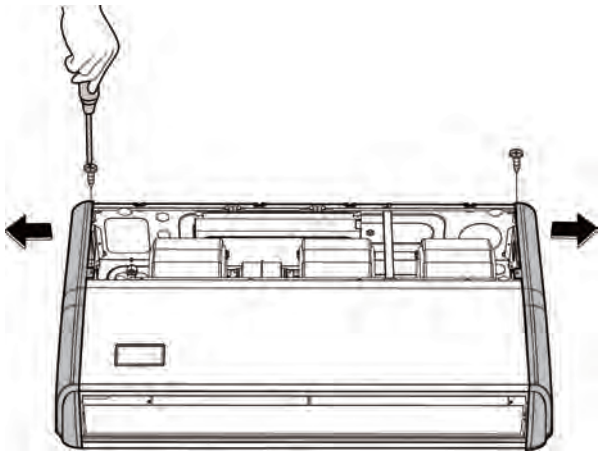
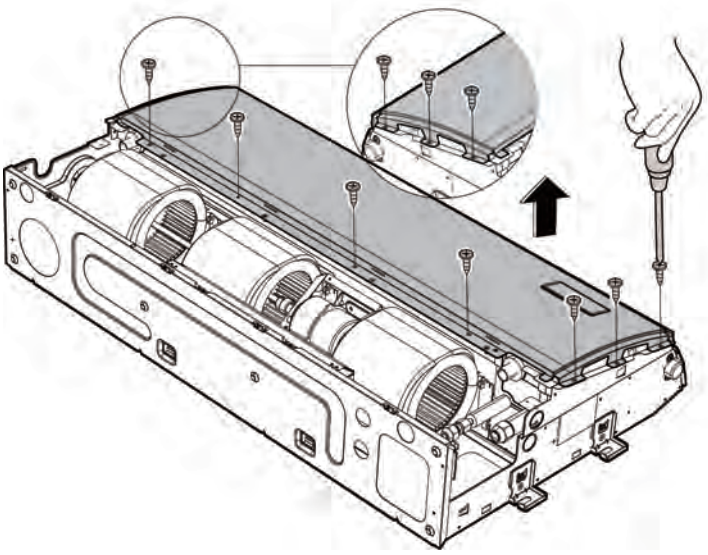
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Remove the screws of fan (3 screws). (see CJ_CF_009)	 CJ_CF_009

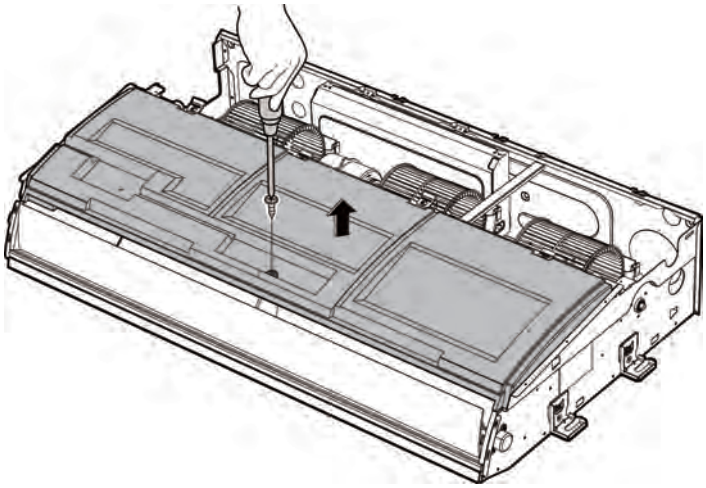
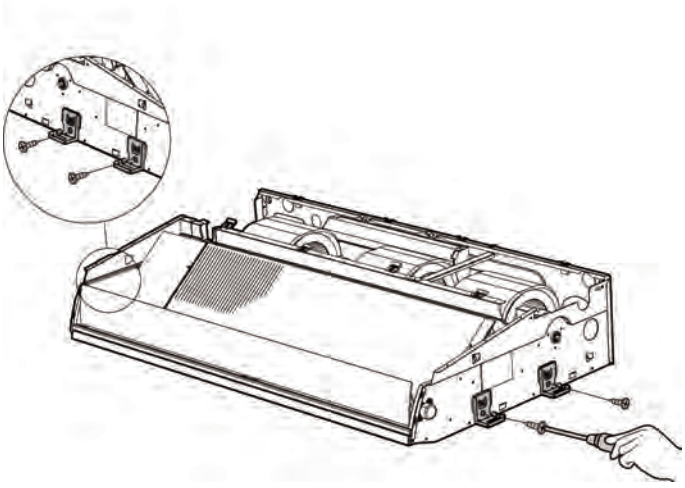
Note: This section is for reference only. Actual unit appearance may vary.

4. Evaporator

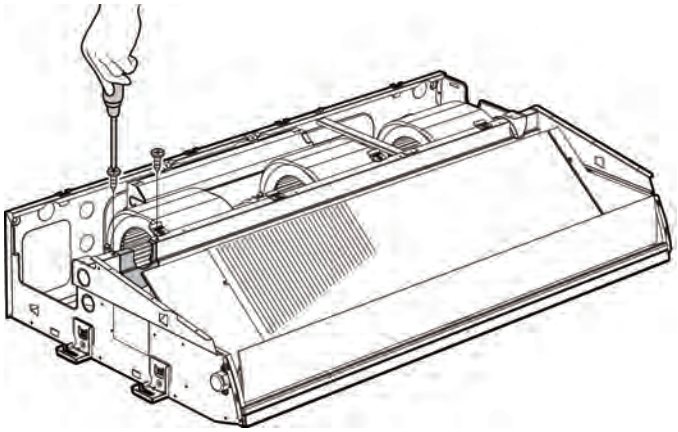
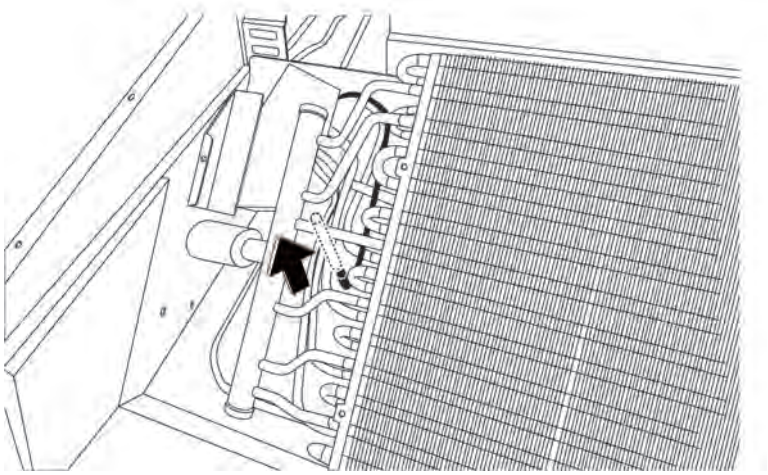
Note: Remove the front panel (refer to 1. front panel) before disassembling evaporator.

Procedure	Illustration
1) Remove the screws of left and right panel and then push it in the direction shown in the figure to move it. (see CJ_CF_010)	 CJ_CF_010
2) Remove the screws of the front panel(9 screws). (see CJ_CF_011)	 CJ_CF_011

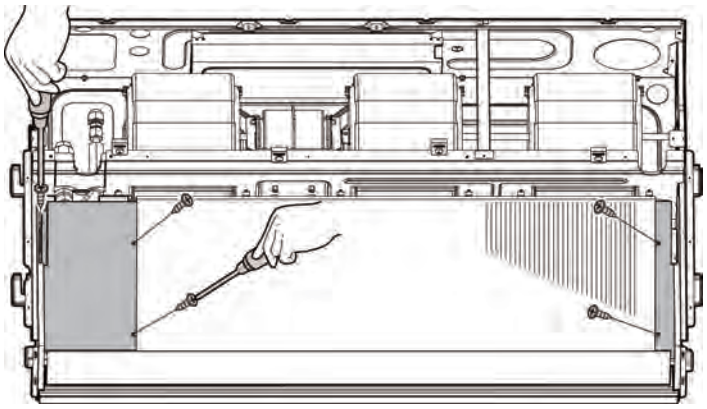
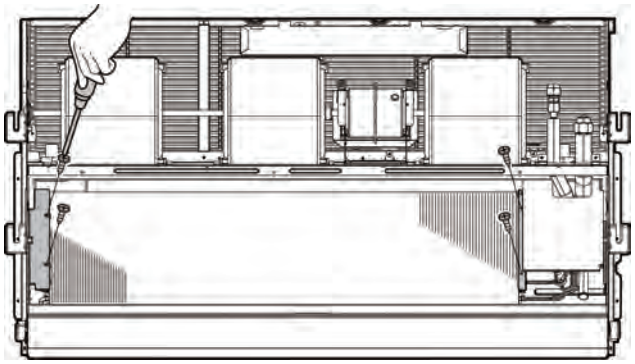
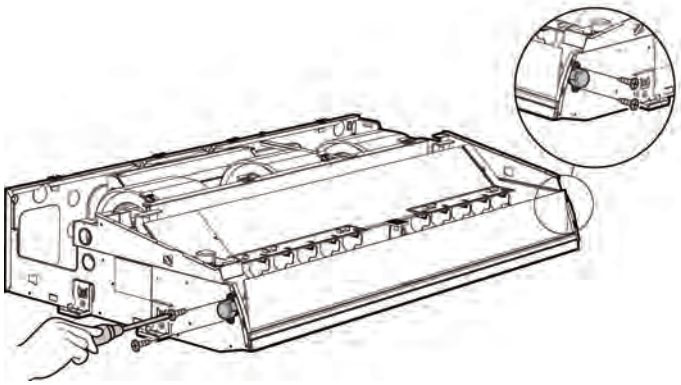
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Remove the 1 screw of the water collector. (see CJ_CF_012)	 CJ_CF_012
4) Remove 3 screws of board and then remove it. (see CJ_CF_013)	 CJ_CF_013

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

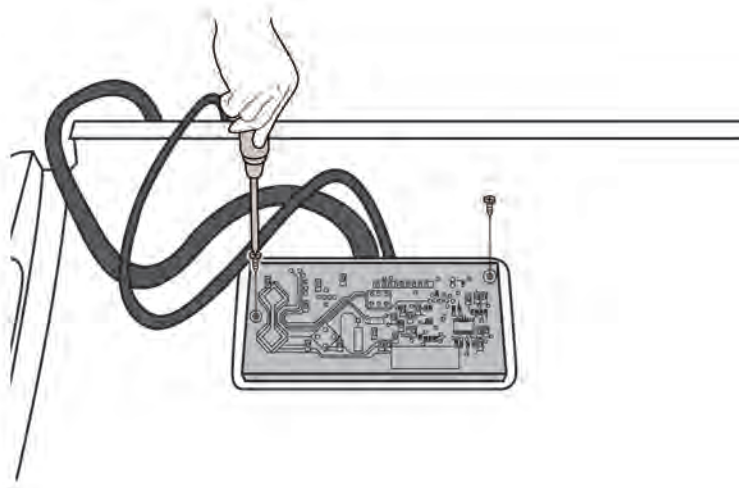
Procedure	Illustration
1) Remove the screws of the pipe clamp board. (see CJ_CF_014)	 CJ_CF_014
2) Pull up the temperature sensor. (see CJ_CF_015)	 CJ_CF_015

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

Procedure	Illustration
3) Remove the screws of the front evaporator support. (5 screws) (see CJ_CF_016)	 CJ_CF_016
4) Remove the screws of the rear evaporator support then pull out the evaporator. (4 screws) (see CJ_CF_017)	 CJ_CF_017
5) Remove 2 screws and Remove step motor. (see CJ_CF_018)	 CJ_CF_018

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

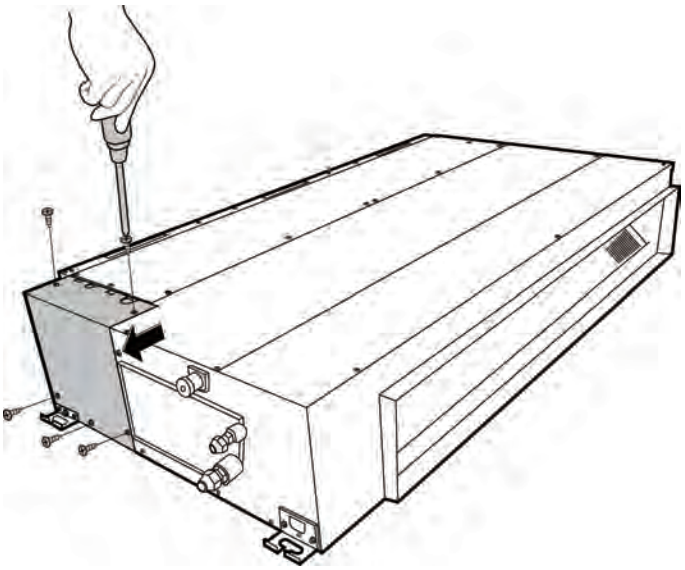
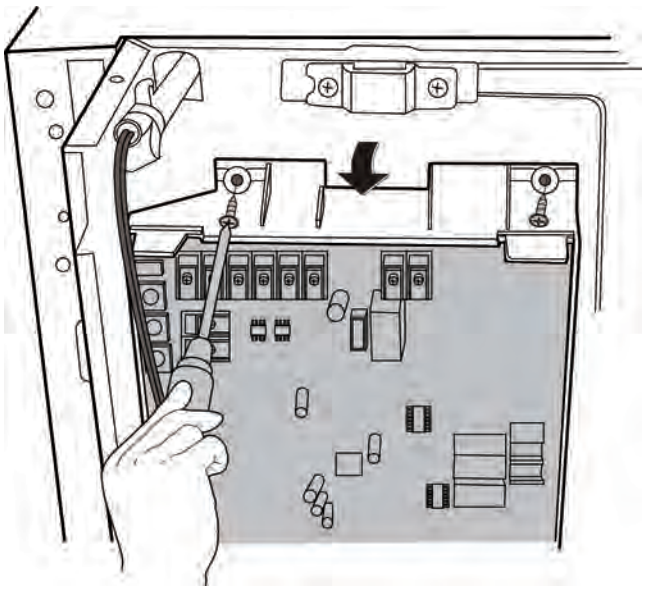
5. Display Board

Procedure	Illustration
1) Remove 2 screws of display board and remove the display. (see CJ_CF_019)	 CJ_CF_019

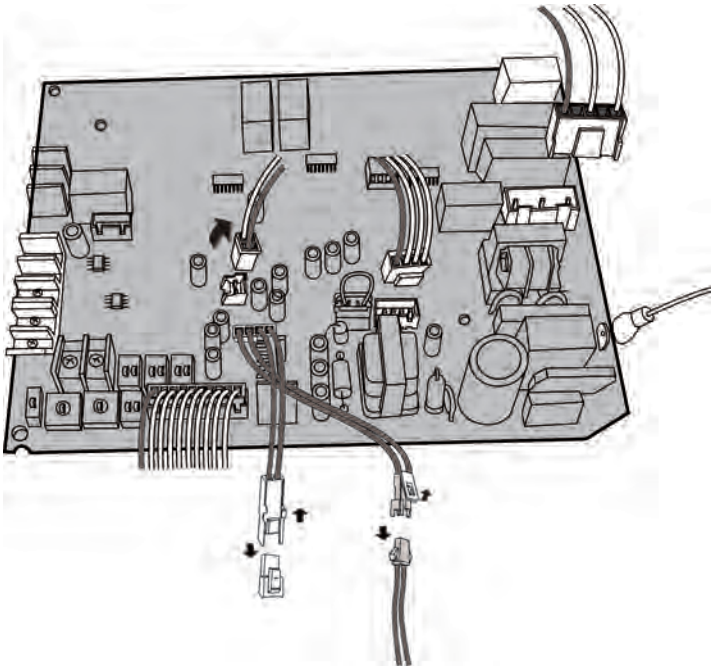
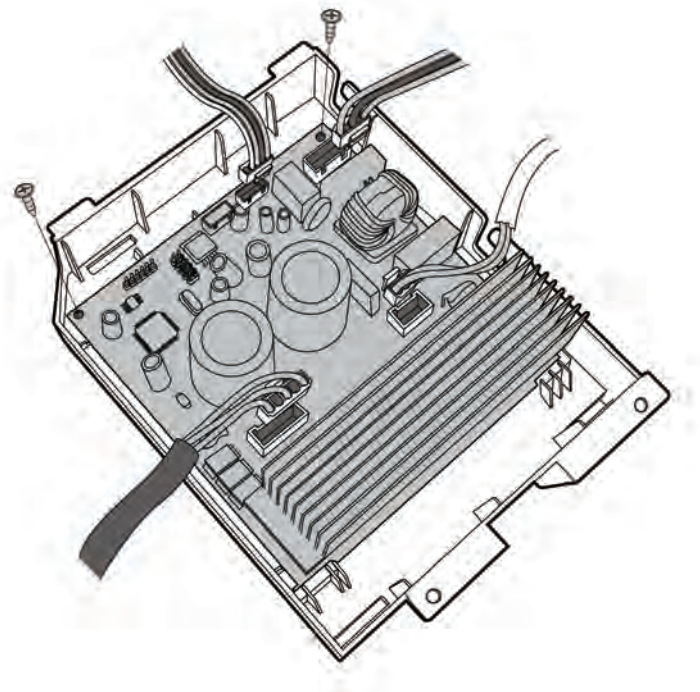
Note: This section is for reference only. Actual unit appearance may vary.

2.1.2 A6 Duct

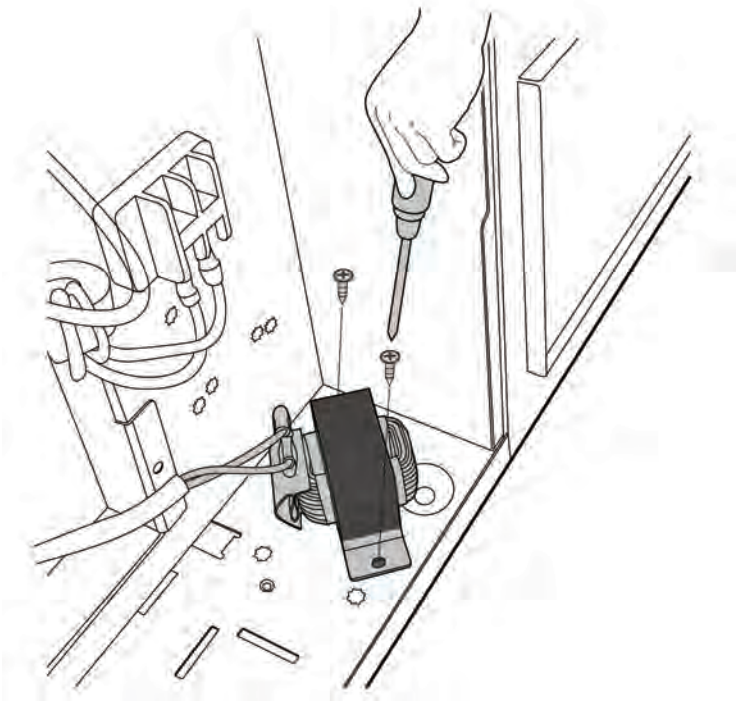
1. Electrical parts (Antistatic gloves must be worn.)

Procedure	Illustration
1) Remove 5 screws of the cover of electronic control box and then remove the cover. (see CJ_A6_001)	 CJ_A6_001
2) Remove 2 screws of the electronic control box. Then release 2 hooks of the main control board. (see CJ_A6_002)	 CJ_A6_002

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

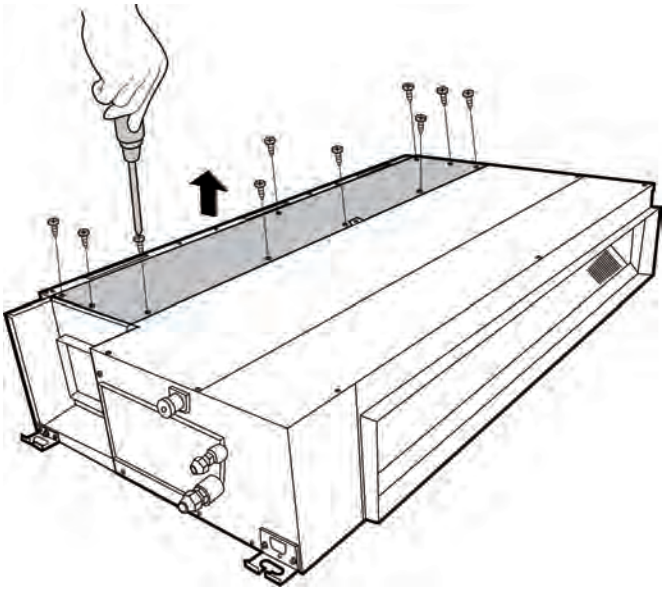
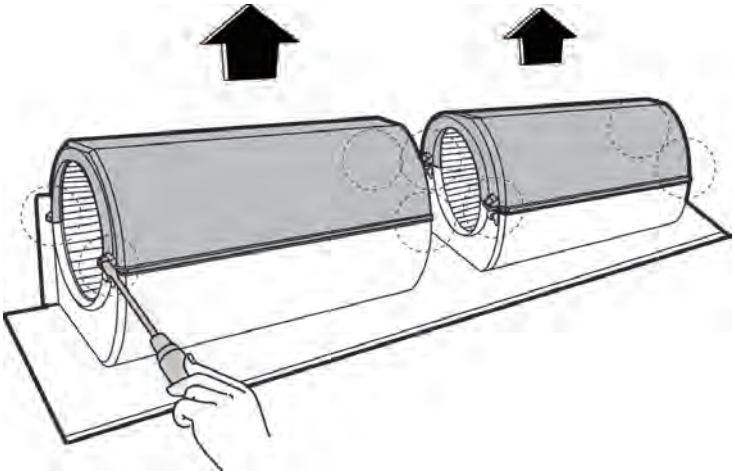
Procedure	Illustration
1) Disconnect the connectors and then remove the front main control board. (see CJ_A6_003)	 CJ_A6_003
2) Turn over the electronic control box. Disconnect the connectors and remove 2 screws of rear main control board. (see CJ_A6_004)	 CJ_A6_004

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

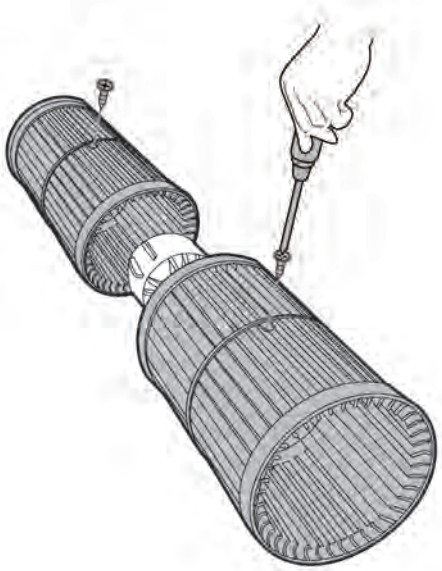
Procedure	Illustration
3) Remove 2 screws of reactor and remove the reactor. (see CJ_A6_005)	 CJ_A6_005

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

2. Fan motor and fan

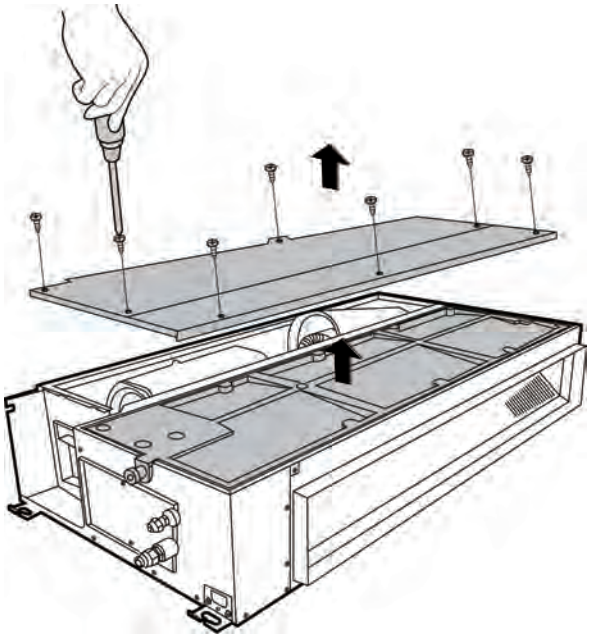
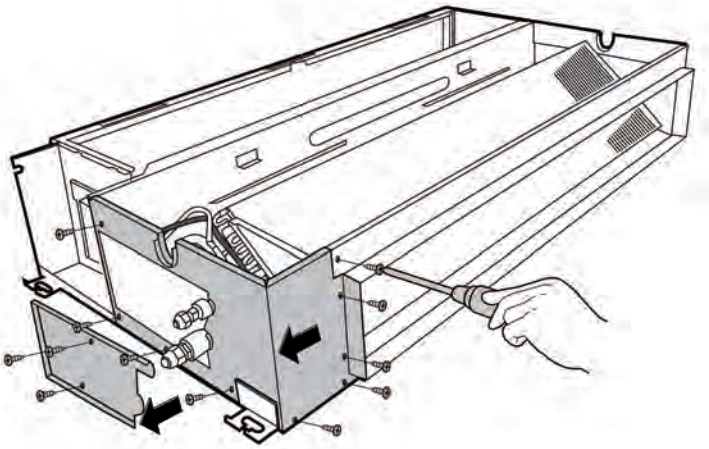
Procedure	Illustration
1) Remove 10 screws of the top cover and then remove the top cover. (see CJ_A6_006)	 CJ_A6_006
2) Release 3 hooks of volute shell. (see CJ_A6_007)	 CJ_A6_007

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

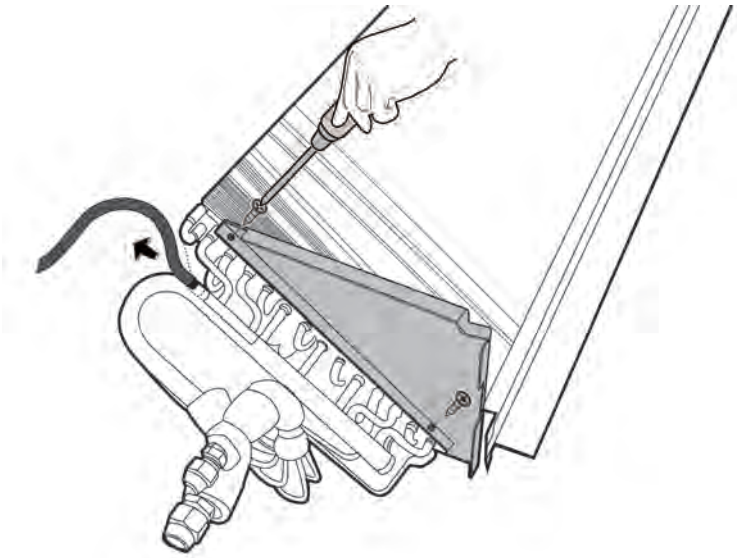
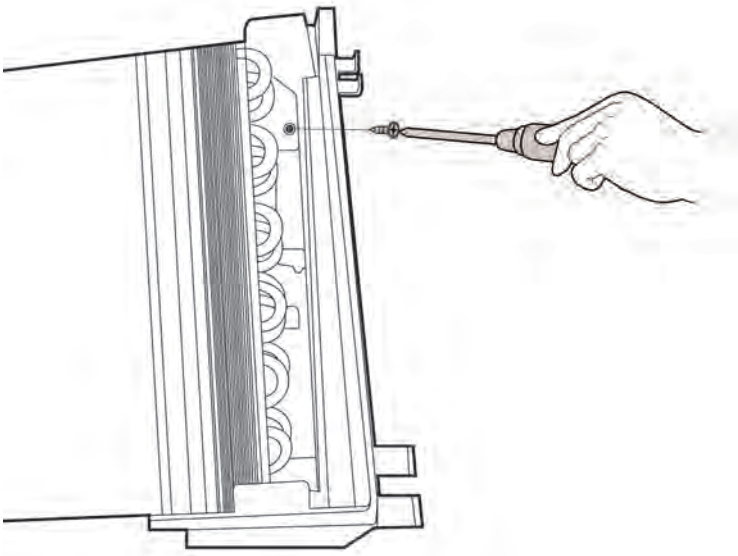
Procedure	Illustration
3) Remove the fiing screws of fan (2 screws). (see CJ_A6_008)	 CJ_A6_008

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

3. Evaporator

Procedure	Illustration
1) Remove 9 Screws of the water collecter and remove the water collecter. (see CJ_A6_009)	 CJ_A6_009
2) Remove the screws of the pipe clamp board and the left side board (3 for the pipe clamp and 9 for left side board). (see CJ_A6_010)	 CJ_A6_010

Note: Remove the front panel (refer to 1. Front panel) before disassembling electrical parts.

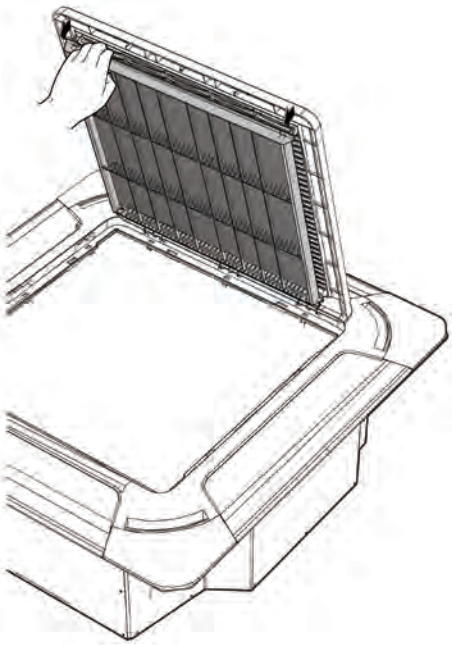
Procedure	Illustration
3) Remove 2 screws of the evaporator support and then pull up the temperature sensor. (see CJ_A6_011)	 CJ_A6_011
4) Remove the screw of the evaporator and then remove it. (see CJ_A6_012)	 CJ_A6_012

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

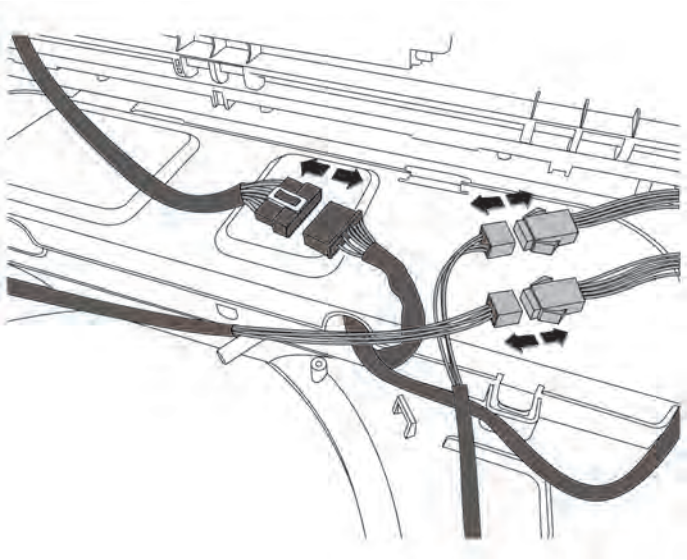
2.1.3 Super-slim Cassette

1. Front Panel and Display Board

i) models except for 60k

Procedure	Illustration
1) Release 2 hooks and open the panel. (see CJ_CASSETTE_001)	 CJ_CASSETTE_001
2) Pull up the filter. (see CJ_ CASSETTE_002)	 CJ_CASSETTE_002

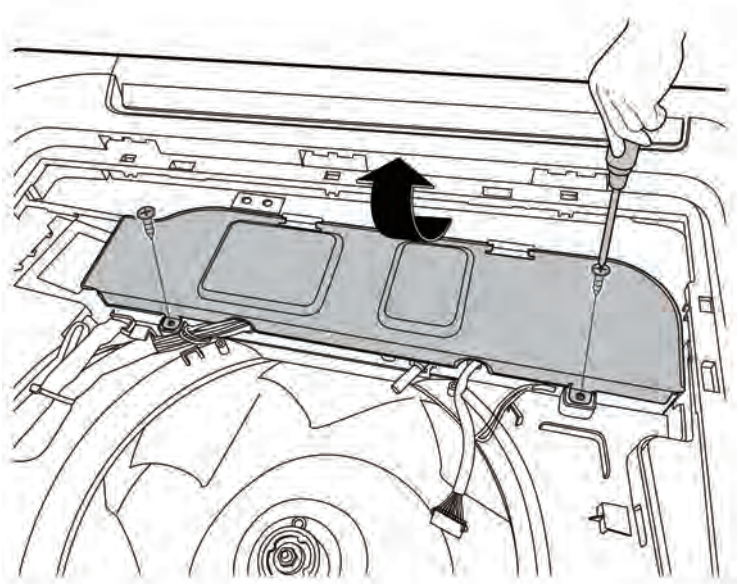
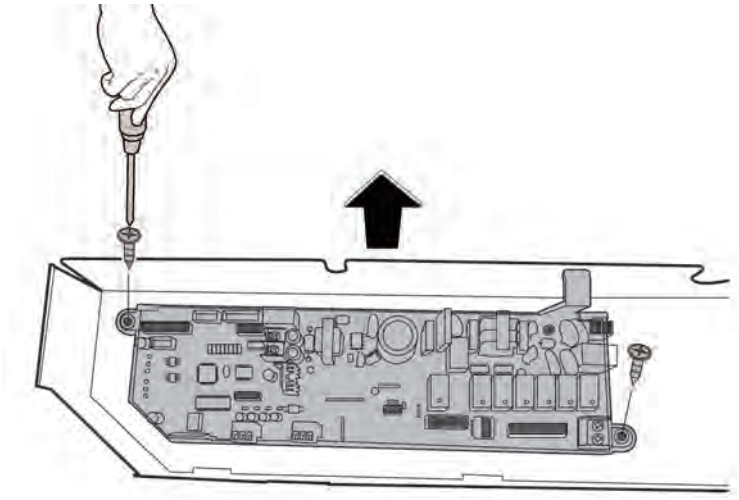
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Disconnect the connectors and release the panel. (see CJ_ CASSETTE_003)	 CJ_CASSETTE_003

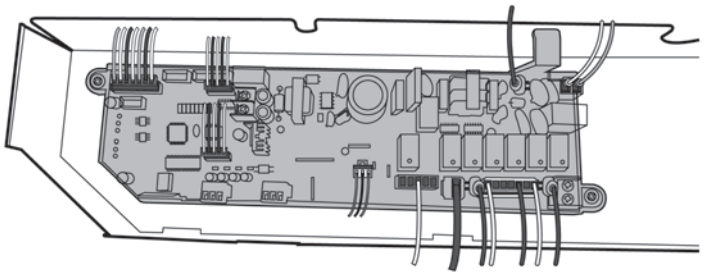
Note: This section is for reference only. Actual unit appearance may vary.

2. Electrical parts (Antistatic gloves must be worn.)

i) models except for 60k

Procedure	Illustration
1) Remove 2 screws and remove the cover of electronic control box. (see CJ_CASSETTE_004)	 CJ_CASSETTE_004
2) Remove 2 screws of the main control board. (see CJ_CASSETTE_005)	 CJ_CASSETTE_005

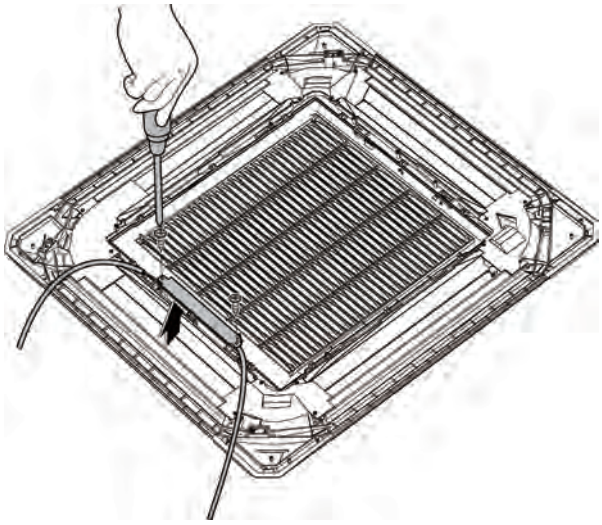
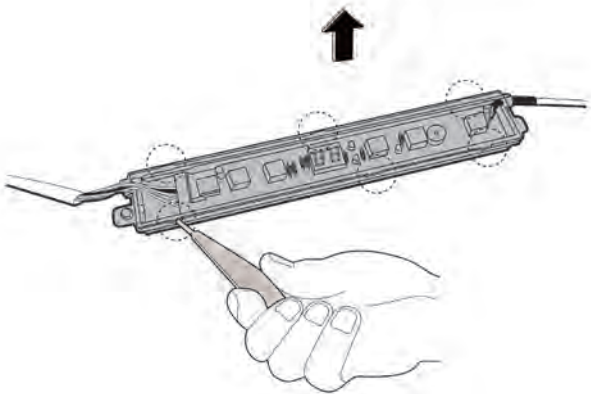
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Disconnect the connectors and then remove the main control board. (see CJ_CASSETTE_006	 **CJ_CASSETTE_006**

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

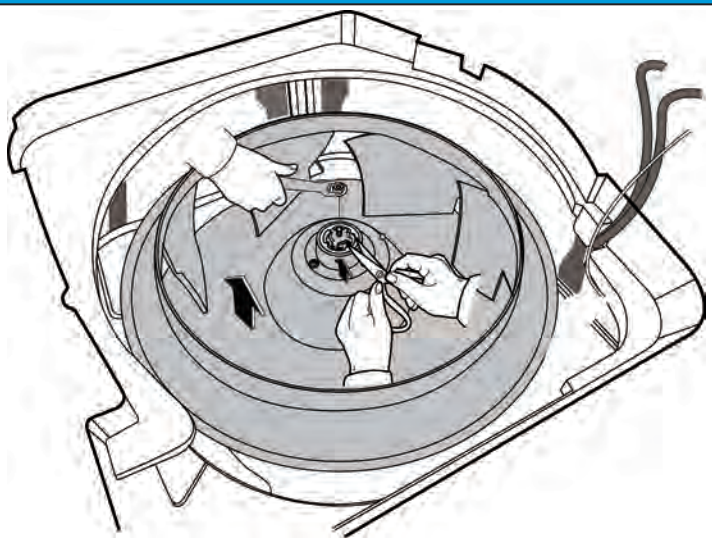
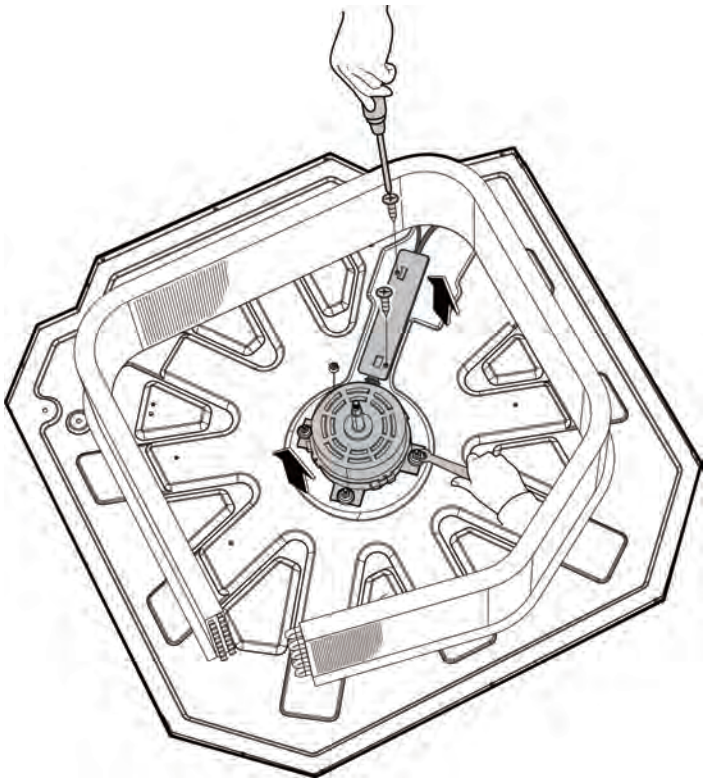
3. Display Board

i) models except for 60k

Procedure	Illustration
1) Remove 2 screws of display board and remove the display board. (see CJ_CASSETTE_007)	 CJ_CASSETTE_007
2) Turn over the display board, rise 3 hooks with a flat screwdriver as shown in the figure. (see CJ_CASSETTE_008)	 CJ_CASSETTE_008

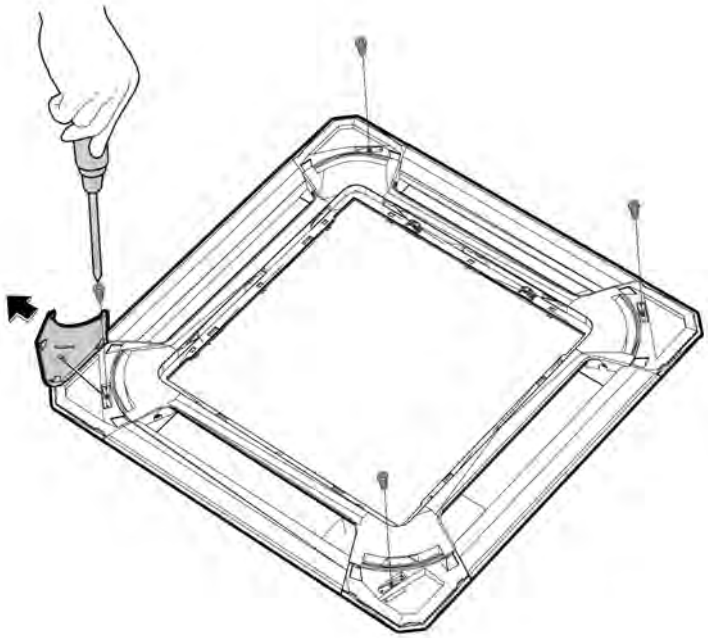
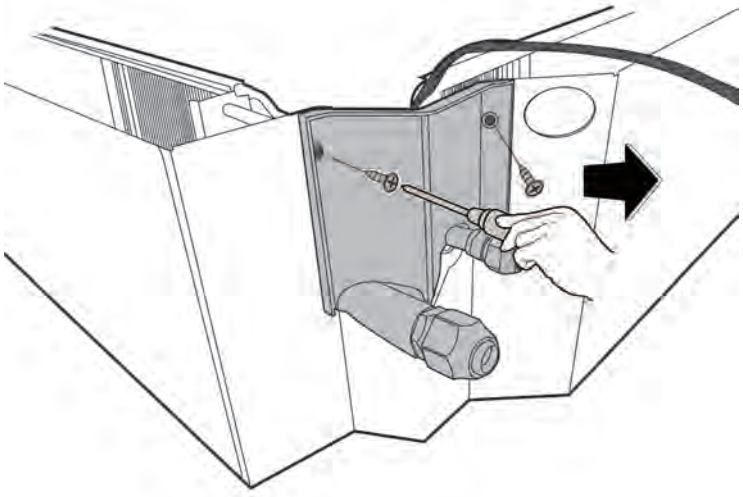
Note: This section is for reference only. Actual unit appearance may vary.

4. Fan motor and fan

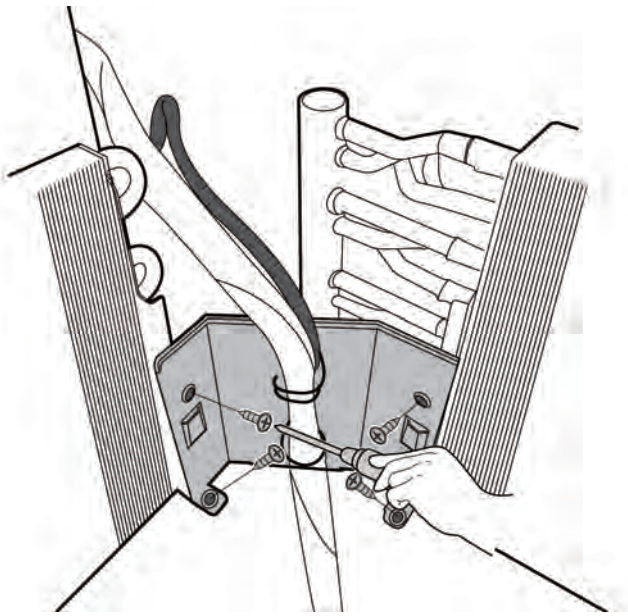
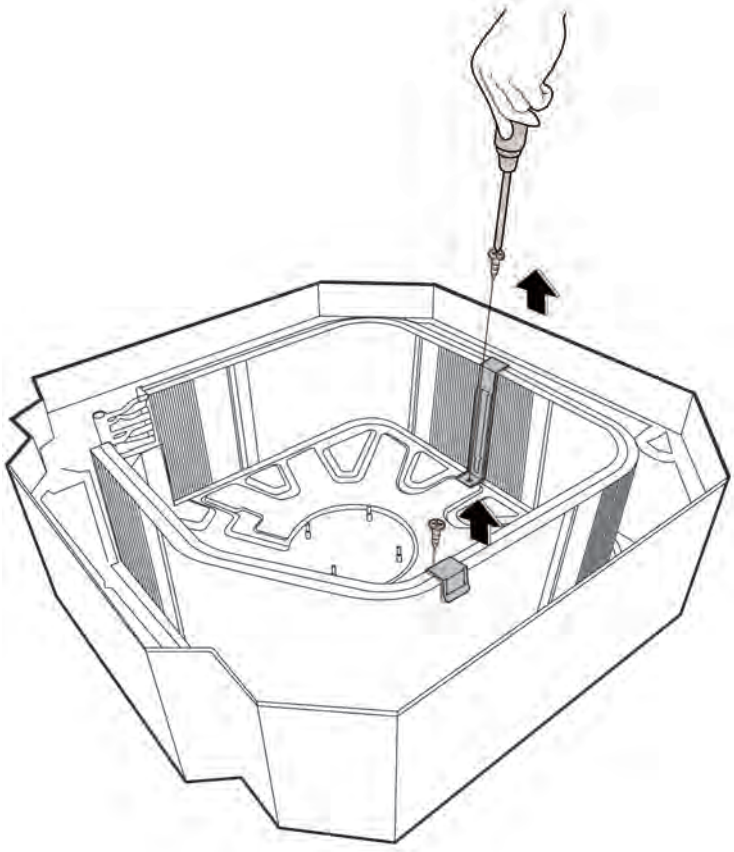
Procedure	Illustration
1) Remove the nut of the fan and then pull up the fan. (see CJ_CASSETTE_009)	 CJ_CASSETTE_009
2) Remove 2 screws of fixing board and 3 nuts of fan motor. (see CJ_CASSETTE_010)	 CJ_CASSETTE_010

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

5. Evaporator

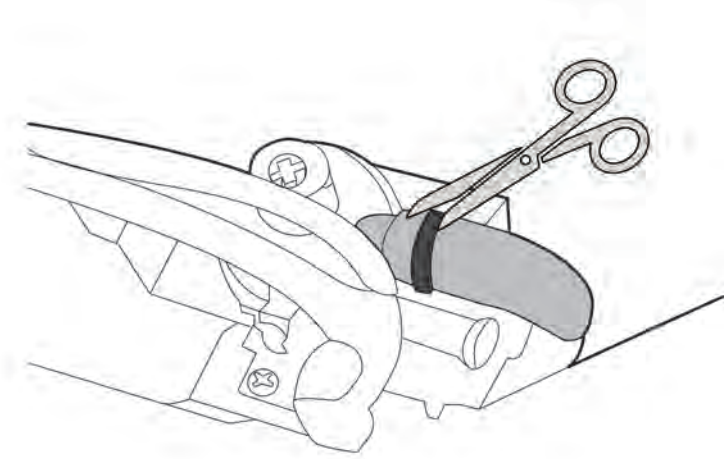
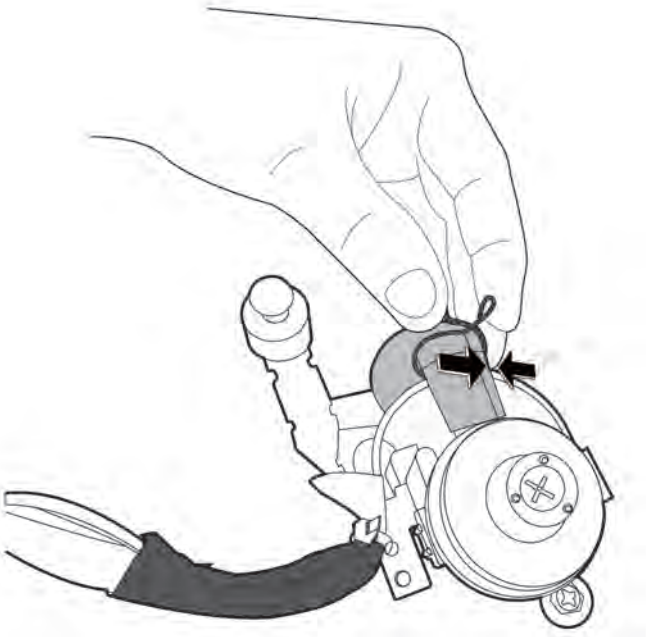
Procedure	Illustration
1) Remove 4 screws of the panel and pull up the panel. (see CJ_CASSETTE_011)	 CJ_CASSETTE_011
2) Remove 2 screws of pipe clamp board. (see CJ_CASSETTE_012)	 CJ_CASSETTE_012

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

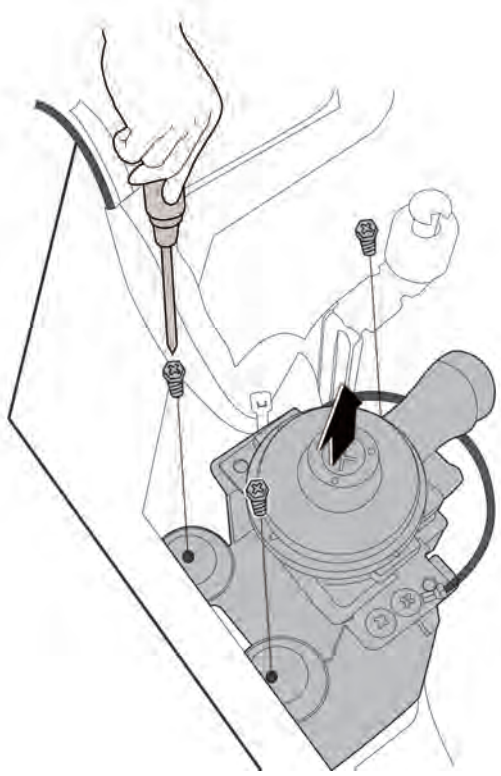
Procedure	Illustration
3) Remove 4 screws of the evaporator support and then remove it. (see CJ_CASSETTE_013)	 CJ_CASSETTE_013
4) Remove 2 screws of the evaporator fixing bracket and then remove it. (see CJ_CASSETTE_014)	 CJ_CASSETTE_014

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

6. Water Pump

Procedure	Illustration
1) Take off the fasten belt of the water pump. (see CJ_CASSETTE_015)	 CJ_CASSETTE_015
2) Pinch the metal wire in the direction shown in the figure to release it. (see CJ_CASSETTE_016)	 CJ_CASSETTE_016

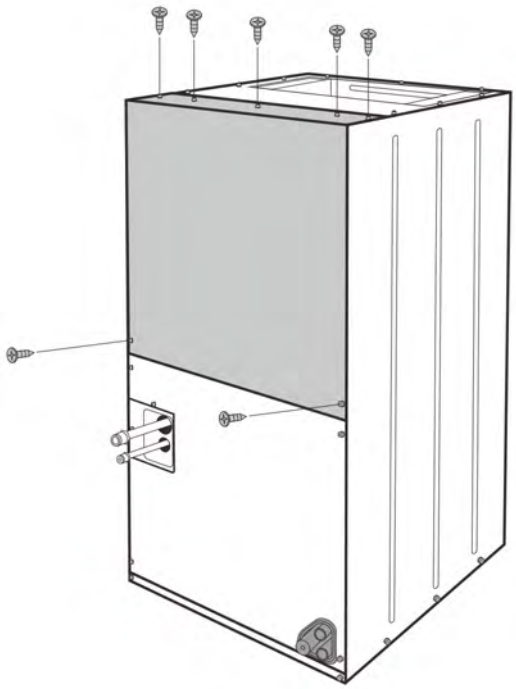
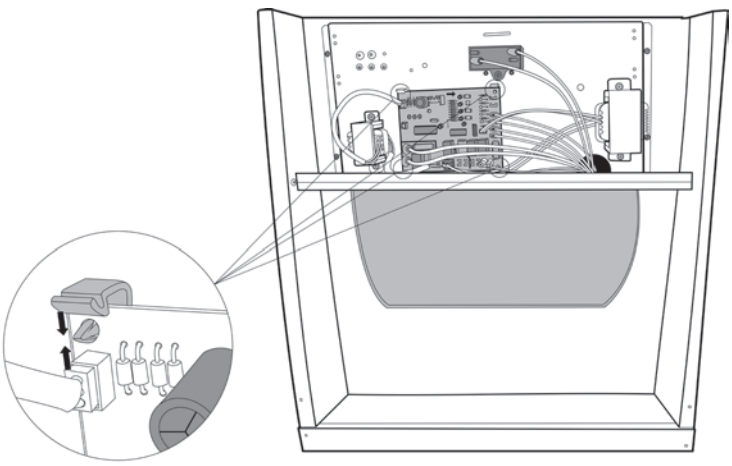
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
3) Remove 3 screws and then remove the water pump. (see CJ_CASSETTE_017)	 CJ_CASSETTE_017

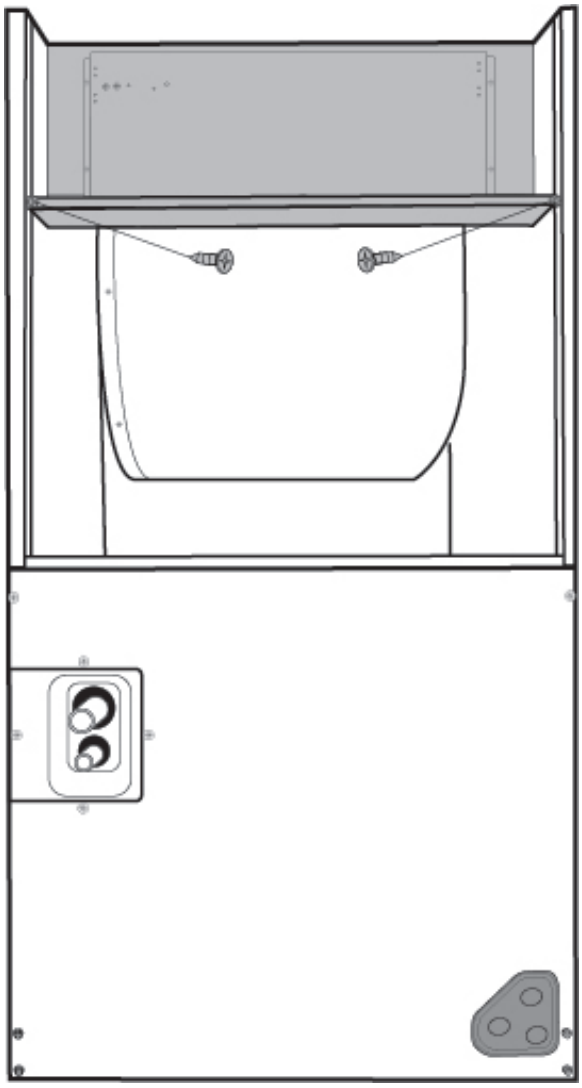
Note: This section is for reference only. Actual unit appearance may vary.

2.1.4 AHU

1. Electrical parts (Antistatic gloves must be worn.)

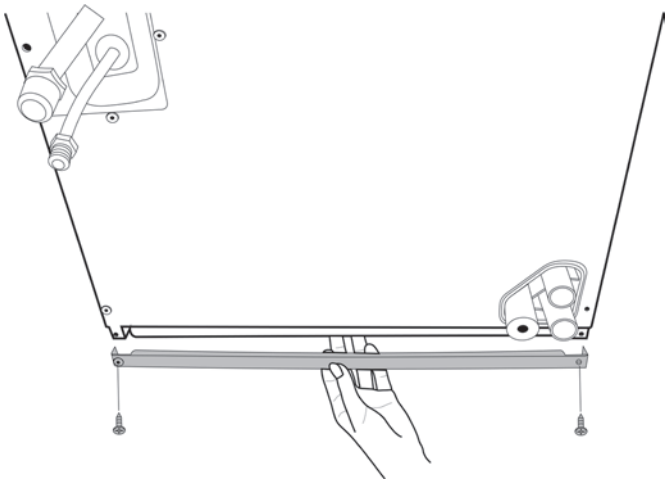
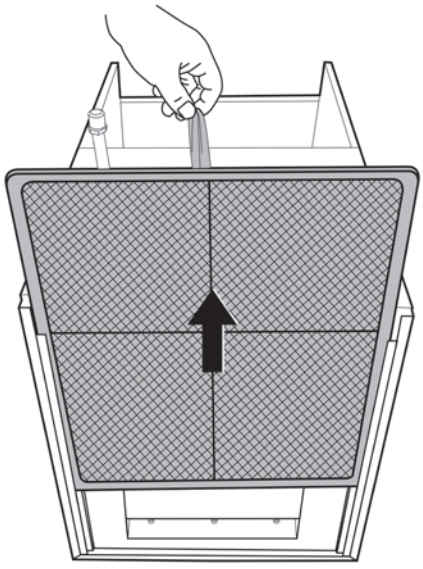
Procedure	Illustration
1) Remove 7 screws of the upside board and then remove the upside plate. (see CJ_AHU_001)	 CJ_AHU_001
2) 2) Release 4 hooks of the main control board to remove the main control board. (see CJ_AHU_002)	 CJ_AHU_002

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

Procedure	Illustration
3) Remove 2 screws of the electronic control box. then remove the electronic control box . (see CJ_AHU_003)	 CJ_AHU_003

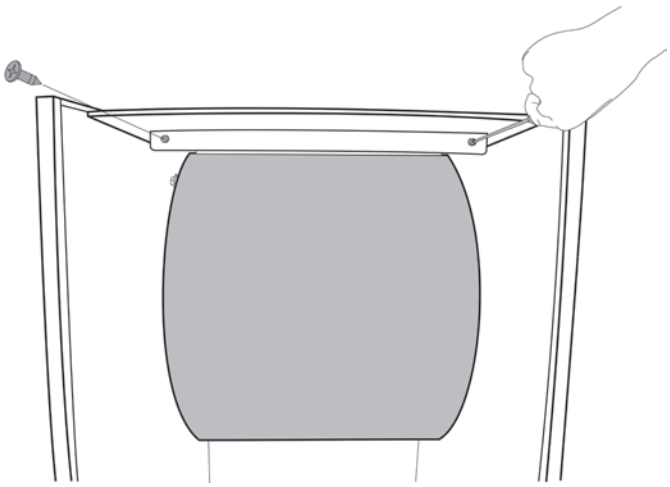
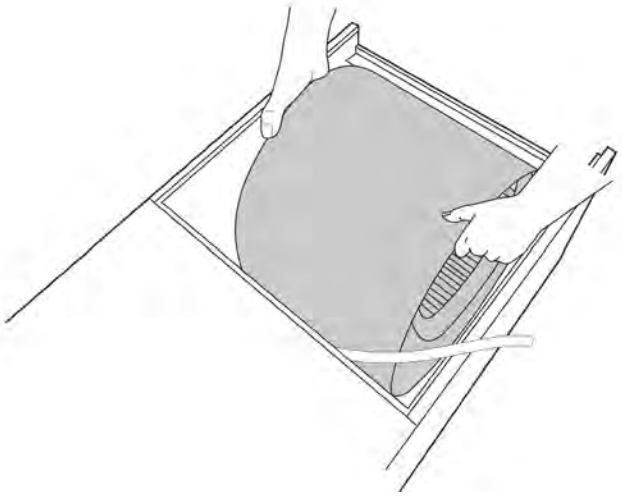
Note: This section is for reference only. Actual unit appearance may vary.

2. Filter

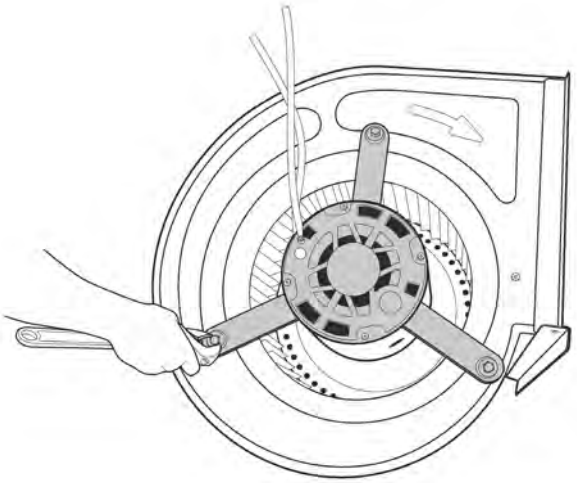
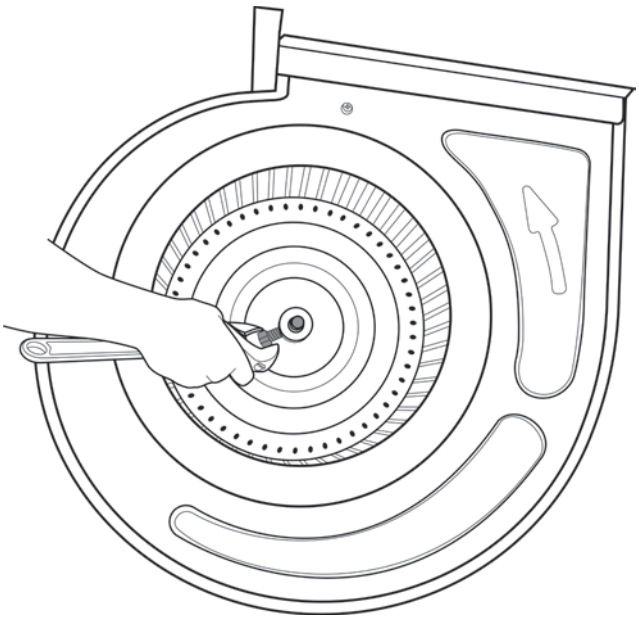
Procedure	Illustration
1) Remove 2 screws of Supporting bar (see CJ_AHU_003)	 CJ_AHU_004
2) Pull out the filter (see CJ_AHU_004)	 CJ_AHU_004

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

3. Fan motor and fan

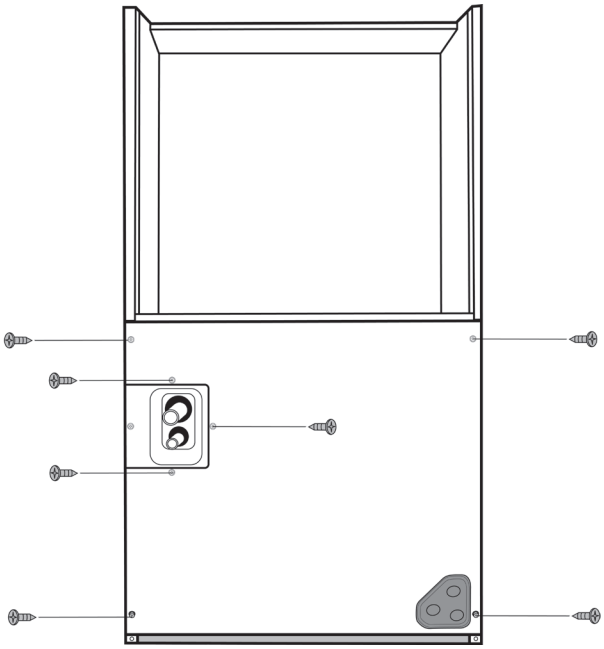
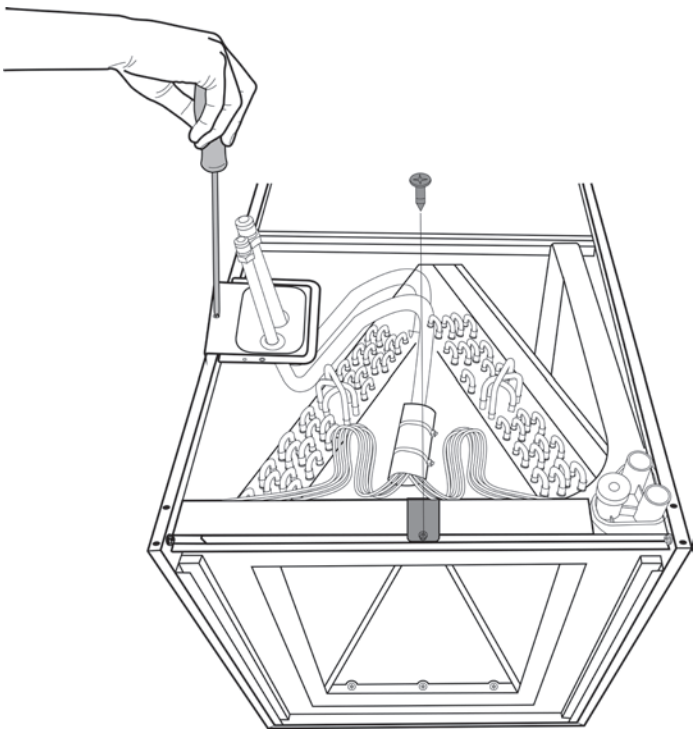
Procedure	Illustration
1) Remove 2 screws of fan assembly (see CJ_AHU_005)	 CJ_AHU_005
2) Take out the fan assembly (see CJ_AHU_006)	 CJ_AHU_006

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

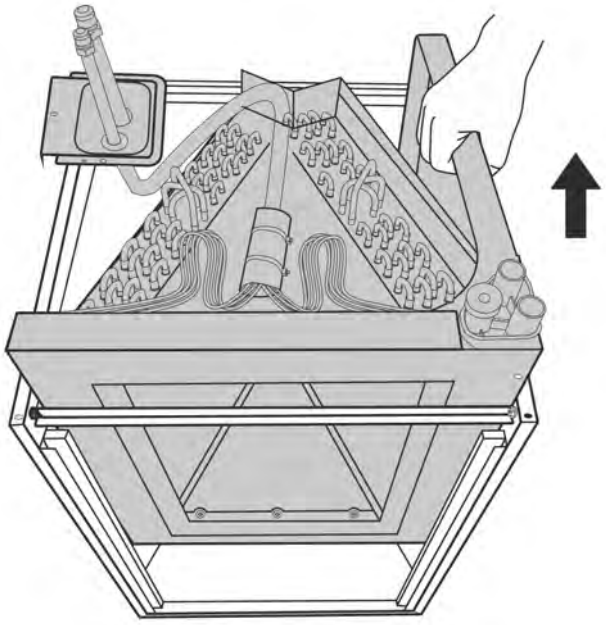
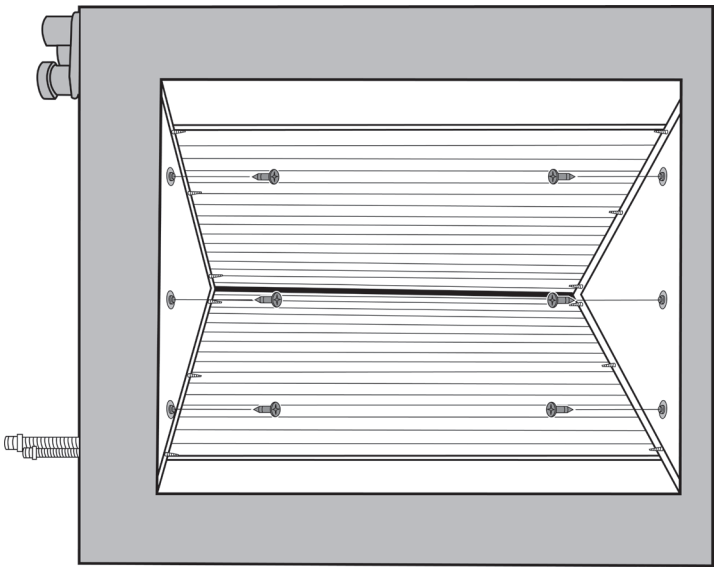
Procedure	Illustration
3) Release 3 nuts fixing the fan motor and then take out the fan motor. (see CJ_AHU_007)	 CJ_AHU_007
4) Release the 1 nut fixing the fan and then take out the fan. (see CJ_AHU_008)	 CJ_AHU_008

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

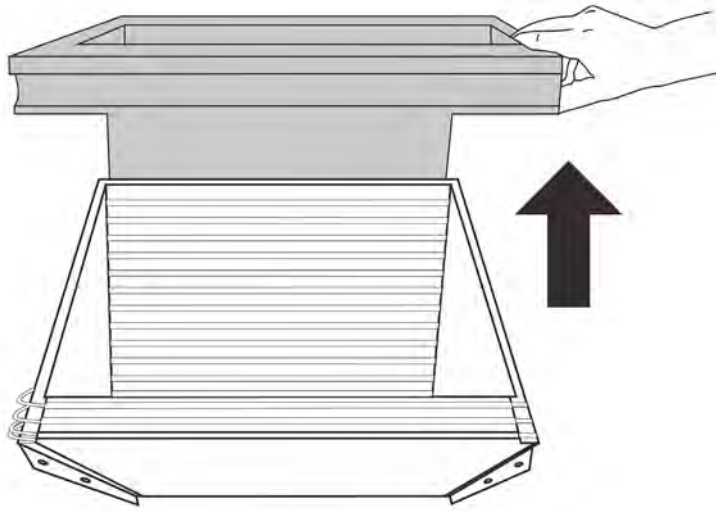
4. Evaporator

Procedure	Illustration
1) Remove 7 screws of side plate(below) (see CJ_AHU_009)	 CJ_AHU_009
2) Remove 1 screw of pipe clamp board and 1 screw of water pan cushion (see CJ_AHU_010)	 CJ_AHU_010

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

Procedure	Illustration
3) Take out the evaporator(with water collector assembly). (see CJ_AHU_011)	 CJ_AHU_011
4) Remove 6 screws of water collector assembly.(see CJ_AHU_012)	 CJ_AHU_012

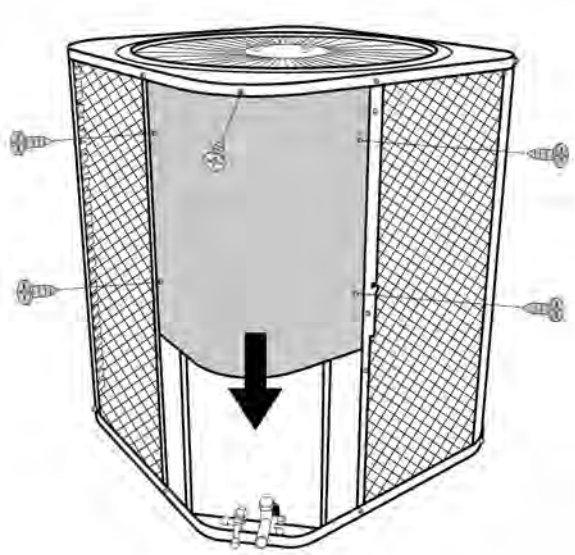
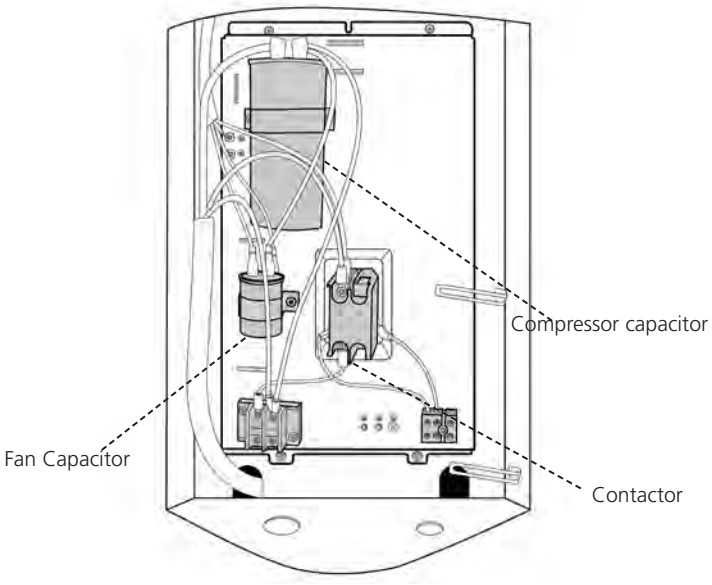
Note: This section is for reference only. Actual unit appearance may vary.

Procedure	Illustration
5) Remove the water collector assembly. (see CJ_AHU_013)	 CJ_AHU_013

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

2.2 Outdoor unit

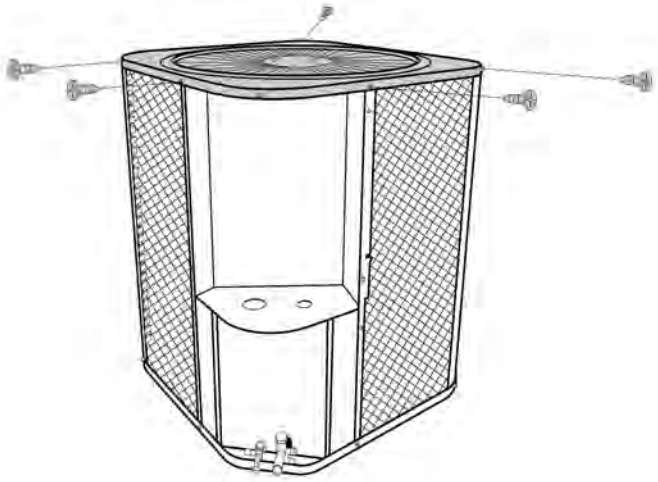
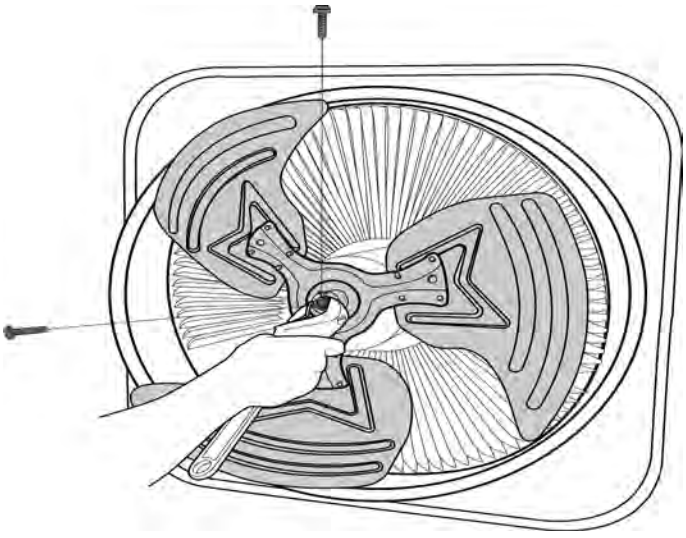
1. Electrical parts

Procedure	Illustration
1) Turn off the air conditioner and the power breaker. 2) Remove the screws of the cover of electrical parts and then remove the cover (5 screws) (see CJ_MOV_001)	 CJ_MOV_001
3) Unplug all the wires connected to the fan capacitor and compressor capacitor, and remove the capacitors.(see CJ_MOV_002) 4) Remove the contactor.(see CJ_MOV_002)	 CJ_MOV_002

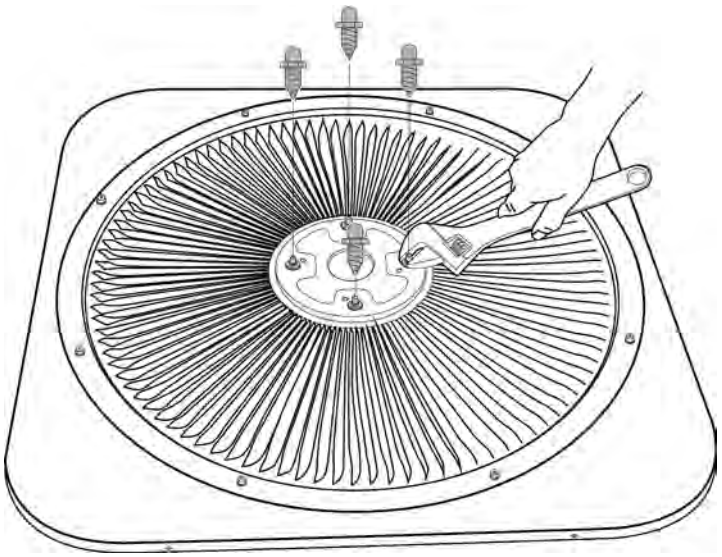
Note: This section is for reference only. Actual unit appearance may vary.

2. Fan disassembly

Note: Remove the electrical parts and (refer to 1. Panel plate) before disassembling fan.

Procedure	Illustration
1) Remove the screws of the top cover and then remove the top cover (5 screws) (see CJ_MOV_003)	 **CJ_MOV_003**
2) Remove two screws and remove the nut securing the fan with a spanner (see CJ_MOV_004). 3) Remove the fan.	 **CJ_MOV_004**

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

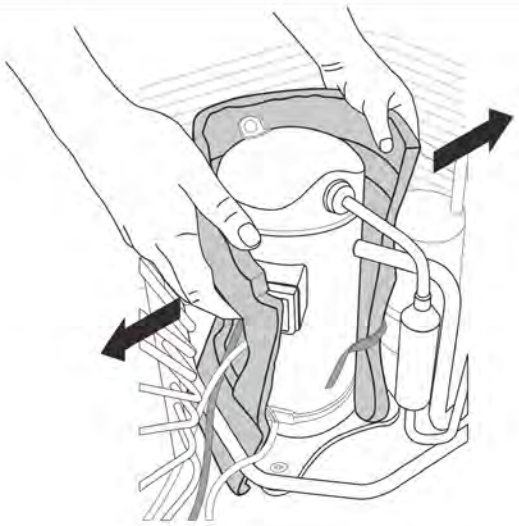
Procedure	Illustration
1) Remove the fixing screws of the fan motor (4 screws) (see CJ_MOV_005). 2) Remove the fan motor.	 **CJ_MOV_005**

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

3. Sound blanket

WARNING: Recover refrigerant from the refrigerant circuit before remove the compressor.

Note: Remove the electrical parts, and fan assembly (refer to 1. Electrical parts, and 2. Fan assembly) before disassembling sound blanket.

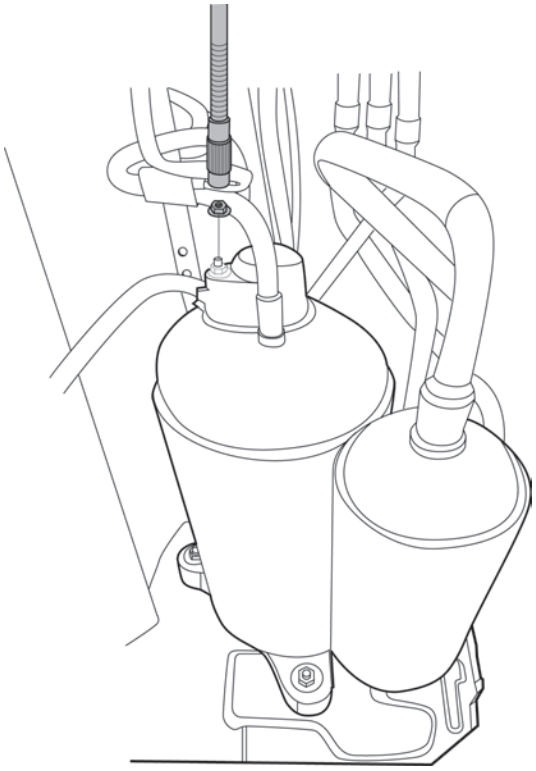
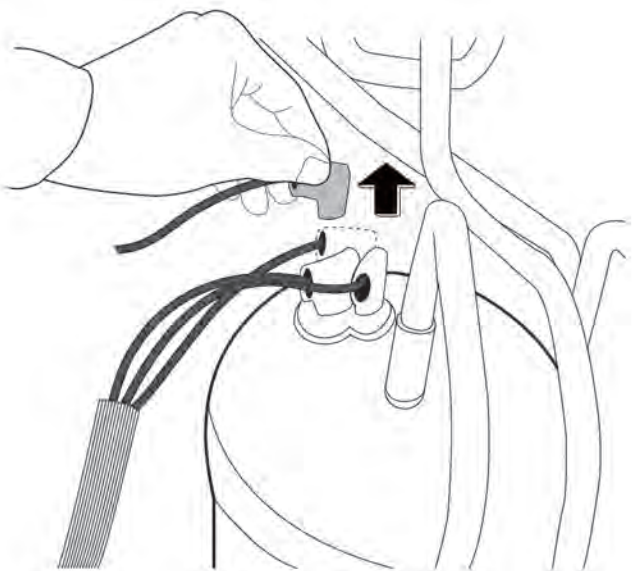
Procedure	Illustration
1) Remove the sound blanket (side and top) (see CJ_MOV_006).	 CJ_MOV_006

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

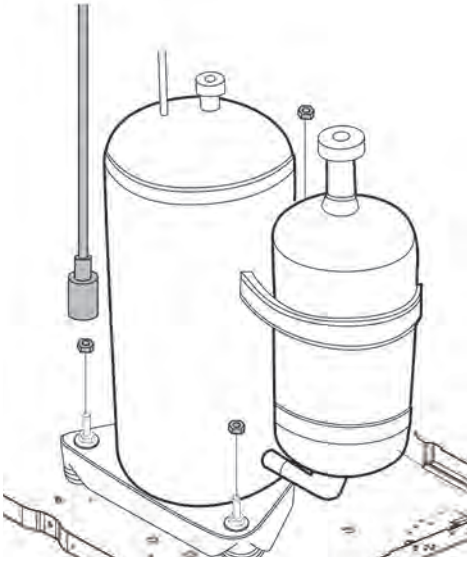
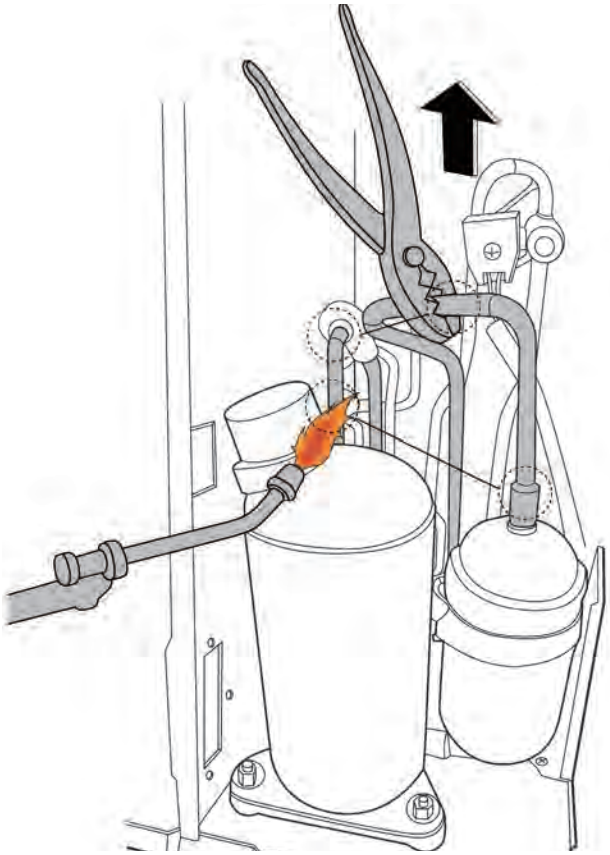
4. Compressor

WARNING: Recover refrigerant from the refrigerant circuit before remove the compressor.

Note: Remove the panel plate, electrical parts, and fan assembly (refer to 1. Panel plate, 2. Electrical parts, and 3. Fan assembly) before disassembling compressor.

Procedure	Illustration
1) Remove the flange nut of terminal cover and remove the termianal cover (see CJ_MOV_007).	 CJ_MOV_007
2) Disconnect the connectors (see CJ_MOV_008).	 CJ_MOV_008

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

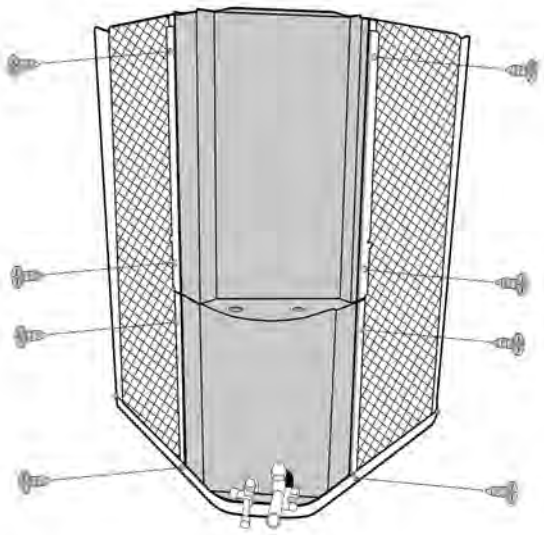
Procedure	Illustration
1) Remove the hex nuts and washers securing the compressor, located on the bottom plate (see CJ_MOV_009).	 CJ_MOV_009
2) Heat up the brazed parts and then remove the the discharge pipe and the suction pipe (see CJ_MOV_010). 3) Lift the compressor from the base pan assembly with pliers.	 CJ_MOV_010

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

5 Condensor

WARNING: Recover refrigerant from the refrigerant circuit before remove the compressor.

Note: Remove electrical parts, fan assembly and compressor(refer to 1. Electrical parts, 2. Fan assembly and 4. compressor) before disassembling condensor.

Procedure	Illustration
1) Remove the screws fixing the condenser(see CJ_MOV_011). 2) Take out the condensor subassembly.	 CJ_MOV_011

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

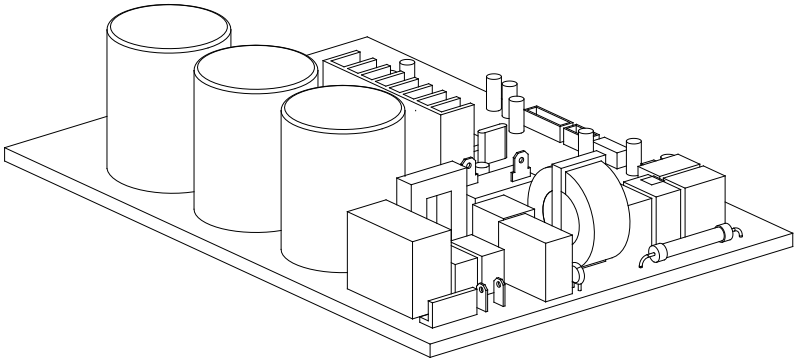
Troubleshooting

Contents

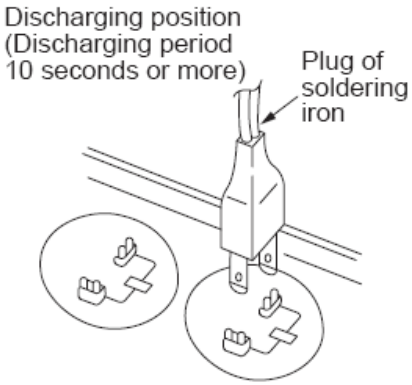
1. Safety Caution

WARNING

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



For other models, connect discharge resistance (approx.100Ω 40W) or a soldering iron plug between the positive and negative terminals of the electrolytic capacitor. The terminals are located on the bottom surface of the outdoor PCB.



Note: This picture is for reference only. Actual appearances may vary.

2. General Troubleshooting

2.1 Error Display (Indoor Unit)

When the indoor unit encounters a recognized error, the indicator light will flash in a corresponding series, the timer display may turn on or begin flashing, and an error code will be displayed. These error codes are described in the following table:

For Ceiling&floor type & Super-slim cassette type:

Operation lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display	Error Information	Solution
OFF	FLASH	OFF	OFF	E2	Indoor room temperature sensor T1 is in open circuit or has short circuited	Page 81
FLASH	OFF	OFF	OFF	E3	Evaporator coil temperature sensor T2 is in open circuit or has short circuited	Page 81
FLASH	FLASH	OFF	OFF	E7	Indoor unit EEPROM parameter error	Page 82
OFF	OFF	OFF	FLASH	E8	Water level alarm malfunction	Page 83
FLASH	OFF	OFF	FLASH	EC	Refrigerant leak detected	Page 84
FLASH	OFF	FLASH	FLASH	F0	Communication malfunction between main PCB and auto-lifting panel (for super-slim cassette type)	Page 85
OFF	FLASH	FLASH	FLASH	F1	Auto-lifting panel malfunction (for super-slim cassette type)	Page 86

For A6 Duct type:

Operation lamp flashes	Timer lamp	Display	Error Information	Solution
1 time	OFF	E0	Indoor unit EEPROM parameter error	Page 82
5 times	OFF	E4	Indoor room temperature sensor T1 is in open circuit or has short circuited	Page 81
6 times	OFF	E5	Evaporator coil temperature sensor T2 is in open circuit or has short circuited	Page 81
7 times	OFF	EC	Refrigerant leak detected	Page 84
8 time	OFF	EE	Water level alarm malfunction	Page 83
11 times	ON	FR	Dual chips communication malfunction	-

For AHU Type:

LED1	LED2	LED3	Error Information	Solution
OFF	FLASH	OFF	T2 temperature sensor open or short circuit	Page 81
FLASH	OFF	FLASH	Wire control input error	-

For other errors:

The display board may show a garbled code or a code undefined by the service manual. Ensure that this code is not a temperature reading.

Troubleshooting:

Test the unit using the remote control. If the unit does not respond to the remote, the indoor PCB requires replacement. If the unit responds, the display board requires replacement.

2.2 Error Display (Outdoor Unit Excluding MOV-48CN1-N)

LED1	LED2	LED3	Error Information	Solution
FLASH	OFF	OFF	Phase sequence	Page 87
FLASH	OFF	OFF	Lack of phase(A,B)	Page 88
OFF	OFF	OFF	Lack of phase(C)	Page 88
FLASH	FLASH	OFF	Protection of low pressure(only for MOV-60CN1-D)	Page 90
OFF	OFF	FLASH	Overload current protection	Page 89
FLASH	OFF	FLASH	High temperature or protection of high pressure(only for MOV-60CN1-D)	Page 90

2.3 Error Display (Two Way Communication Wired Controller)

Display	Error Information
F0	Communication error between wired controller and indoor unit
F1	The cassette faceplate is abnormal
E1	Indoor unit EEPROM parameter error
E1	Communication malfunction between indoor and outdoor units
E2	Indoor room temperature sensor T1 is in open circuit or has short circuited
E3	Evaporator coil temperature sensor T2 is in open circuit or has short circuited
EE	Water level alarm malfunction
EF	Refrigerant leak detected
E5	Outdoor ambient temperature sensor (T4) malfunction
E5	Condenser coil temperature sensor (T3) malfunction
E5	Compressor discharge temperature sensor (T5) malfunction
E0	Outdoor unit EEPROM parameter error
EF	Other malfunction

3. Error Diagnosis and Troubleshooting Without Error Code

WARNING

Be sure to turn off unit before any maintenance to prevent damage or injury.

3.1 Remote maintenance

SUGGESTION: When troubles occur, please check the following points with customers before field maintenance.

	Problem	Solution
1	Unit will not start	Page 75-76
2	The power switch is on but fans will not start	Page 75-76
3	The temperature on the display board cannot be set	Page 75-76
4	Unit is on but the wind is not cold(hot)	Page 75-76
5	Unit runs, but shortly stops	Page 75-76
6	The unit starts up and stops frequently	Page 75-76
7	Unit runs continuously but insufficient cooling(heating)	Page 75-76
8	Cool can not change to heat	Page 75-76
9	Unit is noisy	Page 75-76

3.2 Field maintenance

	Problem	Solution
1	Unit will not start	Page 77-78
2	Compressor will not start but fans run	Page 77-78
3	Compressor and condenser (outdoor) fan will not start	Page 77-78
4	Evaporator (indoor) fan will not start	Page 77-78
5	Condenser (Outdoor) fan will not start	Page 77-78
6	Unit runs, but shortly stops	Page 77-78
7	Compressor short-cycles due to overload	Page 77-78
8	High discharge pressure	Page 77-78
9	Low discharge pressure	Page 77-78
10	High suction pressure	Page 77-78
11	Low suction pressure	Page 77-78
12	Unit runs continuously but insuffiient cooling	Page 77-78
13	Too cool	Page 77-78
14	Compressor is noisy	Page 77-78
15	Horizontal louver can not revolve	Page 77-78

1.Remote Maintenance	Electrical Circuit							Refrigerant Circuit						
Possible causes of trouble	Power failure	The main power tripped	Loose connections	Faulty transformer	The voltage is too high or too low	The remote control is powered off	Broken remote control	Dirty air filter	Dirty condenser fins	The setting temperature is higher/lower than the room's(cooling/heating)	The ambient temperature is too high/low when the mode is cooling/heating	Fan mode	SILENCE function is activated(optional function)	Frosting and defrosting frequently
Unit will not start	☆	☆	☆	☆										
The power switch is on but fans will not start			☆	☆	☆									
The temperature on the display board cannot be set						☆	☆							
Unit is on but the wind is not cold(hot)										☆	☆	☆		
Unit runs, but shortly stops					☆					☆	☆			
The unit starts up and stops frequently					☆						☆			☆
Unit runs continuously but insufficient cooling(heating)								☆	☆	☆	☆		☆	
Cool can not change to heat														
Unit is noisy														
Test method / remedy	Test voltage	Close the power switch	Inspect connections - tighten	Change the transformer	Test voltage	Replace the battery of the remote control	Replace the remote control	Clean or replace	Clean	Adjust the setting temperature	Turn the AC later	Adjust to cool mode	Turn off SILENCE function.	Turn the AC later

Others											
Heavy load condition											
Loosen hold down bolts and / or screws		☆									
Bad airproof	☆		☆								
The air inlet or outlet of either unit is blocked	☆		☆								
Interference from cell phone towers and remote boosters				☆							
Shipping plates remain attached					☆						
Check heat load	☆		☆								
Tighten bolts or screws		☆									
Close all the windows and doors	☆		☆								
Remove the obstacles	☆		☆								
Reconnect the power or press **ON/OFF** button on remote control to restart				☆							
Remove them		☆			☆						

2.Field Maintenance	Electrical Circuit														
Possible causes of trouble	Power failure	Blown fuse or varistor	Loose connections	Shorted or broken wires	Safety device opens	Faulty thermostat / room temperature sensor	Wrong setting place of temperature sensor	Faulty transformer	Shorted or open capacitor	Faulty magnetic contactor for compressor	Faulty magnetic contactor for fan	Low voltage	Faulty stepping motor	Shorted or grounded compressor	Shorted or grounded fan motor
Unit will not start	☆	☆	☆	☆	☆			☆							
Compressor will not start but fans run				☆		☆			☆	☆				☆	
Compressor and condenser (outdoor) fan will not start				☆		☆				☆					
Evaporator (indoor) fan will not start				☆					☆		☆				☆
Condenser (Outdoor) fan will not start				☆		☆			☆		☆				☆
Unit runs, but shortly stops										☆		☆			
Compressor short-cycles due to overload										☆		☆			
High discharge pressure															
Low discharge pressure															
High suction pressure															
Low suction pressure															
Unit runs continuously but insufficient cooling															
Too cool						☆	☆								
Compressor is noisy															
Horizontal louver can not revolve			☆	☆									☆		
Test method / remedy	Test voltage	Inspect fuse type & size	Inspect connections - tighten	Test circuits with tester	Test continuity of safety device	Test continuity of thermostat / sensor & wiring	Place the temperature sensor at the central of the air inlet grille	Check control circuit with tester	Check capacitor with tester	Test continuity of coil & contacts	Test continuity of coil & contacts	Test voltage	Replace the stepping motor	Check resistance with multimeter	Check resistance with multimeter

Replace the compressor														☆		Compressor stuck	Refrigerant Circuit
Leak test				☆	☆		☆		☆	☆						Shortage of refrigerant	
Replace restricted part				☆	☆					☆						Restricted liquid line	
Clean or replace				☆	☆											Dirty air filter	
Clean coil				☆	☆											Dirty evaporator coil	
Check fan				☆	☆											Insufficient air through evaporator coil	
Change charged refrigerant volume		☆				☆		☆	☆	☆						Overcharge of refrigerant	
Clean condenser or remove obstacle				☆				☆	☆	☆						Dirty or partially blocked condenser	
Purge, evacuate and recharge				☆				☆								Air or incompressible gas in refrigerant cycle	
Remove obstruction to air flow				☆				☆								Short cycling of condensing air	
Remove obstruction in air or water flow								☆								High temperature condensing medium	
Remove obstruction in air or water flow								☆								Insufficient condensing medium	
Replace compressor		☆														Broken compressor internal parts	
Test compressor efficiency				☆		☆	☆									Inefficient compressor	
Replace valve					☆											Expansion valve obstructed	
Replace valve					☆					☆						Expansion valve or capillary tube closed completely	
Replace valve					☆					☆						Leaking power element on expansion valve	
Fix feeler bulb						☆										Poor installation of feeler bulb	
Check heat load				☆		☆										Heavy load condition	Others
Tighten bolts or screws		☆														Loosen hold down bolts and / or screws	
Remove them		☆														Shipping plates remain attached	
Choose AC of lager capacity or add the number of AC				☆												Poor choices of capacity	
Rectify piping so as not to contact each other or with external plate		☆														Contact of piping with other piping or external plate	

4. Quick Maintenance by Error Code

If you do not have the time to test whether specific parts are faulty, you can directly change the required parts according the error code.

You can find the parts to replace by error code in the following table.

For Ceiling&floor type & Super-slim cassette type:

Part requiring replacement	Error Code						
	E2	E3	E7	E8	EC	F0	F1
Indoor PCB	✓	✓	✓	✓	✓	✓	x
Outdoor PCB	x	x	x	x	x	x	x
Indoor fan motor	x	x	x	x	x	x	x
Outdoor fan motor	x	x	x	x	x	x	x
T1 sensor	✓	x	x	x	x	x	x
T2 Sensor	x	✓	x	x	✓	x	x
Additional refrigerant	x	x	x	x	✓	x	x
Water-level switch	x	x	x	✓	x	x	x
Water pump	x	x	x	✓	x	x	x
Louver motor	x	x	x	x	x	x	✓
Up-down panel PCB	x	x	x	x	x	x	✓
Capacitor of compressor	x	x	x	x	✓	x	x
Compressor	x	x	x	x	✓	x	x
Capacitor of fan motor	x	x	x	x	✓	x	x
Outdoor fan	x	x	x	x	✓	x	x

For A6 Duct type:

Part requiring replacement	Error Code					
	E0	E3	E4	E5	EE	EC
Indoor PCB	✓	✓	✓	✓	✓	✓
Outdoor PCB	x	x	x	x	x	x
Indoor fan motor	x	✓	x	x	x	x
Outdoor fan motor	x	x	x	x	x	x
T1 sensor	x	x	✓	x	x	x
T2 Sensor	x	x	x	✓	x	✓

Additional refrigerant	x	x	x	x	x	✓
Water-level switch	x	x	x	x	✓	x
Water pump	x	x	x	x	✓	x
Capacitor of compressor	x	x	x	x	x	✓
Compressor	x	x	x	x	x	✓
Capacitor of fan motor	x	x	x	x	x	✓
Outdoor fan	x	x	x	x	x	✓

5. Troubleshooting by Error Code

5.1 Common Check Procedures

5.1.1 Temperature Sensor Check

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

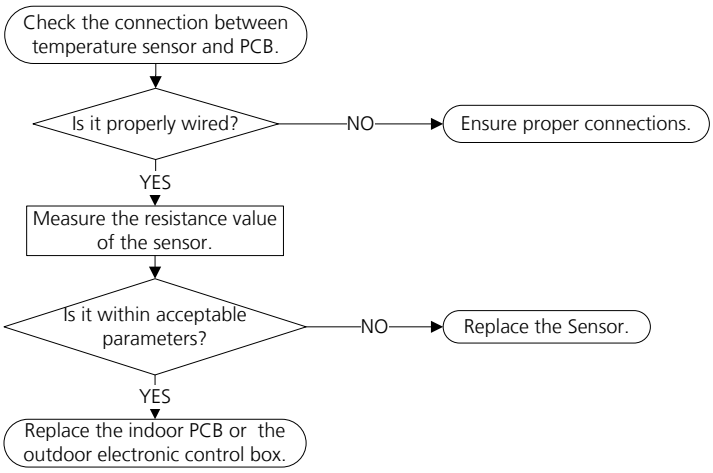
5.2 E2/E3(Cassette& Ceiling&floor) or E4/E5(A6 Duct) (Open circuit or short circuit of temperature sensor diagnosis and solution)

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

Recommended parts to prepare:

- Wiring mistake
- Faulty sensor
- Faulty PCB

Troubleshooting and repair:

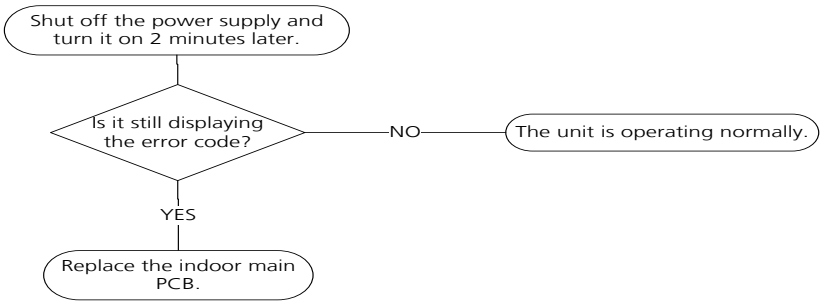


5.3 E7(Cassette& Ceiling&floor)/E0(A6 Duct) (EEPROM parameter error)

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

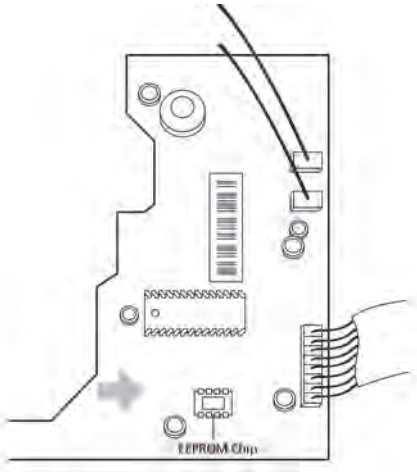
Recommended parts to prepare:

- Indoor PCB
- **Troubleshooting and repair:**



Remarks:

The location of the EEPROM chip on the indoor PCB is shown in the following image:



Note: These images are for reference only.

5.4 EC (Refrigerant Leakage Detection diagnosis and solution)

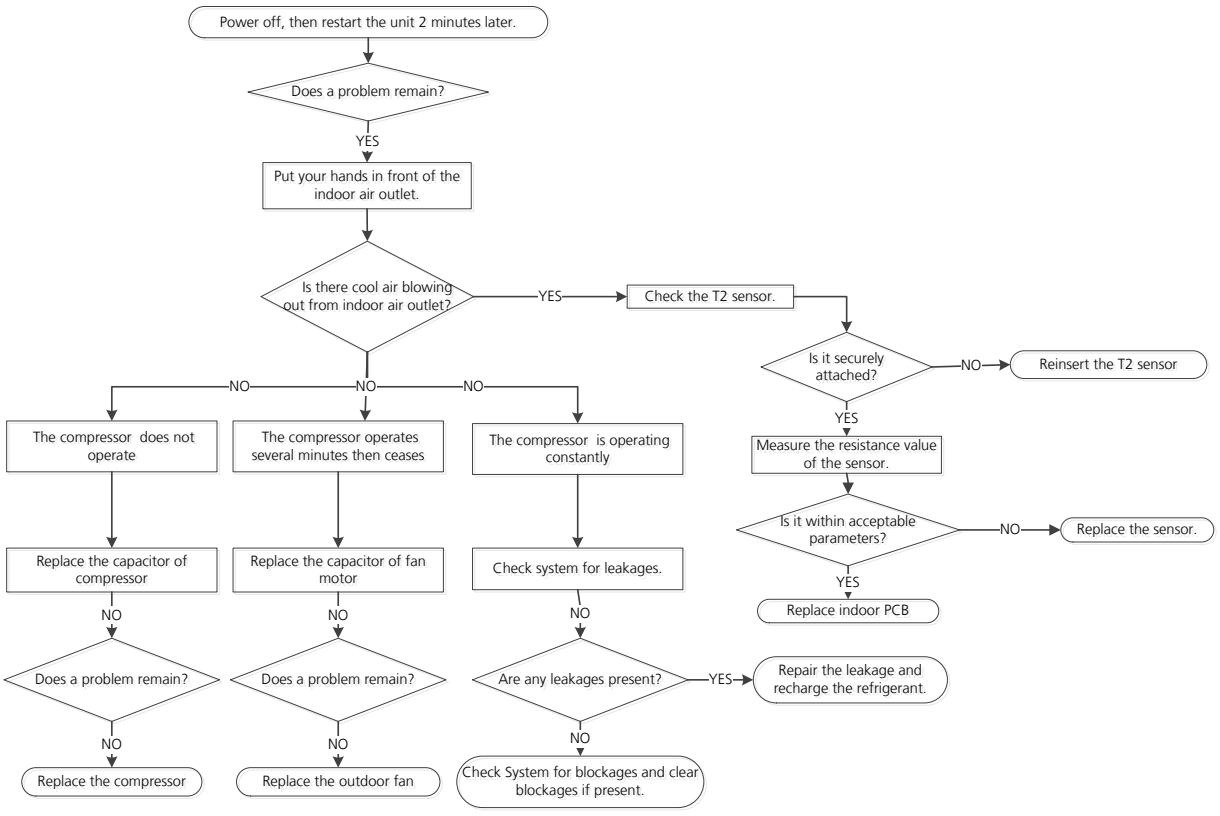
Description: Define the evaporator coil temp.T2 of the compressor just starts running as Tcool.

In the beginning 8 minutes after the compressor starts up, if T2<Tcool-1°C does not keep continuous 4 seconds and compressor running frequency higher than 50Hz does not keep continuous 3 minutes, and this situation happens 3 times, the display area will show "EC" and AC will turn off.

Recommended parts to prepare:

- Faulty T2 sensor
- Faulty compressor
- Faulty capacitor of compressor
- Faulty indoor PCB
- System problems, such as leakage or blockages
- Faulty capacitor of fan motor
- Faulty outdoor fan

Troubleshooting and repair:



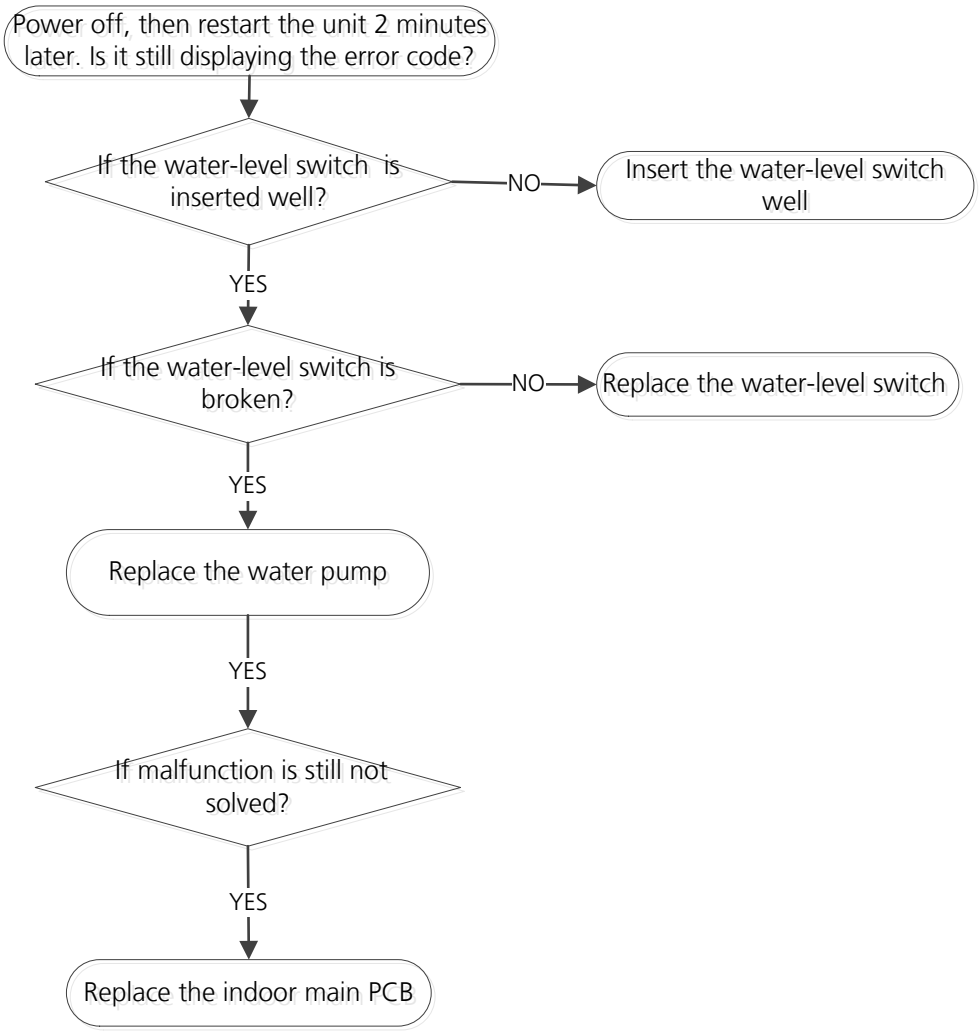
5.5 E8(Cassette& Ceiling&floor)/EE(A6 Duct) (Water level alarm malfunction diagnosis and solution)

Description: The water level switch is at the max. position to shut down the unit.

Recommended parts to prepare:

- Faulty drain pump (for units with drain pump)
- Installation mistake of water level switch (for units with drain pump)
- Short-circuit jumper is missing or broken (for units without drain pump)
- Faulty indoor PCB

Troubleshooting and repair:



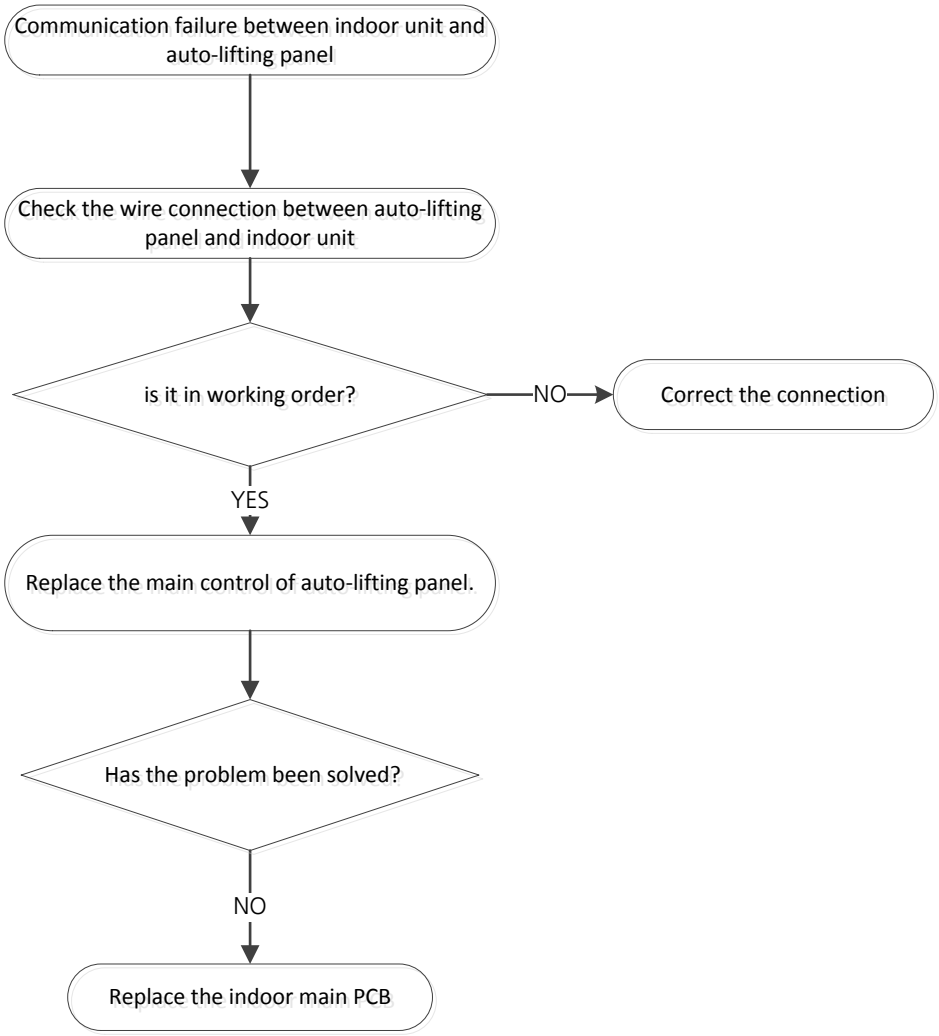
5.6 F0(Communication malfunction between indoor unit and auto-lifting panel diagnosis and solution)

Description: Indoor PCB does not get the feedback from the PCB of auto-lifting panel.

Recommended parts to prepare:

- Wiring mistake between indoor PCB and auto-lifting panel
- Faulty PCB of auto-lifting panel
- Faulty indoor PCB

Troubleshooting and repair:



5.7 F1(Auto-lifting panel malfunction diagnosis and solution)

Description: Indoor PCB does not get the right close position from the PCB of auto lifting-panel when the panel motor stops

Recommended parts to prepare:

- Wiring mistake between indoor PCB and auto-lifting panel
- Faulty PCB of auto-lifting panel
- Faulty louver motor

Troubleshooting and repair:

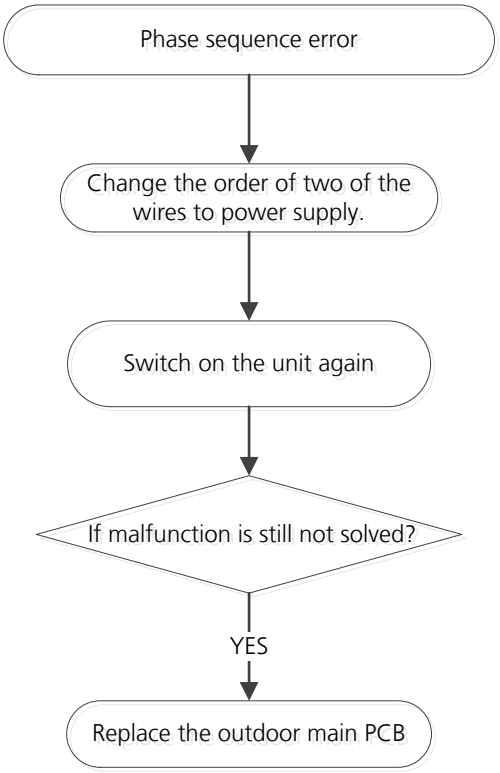
5.8 Phase sequence error diagnosis and solution

Description: Outdoor PCB detects the wrong phase sequence of 3-phase power supply.

Recommended parts to prepare:

- Wiring mistake of 3-phase power supply
- Faulty outdoor PCB

Troubleshooting and repair:



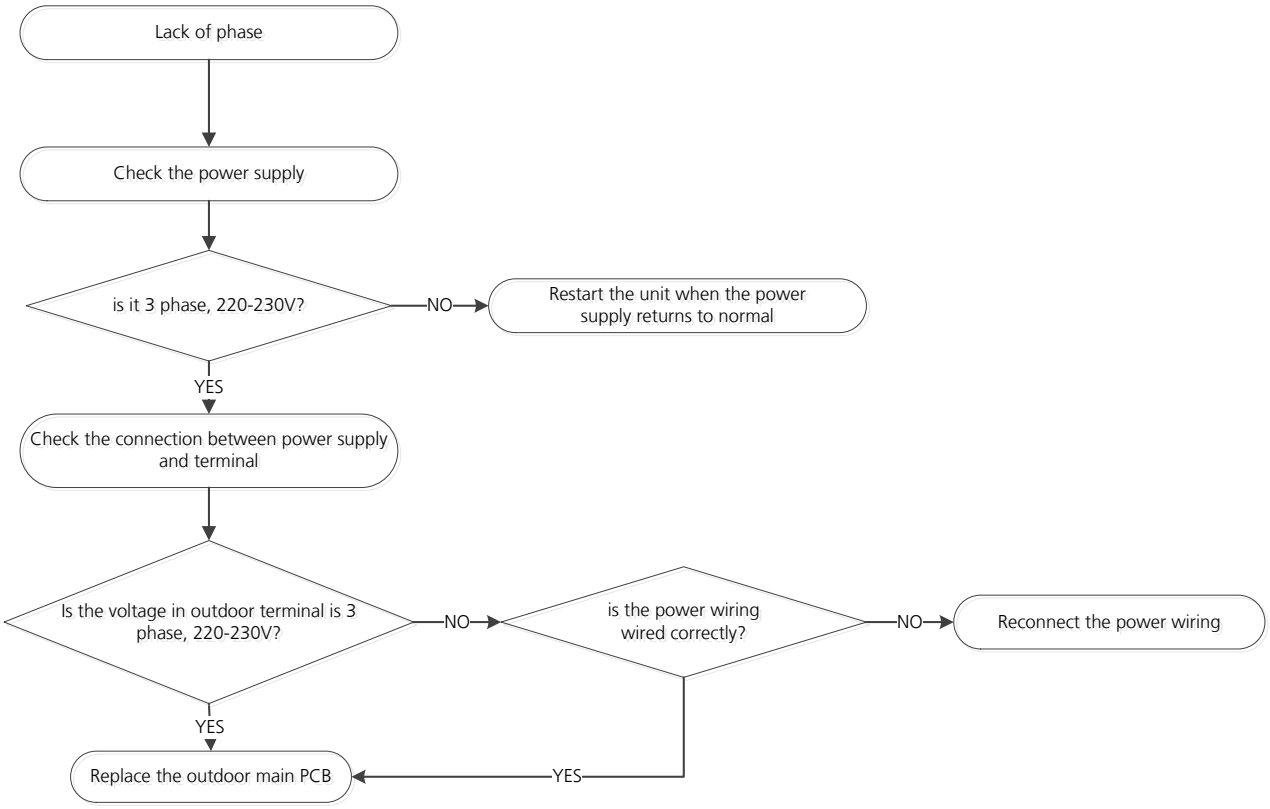
5.9 Lack of Phase diagnosis and solution

Description: Outdoor PCB detects the voltage of one or two phase are very low.

Recommended parts to prepare:

- Problems of 3-phase power supply
- Wiring mistake of 3-phase power supply
- Faulty outdoor PCB

Troubleshooting and repair:



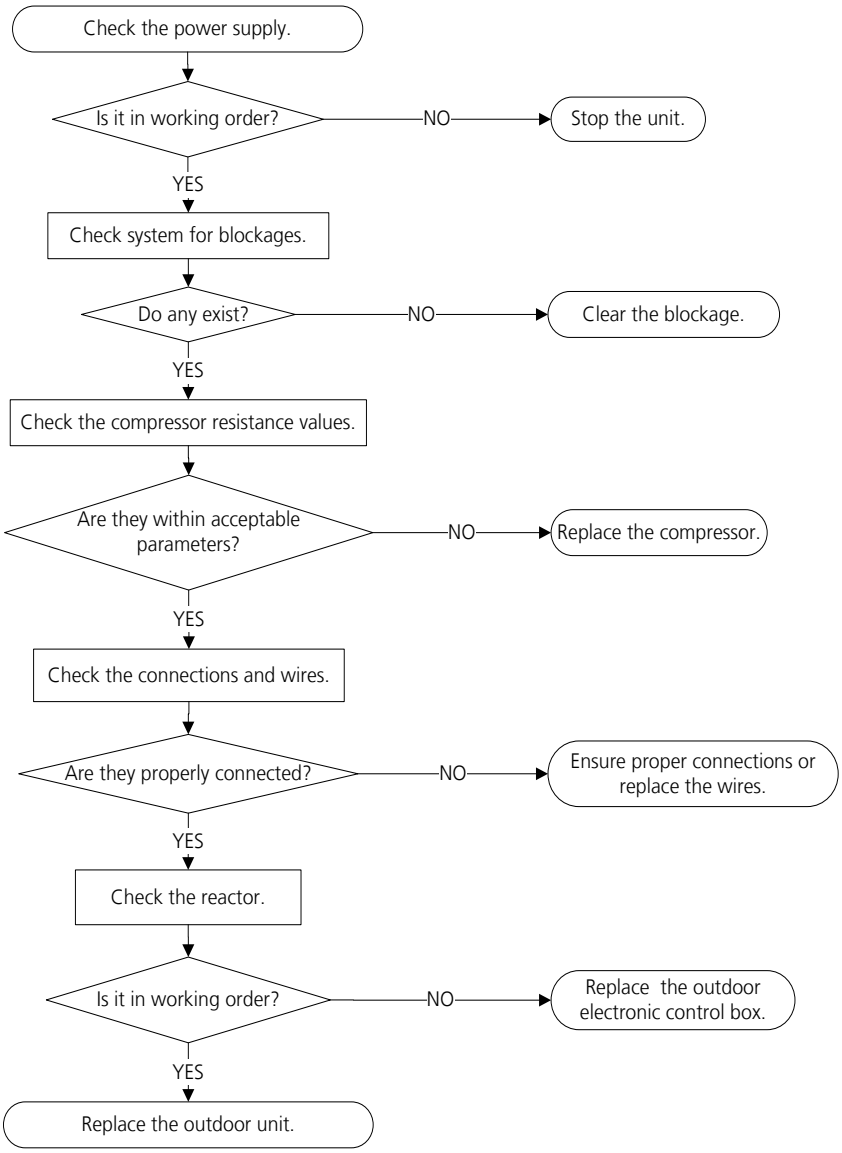
5.10 Overload current protection diagnosis and solution

Description: An abnormal current rise is detected by checking the specified current detection circuit.

Recommended parts to prepare:

- Power supply problems.
- System blockage
- Faulty PCB
- Wiring mistake
- Compressor malfunction

Troubleshooting and repair:



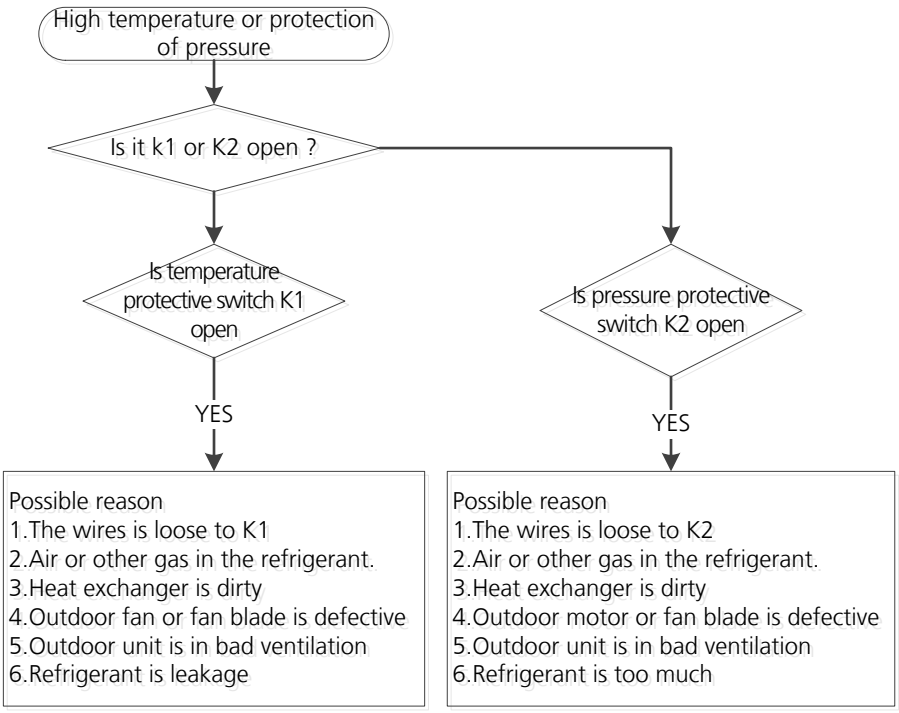
5.11 High temperature or protection of pressure diagnosis and solution

Description: The High pressure switch detects a ultra high pressure or the Low pressure switch detects a ultra low switch, which could damage the system.

Recommended parts to prepare:

- Bad wiring of the pressure switches
- Faulty pressure switches
- Refrigeration system is over load or blocked or lack of refrigerant

Troubleshooting and repair:



Appendix

Contents

i) Temperature Sensor Resistance Value Table for T1,T2,T3 and 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

ii) Temperature Sensor Resistance Value Table for TP (°C – K)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
°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			

iii) Pressure On Service Port

Cooling chart:

°F(°C)	ODT / IDT	75 (23.89)	85 (29.44)	95 (35)	105 (40.56)	115 (46.11)
BAR	70/59	8.2	7.8	8.1	8.6	10.1
BAR	75/63	8.6	8.3	8.7	9.1	10.7
BAR	80/67	9.3	8.9	9.1	9.6	11.2

°F(°C)	ODT / IDT	75 (23.89)	85 (29.44)	95 (35)	105 (40.56)	115 (46.11)
PSI	70/59	119	113	117	125	147
PSI	75/63	124	120	126	132	155
PSI	80/67	135	129	132	140	162

°F(°C)	ODT / IDT	75 (23.89)	85 (29.44)	95 (35)	105 (40.56)	115 (46.11)
MPA	70/59	0.82	0.78	0.81	0.86	1.01
MPA	75/63	0.86	0.83	0.87	0.91	1.07
MPA	80/67	0.93	0.89	0.91	0.96	1.12