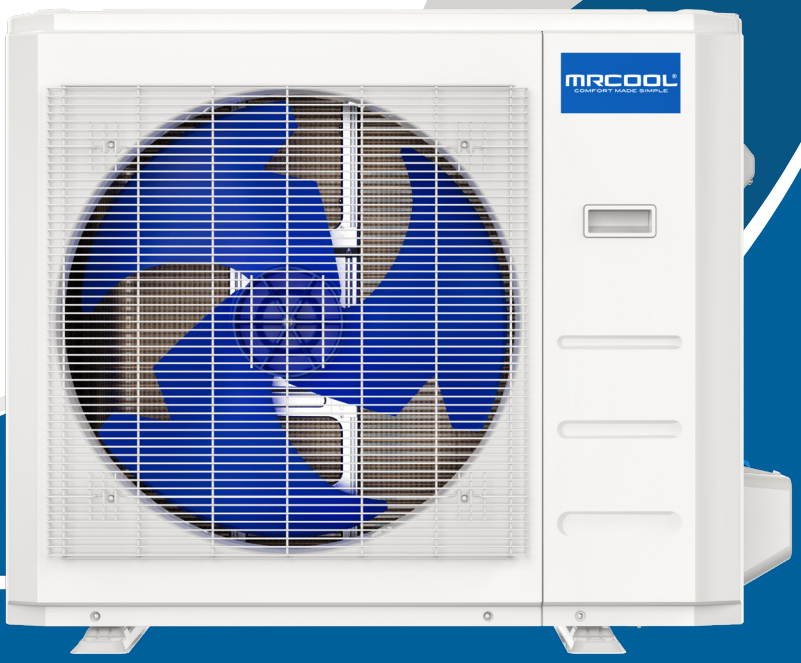
*This product utilizes* **R-454B** *refrigerant*

# DIY® Series Multi-Zone Mini-Split System

## SERVICE MANUAL

### MODELS:

DIY-MULTI*-**-HP-C-230D25-O


Read this manual carefully before installation and keep it where the operator can easily find it for future reference.

Due to updates and constantly improving performance, the information and instructions within this manual are subject to change without notice.

Version Date: March 10, 2025
Please visit www.mrcool.com/documentation to ensure you have the latest version of this manual.

MRCOOL®
COMFORT MADE SIMPLE

# CONTENTS

## 1.1 Model Reference

| Outdoor Unit Model | Capacity (Btu/h) | Power Supply |
|---|---|---|
| DIY-MULTI3-18HP230D-O | 18K | 208/230V~, 60Hz, 1 Phase |
| DIY-MULTI4-27HP230D-O | 27K | |
| DIY-MULTI5-36HP230D-O | 36K | |
| DIY-MULTI6-48HP230-O | 48K | |
| DIY-MULTI6-55HP230D-O | 55K | |

## 1.2 Pipe Length and Drop Height

**Ensure that the length of the refrigerant pipe and the drop height between the indoor and outdoor units meet the requirements shown in the following table.**

| | 1 Drive 2 | 1 Drive 3 | 1 Drive 4 | 1 Drive 5 | 1 Drive 6 |
|---|---|---|---|---|---|
| Max. length for all rooms (ft/m) | 123/37.5 | 172/52.5 | 221/67.5 | 221/67.5 | 221/67.5 |
| Max. length for one IDU (ft/m) | 73/22.5 | 73/22.5 | 73/22.2 | 73/22.5 | 73/22.5 |
| Max. height difference between IDU and ODU (ft/m) | 33/10 | 33/10 | 33/10 | 33/10 | 33/10 |
| Max. height difference between IDUs (ft/m) | 24/7.5 | 24/7.5 | 24/7.5 | 24/7.5 | 24/7.5 |

**Caution:**

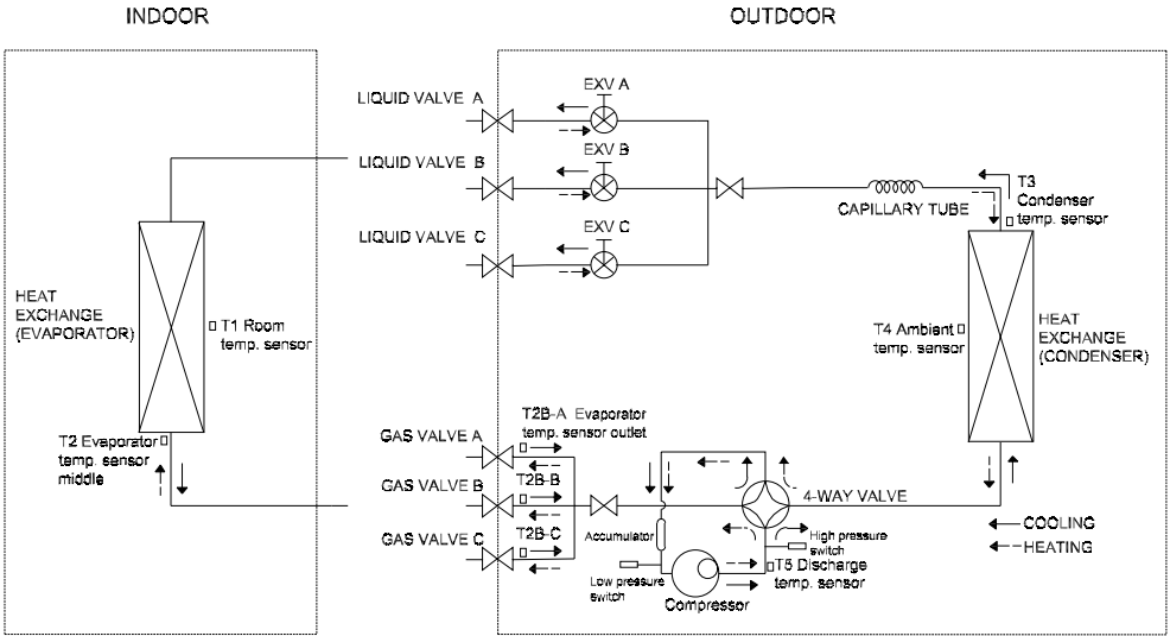
- Refrigerant pipe diameter is different according to the indoor unit to be connected. When using the extension pipe refer to the following tables on pg 3.
- When the refrigerant pipe diameter is different from that of the outdoor unit union, additional transfer connectors need to be used on the outdoor unit.

| Indoor Unit | | | Extension pipe diameter (mm/inch) | |
|---|---|---|---|---|
| Model | Pipe diameter (mm/inch) | | | |
| 6K,9K,12K | Liquid | Φ1/4 (Φ6.35) | Liquid | Φ1/4 (Φ6.35) |
| | Gas | Φ3/8 (Φ9.52) | Gas | Φ3/8 (Φ9.52) |
| 18K | Liquid | Φ1/4 (6.35) | Liquid | Φ1/4 (Φ6.35) |
| | Gas | Φ1/2 (Φ12.7) | Gas | Φ1/2 (Φ12.7) |
| 24K,30K,36K | Liquid | Φ3/8 (Φ9.52) | Liquid | Φ3/8 (Φ9.52) |
| | Gas | Φ5/8 (Φ16) | Gas | Φ5/8 (Φ16) |

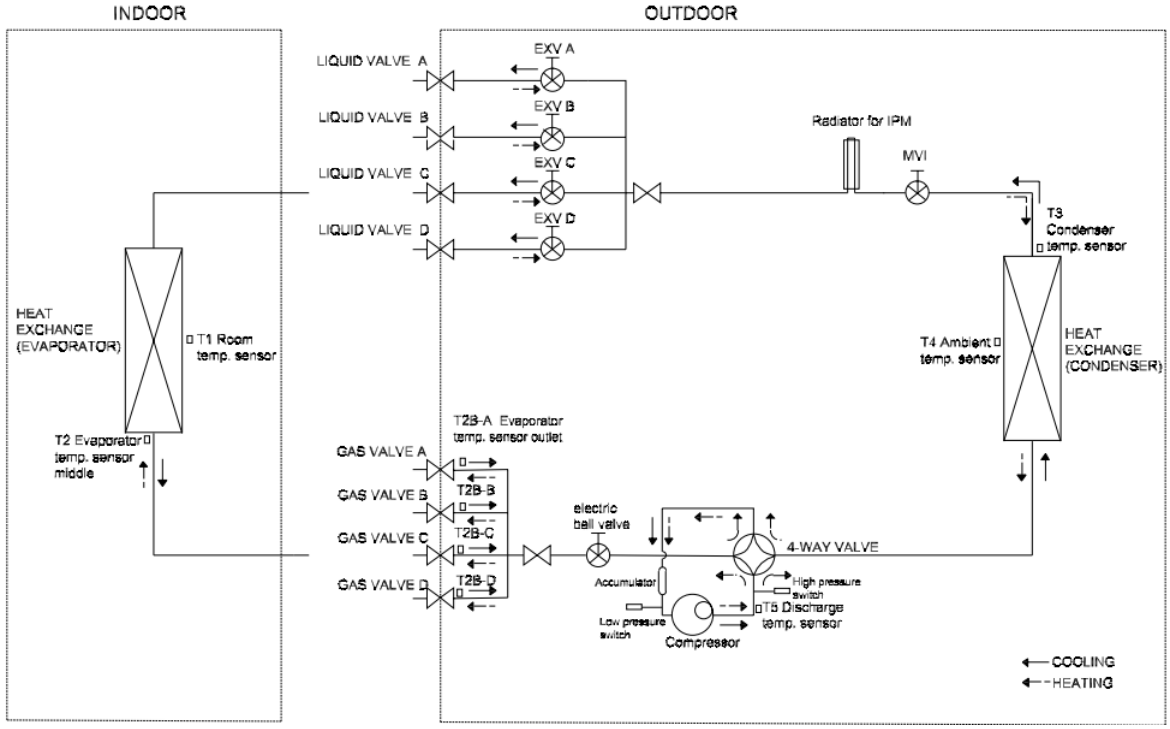
| Outdoor Unit Union Diameter (mm/inch) | | |
|---|---|---|
| 1 drive 3 | Liquid | Φ1/4 (Φ6.35)*3 |
| | Gas | Φ3/8 (Φ9.52)*3 |
| 1 drive 4 | Liquid | Φ1/4 (Φ6.35)*4 |
| | Gas | Φ3/8 (Φ9.52)*4 |
| 1 drive 5 | Liquid | Φ1/4 (Φ6.35)*5 |
| | Gas | Φ3/8 (Φ9.52)*4 |
| | Gas | Φ1/2 (Φ12.7)*4 |
| 1 drive 6 | Liquid | Φ1/4 (Φ16.35)*6 |
| | Gas | Φ3/8 (Φ9.52)*4 |
| | Gas | Φ1/2 (Φ12.7)*2 |

## 1.3 Refrigerant Cycle Diagrams

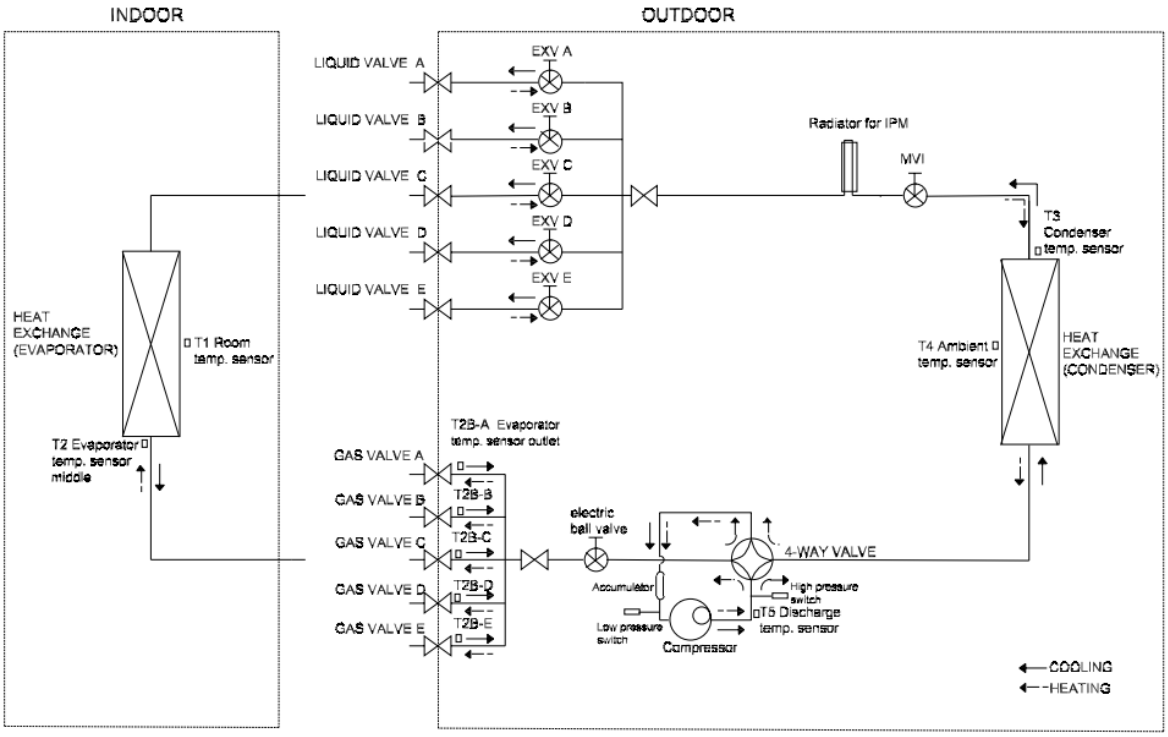
### Refrigeration Cycle Diagram of DIY-MULTI3-18HP230D-O:



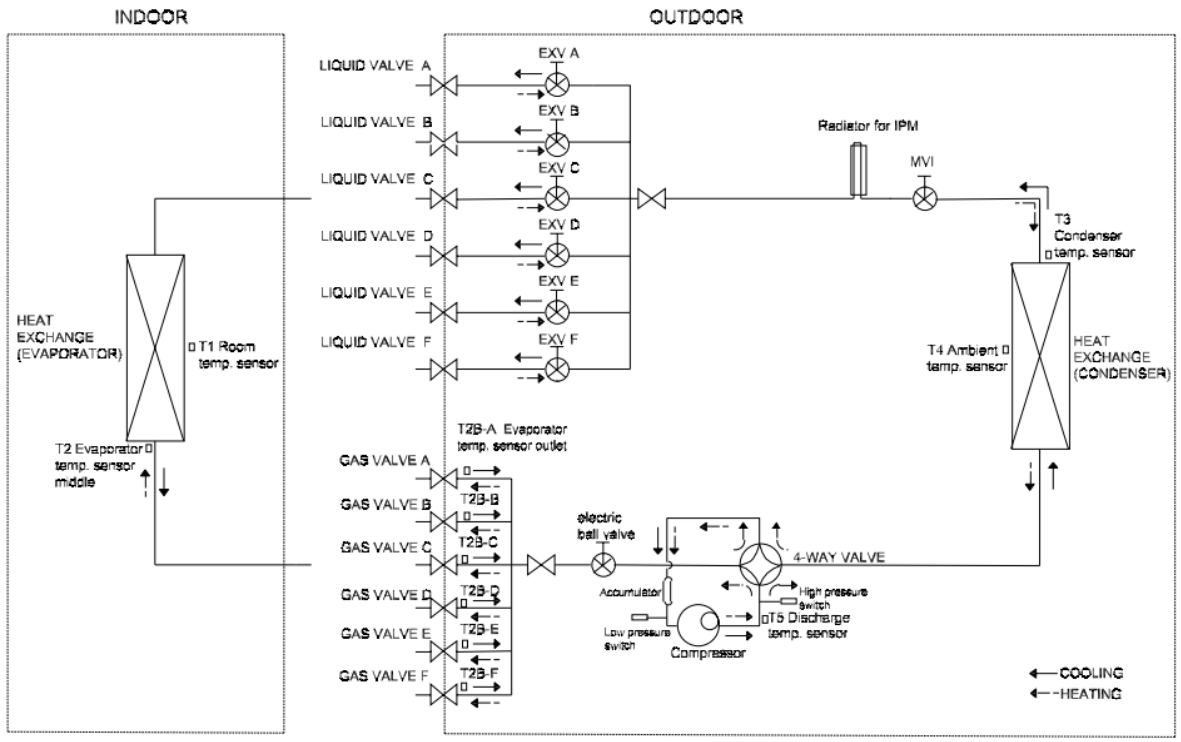

### Refrigeration Cycle Diagram of DIY-MULTI4-27HP230D-O:



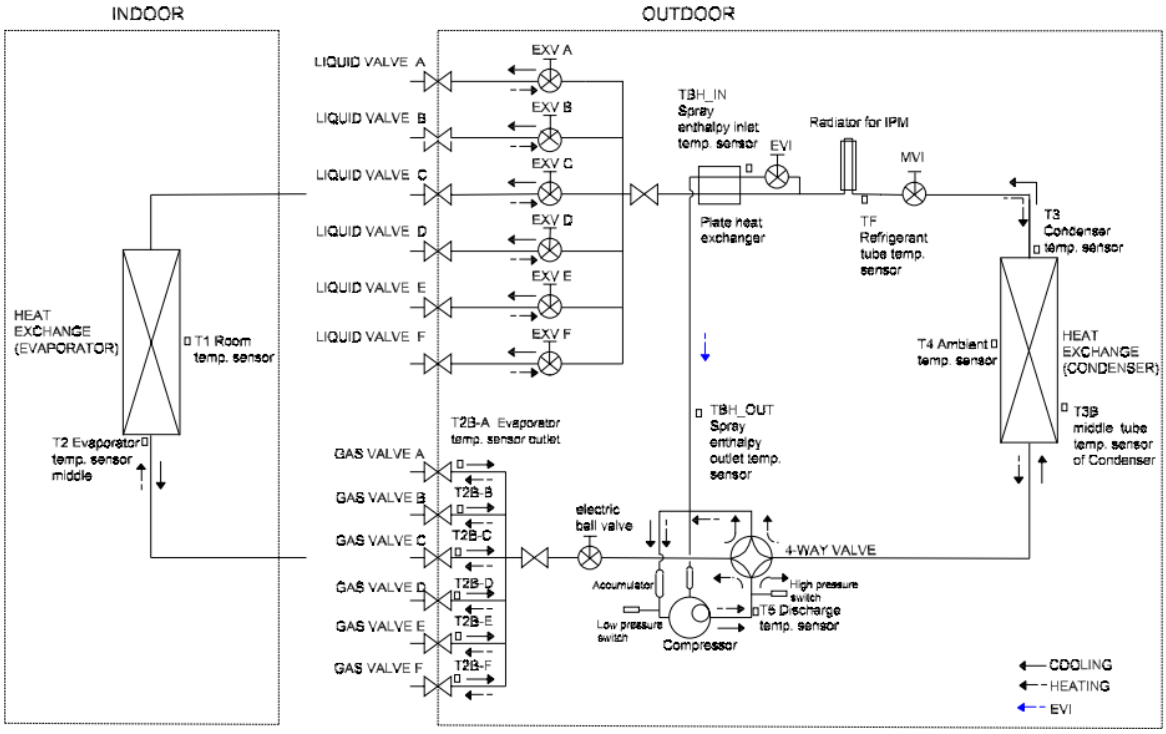
## Refrigeration Cycle Diagram of DIY-MULTI5-36HP230D-O:




## Refrigeration Cycle Diagram of DIY-MULTI6-48HP230-O:



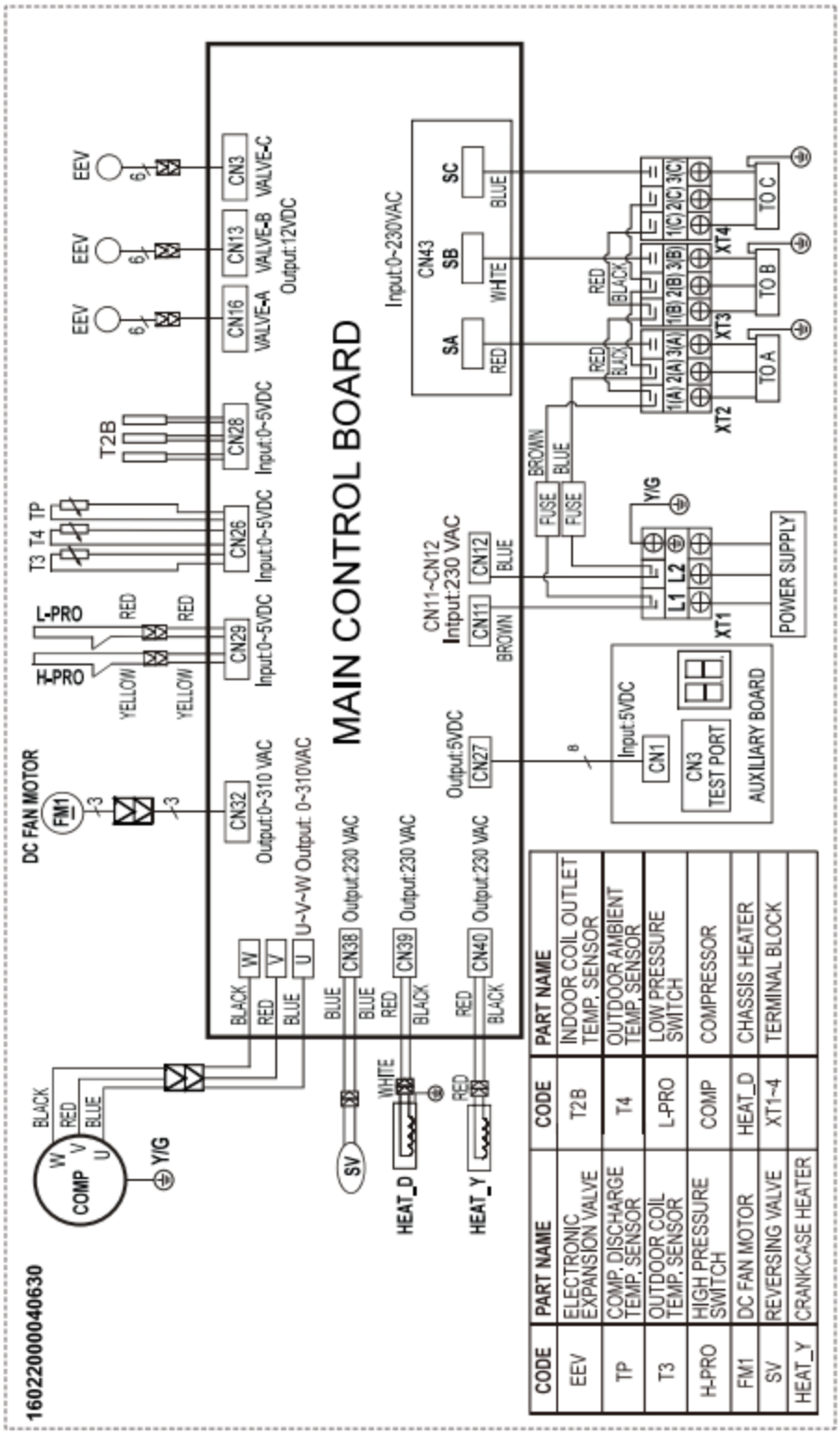
## Refrigeration Cycle Diagram of DIY-MULTI6-55HP230D-O:



## 1.4 Electrical Wiring Diagrams

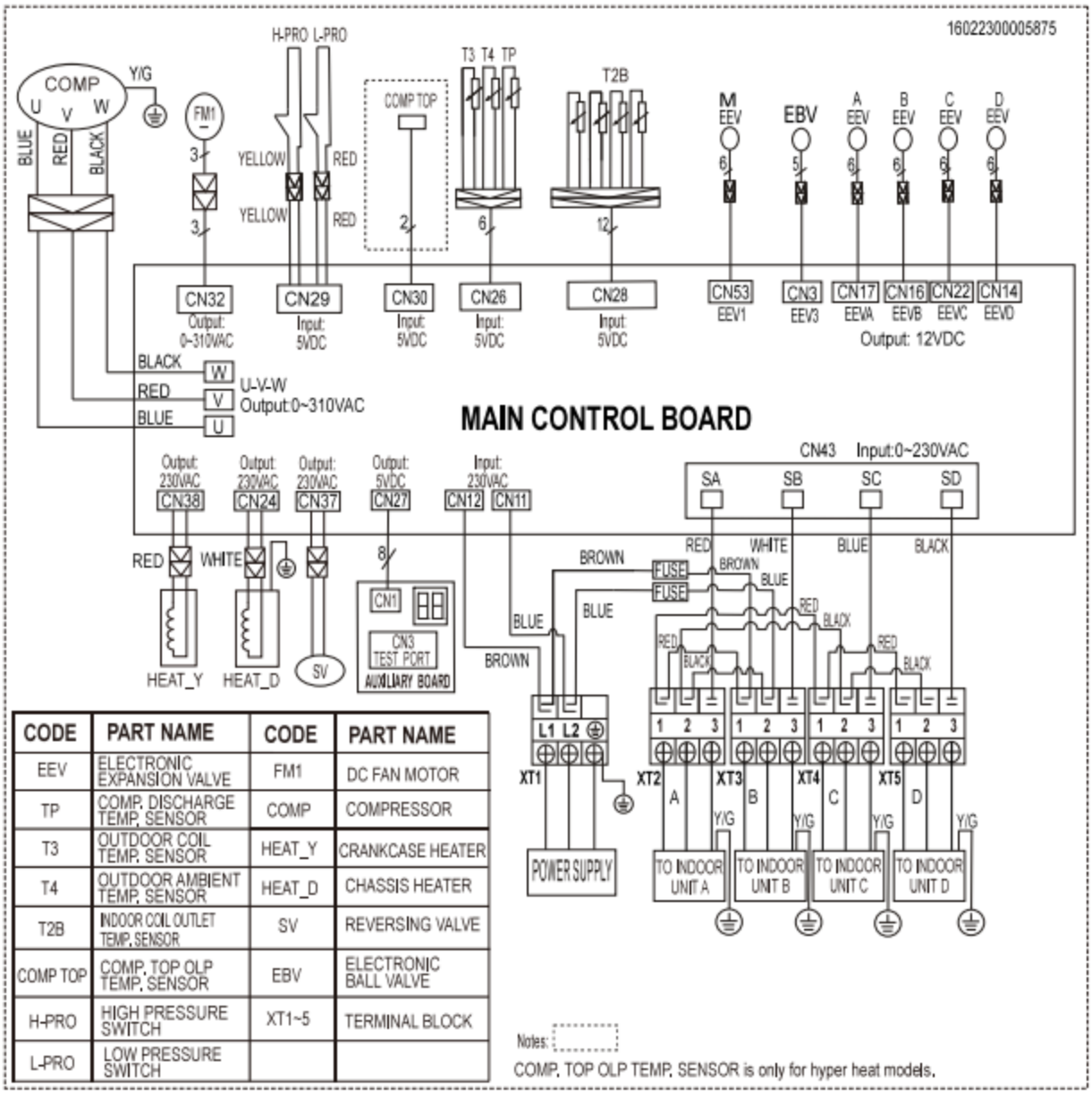
| Outdoor Unit | | |
|---|---|---|
| **ODU Model** | **ODU Wiring Diagram** | **ODU Printed Circuit Board** |
| DIY-MULTI3-18HP230D-O | 16022000040630 | 17122000062842 |
| DIY-MULTI4-27HP230D-O | 16022300005875 | 17122300008875 |
| DIY-MULTI5-36HP230D-O | 16022300005893 | |
| DIY-MULTI6-48HP230-O | 16022000041470 | |
| DIY-MULTI6-55HP230D-O | | |

**Outdoor unit wiring diagram: 16022000040630**



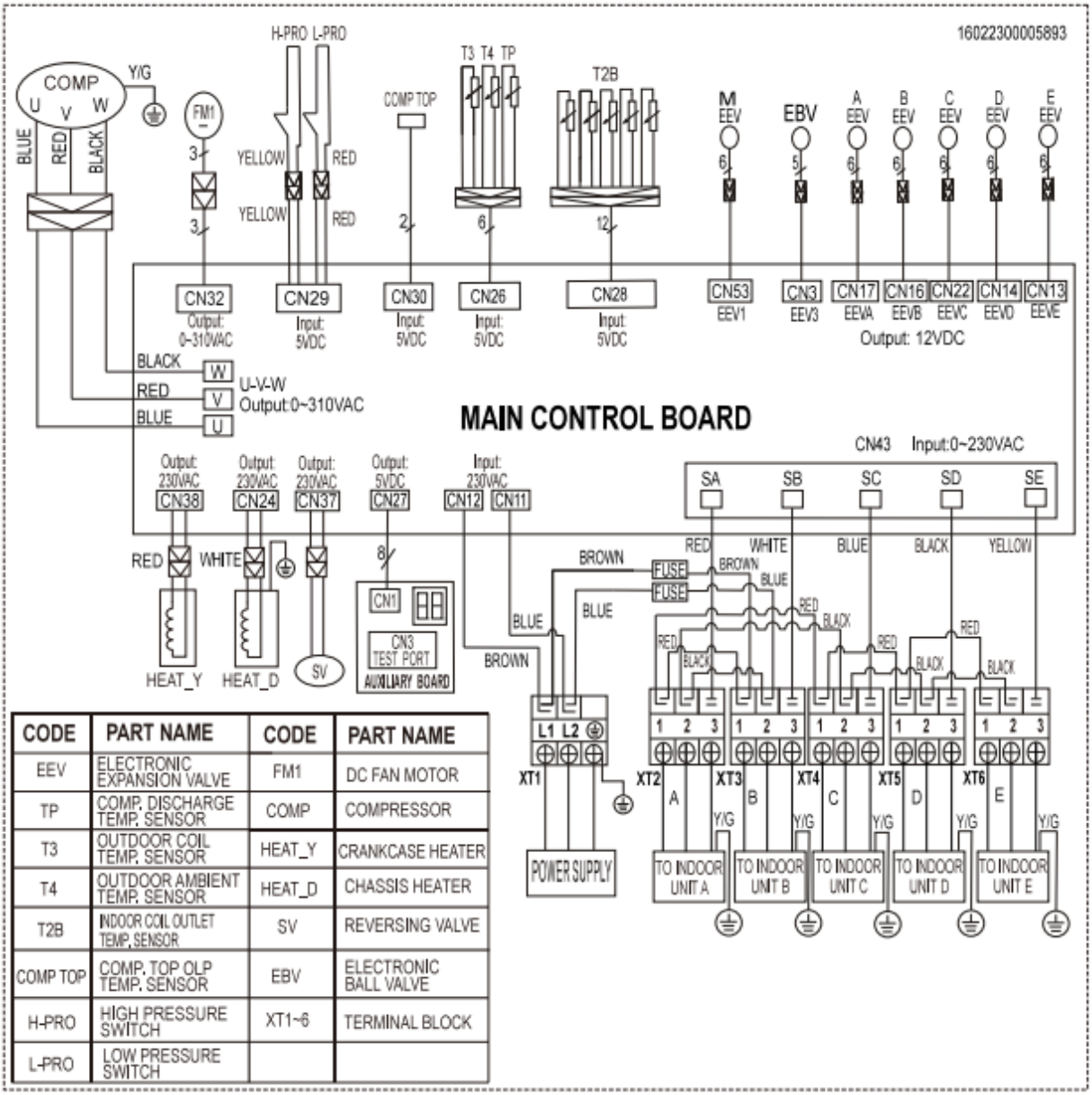

| CODE | PART NAME | CODE | PART NAME |
|---|---|---|---|
| EEV | ELECTRONIC EXPANSION VALVE | T2B | INDOOR COIL OUTLET TEMP. SENSOR |
| TP | COMP. DISCHARGE TEMP. SENSOR | T4 | OUTDOOR AMBIENT TEMP. SENSOR |
| T3 | OUTDOOR COIL TEMP. SENSOR | L-PRO | LOW PRESSURE SWITCH |
| H-PRO | HIGH PRESSURE SWITCH | COMP | COMPRESSOR |
| FM1 | DC FAN MOTOR | HEAT_D | CHASSIS HEATER |
| SV | REVERSING VALVE | XT1~4 | TERMINAL BLOCK |
| HEAT_Y | CRANKCASE HEATER | | |

## Outdoor unit wiring diagram: 16022300005875



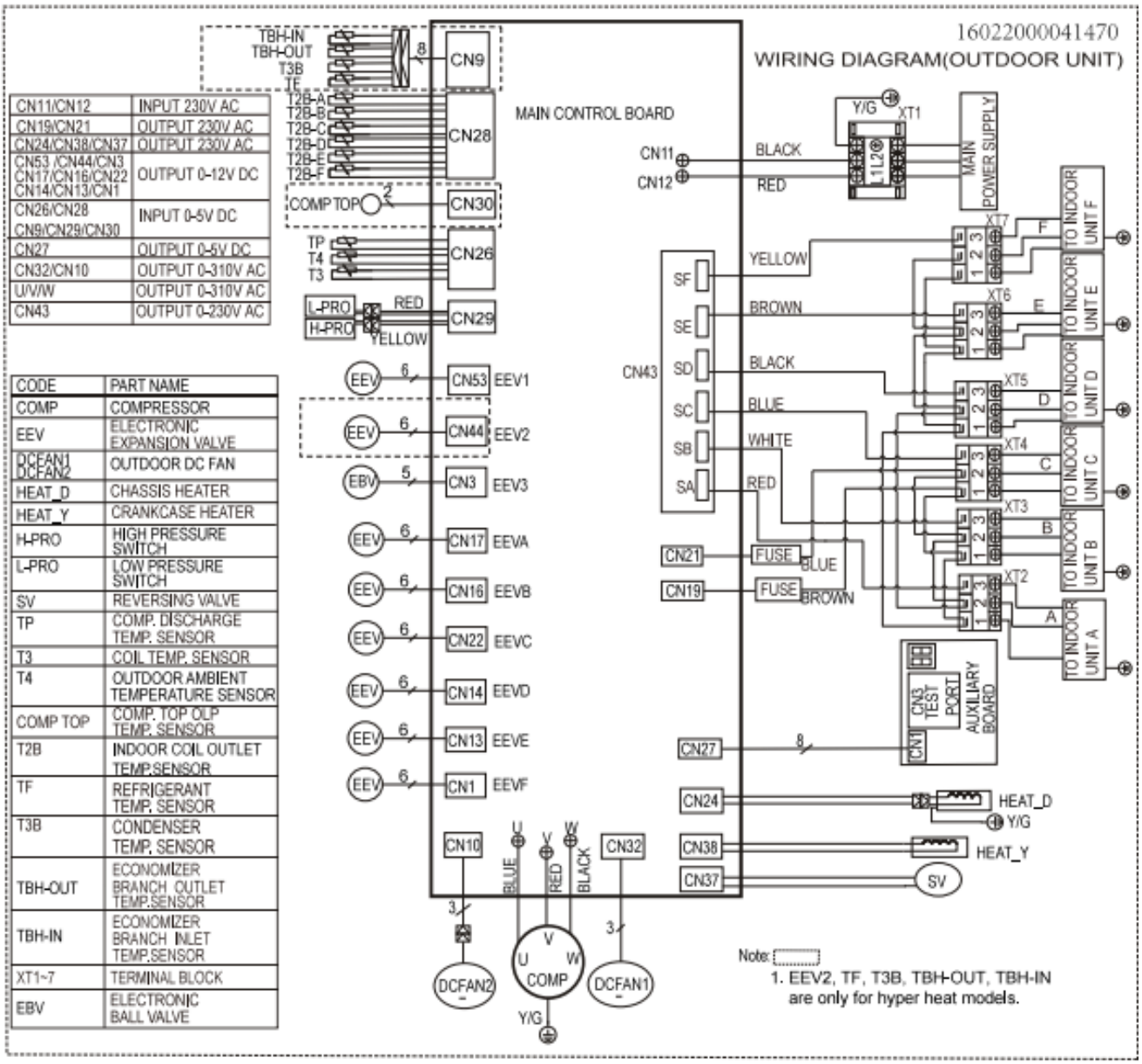

| CODE | PART NAME | CODE | PART NAME |
|---|---|---|---|
| EEV | ELECTRONIC EXPANSION VALVE | FM1 | DC FAN MOTOR |
| TP | COMP. DISCHARGE TEMP. SENSOR | COMP | COMPRESSOR |
| T3 | OUTDOOR COIL TEMP. SENSOR | HEAT_Y | CRANKCASE HEATER |
| T4 | OUTDOOR AMBIENT TEMP. SENSOR | HEAT_D | CHASSIS HEATER |
| T2B | INDOOR COIL OUTLET TEMP. SENSOR | SV | REVERSING VALVE |
| COMP TOP | COMP. TOP OLP TEMP. SENSOR | EBV | ELECTRONIC BALL VALVE |
| H-PRO | HIGH PRESSURE SWITCH | XT1~5 | TERMINAL BLOCK |
| L-PRO | LOW PRESSURE SWITCH | | |

**Outdoor unit wiring diagram: 16022300005893**




| CODE | PART NAME | CODE | PART NAME |
|---|---|---|---|
| EEV | ELECTRONIC EXPANSION VALVE | FM1 | DC FAN MOTOR |
| TP | COMP. DISCHARGE TEMP. SENSOR | COMP | COMPRESSOR |
| T3 | OUTDOOR COIL TEMP. SENSOR | HEAT_Y | CRANKCASE HEATER |
| T4 | OUTDOOR AMBIENT TEMP. SENSOR | HEAT_D | CHASSIS HEATER |
| T2B | INDOOR COIL OUTLET TEMP. SENSOR | SV | REVERSING VALVE |
| COMP TOP | COMP. TOP OLP TEMP. SENSOR | EBV | ELECTRONIC BALL VALVE |
| H-PRO | HIGH PRESSURE SWITCH | XT1~6 | TERMINAL BLOCK |
| L-PRO | LOW PRESSURE SWITCH | | |

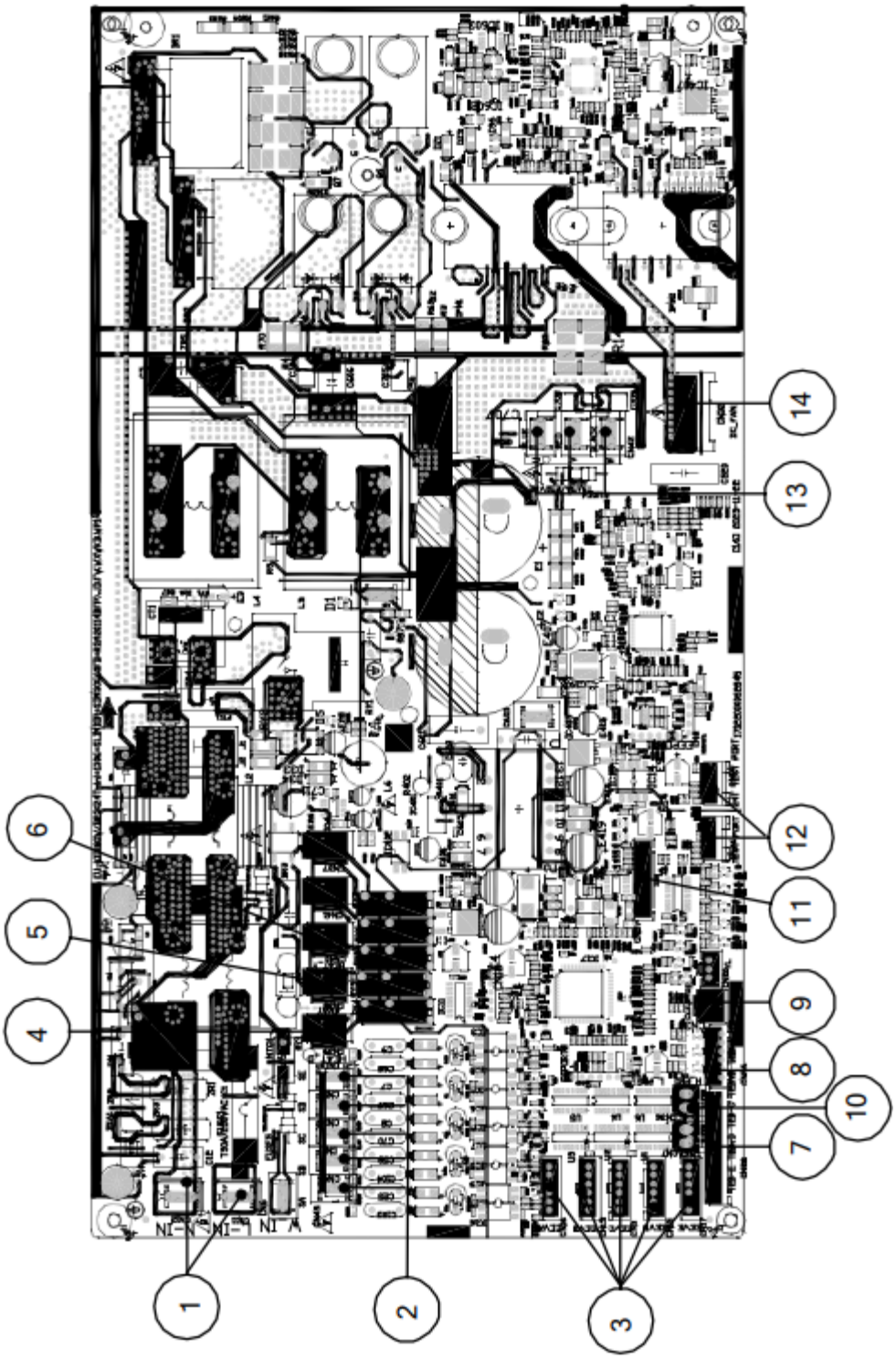
## Outdoor unit wiring diagram: 16022000041470




| | |
|---|---|
| CN11/CN12 | INPUT 230V AC |
| CN19/CN21 | OUTPUT 230V AC |
| CN24/CN38/CN37 | OUTPUT 230V AC |
| CN53 /CN44/CN3 CN17/CN16/CN22 CN14/CN13/CN1 | OUTPUT 0-12V DC |
| CN26/CN28 CN9/CN29/CN30 | INPUT 0-5V DC |
| CN27 | OUTPUT 0-5V DC |
| CN32/CN10 | OUTPUT 0-310V AC |
| U/V/W | OUTPUT 0-310V AC |
| CN43 | OUTPUT 0-230V AC |

| CODE | PART NAME |
|---|---|
| COMP | COMPRESSOR |
| EEV | ELECTRONIC EXPANSION VALVE |
| DCFAN1 DCFAN2 | OUTDOOR DC FAN |
| HEAT_D | CHASSIS HEATER |
| HEAT_Y | CRANKCASE HEATER |
| H-PRO | HIGH PRESSURE SWITCH |
| L-PRO | LOW PRESSURE SWITCH |
| SV | REVERSING VALVE |
| TP | COMP. DISCHARGE TEMP. SENSOR |
| T3 | COIL TEMP. SENSOR |
| T4 | OUTDOOR AMBIENT TEMPERATURE SENSOR |
| COMP TOP | COMP. TOP OLP TEMP. SENSOR |
| T2B | INDOOR COIL OUTLET TEMP.SENSOR |
| TF | REFRIGERANT TEMP. SENSOR |
| T3B | CONDENSER TEMP. SENSOR |
| TBH-OUT | ECONOMIZER BRANCH OUTLET TEMP.SENSOR |
| TBH-IN | ECONOMIZER BRANCH INLET TEMP.SENSOR |
| XT1~7 | TERMINAL BLOCK |
| EBV | ELECTRONIC BALL VALVE |

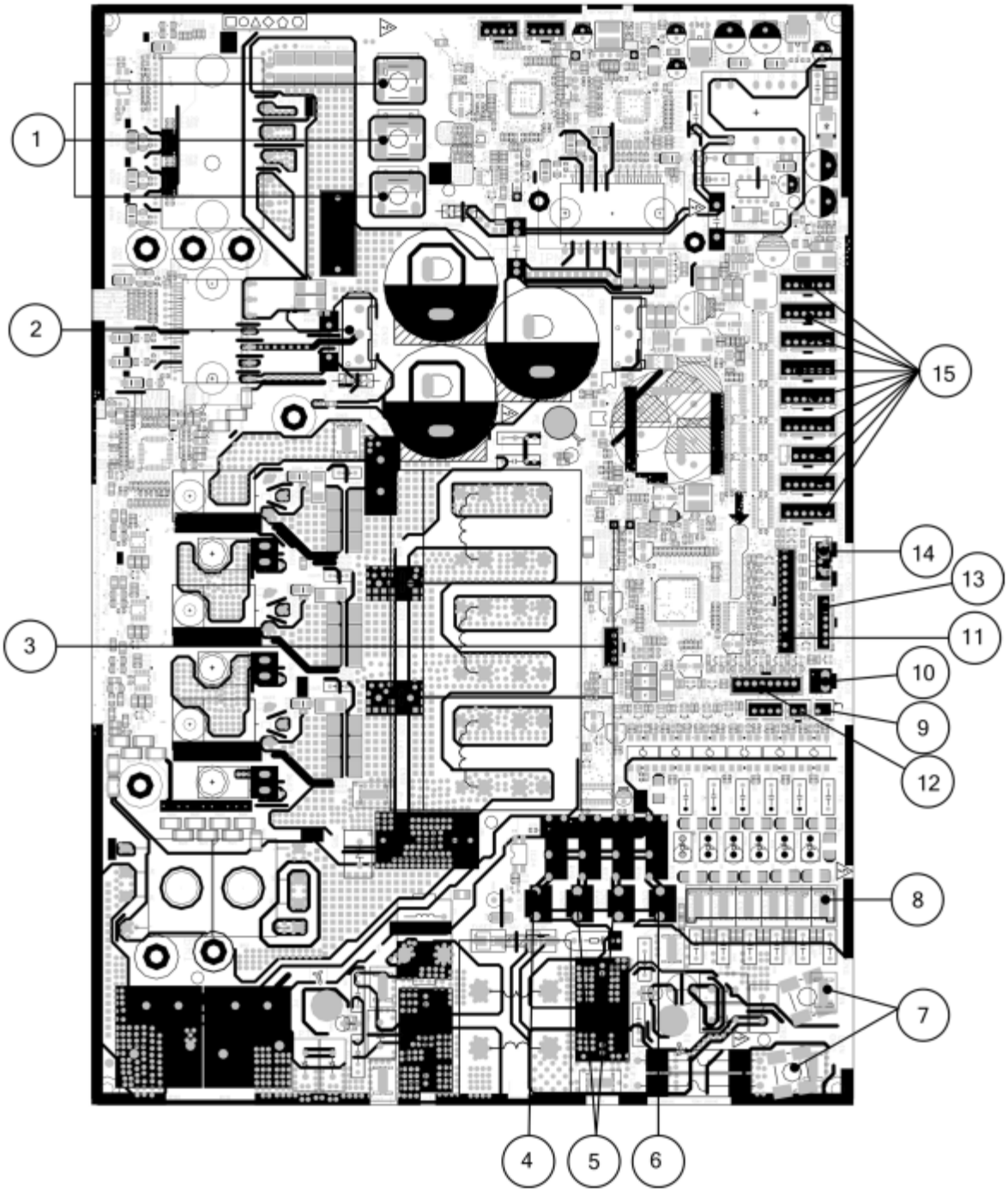
**Outdoor unit printed circuit board diagram: 16022300005893**



| No. | Name | NC# | Meaning |
|---|---|---|---|
| 1 | Power Supply | CN11 | L_in: connects to N-line (208-230VAC input) |
| | | CN12 | N_in: connects to L-line (208-230VAC input) |
| 2 | S-A | CN4 | S: connects to indoor unit communication(pin1-pin2: 24VDC pulse wave; pin2-pin3: 208-240VAC input) |
| | S-B | CN2 | |
| | S-C | CN34 | |
| | S-D | CN5 | |
| | S-E | CN10 | |
| 3 | EEV-A | CN10 | Connects to electronic expansion valve |
| | EEV-B | CN13 | |
| | EEB-C | CN3 | |
| | EEV-D | CN15 | |
| | EEV-E | CN17 | |
| 4 | HEAT_D | CN39 | Connects to chassis heater, 208-240VAC when ON |
| 5 | 4-WAY | CN38 | Connects to 3 way valve, 208-240VAC when ON |
| 6 | HEAY_Y | CN40 | Connects to compressor heater, 208-240VAC when ON |
| 7 | T2B | CN28 | Connects to evaporator coil outlet temperature sensor T2B |
| 8 | T3 T4 TP | CN26 | Connects to pipe temp. sensor T3, ambient temp. sensor T4, exhaust temp. sensor TP |
| 9 | OLP TEMP. SENSOR | CN30 | Connects to compressor top temp. sensor (5VDC pulse wave) |
| 10 | H-PRO, L-PRO | CN29 | Connects to high and low pressure switch (pin1-pin2&pin3-pin4:5VDC pulse wave) |
| 11 | / | CN27 | Connects to key board CN1 |
| 12 | TESTPORT | CN24/CN14 | Used for testing |
| 13 | Compressor | U | Connects to compressor; 0VAC (standby), 10-200VAC (running) |
| | | V | |
| | | W | |
| 14 | DC-FAN | CN32 | Connects to DC fan |

***Note: This section is for reference only. Please take practicality as standard.***

**Outdoor unit printed circuit board diagram: 17122300008875**



| No. | Name | NC# | Meaning |
|---|---|---|---|
| 1 | Compressor | W | Connects to compressor;0VAC (standby); 10-310VAC (running) |
| | | V | |
| | | U | |
| 2 | DC-FAN | CN32 | Connects to DC fan |
| 3 | TESTPORT | CN45 | Used for testing |
| 4 | HEAT_Y | CN38 | Connects to compressor heater, 208-230VAC when on |
| 5 | 4-WAY | CN37 | Connects to 4 way valve 1, 208-230VAC when on |
| | | CN25 | Connects to 4 way valve 2, 208-230VAC when on |
| 6 | HEAT_D | CN24 | Connects to chassis heater, 208-230VAC when on |
| 7 | POWER SUPPLY | CN11 | N_in: Connects to N-line (208-230VAC) |
| | | CN12 | L_in: Connects to L-line (208-230VAC) |
| 8 | S-A | CN43 | S: Connects to indoor unit communication (pin1-pin2: 24VDC pulse wave; pin2-pin3: 208-230VAC input) |
| | S-B | | |
| | S-C | | |
| | S-D | | |
| | S-E | | |
| | S-F | | |
| 9 | TBH-IN TBH-OUT T3B TF | CN9 | Connects to cold plate inlet temp. sensor TBH-IN, coldplate outlet temp. sensor TBH-OUT, condenser coil middle temp. sensor T3B, Refrigerant tube inlet temp. sensor TF |
| 10 | OLP TEMP. SENSOR | CN30 | Connects to compressor top temp. sensor (5VDC pulse wave) |
| 11 | T2B | CN28 | Connects to evaporator coil outlet temp.sensor T2B |
| 12 | / | CN27 | Connects to key board CN1 |
| 13 | T3 T4 TP | CN26 | Connects to condenser coil temp. sensor T3, ambient temp, sensor T4, exhaust temp. sensor TP |
| 14 | H-PRO, L-PRO | CN29 | Connects to high and low pressure switch (pin1-pin2&pin3-pin4:5VDC pulse wave) |
| 15 | EEVA | CN17 | Connects to electric expansion valve |
| | EEVB | CN16 | |
| | EEVC | CN22 | |
| | EEVD | CN14 | |
| | EEVE | CN13 | |
| | EEVF | CN1 | |
| | EEV1 | CN53 | |
| | EEV2 | CN44 | |
| | EEV3 | CN3 | |

***Note: This section is for reference only. Please take practicality as standard.***

## 1.5 Electronic Functions

**Unit Element Abbreviations:**

| Abbreviation | Element |
|---|---|
| T1 | Indoor room temperature sensor |
| T2 | Middle indoor heat exchanger coil temperature |
| T2B | Indoor heat exchanger exhaust coil temperature (located on the outdoor unit) |
| T3 | Coil temperature of condenser |
| T3B | Condenser middle temperature |
| T5 | Refrigerant pipe inlet temperature |
| T6A | Economizer branch inlet temperature |
| T6B | Economizer branch outlet temperature |
| TP | Compressor discharge temperature |

*Note:* T3B, T5, T6A & T6B, are only for hyper heat models.

# Main Protection:

**Sensor Redundancy and Automatic Shutoff:**
- If one temperature sensor (T3, T4,T2B, or TP) malfunctions, the unit ceases operation and displays the corresponding error code.

**Automatic Shutoff Based on Fan:**
- If the outdoor fan speed is operating outside of the normal range, (fan lack of phase or fan zero speed failure) the unit ceases operation.

**Automatic Shutoff Based on Fan:**
- If the outdoor fan speed is operating outside of the normal range, (fan lack of phase or fan zero speed failure) the unit ceases operation.

**Inverter Module Protection:**
- The inverter module has an automatic shutoff mechanism based on the unit's current and temperature. If automatic shutoff is initiated, the corresponding error code is displayed and the unit ceases operation.

**Indoor/Outdoor Unit Communication Protection:**
- If the indoor units do not receive the feedback signal from the outdoor unit for 2 consecutive minutes or the outdoor unit do not receive the feedback signal from any one of the indoor units for 3 consecutive minutes, the unit ceases operation and displays a error code.

**EEPROM Parameter Error:**
- If the main chip does not receive feedback from the EEPROM chip or parameter check error, the unit ceases operation.

**Automatic Shutoff Based on Compressor:**
- If the compressor speed has been out of control or the compressor lack of phase or voltage too low failure occurs the unit ceases operation.

**Temperature Protection of Compressor Discharge:**
- When the discharge temperature of the compressor rises the running frequency is limited. If the discharge temperature is too high the compressor stops and then will restart once the discharge temperature is back to normal range.

**Evaporator Anti-freezing Protection:**
- When the T2 signal sent from the indoor unit to the outdoor unit is too low the unit will limit the compressor and run at a low frequency.

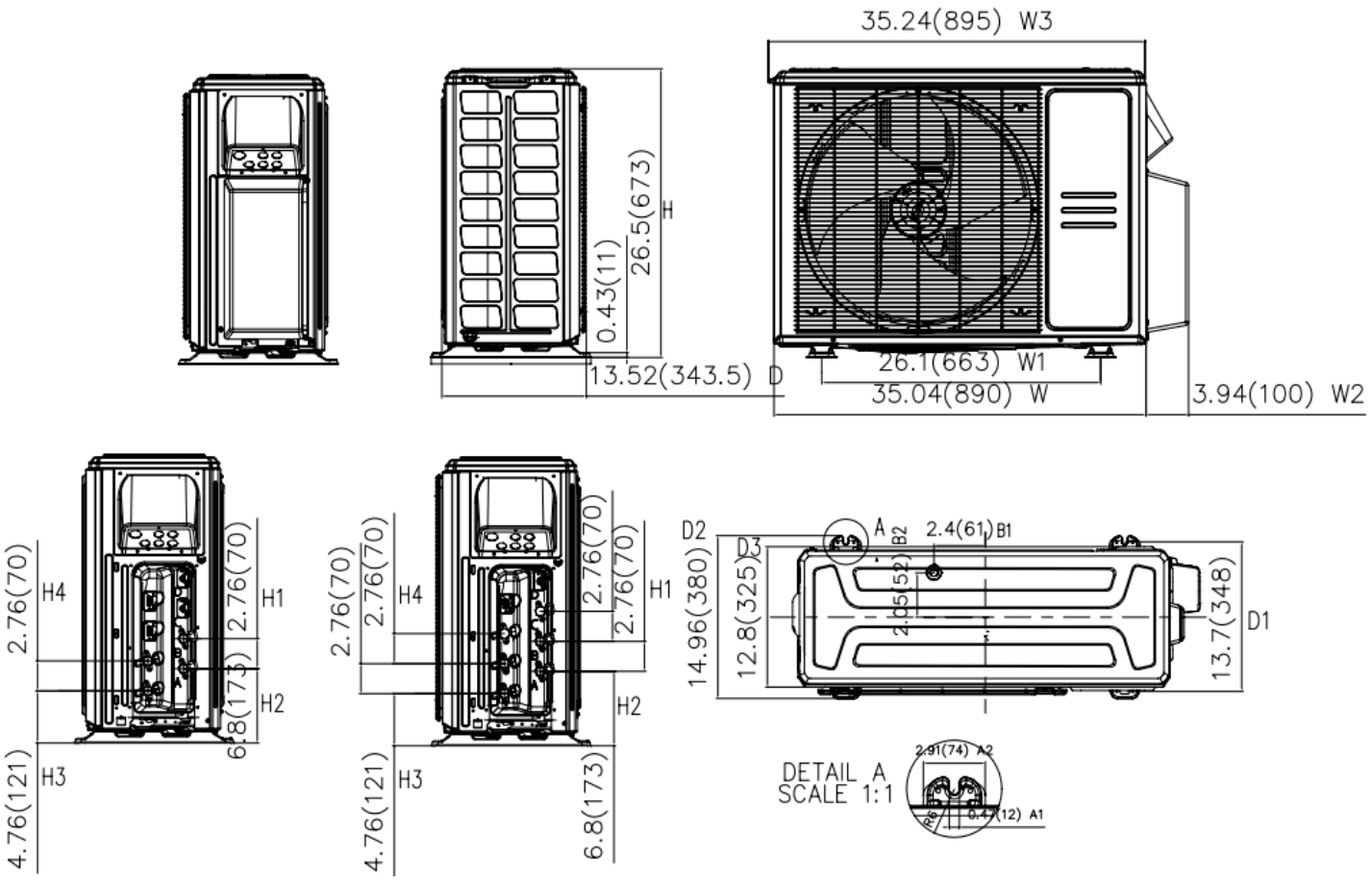
**Oil Return:**
1. If the unit runs at a low frequency for a long time, the unit will run the oil return program to increase the frequency of the compressor.
2. After the unit runs continuously for a period of time, the unit will run the oil return program to increase the compressor frequency.

## 2.1 Outdoor Unit Dimensions

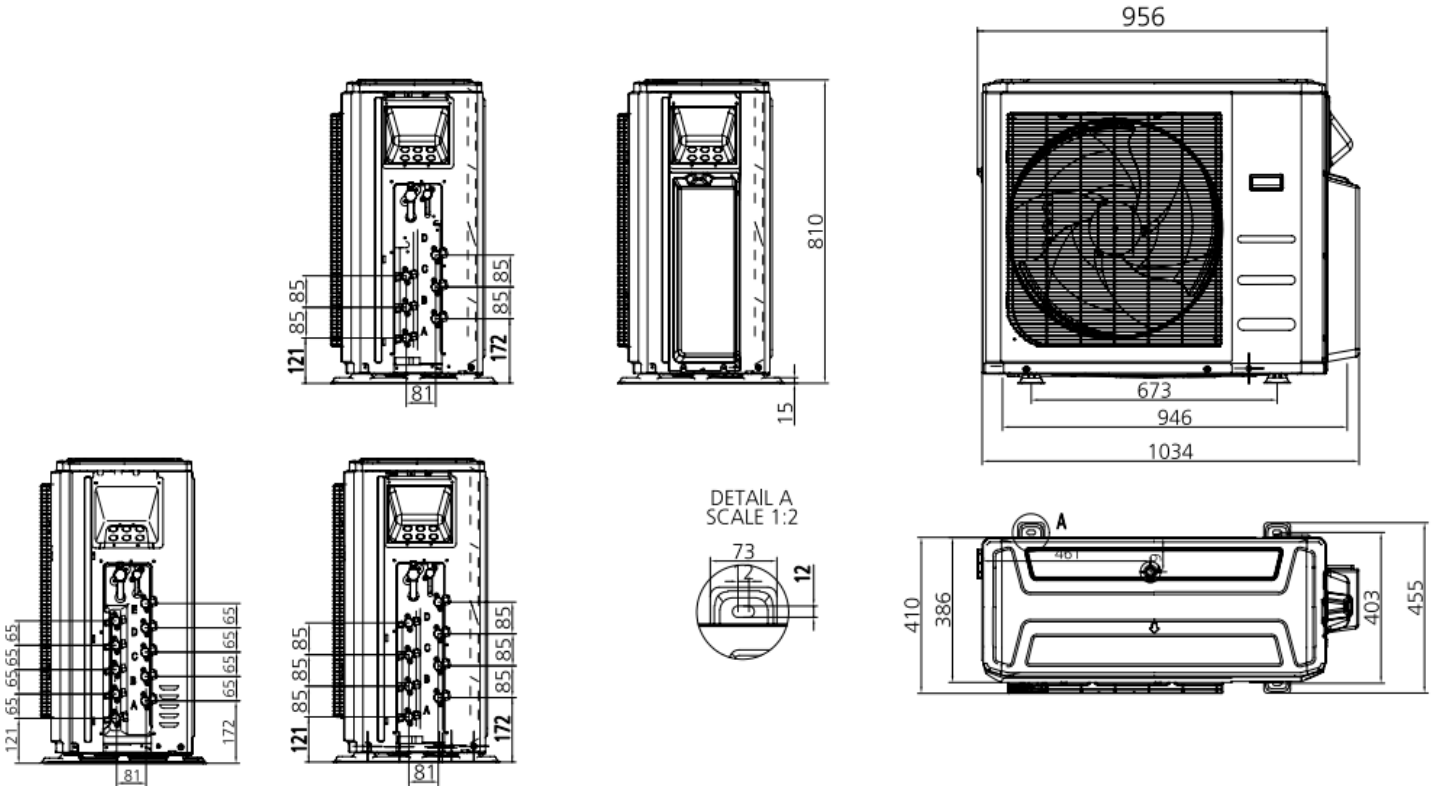
**Outdoor Unit Table:**

| Outdoor Unit Model | Panel Plate | PCB Board |
|---|---|---|
| DIY-MULTI3-18HP230D-O | X430 | PCB board 6 |
| DIY-MULTI4-27HP230D-O | D30 | PCB board 9 |
| DIY-MULTI5-36HP230D-O | D30 | PCB board 9 |
| DIY-MULTI6-48HP230-O | E30 | PCB board 10 |
| DIY-MULTI6-55HP230D-O | E30 | PCB board 10 |

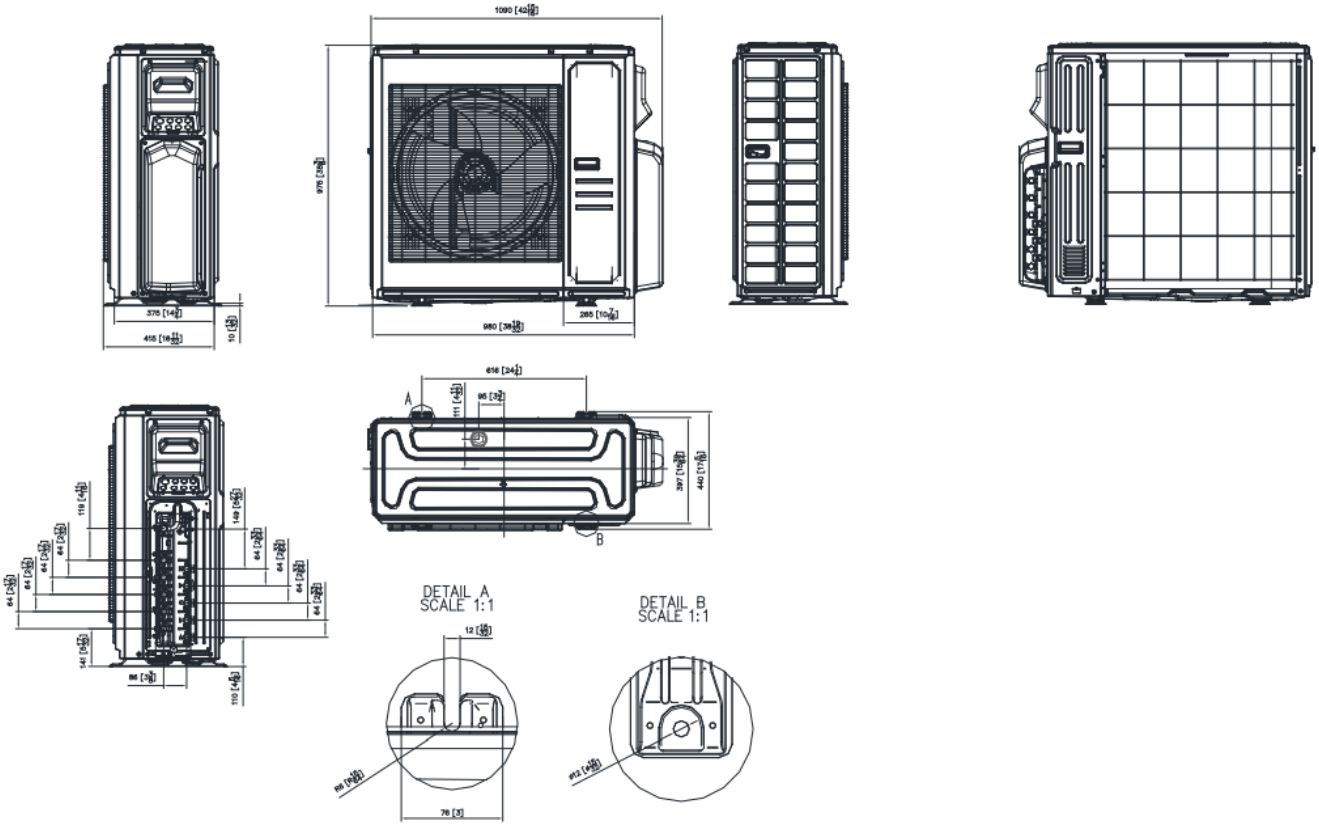
## Dimensions of Panel Plate X430 (1 drive 2 & 1 drive 3):



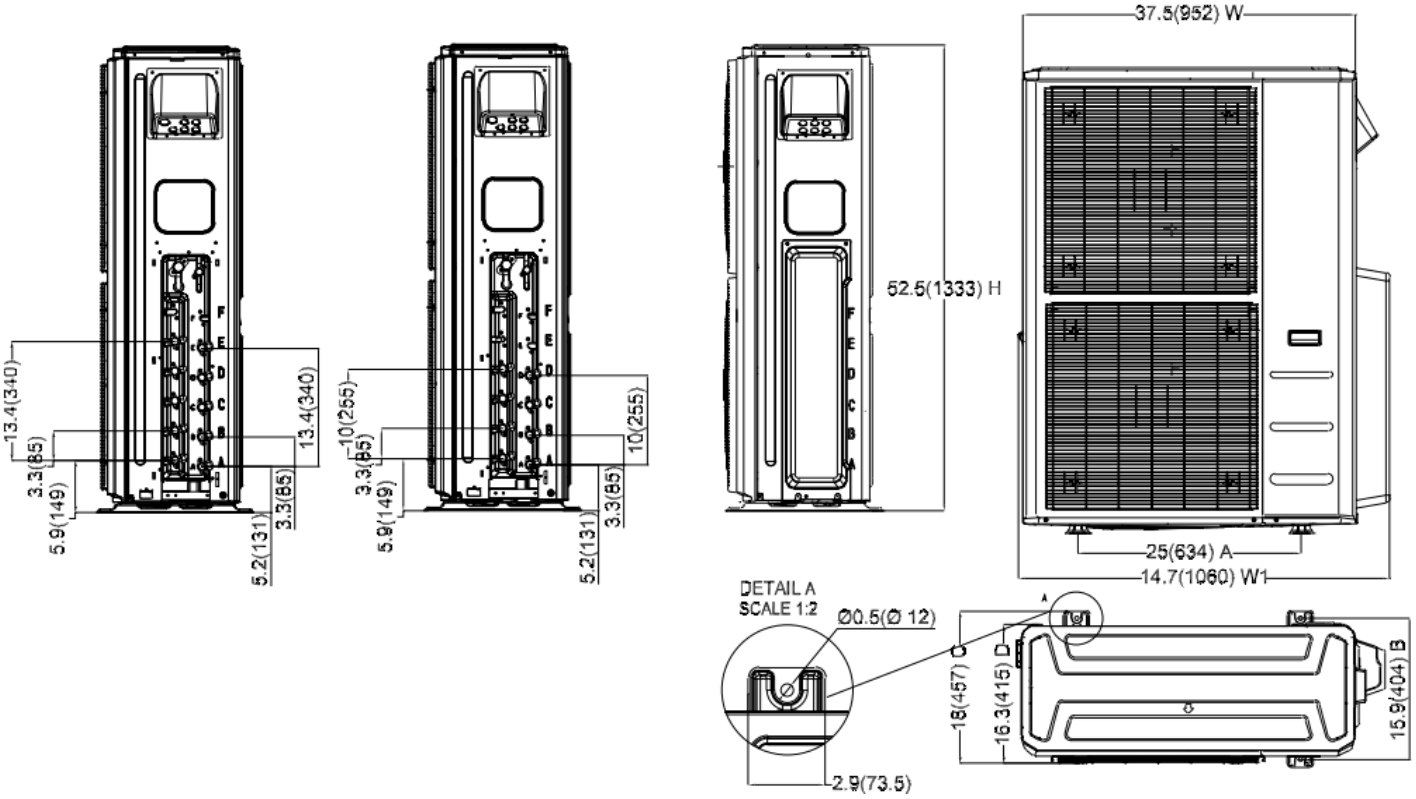
## Dimensions of Panel Plate D30 (1 drive 3, 1drive 4 & 1 drive 5):



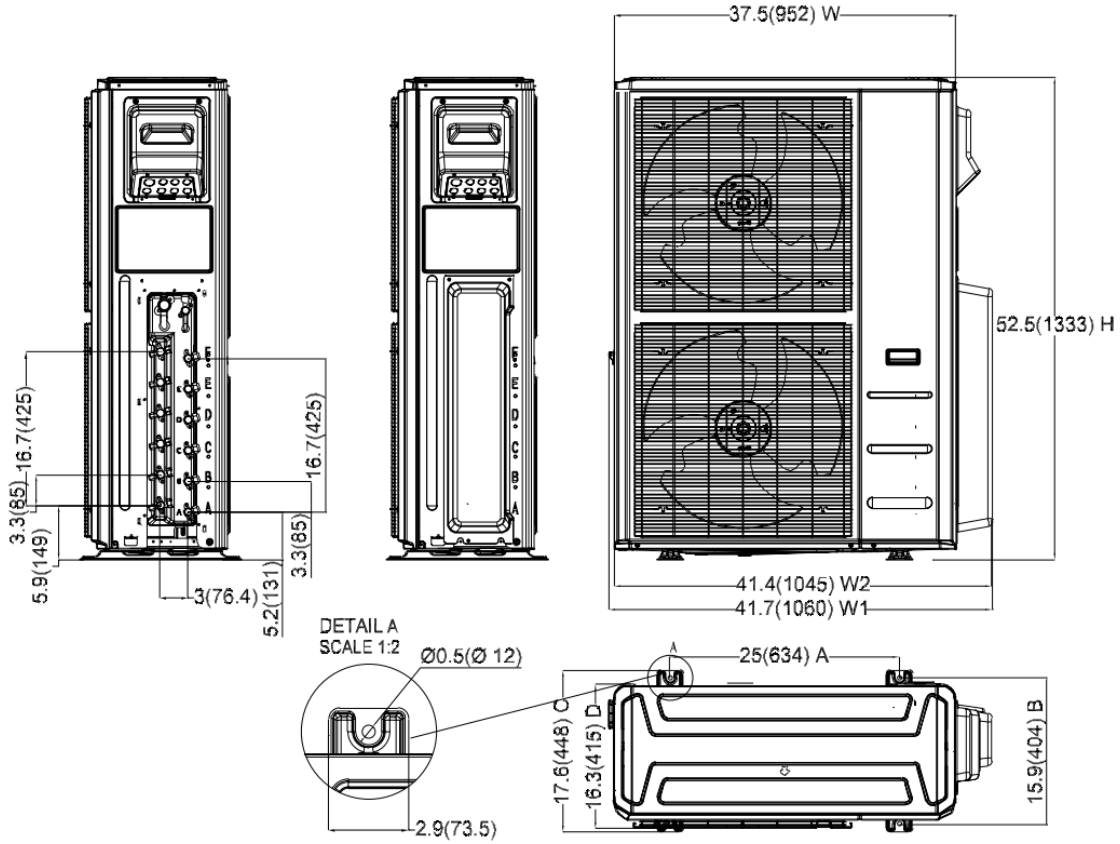

## Dimensions of Panel Plate X630 (1 drive 5):



## Dimensions of Panel Plate E30 (1 drive 4 & 1 drive 5):



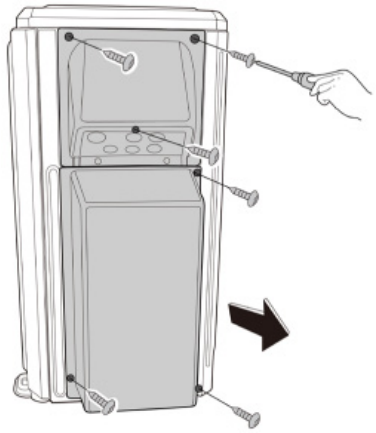

## Dimensions of Panel Plate E30 (1 drive 6):



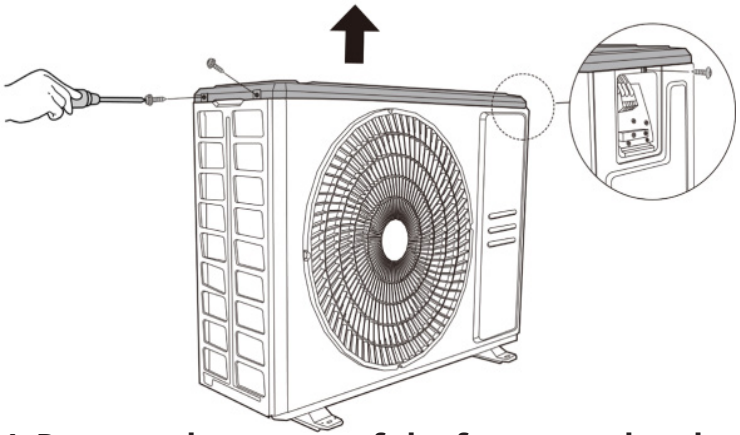
## 2.2 Outdoor Unit Disassembly

### Panel Plate X40:

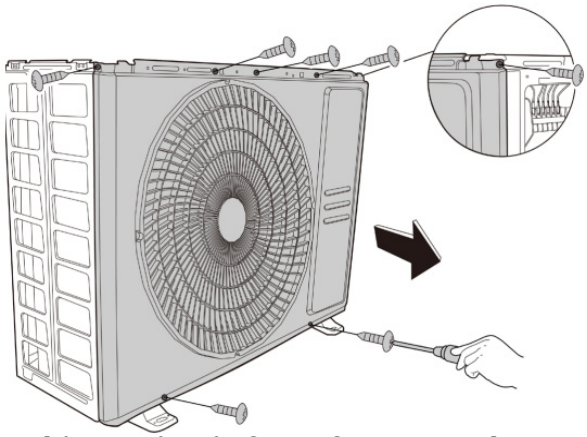
1. Turn off the air conditioner and the power breaker.
2. Remove the screws of the big handler assembly and water collector (6screws).



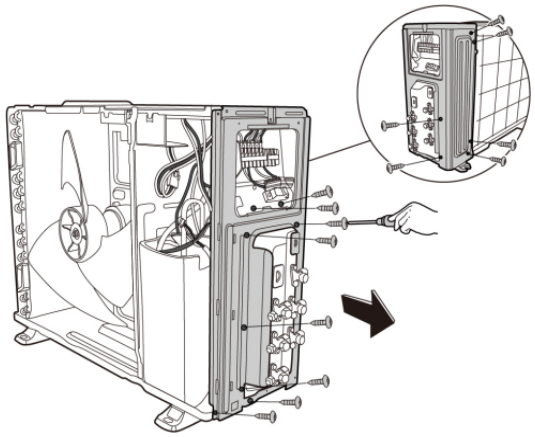
3. Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle.



4. Remove the screws of the front panel and then remove the front panel (7 screws).



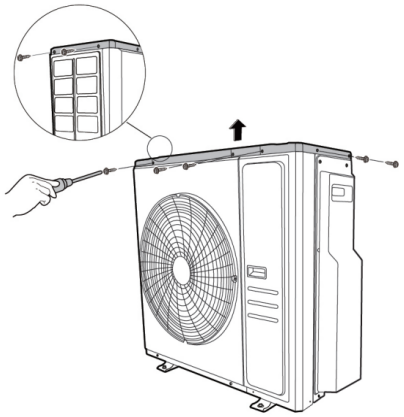
5. Remove the screws of the right panel and then remove the right panel (14 screws, two of them are used to fix the rear grille).



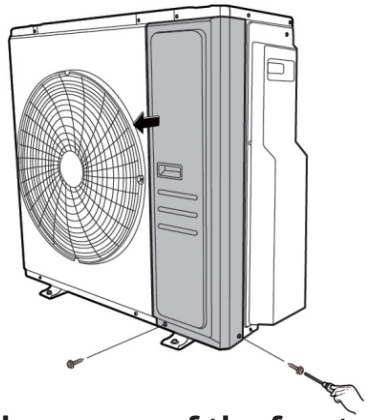
*Note: This section is for reference only. Actual appearance may vary.*

## Panel Plate X40:

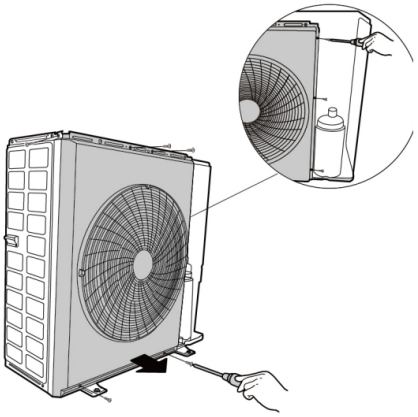
**1. Turn off the air conditioner and the power breaker.**
**2. Remove the screws of the top cover then remove the top cover (7screws).**



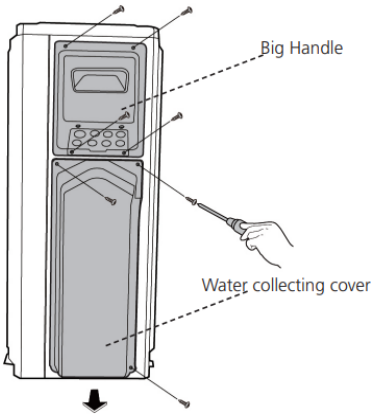
**3. Remove the screws of the front right panel and then remove the front right panel (2 screws).**



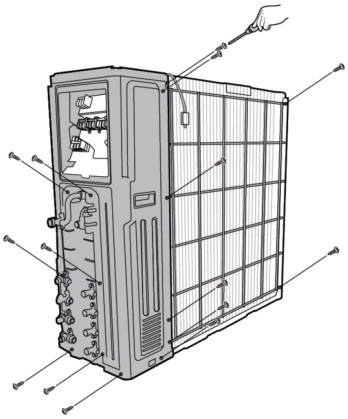
**4. Remove the screws of the front panel and then remove the front panel (8 screws).**



**5. Remove the screws of the big handle assembly and water collector then remove them (7 screws).**



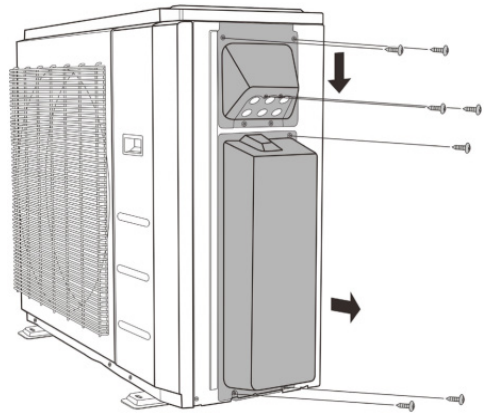

**6. Remove 4 screws of the rear grille and 11 screws of the right-rear panel, then remove the rear grille and right-rear panel.**



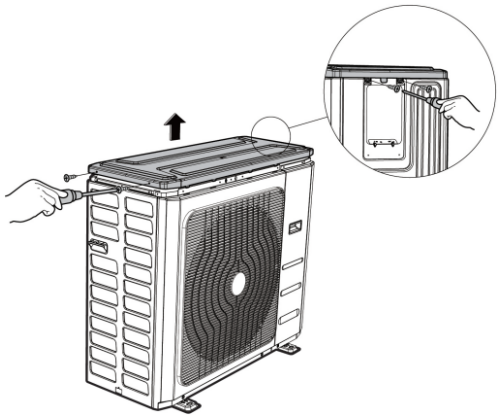
***Note: This section is for reference only. Actual appearance may vary.***

## Panel Plate X40:

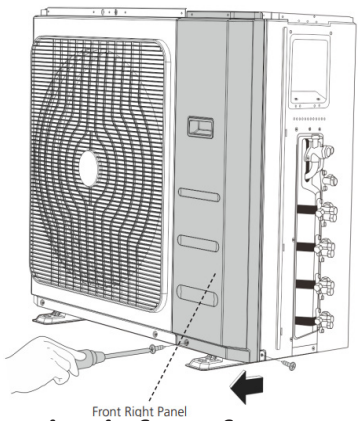
1. Turn off the air conditioner and the power breaker.
2. Remove four screws and then remove the big handle.
3. Remove three screws and then remove the water collecting cover.



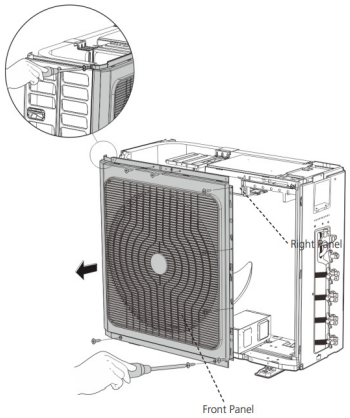
4. Remove the screws of the top cover and then remove the top cover (4 screws). Two of the screws are located under the big handle.



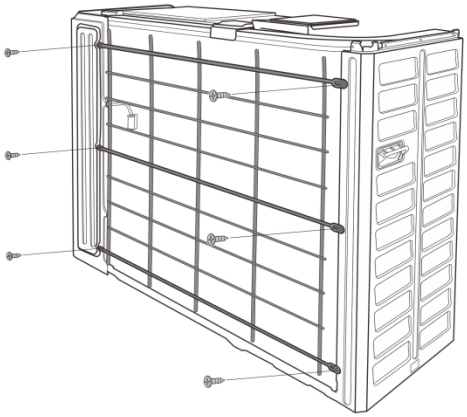
4. Remove the screws of the front right panel and then remove the front right panel (2 screws).



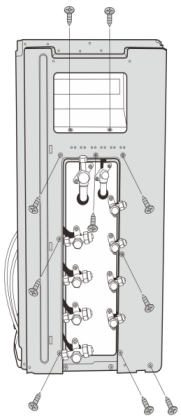

6. Remove the screws of the front panel and then remove the front panel (9 screws).

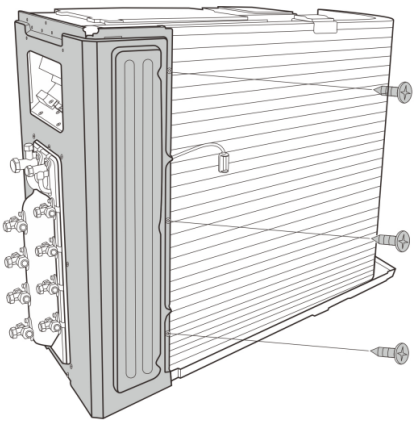



7. Remove the screws of the rear grille and then remove the grille (6 screws).



8. Remove the screws of the right panel and then remove the right panel (12 screws).

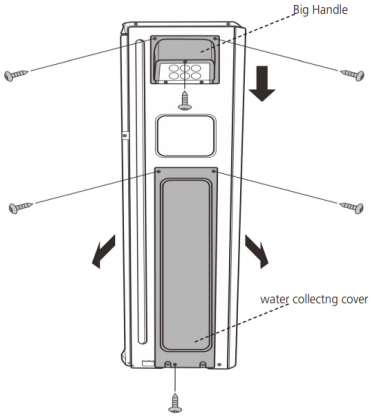




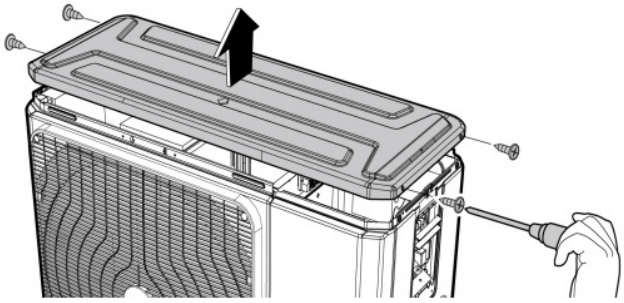
***Note: This section is for reference only. Actual appearance may vary.***

## Panel Plate E30:

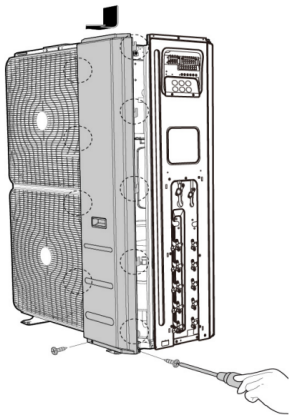
**1. Turn off the air conditioner and the power breaker.**
**2. Remove the screws of the big handler and then remove it (3 screws).**
**3. Remove the screws of the water collector and the remove it (3 screws).**



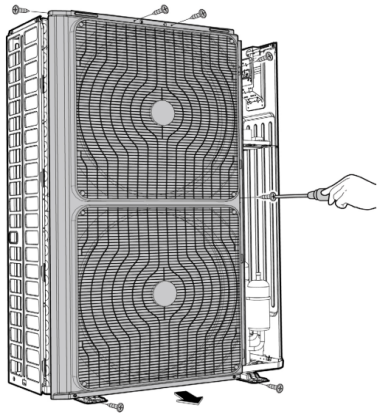

**4. Unfix the four screws of the top cover and then remove it.**



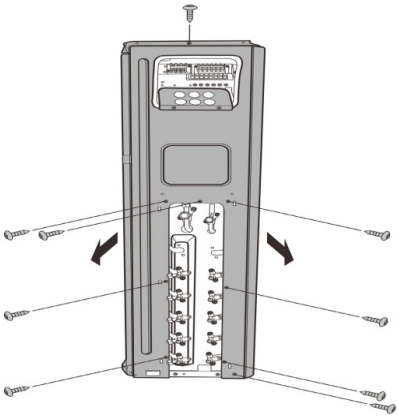
**5. Remove the two screws of the right front panel and then push it down to unhook the right front panel from the 9 hooks.**



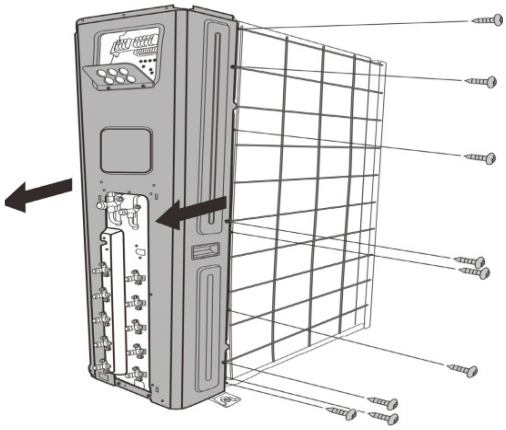
**6. Remove the 7 screws of the front panel and then remove the front panel.**



**7. Unfix the screws on the right side of the right panel (9 screws).**



**8. Remove the screws on the back of the right panel and then remove the right panel and rear grille (9 screws).**



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

## 2.3 Outdoor Components Disassembly

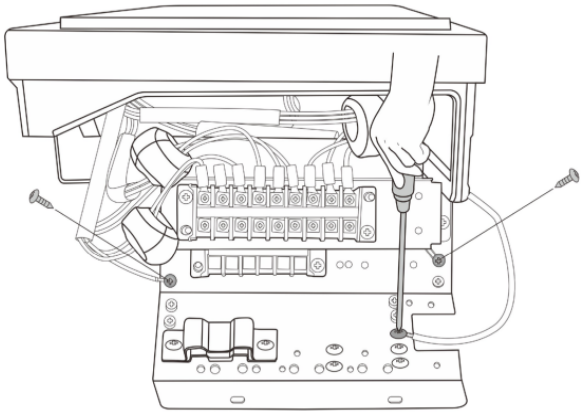
**WARNING**

**While checking the indoor/outdoor PCB, please equip yourself with anti-static gloves or a wrist strap to avoid damaging the board.**
**Electricity will remain in capacitors even when the power supply is off. Ensure the capacitors are fully discharged before troubleshooting.**

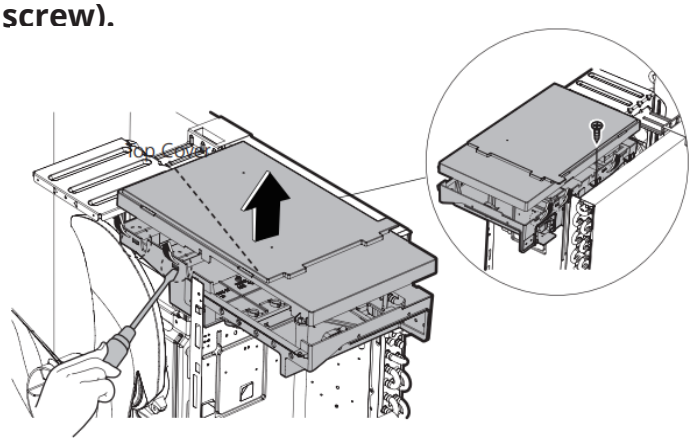
***Note: Remove the air outlet grille before disassembling electrical parts.***

# Electrical Parts of PCB Board 1:

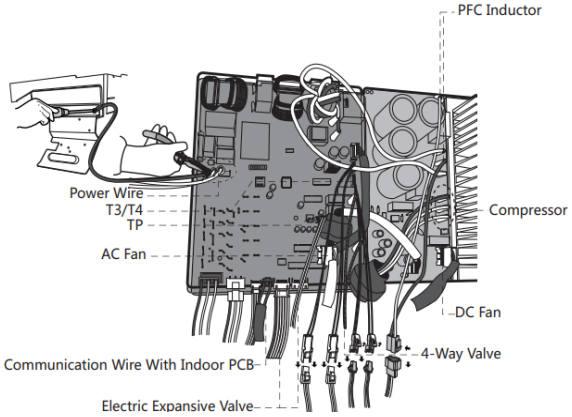
**1. Remove the screws of the ground wirings (3 screws).**



**2. Unfix the hooks and screws and then open the electronic control box cover (5 hooks and 1 screw).**



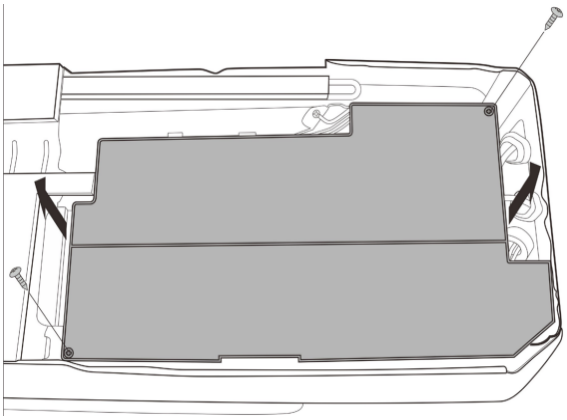

**3. Disconnect the connector for the outdoor DC fan from the electronic control board.**
**4. Remove the connector for the compressor.**
**5. Pull out the two blue wires connected with the four way valve.**
**6. Pull out connectors of the condenser coil temp. sensor (T3), outdoor ambient temp. sensor (T4), and discharge temp. sensor (TP).**
**7. Disconnect the electronic expansion vale wire.**
**8. Disconnect the communication wire indoor PCB.**
**9. Disconnect the PFC inductor.**
**10. Then remove the electronic control box.**



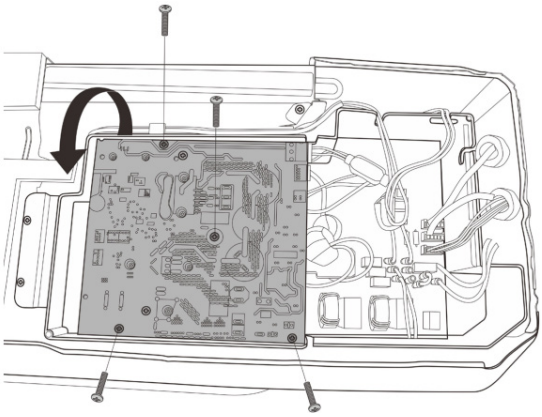

***Note: This section is for reference only. Actual appearance may vary.***

## Electrical Parts of PCB Board 2:

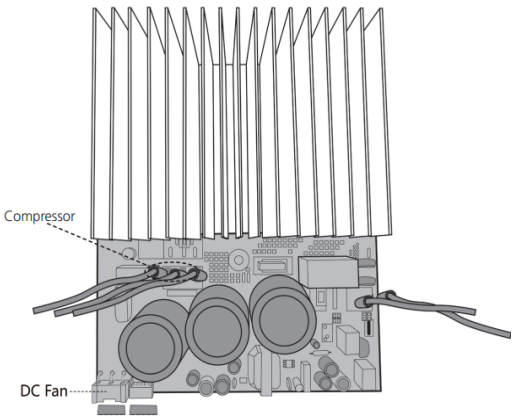
**1. Remove the screws of the top cover (2 screws).**

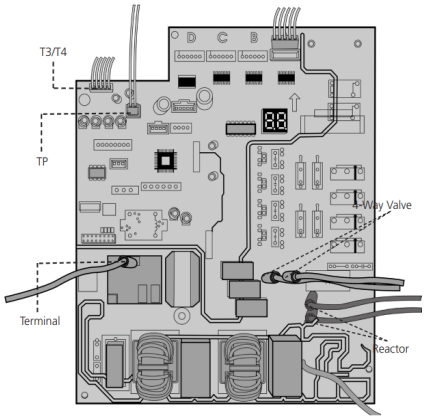


**2. Unfix the screws and then turn over the IPM board (4 screws).**



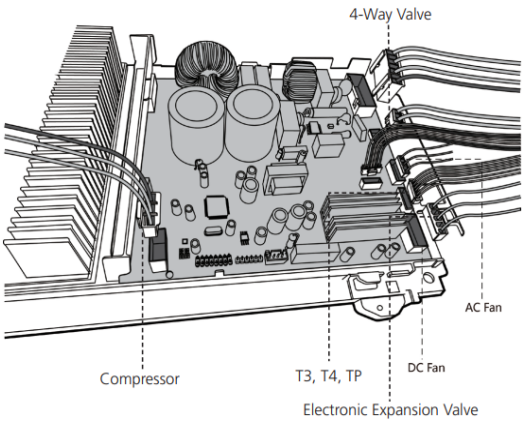
**3. Disconnect the connector for the outdoor DC fan from the electronic control box.**
**4. Remove the connector for the compressor.**
**5. Pull out the two blue wires connected with the four way valve.**
**6. Pull out connectors of the condenser coil temp. (T3), outdoor ambient temp. sensor (T4), and discharge temp. sensor (TP).**
**7. Disconnect the electronic expansion valve wires.**
**8. Disconnect the communication wires to the indoor PCB.**
**9. Disconnect the PFC inductor.**
**10. Then remove the electronic control box.**



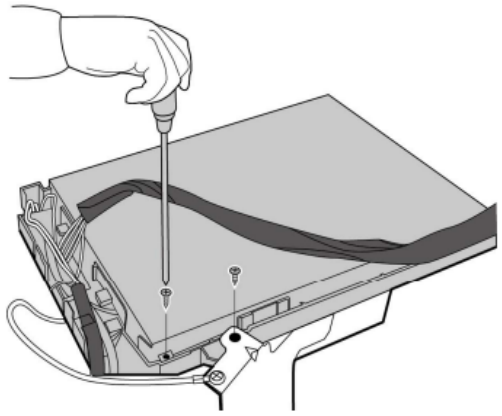




***Note: This section is for reference only. Actual appearance may vary.***

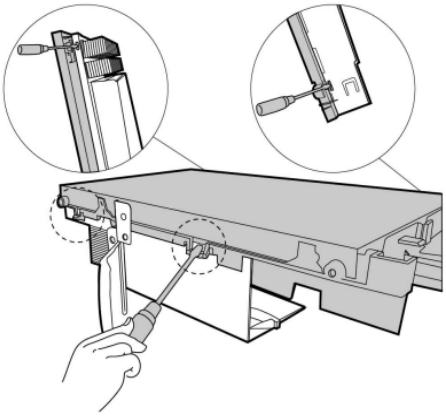
## Electrical Parts of PCB Board 3:




**1. Remove the screws of the top cover (2 screws).**



**2. Unfix the hooks and then open the electronic control box cover (4 hooks).**

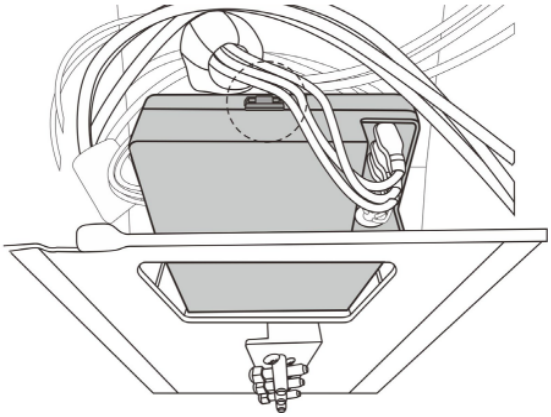


**3. Disconnect the connector for the fan motor from the electronic control box.**
**4. Remove the connector for the compressor.**
**5. Pull out the two blue wires connected with the four way valve.**
**6. Pull out the connectors of the condenser coil temp. (T3), outdoor ambient temp. sensor (T4), and discharge temp. sensor (TP).**
**7. Disconnect the electronic expansion valve wire.**
**8. Then remove the electronic control board.**

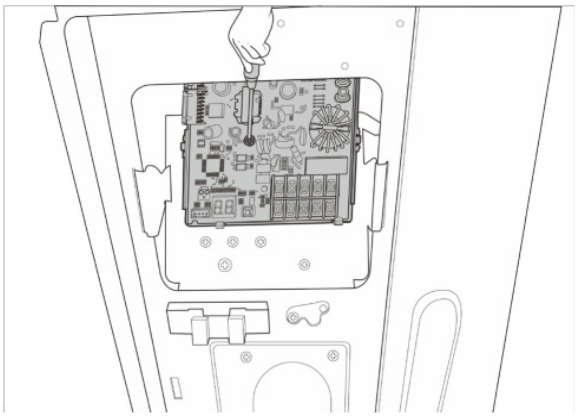
***Note: This section is for reference only. Actual appearance may vary.***

## Electrical Parts of PCB Board 3:

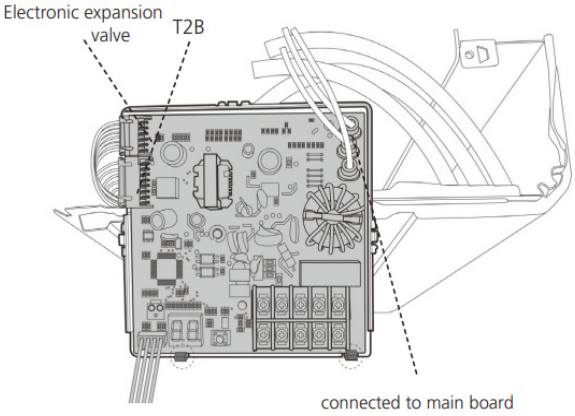
**1. Unfix the hooks and then remove the electronic installing box (2 screws).**



**2. Remove the one screw of the module board.**

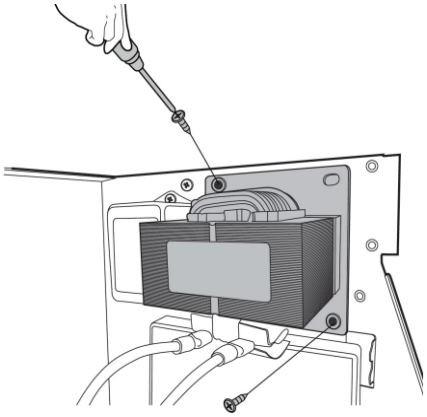


**3. Disconnect the connectors of the module board.**

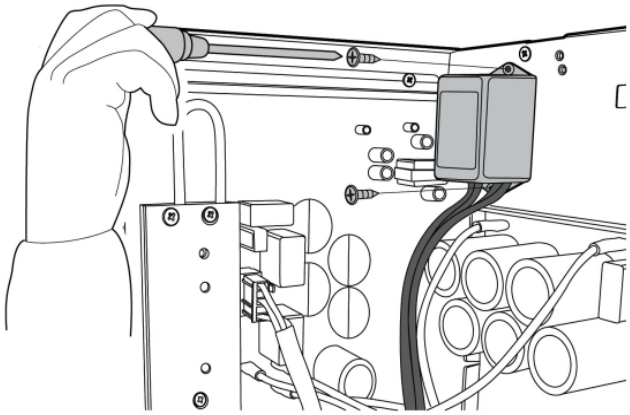



## Electrical Parts of PCB Board 4:

**1. Remove the screws and then remove the reactor (2 screws).**



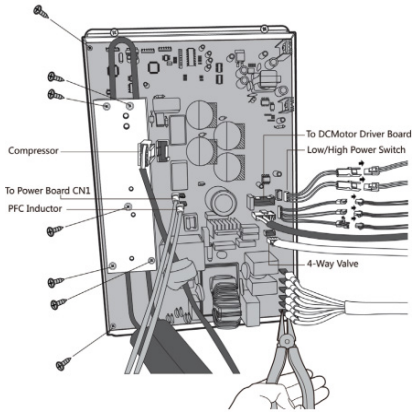
**2. Remove the screws and then remove the reactor.**



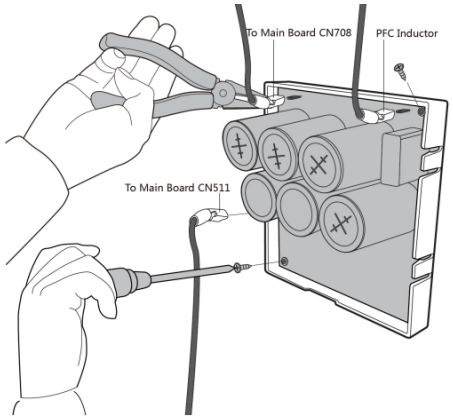
***Note: This section is for reference only. Actual appearance may vary.***

## Electrical Parts of PCB Board 4:

**1. Unfix five screws and then remove the radiating pipe.**

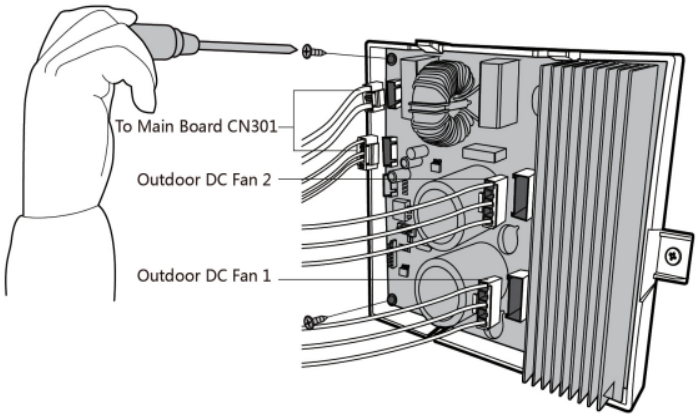



**2. Unfix two screws on the main board.**
**3. Disconnect the connectors on the main board.**
**4. Unfix two screws on the upper board.**
**5. Remove the connectors on the upper board.**




## Electrical Parts of PCB Board 4:

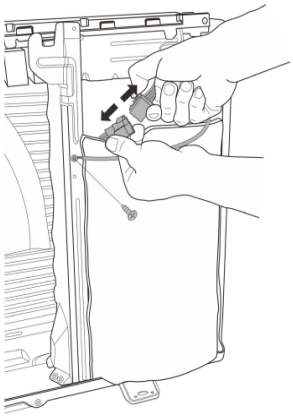
**1. Unfix two screws on the bottom board.**
**2. Disconnect the connectors on the bottom board.**



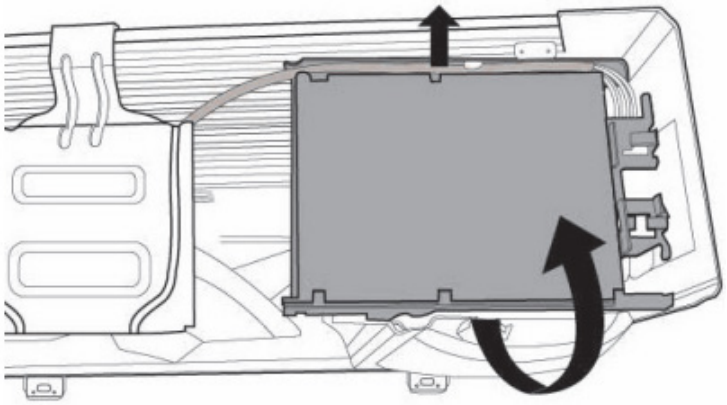

***Note: This section is for reference only. Actual appearance may vary.***

## Electrical Parts of PCB Board 5:

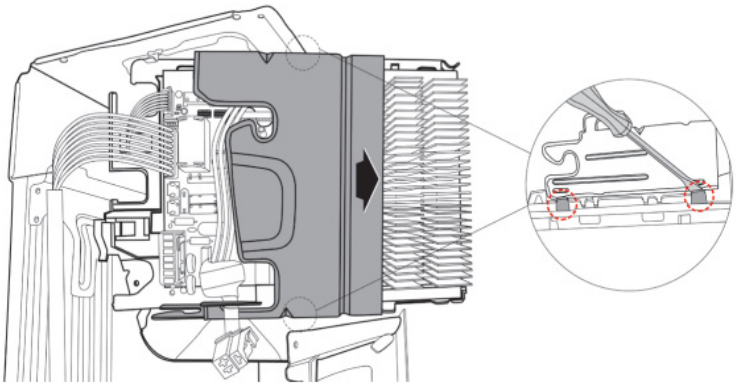
**1. Disconnect the connector for the compressor and release the ground wire (1 screw).**



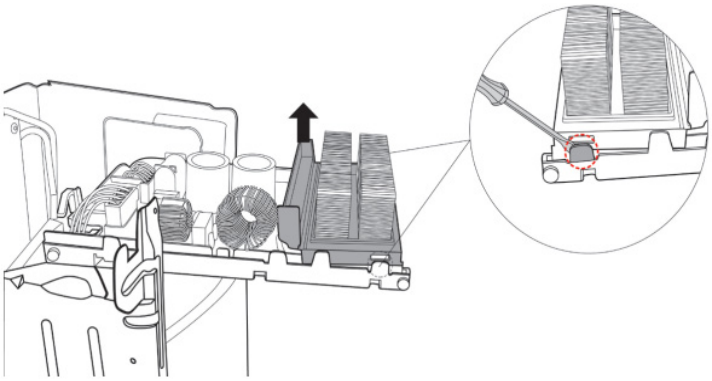
**2. Pull out the wires from the electrical supporting plate and turn over the electronic control assembly.**



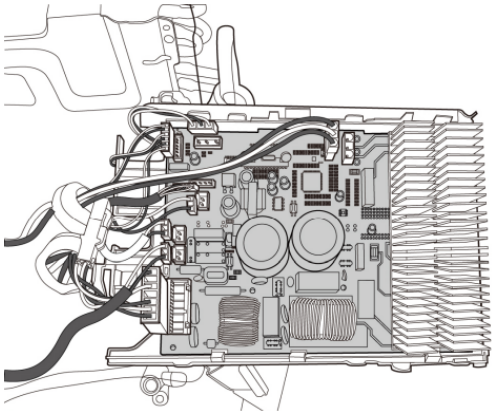
**3. Remove the electronic installing box subassembly (4 hooks).**



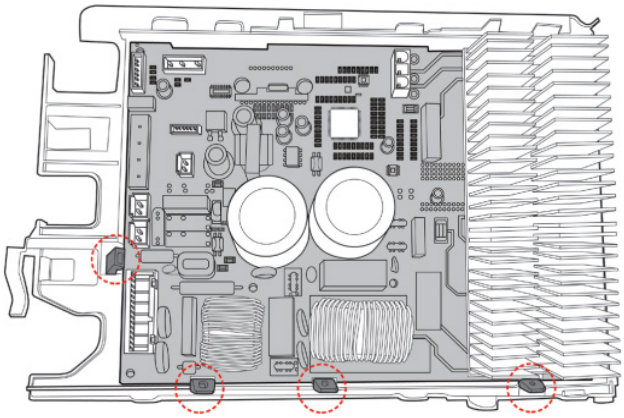
**4. Remove the fixing board (2 hooks).**



**5. Disconnect the connectors from the electronic control board.**

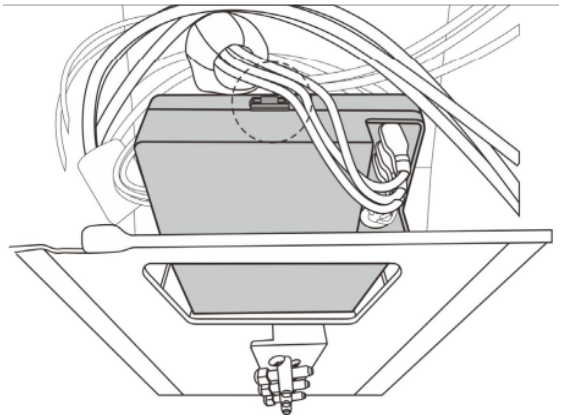


**6. Then remove the electronic control box board (4 hooks).**

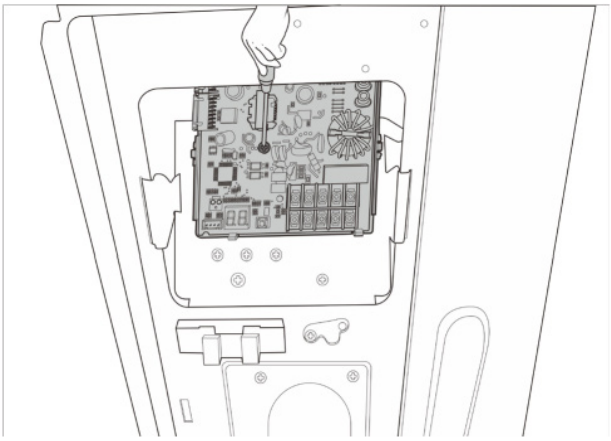


***Note: This section is for reference only. Actual appearance may vary.***

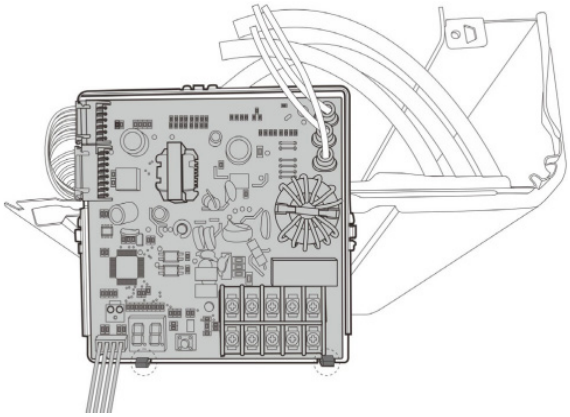
**7. Unfix the hooks and then remove the electronic installing box (2 screws).**



**8. Remove one screw on the module board.**

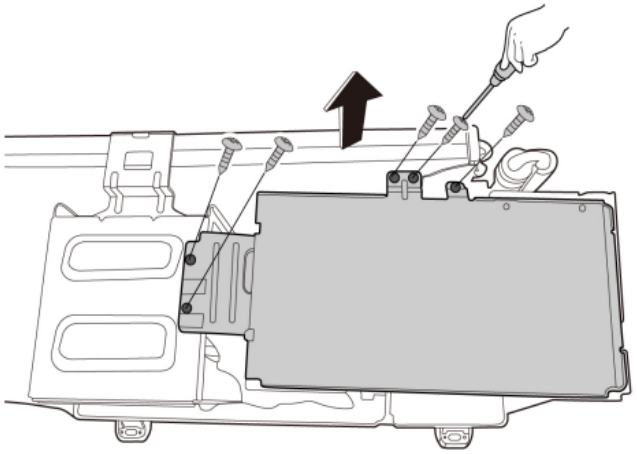


**9. Disconnect the connectors of the module board.**

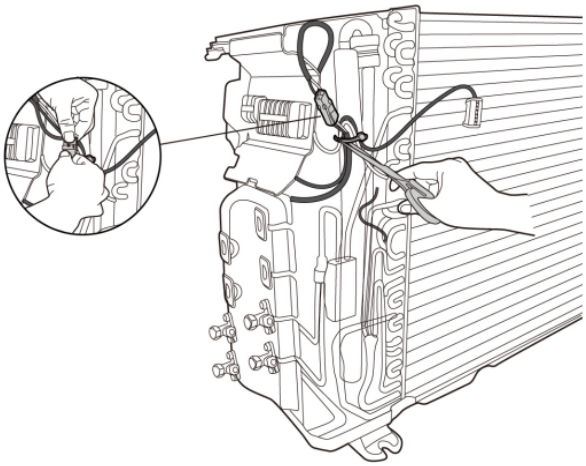


## Electrical Parts of PCB Board 6:

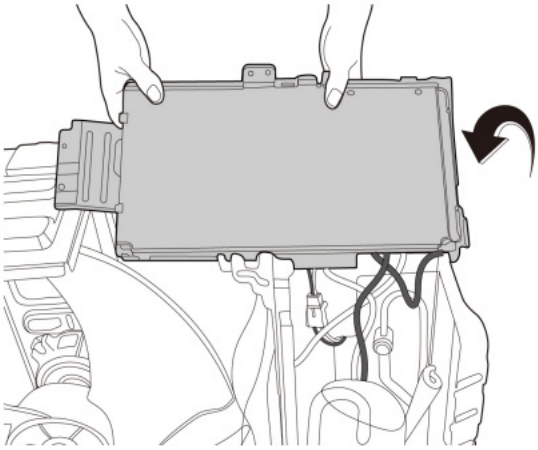
**1. Remove 5 screws of the electrical control box cover and remove it.**



**2. Cut the ribbon by a shear and disconnect the 4-way valve connector.**

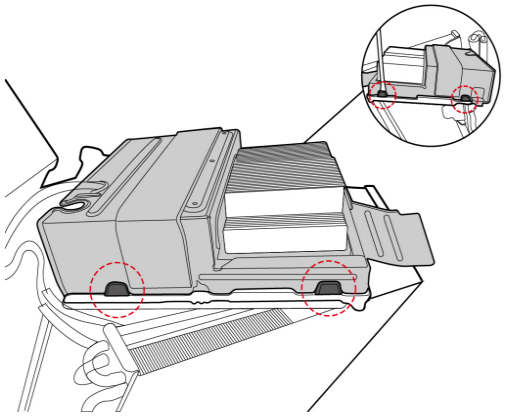


**3. Turn over the electronic control box subassembly.**

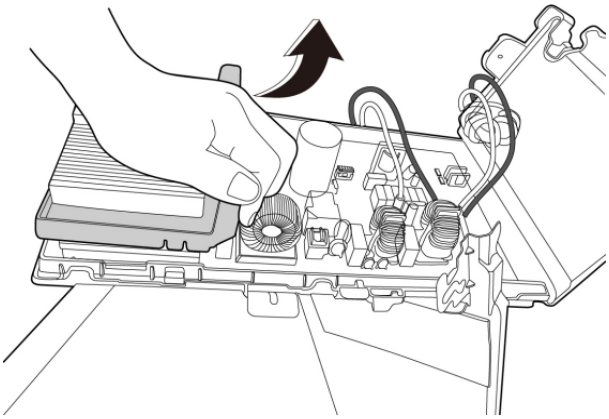


***Note: This section is for reference only. Actual appearance may vary.***

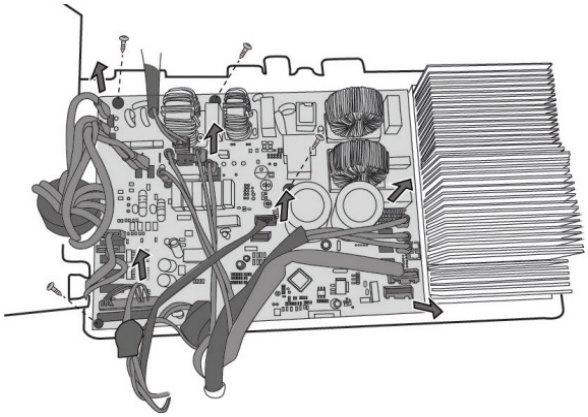
**4. Remove the electronic installing box subassembly (4 hooks).**



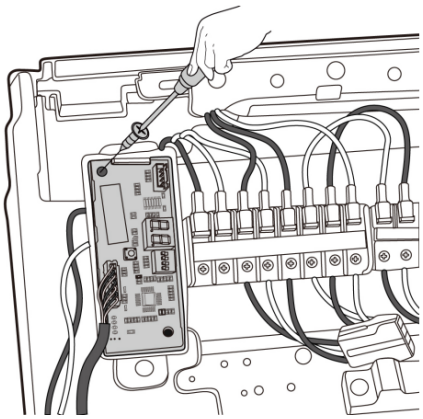
**5. Remove the support of the electronic control box.**



**6. Disconnect the connectors from the electronic control board.**
**7. Remove the 4 screws and then remove the electronic control board.**



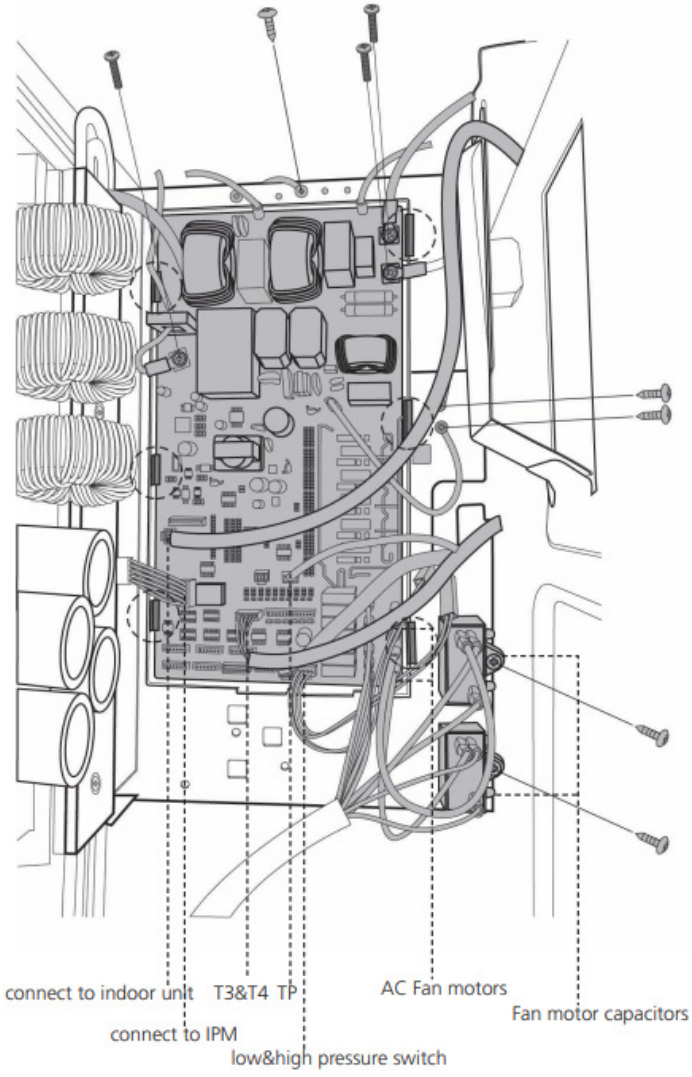
**8. Pull out the connector, remove one screw, and then remove the key board subassembly on the terminal board.**



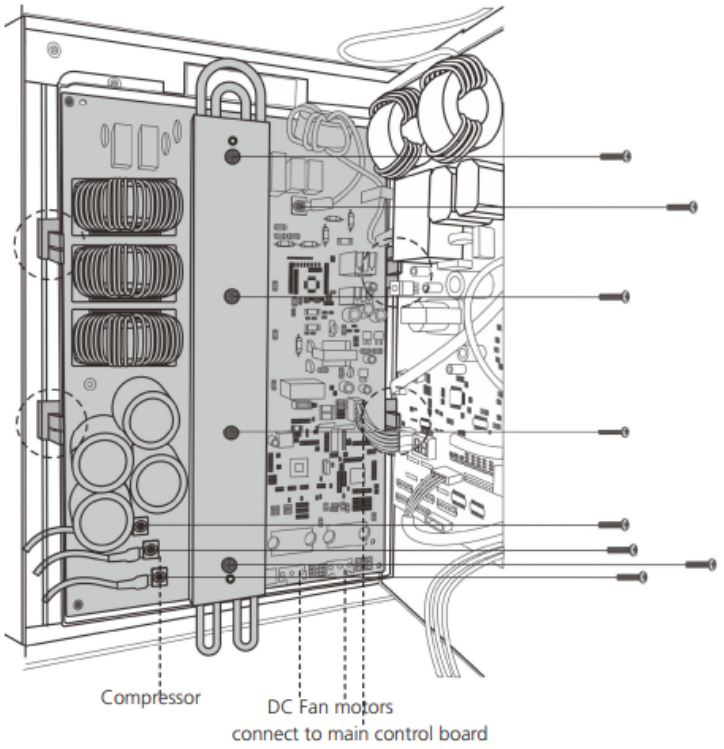
***Note: This section is for reference only. Actual appearance may vary.***

## Electrical Parts of PCB Board 7:

1. Remove 2 screws to disconnect the power supply wires.
2. Remove 3 screws to disconnect the ground wires.
3. Disconnect the wires connected to the main control board.
4. Disconnect the wires between the main control board and IPM module board.
5. Remove 1 screw to remove the fan motor capacitor (1 screw for each capacitor).



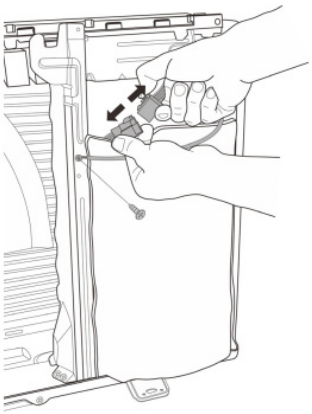

1. Remove 2 screws to disconnect the power supply wires.
2. Remove 3 screws to disconnect the wires connected to the compressor.
3. Remove 3 screws to remove the radiator.
4. Disconnect the wires between the IPM module board and the main control board.
5. Remove the 4 screws and unfix the 4 hooks and then remove the IPM module board.



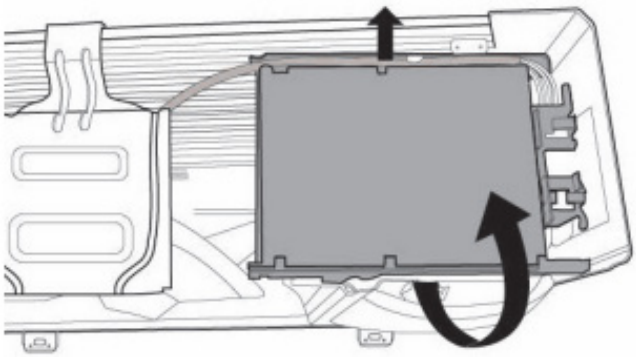

***Note: This section is for reference only. Actual appearance may vary.***

## Electrical Parts of PCB Board 8:

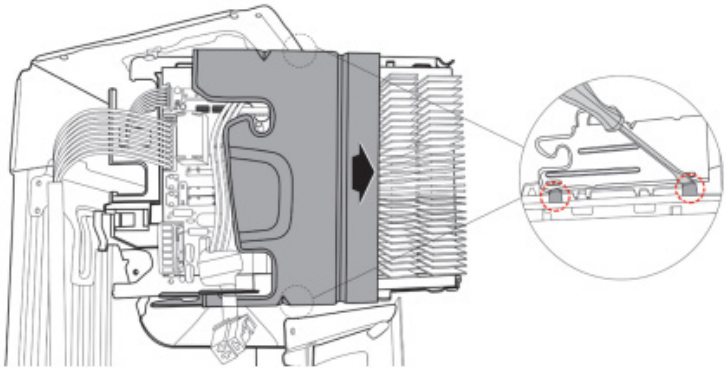
**1. Disconnect the connector for the compressor and release the ground wire (1 screw).**



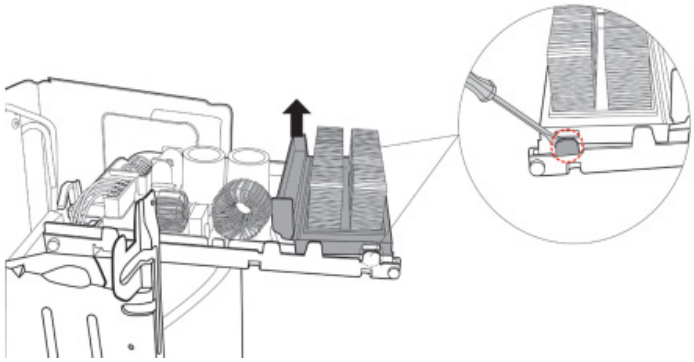
**2. Pull out the wires from the electrical supporting plate and turn over the electronic control assembly.**



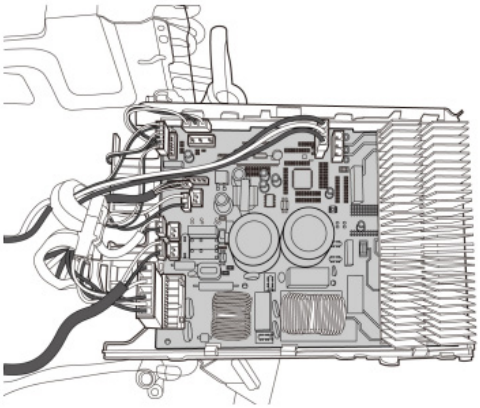
**3. Remove the electronic installing box subassembly (4 hooks).**



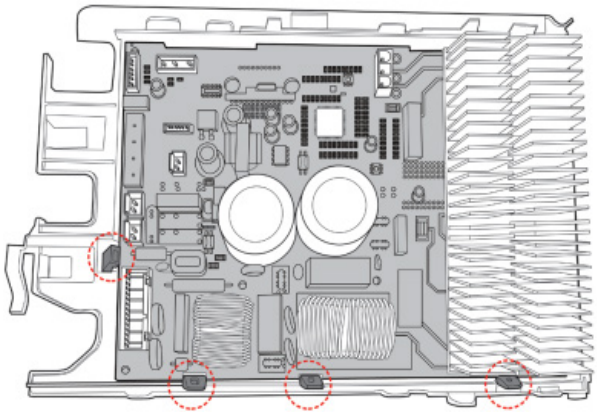
**4. Remove the fixing board (2 hooks).**



**5. Disconnect the connectors from the electronic control board.**

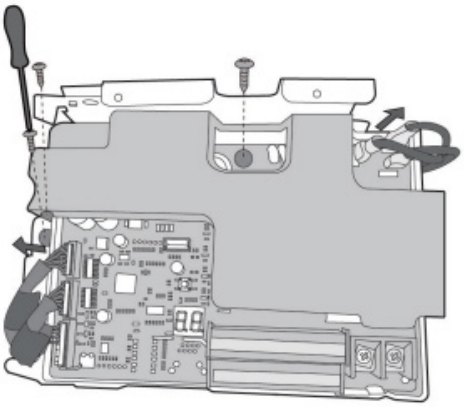


**6. Then remove the electronic control board (4 hooks).**



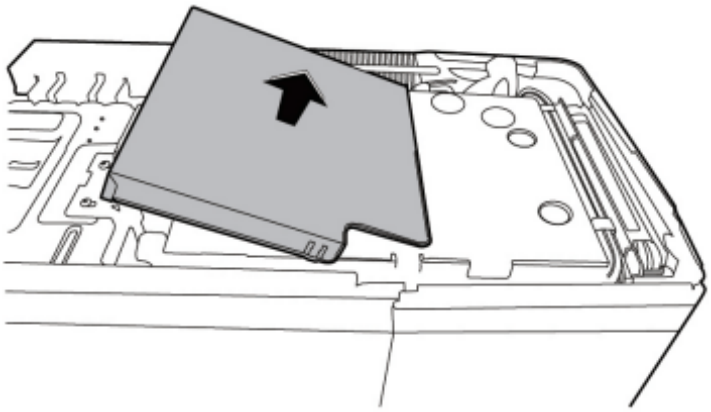
***Note: This section is for reference only. Actual appearance may vary.***

**7. Remove 3 screws and then remove the cover of the electronic installing box.**
**8. Disconnect the connectors of the module board and then remove the module board.**

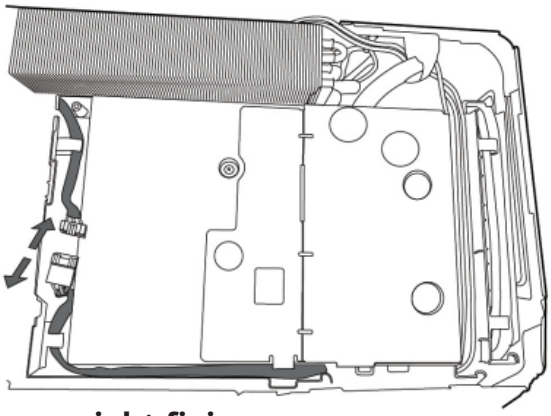


## Electrical Parts of PCB Board 9:

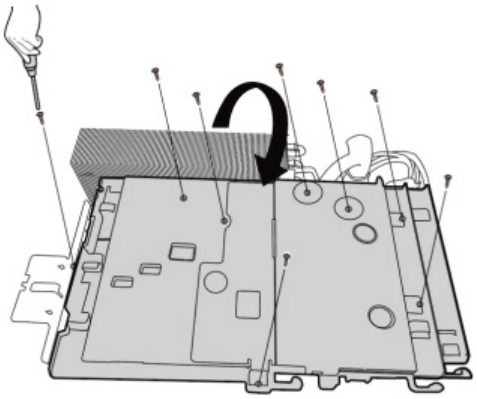
**1. Remove the cover of the electrical control box.**



**2. Disconnect the fan motor connector.**

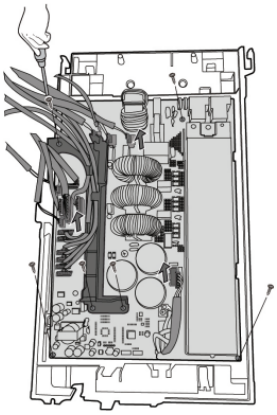


**3. Remove eight fixing screws.**
**4. Turn over the electronic control box subassembly.**

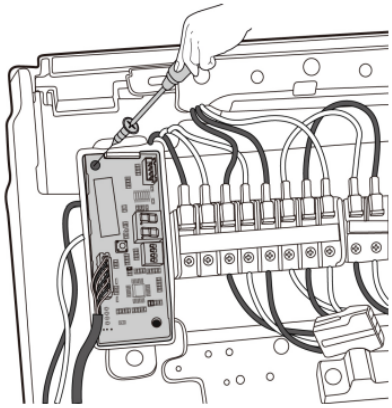


***Note: This section is for reference only. Actual appearance may vary.***

5. Remove 3 screws and then remove the bracket.
6. Disconnect the connectors from the electronic control board.
7. Remove 3 screws and then remove the electronic control board.

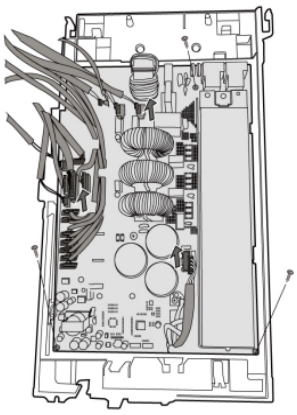


8. Pull out the connector, remove one screw, and then remove the key board subassembly on the terminal board.

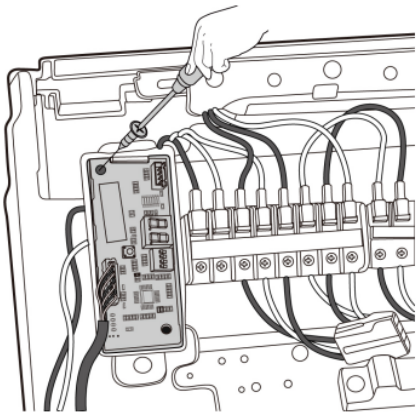


## Electrical Parts of PCB Board 10:

9. Disconnect the connectors from the electronic control board.
10. Remove 3 screws and then remove the electronic control board.



11. Pull out the connector, remove one screw, and then remove the key board subassembly on the terminal board.

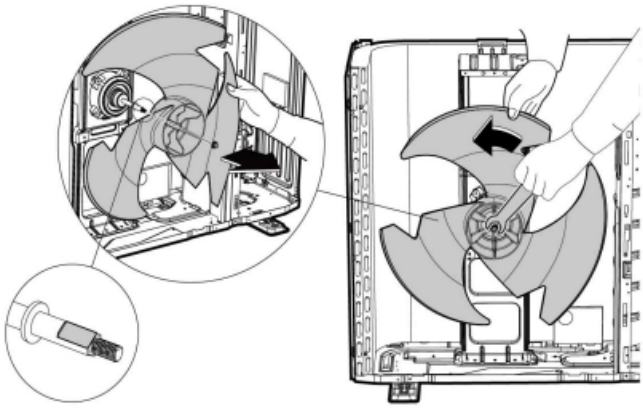


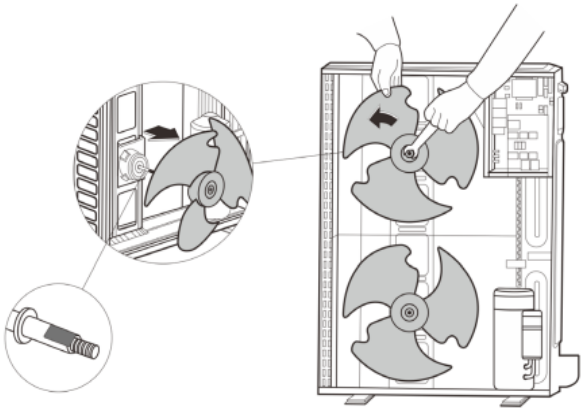
*Note: This section is for reference only. Actual appearance may vary.*

## Fan Assembly:

***Note: Remove the panel plate before disassembling the fan.***

**1. Remove the nut securing the fan with a crescent wrench.**
**2. Remove the fan.**

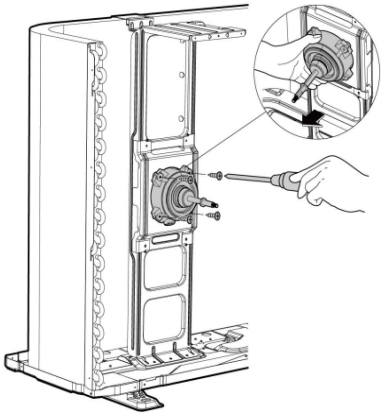




## Fan Motor:

***Note: Remove the panel plate and the connection of the fan motor on the PCB before disassembling fan motor.***

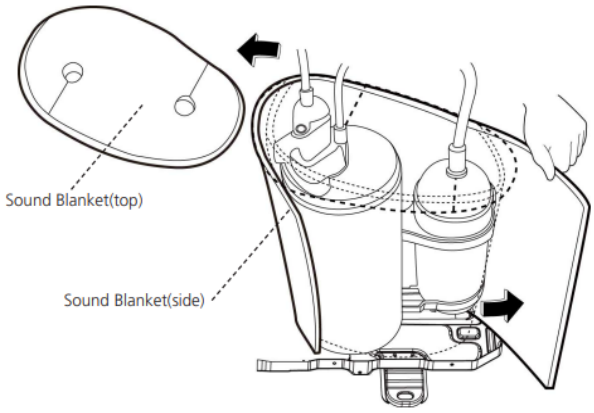
**3. Remove the fixing screws of the fan motor (4 screws).**
**4. Remove the fan motor.**



## Sound Blanket:

***Note: Remove the panel plate before disassembling the sound blanket.***

**1. Remove the sound blanket (side and top).**




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

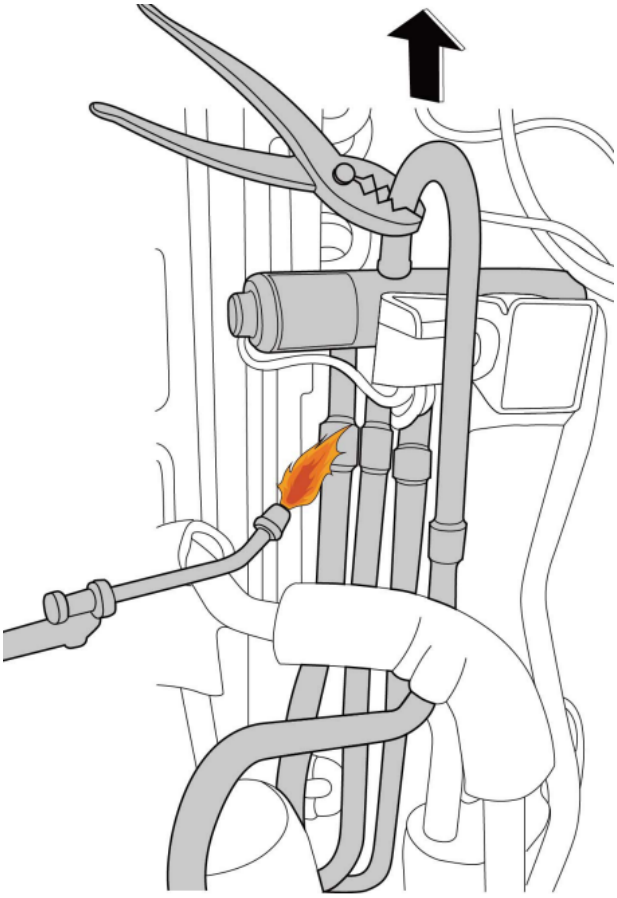
**WARNING**

**Evacuate the system and confirm that there is no refrigerant left in the system before removing the four-way valve and the compressor.**

***Note: Remove the panel plate connection of the four-way valve on PCB before disassembling the sound blanket.***

## Four-way Valve:

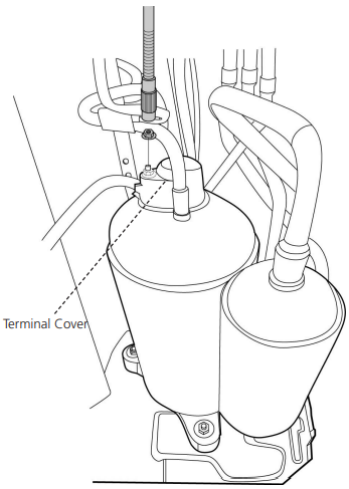
**1. Heat up the brazed parts and then detach the four-way valve and the pipe.**
**2. Remove the four-way valve assembly with pliers.**



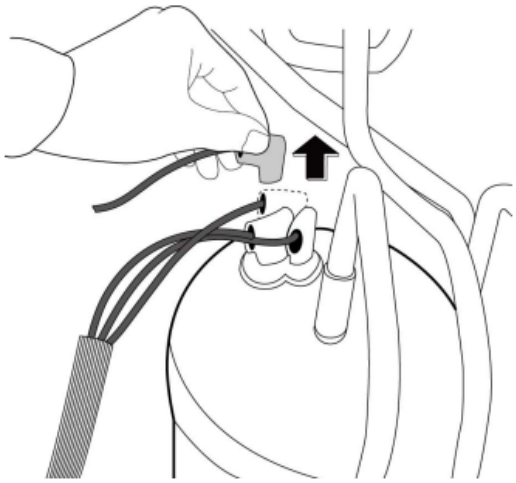
***Note: Remove the panel plate connection of the compressor on PCB before disassembling the sound blanket.***

## Compressor:

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

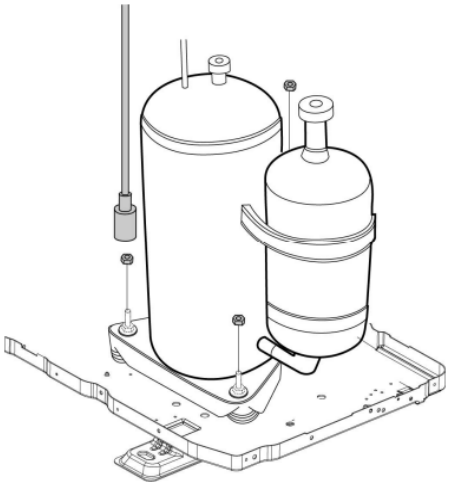



**2. Disconnect the connectors.**

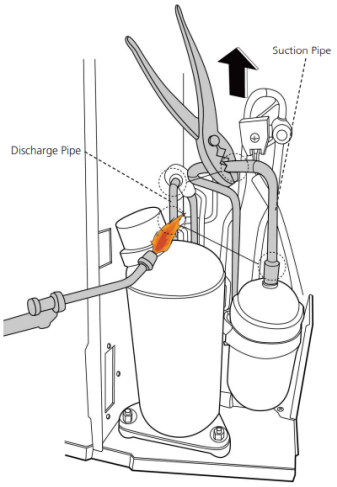


***Note: This section is for reference only. Actual appearance may vary.***

**3. Remove the hex nuts and washers securing the compressor located on the bottom plate.**



**4. Heat up the brazed parts and then remove the discharge pipe and the suction pipe.**
**5. Lift the compressor from the base pan assembly with pliers.**




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

# 3 TROUBLESHOOTING

**⚠ WARNING**

**Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. While checking the indoor/outdoor PCB, please equip yourself with anti-static gloves or a wrist strap to avoid damaging the board.**
**Electricity will remain in capacitors even when the power supply is off. Ensure the capacitors are fully discharged before troubleshooting**

## 3.1 Error Display

| Display | Error Information | Solution |
|---|---|---|
| DF | Defrost | Normal display, not error code |
| FC | Forced cooling | |
| EC 07 | ODU fan speed out of control | TS16 |
| EC 71 | Over current failure of outdoor DC fan motor | TS16 |
| EC 72 | Lack phase failure of outdoor DC fan motor | TS23 |
| EC 50 | ODU temp. sensor error (T3,T4, TP) | TS18 |
| EC 51 | ODU EEPROM parameter error | TS12 |
| EC 52 | ODU coil temp. sensor (T3) error | TS18 |
| EC 53 | ODU ambient temp. sensor (T4) error | TS18 |
| EC 54 | COMP. discharge temp. sensor (TP) | TS18 |
| EC 55 | ODU IPM module temperature sensor malfunction | TS42 |
| EC 56 | IDU coil outlet temp. sensor (T2B) error | TS18 |
| EC 57 | Refrigerant pipe temperature sensor error | TS18 |
| EC 5A | Failure of enthalpy inlet temperature sensor | TS18 |
| EC 5b | Failure of enthalpy outlet temperature sensor | TS18 |
| EC 5E | Condenser temperature sensor (T3B) failure | TS18 |
| EC 5C | Pressure sensor failure | TS43 |
| EH C1 | Refrigerant sensor detects leakage | TS41 |
| EL 01 | IDU & ODU communication error | TS13 |
| PC 00 | IPM module protection | TS21 |
| PC 02 | Compressor top (or IPM) temp. protection | TS21 |
| PC 06 | Discharge temperature protection of compressor | TS29 |
| PC 08 | Outdoor overcurrent protection | TS19 |
| PC 0A | High temperature protection of condenser | TS30 |
| PC 0F | PFC module protection | TS27 |
| PC 0L | Low ambient temperature protection | -- |
| PC 10 | ODU low AC voltage protection | TS23 |
| PC 11 | ODU main control board DC bus high voltage protection | TS23 |
| PC 12 | ODU main control board DC bus low voltage protection / 341 MCE error | S23 |
| PC 13 | The AC power is cut off or the AC voltage detection circuit fails | TS44 |
| PC 30 | System high pressure protection | TS34 |
| PC 31 | System low pressure protection | TS36 |
| PC 40 | Communication error between ODU main chip and compressor driven chip | TS26 |
| PC 43 | ODU compressor lack phase protection | TS39 |
| PC 44 | ODU zero speed protection | TS19 |
| PC 45 | ODU IR chip drive failure | TS40 |
| PC 46 | Compressor speed has been out of control | TS19 |
| PC 49 | Compressor overcurrent failure | TS19 |
| PC A1 | Condensation protection of refrigerant pipe | TS45 |
| LC 06 | High temperature protection of Inverter module (IPM) | TS32 |

## 3.2 Outdoor Unit Point Check Function

- A check switch is included on the auxiliary board.
- Press SW1 to check the unit's status while running. The digital display shows the following codes each time the SW1 button is pushed.

| Number of Presses | Display | Remark |
|---|---|---|
| 00 | Normal display | Display running frequency, running state or malfunction code |
| 01 | Quantity of indoor units with working connection | Display Number of indoor unit |
| 02 | Outdoor unit running mode code | Standby: 0, Fan only: 1, Cooling/Drying: 2, Heating: 3, Forced cooling: 6, Forced defrosting: A |
| 03 | Indoor unit A capacity | The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following: "--" (6K:0.6HP, 7K:0.8HP, 9K:1.0HP, 12K:1.2HP, 18K:1.5HP, 24K:2.5HP, 30K:3.0HP, 36K:3.2HP) |
| 04 | Indoor unit B capacity | |
| 05 | Indoor unit C capacity | |
| 06 | Indoor unit D capacity | |
| 07 | Indoor unit E capacity | |
| 08 | Indoor unit A capacity demand code | Normal code*HP (6K:0.6HP, 7K:0.8HP, 9K:1.0HP, 12K:1.2HP, 18K:1.5HP, 24K:2.5HP, 30K:3.0HP, 36K:3.2HP) |
| 09 | Indoor unit B capacity demand code | |
| 10 | Indoor unit C capacity demand code | |
| 11 | Indoor unit D capacity demand code | |
| 12 | Indoor unit E capacity demand code | |
| 13 | Outdoor unit amendatory capacity demand code | |
| 14 | The frequency corresponding to the total indoor units' amendatory capacity demand | |
| 15 | The frequency after the frequency limit | |
| 16 | The frequency sending to compressor control chip | |
| 17 | Indoor unit A evaporator outlet temperature (T2B) | If the temperature is lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows "--". |
| 18 | Indoor unit B evaporator outlet temperature (T2B) | |
| 19 | Indoor unit C evaporator outlet temperature (T2B) | |
| 20 | Indoor unit D evaporator outlet temperature (T2B) | |
| 21 | Indoor unit E evaporator outlet temperature (T2B) | |

| Number of Presses | Display | Remark |
|---|---|---|
| 22 | Indoor unit A room temperature (T1A) | If the room temperature is lower than 0°C, the digital display shows "0". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows: "--". |
| 23 | Indoor unit B room temperature (T1B) | |
| 24 | Indoor unit C room temperature (T1C) | |
| 25 | Indoor unit D room temperature (T1D) | |
| 26 | Indoor unit E room temperature (T1E) | |
| 27 | Indoor unit A evaporator temperature (T2A) | If the temperature is lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows "--". |
| 28 | Indoor unit B evaporator temperature (T2B) | |
| 29 | Indoor unit C evaporator temperature (T2C) | |
| 30 | Indoor unit D evaporator temperature (T2D) | |
| 31 | Indoor unit E evaporator temperature (T2E) | |
| 32 | Condenser pipe temperature (T3) | |
| 33 | Outdoor ambient temperature (T4) | |
| 34 | Compressor discharge temperature (TP) | The display value is between 30-129°C. If the temperature is lower than 30°C, the digital display shows "30". If the temperature is higher than 99°C, the digital display shows single and double digits. For example, if the display shows 0.5, so 0.5 multiplied by 10 to become 5, then added to 100 to become 105°C. |
| 35 | AD value of current | The display value is hex number.<br>For example, the digital display tube shows "Cd", so C*161+d*160=12*16+13=205, it means AD value is 205.<br>AD value is detected by the chip for DIY-MULTI5-36HP230D-O the actual AD value is AD value plus 60. |
| 36 | AD value of AC voltage | |
| 37 | AD value of DC voltage | |
| 38 | EXV open angle for A indoor unit | Actual data/4<br>If the value is higher than 99, the digital display shows single and double digits.<br>For example, if the digital display shows "2.0", so 2.0 multiplied by 10 to become 20, then added to 100 to become 120, the EXV open angle is 120*4=480p. |
| 39 | EXV open angle for B indoor unit | |
| 40 | EXV open angle for C indoor unit | |
| 41 | EXV open angle for D indoor unit | |
| 42 | EXV open angle for E indoor unit | |
| 43 | MVI open angle (for some models) | |
| 44 | EXI open angle (for some models) | |

<table>
<tr><th>Number of Presses</th><th>Display</th><th colspan="3">Remark</th></tr>
<tr><td rowspan="8">45</td><td rowspan="8">Frequency limit symbol</td><td>Bit7</td><td>Reserved</td><td rowspan="8">The display value is a hexadecimal number. For example, the digital display shows 2A, the corresponding binary is 101010, so Bit5=1, Bit3=1, and Bit1=1.<br>This means that a frequency limit may be caused by current, IPM or T3.</td></tr>
<tr><td>Bit6</td><td>Frequency limit caused by voltage</td></tr>
<tr><td>Bit5</td><td>Frequency limit caused by voltage</td></tr>
<tr><td>Bit4</td><td>Reserved</td></tr>
<tr><td>Bit3</td><td>Frequency limit caused by IPM</td></tr>
<tr><td>Bit2</td><td>Frequency limit caused by Compressor discharge temperature (T5)</td></tr>
<tr><td>Bit1</td><td>Frequency limit caused by Outdoor heat exchanger pipe temperature (T3)</td></tr>
<tr><td>Bit0</td><td>Frequency limit caused by Middle indoor heat exchanger coil temperature (T2)</td></tr>
<tr><td>46</td><td>T2B fault</td><td colspan="3">00:No fault, 01:T2B-A fault, 02:T2B-B fault, 03:T2B-C fault, 04:T2B-D fault, 05:T2B-E fault, 06:T2B-F fault(the display priority is A-B-C-D-E-F)</td></tr>
<tr><td>47</td><td>Average value of T2</td><td colspan="3">(Sum T2 value of all indoor units)(number of indoor units in good connection)(The heating is the average value of T2, and the cooling is the average value of T2B)<br>If the temperature is lower than -9°C, the digital display shows "-9"</td></tr>
<tr><td>48</td><td>Outdoor unit fan speed</td><td colspan="3">See next list</td></tr>
<tr><td>49</td><td>Reason of stop</td><td colspan="3"></td></tr>
<tr><td>50~59</td><td>Reserved</td><td colspan="3"></td></tr>
<tr><td>60</td><td>Air injection enthalpy inlet temperature (for hyper heat models)</td><td colspan="3" rowspan="4">If the temperature is lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows: "--".</td></tr>
<tr><td>61</td><td>Air injection enthalpy outlet temperature (for hyper heat models)</td></tr>
<tr><td>62</td><td>Condenser coil middle temperature (for hyper heat models)</td></tr>
<tr><td>63</td><td>Refrigerant tube inlet temperature (for hyper heat models)</td></tr>
<tr><td>64</td><td>Target discharge temperature</td><td colspan="3">The display value is between 0-199°C, If the temperature is lower than 30°C, the digital display shows "30". If the temperature is higher than 99°C, the digital display shows single and double digits. For example, If the display shows 0.5, so 0.5 multiplied by 10 to become 5, then added to 100 to become 105°C.</td></tr>
<tr><td>65</td><td>Indoor Unit F capacity</td><td colspan="3">The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following "--".</td></tr>
<tr><td>66</td><td>Indoor unit F capacity demand code</td><td colspan="3">Normal code*HP<br>(9K: 1HP, 12K: 1.2HP, 18K: 1.5HP)</td></tr>
</table>

| Number of Presses | Display | Remark |
|---|---|---|
| 67 | Indoor unit F evaporator outlet temperature (T2BF) | If the temperature if lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows: "--". |
| 68 | Indoor unit F room temperature (T1F) | If the temperature is lower than 0°C, the digital display shows "0". If the temperature is higher than 70°C, the digital display shows "70'. If the indoor unit is not connected, the digital display shows "--". |
| 69 | Indoor unit F evaporator temperature (T2F) | If the temperature is lower than -9°C, the digital display shows "-9". If the temperature is higher than 70°C, the digital display shows "70". If the indoor unit is not connected, the digital display shows "--". |
| 70 | EXV open angle for F indoor unit | Actual data/4<br>If the value is higher than 99, the digital display shows single and double digits. |
| 71 | IPM module temperature | The display value is between 0-199°C. If the temperature is higher than 99°C, the digital display shows single and double digits. For example, if the display shows 5.0, so 5.0 multiplied by 10 to become 50, then added to 100 to become 150°C. |
| 72 | The high pressure sensor detects the pressure corresponding to the condensation temperature (Tc) | The digital display shows: "--" |
| 73 | Reserved | |
| 74 | | |

Outdoor unit fan speed corresponding table:

| Outdoor Unit Fan Speed | Display |
|---|---|
| >600rpm | 02 |
| >300rpm & <=600rpm | 03 |
| <=300rpm | 04 |

## 3.3 Quick Maintenance by Error Code

If you do not have the time to test which specific parts are faulty, you can change the required parts according to the error code. You can find the parts to replace by error code in the following table.

| Part Requiring Replacement | Error Code | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EL 01 | EC 50 | EC 51 | EC 52 | EC 53 | EC 54 | EC 55 | EC 56 | EC 57 | EC 5A | EC 5b | EC 5E |
| Indoor PCB | √ | x | x | x | x | x | x | x | x | x | x | x |
| Outdoor PCB | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| ODU coil temp. sensor | x | √ | x | √ | x | x | x | x | x | x | x | x |
| ODU ambient temp. sensor | x | √ | x | x | √ | x | x | x | x | x | x | x |
| COMP. Discharge temp. sensor | x | √ | x | x | x | √ | x | x | x | x | x | x |
| IPM module temperature sensor | x | x | x | x | x | x | √ | x | x | x | x | x |
| IDU coil outlet temp. sensor | x | x | x | x | x | x | x | √ | x | x | x | x |
| Refrigerant pipe temperature sensor | x | x | x | x | x | x | x | x | √ | x | x | x |
| Enthalpy inlet temperature sensor | x | x | x | x | x | x | x | x | x | √ | x | x |
| Enthalpy outlet temperature sensor | x | x | x | x | x | x | x | x | x | x | √ | x |
| Condenser temperature sensor | x | x | x | x | x | x | x | x | x | x | x | √ |
| Reactor | √ | x | x | x | x | x | x | x | x | x | x | x |
| IPM module board | √ | x | x | x | x | x | x | x | x | x | x | x |

| Part Requiring Replacement | Error Code | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | EC 5C | EH C1 | EC 07/ EC 71 | PC 00 | PC 01/ PC 10/ PC 11/ PC 12 | PC 02 | PC 08/ PC 44/ PC 46/ PC 49 | PC 13 | PC A1 | PC 0F |
| Outdoor PCB | √ | x | √ | √ | √ | √ | √ | √ | √ | √ |
| Outdoor fan motor | x | x | √ | √ | x | x | √ | x | x | x |
| Reactor or inductance | x | x | x | √ | √ | x | √ | x | x | √ |
| Compressor | x | x | x | √ | x | x | x | x | x | x |
| IPM module board | x | x | x | √ | √ | x | √ | x | x | x |
| Bridge rectifier | x | x | x | √ | √ | x | √ | x | x | x |
| Pressure sensor | √ | x | x | x | x | x | x | x | x | x |
| PFC module | x | x | x | x | x | x | x | x | x | √ |
| Additional refrigerant | x | √ | x | x | x | x | x | x | x | x |
| Over load protector | x | x | x | x | x | √ | x | x | x | x |
| ODU ambient temp. sensor | x | x | x | x | x | x | x | x | √ | x |
| Refrigerant pipe sensor | x | x | x | x | x | x | x | x | √ | x |

| Part Requiring Replacement | Error Code | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | PC 40 | EC 72 | PC 43 | PC 45 | PC 06 | PC 0A | PC 30 | PC 31 |
| Outdoor PCB | √ | √ | √ | x | √ | √ | √ | √ |
| Outdoor fan motor | x | √ | x | x | x | √ | √ | √ |
| ODU coil temp. sensor | x | x | x | x | x | √ | x | x |
| COMP. discharge temp. sensor | x | x | x | x | √ | x | x | x |
| Compressor | x | x | √ | x | x | x | x | x |
| IPM module board | x | x | x | √ | x | x | x | x |
| Additional refrigerant | x | x | x | x | √ | √ | x | √ |
| Electric control box | √ | x | x | x | x | x | x | x |
| High pressure switch | x | x | x | x | x | x | √ | x |
| Low pressure switch | x | x | x | x | x | x | x | √ |

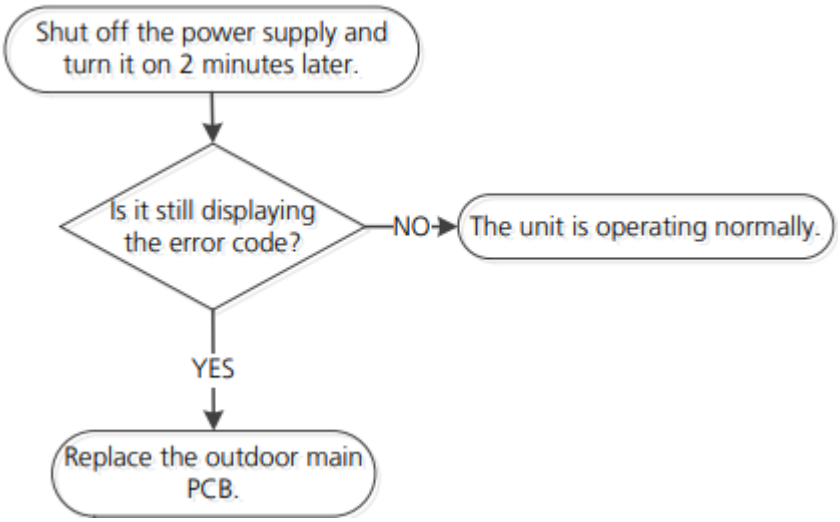
## 3.4 Troubleshooting by Error Code

### EC 51: EEPROM malfunction error diagnosis and solution.

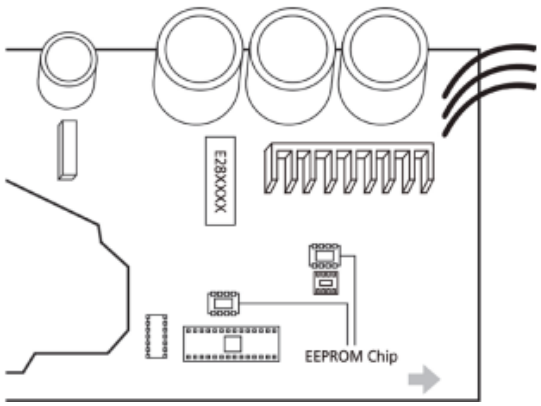
**Description:** Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.
**Recommended parts to prepare:**

- Indoor PCB
- Outdoor PCB

**Troubleshooting and repair:**




**Remarks:**
**EEPROM:** A read-only memory whose contents can be erased and reprogrammed using a puled voltage. The location of the EEPROM chip on the indoor and outdoor PCB is shown in the following image:




*Note: This picture is only for reference, actual appearance may vary.*

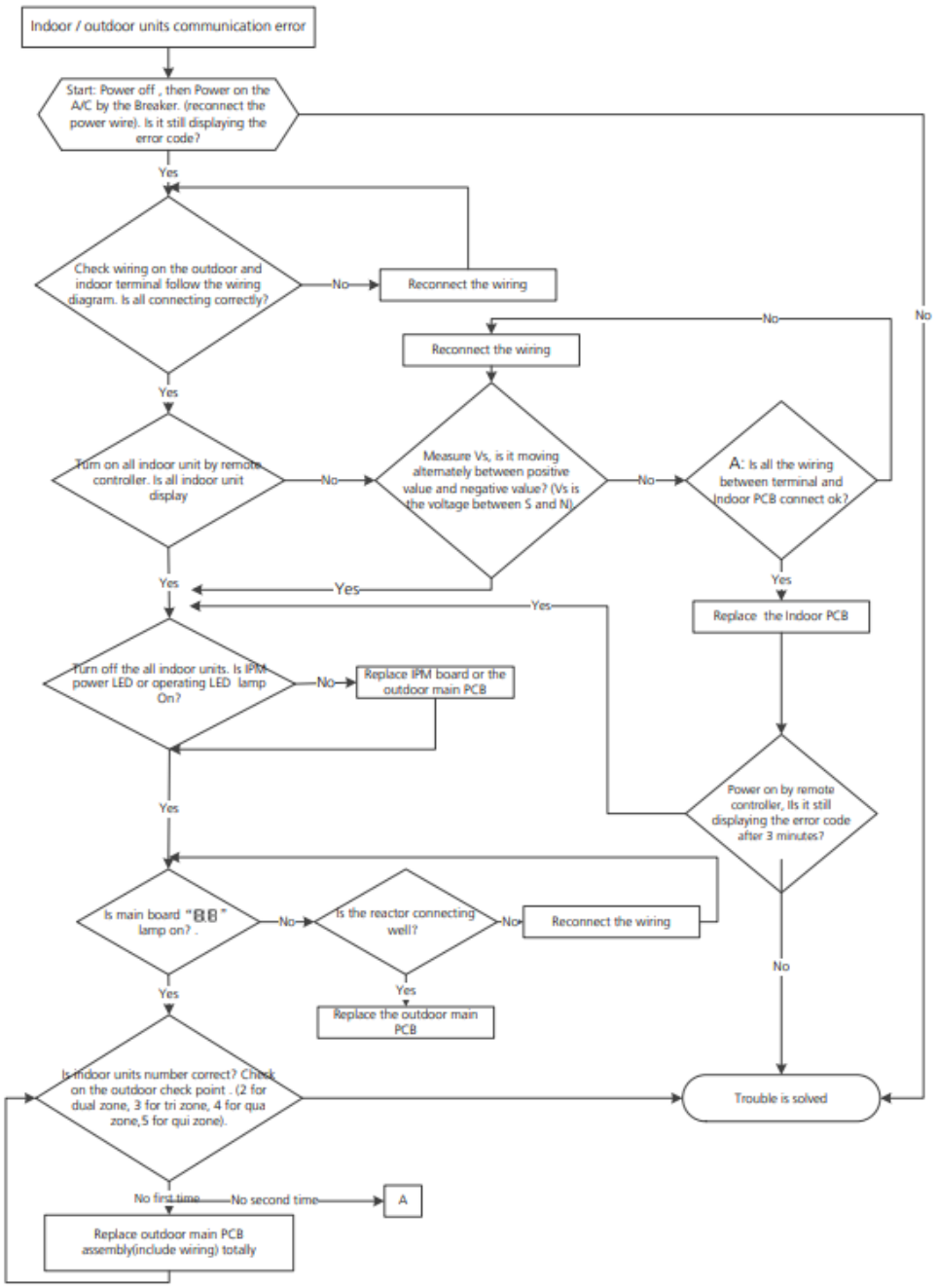
## EL 01: IDU & ODU communication error diagnosis and solution.

**Description:** The indoor unit does not receive the feedback from the outdoor unit during 110 seconds and this condition happens 4 times continuously.

**Recommended parts to prepare:**

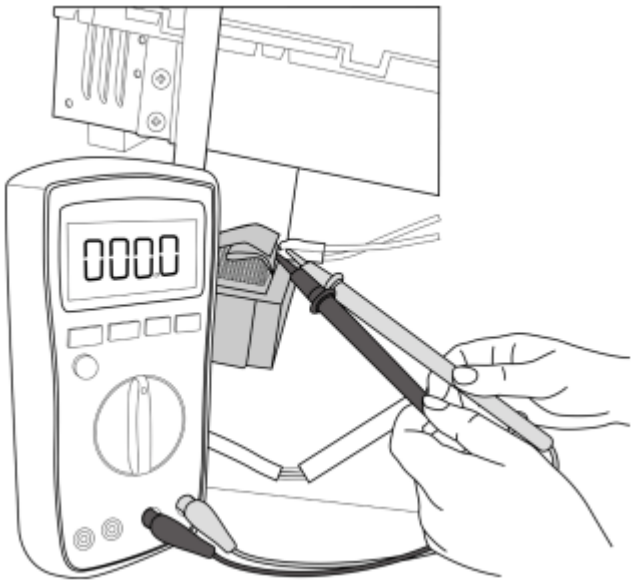
- Indoor PCB
- Outdoor PCB
- IPM module board
- Reactor

**Troubleshooting and repair:**



**Remarks:**

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




*Note: This picture and the value are only for reference, actual condition and specific value may vary.*

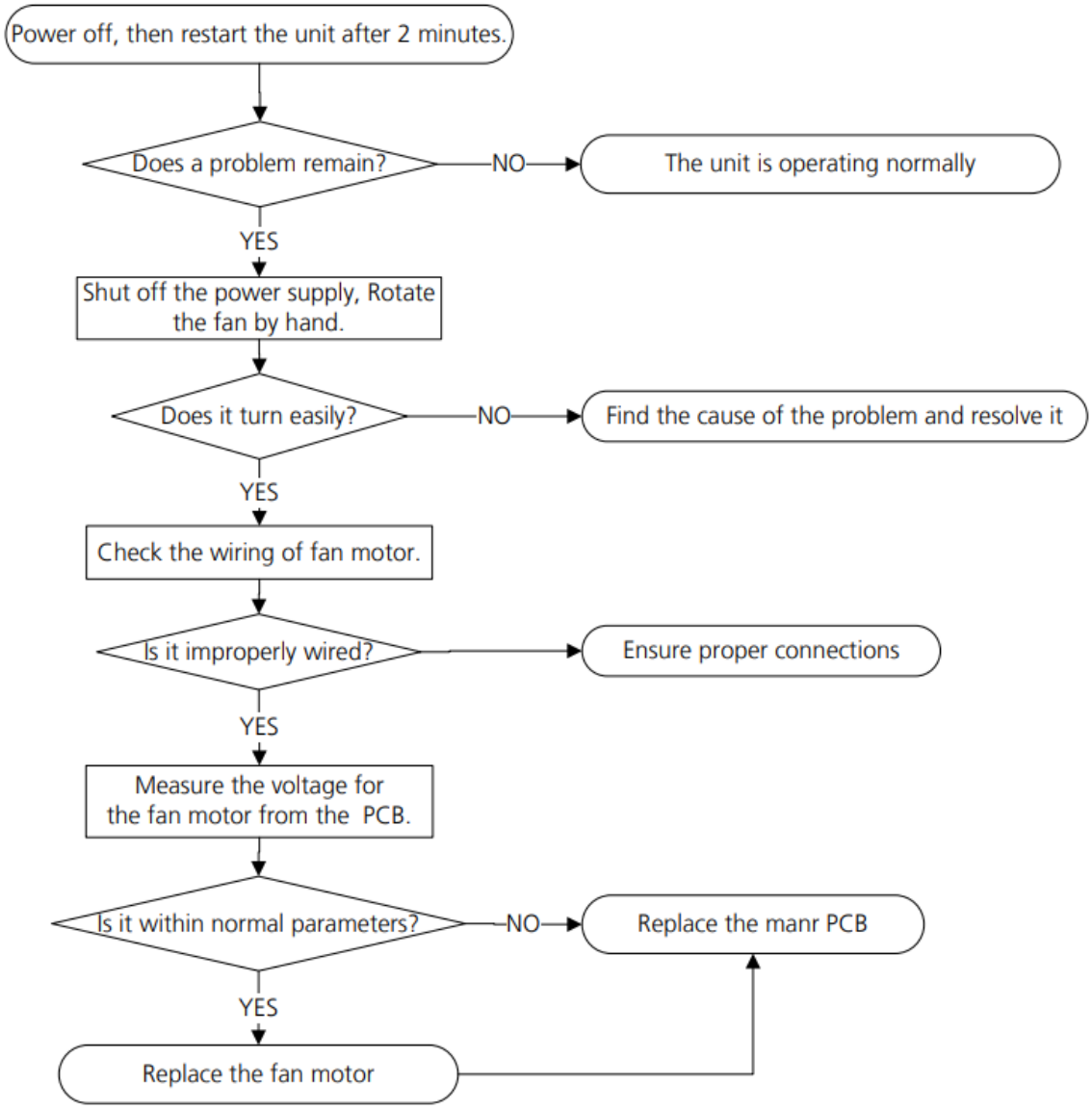
## EC 07: Fan speed is operating outside of normal range. EC 71: Overcurrent failure of outdoor DC fan motor diagnosis and solution.

**Description:** When the indoor/outdoor fan speed keeps too low or too high for a certain time, the LED displays the failure code and the system turns off.

**Recommended parts to prepare:**

- Connection wires
- Fan assembly
- Fan motor
- PCB

**Troubleshooting and repair:**

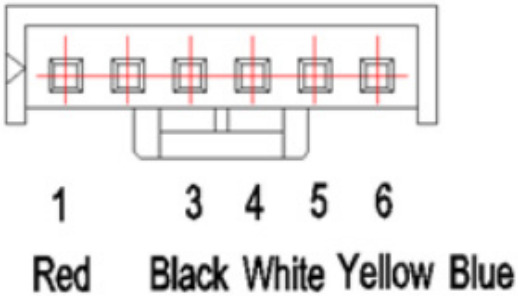


**Index:**

**1. Outdoor DC fan motor (control chip is in fan motor)**

Power on and make sure the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in the fan motor connector. If the value of the voltage is not in the range showing in the tables below the PCB will have problems and will need to be replaced.

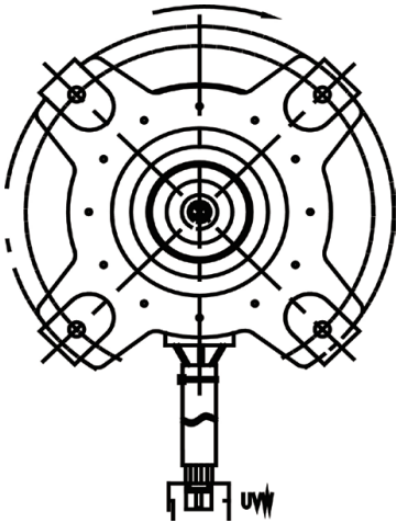
| NO. | Color | Signal | Voltage |
|---|---|---|---|
| 1 | Red | Vs/Vm | 192V~380V |
| 2 | --- | --- | --- |
| 3 | Black | GND | 0V |
| 4 | White | Vcc | 13.5-16.5V |
| 5 | Yellow | Vsp | 0~6.5V |
| 6 | Blue | FG | 13.5-16.5V |




**Index:**

**1. Outdoor DC fan motor (control chip is in outdoor PCB)**

Release the UVW connector and measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other the fan motor has a problem and needs to be replaced. Otherwise the PCB has a problem and needs to be replaced.



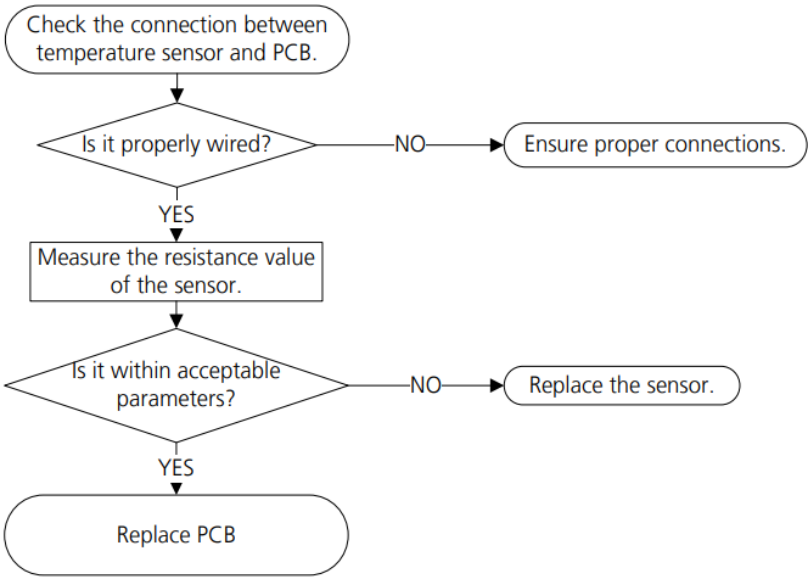
## EC 52/ EC 53/ EC 54/ EC 56/ EC 57/ EC 5A/ EC 5b/ EC 5E/ EC 50: Open circuit or short circuit of temperature sensor diagnosis and solution.

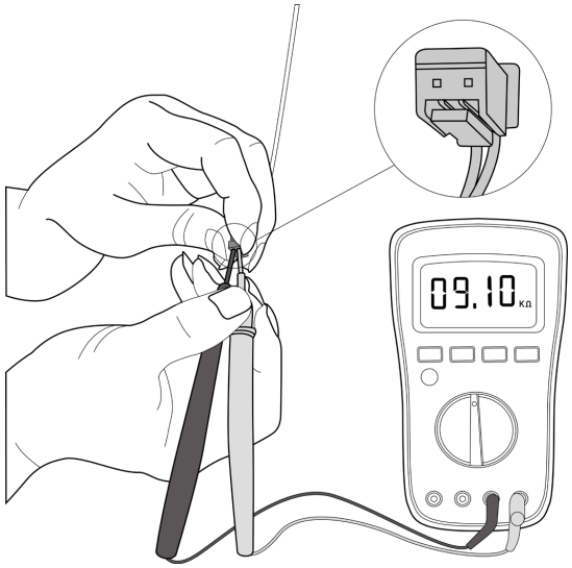
**Description:** If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED displays a fault code.

**Recommended parts to prepare:**

- Connection wires
- Sensors
- PCB

**Troubleshooting and repair:**




*Note: This picture and the value are only for reference, actual condition and specific value may vary.*

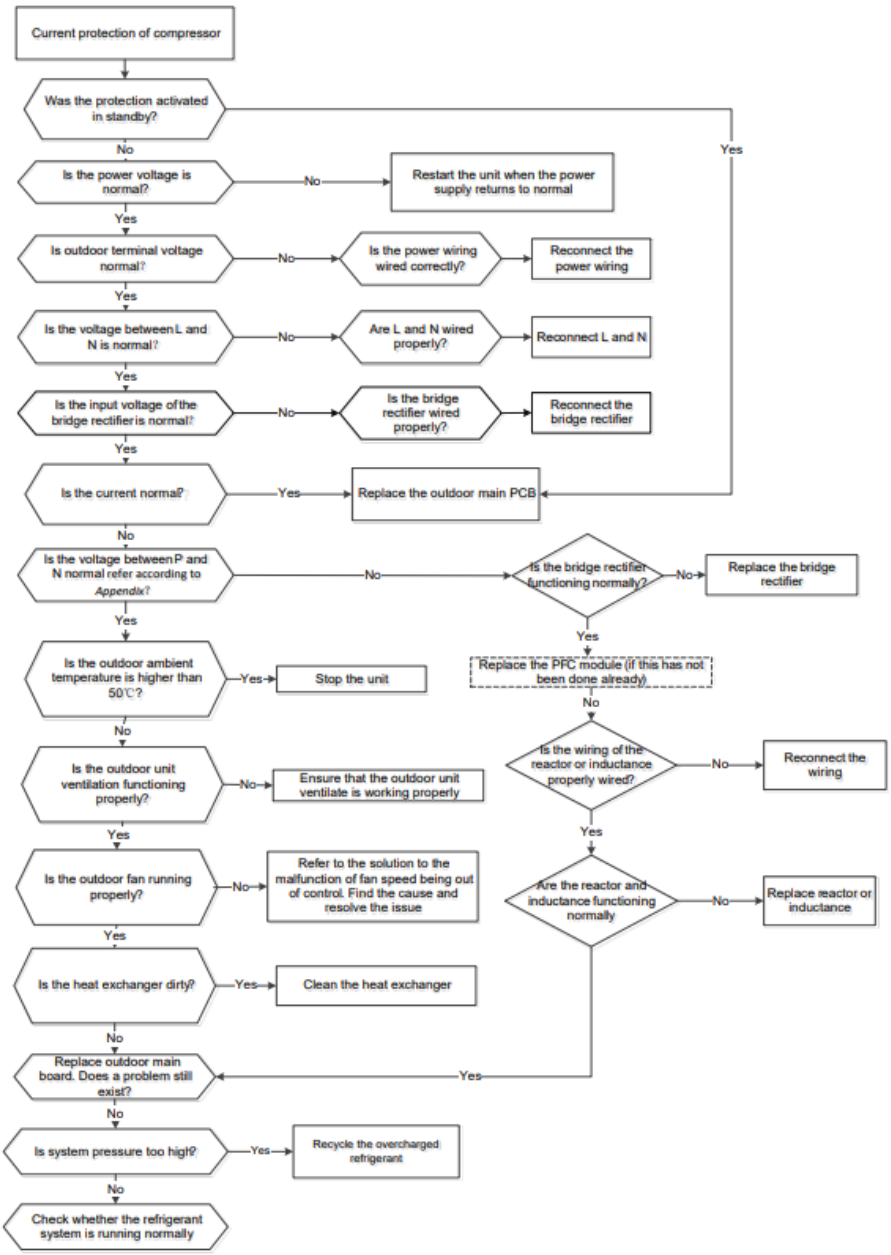
## PC 08: Current overload protection. PC 44: ODU zero speed protection. PC 46: Compressor speed has been out of control. PC 49: Compressor overcurrent failure.

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

**Recommended parts to prepare:**

- Outdoor PCB
- Connection wires
- Bridge rectifier
- PFC circuit or reactor
- Refrigeration piping system
- Pressure switch
- Outdoor fan
- IPM module board

**Troubleshooting and repair:**



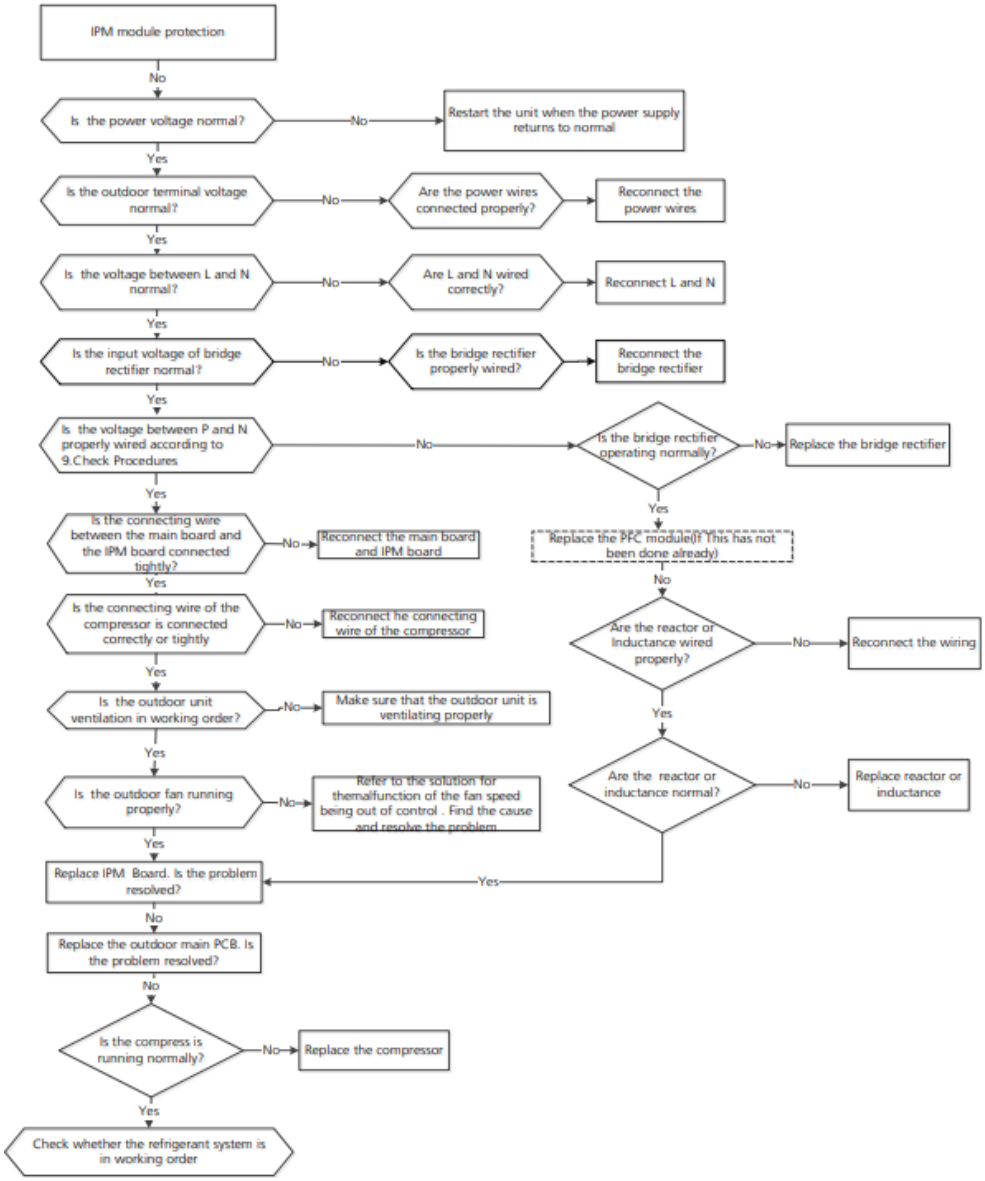
## PC 00: IPM malfunction diagnosis and solution.

**Description:** When the voltage signal the IPM sends to the compressor drive chip is abnormal, the LED displays a fault code and the system turns off.

**Recommended parts to prepare:**

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB
- Reactor or inductance
- Bridge rectifier

**Troubleshooting and repair:** At first test the resistance between every two ports of U, V, W of the IPM and P, N. If any result of them is 0 or close to 0, the IPM is defective. Otherwise, please follow the procedure below:



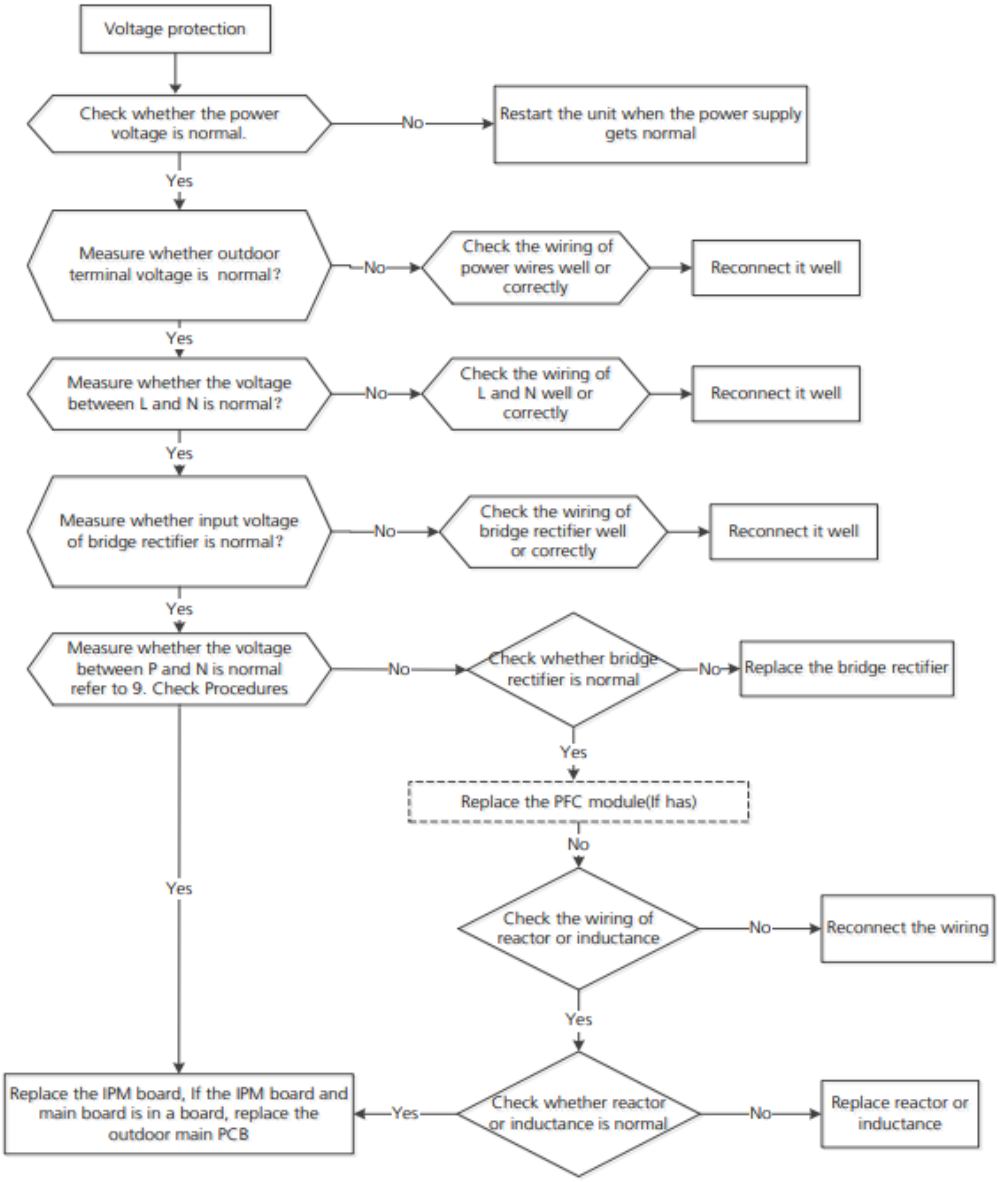
## PC01: over voltage or too low voltage protection. PC 10: ODU low AC voltage protection. PC 11: ODU main control board DC bus high voltage protection. PC 12: ODU main control board DC bus low voltage protection/ 341 MCE error diagnosis and solution.

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

**Recommended parts to prepare:**

- Power supply wires
- IPM module board
- Outdoor PCB
- Bridge rectifier
- PFC circuit or reactor

**Troubleshooting and repair:**



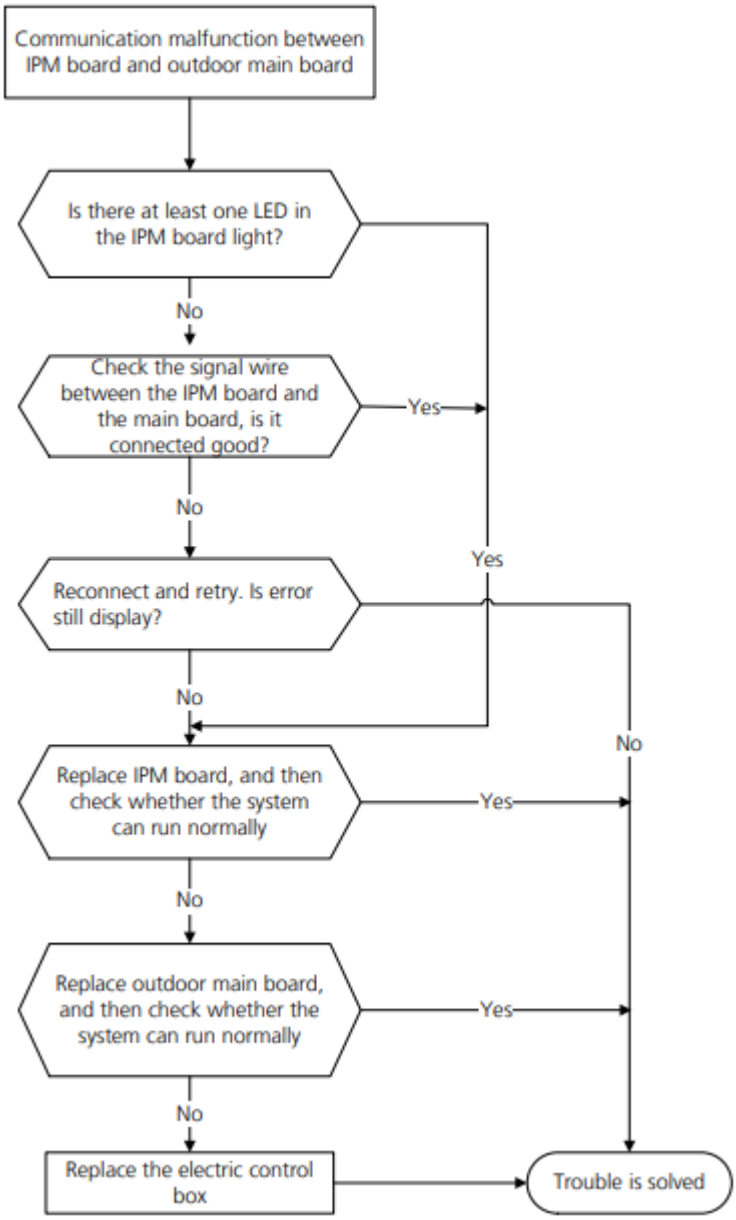
## PC 40: Communication error between ODU main chip and compressor driven chip diagnosis and solution.

**Description:** The main PCB cannot detect the IPM board.

**Recommended parts to prepare:**

- Connection wires
- Outdoor PCB
- IPM module board
- Electric control box

**Troubleshooting and repair:**



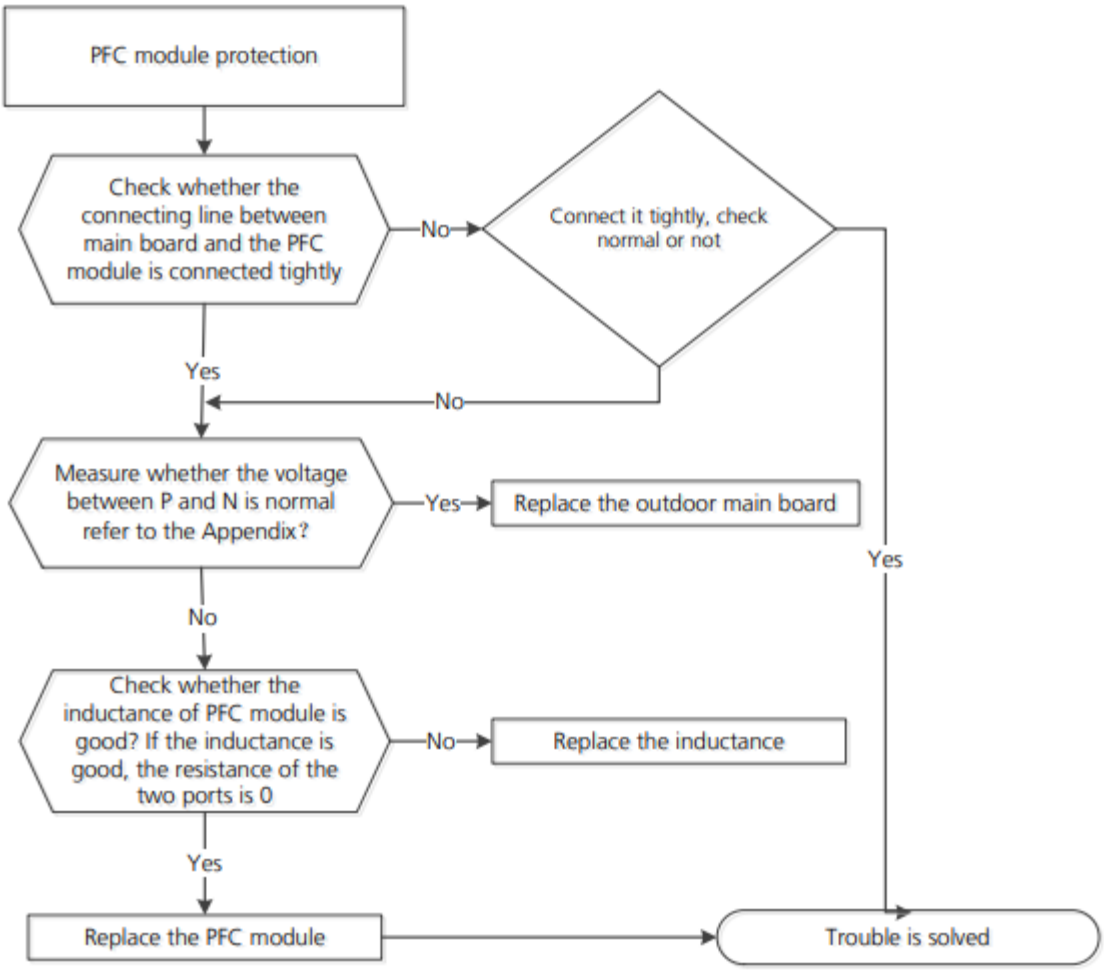
## PC 0F: PFC module protection diagnosis and solution.

**Description:** Outdoor PCB detects PFC signal is low voltage or DC voltage is lower than 340V for 6s when quick check.

**Recommended parts to prepare:**

- Connection wires
- Outdoor PCB
- Inductance
- PFC circuit or IPM module board

**Troubleshooting and repair:**



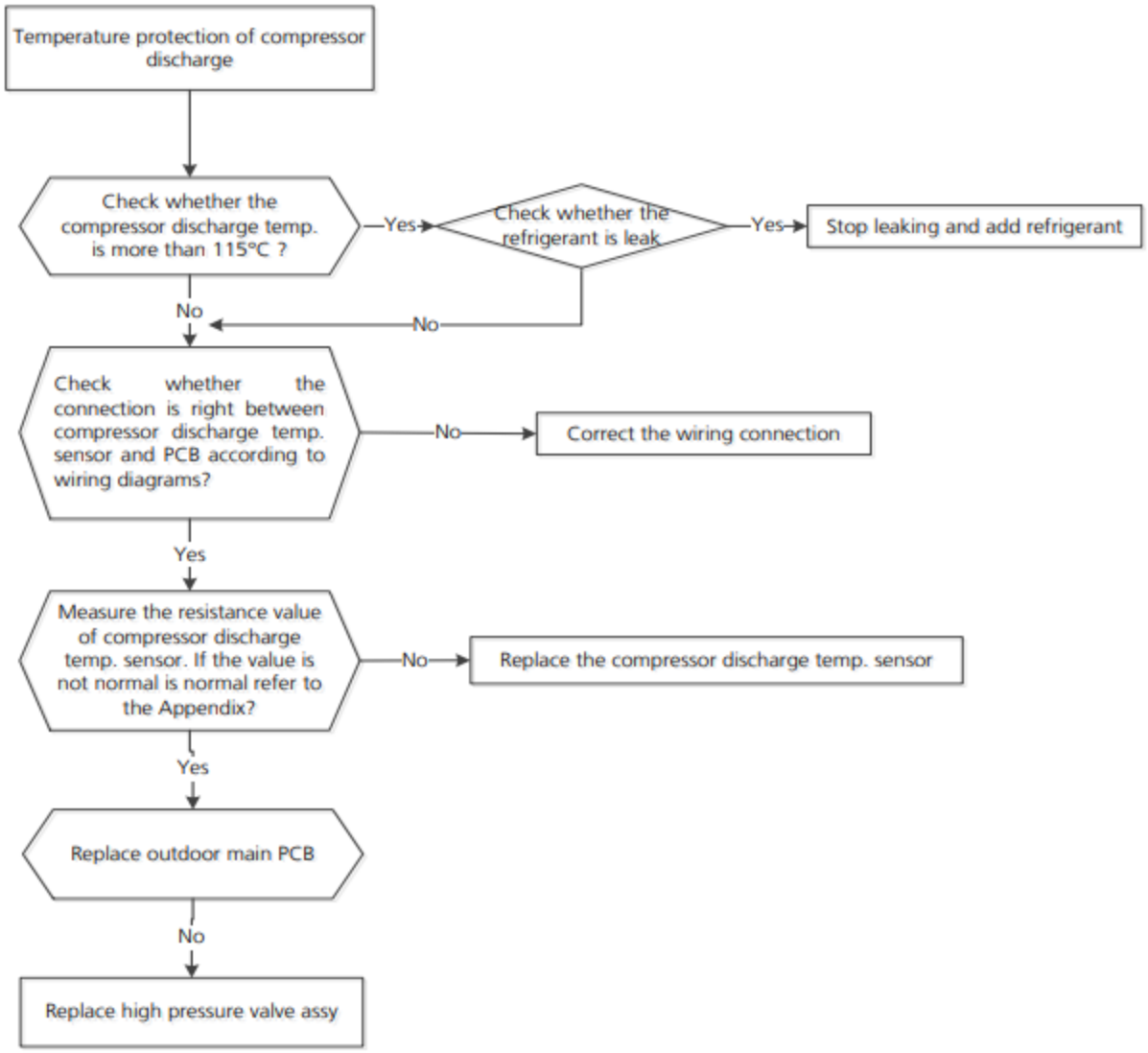
## PC 06: Discharge temperature protection of compressor diagnosis and solution.

**Description:** When the compressor discharge temperature (T5) is more than 115°C for 10 seconds, the compressor ceases operation and does not restart until T5 is less than 90°C.

**Recommended parts to prepare:**

- Connection wires
- Outdoor PCB
- Discharge temperature sensor
- Refrigerant

**Troubleshooting and repair:**



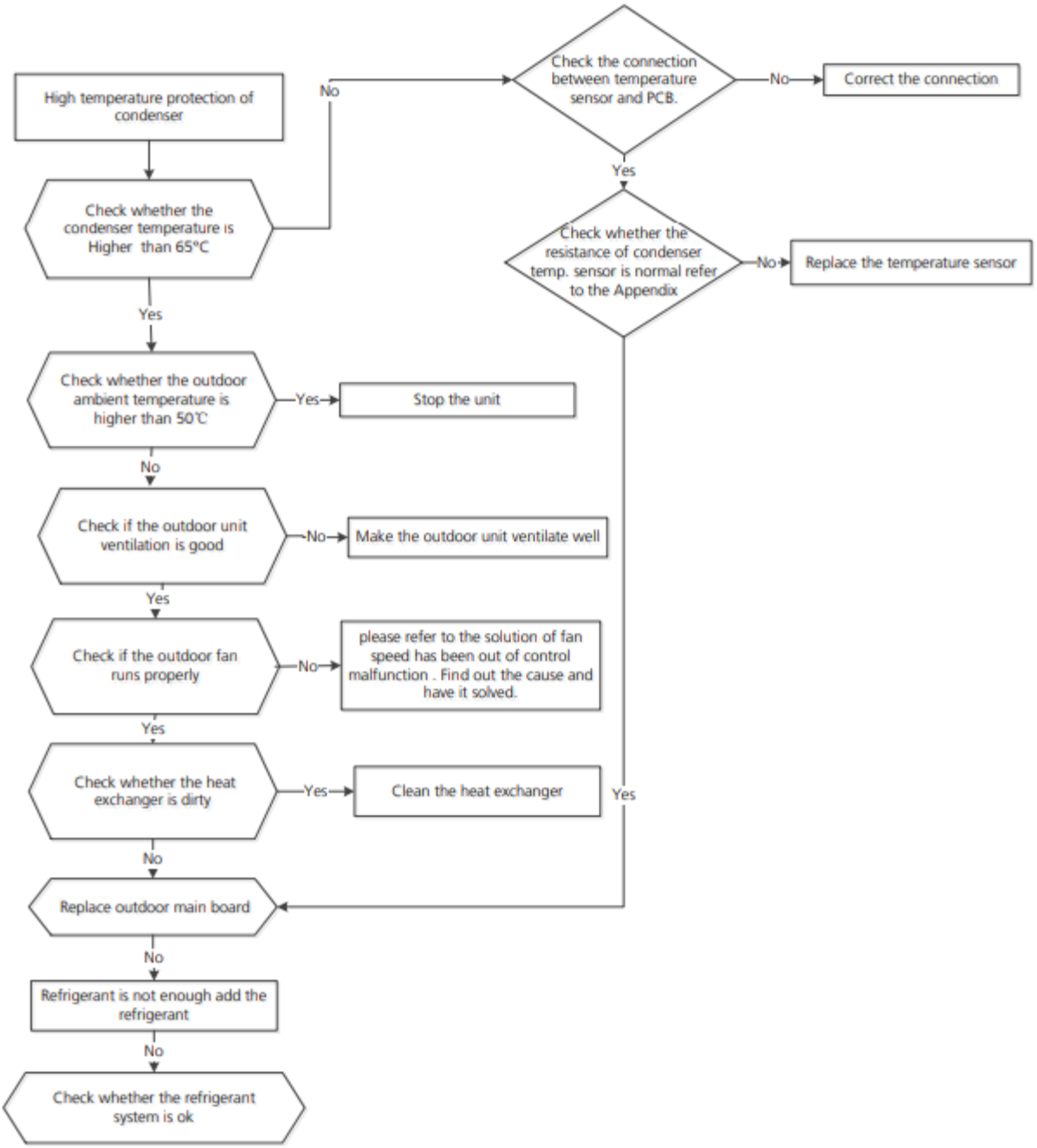
## PC 0A: High temperature protection of condenser diagnosis and solution.

**Description:** The unit will stop when the condenser temperature is higher than 65°C, and runs again when it is less than 52°C.

**Recommended parts to prepare:**

- Connection wires
- Condenser temperature sensor
- Outdoor fan
- Outdoor main PCB
- Refrigerant

**Troubleshooting and repair:**



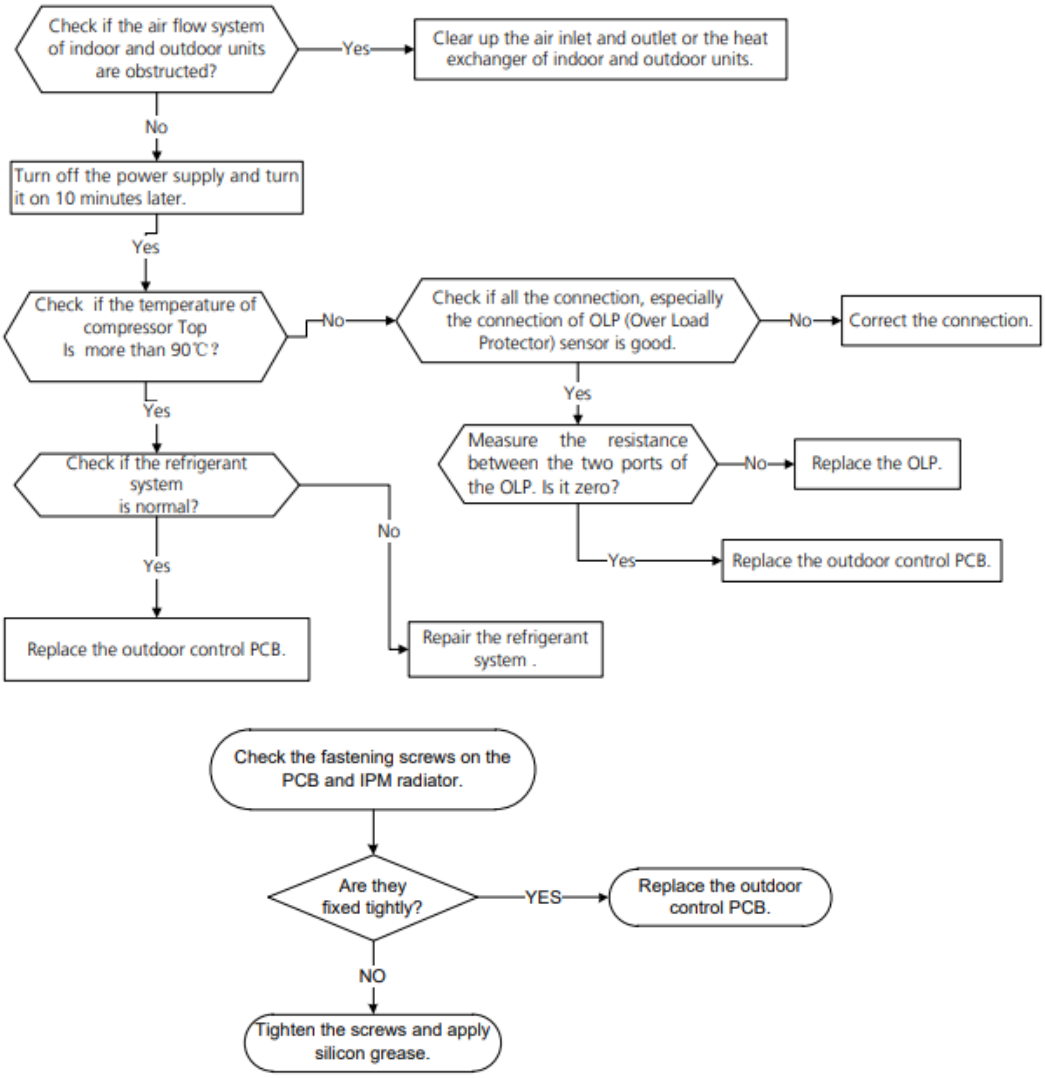
## PC 02/ LC 06: Compressor top (or IPM) temp. protection diagnosis and solution.

**Description:** For some models with an overload protector, if the sampling voltage is not 5V, the LED will display a fault code. If the temperature of the IPM module is higher than a certain value, the LED will display a fault code. Models without an overload protector should be diagnosed according to the second flowchart.

**Recommended parts to prepare:**

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

**Troubleshooting and repair:**



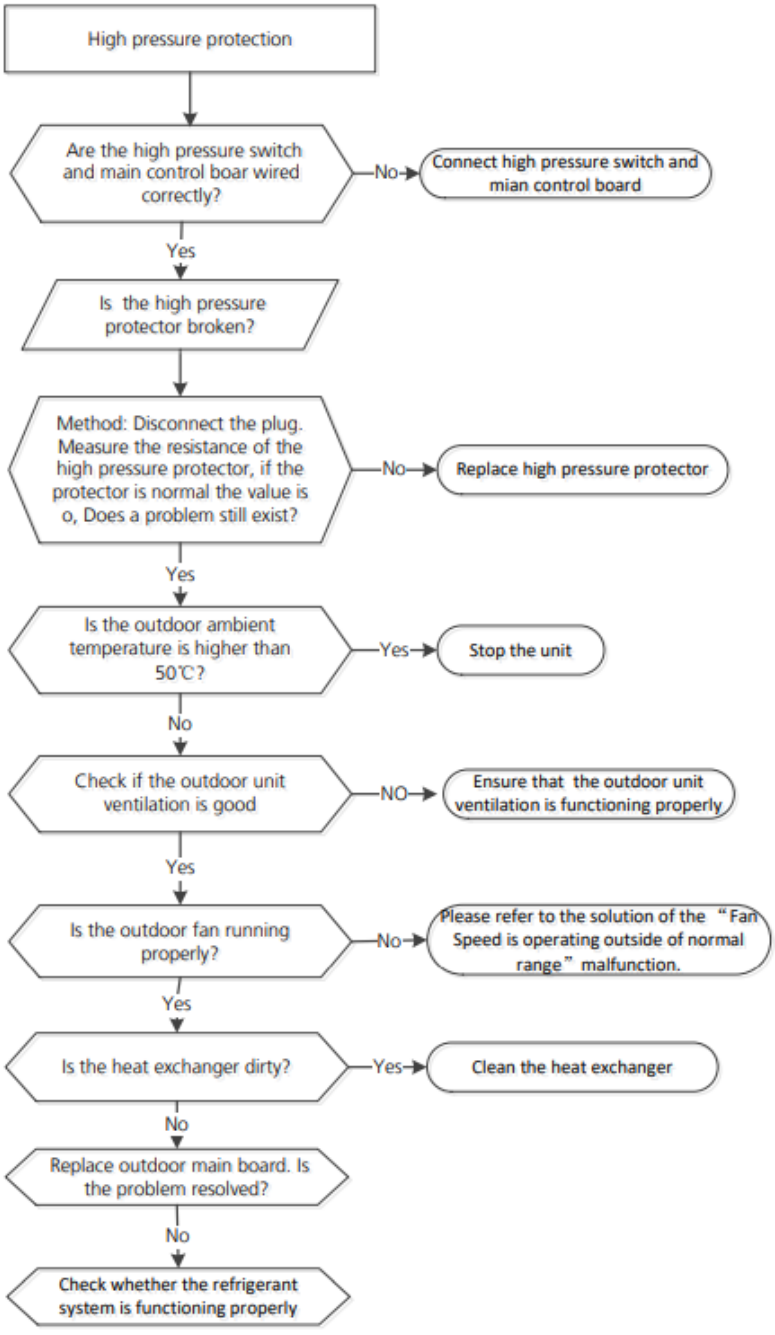
## PC 30: System high pressure protection diagnosis and solution.

**Description:** The outdoor pressure switch cuts off the system because of high pressure ( being higher than 638PSI (4.4MPA)) .

**Recommended parts to prepare:**

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

**Troubleshooting and repair:**



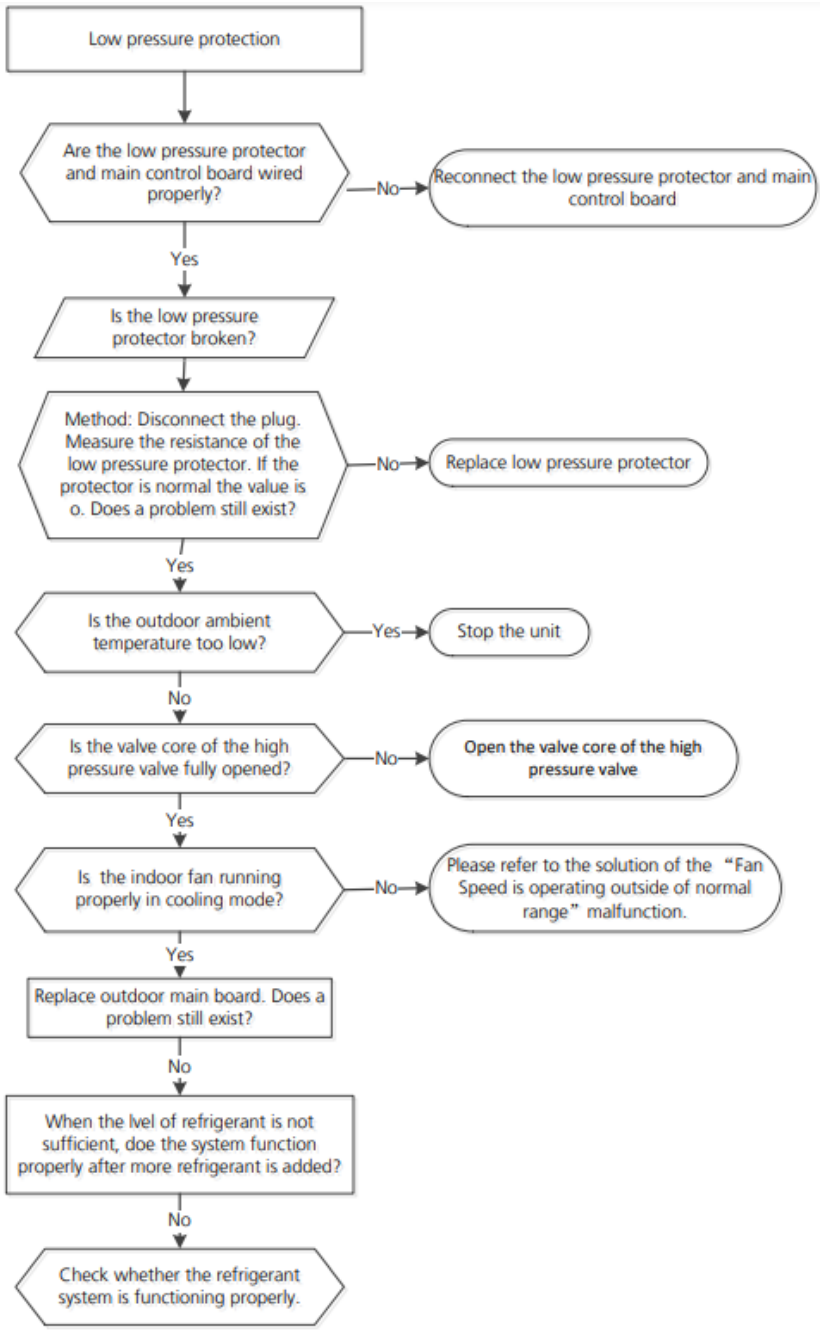
## PC 31: System low pressure protection diagnosis and solution.

**Description:** The outdoor pressure switch cuts off the system because of low pressure ( being lower than 18.85PSI (0.13MPA)) .

**Recommended parts to prepare:**

- Connection wires
- Outdoor PCB
- Low pressure protector
- Refrigerant

**Troubleshooting and repair:**



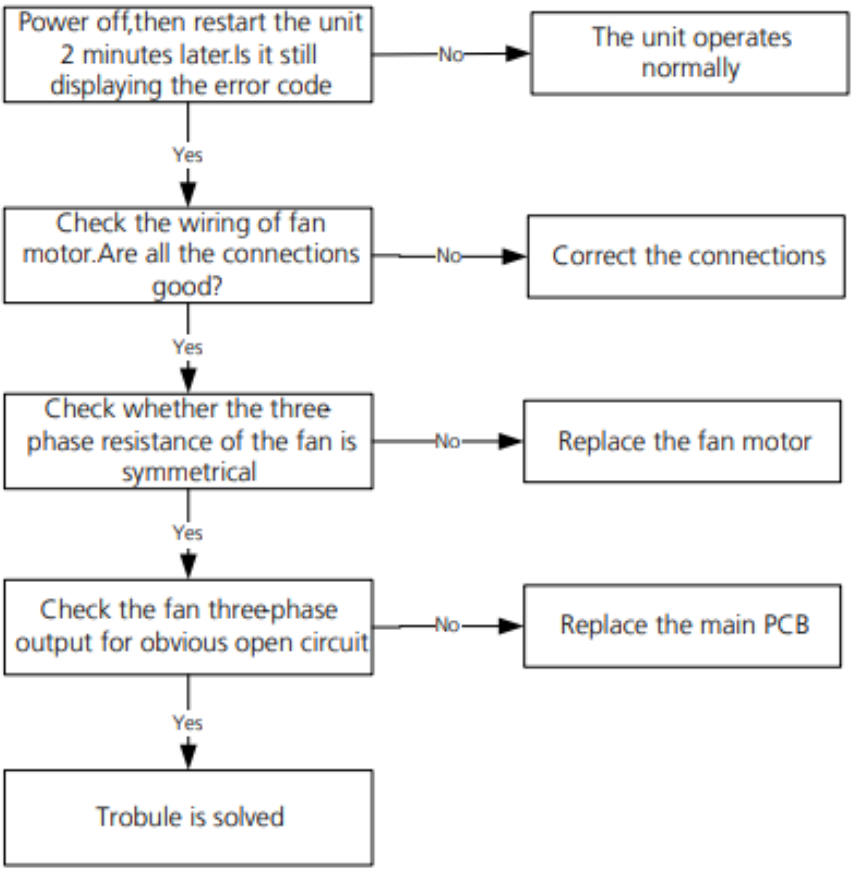
## EC 72: Lack phase failure of the outdoor DC fan motor diagnosis and solution.

**Description:** When the three-phase sampling current of the DC motor is abnormal, especially when the current of one or more phases is always small and almost 0, the LED displays an error code.

**Recommended parts to prepare:**

- Connection wires
- Fan motor
- Outdoor PCB

**Troubleshooting and repair:**



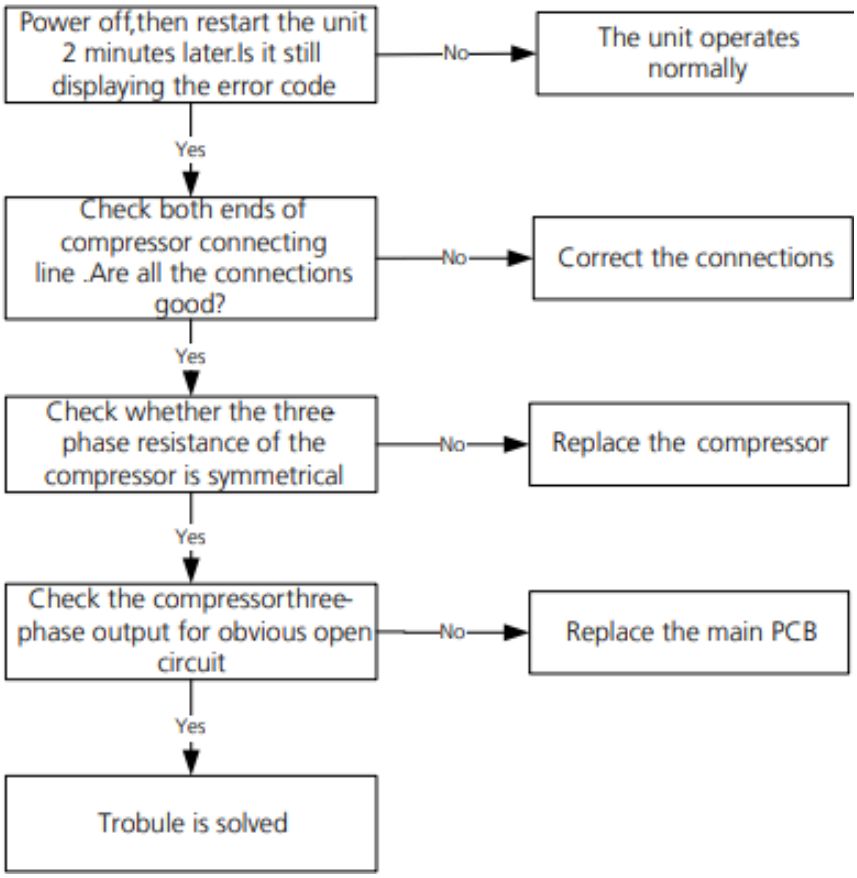
## PC 43: ODU compressor lack phase protection diagnosis and solution.

**Description:** When the three-phase sampling current of the DC motor is abnormal, especially when the current of one or more phases is always small and almost 0, the LED displays an error code.

**Recommended parts to prepare:**

- Connection wires
- Compressor
- Outdoor PCB

**Troubleshooting and repair:**



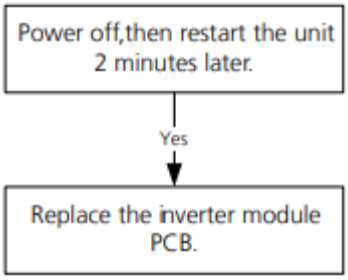
## PC 45: ODU IR chip drive failure diagnosis and solution.

**Description:** When the IR chip detects its own parameter error, the LED displays the fault code when powered on.

**Recommended parts to prepare:**

- Inverter module PCB

**Troubleshooting and repair:**




## CE: Automatic correction of wiring/piping error.

Press the "check switch" on the outdoor units PCB board for 5 seconds until the LED displays "CE" which means this function is working. Approximately 5-10 minutes after the switch is pressed, the "CE" will disappear and the wiring/piping error will be corrected.

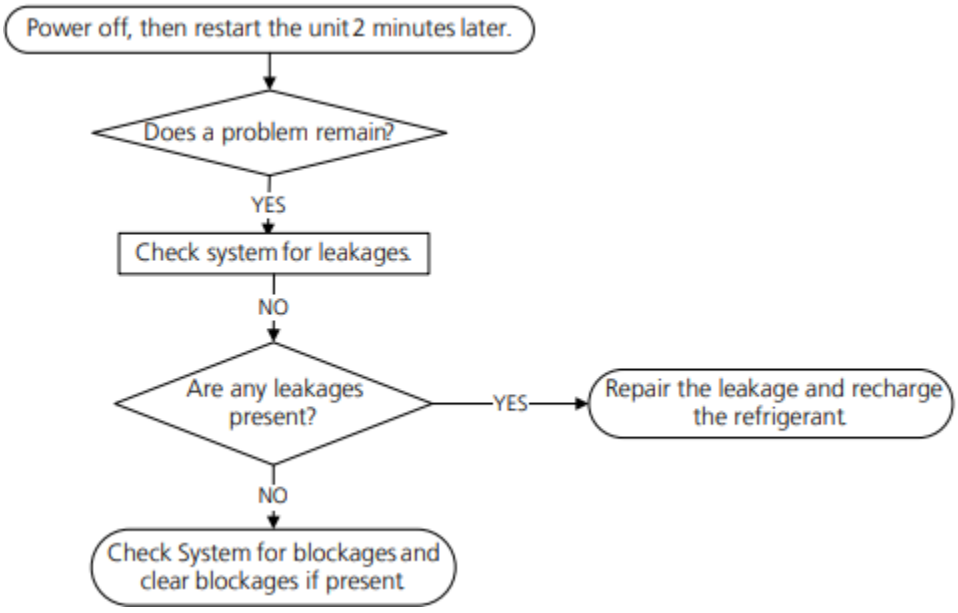
## EH C1: Refrigerant sensor detects leakage or working condition of the refrigerant sensor is out of range and leakage is detected diagnosis ans solution.

**Description:** The refrigerant sensor detects a concentration higher than or equal to 10%*LFL for 10 seconds or the refrigerant sensor detects a concentration higher than or equal to 20%*LFL or the multi mode receives the refrigerant leakage protection fault sent by the outdoor unit.

**Recommended parts to prepare:**

- Additional refrigerant

**Troubleshooting and repair:**



## EC 55: ODU IPM module temperature sensor malfunction diagnosis and solution.

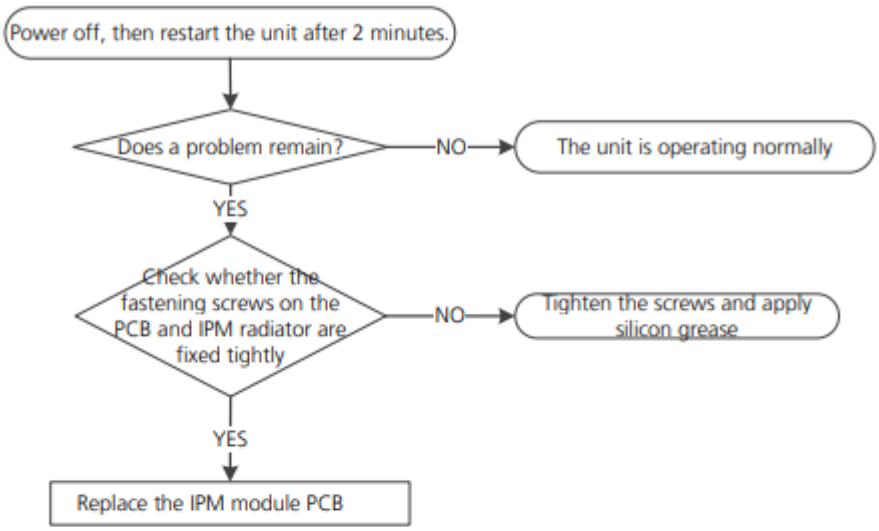
**Description:** If the sampling voltage is 0V or 5V, the LED displays a fault code.

**Recommended parts to prepare:**

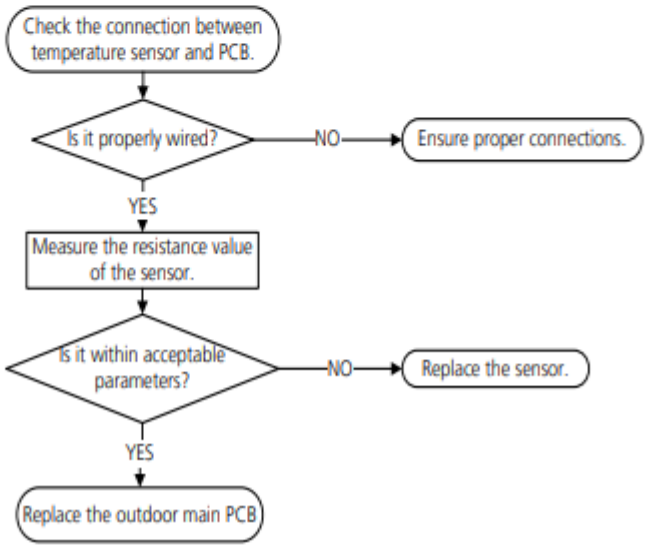
- IPM module PCB
- Connection wires
- Sensors
- Outdoor main PCB

**Troubleshooting and repair:**

If the radiator has no sensor, follow the steps below to resolve,




If the radiator has a sensor(TH), follow the steps below to resolve,



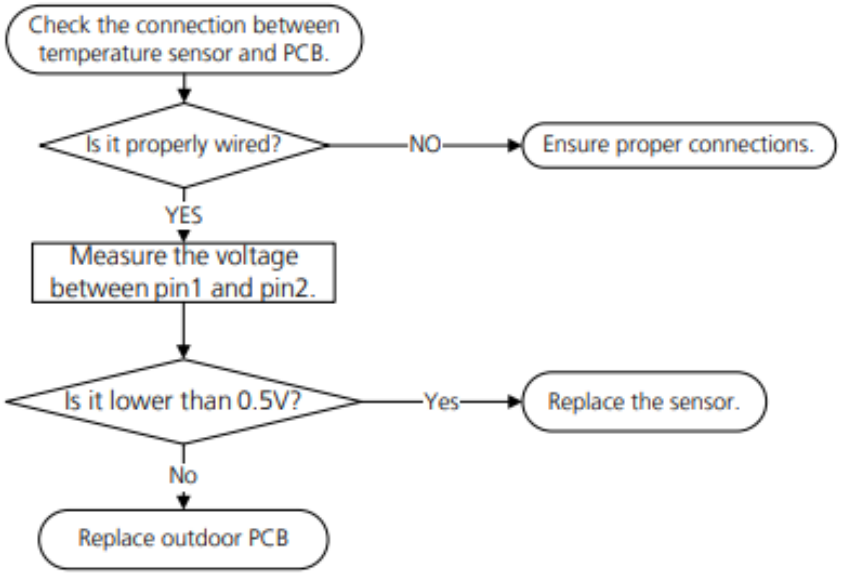
## EC 5C: Pressure sensor failure diagnosis and solution.

**Description:** If the sampling voltage is lower than 2V or higher than 254V.

**Recommended parts to prepare:**

- Connection wires
- Sensor
- Outdoor PCB

**Troubleshooting and repair:**



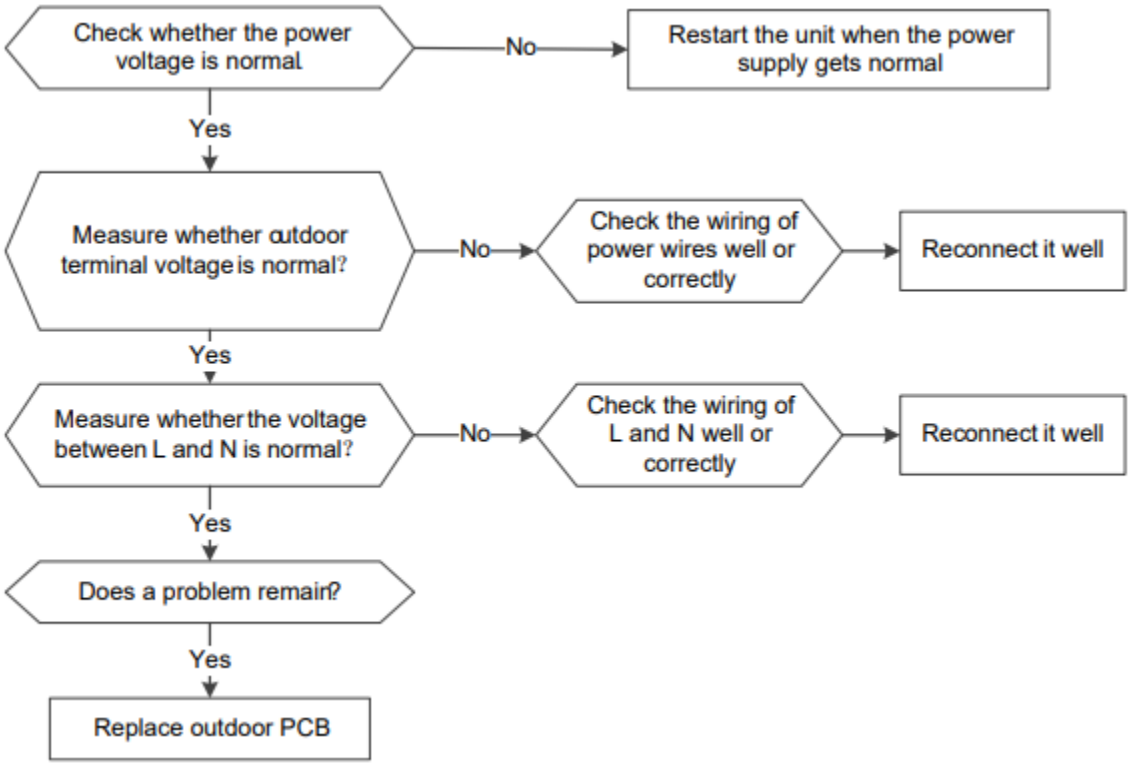
## PC 13: The AC power is cut off or the AC voltage detection circuit fails diagnosis and solution.

**Description:** The machine equipped safety shut-off has detected a power outage from the main power.

**Recommended parts to prepare:**

- Outdoor PCB

**Troubleshooting and repair:**



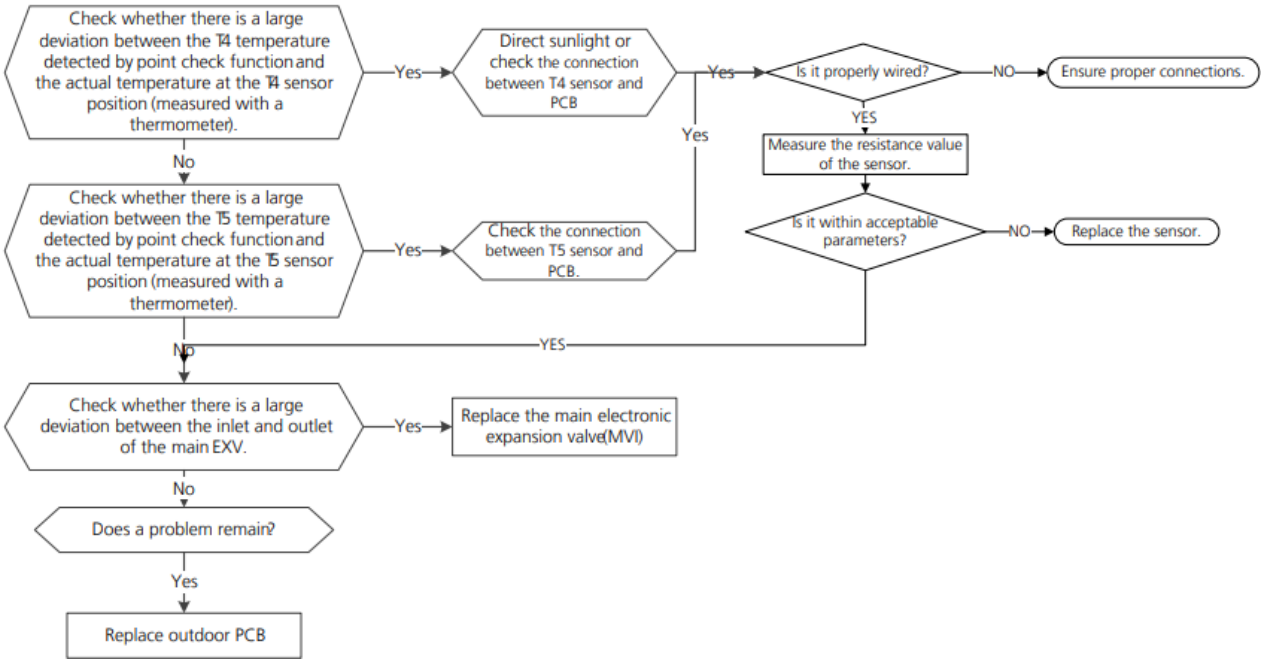
## PC A1: Condensation protection of refrigerant pip diagnosis and solution.

**Description:** If the outdoor ambient temperature is higher than a certain set value of the refrigerant pipe temperature for a period of time, the LED displays a fault code.

**Recommended parts to prepare:**

- T4 sensor
- T5 sensor
- Main EXV
- Outdoor PCB

**Troubleshooting and repair:**



## 3.5 Check Procedures

**WARNING**

**Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. Operate only after the compressor and coil has returned to normal temperature in case of injury.**

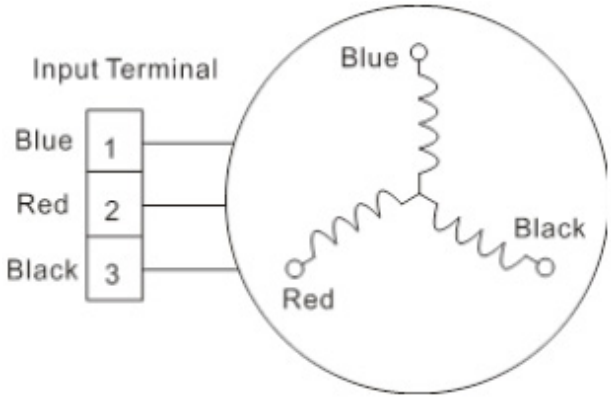
### Temperature Sensor Check:

1. Disconnect the temperature sensor from the PCB.
2. Measure the resistance value of the sensor using a multi-meter.
3. Check corresponding temperature sensor resistance value table.


*Note: The picture and the value are for reference only, actual condition and specific values may vary.*

### Compressor Check:

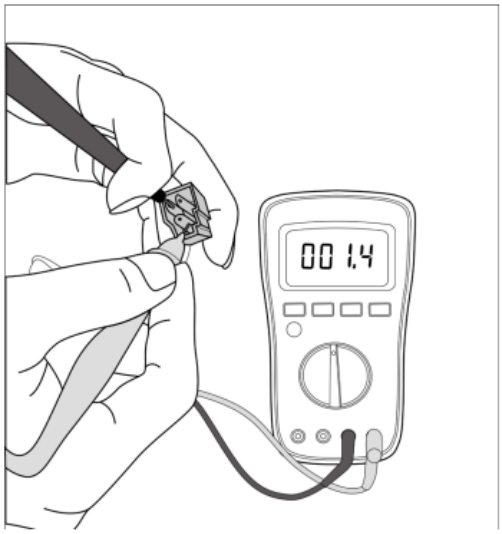
1. Disconnect the compressor power cord from the outdoor PCB.
2. Measure the resistance value of each winding using a multi-meter.
3. Check the resistance value of each winding in the following table.



| Resistance Value | KSK103D33UEZ3 | KSN140D58UFZ | KTF250D22UMT | KTN110D42UFZ | KTF420D62UNT |
|---|---|---|---|---|---|
| Blue-Red | 2.13Ω | 1.86Ω | 0.75Ω | 1.82Ω | 0.86Ω |
| Blue-Black | | | | | |
| Red-Black | | | | | |

| Resistance Value | KTN150D30UFZA | KTM240D46UKT2 | KTF310D43UMT | ETPQ420D1UMUA<br>ETPQ440D1UMUB<br>KTQ420D1UMU<br>EKPQ440D1UMUB | MTH356UKRC8FQL |
|---|---|---|---|---|---|
| Blue-Red | 1.02Ω | 1.04Ω | 0.65Ω | 0.37Ω | 0.487Ω |
| Blue-Black | | | | | |
| Red-Black | | | | | |

| Resistance Value | MTH550UKPC8FU | | | | |
|---|---|---|---|---|---|
| Blue-Red | 0.295Ω | | | | |
| Blue-Black | | | | | |
| Red-Black | | | | | |




*Note: The picture and the value are for reference only, actual condition and specific values may vary.*

## IPM Continuity Check:

**⚠ WARNING**

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

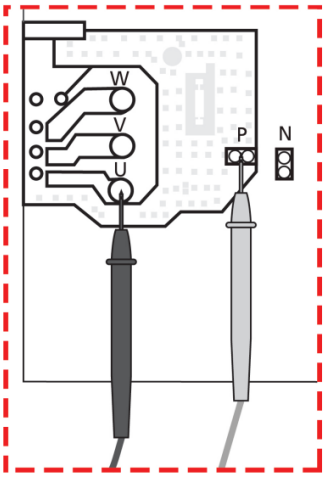
1. Turn off the outdoor unit and disconnect the power supply.
2. Discharge electronic capacitors and ensure all energy-storage units have been discharged.
3. Disassemble the outdoor PCB or disassemble the IPM board.
4. Measure the resistance value between P and U (U,W,N), U(V,W) and N.

| Digital tester | | Resistance Value | Digital Tester | | Resistance Value |
|---|---|---|---|---|---|
| (+)Red | (-)Black | | (+)Red | (-)Black | |
| P | N | ∞ (Several MΩ) | U | N | ∞ (Several MΩ) |
| | U | | V | | |
| | V | | W | | |
| | W | | - | | |

## Or test the conductivity of IPM with diode mode.

| Needle-type Tester | | Normal Value | Needle-Type Tester | | Normal Value |
|---|---|---|---|---|---|
| Red | Black | | Red | Black | |
| P | U | Open-Circuit | N | U | 0.3-0.5V |
| | V | | | V | |
| | W | | | W | |

| Needle-type Tester | | Normal Value | Needle-Type Tester | | Normal Value |
|---|---|---|---|---|---|
| Red | Black | | Red | Black | |
| P | U | 0.3-0.5V | N | U | Open-Circuit |
| | V | | | V | |
| | W | | | W | |



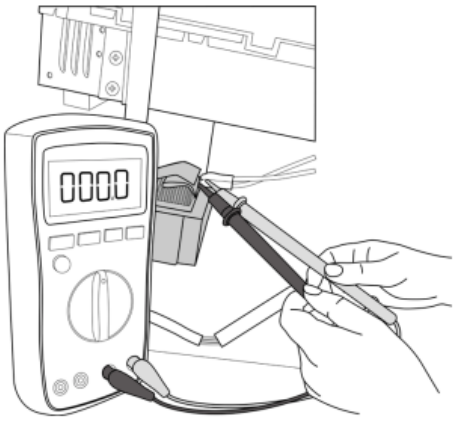

*Note: The picture and the value are for reference only, actual condition and specific values may vary.*

## Normal Voltage of P and N:

| 208-230V (1-phase) | | |
|---|---|---|
| In Standby | | |
| Around 310VDC | | |
| In Operation | | |
| With passive PFC module | With partial active PFC module | With fully active PFC module |
| >200VDC | >310VDC | >370VDC |

## Reactor Check:

Measure the resistance of the reactor. The normal resistance should be around 0.1 ohm and if not the reactor has a malfunction.



## 4-Way Valve Check:

1. Power on, use a digital tester to measure the voltage. When the unit is operating in cooling it is 0V. When the unit operates in heating it is about equal to the power supply voltage. ( If the value of the voltage is not in range, the PCB has a problem and needs to be replaced).
2. Turn off the power and use a digital tester to measure the resistance. The value should be 1.8~2.5KΩ.

## EXV (EEV) Check:

1. Turn off the outdoor unit and disconnect the power supply.
2. Disconnect the connectors of the EXV.
3. Measure the resistance value between Red and Blue(Yellow); Brown and Orange(White).

### Resistance to EXV coil:

| Color of Lead Winding | Normal Value |
|---|---|
| Red-Blue | About 50Ω |
| Red-Yellow | |
| Brown-Orange | |
| Brown-White | |

# 4 TEMPERATURE SENSOR RESISTANCE TABLE

## 4.1 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| -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 | 1.171 |
| 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 | | | |

## Other Temperature Sensor Resistance Value Table (°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 | 1.89627 | 107 | 225 | 0.51426 |
| -12 | 10 | 70.1698 | 28 | 82 | 8.71983 | 68 | 154 | 1.83003 | 108 | 226 | 0.49989 |
| -11 | 12 | 66.0898 | 29 | 84 | 8.3356 | 69 | 156 | 1.76647 | 109 | 228 | 0.486 |
| -10 | 14 | 62.2756 | 30 | 86 | 7.97078 | 70 | 158 | 1.70547 | 110 | 230 | 0.47256 |
| -9 | 16 | 58.7079 | 31 | 88 | 7.62411 | 71 | 160 | 1.64691 | 111 | 232 | 0.45957 |
| -8 | 18 | 56.3694 | 32 | 90 | 7.29464 | 72 | 162 | 1.59068 | 112 | 234 | 0.44699 |
| -7 | 19 | 52.2438 | 33 | 91 | 6.98142 | 73 | 163 | 1.53668 | 113 | 235 | 0.43482 |
| -6 | 21 | 49.3161 | 34 | 93 | 6.68355 | 74 | 165 | 1.48481 | 114 | 237 | 0.42304 |
| -5 | 23 | 46.5725 | 35 | 95 | 6.40021 | 75 | 167 | 1.43498 | 115 | 239 | 0.41164 |
| -4 | 25 | 44 | 36 | 97 | 6.13059 | 76 | 169 | 1.38703 | 116 | 241 | 0.4006 |
| -3 | 27 | 41.5878 | 37 | 99 | 5.87359 | 77 | 171 | 1.34105 | 117 | 243 | 0.38991 |
| -2 | 28 | 39.8239 | 38 | 100 | 5.62961 | 78 | 172 | 1.29078 | 118 | 244 | 0.37956 |
| -1 | 30 | 37.1988 | 39 | 102 | 5.3689 | 79 | 174 | 1.25423 | 119 | 246 | 0.36954 |
| 0 | 32 | 35.2024 | 40 | 104 | 5.17519 | 80 | 176 | 1.2133 | 120 | 248 | 0.35982 |
| 1 | 34 | 33.3269 | 41 | 106 | 4.96392 | 81 | 178 | 1.17393 | 121 | 250 | 0.35042 |
| 2 | 36 | 31.5635 | 42 | 108 | 4.76253 | 82 | 180 | 1.13604 | 122 | 252 | 0.3413 |
| 3 | 37 | 29.9058 | 43 | 109 | 4.5705 | 83 | 181 | 1.09958 | 123 | 253 | 0.33246 |
| 4 | 39 | 28.3459 | 44 | 111 | 4.38736 | 84 | 183 | 1.06448 | 124 | 255 | 0.3239 |
| 5 | 41 | 26.8778 | 45 | 113 | 4.21263 | 85 | 185 | 1.03069 | 125 | 257 | 0.31559 |
| 6 | 43 | 25.4954 | 46 | 115 | 4.04589 | 86 | 187 | 0.99815 | 126 | 259 | 0.30754 |
| 7 | 45 | 24.1932 | 47 | 117 | 3.88673 | 87 | 189 | 0.96681 | 127 | 261 | 0.29974 |
| 8 | 46 | 22.5662 | 48 | 118 | 3.73476 | 88 | 190 | 0.93662 | 128 | 262 | 0.29216 |
| 9 | 48 | 21.8094 | 49 | 120 | 3.58962 | 89 | 192 | 0.90753 | 129 | 264 | 0.28482 |
| 10 | 50 | 20.7184 | 50 | 122 | 3.45097 | 90 | 194 | 0.8795 | 130 | 266 | 0.2777 |
| 11 | 52 | 19.6891 | 51 | 124 | 3.31847 | 91 | 196 | 0.85248 | 131 | 268 | 0.27078 |
| 12 | 54 | 18.7177 | 52 | 126 | 3.19183 | 92 | 198 | 0.82643 | 132 | 270 | 0.26408 |
| 13 | 55 | 17.8005 | 53 | 127 | 3.07075 | 93 | 199 | 0.80132 | 133 | 271 | 0.25757 |
| 14 | 57 | 16.9341 | 54 | 129 | 2.95896 | 94 | 201 | 0.77709 | 134 | 273 | 0.25125 |
| 15 | 59 | 16.1156 | 55 | 131 | 2.84421 | 95 | 203 | 0.7537 | 135 | 275 | 0.24512 |
| 16 | 61 | 15.3418 | 56 | 133 | 2.73823 | 96 | 205 | 0.73119 | 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 | 2.4467 | 99 | 210 | 0.64862 | 139 | 282 | 0.22231 |

# 5 SYSTEM PRESSURE TABLE

## 5.1 System Pressure Table-R454B

| Pressure | | | Temperature | | Pressure | | | Temperature | |
|---|---|---|---|---|---|---|---|---|---|
| Kpa | Bar | PSI | °C | °F | Kpa | Bar | PSI | °C | °F |
| 58.196 | 0.58 | 8.44 | -60 | -76 | 935.23 | 9.35 | 135.64 | 8 | 46.4 |
| 61.517 | 0.62 | 8.92 | -59 | -74.2 | 963.75 | 9.64 | 139.78 | 9 | 48.2 |
| 64.988 | 0.65 | 9.43 | -58 | -72.4 | 992.93 | 9.93 | 14401 | 10 | 50 |
| 68.615 | 0.69 | 9.95 | -57 | -70.6 | 1022.8 | 10.23 | 148.34 | 11 | 51.8 |
| 72.402 | .072 | 10.50 | -56 | -68.8 | 1053.3 | 10.53 | 152.76 | 12 | 53.6 |
| 76.354 | 0.76 | 11.07 | -55 | -67 | 1084.5 | 10.85 | 157.29 | 13 | 55.4 |
| 80.478 | 0.80 | 11.67 | -54 | -65.2 | 1116.4 | 11.16 | 161.91 | 14 | 57.2 |
| 84.776 | 0.85 | 12.30 | -53 | -63.4 | 1149 | 11.49 | 166.64 | 15 | 59 |
| 89.256 | 0.89 | 12.95 | -52 | -61.6 | 1182.3 | 11.82 | 171.47 | 16 | 60.8 |
| 93.923 | 0.94 | 13.62 | -51 | -59.8 | 1216.3 | 12.16 | 176.40 | 17 | 62.6 |
| 98.781 | 0.99 | 14.33 | -50 | -58 | 1251.1 | 12.51 | 181.45 | 18 | 64.4 |
| 103.84 | 1.04 | 15.06 | -49 | -56.2 | 1286.6 | 12.87 | 186.60 | 19 | 66.2 |
| 109.1 | 1.09 | 15.82 | -48 | -54.4 | 1322.8 | 13.23 | 191.85 | 20 | 68 |
| 114.56 | 1.15 | 16.61 | -47 | -52.6 | 1359.9 | 13.60 | 197.23 | 21 | 69.8 |
| 120.25 | 1.20 | 17.44 | -46 | -50.8 | 1397.7 | 13.98 | 202.71 | 22 | 71.6 |
| 126.15 | 1.26 | 18.30 | -45 | -49 | 1436.3 | 14.36 | 208.31 | 23 | 73.4 |
| 132.28 | 1.32 | 19.18 | -44 | -47.2 | 1475.7 | 14.76 | 214.02 | 24 | 75.2 |
| 138.64 | 1.39 | 20.11 | -43 | -45.4 | 1515.9 | 15.16 | 219.85 | 25 | 77 |
| 145.24 | 1.45 | 21.06 | -42 | -43.6 | 1557 | 15.57 | 225.82 | 26 | 78.8 |
| 152.09 | 1.52 | 22.06 | -41 | -41.8 | 1598.9 | 15.99 | 231.89 | 27 | 80.6 |
| 159.18 | 1.59 | 23.09 | -40 | -40 | 1641.6 | 16.42 | 238.09 | 28 | 82.4 |
| 166.54 | 1.67 | 24.15 | -39 | -38.2 | 1685.2 | 16.85 | 244.41 | 29 | 84.2 |
| 174.15 | 1.74 | 25.26 | -38 | -36.4 | 1729.7 | 17.30 | 250.86 | 30 | 86 |
| 182.04 | 1.82 | 26.40 | -37 | -34.6 | 1775 | 17.75 | 257.43 | 31 | 87.8 |
| 190.2 | 1.90 | 27.59 | -36 | -32.8 | 1821.3 | 18.21 | 264.15 | 32 | 89.6 |
| 198.65 | 1.99 | 28.81 | -35 | -31 | 1868.4 | 18.68 | 270.98 | 33 | 91.4 |
| 207.39 | 2.07 | 30.08 | -34 | -29.2 | 1916.5 | 19.17 | 277.95 | 34 | 93.2 |
| 216.42 | 2.16 | 31.39 | -33 | -27.4 | 1965.6 | 19.66 | 285.08 | 35 | 95 |
| 225.76 | 2.26 | 32.74 | -32 | -25.6 | 2015.5 | 20.16 | 292.31 | 36 | 96.8 |
| 235.41 | 2.35 | 34.14 | -31 | -23.8 | 2066.5 | 20.67 | 299.71 | 37 | 98.6 |
| 245.37 | 2.45 | 35.59 | -30 | -22 | 2118.4 | 21.18 | 307.24 | 38 | 100.4 |
| 255.67 | 2.56 | 37.08 | -29 | -20.2 | 2171.3 | 21.71 | 314.19 | 39 | 102.2 |
| 266.29 | 2.66 | 38.62 | -28 | -18.4 | 2225.2 | 22.25 | 322.73 | 40 | 104 |
| 277.25 | 2.77 | 40.21 | -27 | -16.6 | 2280.2 | 22.80 | 330.70 | 41 | 105.8 |
| 288.56 | 2.89 | 41.85 | -26 | -14.8 | 2336.1 | 23.36 | 38.81 | 42 | 107.6 |
| 300.22 | 3.00 | 43.54 | -25 | -13 | 2393.2 | 23.93 | 347.09 | 43 | 109.4 |
| 312.24 | 3.12 | 45.28 | -24 | -11.2 | 2451.3 | 24.51 | 355.52 | 44 | 111.2 |
| 324.63 | 3.25 | 47.08 | -23 | -9.4 | 2510.4 | 25.10 | 364.09 | 45 | 113 |
| 337.39 | 3.37 | 48.93 | -22 | -7.6 | 2570.7 | 25.71 | 372.84 | 46 | 114.8 |
| 350.54 | 3.51 | 50.84 | -21 | -5.8 | 2632.1 | 26.32 | 381.74 | 47 | 116.6 |
| 364.08 | 3.64 | 52.80 | -20 | -4 | 2694.7 | 26.95 | 390.82 | 48 | 118.4 |
| 378.02 | 3.78 | 54.83 | -19 | -2.2 | 2758.33 | 27.58 | 400.04 | 49 | 120.2 |
| 392.37 | 3.92 | 56.91 | -18 | -0.4 | 2823.2 | 28.23 | 409.46 | 50 | 122 |
| 407.13 | 4.07 | 59.05 | -17 | 1.4 | 2889.3 | 28.89 | 419.04 | 51 | 123.8 |

## System Pressure Table-R454B Cont.

| Pressure | | | Temperature | | Pressure | | | Temperature | |
|---|---|---|---|---|---|---|---|---|---|
| Kpa | Bar | PSI | °C | °F | Kpa | Bar | PSI | °C | °F |
| 422.31 | 4.22 | 61.25 | -16 | 3.2 | 2956.5 | 29.57 | 428.79 | 52 | 125.6 |
| 437.92 | 4.38 | 63.5 | -15 | 5 | 3025 | 30.25 | 438.72 | 53 | 127.4 |
| 453.98 | 4.54 | 65.84 | -14 | 6.8 | 3094.7 | 30.95 | 448.83 | 54 | 129.2 |
| 470.47 | 4.70 | 68.23 | -13 | 8.6 | 3165.7 | 31.66 | 459.13 | 55 | 131 |
| 487.43 | 4.87 | 70.69 | -12 | 10.4 | 3238.1 | 32.38 | 469.63 | 56 | 132.8 |
| 504.84 | 5.05 | 73.22 | -11 | 12.2 | 3311.7 | 33.12 | 480.30 | 57 | 134.6 |
| 522.73 | 5.23 | 75.81 | -10 | 14 | 3386.7 | 33.87 | 491.18 | 58 | 136.4 |
| 541.1 | 5.41 | 78.48 | -9 | 15.8 | 3463 | 34.63 | 502.25 | 59 | 138.2 |
| 559.95 | 5.60 | 81.21 | -8 | 17.6 | 3540.7 | 35.41 | 513.52 | 60 | 140 |
| 579.31 | 5.79 | 84.02 | -7 | 19.4 | 3619.9 | 36.20 | 525.00 | 61 | 141.8 |
| 599.16 | 5.99 | 86.90 | -6 | 21.2 | 3700.5 | 37.01 | 536.69 | 62 | 143.6 |
| 619.54 | 6.20 | 89.85 | -5 | 23 | 3782.7 | 37.83 | 548.61 | 63 | 145.4 |
| 640.43 | 6.40 | 92.88 | -4 | 24.8 | 3866.3 | 38.66 | 560.74 | 64 | 147.2 |
| 661.86 | 6.62 | 95.99 | -3 | 26.6 | 3951.5 | 39.52 | 573.10 | 65 | 149 |
| 683.82 | 6.84 | 99.18 | -2 | 28.4 | 4038.3 | 40.38 | 585.69 | 66 | 450.28 |
| 706.34 | 7.06 | 102.44 | -1 | 30.2 | 4126.8 | 41.27 | 598.52 | 67 | 152.6 |
| 729.41 | 7.29 | 105.79 | 0 | 32 | 4217 | 42.17 | 611.60 | 68 | 154.4 |
| 753.06 | 7.53 | 109.22 | 1 | 33.8 | 4309 | 43.09 | 624.95 | 69 | 156.2 |
| 777.28 | 7.77 | 112.73 | 2 | 35.6 | 4402.9 | 44.03 | 638.56 | 70 | 158 |
| 802.08 | 8.02 | 116.33 | 3 | 37.4 | 4498.7 | 44.99 | 652.46 | 71 | 159.8 |
| 827.47 | 8.27 | 120.01 | 4 | 39.2 | 4596.5 | 45.97 | 666.64 | 72 | 161.6 |
| 853.49 | 8.53 | 123.78 | 5 | 41 | 4696.5 | 46.97 | 681.15 | 73 | 163.4 |
| 880.11 | 8.80 | 127.64 | 6 | 42.8 | 4798.9 | 47.99 | 696.00 | 74 | 165.5 |
| 907.35 | 9.07 | 131.60 | 7 | 44.6 | 4904.1 | 49.04 | 711.25 | 75 | 167 |

MRCOOL®

COMFORT MADE SIMPLE

# DIY® Series Multi-Zone Mini-Split System