

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: April 20, 2026
Please visit www.mrcool.com/documentation
to ensure you have the latest version of this manual.



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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:

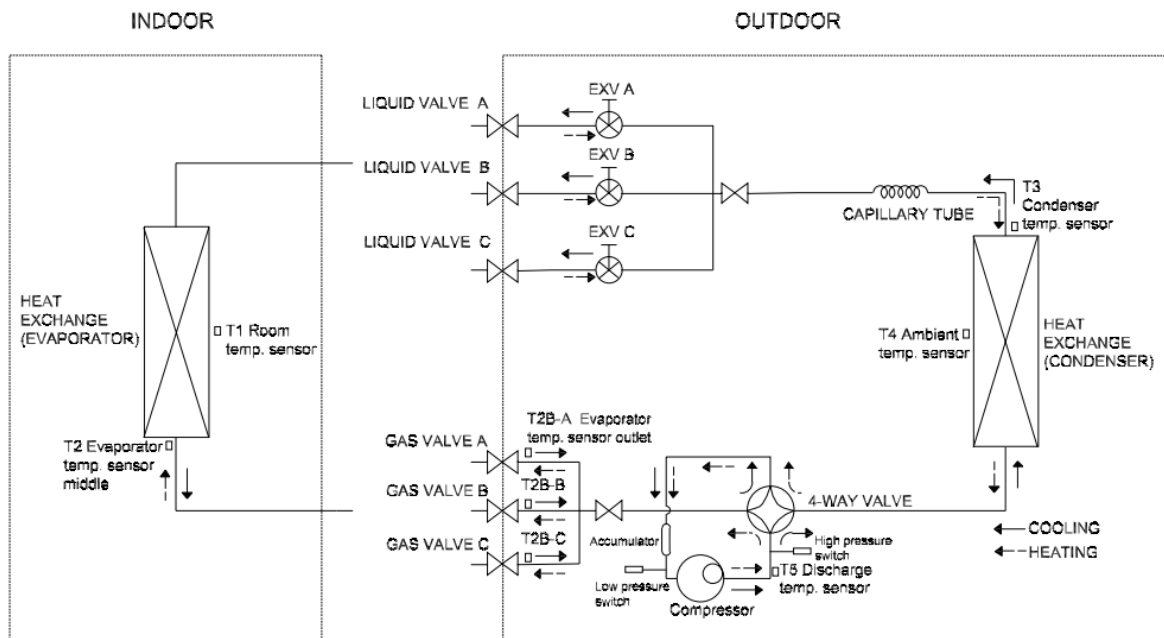
- Refrigerant pipe diameter is different according to the indoor unit to be connected. When using the extension pipe refer to the following tables on pg 3.
- When the refrigerant pipe diameter is different from that of the outdoor unit union, additional transfer connectors need to be used on the outdoor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

1 SYSTEM OVERVIEW

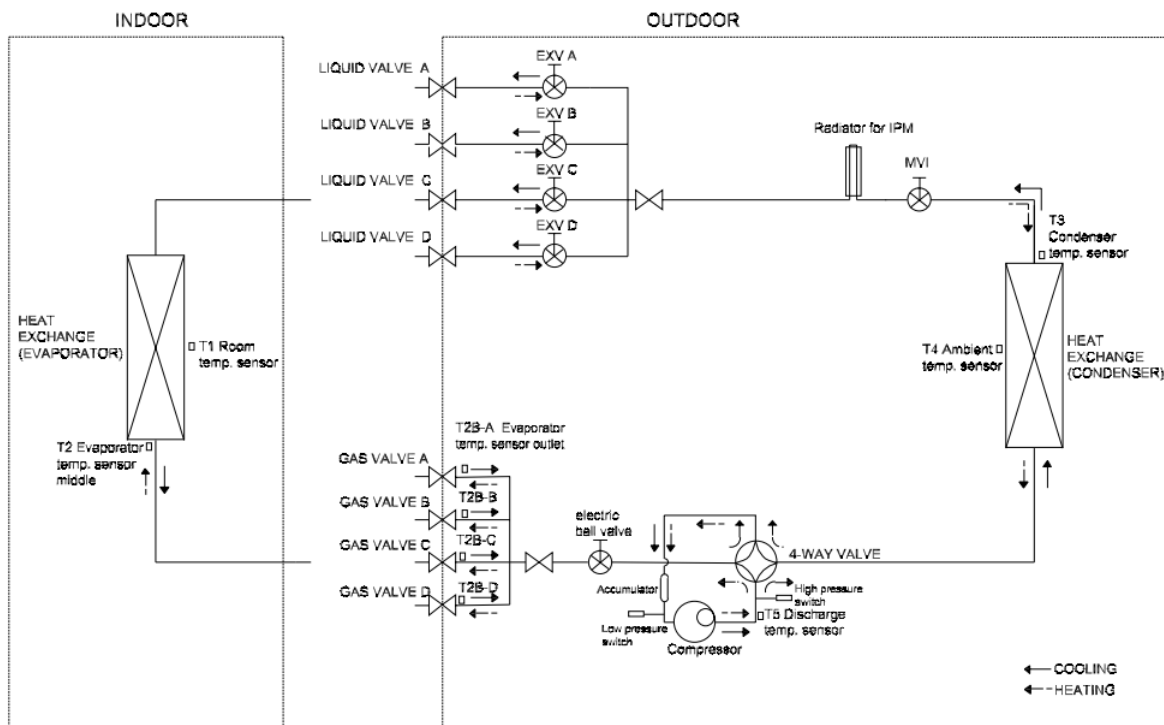
Indoor Unit			Extension pipe diameter (mm/inch)	
Model	Pipe diameter (mm/inch)			
6K,9K,12K	Liquid	Φ1/4 (Φ6.35)	Liquid	Φ1/4 (Φ6.35)
	Gas	Φ3/8 (Φ9.52)	Gas	Φ3/8 (Φ9.52)
18K	Liquid	Φ1/4 (6.35)	Liquid	Φ1/4 (Φ6.35)
	Gas	Φ1/2 (Φ12.7)	Gas	Φ1/2 (Φ12.7)
24K,30K,36K	Liquid	Φ3/8 (Φ9.52)	Liquid	Φ3/8 (Φ9.52)
	Gas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

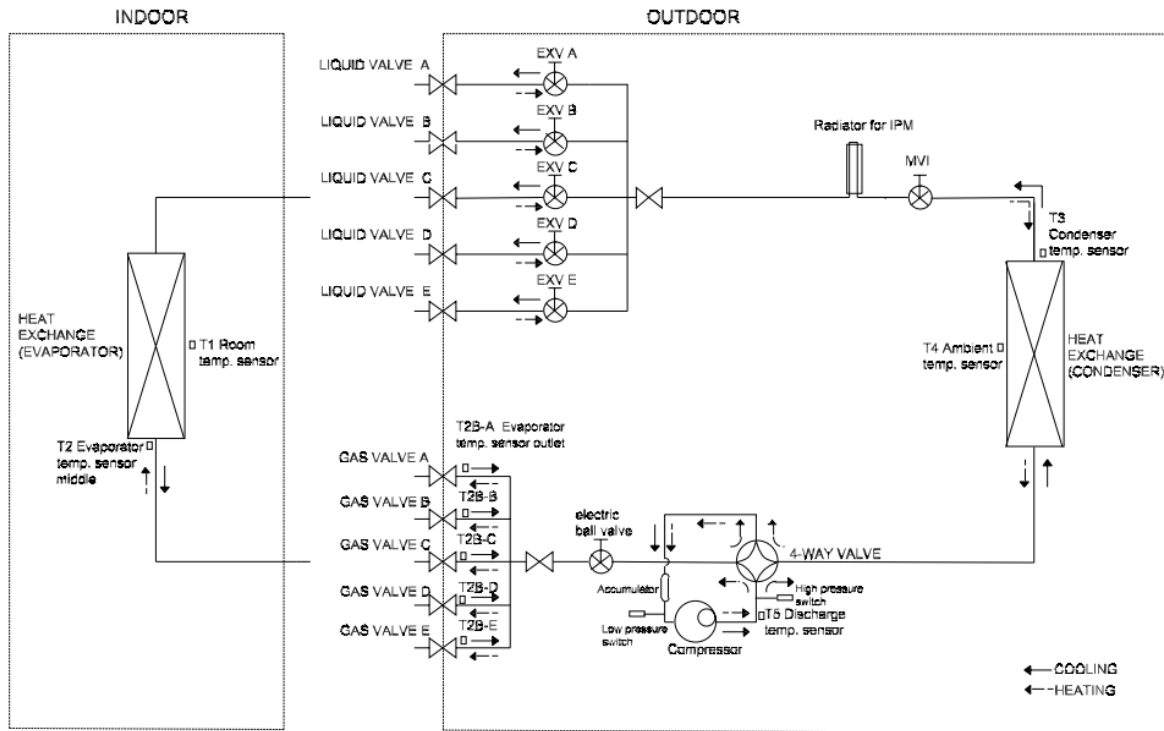


Refrigeration Cycle Diagram of DIY-MULTI4-27HP230D-O:

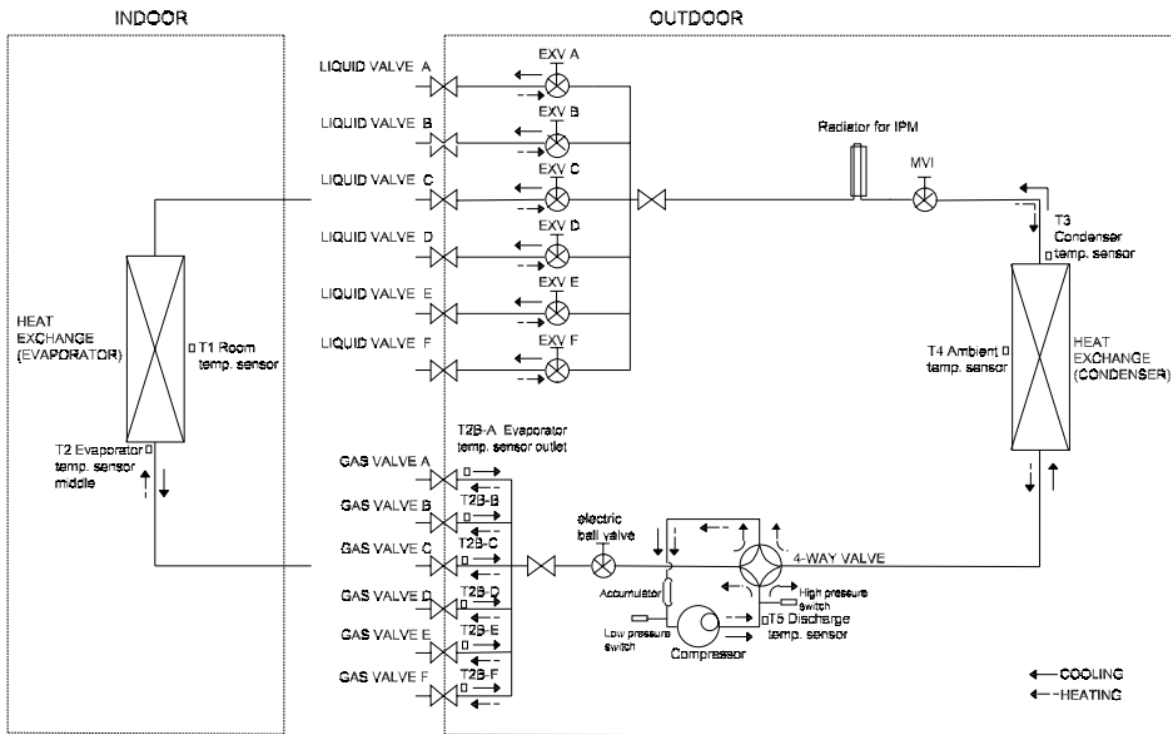


1 SYSTEM OVERVIEW

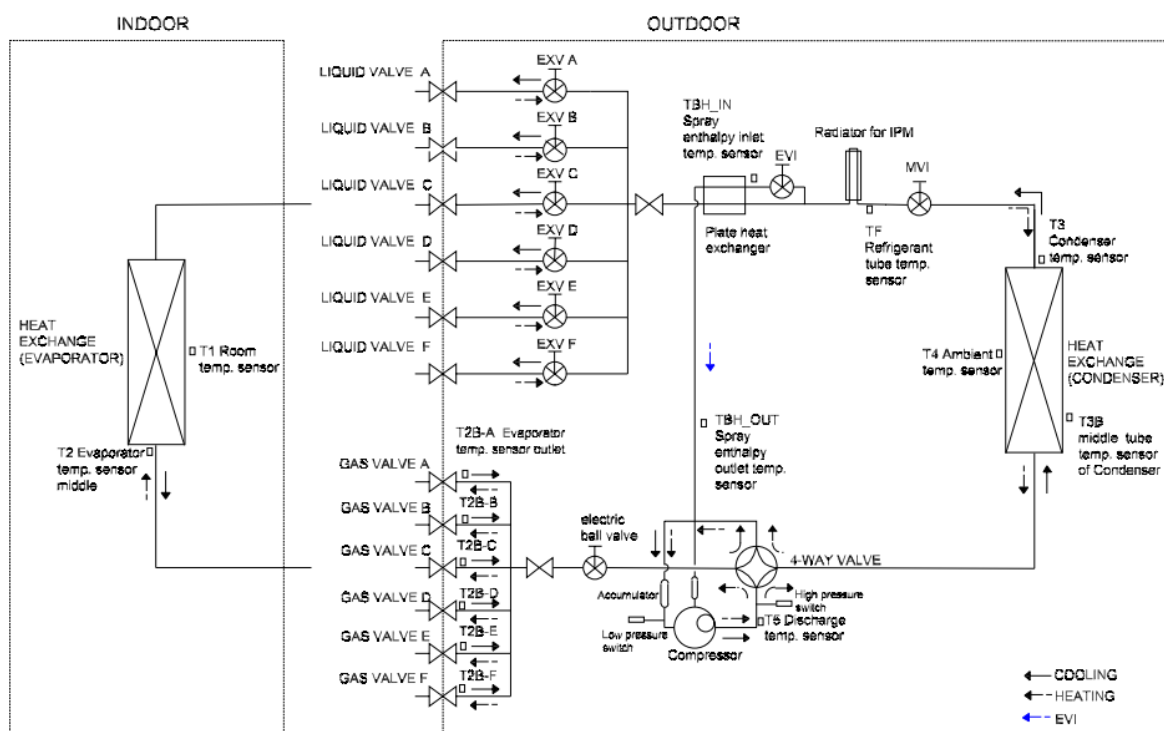
Refrigeration Cycle Diagram of DIY-MULTI5-36HP230D-O:



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



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

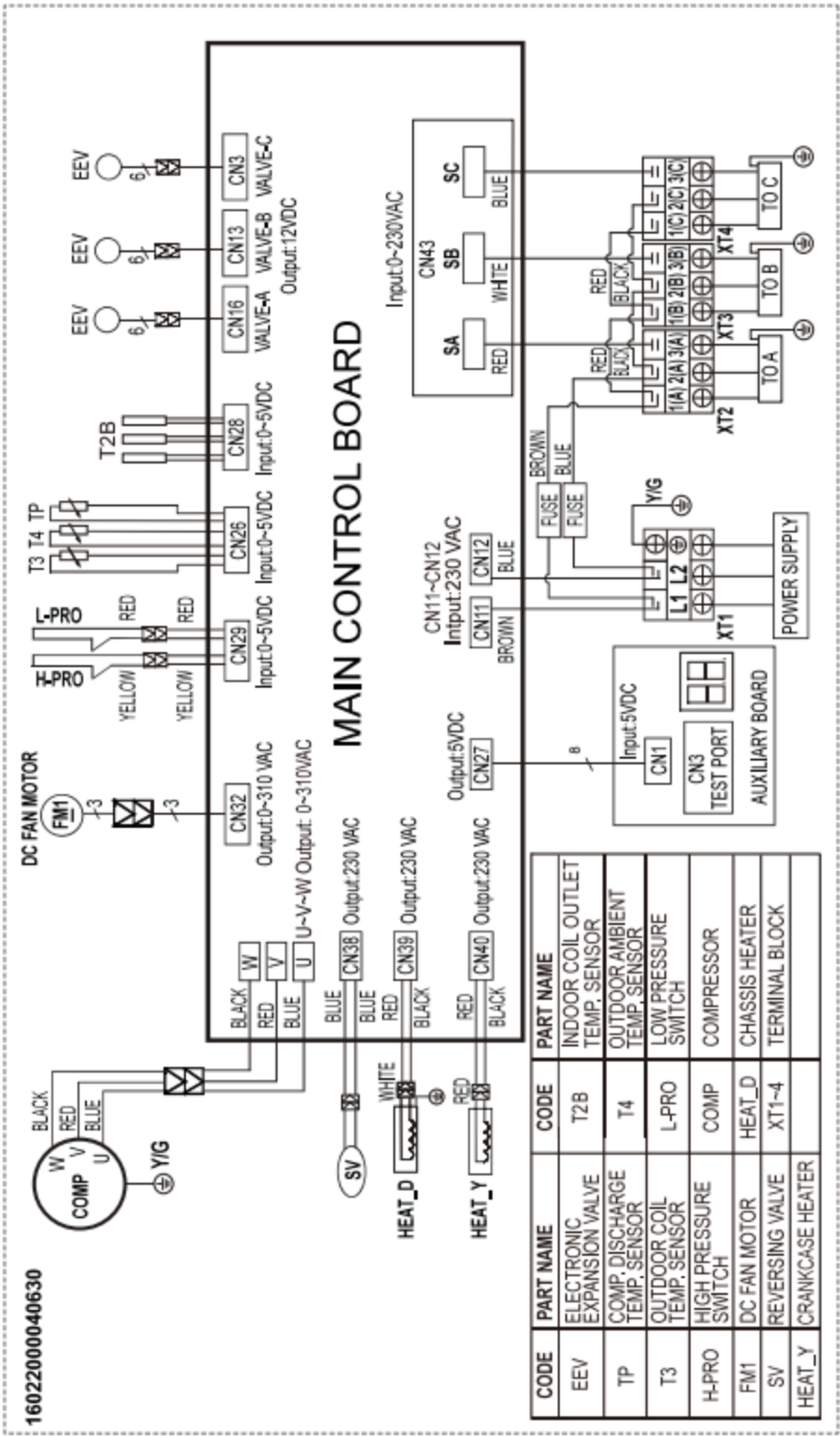


1 SYSTEM OVERVIEW

1.4 Electrical Wiring Diagrams

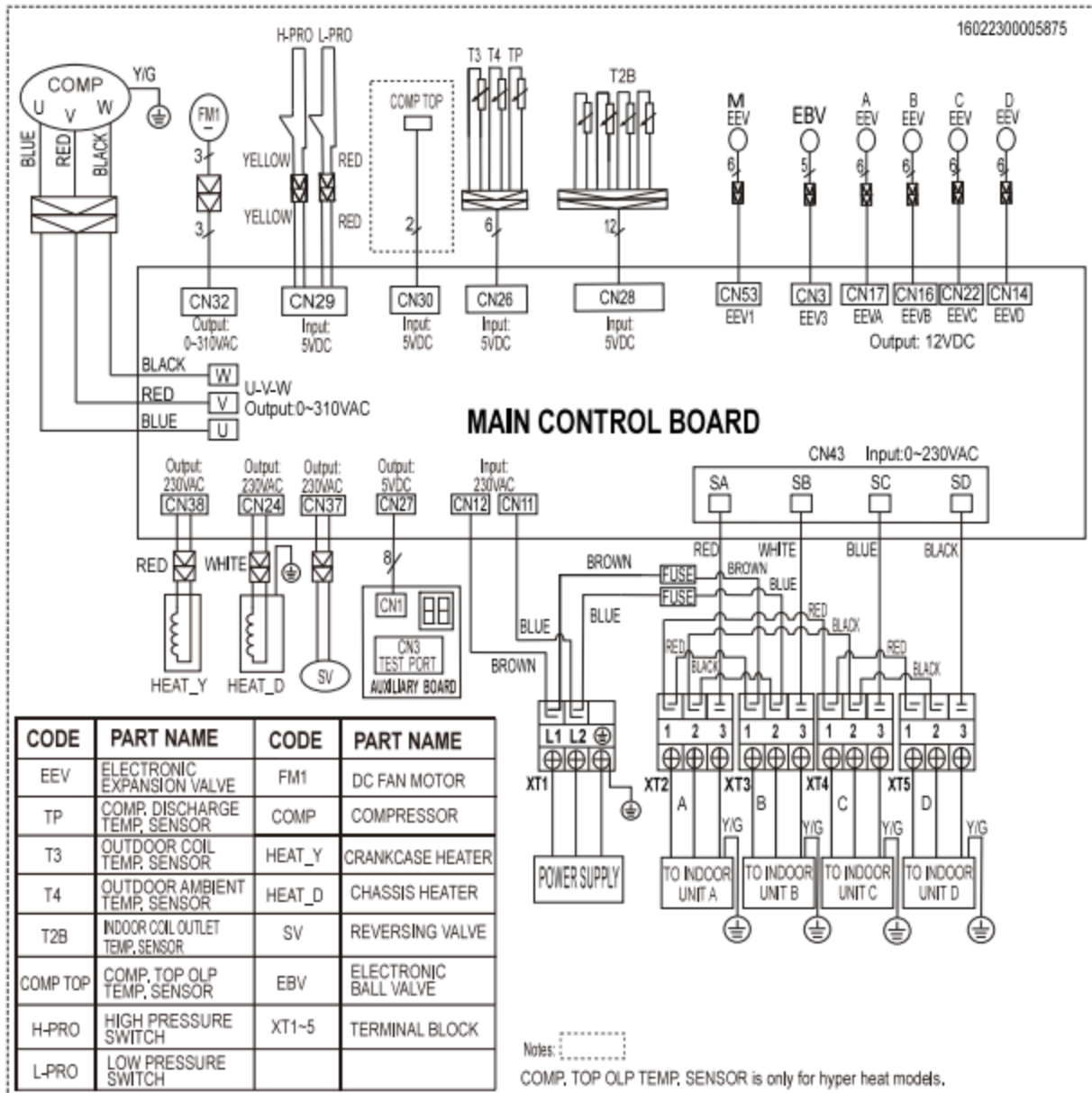
Outdoor Unit		
ODU Model	ODU Wiring Diagram	ODU Printed Circuit Board
DIY-MULTI3-18HP230D-O	16022000040630	17122000062842
DIY-MULTI4-27HP230D-O	16022300005875	17122300008875
DIY-MULTI5-36HP230D-O	16022300005893	
DIY-MULTI6-48HP230-O	16022000041470	
DIY-MULTI6-55HP230D-O		

Outdoor unit wiring diagram: 16022000040630

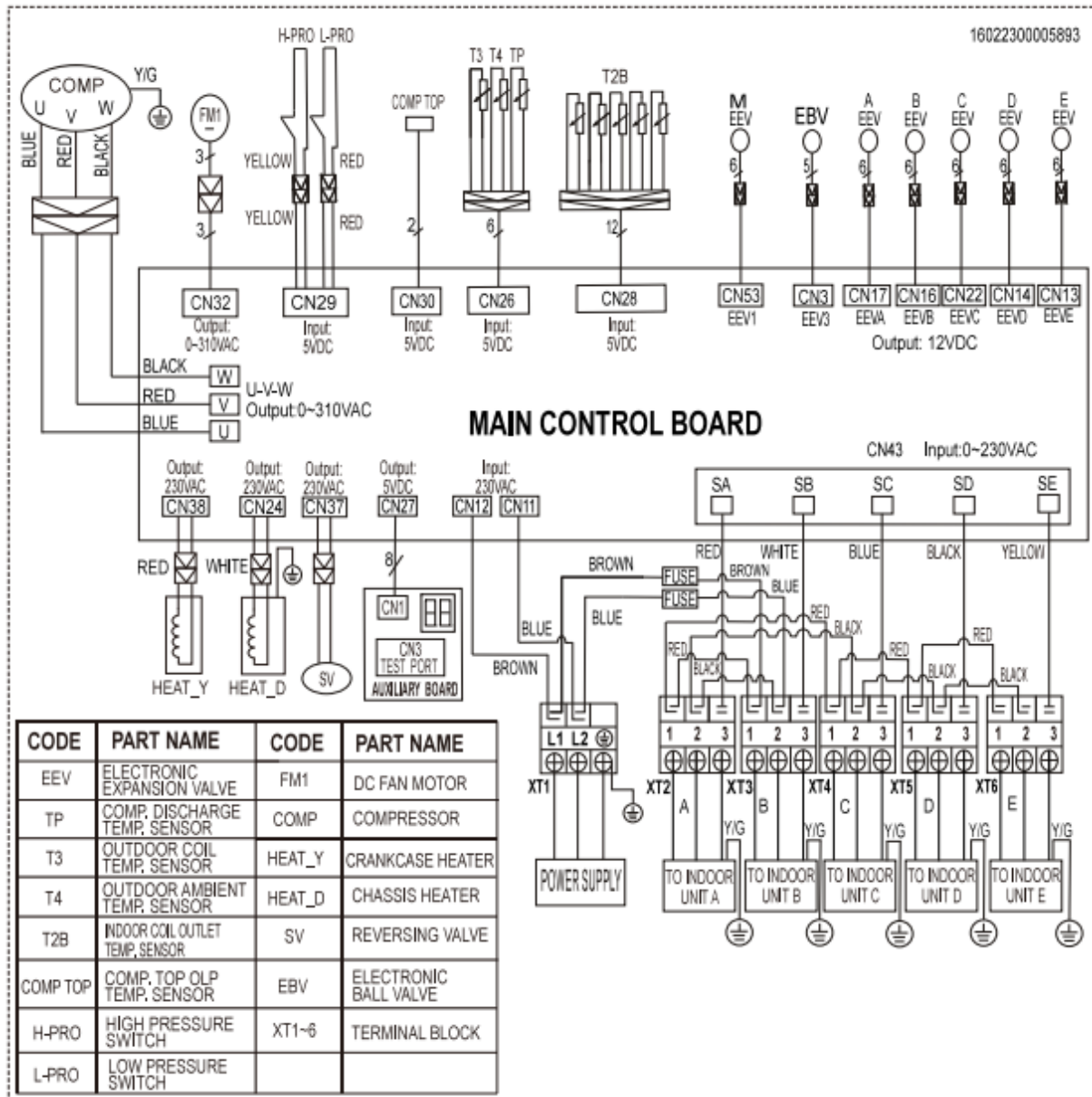


1 SYSTEM OVERVIEW

Outdoor unit wiring diagram: 16022300005875

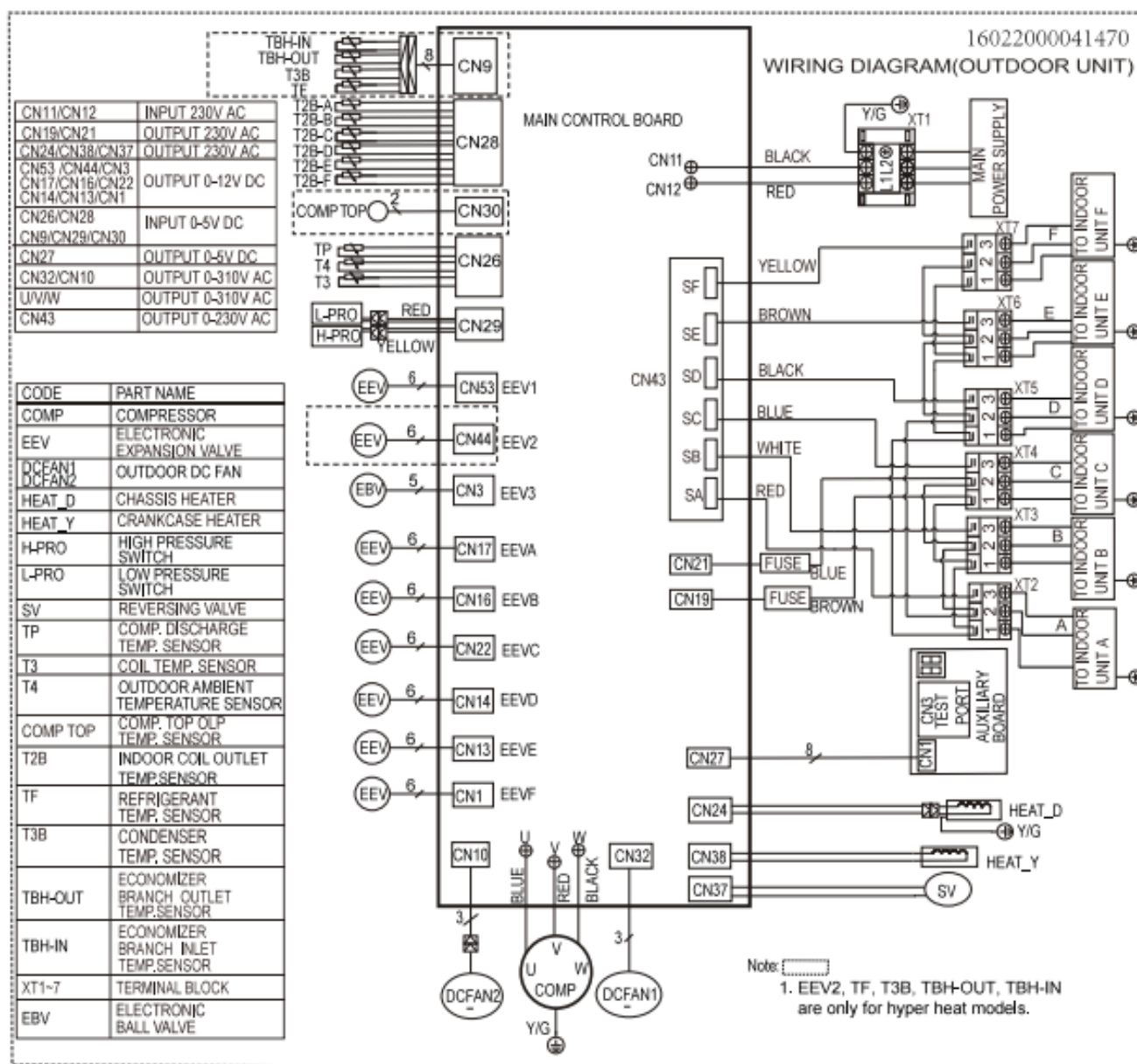


Outdoor unit wiring diagram: 16022300005893



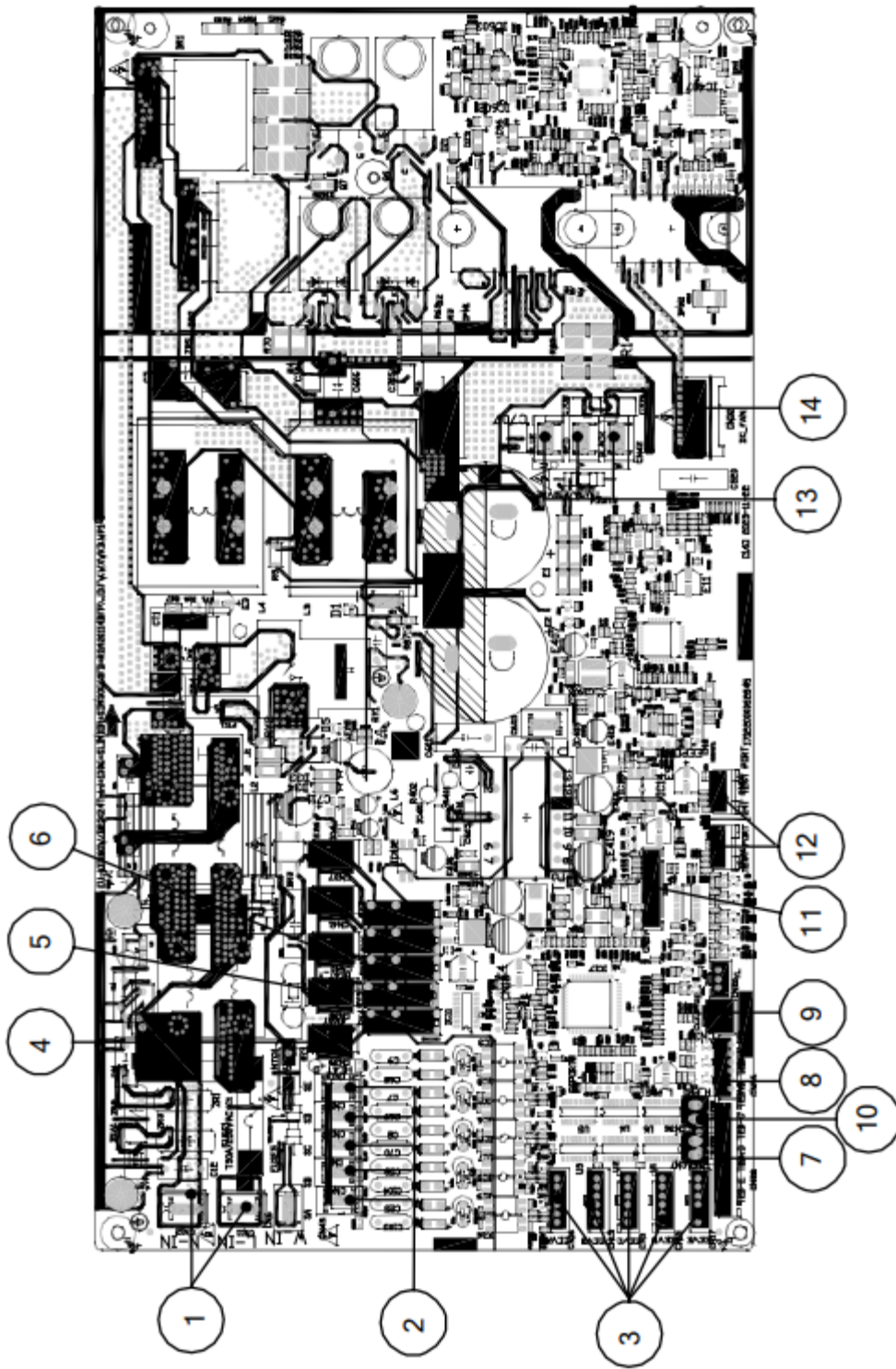
1 SYSTEM OVERVIEW

Outdoor unit wiring diagram: 16022000041470



1

Outdoor unit printed circuit board diagram: 16022300005893

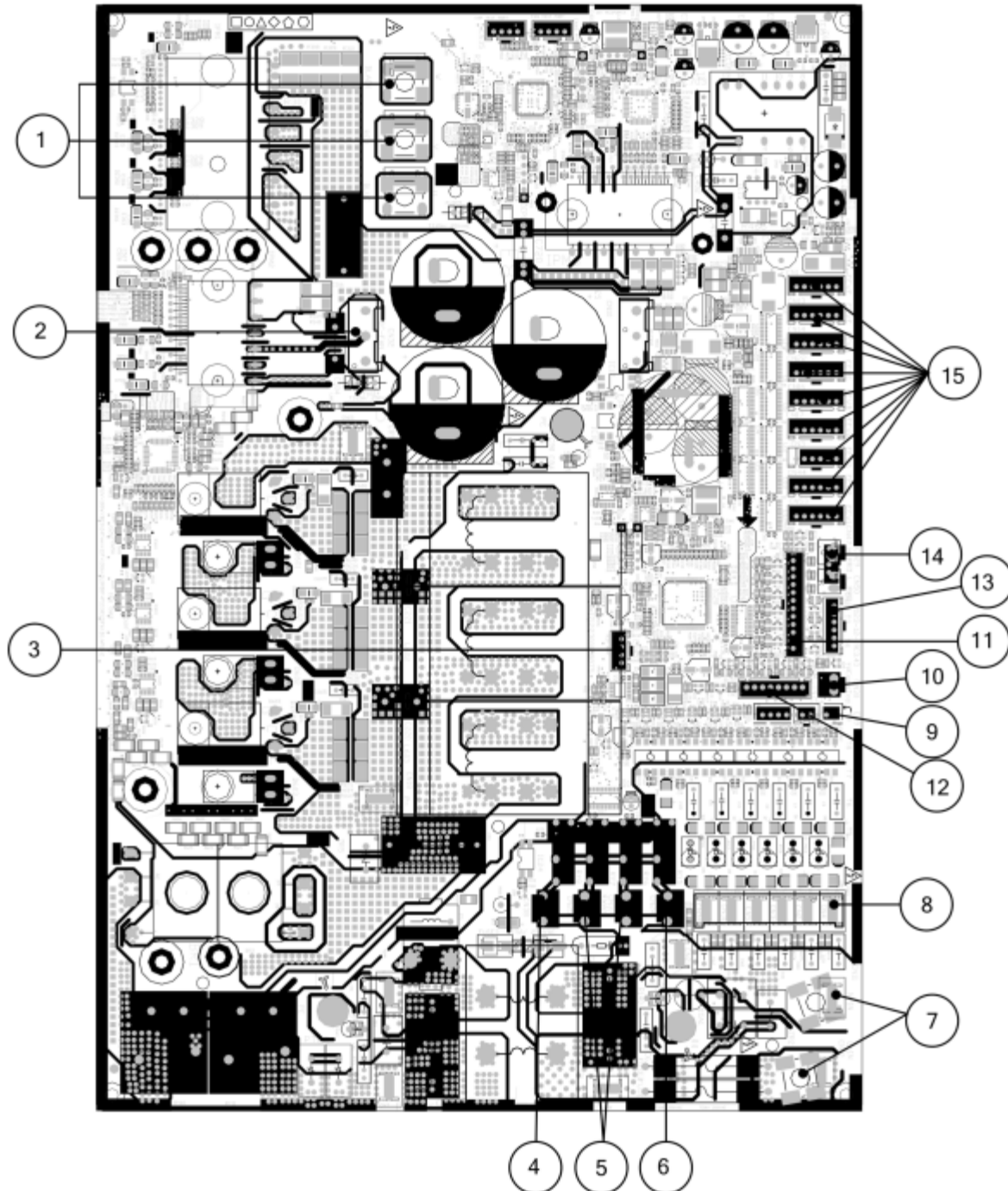


1 SYSTEM OVERVIEW

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



1 SYSTEM OVERVIEW

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:

- 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.
- After the unit runs continuously for a period of time, the unit will run the oil return program to increase the compressor frequency.

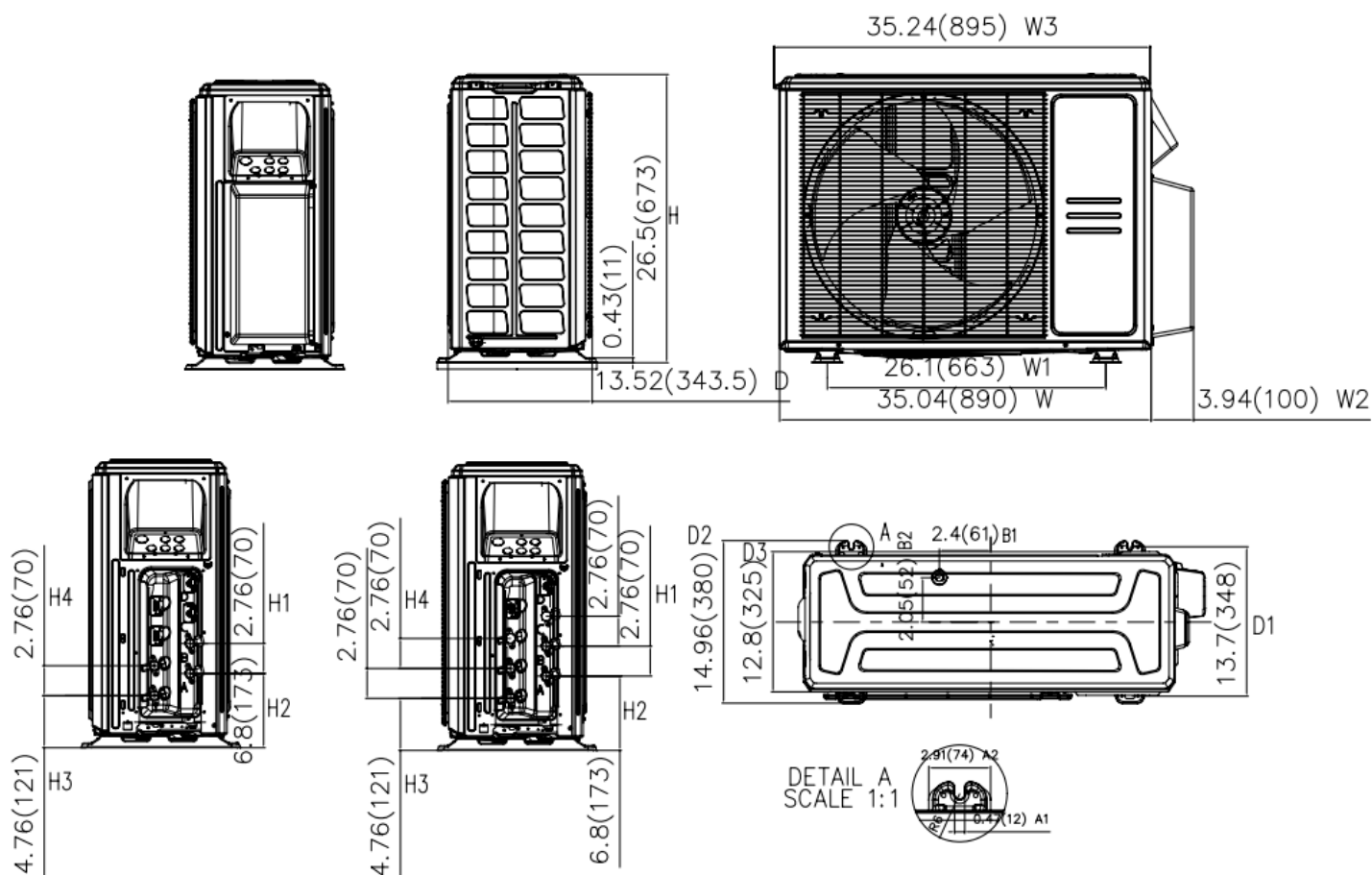
2 DISASSEMBLY

2.1 Outdoor Unit Dimensions

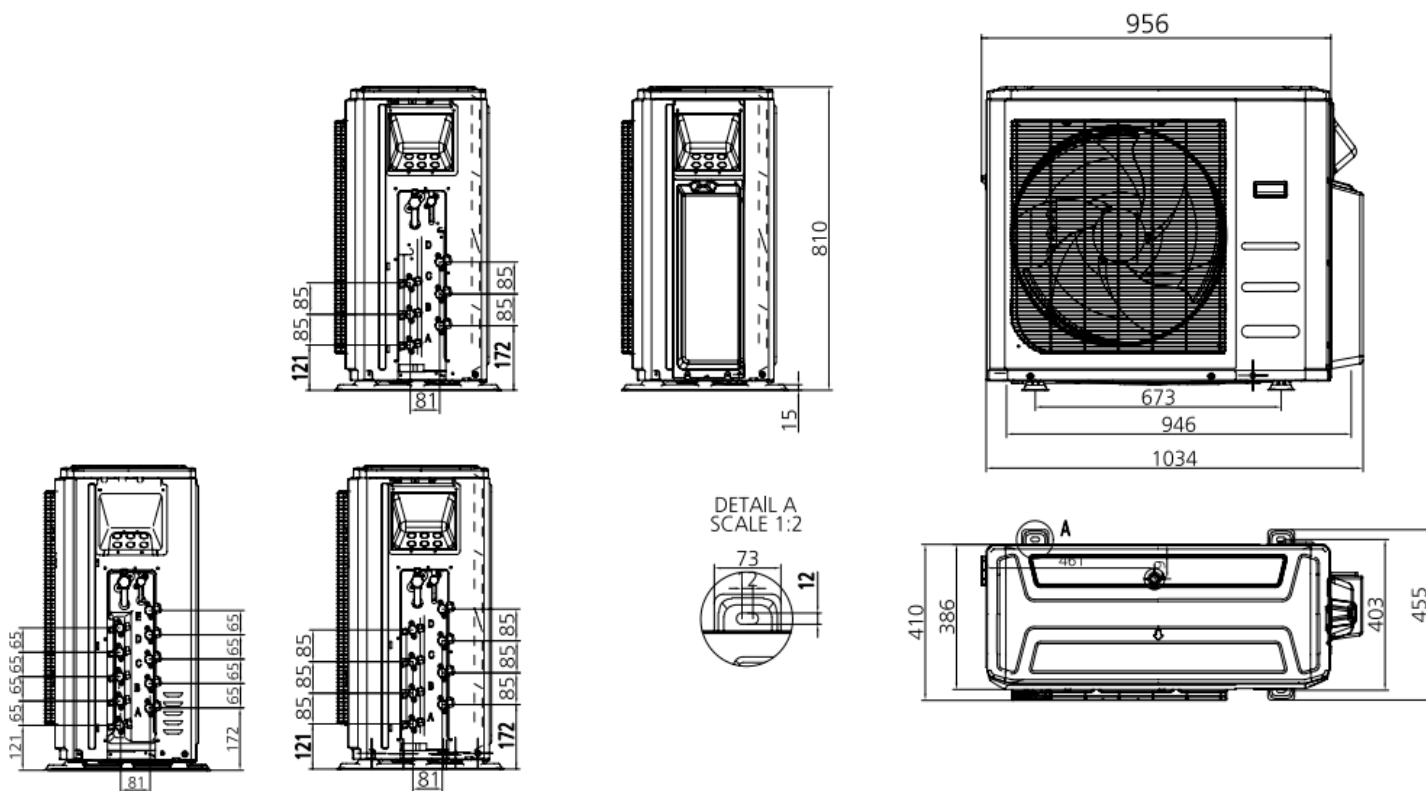
Outdoor Unit Table:

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

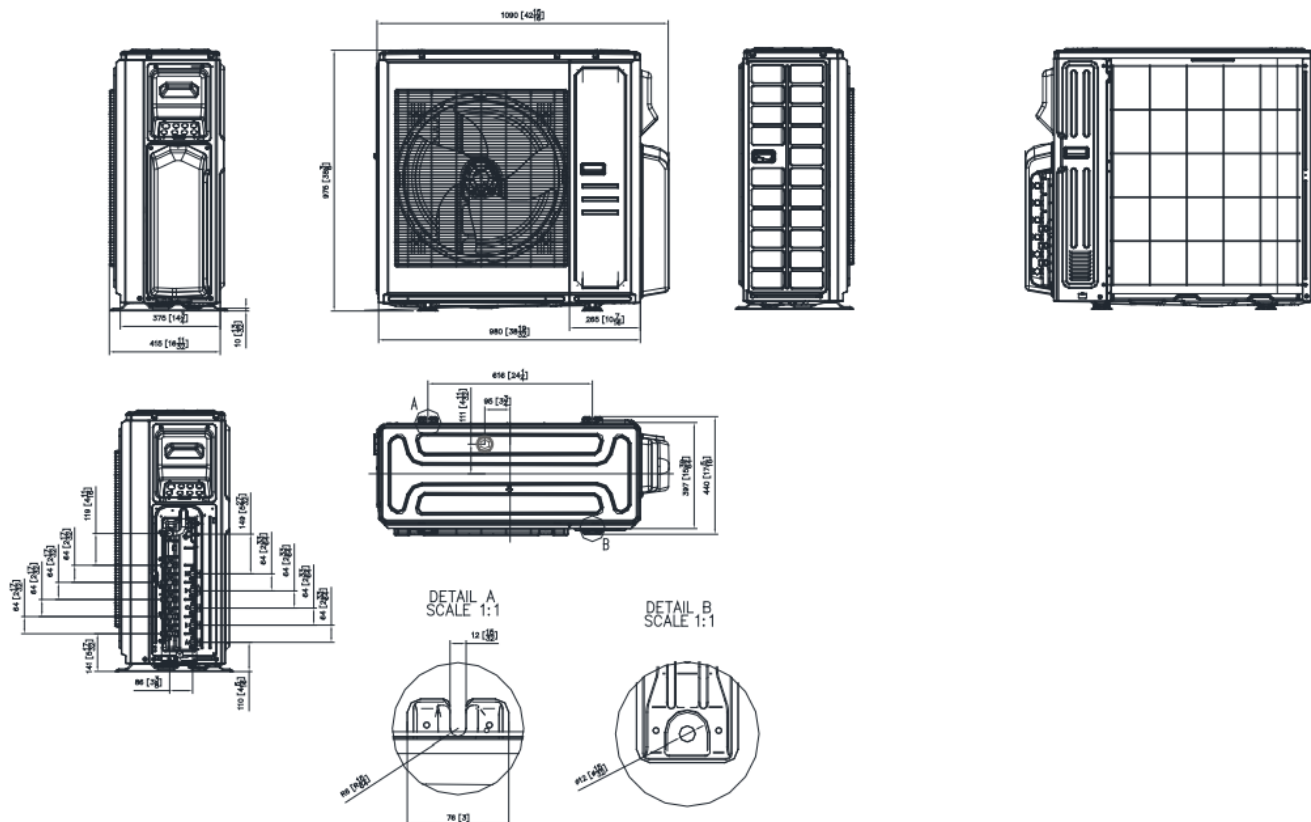
Dimensions of Panel Plate X430 (1 drive 2 & 1 drive 3):



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

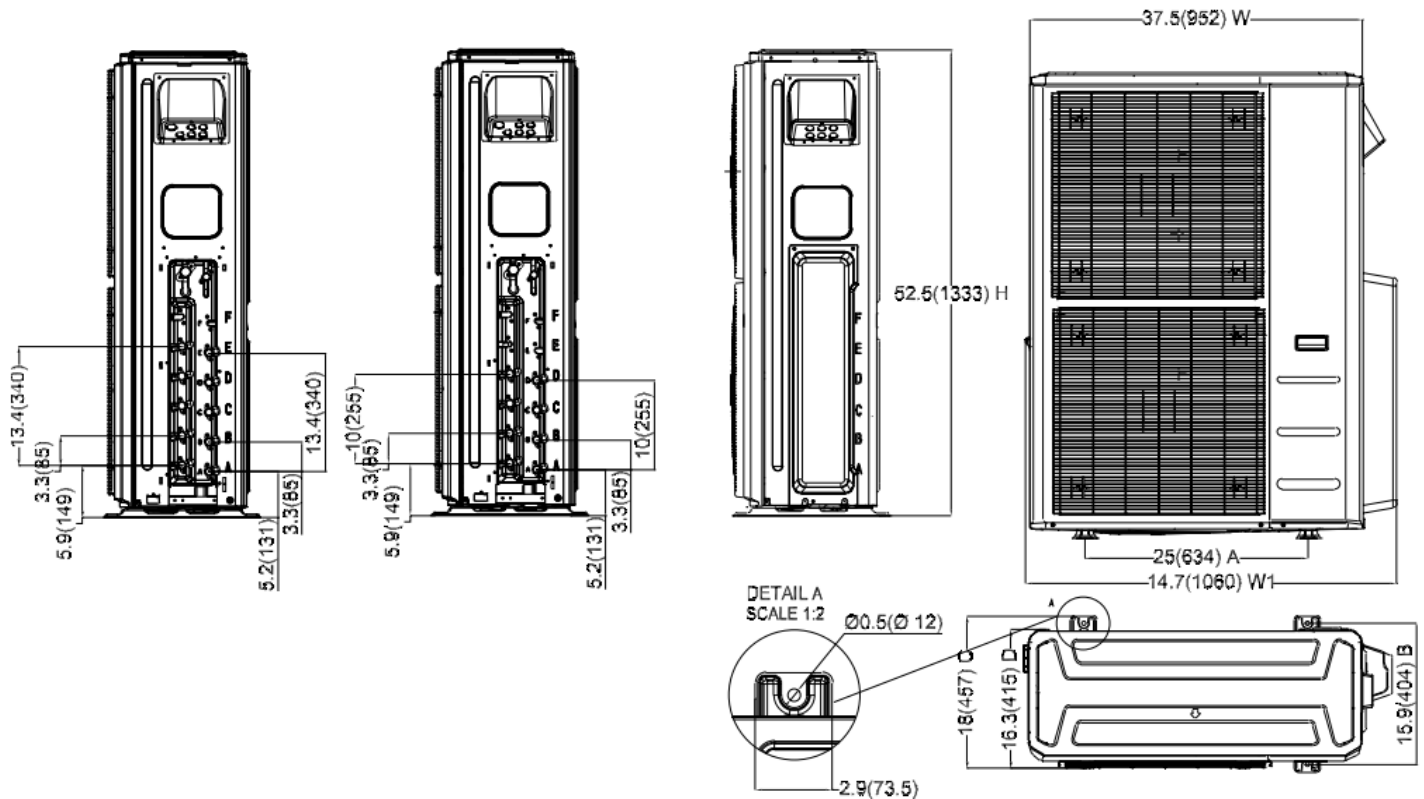


Dimensions of Panel Plate X630 (1 drive 5):

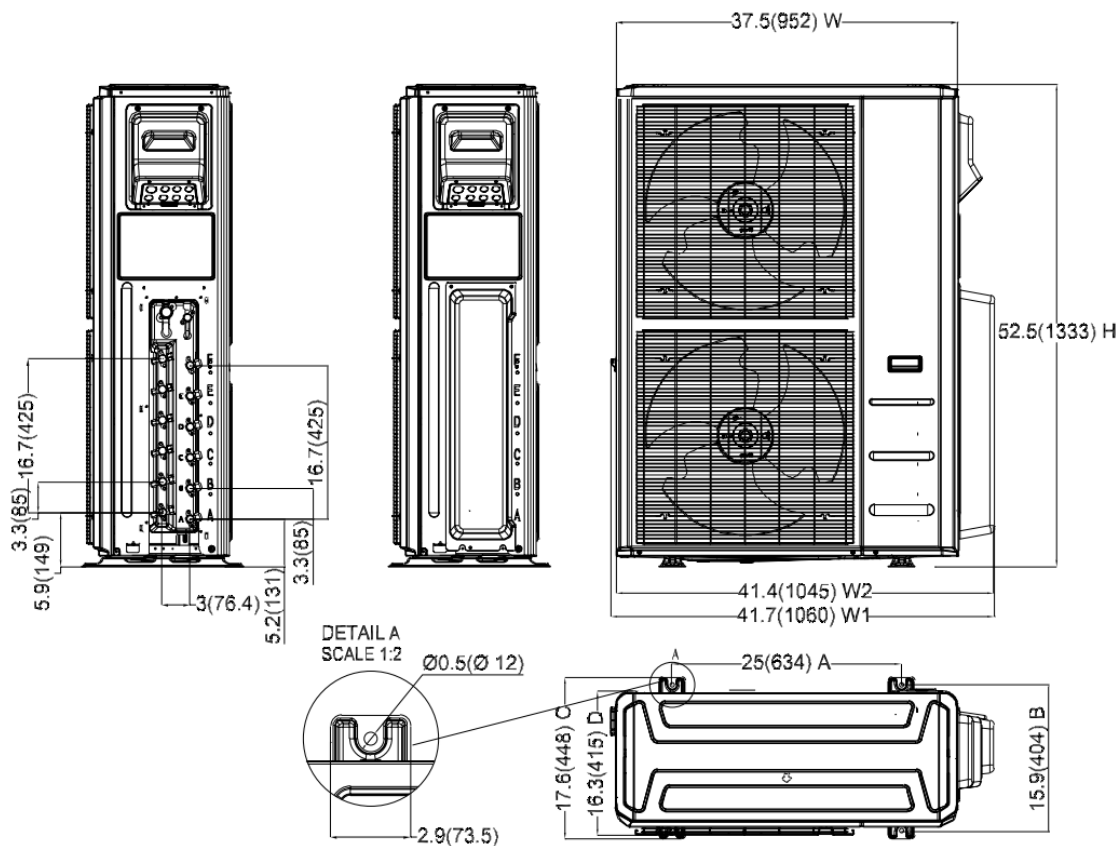


2 DISASSEMBLY

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



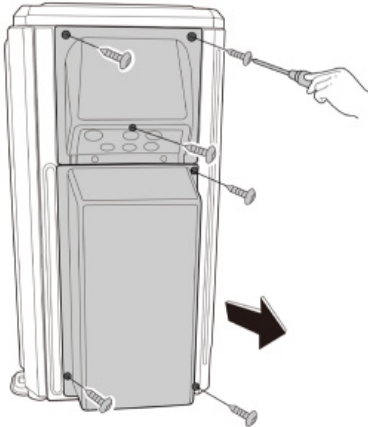
Dimensions of Panel Plate E30 (1 drive 6):



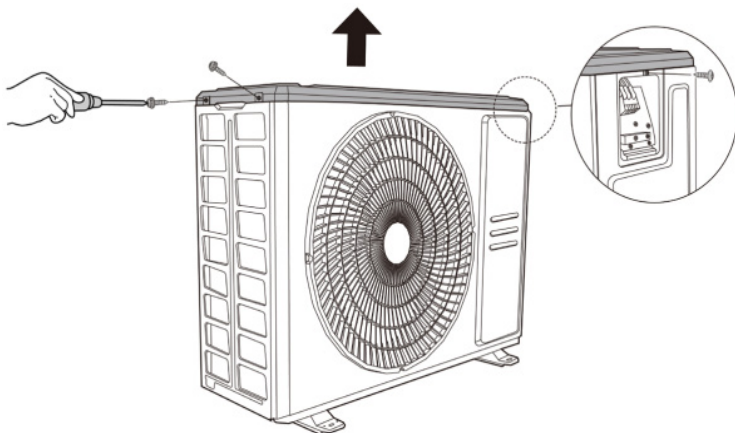
2.2 Outdoor Unit Disassembly

Panel Plate X40:

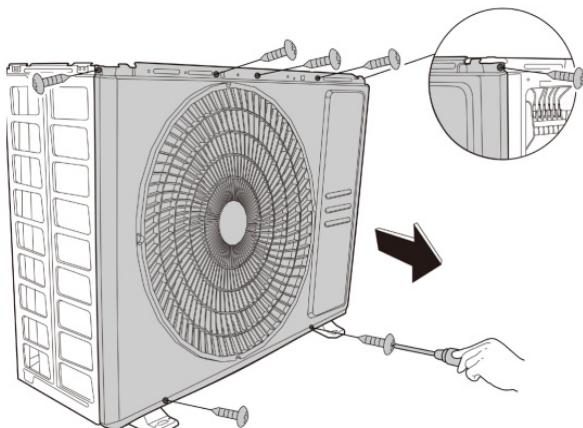
1. Turn off the air conditioner and the power breaker.
2. Remove the screws of the big handler assembly and water collector (6screws).



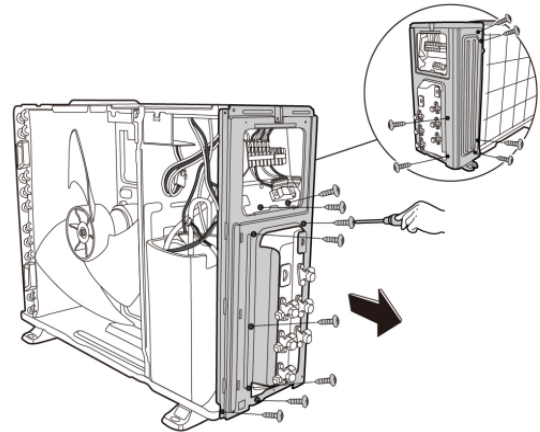
3. Remove the screws of the top cover and then remove the top cover (3 screws). One of the screws is located underneath the big handle.



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).



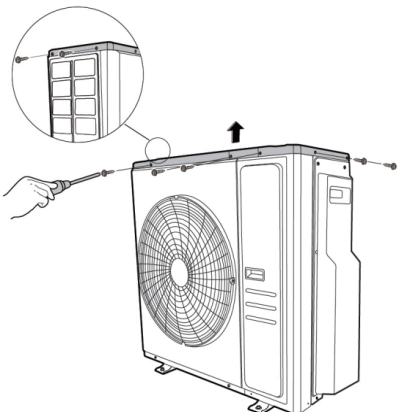
Note: This section is for reference only. Actual appearance may vary.

2 DISASSEMBLY

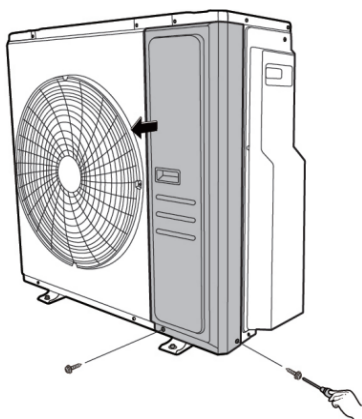
Panel Plate X40:

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

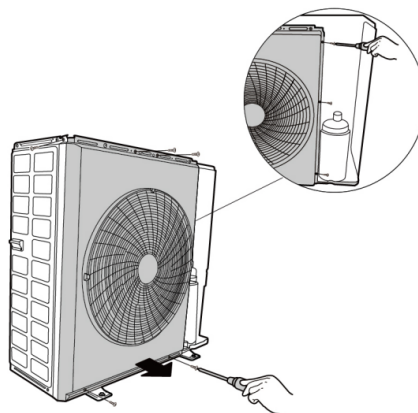
2. Remove the screws of the top cover then remove the top cover (7screws).



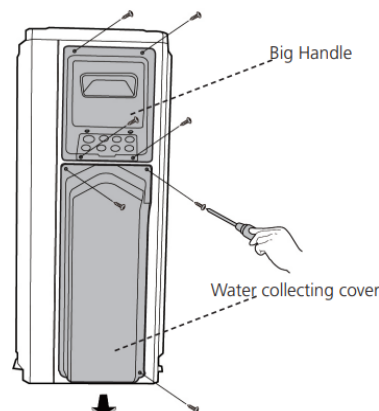
3. Remove the screws of the front right panel and then remove the front right panel (2 screws).



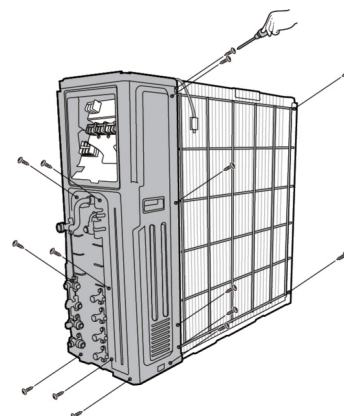
4. Remove the screws of the front panel and then remove the front panel (8 screws).



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



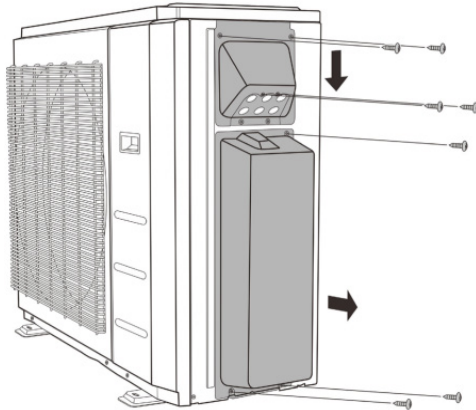
6. Remove 4 screws of the rear grille and 11 screws of the right-rear panel, then remove the rear grille and right-rear panel.



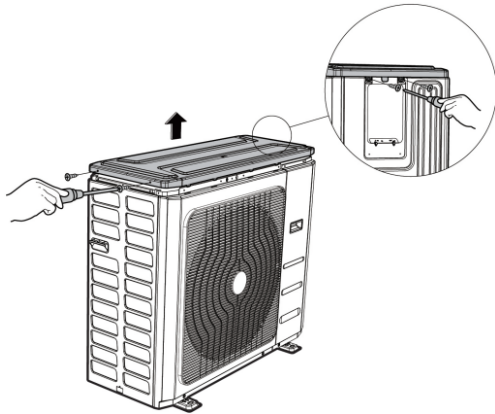
Note: This section is for reference only. Actual appearance may vary.

Panel Plate X40:

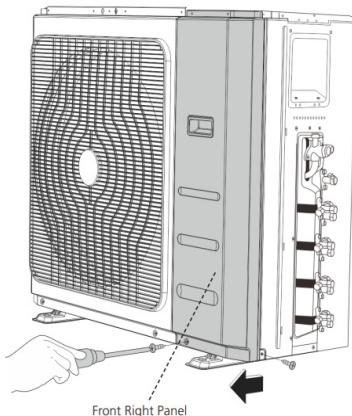
1. Turn off the air conditioner and the power breaker.
2. Remove four screws and then remove the big handle.
3. Remove three screws and then remove the water collecting cover.



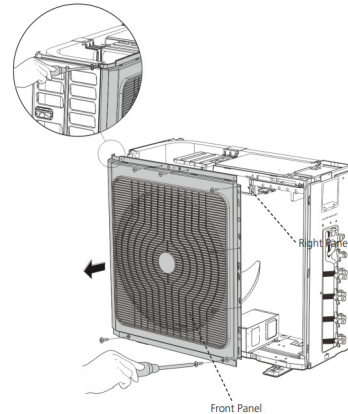
4. Remove the screws of the top cover and then remove the top cover (4 screws). Two of the screws are located under the big handle.



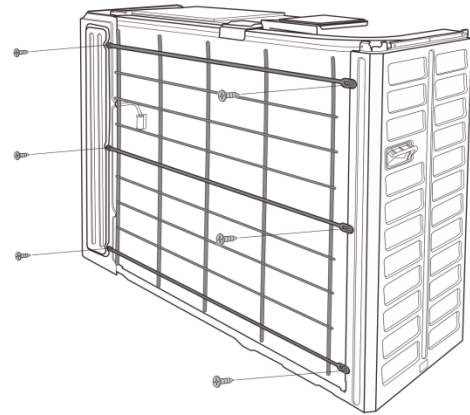
4. Remove the screws of the front right panel and then remove the front right panel (2 screws).



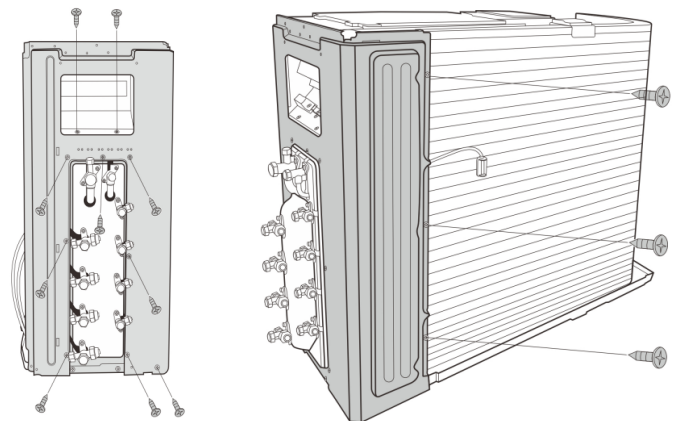
6. Remove the screws of the front panel and then remove the front panel (9 screws).



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).

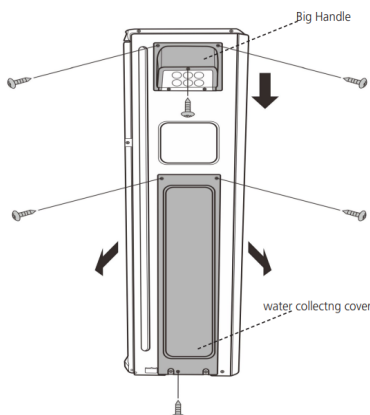


Note: This section is for reference only. Actual appearance may vary.

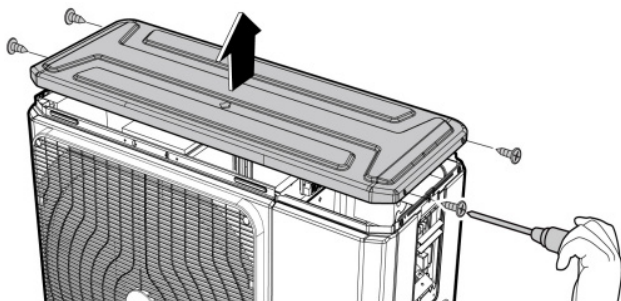
2 DISASSEMBLY

Panel Plate E30:

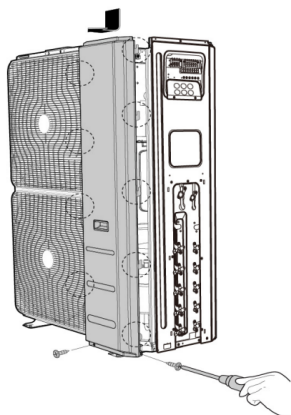
1. Turn off the air conditioner and the power breaker.
2. Remove the screws of the big handle and then remove it (3 screws).
3. Remove the screws of the water collector and the remove it (3 screws).



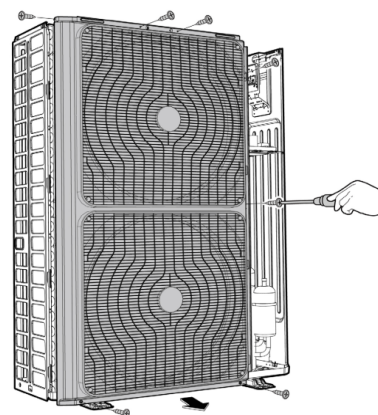
4. Unfix the four screws of the top cover and then remove it.



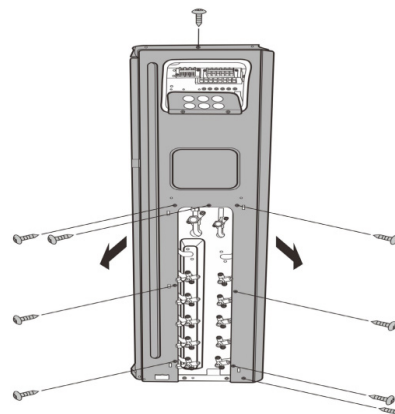
5. Remove the two screws of the right front panel and then push it down to unhook the right front panel from the 9 hooks.



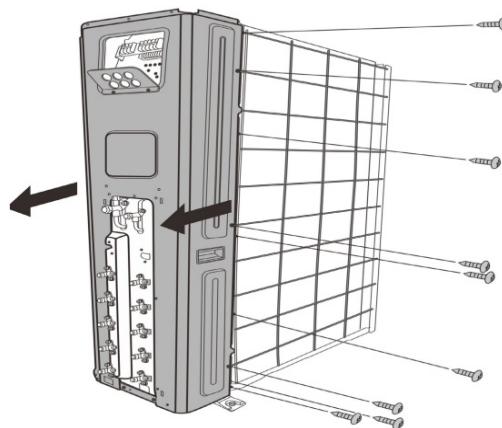
6. Remove the 7 screws of the front panel and then remove the front panel.



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

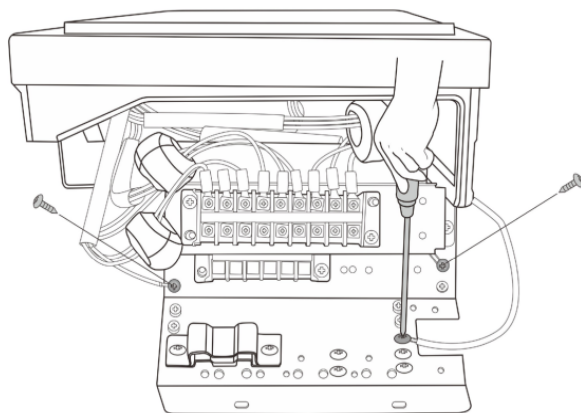
While checking the indoor/outdoor PCB, please equip yourself with anti-static gloves or a wrist strap to avoid damaging the board.

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

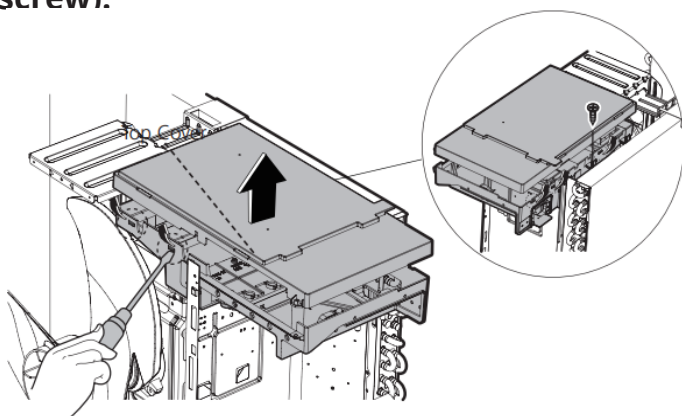
Note: Remove the air outlet grille before disassembling electrical parts.

Electrical Parts of PCB Board 1:

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



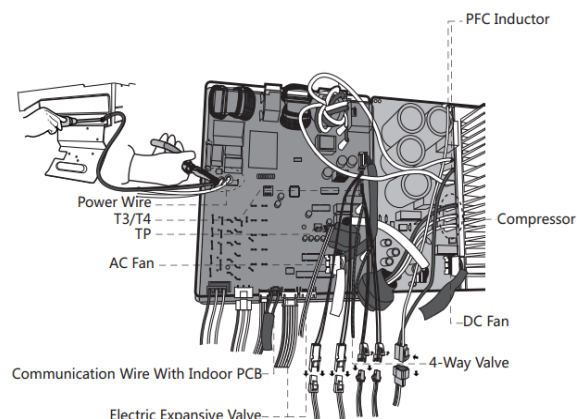
2. Unfix the hooks and screws and then open the electronic control box cover (5 hooks and 1 screw).



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 valve wire.
8. Disconnect the communication wire indoor PCB.

9. Disconnect the PFC inductor.

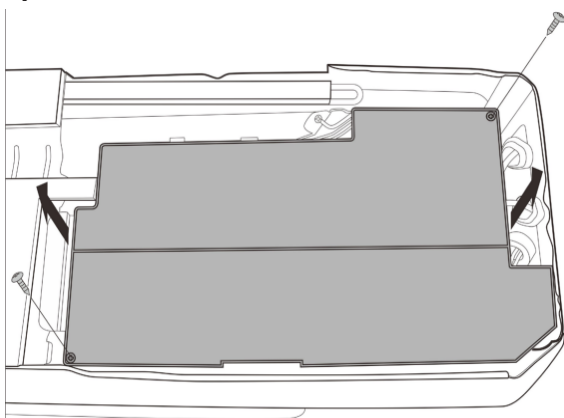
10. Then remove the electronic control box.



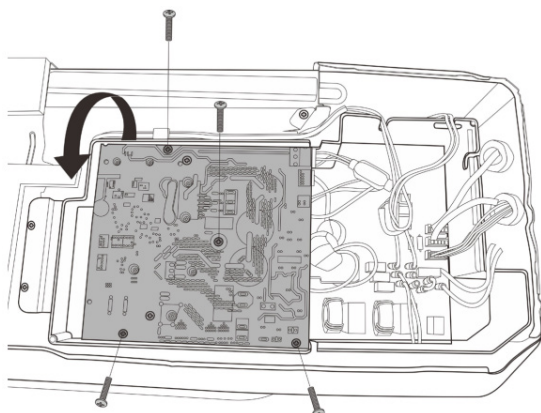
Note: This section is for reference only. Actual appearance may vary.

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.

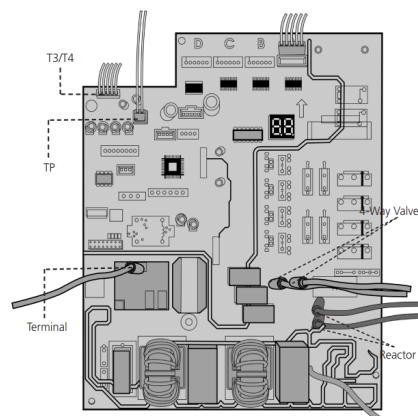
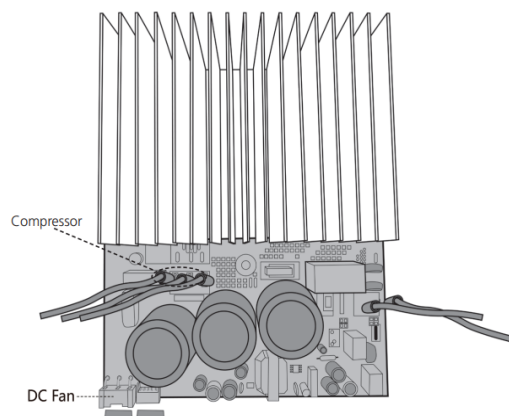
6. Pull out connectors of the condenser coil temp. (T3), outdoor ambient temp. sensor (T4), and discharge temp. sensor (TP).

7. Disconnect the electronic expansion valve wires.

8. Disconnect the communication wires to the indoor PCB.

9. Disconnect the PFC inductor.

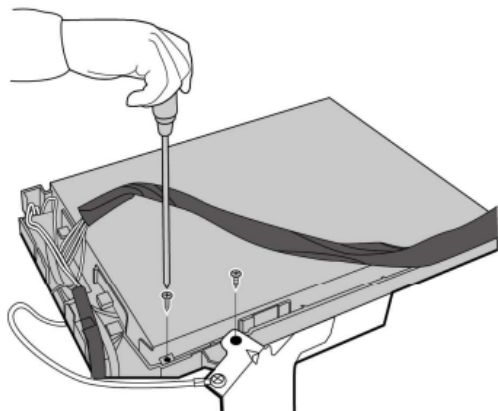
10. Then remove the electronic control box.



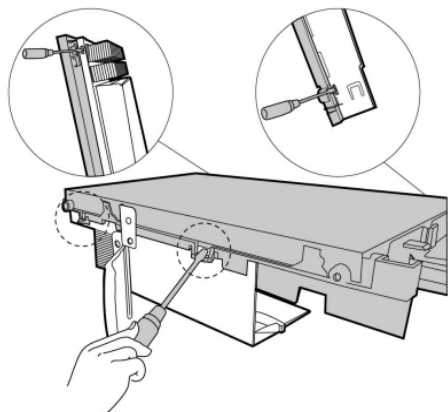
Note: This section is for reference only. Actual appearance may vary.

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.

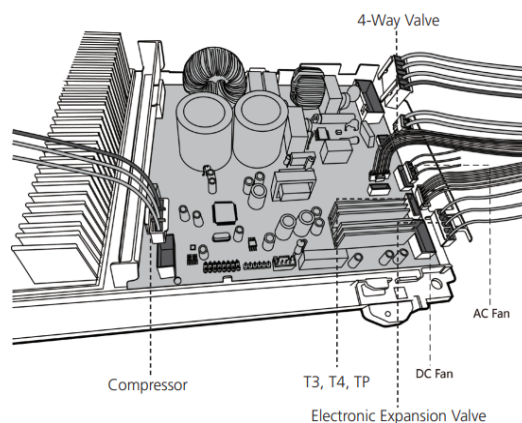
4. Remove the connector for the compressor.

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.

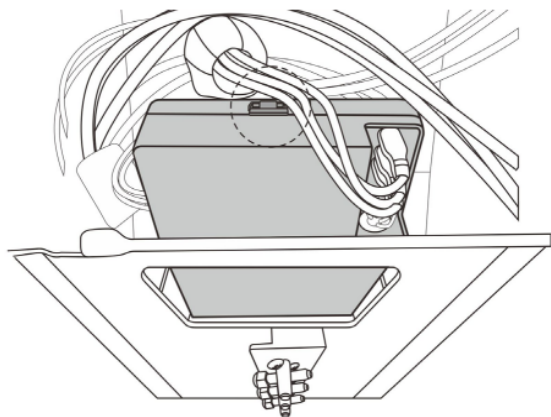


Note: This section is for reference only. Actual appearance may vary.

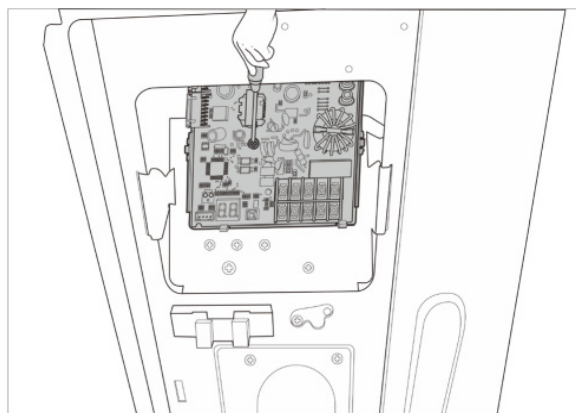
2 DISASSEMBLY

Electrical Parts of PCB Board 3:

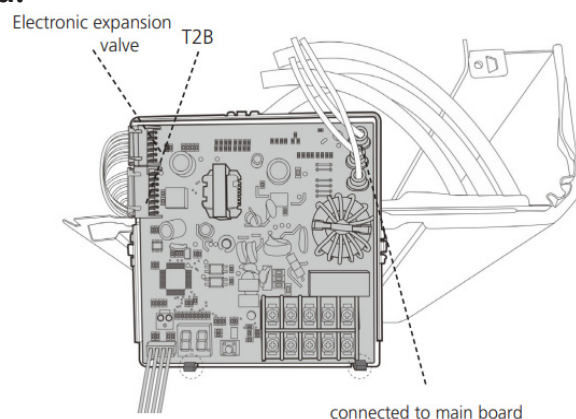
1. Unfix the hooks and then remove the electronic installing box (2 screws).



2. Remove the one screw of the module board.

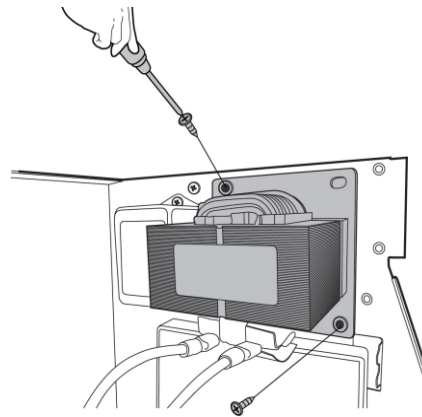


3. Disconnect the connectors of the module board.

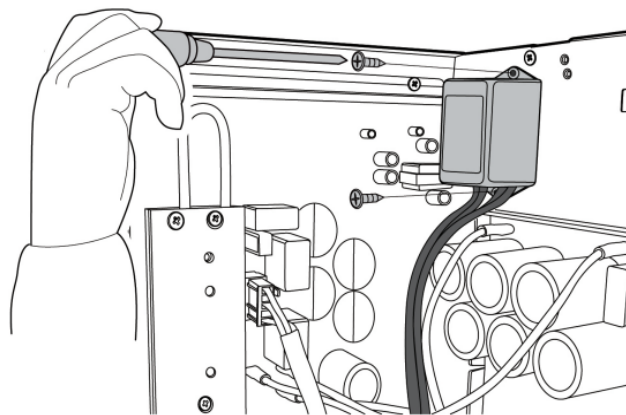


Electrical Parts of PCB Board 4:

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



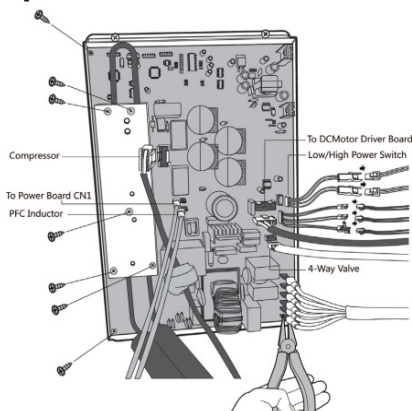
2. Remove the screws and then remove the reactor.



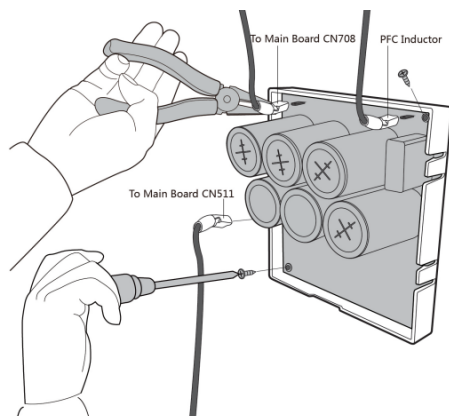
Note: This section is for reference only. Actual appearance may vary.

Electrical Parts of PCB Board 4:

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

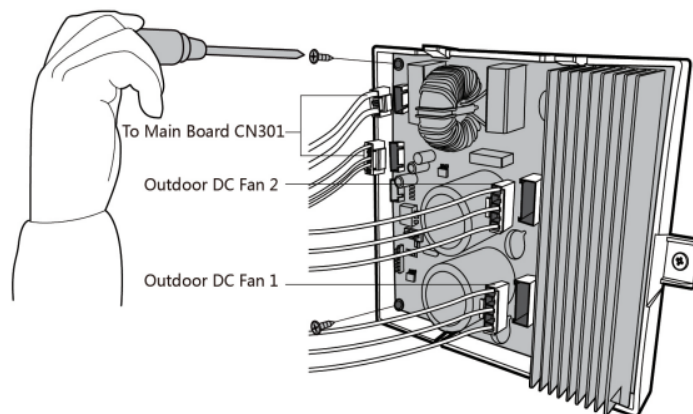


2. Unfix two screws on the main board.
3. Disconnect the connectors on the main board.
4. Unfix two screws on the upper board.
5. Remove the connectors on the upper board.



Electrical Parts of PCB Board 4:

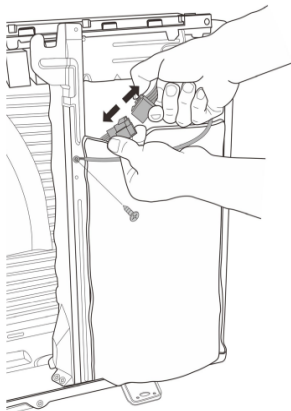
1. Unfix two screws on the bottom board.
2. Disconnect the connectors on the bottom board.



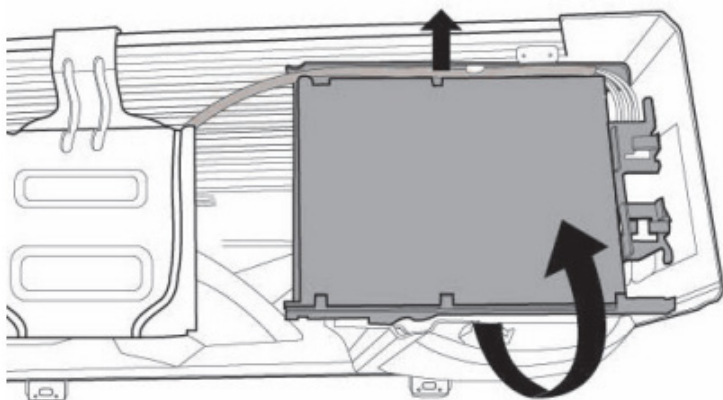
Note: This section is for reference only. Actual appearance may vary.

Electrical Parts of PCB Board 5:

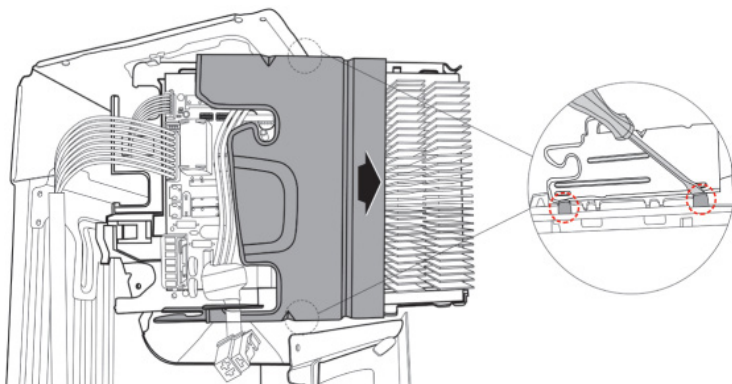
1. Disconnect the connector for the compressor and release the ground wire (1 screw).



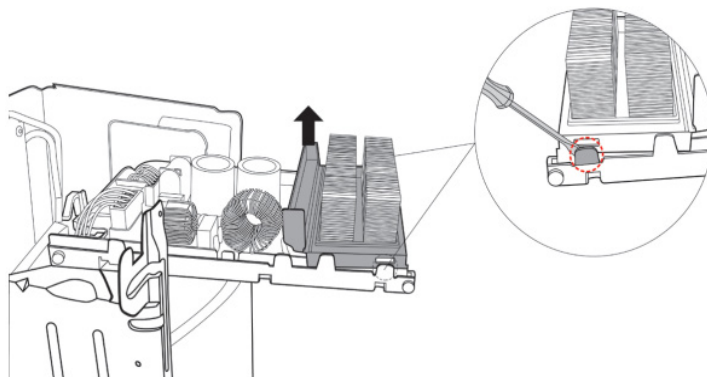
2. Pull out the wires from the electrical supporting plate and turn over the electronic control assembly.



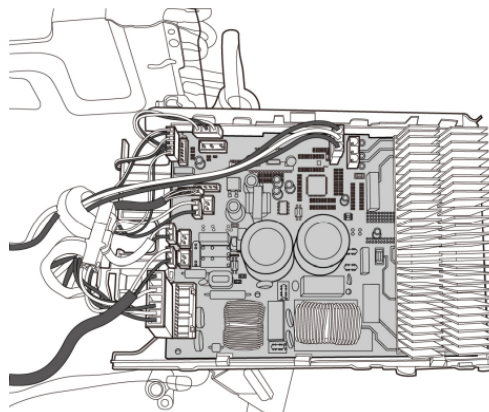
3. Remove the electronic installing box subassembly (4 hooks).



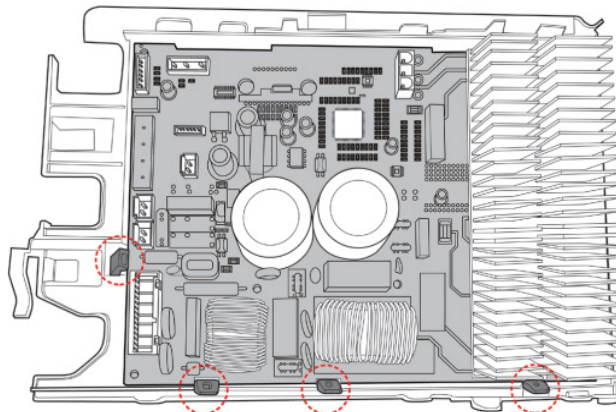
4. Remove the fixing board (2 hooks).



5. Disconnect the connectors from the electronic control board.

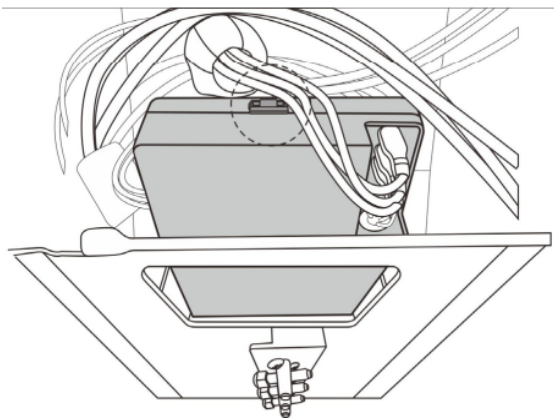


6. Then remove the electronic control box board (4 hooks).

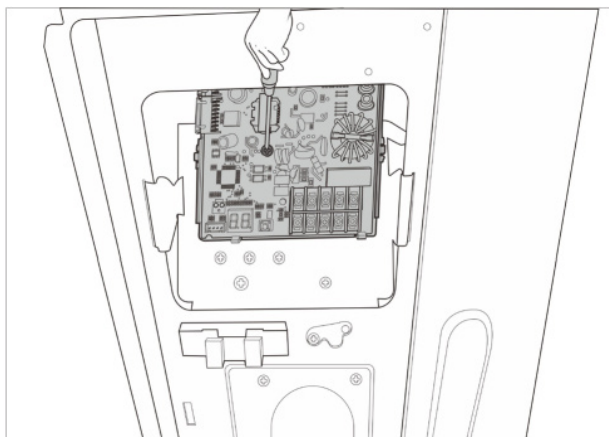


Note: This section is for reference only. Actual appearance may vary.

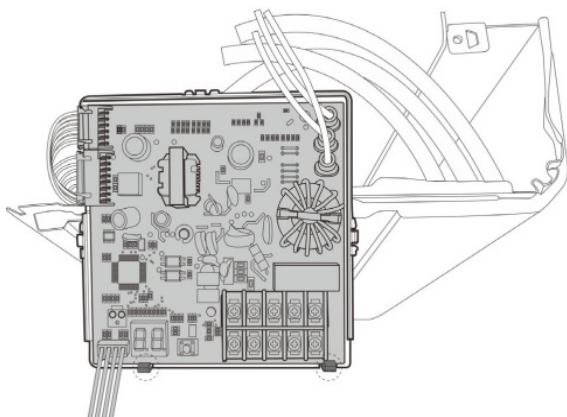
7. Unfix the hooks and then remove the electronic installing box (2 screws).



8. Remove one screw on the module board.

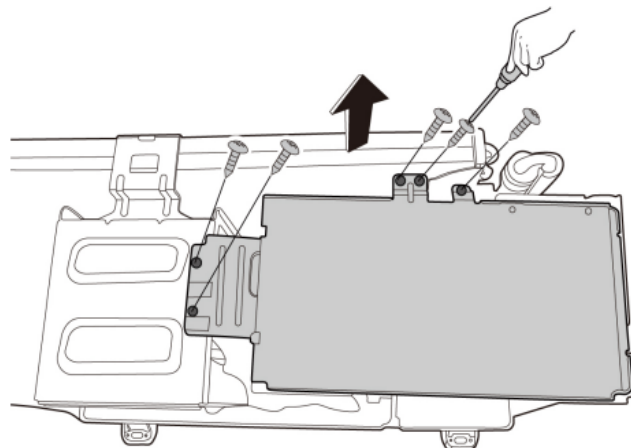


9. Disconnect the connectors of the module board.

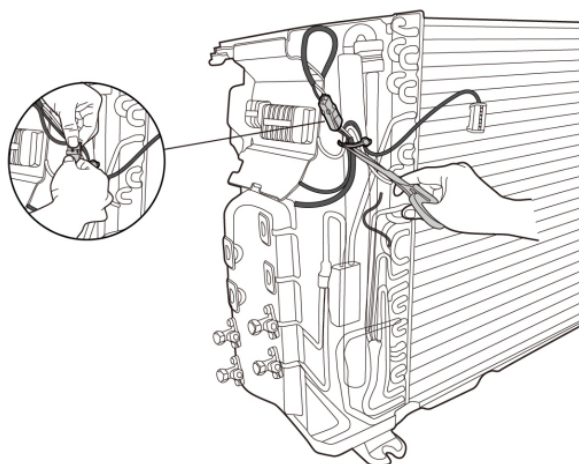


Electrical Parts of PCB Board 6:

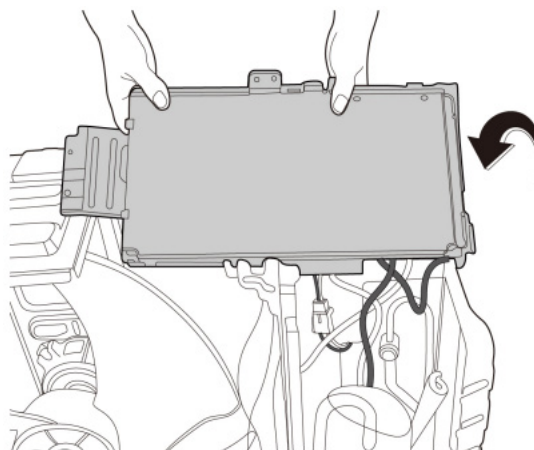
1. Remove 5 screws of the electrical control box cover and remove it.



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



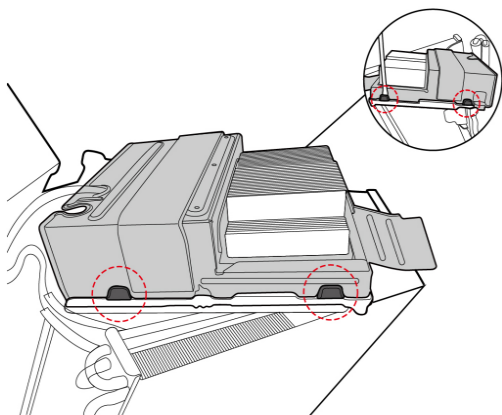
3. Turn over the electronic control box subassembly.



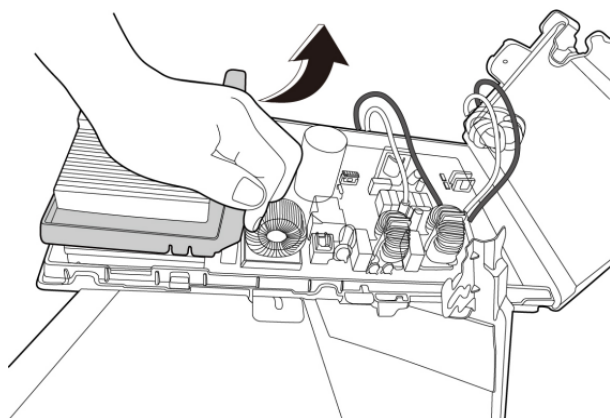
Note: This section is for reference only. Actual appearance may vary.

2 DISASSEMBLY

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

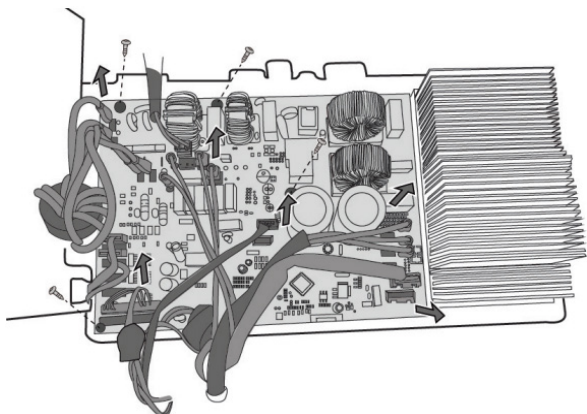


5. Remove the support of the electronic control box.

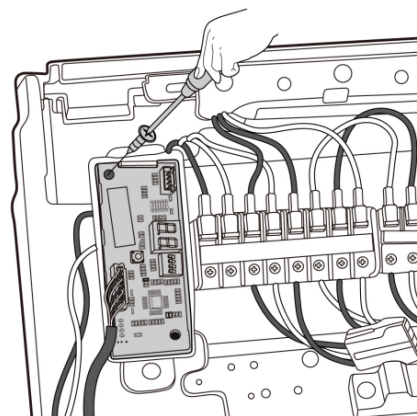


6. Disconnect the connectors from the electronic control board.

7. Remove the 4 screws and then remove the electronic control board.



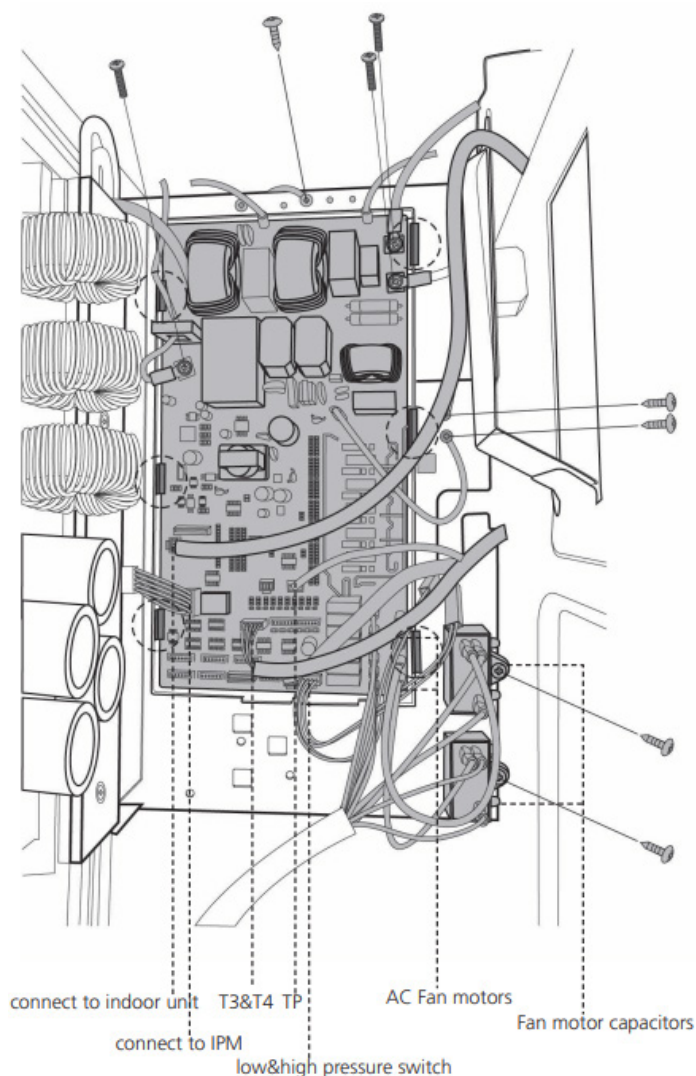
8. Pull out the connector, remove one screw, and then remove the key board subassembly on the terminal board.



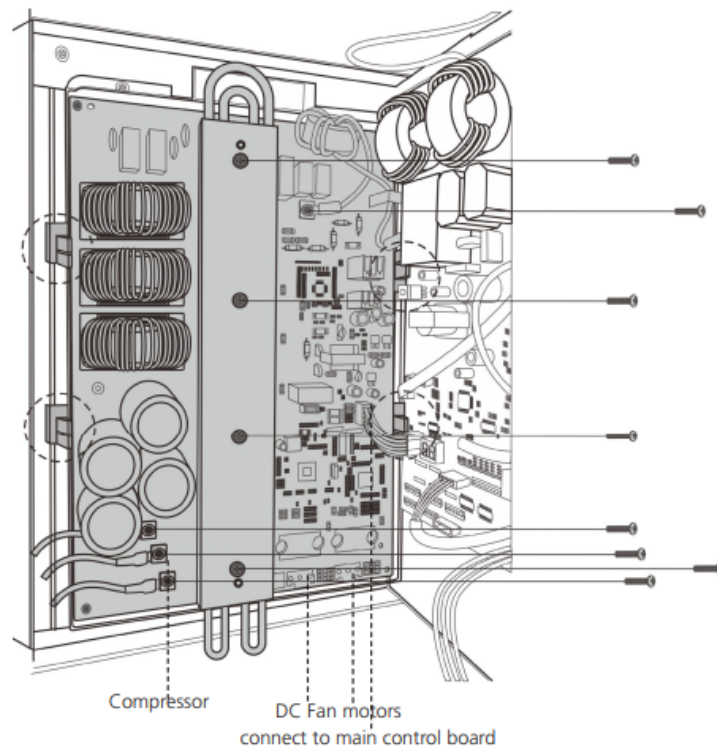
Note: This section is for reference only. Actual appearance may vary.

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).



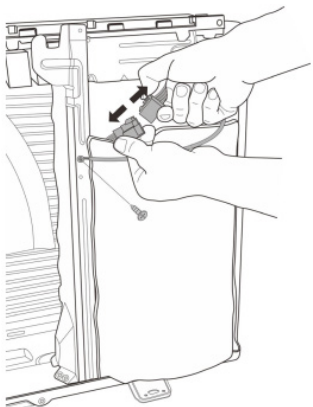
1. Remove 2 screws to disconnect the power supply wires.
2. Remove 3 screws to disconnect the wires connected to the compressor.
3. Remove 3 screws to remove the radiator.
4. Disconnect the wires between the IPM module board and the main control board.
5. Remove the 4 screws and unfix the 4 hooks and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



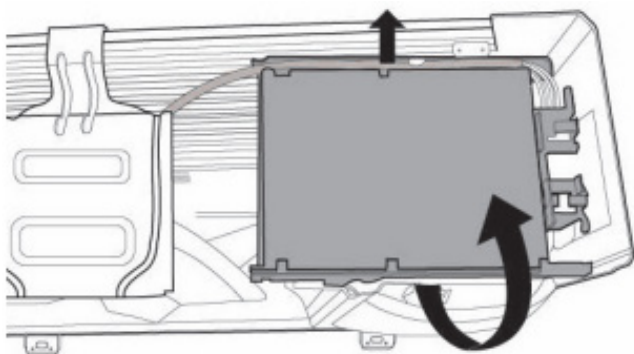
Note: This section is for reference only. Actual appearance may vary.

Electrical Parts of PCB Board 8:

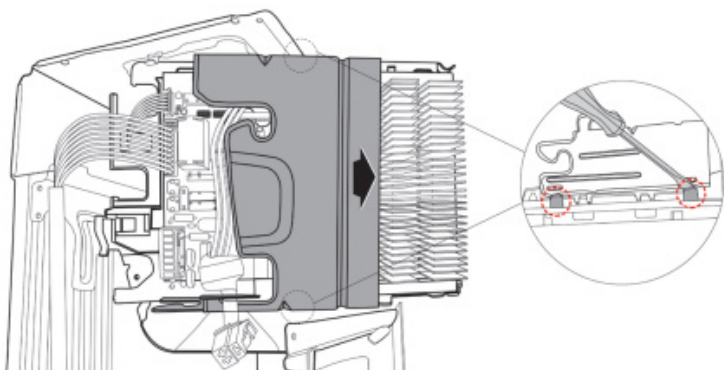
1. Disconnect the connector for the compressor and release the ground wire (1 screw).



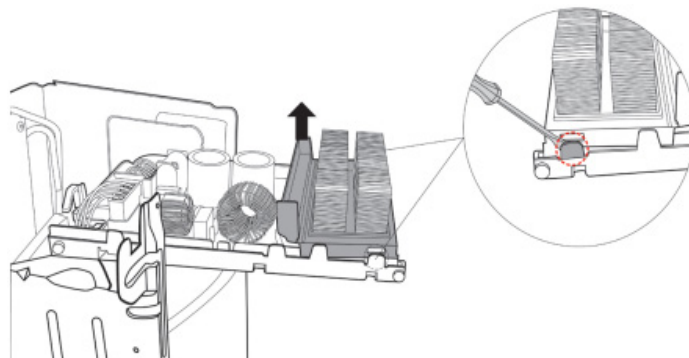
2. Pull out the wires from the electrical supporting plate and turn over the electronic control assembly.



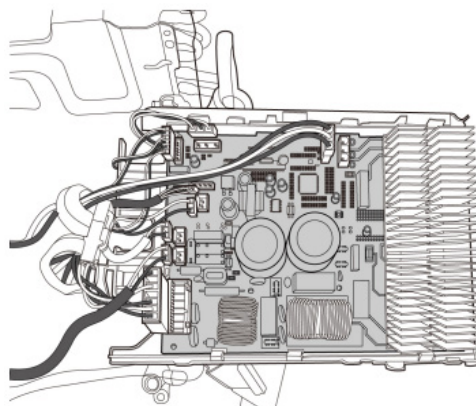
3. Remove the electronic installing box subassembly (4 hooks).



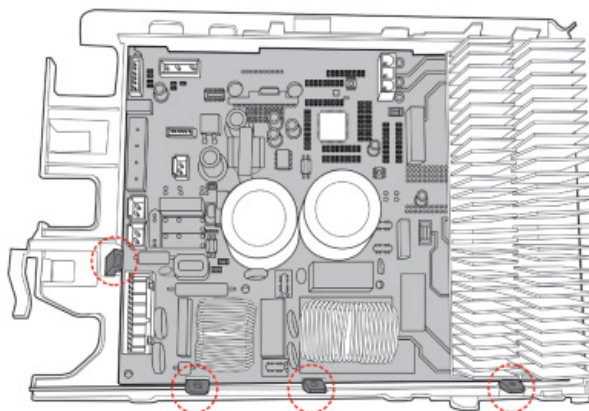
4. Remove the fixing board (2 hooks).



5. Disconnect the connectors from the electronic control board.

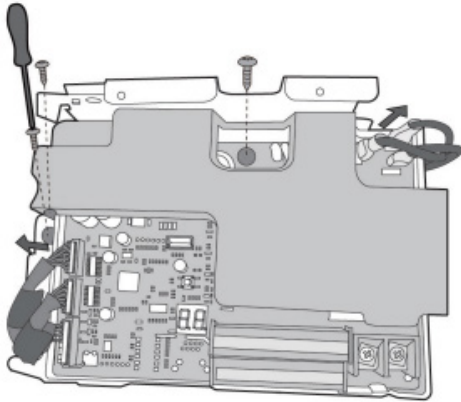


6. Then remove the electronic control board (4 hooks).



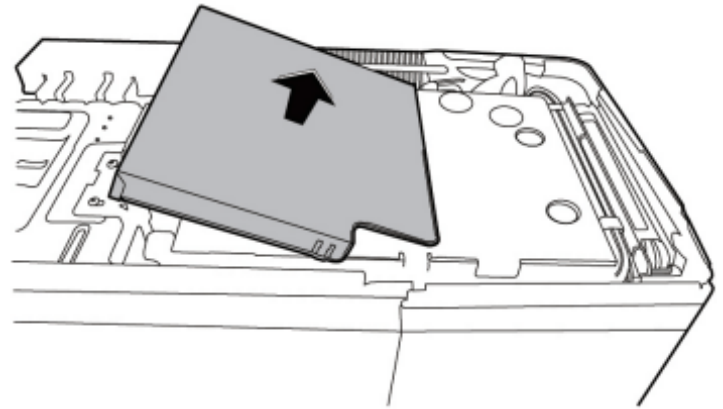
Note: This section is for reference only. Actual appearance may vary.

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.

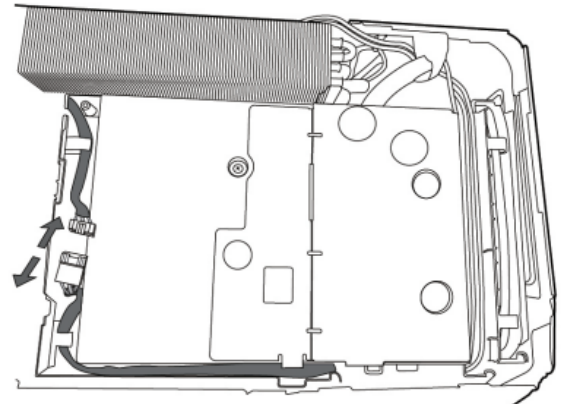


Electrical Parts of PCB Board 9:

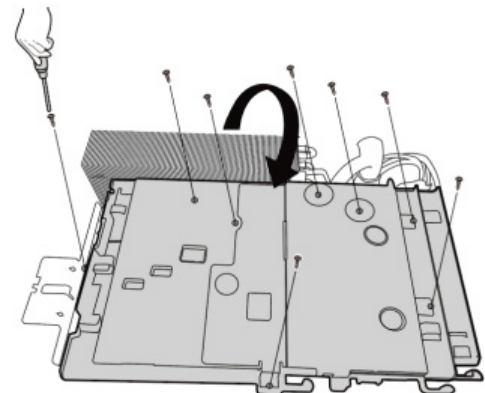
1. Remove the cover of the electrical control box.



2. Disconnect the fan motor connector.



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



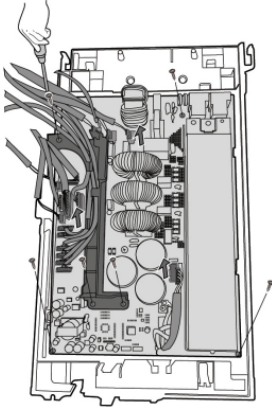
Note: This section is for reference only. Actual appearance may vary.

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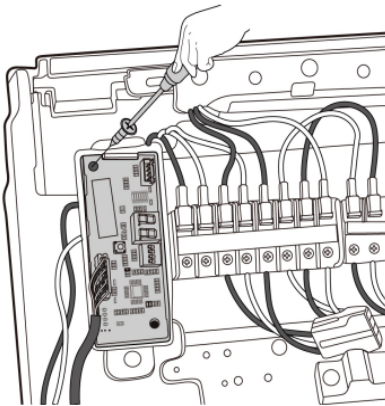
5. Remove 3 screws and then remove the bracket.

6. Disconnect the connectors from the electronic control board.

7. Remove 3 screws and then remove the electronic control board.



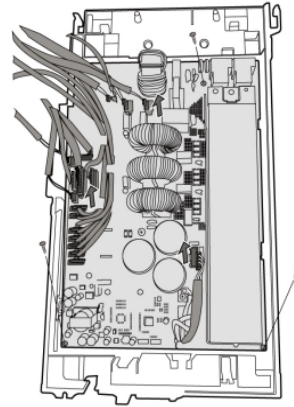
8. Pull out the connector, remove one screw, and then remove the key board subassembly on the terminal board.



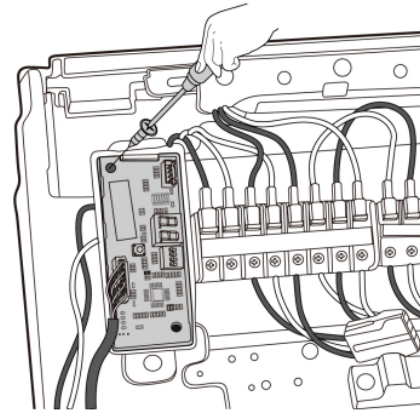
Electrical Parts of PCB Board 10:

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.

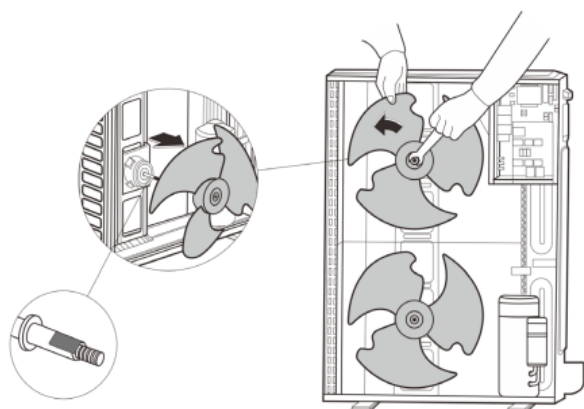
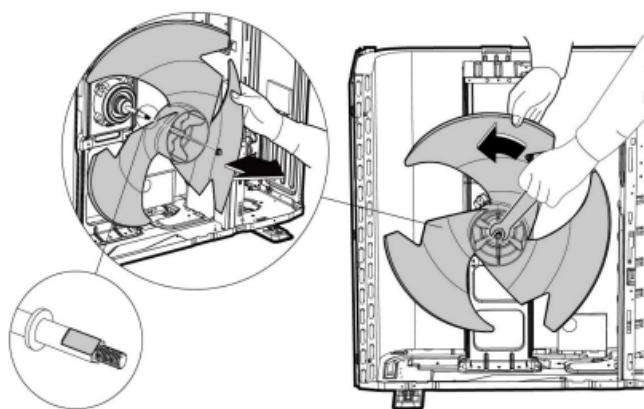


Note: This section is for reference only. Actual appearance may vary.

Fan Assembly:

Note: Remove the panel plate before disassembling the fan.

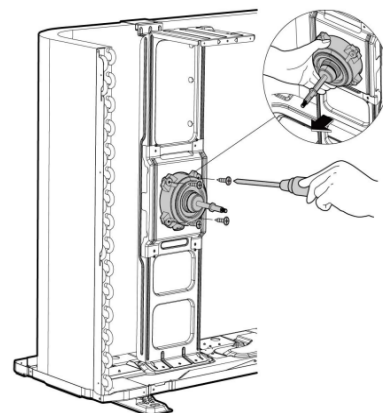
1. Remove the nut securing the fan with a crescent wrench.
2. Remove the fan.



Fan Motor:

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

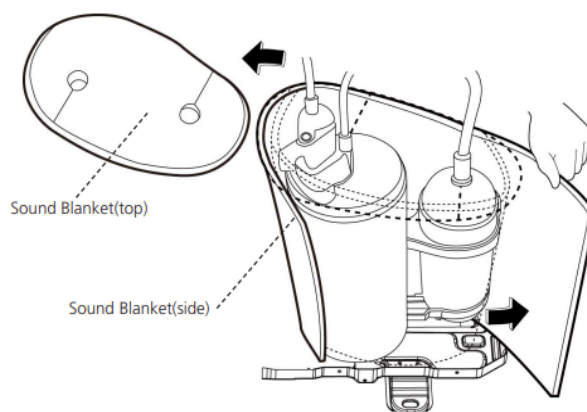
3. Remove the fixing screws of the fan motor (4 screws).
4. Remove the fan motor.



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.

2 DISASSEMBLY

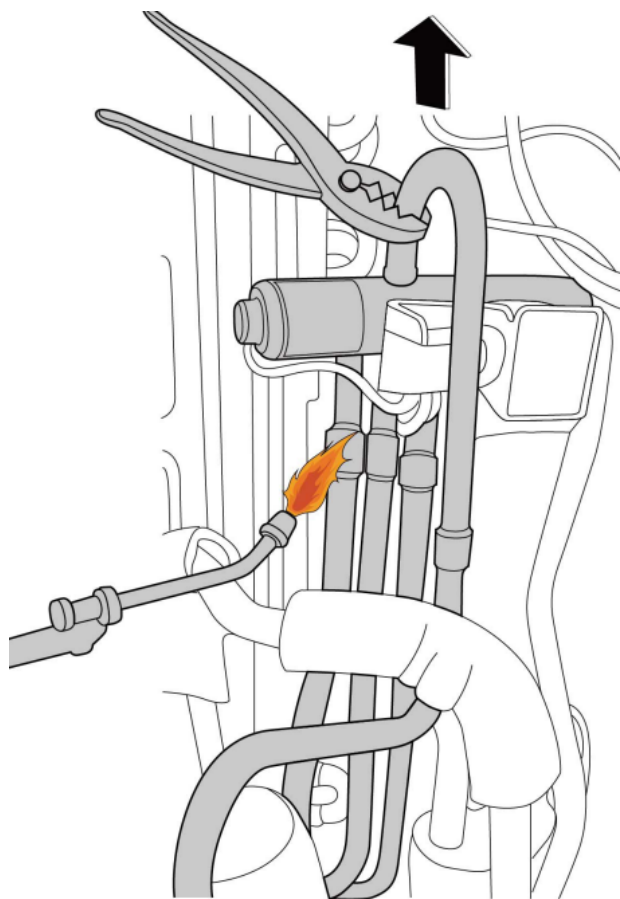
WARNING

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:

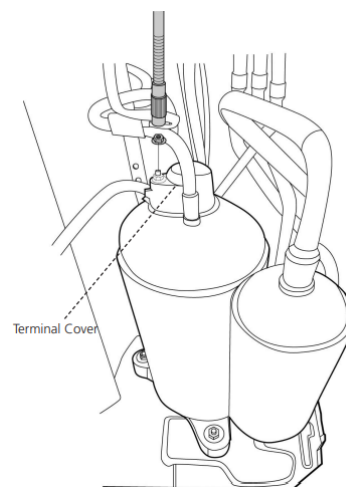
1. Heat up the brazed parts and then detach the four-way valve and the pipe.
2. Remove the four-way valve assembly with pliers.



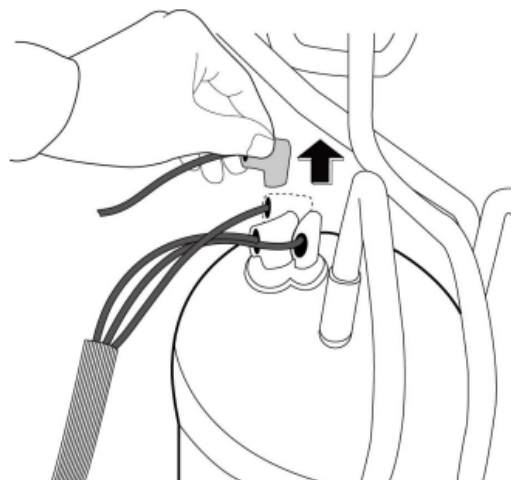
Note: Remove the panel plate connection of the compressor on PCB before disassembling the sound blanket.

Compressor:

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

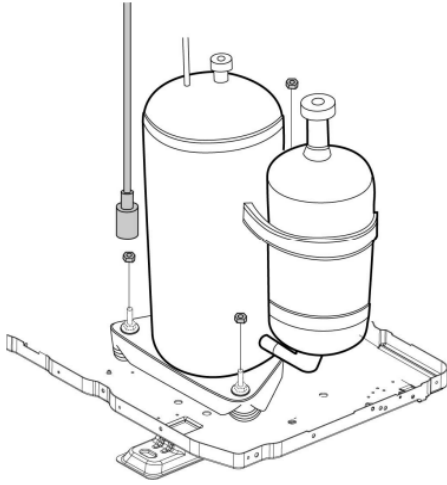


2. Disconnect the connectors.



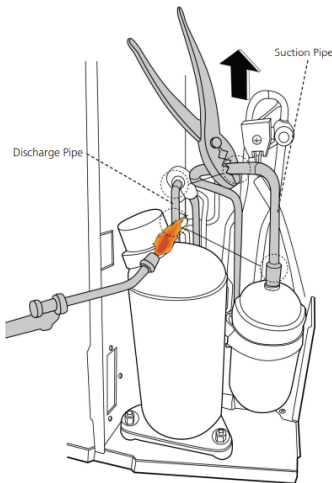
Note: This section is for reference only. Actual appearance may vary.

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)	

3 TROUBLESHOOTING

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. For example, the digital display tube shows "Cd", so $C*161+d*160=12*16+13=205$, it means AD value is 205. 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 If the value is higher than 99, the digital display shows single and double digits. 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)	

Number of Presses	Display	Remark		
45	Frequency limit symbol	Bit7	Reserved	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. This means that a frequency limit may be caused by current, IPM or T3.
		Bit6	Frequency limit caused by voltage	
		Bit5	Frequency limit caused by voltage	
		Bit4	Reserved	
		Bit3	Frequency limit caused by IPM	
		Bit2	Frequency limit caused by Compressor discharge temperature (T5)	
		Bit1	Frequency limit caused by Outdoor heat exchanger pipe temperature (T3)	
		Bit0	Frequency limit caused by Middle indoor heat exchanger coil temperature (T2)	
46	T2B fault	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)		
47	Average value of T2	(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) If the temperature is lower than -9°C, the digital display shows "-9"		
48	Outdoor unit fan speed	See next list		
49	Reason of stop			
50~59	Reserved			
60	Air injection enthalpy inlet temperature (for hyper heat models)	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: "--".		
61	Air injection enthalpy outlet temperature (for hyper heat models)			
62	Condenser coil middle temperature (for hyper heat models)			
63	Refrigerant tube inlet temperature (for hyper heat models)			
64	Target discharge temperature	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.		
65	Indoor Unit F capacity	The capacity unit is horse power. If the indoor unit is not connected, the digital display shows the following "--".		
66	Indoor unit F capacity demand code	Normal code*HP (9K: 1HP, 12K: 1.2HP, 18K: 1.5HP)		

3 TROUBLESHOOTING

Number of Presses	Display	Remark
67	Indoor unit F evaporator outlet temperature (T2BF)	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 "--".
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 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

CAUTION

Do not use a megger for testing as this will damage the compressor.

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

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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 TROUBLESHOOTING

3.4 Troubleshooting by Error Code

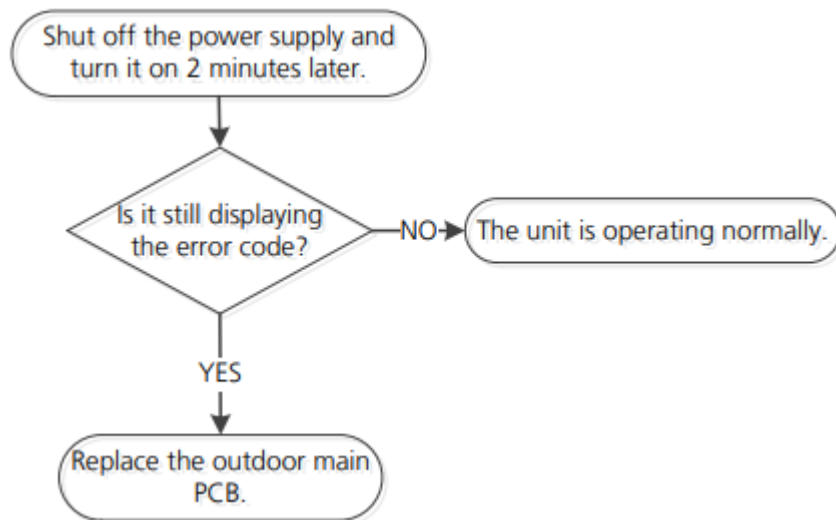
EC 51: EEPROM malfunction error diagnosis and solution.

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

Recommended parts to prepare:

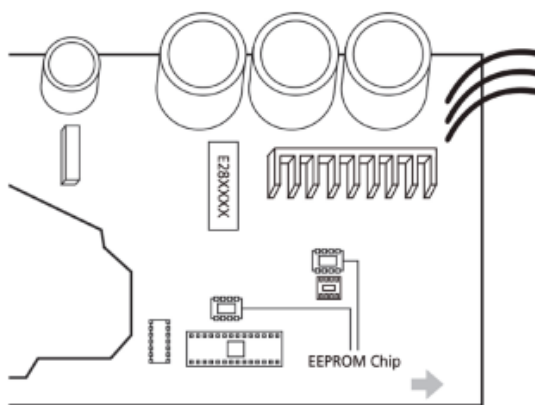
- Indoor PCB
- Outdoor PCB

Troubleshooting and repair:



Remarks:

EEPROM: A read-only memory whose contents can be erased and reprogrammed using a pulsed 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.

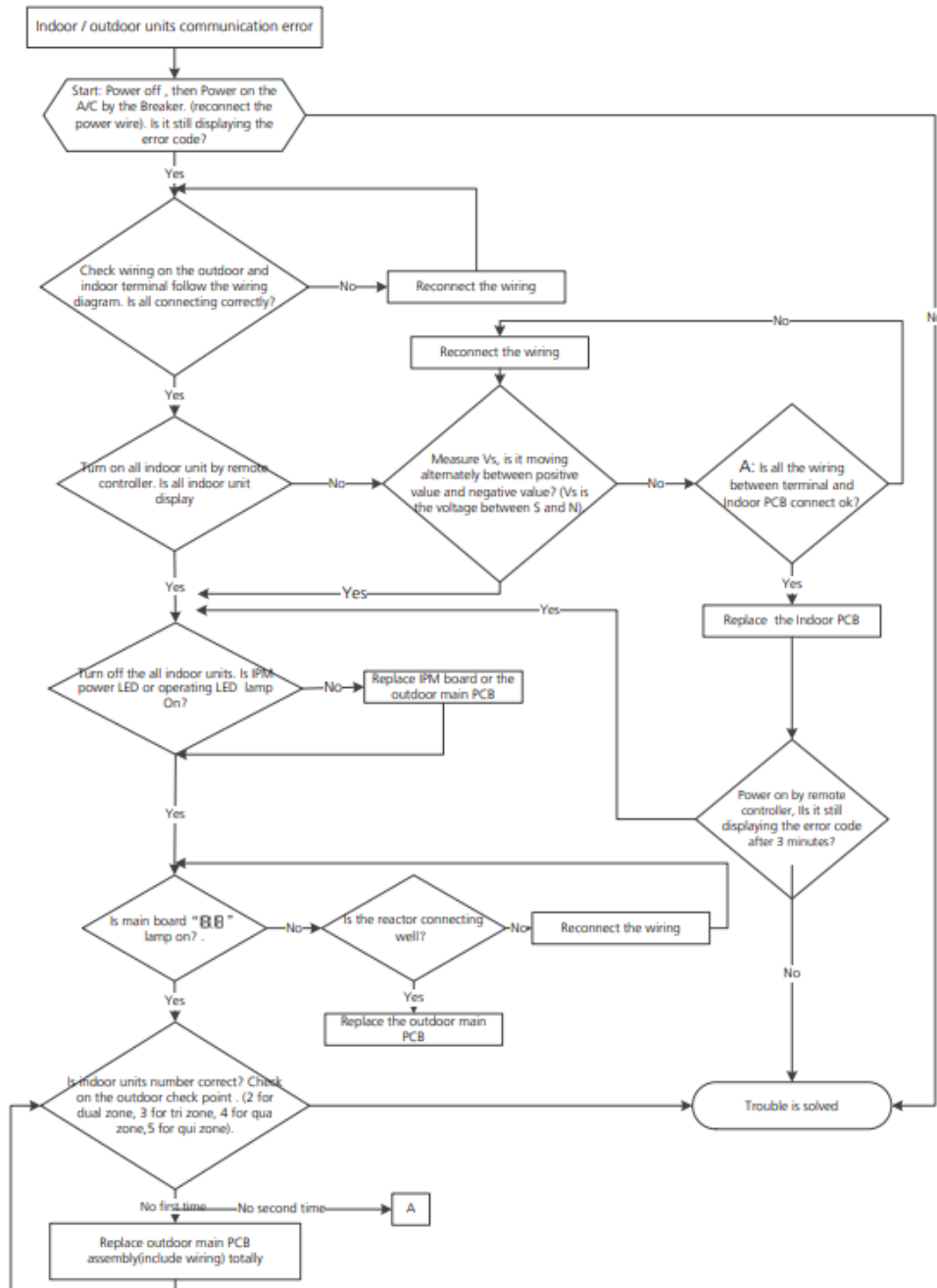
EL 01: IDU & ODU communication error diagnosis and solution.

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

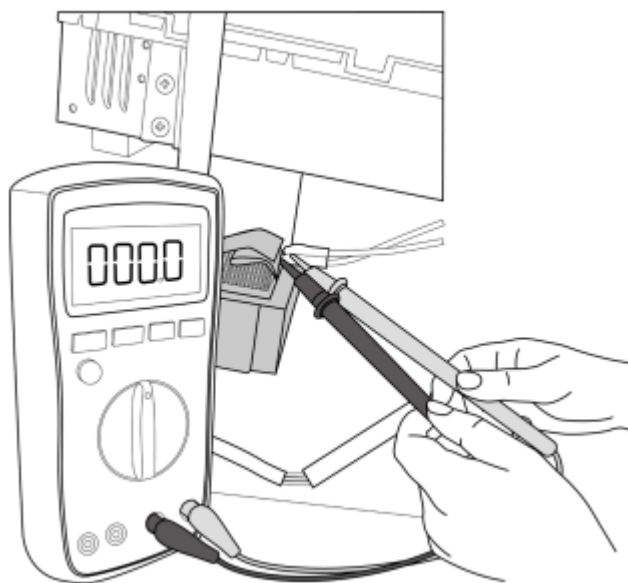
Troubleshooting and repair:



3 TROUBLESHOOTING

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.

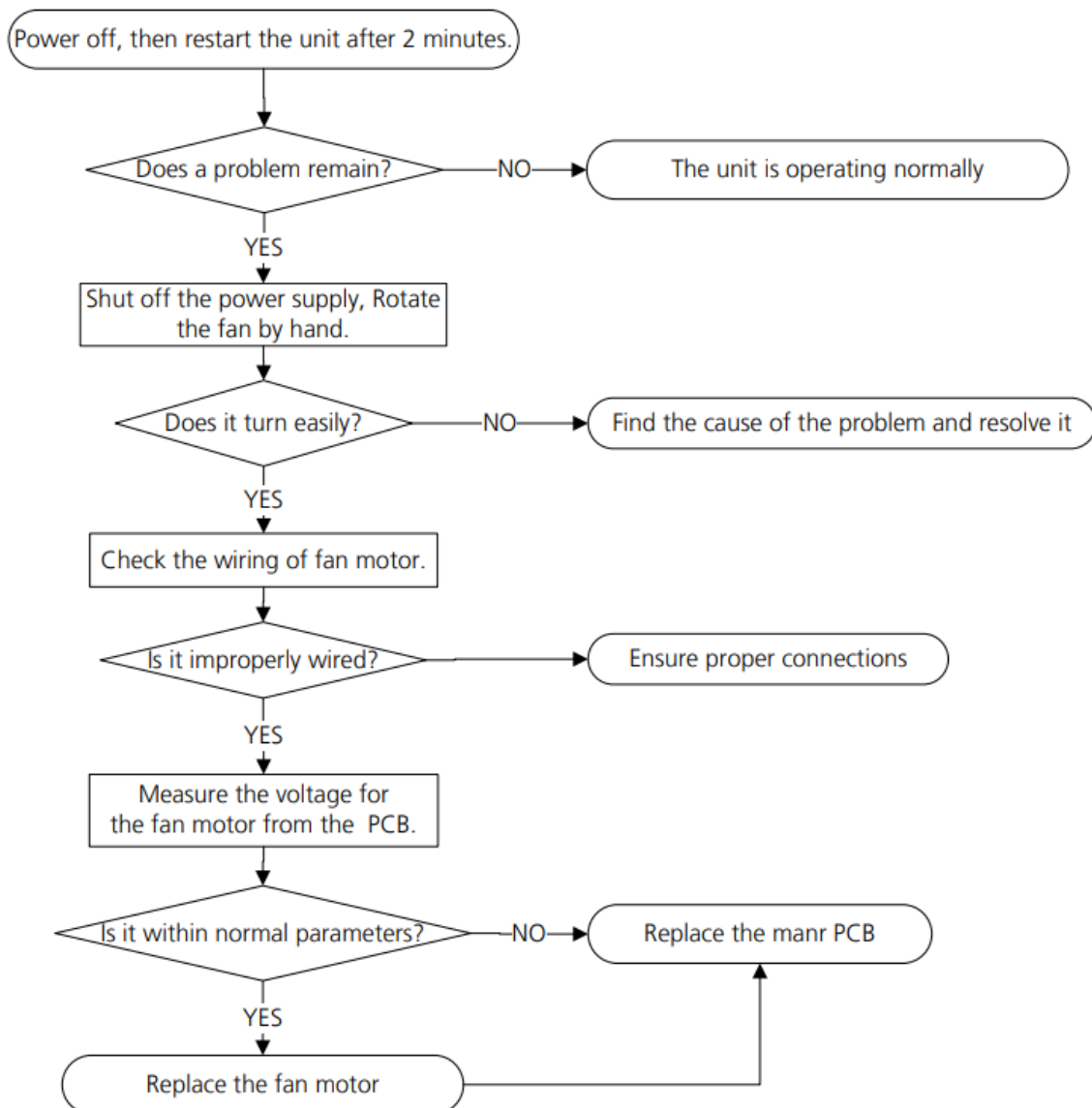
EC 07: Fan speed is operating outside of normal range. EC 71: Overcurrent failure of outdoor DC fan motor diagnosis and solution.

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:



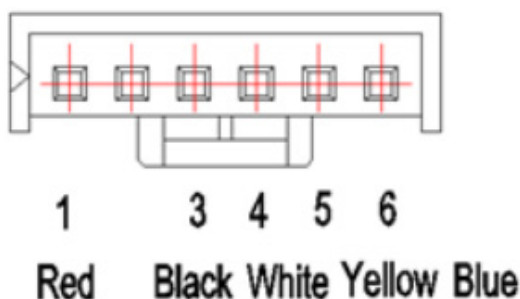
3 TROUBLESHOOTING

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.

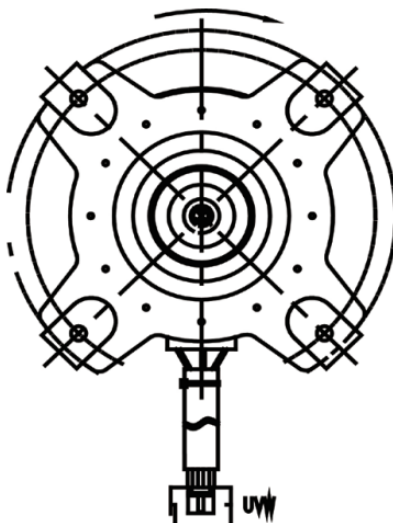
NO.	Color	Signal	Voltage
1	Red	Vs/Vm	192V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5-16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5-16.5V



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.



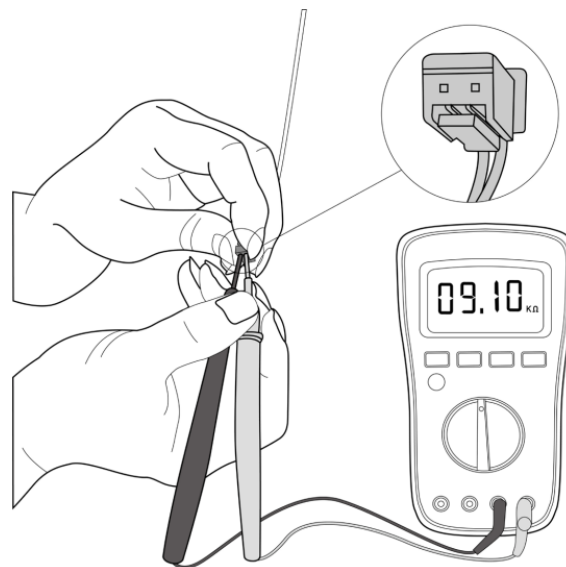
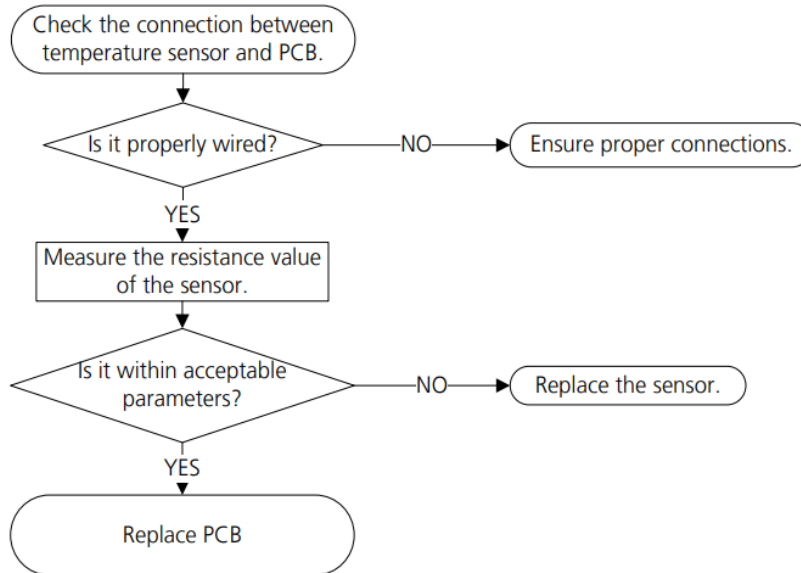
EC 52/ EC 53/ EC 54/ EC 56/ EC 57/ EC 5A/ EC 5b/ EC 5E/ EC 50: Open circuit or short circuit of temperature sensor diagnosis and solution.

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.

3 TROUBLESHOOTING

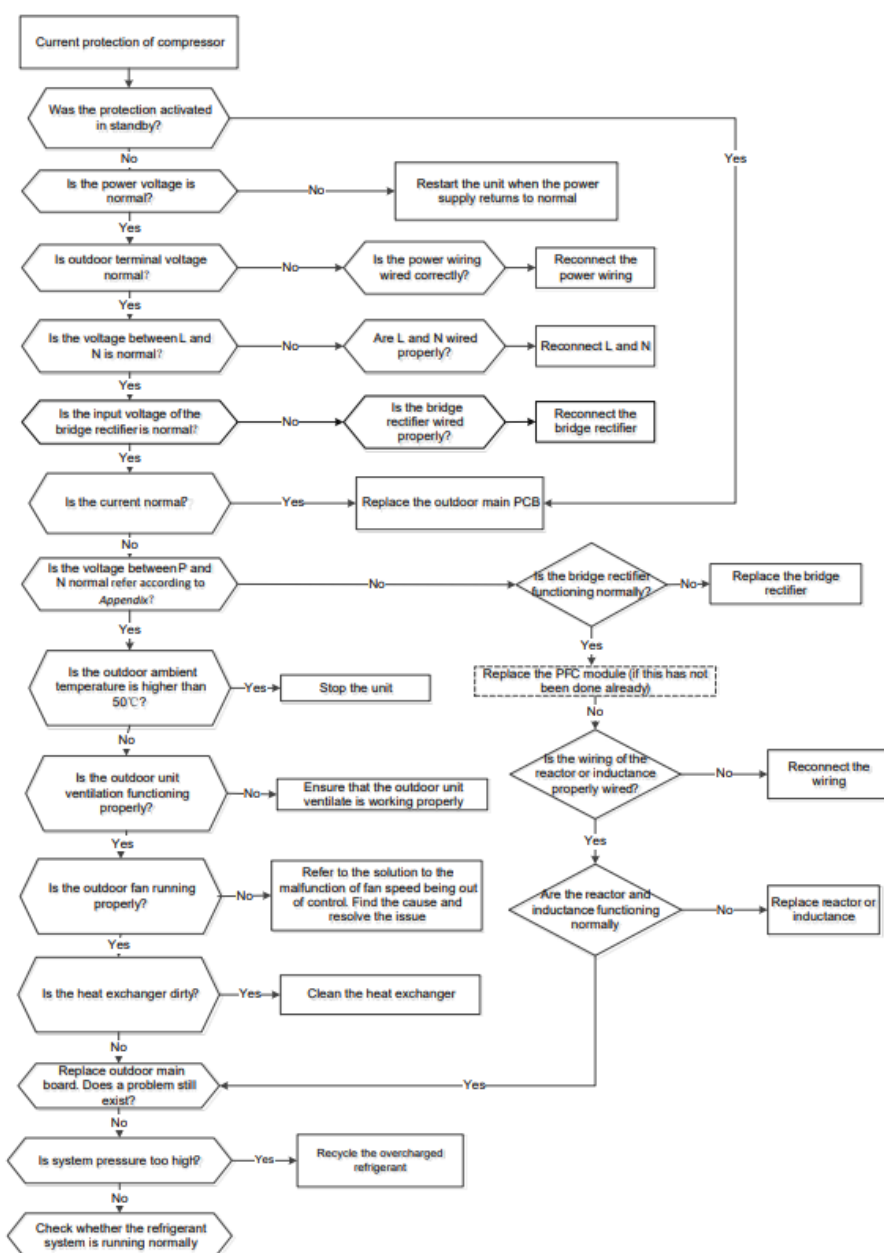
PC 08: Current overload protection. PC 44: ODU zero speed protection. PC 46: Compressor speed has been out of control. PC 49: Compressor overcurrent failure.

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:



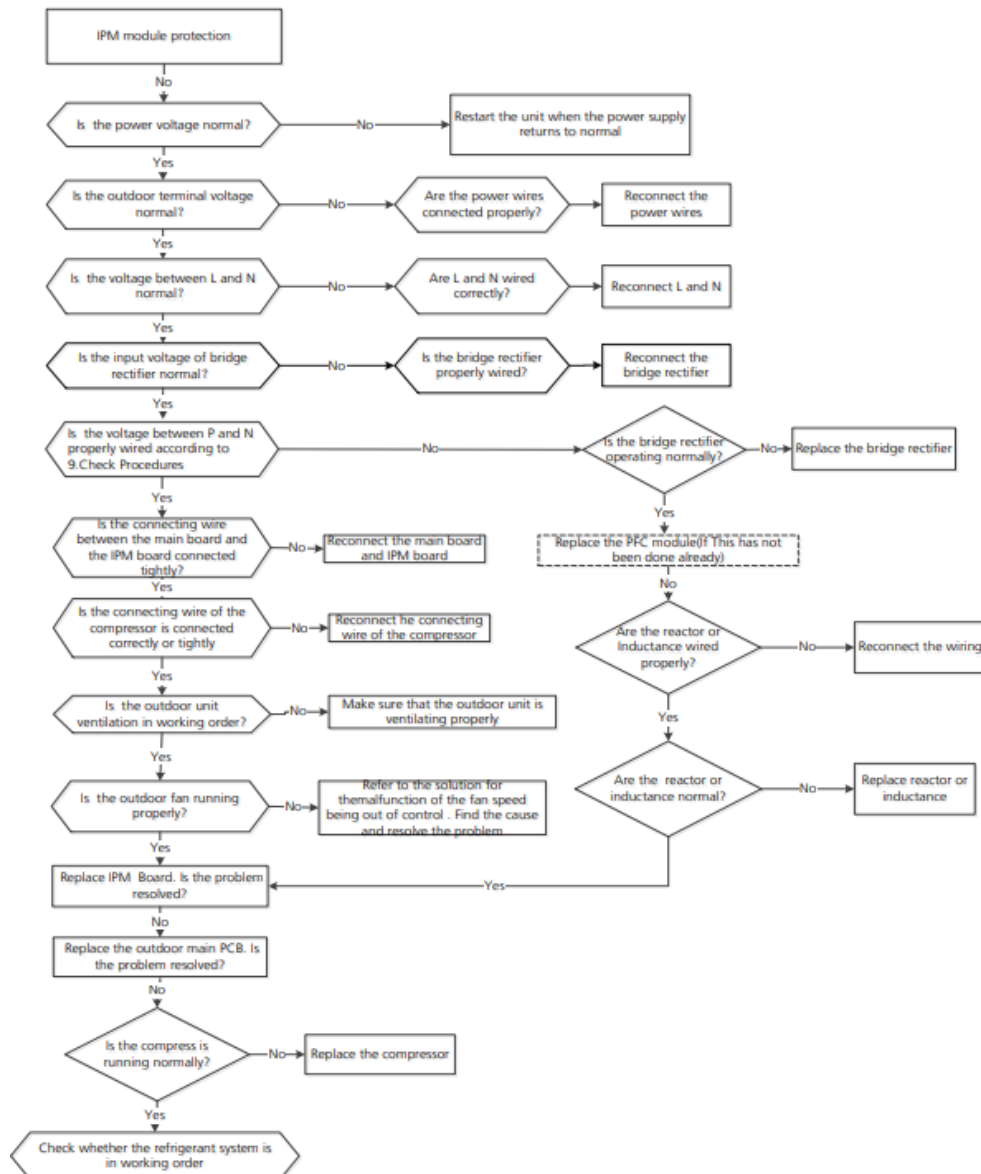
PC 00: IPM malfunction diagnosis and solution.

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:



3 TROUBLESHOOTING

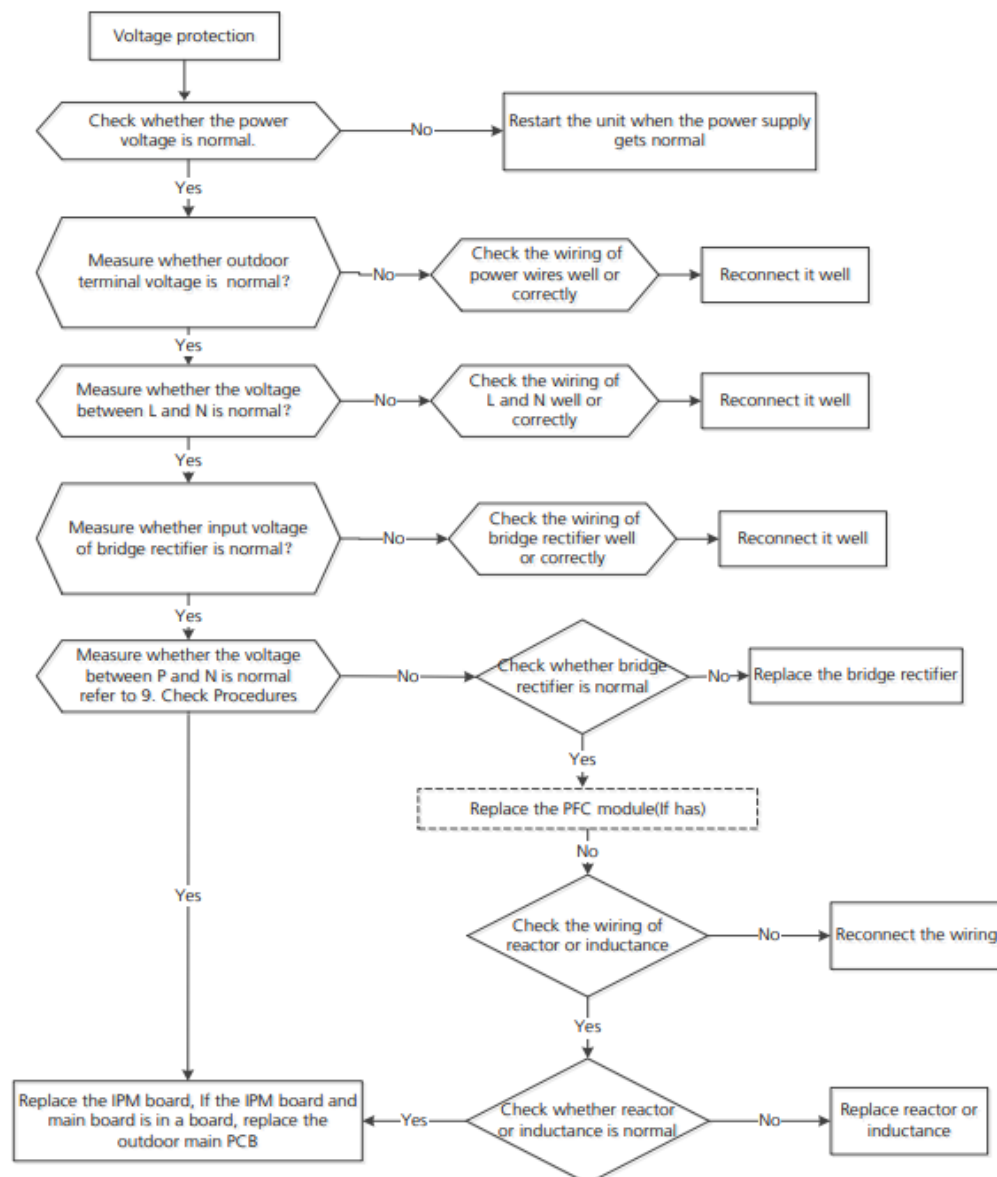
PC01: over voltage or too low voltage protection. PC 10: ODU low AC voltage protection. PC 11: ODU main control board DC bus high voltage protection. PC 12: ODU main control board DC bus low voltage protection/ 341 MCE error diagnosis and solution.

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:



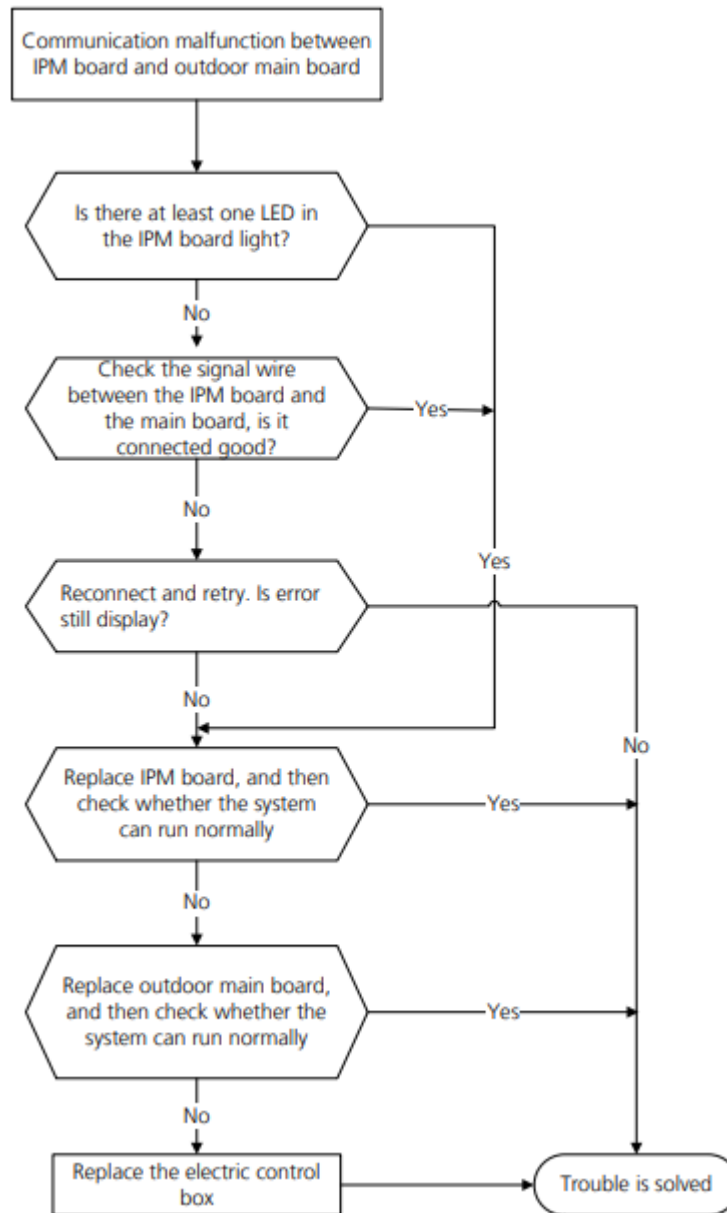
PC 40: Communication error between ODU main chip and compressor driven chip diagnosis and solution.

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:



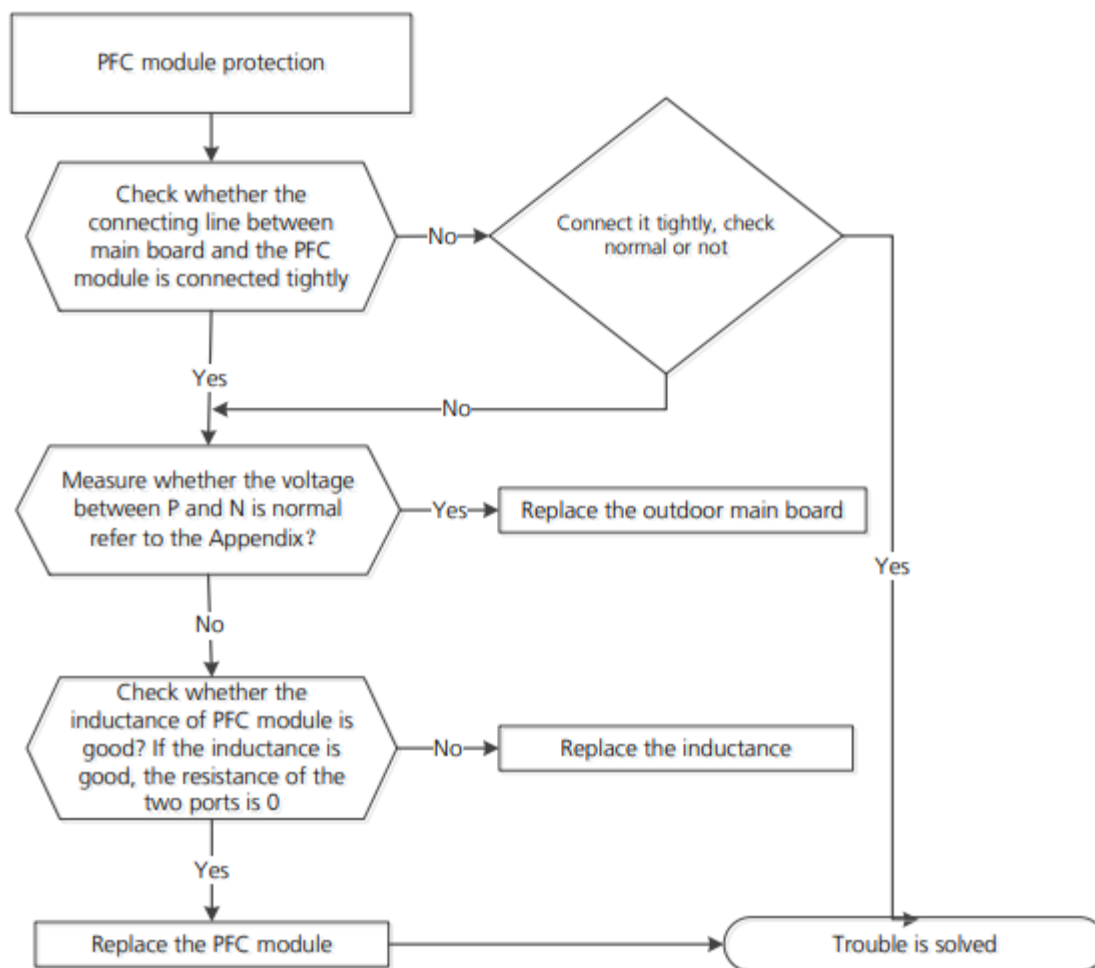
PC 0F: PFC module protection diagnosis and solution.

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:



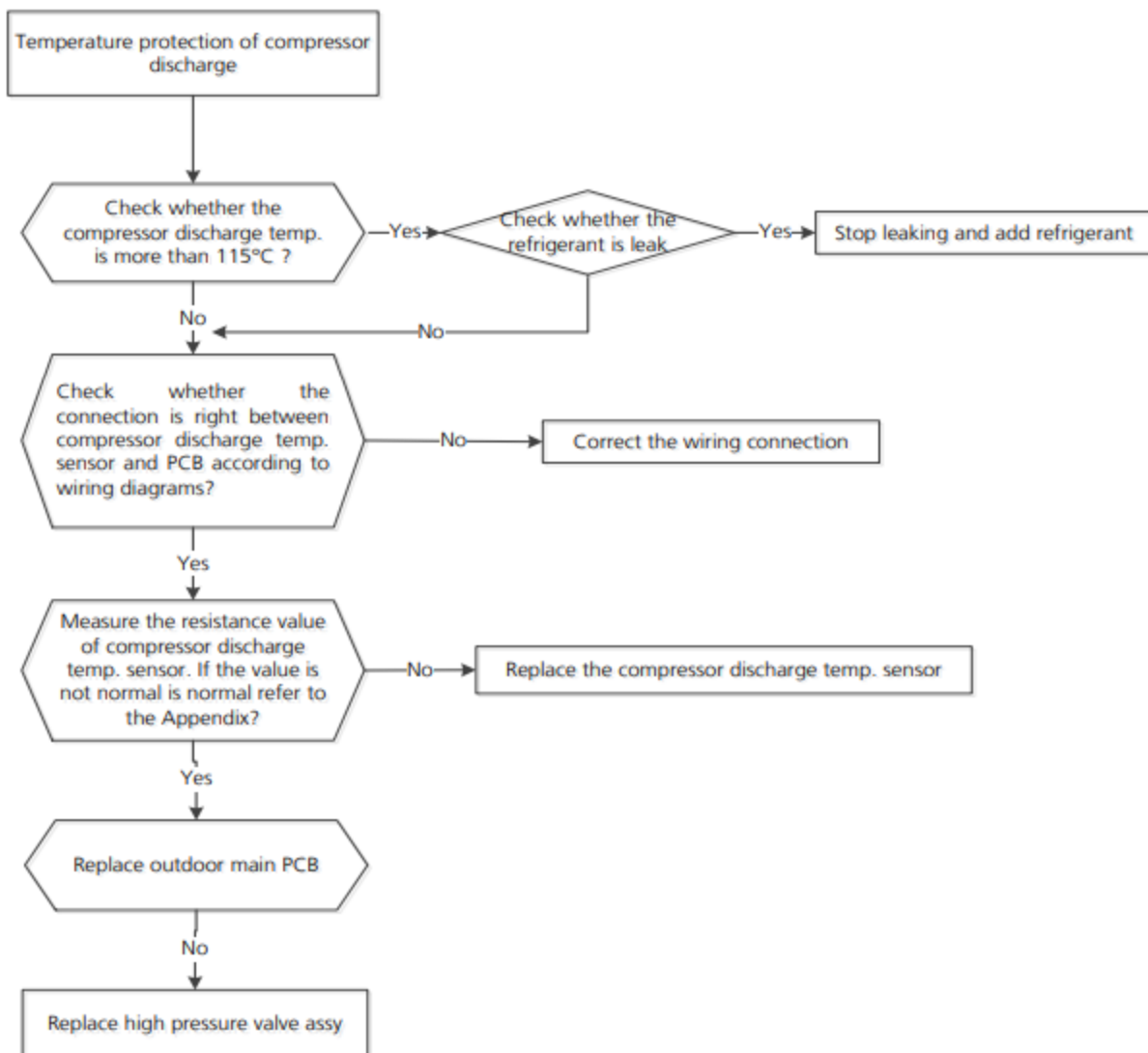
PC 06: Discharge temperature protection of compressor diagnosis and solution.

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:



3 TROUBLESHOOTING

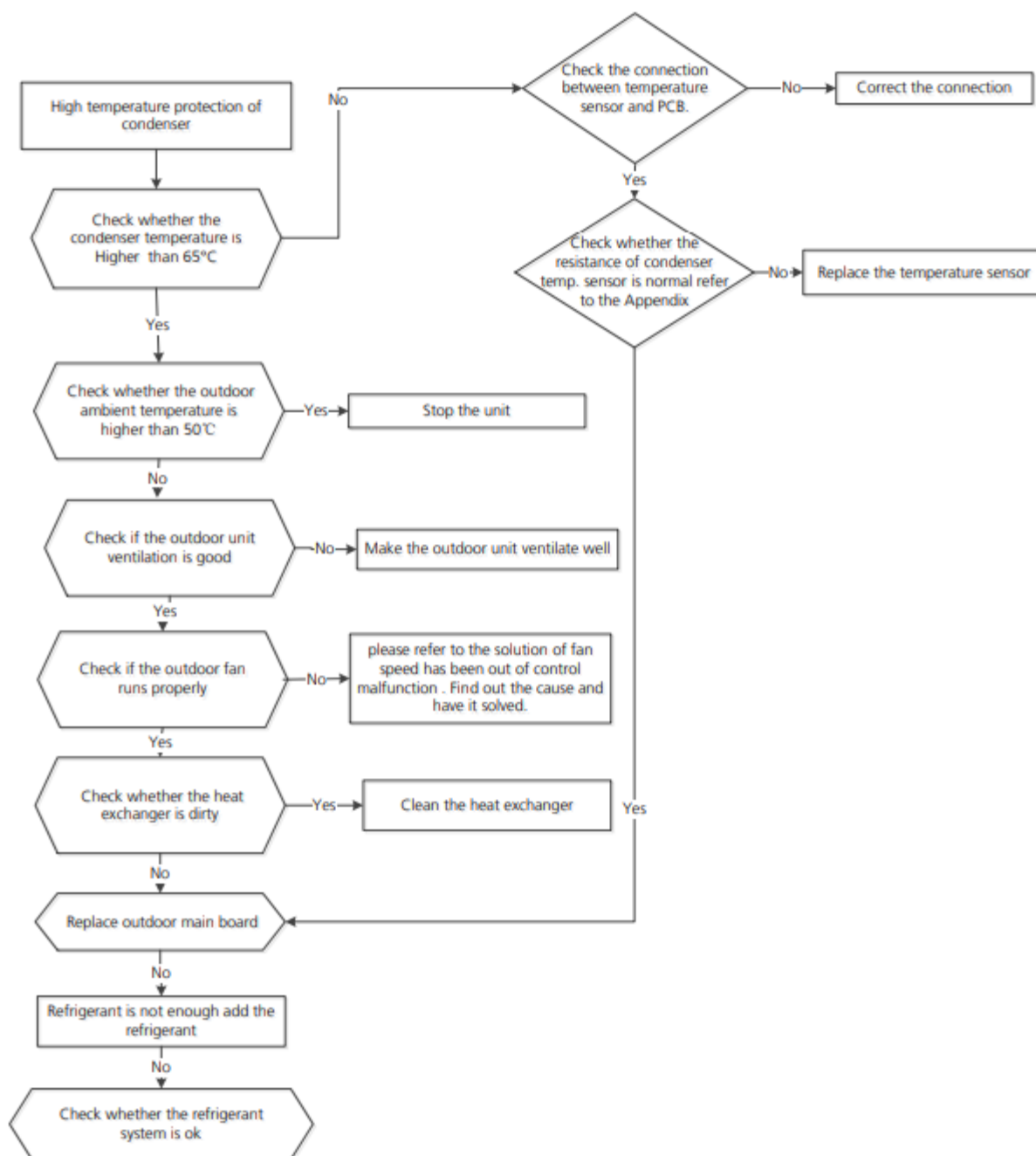
PC 0A: High temperature protection of condenser diagnosis and solution.

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:



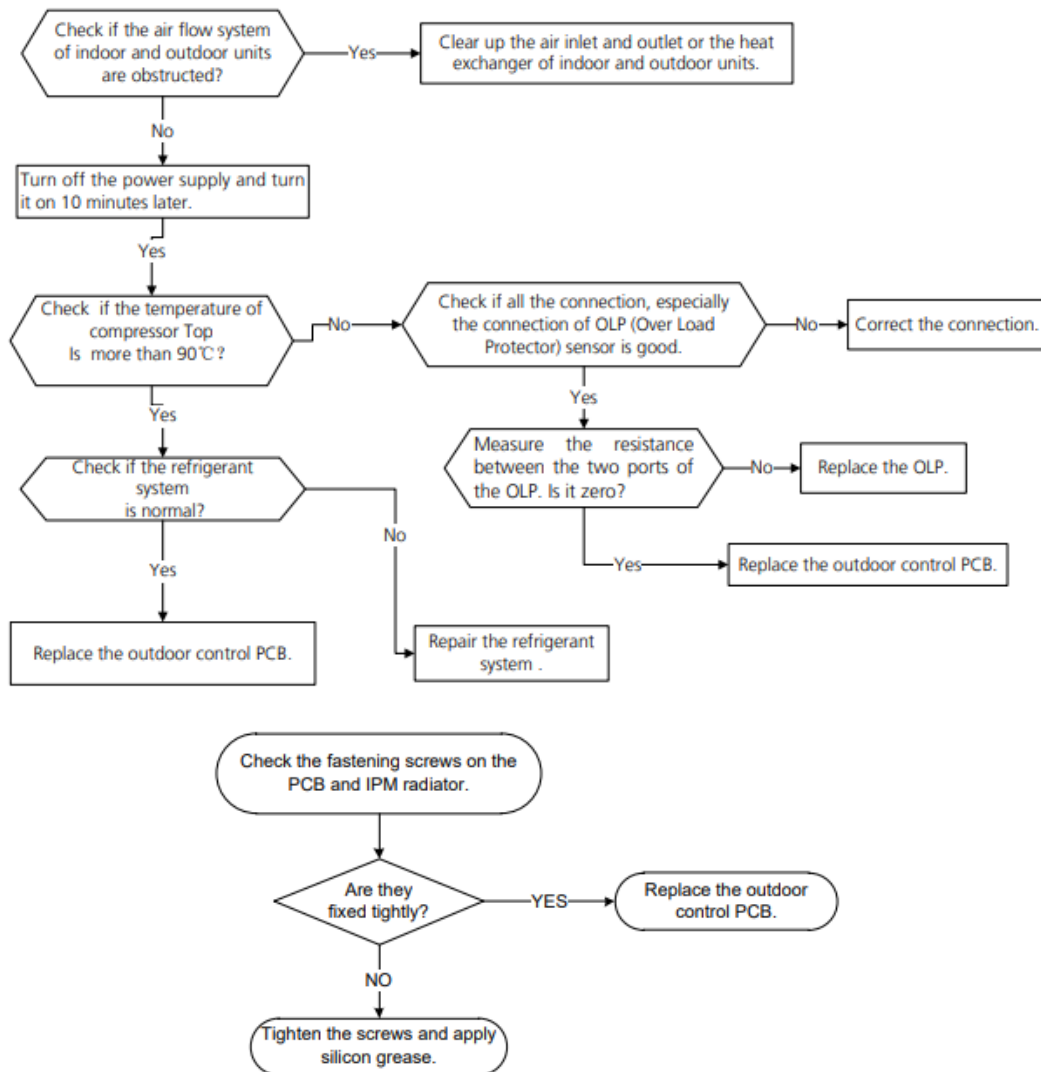
PC 02/ LC 06: Compressor top (or IPM) temp. protection diagnosis and solution.

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:



3 TROUBLESHOOTING

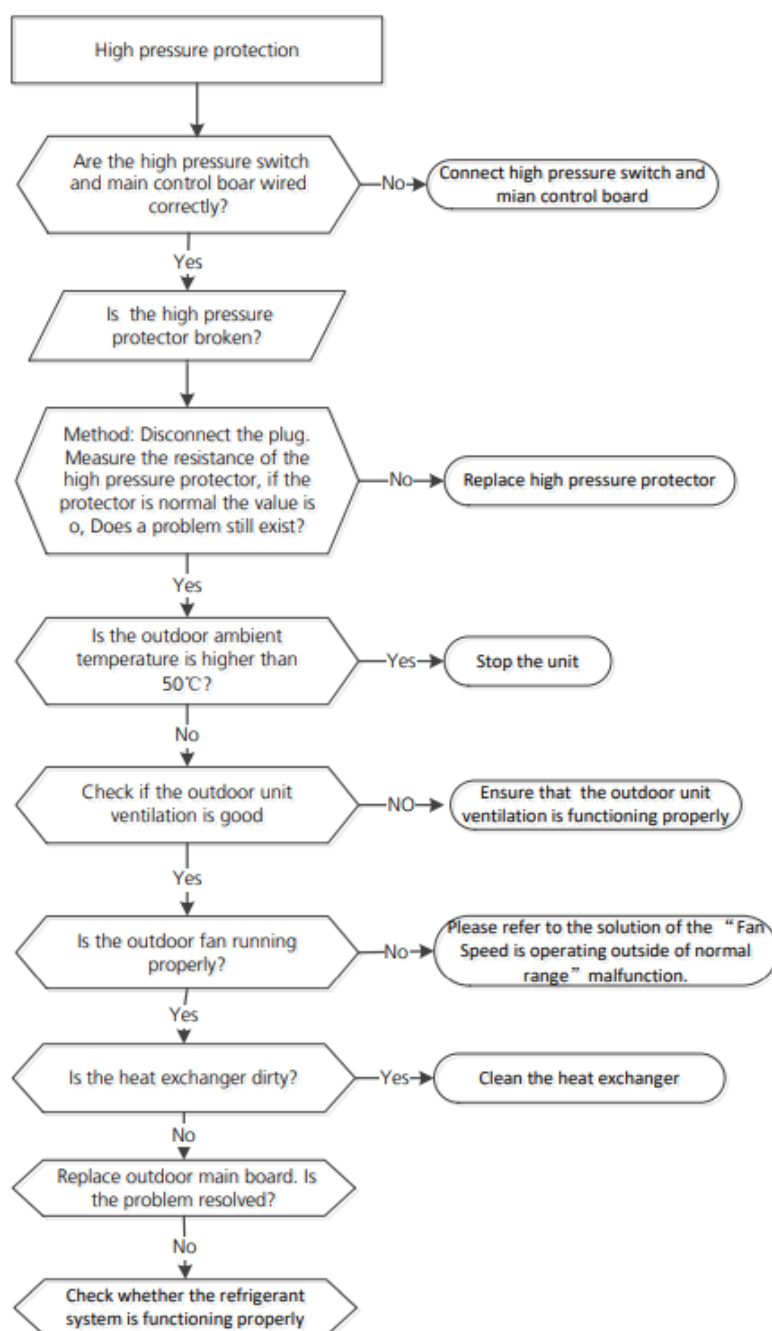
PC 30: System high pressure protection diagnosis and solution.

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:



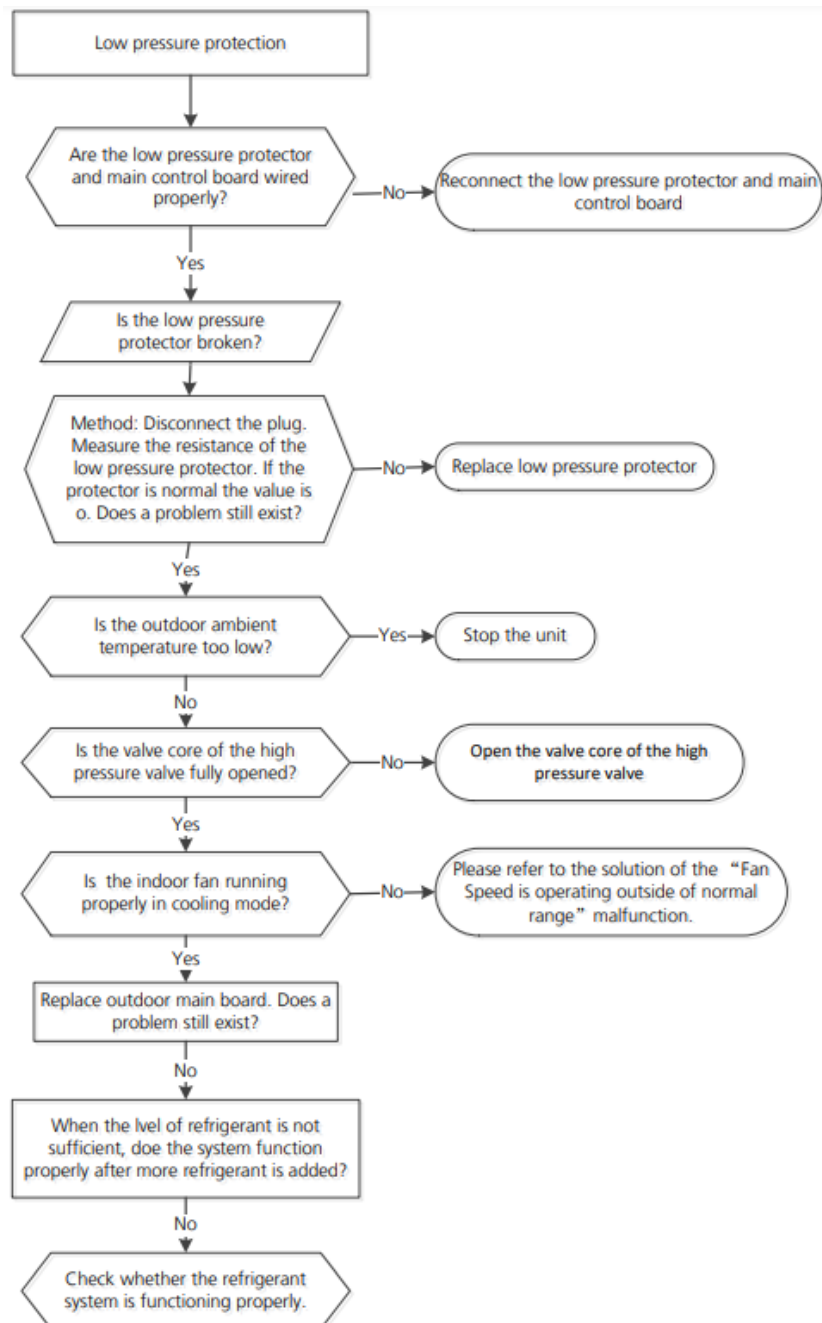
PC 31: System low pressure protection diagnosis and solution.

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:



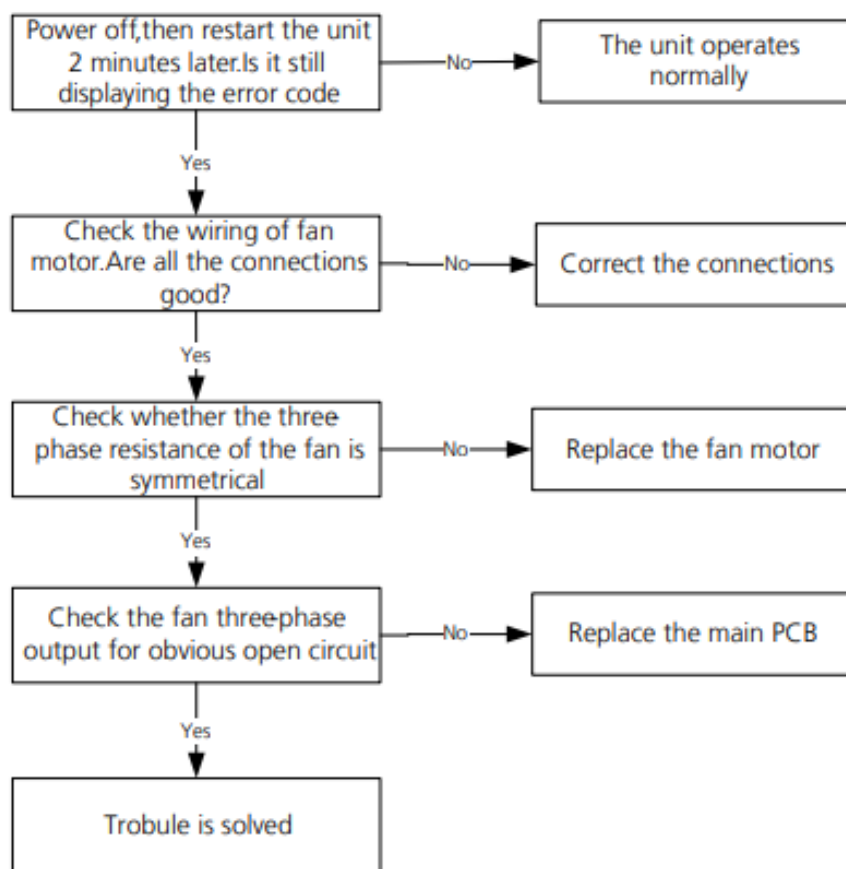
EC 72: Lack phase failure of the outdoor DC fan motor diagnosis and solution.

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:



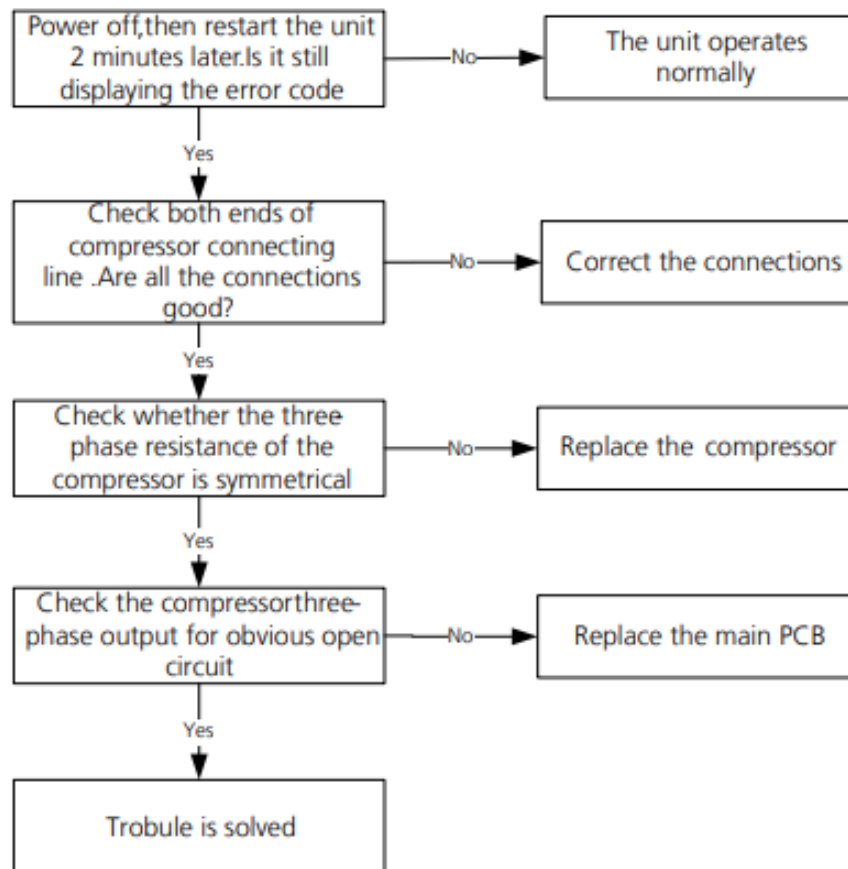
PC 43: ODU compressor lack phase protection diagnosis and solution.

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:



3 TROUBLESHOOTING

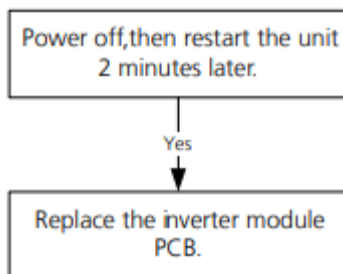
PC 45: ODU IR chip drive failure diagnosis and solution.

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.

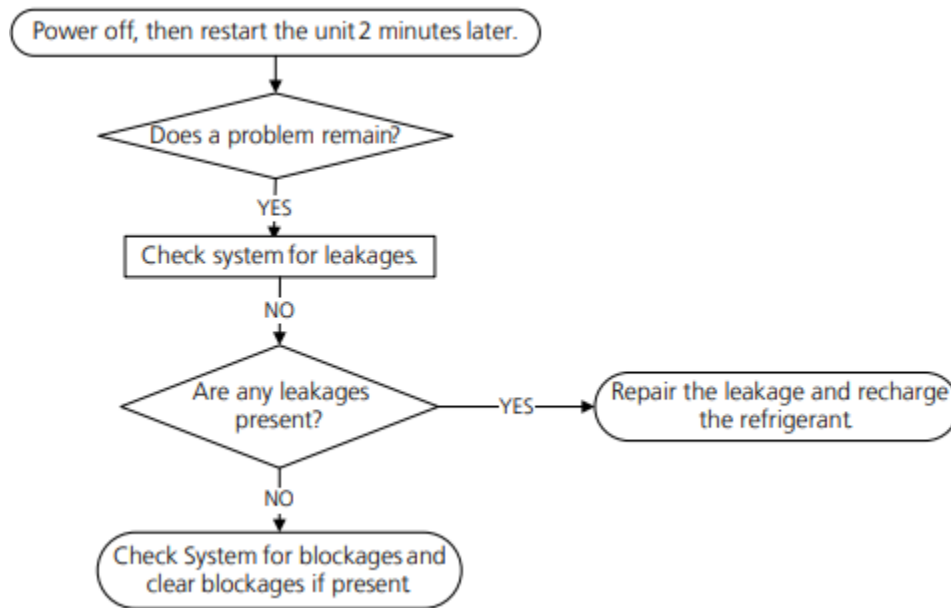
EH C1: Refrigerant sensor detects leakage or working condition of the refrigerant sensor is out of range and leakage is detected diagnosis and solution.

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:



3 TROUBLESHOOTING

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

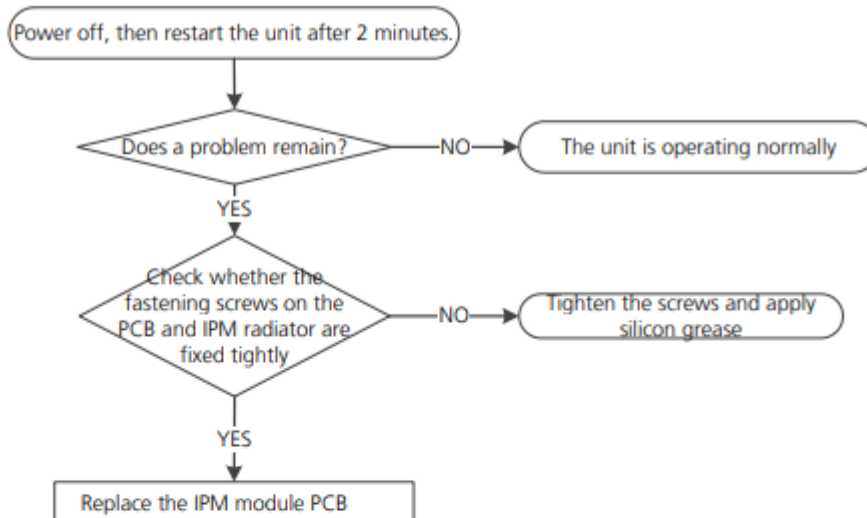
Description: If the sampling voltage is 0V or 5V, the LED displays a fault code.

Recommended parts to prepare:

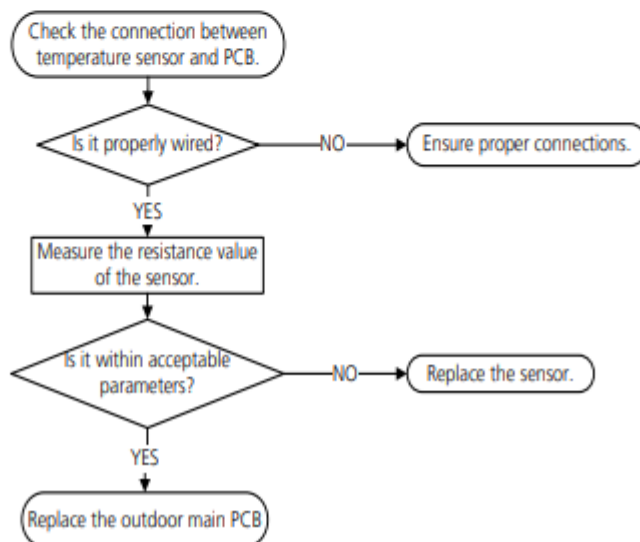
- IPM module PCB
- Connection wires
- Sensors
- Outdoor main PCB

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,



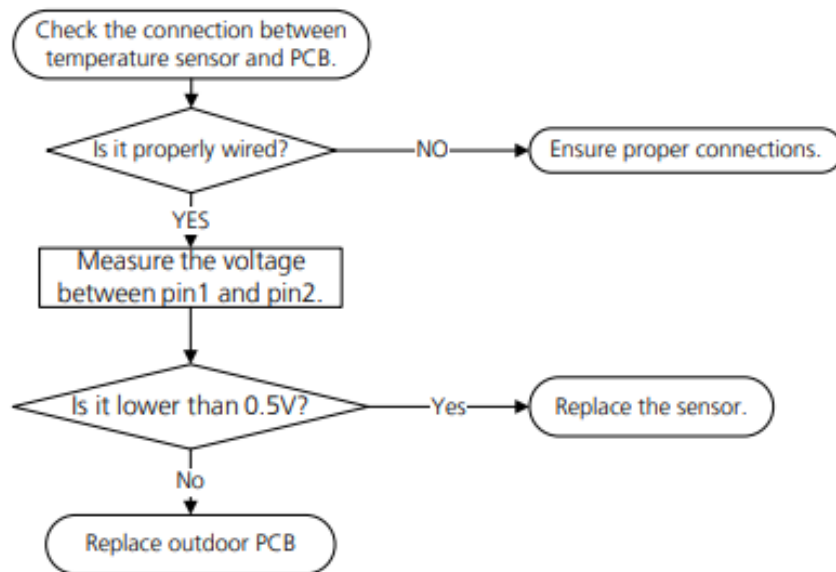
EC 5C: Pressure sensor failure diagnosis and solution.

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:



3 TROUBLESHOOTING

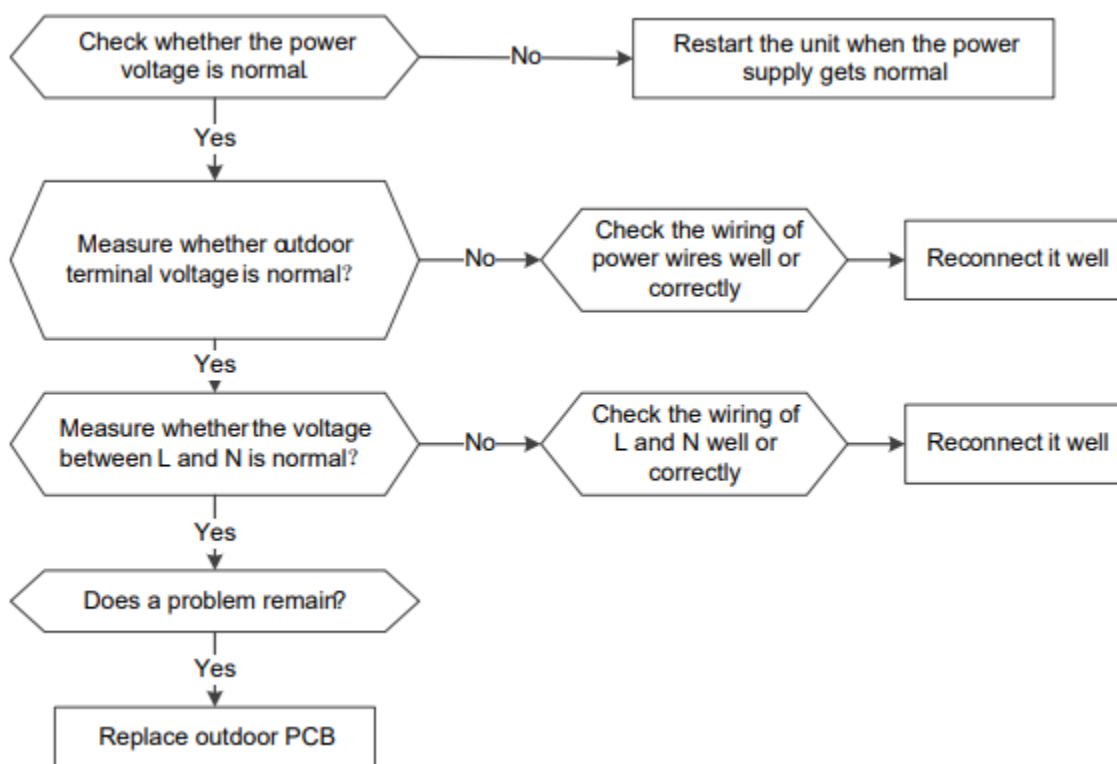
PC 13: The AC power is cut off or the AC voltage detection circuit fails diagnosis and solution.

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:



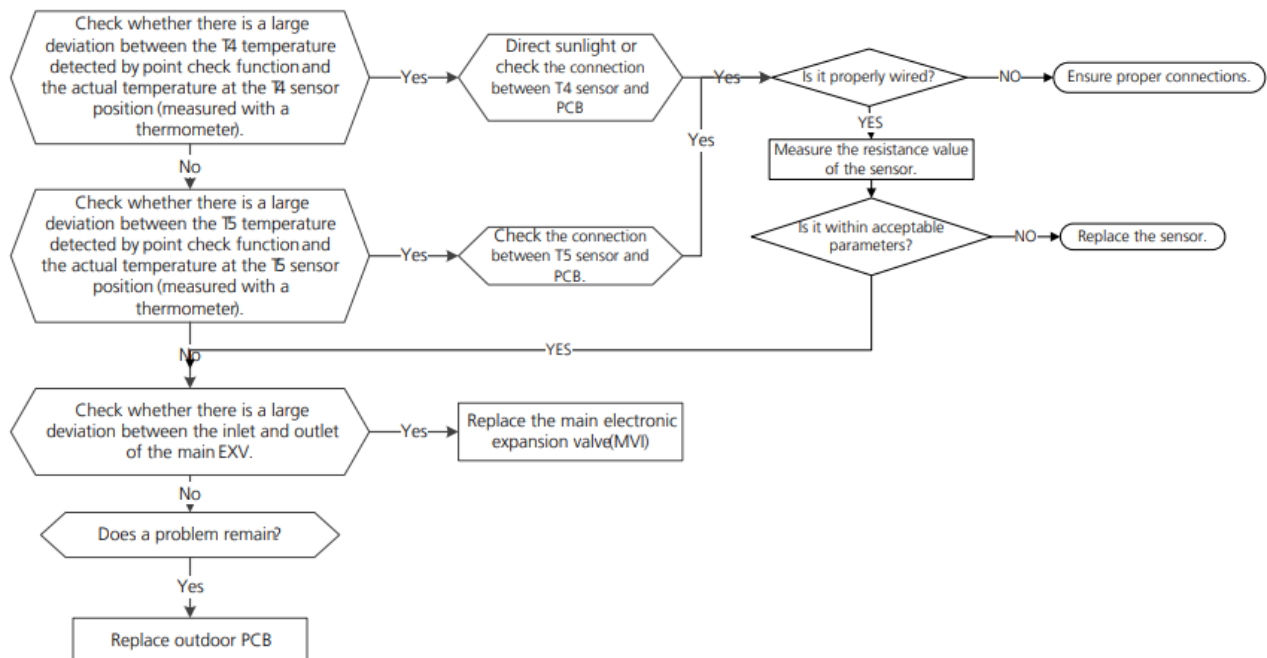
PC A1: Condensation protection of refrigerant pip diagnosis and solution.

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 TROUBLESHOOTING

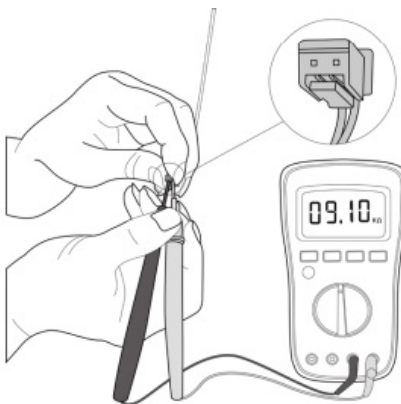
3.5 Check Procedures

! 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:

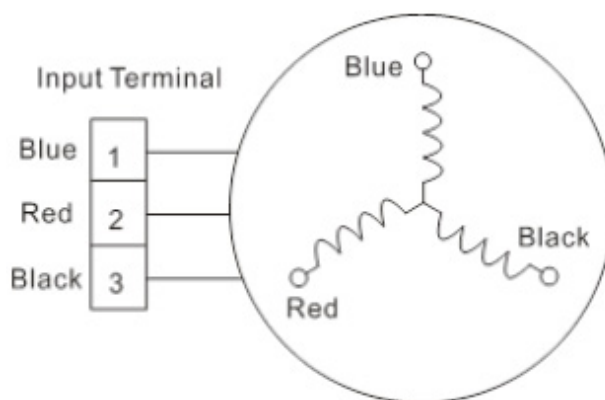
1. Disconnect the temperature sensor from the PCB.
2. Measure the resistance value of the sensor using a multi-meter.
3. Check corresponding temperature sensor resistance value table.



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

Compressor Check:

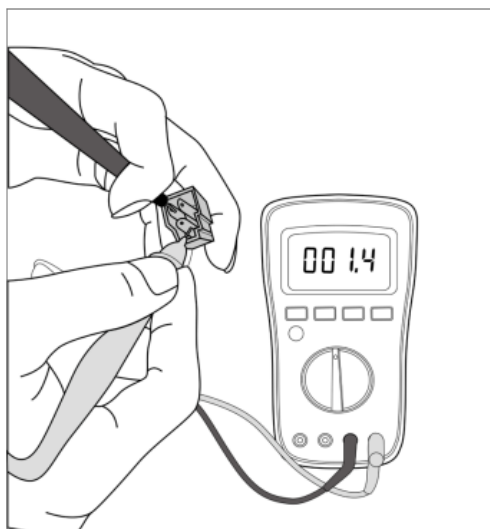
1. Disconnect the compressor power cord from the outdoor PCB.
2. Measure the resistance value of each winding using a multi-meter.
3. Check the resistance value of each winding in the following table.



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 ETPQ440D1UMUB KTQ420D1UMU 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.

3 TROUBLESHOOTING

IPM Continuity Check:



WARNING

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

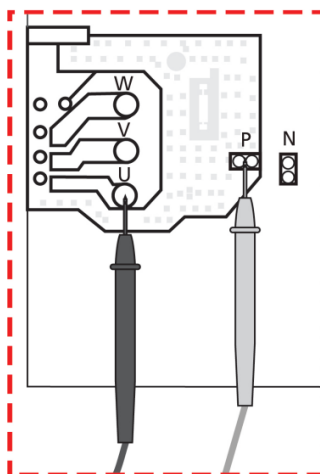
1. Turn off the outdoor unit and disconnect the power supply.
2. Discharge electronic capacitors and ensure all energy-storage units have been discharged.
3. Disassemble the outdoor PCB or disassemble the IPM board.
4. Measure the resistance value between P and U (U,W,N), U(V,W) and N.

Digital tester		Resistance Value	Digital Tester		Resistance Value
(+)Red	(-)Black	∞ (Several M Ω)	(+)Red	(-)Black	∞ (Several M Ω)
P	N		N	U	
	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	Open-Circuit	Red	Black	0.3-0.5V
P	U		N	U	
	V			V	
	W			W	

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



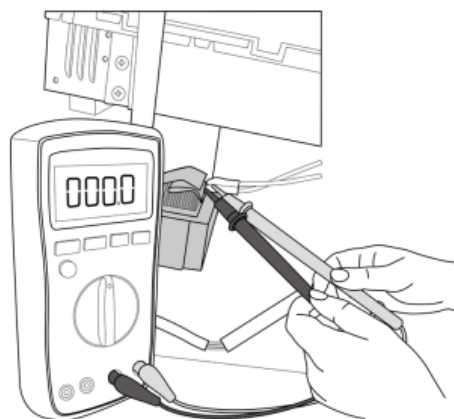
Note: The picture and the value are for reference only, actual condition and specific values may vary.

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	1.711
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			

4 TEMPERATURE SENSOR RESISTANCE TABLE

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	144.01	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	338.81	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	150.2
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



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