

Service Manual

Side Discharge Heat Pump and Multi-Position Air Handler

Models

E4HL5018A1000A

E4HL5024A1000A

E4HL5030A1000A

E4HL5036A1000A

E4HL5042A1000A

E4HL5048A1000A

E4HL5060A1000A

E4AH5E24A1J30A

E4AH5E36A1J30A

E4AH5E48A1K30A

E4AH5E60A1K30A

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Part I Technical Information

1-1. Important notice

This service manual is intended for use by individuals possessing adequate backgrounds of electrical, electronic and mechanical experience. Any attempt to repair the unit may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

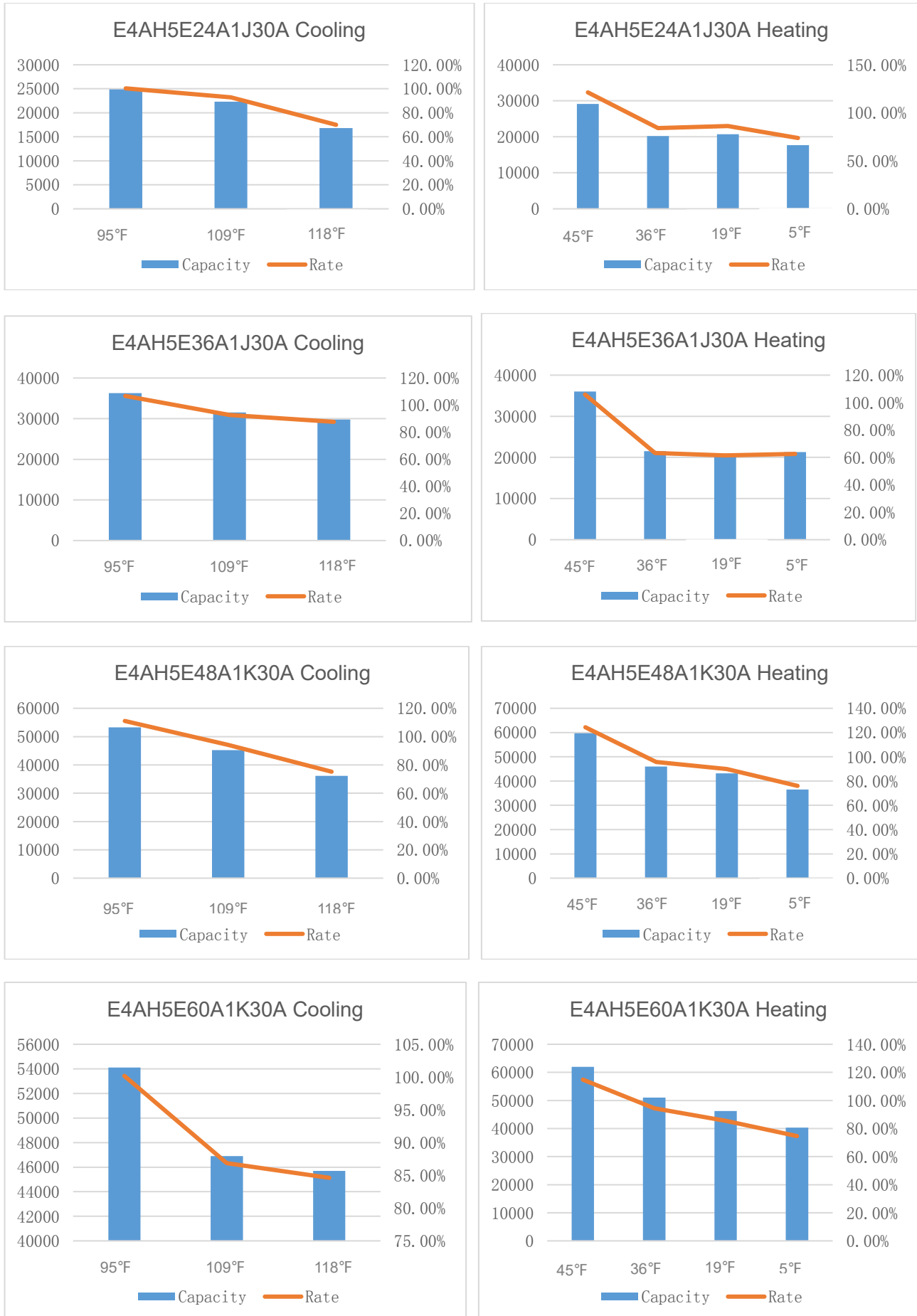
The information, specifications and parameter are subject to change due to technical modification or improvement without any prior notice. The accurate specifications are presented on the nameplate label.

1-2. Specifications

1-2.1 Specifications table

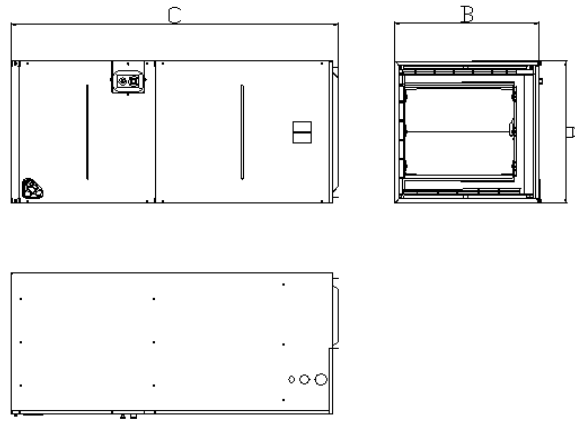
MODEL NUMBER			E4HL5018 A1000A	E4HL502 4A1000A	E4HL5030 A1000A	E4HL5036 A1000A	E4HL5042 A1000A	E4HL5048 A1000A	E4HL5060 A1000A
			E4AH5E2 4A1J30A	E4AH5E2 4A1J30A	E4AH5E36 A1J30A	E4AH5E36 A1J30A	E4AH5E48 A1K30A	E4AH5E48 A1K30A	E4AH5E60 A1K30A
Technology - Fix/INV		-	INV	INV	INV	INV	INV	INV	INV
Model type		AC/HP	HP	HP	HP	HP	HP	HP	HP
Refrigerant type		-	R410A	R410A	R410A	R410A	R410A	R410A	R410A
IDU model		-	AHU	AHU	AHU	AHU	AHU	AHU	AHU
Ambient condition		T1/T2 /T3	T1	T1	T1	T1	T1	T1	T1
Power supply		Volt	208-230V	208-230V	208-230V	208-230V	208-230V	208-230V	208-230V
		Ph	1Ph	1Ph	1Ph	1Ph	1Ph	1Ph	1Ph
		Hz	60Hz	60Hz	60Hz	60Hz	60Hz	60Hz	60Hz
Rated capacity at T1 (Full load)	Cooling	Btu/h	18000	24000	28000	34000	42000	48000	54000
Efficiency measure (SEER2)			15.2	15.2	15.2	15.2	15.2	15.2	15.2
Efficiency measure (HSPF2)			8.5	8.1	8.5	8.1	8.1	8.1	8.1
Pipe connection size	Liquid side diameter	Inch	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
	Suction side diameter	Inch	3/4"	3/4"	3/4"	3/4"	7/8"	7/8"	7/8"
Refrigerant pipe length	Total	Ft	98	98	98	98	164	164	164
(Max height)	Vertical (ODU& IDU)	Ft	49	49	49	49	98	98	98

1-2.2 The relation curve of CAPACITY-TEMPERATURE

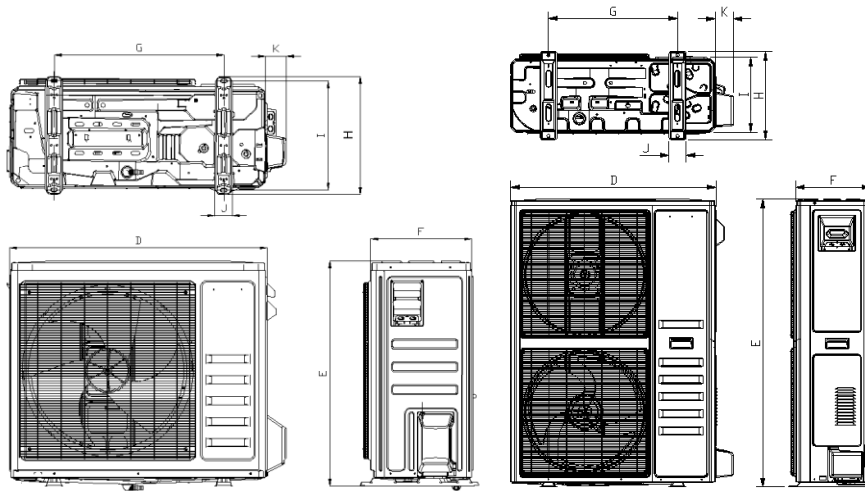


1-3. Product dimensions

Indoor Unit:



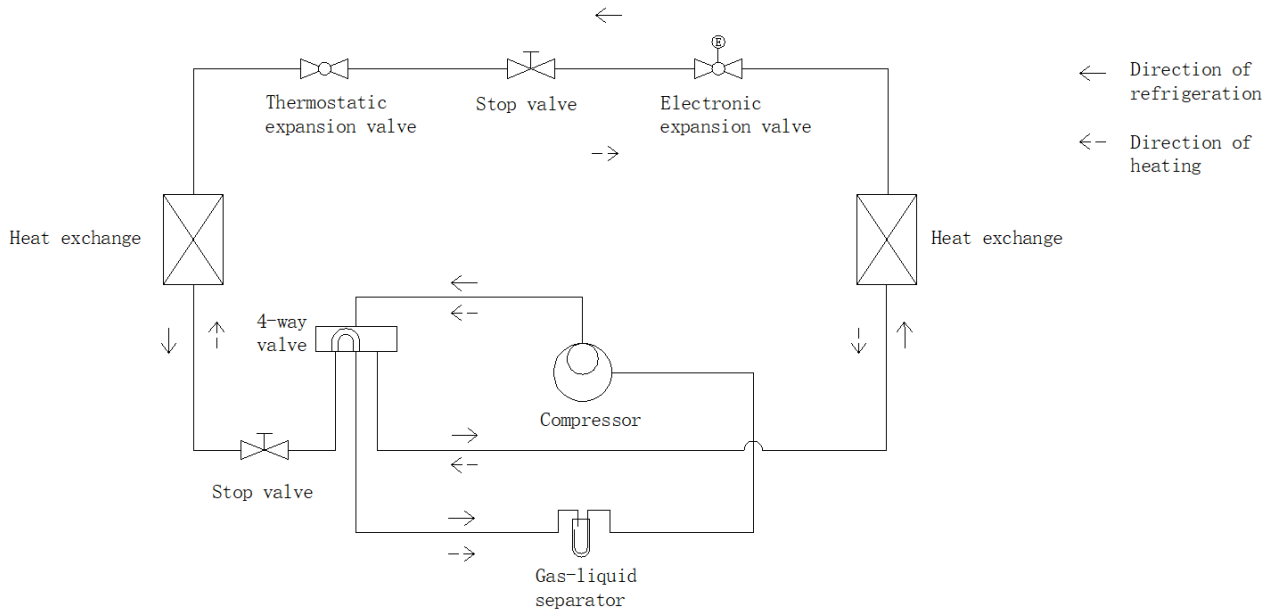
Outdoor Unit:



Unit: (inches)

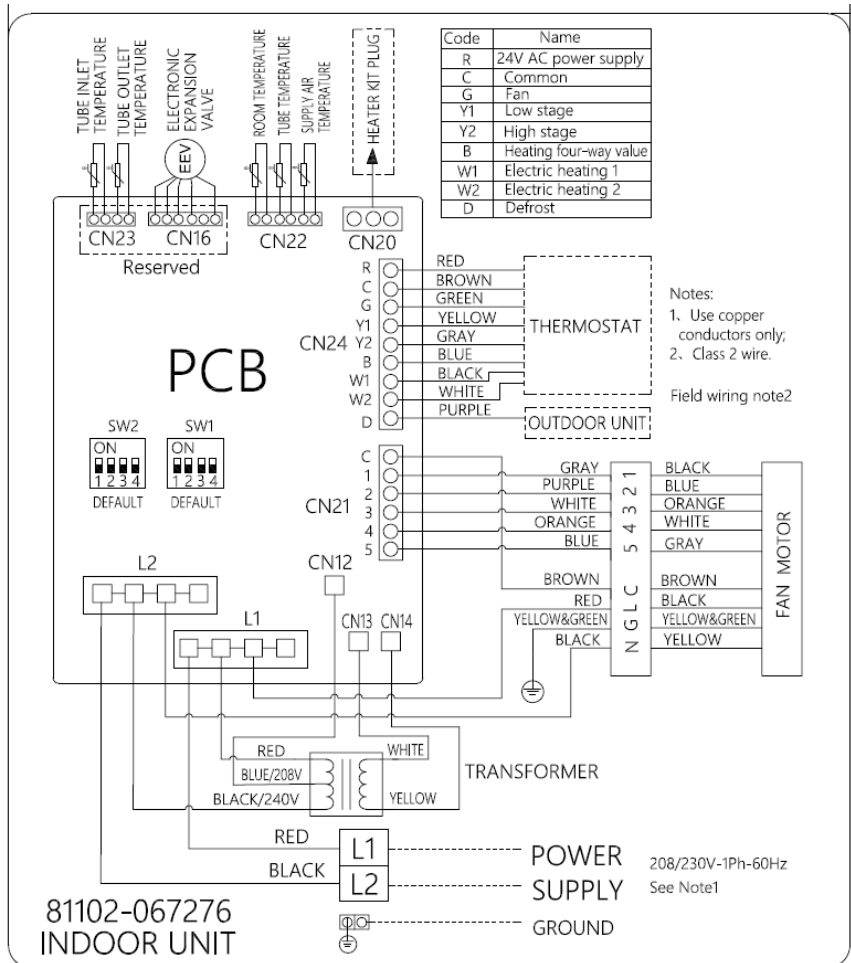
IDU Model	Dimension			ODU Model	Dimension							
	A	B	C		D	E	F	G	H	I	J	K
E4AH5E24A1J30A	21.0	21.0	46.5	E4HL5018A1000A E4HL5024A1000A	35.6	31.6	13.7	23.9	16.6	15.4	2.5	2.6
E4AH5E36A1J30A	21.0	21.0	46.5	E4HL5030A1000A E4HL5036A1000A	35.6	31.6	13.7	23.9	16.6	15.4	2.5	2.6
E4AH5E48A1K30A	21.0	24.5	56.0	E4HL4242A1000A E4HL5048A1000A	37.2	52.7	13.3	23.6	16.1	14.8	3.2	3.3
E4AH5E60A1K30A	21.0	24.5	56.0	E4HL5060A1000A	37.2	52.7	13.3	23.6	16.1	14.8	3.2	3.3

1-4. Refrigeration cycle

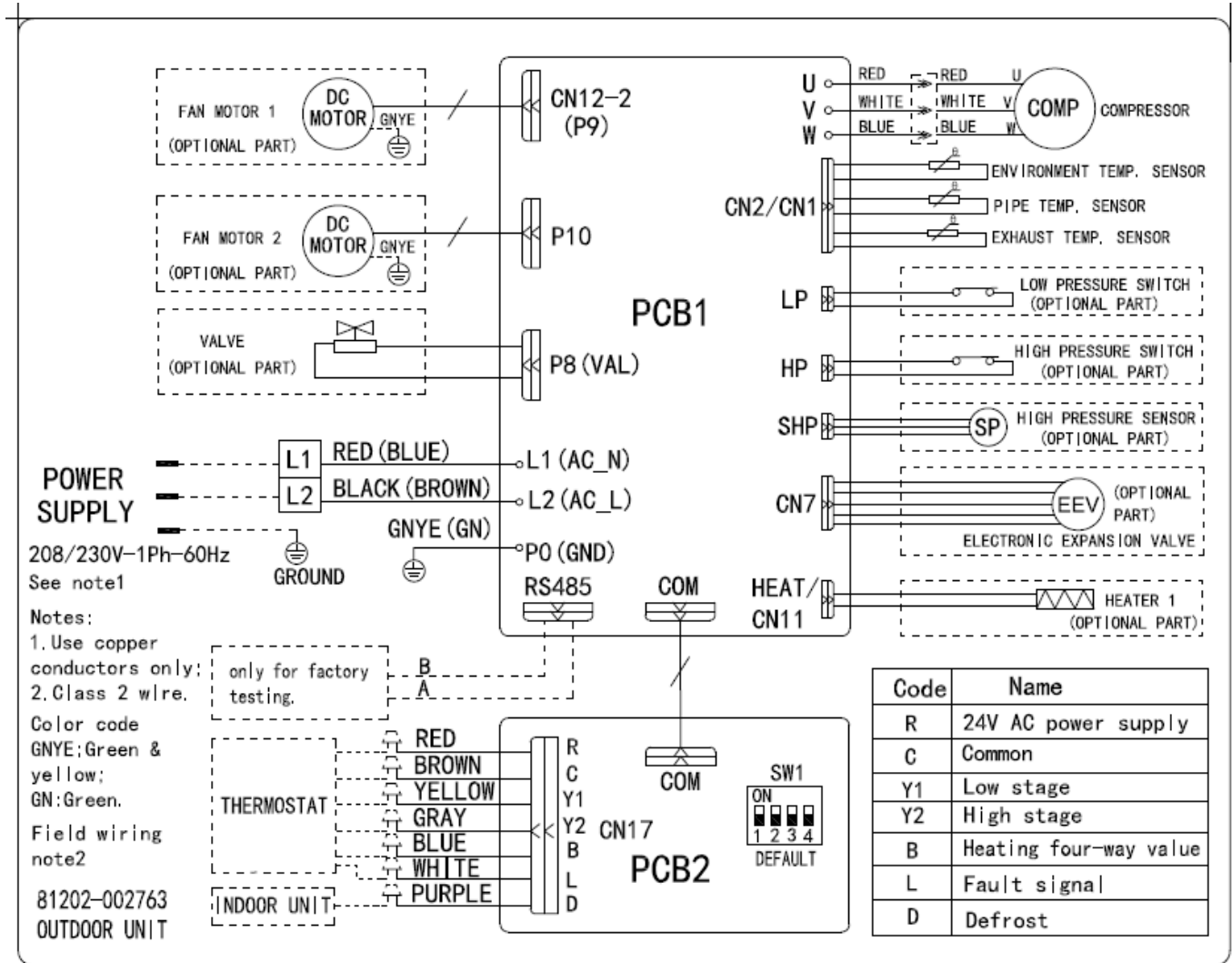


1-5. Electric diagram 1-5.1 Wiring diagram

Indoor unit:

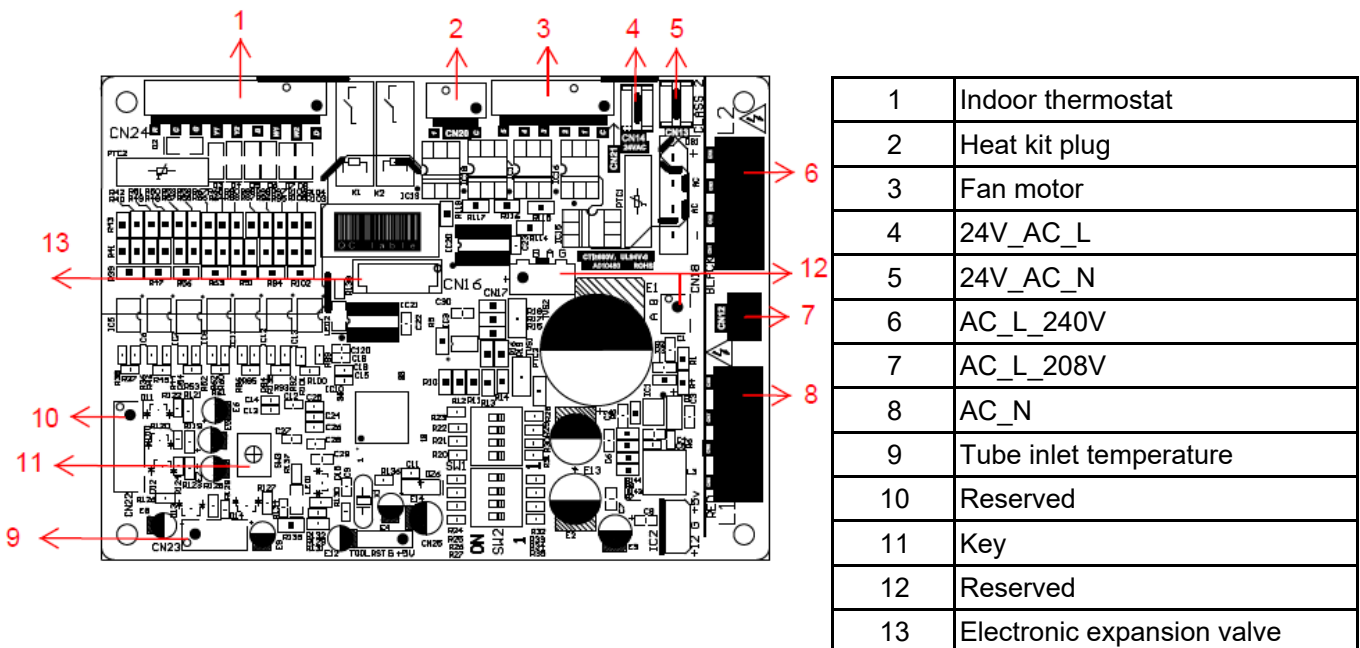


Outdoor unit



1-5.2 PCB layout

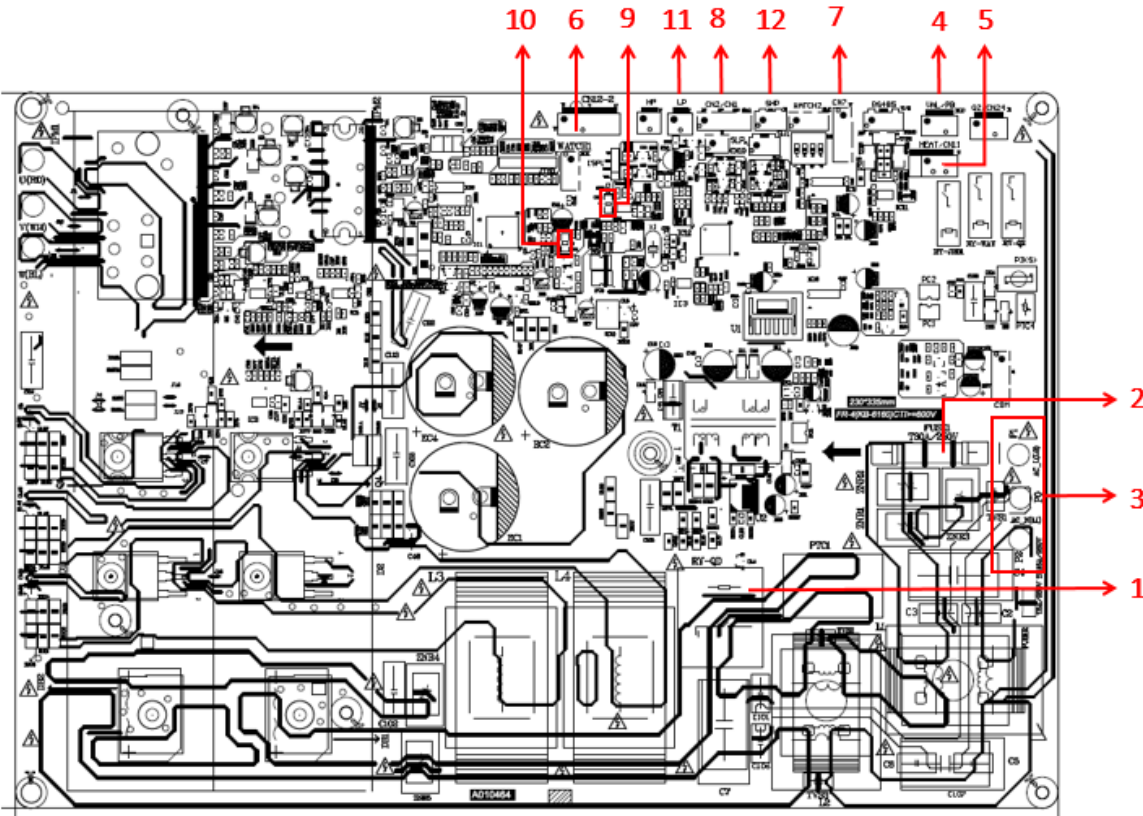
Indoor PCB



Outdoor unit

E4HL5018A1000A, E4HL5024A1000A, E4HL5030A1000A, E4HL5036A1000A

TOP view



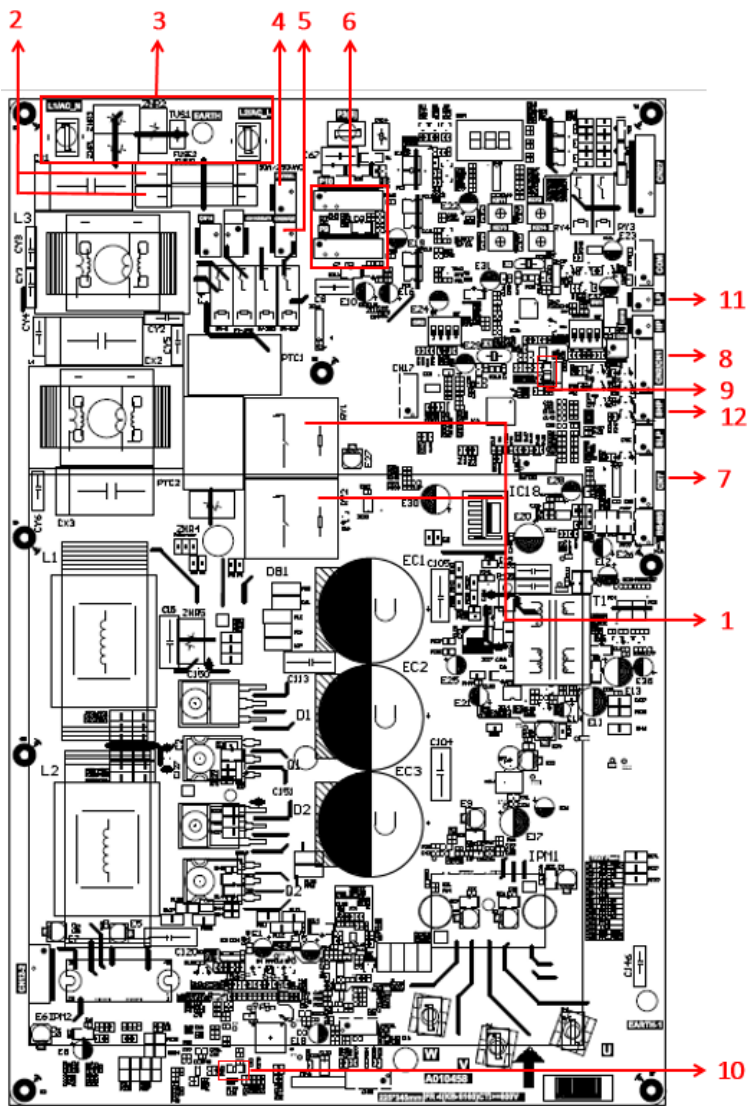
1	ODU PCB Main relay
2	Fuse
3	L1, L2 & P0
4	4-way valve
5	Heater
6	DC fan motor connector
7	Electronic expansion valve
8	ODT / OAT/ OPT connector
9	LED2
10	LED1
11	LP
12	SHP

Note:

OPT---Outdoor Pipe Temperature sensor.
OAT---Outdoor Ambient Temperature sensor.
ODT---Outdoor Discharge Temperature sensor.

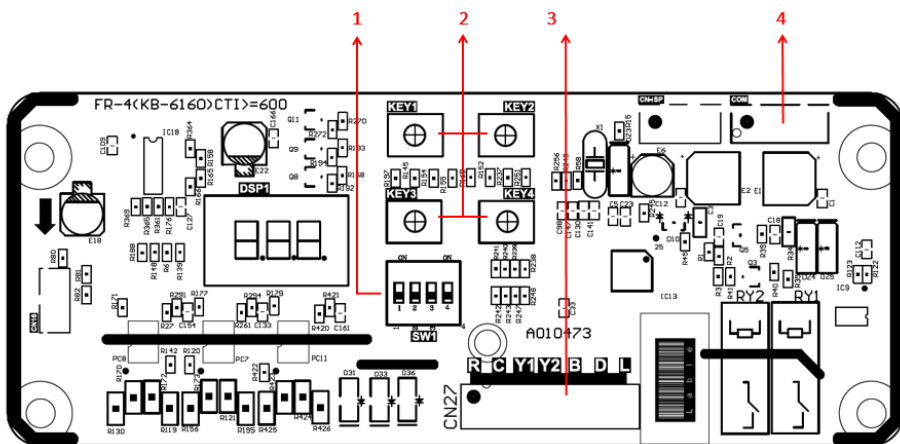
E4HL5042A1000A, E4HL5048A1000A, E4HL5060A1000A

Top view



1	ODU PCB main relay
2	Fuse
3	L1, L2 & P0
4	4-way valve
5	Heater
6	DC fan motor connector
7	Electronic expansion valve
8	ODT/OAT/OPT connector
9	LED2
10	LED1
11	LP
12	SHP

Operating panel



1	Dial switch (SW1)
2	Key(KEY1~KEY4)
3	Thermostat connector
4	Com connector

1-6. The DIP switch & the Key switches operation instructions

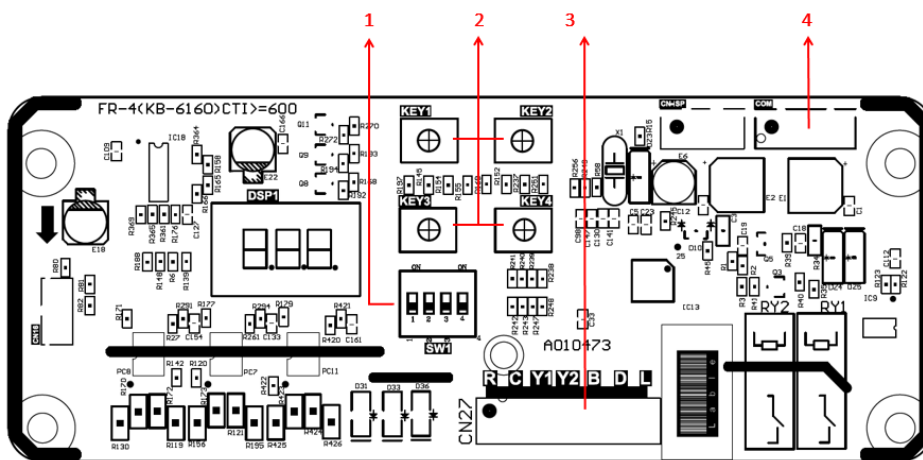
ATTENTION

- ⚠ Operating of the DIP switch and/or Key switches need to open the electric box cover of outdoor unit, or open the front and side panel of indoor unit, and it must be operated by professional electrical personnel.
- ⚠ The DIP switch is effective only when the unit is powered off. Disconnect the power supply of the unit before the operation.
- ⚠ The Key switches are effective only when the unit is in standby or running state. Professional electrical personnel are required to operate the keys switch and take relevant protective measures.

1-6.1 The Outdoor unit DIP-switch

1-6.1.1 The position of ODU DIP switch

The DIP switches of the outdoor unit are located on the operating board of the ODU. There is a set of four-digit DIP switches with the silk mark **SW1** shown as below:



1	Dial switch (SW1)
2	Key(KEY1~KEY4)
3	Thermostat connector
4	Com connector

1-6.1.2 Outdoor unit DIP switch function instruction

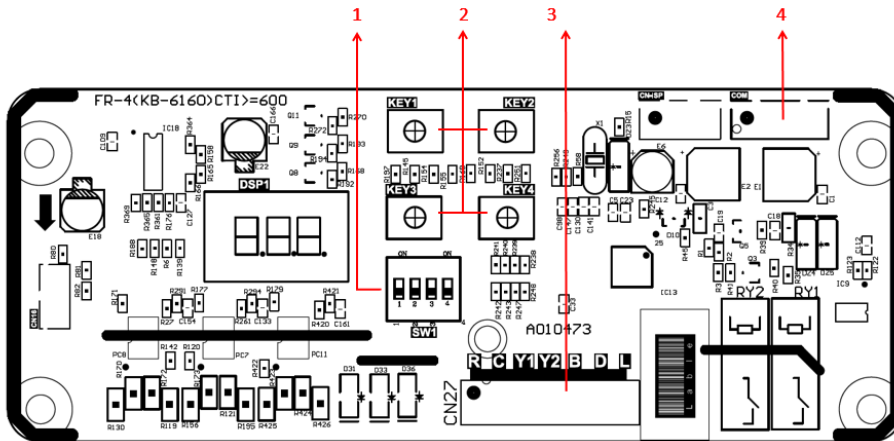
The outdoor unit dip-switch function is as below:

Outdoor unit DIP-switch		Description	
Item	Definition	The DIP set position	Detail description
SW1-1	Cooling only / Heat pump function selection		Default setting, the outdoor is a normal Heat Pump unit, which runs in Cooling or Heating mode based on the customer selection.
			It turns off the Heating function, and operates the Cooling mode when receiving the cooling start signal, and keeps standby while receiving the heating start signal.
SW1-2	Unit capacity selection		100% capacity (default setting)
			75% capacity
SW1-3	For manufacturer adjustment		For manufacturer adjustment, please keep the original setting
SW1-4	For manufacturer adjustment		For manufacturer adjustment, please keep the original setting

1-6.2 The outdoor unit Key switches

1-6.2.1 The position of ODU Key switches.

The outdoor unit key switches are located on the operating board of the ODU. There is a group of four keys shown as below, and marked as **KEY1 ~ KEY4**



1	Dial switch (SW1)
2	Key(KEY1~KEY4)
3	Thermostat connector
4	Com connector

1-6.2.2 Outdoor unit key switches introduction

(1) Outdoor unit **Forced Start** function

When the unit is not connected to the thermostat, or the thermostat cannot normally turn on the cooling/heating mode, it is used to forcibly start the outdoor unit for debugging within a short time.

- ① Forced start in Cooling mode: Press the KEY4 button for 3 seconds and release it, then the third digital tube (DSP1-3) shows 7, and the system enters into the **forced cooling** operation after 1 minute;
- ② Forced start in Heating mode: Longer press the KEY4 button for 6 seconds and release it, the third digital tube (DSP1-3) shows 8, and the system enters the **forced heating** operation after 1 minute;
- ③ Quit from the forced mode operation: press KEY4 once during the forced running.

(2) Outdoor unit **Forced Defrosting** function

When the unit is in freezing rain, snow and other extreme weather conditions, after removing the snow in the unit, such as the condenser is covered by frost, you can enter the forced defrosting operation through the key of the outdoor unit. When the unit has snow in extreme environment, please clean the snow and ice before forced defrosting. If snow often occurs in the area, it is recommended to install the unit in an area that cannot be covered by snow or install a snow cover.

- ① Enter forced defrosting: When the unit is in heating mode, press the KEY4 button twice within 5 seconds, release it after 3 seconds, and the third digital tube (DSP1-3) will display 6, after 3 seconds, the system enters the forced defrosting operation;
- ② Quit from forced defrosting: The unit will automatically decide to exit forced defrosting according to system parameters. After exiting forced defrosting, the unit will continue heating operation according to the mode set by thermostat.

(3) Engineering **Parameter Setting** function

The unit can be differentiated parameter settings according to different engineering conditions, in the standby state, long press KEY1 button for 5 seconds and release it, you can enter the **Engineering Parameter Setting** function menu. In any state while enter the lower menu, short press KEY1 button can return to the upper menu.

① The Lowest outdoor Ambient Temperature setting for heating mode:

While project parameter setting menu under the state of selection:

Press **KEY2** button to adjust the digital tube display to **S01**.

Press **KEY3** button to adjust the parameter menu.

Press **KEY2** button to adjust the parameter value.

And press **KEY3** button to save the above section.

The parameters and their meanings are shown in the following table.

Parameter code	Value	Description
S01	0	The Heating mode cannot be started when the ambient temperature below -40°F (Default)
	1	Heating cannot be started when below 41°F
	2	Heating cannot be started when below 14°F
	3	Heating cannot be started when below -4°F
	4	Heating cannot be started when below -22°F
	5	Heating cannot be started when below -40°F

Note: The heat output of unit will decrease by more than 30% when the ambient temperature lower than 5°F . And it may be shut down due to low system pressure while ambient temperature below -4°F . To ensure the comfort, it is recommended to use backup heat sources for heating at extremely low temperature.

② Timing Defrosting setting:

While project parameter setting menu under the state of selection, Press **KEY2** button to adjust the digital tube display to **S02**, Press **KEY3** button to adjust the parameter **menu**, Press **KEY2** button to adjust the parameter value, and press **KEY3** button to save the above section.

The parameters and their meanings are shown in the following table

Parameter code	Value	Description
S02	0	The compressor runs for 120 minutes accumulatively to perform one defrosting cycle (Default)
	1	The compressor runs for 40 minutes accumulatively to perform one defrosting cycle
	2	The compressor runs for 60 minutes accumulatively to perform one defrosting cycle
	3	The compressor runs for 80 minutes accumulatively to perform one defrosting cycle
	4	The compressor runs for 100 minutes accumulatively to perform one defrosting cycle
	5	Turn off the timing defrosting function

Note: This function is mainly used to solve the problem that the outer ambient temperature sensor easily to be covered by ice and snow in extreme environment, that makes it cannot be accurately detected and the defrost cannot be normally entered. Adding the function of timing defrost can strengthen the defrost ability of the unit. The time can be adjusted according to the actual installation conditions.

③ Anti-freezing protection Pressure setting:

While project parameter setting menu under the state of selection, Press **KEY2** button to adjust the digital tube display to **S03**, Press **KEY3** button to adjust the parameter **menu**, Press **KEY2** button to adjust the parameter value, and press **KEY3** button to save the above section.

The parameters and their meanings are shown in the following table

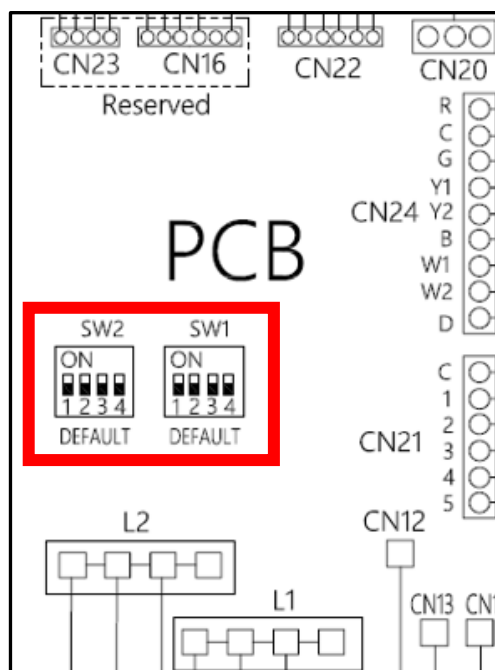
Parameter code	Value	Description
S03	0	The unit will stop Cooling while the system low pressure detected lower than 105.9psi. (Default)
	1	The unit will stop Cooling while the system low pressure detected lower than 98.6psi.
	2	The unit will stop Cooling while the system low pressure detected lower than 91.4psi.
	3	The unit will stop Cooling while the system low pressure detected lower than 84.1psi.
	4	The unit will stop, when the system detect the low pressure is lower than 76.9psi.
	5	The unit will stop Cooling while the system low pressure detected lower than 62.4psi.

Note: This function is mainly used to solve the problem of the freezing risk for IDU the evaporator in cooling mode when the outdoor or indoor ambient temperature is too low. Since the pressure sensor is installed at the outdoor unit side, the protection value can be appropriately reduced to improve the cooling effect under the condition of long connection pipes. If the indoor unit is usually freezing, the protection value can be appropriately increased.

1-6.3 Indoor unit DIP switch

1-6.3.1 The Indoor unit DIP switch position

The indoor unit DIP switch is located on the indoor unit main board (shown as the following picture), the main board can be found by removing the front plate. There are two sets of 4-digit DIP switch, the silk marks are “**SW1**” and “**SW2**” respectively.



1-6.3.2 Indoor unit DIP switches function introduction

The Indoor unit DIP switches provide three functions: **Fan speed adjustment**, **Anti-cold air function**, and **Electrical heater control**.

(1) Fan speed adjustment:

The unit adopts 5-speed (from 1 to 5 speed increasing in turn) constant torque ECM motor, you can choose two of the 5-speed as the actual operation of the High and Low speed.

- ① When the **SW1-1** is located at the **Digital** end (**Default**), the high speed select the 5th speed, and low speed select the 2nd speed.
- ② When the **SW1-1** is located at the **ON** end, the fan will operate the fan speed according to the combination of **SW1-2** and **SW1-3**.

The corresponding combination and fan speed are shown as table.

Combination	SW1 setting	Low speed	High speed
1(Default)		2 nd speed	5 th speed
2		1 st speed	2 nd speed
3		1 st speed	3 rd speed
4		2 nd speed	4 th speed
5		3 rd speed	5 th speed

During installation, the fan speed adjustment should be according to the **Actual Static Pressure** of the air duct and the **Air Volume-Static Pressure** shown as table below.

Model	Motor Speed		SCFM / Watts										
			External Static Pressure-Inches W.C.										
			0	0.1	0.16	0.2	0.3	0.4	0.5	0.6	0.7	0.8	
			[0]	[.003]	[.023]	[.029]	[.044]	[.058]	[.072]	[.087]	[.102]	[.116]	
E4AH5E24A1J30A	Tap (5)factory	SCFM	1013	968	947	948	948	936	899	857	808	755	
		Watts	181	192	196	198	200	207	217	226	236	245	
	Tap (4)	SCFM	862	810	810	804	790	746	702	655	607	562	
		Watts	114	118	122	124	131	139	148	159	169	177	
	Tap (3)	SCFM	767	735	728	729	680	630	576	535	490	454	
		Watts	80	85	88	91	99	108	118	127	135	141	
	Tap (2)factory	SCFM	668	642	636	614	590	510	471	418	380	334	
		Watts	59	63	66	68	72	85	95	101	107	116	
	Tap (1)	SCFM	598	569	553	528	475	428	373	325	277	260	
		Watts	45	46	53	55	64	72	79	85	92	97	
	E4AH5E36A1J30A	Tap (5)factory	SCFM	1458	1412	1390	1366	1320	1274	1194	1167	1072	1027
			Watts	280	295	298	300	308	317	327	337	350	357
Tap (4)		SCFM	1287	1240	1210	1192	1149	1077	1006	939	888	832	
		Watts	203	212	216	221	228	232	246	258	266	272	
Tap (3)		SCFM	1133	1084	1057	1035	979	896	835	777	724	670	
		Watts	147	154	157	162	169	180	190	197	204	211	
Tap (2)factory		SCFM	929	872	839	796	716	653	598	527	460	380	
		Watts	81	92	95	100	114	120	127	136	143	153	
Tap (1)		SCFM	802	756	692	651	594	525	453	355	270	210	
		Watts	60	69	72	78	87	91	98	108	114	119	
E4AH5E48A1K30A		Tap (5)factory	SCFM	1950	1903	1877	1863	1819	1784	1744	1708	1666	1616
			Watts	562	570	575	578	585	591	597	604	611	619
	Tap (4)	SCFM	1718	1682	1659	1648	1612	1575	1533	1498	1453	1401	
		Watts	412	422	361	433	444	453	460	466	473	482	
	Tap (3)	SCFM	1505	1465	1443	1428	1391	1353	1325	1293	1254	1174	
		Watts	277	290	298	302	313	325	338	348	358	374	
	Tap (2)factory	SCFM	1211	1175	1174	1174	1100	1066	1031	957	917	879	
		Watts	155	167	176	179	191	206	217	232	247	260	
	Tap (1)	SCFM	931	927	894	905	857	796	785	744	717	676	
		Watts	83	100	110	116	129	144	158	176	188	206	
	E4AH5E60A1K30A	Tap (5)factory	SCFM	1950	1903	1877	1863	1819	1784	1744	1708	1666	1616
			Watts	562	570	575	578	585	591	597	604	611	619
Tap (4)		SCFM	1718	1682	1659	1648	1612	1575	1533	1498	1453	1401	
		Watts	412	422	361	433	444	453	460	466	473	482	
Tap (3)		SCFM	1505	1465	1443	1428	1391	1353	1325	1293	1254	1174	
		Watts	277	290	298	302	313	325	338	348	358	374	
Tap (2)factory		SCFM	1211	1175	1174	1174	1100	1066	1031	957	917	879	
		Watts	155	167	176	179	191	206	217	232	247	260	
Tap (1)		SCFM	931	927	894	905	857	796	785	744	717	676	
		Watts	83	100	110	116	129	144	158	176	188	206	

Notes:

- a. Heat pump systems require a specified airflow each ton of cooling requires between 300 and 450 **Cubic Feet per Minute (CFM)**. The shaded boxes represent airflow outside the required 300-450cfm/ton at full load.
- b. Airflow based upon cooling performance at 230V with no electric heat and no filter airflow at 208V is approximately the same as 230V because the multi tap ECM motor is a constant torque motor.

Note: If the unit is installed with electric auxiliary heater, the fan speed selection must meet the following static pressure requirements, and the gray boxes part is not allowed to use electric auxiliary heating.

Model	Motor Speed	Available electric auxiliary heater									
		External Static Pressure-Inches W.C.									
		0	0.1	0.16	0.2	0.3	0.4	0.5	0.6	0.7	0.8
		[0]	[.003]	[.023]	[.029]	[.044]	[.058]	[.072]	[.087]	[.102]	[.116]
E4AH5E24A1J30A	Tap (5)	5-10kW									
	Tap (4)	5-10kW									
	Tap (3)	5-10kW									
	Tap (2)										
	Tap (1)										
E4AH5E36A1J30A	Tap (5)	5-15kW									
	Tap (4)	5-15kW									
	Tap (3)	5-15kW									
	Tap (2)										
	Tap (1)										
E4AH5E48A1K30A	Tap (5)	5-20kW									
	Tap (4)	5-20kW									
	Tap (3)	5-15kW									
	Tap (2)										
	Tap (1)										
E4AH5E60A1K30A	Tap (5)	5-20kW									
	Tap (4)	5-20kW									
	Tap (3)	5-15kW									
	Tap (2)										
	Tap (1)										

(2) Cold air Prevention

① When **SW1-4** is located at the **Digital** end (Default), the cold air prevention function of the unit is activated. The specific effect is that the fan runs at a low speed to quickly increase the air temperature, when the temperature of the inner coil tube is too low in the early start-up period, the fan motor will stop working during the defrosting process to avoid blowing cold air.

② When the **SW1-4** is located at the **ON** end, the function fails, and the fan motor always runs the corresponding level according to the high and low signal of the thermostat.

(3) Electric Auxiliary Heater control

① When **SW2-3** is located at the **digital** end (factory default), the electrical auxiliary heater is controlled by the **Air Outlet temperature** of the indoor evaporator. When the air temperature after passing through the evaporator is too high, the electrical auxiliary heater is not allowed to start, to prevent the electrical auxiliary heater frequently start and stop, or cause uncomfortable while the air outlet temperature after the electrical auxiliary heat is too high.

② When the **SW2-3** is located at the **ON** end, the electrical auxiliary heater is not controlled by the air outlet temperature of the indoor evaporator, the start and stop control is carried out according to the signal of the thermostat.

(4) Other setting of the DIP switch

Any other DIP switch setting not mentioned above cannot be adjusted, please keep them at the original position (Default digital end).

PART II Maintenance

2-1. Notes for maintenance

Safety Precautions

Important!

Please read the safety of precautions carefully before installation and maintenance. The following contents are very important for installation and maintenance. Please follow the instructions:

- The installation or maintenance must accord with the instructions.
- Comply with all national electrical codes and local electrical codes.
- Pay attention to the warnings and cautions in this manual.
- All installation and maintenance shall be performed by distributor or qualified person.
- All electric work must be performed by licensed technician according to local regulations and instructions given in this manual.
- Be cautious during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.

Warnings

Electrical safety Precautions.

- 1) Cut off the power supply of unit before checking and maintenance.
- 2) The unit must apply specialized circuit and prohibit share the same circuit with other appliances.
- 3) The unit should be installed in suitable location and ensure the power plug is touchable.
- 4) Make sure each wiring terminal is connected firmly during installation and maintenance.
- 5) Have the unit adequately grounded. The grounding wire can't be used for other purposes.
- 6) Must apply protective accessories such as protective boards, cable-cross loop and wire clip.
- 7) The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the unit.
- 8) The power cord and power connection wires can't be pressed by hard objects.
- 9) If power cord or connection wire is broken, it must be replaced by qualified person.
- 10) If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacturer or distributor.
- 11) For the unit without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more than 0.12 inch.
- 12) Make sure all wires and pipes are connected properly and the valves are opened before energizing.
- 13) Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.
- 14) Replace the fuse with a new one of the same specification if it is damaged, don't replace it with a cooper wire or conducting wire.
- 15) If the unit is to be installed in a humid place, the circuit breaker must be installed.

Maintenance

1) Inspections before maintenance.

(1) Inspection of maintenance environment

- There should be no leaked refrigerant in the room before operation.
- It is only allowed to operate in a room which meets the area requirement on the nameplate.
- It is necessary to make the room keep a continuous ventilation state at the time of maintenance.

(2) Inspection of maintenance equipment

- Check the maintenance equipment is applicable to the refrigerant or not and it is only allowed to use the professional equipment recommended by the unit manufacturer.

2) Inspection of unit

- It is necessary to ensure that the unit is in reliable ground connection before maintenance.
- Make sure power supply to air conditioner is off. Before maintenance, it is necessary to cut off the power and discharge the capacitor power which used in the air conditioner.

3) Safety principles during the maintenance

- At the time of maintenance, it is necessary to ensure well-ventilation on the site.
- At the time of maintenance, if the relative humidity is lower than 40%, it is necessary to wear anti-static clothing and gloves.

4) Requirements for charging

- It is necessary to use nitrogen to clear the cyclic system before operating the refrigerating system and vacuum the outdoor unit for 30 minutes at least.
- It is necessary to ensure that there is no cross contamination among different refrigerants when the refrigerant filling device is used. The total length including the refrigerant pipeline should be as short as possible in order to reduce the residual refrigerant inside such pipeline.
- It is necessary to vertically place the refrigerant storage tanks.
- It is necessary to ensure that the refrigerating system is in ground connection before the refrigerant is filled.
- When filling the refrigerant, it is necessary to fill corresponding type and volume of refrigerant as per the requirements on the product nameplate and overfilling is prohibited.
- It is necessary to seal the system in a safe sealing way after maintaining the refrigerating system.
- It is necessary to ensure that the maintenance will not damage or reduce the safety protection grade of the original system.

5) In-maintenance brazing

- It is necessary to ensure that the maintenance location is well-ventilated.
- Before brazing the outdoor unit, it is a must to confirm that the refrigerating system has been drained and the system has been cleaned and ensure that there has been no refrigerant in the outdoor unit.
- It is necessary to close the stop valve of the outdoor unit when using a brazing gun to do the maintenance work such as cutting and brazing.

6) Maintenance of electrical components

- It is not allowed to refit, remove or cancel any component with the safety protection function after finishing the maintenance process.
- When maintaining the sealed parts, it is necessary to turn off the power of air conditioner before opening the sealing cover. When power supply is needed, it is necessary to do the ongoing leak detection at the most dangerous position in order to prevent potential danger.
- It is necessary to specially note that the maintenance of electrical components will not affect the replacement of protective cover.

Warning

Before doing the trial operation after finishing the maintenance, it is a must to use a practical leak detector to inspect the leakage and reliability of ground connection in order to ensure that no refrigerant leakage and reliable ground connection.

The refrigerant storage tanks should be separately placed in a well-ventilated place at the temperature ranging from 14°F to 122°F and label them with warning labels.

Electric Heat Data

Kit Model	Model Number	Electric Heat (kW)	MIN. Circuit Ampacity		MAX. Fuse or Breaker (HACR) Ampacity		Fan speed				
			208	230	208	230	1	2	3	4	5
BAYHTR1605BRKA	E4AH5E24A1J30A	5	23	25	25	30	x	x	•	•	•
BAYHTR1610BRKA		10	45	50	50	60	x	x	•	•	•
BAYHTR1605BRKA	E4AH5E36A1J30A	5	23	25	25	30	x	x	•	•	•
BAYHTR1610BRKA		10	45	50	50	60	x	x	•	•	•
BAYHTR1615BRKA		5+10	23+45	25+50	25+50	60+30	x	x	•	•	•
BAYHTR1605BRKA	E4AH5E48A1K30A	5	23	25	25	30	x	x	•	•	•
BAYHTR1610BRKA		10	45	50	50	60	x	x	•	•	•
BAYHTR1615BRKA		5+10	23+45	25+50	25+50	60+30	x	x	•	•	•
BAYHTR1620BRKA		10+10	45+45	50+50	50+50	60+60	x	x	x	•	•
BAYHTR1605BRKA	E4AH5E60A1K30A	5	23	25	25	30	x	x	•	•	•
BAYHTR1610BRKA		10	45	50	50	60	x	x	•	•	•
BAYHTR1615BRKA		5+10	23+45	50+25	50+25	60+30	x	x	•	•	•
BAYHTR1620BRKA		10+10	45+45	50+50	50+50	60+60	x	x	x	•	•

*MCA and Max Fuse Ampacity contains the motor amps.

Electric heat kits are suitable for air handler multiple position installation.

“•” means available “x” means unavailable

Safety Cautions All electric work must be performed by qualified personnel.

- (1) BAYHTR16* series is designed and approved to be installed in the AMERISTAR or RUNTRU series air handlers.
- (2) Check the BAYHTR16* label to confirm BAYHTR16* size based on room load under lowest temperature ambient.
- (3) Inspect all porcelain in insulators for breakage and the intact of heater element wire. Contact local distributor immediately if there is any occurred damage.

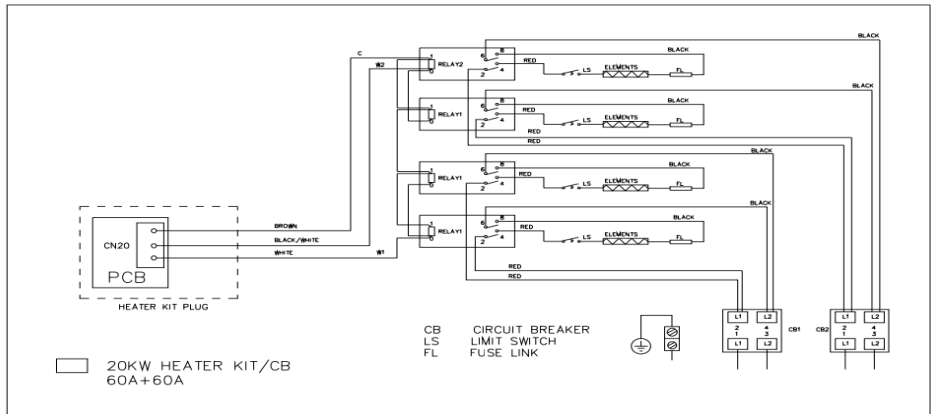
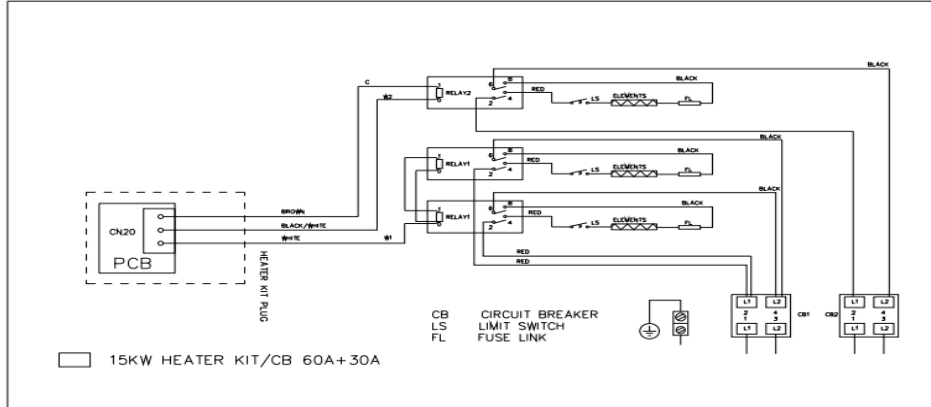
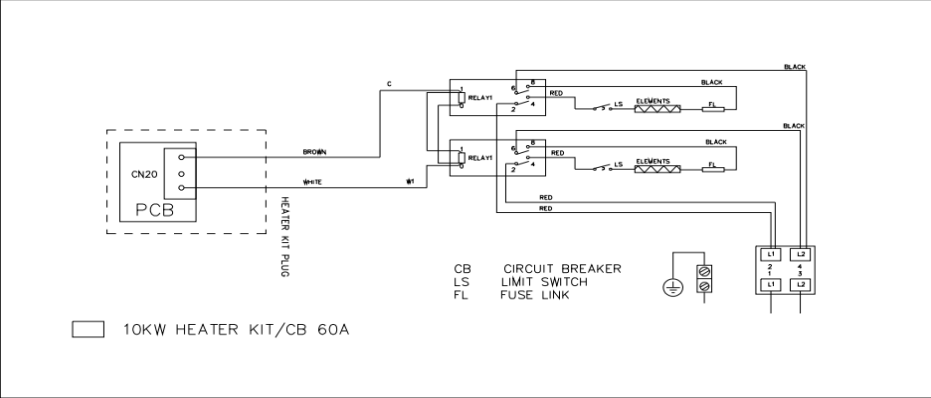
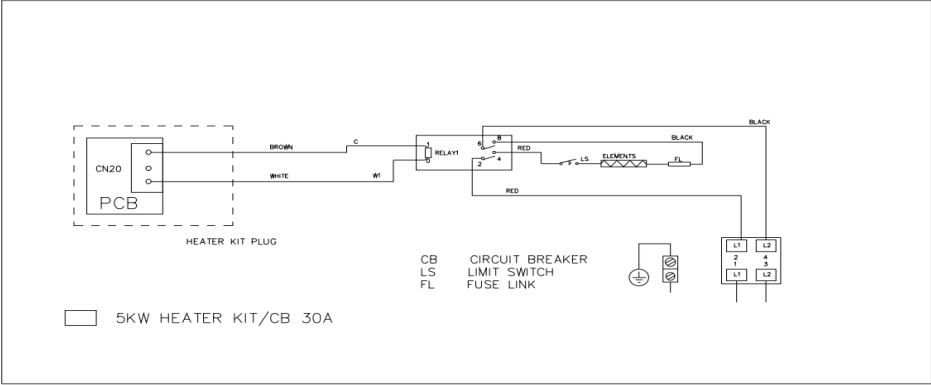


Warning

- (1) Disconnect all external power supplies before performing installation and servicing. Turn off accessory heater power switch if applicable. Failure to do so may cause serious injury.
- (2) BAYHTR16* must be properly grounded and use copper supply wires.
- (3) Make sure to follow national electric code and local regulations.
- (4) When installing it in an enclosed area such as a garage, heater elements should have a minimum clearance of 18” from the floor to insure the proper ventilation.

WARNING

Disconnect all power to unit before installing or servicing. More than one disconnected switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.



2-2. Maintenance

2-2.1 Failure code

Note: IDU=Indoor unit, ODU=Outdoor unit, Dry mode= Dehumidification mode

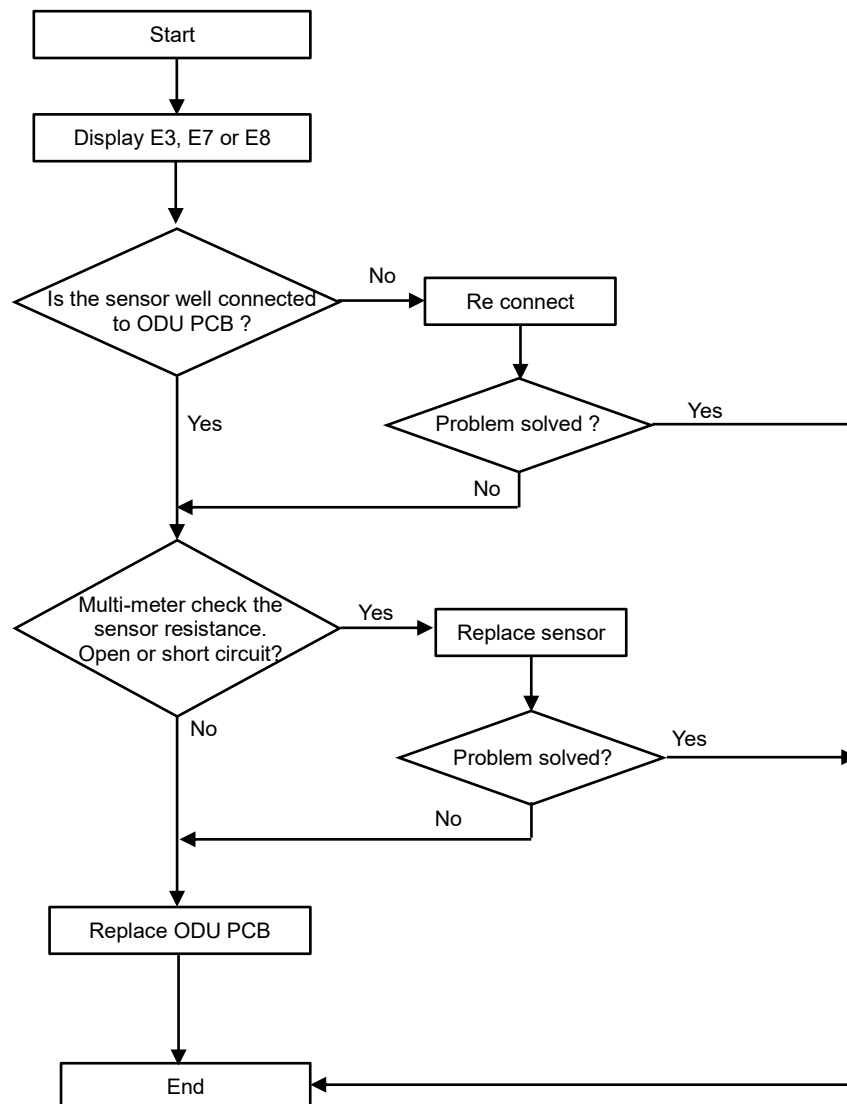
RT=Room temperature, IPT= Indoor unit coil pipe temperature

Code	Reason	Remark
E3	ODU Coil temperature sensor failure. (OPT)	ODU coil sensor and ODU PCB
E7	ODU Ambient Temperature sensor failure	ODU ambient sensor and ODU PCB.
E8	ODU Exhaust Temperature sensor failure.	ODU Exhaust sensor and ODU PCB.
E9	IPM / Compressor driving control abnormal.	ODU PCB , compressor, etc.
EA	ODU current sampling failure	ODU PCB
Eb	The Communication abnormal of Main PCB and operating board (IDU failure)	Display board and main PCB.
EC	The communication abnormal of ODU main PCB and operating PCB	ODU main PCB, ODU operating PCB
EE	ODU EEPROM failure.	1. ODU PCB broken? 2. Try to re-power on AC unit.
EF	ODU DC fan motor failure.	Fan motor, ODU PCB.
P0	IPM module protection.	ODU PCB
P1	Over / under voltage protection.	1. ODU PCB broken? 2. Power supply abnormal?
P2	Over current protection.	1. ODU PCB broken? 2. Power supply abnormal?
P4	ODU Exhaust pipe Over temperature protection.	Please check the troubleshooting for detail.
P5	Sub-cooling protection on Cooling mode.	Please check the troubleshooting for detail.
P6	Overheating protection on Cooling mode.	Please check the troubleshooting for detail.
P7	Overheating protection on Heating mode.	Please check the troubleshooting for detail.
P8	Outdoor Over temperature/Under temperature protection.	Please check the troubleshooting for detail.
P9	Compressor driving protection (Load abnormal).	Please check the troubleshooting for detail.
F5	PFC PROTECTION	Please check the troubleshooting for detail.
F6	The Compressor lack of phase / Anti-phase PROTECTION.	Please check the troubleshooting for detail.
F7	IPM Module over temperature PROTECTION	Please check the troubleshooting for detail.
F8	4-Way Valve reversing abnormal..	Please check the troubleshooting for detail.
FA	The compressor Phase-current test circuit failure.	ODU PCB
H1	High pressure switch failure	1. High pressure switch damage 2. High pressure switch connection is loose 3. ODU main PCB damage
H2	Low pressure switch failure	1. Low pressure switch damage 2. Low pressure switch connection is loose 3. ODU main PCB damage
H3	High pressure sensor failure	1. High pressure sensor damage 2. High pressure sensor connection is loose 3. ODU main PCB damage
H4	Low pressure sensor failure	1. Low pressure sensor damage 2. Low pressure sensor connection is loose 3. ODU main PCB damage

2-2.2 Trouble shooting

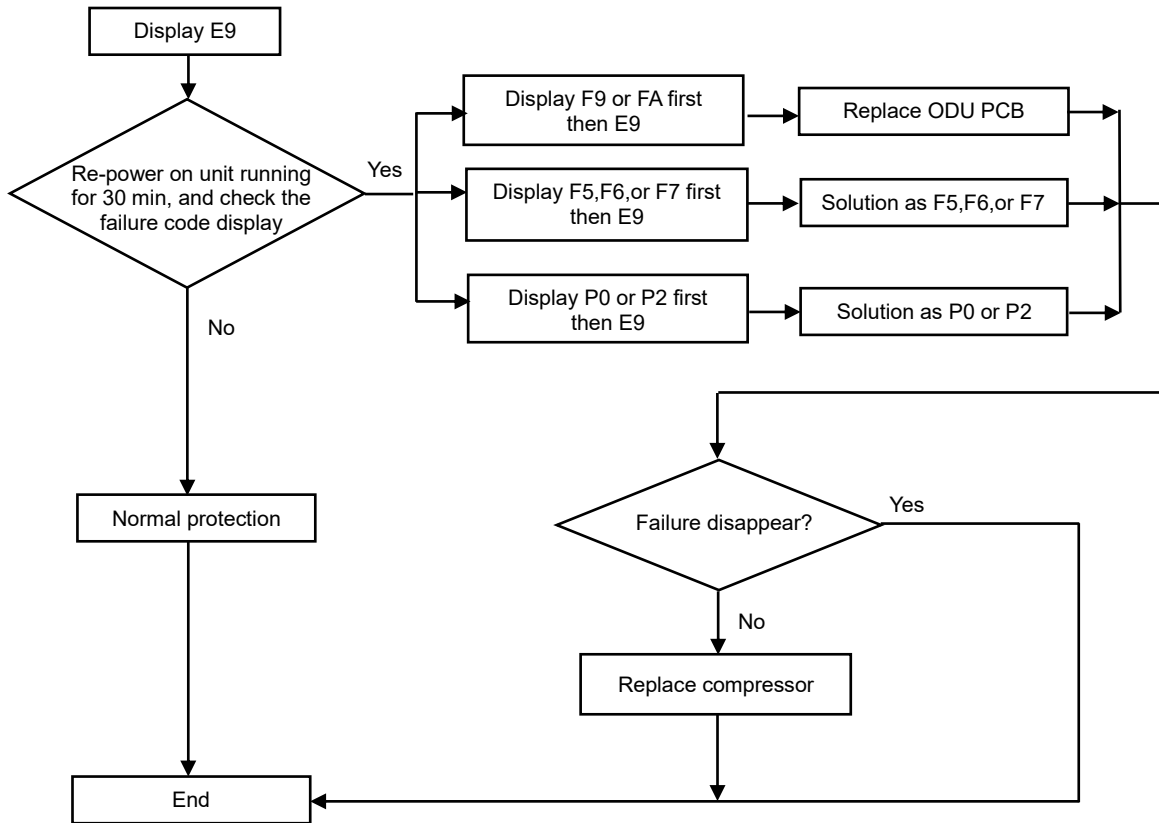
2-2.2.1 E3, E7 or E8----ODU Coil temperature sensor, Ambient temperature sensor or Discharge temperature sensor failure.

When any of the sensors open or short circuits, the unit will display failure code as E3/E7 or E8, IDU and ODU turns off. When the sensor resistance is recovered, the unit will revert to be on standby, the unit can be switched on directly.



2-2.2.2 E9---ODU IPM /Compressor drive fault

If unit stops working 6 times continuously caused by IPM protection (P0), it will display E9 error, and unit can't be operate, except press the ON/OFF button.



2-2.2.3 EA - ODU current sampling failure

Cause: Outdoor current sampling circuit failure or driver parameter mismatch
 Solution: Replace the ODU PCB.

2-2.2.4 Eb code- IDU communication abnormal of main board and operating board

Cause: 1. The communication wire damaged. 2. Outdoor main board damaged 3. Operating board damaged.
 Solution: 1. Replace the communication wire.
 2. Replace the outdoor main board.
 3. Replace the operating board.

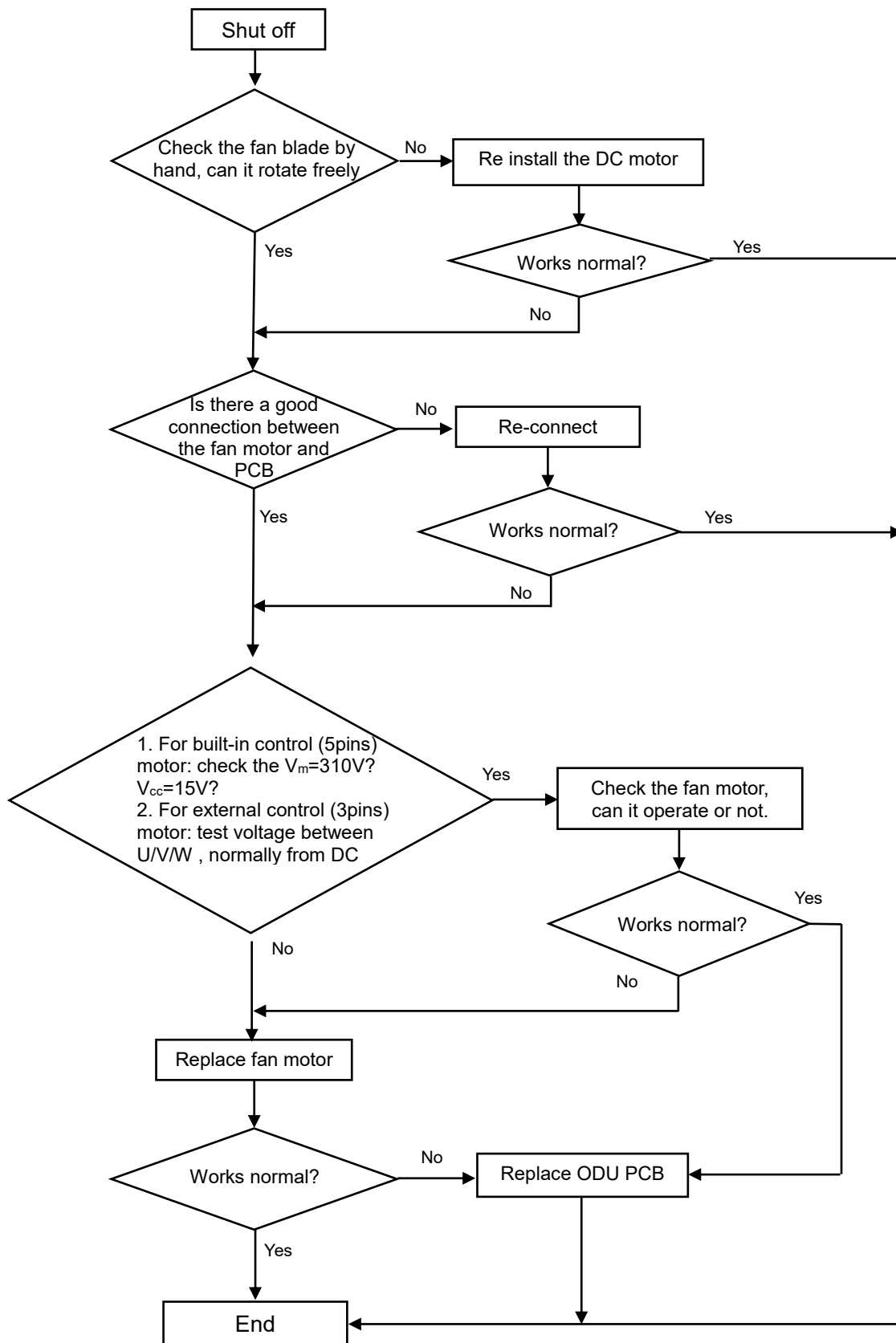
2-2.2.5 EC - Communication Error between ODU mainboard and drive board

Cause: The ODU mainboard damaged
 Solution: Replace the ODU PCB.

2-2.2.6 EE - ODU EEPROM failure.

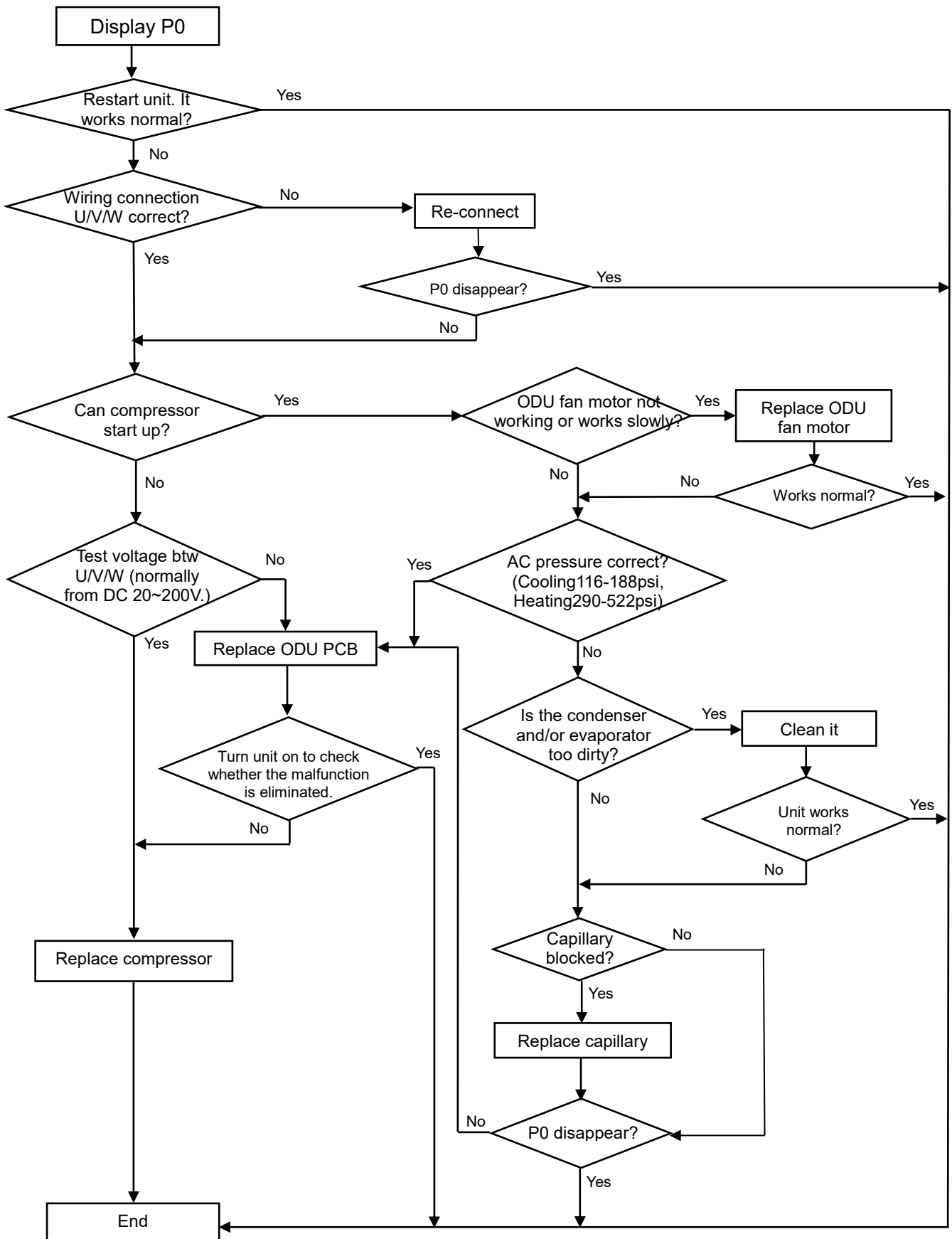
Cause: The ODU mainboard damaged.
 Solution: Replace the ODU PCB.

2-2.2.7 EF---ODU DC fan motor failure



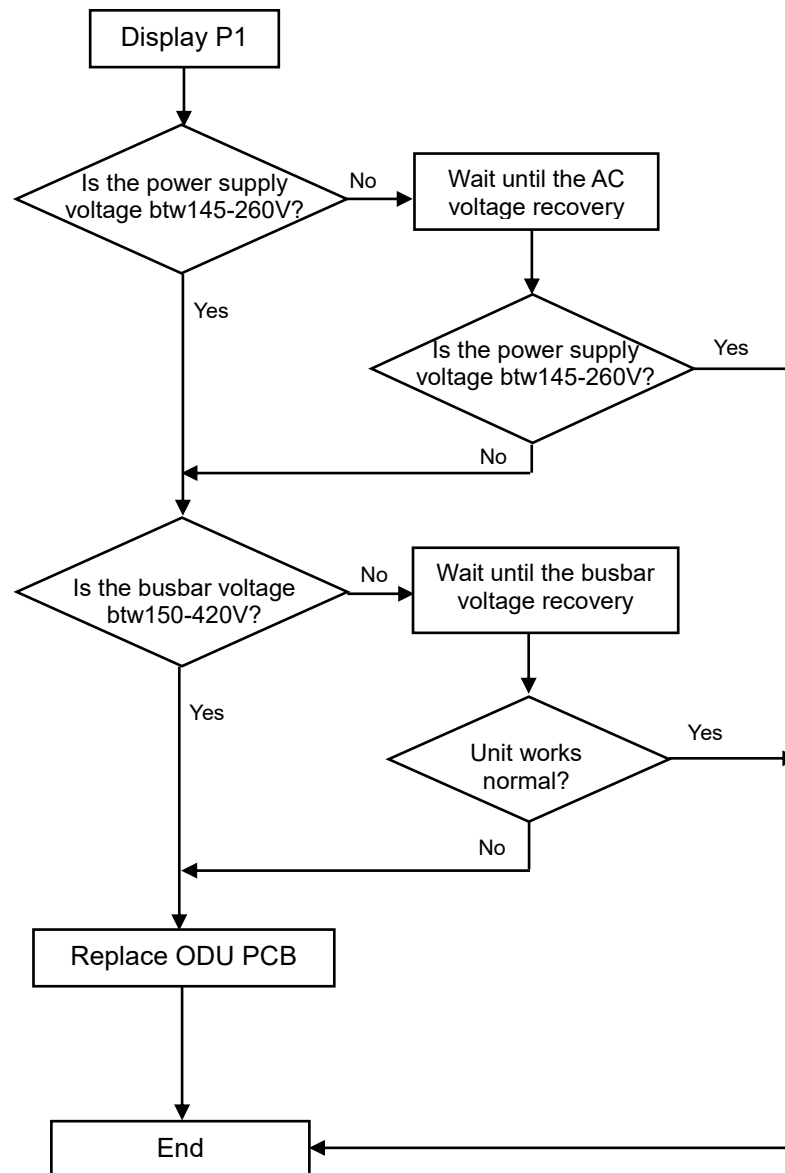
2-2.2.8 P0---IPM protection

When overheating or overcurrent happens for IPM, IDU will display P0 protection.



2-2.2.9 P1--- Over / under voltage protection

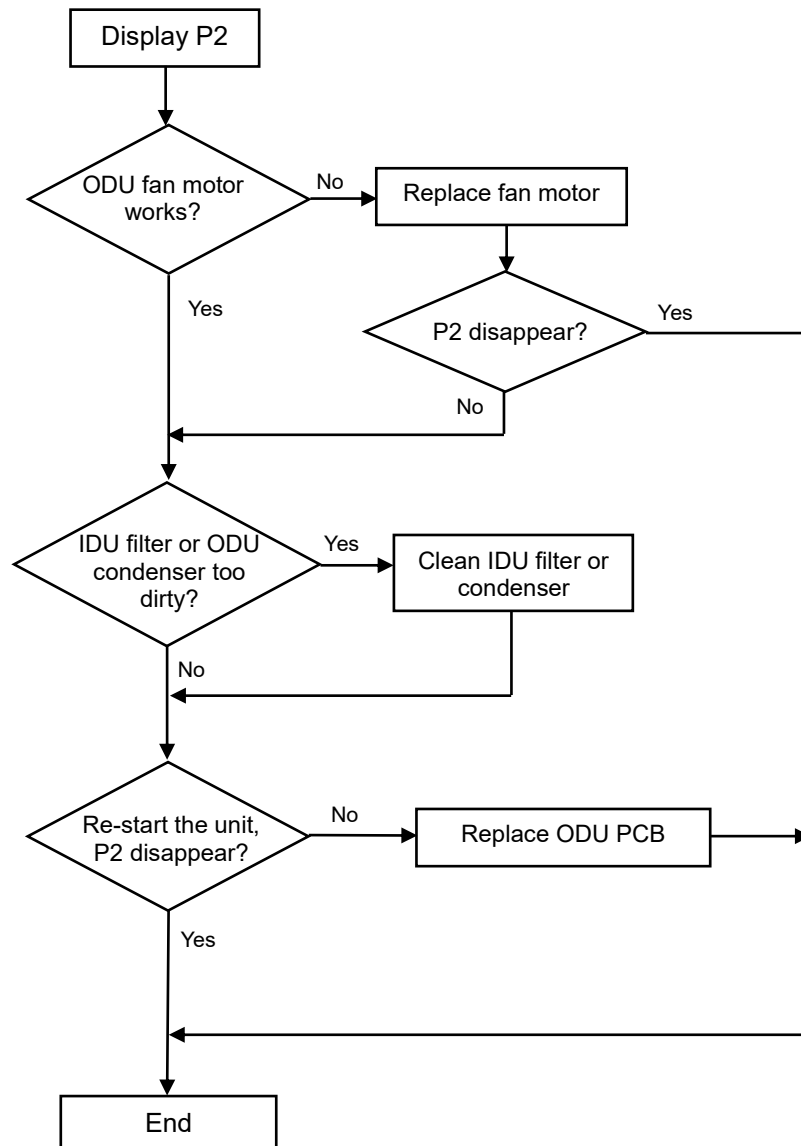
1. Test voltage between L1 & L2, When the power supply $V > AC260V$ or $V < AC150V$, AC will display P1 protection, unit will recover back to previous status while $V > AC155V$.
2. Test voltage on the electrolytic capacitor of ODU PCB, When DC busbar voltage $V > DC420V$ or $V < DC150V$, unit will recover back to previous status while $DC190V < V < DC410V$



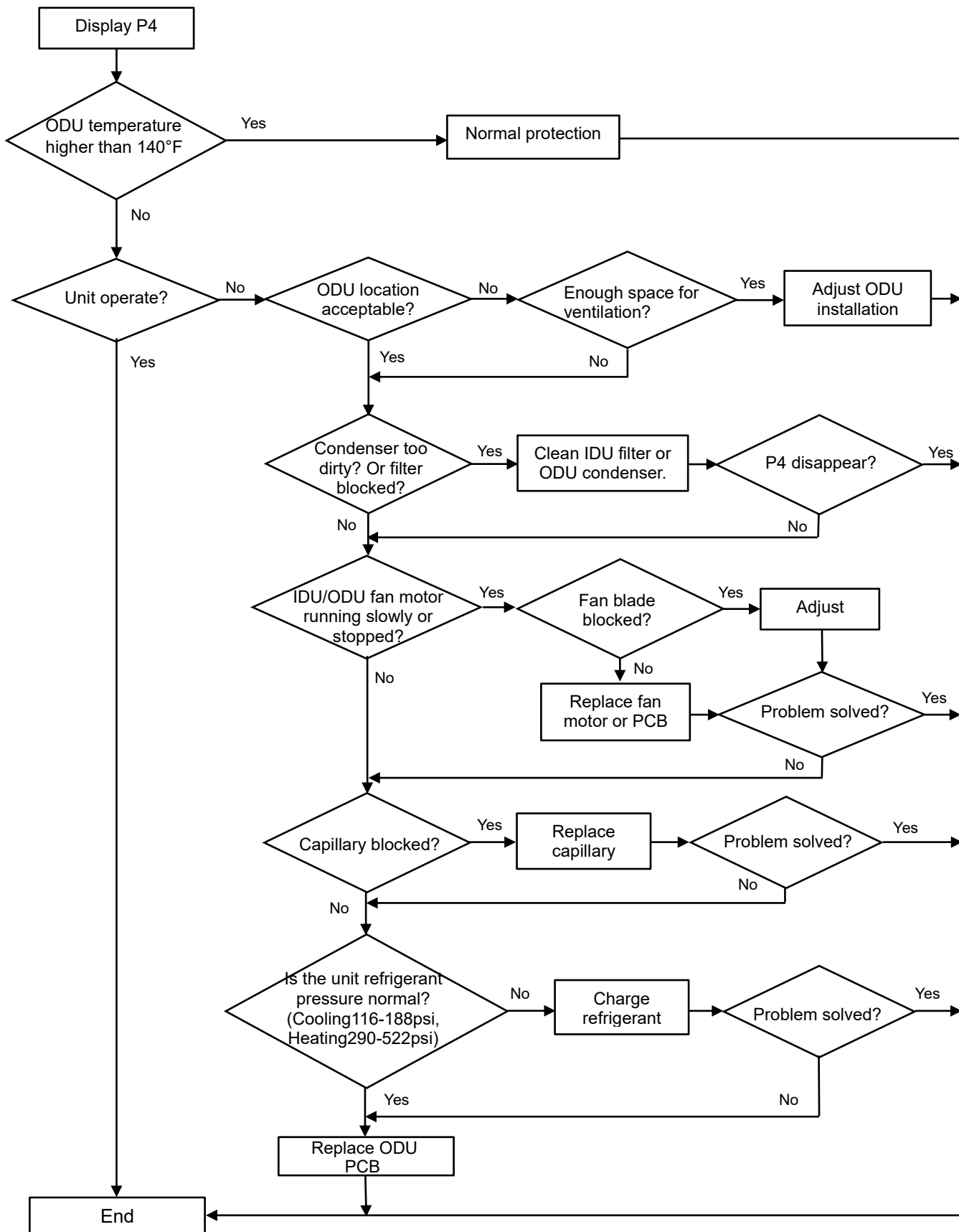
Note: btw=Between.

2-2.2.10 P2---Over Current protection

When the AC unit running current more than I_{max} , it will stop and display P2 protection.

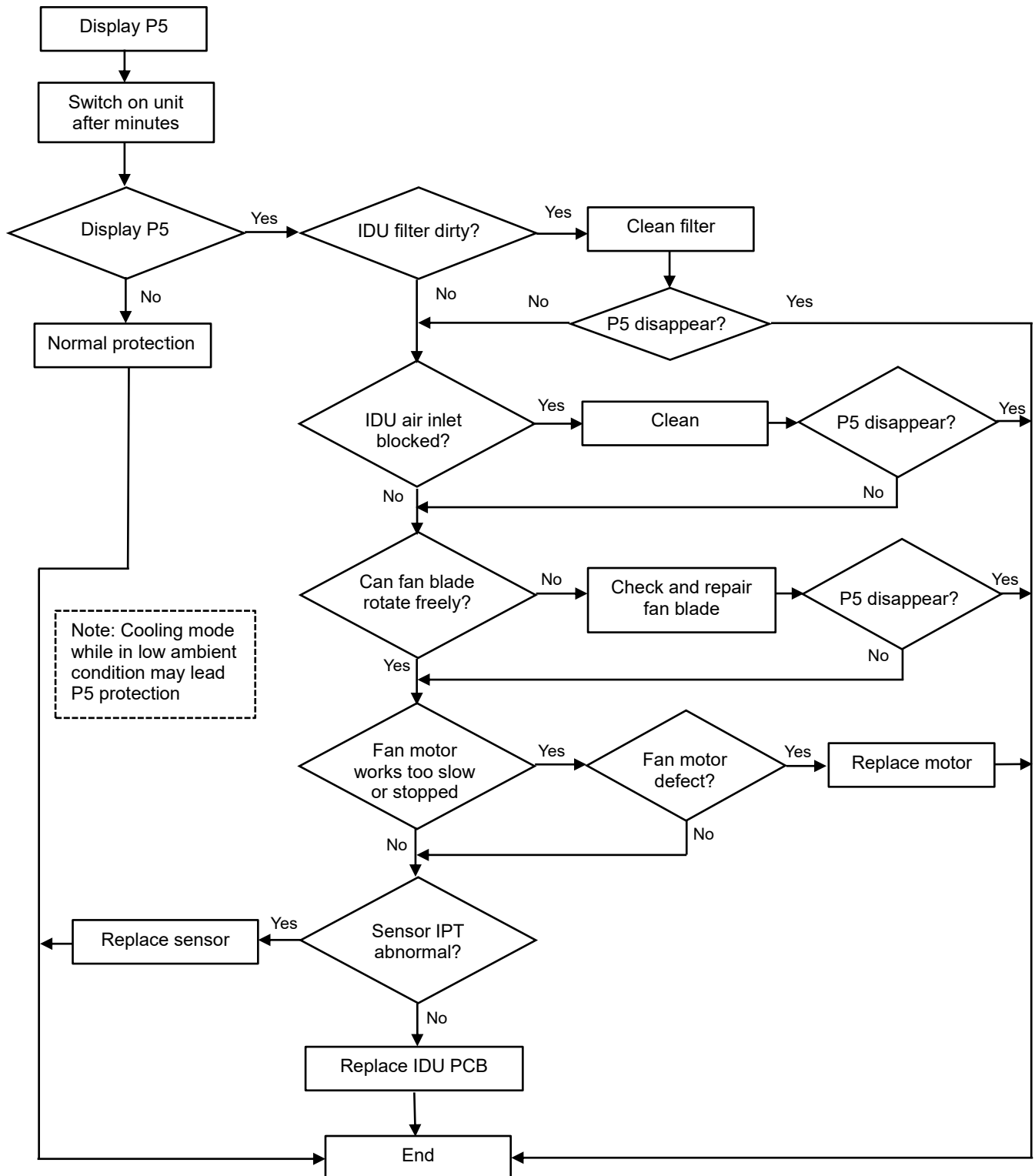


2-2.2.11 P4 ---ODU Exhaust temperature overheating protection



2-2.2.12 P5---Sub-cooling protection on Cooling mode

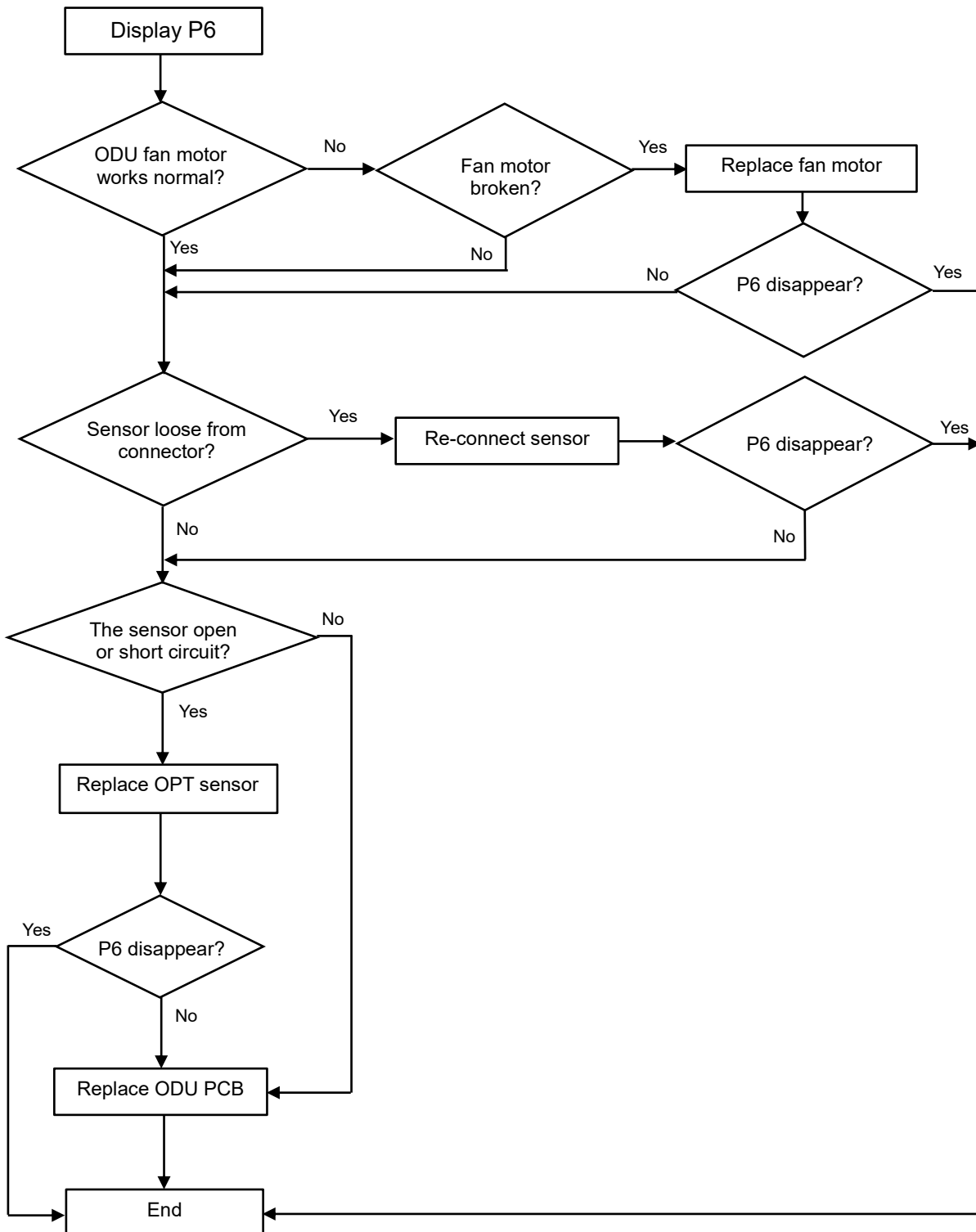
On **Cooling** mode, when IDU **evaporator coil temperature IPT** < 33.8°F continuously for 3 min after compressor start up for 6 min, CPU will switch off outdoor unit and show P5 failure code.



Note: IPT=Indoor unit Pipe(coil) Temperature.

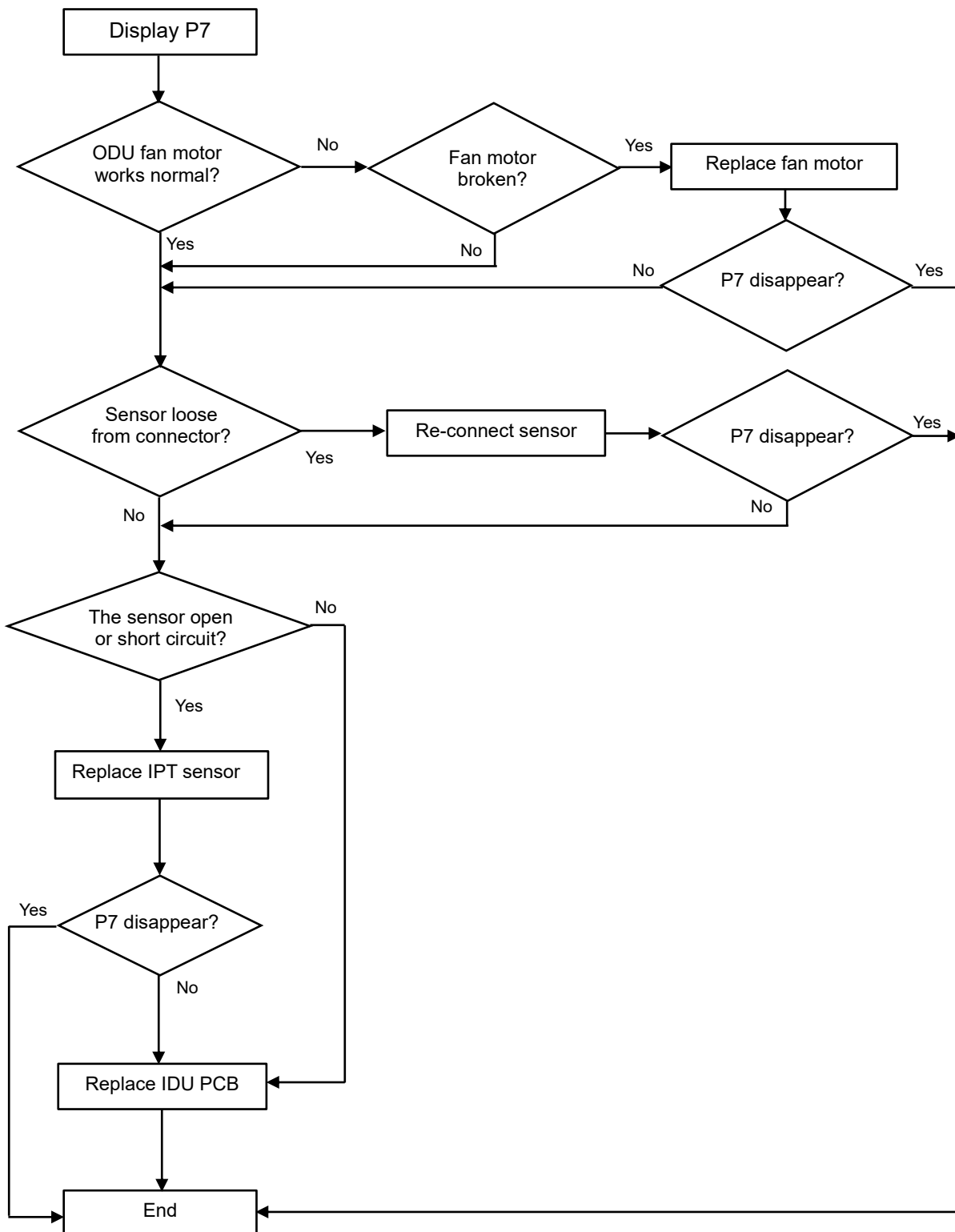
2-2.2.13 P6---Overheating protection on Cooling mode

On **Cooling** mode, when ODU condenser coil temperature $OPT \geq 143^{\circ}F$, PCB will switch off outdoor unit and show P6 failure code.



2-2.2.14 P7---Overheating protection on Cooling mode

On heating mode, when IDU evaporator coil temperature $IPT \geq 143.6^{\circ}F$, ODU PCB will switch off outdoor unit and show P7 failure code.



2-2.2.15 P8---Outdoor Overtemperature/Under-temperature protection

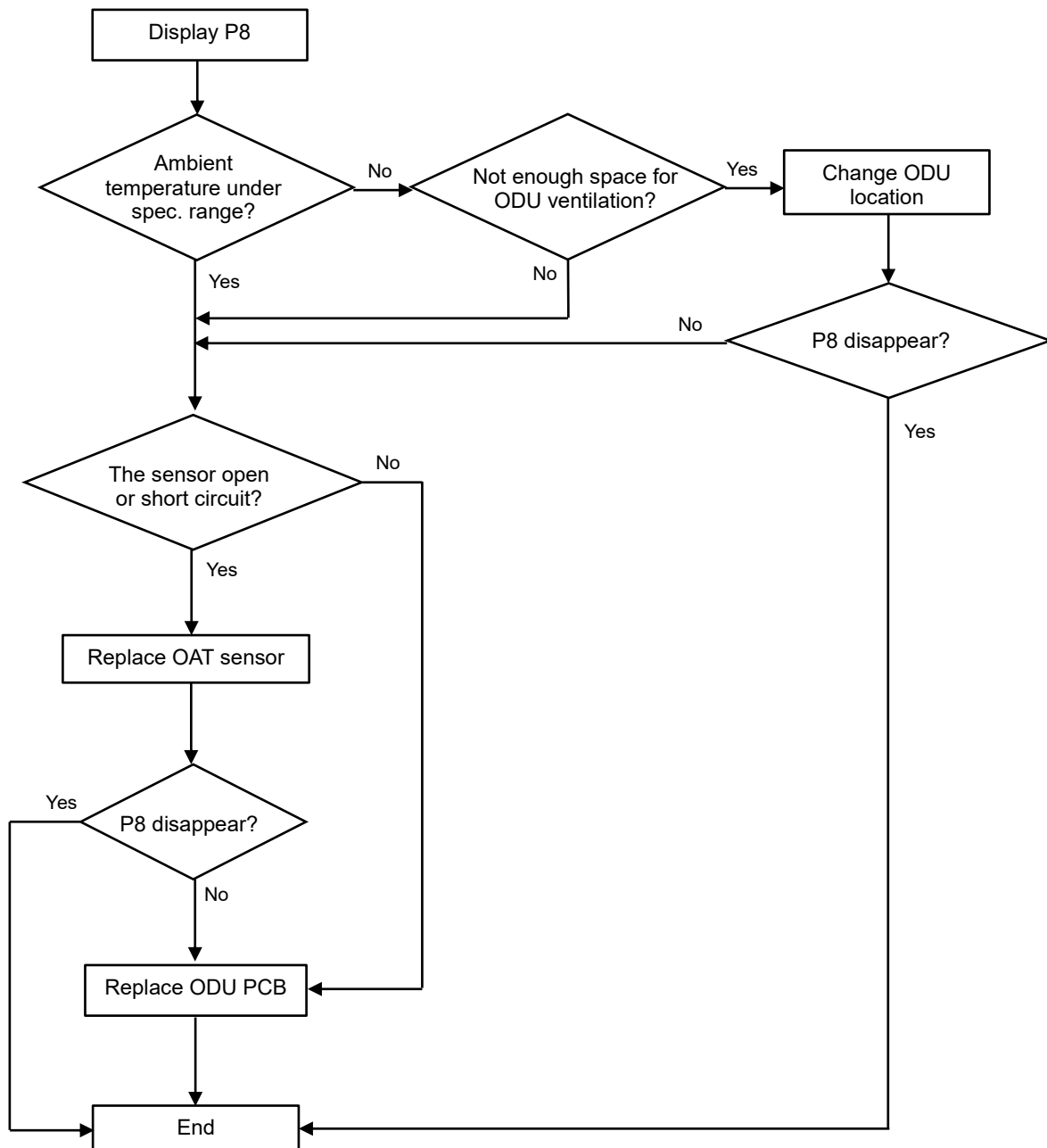
When ambient temperature is in the condition listed as below, the compressor will stop working, after 200s delay, the IDU will show P8 failure code.

(1). **On Cooling:** ODU ambient temperature: $OAT < -4^{\circ}F$ or $OAT > 145^{\circ}F$;

(2). **On Heating mode:**

a. $OAT \geq 104^{\circ}F$

b. $86^{\circ}F < OAT \leq 104^{\circ}F$ and $RT > 95^{\circ}F$



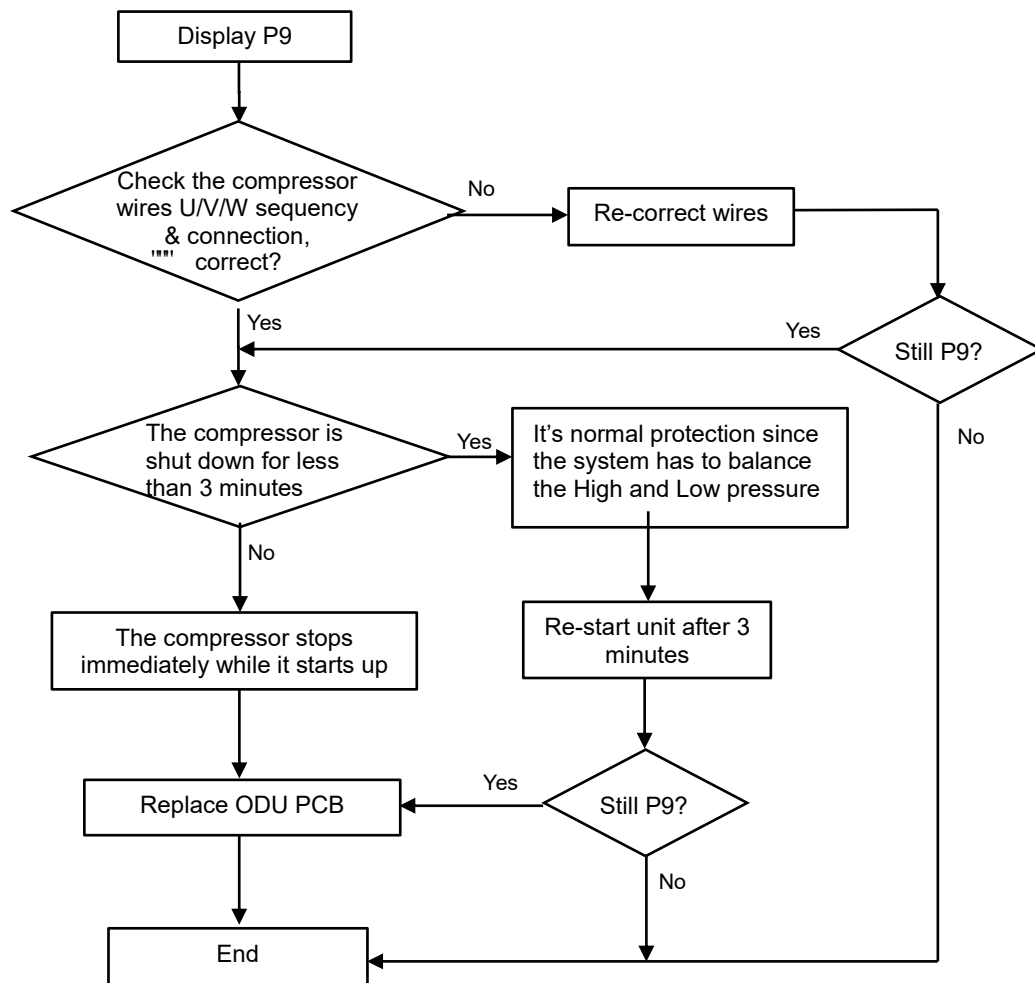
2-2.2.16 P9---The compressor driving part protection (compressor abnormal load)

When compressor starts up or is operating, if:

- (1). PCB can't receive the feedback signal from compressor, or
- (2). Tested an abnormal signal from compressor, or
- (3). The compressor starts up abnormal.

The outdoor unit will shut off, and show P9 protection.

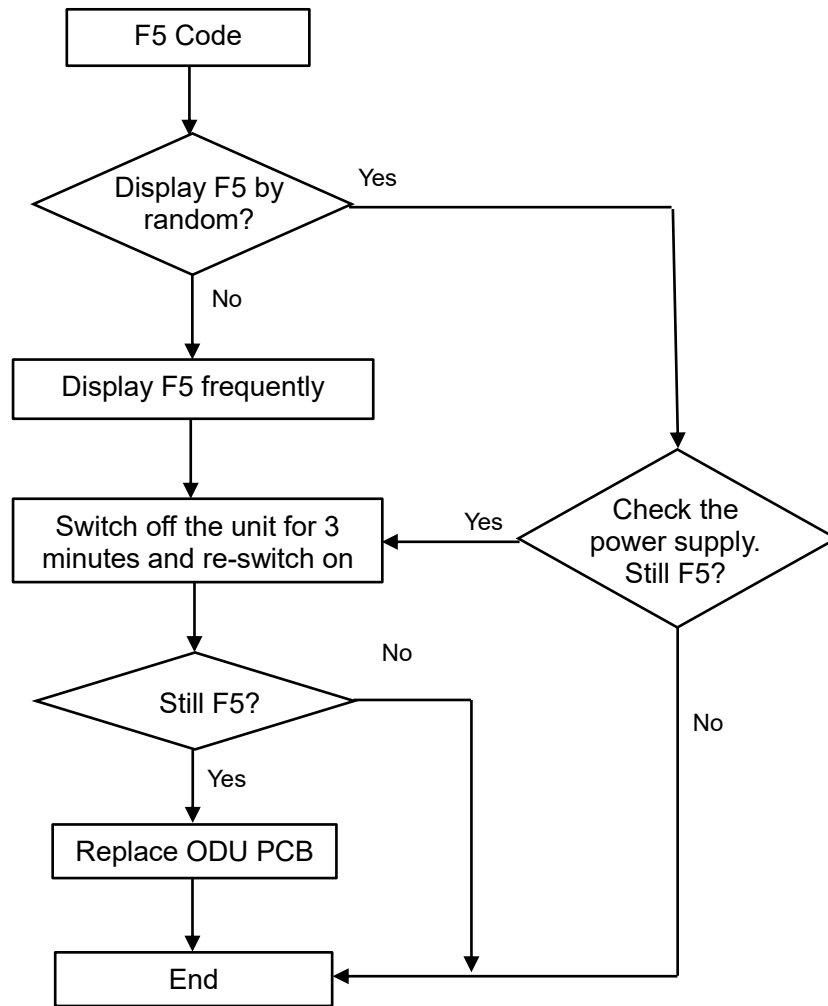
(The unit will re-startup 6 times continuously, if it still can't work normal, then show P9 code)



Note: Compressor with 3 minutes protection to balance high side and low side refrigerant pressure in the air condition system, otherwise the compressor is difficult to starts up.

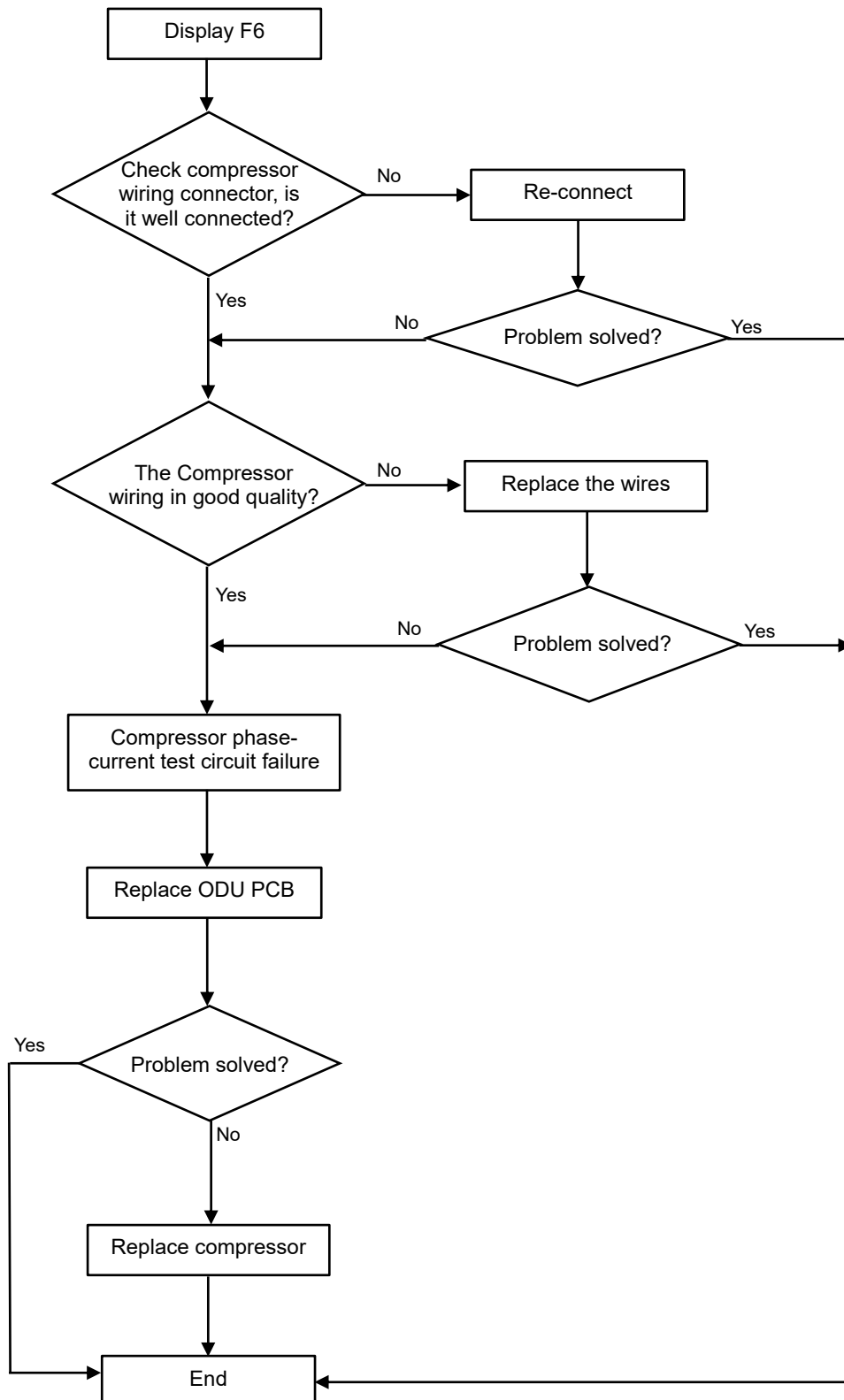
2-2.2.17 F5---PFC Protection

PFC Overcurrent protection



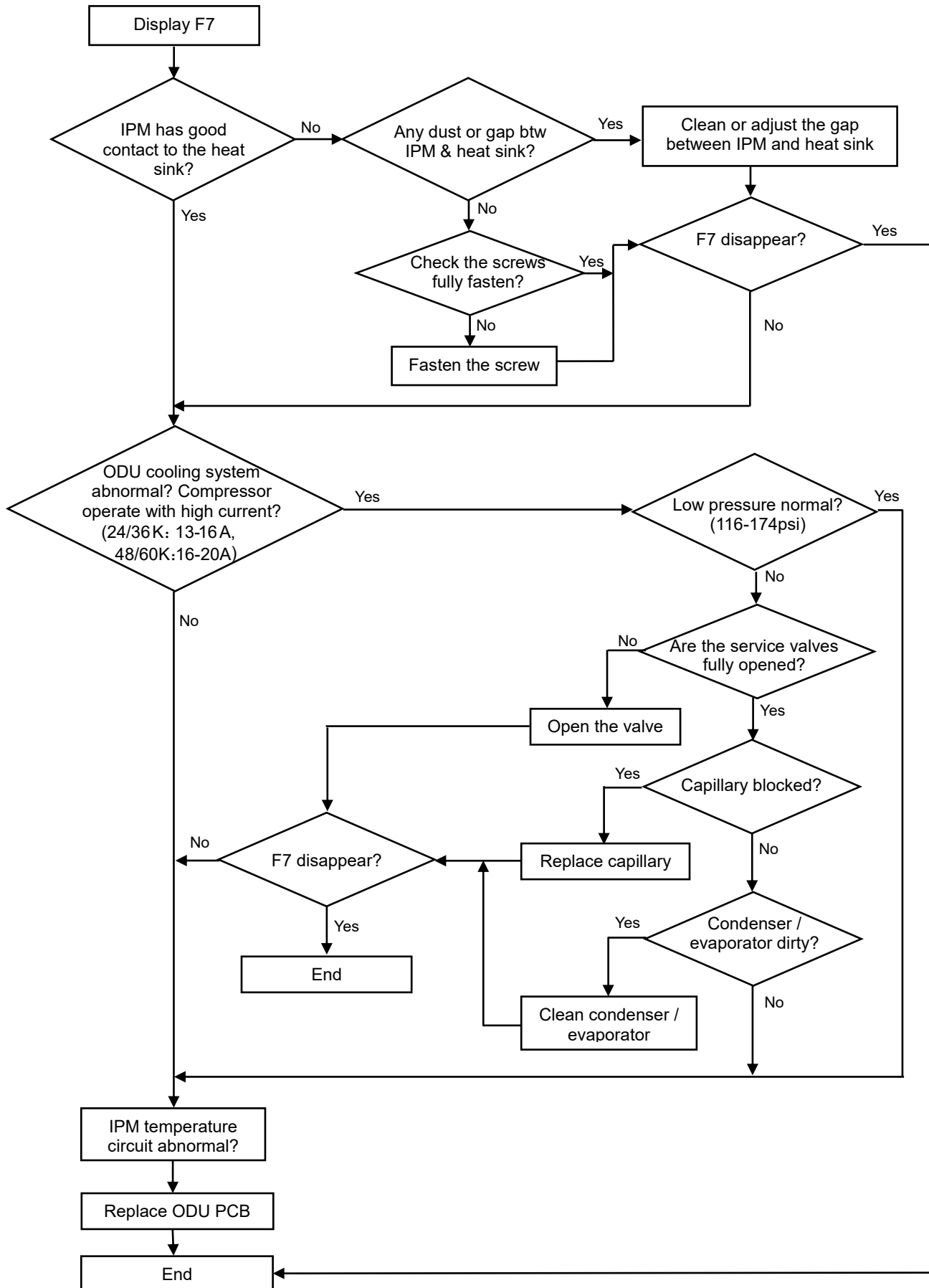
2-2.2.18 F6 The Compressor Lack phase / Anti-phase protection.

If ODU PCB can't test compressor U/V/W phase current, or there is U/V/W phase sequence mistake, it will show F6 protection.



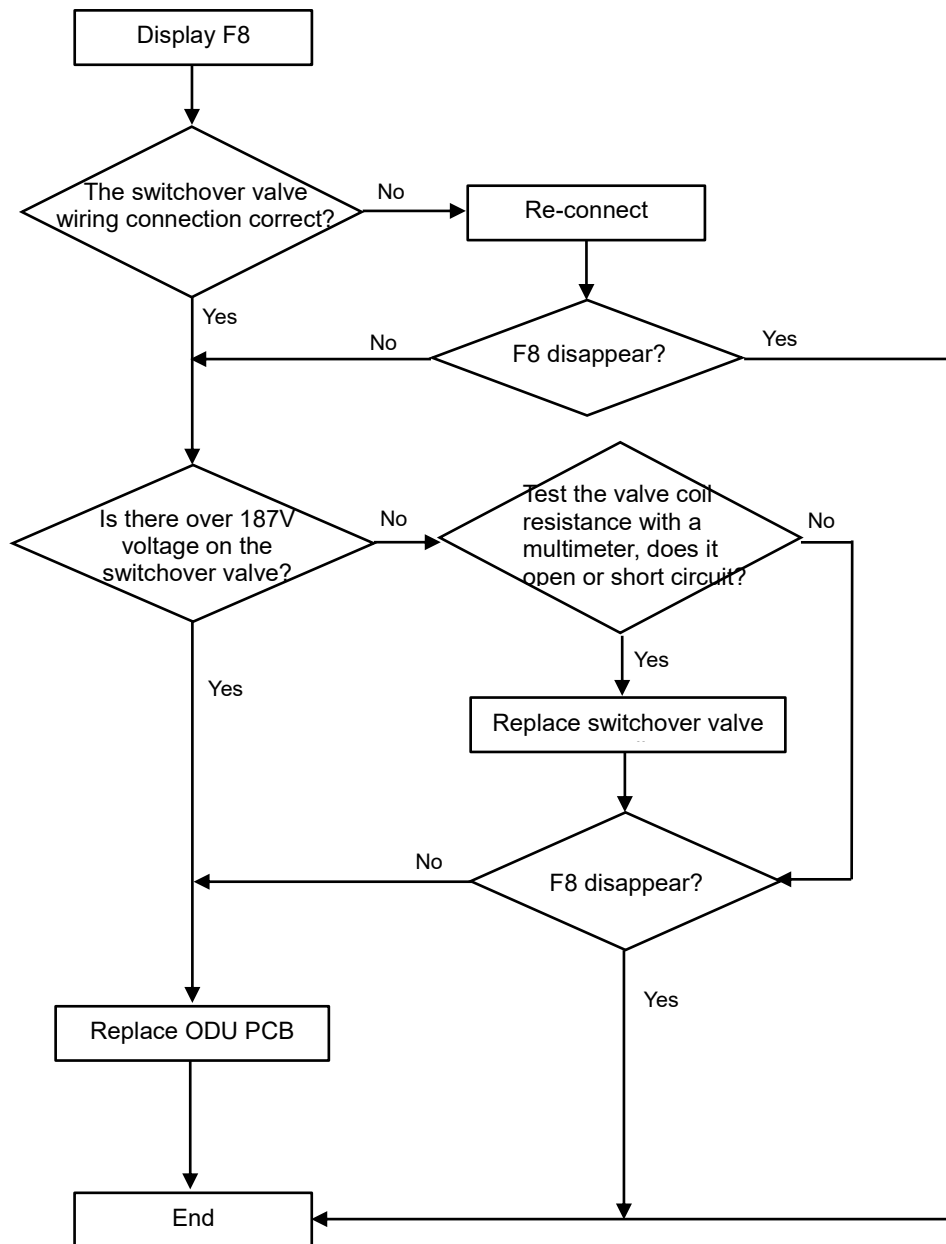
2-2.2.19 F7---Module temperature protection.

IPM overtemperature protection, when IPM temperature more than 203°F, it will show F7.



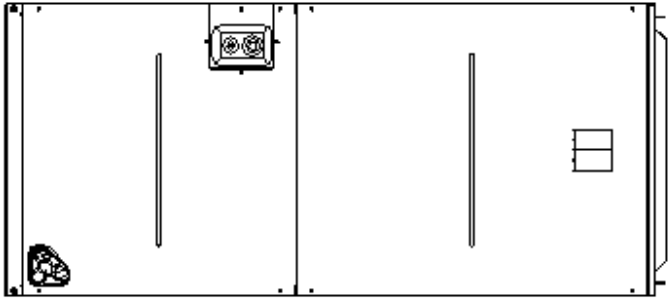
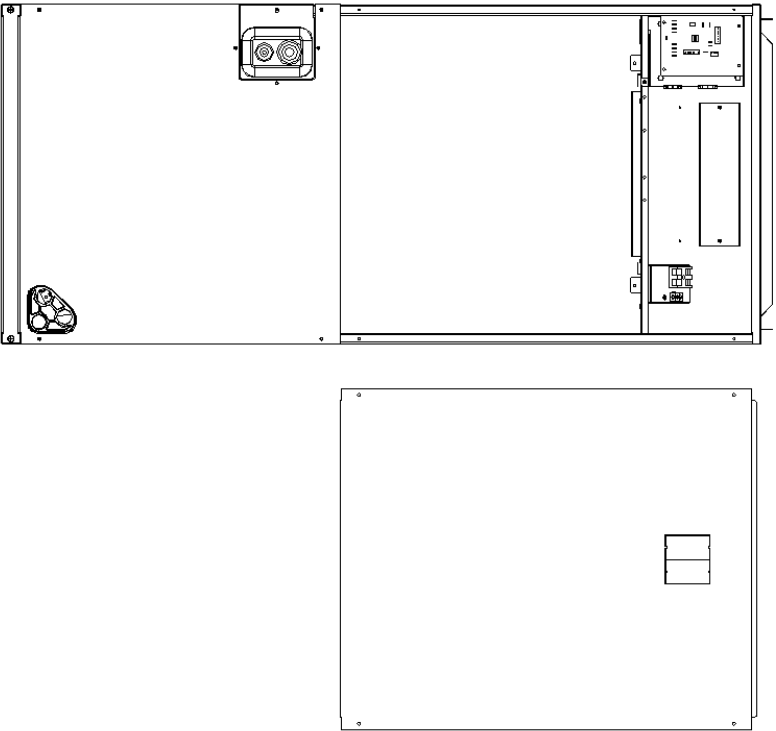
2-2.2.20 F8---Switchover Value Reversing abnormal

On heating mode, if the IDU Coil temperature is 9°F lower than Room temperature or more after compressor is on for 8 minutes, the unit will show F8 code.



2-3. Disassembly IDU & ODU

2-3.1 IDU disassembly

Step	Reference picture
1. Before disassembly	
Fully assembled unit	 A line drawing of a rectangular metal cabinet. On the left side, there is a circular fan grille. In the center, there is a vertical slot. On the right side, there is another vertical slot and a small rectangular panel near the top right corner.
2. Disassemble front panel, display board and WIFI module.	
A. Open front panel. B. Remove one screw and take the display box out from the panel. C. Release access panel out from middle frame and take the panel out. D. Unscrew and take the WIFI module out from middle frame.	 Two line drawings illustrating the disassembly process. The top drawing shows the unit with the front panel open, revealing internal components like a display board and a WIFI module. The bottom drawing shows the front panel removed, with a small rectangular panel (the access panel) shown separately below it.

3. Disassemble the control box.

A. Remove the RT & IPT out from evaporator.

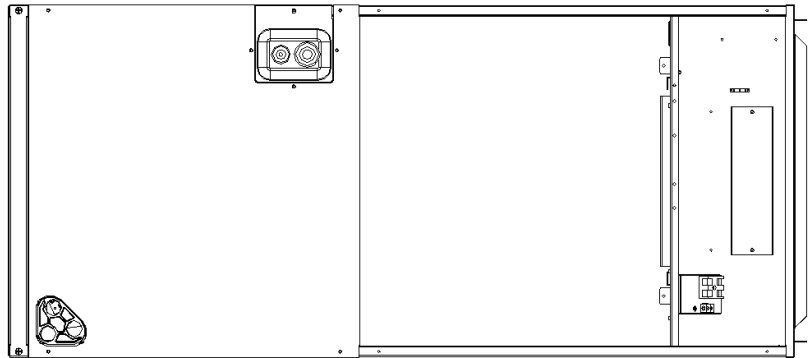
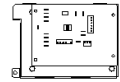
B. Unscrew all the ground wirings on the evaporator.

C. Take all the connectors out from PCB.

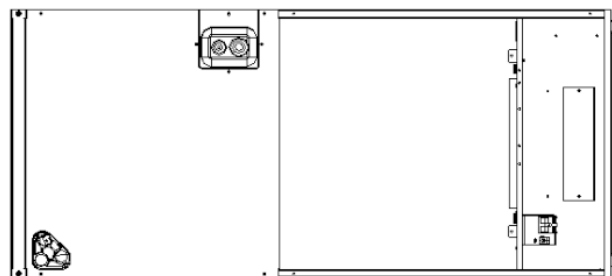
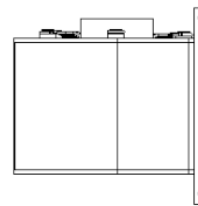
D. Unscrew one screw of the control box with unit BASE FRAME, and take the control box out from unit.

Note: The picture to the right for your reference only. Exact model wiring may be different.

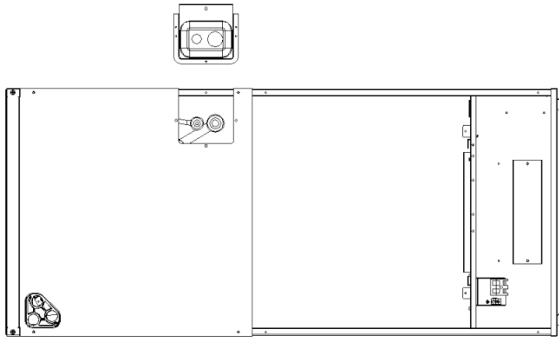
Electric control box



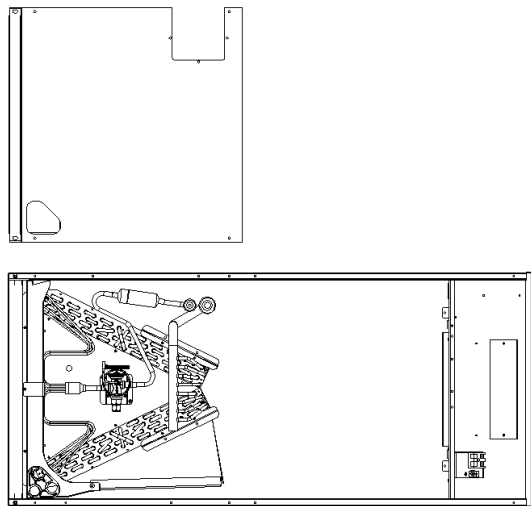
Unscrew and remove the air duct assembly



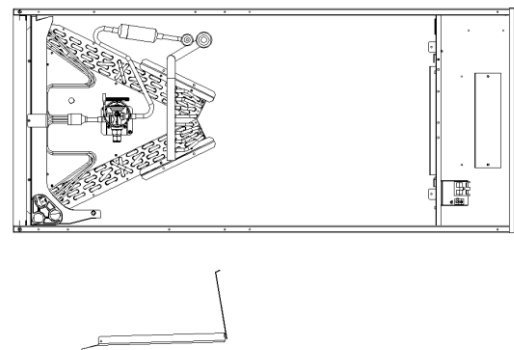
Remove screws from line set panel



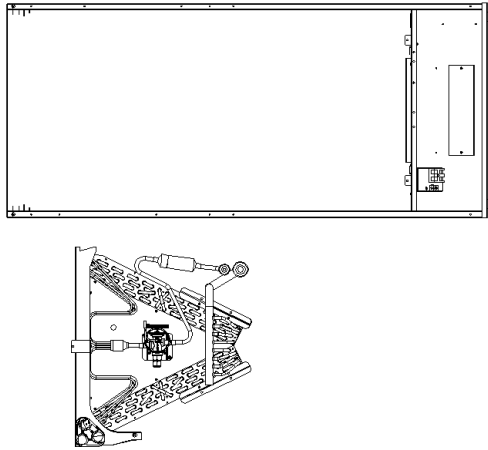
Remove screws from coil panel



Remove screws from drain pan and bracket.



Remove screws from coil assembly

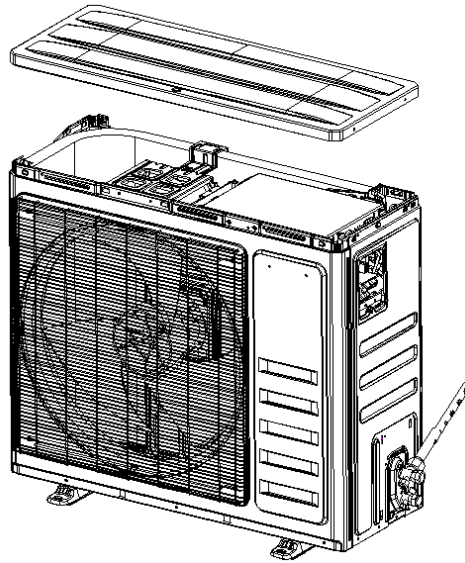


2-3.2 ODU disassembly

Step	Reference picture
Step 1: Remove the control box cover , valve cover and top cover	
A 1). Unscrew one screw on the control box cover, you can take the cover out from unit. 2). Unscrew one screw on the valve cover, you can take it out easily.	

B

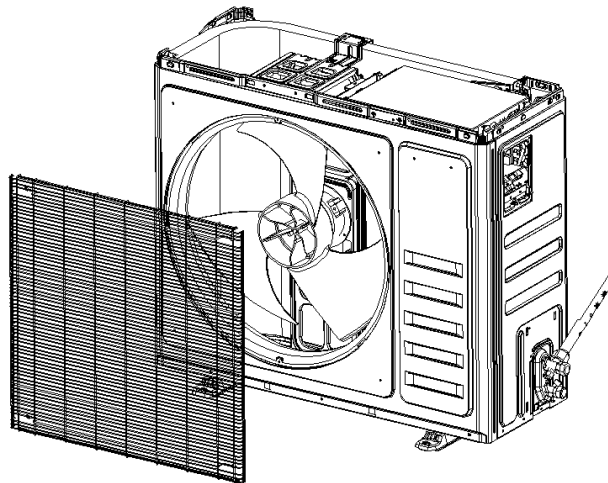
Unscrew top panel screws and remove top panel.



Step 2: Disassemble the fan guard and front panel

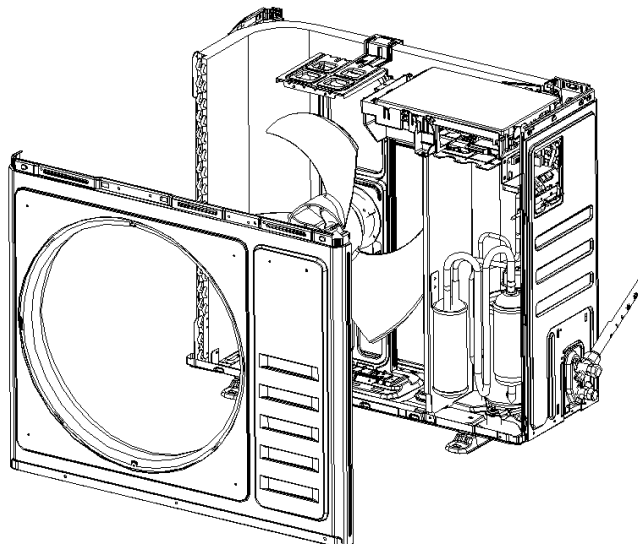
A

Unscrew screws on front panel with fan guard.



B

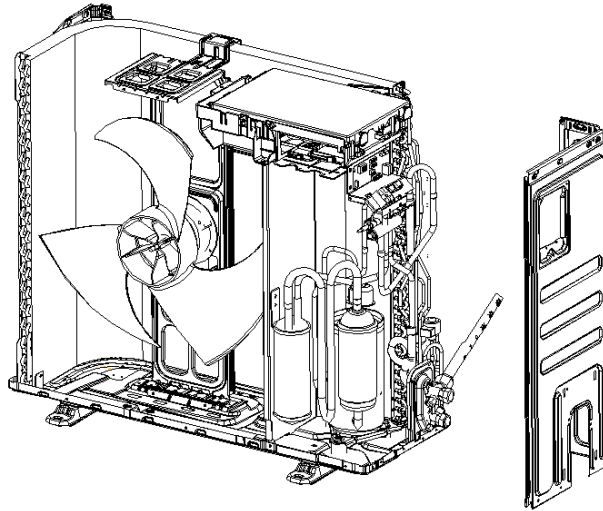
Lift and remove front panel from unit.



Step 3: Disassemble the left and right plate.

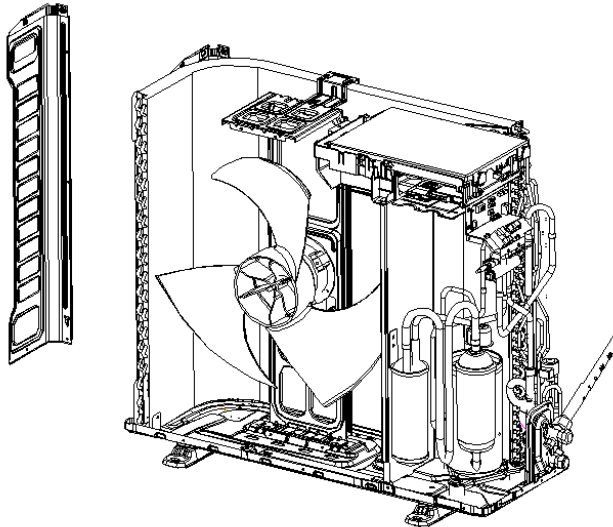
A

Remove screws from right plate to disassemble.



B

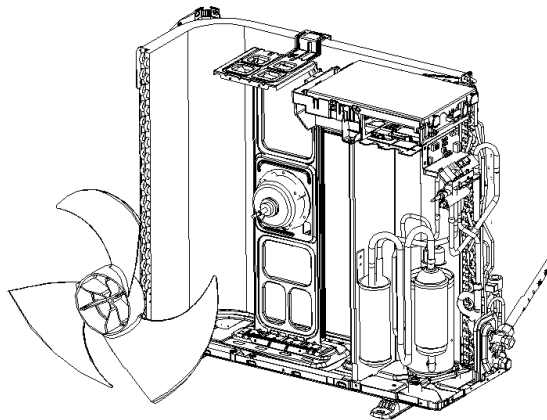
Remove screws from left plate to disassemble.



Step 4: Disassemble the axis fan blade

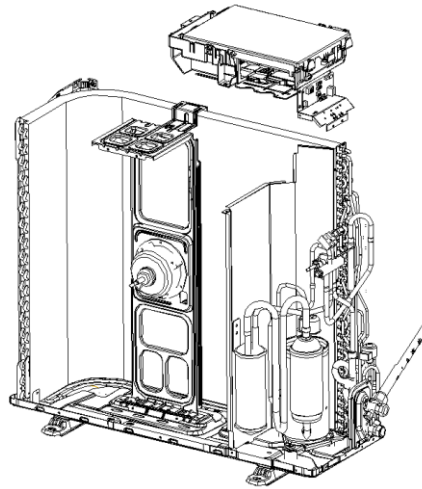
A

Unscrew the fan blade nut, and take the blade out.



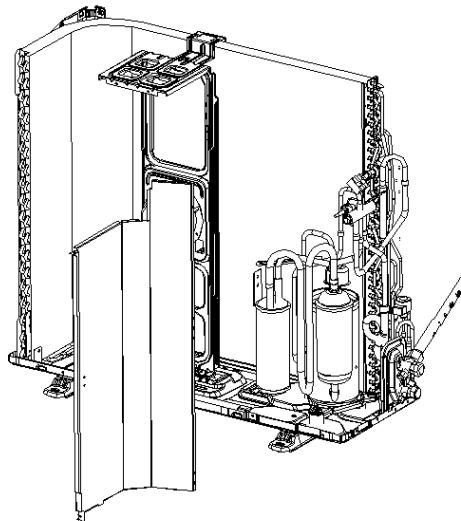
Step 5: Disassemble the electric box

Unscrew screw between control box and motor supporter etc. loosen the wiring clamp, take the control box out.



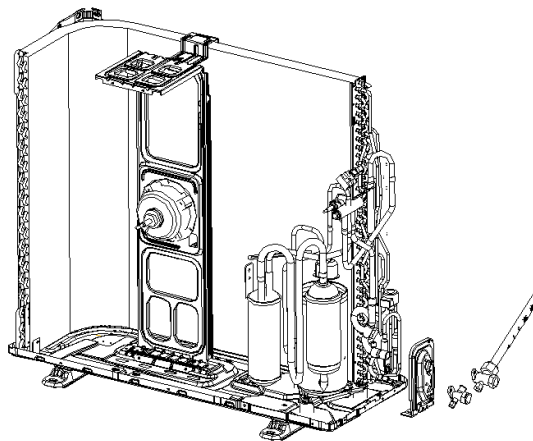
Step 6: Disassemble the separate plate

Unscrew the screw between separate plate and unit, and take it out



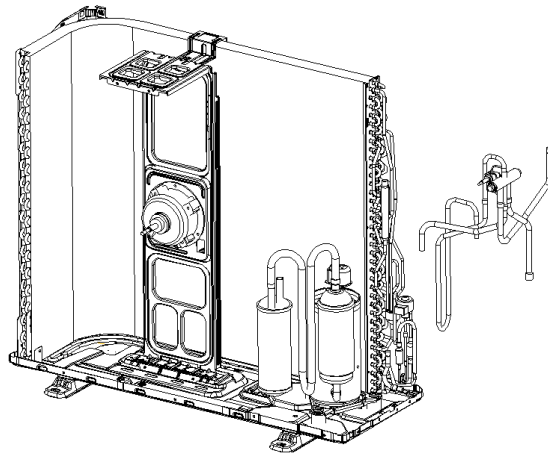
Step 7: Disassemble the service valves

Unscrew screw between valve plate and base, you can take the service valves out by brazing.



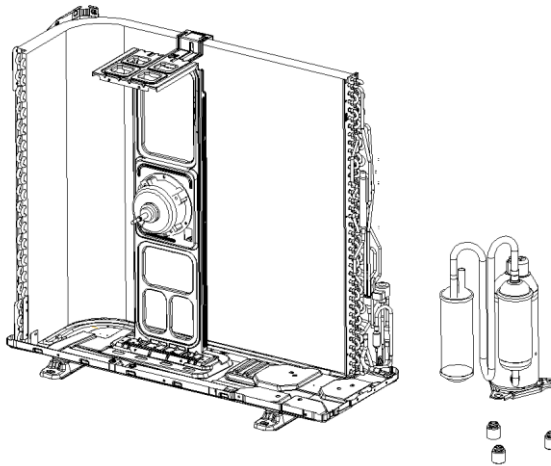
Step 8: Disassemble the switchover valve assembly

Take the switchover valve out from system by brazing.



Step 9: Disassemble the compressor.

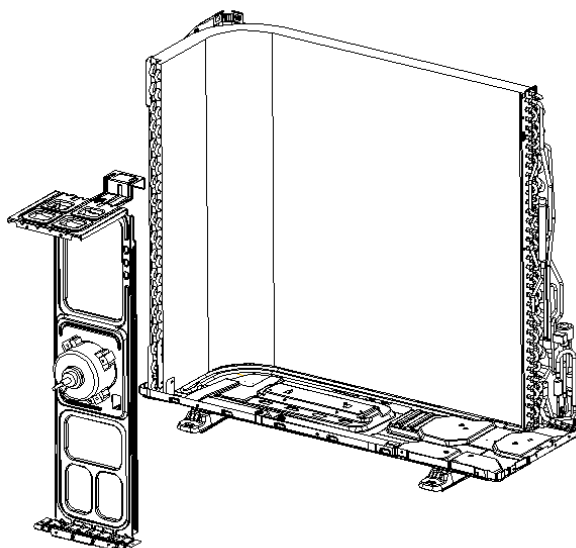
Unscrew the nuts and take the compressor out.

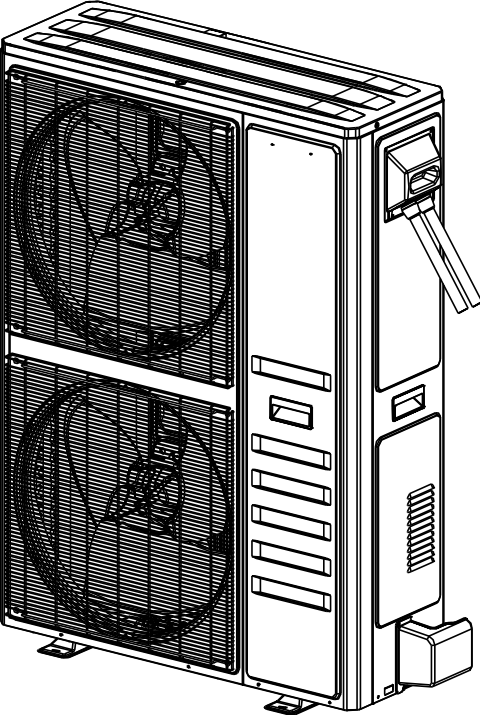
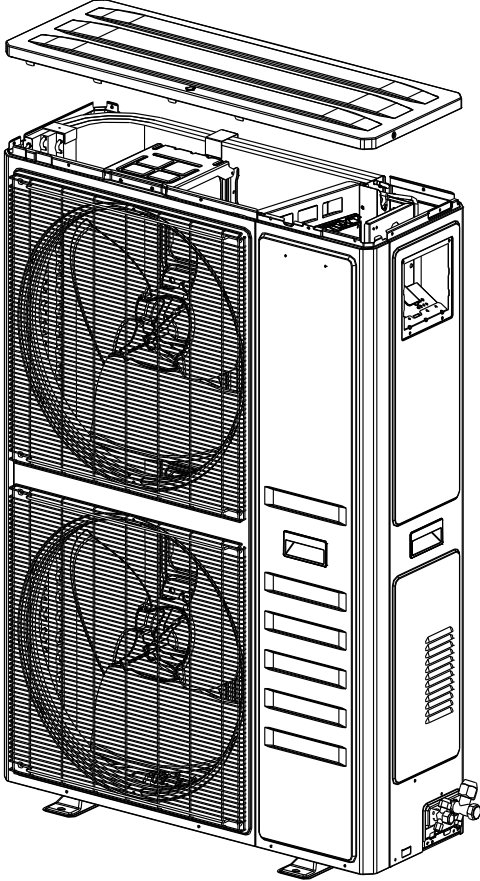


Step 10: Remove the fan motor and fan supporter.

Unscrew screws between fan motor with supporter, and supporter with base plate.

Note:
Pay attention to the motor wiring, it can't be taken out by force.

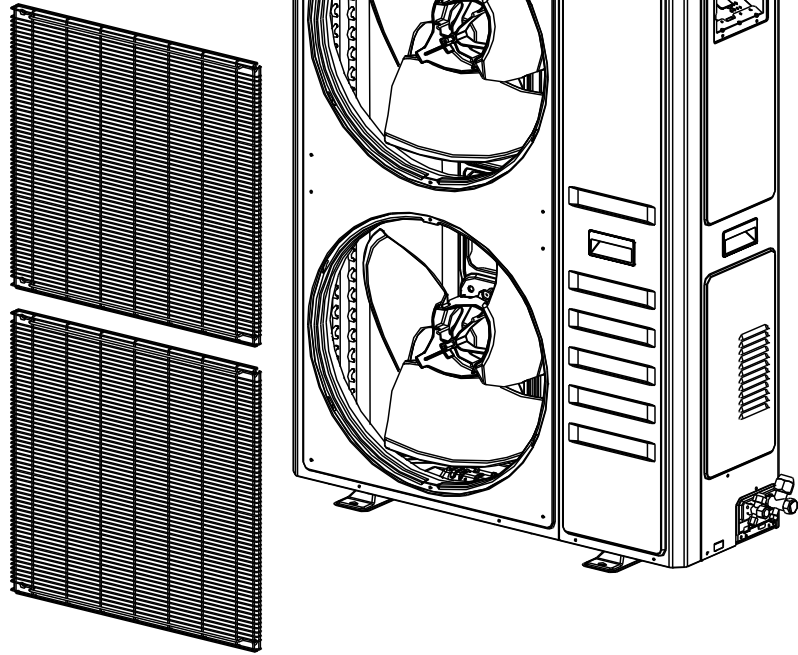


Step	Reference picture
Step 1: Remove the control box cover , valve cover and top cover	
<p>A</p> <ol style="list-style-type: none"> 1). Unscrew one screw on the control box cover, take the cover out from unit. 2). Unscrew one screw on the valve cover, and take it out. 	
<p>B</p> <p>Unscrew top panel screws and remove top panel.</p>	

Step 2: Disassemble the fan guard and front panel

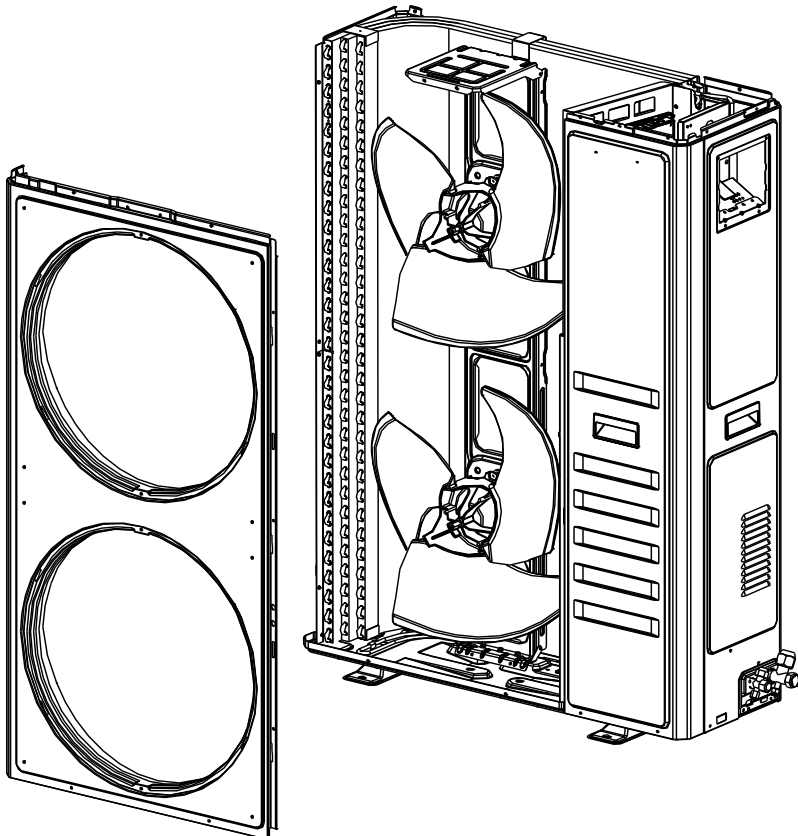
A

Unscrew screws on front panel with fan guard.



B

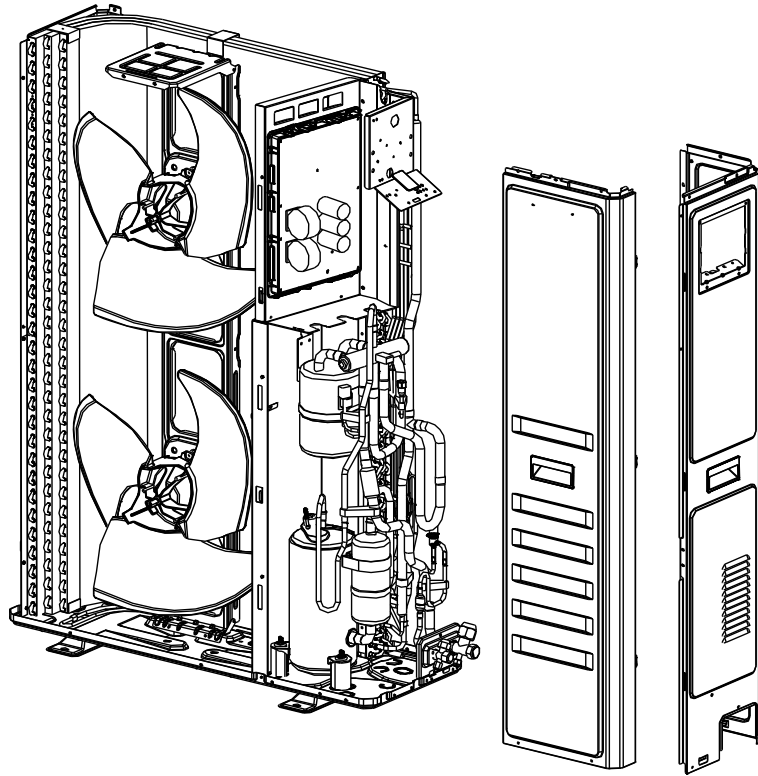
ODU middle separate plate and base plate, lift front panel and take it out from unit.



Step 3: Disassemble the left and right plate.

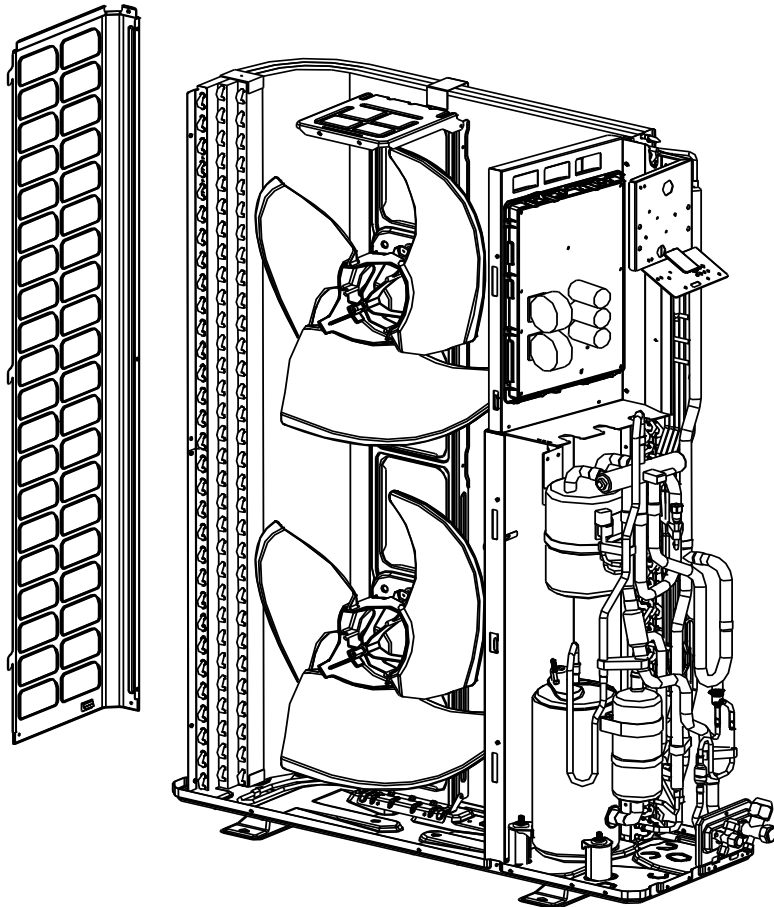
A

Unscrew screws between right plate and the control box assembly, valve plate, base plate, and take the right plate out.



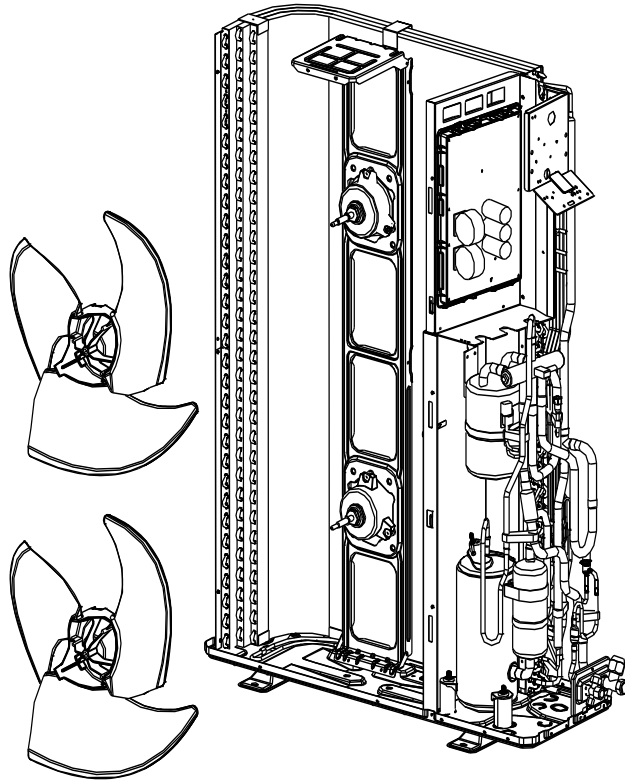
B

Unscrew screws between left plate, base plate and condenser plate, and take the left plate out.



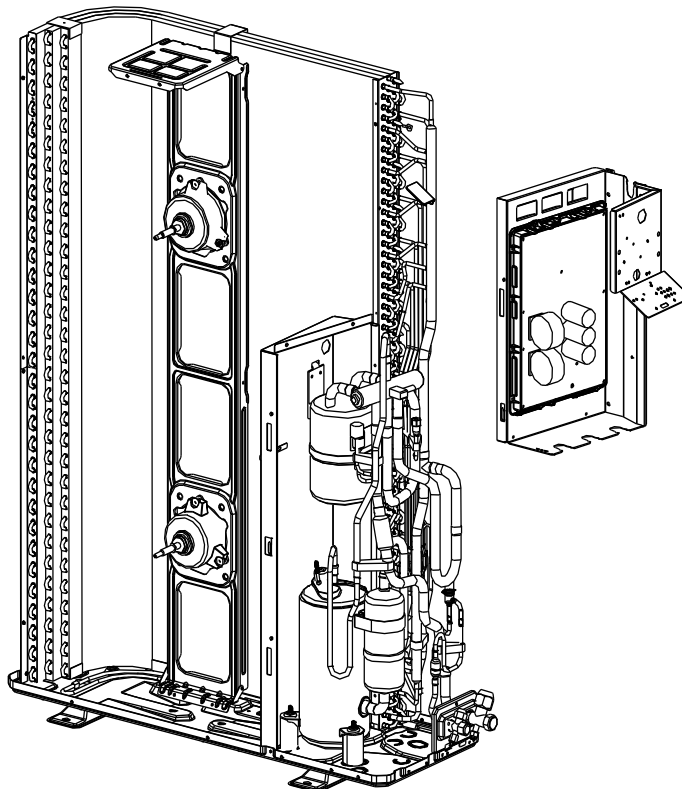
Step 4: Disassemble the axis fan blade

A Unscrew the fan blade nut, and take the blade out.



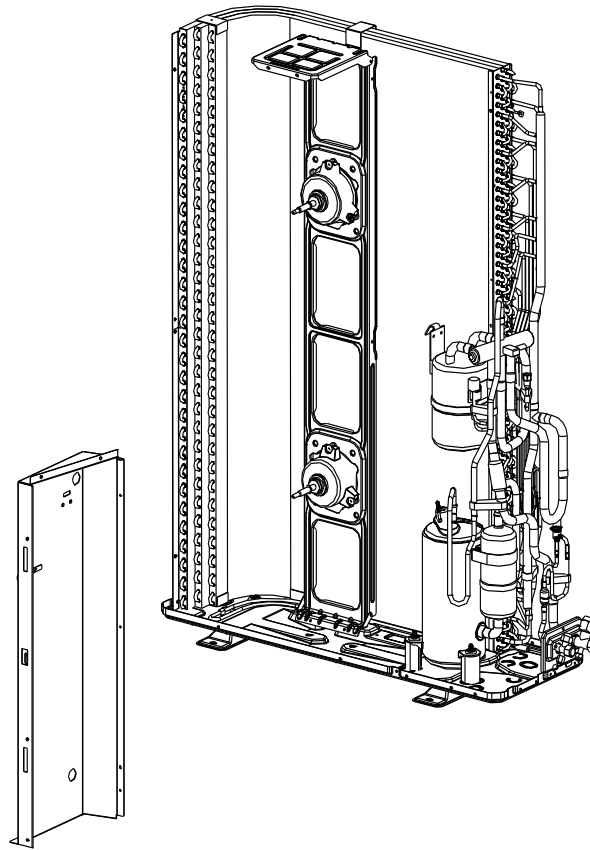
Step 5: Disassemble the electric box

Unscrew screws between control box and motor supporter etc. loosen the wiring clamp, take the control box out.



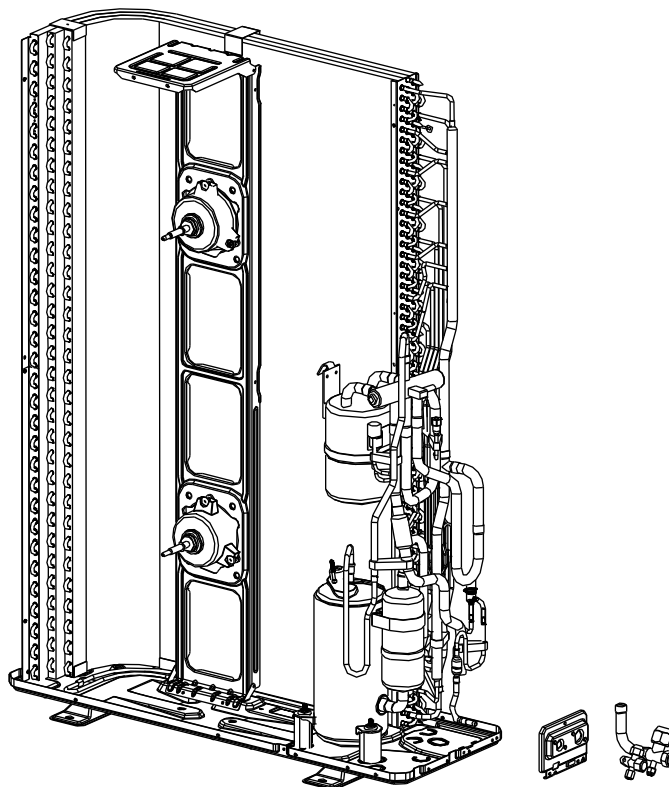
Step 6: Disassemble the separate plate

Unscrew screws between separate plate and unit, and take it out



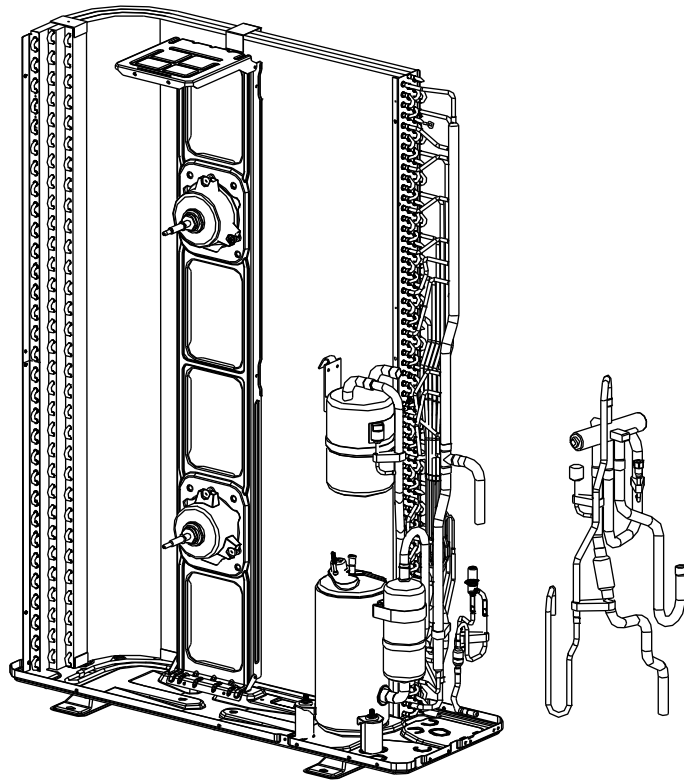
Step 7: Disassemble the service valves

Unscrew screws between valve plate and base, take the service valves out by brazing.



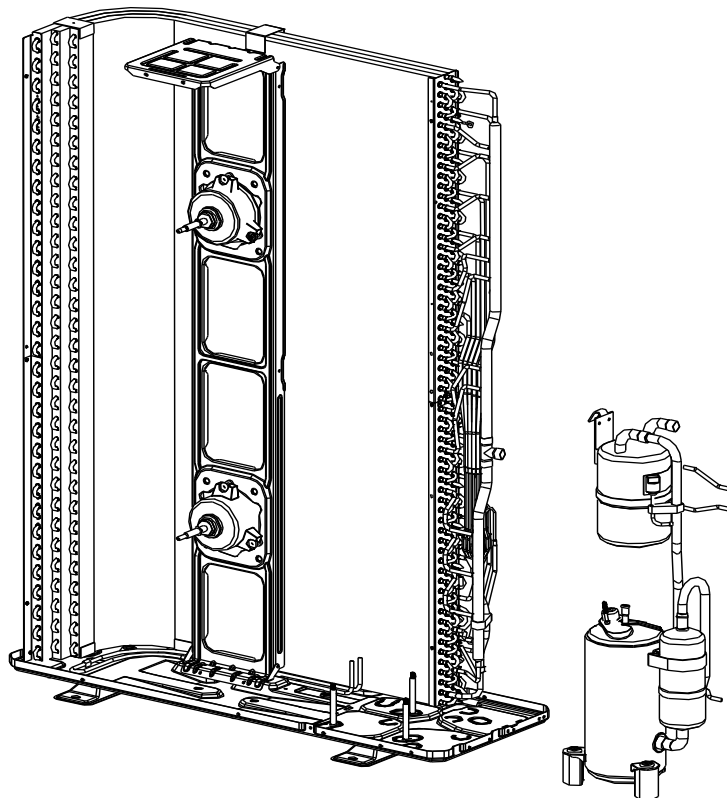
Step 8: Disassemble the switchover valve assembly

Take the 4-way valve out from system by brazing.



Step 9: Disassemble the compressor.

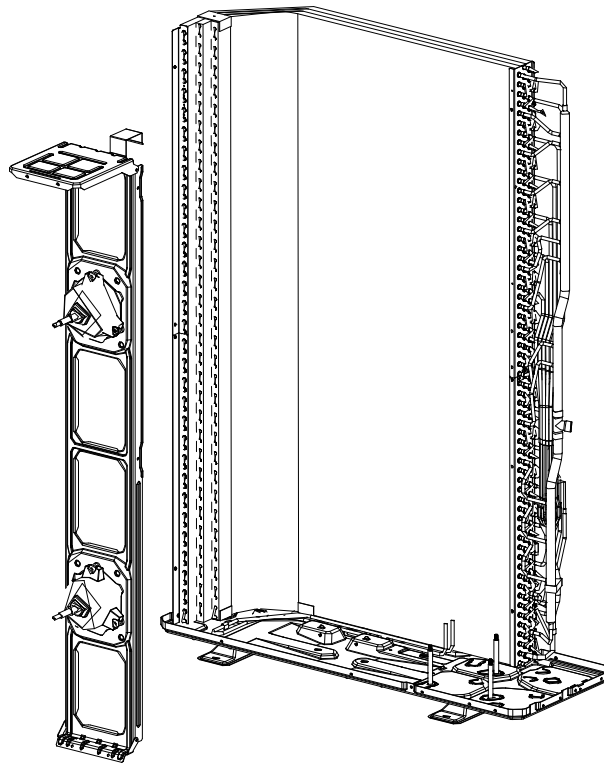
Unscrew the nuts and take the compressor out.



Step 10: Remove the fan motor and fan supporter.

Unscrew screws between fan motor with supporter, and supporter with base plate.

Note:
Pay attention to the motor wiring, it can't be taken out by force.



Appendix 1: Connecting pipes size and length for installation

Model	Pipe size(Inch)	
	Liquid	Gas
E4HL5018A1000A E4HL5024A1000A	3/8	3/4
E4HL5030A1000A E4HL5036A1000A	3/8	3/4
E4HL5042A1000A E4HL5048A1000A	3/8	7/8
E4HL5060A1000A	3/8	7/8

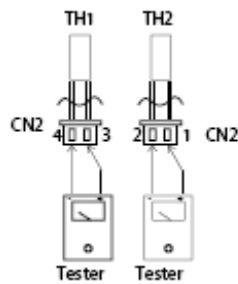
Model	Standard length (ft)	Refrigerant piping Max. length (ft) A	Additional refrigerant charging: $Xg = B * (A - 16.4ft)$ B
E4HL5018A1000A E4HL5024A1000A	24.6	98.4	0.033lbs/ft
E4HL5030A1000A E4HL5036A1000A	24.6	98.4	0.033lbs/ft
E4HL5042A1000A E4HL5048A1000A	24.6	164	0.033lbs/ft
E4HL5060A1000A	24.6	164	0.033lbs/ft

Appendix 2: Thermistor temperature characteristics

1). Indoor unit and outdoor exchange temperature and outside air temperature sensor temperature characteristics

TEMP. (°F)	Resistance (k Ohm)	Voltage of resistance	TEMP. (°F)	Resistance (k Ohm)	Voltage of resistance	TEMP. (°F)	Resistance (k Ohm)	Voltage of resistance
-22.0	63.513	4.628	59.0	7.447	2.968	140.0	1.464	1.115
-20.2	60.135	4.609	60.8	7.148	2.918	141.8	1.418	1.088
-18.4	56.956	4.589	62.6	6.863	2.868	143.6	1.374	1.061
-16.6	53.963	4.568	64.4	6.591	2.819	145.4	1.331	1.035
-14.8	51.144	4.547	66.2	6.332	2.769	147.2	1.290	1.009
-13.0	48.488	4.524	68.0	6.084	2.720	149.0	1.250	0.984
-11.2	45.985	4.501	69.8	5.847	2.671	150.8	1.212	0.960
-9.4	43.627	4.477	71.6	5.621	2.621	152.6	1.175	0.936
-7.6	41.403	4.452	73.4	5.404	2.572	154.4	1.139	0.913
-5.8	39.305	4.426	75.2	5.198	2.524	156.2	1.105	0.890
-4.0	37.326	4.399	77.0	5.000	2.475	158.0	1.072	0.868
-2.2	35.458	4.371	78.8	4.811	2.427	159.8	1.040	0.847
-0.4	33.695	4.343	80.6	4.630	2.379	161.6	1.009	0.825
1.4	32.030	4.313	82.4	4.457	2.332	163.4	0.979	0.805
3.2	30.458	4.283	84.2	4.292	2.285	165.2	0.950	0.785
5.0	28.972	4.252	86.0	4.133	2.238	167.0	0.922	0.765
6.8	27.567	4.219	87.8	3.981	2.192	168.8	0.895	0.746
8.6	26.239	4.186	89.6	3.836	2.146	170.6	0.869	0.728
10.4	24.984	4.152	91.4	3.697	2.101	172.4	0.843	0.710
12.2	23.795	4.117	93.2	3.563	2.057	174.2	0.819	0.692
14.0	22.671	4.082	95.0	3.435	2.012	176.0	0.795	0.675
15.8	21.606	4.045	96.8	3.313	1.969	177.8	0.773	0.658
17.6	20.598	4.008	98.6	3.195	1.926	179.6	0.751	0.641
19.4	19.644	3.969	100.4	3.082	1.883	181.4	0.729	0.625
21.2	18.732	3.930	102.2	2.974	1.842	183.2	0.709	0.610
23.0	17.881	3.890	104.0	2.870	1.800	185.0	0.689	0.595
24.8	17.068	3.850	105.8	2.770	1.760	186.8	0.669	0.580
26.6	16.297	3.808	107.6	2.674	1.720	188.6	0.651	0.566
28.4	15.565	3.766	109.4	2.583	1.681	190.4	0.633	0.552
30.2	14.871	3.723	111.2	2.494	1.642	192.2	0.615	0.538
32.0	14.212	3.680	113.0	2.410	1.604	194.0	0.598	0.525
33.8	13.586	3.635	114.8	2.328	1.567	195.8	0.582	0.512
35.6	12.991	3.590	116.6	2.250	1.530	197.6	0.566	0.499
37.4	12.426	3.545	118.4	2.174	1.495	199.4	0.550	0.487
39.2	11.889	3.499	120.2	2.102	1.459	201.2	0.535	0.475
41.0	11.378	3.452	122.0	2.032	1.425	203.0	0.521	0.463
42.8	10.893	3.406	123.8	1.965	1.391	204.8	0.507	0.452
44.6	10.431	3.358	77.8	1.901	1.357	206.6	0.493	0.441
46.4	9.991	3.310	74.0	1.839	1.325	208.4	0.480	0.430
48.2	9.573	3.262	70.3	1.779	1.293	210.2	0.467	0.419
50.0	9.174	3.214	66.8	1.721	1.262	212.0	0.455	0.409
51.8	8.795	3.165	63.6	1.666	1.231			
53.6	8.433	3.116	60.5	1.613	1.201			
55.4	8.089	3.067	57.5	1.561	1.172			
57.2	7.760	3.017	54.8	1.512	1.143			

Resistance at 77°F. 5 kΩ.



TH1: indoor room temperature sensor and outside air temperature sensor

TH2: indoor exchange temperature sensor and outside exchange temperature sensor

Before measuring resistance, disconnect connectors as shown above.

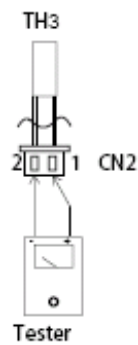
2). Outdoor unit sensor temperature characteristics

TEMP. (°FŁ)	R min (k Ohm)	R(t) (k Ohm)	R max (k Ohm)	TEMP. (°FŁ)	R min (k Ohm)	R(t) (k Ohm)	R max (k Ohm)	TEMP. (°FŁ)	R min (k Ohm)	R(t) (k Ohm)	R max (k Ohm)
-22.0	283.323	322.912	367.712	75.2	19.364	20.890	22.521	172.4	2.563	2.654	2.745
-20.2	267.412	304.423	346.332	77.0	18.551	20.000	21.541	174.2	2.481	2.567	2.654
-18.4	252.532	287.140	307.451	78.8	17.774	19.140	20.620	176.0	2.402	2.484	2.567
-16.6	238.512	270.908	307.441	80.6	17.034	18.320	19.740	177.8	2.327	2.404	2.483
-14.8	225.421	255.707	289.860	82.4	16.321	17.550	18.854	179.6	2.254	2.327	2.401
-13.0	213.143	241.425	273.311	84.2	15.651	16.810	18.047	181.4	2.183	2.253	2.323
-11.2	201.522	228.413	257.945	86.1	15.012	16.100	17.273	183.2	2.115	2.182	2.248
-9.4	190.601	215.512	243.423	87.8	14.391	15.430	16.544	185.0	2.050	2.113	2.176
-7.6	180.324	203.631	229.885	89.6	13.812	14.790	15.342	186.8	1.985	2.047	2.109
-5.8	170.732	192.512	217.481	91.4	13.250	14.180	15.174	188.6	1.922	1.983	2.045
-4.2	161.611	182.122	205.213	93.2	12.712	13.600	14.543	190.4	1.861	1.922	1.983
-2.2	153.143	172.314	193.756	95.0	12.221	13.050	13.934	192.2	1.802	1.862	1.923
-0.4	145.412	163.143	183.277	96.8	11.712	12.520	13.366	194.0	1.746	1.805	1.865
1.4	137.524	154.422	173.253	98.6	11.216	12.010	12.813	195.8	1.692	1.750	1.809
3.2	130.345	146.244	163.921	100.4	10.822	11.530	12.291	197.6	1.639	1.697	1.755
5.0	123.627	138.525	155.145	102.2	10.269	11.070	11.787	199.4	1.589	1.646	1.703
6.8	117.344	131.346	146.855	104.0	9.986	10.630	11.312	201.2	1.540	1.596	1.653
8.6	111.321	125.244	139.756	105.8	9.600	10.210	10.853	203.0	1.493	1.549	1.604
10.4	105.262	118.012	131.796	107.6	9.231	9.813	10.425	204.8	1.448	1.502	1.558
12.2	100.334	111.921	124.718	109.4	8.878	9.430	10.056	206.6	1.404	1.458	1.512
14.0	95.241	106.121	118.256	111.2	8.540	9.064	9.612	208.4	1.362	1.415	1.469
15.8	90.493	100.823	112.171	113.0	8.217	8.714	9.233	210.2	1.321	1.373	1.426
17.6	85.994	95.685	106.326	114.8	7.908	8.380	8.872	212.0	1.284	1.335	1.387
19.4	81.751	90.867	100.854	116.6	7.612	8.060	8.526	213.8	1.245	1.296	1.348
21.2	77.743	86.312	95.746	118.4	7.328	7.754	8.196	215.6	1.209	1.258	1.309
23.0	73.942	82.014	90.880	120.2	7.057	7.461	7.881	217.4	1.173	1.222	1.272
24.8	70.351	77.956	86.291	122.0	6.797	7.180	7.578	219.2	1.139	1.187	1.236
26.6	66.963	74.118	81.966	123.8	6.548	6.912	7.289	221.0	1.105	1.153	1.202
28.4	63.741	70.481	77.874	125.6	6.309	6.655	7.013	222.8	1.073	1.120	1.168
30.2	60.695	67.052	74.052	127.4	6.081	6.409	6.748	224.6	1.042	1.089	1.136
32.0	57.814	63.845	70.345	129.2	5.861	6.173	6.495	226.4	1.013	1.058	1.104

33.8	55.089	60.723	66.882	131.0	5.651	5.947	6.253	228.2	0.983	1.028	1.074
35.6	52.496	57.810	63.611	132.8	5.449	5.730	6.020	230.0	0.955	0.999	1.045
37.4	50.034	55.054	60.525	134.6	5.255	5.522	5.798	231.8	0.928	0.971	1.016
39.2	47.712	52.442	57.594	136.4	5.073	5.323	5.585	233.6	0.902	0.945	0.989
41.0	45.502	49.973	54.823	138.2	4.891	5.132	5.381	235.4	0.876	0.919	0.962
42.8	43.414	47.626	52.228	140.0	4.720	4.949	5.101	237.2	0.852	0.894	0.936
44.6	41.426	45.412	49.715	141.8	4.556	4.774	4.997	239.0	0.808	0.859	0.911
46.4	39.533	43.225	42.334	143.6	4.398	4.605	4.817	240.8	0.805	0.846	0.887
48.2	37.744	41.291	45.122	145.4	4.247	4.448	4.644	242.6	0.783	0.823	0.864
50.0	36.042	39.392	43.012	147.2	4.101	4.288	4.479	244.4	0.762	0.801	0.841
51.8	34.429	37.590	41.021	149.0	3.961	4.139	4.320	246.2	0.741	0.779	0.819
53.6	32.893	35.871	39.157	150.8	3.827	3.995	4.167	248.0	0.720	0.758	0.791
55.4	31.434	34.255	37.295	152.6	3.698	3.858	4.021	249.8	0.702	0.738	0.777
57.2	30.041	32.716	35.584	154.4	3.552	3.712	3.883	251.6	0.663	0.719	0.757
59.0	29.725	31.245	33.958	156.2	3.410	3.692	3.742	253.4	0.664	0.700	0.737
60.8	28.316	30.722	31.823	158.0	3.339	3.476	3.616	255.2	0.647	0.682	0.718
62.6	26.877	29.216	30.721	159.8	3.229	3.359	3.491	257.0	0.630	0.664	0.700
64.4	25.135	27.269	29.550	161.6	3.122	3.246	3.372	258.8	0.613	0.647	0.682
66.2	24.053	26.074	28.235	163.4	3.020	3.138	3.257	260.6	0.597	0.630	0.665
68.0	23.021	24.932	26.974	165.2	2.921	3.033	3.146	262.4	0.581	0.614	0.649
69.8	22.042	23.845	25.772	167.0	2.827	2.933	3.040	264.2	0.566	0.599	0.632
71.6	21.156	22.813	24.635	168.8	2.735	2.836	2.938	266.0	0.552	0.583	0.617
73.4	20.212	21.831	23.554	170.6	2.647	2.743	2.841				

R—Resistance

Resistance at 77°F: 20 kΩ



TH3: Outdoor unit discharge pipe sensor

Before measuring resistance, disconnect connectors as shown above.

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