Inverter Air Conditioner

Service Manual

Models:

WYT009ALSI20RL WYT009GLSI20RL
WYT012ALSI20RL WYT012GLSI20RL
WYT018GLSI20RL WYT024GLSI20RL
WYT030GLSI20RL WYT036GLSI20RL

CONTENTS

Part Ⅰ Technical Information

1. Important Notice

This service manual is intended for individuals with adequate electrical, electronic, and mechanical experience. Any attempt to repair the appearance may result in personal injury and/or 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 parameters are subject to change due to technical modifications or improvements without any prior notice. The accurate specifications are presented on the nameplate label.

How to Order Spare Parts

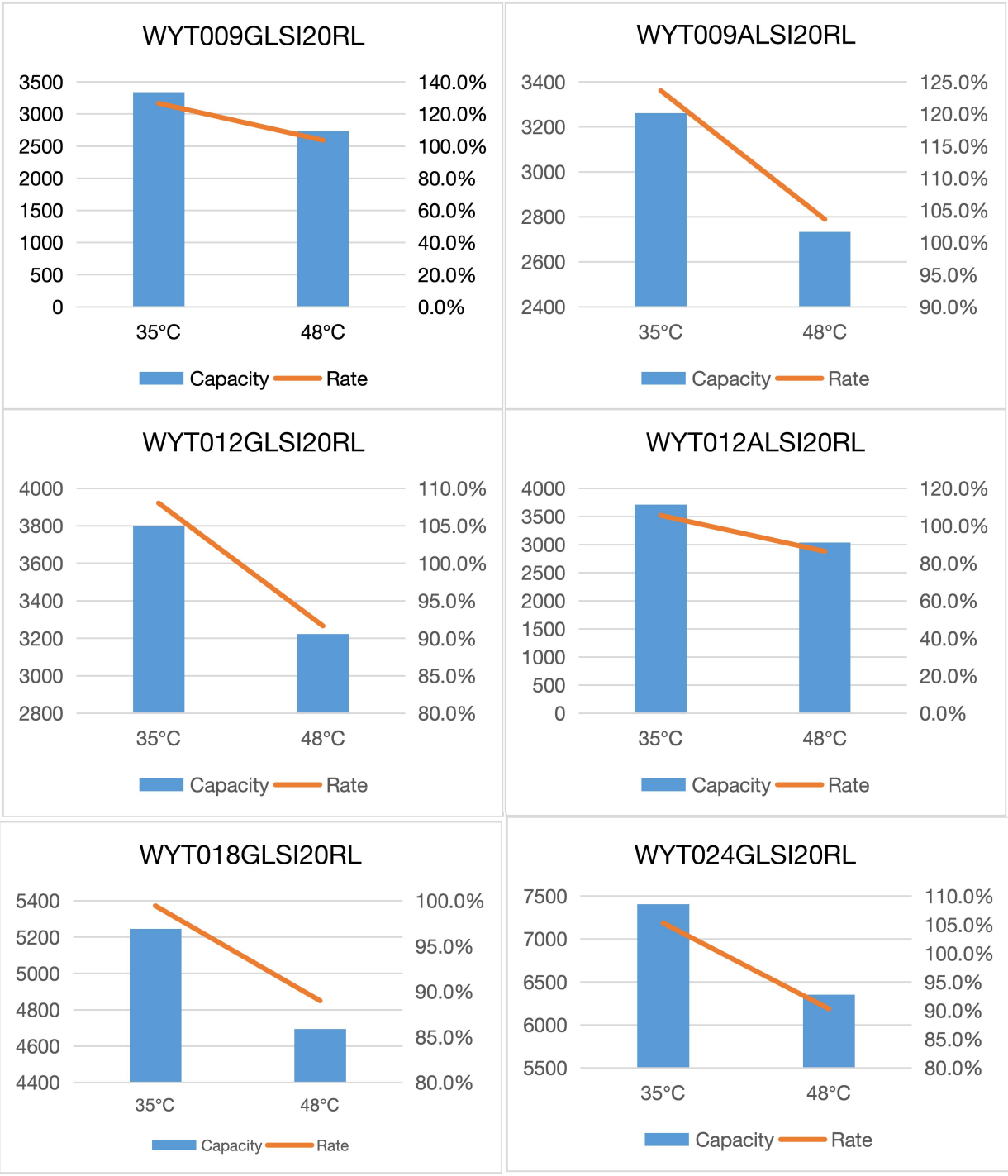
To ensure you place an accurate order, provide the following information:

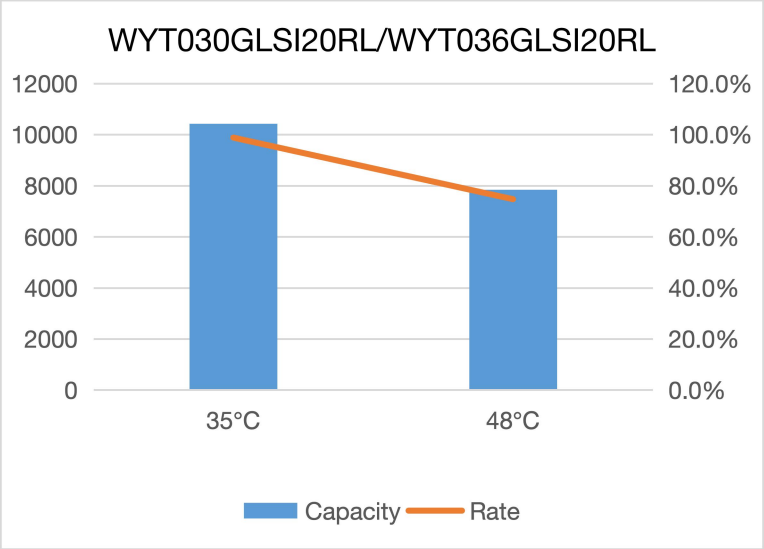
1. Model numbers of the indoor and outdoor units
2. Item number in exploded diagram
3. Part number
4. The quantity you want to order

2. Specifications

2.1 Operation Characteristic Curve

2.1.1 The Relation Curve of Capacity-Ambient Temperature





2.1.2 The Relation Curve of Pressure-Temperature

	WYT009GLSI20RL			WYT009ALSI20RL			WYT012GLSI20RL			WYT009ALSI20RL		
	f(Hz)	HP (MPa/psi)	LP (MPa/psi)	f(Hz)	HP (MPa/psi)	LP (MPa/psi)	f(Hz)	HP (MPa/psi)	LP (MPa/psi)	f(Hz)	HP (MPa/psi)	LP (MPa/psi)
35℃ | 95˚F Cooling	70	2.34 /339.39	0.94 /136.34	70	2.39 /346.64	1.05 /152.29	78	1.97 /285.72	1.06 /153.74	78	1.92 /278.47	1.13 /163.89
43℃ | 109˚F Cooling	62	2.92 /423.51	1.02 /147.94	62	3.00 /435.11	1.08 /156.64	68	2.37 /343.74	1.00 /145.04	66	2.35 /340.84	1.01 /146.49
48℃ | 118˚F Cooling	54	3.32 /481.53	1.29 /187.1	54	3.32 /481.52	1.29 /187.1	54	2.73 /395.95	1.21 /175.49	56	2.67 /387.25	1.19 /172.59
7℃ | 45˚F Heating	78	2.12 /307.48	0.61 /88.47	78	2.12 /307.48	0.61 /88.47	78	2.36 /342.29	0.67 /97.18	78	2.36 /342.29	0.67 /97.18
	WYT018GLSI20RL			**WYT024GLSI20RL**			**WYT030GLSI20RL**			**WYT036GLSI20RL**		
	f(Hz)	HP (MPa/psi)	LP (MPa/psi)	f(Hz)	HP (MPa/psi)	LP (MPa/psi)	f(Hz)	HP (MPa/psi)	LP (MPa/psi)	f(Hz)	HP (MPa/psi)	LP (MPa/psi)
35℃ | 95˚F Cooling	84	2.86 /414.81	0.687 /99.64	84	2.93 /424.96	0.787 /114.1	96	2.717 /394.07	0.686 /99.49	96	2.717 /394.07	0.686 /99.49
43℃ | 109˚F Cooling	82	3.163 /458.75	0.71 /102.98	82	3.404 /493.71	0.803 /116.46	84	3.173 /460.2	0.765 /110.95	84	3.173 /460.2	0.765 /110.95
48℃ | 118˚F Cooling	74	3.524 /511.11	0.878 /127.34	68	3.748 /543.6	0.979 /141.99	68	3.448 /500.09	0.956 /138.65	68	3.448 /500.09	0.956 /138.65
7℃ | 45˚F Heating	92	2.56 /371.3	0.537 /77.89	96	2.63 /381.45	0.564 /81.80	90	2.514 /364.62	0.557 /80.78	90	2.514 /364.62	0.557 /80.78

Note:

The test under condition:

Rated Cooling: IDU Dry Bulb 81°F / Wet Bulb 66°F / ODU Dry Bulb 95°F / Wet Bulb 75°F / Connection Pipes: 16.4ft

Rated Heating: IDU Dry Bulb 68°F / Wet Bulb 59°F / ODU Dry Bulb 45°F / Wet Bulb 43°F / Connection Pipes: 16.4ft

Important:

The above data under test standard in the lab, the HP (high pressure) and LP (low pressure) will vary along with the variation of operation frequency, ambient temperature, and\or fan speed.

2.1.3 The Relation Curve of Noise-Operation Frequency

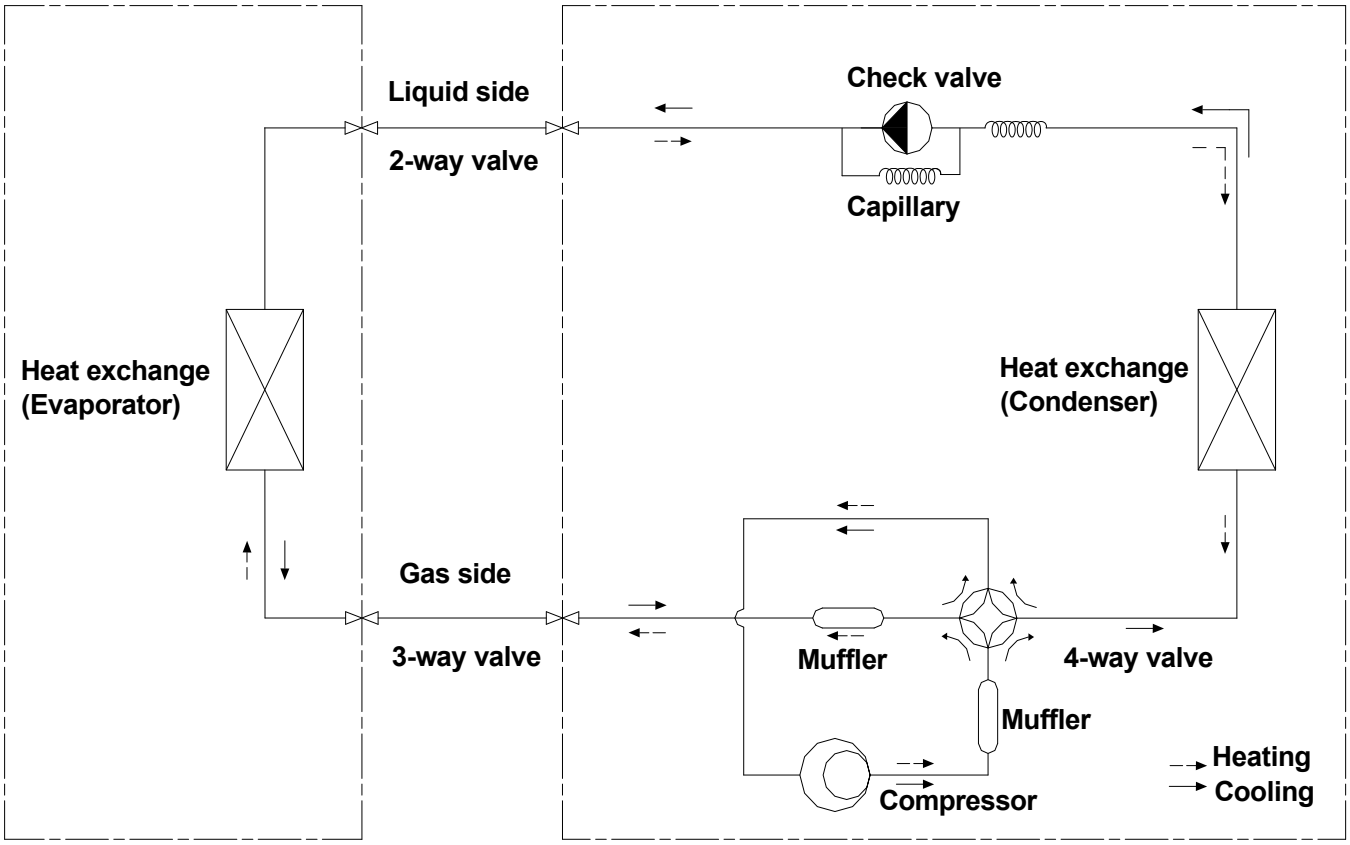
2.1.4 The Normal Temperature Range for Working Environments

	WYT009GLSI20RL		WYT009ALSI20RL		WYT012GLSI20RL		WYT012ALSI20RL	
Mode	**Room Temperature**	**Outdoor Temperature**	**Room Temperature**	**Room Temperature**	**Room Temperature**	**Room Temperature**	**Room Temperature**	**Room Temperature**
Cooling	17~32℃ 63~90˚F	-15~53℃ 5~127˚F	17~32℃ 63~90˚F	-15~53℃ 5~127˚F	17~32℃ 63~90˚F	-15~53℃ 5~127˚F	17~32℃ 63~90˚F	-15~53℃ 5~127˚F
Heating	0~30℃ 32~86˚F	-20~30℃ -4~86˚F	0~30℃ 32~86˚F	-20~30℃ -4~86˚F	0~30℃ 32~86˚F	-20~30℃ -4~86˚F	0~30℃ 32~86˚F	-20~30℃ -4~86˚F
Drying	10~32℃ 50~90˚F	0~50℃ 32~122˚F	10~32℃ 50~90˚F	0~50℃ 32~122˚F	10~32℃ 50~90˚F	0~50℃ 32~122˚F	10~32℃ 50~90˚F	0~50℃ 32~122˚F

	WYT018GLSI20RL		WYT024GLSI20RL		WYT030GLSI20RL/WYT036GLSI20RL	
Mode	**Room Temperature**	**Outdoor Temperature**	**Room Temperature**	**Outdoor Temperature**	**Room Temperature**	**Outdoor Temperature**
Cooling	17~32℃ 63~90˚F	-15~53℃ 5~127˚F	17~32℃ 63~90˚F	-15~53℃ 5~127˚F	17~32℃ 63~90˚F	-15~53℃ 5~127˚F
Heating	0~30℃ 32~86˚F	-20~30℃ -4~86˚F	0~30℃ 32~86˚F	-20~30℃ -4~86˚F	0~30℃ 32~86˚F	-20~30℃ -4~86˚F
Drying	10~32℃ 50~90˚F	0~50℃ 32~122˚F	10~32℃ 50~90˚F	0~50℃ 32~122˚F	10~32℃ 50~90˚F	0~50℃ 32~122˚F

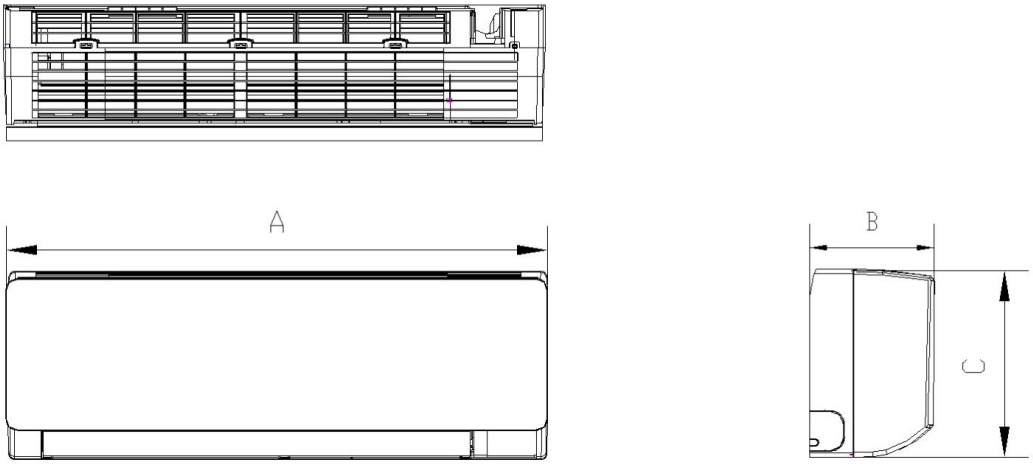
2.2 Refrigeration Cycle Diagram

WYT009GLSI20RL
WYT009ALSI20RL
WYT012GLSI20RL
WYT012ALSI20RL
WYT018GLSI20RL
WYT024GLSI20RL
WYT030GLSI20RL
WYT036GLSI20RL

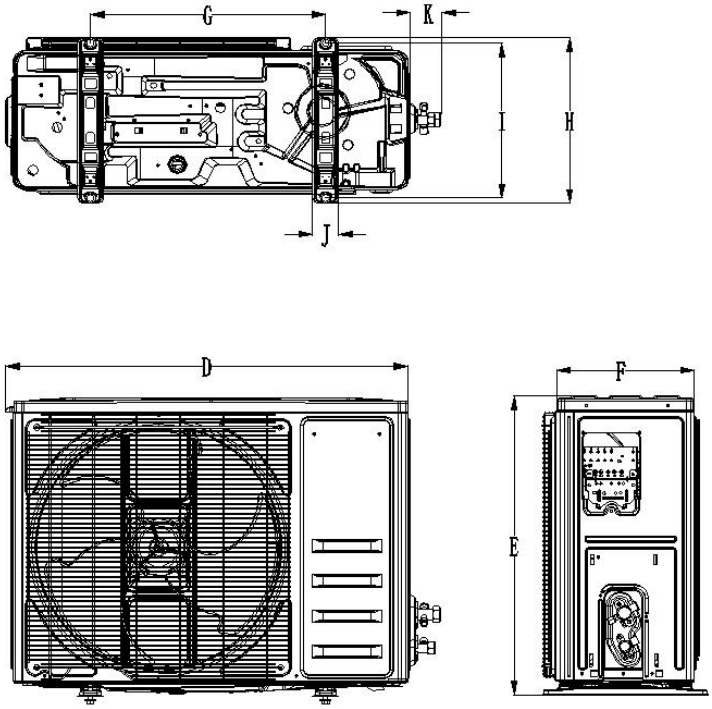


3. Product Dimensions

Indoor Unit:



Outdoor Unit:



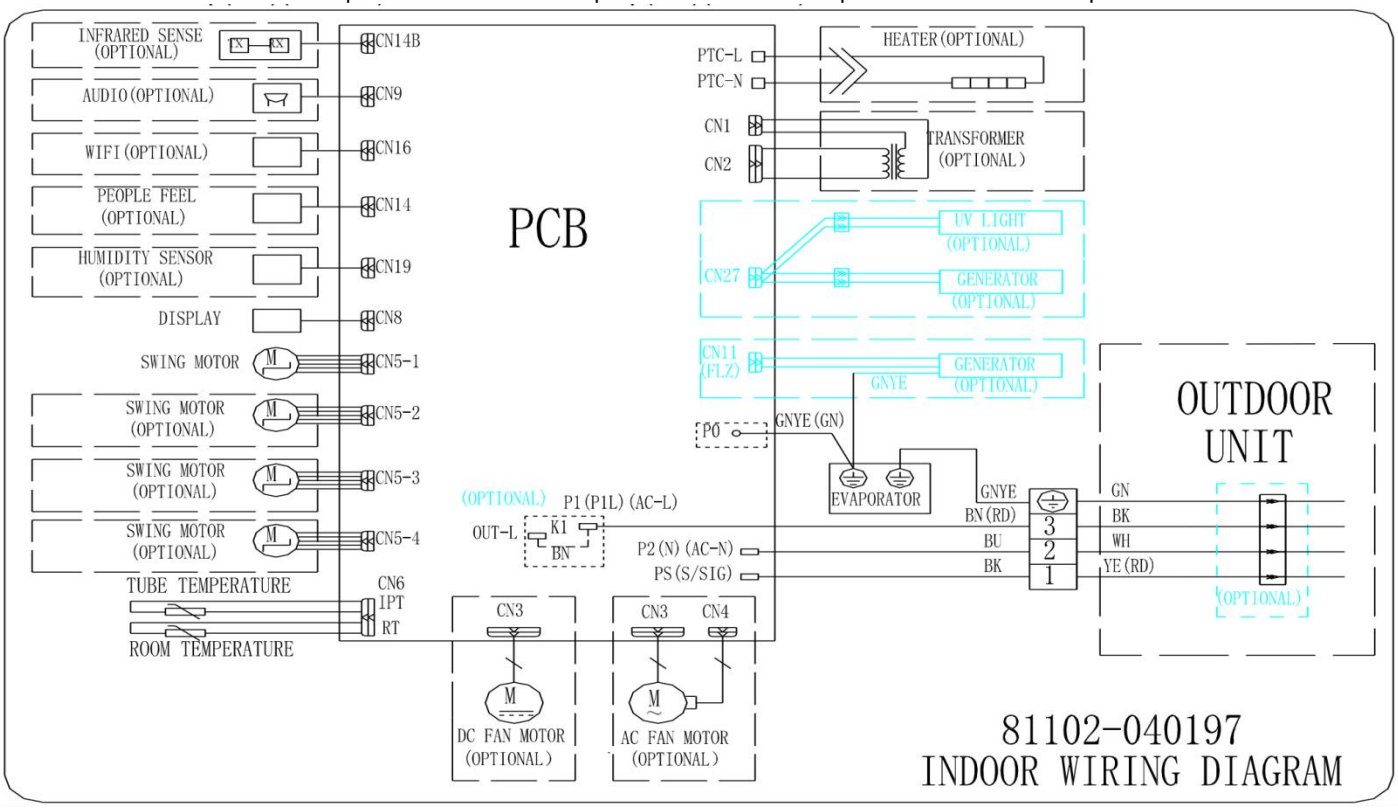
Model	Indoor Unit(mm/inch)			Outdoor Unit(mm/inch)							
	A	B	C	D	E	F	G	H	I	J	K
WYT009GLSI20RL	811 /31.93	292 /11.50	202 /7.95	712 /28.03	498 /19.61	234 /9.21	415 /16.34	290.4 /11.43	263 /10.35	48 /1.89	55.9 /2.2
WYT009ALSI20RL	811 /31.93	292 /11.50	202 /7.95	712 /28.03	498 /19.61	234 /9.21	415 /16.34	290.4 /11.43	263 /10.35	48 /1.89	55.9 /2.2
WYT012GLSI20RL	811 /31.93	292 /11.50	202 /7.95	712 /28.03	498 /19.61	234 /9.21	415 /16.34	290.4 /11.43	263 /10.35	48 /1.89	55.9 /2.2
WYT012ALSI20RL	811 /31.93	292 /11.50	202 /7.95	712 /28.03	498 /19.61	234 /9.21	415 /16.34	290.4 /11.43	263 /10.35	48 /1.89	55.9 /2.2
WYT018GLSI20RL	1010 /39.76	315 /12.4	220 /8.66	780 /30.71	602 /23.7	288 /11.34	516 /20.31	349 /13.74	314 /12.36	54 /2.13	57 /2.24
WYT024GLSI20RL	1186 /46.69	340 /13.39	268 /10.55	845 /33.27	699 /27.52	326 /12.83	586 /23.07	375 /14.76	348 /13.7	55 /2.17	55.9 /2.2
WYT030GLSI20RL /WYT036GLSI20RL	1186 /46.69	340 /13.39	268 /10.55	910 /35.83	803 /31.61	359 /14.13	607 /23.9	421 /16.57	390 /15.35	60 /2.36	63 /2.48

4. Electric Diagram

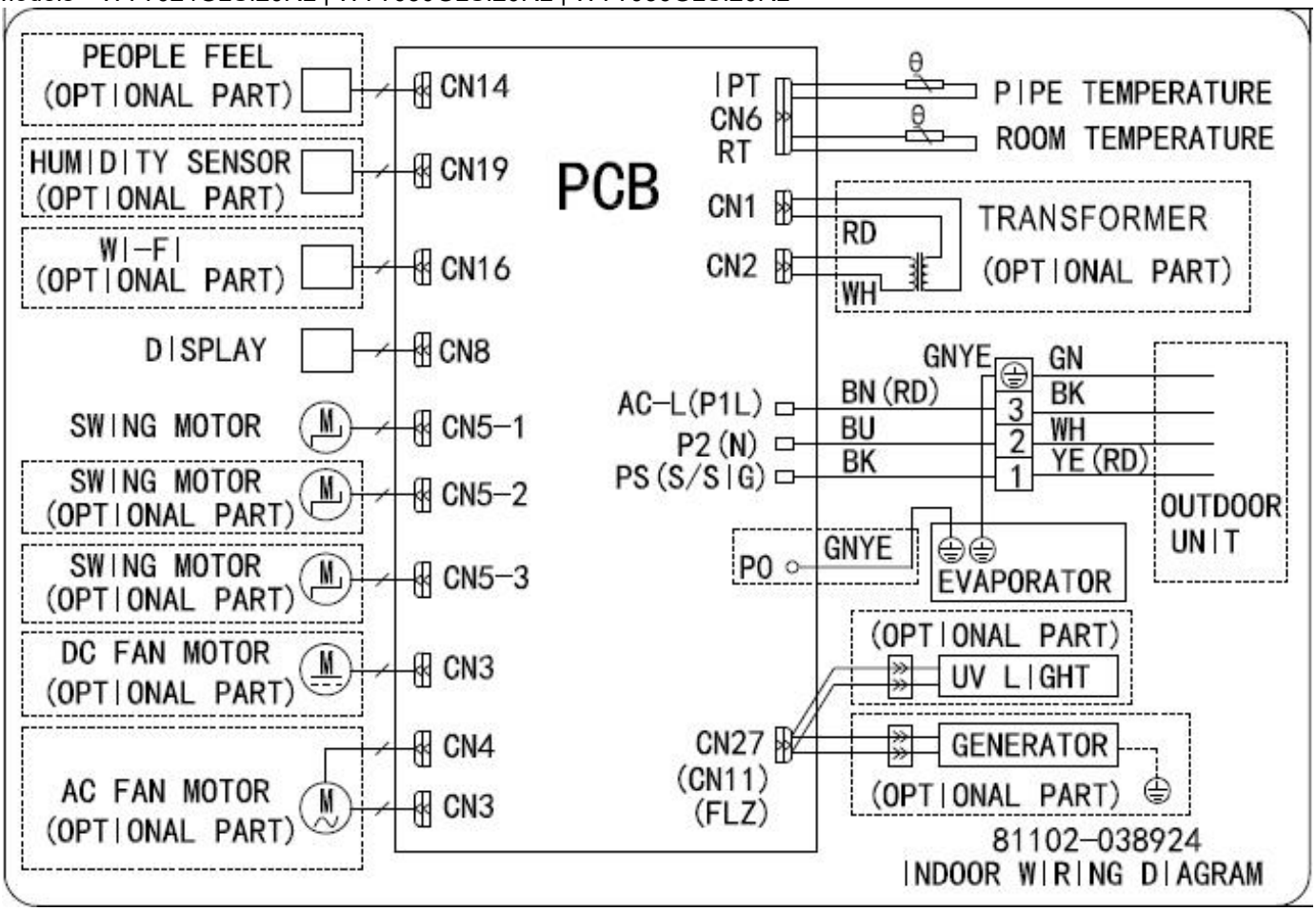
4.1 Wiring Diagram

Indoor Unit:

Models: WYT009ALSI20RL | WYT009GLSI20RL | WYT012ALSI20RL | WYT012GLSI20RL | WYT018GLSI20RL

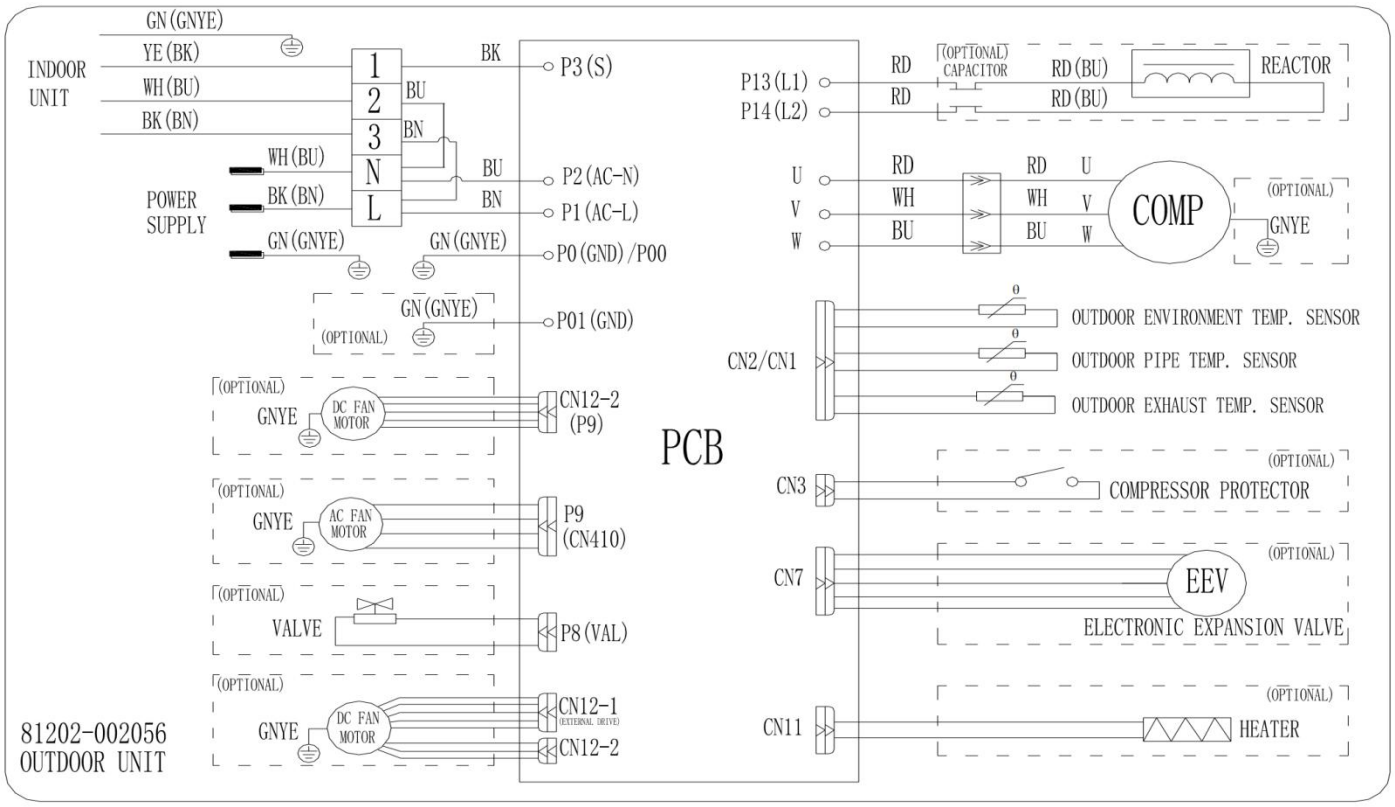


Models: WYT024GLSI20RL | WYT030GLSI20RL | WYT036GLSI20RL

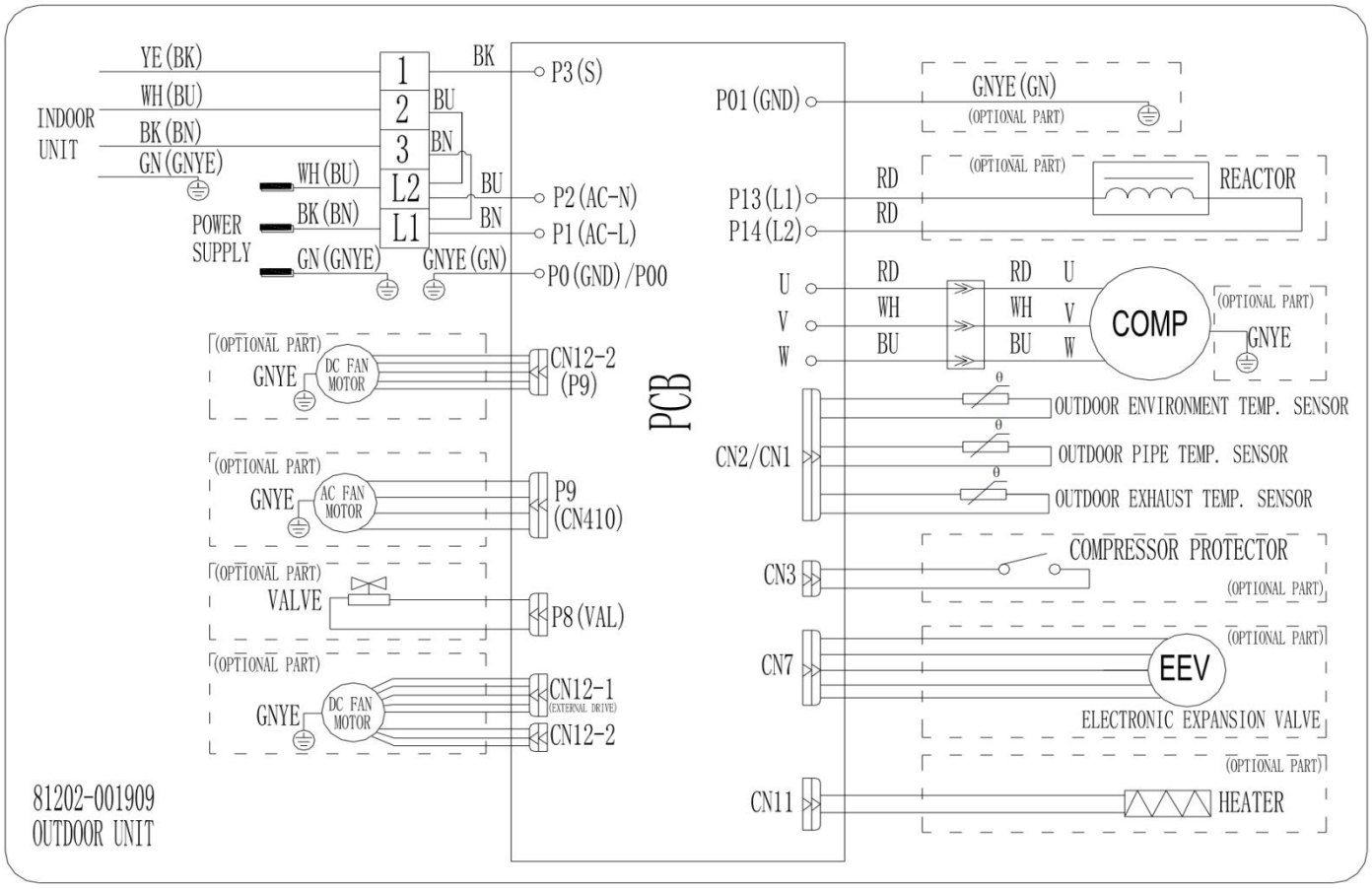


Outdoor Unit:

Models: WYT009ALSI20RL | WYT012ALSI20RL

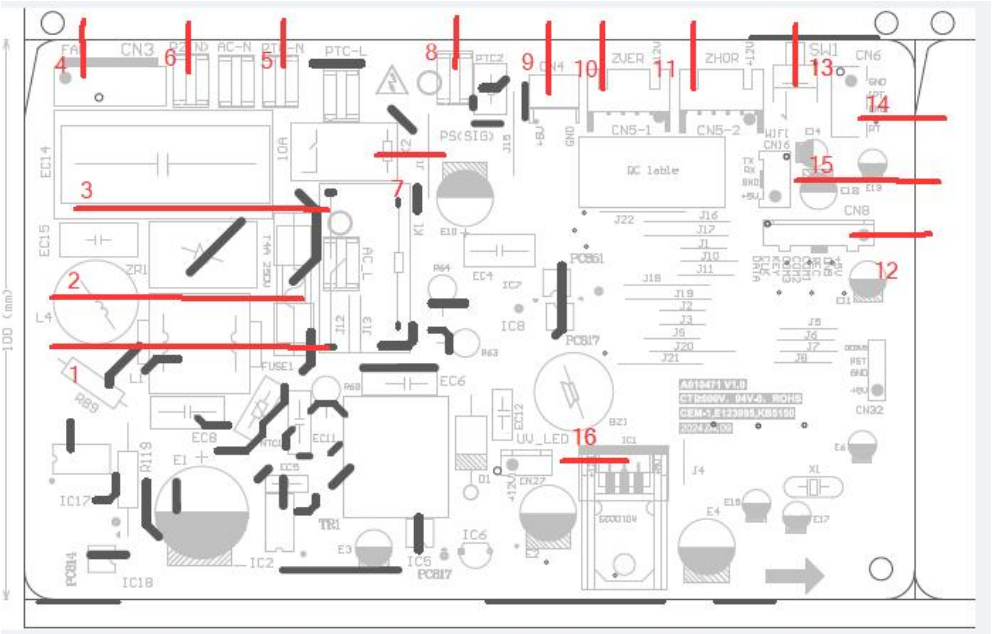


Models: WYT009GLSI20RL | WYT012GLSI20RL | WYT018GLSI20RL | WYT024GLSI20RL | WYT030GLSI20RL | WYT036GLSI20RL



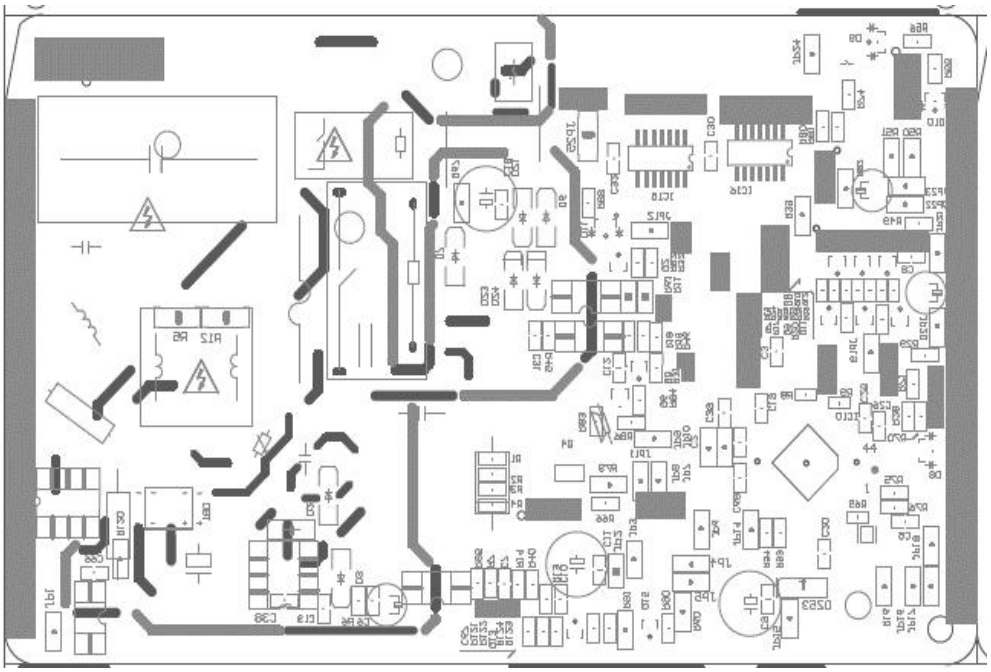
4.2 PCB Layout

Indoor Unit
WYT009ALSI20RL
Indoor PCB
Top view



1	ODU AC Power Output
2	Fuse
3	ODU AC Power Input
(3)	ODU Power Supply IDU Power Input
4	AC Motor Driver
5	IDU/ODU Wiring Connection-N Connector
6	Power Supply-N Connector
7	Anion Connector
8	IDU/ODU Communication Wiring
9	AC Motor Feedback
10	Up-Down Swing Connector
11	Left-Right Swing Connector
12	Display
13	Emergency Button
14	Temperature Sensor Connector
15	Wi-Fi Connector

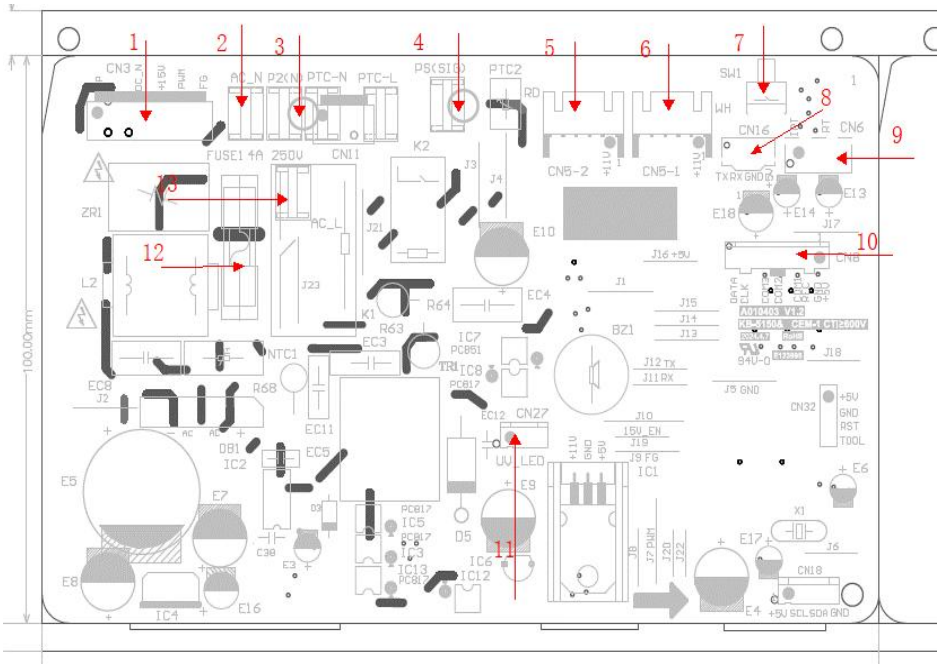
Bottom view



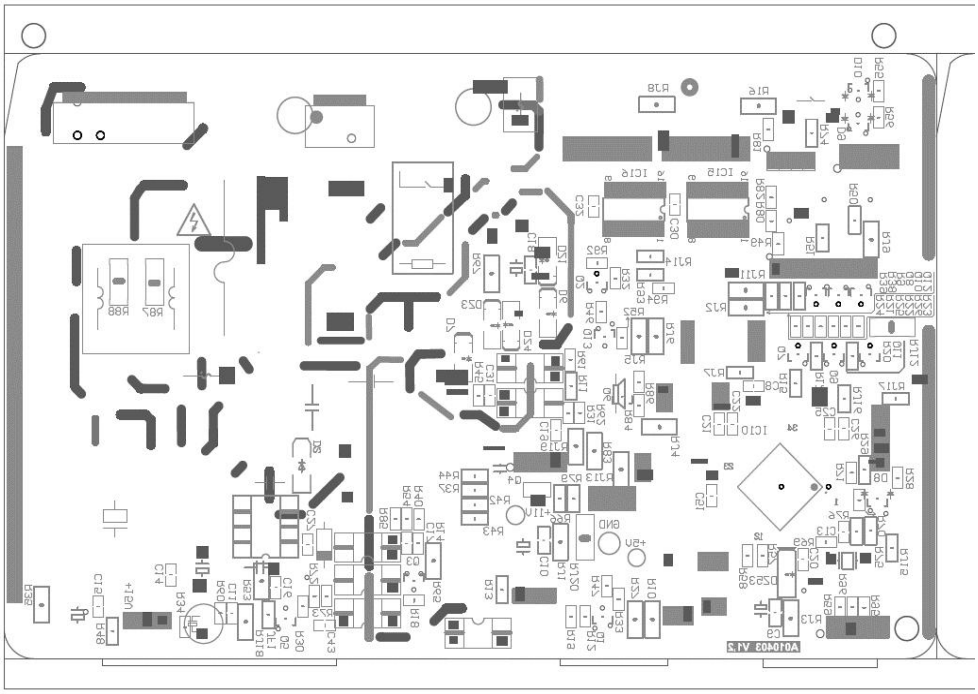
Indoor PCB

WYT024GLSI20RL | WYT030GLSI20RL | WYT036GLSI20RL

Top view



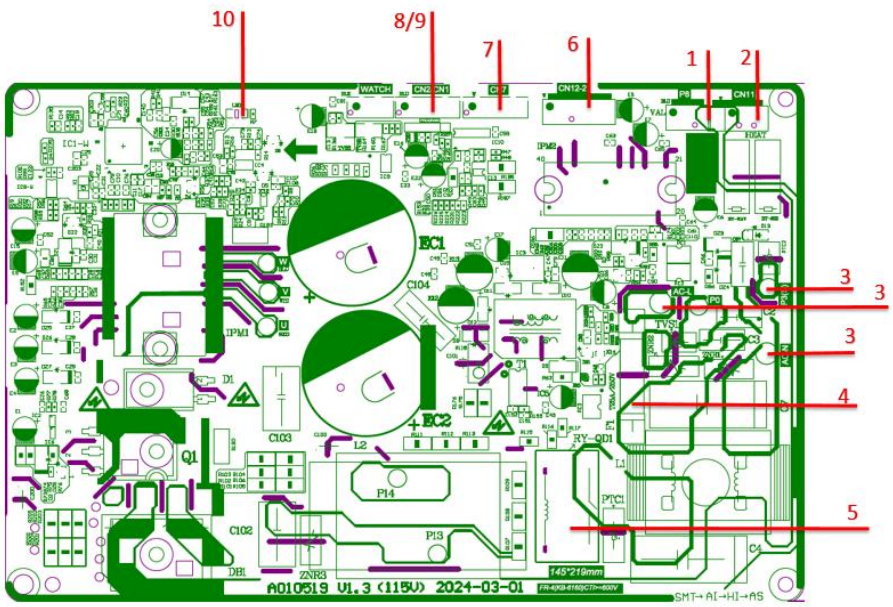
Bottom view



1	ODU AC Power Output
2	Fuse
3	ODU AC Power Input
4	AC Motor Driver
5	IDU/ODU Wiring Connection-N Connector
6	Power Supply-N Connector
7	IDU/ODU Communication Wiring
8	AC Motor Feedback
9	Up-Down Swing Connector
10	Left-Right Swing Connector
11	Display
12	Emergency Button
13	Temperature Sensor Connector
14	Wi-Fi Connector

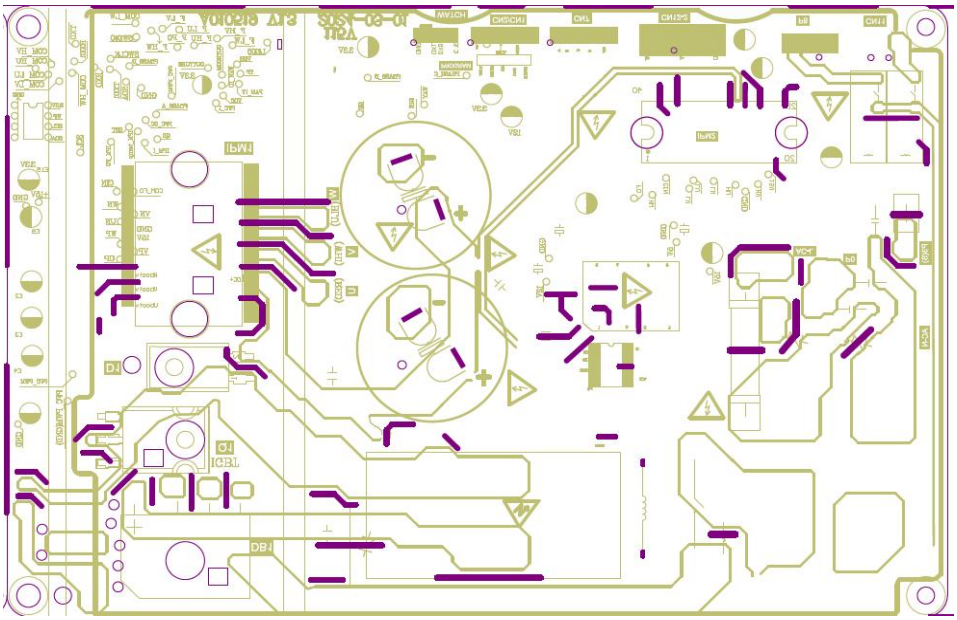
Outdoor Unit
Outdoor PCB
WYT009ALSI20RL | WYT012ALSI20RL

Top view



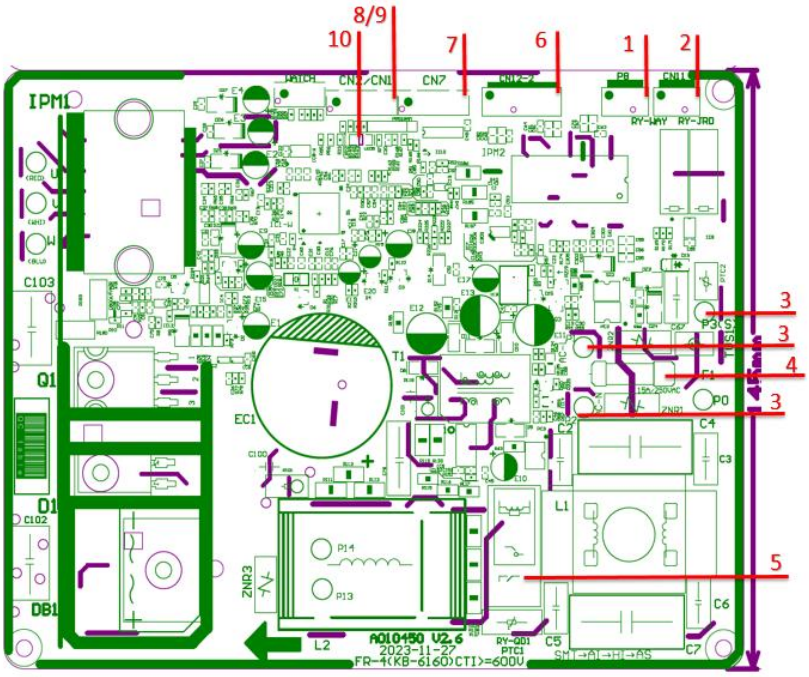
1	ODU PCB Main Relay
2	Fuse
3	L, N and 1 Communication Wiring
4	4-way Valve
5	Heater
6	DC Fan Motor Connector
7	Electronic Expansion Valve
8	Discharge Sensor Connector
9	OAT/OPT Connector
10	LED5

Bottom view



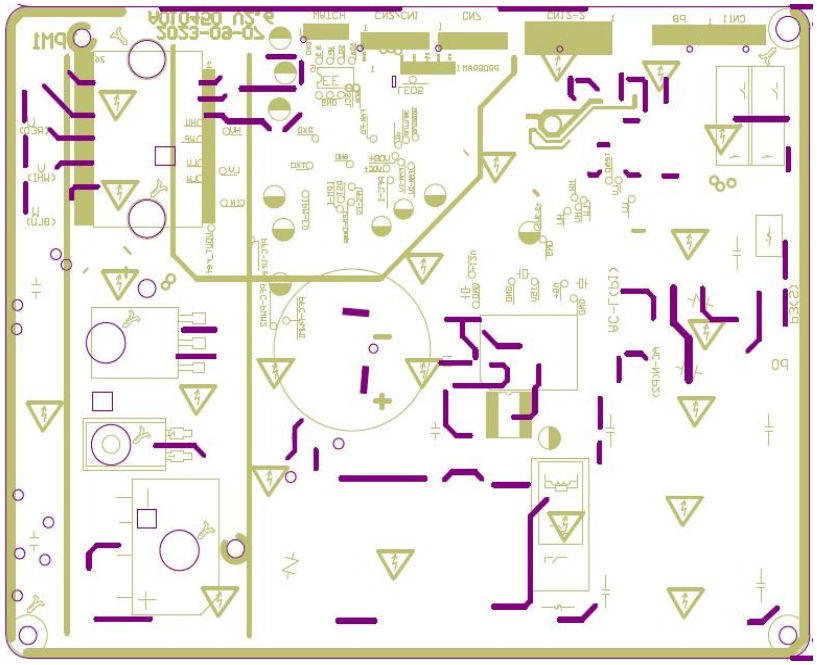
Outdoor PCB
WYT009GLSI20RL | WYT012GLSI20RL

Top view



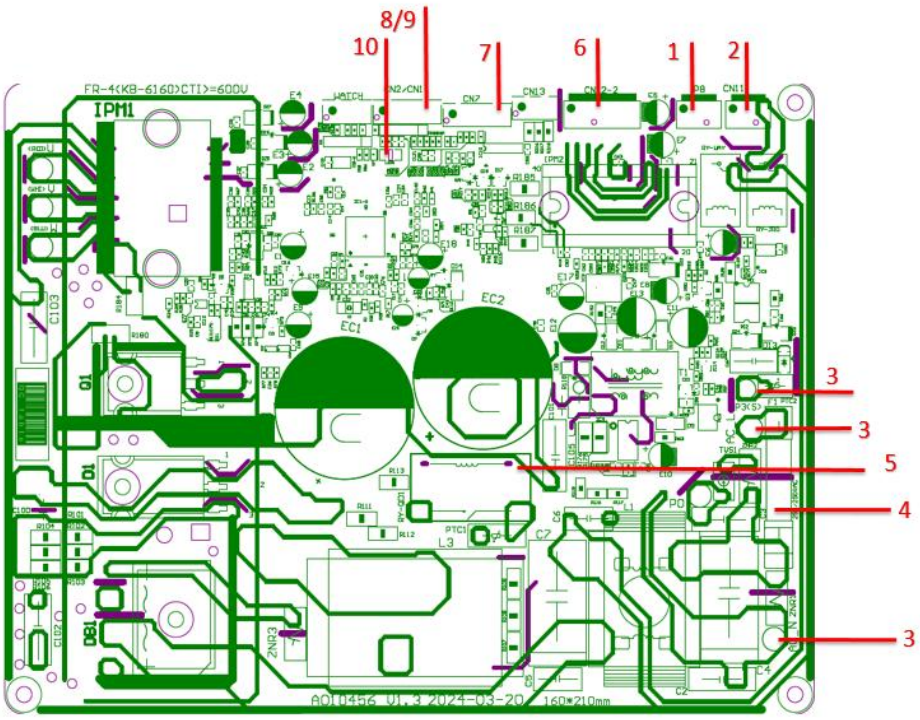
1	4-way Valve
2	Heater
3	L, N and Communication
4	Fuse
5	ODU PCB Main Relay
6	DC Motor Connector
7	Electronic Expansion Valve
8	Discharge Sensor Connector
9	OAT/OPT Sensor Connector
10	LED5

Bottom view

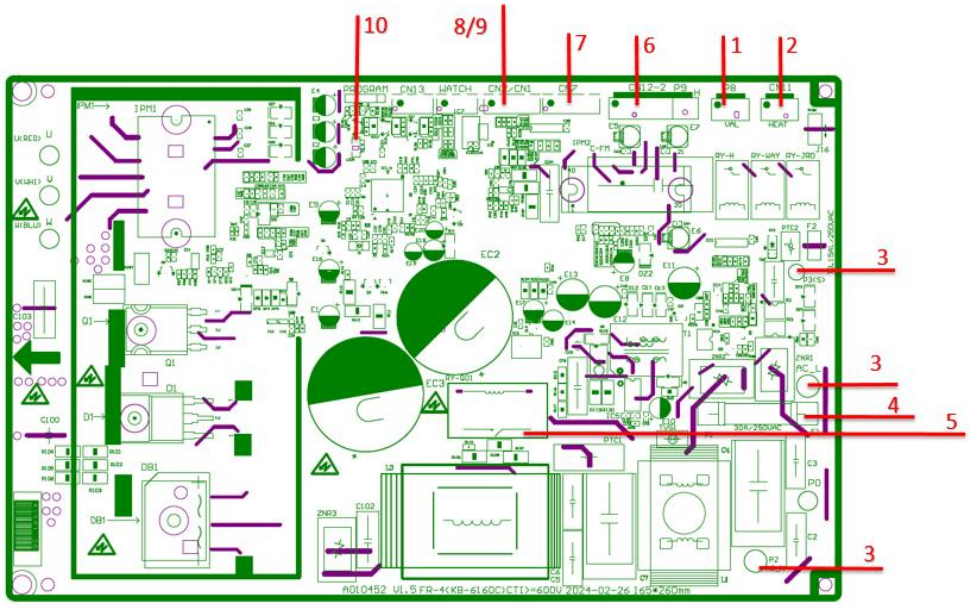


Outdoor PCB
WYT018GLSI20RL | WYT024GLSI20RL | WYT030GLSI20RL | WYT036GLSI20RL

Top view



1	DRED (Option)
2	OAT/OPT Connector
3	Discharge Sensor Connector
4	Electronic Expansion Valve
5	AC/DC Fan Motor Connector
6	Heater
7	4-way Valve
8	LED5
9	Communication Wiring
10	Fuse
11	L, N Line
12	ODU PCB Main Relay
13	LED1-LED4



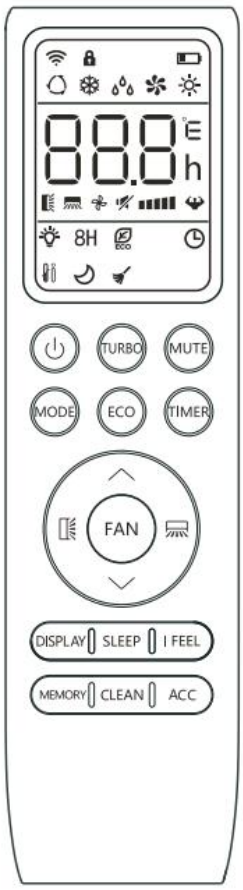
1	4-way Valve P8
2	Heater CN11
3	L, N and Communication
4	Fuse1
5	ODU PCB Main Relay RY-QD1
6	DC Motor Connector CN12-2
7	Electronic Expansion Valve CN7
8	Discharge Sensor Connector CN2
9	OAT/OPT Sensor Connector CN1
10	LED5
11	AC Motor Connector P9
12	LED1-LED4

Note:
OAT: Outdoor Ambient Temperature
OPT: Outdoor Pipe Temperature

5. Electronic Controller Introduction

5.1 Remote Controller

No.	Symbols	Meaning
1		Battery indicator
2		Auto Mode
3		Cooling Mode
4		Dry Mode
5		Fan only Mode
6		Heating Mode
7	ECO	ECO Mode
8		Timer
9	8.8 °E	Temperature indicator
10		Fan speed: Auto/ low/ low-mid/ mid/ mid-high/ high
11		Mute function
12		TURBO function
13		Up-down auto swing
14		Left-right auto swing
15		SLEEP function
16		I FEEL function
17	8H	8°C heating function
18		Signal indicator
19		Child-Lock
20		Display ON/OFF
21		Self-Clean function



⚠ The appearance and some functions of the remote controller may differ.

⚠ The shape and position of switches and indicators may be different according to the model, but their function is the same. The actual shape and position shall prevail.

Remote Controller Display

No.	Button	Function
1	⏻	To turn on/off the air conditioner .
2	∧	To increase temperature, or Timer setting hours.
3	∨	To decrease temperature, or Timer setting hours.
4	MODE	To select the mode of operation (AUTO, COOL, DRY, FAN, HEAT).
5	ECO	To activate/deactivate the ECO function.
		Long press to activate/deactivate the 8°C heating function (depending on models).
6	TURBO	To activate/deactivate the TURBO function.
7	FAN	To select the fan speed of auto/mute/low/low-mid/mid/mid-high/high/turbo.
8	TIMER	To set the time for timer on/off.
9	SLEEP	To switch-on/off the function SLEEP.
10	DISPLAY	To switch-on/off the LED display.
11		To stop or start horizontal flaps louver movement or set the desired up/down air flow direction.
12		To stop or start vertical deflectors louver movement or set the desired left/right air flow direction.
13	I FEEL	To switch-on/off the I FEEL function.
14	MUTE	To switch-on/off the MUTE function.
		Long press to activate/deactivate the GEN function (depending on models).
15	MODE + TIMER	To activate/deactivate the CHILD-LOCK function.
16	CLEAN	To activate/deactivate the SELF-CLEAN function (depending on models).
17	MEMORY	To memory the setting temperature, setting mode and setting fan speed as you need.
18	ACC	/

⚠ The appearance and some functions of the remote controller may differ.

⚠ The shape and position of the buttons and indicators may vary according to the model, but their function is the same.

⚠ The unit will beep to confirm the correct reception of each button.

5.2 Electronic Controller

RT --- Room Temperature
IPT --- Indoor Pipe (Coil) Temperature
IST --- Indoor Setting Temperature
OPT --- Outdoor Pipe Temperature
OAT --- Outdoor Ambient Temperature
ODT --- Outdoor Discharge Temperature
CRT --- Compensated Room Temperature
IDU --- Indoor Unit
ODU --- Outdoor Unit

Note: When finishing installation, the air inlet on the unit and airflow throughout the room can vary in temperature. This occurs because the air ventilation and temperature test sensor are in different locations. The sensor is located in the unit's air inlet. The temperature for the IDU PCB control needs compensation.

1. Cooling mode: CRT=RT;
2. Heating mode: CRT=RT(27˚F)---Split AC

5.2.1 Auto Mode

1. The set temperature can be adjusted from 61-88˚F in Auto mode. The fan speed and vane position will automatically adjust based on the Cooling mode presets.

2. Operation
When the unit is set to Auto mode, it will operate on Cooling, Heating, or Fan mode according to Δt -- the temperature difference between RT and ST shown in the table:

Mode	Δt=RT-ST
Cooling	Δt >34˚F
Fan	30˚F≤Δt≤ 34˚F
Heating	Δt <30˚F

5.2.2 Cooling Mode

1. Temperature Control: 61-88˚F, and the fan speed and louver position will automatically adjust based on the Cooling mode presets.

2. Compressor and Process Control:
1). When RT-ST≥33˚F, the compressor starts up and the AC operates as customer preset.
2). When:
a. RT-ST≤ 27˚F and the compressor keeps 2 min continuously or
b. RT-ST≤ 28˚F and the compressor works in the lowest frequency for 5 min continuously or
c. RT-ST≤ 30˚F and the compressor works in the lowest frequency for 10 min continuously.
The compressor stops operation.
3). The compressor frequency control: Based on the relation of RT and ST and the changing speed of RT.
4). The compressor also stops operating while the unit is:
a. Switched Off
b. Under protection
c. Changed to Fan mode
5). The compressor works for a minimum of 7 min before being stopped by its programming in normal operation.
6). In the process of unit operation, once the compressor ceased, it should be a 3-min delay for the next procedure.

3. ODU Fan Motor Control:
1). While the unit is:
a. Switched Off

b. Under protection

c. To the set temperature

After the compressor ceases, the fan motor stops working according to the temperature of OPT and OAT. The max delay for the motor should be less than 160s.

2). When switching the unit to Cooling mode, the ODU fan motor will delay 5s after the compressor starts up.

4. When ODU failure or stops for protection, the IDU works as preset.

5. Anti-Frosting Protection

Control the unit operation frequency and frequency changing rate to achieve anti-frosting protection.

1). Frequency Slowly Increasing (FSI):

a. If 43°F≤IPT < 45˚F, the frequency increasing rate is 1Hz/60s, slowly increasing operation speed.

b. When IPT≥45˚F, the unit quits from protection.

2). Frequency Limitation:

If 41°F≤IPT < 43˚F, the compressor frequency is forbidden to increase.

3). Normal Frequency Decreasing (NFD):

If 37˚F≤IPT < 39˚F, the frequency decreasing rate is 8Hz/90s until the lower frequency limit.

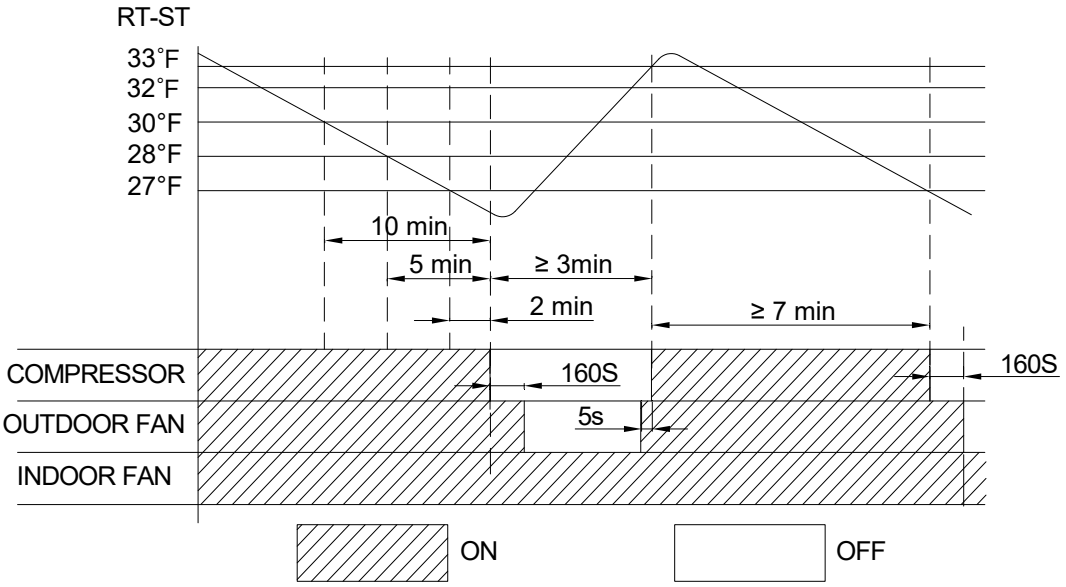
4). Fast Frequency Decreasing (FFD):

If 36˚F≤IPT < 37˚F, the frequency decreasing rate is 16Hz/90s until the lower frequency limit.

5). Unit stops:

a. When IPT < 34˚F for 3 min continuously, the unit stops working for anti-defrosting protection.

b. While IPT > 43˚F and the has unit stopped for 3 min already, the unit can recover to operation.



5.2.3 Dry Mode

1. Temperature Control: 61-88˚F
Fan Speed: Low
Vane Blade Position: As customer preset
2. When ODU failure or stops for protection, the IDU works as preset.
3. Failure Protection: Cooling mode
4. Energy Saving and Sleep Mode: Invalid
5. The ODU fan motor stops working.

5.2.4 Heating Mode

1. Temperature Control: 61-88˚F
2. Compressor and Process Control:

1). When ST-CRT≥33˚F, the compressor starts up and the AC operates as customer preset.

2). When:

a. ST-CRT≤27˚F and the compressor keeps 2 min continuously or
b. ST-CRT≤28˚F and the compressor works in the lowest frequency for 5 min continuously or
c. RT-CRT≤30˚F and the compressor works in the lowest frequency for 10 min continuously.
The compressor stops operation.

3). The compressor frequency control: Based on the relation of RT and ST and the changing speed of RT.
4). The compressor will also stop operating while the unit is:

a. Switched Off
b. Under protection
c. Changed to Fan mode

5). The compressor works for a minimum of 7 min before being stopped by its programming in normal operation (Active cooling, heating, or an error code)
6). In the process of unit operation, once the compressor ceased, it should be a 3-min delay for the next procedure.

3. IDU Time Delay: When the compressor stops or unit switches Off while in Heating mode, the IDU fan motor will operate for a few more seconds to prevent overheat.

4. ODU Fan Motor Control:

1). While unit:

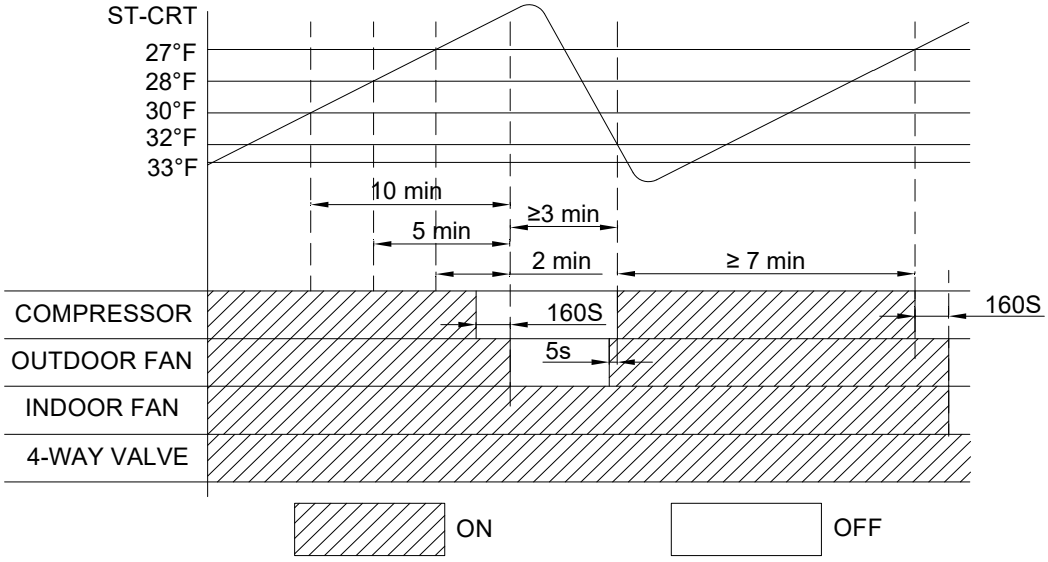
a. Switched Off
b. Under protection
c. To the set temperature

After the compressor ceased, the fan motor stops working according to the temperature of OPT and OAT. The max delay for the motor should be less than 160s.

2). When switching the unit to Heating mode, the ODU fan motor will delay 5s after the compressor starts up.
3). In the defrosting process, the fan motor will stop operation for a 48s delay after the compressor stops.
4). When defrosting finishes, the compressor stops operation and the fan motor will start operating simultaneously.

5. 4-Way Valve Control:

1). In Cooling/Dry/Fan mode, the 4-way valve will be Off**.** When the unit switches to Heating mode, the 4-way valve will be On.
2). When Heating mode switches Off or changes from heating to other modes, the 4-way valve will be Off for a 2-min delay after the compressor stops working.
3). The unit stops working and is caused by any kind of protection, the 4-way valve will be Off for a 4-min delay.
4). In the defrosting process, 4-way valve will be Off for a 43s delay after the compressor stops.
5). When defrosting finishes, the compressor stops operation and the 4-way valve will be On after a 43s delay.



6. Defrost

t1: The compressor continuous work time.

t2: AC unit operation first time going to defrost circle.

t3: The compressor's accumulated working time. When OPT≤37˚F, the unit starts to count the time for t3.

When AC unit working to:

a. t1≥t2, or

b. t3≤t1 < t2

and also the temperature (related to OAT and OPT) tested 3 min continuously meets for defrosting.

1) Defrosting starts up: The compressor stops operating and restarts after a 50s delay.

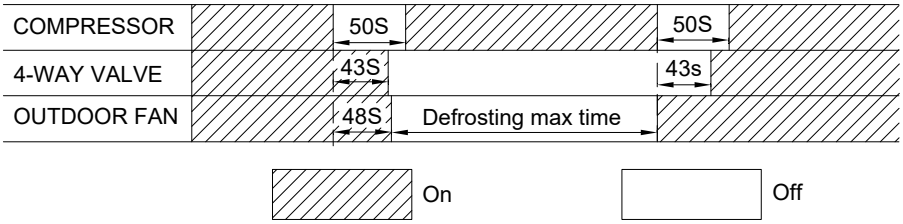
2) Conditions for quitting defrosting:

a. After defrosting 60s, and OAT≥54˚F or

b. OAT < -41˚F, and OPT ≥46˚F for 80s continuously or

c. The defrosting for 10 min.

When AC meets any of condition a, b or c, defrosting finish.



3) Defrosting finishes: The compressor stops operating and restarts after a 50s delay.

7. Cold Air Prevention:

This function prevents cold air from being discharged when the heating operation starts up.

1). IDU fan motor for cold air prevention:

When RT < 75˚F:

a. If ITP > 88˚F while the compressor works for 5 min, the fan motor will operate according to preset fan speed.

b. If IPT≤88˚F, the fan motor stops operating while compressor operation within 2 min.

c. If IPT≥81˚F, the fan motor operates in low speed for 2 min, then changes to preset speed.

When RT≥75˚F:

a. Within 2 min after the compressor starts up and once IPT > 81˚F, the fan motor changes to preset speed.

b. After the compressor starts working for 2 min, the fan motor changes to preset speed directly.

2). Vane blade operation for cold air prevention:

a. If the vane works on the status of **non-swing** while IPT increases to a special degree, the vane blade will change the position to:

-- Default angle or

-- Previous position or

-- Customer preset.

The above operation can only work one time. When the compressor stops operating, the unit will once again inspect the function.

b. If the vane works on the status of **swing** when the IDU quits from cold air prevention, the vane operates as preset.

8. 46˚F Heating

When this function is effective, it ensures the room temperature will not reach 46°F. Once the room temperature is lower than 46°F, the unit operates in Heating mode.

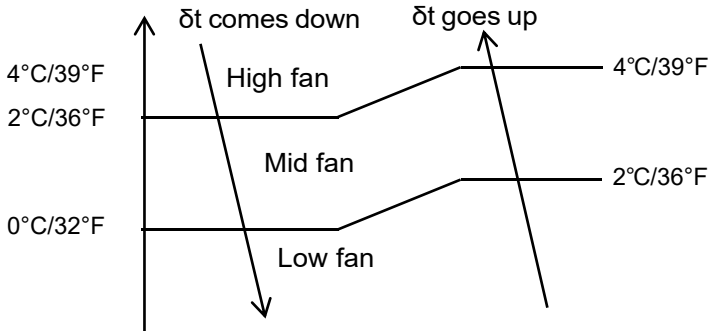
5.2.5 Fan Mode

1. **Temperature Setting**: 61-88˚F

Fan Speed and Vane Position: As preset. The function for remote controller 58E only.

2. For the above function, when the unit is preset for Auto Fan mode, the fan motor will change its operation speed based on the temperature difference of the ambient and preset temperatures.

3. ODU always Off



5.2.6 Timer

The unit has times control. When the unit meets the timer preset, it will switch On or Off automatically.

Timer On

1). Timer On can only be set when the air conditioner is Off.
2). Press "Timer" on the remote control 1 time to enter the time setting.
3). Press "▲" or "▼" to set the start time for the unit.
4). Set other function as Mode, Fan Speed, Swing, etc.
5). Press "Timer" 1 time again to confirm the Time On setting.

Timer Off

1). Timer Off can only be set when the air conditioner is On.
2). Press "Timer" on the remote control 1 time to enter the time setting.
3). Press "▲" or "▼" to set the stop time for the unit.
4). Press "Timer" 1 time again to confirm the Time Off setting.

Note: If you do not input a selection for the time setting within 10s, the timer function will turn Off automatically.

5.2.7 Sleeping Mode

While the AC works in Sleeping mode, the power supply and sleep lights will always be On. The temperature display will be Off after 15s. In this mode, the AC unit works according to the Sleep Curve as designed. In Sleeping mode, the unit can work 10 hours continuously. After, the unit will quit from this mode and operate as previous preset.

5.2.8 Emergency Switch

When the emergency switch is pressed 1 time, Cooling mode is selected. If the switch is pressed again within 3s, Heating mode is selected. If pressed 1 time again, the unit will be switched Off. For example, if the remote controller is out of function and the batteries lost power, the emergency button on the front of the indoor unit can be used for the function test.

Note: Do not press the emergency switch during normal operation.

5.2.9 Auto-Restart Function

While the air conditioner is operating in one mode, all of its operation data will be memorized into IC by the main PCB, such as the working mode, preset temperature, etc. If the power supply cuts Off due to reasons and recovers again, the Auto-Restart function will set synchronously and the air conditioner will operate in the same model as before.

Note: The function setting:
Within 3 min of powering On the unit, set the unit to Cooling mode, temperature to 86˚F, and mid fan speed. Press the Eco button 10 times consecutively within 8s and the Auto-Restart function activates.

5.2.10 Protection

5.2.10.1 Overload Protection

1. Overload Protection for Cooling or Dry Mode

1). If:

a. OPT≥144˚F, the unit stops operating for overload protection.

b. OPT < 131˚F and after the compressor stopped for 3 min, the unit can be started to operate.

2). When OPT≥131˚F, the compressor will be frequency limited/reduced for overload protection.

3). If the unit has entered overload stop-working protection 6 times consecutively, the protection can't be recovered unless pressing the On/Off button. The unit will show a failure code. Once the compressor runs more than 6 min continuously, the counter of the overload stop-working protection will be reset to zero, restarting the counting process. The failure and times for protection will eliminate immediately once the unit is switched Off or changed to Fan or Heating mode.

Note: If the defective failure can’t be recovered, the failure can’t be eliminated even if the operation mode changes.

2. Overload Protection for Heating Mode

1). If:

a. IPT≥144˚F, the unit stops operating for overload protection.

b. IPT < 131˚F and after the compressor stopped for 3 min, the unit can be started to operate.

2). When IPT≥131˚F, the compressor will be frequency limited/reduced for overload protection.

3). If the unit has entered overload stop-working protection 6 times consecutively, the protection can't be recovered unless pressing the On/Off button. The unit will show a failure code. Once the compressor runs more than 6 min continuously, the counter of the doverload stop-working protection will be reset to zero, restarting the counting process. The failure and times for protection will eliminate immediately once the unit is switched Off or changed to Fan or Heating mode.

Note: If the defective failure can’t be recovered, the failure can’t be eliminated even if the operation mode changes.

5.2.10.2 Compressor Discharge Temperature Protection

1. If ODT≥239˚F, the unit stops operating for over-temperature protection;
While ODT < 212˚F and after the compressor stopped for 3 min, the unit can be started to operate.

2. If ODT≥212˚F, the compressor will be frequency limited/reduced for over-temperature protection.

3. If the unit has entered discharge over-temperature stop-working protection 6 times consecutively, the protection can't be recovered unless pressing the On/Off button. The unit will show a failure code. Once the compressor runs more than 6 min continuously, the counter of the discharge over-temperature stop-working protection will be reset to zero, restarting the counting process. The failure and times for protection will eliminate immediately once the unit is switched Off or changed to Fan mode.

Note: If the defective failure can’t be recovered, the failure can’t be eliminated even if operation mode changes.

5.2.10.3 Current Protection

1. If the A/C unit's working current is more than **Limited current (I_{LC})**, the compressor will be frequency limited/ reduced for over-current protection.
2. If the A/C unit's working current is more than **Stopped current (I_{SC})**, the AC unit stops working. Only when the compressor stops for 3 min can the unit be recovered.

3. If the unit has entered over-current stop-working protection 6 times consecutively, the protection can't be recovered unless pressing the On/Off button. Once the compressor runs more than 6 min continuously, the counter of the stop-working protection will be reset to zero, restarting the counting process.

Note: For different models, I_{LC} and I_{SC} have different programmed values.

5.2.10.4 IPM Overheating Protection

1. When IPM temperature T_{IPM}≥189˚F, the compressor will be frequency limited/reduced for IPM over-temperature protection.
2. When T_{IPM}≥203˚F, the AC unit stops working for AC-system protection.
If $T_{IPM} < 189$˚F and after the compressor stops for 3 min, the unit can be started to operate.
3. If the unit has entered IPM over-temperature stop-working protection 6 times consecutively, the protection can't be recovered unless pressing the On/Off button. The unit will show a failure code. Once the compressor runs more than 6 min continuously, the counter of the overload stop-working protection will be reset to zero, restarting the counting process. The failure and times for protection will eliminate immediately once the unit is switched Off or changed to Fan mode.
Note: If the defective failure can’t be recovered, the failure can’t be eliminated even if the operation mode changes.

5.2.11 Complementary

5.2.11.1 Energy Saving (Eco)

Function effective in Cooling and Heating modes only.

In Cooling mode, the set temperature range is from 79-88°F. In Heating mode, the set temperature range is from 61-77°F.

5.2.11.2 Turbo

Function effective in Cooling, Heating, Fan, and Auto modes. The fan speed operates on highest.

5.2.11.3 The Communication Control

If the ODU PCB can’t get signal feedback from the IDU for 2 min continuously, the AC unit stops operating and displays the "E0" error code. The "E0" error code represents IDU/ODU communication failure. The unit can be recovered to operate after the IDU and ODU communication recovers and the compressor stops for 3 min.

5.2.12 Calibration Test Mode

Turn On the indoor unit and within 3 min set the unit as:

1) Cooling mode.

2) Set temperature to 86°F.

3) Mid-fan speed.

Press the Eco button 7 times consecutively within 8s and the unit will change to Calibration Test mode. The buzzer sounds 3 times.

PART Ⅱ Installation and Maintenance

1. Notes for Installation and Maintenance

Safety Precautions

Important!

Read the safety precautions carefully before installation and maintenance. The following contents are very important for installation and maintenance. Follow the instructions below:

- The installation or maintenance must accord with the instructions.
- Comply with all national and local electrical codes.
- Pay attention to the warnings and cautions in this manual.
- All installation and maintenance must be performed by a distributor or qualified person.
- All electric work must be performed by a 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.
- Use the flammable gas detector to check the area before unloading and opening the container.
- No fire sources and smoking.

Warnings

Electrical Safety Precautions

1) Turn Off the air conditioner's power supply before checking and starting maintenance.
2) The air conditioner must apply a specialized circuit. Prohibit sharing the same circuit with other appliances.
3) The air conditioner should be installed in suitable location. 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) Apply protective accessories such as protective boards, cable-cross loops, and wire clips.
7) The live, neutral, and grounding wires of the power supply must be correspond to the live, neutral, and grounding wires of the air conditioner.
8) The power cord and power connection wires can’t be pressed by hard objects.
9) If the power cord or connection wire is broken, it must be replaced by a qualified person.
10) If the power cord or connection wire is not long enough, get a specialized power cord or connection wire from the manufacturer or distributor. Prohibit prolonging the wire by yourself.
11) For air conditioners without plugs, 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 0.1in.
12) Confirm 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, eliminate the electric leakage.
14) Replace the fuse with a new one of the same specification if it is burnt down. Don’t replace it with cooper or conducting wires.
15) If installing the unit in a humid place, a circuit breaker must be installed.

Risk of Fire Safety Precautions

Warning - Risk of fire due to the flammable refrigerant used

- Repairs must only be conducted by trained service personnel. Do not puncture the refrigerant tubing.
- Dispose of materials properly in accordance with federal or local regulations.
- Consult the repair manual/owner’s guide before attempting to service this product. All safety precautions must be followed.
- Follow handling instructions carefully in compliance with national regulations.

Read operator's manual

Operating instructions

Read technical manual

Installation Safety Precautions

1) Select the installation location according to the requirements of this manual. (See the requirements in the Installation section).
2) Handle unit transportation with care. The unit should not be carried by only one person if it is more than 44lbs.
3) When installing the indoor and outdoor units, a sufficient fixing bolt must be installed, ensuring the installation supporter is firm.
4) Wear a safety belt if the working height is above 7ft.
5) Use equipped or appointed components during installation.
6) Make sure no foreign objects are left in the unit after finishing installation.

Improper installation may lead to fire hazard, explosion, electric shock, or injury.

Safety precautions for installing and relocating the unit.
To ensure safety, be mindful of the following precautions.

⚠ **Warnings**

1) When installing or relocating the unit, ensure the refrigerant circuit is purged and free from air and other contaminants. Any presence of air or other foreign substances in the refrigerant circuit will cause system pressure rise or compressor rupture, resulting in injury.

2) Do not charge the unit with refrigerant that does not comply with the nameplate or with unqualified refrigerant during installation or relocation. Otherwise, it may cause abnormal operations, wrong actions, mechanical malfunctions, or even series safety accidents.

3) When refrigerant needs to be recovered during relocating or repairing the unit, confirm the unit is running is Cooling mode. Then, fully close the valve at the high-pressure side (2-way valve). About 30-40s later, fully close the valve at the low-pressure side (3-way valve). Immediately stop the unit and disconnect the power.
Note: The time for refrigerant recover should not exceed 1 min. If refrigerant recovery takes too long, it may cause the compressor to overheat, resulting in injury.

4) During refrigerant recovery, ensure that both 2-way and 3-way valves are fully closed and power is disconnected before detaching the connecting the pipe. If the compressor starts running when the valve is open and the connecting pipe is not yet connected, air will be sucked in, which can cause the pressure to rise, potentially leading to compressor overheating or a gas leak.

5) Ensure the connecting pipe is securely attached before starting the compressor when installing the unit. If the compressor starts running when the valve is open and the connecting pipe is not yet connected, air will be sucked in, which can cause the pressure to rise, potentially leading to compressor overheating or a gas leak.

6) Do not install the unit in a place where corrosive or flammable gas may leak. If there is leaked gas around the unit, it may cause an explosion or other accidents.

7) Do not use extension cords for electrical connections. If the electric wire is not long enough, contact an authorized local service center and ask for a proper electric wire. Poor connection may lead to electric shock or fire.

8) Use the specified types of wires for electrical connections between the indoor and outdoor units. Firmly clamp the wires so their terminals receive no external stresses.

Electric wires with insufficient capacity, wrong wire connections, or insecure wire terminals may cause electric shock or fire.

Introduction to R454B Air Conditioner Installation

1) Introduction to Refrigerants R454B

The refrigerants used for air conditioners are environmentally-friendly hydrocarbons R454B. The two kinds of refrigerants are combustible and odorless. In addition, they can burn and explode under certain condition. However, there will be no risk of burning and explosion, if you correctly utilize the following table to install your air conditioner in a room with an appropriate area.

Compared to ordinary refrigerants, Refrigerants R454B are environmentally friendly and do not destroy the ozone sphere. Its values of greenhouse effect are also very low.

2) R454B Air Conditioner Installation Area Requirement

$m1=(6m^3)\times LFL$, $m2=(52m^3)\times LFL$, $m3=(260m^3)\times LFL$

Where LFL is the lower-flammable limit in kg/m^3, R454B LFL is $0.296kg/m^3$.

For the appliances with a charge amount m1<M<m2:

The maximum refrigerant charge in a room shall be in accordance with the following: $M_{max}=2.5\times(LFL)(5/4)\times h0\times A^{1/2}$ not to exceed $M_{max} = SF \times LFL \times h0 \times A$ (GG.3DV)

The required minimum floor area A_{min} to install an appliance with refrigerant charge M(kg) shall be in accordance with following: $A_{min}= (M/ (2.5 \times (LFL)^{(5/4)} \times h^0))^2$ not less than $A_{min} = M / (SF \times LFL \times h)$ (GG.4DV)

Where:

M_{max} is the allowable maximum charge in a room, in kg;

M is the refrigerant charge amount in appliance, in kg;

A_{min} is the required minimum room area, in m^2;

A is the room area, in m^2;

LFL is the lower-flammable limit, in kg/m^3

h0 is the installation height of the appliance, in meters for calculating M_{max} or A_{min}, 1.8 m for wall mounted;

Table GG.1 - Maximum Charge (kg)

Category	LFL kg/m³ (kg/ft³)	h0 (m/ft)	Floor Area (m²/ft²) Maximum Charge (kg)						
			4/43.06	7/75.35	10/107.64	15/161.46	20/215.28	30/322.92	50/538.2
R454B	0.296/0.083	0.6/1.97	0.36	0.62	0.89	1.27	1.46	1.79	2.32
		1/3.28	0.59	1.04	1.48	2.11	2.44	2.99	3.86
		1.8/5.9	1.07	1.86	2.66	3.81	4.39	5.38	6.95
		2.2/7.22	1.3	2.28	3.26	4.65	5.37	6.58	8.49
		2.6/8.53	1.54	2.69	3.85	5.50	6.35	7.77	10.03
		3.0/9.84	1.78	3.11	4.44	6.34	7.32	8.97	11.58

Table GG.2 - Minimum Room Area (m²)

Category	LFL kg/m³ (kg/ft³)	h0 (m/ft)	Charge Amount (M) (kg) Minimum Room Area (m²/ ft²)						
			1.776kg	2.664kg	3.552kg	5.328kg	7.104kg	8.88kg	11.544kg
R454B	0.296/0.083	0.6/1.97	/	66.17	117.63	264.68	470.54	735.21	1242.51
		1/3.28	/	23.82	42.35	95.28	169.39	264.68	447.3
		1.8/5.9	/	10	13.33	29.41	52.28	81.69	138.06
		2.2/7.22	/	8.18	10.91	19.69	35	54.69	92.42
		2.6/8.53	/	6.92	9.23	14.10	25.06	39.15	66.17
		3.0/9.84	/	6.00	8.00	12.00	18.82	29.41	49.70

Caution:

- Contact your nearest after-sale service center when maintenance is necessary. At the time of maintenance, the maintenance personnel must strictly comply with the Operation Manual provided by the corresponding manufacturer. Any non-professional is prohibited to maintain the air conditioner.
- Comply with the provisions of gas-related national laws and regulations.
- Clear away the refrigerant in the system when maintaining or scrapping an air conditioner.
- When filling the combustible refrigerant, any of your rude operations may cause serious injury or injuries to human body or bodies and object or objects.
- A leak test must be done after the installation is completed.
- Before maintaining or repairing an air conditioner using combustible refrigerant, complete the safety inspection in order to ensure the fire risk is reduced to minimum.

Installation Safety

Installation Safety Principles

Site Safety

Open Flames Prohibited

Ventilation Necessary

Operation Safety

Open Flames Prohibited

Mind static electricity Must wear protective clothing and anti-static gloves Don`t use mobile phone

Installation Safety

● Refrigerant Leak Detector ● Appropriate Installation Location	 The left picture is the schematic diagram of a Refrigerant Leak Detector.

Caution:

- Installation should occur in a well-ventilated location.
- When using Refrigerant R290/R32 during installation or maintenance, the location should be free from open fire, welding, smoking, drying oven, or any other goods with temperatures higher than 698°F (R290) or 1,018° F (R32).
- Appropriate anti-static measures, such as wearing anti-static clothing and gloves, are necessary when installing air conditioners using R290/R32.
- Select a location where the indoor and outdoor units' air inlets and outlets are unobstructed. Ensure the air inlets and outlets of the indoor unit are even.
- Ensure the location is not near heat sources or a combustible/explosive environment.
- Avoid locations where electrical products, power switch plugs, electrical sockets, kitchen cabinets, beds, sofas, and other valuables are right under the lines of the indoor unit on two sides.
- If the indoor unit experiences a refrigerant leak during installation, immediately turn Off the valve of the outdoor unit. All personnel must leave the location for a least 15 min until the refrigerant leaks completely. If the product is damaged, carry it back to the maintenance station. Welding the refrigerant pipe or conducting other operations on the user's site is prohibited.

1) Inspect the area
Before working on systems containing flammable refrigerants, safety checks are required to ensure the risk of ignition is minimized. The following precautions must be complied with prior to conducting repairs on the system.

2) Work procedure
To minimize the risk of flammable gas or vapor presence, you must conduct work using controlled procedures.

3) General work area
All maintenance staff and individuals working in the local area must be informed about the nature of the work being performed. Avoid working in confined spaces. Section off the area around the workspace. Ensure the area is safe by controlling flammable materials.

4) Check for refrigerant
The area must be checked with an appropriate refrigerant detector before and during work to ensure the technician is aware of potentially flammable atmospheres. Ensure the leak detection equipment is suitable for flammable refrigerants, i.e. non-sparking, adequately sealed, or intrinsically safe.

5) Fire extinguisher
If you need to conduct hot work on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment must be available. Keep a dry powder or CO2 fire extinguisher adjacent to the charging area.

6) No ignition sources
Individuals carrying out work involving exposed pipework on a refrigerant system are prohibited from using any sources of ignition that may lead to a risk of fire or explosion. All possible ignition sources, such as cigarette smoking, must be performed at a sufficient distance from the installation or maintenance site. Before conducting work on the equipment, the surrounding area must be surveyed to ensure there are no flammable hazards or ignition risks. No Smoking signs must be displayed.

7) Well-ventilated area
Ensure the area is open and well-ventilated before accessing the system or performing any work that generates heat. Ventilation must be maintained to a certain degree while work is being carried out. The ventilation should safely disperse any released refrigerant and expel it externally into the atmosphere.

8) Inspect the refrigeration equipment

When changing electrical components, they must be fit-for-purpose and meet the correct specifications. You must follow the manufacturer's maintenance and service guidelines at all times. If in doubt, consult the manufacturer's technical department for assistance. For installations using flammable refrigerants, check the following:

-- Ensure the charge size is appropriate for the room in which the refrigerant-containing parts are installed.

-- Confirm the ventilation machinery and outlets are operating adequately and not obstructed.

-- If an indirect refrigerating circuit is being used, check the secondary circuit for the presence of refrigerant.

-- Confirm the equipment markings are visible and legible. Correct markings and signs that are illegible.

-- Ensure the refrigeration pipe or components are installed in a position that minimizes the risk of corrosion from harmful substances, unless constructed of corrosion-resistant materials and suitably protected.

9) Inspect the electrical devices

Repairing and maintaining electrical components must include initial safety checks and component inspections. If a fault exists that could compromise safety, then the electrical supply must not be connected to the circuit until the fault is resolved. If the fault cannot be immediately corrected but it is necessary to continue operation, a temporary solution must be implemented. If a temporary solution is implemented, it must be reported to the owner of the equipment, ensuring both parties are informed. Initial safety checks must include the following:

-- Confirm the capacitors are discharged. Ensure this is done in a safe manner to avoid the possibility of sparking.

-- Ensure that no live electrical components and wiring are exposed while charging, recovering, or purging the system.

-- Confirm there is continuity of earth bonding.

Special Tools:

Tool Name	Requirement(s) for Use
Mini Vacuum Pump	An explosion-proof vacuum pump that can ensure certain precision. Its vacuum degree should be lower than 10Pa.
Filling Device	A special explosion-proof filling device that can ensure certain precision. Its filling deviation should be less than 5g.
Leak Detector	Ensure it is calibrated regularly. Its annual leak rate should not exceed 10g.
Concentration Detector	A) Equip the maintenance site with a fixed-type combustible refrigerant concentration detector. Connect the detector to a safeguard alarm system. Its error must not exceed 5%. B) Equip the installation site with a portable combustible refrigerant concentration detector that can realize the two-level audible and visual alarm. Its error must not exceed more than 10%. C) Ensure the concentration detectors are calibrated regularly. D) Check and confirm the functions before using the concentration detectors.
Pressure Gauge	A) Ensure the pressure gauges are calibrated regularly. B) The pressure gauge used for Refrigerant 22 can also be used for Refrigerants R290 and R161. The pressure gauge used for R410A can also be used for Refrigerant 32.

Fire Extinguisher	Carry fire extinguisher(s) during installation and maintenance. On the maintenance site, ensure there are two or more kinds of dry powder, carbon dioxide, and foam fire extinguishers. The items should have eye-catching labels and be placed a stipulated positions.

Maintenance

1). Inspections Before Maintenance

(1) Inspection of Maintenance Environment

- Before operation, ensure no leaked refrigerant is present in the room.
- Only operate in rooms meeting the area requirements on the nameplate.
- Ensure the room maintains a continuous ventilation state.
- Restrict fire, welding, smoking, drying oven, or any other goods with temperatures higher than 698°F (R290) or 1,018°F (R32) from being in the room.
- Ensure mobile phones or any electronic products containing radiation are powered Off while in the room.
- Equip the maintenance area with a functioning drying powder or carbon dioxide fire extinguisher.

(2) Inspection of Maintenance Equipment

- Check whether the maintenance equipment is applicable to the refrigerant or not. Only use the professional equipment recommended by the air conditioner manufacturer.
- Check whether the refrigerant leak detector has been calibrated. The set maximum alarm concentration of the refrigerant leak detector should not exceed 25% of the lower explosion limit (LEL). The refrigerant leak detector must be operating during maintenance.

2). Inspection of Air Conditioner

- Before maintenance, ensure the air conditioner is in reliable ground connection.
- Ensure the air conditioner's power supply is Off. Before maintenance, turn Off the power and discharge the capacitor power, which is used in the air conditioner. If you need the power supply during maintenance, perform ongoing leak detections at the most dangerous position/point to avoid potential danger.
- Check whether the warning labels on the air conditioner are in good condition. It is necessary to replace damaged or smeared warning labels.

3). Leak Inspection Before Maintenance

Before maintenance, check whether the air conditioner is leaking using the leak detector or concentration detector (pump-type) recommended by the corresponding air conditioner manufacturer.

Warning

If a leak potentially exists, extinguish or remove all the fire from the site. Then, immediately shut Off the air conditioner. Meanwhile, ensure the area is well-ventilated.

4). Safety Principles During Maintenance

- During maintenance, ensure the site is well-ventilated.
- Using fire, such as welding or smoking, is prohibited. Using mobile phones is also prohibited.
- If the relative humidity is lower than 40%, wear anti-static clothing and gloves.
- If the combustible refrigerant is found leaking during maintenance, immediately implement forced ventilation and plug up the leak source.

- If the product is damaged to the extent that the refrigerant system must be opened for maintenance, carry the product back to the maintenance station. Welding refrigerant pipes or conducting similar operations are prohibited at the user's site.
- If providing visiting service is necessary due to lacking spare parts during maintenance, return the air conditioner to its initial state. Ensure the refrigerant system is in secure ground connection.
- When storing the cylinder in a vehicle or on the maintenance site, ensure it is placed vertically and securely. Keep the cylinder away from heat, combustion, and radiation sources, as well as electrical equipment.

5). Requirements for the Maintenance-Station Site

- The maintenance location should be well-ventilated with leveled a ground. The location should not be in a basement.
- Divide the maintenance location into welding and non-welding areas and label them clearly. Ensure there is a certain safety distance between the two areas.
- Equip the maintenance location with ventilation and air-exhaustion to prevent the refrigerant gas from aggregating.
- Set the main power switch outside the maintenance location. Equip the main power switch with protective (explosion-proof) devices.
- Provide firefighting devices appropriate for extinguishing electrical fires, such as dry power or carbon dioxide fire extinguishers. Keep the firefighting devices in usable condition.
- Temporary wires and sockets are prohibited in the maintenance location.

6). Requirements for Filling the Refrigerants

- Before operating the refrigerant system, clear the cyclic system using nitrogen. Vacuum the outdoor unit for at least 30 min.
- Ensure there is no cross contamination among different refrigerants when using the refrigerant filling device. The total length, including the refrigerant pipeline, should be as short as possible in order to reduce the residual refrigerant inside the pipeline.
- Vertically place the refrigerant storage tanks.
- Ensure the refrigerating system is in ground connection before filling the refrigerant.
- When filling the refrigerant, utilize the corresponding type and volume of refrigerant as per the requirements on the product nameplate. Overfilling is prohibited.
- Seal the system safely after maintaining the refrigerating system.
- Ensure the maintenance will not damage or reduce the safety protection grade of the original system.

7). In-Maintenance Welding

- Ensure the maintenance location is well-ventilated.
- Before welding the outdoor unit, confirm the refrigerating system has been drained and cleaned. Ensure there has been no refrigerant in the outdoor unit.
- Close the stop valve of the outdoor unit when using a welding gun for maintenance.

8). Maintenance of Electrical Components

- Use a special leak detector to check whether the location of the maintained electrical parts has a refrigerant leak.
- It is prohibited to refit, remove, or cancel any component with the safety protection function after finishing maintenance.
- When maintaining the sealed parts, you must turn Off the air conditioner's power before opening the sealing cover. When power supply is needed, perform ongoing leak detection at the most dangerous position.
- It is necessary to note that the maintenance of electrical components will not affect the replacement of protective cover.
- Ensure the sealing function is not damaged after maintenance. Ensure the sealing material's ability to prevent combustible gas leaks will not diminish due to aging. The substitute components should meet the requirements recommended by the air conditioner manufacturer.

Warning

Before doing the trial operation after finishing the maintenance, use a practical leak detector to inspect the leakage and reliability of the ground connection. This is required to ensure there is a reliable ground connection and no refrigerant leakage. Separately place the refrigerant storage tanks in a well-ventilated place with the temperatures ranging from 14-122°F. Label refrigerant storage tanks with warning labels.

9). Emergency Accident Handling

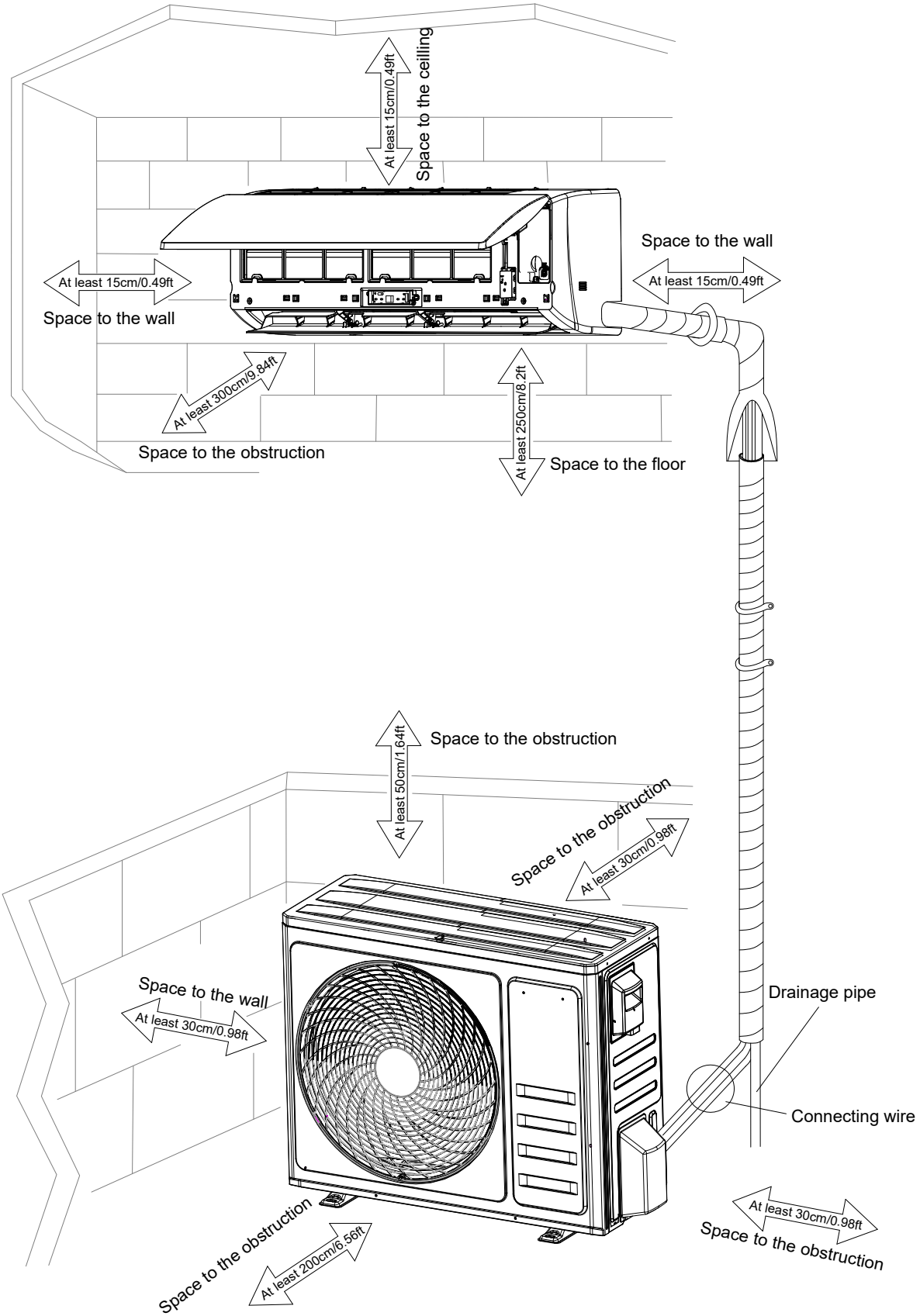
Establish emergency handling plans for the maintenance station. Take appropriate precautionary measures while working. For example, it is prohibited to enter the location with any kindling material or wear clothing and shoes that easily produce static.

Use these suggestions if a large amount of combustible refrigerant leaks:

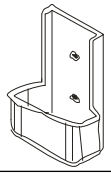
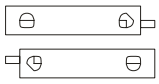
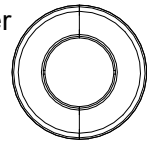
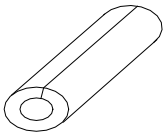
- Immediately operate the ventilating equipment while cutting Off the other power supply. Evacuate the affected personnel urgently from the location.
- Inform nearby residents to evacuate for over 66ft from the location and make an alarm call. Set the emergency area and prohibit irrelevant personnel and vehicles from approaching.
- The professional firefighters should wear anti-static clothing to handle the emergency on the site. The firefighters should also cut Off the source of the leak.
- Use nitrogen for blowing the site, especially the low-lying positions. Clear away the residual combustible refrigerant gas from any area surrounding the leak point and nearby. Use a handheld detector for detection. Do not clear the alarm until the concentration of refrigerant is zero.

2. Installation

2.1 Installation Dimension Diagram



2.2 Accessory

Remote Controller 	Remote Controller Supporter 	Batteries 	Vinyl Tape 
Drain Hose 	Hole Cover 	Screw 	Insulation Material 

2.3 Position

Indoor Unit

- Install the indoor unit level on a strong wall that is not subject to vibrations.
- The inlet and outlet ports should not be obstructed. The air should be able to blow all over the room.
- Do not install the unit near a source of heat, steam, or flammable gas.
- Do not install the unit in places that are too windy or dusty.
- Do not install the unit where people often pass. Select a place where the air discharge and operating sound level will not disturb the neighbors.
- Install the unit in a location that simplifies the connection process for the indoor and outdoor units.
- Install the unit where it is easy to drain the condensed water.
- Check the machine operation regularly and leave the necessary spaces as shown in the picture.
- Install the indoor unit where the filter can be easily accessible.

Outdoor Unit

- Do not install the outdoor unit near sources of heat, steam, or flammable gas.
- Do not install the unit in places that are too windy or dusty.
- Do not install the unit where people often pass. Select a place where the air discharge and operating sound level will not disturb the neighbors.
- Avoid installing the unit where it will be exposed to direct sunlight. If needed, use protection that will not interfere with the air flow.
- Leave spaces, as shown in the picture, for the air to circulate freely.
- Install the outdoor unit in a safe and solid place.
- If the outdoor unit is subject to vibration, place rubber gaskets onto the feet of the unit.
- Install the indoor unit in a room that will be air conditioned. Avoiding installation in corridors or communal areas.
- Install the indoor unit at a height of at least 8ft from the ground. Minimum space to be left (mm) showing in the picture.

2.4 Electricity and Wiring

Safety Precautions

1) Follow the electric safety regulations when installing the unit.
2) According to the local safety regulations, use qualified power supply circuit and air switches.
3) Ensure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock, fire hazard, or malfunction. Install proper power supply cables before using the air conditioner.

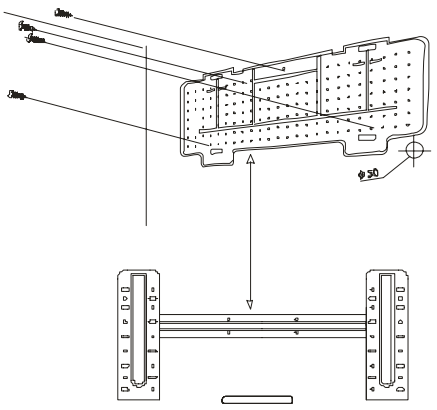
Select the power cord according to the following specifications sheet:

Appliance Amps(A)	Wire Size (mm^2/in^2)
5	0.75/0.0012
10	1.0/0.0016
13	1. 5/0.0023
18	1.6/0.0025
25	2.0/0.0031
30	2.5/0.0039

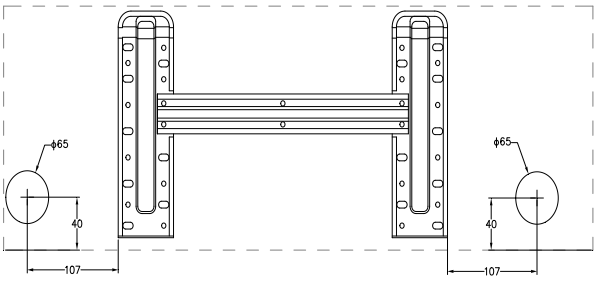
2.5 IDU Installation

2.5.1 Installation of the Mounting Plate

1) Using a level, place the mounting plate in a perfect square position vertically and horizontally.
2) Drill 1.3in deep holes in the wall to fix the plate.
3) Insert the plastic anchors into the hole.
4) Fix the mounting plate by using the provided tapping screws.
5) Check that the mounting plate is correctly fixed.



9K



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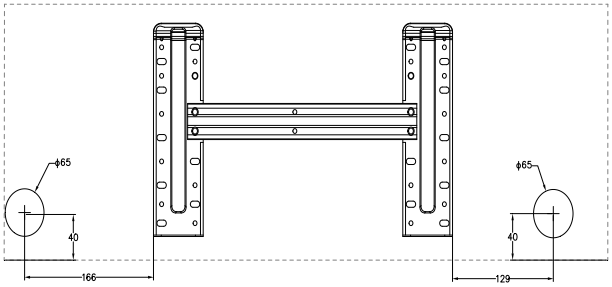

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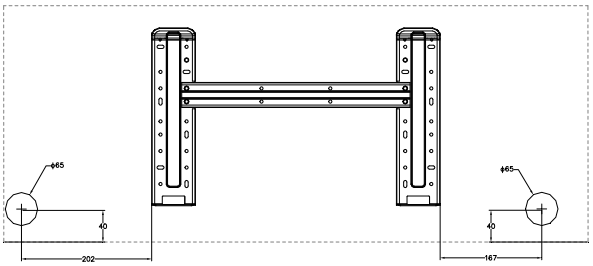

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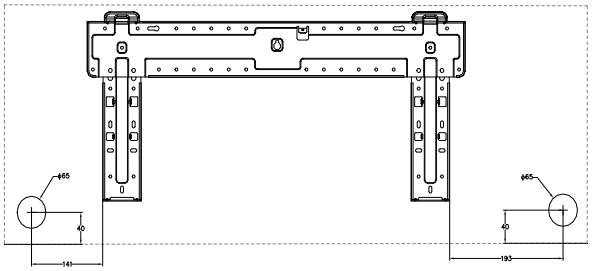
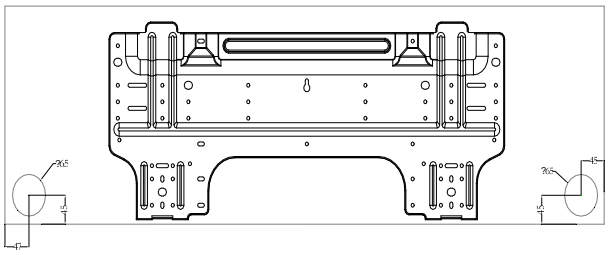


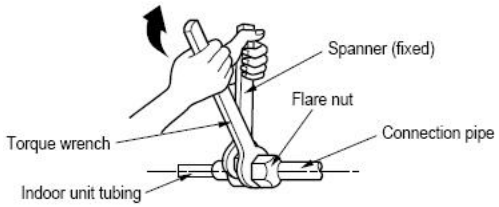
30K/36K

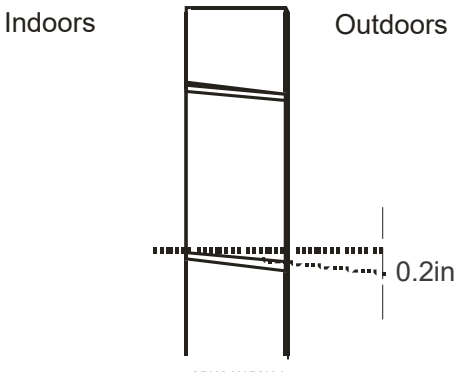


Note: The shape of the mounting plate may be different from the one above. However, the installation method is similar.

2.5.2 Drilling a Hole in the Wall for the Piping

1. Decide where to drill the hole in the wall for the piping (if necessary) according to the position of the mounting plate.
2. Install a flexible flange through the hole in the wall to keep the latter intact and clean.





The hole must slope downwards towards the exterior.

Note: Keep the drain pipe down towards the direction of the wall hole, otherwise leakage may occur.

2.5.3 Electrical Connections - Indoor Unit

1). Lift the front panel.

2). Take off the cover, as indicated in the picture, by removing a screw or breaking the hooks.

3). For the electrical connections, see the circuit diagram on the right part of the unit under the front panel.

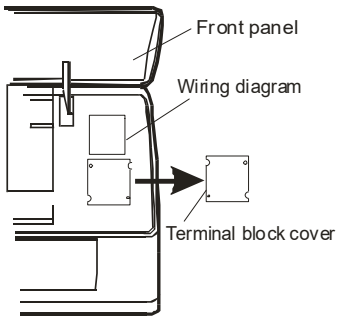
4). Connect the cable wires to the screw terminals by following the numbering. Use a wire size suitable to the electric power input (see name plate on the unit) and according to all current national safety code requirements.

5). The cable connecting the outdoor and indoor units must be suitable for outdoor use.

6). The plug must be accessible after the appliance has been installed so that it can be pulled out if necessary.

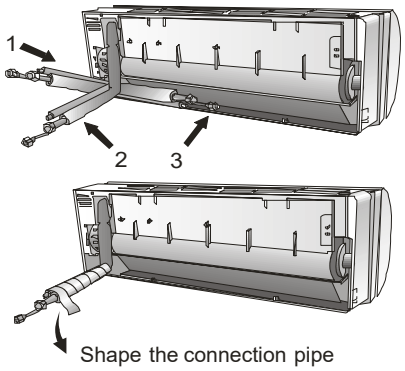
7). Ensure an efficient earth connection must be ensured.

8).If the power cable is damaged, it must be replaced by an authorized Service Centre.



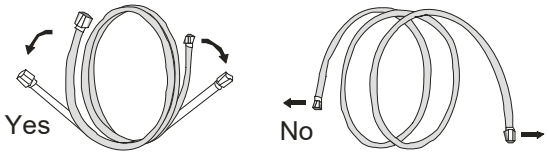
★ **Refrigerant piping connection**

The piping can be run in the 3 directions, which is indicated by numbers in the picture. When the piping is run in direction 1 or 3, cut a notch along the groove on the side of the indoor unit with a cutter. Run the piping in the direction of the wall hole. Then, bind the copper pipes, drain pipe, and the power cables together with the tape. The drain pipe should be at the bottom, so water can flow freely.



2.5.4 Connecting the Pipes

- Do not remove the cap from the pipe until connecting it to avoid dampness or dirt from entering.
- If the pipe is bent or pulled too often, it will become stiff. Do not bend the pipe more than 3 times at one point.
- When extending the rolled pipe, straighten the pipe by unwinding it gently as shown in the picture.

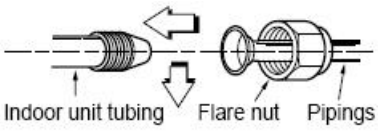


Extending the rolled pipe

2.5.5 Connections to the Indoor Unit

1). Remove the indoor unit pipe cap. Confirm there is no debris inside.

2). Insert the fare nut and create a flange at the extreme end of the connection pipe.

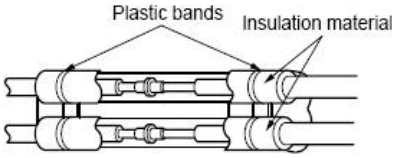


3).Tighten the connections by using 2 wrenches working in opposite directions.

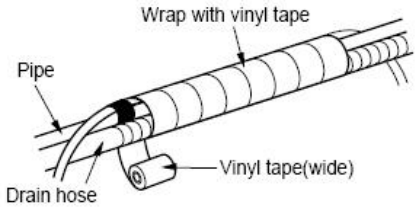
4). When extending the drain hose for the indoor unit, install the drain pipe.

Wrap the Insulation Material Around the Connecting Portion

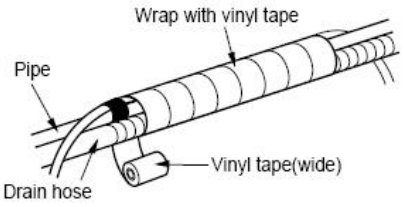
- Overlap the connection pipe insulation material and indoor unit pipe insulation material. Bind them together with vinyl tape so that there is no gap.



- Wrap the area that accommodates the rear piping housing section with vinyl tape.



- Bundle the piping and drain hose together by wrapping them with vinyl tape. Ensure the tape covers the entire range within which they fit into the rear piping housing section.



2.5.6 Indoor Unit Condensed Water Drainage

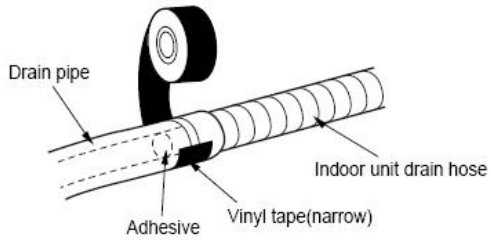
The indoor unit condensed water drainage is fundamental for the success of the installation.

1).Place the drain hose below the piping, taking care not to create siphons.

2).The drain hose must slant downwards to aid drainage.

3).Do not bend the drain hose or leave it protruding or twisted and do not put the end of it in water. If an extension is connected to the drain hose, ensure that it is lagged when it passes into the indoor unit.

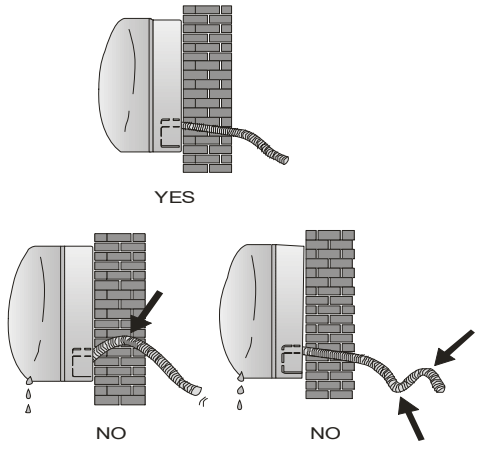
4).If the piping is installed to the right, the pipes, power cable, and drain hose must be lagged and secured onto the rear of the unit with a pipe connection.



- Insert the pipe connection into the relative slot.

Capacity (Btu/h)	Pipe Size (Torque)	
	Gas	Liquid
7/9/12K	3/8" (4.2kg.m/30.38ibf.ft)	1/4" (1.8kg.m/13.02 ibf.ft)
18K	1/2" (5.5kg.m/39.78ibf.ft)	1/4" (1.8kg.m/13.02 ibf.ft)
24K	5/8" (6.6kg.m/47.74 ibf.ft)	3/8" (4.2kg.m/30.38 ibf.ft)

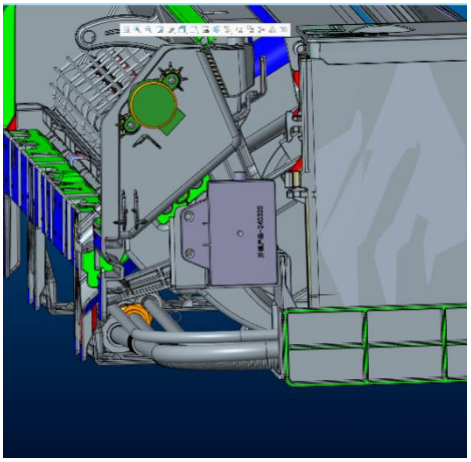
- Press to join the pipe connection to the base.



2.5.7 Refrigerant Detector Installation

The refrigerant detector is an optional device installed in the indoor unit. The location to install it is shown below. The refrigerant detector is mounted on the power cord plate and fixed with 2 screws (ST4.2×13). Parts such as the center frame needs to be disassembled when installing it. PCB connection port is CN30.

For refrigerant detector installation, refer to Part II Installation and Maintenance and 4.1 IDU Disassembly of this manual.



2.6 ODU Installation

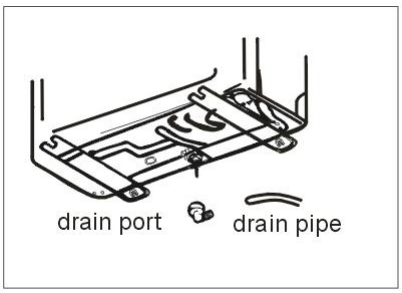
- Install the outdoor unit on a solid wall and fasten the unit securely.
- Before connecting the pipes and cables, select the position on the wall and leave enough space for maintenance.
- Fasten the support to the wall using screw anchors, which are particularly suited for the type of wall.
- To avoid vibration during operation, use a larger quantity of screw anchors than normally required. Keep the anchors fastened in the same position for years without the screws becoming loose.
- The unit must be installed following the national regulations.

Outdoor Unit Condensed Water Drainage (Only for Heat Pump Models)

The condensed water and ice formed in the outdoor unit during heating operation can be drained away through the drain pipe.

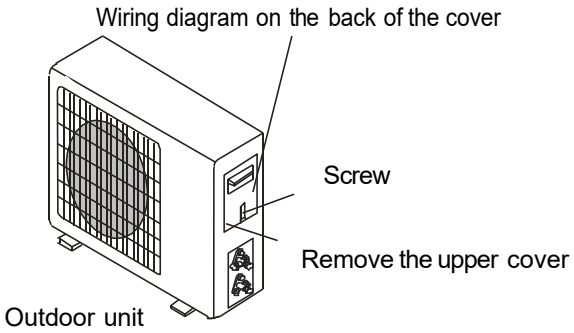
1) Fasten the drain port in the 1in hole placed in the part of the unit as shown in the picture.

2) Connect the drain port and the drain pipe. Ensure the water is draining in a suitable place.



Electronic Connections

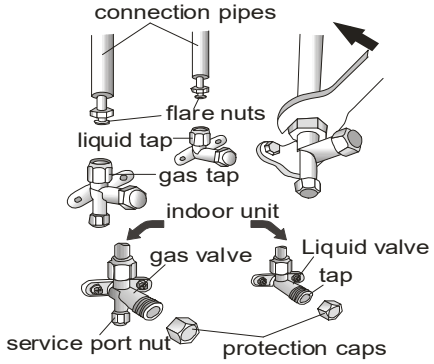
1. Take the cover away.
2. Connect the cable wires to the terminal board using the same numbering as in the indoor unit.
3. For the electrical connections, see the wiring diagram on the back of the cover.
4. Fasten the cables with a cable-clamp.
5. Ensure an efficient earth connection.
6. Replace the covers.



Connecting the Pipe

Screw the flare nuts to the outdoor unit coupling with the same tightening procedures described for the indoor unit.

Note: If the tightening torque is not sufficient, there will probably be some leakage. With excessive tightening torque there will also be some leakage, as the flange could be damaged.



2.7 Vacuum and Gas Leakage Test

1. Use Vacuum Pump

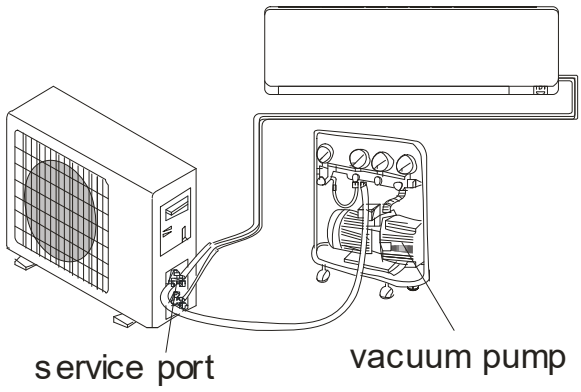
1). After connecting the indoor and outdoor units, bleed the air and humidity from the refrigerant circuit by using a vacuum pump. Air and humidity left inside the refrigerant circuit can cause compressor malfunction.

2). Open the piezometer and conduct the operation for 10-15 min to check if the piezometer's pressure remains in -0.1Mpa.

3). Close the vacuum pump and maintain this status for 1-2 min to check if the piezometer's pressure remains in -0.1Mpa. If the pressure decreases, there may be leakage.

4). Remove the piezometer, then completely open the valve cores of the liquid and gas valves.

5). Tighten the screw caps of the valve and refrigerant charging vent.



2. Leakage Detection

1). Check if there is leakage with leakage detection.

2). If leakage detection is not available, use soap water for leakage detection. Apply soap water at the suspected position and keep the soap water there for more than 3 min. If there are air bubbles coming out of this position, there's a leakage.

2.8 Final Test

1. Preparation for Test Operation

- The client approves the air conditioner installation.
- Specify the important notes of the air conditioner to the client.

2.9 Method of Test Operation

- Press the On/Off button on the remote controller to start the operation.
- Press the Mode button, then select either Auto, Cool, Dry, Fan, and Heat to check whether the operation is normal or not. If the ambient temperature is lower than 61°F, the air conditioner can't start cooling.

3. Maintenance

3.1 Failure Code

Code	Reason	Remark
E0	IDU and ODU Communication failure	Is the IDU and ODU wiring connection correct?
E1	IDU room temperature sensor failure (IDU RT failure)	IDU sensor and PCB
E2	IDU coil temperature sensor failure (IDU IPT failure)	IDU sensor and PCB
E3	ODU coil temperature sensor failure (OPT)	ODU coil sensor and ODU PCB
E4	AC-cooling system abnormal	Gas leakage? 2-way or 3-way valve blocked, etc.
E5	IDU/ODU mismatched failure (Specific performance test on the production line)	/
E6	IDU PG fan motor/DC fan motor works abnormal (IDU failure)	Fan motor, fan blade, and PCB
E7	ODU ambient-temperature sensor failure	ODU ambient sensor and ODU PCB
E8	ODU discharge-temperature sensor failure	ODU discharge sensor and ODU PCB
E9	IPM/Compressor driving control abnormal	ODU PCB, compressor, etc.
EA	ODU current test circuit failure	Is the ODU PCB broken?
Eb	The communication abnormal of main PCB and display board (IDU failure)	Display board and main PCB
EE	ODU EEPROM failure	1. Is the ODU PCB broken? 2. Try to re-power On the AC unit
EF	ODU DC fan motor failure	Fan motor and ODU PCB
EU	ODU voltage test circuit abnormal	ODU PCB
P0	IPM module protection	ODU PCB
P1	Over/Under-voltage protection	1. Is the ODU PCB broken? 2. Is the power supply abnormal?
P2	Over-current protection	1. Is the ODU PCB broken? 2. Is the power supply abnormal?
P4	ODU discharge pipe over-temperature protection	Check the troubleshooting for details
P5	Sub-cooling protection in Cooling mode	Check the troubleshooting for details
P6	Overheating protection in Cooling mode	Check the troubleshooting for details
P7	Overheating protection in Heating mode	Check the troubleshooting for details
P8	Outdoor over-temperature/under-temperature protection	Check the troubleshooting for details
P9	Compressor driving protection (Load abnormal)	Check the troubleshooting for details
PA	Communication failure for TOP flow unit/ Preset mode conflict (IDU failure)	Check the troubleshooting for details
F0	Infrared customer feeling test sensor failure (IDU failure)	Query by pressing the remote controller
F1	Electric power test module failure (IDU failure)	Query by pressing the remote controller
F2	Discharge temperature sensor failure protection	Check the troubleshooting for details
F3	ODU coil temperature failure protection	Check the troubleshooting for details

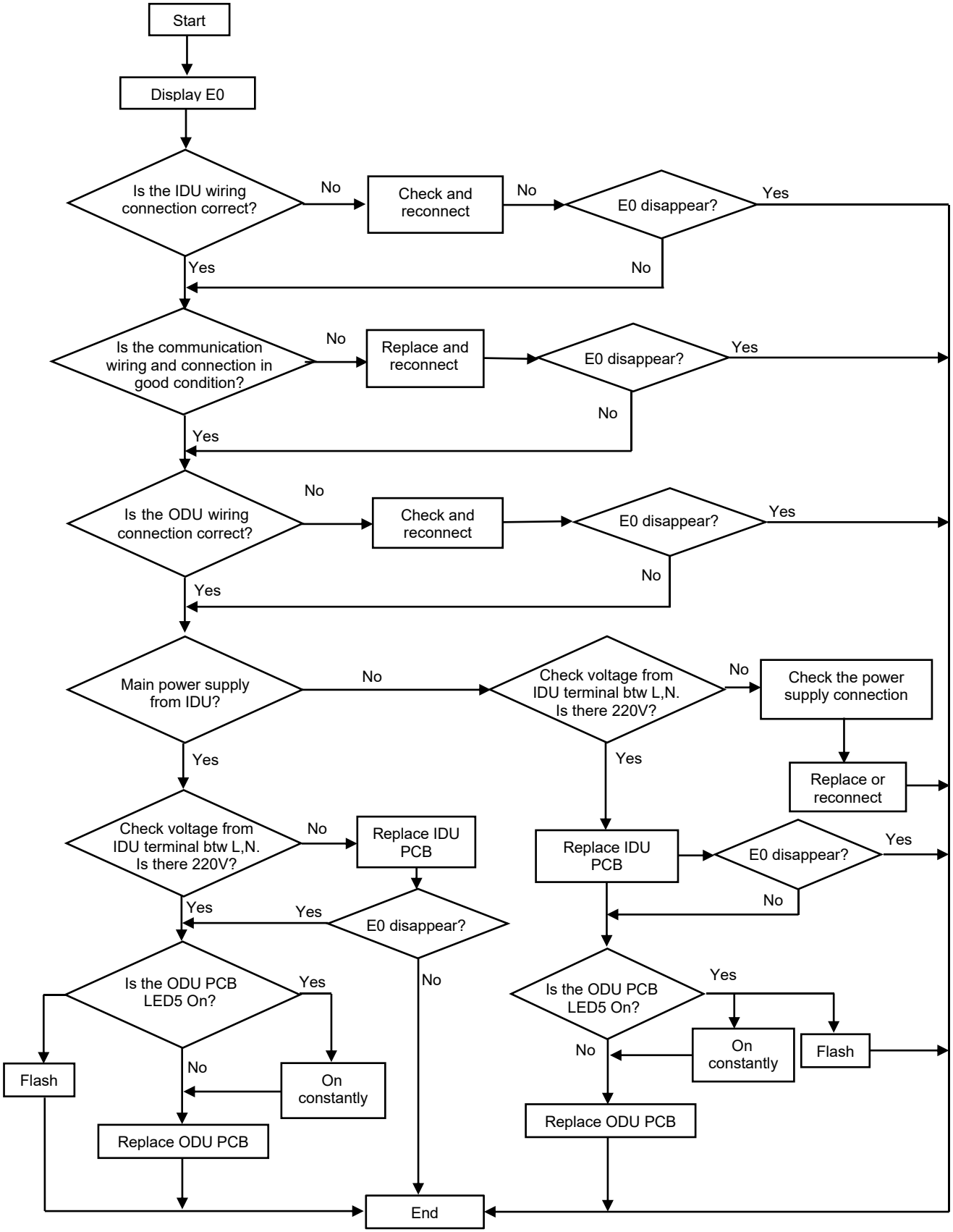
F4	Cooling system gas flow abnormal protection	Check the troubleshooting for details
F5	PFC protection	Check the troubleshooting for details
F6	The compressor lack of phase/Anti-phase protection	Check the troubleshooting for details
F7	IPM module temperature protection	Check the troubleshooting for details
F8	4-way value reversing abnormal	Check the troubleshooting for details
F9	The module temperature test circuit failure	ODU PCB
FA	The compressor phase-current test circuit failure	ODU PCB
Fb	Limiting/Reducing frequency for overload protection in Cooling/Heating mode	Query by pressing the remote controller
FC	Limiting/Reducing frequency for high-power consumption protection	Query by pressing the remote controller
FE	Limiting/Reducing frequency for module current protection (phase current of compressor)	Query by pressing the remote controller
FF	Limiting/Reducing frequency for module temperature protection	Query by pressing the remote controller
FH	Limiting/Reducing frequency for compressor driving protection	Query by pressing the remote controller
FP	Limiting/Reducing frequency for anti-condensation protection	Query by pressing the remote controller
FU	Limiting/Reducing frequency for anti-frost protection	Query by pressing the remote controller
Fj	Limiting/Reducing frequency for discharge over-temperature protection	Query by pressing the remote controller
Fn	Limiting/Reducing frequency for ODU AC-current protection	Query by pressing the remote controller
Fy	Gas leakage protection	Check the troubleshooting for detail
bf	TVOC sensor failure (IDU failure, optional)	Query by pressing the remote controller
bc	PM2.5 sensor failure (IDU failure, optional)	Query by pressing the remote controller
bj	Humidity sensor failure (IDU failure)	Query by pressing the remote controller
Fd	Refrigerant detector failure	Refrigerant detector failure or PCB is not receiving a response from the refrigerant detector
Hd	Refrigerant leakage protection	The detector detects refrigerant leakage

Note: Remote Controller Failure Code Querying function

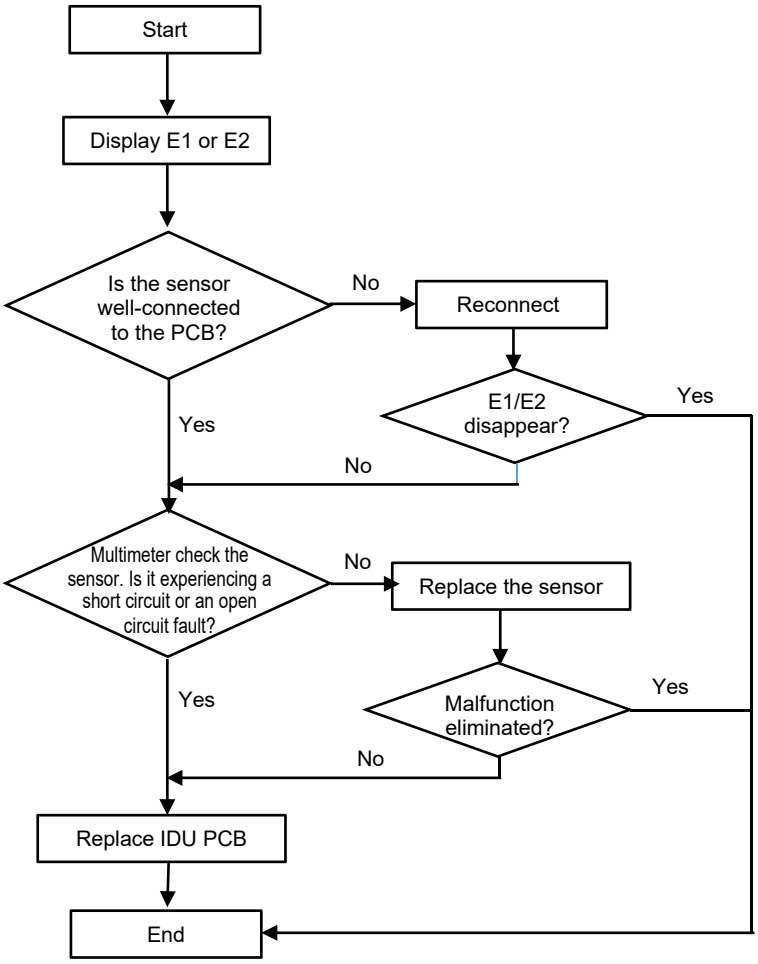
As shown in the table above, some of the codes (Fb~bj) need you to press the remote control for inspection. To inspect special failures codes (Fb~Fn, bj, etc), press the Eco button 8 times consecutively in 8s, as well as the buzzer BIBI 2 times.

3.2 Troubleshooting

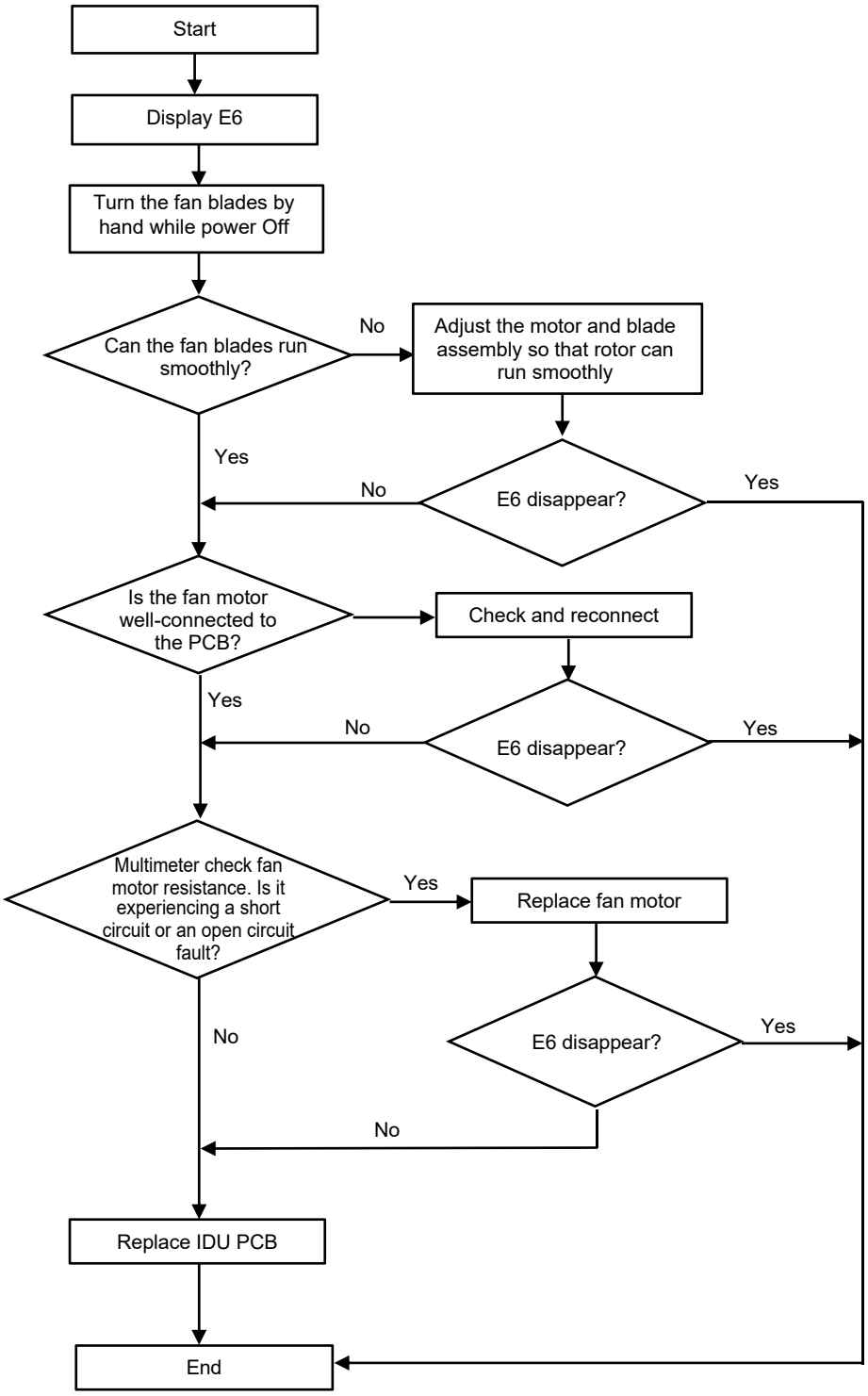
3.2.1 E0 --- IDU and ODU Communication Failure



3.2.2 E1, E2 --- IDU Room Temperature Sensor and/or Coil Temperature Sensor Failure

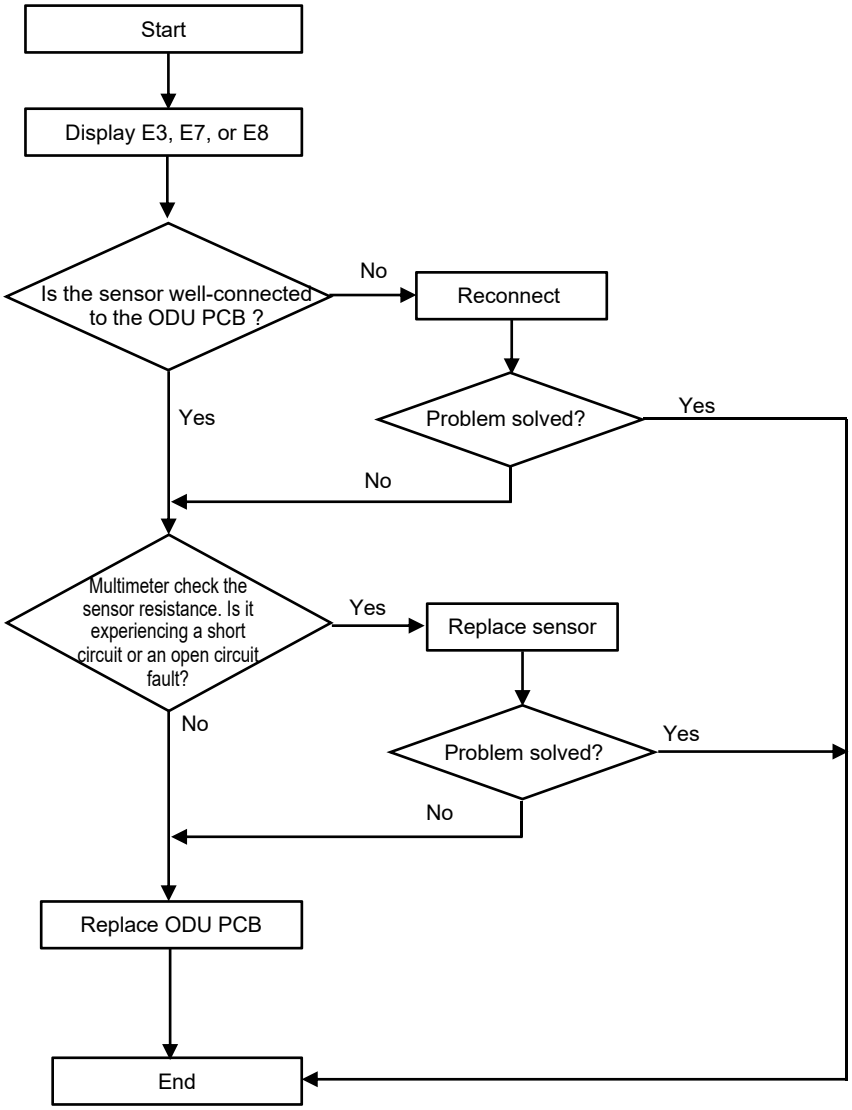


3.2.3 E6 --- IDU Ventilation Failure (PG and DC Fan Motor Only)



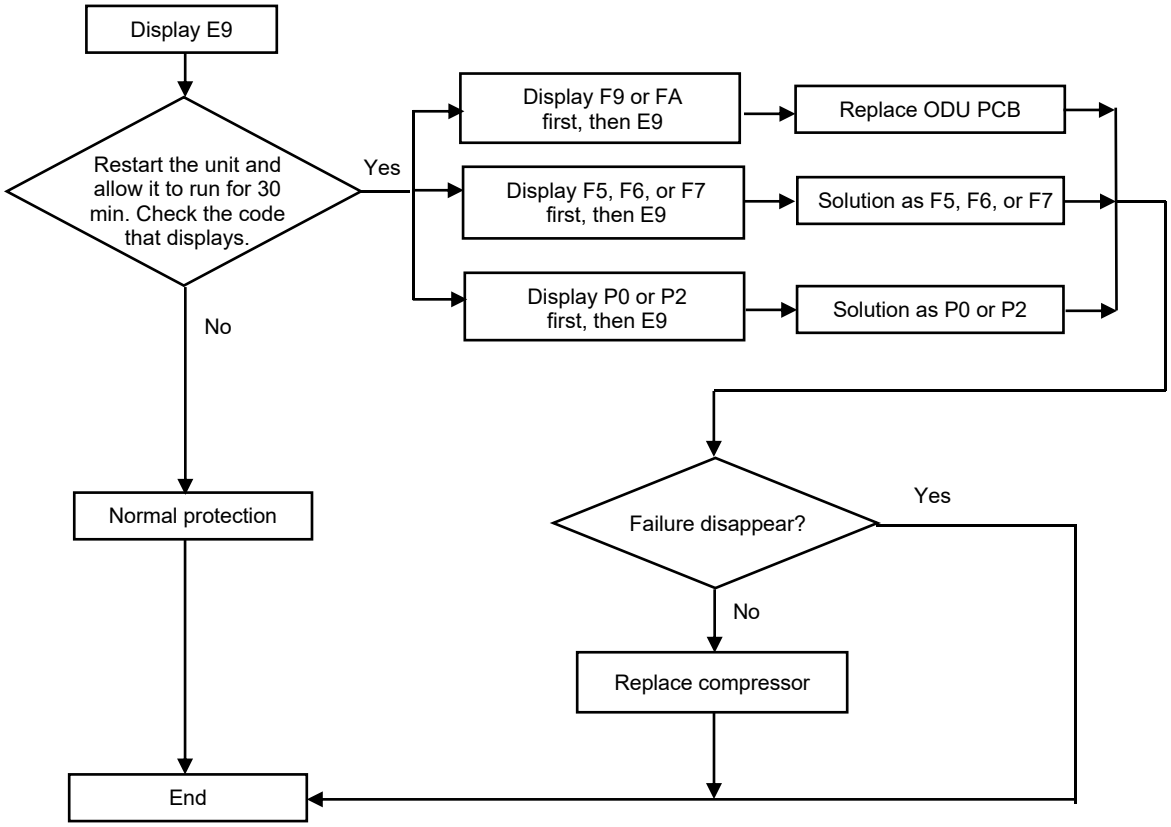
3.2.4 E3, E7, or E8 --- ODU Coil Temperature Sensor, Ambient Temperature Sensor, or Discharge Temperature Sensor Failure

If any of the sensors resistances experience a short circuit or an open circuit fault, the unit will display error codes as "E3", "E7", or "E8". The IDU and ODU turns Off. When the sensor resistance recovers, the unit reverts to standby. The customer can switch On the unit directly.



3.2.5 E9 --- ODU IPM/Compressor Drive Fault

If the unit stops working for IPM protection 6 times consecutively, it will display the "E9" error code. The unit can't be recovered to operation, except by pressing the On/Off button.



Remark:

1. F9 code

Reason: The IPM module temperature test circuit failure.

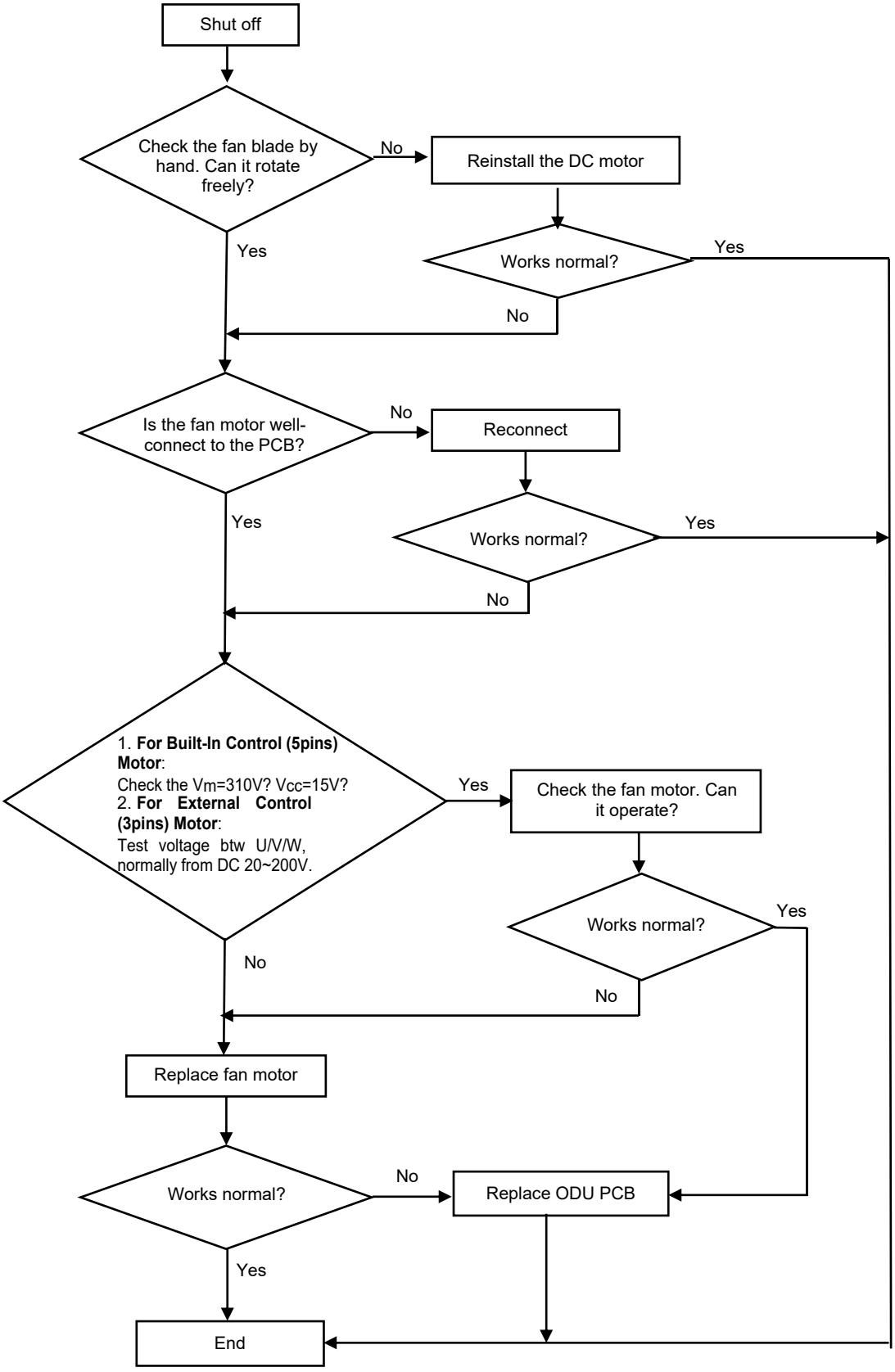
Solution: Replace the ODU PCB.

2. FA code

Reason: The compressor phase-current test circuit failure.

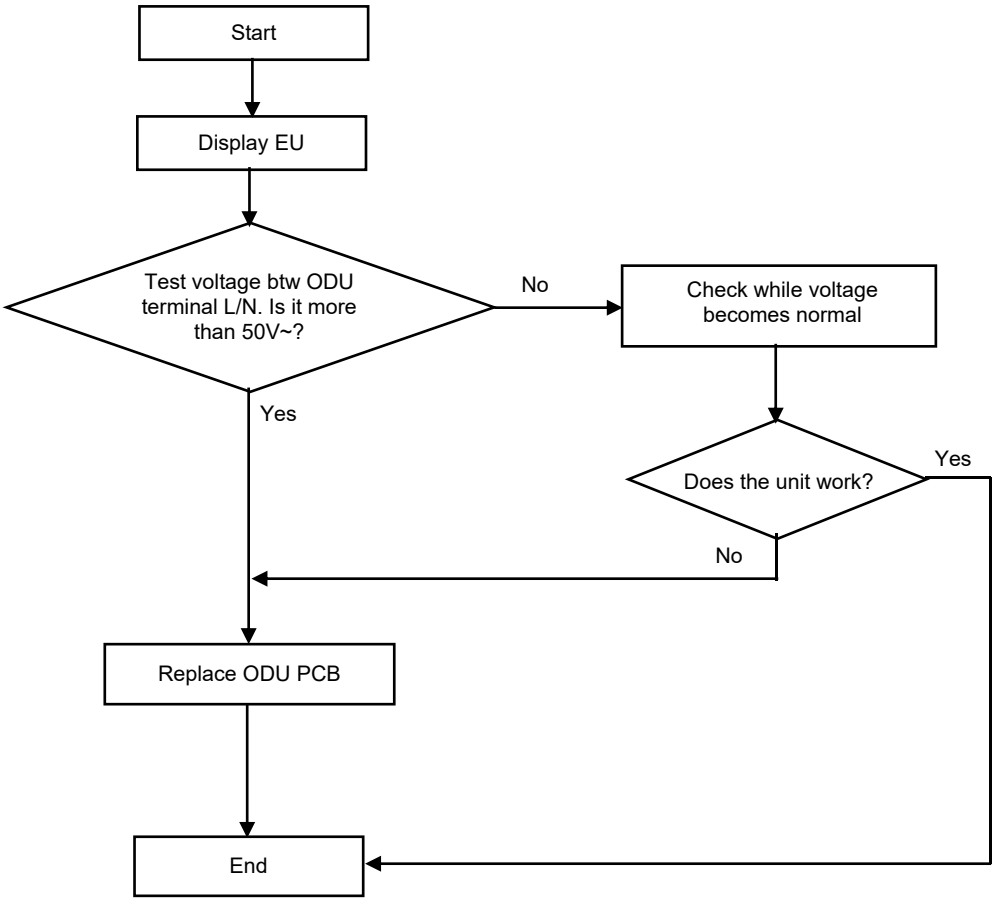
Solution: Replace the ODU PCB.

3.2.6 EF --- ODU DC Fan Motor Failure



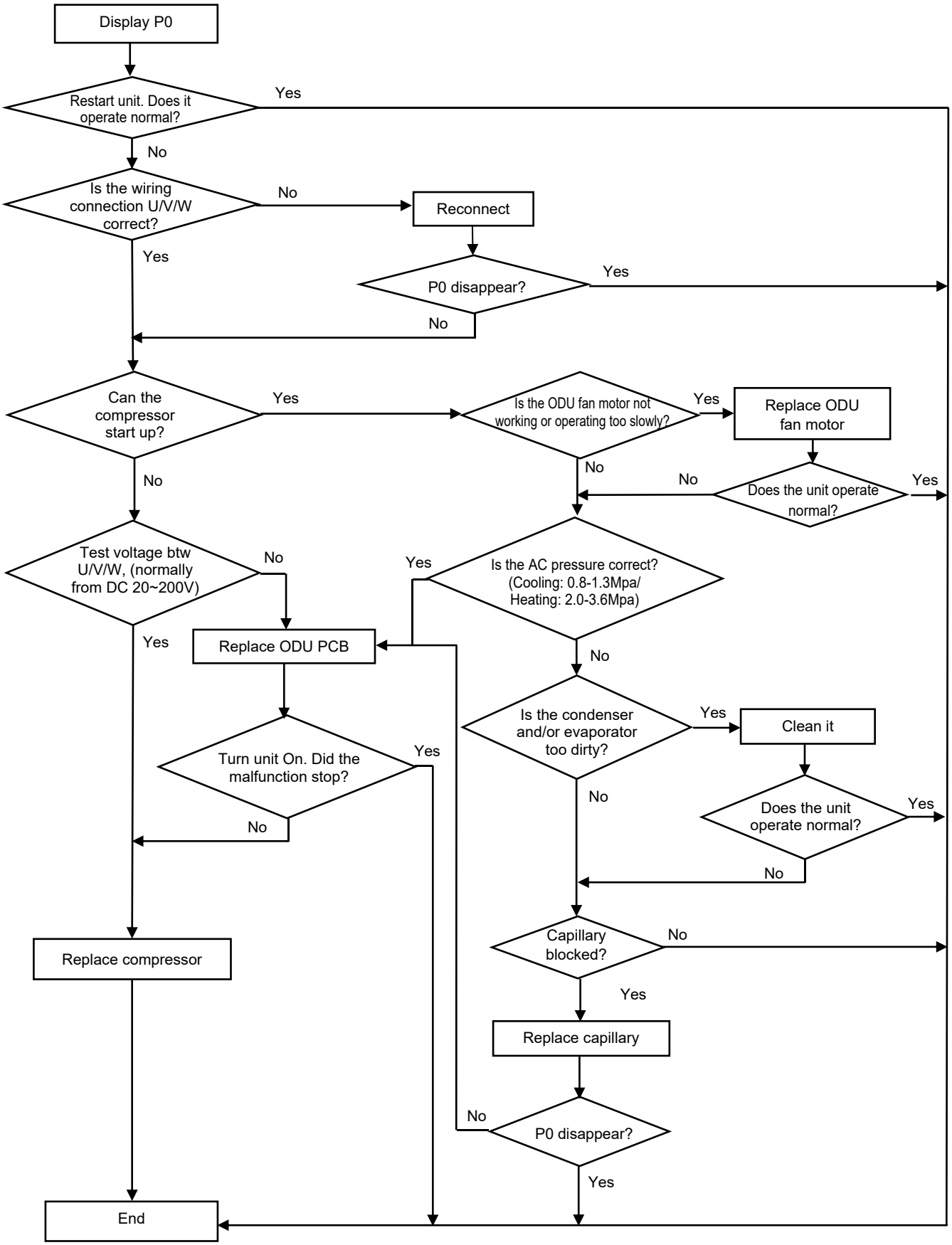
3.2.7 EU --- ODU Voltage Test Sensor Failure

After the power relay works, if the tested effective voltage is less than 50V for 3s continuously, the unit will display the “EU” error code.



3.2.8 P0 --- IPM Protection

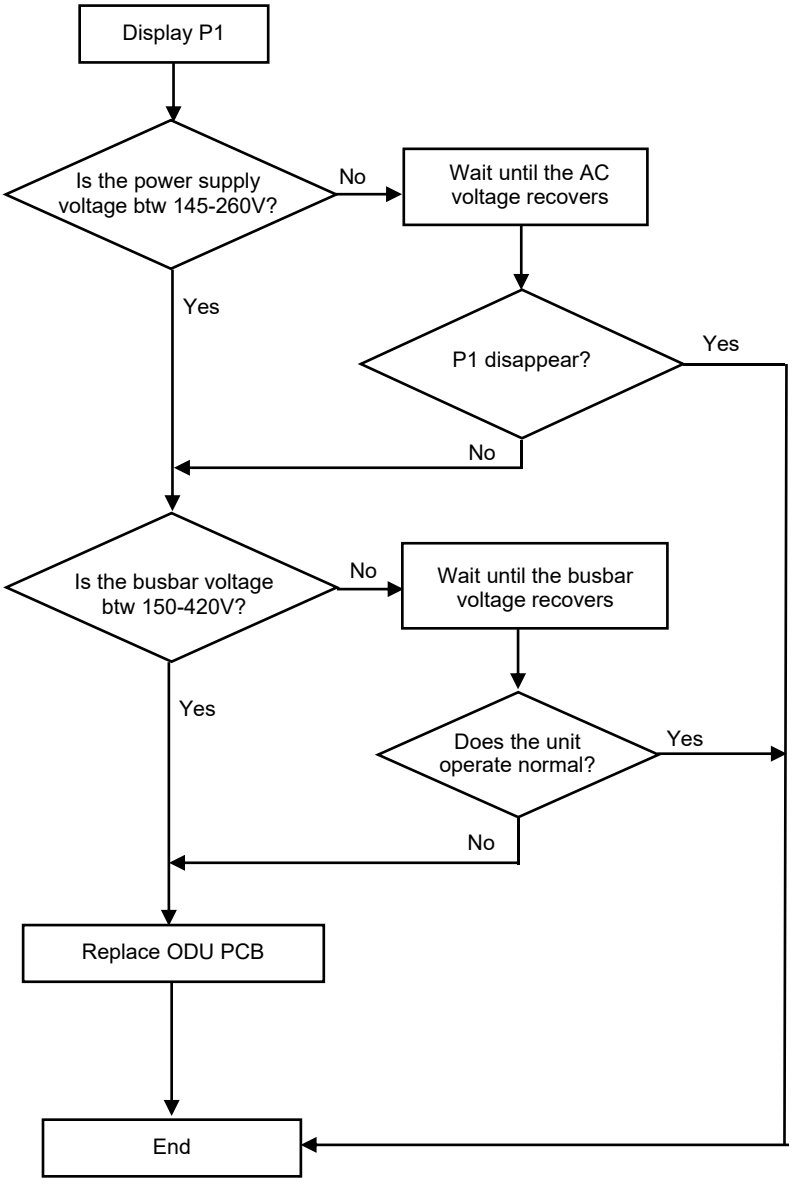
If the IPM is experiencing overheating or over-current conditions, the AC unit will display the "P0" error code.



3.2.9 P1 --- Over/Under-Voltage Protection

1. Test voltage between L and N. When the power supply V > AC260V or V < AC150V, the AC will display the "P1" error code. The unit will recover back to the previous status while V > AC155V.

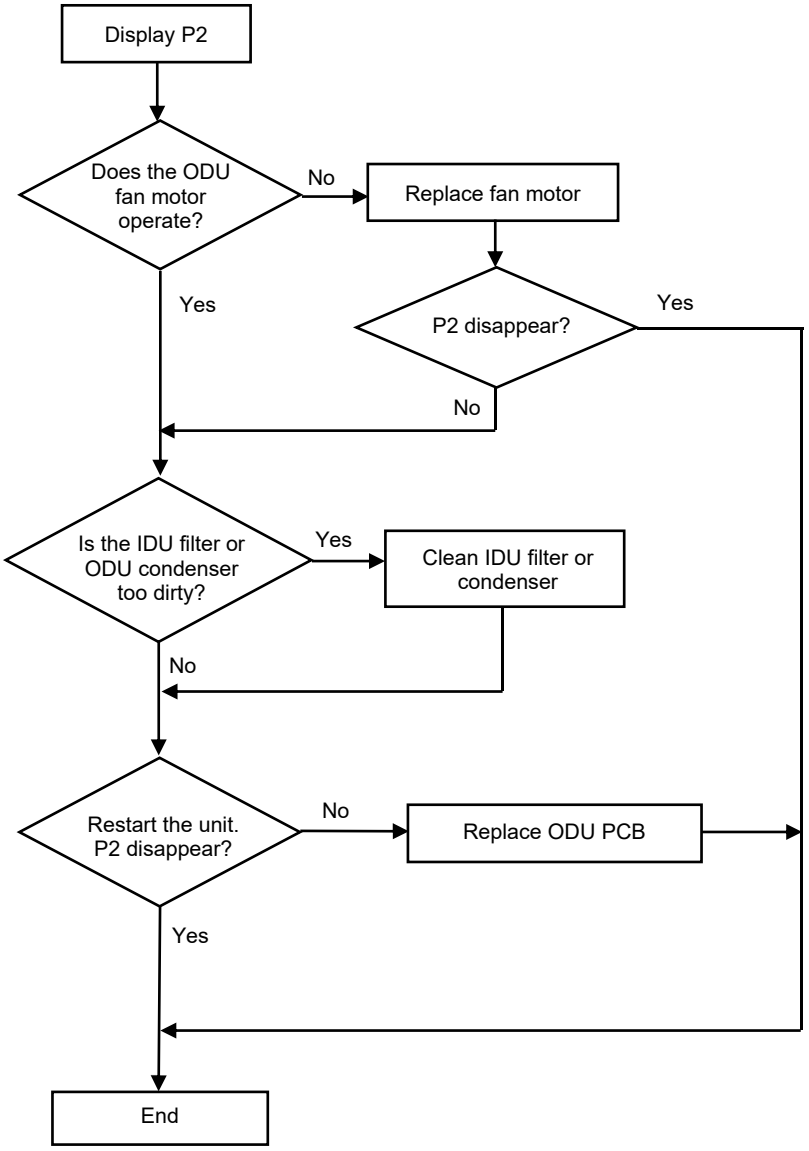
2. Test voltage on the big size electrolytic capacitor of ODU PCB. When DC busbar voltage V > DC420V or V < DC150V, the unit will recover back to the previous status while DC190V < V < DC410V.



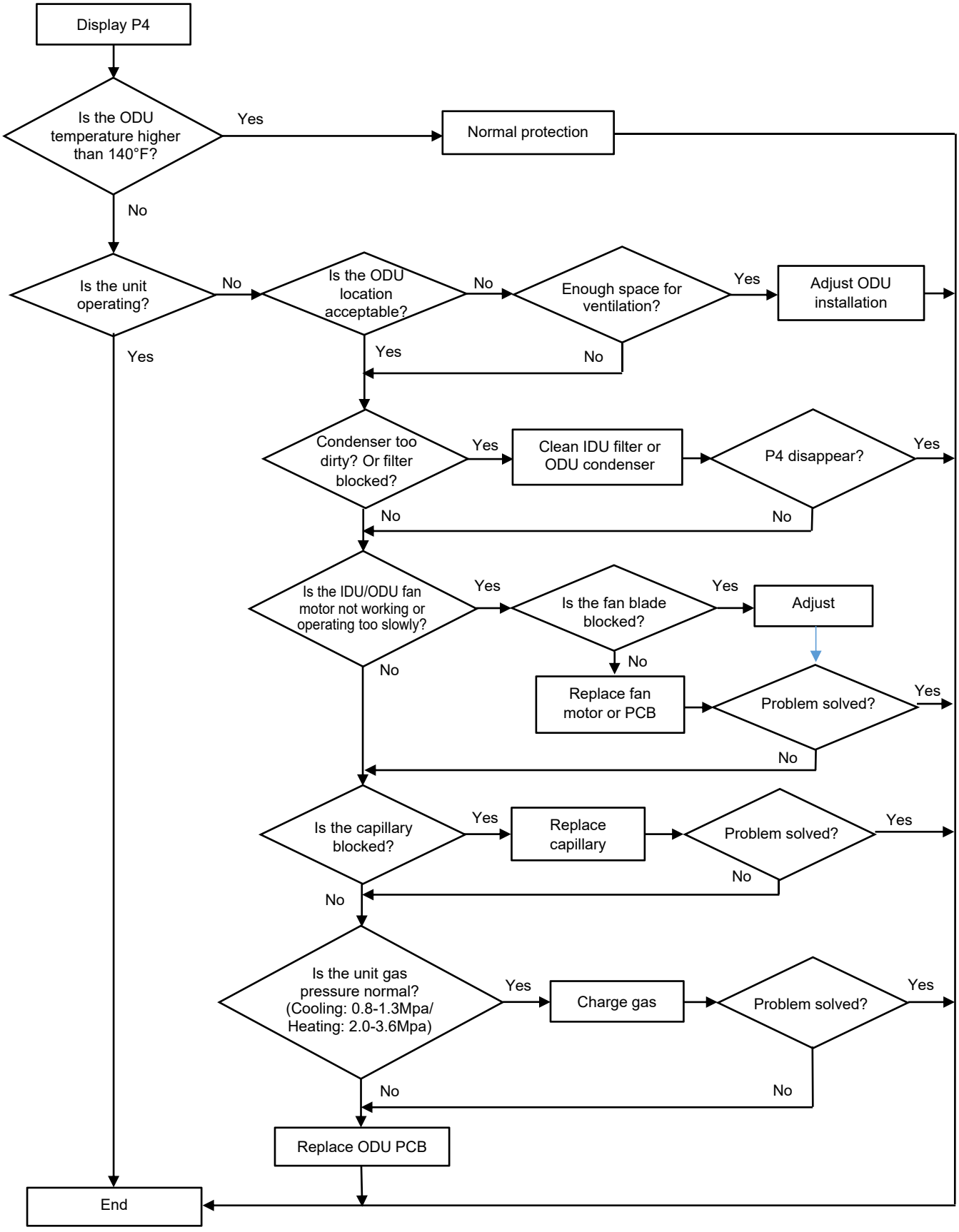
3.2.10 P2 --- Over-Current Protection

When the AC unit's running current is more than I_{max}, the unit will stop and display the "P2" error code.

Note: For different AC models, the I_{max} has different valves.

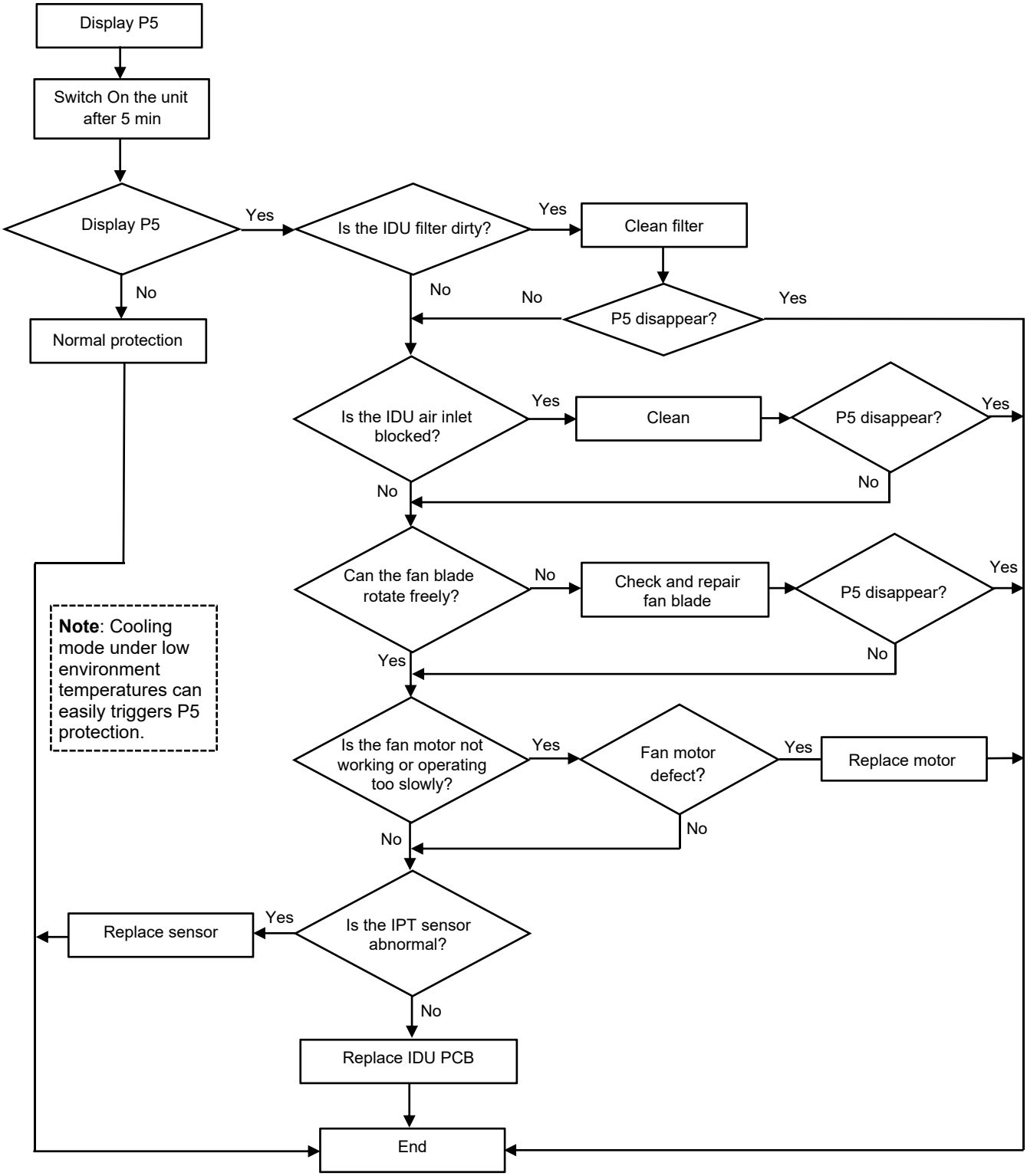


3.2.11 P4 --- ODU Discharge Temperature Overheating Protection



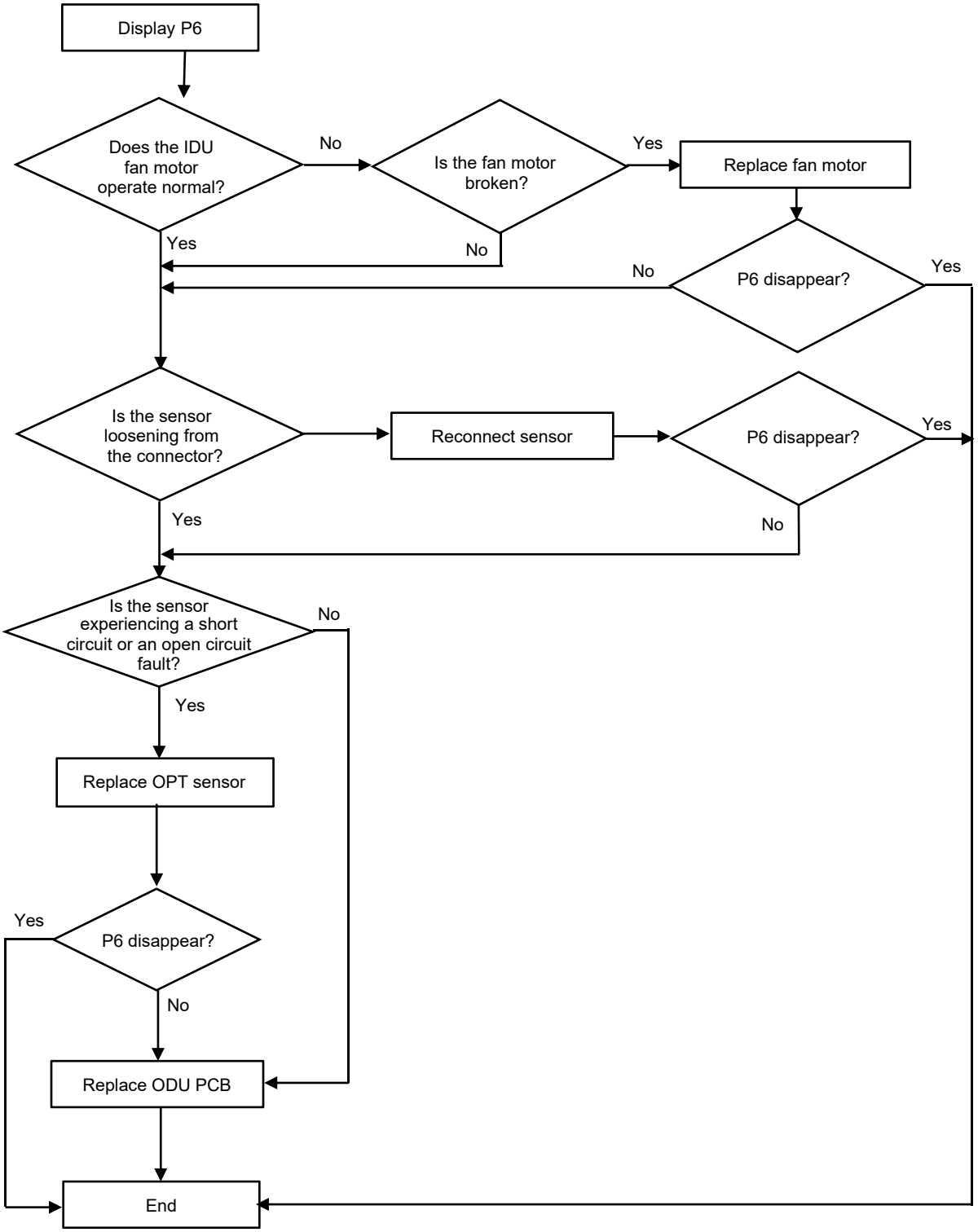
3.2.12 P5 --- Sub-Cooling Protection in Cooling or Dry Mode

In Cooling or Dry mode, when the IDU evaporator coil temperature IPT < 34°F continuously for 3 min after the compressor starts up for 6 min, the CPU will switch Off the outdoor unit and display the "P5" error code.



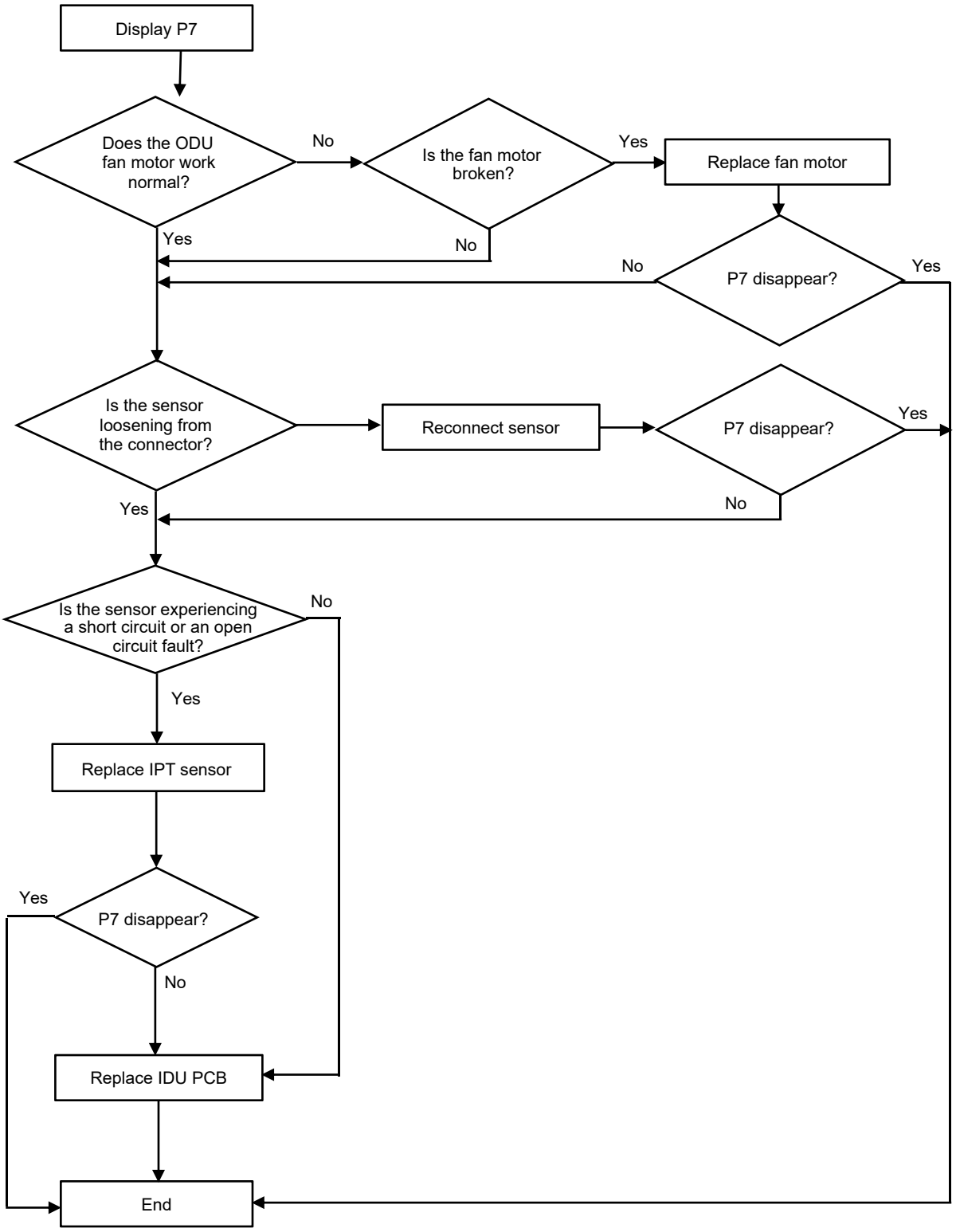
3.2.13 P6 --- Overheating Protection in Cooling Mode

In Cooling or Dry mode, when the ODU condenser coil temperature OPT≥144°F, the MCU will switch Off the outdoor unit and display the "P6" error code.



3.2.14 P7 --- Overheating Protection in Heating Mode

In Heating mode, when the IDU evaporator coil temperature IPT≥144°F, the ODU PCB will switch Off the outdoor unit and display the "P7" error code.



3.2.15 P8 --- Outdoor Over-Temperature/Under-Temperature Protection

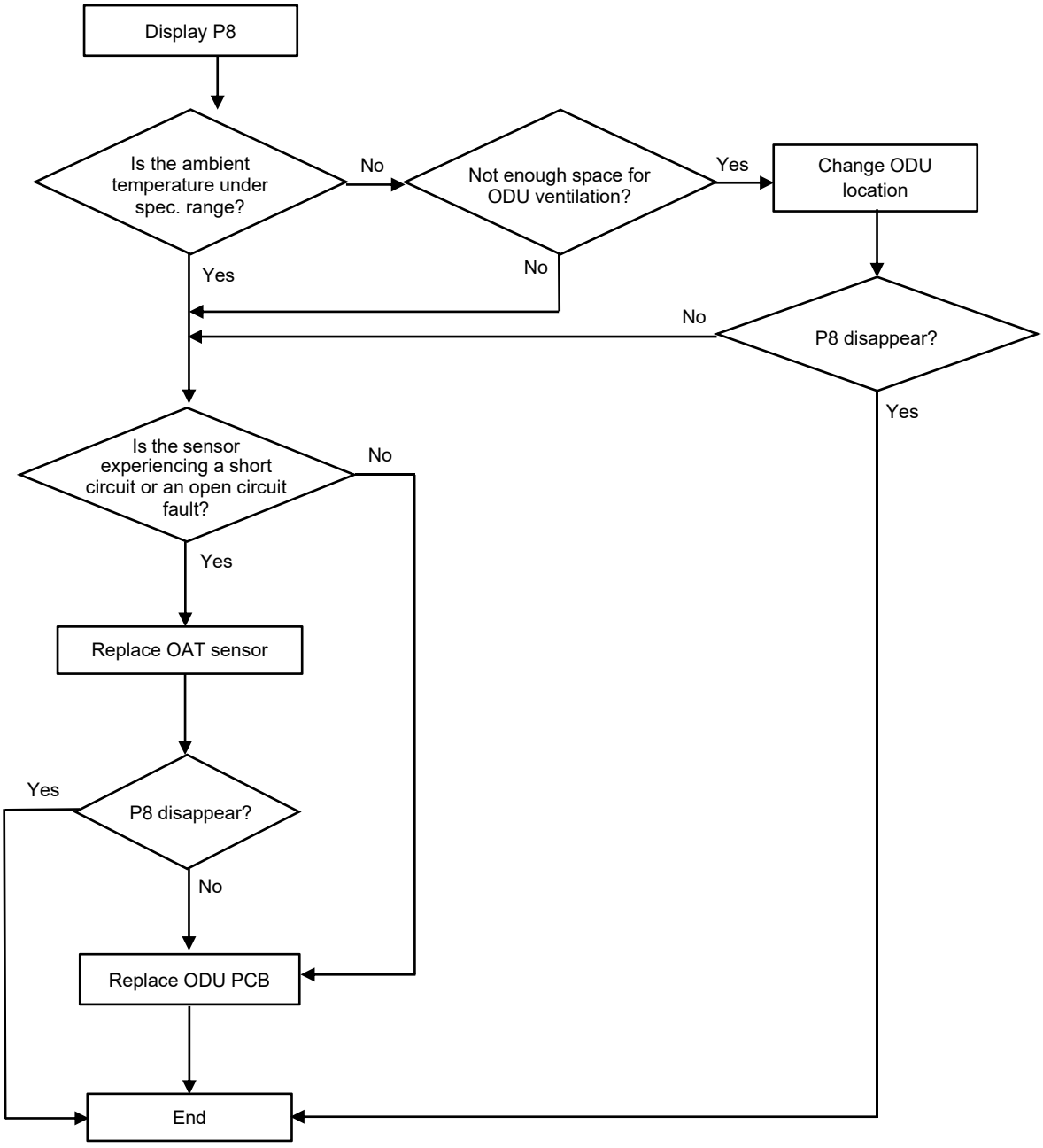
If the system experiences the following environment temperatures, the compressor will stop operating. After a 200s delay, the IDU will display the "P8" error code.

(1). **In Cooling or Dry mode**: ODU ambient temperature: OAT＜-4°F or OAT＞145°F

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

a. OAT≥104°F

b. 86°F＜OAT≤104°F and RT＞95°F



3.2.16 P9 --- Compressor Driving Protection (Compressor Load Abnormal)

When the compressor starts up or in the process of operation, if:

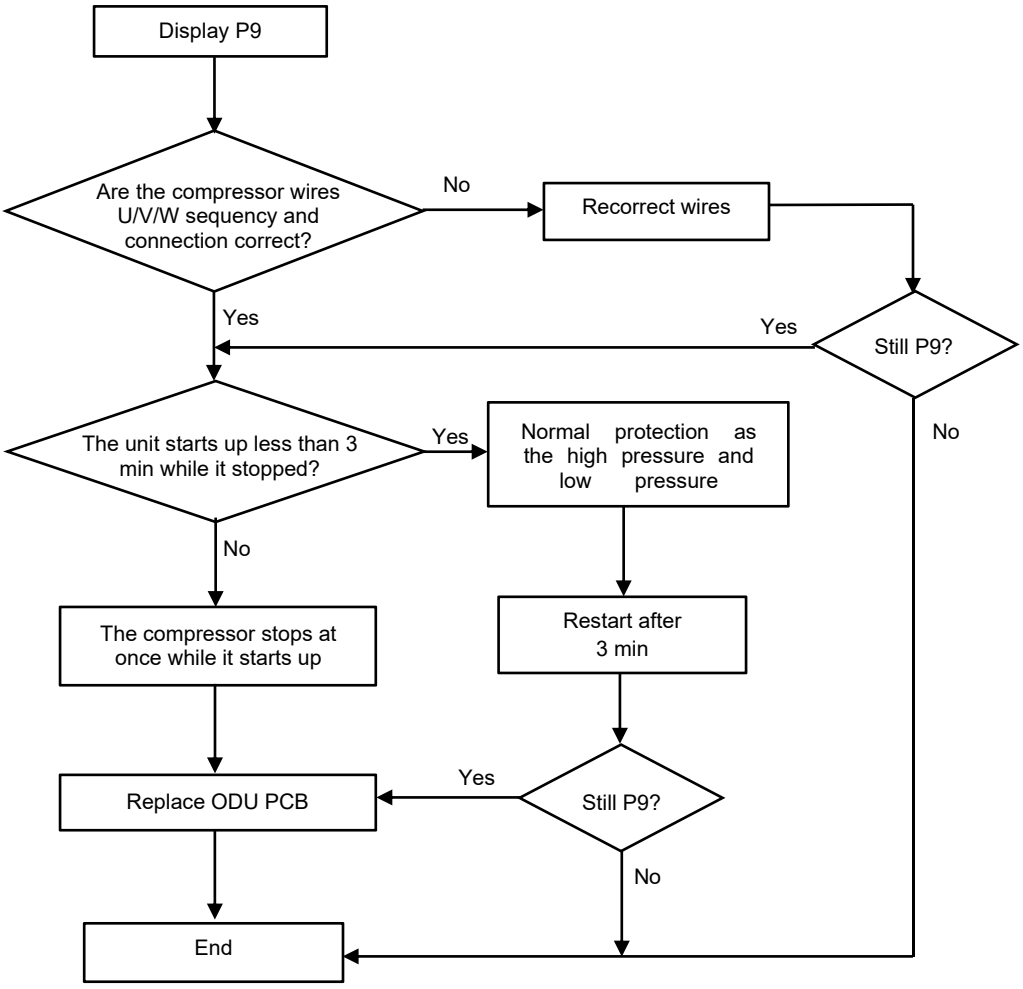
(1). MCU can’t test the feedback signal from the compressor, or

(2). Tested an abnormal signal from the compressor, or

(3). The compressor startup is abnormal.

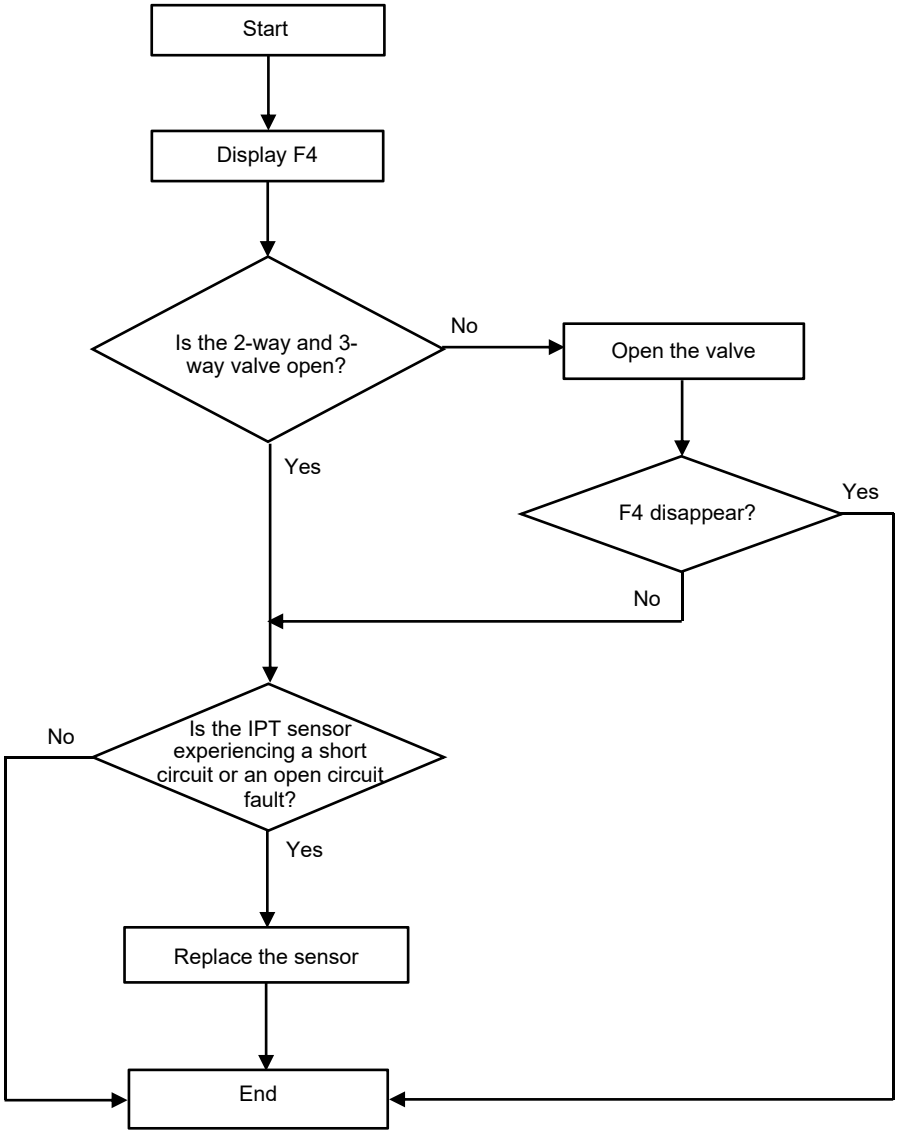
The outdoor unit will shut Off and display the "P9" error code.

The unit will restart 6 times continuously. If it still can’t work normal, then the unit will display the P9 error code again.



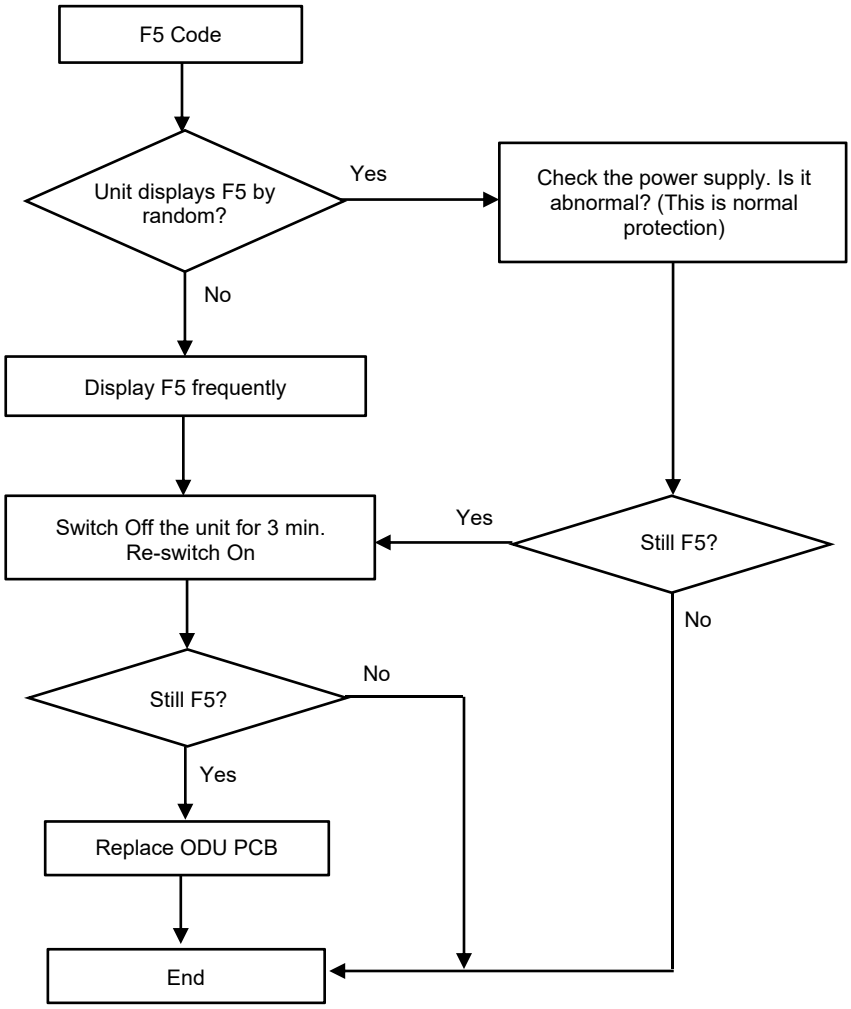
3.2.17 F4 --- Cooling System Gas Flow Abnormal Protection

When the compressor starts up, the unit will check the variation of the IDU coil temperature. If the installer forgets to open the 2-way or 3-way valve on the ODU, the gas can't flow in the cooling system. The unit will undergo cooling system gas flow abnormal protection and display the "F4" error code.



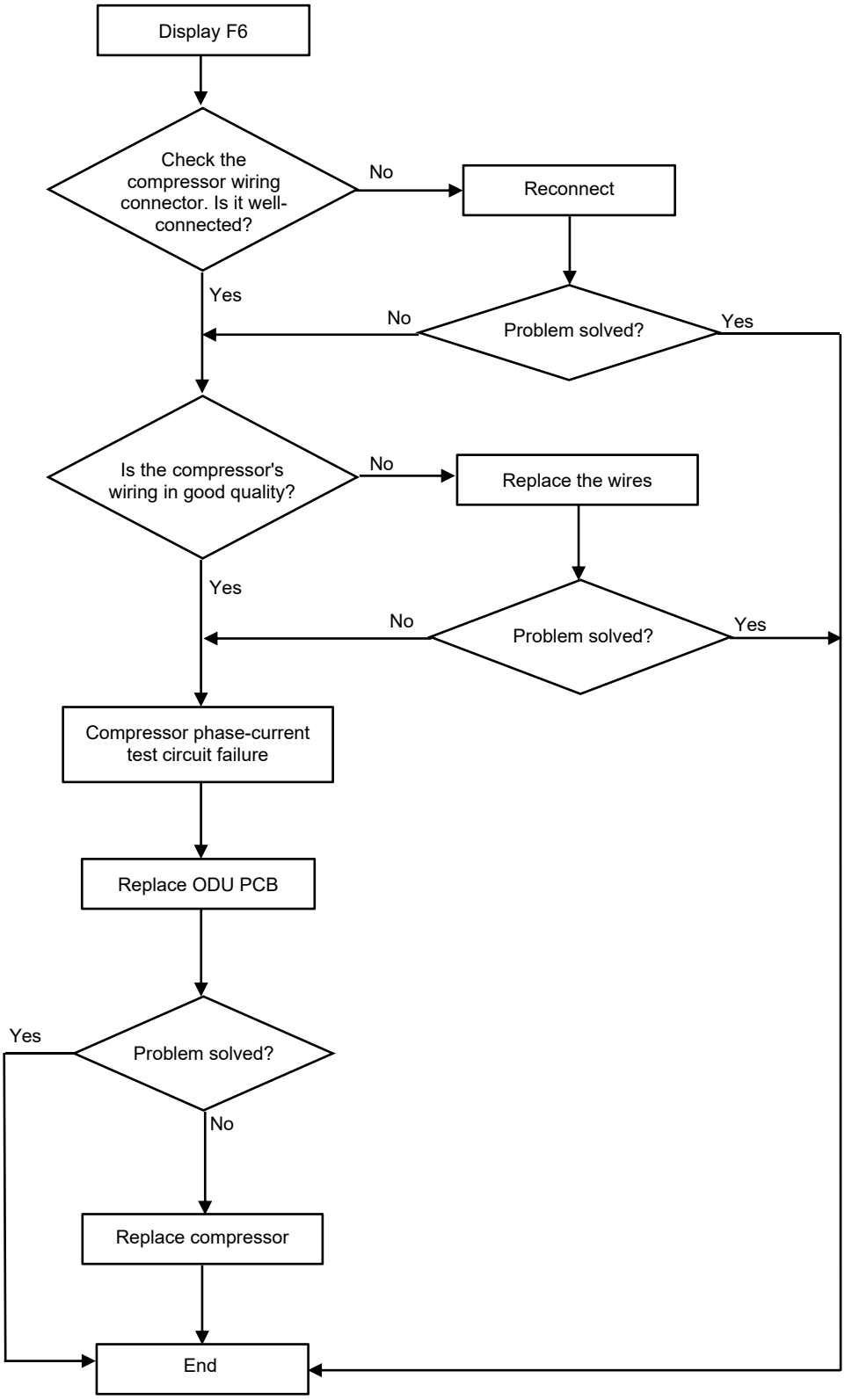
3.2.18 F5 --- PFC Protection

If the system undergoes PFC Over-Current Protection, the unit will display the "F5" error code.



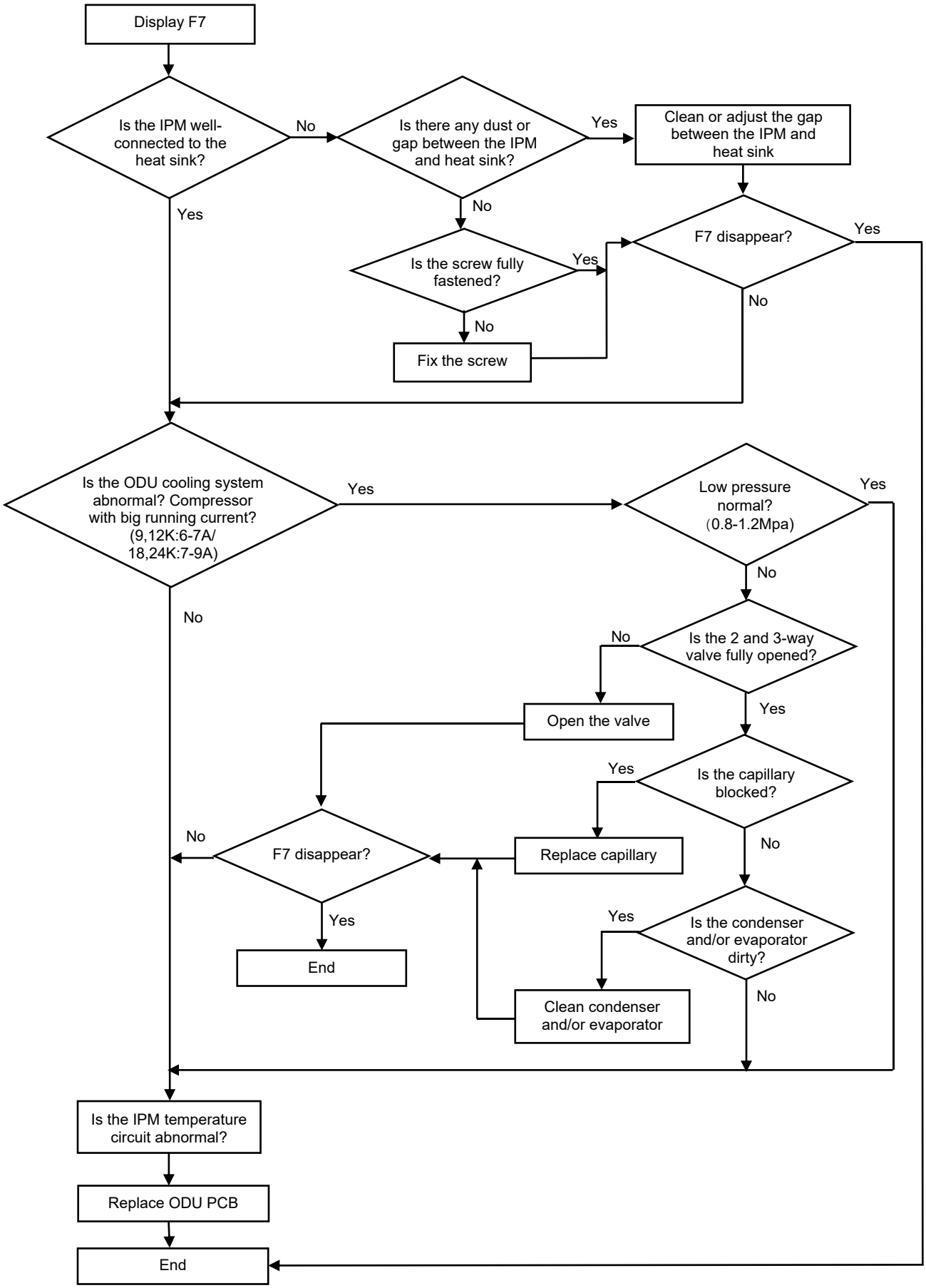
3.2.19 F6 --- Compressor Lack of Phase / Anti-Phase Protection

If the ODU PCB can’t test one or even three phases of the compressor's current, the unit will undergo anti-phase protection and display the "F6" error code.



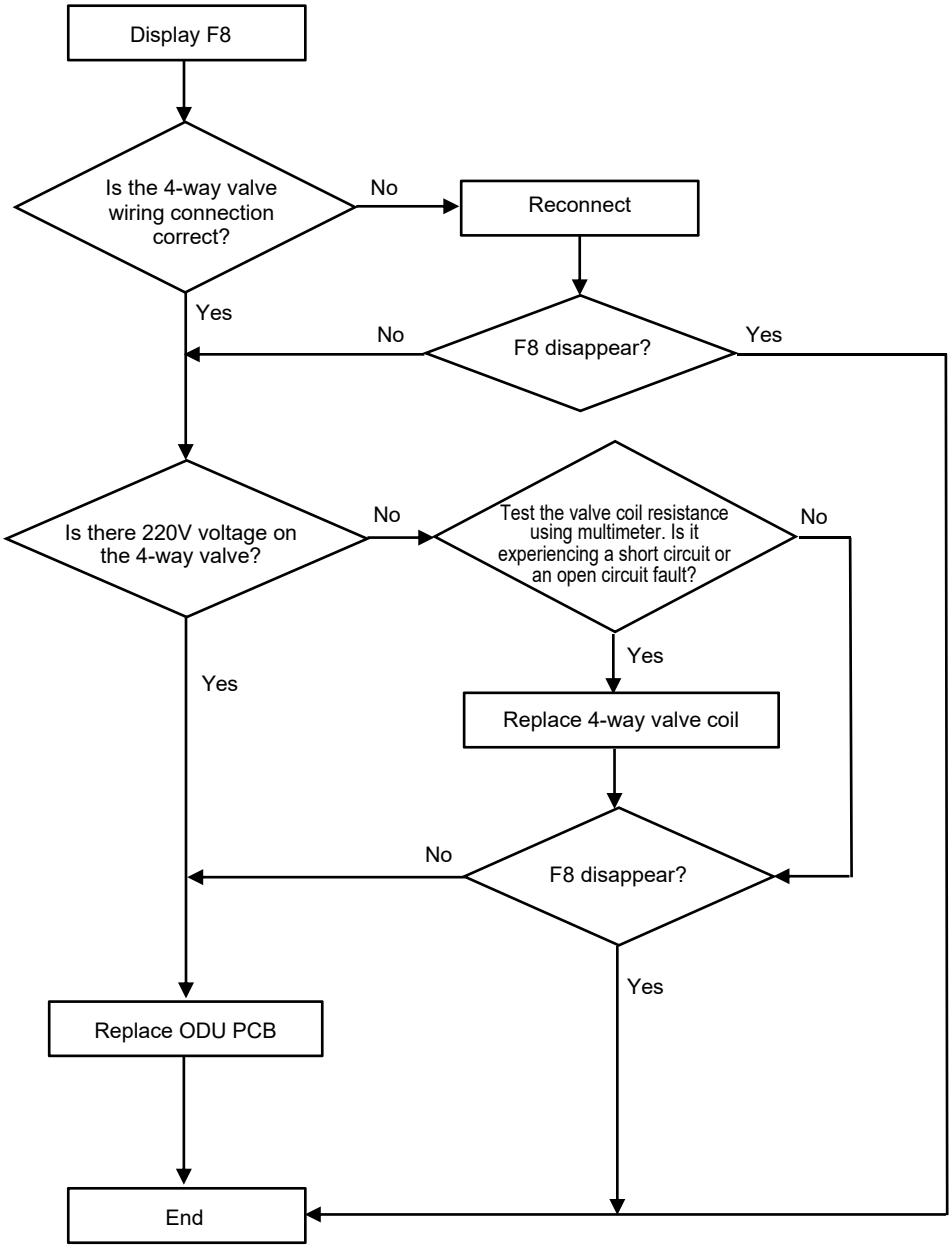
3.2.20 F7 --- Module Temperature Protection

If the IPM temperature is more than 203°F, the system will undergo IPM over-temperature protection and display the “F7” error code.



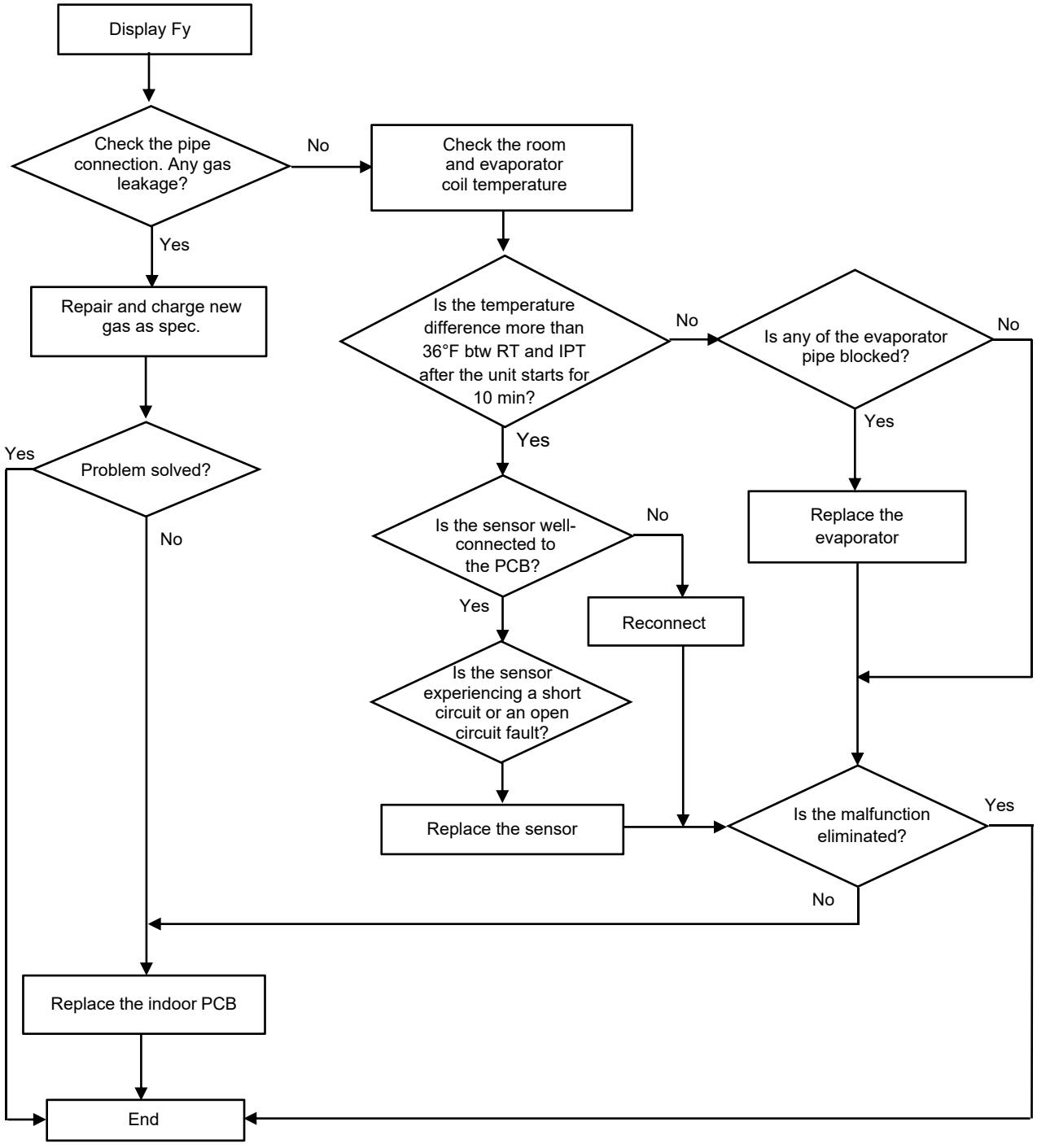
3.2.21 F8 --- 4-Way Value Reversing Abnormal

In Heating mode, if the IDU coil temperature is measured at 41°F (room temperature) or lower after the compressor operates for 8 min, the unit will display the "F8" error code.



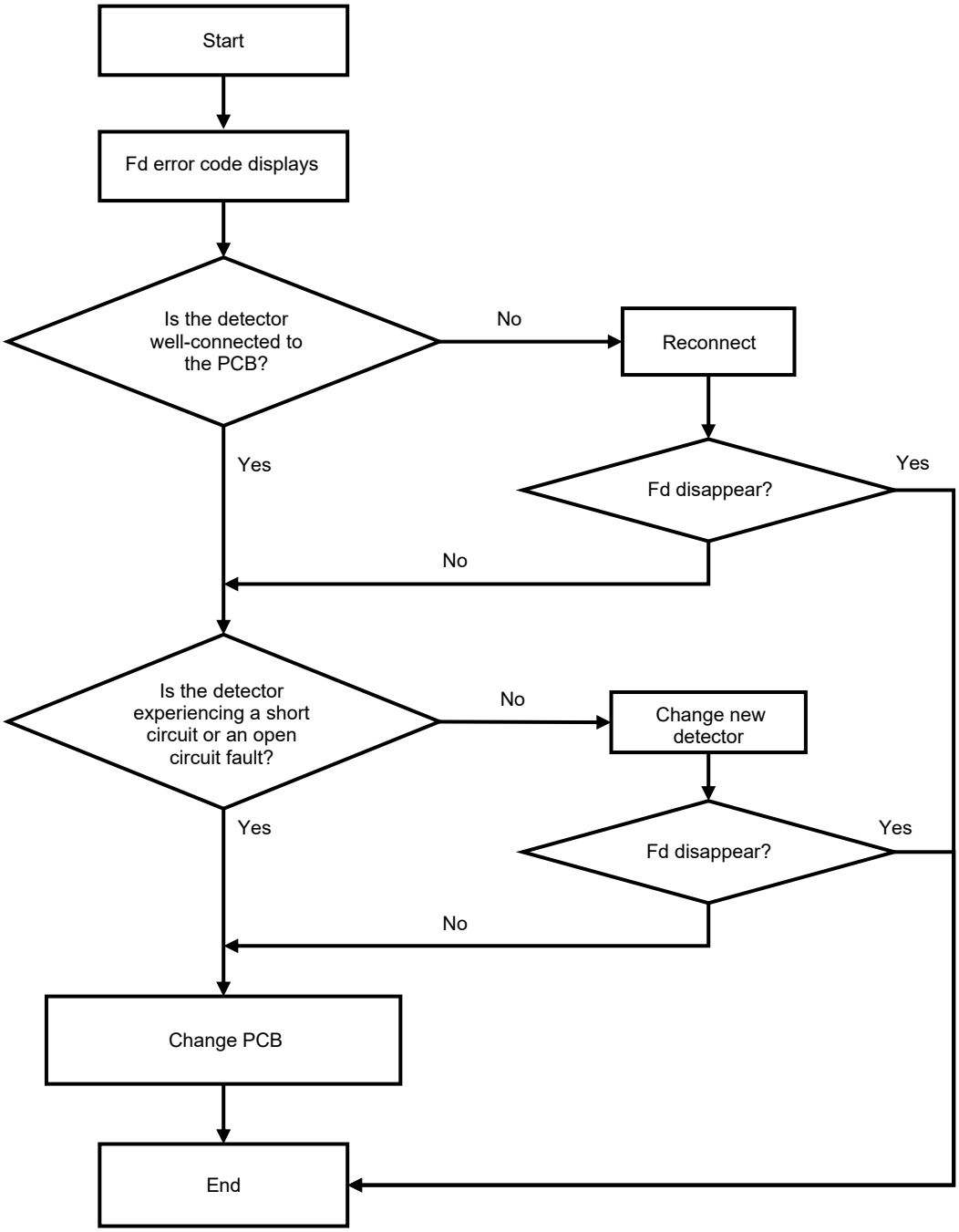
3.2.22 Fy --- Gas Leakage Protection

After the compressor operates at high frequency for 9 min, if the IDU evaporator and ODU condenser temperatures show only minor variations compared to previous readings but the compressor discharge temperature remains high, the unit will display the "Fy" error code.



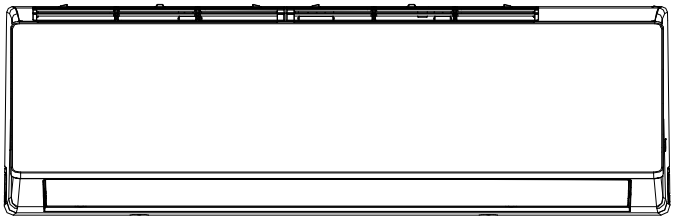
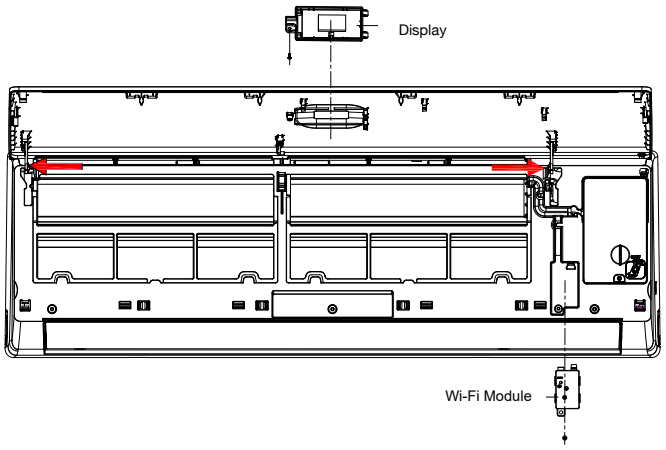
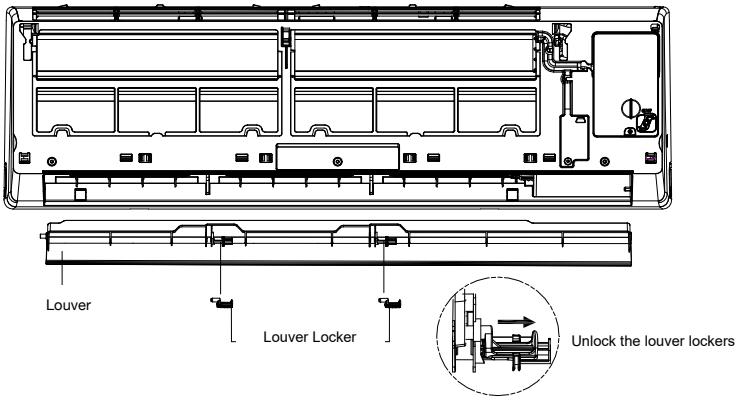
3.2.23 Fd --- Refrigerant Detector Failure

If the system has detected a refrigerant leakage, the unit will display the "Fd" error code. Turn Off the unit immediately and contact a professional to check for the leakage point.



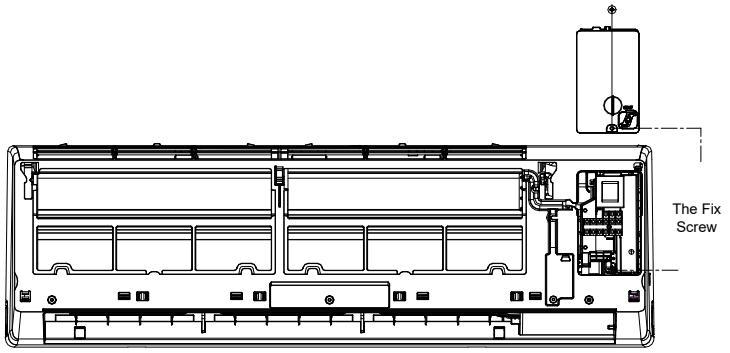
4. Disassembly IDU and ODU

4.1. IDU Disassembly

Steps	Reference Photo
1. Before disassembly	
The original status.	
2. Disassembly front panel, display board, and Wi-Fi module	
A. Open front panel. B. Remove 1 screw, then take the display box out from the panel. C. Release the panel axis, which is shown in red arrows, out from the middle frame and take the panel out. D. Unscrew and remove the Wi-Fi module out from the middle frame.	
3. Remove the louver	
Unlock the louver lockers (clip). Bend the louver slightly by hand and remove it from the middle frame and stepping motor.	

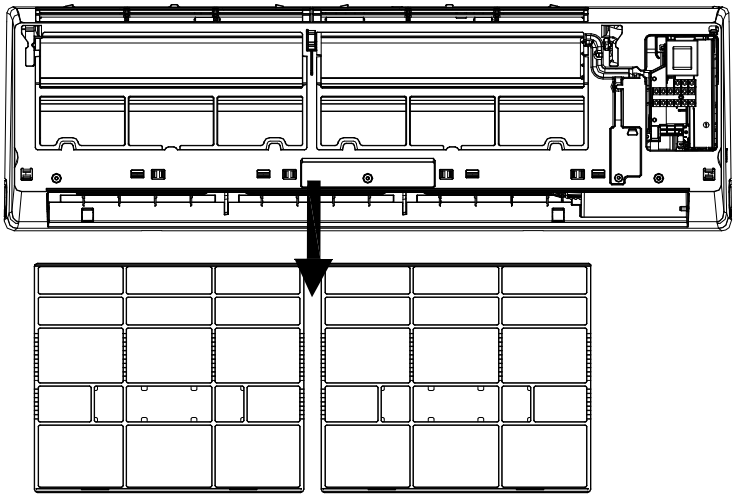
4. Remove the electric control box cover

Unfix 1 screw on the electric box cover, then remove the cover.



5. Remove the filter

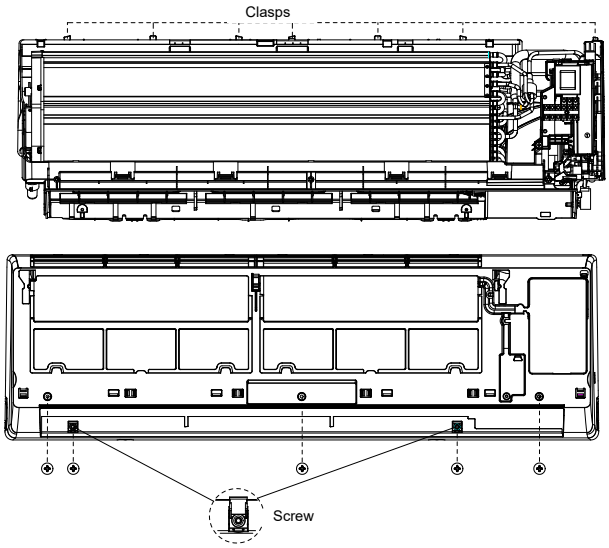
Push the filter upwards a little. You can take it out from the unit.



6. Disassemble the middle frame

A. Open the screw cover and unfix the screw with a cross screwdriver.

B. Remove the middle frame by loosening the clasps of the unit base, as shown in the picture. Take the frame out.



7. Disassemble the electric control box

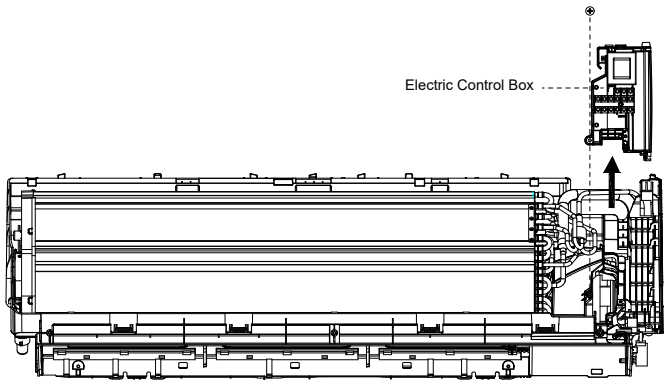
A. Remove the RT and IPT from the evaporator.

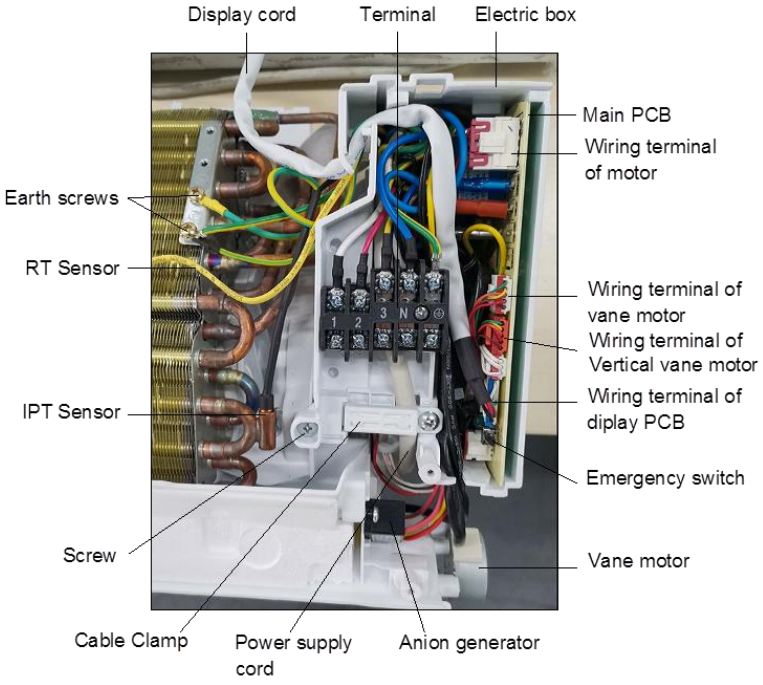
B. Unscrew all the earth ground wirings on the evaporator.

C. Take all the connectors out from the PCB.

D. Unfix 1 screw from the control box of the unit base frame. Remove the control box from the unit.

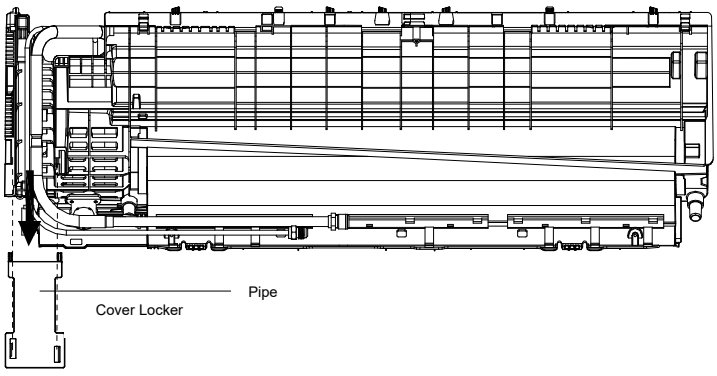
Note: The picture on the right is for your reference only. The wiring connection for the exact model may be slightly different.





8. Remove the pipe cover

Loosen the lower edge of the pipe cover from the base frame, then remove the cover from the unit.

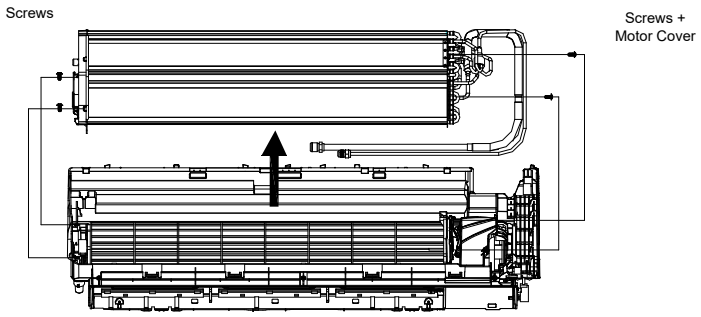


9. Disassemble the evaporator

A. Unfix 2 screws on the left side, as shown as picture.

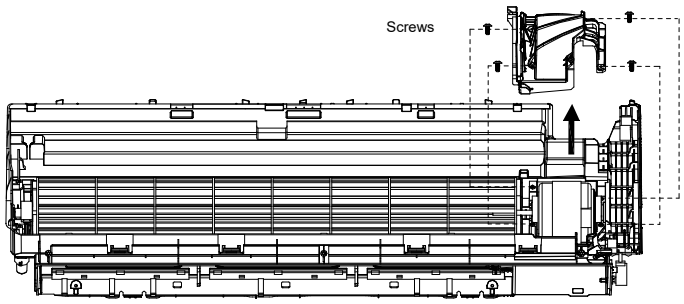
B. Unfix 2 screws on the right side of the motor cover/right support plate.

C. Take the evaporator out from the unit by uplifting the input/output pipes slightly.



10. Remove the motor cover

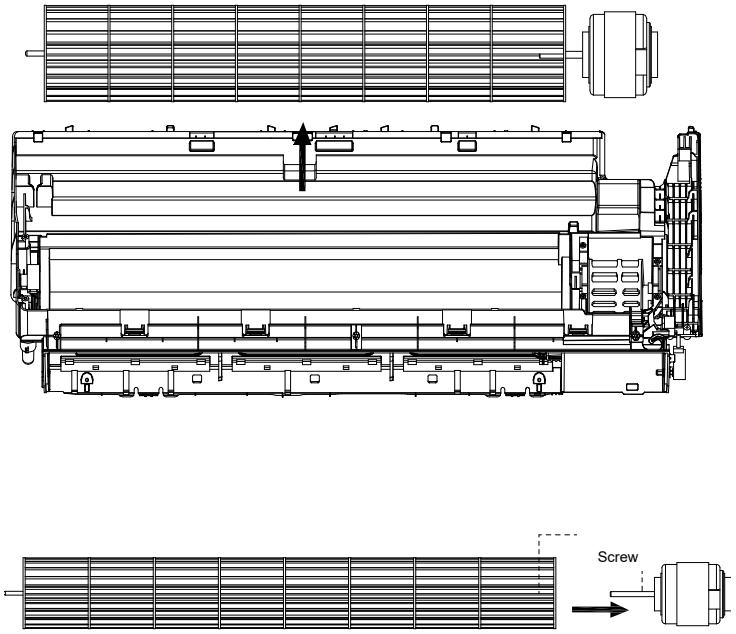
Unfix 4 screws on the motor cover of the base frame.



11. Disassemble fan motor and fan blade

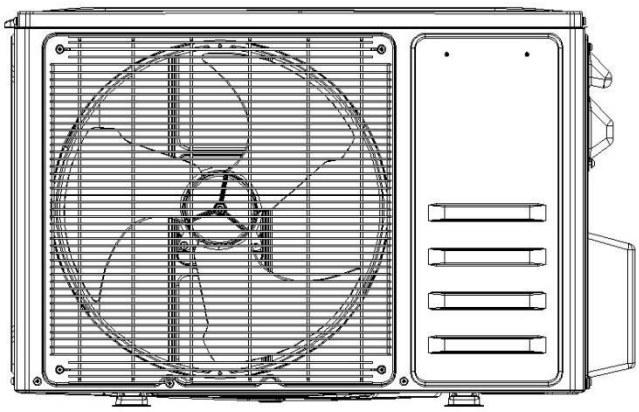
A. Lift the fan blade and fan motor. Take the base frame out.

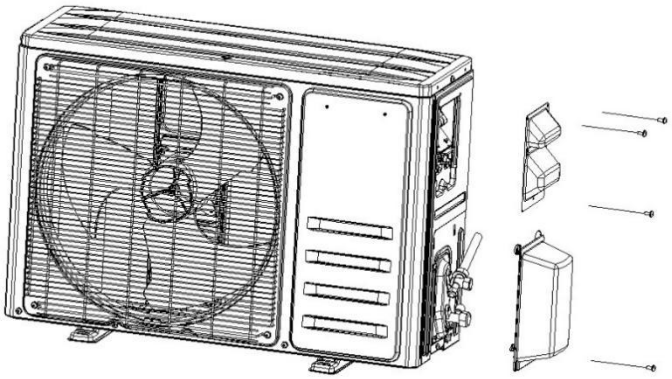
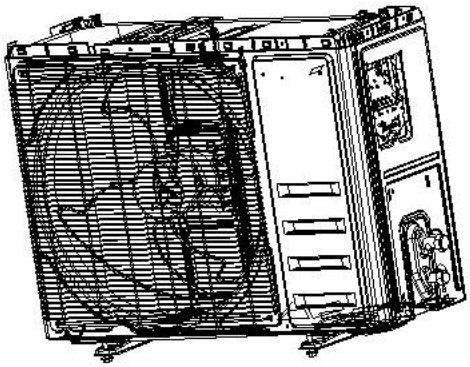
B. Unfix 1 screw on the axis of fan motor, then you can separate the fan blade and fan motor.

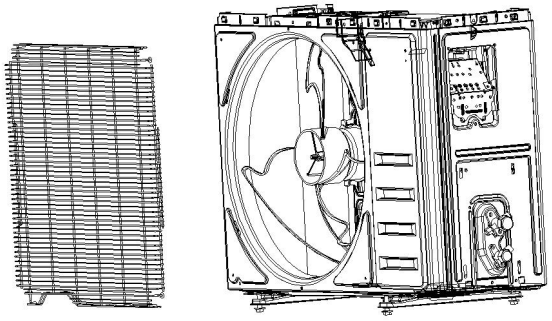
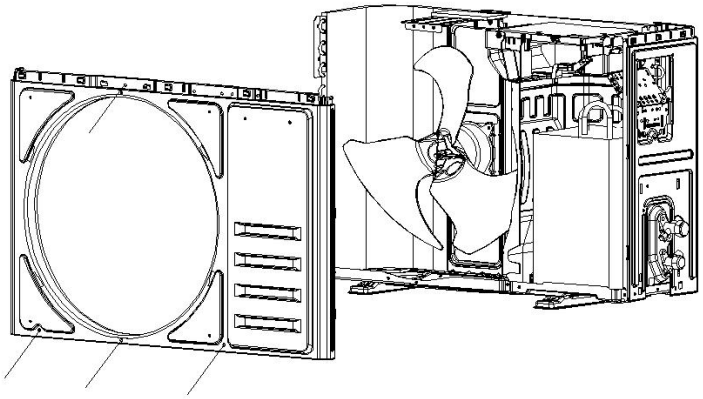
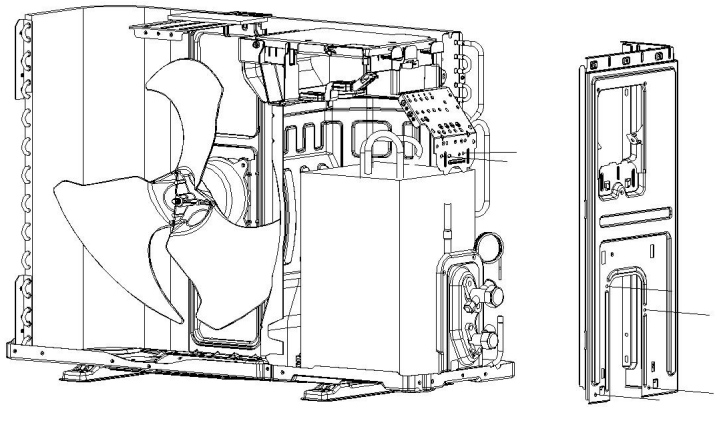


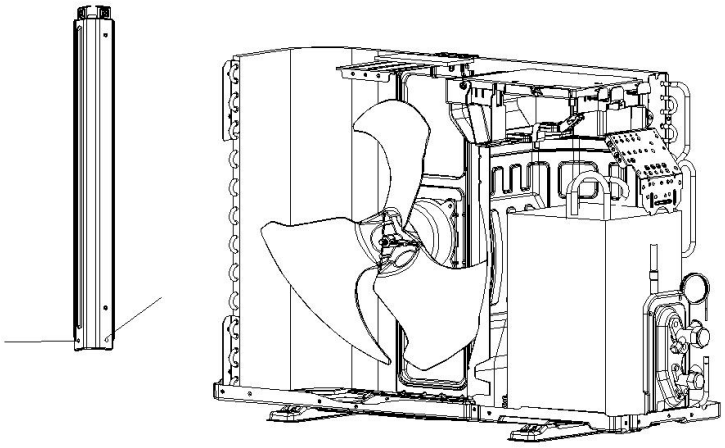
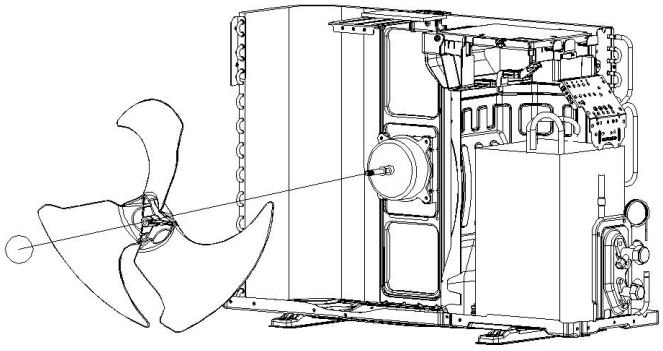
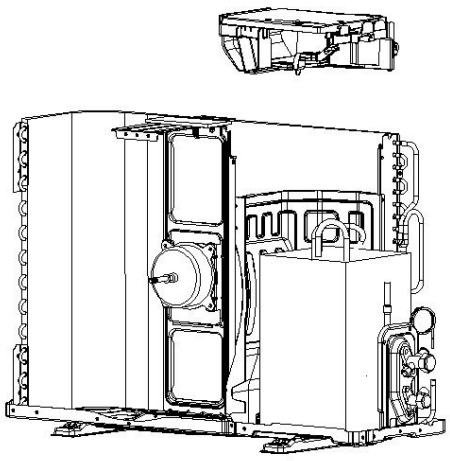
4.2 ODU Disassembly

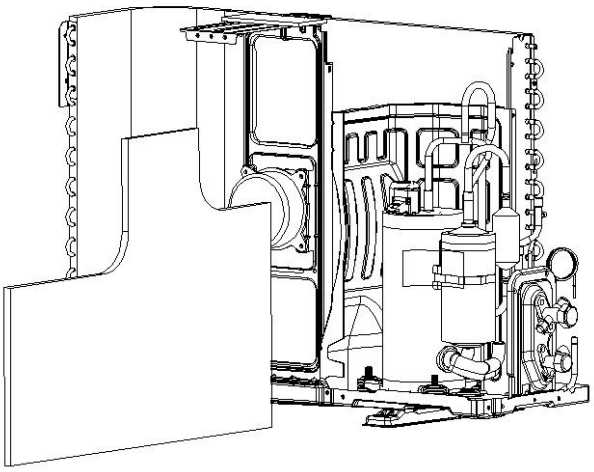
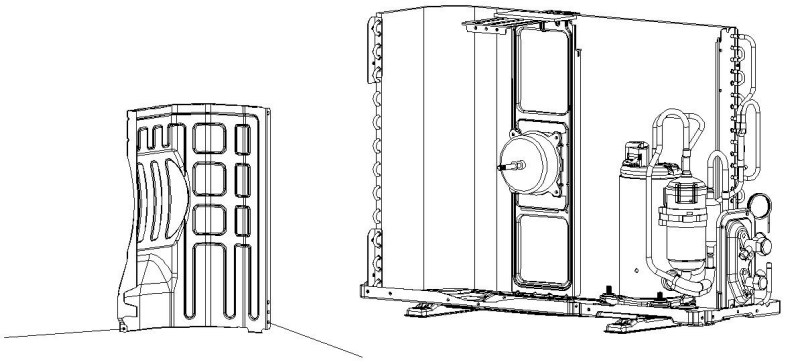
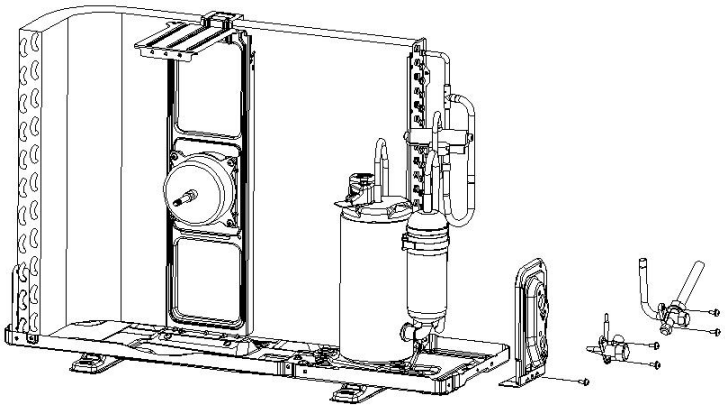
<table>
<tr><th colspan="2">Step</th><th>Reference Picture</th></tr>
<tr><td colspan="2">Before disassembly

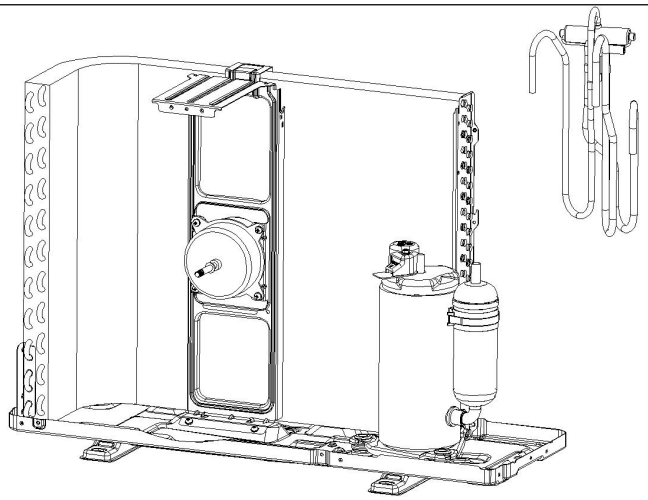
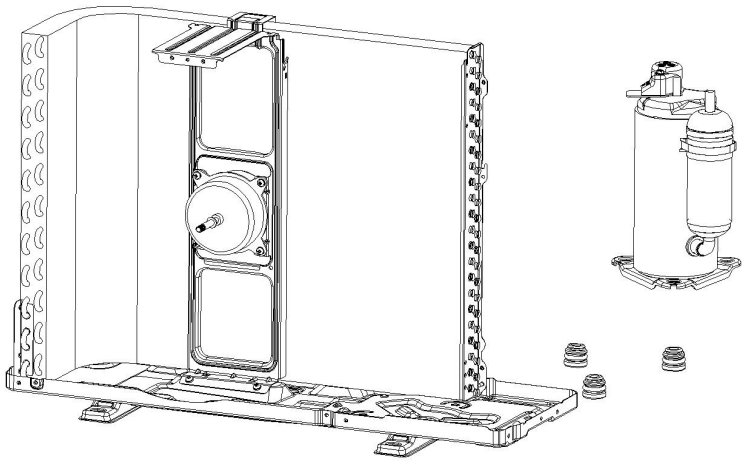
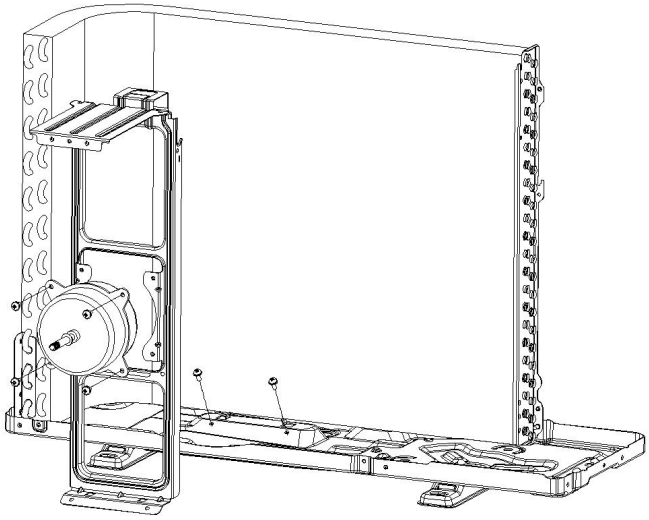
The original status.</td><td>  </td></tr>
<tr><td colspan="3">1. Remove the PCB cover, valve cover, and top cover</td></tr>
<tr><td>A</td><td>1). Unfix 1 screw on the PCB cover, then you can remove the cover from the unit.

2). Unfix 1 screw on the valve cover, and then you can take it out.</td><td>  </td></tr>
<tr><td>B</td><td>Unfix the screws on the top/left/right plates, and then you can take the top cover off.</td><td> 
  </td></tr>
</table>

2. Disassemble the fan guard and front panel		
A	Remove the grille screws from the front panel, then take out the grille.	
B	1). Unfix the screws on the front panel of the fan guard. 2). Separate the ODU middle plate and base plate. Lift the front panel so you can take it out from the unit.	
3. Disassemble the left and right plate		
A	Unfix the screws on the right plate, electric box assembly, valve plate, and base plate. You can then remove the right plate.	

B	Unfix the screws on the left plate, base plate, and condenser plate. You can then take the left plate out.	
4. Disassemble the axis fan blade		
A	Unscrew the fan blade nut. Remove the blade.	
5. Disassemble the electric box		
A	Unfix the screws on the electric box and motor supporter, etc. Loosen the wiring clamp, then you can take the control box out.	

6. Remove the noise cotton		
A	Take the cotton out, as shown in the picture.	
7. Disassemble the separate plate		
A	Unfix the screw on the separate plate and unit, then take it out.	
8. Disassemble the 2-way and 3-way valve		
A	Unfix the screws on the valve plate and base. You can take the 2-way and 3-way valve out by welding. **Note**: 1). Welding can only occur while there is no gas in the unit. 2). Pay attention to the fire to prevent any injury.	

9. Disassemble the 4-way valve assembly		
A	Remove the 4-way valve from the system by welding. Ensure there is no damage to the compressor, nameplate, etc.	
10. Disassemble the compressor		
A	Unscrew the nuts and remove the compressor.	
11. Remove the fan motor and fan supporter		
A	Unfix the screws on the fan motor and supporter, then remove the supporter of the base plate. **Note**: Pay attention to the motor wiring. It can't be taken out by force.	

Appendix

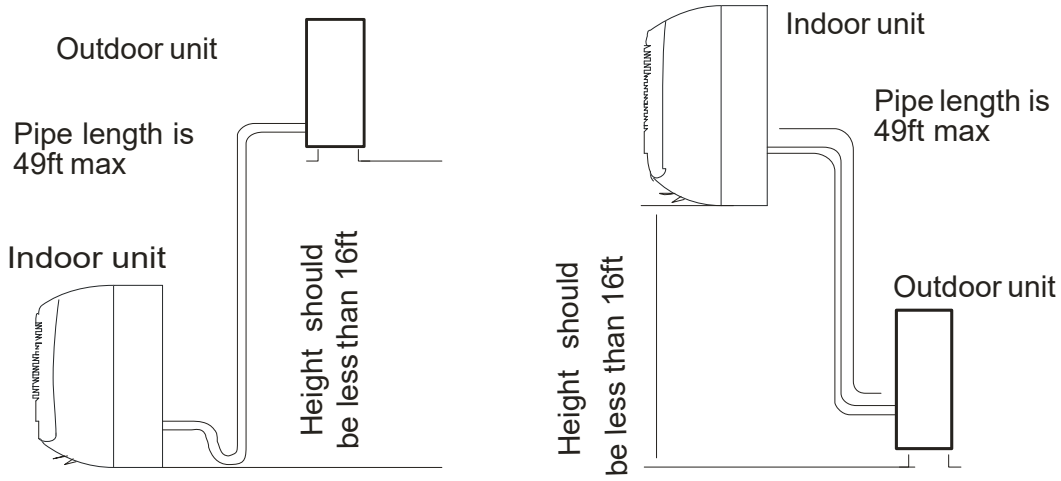
Appendix 1 Comparison Table of Celsius-Fahrenheit Temperature

Fahrenheit Display Temp. (℉)	Fahrenheit (℉)	Celsius (℃)	Fahrenheit Display Temp. (℉)	Fahrenheit (℉)	Celsius (℃)	Fahrenheit Display Temp. (℉)	Fahrenheit (℉)	Celsius (℃)
61	60.8	16	69/70	69.8	21	78/79	78.8	26
62/63	62.6	17	71/72	71.6	22	80/81	80.6	27
64/65	64.4	18	73/74	73.4	23	82/83	82.4	28
66/67	66.2	19	75/76	75.2	24	84/85	84.2	29
68	68	20	77	77	25	86	86	30

Appendix 2 Pipe Length and Gas Charging

Size and length of the connecting pipes for installation.

Model	Pipe Size(inch)	
	Liquid	Gas
WYT009GLSI20RL	1/4	3/8
WYT009ALSI20RL	1/4	3/8
WYT012GLSI20RL	1/4	3/8
WYT012ALSI20RL	1/4	3/8
WYT018GLSI20RL	1/4	3/8
WYT024GLSI20RL	1/4	1/2
WYT030GLSI20RL WYT036GLSI20RL	1/4	5/8



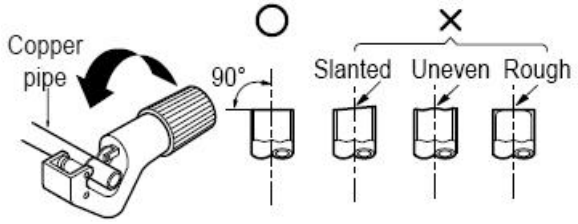
Mode	Standard Length (m/inch)	Refrigerant Piping Max. Length (m/inch) A	Additional Refrigerant Charging: Xg= B * (A-5m) B
WYT009GLSI20RL	7.5/295	15/591	10g/m(0.11oz/ft)
WYT009ALSI20RL	7.5/295	15/591	10g/m(0.11oz/ft)
WYT012GLSI20RL	7.5/295	15/591	10g/m(0.11oz/ft)
WYT012ALSI20RL	7.5/295	15/591	10g/m(0.11oz/ft)
WYT018GLSI20RL	7.5/295	15/591	10g/m(0.11oz/ft)
WYT024GLSI20RL	7.5/295	15/591	10g/m(0.11oz/ft)
WYT030GLSI20RL WYT036GLSI20RL	7.5/295	15/591	10g/m(0.11oz/ft)

Appendix 3 Pipes Flaring

Main cause for gas leakage is due to defect in flaring work. Carry out correct flaring work in the following procedure.

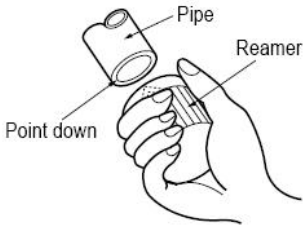
A. Cut the pipes and the cable

1) Use the piping kit accessory or the pipes purchased locally.
2) Measure the distance between the indoor and outdoor units.
3) Cut the pipes a little longer than the measured distance.
4) Cut the cable 5ft longer than the pipe length.



B. Burrs removal

1) Completely remove all burrs from the cut cross section of pipe/tube.
2) Put the end of the copper tube/pipe in a downward direction while removing the burrs in order to avoid dropping burrs into the tubing.

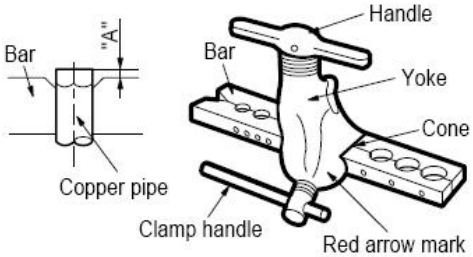


C. Flaring work

1) Carry out flaring work using flaring tool, as shown below.

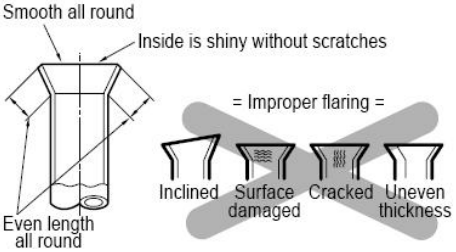
Outside Diameter		A
mm	inch	mm /inch
ø6.35	1/4	1.0~1.3(0.04~0.06)
ø9.52	3/8	0.8~1.0(0.03~0.04)
ø12.7	1/2	0.5~0.8(0.02~0.03)
ø15.88	5/8	0.5~0.8(0.02~0.03)

2) Firmly hold copper pipe in a die in the dimension shown in the table above.



D. Check

1) Compare the flared work with the figure below.
2) If the flare is noted to be defective, cut off the flared section and do the flaring work again.

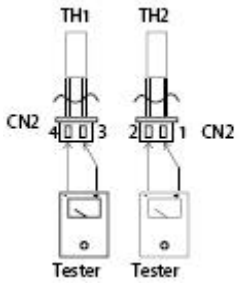


Appendix 4 Thermistor Temperature Characteristics

1). Temperature characteristics of the indoor and outdoor units exchange temperature and outside air temperature sensor

Temp. ℉	Resistance (k Ohm)	Voltage of Resistance	Temp. ℉	Resistance (k Ohm)	Voltage of Resistance	Temp. ℉	Resistance (k Ohm)	Voltage of Resistance
-22	63.513	4.628	59	7.447	2.968	140	1.464	1.115
-20	60.135	4.609	61	7.148	2.918	142	1.418	1.088
-18	56.956	4.589	63	6.863	2.868	144	1.374	1.061
-17	53.963	4.568	64	6.591	2.819	145	1.331	1.035
-15	51.144	4.547	66	6.332	2.769	147	1.290	1.009
-13	48.488	4.524	68	6.084	2.720	149	1.250	0.984
-11	45.985	4.501	70	5.847	2.671	151	1.212	0.960
-9	43.627	4.477	72	5.621	2.621	153	1.175	0.936
-8	41.403	4.452	73	5.404	2.572	154	1.139	0.913
-6	39.305	4.426	75	5.198	2.524	156	1.105	0.890
-4	37.326	4.399	77	5.000	2.475	158	1.072	0.868
-2	35.458	4.371	79	4.811	2.427	160	1.040	0.847
0	33.695	4.343	81	4.630	2.379	162	1.009	0.825
1	32.030	4.313	82	4.457	2.332	163	0.979	0.805
3	30.458	4.283	84	4.292	2.285	165	0.950	0.785
5	28.972	4.252	86	4.133	2.238	167	0.922	0.765
7	27.567	4.219	88	3.981	2.192	169	0.895	0.746
9	26.239	4.186	90	3.836	2.146	171	0.869	0.728
10	24.984	4.152	91	3.697	2.101	172	0.843	0.710
12	23.795	4.117	93	3.563	2.057	174	0.819	0.692
14	22.671	4.082	95	3.435	2.012	176	0.795	0.675
16	21.606	4.045	97	3.313	1.969	178	0.773	0.658
18	20.598	4.008	99	3.195	1.926	180	0.751	0.641
19	19.644	3.969	100	3.082	1.883	181	0.729	0.625
21	18.732	3.930	102	2.974	1.842	183	0.709	0.610
23	17.881	3.890	104	2.870	1.800	185	0.689	0.595
25	17.068	3.850	106	2.770	1.760	187	0.669	0.580
27	16.297	3.808	108	2.674	1.720	189	0.651	0.566
28	15.565	3.766	109	2.583	1.681	190	0.633	0.552
30	14.871	3.723	111	2.494	1.642	192	0.615	0.538
32	14.212	3.680	113	2.410	1.604	194	0.598	0.525
34	13.586	3.635	115	2.328	1.567	196	0.582	0.512
36	12.991	3.590	117	2.250	1.530	198	0.566	0.499
37	12.426	3.545	118	2.174	1.495	199	0.550	0.487
39	11.889	3.499	120	2.102	1.459	201	0.535	0.475
41	11.378	3.452	122	2.032	1.425	203	0.521	0.463
43	10.893	3.406	124	1.965	1.391	205	0.507	0.452
45	10.431	3.358	126	1.901	1.357	207	0.493	0.441
46	9.991	3.310	127	1.839	1.325	208	0.480	0.430
48	9.573	3.262	129	1.779	1.293	210	0.467	0.419
50	9.174	3.214	131	1.721	1.262	212	0.455	0.409
52	8.795	3.165	133	1.666	1.231			
54	8.433	3.116	135	1.613	1.201			
55	8.089	3.067	136	1.561	1.172			
57	7.760	3.017	138	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 the connectors as shown above.

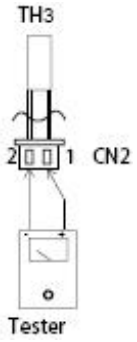
1) Outdoor unit sensor temperature characteristics

TEMP. ℉	R min (k Ohm)	R(t) (k Ohm)	R max (k Ohm)	TEMP. ℉	R min (k Ohm)	R(t) (k Ohm)	R max (k Ohm)	TEMP. ℉	R min (k Ohm)	R(t) (k Ohm)	R max (k Ohm)
-22	283.3	322.9	367.7	75	19.36	20.89	22.52	172	2.563	2.654	2.745
-20.2	267.4	304.4	346.3	77	18.55	20	21.54	174	2.481	2.567	2.654
-18	252.5	287.1	307.4	79	17.77	19.14	20.6	176	2.402	2.484	2.567
-17	238.5	270.9	307.4	81	17.03	18.32	19.7	178	2.327	2.404	2.483
-15	225.4	255.7	289.8	82	16.32	17.55	18.85	180	2.254	2.327	2.401
-13	213.1	241.4	273.3	84	15.65	16.81	18.04	181	2.183	2.253	2.323
-11	201.5	228	257.9	86	15	16.1	17.27	183	2.115	2.182	2.248
-9	190.6	215.5	243.4	88	14.39	15.43	16.54	185	2.05	2.113	2.176
-8	180.3	203.6	229.8	90	13.81	14.79	15.34	187	1.985	2.047	2.109
-6	170.7	192.5	217	91	13.25	14.18	15.17	189	1.922	1.983	2.045
-4	161.6	182.1	205	93	12.72	13.6	14.54	190	1.861	1.922	1.983
-2	153.1	172.3	193.7	95	12.21	13.05	13.93	192	1.802	1.862	1.923
0	145	163.1	183.2	97	11.72	12.52	13.36	194	1.746	1.805	1.865
1	137.5	154.4	173.2	99	11.26	12.01	12.81	196	1.692	1.75	1.809
3	130.3	146.2	163.9	100	10.82	11.53	12.29	198	1.639	1.697	1.755
5	123.6	138.5	155.1	102	10.29	11.07	11.78	199	1.589	1.646	1.703
7	117.3	131.3	146.8	104	9.986	10.63	11.31	201	1.54	1.596	1.653
9	111.3	124.4	139	106	9.6	10.21	10.85	203	1.493	1.549	1.604
10	105.6	118	131.7	108	9.231	9.813	10.42	205	1.448	1.502	1.558
12	100.3	111.9	124.7	109	8.878	9.43	10	207	1.404	1.458	1.512
14	95.24	106.2	118.2	111	8.54	9.064	9.612	208	1.362	1.415	1.469
16	90.49	100.8	112.1	113	8.217	8.714	9.233	210	1.321	1.373	1.426
18	85.99	95.68	106.3	115	7.908	8.38	8.872	212	1.284	1.335	1.387
19	81.75	90.86	100.8	117	7.612	8.06	8.526	214	1.245	1.296	1.348
21	77.74	86.31	95.74	118	7.328	7.754	8.196	216	1.209	1.258	1.309
23	73.94	82.01	90.88	120	7.057	7.461	7.88	217	1.173	1.222	1.272
25	70.35	77.95	86.29	122	6.797	7.18	7.578	219	1.139	1.187	1.236
27	66.96	74.11	81.96	124	6.548	6.912	7.289	221	1.105	1.153	1.202

28	63.74	70.48	77.87	126	6.309	6.655	7.013	223	1.073	1.12	1.168
30	60.69	67.05	74	127	6.08	6.409	6.748	225	1.042	1.089	1.136
32	57.81	63.8	70.34	129	5.861	6.173	6.495	226	1.013	1.058	1.104
34	55.08	60.72	66.88	131	5.651	5.947	6.253	228	0.9833	1.028	1.074
36	52.49	57.81	63.61	133	5.449	5.73	6.02	230	0.9553	0.9997	1.045
37	50.03	55.05	60.52	135	5.255	5.522	5.798	232	0.9283	0.9719	1.016
39	47.71	52.44	57.59	136	5.07	5.323	5.585	234	0.9021	0.9451	0.9892
41	45.5	49.97	54.82	138	4.891	5.132	5.381	235	0.8765	0.9191	0.9626
43	43.41	47.62	52.2	140	4.72	4.949	5.101	237	0.8524	0.894	0.9367
45	41.42	45.4	49.71	142	4.556	4.774	4.997	239	0.8087	0.8595	0.9117
46	39.53	43.2	42.33	144	4.398	4.605	4.817	241	0.8059	0.8461	0.8875
48	37.74	41.29	45.12	145	4.247	4.448	4.644	243	0.7837	0.8233	0.8641
50	36.04	39.39	43.01	147	4.101	4.288	4.479	244	0.7623	0.8012	0.8413
52	34.42	37.59	41	149	3.961	4.139	4.32	246	0.7415	0.7798	0.8193
54	32.89	35.87	39.1	151	3.827	3.995	4.167	248			
55	31.43	34.25	37.29	153	3.698	3.858	4.021	250	0.702	0.7386	0.7773
57	30.04	32.71	35.58	154				252	0.6631	0.7195	0.7572
59	29.72	31.24	33.95	156				253	0.6649	0.7007	0.7378
61				158	3.339	3.476	3.616	255	0.6472	0.6824	0.7189
63				160	3.229	3.359	3.491	257	0.6301	0.6647	0.7006
64	25.13	27.26	29.55	162	3.122	3.246	3.372	259	0.6135	0.6476	0.6829
66	24.05	26.07	28.23	163	3.02	3.138	3.257	261	0.5974	0.6309	0.6657
68	23.02	24.93	26.97	165	2.921	3.033	3.146	262	0.5818	0.6148	0.649
70	22.04	23.84	25.77	167	2.827	2.933	3.04	264	0.5667	0.5991	0.6328
72	21.1	22.81	24.63	169	2.735	2.836	2.938	266	0.5521	0.5839	0.6171
73	20.21	21.83	23.55	171	2.647	2.743	2.84				

R—Resistance

Resistance at 77˚F: 20 kΩ



TH3: Outdoor unit discharge pipe sensor

Before measuring resistance, disconnect the connectors as shown above.

The design and specifications of this product are subject to change without prior notice as development continues. Consult with the sales agency or manufacturer for details. Refer to the equipment nameplate for all other applicable specifications.

PIONEER®

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