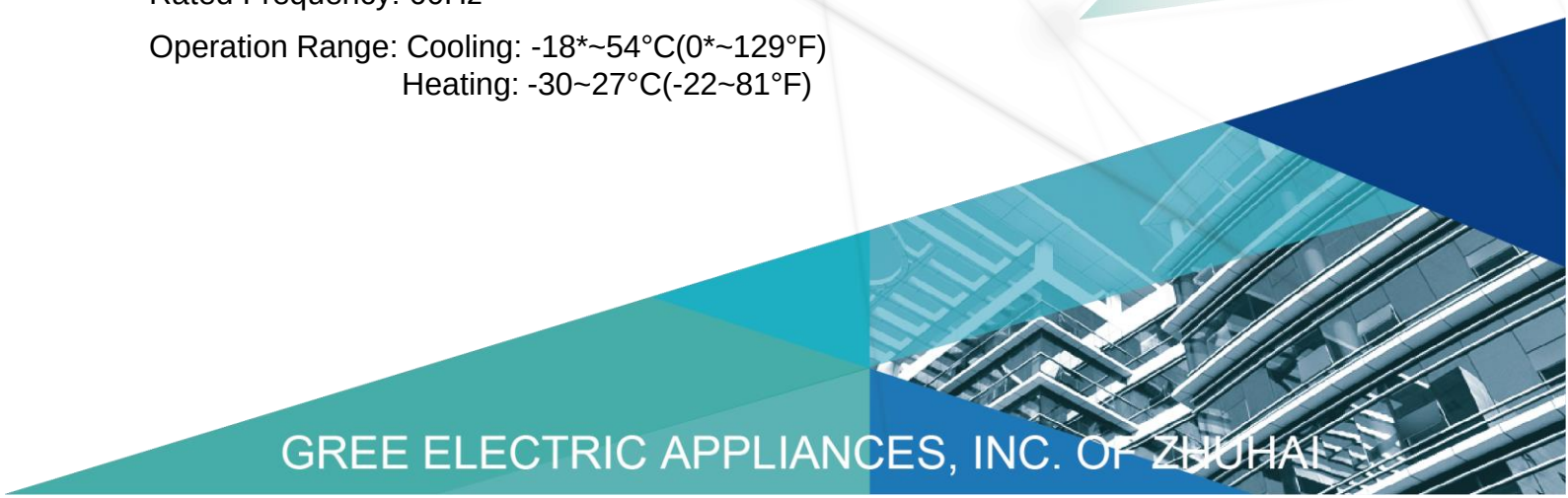
Service Manual

Ultra Heat GMV6 Mini DC Inverter VRF Units

Capacity: 36000Btu/h~60000Btu/h

Rated Frequency: 60Hz

Operation Range: Cooling: -18*~54°C(0*~129°F)
Heating: -30~27°C(-22~81°F)



GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI

Contents

Chapter 1 Product **2**
1 Unit List **2**
2 Parameters **2**
3 The Range of Production Working Temperature **3**
Chapter 2 Commissioning **4**
1 Commissioning Process **4**
2 Safety Requirements **4**
3 Unit Commissioning **5**
4 Unit Function Settings **15**
Chapter 3 Faults **35**
1 Error Indication **35**
2 Troubleshooting **43**
3 Non-fault Type Troubleshooting **48**
Chapter 4 Maintenance **51**
1 Precautions for Refrigerant Leakage **51**
2 Vacuum Pumping, Refrigerant Adding **51**
3 Inspection of Key Parts **55**
4 Replacement of Key Unit Parts **84**
5 Explosive View and Parts List **95**
Appendixes **97**
Appendix 1 Temperature Senor Resistance and Temperature Relationship Table **97**
Appendix 2 Refrigerant Temperature and Pressure Table **104**
Appendix 3 Pressure Sensor Voltage and Pressure Table **105**
Appendix 4 Electric Specifications **109**
Appendix 5 Circuit Diagram **111**
Appendix 6 Schematic Diagram **112**
Appendix 7 Names and Functions of Components **113**
Appendix 8 YAP1F Remote Special Functions **114**

Preface

Thank you for purchasing Ultra Heat GMV6 Mini DC Inverter VRF Units. For correct operation, please read this manual carefully.

This manual applies to Ultra Heat GMV6 Mini DC Inverter VRF Units. It clarifies the safety requirements, basic principles and implementation methods in engineering commissioning, troubleshooting, and after-sales maintenance. Relevant professionals must follow the national (local) safety and technical requirements as well as this manual. Failure to do so may result in improper functioning or damage to the air conditioning system, or even personal injury.

Safety Instructions

Warning symbols

Symbols in this document indicate different severities and possibilities.

DANGER!

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING!

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

CAUTION!

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. Or indicates an unsafe behavior.

NOTES!

Indicates a situation which could result in equipment or property loss.

INFO

Indicates helpful tips or additional information.

JUMP

Indicates a jump connection.

Chapter 1 Product

1 Unit List

1.1 Models

Ton	Product Code	Model	Power	External view
3	CN851W4090	GMV-V36WL/C-T(U)	208/230V ~60Hz	
4	CN850W1220	GMV-V48WL/C-T(U)	208/230V ~60Hz	
5	CN850W1210	GMV-V60WL/C-T(U)	208/230V ~60Hz	

2 Parameters

2.1 Parameters of Models

Model			GMV-V36WL/C-T(U)	GMV-V48WL/C-T(U)	GMV-V60WL/C-T(U)
Capacity	Cooling	Btu/h	36000	48000	60000
		W	10600	14100	17600
	Heating	Btu/h	36000	48000	60000
		W	10600	14100	17600
Minimum Circuit Ampacity		A	33.8	38.8	38.8
Maximum Overcurrent Protection		A	35	40	40
Power supply		-	208/230V ~60Hz	208/230V ~60Hz	208/230V ~60Hz
Air volume		m^3/h	6000	6600	6600
		CFM	3531	3885	3885
Sound pressure level		dB(A)	50	52	55
Compressor type		-	Inverter Rotary	Inverter Rotary	Inverter Rotary
Compressor quantity		N	1	1	1
Refrigerant oil model		-	FW68L(FW68DA)	FW68L(FW68DA)	FW68L(FW68DA)
Refrigerant type		-	R410A	R410A	R410A
Refrigerant charge		kg	4.0	4.0	4.4
		LBS	8.8	8.8	9.7
Max. number of connectable IDUs		unit	7	8	10
Gas pipe		mm	Φ15.9	Φ15.9	Φ19.05
		inch	Φ5/8	Φ5/8	Φ3/4
Liquid pipe		mm	Φ9.52	Φ9.52	Φ9.52
		inch	Φ3/8	Φ3/8	Φ3/8
Outline dimensions (W × D × H)		mm	900×340×1345	900×340×1345	900×340×1345
		inch	35-3/8×13-3/8×53	35-3/8×13-3/8×53	35-3/8×13-3/8×53
Packing dimensions (W × D × H)		mm	993×453×1500	993×453×1500	993×453×1500
		inch	39-1/4×18×59-1/16	39-1/4×18×59-1/16	39-1/4×18×59-1/16
Net weight/Gross weight		kg	113/124	113/124	113/124
		LBS	250/270	250/270	250/270

Note:

① Sound Pressure Level: Anechoic chamber conversion value, measured in a semi-anechoic room. During actual operation, the value may be higher due to ambient noise and echoes of the installation conditions.

② The total capacity of connected indoor units must be in the range of 50%~135% of the outdoor unit capacity. The relevant parameters can be corrected by referring to the unit capacity correction table.

③ The above parameters are tested based on the standard connection pipe length. In the actual project, the parameters should be corrected referring to the capacity correction for the long connection pipe of units.

④ Specifications may be changed due to product improvement. Please refer to nameplates of the units.

3 Temperature Operating Range

—	Cooling	Heating
Ambient temperature	-18℃*~54℃DB(0*~129°F)	-30℃~27℃DB(-22~81°F)
Indoor temperature	14℃~25℃WB(57~77°F)	15℃~27℃DB(59~80°F)
Indoor humidity	≤80%	

***Note:** Cooling at -18~ -5℃(0~23°F) is conditional. Please inquire our engineers for more information. Generally, the lowest operating temperature for cooling is -5℃(23°F).

When the indoor units are all VRF fresh air processor, the unit operating range is as follows:

Cooling	Ambient temperature: 16℃(60.8℉)~45℃(113℉)
Heating	Ambient temperature: -7℃(19.4℉)~16℃(60.8℉)

NOTE!

If exceeding the temperature range for working, the product may be damaged, which is not within the warranty range.

Chapter 2 Commissioning

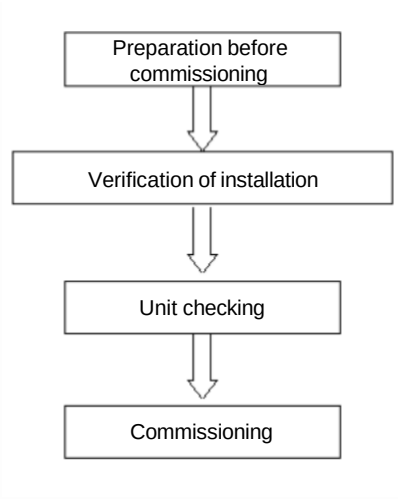
WARNING!

Before performing operations (such as commissioning, maintenance, and repair) on the device, you need to shut down the unit and cut off the power and use a relevant instrument to ensure that the voltage at the power input terminal is zero, and the power indicator on the main board is off. Otherwise, an electric shock or injury may be caused.

NOTE!

The unit features a low-power standby function. When the unit is standby, the power indicators on the main control board and the drive board are on.

1 Commissioning Process



2 Safety Requirements

WARNING!

Safety measures must be taken for outdoor operations. All involved commissioning personnel and maintenance personnel must master the building construction safety regulations and strictly follow them.

Special workers like refrigeration workers, electricians, and welders must hold special work licenses and cannot work on other posts.

When the device is operated, the power of the entire system must be cut off, and the equipment safety requirements must be strictly followed.

All installation and maintenance operations must comply with the product design requirements and national and local safety requirements.

It is strictly forbidden to directly connect the compressor to the power.

3 Unit Commissioning

3.1 Preparation

3.1.1 Tools

Name	Picture
Screwdrivers	
Wrench	
Hex key tool	
Pliers	
Vacuum pump	
Electronic balance	
Pressure gauge	
Multimeter	

3.1.2 Files

To record the installation and commissioning of the unit, all the following documents need to be prepared: minutes of the pre-commissioning scheme determining meeting, commissioning personnel record form, pre-commissioning checklist, commissioning data record form, and commissioning report.

Minutes of the commissioning scheme determining meeting:

Minutes of the commissioning scheme determining meeting for XXX project:
Theme: xxx
Date: xxx
Place: xxx
Participants: xxx
Details: xxx
1
2
3

Checklist of the commissioning system appearance:

Checklist of the equipment appearance of xxx air-conditioning project				
Item		Defect	Inspector	Time
Refrigerating system	Outdoor unit appearance			
	Indoor unit appearance			
	Copper pipe insulation			
Drainage system	Condensate water pipe insulation			
Electrical system	Power cable diameter			
	Power cable layout			
	Air circuit breaker			
Communication system	Communication cable material			
	Communication cable connection			

Commissioning data record form

Project name:				Unit model:	
Debugger:				Date:	
Rated capacity of the outdoor unit (kW):		Rated capacity of the indoor unit (kW):		Total length of the refrigerant pipe (m):	
Maximum drop between the indoor unit and outdoor unit (m):		Supplemented refrigerant (kg):			
Commissioning status: □ Cooling □ Heating Qty and capacity of indoor units:					
Status Parameter		Unit	Before Startup	30 min	60 min
Status parameters of the outdoor unit	Outdoor ambient temperature	℃			
	Power voltage	V			
	Frequency	Hz			
	Compressor current	A			
	Discharge temperature	℃			
	High system pressure	℃			
	Low system pressure	℃			
	...				
Parameters of indoor unit 1#	Rated capacity	kW			
	Ambient temperature	℃			
	Air position	Position			
	Temperature at the air outlet	℃			
	Outlet airflow	M/S			
	Noise	dB			
	Drainage pan	—			
Parameters of indoor unit 2#	Rated capacity	kW			
	Ambient temperature	℃			
	Air position	Position			
	Temperature at the air outlet	℃			
	Outlet airflow	M/S			
	Noise	dB			
	Drainage pan	—			

3.2 Check Items after Installation and Test Operation

3.2.1 Check Items after Installation

Check items	Possible conditions due to improper installation	Check
Each part of the unit is installed securely?	Unit may drop, shake or emit noise.	
Gas leakage test is taken or not?	Insufficient cooling (heating) capacity.	
Unit gets proper thermal insulation or not?	There may be condensation and dripping.	
Drainage is smooth or not?	There may be condensation and dripping.	
Is the voltage in accordance with the rated voltage specified on the nameplate?	Unit may have malfunction or components may get damaged.	
Is the electric wiring and pipe connection installed correctly?	Unit may have malfunction or components may get damaged.	
Unit is securely grounded or not?	Electrical leakage.	
Power cord meets the required specification?	Unit may have malfunction or components may get damaged.	
Is the air inlet/outlet blocked?	Insufficient cooling (heating) capacity.	
Length of refrigerant pipe and the charging amount of refrigerant are recorded or not?	The refrigerant charging amount is not accurate.	
Binding pieces on compressor feet are removed or not?	Compressor may get damaged.	

3.2.2 Test Operation and Debugging

NOTICE
(1) After finishing the first installation or replacing the main board of outdoor unit, it is necessary to perform test operation and debugging. Otherwise, unit won't be able to work.
(2) Test operation and debugging must be performed by professional technicians or under the guidance of professional technicians.

3.2.2.1 Prepare the Test Operation and Debugging

(1) Do not connect power until all installation work is finished.

(2) All control circuits and wires are correctly and securely connected.

(3) Check whether unit's appearance and pipeline system has been damaged during transportation.

(4) Calculate the quantity of refrigerant that needs to be added according to the pipe length. Pre-charge the refrigerant. In case that the required charging quantity is not reached while refrigerant can't be added, record the quantity of refrigerant that still needs to add and complement the quantity during test operation. For details of adding refrigerant during test operation, see below.

(5) After refrigerant is added, make sure valves of outdoor unit are completely open.

(6) For the convenience of troubleshooting during debugging, unit shall be connected to a PC with applicable debugging software. Make sure unit's real-time data can be checked through this computer. The installation and connection of debugging software can be found in the Service Manual.

(7) Before test operation, make sure unit is power on and compressor has been preheated for more than 8 hours. Touch the unit to check whether it's normally preheated. If yes, start test operation. Otherwise, the compressor might be damaged.

3.2.2.2 Test Operation and Debugging

Description of test operation procedures and main board display of ODU

Description of each stage of debugging progress			
—	Debugging code		Code meaning and operation method
Progress	LED		
	Code	Display status	
01_Set master unit	A0	ON	System is not debugged, hold main board's SW3 button for 5s to start debugging.
	01	ON	2s later, next step starts.
02_ Allocate addresses	02/Ad	Display circularly	The system is allocating addresses. 10s later, display as below:
	02/L7	Display circularly	No master indoor unit. Display will be on for 1min, during which master IDU can be set manually. If not, system will set the unit with minimum IP address as the master IDU.
	02/oC	Display circularly	Allocation is finished. 2s later, next step starts.
03_ Confirm the quantity of ODU	03/01	Display circularly	System is confirming. 1s later, next step starts.
04_ Confirm the quantity of IDU	04/00~16	Display circularly	"00~16" displays the quantity of indoor unit. Confirm the number manually. If the number is not consistent with the display one, cut off power of IDU and ODU and check whether communication wire of IDU is correctly connected. After the check, connect power and start debugging from progress 01. If the number is then correct, press main board's SW3 button to confirm. Then the display is as below.
	04/oC	Display circularly	System has confirmed the quantity. 2s later, next step starts.
05_ Detect ODU's internal communication and capacity ratio	05/C2	Display circularly	Communication between master ODU and driver has error. Check the communication connection of ODU's main board and drive board. When the error is eliminated, start the next step. If power is off during troubleshooting, then restart debugging from progress 01 after power is on.
	05/oC	Display circularly	Communication of master ODU and driver is normal. The unit will display as in the left for 2s and detect the capacity ratio of IDU and ODU. If the ratio is within range, then the next step will start 2s later. If the ratio is out of range, unit will display as below.
	05/CH	Display circularly	Rated capacity ratio of IDU is too high. Change the combination way of IDU and ODU to make the ratio within range. And restart debugging from progress 01.
	05/CL	Display circularly	Rated capacity ratio of IDU is too low. Change the combination way of IDU and ODU to make the ratio within range. And restart debugging from progress 01.

Description of each stage of debugging progress			
—	Debugging code		Code meaning and operation method
Progress	LED		
	Code	Display status	
06_ Detect outdoor components	06/error code	Display circularly	Outdoor component's error. Besides "06", the other blinking will display the related error code. After errors are eliminated, the system will start next step automatically. If power is off during troubleshooting, then restart debugging from progress 01 after power is on.
	06/oC	Display circularly	System detects no error on outdoor component. 10s later, next step starts.
07_ Detect indoor components	07/XX/error code	Display circularly	System detects error on indoor components. XX means the project code of IDU with error, e.g. no.1 IDU has d5 and d6 errors, meanwhile no.3 IDU displays error d6 and d7, then the LED will display "07", "01", "d5", "d6"and "03" circularly. After errors are eliminated, the system will start next step automatically. If power is off during troubleshooting, then restart debugging from progress 01 after power is on.
	07/XXXX/error code	Display circularly	If errors occur in IDU which the project code is ≥ 3-digit number, then it will display the 2 big digits of project code first, then the 2 small digits, finally the error code, e.g: L1 error occurs in no.101 IDU, then the LED will display "01","01" and "L1" circularly. Display method is the same for several IDUs with multiple errors.
	07/oC	Display circularly	No error on components of IDU. 5s later, next step starts.
08_ Confirm preheated compressor	08/U0	Display circularly	Preheat time for compressor is less than 8 hours. Display will be as in the left until the preheat time reaches 8 hours. Press main board's SW3 button to confirm manually that the preheat time has reached 8 hours. Then start next step. (NOTE: Compressor may get damaged if it is started without 8 hours of preheat time)
	08/oC	Display circularly	The compressor has been preheated for 8 hours. 2s later, next step starts.
09_ Refrigerant judgments before startup	09/U4	Display circularly	The system lacks refrigerant, and display will be as in the left. Please cut off the power of IDU and ODU and check if there is leakage on pipeline. Solve the leakage problem and complement refrigerant into the unit. Then connect power and restart debugging from progress 01. (Note: Before re-charging refrigerant, unit must be power off in case system starts progress 10 automatically).
	09/oC	Display circularly	Refrigerant is normal and unit will display as in the left for 2s. Then next step starts.
10_Status judgments of outdoor valves before startup	10/on	Display circularly	The values of ODU are being inspected. Compressor will start operation for 2min or so and then stop. The opening and closing status of outdoor valves are as below.
	10/U6	Display circularly	Outdoor valves are not fully turned on. Press main board's SW4 button and display shows "09/OC". Then check if the gas and liquid valves of ODU are completely open. After confirmation, press the SW4 button again. Then compressor will start running for about 2min to inspect the status of valves.
	10/oC	Display circularly	Valves status is normal. Unit will display as in the left for 2s and then start next step.

Description of each stage of debugging progress			
—	Debugging code		Code meaning and operation method
Progress	LED		
	Code	Display status	
12_ Confirm debugging startup	12/AP	Display circularly	Ready for units to start debugging. Press main board's SW3 button to confirm startup of debugging. 2s later, main board will display as below.
	12/AE	Display circularly	Startup is confirmed. After displaying for 2s, the system will choose "15_Cooling debugging" or "16_Heating debugging" according to ambient temperature. If the project requests to add refrigerant but it is not complemented before debugging, then refrigerant can be added in this process through the L-VALVE.
15_ Cooling debugging	15/AC	Display circularly	Debugging for cooling mode. If no malfunction occurs for 50min when compressor is running, then the system is certified as normal. After shutting down the unit for 5s, the system will enter normal standby status.
	15/error code	Display circularly	Malfunction occurs when debugging for cooling mode.
16_ Heating debugging (For heat pump units only)	16/AH	Display circularly	Debugging for heating mode. If no malfunction occurs for 50min when compressor is running, then the system is certified as normal. After shutting down the unit for 5s, the system will enter normal standby status.
	16/error code	Display circularly	Malfunction occurs when debugging for heating mode.
17_ Debugging finished	oF	ON	The entire unit has finished debugging and under standby-by condition.

NOTE!

In commissioning status and before the above commissioning processes are completed, when the SW1 up button and SW4 back button are pressed for over 5 seconds, the system enters non-wired-controller commissioning mode, and no longer detects the communication status between the wired controller and indoor units.

Once the debugging for the complete unit is finished, please set relevant functions for the unit according to the actual functional requirements of the project. Refer to relative technical materials for the detailed operation method. If there is no special requirement, skip this step directly.

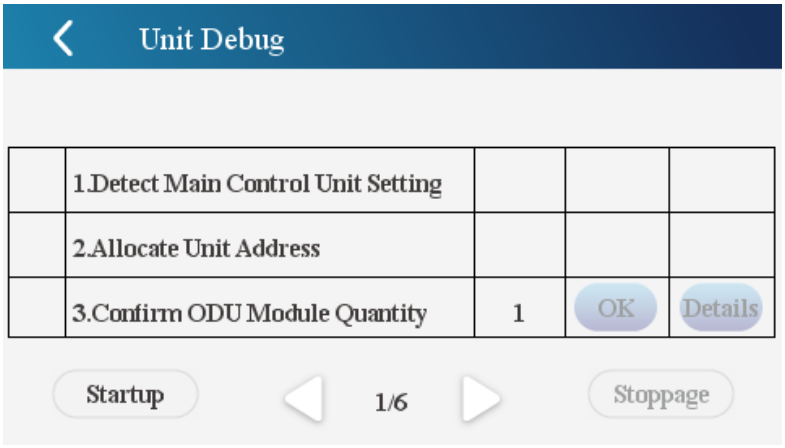
When delivering it to the user for operation, explain the precautions to the user.

3.2.4 Unit Commissioning by Using Multi-functional Debugger

Step 1: Connect multi-functional debugger. For details, see the user manual of multi-functional debugger.

Step 2: Click **Unit Debug** on the home page to enter the commissioning page.

Step 3: On the commissioning page, click **Startup** to start commissioning or click **Stoppage** to stop commissioning.



Step 4: During commissioning, multi-functional debugger shows the current process (step). In steps 3, 4, 8, and 12, click Confirm to go to the next step. In step 10, click Skip or Back. In steps 3, 4, 5, 6, and 7, you can view the details.

Step 5: After the commissioning, the outdoor unit displays "OF" (or a fault, if any, or "on" when the unit is started up).

Warning:

After the product is used, the cable connection of the air-conditioner unit must be recovered. Otherwise, the actual use will be affected.

3.2.5 After Commissioning

Organize and save the data. Make complete and detailed records of exceptions and corresponding solutions in the commissioning process for future maintenance and query. Finally, export the commissioning report and hand it over to the user.

After the commissioning, instruct the user of the following precautions:

When the outdoor unit is continuously powered off for more than 24 hours, it must be warmed up for at least 8 hours to avoid damage to the compressor.

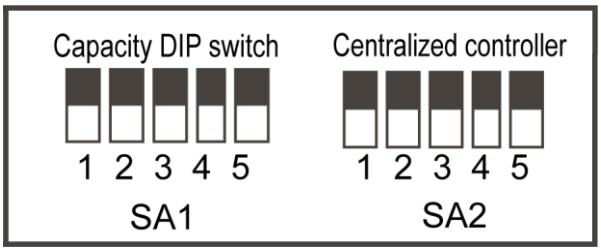
3.2.6 Reference Values of Unit Normal Operation Parameters (Commissioning Check)

No.	Debug item		Parameter name	Unit	Reference
1	System parameters	ODU parameters	Outdoor temperature	°C(°F)	—
2			Compressor discharge temperature	°C(°F)	● When compressor starts, discharge temp in cool mode is within 70~105°C(158~221°F) and at least 10°C(50°F) higher than the high-pressure saturation temperature. ● As for temp in heat mode, it is within 65~90°C(149~194°F) and at least 10°C(50°F) higher than the high-pressure saturation temperature.
3			Defrosting temperature	°C(°F)	● In cool mode, the defrosting temperature is 4~10°C(39~50°F) lower than system's high-pressure value. ● In heat mode, defrosting temperature is about 2°C(36°F) different from system's low pressure value.
4			System high pressure	°C(°F)	● In cool mode, the normal high-pressure value is within 20~55°C(68~131°F). According to the change of ambient temperature and system's operating capacity, the high-pressure value will be 10~30°C(50~86°F) higher than ambient temperature. The higher the ambient temperature is, the smaller temperature difference is. If ambient temp is 25~35°C(77~95°F) in cool mode, system's high-pressure value will be within 44~53°C(111~127°F). ● In heat mode, if ambient temperature is above -5°C(23°F), system's high-pressure value is within 40~52°C(104~126°F). If ambient temperature is low and many IDUs are turned on, the high pressure will be lower.
5			System low pressure	°C(°F)	● When ambient temperature in cool mode is 25~35°C(77~95°F), the low-pressure value is 0~8°C(32~46°F). ● When ambient temperature in heat mode is above -5°C(23°F), the low-pressure value is -15~8°C(5~46°F).
6			Opening degree of thermal EXV	PLS	● In cool mode, the thermal electronic expansion valve remains 480PLS. ● In heat mode, the adjustable opening degree of EXV is 60~480PLS.
7			Compressor's operating frequency	Hz	Changes in 15Hz~120Hz.
8			Compressor's operating current	A	When compressor works normally, the current is no more than 18A.
9			Compressor's IPM temperature	°C(°F)	When ambient temperature is below 35°C(95°F), IPM temp is lower than 80°C(176°F) and the highest temperature won't be above 95°C(203°F).
10			Fan motor's operating frequency	Hz	Changes in 0~50Hz according to system's pressure.

No.	Debug item		Parameter name	Unit	Reference
11	System parameters	IDU parameters	IDU ambient temperature	°C(°F)	—
12			Indoor heat exchanger's inlet temperature	°C(°F)	● According to ambient temperature, for a same IDU in cool mode, the inlet temp will be 1~7°C(34~45°F) lower than the outlet temperature, and 4~9°C(39~48°F) higher than the low-pressure value. ● For a same IDU in heat mode, the inlet temperature will be 10~20°C(50~68°F) lower than the outlet temperature.
13					
14			Opening degree of indoor EXV	PLS	● In cool mode, the opening degree of indoor EXV varies within 50~480PLS. ● In heat mode, the opening degree of indoor EXV varies within 35~480PLS.
15	Communication parameters		Communication data	—	The number of IDUs detected by software is the same as the actual number. No communication error.
16	Drainage system		—	—	Indoor unit can drain water out completely and smoothly. Condensate pipe has no backward slope of water; Water of outdoor unit can be drained completely through drainage pipe. No water drop from unit base.
17	Others		—	—	Compressor and indoor/outdoor fan motor do not have strange noise. Unit can operate normally.

4 Unit Function Settings

4.1 DIP Switch Settings



Code	Name	Meaning	Default Setting	Remarks
SA1_capacity	Capacity DIP switch	Defines the rated capacity of the unit.	Depending on the model	The DIP switch is set by the factory and cannot be changed.
SA2_Addr-CC	Address DIP switch for centralized control	Defines and distinguishes addresses of different systems for centralized control of multiple systems.	00000	The code is used only for centralized control. Otherwise, keep the default setting. This address can be set only on the master unit.

NOTES!

① The function DIP switches must be set when the outdoor unit is powered off. A DIP switch setting takes effect after the unit is re-powered on.

② SA1 DIP Are the Capacity dip switches only need adjustment for board replacement.

4.1.1 Unit Capacity DIP Switch (SA1_capacity)

This DIP switch is set by the factory before shipment, Do not adjust these unless the main board is replaced then adjust them the same as the original board. Otherwise, the system will work abnormally and could damage the compressor.

SA1					
1	2	3	4	5	Capacity
0	0	1	0	0	36K
0	0	1	0	1	48K
0	1	0	0	0	60K

4.1.2 Address DIP Switch for Centralized Control (SA2_Addr-CC)

This DIP switch indicates the address for centralized control of different refrigerating systems. It is set to 0000× by default.

If centralized control is not required between multiple refrigerating systems, keep the default setting of this DIP switch.

If centralized control is required between multiple refrigerating systems, set as follows:

(1) Be sure to set the DIP switch on the master unit.

(2) Setting this DIP switch on non-master units in a refrigerating system is invalid and unnecessary.

(3) Be sure to set the address DIP switch for centralized control (SA2_Addr-CC) on the master unit of a refrigerating system to "0000x". Then, this system is the main system.

(4) Set the address DIP switch for centralized control (SA2_Addr-CC) on the master units of other refrigerating systems as follows:

SA2					Address No.
DIP1	DIP2	DIP3	DIP4	DIP5	
1	0	0	0	×	2
0	1	0	0	×	3
1	1	0	0	×	4
0	0	1	0	×	5
1	0	1	0	×	6
0	1	1	0	×	7
1	1	1	0	×	8
0	0	0	1	×	9
1	0	0	1	×	10
0	1	0	1	×	11
1	1	0	1	×	12
0	0	1	1	×	13
1	0	1	1	×	14
0	1	1	1	×	15
1	1	1	1	×	16

Note:

① DIP switch at the ON end indicates 0;

② DIP switch at the other end indicates 1;

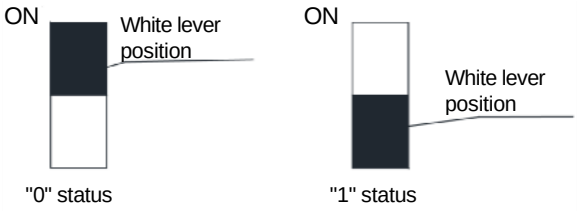
③ × indicates invalid.

(5) This DIP switch of different refrigerating systems cannot be set the same. Otherwise, an address conflict will occur and the unit will not operate.

4.1.3 DIP switch position description

DIP switch at the ON end indicates 0; DIP switch at the other end indicates 1.

The white lever is DIP switch position.



4.2 System Function Operations

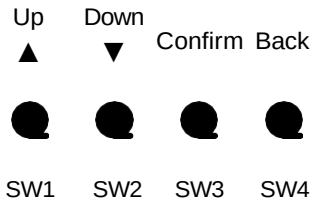
CAUTIONS!

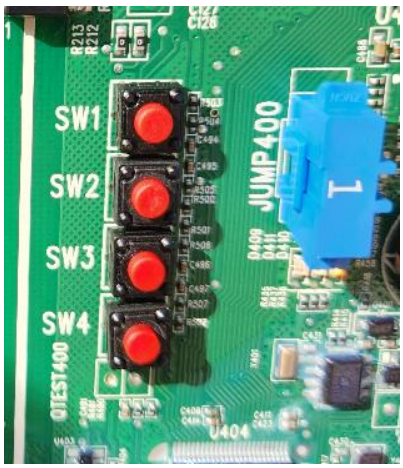
① System function settings and queries must be performed after the entire system is commissioned.

② System function settings and queries can be performed regardless of whether the entire system is running or not.

4.2.1 Function Buttons

There are four function buttons on the main board of the outdoor unit, as shown below:





Names and Functions of the Buttons		
Button No.	Code	Function
SW1	Up	Selects the upper item.
SW2	Down	Selects the lower item.
SW3	Confirm	Confirms the selection.
SW4	Back	Returns to the previous operation.

4.2.2 Function Description

Function Code	Function Name	Description	Default Setting		Remarks
			Code	Meaning	
A2	Refrigerant recycle (pump down)	This function is automatically started during maintenance. Based on the system pressure change, this function recycles all or partial refrigerant of the faulty module or the indoor unit pipeline.	—	—	This function can only be set.
A6	Cooling/heating of the entire system	The unit can be set to cooling and heating, cooling only, heating only, or fan mode for centralized management.	nA	Cooling and heating	This function can be set and queried.
A7	Outdoor silence mode	This function sets different silence modes based on the user's needs.	00	No silence	This function can be set and queried.
A8	After-sales vacuum pumping mode	During maintenance, the system automatically turns on all electronic expansion valves and solenoid valves to ensure that all lines can be vacuumed.	—	—	This function can only be set.
n0	Auto energy saving	This function can automatically reduce power consumption of the unit based on system operating parameters.	01	Capability priority control	This function can be set and queried.
n3	Forced defrosting	This function forcibly enables defrosting of the outdoor unit of the system.	—	—	This function can only be set.
n4	Forced energy saving	This function forcibly reduces the maximum power consumption of the unit.	10	100% capability output	This function can be set and queried.
n5	Indoor unit engineering SN offset	When different refrigerating systems are controlled in a centralized manner, this function avoids the conflict of indoor unit engineering numbers.	—	—	This function can only be set.
C9	Fan emergency setting	—	00	Normal operation of the fan	—

4.2.3 Function Operations

Before setting every function, perform the following steps to select the function you want to set. The following premise steps will not be repeated.

Premise steps for function setting:

Step 1: Power on the entire system.

Step 2: Press and hold the SW1 up button on the unit for over 5 seconds. The system enters the function setting status. The unit displays as follows by default.

LED1	
Function code	Display status
A7	Blinks

Press the SW1 up button and the SW2 down button on the unit to select the corresponding function/parameter:

LED1		Function Name
Function code	Display status	
A7	Blinks	Outdoor unit silence
A6	Blinks	Cooling/heating of the entire system
A2	Blinks	Refrigerant recycle (pumpdown)
A8	Blinks	After-sales vacuum pumping
n0	Blinks	Auto energy saving
n3	Blinks	Forced defrosting
n4	Blinks	Forced energy saving
n5	Blinks	Indoor unit engineering SN offset
C9	Blinks	Fan emergency setting

After selecting the function to be set, press the SW3 confirm button to enter the function setting. The unit displays as follows:

Display step1		Display step2		Function Name
LED1		LED1		
Function code	Display status	Current process	Display status	
A7	Blinks	00	Blinks	Outdoor unit silence
A6	Blinks	00	Blinks	Cooling/heating of the entire system
A2	Blinks	00	Blinks	Refrigerant recycle (pumpdown)
A8	Blinks	00	On	After-sales vacuum pumping
n0	Blinks	01	Blinks	Auto energy saving
n3	Blinks	00	On	Forced defrosting
n4	Blinks	00	Blinks	Forced energy saving
n5	Blinks	00	On	Indoor unit engineering SN offset
C9	Blinks	00	Blinks	Fan emergency setting

Then, set the function/parameter accordingly.

After entering the function/parameter setting status, press the SW4 back button to return to the previous process or exit the function setting status. If you do not press any button in 5 minutes, the system will automatically exit the current screen, and the unit will resume displaying the current status.

4.2.3.1 **"A2" Refrigerant Recycle** (Pumpdown): **Introduction**

This function is mainly used to recycle some refrigerant in the fault module and indoor unit pipeline during unit maintenance. The table below lists the maximum amount of refrigerant that can be recycled:

GMV6	Refrigerant (oz./lbs.)
GMV-36WL/C-T(U)	158.7/9.92
GMV-48WL/C-T(U)	158.7/9.92
GMV-60WL/C-T(U)	172.8/10.8

After entering refrigerant recycle, the outdoor unit automatically starts and recycles the refrigerant to the pipeline of the outdoor unit or indoor unit.

Setting steps

Step 1: Enter A2 refrigerant recycle, and ensure that the outdoor unit displays as follows:

LED1	
Current process	Display status
01	Blinks

Step 2: When the default value 01 is displayed, press the SW1 up button and the SW2 down button to select the corresponding recycle mode. Press SW3 to confirm the selected mode.

Press the SW4 back button on the master module to return to the previous process or exit the function setting status.

If you do not press any button in 5 minutes, the system will automatically exit the current screen and the unit will resume displaying the current status.

Indoor unit pipeline refrigerant recycle (Pumpdown):

Step 3: Select 01 in step 2 to enter indoor unit pipeline refrigerant recycle. The LED1 of outdoor unit display as follows:

LED1	
Current status	Display status
[Module low pressure Ps]	On

LED1 shows the low-pressure value of the module. If it is negative, LED1 circularly displays negative value code "nE" and the numerical value every 1 second. For example, for –30, LED3 circularly displays nE for 1 second, and 30.

Step 4: When the system prompts for manual operation of refrigerant recycle, press SW3 on the master unit to confirm refrigerant recycle. The entire system will stop immediately, and cannot be restarted in 10 minutes. After 10 minutes, the system will exit refrigerant recycle and enter standby status.

Then, press the SW4 back button to return to the previous process to resume the standby status of the entire system. (During setting, press SW4 to return to the previous process. If the setting is completed, press SW4 to resume the unit to the current normal working status.)

Note: After refrigerant recycle, the system cannot be restarted within 10 minutes.

4.2.3.2 "A6" **Cooling/Heating of the Entire System**

Introduction:

This function sets the cooling/heating mode of the entire system. Available modes include:

Outdoor Unit Function Mode		Available Indoor Unit Operation Modes
Code	Name	
nA	Cooling and heating	Cooling, dry, heating, and fan (Note: Heating mode cannot run with other modes at the same time.) (Default setting)
nC	Cooling only	Cooling, dry, and fan
nH	Heating only	Heating and fan (Note: Heating mode cannot run with other modes at the same time.)
nF	Fan	Fan

The user or administrator needs to set the mode of the outdoor unit based on the actual usage to avoid conflicts.

Setting steps:

Step 1: Enter A2 refrigerant recycle, and ensure that the outdoor unit displays as follows:

LED1	
Current process	Display status
01	Blinks

Step 2: When the default value 01 is displayed, press the SW1 up button and the SW2 down button to select the corresponding recycle mode. Press SW3 to confirm the selected mode.

Press the SW4 back button on the master module to return to the previous process or exit the function setting status.

If you do not press any button in 5 minutes, the system will automatically exit the current screen and the unit will resume displaying the current status.

Indoor unit pipeline refrigerant recycle (Pumpdown):

Step 3: Select 01 in step 2 to enter indoor unit pipeline refrigerant recycle. The LED1 of outdoor unit display as follows:

LED1	
Current status	Display status
[Module low pressure Ps]	On

LED1 shows the low-pressure value of the module. If it is negative, LED1 circularly displays negative value code "nE" and the numerical value every 1 second. For example, for –30, LED3 circularly displays nE for 1 second, and 30.

Step 4: When the system prompts for manual operation of refrigerant recycle, press SW3 on the master unit to confirm refrigerant recycle. The entire system will stop immediately, and cannot be restarted in 10 minutes. After 10 minutes, the system will exit refrigerant recycle and enter standby status.

Then, press the SW4 back button to return to the previous process to resume the standby status of the entire system. (During setting, press SW4 to return to the previous process. If the setting is completed, press SW4 to resume the unit to the current normal working status.)

Note:

After refrigerant recycle, the system cannot be restarted within 10 minutes.

4.2.3.3 "A6" **Cooling/Heating of the Entire System**

Introduction:

This function sets the cooling/heating mode of the entire system. Available modes include:

Outdoor Unit Function Mode		Available Indoor Unit Operation Modes
Code	Name	
nA	Cooling and heating	Cooling, dry, heating, and fan (Note: Heating mode cannot run with other modes at the same time.) (Default setting)
nC	Cooling only	Cooling, dry, and fan
nH	Heating only	Heating and fan (Note: Heating mode cannot run with other modes at the same time.)
nF	Fan	Fan

The user or administrator needs to set the mode of the outdoor unit based on the actual usage to avoid conflicts.

Setting steps:

Step 1: Enter A6 cooling/heating setting of the entire system, and ensure that the outdoor unit displays as follows:

LED1	
Current process	Display status
nC	Blinks

Step 2: Press the SW1 up button and the SW2 down button to select the corresponding cooling/heating mode.

LED1	
Current process/mode	Display status
nC	Blinks
nH	Blinks
nA	Blinks
nF	Blinks

Step 3: After selecting the mode, press the SW3 confirm button. The outdoor unit displays as follows:

LED1	
Current process/mode	Display status
nC	On
nH	On
nA	On
nF	On

Press the SW4 back button on the outdoor unit to return to the previous process or exit the function setting status.

The outdoor unit memorizes this setting and does not clear it even upon power failure and power-on again. The default value is nA cooling and heating mode.

4.2.3.4 A7 **Outdoor Silence Mode**

Introduction:

This function is mainly used in scenarios where the user requires low ambient noise. Smart night silence mode and forced silence mode are available.

In smart night silence mode, need to set timer of outdoor units.

to ensure low-noise operation at night. Smart night silence mode has nine options:

Silence Mode	Code
Mode 1	01
Mode 2	02
Mode 3	03
Mode 4	04
Mode 5	05
Mode 6	06
Mode 7	07
Mode 8	08
Mode 9	09

Note:

In forced silence mode, the system operates in low-noise mode regardless of day or night. This mode has three options:

Silence Mode	Code
Mode 10	10

Silence Mode	Code
Mode 11	11
Mode 12	12
Mode 13	13

Note:

After a silence mode is set, the system capability will be attenuated. Therefore, the noise and the capability need to be balanced when a silence mode is selected.

No silence is set by default, that is, "00" status.

Setting steps:

Step 1: Enter A7 outdoor silence mode, and ensure that the master module displays as follows:

LED1	
Silence mode code	Display status
00	Blinks

Step 2: Press the SW1 up button and the SW2 down button to select the corresponding silence mode.

LED1	
Silence mode code	Display status
00	Blinks
01	Blinks
02	Blinks
03	Blinks
04	Blinks
05	Blinks
06	Blinks
07	Blinks
08	Blinks
09	Blinks
10	Blinks
11	Blinks
12	Blinks
13	Blinks

Step 3: After selecting the corresponding silence mode, press the SW3 confirm button. The outdoor unit displays as follows:

LED1	
Silence mode code	Display status
00	On
01	On
02	On
03	On
04	On
05	On
06	On
07	On
08	On
09	On
10	On
11	On
12	On
13	On

Press the SW4 back button on the master module to return to the previous process or exit the function setting status.

The default status is 00, that is, no silence.

4.2.3.5 **A8 Vacuum Mode**

Introduction:

This function is used to ensure the vacuum of the entire system during maintenance and to avoid dead pipeline zones. When this function is set, both the expansion valve and the solenoid valve of the unit will open.

Setting steps:

Step 1: Enter A8 vacuum mode, and ensure that the master module displays as follows:

LED1	
Current process	Display status
00	Blinks

The system enters the to-be-confirmed status of vacuum pumping mode.

Step 2: Press the SW3 button. The system enters the confirmed status of vacuum pumping mode, and all modules display as follows:

LED1	
Function code	Display status
A8	On

At this time, the expansion valves of all indoor and outdoor units are open, and the entire system cannot be started.

When you press the SW4 back button on the master unit for over 5 seconds or the vacuum pumping status remains for 24 hours, the entire system exits the status.

4.2.3.6 n0 **Auto Energy Saving**

Introduction:

This function sets the user-required energy saving mode. The default mode is capability priority control.

After energy saving mode is set, the system capability will deteriorate.

Code	Function Name
01	Capability priority control (default setting)
02	Energy saving priority control

Setting steps:

Step 1: Enter n0 system energy saving operation, and ensure that the outdoor unit displays as follows:

LED1	
Current process/mode	Display status
01	Blinks

Step 2: Press the SW1 up button and the SW2 down button to select the corresponding mode.

LED1	
Current process/mode	Display status
01	Blinks
02	Blinks

Step 3: After selecting the mode, press the SW3 confirm button. The outdoor unit displays as follows:

LED1	
Current process/mode	Display status
01	On
02	On

If you do not press any button on the outdoor unit in 5 minutes, the system will automatically exit the current screen, and the unit will resume displaying the current status. (During setting, press SW4 to return to the previous process. If the setting is completed, press SW4 to resume the unit to the current normal working status.)

4.2.3.7 n3 **Forced Defrosting**

Introduction:

This function is used when forced defrosting is required during unit maintenance. After entering forced defrosting, the system automatically exits according to the exit conditions, and then automatically runs according to the system conditions.

Setting steps:

Step 1: Enter n3 forced defrosting, and ensure that the outdoor unit displays as follows:

LED1	
Current process/mode	Display status
00	Blinks

Step 2: Press the SW3 confirm button. The outdoor unit displays as follows:

LED1	
Function code	Display status
n3	On

If the defrosting condition is not met, the outdoor unit the set mode. If the setting is completed, press SW4 to resume the unit to the current normal working status.

When the defrosting exit condition is met, the system automatically exits and resumes normal running control.

4.2.3.8 n4 **Forced Energy Saving Mode**

Introduction:

The maximum output capability limit is used in scenarios where the user needs to forcibly limit the system power consumption. Available functions are as follows:

Code	Maximum Output Capability
10	100% (default setting)
09	90%
08	80%

Note:

After the capability limit is set, the cooling or heating effect is correspondingly reduced.

Setting steps:

Step 1: Enter n4 maximum output capability limit setting, and ensure that the outdoor unit displays as follows:

LED1	
Current process/mode	Display status
10 or 09 or 08	Blinks

Step 2: Press the SW1 up button and the SW2 down button to select the corresponding value.

LED1	
Current process/mode	Display status
10	Blinks
09	Blinks
08	Blinks

Step 3: After selecting the value, press the SW3 confirm button. The outdoor unit displays as follows:

LED1	
Current process/mode	Display status
10	On
09	On
08	On

If you do not press any button on the outdoor unit in 5 minutes, the system will automatically exit the current screen, and the unit will resume displaying the current status. (During setting, press SW4 to return to the previous process. If the setting is completed, press SW4 to resume the unit to the current normal working status.)

4.2.3.9 **n5 Indoor Unit Engineering SN Offset**

Introduction:

When different refrigerating systems are controlled in a centralized manner (by remote monitoring or a centralized controller), this function sets the engineering numbers of indoor units and avoids their conflict among different systems, and therefore must be set.

Set this function only in the master system, whose centralized control address SA2 is "0000×". For details, see the settings in section "Address DIP Switch for Centralized Control (SA2_Addr-CC)".

Setting steps:

Step 1: Enter n5 indoor unit engineering SN offset, and ensure that the outdoor unit displays as follows:

LED1	
Current process/mode	Display status
00	Blinks

Step 2: Press the SW3 confirm button to send the engineering number offset instruction. The outdoor unit displays as follows:

LED1	
Function code	Display status
n5	On

After 10s, the system exits the mode and enters normal working.

4.2.3.10 C9 Fan Failure Emergency Operation

This function is an after-sales emergency setting when a fan on a dual-fan module works abnormally. It shields the abnormal fan in a short time to ensure the emergency operation of the system.

Setting steps:

Enter the function setting on the main board of the faulty outdoor unit. The outdoor unit displays as follows:

LED1	
Current process	Display status
00	Blinks

Press the SW1 up button and the SW2 down button to select the corresponding fan emergency operation status.

LED1		Description
Current process	Display status	
00	Blinks	Fans 1 and 2 run normally.
01	Blinks	The operation of fan 1 is shielded.
02	Blinks	The operation of fan 2 is shielded.

After selecting the corresponding value, press the SW3 confirm button. outdoor unit display as follows:

LED1	
Mode	Display status
00	On
01	On
02	On

The outdoor unit memorizes this setting and does not clear it even upon power failure and power-on again. The default value is 00.

Then, press the SW4 back button to return to the previous process. (During setting, press SW4 to return to the previous process. If the setting is completed, press SW4 to resume the unit to the current normal working status.)

If you do not press any button in 5 minutes, the system will automatically exit the current screen and the unit will resume displaying the current status.

NOTES!

① This function is applicable only to dual fan models;

② A module can set only one fan to emergency mode.

③ The default status is 00.

④ The system cannot run continuously for more than 120 hours in fan emergency operation status. If it exceeds 120 hours, the entire system is stopped, and the indoor unit displays the limit operation code.

4.2.4 Outdoor Unit Status Query

The following functions can be queried:

Function Code	Function Name
n6	Fault query
n7	Parameter query
n8	Indoor unit engineering SN query
n9	Online indoor unit qty query
nb	Outdoor unit barcode query

After the unit is powered, you can query the function setting status, historical fault record, indoor unit engineering number and real-time parameter of the unit in any status. The query method is as follows:

On the master unit, press and hold the SW2 down button for over 5 seconds. The master unit displays the current function setting status, and other modules display based on their current status. Press the SW1 up button and the SW2 down button on the master unit to select the corresponding query. The default selection is A6.

In function query status, if there are two levels of menus, you can press the SW4 back button to return to the previous level. Press the SW4 query button again to exit query status.

In function query status, if you do not press any button on the master unit in 5 minutes, the system will automatically exit the current screen, and the unit will resume displaying the current status.

4.2.4.1 n6 **Fault Query**

Press the SW1 up button and the SW2 down button to select fault query. The outdoor unit displays as follows:

LED1	
Function Code	Display status
n6	Blinks

Press the SW3 confirm button on the outdoor unit to confirm the selection.

Introduction:

This function is used to query historical faults in the system. Up to five historical faults can be stored in the order of time.

Operations:

In fault query status, press the SW1 up button and the SW2 down button. LED1 circularly displays the code and address of the faulty module in history in the order of time (at an interval of 1s),. If there is no historical fault, LED1 displays "00" by default. Up to five latest historical faults can be queried. Faults that can be stored and queried are as follows:

1	High pressure protection	20	Inverter compressor over-current protection
2	Low pressure protection	21	Current detection circuit fault of the inverter compressor driver
3	Lack-of-refrigerant protection	22	Loss of synchronization protection for the inverter compressor
4	Air discharge low temperature protection	23	Communication fault between the primary controller and inverter compressor driver
5	Over low-pressure ratio protection	24	Over temperature protection for the inverter compressor driver module.
6	Over high-pressure ratio protection	25	Temperature sensor fault of the inverter

			compressor driver module.
7	Four-way valve air backflow protection	26	Charging loop fault of the inverter compressor driver.
8	High pressure low protection	27	Under voltage protection for DC bus of the inverter outdoor fan driver
9	High temperature protection for compressor 1	28	Over voltage protection for DC bus of the inverter outdoor fan driver
10	High temperature protection for compressor 2	29	IPM module protection for the inverter outdoor fan driver.
11	Compressor 2 over-current protection	30	Inverter outdoor fan startup failure.
12	Shell roof high temperature protection for compressor 1	31	Inverter outdoor fan phase loss protection.
13	Shell roof high temperature protection for compressor 2	32	Inverter outdoor fan driver module reset.
14	Under voltage protection for the DC bus of inverter compressor driver	33	Inverter outdoor fan over-current protection.
15	Over voltage protection for DC bus of the inverter compressor driver.	34	Current detection circuit fault of the inverter outdoor fan driver.
16	IPM module protection for the inverter compressor driver.	35	Loss of synchronization protection for the inverter outdoor fan.
17	Inverter compressor startup failure	36	Communication fault between the primary controller and inverter outdoor fan driver.
18	Inverter compressor phase loss protection.	37	Over temperature protection for the inverter outdoor fan driver module.
19	Inverter compressor driver module reset.	38	Temperature sensor fault of the inverter outdoor fan driver module.

The figure below shows the Debug page.

LED1	
Current status	Display status
Historical fault/module address	Alternated
	Alternated
	Alternated
	Alternated
	Alternated

If historical faults are less than five, after the last fault is displayed, LED1 displays 00, indicating no more fault.

In fault query status, press and hold the SW3 confirm button for over 5 seconds to clear all historical faults of the outdoor unit.

4.2.4.2 n7 **Parameter Query**

Press the SW1 up button and the SW2 down button to select parameter query. The outdoor unit displays as follows:

LED1	
Function Code	Display status
n7	Blinks

Press the SW3 confirm button on the outdoor unit to confirm the selection.

Introduction:

This function is used to query running parameters of each module of the outdoor unit in real time.

Operations:

In parameter query status, the outdoor unit displays as follows:

LED1	
Function Code	Display status
n7	On

Press the SW1 up button and the SW2 down button to select the corresponding query module and press the SW3 confirm button. The unit displays as follows:

LED1	
Function Code	Display status
module	On

LED1 displays the module parameter code and the specific value. The parameters and display sequence are listed below. "Outdoor ambient temperature (master module)" is displayed by default. Press the SW1 up button and the SW2 down button to select the corresponding query parameter value.

Parameter Code	Parameter Name	Remarks
01	Outdoor ambient temperature	Outdoor ambient temperature of the outdoor unit is used.
02	Operating frequency of compressor 1	—
03	Operating frequency of compressor 2	—
04	Operating frequency of the outdoor fan	Operating frequency of outdoor fan 1 is used.
05	Module high pressure	Temperature value corresponding to the pressure
06	Module low pressure	Temperature value corresponding to the pressure
07	Discharge temperature of compressor 1	The air discharge pipe temperature is used.
08	Discharge temperature of compressor 2	The air discharge pipe temperature is used.
09	Discharge temperature of compressor 3	—
10	Discharge temperature of compressor 4	—
11	Discharge temperature of compressor 5	—
12	Discharge temperature of compressor 6	—
13	Operating frequency of compressor 3	—
14	Current of compressor 1	The integer value is used, and the wired controller does not query.
15	Current of compressor 2	The integer value is used, and the wired controller does not query.
16	Current of compressor 3	The integer value is used, and the wired controller does not query.
17	Current of compressor 4	The integer value is used, and the wired controller does not query.
18	Current of compressor 5	The integer value is used, and the wired controller does not query.
19	Current of compressor 6	The integer value is used, and the wired controller does not query.
20	Reserved	—
21	Module temperature of compressor 1	The wired controller does not query.
22	Module temperature of compressor 2	The wired controller does not query.
23	Module temperature of outdoor fan 1	The wired controller does not query.
24	Module temperature of outdoor fan 2	The wired controller does not query.
25	Outdoor unit heating EEV 1	The displayed value is the integer value of the actual value divided by 10.
26	Outdoor unit heating EEV 2	The displayed value is the integer value of the actual value divided by 10.
27	Subcooler EEV	The displayed value is the integer value of the actual value divided by 10.
28	Defrost temperature	Defrost temperature 1 is used.
29	Subcooler's liquid outlet temperature	—

Parameter Code	Parameter Name	Remarks
30	Outlet temperature of accumulator	—
31	Oil return temperature	—
32	Inlet pipe temperature of the condenser	—
33	Outlet pipe temperature of the condenser	—

Note:

If a parameter value is negative, LED1 circularly displays negative value code "nE" and the numerical value every 1 second. For example, for –30, LED1 circularly displays nE for 1 second, and 30.

Discharge temperature and ambient temperature values are in four digits. The LED1 circularly displays the left two digits and then the right two digits. For example, 01 and 15 indicate 115 degrees, while nE, 00, and 28 indicate –28 degrees.

If a parameter is invalid on the unit, value "00" is displayed.

If there are two levels of menus on the outdoor unit, you can press the SW4 back button to return to the previous level. Press the SW4 query button again to exit query status.

If you do not press any button on the master unit in 5 minutes, the system will automatically exit the current screen, and the unit will resume displaying the current status.

4.2.4.3 n8 **Indoor Unit Engineering SN Query**

Introduction:

This function makes all indoor units display their SN respectively by performing an operation on the outdoor unit, facilitating indoor unit address query.

Operations:

Press the SW1 up button and the SW2 down button to select indoor unit engineering SN query. The outdoor unit displays as follows:

LED1	
Function Code	Display status
n8	Blinks

Press the SW3 confirm button on the outdoor unit to confirm the selection. The outdoor unit displays as follows:

LED1	
Function Code	Display status
n8 or 00	On

At this time, regardless of the current display status of all indoor unit wired controllers or display panels, all of them switch to display the engineering number of the internal unit, without affecting the setting and operation status of the indoor units and the outdoor unit.

Press the SW4 back button on the outdoor unit to return to the upper operation level, but the indoor units remain displaying the engineering numbers.

Press and hold the SW4 back button on the master unit for over 5 seconds to make all indoor units exit displaying the engineering numbers and return to the upper operation level.

If you do not press any button on the master unit to exit indoor unit engineering SN query in 30

minutes, the system will automatically exit the current screen, and the unit will resume displaying the current status.

4.2.4.4 n9 **Online Indoor Unit Qty Query**

Introduction:

This function directly uses the outdoor unit to query the quantity of online indoor units.

Operations:

In n9 online indoor unit qty query status, the module displays as follows:

LED1	
Function Code	Display status
n9/ quantity,	On

LED1 circularly displays the code and quantity, for example, if the indoor unit quantity is 75, 75 is displayed.

If there are two levels of menus on the outdoor unit, you can press the SW4 back button to return to the previous level. Press the SW4 query button again to exit query status.

If you do not press any button on the outdoor unit in 5 minutes, the system will automatically exit the current screen, and the unit will resume displaying the current status.

Note:

This function can query the quantity of indoor units only on a single-system network.

4.2.4.5 nb **Outdoor Unit Barcode Query**

Introduction:

This function queries the barcodes of the outdoor unit and controller.

Operations:

Press the SW1 up button and the SW2 down button to select outdoor unit barcode query. The outdoor unit displays as follows:

LED1	
Function Code	Display status
nb	Blinks

Press the SW3 confirm button on the outdoor unit to enter the next level of menu. The unit displays as follows:

LED1	
Function Code	Display status
nb	On

Press the SW1 up button and the SW2 down button to select the corresponding query module and press the SW3 confirm button. The unit displays as follows:

LED1	
Parameter Code	Display status
Un/Pc	Blinks

Note:

Un indicates the unit barcode, while Pc indicates the controller barcode.

After confirming the module, press the SW1 up button and the SW2 down button to select the barcode sequence. The displayed sequence is as follows:

Unit barcode digits 1–13, controller barcode digits 1–13, that is, unit barcode head, unit barcode (digits 1–6), unit barcode (digits 7–12), unit barcode (digit 13), controller barcode head, controller barcode (digits 1–6), controller barcode (digits 7–12), controller barcode (digit 13). The LED display as follows:

LED1	
Parameter code	Display status
Barcode	Blinks

If a parameter is invalid on the unit, value "00" is displayed.

If there are two levels of menus on the outdoor unit, you can press the SW4 back button to return to the previous level. Press the SW4 query button again to exit query status.

If you do not press any button on the outdoor unit in 5 minutes, the system will automatically exit the current screen, and the unit will resume displaying the current status.

4.3 Restoration to Default Settings

Restoration to default settings 1 (clearing all settings)

On the main board of the master unit, press and hold the SW1 up button and SW4 back button for over 10 seconds to restore the system default settings. The unit display as follows:

LED1	
Status code	Display status
0C	Blinks for 3 seconds

At this time, the system clears all settings, including engineering numbers of the indoor and outdoor units, quantities of the indoor and outdoor units, and commissioning completion status.

Restoration to default settings 2 (clearing all settings except the commissioning status)

On the main board of the master unit, press and hold the SW2 down button and SW4 back button for over 10 seconds to clear all the system settings. The unit display as follows:

LED1	
Status code	Display status
0C	Blinks for 5 seconds

At this time, the system clears all settings, including engineering numbers of the indoor and outdoor units, but stores quantities of the indoor and outdoor units, and commissioning completion status.

Restoration to default settings 3 (clearing only function settings of the outdoor unit)

On the main board of the master unit, press and hold the SW3 back button and SW4 back button for over 10 seconds to clear all the system settings. The unit display as follows:

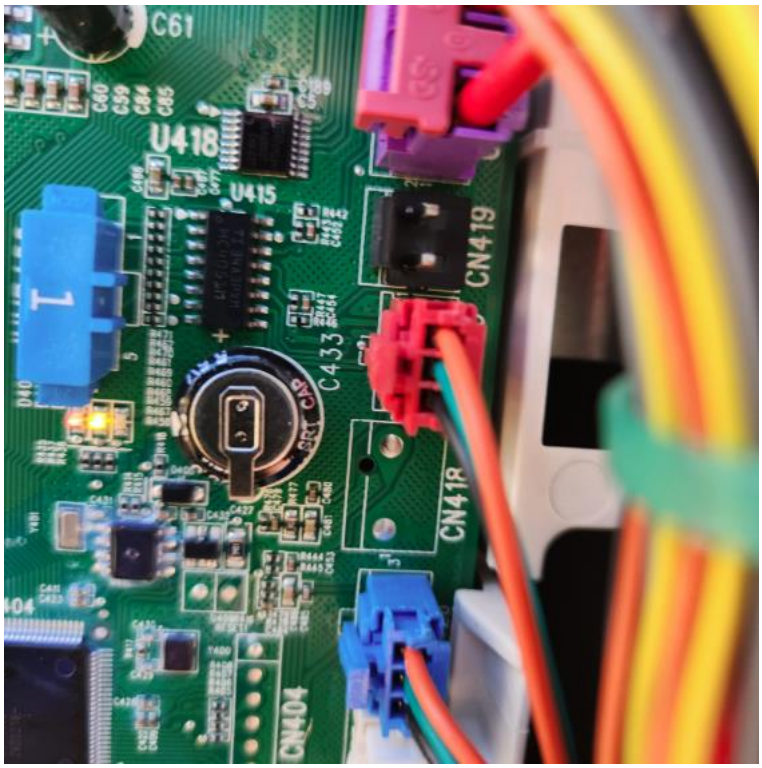
LED1	
Status code	Display status
0C	Blinks for 7 seconds

At this time, the system clears all settings, but stores engineering numbers of the indoor and outdoor units, quantities of the indoor and outdoor units, and commissioning completion status.

4.4 Fire Alarm Function Setting

The VRF unit system reserves a fire alarm interface "CN419", which connects with the external fire alarm system. In case of an external fire, the unit urgently shuts down for protection based on the received signal. Then, the unit enters the standby status.

Fire Shut Down Wiring Harness Part Number: **GREE420400075369**



Chapter 3 Faults

4.1Error Indication

	Error Code	Description	Recommended Action
Status	A0	Unit waiting for debugging. System must be placed in startup mode.	System must be placed in startup mode. See page 8.
Function: See unit function settings.	A2	Pump down mode.	Used for pumping refrigerant into the outdoor unit. Liquid service valve must be closed. See page 19.
Status	A3	Defrosting	No action needed. Unit is in defrost operation.
Status	A4	Oil-return	No action needed. Unit is in oil return operation.
Function: See unit function settings.	A6	Heat pump function setting	Enables setting system to only in heating, only in cooling, or only in fan modes.
Function: See unit function settings.	A7	Quiet mode setting	Limits the maximum performance of the system in favor of reducing the noise level.
Function: See unit function settings.	A8	Vacuum pump mode	Opens all valves for evacuation and recovery. Used for repair, not installation. Disconnect power to indoor units prior to disconnecting power to outdoor unit. Indoor EEV's will remain open. See Page 24.
Function	A9	Set Back function	Not available on MultiPRO.
System Error	Ab	Emergency stop of operation	Emergency stop interface connection is open, indicating emergency stop. See Page 34.
Status	AC	Cooling	No action needed. System is in Cooling Mode.
Status	AE	Charge refrigerant manually	Displayed during step 12 of Debug, this is when additional refrigerant is added, if required.
Status	AF	Fan	No action needed. Status that indicates that all indoor units are in Fan Mode.
Status	AH	Heating	No action needed. System is in Heating Mode
Status	AJ	Cleaning reminding of filter	This is set in the controller and will display this status when time has elapsed.
Status	AP	Debugging confirmation when starting up the unit	Displayed during step 12 of Debug. Ready manifold, scale, and refrigerant cylinder for manual charging of additional refrigerant, if required.
Status	AU	Long-distance emergency stop	System has been disabled remotely from BMS or Central Controller.
	Ay	Shielding status	System has been limited remotely from BMS or Central Controller.

Outdoor Error	b1	Malfunction of Outdoor Ambient Temperature Sensor (RT7) (CN421 Blue)	15K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 97
Outdoor Error	b2	Malfunction of Defrosting Temperature Sensor (RT3) (CN422 White)	20K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 99
Outdoor Error	b4	Malfunction of Sub-Cooler Liquid Outlet Temperature Sensor (RT5) (CN416 Red)	20K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 99
Outdoor Error	b5	Malfunction of Sub-Cooler Gas Outlet Temperature Sensor (RT4) (CN416 Red)	20K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 99
Outdoor Error	b6	Malfunction of Accumulator Inlet Temperature Sensor (RT1) (CN422 White)	20K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 99
Outdoor Error	b7	Malfunction of Accumulator Inlet Temperature Sensor (RT2) (CN422 White)	20K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 99
Outdoor Error	bd	Malfunction of Sub-Cooler Gas Inlet Temperature Sensor (RT6) (CN416 Red)	20K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 99
Outdoor Error	bH	Clock of system is abnormal	Clock is set from wired controller or commissioning tool. Replace outdoor unit control board.
Outdoor Error	bJ	High-pressure sensor and low-pressure sensor are connected reversely	Pressure transducers (sensors) need to be moved to the correct Molex plugs on the outdoor control board. Correct locations are LP=CN426 HP=CN425
System Error	C0	Communication malfunction between IDU, ODU and IDU's wired controller	Check D1/D2 wiring. Ensure D1/D2 wiring is not mixed with H1/H2 or G1/G2. Make sure ODU and IDU units have 208/230VAC across L1/L2. See page 109/110.
Outdoor Error	C1	Communication malfunction between main control and DC-DC controller	Perform Ohm Check to Compressor and fan motors. Equal resistance between windings and open to ground. If motors are good replace outdoor control board. See page 68, 74.
Outdoor Error	C2	Communication malfunction between main control and inverter compressor driver	Perform Ohm Check to Compressor and fan motors. Equal resistance between windings and open to ground. If motors are good replace outdoor control board. See page 68, 74.
Outdoor Error	C3	Communication malfunction between main control and inverter fan driver	Perform Ohm Check to Compressor and fan motors. Equal resistance between windings and open to ground. If motors are good replace outdoor control board. See page 68, 74.

System Error	C4	Malfunction of lack of IDU	The system must have at least 50% connected capacity. Ensure all indoor units have 208/230VAC between L1/L2. If CO on indoor, check D1/D2 wiring.
System Error	C5	Alarm because project code of IDU is inconsistent	Mostly for Central Control and BMS. Two or more indoor units have the same project number/address. Set unique address.
System Error	CH	Rated capacity is too high	The total indoor unit capacity exceeds 135% of the outdoor unit capacity. Total IDU Capacity divided by ODU capacity is larger than 135%.
System Error	CL	The matching ratio of rated capacity for IDU and ODU is too low	The system must have at least 50% connected capacity. Ensure all indoor units have 208/230VAC between L1/L2. If CO on indoor, check D1/D2 wiring.
Debugging Code (Not an Error)	CP	Malfunction of multiple wired controllers. See owner's manual for the controller.	Two or more wired controllers on H1/H2 are set as Main (Master) units.
Indoor Error	d1	Indoor Unit Main Control Board Malfunction	Chip error. Replace Main Control Board.
Indoor Error	d3	Malfunction of ambient temperature sensor	15K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 97
Indoor Error	d4	Malfunction of inlet-tube / pipe temperature sensor. See indoor unit service manual.	20K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 99
Indoor Error	d5	Malfunction of mid-tube / pipe temperature sensor. See indoor unit service manual.	20K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 99
Indoor Error	d6	Malfunction of outlet-tube / pipe temperature sensor. See indoor unit service manual.	20K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 99
Indoor Error	d7	Malfunction of humidity sensor. See indoor unit service manual.	Not used in current equipment production
Indoor Error	d9	Malfunction of jumper cap. See indoor unit service manual.	Jumper Cap not installed or incorrect jumper cap, when board is replaced the jumper cap needs to be taken from the original board it does not come with the replacement board.
Indoor Status Code	db	Debugging status	Unit is running in startup / commissioning Page 8
Indoor Error	dC	Setting capacity of DIP switch code is abnormal. See indoor unit service manual.	This usually happens when the board is replaced, dip switches need to be set same as original board.
Indoor Error	dH	PCB of wired controller is abnormal. See indoor unit service manual.	Check Wiring to the wired controller / replace controller
Indoor Error	dL	Malfunction of air outlet temperature sensor. See indoor unit service manual.	15K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 97

Indoor Error	dn	Malfunction of swing parts	Check swing motor and swing louvers possibly jammed
Outdoor Error	E0	Malfunction of ODU / Also displays error code	This code will display along with the malfunction error that is causing the issue.
Outdoor Error	E1	High-pressure protection	High Pressure Sensor / Pressure Transducer detected high pressure of 609PSI
Outdoor Error	E2	Discharge low-temperature protection	See Page 43
Outdoor Error	E3	Low-pressure protection	Code is generated when evaporator temperature falls below 10 psi See page 45
Outdoor Error	E4	High discharge temperature protection of compressor	Code is generated when compressor discharge temperature exceeds 244°F See page 46
Outdoor Error	Ed	Drive IPM low temperature protection	Code is generated when the internal sensor on the IPM module is lower than ambient temperature
Outdoor Error	F0	Main board of ODU is poor	Abnormal Address Chip, Memory Chip, or Clock Chip. Replace Mainboard
Outdoor Error	F1	Malfunction of High Pressure Sensor (Wiring Diagram:SP1) (Connector:CN425 Red)	See Appendix 3 for Voltage / Pressure Chart Page 105
Outdoor Error	F3	Malfunction of Low Pressure Sensor (Wiring Diagram:SP2) (Connector:CN426 Blue)	See Appendix 3 for Voltage / Pressure Chart Page 105
Outdoor Error	F5	Malfunction of Discharge Temperature Sensor of Compressor (Wiring Diagram:RT8) (Connector:CN423 Black)	Located on the compressor discharge pipe. 50K thermistor is either electrically open or shorted. Use ohm chart to test thermistor / sensor. Page 102
Outdoor Error	FP	Malfunction of DC motor	Fan Motor Check See Page 68
Outdoor Error	H0	Malfunction of driving board of fan	Fan Motor Check See Page 81
Outdoor Error	H1	Driving board of fan operates abnormally	Fan Motor Check See Page 81
Outdoor Error	H2	Voltage protection of driving board power of fan	Fan Motor Check See Page 81
Outdoor Error	H3	Reset protection of driving module of fan	Fan Motor Check See Page 81
Outdoor Error	H4	Drive PFC protection of fan	Fan Motor Check See Page 81
Outdoor Error	H5	Over-current protection of inverter fan	Fan Motor Check See Page 68
Outdoor Error	H6	Drive IPM module protection of fan	Fan Motor Check See Page 81
Outdoor Error	H7	Malfunction of drive temperature sensor of fan	Fan Motor Check See Page 68
Outdoor Error	H8	Drive IPM high temperature protection of fan	Fan Motor Check See Page 68/81
Outdoor Error	H9	Desynchronizing protection of inverter fan	Fan Motor Check See Page 68/81
Outdoor Error	HA	Malfunction of drive storage chip of inverter outdoor fan	Fan Motor Check See Page 81

Outdoor Error	HC	Malfunction of current detection circuit of fan drive	Fan Motor Check See Page 68
Outdoor Error	HE	Phase-lacking of inverter fan	Fan Motor Check See Page 81
Outdoor Error	HF	Malfunction of charging loop of fan drive	Fan Motor Check See Page 81
Outdoor Error	HH	High-voltage protection of fan's drive DC bus bar	Fan Motor Check See Page 81
Outdoor Error	HJ	Failure startup of inverter fan	Fan Motor Check See Page 81
Outdoor Error	HL	Low voltage protection of bus bar of fan drive	Fan Motor Check See Page 81
Outdoor Error	HP	AC current protection of inverter fan	Fan Motor Check See Page 81
Outdoor Error	HU	AC input voltage of drive of inverter fan	Fan Motor Check See Page 81
Outdoor Error	J1	Over-current protection of compressor 1	Ohm the compressor should have equal resistance between the windings and no resistance to ground. Improper refrigerant flow along with dirty filters, coils, blower wheels can also lead to high current of the compressor See Page 70/75
Outdoor Error	J7	Gas-mixing protection of 4-way valve	Code Is generated when the high pressure and low pressure have a differential of less 14psi. Measured by the pressure transducers, check RV and Pressure Transducers SEE Page Numbers 64/72
Outdoor Error	J8	High pressure ratio protection of system	Code is usually generated in heat mode when high pressure is too low
Outdoor Error	J9	Low pressure ratio protection of system	Code is usually generated in cool mode when high- and low-pressure differential is too low
Outdoor Error	JA	Protection because of abnormal pressure	Code usually generated when the system is significantly low on refrigerant or a malfunctioning low- or high-pressure sensor SEE page 105
Outdoor Error	JL	Protection because high pressure is too low	Code usually generated when the system is significantly low on refrigerant or a malfunctioning high pressure sensor see page 105
Indoor Error	L0	Malfunction of IDU	See indoor unit service manual
Indoor Error	L1	Protection of indoor fan	See indoor unit service manual
Indoor Error	L3	Water-full protection	Internal or external condensate float switch has opened due to clogged drain or condensate pump problem. See Indoor unit service manual
Indoor Error	L4	Abnormal Power for wired controller	See indoor unit service manual
Indoor Error	L5	Freeze prevention protection	See indoor unit service manual
Indoor Error	L6	Mode conflict / Only applies to systems using a 24 volt adapter	See indoor unit service manual. Master indoor unit controls mode therefore master indoor is set to different mode of operation
Indoor Error	L7	No main IDU: During debugging one of the indoor units is designated as master to change or correct this use wireless remote or wired controller.	Check D1 and D2 wiring to the main indoor unit. For wireless remote. See Pg. 114

Indoor Error	L8	Power is insufficient	Check line voltage to the indoor unit
Indoor Error	L9	For single control over multiple units, number of IDU is inconsistent (HBS network)	Wired controller is set to control the wrong number of indoor units / See controller manual
Indoor Error	LA	For single control over multiple units, IDU series is inconsistent (HBS network)	Wired controller is set to control the wrong number of indoor units / See controller manual
Indoor Error	Lb	For single control over multiple units, IDU is inconsistent (reheating-dehumidifying system)	Wired controller is connected to indoor units from separate systems / See controller manual
Indoor Error	LC	IDU is not matching with outdoor unit	Indoor unit will not communicate with outdoor unit / make sure indoor unit model is compatible with the outdoor unit
Indoor Error	LH	Alarm due to bad air quality	Not used at this time in the US market
Indoor Error	LJ	Setting of functional DIP switch code is wrong	When replacing an indoor board make sure dip switches are set the same as the original board
Indoor Error	LL	Malfunction of water flow switch	See indoor unit service manual
Indoor Error	LP	Zero-crossing malfunction of PG motor	See indoor unit service manual
Indoor Error	LU	Zero-crossing malfunction of PG motor	See indoor unit service manual
Function	n0	See operation setting of system	Energy savings mode see page 24
Function	n1	Defrosting cycle K1 setting	Defrosting Cycle can be set 40,50,60 minutes see wired controller manual
Function	n3	Compulsory defrosting	Forced defrosting see page 25 can also be done by wired controller see controller manual / indoor unit service manual
Function	n4	Limit setting for max. capacity/output capacity	Forced energy savings see page 25 can also be set by wired controller see controller manual / indoor unit service manual
Function	n5	Compulsory excursion of engineering code of IDU	When using a central controller this will correct project number of indoor unit conflict see page 26, can also be set by wired controller see controller manual / indoor unit service manual
Function	n6	Inquiry of malfunction / see previous faults up to 5 are stored	See page 28
Function	n7	Inquiry of parameters	See page 29 this will allow running parameters to be viewed / can also be viewed from wired controller see controller manual
Function	n8	Inquiry of project code of IDU	See page number 31 this will display indoor unit project number on the indoor unit or wired controller / Can also be done by the wired controller see controller manual

Function	n9	Check number of indoor units that are communicating.	See page 32 This will display how many indoor units the unit is communicating with
Function	nA	Heat pump unit	See page 20 this setting allows Cooling and heating
Function	nb	Bar code inquiry	See page 32
Function	nC	Cooling Mode only.	See page 20 this setting allows Cooling Only
Status	nE	Negative code. Displays circularly with a two-digit number (Mpa) to indicate a negative pressure.	See page 20
Function	nF	Fan Mode only.	See page 20 this setting allows Fan Only
Function	nH	Heating Mode only.	See page 20 this setting allows Heating Only
Function	nJ	High temperature prevention when heating	Needs factory direction.
Function	nn	Length modification of connection pipe of ODU	Needs factory direction.
Function	nU	Eliminate the long-distance shielding command of IDU	Needs factory direction.
Outdoor Error	P0	Malfunction of driving board of compressor	If the fault code displayed on the wired controller of the indoor unit is PO, check the fault code displayed on the 2-digit digital LED of the main control board of the outdoor unit. It will be a different code.
Outdoor Error	P1	Driving board of compressor operates abnormally	If the fault code displayed on the wired controller of the indoor unit is PO, check the fault code displayed on the 2-digit digital LED of the main control board of the outdoor unit. Pg 74
Outdoor Error	P2	Voltage protection of driving board power of compressor	If the fault code displayed on the wired controller of the indoor unit is PO, check the fault code displayed on the 2-digit digital LED of the main control board of the outdoor unit.
Outdoor Error	P3	Reset protection of driving module of compressor	Power off the ODU for 15 Minutes then power back on if code does not reset after unit has been power cycled like this 3 times replace mainboard
Outdoor Error	P4	Drive PFC protection of compressor	Ohm test the compressor should be equal resistance with no resistance to ground. Improper refrigerant flow, dirty coils, filters, and blower wheels can also cause this error. Pg 75
Outdoor Error	P5	Over-current protection of inverter compressor	Ohm test the compressor should be equal resistance with no resistance to ground. Improper refrigerant flow, dirty coils, filters, and blower wheels can also cause this error. Pg 75
Outdoor Error	P6	Drive IPM module protection of compressor	Ohm test the compressor should be equal resistance with no resistance to ground. Improper refrigerant flow, dirty coils, filters, and blower wheels can also cause this error. Pg 75

Outdoor Error	P7	Malfunction of drive temperature sensor of compressor	Power off the ODU for 15 Minutes then power back on if code does not reset after unit has been power cycled like this 3 times replace mainboard
Outdoor Error	P8	Drive IPM high temperature protection of compressor	Replace Mainboard
Outdoor Error	P9	Desynchronizing protection of inverter compressor	Ohm test the compressor should be equal resistance with no resistance to ground. Improper refrigerant flow, dirty coils, filters and blower wheels can also cause this error. Pg 75
Outdoor Error	PA	Malfunction of drive storage chip of compressor	Replace Mainboard
Outdoor Error	PC	Malfunction of current detection circuit drive of compressor	Power off the ODU for 15 Minutes then power back on if code does not reset after unit has been power cycled like this 3 times replace mainboard
Outdoor Error	PE	Phase-lacking of inverter compressor	Replace Mainboard
Outdoor Error	PF	Malfunction of charging loop of driven of compressor	Check Supply voltage for 208/230VAC /Replace Mainboard
Outdoor Error	PH	High-voltage protection of compressor's drive DC bus bar	Check Supply voltage for 208/230VAC /Replace Mainboard
Outdoor Error	PJ	Failure startup of inverter compressor	Ohm test the compressor should be equal resistance with no resistance to ground. Improper refrigerant flow, dirty coils, filters, and blower wheels can also cause this error,
Outdoor Error	PL	Low voltage protection for DC bus bar of drive of compressor	Check Supply voltage for 208/230VAC /Replace Mainboard
Outdoor Error	PP	AC current protection of inverter compressor	Ohm test the compressor should be equal resistance with no resistance to ground. Improper refrigerant flow, dirty coils, filters, and blower wheels can also cause this error. Pg 75
Outdoor Error	PU	AC input voltage of drive of inverter compressor	Check Supply voltage for 208/230VAC /Replace Mainboard
Debugging Code (Not an Error)	U0	Preheat time of compressor is insufficient	Unit requires 8 hour compressor warm up before Strat Up / Commissioning of the unit
Debugging Code (Not an Error)	U2	Wrong setting of ODU's capacity code/jumper cap	Usually happens when mainboard is replaced Jumper Caps must be taken from the original board and all dip switches set the same as original board.
Debugging Code (Not an Error)	U4	Refrigerant-lacking protection	If high pressure or low-pressure saturation temperature is lower than ambient the unit will not start due to loss of refrigerant.
Debugging Code (Not an Error)	U5	Wrong address for driving board of compressor	Ohm Compressor / replace mainboard

Debugging Code (Not an Error)	U6	Alarm because valve is abnormal	This is an indication; the service valves were not opened properly check both valves to see if they are open press SW3 to continue commissioning.
Debugging Code (Not an Error)	U8	Malfunction of pipeline for IDU	This is an indication that there is a refrigerant flow issue through the indoor unit check EEV's, possible restriction in piping.
Debugging Code (Not an Error)	U9	Malfunction of pipeline for ODU	This is an indication that there is a refrigerant flow issue through the outdoor unit check EEV's, possible restriction in piping.
Debugging Code (Not an Error)	UC	Setting of main IDU is succeeded	Indication that Main (Master) indoor unit set was successful
Debugging Code (Not an Error)	UE	Charging of refrigerant is invalid	Indication that the unit has little to no refrigerant

"E2" Protection in Case of Too Low Discharge Temperature of Compressor

Fault display: main board of outdoor unit, wired controller of indoor unit and receiver of indoor unit display 

Fault diagnosis:

When the difference between the discharge temperature of compressor and the condensing temp (obtained from gauges) is below 18°F, the unit stops running to ensure safe operation. Low discharge temp is a symptom of the compressor being flooded.

Possible causes:

- The compressor's discharge temperature sensor is faulty or out of range.
- Excessive refrigerant in the unit.
- Dirty Coil or Filters
- The electronic expansion valve of indoor unit overfeeding refrigerant or stuck open in cooling mode;
- The electronic expansion valve of outdoor unit overfeeding refrigerant or stuck open in heating mode;

Troubleshooting: Cooling Mode

Step 1: Ensure that all filters, coils, and blower wheels are clean, check for any other airflow obstructions.

Step 2:

- Disconnect power to the outdoor unit Check whether the discharge pipe sensor is installed firmly.
- Check whether the resistance corresponding to temperature is normal based on the temperature - resistance table of temperature sensor. If not, replace the temperature sensor.

Step 3:

- Power unit back on run the unit in cooling mode check inlet and outlet temps of the indoor

coil. This can be checked with the portable service tool, wired controller or temperature clamp at the inlet and outlet of the coil.

- If there is less than a 2°F differential this indicates that the EEV may be overfeeding the coil.

Step 4:

- Power off the indoor unit then reapply power listen for the clicking of the EEV finding it's home position.
- If the clicking is not heard perform an ohm check of the EEV see page 68.
- If the EEV ohm test proves the EEV is good then verify EEV coil is attached properly to the EEV valve body, then replace indoor main board.
- If the EEV test proves a coil issue replace the EEV power head.
- If the clicking is heard, then repeat step 3 checking inlet and outlet temps.

Step 5:

- Check the outdoor Sub-Cooler EEV (EKV2) if there is frost from the outlet of the EEV all the way to and through the accumulator then this EEV may be stuck.
- To do an ohm check to the EEV see page 68.
- Make sure the EEV coil is attached properly to the EEV (EKV2)valve body.
- If the ohm check proves EEV coil is good, then cycle power to the outdoor unit listen for the EEV clicking to find it's home position if there is no clicking at power up replace the outdoor mainboard
- If the clicking is heard and the frosting continues the EEV is stuck and will need to be replaced.

Troubleshooting: Heating Mode

Step 1:

- Disconnect power to the outdoor unit Check whether the discharge pipe sensor is installed firmly.
- Check whether the resistance corresponding to temperature is normal based on the temperature - resistance table of temperature sensor. If not, replace the temperature sensor.

Step 2:

- To do an ohm check to the EEV see page 68.
- Make sure the EEV (EKV1) coil is attached properly to the EEV valve body.
- If the ohm check proves EEV coil is good, then cycle power to the outdoor unit listen for the EEV clicking to find it's home position if there is no clicking at power up replace the outdoor mainboard
- If after power rest the EEV (EKV1) is still overfeeding refrigerant, then replace the EEV.

Note: Check whether the refrigerant is added in accordance with the design requirements, as excessive refrigerant may trigger system protection.

Solution: Add refrigerant in accordance with the design requirements.

2.62 "E3" System Low Pressure Protection

Fault display: main board of outdoor unit, wired controller of indoor unit and receiver of indoor unit display 

Note: Cooling Mode EEV Testing: When checking EEV flow measure the liquid line temperature at the condenser and at the indoor unit should be within 4°F before condemning and EEV.

Note: Heating Mode EEV Testing: Be observant to frost and check for temperature drops of 3°F across strainers before condemning an outdoor EEV

Fault diagnosis:

The low pressure sensor detects the compressor's suction pressure. When the saturation temperature corresponding to the low pressure is below 10psig -41°C, the unit stops to ensure safe operation.

Possible causes:

- Unit is very low on refrigerant.
- Dirty Coils, Filter Blower Wheel, or other airflow restriction
- EEV not feeding refrigerant properly.
- Restrictions in refrigerant piping
- Service Valves not open
- Faulty Low Pressure Sensor
- Ambient temperature too low

Step 1: Ensure that all filters, coils, and blower wheels are clean, check for any other airflow obstructions.

Step 2:

- Connect a low side gauge to the system. Since the unit is off on an error code the pressure should be equal to the outside ambient temperature. If the pressure is lower than the ambient temperature then most likely the unit is low on charge. At this point it would be best to recover and weigh out the charge. This will confirm if the unit is low on charge.

Step 3:

- If the system does have pressure equal to the ambient temperature, then verify voltages from the pressure sensor are equal to what the Appendix 3 Pressure Sensor Voltage and Pressure Table on page 107 shows it should be at that pressure.
- If the voltages do not match the table, replace the pressure sensor.
- If there is no output voltage from Black to Orange (5vdc) then the mainboard needs to be replaced.

2.61 "E4" Protection in Case of Too High Discharge Temperature of Compressor

Fault display: main board of outdoor unit, wired controller of indoor unit and receiver of indoor unit display 

Note: Cooling Mode EEV Testing: When checking EEV flow measure the liquid line temperature at the condenser and at the indoor unit should be within 4°F before condemning and EEV.

Note: Heating Mode EEV Testing: Be observant to frost and check for temperature drops of 3°F across strainers before condemning an outdoor EEV

Fault diagnosis:

When the compressor's discharge temperature is above 244°F, the unit stops running to ensure safe operation.

- **Possible causes:**
- Service Valves are closed.
- Insufficient refrigerant in the unit.
- Dirty coils, filters, or blower wheel.
- The electronic expansion valve operates improperly.
- Faulty indoor or outdoor fan motor
- Restriction in refrigerant piping or plugged strainer.
- The ambient temperature where the unit operates exceeds the limit.

Troubleshooting:

Step 1: Inspect and make sure that the service valves of the gas pipe and liquid pipe of the outdoor unit are fully opened.

Step 2: Before turning power off to the outdoor unit verify pressures are equal to the ambient temperature. This can be done by connecting gauges, portable service tool, or using the display parameters on the mainboard display see page 106. If the pressure is lower than the ambient temperature outside, then most likely the unit is low on refrigerant.

Step 4: Power on the units based on the capacity and number of indoor units enabled previously in the case of protection state. Observe whether the indoor and outdoor fans are operating properly according to the rotational speed displayed by the portable service tool. If not, replace the motor or motor drive module (outdoor fan).

Step 3:

- Power on the units based on the capacity and number of indoor units enabled previously in the case of protection state.
- Check inlet and outlet coil temperature of the indoor unit(s) using the portable service tool / wired controller or temperature clamps warm outlet temperature is an indication of EEV underfeeding the coil with refrigerant. In heating mode if the EEV is underfeeding then frosting at the EEV outlet and an uneven frost pattern across the outdoor coil will be observed.

- Verify that the EEV coil is attached to the valve body properly.
- Cycle power to the indoor or outdoor units depending on mode and listen for the EEV clicking of the EEV finding it's home position.
- If the clicking of the EEV is heard then run unit again and check inlet and outlet temperatures again if the outlet temperature is still warm then the EEV needs to be replaced.
- If the EEV clicking is not heard perform an ohm check of the EEV see page 68, if the ohm test of the EEV coil proves the EEV coil is good then replace the mainboard for that EEV. If the ohm test proves there is an issue with the EEV coil then replace the EEV coil.

Step 5: Check whether the air return temperature of the unit exceeds the limit during operation (requirements in cooling mode: outdoor ambient temperature -5°C to +50°C, indoor ambient temperature 16°C to 32°C; requirements in heating mode: outdoor ambient temperature -20°C to +24°C, indoor ambient temperature 16°C to

3 Non-fault Type Troubleshooting

⚠WARNING
(1) If an abnormal situation (such as peculiar smell) occurs, please stop the operation immediately and turn off the main power supply, and then contact Gree authorized maintenance center. If the unit continues to operate under abnormal situation, the air conditioner will be damaged, and an electric shock or fire accident may result.
(2) Do not maintain the air conditioner by yourself, mis operation may cause electric shock or fire hazard. Please contact professional personnel of Gree authorized maintenance center to maintain.

● Before asking for maintenance, please check the following issues first.

Phenomenon	Causes	Troubleshooting
Air conditioner can't operate	Fuse is broken or circuit breaker is open	Replace fuse or close the circuit breaker
	Power failure	Restart up the unit and then the unit will operate
	Power supply is not connected	Connect the power supply
	The power for batteries of remote controller is insufficient	Replace the batteries
	Remote controller is not within the remote-control range	Remote control range is within 8m
Air conditioner operates, while it stops operation immediately	Air inlet or air outlet of indoor unit/outdoor unit is blocked	Eliminate the obstacles
Cooling or heating is abnormal	Air inlet or air outlet of indoor unit/outdoor unit is blocked	Eliminate the obstacles
	Temperature setting is improper	Adjust temperature setting by remote controller or wired controller
	Fan speed is set too low	Adjust fan speed setting by remote controller or wired controller
	Fan direction is not correct	Adjust fan direction setting by remote controller or wired controller
	Door or window is open	Close door and window
	Direct sunshine	Hang curtains or window shade at the window
	Too many persons in the room	—
	Too many thermal source in the room	Reduce the thermal source
	The filter is dirty and blocked	Clean the filter

NOTICE

If problem cannot be solved after checking the above items, please contact Gree service center and describe the cases and models.

● The following circumstances are not malfunctions.

Phenomenon		Causes
Unit doesn't run	When unit is started immediately after it is just turned off	Overload protection switch makes it run after 3 minutes delay
	When power is turned on	Standby operating for about 1 minute
Mist comes from the unit	Under cooling	Indoor high humidity air is cooled rapidly
Noise is emitted	When the power supply is connected, there is small "dada" sound.	It is the sound of startup action of electronic expansion valve.
	When the system is conducting cooling or defrosting, there is continuous "sa——" sound.	This is the sound of refrigerant flowing inside the unit.
	When the system is switching cooling and heating modes; during heating operation, the unit enters or quits defrosting operation or oil return operation, there is "chi——" sound.	This is the sound for direction reversal of 4-way valve.

Phenomenon		Causes
Noise is emitted	When the system is started or stopped for a short time, you can hear the sound of “sa——”; you can also hear this sound for a short time after the start or stop of the defrosting operation.	This is the sound produced when the refrigerant stops or changes the flow.
	When the system is in cooling operation or after it stops running, a continuous “sa ——” sound can be heard	This is the operation sound of drain system.
	When the system is running or after it stops running, a “creaking” sound can be heard.	This is the sound produced when plastic parts such as panel expansion and contraction due to temperature changes.
	When the system is in heating operation, after the indoor unit stops running, the sound like running water can be heard.	The unit is melting the frost on the outdoor unit, please wait about 10 minutes (due to different unit models, the waiting time will vary).
	When the indoor unit stops running, a faint “sa——” sound or “gurgling” sound can be heard.	This sound can be heard when other indoor units are running. This is to prevent oil and refrigerant from staying in the indoor unit, and to keep a small amount of refrigerant flowing.
	When the unit is running, the operating sound of the compressor changes.	This is caused by changes in compressor operating frequency.
	During the operation of the unit or after the operation is started or stopped, a continuous “sa ——” sound can be heard.	This is the sound produced when the refrigerant bypass valve operates.
	When the operating mode of the unit changes, the indoor unit and outdoor unit will produce “sa ——” and “gurgling” sounds.	This is the sound produced when the refrigerant stops or changes flow.
	The sound from the outdoor unit can be heard indoors	This is because the outdoor unit is installed close to the window or wall, and the sound insulation is poor, and the external noise is transmitted in.
There is dust blowing out from the unit	Start operation after it is not used for a long time	Dust in indoor unit is blew out
The unit emits odor	Operating	The odor of the air conditioner is sucked into the room and then blown out
The indoor unit is still running after shutting down	The indoor unit is still running after shutting down	The fan of indoor unit will continue to work for 20 to 70 seconds to fully use the residual cooling or heat of the heat exchanger, and to prepare for the next use.
Mode conflict	Cooling or heating mode cannot start up	When the selected operation mode of the indoor unit conflicts with the operation mode of the outdoor unit, after five seconds, the indoor unit error indicator flashes or the remote controller displays the operation conflict, and the indoor unit shuts down. At this time, the indoor unit can be converted to run with the outdoor unit. The mode can be restored to normal without conflict. The cooling mode and dry mode do not conflict, and the air supply does not conflict with any mode.

Phenomenon		Causes
Wired controller displays A3 code	Unit enters frost mode operation	During cold weather heating operation, when frost or ice may form on the outdoor unit heat exchanger, the unit will automatically enter the defrost mode for a few minutes.
Wired controller displays A4 code	Unit enters oil-return mode operation	When the outdoor unit runs for a certain time, it will automatically enter the oil return mode to run for a few minutes to ensure that the internal compression of the external machine is effectively lubricated.

Chapter 4 Maintenance

WARNING! During the maintenance of a modular unit, all the outside units must be powered on and off concurrently. Avoid doing so to only some of the outdoor units.

1 Precautions for Refrigerant Leakage

(1) AC project designers and installers shall obey the local laws and regulations on the safety requirements toward the usage and leakage of refrigerant.

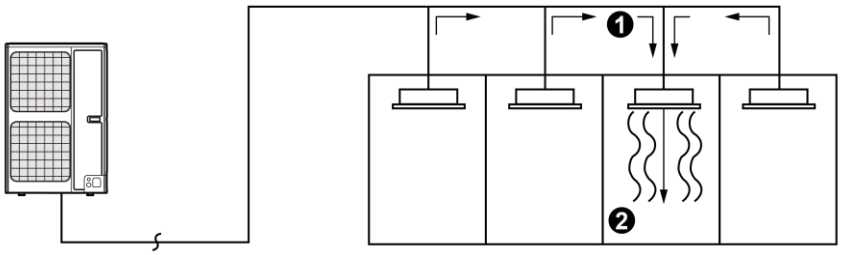
(2) The multi VRF unit adopts R410A refrigerant. When installing the unit in the space where people included, the refrigerant's amount shall not exceed the maximum allowable concentration. Otherwise, suffocation will occur to the people nearby. For example, the maximum refrigerant's allowable concentration for European safety standard and regulation is 0.44kg/m^3.

Maximum refrigerant's charging amount(kg) = Room volume(m^3)× maximum allowable concentration(kg/m^3)

Refrigerant charge(kg)= Additional quantity of refrigerant(kg)+ ∑ factory charge for ODU(kg)

Refrigerant charge ≤ Maximum refrigerant charge

(3) When refrigerant's charging amount exceeds the maximum allowable amount, re-design the refrigeration system and divide the refrigeration system to several refrigeration systems with small volume, or adopt corresponding ventilation measures and alarms.



❶ Flow direction of refrigerant leakage

❷ Room for refrigerant leakage.

Since the concentration of refrigerant is greater than that of air, pay attention to the spaces where the refrigerant may residue, for example, the basement.

2 Pressure test, evacuation and, Refrigerant Adding

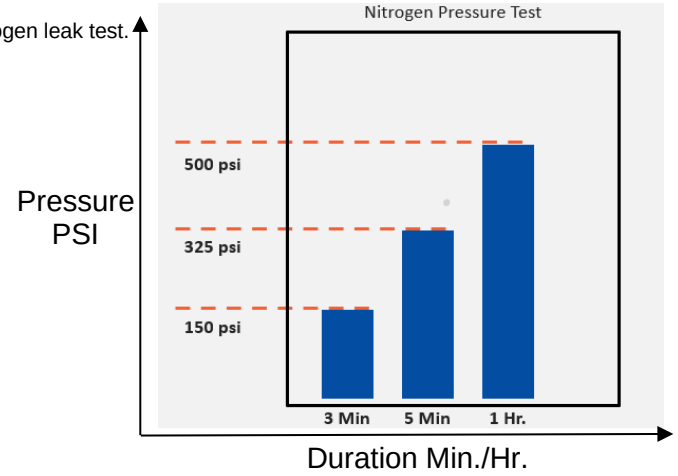
CAUTION

Only use inert gas/nitrogen to pressurize the system. Never use compressed air with refrigerants but use a vacuum pump to vacuum the installation! There is no extra refrigerant in the outdoor unit for air purging!

2.0 Pressure testing

(1) Once piping is complete, pressure test the system, start are 150 PSI and hold for 3 minutes. Next, increase the pressure to 325 PSI and hold for 5 minutes. Next, increase the pressure to 500 PSI and hold for 1 hour.

*Reference chart for nitrogen leak test.



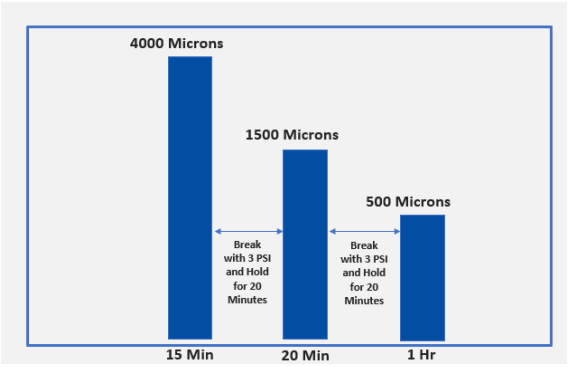
2.1 Vacuum/evacuation procedure

(1) Use a Micron Gauge
(2) Connect to Liquid and Gas
(3) Triple Evacuation is recommended
- Ensures clean system
- Often quicker

(4) Pull down to 4000 microns
- Hold for 15 minutes
- Break with 3 psi of Dry Nitrogen
- Hold for 20 minutes

(5) Pull down to 1500 microns
- Hold for 20 minutes
- Break with 3 psi of Dry Nitrogen
- Hold for 20 minutes

(6) Pull down to 500 microns
- Hold for 1 hour
- Does not rise above 1000 microns



Vacuum setup

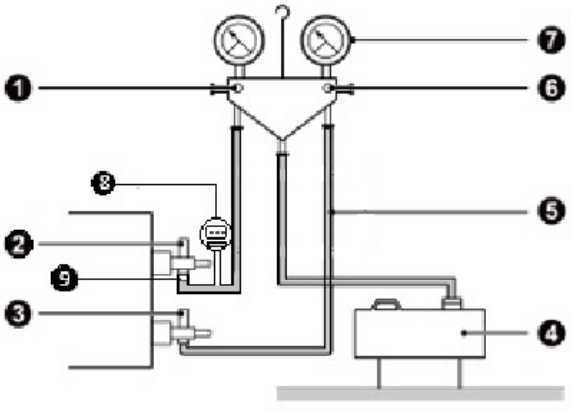


Fig.4.5.1

1. Low side on compound gauge
2. Low side service valve
3. Hi-side service valve
4. Vacuum pump
5. Refrigerant hose
6. Hi-side on compound gauge
7. Analog gauge hi-side
8. Vacuum Gauge
9. 5/16 connection adapter

2.2 Additional Refrigerant Charging

NOTICE
(1) The amount of refrigerant charged into the system before leaving the factory does not include the amount of refrigerant added to the pipelines and the outdoor unit.
(2) The additional amount of refrigerant added to the pipelines is determined according to the size of the liquid pipe and its length on site.
(3) Record the amount of refrigerant added to facilitate after-sales maintenance.

①Additional refrigerant charge R = pipeline additional refrigerant charge A + outdoor unit additional refrigerant charge B

②Calculation of pipeline additional refrigerant charge A

Pipeline additional refrigerant charge A = liquid pipe length (Σ) × additional refrigerant charge per meter of the liquid pipe.

X1: The length of 1/4" liquid pipe

X2: The length of 3/8" liquid pipe

The length of X1+X2	The length of X2	Quantity additional refrigerant charge per meter of the liquid pipe A
65 Feet	65 Feet	0
> 65 Feet	≥ 65 Feet	(X2-65)×0.58+X1×0.24 = oz per foot
	< 65 Feet	(X1+X2- 65)×.24 = oz per foot

③Calculation of outdoor unit additional refrigerant charge B(kg(LBS))

Indoor Unit Quantity	Outdoor Unit Capacity(kBtu/h)		
	36	48	60
≤2	0	0	0
3	10.5 oz	10.5 oz	17.5 oz
4	21 oz	21 oz	21 oz
≥5	21 oz	21 oz	35 oz

NOTE:The maximum refrigerant charging volume for the system can't exceed 16.5LBS (including the refrigerant charged in the factory).

Record the amount of refrigerant added to facilitate after-sales maintenance. After ensuring that the system does not leak and the compressor is not working, first charge the specified amount of R410A into the unit from the injection port of the outdoor unit liquid pipe valve until the required amount is reached. If the amount of refrigerant that needs to be added cannot be filled quickly due to pressure rise in the pipe, then power on the unit in cooling mode and charge the refrigerant through the gas valve of the outdoor unit.

For example:

The ODU is composed of the module: 60 kBtu/h.

The IDUs are made up of 4 sets of 15 kBtu/h.

X1=30m(98feet), X2=15m(49feet)

The pipeline additional refrigerant charge A =(30+15-20)×0.022=0.55kg

(98+49-65-5/8)×0.015=1.22LBS

outdoor unit additional refrigerant charge B=0.6kg(1.32LBS)

Total Additional refrigerant charge R =0.55+0.6=1.15kg (1.22+1.32=2.54LBS).

2.3 Engineering Installation Information Confirmation

Calculate the additional refrigerant quantity according to the method in section 2.2, and record the additional refrigerant quantity and related engineering pipe length information in the engineering installation information confirmation table.

INFORMATION CONFIRMATION TABLE FOR ENGINEERING INSTALLATION		
Length and height of connection pipe	The length from the outdoor unit to the first branch	ft.
	The length from the first branch to the farthest indoor unit	ft.
	Location of outdoor unit	☐upper side/☐middle/☐lower side
	The maximum height from the indoor unit to the outdoor unit (outdoor unit is above indoor unit/outdoor unit is under the indoor unit)	/ ft.
Refrigerant additional information	The length of pipe Φ1/4 inch/The length of pipe Φ3/8 inch	ft.
	Additional refrigerant volume A for the pipe/Additional refrigerant charge volume B for the outdoor unit	/ LBS.
	Total additional refrigerant volume A+B	/ LBS.
Installation completion date/Commissioning completion date		/

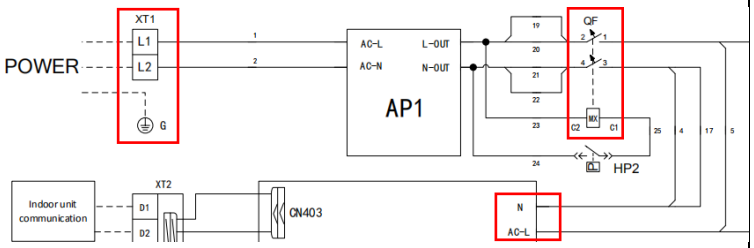
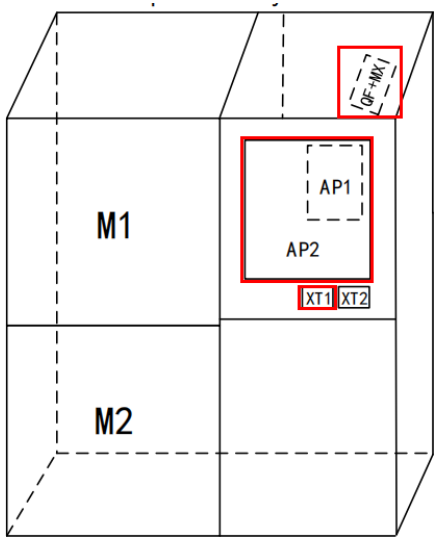
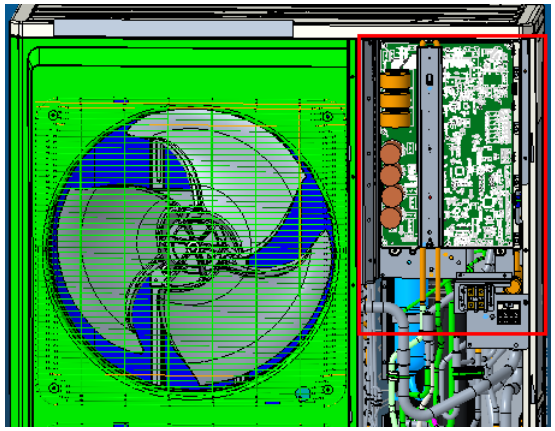
1. Length and height of connection pipes can't exceed the range indicated in the instruction manual.
2. The maximum refrigerant charging volume for the system can't exceed 16.5LBS (including the refrigerant charged in the factory).
3. When this table is filled, please stick it at the inner surface of side plate of the unit for checking during maintenance.

3 Inspection of Key Parts

3.0 Power

<table>
<tr><th>Specifications</th><th colspan="2">Description</th></tr>
<tr><td>The power supplies of the compressor and fan comprise the following three parts:
① The specifications of the input power are 208/230V ~ 60Hz and earth line.
② The main control board can convert AC power to DC power, also can convert DC power to three phase AC power.
③The circuit breaker and the shunt release are one of the protectors of the main circuit.</td><td colspan="2">Use of power to the main control board:
① Providing AC power for the solenoid valve coil and 4-way valve coil.
② Generating the low-voltage DC power.</td></tr>
<tr><th>Circuit diagram</th><th>Layout of electrical appliance box</th><th>Physical position</th></tr>
<tr><td colspan="3">Models: GMV-V36WL/C-T(U)、GMV-V48WL/C-T(U)、GMV-V60WL/C-T(U)</td></tr>
</table>

Specifications	Description
The power supplies of the compressor and fan comprise the following three parts: ① The specifications of the input power are 208/230V ~ 60Hz and earth line. ② The main control board can convert AC power to DC power, also can convert DC power to three phase AC power. ③The circuit breaker and the shunt release are one of the protectors of the main circuit.	Use of power to the main control board: ① Providing AC power for the solenoid valve coil and 4-way valve coil. ② Generating the low-voltage DC power.

Circuit diagram	Layout of electrical appliance box	Physical position
		

3.0.1 Mechanical Inspection

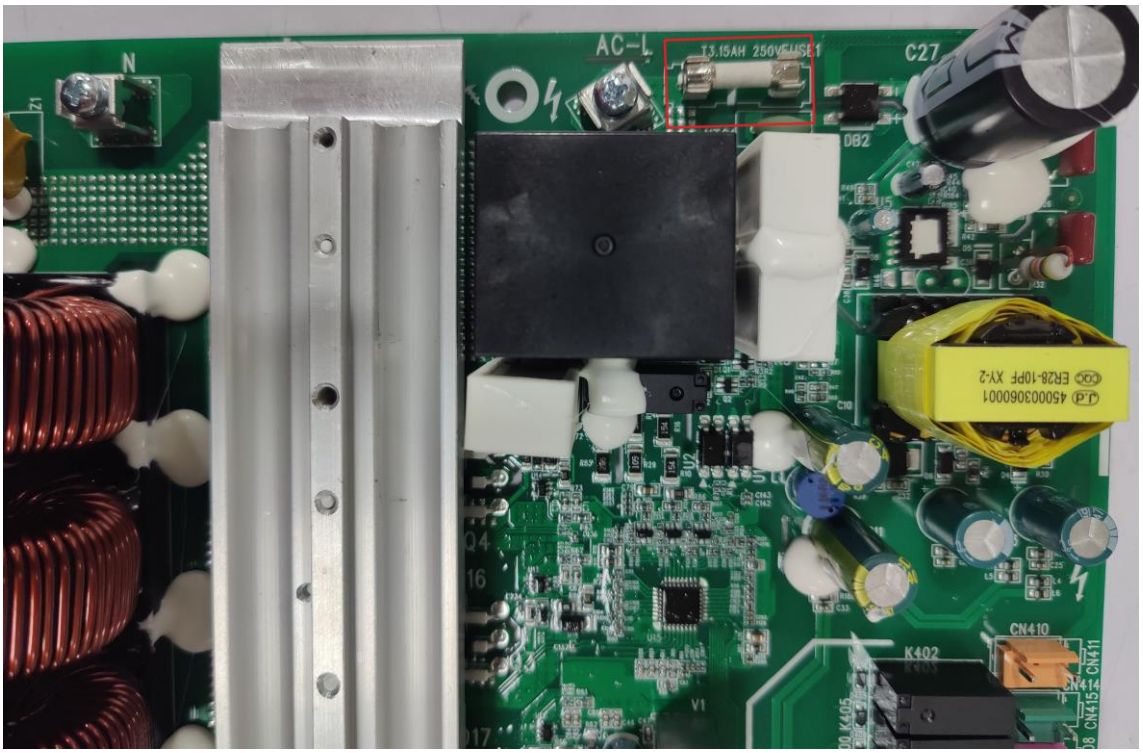
(1) Confirm that the unit power is disconnected.

(2) Remove the electrical appliance cover.

(3) Check whether the power cable is fixed on the wiring board.

(4) Check whether the fuses on the main board and filter board are damaged.

(5) Check whether the varistors on the main board and filter board are damaged.



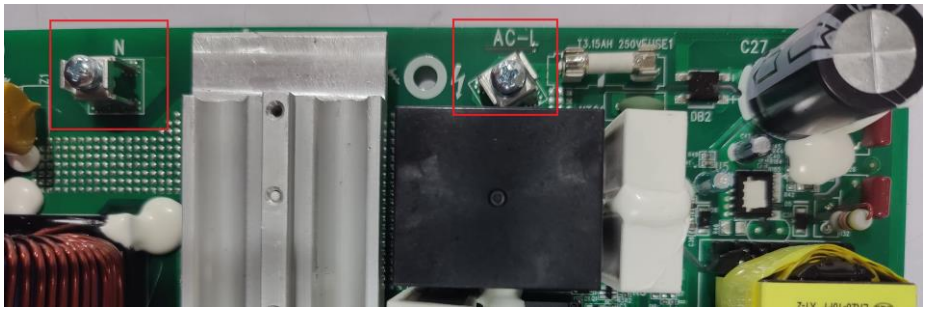
3.0.2 Electrical Inspection

Check the power cable from the main switch board to the ODU:

(1) Use an ohmmeter of at least 500V DC to check whether the insulation resistance between each phase and the ground reaches at least 1 megohm. Small insulation resistance indicates a potential electric leakage.

Warning: Electric shock

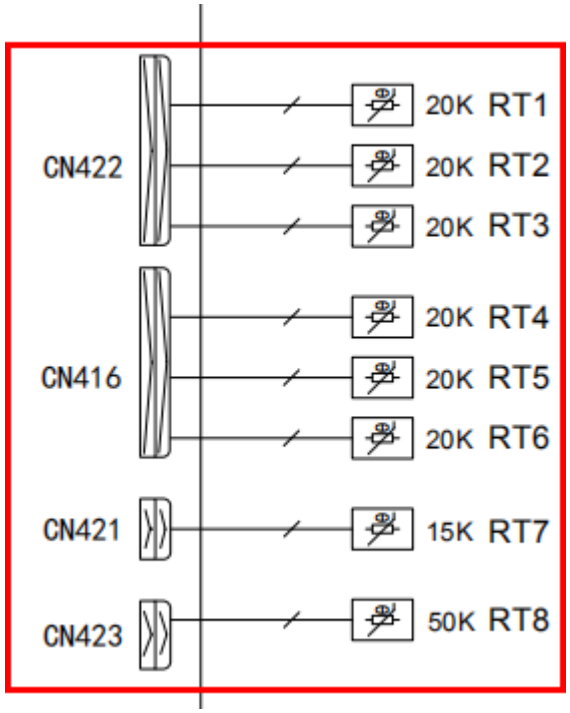
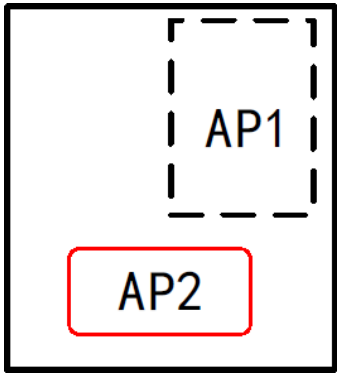
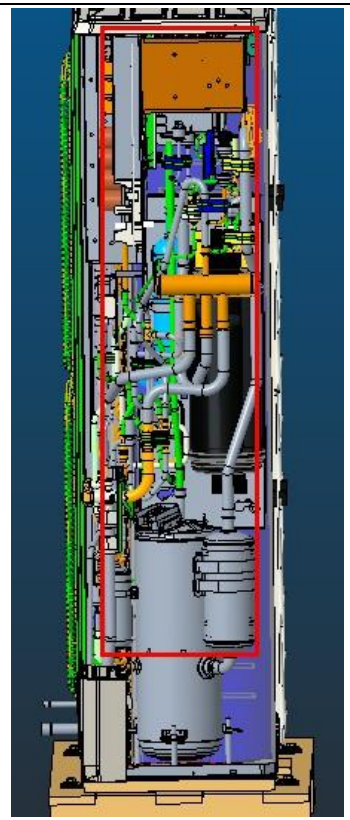
(2) After checking, connect the power and verify that the voltage of the power terminals is correct: Voltage between N and AC-L: 208/230 VAC.



3.1 Temperature Sensors

Specifications	Description
Three types of temperature sensors of different specifications are used, including 50K, 20K and 15K.	The sensors are used to measure the temperature of the unit at different positions.

Models: GMV-V36WL/C-T(U)、GMV-V48WL/C-T(U)、GMV-V60WL/C-T(U)

Circuit diagram	Layout of electrical appliance box	Physical position
		

3.1.1 Mechanical Inspection

(1) Confirm that the unit Power is disconnected.

(2) Find the place corresponding to each sensor on the unit and check if the sensors are firmly fixed on the unit.

3.1.2 Electrical Inspection

Measure the actual temperature and resistance of the temperature sensors and compare it with the characteristic curve of the temperature sensors to determine whether the thermocouple is normal.

(1) Power off the unit. Remove the electrical appliance cover after the ODU stops.
Warning: Electric shock

(2) Remove the electrical appliance cover and check whether the connecting terminal of the temperature sensors is firm.

(3) Use a thermometer to measure the temperature of the spot sensed by the temperature sensors.

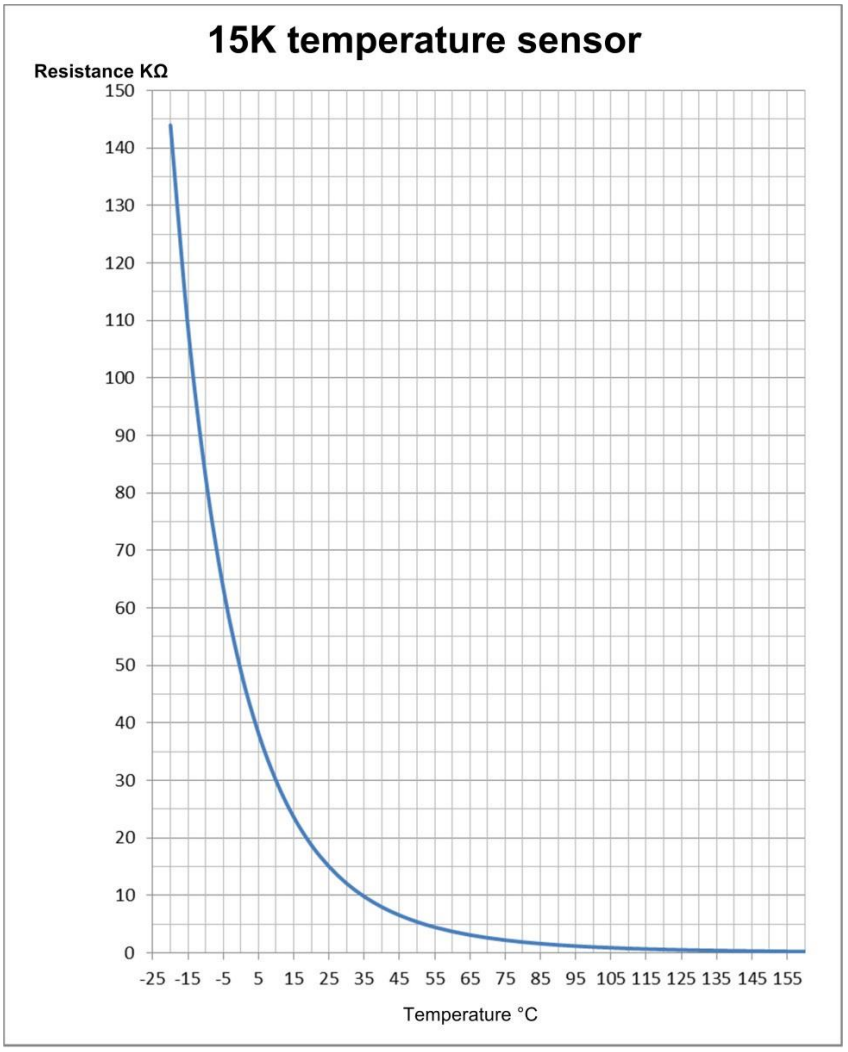
(4) Disconnect the connecting terminal of the corresponding temperature sensor from the main board. Use a multimeter to measure the resistance of the temperature sensors and compare it with the confirmed temperature range.

(5) If the measured resistance and temperature do not match with the resistance and temperature in the characteristic curve of the temperature sensor, the temperature sensor needs to be replaced.

(6) If the measured resistance and temperature match with the resistance and temperature in the characteristic curve of the temperature sensor, but the temperature of the spot is abnormal according to the monitoring of the unit, the main board needs to be replaced.

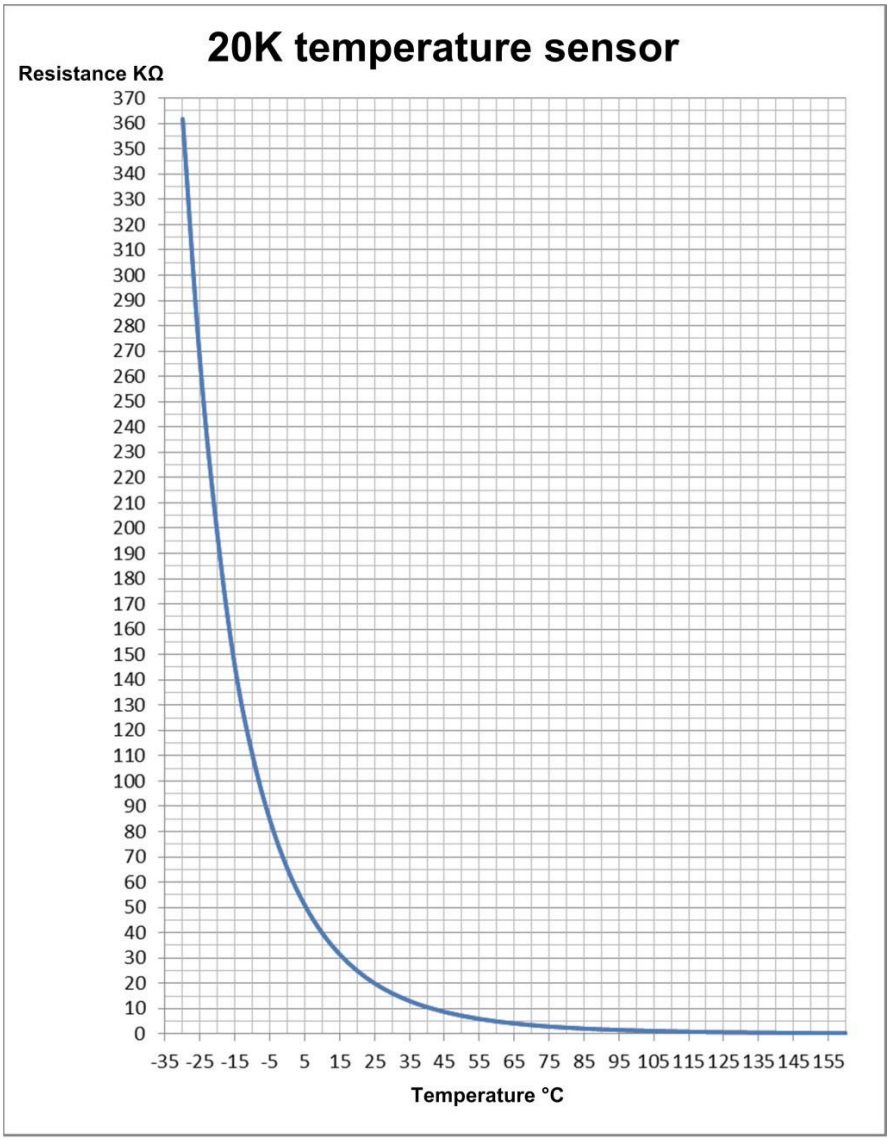
15K temperature sensor resistance - temperature curve

15K	
Temperature\°C	Resistance\KΩ
-20	144
-15	108.7
-10	82.75
-5	63.46
0	49.02
5	38.15
10	29.9
15	23.6
20	18.75
25	15
30	12.07
35	9.779
40	7.967
45	6.529
50	5.379
55	4.456
60	3.711
65	3.105
70	2.611
75	2.205
80	1.871
85	1.594
90	1.363
95	1.171
100	1.009
105	0.873
110	0.7577
115	0.6599
120	0.5765
125	0.5052
130	0.4441
135	0.3914
140	0.346
145	0.3066
150	0.2725
155	0.2427
160	0.2166



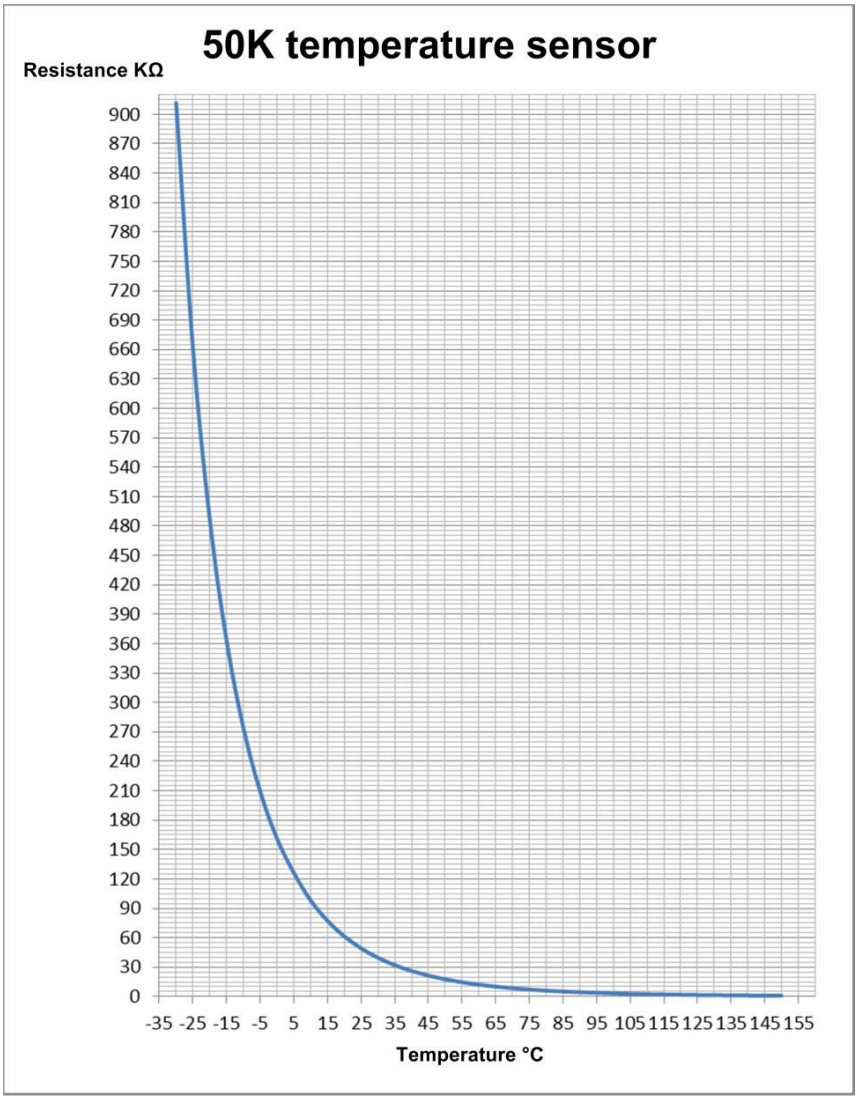
20K temperature sensor resistance - temperature curve

20K	
Temperature\°C	Resistance\KΩ
-30	361.8
-25	265.5
-20	196.9
-15	145
-10	110.3
-5	84.61
0	65.37
5	50.87
10	39.87
15	31.47
20	25.01
25	20
30	16.1
35	13.04
40	10.62
45	8.705
50	7.173
55	5.942
60	4.948
65	4.14
70	3.481
75	2.94
80	2.495
85	2.125
90	1.818
95	1.561
100	1.346
105	1.164
110	1.01
115	0.8799
120	0.7687
125	0.6736
130	0.5921
135	0.5219
140	0.4613
145	0.4088
150	0.3633
155	0.3237
160	0.2891

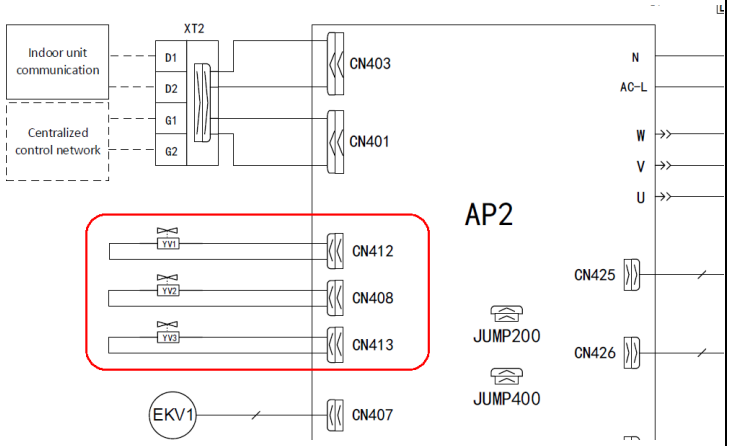
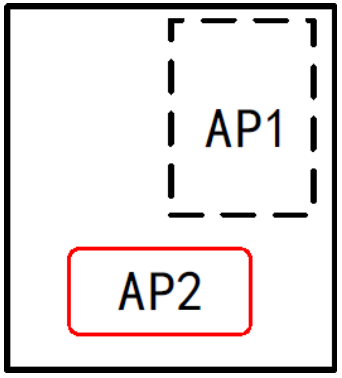
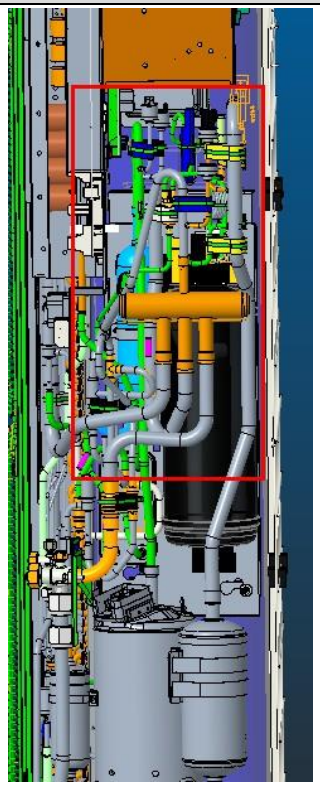


50K temperature sensor resistance - temperature curve

50K	
Temperature\°C	Resistance\KΩ
-30	911.56
-25	660.93
-20	486.55
-15	362.99
-10	274.02
-5	209.05
0	161.02
5	126.17
10	98.006
15	77.349
20	61.478
25	49.191
30	39.61
35	32.088
40	26.147
45	21.425
50	17.651
55	14.618
60	12.168
65	10.178
70	8.5551
75	7.2245
80	6.1288
85	5.2223
90	4.4693
95	3.841
100	3.3147
105	2.8721
110	2.4983
115	2.1816
120	1.9123
125	1.6821
130	1.485
135	1.3155
140	1.1694
145	1.0429
150	0.9331



3.2 Solenoid Valve

<table>
<tr><th>Specifications</th><th colspan="2">Description</th></tr>
<tr><td>Coils of different types are used on:
① 4-way valve
② Solenoid valve.</td><td colspan="2">① The 4-way valve is used to switch between cooling mode and heating mode. If the 4-way valve is active, the unit works in heating mode, if the 4-way valve is inactive, the unit works in cooling mode.
② The solenoid valve is used to control the on-and-off of the pipeline. The valve of the unit is solid closed. That is, the valve is closed when it is inactive, open when it is active.</td></tr>
<tr><th>Circuit diagram</th><th>Layout of electrical appliance box</th><th>Physical position</th></tr>
<tr><td colspan="3">Models: GMV-V36WL/C-T(U)、GMV-V48WL/C-T(U)、GMV-V60WL/C-T(U)</td></tr>
<tr><td> 
</td><td> 
</td><td>  </td></tr>
</table>

3.2.1 Mechanical Inspection

(1) Confirm that the unit Power is disconnected.

(2) Find the 4-way valve or solenoid valve, check whether the fixing screw is loose and whether the valve and coil have any apparent exceptions.

3.2.2 Electrical Inspection

Compare the measured coil resistance with the normal coil resistance to check whether the coil is damaged.

(1) Power off the unit. Remove the electrical appliance cover after the ODU stops.
Warning: Electric shock

(2) Remove the electrical appliance cover and check whether the connecting terminal of the 4-way valve or solenoid valve is firm.

(3) Disconnect the corresponding valve's coil terminal from the main board and use a multimeter to measure the coil resistance.

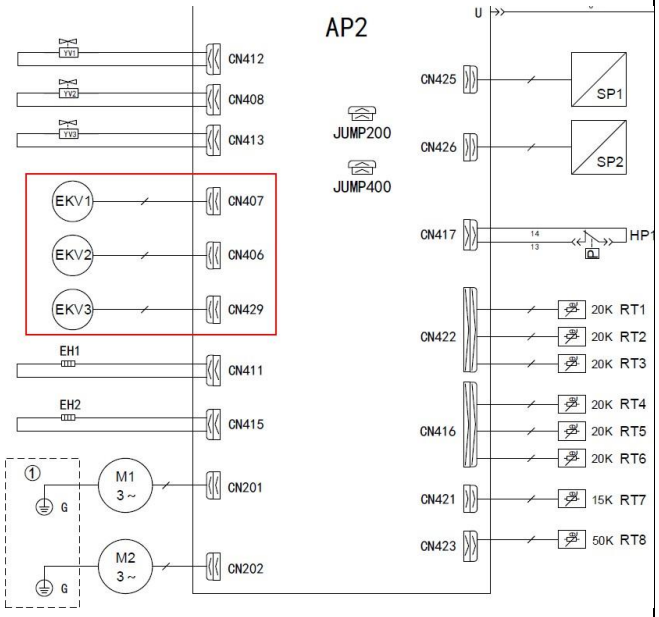
(4) If the measured resistance does not match with that in the following table, the coil needs to be replaced.

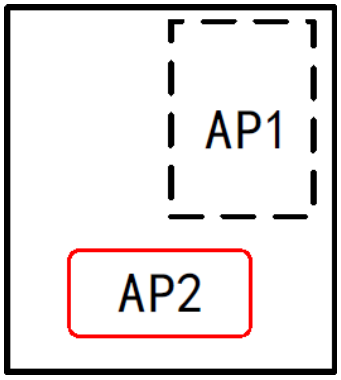
Coil	Bolt on the main board	Resistance (Ω)	Normal range of deviation
4-way valve	CN412	1880	±10%
Sub cooler solenoid valve	CN408	1830	±10%
Sub oil return solenoid valve	CN413	1830	±10%

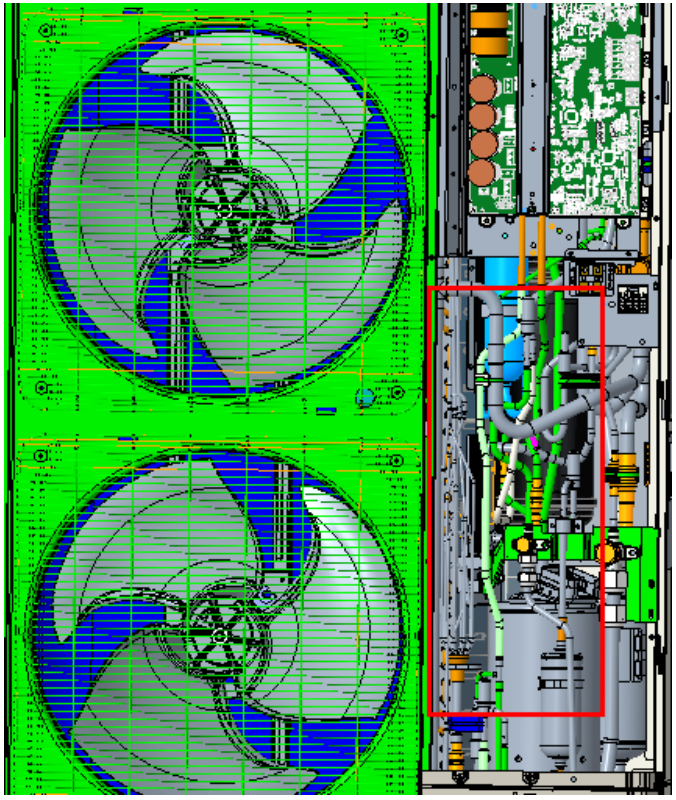
3.3 Electronic Expansion Valve

Specifications	Description
The electronic expansion valve with the largest openness of 480 pls and 5-core coil.	The electronic expansion valve is used to control the flow. When the electronic expansion valve is closed (the openness is 0 pls), the flow is stopped.

Circuit diagram	Layout of electrical appliance box	Physical position
Models: GMV-V36WL/C-T(U)、GMV-V48WL/C-T(U)、GMV-V60WL/C-T(U)		







3.3.1 Mechanical Inspection

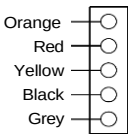
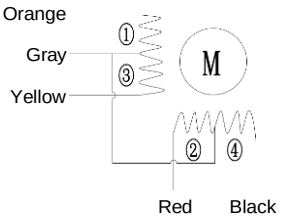
Step 1: Switch off the power of the ODU.

Step 2: Check whether the coil of the electronic expansion valve is firmly fixed on the electronic expansion valve.

3.3.2 Electrical Inspection

Step 1: Power off the ODU and power on it. When the ODU is powered on again, the electronic expansion valve should be reset. When the electronic expansion valve is reset, touch the valve with a hand to check if the valve core rotates. In the second half of the resetting process, the valve core will click and vibrate obviously; otherwise, the electronic expansion valve, coil or the main board needs to be replaced.

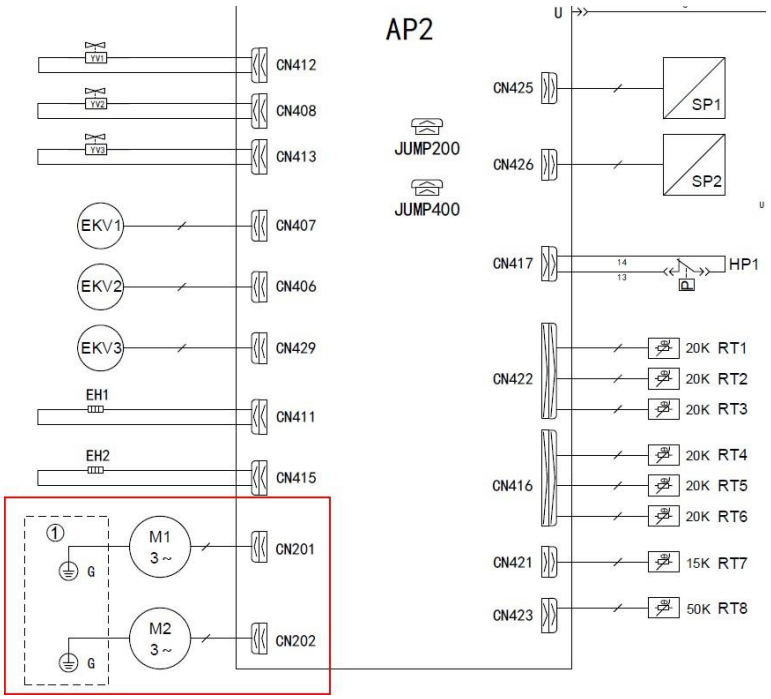
Step 2: Switch off the power of the ODU, disconnect the coil terminal of the electronic expansion valve from the main board and use a multimeter to measure the resistance of each contact point of the terminal. The normal range of the resistance is shown in the following table. If any value is beyond the normal range, the coil is damaged and needs to be replaced.

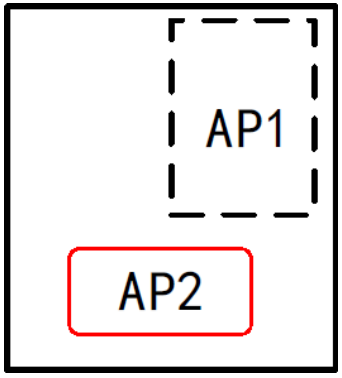
Coil	Interface No.	Color	Port specifications	Max. number of steps	Terminal layout	Diagram of internal coils	Coil resistance range
Heating electronic expansion valve	CN407	White	5 cores	480			46Ω±3.7Ω
Subcooler electronic expansion valve	CN406	Red	5 cores	480			
Vapor injection electronic expansion valve	CN429	Black	5 cores	480			

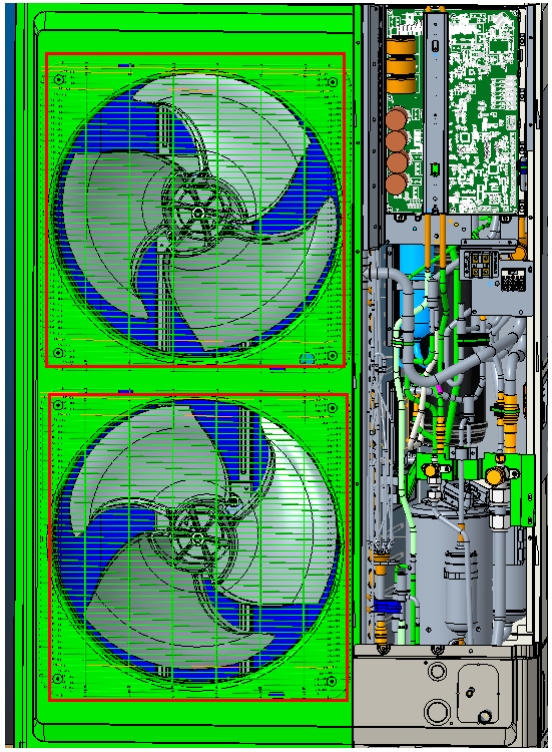
3.4 Fans

Specifications	Description
The unit is equipped with two fans. The fans are connected to the main control board.	The fans are powered by a DC inverter motor and can adjust the speed automatically according to the environmental temperature and load, thus adapting to the demand of the unit operation.

Circuit diagram	Layout of electrical appliance box	Physical position
Models: GMV-V36WL/C-T(U)、GMV-V48WL/C-T(U)、GMV-V60WL/C-T(U)		







3.4.1 Mechanical Inspection

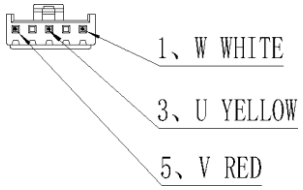
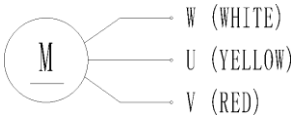
Step 1: Switch off the power of the ODU.

Step 2: Check whether the connector between the fan motor and fan drive board is firmly connected.

Step 3: Rotate the blades with a hand to check whether they can rotate smoothly and whether the blades rub the baffle ring during rotation. If the blades are blocked during rotation, the motor needs to be replaced; if the blades rub the baffle ring during rotation, check whether the blades and baffle ring deform and needs to be replaced.

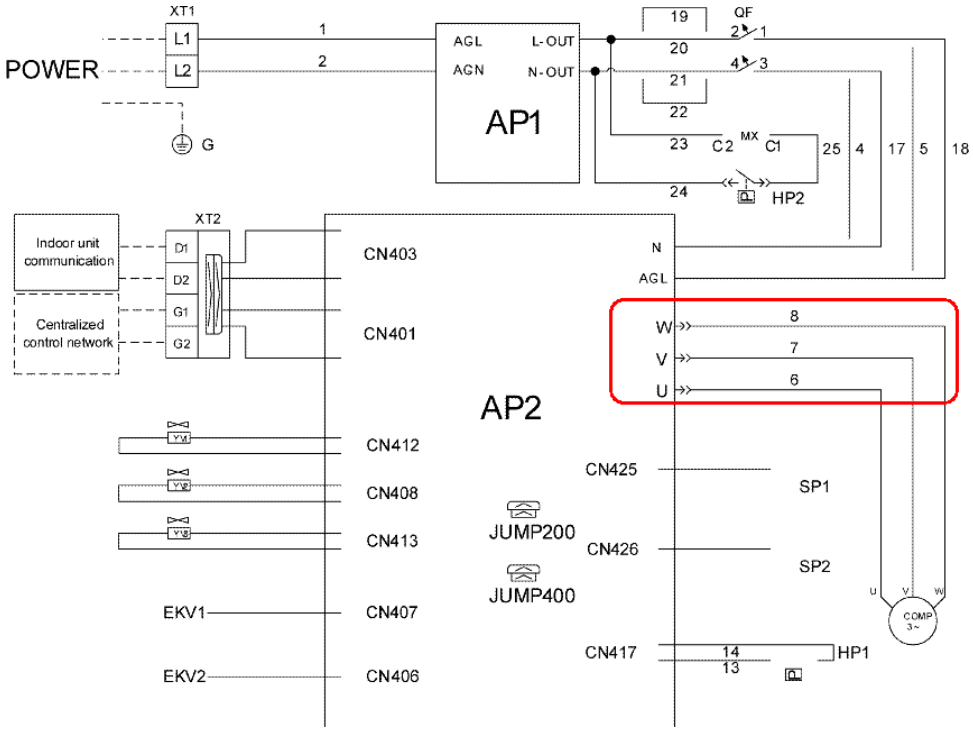
3.4.2 Electrical Inspection

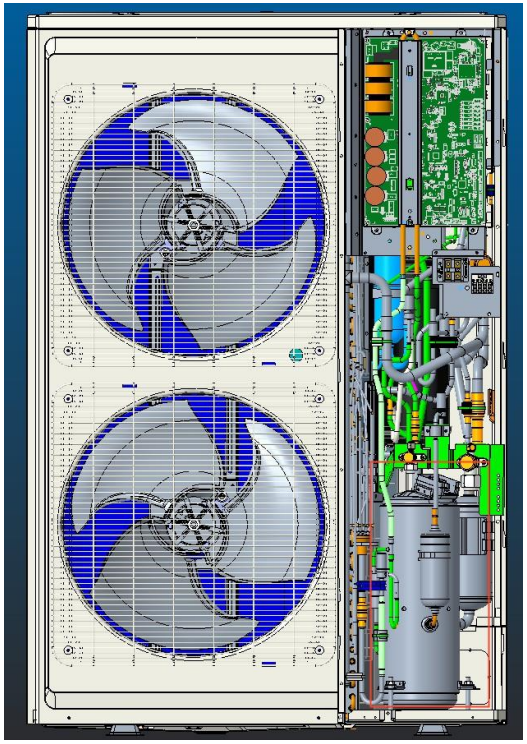
Switch off the power of the ODU. Disconnect the connector between the fan motor and fan drive board. Use a multimeter to measure the resistance of each contact point of the motor terminal. The normal range of the resistance is shown in the following table. If any value is beyond the normal range, the motor is damaged and needs to be replaced.

Terminal layout	Diagram of internal coils	Range of coil resistance between any two phases
		37.4Ω±8%

3.5 Compressor

Specifications	Description
Models: QXAT-F400zN450	Compression refrigerant, recycling refrigerant.
Models: GMV-V36WL/C-T(U)、GMV-V46WL/C-T(U)、GMV-V60WL/C-T(U)	
Circuit diagram	Physical position





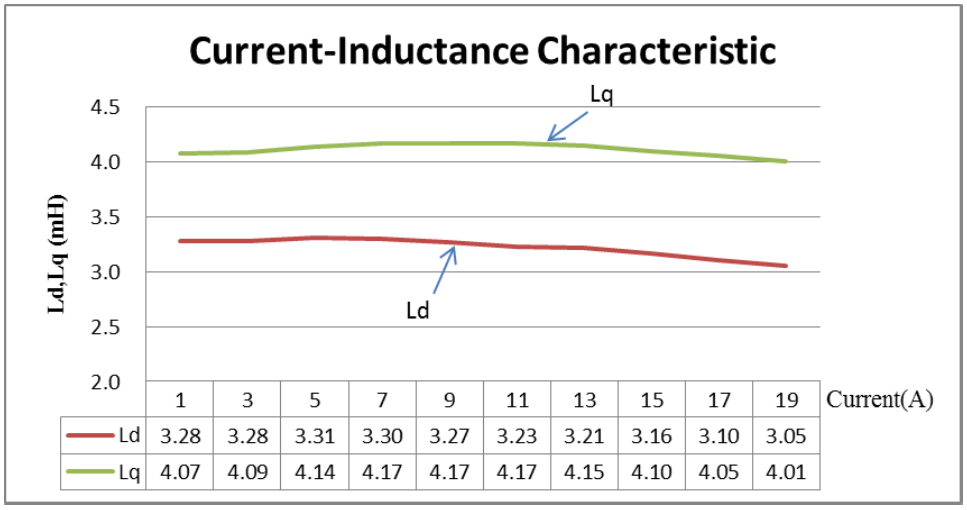
3.5.1 Diagnosis of Compressor Failures

3.5.1.1 When the unit can be started

Step 1:

If the unit can be started, check the faulty compressor's line current. Use a pressure gauge to measure the gas and liquid valve pressure and monitor the measured data on a PC. Compare the data to the following table of recommended current. The current may deviate by about 10% depending on the inverter compressor's speed and working condition.

When the compressor frequency is 30 Hz, the current curve under different evaporation temperature and condensation temperature is shown as follows:



	1	3	5	7	9	11	13	15	17	19	Current(A)
Ld	3.28	3.28	3.31	3.30	3.27	3.23	3.21	3.16	3.10	3.05	
Lq	4.07	4.09	4.14	4.17	4.17	4.17	4.15	4.10	4.05	4.01	

NOTE!

When the compressor is working at another frequency, the current curve can be obtained through interpolation calculation of the above frequency.

NOTE!

When the compressor is working at another frequency, the current curve can be obtained through interpolation calculation of the above frequency.

Step 2:

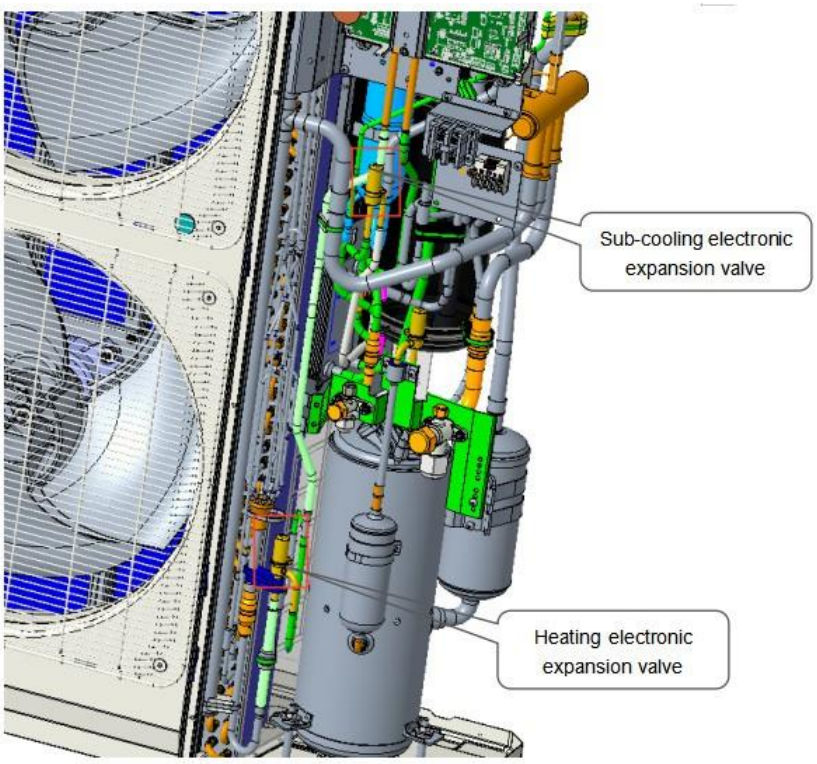
Check whether the running sound of the compressor is normal and whether any high-pitched sound or obvious scratch can be heard. If there is a nearby unit running properly, compare the sound of the compressor under inspection with that of the normally running unit.

Step 3:

Check whether the electronic expansion valve of the ODU and 4-way valve work properly, and whether the oil-return pipeline and oil-return valve are normal. Touch the oil-return capillary tube with a hand to check whether oil flows in the tube and check the pipeline temperature.

Diagnosis method:

1) Electronic expansion valve: When the unit is powered on and off each time, the electronic expansion valve needs to reset. Touch the valve with a hand to check if the valve core rotates. In the second half of the resetting process, the valve core will click and vibrate obviously.



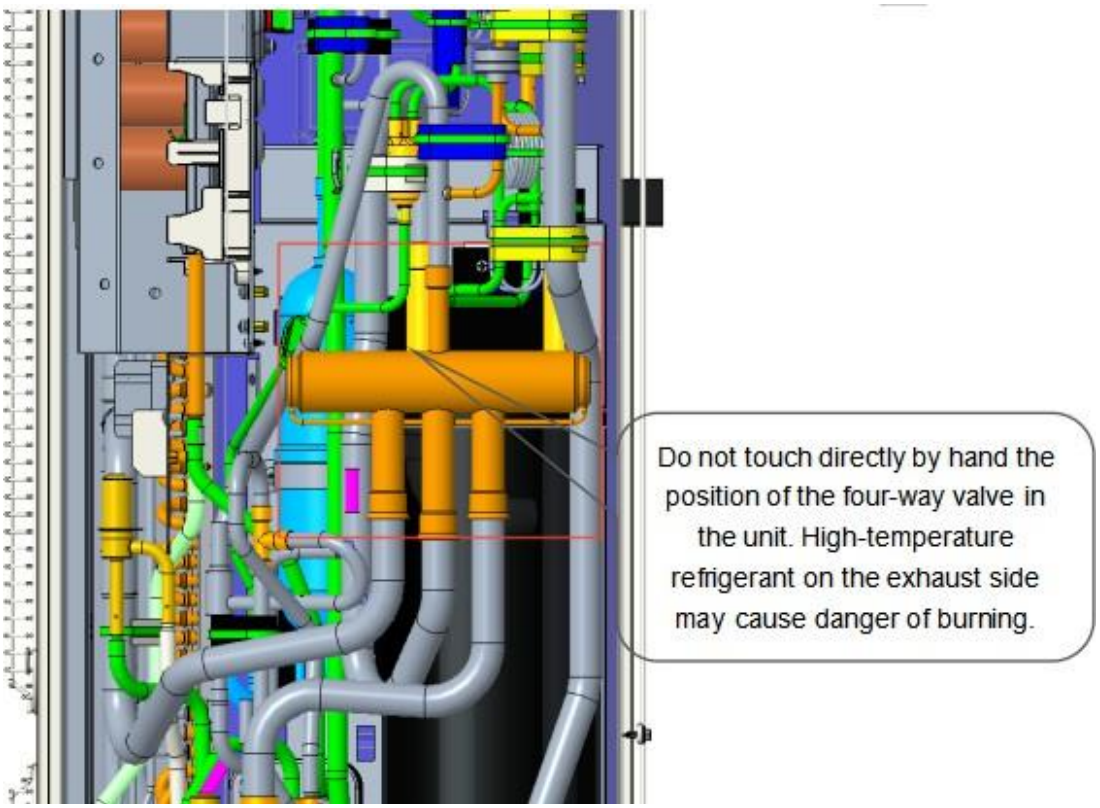
Note on touching the electronic expansion valve:

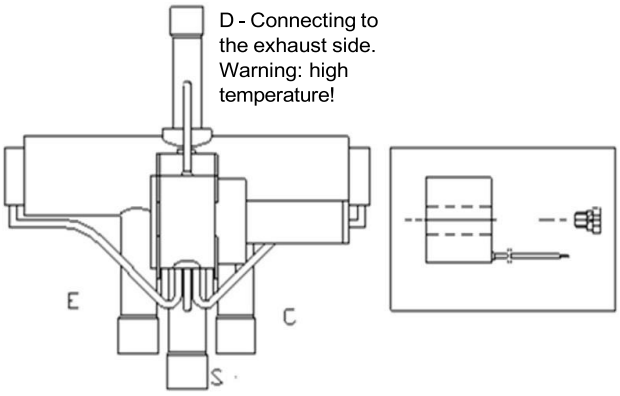
Notes:

① Check whether the coil is firmly fixed.

② Touch the upper part of the electronic expansion valve and check whether the resetting of the unit can be clearly felt.

2) 4-way valve: When it is normal, the temperature different between it and the four copper tubes connecting to the valve is obvious. When the 4-way valve works, obvious sound and vibration can be heard and felt.

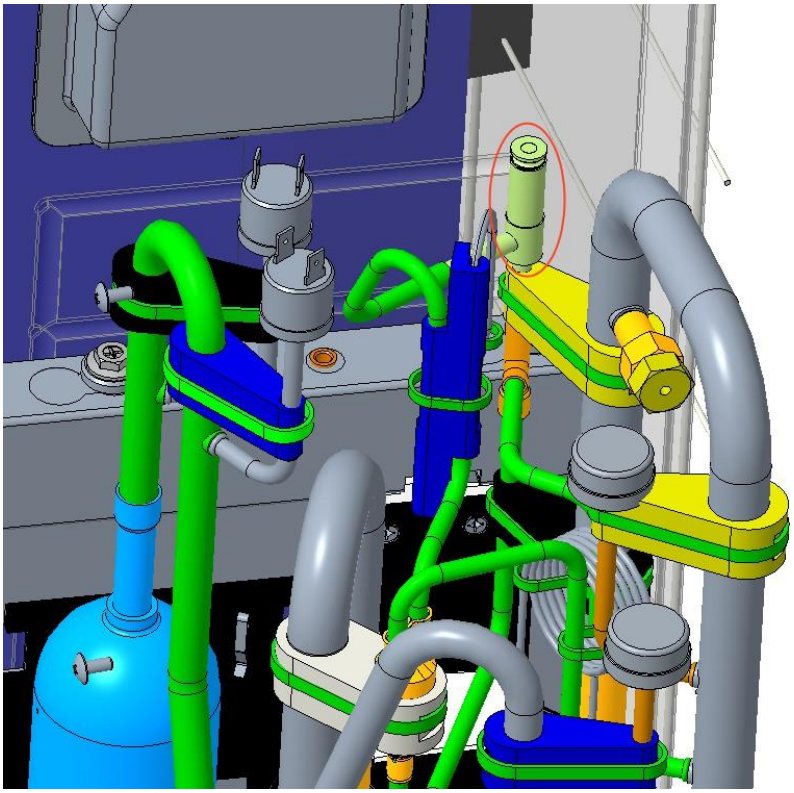




Marks are made on the 4-way valve: D indicates connection to the exhaust side, E indicates connection to the IDU evaporator, S indicates connection to the air inlet of gas-liquid separator, C indicates connection to the condenser; when the system runs in the cooling mode, C indicates that the pipeline is in the high-pressure and high-temperature status, while E and S indicate that the pipeline is in the low-pressure and low-temperature status; when the system runs in the heating mode, E indicates that the pipeline is in the high-pressure and high-temperature status, while C and S indicate that the pipeline is in the low-pressure and low-temperature status; the pipe marked by D is connected to the air outlet and remains in the high-pressure and high-temperature status. When the unit is being started, defrosting

and conducting oil return, the 4-way valve produces obvious valve pushing sound. Do not touch the pipeline with hands. Otherwise, you may get scalded.

3) Oil-return solenoid valve: It can be diagnosed based on the oil-return valve status displayed on the monitor program and the actual operation. When the balance valve is open, the coil heats up and the lubricant flow before and after the valve is obvious.

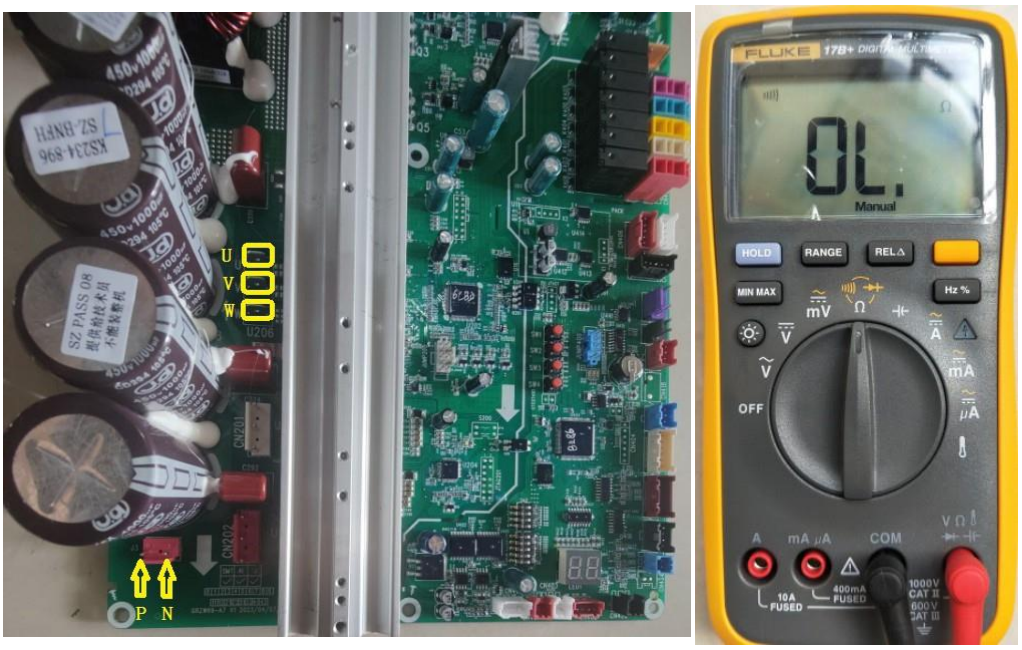


Step 4:

Test the main board (IPM module).

1: Disconnect the power and wait five minutes, and unplug the compressor cable.

2: As shown in the figure, switch the multimeter to the diode gear. Point the black probe to the P bonding pad and the red probe to the N wiring terminal. In the normal condition, the multimeter will not beep. If it does, the main board is damaged and needs to be replaced.



3: Point the black probe to the P needle file and the red probe to the V wiring terminal. In the normal condition, the multimeter will not beep. If it does, the drive board is damaged and needs to be replaced.

4: Point the black probe to the P needle file and the red probe to the W wiring terminal. In the normal condition, the multimeter will not beep. If it does, the drive board is damaged and needs to be replaced.

5: Point the black probe to the U wiring terminal and the red probe to the N needle file. In the normal condition, the multimeter will not beep. If it does, the drive board is damaged and needs to be replaced.

6: Point the black probe to the V wiring terminal and the red probe to N needle file. In the normal condition, the multimeter will not beep. If it does, the drive board is damaged and needs to be replaced.

7: Point the black probe to the W needle file and the red probe to the N needle file. In the normal condition, the multimeter will not beep. If it does, the drive board is damaged and needs to be replaced.

3.5.1.2 When the unit cannot be started properly.

Step 1:

Disconnect the unit from power. Remove the terminal box cover and check whether the compressor is wired correctly.

Step 2:

Measure the resistance between any two of the wiring terminals of the compressor (U, V and W). The resistance between two wiring terminals is 0.197±7% Ω.

Measure the grounding resistance of each wiring terminal, which should be greater than 10 MΩ; otherwise, the compressor has an internal fault.

Step 3:

When the unit cannot be started properly, the solenoid valves of the system, including the electronic expansion valve and oil-return valve, need to be checked using the same method described above.

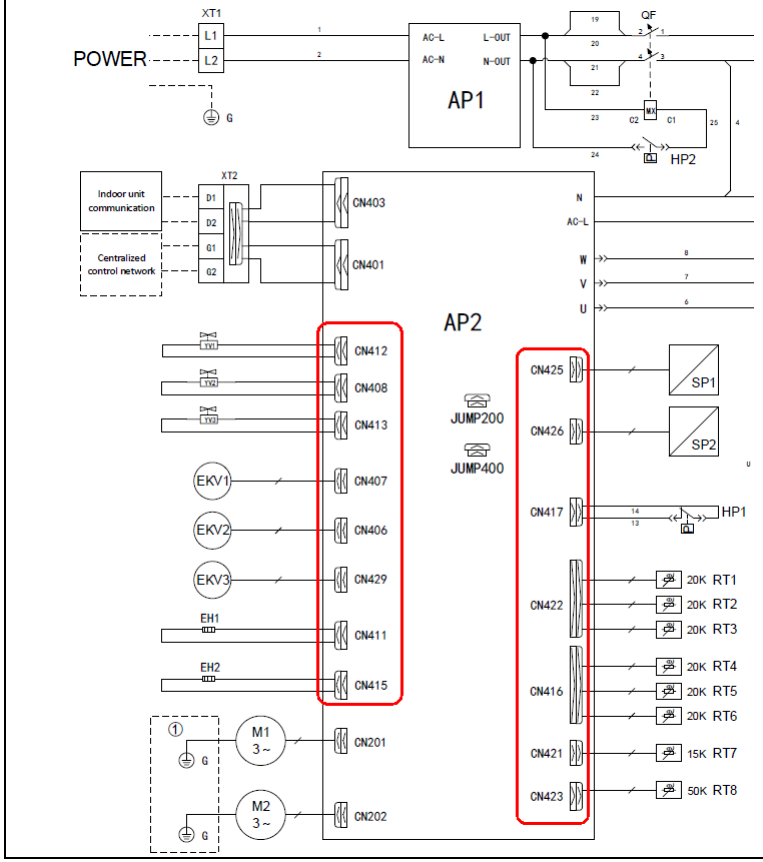
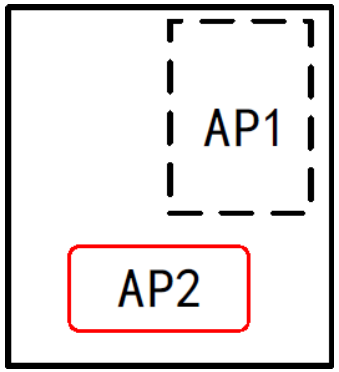
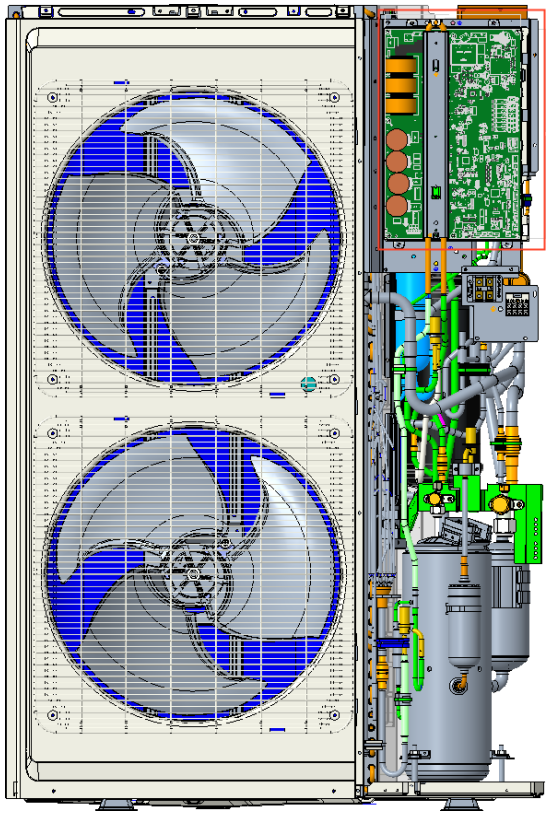
Step 4:

Check the IPM module using the same method described above.

3.6 Board

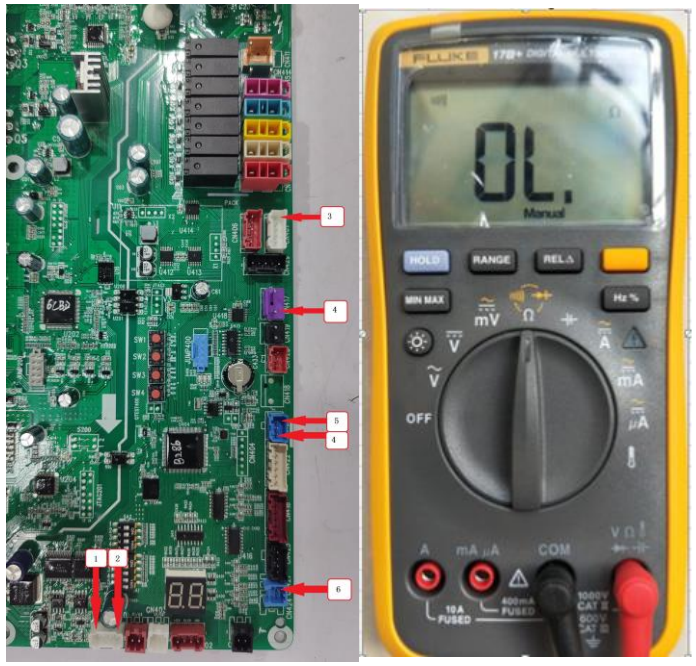
3.6.1 Main Board

The main board is used to control the load of the ODU.

Models: GMV-V60WL/C-T(U)、GMV-V48WL/C-T(U)、GMV-V36WL/C-T(U)		
Circuit diagram	Layout of electrical appliance box	Physical position
		

Step 1: Disconnect the power and wait five minutes.

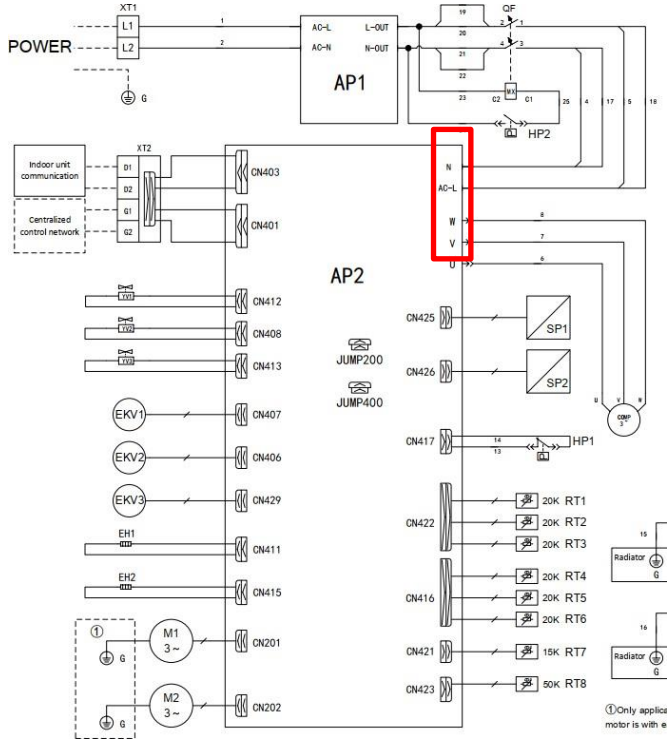
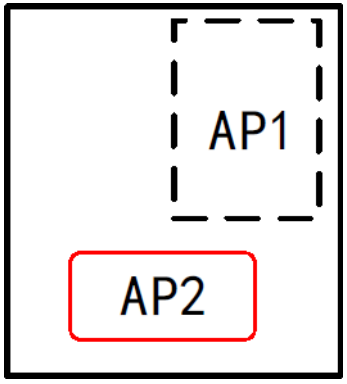
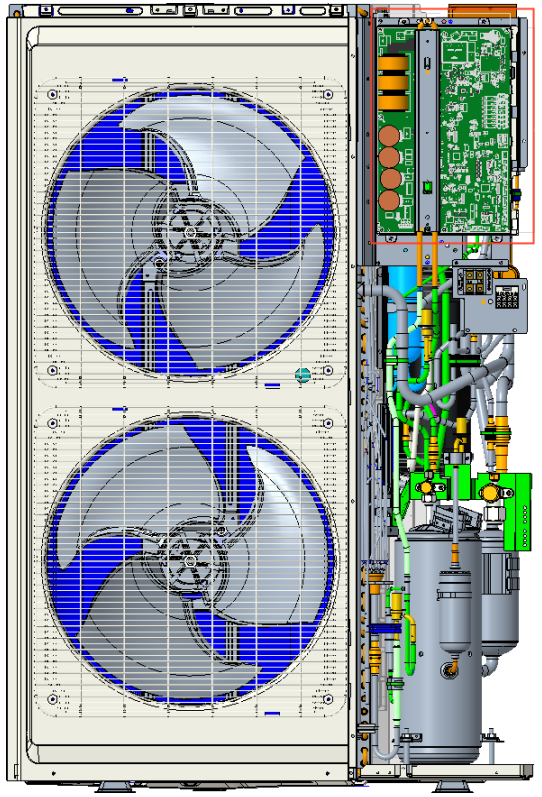
Step 2: As shown in the figure, switch the multimeter to the diode gear. Point the black and red probes to the following positions to check if the main board is normal.



Black probe	Red probe	Symptom
CN400 (1)	CN400 (2)	The main board is normal if the multimeter does not beep.
CN407 (3)	CN417 (4)	The main board is normal if the multimeter does not beep.
CN426(5)	CN417 (4)	The main board is normal if the multimeter does not beep.
CN421 (6)	CN417 (4)	The main board is normal if the multimeter does not beep.
CN407 (3)	CN426 (5)	The main board is normal if the multimeter does not beep.
CN421 (6)	CN426 (5)	The main board is normal if the multimeter does not beep.

3.6.2 Compressor Drive

Specifications	Description
—	This part is used to control the operation of the compressor.
Models: GMV-V60WL/C-T(U)、GMV-V48WL/C-T(U)、GMV-V36WL/C-T(U)	

Circuit diagram	Layout of electrical appliance box	Physical position
		

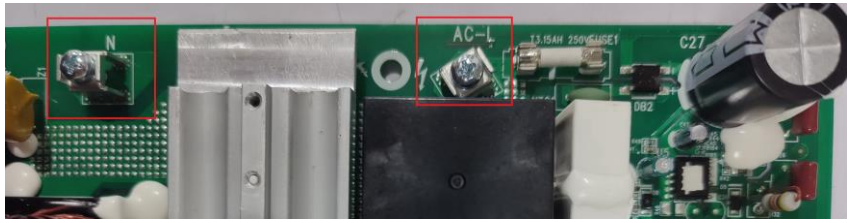
(1) Before the inspection: Find a correct digital multimeter and switch it to the diode gear. Power off the unit and wait two minutes. Disconnect the U, V and W cables of the compressor and N and AC-L power cables from the main board. Do not operate without waiting two minutes after the unit is powered off.

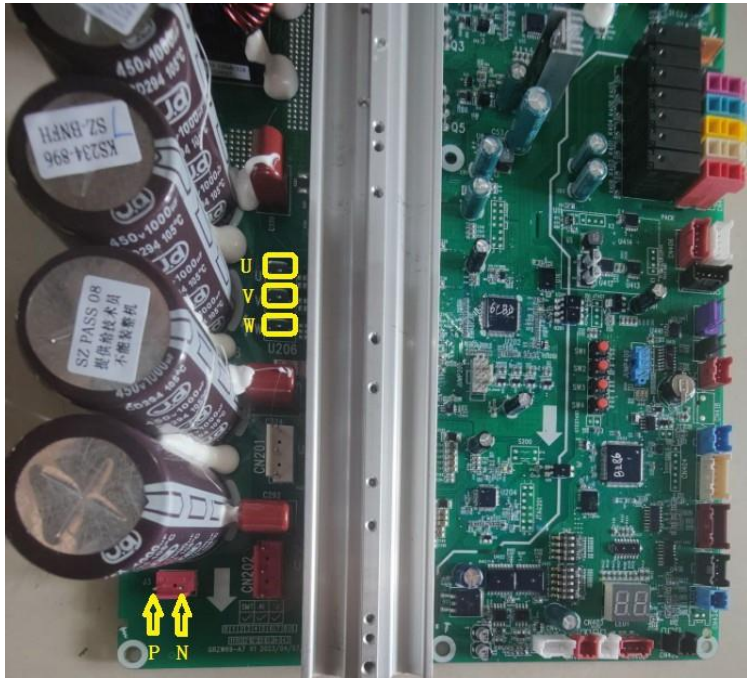
(2) Testing method:

① Point the black probe of the multimeter to the P needle file shown in the following figure and the red probe to U, V and W wiring terminals respectively and check the readings of the multimeter;

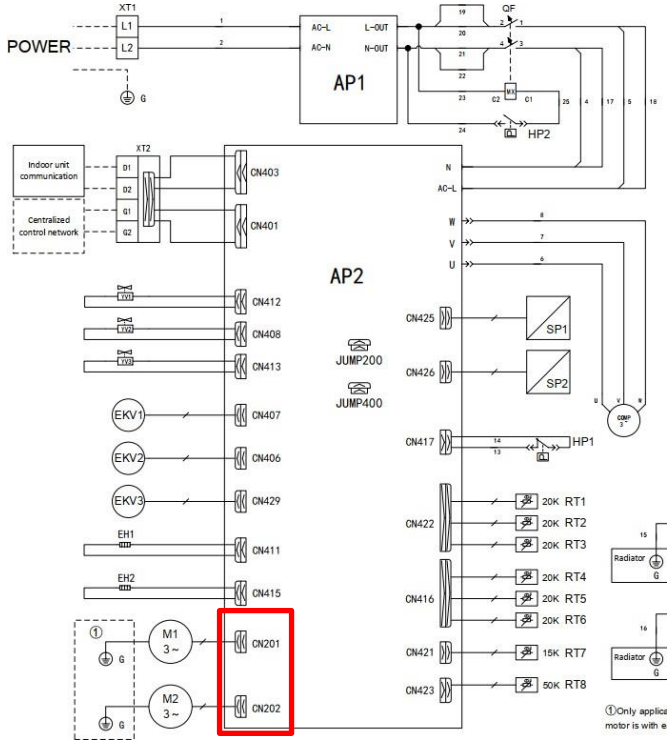
② Point the red probe of the multimeter to the N needle file shown in the following figure and the black probe to U, V and W wiring terminal respectively and check the readings of the multimeter.

(3) Result analysis: If all the readings of the multimeter are between 0.3 V and 0.7 V in the above 12 conditions, the module is normal; if any of the readings is 0, the module is damaged.





3.6.3 Fan Drive

<table>
<tr><th colspan="2">Specifications</th><th>Description</th></tr>
<tr><td colspan="2">—</td><td>This part is used to control the operation of the fan.</td></tr>
<tr><td colspan="3">Models: GMV-V60WL/C-T(U)、GMV-V48WL/C-T(U)、GMV-V36WL/C-T(U)</td></tr>
<tr><td>Circuit diagram</td><td>Layout of electrical appliance box</td><td>Physical position</td></tr>
<tr>
<td> 
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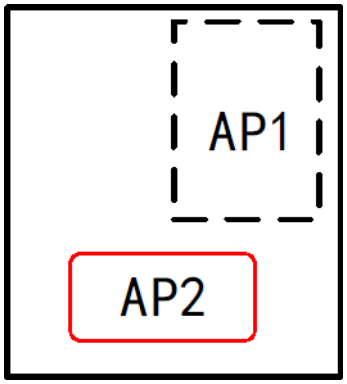
<td> 
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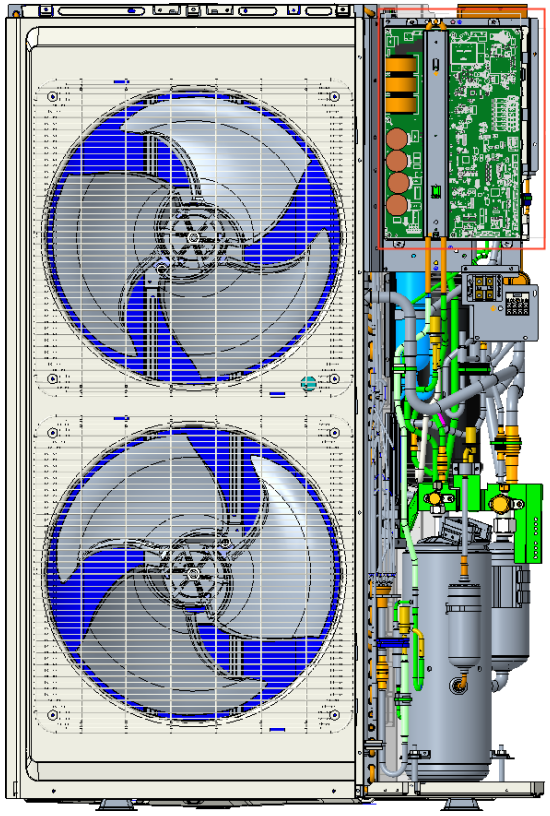
<td>  </td>
</tr>
</table>

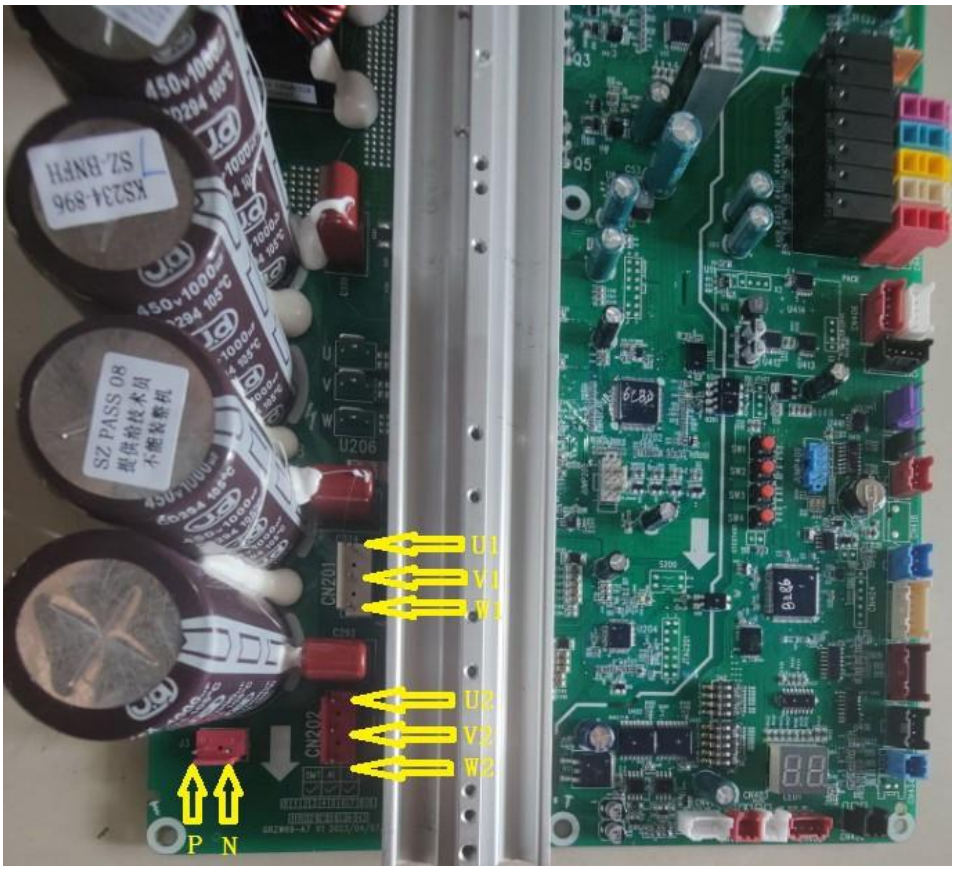
1. Upper Fan Inspection

(1) Before the inspection: Find a correct digital multimeter and switch it to the diode gear. Power off the unit and wait two minutes. Disconnect the U1, V1 and W1 cables of the fans from the drive board. Do not operate without waiting two minutes after the unit is powered off.

(2) Testing method: Point the black probe of the multimeter to the P needle file shown in the following figure and the red probe to U1, V1and W1 wiring terminals respectively and check the readings of the multimeter; point the red probe of the multimeter to the N needle file shown in the following figure and the black probe to U1, V1 and W1 wiring terminal respectively and check the readings of the multimeter.

(3) Result analysis: If all the readings of the multimeter are between 0.3 V and 0.7 V in the above six conditions, the module is normal; if any of the readings is 0, the module is damaged.

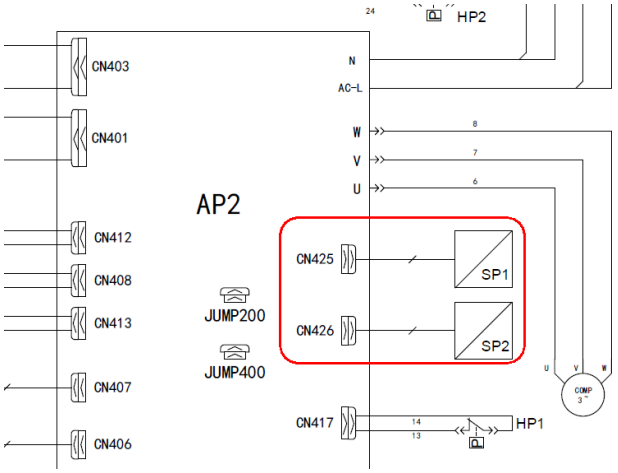
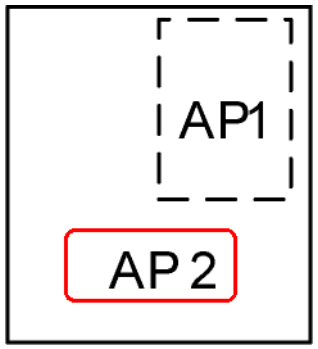
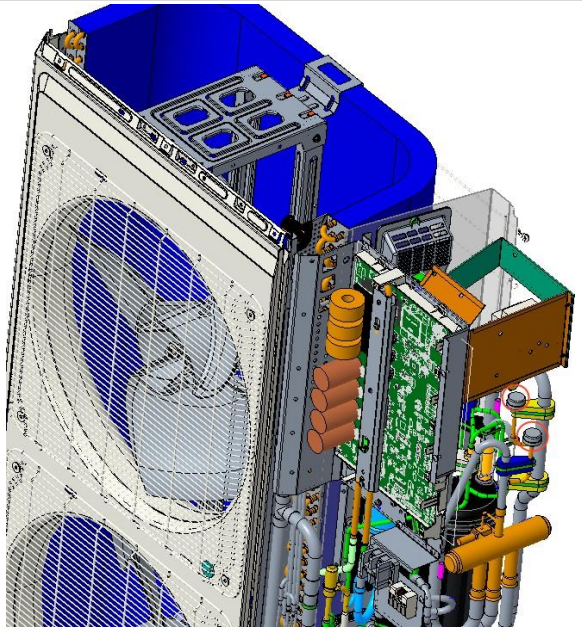
2. Under Fan Inspection in a similar way



3.7 Pressure Sensor

Specifications	Description
—	Inspection of high-pressure temperature of the high-pressure sensor: 1. Control of compressor output capacity 2. Conversion and calculation of saturated condensing temperature 3. Protection high pressure 4. Inspection of high-pressure value and calculation of exhaust superheat degree 5. Inspection of the minimum and maximum compression ratio Inspection of low-pressure temperature of the low-pressure sensor: 1. Control of compressor output capacity 2. Conversion and calculation of saturated evaporating temperature 3. Inspection of suction superheat degree 4. Low-pressure protection functions 5. Inspection of the minimum and maximum compression ratio

Models: GMV-V60WL/C-T(U)、GMV-V48WL/C-T(U)、GMV-V36WL/C-T(U)

Circuit diagram	Layout of electrical appliance box	Physical position
		

Inspection procedure

1. Preparations
   (1) Use the wired controller or remote controller to shut down the unit.
   (2) Remove the front cover and open the electrical appliance box.
2. Inspection of low-pressure sensor
   (1) Connect the pressure gauge to the gas valve and check if the gas and liquid valves are open.
   (2) Switch the unit to cooling mode. After the system stabilizes, check the reading of the pressure gauge.
   (3) Check the unit's suction pressure via the wired controller and compare it with the reading of the pressure gauge on the gas valve. If the value shown on the wired controller is within the range of ±10% of the reading of the pressure gauge, the pressure sensor is normal. Otherwise, it is abnormal.
3. Inspection of high-pressure sensor
   (1) Connect the pressure gauge to the gas valve and check if the gas and liquid valves are open.
   (2) Switch the unit to the heating mode. After the system stabilizes, check the reading of the pressure gauge.
4. Check the unit's exhaust pressure via the wired controller and compare it with the reading of the pressure gauge on the gas valve. If the value shown on the wired controller is within the range of ±10% of the reading of the pressure gauge, the pressure sensor is normal. Otherwise, it is abnormal.

4 Replacement of Key Unit Parts

4.0 Key Parts

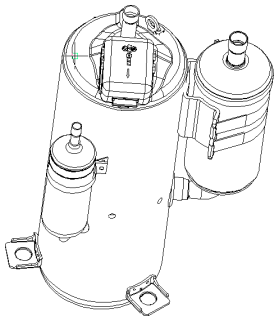
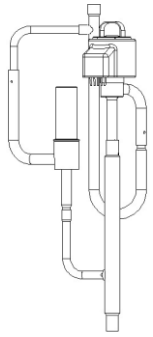
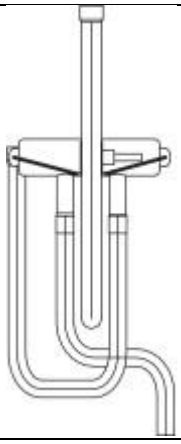
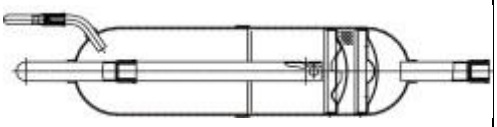
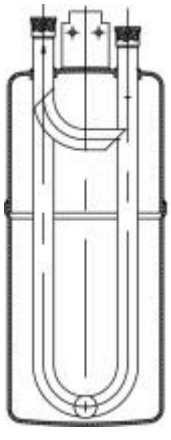
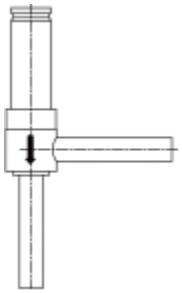
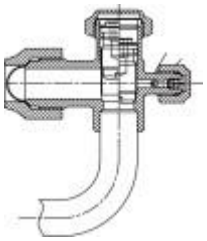
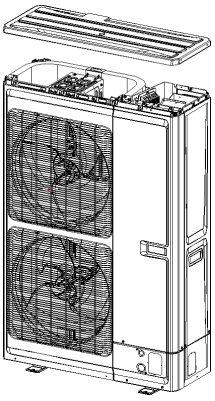
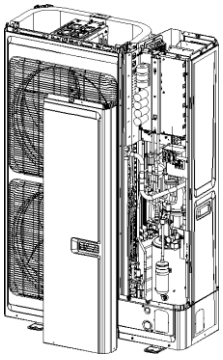
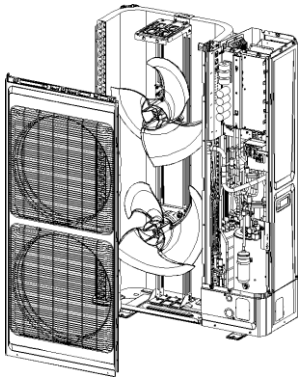
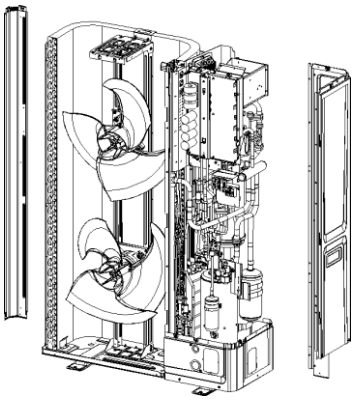
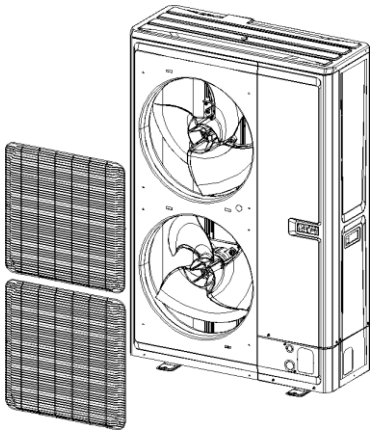
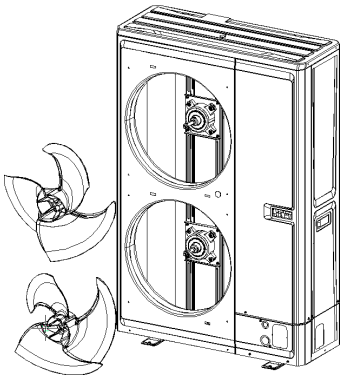
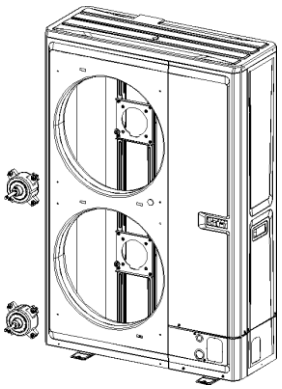
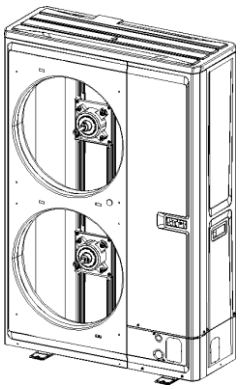
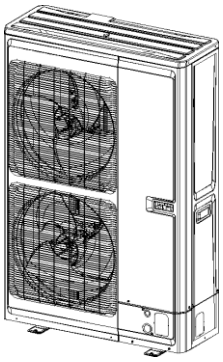
Photo	Name	Function
	compressor	Core part of air conditioning system. It sucks low temperature and low pressure gas, compress it to high temperature and high pressure gas, and then discharge it.
	Electronic expansion valve	Throttling device. It transforms high pressure refrigerant liquid into low pressure steam.
	4-way valve	It changes the flow direction of refrigerant for switching between cooling and heating.
	Oil separator	It stays between discharge outlet of compressor and inlet of condenser. It used for separating the lubricant oil of compressor when the high temperature and high pressure refrigerant gas is discharged from the compressor.
	Vapour liquid separator	It stays between outlet of evaporator and suction ouitlet of compressor. It used for separating low temperature and low pressure refrigerant.

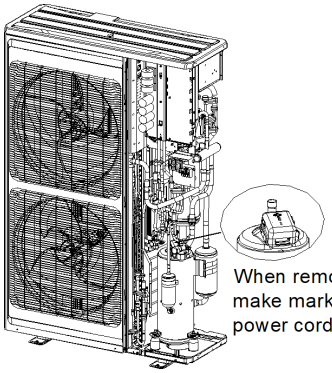
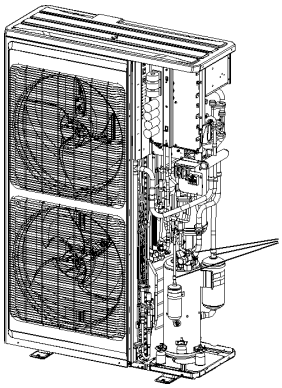
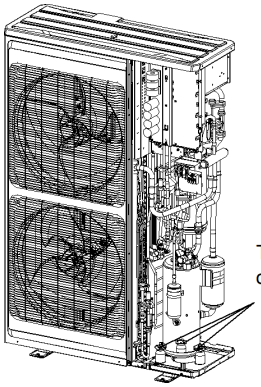
Photo	Name	Function
	High pressure liquid storage tank	It used for storing the superfluous high pressure refrigerant liquid during cooling process.
	Solenoid valve	—
	Cut-off valve	It used for connecting indoor unit and outdoor unit, and used for maintenance and installation.

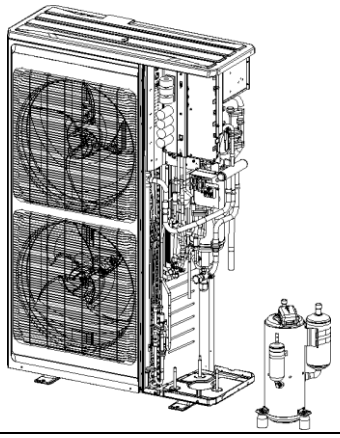
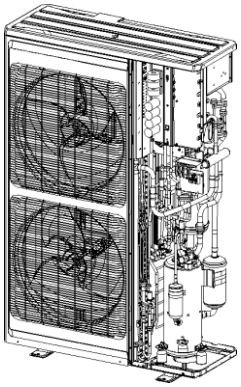
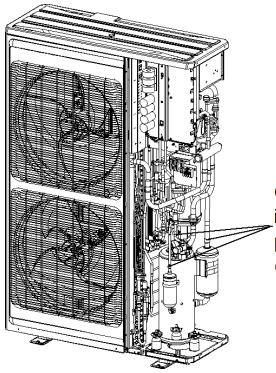
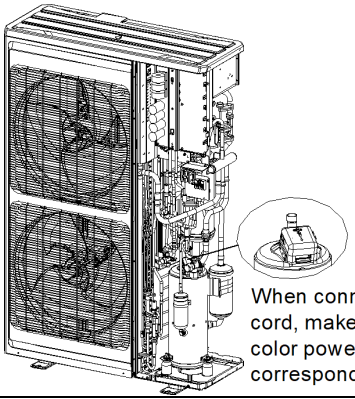
4.1 Removal of Key Parts

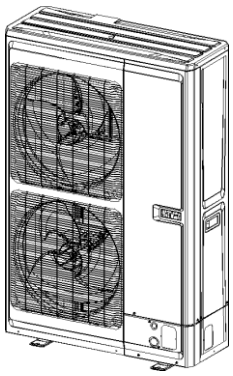
Removal operation for panel		
Remark: Before removing the panel, please make sure that the unit is disconnected with the power		
Process	Photo	Operation Instruction
1.Remove top cover		● Loose the screws fixing the top cover with screwdriver ● Hold the top cover upwards and then put it on the floor flatly
2.Remove front side plate sub-assy		● Loose the screw fixing the front side plate with screwdriver ● Hold the front side plate upwards and then put it on the floor flatly
3.Remove front panel and grille		● Loose the screws fixing the front panel and grille with screwdriver ● Put the front panel and grille on the floor flatly
4.Remove left side plate and rear side plate		● Loose screws fixing left side plate and rear side plate with screwdriver ● remove the rear side plate

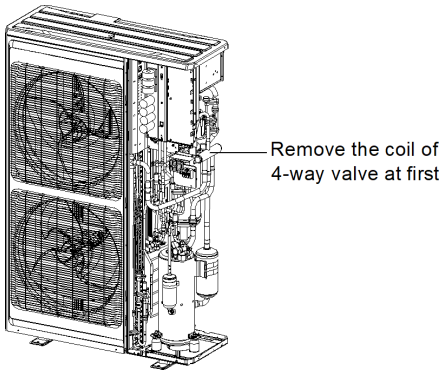
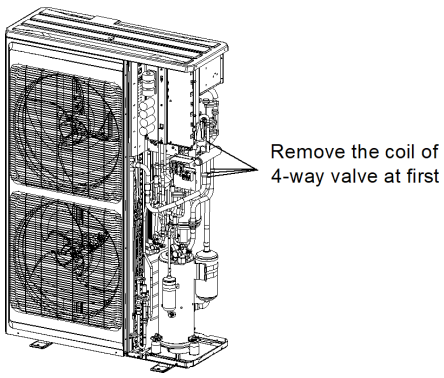
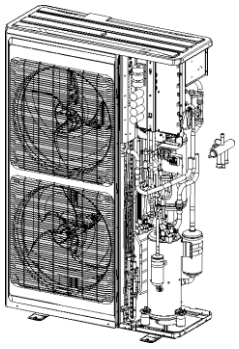
Removal operation for blade		
Remark: Before removing the motor, please make sure that the unit is disconnected with the power.		
Process	Photo	Operation Instruction
1.Remove grille		● Loose screws fixing the panel with screwdriver ● Then remove the grille
2.Remove blade		● Loosen nuts fixing the blade with wrench ● Then remove the blade and put it on the floor flatly
3.Remove motor		● Loose screws fixing the motor with screwdriver ● then remove the power cord of motor ● Take out the damaged motor
4.Install motor		● Replace the motor, tighten screws with screwdriver and then connect the power cord of motor

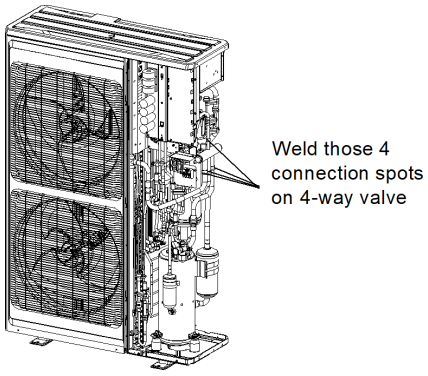
Removal operation for blade		
Remark: Before removing the motor, please make sure that the unit is disconnected with the power.		
Process	Photo	Operation Instruction
5.Assemble unit		● Assemble the unit in the the converse sequence

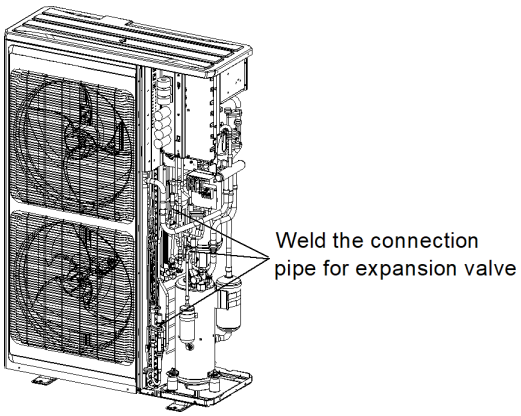
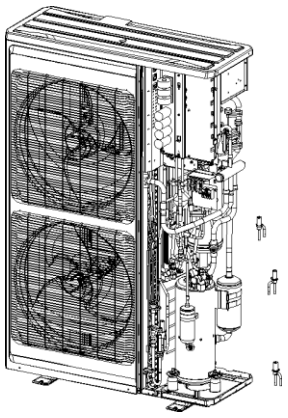
Removal operation of compressor		
Remark: Before removing the compressor, please make sure that there's no refrigerant inside the pipeline and the power is disconnected.		
Process	Photo	Operation Instruction
1.Remove wiring cover of compressor	 When removing the power cord, make marks for different color power cords and corresponding	● Loose screws fixing the compressor with screwdriver ● Then pull out the power cord **NOTE**: When removing the power cord, make marks for different color power cords and corresponding wiring terminals for wrong terminal.
2.Disconnect compressor 、vapor injection tube and connected pipeline	 Weld these three points and then pull out the suction pipe、the discharge pipe and vapor injection tube	● Weld suction pipe、vapor injection tube and discharge pipe of compressor ● then pull out the connection pipe from the compressor **NOTE**: During welding process, do not let the flame burn out other parts.
3.Loose nuts fixing the foot of compressor	 Twist off the nuts for compressor with wrench	● Twist off the nuts for compressor with wrench

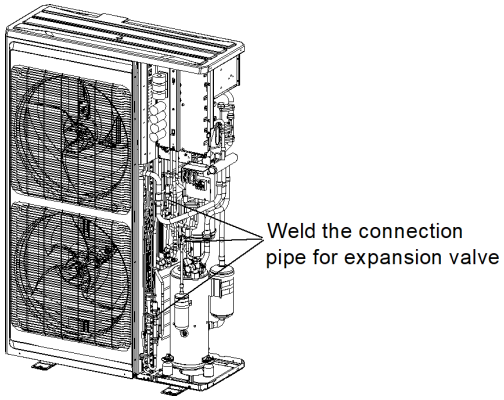
Removal operation of compressor		
Remark: Before removing the compressor, please make sure that there's no refrigerant inside the pipeline and the power is disconnected.		
Process	Photo	Operation Instruction
4.Remove the chassis from compressor		● Take out the compressor and replace it **NOTE**: When replacing the compressor, do not damage nearby pipelines and other parts
5.Fix the new compressor at the chassis		● After replacing the compressor, fix the nuts at the bottom of compressor
6.Connect suction pipe、vapor injection tube and discharge pipe of compressor and pipeline of system again		● Weld the connection pipe of compressor, connect the pipeline and compressor **NOTE**: During welding process, do not let flame burn out other parts
7.Connect the power cord of compressor well		● Loose screws fixing the power cord with screwdriver ● connect the power cord well again **NOTE**: When connecting the power cord, make marks for different color power cords and corresponding wiring terminals

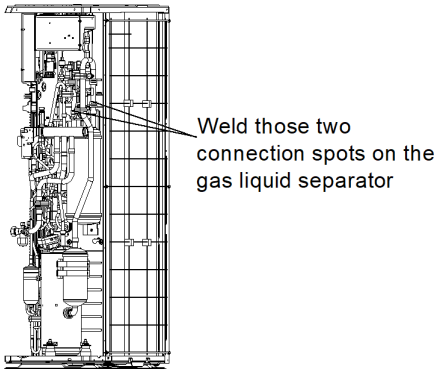
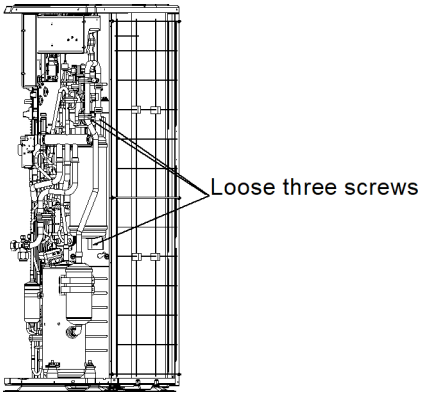
Removal operation of compressor		
Remark: Before removing the compressor, please make sure that there's no refrigerant inside the pipeline and the power is disconnected.		
Process	Photo	Operation Instruction
8.Check and open the upper cover plate		• Check whether the pipeline is connected well • Check whether all parts and connection wires are connected well • If there's no problem after checking, install front and rear cover plates

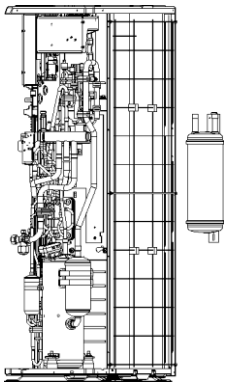
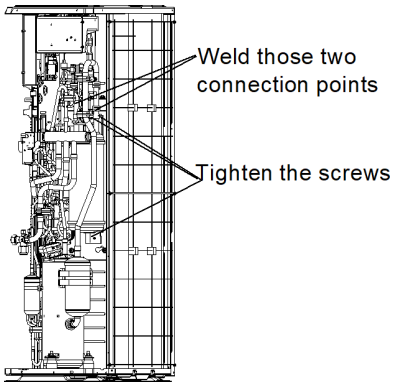
Removal operation for 4-way valve		
Remark: Before removing the 4-way valve, please make sure that there's no refrigerant inside the pipeline of system and then power is disconnected.		
Process	Photo	Operation Instruction
1.Disconnect the coil of 4-way valve from the 4-way valve		• Remove the coil of 4-way valve at first
2.Disconnect the 4-way valve and connection pipeline		● Weld those 4 connection spots on 4-way valve, and then pull out the connection pipe **NOTE**: During welding process, do not let the flame burn out other parts
3.Replace 4-way valve		● Replace 4-way valve **NOTE**: During welding process, do not let the flame burn out other parts

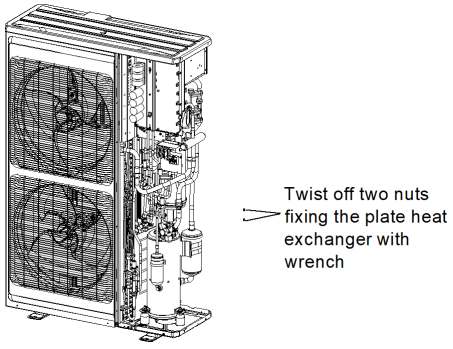
Removal operation for 4-way valve		
Remark: Before removing the 4-way valve, please make sure that there's no refrigerant inside the pipeline of system and then power is disconnected.		
Process	Photo	Operation Instruction
4.Replace 4-way valve		● Weld the connection position between 4-way valve and pipeline **NOTE**: During welding process, do not let flame burn out other parts

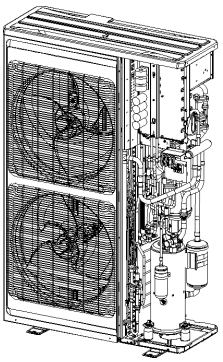
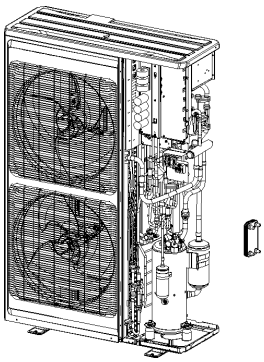
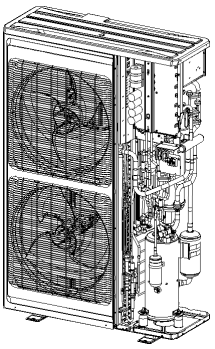
Removal operation for electronic expansion valve		
Remark: Before removing the electronic expansion valve, please make sure that there's no refrigerant in the pipeline of system and the power is disconnected		
Process	Photo	Operation Instruction
1.Disconnect the electronic expansion valve from the pipeline		● Remove the coil of electronic expansion valve at first ● Weld the connection pipe for expansion valve, and then pull out the connection pipe **NOTE**:During welding process, do not let flame burn out other parts
2.Take out the electronic expansion valve and replace it		• Take out the electronic expansion valve and replace it

Removal operation for electronic expansion valve		
Remark: Before removing the electronic expansion valve, please make sure that there's no refrigerant in the pipeline of system and the power is disconnected		
Process	Photo	Operation Instruction
3.Replace electronic expansion valve		● Weld the connection pipe of electronic expansion valve ● Install the coil of electronic expansion valve **NOTE**:During welding process, do not let the flame burn out other parts

Removal operation of gas liquid separator		
Remark: Before removing the gas liquid separator, please make sure that there's no refrigerant inside the pipeline of system and disconnect the power		
Process	Photo	Operation Instruction
1.Disconnect inlet pipe and exit pipe of gas liquid separator		● Weld those two connection spots on the gas liquid separator and then pull out the connection pipe **NOTE**: During welding process, do not let flame burn out other parts
2.Replace gas liquid separator		● Loose three screws with screwdriver ● Replace gas liquid separator

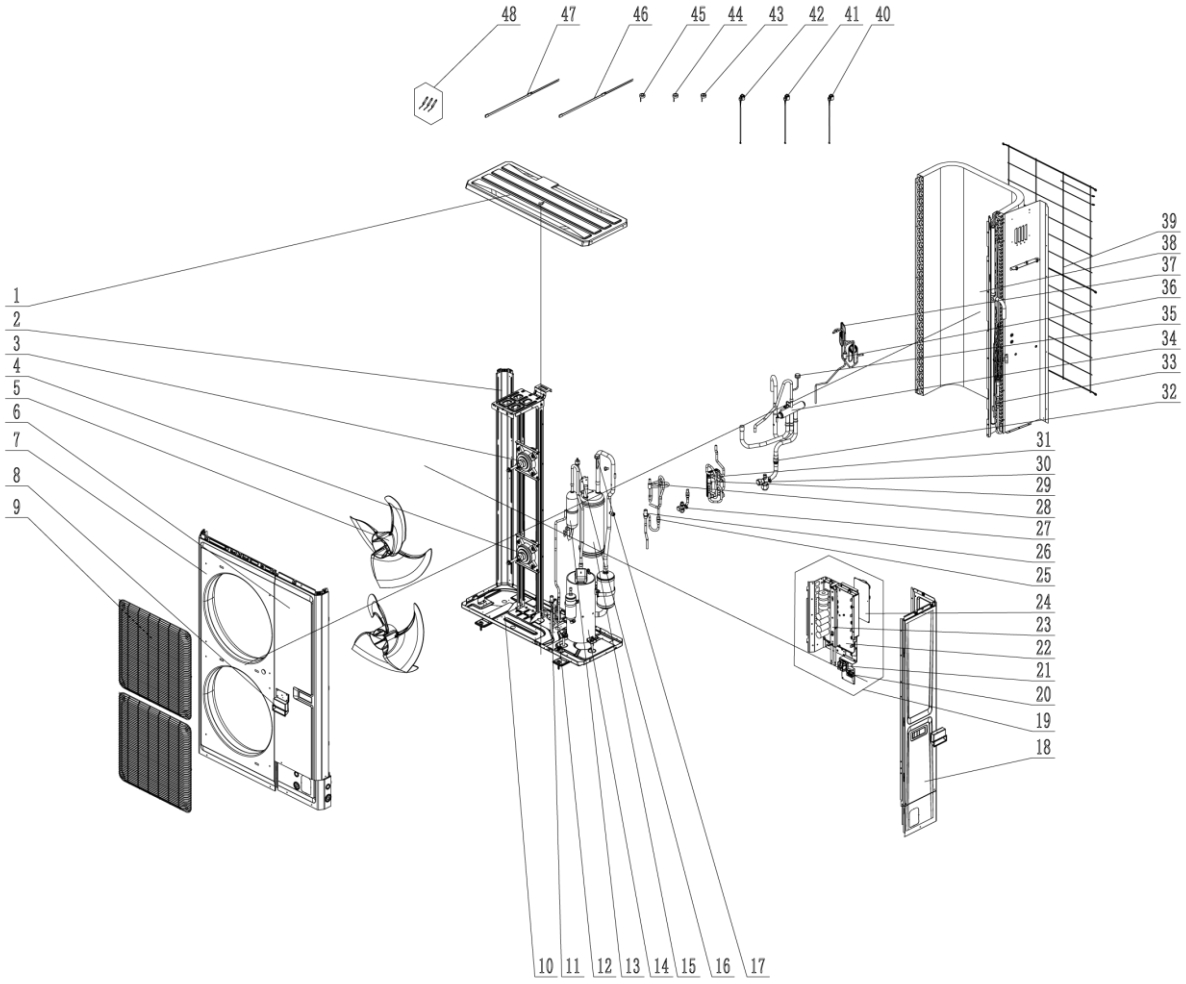
Removal operation of gas liquid separator		
Remark: Before removing the gas liquid separator, please make sure that there's no refrigerant inside the pipeline of system and disconnect the power		
Process	Photo	Operation Instruction
3.Replace gas liquid separator		● Weld the pipe connected with gas liquid separator **NOTE**: During welding process, do not let flame burn out other parts
4.Replace gas liquid separator		● Fix the screws at the base of gas liquid separator well again NOTE: During welding process, do not let flame burn out other parts

Removal operation for plate heat exchanger		
Remark: Before removing the plate heat exchanger, please make sure that there's no refrigerant inside the pipeline of system and disconnect the power		
Process	Photo	Operation Instruction
1.Twist off two nuts fixing the plate heat exchanger with wrench		• Twist off two nuts fixing the plate heat exchanger with wrench

Removal operation for plate heat exchanger		
Remark: Before removing the plate heat exchanger, please make sure that there's no refrigerant inside the pipeline of system and disconnect the power		
Process	Photo	Operation Instruction
2.Disconnect inlet pipe and outlet pipe of plate heat exchanger	 Weld those 4 connection spots on the plate heat exchanger	● Weld those 4 connection spots on the plate heat exchanger, and then pull out the connection pipe. **NOTE**: During welding process, do not let flame burn out other parts
3.Replace plate heat exchanger	 Replace plate heat exchanger	• Replace plate heat exchanger
4..Replace plate heat exchanger	 Weld the pipe connected with plate heat exchanger	● Weld the pipe connected with plate heat exchanger **NOTE**: During welding process, do not let flame burn out other parts

5 Explosive View and Parts List

GMV-V36WL/C-T(U), GMV-V48WL/C-T(U) and GMV-V60WL/C-T(U)



Parts list of GMV-V36WL/C-T(U), GMV-V48WL/C-T(U) and GMV-V60WL/C-T(U)

No.	Name	Material code	Qty
1	Coping	012049060098P	1
2	Left Side Plate	012055060285P	1
3	Brushless DC Motor	150104060074	1
4	Brushless DC Motor	15010406007401	1
5	Axial Flow Fan	1043410000301	2
6	Front Side Plate	012050060023P	1
7	Cabinet	012022060009P	1
8	Handle	200149060003	2
9	Front Grill	016004060002	2
10	Chassis Sub-assy	017000060951P	1
11	Electronic Expansion Valve	072009060008	1
12	Discharge Charge Valve	071015000002	1
13	Oil Separator	035028000003	1
14	Compressor and Fittings	009001060980	1
15	Gas-liquid Separator	03502706002001	1
16	Pressure Protect Switch	46020006	1

No.	Name	Material code	Qty
17	Pressure Sensor	430044060023	1
18	Connection Board	012077060725P	1
19	Electric Box Assy	100002078277	1
20	Terminal Board	42200006005403	1
21	Terminal Board	42200006001201	1
22	Main Board	300027063015	1
23	Radiator	43003406008701	1
24	Filter Board	300020060111	1
25	Strainer	035021060019	2
26	Electronic Expansion Valve	072009060041	1
27	Cut off Valve	07330000002	1
28	Electromagnetic Valve	072008060021	1
29	Electronic Expansion Valve	072009060011	1
30	Cut off Valve	07330000001	1
31	Plate-type Heat Exchanger	010007060010	1
32	Strainer	07212402	1
33	Strainer	0721212101	1
34	4-Way Valve	43000338	1
35	Pressure Sensor	430044060022	1
36	Strainer	07213046	1
37	Electromagnetic Valve	43044100144	1
38	Condenser Assy	01100206224501	1
39	Rear Grill	01574100004	1
40	Electric Expand Valve Fitting	07200206002002	1
41	Electric Expand Valve Fitting	4304413251	1
42	Electric Expand Valve Fitting	4304413261	1
43	4 Way Valve Coil	07201006000604	1
44	Magnet Coil (electromagnetic valve)	07200106001532	1
45	Magnet Coil (electromagnetic valve)	07200106001522	1
46	Electrical Heater(Compressor)	7651521216	1
47	Electrical Heater	7651000428	1
48	Sensor Sub-assy	390002060389	1

Appendixes

Appendix 1 Temperature Senor Resistance and Temperature Relationship Table

Environmental temperature sensor **15kΩ resistance** ~ voltage correspondence table (including outdoor and indoor environment temperature sensors)

°C	°F	Resistance kΩ	Volts VDC	°C	°F	Resistance kΩ	Volts VDC
-20	-4	144	0.311	71	160	2.523	2.825
-19	-2	138.1	0.323	72	162	2.439	2.838
-18	0	128.6	0.345	73	163	2.358	2.852
-17	1	121.6	0.362	74	165	2.28	2.865
-16	3	115	0.381	75	167	2.205	2.877
-15	5	108.7	0.4	76	169	2.133	2.889
-14	7	102.9	0.42	77	171	2.064	2.901
-13	9	97.4	0.44	78	172	1.997	2.912
-12	10	92.22	0.462	79	174	1.933	2.923
-11	12	87.35	0.484	80	176	1.871	2.934
-10	14	82.75	0.506	81	178	1.811	2.945
-9	16	78.43	0.53	82	180	1.754	2.955
-8	18	74.35	0.554	83	181	1.699	2.964
-7	19	70.5	0.579	84	183	1.645	2.974
-6	21	66.88	0.605	85	185	1.594	2.983
-5	23	63.46	0.631	86	187	1.544	2.992
-4	25	60.23	0.658	87	189	1.497	3.001
-3	27	57.18	0.686	88	190	1.451	3.009
-2	28	54.31	0.714	89	192	1.408	3.017
-1	30	51.59	0.743	90	194	1.363	3.025
0	32	49.02	0.773	91	196	1.322	3.033
1	34	46.8	0.801	92	198	1.282	3.04
2	36	44.31	0.835	93	199	1.244	3.047
3	37	42.14	0.866	94	201	1.207	3.054
4	39	40.09	0.899	95	203	1.171	3.061
5	41	38.15	0.931	96	205	1.136	3.068
6	43	36.32	0.965	97	207	1.103	3.074
7	45	34.58	0.998	98	208	1.071	3.08
8	46	32.94	1.033	99	210	1.039	3.086
9	48	31.38	1.067	100	212	1.009	3.092
10	50	29.9	1.102	101	214	0.98	3.098
11	52	28.51	1.138	102	216	0.952	3.103
12	54	27.18	1.174	103	217	0.925	3.108
13	55	25.92	1.21	104	219	0.898	3.114
14	57	24.73	1.246	105	221	0.873	3.119
15	59	23.6	1.282	106	223	0.848	3.123

°C	°F	Resistance kΩ	Volts VDC	°C	°F	Resistance KΩ	Volts VDC
16	61	22.53	1.319	107	225	0.825	3.128
17	63	21.51	1.356	108	226	0.802	3.133
18	64	20.54	1.393	109	228	0.779	3.137
19	66	19.63	1.429	110	230	0.758	3.141
20	68	18.75	1.467	111	232	0.737	3.145
21	70	17.93	1.503	112	234	0.717	3.15
22	72	17.14	1.54	113	235	0.697	3.153
23	73	16.39	1.577	114	237	0.678	3.157
24	75	15.68	1.613	115	239	0.66	3.161
25	77	15	1.65	116	241	0.642	3.165
26	79	14.36	1.686	117	243	0.625	3.168
27	81	13.74	1.722	118	244	0.608	3.171
28	82	13.16	1.758	119	246	0.592	3.175
29	84	12.6	1.793	120	248	0.577	3.178
30	86	12.07	1.829	121	250	0.561	3.181
31	88	11.57	1.863	122	252	0.547	3.184
32	90	11.09	1.897	123	253	0.532	3.187
33	91	10.63	1.931	124	255	0.519	3.19
34	93	10.2	1.964	125	257	0.505	3.192
35	95	9.779	1.998	126	259	0.492	3.195
36	97	9.382	2.03	127	261	0.48	3.198
37	99	9.003	2.062	128	262	0.467	3.2
38	100	8.642	2.094	129	264	0.456	3.203
39	102	5.997	2.125	130	266	0.444	3.205
41	106	7.653	2.185	131	268	0.433	3.207
42	108	7.352	2.215	132	270	0.422	3.21
43	109	7.065	2.243	133	271	0.412	3.212
44	111	6.791	2.272	134	273	0.401	3.214
45	113	6.529	2.299	135	275	0.391	3.216
46	115	6.278	2.326	136	277	0.382	3.218
47	117	6.038	2.353	137	279	0.372	3.22
48	118	5.809	2.379	138	280	0.363	3.222
49	120	5.589	2.404	139	282	0.355	3.224
50	122	5.379	2.429	140	284	0.346	3.226
51	124	5.179	2.453	141	286	0.338	3.227
52	126	4.986	2.477	142	288	0.33	3.229
53	127	4.802	2.5	143	289	0.322	3.231
54	129	4.625	2.522	144	291	0.314	3.232
55	131	4.456	2.544	145	293	0.307	3.234
56	133	4.294	2.566	146	295	0.299	3.235

°C	°F	Resistance KΩ	Volts VDC	°C	°C	Resistance KΩ	Volts VDC
57	135	4.139	2.586	147	297	0.292	3.237
58	136	3.99	2.607	148	298	0.286	3.238
59	138	3.848	2.626	149	300	0.279	3.24
60	140	3.711	2.646	150	302	0.273	3.241
61	142	3.579	2.664	151	304	0.266	3.242
62	144	3.454	2.682	152	306	0.261	3.244
63	145	3.333	2.7	153	307	0.254	3.245
64	147	3.217	2.717	154	309	0.248	3.246
65	149	3.105	2.734	155	311	0.243	3.247
66	151	2.998	2.75	156	313	0.237	3.249
67	153	2.898	2.766	157	315	0.232	3.25
68	154	2.797	2.781	158	316	0.227	3.251
69	156	2.702	2.796	159	318	0.222	3.252
70	158	2.611	2.811	160	320	0.217	3.253

Pipeline temperature sensor **20kΩ resistance** ~ voltage correspondence table (including defrosting temperature sensor, subcooler temperature sensor, gas-liquid separator temperature sensor, IDU inlet and outlet tube temperature sensor)

°C	°F	Resistance kΩ	Voltage VDC	°C	°F	Resistance kΩ	Voltage VDC
-30	-22	361.8	0.173	66	151	3.998	2.75
-29	-20	339.8	0.183	67	153	3.861	2.766
-28	-18	319.2	0.195	68	154	3.729	2.781
-27	-17	300	0.206	69	156	3.603	2.796
-26	-15	282.2	0.218	70	158	3.481	2.811
-25	-13	265.5	0.231	71	160	3.364	2.825
-24	-11	249.9	0.245	72	162	3.252	2.838
-23	-9	235.3	0.259	73	163	3.144	2.852
-22	-8	221.6	0.273	74	165	3.04	2.865
-21	-6	208.9	0.288	75	167	2.94	2.877
-20	-4	196.9	0.304	76	169	2.844	2.889
-19	-2	181.4	0.328	77	171	2.752	2.901
-18	0	171.4	0.345	78	172	2.663	2.912
-17	1	162.1	0.362	79	174	2.577	2.923
-16	3	153.3	0.381	80	176	2.495	2.934
-15	5	145	0.4	81	178	2.415	2.944
-14	7	137.2	0.42	82	180	2.339	2.954

°C	°F	Resistance kΩ	Voltage VDC	°C	°F	Resistance kΩ	Voltage VDC
-13	9	129.9	0.44	83	181	2.265	2.964
-12	10	123	0.462	84	183	2.194	2.974
-11	12	116.5	0.484	85	185	2.125	2.983
-10	14	110.3	0.507	86	187	2.059	2.992
-9	16	104.6	0.53	87	189	1.996	3.001
-8	18	99.13	0.554	88	190	1.934	3.009
-7	19	94	0.579	89	192	1.875	3.017
-6	21	89.17	0.605	90	194	1.818	3.025
-5	23	84.61	0.631	91	196	1.763	3.033
-4	25	80.31	0.658	92	198	1.71	3.04
-3	27	76.24	0.686	93	199	1.658	3.047
-2	28	72.41	0.714	94	201	1.609	3.054
-1	30	68.79	0.743	95	203	1.561	3.061
0	32	65.37	0.773	96	205	1.515	3.068
1	34	62.13	0.804	97	207	1.47	3.074
2	36	59.08	0.835	98	208	1.427	3.08
3	37	56.19	0.866	99	210	1.386	3.086
4	39	53.46	0.898	100	212	1.346	3.092
5	41	50.87	0.931	101	214	1.307	3.098
6	43	48.42	0.965	102	216	1.269	3.103
7	45	46.11	0.998	103	217	1.233	3.108
8	46	43.92	1.033	104	219	1.198	3.114
9	48	41.84	1.067	105	221	1.164	3.119
10	50	39.87	1.102	106	223	1.131	3.123
11	52	38.01	1.138	107	225	1.099	3.128
12	54	36.24	1.174	108	226	1.069	3.133
13	55	34.57	1.209	109	228	1.039	3.137
14	57	32.98	1.246	110	230	1.01	3.141
15	59	31.47	1.282	111	232	0.9825	3.145
16	61	30.04	1.319	112	234	0.9556	3.15
17	63	28.68	1.356	113	235	0.9295	3.153
18	64	27.39	1.393	114	237	0.9043	3.157
19	66	26.17	1.429	115	239	0.8799	3.161
20	68	25.01	1.466	116	241	0.8562	3.165
21	70	23.9	1.503	117	243	0.8333	3.168
22	72	22.85	1.54	118	244	0.8111	3.171
23	73	21.85	1.577	119	246	0.7895	3.175
24	75	20.9	1.614	120	248	0.7687	3.178
25	77	20	1.65	121	250	0.7485	3.181
26	79	19.14	1.686	122	252	0.7289	3.184
27	81	18.32	1.722	123	253	0.7099	3.187
28	82	17.55	1.758	124	255	0.6915	3.19
29	84	16.8	1.793	125	257	0.6736	3.192

°C	°F	Resistance kΩ	Voltage VDC	°C	°F	Resistance kΩ	Voltage VDC
30	86	16.1	1.828	126	259	0.6563	3.195
31	88	15.43	1.863	127	261	0.6395	3.198
32	90	14.79	1.897	128	262	0.6232	3.2
33	91	14.18	1.931	129	264	0.6074	3.203
34	93	13.59	1.965	130	266	0.5921	3.205
35	95	13.04	1.998	131	268	0.5772	3.207
36	97	12.51	2.03	132	270	0.5627	3.21
37	99	12	2.063	133	271	0.5487	3.212
38	100	11.52	2.094	134	273	0.5351	3.214
39	102	11.06	2.125	135	275	0.5219	3.216
40	104	10.62	2.155	136	277	0.509	3.218
41	106	10.2	2.185	137	279	0.4966	3.22
42	108	9.803	2.215	138	280	0.4845	3.222
43	109	9.42	2.243	139	282	0.4727	3.224
44	111	9.054	2.272	140	284	0.4613	3.226
45	113	8.705	2.299	141	286	0.4502	3.227
46	115	8.37	2.326	142	288	0.4394	3.229
47	117	8.051	2.353	143	289	0.4289	3.231
48	118	7.745	2.379	144	291	0.4187	3.232
49	120	7.453	2.404	145	293	0.4088	3.234
50	122	7.173	2.429	146	295	0.3992	3.235
51	124	6.905	2.453	147	297	0.3899	3.237
52	126	6.648	2.477	148	298	0.3808	3.238
53	127	6.403	2.5	149	300	0.3719	3.24
54	129	6.167	2.522	150	302	0.3633	3.241
55	131	5.942	2.544	151	304	0.3549	3.242
56	133	5.726	2.565	152	306	0.3468	3.244
57	135	5.519	2.586	153	307	0.3389	3.245
58	136	5.32	2.607	154	309	0.3312	3.246
59	138	5.13	2.626	155	311	0.3237	3.247
60	140	4.948	2.646	156	313	0.3164	3.249
61	142	4.773	2.664	157	315	0.3093	3.25
62	144	4.605	2.682	158	316	0.3024	3.251
63	145	4.443	2.7	159	318	0.2956	3.252
64	147	4.289	2.717	160	320	0.2891	3.253
65	149	4.14	2.734	—	—	—	—

Exhaust temperature sensor **50kΩ resistance** ~ voltage correspondence table (including compressor top shell temperature sensor and air exhaust pipe temperature sensor)

°C	°F	Resistance kΩ	Voltage VDC	°C	°F	Resistance kΩ	Voltage VDC
-30	-22	911.56	0.036	61	142	11.736	1.518
-29	-20	853.66	0.038	62	144	11.322	1.548
-28	-18	799.98	0.041	63	145	10.925	1.577
-27	-17	750.18	0.043	64	147	10.544	1.606
-26	-15	703.92	0.046	65	149	10.178	1.635
-25	-13	660.93	0.049	66	151	9.8269	1.664
-24	-11	620.94	0.052	67	153	9.4896	1.693
-23	-9	583.72	0.056	68	154	9.1655	1.722
-22	-8	549.04	0.059	69	156	8.9542	1.741
-21	-6	516.71	0.063	70	158	8.5551	1.778
-20	-4	486.55	0.066	71	160	5.9676	1.806
-19	-2	458.4	0.07	72	162	7.9913	1.834
-18	0	432.1	0.075	73	163	7.7257	1.862
-17	1	407.51	0.079	74	165	7.4702	1.889
-16	3	384.51	0.084	75	167	7.2245	1.916
-15	5	362.99	0.088	76	169	6.9882	1.943
-14	7	342.83	0.094	77	171	6.7608	1.969
-13	9	323.94	0.099	78	172	6.542	1.995
-12	10	306.23	0.104	79	174	6.3315	2.021
-11	12	289.61	0.11	80	176	6.1288	2.046
-10	14	274.02	0.116	81	178	5.9336	2.071
-9	16	259.37	0.123	82	180	5.7457	2.096
-8	18	245.61	0.129	83	181	5.5647	2.12
-7	19	232.67	0.136	84	183	5.3903	2.144
-6	21	220.5	0.143	85	185	5.2223	2.168
-5	23	209.05	0.151	86	187	5.0605	2.191
-4	25	195.97	0.158	87	189	4.9044	2.214
-3	27	188.12	0.167	88	190	4.7541	2.237
-2	28	178.65	0.175	89	192	4.6091	2.259
-1	30	169.68	0.184	90	194	4.4693	2.281
0	32	161.02	0.193	91	196	4.3345	2.302
1	34	153	0.202	92	198	4.2044	2.323
2	36	145.42	0.212	93	199	4.0789	2.344
3	37	135.96	0.223	94	201	3.9579	2.364
4	39	131.5	0.233	95	203	3.841	2.384
5	41	126.17	0.242	96	205	3.7283	2.404
6	43	119.08	0.256	97	207	3.6194	2.423
7	45	113.37	0.267	98	208	3.5143	2.442
8	46	107.96	0.28	99	210	3.4128	2.46
9	48	102.85	0.292	100	212	3.3147	2.478
10	50	98.006	0.306	101	214	3.22	2.496
11	52	93.42	0.319	102	216	3.1285	2.514
12	54	89.075	0.333	103	217	3.0401	2.531

°C	°F	Resistance kΩ	Voltage VDC	°C	°F	Resistance kΩ	Voltage VDC
13	55	34.57	1.209	109	228	1.039	3.137
14	57	32.98	1.246	110	230	1.01	3.141
15	59	31.47	1.282	111	232	0.9825	3.145
16	61	30.04	1.319	112	234	0.9556	3.15
17	63	28.68	1.356	113	235	0.9295	3.153
18	64	27.39	1.393	114	237	0.9043	3.157
19	66	26.17	1.429	115	239	0.8799	3.161
20	68	25.01	1.466	116	241	0.8562	3.165
21	70	23.9	1.503	117	243	0.8333	3.168
22	72	22.85	1.54	118	244	0.8111	3.171
23	73	21.85	1.577	119	246	0.7895	3.175
24	75	20.9	1.614	120	248	0.7687	3.178
25	77	20	1.65	121	250	0.7485	3.181
26	79	19.14	1.686	122	252	0.7289	3.184
27	81	18.32	1.722	123	253	0.7099	3.187
28	82	17.55	1.758	124	255	0.6915	3.19
29	84	16.8	1.793	125	257	0.6736	3.192

Appendix 2 Refrigerant Temperature and Pressure Table

Refrigerant R-410A

°C	°F	PSIG	°C	°F	PSIG	°C	°F	PSIG
-43	-45	8	-9	16	72	25	77	224
-42	-44	9	-8	18	75	26	79	232
-41	-42	10	-7	19	77	27	81	239
-40	-40	11	-6	21	80	28	82	243
-39	-38	12	-5	23	84	29	84	250
-38	-36	13	-4	25	87	30	86	258
-37	-35	14	-3	27	91	31	88	266
-36	-33	15	-2	28	93	32	90	274
-35	-31	17	-1	30	97	33	91	278
-34	-29	19	0	32	101	34	93	286
-33	-27	20	1	34	105	35	95	295
-32	-26	21	2	36	109	36	97	304
-31	-24	23	3	37	112	37	99	313
-30	-22	25	4	39	116	38	100	317
-29	-20	26	5	41	121	39	102	326
-28	-18	28	6	43	125	40	104	336
-27	-17	29	7	45	130	41	106	345
-26	-15	31	8	46	133	42	108	355
-25	-13	33	9	48	138	43	109	360
-24	-11	35	10	50	143	44	111	370
-23	-9	37	11	52	148	45	113	380
-22	-8	39	12	54	153	46	115	391
-21	-6	41	13	55	156	47	117	401
-20	-4	43	14	57	162	48	118	407
-19	-2	46	15	59	167	49	120	418
-18	0	48	16	61	173	50	122	429
-17	1	50	17	63	179	52	126	452
-16	3	52	18	64	182	54	129	470
-15	5	55	19	66	188	56	133	495
-14	7	58	20	68	195	58	136	514
-13	9	61	21	70	202	60	140	541
-12	10	62	22	72	209	62	144	569
-11	12	65	23	73	211	65	149	605
-10	14	68	24	75	218	67	153	635

Appendix 3 Pressure Sensor Voltage and Pressure Table

Black to Orange is the output voltage from the board. 5VDC

Black to Green is feedback voltage and will read according to the table.

High-pressure-transducer voltages (R410A)

°C	°F	PSIG	Volts VDC	°C	°F	PSIG	Volts VDC
-39	-38	12	0.111	17	63	180	1.34
-38	-36	13	0.12	18	64	183	1.38
-37	-35	14	0.13	19	66	188	1.421
-36	-33	15	0.139	20	68	195	1.463
-35	-31	17	0.149	21	70	202	1.506
-34	-29	19	0.16	22	72	208	1.551
-33	-27	20	0.17	23	73	211	1.596
-32	-26	22	0.181	24	75	218	1.641
-31	-24	22	0.193	25	77	225	1.688
-30	-22	24	0.206	26	79	233	1.735
-29	-20	26	0.216	27	81	240	1.784

°C	°F	PSIG	Volts VDC	°C	°F	PSIG	Volts VDC
-28	-18	28	0.229	28	82	244	1.834
-27	-17	29	0.242	29	84	251	1.884
-26	-15	31	0.255	30	86	260	1.937
-25	-13	33	0.268	31	88	267	1.989
-24	-11	35	0.282	32	90	275	2.042
-23	-9	38	0.297	33	91	280	2.098
-22	-8	39	0.312	34	93	287	2.153
-21	-6	41	0.328	35	95	296	2.21
-20	-4	43	0.344	36	97	304	2.268
-19	-2	46	0.36	37	99	314	2.327
-18	0	48	0.377	38	100	318	2.388
-17	1	50	0.394	39	102	327	2.448
-16	3	52	0.412	40	104	337	2.511
-15	5	55	0.43	41	106	346	2.574
-14	7	58	0.45	42	108	356	2.639
-13	9	61	0.469	43	109	361	2.705
-12	10	62	0.488	44	111	371	2.772
-11	12	66	0.509	45	113	381	2.841
-10	14	69	0.53	46	115	392	2.91
-9	16	72	0.551	47	117	403	2.98
-8	18	75	0.573	48	118	408	3.053
-7	19	77	0.596	49	120	419	3.126
-6	21	80	0.619	50	122	430	3.201
-5	23	84	0.644	51	124	442	3.277
-4	25	88	0.668	52	126	453	3.353
-3	27	91	0.693	53	127	460	3.432
-2	28	93	0.718	54	129	472	3.511
-1	30	97	0.745	55	131	484	3.592
0	32	101	0.772	56	133	496	3.675
1	34	106	0.799	57	135	509	3.759
2	36	110	0.828	58	136	515	3.844
3	37	112	0.857	59	138	529	3.93
4	39	117	0.887	60	140	542	4.018
5	41	121	0.917	61	142	556	4.106
6	43	125	0.947	62	144	570	4.197
7	45	130	0.979	63	145	577	4.288
8	46	133	1.012	64	147	591	4.381
9	48	138	1.046	65	149	606	4.475
10	50	143	1.08	66	151	623	4.57
11	52	148	1.114	67	153	638	4.666
12	54	154	1.15	68	154	646	4.763
13	55	157	1.186	69	156	662	4.86
14	57	162	1.224	70	158	677	4.958
15	59	168	1.261	71	160	693	5.13

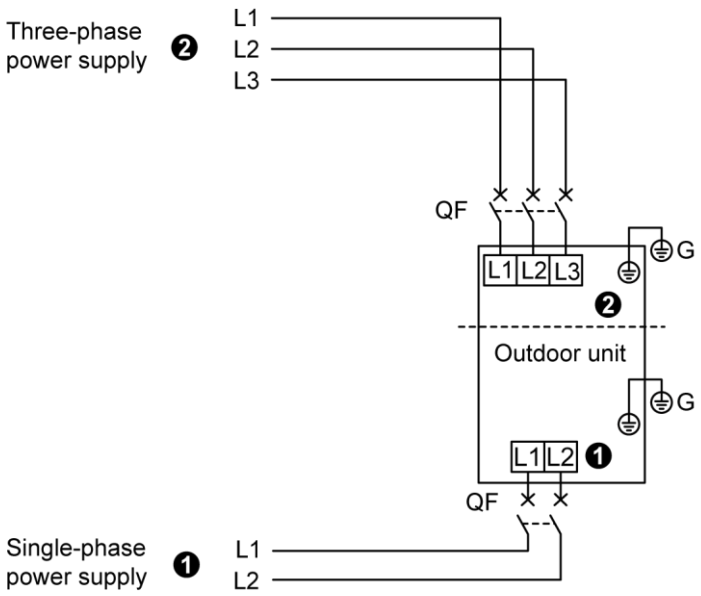
Low-pressure-transducer voltages (R410A)

°C	°F	PSIG	Volts VDC	°C	°F	PSIG	Volts VDC
-70	-94	-10	0.369	-14	7	58	1.301
-69	-92	-9	0.373	-13	9	60	1.337
-68	-90	-9	0.377	-12	10	62	1.373
-67	-89	-8	0.383	-11	12	66	1.413
-66	-87	-8	0.389	-10	14	68	1.451
-65	-85	-8	0.393	-9	16	72	1.491
-64	-83	-7	0.399	-8	18	75	1.533
-63	-81	-7	0.405	-7	19	77	1.575
-62	-80	-6	0.411	-6	21	80	1.619
-61	-78	-6	0.419	-5	23	84	1.665
-60	-76	-5	0.425	-4	25	87	1.711
-59	-74	-5	0.433	-3	27	91	1.757
-58	-72	-4	0.441	-2	28	93	1.805
-57	-71	-3	0.449	-1	30	97	1.895
-56	-69	-3	0.457	0	32	101	1.905
-55	-67	-2	0.465	1	34	105	1.957
-54	-65	-2	0.475	2	36	109	2.011
-53	-63	-1	0.485	3	37	112	2.065
-52	-62	0	0.495	4	39	116	2.121
-51	-60	0	0.505	5	41	121	2.177
-50	-58	1	0.515	6	43	125	2.235
-49	-56	2	0.527	7	45	130	2.295
-48	-54	3	0.539	8	46	133	2.357
-47	-53	4	0.551	9	48	138	2.419
-46	-51	5	0.563	10	50	143	2.489
-45	-49	6	0.577	11	52	148	2.547
-44	-47	7	0.589	12	54	154	2.615
-43	-45	8	0.605	13	55	156	2.683
-42	-44	8	0.619	14	57	162	2.753
-41	-42	9	0.633	15	59	167	2.823
-40	-40	10	0.649	16	61	174	2.897
-39	-38	12	0.665	17	63	180	2.971
-38	-36	13	0.683	18	64	182	3.047
-37	-35	14	0.701	19	66	188	3.123
-36	-33	15	0.719	20	68	195	3.203
-35	-31	17	0.737	21	70	202	3.283
-34	-29	18	0.757	22	72	208	3.367
-33	-27	20	0.777	23	73	211	3.451
-32	-26	21	0.797	24	75	218	3.537
-31	-24	22	0.819	25	77	225	3.625
-30	-22	24	0.841	26	79	232	3.713
-29	-20	26	0.863	27	81	240	3.805
-28	-18	28	0.887	28	82	244	3.899
-27	-17	29	0.911	29	84	251	3.993

°C	°F	PSIG	Volts VDC	°C	°F	PSIG	Volts VDC
-26	-15	31	0.935	30	86	260	4.091
-25	-13	33	0.961	31	88	267	4.189
-24	-11	35	0.987	32	90	275	4.289
-23	-9	37	1.015	33	91	279	4.393
-22	-8	38	1.043	34	93	287	4.497
-21	-6	41	1.073	35	95	296	4.603
-20	-4	43	1.103	36	97	305	4.713
-19	-2	45	1.133	37	99	314	4.823
-18	0	48	1.165	38	100	318	4.937
-17	1	49	1.197	39	102	327	5.051
-16	3	52	1.231	40	104	337	5.175
-15	5	55	1.265	—	—	—	—

Appendix 4 Electric Specifications

⚠WARNING
(1) All electrical installation must be performed by qualified technicians in accordance with local laws, regulations and this user manual.
(2) Use air conditioner specialized power supply and make sure that it is consistent with system's rated voltage.
(3) Do not pull the power cord with force.
(4) Caliber of the power cord must be large enough. A damaged power cord or connection wire must be replaced by specialized electrical cords.
(5) Connect the unit to specialized grounding device and make sure it is securely grounded. It's a must to install air switch and current circuit breaker that can cut off the power of the entire system. The air switch should include magnetic trip function and thermal trip function so that system can be protected from short circuit and overload.
(6) Air conditioner belongs to class I electrical appliance, so it must be securely grounded.
(7) The yellow-green wire inside the unit is a ground wire. Do not cut it off or secure it with tapping screws, otherwise it will lead to electric shock.
(8) Power supply must include secure grounding terminal. Do not connect the ground wire to the following: ①Water pipe; ②Gas pipe; ③Drain pipe; ④Other places that are deemed as not secure by professional technicians.
(9) Be sure the power supply has been cut off and the capacitor on the main board has been discharged prior to electric wiring and service.
(10) Do not change any part; and do not shield, shortcut or remove any part.



NOTE: For single-phase units, connect wires according to drawing ❶; for three-phase units, connect wires according to drawing ❷.

NOTE: Connect the power cord to the corresponding terminal and grounding screws. Please refer to the circuit diagram for wiring.

⚠WARNING
(1) Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.
(2) Wrong wire connection may burn the electrical components.
(3) Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.
(4) Always connect the ground wire.

Electrical Parameters：

Model	Power Supply	Fuse Capacity (A)	Maximum Over-Current Protection (A)	Minimum Circuit Ampacity (A)
GMV-V36WL/C-T(U)	208/230V-1Ph-60Hz	35	35	33.8
GMV-V48WL/C-T(U)	208/230V-1Ph-60Hz	40	40	38.8
GMV-V60WL/C-T(U)	208/230V-1Ph-60Hz	40	40	38.8

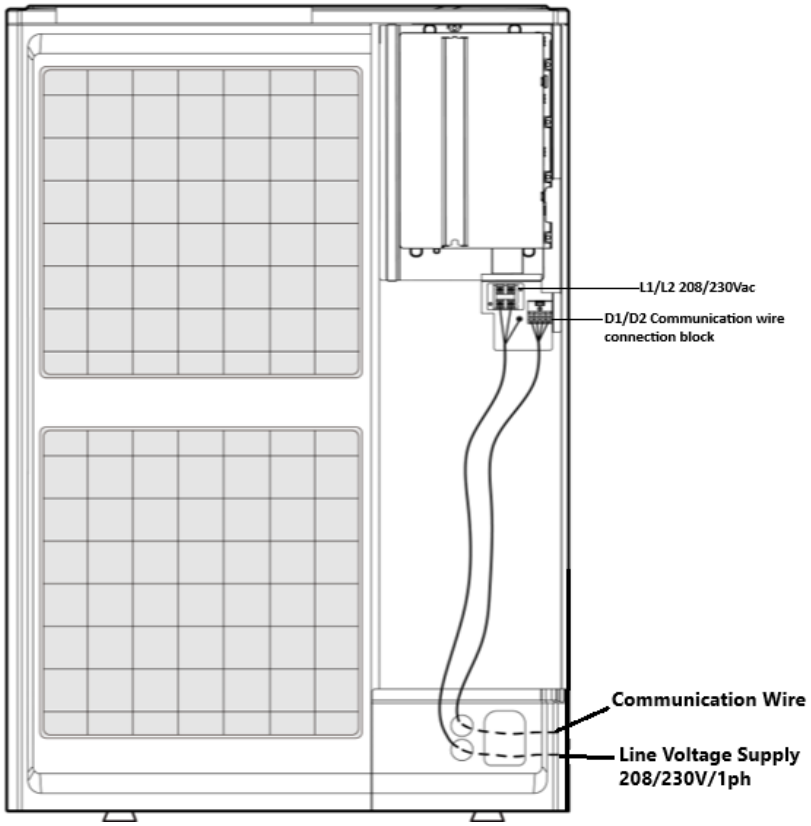
Engineering Wiring of Power Supply and Communication Cable：

(1) Please refer to the following part for wiring. Connect the power cord and communication cord to the corresponding wiring board and grounding screws according to the circuit diagram.

(2) The wiring shall not touch the pipeline, edge and device.

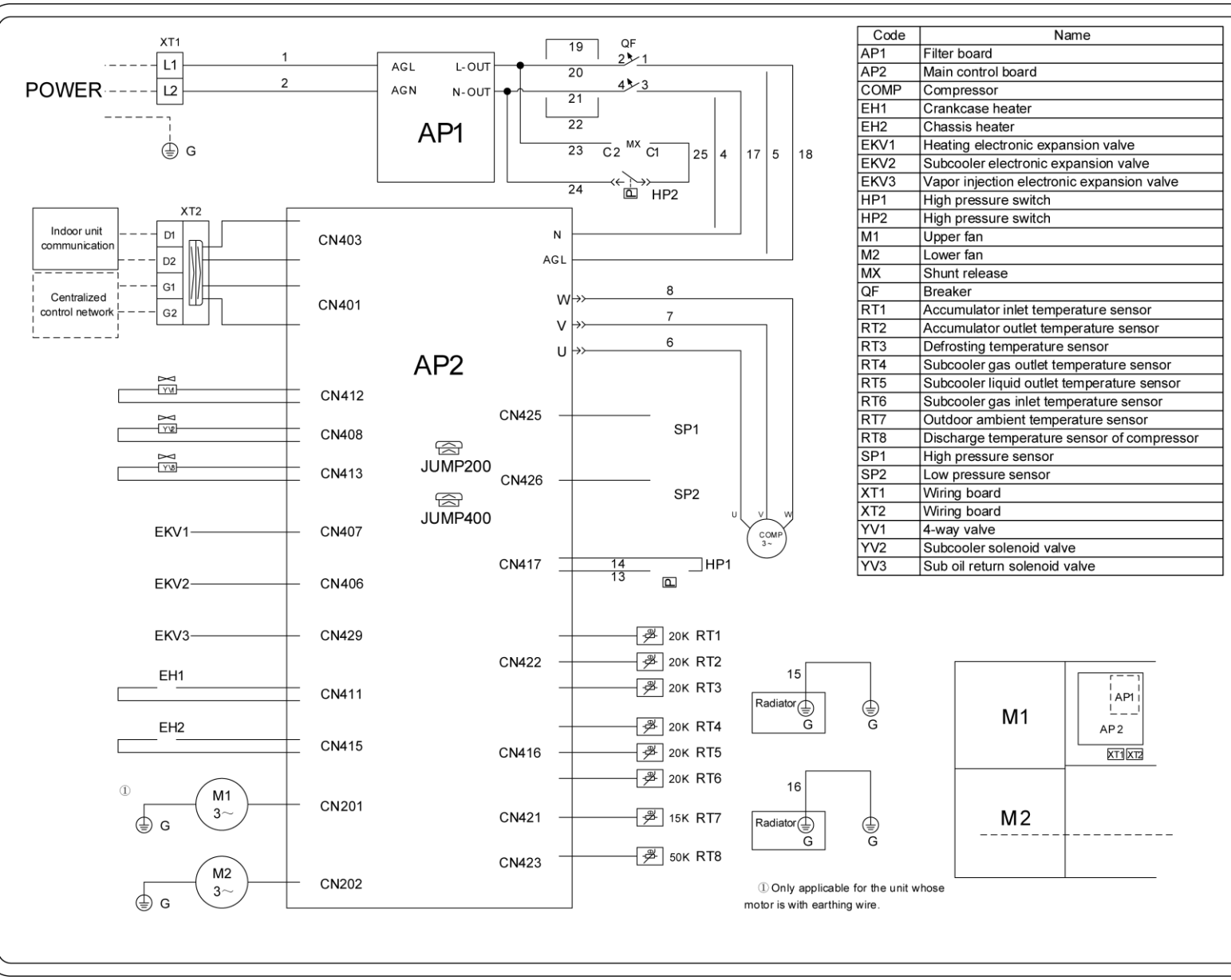
(3) For the wiring of power and communication cord, the picture is for reference only. If there're discrepancies between it and the structure in the picture, the actual unit shall prevail.

(4) Wiring is subject to the self-equipped diagram of the unit used at present.



Appendix 5 Circuit Diagram

GMV-V36WL/C-T(U)、GMV-V48/C-T(U)、GMV-V60WL/C-T(U)



Code	Name
AP1	Filter board
AP2	Main control board
COMP	Compressor
EH1	Crankcase heater
EH2	Chassis heater
EKV1	Heating electronic expansion valve
EKV2	Subcooler electronic expansion valve
EKV3	Vapor injection electronic expansion valve
HP1	High pressure switch
HP2	High pressure switch
M1	Upper fan
M2	Lower fan
MX	Shunt release
QF	Breaker
RT1	Accumulator inlet temperature sensor
RT2	Accumulator outlet temperature sensor
RT3	Defrosting temperature sensor
RT4	Subcooler gas outlet temperature sensor
RT5	Subcooler liquid outlet temperature sensor
RT6	Subcooler gas inlet temperature sensor
RT7	Outdoor ambient temperature sensor
RT8	Discharge temperature sensor of compressor
SP1	High pressure sensor
SP2	Low pressure sensor
XT1	Wiring board
XT2	Wiring board
YV1	4-way valve
YV2	Subcooler solenoid valve
YV3	Sub oil return solenoid valve

Note: Refer to the mark on the unit for the actual circuit diagram.

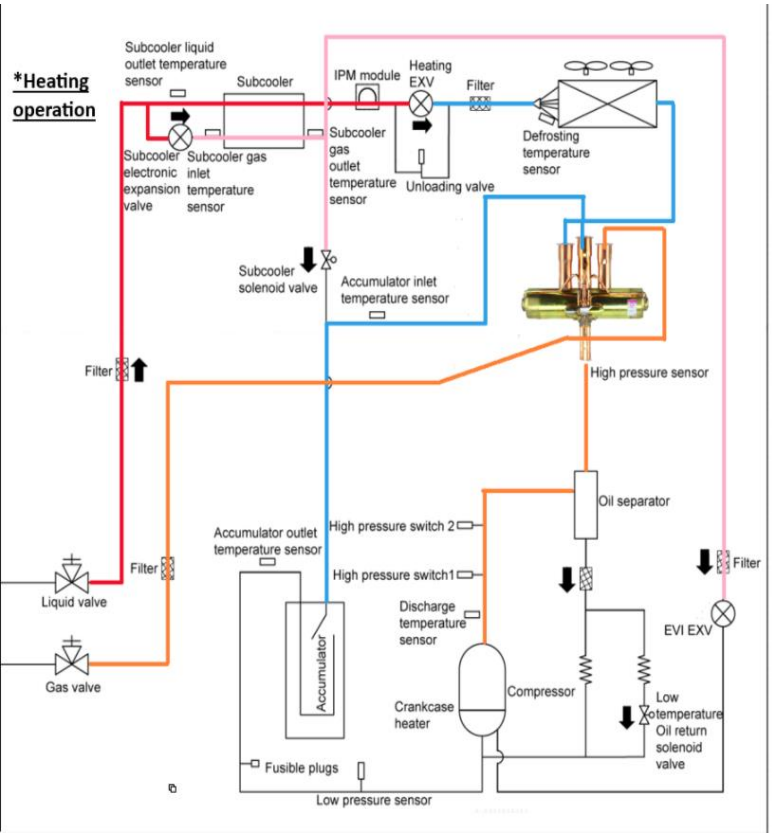
Appendix 6 Schematic Diagram

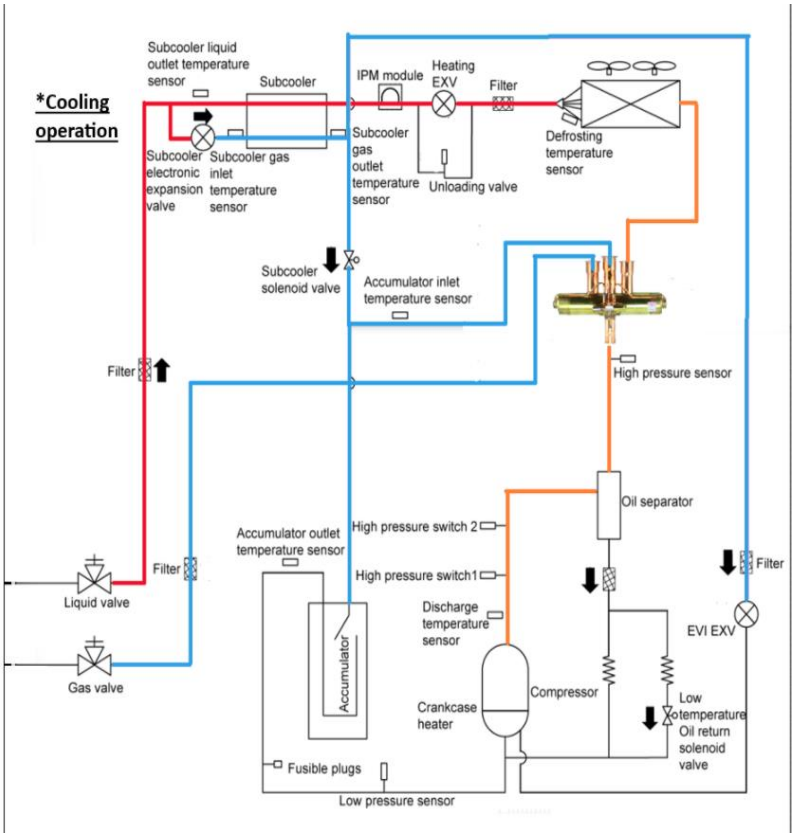
The working principle of Ultra Heat GMV6 Mini is as follows: when the indoor unit is running in the cooling mode, the outdoor unit starts the outdoor module according to the running load demand of the indoor unit. The outdoor heat exchanger is used as the condenser of the system, and the heat exchangers of indoor units are connected in parallel as the evaporator of system. It realizes the adjustment of the air temperature and humidity for indoor space through the return air circulation of the indoor unit; when the indoor unit is in the heating mode, all the four-way valves of the outdoor unit are switched to the energizing state, the outdoor heat exchanger is used as the evaporator of the system and the heat exchanger of indoor unit is used as the condenser of the system. The air temperature and humidity in the indoor space is realized by the return air circulation of the indoor unit.

Working principle diagrams:

System principle diagram of GMV-V36WL/C-T(U)、GMV-V48/C-T(U)、GMV-V60WL/C-T(U)

The arrows in the illustration indicate the mounting direction of the components. Cooling and heating operation below





Appendix 7 Names and Functions of Components

No.	Name	Main Functions
1	Compressor	The compressor changes its speed according to the actual system need for capacity adjustment.
2	Crankcase heater	In the standby state, the oil temperature of the compressor is guaranteed to prevent backflow.
3	Discharge temperature sensor of the inverter compressor	The exhaust temperature of the compressor is detected to achieve the purpose of controlling and protecting the compressor.
4	High pressure switch	When the exhaust pressure of the compressor exceeds the action value of the high-pressure switch, the feedback signal immediately stops the operation of the whole unit to achieve the purpose of protecting the compressor.
5	Oil separator	It separates the system's gas and oil to ensure the reliability of the compressor.
6	Enthalpy-adding electronic expansion valve	It is used to control the EVI capacity of the compressor.
7	High pressure sensor	It detects real-time high voltage values of the system, protects the compressor and realizes other control purposes.
8	4-way valve	It is used for cooling and heating switching of the IDU.
9	Heat exchanger	It is used for outdoor heat exchange.
10	Fan	It improves the heat exchange efficiency.
11	Defrosting temperature sensor	It is used to detect defrosting.
12	Heating electronic expansion valve	It adjusts the refrigerant in heating mode
13	Electronic expansion valve of the sub-cooler	It is used to control the liquid pipe refrigerant subcooling degree during the cooling operation of the system and reduce the loss of the pipeline capacity.
14	Sub-cooler	It is used to control the liquid pipe subcooling degree.
15	Liquid outlet temperature sensor of the sub-cooler	It is used to detect the liquid pipe temperature.
16	Inlet temperature sensor of the gas-liquid separator	It is used to check the inlet temperature of the gas-liquid separator to prevent liquid refrigerant from entering the system.
17	Gas inlet temperature sensor of the sub-cooler	It is used to detect the gas pipe temperature.
18	Low pressure sensor	It is used to detect the low pressure of the system and prevent the operation pressure from being too low.
19	Gas-liquid separator	It separates the gas and liquid and prevents liquid refrigerant from entering the compressor.
20	Outlet temperature sensor of the gas-liquid separator	It is used to detect the internal state of the gas-liquid separator and further control the suction state of the compressor.
21	Liquid valve	It is closed after the unit is delivered from the factory.
22	Gas valve	It is closed after the unit is delivered from the factory.
23	Unloading valve	It prevents a dead zone in the pipeline, which may cause over high pressure.
24	Low-temperature oil-return solenoid valve	It is used to control the connection of the compressor return oil pipeline.

Appendix 8 YAP1F Remote Special Functions

Setting Master Indoor Unit
1. Set Mode to Fan
2. Set Temp to 86°F or 30° C
Press Down/Up 3 times quickly
UC will display on indoor unit

Finding the Master Indoor unit
Try to change the mode by pressing the mode button
Single Beep it is the master
Double Beep it is not the master

View Indoor unit address
1. Set Mode to Fan
2. Set Temp to 61°F or 16°C
3. Press light button 5 times
Will hold this for 30 minutes
Press Light button 5 times to exit

View Indoor unit address all units
1. Set Mode to Fan
2. Set temp to 86°F or 30°C
3. Press light button 5 times
Will hold this for 30 minutes
Press Light button 5 times to exit

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