Service Manual

Floor Standing Type Split Air Conditioner Units

GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI

CONTENTS

PRODUCT

1 Product List

Model	Capacity(kW)		Power type	Refrigeran	Appearance	
	Cooling Capacity	Heating Capacity			Outdoor	Indoor
RF28WPd/Na-M	28.1	30	380-415V 3N~/50Hz	R410A		
LF28WPd/Na-M	28	-				
RF28WPd/Na-H	19.3	30	400V 3N~/60Hz			

2 Nomenclature

$$\frac{R}{1}\frac{F}{2}\frac{28}{3}\frac{W}{4}\frac{Pd}{5}/\frac{Na}{6}-\frac{M}{7}\frac{(O)}{8}$$

NO.	Name	Description
1	Unit type	R- Heat pump L- Cooling only
2	Cooling mode	F-Air-Cooled
3	Cooling capacity	Max. cooling capacity(kW)
4	Compressor place	W- Compressor outdoor
5	System type	Pd-Inverter
6	Refrigerant type	Na-R410A
7	Power type	M-380-415V 3N～50Hz H-400V 3N～ 60Hz
8	Indoor and outdoor unit code	(O)- Outdoor unit (I)- Indoor unit The entire unit is not expressed

3 Working principle

3.1 Introduction of working principle

The ODU adopts an inverter compressor. During refrigeration circulation, the refrigerant will flow to outdoor heat exchanger and heat dissipation module of controller through 4-way valve, after that, it will come to IDU

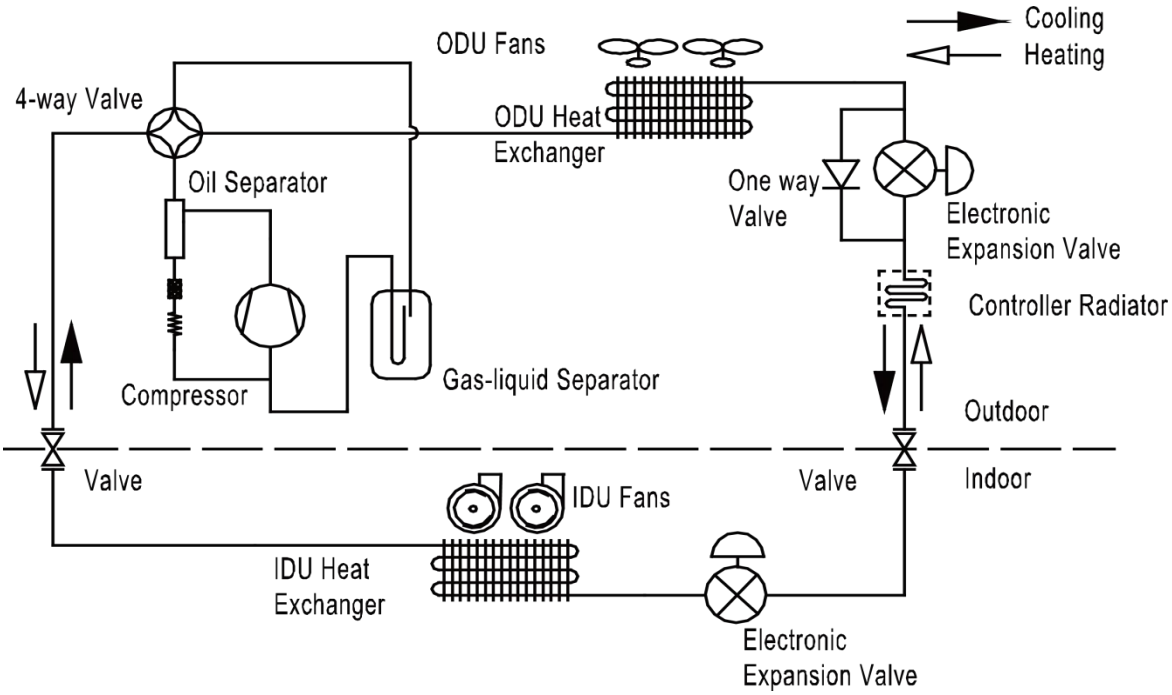
through the connection pipe of IDU&ODU. In IDU, after throttling with electronic expansion valve, the refrigerant will be distributed to the U tube of evaporator through separator evenly, and returned to ODU from the gas connection pipe after summarizing. Then, it will return to the compressor for compression by means of gas-liquid separator to complete a circulated refrigeration project. During heating circulation, the refrigerant will flow to indoor heat exchanger first through 4-way valve. After condensation in IDU, the refrigerant will be returned to ODU through liquid pipe. Electronic expansion valve of ODU will conduct throttling, through the heat dissipation module of controller and ODU heat exchanger; it will be evaporated as vapour of low temperature and low voltage. Through 4-way valve and gas-liquid separator, it will be returned to compressor for compression, completing a circulated heating project.

Cooling only type has no heating circulation, only refrigeration circulation is available.

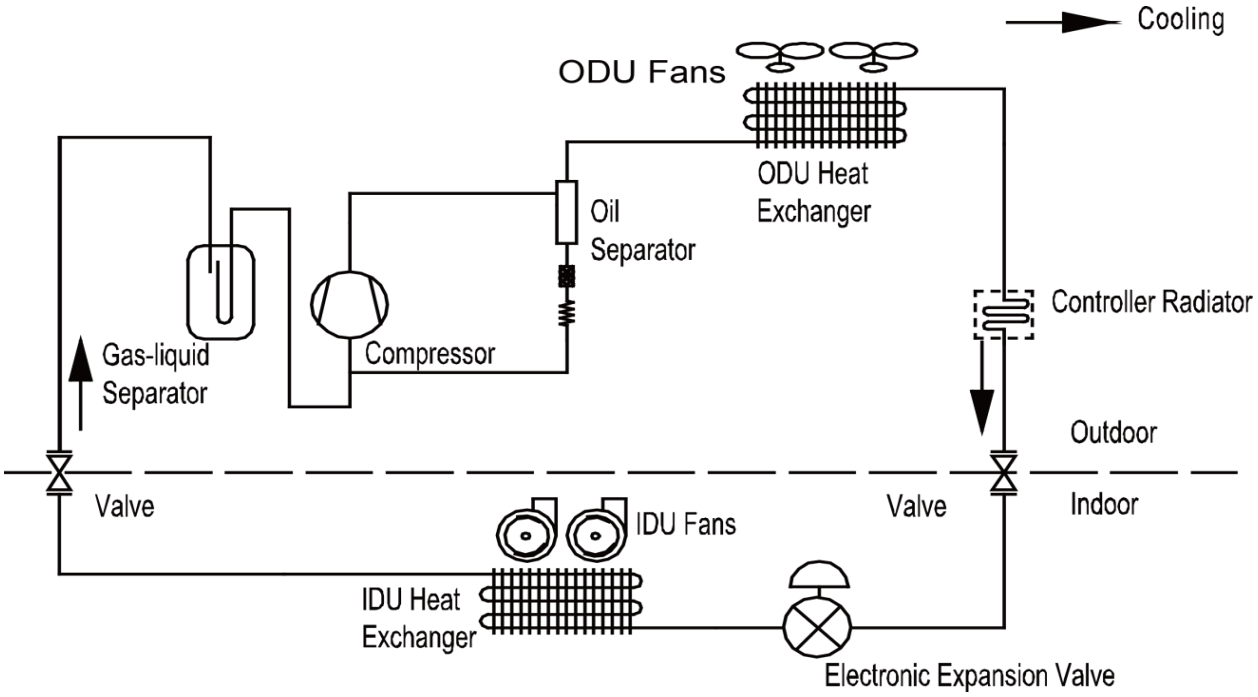
System high pressure conducts detection and simulation through temperature sensor of heat exchanger at high pressure sidel, while system low pressure conducts detection and simulation through temperature sensor of heat exchanger at low pressure side.High pressure switch, low pressure switch, discharge temperature detection, etc. are set for the unit to ensure stable operation within a reasonable range.

3.2 Working principle diagram

3.2.1 Working principle diagram for cooling and heating unit



3.2.2 Working principle diagram for cooling only type



3.2.3 Component name and main function

No.	Name	Main function
1	Compressor	Through compression of the compressor, the volume of low pressure refrigerant will decrease,as the increase of pressure and temperature, it will become the refrigerant of high pressure and high temperature and driving force of the whole system. Meanwhile, the rotate speed of compressor can be adjusted according to actual sysment requirement to achieve the purpose of capacity adjustment.
2	Oil separator	Separate the gas and the oil to ensure reliability of the compressor.
3	4-way valve	To switch cooling operation mode and heating operation mode of the unit.
4	Outdoor heat exchanger	During cooling, discharge heat to the outside air as a condenser; during heating, absorbe heat from the outside air as an evaporator.
5	ODU fans	Convection heat transfer between outdoor heat exchanger and outdoor air through fan motor
6	Controller Radiator	Heat exchange between refrigerant after condensation and components of controller to ensure normal operation of controller.
7	Electronic expansion valve	Refrigerant throttling control, adjust refrigerant flow accurately according to system status.
8	One way valve	Control unidirection flow of refrigerant. During cooling, it is open, the refrigerant will not pass through the electronic expansion valve of ODU; during heating, it is closed, the refrigerant will pass through the electronic expansion valve of ODU for throttling.
9	Cut off valve	The flowing switch component of refrigerant in pipeline, it is closed when leaving the factory, after installation, it must be open completely.
10	IDU heat exchanger	During cooling, absorbe heat from the indoor air as an evaporator; during heating, discharge heat to the indoor air as a condenser.

No.	Name	Main function
11	IDU fans	Convection heat transfer between indoor heat exchanger and indoor air through fan motor
12	Gas-liquid separator	Separate gas and liquid for the refrigerant absorbed into the compressor to avoid wet operation of compressor.

4 Unit parameter

Model			RF28WPd/Na-M	LF28WPd/Na-M	RF28WPd/Na-H
Capacity	T1 Nominal cooling capacity	kW	28.1	28	19.3
		BTU/h	96000	96000	66000
	T1 Cooling capacity range	kW	12.3~28	12.3~28	12.3~28
		BTU/h	43000~96000	43000~96000	43000~96000
	T3 Nominal coling capacity	kW	23	23	18.2
		BTU/h	62000	62000	62000
	Nominal heating capacity	kW	30	-	30
		BTU/h	102000	-	102000
	Heating capacity range	kW	11.7~30	-	11.7~30
		BTU/h	40000~102000	-	40000~102000
Power type			380-415V 3N~ 50Hz	380-415V 3N~ 50Hz	400V 3N~ 60Hz
Max. input power		kW	15.4	15.4	15.4
Max. input current		A	27.5	27.5	27.5
Refrigerant type			R410A		
Refrigerant charge		kg	8.0	8.0	8.0
IDU	Airflow volume	m^3/h	4000	4000	4000
	Static pressure	Pa	0	0	0
	Noise	dB(A)	63	63	63
	Size (WxDxH)	mm	1200×400.×1850	1200×400.×1850	1200×400.×1850
	Net weight	kg	129	129	133
ODU	Noise	dB(A)	63	63	63
	Size (WxDxH)	mm	940×460×1615	940×460×1615	940×460×1615
	Net weight	kg	160	156	182
Connection pipe	Liquid pipe	mm	Φ9.52	Φ9.52	Φ9.52
	Gas pipe	mm	Φ22.2	Φ22.2	Φ22.2
	Max.height fall	m	30	30	30
	The longest connection pipe	m	70	70	70

Notes：

① Test working condition for T1 cooling capacity is 35℃（dry bulb）/24℃（wet bulb）at outdoor side

and 27℃（dry bulb）/19℃（wet bulb）at indoor side;

② Test working condition for T3 cooling capacity is 46℃（dry bulb）/24℃（wet bulb）at outdoor side and 29℃（dry bulb）/19℃（wet bulb） at indoor side;

③ Test working condition for heating capacity is 7℃（dry bulb）/6℃（wet bulb）at outdoor side and 20℃（dry bulb）/15℃（wet bulb） at indoor side;

④ Noise value of the unit is the test value in semi-anechoic room according to related stardard, during actual operation; the value will be slightly higher due to environment change.

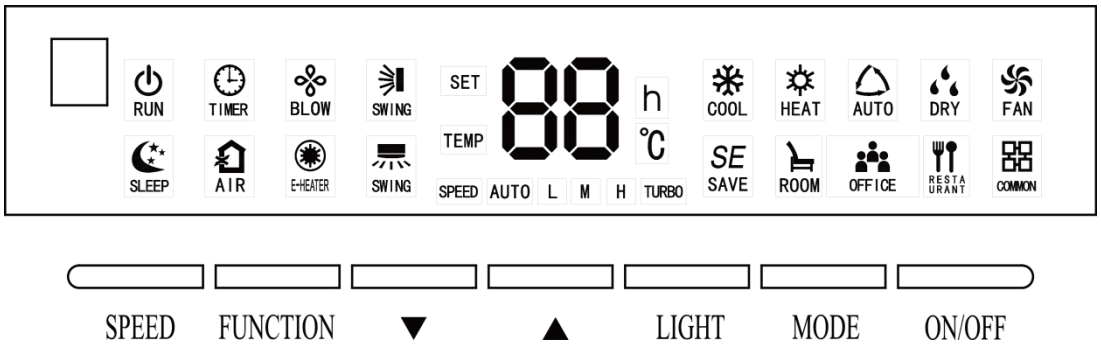
⑤ The refrigerant charge in the table is the data not considering the long connection pipeline, refrigerant charge might be added according to actual condition in actual installation.

⑥ Unit performance parameter is subject to product improvement without further notice, please refer to product nameplate for concrete parameter.

CONTROL

1 Cntrol and Display of Indoor unit

1.1 Control Panel



Note:

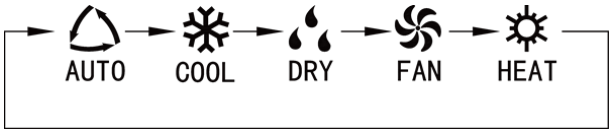
"AIR" function is an optional function of indoor unit, for the unit without such function, this function is invalid;"AIR",HEATER", "ROOM", "OFFICE", "RESTAURANT", "COMMON" are obligate functions of indoor unit that cannot be set.

1.2 Operational Instruction

1.2.1 Start Up and Close Down Unit

Press "ON/OFF" button to start up the unit. Press "ON/OFF" button to close down the unit.

1.2.2 Mode Setting



Under power-on status, each time press "Mode" button, the mode will be switched according to the following order circularly:

Notes:

① Under auto mode, if the indoor unit is in auto cooling, the "" and "" icons are on; if the indoor unit is in auto heating, the "" and "" icons are on.

② Cooling only unit doesn't have heating function and heating mode cannot be set.

1.2.3 Setting of Light ON/OFF Function

Light ON/OFF Function: can set the ON and OFF of light for display panel.

(1) Under power-on or power-off status, press “Light” button to turn on and turn off the light of display panel.

(2) When the light of display panel is turned off, press the other buttons other than “Light” button, the light on display panel will be turned off after 5 seconds.

1.2.4 Temperature Setting

Press “▼” or “▲” buttons under power-on status, the set temperature will be increased or decreased at 1℃ each time; when long press the buttons, the temperature will be increased or decreased at 1℃ every 0.3 seconds. The temperature setting range is: 16℃～30℃.

Note:

Under auto mode, the temperature cannot be set through pressing “▼” or “▲” buttons.

1.2.5 Function Setting

Press “FUNCTION” button under power-on or power-off status, it can enter into function setting status. Under function setting status, press “ON/OFF” button or without pressing any buttons for consecutively 5 seconds, it will quit the function setting status.

(1) Left and right swing function settings

Press “FUNCTION” button under power-on status to switch to left and right swing function, when “  ” flickers, press “▲” or “▼” button to start up or cancel the left and right swing function. If “  ” icon is on it means the function has been started up; if “  ” icon is off it means the function has been cancelled.

(2) Settings of X-fan

X-fan function: after closing down the unit under cooling and dry mode, the air conditioner will automatically dry the water of evaporator of indoor unit to prevent breeding of bacteria and mildew.

Turn on or cancel X-fan function: with the unit is started up, under cooling or dry mode, press “FUNCTION” button to switch to X-fan function, when “  ” flickers, press “▲”or“▼” buttons to start or cancel X-fan function. If “  ” icon is on it means the X-fan function has been started up, if “” icon is off it means the X-fan function has been cancelled.

(3) Settings of Timer Function

1) Timer Function: under power-on status, the countdown of power-off time can be set. Under power-off status, the countdown of power-on time can be set.

2) Timer setting: press “FUNCTION” button to switch to timer function, when “” icon flickers, press “▲” or “▼” button to adjust the setting time. After setting the time, press “ON/OFF” button or without pressing any buttons for consecutive 5 seconds, the setting time is confirmed and quit the function setting status. After quitting the function setting status, the “” icon is on, it means the timer function has been turned on.

3) Cancel timer: press “FUNCTION” button to switch to timer function, when “” icon flickers, press “▲” or “▼” button to set the time to be “00”, then the timer function is cancelled; press “ON/OFF” button or without pressing any buttons for consecutive 5 seconds, it will quit the function setting status. After quitting the function setting status, the “” icon is off, it means the timer function has been cancelled.

4) Count down setting range: 00~24 hours, in which “00” refers to closedown of timer function. Each time press “▲” or “▼” button, if it is within 10 hours, it will increase or decrease 0.5 hour each time, if long press “▲” or “▼” button, it will increase or decrease 0.5 hour every 0.3 second; if it is over 10 hours, each time press “▲” or “▼” button will increase or decrease 1 hour each time, and if long press “▲” or “▼” button, it will increase or decrease 1 hour every 0.3 second.

(4) Setting of Sleeping Function

1) Sleeping function: set the unit to enter into sleeping operational status, the unit will operate according to the preset sleeping temperature curve to create a comfortable sleeping environment and improve sleeping quality.

2) Turn on or cancel sleeping function: press “FUNCTION” button under power-on status to switch to sleeping function, when “” icon flickers, press “▲” or “▼” button to turn on or cancel sleeping function. If “” icon is on, it means the sleeping function is turned on; if “” icon is off, it means the sleeping function is cancelled.

3) There is no sleeping function under auto and swing mode.

(5) Setting of energy-saving function

1) Energy-saving function: through setting the lower temperature limit of cooling and dry mode and upper temperature limit of heating mode, to make the air conditioner operate in a smaller temperature range, thus save energy.

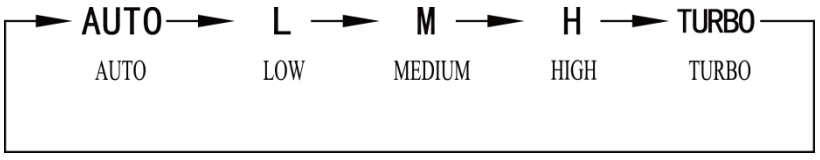
2) Turn on cooling energy-saving: with the unit is started up, under cooling or dry mode, press "FUNCTION" button to switch to energy-saving function, when "SE" icon flickers, press "▲"or "▼" button to adjust cooling temperature limit, after setting cooling temperature limit, press "ON/OFF" button or without pressing any buttons for consecutive 5 seconds, the energy-saving function is confirmed to be turned on and quit the function setting status. After quitting function setting status, the "SE" icon is on, it means the cooling energy-saving function has been turned on.

3) Turn on heating energy-saving: with the unit is started up, under heating mode, press "FUNCTION" button to switch to energy-saving function, press "▲"or "▼" button to adjust heating temperature limit, if the "SE" icon flickers, after setting heating temperature limit, press "ON/OFF" button or without pressing any buttons for consecutive 5 seconds, the energy-saving function is confirmed to be turned on and quit the function setting status. After quitting function setting status, the "SE" icon is on, it means the heating energy-saving function has been turned on.

4) Cancel energy-saving function: under energy-saving function setting status or under normal power-on status, press "FUNCTION" button and "▼" button simultaneously to cancel energy-saving function, when "SE" icon is off, it means the energy-saving function is cancelled.

1.2.6 Speed Settings

Under power-on status, press "SPEED" button, the speed will be circularly switched according to the following order:



Notes:

① Under dry mode, the speed cannot be adjusted, it will be automatically set to be low.

② When the speed of indoor unit is adjusted to be auto speed, the indoor unit will automatically change speed according to the indoor ambient temperature, to make the indoor ambient temperature be more stable and comfortable.

1.2.7 Special Functions

(1) Inquire address of indoor unit

Under power-off status, press “SPEED” button and “ON/OFF” button simultaneously for 5 seconds, then the “88” LED will display the engineering No. of the indoor unit for 5 seconds; if the engineering No. is over two digits, it will circularly display the higher two digits and lower two digits.

(2) Inquire unit type

Under power-off status, simultaneously press “MODE” button and “ON/OFF” button for 5 seconds, then the “88” LED will display corresponding code for 5 seconds: heat pump unit will display “nA”, cooling only unit will display “nC”, heating only unit will display “nH”, swing type unit will display “nF”.

(3) Setting of power-fail memory function

Under power-off status, simultaneously press “MODE” button and “▲” button for 5 seconds to switch the memory method: if “88” LED displays “on”, it means it will memorize the on and off status of the unit after being de-energized (that is, after de-energizing and energizing the unit, the unit will resume to be the status before it is de-energized); if “88” LED displays “oF”, it means it will not memorize the on and off status of the unit after being de-energized (that is, after de-energizing and energizing the unit, the unit will still be under power-off status).

(4) Setting of master indoor unit function

Under power-off status, long press “MODE” button for 5 seconds to set the indoor unit to be master pattern indoor unit (master indoor unit), after finishing setting, the “88” LED will display “UC” for 5 seconds.

Note：

When the master indoor unit is started up, the operation light “⏻” on display panel will flicker for three times.

(5) Settings of Child Lock Function

1) Under power-on or power-off status, simultaneously press “▲” button and “▼” button for 5 seconds, it will turn on child lock function, the “88” LED will flicker and display “An” for three times; press “▲” button and “▼” button again for 5 seconds, it will cancel child lock function.
2) Under child lock status, the unit will not response if pressing other buttons, and the “88” LED will flicker and display “An” to remind the user that the unit is under child lock status.

(6) Long-distance Shielding Function

1) Long-distance shielding function: long-distance monitor or centralized controller can remotely control related functions of indoor unit or conduct shielding to make the operation invalid, thus realize long-distance control function.

2) Long-distance shielding function can be divided into full shielding and partial shielding. When it is in full shielding, all the remote control or operation by pressing buttons to the indoor unit will be invalid. If it is in partial shielding, the remote control or operation by pressing buttons to the shielded function of indoor unit will be invalid.

3) When long-distance monitor or centralized controller conducts long-distance shielding to indoor unit, if the user wants to remotely control or operate the unit by pressing buttons, the “88” LED will flicker and display “Ay” to remind the user that it is under long-distance shielding status.

2 Monitoring Software

2.1 Function introduction

Integrating with telecommunication technology and computing software, Gree Commissioning Tool Kits can realize the comprehensive monitor, control and commissioning on central air conditioners. It is an efficient solution for the management of central air conditioners that are separated in different parts of a building. Administrator doesn’t need to control every unit on site, but rather controls the units by just sitting in front of a computer. This will not only improve the productivity, but also reduce cost on human resources, property and management.

Gree Commissioning Tool Kits can monitor and control the duct type split air conditioner inverter series. User can monitor and control units by monitoring the computer. This software is an efficient tool for the intelligent air conditioning management as well as installation and after-sales service and commissioning. It can debug units and control units’ operation status quickly and conveniently. It will not only improve the productivity but also reduce the difficulty and cost of commissioning and maintenance, providing better and faster service to customers.

2.2 Connection of computer and units

It can be connected with single-system network or multi-system network. In the single-system network, indoor units or outdoor units are connectable, while in the multi-system network, only the master outdoor unit can be connected.

Seen from the diagram, Gree commissioing network is made up of 3 parts:

The 1st part is the monitoring computer, including Gree debugger and Gree USB converter driver that are installed in the computer.

The 2nd part is Gree USB converter, which is to convert the air conditioning communication into computing communication. This part is made up of Gree USB data converter and USB data wire.

The 3rd part is air conditioners, including outdoor units, indoor units and the connection wires. If connection wire is not long enough, it's OK to connect via the patching board of the commissioning tool kits. In a single-system network, both indoor units and outdoor units can be connected, while in a multi-system network, only the master outdoor unit can be connected.

2.3 Parts introduction

2.3.1 List of parts

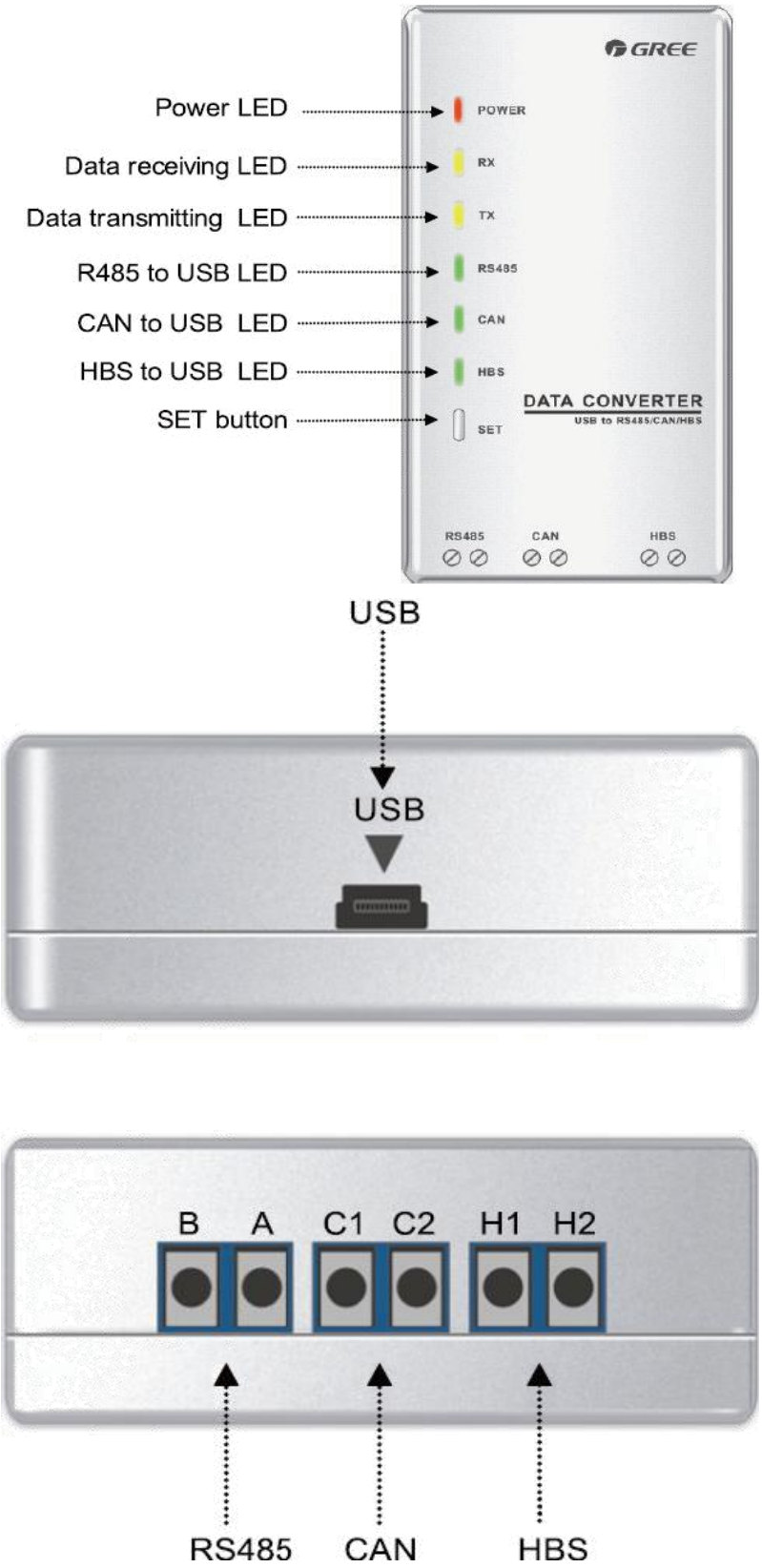
Name	Model	Material no.	Remark
Gree USB data converter	ME40-00/B	MC200062	Convert the air conditioning communication into computing communication
Gree Commissioning Tool Kits (CD-ROM)	DE40-33/A(C)	MC200068	Include Gree debugger, monitoring software, USB driver and USB converter configuring software.
USB wire	\	40020082	Wire connecting computer's USB interface and converter
Communicaiton board	\	30118015	This board can be used when units are far from the computer.
Board connection wire (1m)	\	4001023229	4-core wire connecting units and converter
Board connection wire (5.5m)	\	4001023214	4-core wire connecting units and converter
Instruction manual	\	66174100018	Instruction manual

2.3.2 Gree USB data converter

2.3.2.1 Functions introduction

Gree USB data converter will convert the RS485, HBS and CAN commucation within the air conditioners into the communication that is recognizable by computer's USB interface.

2.3.2.2 Appearance



2.3.2.3 Operation instruction

(1) Power LED: a red light. If the red light is on, it indicates normal power supply. If the red light is off, it indicates the power supply of converter is not normal.

(2) Communication LEDs: yellow lights. When converter is working and the computer is transmitting data, the TX data transmitting light will be flickering. When units are uploading data to the computer, the RX data receiving light will be flickering.

(3) When converter is under RS485 data transferring mode, the function LED of RS485 to USB will be on.

(4) When converter is under CAN data transferring mode, the function LED of CAN to USB will be on.

(5) When converter is under HBS data transferring mode, the function LED of HBS to USB will be on.

(6) USB interface: connect USB data wire.

(7) CAN interface: When converter is under CAN communication mode, connect air conditioner's CAN data interface. CAN interface exhibits no polarity (A and B are equal).

(8) HBS interface: When HBS converter is under HBS communication mode, connect air conditioner's HBS data interface. HBS interface exhibits no polarity (This interface is not yet available for Gree debugger and the monitoring software).

(9) RS485 interface: When RS485 converter is under RS485 communication mode, connect air conditioner's RS485 data interface. RS485 interface exhibits polarity and terminal A and B are different.

2.3.2.4 Installation notice

(1) Install indoors. To avoid collision, it is suggested to place it in the monitoring room together with the computer.

(2) No need of power supply. Power is supplied through computer's USB interface.

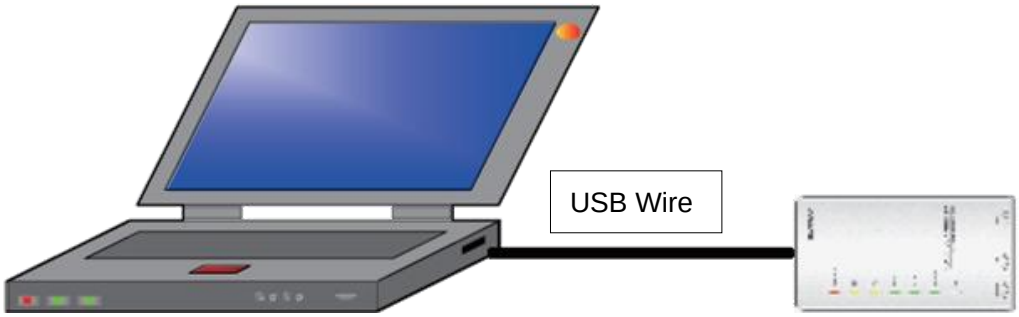
2.3.3 Communication board

Communication board is mainly used for transferring data. It functions similar with a patching board. Provided that units are far away from the monitoring computer, communication board can be used for connection.

2.3.4 Communication cord

2.3.4.1 USB wire

Connect USB wire with computer's USB interface at one end and with the USB interface of USB data converter at the other end, as indicated below:



2.3.4.2 Board Connection Wire

There are 2 board connection wires supplied for the commissioning tool kits. One is 1 meter's long and the other is 5.5 meters' long. They are only different in length. One end of the wire shall connect with air conditioner's communication interface and the other end shall connect with CAN interface of Gree USB converter. The wire can be connected to the communication interface of outdoor unit or the communication interface of indoor unit:

2.4 Software introduction

(1) One-button commissioning

Personnel responsible for the commissioning of air conditioners can start commissioning by pressing one button according to the commissioning logic of software, which will give the commissioning order to units. Then commissioning will be started up automatically step by step. During the commissioning, the corresponding process will be ticked in green on the software interface. If any commissioning process is not normal, it will be displayed in red.

(2) Comprehensive monitoring

The software can monitor every part of the air conditioning system, including functions, equipment and components operating status. The monitoring results will be displayed in text or curve so that user can acquire the operating status of the entire system conveniently and straightforwardly.

(3) Real-time control

Air conditioner's operating time and requirements may be different based on areas and functions. User can set units' parameters on computer according to actual needs, such as the on/off, temperature, fan speed, mode, etc. Meanwhile, the software can also set or view the function parameters of outdoor units, gateway and other equipment. In this way, the mangement of central air conditioners is realized.

(4) Replay history

Software can replay and save the historical monitoring information in the data base. The replay speed can be selected and the information will be shown in text or curve. This function has greatly saved the time to track problem cause and resolved the difficulty of problem reproduction.

(5) Applicable to multiple series, models and users

Gree Commissioning Tool Kits is applicable to air conditioning system that comsists of multiple series and models. Later, it will be developed to cover all series of Gree central air conditioners, such as multi VRF, centrifugal chiller, screw type chiller, ground source heat pump units, modular units, fan coiled units, close control units, etc. It can be used by system and controller designers to develop and monitor units, or used for maintenance and commissioning.

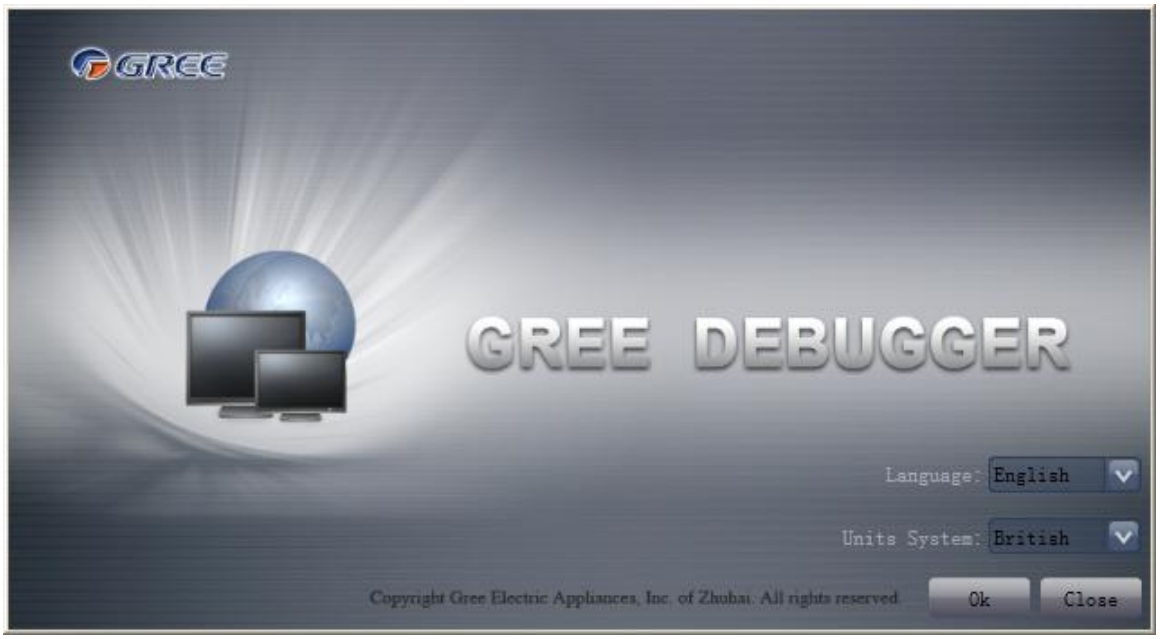
(6) Other functions

For the convenience of users, the software has added functions like connection guide, printing screen, opening database folder, rebuilding database, changing database saving path, etc.

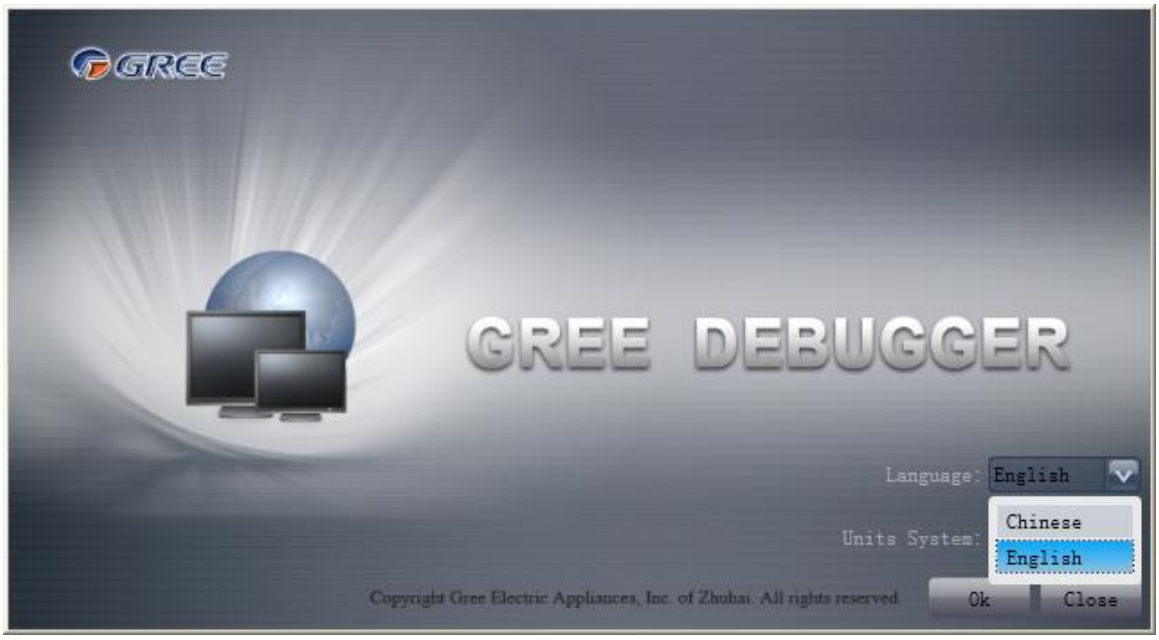
2.4.1 Data monitoring

(1) Start up Gree Debugger.

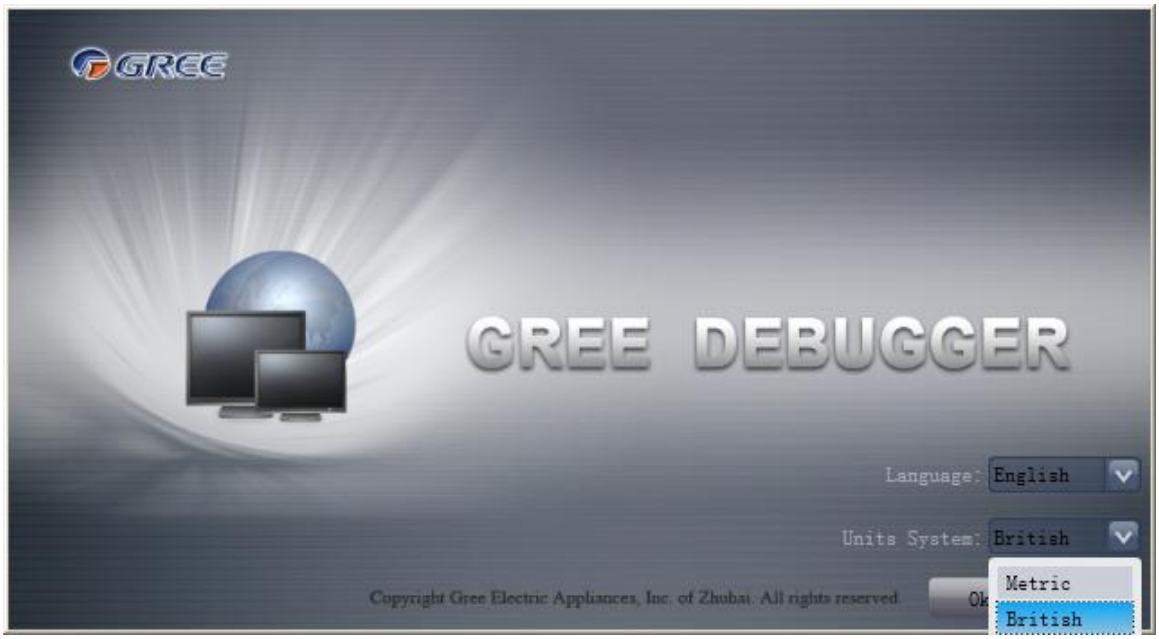
(2) On the original interface, user can select language and units system. Click “OK” to confirm the defaulted language and units system and start up the software.



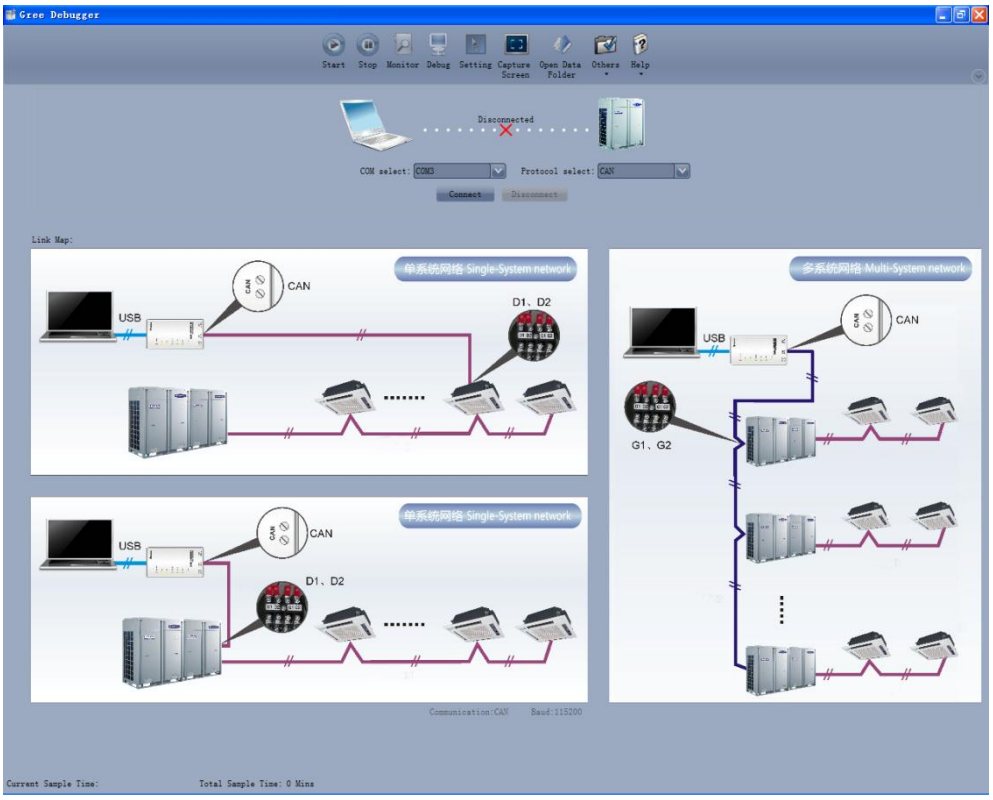
(3) Select language.



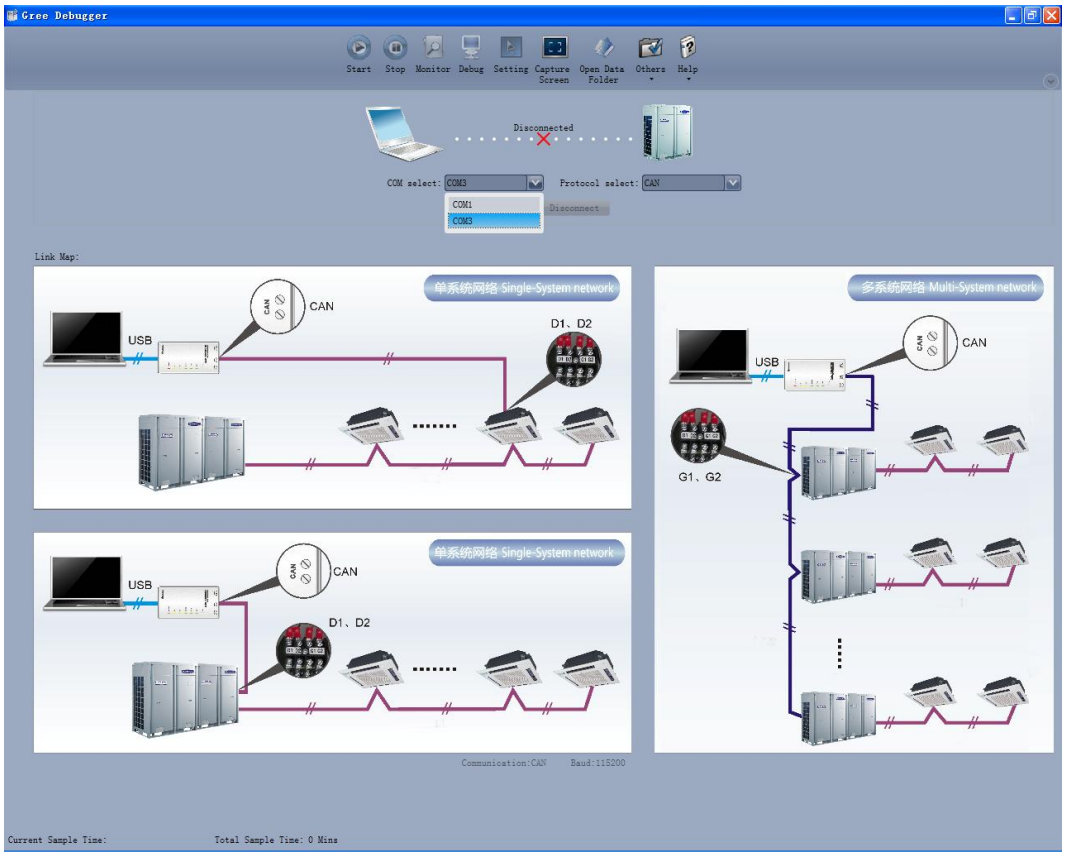
(4) Select system of units.



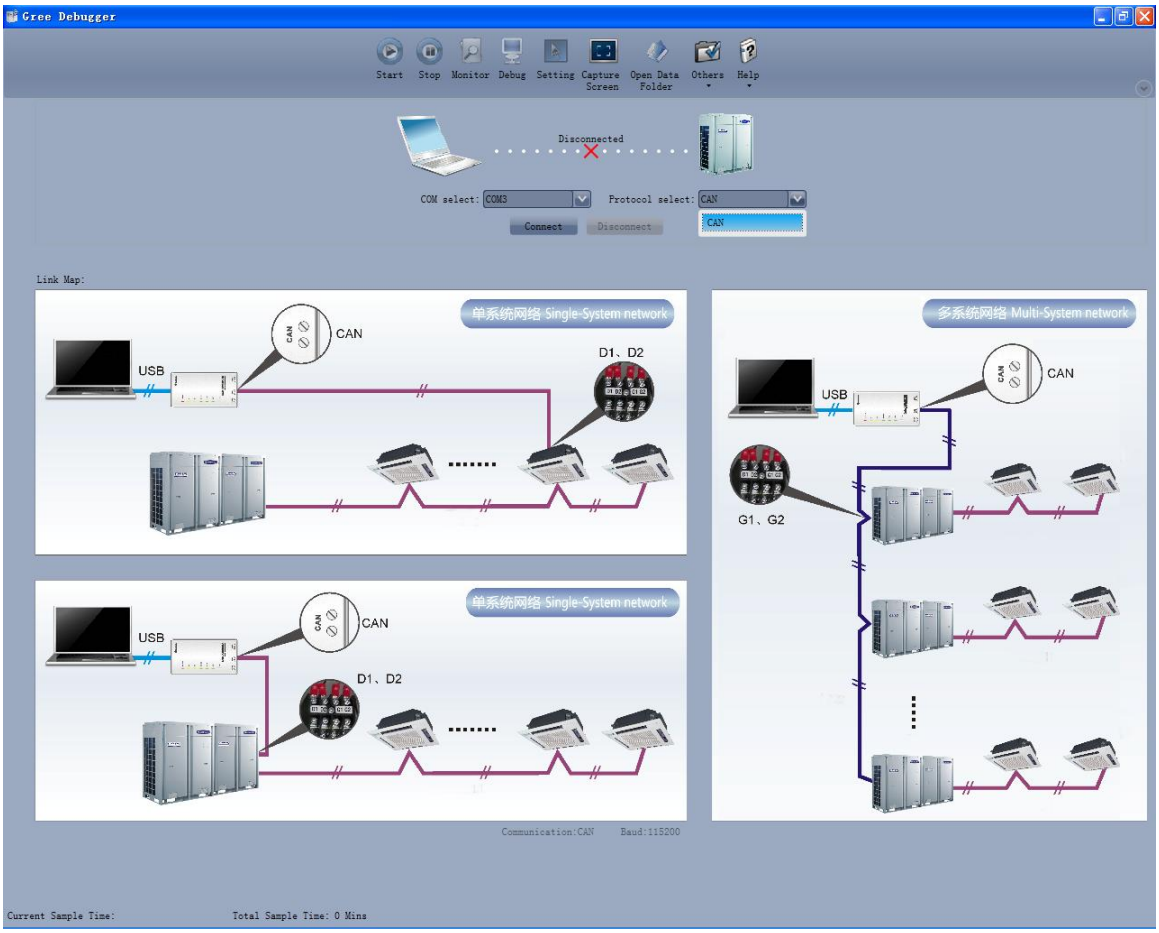
(5) If units you want to monitor are already connected, and able to communicate normally, with correct COM and protocal, then you may click “Connect” to enter the interface of numbers. Otherwise, connect in accordance with the connection diagram shown below.



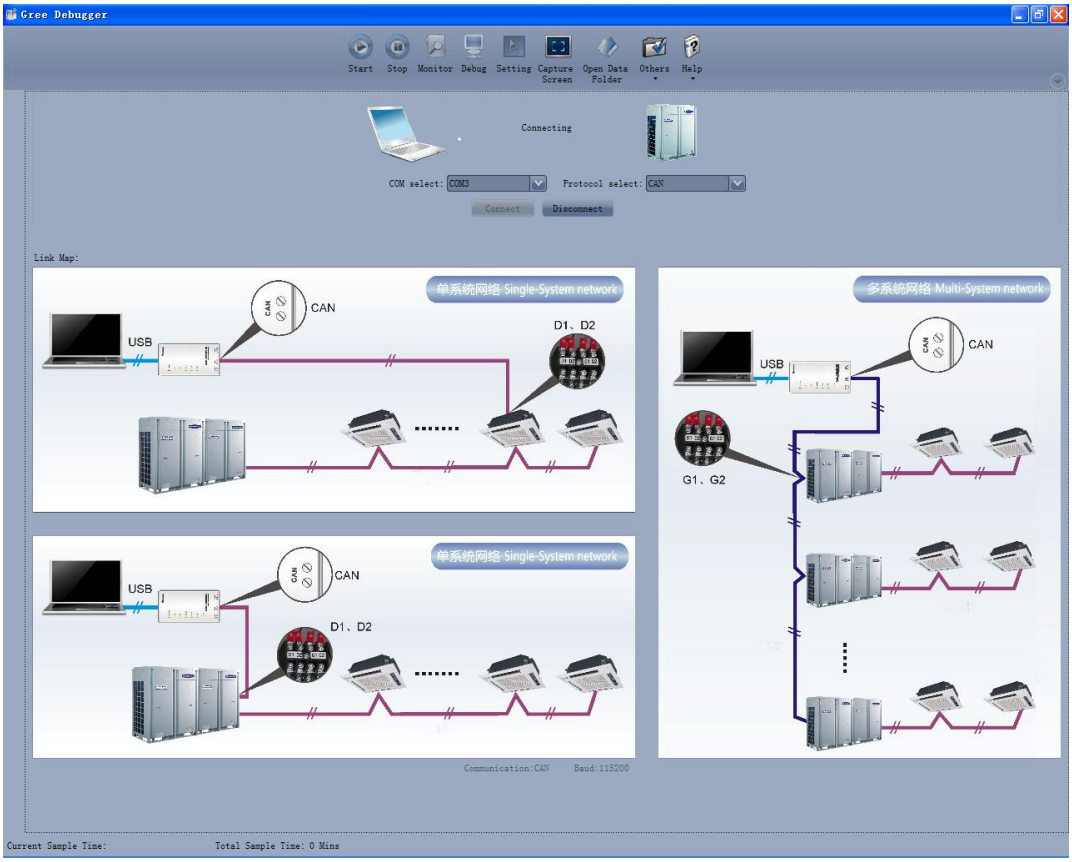
(6) COM selection: the serial port in your computer can be detected automatically. You just need to select your desired serial port.

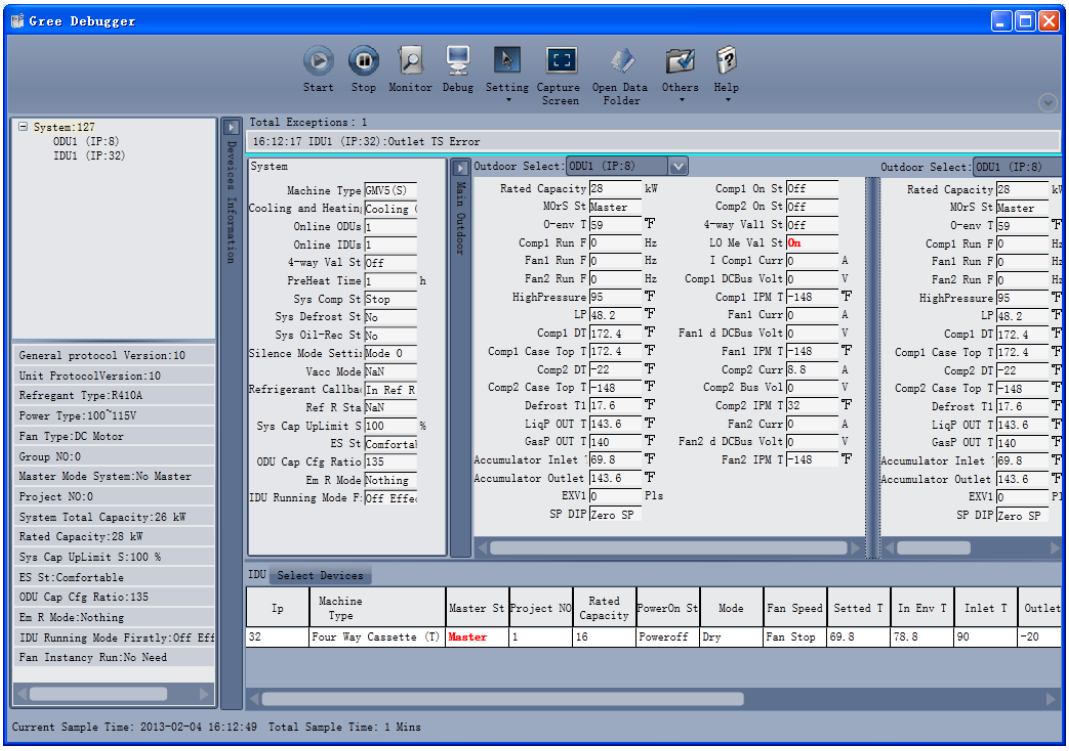


(7) Protocal selection: This is to select the communication method of your units. Currently, CAN is applicable to the units.

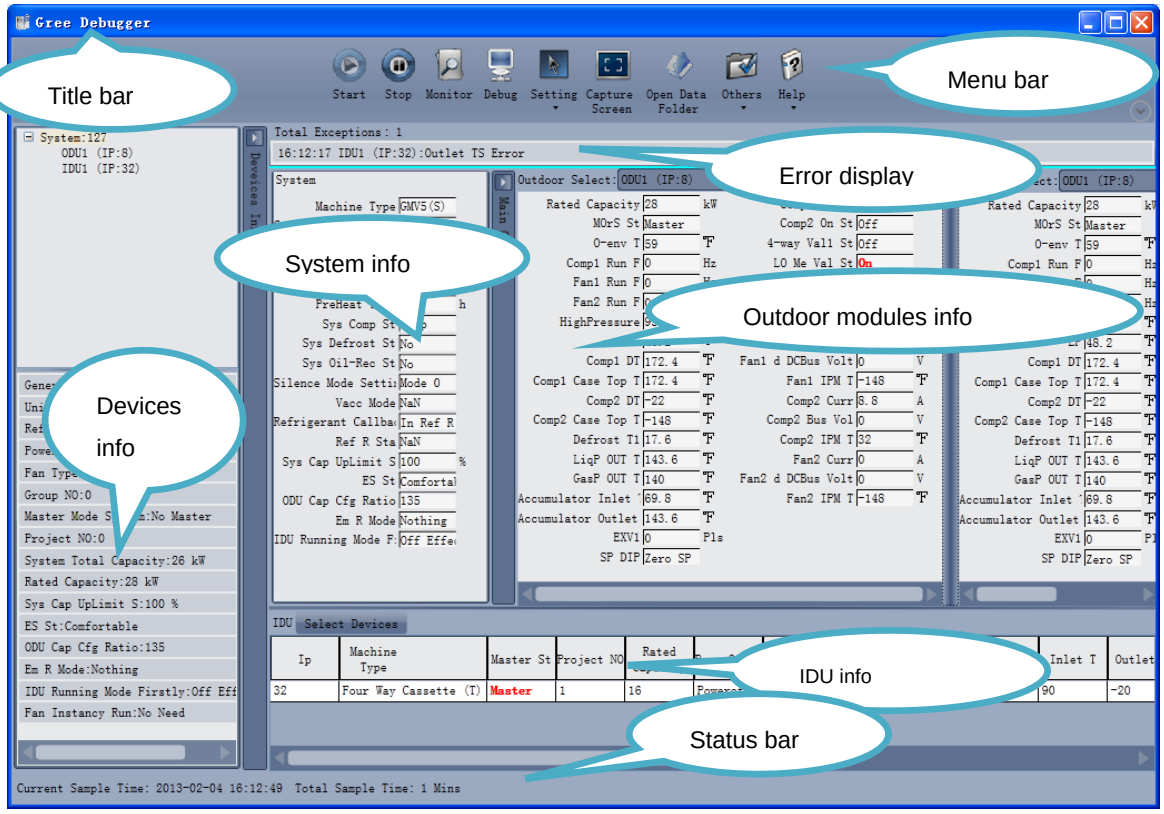


(8) After the selection, click “Connnect”. If units can communicate normally with computer, then the interface of numbers will be shown soon. Otherwise, “Connecting” will be shown.

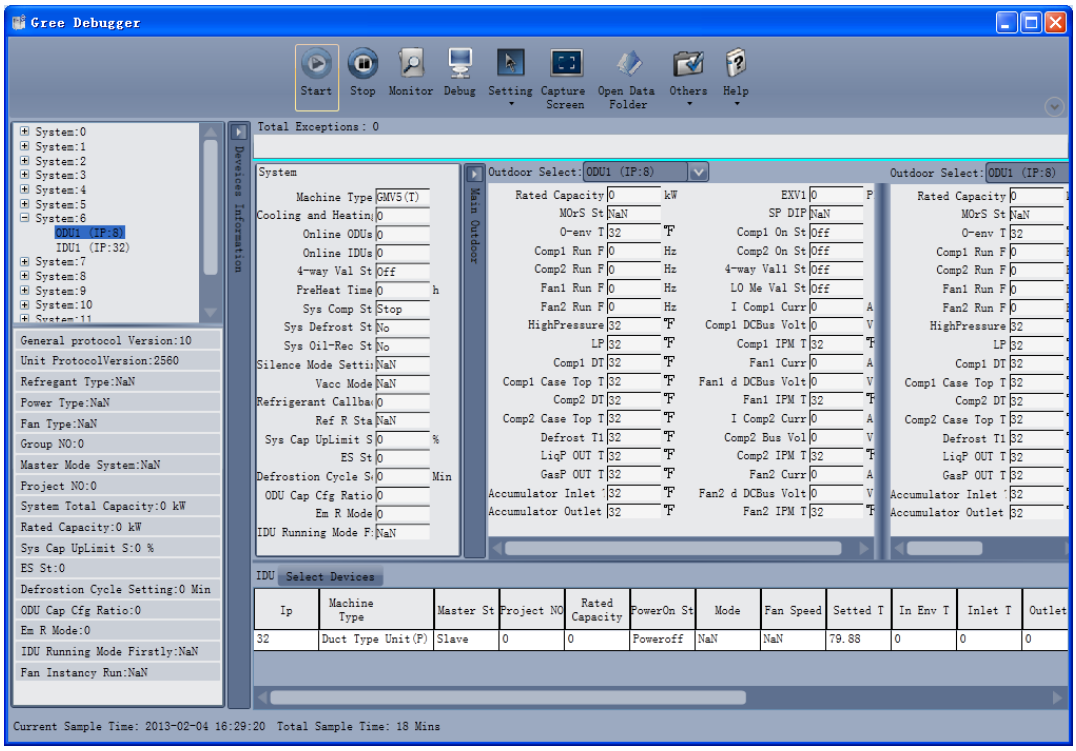




(9) There are several display zones on this interface. You can hide devices information and system information by clicking devices information icon and system icon . Display zones of indoor unit information and errors can be dragged up and down at the dividing lines. As to the display zone of outdoor modules information, it can show information of only one module and hide information of others (two modules are defaulted to be shown). Menu bar can be hidden by clicking icon . Status bar shows the current time and period for data collection.

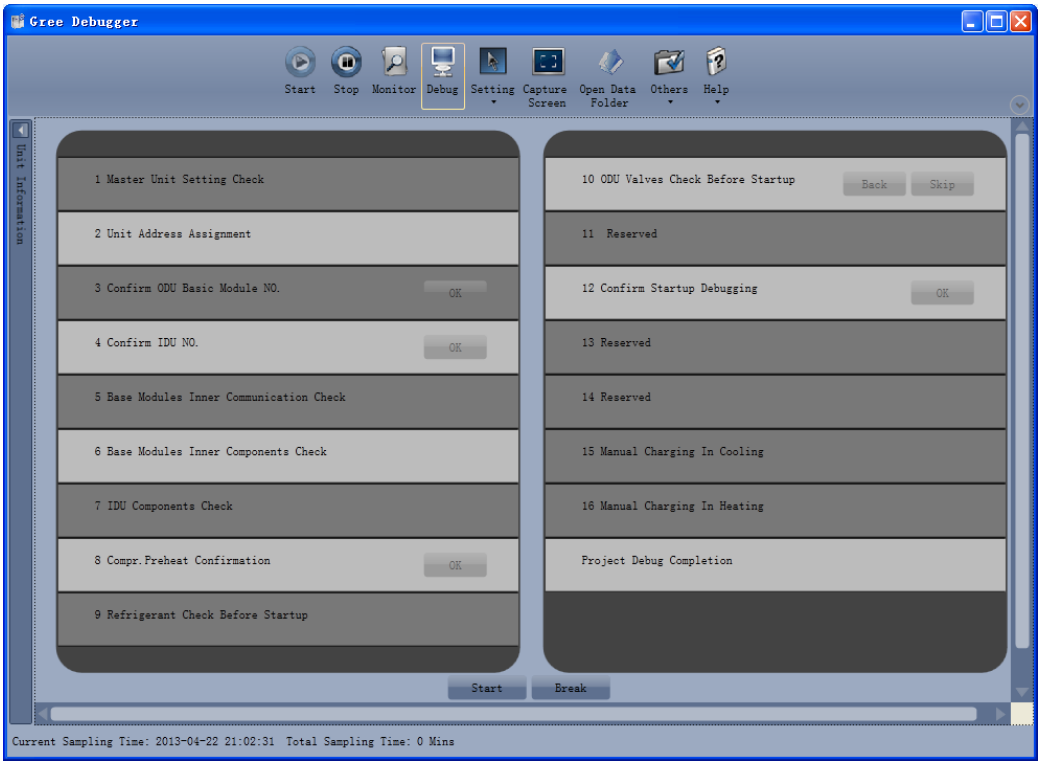


(10) On the display zone of devices information, you may click to select and view units that need monitoring.

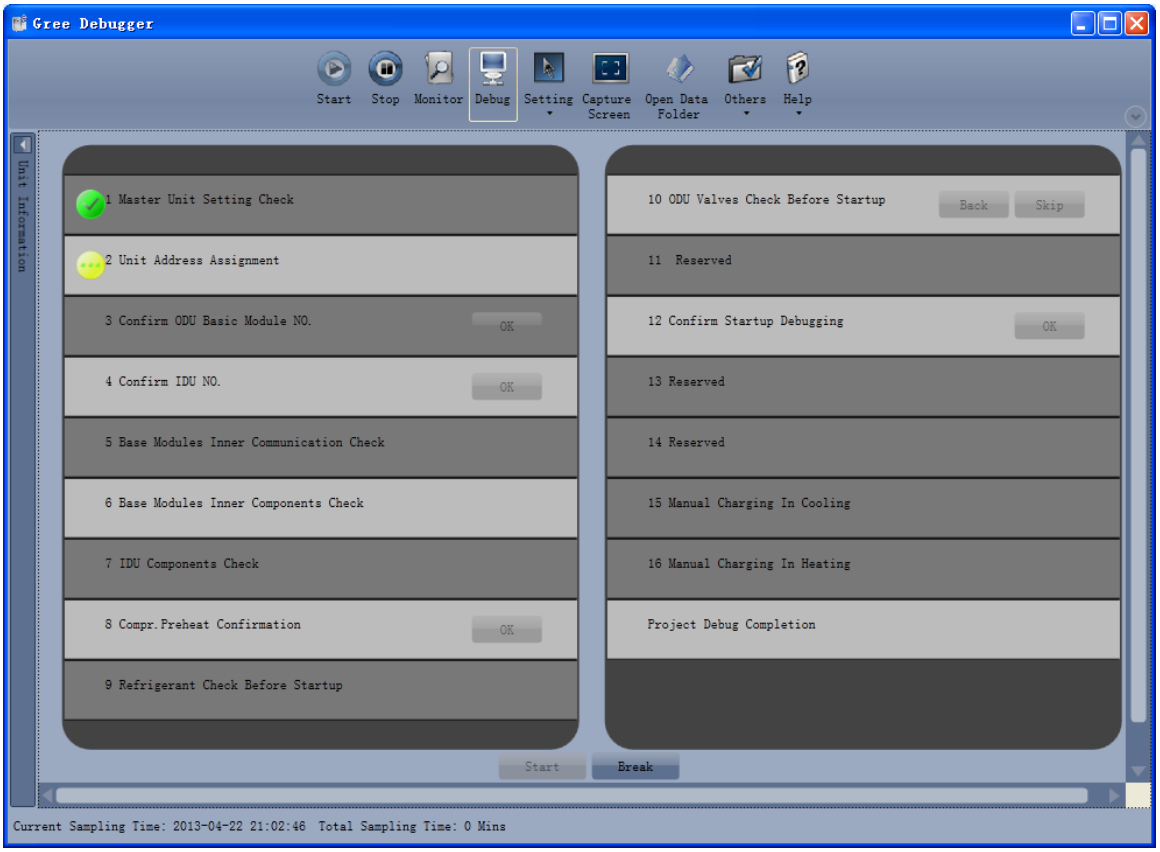


2.4.3 Project debugging

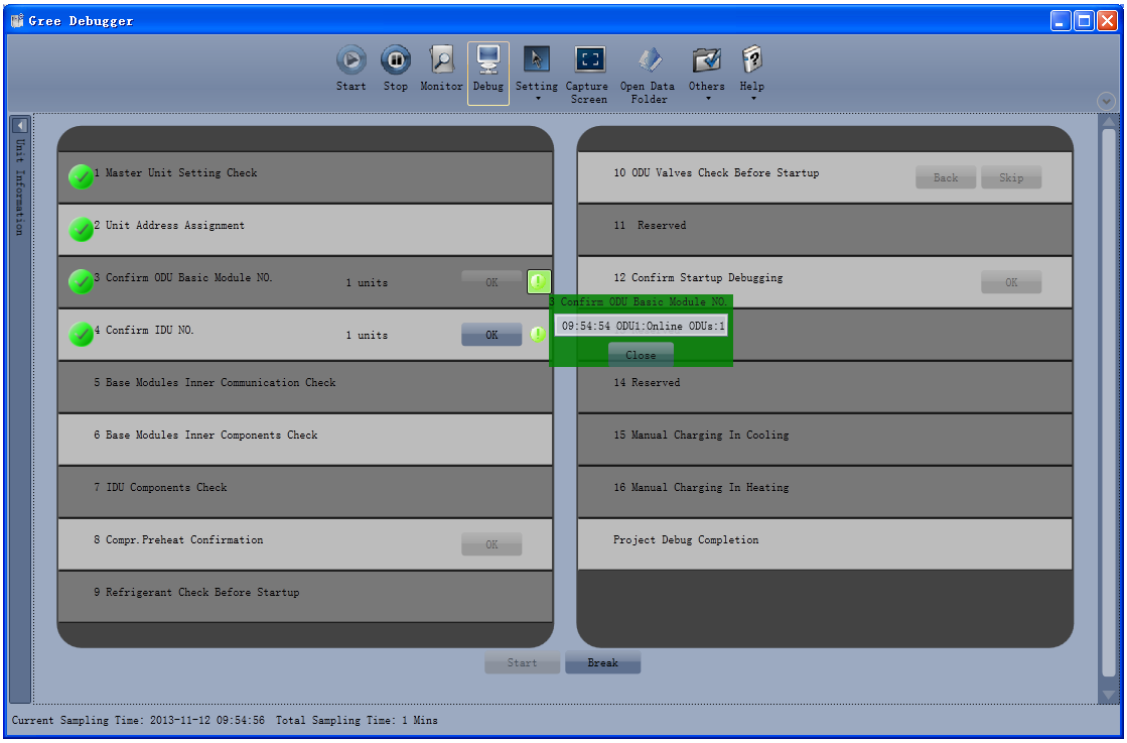
(1) Click icon of “Debug” on the menu bar and the interface will be switched to project debugging, where auto debugging will be started from up to down and from left to right. Note: Debugging function is only applicable to a single-system network.

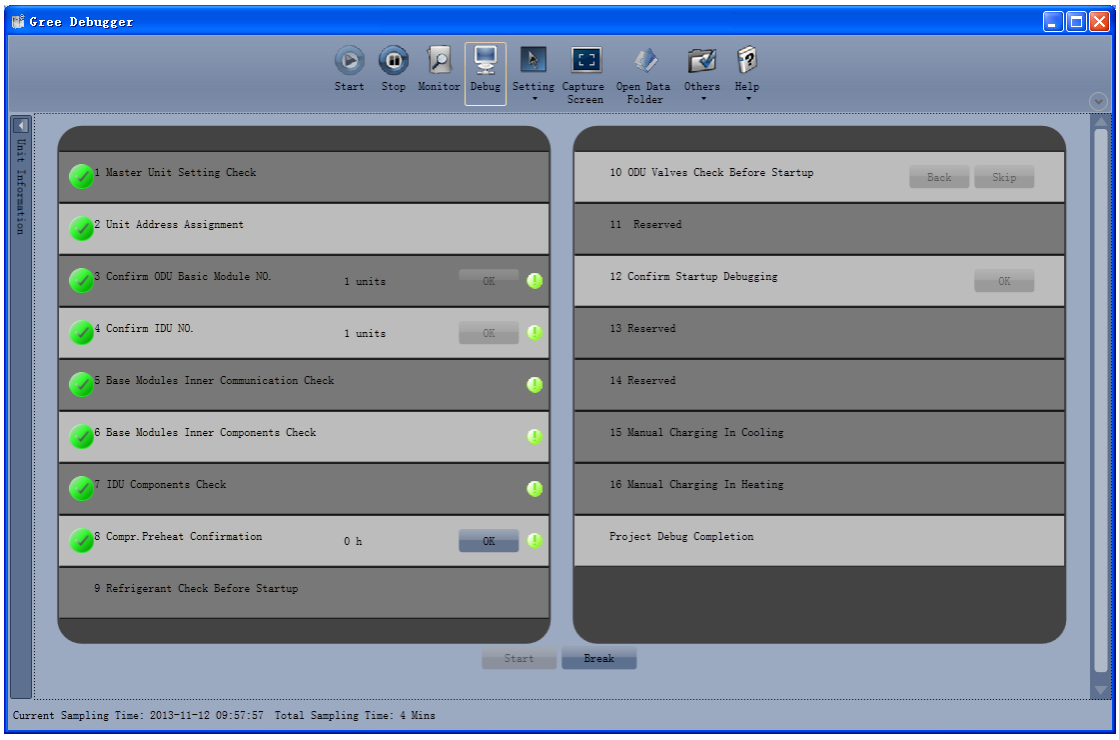


(2) Click “Start” to enable the debugging function. Then debugging will be started up automatically.  indicates that debugging is in progress while  indicates debugging is completed.

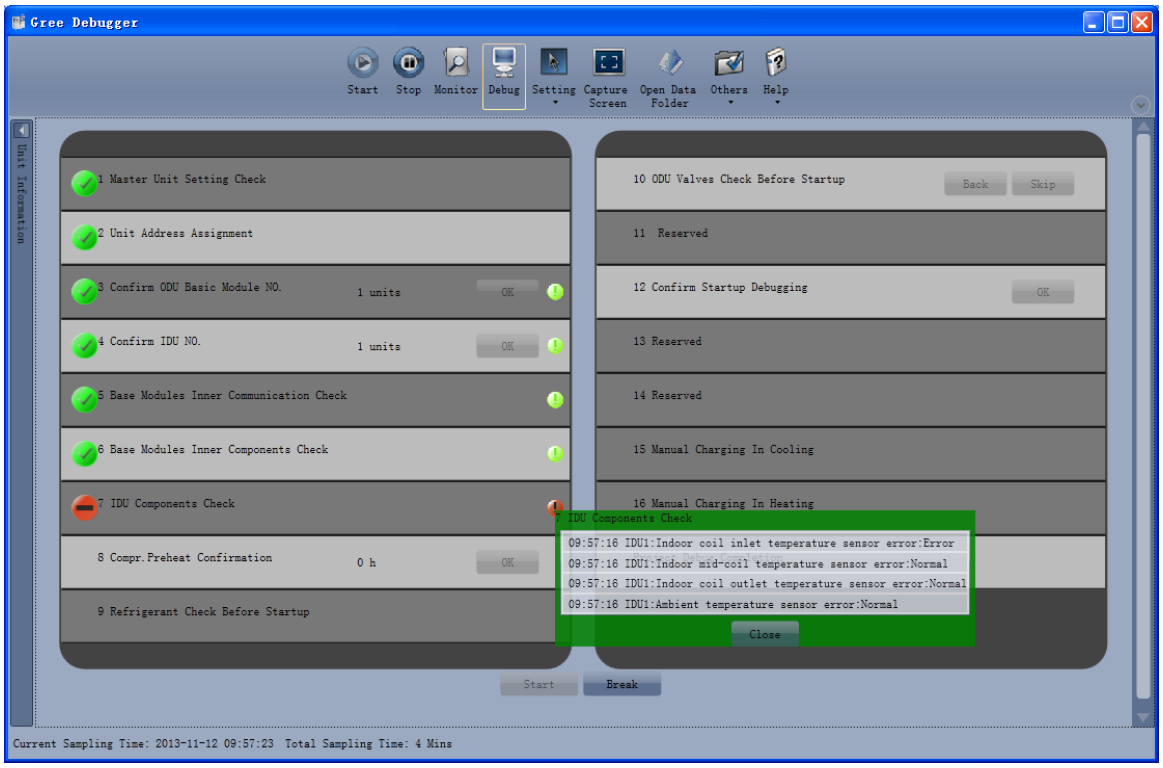


(3) If “OK” button is displayed, it means user needs to judge whether to continue debugging or not. Click icon and relevant information will be shown for your reference. Click “Close” to close the pop-up (For No.3 Confirm ODU Basic Module NO. and No.4 Confirm IDU NO., the current number of units under debugging will be displayed. See the following marked with circle. For No.8 Compr. Preheat Confirmation, the preheat time will be displayed. See the following marked with circle).

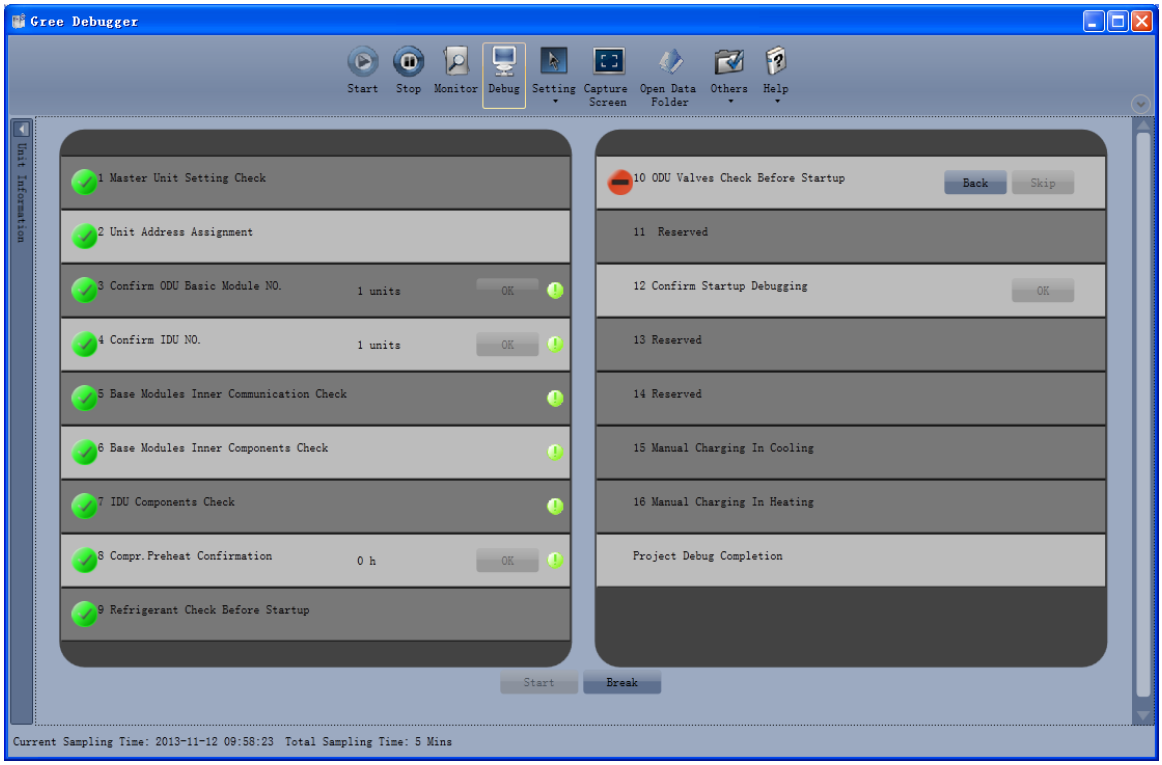


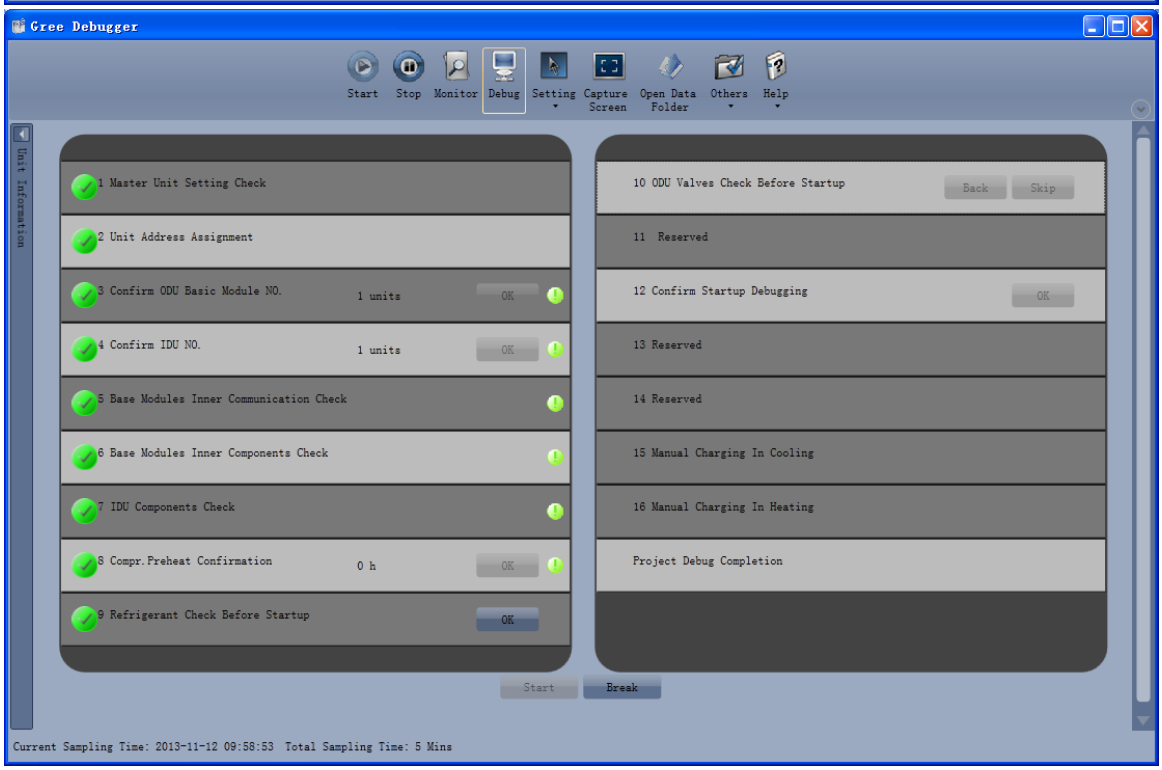


(4) Icon  indicates that there is problem found during debugging. Debugging will not be completed unless problem is solved (after problem is solved, step without “OK” button will switch to the next step automatically, otherwise user needs to click “OK” to continue). Click icon  and relevant information detected in this step will be displayed for your reference in order to solve problems. Click “Close” to close the pop-up.

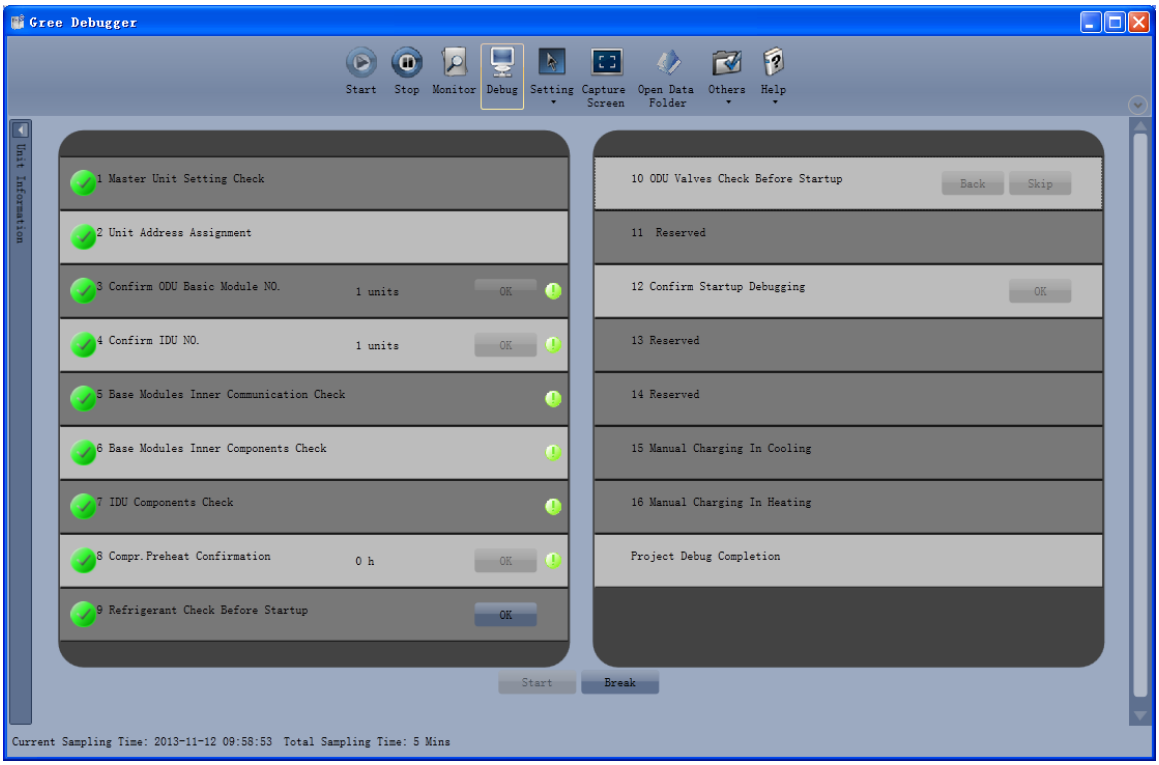


(5) During debugging, a click on “Break” can stop debugging. Click “Start” to resume debugging and then debugging will be finished step by step. For No.10 ODU Valves Check Before Startup, there are “Back” and “Skip” buttons. If there is error in this step, you can back to step No.9 and click “OK” to restart debugging on step No.10. If the error in step No.10 is U6 error (valve error alarm), you can click “Skip”. In other cases, “Skip” button is null.


Gree Debugger
Start
Stop
Monitor
Debug
Setting
Capture Screen
Open Data Folder
Others
Help
Unit Information
1 Master Unit Setting Check
2 Unit Address Assignment
3 Confirm ODU Basic Module NO. 1 units OK
4 Confirm IDU NO. 1 units OK
5 Base Modules Inner Communication Check
6 Base Modules Inner Components Check
7 IDU Components Check
8 Compr.Preheat Confirmation 0 h OK
9 Refrigerant Check Before Startup
10 ODU Valves Check Before Startup Back Skip
11 Reserved
12 Confirm Startup Debugging OK
13 Reserved
14 Reserved
15 Manual Charging In Cooling
16 Manual Charging In Heating
Project Debug Completion
Start
Break
Current Sampling Time: 2013-11-12 09:58:23 Total Sampling Time: 5 Mins

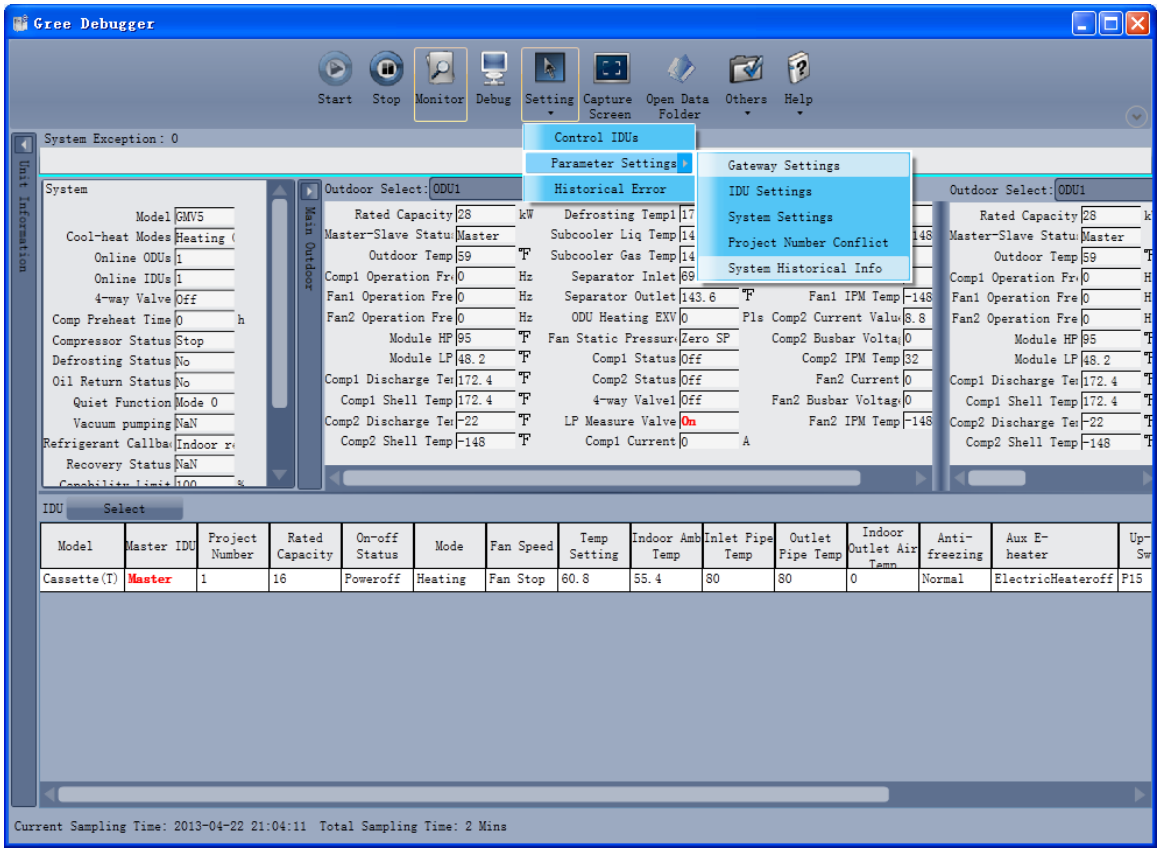

Gree Debugger
Start
Stop
Monitor
Debug
Setting
Capture Screen
Open Data Folder
Others
Help
Unit Information
1 Master Unit Setting Check
2 Unit Address Assignment
3 Confirm ODU Basic Module NO. 1 units OK
4 Confirm IDU NO. 1 units OK
5 Base Modules Inner Communication Check
6 Base Modules Inner Components Check
7 IDU Components Check
8 Compr.Preheat Confirmation 0 h OK
9 Refrigerant Check Before Startup OK
10 ODU Valves Check Before Startup Back Skip
11 Reserved
12 Confirm Startup Debugging OK
13 Reserved
14 Reserved
15 Manual Charging In Cooling
16 Manual Charging In Heating
Project Debug Completion
Start
Break
Current Sampling Time: 2013-11-12 09:58:53 Total Sampling Time: 5 Mins

(6) Step 11, 13 and 14 are reserved steps. And step 13, 14, 15 and 16 are steps in parallel (only one of the four will be selected according to actual needs).

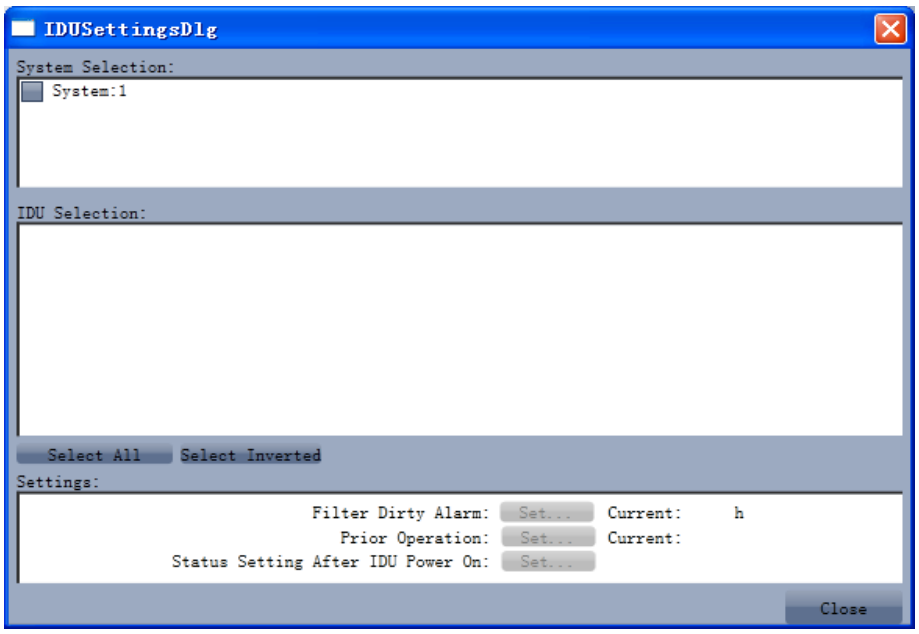


2.4.4 Control units

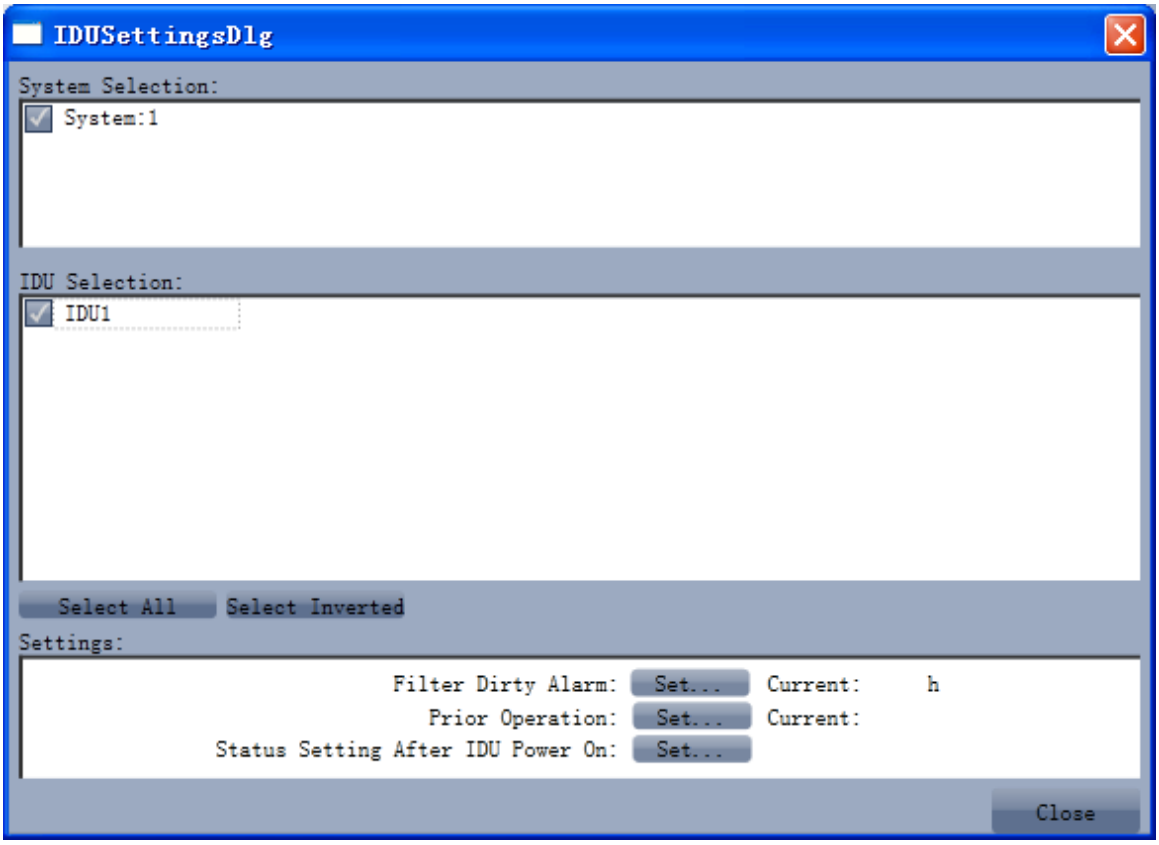
(1) Click icon of “Setting” on menu bar and select parameter settings, which include “Gateway Settings”, “IDU Settings”, “System Settings”, “Project Number Conflict (In case there is project number conflict in indoor units, other functions will be shielded. Then this parameter needs to be set in order to eliminate the conflict)” and “System Historical Info”. Click the corresponding set and adjust the parameters.

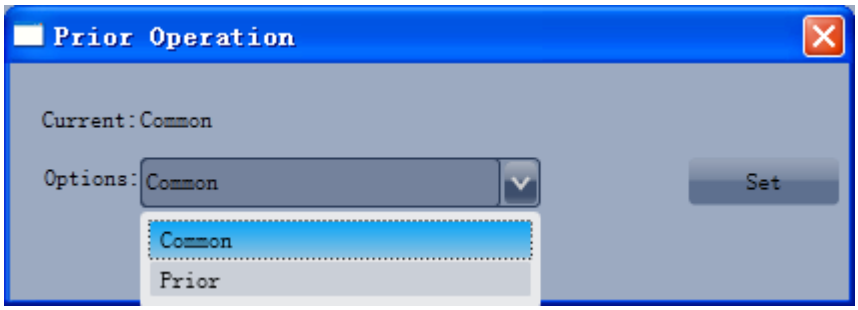


(2) Take indoor unit as an example. Click “IDU Settings” and a dialog box will pop up.



(3) Tick the indoor units that need setting in the IDU selection zone or you may click “Select All” to select all of them or “Select Inverted” to select none of them. After selection, the current values of the corresponding parameters will be displayed in the zone of settings. Click “Set” and then click  in the pop-up dialog box to select values. Click “Set” and then the corresponding order will be sent to units. If setting is successful, it will be displayed at the current values.

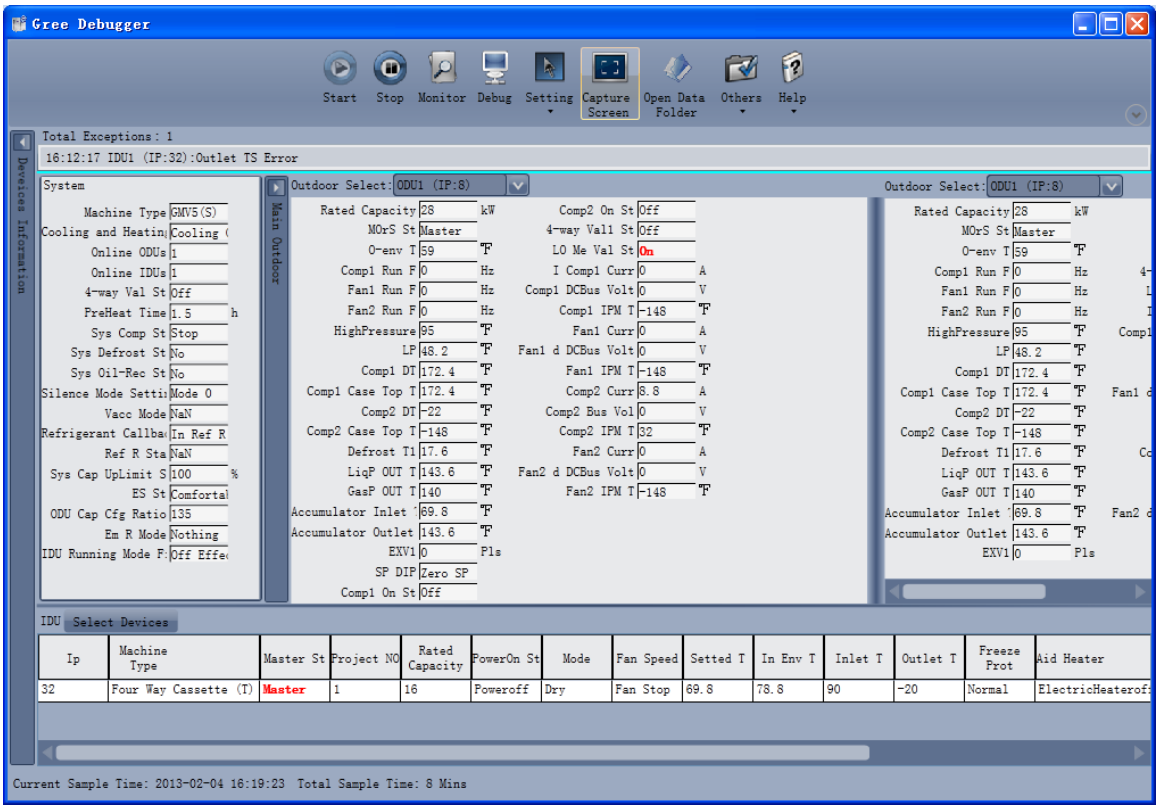


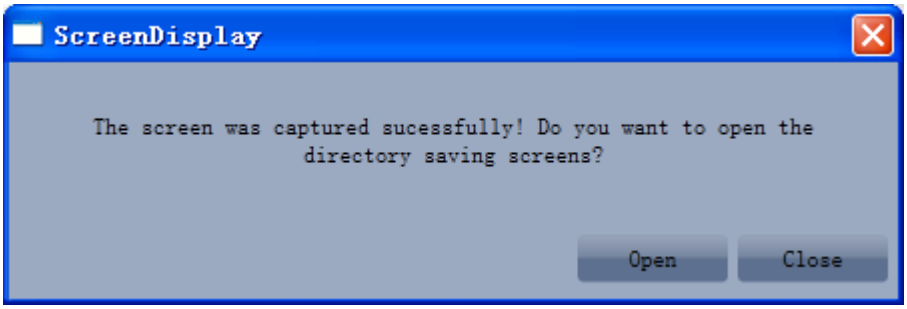


2.4.5 Other functions

(1) Capture screen

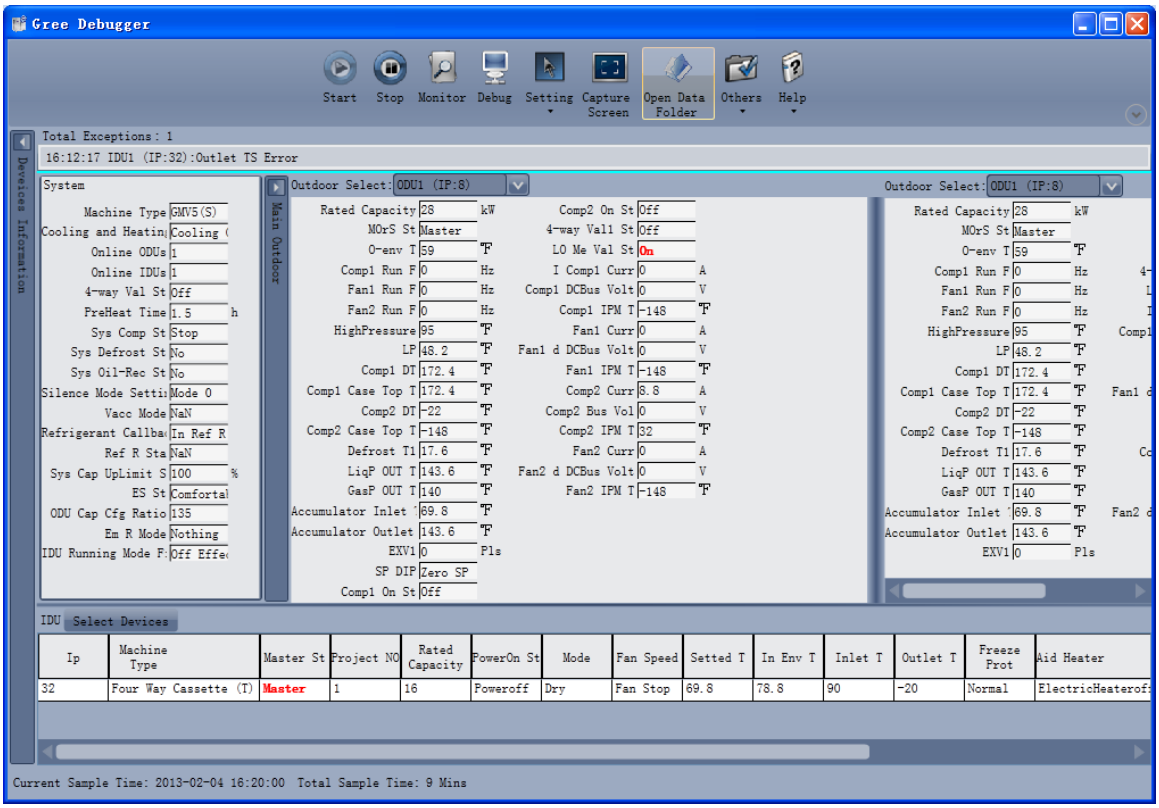
Click icon of “Capture Screen” to print the interface. If you want to open the interface, click “Open”.

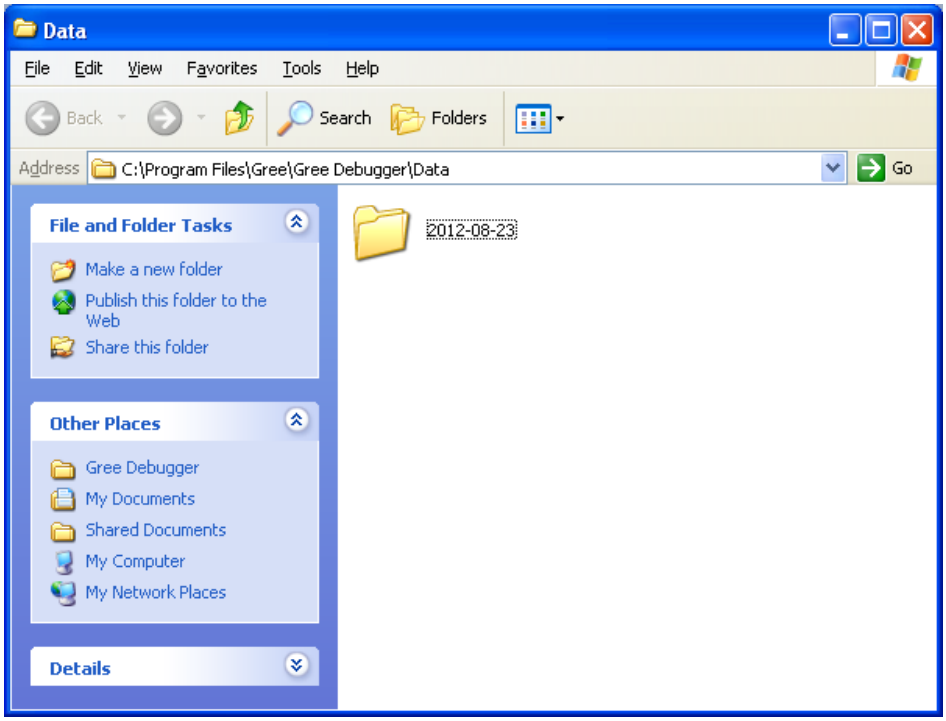




(2) Search for database folder

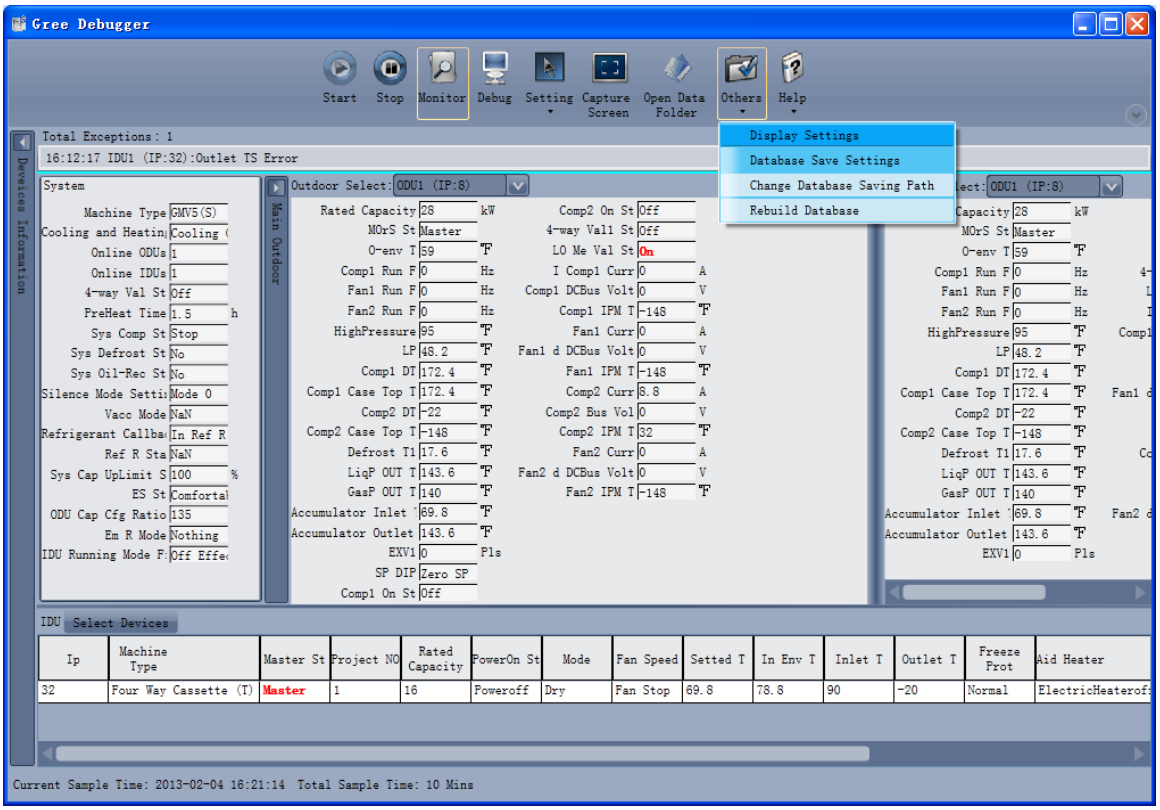
Click icon of “Open Data Folder” on the menu bar to open database folder.

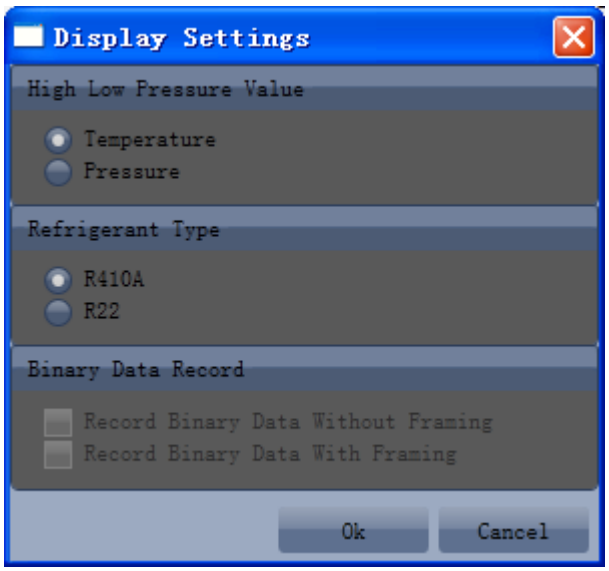

Gree Debugger
Start
Stop
Monitor
Debug
Setting
Capture Screen
Open Data Folder
Others
Help
Total Exceptions : 1
16:12:17 IDU1 (IP:32):Outlet TS Error
Devices Information
System
Machine Type GMV5(S)
Cooling and Heatin Cooling (
Online ODUs 1
Online IDUs 1
4-way Val St Off
PreHeat Time 1.5 h
Sys Comp St Stop
Sys Defrost St No
Sys Oil-Rec St No
Silence Mode Setti Mode 0
Vacc Mode NaN
Refrigerant Callba In Ref R
Ref R Sta NaN
Sys Cap UpLimit S 100 %
ES St Comfortal
ODU Cap Cfg Ratio 135
Em R Mode Nothing
IDU Running Mode F Off Effe
Main Outdoor
Outdoor Select: ODU1 (IP:8)
Rated Capacity 28 kW
MOrS St Master
O-env T 59 °F
Comp1 Run F 0 Hz
Fan1 Run F 0 Hz
Fan2 Run F 0 Hz
HighPressure 95 °F
LP 48.2 °F
Comp1 DT 172.4 °F
Comp1 Case Top T 172.4 °F
Comp2 DT -22 °F
Comp2 Case Top T -148 °F
Defrost T1 17.6 °F
LiqP OUT T 143.6 °F
GasP OUT T 140 °F
Accumulator Inlet T 69.8 °F
Accumulator Outlet 143.6 °F
EXV1 0 Pls
SP DIP Zero SP
Compl On St Off
Comp2 On St Off
4-way Val1 St Off
LO Me Val St On
I Comp1 Curr 0 A
Comp1 DCBus Volt 0 V
Comp1 IPM T -148 °F
Fan1 Curr 0 A
Fan1 d DCBus Volt 0 V
Fan1 IPM T -148 °F
Comp2 Curr 8.8 A
Comp2 Bus Vol 0 V
Comp2 IPM T 32 °F
Fan2 Curr 0 A
Fan2 d DCBus Volt 0 V
Fan2 IPM T -148 °F
IDU
Select Devices
Ip
Machine Type
Master St
Project NO
Rated Capacity
PowerOn St
Mode
Fan Speed
Setted T
In Env T
Inlet T
Outlet T
Freeze Prot
Aid Heater
32
Four Way Cassette (T)
Master
1
16
Poweroff
Dry
Fan Stop
69.8
78.8
90
-20
Normal
ElectricHeateroff
Current Sample Time: 2013-02-04 16:20:00 Total Sample Time: 9 Mins


Data
File Edit View Favorites Tools Help
Back
Search
Folders
Address C:\Program Files\Gree\Gree Debugger\Data
Go
File and Folder Tasks
Make a new folder
Publish this folder to the Web
Share this folder
Other Places
Gree Debugger
My Documents
Shared Documents
My Computer
My Network Places
Details
2012-08-23

(3) Conversion of pressure value

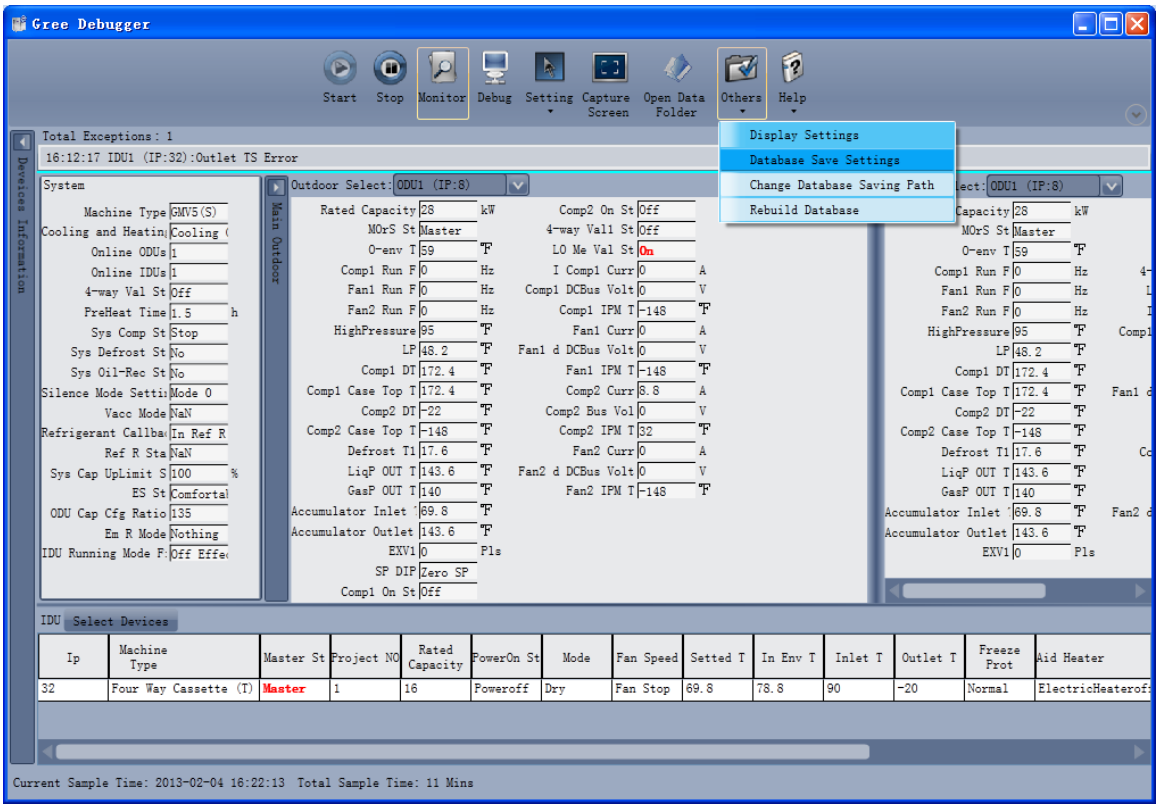
Click icon of “Others” on the menu bar and then click “Display Settings” to select “High Low Pressure Value” and “Refrigerant Type”. Select “Temperature” and the pressure parameter displayed on the interface will be temperature. Select “Pressure” and the pressure parameter displayed on the pressure interface will be pressure. Refrigerant type will affect the pressure parameter displayed on the interface.

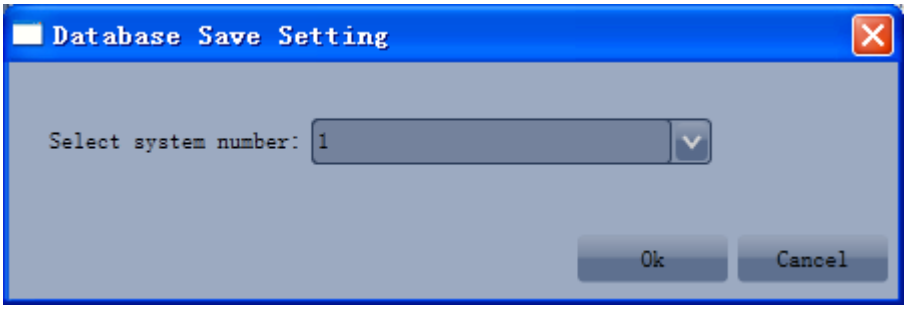




(4) Database saving of multiple systems

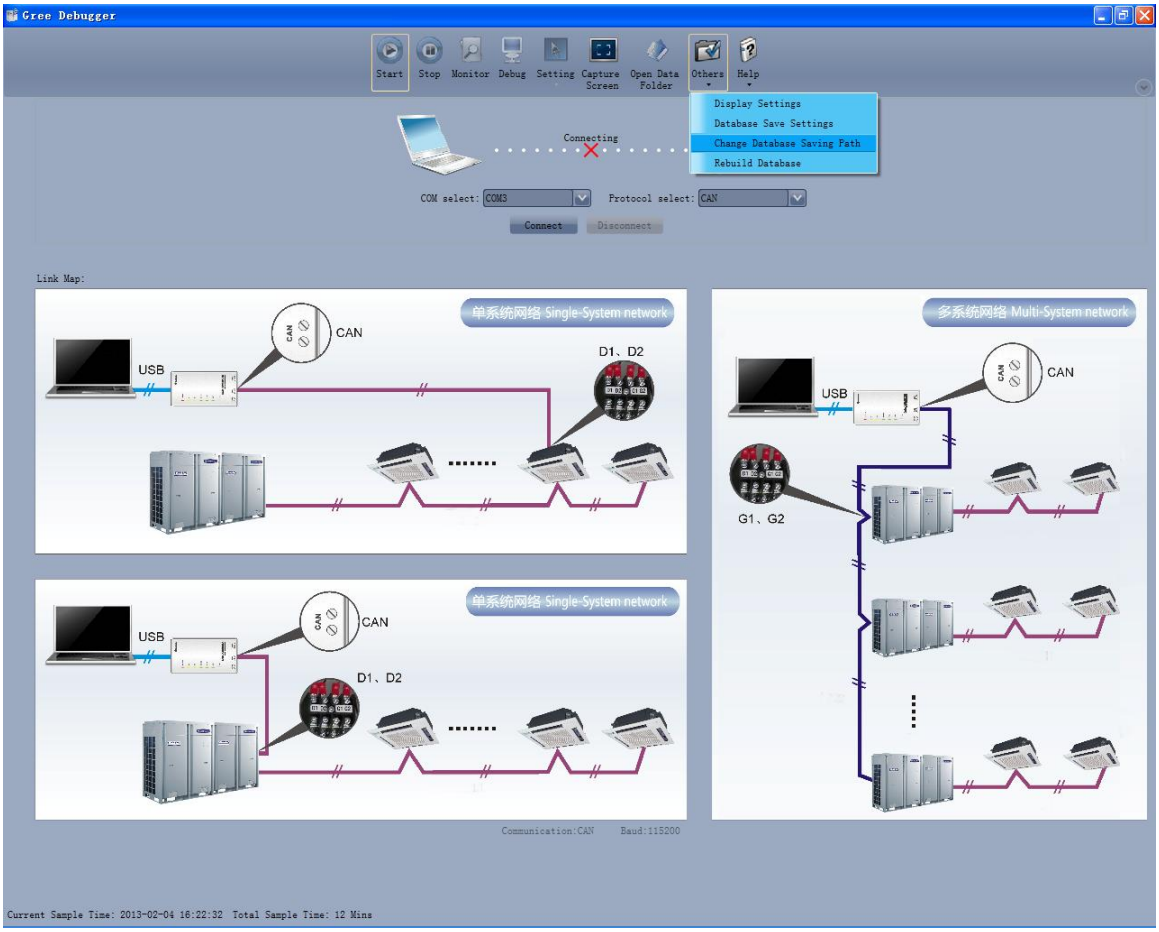
Click icon of “Others” on the menu bar and click “Database Save Settings” to select which system that needs to save database. Because there is a large quantity of data in a network that contains multiple systems, data of only one system can be saved.

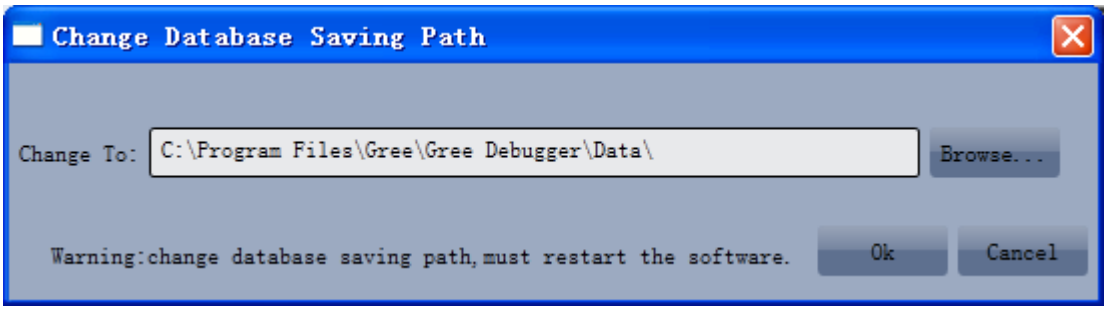


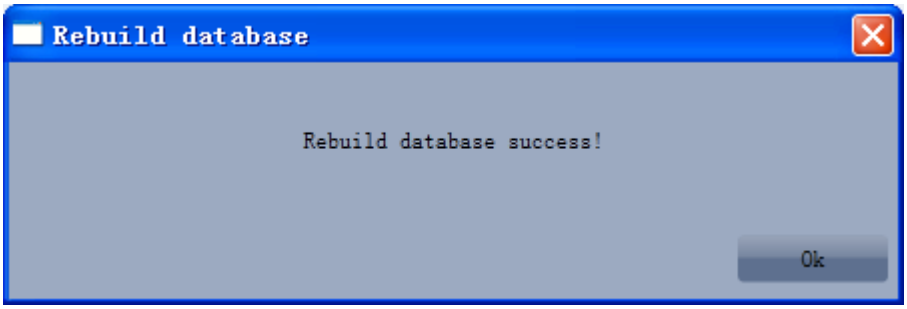


(5) Change database saving path and rebuild database

Change of database saving path and rebuilding of database should be set before the software starts monitoring (see below interface). Click “Change database saving path” and click “Browse” to change the saving path. Click “Rebuild Database” to rebuild the database folder. You can also stop monitoring and turn back to the connection interface to change saving path or rebuild database during monitoring.


Gree Debugger
Start
Stop
Monitor
Debug
Setting
Capture Screen
Open Data Folder
Others
Help
Display Settings
Database Save Settings
Change Database Saving Path
Rebuild Database
Connecting
COM select: COM3
Protocol select: CAN
Connect
Disconnect
Link Map:
单系统网络 Single-System network
USB
CAN
D1、D2
多系统网络 Multi-System network
G1、G2
Communication:CAN
Baud:115200
Current Sample Time: 2013-02-04 16:22:32 Total Sample Time: 12 Mins


Change Database Saving Path
Change To:
C:\Program Files\Gree\Gree Debugger\Data\
Browse...
Warning:change database saving path, must restart the software.
Ok
Cancel


Rebuild database
Rebuild database success!
Ok

INSTALLATION

1 Preparation before installation

1.1 Installation notice

1.1.1Safety requirement for project installation and construction

 Personnel and property safety are highly concerned during the entire installation process. Installation implementation must abide by relevant national safety regulations to ensure personnel and property safety.

 All personnel involved in the installation must attend safety education courses and pass corresponding safety examinations before installation. Only qualified personnel can attend the installation. Relevant personnel must be held responsible for any violation of the regulation.

1.1.2 Importance of project installation

Refrigeration system of air conditioner is evaporated directly. High level of pipe cleanness and dryness is required in the system. Since various pipes need to be prepared and laid out onsite, carelessness or maloperation during installation may leave impurities, water, or dust inside refrigerant pipes. If the design fails to meet the requirement, various problems may occur in the system or even lead to system breakdown.

Problems that usually occur during installation are as follows:

No.	Installation Problem	Possible Consequence
1	Dust or impurities enter into the refrigeration system.	Pipes are more likely to be blocked; air conditioning performance is reduced; compressor wear is increased or even hinder the normal operation of the system and burn the compressor.
2	Nitrogen is not filled into the refrigerant pipe or insufficient nitrogen is filled before welding.	Pipes are more likely to be blocked; air conditioning performance is reduced; compressor wear is increased or even hinder the normal operation of the system and burn the compressor.
3	The vacuum degree in the refrigerant pipe is insufficient.	The refrigeration performance is reduced. The system fails to keep normal operation due to frequent protection measures. When the problem is getting serious, compressor and other major components can be damaged.
4	Water enters into the refrigeration pipe.	Copper plating may appear on the compressor and reduce the compressor efficiency with abnormal noise generated; failures may occur in the system due to ice plug.
5	The refrigerant pipe specifications do not meet the configuration requirements.	Smaller configuration specifications can increase the system pipe resistance and affect the cooling performance; larger configuration specifications are waste of materials and can also reduce the cooling performance.
6	Refrigerant pipe is blocked.	The cooling performance is reduced; in certain cases, it may cause long-term compressor operating under overheat conditions; the lubricating effect can be affected and the compressor may be burnt if impurities were mixed with the lubricating oil.
7	Refrigerant pipe exceeds the limit.	The loss in pipe is considerable and the unit energy efficiency decreases, which are harmful for long-term running of the system.
8	Incorrect amount of refrigerant is filled.	The system cannot correctly control the flow allocation; the compressor may be operating under over-heating environment or running in wet.
9	The refrigerant pipe leaks.	Insufficient refrigerant circulating in the system decreases the cooling performance of the air conditioner. Long-term operation under such circumstance may cause an overheating compressor or even damage the compressor.
10	Water drainage from the condensate water pipe is not smooth.	Residual water in IDUs can affect the normal operation of the system. The possible water leakage can damage the IDU's decoration.

No.	Installation Problem	Possible Consequence
11	The ratio of slop for condensate water pipe is insufficient or the condensate water pipe is incorrectly connected.	Reverse slop or inconsistent direction of slop can hinder the smooth drainage and cause leakage of the IDU.
12	Heat preservation for refrigerant pipe or condensate water does not meet the requirement	Condensation is likely to occur, which might damage indoor decoration; if it is serious, it might even cause over-heat operation of the system.
13	The ODU is improperly installed.	The ODU is difficult to be maintained; unit exhaust is not smooth, which reduces the heat exchanging performance or even prevent the system from normal operation; in addition, the cold and hot air for heat exchange and the noise may annoy people in surrounding areas.
14	Power cables are incorrectly provided.	Unit components may be damaged and potential safety hazard may occur.
15	Control communication cables are incorrectly provided or improperly connected.	The normal communication in the system fails or the control over IDUs and ODUs turn in a mess.
16	Control communication cables are not properly protected.	The communication cables are short-circuited or disconnected, and the unit cannot be started up due to communication failure.

Understand the special requirement (if any) for unit installation before implementation to ensure installation quality. Relevant installers must have corresponding engineering construction qualifications.

Special type operators involved in the engineering implementation, such as welders, electricians, and refrigeration mechanics must have relevant operating licenses and are accredited with vocational qualification certification.

1.1.3 Cooperation

Installation quality of air conditioning project relys on the cooperation of each link, such as architecture, structure, electric, water supply and drainage, fire control, decoration and so on. While arranging the pipeline, please avoid the auto spray header; the pipeline, electric, spotlight and decoration panel shall be allocated reasonably.

1.1.3.1 Requirment for civil engineering：

(1) Vertical pipe of air conditioner shall be laid inside the tube well and horizontal pipe shall be laid inside the ceiling;

(2) Please reserve installation base for ODU to avoid damaging roofing water-proof layer and heat preservation layer;

(3) Rreserve a hole or lay a casing pipe for the refrigerant pipes which are led through the wall, for the load-bearing girder, steel casing pipe shall be laid.

1.1.3.2 Cooperation requirement with decoration project：

(1) Installation project of air conditioner shall not destroy the load-bearing structure of architecture and decoration style;

(2) Please lay the air conditioner pipe along with the bottom of girder.

1.1.3.3 Cooperation requirement with electric：

After selecting capacity for air conditioner, please confirm with related personnel of electric design in time:

(1) If the electrical load design meet air conditioning requirements;

(2) If the power cord and air switch meet air conditioning requirements or related national safety regulations;

(3) If the quality of regional power supply (include electric wave and interference clutter) meet national standard.

In case any inconsistencies exist, please solve the problem with each other actively.

1.2 Selection of installation meterial

1.2.1 Notices for selection of installation meterial

(1) The material and device for the construction of air conditioning project shall have certification and test report.

(2) Products with fireproofing requirement shall have fire protection certification and meet national and related mandatory stipulations.

(3) If eco-friendly material is required by the user, all materials shall meet national environmental protection requirements and relative certification shall be provided.

1.2.2 Selection requirement of installation material

1.2.2.1 Copper pipe

(1) The tensile strength must be at least 240 kgf/mm².

(2) Specifications requirement:

R410A		
OD (mm/inch)	Wall Thickness (mm)	Model
9.52(3/8)	≥0.8	0
12.7(1/2)	≥0.8	0
19.05(3/4)	≥1.0	0
22.2(7/8)	≥1.0	0
25.4(1)	≥1.0	0

1.2.2.2 Slection of condensate water pipe

Pipes that can be used for air conditioner drainage include: water supplying UPVC pipe, PP-R pipe, PP-C pipe, and HDG steel pipe;

Requirements for specifications and wall thickness

(1) Water supplying UPVC pipe: Φ32mm×2mm，Φ40mm×2mm，Φ50mm×2.5mm;

(2) HDG steel pipe: Φ25mm×3.25mm，Φ32mm×3.25mm，Φ40mm×3.5mm，Φ50mm×3.5mm.

1.2.2.3 Insulation material

(1) Material: rubber and plastic foaming

(2) Specification and requirement

① Flame retardancy level: B1 or higher;

② Refractoriness: at least 120℃;

③ The insulation thickness of condensate water pipe: at least 10 mm;

④ When the diameter of copper pipe is equal to or greater than Φ15.9 mm, the thickness of insulation material should be at least 20 mm; when the diameter of copper pipe is less than 15.9 mm, the thickness of insulation material should be at least 15 mm.

1.2.2.4 Communication cord

Note: For air conditioning units installed in places with strong electromagnetic interference, shielded twisted pairs must be used as the communication cord between the IDU and ODU.

Communication cord selection for ODU and IDUs

Wire Type	Length of Communication Cord Between IDU and ODU: L(m)	Number of Wire Pieces x Wire Diameter (mm^2)
Common sheath twisted pair copper core (RVV)	L≤1,000	≥2×0.75

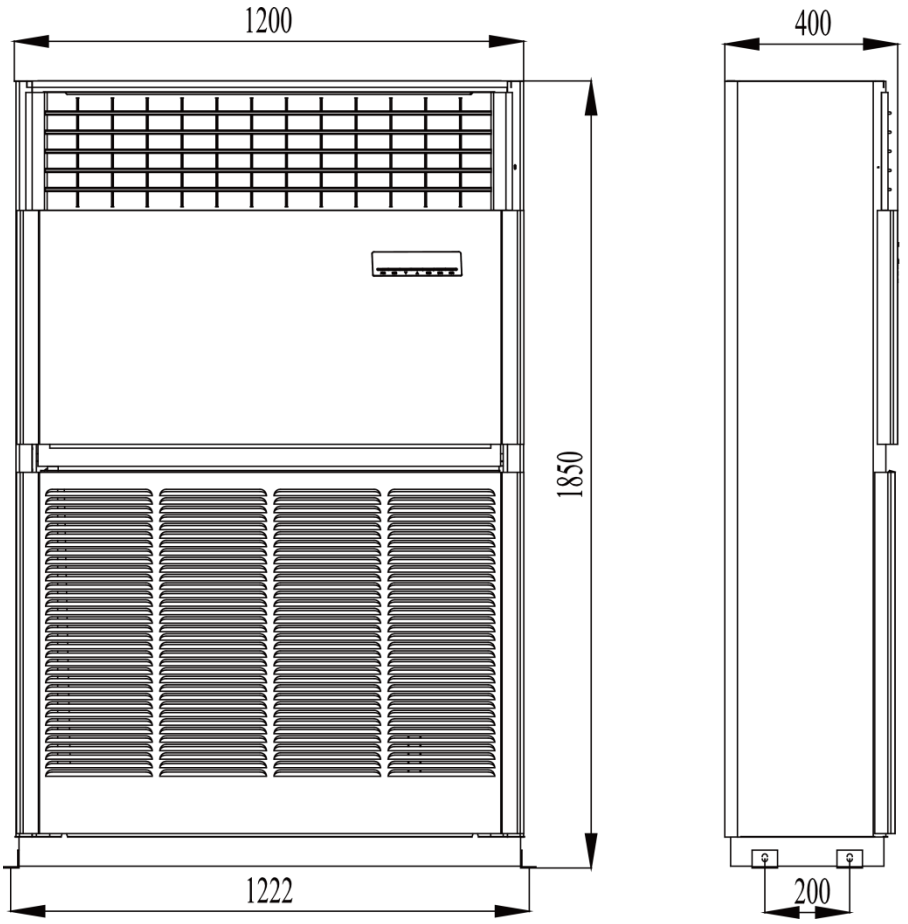
1.2.2.5 Power cord

Only copper conductors can be used as power cords. The copper conductors must meet relevant national standard and satisfy the carrying capacity of unit.

2 Installation of Indoor Unit

2.1 Outline and installation dimension

Unit: mm



2.2 Selection of installation location

(1) Avoid direct sunshine.

(2) Don’t install it in places with corrosive gas and severe dust, salt mist, lampblack, or wet locations.

(3) Don’t install it in places with inflammable and explosive products or with leaked, explosive or inflammable gases.

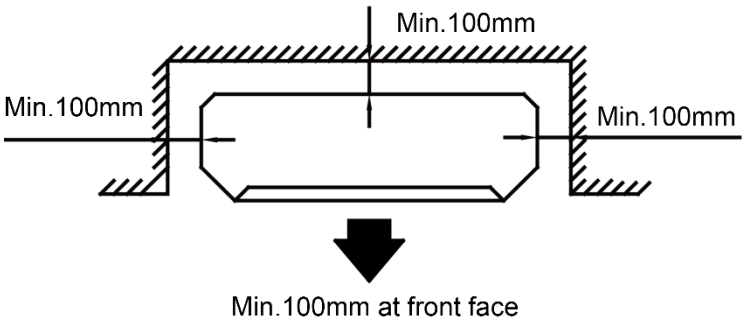
(4) Connection pipe of IDU and ODU shall be drained to outdoor easily.

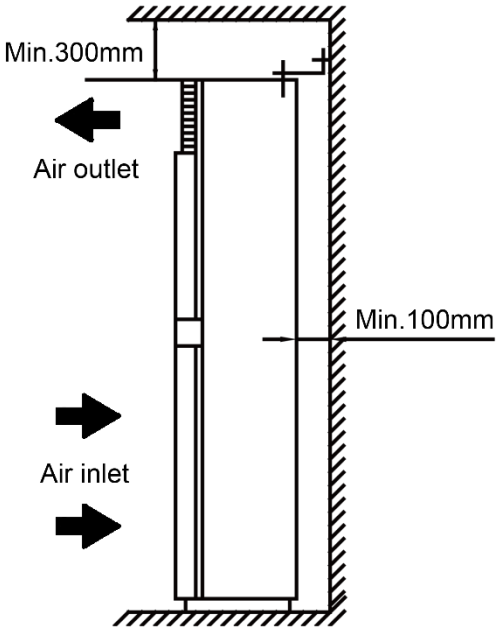
(5) Don’t connect drain pipe with the ground sewage pipeline in kitchen or in the wash room to avoid the pecular smell entering IDU.

(6) The unit shall be installed in flat cement foundation, with iron platform and rubber plate of the thickness of 15mm.

(7) Ensure a horizontal surface for the ground. After installation, the inclination degree shall be ≤0.7º along with the length direction and ≤0.5º along with the width direction.

2.3 Installation space requirement

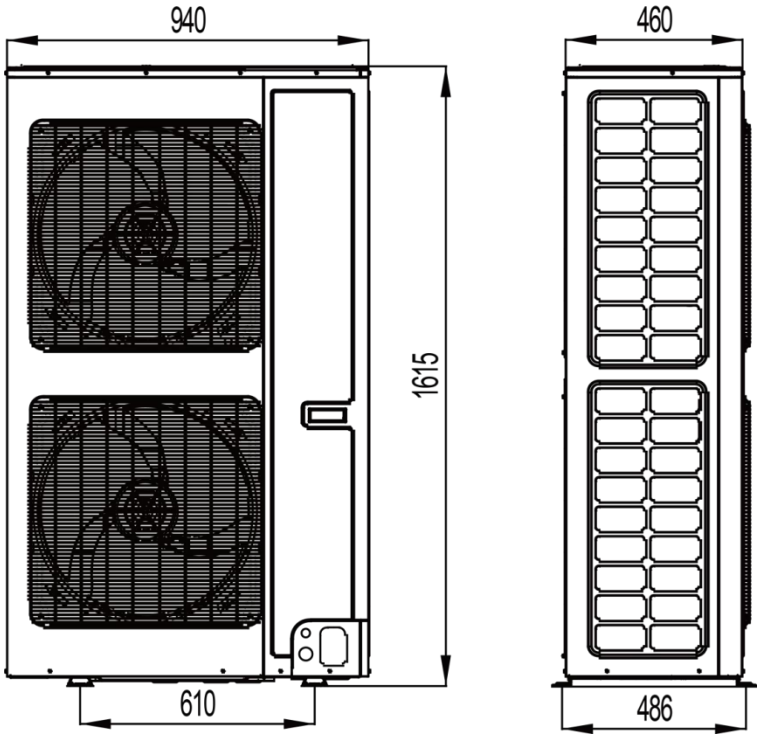




3 Installation of Outdoor Unit

3.1 Outline dimension and position of installation hole

Unit: mm



3.2 Installation location for ODU

(1) ODU must be installed in stable and firm supporting panel of architecture.

(2) ODU and IDU shall be close as much as possible, try to decrease the length of refrigerant pipe and quantity of bends.

(3) Try to avoid placing ODU under the window or among buildings, for fear that noise will come inside.

(4) Select locations without direct sunshine, rain or direct heat source of radiation, effective sunshade plate or rain/snow-proof shed shall be installed in locations with direct sunshile or rain.

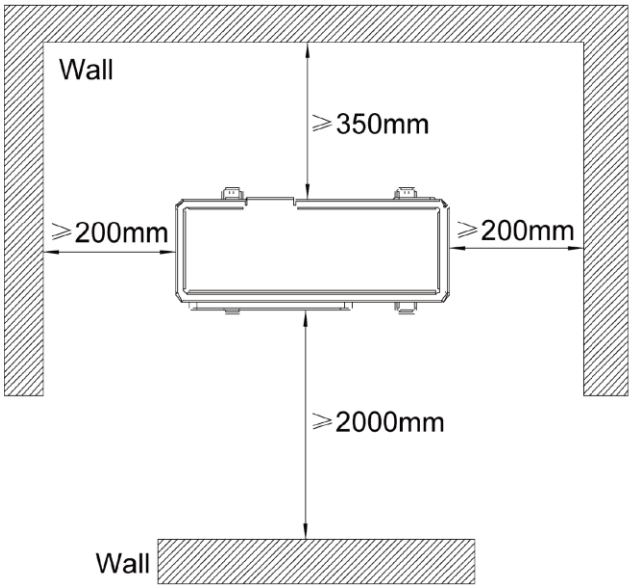
(5) Airflow in air inlet/outlet shall have no impediment.

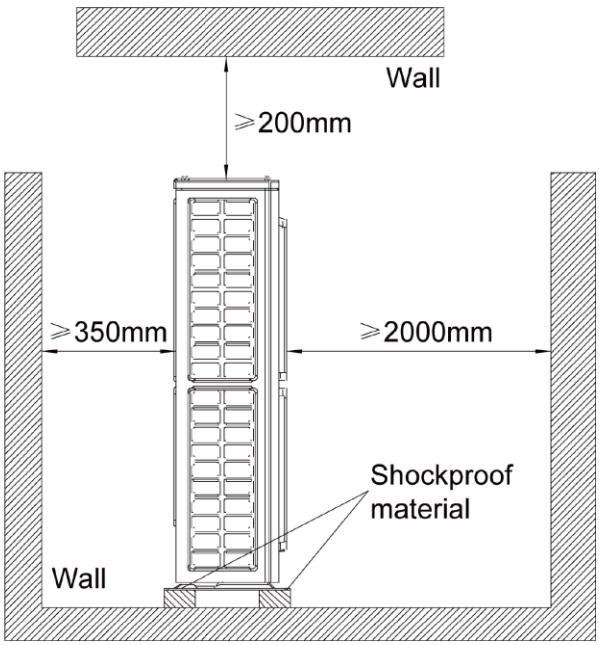
(6) Select locations with well ventilation so that the unit can absorbe and discharge enough non-recycled air.

(7) Don't install in locations with flammable and explosive objects, or polluted locations with serious dust and salt mist.

(8) Don't install induced air duct in air inlet/outlet of ODU. During heating, the condensate water will flow downward from the bottom shelf of ODU, when outdoor temperature is lower than 0℃（32℉）, the condensate water will freeze. While setting rain-proof shed for ODU, don't affect heat dissipation effect.

3.3 Installation space requirement





3.4 Installation base of ODU

Concrete base in the installation location of ODU shall have enough strength; meanwhile, drainage shall be smooth and not affect drainage on the ground or in downstair.

Method of concrete base：

(9) The concrete base shall have enough rigidity and strength to bear the operation weight, and the surface shall be flat. Height of the base is 200～300mm, please leave proper size for subsequent maintenance according to unit size;

(10) Concrete proportion: cemet:sand:stone=1:2:4, and 10 reinforced steel of φ10mm shall be placed in an interval of 30mm;

(11) Cover the base surface with mortar and make chamfer on the edge;

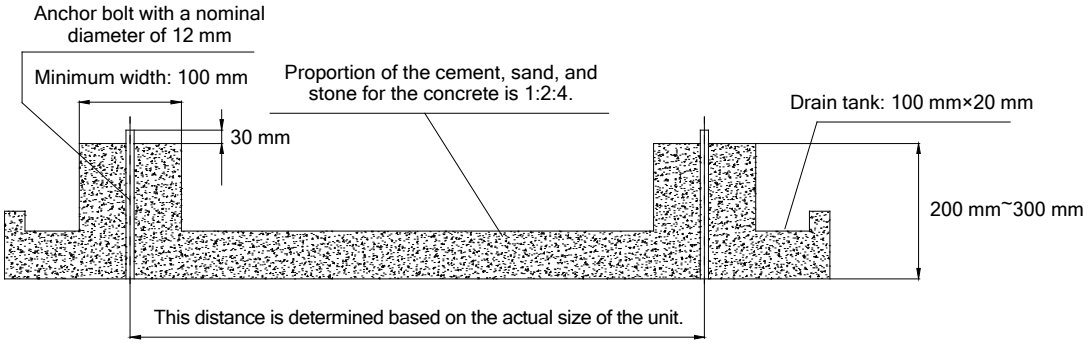
(12) If the base is on the floor of concrete, gravel is needless, but burr treatment shall be conducted on the base surface;

(13) The greasy dirt, gravel and ponding in the reserved anchor foot shal be cleared away, before installing the bolt, please add a temporary cover plate protection;

(14) Drainage ditch shall be made around the base so as to discharge the condensate water in equipment installation location;

(15) Before installing air conditioner on the roofing, please check the strength of the building and take waterproof measures;

(16) If adopting channel steel base, the design structure shall have enough rigidity and strength.



Cement foundation diagram

3.5 Antivibration requirement for ODU

ODU installation shall adopt rubber shock absorption pad or spring shock absorber to meet the vibration requirement of noise machine.

4 Pipeline design of refrigerant

4.1 Notices for pipeline design

Pipeline length and vertical fall shall within the required range, and the pipeline length and fall shall be as short as possible; when vertical fall of pipeline is too big, please set oil return loop as required;

The pipeline shall not go through the load bearing wall/beam of building;

4.2 Allowable length and fall for refrigerant pipe in IDU and ODU

Model	Pipe dimension (mm)		Max pipe length (m)	Max height difference between indoor unit and outdoor unit (m)
	Gas pipe	Liquid pipe		
RF28WPd/Na-M	Φ9.52	Φ22.2	70	30
LF28WPd/Na-M	Φ9.52	Φ22.2	70	30
RF28WPd/Na-H	Φ9.52	Φ22.2	70	30

4.3 Design of oil loop

4.3.1 Purpose of setting oil loop

If big fall exist in the pipe, in order to prevent the problem that the refrigeration oil can't return to the compressor effectively, oil loop must be set in the vertical pipeline.

4.3.2 Principle of setting oil loop

When there's a difference between IDU and ODU, for the vertical gas pipe, an oil loop shall be installed every 10m from the bottom up.

Oil loop shall adopt two U-shaped loops or one O-shaped loop, the height is 3～5 times the size of pipe diameter.

4.3.3 Installation notices for oil loop

For the vertical gas pipe, an oil loop shall be installed every 10m from the bottom up, meanwhile, the lowest/highest point of the vertical pipe shall be set with oil loop and check loop.

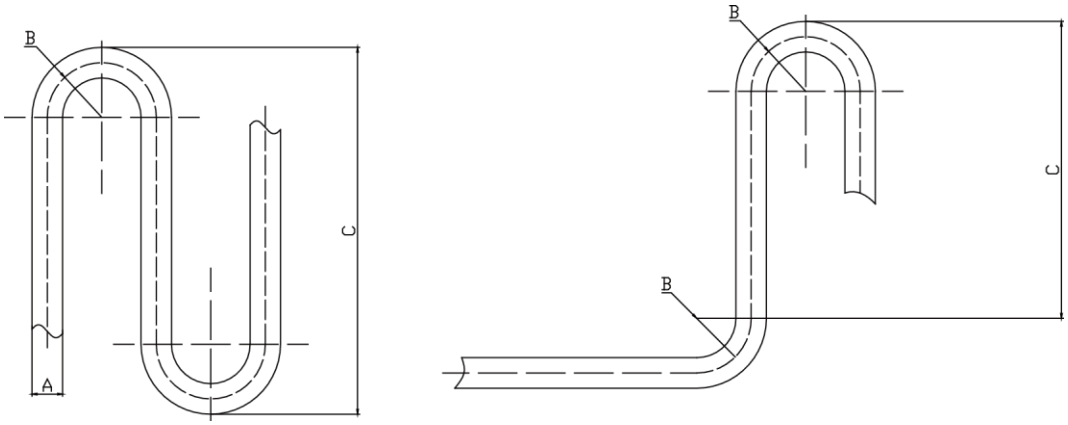
4.3.4 Manufacture requirement for oil loop and check loop

Setting and manufacture method of oil loop is as follows：

(1) Set the oil loop as U-shape or O-shape；

(2) If ODU is below IDU, it's needless to set oil loop at the lowest/highest point of the vertical pipe; if ODU is above IDU, then oil loop and check loop must be set separately at the lowest/highest point;

(3) Manufacture size of oil loop is as follows：



A(mm)	B(mm)	C(mm)
19	≥34	≤105
22	≥34	≤150
28	≥45	≤150
35	≥60	≤250
42	≥80	≤450

5 Pipeline installation and heat preservation

5.1 Pipeline installation of refrigeration system

5.1.1 Processing of refrigerant piping

5.1.1.1 Cut the copper pipe

(1) Use special pipe cutter which fits the copper pipe size (large, medium and small) to cut it along the axis direction.

(2) During operation, step up and rotate the pipe cutter slowly, cut the copper pipe if it is not deformed. In case the pipe end is deformed obviously, please cut it off and throw it away to conduct re-processing.

(3) No saw or grinding machine shall be used because the copper scrap will be left internally. The whole work might be discarded as useless even for one-time usage. It's better that every operating personnel on site shall have a pipe cutter, at least a big pipe cutter shall be equipped at each site.

(4) It's forbidden to put the copper pipe on the ground for operation directly, in such case, water and rubbish might enter inside.

(5) Remove the burr on the cutting surface, and the cutting surface of copper pipe might generate rough selvedge, which must be removed, meanwhile, clean the sundries inside the pipe and renovate the pipe end, remove the inside burr with scraper. Please make the pipe end downward to prevent the copper scrap dropping inside the pipe.

(6) Polish the cutting surface, place the notch of copper pipe downward and polish it.

(7) Clean the inside surface of copper pipe

(8) Wash with silk cloth——suitable for the straight pipe

① Prepare a clean silk cloth, wind it in round shape on the thin steel wire, diameter of the cloth round shall be slightly higher than that of cooper pipe;

② Drip some trichloroethylene on the silk cloth, enter from one side of the copper pipe and pull it out from the other side;

③ Clean the silk cloth with trichloroethylene for every pull to wash the dust and impurities on it.

④ Clean it repeatedly until no dust or impurities inside the pipe.

(9) Blow wash——suitable for coil

(10) Blow the dust and impurities inside the pipe with nitrogen.

Warning! After cleaning, remember to seld the pipe end of copper pipe with seal cap or tape in time.

5.1.1.2 Elbow

(11) Processing requirement：

The bending radius of the pipeline shall be over 3.5D, the proportion of short diameter of deformed pipeline and the original diameter shall be over 2/3.

(12) Processing method：

① Manual elbow——suitable for thin copper pipe （Φ6.35mm~Φ12.7mm）

② Mechanical elbow——suitable range （Φ6.35mm~Φ54.1mm）

Notices：

① The inner side of bending location of copper pipe shall not be wrinkled or deformed;

② The welding connector of pipeline shall not be placed in bending location, the distance between the welding joint and pipeline/bending component of pipe fitting shall be less than 100mm.

③ Elbow angle shall not exceed 90º, othersiwe, crinkle will occur inside the copper pipe and leakage is likely to happen.

5.1.1.3 Processing of expansion pipe

Expansion pipe is a processing method for the pipeline to connect the welding point; the following problems shall be paid attention to:

(1) Add proper lubricating oil on the surface of the expansion pipe (the lubricating oil must meet the corresponding requirement for refrigerant)

(2) The length of expansion pipe shall accord with the inserted depth of pipe diameter；

(3) To avoid straight line trace in expansion pipe, which might lead to leakage, during operation, please rotate the copper pipe to another angle for rectification.

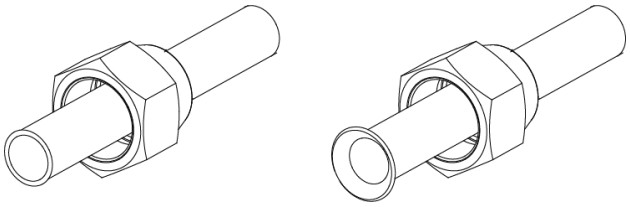
(4) When the pipe is expanding, don’t exert too much force to avoid crackle.

5.1.1.4 Processing of flaring

The other pipeline connection method is to connect with bellmouth. Before connecting with bellmouth, expand the mouth of the pipeline for processing.

(1) Cover the nut of flaring on the copper pipe;

(2) Place the copper pipe to the root of the expander and expand the mouth;



(3) When expanding the mouth, smear engine oil which meets the requirement of corresponding refrigerant system on the surface of the flaring, so that the nut can pass through smoothly, thus preventing tortuosity;

(4) After expanding the mouth of copper pipe, keep it concentric, the end face of the flaring shall be smooth, no defects like burr or crackle;

(5) Minor burr on the mouth of the pipe can be removed by file.

5.1.2 Installation of refrigerant piping

5.1.2.1 Installation sequence of piping

General installation sequence of refrigerant pipeline is as follows：

Manufacture and installation of support and hanging bracket---piping according to drawing---pipeline cleaning---cover with heat preservation sleeve---fixing---blow the dirt in pipeline system---air impermeability test---heat preservation.

5.1.2.2 Construction of metal embedded part

(1) Construction of the support and hanging bracket of pipeline: reasonable type and be firm, no dirt on the surface, no paint or coating in the embedded wall or floor slab and no greasy dirt. Keep it straight and don't incline it.

(2) Construction of fixed bolt： ensure enough strength based on the requirements. The exposed part of embedded part shall conduct anticorrosion treatment. Besides, if required, water proof treatment is needed;

(3) Construction of steel sleeve: equip a steel sleeve for the pipe which are led through the wall or floor slab. Don’t place the weld joint of pipeline inside the sleeve. Align the steel sleeve with the wall/floor slab bottom, which shall be 20mm over the bottom. Diameter of steel sleeve shall consider the thickness of

heat preservation layer and the gradient of condensate water pipe. Fill the gap between the pipe and the sleeve with flexible and non-flammable materials. The sleeve cannot be used as a support point of the pipe.

(4) Operation sequence

(5) Embedded metal; mark a label; install the metal embedded part

(6) Mark a label on the floor, then project it to the roof, which is efficient and correct.

(7) Install the metal embedded part firstly, select according to local specification.

(8) Install expansion bolt later, any occasions that can't utilize metal embedded part due to design change, expansion bolt can be used.

5.1.2.3 Molding and fixing of piping

(1) When installing the refrigerant piping, please make sure the arrangement is the shortest. Try to avoid any corners. Put it right after installation. Other operations like heat preservation, can not affect pipeline location and elevation. When piping is completed, no bending or crinkle shall be occurred.

(2) When fixing the piping, steel angle support, bracket or round bar steel, U-shape pipe clamp or flat steel shall be fixed outside the heat preservation layer; in principle, don't compress the heat preservation material to ensure its effect.

(3) The maximum interval among the support and hanging bracket of refrigerant pipeline is as follows:

(mm)External diameter of copper pipe	φ≤15.9	25.4＞φ≥19.05
(mm)Interval of horizontal pipe	1,000	1,500
(mm)Interval of vertical pipe	1,500	2,000

(4) The distance of 300mm between both ends of the pipeline of TTW or beam shall be fixed with support and hanging bracket.

(5) During installation, the distance between all refrigerant pipeline and electrical box shall be over 500mm to ensure enough maintenance space. For spaces with special limitation, final piping method shall be approved by the technician.

5.1.2.4 Copper pipe through the wall

(1) Seal the port before the pipeline passes through the wall to avoid any impurities from entering.

(2) The hole on the external wall which the pipeline passes through must be sealed, and tilted downward and outward, no rainwater inside.

(3) Protective sleeve shall be set on the wall which the pipeline passes through or on the floor slab, the length of through-wall sleeve shall be the same with the wall, and align the sleeve of floor slab with the bottom of floor slab, the top surface shall be over 20mm, when it is placed in wash room, it shall be 50mm higher than the floor; besides, the gap between pipeline and sleeve shall be stuffed with heat insulation or other nonflammable materials.

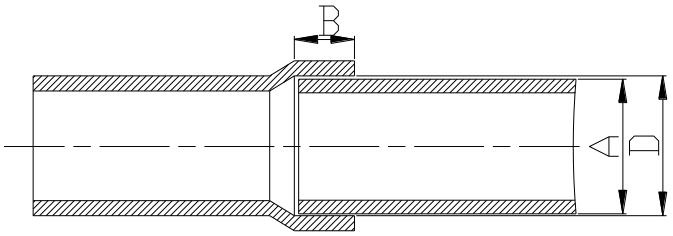
(4) Sleeve shall not be the support of pipeline.

(5) The weld joint of pipeline and nut of flaring shall not be placed inside the through-wall sleeve.

5.1.2.5 Connection of pipeline

(6) Socket Welding

The gap between socket components should be proper to ensure that the connection will not loose from the friction surface. The flaring direction of the socket component must face towards the direction of medium flow .During pipe connect, protect the braze welding part according the length specified below:



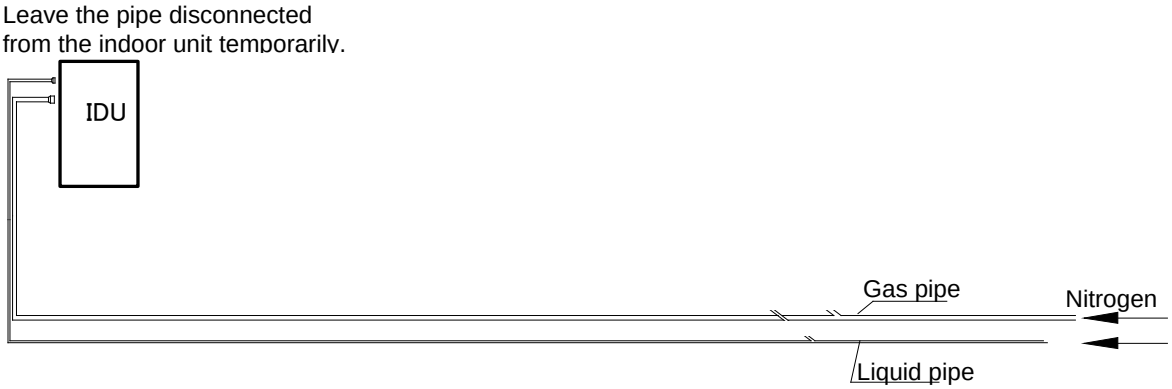
A: External Diameter of the Pipe (mm)	B: Minimum Insertion Depth (mm)	D-A: Gap between Pipes (mm)
φ9.52	8	0.05～0.27
φ12.7	8	
φ15.9	8	
φ19.05	10	
φ22.2	12	
φ25.4	12	

(7) Bell Socket Welding

The bell socket welding is another form of socket welding. It uses the sleeve or pipe in a larger size for welding. The insertion depth cannot be smaller than that required by socket welding.

5.1.2.6 Pipe Cleaning

When installing refrigerant pipeline, don’t connect the pipeline with IDU first, welding can ba conducted after the following pipe cleaning is finished; Firstly, connect the pressure regulating valve of nitrogen gas cylinder to the liquid pipe of ODU pipeline system, then adjust the pressure of nitrogen to about 0.5MPa, charge gas inside to pipe for 1min, repeat this operation for three times till the dirt and water are discharged; after cleaning the liquid pipe, perform the same operation to clean the gas pipe.



Perform an air-tightness test and a vacuum test to the entire refrigerant pipe system after the construction is finished.

There must be a secure distance between pipes. Pipes in different types must be fixed separately.

5.1.3 Welding Protection

Aerate with nitrogen before and during welding and keep aerating for 30s after the welding is finished.

Equip a pressure regulator valve to the nitrogen cylinder.

The nitrogen flow is above 4-6 L/min (pressure of 0.02 to 0.05 MPa) and must be regulated based on the pipe caliber.

5.1.4 Vacuumization and Desiccation for the System

5.1.4.1 Requirements on the Vacuum Pump

(1) The vacuum pump for different refrigerant systems cannot be the same.

(2) The ultimate vacuum degree of the vacuum pump should reach -0.1 MPa.

(3) The air discharge capacity of the vacuum pump must be greater than 1～2 L/S.

(4) The precision of the vacuum pump must be greater than 0.02 mmHg.

5.1.4.2 Procedure and Precautions for Vacuumization and Desiccation

(1) Procedure

① Before vacuumization, ensure that the stop valves of the gas and liquid pipes are turned off.

② Use the perfusing duct to connect the regulator valve and vacuum pump to detection connectors of the gas pipe and liquid pipe.

③ Vacuumize for 30min and check whether the vacuum degree reaches -0.1 MPa or more. If not, leakage may exist. Perform leakage check again. If no leakage exists, continue to vacuumize for 30min.

④ If the vacuum degree cannot be kept after vacuumization is performed for twice, there may be water in the pipe when it is confirmed that no leakage exists. In this case, discharge water by means of vacuum breaking. Perfuse nitrogen at 0.05 MPa to the pipe. Vacuumize for 30min and keep vacuuming for 30min.

If the vacuum degree of -0.1 MPa cannot be reached, repeat this operation till water is discharged.

⑤ After vacuumization, turn off the regulator valve and keep for 30min. Ensure that the pressure of the regulator valve does not increase.

(2) Precautions:

① The gas pipe and liquid pipe must be vacuumized at the same time.

② Turn off the valve before powering off the vacuum pump.

③ Keep vacuuming for 0.5hours. The vacuum meets the requirement if the pressure displayed by the vacuum gauge does not increase.

5.2 Pipe Installation for the Condensate Water System

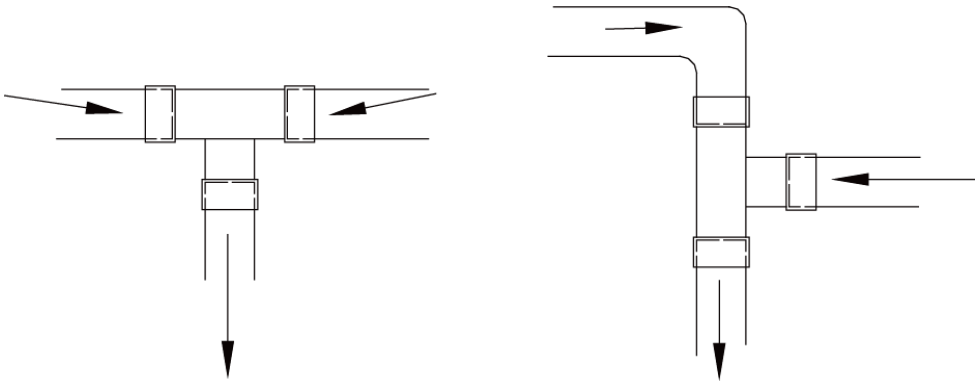
5.2.1 Pipes

Generally, U-PVC water supply pipes bonded with special glue are adopted as condensate water pipes. PP-R, PP-C, and hot galvanized steel pipes can also be adopted. Aluminium plastic compound pipes cannot be used.

5.2.2 Key points for pipe installation

(1) The inclination degree of the condensate water pipe must be above 1% and that of the main pipe cannot be lower than 0.3%. Adverse slopes are not allowed.

(2) When connecting three-way pipes, the two-way straight pipes must be laid on the same slope; both ends of the two-wa pipe shall not have two slopes, as shown in the following figures.



Incorrect connection Correct connection

(3) The condensate water pipe cannot be tied with the refrigerant pipe.

(4) A ventilation hole must be provided on the top of the drain pipe to ensure smoother discharge of condensate water.

(5) After pipes are connected, perform a test with some water and another test with full water in the pipe to

check whether drainage is smooth and whether water leakage exists in the pipe system.

(6) Equip a steel casing for all pipes which are led through the wall or floor. Pipe bonding joints cannot be placed inside the sleeve. The steel casing must be parallel with the bottom of the floor or wall. There must be a height drop of 20 mm from the ground when the pipe is lead through the floor. The sleeve cannot affect the inclination degree of the pipe. Fill the gap between the pipe and the sleeve with flexible and non-flammable materials. The sleeve cannot be used as a support point of the pipe.

(7) Bond the insulation material joints with special glue and then wrap them with plastic adhesive tape. The width of the adhesive tape must be 5 cm or more to prevent dewing.

5.2.3 Concrete installation requirement for drain pipe

(1) Connect the drain pipe to that of the IDU, fix the pipes with adhesive tape;

(2) When connecting the drain pipe branches to the main pipe, lead through from the above part of the main pipe.

(3) When there are multiple IDUs in the same building, centralized drainage is adopted.

(4) When a header pipe is used, the drain pipe of each IDU must be higher than the header pipe.

(5) The diameter of the header pipe must be determined on the number and capacity of IDUs.

(6) When installing pipe, start from the highest point of the pipe and follow the specified inclination to smoothly discharge condensate water.

(7) After connection, please check water drainage is smooth and ensure no leakage.

5.3 Heat preservation measure

Select heat insulation material according to the following table

Type		Insulation material	Thickness（mm）	
			General environment	Thermal and humid environment
Copper pipe	Φ6.35～15.9	Rubber and plastic heat preservation pipe	15	20
	≥19.05		20	30
Condensate water pipe		Rubber and plastic heat insulation pipe	10	15

Notes：

① Heat insulation material must meet the fireproof requirement；

② Thickness of heat preservatio material varies from different manufacturers, please conduct model selection according to the recommended manufacturers.

③ Thermal and humid environment regions mean the coastal region.

5.3.1 Heat preservation of refrigerant pipe

5.3.1.1 Heat preservation steps for copper pipe

(1) Before installing the pipeline, cover the straight pipe or smooth and curve pipeline with pipes, lay aside the heat preservation of copper pipe near the connection location.

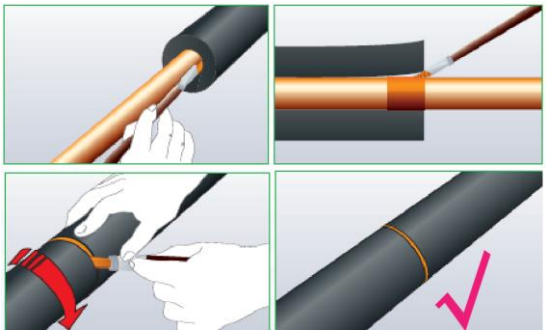
(2) After intensity and air tightness test of pipeline system is qualified, conduct heat preservation and reparation to the exposed copper pipe without thermal insulation cover.

5.3.1.2 Notices for heat preservation of copper pipe

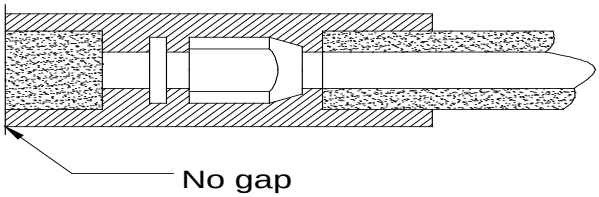
(1) Before heat preservation, please confirm that the specification of sleeve shall accord with the copper pipe to avoid too big or too small. The surface of thermal insulation material shall be clean.

(2) Conduct heat insulation for the gas and liquid pipe, it’s forbidden to pack them together for heat preservation.

(3) Glue must be smeared in the connection joint of heat preservation for connection; the connector shall be flush and flat without gaps. It's forbidden to glue the heat preservation pipe in both ends for connection after stretching.



(4) The connector between copper pipe and IDU must conduct heat preservation and be tightly sealed.



5.3.2 Heat preservation for condensate pipeline

5.3.2.1 Heat preservation steps for condensate drainpipe

(1) Before installing the pipeline, cover the straight pipe or smooth and curve pipeline with pipes directly, lay aside the heat preservation of water pipe near the connection location.

(2) After water test and full water test of drainpipe is qualified, conduct heat preservation and reparation to the exposed water pipe without thermal insulation cover.

5.3.2.2 Notices for heat preservation of condensate drainpipe

(1) Before heat preservation, please confirm that the specification of sleeve shall accord with the drainpipe to avoid too big or too small. The surface of thermal insulation material shall be clean.

(2) Glue must be smeared in the connection joint of heat preservation for connection; the connector shall be flush and flat without gaps. It's forbidden to glue the heat preservation pipe in both ends for connection after stretching.

(3) Drainpipe of the embedded wall has heat preservation；

(4) Heat preservation in the connection location between drainpipe and accessory hosepipe of IDU is

completely sealed with glue.

(5) Heat preservation of 3-way valve has no gap, the glue shall be tight.

6 Electric installation

(1) The air conditioning unit is category I electrical appliance which requires reliable grounding.

(2) The yellow green cable inside the air conditioning unit is a grounding cable. It cannot be used for other purposes or be cut off. Do not fix it with tapping screws. Otherwise, an electric shock may be caused.

(3) A reliable ground terminal must be provided for the power. Do not connect the grounding cable to any of the following:a. Water pipes b. Gas pipes c. Drainage pipe d. Other places deemed as unreliable

(4) The power cable and communication cable must be laid separately with a distance of greater than 10 cm. Otherwise, the communication of the unit will be abnormal.

(5) Don't mix the power cable and communication cable in project installation, if the power cable is connected to the communication port, the main board will be burnt!

6.1 Power installation

6.1.1 Installation steps of power cable

(1) Conduct wiring according to the accessory circuit diagram, wiring of power cable must be protected with sleeve. Reserve enough length at both sides of power cable to during wiring to ensure power cable shall not be pulled tightly, and it’s forbidden to connect and lengthening the power cord;

(2) After installing and fixing the unit, connect the power cable to the unit from a dedicated location. At the beginning of the wiring, please confirm that the power switch is OFF and mark with warning lable.

(3) Open the electrical box cover, put the cable through the rubber ring, connect the corresponding phase line (live line), zero line, earth wire to the correct location according to the requirement of the circuit diagram;

(4) If the power of the unit is a three phase power, please check to confirm if the phase sequence is correct, otherwise, the unit can not be started;

(5) After confirming the wiring of power cable is correct, fix the power cable with a dedicated wire clip inside the electrical box, avoid the problem that the wiring terminal is loose or pulled with external force;

(6) After wiring, cover the electrical box and take dustproof and water proof actions.

6.1.2 Power cable diameter and air switch selection

Model		Power supply	Circuit breaker capacity (A)	Number of ground wire × Min sectional area (mm^2)	Number of power cord ×Min sectional area (mm^2)
RF28WPd/Na-M	RF28WPd/Na-M(I)	220-240V～ 50Hz	10	1×1.5	2×1.5
	RF28WPd/Na-M(O)	380-415V 3N～ 50Hz	25	1×2.5	4×2.5
LF28WPd/Na-M	LF28WPd/Na-M(I)	220-240V～ 50Hz	10	1×1.5	2×1.5
	LF28WPd/Na-M(O)	380-415V 3N～ 50Hz	25	1×2.5	4×2.5
RF28WPd/Na-H	RF28WPd/Na-H(I)	230V～60Hz	10	1×1.5	2×1.5
	RF28WPd/Na-H(O)	400V 3N～60Hz	25	1×2.5	4×2.5

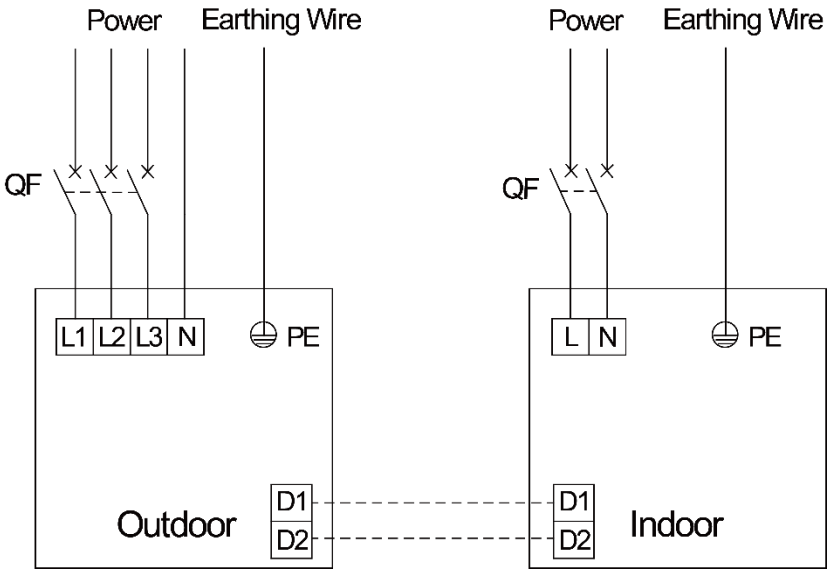
Notes：

① Selection of circuit breaker and power cord in the above table is based upon units maximum power (maximum current).

② Specification of power cord is based on the working condition where ambient temperature is 40℃ and multi-core copper cable (working temperature is 90℃, e.g. power cable with YJV cross-linked copper, insulated PE and PVC sheath) is lying on the surface of slot. If working condition changes, please adjust the specification according to national standard.

③ Specification of circuit breaker is based on the working condition where ambient temperature of circuit breaker is 40℃. If working condition changes, please adjust the specification according to national standard.

6.1.3 Wiring diagram



Notes：

① For the specification of power cord, please refer to the wiring requirements in “Requirements for Connecting Electricity”.

② Take two wires of 0.75mm^2 as the communication cable between indoor unit and outdoor unit. Max wire length is 50m. Please select the suitable wire length according to actual installation situation. The communication cable cannot be twisted together.

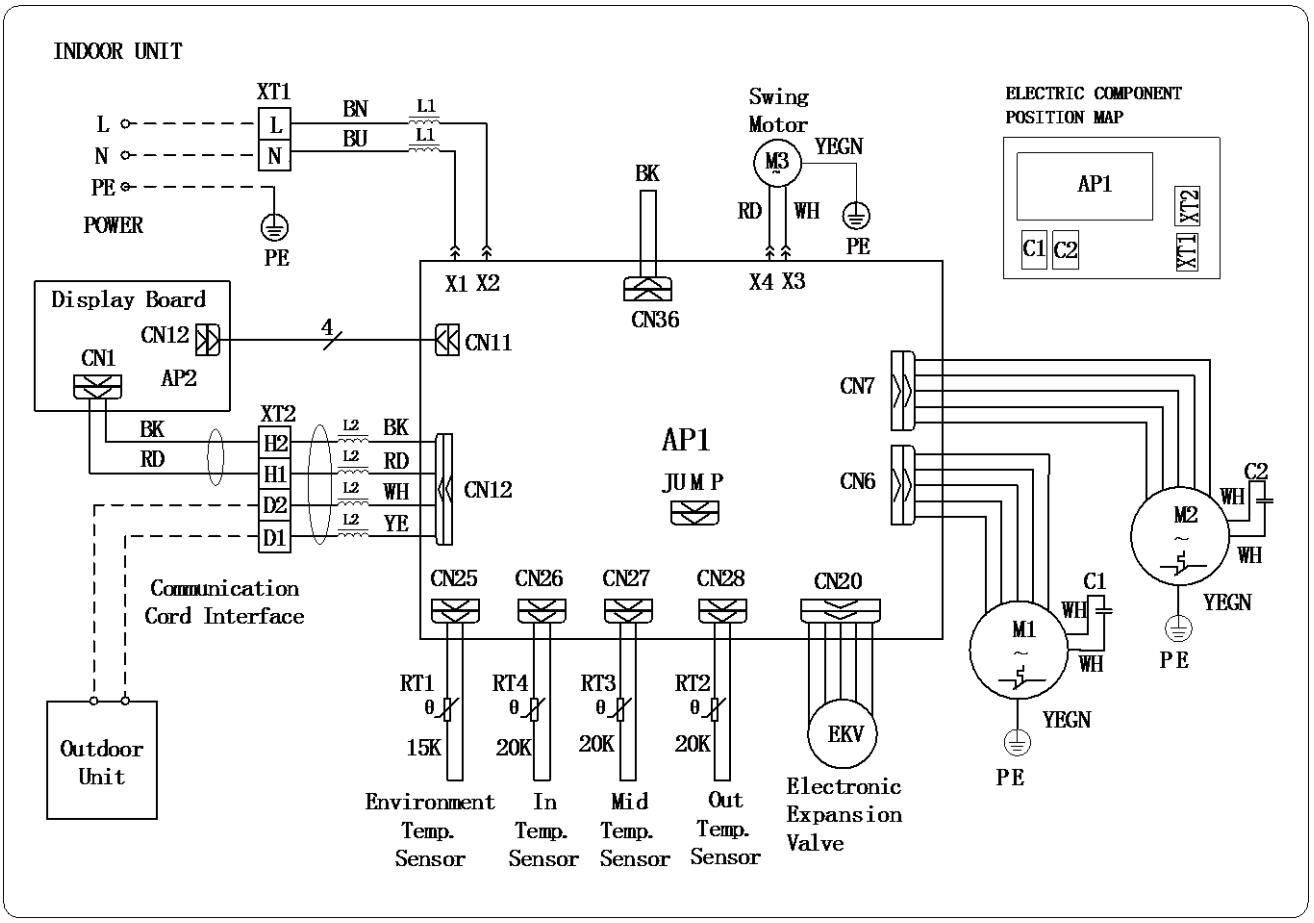
③ If air conditioner is used under strong electronic-magnetic interference circumstance, STP (shielded twisted pair) communication cable must be adopted.

6.2 Circuit diagram

Concrete circuit diagram shall refer to the one pasted on the unit.

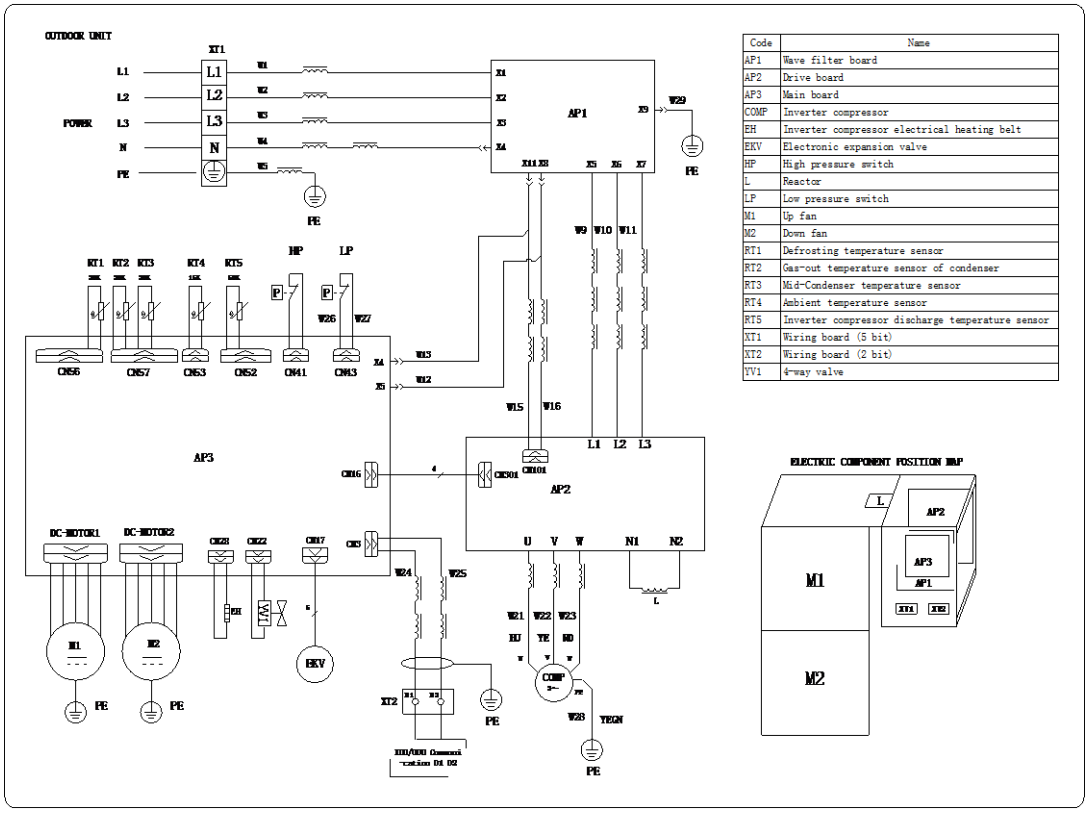
6.2.1 Circuit diagram of IDU

RF28WPd/Na-M(I)、LF28WPd/Na-M(I)、RF28WPd/Na-H(I)：



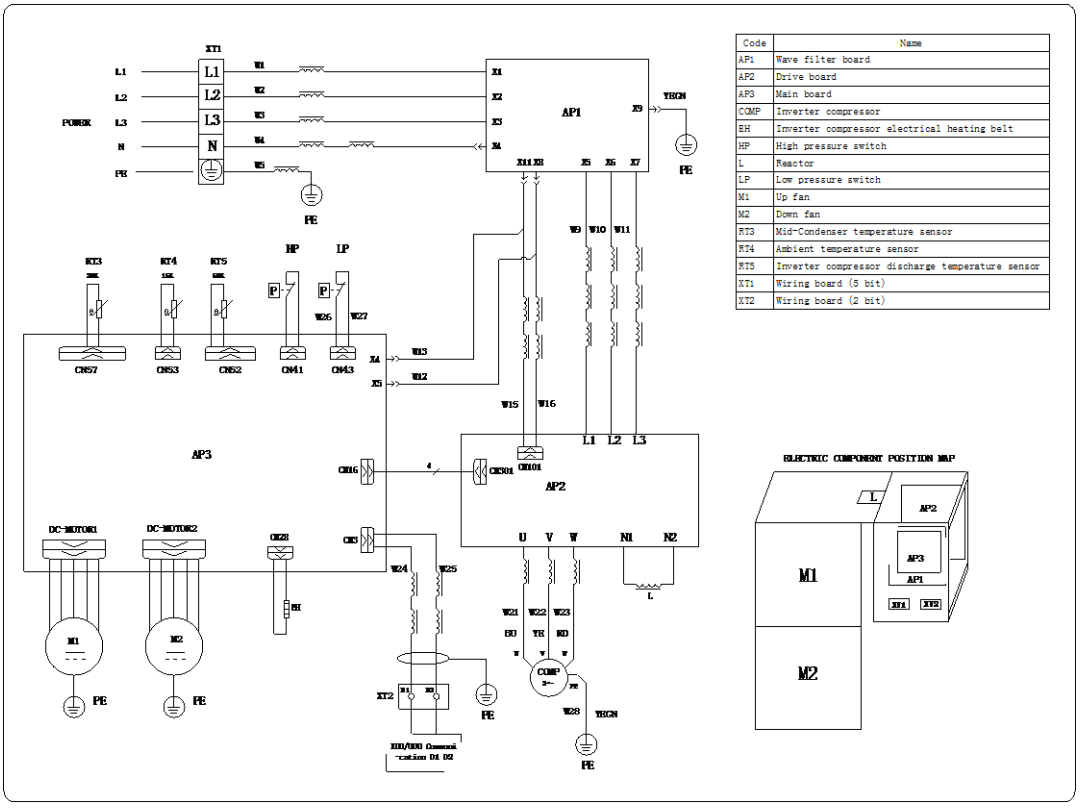
6.2.2 Circuit diagram of ODU

RF28WPd/Na-M(O)：



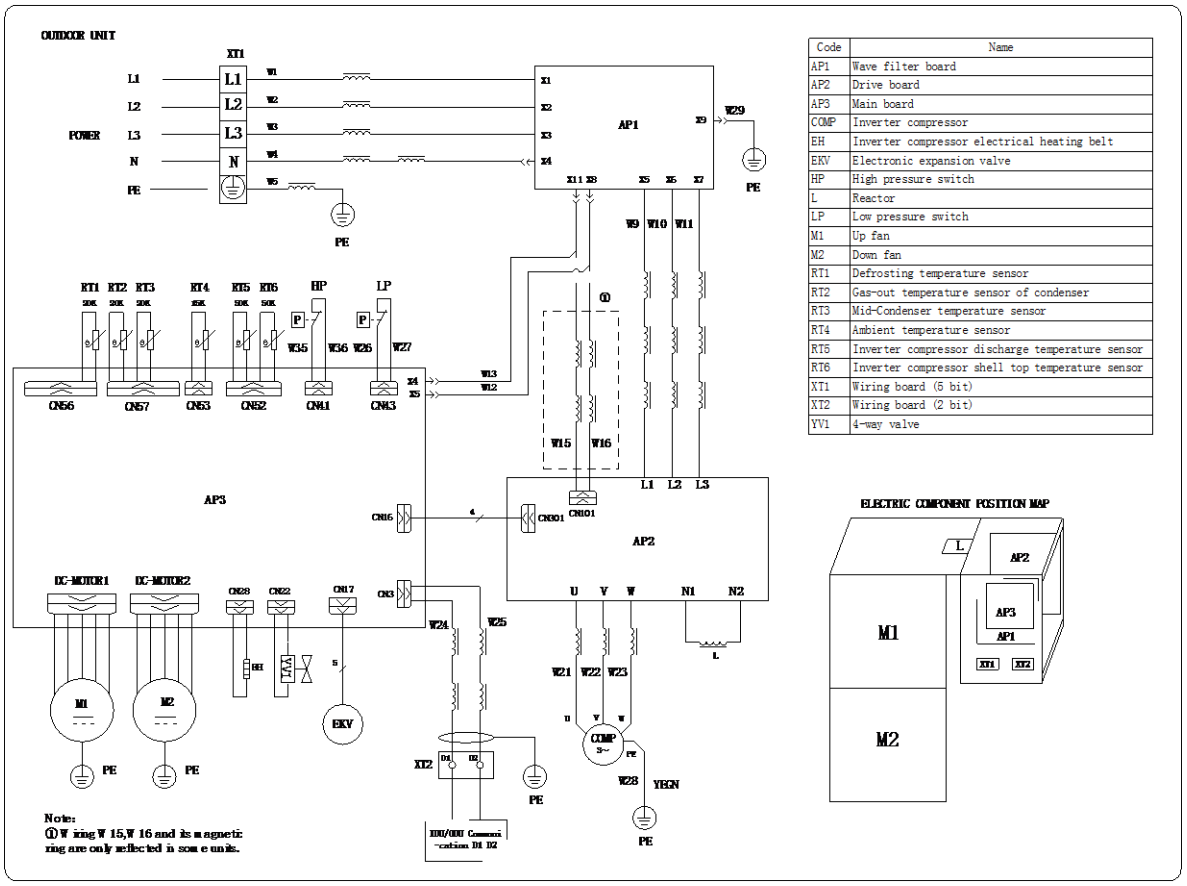
Code	Name
AP1	Wave filter board
AP2	Drive board
AP3	Main board
COMP	Inverter compressor
EH	Inverter compressor electrical heating belt
EKV	Electronic expansion valve
HP	High pressure switch
L	Reactor
LP	Low pressure switch
M1	Up fan
M2	Down fan
RT1	Defrosting temperature sensor
RT2	Gas-out temperature sensor of condenser
RT3	Mid-Condenser temperature sensor
RT4	Ambient temperature sensor
RT5	Inverter compressor discharge temperature sensor
XT1	Wiring board (5 bit)
XT2	Wiring board (2 bit)
YV1	4-way valve

LF28WPd/Na-M(O)：



Code	Name
AP1	Wave filter board
AP2	Drive board
AP3	Main board
COMP	Inverter compressor
EH	Inverter compressor electrical heating belt
HP	High pressure switch
L	Reactor
LP	Low pressure switch
M1	Up fan
M2	Down fan
RT3	Mid-Condenser temperature sensor
RT4	Ambient temperature sensor
RT5	Inverter compressor discharge temperature sensor
XT1	Wiring board (5 bit)
XT2	Wiring board (2 bit)

RF28WPd/Na-H(O)：



Code	Name
AP1	Wave filter board
AP2	Drive board
AP3	Main board
COMP	Inverter compressor
EH	Inverter compressor electrical heating belt
EKV	Electronic expansion valve
HP	High pressure switch
L	Reactor
LP	Low pressure switch
M1	Up fan
M2	Down fan
RT1	Defrosting temperature sensor
RT2	Gas-out temperature sensor of condenser
RT3	Mid-Condenser temperature sensor
RT4	Ambient temperature sensor
RT5	Inverter compressor discharge temperature sensor
RT6	Inverter compressor shell top temperature sensor
XT1	Wiring board (5 bit)
XT2	Wiring board (2 bit)
YV1	4-way valve

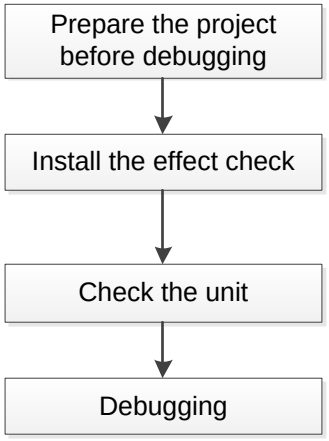
7 Installation acceptance

Inspection items after installation：

Inspection items	Situation might happen if installed improperly	Inspection record
Is installation of each part firm?	The unit might fall down, vibrate or make noise	
Is air leakage checked?	Insufficiency of cooling capacity (heating capacity)	
Is heat insulation sufficient?	Water condensing or dropping water	
Is drainage smooth?	Water condensing or dropping water	
Is power voltage and product nameplate consistent?	Unit malfunction or the component is burnt	
Is circuit and pipeline installation correct?	Unit malfunction or the component is burnt	
Is the unit grounded safely?	Leakage of electricity	
Does the wire specification meet the requirement?	Unit malfunction or the component is burnt	
Are there any barriers in indoor, air outlet of ODU or air inlet?	Insufficiency of cooling capacity (heating capacity)	
Is refrigerant pipe length and refrigerant charging quantity recorded?	Cannot decide the filled refrigerant quantity	

DEBUGGING & MAINTENANCE

1 Debugging flow chart



2 Safety notice

Warning!

Take safety measure for outdoor operation. All the participated debugging and maintenance personnel must learn of the safty regulation on architecture construction, and follow the instruction strictly;

Personnel of special type of work, such as refrigeration worker, electrician and welder, must have the work permit for special type of work, and they are not allowed to leave their post and visit others during work hours;

Cut off the power before conducting related operation to the equipment, meanwhile, the operation must be based on safety requirement strictly;

All installations and maintenance operations must accord with the design requirement of this product and national and local safety operation requirement.

It’s forbidden to start the compressor compulsorily by connecting the power directly.

3 Preparation before debugging

3.1 Preparation for debugging tool

Inner hexagon spanner	Digital thermometer
Shifting spanner	Noise meter
Cross screwdriver	Clamp meter
Straight screwdriver	Digital multimeter
Vacuum pump	Electricity meter
Electronic balance	Timer
System high and low pressure gauges for corresponding refrigerants	Step ladder
Wind-speed transmitter	

3.2 Preparation for debugging document

To record unit installation and debugging situation, please make sure the following debugging document is complete: meeting minute on debugging scheme, record of debugging personnel, inspection record before debugging, debugging data record and debugging report and so on.

Meeting minute on debugging scheme

Confirmation meeting on air conditioner debugging scheme
Subject：***
Time：***
Location：***
Participant：***
Detailed content：***
1
2
3

Debugging data record：

Project name：				Debugging person：		
Unit model：				Date：		
Max fall of IDU and ODU（m）：		Total length of refrigerant pipeline（m）		Additional charge quantity of refrigerant (kg)		
Debugging status： □Cooling □Heating Number and capacity of operating IDU：						
Status parameter		Unit	Before startup	30min	60min	90min
Parameter of ODU status	Outdoor ambient temperature	℃				
	Power voltage	V				
	Frequency	Hz				
	Discharge temperature	℃				
	System high pressure	℃				
	System low pressure	℃				
	Pressure of liquid pipe valve	MPa				
	Pressure of gas pipe valve	MPa				
	……					
IDU parameter	Ambient temperature	℃				
	IDU fan speed	Fan speed				
	Temperature of air outlet	℃				
	Fan speed of air vent	m/s				
	Noise	dB(A)				
	Water discharge condition water tray	——				

3.3 Inspection before debugging

 Notice!

Please record those installations which are inconsistent with the specification in time, so as to provide corresponding analysis basis while testing the refrigeration system.

Inspection record before debugging

Inspection record before debugging					
Type	No.	Inspection items	Reference value	Pass or not	Examiner
Inspect drawing	1	Is the drawing complete?			
	2	Follow the construction drawing?			
Inspect installation environment	3	Is there pollution source in the installation environment of ODU? Is the installation location of ODU correct?	Refer to the installation of ODU		
	4	Is the ODU base firm? Does vibration attenuation and water discharge meet the requiremene?	Refer to the installation of ODU		
	5	Is the installation of basic module of ODU at the same level?	Refer to the installation of ODU		
	6	Is the ODU operated with static pressure?			
Inspection of refrigeration system	7	Does the fall between IDU and ODU meet unit design requirement?	Refer to the specification of ODU		
	8	For the vertical gas pipe, is the oil loop installed every 10m?	For the vertical gas pipe, one oil loop shall be installed every 10m from the top down		
	9	Is the opening angle of the cut off valve of ODU the widest?	Open it completely		
	10	Is refrigerant pressure normal? Connect the liquid pipe valve of ODU with high pressure gauge and connect the gas pipe valve of ODU with low pressure gauge, then read the corresponding the numerical value.	At this moment, the high and low pressure of the system is balanced, and the difference between saturation temperature which is corresponding to the equilibrium pressure value and ambient temperature (subject to lower value of indoor and outdoor temperature) shall not exceed 5℃, if exceeding 5℃, please check if the ODU is leaked.		

Inspection record before debugging					
Type	No.	Inspection items	Reference value	Pass or not	Examiner
	11	Leakage in valve?	If yes, please leakage detecting with soap or leak detector immediately to confirm the condition. After confirming, please stop the subsequent debugging right now, then re-debug it after the problem is solved.		
	12	Before starting debugging, is the preheat time of ODU over 8h?	Before starting the unit for debugging, please ensure the ODU is energized for over 8h.		
Electrical system inspection	13	Is wiring method of power cable correct? Is the wiring terminal firm?	Make sure the wiring is correct and firm.		
	14	Is the appearance of power cable in good condition without exposure?	The appearance is in good condition, exposure is not allowed.		
	15	Is the power capacitance less than the max power of the unit?	Greater than the max power of the unit		
	16	Under power outage condition, is the electrical component inside the electrical box loose?	Loose is not allowed		
	17	Does the IDU and ODU wire diameter meet unit design requirement?	Refer to electric installation		
	18	Does the circuit breaker and leakage switch meet unit design requirement?	Refer to electric installation		
	19	Does the supply voltage, phase sequence and frequence meet unit design requirement?	Consistent with unit nameplate, fluctuation range of voltage is within ±10%.		
	20	Is the distance between power cable and TV over 1m?	The distance between power cable and TV shall be over 1m.		
	21	Are there strong electromagnetic interference, dust, acid and alkaline gas around the unit?	No battery interference, dust, acid and alkaline gas around the unit.		
Communication system inspection	22	Does the communication wire diameter meet unit design requirement?			
	23	Is the communication of outdoor master unit and IDU correct?	Tandem connection		

Inspection record before debugging					
Type	No.	Inspection items	Reference value	Pass or not	Examiner
	24	Is the communication connection between IDU and wired controller correct?			
	25	Communication cord and power cord shall not be laied in the same trunking, lay individually with inflaming retarding hard PVC pipe, and the parallel interval between communication cord and strong wire shall be over 20cm.			
IDU installation inspection	26	Any slope of 1/100 in drain pipe of IDU?			
	27	Is the lifted height of drain pipe of IDU below 85cm?	Water pump unit		
	28	Is drain pipe of IDU smooth?			
	29	Are there U-shape water loop in drain pipe of IDU?			
	30	Soft connection in air outlet/inlet of IDU?	Duct type unit		
	31	Air discharge outlet in drain pipe of IDU?			

4 Debugging of Unit

Caution:

① After the initial installation is finished and the main board of outdoor unit is replaced, it must perform debugging. Otherwise, the unit can't operate.

② The debugging must be performed by professional person or under the the guide of professional person.

4.1 Preparation for debugging

4.1.1 Confirm before commissioning Description

(1) Do not disconnect the power before the installation is finished.

(2) All wires for controller and electric wires must be connected correctly and reliably.

(3) Check the fixing ring of the foot of compressor for transportaion is removed.

(4) Remove all sundries from the unit, such as metal chips, joint, forceps holder, and so on.

(5) Check whether the appearance and pipeline system are damaged during carry or transportation process.

(6) Calculate the required added refrigerant-charging volume according to the length of pipe of system and pre-charge the refrigerant. If refrigerant can't be added any more when the required refrigerant-charging volume hasn't been reached, record to refrigerant volume which still needs to be added and continue to

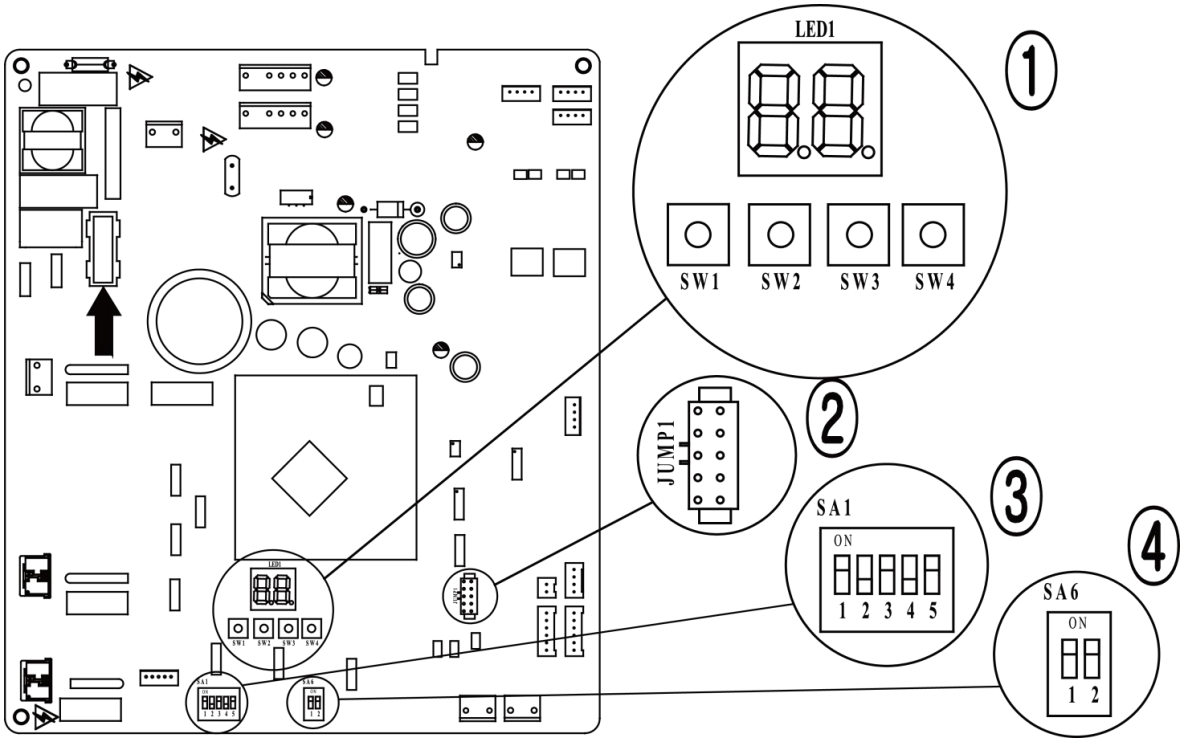
add refrigerant during run test operation process. Please refer to below run test for the refrigerant-adding stage during run test process.

(7) After adding refrigerant, please make sure the valve for outdoor is opened completely.

(8) For the convenient of troubleshooting, the unit can't be connected to the PC which installed with related debugging software and make sure that the data in real time of this unit can be inspected by this computer. Please refer to Service Manual for the installation and connection of the bebugging software.

(9) Before turn test, please do make sure that the preheat time for compressor is 8h above and touch the compressor to see whether preheat is normal. You can perform run test only after normal preheat. Otherwise, it may damage the compressor.

4.1.2 Main board of ODU



Instruction：

① Indicator of main board (digital display tube) "LED1" and four button: "SW1", "SW2", "SW3" and "SW4";

Key No.	SW1	SW2	SW3	SW4
Function	Up	Down	OK	Back

② Jumper cap of the unit "JUPM1", jumper cap No. varies from different type.

③ DIP switch "SAI", DIP switch varies from different cooling capcity, before leaving the factory, DIP switch is set for different models and fixed with glue.

④ The main control function DIP switch “SA6” is used to set master module and subsidiary module, the defaulted factory setting is the main module. As the fig is shown, dialing to “ON” side represents “0” and dialing to the figure side represents “1”, the defaulted setting for the unit is “00”. For the system with two outdoor units, one of them shall be set as the main module, namely, dial “SA6” to “00”, then set the other unit as subsidiary module, namely, dial the “SA6” to “10”.

Function	SA6	
	1	2
Master module	0	0
Subsidiary module	1	0

4.2 DEBUGGING

4.2.1 Basic operation of project debugging

(1) Start project debugging

(2) Press “SW3” button consecutively in the master module for over 5s to enter auto debugging.

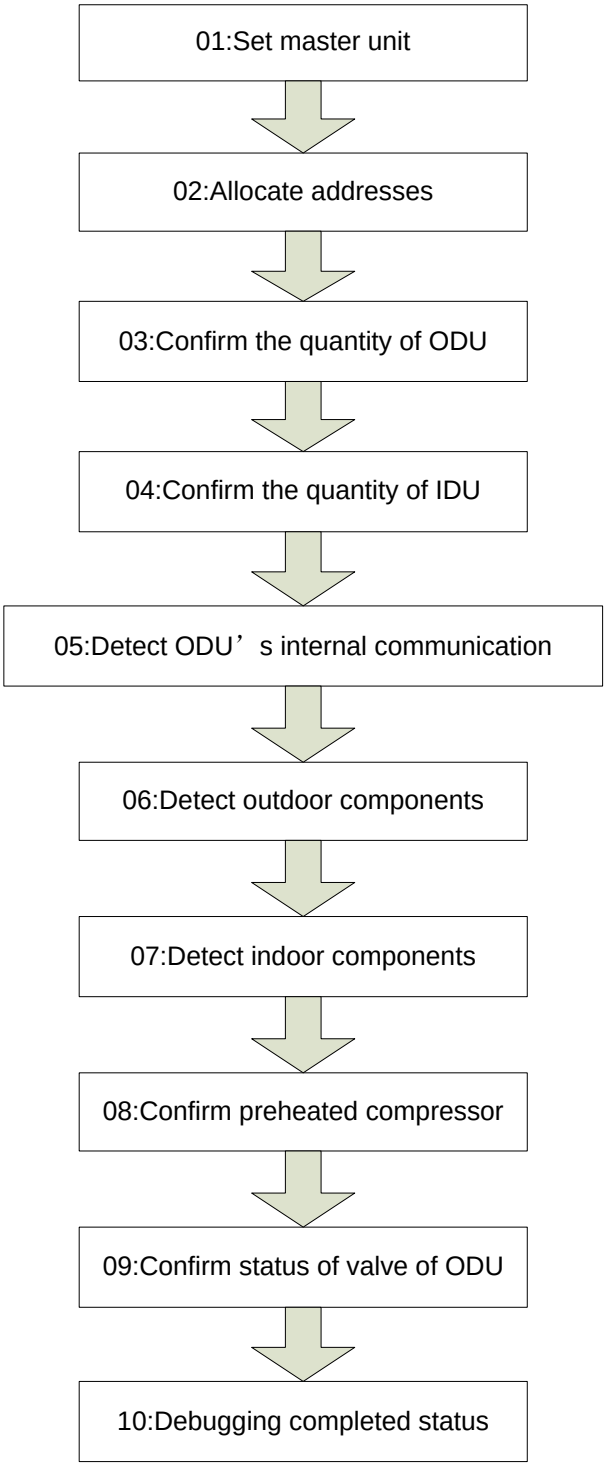
(3) Exit project debugging

(4) After entering project debugging, press “SW3” button consecutively in the master module for over 5s to exit the debugging.

(5) Complete project debugging

(6) After entering project debugging and completing step “04”, press “SW2” and “SW3” button consecutively in the master module for over 5s to exit the debugging, then the system can operate normally.

4.2.2 Flow-process diagram of debugging



4.2.3 Basic operation of project debugging

(1) Start project debugging

Press “SW3” button consecutively in the master module for over 5s to enter auto debugging.

(2) Exit project debugging

After entering project debugging, press “SW3” button consecutively in the master module for over 5s to exit the debugging.

(3) Complete project debugging

After entering project debugging and completing step “04”, press “SW2” and “SW3” button consecutively in the master module for over 5s to exit the debugging, then the system can operate normally.

4.2.4 Debugging process

(1) Manufacture the unit before Oct 30, 2018.

Debugging procedure for test run, display instruction for indicator on main board of outdoor unit and operation method are as below:

Description of each stage of debugging progress			
——	Debugging Code		Instruction for Code and Operating Method
Progress	LED		
	Display Code	Display Code	
Start	A0	Always ON	No debugged yet. Press “SW3” button consecutively in the master module for over 5s to enter auto debugging.
01_Master unit setting	01/CC	Display repeatedly	There is no master unit in the system. The system cannot continue to conduct debugging, and all the buttons are invalid that must be reset by cutting the power.
	01/CF	Display repeatedly	There are two or more master units in the system. The system cannot continue to conduct debugging, and all the buttons are invalid that must be reset by cutting the power. Please set the correct “SA6” DIP switch.
	01/oC	Display repeatedly	There is only one master unit in the system. The unit will automatically enter into the next step after displaying for once.
02_Address allocation	02	Flicker	The system is allocating addresses. It will display as below after 10 seconds:
	02/L7	Display repeatedly	There is no master unit. The display will last for 1 minute, within this 1 minute, the master IDU can be set by debugging software. If the master IDU has not been set within this 1 minute, the system will automatically set the IDU with the minimum IP address as the master IDU.
	02/oC	Display	The system has finished allocating the addresses, there is master IDU.

Description of each stage of debugging progress			
——	Debugging Code		Instruction for Code and Operating Method
Progress	LED		
	Display Code	Display Code	
		repeatedly	It will automatically enter into the next step's operation after displaying for once.
03_ Confirm quantity of outdoor units	03/ quantity of modules in the system	Display repeatedly	Confirmation of quantity of modules in the system. To differentiate from the debugging step, the QTY of module will display only 1-digit on the right. If the actual quantity of ODU is inconformity with the displayed quantity, please check the dial code and wire connection and then conduct debugging for confirmation.
	03/oC	Display repeatedly	If the actual quantity of ODU is in conformity with the displayed quantity, press SW3 button to confirm. After confirmation, all the module nixie tubes will repeatedly display "03" and "0C", after displaying for once, the system will automatically enter into the next operation.
04_Confirm quantity of indoor units	04/Cb	Display repeatedly	It is not allowed to connect more than one indoor unit in the system. Please check and debug again to confirm.
	04/oC	Display repeatedly	The quantity of IDU in the system has been confirmed.It will enter into the next step.
05_ Internal communication of outdoor unit	05/C2	Display repeatedly	Communication error between master control and drive of compressor. Please check if the communication wire between mainboard and driving board of ODU is correctly connected, if it is, enter into the next step. If the ODU should be powered off for the debugging, after re-energizing the unit, please conduct debugging from the above 01 step.
	05/oC	Display repeatedly	The communication between master control and driving of ODU is normal. After displaying for once, it will automatically enter into the next step.
06_ Component detection of outdoor unit	06/corresponding error code	Display repeatedly	Error of components of ODU. After eliminating all the errors, it will automatically enter into the next step. If the ODU should be powered off for the debugging, after re-energizing the unit, please conduct debugging from the above 01 step.
	06/corresponding error code	Display repeatedly	Error of components of ODU. After eliminating all the errors, it will automatically enter into the next step. If the ODU should be powered off for the debugging, after re-energizing the unit, please conduct debugging from the above 01 step.
	06/oC	Display repeatedly	No component of ODU is found in the system, it will enter into the next step 10 seconds later.
07_Component inspection of indoor unit	07/ corresponding error code	Display repeatedly	Error of components of IDU is detected. If the ODU should be powered off for the debugging, after re-energizing the unit, please conduct debugging from the above 01 step.

Description of each stage of debugging progress			
——	Debugging Code		Instruction for Code and Operating Method
Progress	LED		
	Display Code	Display Code	
	07/oC	Display repeatedly	No component of IDU is found in the system, It will automatically enter into the next step 5 seconds later.
08_Preheat confirmation of compressor	08/U0	Display repeatedly	Insufficiency preheating of compressor. If the consecutive energization time of all basic modules detected at present is over or equal to 8h, or the discrepancy between the moment when the last consecutive energization time is over or equal to 8h and current time is less than 2h, it means preheat is complete, otherwise, it means preheating is insufficient, direct startup will damage the compressor. At this time, short press SW3 to skip the waiting time to automatically enter the next step.
	08/oC	Display repeatedly	Sufficient preheating of compressor. After displaying once circularly, the system will enter the next step automatically.
09_Confirmation of valve of outdoor unit	09/oF	Display repeatedly	Standby status, ready to start.
	09/on	Display repeatedly	The system has started.
	09/U6	Display repeatedly	The system shuts down due to malfunction. The error module nixie tube repeatedly display “09” and “U6”, other module nixie tubes repeatedly display “09” and “J0”. If erroe occurs, please check if the valve is opened, and at the same time check if the connecting pipes between different modules are correctly connected.
	09/oC	Display repeatedly	Confirmation on valve status is complete. All the modules shut down, then all the module nixie tube will display once.
10_Debugging completed	oF	Always ON	Debugging is completed, the system is in standby status.

(2) Manufacture the unit after Oct 30, 2018.

Debugging procedure for test run, display instruction for indicator on main board of outdoor unit and operation method are as below:

Description of each stage of debugging progress			
——	Debugging code		Instruction for Code and Operating Method
Progress	LED		
	Display code	Display status	
Start	A0	Always ON	No debugged yet. Press “SW3” button consecutively in the master module for over 5s to enter auto debugging.

Description of each stage of debugging progress			
——	Debugging code		Instruction for Code and Operating Method
Progress	LED		
	Display code	Display status	
01_Master unit setting	01/CC	Display repeatedly	The system has no master unit. Debugging can't be continued, all buttons are invalid, disconnect the power to reset the correct "SA6" DIP.
	01/CF	Display repeatedly	The system has two or more master units. Debugging can't be continued, all buttons are invalid, disconnect the power to reset the correct "SA6" DIP.
	01/oC	Display repeatedly	The system has only one master unit. After displaying once circularly, the system will enter the next step automatically.
02_Address allocation	02	Bllink	The system is allocating address, which might take 10s.
	02/L7	Display repeatedly	No master indoor unit. It will display for 1min continuously. The user can set master through debugging the software within 1min. If no master unit is set manually within 1min, the system will set the indoor unit with the smallest IP address automatically as the master indoor unit.
	02/oC	Display repeatedly	Address allocation of the system is complete with master indoor unit. After displaying once circularly, the system will enter the next step automatically.
03_Confirm quantity of outdoor units	03/ quantity of modules in the system	Display repeatedly	Confirmation of quantity of modules in the system. To differentiate from the debugging step, the QTY of module will display only 1-digit on the right.
	03/oC	Display repeatedly	After 10S, all the nixie tubes of modules will display "03" and "oC", after displaying once circularly, the system will enter the next step automatically.
04_Confirm quantity of indoor units	04/Cb	Display repeatedly	The quantity of indoor unit is more than 1. The system shall not connect more than 1 indoor unit, after inspection, please redebug for confirmation.
	04/oC	Display repeatedly	The quantity of indoor unit is 1. After confirming the quantity of indoor unit, it will enter the next step 2s later.
05_Internal communication of outdoor unit	05/C2	Display repeatedly	Communication error between master control and compressor drive. Please check the connection between the main board of outdoor unit and communication cord of drive board, after eliminating the errors, enter the next step. If the ODU should be powered off for troubleshooting, after re-energizing the unit, please conduct debugging from the above 01 step.

Description of each stage of debugging progress			
——	Debugging code		Instruction for Code and Operating Method
Progress	LED		
	Display code	Display status	
	05/oC	Display repeatedly	Communication between the master control of outdoor unit and drive is normal. After displaying once circularly, the system will enter the next step automatically.
06_Component detection of outdoor unit	06/ Corresponding error code	Display repeatedly	Component error of outdoor unit. After eliminating all the errors, enter the next step automatically, if the ODU should be powered off for troubleshooting, after re-energizing the unit, please conduct debugging from the above 01 step.
	06/oC	Display repeatedly	No component error of outdoor unit. After displaying for 10s circularly, the system will enter the next step automatically.
07_Component inspection of indoor unit	07/ Corresponding error code	Display repeatedly	Component error of indoor unit. After eliminating all the errors, enter the next step automatically, if the ODU should be powered off for troubleshooting, after re-energizing the unit, please conduct debugging from the above 01 step.
	07/oC	Display repeatedly	No component error of indoor unit After displaying for 5s circularly, the system will enter the next step automatically.
08_Preheat confirmation of compressor	08/oC	Display repeatedly	After displaying for 2s circularly, the system will enter the next step automatically.
09_Confirmation of valve of outdoor unit	09/oF	Display repeatedly	Standby status, ready to start.
	09/on	Display repeatedly	The system has started.
	09/U6	Display repeatedly	。Malfunction shutdown. The nixie tube of faulted module will display “09” and “U6” repeatedly and the nixie tube of other modules will display “09” and “J0”. In canse malfunction occurd, please check if the valve is opened and if the connection pipes among different modules are correctly connected.
	09/oC	Display repeatedly	Confirmation of valve status All modules are halted normally, nixie tubes of all modules will display once circularly.
10_Debugging completed	oF	Always ON	Debugging is completed, the system is in standby status.

5 Function setting

5.1 Function setting of outdoor unit

After debugging, long press “SW1” button in master control for 5s, the system will enter function standby status, main board indicator of outdoor unit is displayed acquiescently as follows:

LED	
Function code	Display method
A7	Blink

Select corresponding function to switch LED function code through “SW1” and “SW2” button in master control, function setting includes: outdoor quiet mode setting (A7), unit cooling and heating function setting (A6), mandatory defrosting operation (n3) and energy conservation mode setting (n0).

After selecting corresponding function, short press “SW3” button for confirmation, main board indicator of outdoor unit is displayed as follows:

LED	
Function code	Display method
A7	Blink
A6	Blink
n3	Blink
n0	Blink

5.1.1 Quiet function of outdoor unit

This function applys to project with high requirements for noise of outdoor unit, after entering function setting (A7), main board indicator of outdoor unit is displayed as follows:

LED	
Function code	Display method
00，10，11 or 12	Blink

Select corresponding quiet mode through “SW1” and “SW2”, short press “SW3” to confirm the selected mode.

Note: code 00 is the normal mode, code 10～12 is the compulsory quiet mode, the biggier the numerical value is, the better quiet effect is. After setting is completed, the master control unit will memorize the setting, and the setting shall not be cleared even after power outage and energization. The defaulted factory setting for the unit is 00.

5.1.2 Unit cooling and heating function setting

This function can conduct compulsory setting to unit operation mode, after entering function setting (A6), main board indicator of outdoor unit is displayed as follows:

LED	
Function code	Display method
nC / nH / nA / nF	Blink

Select corresponding quiet mode through “SW1” and “SW2”, short press “SW3” to confirm the selected mode.

Note: “nA” is cooling and heating type; “nC” means cooling only; nH means heat pump; “nF” means air supply; After setting is completed, the master control unit will memorize the setting, and the setting shall not be cleared even after power outage and energization.

5.1.3 Mandatory defrosting operation

Mandatory defrosting setting is only effective if the compressor of outdoor unit is operating, after entering the function setting (n3), main board indicator of outdoor unit is displayed as follows:

LED	
Function code	Display method
n3	Blink

Short press “SW3” to confirm, at this time, the unit will enter mandatory defrosting mode, once entering mandatory defrosting mode, the exist of the system must meet the defrosting exist condition, other operations are invalid.

5.1.4 Energy conservation operation setting

The function enables the unit to operate in energy conservation mode, after entering function setting (n0), main board indicator of outdoor unit is displayed as follows:

LED	
Function code	Display method
01/02	Blink

Select corresponding quiet mode through “SW1” and “SW2”, short press “SW3” to confirm the selected mode.

Note: the defaulted factory setting is “capacity comes first”, namely “01”, which means the capacity shall control preferentially, “02” means the master control unit will memorize the setting after setting energy conservation control preferentially, and the setting will not be cleared after re-energization.

5.1.5 Reset factory setting

(1) Reset defaulted factory setting 1 (clear all settings):

Long press “SW1 + SW4” button for over 10s in the main module, the nixie tube will display “oC” for 3s, the main board will remove all settings, including IP address of indoor and outdoor unit.

(2) Reset defaulted setting 2 (clear all settings other than project debugging status)

Long press “SW2 + SW4” for over 10s in the main module, the nixie tube will display “oC” for 5s, the main board will remove all settints, including IP address of indoor and outdoor unit, but completion label for project debugging and the memory of indoor and outdoor unit quantity shall be kept.

(3) Reset defaulted setting 3 (clear function setting of outdoor unit only)

Long press “SW3 + SW4” for over 10s in the main module, the nixie tube will display “oC” for 7s, then clear all function settings of the system, but project code of indoor and outsoor unit, the memory of indoor and outdoor unit quantity and completion label for project debugging shall be kept.

TROUBLESHOOTING

1 Malfunction List

Malfunction list for the IDU

Display code	Content	Display code	Content	Display code	Content
L0	Malfunction of indoor unit	L9	Wrong number of indoor unit for one-to-more indoor unit	d9	Malfunction of jumper cap
L1	Indoor fan protection	LA	Wrong series for one-to-more indoor unit	dA	Abnormal address for indoor unit
L2	E-heater protection	LH	Alarming due to bad air quality	dH	Abnormal PCB for wired controller
L3	Water overflow protection	LC	The indoor unit model can't match with outdoor unit model	dC	Abnormal code-dialing setting of capacity
L4	Overload protection of power supply	d1	Malfunction of indoor circuit board	C0	Communication error
L5	Freeze prevention protection	d3	Malfunction of ambient temperature sensor	AJ	Clean alarming for filter
L6	Mode conflict	d4	Malfunction of entry tube temperature sensor		
L7	No main indoor unit	d6	Malfunction of exit tube temperature sensor		
L8	Insufficient power supply	d7			
db	Special code: engineering debugging code				

Status display table for indicators on main board of ODU

Display code	Content	Display code	Content	Display code	Content
E0	Malfunction of outdoor unit	E1	High pressure protection	E2	Low-temperature protection for discharge
E3	Low pressure protection	E4	Discharge high temperature protection for compressor		
F0	Poor main board of outdoor unit	F1	Malfunction of high pressure sensor	F3	Malfunction of low pressure sensor
F5	Malfunction of discharge temperature sensor for compressor 1				
J0	Protection for other modules	J1	Overload protection for compressor 1	J7	Air-mixing protection for 4-way valve

Display code	Content	Display code	Content	Display code	Content
b1	Malfunction of outdoor ambient temperature sensor	b2	Maflunction of defrosting temperature sensor 1	b6	Malfunction for temperature sensor of inlet tube of gas and liquid separator
b7	Malfunction for temperature sensor of exit tube of gas and liquid separator (exit tube A)	b9	Malfunction of gas exit temperature sensor for heat exchanger	bH	Abnormal clock of system
P0	Malfunction driven board for compressor	P1	Driven board of compressor works abnormally	P2	Power voltage protection for the driven board of compressor
P3	Reset protection for the driven module of compressor	P4	Driven PFC protection of compressor	P5	Overcurent protection for inverter compressor
P6	Driven IPM module protection for compressor	P7	Malfunction of driven temperature sensor for compressor	P8	Overheating protection for driven IPM of compressor
P9	Desynchronizing protection for inverter compressor	PH	High voltage protection for driven DC bus bar of compressor	PC	Circuit malfunction of driven current detection for compressor
PL	Low voltage protection for driven DC bus bar of compressor	PE	Phase-losing of inverter compressor	PF	Malfunction of driven charging loop for compressor
PJ	Failure startup for inverter compressor	PP	AC current protection for inverter compressor		
U0	Insufficient preheat time for compressor	U2	Wrong setting of capacity dial code/jumper cap of outdoor unit		
U5	Wrong address for the driven board of compressor	U6	Alarm due to abnormal valve	U8	Malfunction of pipeline for indoor unit
UC	Setting for indoor unit and oudoor unit is succeeded	UL	Wrong code-dialing during emergency operation	UE	Refrigerant-charging is invalid
C0	Communication malfunction for indoor unit, outdoor unit and wired controller of indoor unit	C2	Driven communication malfunction between main board and inverter compressor	C3	Driven communication malfunction between main board and inverter compressor
C4	Malfunction of indoor unit-lacking	C5	Alarming due to engineering series number	C6	Alarming due to wrong quanity of outdoor unit

Display code	Content	Display code	Content	Display code	Content
			shock of indoor unit		
C8	Emergency status of compressor	C9	Emergency status of fan	CA	Energycy status of module
CC	No malfunction of main control unit	CF	Malfunction of main control unit	CJ	Address shock of syste
Cb	Distribution overflow of Ip address				
A0	Debugging for unit	A1	Operational parameter inquiry of compressor	A2	Refrigerant recovery
A3	Defrosting	A4	Oil return	A5	On-line test
A6	Cooling/heating function setting	A7	Quiet mode setting	A8	Vacuum pump mode
AH	Heating	AF	Fan blow	AU	Remote emergency stop
AJ	Cleaning alarm for filter	Ab	Emergency stop	Ad	Limit opereation
n0	Energy conservation setting for the operation	n1	Defrosting period K 1 setting	n4	Limit setting for the maximum ouput capacity
n6	Engineering series number inqury for indoor unit	n7	Malfunction inquiry	n8	Parameters inquiry
nA	Heat pump unit	nH	Heating only model	nC	Cooling only model
nF	Fan model	nE	Negative code		

2 Troubleshooting

(1) “A0” debugging for unit

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models

Judgment condition and method for the fault：

It is a status code. If engineering debugging is not finished, the unit will display the code, at this time, the unit can’t be started for operation.

Possible reason: the unit is energized for startup for the first time, new main board is replaced for the unit.

Troubleshooting: refer to the complete unit debugging in related chapter.

(2) “A3” defrosting

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all heat pump models

Judgment condition and method for the fault：

It is a status code, which means the system has entered defrosting status, the indoor fan will suspend for 5-10min.

Possible reason: the outside ambient temperature is low, after heating for a long period, frosting at the outside heat exchanger is quite thick.

Troubleshooting: not faulted.

(3) “A4” oil return

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models

Judgment condition and method for the fault：

It is a status code, which means the system has entered oil return status, if the oil returns under heating mode, the indoor fan will suspend for 5-10min.

Possible reason: the load for the air conditioner is low, unit compressor has been operating in low frequency for a long time.

Troubleshooting: not faulted.

(4) “A6” cooling/heating function setting

Fault display: the main board of outdoor unit will display 

Applicable model: all models

Judgment condition and method for the fault：

It is a status code, which means the system has entered cooling/heating function setting status, at this time, choose cooling/heating (nA), cooling only (nC), heating only (nH) and fan blow (nF) for setting.

Possible reason：——

Troubleshooting: not faulted.

(5) “A7” quiet mode setting

Fault display: the main board of outdoor unit will display 

Applicable model: all models

Judgment condition and method for the fault：

It is a status code, which means the system has entered quiet mode setting status.

Judgment condition and method for the fault： ——

Troubleshooting：——

(6) “AH” heating

Fault display: the main board of outdoor unit will display 

Applicable model: all models

Judgment condition and method for the fault：

It is a status code, which means the system has entered heating mode setting status.

Possible reason：——

Troubleshooting：——

(7) “AC” cooling

Fault display: the main board of outdoor unit will display 

Applicable model: all models

Judgment condition and method for the fault：

It is a status code, which means the system has entered cooling mode setting status.

Possible reason： ——

Troubleshooting：——

(8) “AF” fan blow

Fault display: the main board of outdoor unit will display 

Applicable model: all models

Judgment condition and method for the fault：

It is a status code, which means the system has entered fan blow mode, at this time, the indoor unit can only operate in fan blow mode.

Possible reason：——

Troubleshooting：——

(9) "AJ" cleaning alarm for filter

Fault display: the indoor unit will display 

Applicable model: all indoor units

Judgment condition and method for the fault：

It is a status code, which means cleaning alarm for indoor unit filter is due, the filter shall be cleaned, and the period can be set according to actual operation circumstances.

Possible reason：——

Troubleshooting： Clean the filter and remove the alarm, then enter the next usage period.

(10) "AU" remote emergency stop

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models

Judgment condition and method for the fault：

It is a status code, which means the unit is controlled in emergency stop status remotely, unless eliminating the status, otherwise, the unit can't be started.

Possible reason：——

Troubleshooting：——

(11) "Ab" emergency stop

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models, but extra wiring is needed

Judgment condition and method for the fault：

It is a status code, which means the main board of outdoor unit has received emergency stop signal, unless eliminating the status, otherwise, the unit can't be started.

Possible reason：——

Troubleshooting：——

(12) “Ad” limit operation

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models

Judgment condition and method for the fault：

It is a status code, which means emergency operation status is set, however, emergency operation time has exceeded the limit requirement, at this time, the unit is not allowed to conduct emergency operation.

Possible reason：——

Troubleshooting：——

(13) “b1” malfunction of outdoor ambient temperature sensor

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all outdoor units

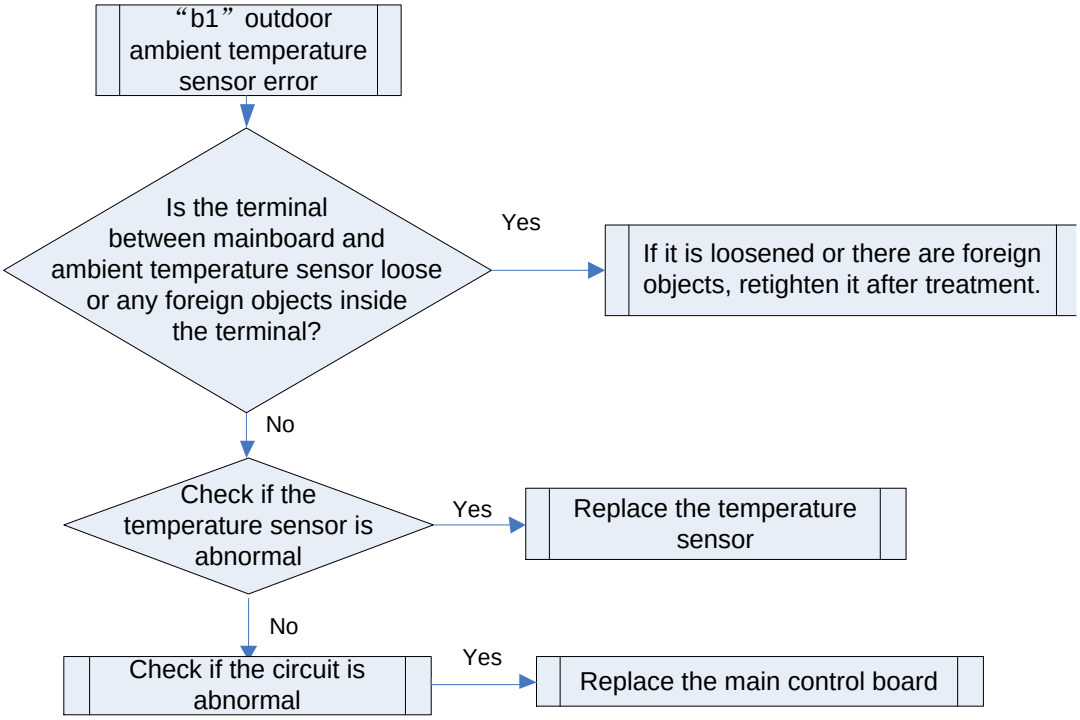
Judgment condition and method for the fault：

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, if the sampling AD value exceeds upper limit and lower limit in 30 seconds continuously, report the error

Possible reason：

■Poor contact between ambient temperature sensor and terminal in mainboard interface
■Temperature sensor is abnormal
■The detected circuit is abnormal

Troubleshooting：



(14) “b2” malfunction of defrosting temperature sensor 1

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all outdoor units

Judgment condition and method for the fault：

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, if the sampling AD value exceeds upper limit and lower limit in 30 seconds continuously, report the error

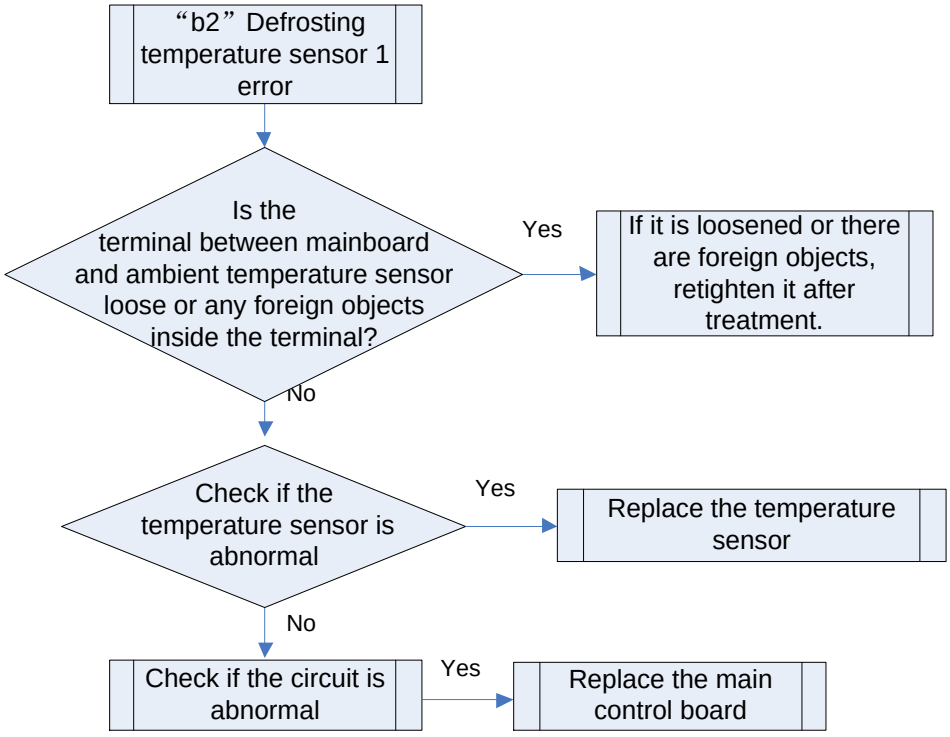
Possible reason：

■Poor contact between ambient temperature sensor and terminal in mainboard interface

■Temperature sensor is abnormal

■The detected circuit is abnormal

Troubleshooting：



(15) “b9” malfunction of gas exit temperature sensor for heat exchanger

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all outdoor units

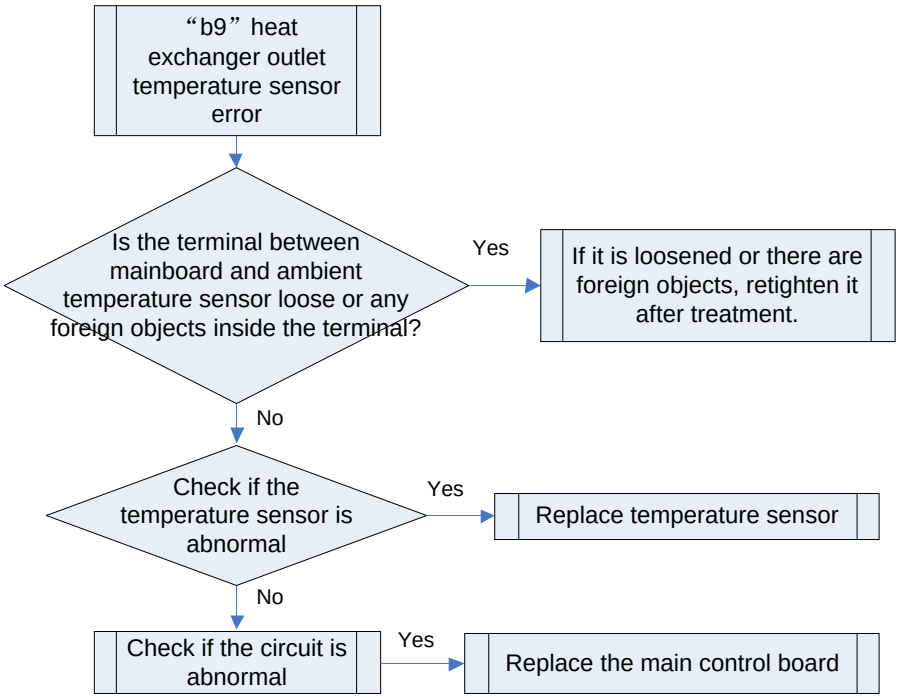
Judgment condition and method for the fault：

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, if the sampling AD value exceeds upper limit and lower limit in 30 seconds continuously, report the error

Possible reason：

■Poor contact between ambient temperature sensor and terminal in mainboard interface
■Temperature sensor is abnormal
■The detected circuit is abnormal

Troubleshooting：



(16) "C2" driven communication malfunction between main board and inverter compressor

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all outdoor units

Judgment condition and method for the fault:

The outdoor unit cannot detect the data of inverter compressor drive board in 30s, then it will give alarm.

Possible reason:

■The communication cable is not correctly connected.
■The inverter compressor drive board is abnormal.
■The main board is abnormal.

Troubleshooting:

1) Check if the cable connecting the control board and the compressor's drive board is loose. If yes, reconnect it;
2) Check if the cable connecting the control board and compressor's drive board is broken. If yes, replace the cable;
3) Check the contact of the communication cable connecting the control board and compressor's drive board;
4) Replace the control board. If the fault is solved, the control board is faulty. Replace the

compressor's drive board. If the fault is solved, the compressor's drive board is faulty.

(17) “C6” alarming due to wrong quantity of outdoor unit

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all outdoor units

Judgment condition and method for the fault：

The system will detect the quantity of online outdoor module at real time. When the detected quantity of current module is inconsistent with the one memorized by previous debugging, the unit will give alarm and stopt the unit for protection.

Possible reason：

■Communication among modules is abnormal;

■No electricity for the module;

Troubleshooting：

1. If the communication cable is loose, reconnect it;
2. If the communication cable is broken, replace it;
3. Check contact of the communication cable;
4. Replace the control board.

(18) “CC” no malfunction of main control unit

Fault display: the main board of outdoor unit and indoor unit will display 

Applicable model: all outdoor units

Judgment condition and method for the fault：

The main board will detect the dial-code of master control unit （SA6）to judge if it is the master control unit

Possible reason：

1. Switch the SA6 dial switch of an ODU to 00;
2. Replace the control board or switch an ODU's SA6 dial switch to 00.

(19) “d1” Indoor circuit board error

Error display: wired controller of IDU and the dash receiver of IDU will display 

Applicable mode: all indoor units

Error judgment condition and method:

Check if the reading of address chip and memory chip of IDU mainboard is normal. If the data of address chip and memory chip cannot be read, it is abnormal

Possible reason：

■Address chip is abnormal

■Memory chip is abnormal.

Troubleshooting:

Replace main control board directly

(20) “d3” Ambient temperature sensor error

Error display: wired controller of IDU and the dash receiver of IDU will display 

Error judgment condition and method:

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, if the sampling AD value exceeds upper limit and lower limit in 5 seconds continuously, report the error

Possible reason：

■Poor contact between ambient temperature sensor and terminal in mainboard interface

■Ambient temperature sensor is abnormal

■Detecting circuit is abnormal

(21) “d4” Inlet pipe temperature sensor error

Error display: wired controller of IDU and the dash receiver of IDU will display 

Error judgment condition and method:

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value. If the sampling AD value exceeds upper limit and lower limit in 5 seconds continuously, report the error

Possible reason：

■Poor contact between inlet pipe temperature sensor and terminal in mainboard interface

■Inlet pipe temperature sensor is abnormal

■Detecting circuit is abnormal

(22) “d5” midst pipe temperature sensor error

Error display: IDU displays 

Applicable mode: all indoor units

Error judgment condition and method:

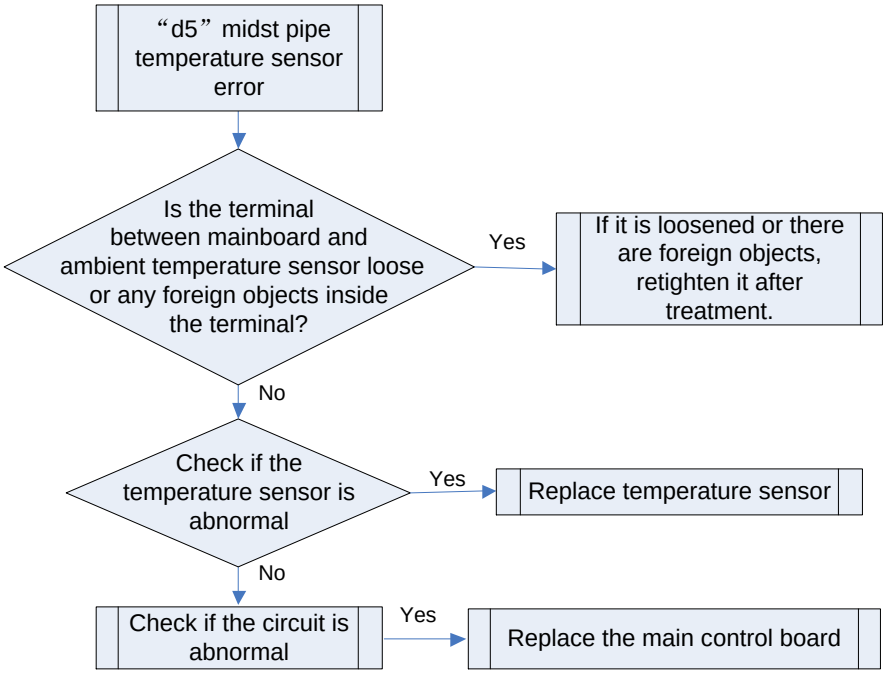
Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value. If the sampling AD value exceeds upper limit and lower limit in 5 seconds continuously, report the error

Possible reason:

■Poor contact between midst pipe temperature sensor and terminal in mainboard interface

■Midst pipe temperature sensor is abnormal

■Detecting circuit is abnormal



(23) "d6" Outlet pipe temperature sensor error

Error display: IDU displays 

Error judgment condition and method:

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value. If the sampling AD value exceeds upper limit and lower limit in 5 seconds continuously, report the error

Possible reason:

■Poor contact between outlet pipe temperature sensor and terminal in mainboard interface

■Outlet pipe temperature sensor is abnormal

■Detecting circuit is abnormal

(24) “d9” Jumper cap error

Error display: IDU displays 

Error judgment condition and method:

Possible reason：

If jumper cap model doesn’t match with mainboard, report the error

■Jumper cap is not installed

■Jumper cap model is wrong

■Detecting circuit is abnormal

Troubleshooting:

(25) “dC” Capacity DIP switch setting error

Error display: wired controller of IDU and the dash receiver of IDU will display 

Error judgment condition and method:

If capacity DIP switch is set to the wrong position, report the error.

Possible reason：

■Capacity DIP switch is set to the wrong position

■Detecting circuit is abnormal

(26) “db” Project debugging

Error display: ODU mainboard, IDU displays 

Error judgment condition and method:

This is a status code of project debugging, not a error code. When IDU or ODU displays this code, it means the unit is under debugging status and the IDU cannot be operated.

Troubleshooting: ——

Possible reason：——

(27) “E1” high pressure protection

Error display: ODU mainboard, IDU displays 

Applicable model: all models

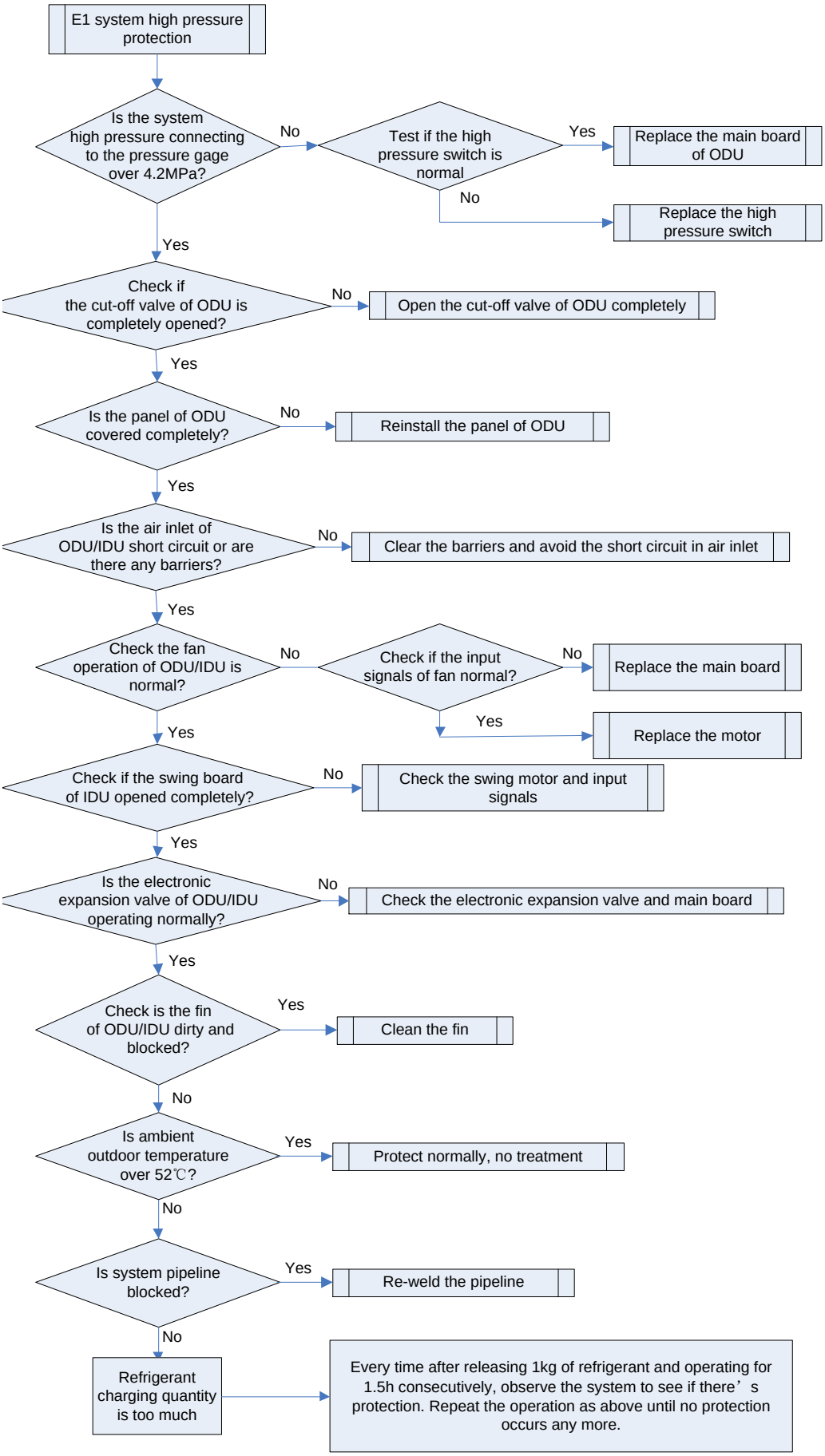
Error judgment condition and method：

Judge through detecting the real-time high pressure or the high pressure switch. If the sensor detects that the high pressure value is over 65℃ or the high pressure switch is disconnected, then it is judged as high pressure, the system will stop the unit for protection.

Possible reason：

Cut-off valve of ODU is not opened;
High pressure switch operation is abnormal;
Outdoor or indoor fan is abnormal;
Filter screen of IDU or air duct is blocked (heating mode);
Ambient operation temperature is too high;
Refrigerant charging of the system is too much;
System pipeline is blocked;

Troubleshooting：



(28) “E3” system low pressure protection

Error display: ODU mainboard, IDU displays 

Applicable model: all models

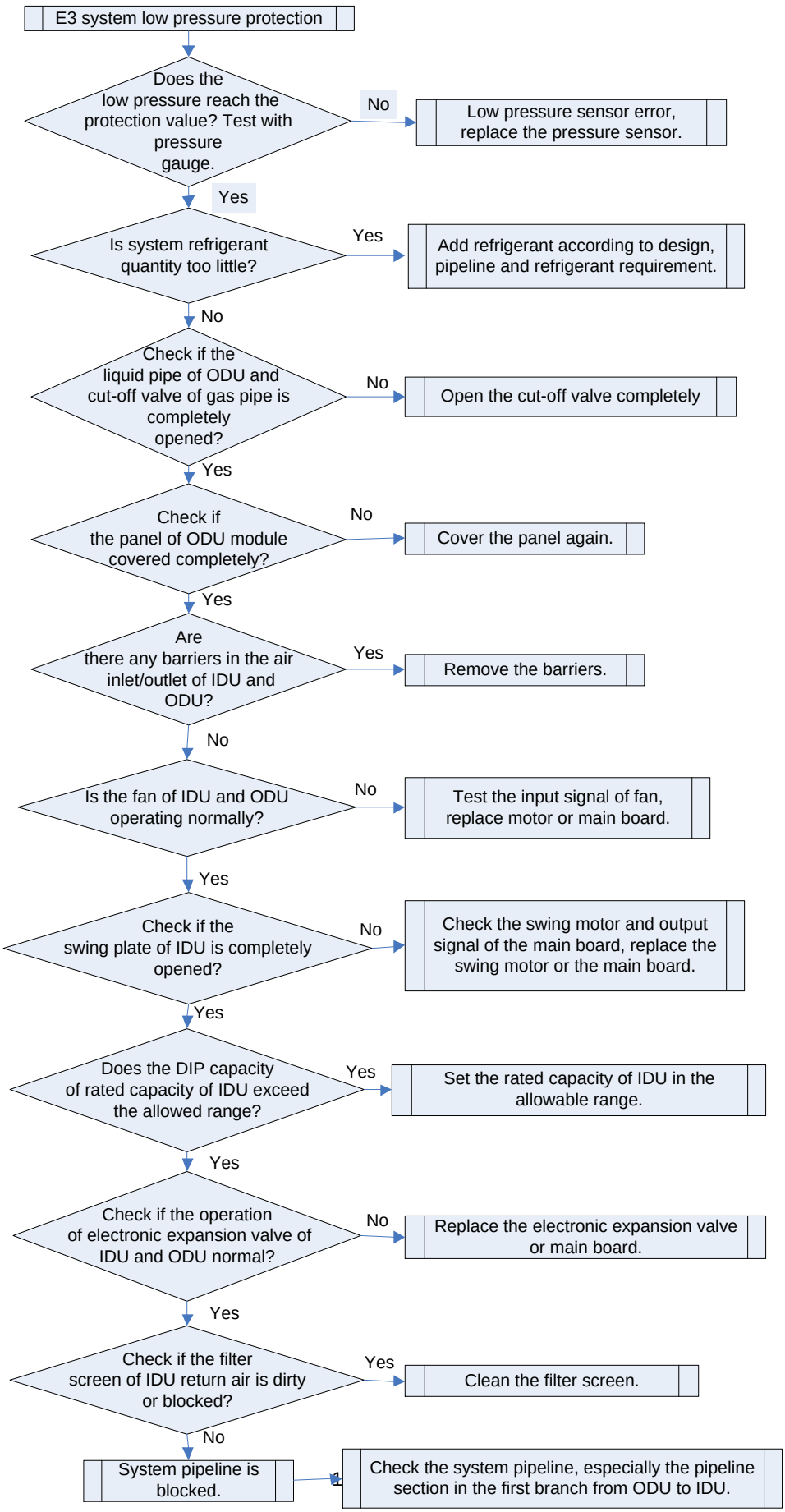
Error judgment condition and method：

Detect the suction pressure of compressor through pressure sensor of low pressur, when the pressure value is below -41℃, the system will stop operation.

Possible reason：

■Cut-off valve of ODU is not opened;
■Low pressure sensor is abnormal;
■Outdoor or indoor fan is abnormal;
■Filter screen of IDU or air duct is blocked (cooling mode);
■Ambient operation temperature is too low;
■Insufficient refrigerant charging quantity
■System pipeline is blocked;

Troubleshooting：


E3 system low pressure protection
Does the low pressure reach the protection value? Test with pressure gauge.
No
Low pressure sensor error, replace the pressure sensor.
Yes
Is system refrigerant quantity too little?
Yes
Add refrigerant according to design, pipeline and refrigerant requirement.
No
Check if the liquid pipe of ODU and cut-off valve of gas pipe is completely opened?
No
Open the cut-off valve completely
Yes
Check if the panel of ODU module covered completely?
No
Cover the panel again.
Yes
Are there any barriers in the air inlet/outlet of IDU and ODU?
Yes
Remove the barriers.
No
Is the fan of IDU and ODU operating normally?
No
Test the input signal of fan, replace motor or main board.
Yes
Check if the swing plate of IDU is completely opened?
No
Check the swing motor and output signal of the main board, replace the swing motor or the main board.
Yes
Does the DIP capacity of rated capacity of IDU exceed the allowed range?
Yes
Set the rated capacity of IDU in the allowable range.
Yes
Check if the operation of electronic expansion valve of IDU and ODU normal?
No
Replace the electronic expansion valve or main board.
Yes
Check if the filter screen of IDU return air is dirty or blocked?
Yes
Clean the filter screen.
No
System pipeline is blocked.
Check the system pipeline, especially the pipeline section in the first branch from ODU to IDU.

(29) “E4” discharge high temperature protection for compressor

Error display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models

Error judgment condition and method：

Detect compressor discharge temperature through compressor exhaust pipe and the temperature sensor of shell, if the detection value is over 118℃, the system will stop the unit for protection.

Possible reason：

- Cut-off valve of ODU is not opened;
- Operation of electronic expansion valve is abnormal;
- Outdoor or indoor fan is abnormal;
- Filter screen or air duct of IDU is blocked (cooling mode);
- Ambient operation temperature exceeds the operation range;
- Refrigerant charge is insufficient;
- System pipeline is blocked;

Troubleshooting：

- Step 1: Check and confirm the cut-off valve of ODU gas pipe and liquid pipe is completely opened;
- Step 2: Restart the unit, after confirming the coil of IDU/ODU expansion valve is normally connected, disconnect the power and energize it to check the reset operation. If it is abnormal, replace the coil or main board; if it is normal, please check the other items;
- Step 3: Restart the unit and observe if the fan of IDU/ODU is operating normally; if not, please replace motor or main board;
- Step 4: If the protection is under cooling mode, please check if the filter screen of IDU is dirty, blocked or if the resistance of air duct is too big;
- Step 5: Confirm that if the air return temperature of the unit exceeds the operation requirement (requirement for cooling mode: external temperature is -5~52℃ and internal temperature is 16~32℃; requirement for heating mode: external temperature is -20~24℃ and internal temperature is 16~30℃);
- Step 6: Confirm if the refrigerant charge is added according to design requirement, insufficient refrigerant will cause protection;
- Step 7: Restart the unit, confirm if the pipeline or expansion valve is blocked according to IDU/ODU parameter and cold/heat status of the pipeline (feel with hands).

(30) “F0” poor main board of outdoor unit

Error display: the main board of outdoor unit and indoor unit will display 

Applicable model: all outdoor units

Error judgment condition and method：

Check the reading of address chip, memory chip and clock chip of ODU main board is normal, if not, it can be judged as abnormal.

Possible reason：

- The clock chip on the main board is damaged.
- The memory chip on the main board is damaged.
- The address chip on the main board is damaged.

Troubleshooting：

- Replace the small CPU board.
- Replace the control board.
- Replace the control board.

(31) “F5” malfunction of discharge temperature sensor for compressor 1

Error display: the main board of outdoor unit and indoor unit will display 

Applicable model: all outdoor units

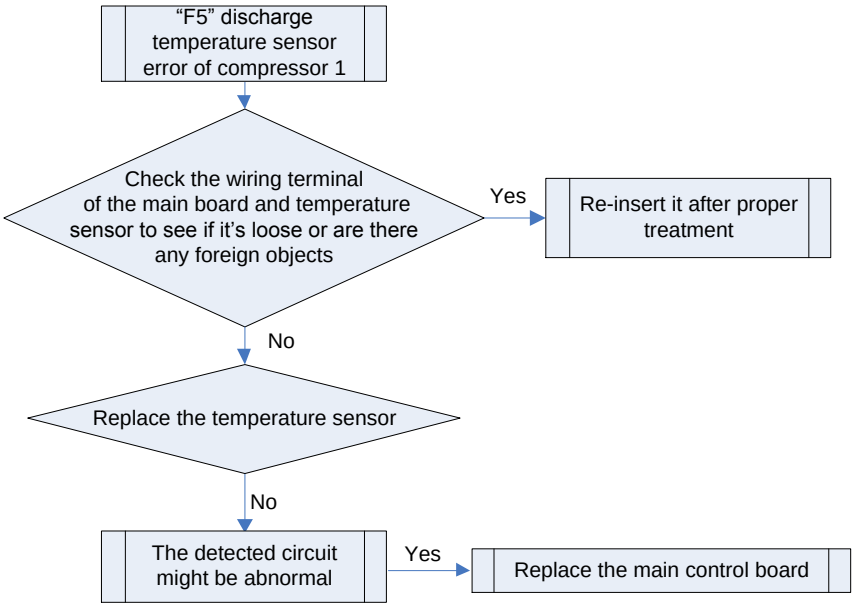
Error judgment condition and method：

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, if the sampling AD value exceeds upper limit and lower limit in 30 seconds continuously, report the error

Possible reason：

■Poor contact between discharge temperature sensor and terminal in mainboard interface
■The discharge temperature sensor is abnormal
■The detected circuit is abnormal

Troubleshooting：



(32) "J7" air-mixing protection for 4-way valve

Error display: the main board of outdoor unit and indoor unit will display 

Applicable model: heat pump models

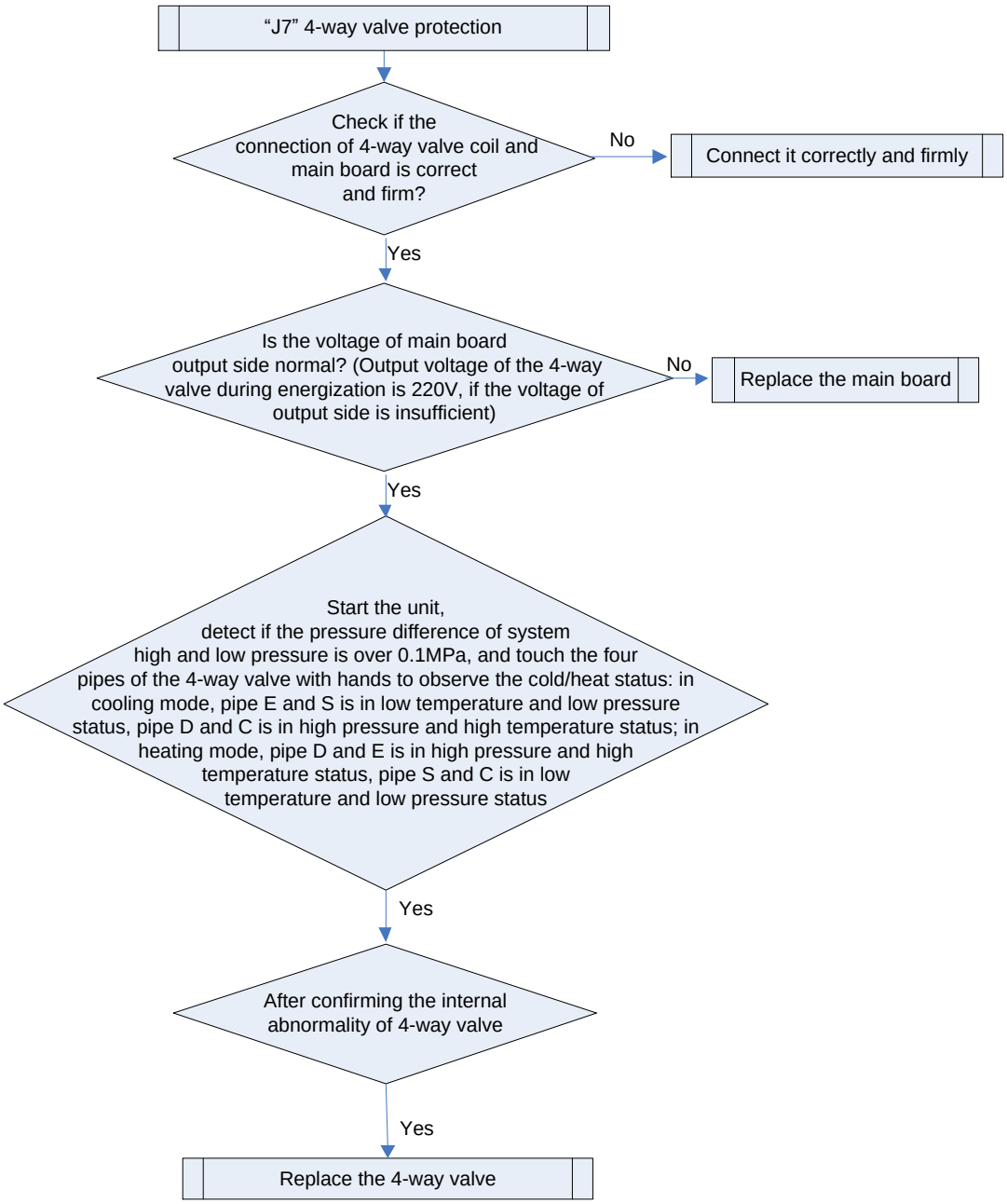
Error judgment condition and method:

Detect system high and low pressure through pressure sensor, start the unit, when the pressure difference of high and low pressure is less than 0.1MPa, the unit will be stopped for protection.

Possible reason:

■Coil or connection wire is abnormal;
■The main board is abnormal;
■The internal of 4-way valve is abnormal;

Troubleshooting:



(33) "L1" Indoor fan protection

Error display: wired controller of IDU and the dash receiver of IDU will display 

Error judgment condition and method:

Check if the rotation speed of IDU is too slow, or it stops rotation, or protection signal of outdoor fan is transferred. If yes, it is judged that indoor fan protection occurs.

Possible reason:

■Motor stops operation or it is blocked

■IDU mainboard is abnormal

(34) “L5” freeze protection

Error display: wired controller of IDU and the dash receiver of IDU will display 

Error judgment condition and method:

Check IDU pipe temperature. When pipe temperature is too low, freeze protection will be activated to prevent freezing damage of evaporator.

Possible reason：

■IDU filter and evaporator are dirty

■IDU motor is blocked

■Refrigerant amount is insufficient

■Ambient temperature of IDU and ODU is too low

(35) “n0” energy conservation setting for operation

Error display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models

Error judgment condition and method：

It is a code for function setting status, which means the system has entered energy conservation setting status. “00” means comfort shall take preferential control; “01” means energy conservation shall take preferential control; at this time, 15% of energy conservation can be achieved to the greatest extent.

Possible reason：——

Troubleshooting：——

(36) “n4” limit setting for the maximum output capacity

Error display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models

Error judgment condition and method：

It is a code for function setting status, which means the system has entered the highest limit setting for the maximum output capacity. “10” means the highest output capacity is 100%; “09” means the highest output capacity is 90%; “08” means the highest output capacity is 80%.

Possible reason： ——

Troubleshooting：——

(37) “n6” malfunction inquiry

Error display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models

Error judgment condition and method：

It is a status inquiry code, which means the system has entered malfunction inquiry status. At this time, 5 historical malfunctions can be reviewed, please review the malfunctions of IDU and ODU separately.

Possible reason：——

Troubleshooting：——

(38) “n7” parameters inquiry

Error display: the main board of outdoor unit and indoor unit will display 

Applicable model: all models

Error judgment condition and method：

It is a status inquiry code, which means the system has entered parameter inquiry status.

Possible reason：——

Troubleshooting：——

(39) “n8” engineering series number inquiry for indoor unit

Error display: wired controller of IDU will display 

Applicable model: all models

Error judgment condition and method：

It is a status inquiry code, which means the system has entered parameter inquiry status. After entering this function, the wired controller will display the engineering code of the IDU, meanwhile, the buzzer of the IDU will give out a sound.

Possible reason：——

Troubleshooting：——

(40) “nA” quantity inquiry status of online IDU

Error display: the main board of ODU will display 

Applicable model: all models

Error judgment condition and method：

It is a status inquiry code, at this time, the quantity of online IDU can be inquired.

Possible reason： **——**

Troubleshooting：——

(41) “nH” heating only model

Error display: ODU mainboard displays 

Applicable model: all models

Condition and method for fault judgement:

The code represents the heating only status, which prompts that the system has been set as heating only status, the IDU can only conduct heating operation.

Possible cause: ——

Troubleshooting: ——

(42) “nC” cooling only model

Display: ODU mainboard displays 

Applicable model: all models

Condition and method for fault judgement:

The code represents the cooling only status, which prompts that the system has been set as cooling only status, the IDU can only conduct cooling operation.

Possible cause: ——

Troubleshooting: ——

(43) “nE” negative code

Error display: ODU mainboard displays 

Applicable model: all models

Condition and method for fault judgement

The code is negative code that prompts the data displayed later is negative.

Possible cause: ——

Troubleshooting: ——

(44) “nF” fan model

Error display: ODU mainboard displays 

Applicable model: all models

Condition and method for fault judgement:

The code represents fan status, which prompts that the system has been set as fan status, the IDU can only conduct fan mode operation.

Possible cause: ——

Troubleshooting: ——

(45) “P0” malfunction driven board for compressor

Error display: IDU wired controller displays 

Applicable model: all models

Condition and method for fault judgement:

View the error code via IDU wired controller, if the IDU wired controller displays PO, then view the display of dual-8 nixie tube of main control board of ODU. According to the error code of main control board can estimate the the specific error of driven board of compressor, and then conduct troubleshooting by referring to specific troubleshooting methods.

Possible causes:

■Reset protection for the driven module of compressor (dual-8 nixie tube of main control board of ODU displays P3)

■Malfunction of driven temperature sensor for compressor (dual-8 nixie tube of main control board of ODU displays P7)

■Overheating protection for driven IPM of compressor (dual-8 nixie tube of main control)

■Circuit malfunction of driven current detection for compressor (dual-8 nixie tube of main control board of ODU displays PC)

■Malfunction of driven charging loop for compressor (dual-8 nixie tube of main control board of ODU displays PF)

■Desynchronizing protection for inverter compressor (dual-8 nixie tube of main control board of ODU displays P9)

■Failure startup for inverter compressor (dual-8 nixie tube of main control board of ODU displays PJ)

Troubleshooting: find corresponding solution according to the error code displayed in the mainboard of

ODU.

(46) “P2” power voltage protection for the driven board of compressor

Error display: IDU wired controller displays 

Applicable model: all models

Condition and method for fault judgement:

View the error code via IDU wired controller, if the IDU wired controller displays P2, then view the display of dual-8 nixie tube of main control board of ODU. According to the error code of main control board can estimate the the specific error of driven board of compressor, and then conduct troubleshooting by referring to specific troubleshooting methods.

Possible causes:

■High voltage protection for driven DC bus bar of compressor (dual-8 nixie tube of main control board of ODU displays PH)

■Low voltage protection for driven DC bus bar of compressor (dual-8 nixie tube of main control board of ODU displays PL)

Troubleshooting: find corresponding solution according to the error code displayed in the mainboard of ODU.

(47) “P3” reset protection for the driven module of compressor

Error display: ODU mainboard displays 

Applicable model: all models

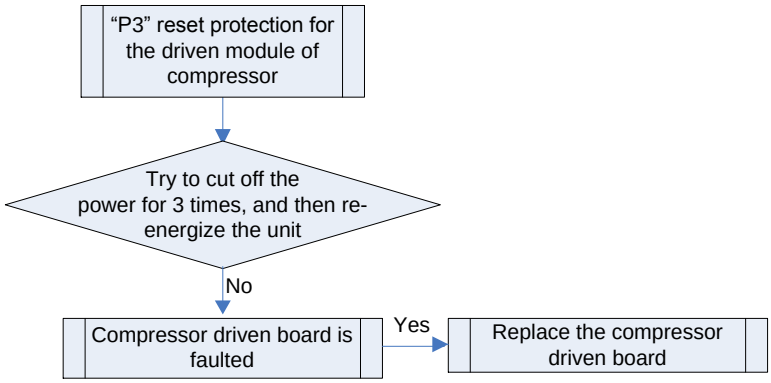
Condition and method for fault judgement:

View the error code displayed in dual-8 nixie tube of main control board of ODU, if the nixie tube displays P3, it means reset protection for the driven module of compressor.

Possible cause:

■Compressor driver board error

Troubleshooting:



(48) "P5" overcurent protection for inverter compressor

Error display: ODU mainboard displays 

Applicable model: all models

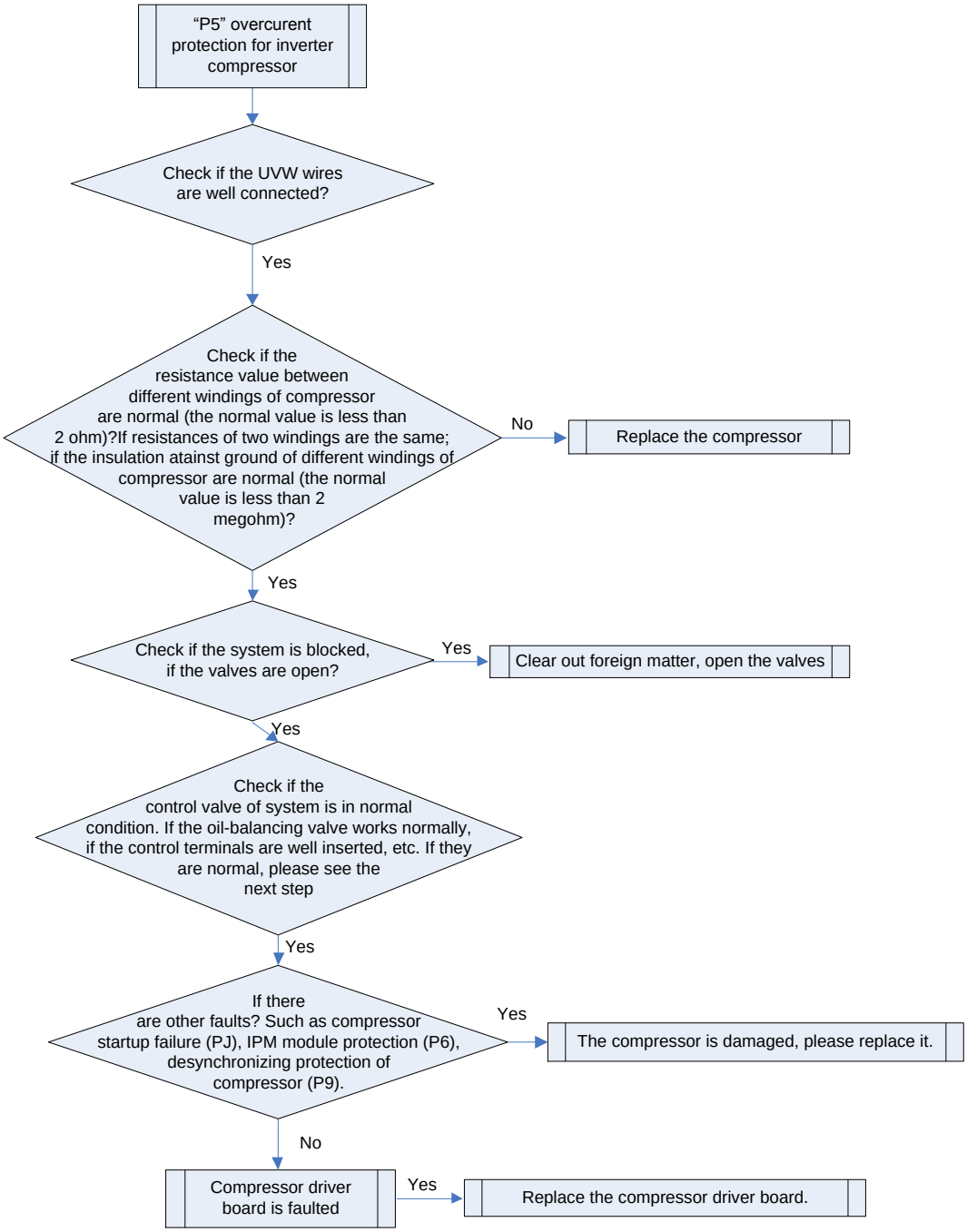
Condition and method for fault judgement:

View the error code displayed in dual-8 nixie tube of main control board of ODU, if the nixie tube displays P5, it means overcurent protection for inverter compressor.

Possible cause:

■Poor contact of compressor UVW wires;
■Incorrect connecting order of compressor UVW wires;
■Compresso is damaged;
■The system is blocked;
■IPM module of compressor driven board is damaged.

Troubleshooting:



(49) "P6" driven IPM module protection for compressor

Error display: ODU mainboard displays 

Applicable model: all models

Condition and method for fault judgement:

View the error code displayed in dual-8 nixie tube of main control board of ODU, if the nixie

tube displays P6, it means driven IPM module protection for compressor.

Possible causes:

■Poor contact of compressor UVW wires;
■Incorrect connecting order of compressor UVW wires;
■Compresso is damaged;
■The system is blocked;
■IPM module of compressor driven board is damaged.

(50) "P7" malfunction of driven temperature sensor for compressor

Error display: ODU mainboard displays 

Applicable model: all models

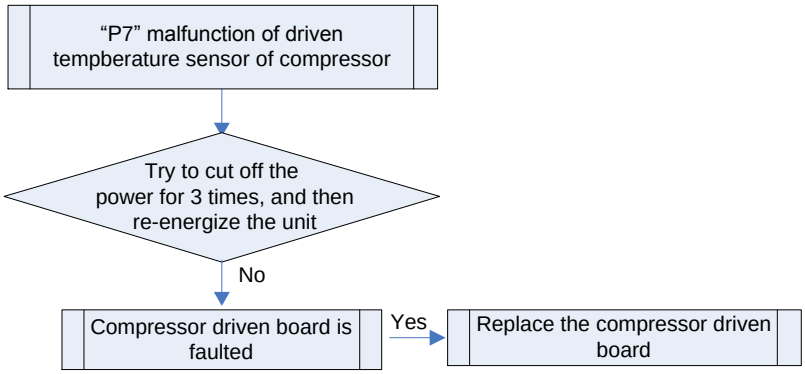
Condition and method for fault judgement:

View the error code displayed in dual-8 nixie tube of main control board of ODU, if the nixie tube displays P7, it means malfunction of driven temperature sensor of compressor.

Possible cause:

■Driven board of compressor is faulted.

Troubleshooting:



(51) "P8" overheating protection for driven IPM of compressor

Error display: ODU mainboard displays 

Applicable model: all models

Condition and method for fault judgement

View the error code displayed in dual-8 nixie tube of main control board of ODU, if the nixie tube displays P8, it means overheating protection for driven IPM of compressor.

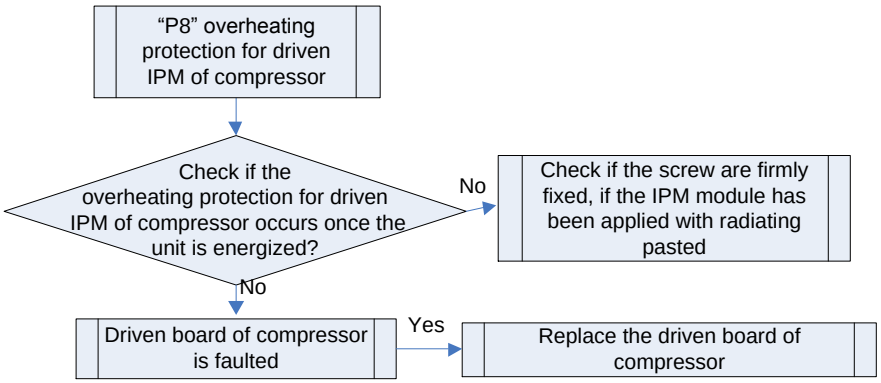
Possible cause:

■Screws for IPM module has not been firmly fixed.

■No radiating paste in the IPM module, uneven application of radiating paste or the radiating paste is dry;

■The driven board od compressor is faulted.

Troubleshooting:



(52) "P9" desynchronizing protection for inverter compressor

Error display:ODU mainboard displays 

Applicable model: all models

Condition and method for fault judgement:

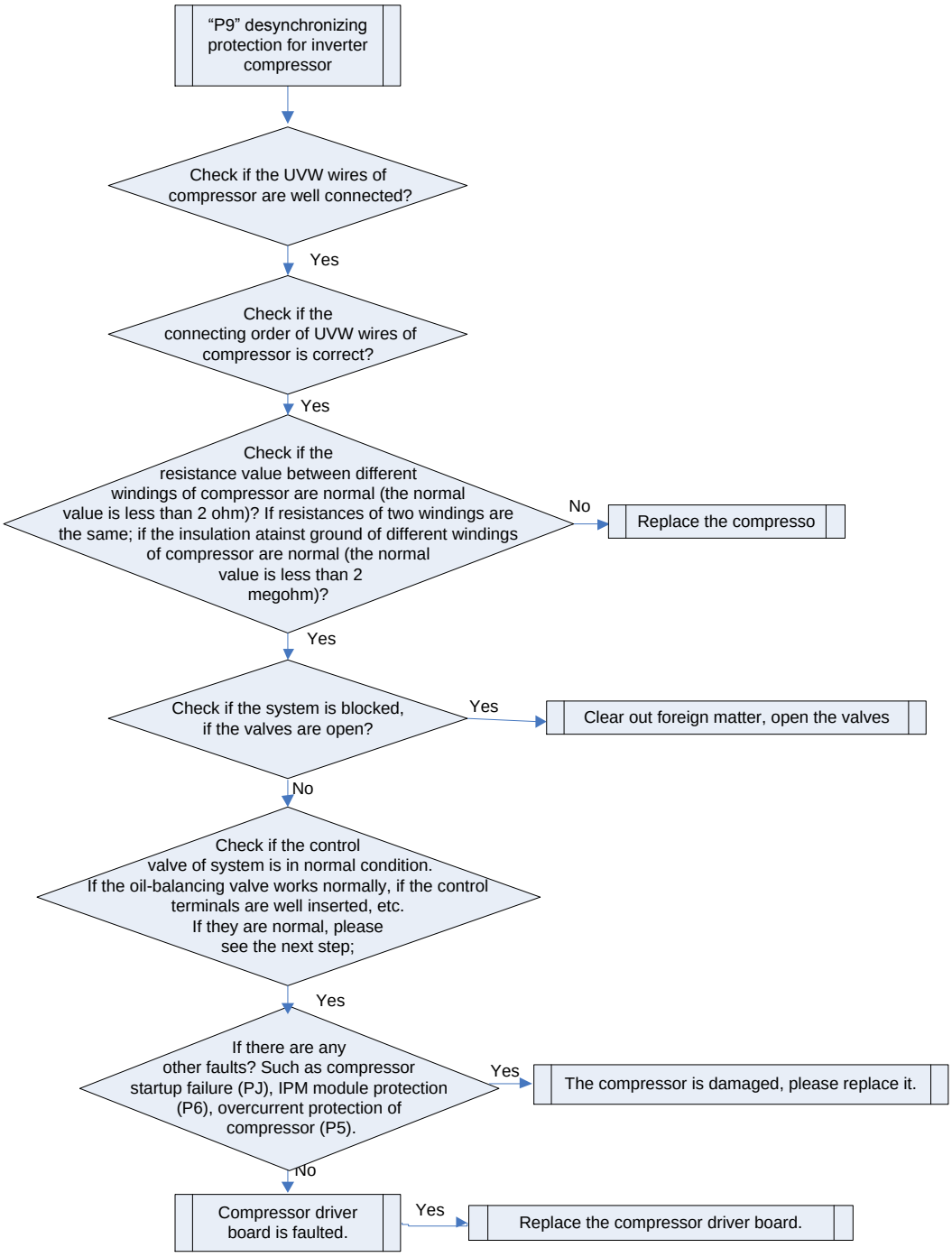
View the error code displayed in dual-8 nixie tube of main control board of ODU, if the nixie tube displays P9, it means desynchronizing protection for inverter compressor.

Possible causes:

■Driven board of compressor is faulted;

■Compresor is damaged.

Troubleshooting:



(53) "PC" circuit malfunction of driven current detection for compressor

Error display: ODU mainboard displays 

Applicable model: all models

Condition and method for fault judgement:

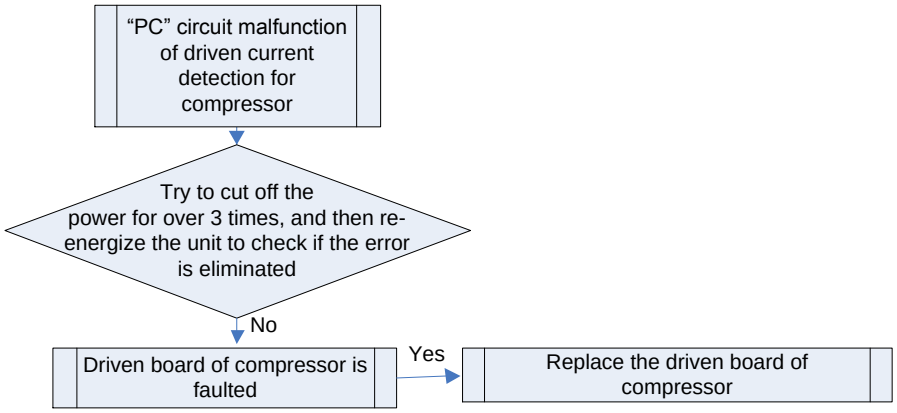
View the error code displayed in dual-8 nixie tube of main control board of ODU, if the nixie

tube displays PC, it means circuit malfunction of driven current detection for compressor.

Possible cause:

■Driven board of compressor is faulted;

Troubleshooting:



(54) "PH" high voltage protection for driven DC bus bar of compressor

Error display: ODU mainboard displays 

Applicable model: all models

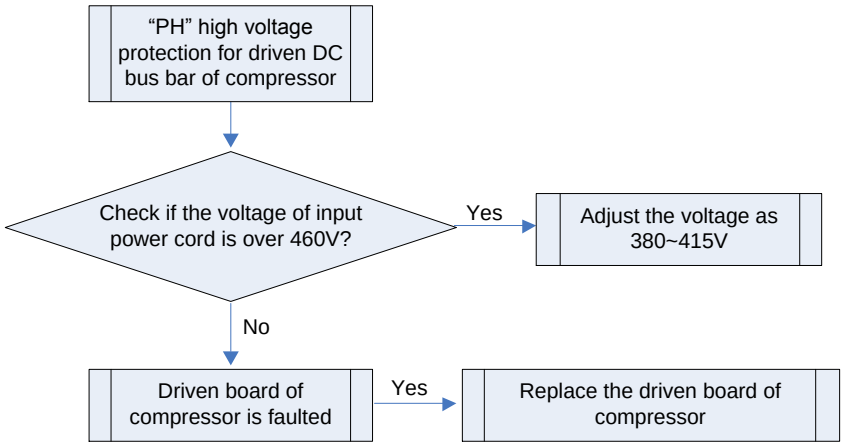
Condition and method for fault judgement:

Check if the voltage of input power cord for mainboard is over 460V, if yes, the protection occurs.

Possible causes:

■Voltage of input power cord is over 460V;
■Driven board of compressor is faulted.

Troubleshooting:



(55) "PL" low voltage protection for driven DC bus bar of compressor

Error display:ODU mainboard displays 

Applicable model: all models

Condition and method for fault judgement:

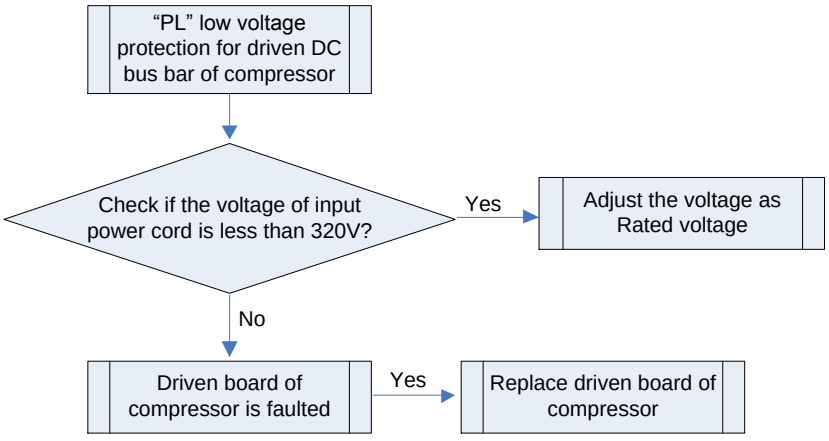
Check if the voltage of input power cord for mainboard is less than 320V, if yes, the protection occurs.

Possible causes:

■Voltage of input power cord is less than 320V

■Driven board of compressor is faulted.

Troubleshooting:



(56) "PJ" failure startup for inverter compressor

Error display:ODU mainboard displays 

Applicable model: all models

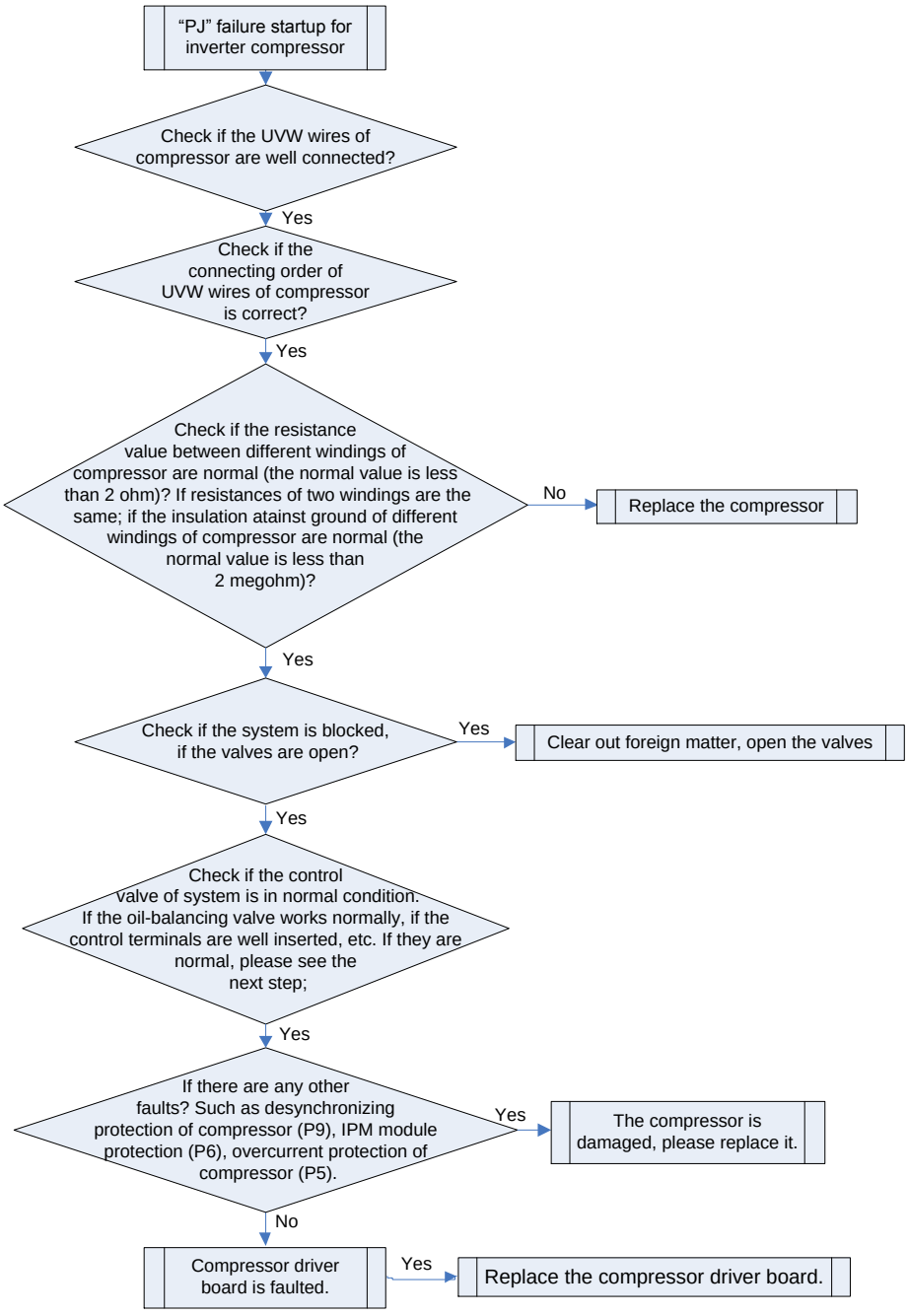
Condition and method for fault judgement:

View the error code displayed in dual-8 nixie tube of main control board of ODU, if the nixie tube displays PJ, it means failure startup for inverter compressor.

Possible causes:

■Poor contact of compressor UVW wires;
■Compressor is damaged;
■Driven board of compressor is faulted.

Troubleshooting:



(57) "U0" insufficient preheat time for compressor

Error display:ODU mainboard and IDU display 

Applicable model: all models

Condition and method for fault judgement:

Check the preheat time of oil temperature before startup of compressor, if it is less than 8 hours, it will report the error.

Possible cause: ——

Troubleshooting:

Preheat the unit for over 8 hours before startup.

(58) “U2” wrong setting of capacity dial code/jumper cap of outdoor unit

Error display: ODU mainboard and IDU display 

Applicable model: all ODUs

Condition and method for fault judgement:

Inconsistency between the capacity dial code detected by ODU mainboard and actual capacity of unit.

Inconsistency between the jumper cap value detected by ODU mainboard and actual jumper cap value of unit.

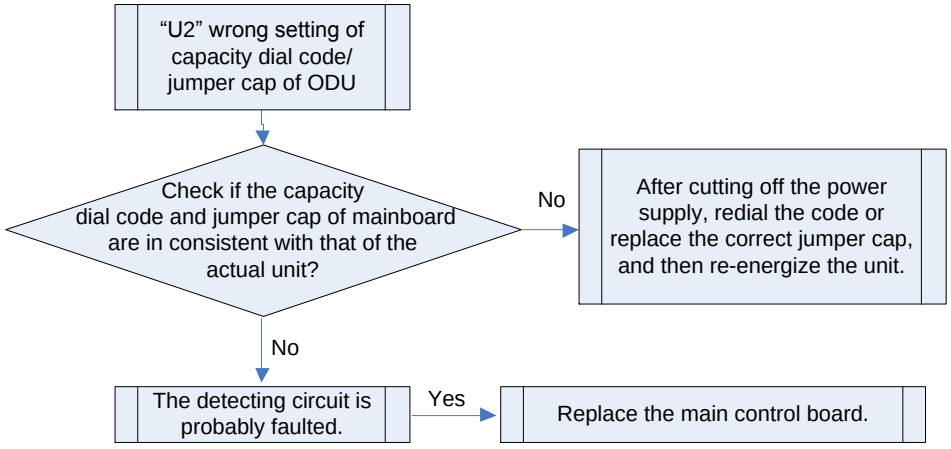
Possible causes:

■Wrong capacity dial code or wrong jumper cap (some models are without juper cap)

■Dial code switch or jumper cap is damaged;

■Detecting circuit is faulted.

Troubleshooting:



(59) “U6” alarm due to abnormal valve

Error display: ODU mainboard and IDU display 

Applicable model: all models

Condition and method for fault judgement:

During debugging, detect the system parameters via pressure senser to estimate if the the cut-off valve of ODU is open; if the parameters are abnormal, it will prompt to check to open

the cut-off valve again, after it is checked, press SW5 to enter to the next step.

Possible cause:

■Cut-off vale of ODU is not opened;

Troubleshooting:

Recheck and open the cut-off valve of ODU.

(60) Setting for indoor unit and oudoor unit is succeeded

Error display:ODU mainboard and IDU display 

Applicable model: all models

Condition and method for fault judgement：

The code refers to quantity of state instead of error. During the debugging, it means the master IDU has been successively set.

Possible cause: ——

Troubleshooting: ——

(61) Poor cooling/heating effect

Applicable model: all IDUs

Condition and method for fault judgement:

1、When IDU operates under cooling mode, and the electronic expansion valve opens to 480PLS, tube outlet temperature of IDU coil is 5℃ or above over than tube inlet temperature;

2、When IDU operates under heating mode, and the electronic expansion valve opens to 480PLS, tube inlet temperature of IDU coil is 12℃ or above less than corresponding saturation temperature of high pressure;

Possible causes:

■Cut-off valve of ODU has not been opened to the greatest flow position as required.

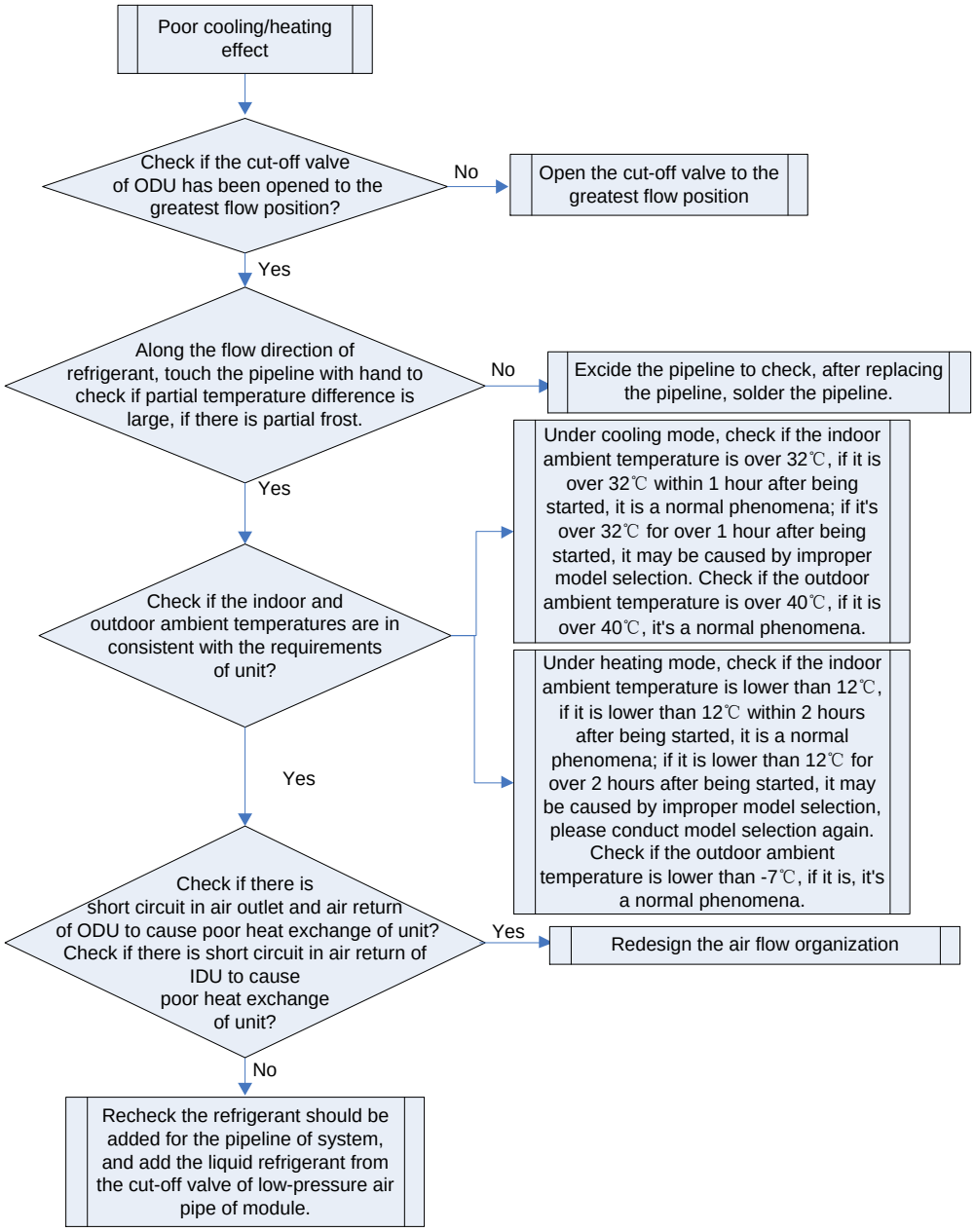
■The system pipeline is blocked.

■Operating environment condition exceeds the applicable range.

■Poor design of air flow organization.

■Insufficient charging volume of refrigerant.

Troubleshooting:



3 Attachment-Inquiry of General Parameters

3.1 Corresponding Saturation Temperature for Pressure of R410A Refrigerant

Temperature (℃)	Corresponding saturation pressure (BAR)	Temperature (℃)	Corresponding saturation pressure (BAR)	Temperature (℃)	Corresponding saturation pressure (BAR)
-43	1.54	-9	5.96	25	16.4
-42	1.61	-8	6.16	26	16.9
-41	1.68	-7	6.37	27	17.3
-40	1.76	-6	6.58	28	17.8
-39	1.84	-5	6.80	29	15.9
-38	1.93	-4	7.03	30	18.7
-37	2.02	-3	7.26	31	19.2
-36	2.11	-2	7.50	32	19.7
-35	2.24	-1	7.74	33	20.2
-34	2.33	0	7.99	34	20.7
-33	2.43	1	5.94	35	21.2
-32	2.53	2	8.50	36	21.7
-31	2.64	3	8.77	37	22.3
-30	2.75	4	9.04	38	22.8
-29	2.86	5	9.32	39	23.4
-28	2.98	6	9.61	40	24.0
-27	3.10	7	9.90	41	24.6
-26	3.22	8	10.2	42	25.2
-25	3.35	9	10.5	43	25.8
-24	3.48	10	10.8	44	26.4
-23	3.61	11	11.1	45	27.0
-22	3.75	12	11.5	46	27.7
-21	3.89	13	11.8	47	28.3
-20	4.04	14	12.1	48	29.0
-19	4.19	15	12.5	49	29.6
-18	4.35	16	12.8	50	30.3
-17	4.51	17	13.2	52	31.7
-16	4.67	18	13.6	54	33.2
-15	4.84	19	14.0	56	34.7
-14	5.02	20	14.4	58	36.3
-13	5.19	21	14.7	60	37.9
-12	5.38	22	15.2	62	40.17
-11	5.57	23	15.6	65	42.78
-10	5.76	24	16.0	67	44.57

3.2 Corresponding Table for Resistance and Temperatur of Temperature Sensor

3.2.1 Corresponding table for 15kΩ resistance of ambient temperature sensor and temperature

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-20	144	10	29.9	40	7.967
-19	138.1	11	28.51	41	7.653
-18	128.6	12	27.18	42	7.352
-17	121.6	13	25.92	43	7.065
-16	115	14	24.73	44	6.791
-15	108.7	15	23.6	45	6.529
-14	102.9	16	22.53	46	6.278
-13	97.4	17	21.51	47	6.038
-12	92.22	18	20.54	48	5.809
-11	87.35	19	19.63	49	5.589
-10	82.75	20	18.75	50	5.379
-9	78.43	21	17.93	51	5.179
-8	74.35	22	17.14	52	4.986
-7	70.5	23	16.39	53	4.802
-6	66.88	24	15.68	54	4.625
-5	63.46	25	15	55	4.456
-4	60.23	26	14.36	56	4.294
-3	57.18	27	13.74	57	4.139
-2	54.31	28	13.16	58	3.99
-1	51.59	29	12.6	59	3.848
0	49.02	30	12.07	60	3.711
1	46.8	31	11.57		
2	44.31	32	11.09		
3	42.14	33	10.63		
4	40.09	34	10.2		
5	38.15	35	9.779		
6	36.32	36	9.382		
7	34.58	37	9.003		
8	32.94	38	8.642		
9	31.38	39	8.297		

3.2.2 Corresponding table for 20kΩ resistance of tube temperature sensor and temperature

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-30	361.8	10	39.87	50	7.173
-29	339.8	11	38.01	51	6.905
-28	319.2	12	36.24	52	6.648
-27	300	13	34.57	53	6.403
-26	282.2	14	32.98	54	6.167
-25	265.5	15	31.47	55	5.942
-24	249.9	16	30.04	56	5.726
-23	235.3	17	28.68	57	5.519
-22	221.6	18	27.39	58	5.32
-21	208.9	19	26.17	59	5.13
-20	196.9	20	25.01	60	4.948
-19	181.4	21	23.9	61	4.773
-18	171.4	22	22.85	62	4.605
-17	162.1	23	21.85	63	4.443
-16	153.3	24	20.9	64	4.289
-15	145	25	20	65	4.14
-14	137.2	26	19.14	66	3.998
-13	129.9	27	18.32	67	3.861
-12	123	28	17.55	68	3.729
-11	116.5	29	16.8	69	3.603
-10	110.3	30	16.1	70	3.481
-9	104.6	31	15.43	71	3.364
-8	99.13	32	14.79	72	3.252
-7	94	33	14.18	73	3.144
-6	89.17	34	13.59	74	3.04
-5	84.61	35	13.04	75	2.94
-4	80.31	36	12.51	76	2.844
-3	76.24	37	12	77	2.752
-2	72.41	38	11.52	78	2.663
-1	68.79	39	11.06	79	2.577
0	65.37	40	10.62	80	2.495
1	62.13	41	10.2	81	2.415
2	59.08	42	9.803	82	2.339
3	56.19	43	9.42	83	2.265
4	53.46	44	9.054	84	2.194
5	50.87	45	8.705	85	2.125
6	48.42	46	8.37	86	2.059

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
7	46.11	47	8.051	87	1.996
8	43.92	48	7.745	88	1.934
9	41.84	49	7.453	89	1.875

3.2.3 Corresponding table for 50kΩ resistance of air discharge temperature sensor and temperature

Note: including compressor top temperature sensor and air discharge tube temperature sensor.

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
10	98.01	50	17.65	90	4.47	130	1.49
11	93.42	51	16.99	91	4.33	131	1.45
12	89.08	52	16.36	92	4.20	132	1.41
13	84.96	53	15.75	93	4.08	133	1.38
14	81.05	54	15.17	94	3.96	134	1.35
15	77.35	55	14.62	95	3.84	135	1.32
16	73.90	56	14.09	96	3.73	136	1.28
17	70.50	57	13.58	97	3.62	137	1.25
18	67.34	58	13.09	98	3.51	138	1.22
19	64.33	59	12.62	99	3.41	139	1.20
20	61.48	60	12.17	100	3.31	140	1.17
21	58.77	61	11.74	101	3.22	141	1.15
22	56.19	62	11.32	102	3.13	142	1.12
23	53.74	63	10.93	103	3.04	143	1.09
24	51.41	64	10.54	104	2.95	144	1.07
25	49.19	65	10.18	105	2.87	145	1.04
26	47.08	66	9.83	106	2.79	146	1.02
27	45.07	67	9.49	107	2.72	147	1.00
28	43.16	68	9.17	108	2.64	148	0.98
29	41.31	69	8.95	109	2.57	149	0.95
30	39.61	70	8.56	110	2.50	150	0.93
31	37.96	71	8.27	111	2.43		
32	36.38	72	7.99	112	2.37		
33	34.88	73	7.73	113	2.30		
34	33.45	74	7.47	114	2.24		
35	32.09	75	7.22	115	2.18		
36	30.79	76	6.99	116	2.12		
37	29.54	77	6.76	117	2.07		
38	28.36	78	6.54	118	2.01		
39	27.23	79	6.33	119	1.96		
40	26.15	80	6.13	120	1.91		

Temperatur e (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperatur e (°C)	Resistance (kΩ)	Temperatur e (°C)	Resistance (kΩ)
41	25.11	81	5.93	121	1.87		
42	24.13	82	5.75	122	1.82		
43	23.19	83	5.56	123	1.77		
44	22.29	84	5.39	124	1.73		
45	21.43	85	5.22	125	1.68		
46	20.60	86	5.06	126	1.64		
47	19.81	87	4.90	127	1.60		
48	19.06	88	4.75	128	1.56		
49	18.34	89	4.61	129	1.52		

4 Removal of Parts

4.1 Key parts

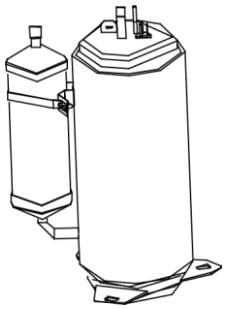
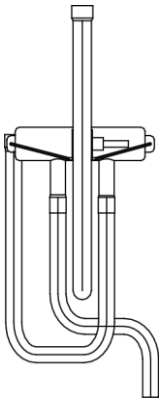
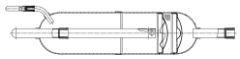
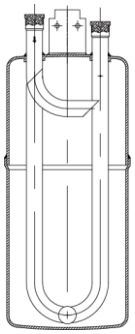
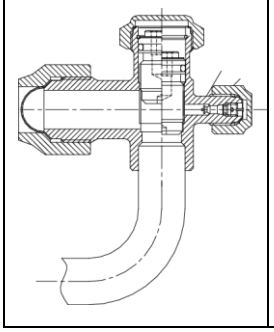
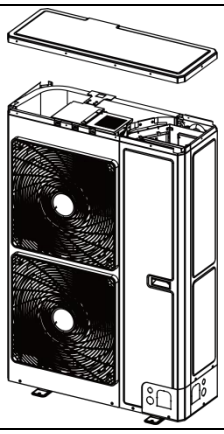
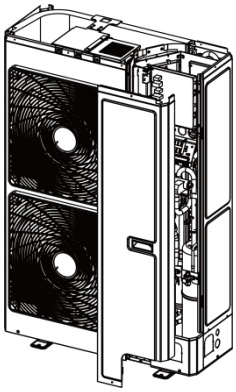
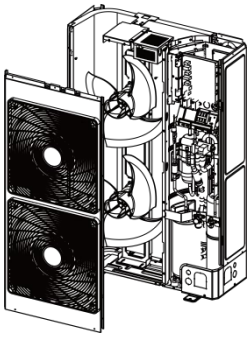
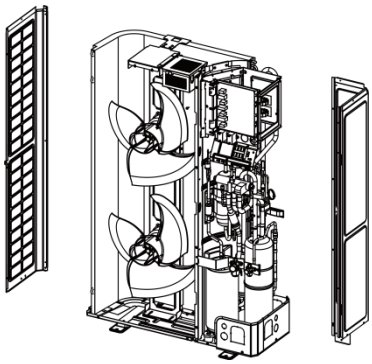
Photo	Name	Function
	compressor	Core part of air conditioning system. It sucks low temperature and low pressure gas, compress it to high temperature and high pressure gas, and then discharge it.
	Electronic expansion valve	Throttling device. It transforms high pressure refrigerant liquid into low pressure steam.

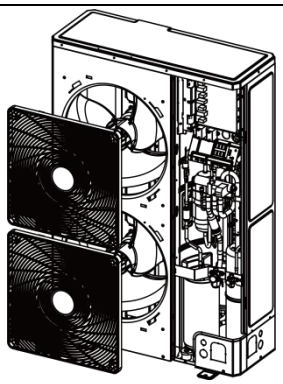
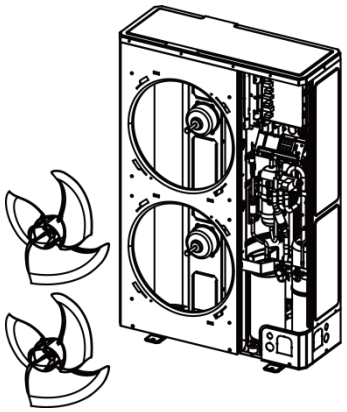
Photo	Name	Function
	4-way valve	It changes the flow direction of refrigerant for switching between cooling and heating.
	Oil separator	It stays between discharge outlet of compressor and inlet of condenser. It used for separating the lubricant oil of compressor when the high temperature and high pressure 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.
	Cut-off valve	It used for connecting indoor unit and outdoor unit, and used for maintenance and installation.

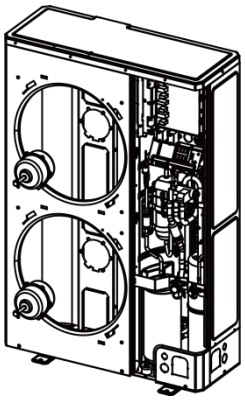
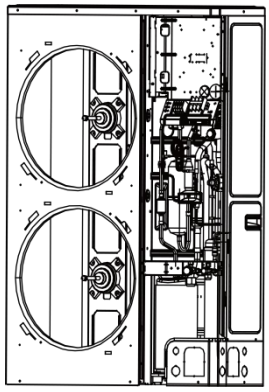
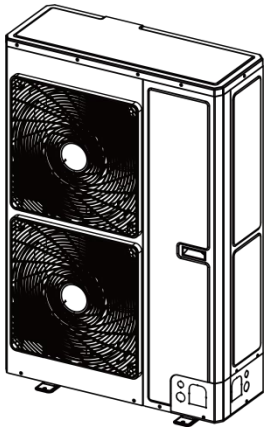
4.2 Disassembly of key components

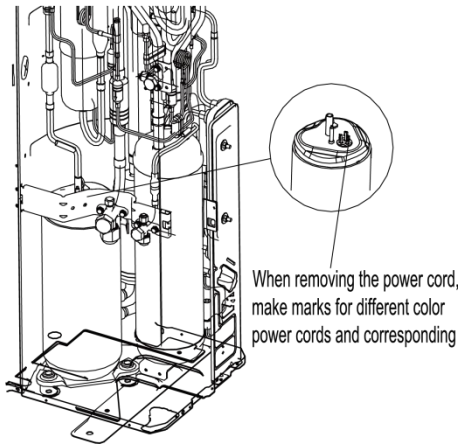
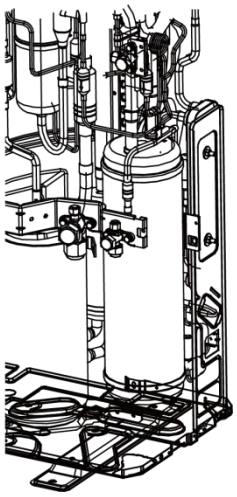
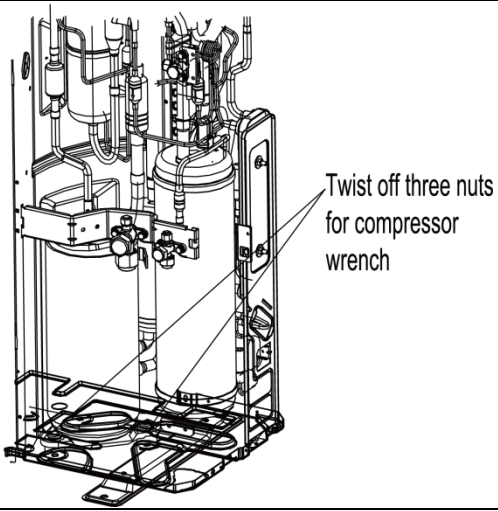
4.2.1 Disassembly of outdoor unit

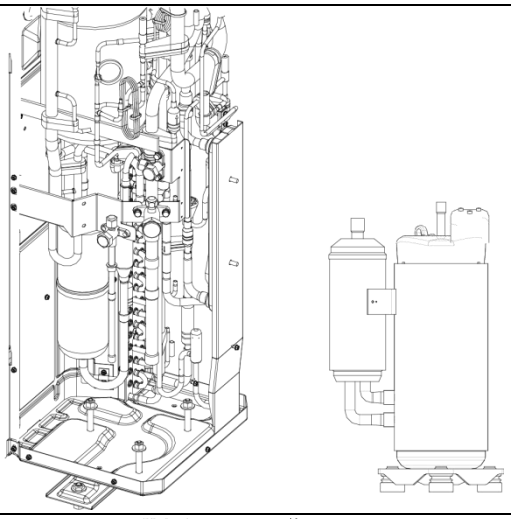
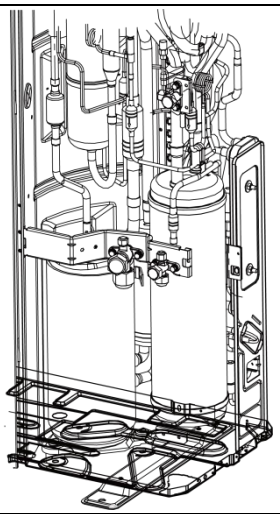
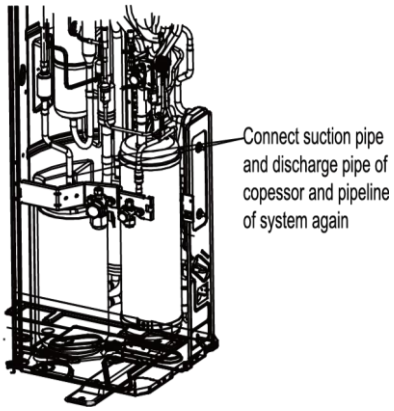
Removal operation for panel		
Remark: Before removing the panel, please make sure that the unit is disconected with the power		
Process	Photo	Operation Instruction
1、Remove top cover		● Loose the screws fixing the top cover with screwdriver ● Hold the top cover upwards and then put it on the floor flatly
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

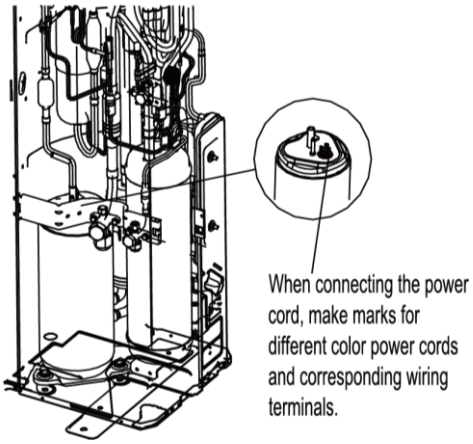
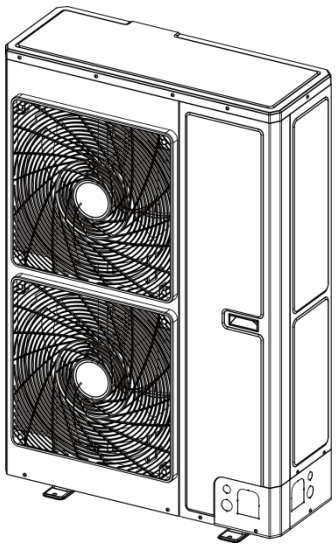
Removal operation for panel		
Remark: Before removing the panel, please make sure that the unit is disconected with the power		
Process	Photo	Operation Instruction
4)Remove left side plate and rear side plate		● Loose screws fixing left side plate and rear side plate with screwdriver ● remove the rear side plate

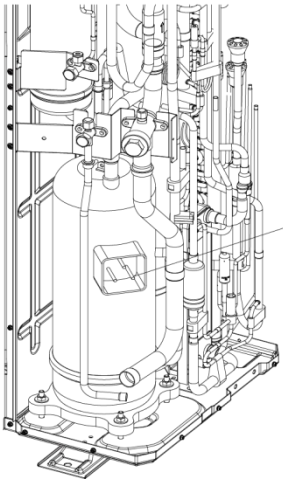
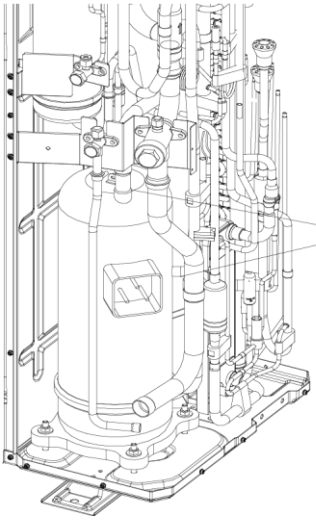
Removal operation for blade		
Remark: Before removing the motor, please make sure that the unit is disconnected with the power.		
Process	Photo	Operation Instruction
1) Remove grille		● Loose screws fixing the panel with screwdriver ● Then remove the grille
2) Remove blade		● Loosen nuts fixing the blade with wrench ● Then remove the blade and put it on the floor flatly

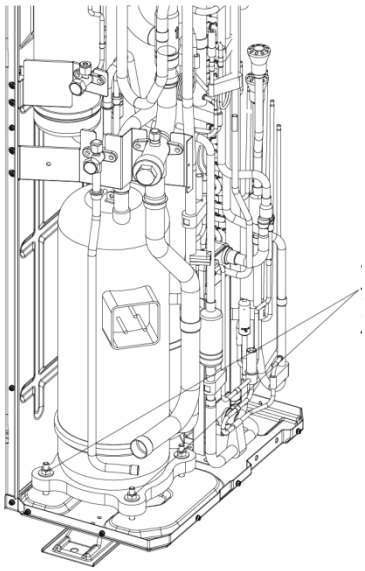
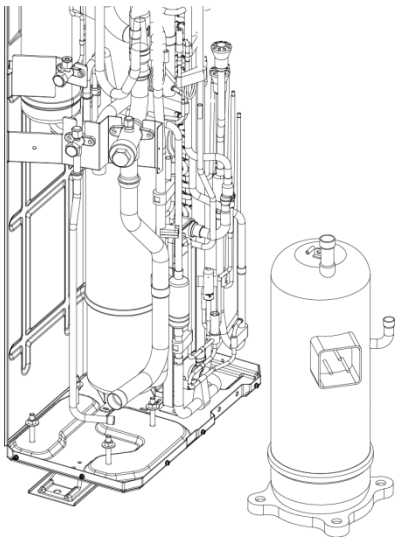
Removal operation for blade		
Remark: Before removing the motor, please make sure that the unit is disconnected with the power.		
Process	Photo	Operation Instruction
3) Remove motor		Loose screws fixing the motor with screwdriver ● then remove the power cord of motor ● Take out the damaged motor
4)Install motor		● Replace the motor, tighten screws with screwdriver and then connect teh power cord of motor
5) Assemble unit		● Assemble the unit in the the converse sequence

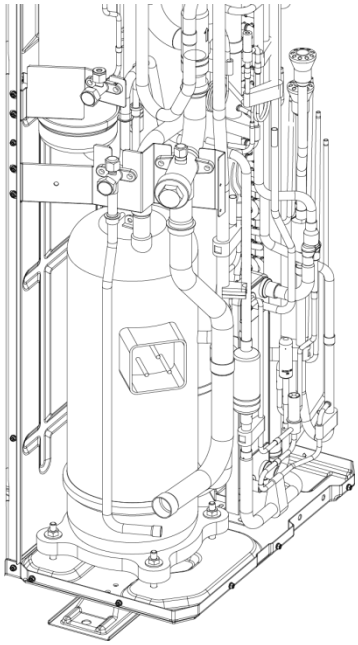
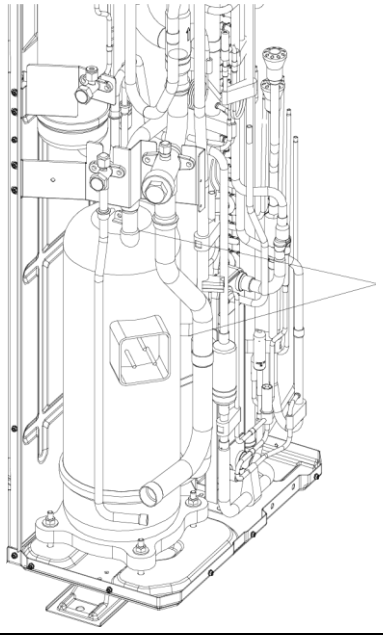
Removal operation of compressor Applicable to RF28WPd/Na-M(O)、LF28WPd/Na-M(O)		
Remark: Before removing the compressor, please make sure that there's no refrigerant inside the pipeline and the power is disconnected.		
Process	Photo	Operation Instruction
1) Remove wiring cover of compressor		●Loose screws fiixng 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 and connected pipeline		● Weld suction pipe 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

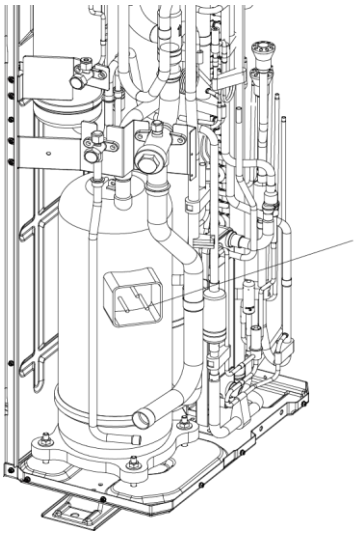
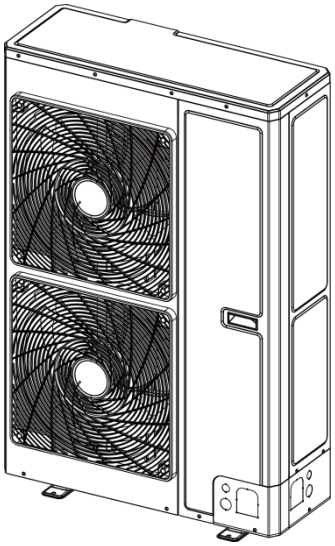
Removal operation of compressor Applicable to RF28WPd/Na-M(O)、LF28WPd/Na-M(O)		
Remark: Before removing the compressor, please make sure that there's no refrigerant inside the pipeline and the power is disconnected.		
4)Take out the compressor and replace it		● Take out the compressor and replace it Note: When replacing the compressor, do not damage nearby pipelines and other parts
5)Fix the new compressor at the chassis		After replacing the compresor, fix the nuts at the bottom of compressor
6) Connect suction pipe and discharge pipe of copressor 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

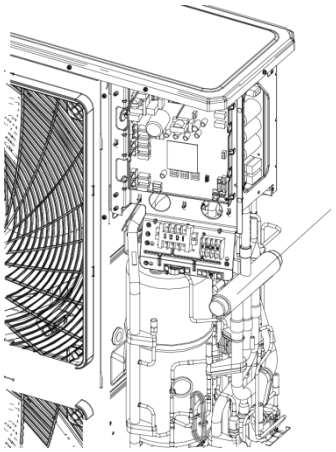
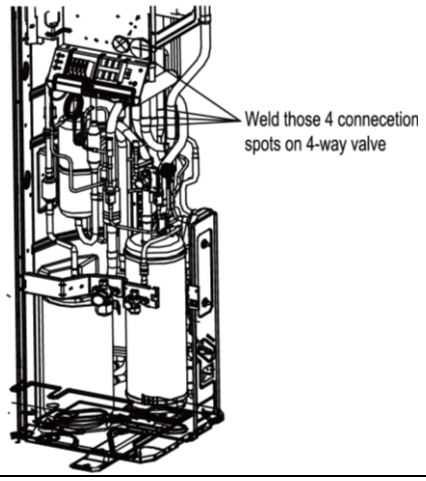
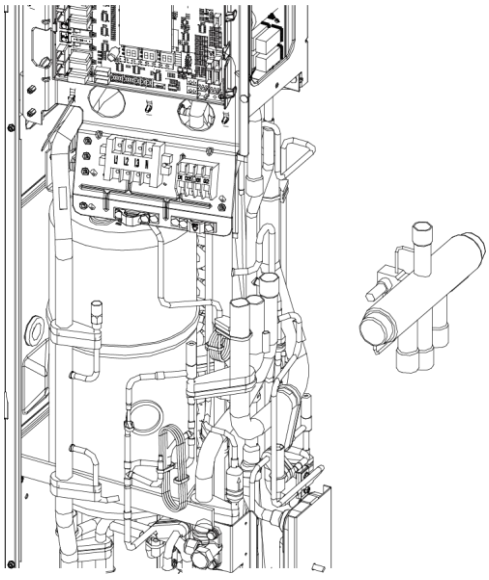
<table>
<tr><td colspan="3">Removal operation of compressor
Applicable to RF28WPd/Na-M(O)、LF28WPd/Na-M(O)</td></tr>
<tr><td colspan="3">Remark: Before removing the compressor, please make sure that there’s no refrigerant inside the pipeline and the power is disconnected.</td></tr>
<tr><td>7) Connect the power cord of compressor well</td><td> 
</td><td>● Loose screws fixing the power cord with screwdriver
● conenct the power cord well again
Note: When connecting the power cord, make marks for different color power cords and corresponding wiring terminals.</td></tr>
<tr><td>8) Check and open the upper cover plate</td><td>  </td><td>●Check whether the pipeline is connected well
●Check whetehr all parts and connection wires are connected well
●If there’s no problem after checking, install front and rear cover plates.</td></tr>
</table>

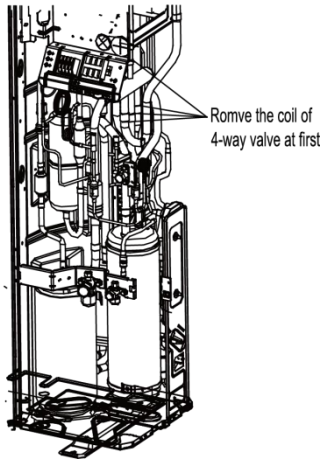
<table>
<tr><td colspan="3">Removal operation of compressor
Applicable to RF28WPd/Na-H (O).</td></tr>
<tr><td colspan="3">Remark: Before removing the compressor, please make sure that there’s no refrigerant inside the pipeline of system and the power is disconnected.</td></tr>
<tr><td>Process</td><td>Photo</td><td>Operation Instruction</td></tr>
<tr><td>1 Remove the wire connecting cover of compressor</td><td> 
Note to mark the corresponding terminals colors for power cord</td><td>●First unscrew the fixing screws for the compressor cover with screwdriver.
●And then pull out the power cord.
Note: when removing the power cord, please mark the corresponding terminals color for power cord to prevent wrong connection when reconnecting the power cord.</td></tr>
<tr><td>2 Pull out pipelines from compressor</td><td> 
Unweld thest two joints, and then pull out the inhalation tube and air discharge tube</td><td>●First weld the inhalation tube and air discharge tube of compressor.
●And then pull out the tubes from the compressor.
Note: prevent the flame from welding other parts and components.</td></tr>
</table>

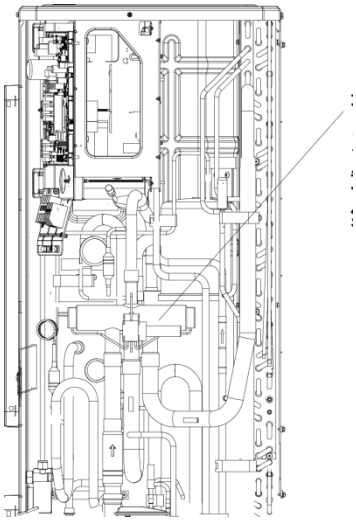
<table>
<tr><td colspan="3">Removal operation of compressor
Applicable to RF28WPd/Na-H (O).</td></tr>
<tr><td colspan="3">Remark: Before removing the compressor, please make sure that there’s no refrigerant inside the pipeline of system and the power is disconnected.</td></tr>
<tr><td>3 Unscrew the fixing nuts for compressor feet</td><td> 
Use spanner to unscrew the four
Use spanner to unscrew the four fixing nuts</td><td>●Use spanner to unscrew the nuts of compressor.</td></tr>
<tr><td>4 Remove the compressor from the chassis.</td><td>  </td><td>● Take out the compressor and replace it.
Note: do not damage the nearby pipes and other components when replacing the compressor.</td></tr>
</table>

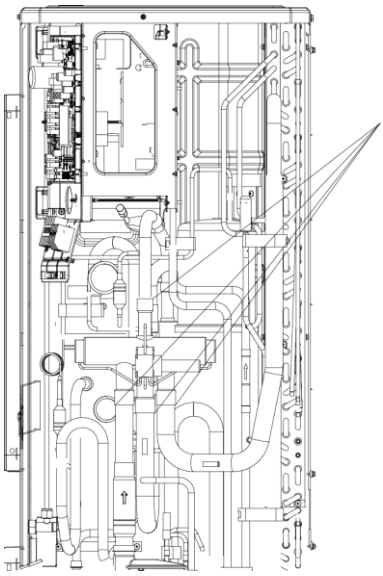
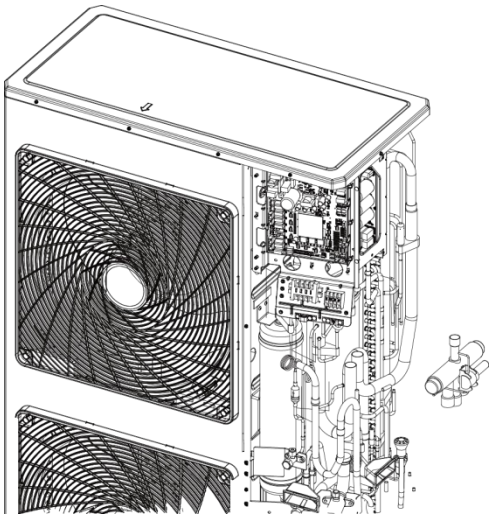
<table>
<tr><td colspan="3">Removal operation of compressor
Applicable to RF28WPd/Na-H (O).</td></tr>
<tr><td colspan="3">Remark: Before removing the compressor, please make sure that there’s no refrigerant inside the pipeline of system and the power is disconnected.</td></tr>
<tr><td>5 Refix the new compressor into the chassis</td><td>  </td><td>● After replacing the compressor, screw up the nuts for the compressor.</td></tr>
<tr><td>6 Reconnect the inhalation tube and system pipelines with the compressor</td><td>  </td><td>● Weld the connecting pipes of compressor, and the connect the pipelines with the compressor.
Note: prevent the flame from welding other parts and components.</td></tr>
</table>

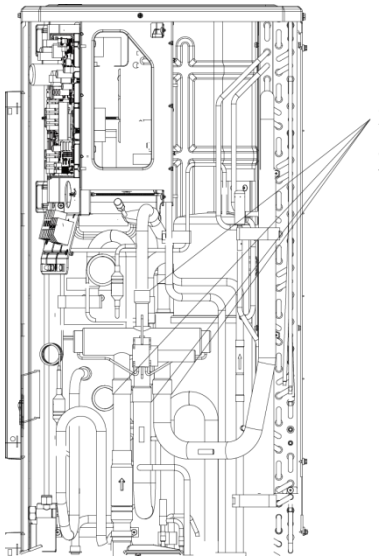
<table>
<tr><td colspan="3">Removal operation of compressor
Applicable to RF28WPd/Na-H (O).</td></tr>
<tr><td colspan="3">Remark: Before removing the compressor, please make sure that there’s no refrigerant inside the pipeline of system and the power is disconnected.</td></tr>
<tr><td>7 Reconnect the power cord of compressor</td><td> 
Note to mark the corresponding terminals colors for power cord when connecting the power cord</td><td>●First use screwdriver to screw up the screw of power cord.
● Reconnect the power cord
Note: when connecting the power cord, please mark the corresponding color of terminal for power cord.</td></tr>
<tr><td>8 Check and install the cover plate again</td><td>  </td><td>● Check if the pipes are connected.
● Check if the components and wires are well connected.
● After checking, install the front and rear cover plates.</td></tr>
</table>

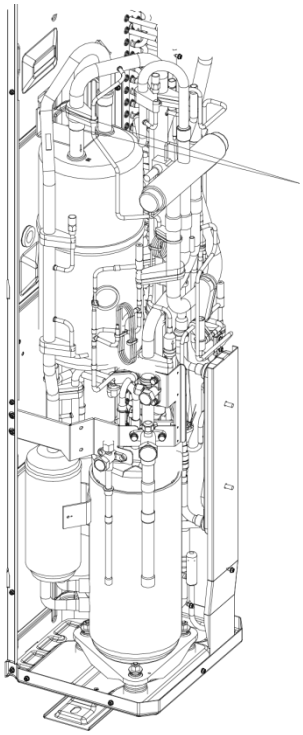
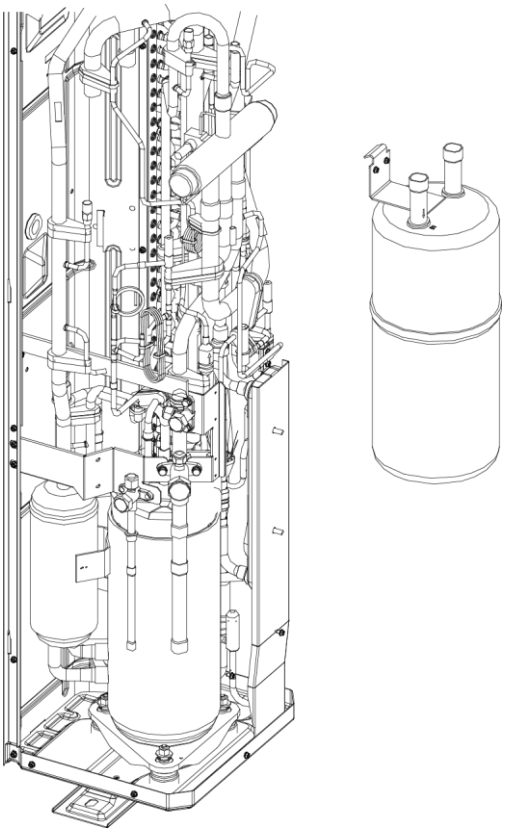
Removal operation for 4-way valve Applicable to RF28WPd/Na-M(O)、LF28WPd/Na-M(O)。		
Remark: Before removing the 4-way valve, please make sure that there's no refrigerant inside the pipeline of system and then power is disconnected.		
Process	Photo	Operation Instruction
1 Disconnect the coil of 4-way valve 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 flae 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

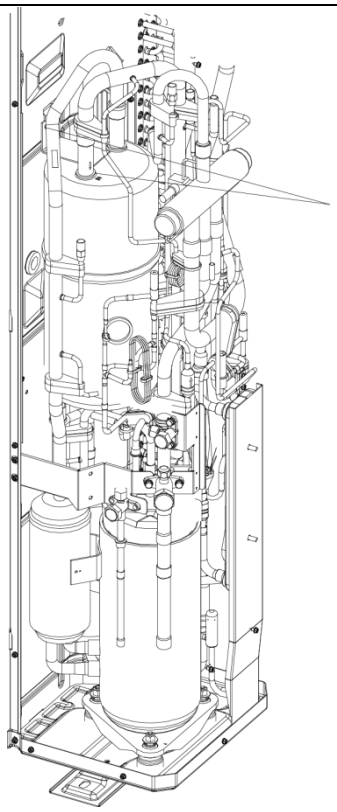
Removal operation for 4-way valve Applicable to RF28WPd/Na-M(O)、LF28WPd/Na-M(O)。		
Remark: Before removing the 4-way valve, please make sure that there's no refrigerant inside the pipeline of system and then power is disconnected.		
Process	Photo	Operation Instruction
4 Replace 4-way valve		● Weld the connection position between 4-way valve and pipeline Note: During welding process, do not let flame burn out other parts

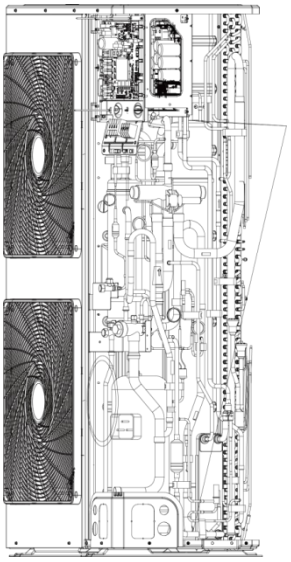
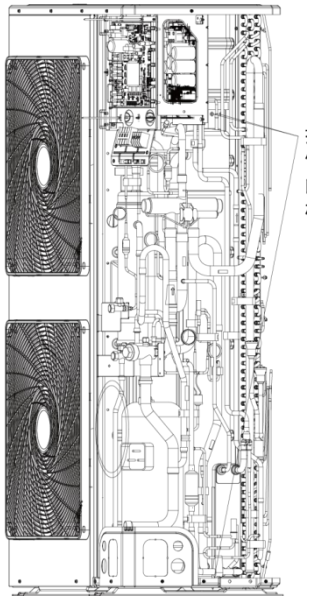
Removal operation for 4-way valve Applicable to RF28WPd/Na-H (O).		
Remark: Before removing the 4-way valve, please make sure that there's no refrigerant inside the pipeline of system and then power is disconnected.		
Process	Photo	Operation Instruction
1 Disconnect the coil of 4-way valve from the 4-way valve		●Remove the coil of 4-way valve at first

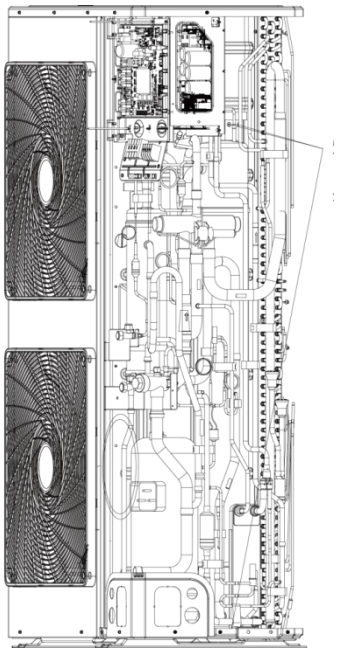
Removal operation for 4-way valve Applicable to RF28WPd/Na-H (O).		
Remark: Before removing the 4-way valve, please make sure that there's no refrigerant inside the pipeline of system and then power is disconnected.		
Process	Photo	Operation Instruction
2 Disconnect the 4-way valve and connection pipeline		● 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 Applicable to RF28WPd/Na-H (O).		
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

<table>
<tr><td colspan="3">Removal operation for gas-liquid separator
Applicable to RF28WPd/Na-M (O), LF28WPd/Na-M (O).</td></tr>
<tr><td colspan="3">Remark: Before removing the gas-liquid separator, please make sure that there’s no refrigerant inside the pipeline of system and then power is disconnected.</td></tr>
<tr><td>Process</td><td>Photo</td><td>Operation Instruction</td></tr>
<tr><td>1Disconnect the inlet tube and outlet tube of gas-liquid separator</td><td>  </td><td>●Unweld the joints of gas-liquid separator, and then pull out the connection pipe.
Note: prevent the flame from welding other parts and components.</td></tr>
<tr><td>2 Replace the gas-liquid separator</td><td>  </td><td>●Use screwdriver to unscrew the fixing screws
●Take out the gas-liquid separator from the unit
●Replace the gas-liquid separator</td></tr>
</table>

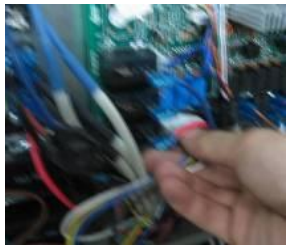
Removal operation for gas-liquid separator Applicable to RF28WPd/Na-M (O), LF28WPd/Na-M (O).		
Remark: Before removing the gas-liquid separator, please make sure that there's no refrigerant inside the pipeline of system and then power is disconnected.		
Process	Photo	Operation Instruction
3 Install the gas-liquid separator		●Weld the connection pipe for connecting the gas-liquid separator ●Use screwdriver to screw up the fixing screws Note: prevent the flame from welding other parts and components.

Removal operation for gas-liquid separator Applicable to RF28WPd/Na-H(O).		
Remark: Before removing the gas-liquid separator, please make sure that there's no refrigerant inside the pipeline of system and then power is disconnected.		
Process	Photo	Operation Instruction
1Disconnect the inlet tube and outlet tube of gas-liquid separator		●Unweld the 3 connection points in gas-liquid separator, and then pull out the connection pipe. Note: prevent the flame from welding other parts and components.
2 Replace the gas-liquid separator		●Unscrew 4 screws with screwdriver. ●Take out the gas-liquid separator from the space of top cover plate of unit. ●Replace the gas-liquid separator.

Removal operation for gas-liquid separator Applicable to RF28WPd/Na-H(O).		
Remark: Before removing the gas-liquid separator, please make sure that there's no refrigerant inside the pipeline of system and then power is disconnected.		
3 Install the gas-liquid separator		●Weld the connection pipe for connecting the gas-liquid separator. ●Use screwdriver to screw up the screws for gas-liquid separator in the chassis, the replacement is done. Note: prevent the flame from welding other parts and components.

4.2.2 Removal operation of IDU

Removal operation of IDU motor		
Process	Photo	Operation Instruction
1 Unscrew the fixing screws in the middle panel.		Use screwdriver or other related tools
2Take out the air inlet panel, and then take out the filter parts		Manual operation
3 Remove the fixing nuts for fan motor		screwdriver or other related tools

4Take out the fan blade		Manual operation Note: prevent sudden exertion during operation to avoid injury.
5Remove the motor, and take out the fixing nuts, etc.		Use screwdriver or other related tools
6Remove the press wire plate, and then take out the motor.		Note: before removing the motor, take apart the press wire plate first, otherwise the motor cannot be removed. Moreover, note to take out the motor wire from the electric box, so as to remove the motor. The process is as below.
7Take out the fixing screws of electric box cover, and then take out the electric box cover.		Use screwdriver or other related tools
8 Take out the wire of motor		Please refer to the wire connection of circuit diagram for removing the motor.
During installation, please operate reversely according to the above steps.		

MAINTENANCE

Routine check and maintenance can proling the service life of air conditioner. Maintenance should be operated by special personnel.

1 Heat exchanger of ODU

Heat exchanger of ODU should be washed regularly for at least once in every two months. User can use cleaner and nylon brush to wash the surface of heat exchanger to remove dust and forein matters; if there is compressed air source, user can use compressed air to remove the dust in the surface of heat exchanger. Please do not use water to wash.

2 Drain pipe

Check if the drain pipe is blocked regularly to ensure the drainage of condensate water.

3 Air filter

Take apart the air filter of air inlet, use cleaner or water to wash the filter, if the filter is very dirty (with oil), user can use natural detergent with mild water (lower than 45℃) to wash, and then air dry it.

If the air conditioning environment is dusty, the air filter should be wash for many times (general once for evry two weeks).

Note: it is not allowed to wash the filter with water temperature of over 45℃, which may decolor or distort the filter. It is not allowed to dry it with fire, otherwise the filter may catch fire or distort.

4 Notices before operation (serviceable season)

(62) Check if the air inlet and outlet of IDU and ODU are blocked;

(63) Check if the earth wire is grounded;

(64) Check if the batteries of remote controller have been replaced;

(65) Check if the air filter is well installed;

(66) If the unit is shut down for a long time and should be restarted, the power switch of air conditioner should be turned on for 8 hours before operation, so as to preheat the crankcase of compressor;

(67) Check if the outdoor unit is firmly installed, if not, please contact Gree specialized maintenance center.

5 Notices after operation (unserviceable season)

(68) Cut off power supply of air conditioner;

(69) Clean the filter and unit body of IDU and ODU;

(70) Remove the dust and foreign matter of IDU and ODU;

(71) If the ODU is rusty, the rust position should be painted with oil paint to prevent it from enlarging.

6 Replacement of components

Fittings can be acquired from the nearby Gree office or Gree dealers.

 Caution:

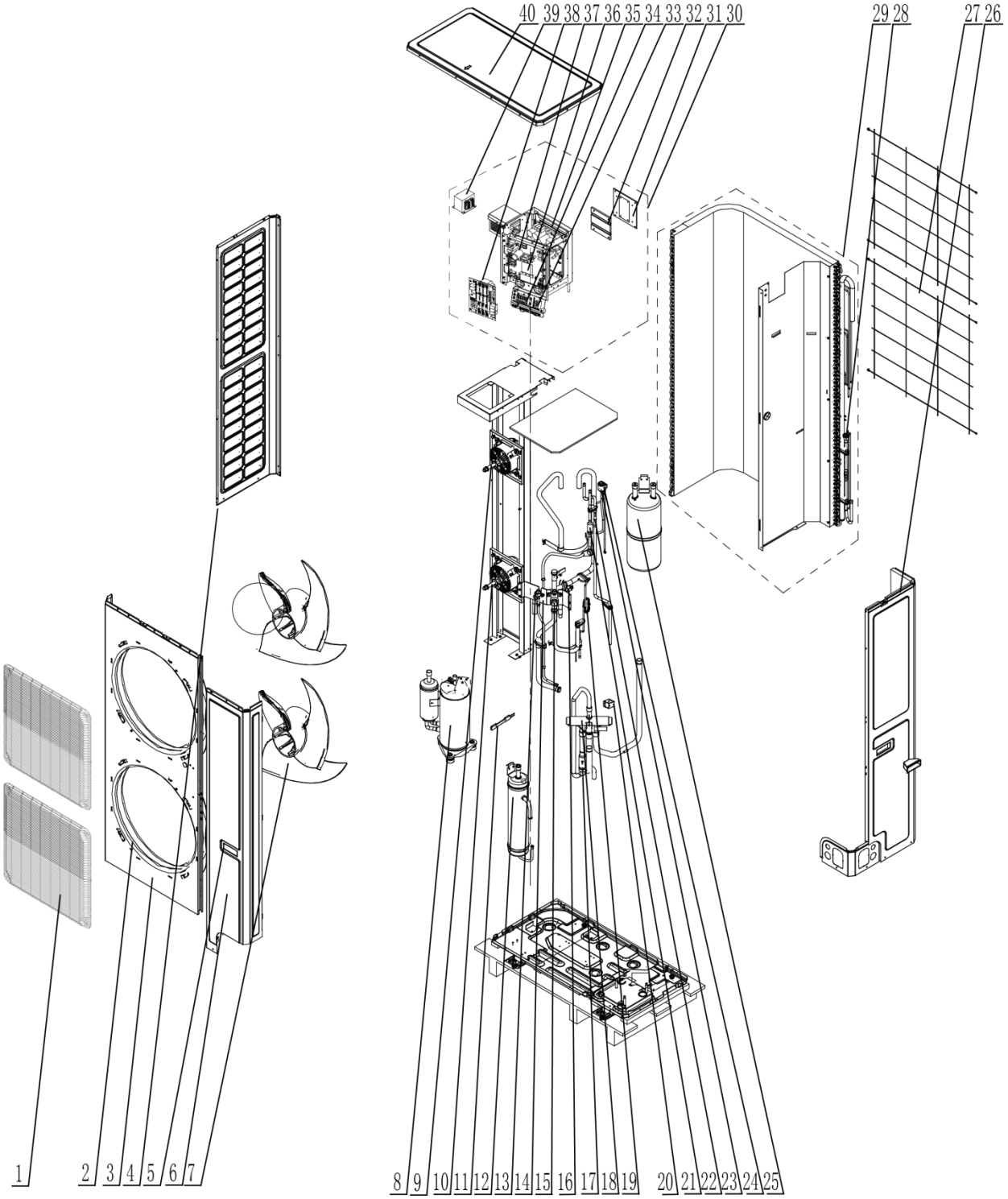
When conducting gas proofness test or leakage test, it is not allowed to mix oxygen, ethyne or other dangerous gas into the refrigerant circuit! It is better to use nitrogen or refrigerant to conduct the test to ensure safety.

7 Exploded View of Unit and Parts' List

7.1 Exploed view for outdoor unit and parts' list

7.1.1 Model: RF28WPd/Na-M(O)

Exploded view：

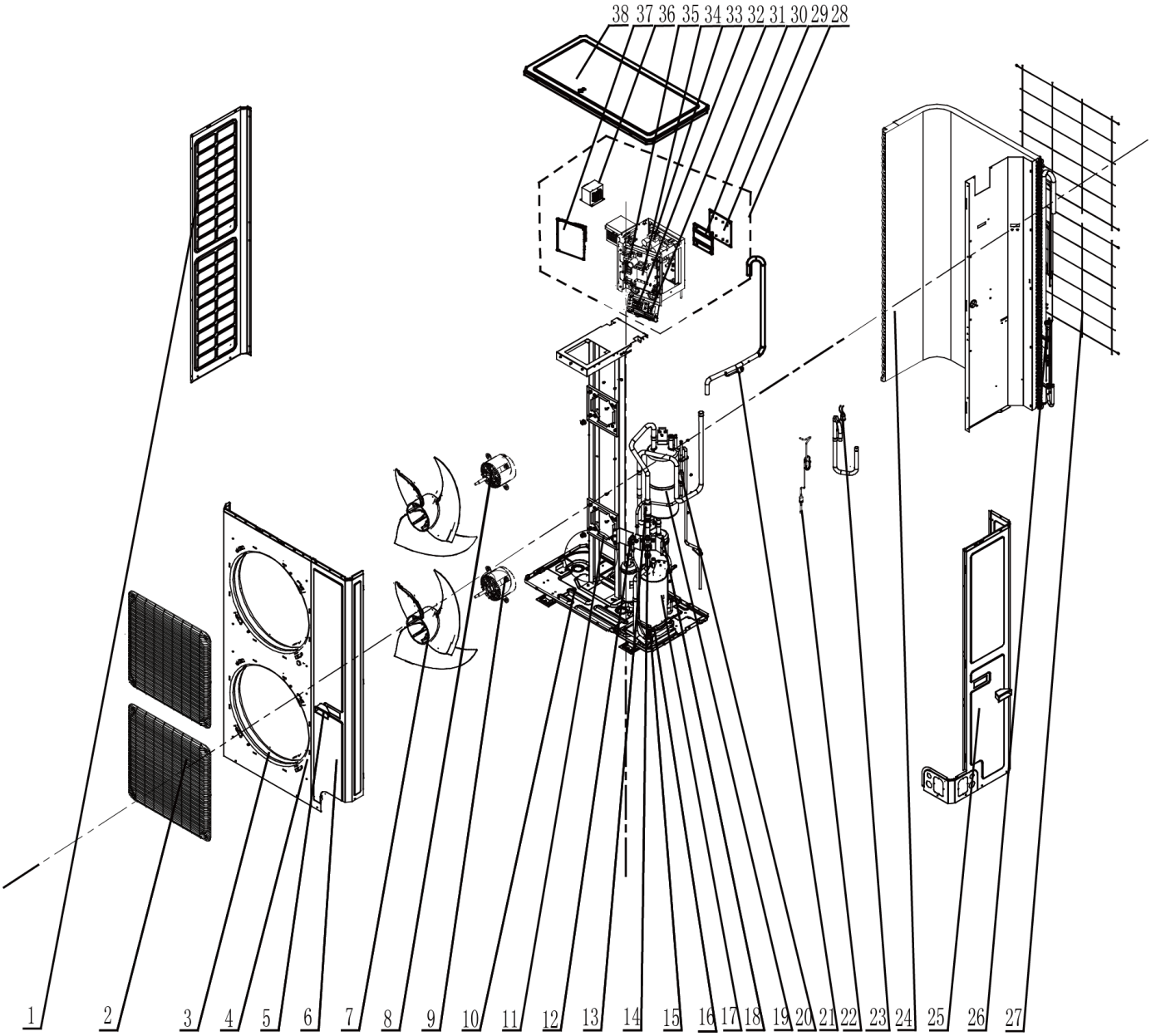


List of parts and components:

No.	Material name	QTY	Material code
1	Front Grill	2	01572800003
2	Diversion Circle	2	10474100003
3	Cabinet	1	01514100016P
4	Left Side Plate	1	01314100090P
5	Handle	2	26235253
6	Front Side Plate	1	01314100091P
7	Axial Flow Fan	2	10434100008
8	Compressor and Fittings	1	00204100033
9	Brushless DC Motor	1	15704100010
10	Brushless DC Motor	1	1570410001001
11	Electrical Heater(Compressor)	1	7651521212
12	Oil Separator	1	07424100050
13	Cut off Valve	1	07334100011
14	Valve Support Sub-Assy	1	017104000013
15	Cut off Valve	1	07334100012
16	Pressure Protect Switch	1	4602000902
17	Strainer	1	07414100026
18	4-way Valve	1	43000339
19	Capillary sub-assy	1	030006000461
20	Magnet Coil	1	4300040032
21	Bidirection Strainer	1	07220016
22	One way Valve	1	04324001
23	Electronic Expansion Valve	1	43044100173
24	Electric Expand Valve Fitting	1	4304413205
25	Gas-liquid Separator	1	07424140
26	Rear Side Plate	1	01314100092P
27	Rear Grill	2	01574100014
28	Current Divider Sub-assy	1	04434100018
29	Condenser Assy	1	011002000593
30	Electric Box Assy	1	100002001106
31	Radiator	1	49018000080
32	Radiator	1	49018000088
33	Terminal board	1	420001000019
34	Terminal Board	1	42000100000401
35	Main Board	1	300027000392
36	Main Board	1	300027000243
37	Main Board	1	300027000244
38	Filter Board	1	30223000118
39	Reactor	1	4313017401
40	Coping	1	01264100052P

7.1.2 Model: LF28WPd/Na-M(O)

Exploded view：



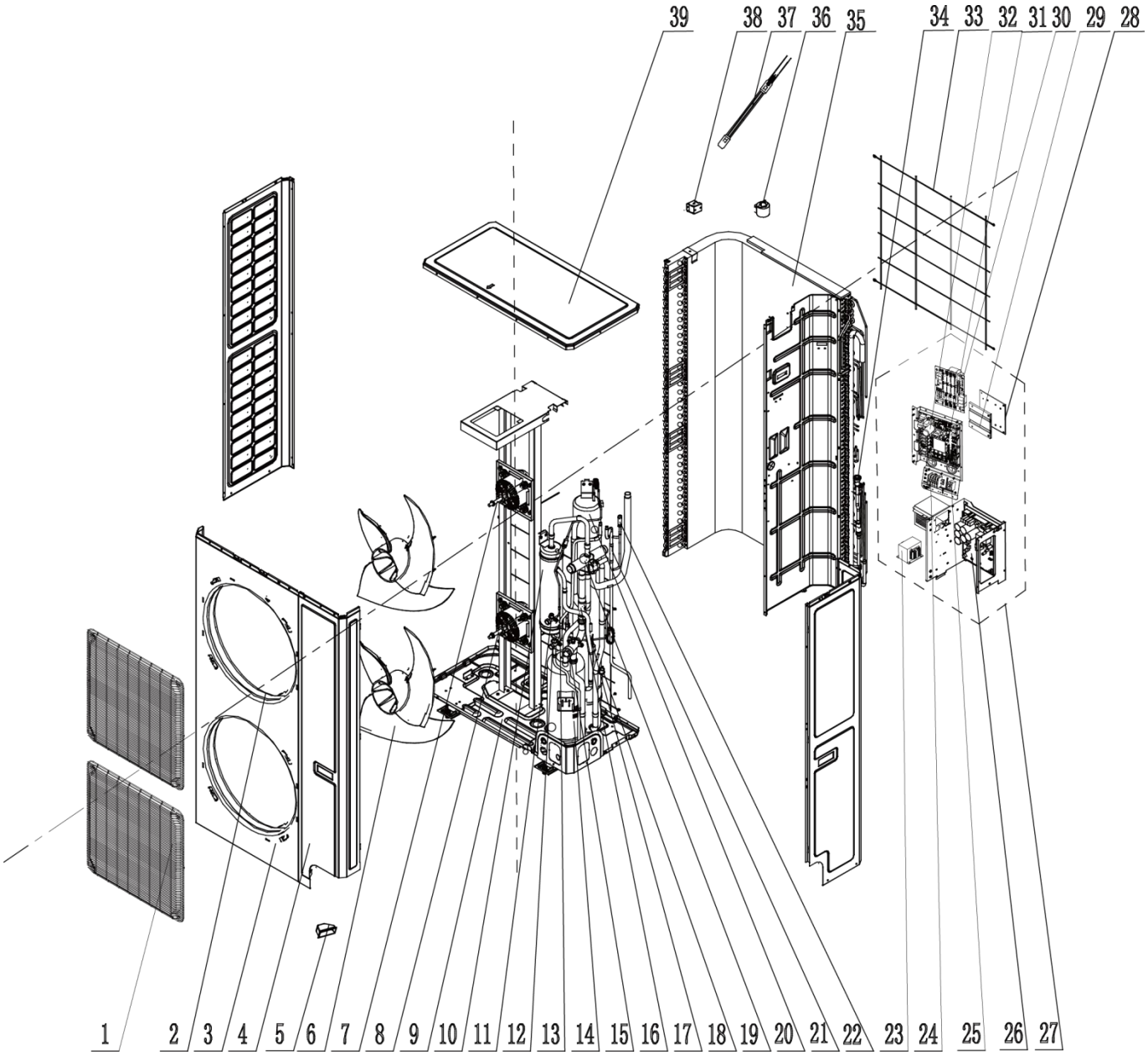
List of parts and components:

No.	Material name	QTY	Material code
1	Left Side Plate	1	01314100090P
2	Front Grill	2	01572800003
3	Diversion Circle	2	10474100003
4	Cabinet	1	01514100016P
5	Handle	2	26235253
6	Front Side Plate	1	01314100091P
7	Axial Flow Fan	2	10434100008
8	Brushless DC Motor	1	15704100010

No.	Material name	QTY	Material code
9	Brushless DC Motor	1	1570410001001
10	Chassis Sub-assy	1	017000000062P
11	Mounting Plate Sub-Assy	2	01324100103P
12	Cut off Valve	1	07334100011
13	Strainer	1	07414100026
14	Cut off Valve	1	07334100012
15	Compressor Gasket	3	76814100017
16	Electrical Heater(Compressor)	1	7651521212
17	Compressor and Fittings	1	00204100033
18	Oil Separator	1	07424100050
19	Gas-liquid Separator	1	07424141
20	Bidirection Strainer	1	07220016
21	Pressure Protect Switch	1	4602000902
22	Capillary sub-assy	1	030006000461
23	Pressure Protect Switch	1	46020007
24	Condenser Assy	1	011002060018
25	Rear Side Plate	1	01314100092P
26	Current Divider Sub-assy	1	030001060003
27	Rear Grill	2	01574100014
28	Electric Box Assy	1	100002001106
29	Radiator	1	49018000080
30	Radiator	1	49018000088
31	Terminal board	1	420001000019
32	Terminal Board	1	42000100000401
33	Main Board	1	300027000392
34	Main Board	1	300027000243
35	Main Board	1	300027000244
36	Reactor	1	4313017401
37	Filter Board	1	30223000118
38	Coping	1	01264100052P

7.1.3 Model: RF28WPd/Na-H(O)

Exploded view：



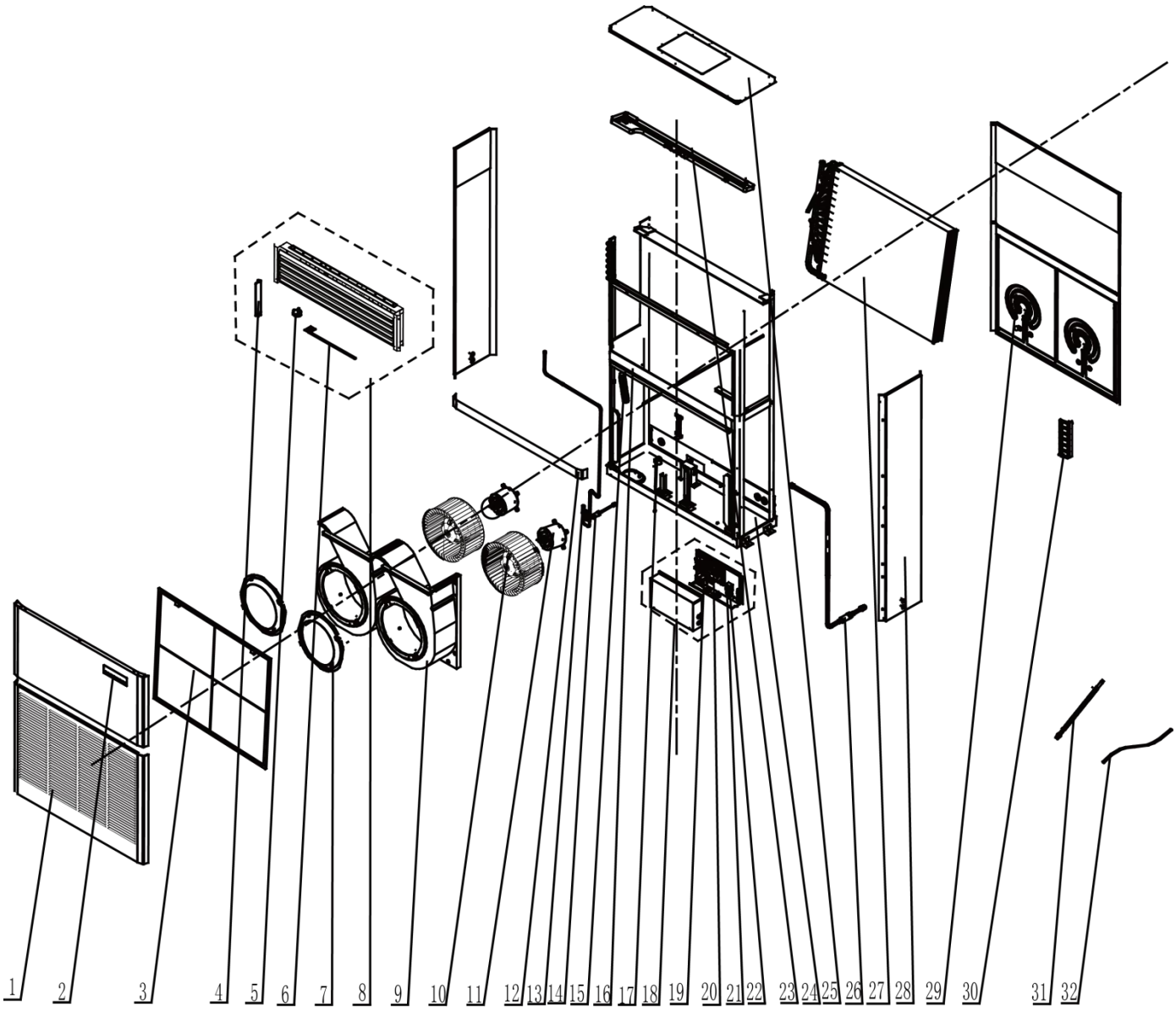
List of parts and components:

No.	Material name	QTY	Material code
1	Front Grill	2	01572800003
2	Diversion Circle	2	10474100003
3	Cabinet	1	01514100016P
4	Front Side Plate	1	01314100091P
5	Handle	2	26235253
6	Axial Flow Fan	2	10434100008
7	Brushless DC Motor	1	15704100010
8	Brushless DC Motor	1	1570410001001

No.	Material name	QTY	Material code
9	Chassis Sub-assy	1	01194100081P
10	Oil Separator	1	07424100050
11	Cut off Valve	1	07130208
12	Cut off Valve	1	07334100013
13	Low Pressure Survey Valve Sub-assy	1	030090000006
14	Compressor and Fittings	1	00204100015
15	Cut off Valve	1	07334100014
16	Strainer	1	07414100024
17	Pressure Protect Switch	1	46020006
18	Pressure Protect Switch	1	46020007
19	4-way Valve	1	43000339
20	Gas-liquid Separator	1	07424100048
21	One way Valve	1	04324001
22	Electronic Expansion Valve	1	43044100190
23	Reactor	1	4313017401
24	Terminal Board	1	42000100000401
25	Terminal board	1	420001000019
26	Main Board	1	30223000039
27	Electric Box Assy	1	100002001274
28	Radiator	1	49018000080
29	Radiator	1	49018000088
30	Filter Board	1	30223000118
31	Main Board	1	300027000243
32	Main Board	1	300027000244
33	Rear Grill	2	01574100014
34	Liquid Collecting Pipe Assy	1	04224100387
35	Condenser Assy	1	011002000581
36	Electric Expand Valve Fitting	1	4304413205
37	Electric Heater(Compressor)	1	7651540714
38	Magnet Coil	1	4300040032
39	Coping	1	01264100052P

7.2 Exploded view of IDU and list of parts and components

Exploded view：



List of parts and components:

No.	Material name	QTY	Material code
1	Air intake Panel	1	01534805
2	Display Board	1	30296000044
3	Filter Sub-Assy	1	11723201
4	Air Louver	12	10514801
5	Synchronous Motor	1	15014803
6	Swing lever	2	10584801
7	Diversion Circle	2	10374435
8	Air Outlet Frame Assy	1	000141060008
9	Propeller housing Assy	2	12103202

No.	Material name	QTY	Material code
10	Centrifugal Fan	2	10314401
11	Fan Motor	2	R(L)F28WPd/Na-M(I): 1501442409 RF28WPd/Na-H(I): 1501442410
12	Decorative Cover	1	26114802
13	Electronic Expansion Valve	1	43044100190
14	Bidirection Strainer	2	07220016
15	Drainage Pipe Sub-assy	1	05238201
16	Decorative Rim Sub-Assy	1	26114800
17	Electric Expand Valve Fitting	1	4304413205
18	Electric Box Assy	1	100002060154
19	Capacitor CBB61S	2	3301074709
20	Main Board	1	300002060041
21	Terminal Board	1	4201800002601
22	Terminal Board	1	42000100000101
23	Water Tray Assy	1	01283231
24	Chassis Sub-assy	1	017000060029P
25	Top Cover Plate Sub-Assy	1	01254805
26	Strainer	1	07413900026
27	Evaporator Assy	1	011001060037
28	Side Plate	2	01304805
29	Rear plate assy 2	1	01313237
30	Decorative Board	2	26114803R
31	Corrugated Pipe	1	05010057
32	Drain Pipe	1	05230022

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