The following are examples:

Example	Temperature area	Timer area	Remarks 1	Remarks
Barcode of the entire indoor unit N1r0128150066	Un (display to the right)	-n (display in the middle)	It indicates that the following is the barcode of the entire indoor unit	Press " to displa downwa and pre: "▲" to displa upward
	N1r	0128	It indicates the former seven bits of the barcode	
	150	066	It indicates the latter six bits of the barcode	
Barcode of controller of indoor unit N1r0128150067	Pc	-n	It indicates that the following is the barcode of controller of indoor unit	
	N1r	0128	It indicates the former seven bits of the barcode	
	150	067	It indicates the latter six bits of the barcode	

Notes:

1. Un indicates the barcode of the entire indoor unit; Pc indicates the barcode of controller of indoor unit;

2. When there is only one indoor unit, press "Mode" button under "nb" status to directly enter into barcode inquiry without selecting the engineering number of indoor unit;

3. The system will quit the inquiry status if there is no operation within 60 seconds.

			4. The barcode inquiry starts from barcode of the entire indoor unit and ends at the controller bar code of indoor unit without circulatiohn. That is, the inquiry will not start again even if users press "▼".

Notes:

Under parameter inquiry status, "Function", "Timer", "Heating water/Floor heating" buttons are invalid. Press "ON/OFF" button can return to the main interface but will not turn on/off the unit.

Engineering Parameter Settings

Engineering parameters can be set under power-on or power-off status of unit.

1) Press and hold "Function" button for five seconds, temperature area will display "C00". Continuously press "Mode" button for three times, and then press and hold "Function" button for five seconds to enter into engineering parameter setting interface, then the temperature area will display "P00".

2) Press "∧" or "∨" button can select parameter code, press "Mode" button to switch to parameter setting. Then the parameter flickers, press "∧" or "∨" button can adjust the parameter. Press "Enter/Cancel" button to complete settings.

3) Press "Enter/Cancel" button can return to the upper level till quitting parameter setting.

Under the engineering parameter setting interface, users can also set user parameters.

The engineering parameter setting list is as below:

Engineering Parameter Setting List

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
P15	Power-fail memory mode	00: standby after power-fail revovery 01: restoring the original status after power-fail recovery	00	
P17	Historical fault clearing of indoor unit	00: not cleared 01: cleared	00	Historical faults of all indoor units controlled by the current wired controller are cleared.
P35	Factory setting recovery of user functions	00: invalid 01: valid	00	After selecting 01, press and hold "Enter/Cancel" button to resumes to the factory settings for user functions (factory setting recovery fails if remote shielding is valid).
P36	Factory setting recovery of engineering settings	00: invalid 01: valid	00	After selecting 01, press and hold "Enter/Cancel" button to resumes to the factory status for engineering settings (factory setting recovery fails if remote shielding is valid).
P42	Engineering number settings of hydro box	1~255	Automatically generated when the system operates initially	Under "P42" status, press "Mode" button to enter into setting menu. The engineering number in timer area will flicker, press "∧" or "∨" button to adjust engineering number. Press "Enter/Cancel" button to confirm the setting and return to the upper level menu.
P45	One-key engineering	00: invalid 01: valid	00	When it is set to be 01, the wired controller initiates an project

	number reset of hydro box			number reset command.
P48	Preferencial setting of system	00: No 01: air conditioner takes priority 02: heating water takes priority 03: floor heating takes priority	00	
P49	Highest hot water temperature setting of water tank	55~70℃	55℃	
P51	Highest water temperature automatically set by hydro box	50~maximum setting hot water temperature	55℃	P51 parameter value is larger than P52 parameter value;
P52	Lowest water temperatyre automatically set by hydro box	40~52℃	48℃	
P57	Whether auxiliary heating of hot water is allowed to open when the outdoor unit closes down	00: allowed; 01: not allowed;	00	
P60	Setting for capacity of water tank	150~3500L	300L	
P62	Preset deferring time	1~4h	2h	
P63	Preset time revision value	0~3h	1	
P64	Time interval when water returning pump starts up	0.5~10h	2	
P65	Operating time of water returning pump	1~10min	2	
P72	Floor heating capacity setting of hydro box	05~45kw	The same as name plate of hydro box	The maximum value can only be set to the nominal value in name plate of hydro box

P74	Highest water outlet temperature automatically set by floor heating	25~Maximum setting value of water outlet temperature of floor heating	45℃	
P75	Lowest water outlet temperature automatically set by floor heating	25~ Maximum setting value of water outlet temperature of floor heating	35℃	
P76	Automatically setting revision value of floor heating water temperature	-2～8℃	0℃	
P77	Highest notch B of water pump of hydro box	5～10	10	
P78	Lowest notch A of hydro box	3～10	5	
P79	Setting of corresponding engineering number of indoor unit for shunt valve	1～255	No	Operating method: Press "Mode" button to enter into selection menu of hydro box, press "▲" and "▼" button to switch serial number of hydro box; Press "Mode" button to enter into shunt valve selection menu, press "▲" and "▼" to switch serial number of shunt valve; Press "Mode" button to enter into selection menu of indoor unit, the engineering number in timer area flickers, press "▲" and "▼" to adjust engineering number; press and hold the button within 5 seconds, the unit digit of engineering number will increase/decrease; press and hold the button for 5~10 seconds, the tens digit of engineering number will increase/decrease. Press "Enter/Cancel" button can return to the upper level status. Display mode: Temperature area: displays serial

				number of hydro box – serial number of shunt valve;
				Timer area: engineering number is on/flickering, the "number" is on.
				Notes:
				When there is only one hydro box in the HBS network, skip over the selection of hydro box and set directly from serial number of shunt valve;
				If there is no corresponding setting in P79, then the corresponding indoor unit engineering number of shunt valve are all 0, which deems that the P79 setting is invalid.
				Multiple shunt valves are allowed to match with the same indoor unit (engineering number), but the same shunt valve is not allowed to match with multiple indoor unit (engineering number);
				In the same HBS network, if corresponding relation setting between one shunt valve and indoor unit is valid, then the linkage setting between indoor unit and shunt valve is deemed valid;
n0	System conservation operation settings	00: comfortability preferred 01: conservation preferred	00	
n1	Defrosting period ssettings	40: 40 minutes 50: 50 minutes 60: 60 minutes	50	
n3	Forcible defrosting	00: common 01: forcible defrosting		After setting, it will automatically resumes to 00.
n4	Highest capacity output limitation settings for outdoor unit	08：80% 09：90% 10：100%	10	Enter into the inquiry under "n4" status, temperature area displays function code and timer area displays corresponding function setting value.
A7	Silent function of outdoor unit	00: no silent function 01~09: intelligent night-time silent mode from mode 1 to mode 9 10~12: forcible silent	10	Enter into the inquiry under "A7" status, temperature area displays function code, and timer area displays corresponding function setting value.

		mode from mode 1 to mode 3		

Notes:

Under parameter setting status, "heating water/air conditioner/floor heating" and "timer" buttons are invalid. By pressing "ON/OFF" button, users can return to the main interface but will not turn on/off the unit.

Failure Display

When a fault occurs during operation of system, temperature area of wired controller will display fault code. When multiple faults occur, the fault codes will be displayed circularly.

When a fault occurs, please turn off the unit and ask for professional maintenance personnel for help.

The following figure shows that under power-on status of unit and one wired controller controls multiple units, the fault interface of inconsistent quantity of hydro boxes.

Chapter 5 Maintenance

1. Table of Error Codes

Content symbol / Distinctive symbol		0	1	2	3	4	5
Indoor	L	Indoor unit fault	Indoor fan protection	Auxiliary heating protection	Water overflow protection	Power supply overcurrent protection	Anti-freezing protection
	d		Indoor unit PCB fault	Lower water temperature sensor of water tank is faulted	Ambient temperature sensor fault	Intake temperature sensor fault	Middle temperature sensor fault
	y						
Outdoor	E	Outdoor unit fault	High pressure protection	Low exhaust temperature protection	Low pressure protection	High exhaust temperature protection for compressor	
	F	Outdoor unit main board fault	High pressure sensor fault		Low pressure sensor fault		Compressor 1 exhaust temperature sensor fault
	J	Other module protection	Overcurrent protection for compressor 1	Overcurrent protection for compressor 2	Overcurrent protection for compressor 3	Overcurrent protection for compressor 4	Overcurrent protection for compressor 5
	b		Outdoor ambient temperature sensor fault	Defrosting temperature sensor 1 fault	Defrosting temperature sensor 2 fault	Subcooler outflow temperature sensor fault	Subcooler exhaust temperature sensor fault
	P	Compressor driver board fault	Compressor driver board failure	Compressor driver board power voltage protection	Compressor drive module reset protection	Compressor drive PFC protection	Inverter compressor overcurrent protection
	H	Fan driver board fault	Fan driver board failure	Fan driver board power voltage protection	Fan drive module reset protection	Fan drive PFC protection	Inverter fan overcurrent protection
Commissioning	U	Deficient preheating of the compressor		Wrong ODU capacity code/jumper cap setting	Power phase sequence protection	Refrigerant shortage protection	Wrong compressor drive board address
	C	Communication malfunction between indoor unit and outdoor unit, indoor units wires control		Communication malfunction between main control and inverter compressor driver	Communication malfunction between main control and inverter fan driver	Malfunction of lacking of indoor unit	Project series Nol of indoor unit is in conflict
Status	A	The unit is not commissioned		Aftersales refrigerant recycling	Defrosting	Oil recycling	

GMV5 Home DC Inverter Multi VRF Units

Content symbol / Distinctive symbol		6	7	8	9	A	H
	n	Economic mode setting			Compulsory defrosting	Maximum output capacity limit setting	Compulsory indoor unit project number shift

Content symbol / Distinctive symbol		6	7	8	9	A	H
Indoor	L	Mode conflict	No master IDU	Power supply shortage	Inconsistent number of multi-split IDUs	Inconsistent series of multi-split IDUs	Warning about poor air quality
	d	Exhaust temperature sensor fault	Humidity sensor fault	Water temperature sensor fault	Jumper cap fault	Indoor unit network address exception	Wired controller PCB exception
	y						
Outdoor	E						
	F	High exhaust temperature protection for compressor 2	High exhaust temperature protection for compressor 3	High exhaust temperature protection for compressor 4	High exhaust temperature protection for compressor 5	High exhaust temperature protection for compressor 6	Current sensor fault for compressor 1
	J	Overcurrent protection for compressor 6	Four-way valve leakage protection	High system pressure ratio protection	Low system pressure ratio protection	Exceptional pressure protection	
	b	Air intake temperature sensor 1 fault	Air outlet temperature sensor fault(outlet tube A)	Outdoor humidity sensor fault	Heat exchanger exhaust temperature sensor fault	Oil return temperature sensor fault	System clock exception
	P	Compressor drive IPM module protection	Compressor drive temperature sensor fault	Compressor drive IPM over-temperature protection	Inverter compressor out-of-step protection	Compressor drive storage chip fault	Compressor DC bus high voltage protection
	H	Fan drive IPM module protection	Fan drive temperature sensor fault	Fan drive IPM over-temperature protection	Inverter fan out-of-step protection	Inverter fan drive storage chip fault	Fan drive DC bus high voltage protection

Content symbol / Distinctive symbol		6	7	8	9	A	H
Commissioning	U	Valve exception warning		Indoor unit pipeline fault	Outdoor unit pipeline fault		
	C	Alarm due to inconsistent quantity of outdoor unit	Communication fault of convertor	Emergency status of compressor	Emergency status of fan	emergency status of module	Rated capacity of indoor and outdoor unit is too high
Status	A	Cooling and heating setting	Silent mode setting	Vacuum mode			heating
	n	Unit fault inquiry	Unit parameter inquiry	Indoor project No. inquiry	Indoor unit online quantity inquiry	Heat pump unit	Heating only unit

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Content symbol / Distinctive symbol		C	L	E	F	J	P
Indoor	L	Mismatching indoor and outdoor unit models	Waterflow switch fault	EC DC water pump revolving speed fault	Shunt valve setting fault	Functional dial switch setting fault	PG motor zero passage fault
	d	Volume dial switch setting exception	Air outlet temperature sensor fault	Indoor CO sensor fault	Upper water temperature sensor of water tank is faulted	Back water temperature sensor fault	Floor heating inlet temperature sensor fault
	y						
Outdoor	E						
	F	Compressor 2 current sensor fault	Compressor 3 current sensor fault	Compressor 4 current sensor fault	Compressor 5 current sensor fault	Compressor 6 current sensor fault	DC motor fault
	J	Water flow switch protection	Low high pressure protection	Oil returning tube is blocked	Oil returning tube is leaking		
	b	Cover temperature sensor falling protection for compressor 1	Cover temperature sensor falling protection for compressor 2	Inlet temperature sensor of condenser fault	Outlet temperature sensor of condenser fault	High pressure sensor and low pressure sensor are reversely connected	Oil returning 2 temperature sensor fault
	P	Compressor drive current detection circuit fault	Compressor drive DC bus low voltage protection	Inverter compressor out-of-phase protection	Compressor drive recharging circuit fault	Inverter compressor startup failure	Inverter compressor AC current protection
	H	Fan drive current detection circuit fault	Fan driv DC bus low voltage protection	Inverter fan out-of-phase protection	Fan drive recharging circuit fault	Inverter fan startup failure	Inverter fan AC current protection
Commissioning	U	Master IDU is set	Wrong compressor emergency operational dial switch	Invalid refrigerant injection			
	C	No main control unit fault	Rated capacity of indoor and outdoor unit is too low		Malfunction of multi main control unit	Dial switch of system address is in conflict	Malfunction of multi main wired controller
Status	A	Cooling	Auto refrigerant charging	Manual refrigerant charging	Air supply	Filter cleaning reminder	Unit startup commissioning confirmation
	n	Cooling only unit		Negative code	Air supply model	Anti-high temperature in heating	

Content symbol / Distinctive symbol		U	b	d	n	y
Indoor	L					
	d	Floor heating water-out temperature sensor fault	Commissioning status of unit	Solar energy temperature sensor fault	Swing parts fault	
	y					

Outdoor	E					
	F	Compressor 1 cover temperature sensor fault	Compressor 2 cover temperature sensor fault			
	J					
	b	Oil returning 3 temperature sensor fault	Oil returning 4 temperature sensor fault			
	P	Inverter compressor drive AC input voltage exception protection				
	H	Inverter compressor drive AC input voltage exception protection				
Commissioning	U					
	C	Communication malfunction between indoor unit and receiving lamp plate	Overflowing distribution of IP address			
Status	A	Long-distance emergency shutdown	Emergency shutdown	Restricted operation	Child-lock status	Shielding status
	n	Eliminate indoor unit long-distance shielding order	Barcode inquiry		Revision of length of connecting pipe for outdoor unit	

For example, when E4 is displayed on the ODU, find line E and column 4 in the above tables. The fault is shown in the intersection of the line and column: High exhaust temperature protection.

Note: Previous faults in the system can be inquired on the main board of the ODU and commissioning software. See n6 Fault Enquiry of the ODU or enquiry function of the commissioning software for the method.

2. Setting of outdoor unit noise reduction

2.1 Setting instruction

(1) Applicable models are as below:

Series	Subseries	Model
Multi VRF System	GMV　Unic	GMV-S224W/A-X、GMV-S280W/A-X

(2)Setting of silent mode:

First: open the debugging window in panel of main control unit;

Second: energize the unit;

Third: shortly press SW3 button in mainboard outdoor unit, the system will enterinto standby status; display of mainboard are as below:

LED1		LED2		LED3	
Functional Code	Display	Code of silent mode	Display	Current status	Display
A7	On	00	Flicker	OC	Flicker
A7	On	01	Flicker	OC	Flicker
A7	On	02	Flicker	OC	Flicker
A7	On	03	Flicker	OC	Flicker
A7	On	04	Flicker	OC	Flicker
A7	On	05	Flicker	OC	Flicker
A7	On	06	Flicker	OC	Flicker
A7	On	07	Flicker	OC	Flicker
A7	On	08	Flicker	OC	Flicker
A7	On	09	Flicker	OC	Flicker
A7	On	10	Flicker	OC	Flicker
A7	On	11	Flicker	OC	Flicker
A7	On	12	Flicker	OC	Flicker

Fourth：press UP button of SW1 and DOWN button of SW2 in mainboard of outdoor unit can select corresponding function, selece "A7 outdoor silent mode". Display is as below:

LED1		LED2		LED3	
Functional code	Display	Functional code of outdoor unit	Display	Functional code of outdoor unit	Display
A7	Flicker	00	Flicker	00	Flicker

Shortly press SW7 in mainboard of outdoor unit, enter into "A7 outdoor silent mode" setting, after setting, the mainboard will display as below:

LED1		LED2		LED3	
Functional code	Display	Code of silent mode	Display	Current status	display
A7	On	10 (current silent setting)	Flicker	OC	Flicker

Fifth: press UP of SW1 and DOWN of SW2 can select the following corresponding silent mode.

Sixth: after selecting corresponding mode, press SW7 to confirm selected mode, corresponding display will as below:

LED1		LED2		LED3	
Functional code	Display	Code of silent code	Display	Current status	display
A7	On	00	On	OC	On
A7	On	01	On	OC	On

A7	On	02	On	OC	On
A7	On	03	On	OC	On
A7	On	04	On	OC	On
A7	On	05	On	OC	On
A7	On	06	On	OC	On
A7	On	07	On	OC	On
A7	On	08	On	OC	On
A7	On	09	On	OC	On
A7	On	10	On	OC	On
A7	On	11	On	OC	On
A7	On	12	On	OC	On

Press SW6 button in main control unit to return to the previous level. (Under setting status, shortly press the button to return to the previous level, after finishing setting, shortly press SW6, the unit will resume to current normal working status).

If there is no operation for consecutive 5 minutes, the unit will exit automatically and resume to the current status.

2.2 Effect of quiret mode:

Outdoor silent function is mainly for the location that requires lower noise, there are night-time auto silent mode and compulsory quiet mode.

Night-time auto silent mode will automatically estimate the highest ambient temperature in the daytime, and then it can operate in silent mode according to certain interval, so as to operate with low noise in night-time. There are 9 selections for night-time auto silent modes, as below:

Silent mode	Code	Estimate maximum temperature in daytime, X hours later will enter into silent mode	Quit the mode after operating night-time silent mode for Y hours	Noise level
Mode 1	01	6	10	Low noise mode
Mode 2	02	6	12	
Mode 3	03	8	8	
Mode 4	04	8	10	
Mode 5	05	10	8	
Mode 6	06	10	10	
Mode 7	07	4	14	
Mode 8	08	6	8	Medium and low noise mode
Mode 9	09	12	10	Ultra low noise mode

Notes: highest temperature in daytime is generally in 13:00~15:00.

Compulsory silent mode means the unit operates in low noise mode in both daytime and night-time. There are the following 3 kinds of selecting modes:

Silent mode	Code	Noise level
Mode 10	10	Low noise mode
Mode 11	11	Medium and low noise mode
Mode 12	12	Super low noise mode

Notes: after setting silent mode, capacity of system will be weakened, so please choose a balance point between noise and performance.

3. Instruction for "leaving out charging water" between generator and water tank

3.1 Description of question

When installing GMV Unic unit, after connecting circulating water pipe between hydro box (NRQD16G/A-S) and water tank, it has not charge water or drive out the air in the circulating water pipe, but charge water and drive out air in the water tank. Later in debugging, the unit will apprear "water flow switch fault LL", "high pressure protection E1", "temperature sensor falling dU", "water pump is damaged", and other malfunctions.

3.2 Analysis

As shown in the following picture: the matching water tank of hydro box (NRQD16G/A-S) is "water tank with inner heat exchange coil pipe", model of water tank is "SXVD***LCJ*/A-K".

"Circulating water pipe" and "heat exchange coil pipe" are through, after heating the water inside "circulating water pipe" by generator, the hot water inside circulating water pipe will heat the water inside water tank via heat exchange coil pipe. So the "water inside water tank" is separated from "circulating water pipe". "Circulating water pipe" must be independently charged with water to drive out the air.
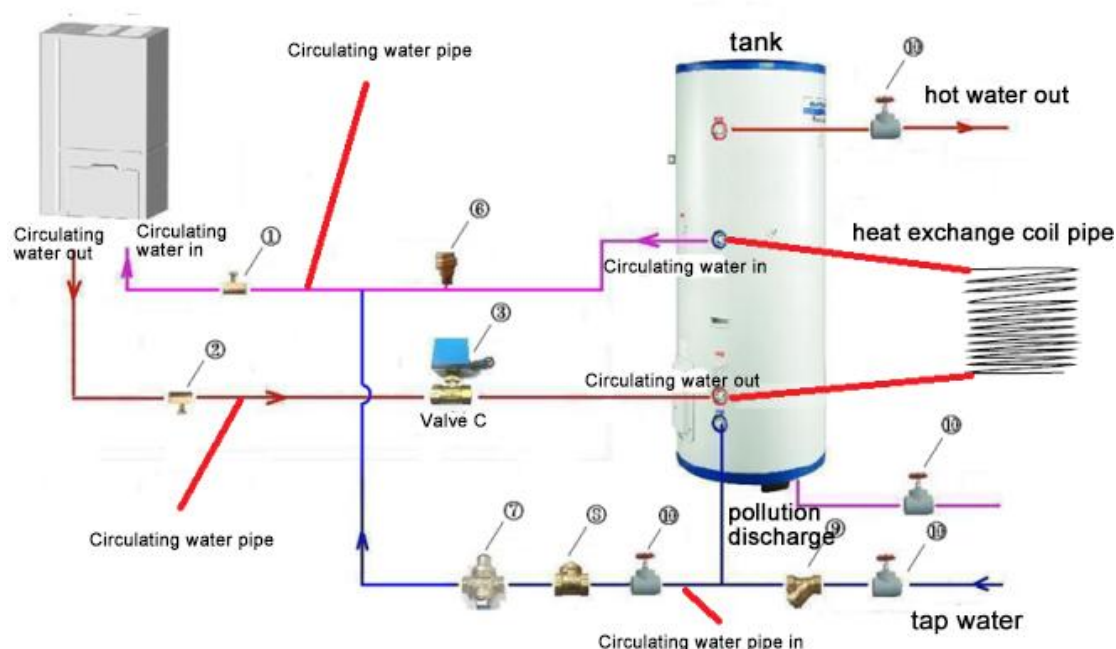
If the circulating water pipe has not been charged with water and driven out the air, then there will be no water inside the generator to conduct heat exchange with refrigerant, and then the pressure in the system will be high that will cause "high pressure protection"; water pump will be idling, and water flow switch will failure to actuate, which will lead to "water flow switch malfunction", "water pump is damaged"; when the temperature detected by temperature sensor of generator circulating water pipe inlet and outlet is changeless, it will cause "temperature sensor falls out" and related malfunction.

3.3 Troubleshooting

When such problem arises, please charge water and drive out the air in "circulating water pipe" between generator and water tank strictly according to requirements of instruction manual. The following are related steps.

(1) Leak detection: after all the water pipelines are connected, first conduct leak detection, and then conduct heat insulation for all the water pipeline system, especially for the valves, joints of pipe. It is recommended to use heat insulating cotton with the thickness not less than 15mm.

(2) Charge water and drive out the air among generator, water tank and floor heating pipe:

A. Make sure that each water pipeline has been connected, close the air outlet valve of hot water generater, and ensure that the drain outlet has been closed;

B. Open the water replenishing valve ⑩ to fill with water, half open the air outlet valve ①;

C. When there is water flowing out from air outlet valve ①, completely open the air outlet valve ①;

D. When opening air outlet valve ① and water are flowing out, energize the hydro box, and then start to drain after entering into washing mode. Operating method: under the closedown status of hydro box, long press "hot water/air conditioner/floor heating" button for 5 seconds, the "wash" icon will turn on;

⑤After operating for 10 minutes, if the water flows out from air outlet valve ① is stable and without airflow, it means the air has been driven out. Then close air outlet valve ①, and stop the operation of hydro box. Operating method: long press "hot water/air conditioner/floor heating" button for 5 seconds, the washing is stopped, icon of "wash" is turned off.

(3) Drive out the air in the pipeline between water tank and user side:

A. Make sure that each pipeline of water tank has been connected, ensure that drain outlet of water tank is closed;

B. Open the water replenishing valve of water tank, open water valve in user side, fill in water till there is water flowing out from water tank of user side without bubbles, it means the air has been driven out from water tank. Close water valve in user side and enter into debugging of unit.

4. Troubleshooting

4.1 Analysis in Forms

4.1.1 Control

Fault code	Fault	Possible causes	Solution
F0	Faults in the ODU's main board (such as memory and address chip exceptions)	1 The clock chip on the main board is damaged. 2 The memory chip on the main board is damaged. 3 The address chip on the main board is damaged.	1 Replace the small CPU board 2 Replace the control board. 3 Replace the control board.
FC	Faults in the constant frequency compressors current sensor	1 The constant frequency compressor is not started. 2 The current detection bord is faulty. 3 The main boards detection circuit is faulty.	1 If the compressor is not started, check if the AC contact is closed. If not, replace the AC contact. If the connection is loose, reconnect it; 2 Replace the current detection board. 3 Replace the main board.
U2	Wrong outdoor capacity code setting	1 The capacity code is wrong. 2 The dial component is faulty.	1 Modify the capacity code setting. 2 Replace the main board.
U3	Power phase sequency protection	1 The three phase power cable is not connected correctly. 2 The main boards detection circuit is faulty.	1 Check connection of the power cable. 2 Replace the control board.
UL	Wrong emergency operation dial code	1 The dial setting is wrong. 2 The dial component is faulty.	1 Modify the dial setting. 2 Replace the main board.
C0		1. The	If C0 is not displayed on the control board of the ODU,

	Communication faiure between indoor and outdoor unit and indoor units wired controller	communication cable is not connected. 2. The communication cable is disconnected. 3. The communication cable is in poor connection. 4. The controller is faulty	check the network between the IDU and wired controller. If C0 is displayed, check the network between the IDUs and between the IDU and wired controller as below: 1.Check if the cables connecting the control board of the ODU and thd IDU and connecting the IDU and wired controller are loose. If they are, reconnect them; 2. Check if the cables connecting the control board and IDU and connecting the IDU and wired controller are broken. If they are, replace the cables; 3. Please check the contact of the communication cables; 4.Replace the control board. If the fault is solved, the control board is faulty. Replace the IDU. If the fault is solved, it means the mainboard of indoor unit is faulty.
C2	Communication failure between main control board and inverter compressor drive	1. The communication cable is loose. 2. The communication cable is disconnected. 3. The communication cable is in poor connection. 4. The controller is faulty.	1.,Check if the cable connecting the control board and the compressors drive board is loose. If it is, reconnect it. 2.Check if the cable connecting the control board and compressor's drive board is broken. If it is, replace the cable; 3.Check the contact of the communication cable connecting the control board and compressors drive board; 4.Replace the control board. If the fault is solved, the control board is faulty; replace the compressors drive board, if the fault is solved, it means the compressors drive board is faulty.
C3	Communication failure between main control board and inverter fan drive	1. The communication cable is loose. 2. The communication cable is disconnected; 3. The communication cable is in poor connection. 4. The controller is faulty.	1.Check if the cable connecting the fans drive board and the compressors drive board is loose, if it is, reconnect it; 2.Check if the cable connecting the fans drive board and compressors drive board is broken, if it is, replace the cable; 3.Check the contact of the communication cable connecting the fans drive board and compressors drive board; 4.Replace the main control board, if the fault is solved, the main control board is faulty; replace the fans drive board, if the fault is solved, the fans drive board is faulty.
C5	Indoor unit project number conflict warning	1 Project numbers conflict with each other.	1 Change conflicting project numbers and ensure that no IDUs project number is repeated.
C6	Outdoor unit number inconsistency warning	1. Communication cables between ODUs are loose. 2. Communication	1,If the communication cable is loose, reconnect it. 2,If the communication cable is broken, replace it; 3Check contact of the communication cable; 4Replace the main control board.

		cables between ODUs are broken. 3. Communication cables between ODUs are in poor connection. 4. The controller is faulty.	
CC	No controlling unit	SA800 The SA8 dial switch of the ODU is not switched to 00. SA8 The SA8 dial switch of the ODU is faulty	1 SA800Switch the SA8 dial switch of one of ODU to 00; 2 SA800Replace the control board or switch an ODUs SA8 dial switch to 00.
CF	Multiple controlling units	SA800 SA8 dial switches of multiple ODUs are switched to 00. Dial switches of multiple ODUs are faulty.	1 SA80011Leave one SA8 dial switch unchanged, while switch all the other dial switches to 11; 2 Replace the main control board.
L7	No master IDU	The master IDU is powered off. The communication of the master IDU fails. The main board of the master IDU is faulty. No master IDU is set in the system.	Check if the master IDU is powered on. If yes, replace the main board; C0Check the contact of the communication cable of the master IDU. If no communication failure (C0) is reported, replace the main board. Replace the IDU's main board and reset the master IDU. Set the master IDU.
C5	Project number conflict	Multiple IDUs share one project number	1Reset the repeated project number

Fault code	Fault	Possible causes	Solution

C2	Communication failure between main control board and inverter compressor drive	1 The control board is powered off; 2 The compressor drive board is powered off; 3 The communication cable between the control board and compressor drive board is not connected; 4 The compressor drive board's dial switch SA201 is wrong.	1Check the power supply of the control board. Replace the control board if it works properly; 2Check the power supply of the drive board. Replace the drive board if it works properly; 3Connect the main board and drive board using the communication cable; 4Adjust the dial switch of the compressor drive board.
P3	Compressor drive module reset protection	1The compressor drive board is faulty.	1Replace the compressor drive board.
P5	Inverter compressor over-current protection	1IPMThe drive board's IPM module is damaged; 2The compressor's UVW cable is not connected properly; 3The compressor is damaged.	1 Replace the compressor drive board; 2 UVWReconnect the compressor's UVW cable; 3 Replace the compressor.
P6	Compressor drive IPM module protection	1 The drive board's IPM module is damaged; 2 The compressor's UVW cable is not connected properly; 3 The compressor is damaged.	1Replace the compressor drive board; 2 Reconnect the compressor's UVW cable; 3Replace the compressor.
P7	Compressor drive temperature sensor fault	1The compressor drive board is faulty.	1Replace the compressor drive board.
P8	Compressor drive IPM over-temperature protection	1The compressor drive board is faulty; 2Thermal gel is not applied evenly on the IPM module; 3The IPM module is not screwed properly.	1Replace the compressor drive board; 2 Apply thermal gel evenly on the IPM module; 3 Screw the IPM module properly.
P9	Inverter compressor out-of-step protection	1The compressor drive board is faulty.	1Replace the compressor drive board.
PH	Compressor drive DC bus high voltage protection	1 Whether the voltage of the input power cable of the whole system exceed 460 V; 2 The compressor drive board is faulty.	1Adjust the input power voltage to the required range; 2Replace the compressor drive board.
PL	Compressor drive DC bus low voltage protection	1 Is the voltage of the input power cable of the whole system lower than 320 V; 2 The compressor drive board is faulty.	1 Elevate the voltage of the input power cable to the required range; 2 Replace the compressor drive board.
PC	Compressor drive current check circuit fault	1The compressor drive board is faulty.	1Replace the compressor drive board.
PF	Compressor drive recharging circuit fault	1 Is the voltage of the input power cable of the whole system lower than 280 V;	1 Elevate the voltage of the input power cable to the

		2 The compressor drive board is faulty.	required range; 2 Replace the compressor drive board.
PJ	Inverter compressor starting failure	1 The drive board is faulty; 2 The compressor's UVW cable is not connected properly; 3 The compressor is damaged.	1Replace the compressor drive board; 2 Reconnect the compressor's UVW cable; 3Replace the compressor.
C3	Communication failure between main control board and variable frequency fan drive	1The control board is powered off; 2The fan drive board is powered off; 3The communication cable between the control board and fan drive board is not connected; 4The fan drive board's dial switch is wrong.	1Check the power supply of the control board. Replace the control board if it works properly; 2Check the power supply of the drive board. Replace the drive board if it works properly; 3Connect the main board and drive board using the communication cable; 4Adjust the dial switch of the fan drive board.
H3	Fan drive module reset protection	1The fan drive board is faulty.	1Replace the fan drive board.
H5	Inverter fan overcurrent protection	1 The fan drive board's IPM module is damaged; 2 The fan's UVW cable is not connected properly; 3 The fan is damaged.	1 Replace the fan drive board; 2 Reconnect the fan's UVW cable; 3 Replace the fan.
H6	Fan drive IPM module protection	1 The fan drive board's IPM module is damaged; 2 The fan's UVW cable is not connected properly; 3 The fan is damaged.	1 Replace the fan drive board; 2 Reconnect the fan's UVW cable; 3 Replace the fan.
H7	Fan drive temperature sensor fault	1The fan drive board is faulty.	1Replace the fan drive board.
H8	Fan drive IPM over-temperature protection	1 The fan drive board is faulty; 2 Thermal gel is not applied evenly on the IPM module; 3 The IPM module is not screwed properly.	1Replace the fan drive board; 2 Apply thermal gel evenly on the IPM module; 3Screw the IPM module properly.
H9	Inverter fan out-of-step protection	The fan drive board is faulty.	Replace the fan drive board.
H H	Fan drive DC bus high voltage protection	1 Whether the voltage of the input power cable of the whole system exceeds 460 V; 2 The fan drive board is faulty.	1Lower the voltage of the input power cable to the required range; 2Replace the fan drive board.

HL	Fan drive DC bus low voltage protection	1 Is the voltage of the input power cable of the whole system lower than 320 V; 2Is the fan drive board well connected with the compressor drive board; 3The fan drive board is faulty.	1Elevate the voltage of the input power cable to the required range; 2Connect the fan drive board with the compressor drive board according to the wiring diagram; 3Replace the fan drive board.
H C	Fan drive current detection circuit fault	1 The fan drive board is faulty.	1Replace the fan drive board.
HJ		1 The drive board is damaged; 2 The fan's UVW cable is not connected properly; 3 The fan is damaged.	1Replace the fan drive board; 2Reconnect the fan's UVW cable; 3Replace the fan.

4.1.2 System faults

4.1.2.1 System exhaust temperature exception

Fault code	Fault	Possible causes						Solution
		Primary cause		Secondary cause		Tertiary cause		
		Description	Confirmation method	Description	Confirmation method	Description	Confirmation method	
E4	High exhaust temperature protection	1.The stop valve of the ODU is not fully opened as required.	———	———	———	———	Manual check	Fully open the stop valve.
		2.The IDU's electronic expansion valve is not working properly.	When the IDU is working in the cooling mode and the electronic expansion valve is opened to 2000PLS, the exhaust temperature of the IDU's coil is more than 15°C higher than the intake temperature; when the IDU is working in the heating mode and the electronic expansion valve is opened to 2000PLS, the intake temperature of the	2.1The controlling of electronic expansion valve by main board of indoor unit is abnormal.	Reset the IDU. Listen to the sound and touch the tube to see if the electronic expansion valve is reset. If it is set, it is normal. Otherwise, it is faulty.	2.1.1The control wire of the electronic expansion valve is not connected to the main board.	Manual check	Connect the electronic expansion valve's control wire to the main board.
						2.1.2The control wire that connects the electronic expansion valve to the main board is broken.	Manual check	Repair or replace the control wire of the electronic expansion valve.
				2.2The electronic expansion valve in the mode switcher is faulty.	Other reasons	2.2.1Affected by impurities in the system		Clean the system and clear the impurities. Replace the body of the electronic

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			IDU's coil is more than 10°C higher than the intake temperature;					expansion valve.
						2.2.2The valve body is faulty.		Replace the body of the electronic expansion valve.
		3.The system pipeline is blocked.	The system's exhaust temperature rises and the low pressure is too low (compared with the reference value).	3.1The fluid pipe is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large or part of the pipe is frosting.	——	——	Replace and solder the pipe.
				3.2The air pipe is blocked.				Replace and solder the pipe.
				3.3The pipe that connects the IDU is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large or part of the pipe is frosting.	3.3.1The block is caused by solder.	Cut off the pipe to see if it is blocked.	Replace and solder the pipe.
						3.3.2The pipeline is blocked by impurities.		Replace and solder the pipe.

		4.Lacking refrigerant	The system's exhaust temperature rises and the low pressure is too low (compared with the reference value).	4.1Not enough refrigerant				Inject refrigerant as required.
				4.2Refrigerant pipe leakage	Use the refrigerant leak detector to detect the leak along the pipe.			Stop the leak. Pump out air and inject refrigerant again.
		5.Wrong refrigerant is injected.	20 Stop the whole system. Test the system's balance pressure 20 minutes later and convert the pressure into the corresponding saturation temperature. Compare it with the outdoor ambient temperature. If the difference is larger than 5°C, it is exceptional.	——	——	——	——	Discharge existing refrigerant and inject the correct refrigerant as required.
		6.Exhaust temperature sensor failure						Replace the temperature sensor or main

							board.
		7.The ambient temperature exceeds the scope of temperature required for safe operation.		50The outdoor ambient temperature exceeds 50C.	Measure the ambient temperature.		It is a normal phenomenon caused by the protection function.
E2	Low exhaust temperature protection	1.The ODU's electronic expansion valve is not working properly.	When the system is working in the heating mode and the ODU's electronic expansion valve is opened to 100PLS, the intake temperature of the corresponding liquid-air separator is more than 1°C lower than the low-pressure saturation temperature and the difference between the compressor's exhaust temperature or cover temperatur	1.2The controlling heating electronic expansion of the main board or the electronic expansion valve of the subcooler is faulty.	Reset the ODU. Listen to the sound and touch the tube to see if the electronic expansion valve is reset. If it is set, it is normal. Otherwise, it is faulty.	1.2.1The control wire of the electronic expansion valve is not connected to the main board.	Manual check	Connect the electronic expansion valve's control wire to the main board.
						1.2.2The control wire that connects the electronic expansion valve to the main board is broken.	Manual check	Repair or replace the control wire of the electronic expansion valve.
				1.3The body of the electronic expansion valve is not working properly.	Other reasons	1.3.1Affected by impurities in the system		Clean the system and clear the impurities. Replace the body of the electronic expansion valve.

					1.3.2The body of the valve is faulty.		Replace the body of the electronic expansion valve.
		2.The IDU's electronic expansion valve is not working properly	When the system is working in the cooling mode and the ODU's electronic expansion valve is opened to 200PLS, the exhaust temperature of the IDU's coil is more than 1°C lower than the intake pipe's temperature and the difference between the compressor's exhaust temperature or cover temperature and the high-pressure temperature is smaller than 10°C.	2.1 The controlling of electronic expansion valve by main board of indoor unit is abnormal.	Reset the IDU. Listen to the sound and touch the tube to see if the electronic expansion valve is reset. If it is set, it is normal. Otherwise, it is faulty.	2.1.1The control wire of the electronic expansion valve is not connected to the main board.	Manual check	Connect the electronic expansion valve's control wire to the main board.
						2.1.2The control wire that connecting the electronic expansion valve to the main board is broken.	Manual check	Repair or replace the control wire of the electronic expansion valve.
				2.2 The body of the electronic expansion valve is not working properly.	Other reasons	2.2.1Affected by impurities in the system		Clean the system and clear the impurities. Replace the body of the electronic expansion valve.
						2.2.2The valve body is faulty.		Replace the body of the electronic expansion valve.
		3.Exhaust temperatu						Replace the

		re sensor failure						temperature sensor or main board.
		4.Too much refrigerant	Other reasons	Incorrect quantity of refrigerant is injected.				Check the necessary amount of refrigerant and discharge the unneeded refrigerant slowly via the stop valve of the fluid pipe.

4.1.2.2 Pressure

Fault code	Fault	Possible causes						Solution
		Primary cause		Secondary cause		Tertiary cause		
		Description	Confirmation method	Description	Confirmation method	Description	Confirmation method	
E1	High pressure protection	1.The stop valve of the ODU is not fully opened as required.					Manual check	Fully open the stop valve.
		2.The system pipeline is blocked.	The system's exhaust pressure rises and the low pressure is too low (compared with the reference	2.1The system air pipeline is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large.	2.1.1The block is caused by solder.	Cut off the pipe and check it.	Replace and solder the pipe.
						2.1.2The pipeline is blocked by impurities.		Replace and solder the pipe.

				value).	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large or part of the pipe is frosting.			Replace and solder the pipe.
				2.2The fluid pipe is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large or part of the pipe is frosting.			Replace and solder the pipe.
				2.4The pipe that connects the IDU is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large or part of the pipe is frosting.	2.4.1The block is caused by solder.	Cut off the pipe and check it.	Replace and solder the pipe.
						2.4.2The pipeline is blocked by impurities.		Replace and solder the pipe.
		3.The ambient temperature is too high.		3.150In the cooling mode, the outdoor temperature is over 50C.	Measure the outdoor ambient temperature.			It is a normal phenomenon caused by the protection function.
				3.2In the heating mode, the actual ambient temperature of the IDU's return air is over 30C.	Measure the outdoor ambient temperature.			It is a normal phenomenon caused by the protection function.

		4.The pressure sensor is faulty.			4.1The high pressure sensor is faulty.	205 Stop the whole system. Test the system's balance pressure 20 minutes later and convert the pressure into the corresponding saturation temperature. Compare it with the outdoor ambient temperature. If the difference is larger than 5C, it is exceptional.			Replace the high pressure sensor.
					4.2The high pressure and low pressure sensors are connected reversely.	Connect the stop valve of the module fluid pipe and air pipe to the high and low pressure gauges and transform the readings into corresponding temperatures. Compare them to the high- and low-temperatures tested by the system. If the difference is larger than 5C, it is exceptional.			Check the high and low-pressure sensors.

				5.1.1The pressure switch is not connected to the main board.		Reconnect it.
5.The high pressure switch is faulty.	E1 E1 protection is displayed on the unit when it is powered on.	5.1The high pressure switch is not connected to the main board.		5.1.2The connect wire between the pressure switch and main board is faulty.		Replace the connect wire.
		5.2The high pressure switch is damaged.				Replace the pressure switch.
6.The fan is not working properly.	A. B. A. The ODU's fan does not work in the cooling mode. B. The IDU's motor does not work in the heating mode.	6.1The IDU's fan is faulty.	Manual check	6.1.1The power cable connecting the motor and main board is loose.	Manual check	Reconnect the motor with the power cable.
				6.1.2The electric capacity is not connected or is damaged.	Manual check	Connect or replace the electric capacity.
				6.1.3The motor is damaged.	Other reasons	Replace the motor.

					6.2The ODU's fan is faulty.	Manual check	6.2.1The fan motor is not properly connected with the control board of the motor with the power cable.	Manual check	Reconnect it properly.
							6.2.2The fan motor is not properly connected with the control board of the motor with the signal feedback cable.	Manual check	Reconnect it properly.
							6.2.3The control board of the fan's motor is damaged.	Manual check	Replace the control board of the motor.
							6.2.4The main board of the fan's motor is damaged.	Other reasons	Replace the motor.

		7.Too much refrigerant	Other reasons	Incorrect quantity of refrigerant is injected.				Check the necessary amount of refrigerant and discharge unneeded refrigerant slowly via the stop valve of the fluid pipe.
JL	Low high pressure protection	1.The ambient temperature exceeds the range.		1.1The outdoor ambient temperature in the cooling mode is lower than -10C.	Measure the outdoor ambient temperature.			It is a normal phenomenon caused by the protection function.
				1.2The indoor ambient temperature in the heating mode is lower than 5C.	Measure the temperature of the unit's return air.			It is a normal phenomenon caused by the protection function.
		2.Not enough refrigerant						Locate the leak and inject refrigerant.

Fault code	Fault	Possible causes						Solution
		Description	Confirmation method	Description	Confirmation method	Description	Confirmation method	
E3	Low pressure protecti	1.The stop valve of the ODU is					Manual check	Fully open the stop valve.

		on	not fully opened as required.					
			2.The system pipeline is blocked.	The system's exhaust pressure rises and the low pressure is too low (compared with the reference value).	2.1The system air pipeline is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large.	2.1.1The block is caused by solder.	Cut off the pipe and check it.	Replace and solder the pipe.
							2.1.2The pipeline is blocked by impurities.		Replace and solder the pipe.
					2.2The fluid pipe is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large or part of the pipe is frosting.			Replace and solder the pipe.
					2.4The pipe that connects the IDU is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large or part of the pipe is frosting.	2.4.1The block is caused by solder.	Cut off the pipe and check it.	Replace and solder the pipe.
							2.4.2The pipeline is blocked by impurities.		Replace and solder the pipe.
			3.The ambient temperature is too low.		3.1The outdoor ambient temperature is lower than -25C in the	Measure the outdoor ambient temperature.			It is a normal phenomenon caused by the protection function.

				heating mode.				
		4.The pressure sensor is faulty.		4.1The low pressure sensor is faulty.	20 Stop the whole system. Test the system's balance pressure 20 minutes later and convert the pressure into the corresponding saturation temperature. Compare it with the outdoor ambient temperature. If the difference is larger than 5C, it is exceptional.			Replace the high pressure sensor.
				4.2The high pressure and low pressure sensors are connected reversely.	Connect the stop valves of the module high- and low-pressure air pipes to the high and low pressure gauges and transform the readings into corresponding temperatures. Compare them to the high- and low-temperatures tested by			Reconnect the high- and low-pressure sensors.

				the system. If the difference is larger than 5C, it is exceptional.			
6.The fan is not working properly.		A. The IDU's fan does not work in the cooling mode. B. The ODU's fan does not work in the heating mode.	6.1The IDU's fan is faulty.	Manual check	6.1.1The power cable connecting the motor and main board is loose.	Manual check	Reconnect the motor with the power cable.
					6.1.2The electric capacity is not connected or is damaged.	Manual check	Connect or replace the electric capacity.
					6.1.3The motor is damaged.	Other reasons	Replace the motor.
			6.2The ODU's fan is faulty.	Manual check	6.2.1The fan motor is not properly connected with the control board of the motor.	Manual check	Reconnect it properly.
					6.2.2The fan motor is not properly connected with the control board of the motor with the communication feedback cable.	Manual check	Reconnect it properly.
					6.2.3The		

						control board of the fan's motor is damaged.	Manual check	Replace the control board of the motor.
						6.2.4The main board of the fan's motor is damaged.	Other reasons	Replace the motor.
		7.Not enough refrigerant	Other reasons	Incorrect quantity of refrigerant is injected.				Check the necessary amount of refrigerant and inject refrigerant slowly via the stop valve of the low-pressure air pipe.

4.1.2.3/ Poor cooling/heating performance

Feedback from user	Exception	Possible causes						Solution
		Primary cause		Secondary cause		Tertiary cause		
		Description	Confirmation method	Description	Confirmation method	Description	Confirmation method	
Poor heating/cooling performance	A. When the IDU is working in the cooling mode and the electronic expansion valve is opened to 2000PLS, the exhaust temperature of the IDU's coil is more than 5C higher than the intake temperature; B. when the IDU is working in the heating mode and	1.The stop valve of the ODU is not fully opened as required.					Manual check	Fully open the stop valve.
		2.The system pipeline is blocked.		2.1The system air pipeline is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large.	2.1.1The block is caused by solder.	Cut off the pipe and check it.	Replace and solder the pipe.
						2.1.2The pipeline is blocked by impurities.		Replace and solder the pipe.
				2.2The fluid pipe is blocked.	Touch the pipe along the flowing			Replace and solder the pipe.

the electronic expansion valve is opened to 2PLS, the intake temperature of the IDU's coil is more than 12C lower than the saturation temperature corresponding to the high pressure;				direction of refrigerant to feel the temperature difference. The difference is large or part of the pipe is frosting.		
			2.4The pipe that connects the IDU is blocked.	Touch the pipe along the flowing direction of refrigerant to feel the temperature difference. The difference is large or part of the pipe is frosting.	2.4.1The block is caused by solder.	Cut off the pipe and check it.	Replace and solder the pipe.
					2.4.2The pipeline is blocked by impurities.		Replace and solder the pipe.
	3.The ambient temperature exceeds the required range.		3.1The ambient temperature of the IDU that works in the cooling mode is higher than 32C.	Measure the outdoor ambient temperature.	3.1.11 The system has worked for less than 1 hour.		It is a normal phenomenon
					3.1.2An improper system is selected		Choose another system with larger power.
			3.2The outdoor ambient temperature in the cooling mode is higher than 40C.	Measure the outdoor ambient temperature.			It is a normal phenomenon.
			3.312The ambient temperature of the IDU that works in the heating mode is lower than 12C.	Measure the outdoor ambient temperature.	3.3.12The system has worked for less than 2 hours.		It is a normal phenomenon.
					3.3.2An improper system is selected		Choose another system with larger power.

			3.4-7The outdoor ambient temperature in the heating mode is lower than -7C.	Measure the outdoor ambient temperature.			It is a normal phenomenon.
	4.Poor airflow distribution design		4.1The air intake and return inlet of the ODU are too close to each other, affecting the heat exchange performance of the unit.	Check the distance.			Re-design the airflow distribution.
			4.2The air intake and return inlet of the IDU are too close to each other, causing poor heat exchange of the unit.	Check the distance.			Re-design the airflow distribution.
	7.Not enough refrigerant	Other reasons	Incorrect quantity of refrigerant is injected.				Check the necessary amount of refrigerant and inject refrigerant slowly via the stop valve of the low-pressure air pipe.

4.2Flowchart analysis

4.2.1 High exhaust temperature protection (E4)

When the system appears high exhaust temperature protection for compressor, the IDU will display high exhaust temperature fault E4, while the IDU will display the specific faulty compressor. For example, when high exhaust temperature protection is enabled on compressor 2# of module 3# of the ODU, IDUs will display E4 and the module will display E6, indicating that high exhaust temperature protection is enabled on compressor 2#.

E4 high discharge temperature protection is indicated on the indoor unit.

Confirm the specific outdoor unit's protection module and compressor.

Restart the unit and check if the discharge temperature of the failing compressor is equal to or higher than 118°C.

No → Is the discharge temperature sensor's resistance normal?

No → Replace the temperature sensor

Yes → Replace the main board of the outdoor unit.

Yes → Check if the electronic expansion valve of the subcooler is connected to the main board correctly.

No → Re-connect the electronic expansion valve of the subcooler.

Yes → Does the indoor unit's capacity match that of the outdoor unit?

No → Check rating capacities of the indoor and outdoor units again.

Yes → Does the environmental temperature of the unit exceed the permitted scope of temperature of the unit?

Yes → Check rating capacities of the indoor and outdoor units again.

No ↓

1. Check the system's refrigerant pipe for any leak and add refrigerant
2. Check if the pipeline is jammed;

4.2.2 Low exhaust temperature protection (E2)
4.2.3 System high pressure protection (E1)

4.2.4 System low pressure protection (E3)

4.2.5. System refrigerant lacking protection (U4)

Refrigerant lacking protection (U4)

Test the system's high pressure 30 minutes after the whole machine is halted

Transfer the tested high pressure into the corresponding saturation temperature

Is the saturation temperature corresponding to the high pressure five or more Celsius degrees lower than the outdoor temperature? — **NO** →

Is the system injected with refrigerant as required? — **NO** →

YES

Check the pipeline in case of leakage after only the indoor unit with the smallest capacity works continuously for 30 minutes in the cooling mode.

Add refrigerant as required.

YES

Start the system and enable only the IDU with the minimum capacity for refrigerating. Keep the IDU running for a continuous 30 minutes. Then, the system is detected to have leakage. In this case, check the piping system.

Is the high pressure of the operating module higher than 15 degrees? — **YES** → Add another 3 kg of refrigerant.

NO

Is the system injected with refrigerant as required? — **NO** →

YES

Check the pipeline in case of leakage.

Add refrigerant as required.

4.2.6.System high pressure ratio protection (J8)

```
                      ┌─────────────────────┐
                      │  Refrigerant lacking │
                      │    protection (U4)   │
                      └─────────────────────┘
                                │
                                ▼
                      ┌─────────────────────┐
                      │  Test the system's high │
                      │ pressure 30 minutes after the │
                      │  whole machine is halted │
                      └─────────────────────┘
                                │
                                ▼
                      ┌─────────────────────┐
                      │ Transfer the tested high │
                      │    pressure into the │
                      │ corresponding saturation │
                      │     temperature      │
                      └─────────────────────┘
```

Is the saturation temperature corresponding to the high pressure five or more Celsius degrees lower than the outdoor temperature? — NO → **Is the system injected with refrigerant as required?** — NO → **Add refrigerant as required.**

YES (saturation temperature) ↓

Start the system and enable only the IDU with the miminum capacity for refrigerating. Keep the IDU running for a continuous 30 minutes. Then, the system is detected to have leakage. In this case, check the piping system.

YES (is the system injected with refrigerant as required?) → **Check the pipeline in case of leakage after only the indoor unit with the smallest capacity works continuously for 30 minutes in the cooling mode.**

Is the high pressure of the operating module higher than 15 degrees? — YES → **Add another 3 kg of refrigerant.**

NO ↓

Is the system injected with refrigerant as required? — NO → **Add refrigerant as required.**

YES ↓

Check the pipeline in case of leakage.

4.2.7. System low pressure ratio protection (J9)

```
                    ┌─────────────────────┐
                    │  System low pressure │
                    │   ratio protection   │
                    └─────────────────────┘
                               │
                    ┌─────────────────────┐
                    │ Restart the system   │
                    │ and test the pressure│
                    │ at the valve of the  │
                    │ high pressure and low│
                    │   pressure pipe.     │
                    └─────────────────────┘
                               │
                    ┌─────────────────────┐
                    │  Compare the tested  │
                    │ valve with that      │
                    │  tested by the       │
                    │      software        │
                    └─────────────────────┘
                               │
            ┌──────────────────────────┐        ┌──────────────────┐
            │ Is the difference in the │  YES   │ The high pressure│
            │ high pressure larger than├───────>│ sensor broken.   │
            │   5 Celsius degree?      │        │ Replace the      │
            └──────────────────────────┘        │     sensor       │
                        │ NO                     └──────────────────┘
            ┌──────────────────────────┐        ┌──────────────────┐
            │ Is the difference in the │  YES   │ The low pressure │
            │ low pressure larger than ├───────>│ sensor is broken.│
            │     Celsius degree?      │        │ Replace the      │
            └──────────────────────────┘        │     sensor       │
                        │ NO                     └──────────────────┘
            ┌──────────────────────────┐  NO    ┌──────────────────┐
            │ Does the outdoor unit's  ├───────>│ Replace the      │
            │ four-way valve reverse   │        │ four-way valve   │
            │        properly?         │        └──────────────────┘
            └──────────────────────────┘
                        │ YES
            ┌──────────────────────────┐  NO    ┌──────────────────┐
            │ Does the indoor unit's   ├───────>│ Replace the      │
            │ four-way valve reverse   │        │ four-way valve   │
            │        properly?         │        └──────────────────┘
            └──────────────────────────┘
                        │ YES
            ┌──────────────────────────┐  NO    ┌──────────────────┐
            │ Are the electronic       ├───────>│ Check electronic │
            │ expansion valves of the  │        │ expansion valves │
            │ indoor and outdoor units │        └──────────────────┘
            │   working properly?      │
            └──────────────────────────┘
                        │ YES
                    ┌─────────────────────┐
                    │  The system pipeline │
                    │ is connected         │
                    │     incorrectly      │
                    └─────────────────────┘
                               │
                    ┌─────────────────────┐
                    │ Check connection of  │
                    │    the high- and     │
                    │  low-pressure pipes  │
                    └─────────────────────┘
```

4.2.8. Indoor unit anti-freezing protection (L5)

```
┌─────────────────────────┐
│     Indoor unit's E2    │
│  anti-freezing protection│
└─────────────────────────┘
             │
             ▼
      ◇ Is the Indoor temperature     YES    ┌──────────────────┐
        lower than 23 Celsius      ─────────▶ │ Normal protection │
            degrees? ◇                        └──────────────────┘
             │
            NO
             ▼
      ◇ Is the indoor unit's          NO     ┌──────────────────┐
         motor working            ─────────▶ │  Check the motor │
           properly? ◇                        └──────────────────┘
             │
            YES
             ▼
      ◇ Is the Indoor unit's electronic  NO   ┌──────────────────────┐
        expansion valve working      ──────▶  │ Check the electronic │
           properly? ◇                        │   expansion valve    │
             │                                └──────────────────────┘
            YES
             ▼
      ◇ Is the indoor unit's pipe       NO    ┌──────────────────────┐
       temperature sensor working   ──────▶   │    Check the         │
           properly? ◇                        │ temperature sensor   │
             │                                └──────────────────────┘
            YES
             ▼
   ┌─────────────────────────┐
   │ Check if the return air inlet │
   │   or filter is blocked  │
   └─────────────────────────┘
```

4.2.9. Indoor unit water overflow protection (L3)

Indoor unit water overflow protection (L3)

Is the water tray full of water? — No → Is the voltage output of the water level switch terminal normal? — No → Replace the indoor unit's main board.

Is the voltage output of the water level switch terminal normal? — Yes → Check the water level switch.

Is the water tray full of water? — Yes ↓

Is the water pump working properly? — No → Is the water pump's output signal on the main board normal? — No → Replace the indoor unit's main board.

Is the water pump's output signal on the main board normal? — Yes → Check connection of the water pump.

Is the water pump working properly? — Yes ↓

Is the drainage pipe blocked or steep enough? — No → Clear the obstacle or adjust the slope of the drainage pipe.

Is the drainage pipe blocked or steep enough? — Yes ↓

Replace the pump.

4.2.10. Temperature sensor fault

The temperature sensor fails

Is the temperature sensor's terminal properly connected to the main board? — No → Reconnect it or replace the terminal.

Is the temperature sensor's terminal properly connected to the main board? — Yes ↓

Unplug the temperature sensor. Is the resistance normal when the sensor is used to test the environmental temperature? — No → Replace the temperature sensor.

Unplug the temperature sensor. Is the resistance normal when the sensor is used to test the environmental temperature? — Yes ↓

Replace the main board.

4.2.11. Pressure sensor fault

4.2.12. Analysis of drive control system faults

When the unit fails and halts, first check the dual-8 digit nixie tube of main control board and fault table to find out the specific fault. Then check and solve the fault according to the following methods.

1) Communication failure between the compressors drive board and control board (outdoor fault C2)

C2

Check if the control board and compressors drive board are powered

NO → If the LED of the control board is off, replace the control board; if the LED of the drive board is off, replace the drive board.

YES

Check if the control board and compressors drive board are well connected to each other with communication cable.

NO → If not, reconnect them. If the cable is not conducting, replace the cable.

YES

Check if the dial switch of the compressors drive board is correct.

NO → Adjust the drive boards dial switch as required.

YES

Replace the main control board. Is the fault solved?

NO

Drive board of compressor is faulty, replace the drive board

complete

Faults in the IPM temperature sensor of the inverter compressor's drive board (IDU fault code P7), current detection circuit (ODU fault code PC), drive module reset protection (ODU fault P3) and out-of-step protection (ODU fault P9).

```
┌─────────────────────────┐
│   P3, P7, P9 or PC       │
└─────────────────────────┘
            │
            ▼
       ◇ Check if the fault
   is solved after turning on the
       system for three times ◇
            │
            ▼  No
       ◇ The compressor's drive board is
   faulty and needs to be replaced. ◇
            │
            ▼
┌─────────────────────────┐
│       Complete           │
└─────────────────────────┘
```
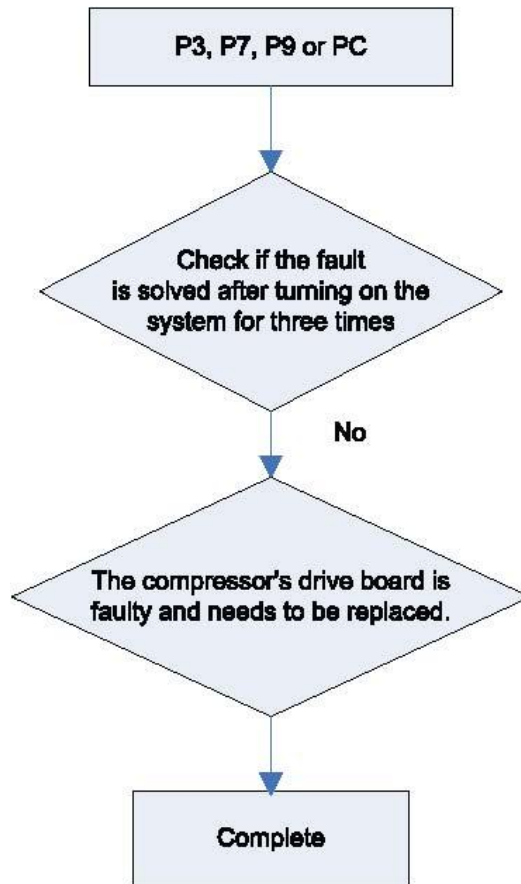
Inverter compressor overcurrent protection (ODU fault code P5) and IPM module protection faults (ODU fault P6)

P5 or P6

Check if the IPM module is damaged according to the methods mentioned in Attachment 3.3

YES → Replace the compressors drive board

NO

Check if the compressors UVW cables are well connected

NO → Connect the compressors UVW cables well

YES

Is the fault solved after the compressors drive board is replaced?

NO

The compressor is faulty and needs to be replaced

Complete
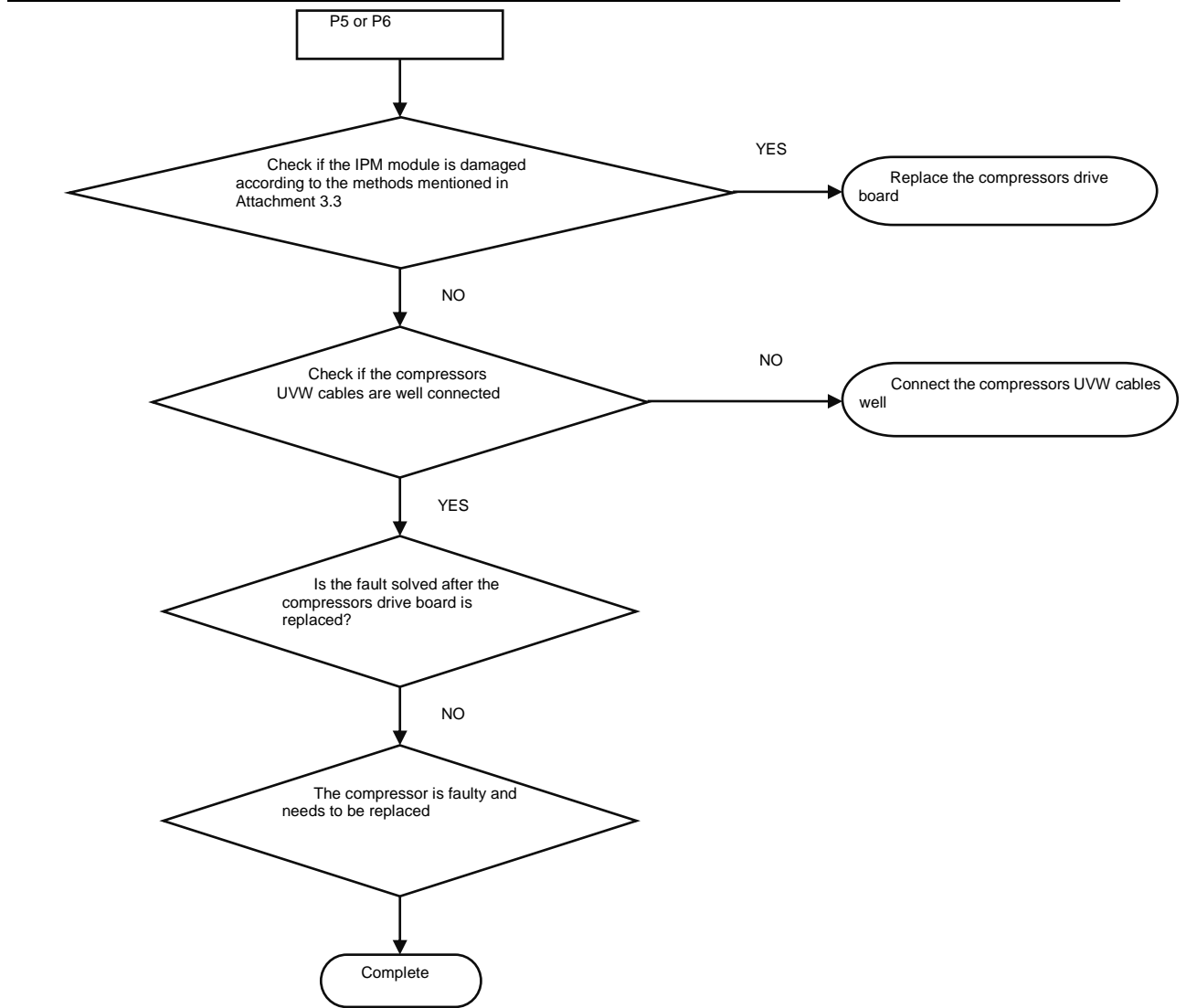
Attachment: How to check whether the IPM module is damaged:

7) Preparation: Find a digital multi-meter and switch it to the diode. Remove U, V and W cables of the compressor from the drive board two minutes after the system is powered off. Make sure that it is tested at least two minutes after the system is powered off.

8) Method: Use the black probe of the multi-meter to touch the place marked by P in the follow picture and the red probe to touch places marked by U, V and W respectively and record readings of the multi-meter. Use the red probe to touch the place marked by N and black probe to touch places marked by U, V and W respectively and record readings of the multi-meter.

9) Analysis: If the reading ranges between 0.3 V and 0.7 V in the above-mentioned six scenarios, the IPM module is normal. If the reading is 0 in one or multiple scenarios, the IPM module is damaged.

Inverter compressor drive board IPM module over-temperature fault (ODU fault code P8)

P8

Check if the fault occurs when the system is powered on

No → Replace the compressor's drive

Yes

Check if the IPM module is screwed well and thermal gel is applied on the surface.

Yes → Screw the IPM module properly and apply thermal gel on the surface.

Complete
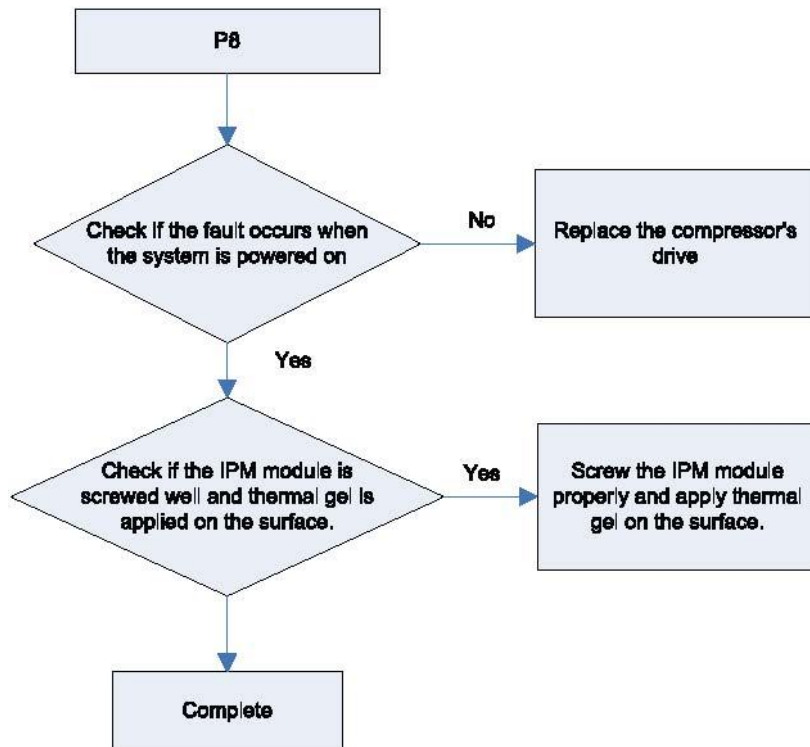
Recharging circuit faulty of the inverter compressor drive board (ODU fault code PF)

PF

Check if the voltage of the whole system's input power cable reaches 280V.

No → Elevate the voltage of the input power cable to 380V.

Yes

The compressor drive board is faulty and needs to be replaced.

Complete

High voltage protection for the DC bus of the inverter compressors drive board (ODU fault code PH)

```
┌─────────────────────┐
│         PH          │
└─────────────────────┘
            │
            ▼
```

Check if the voltage of the whole system's input power cable exceeds 460 V.0V. —Yes→ Lower the voltage of the input power cable to 380 V.

No
│
▼

The compressor's drive board is faulty and needs to be replaced.

│
▼

Complete

Low voltage protection for the DC bus of the inverter compressors drive board (ODU fault PL)

```
┌─────────────────────┐
│         PL          │
└─────────────────────┘
            │
            ▼
```

Check if the voltage of the whole system's Input power cable is lower than 320V. —Yes→ Elevate the voltage of the input power cable to 380 V.

No
│
▼

The compressor's drive board is faulty and needs to be replaced.

│
▼

Complete

Inverter compressor startup failure (ODU fault code PJ)

PJ

Restart the system five minutes after shutting down it to see if the failure is solved.

No

Check if the compressor's UVW cable is connected properly.

No → Reconnect the compressor's UVW cable.

Yes

Replace the compressor's drive board to see if the failure is solved.

No

The compressor is faulty and needs to be replaced.

Complete

Analysis of faults in the inverter fan drives control system

(1) Communication failure between the fans drive board and control board (outdoor fault C3)
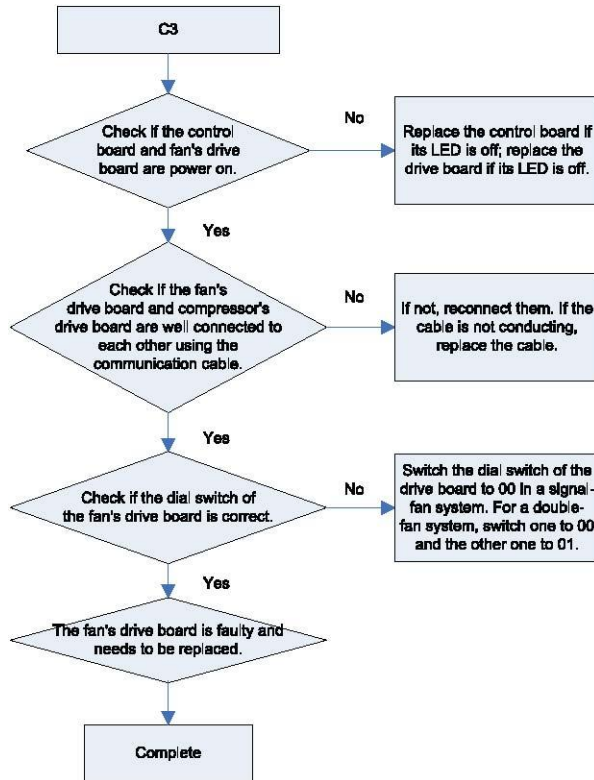
4) Faults in the IPM temperature sensor of fans drive board (ODU fault code H7), current detection circuit (ODU fault code HC), and out-of-step protection (ODU fault H9).
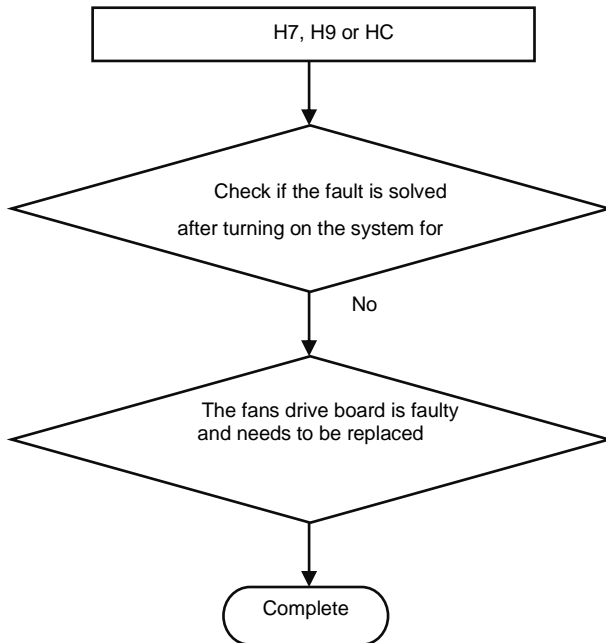
5) Inverter fan overcurrent protection (ODU fault code H5), and IPM module protection fault (ODU fault code H6)

```
┌──────────────┐
│   H5 or H6   │
└──────────────┘
        │
        ▼
   ╱────────────────────────────────────╲            YES      ╭─────────────────────────────╮
  ╱  Check if the IPM module is damaged   ╲──────────────────▶│  Replace the fans drive board │
  ╲  according to the methods stipulated  ╱                   ╰─────────────────────────────╯
   ╲       in Attachment 4.3             ╱
    ╲────────────────────────────────────╱
        │ NO
        ▼
   ╱────────────────────────────╲                    NO       ╭───────────────────────────────╮
  ╱  Check if the fans UVW cables ╲─────────────────────────▶│  Connect the fan's UVW cables  │
  ╲     are well connected        ╱                          │              well              │
   ╲────────────────────────────╱                            ╰───────────────────────────────╯
        │ YES
        ▼
   ╱────────────────────────────╲
  ╱   Replace the fan's drive     ╲
  ╲ board to see if the fault is  ╱
   ╲        solved               ╱
    ╲──────────────────────────╱
        │ NO
        ▼
   ╱────────────────────────────╲
  ╱  The fan is faulty and needs  ╲
  ╲     to be replaced            ╱
   ╲────────────────────────────╱
        │
        ▼
   ╭──────────────╮
   │   Complete   │
   ╰──────────────╯
```
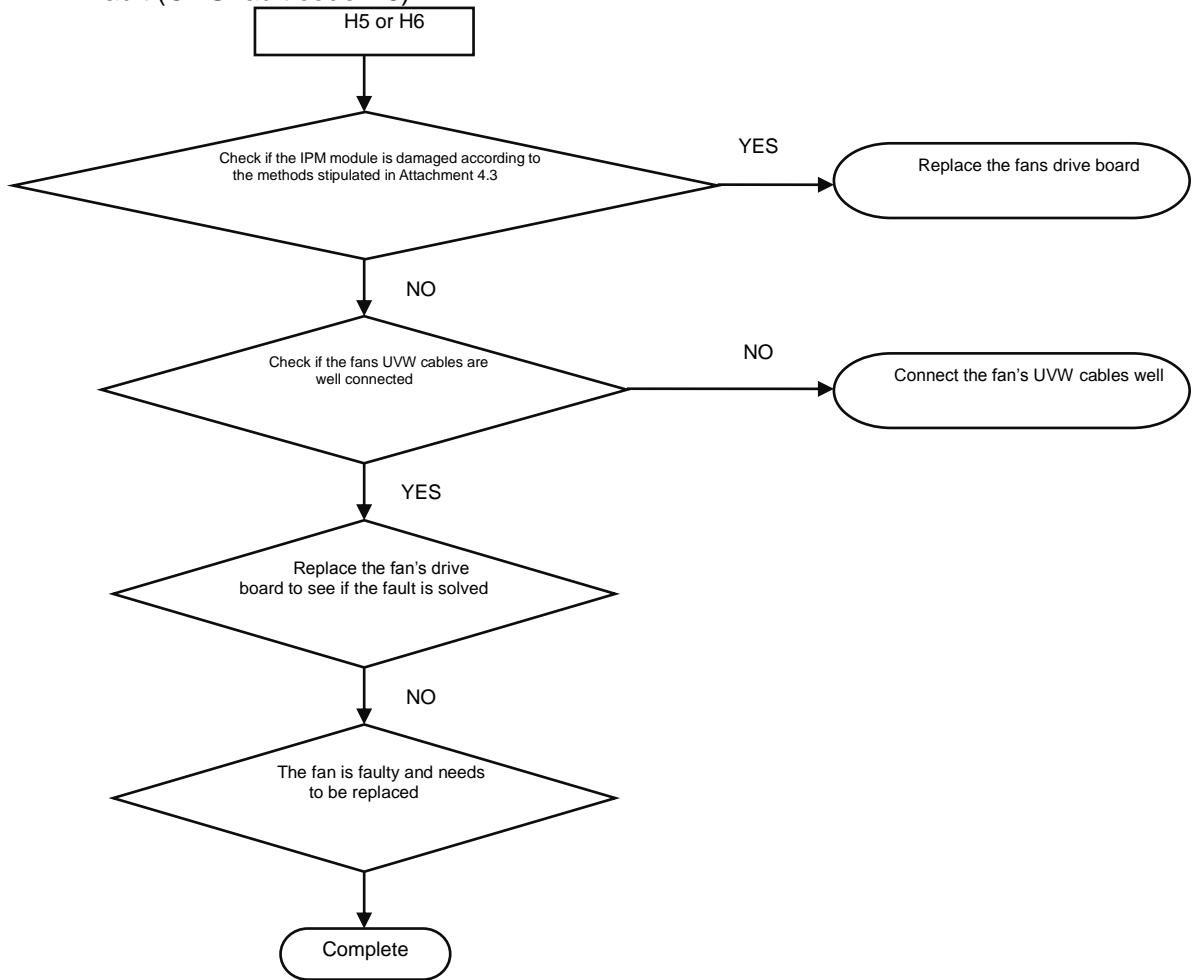
Attachment: How to check whether the IPM module is damaged:

①Preparation: Find a digital multi-meter and switch it to the diode. Remove U, V and W cables of the fan from the drive board two minutes after the system is powered off. Make sure that it is tested two minutes after the system is powered off.

②Method: Use the black probe of the multi-meter to touch the place marked by P in the follow picture and the red probe to touch places marked by U, V and W respectively and record readings of the multi-meter. Use the red probe to touch the place marked by N and black probe to touch places marked by U, V and W respectively and record readings of the multi-meter.

③Analysis: If the reading ranges between 0.3 V and 0.7 V in the above-mentioned six scenarios, the IPM module is normal. If the reading is 0 in one or multiple scenarios, the IPM module is damaged.
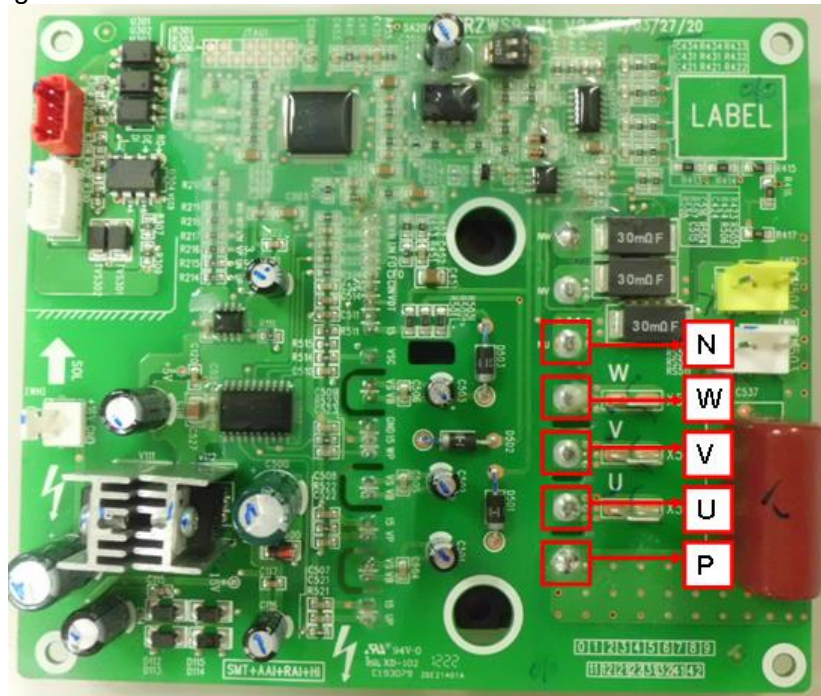
Inverter fan drive board IPM module over-temperature fault (ODU fault code H8)

High voltage protection for the DC bus of the inverter fan's drive board (ODU fault code HH)

```
        ┌─────────────────┐
        │       HH        │
        └─────────────────┘
                 │
                 ▼
        ╱─────────────────╲
       ╱  Check If the     ╲        Yes      ┌──────────────────────────┐
      ╱  voltage of the     ╲──────────────▶│ Lower the voltage to 380 V. │
      ╲  whole system's     ╱                └──────────────────────────┘
       ╲ input power cable ╱
        ╲ exceeds 460V    ╱
         ╲───────────────╱
                 │  No
                 ▼
        ╱─────────────────╲
       ╱ The fan's drive   ╲
      ╱  board is faulty    ╲
      ╲ and needs to be     ╱
       ╲ replaced.         ╱
        ╲───────────────╱
                 │
                 ▼
        ┌─────────────────┐
        │    Complete     │
        └─────────────────┘
```

Low voltage protection for the DC bus of the inverter fan's drive board (ODU fault code HL)

```
        ┌─────────────────┐
        │       HL        │
        └─────────────────┘
                 │
                 ▼
        ╱─────────────────╲
       ╱ Check if the input ╲       YES      ╭──────────────────────╮
      ╱ power voltage of the ╲──────────────▶│ Low input power       │
      ╲ whole system is      ╱               │ voltage fault, adjust │
       ╲ lower than 320V    ╱                │ the voltage to 380V   │
        ╲───────────────╱                    ╰──────────────────────╯
                 │  NO
                 ▼
        ╱─────────────────╲
       ╱ Check if the        ╲      NO       ╭──────────────────────╮
      ╱ terminals CN503 and   ╲─────────────▶│ The fan's drive       │
      ╲ CN504 are connected   ╱              │ board is faulty and   │
       ╲ to wires            ╱               │ needs to be replaced  │
        ╲───────────────╱                    ╰──────────────────────╯
                 │  YES
                 ▼
        ╱─────────────────╲
       ╱ Connect the wires    ╲
      ╱ well in terminals      ╲
      ╲ CN503 and CN504 in     ╱
       ╲ fan's drive board    ╱
        ╲───────────────╱
                 │
                 ▼
        ╭─────────────────╮
        │    Complete     │
        ╰─────────────────╯
```

Inverter fan startup failure (ODU fault code HJ)

```
                    ┌─────────────────────┐
                    │         HJ          │
                    └─────────────────────┘
                               │
                               ▼
                        ╱───────────╲
                       ╱ Check if the ╲          No    ┌──────────────────────┐
                      ╱ fan's UVW cable ╲──────────────▶│ Reconnect It properly.│
                      ╲ is connected     ╱              └──────────────────────┘
                       ╲ properly.      ╱
                        ╲───────────╱
                               │
                             Yes
                               ▼
                        ╱───────────╲
                       ╱ Replace the  ╲
                      ╱ fan's drive     ╲
                      ╲ board to see If  ╱
                       ╲ the fault Is   ╱
                        ╲ solved.      ╱
                        ╲───────────╱
                               │
                              No
                               ▼
                        ╱───────────╲
                       ╱ The fan Is    ╲
                      ╱ faulty and needs ╲
                      ╲ to be replaced.  ╱
                       ╲               ╱
                        ╲───────────╱
                               │
                               ▼
                    ┌─────────────────────┐
                    │      Complete       │
                    └─────────────────────┘
```

5.Power Distribution

5.1 Power distribution method
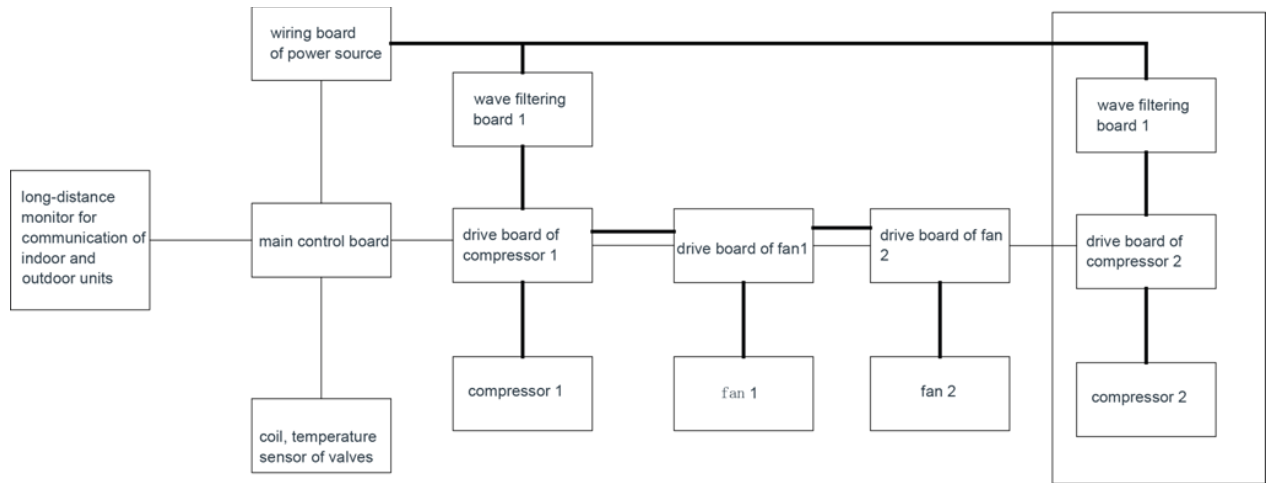
5.2 Introduction on key electric parts

Name	Picture	Introduction of functions
Wave filtering board		It's mainly for filtering interference in the power source, protecting anti-interference performance of unit in inferior quality of power sourece; second, it can restrain unit's interference to power source to prevent the operation of unit from impacting other home appliances' operation.
Air switch		For connection and disconnection of main circuit, can protect the unit in overcurrent and short circuit situations.
IPM module		Inside the IPM module, it has integrated 3 sets of complementary IGBT tubes, their connection and disconnection can be controlled by PWM wave, which can apply the voltage of DC bus to different winding of stator in different period of time, and can bring current in the stator and at the same time induce magnetic field in rotor coil, so as to drive the operation of rotor and compressor.

PFC module		Inside the PFC module, it has integrated four diodes and 2 MOS tubes, which can convert inputted AC power source into outputted DC power source, at the same time control connection and disconnection of MOS tube via PWM wave, and resort to inductance to increase the voltage.

5.3 Circuit Diagram

5.3.1 Circuit diagram of outdoor unit

Circuit diagram of GMV-S224W/A-X, GMV-S280W/A-X
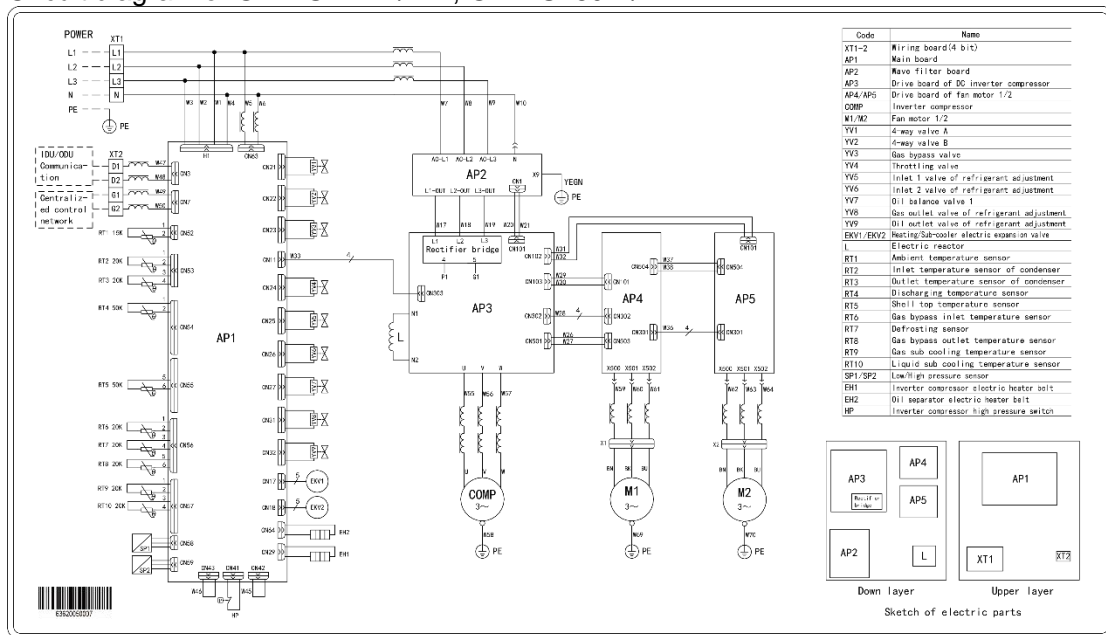
Notes: The above circuit diagram is only for reference, for specific contents please subject to circuit diagram stuck in electric box of unit.

5.3.2 Circuit diagram of hydro box

Electric schematic diagram of NRQD16G/A-S
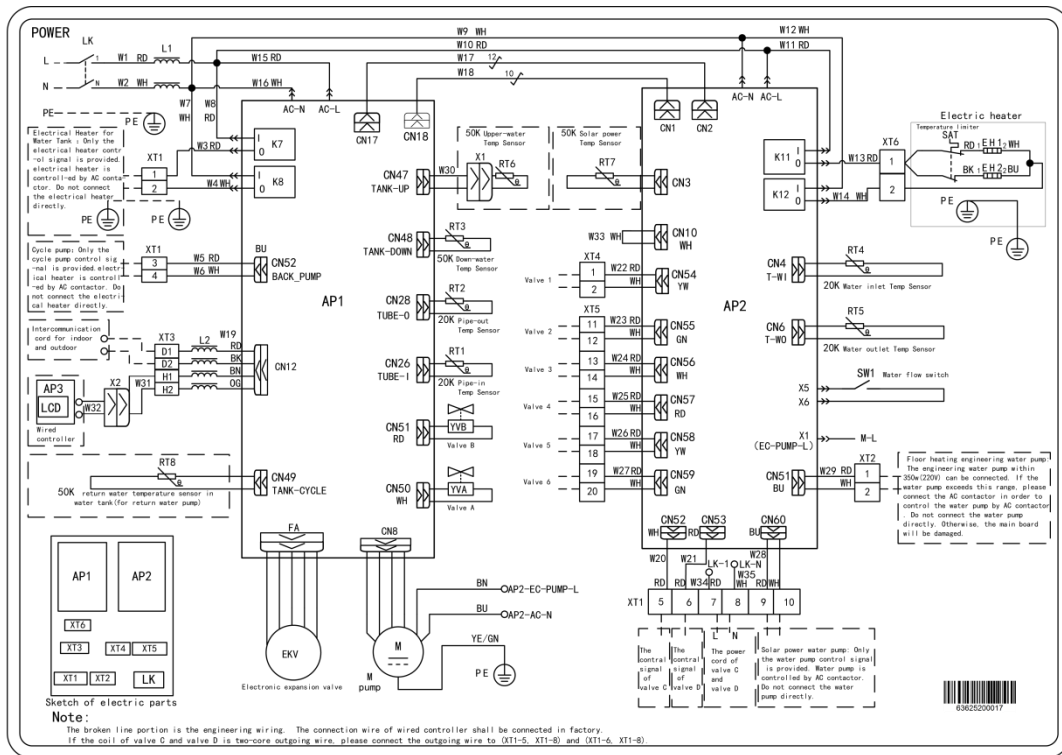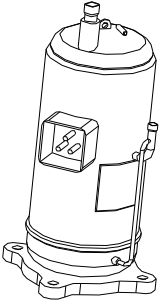
Notes: The above circuit diagram is only for reference, for specific contents please subject to circuit diagram stuck in electric box of unit.
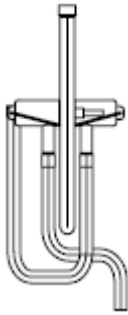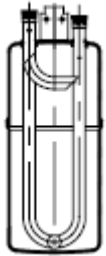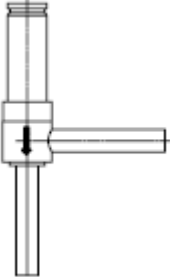
6. Assembly and Disassembly of parts

6.1 Introduction on key parts
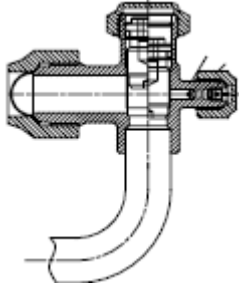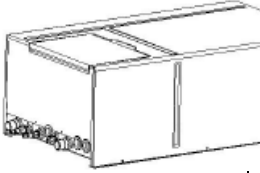
The picture column is shown with 3D projection drawing

Picture	Name	Fuction
	Compressor	Through compression of compressor, the volume of low-pressure cooling work medium is reduced, the pressure and temperature are increased, the high-pressure and high-temperature cooling work medium is the motive power souce of the whole system.
	Electronic expansion valve	It's a throttling device, convert high-pressure liquid refrigerant into low-pressure steam

	Four-way valve	Alter flow direction of refrigerant, achieve conversion between cooling and heating
	Oil separator	It is located between air outlet of compressor and inlet of condenser, for separating lubricant brought by high-temperature, high-pressure and high-speed refrigerant gas discharged from compressor.
	Gas-liquid separator	It is located between outlet of evaporator and air inlet of compressor, for separating low-temperature and low-pressure refrigerant.
	One-way valve	Restrict flow direction of refrigerant, prevent it from flowing conversely
	Magnetic valve	Control connection and disconnection of strong current, the valve is opened after being energized, and is closed after being de-energized.
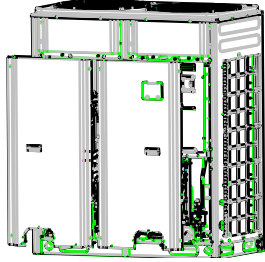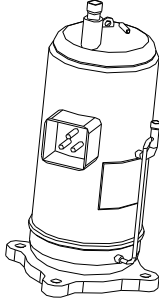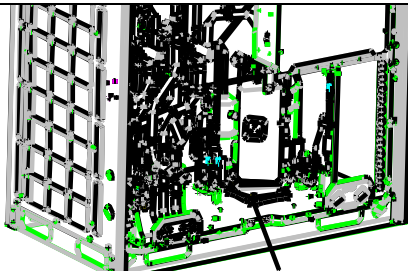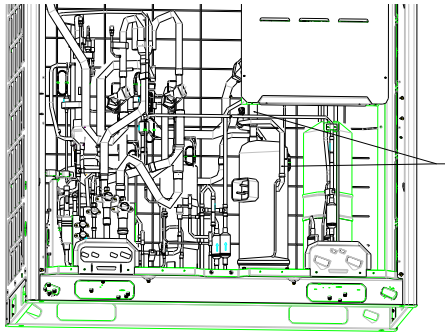
	Cut-off valve	For connecting indoor and outdoor units, and for maintenance and installation.
	Hydro box	The part for conducting heat exchange between refrigerant and water
	Thermal insulation water tank	For storing hot water

6.2 Assembly and disassembly of key parts
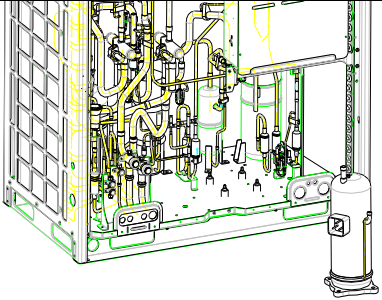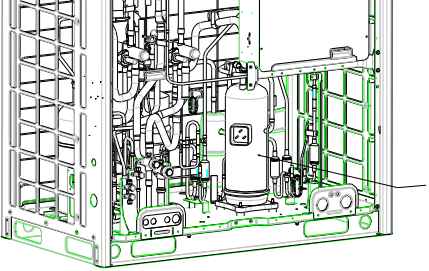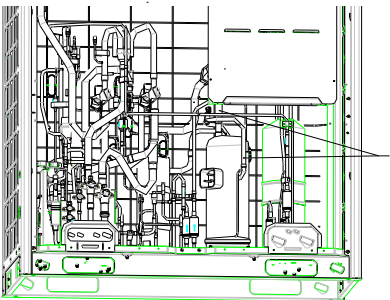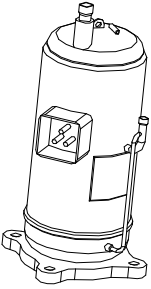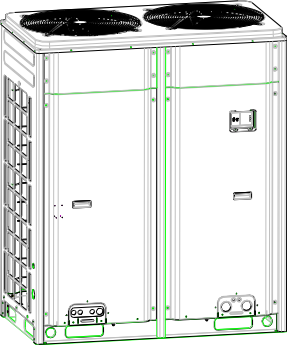
Assembly and disassembly of outdoor unit

Assembly and disassembly of compressor		
Precondition: No refrigerant exists in the pipeline system and the power supply has been disconnected.		
Step	Diagram	Operation Instruction
1. Remove the front panels.		●Use a screwdriver to unscrew the upper and lower front panels. ●Lift the front panels to take it out, and then take it out to set it aside. Note: There are four fasteners in left and right front panels to connect to the left and right side panels.
2. Disassemble the power cord, electric heating belt, top temperature sensor and discharge air temperature sensor of compressor.		●Remove the sound-proof sponge from the compressor first; ●Use a screwdriver to unscrew the power cord; ●Remove the power cord; ●Remove the electric heating belt, top temperature sensor and discharge air temperature sensor. Note: Before removing the power cord, mark the color of the cord and corresponding wiring terminals.
3. Screw off the nuts of compressor		● Use a wrench to unscrew the four nuts of compressor.
4. Remove the suction and discharge pipes.		●Heat up the suction and discharge pipes with acetylene welding and then remove the pipes; ●During the welding, charge nitrogen into the pipes. The pressure should be controlled within 0.5±0.1kgf/cm2 (relative pressure). ●Prevent nearby materials from being burnt during welding.
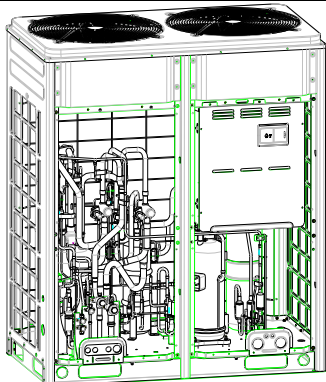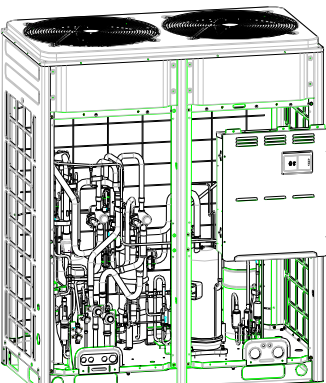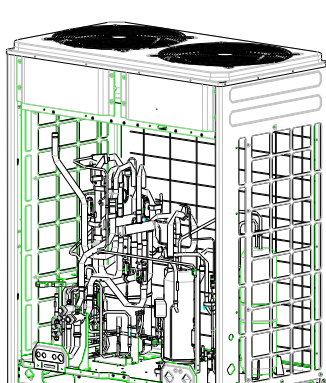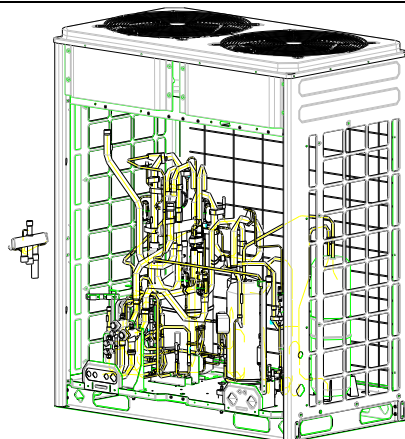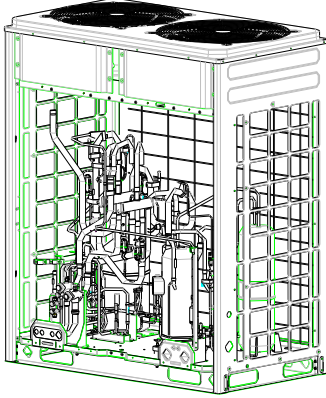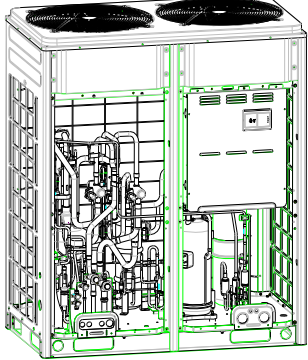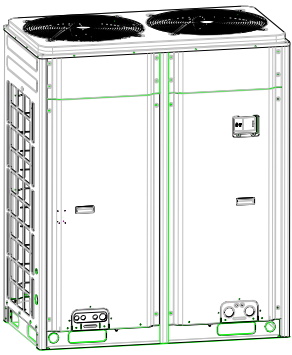
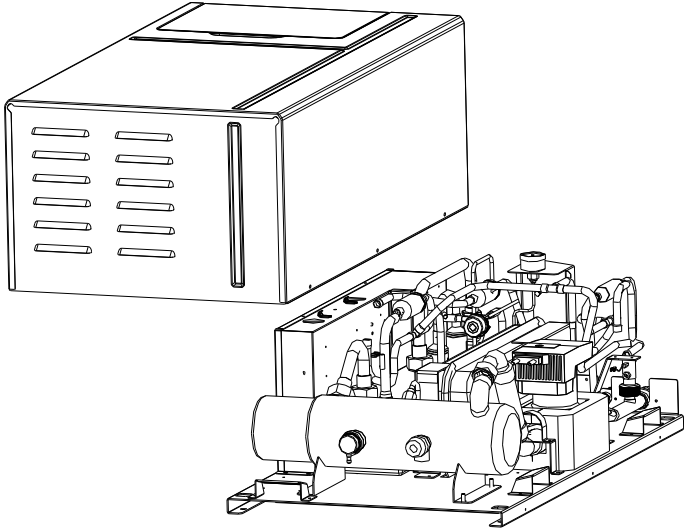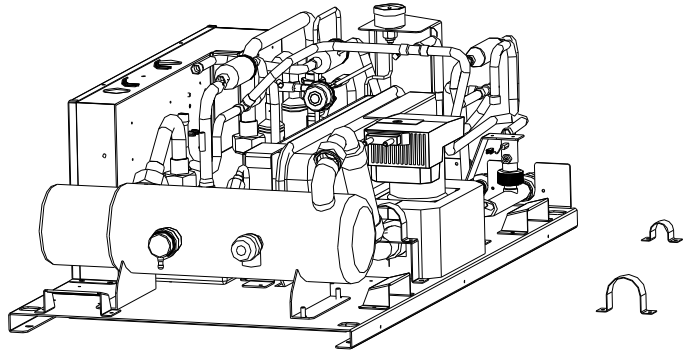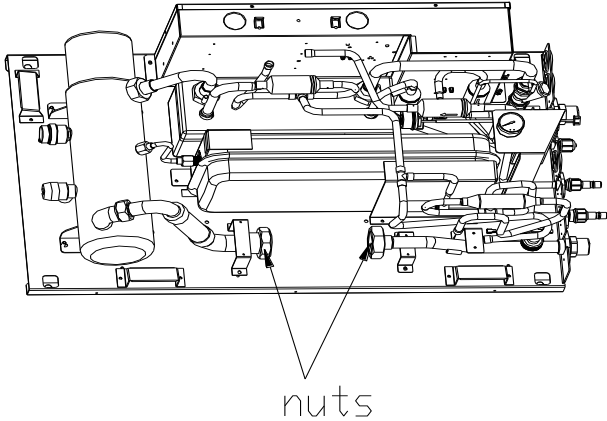|		
5. Take out the compressor.		●Remove the compressor from the chassis.
6. Install a new compressor on the chassis.		●Put the compressor in a proper position; ●Use a wrench to screw the nuts on the compressor ● The compressor should not be installed upside down.
7. Connect the suction and discharge pipes of the compressor to the pipeline system.		●Heat up the suction and discharge pipes by acetylene welding and then pull out the pipes. ●During welding, charge nitrogen into the pipes. The pressure should be controlled within 0.5 ± 0.1 kgf/cm$_2$ (relative pressure). ●Note to prevent nearby materials from being burnt during welding.
8. Connect power cord to the compressor, and install electric heating belt, top temperature sensor, and discharge air temperature sensor.		●Put the power cord in a proper position; ● Use a screwdriver to screw the power cord; ● Install the electric heating belt, top temperature sensor, and discharge air temperature sensor. ● Put the sound-proof sponge back to position.
9. Check and then install the front panels.		●Check the parts and connecting wires; ●If no problem is found, hook the front panels and tighten the screws.

GMV5 Home DC Inverter Multi VRF Units
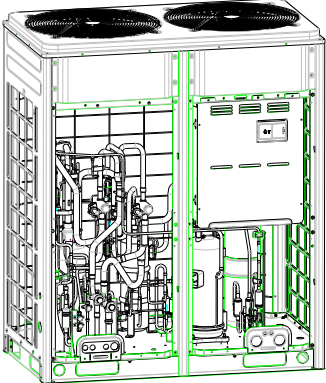
Step	Diagram	Operation Instruction
	Assembly and disassembly of four-way valve	
	Precondition: No refrigerant exists in the pipeline system and the power supply has been disconnected.	
1. Loosen the hooks at the bottom of the electric box and the screws.		●Remove the left and right front panels and set them aside; ●Loosen the hooks at the bottom of the electric box; ●Use a screwdriver to unscrew the electric box.
2. Remove the electric box.		●Disconnect internal and external connecting wires of the electric box; ●Protect the internal parts during the disassembly.
3. Disassemble the four-way valve.		Use a screwdriver to unscrew assessories of the four-way valve. Remove the accessories; ●Heat up the nozzles of connecting pipes of the four-way valve with acetylene welding and then remove the pipes; ● Record the direction of the valve and position of the pipe joints. Note: Prevent nearby parts from being burnt during welding.
4. Remove the four-way valve		●Remove the four-way valve from the pipeline.
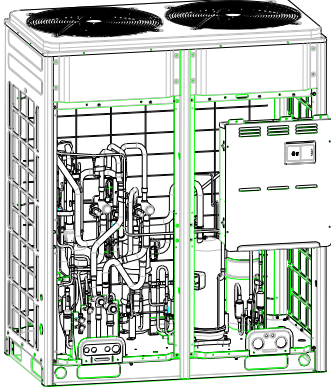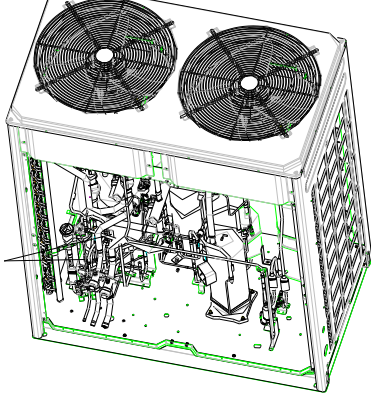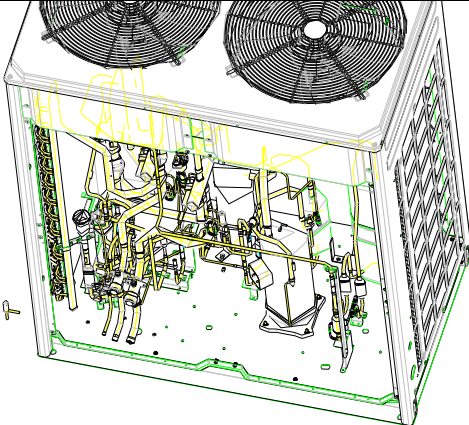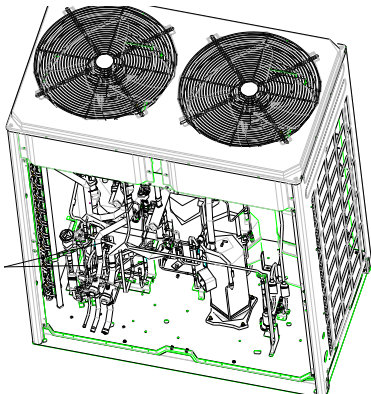
Step	Diagram	Operation Instruction
5. Install a new four-way valve.		●Put the valve in a proper position for installation; ●Weld the valve with the pipeline. ●Before welding, cover the valve with wet cloth to prevent internal slide from being burnt and prevent water from flowing in the pipeline. ●During welding, charge nitrogen into the pipes. The pressure should be controlled within 0.5±0.1 kgf/cm$_2$ (relative pressure).
6. Fix and wire the electric box.		●Put the electric box back to original position and screw it up. ●Connect all the wires.
7. Check and install the front panels.		●Check the parts and connecting wires; ●If no problem is found, hook the front panels and tighten the screws.

Assembly and disassembly of electric expansion valve		
Precondition: No refrigerant exists in the pipeline system and the power supply has been disconnected.		
Step	Diagram	Operation Instruction
1. Loosen the hooks at the bottom of the electric box and the screws.		●Remove the left and right panels and set them aside; ●Loosen the hooks at the bottom of the electric box; ●Use a screwdriver to unscrew the electric box.
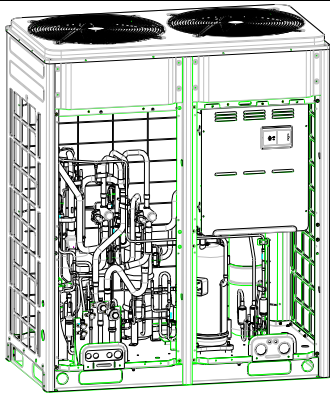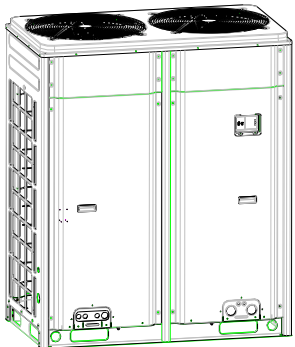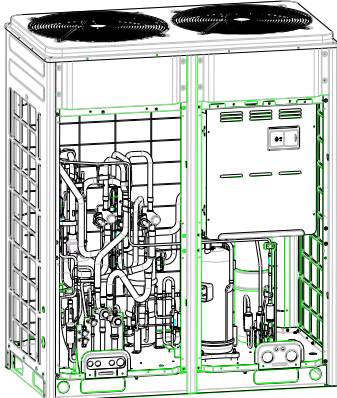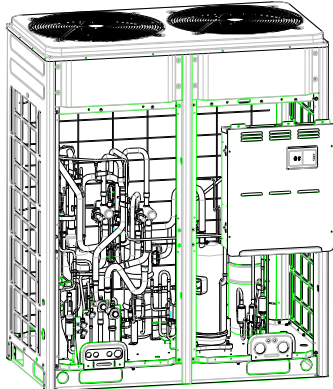
2. Remove the electric box.		●Disconnect internal and external connecting wires of the electric box. ●Protect the internal parts during the disassembly.
3. Disassemble the electric expansion valve.		●Remove the coil from the electric expansion valve; ●Heat up the connecting pipes of the electric expansion valve with welding and then remove the pipes. Note: Prevent nearby parts from being burnt during welding.
4. Remove the electric expansion valve.		●Remove the electric expansion valve.
5. Install a new electric expansion valve.		●Weld the connecting pipes of the electric expansion valve. ●Before welding, cover the valve with wet cloth. ●During welding, charge nitrogen into the pipes. The pressure should be controlled within 0.5 ± 0.1 kgf/cm$_2$ (relative pressure). Note: Prevent nearby parts from being burnt during welding. ●Install the coil on the electric expansion valve.
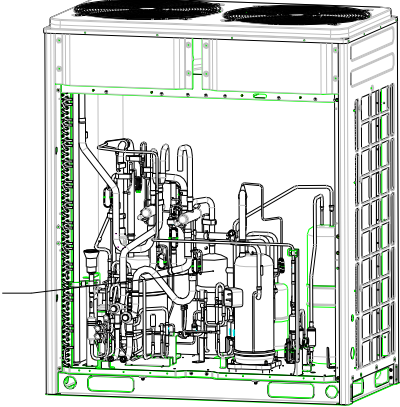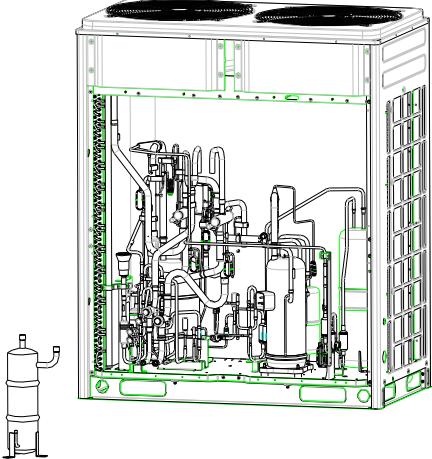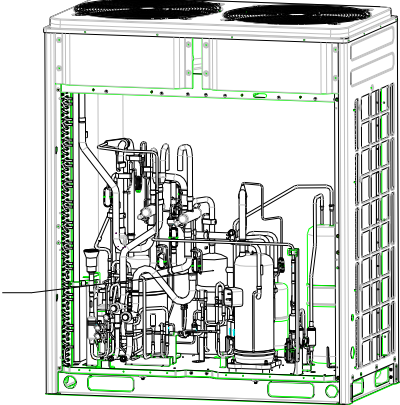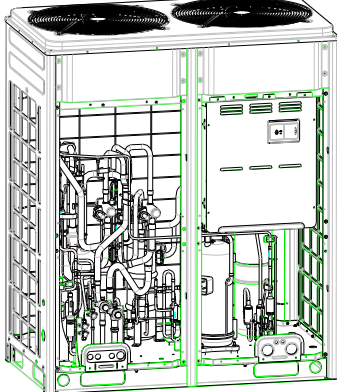
| 6. Fix and wire the electric box. | | ●Put the electric box back to original position and screw it up.
●Connect all wires. |
| 7. Check and install the front panels. | | ●Check the parts and connecting wires;
●If no problem is found, hook the front panels and tighten the screws. |

Assembly and disassembly of oil separator		
Precondition: No refrigerant exists in the pipeline system and the power supply has been disconnected.		
Step	Diagram	Operation Instruction
1. Loosen the hooks at the bottom of the electric box and the screws.		●Remove the left and right front panels and set them aside; ●Loosen the hooks at the bottom of the electric box. ● Use a screwdriver to unscrew the electric box.
2. Remove the electric box.		●Disconnect internal and external connecting wires of the electric box. ●Protect the internal parts during the disassembly.
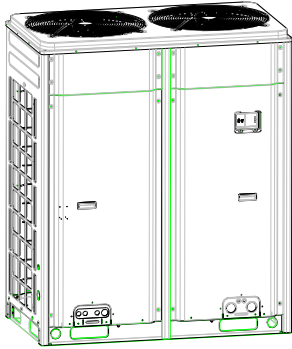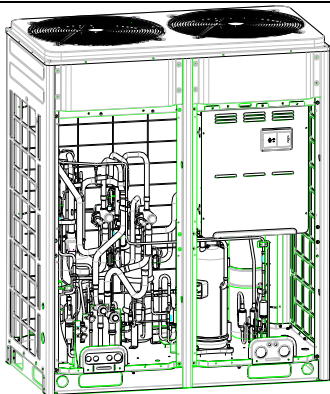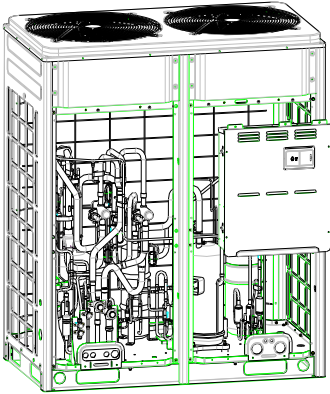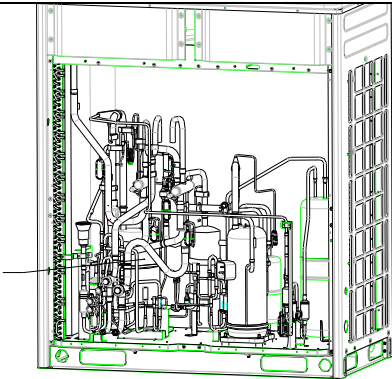
3. Disassemble the oil separator.		●Unscrew the screws for fixing oil separator with screwdriver; ●Loosen the electric heating belt in oil separator; ●Heat up the four connecting points in oil separator and pull out the connecting pipe. Note: Prevent nearby parts from being burnt during welding.
4. Remove the oil separator.		●Remove the oil separator from the chassis.
5. Install a new oil separator		●Weld the four connecting points in oil separator. During welding, the pressure of nitrogen should be within 0.5±0.1kgf/c ㎡ (relative pressure). Note: Prevent nearby parts from being burnt during welding. ●Install the screws of oil separator. ●Install electric heating belt.
6. Fix and wire the electric box.		●把 Put the electric box to original position and screw it up. ●Connect all the wires.
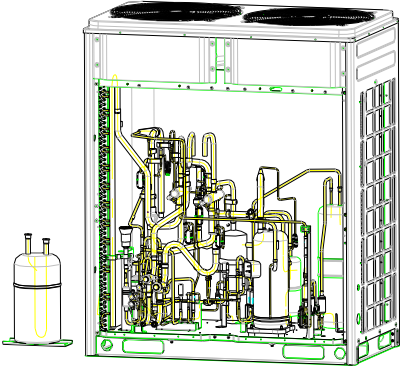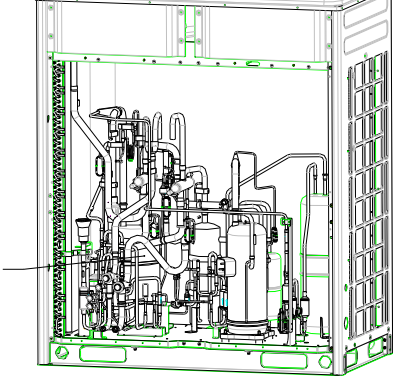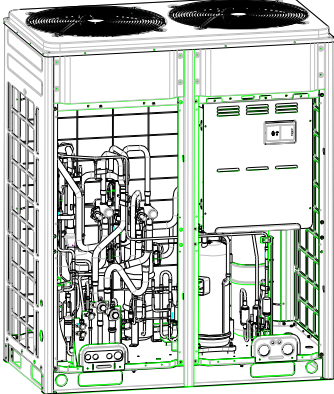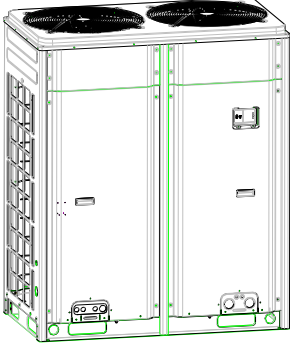
7. Check and install the front panels.		●Check the parts and connecting wires; ●If no problem is found, hook the front panels and tighten the screws.

Assembly and disassembly of gas liquid separator		
Precondition: No refrigerant exists in the pipeline system and the power supply has been disconnected.		
Step	Diagram	Operation Instruction
1. Loosen the hooks at the bottom of the electric box and the screws.		●Remove the left and right front panels and set them aside; ●Loosen the hooks at the bottom of the electric box; ● Use a screwdriver to unscrew the electric box.
2. Remove the electric box.		●Disconnect internal and external connecting wires of the electric box. ●Protect the internal parts during the disassembly.
3. Disassemble the gas liquid separator.		●Heat up the two nozzles of connecting pipes of gas liquid separator with acetylene welding and then remove the pipes. Note: Prevent nearby parts from being burnt during welding.
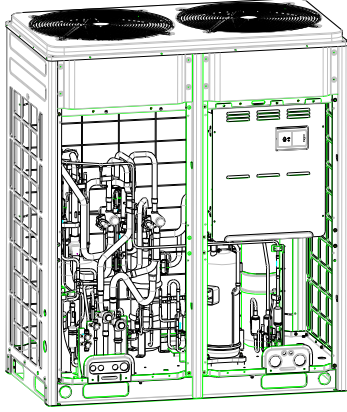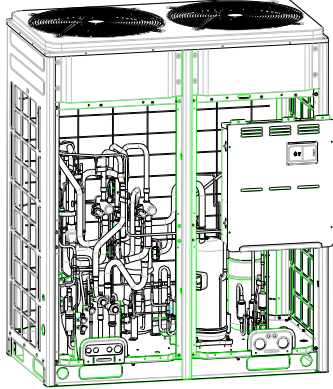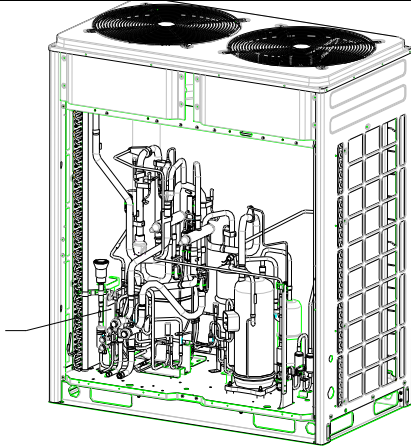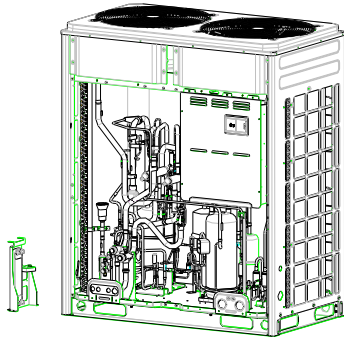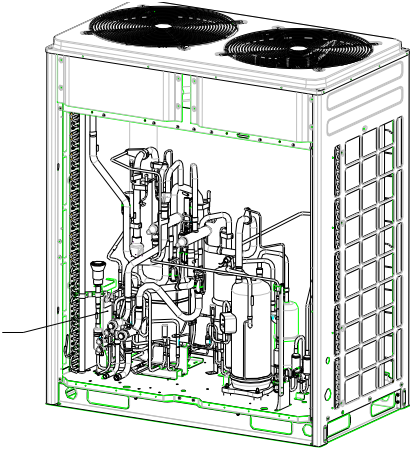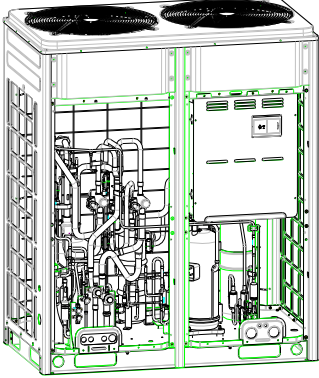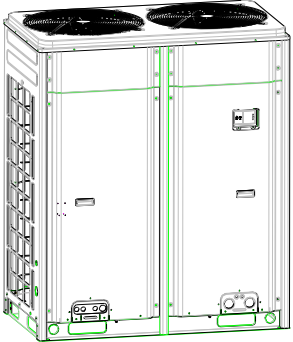
4. Remove the gas liquid separator.		●Unscrew and remove the gas liquid separator.
5. Install a new gas liquid separator		●Put the gas liquid separator according to the position of the suction and discharge pipes and weld the pipes of gas liquid separator. ●During welding, charge nitrogen into the pipes. The pressure should be controlled within 0.5±0.1 kgf/cm$_2$ (relative pressure). Note: Prevent nearby parts from being burnt during welding. ●Screw the gas liquid separator
6. Fix and wire the electric box.		●Put the electric box back to original position and screw it up. ●Connect all wires.
7. Check and install the front panels.		●Check various parts and connecting lines. ●If no problem is found, hook the front panels and tighten the screws.

Step	Diagram	Operation Instruction
Assembly and disassembly of plate type heat exchanger		
Precondition: No refrigerant exists in the pipeline system and the power supply has been disconnected.		
1. Loosen the hooks at the bottom of the electric box and the screws.		●Remove the left and right front panels and set them aside; ●Loosen the hooks at the bottom of the electric box. ●Use a screwdriver to unscrew the electric box.
2. Remove the electric box.		●Disconnect internal and external connecting wires of the electric box. ●Use a screwdriver to unscrew the electric box.
3. Disassemble the heat exchanging board.		●Heat up the nozzles of connecting pipes of the plate type heat exchanger with acetylene welding and then remove the pipes. Note: Prevent nearby parts from being burnt during welding. The joints of the plate type heat exchanger must be welded with copper plated steel. Ensure the welding quality.
4. Remove the plate type heat exchanger.		●Unscrew the support of the plate type heat exchanger, and remove the support and heat exchanger.
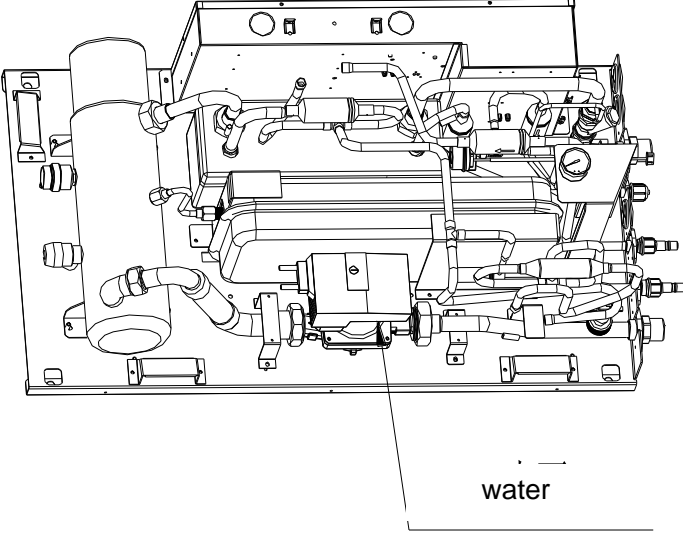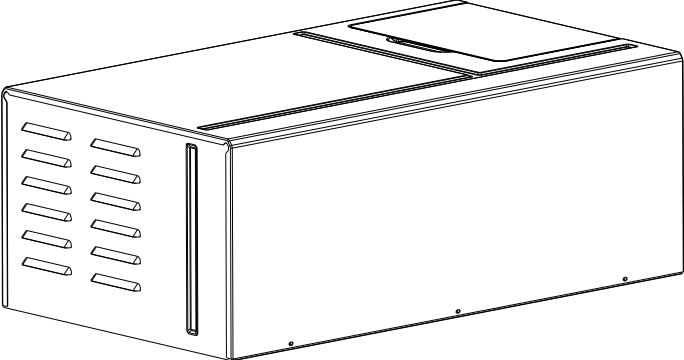
5. Install a new plate type heat exchanger		●Screw the support of the plate type heat exchanger and fix the heat exchanger onto the chassis. ●Put the plate type heat exchanger according to the position of the suction and discharge pipes and weld the pipes with the heat exchanger. ●During welding, charge nitrogen into the pipes. The pressure should be controlled within 0.5±0.1 kgf/cm$_2$ (relative pressure). Note: Prevent nearby parts from being burnt during welding.
6. Fix and wire the electric box.		●Put the electric box back to original position and screw it up. ●Connect all the wires.
7. Check and install the front panels.		●Check the parts and connecting wires. ●If no problem is found, hook the front panels and tighten the screws.

Hydro box.

Step	Diagram	Operation Instruction
Assembly and disassembly of hydro box		
Precondition: No refrigerant exists in the pipeline system and the power supply has been disconnected.		
1. Remove the panel.		●Unscrew the screws of panels with screwdriver and remove the panel; ●Note to lift the panel.
2. Disassemble the parts of water pipe and pipe clip of electric heating water pipe.		●Unscrew the screws with screwdriver and take out the pipe clip.
3. Disassemble the water pump.	nuts	●Unscrew the nuts in two ends of water pump. ●Remove sponge of water pump and take out the water pump.

4. Reassemble the water pump.	water	●Cover thermal insulating cotton of water pump. ●Put the water pump to the original position and install nuts.
5. Recovery.		●Install pipe clips in order, cover with panel and install screws.

7. Common Maintenance

Routine checkup and maintenance can prolong service life of unit, please ask for professional personnel to conduct maintenance.

7.1 Outdoor Unit Heat Exchanger

Heat exchanger of outdoor unit should be washed regularly that at least once in two months. Use cleaner and nylon brush to remove dust and impurities; if there is compressed air source, use compressed air to remove the dust in the surface of heat exchanger. Please do not wash with tap water.

7.2 Drain Pipe

Regularly check if the drain pipe is blocked, ensure the condensate water is drained smoothly.

7.3 Notice at the beginning of use season

(1) Check if there is blockage in air inlet and outlet of indoor and outdoor units;

(2) Check if the grounding is reliable;

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

(4) Check if the air filter has been well installed;

(5) After long-term closedown of unit, before restarting the unit, turn on the power switch of air conditioner 8 hours before starting operation, so as to conduct preheating of crankcase of outdoor compressor;

(6) Check if outdoor unit is firmly installed, if there is any faults, please contact with Gree maintenance center.

7.4 Maintenance at the end of use season

(1) Cut off general supply source of air conditioner unit;

(2) Clean the filter and case of indoor and outdoor units;

(3) Remove the dust and impurities of indoor and outdoor units;

(4) If the outdoor unit gets rusty, smear with paint in rusty place to prevent it from expanding.

7.5 Parts Replacement

Acquire parts from nearby GREE agency or GREE franchiser.

7.6 System Leak Detection

Use soapy water to conduct leak detection, smear the soapy water in possible leaking point (welding points, spool, joints, etc.), if bubbles appear, it means there is leakage, please weld or repair.

If leaking point cannot be detected with soapy water, use electronic leak detector or charge 20Kgf/cm^2 of nitrogen into system and put it into water tank to detect leakage.

7.7 System Vacuum Pumping

(1) Conduct vacuum pumping with vacuum pump, operation are as below:

   1) Unscrew the nut cap of refrigerant charging spout in inhalation tube;

   2) Connect low pressure soft tube of vacuum gauge to joint of refrigerant charging spout;

   3) Connect joint of intermediate tube of vacuum gauge to pressure soft tube, connect another end of soft tube to vacuum pump;

   4) Screw up the high pressure gauge and open the low pressure gauge, energize the vacuum pump;

   5) When the indicating needle of vacuum pump points at 15mmHg (gauge pressure), screw up the low pressure gauge and turn off the power supply, unscrew the soft tube in regfrigerant charging spout and cover with nut cap.

Supplement and charge of regrigerant

6) Connect intermediate soft tube of refrigerant gauge to refrigerant tank, connect one end of blue soft tube of low pressure gauge to refrigerant charging spout of inhalation tube, lock it up, and then open the valve of refrigerant tank, open the valve besides low pressure gauge of refrigerant gauge and discharge for 5 seconds, and then screw up the joint of soft tube of refrigerant in three-way valve.

Wait for 3 munites, after the unit is started up, we can see that the indicating needle of low pressure gauge is slowly increasing, and then unscrew the valve besides low pressure gauge and charge refrigerant (when the low pressure gauge displays 0.4~0.45Mpa, it means it is enouph).

Notes:

7) The outdoor unit has been charged with refrigerant before leaving the factory, when connecting pipes on the spot, please charge supplementary refrigerant;

8) Check if liquid valve and air valve of outdoor unit have been completely closed;

9) When conducting air proofness and leak detection, please do not mix oxygen, zcetylene and related dangerous gas into pipelines of refrigerant. In order to avoid danger, it is better to use nitrogen or refrigerant to conduct the test.

10) As shown below, draw off the air inside the indoor unit, hydro box and connecting pipe with vacuum pump from valve of outdoor unit.
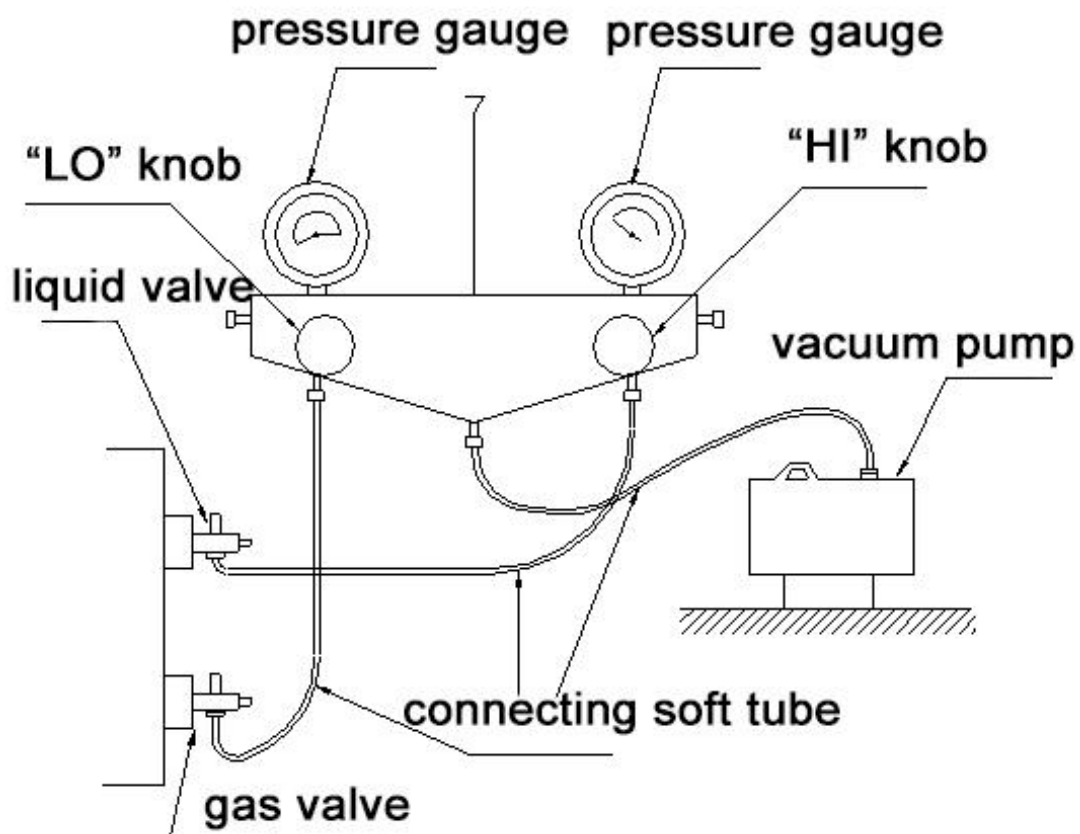
8.Exploded Views and List of Spare Parts

8.1 Outdoor Unit

Outdoor unit: GMV-S224W/A-X, GMV-S280W/A-X
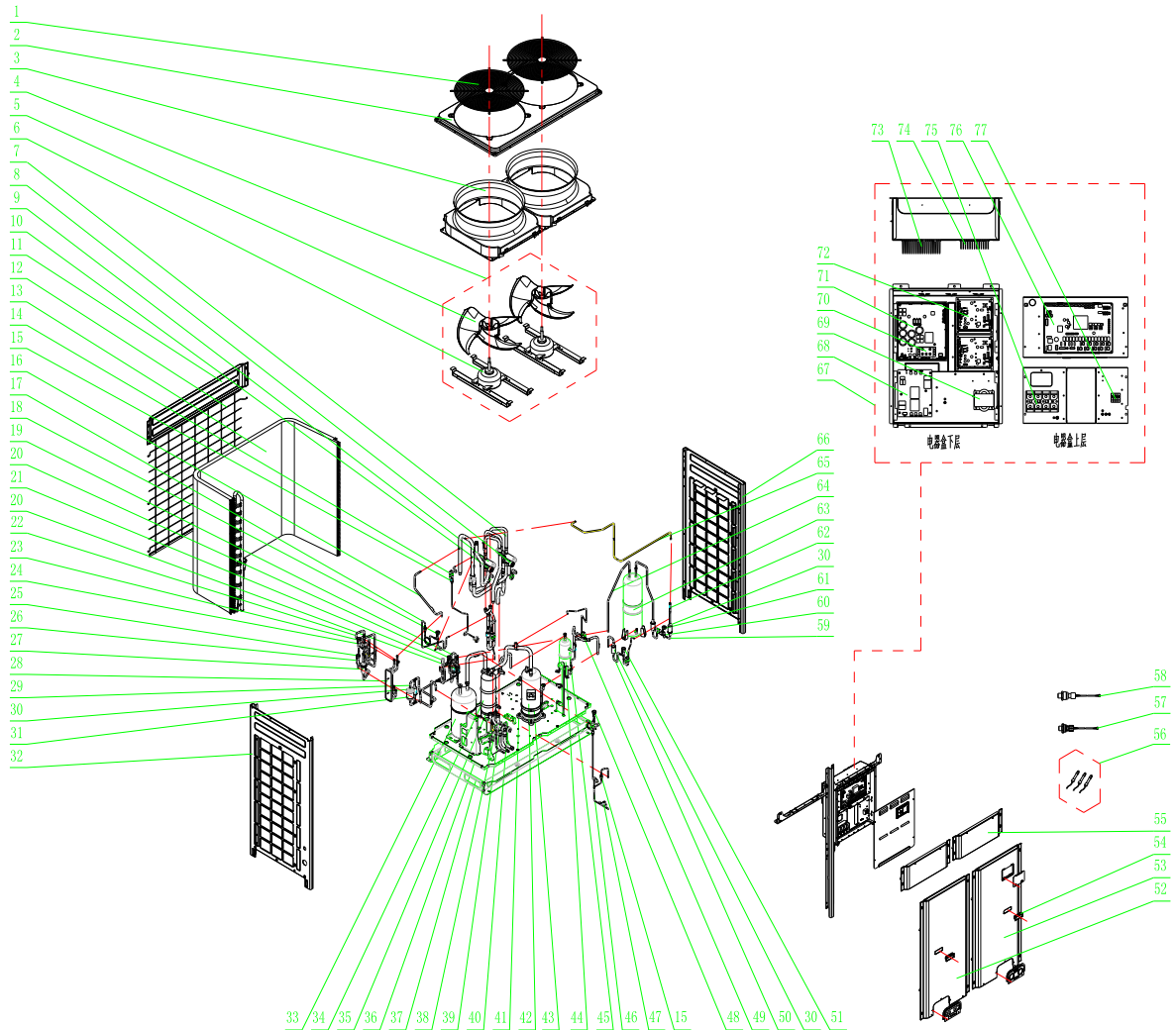
List of Parts

Outdoor unit: GMV-S224W/A-X, GMV-S280W/A-X

NO.	Name of part	Quanlity	Part code
	Product code:CN853W0140		
1	Compressor and Fittings	1	204100008
2	Compressor Gasket	4	76814100007
3	Condenser Assy	1	0112410009601
4	Capillary tube	21	81020167
5	Temp Sensor Sleeving	1	5212423
6	Top Cover (front)	2	01264100004P
7	Upper Cover Plate (back)	1	01264100005P
8	Coping	1	01264100006P
9	Rear Grill	2	1574100002
10	Electric Box Cover	1	01264714P

11	Base Frame Sub-Assy	1	1284100122
12	Left Side Plate	1	01314712P
13	Right Side Plate	1	01314713P
14	Electric Box Assy	1	1394100374
15	Cable Cross Loop	1	26900000008
16	Main Board	1	30223000020
17	Main Board	1	30223000021
18	XY capacitor	1	33020201
19	XY capacitor	1	33030013
20	High Frequency Transformer	1	43110030
21	Fuse	1	46010055
22	Radiator	1	49010252
23	Main Board	1	30228000010
24	Terminal Board	1	42010264
25	Radiator	1	49010252
26	Filter Board	1	30228000015
27	Main Board	2	30229009
28	Radiator	1	49010252
29	Magnetic Ring	1	49010104
30	Magnetic Ring	6	49010109
31	Terminal Board	1	42010247
32	Terminal Board	1	42018000026
33	Reactor	1	4313017401
34	Rectifier	1	46010604
35	Radiator	2	49018000001
36	Radiator	1	49018000002
37	Bolt	1	70210051
38	Cable Clamp	21	71000151
39	Cable Tie	9	7102026504
40	Cable Cross Loop	1	76510021
41	Front Panel (left)	1	01544100003P
42	Front Panel (right)	1	01544100005P
43	Rear Grill	1	1574100001
44	Tube Clip	1	21400053
45	Tube Clip	1	21400055
46	Filter	1	7218603
47	4-way Valve	1	43000339
48	4-Way Valve Sub-Assy	1	4144100002
49	Temp Sensor Sleeving	2	5212423
50	Nozzle for Adding Freon	2	6120012
51	4-way Valve	1	43000339
52	Strainer	1	7415200002
53	One way Valve	1	7335210
54	Oil Balancing Tube Sub-assy 1	1	4224100273
55	Cut off Valve	1	7130239
56	Strainer	2	7415200002
57	Electromagnetic Valve	1	43000054
58	Discharge Tube Sub-assy	1	4534100081
59	Strainer	1	7415200002

60	Temp Sensor Sleeving	1	5210001
61	Oil Separator	1	7424100023
62	Pressure Protect Switch	1	4602000910
63	Cut off Valve	1	7334100012
64	Gas By-pass sub- assy	1	4634100012
65	Strainer	1	7415200002
66	Electromagnetic Valve	1	43000054
67	Temp Sensor Sleeving	1	5212423
68	Cut off Valve	1	7334100012
69	Connection Pipe	1	5024100671
70	Connection pipe sub-assy	1	5024100672
71	Connection pipe sub-assy	1	5024100728
72	Temp Sensor Sleeving	1	5212423
73	Plate-type Heat Exchanger Sub-Assy	1	904100012
74	Plate-type Heat Exchanger	1	904100005
75	Dry Filter Sub-Assy	1	7414100009
76	Temp Sensor Sleeving	1	5212423
77	Dry Filter	1	7218769
78	Gas Tube Filter	1	72190511
79	Electric Expansion Valve Sub-Assy	1	43044100092
80	One way Valve	1	4324001
81	Temp Sensor Sleeving	1	5212423
82	Bidirection Strainer	1	7210044
83	Discharge Charge Valve	1	7334100002
84	Electronic Expansion Valve	1	7334390
85	Electronic Expansion Valve	1	7334412
86	Electromagnetic Valve	1	43000054
87	Liquid Valve Sub-Assy	1	7304100002
88	Cut off Valve	1	7334100011
89	Discharge Charge Valve Sub-Assy	1	7334100047
90	One way Valve	1	4324001
91	Gas Tube Filter	2	72190511
92	Discharge Charge Valve	1	7334100002
93	Electromagnetic Valve	2	43000054
94	Low Pressure Survey Valve Sub-assy	1	7334100048
95	Cut off Valve	1	7130239
96	Strainer	1	7415200002
97	Capillary tube	1	81020143
98	Accumulator	1	7424100036
99	Oil Separator	1	742418601
100	Gas-liquid Separator	1	7424188
101	Diversion Circle	2	10474100002
102	Motor for Axial Fan Assy	2	15404100018
103	Motor Support Sub-Assy	2	01804771P
104	Motor Support Sub-Assy	1	1804771
105	Axial Flow Fan	1	10434100002
106	Axial Flow Fan nesting	1	2204102
107	Fan Motor	1	15704124
108	Handle	2	26904100016

109	Temperature Sensor Support	1	26904100025
110	Pressure sensor	1	32218000008
111	Pressure Sensor	1	32218000009
112	Sensor Sub-assy	1	39008000086G
113	Magnet Coil	1	4300040030
114	Magnet Coil	1	4300040064
115	Magnet Coil	1	4304000401
116	Magnet Coil	1	4304000413
117	Magnet Coil	1	4304000414
118	Magnet Coil	1	4304000415
119	Magnet Coil	1	4304000425
120	Magnet Coil	1	4304000428
121	Magnet Coil	1	4304000439
122	Electromagnetic Valve Sub-assy	1	43044100091
123	One way Valve	1	4324001
124	Gas Tube Filter	2	72190511
125	Electromagnetic Valve	1	43000055
126	Electromagnetic Valve Sub-assy	1	43044100100
127	Gas Tube Filter	1	72190511
128	Electromagnetic Valve	1	43000054
129	Electric expand valve fitting	1	4304413203
130	Electric Expand Valve Fitting	1	4304413204
131	M8Xφ22X8	4	70310014
132	Electric Heater(Compressor)	1	7651540713
133	Electrical Heater(Compressor)	1	7651873209

8.2 Hydro Box
 Model: NRQD16G/A-S
 Exploded View
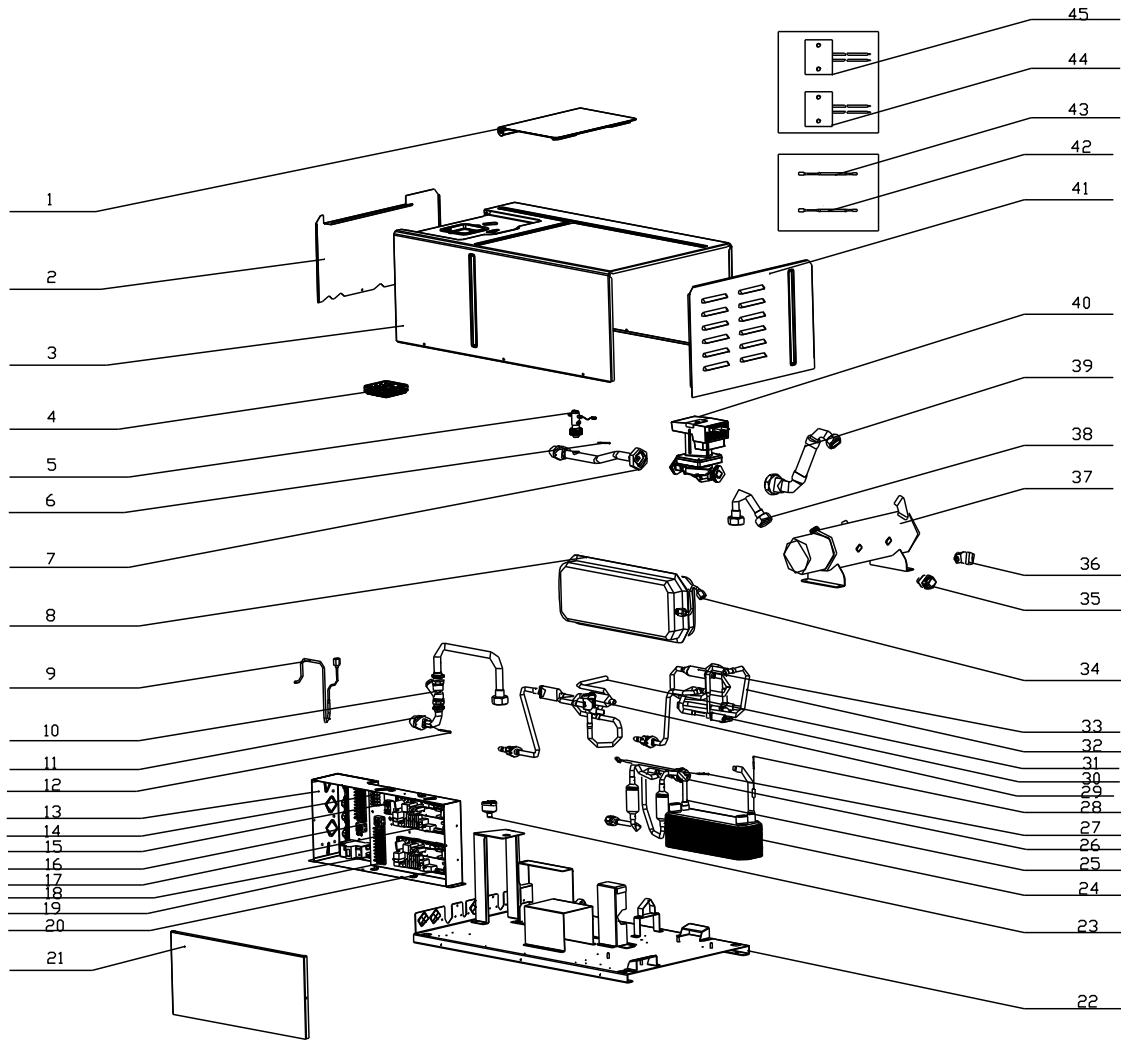
List of parts of NRQD16G/A-S

NO.	Name of part Product code:CN700N0010	Quanlity	Part code
1	Plate-type Heat Exchanger Assy	1	902800032
2	Plate-type Heat Exchanger	1	902812
3	Temp Sensor Sleeving	2	5212423
4	Electric Expansion Valve Sub-Assy	1	43042800046
5	Gas Tube Filter	2	72190511
6	Electronic Expansion Valve	1	7334503
7	Chassis Sub-assy	1	01194100002P
8	Electric Box Assy	1	1392800089
9	Guide Strip	0.1	1790001
10	Terminal Baffle	2	26118001
11	Main Board	1	30226000053
12	XY capacitor	2	33030013
13	Fuse	1	46010055
14	Main Board 2	1	30227000008
15	Fuse	1	46010055
16	Terminal Board	2	420101852
17	Terminal Board	1	42011103

18	Terminal Board	2	42011135
19	Terminal Board	1	4201800002601
20	Circuit breaker	1	4602800301
21	Insulation GasketC	2	70410523
22	Wire Clamp	3	71010102
23	Cable Cross Loop	2	76510021
24	Electric Box Cover	1	1422800035
25	Front Panel Assy	1	1542800039
26	Front panel cover	1	26902800006
27	Bottom Cover Plate	1	1262800013
28	Top Cover	1	1264100003
29	Front Panel	1	1542800004
30	Display Board	1	30296000024
31	Kid board	1	30276000005
32	Tube Clip	1	21400055
33	Discharge pipe Sub-Assy	1	4262800120
34	Temp Sensor Sleeving	1	5212423
35	Steam current Switch sub- Assy	1	45028065
36	Enter Water Pipe Assy	1	4262800121
37	Temp Sensor Sleeving	1	5212423
38	Strainer	1	7412808
39	Water inlet pipe sub-assy(electric heating)	1	4262800123
40	Outlet Water Pipe Sub-Assy	1	4362917
41	pipe connector	2	6652805
42	Auto Air Outlet Valve	1	7108208
43	Auto Air Outlet Valve	1	7108208
44	pressure maintaining valve	1	7333700052
45	Relief Valve	1	7382814
46	Expansion Drum	1	7422800004
47	Electric Heater	1	32000003
48	Temperature Sensor	1	390000372
49	Temperature Sensor	1	3900012121
50	Temperature Sensor	1	390001921
51	Temperature Sensor	1	39000283
52	Temperature Sensor	2	3900028301
53	Tube sensor	1	39000284G
54	Magnetic Ring	1	49010104
55	Magnetic Ring	1	49010109
56	Magnet Coil	1	4304000408
57	Magnet Coil	1	4304000431
58	Electromagnetic Valve Sub-assy	1	43042800047
59	Gas Tube Filter	2	72190511
60	Electromagnetic Valve	1	43000073
61	Electromagnetic Valve Sub-assy	1	43042800048
62	One way Valve	1	7130118
63	Discharge Charge Valve	1	7334100002
64	Electromagnetic Valve	1	43000073
65	Water Pump	1	43138223
66	Cable Cross Loop	3	76515202

Chapter 6 Care

1.Care

Routine checkup and maintenance can prolong service life of unit, please ask for professional personnel to conduct maintenance.

1.1 Outdoor Unit Heat Exchanger

Heat exchanger of outdoor unit should be washed regularly that at least once in two months. Use cleaner and nylon brush to remove dust and impurities; if there is compressed air source, use compressed air to remove the dust in the surface of heat exchanger. Please do not wash with tap water.

1.2 Drain Pipe

Regularly check if the drain pipe is blocked, ensure the condensate water is drained smoothly.

1.3 Notices at the Beginning of Use Season

(1)Check if there is blockage in air inlet and outlet of indoor and outdoor units;

(2)Check if the grounding is reliable;

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

(4)Check if the air filter has been well installed;

(5)After long-term closedown of unit, before restarting the unit, turn on the power switch of air conditioner 8 hours before starting operation, so as to conduct preheating of crankcase of outdoor compressor;

(6)Check if outdoor unit is firmly installed, if there is any faults, please contact with Gree maintenance center.

1.4 Notices at the End of Use Season

(1)Cut off general supply source of air conditioner unit;

(2)Clean the filter and case of indoor and outdoor units;

(3)Remove the dust and impurities of indoor and outdoor units;

(4)If the outdoor unit gets rusty, smear with paint in rusty place to prevent it from expanding.

1.5 Parts Replacement

Acquire parts from nearby Gree agency or Gree franchiser.

⚠ Notes:

When conducting air proofness and leak detection, please do not mix oxygen, xcetylene and related dangerous gas into pipelines of refrigerant. In order to avoid danger, it is better to use nitrogen or refrigerant to conduct the test.

Chapter 7 Monitoring Software

1 Function Introduction

With the rapid development of building complex, more and more central air conditioners in various models are used in different places, resulting in inconvenience for the management of air conditioners. 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 2nd generation of Gree Multi VRF. 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 Connection of Computer and Units
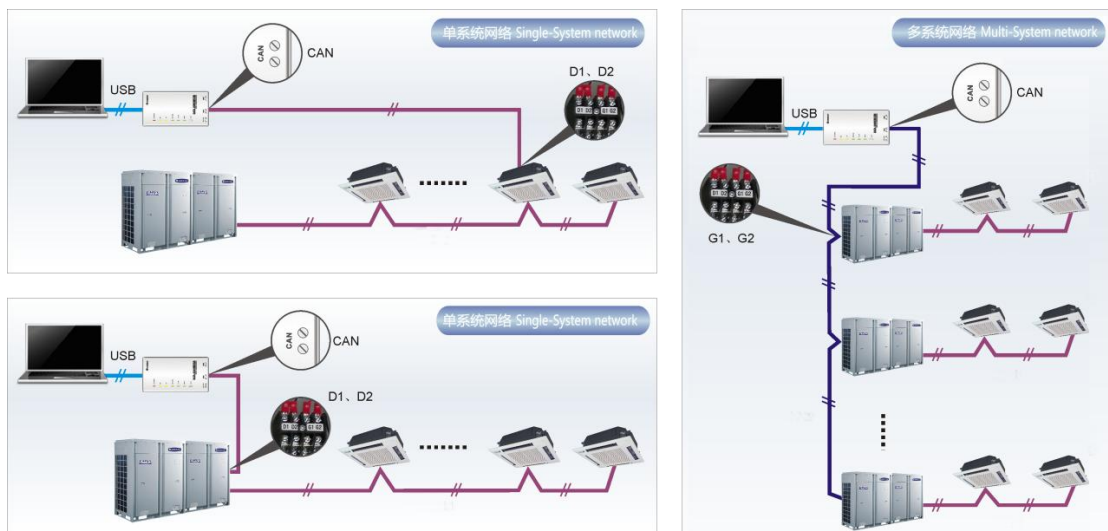
It can be connected with single-system network or multi-system network. In the single-system network, indoor units or outdoor units are connectable, while in the multi-system network, only the master outdoor unit can be connected.

Instructions on Connection Diagram

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.

3 Hardware Introduction

3.1 List of parts

Name	Model	Material No.	Remarks
Gree USB data converter	MC40-00/B	30118027	Convert the air conditioning communication into computing communication
Gree Commissioning Tool Kits (CD-ROM)	DG40-33/A(C)	36400000003	Include Gree debugger, monitoring software, USB driver and USB converter configuring software.
USB wire	\	40020082	Wire connecting computer's USB interface and converter
Communication 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	\	64134100023	Instruction manual

3.2 Gree USB Data Converter

3.2.1 Functions Introduction

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

3.2.2 Appearance

Power LED ··········→ POWER

Data receiving LED ··········→ RX

Data transmitting LED ··········→ TX

R485 to USB LED ··········→ RS485

CAN to USB LED ··········→ CAN

HBS to USB LED ··········→ HBS

SET button ··········→ SET

DATA CONVERTER
USB to RS485/CAN/HBS

RS485   CAN   HBS

USB

USB

B A   C1 C2   H1 H2

RS485   CAN   HBS
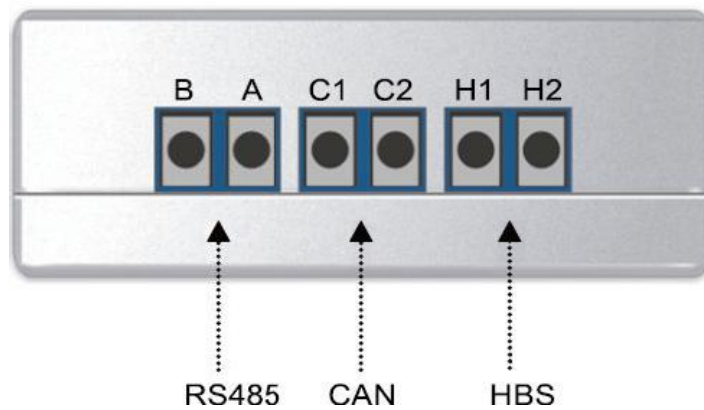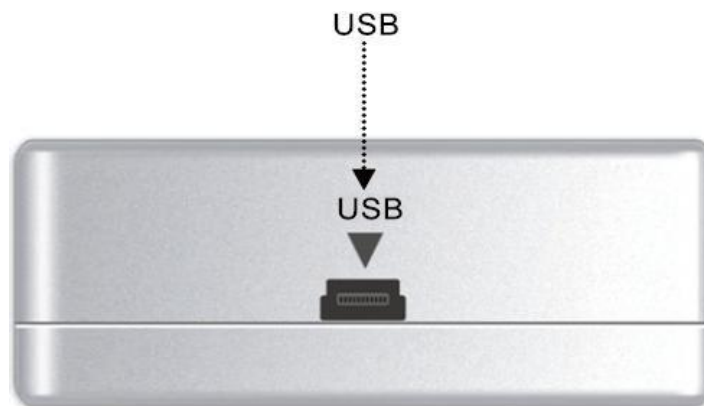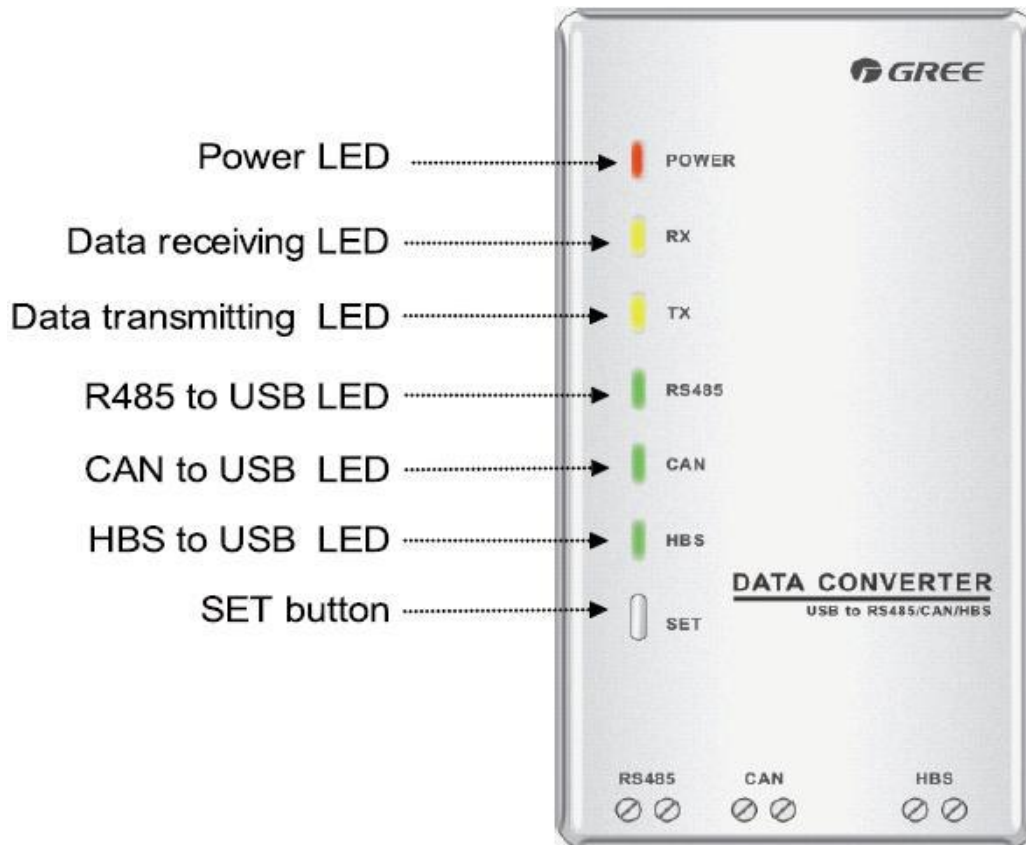
3.2.3 Operation Instruction

- 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.
- 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.
- Function LEDs: green lights
- When converter is under RS485 data transferring mode, the function LED of RS485 to USB will be on.
- When converter is under CAN data transferring mode, the function LED of CAN to USB will be on.
- When converter is under HBS data transferring mode, the function LED of HBS to USB will be on.
- USB interface: connect USB data wire.
- 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).
- 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).
- 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.

3.2.4 Installation Notices

- Install indoors. To avoid collision, it is suggested to place it in the monitoring room together with the computer.
- No need of power supply. Power is supplied through computer's USB interface.

3.3 Communication Board

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

3.4 Communication Wire

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:
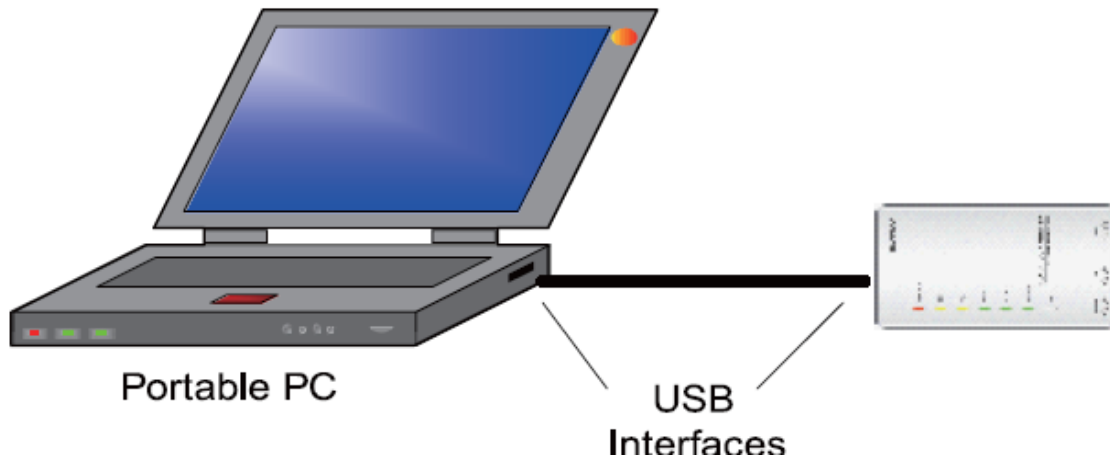
3.4.2 Board Connection Wire

● There are 2 board connection wires supplied for the commissioning tool kits. One is 1 meter 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 communication interface and the other end shall connect with Gree USB converter CAN interface. As shown below, the wire can be connected to the communication interface of outdoor unit or the communication interface of indoor unit:
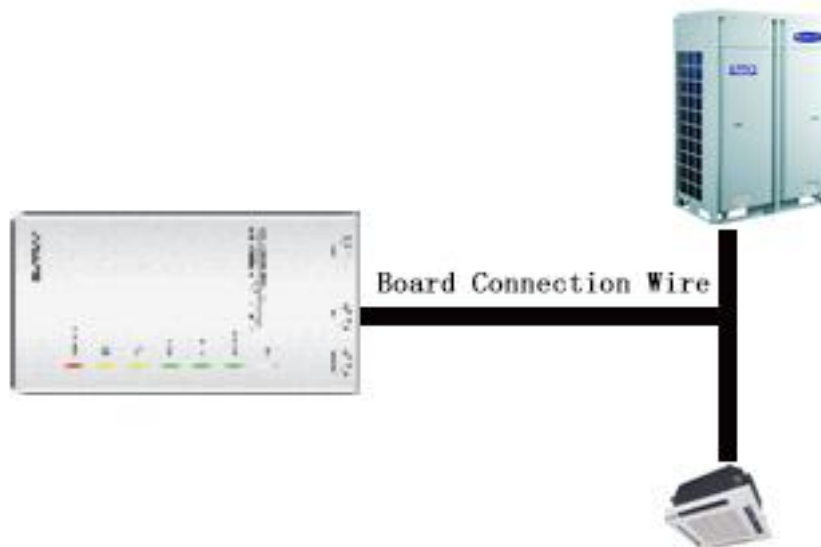
4 Software Introduction

4.1 Installation Requirements

4.1.1 Computer Configuration

Memory	1 GB at least 2 GB or larger is preferred
Hard Disc	10 GB available

CPU	Core 2 or higher 1 GHz at least 2 GHz or above is preferred
Operation System	Windows Server 2003 SP3 or later versions Windows XP SP3 or later versions Windows Vista Windows 7

4.1.2 CD Playing

Make sure you have administrator access to the computer and there is a CD-ROM in the computer. Put the CD into the CD-ROM. If it's automically running, then the following display will be shown. Or double-click the file "Launcher.exe".

For the first time to use Gree Commissioning Tool Kits, install these programmes: .Net Framework 4.0, USB Converter Driver, Access Driver (necessary for versions older than OFFICE 2007), Gree Debugger.

4.2 Installation Flowchart

```
                    ┌─────────────┐
                    │    Start    │
                    └─────────────┘
                           │ ────────── No ──────┐
                      Yes  │                      │
                    ┌─────────────┐               │
                    │Install Access│              │
                    │   Driver    │               │
                    └─────────────┘               │
                           │ ────── No ───────┐   │
                      Yes  │                   │   │
                    ┌─────────────┐            │   │
                    │Install .Net │            │   │
                    │Framework 4.0│            │   │
                    └─────────────┘            │   │
                           │                   │   │
                    ┌─────────────┐            │   │
                    │Install Gree │            │   │
                    │  Debugger   │            │   │
                    └─────────────┘            │   │
                           │ ─── No ────┐      │   │
                      Yes  │            │      │   │
                    ┌─────────────┐     │      │   │
                    │ Install USB │     │      │   │
                    │Converter Driver│  │      │   │
                    └─────────────┘     │      │   │
                           │ ── No ──┐  │      │   │
                      Yes  │         │  │      │   │
                    ┌─────────────────┐│  │      │   │
                    │Install Gree USB ││ │      │   │
                    │  data converter ││ │      │   │
                    │configuration software│    │   │
                    └─────────────────┘│  │      │   │
                           │           │  │      │   │
                    ┌─────────────┐
                    │     End     │
                    └─────────────┘
```
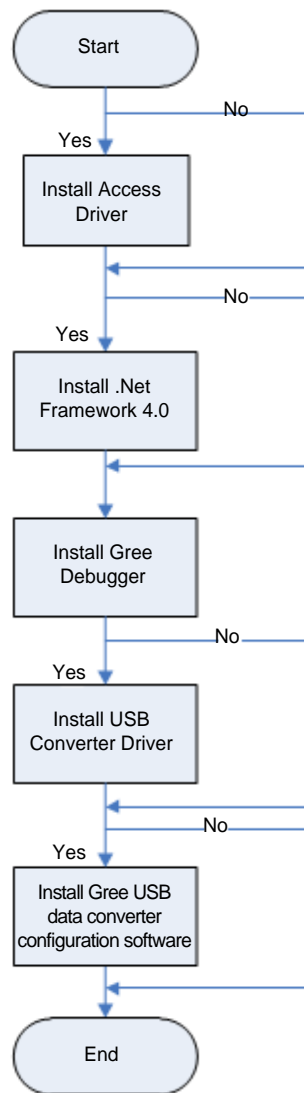
This flowchart describes basically the software installation process. See below for details.

4.3 Installation Procedure

4.3.1 Install .Net Framework 4.0

● If your computer has installed .Net Framework 4.0 or later versions, there's no need to install again. Otherwise, click "Install .Net Framework 4.0".

● Extracting files
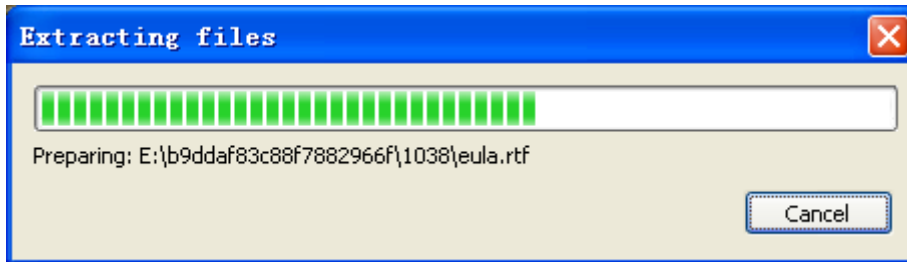
● Click and select "I have read and accept the license terms". Then click "Install".
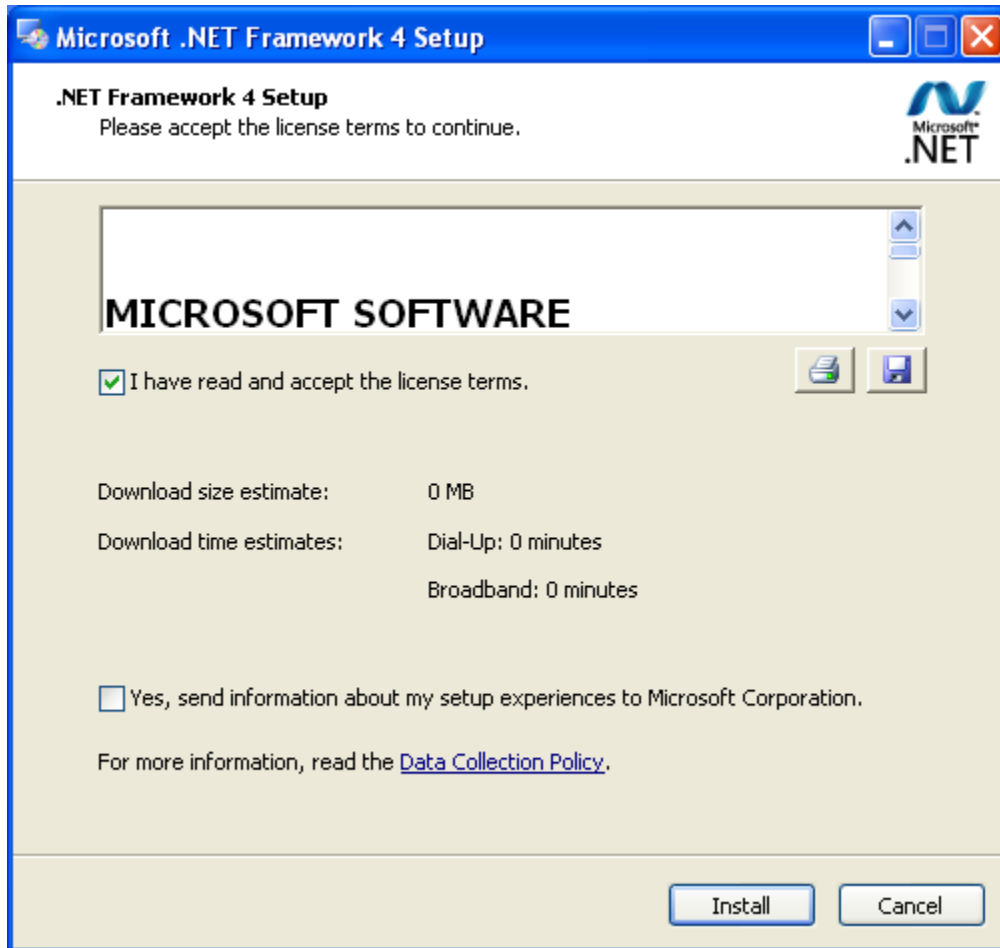
● Installation is in progress.
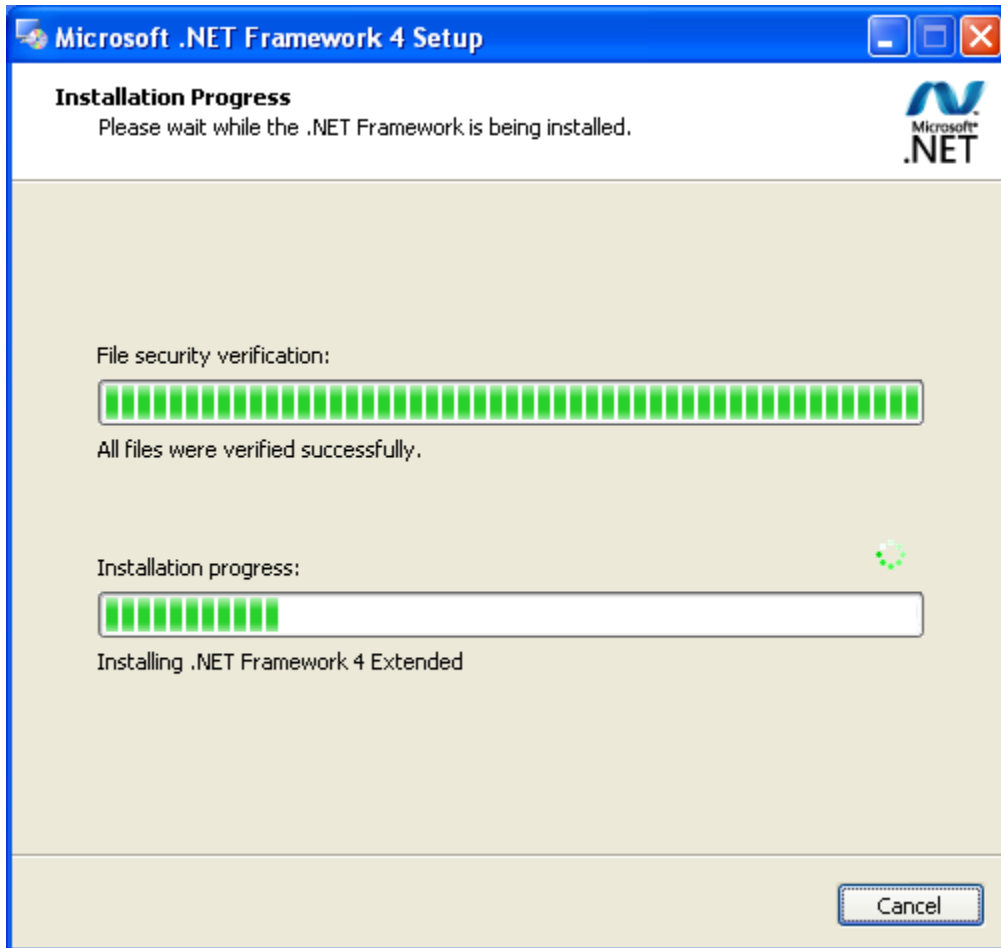
● Click "Finish" to complete the installation.
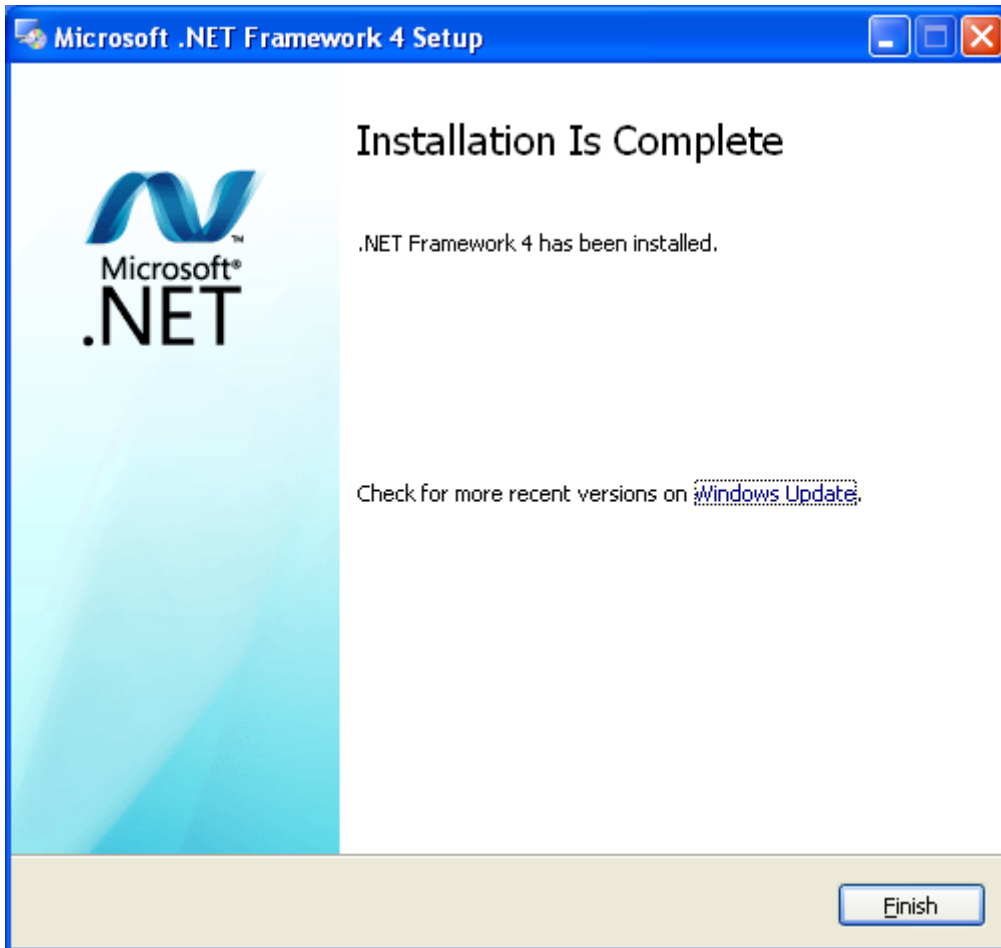
4.3.2 Install Access Driver

- Before operating Gree commissioning software, please first install Access Driver (necessary for versions older than OFFICE 2007). Click "Install Access Driver".

- Click "Next".
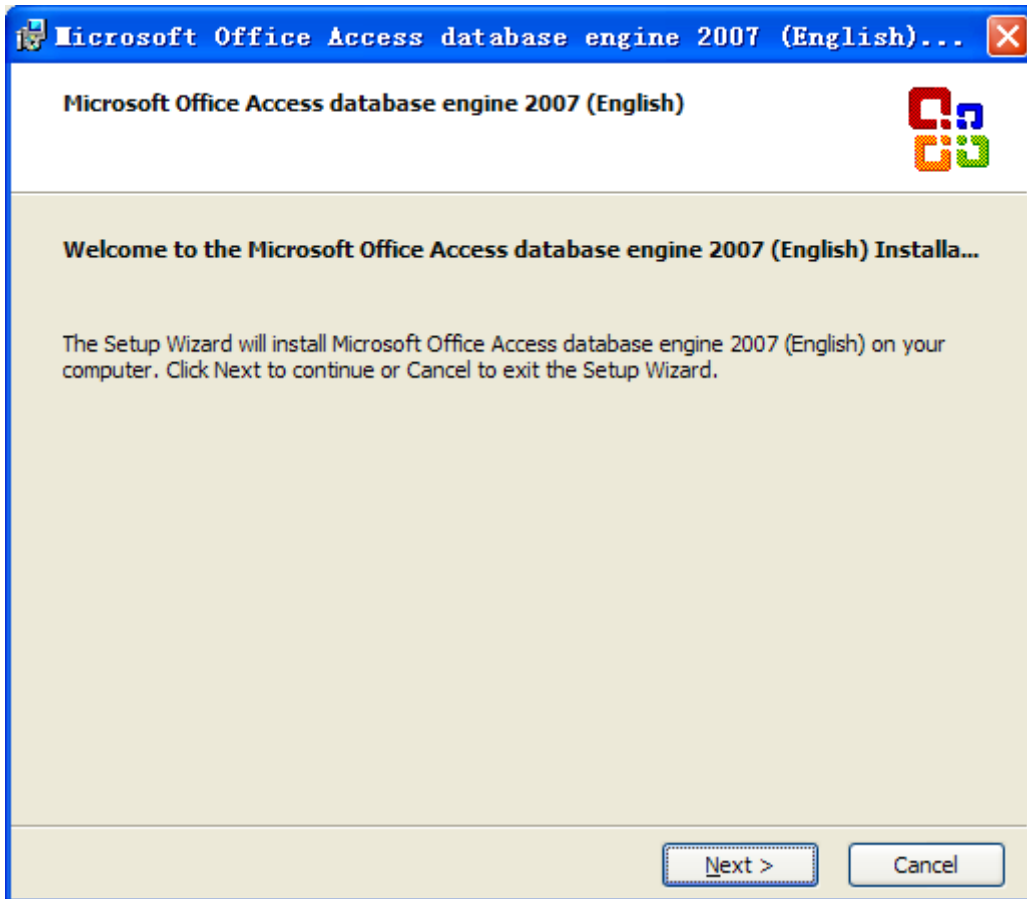
● Tick "I accept the terms in the License Agreement" and then click "Next"

● Click "Browse" to change the default folder to the expected one, or click "Install" to

continue the installation.
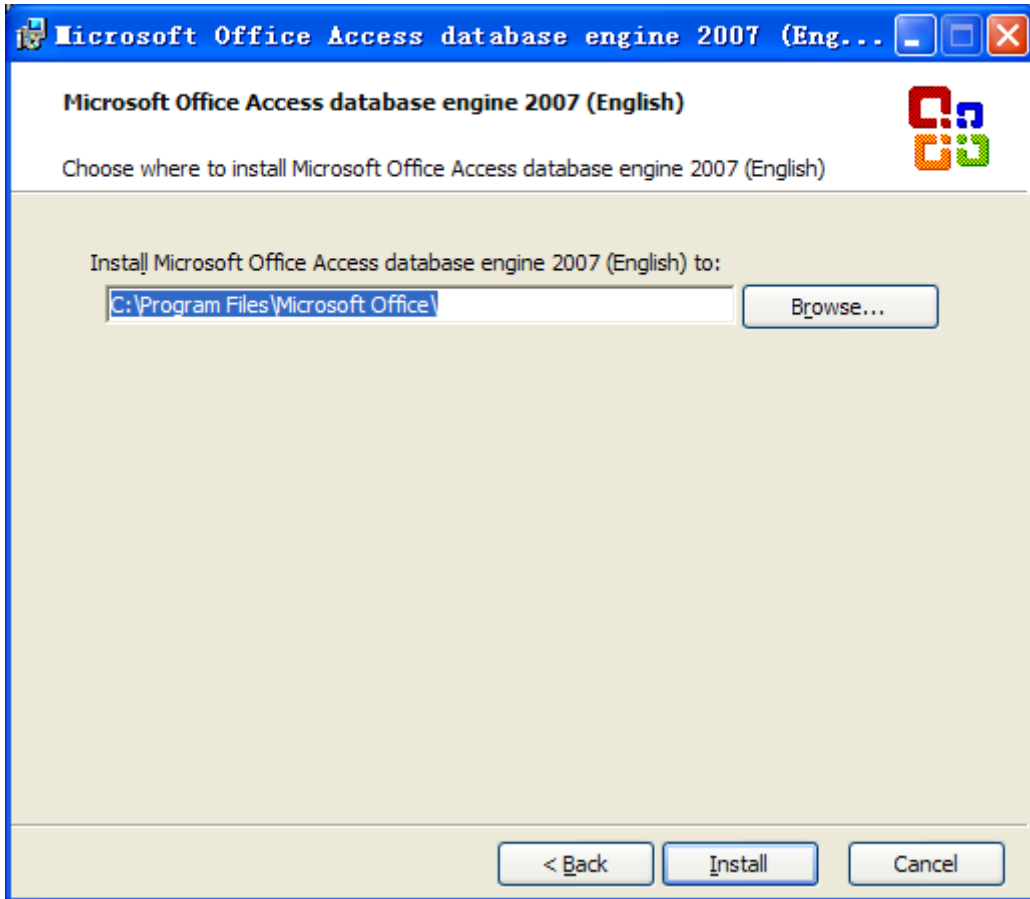
● Installation is in progress.
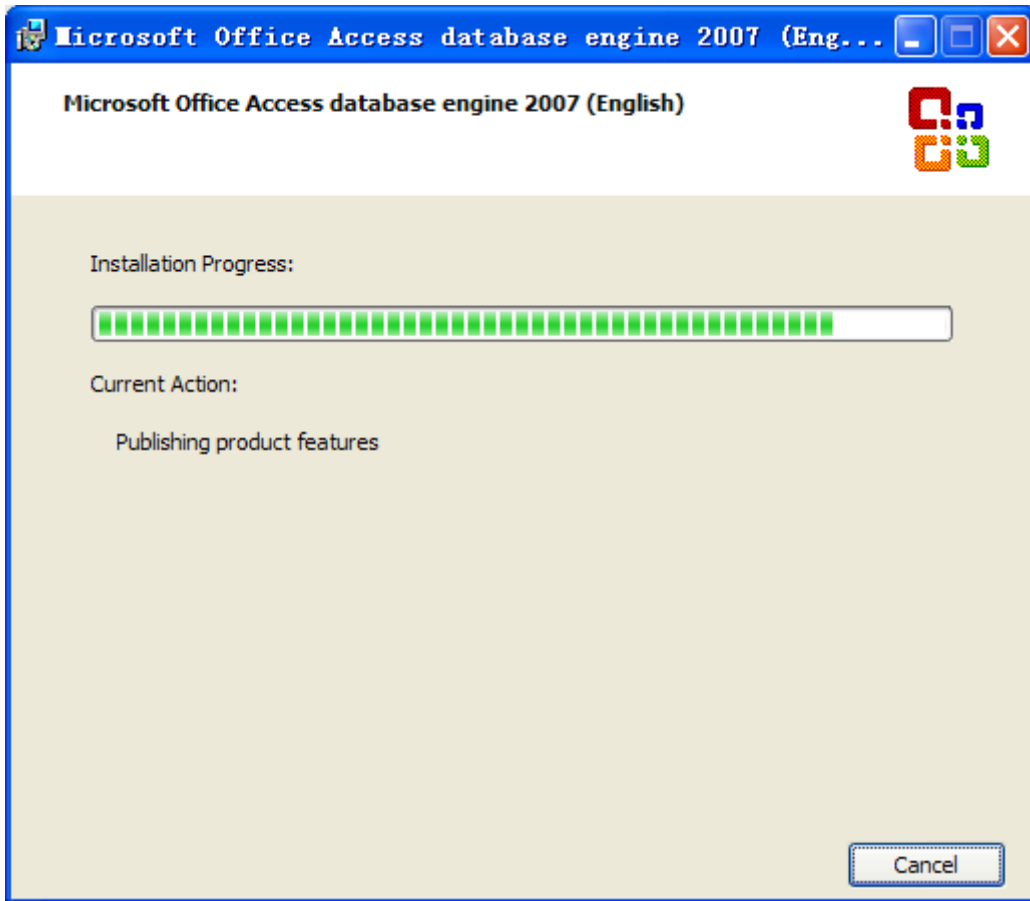
● Click "Ok" to complete the installation.

4.3.3 Install Gree Debugger

● Before installing Gree debugger, make sure that your computer is installed with .Net Framework 4.0 or later versions. Then click "Install Gree Debugger".

● Click "Next".
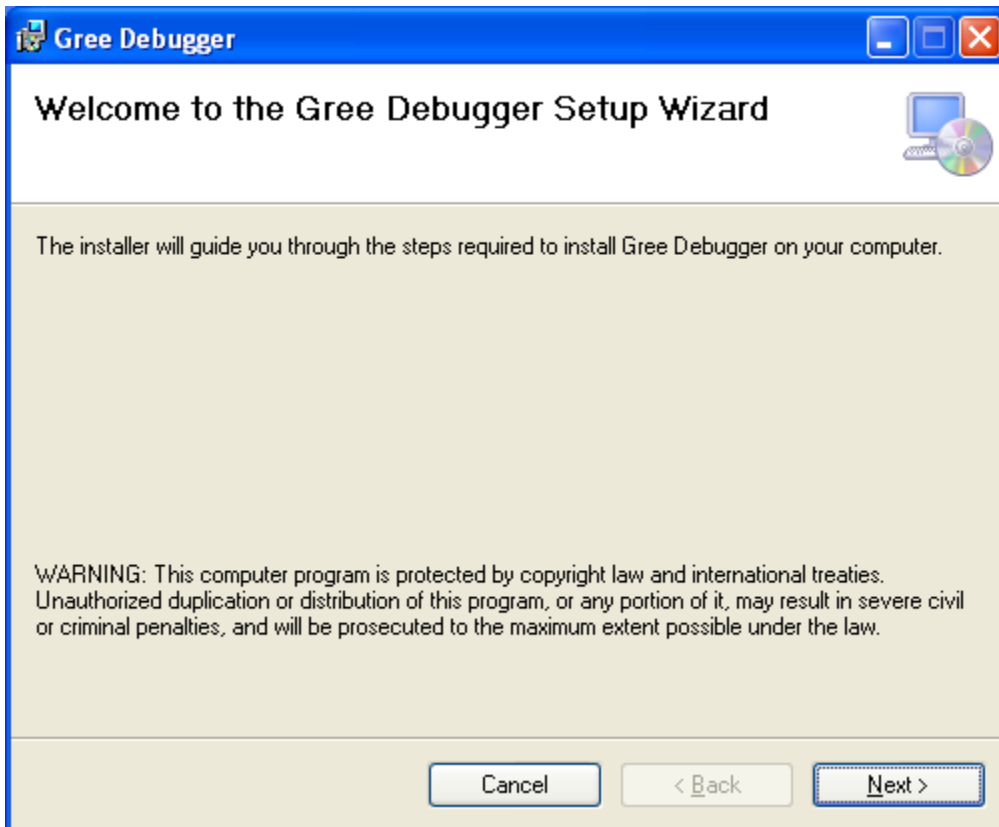
● Click "Browse" to select installation folder. If no change is needed for the folder, click "Next" to continue the installation.
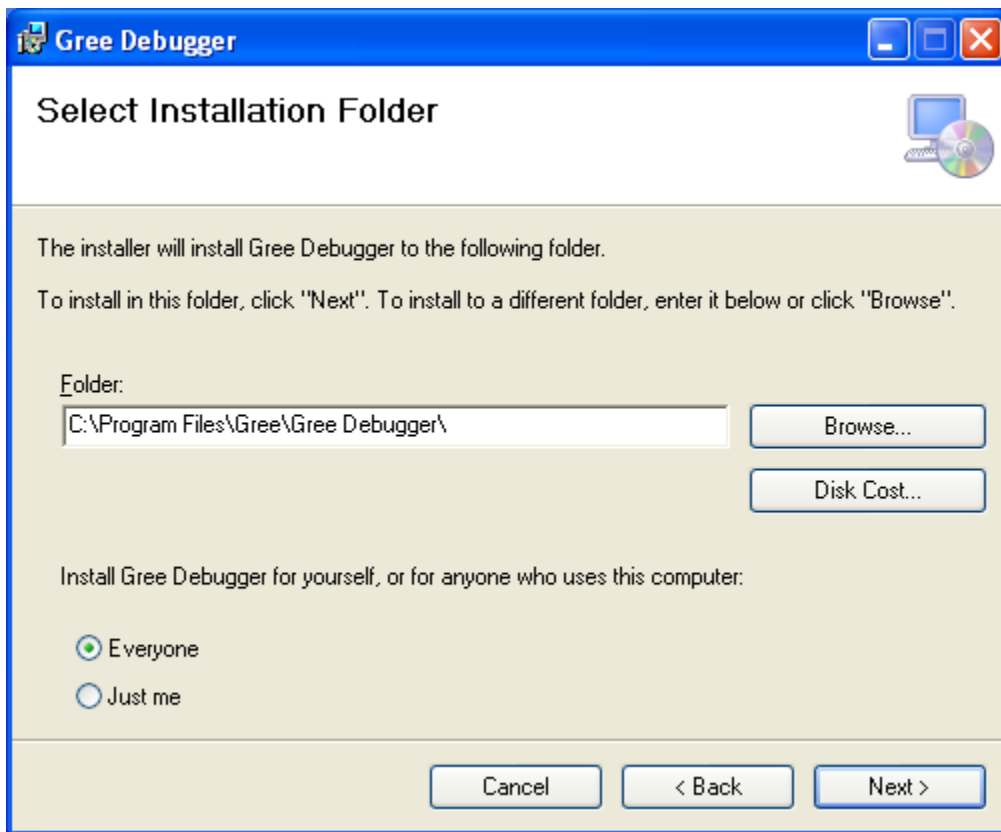
● "Click "Next".
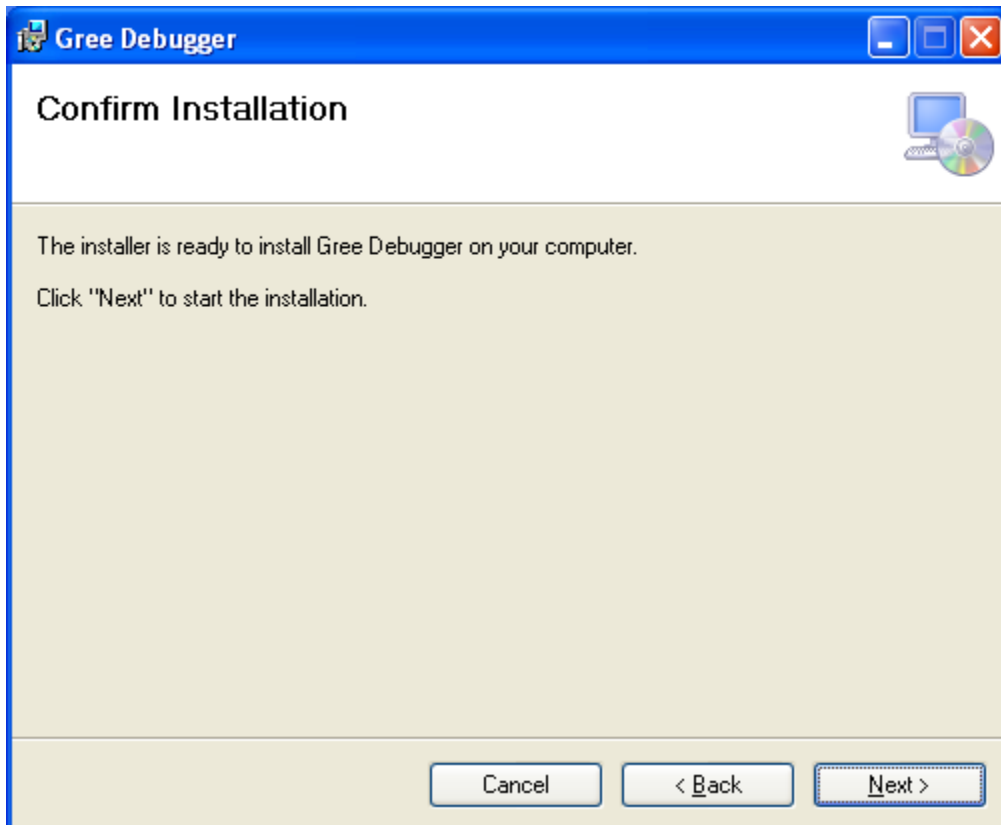
● Installation is in progress.
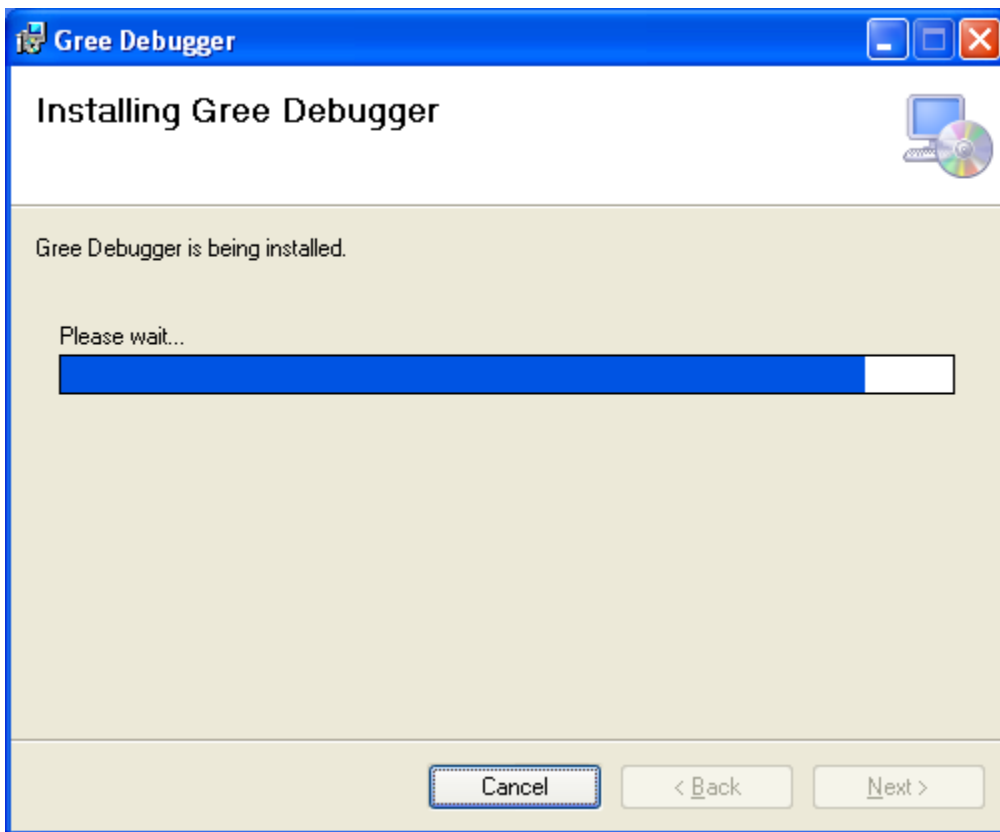
● Click "Close" to complete the installation.
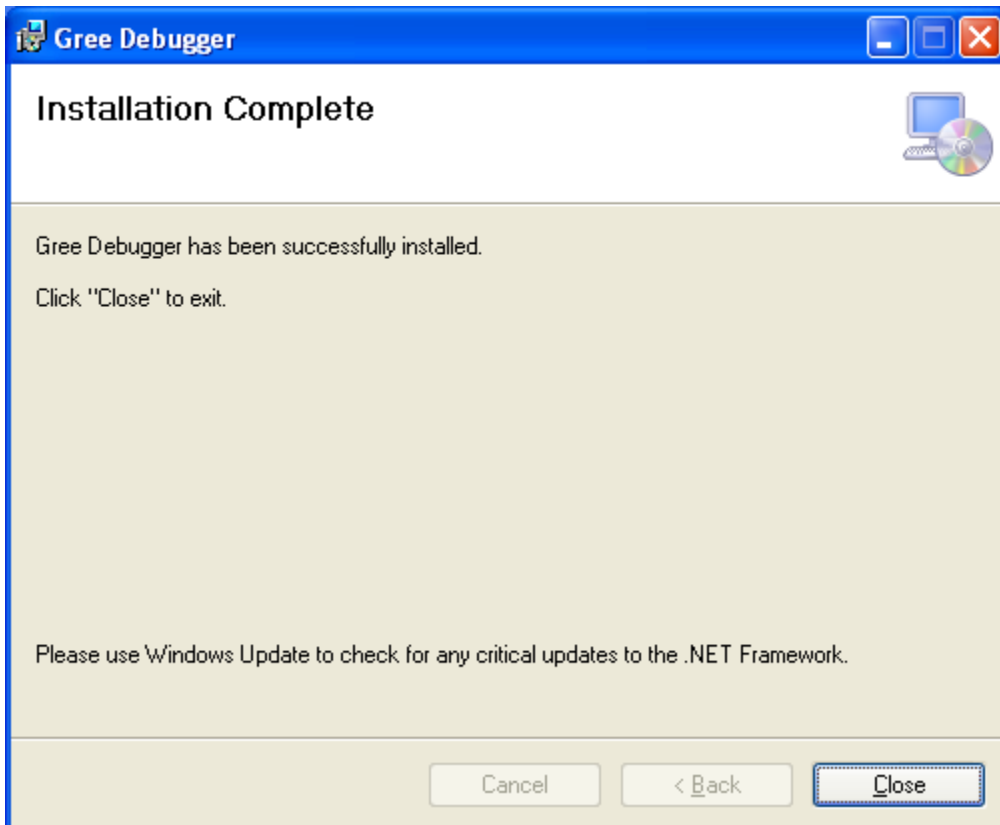
4.3.4 Install USB Converter Driver

If USB converter driver is already installed in your computer, you can skip this step. Otherwise, click "Install USB Converter Driver".

- Then the following installation window will be shown.
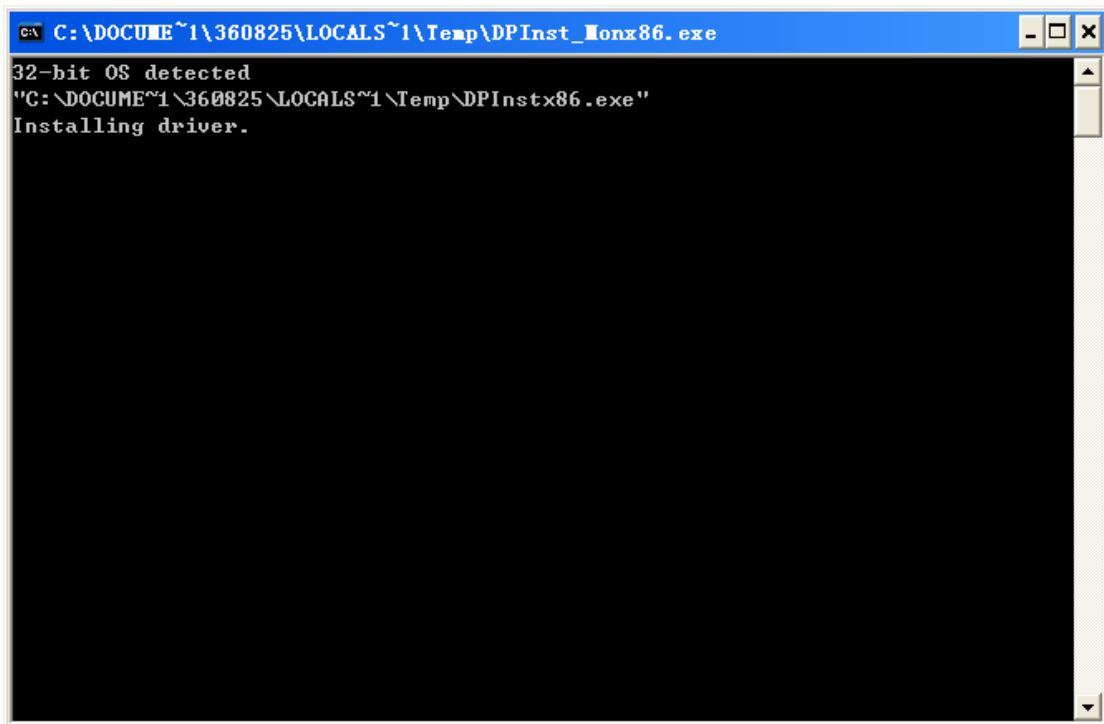
- This window will exit after installation is finished.
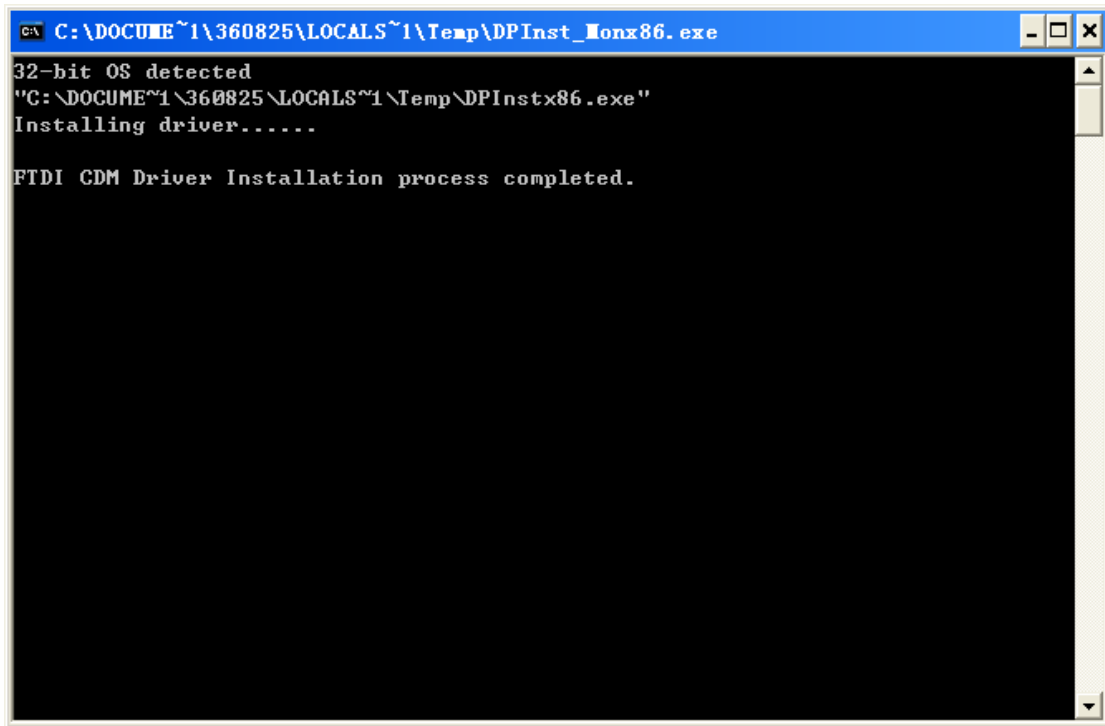
4.3.5 Install Gree USB Data Converter

If converter baud rate is needed to be set, then converter configuring software must be installed. Click "Install Gree USB Data Converter".

● Then select the setup language. You can choose Chinese "simplified", Chinese "traditional" or English. Then click "OK".
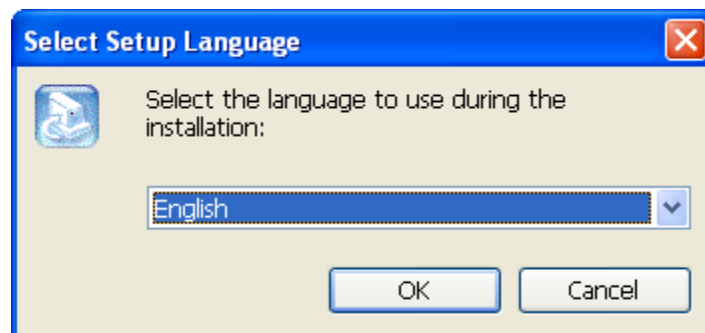
● Click "Next".
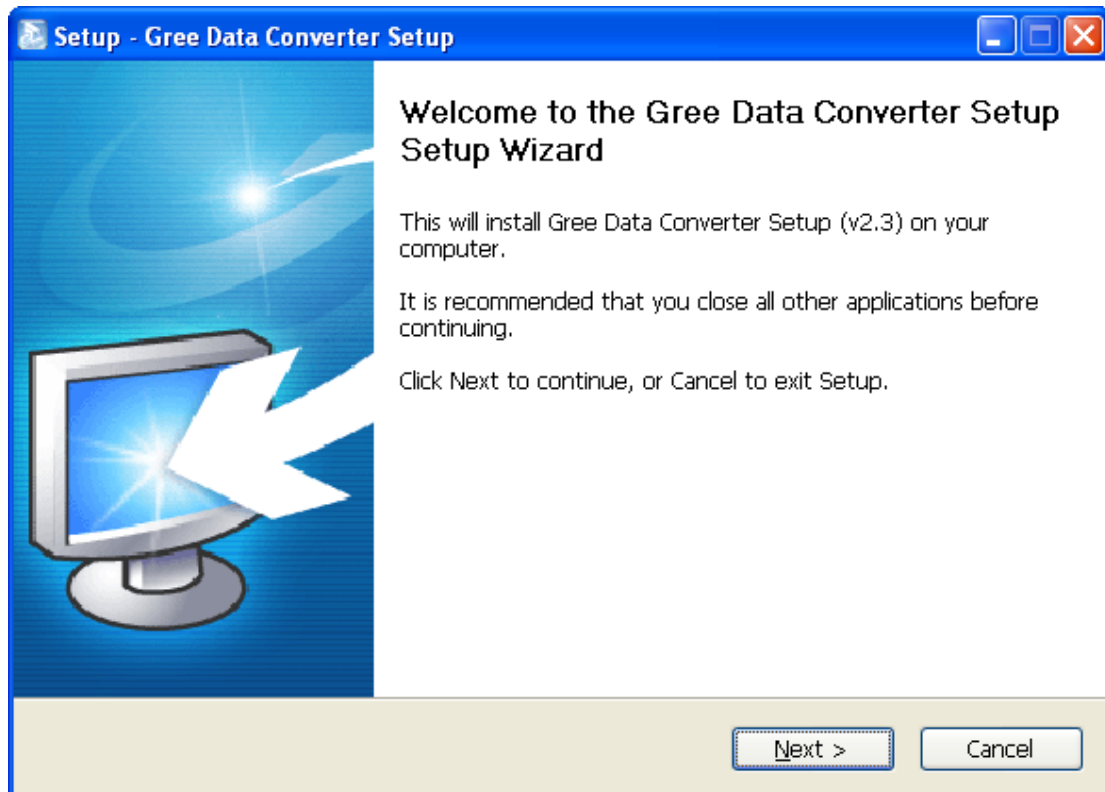
● Tick "I accept the agreement". Then click "Next" to continue installation.
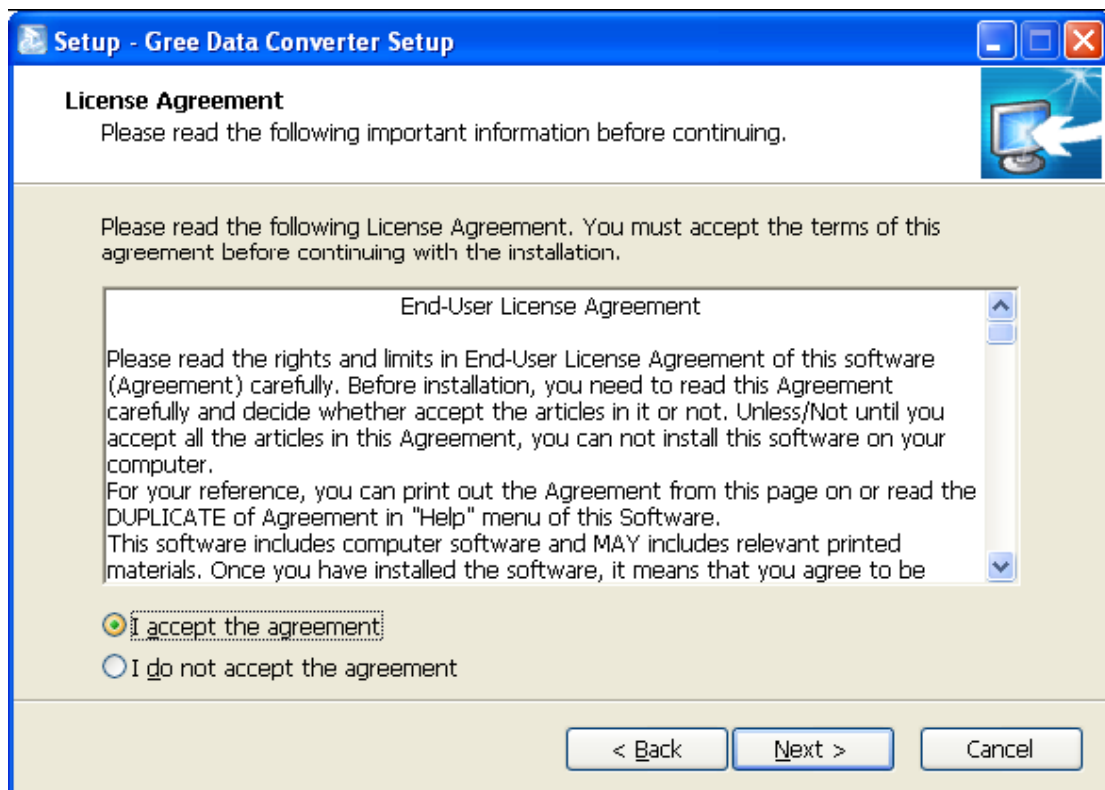
● Click "Browse" to select your expected installation folder. Click "Next" to continue.
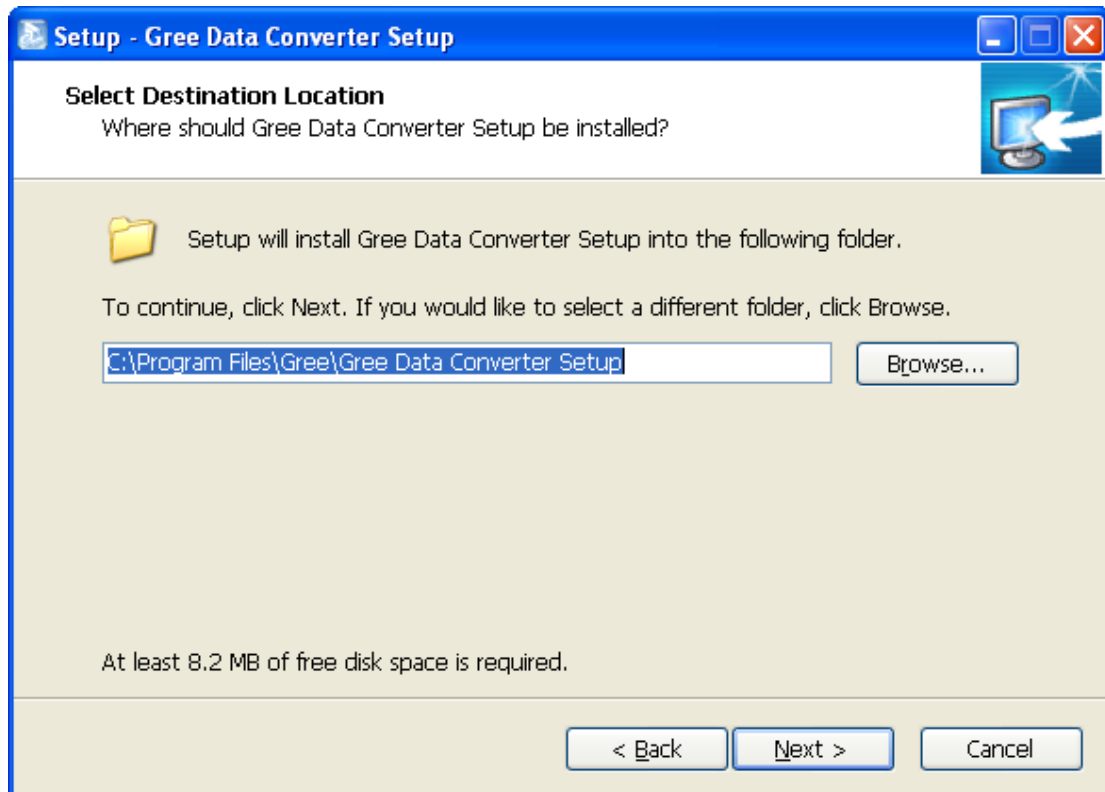
- Click "Browse" to change folder. Click "Next" to continue.
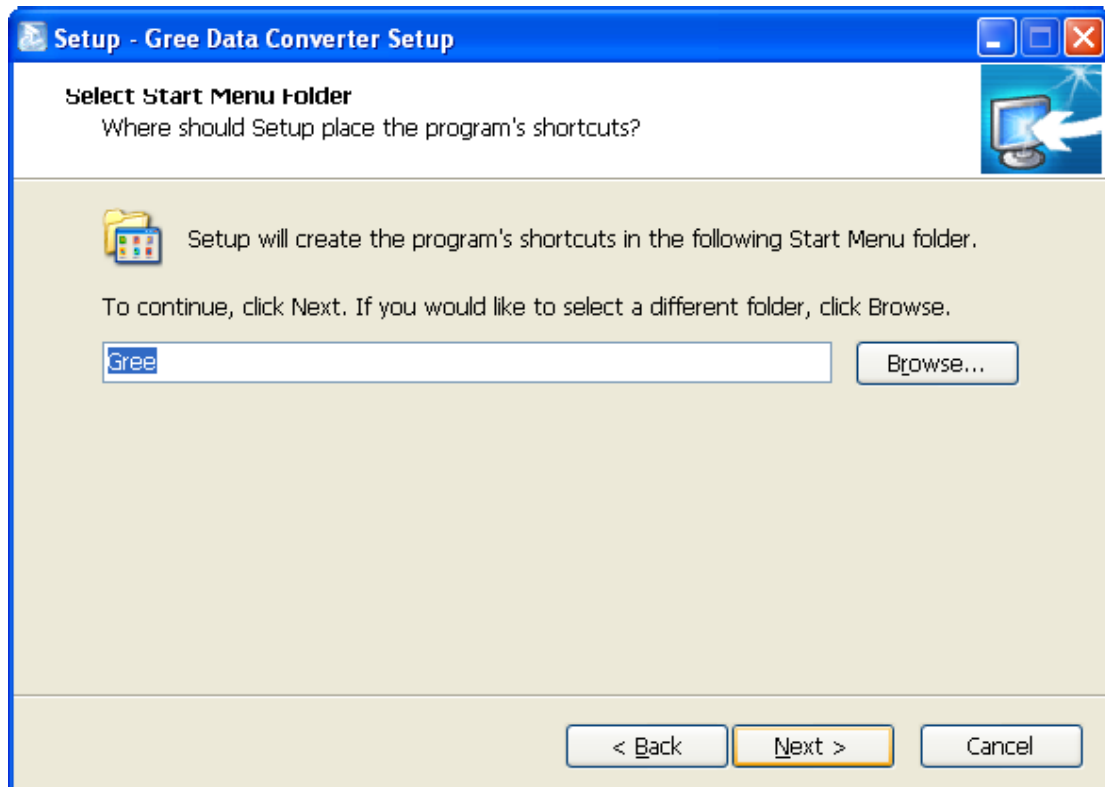
- If you want to create a desktop shortcut, tick "Create a desktop icon". Then click "Next" to continue.
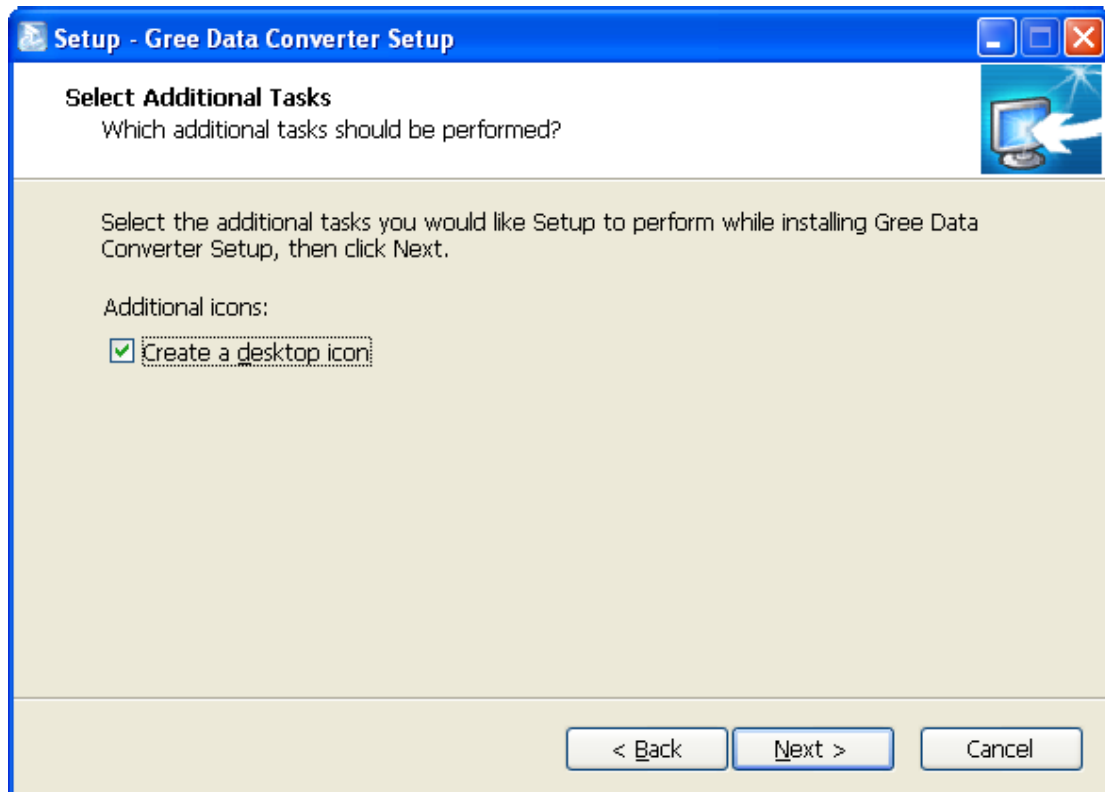
● Destination location, folder and additional task will be shown in the next step. If you need to change any of it, please click "**Back**". If not, click "**Install**" to start installation.
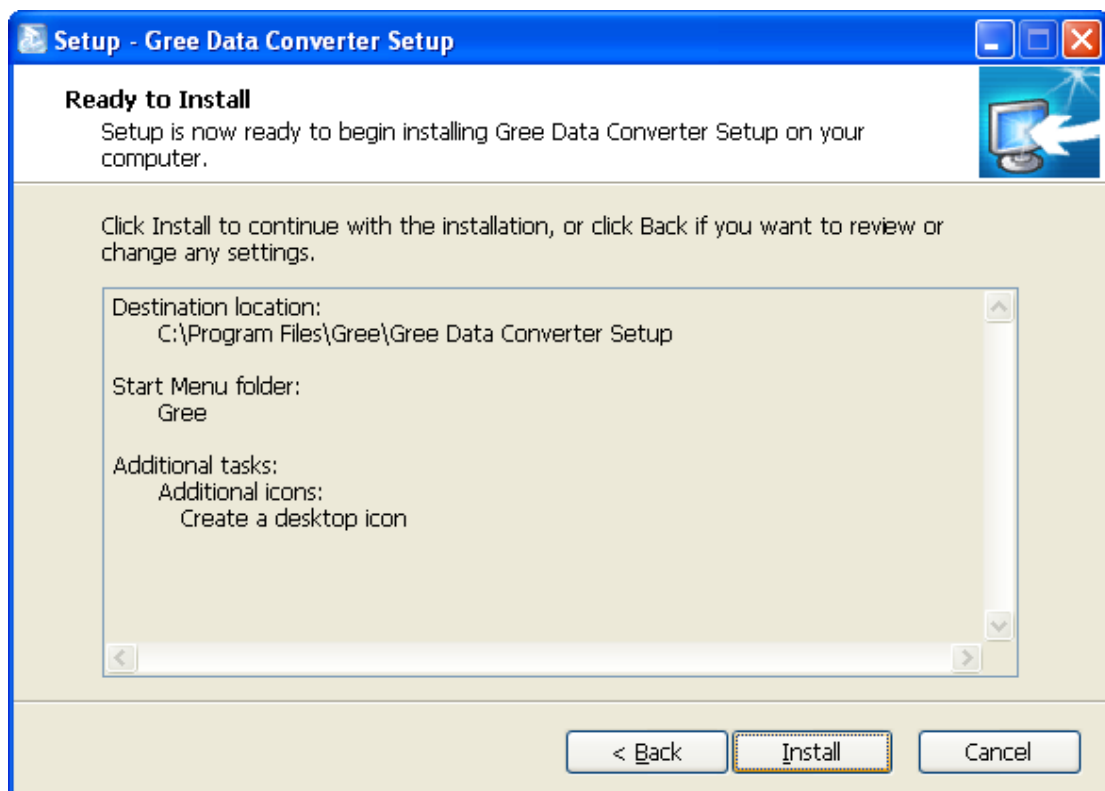
● Installation is in progress.
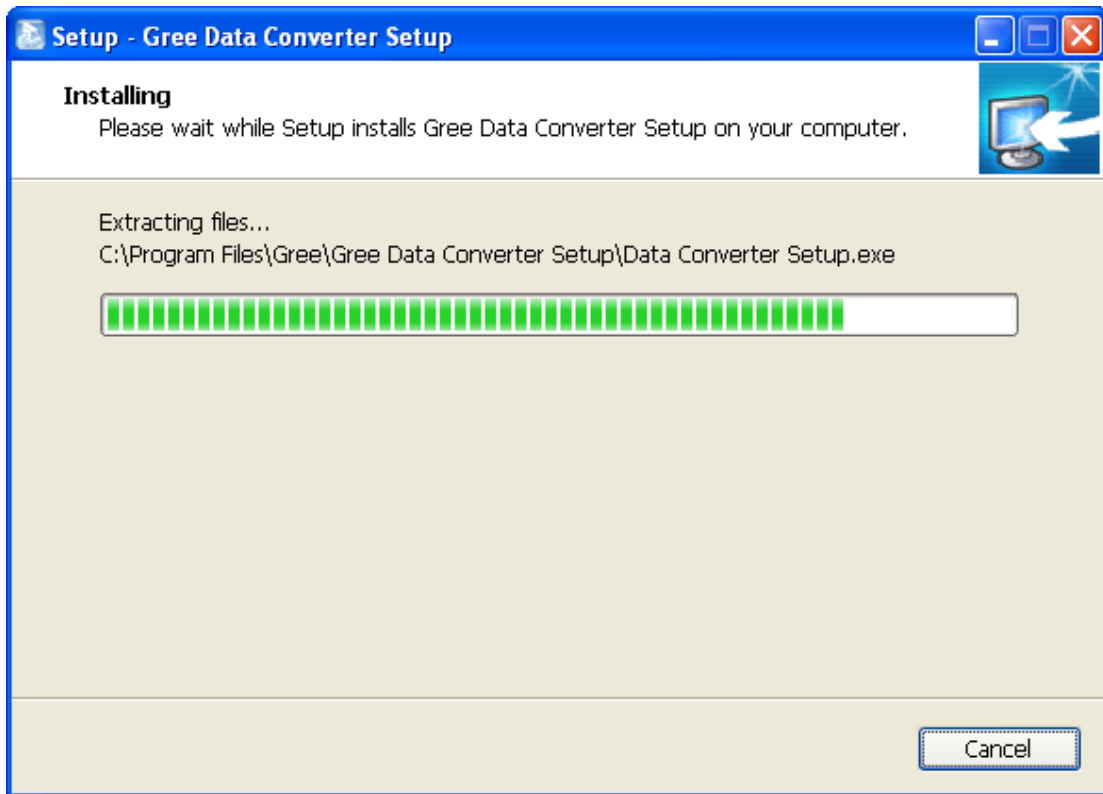
● Click "Finish" to complete the installation.
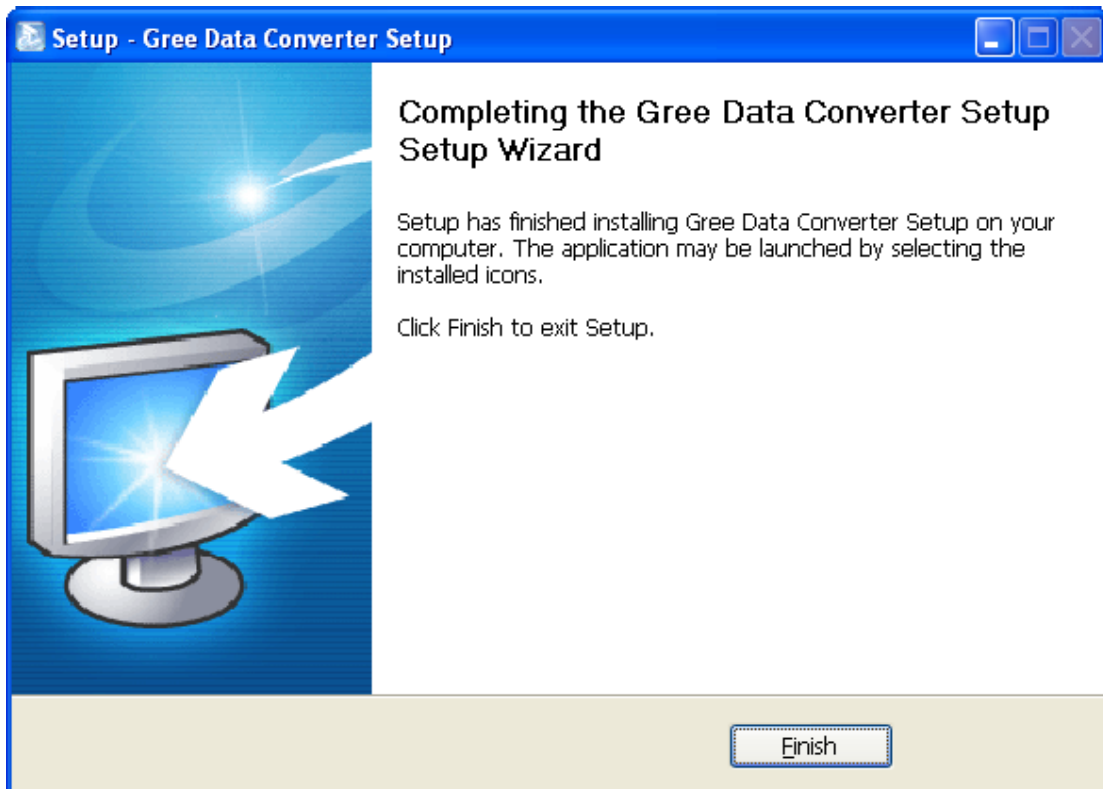
5. Use of Software

5.1 Introduction of Functions

5.1.1 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 commissioning order to units. Then commissioning will start 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.

5.1.2 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.

5.1.3 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 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.

5.1.4 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 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.

5.1.5 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.

5.2 Operation Methods

5.2.1 Data Monitoring

● Start up Gree Debugger.

● 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.
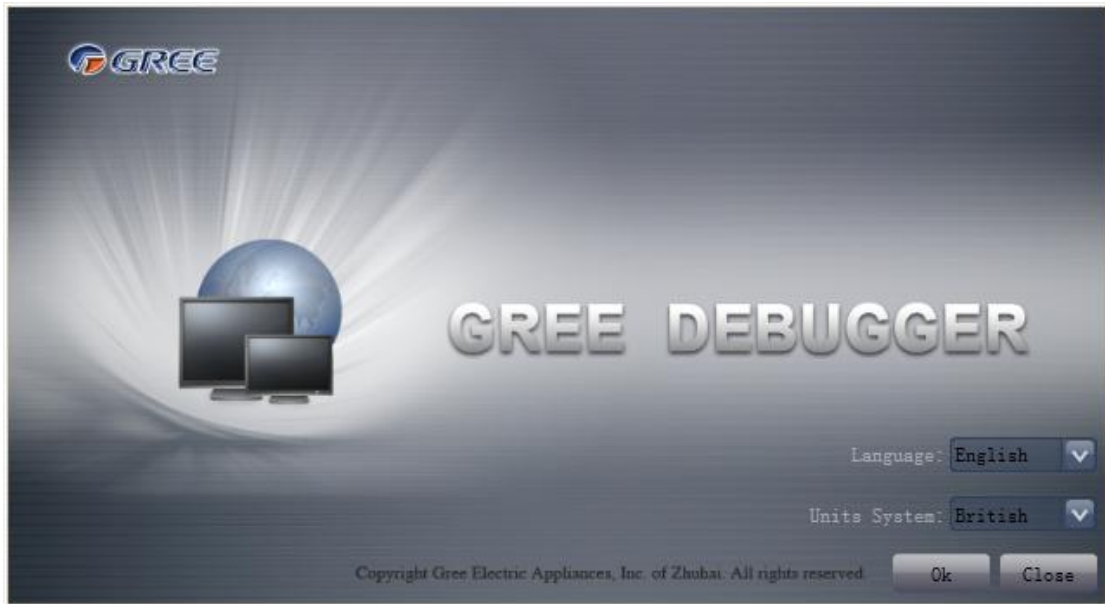
● Select language.
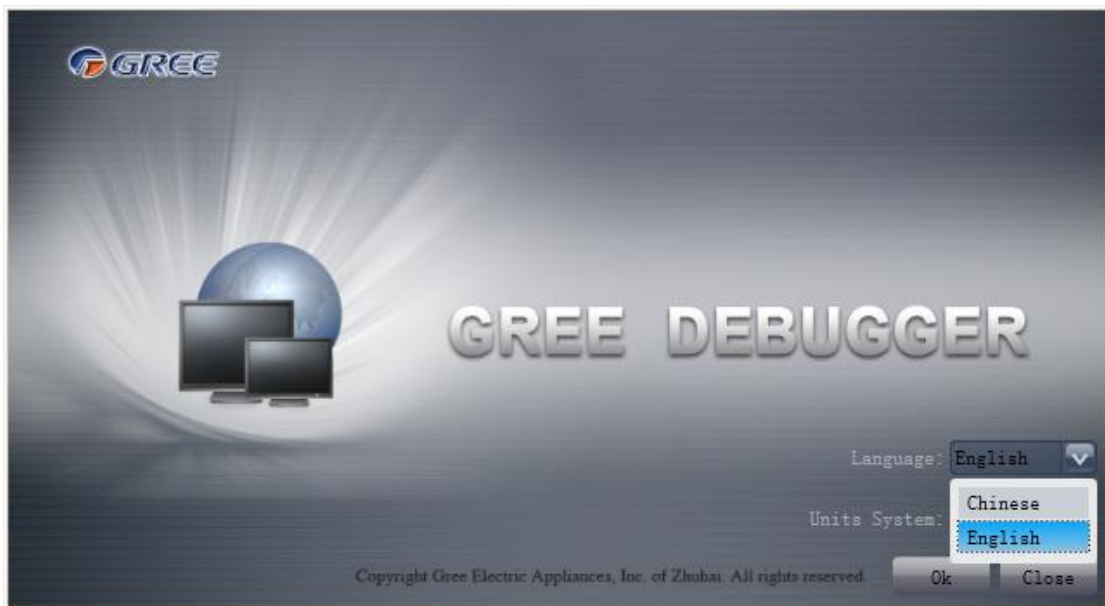
● Select system of units.
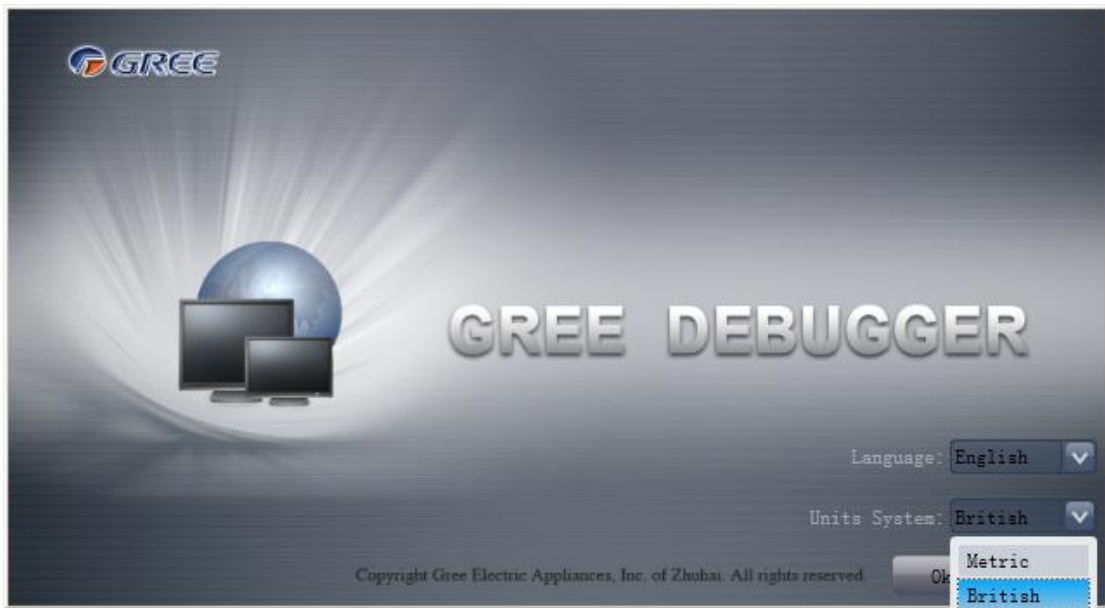
If units you want to monitor are already connected, and able to communicate normally, with correct COM and protocol, then you can click "Connect" to enter the interface of numbers. Otherwise, connect in accordance with the connection diagram shown below.
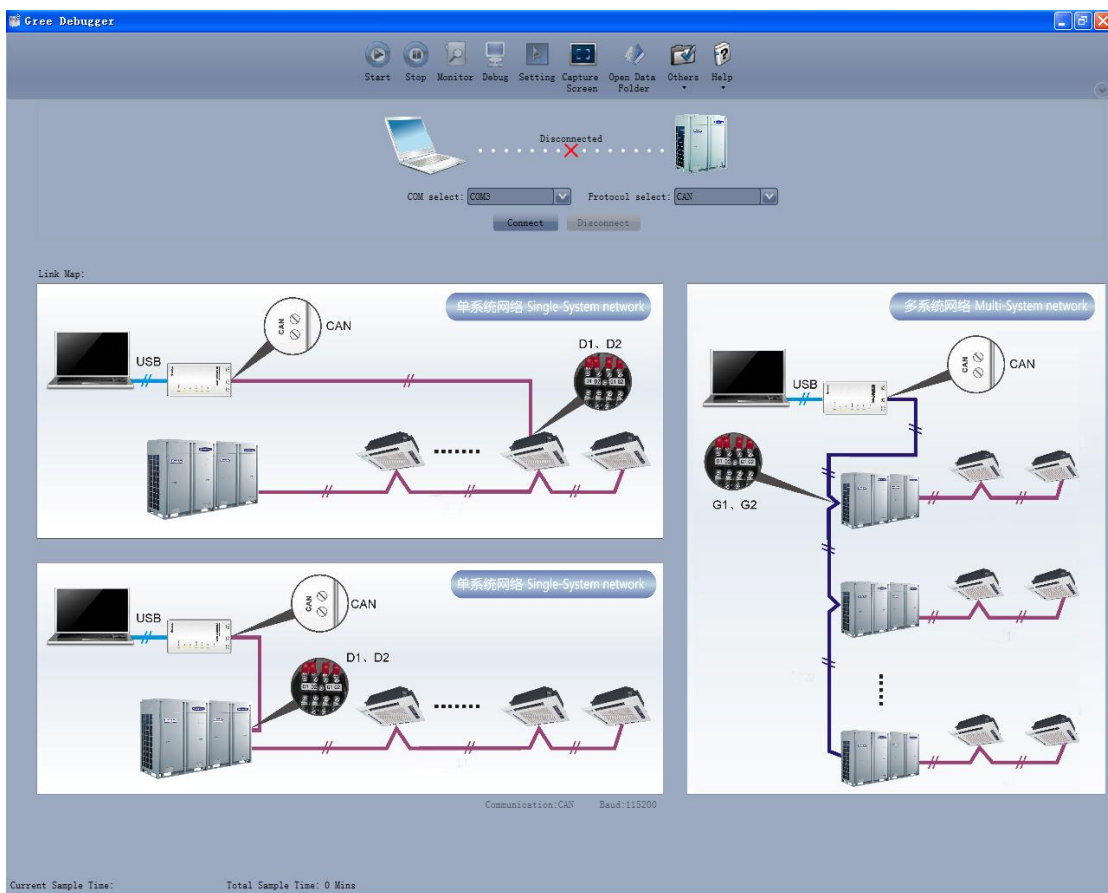
● COM selection: The serial port in your computer can be detected automatically. You just need to select your desired serial port.
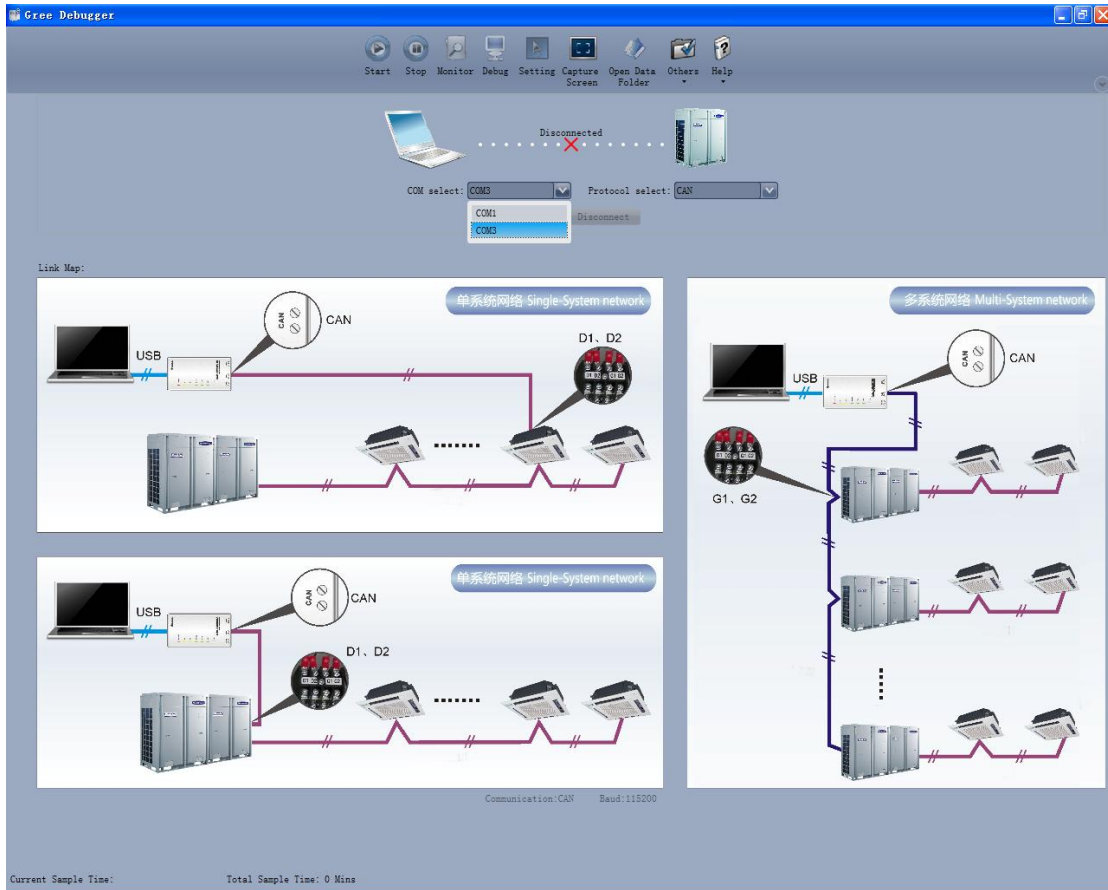
● Protocol selection: This is to select the communication method of your units. Currently, CAN is applicable to the units.
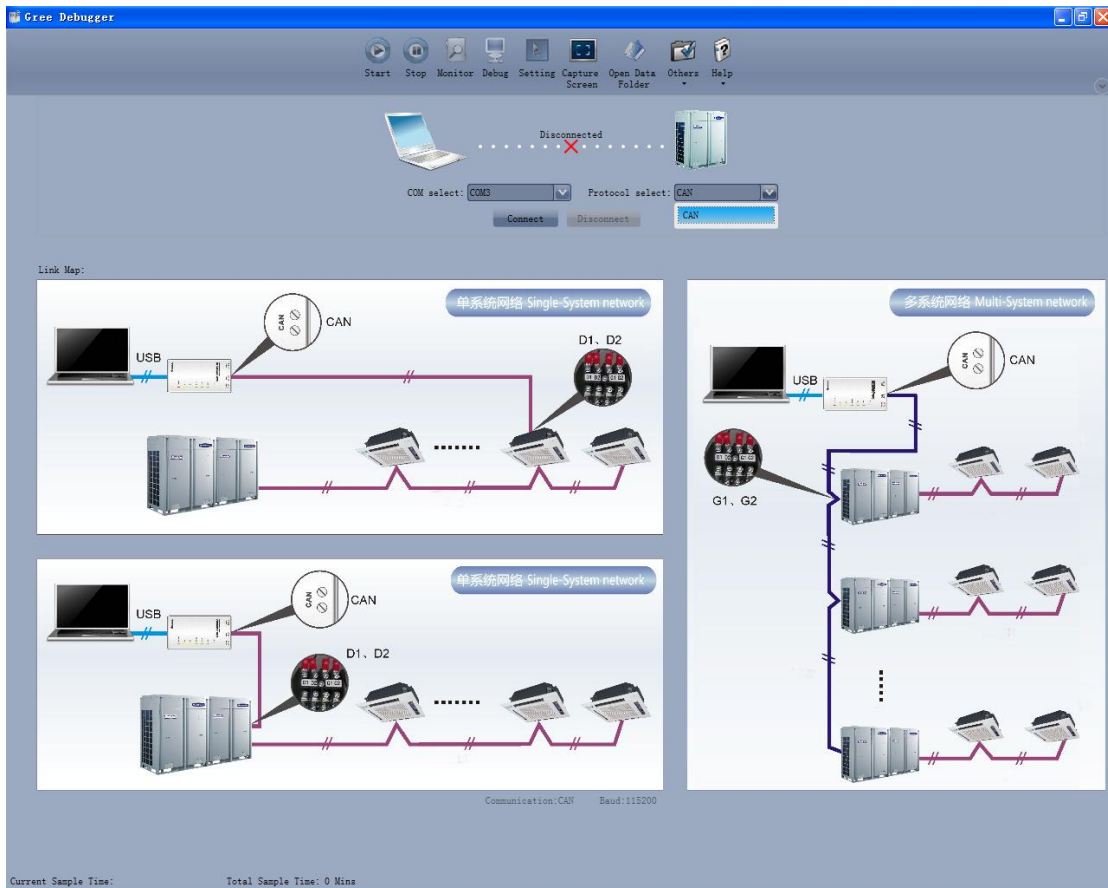
● After the selection, click "Connect". If units can communicate normally with computer, then the interface of numbers will be shown soon. Otherwise, "Connecting" will be shown.
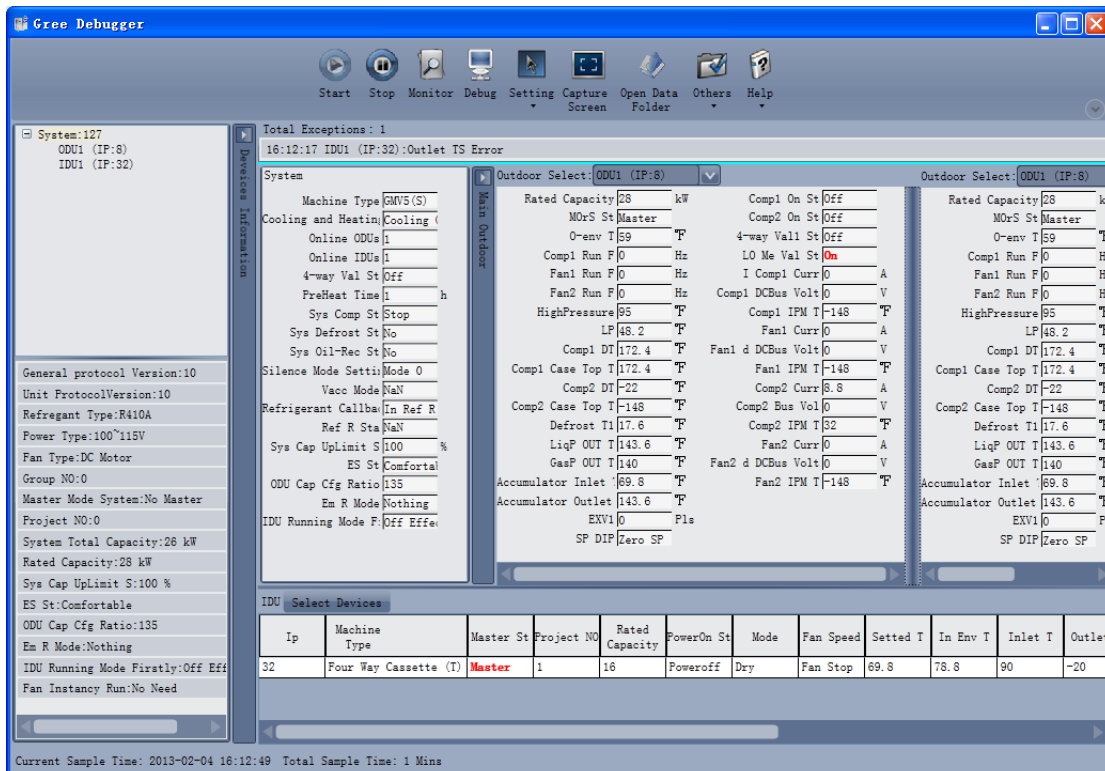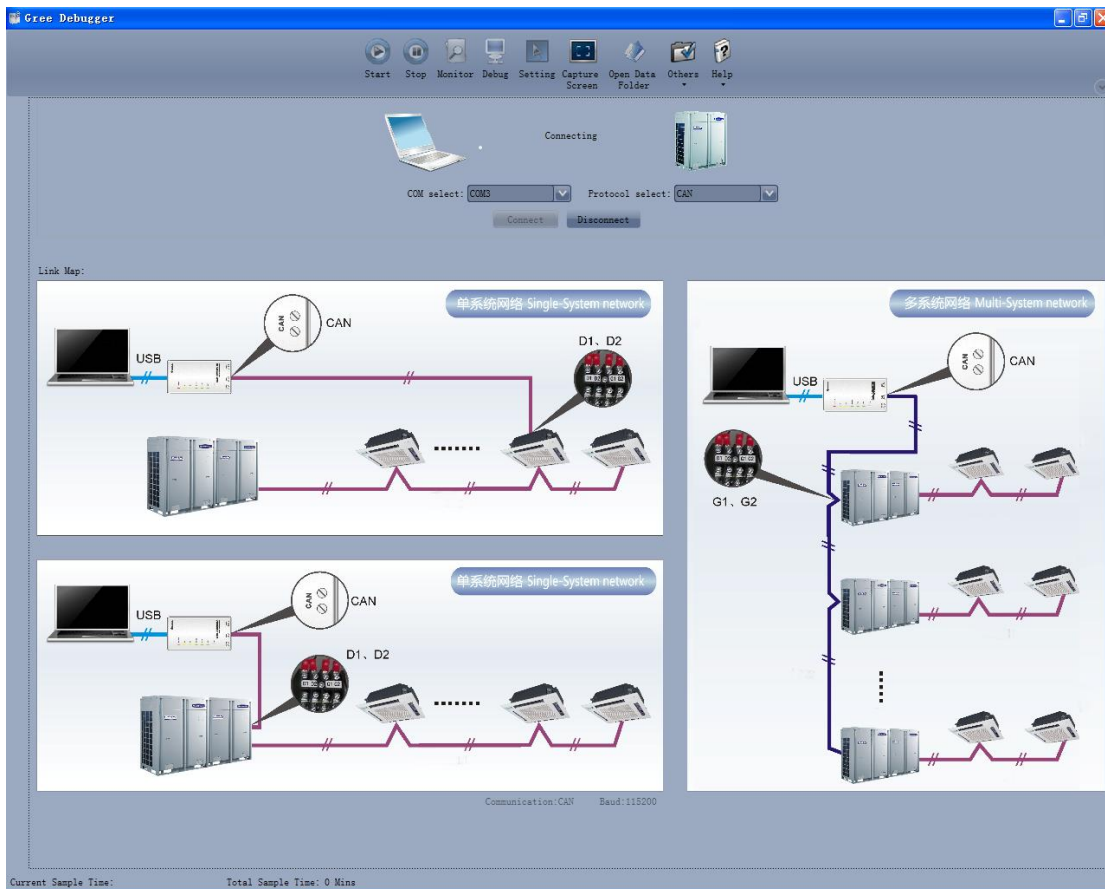
● There are several display zones on this interface. You can hide devices information and system information by clicking devices information icon and system icon . Display zones of indoor unit information and errors can be dragged up and down at the dividing lines. As to the

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.
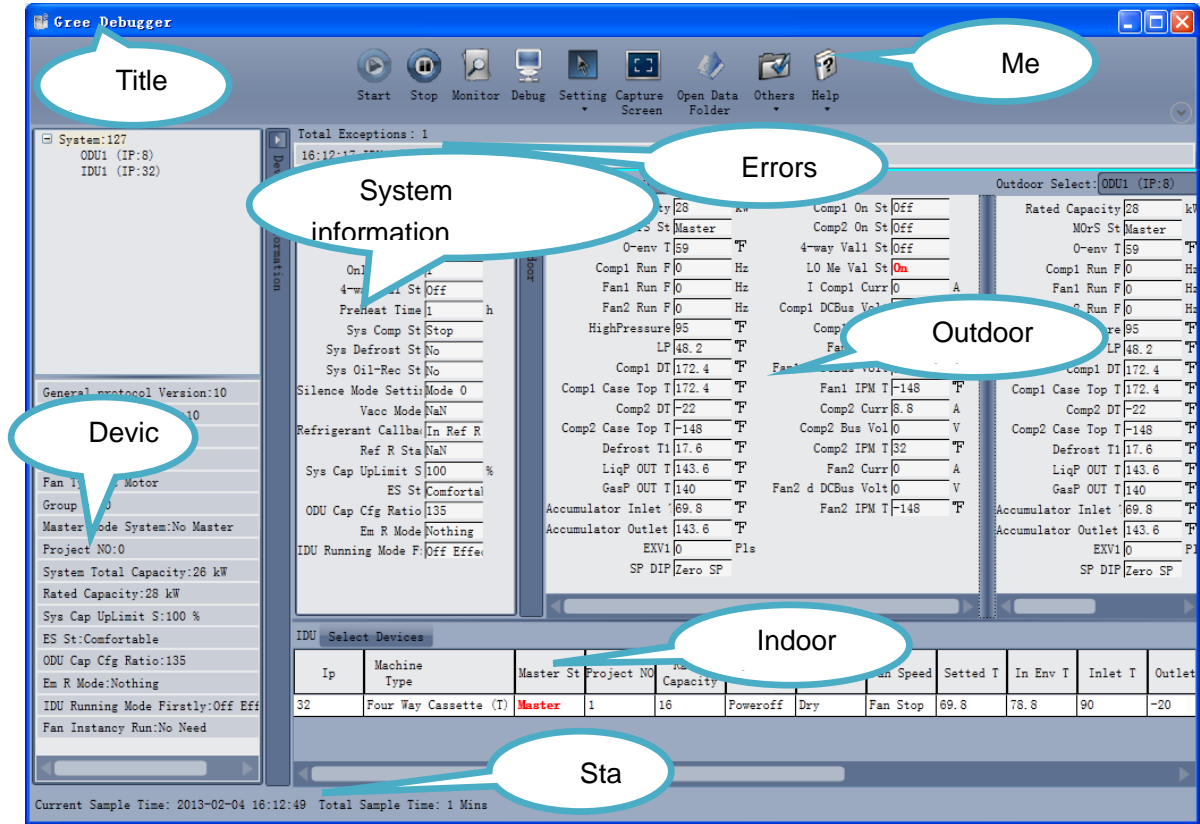
● On the display zone of devices information, you can click to select and view units that need monitoring.
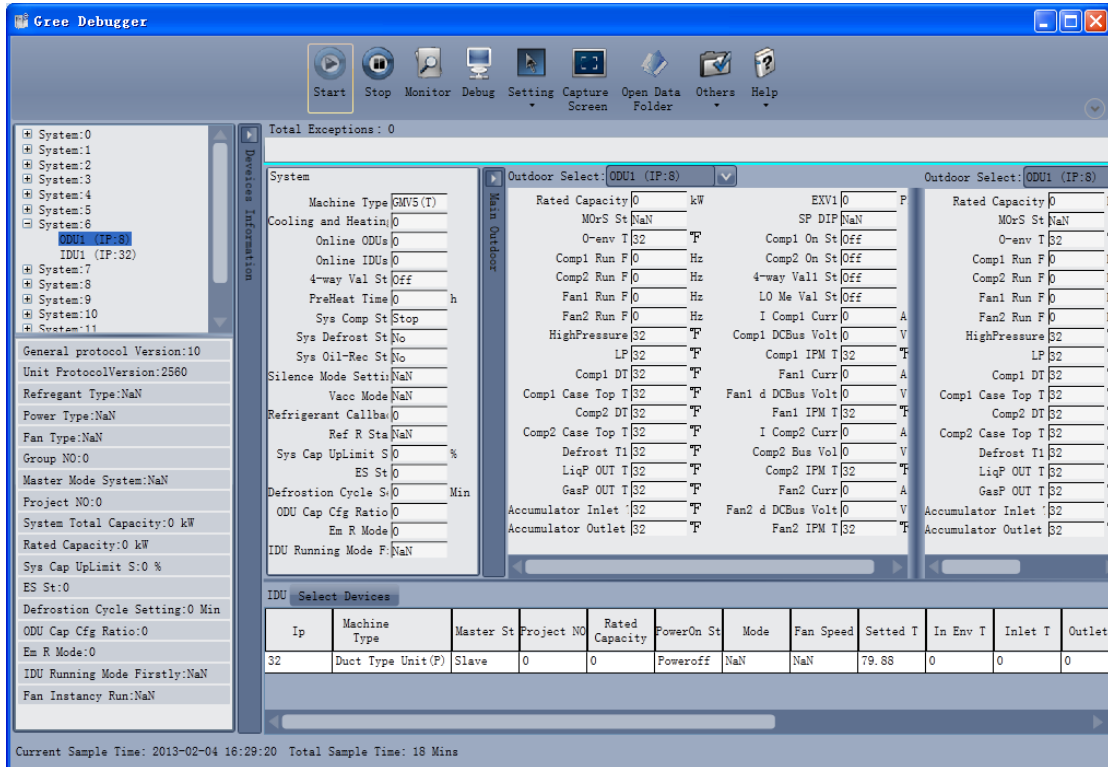
5.2.2 Project Debugging

● Click icon of "Debug" on the menu bar and the interface will be switched to project debugging, where auto debugging will start from up to down and from left to right. Note: Debugging function is only applicable to a single-system network.
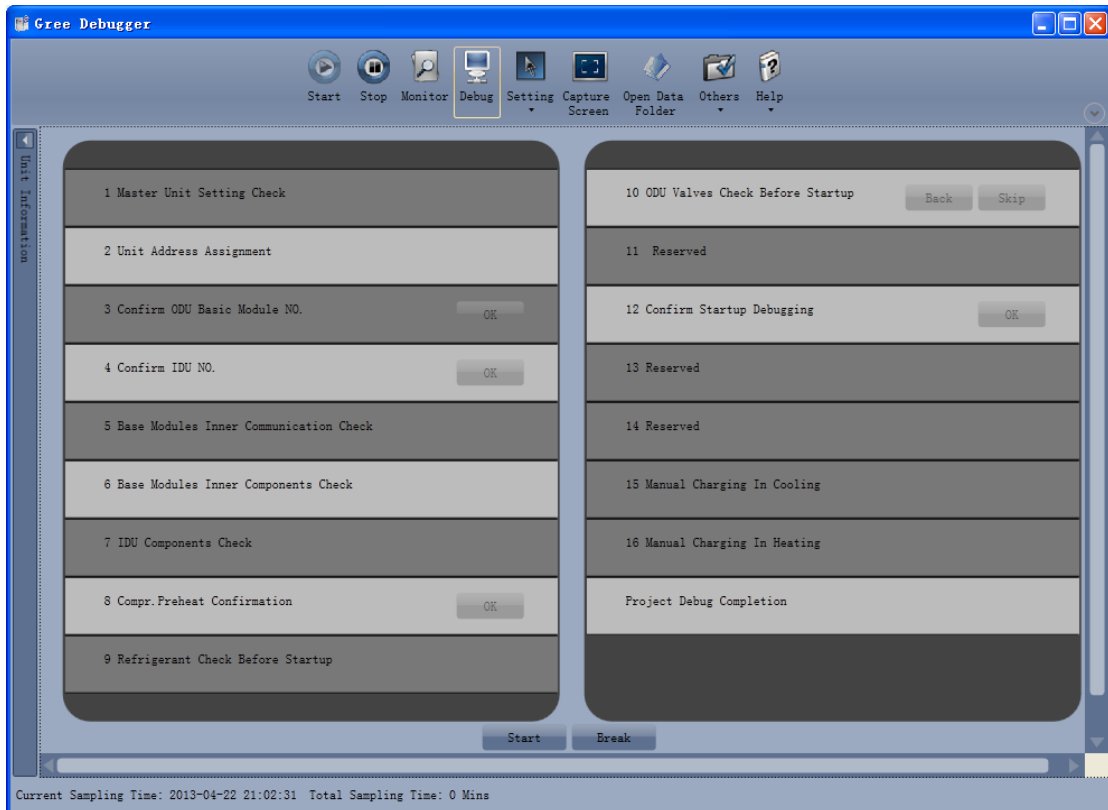
● Click "Start" to enable the debugging function. Then debugging will start automatically. indicates that debugging is in progress while indicates debugging is completed.
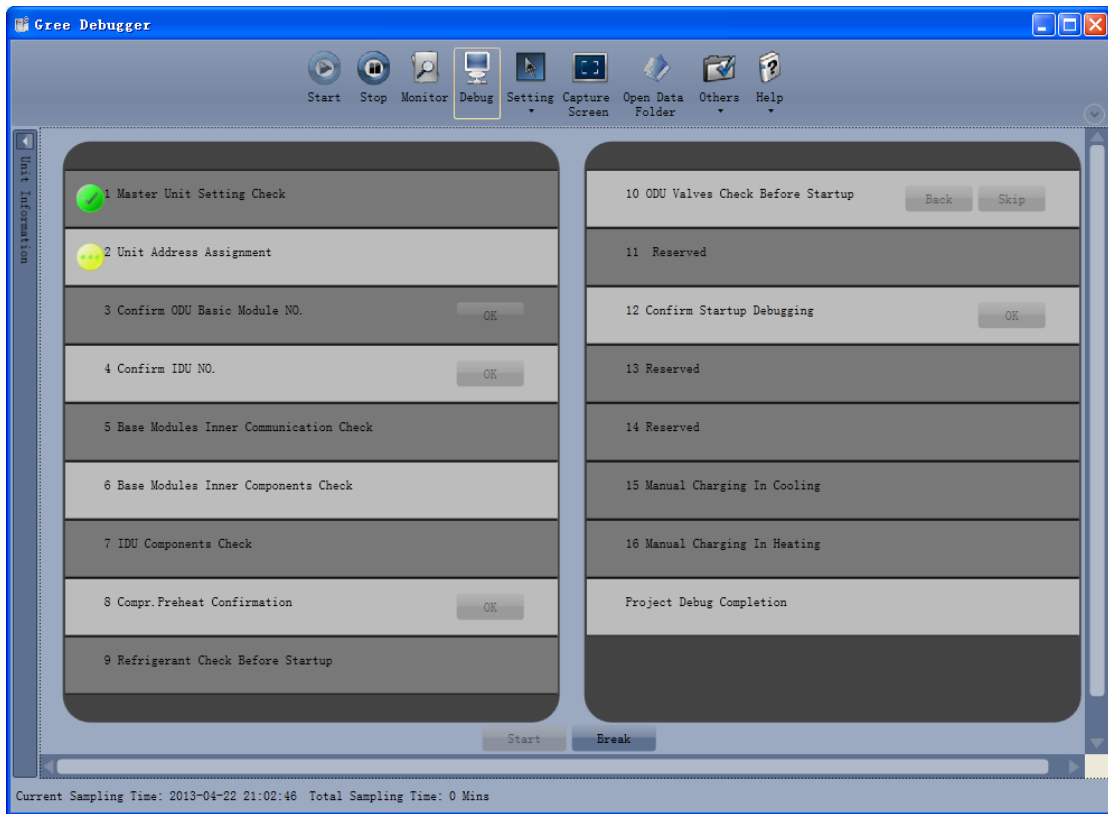
● If "OK" button is displayed, it means user needs to judge whether to continue debugging or

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).
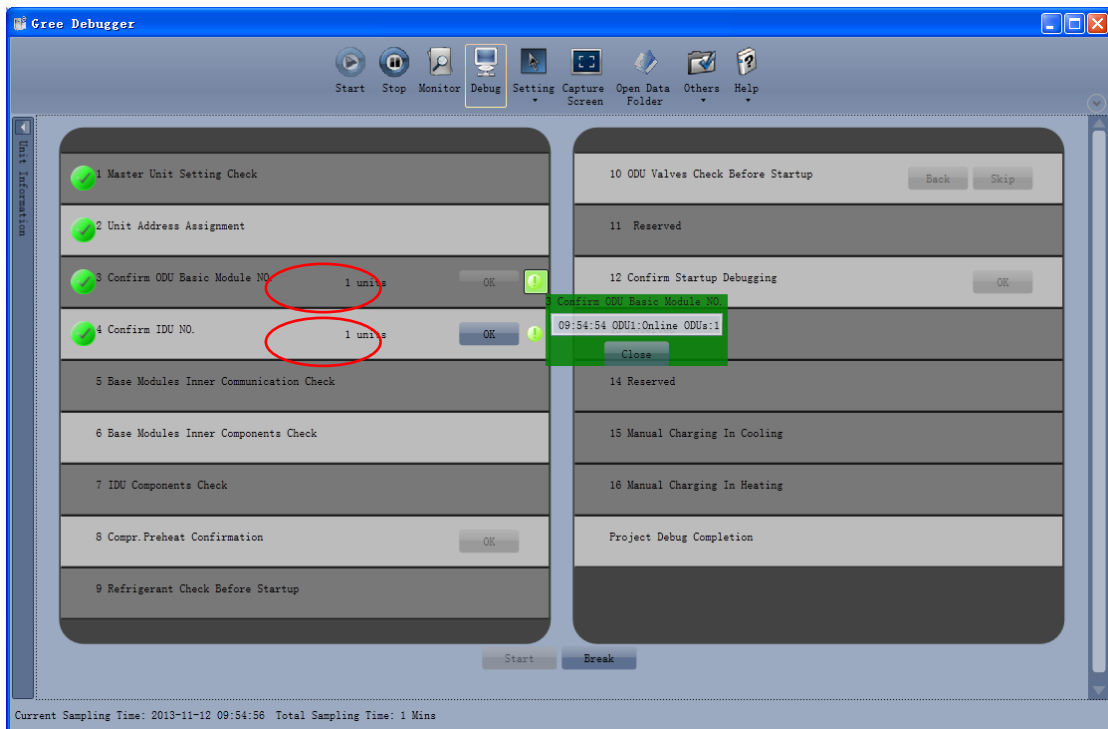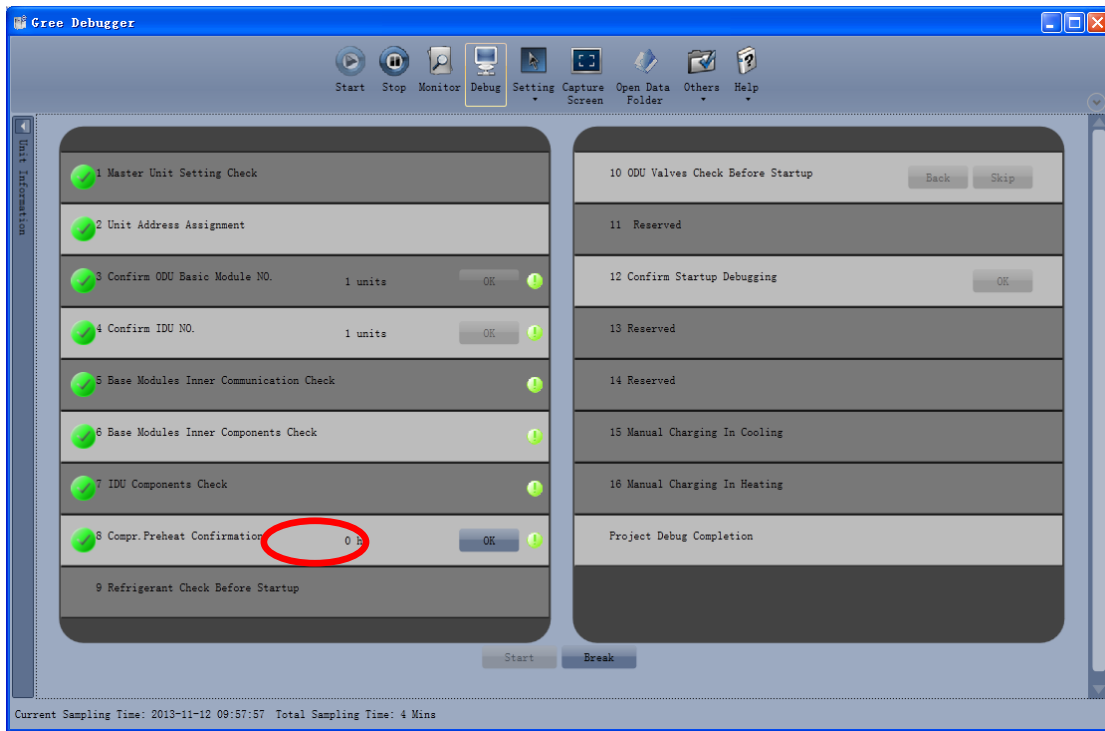
● Icon ⬛ indicates that there is problem found during debugging. Debugging will not be completed unless problem is solved (after problem is solved, step without "OK" button will switch to the next step automatically, otherwise user needs to click "OK" to continue). Click icon 🔴 and relevant information detected in this step will be displayed for your reference in order to solve problems. Click "Close" to close the pop-up.
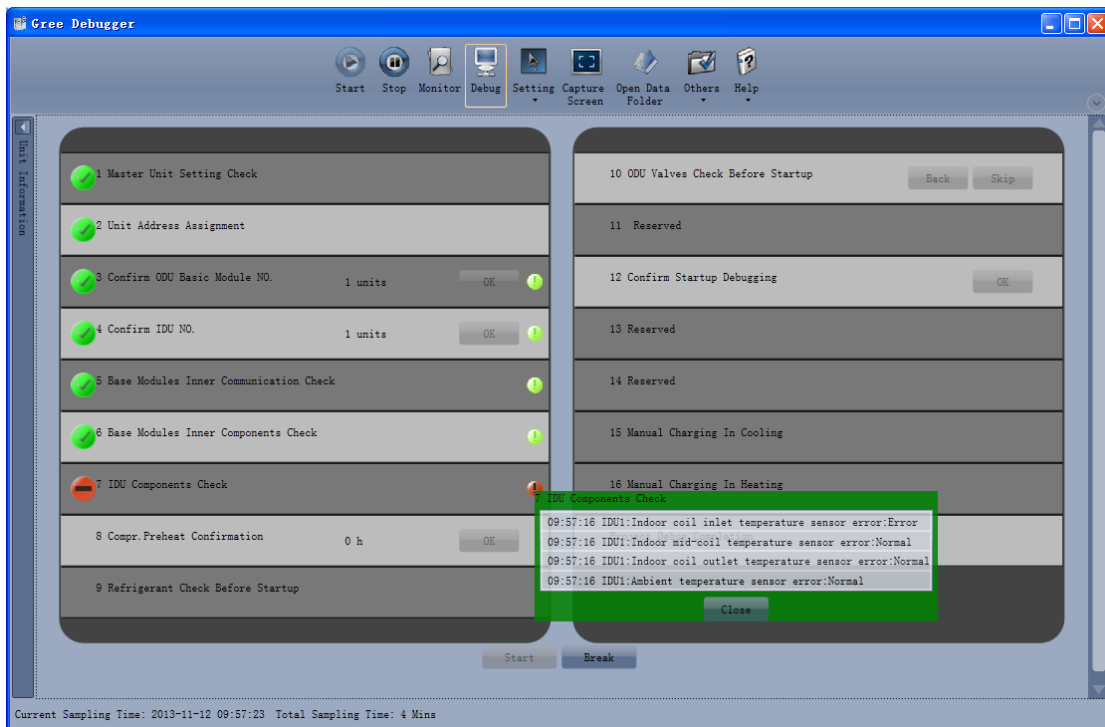
● During debugging, a click on "Break" can stop debugging. Click "Start" to resume debugging and then debugging will be finished step by step. For No.10 ODU Valves Check Before Startup, there are "Back" and "Skip" buttons. If there is error in this step, you can go back to step No.9 and

click "OK" to restart debugging on step No.10. If the error in step No.10 is U6 error (Warning against valve error), you can click "Skip". In other cases, "Skip" button is null.
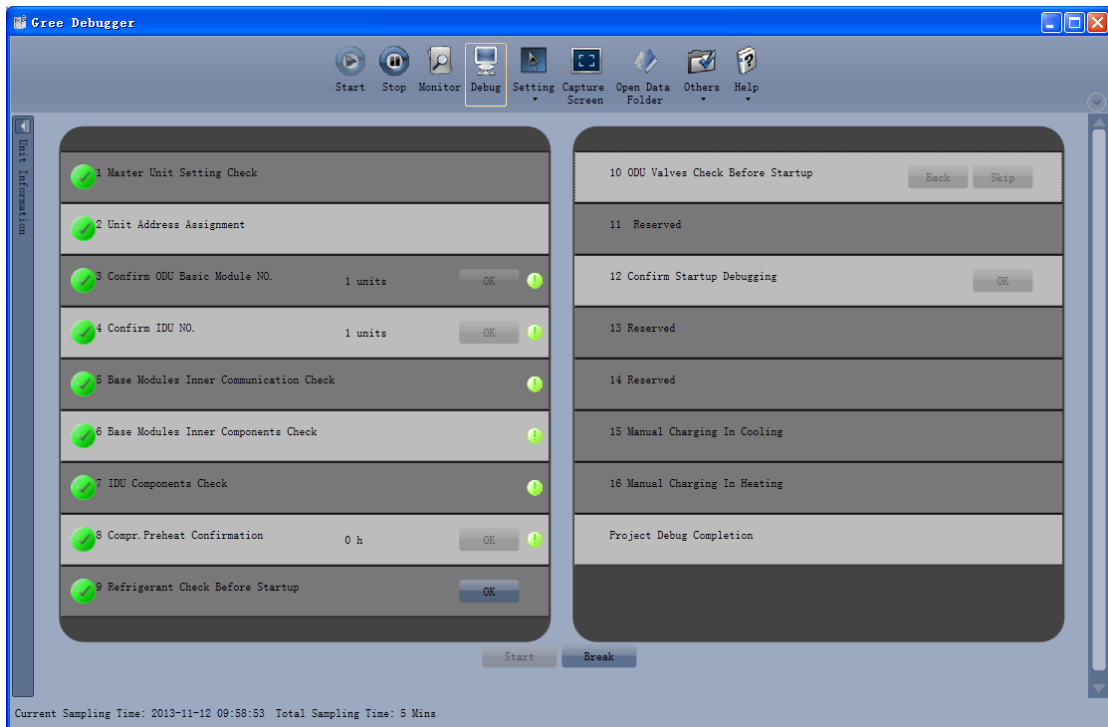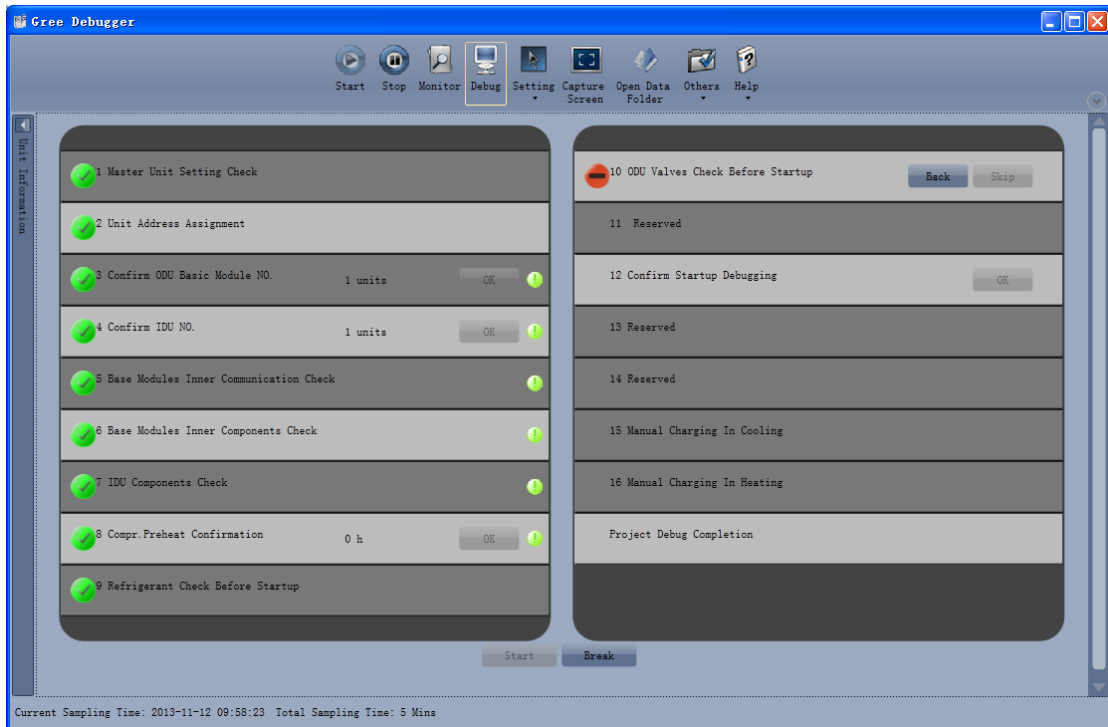
● Step 11, 13 and 14 are reserved steps. And step 13, 14, 15 and 16 are steps in parallel (only one of the four will be selected according to actual needs). In the end, when the step "Project Debug Completion" shows green, debugging is completed.
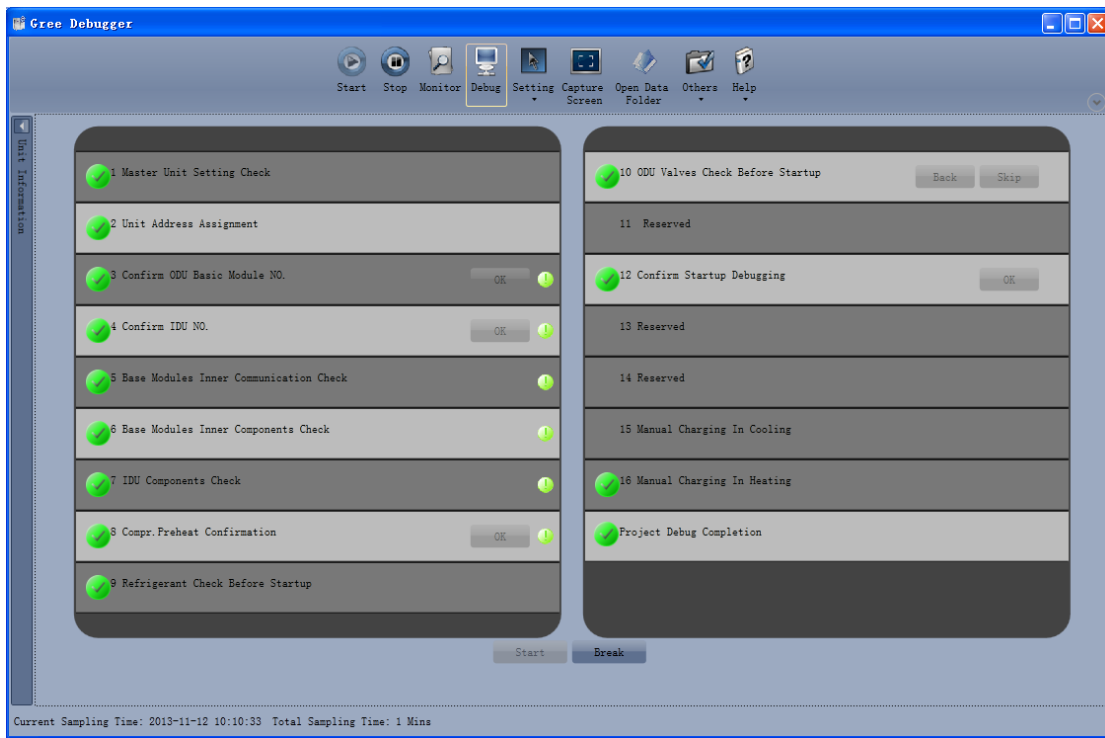
5.2.3 Control Units

● 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 module and adjust the parameters.
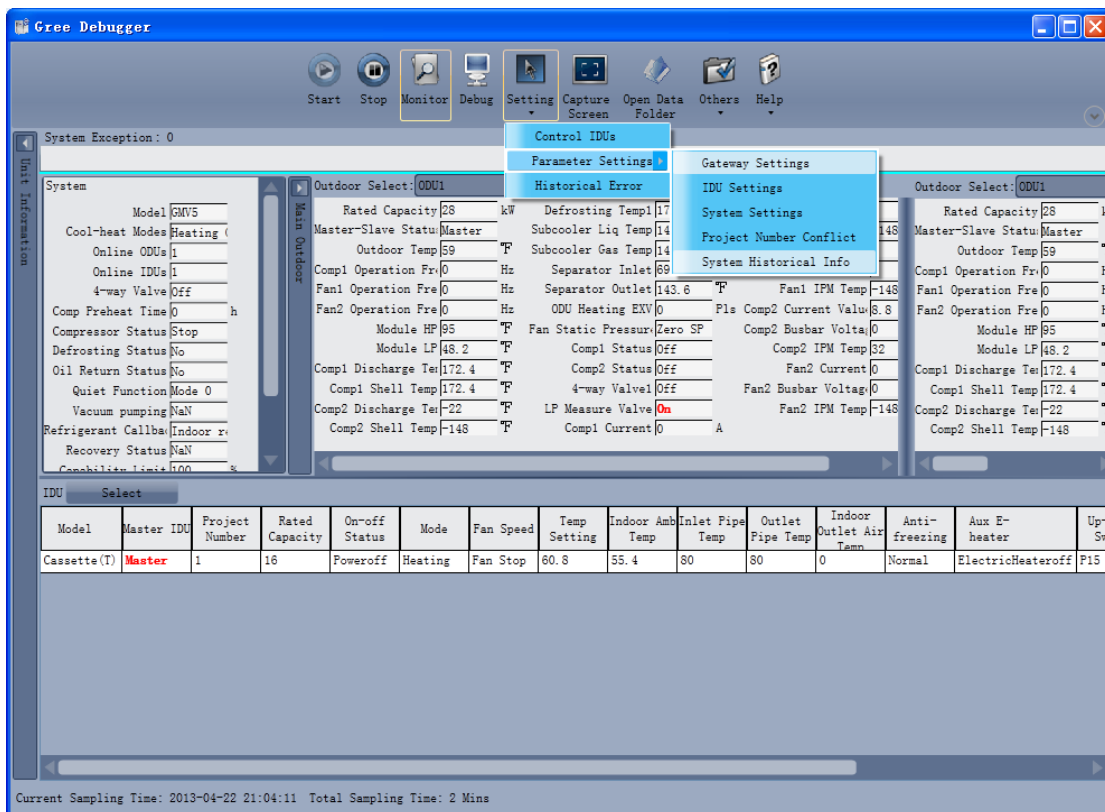
● Take indoor unit as an example. Click "IDU Settings" and a dialog box will pop up.
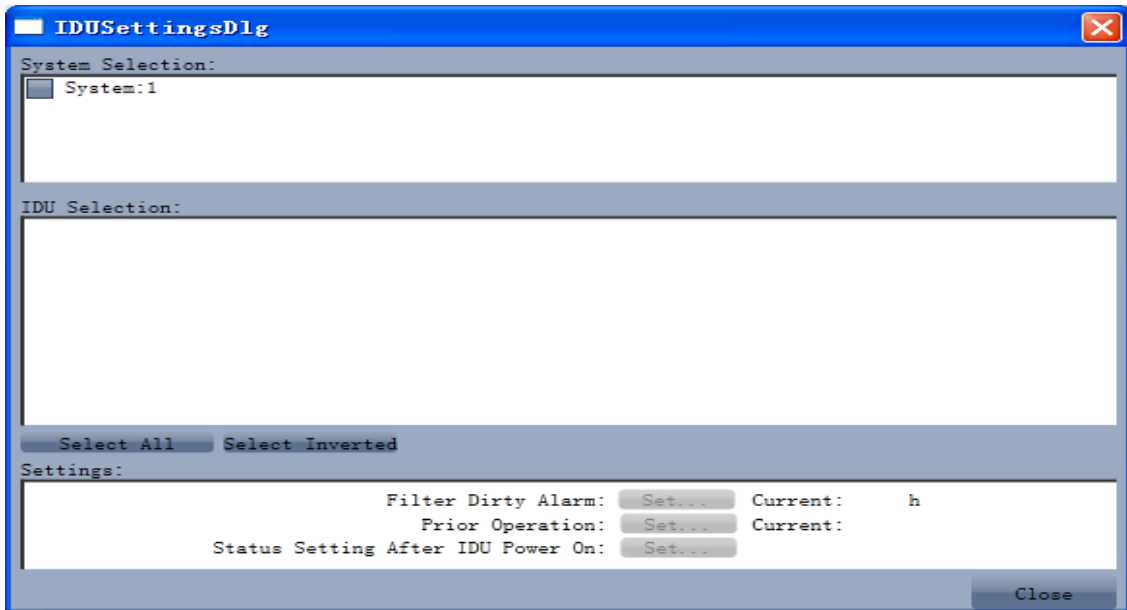
● Tick the indoor units that need setting in the IDU selection zone or you may click "Select All" to select all of them or "Select Inverted" to select none of them. After selection, the current values of the corresponding parameters will be displayed in the zone of settings. Click "Set" and then click

 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.

5.2.4 Other Functions

Capture Screen

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

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

System

Machine Type	GMV5(S)
Cooling and Heating	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

Outdoor Select: ODU1 (IP:8)

Rated Capacity	28	kW	Comp2 On St	Off	
MOrS St	Master		4-way Val1 St	Off	
O-env T	59	℉	LO Me Val St	On	
Comp1 Run F	0	Hz	I Comp1 Curr	0	A
Fan1 Run F	0	Hz	Comp1 DCBus Volt	0	V
Fan2 Run F	0	Hz	Comp1 IPM T	-148	℉
HighPressure	95	℉	Fan1 Curr	0	A
LP	48.2	℉	Fan1 d DCBus Volt	0	V
Comp1 DT	172.4	℉	Fan1 IPM T	-148	℉
Comp1 Case Top T	172.4	℉	Comp2 Curr	8.8	A
Comp2 DT	-22	℉	Comp2 Bus Vol	0	V
Comp2 Case Top T	-148	℉	Comp2 IPM T	32	℉
Defrost T1	17.6	℉	Fan2 Curr	0	A
LiqP OUT T	143.6	℉	Fan2 d DCBus Volt	0	V
GasP OUT T	140	℉	Fan2 IPM T	-148	℉
Accumulator Inlet	69.8	℉			
Accumulator Outlet	143.6	℉			
EXV1	0	Pls			
SP DIP	Zero SP				
Comp1 On St	Off				

Outdoor Select: ODU1 (IP:8)

Rated Capacity	28	kW
MOrS St	Master	
O-env T	59	℉
Comp1 Run F	0	Hz
Fan1 Run F	0	Hz
Fan2 Run F	0	Hz
HighPressure	95	℉
LP	48.2	℉
Comp1 DT	172.4	℉
Comp1 Case Top T	172.4	℉
Comp2 DT	-22	℉
Comp2 Case Top T	-148	℉
Defrost T1	17.6	℉
LiqP OUT T	143.6	℉
GasP OUT T	140	℉
Accumulator Inlet	69.8	℉
Accumulator Outlet	143.6	℉
EXV1	0	Pls

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	ElectricHeaterof

Current Sample Time: 2013-02-04 16:20:00　Total Sample Time: 9 Mins

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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

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.
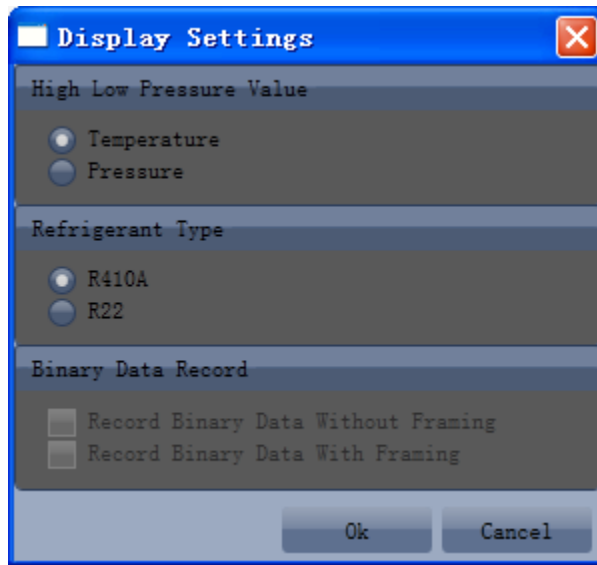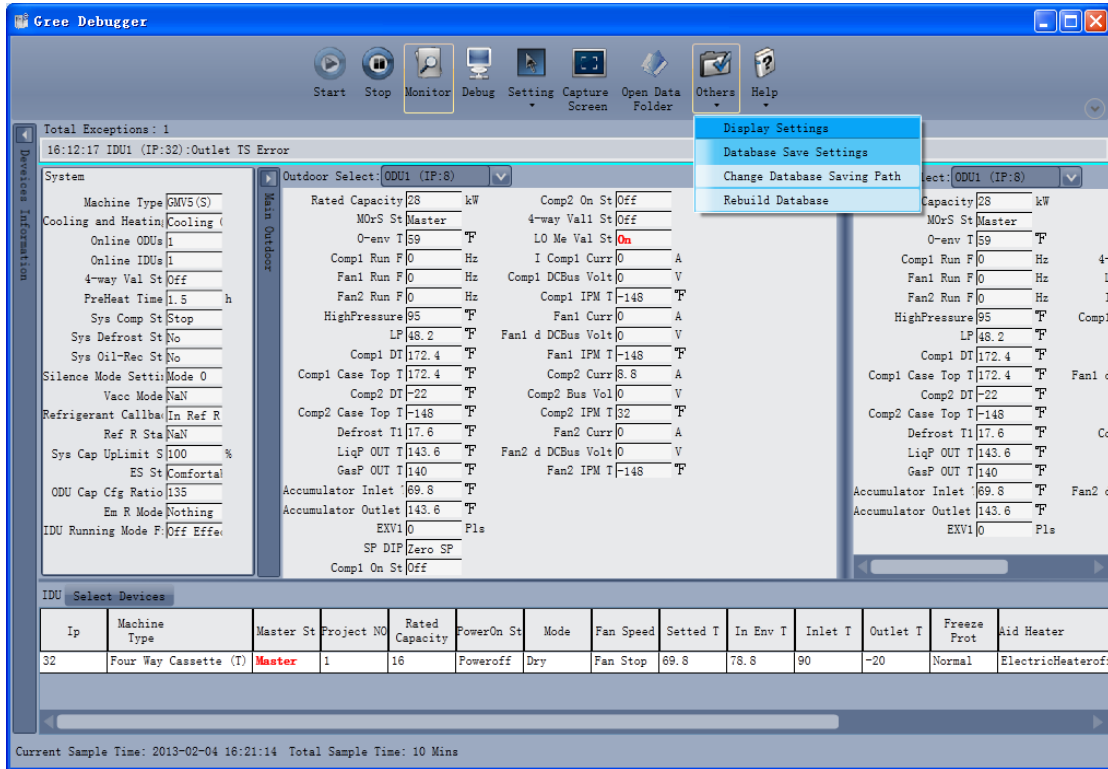
Database Saving of Multiple Systems

● 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.
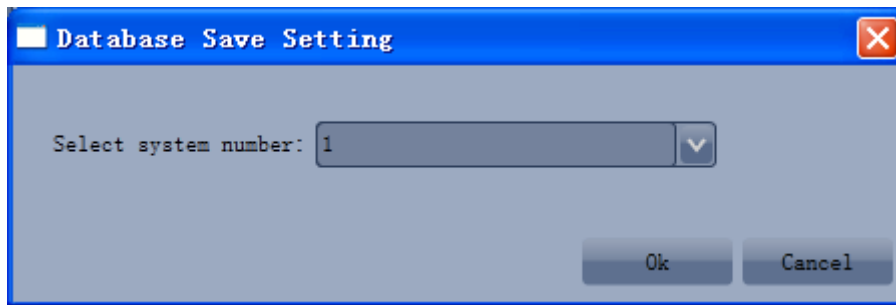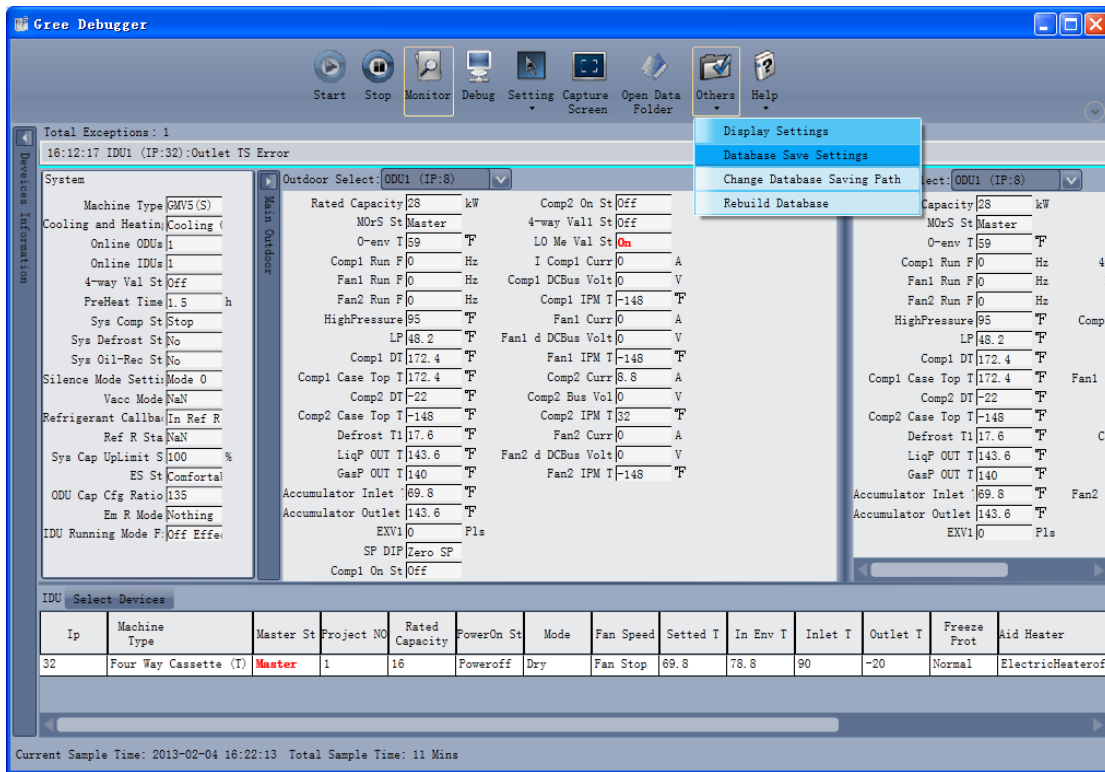
Change Database Saving Path and Rebuild Database

● 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.
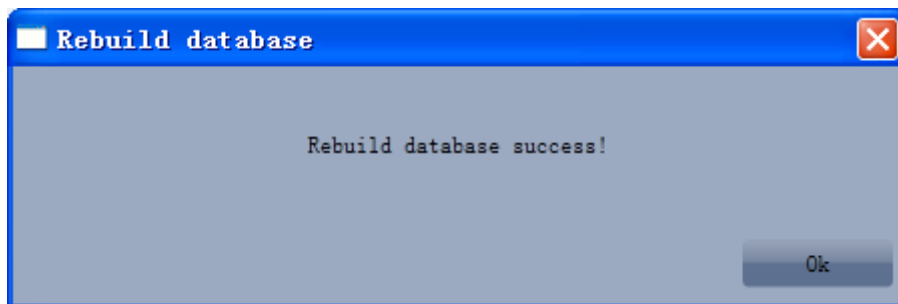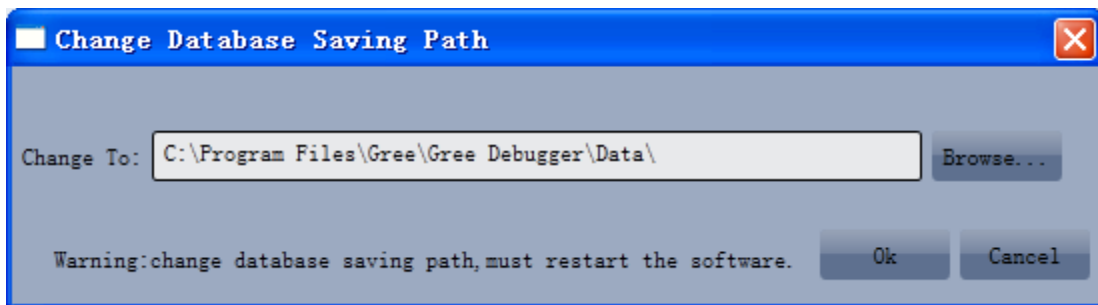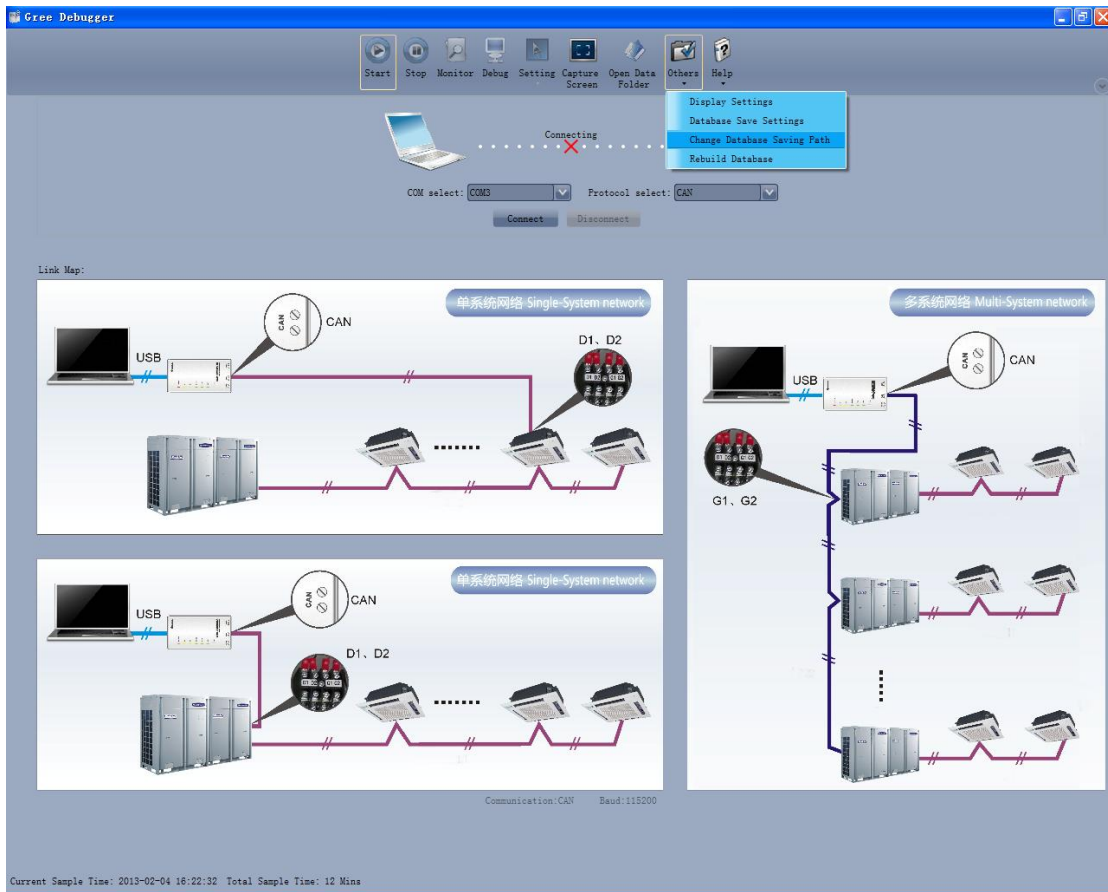
5.2.5 Use of USB Converter

Usage of converter:

● Gree commissioning software should be connected with CAN interface when converter is used. For air conditioners with a single system, connect D1 and D2 interfaces of the wiring board. For air conditioners with multiple systems, connect G1 and G2 interfaces of the wiring board.
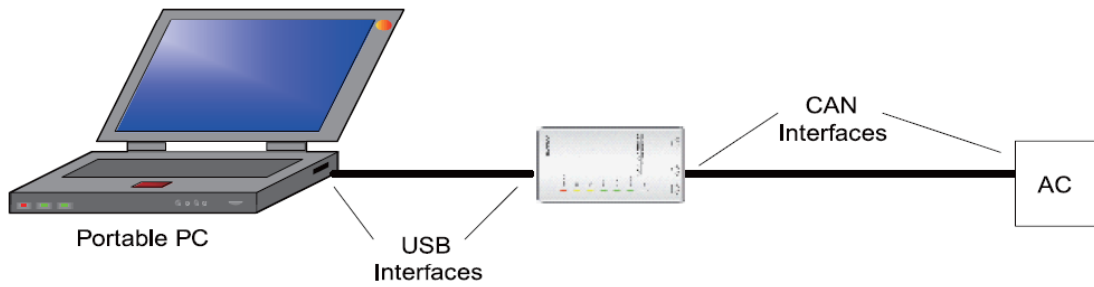
● Gree monitoring software should be connected with RS485 interface when converter is used. Connect outdoor or indoor units or the main board of wired controller according to actual needs.
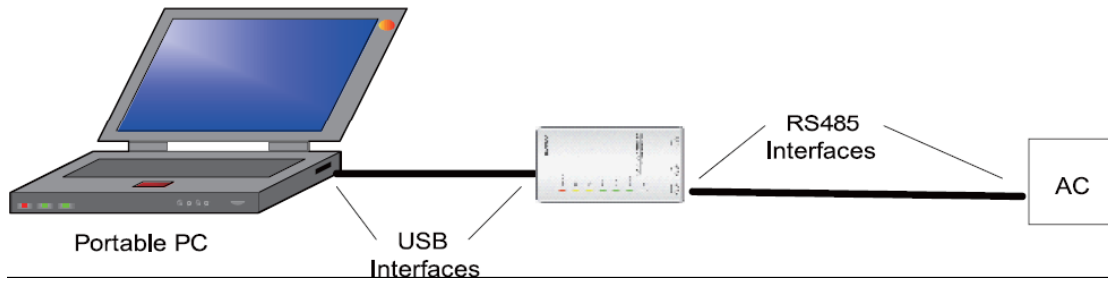
● HBS, CAN and RS485 of the converter can be switched by buttons. Press the button "SET" on the converter to realize conversion among HBS, CAN and RS485 interfaces. You can check the setting through function LEDs.

Notice: If it's the first time your PC uses Gree USB data converter, in order to prevent Gree USB data converter from being mistaken by your computer as other devices and make sure your mouse can work well, it is necessary to turn off the Serial Enumerator of computer after Gree USB data converter is connected. Below are the steps:

Step 1: Right click "My Computer" on the desktop and click "Manage".
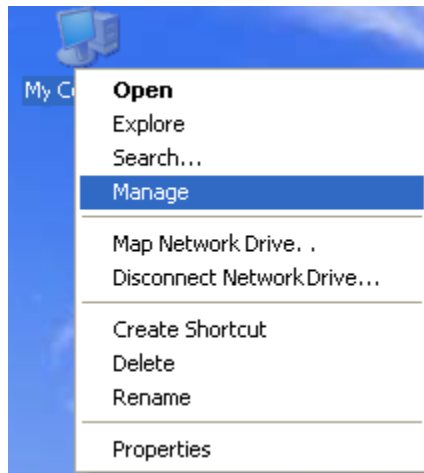
Step 2: In the pop-up window, select "Device Manager" in the left column and then find "Port (COM and LPT)" in the right column. Click its ⊞.
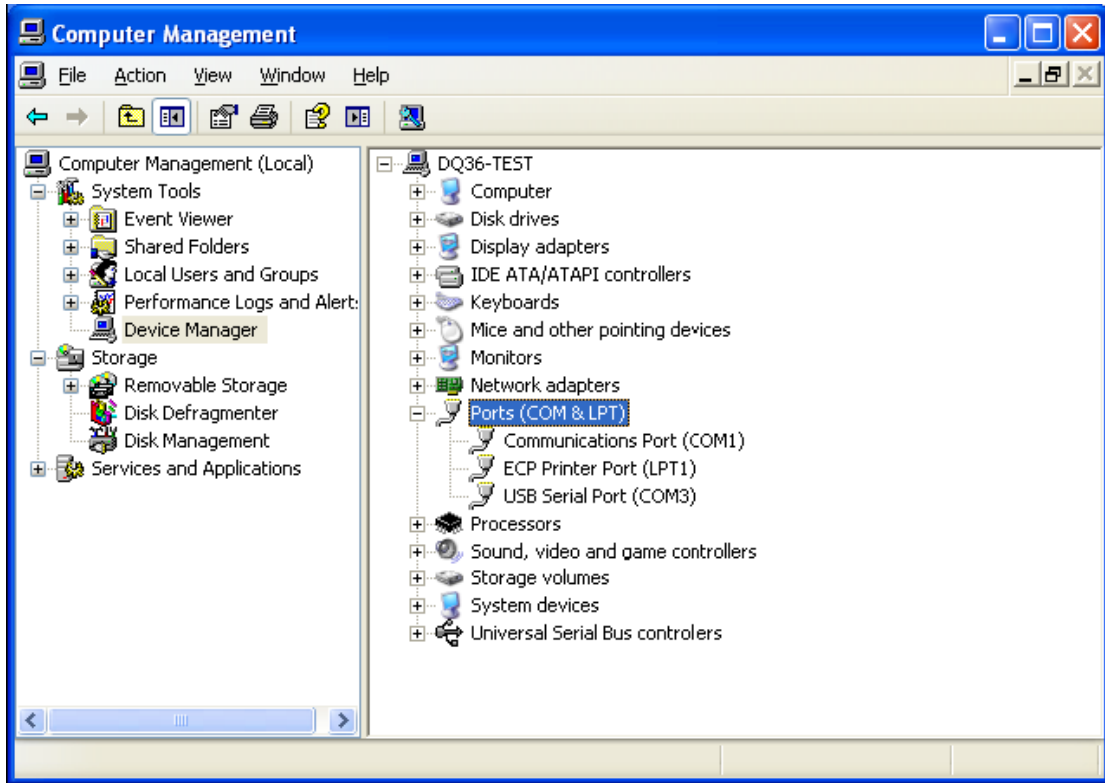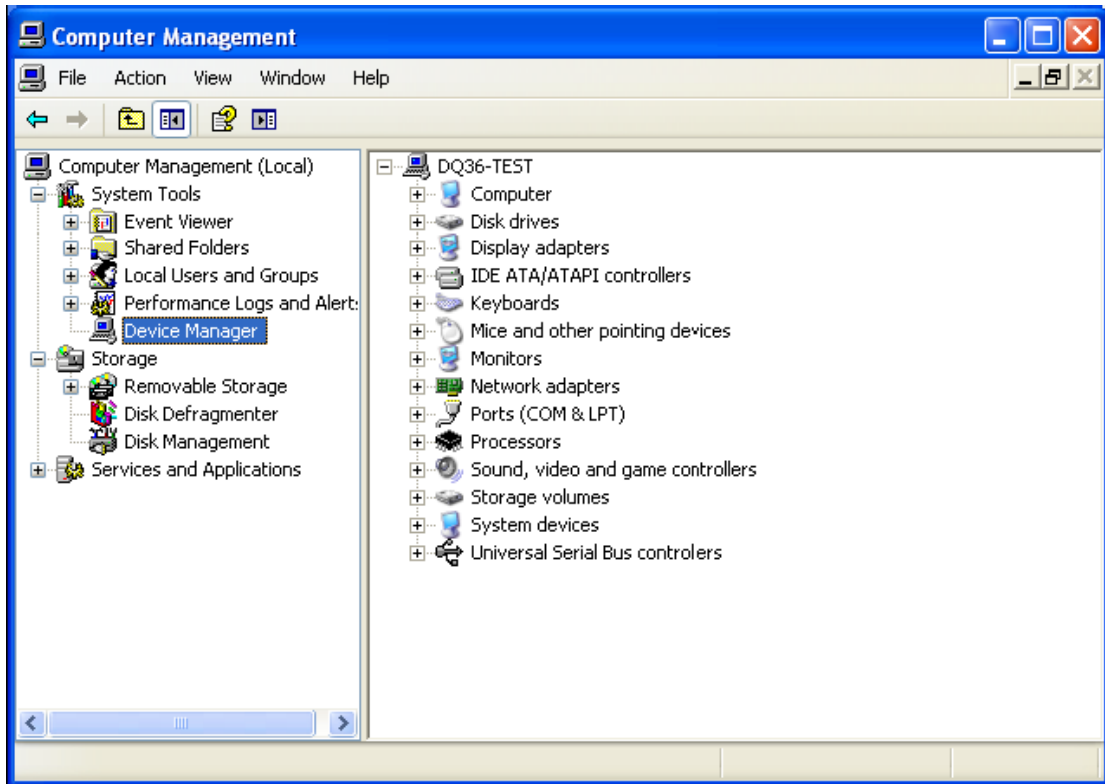
Step 4: Right click "USB Serial Port (COM6)" and then click "Properties". The dialog box of properties will then pop up.
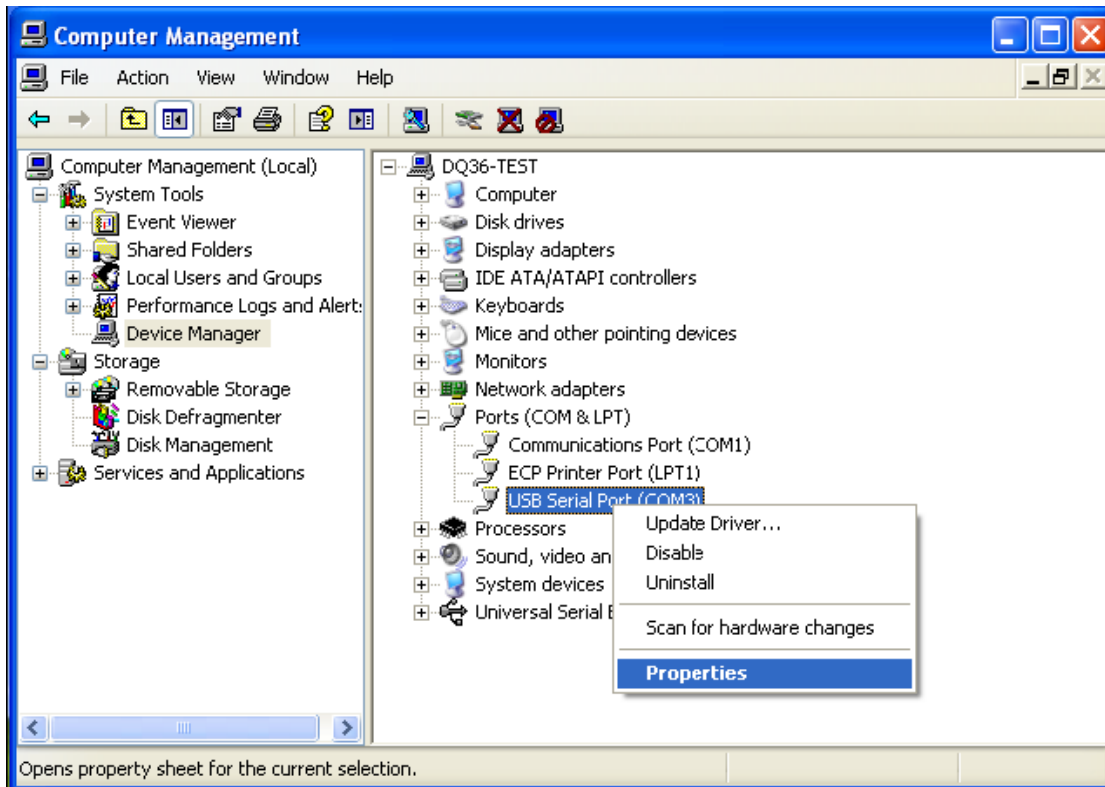
Step 5: Then click "Port Settings" in the dialog box.
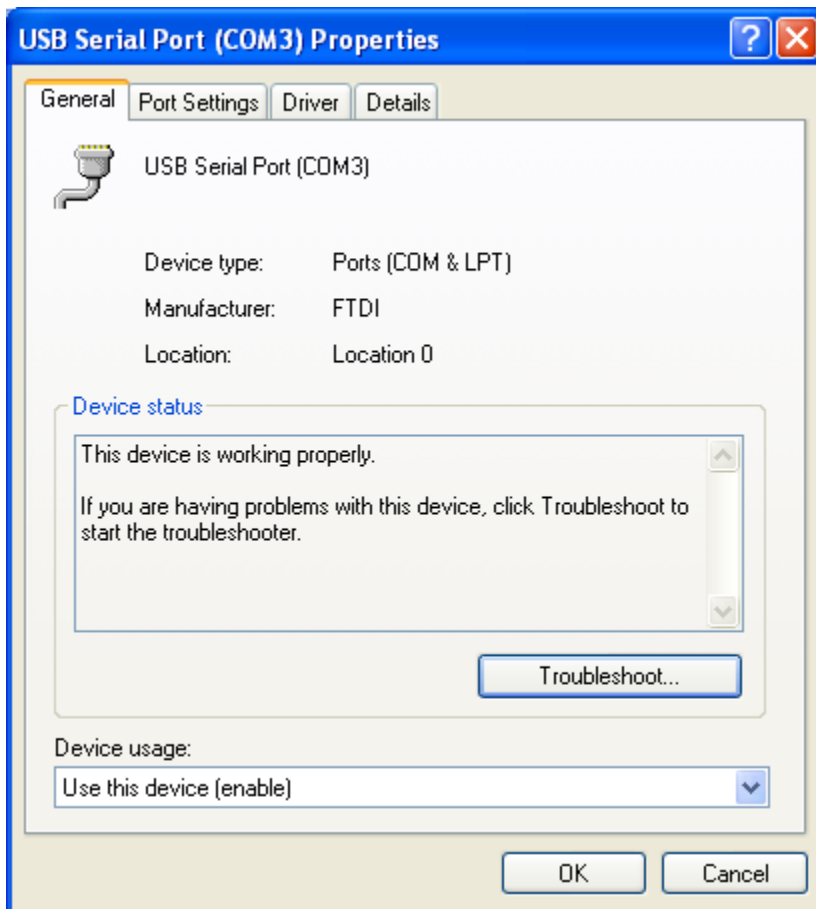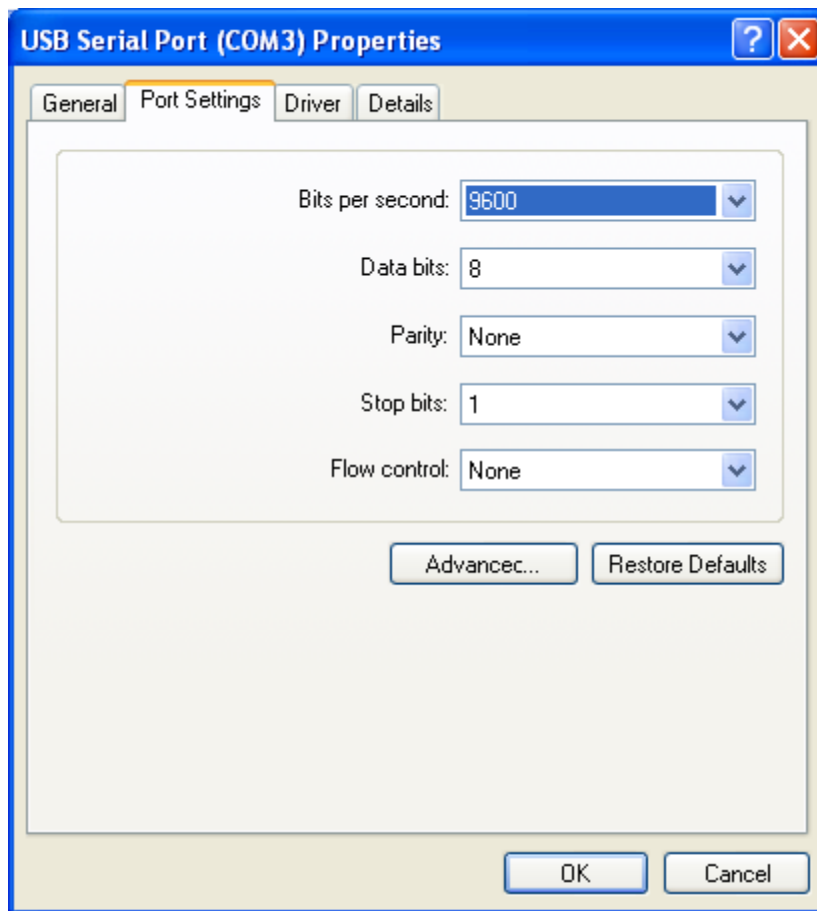
Step 6: Click "Advanced" and then a new dialog box will pop up. Find the "Serial Enumerator" in the miscellaneous options and cancel the tick. Click "OK" to exit.
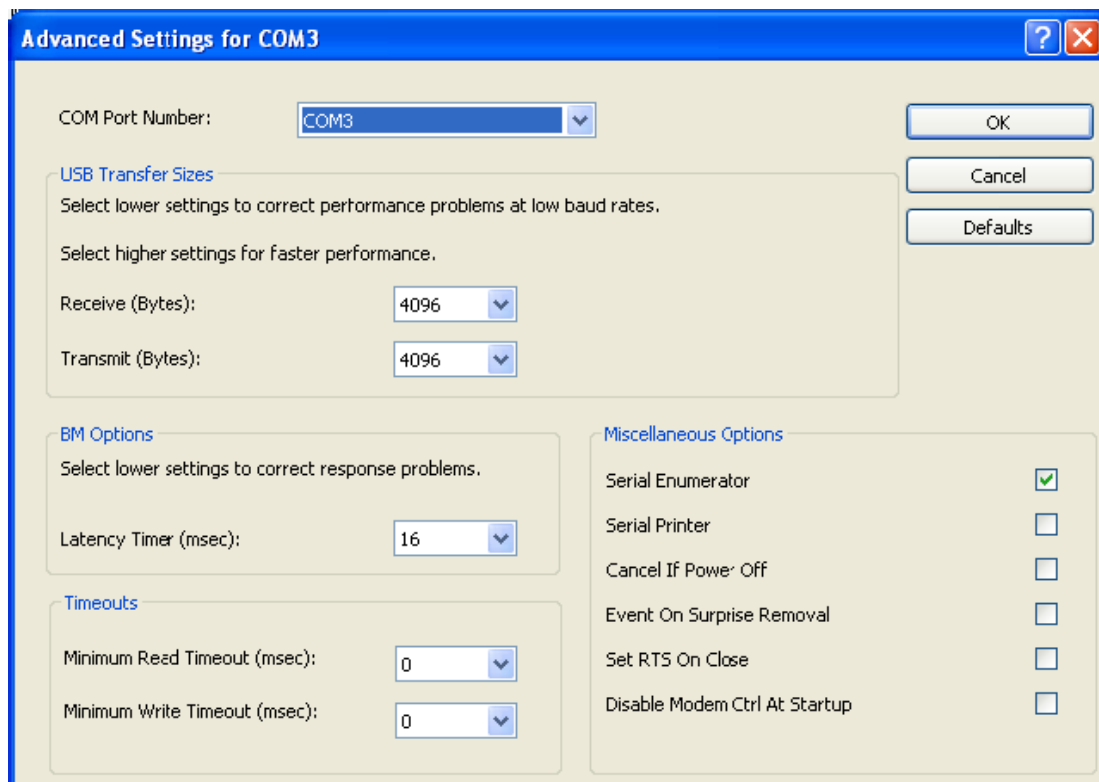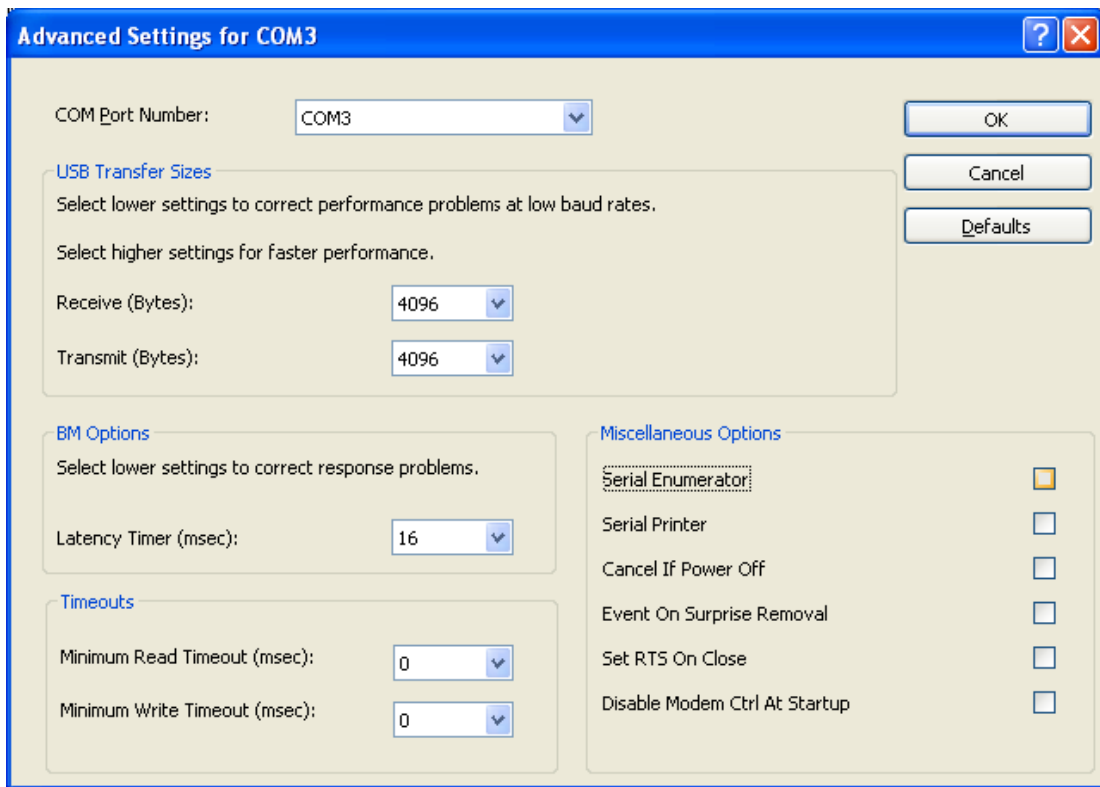
Usage of Converter Configuring Software:

When the converter is working, hold the button "SET" for 5 seconds. Function LED will be flickering, indicating that the converter has entered the baud rate setting mode. Then you can use the converter configuring software to set the baud rate of converter. Baud rate is supported by the converter (baud rate of air conditioner's communication interface matches with the baud rate of USB interface automatically):

Ex-factory defaulted baud rate: (unit: bps)

AC interface	Baud rate of AC interface	Baud rate of USB interface
CAN	20000/50000self-adaptive	115200
HBS	57600	38400
RS485	9600	9600

Baud rate look-up table for RS485 interface (unit: bps)

RS485	4800	9600	19200	38400	57600	115200
USB interface	4800	9600	19200	38400	57600	115200

Baud rate look-up table for HBS interface (unit: bps)

HBS	9600	19200	38400	57600
USB	4800	9600	19200	38400

Baud rate look-up table for CAN interface (unit: bps)

CAN	20000	50000	100000	125000

| USB	115200	115200	256000	256000

● Double click the desktop shortcut.

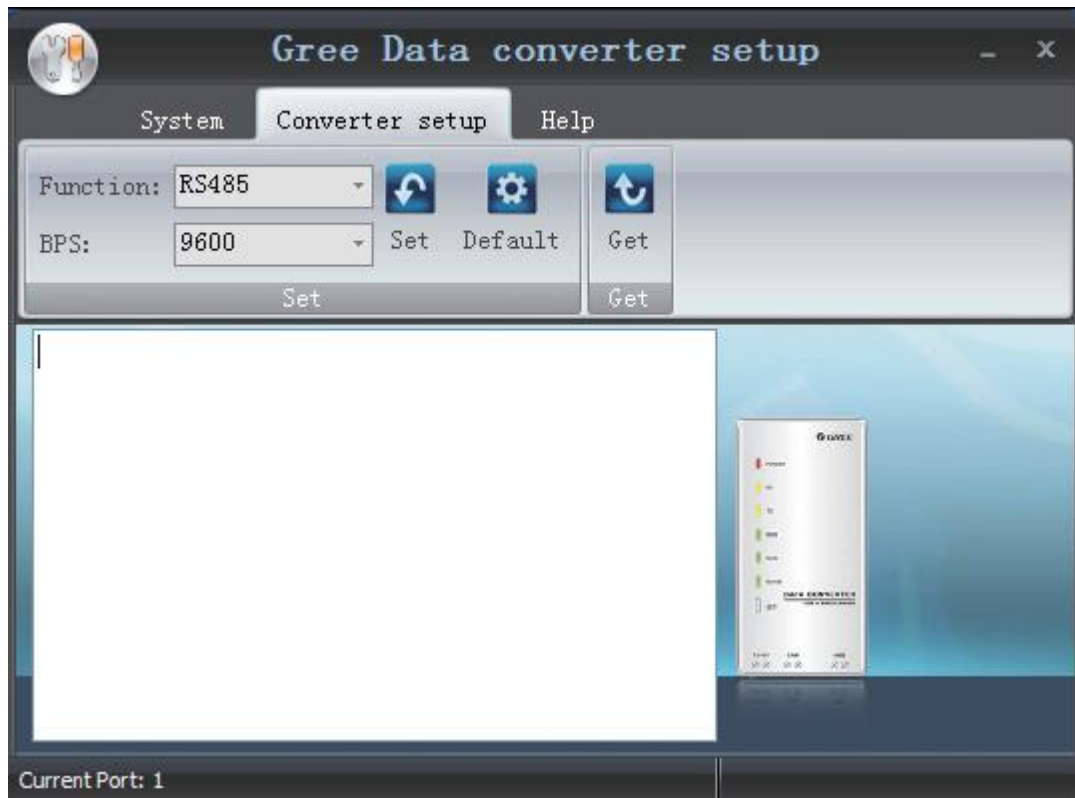● Select the needed communication serial port and language in "System Settings".
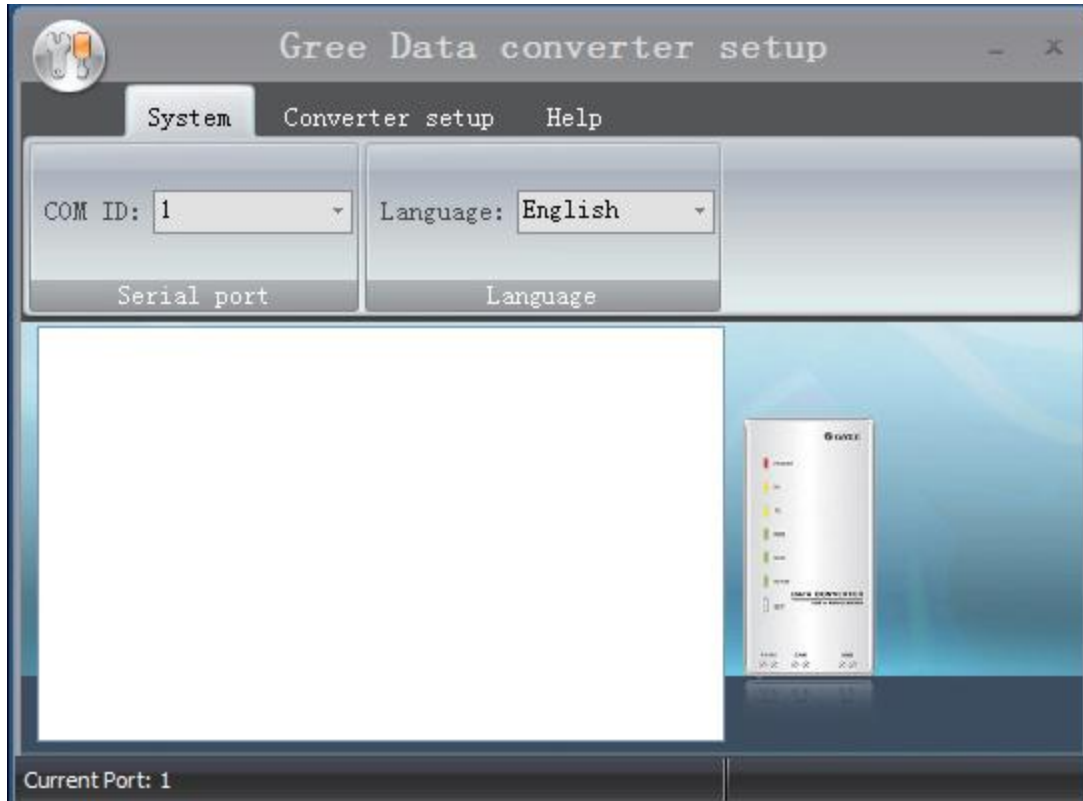
● Select the function that is to be set and the corresponding baud rate (refer to the look-up table) in "Converter Setup". Then click "Set".
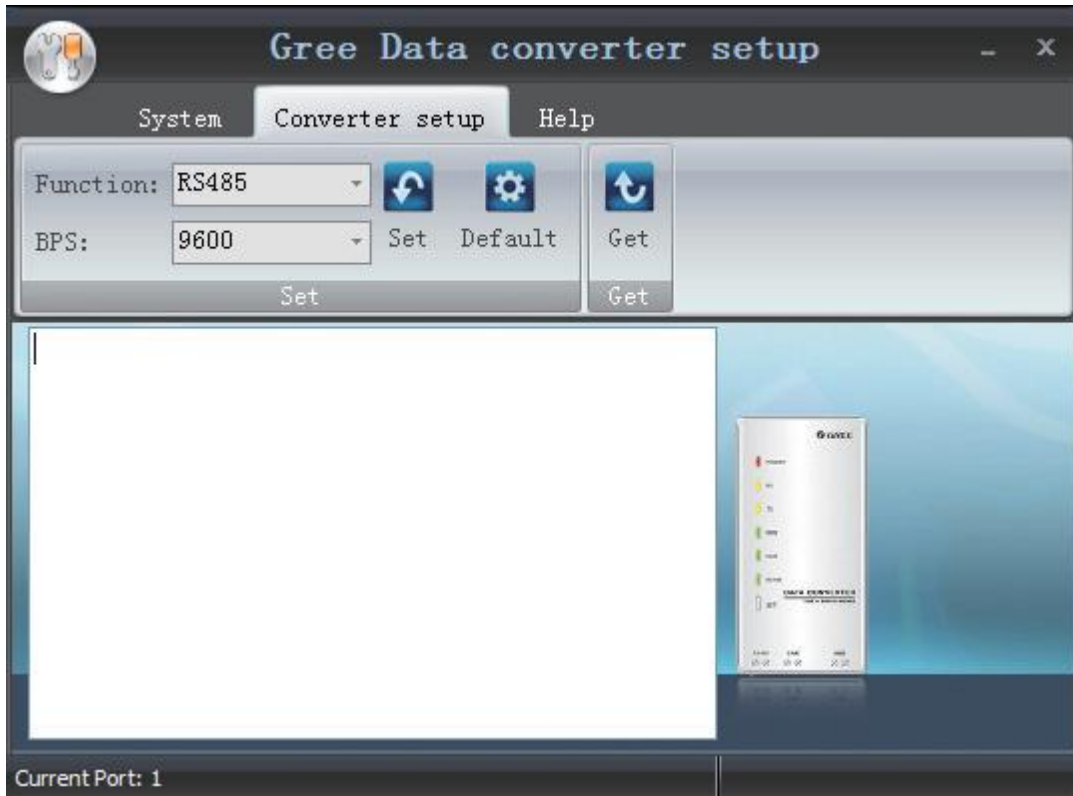
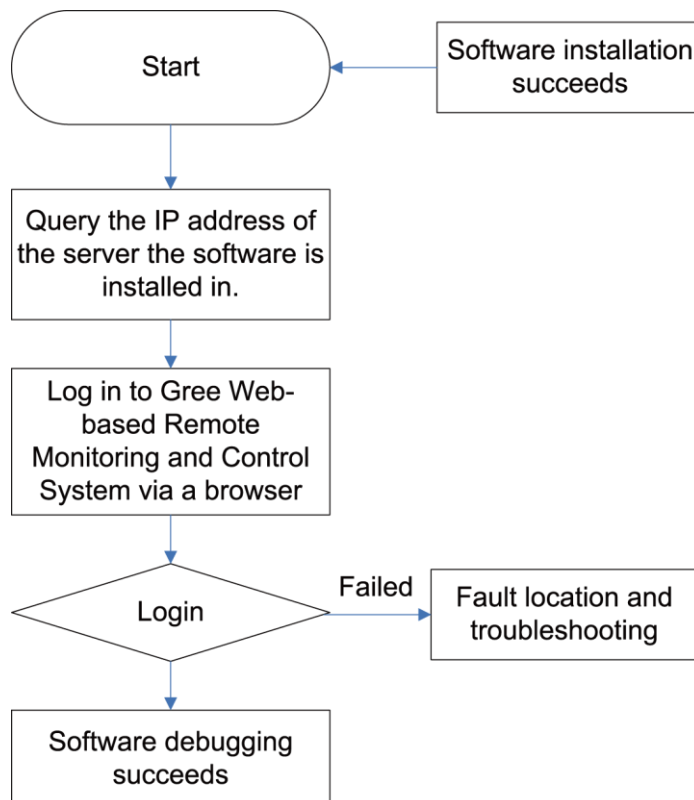● If you want to restore ex-factory settings, click "Default" to restore the default settings.
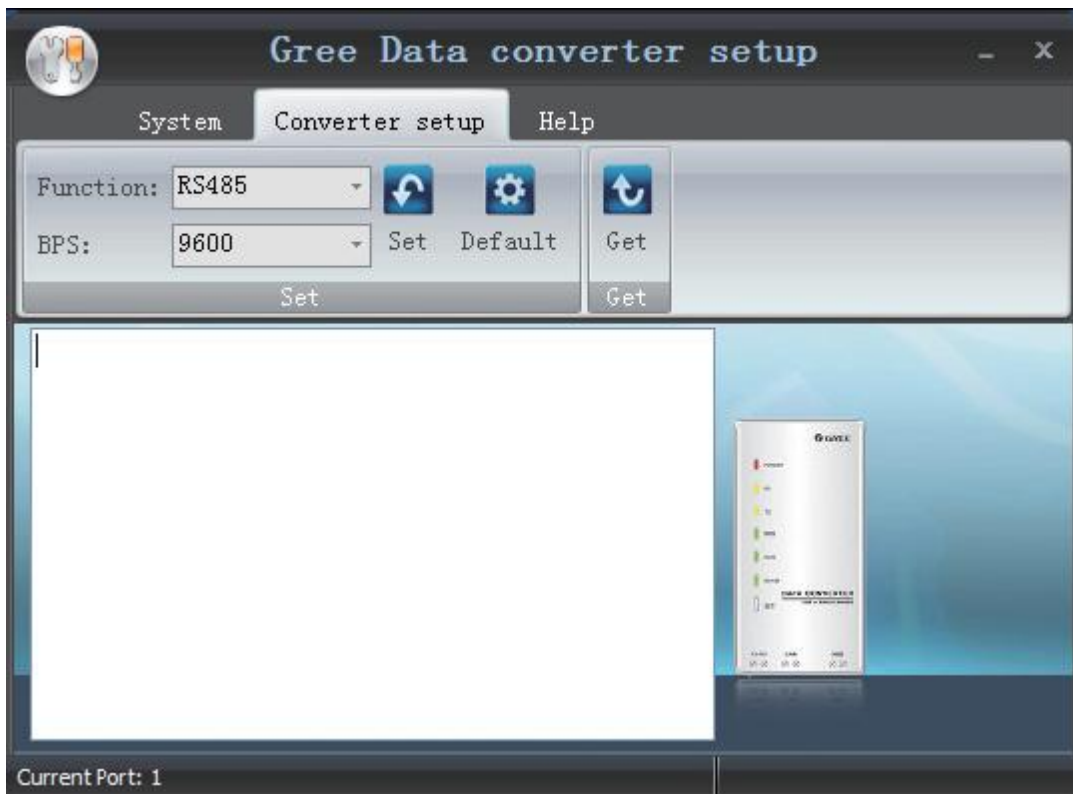
● Click "Get" to get the current setting details of converter.

6. Debugging of Software

6.1 Flowchart of Debugging

This is a simplified software debugging procedure. For details, please read the following section.

6.2 Troubleshooting

6.2.1 Installation Faults

- Faults that may occur during Gree Debugger setup.

  After you click "Install Gree Debugger" to run, the following promt is displayed.
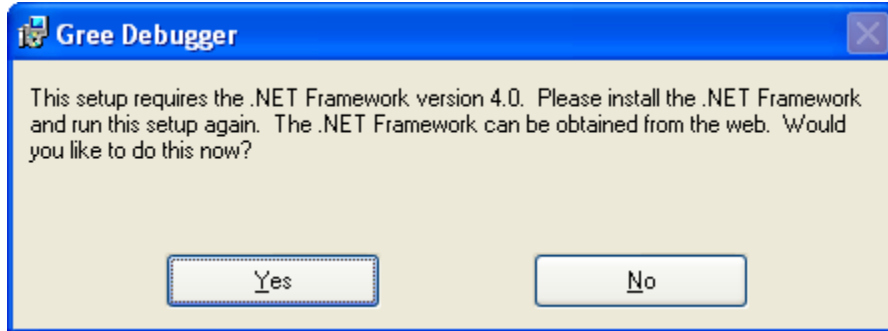
Cause:

.Net Framework 4.0 is not installed.

Troubleshooting: Install .Net Framework 4.0 first and then install Gree Debugger.

JF00302675