



THE 5TH GENERATION OF

GREE MULTI VRF SYSTEM



GMV5 System Commissioning

Overseas Sales Co, GREE





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1

DIP Switch Setting of ODU



1.1 DIP Switch

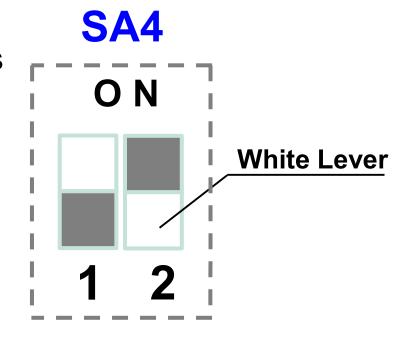


① Explanation

Position "ON" means "0" status while the opposite position means "1" status. The white lever is for position changing.

② Example

If you want to set SA4 to be "01", then DIP switch is as **below**:





1.2 Function Setting

Code	Name	Default
SA1_Capacity	Capacity code	Ex-factory setting
SA2_Addr-CC	Address code of central control	00000
SA3_COMP-E	Compressor emergency code	00000
SA4_I/M-E	Compressor/module emergency code	00
SA5_FAN-E	Fan motor emergency code	00
SA6_ESP_S	External fan static pressure code	00
SA7	Reserved code	00
SA8_MASTE	Master control unit setting	00



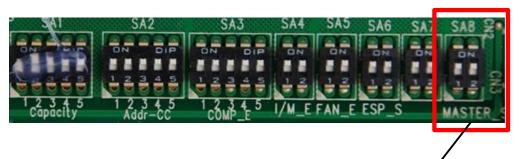
1.3 Master Unit Setting

Set master module of outdoor unit:

Before power on, set one of the outdoor units as the master module;

Note: only one ODU can be set as master module.





SA8_MASTE

- 1. Upon factory departure, all modules are in "00" master unit status by default.
- 2. When multiple modules are connected in parallel, only one module retains the master unit status and other modules are set to sub-module status.



1.3 Master Unit Setting

The setting methods are as follows:

Master Unit Setting DIP Switch (SA8_MASTE)				
DIP1	DIP2 Remark			
0	0	Master unit		
1	0	Sub-module		

- 1. When the DIP switch setting is not covered in the above scope, like "01" or "11", a DIP switch setting exception fault may occur.
- 2. Settings must be performed in power-off status.



1.4 Fan Static Pressure

The outdoor unit fan external static pressure code (**SA6_ESP_S**) is used for special installation locations, such as an equipment room or locations where air ducts need to be connected.

Based on different air duct design, there are 4 static pressure modes: 0Pa, 30Pa, 50Pa and 80Pa.

Fan ESP Code (SA6_ESP_S)			
DIP1	DIP2	Static pressure	
0	0	0 Pa	
1	0	30 pa	
0	1	50 Pa	
1	1	80 Pa	

- 1. Default setting is "00".
- 2. According to project requirements, static pressure of modules in a same cooling system can be different.



1.5 Fan Emergency Function

Set fan motor emergency code (SA5_FAN-E):

Fan motor emergency code (SA5_FAN-E)is used for after-sales emergency setting when the module with double fan motors has some error. This will shield the operation of one fan motor in a short time to ensure normal operation of the system. The default factory setting is "00".







1.5 Fan Emergency Function

Setting methods:

Fan motor emergency code(SA5_FAN-E)					
DIP1	DIP1 DIP2 Remark				
0	0 No emergency operation of fan motor				
1	0 Shield 1# fan motor operation				
0	1	Shield 2#fan motor operation			

- 1. If DIP switch setting is out of the above range, DIP switch malfunction will occur.
- 2. For each module, only one fan motor can be set in emergency mode.
- 3. System cannot run continuously for 120 hours under fan motor emergency mode, otherwise, system will force a stop, "Ad" error code will display on the indoor unit.

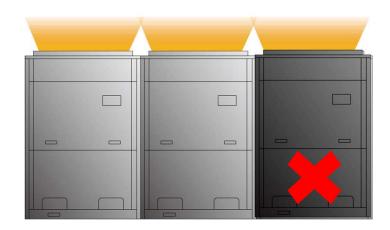


1.6 Module\COMP Emergency Function

Set 1# compressor/module emergency code(SA4_I/M-E)::

The SA4 is used for emergency settings when an exception occurs on the 1# compressor/module. It can shield the operation of the abnormal compressor/module in a short time and guarantee the emergency operation of other compressors. The default factory setting is "00".







1.6 Module\COMP Emergency Function

Setting methods:

1#compressor/module emergency code (SA4_I/M-E)				
DIP1 DIP2 Remark				
0	0	1#compressor and module unshielded status		
1	0	Shield 1#compressor operation		
0	1	Shield module operation		

- 1. If DIP switch setting is out of the above range, DIP switch malfunction will occur.
- 2. For each module, only one compressor can be set in emergency mode.
- 3. Compressor emergency mode will only be effective in system with a single module.
- 4. Module emergency mode will only be effective in system with more than 2 modules.
- 5. For each system, only one module can be set in emergency mode.
- 6. System cannot run continuously for 48 hours under module emergency mode, otherwise, system will force a stop, "Ad" error code will display on the indoor unit.



1.7 COMP Emergency Function

Set 2#~6# compressor emergency code (SA3_COMP-E):

Corresponding to 2#-6# compressors, the compressor emergency operation DIP switch (SA3_COMP-E) is used for after sales emergency settings when an exception occurs on a compressor.

The default factory setting is "00000".

It can shield the operation of the abnormal compressor in a short time and guarantee the emergency operation of other compressors.

Note: Compressor emergency mode will only be effective in system with a single module.







1.7 COMP Emergency Function

Setting methods:

Compressor emergency code (SA3_COMP-E)				Remark	
DIP1	DIP2	DIP3	DIP4	DIP5	
0	0	0	0	0	2#compressor~6#compressor unshielded status
1	0	0	0	0	Shield 2#compressor operation
0	1	0	0	0	Shield 3#compressor operation
0	0	1	0	0	Shield 4#compressor operation
0	0	0	1	0	Shield 5#compressor operation
0	0	0	0	1	Shield 6#compressor operation

- 1. If DIP switch setting is out of the above range, DIP switch malfunction will occur.
- 2. For each module, only one compressor can be set in emergency mode.
- 3. System cannot run continuously for 24 hours under compressor emergency mode, otherwise, system will force a stop, "Ad" error code will display on the indoor unit...



1.8 Centralized Control Address

The centralized control address DIP switch (SA2_Addr-CC) indicates the centralized control address required when different refrigerating systems are controlled in a centralized manner. The default factory setting is "00000".



Setting methods:

SA2					Address
DIP1	DIP2	DIP3	DIP4	DIP5	No.
1	0	0	0	0	2
0	1	0	0	0	3
0	0	1	0	0	4
0	0	0	1	0	5
0	0	0	0	1	6
1	0	0	0	1	7
0	_1	0	0	1	8
0	0	1	0	1	9
0	0	0	1	1	10
1	0	0	1	1	11
0	1	0	1	1	12
0	0	1	1	1	13
1	0	1	1	1	14
О		1	1	1	15
1	1	1	1	1	16

- **NOTE:** (1). The DIP switch must be set on the master unit. Otherwise, the setting is invalid.
 - (2). For one GMV5 system, SA2 DIP switch on the slave unit is invalid, and it is unnecessary to change the settings.
 - (3). Several GMV5 systems need the centralized control, one DIP switch must be set to "00000" state, and the corresponding system is the master system.



- 1 SA8 DIP switch should be set before commissioning. Only one master module shall exist in one system.
- ② SA1 shall remain unchanged, otherwise, system will have malfunctions.
- ③ If no special needs, do not change the ex-factory setting of other DIP switches. Default setting is 00 or 00000.
- ④ Functional DIP switches must be set when outdoor unit is power off. Restart power to enable the setting.
- (5) Address code of central control (SA2_Addr-CC) is the central control address when central control is needed for multiple cooling systems. Ex-factory setting is "00000". If central control of multiple cooling systems is not needed, keep the ex-factory setting unchanged.







Preparation of Commissioning



2.1 Debugging Tools



Vacuum Pumping



Refrigerant supplementing



DIP Switch Operation



Survey Meter





2.2 Debugging Process

Vacuum pumping

Refrigerant supplementing

Power supply check

Preheating

Preparation

Commissioning



2.3 Vacuum Pumping

Prepare for the vacuum pumping:

- 1 The limit of vacuum degree shall reach -0.1Mpa;
- ② The air discharge speed of the pump should be above 4L/S;
- The accuracy of the pump should be above 0.02mmHg;
- 4 Check valve must be included;
- (5) Before vacuum pumping, observe the vernier scale if it is as required (1/3~2/3).

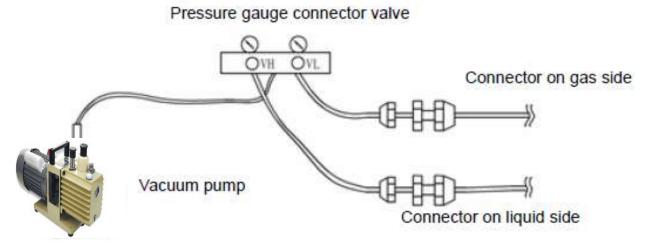




2.3 Vacuum Pumping

Procedures:

- ① Before vacuum pumping, reconfirm the cut-off valves of liquid pipe and gas pipe. Make sure they are closed.
- ② Use a guiding pipe to connect the control valve and the vacuum pump to the connectors on gas side and liquid side.



3 Start vacuum pumping. After 4 hours, check if the vacuum degree is -0.1MPa or above. If not, there might be leakage. Conduct a leakage inspection again. If no leak is detected, then continue vacuum pumping for another 2 hours.



2.3 Vacuum Pumping

- If there is no leakage but vacuum degree is not as required after pumping for two times, then the reason will be the water inside the pipe. In this case, drain out the water.

 Method: Fill nitrogen of 0.05Mpa into the pipe and start vacuum pumping for 2 hours. Keep the vacuum status for 1 hour. If the vacuum degree still cannot be -0.1MPa, then repeat this step until water is all drained out.
- Solution
 Steel Stop vacuum
 After vacuum pumping, close the control valve. Stop vacuum
 pumping for 1 hour and make sure the pressure of control valve does not go up.

Kindly Remind:

Vacuum pumping must be done on liquid side and gas side simultaneously to meet the required vacuum degree. If the number of outdoor units is ≥2, make sure the oil balance cut-off valve of outdoor units are closed before vacuum pumping.



2.4 Refrigerants Supplementing

Outdoor unit is already filled with refrigerant before going out of the factory. The amount of refrigerant does not include the supplementary amount needed for the connecting pipe of indoor units and outdoor units.





Kindly Remind: First of all, make sure the system has **no leakage**. Then when compressor is not working, fill the required amount of R410a into the system through the filling opening of the outdoor liquid valve.

If pressure inside the tube rises so that the required amount of refrigerant cannot be filled in quickly, then turn unit on in cool mode and fill the refrigerant through the outdoor gas valve. (For GMV5, the refrigerant amount during commissioning shall take at least 70% of the total refrigerant amount.)



2.4 Refrigerants Supplementing

- Refrigerant supplementary amount = Supplementary amount for pipe + Supplementary amount for module
- > Supplementary amount for module = Σ supplementary amount for each module
- > Supplementary amount for pipe =Σ liquid pipe length
- × supplementary amount every 1m for liquid pipe



Supplementary amount for pipe

The pipe connected on site shall be filled with refrigerant. The amount is determined by the pipe size and pipe length. Refer to the following table (based on liquid pipe):

Liquid pipe size	[Supplementary amount every 1m(kg/m)]
Ф6.35	0.022
Ф9.52	0.054
Ф12.7	0.110
Ф15.9	0.170
Ф19.05	0.250
Ф22.2	0.350
Ф25.4	0.520
Ф28.6	0.680

Supplementary amount for pipe=Σ liquid pipe length × supplementary amount every 1m for liquid pipe



Supplementary amount for module

Capacity Ratio	IDU Quantity	Capacity of ODU(HP)				
IDU and ODU		8	10	12	14	16
50% ≤ C ≤ 70%	≤ 4	0	0	0	0	0
30 /0 \(\text{S} \text{C} \(\text{S} \) /0	> 4	0.5	0.5	0.5	0.5	0.5
70% < C ≤ 90%	≤ 4	0.5	0.5	1	1.5	1.5
70% < C \(\) \(\) \(\)	> 4	1	1	1.5	2	2
000/ .0 < 1050/	≤ 4	1	1	1.5	2	2
90% < C ≤ 105%	> 4	2	2	3	3.5	3.5
105% < C ≤ 115%	≤ 4	2	2	2.5	3	3
103/0 < C \(\) 113/0	> 4	3.5	3.5	4	5	5
115% < C ≤ 135%	≤ 4	3	3	3.5	4	4
113/0 < C \(\) 133/0	> 4	4	4	4.5	5.5	5.5



Example:

The ODU consists of modules GMV-280WM/B-X, GMV- 400WM/B-X, and GMV-450WM/B-X. The IDU consists of 8 pieces of GMV-ND140PLS/A-T.

Rated capacity configuration rate C for IDUs and ODUs = 140 x 8/(280+400+450) = 100%. The number of IDUs is greater than 4, according to the above table,

The quantity of refrigerant perfused for module GMV-280WM/ B-X (B) is 2 kg. The quantity of refrigerant perfused for module GMV-400WM/ B-X (B) is 3.5kg. The quantity of refrigerant perfused for module GMV- 450WM/B-X (B) is 3.5kg. Therefore,

Σ Quantity of refrigerant perfused for each module (B) = 2+3.5+3.5 = 9 kg Assume that the quantity of refrigerant perfused for the pipe (A) = Σ Length of the liquid pipe x Quantity of refrigerant perfused for the liquid pipe per meter = 25 kg

Total quantity of refrigerant perfused for the system (R) = 25+9 = 34 kg



2.5 Preheating

After installation is finished, turn power on and preheat the unit.

Because the GMV units use scroll type all-enclosed compressor, the lubricating oil and refrigerant can be mutually soluble. During production, transportation and storage, refrigerant may easily get into the compressor, which may damage the compressor in commissioning. Therefore, preheating is necessary.

8 hours preheating ensures reliability





2.6 Operation Mode selection

- ① When unit starts commissioning, system will select mode automatically according to current ambient temperature: if outdoor temperature is **above** 20°C, system will select cool mode; if outdoor temperature is **below 20**°C, system will select heat mode.
- ② Before commissioning, reconfirm that the cut-off valve of each basic module is completely opened.
- 3 Before commissioning, make sure the refrigerant supplementing is finished or more than 70% of supplementary refrigerant has been filled.

Remind: If system is power on without commissioning, digital tube of master control will indicate 01 OF AO (AO means system is not yet commissioned).





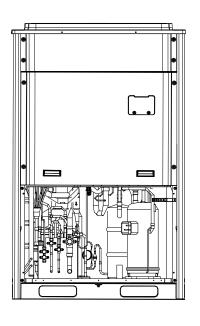


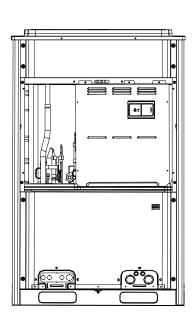
Startup and Commissioning

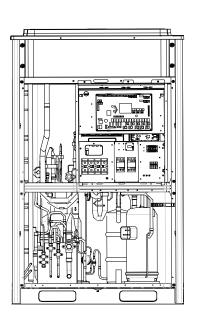


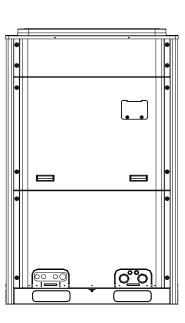
3.1 Notice for commissioning

During commissioning, front panel must be closed. Otherwise, commissioning will be affected!



















- ➤ Operation on buttons of ODU;
- **≻Operation through Gree Commissioning Software.**

When it is confirmed that preheating is finished, start unit up for commissioning. Turn on all commissioning interfaces of outdoor units. Commissioning procedures are mainly targeted to master outdoor units, however the self-status of each module is displayed by module's own LED. Pay attention if there is any abnormal condition in each module.







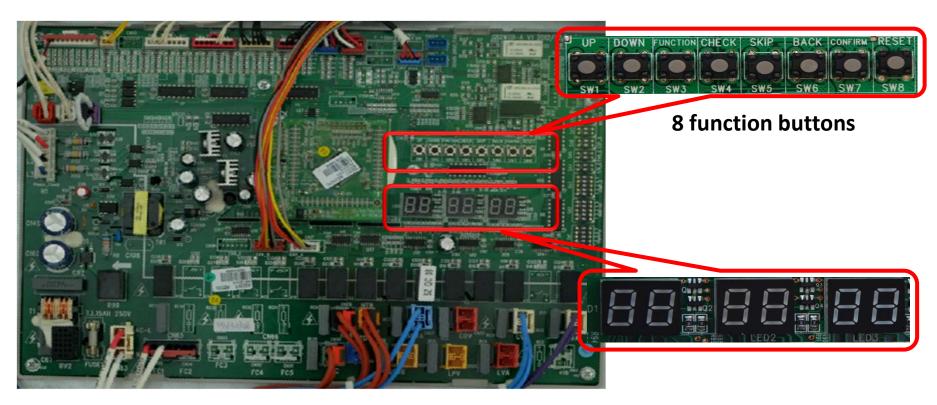
Software commissioning



Functions set by buttons

Notice:

- ①System functions can only be set or viewed after the entire system finishes debugging.
- 2Whether or not the entire system is running, system functions can be set or viewed.



6 digital tubes, display in 3 pairs: LED1, LED2, LED3



Functions set by buttons



Button	Name	Meaning
SW1	UP	Up button
SW2	DOWN	Down button
SW3	FUNCTION	Button for functions setting
SW4	CHECK	Buttons for checking functions
SW5	SKIP	Skip button
SW6	BACK	Button for returning to the previous step
SW7	CONFIRM	Confirm button
SW8	RESET	Button for resetting factory settings



Function No.	Name	Remark
A2	Refrigerant recovery	Only setting is available.
A6	Unit Cool/Heat function	Setting and inquiry is available.
A7	Outdoor silent mode	Setting and inquiry is available.
A8	After sales vacuum pumping	Only setting is available.
n0	Power saving 1	Setting and inquiry is available.
n3	Forced defrosting	Only setting is available.
n4	Power saving 2	Setting and inquiry is available.
n6	Error inquiry	Only inquiry is available.
n7	Parameter inquiry	Only inquiry is available.
n8	IDU project code inquiry	Only inquiry is available.
n9	Online IDU number inquiry	Only inquiry is available.



Step1. Master ODU Detection

- ① Find out the master control unit, which is the module with "01" address. Then long-press SW7 on the master control unit for 5 seconds to start commissioning.
- ② System enters step 1 automatically and the LED displays "db 01 oC".



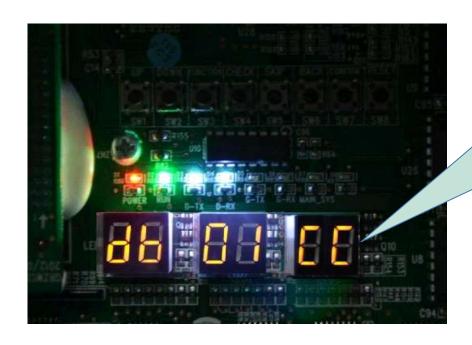


Remind: db means system is under commissioning; 01 means commissioning progress(step 1); OC means commissioning is in normal status.



Step1. Master ODU Detection

Abnormal and solution



CC: No Master ODU

CF: Multi Master ODU

OC: OK (only one Master)

Remind: OC means commissioning is in normal status. CC means lack of master control unit; CF means duplicate master control units.



Step2. IDUs Address Allocation

- System will enter step 2
 automatically to allocate address
 for indoor units.
- ② If system is normal, digital tube will display db 02 Ad.
- ③ When the allocation is finished, digital tube will display db 02 oC. Then the next step will be initiated.



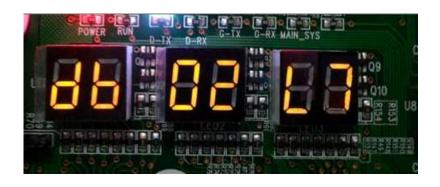
Remind: All buttons will be null in this step.



Step2. IDUs Address Allocation

Abnormal and solution

No master IDU, Error code "L7"



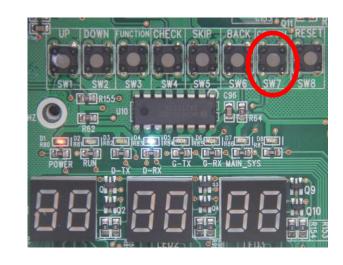
- (1) Wait 1 min and system will select the master indoor unit Master indoor unit can be set via function setting after commissioning if need; or
- (2) The master indoor unit set through the commissioning software within1 minute after "L7" Error; or
- (3) The master indoor unit set through the Wired Remote Control before commissioning, or within 1 minute after "L7" Error appears.



Step3. Confirm the quantity of ODU basic modules

If the display number is the same with the actual number, then press SW7 on the master control unit to confirm it.

If status code OC is then displayed, then next step will be initiated.





Number of ODUs



Remark:

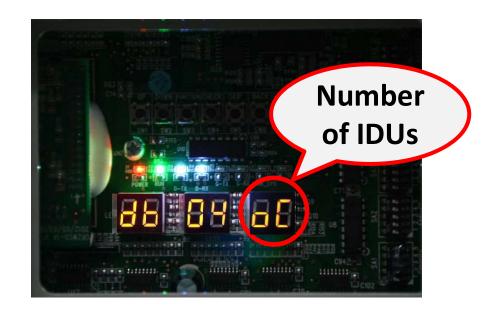
If the display number is incorrect, then disconnect power and check if the communication line between each module is correctly connected. After that, restart commissioning.



Step4. Confirm the quantity of IDU

If the display number is the same with the actual number, then press SW7 on the master control unit to confirm it.

If status code OC is then displayed, then next step will be initiated.



Remark: If the display number is incorrect, disconnect power and check if the communication line between each indoor unit is correctly connected. After that, restart commissioning.



Step5. Check inter-communication among ODUs

If no communication error is detected, then next step will be initiated. If there is error, then system cannot go on working until the error is eliminated.



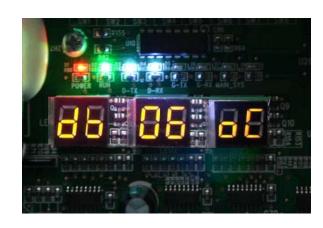
Code	Meaning
C2	Communication error between master control and inverter compressor drive
C3	Communication error between master control and inverter fan motor drive
СН	Rated capacity is too high.
CL	Rated capacity is too low.
OC	Next step will be started.



Step6. Check components of basic modules

This step is used for confirming whether the components of outdoor modules have any error.

If no error is detected, then display will be as shown in the picture and next step will be initiated.



Remind:

If the inner parts of basic modules have error, check the following table according to the error code. Modules without error will show the code of "other module error".

e.g. module 3 has no error but other modules have, then module 3 will show "db 03 J0".

If there are several errors, then the error codes will be displayed in turn.

e.g. F5 and F6 errors occur at the same time, then the digital tube of LED3 will display F5 and F6 in turn. If error is recovered, processing method will be pursuant to normal recovery.



Table of error codes for components of basic modules:

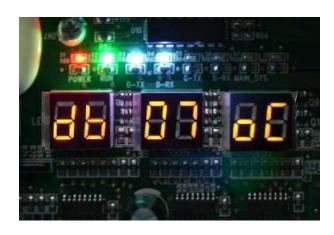
LED1	LED2	LED3	
Function code	Current progress	Current status	Error Name
db	06	b1	Outdoor ambient temperature sensor error
db	06	b2	Defrosting temperature sensor 1 error
db	06	FU	Compressor 1 top temperature sensor error
db	06	F5	Compressor 1 discharge temperature sensor error
db	06	Fb	Compressor 2 top temperature sensor error
db	06	F1	High pressure sensor error
db	06	F3	Low pressure senor error
db	06	b4	Subcooler liquid-out temperature sensor error
db	06	b5	Subcooler gas-out temperature sensor error



Step7. Check components of IDUs

This step is used for confirming whether the components of indoor units have any error.

If no error is detected, then display will be as shown in the picture and next step will be initiated.



Remind:

- 1. If any one indoor unit has component error, then all digital tubes will display the corresponding error.
- 2. System detects that indoor unit has component error, XXXX refers to the project number of faulted indoor unit. 3 seconds later, error code will be displayed. E.g. indoor unit No.100 has d5 error, then LED 3 will display the following codes circularly: 01 (2 seconds later)→00 (2 seconds later)→d5



Error examples:

Example 1: One IDU has a single error, then project number and error code will be displayed in turn. E.g. IDU No.01 has d5 error, LED 3 will display 00, 01, 05 in turn.

Example 2: One IDU has multiple errors, then the codes will be displayed in turn. E.g. IDU No.01 has d5 and d6 errors, LED 3 will display 00, 01, d5, d6 in turn.

Example 3: If several IDUs have several errors, the error codes of those several units will be displayed in turn. E.g. IDU No.01 has d5 and d6 errors and IDU No. 03 has d6 and d7 errors, then LED 3 will display 00, 01, d5, d6, 00, 03, d6, d7 in turn.

Example 4: If the project number of the faulted IDU has at least 3 digits, then the display order will be: the former 2 digits, the latter 2 digits, error code. E.g. IDU No.101 has L1 error, then LED3 will display 01, 01, L1 in turn every 2 seconds.

For multiple IDUs with multiple errors, the display method is as above.



Error code

LED1	LED2	LED3	
Function code	Current progress	Current status	Error name
db	07	xxxx/d3	No. xxxx IDU ambient temperature sensor error
db	07	xxxx/d4	No. xxxx IDU inlet pipe temperature sensor error
db	07	xxxx/d5	No. xxxx IDU mid pipe temperature sensor error
db	07	xxxx/d6	No. xxxx IDU outlet pipe temperature sensor error
db	07	xxxx/d7	No. xxxx IDU Humidity sensor error
db	07	xxxx/L1	No. xxxx IDU motor error



Step8. Confirm compressor preheating

Before commissioning, the preheat time shall be more than 8 hours. Do not disconnect power after preheating. Once system detects that the required preheat time is met, digital tube will display OC and the next step will be initiated. If preheat time is not enough, U0 will be displayed.



If display:
"db 08 U0"
U0 means
preheat time
is not enough.



Important Notice:

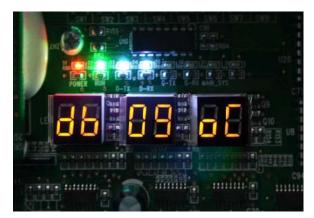
If the compressor preheating last for 8 hours, but after that being cut off the power supply for 2 hours or more, compressor need to be preheated 8 hours or above again.

Considering there might be improper operation before commissioning, such as power on or off, when the preheat time for compressor is not enough, you may press SW7 to skip the waiting time and start next step. However, this will force compressor to start up, which may damage the compressor.

Step9. Refrigerant inspection before startup

If the system is lack of refrigerant or refrigerant is insufficient to start operation, system will display U4 "Protection of lack of refrigerant" and cannot proceed operation. In this case, fill refrigerant inside (70% of the total refrigerant amount) until the error is eliminated. When error is eliminated, OC will be displayed and next step will be started.





Remind: If system displays "Protection of lack of refrigerant", check if any leakage in the system.



Step10. Check outdoor valves before startup

System is in valve checking progress. If master control unit displays the code as shown in the picture, it means system is initiating the checking progress.

System starts operation automatically.



ON: Checking

CF: Valves are not fully open

OC: Outdoor valves are normal



Remind:

If U6 is displayed, it means valves are not in proper status. Check if all valves are open. If yes, press SW6 to return to the previous step and start system checking again.

If you can make sure all valves are open though U6 is displayed, you can press SW7 to start next step.









Step11. Refrigerant charging confirmation

Step 11 is only for reminding, the refrigerant should be carefully calculating of adding amount and charging to the system preciously.

No operation needed and next step will be initiated automatically.



Step12. Confirm to startup

This step is set to prevent wrong startup before preparation work is finished. In this step, reconfirm unit startup and commissioning.

Operation method is as below:



At the beginning, "AP" will be blinking. Press SW7 to confirm startup and "AE" will be displayed.



Step13. Startup the system

The amount of supplementary refrigerant must be calculated accurately by strictly following the instruction manual. Before commissioning, at least 70% of the total refrigerant amount has to be filled. The remaining amount will be filled after system is turned on.



AC: commissioning

of cool mode;

AH: commissioning

of heat mode

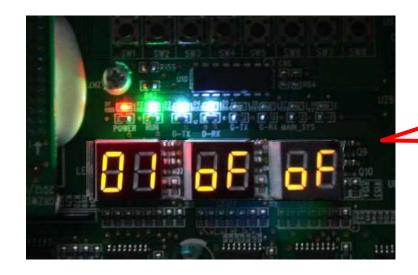
Remind:

After system starts up, it will select cool or heat mode according to ambient temperature. By this time, you can finish supplementing the remaining refrigerant. (Progress code 15 means cooling and 16 means heating.)



Step14. Commissioning OK

If no error occurs after system continues operation for about 40 minutes, then commissioning is OK and system will stop operation and resumes standby status. Below is the corresponding display:

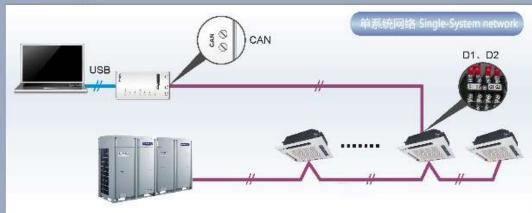


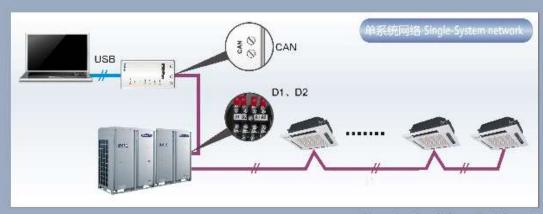
Commissioning is OK. System is ready for operation.

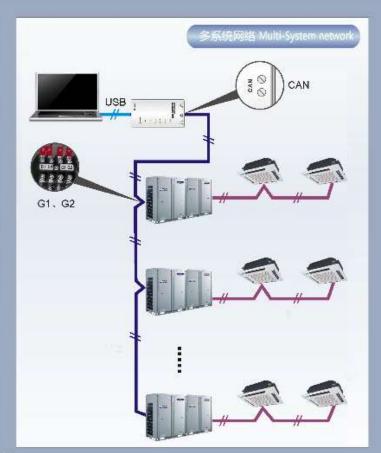




Connection Diagram:







Communication: CAN Baud Rate: 115200















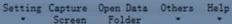
















Start

