



# GMV5

THE 5<sup>TH</sup> GENERATION OF

GREE MULTI VRF SYSTEM



## GMV5 Key Parts Maintenance

Overseas Sales Co, GREE



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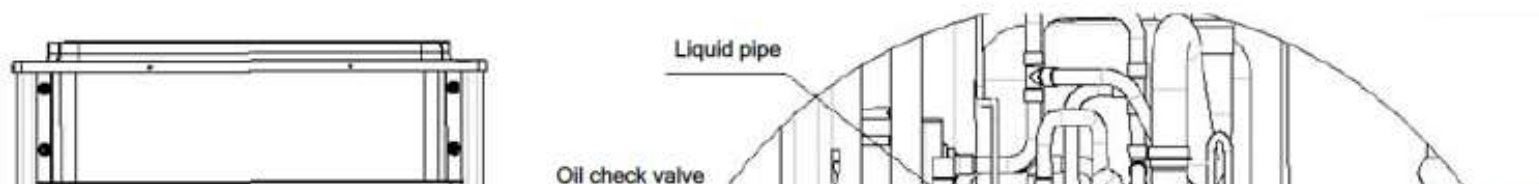
## Unit Structure



# Structure Schematic

**GMV-224WM/A-M**

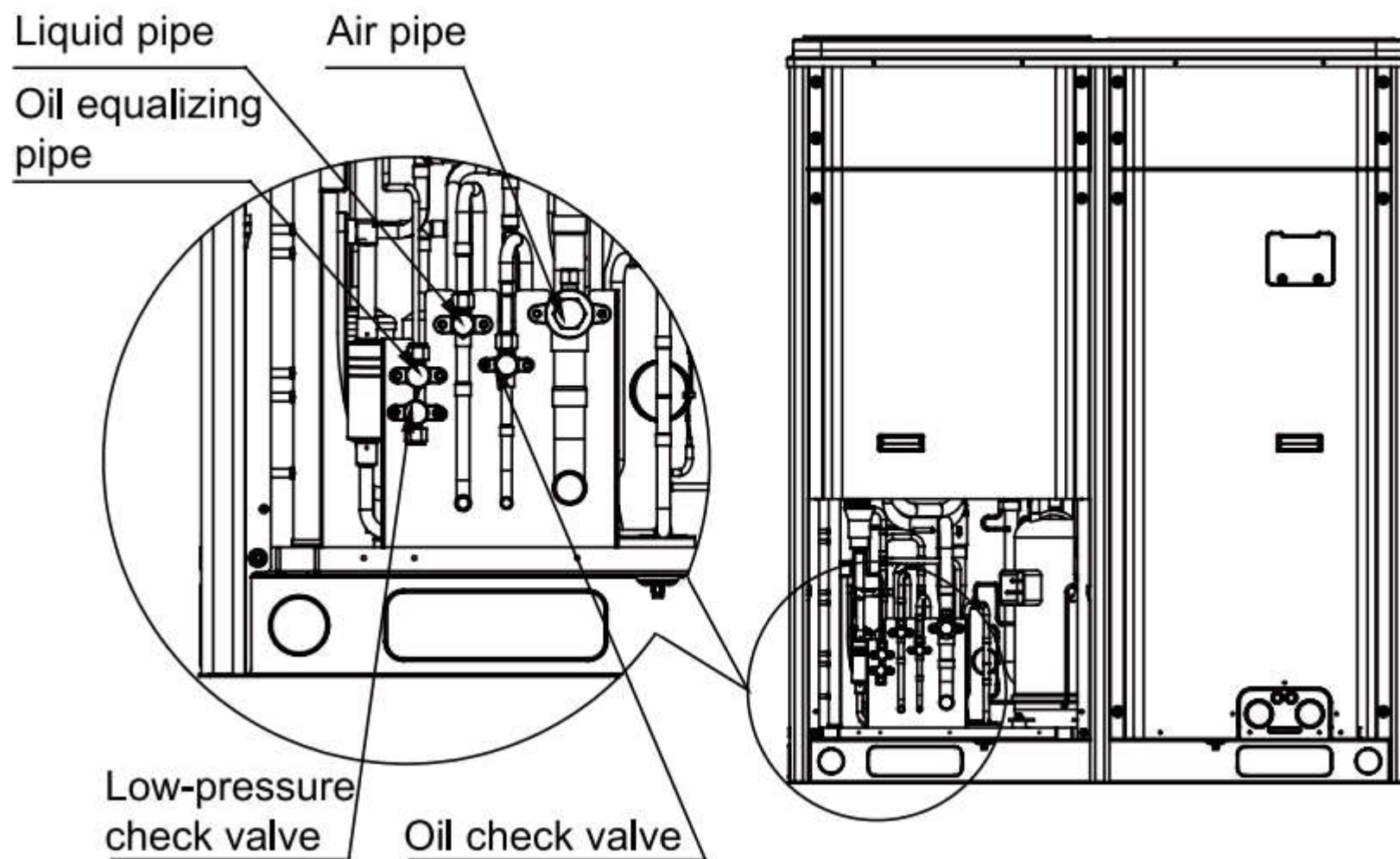
**GMV-280WM/A-M**





# Structure Schematic

## GMV-335WM/A-M

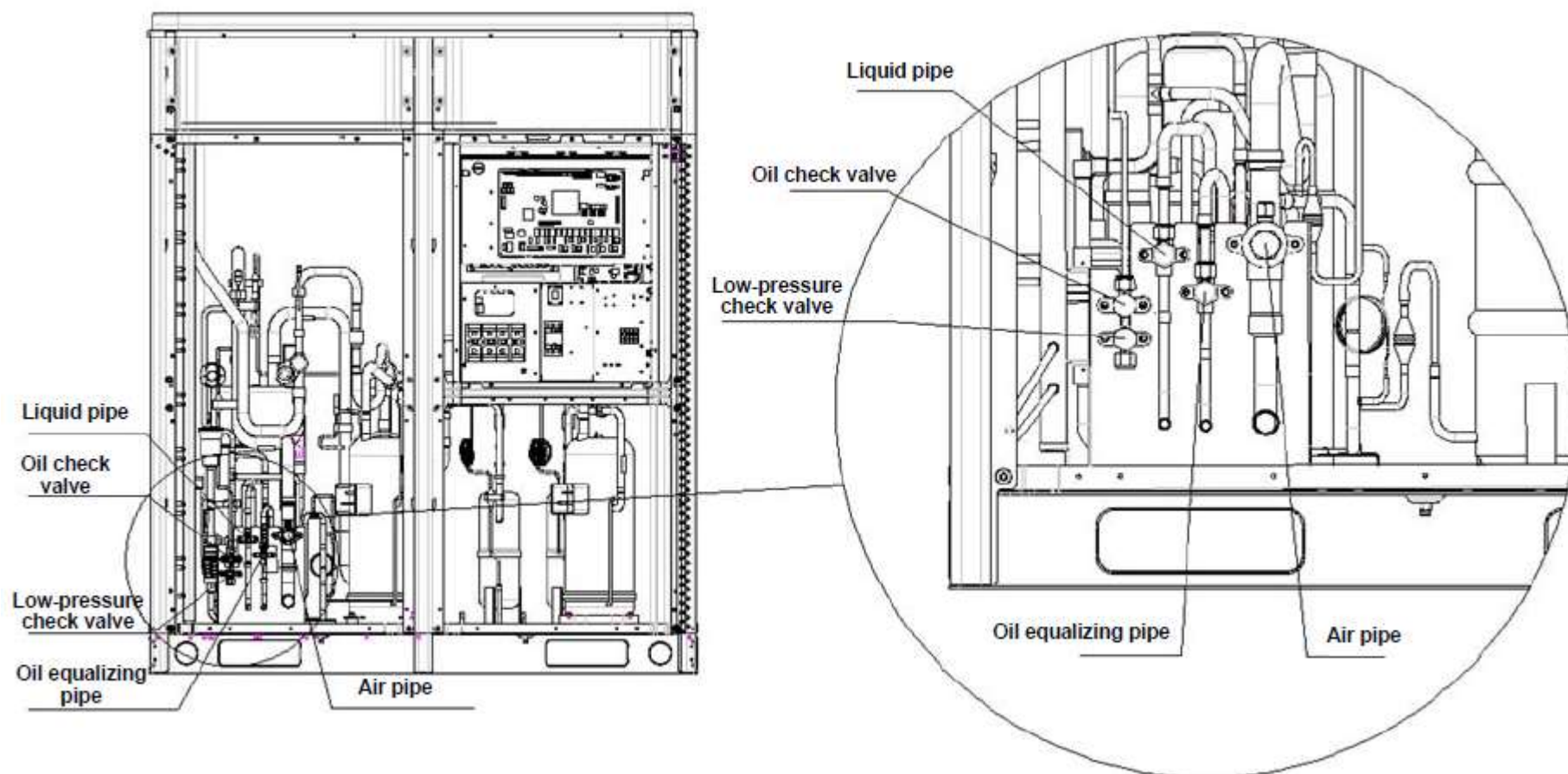




# Structure Schematic

**GMV-400WM/A-M**

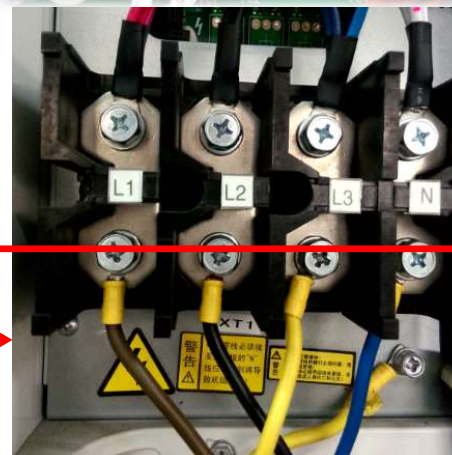
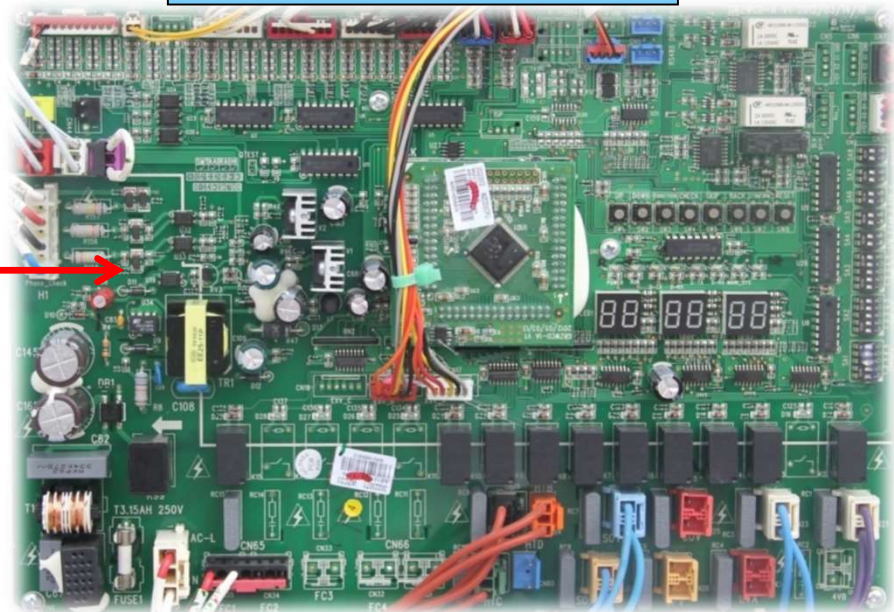
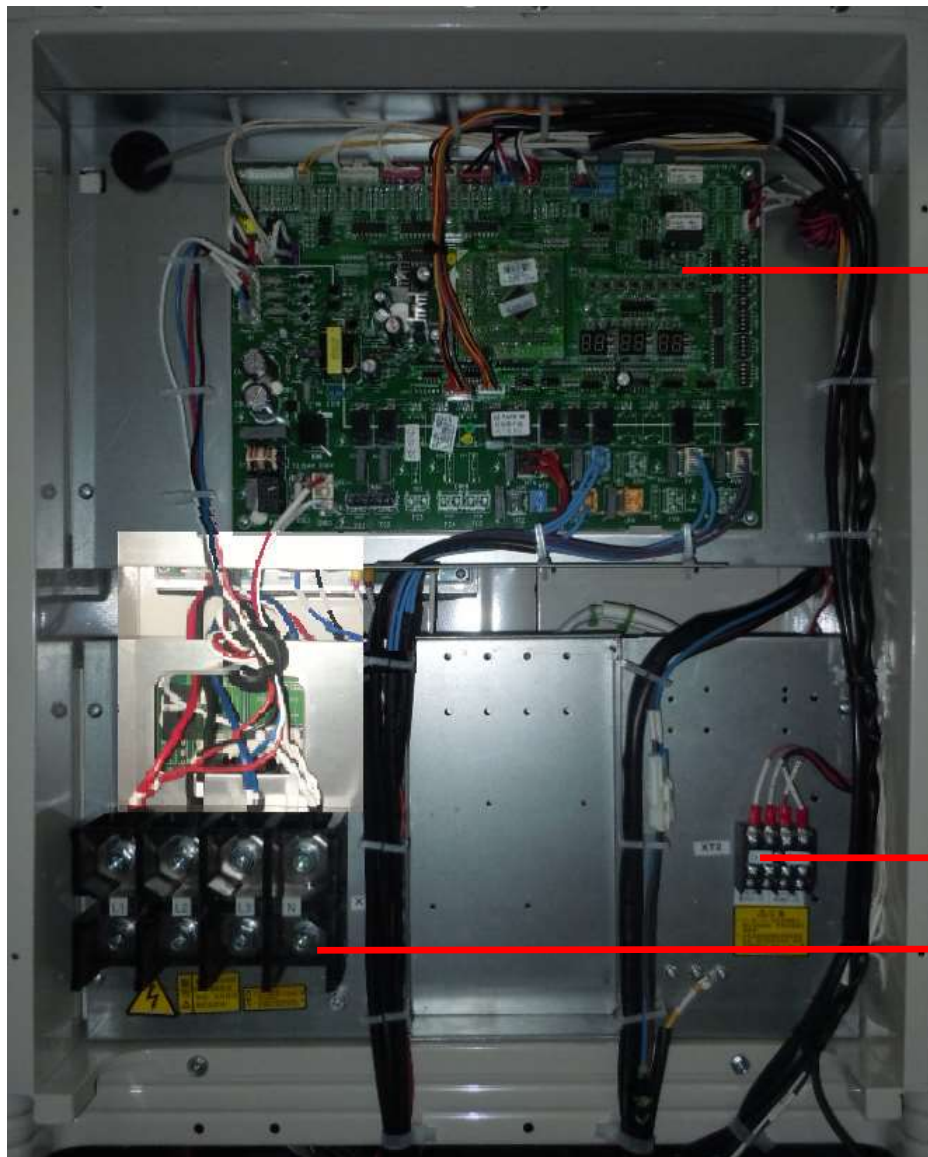
**GMV-450WM/A-M**



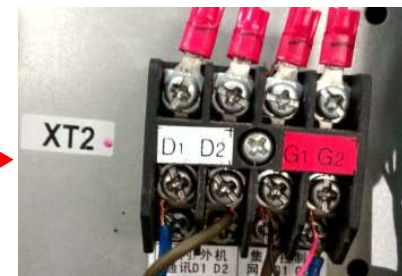


# Electric Box

Main board AP1



Power supply wiring board XT1



Communication wiring board XT2

## Electric Box



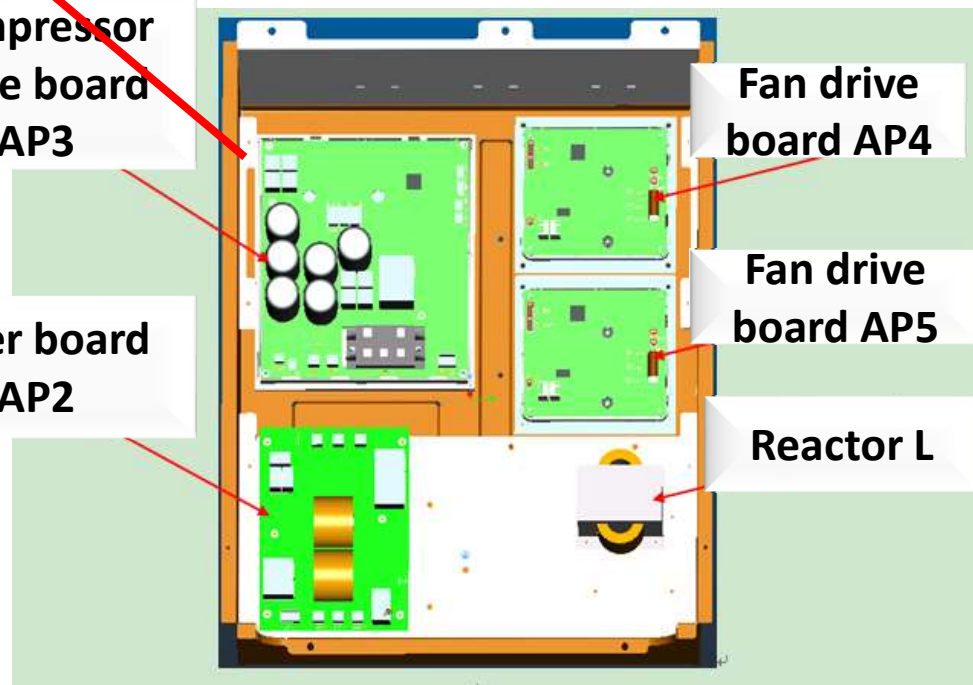
Compressor  
drive board  
AP3

Filter board  
AP2

Fan drive  
board AP4

Fan drive  
board AP5

Reactor L







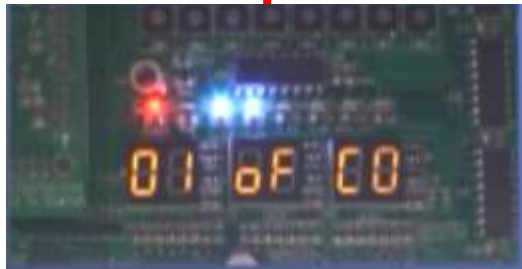
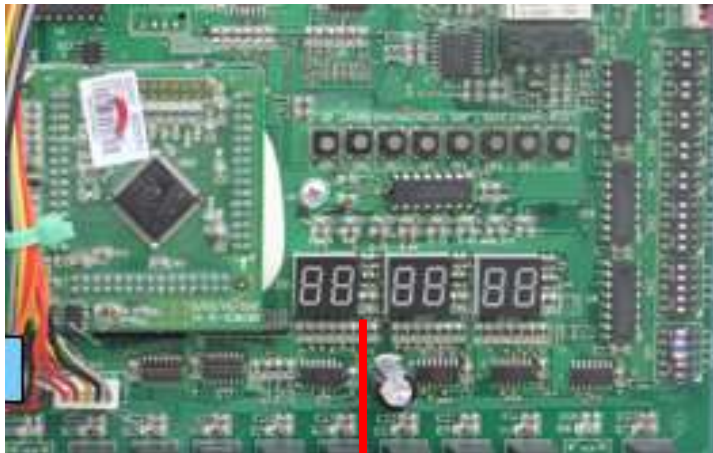
# 2

## Troubleshooting



# Malfunction Indicator

ODU



IDU



Wired Controller





# Malfunction analysis and troubleshooting

- Indoor unit address conflict warning-----C5

## Cause

Address conflict with each other indoor unit.

## Trouble shooting

Change the conflicting indoor unit address and ensure that no IDU's address is repeated.





# Malfunction analysis and troubleshooting

- Indoor unit address conflict warning-----C5

How To change the IDU's Address



Press **FUNCTION** button and hold for **5s**



Press **MODE** button for three times within **5s**



Press **“^”** or **“v”** button to select P42---IDU's address setting





# Malfunction analysis and troubleshooting

- Indoor unit address conflict warning-----C5

How To change the IDU's Address



Press **MODE** button  
to enter editable status



Press **“^”** or **“v”** button to  
change the address value



Press **ENTER/CANCEL**  
button to return to last step



# Malfunction analysis and troubleshooting

- Communication malfunction-----C0

## Description

Communication failure : ODU<sub>s</sub> VS ODU<sub>s</sub>, IDU<sub>s</sub> VS ODU<sub>s</sub> , IDU<sub>s</sub> VS IDU<sub>s</sub>, IDU<sub>s</sub> VS wire controllers

## Cause

- a. The communication cable is not connected.
- b. The wire controller is disconnected.
- c. The communication cable is poorly connected.
- d. The wire controller is faulty.
- e. Mainboard of indoor or outdoor unit malfunction

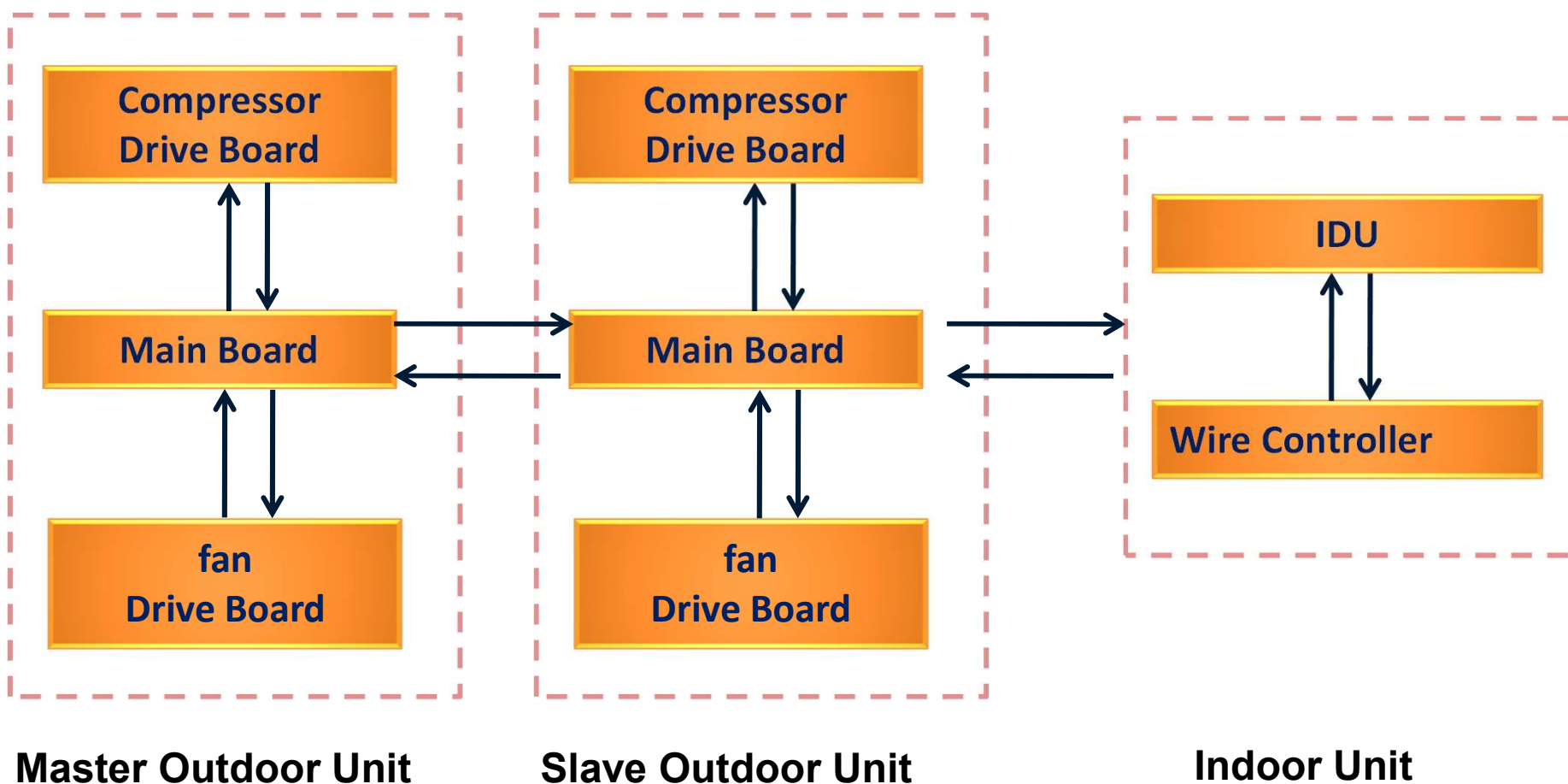




# Malfunction analysis and troubleshooting

- Communication malfunction-----C0

## Communication Principle





- Communication malfunction-----C0

**Communication Malfunction**

**C0 only displays on IDU/ wire controller**

1. IDU / wire controller malfunction
2. IDU & IDU can't communicate

**C2 /C3 displays on ODU**

1. C2: main board & compressor drive board can't communicate
2. C3: main board & fan driving board can't communicate

**C0 displays on ODU**

1. ODU& IDU can't communicate
2. The controller board of IDU/ODU has malfunction

**C6 displays on ODU**

1. C6:ODU &ODU can't communicate





# Malfunction analysis and troubleshooting

## Basic Checking For System Malfunction

1. Gas and liquid valves should be opened fully.

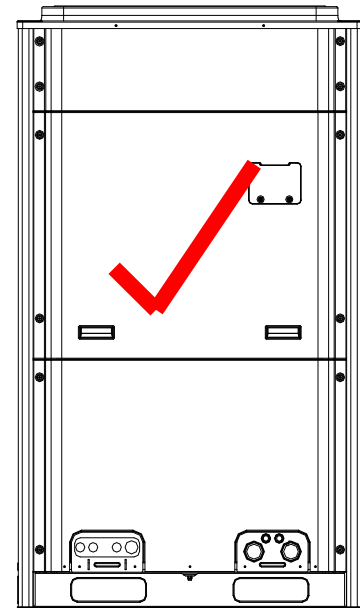
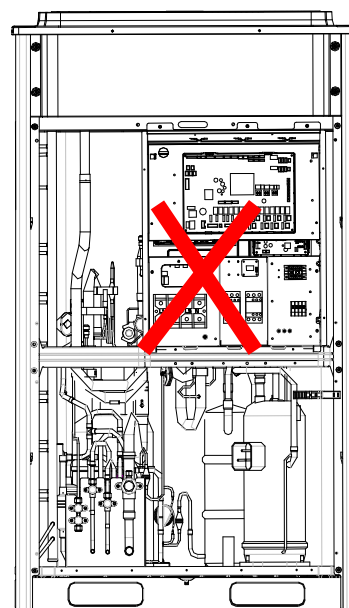
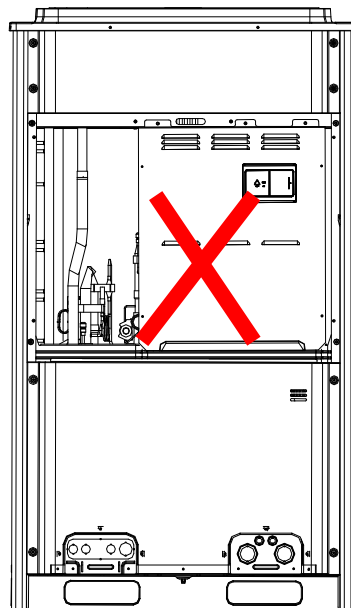
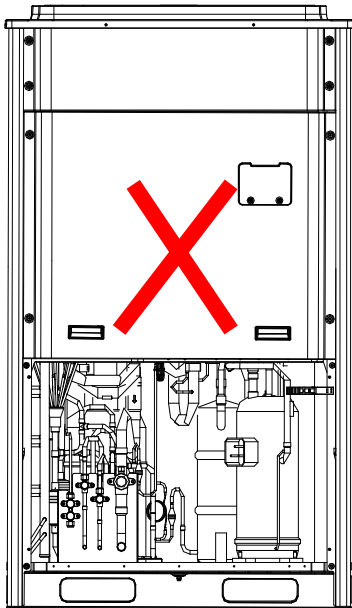




# Malfunction analysis and troubleshooting

## Basic Checking For System Malfunction

### 2. Front plate should be covered tightly.





# Malfunction analysis and troubleshooting

## Basic Checking For System Malfunction

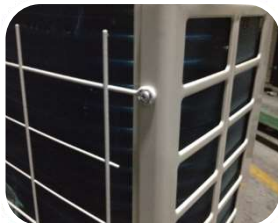
### Heat exchange



3. Air inlet and outlet (IDU & ODU) should be on good condition.



4. Fan (IDU & ODU) should run normally

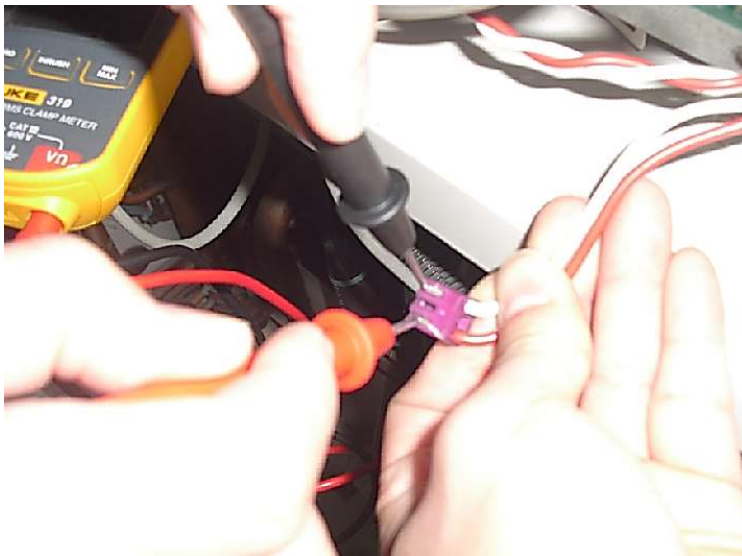


5. Heat exchanger ( IDU & ODU) should be clean. Filter for IDU is clean.

# Malfunction analysis and troubleshooting

## Basic Checking For System Malfunction

### 6. Check pressure switch



**No Beep!**



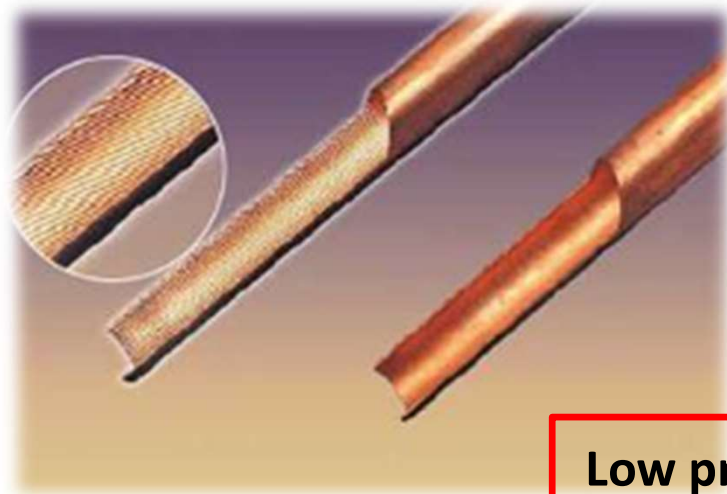
pressure  
switch failed





# Malfunction analysis and troubleshooting

## Basic Checking For System Malfunction

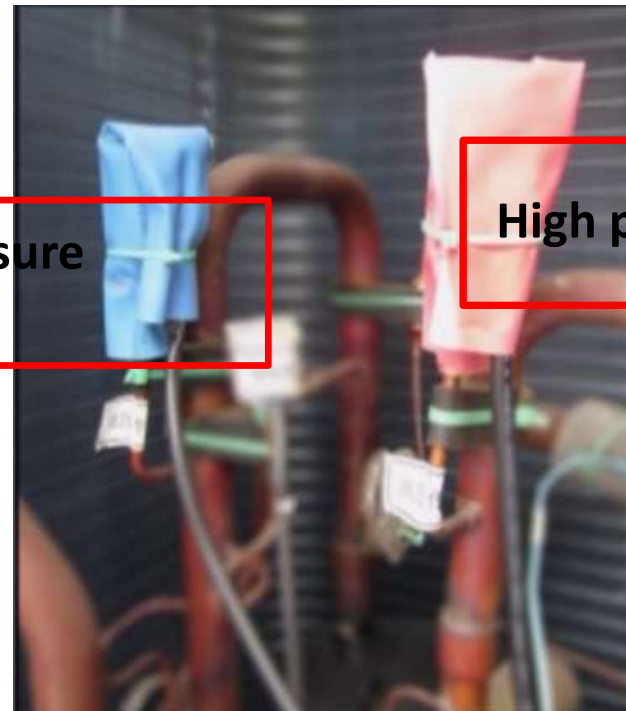


### 7. No block in piping system

Low pressure  
sensor

High pressure sensor

### 8. Pressure sensors are normal





# Malfunction analysis and troubleshooting

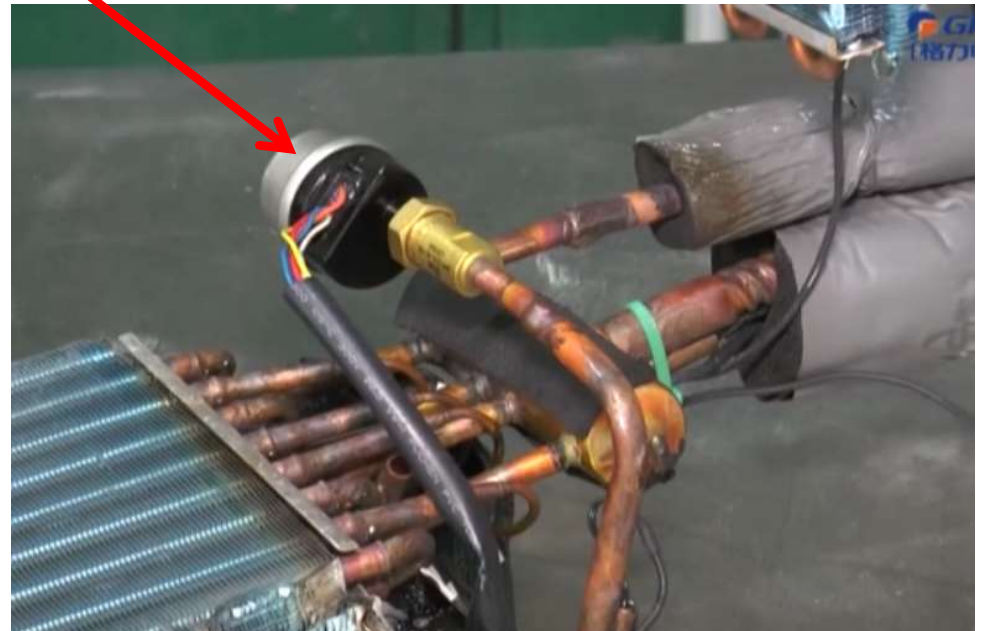
## Basic Checking For System Malfunction

### 9. EXVs are normal

Make sure the coil is firm and fixed



Outdoor unit's EXV



Indoor unit's EXV



# Malfunction analysis and troubleshooting

- High exhaust temperature protection ----E4



## Cause

- a. The gas and liquid valve of the ODU is not fully opened as required.
- b. The system pipeline is blocked.
- c. Lacking refrigerant ---1.Not enough refrigerant 2.pipe leakage
- d. The IDU's electronic expansion valve is not working properly.

## Trouble shooting

- a. Fully open the gas valve and liquid valve
- b. Replace and solder the blocked pipe
- c. Stop the leak, Pump out air and inject refrigerant again.
- d. Replace the electronic expansion valve.



# Malfunction analysis and troubleshooting

- Low exhaust temperature protection ----E2



## Cause

- 1) Exhaust temperature sensor failure.
- 2) The IDU's electronic expansion valve is not working properly.(cooling mode)
- 3) The ODU's electronic expansion valve is not working properly.(heating mode)
- 3) Too much refrigerant.

## Trouble shooting

- 1) Replace the temperature sensor or main board.
- 2) Replace the body of the electronic expansion valve.
- 3) Check the necessary amount of refrigerant and discharge the unneeded refrigerant slowly via the stop valve of the fluid pipe.





# Malfunction analysis and troubleshooting

- High pressure protection ----E1



## Cause

- a. The stop valve of the ODU is not fully opened as required.
- b. The system pipeline is blocked.
- c. The ambient temperature is too high (It is a normal phenomenon).
- d. The pressure sensor is faulty.
- e. The high pressure switch is faulty.
- f. The fan is not working properly.
- g. Too much refrigerant.

## Trouble shooting

- a. Fully open the stop valve.
- b. Replace and solder the blocked pipe.
- c. Replace the high pressure sensor.
- d. Reconnect it or replace the pressure switch.
- e. Replace the fan motor.
- f. Check the necessary amount of refrigerant and discharge the unneeded refrigerant slowly via the stop valve of the fluid pipe.



# Malfunction analysis and troubleshooting

- Low pressure protection ----E3

## Cause

- a. The stop valve of the ODU is not fully opened as required.
- b. The system pipeline is blocked.
- c. The ambient temperature is too low (It is a normal phenomenon).
- d. The pressure sensor is faulty.
- e. The high pressure switch is faulty.
- f. The fan is not working properly.
- g. Not enough refrigerant.

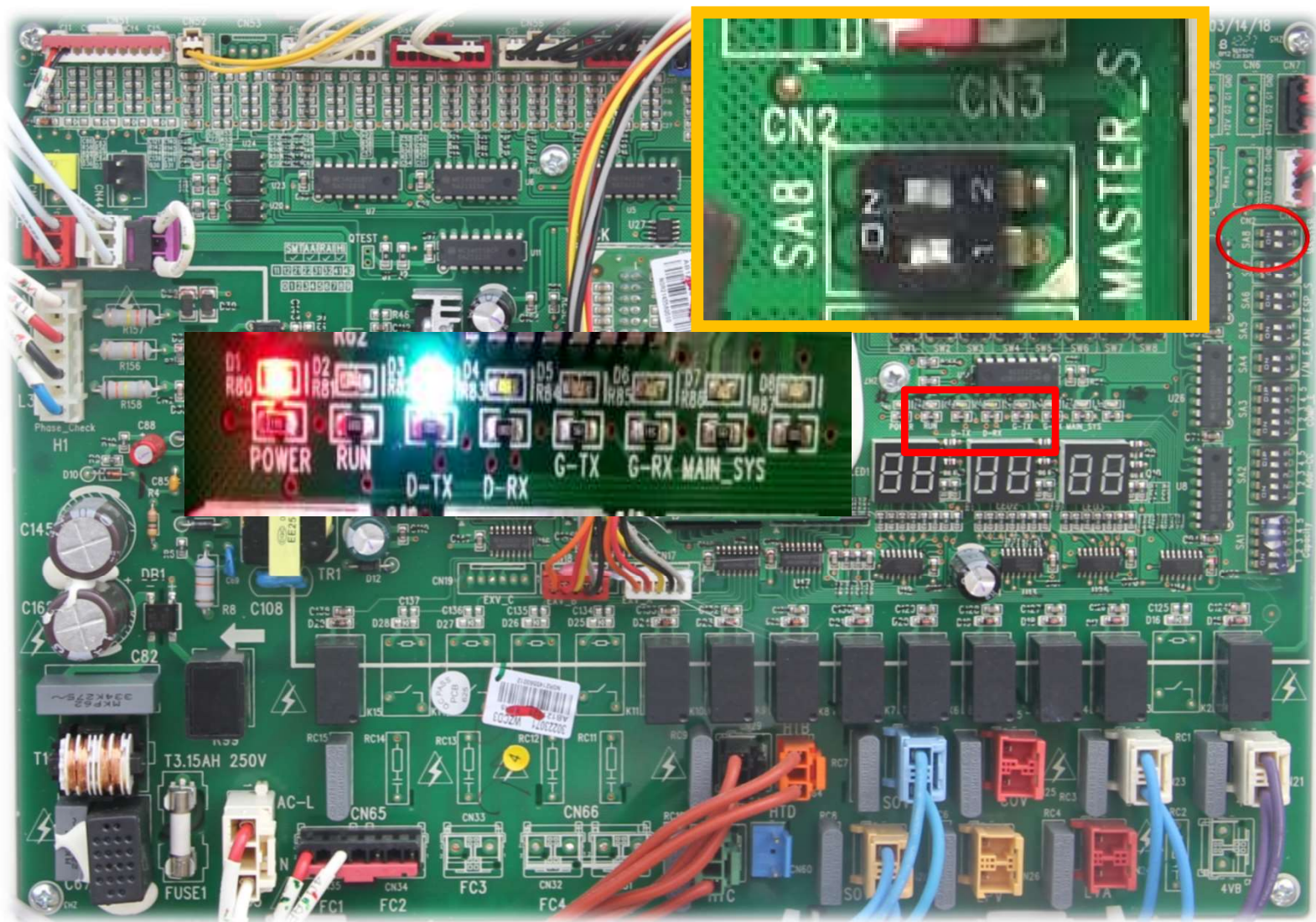
## Trouble shooting

- a. Fully open the stop valve.
- b. Replace and solder the blocked pipe.
- c. Replace the low pressure sensor.
- d. Reconnect the pressure switch or replace the pressure switch.
- e. Replace the fan motor.
- f. Check the necessary amount of refrigerant and inject the refrigerant slowly. via the stop valve of the low-pressure gas pipe.



## **Key Parts Maintenance**

# I. Cautions on ODU AP1 Replacement





# Note

1. After AP1 is replaced, **you should power on the ODU and IDUs at the same time or power on the ODU first**; otherwise, “CC: does not have module” will display and a “C0 fault” alarm will display on the IDUs.
2. **Debug the entire system** after master module AP1 replacement, but commissioning is not needed when replacing the slave module.





## II. Cautions on IDU AP1 Replacement





## Note

If the AP1 of the master IDU needs to be replaced, after the IDU is powered on, “No master IDU (L7)” or “Address conflict (C5)” alarm may be reported.



**Tips:** If there are N units within the network, the units should be numbered from N+1.



### III. Determining Compressor Fault

**Unit can be normally started:**

- ◆ **Step 1:** Measure line current of faulty compressor.
- ◆ **Step 2:** Check the faulty compressor sounds.
- ◆ **Step 3:** Check the electric expansion valves of ODUs.
- ◆ **Step 4:** Check the 4-way valves act.

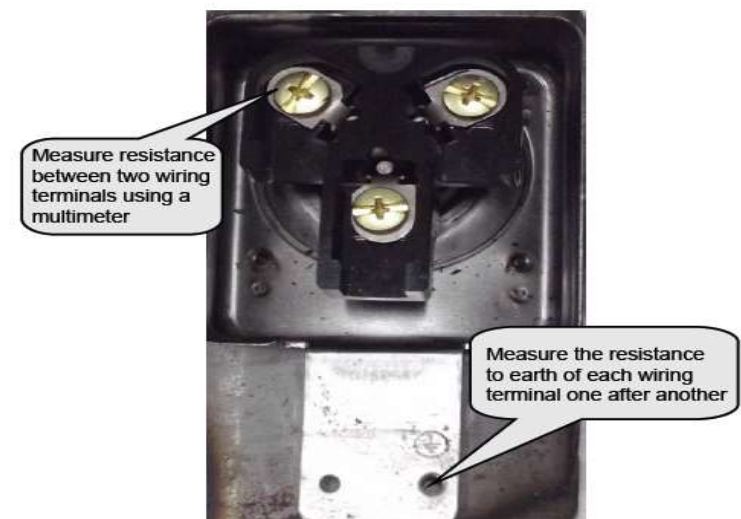




### III. Determining Compressor Fault

#### Units cannot be normally started

- ◆ **Step 1:** Check whether wiring of the compressor is intact.
- ◆ **Step 2:** Measure resistance between two wiring terminals(U,V, W), and the resistance to earth of each wiring terminals.
- ◆ **Step 3:** Check the solenoid valves of system, include electric expansion valves, oil return valves, and oil balance valves.
- ◆ **Step 4:** Check the IPM module.

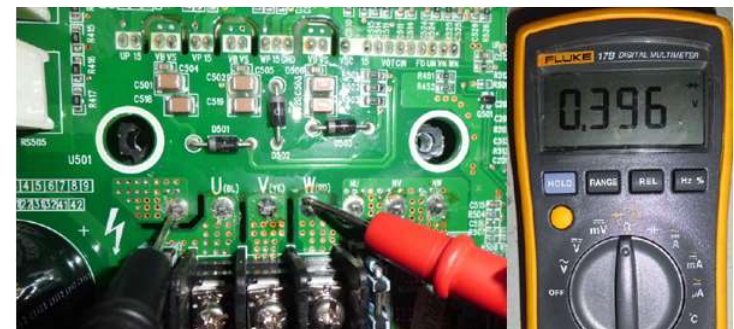
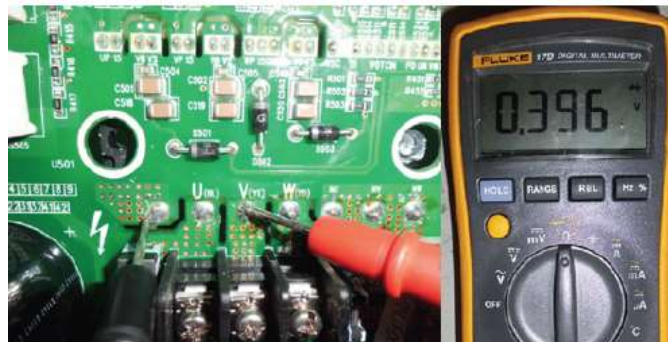






### III. Determining Compressor Fault

#### How To Test the IPM Module

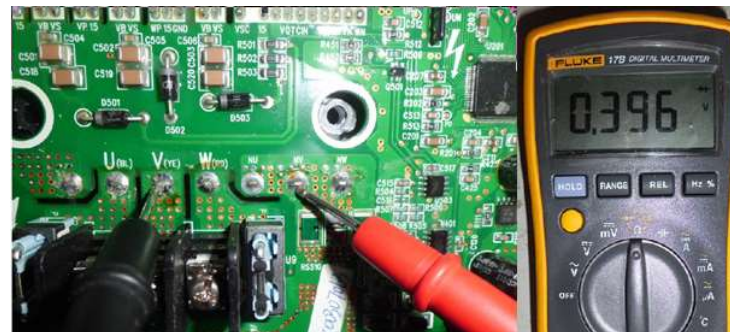


**Note:** Before testing , disconnect the power supply, five mins later, remove the line of the faulty compressor



### III. Determining Compressor Fault

#### How To Test the IPM Module



**Note:** Before testing , disconnect the power supply, five mins later, remove the line of the faulty compressor



## IV. Compressor replacement

- ◆ **Step 1:** Disconnect power supply.
- ◆ **Step 2:** Clear electric parts(do not need to disassemble the electric box).
- ◆ **Step 3:** Check the oil quality.



## IV. Compressor replacement

### Oil quality checking

normal

light contaminated

heavy contaminated



### Note:

1. If oils are contaminated(as picture 2), replace the **compressor, oil separator, and gas/liquid separator**.
2. If oil changes to black(as picture 3), **still need to check oils of other modular units**. The check procedure is similar to the preceding.



## IV. Compressor replacement

- ◆ **Step 4:** Recover refrigerant
- ◆ **Step 5:** Remove faulty compressors
- ◆ **Step 6:** Check system parts, including oil separator, gas/liquid separator, and storage tank.

### **Note:**

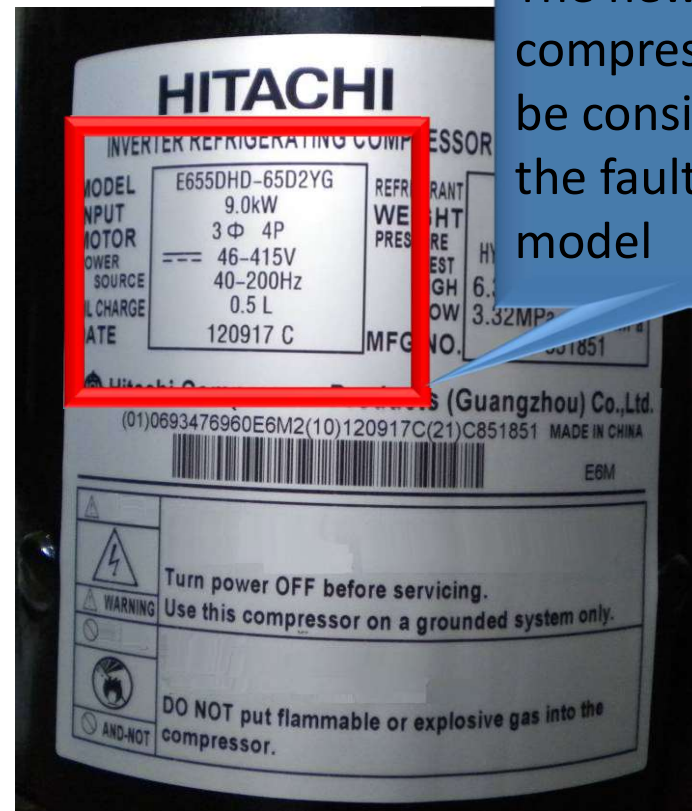
Volumes of oils drawn out from the oil separator, gas separator, and oil balancer should be recorded. After faulty compressors and parts are replaced, you should fill new oils of equivalent amount into the compressors and parts.





## IV. Compressor replacement

### ◆ Step 7: Install a new compressor



The new compressor must be consistent with the faulty one in model

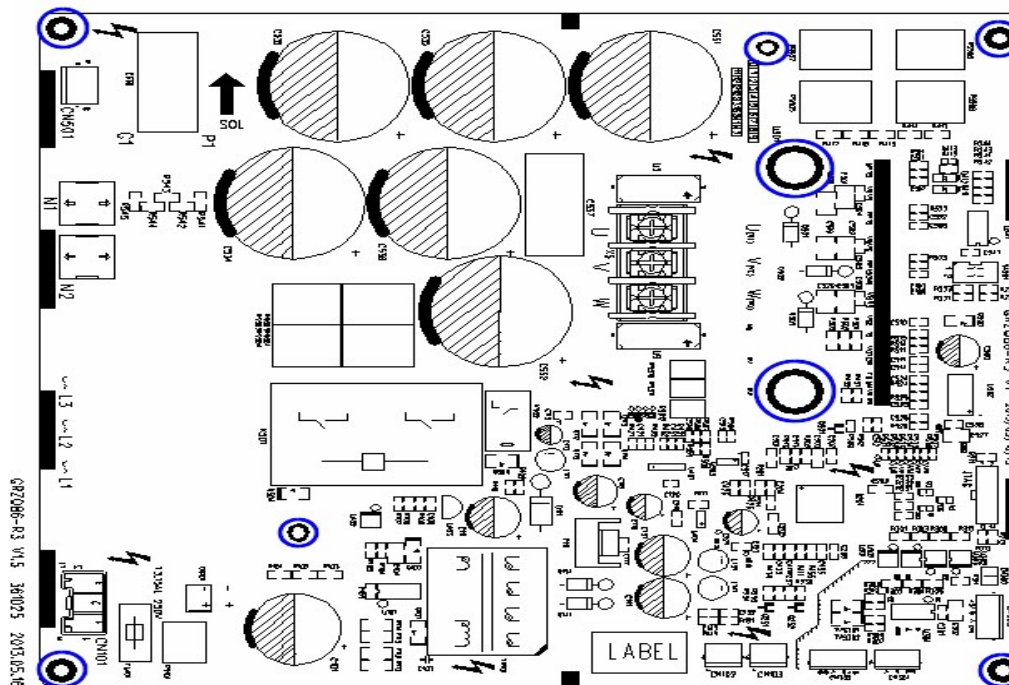
**Note:** Compressor lubricant must be kept completely airtight, Hitachi compressors use special lubricant FVC68D whose moisture absorption capability is high





## V. Cautions on Compressor Drive Replacement

- ◆ **Step 1:** Disconnect the power supply of the system.  
Set a mark beside the power supply for warming.
- ◆ **Step 2:** Disconnect all lines of the compressor drive.  
Loosen the screws on the compressor drive, as shown below.

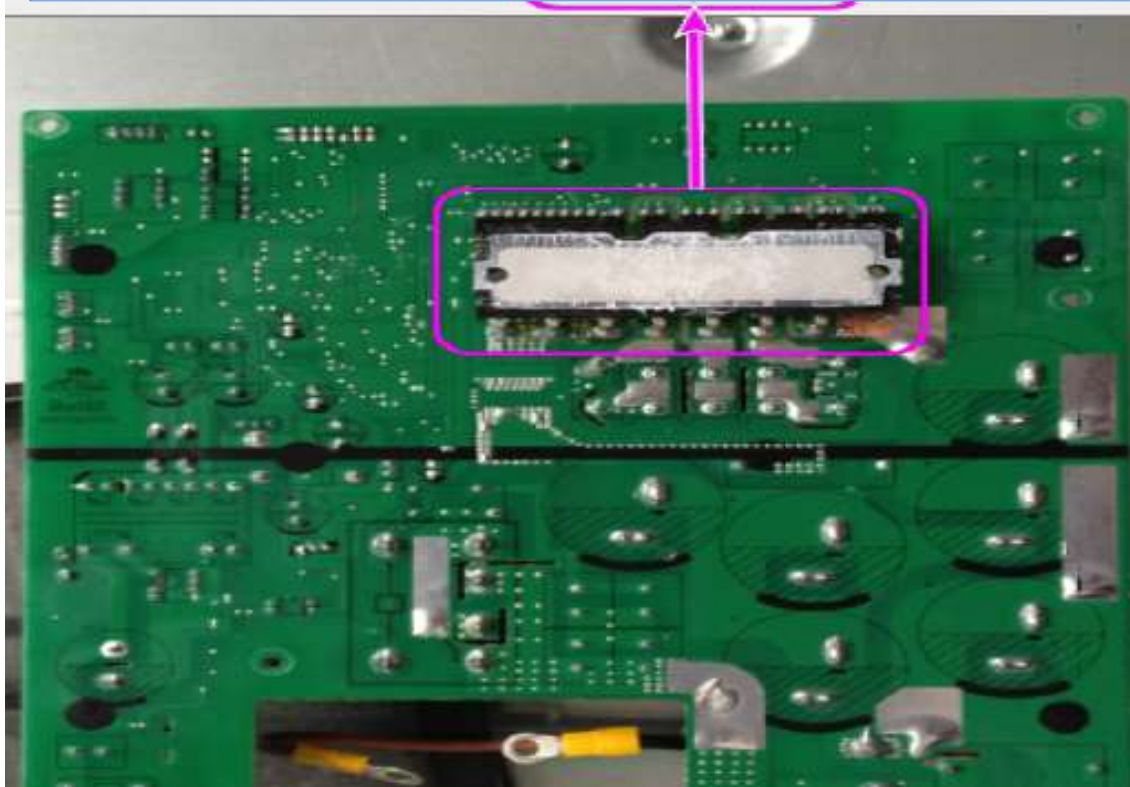




## V. Cautions on Compressor Drive Replacement

- ◆ **Step 3:** Replace the compressor drive.

Apply some silicone tape onto the IPM module





## V. Cautions on Compressor Drive Replacement

- ◆ **Step 4:** Install a new compressor drive, screw and wire it.





# 4

## Case Analysis





## Case1. Branch pipes wrongly join

### Malfunction description:

Mongolia: VRF project, No.4 IDU display U8 malfunction during running status---- IDU pipeline malfunction.





## Case1. Branch pipes wrongly join

Possible cause:

Firstly, check the running data when it is cooling mode. The temp. of the inlet pipe and outlet pipe are abnormal. The temp. between inlet and outlet pipes are almost the same. And it is different from the normal data.

Project Number	Model	Rated Capacity	Master IDU	On-off Status	Mode	Fan Speed	Temp Setting	Indoor Amb Temp	Inlet Pipe Temp	Outlet Pipe Temp	Indoor Outlet Air Temp	EXV Status	Target EXV	Aux E-heater
2	Cassett	11.2	Slave	On	Cooling	High	16	25	2	10	0	432	432	Off
1	Cassett	10	Slave	On	Cooling	High	16	23	1	6	0	339	339	Off
5	Cassett	10	Master	On	Cooling	High	16	27	2	9	0	411	411	Off
3	Cassett	11.2	Slave	On	Cooling	High	16	26	4	11	0	391	391	Off
4	Cassett	7.1	Slave	On	Cooling	Low Sp	16	31	31	32	0	64	0	Off



## Case1. Branch pipes wrongly join

Possible cause:

Secondly, check the running data when it is heating mode. The temp. of the inlet pipe and outlet pipe of No.4 IDU are abnormal. The temp. of the inlet pipe is much more lower than the temp. of the outlet pipe. The data is from 10-20°C. Then we can come to conclusion that there is something wrong with the pipeline.

工程编号	机型	额定容量	主内机	开关机状态	模式	风速	温度设定	室内环境温度	入管温度	出管温度	室内出风温度	EXV	目标EXV	辅助电加热状态
3	天井机(I)	11.2	从	开机	制热	超低速	30	34	49	69	0	71	71	关
4	天井机(I)	7.1	从	开机	制热	超高速	30	29	66	35	0	480	480	关
2	天井机(I)	11.2	从	开机	制热	超低速	30	33	49	73	0	71	71	关
5	天井机(I)	10	主	开机	制热	超低速	30	32	42	73	0	68	68	关
1	天井机(I)	10	从	开机	制热	超高速	30	29	43	73	0	101	101	关



## Case1. Branch pipes wrongly join

Possible cause:

Thirdly, the reason is that the “Y” branch tubes(liquid pipe and gas pipe) of No.4 IDU are exchanged and joined by mistake. See the following picture.







## Case1. Branch pipes wrongly join

Handling process:

Modify the pipeline. Remove the liquid pipe and gas pipe, exchange them, and weld them.

Before



After





## Case1. Branch pipes wrongly join

Handling process:

Restart the unit after everything is OK. The running data of the units are normal. We record the running data as below after the unit runs for about 30 minutes.

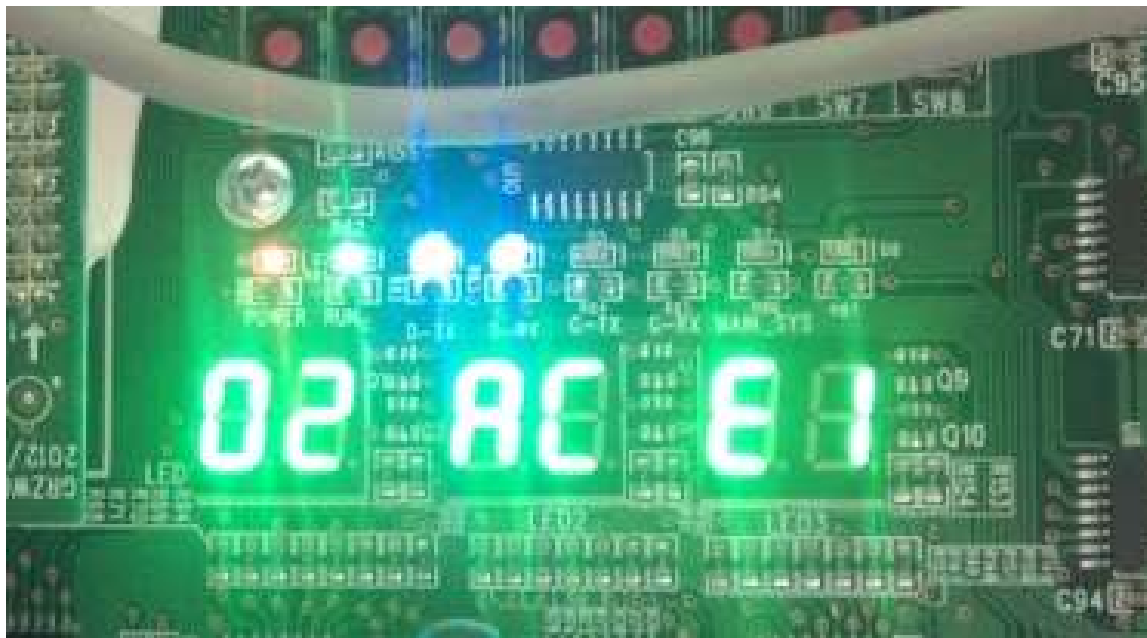
工程编号	机型	额定容量	主内机	开关机状态	模式	风速	温度设定	室内环境温度	入管温度	出管温度	室内出风温度	EXV	目标EXV	辅助电加热状态
4	天井机(I	7.1	从	开机	制冷	超高速	16	26	10	12	0	149	149	关
2	天井机(I	11.2	从	开机	制冷	高速	16	25	7	10	0	199	199	关
1	天井机(I	10	从	开机	制冷	高速	16	24	7	9	0	199	199	关
5	天井机(I	10	主	开机	制冷	高速	16	25	7	9	0	198	198	关
3	天井机(I	11.2	从	开机	制冷	高速	16	26	9	11	0	196	196	关



## Case2. E1 High pressure malfunction

### Malfunction description:

Malaysia GMV5 project: This GMV5 system compose by 4 ODU module. The ODU module 2 always display E1 malfunction.





## Case2. E1 High pressure malfunction

Possible cause:

Firstly, ODU module 2(inverter compressor) starts running, the whole unit appears E1 immediately. The high pressure is only 2.556Mpa at this time. Normal high pressure value is 4.2Mpa . This value doesn't meet the protection value.

风机1运行频率	55	Hz	汽分进管
风机2运行频率	51	Hz	汽分出管
模块高压	2.556	Mpa	室外机制热
模块低压	0.799	Mpa	外风机静压
压缩机1排气温度	86	°C	压缩机1
压缩机1壳顶温度	87	°C	压缩机2
压缩机2排气温度	85	°C	四通阀1

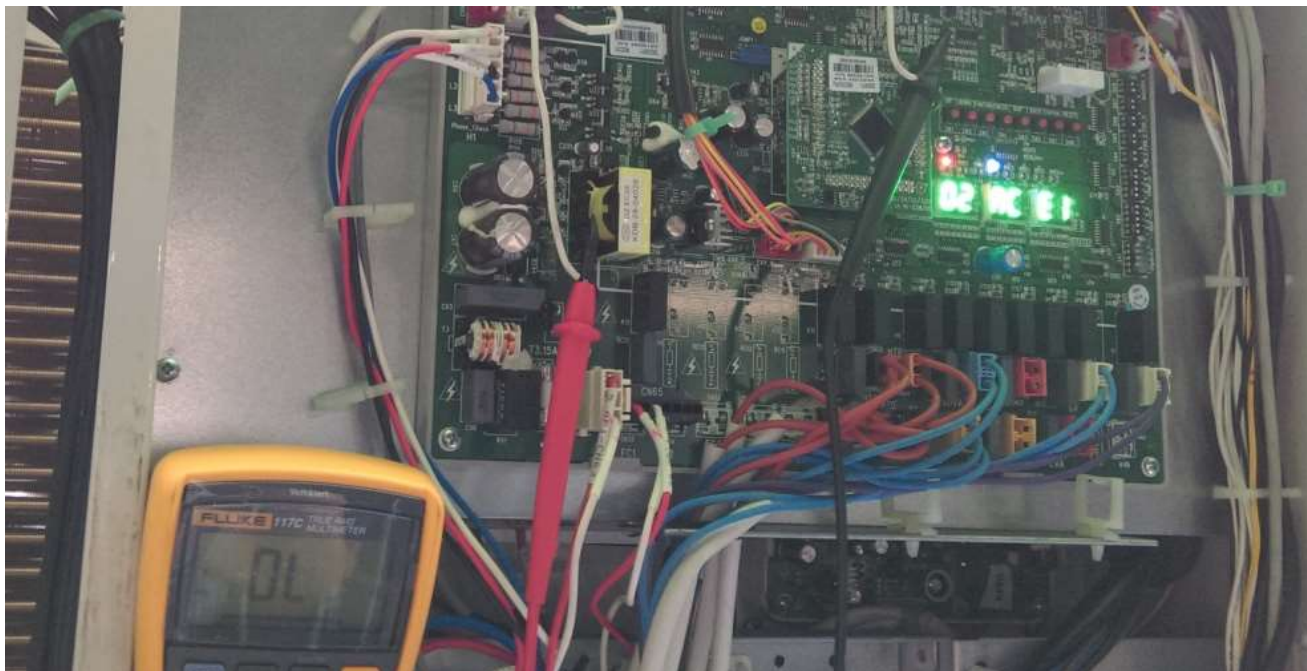




## Case2. E1 High pressure malfunction

Possible cause:

Secondly, when the unit displays E1 malfunction, use the multi-meter to test the high pressure switch is ok or not.

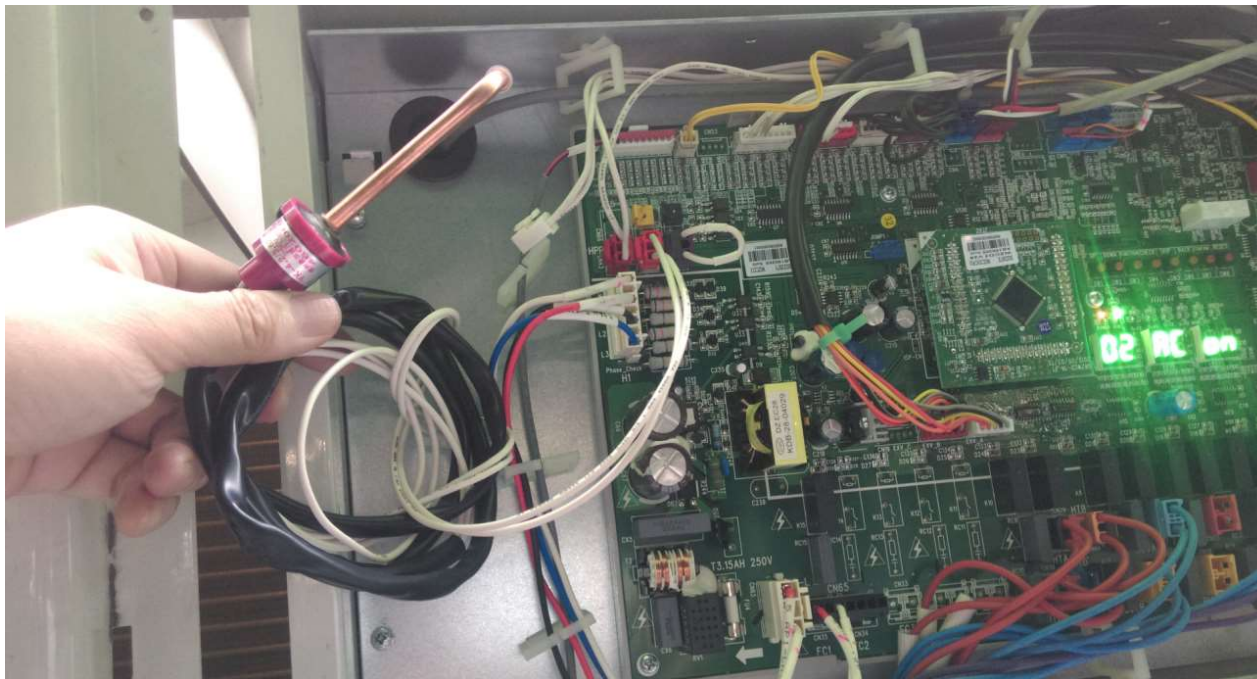




## Case2. E1 High pressure malfunction

Possible cause:

Thirdly, replace a new high pressure switch and then test run.  
Conclusion: The high pressure switch is broken. So that leads to E1 malfunction.

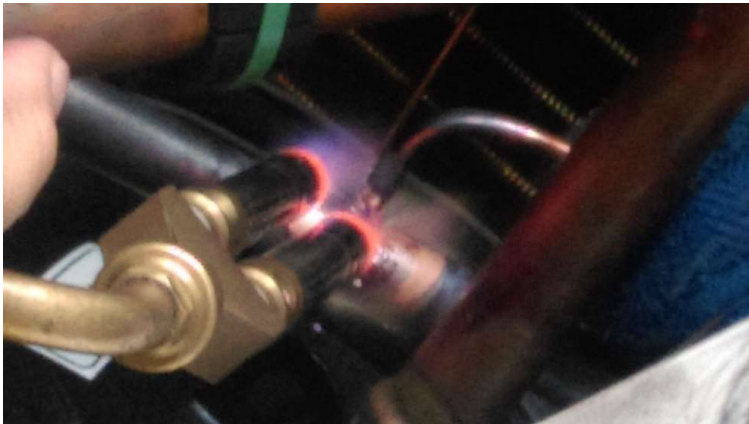




## Case2. E1 High pressure malfunction

Handling process:

Replace a new high pressure switch.







## Case3. E2 Low pressure malfunction

Malfunction description:

Malaysia GMV5 project: The unit displays E2 malfunction after running for a period of time. E2 malfunction means low discharging temp. protection.

额定容量	45	kW	化霜温度1	40	°C
主子机状态	子机2		过冷器液出温度	34	°C
室外环境温度	29	°C	过冷器气出温度	35	°C
压缩机1运行频率	58	Hz	汽分进管温度	2	°C
风机1运行频率	60	Hz	汽分出管温度	2	°C
风机2运行频率	56	Hz	室外机制热EXV	480	Pls
模块高压	40	°C	外风机静压模式	零静压	
模块低压	1	°C	压缩机1状态	开	
压缩机1排气温度	67	°C	压缩机2状态	开	
压缩机1壳顶温度	69	°C	四通阀1状态	关	
压缩机2排气温度	72	°C	低压测量阀状态	开	
压缩机2壳顶温度	-100	°C	压缩机1电流	10.78	A

Discharging temperature is only 67°C





## Case3. E2 Low pressure malfunction

Possible cause:

Firstly, the air outlet temp. of No. 7 IDU fluctuates obviously.  
The range is 3°C~30°C.

The air outlet temp. of No. 8 IDU is higher than normal temp.  
As below:

工程编号	机型	额定容量	主内机	开关机状态	模式	风速	温度设定	室内环境温度	入管温度	出管温度	室内出风温度	EXV
7	风管机(PHE)	22.4	主	开机	制冷	高速	16	23	8	-3	0	180
12	风管机(PHE)	22.4	从	开机	制冷	高速	16	23	7	13	0	170
10	风管机(PHE)	28	从	开机	制冷	高速	16	18	3	7	0	170
8	风管机(PHE)	22.4	从	开机	制冷	高速	16	22	6	19	0	170
91	风管机(PHE)	28	从	开机	制冷	高速	16	23	3	3	0	170
11	风管机(PHE)	22.4	从	开机	制冷	高速	16	16	6	9	0	170
9	风管机(PHE)	22.4	从	开机	制冷	高速	16	23	6	5	0	170

工程编号	机型	额定容量	主内机	开关机状态	模式	风速	温度设定	室内环境温度	入管温度	出管温度	室内出风温度	EXV
7	风管机(PHE)	22.4	主	开机	制冷	高速	16	23	9	30	0	180
12	风管机(PHE)	22.4	从	开机	制冷	高速	16	23	7	14	0	170
10	风管机(PHE)	28	从	开机	制冷	高速	16	18	3	6	0	170
8	风管机(PHE)	22.4	从	开机	制冷	高速	16	22	7	19	0	170
91	风管机(PHE)	28	从	开机	制冷	高速	16	23	3	3	0	170
11	风管机(PHE)	22.4	从	开机	制冷	高速	16	16	5	9	0	170
9	风管机(PHE)	22.4	从	开机	制冷	高速	16	23	6	4	0	170



## Case3. E2 Low pressure malfunction

Possible cause:

Secondly, the discharging temp. is about 65°C. It is a little low because normal temp. should be 70~90°C.

模块地址: 外机2	
额定容量	28 kW
主子机状态	子机2
室外环境温度	36 °C
压缩机1运行频率	60 Hz
风机1运行频率	35 Hz
风机2运行频率	0 Hz
模块高压	2.439 Mpa
模块低压	0.857 Mpa
压缩机1排气温度	63 °C
压缩机1壳顶温度	63 °C
压缩机2排气温度	-30 °C
压缩机2壳顶温度	-100 °C
化霜温度1	39 °C
过冷器液出温度	34 °C
过冷器气出温度	32 °C
汽分进管温度	3 °C
汽分出管温度	2 °C
室外机制热EXV	480 Pls
外风机静压模式	零静压
压缩机1状态	开
压缩机2状态	关
四通阀1状态	关
低压测量阀状态	开
压缩机1电流	10.49 A



## Case3. E2 Low pressure malfunction

Possible cause:

Thirdly, to fix the discharging sensor. And test the sensor to confirm if the resistance value is normal or not.





## Case3. E2 Low pressure malfunction

Possible cause:

Fourthly, to check the IDU tube sensor. We find out that the sensor is not the ex-factory sensor. Our customer told us that the ex-factory sensor was broken and they bought a new resistance to replace the sensor from their local market.

Conclusion: The new resistance our customer bought from local market cannot work normally. That makes the EEX work abnormally and makes the discharging temp. low.



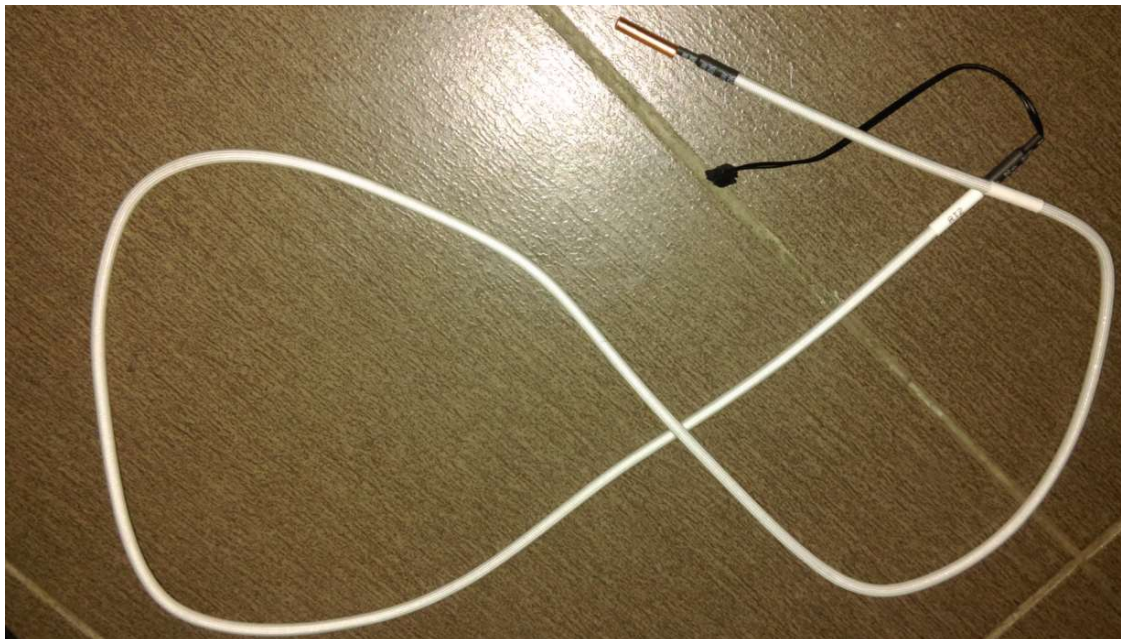




## Case3. E2 Low pressure malfunction

Handling process:

Replace a new IDU tube sensor. The sensor model should be accordance with the ex-factory specification.

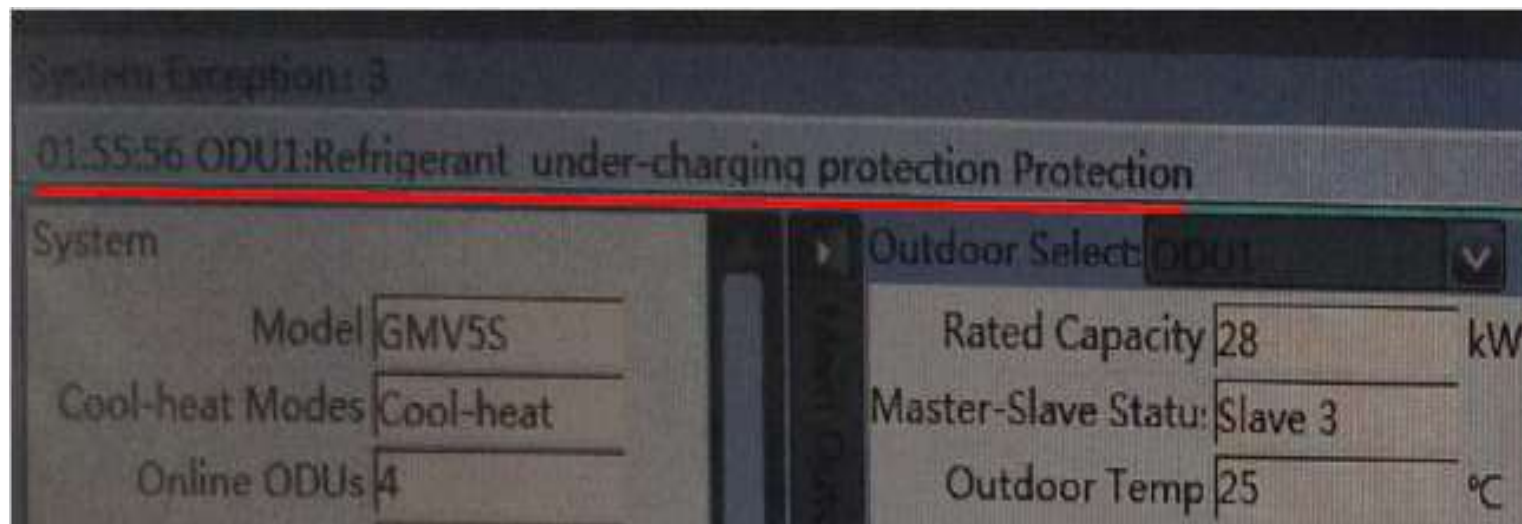




## Case4. U4 Refrigerant Shortage Protection

### Malfunction description:

Ecuador GMV5 project: The unit displays U4 malfunction after running for a period of time. U4 malfunction means the unit is lack of refrigerant.

A screenshot of a digital display for an HVAC system. At the top, it says "System Exception: 3" and "01:55:56 ODU1:Refrigerant under-charging protection Protection". Below this, there's a table with system parameters. The "Outdoor Select" dropdown is set to "ODU1". The table lists Model (GMV5S), Cool-heat Modes (Cool-heat), Online ODUs (4), Rated Capacity (28 kW), Master-Slave Statu (Slave 3), and Outdoor Temp (25 °C).

System Exception: 3	
01:55:56 ODU1:Refrigerant under-charging protection Protection	
System	Outdoor Select ODU1
Model GMV5S	Rated Capacity 28 kW
Cool-heat Modes Cool-heat	Master-Slave Statu Slave 3
Online ODUs 4	Outdoor Temp 25 °C



## Case4. U4 Refrigerant Shortage Protection

Possible cause:

Firstly, we check out that the static state data is abnormal before starting the unit. When the ambient temp. is 25 °C, the high and low pressure of the 4 pieces ODU in the same system is 5~6°C (almost 9 kilogram) . But the static state of other normal system is 17~18kilogram.

Abnormal static state value

Outdoor Select: ODU1			
Rated Capacity	28	kW	ODU Fan Static Pre 0 Static Press
Master-Slave Status	Slave 3		Comp1 Status Off
Outdoor Temp	25	°C	Comp2 Status Off
Comp1 Operation F	0	Hz	4-way Valve1 Off
Comp2 Operation F	0	Hz	LP Measure Valve On
Fan1 Operation Fre	0	Hz	Comp1 Current 0 A
Fan2 Operation Fre	0	Hz	Comp1 Busbar Volt 299 V
Module HP	5	°C	Comp1 IPM Temp 30 °C
Module LP	6	°C	Fan1 Current 0 A
Comp1 Discharge T	28	°C	Fan1 Busbar Voltage 299 V
Comp1 Shell Temp	34	°C	Fan1 IPM Temp 30 °C
Comp2 Discharge T	-30	°C	Comp2 Current 0 A
Comp2 Shell Temp	-30	°C	Comp2 Busbar Volt 0 V

Normal static state value

Outdoor Select: ODU2			
Rated Capacity	28	kW	ODU Fan Static Pre 0 Static Press
Master-Slave Status	Master		Comp1 Status Off
Outdoor Temp	19	°C	Comp2 Status Off
Comp1 Operation F	0	Hz	4-way Valve1 Off
Comp2 Operation F	0	Hz	LP Measure Valve On
Fan1 Operation Fre	0	Hz	Comp1 Current 0 A
Fan2 Operation Fre	0	Hz	Comp1 Busbar Volt 308 V
Module HP	17	°C	Comp1 IPM Temp 25 °C
Module LP	18	°C	Fan1 Current 0 A
Comp1 Discharge T	25	°C	Fan1 Busbar Voltage 307 V
Comp1 Shell Temp	31	°C	Fan1 IPM Temp 25 °C
Comp2 Discharge T	-30	°C	Comp2 Current 0 A
Comp2 Shell Temp	-30	°C	Comp2 Busbar Volt 0 V





## Case4. U4 Refrigerant Shortage Protection

Possible cause:

Secondly, start the unit and observe the running data when the ambient temp. is about 21°C. When the unit runs for about 10 minutes, we check out that the high pressure reaches to 33 kilogram, but the low pressure is only 5.3kilogram. And the high and low pressure is not stable.

Outdoor Select: ODU1			
Main Outdoor	Rated Capacity	45	kW
	Master-Slave Statu:	Master	
	Outdoor Temp	21	°C
	Comp1 Operation f	59	Hz
	Comp2 Operation f	100	Hz
	Fan1 Operation Fre	20	Hz
	Fan2 Operation Fre	16	Hz
	Module HP	3.3	Mpa
	Module LP	0.538	Mpa
	Comp1 Discharge T	70	°C
	Comp1 Shell Temp	86	°C
	Comp2 Discharge T	70	°C
	Comp2 Shell Temp	83	°C
	ODU Heating EXV	480	Pl
	ODU Fan Static Pre	0	Static Pressu
		Comp1 Status	On
		Comp2 Status	On
		4-way Valve1	Off
		LP Measure Valve	Off
		Comp1 Current	29.41 A
		Comp1 Busbar Volt	281 V
		Comp1 IPM Temp	46 °C
		Fan1 Current	0.15 A
		Fan1 Busbar Voltage	280 V
		Fan1 IPM Temp	31 °C
		Comp2 Current	30 A





## Case4. U4 Refrigerant Shortage Protection

Possible cause:

Thirdly, to judge the quality of the refrigerant is ok or not. Take one tin of the refrigerant from the system to test the refrigerant pressure. The pressure is 13.6 kilogram. The corresponding saturation temp. is about 20°C. And the outdoor ambient temp. is about 25°C. The difference is 5 °C. So, the refrigerant is not OK.





## Case4. U4 Refrigerant Shortage Protection

Possible cause:

Fourthly, we try to release the refrigerant from the valves to judge the quality. Put your hand on the pipe nozzle find out that the refrigerant is not cool. We can judge the refrigerant is not OK.





## Case4. U4 Refrigerant Shortage Protection

Handling process:

To replace new refrigerant. Buy qualified refrigerant. Test the saturation temp. and compare the ambient temp. The difference is  $1.5^{\circ}\text{C}$ . Judging the refrigerant is normal. Release the refrigerant. Vacuum the whole system. And then charge qualified refrigerant. At last run the unit.







## Case4. U4 Refrigerant Shortage Protection

### Handling process:

The static state data is normal. The high and low pressure which are corresponding to the saturation temp and ambient temp are almost the same. The difference is about 1~2 °C. It is normal.

Outdoor Select: ODU2					
Rated Capacity	28	kW	ODU Fan Static Pre	0	Static Pressu
Master-Slave Statu	Master		Comp1 Status	Off	
Outdoor Temp	19	°C	Comp2 Status	Off	
Comp1 Operation f	0	Hz	4-way Valve1	Off	
Comp2 Operation f	0	Hz	LP Measure Valve	On	
Fan1 Operation Fre	0	Hz	Comp1 Current	0	A
Fan2 Operation Fre	0	Hz	Comp1 Busbar Volt	308	V
Module HP	17	°C	Comp1 IPM Temp	25	°C
Module LP	18	°C	Fan1 Current	0	A





## Case4. U4 Refrigerant Shortage Protection

Handling process:

The unit runs normally. The U4 malfunction disappears. All of the data is OK.

System		Outdoor Unit										Indoor Unit									
Model: LHM5L		Rated Capacity: 15					LW: ODU Heating DRV480					Rated Capacity: 15					kW: ODU Heating DRV480				
Cool/Heat Modes: Cool/Heat		Master/Slave Status: Master					ODU Fan Static Press Static Press					Master/Slave Status: Slave 1					ODU Fan Static Press Static Press				
Online ODU: 4		Outdoor Temp: 15					Comp1 Status: ON					Outdoor Temp: 14					Comp1 Status: ON				
Defrost IDU: 13		Comp1 Operation: 125					Comp2 Status: ON					Comp1 Operation: 148					Comp2 Status: ON				
4-way Valve: ON		Comp2 Operation: 187					4-way Valve: ON					Comp2 Operation: 18					4-way Valve: ON				
Comp1 Preheat Time: 1.5		Fan1 Operation: 126					LP Measure Value: ON					Fan1 Operation: 113					LP Measure Value: ON				
Compressor Status: Running		Fan2 Operation: 123					Comp1 Current: 14.74					Fan2 Operation: 116					Comp1 Current: 15.77				
Defrosting Status: No		Module HP: 2.12					MpaComp1 Busbar Volt: 287					Module HP: 2.12					MpaComp1 Busbar Volt: 288				
DR Return Status: No		Module LP: 2.004					MpaComp1 3PM Temp: 62					Module LP: 2.004					MpaComp1 3PM Temp: 60				
Quiet Function: Quiet Mode: 0		Comp1 Discharge: 170					Fan1 Current: 0.25					Comp1 Discharge: 177					Fan1 Current: 0.18				
Vacuum pumping: No		Comp1 Shell Temp: 67					Fan1 Busbar Voltage: 288					Comp1 Shell Temp: 71					Fan1 Busbar Voltage: 288				
Refrigerant Callous: Indoor Reflog		Comp2 Discharge: 175					Fan1 3PM Temp: 61					Comp2 Discharge: 1710					Fan1 3PM Temp: 63				
Recovery Status: No		Comp2 Shell Temp: 70					Comp2 Current: 19					Comp2 Shell Temp: 70					Comp2 Current: 19				
Capacity Limit: 100		Defrosting Temp: 125					Comp2 Busbar Volt: 288					Defrosting Temp: 134					Comp2 Busbar Volt: 288				
Auto Energy Saving: Comfort		Subcooler Gas Temp: 13					Comp2 3PM Temp: 57					Subcooler Gas Temp: 13					Comp2 3PM Temp: 59				
Defrosting Cycle: 50		Subcooler Gas Temp: 65					Fan2 Current: 0.11					Subcooler Gas Temp: 63					Fan2 Current: 0				
Distribution Rate: 133		Separator Inlet: 9					Fan2 Busbar Voltage: 289					Separator Inlet: 10					Fan2 Busbar Voltage: 289				
Emergency Mode: Nothing		Separator Outlet: 1					Fan2 3PM Temp: 66					Separator Outlet: 12					Fan2 3PM Temp: 68				

Project Number	Model	Rated Capacity	Master IDU	On-off Status	Mode	Fan Speed	Temp Setting	Indoor Air Temp	Indoor Pipe Temp	Outdoor Pipe Temp	Indoor Outdoor Air Temp	DRV Status	Auto-Defrost	Micro-Defrost	Self-Defrost	Anti-Frost Protection	Room Number	Alarm Status
12	Unit01-Ph	22.8	Master	On	Cooling	High	18	18	7	8	5	18	ON	ON	ON	Normal	12	Normal
13	Unit02-Ph	13.1	Slave	On	Cooling	High	18	18	3	23	0	20	ON	OFF	ON	Normal	13	Normal
14	Unit03-Ph	22.8	Slave	On	Cooling	High	18	18	5	20	0	5	ON	ON	ON	Normal	14	Normal
15	Unit04-Ph	28	Slave	On	Cooling	High	18	18	18	28	0	18	ON	ON	ON	Normal	15	Normal
16	Unit05-Ph	28	Slave	On	Cooling	High	18	18	4	4	0	15	ON	ON	ON	Normal	16	Normal



**THANK YOU**

