Service Manual

ARV Outdoor Unit

ARV 6 All DC Inverter T1

ARV-H250/SR1MV

ARV-H280/SR1MV

ARV-H330/SR1MV

ARV-H400/SR1MV

ARV-H450/SR1MV

ARV-H500/SR1MV

ARV-H560/SR1MV

ARV-H610/SR1MV

2018.8

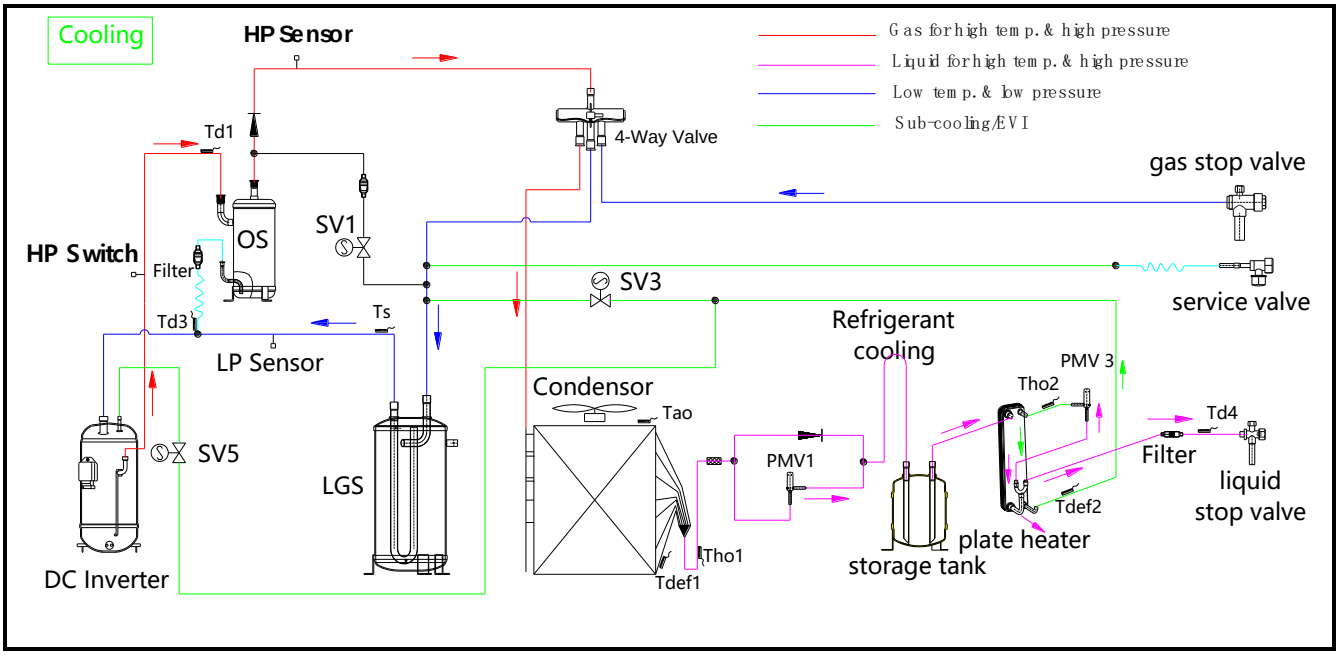
CONTENT

Part1 Refrigerant Circuit

1. Cooling Operation

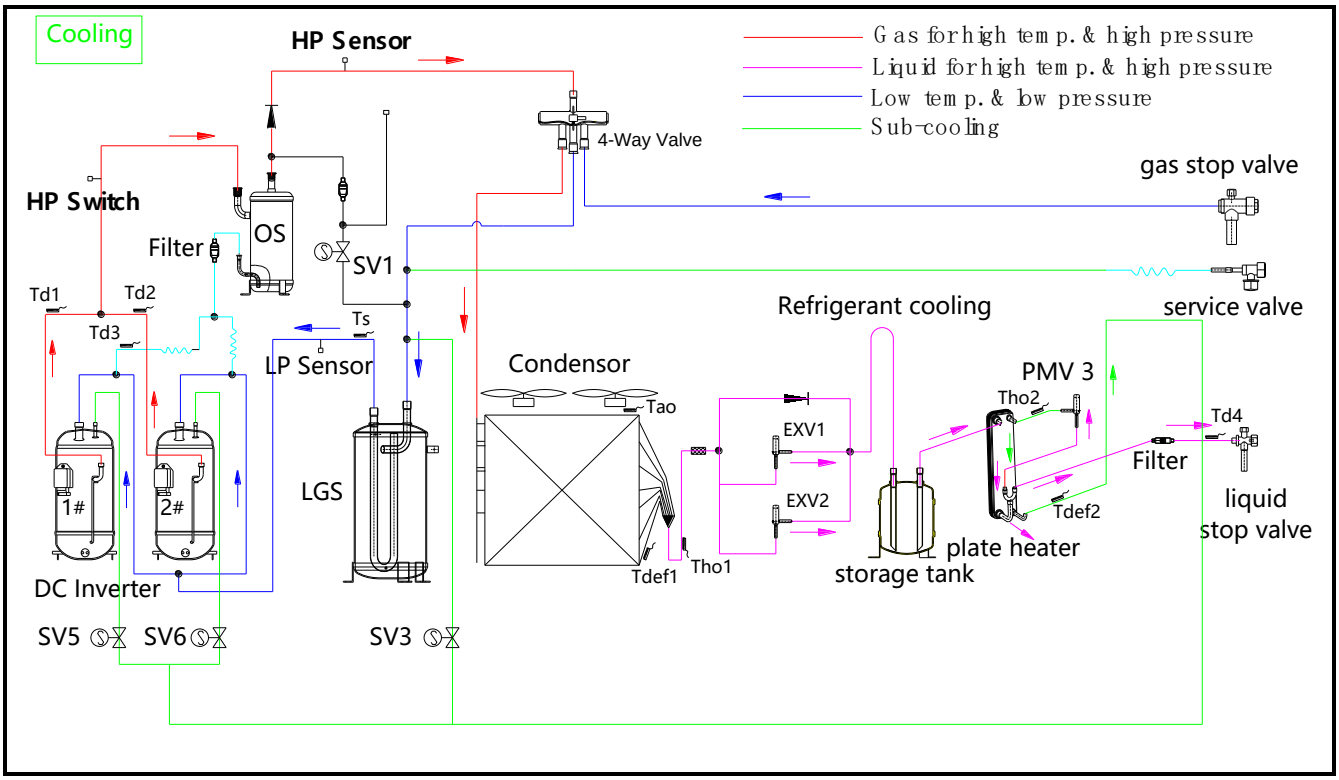
ARV-H250/SR1MV, ARV-H280/SR1MV, ARV-H330/SR1MV

ARV-H400/SR1MV, ARV-H450/SR1MV



NO.	Component (Sensors)	Full name
1	T_{ho2}	Outlet temperature of PMV3
2	T_{def2}	Outlet temperature of sub-cooler
3	T_{ao}	Environment temperature
4	T_s	Gas-liquid separator outlet/Suction temperature
5	T_{ho1}	Condenser outlet temperature
6	T_{def1}	Defrost temperature
7	T_{d1}	Discharge of compressor 1#
8	T_{d3}	Oil temperature
9	T_{d4}	Liquid piping temperature of ODU

ARV-H500/SR1MV, ARV-H560/SR1MV, ARV-H610/SR1MV



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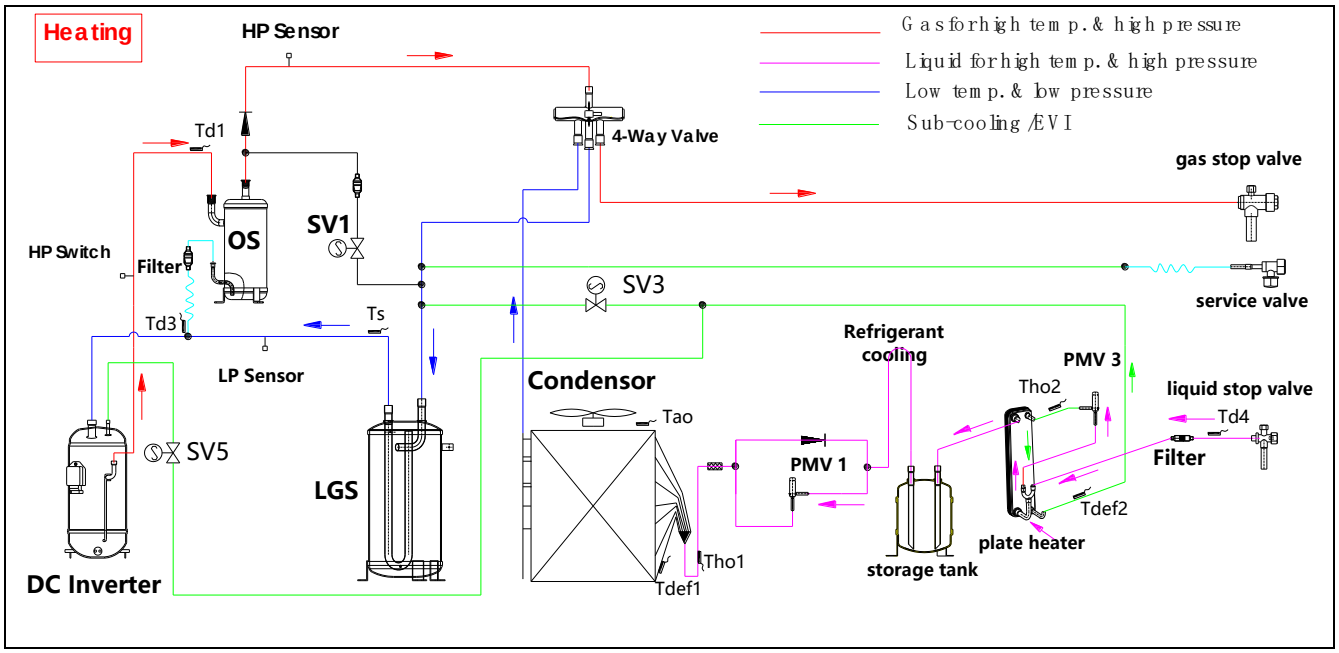
9	T_{d4}	Liquid piping temperature of ODU
10	T_{d2}	Discharge of compressor 2#

2. Heating Operation

ARV-H250/SR1MV, ARV-H280/SR1MV, ARV-H330/SR1MVARV-H400/SR1MV, ARV-H450/SR1MV



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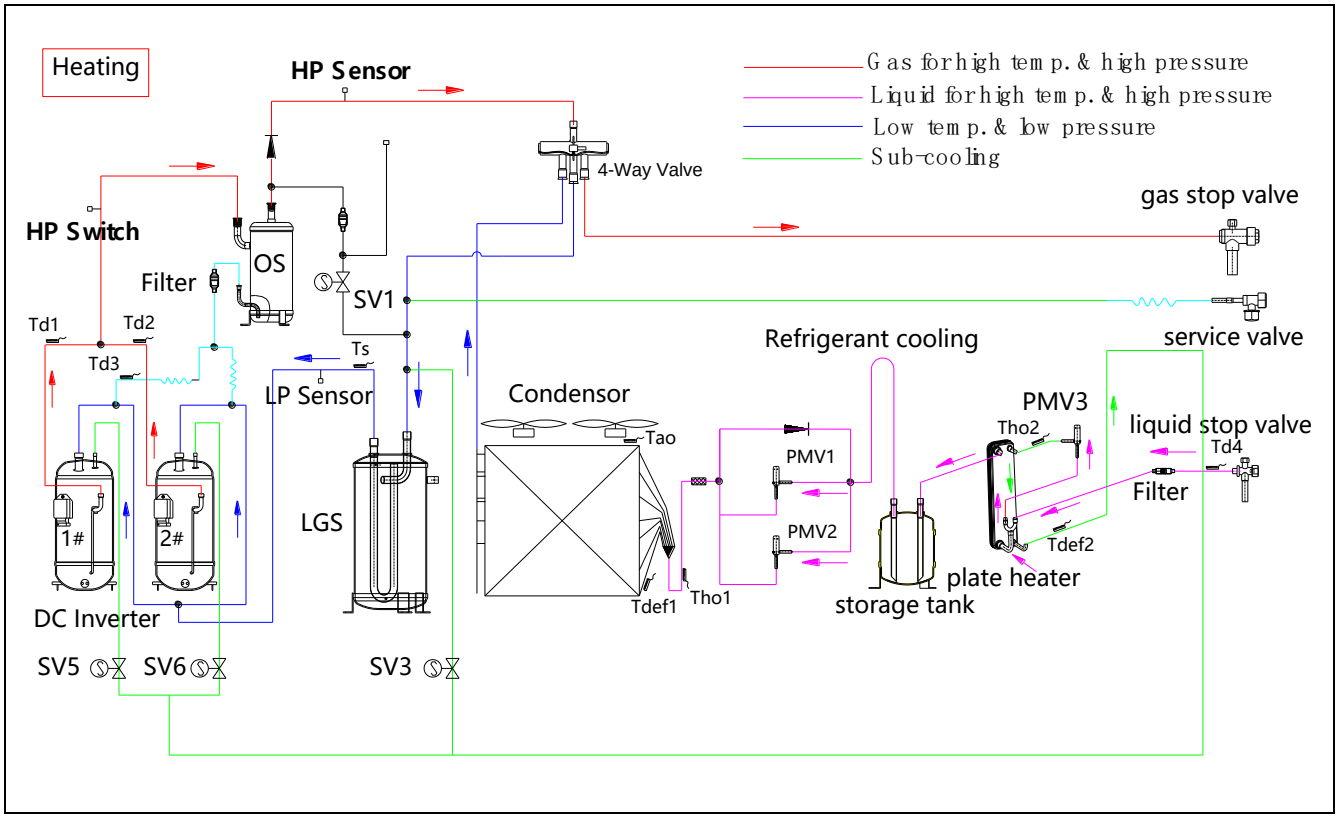
ARV-H500/SR1MV, ARV-H560/SR1MV, ARV-H610/SR1MV



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10	T_{d2}	Discharge of compressor 2#

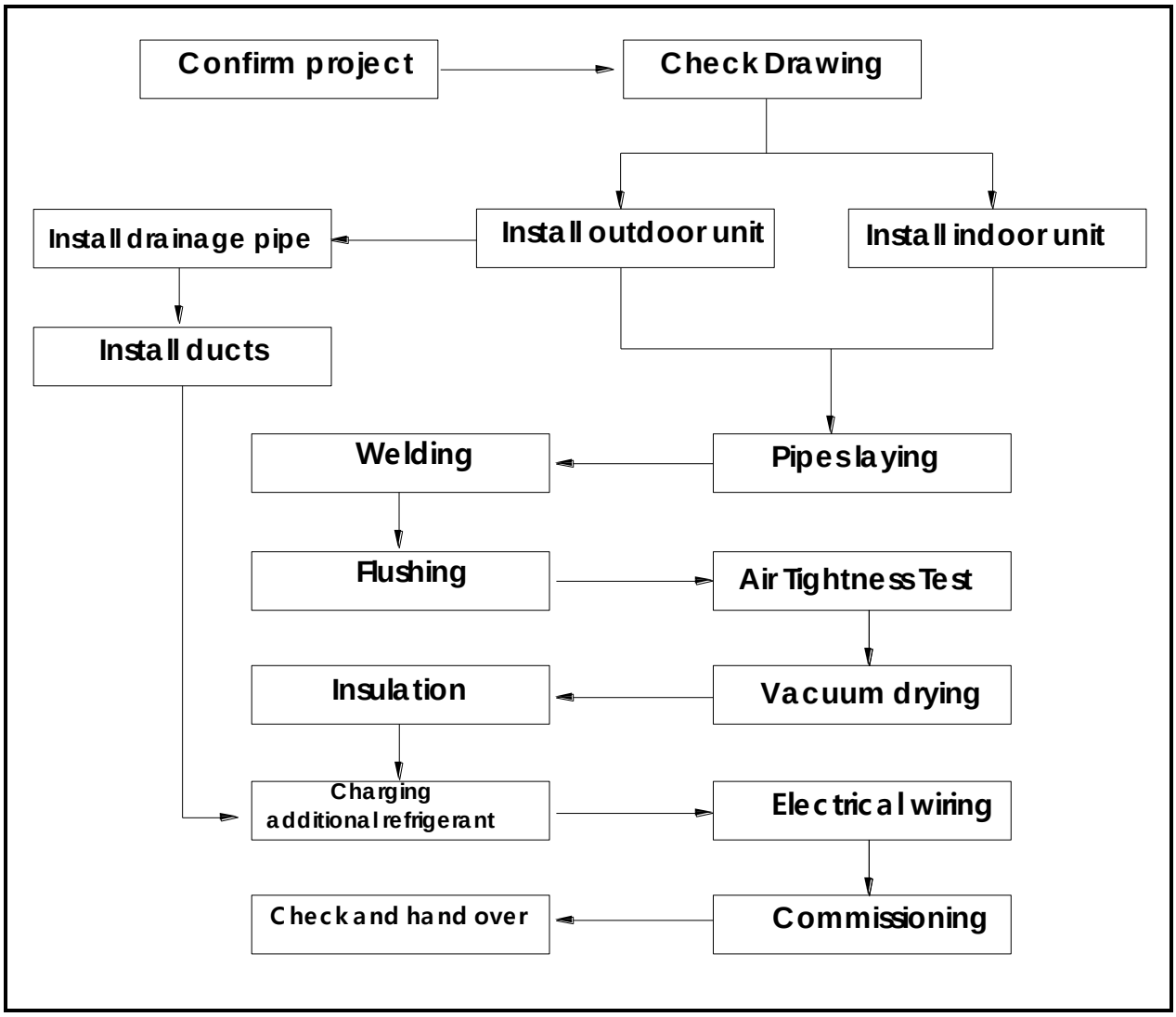
3. Component introduce

Component name	Main function
DC Inverter	**DC inverter Compressor :** Compressor work frequency range is 20~120 Hz.
HP Switch	**High Pressure Switch:** When refrigerant high pressure value over the target pressure value , switch valve is disconnected, signal is interrupted ,then stop running to protect the refrigerant system
OS	**Oil Separator:** To separate refrigeration oil and high pressure refrigerant
Filter	Filter impurities to avoid blockage of electronic expansion valve
SV1	**Unload Valve**
SV5/ SV6	**Enhance vapor injection Valve**
HP sensor	**High Pressure Sensor:** Detecting refrigerant system high pressure value
4-way valve	Change the refrigerant flow direction to achieve cooling or heating mode
Plate Heater	**Sub-cooler:** 5.5℃ sub-cooling by plate heat exchanger make sure liquid refrigerant flow into evaporator Instead of gas-liquid refrigerant flow into evaporator , reduce Airflow noise and temperature fluctuation and support long piping length
SV3	**Sub-cooling Valve**
Refrigerant Cooling	Well cooled by refrigerant, ensuring the long life time of the PCB

PMV	**EXV:** throttling and reducing refrigerant pressure
LGS	**Liquid-gas separator:** To separate gas refrigerant and liquid refrigerant
LP Sensor	**Low Pressure Sensor:** Detecting refrigerant system low pressure value

Part2 Installation

1. Preface of installation



⚠Caution

✧ The proper design and installation is a critical element of ARV system, installation of piping and electrical works must be carried out by ***suitably qualified, certified professionals*** and in accordance with all applicable legislation.

✧ In this service manual, the term “applicable legislation” refers to all national, local and other laws, standard, codes, rules, regulations and other legislation that apply in a given situation.

2. Installation of Outdoor Unit

2.1 Installation Location and Foundation

1. Ensure that the outdoor unit is ***installed in a dry, well-ventilated place***.

2. Ensure that the ***noise and exhaust ventilation*** of the outdoor unit ***do not affect the neighbors*** of the property owner or any surrounding ventilation.

3. Ensure that the outdoor unit is ***installed in a cool place*** without direct sunlight exposure or direct radiation of a high-temp heat source.

4. The ***outdoor unit*** should ***be installed*** as ***close*** as possible ***to the indoor unit***.

5. The installation location must be ***far from waste and oil mist***.

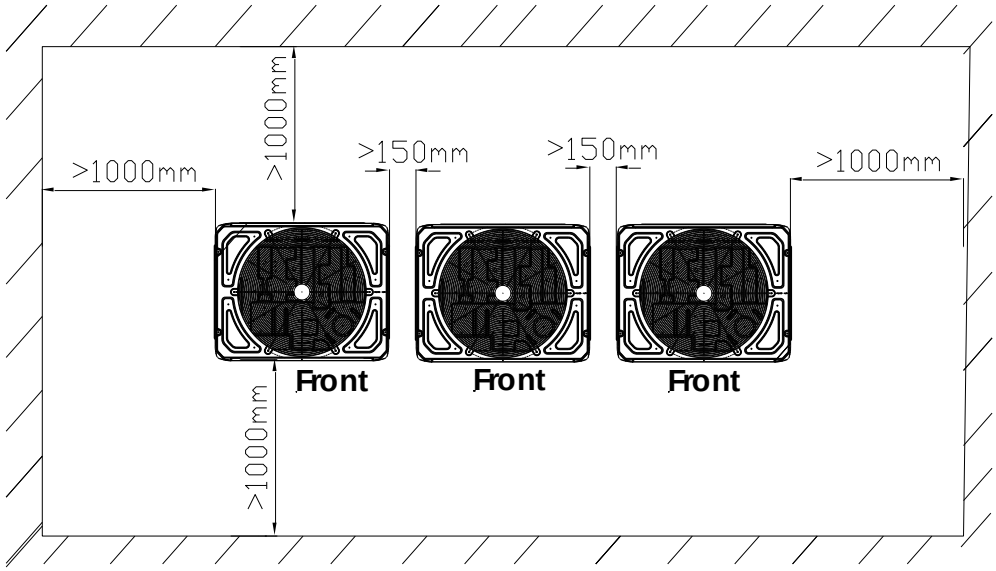
6. The ***foundation should be strong enough*** to support the outdoor unit.

2.2 Pre tools

Tape measure	Spanner	Electric hammer
		
Screw driver	**Nut gasket**	**Level meter**
		

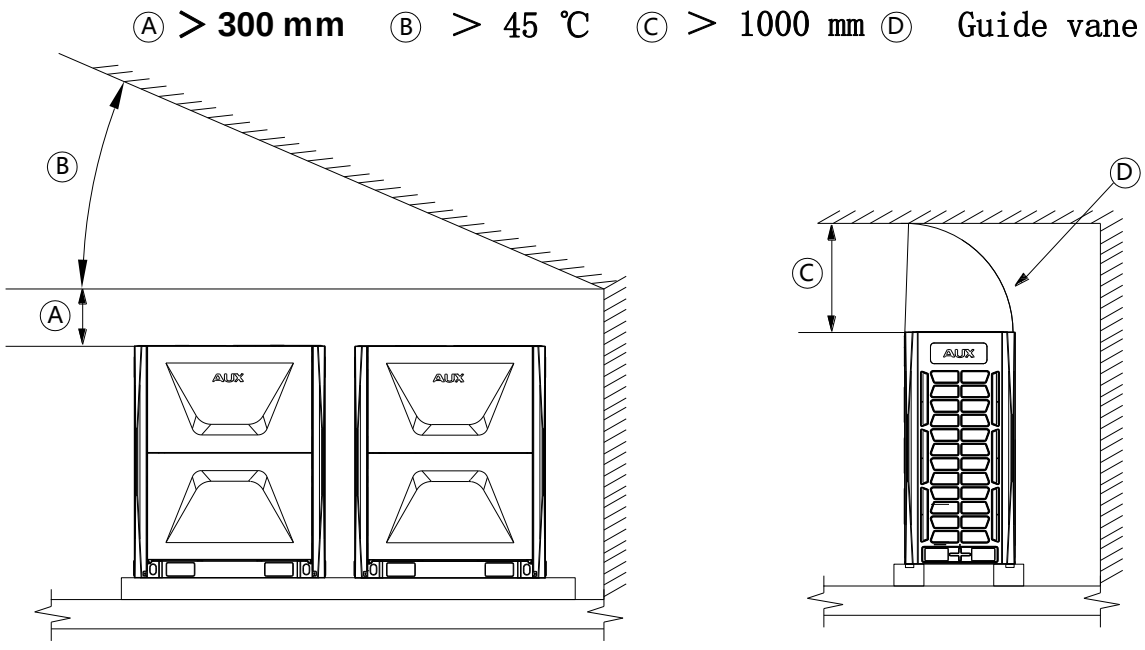
2.3 Maintenance and Ventilation Space

2.3.1 Ensure necessary installation and maintenance space.



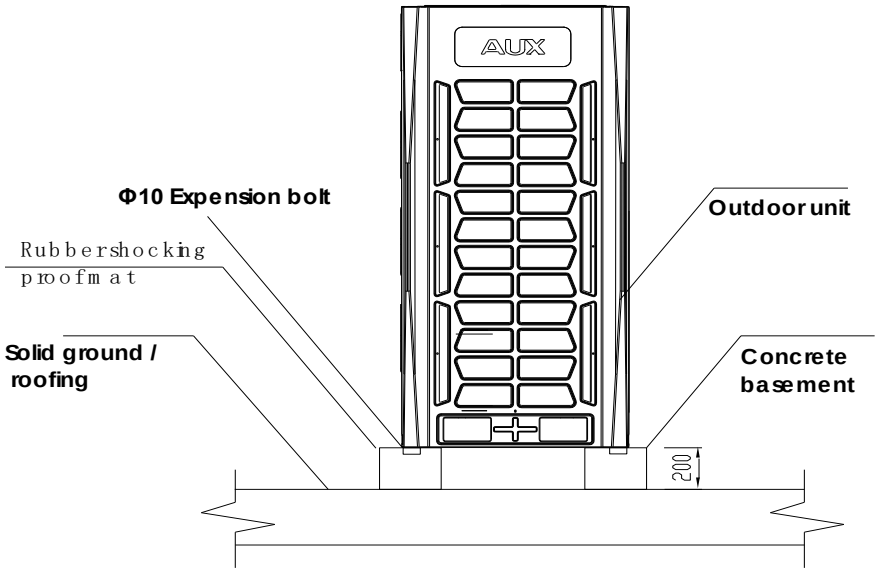
2.3.2 If there are ***two rows of outdoor units***, we ***suggest face to face installation*** for easy maintenance, and avoid air short circuit.

2.3.3 If miscellaneous articles are piled around the outdoor unit, it should be ***at least 1000mm higher*** than the top of outdoor unit. Otherwise, a mechanical discharge device must be added to improve the ventilation.

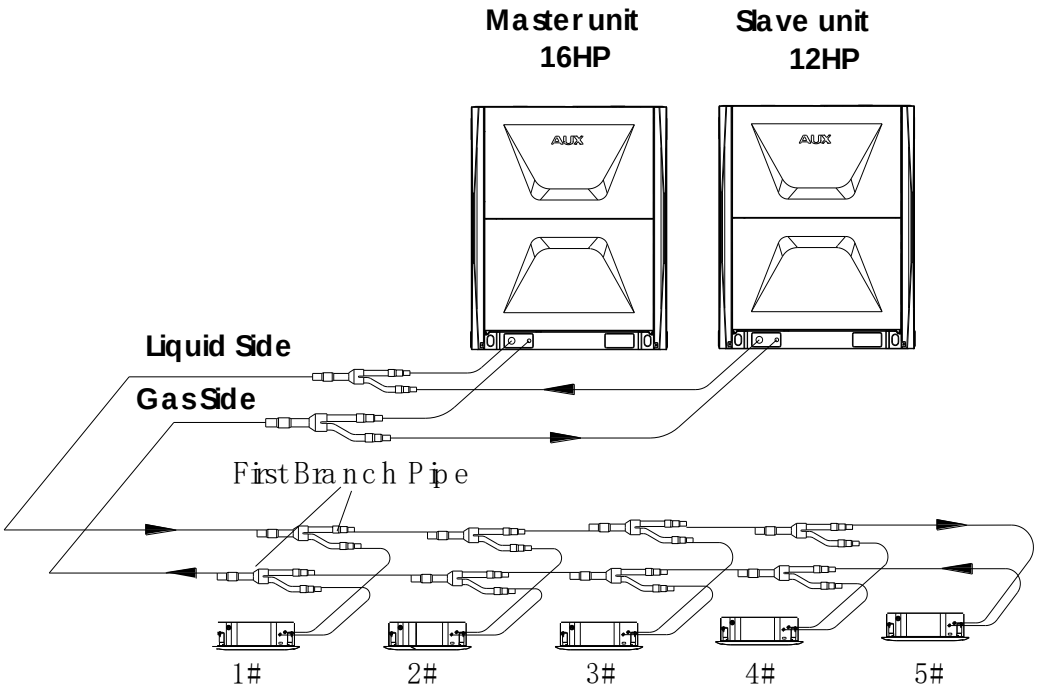


2.4 Installation of Outdoor Unit

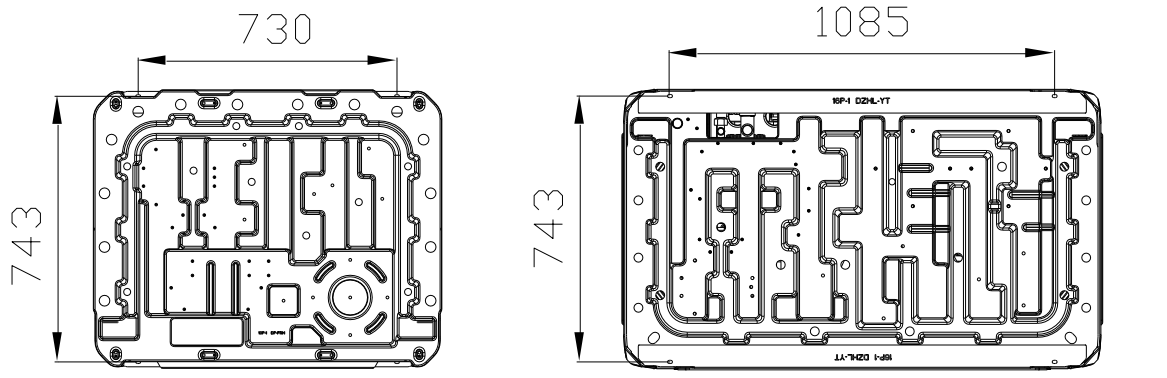
2.4.1 Tighten outdoor unit on mounting support with ***M10*** bolt and nut, and keep it horizontal. The bolt should have a proper length of 20mm more than base surface.



2.4.2 If the system has more than two outdoor units. The ***largest capacity*** unit should ***be set as the master unit***, while the ***others should be set as slave*** units, as shown in the following example.



2.4.3 The installation space for a fixed bolt, please refer to the following drawing.



8HP,10HP,12HP 14HP,16HP,18HP,20HP,22HP

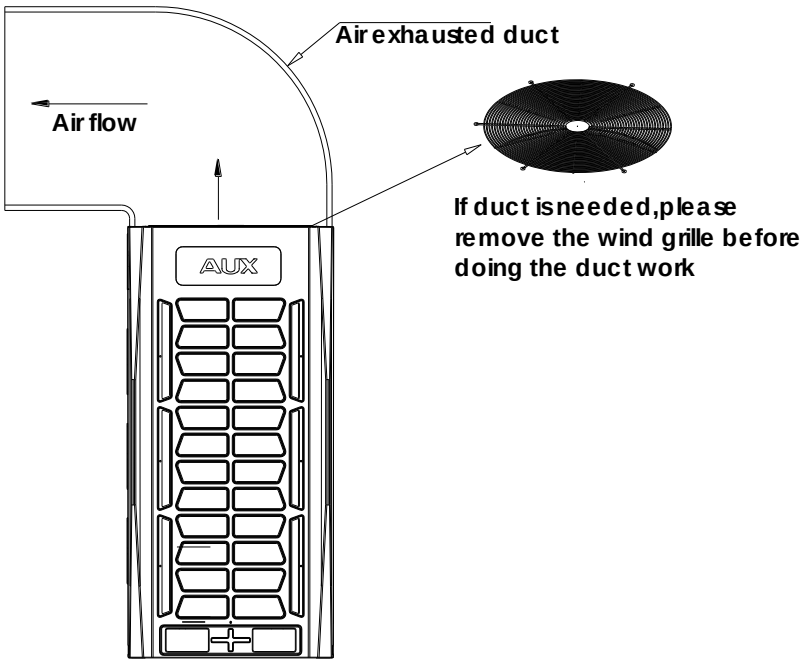
2.4.4 The foundation can be made of ***channel steel or concrete***. ***Reserve*** the space for ***discharging*** the condensate ***water*** from outdoor units.

2.4.5 Install drainage channels to ensure condensed ***water flow out*** smoothly.

2.4.6 ***Don't*** use ***four-square base*** to support outdoor unit.

2.4.7 ***Rubber anti-vibration pads*** are necessary to avoid ***vibration***.

2.4.8 If the outdoor unit need side air flow outlet by a ***duct***, it is necessary to ***remove*** out the wind ***grille***.



3. Pipes Laying

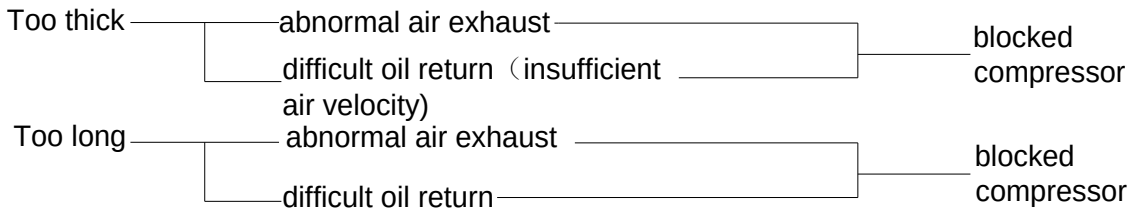
3.1 Pre tools

Tube expander	Spanner	Expander
		
Screw driver	Electric hammer	**Pipe bender**
		
Mounting bracket hanger	Hoop	Expansive bolt
		

3.2 Selection of copper pipe

3.2.1 Please use ***seamless red copper pipe***.

3.2.2 ***Specification*** of refrigerant pipe should be selected according to ***unit requirement***

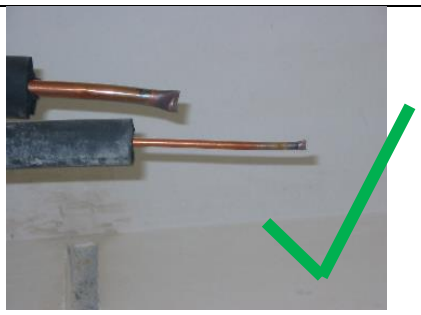


※ ***Thickness of copper tube***

Specifications		Thickness (mm)	Weight / length	
inch	mm		1m =* Kg	1Kg=* m
1/4	Φ 6.35	0.8	0.124	8.06
3/8	Φ 9.52	0.8	0.195	5.12
1/2	Φ 12.7	0.9	0.297	3.36
5/8	Φ 15.88	1.0	0.416	2.4
3/4	Φ 19.05	1.0	0.505	1.98
7/8	Φ 22.22	1.2	0.706	1.41
1	Φ 25.4	1.2	0.813	1.23
	Φ 28.6	1.2	0.92	1.08
	Φ 31.8	1.2	1.11	0.9
	Φ 34.9	1.3	1.223	0.817
	Φ 38.1	1.4	1.438	0.695

	Φ 41.3	1.5	1.671	0.598
	Φ 44.5	1.5	1.823	0.554

3.2.3 If ***pipes*** will be ***stored*** for a ***long time***, the pipes should be ***charged*** into ***0.2~0.5MPa N2*** and the ***nozzle*** should be ***sealed*** by welding.

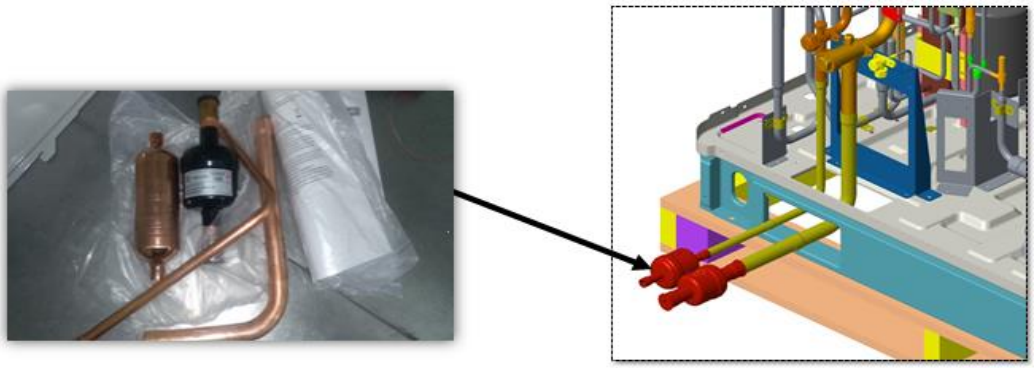


3.2.4 ***Don't let dust*** such as concrete fragment, sand and copper slag ingress ***into the system***;

3.2.5 ***Don't install pipe while raining to prevent water ingression****;* blocking capillary or expansion valve, generating acid Iron/copper erosion due to refrigerant hydrolysis, generating foreign matter crystal (cage compounds) due to reaction of refrigeration oil

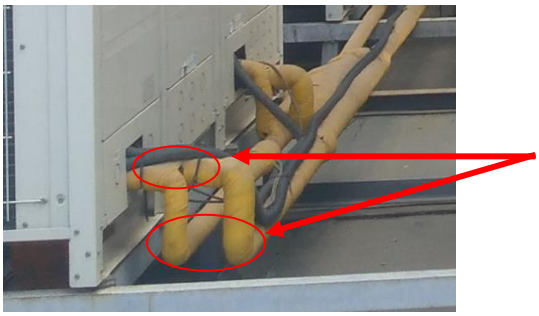
3.3 Accessory bag

Accessory bag in outdoor unit



3.4 Bending of copper tube

3.4.1 ***Do not*** right angle ***bending many times in a short distance***



3.4.2 ***Pipe bender must be used*** for pipe bending. The curvature can't be too small, otherwise the pipe may be bent and shrunken, affecting refrigerant flow;

3.4.3 ***Don't repeat bending*** and unbending operation over three times on the same position of pipe (because pipe will be hardened in this way).

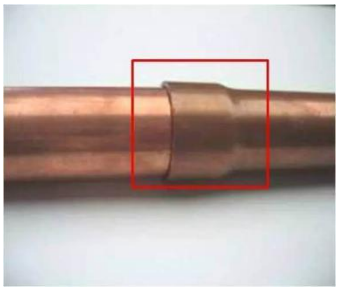
		

3.5 Flaring of copper tube

3.5.1 The ***burr*** of the copper tube ***should be removed*** before the copper tube is expanded

3.5.2 It is required to expand the inside diameter at connection area with ***Tube expander***

3.5.3 The copper pipe connected to the indoor units needs to be expanded by ***Expander***

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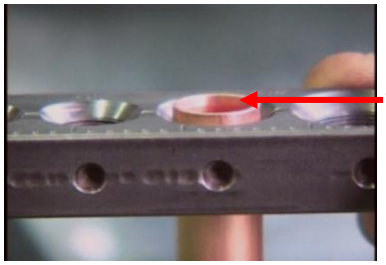
<tr><td> 
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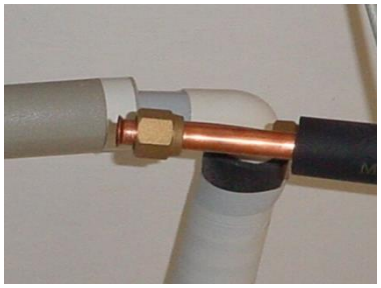
<tr><td>  </td><td>  </td></tr>
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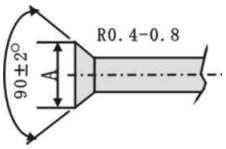
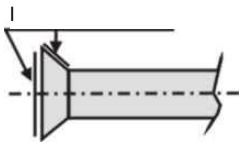
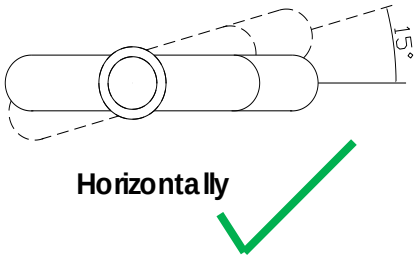
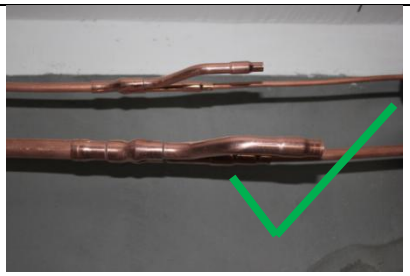
Flare pipe with ***Expander*** as per the dimensions of flaring opening in the following table.

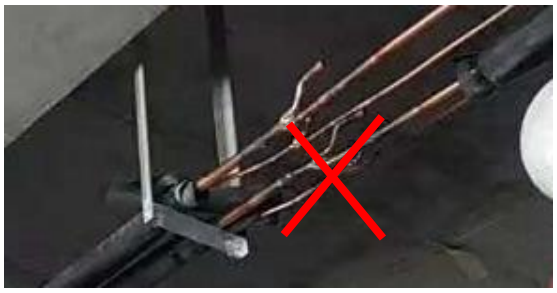
Diameter of pipe	Tightening torque	Machining dimension of	Shape of flaring	Apply oil
1/4in(φ6.35mm)	15-19 (N·m)	8.8-9.1mm		
3/8in(φ9.52mm)	35-40 (N·m)	12.8-13.2mm		
1/2in(φ12.7mm)	50-60 (N·m)	16.2-16.6mm		
5/8in(φ15.88mm)	68-80 (N·m)	19.2-19.6mm		
3/4in(φ19.05mm)	100-120 (N·m)	23.6-24mm		

3.6 Separation Tube (branch joint)

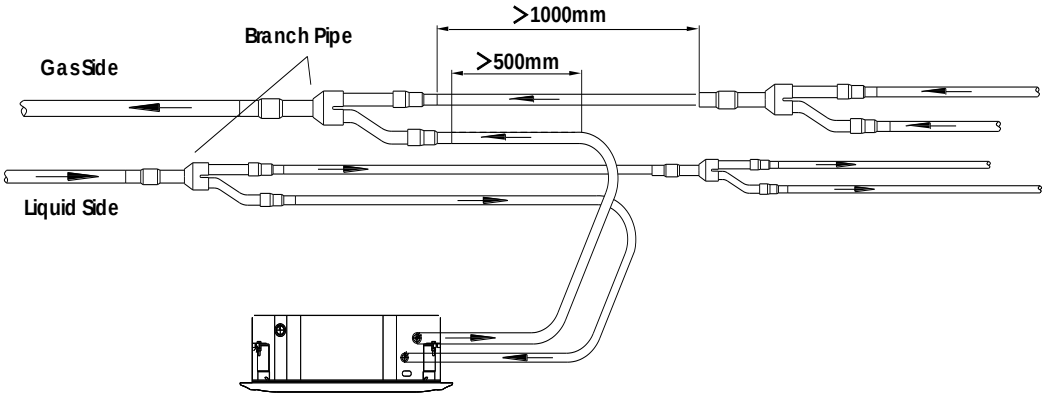
3.6.1 The ***branch*** joint must be installed ***horizontally*** and the lean ***angel*** should be ≤ 15° to avoid refrigerant distribution unbalance.





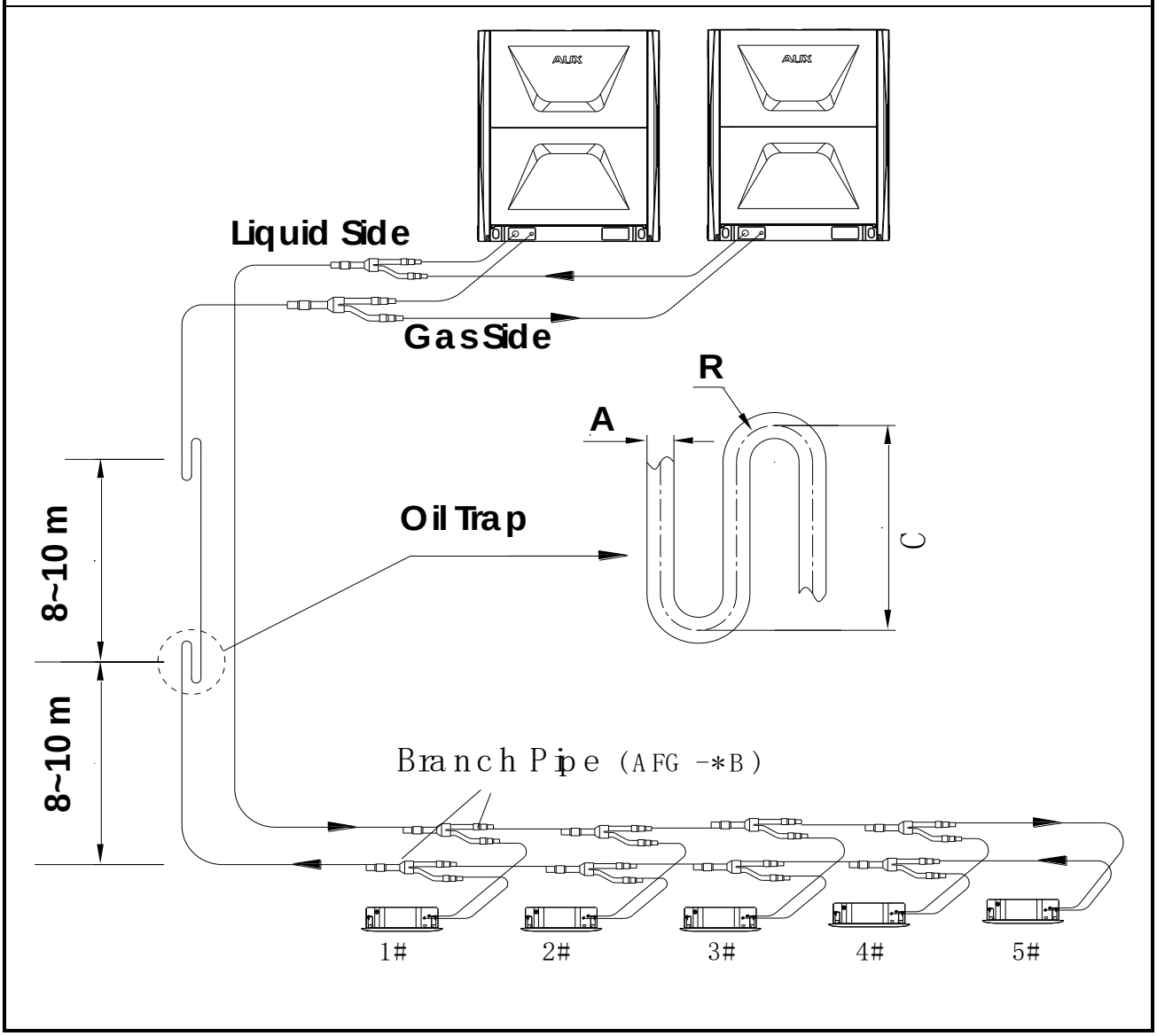


3.6.2 To ensure the refrigerant distribution is balance, pipe length which between two branch joints ≥1000mm, the straight pipe length after the branch pipe ≥500m



3.7 Oil Trap

When the Vertical ***height*** between indoor and outdoor units more than ***8 or 10 meters***, ensure the Refrigeration ***oil return to compressor*** smoothly, the ***oil trap is necessary***



A		R	C
mm	inch	mm	mm
Φ 19.05	3/4	≥ 31	≥ 105
Φ 22.22	7/8	≥ 31	≥ 150
Φ 25.4	1	≥ 45	≥ 150
Φ 28.6	9/8	≥ 45	≥ 150
Φ 34.9	11/8	≥ 60	≥ 250

3.8 Pipeline fixing

Refrigerant pipe should be fixed, when running, refrigerant pipe will sway, expand or shrink, if unfixed, load will concentrate on certain part, result fracture of refrigerant pipe. The pipe should be fixed ***every 1~2m***.

4. Welding

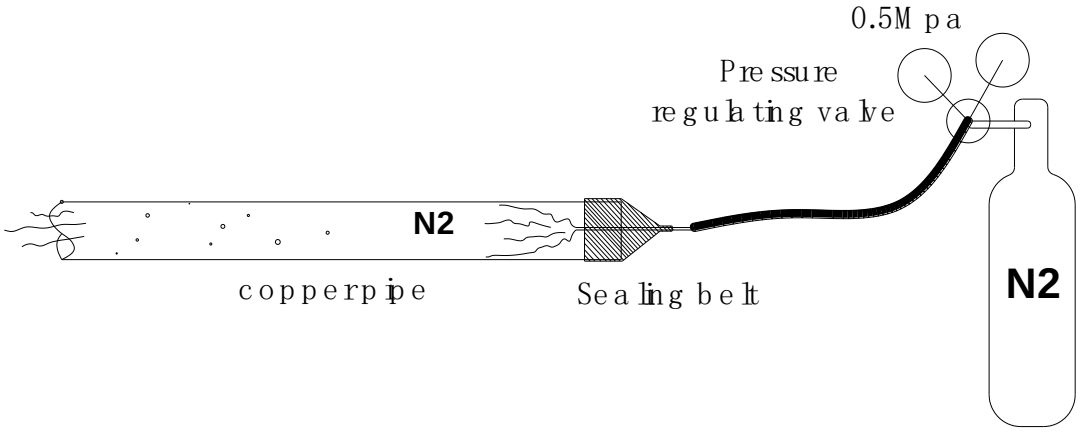
4.1 Pre tools

Nitrogen cylinder	Nitrogen pressure regulating valve	Nitrogen pressure gauge
		
Welding device	Connection hose	

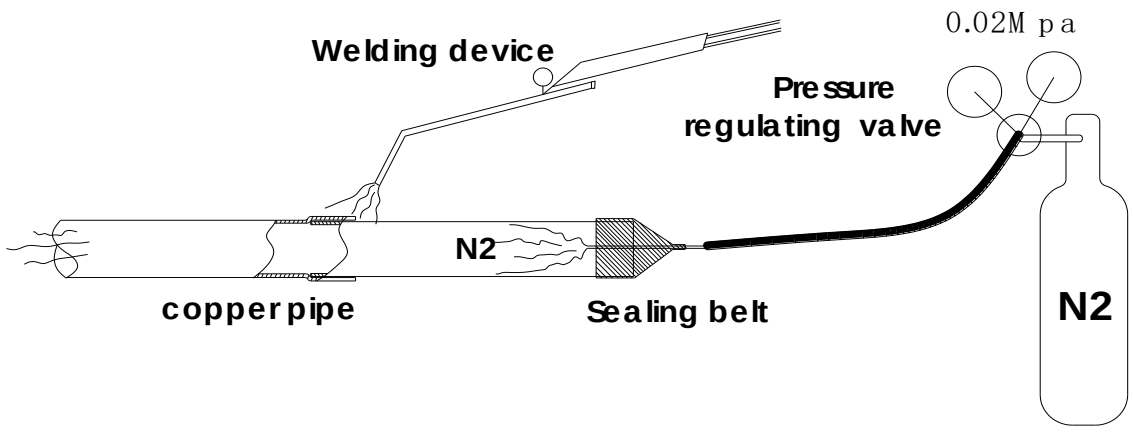
4.2 Flushing

Before connection use nitrogen（The pressure of the nitrogen is ***0.5 MPa***） or air to ***remove dust*** and ***moisture*** inside pipe.

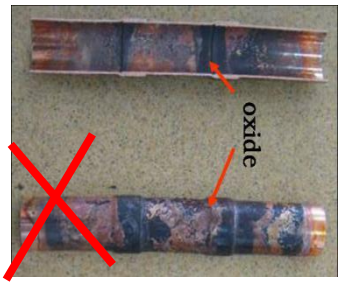


4.3 Fill nitrogen and welding

4.3.1 Ensure to fill nitrogen (The pressure of the nitrogen is ***0.02 MPa***) for protection when welding.



4.3.2 It's necessary to ***fill nitrogen to prevent*** oxidation layer ***(Cu_2O)*** formed in copper pipe when welding, otherwise substantial oxidation layers will cause blockage of capillary tube or expansion valve, abnormal discharge temperature, poor cooling or heating performance.

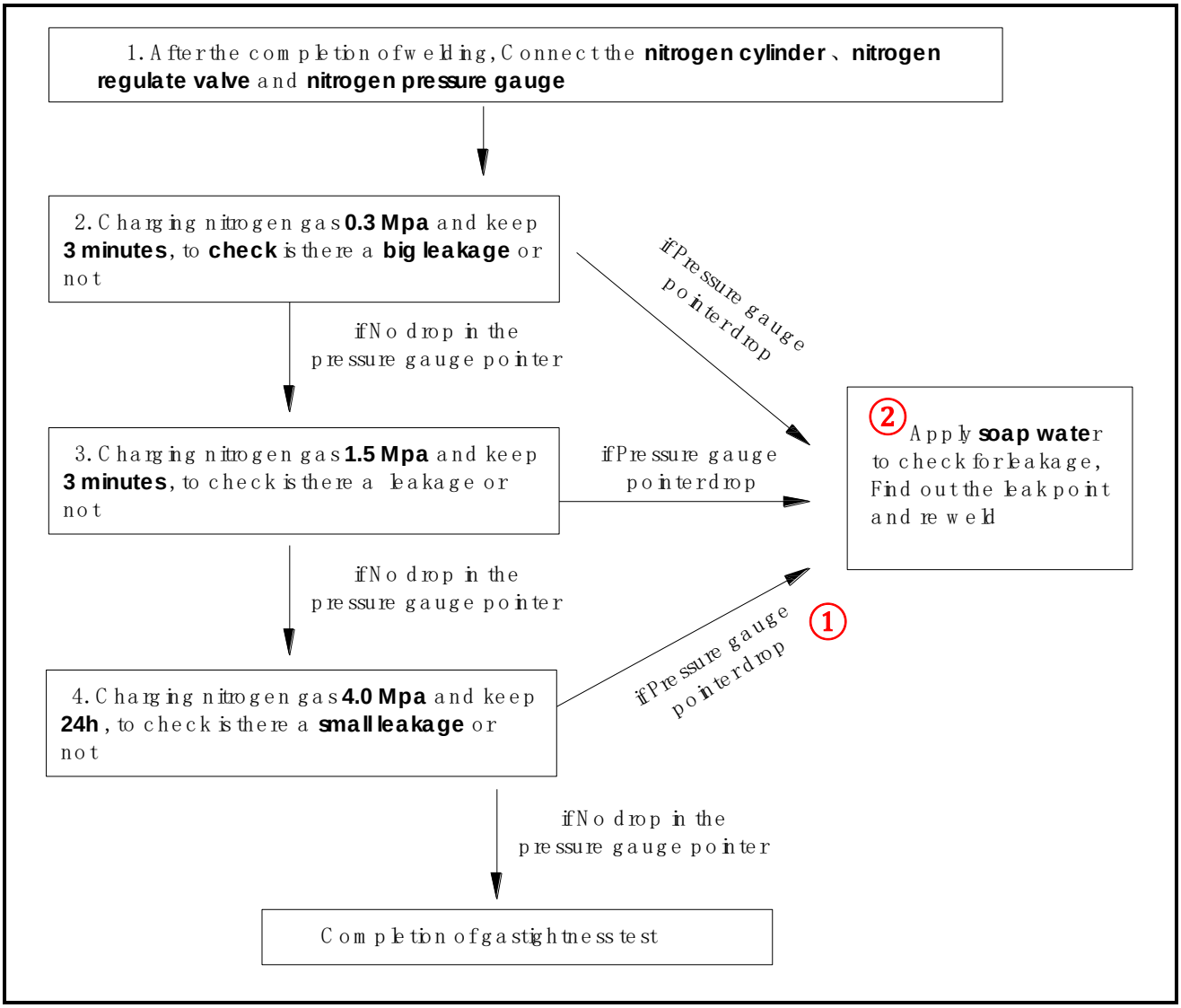
Charge N2 to the pipes	*NO N2 to the pipes*
	 *Cause blockage of EXV* *Cause Compressor wear* *Poor cooling/ heating performance*

4.3.3 If permitted, it's recommended to use ***less indoor units and shorter pipeline***

5. Gas Tightness Test

5.1 Purpose and Steps

To confirm whether there is leakage in pipe by using nitrogen, and the steps are as follows



① Observe pressure drops

It's necessary to correct if pressurized temperature is different from observed ambient temperature with difference of ***0.01MPa/1℃***.

Correction value = (Pressurized temperature - observed temperature) x 0.01

Example:

Pressure is 4.0 MPa and temperature is 25℃ in case of pressurization.

After 24 hours, if the pressure is 3.95MPa and temperature is 20℃, it is deemed qualified.

② **Check leakage point.**

If there is pressure drop but leakage point can't be found in pressure test:

1. Discharge nitrogen until the pressure is ***0.3MPa***.
2. Charge R410a refrigerant to ***0.5MPa*** (namely the mixed state of nitrogen and refrigerant).
3. Check with halogen lamp, butane gas (petroleum gas) detector and electric detector.
4. If leakage point can't be found, recheck by continuously pressurize up to ***2.8MPa***. (maximum pressure is 4.0MPa)

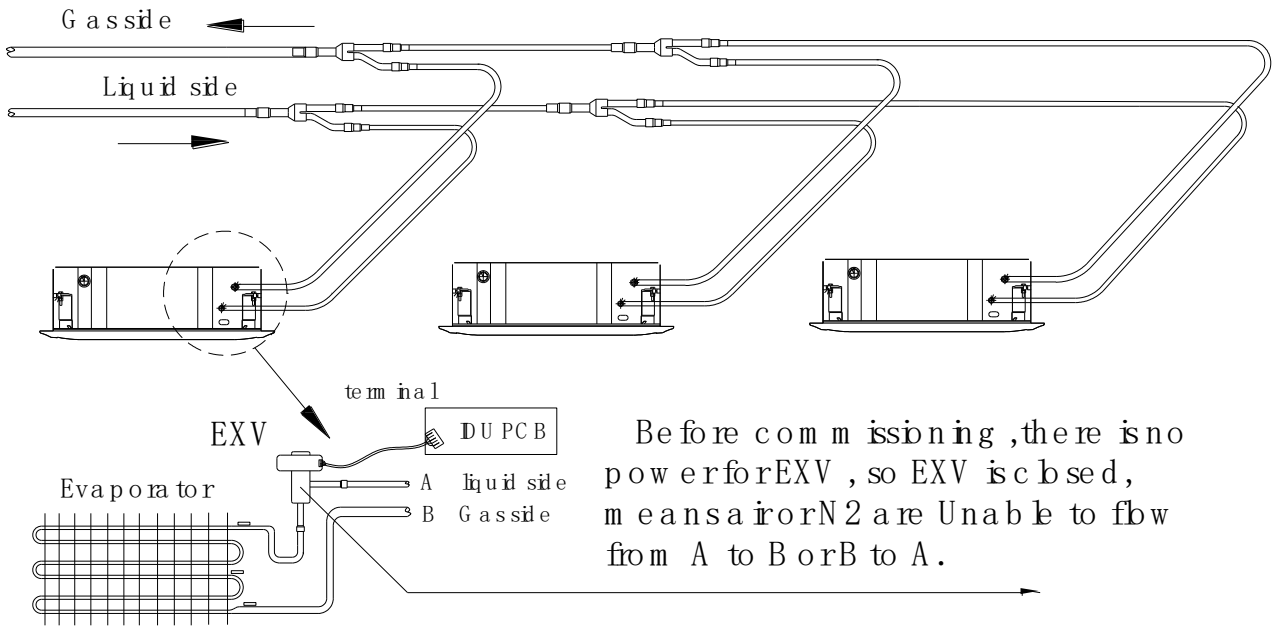
5.2 Pre Test tool

nitrogen cylinder	Nitrogen pressure regulating valve	Nitrogen pressure gauge
		
Soap water (Use of leakage)	Welding device (Use of leakage)	Connection hose

5.3 Caution

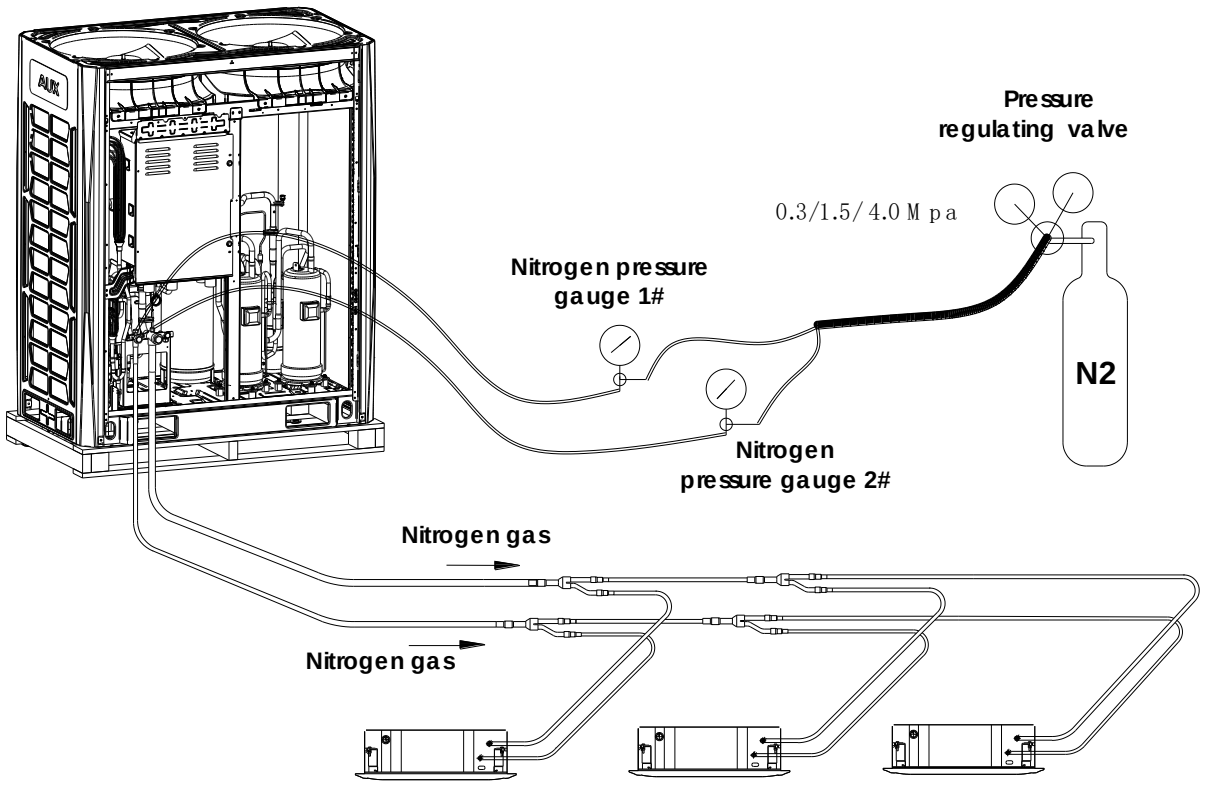
There is no power for indoor unit's EXV before commissioning, so the EXV is closed, the nitrogen gas unable to flow from A to B or B to A

So when charging the nitrogen gas, ***it should be charged from the both (liquid & gas) sides***

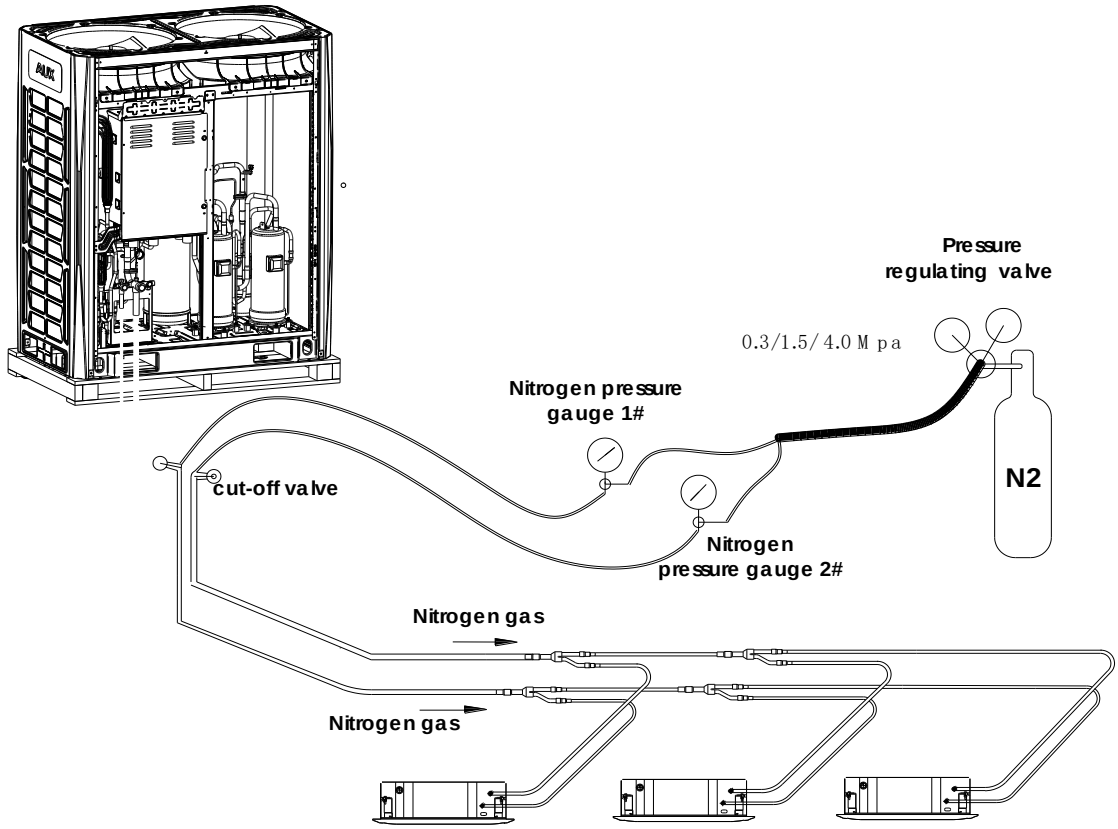


5.4 Schematic diagram

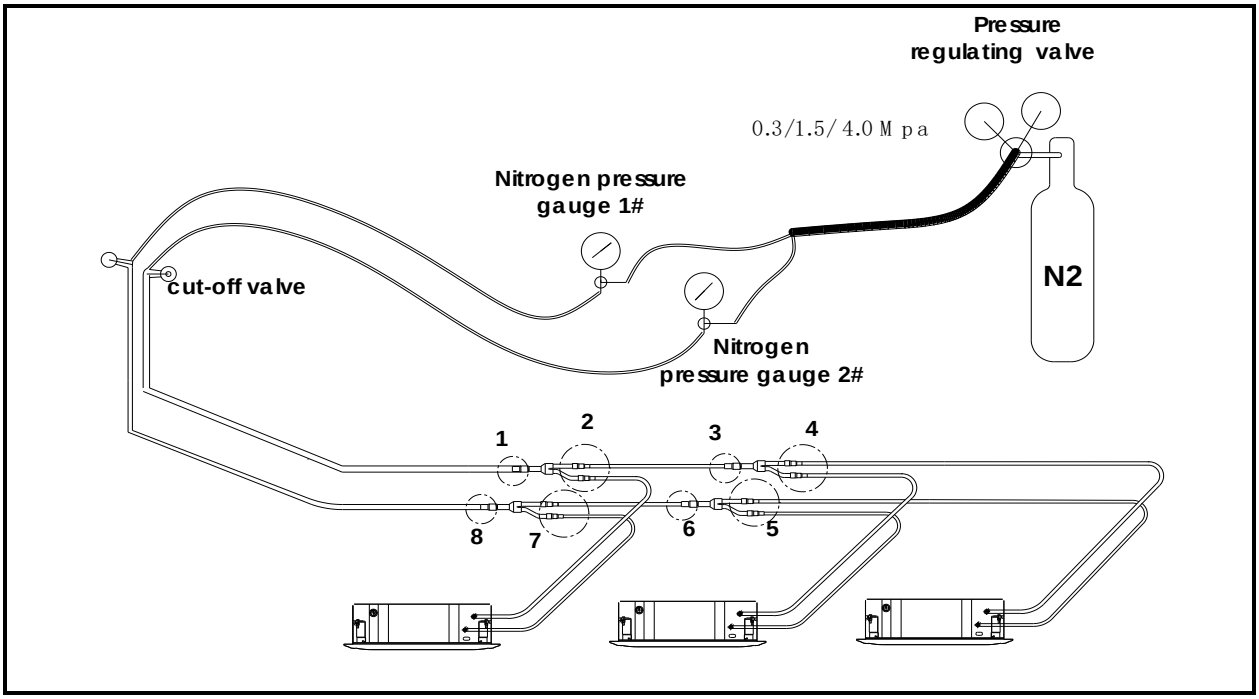
Nitrogen filling mode 1: Connect to gas and liquid cut-off valve



***Nitrogen filling mode 2**:* Connect to main gas & liquid piping



If pressure gauge point drops, apply soap water (*Focus on inspection of welding points, such as 1~8 below*) to check for leakage, Find out the leak point and re weld



6. Vacuum Drying

6.1 Selection of vacuum pump

1. Vacuuming suction must be less than -14.6PSI (756mmHg).

2. The discharge of vacuum pump is over ***4L/s.***

3. The precision of vacuum pump is over 0.001ft.H_2O (0. 02mmHg)

Note:

1. Under the normal air pressure, the boiling point of water (steam temperature) ***is 100℃***, but the pressure in vacuum pump pipe is near vacuum, this makes the boiling point lower to below the outside air temperature, and the water in the pipe is evaporated.

2. After the vacuuming process of R410A refrigerant circulation system is complete, vacuum pump will stop running. As a result of suction in the in the air conditioning system, vacuum pump lubricant will seep back into the system. This situation will also occur if vacuum pump suddenly stops during operation. It will cause different oils mix, leading to system malfunction, therefore it is recommended to use one-way valve to prevent reverse flow of oil in vacuum pump.

Water's boiling point (℃)	Pressure (mmHg)	Vacuum degree (mmHg)
40	55	-705
30	36	-724
26.7	25	-735
24.4	23	-737
22.2	20	-740
20.6	18	-742
17.8	15	-745
15.0	13	-747
11.7	10	-750
7.2	8	-752
0	5	-755

Example: When the ambient temperature is 7.2℃, vacuuming can be carried out under -752mmHg.

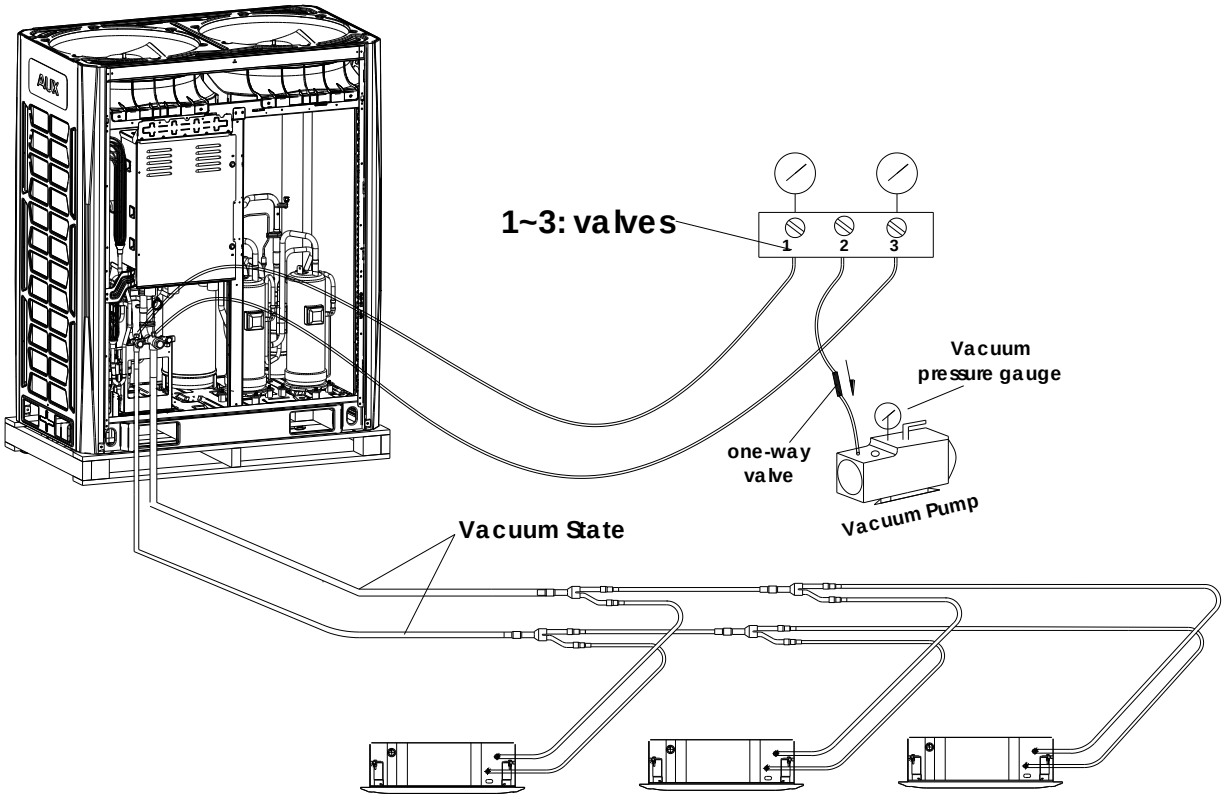
6.2 Pre tools

Vacuum pump (4L/s)	vacuum pressure gauge	Connection hose

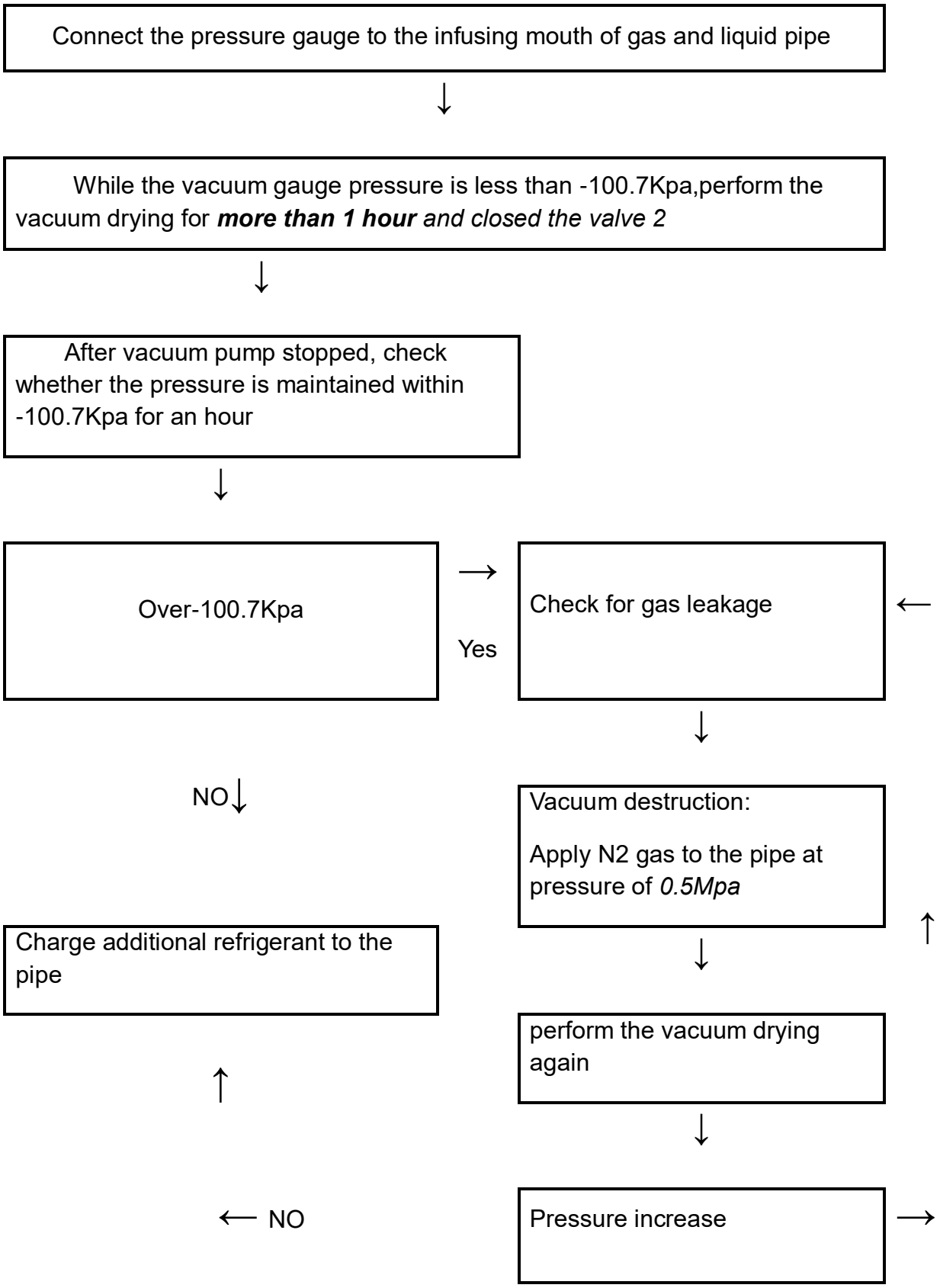

6.3 Schematic diagram

Gas and liquid stop valve must be closed, 1~3 valves should be opened

Vacuum pump with ***one-way valve*** to ***prevent pump oil*** from flowing backward while the vacuum pump is stopped



6.5 Vacuum drying



	Yes

7. Insulation

7.1 Purpose of Insulation

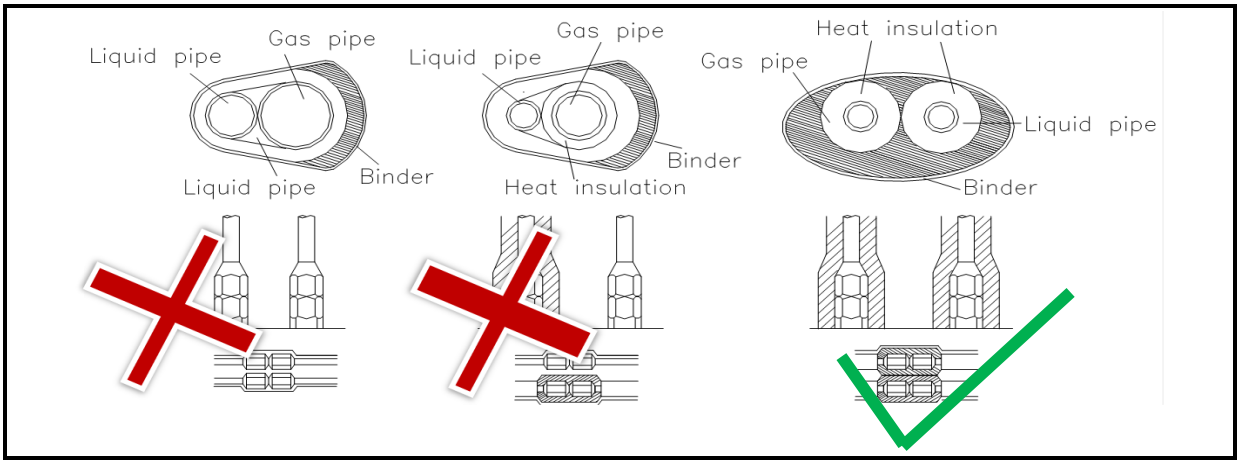
- Prevent condensate water adhere to the gas pipe
- Protect people from hurt of high temp.
- Avoid energy loss

7.2 Pre tools

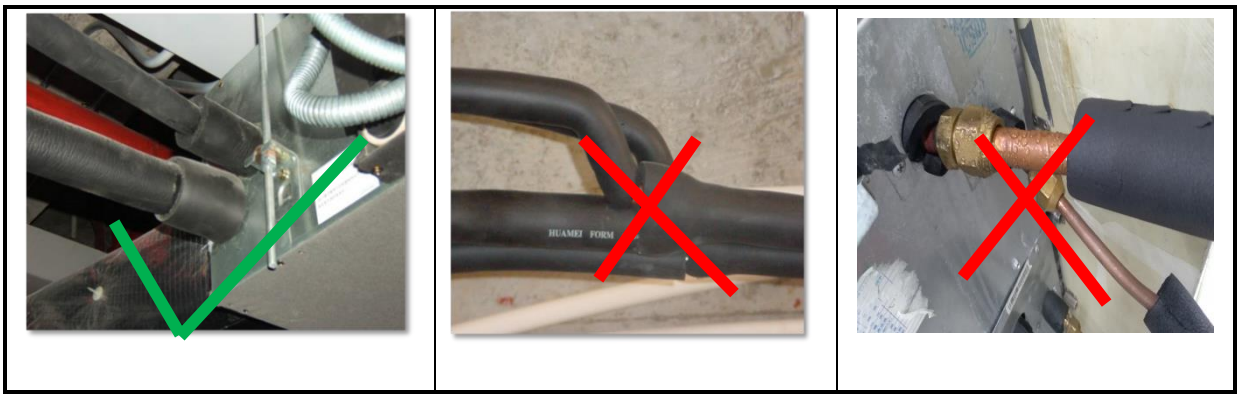
Rubber and plastic insulation casing	Cutting knife	Air conditioning bandage
		

7.3 Caution

7.3.1 The insulation of liquid pipe and gas pipe must be separate



7.3.2 The insulation work must be done to every part of refrigerant pipes



7.3.3 Insulation material

Pipe diameter	Thickness
Φ6.4~15.9mm	≥15mm
Φ15.9~38.1mm	≥20mm

Φ38.1~54.1mm	≥25mm

7.3.4 Thermal insulation wrapping of pipe

Thermal insulation materials should be used for drainage pipe and refrigerant pipe to **prevent condensation or water leakage.**

Note:

✧ Wrap refrigerant pipe with thermal insulation materials of good insulation performance (> 120℃).

✧ Notice for high-humidity environment: the A/C system is verified by condensation conditions test. However, it may subject to dripping if working in high-humidity (condensation temperature > 23℃) environment for a long time. In this case, please add the following thermal insulation materials:

✧ The thermal insulation materials should be glass fiber thermal insulation materials with 10~20mm thickness.

7.3.5 Sealing of Wall Opening

After installing pipe and drainage pipe, it's necessary to ***seal the gap*** among wall opening, refrigerant pipe, ***drainage*** pipe and electric wire with ***mortar or putty*** to prevent capacity degradation or water leakage caused by rainwater or foreign matter from ingress into room and A/C system.

8. Additional refrigerant

8.1 Calculate refrigerant charge volume

Calculate the required refrigerant volume by the length of liquid pipe → recharge refrigerant.

Pipe size of liquid side (mm)	L1 Φ25.4	L2 Φ22.22	L3 Φ19.05	L4 Φ15.88	L5 Φ12.7	L6 Φ9.52	L7 Φ6.35
Additional refrigerant charge per meter (kg)	0.52	0.34	0.25	0.17	0.11	0.054	0.022

Additional refrigerant charge volume = (L1×0.52) + (L2×0.34) + (L3×0.25) + (L4×0.17) + (L5×0.11) + (L6×0.054) + (L7×0.022)

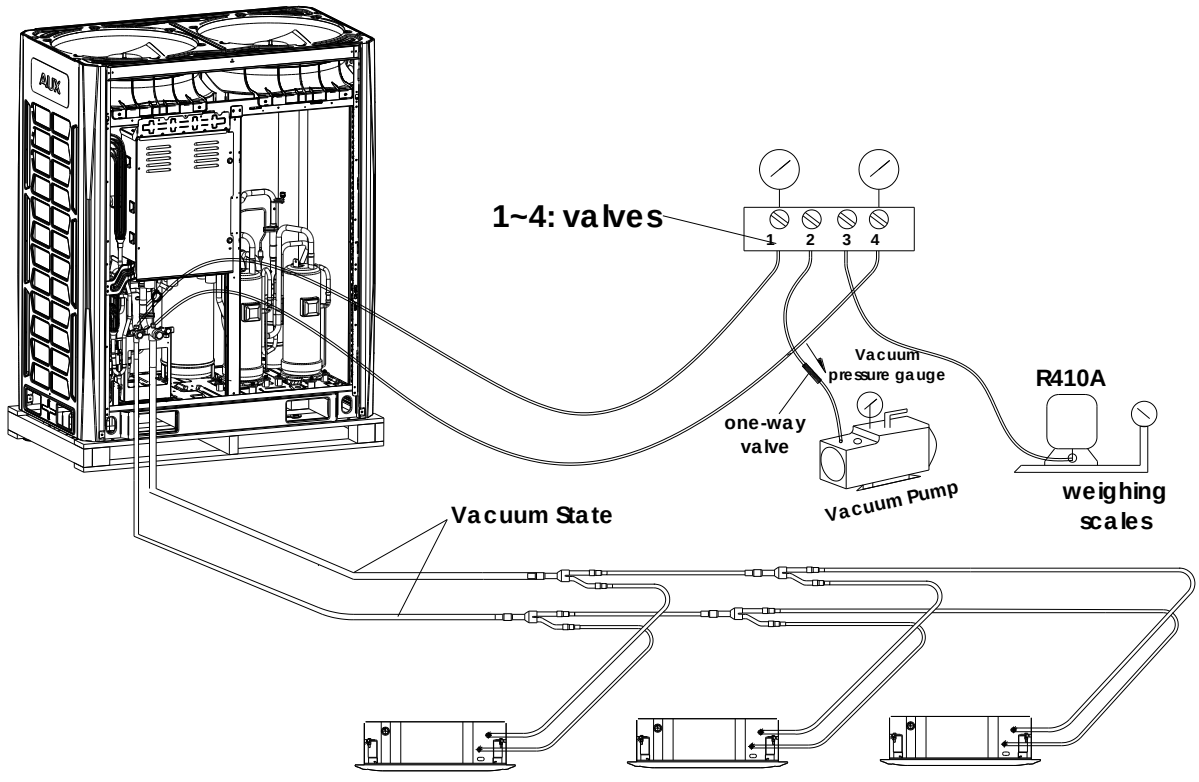
8.2 Pre tools

Vacuum pump (4L/s)	Connection hose	electronic scale
		
R410A		
		

8.3 Schematic diagram

1. 1~4 # valves all are opened

2. 1#, 3#, 4# valves are opened, 2# valve are closed



8.4 Steps for recharging refrigerant

1. Make sure ***vacuum drying*** is qualified before recharging refrigerant.

2. ***Calculate the required refrigerant volume*** by the diameter and the length of liquid pipe.

3. Use ***electronic scale*** or fluid infusion apparatus to weigh the recharged refrigerant volume.

4. Use soft pipe to connect refrigerant cylinder, pressure gauge, and examine valve of outdoor unit. And recharge in liquid mode. Before recharging, clear the air in the soft pipe and pressure gauge's pipe.

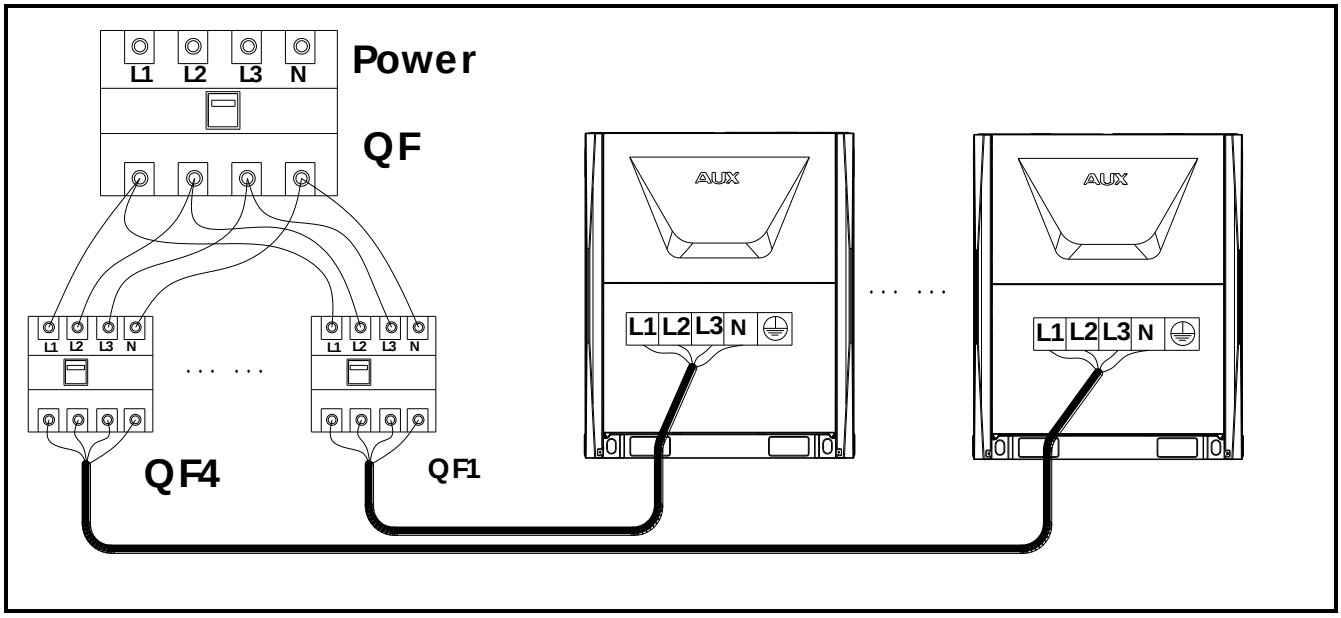
9. Electrical Wiring

9.1 Wiring Diagram of Indoor Unit and Outdoor Unit

Power line must be properly fixed; Outdoor unit must be grounded;

Each indoor unit must be grounded; Power wire must be thickened when it is overlong.

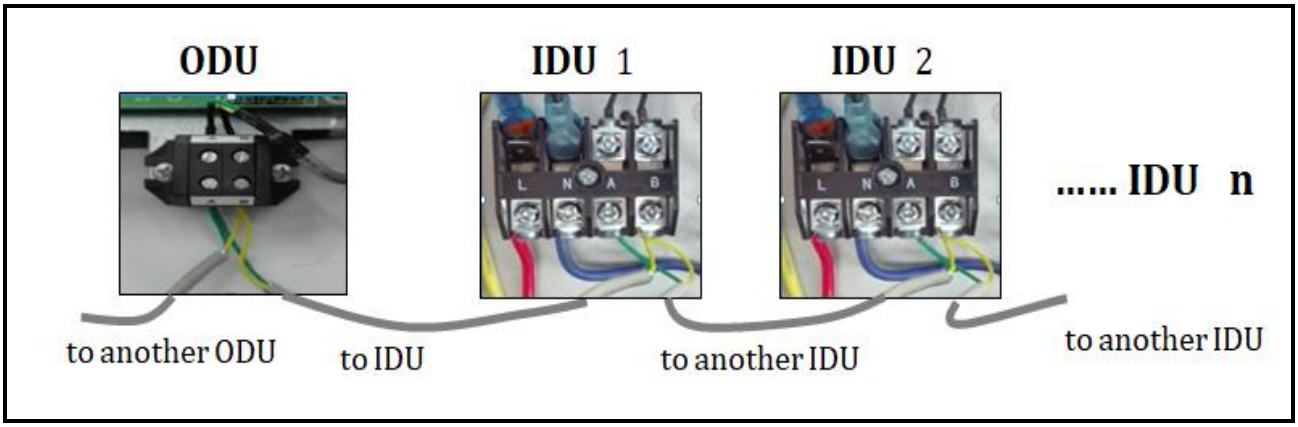
Wiring Diagram of Modular Outdoor Unit

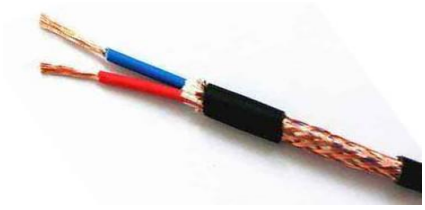
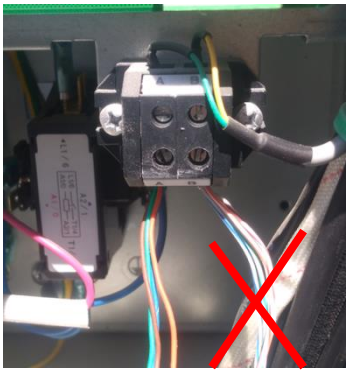
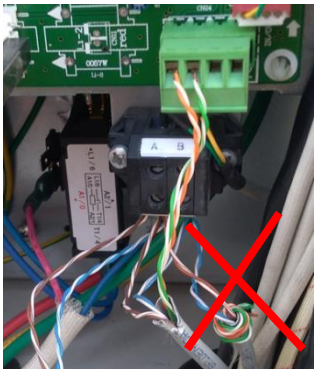


Recommended Specification for Power Line of Outdoor Unit (stand-alone power supply)

Item / Unit / Type		Power supply	power line (mm^2)	breaker (A)	leakage current Operate time	ground wire(mm^2)
Separate power	ARV-H250/SR1MV	380~415V 3Ph ~ 50/60Hz	4	32	30mA, < 0.1 sec.	4
	ARV-H280/SR1MV		6	32	30mA, < 0.1 sec.	6
	ARV-H330/SR1MV		6	40	30mA, < 0.1 sec.	6
	ARV-H400/SR1MV		6	50	30mA, < 0.1 sec.	6
	ARV-H450/SR1MV		6	50	30mA, < 0.1 sec.	6
	ARV-H500/SR1MV		10	63	30mA, < 0.1 sec.	10
	ARV-H560/SR1MV		10	63	30mA, < 0.1 sec.	10
	ARV-H610/SR1MV		16	63	30mA, < 0.1 sec.	16

9.2 Communication Wire Connection



Use 2-Core shielded wire as sighal wire 		

9.3 Wiring

9.3.1 Open electric controlled ***box cover*** of indoor unit, wire according to ***electrical schematic diagram*** on electric controlled box cover, firmly press connecting wire on connecting terminal without loosening, ground wire must be ***connected at designated position***.

9.3.2 Open cover plate of electric appliance on right of outdoor unit and wire according to electrical schematic diagram on backside of electric appliance cover plate.

9.3.3 Make sure to thread connecting wire through tension disc and press firmly, wire end must be ***firmly pressed*** on connecting terminal without loosening and ***ground wire*** must be connected at designated position.

Part3 Commissioning

1. Preparatory work

1.1 Inspection and confirmation

- Confirm that ***refrigeration piping and communication*** wire of indoor and outdoor units have been connected to the same refrigeration system in order avoid unnecessary malfunctions.
- Confirm ***power voltage*** is within ±15% rated voltage.
- Confirm that the ***power wire and control wire*** are correctly connected
- Confirm ***wired controller*** is properly connected.
- Confirm all units have passed ***nitrogen*** pressure-keeping test for ***24 hours***.
- Confirm the system has been carried out ***vacuum drying*** and charged with refrigeration as required.

1.2 Preparation before start up

- Turn on power switches of outdoor unit in advance, and keep connected for ***a minimum of 6 hours*** to ensure refrigerant oil is sufficiently heated.
- ***Turn on all valves***. If valves are not fully open unit may be damaged.
- All dial ***switches*** of indoor / outdoor units have been ***set according to the technical requirements.***

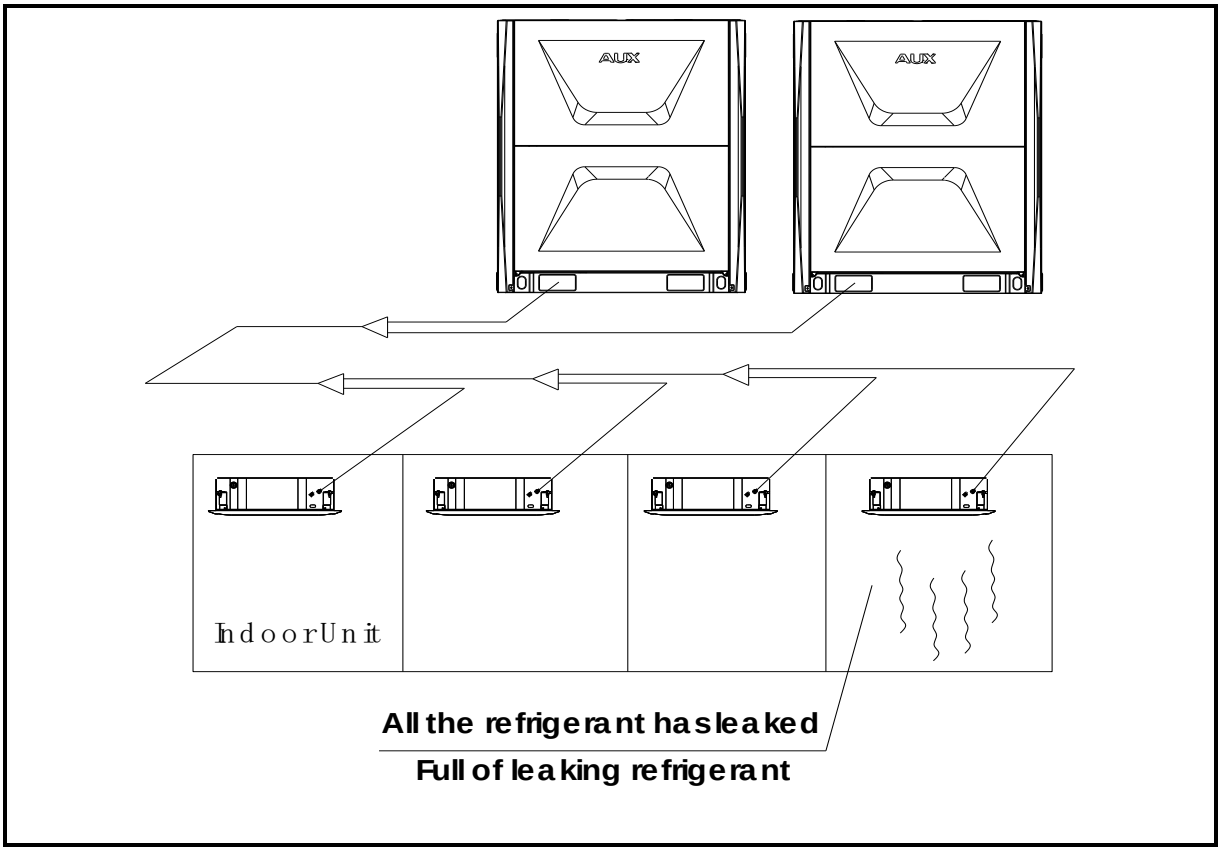
1.3 Inspection list of trial run

- Confirm the ***fan*** impeller is rotating according to its intended route and turns smoothly.
- Check for abnormal ***noise*** during operation of refrigerant system and compressor.
- Confirm ***drainage*** is smooth and its lift pump is operational.
- Confirm operating ***current*** is within the allowed range.
- Confirm each ***operating parameter*** is within the range permitted by the equipment.

1.4 Refrigerant leakage caution

This air conditioner adopts R410A as refrigerant, which is safe and noncombustible.

R410A critical thickness: 0.3kg/m^3 (Critical thickness: the max thickness of Freon without any harm to person).



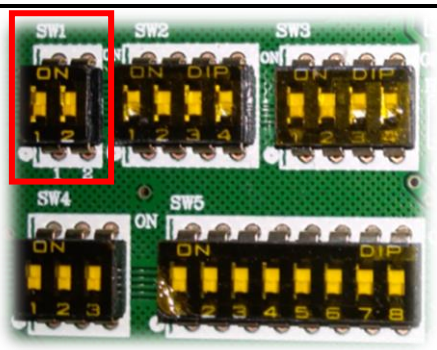
Calculate the critical thickness through following steps, and take necessary actions.

1) Calculate the refrigerant charge volume A, A= factory charge volume + additional charge volume

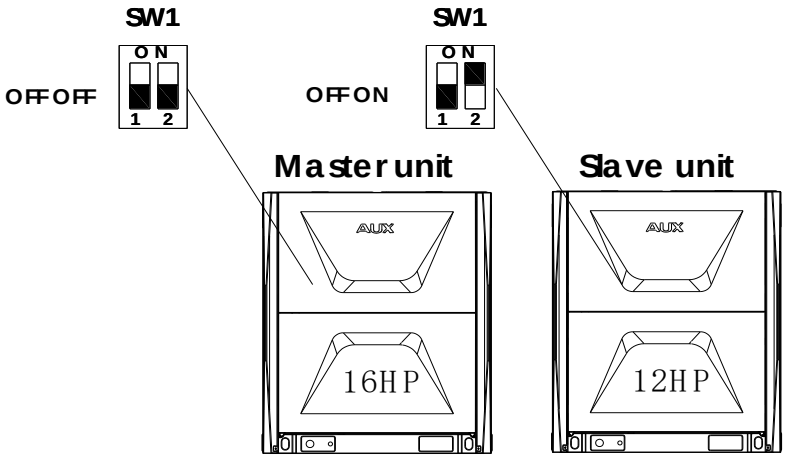
2) Calculate the indoor area volume (B) (as the minimum volume)

3) Calculate the refrigerant thickness, A/B ≤ critical thickness 0.3kg/$m^{3.}$

2. Master unit setting



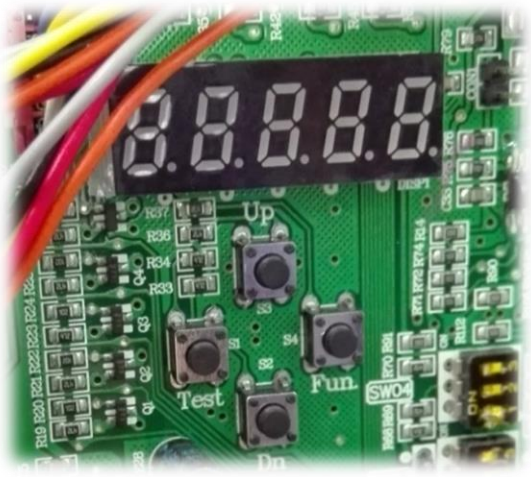
1	2	Definition
OFF	OFF	Master
OFF	ON	Slave 1
ON	OFF	Slave 2
ON	ON	Slave 3



3. Commissioning

IDU and ODU power on, then the main ***PCB digital tube displays*** "d ", it means the system is ***waiting for commissioning***

3.0 Enter Commissioning



● ***Enter***

Long press *"Fun"* button for ***more than 5 s***

● ***Exit***

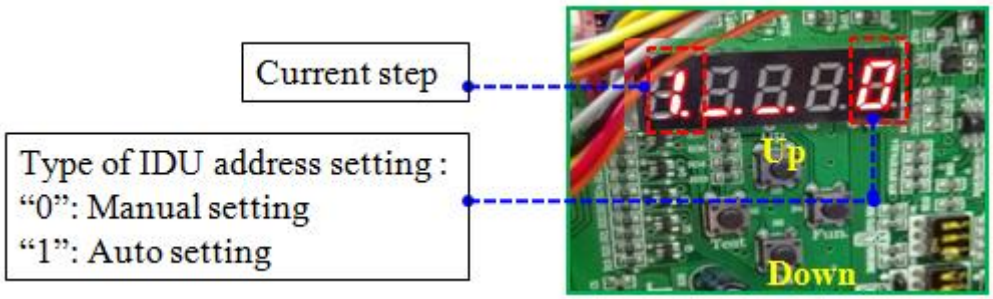
Long press *"Test"* button for ***more than 5 s***.

● ***Quick finish***

After completing Step "3", long press ***"Fun" + "Test"*** buttons for ***more than 5 s*** to complete project commissioning in advance

3.1 Address Setting

Digital tube will display"0"



Press ***"Up"*** or ***"Down"*** buttons ***to choose 0 or 1***

Short press ***"Fun" to confirm***

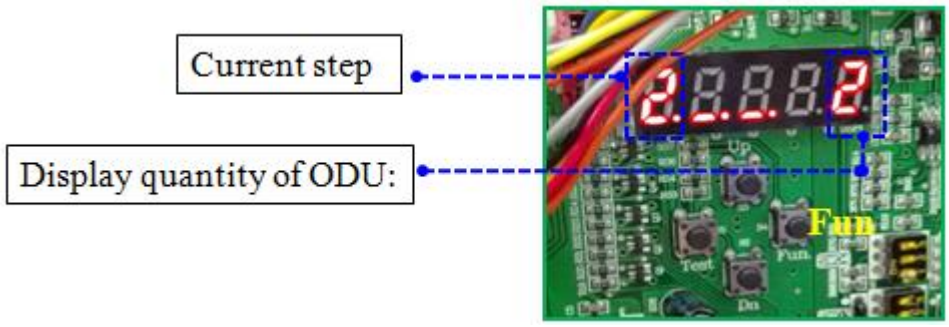
If ***manual addressing*** is chosen, digital tube will ***display***"0" (the indoor unit's address should be set by remote controller or wired controller.)

If ***automatic addressing*** is chosen, digital tube will ***display*** "1"

About 2 s later, ***enter step 2***.

3.2 Quantity of ODU

Digital tube displays "2.....1 "



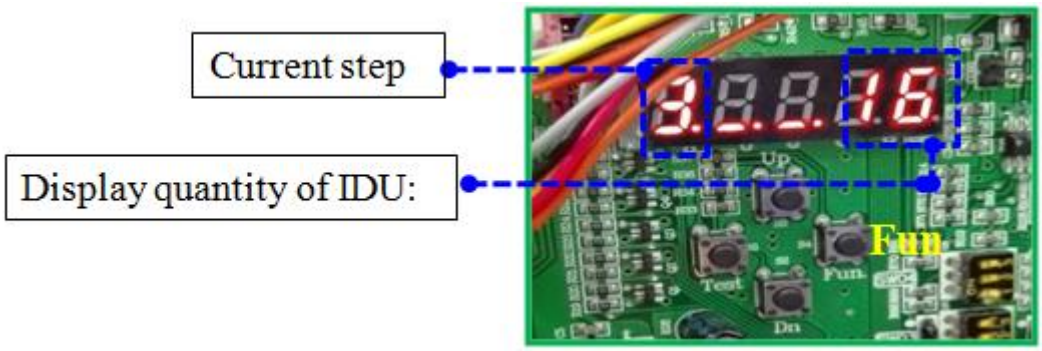
If display ***quantity of ODU is inconsistent***, need to conduct manual check (DIP address, communication cable and etc.) and commissioning confirmation again.

If display ***quantity of ODU is consistent***, short press ***"Fun"*** button ***to confirm***, digital tube will ***display*** "2.....1 ",

About 2 s later, ***enter step 3***.

3.3 Quantity of IDU

Digital tube displays "3.....16 "



If display ***quantity of IDU is inconsistent***, need to conduct check (power and

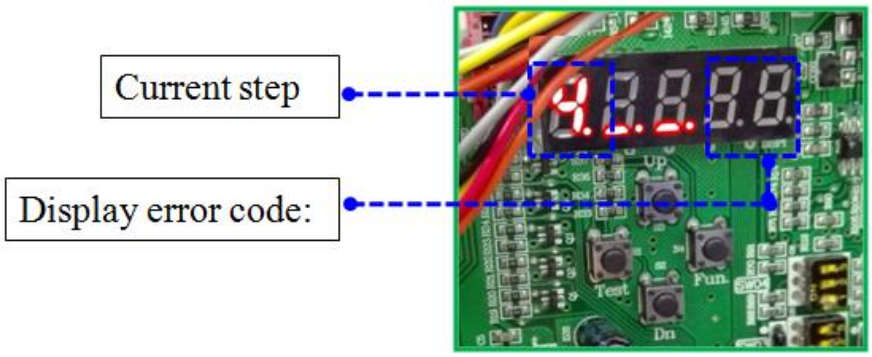
communication cable of indoor units, and etc.) commissioning confirmation again.

If display ***quantity of IDU is consistent***, short press ***"Fun"*** button to confirm. digital tube will ***display*** "3 16" ,

About 2 s later, ***enter step 4.***

3.4 Communication of ODUs

Automatically detects the ***communication*** between ***master main PCB*** and ***drivers*** (fan motor and compressor), after 2 s



If there is ***a faulty***, it will ***display*** "4 03 ", all buttons are invalid, ***need to do Troubleshooting***, if it is ***normal***, it will ***display*** "4 0 0 0 "

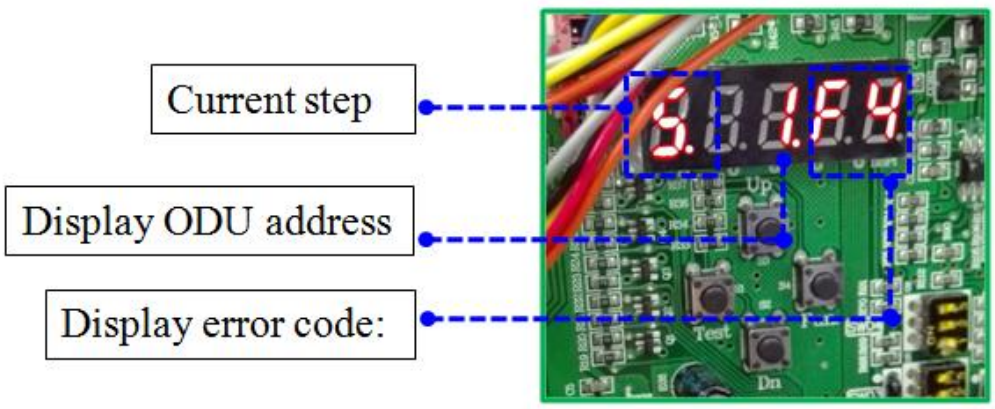
Then ***detects*** indoor and outdoor unit's ***capacity ratio***, if it is ***out of range***, ***display*** " 4 0 0 09 " ***need to do Troubleshooting***. If ratio is ***normal***, it will ***display*** " 4 0 0 0 0 "

About 2 s later, ***enter the step 5.***

3.5 Components of ODUs

Automatically ***detect components*** of outdoor units,

During detecting, display "5 - - - - "



If ***abnormal***, then corresponding ***failure displays***, for example, "5 0 1 F 4 "

It cannot enter the next judgment

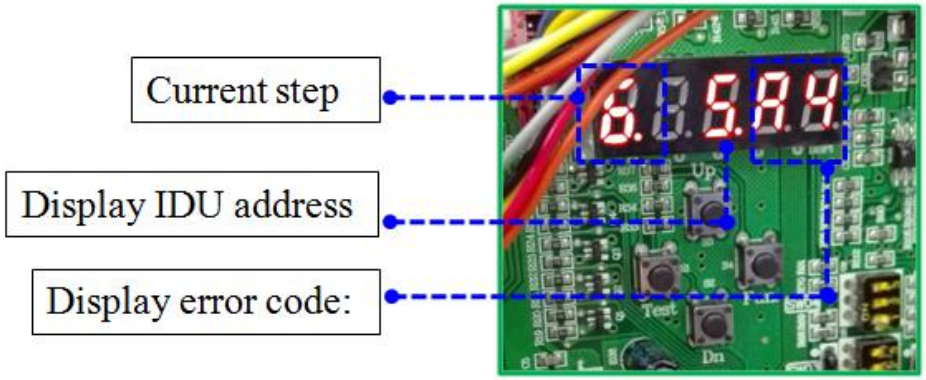
Only ***displays*** the ***fault*** with the ***highest priority***. In case that several modules had faults, displays the fault codes in turn by address order.

If there are ***no*** any ***faults*** or all faults were solved, digital tube displays "5 0 0 0 0 "

About 2 s later, ***enter step 6.***

3.6 Components of IDUs

During detecting, digital tube displays “6.□□□□□ ”



■ If one of indoor units occur ***a fault***, display “6.□5.A4” ***need to do Troubleshooting***

All buttons are invalid

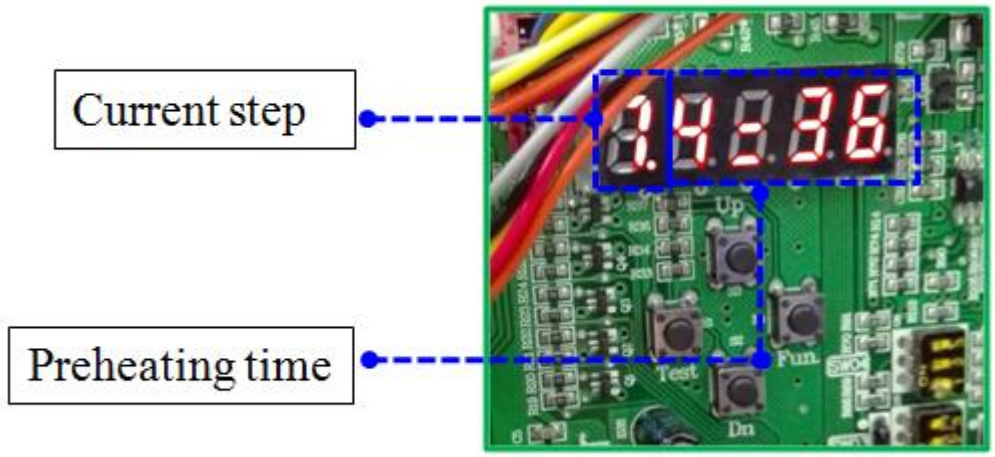
■ If there are ***no*** any ***faults*** or all faults were solved, digital tube displays “6.□□□□□ ”, About 2 s later, ***enter step 7***

3.7 Compressor preheating

■ If the outdoor unit has been continuously energized for ***more than 6 hours,*** displays “7.□□□□□ ”, 2 s later, ***enter step 8.***

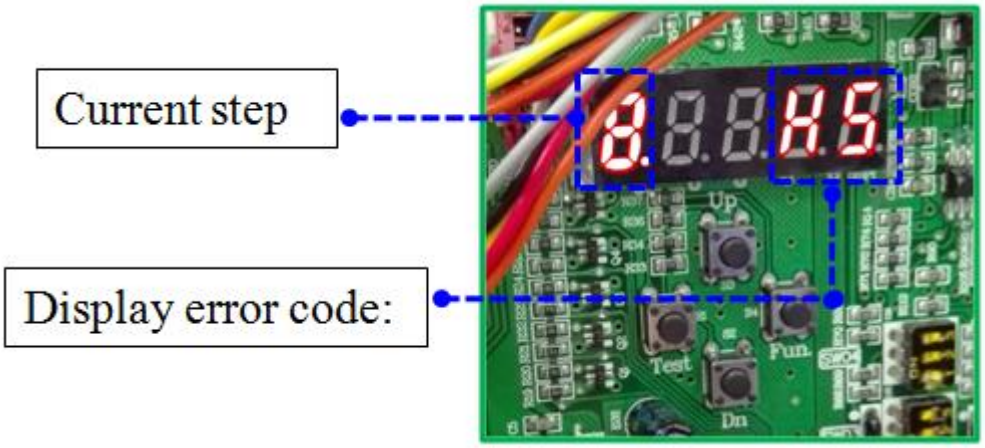
■ Otherwise display “7.4□36”, Short press ***“Fun”*** button, ***can skip waiting*** and ***enter***

step 8



3.8 Refrigerant judgment

During detecting, display "8.8.8.8.8"



■ If any [***module low pressure P s***] **≤ -25** ℃, then point out refrigerant lack protection, display "8.8.HS"

All buttons are invalid

It required to check is there any leakage, need to do air tightness test , maintenance, vacuuming, add refrigerant and do commissioning again

■ If it is ***normal***, display "8 ",

About 2 s later, ***enter step 9.***

3.9 Status judgment

The status judgment of outdoor unit valve "9 ", 2sec later, enter the next step.

3.10 Start commissioning

Automatically select operating mode according to outdoor environment temperature

If temperature ≥ 20 ℃, running cooling model

If temperature <20 ℃, running heating model

This step, displays "10 ", waiting for start commissioning. Press "***Fun***" button to start cooling or heating operation test

3.11 Cooling Operation

Display "11 ", all indoor units run in ***16 ℃& high speed***

If there is a **fault**, displays' ***Err'*** and fault code, like "Err E3 ", ***need to do troubleshooting*** and commissioning again

If there is ***no any fault***, 20min later, displays “ ”

After 5s, ***enters normal standby status*** “ ” or locking “ ”

Project commissioning is finished

3.12 Heating Operation

Display “ ” , all indoor units run in ***30℃& high speed***

If there is ***no any fault***, 20min later, displays “ ”,

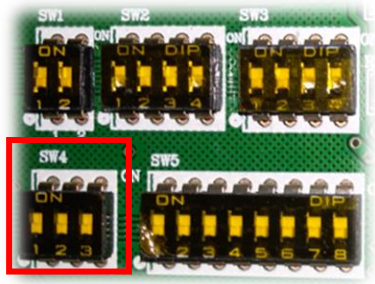
After 5s, ***enters normal standby status*** “ ” or locking “ ”.

Project commissioning is finished.

4. Parameter Setting (Main PCB)

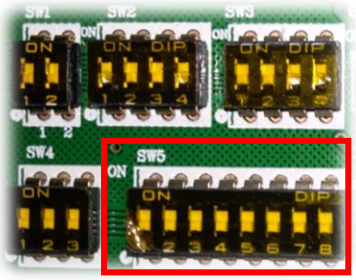
4.1 Functions set by switch

Function setting-**SW4**



1	2	Function	3	Function
OFF	OFF	Without Compressor emergency(Default)	OFF	Without Modular emergency(Default)
OFF	ON	1# Compressor emergency	ON	Modular emergency
ON	OFF	2# Compressor emergency		
ON	ON	/		

Function setting-**SW5**



1	2	Function
OFF	OFF	Without quiet mode(Default)
OFF	ON	Quiet in night
ON	OFF	Quiet mode
ON	ON	Strong mode

3	4	Function	5	6	Function	7	8
OFF	OFF	First-ON (Default)	OFF	OFF	static pressure 0 Pa(Default)	Reserve	
OFF	ON	Heating priority	OFF	ON	20 Pa		
ON	OFF	Cooling priority	ON	OFF	50 Pa		
ON	ON	Majority rule	ON	ON	80 Pa		

Notice：

- In the table ***"OFF"*** means switch to down, ***"ON"*** means switch to up.
- When you want to change any set, please consult our factory first.
- When you set ***Compressor or modular emergency***, please close the Gas/Liquid valve of the ODU, and solve the problem ***within 24-48h***, because the emergency cannot work long time. After solved the problem, please cancel emergency setting, others the ODU cannot run.

4.2 Parameter set by Key button

4.2.1 General introduce

After commissioning, the system is standing-by.

1st step--- Press ***"Fun"*** key for 2 s, the Main digital tube will displays as below:

1.【Parameter Checking"E□□□□" (flash) 】、

2.【Function Setting "P□□□□" (flash) 】、

3.【Parameter Setting"L□□□□" (flash) 】、

4.【Commissioning "d□□□□" (flash) 】、

5.【Restore to factory setting"r□□□□" (flash) 】

2st step---Press ***"Up"*** or ***"Down"*** key to choose ***[E]****or* ***[P]*** *or* ***[d]*** *or* ***[r]***

3st step---Press ***"Fun"*** to confirm

Sketch Map:

	***1st:*** *Press "Fun" 2 s*	***2st:*** *"Up" or "Down" to choose below*	***3st :*** *Press "Fun" to confirm*

				
Commissioning	Status	Checking	Parameter Checking	Restore to factory setting

4.2.2 [E] Parameter Checking

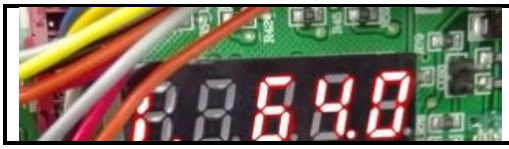
Choose "E0000" , press ***"Fun"*** key

1. Press ***"Up"*** or ***"Down"*** key to choose the number of function you want ***(1~15)***

2. Then press ***"Fun"*** to display

For example：Digital tube displays like 1 64.0, means ***frequency of 1# comp is 64 rps***

Sketch Map:

	1 means : *Frequency of 1# comp*

	64 means: *1# compressor's running frequency is 64 rps*
	To Check other statue information by Press "***up"/"down***", display from 1~ 15

No	parameter name	units	No	parameter name	units
1	***Frequency of 1# comp***	***rps***	**9**	ODU environment temp.	0.1℃
2	Frequency of 2# comp	rps	**10**	Suction temp.	0.1℃
3	Open degree of PMV1	pls	**11**	Tci1(outlet of condenser 1)	0.1℃
4	Open degree of PMV2	pls	**12**	Tci1(outlet of condenser 2)	0.1℃
5	High press sensor-Temp.	0.1℃	**13**	Tdef1(defrost temperature)	0.1℃
6	Low press sensor-Temp.	0.1℃	**14**	Tdef2(defrost temperature)	0.1℃
7	Dis-Temp. of 1# comp	0.1℃	**15**	Edition of procedure	/
8	Dis-Temp. of 1# comp	0.1℃			

4.2.3 [P] Present Function Checking

Choose "P0000" , and press ***"Fun"*** key

1. Press ***"Up"*** or ***"Down"*** key to choose the number of function you want ***(1/3/4/6)***

For example：Digital displays like "P0001" (P-light, 1-Flash)

2. Then press ***"Fun"*** to display

For example: display a parameter like”  ”, means the present max capacity rate of IDU/ODU (No 1) is ***135%***

Serial Number	Function Name	Display
1	IDU/ODU capacity rate	***135 or 200*** [135: Rate is135%] [200: Rate is200%]
3	VER (variable energy-efficiency regulation)	***0 or 1 or 2*** [0：basic mode] [1：high efficiency] [2：turbo mode]
4	Blow off snow (Auto snow-blowing)	***0 or 1 or 2 or 3 or 4*** [0：without this function] [1：0.5h Cycle time] [2：1h Cycle time] [3：3h Cycle time] [4：10h Cycle time]
6	Economic locking (26℃)	***0 or 1*** [0：without this function] [1：lock 20/26℃]

4.2.4 [C] Function Setting

Choose "C-----" , short press ***"Fun"*** key

1. Press ***"Up"*** or ***"Down"*** key to choose the number of function you want ***(1~8)***

For example：Digital displays "C----1" (C-light,1-flash)

2. Then **press** ***"Fun"*** key **to enter** the setting.

3. Change the setting by pressing ***"Up"*** or ***"Down"*** key

4. Short press ***"Fun"*** key to confirm

The function name and number show in the table below.

Function names	**1st step**	**2nd step**	**3rd step**	**Notice**
	Main menu	Serial Number	Parameter Setting	
IDU/ODU capacity rate	C----	1	135：IDU/ODU≤135% 200：IDU/ODU≤200%	1. Choose the **number [*1*]** 2. Short press [**Fun**] 3. Choose ***[135] or [200]*** ***135 is default*** ,when you change it，it will influence the comfort，please consult our factory first.
Clean (Auto dust removal)		2	/	1. Choose the **number *[2]*** 2. Short press ***[Fun]***, ***1 time effective*** Then outdoor fan will run immediately

VER (variable energy-efficiency regulation)		3	0：basic mode 1：high efficiency 2：turbo mode	1. Choose ***number [3]*** 2. Short press ***[Fun]*** 3. choose ***[0] or [1] or [2]*** 0 is default, when you change it ,it will influence the comfort or power consumption
Blow off snow (Auto snow blowing)		4	0：No this function 1：0.5h (cycle time) 2：1h (cycle time) 3：3h (cycle time) 4：10h (cycle time)	1. Choose the **number *[4]*** 2. Short press ***[Fun]*** 3. Choose ***[0] or [1] or [2] or [3] or [4]*** 0 is default, when you change it ,the outdoor fan will run to blowing off snow ***automatically and cycle by cycle***
Vacuum Pumping		5	/	1. Choose the **number *[5]*** 2. Short press ***[Fun]***, ***1 time effective*** Then ODU will be ready for Vacuum pumping
Economic locking (26℃)		6	0：No this function 1：lock 20/26℃	1. Choose ***number [6]*** 2. Short press ***[Fun]*** 3. choose ***[0] or [1]*** 0 is default, when you change it , the IDU setting temperature will ***be locked at 20℃ in heating mode*** and ***26℃ in cooling mode***

Refrigerant recycle		7	/	1. Choose the **number *[7]*** 2. Short press ***[Fun]***, ***1 time effective*** Then Recycle refrigerant to ODU
Refrigerant charging		8	/	1. Choose the **number *[8]*** 2. Short press ***[Fun]***, ***1 time effective*** Automatically determine whether the refrigerant is filled up(by detecting pressure)requires

4.2.5 [r] Restore to Factory Setting

Choose "r" , short press ***"Fun"*** key

1. Press ***"Up"*** or ***"Down"*** key to choose the number of function you want ***(1~3)***

[1]: Control parameter be restored to factory default

[2]: Control parameter, running storage parameter are restored to factory default

[3]: Control parameter, running storage parameter, commissioning storage parameter are restored to factory default

2. Press ***"Fun"*** key to confirm

5. Commissioning Based on Monitoring Software

5.1 General Information

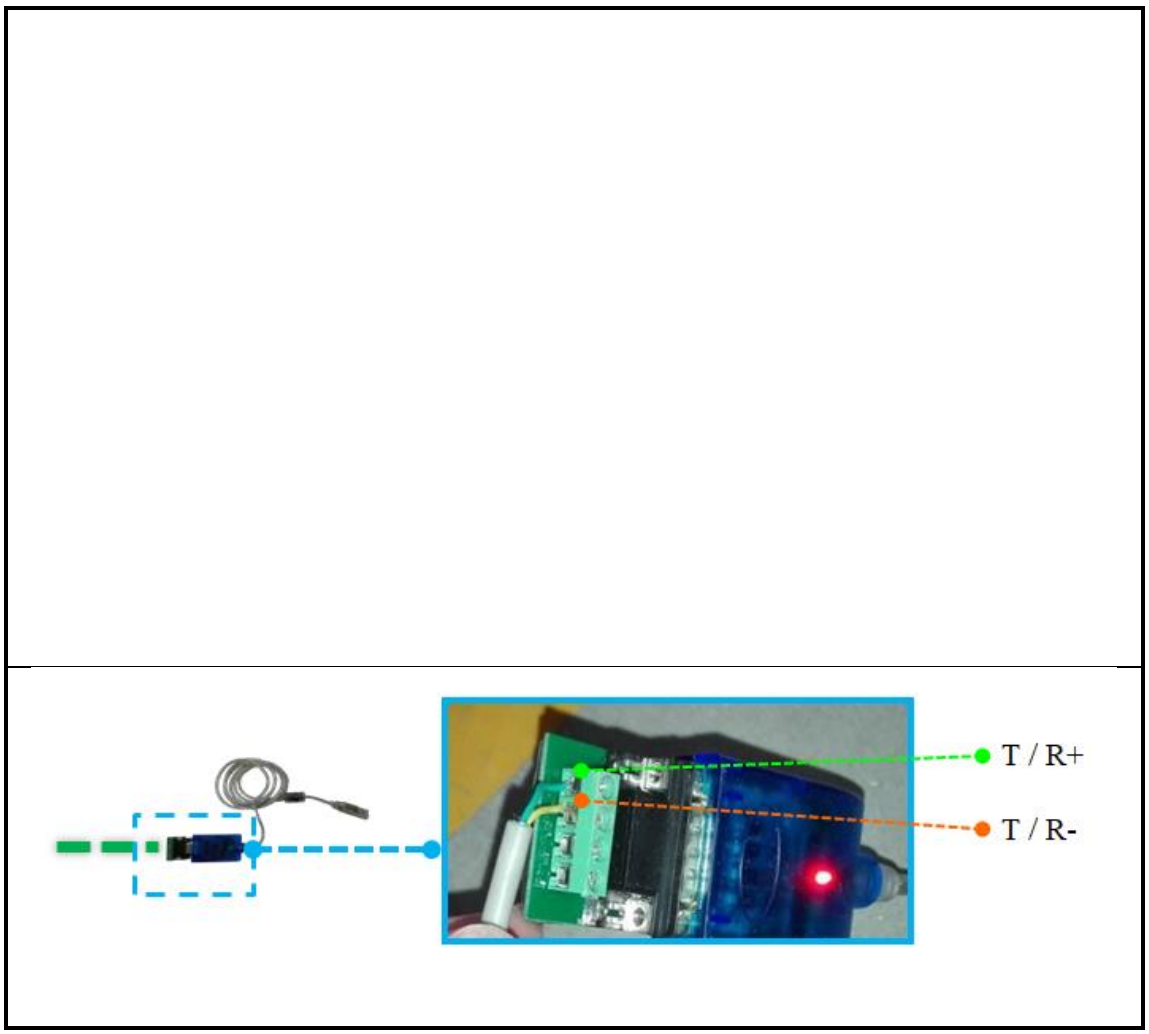
1. Main Function

1.1 Used for ***monitoring*** indoor and outdoor units' ***operation parameters ,*** check the refrigerant system is normal or not

1.2 ***Control*** indoor units' ***operation state*** (temperature setting, fan speed, ON/OFF, operation mode…)

1.3 Operation parameters and curve can ***be saved*** as a *data base file*

2. Installation Diagram

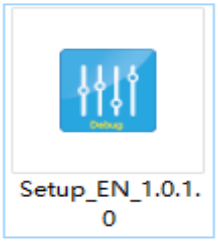


5.2 Accessory

1. Hardware

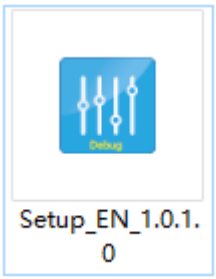
Laptop	USB to RS485 converter
	

2. Software

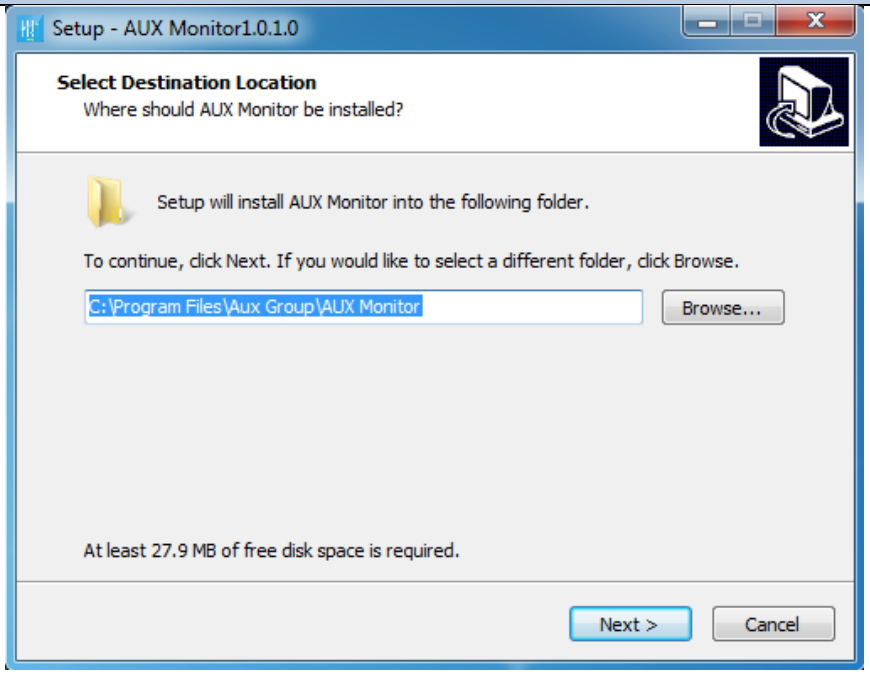
Monitoring Software	Driver Program
	

5.3 Installation of software

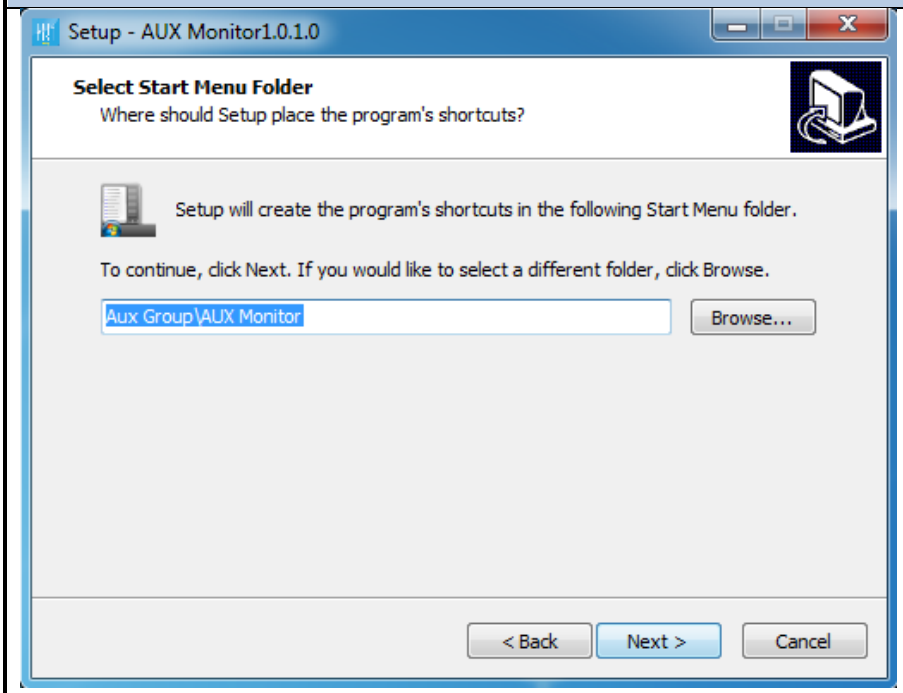
1. Double click



2. Choose the installation path, then click "***Next***"

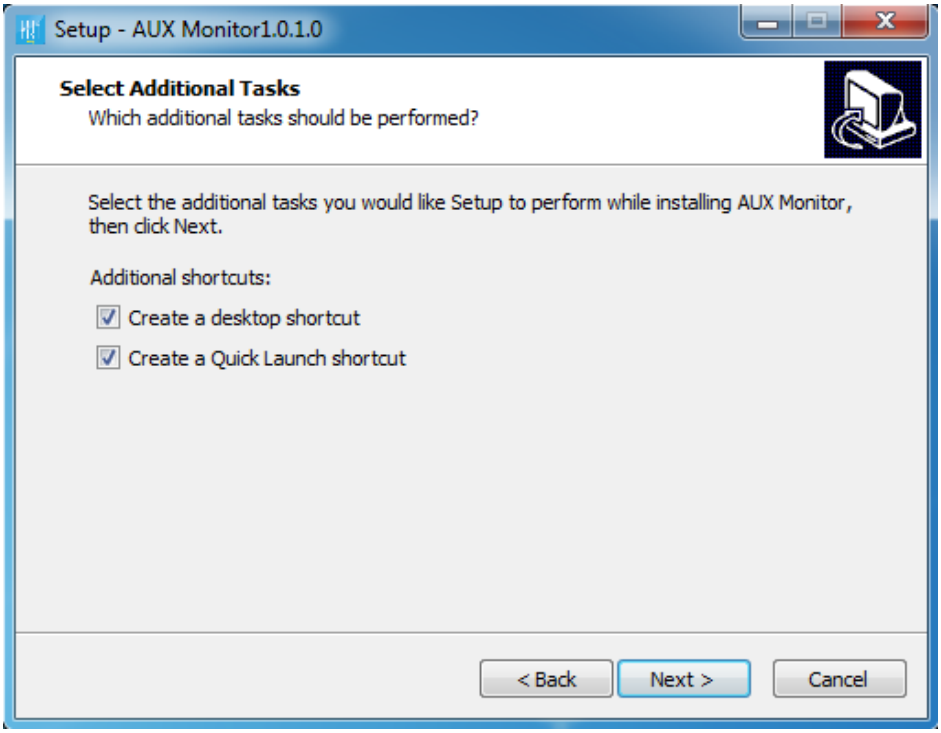


3. Confirm the installation path, then click "***Next***"

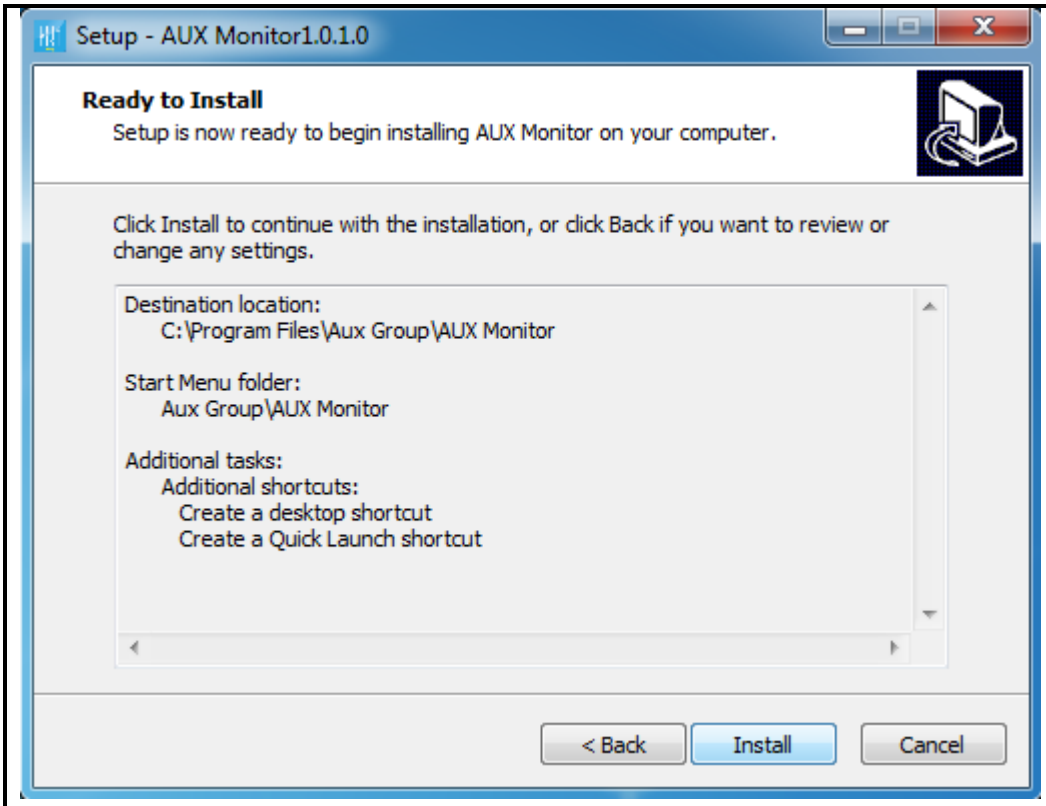


4. Choose "***Create a desktop shortcut***" and "***Create a quick launch shortcut*** ", then

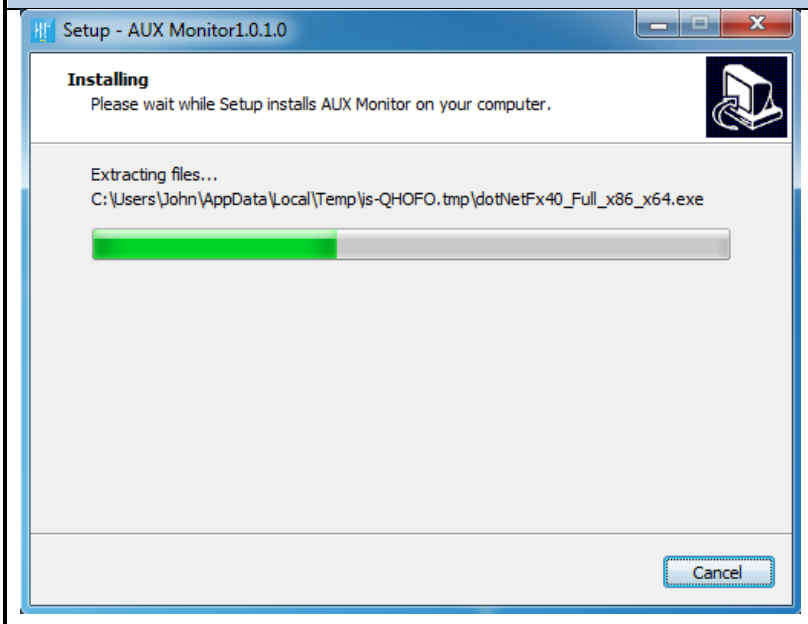
click "***Next***"



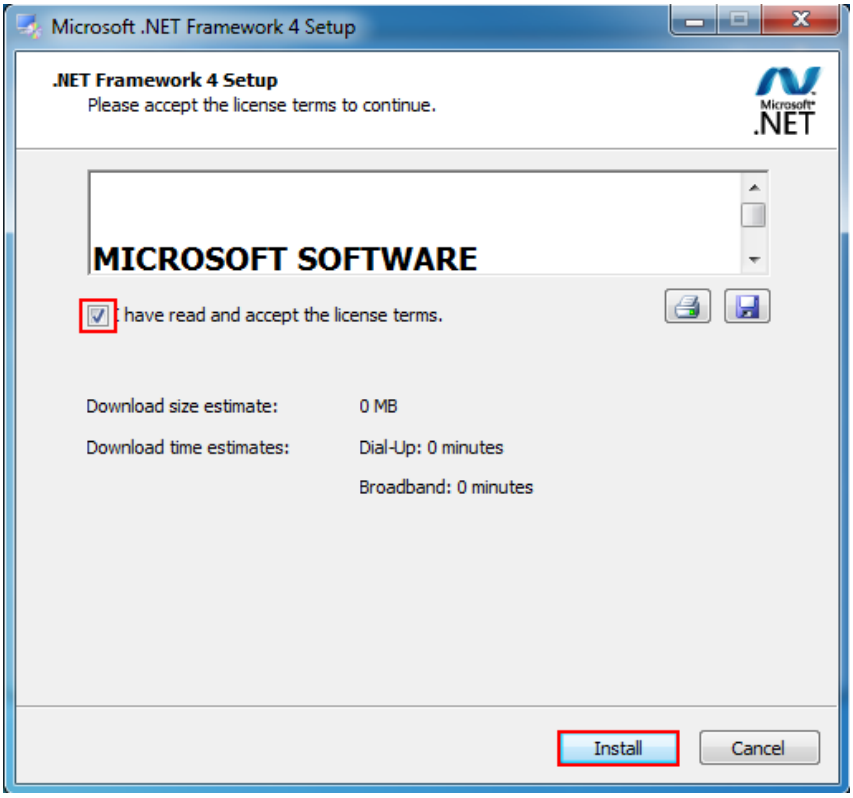
5. Confirm, click "***Install***"



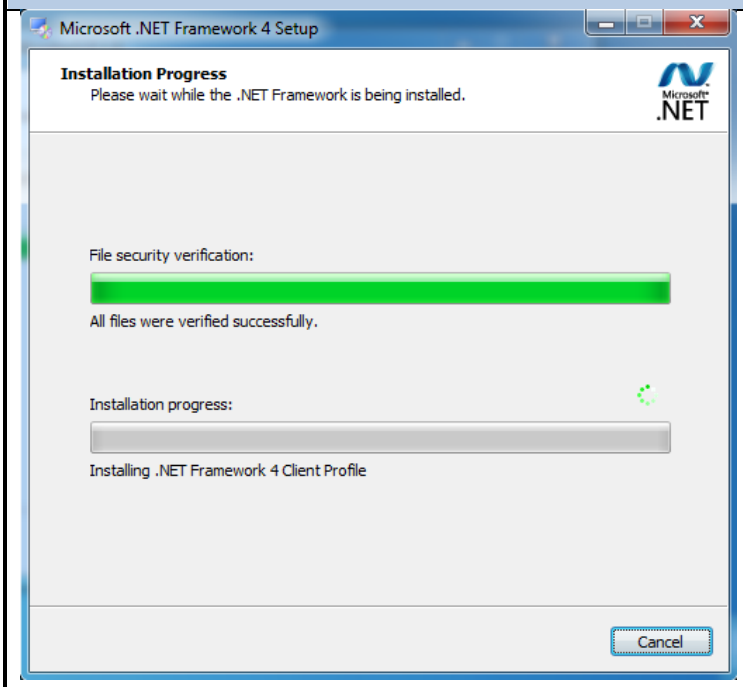
6. Install... waiting



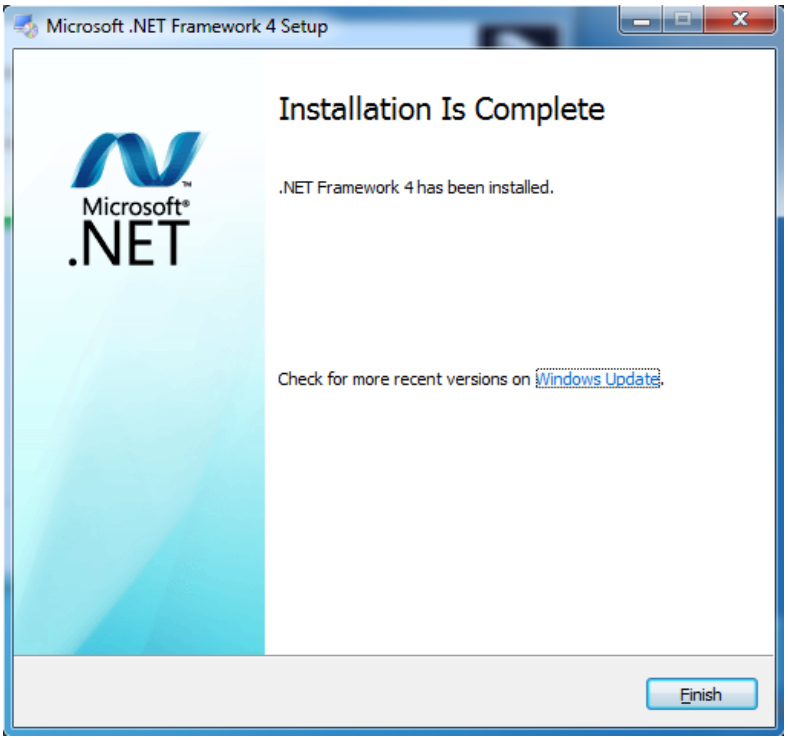
7. Automatic judge install ”Microsoft .net Framework 4.0”or not，If it should be installed，please choose ***“I have read and accept the license terms***.”then colick ”***Install***“



8. Install “Microsoft .net Framework 4.0” , waiting…



9. Finishing



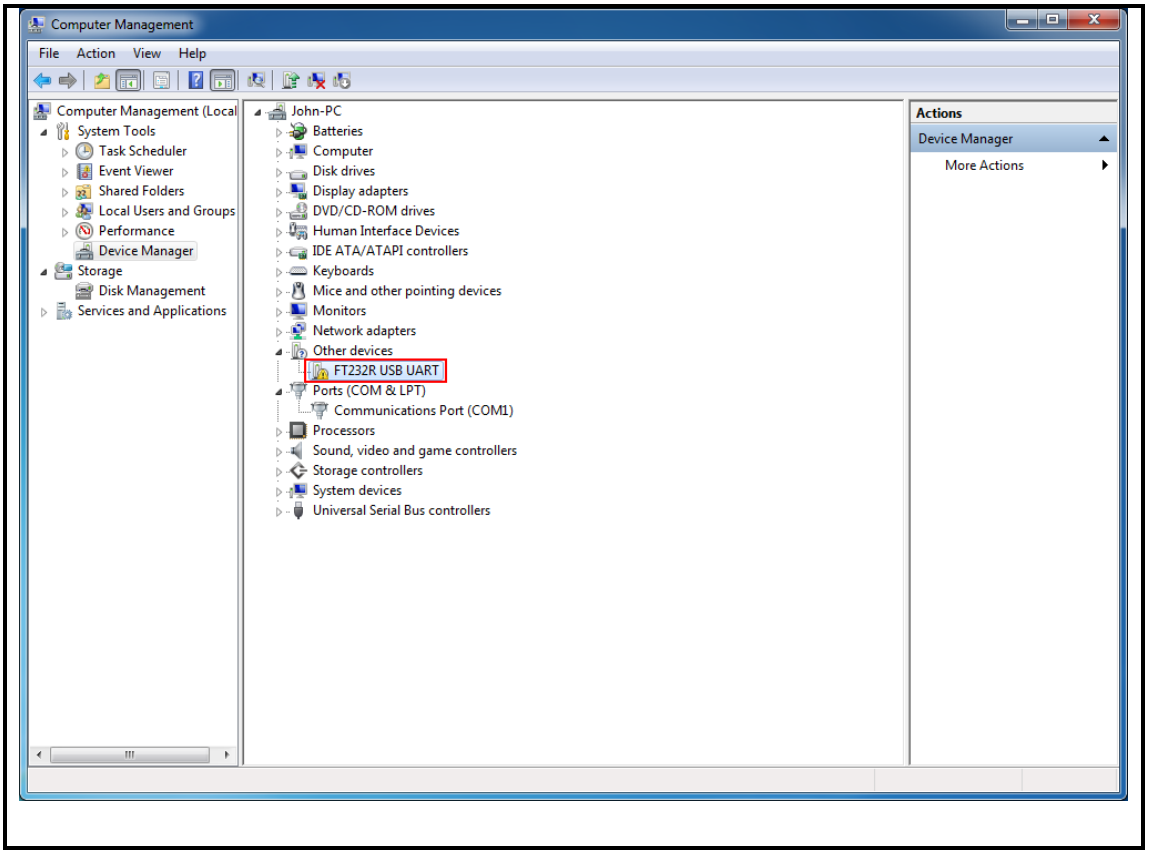
10. Finish the installation

Desktop Icon

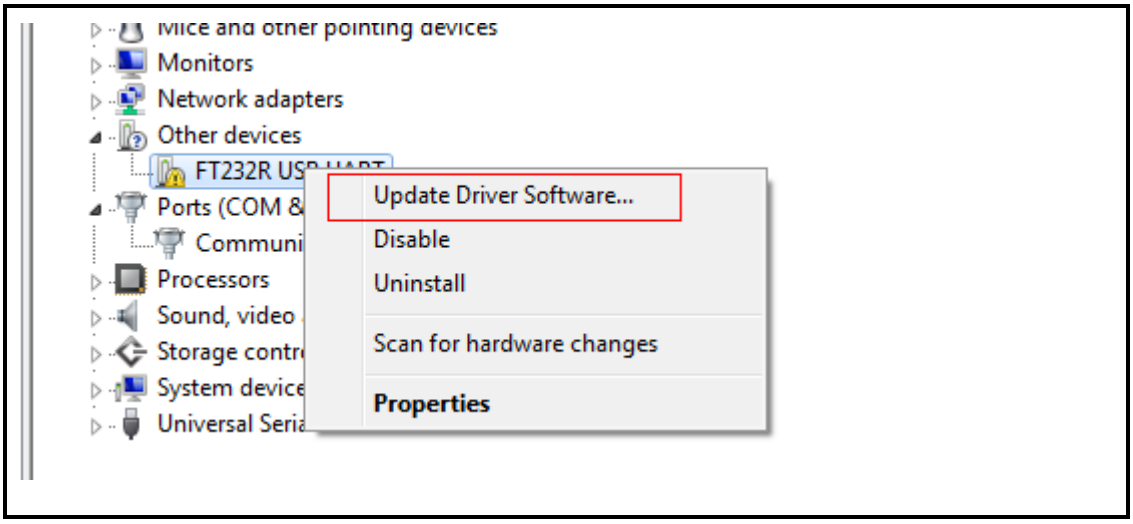
5.4 Installation of Driver

1. Installation steps

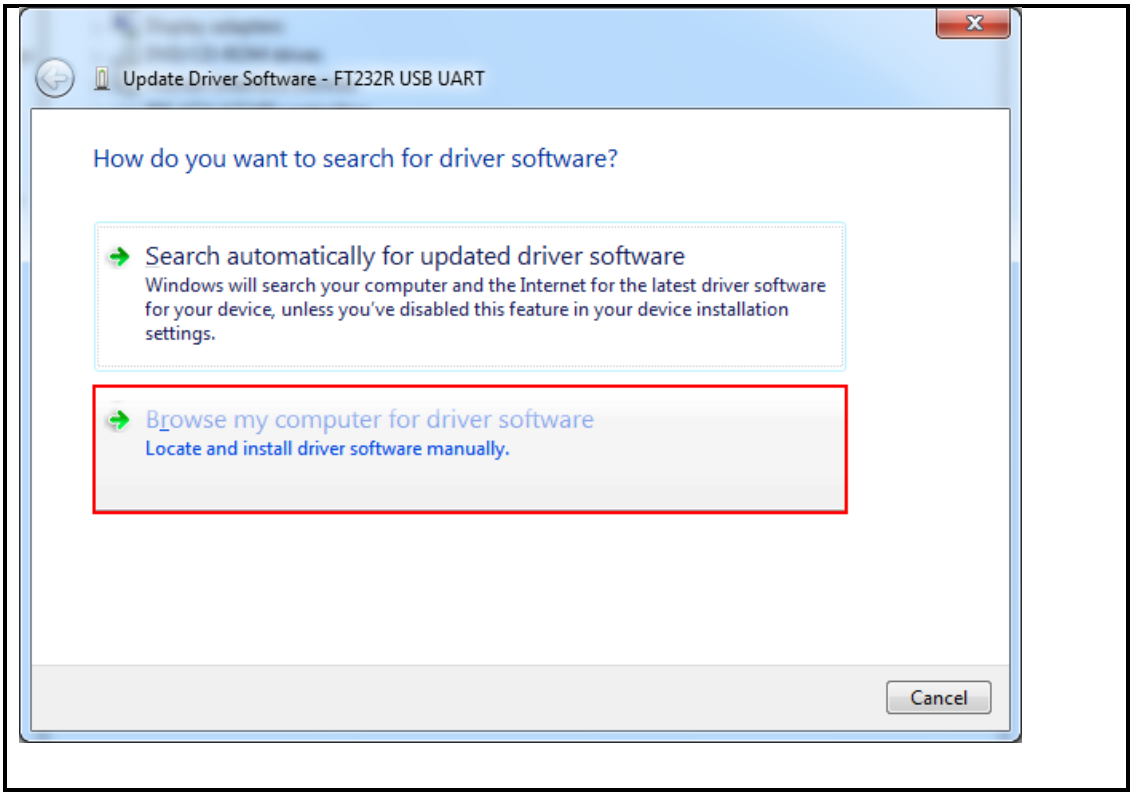
1. After USB to RS485 converter be connect to laptop's "***USB port***", Open Management->Other devices-> "***FT232R_USB_UART***"。



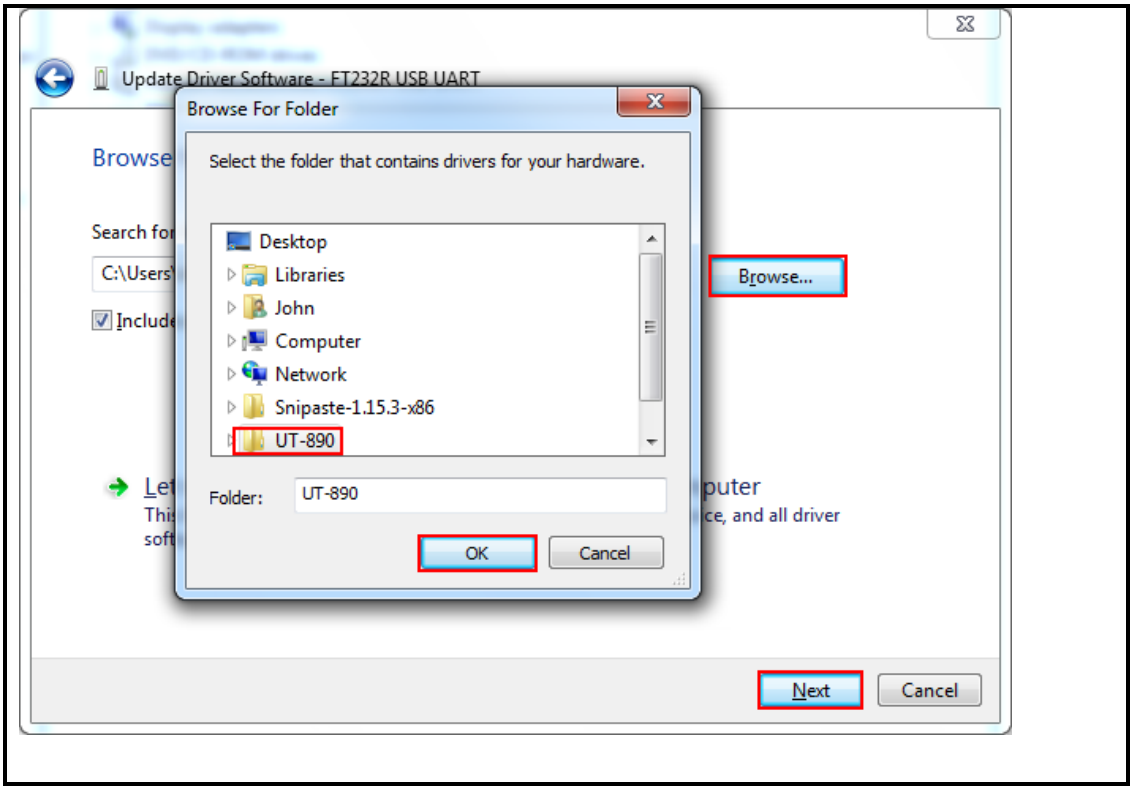
2、Choose"***FT232R_USB_UART***" right click, then choose "***Update Driver Software"***



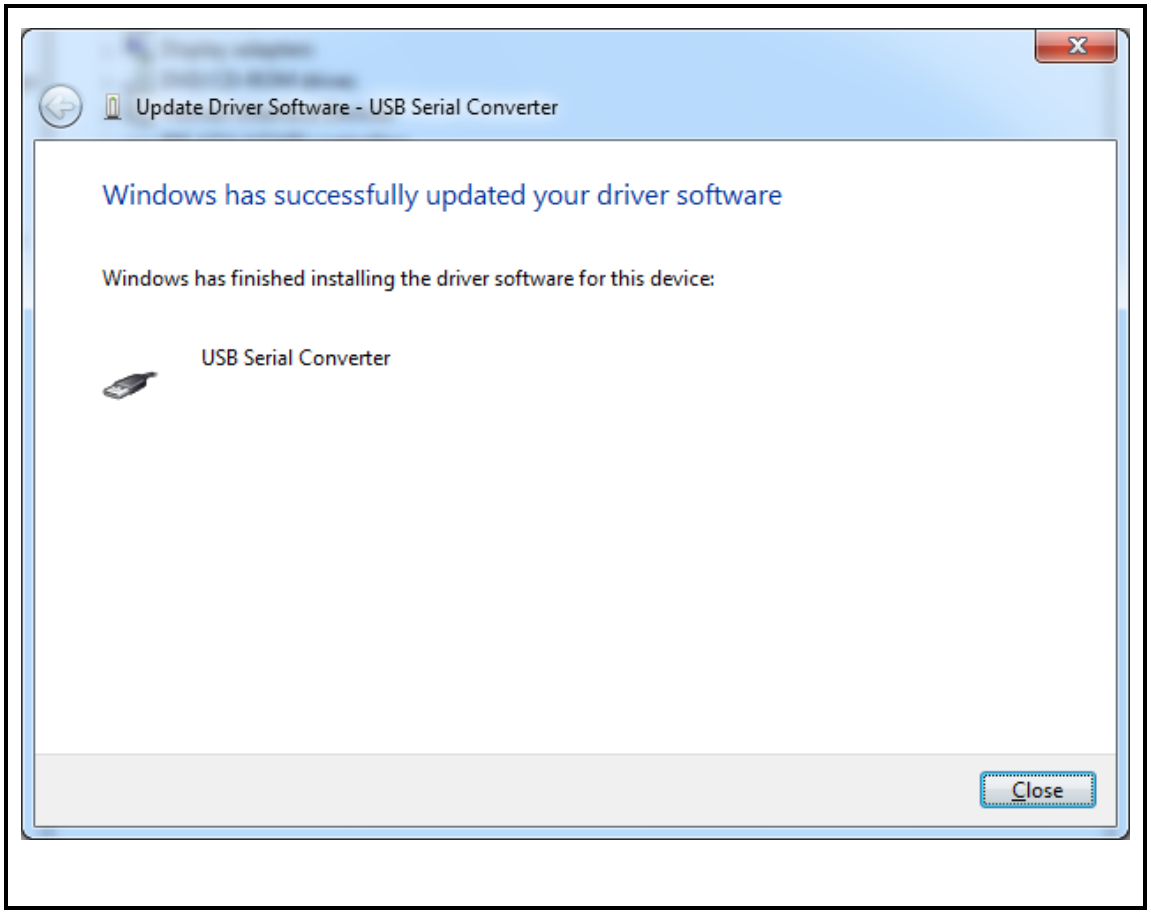
3、Choose and click ”***Browse my compute for driver software***“



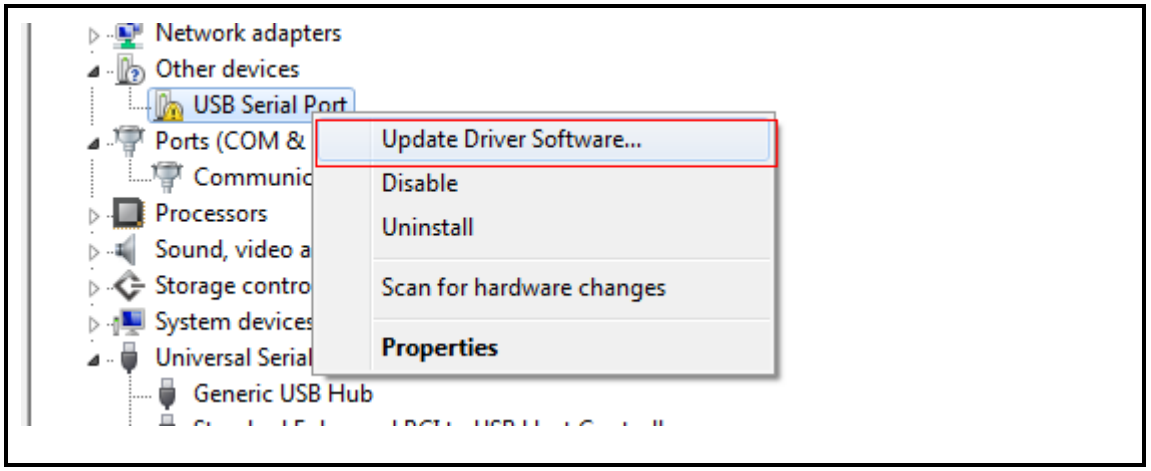
4、Choose the position of the Driver program，Click ”***OK***”, then “***Next***”



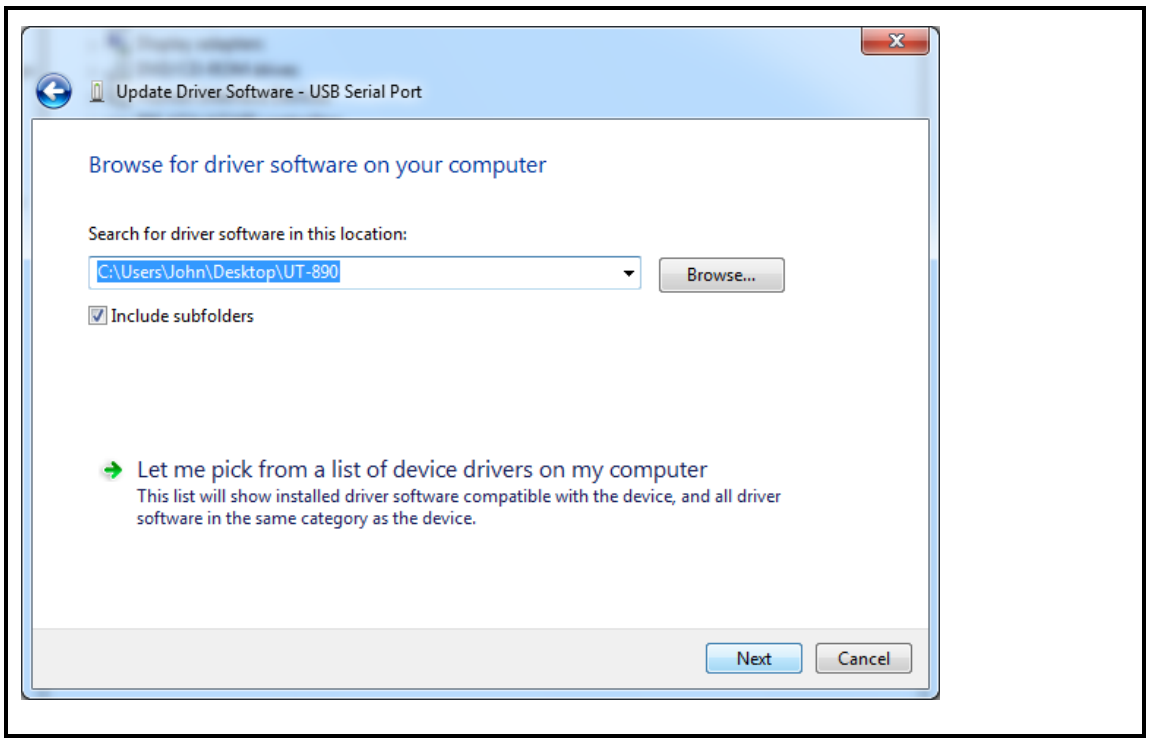
5、Finish installation of the first part



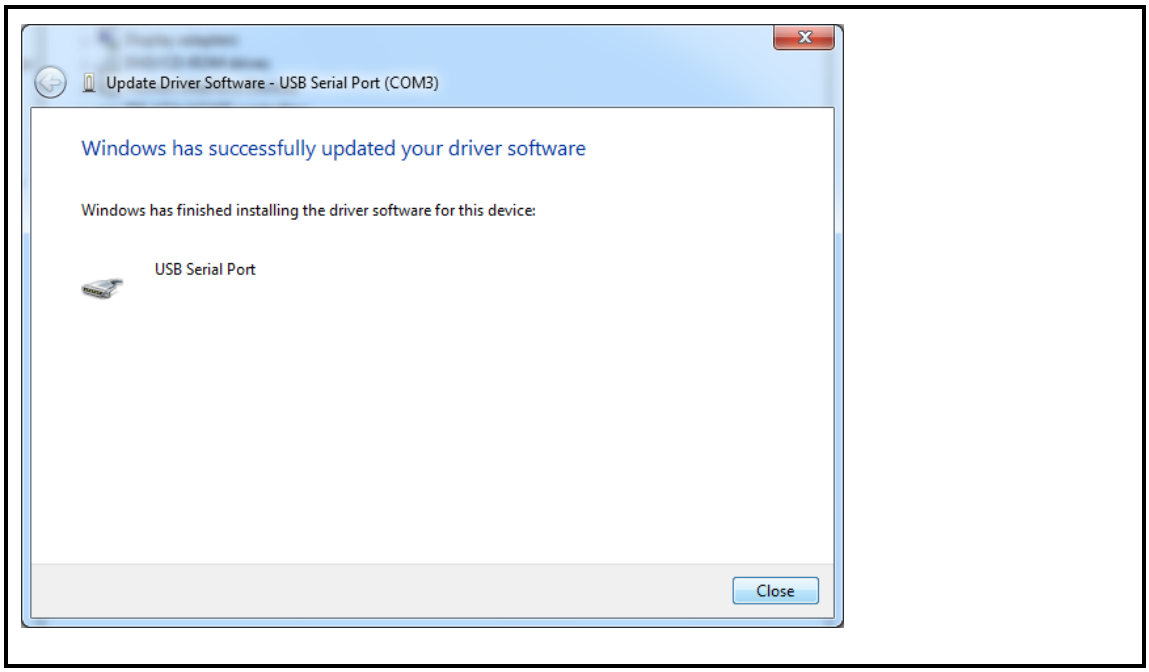
6、Open Management->Other devices-> "***USB Serial Port***" right click, then choose "***Update Driver Software***"



7、Choose the position of the Driver program，Click “***OK***”，then “***Next***”



8、Finishing installation

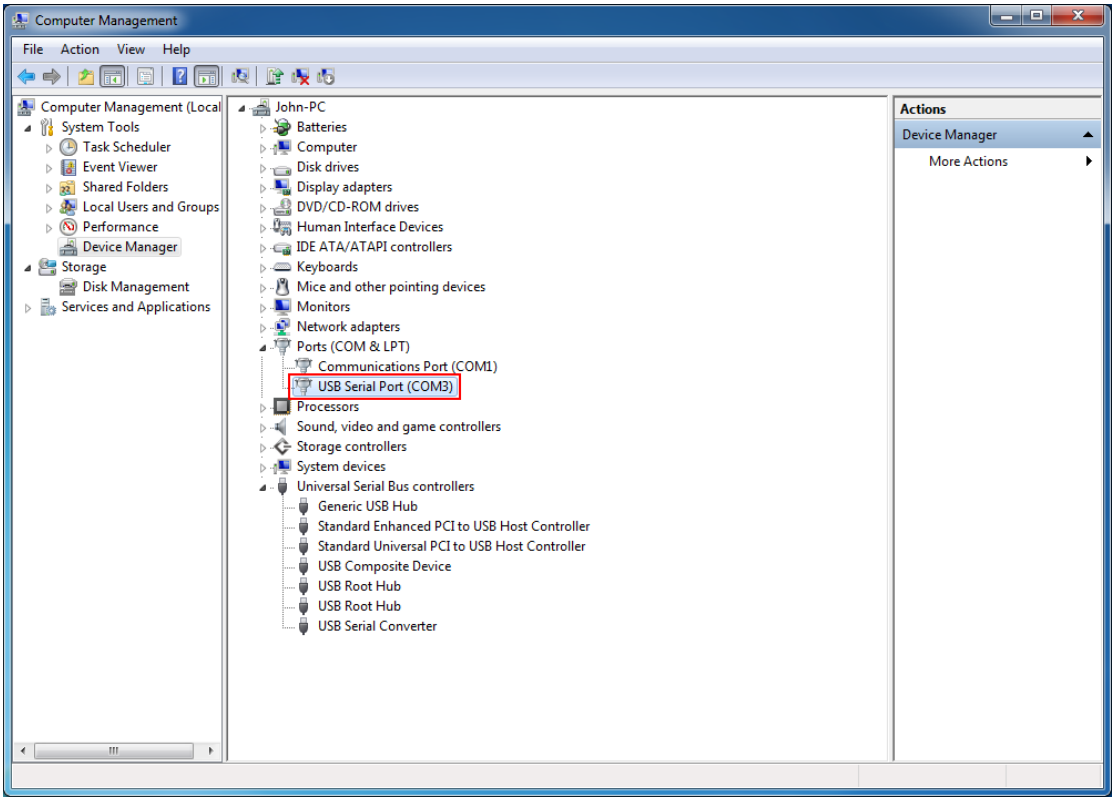


2. Check USB-485 COM

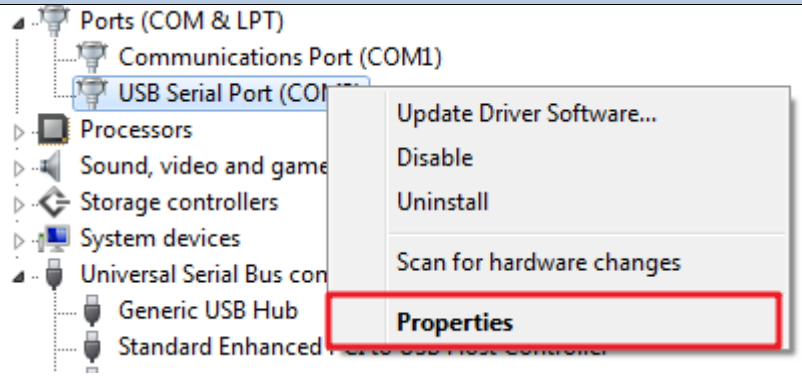
1. Open the device manager

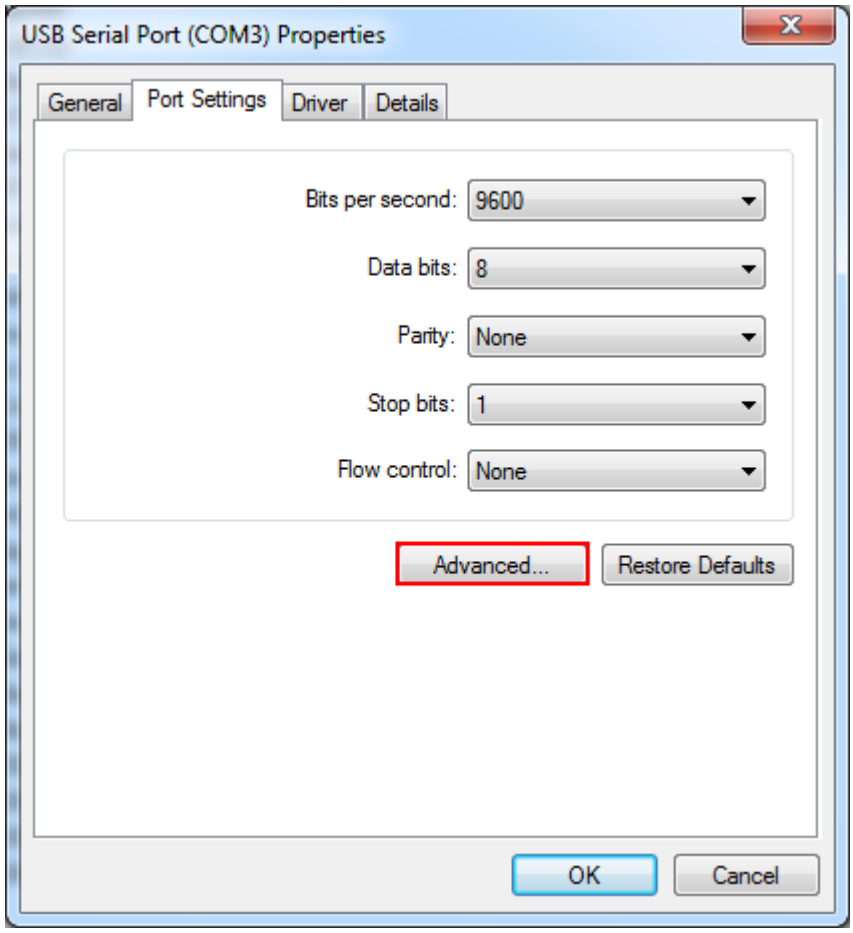
(***Win 7 path is***: Control Panel > device manager; ***Win XP path is:*** Control Panel > management tool > Computer Management > device manager. The following Win 7 system is taken as an example)

2. Click " ***COM***' can check the USB-485 port "USB Serial Port(***COM x***)"

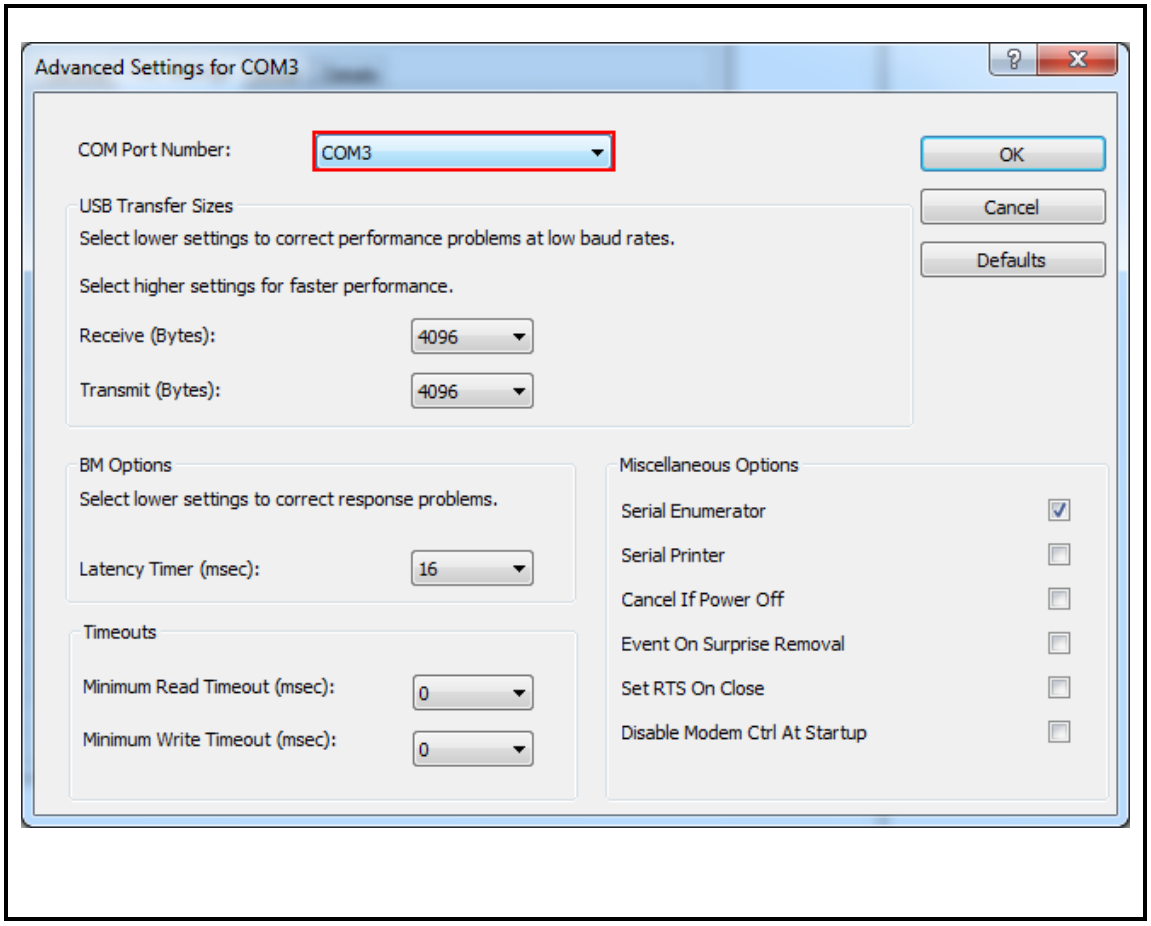


3. Change USB-485 COM

1. Choose the ”***USB serial port*** ” , Choose “***attribute***” by right mouse button

2. Click “***port setting***”, then choose “***Advanced***” by left mouse button



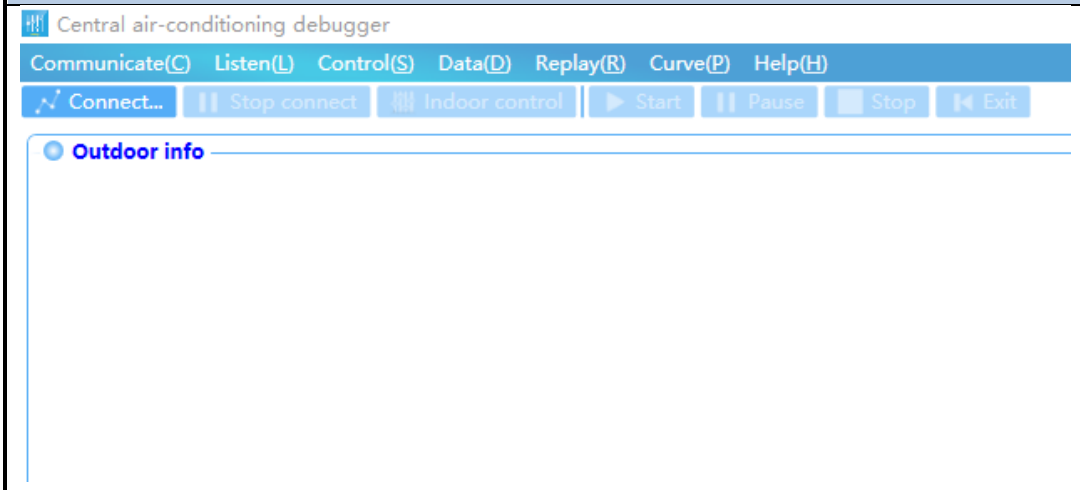
3. Through "***COM port***" choose a "***COM x***", then click "***OK***" to finish change


Advanced Settings for COM3
COM Port Number:
COM3
OK
Cancel
Defaults
USB Transfer Sizes
Select lower settings to correct performance problems at low baud rates.
Select higher settings for faster performance.
Receive (Bytes):
4096
Transmit (Bytes):
4096
BM Options
Select lower settings to correct response problems.
Latency Timer (msec):
16
Timeouts
Minimum Read Timeout (msec):
0
Minimum Write Timeout (msec):
0
Miscellaneous Options
Serial Enumerator
Serial Printer
Cancel If Power Off
Event On Surprise Removal
Set RTS On Close
Disable Modem Ctrl At Startup

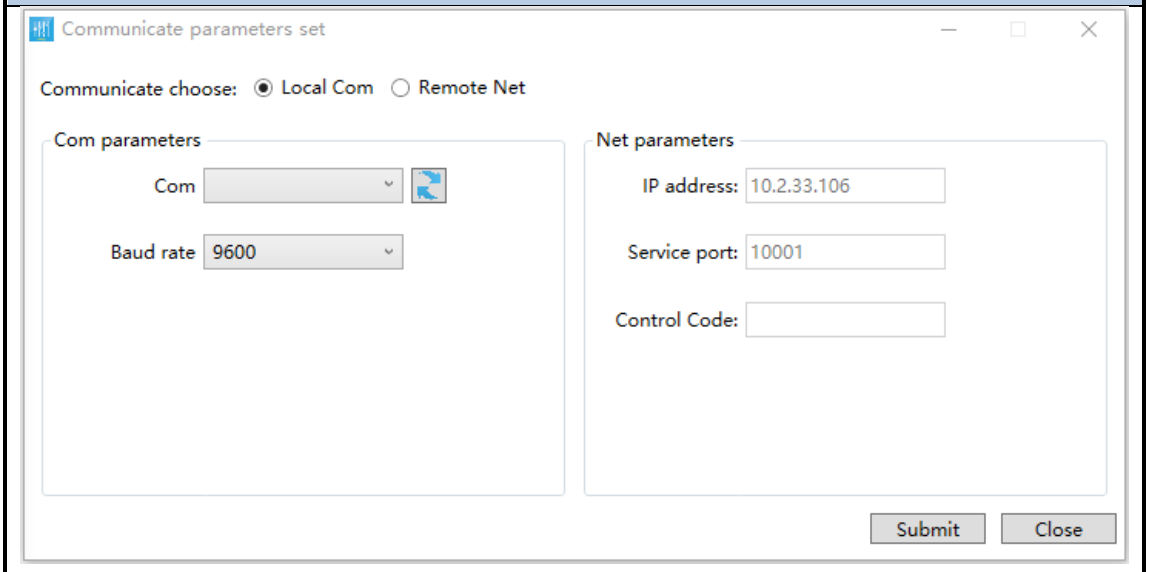
5.5 Function

1. Communication Port

1. Click " ***Connect*** " button

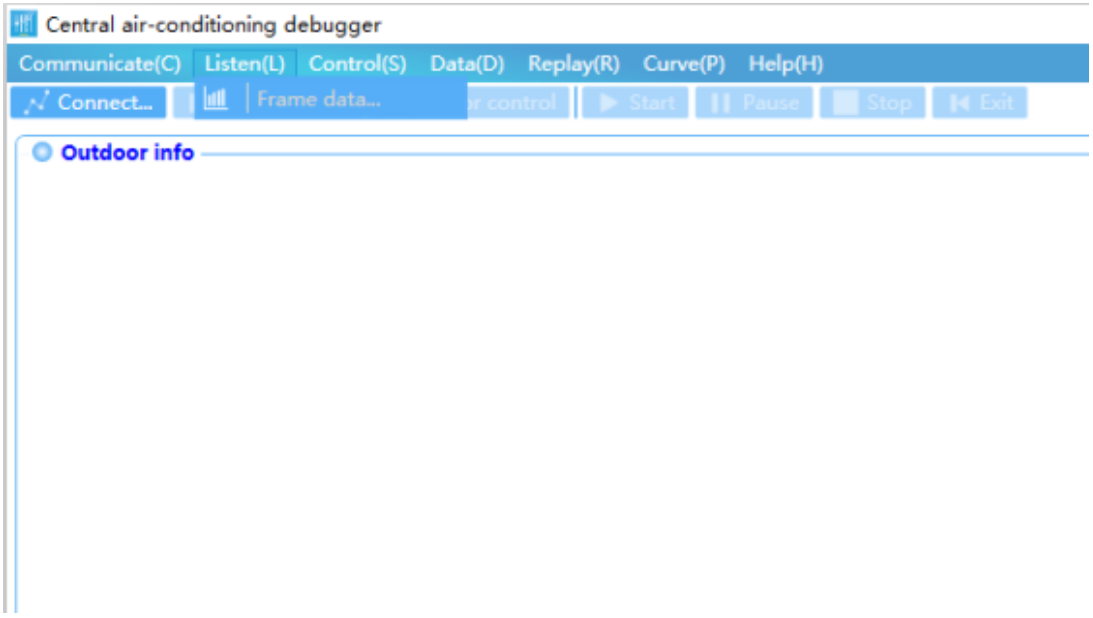


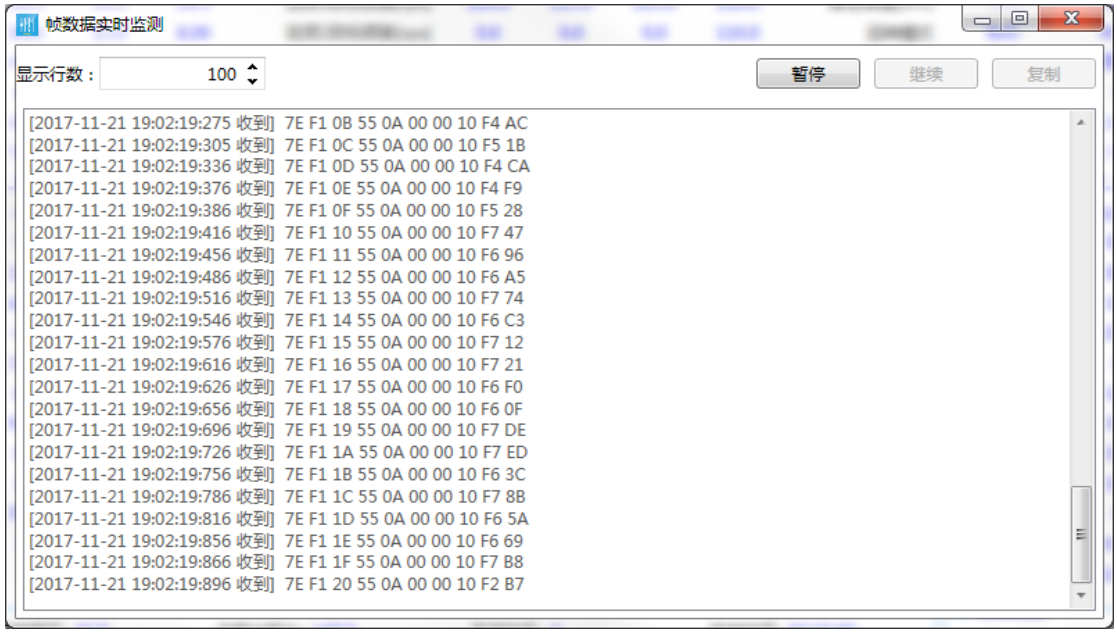
2. Choose " ***Com*** ", then click " ***Submit*** " to start



2. Data Frame

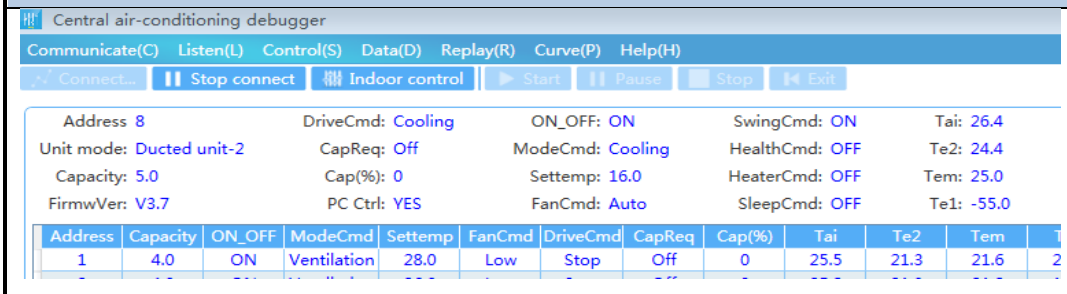
1. Click " ***Listen(L)*** " button, Choose" ***Frame date***"



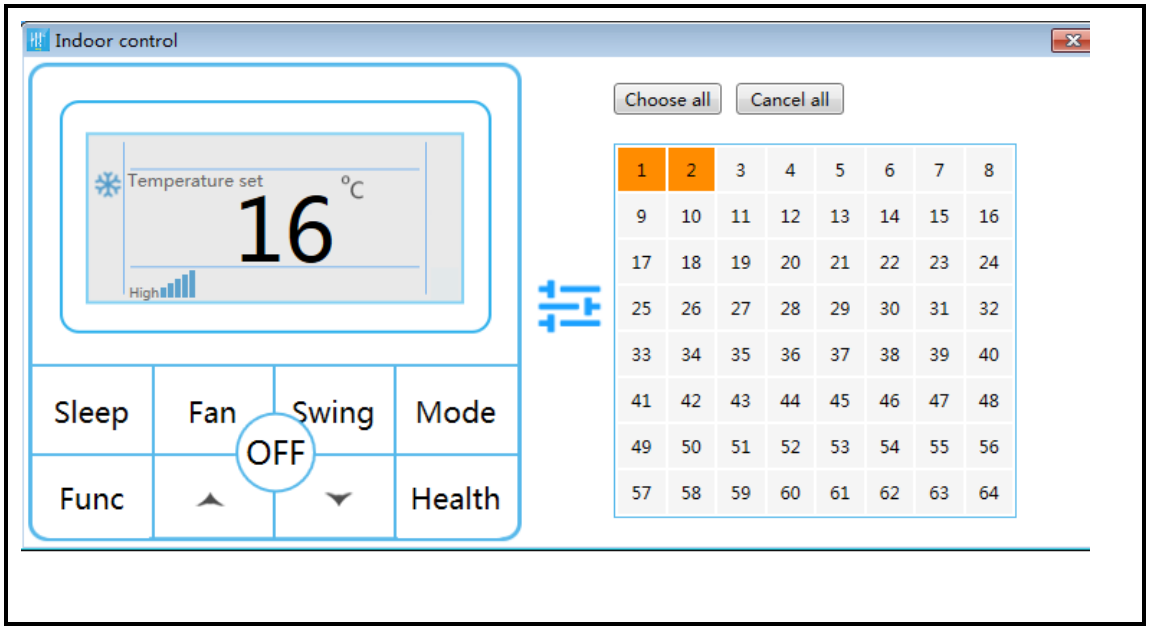


3. Control Indoor Unit

Click "***indoor control***" button, Pop-up the following window



Wired controller	Indoor units' IP address

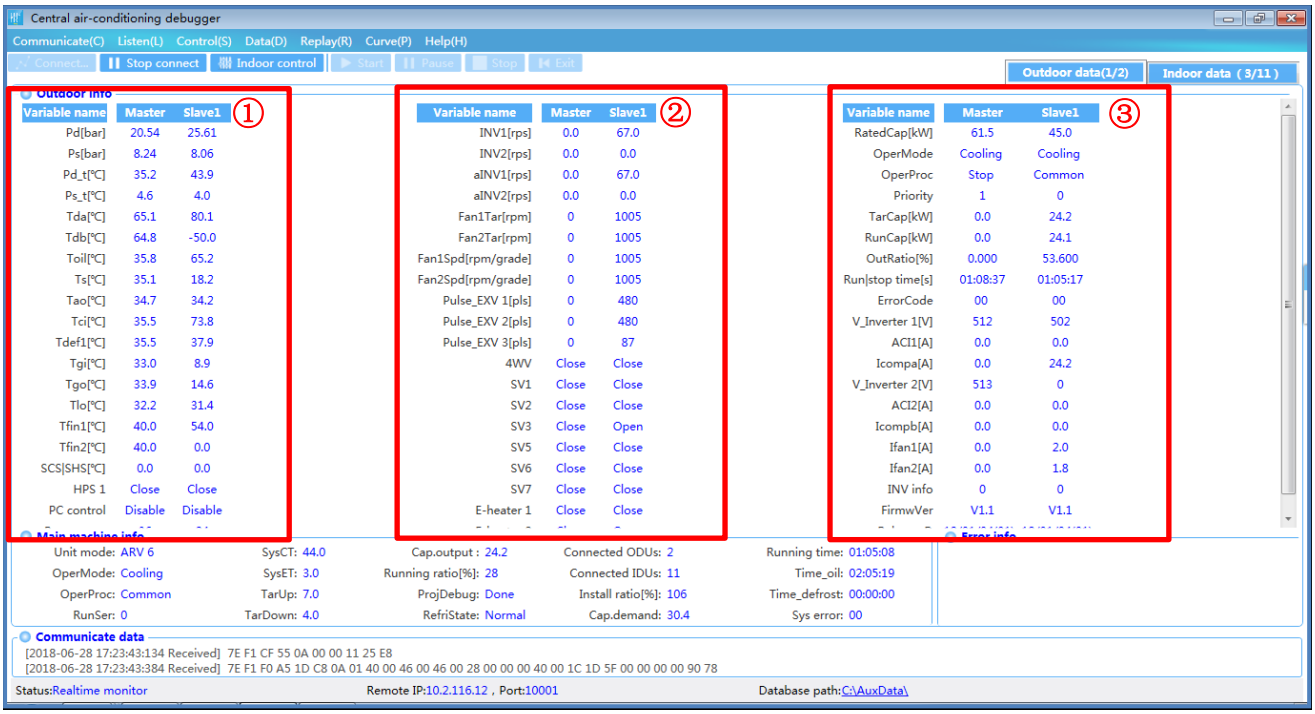


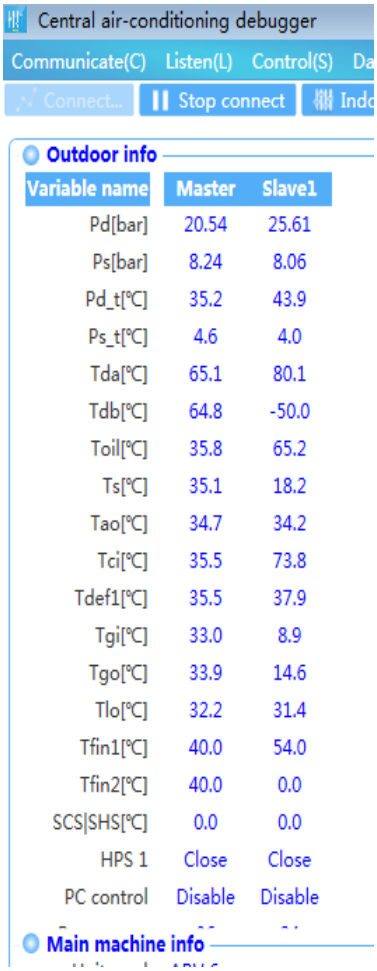
4. Operation Parameter Information

1. "***Outdoor data(1/2)***" means: The system had ***2 ODUs***, ***1 unit was running*** and ***another unit was standby***

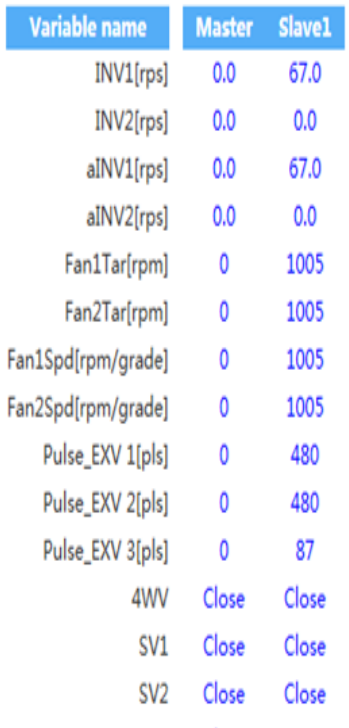
"***Indoor data(3/11)***" means: The system had ***11 IDUs***, ***3 units were running*** and ***8 units were standby***

2. Whole outdoor data interface

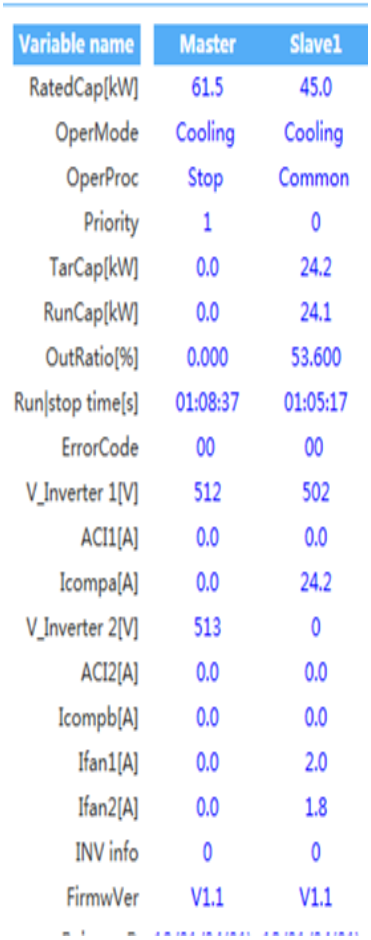


NO. ①	Name	Detailed information	Reference
	P_d [bar]	Discharge pressure (***1bar=0.1Mpa***)	**< 32bar**
	P_s [bar]	Suction pressure (***1bar=0.1Mpa***)	**< 10bar**
	P_{d_t} [℃]	Saturation temp. (***discharge*** pressure)	**/**
	P_{s_t} [℃]	Saturation temp. (***suction*** pressure)	**/**
	T_{da} [℃]	Discharge temp. (***1# Compressor***)	**< 92℃**
	T_{db} [℃]	Discharge temp. (***2# Compressor***)	**< 92℃**
	T_{oil} [℃]	Oil temp.	**/**
	T_s [℃]	Suction temp.	**< 22℃**
	T_{ao} [℃]	Outdoor ambient temp.	**/**
	T_{ci1}[℃]	Outlet temp. of condenser	**< 45℃**
	T_{def1}[℃]	Defrost temp.	**< 45℃**
	T_{gi}[℃]	Outlet temperature of PMV3	**/**
	T_{go}[℃]	Outlet temperature of sub-cooler	**/**
	T_{lo}[℃]	Liquid piping temperature of ODU	**≤Tci1[℃]**
	T_{fin1}[℃]	Temp. of 1# driver module	**/**
	T_{fin2}[℃]	Temp. of 2# driver module	**/**
	SCS[℃]	/	**/**
	H_{PS1}	High pressure switch state	**Close**
	PC control	/	**/**

Variable name	Master	Slave1
Pd[bar]	20.54	25.61
Ps[bar]	8.24	8.06
Pd_t[℃]	35.2	43.9
Ps_t[℃]	4.6	4.0
Tda[℃]	65.1	80.1
Tdb[℃]	64.8	-50.0
Toil[℃]	35.8	65.2
Ts[℃]	35.1	18.2
Tao[℃]	34.7	34.2
Tci[℃]	35.5	73.8
Tdef1[℃]	35.5	37.9
Tgi[℃]	33.0	8.9
Tgo[℃]	33.9	14.6
Tlo[℃]	32.2	31.4
Tfin1[℃]	40.0	54.0
Tfin2[℃]	40.0	0.0
SCS|SHS[℃]	0.0	0.0
HPS 1	Close	Close
PC control	Disable	Disable

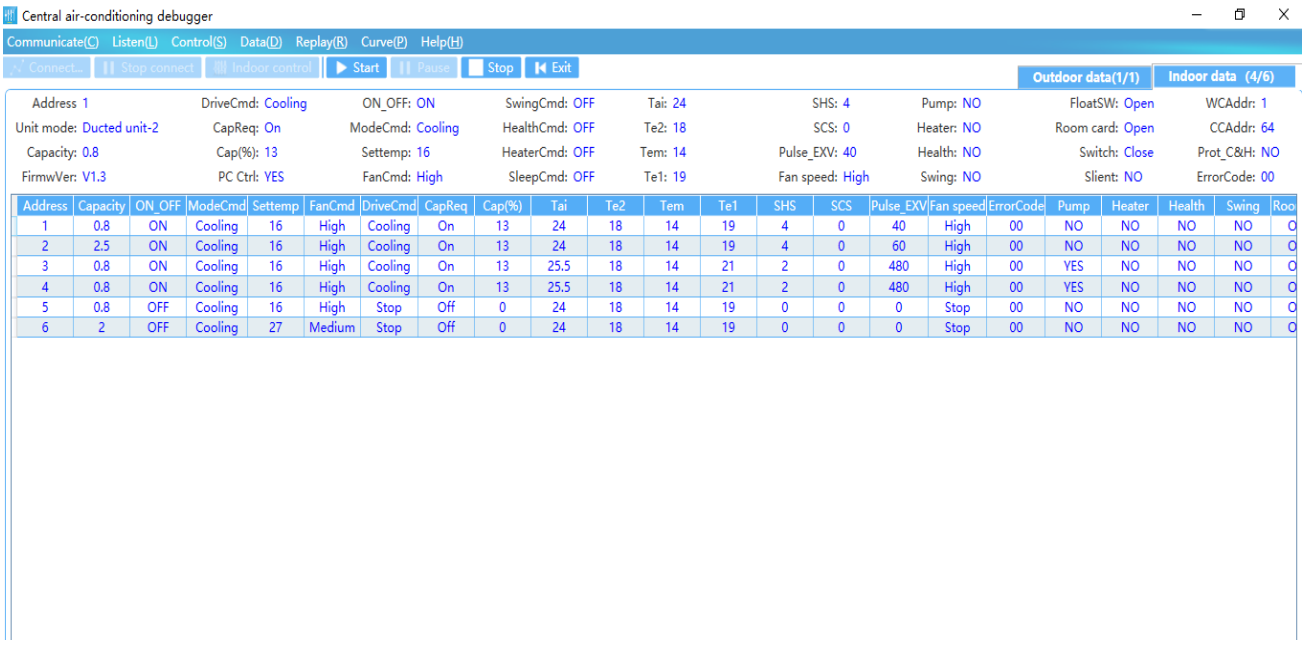
NO. ②	Name	Detailed information	Reference
	INV1[rps]	Target frequency (***1# Compressor***)	/
	INV2[rps]	Target frequency (***2# Compressor***)	/
	aINV1[rps]	Running frequency (***1# Compressor***)	/
	aINV2[rps]	Running frequency (***2# Compressor***)	/
	Fan1Tar	Target rpm (***1# motor***)	/
	Fan2Tar	Target rpm (***2# motor***)	/
	Fan1Spd	Running rpm (***1# motor***)	/
	Fan2Spd	Running rpm (***2# motor***)	/
	Pluse_EXV1	Pluse_EXV1 （**heating**）	**480(cooling)**

	Pluse_EXV2	Pluse_EXV2 (**heating**)	**480(cooling)**
	Pluse_EXV3	Pluse_EXV3(**sub-cooling**)	/
	4WV	4-way valve (**heating**)	**Close(cooling)**
	SV1	Unloading valve	/
	SV2	/	/
	SV3	Sub-cooling valve	**Open(cooling)**
	SV5	Vapor injection valve (***1# Comp.***)	**Open(heating)**
	SV6	Vapor injection valve (***2# Comp.***)	**Open(heating)**
	SV7	/	/
	E-heater1	Preheating (***1# Compressor***)	/
	E-heater1	Preheating (***2# Compressor***)	/

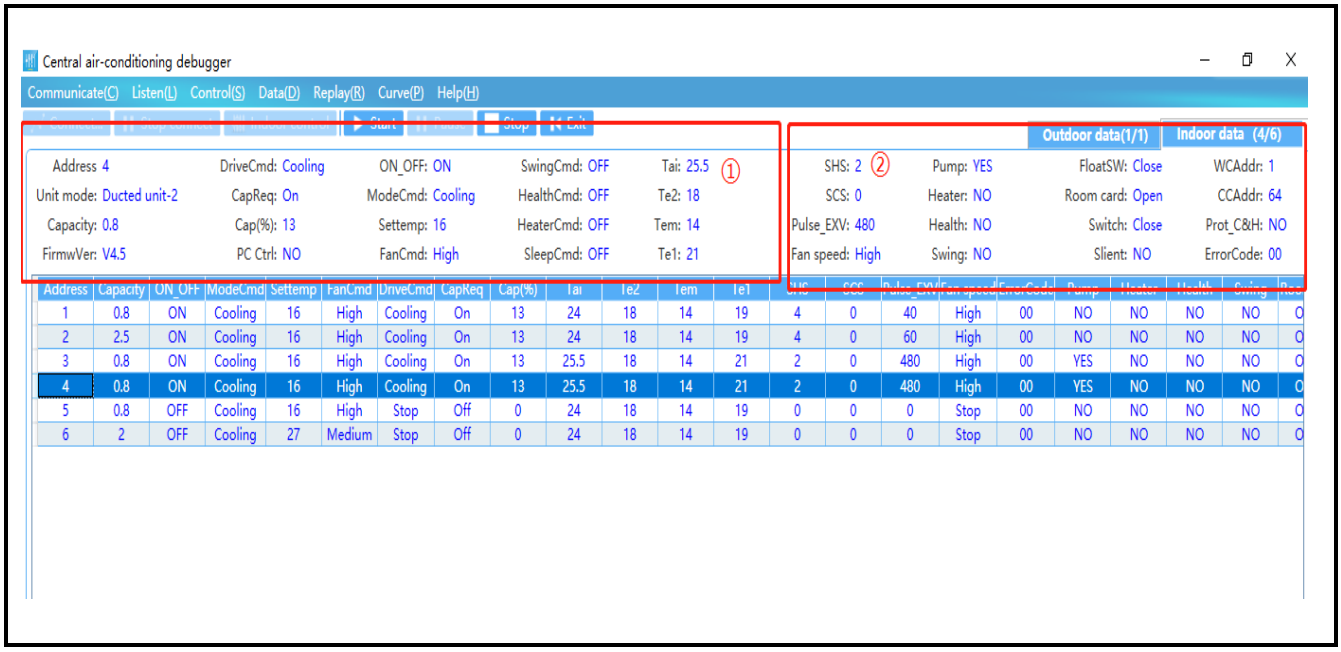
NO. ③	Name	Detailed information	Reference
	Rated Cap [kW]	Outdoor capacity	**Nameplate**
	Oper Mode	Operating Mode	**/**
	Oper Proc	Operating process state	**Oil return/Comm**
	Priority	Priority	1/0
	TarCap	Target output capacity	0~100
	RunCap	Running output capacity	0~100
	OutRatio	Target output capacity/ Outdoor capacity	/
	Run/Stop	Running time	/
	Error Code	Error Code	/
	V_Inverter1	Busbar voltage (***1# Compressor***)	512
	ACI1[A]	1# Drive module current input	
	Icompa[A]	Current (***1# Compressor***)	**Nameplate**
	V_Inverter2	Busbar voltage (***2# Compressor***)	512
	ACI2A]	2# Drive module current input	
	IcompbA]	Current (***2# Compressor***)	**Nameplate**
	Ifan1[A]	Current (***1# Fan Motor***)	**Nameplate**
	Ifan2A]	Current (***2# Fan Motor***)	**Nameplate**

Variable name	Master	Slave1
RatedCap[kW]	61.5	45.0
OperMode	Cooling	Cooling
OperProc	Stop	Common
Priority	1	0
TarCap[kW]	0.0	24.2
RunCap[kW]	0.0	24.1
OutRatio[%]	0.000	53.600
Run|stop time[s]	01:08:37	01:05:17
ErrorCode	00	00
V_Inverter 1[V]	512	502
ACI1[A]	0.0	0.0
Icompa[A]	0.0	24.2
V_Inverter 2[V]	513	0
ACI2[A]	0.0	0.0
Icompb[A]	0.0	0.0
Ifan1[A]	0.0	2.0
Ifan2[A]	0.0	1.8
INV info	0	0
FirmwVer	V1.1	V1.1

3. Whole Indoor data interface

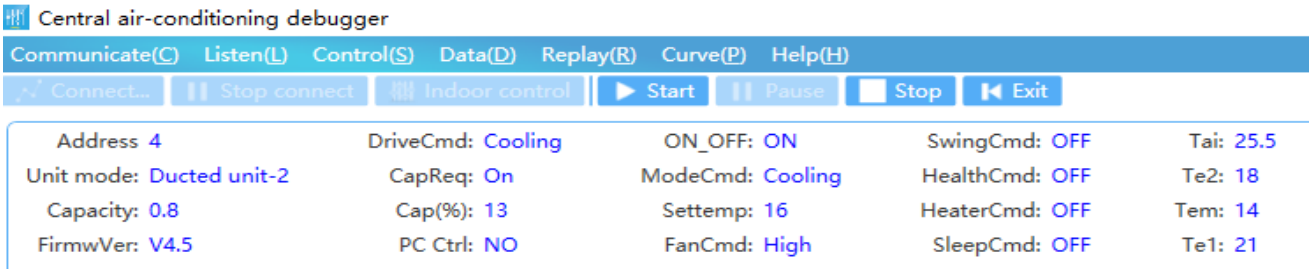


Choose a line(one of the indoor unit), then the ***detailed information*** of this indoor unit ***will be displayed*** above this line (① & ②)



Address	Capacity	ON_OFF	ModeCmd	Settemp	FanCmd	DrveCmd	CapReq	Cap(%)	Tai	Te2	Tem	Te1	TVC	SCS	Pulse_EXV	Fan speed	Error Code	Pump	Heater	Health	Swing	Pro
1	0.8	ON	Cooling	16	High	Cooling	On	13	24	18	14	19	4	0	40	High	00	NO	NO	NO	NO	O
2	2.5	ON	Cooling	16	High	Cooling	On	13	24	18	14	19	4	0	60	High	00	NO	NO	NO	NO	O
3	0.8	ON	Cooling	16	High	Cooling	On	13	25.5	18	14	21	2	0	480	High	00	YES	NO	NO	NO	O
4	0.8	ON	Cooling	16	High	Cooling	On	13	25.5	18	14	21	2	0	480	High	00	YES	NO	NO	NO	O
5	0.8	OFF	Cooling	16	High	Stop	Off	0	24	18	14	19	0	0	0	Stop	00	NO	NO	NO	NO	O
6	2	OFF	Cooling	27	Medium	Stop	Off	0	24	18	14	19	0	0	0	Stop	00	NO	NO	NO	NO	O

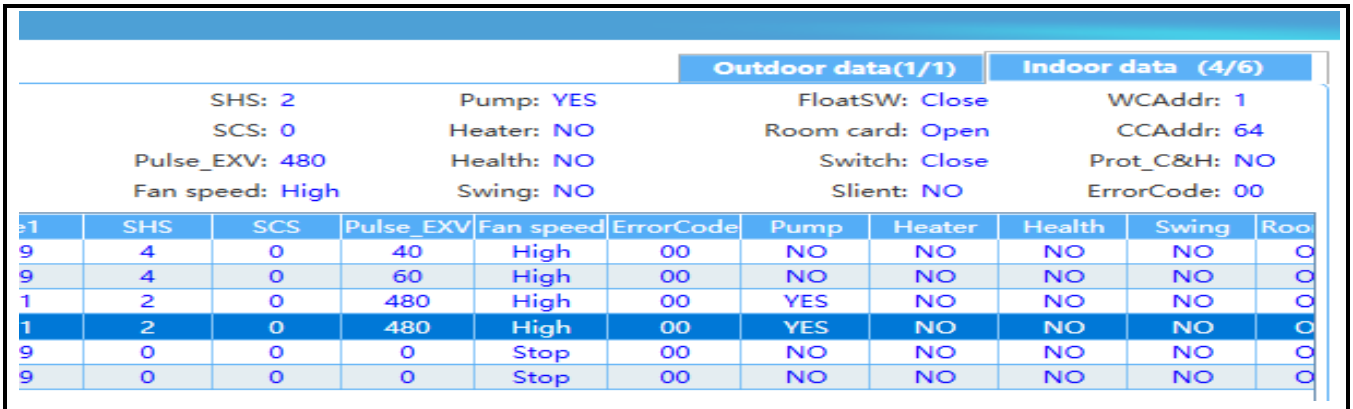
NO. ①



Name	Detailed information	Reference
Address	Indoor unit IP address	
Unit Mode	Type of indoor unit	
Capacity	Indoor unit's capacity	**Nameplate**
FirmwVer	/	

DriveCmd	Drive mode state	
CapRed	Demand state	
Cap(%)	Capacity ration	
PC Ctrl	/	
ON_OFF	ON/OFF state	
ModeCmd	Setting Mode	
Settemp	Setting temperature	
FanCmd	Setting fan speed	
SwingCmd	Setting swing mode	
HealthCmd	Health mode	
HeaterCmd	Electric auxiliary heat mode	
SleepCmd	Sleep mode	
Tai	Room temperature	
Te2	Inlet temperature of evaporator	
Tem	Mid temperature of evaporator	
Te1	Outlet temperature of evaporator	

NO. ②

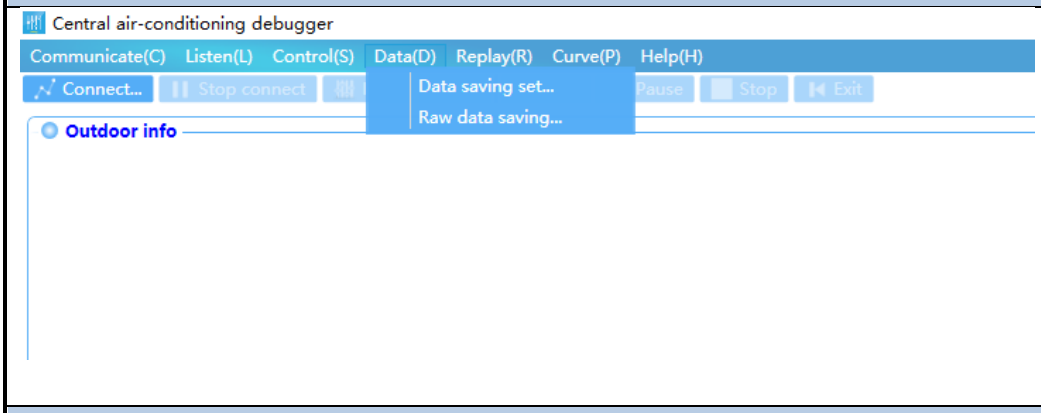


Name	Detailed information	Reference
SHS	Super-heat	
SCS	Sub-cooled	
Pulse_EXV	Pulse_EXV	**100~300**
Fan speed	Fan speed state	
Pump	Pump	
Heater	Electric auxiliary heat	
Health	Health	
Swing	Swing	
FloatSW	Float switch state	
Room card	Room card state	
Switch	/	
Slient	Slient mode	
WCAddr	Wired controller address	
CCAddr	Central controller address	
Prot_C&H	Protect of super-heat state	

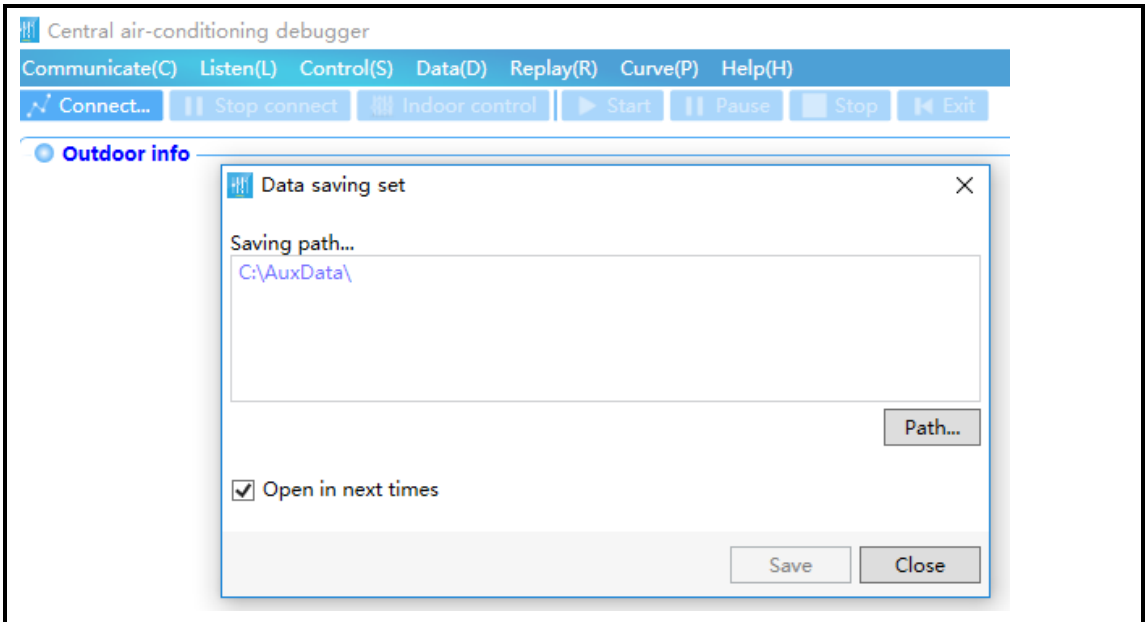
Error code	Error code	

5. Operation Parameter Save

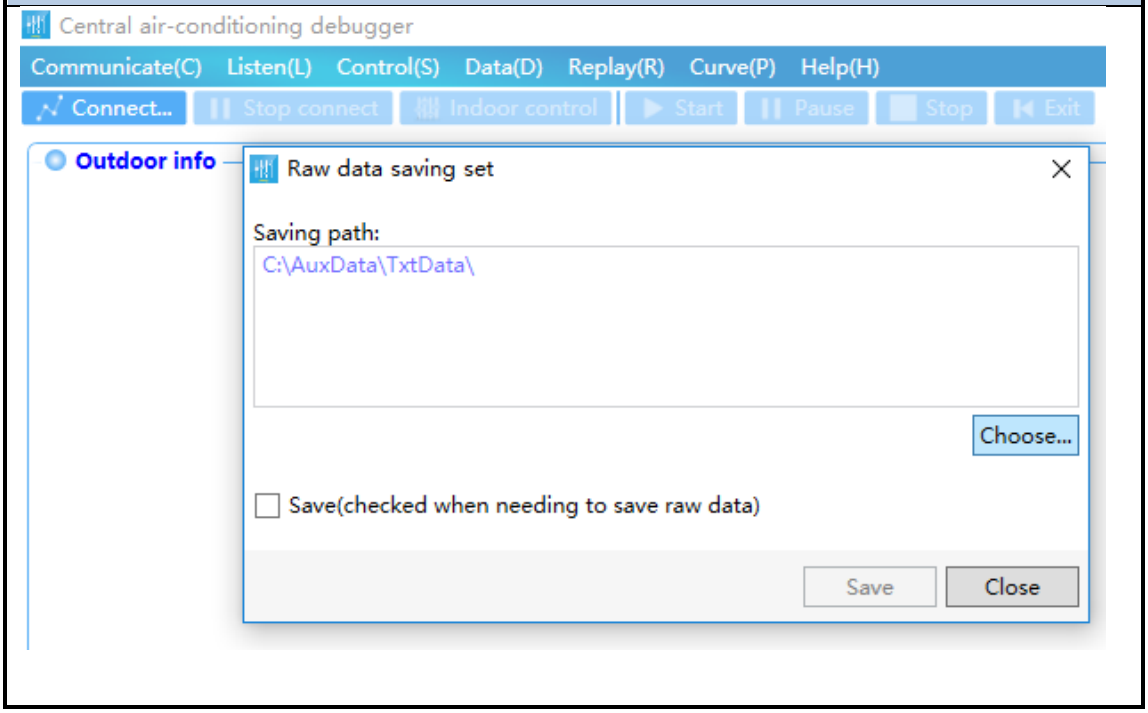
1. Click "***Data***" button



2. Choose "***Data save setting***" button

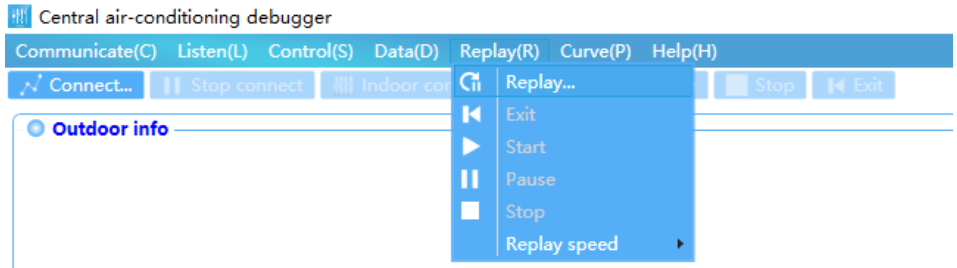


3. Choose "***Raw Data save setting***" button

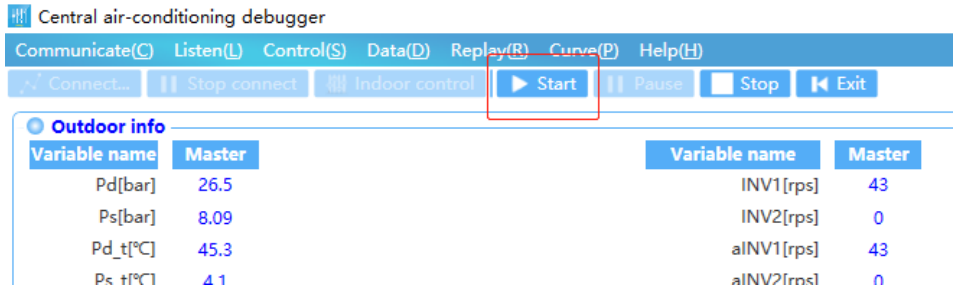


6. Operation Parameter Replay

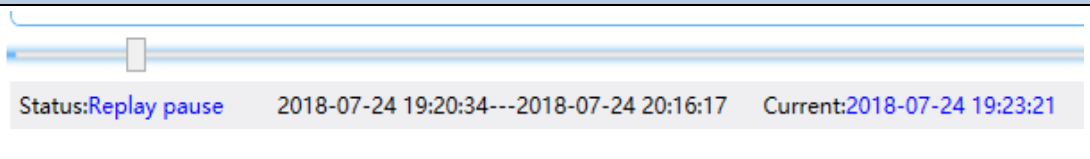
1. Click "***Replay(R)*** " button, choose a data file to replay

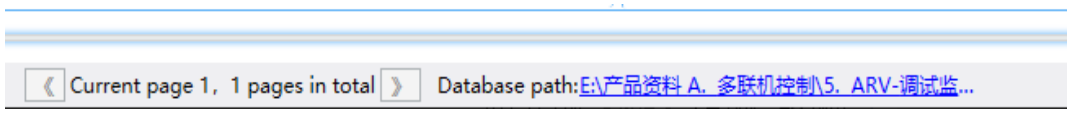


2. Click "***Start***" button to replay



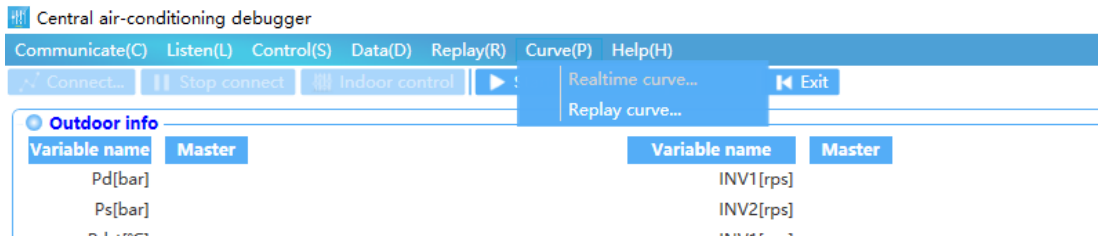
3. Replay progress, replay time, data path were displayed at the bottom.





7. Operation Parameter Curve

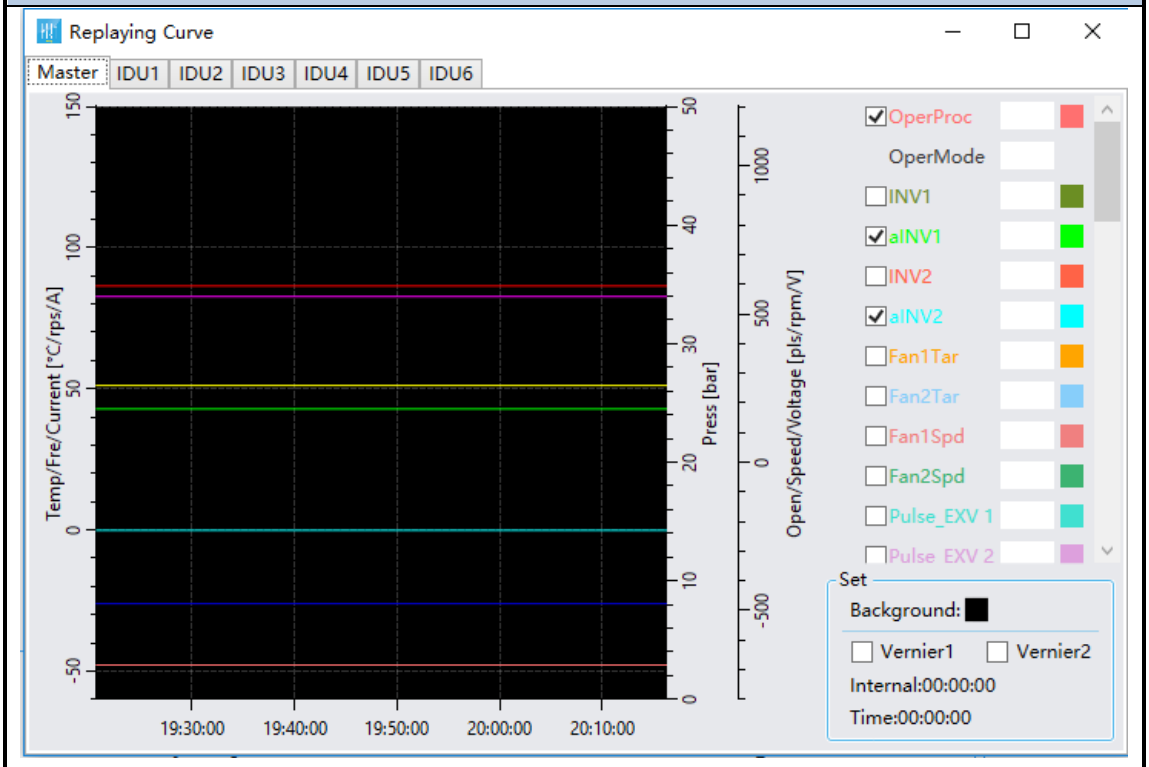
1. Click " ***Curve(P)***" button



2. ***The curve***

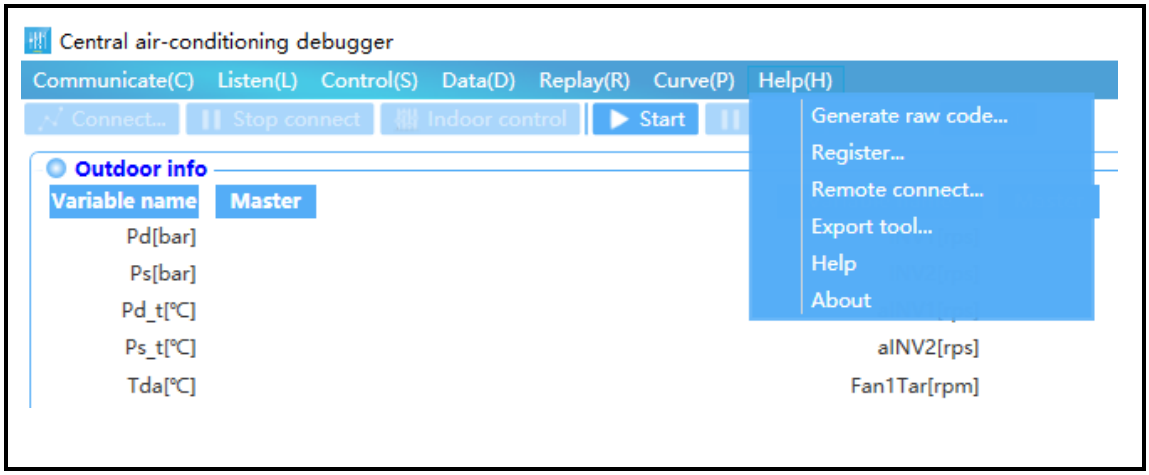
Can show all parameters which changing according the time

Can read the real time parameters within recent 30 min



8. Operation Manual

1. Click "***Help(H)*** " button ,then choose "***Help***" to open the operation manual



5.5 Registration

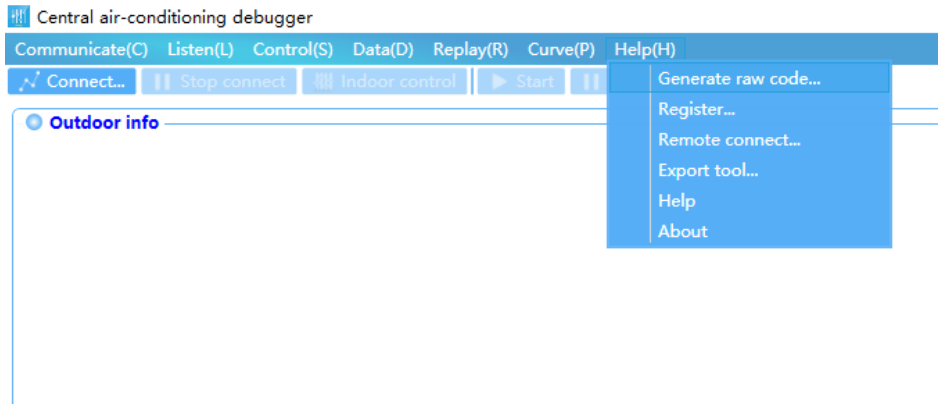
1. Permission Description

The software's default state is the unregistered which can ***read real-time parameter***, ***operation data's save***, ***indoor units' control***, ***operation parameter's curve***

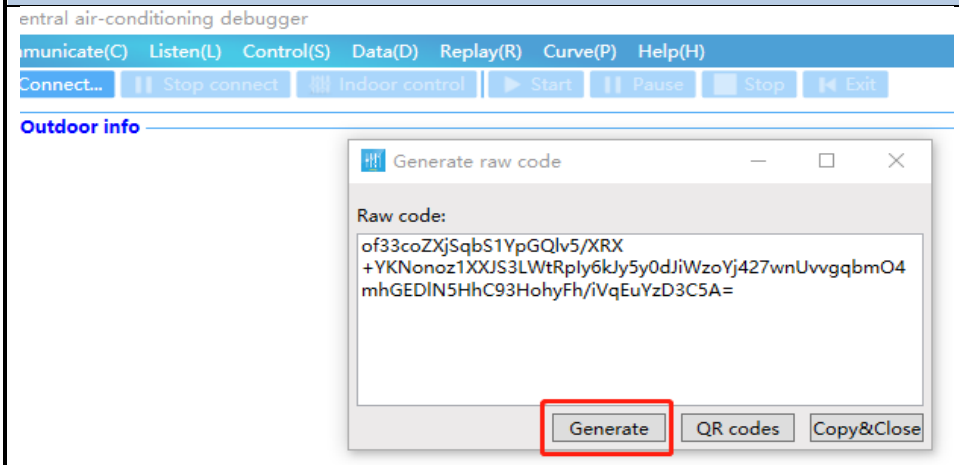
Parameter data ***replay*** function ***need to be registered***, otherwise, cannot replay data

2. Registration Steps

1. Click "***Help(H)*** " button to choose "***Generate raw code***",



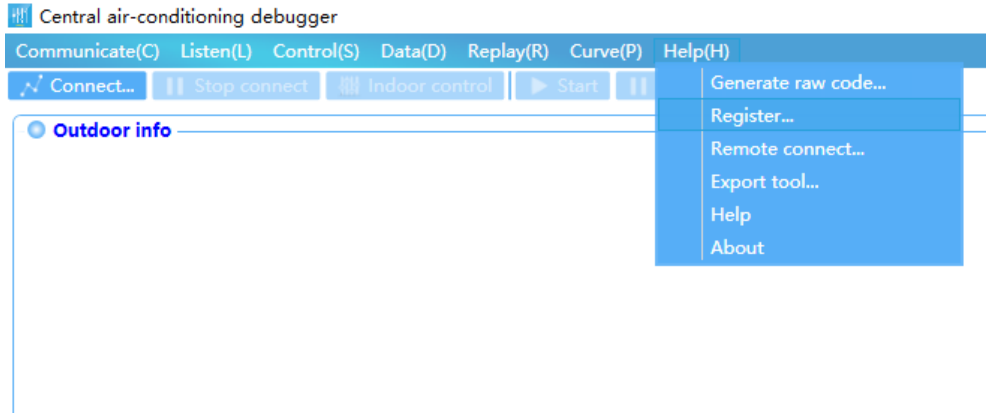
2. Click "***Generate***"



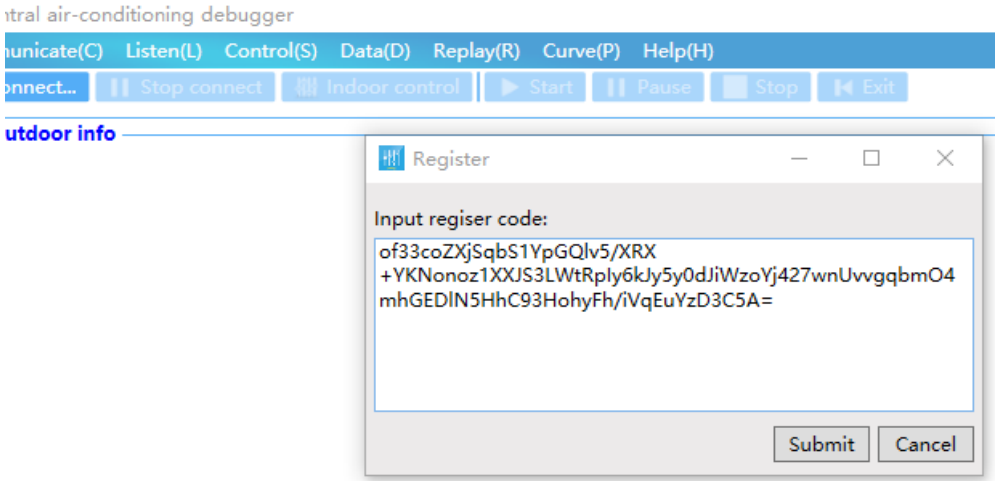
3. ***Copy raw code***, then ***send to technical*** support engineer

4. Technical support engineer ***provide registration code***

5. Click "***Help(H)*** " button to choose "***Register***"



5. Input the Register and finish



6. IDU Parameter setting by Controller

6.1 Parameter Setting Items

No.	Parameter Setting Items	Default value	Min. value	Max. value	Remark
1	Communication ID address	1	1	64	
2	Centralized ID address	1	1	64	
3	wired controller ID address	1	1	16	
4	model of indoor unit	1	0	**35**	01 :50HZ Low ESP Duct (*Drain Pump)* 01 :Mid ESP Duct (*Drain Pump*) 02 :High ESP Duct (*Within 60K*) 02 :High ESP Duct *(2 Pipes systems, 22.28.45.54kw)* 10 :Cassette Unit C7 Type *(09-18K)* 10 :DC Cassette Unit E Type *(09-18K)* 11 :DC Cassette Unit (*24-48K,MB12*) 12 :DC Mid ESP Duct 13 :Ceiling & Floor Unit 22 :Fresh Air Processor (*1 pipe system, 22.28kw*) 23 :AHU 24 :Mid ESP duct (*Optional Drain Pump)*

					24 :60HZ low ESP duct *（Drain Pump)* 24 :DC low ESP duct (*Drain Pump)* 24 :AC low ESP duct *(Optional Drain Pump ）* 26 :DC E type Low ESP Duct 28 :One way cassette 30 :Two way cassette 32 :Wall - Mounted (*L Type*) 34 :Fresh Air Processor (*2 Pipe system, 22.28kw*) 35 :High ESP Duct (*1 Pipe system, 22.28kw*)
5	capacity of indoor unit	8	1	100	280W/unit
6	priority of indoor unit	0	0	3	0--No priority 1--priority 1 2--priority 2 3--priority 3
7	selection of room silent mode	0	0	1	0--normal 1--silent mode
8	auto restart function of indoor unit	1	0	1	0—Available 1--not available
9	room card selection	0	0	1	0--invalid room card 1--valid room card
10	clearing time of filter net	5	1	5	500h/unit

11	operating mode displayed by wired controller	1	0	2	0--[auto][heating] [dehumidification][cooling][ventilation] 1--[heating] [dehumidification][cooling][ventilation] 2--[dehumidification][cooling][ventilation]
12	installation height of indoor unit	0	0	1	0-- installation height is lower than 2.7m 1--installation height is higher than 2.7m
13	switching between Celsius degree and Fahrenheit	0	0	1	0--Celsius degree 1--Fahrenheit
14	display of room temperature	0	0	1	0-- room temperature not to be displayed 1-- room temperature to be displayed
15	selection of room temperature	0	0	1	0-- temperature sensor of return air 1--temperature sensor of wired controller

6.2 Parameter setting by YK – L

6.2.1 Enter the setting interface

① Make sure the remote controller is ***off***

② Press the ***two white button*** at the down side simultaneously ***more than 10s*** to enter the address setting mode.

③ First, will display "***1***" , "***1***" ,

④ the above number means : Series parameter number, from ***1~15***

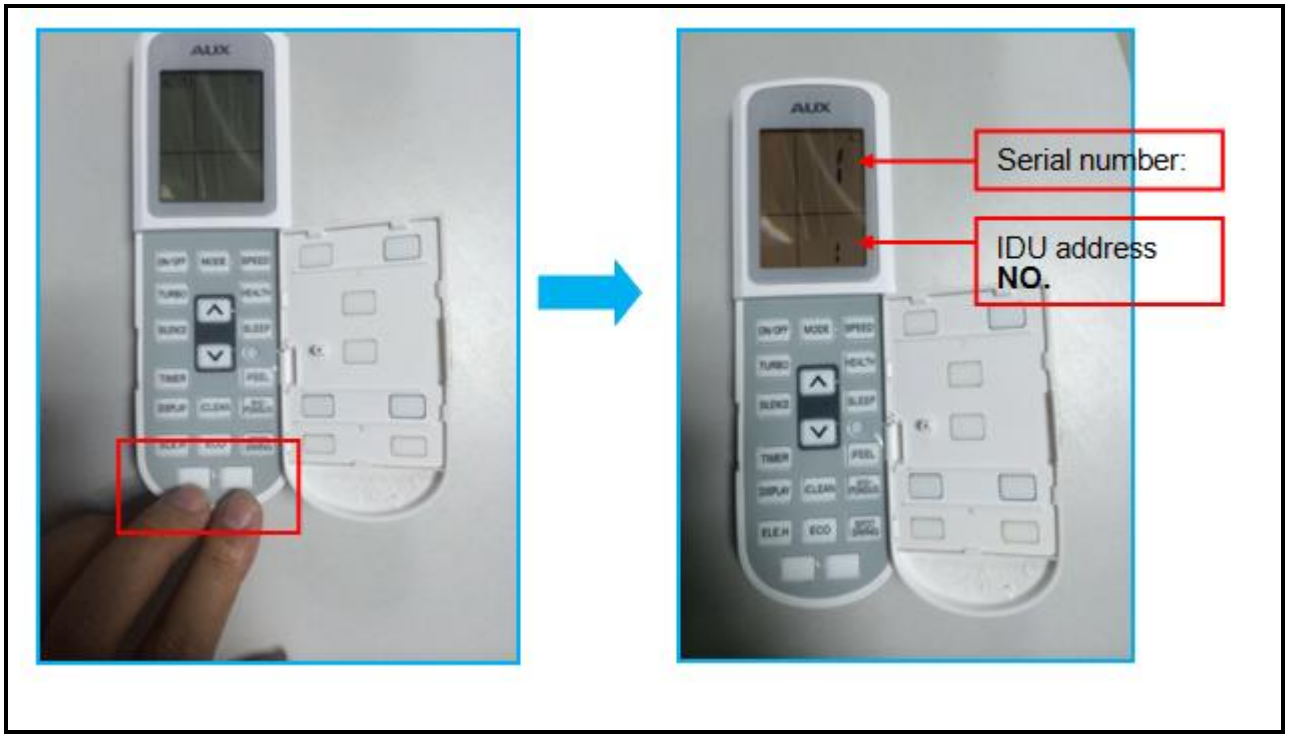
⑤ the below number means：Meaning of parameter correspondence

For example:

Check "***6.1 Parameter Setting Items***" for number of parameters and corresponding meaning.

"1" , "1" , the indoor unit's address is ***1#***

"4" , "32" , the indoor unit's type is ***Wall - Mounted (L Type)***

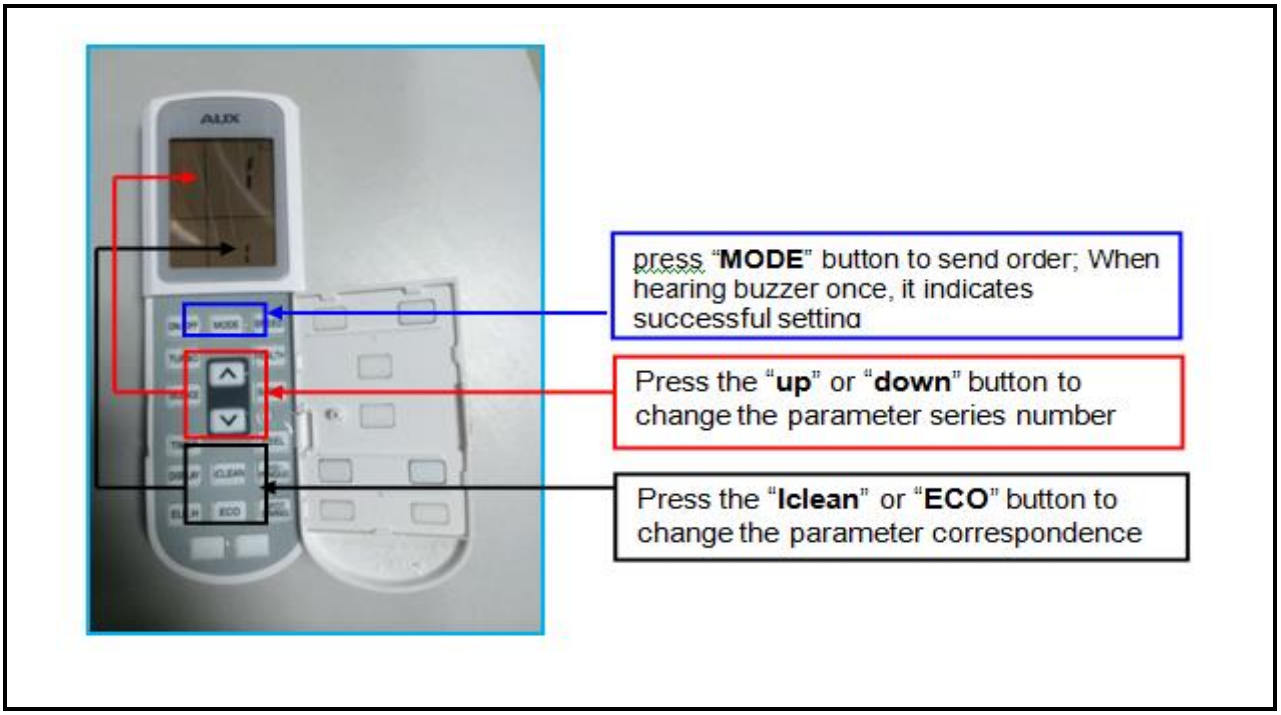


6.2.2 Parameter Setting

1. Press the **[∧]** or **[∨]** button to change the parameter series number

2. Press the **[IClean]** or **[ECO]** button to change the parameter correspondence

3. Press the **[MODE]** button to send order (Sent signal to display panels or receivers), Then can hearing buzzer once


press "MODE" button to send order; When hearing buzzer once, it indicates successful setting
Press the "up" or "down" button to change the parameter series number
Press the "Iclean" or "ECO" button to change the parameter correspondence

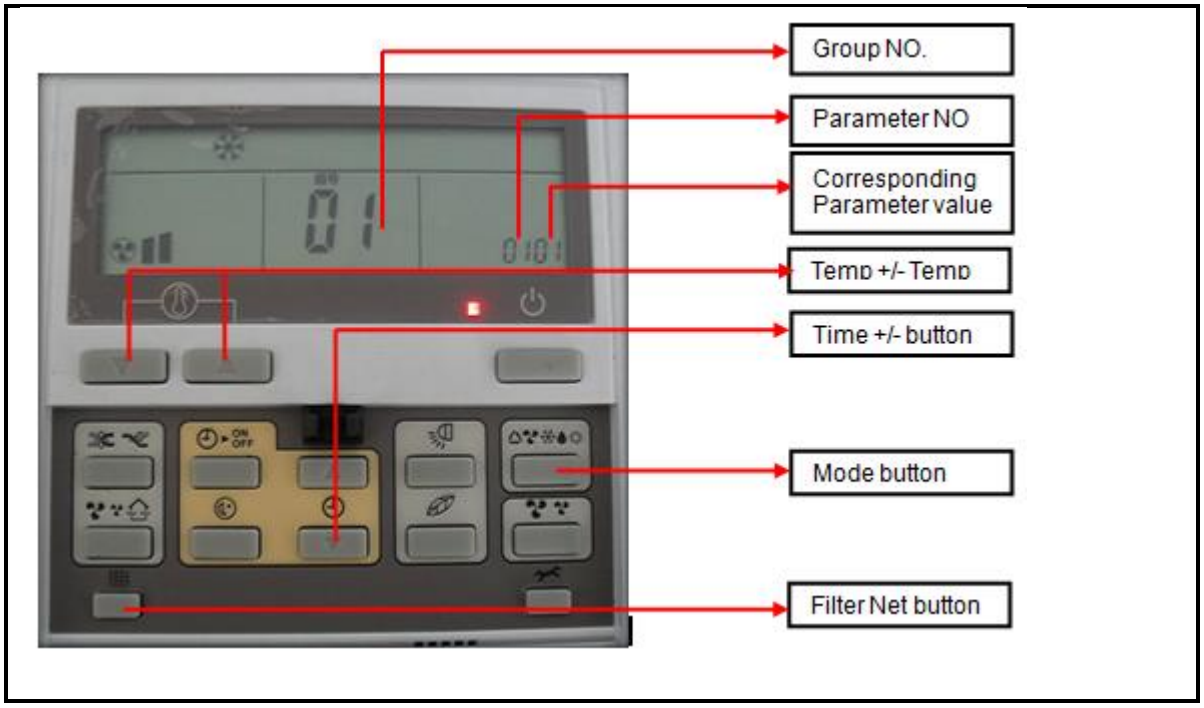
6.3 Parameter setting by XK-02A

6.3.1 Enter the setting interface

① Press [***Filter Net Button***] for ***5 seconds,*** group number ***"01"*** of wired controller will be displayed in temperature zone of LCD screen and ***"0101"*** will be displayed in timing setting zone of LCD screen.

② "**0101**" means this indoor unit ID a*ddress is No. 1*

③ *Press [**+/- Button of Time**], **"0201", "0301", "0401" "0510"** will be displayed successively. Check* "**6.1 Parameter Setting Items**" for number of parameters and corresponding meaning.



6.3.2 Parameter Setting

After press [***Filter Net Button***] for ***5 seconds***, then

1. Press [***Time +/- button***] to change number of parameters (***1~15***), ***"0101" ~"1501"***

2. Press [***Mode Button***] once, ***"0101"***, ***01 will flash***

3. Press [***Temp +/- button***] to change the value, for example ***"0105"***

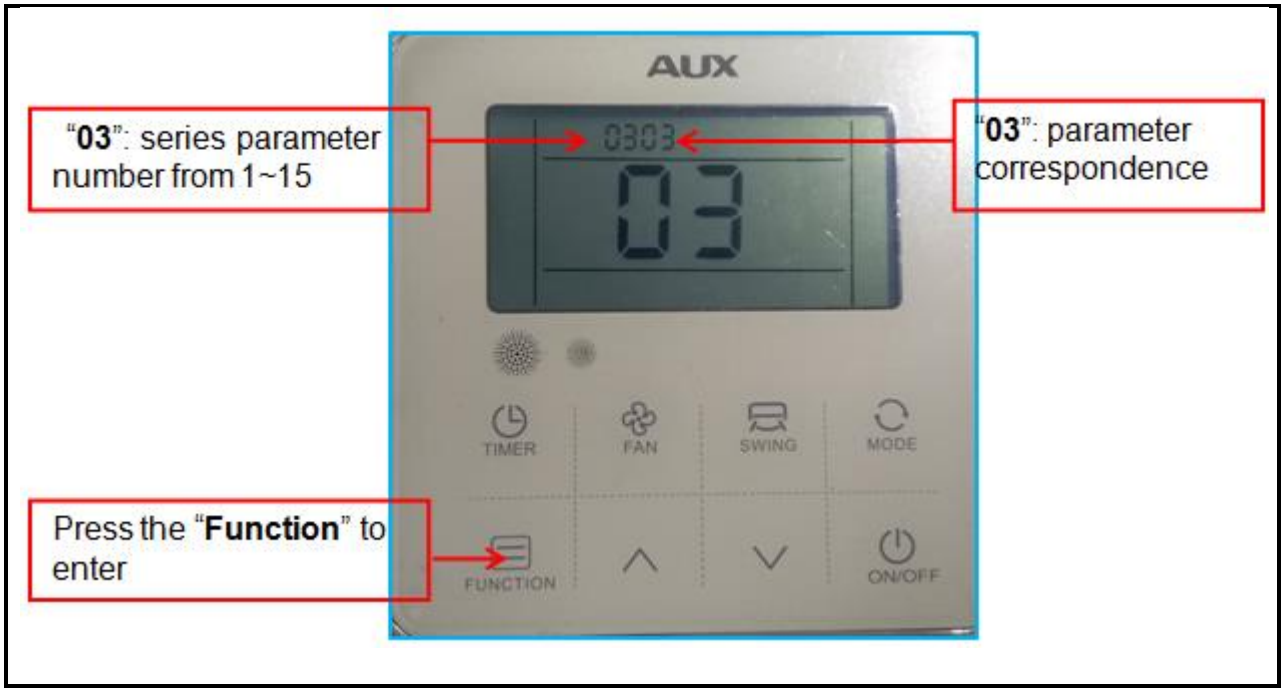
4. Press [***Mode Button***] to confirm

6.4 Parameter setting by XK-05A

6.4.1 Enter the setting interface

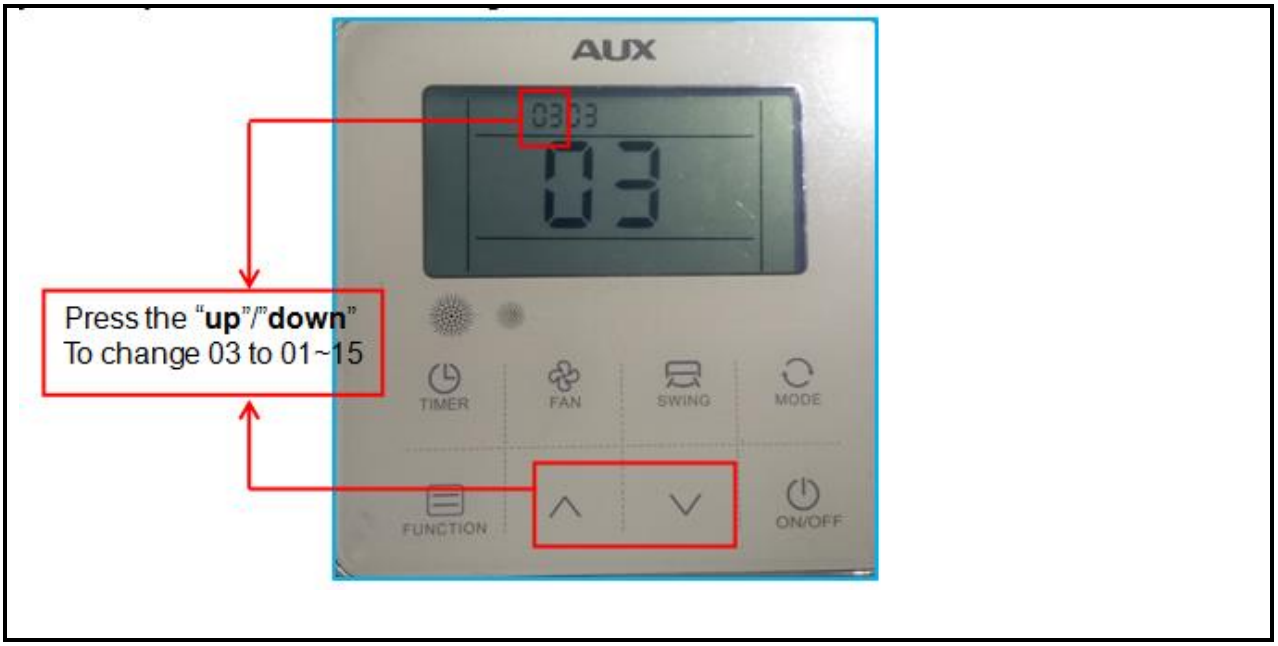
1. Press ***"Function"*** button for ***10s*** to enter the setting interface.

2. ***"0303"*** can check ***"6.1 Parameter Setting Items"*** for number of parameters and corresponding meaning.



6.4.2 Change series parameter number

Press ***"up" /"down"*** button to change the number (***1~15***), ***"0101" ~"1501"***

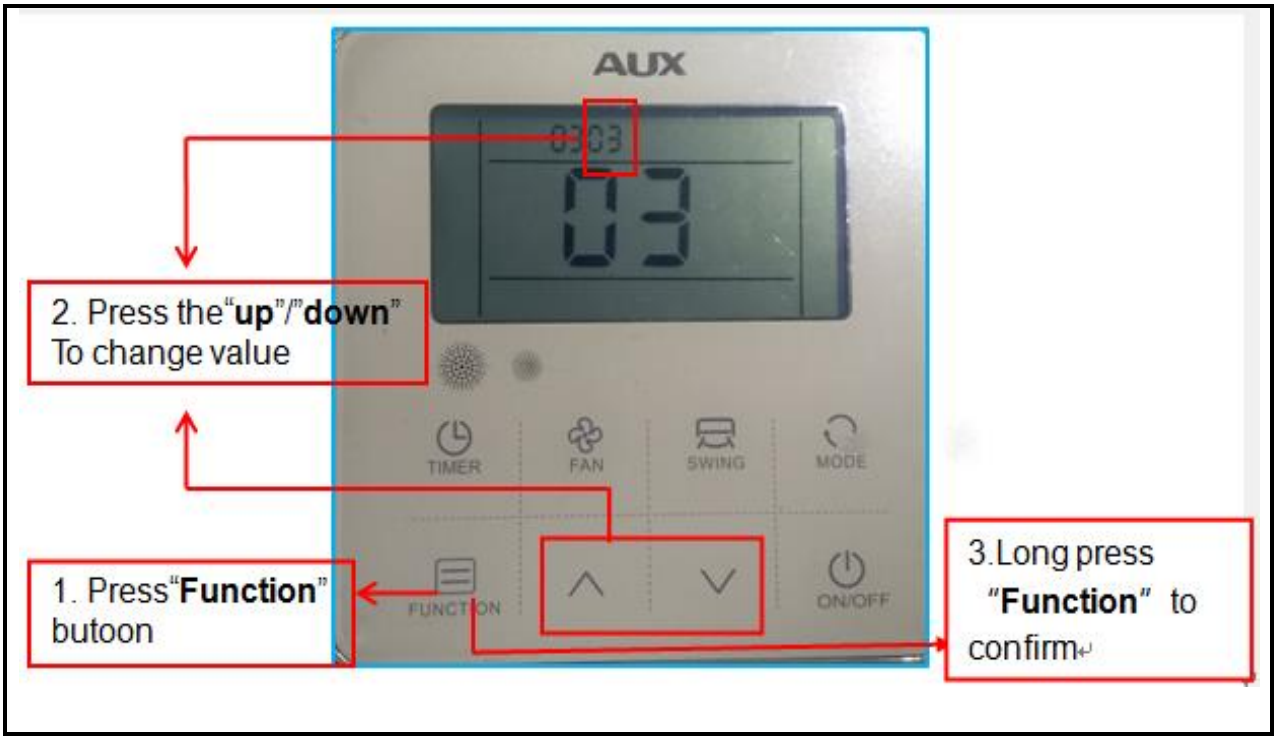


6.4.3 Parameter Correspondence Setting

1. Long press ***"Function"*** button for 5s, the second ***"0303" 03*** will flash

2. Press ***"up" /"down"*** button to change the number

3. Press [***Function Button***] to confirm

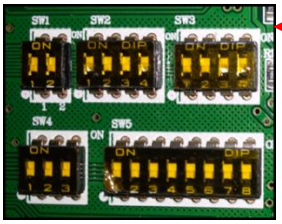
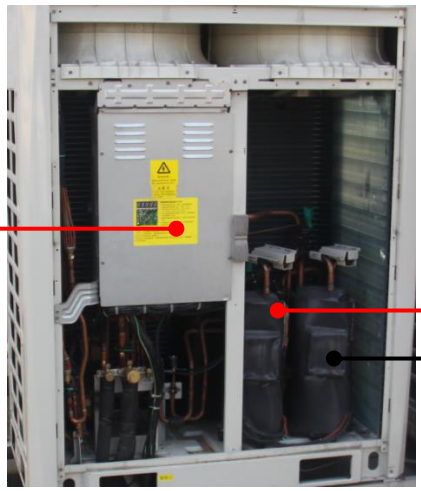

AUX
03
2. Press the"up"/"down"
To change value
TIMER
FAN
SWING
MODE
1. Press"Function"
butoon
FUNCTION
ON/OFF
3.Long press
"Function" to
confirm

Part4 Special Control

1. Special Control

1.1 Compressor emergency

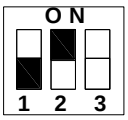
1. This function is used for twin compressor models (***18-22HP***)

Dip Switch in Main PCB		Compressor Information
		***1# Comp. Abnormal*** ***2# Comp. Normal***

<table>
<tr><td colspan="2">2. When one of these compressors had a fault

For example : 1 # compressor abnormal</td></tr>
<tr><td>3. Set emergency function for 1# compressor, as right diagram (Change according “Part 3 - 4.1 Functions set by switch”)

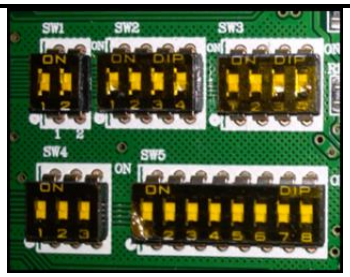
Then will shields all faults of 1# compressor.</td><td>1# Compressor emergency

SW4
OFF NO
1 2
 
</td></tr>
<tr><td colspan="2">4. The system will only run 2# compressor</td></tr>
</table>

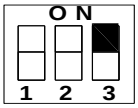
1.2 Modular emergency（ODU）

1. This function should be used in **N**≥2 (N: A system's quantity of outdoor units)

Dip Switch in Main PCB	

<table>
<tr><td>  </td><td></td></tr>
<tr><td colspan="2">2. When one of these outdoor units had a fault,

For example : Slave 2 # abnormal</td></tr>
<tr><td>3. Set emergency function for Slave 2 #, as right diagram (Change according “Part 3 - 4.1 Functions set by switch”)

Then will shields all faults of Slave2#</td><td>Modular emergency
SW4
NO 3
  </td></tr>
<tr><td colspan="2">4. Close the liquid and gas stop valve of slave 2#</td></tr>
<tr><td colspan="2">5. Other outdoor units operate automatic, the outdoor unit (Slave 2#) which was choose emergency function will keep standby.</td></tr>
</table>

1.3 Quiet mode

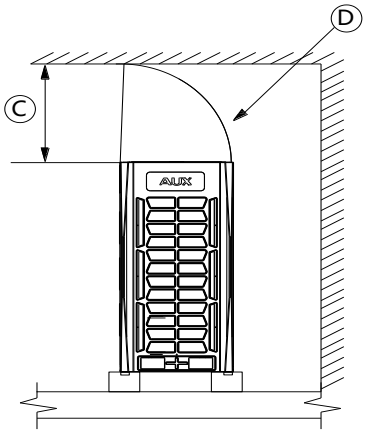
Quiet in cooling mode
Max frequency of compressor 90HZ
Max frequency of fan motor 49HZ(single fan modular)
Max frequency of fan motor 58HZ(twin fan modular)
Quiet in heating mode
Max frequency of compressor 100HZ
Max frequency of fan motor 49HZ(single fan modular)
Max frequency of fan motor 60HZ (twin fan modular)

1.4 Operation Priority

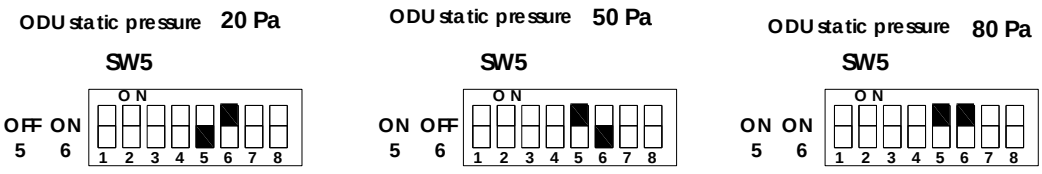
First-ON:
The first “ON” indoor unit determines the running mode of the whole system until shutdown.
Heating priority:
When any indoor unit receives the heating command, the outdoor unit runs according to the heating mode until the heating mode is stopped.
Cooling priority:
When any indoor unit receives the cooling command, the outdoor unit runs according to the cooling mode until the cooling mode is stopped.
VIP:
Manual address set the indoor unit’s address to 63, 64, A system can have 2 VIP indoor units, VIP indoor unit determines the running mode of the

whole system until.

1.5 ODU static pressure control

If the installation space the same as right diagram	Ⓒ ＜ 1000 mm Ⓓ Air exhausting device 
1. Air exhausting device is necessary to be added to improve the ventilation	
2. Outdoor unit's static pressure should be set to ***20 or 50 or 80Pa*** according the air exchausting device	

Before power on, outdoor unit's static pressure can be set to 20/50/80Pa according to project demand *(Change according "**Part 3 - 4.1 Functions set by switch" SW5**)*



1.6 Clean (Auto dust removal)

Outdoor fan motor run as opposite direction for a period of time to blow away the dust *(Choose the function according "**Part 3 – 4.2.4 [C] Function Setting** "-【C……2】)*

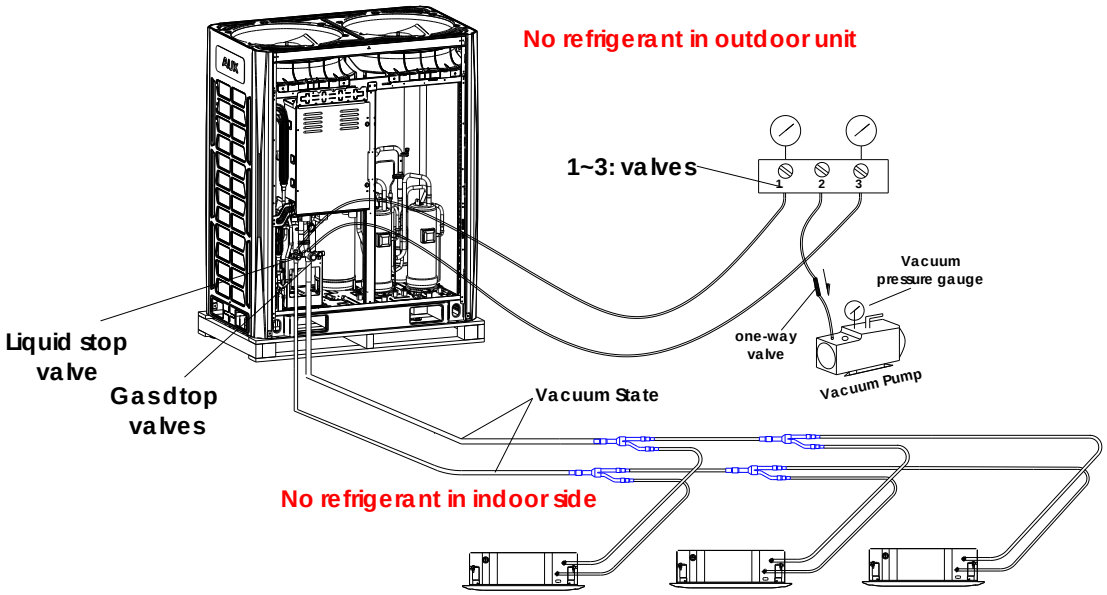
1.7 Blow off Snow (Auto snow-blowing)

The fan motor will run for a period of time to blow away the snow *(Choose the function according "**Part 3 – 4.2.4 [C] Function Setting** " -【C…..4】)*

※ System will respond this function only when the outdoor environment temperature [***Tao***] ≤ -5℃

1.8 Vacuum Pumping

For after-sale : If a system had a refrigerant leakage, should find out the leakage point and re-welding first, and there should be no any refrigerant in the system, so we can choose the **Vacuum pumping function** *(Choose the function according "**Part 3 – 4.2.4 [C] Function Setting** " – 【C….5】)* to do Vacuum



1. Connect the vacuum pump and vacuum pressure gauge as above diagram
2. Through Master unit to set vacuum pumping function
3. Then outdoor units keep standby state and all EXVs keep ON state, the sub-cooling solenoid valve alternating switch for 5 minutes.

1.9 Economic locking (26℃)

Through Master unit to set the Economic locking function, *(Choose the function according "**Part 3 – 4.2.4 [C] Function Setting** "-【C……6】)* All indoor units will run as energy saving mode state:

Cooling mode: indoor unit's set temperature **will be keep to 26**℃（lowest set temperature）

Heating mode: indoor unit's set temperature **will be keep to 20**℃（Highest set temperature）

1.10 Refrigerant Recycle

For after-sale: If one of the system's indoor unit must be replaced due to a refrigerant leakage point was find out in its evaporator

Then we can choose the **Refrigerant recycle function** through master unit *(Choose the function according "**Part 3 – 4.2.4 [C] Function Setting** "-【C……..7】)* to recycle refrigerant to outdoor units.

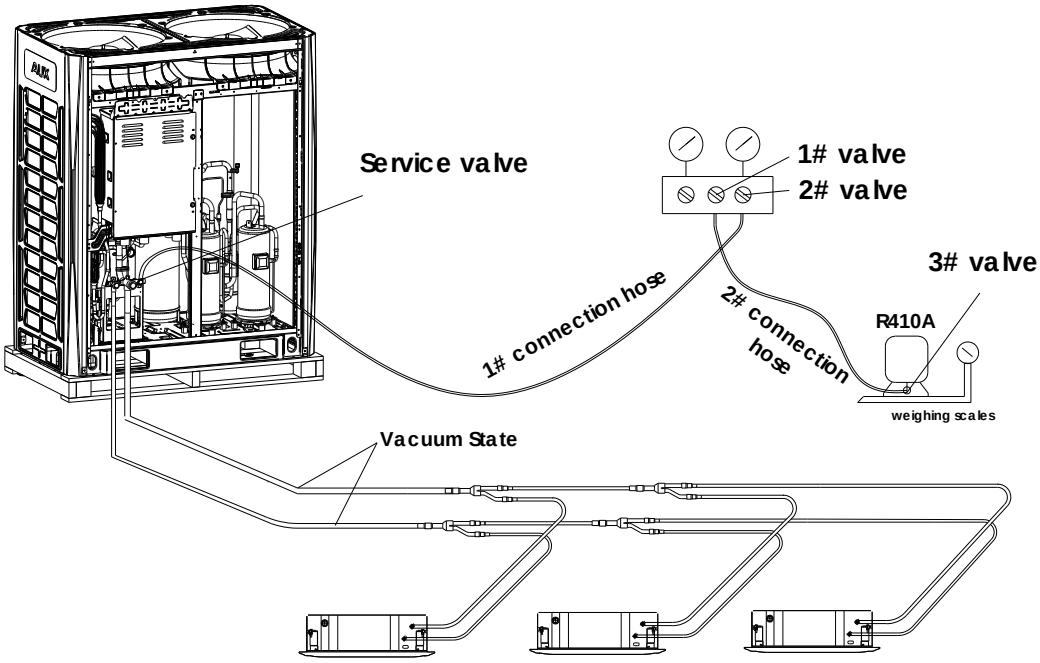
1. After choose this function
2. Outdoor units will run cooling mode
3. Close ***liquid stop valve***
4. When display error code ***F3:*** (high pressure protect) or ***F6:*** (low pressure protect) in digital tube, it means all refrigerant recycled to outdoor unit
5. Close ***Gas stop valve***
6. long press exit button [***Test***] 5s to exit this function

Liquid stop valve ***Gas stop valve***

※ If outdoor environment temperature ≤5℃, the system will not respond to outdoor unit's refrigerant recycle function.

1.11 Refrigerant Charging

For after-sale: If a system lack of refrigerant , then we can choose the **Refrigerant Charging function** through master unit *(Choose the function according "**Part 3 – 4.2.4 [C] Function Setting** "-【C……8】)* to add refrigerant
1. Choose the **Refrigerant Charging function** in Master unit's main PCB
2. Running cooling mode automatic, according running parameters, main PCB digital tube will display (*Refrigerant state*): ● 【F.....1】: ***Refrigerant is not enough*** ● 【F.....2】: Refrigerant is enough ● 【F.....3】: Excess of refrigerant
3. If 【F…..1】was displayed in the tube, press 【**Fun**】to add refrigerant, system will run as following: ● **Cooling mode** ● Outdoor units' **output capacity ⩾ 75%** ● Sub-cooling valve（**EXV3**）**be closed** 4. prepare tools as below diagram in advance



5. Connect ***1# connection hose*** to ***Service valve***

6. Open ***1# valve*** and ***2# valve***

7. Then gas refrigerant will push out the air which inside of ***1# connection hose*** and ***2 # connection hose***

8. Open ***3# valve***

9. When 【F.....2】be displayed, means additional refrigerant will be enough

10. Then 【F.....0】will be displayed after 3 min, it means finish, system will stop running automatic , the ***service valve*** must be closed at the same time

Note:

※ System will respond refrigerant charging function only when meet the following 3 conditions at the same time：

1. Outdoor temperature ***"Tao"*** should ***15℃≤Tao≤40℃*** ,

2. Indoor temperature ***"Tai"*** should ***10℃≤Tai≤32℃*** ,

3. The quantity of indoor units which (***capacity ≤1.5HP***) should less than 70% of total quantity of indoor units

Part5 Trouble shooting

1. IDU Error code table (No.16)

1.1 Temperature sensor failure (4)

Code	Definition	Possible reason for error code
A1	Indoor ambient temperature	1. Indoor unit's PCB failure 2. The fuse of indoor PCB is broken 3. Temperature sensor failure , or exceed test limit
A2	Evaporator mid temperature sensor	
A3	Evaporator inlet temperature sensor	
A4	Evaporator outlet temperature sensor	

1.2 Communication failure (2)

Code	Definition	Possible reason for error code
A9	The communication between indoor unit and outdoor unit failed	1. The communication wire between indoor unit and outdoor unit is broken. 2. Indoor unit power failure 3. Indoor PCB failure
AA	The communication between indoor unit and wire controller failed	1. The communication wire between indoor unit and outdoor unit is broken. 2. Indoor unit power failure 3. Indoor PCB failure 4. Wire controller is broken

1.3 Others failure (12)

Code	Definition	Possible reason for error code
A5	Indoor water pump failure	1. Water pump no power 2. Water pump switch short-circuit or unconnected 3. Water pump is broken 4. Drain pipe block or up lean 5. Indoor PCB is broken
A6	Failure of indoor PG fan	1. Fan motor failure 2. Fan motor block 3. The connection between PCB and fan motor failure 4. Indoor fan block
A7	Failure of reversible synchronous motor	1. Step motor failure

		2. The connection between PCB and step motor failure.
A8	Indoor unit ERRPROM module failure	1. Indoor unit PCB is broken 2. Error module is broken
AC	More than 2 indoor units' central control system address repeated	The central control address setting incorrect
AE	Operation mode conflict	The operation mode setting incorrect
AH	Two or more indoor unit refrigerant system address repeated	System address setting incorrect
AJ	Indoor unit total capacity exceeded	Stop some indoor units
AF	The EXV leakage	1. EXV is blocked 2. Evaporator inlet sensor failure. 3. Indoor unit's temp. sensor failure
A0	The EXV open failure	

2. ODU Error code table (No.65)

2.1 Communication failure (4)

Code	Definition	Possible reason for error code
J1	Communication failure between **outdoor units**	1. The communication wire between outdoor units is disconnect, short circuit or incorrect 2. Outdoor unit's main PCB failure 3. Outdoor unit's main power failed
J2	Communication failure between	1. The communication wire between

	outdoor and **indoor units**	indoor unit and outdoor unit disconnect, short circuit or incorrect 2. Indoor unit's main power failed 3. Indoor unit's PCB failure 4. Outdoor unit's main PCB failure
J3	Communication failure between **main PCB** and **compressor drive module**	1. The connection between driving module and main PCB failure 2. The communication part of outdoor unit control PCB failure 3. Compressor driving module failure 4. Compressor failure 5. Main PCB failure
J4	Communication failure between **main PCB** and **fan motor drive module**	1. DC fan motor drive module failure 2. DC fan motor failure 3. Supply voltage exceed limit 4. Main PCB failure

2.2 Pressure sensor failure (2)

Code	Definition	Possible reason for error code
F1	【P_d】High pressure sensor failure	1. High pressure sensor failure 2. High pressure sensor connection is incorrect 3. Outdoor unit's main PCB failure
F4	【P_s】Low pressure sensor failure	1. Low pressure sensor failure 2. The connection between sensor and outdoor PCB incorrect 3. Outdoor unit's main PCB failure

2.3 Pressure abnormal (4)

Code	Definition	Possible reason for error code
F3	【P_d】High pressure too high	1. Exhaust pipe or condenser pipe block 2. Condenser dirty 3. Outdoor unit fan stop or low speed 4. Refrigerant overcharge
F6	【P_s】Low pressure too low	1. Indoor unit fan stop or low speed 2. Evaporator dirty 3. Indoor EXV full open in cooling mode (Outdoor EXV full open in heating mode) 4. Lack refrigerant 5. The pipe between evaporator and suction port block

F8	Compression ratio too high protection	Compressor failure
F9	Compression ratio too low protection	Compressor failure

2.4 Temperature sensor failure (10)

Code	Definition	Possible reason for error code
C1	【T_{ao}】ambient temp.	1.Temperature sensor failure 2.Test temperature exceed limit 3.Sensor connection is incorrect 4.Outdoor unit's main PCB failure
C2	【T_{def1}】Defrosting temp.	
C3	【T_{da}】discharge temp. of 1# comp.	
C4	【T_{db}】discharge temp. of 2# comp.	
C6	【T_s】Suction temp. of compressor	
C9	【T_{ho1}】Condenser outlet temp.	
CJ	【T_{d3}】Oil temperature	
CC	【T_{d4}】Liquid piping temp. of ODU	
CE	【T_{ho2}】Outlet temp. of PMV3	
CF	【T_{def2}】Outlet temp. of sub-cooler	

2.5 Temperature abnormal (3)

Code	Definition	Possible reason for error code
FH	Discharge temperature too low	Compressor failure
E3	【T_{da}】1# Compressor discharge temperature too high	1.System lack of refrigerant 2.DC inverter Compressor failure 3.Compressor air return filter block 4.EXV block 5.Gas stop valve was closed 6.Liquid stop valve was closed 7.dischargr sensor failure 8.Outdoor unit PCB failure
E4	【T_{db}】2# Compressor discharge temperature too high	

2.6 1# Comp. and drive failure (11)

Code	Definition	Possible reason for error code
31	Drive Module IPM protection (F0)	1. Low supply voltage, excessive current 2. Supply voltage exceed limit 3. Outdoor fan stop or low speed 4. Drive module temp. too high
32	Drive Module hardware protection	
33	Drive Module software protection	
34	Drive module unconnected	1.The connect of driving module and DC inverter compressor incorrect 2.Driving module failure 3.Compressor failure

35	Drive module current overload	1. Compressor overload 2. Compressor coil disconnect 3. Inverter driving board failure 4. Compressor failure
36	Drive module DC bus voltage over-voltage or under-voltage failure	1. Supply voltage below level 2. Supply voltage exceed limit 3. Drive module failure
37	Temperature sensor of drive module heat fins failure	Drive module failure
38	Drive module high temperature limit frequency failure	1. Driving module failure 2. Compressor failure 3. Outdoor unit fan stop or low speed
39	Drive module high temperature shutdown protection	1. Driving module failure 2. Compressor failure 3. Temperature sensor failure
3E	Drive module AC Input over current protection	Drive module failure
3F	Drive Module PFC protection (F0)	Drive module failure

2.7 2# Comp. and drive failure (11)

Code	Definition	Possible reason for error code
51	Drive Module IPM protection (F0)	1. Low supply voltage, excessive current

52	Drive Module hardware protection	2. Supply voltage exceed limit 3. Outdoor fan stop or low speed 4. Drive module temp. too high
53	Drive Module software protection	
54	Drive module unconnected	1.The connect of driving module and DC inverter compressor incorrect 2.Driving module failure 3.Compressor failure
55	Drive module current overload	1. Compressor overload 2. Compressor coil disconnect 3. Inverter driving board failure 4. Compressor failure
56	Drive module DC bus voltage over-voltage or under-voltage failure	1. Supply voltage below level 2. Supply voltage exceed limit 3. Drive module failure
57	Temperature sensor of drive module heat fins failure	Drive module failure
58	Drive module high temperature limit frequency failure	1. Driving module failure 2. Compressor failure 3. Outdoor unit fan stop or low speed
59	Drive module high temperature shutdown protection	1. Driving module failure 2. Compressor failure 3. Temperature sensor failure
5E	Drive module AC Input over current protection	Drive module failure
5F	Drive Module PFC protection (F0)	Drive module failure

2.8 1# Fan motor and drive failure (5)

Code	Definition	Possible reason for error code
3A	Drive module high temperature	1. DC fan motor abnormal 2. DC fan drive module abnormal
3C	Drive module over current	
3H	Drive module start failure or running out of step	
3J	Drive module over-voltage or under-voltage	
41	Drive module IPM alarm	

2.9 2# Fan motor and drive failure (5)

Code	Definition	Possible reason for error code
5A	Drive module high temperature	1. DC fan motor abnormal 2. DC fan drive module abnormal
5C	Drive module over current	
5H	Drive module start failure or running out of step	
5J	Drive module over-voltage or under-voltage	

49	Drive module IPM alarm	

2.10 Others failure (10)

Code	Definition	Possible reason for error code
H1 (B1)	【HP1】High pressure switch failure	1. High pressure exceed high pressure switch limit. 2. High pressure switch failure 3. High pressure sensor failure 4. Instantaneous power-off 5. Stop valve closed 6. Outdoor unit fan stop 7. Outdoor unit air outlet block 8. In heating mode indoor unit fan stop 9. In heating mode indoor unit EXV block
H5	Refrigerant shortage fault	System leakage

HF	Oil shortage fault	Once confirm the unrecoverable
HJ	Main power failure	1. Supply power phase-reversal 2. Supply power phase lack 3. Outdoor unit PCB failure
J5	Parameter set incorrect	1. Outdoor unit dial switch incorrect 2. Main PCB failure
J7	Outdoor unit main control PCB ERROM module failure	Mail PCB failure
JJ	Indoor unit total capacity exceeding	Indoor units' total capacity over 130% of the outdoor units' total capacity
47	Indoor unit loss failure	1. Communication wire between indoor units failure 2. Indoor PCB failure 3. Power supply of indoor units failure
E1	The 4-way valve is fault	
E9	Drive refrigerant cooling pipe low temperature protection	

3. Indoor unit error code display

3.1 Error code display by YK-02A

After indoor and outdoor units shut down due to failure, failure code will display on wired controller. In case of normal protection, no failure code will display on wired controller. Among others, wired controller doesn't automatically send warning, which requires pressing CHECK button to display corresponding failure codes.

<table>
<tr><td rowspan="2">  </td><td>Press"  " to enter error code check</td></tr>
<tr><td>"A1A2" means The last two failures are "A1""A2"
through the " 2.1 IDU Fault code table" to check error code definition,
If there is no error, will display "- - - -"</td></tr>
</table>

3.2 Error code display by YK-05A

<table>
<tr><td> 
</td><td>Press "Function" & "Up" button at the same time to enter the error code check</td></tr>
</table>

	"E0A1" means the first error code ***"A1"*** ,through the ***"2.1 IDU Fault code table"*** to check error code definition, ***"E2A3"*** means the second error code is ***"A3"***

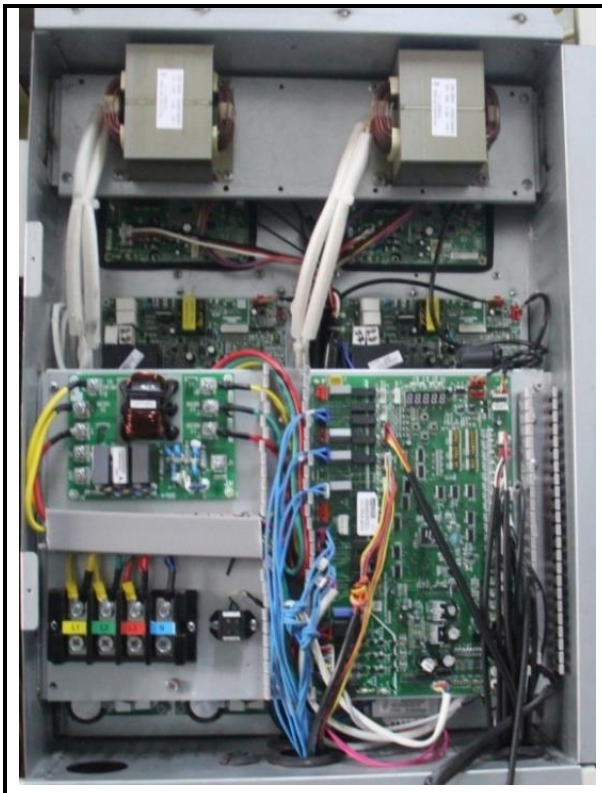
3.3 Error code display by display panel

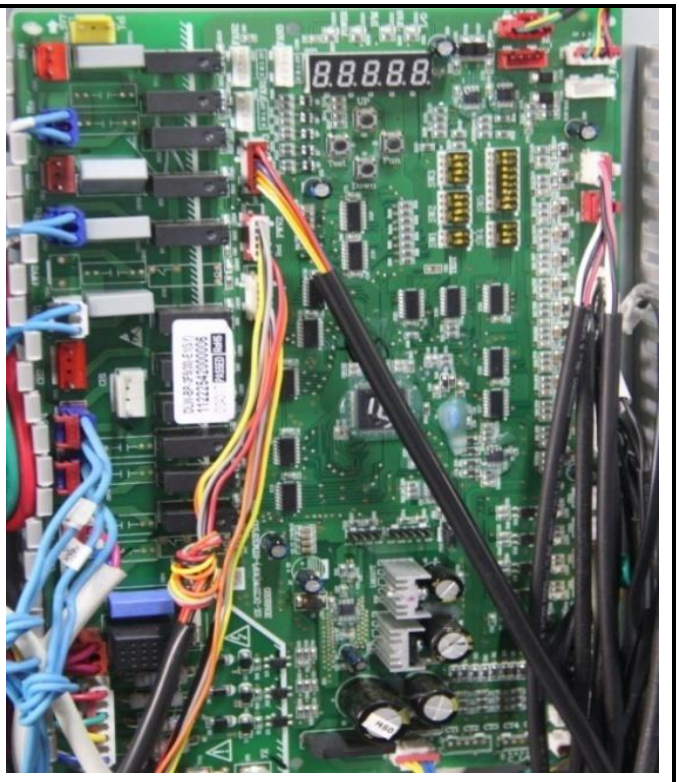
"E0" error code

4. Outdoor unit error code display

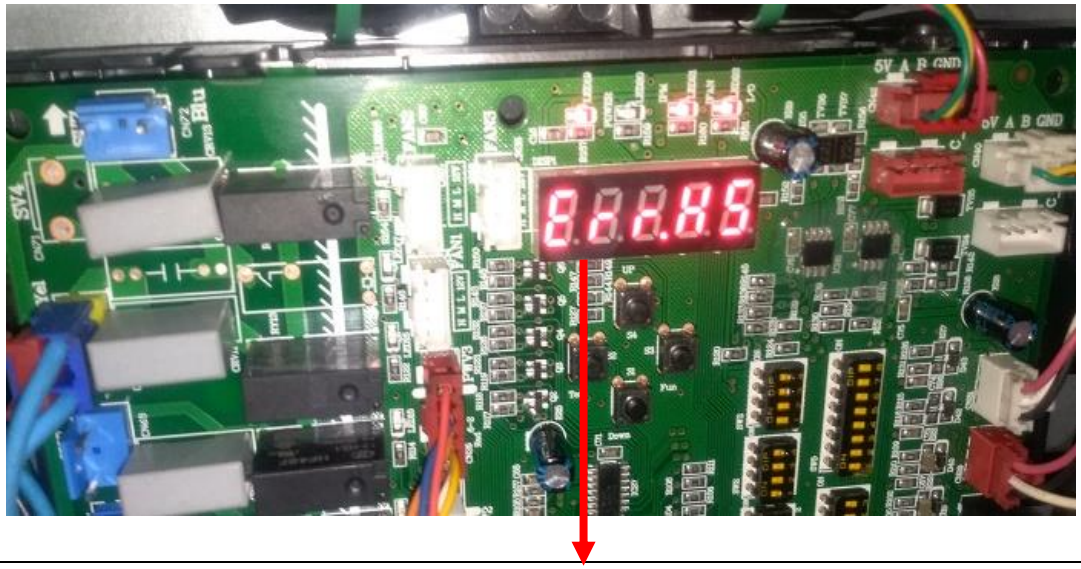
For outdoor units, the error code displays on the main PCB (Master unit)

Outdoor unit control box	Outdoor unit main PCB



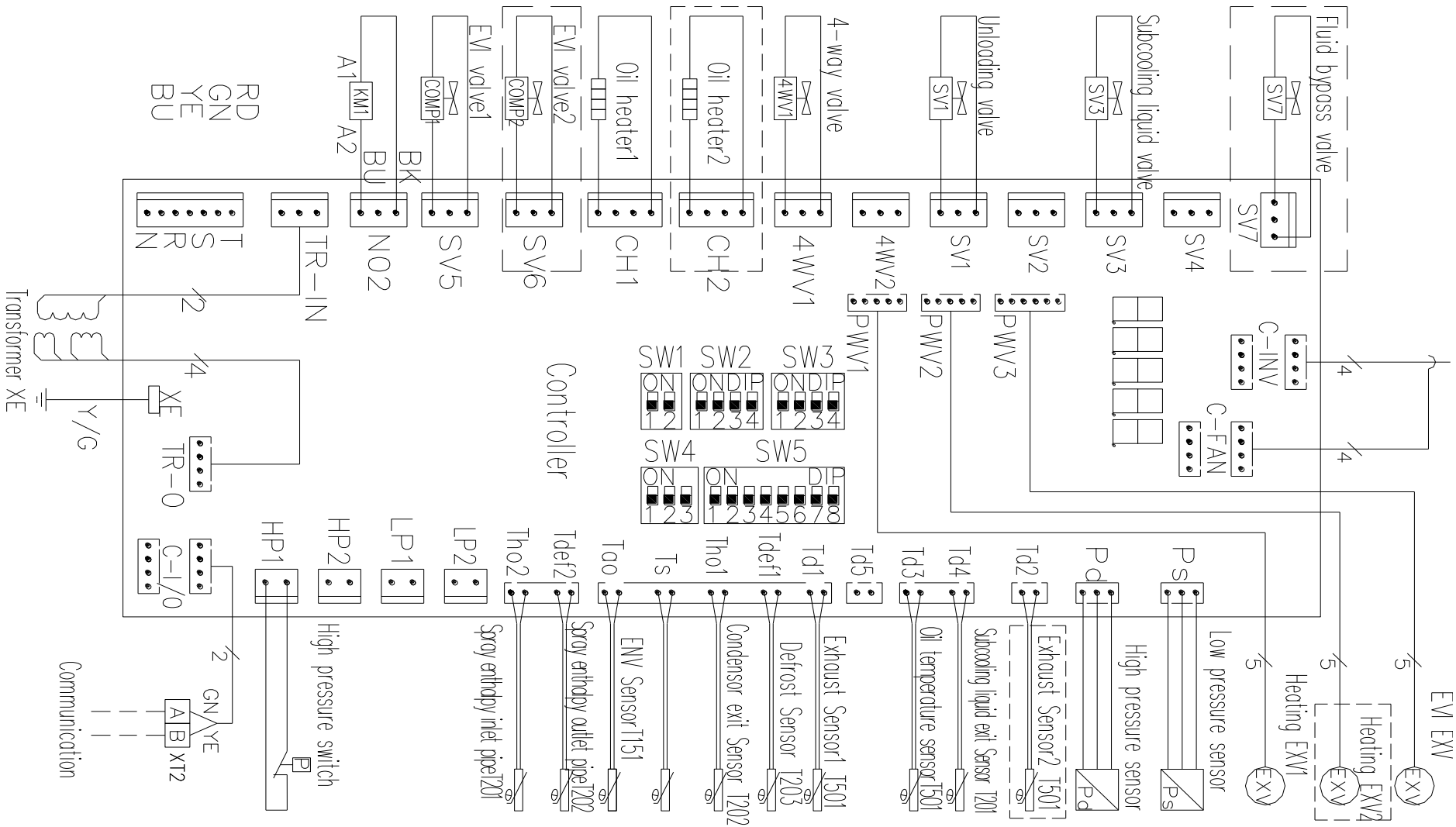


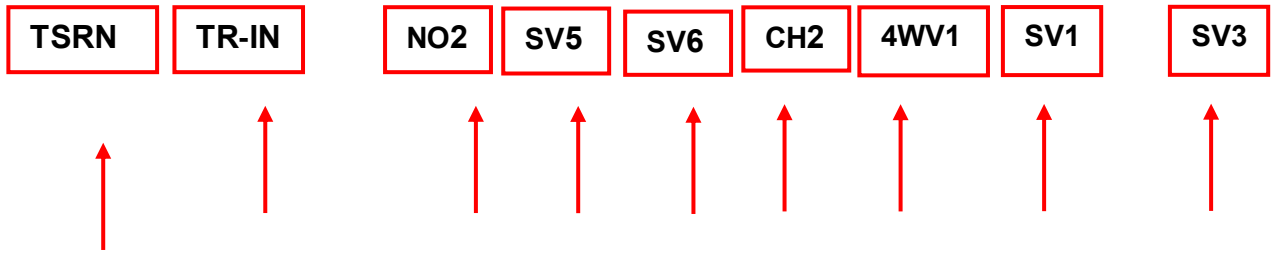
Digital tube in main PCB

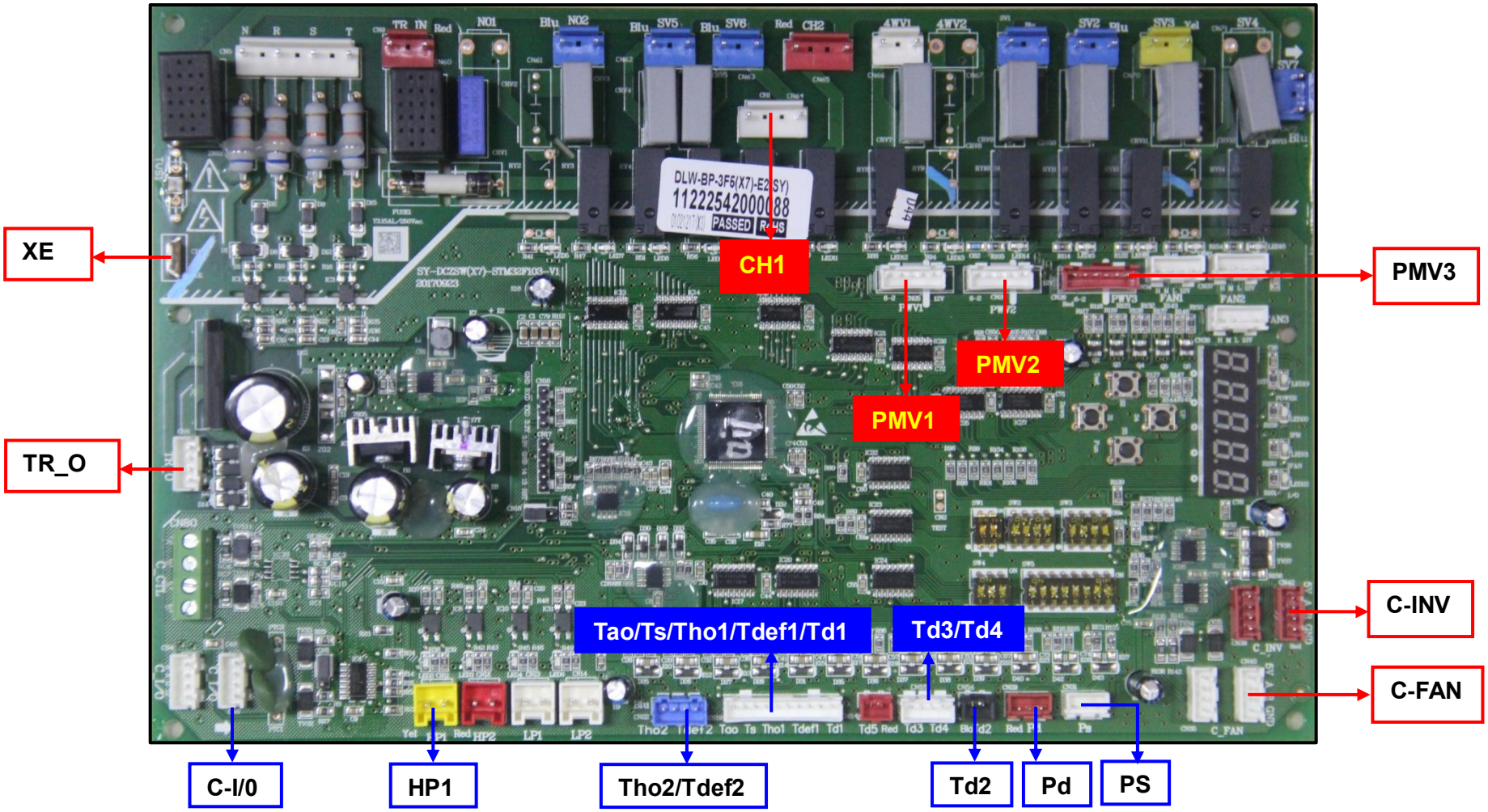


Error code ***" H5 "***, through the ***"2.2 ODU Fault code table"*** to check the definition: system leakage

Symbol Description


Fluid bypass valve
SV7
Subcooling liquid valve
SV3
Unloading valve
SV1
4-way valve
4WV1
Oil heater2
CH2
Oil heater1
CH1
EVI valve2
SV6
EVI valve1
SV5
BK
BU
NO2
A1
KM1
A2
RD
GN
YE
BU
T
S
R
N
TR-IN
Transformer XE
XE
Y/G
TR-0
C-I/O
HP1
HP2
LP1
LP2
Tho2
Tdef2
Tao
Ts
Tho1
Tdef1
Td1
Td5
Td3
Td4
Td2
Pd
Ps
SW1
SW2
SW3
SW4
SW5
Controller
PWV1
PWV2
PWV3
4WV2
SV2
SV4
C-INV
C-FAN
EVI EXV
Heating EXV2
Heating EXV1
Low pressure sensor
High pressure sensor
Exhaust Sensor2 T501
Subcooling liquid exit Sensor T201
Oil temperature sensor T501
Exhaust Sensor1 T501
Defrost Sensor T203
Condensor exit Sensor T202
ENV Sensor T151
Spray enthalpy outlet pipe T202
Spray enthalpy inlet pipe T201
High pressure switch
GN
YE
A
B
XT2
Communication


TSRN
TR-IN
NO2
SV5
SV6
CH2
4WV1
SV1
SV3


XE
TR_O
CH1
PMV3
PMV2
PMV1
C-INV
C-FAN
Tao/Ts/Tho1/Tdef1/Td1
Td3/Td4
C-I/0
HP1
Tho2/Tdef2
Td2
Pd
PS

Definition of ports

Symbol Abbreviation	Detailed information
N R S T	Power input
TR_IN	Transform input
N02	AC contact
CH1	1# Compressor preheating
CH2	2# Compressor preheating
4WV1	4-way valve
SV1	Unloading valve
SV5	1# Vapor injection valve
SV6	2# Vapor injection valve
SV3	Sub-cooling valve
PWV1	1# Heating EXV
PWV2	2# Heating EXV
PWV3	Electronic expansion valve of Vapor injection
C_INV	Drive modular of compressor
C_FAN	Drive modular of fan motor
C_I/O	Communication Ports
HP1	High pressure switch
T_{ho2}	Outlet temperature of PMV3
T_{def2}	Outlet temperature of sub-cooler
T_{ao}	Environment temperature
T_s	Gas-liquid separator outlet/Suction temperature
T_{ho1}	Condenser outlet temperature
T_{def1}	Defrost temperature
T_{d1}	Discharge of compressor 1#
T_{d3}	Oil temperature
T_{d4}	Liquid piping temperature of ODU
T_{ho2}	Outlet temperature of PMV3
Pd	High pressure sensor
Ps	Low pressure sensor
TR_O	Transform output

XE	Ground wire

5. Outdoor unit trouble shooting

5.1 E3 E4 Error Code

E3 / E4 : Discharge temperature *"Tda" "Tdb"* too high

Compressor discharge temperature sensor detected *Td ≥120 ℃* and Lasts for *10s*, whole system will stop running, after 4 minutes later will restart, but if stop running more than *3 times within an hour*, ODU PCB will display E3 or E4 error code. Stop running until power up again.

↓

Check whether Lack of refrigerant

1. No additional refrigerant?
2. Low pressure is too low?
3. High temperature of IDU air outlet?

Yes → Add refrigerant

NO↓

Check whether Lack of frozen oil

Through monitoring software to check is the system frequent to run the oil return mode

Yes → Add oil

NO↓

Check whether high pressure too high

1. ODU fan running abnormal?
2. Condenser is dirty block?

Yes →

1. Replace fan or fan motor
2. Clean the condenser

NO↓

Check whether refrigerant circuit is unblocked

1. IDU's coil of EXV is abnormal?
2. IDU's EXV is abnormal, through monitoring software to check the EXV's open degree
3. IDU's EXV is dirty block?

Yes → 1. Replace power coil of EXV; 2. Replace EXV

↓

Contact the manufacturer's Technician

5.2 F8 Error code

F8： *Compression ratio too high protection*

When detect the *pd / ps > 8* , then system begin to slow down the compressor running frequency . After the frequency was down to the lowest value and detected the *pd/ps > 8* all the time *within 400s*. Then will appear F8 Error code, whole system stop running. ※ pd: High pressure value ps: Low pressure value

↓

Stop valve is OFF? → Open

NO ↓

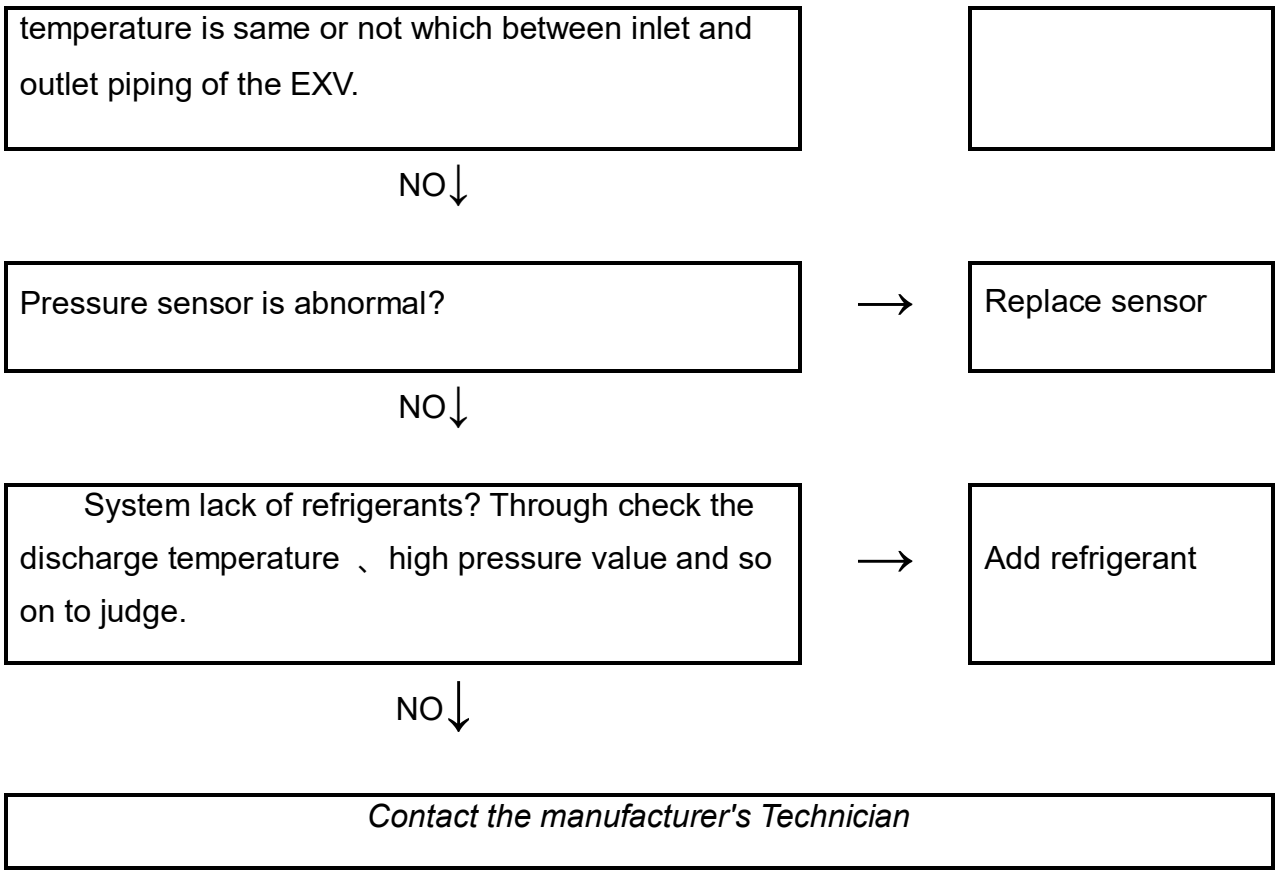
Condenser and evaporator dirty block? → Clean

NO ↓

Pipe is flattened? → Re welding

NO ↓

Heating EXV is abnormal? Through check the → Replace EXV



5.3 F9 Error code

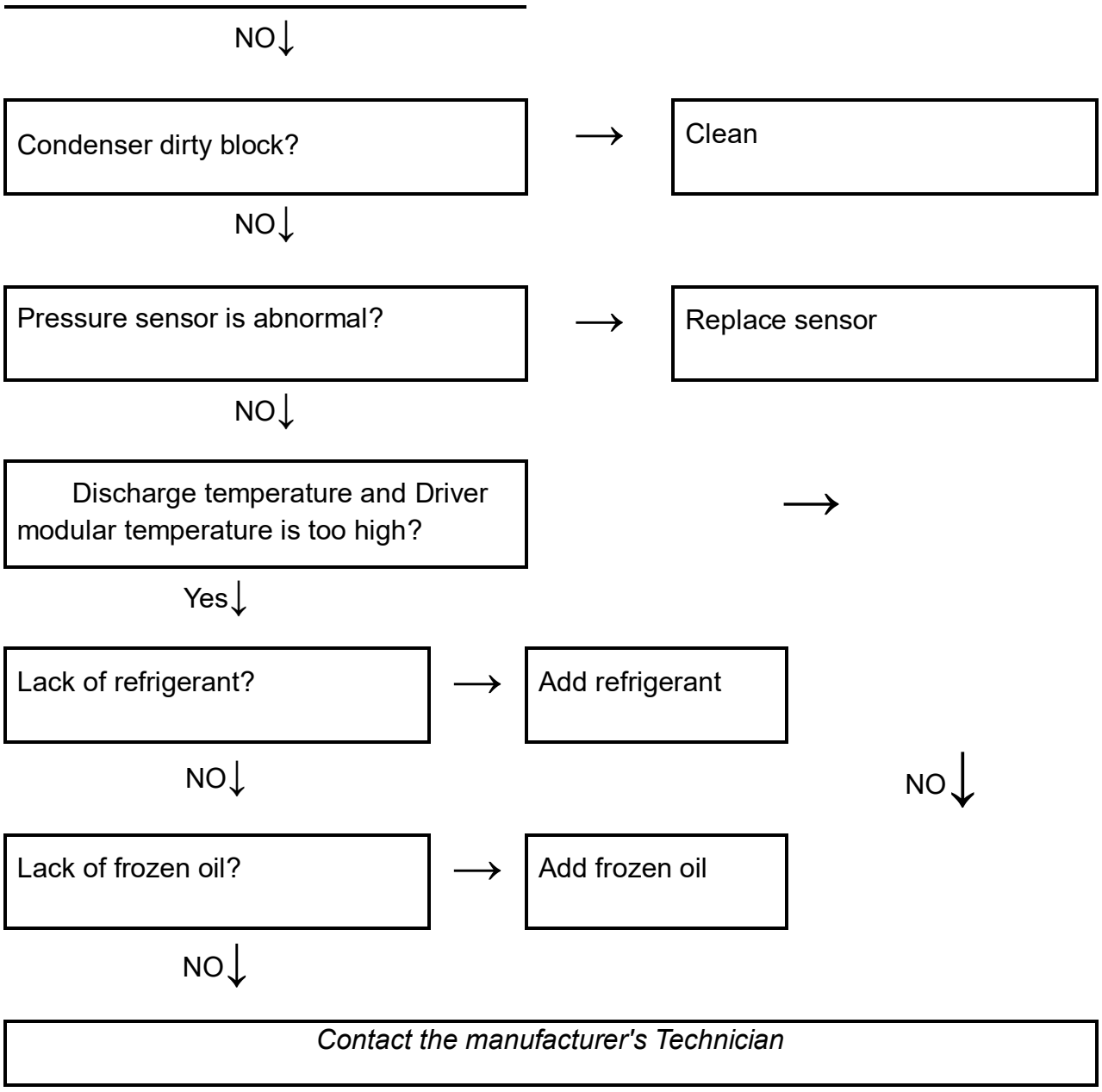
F9： *Compression ratio too low protection*

When detect the *pd / ps < 1.8* , then system begin to increase the compressor running frequency . every 40s later detect again , After 45 cycles and the *pd / ps < 1.8* remain the same . Then will appear F9 Error code, whole system stop running.

※ pd: High pressure value ps: Low pressure value

↓

4-way valve is abnormal? Through check the inlet temperature of the condenser → Adjust or replace 4-way valve


NO
Condenser dirty block?
Clean
NO
Pressure sensor is abnormal?
Replace sensor
NO
Discharge temperature and Driver modular temperature is too high?
Yes
Lack of refrigerant?
Add refrigerant
NO
NO
Lack of frozen oil?
Add frozen oil
NO
Contact the manufacturer's Technician

5.4 HF Error code

HF： *Oil shortage fault*

When detect the oil temperature is abnormal, low temperature near the environment temperature. In addition, discharge super-heat is normal. Then will appear HF Error code, whole system will stop running. Once confirm the unrecoverable

↓

Oil temperature sensor is abnormal? → Replace sensor

NO ↓

Oil return capillary is blocked? → Replace capillary

NO ↓

Through monitoring software to check is the system frequent to run the oil return mode? → Add oil

NO ↓

Contact the manufacturer's Technician

5.5 HJ Error code

HJ：*Main power failure*

When detect incorrect phase sequence, Then will appear *HJ* Error code, whole system stop running.

↓

Power terminal board wiring loosening? → Tighten the wiring

NO↓

Wrong phase sequence? → Change phase sequence

NO↓

Main PCB is abnormal? → Replace PCB

NO↓

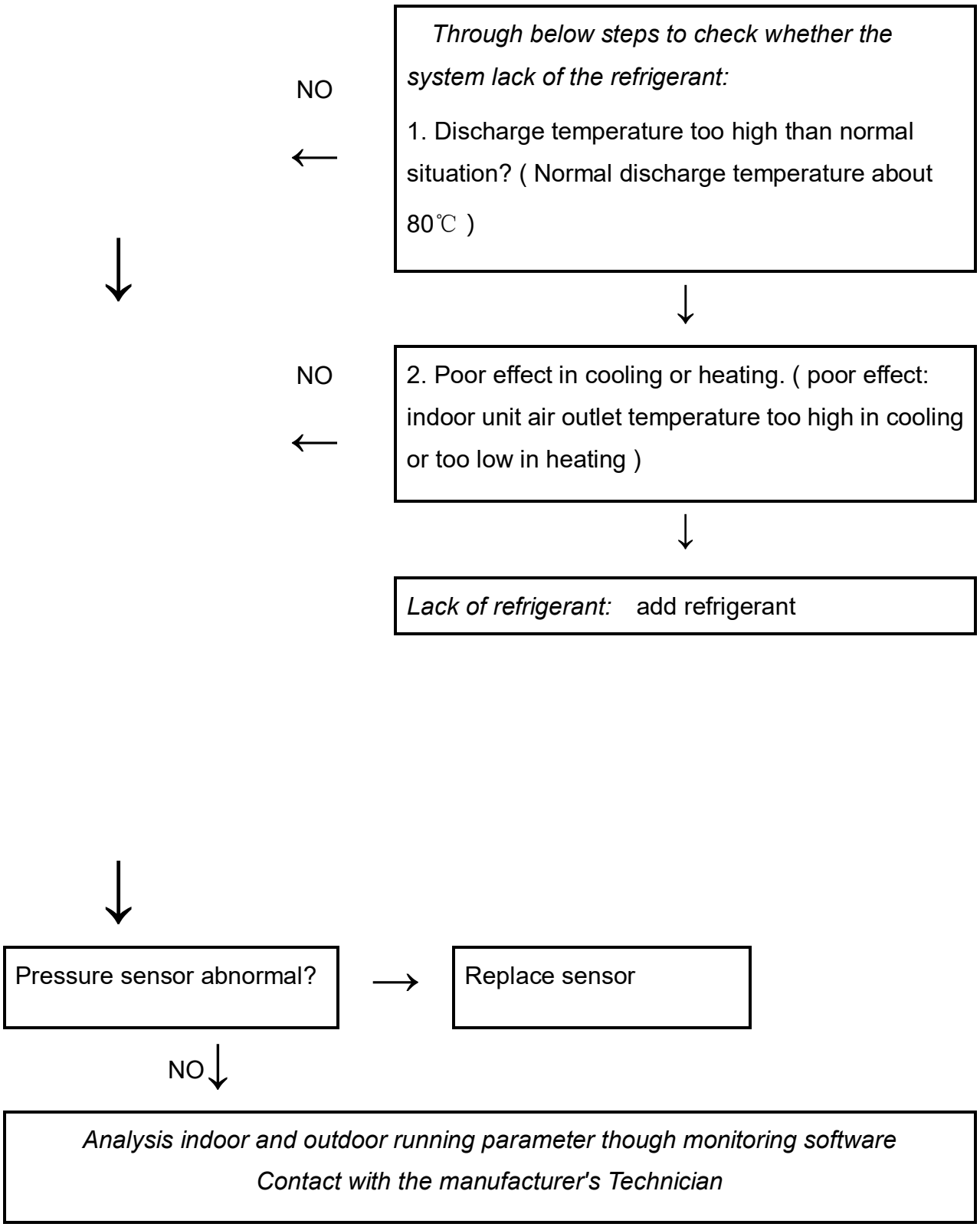
Contact the manufacturer's Technician

5.6 H5 Error code

H5：*Refrigerant shortage fault*

Long time power off or standby (over 4 hours), through detect high pressure value and compare with pressure value which under normal environment temperature, then judge whether lack of refrigerant and appear H5 Error code

↓


Through below steps to check whether the system lack of the refrigerant:
1. Discharge temperature too high than normal situation? (Normal discharge temperature about 80℃)
NO
2. Poor effect in cooling or heating. (poor effect: indoor unit air outlet temperature too high in cooling or too low in heating)
NO
Lack of refrigerant: add refrigerant
Pressure sensor abnormal?
Replace sensor
NO
Analysis indoor and outdoor running parameter though monitoring software
Contact with the manufacturer's Technician

5.7 FH Error code

FH：Discharge temperature "Tdi" too low limit frequency protection

System detect discharge superheat temperature less than 10℃ within 20 minutes , then will appear FH error code to protect

↓

Check whether the system excess refrigerant:

1. Already add excess refrigerant

NO ←

↓

2. Whether indoor unit's EXV less open degree

Through monitoring software detect

NO ←

↓

Blow off some refrigerant

Condenser dirty block effect heating mode → Clean

NO ↓

Evaporator dirty block effect cooling mode → Clean

NO↓

Discharge temperature sensor abnormal	→	Replace

NO↓

Contact with the manufacturer's Technician

6. Appendix

Relation between temperature sensor of compressor and resistance

R25=50KΩ±1%			
B25/50=3950K ±1%			
T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]
-20	449.9	464.7	479.9
-19	425.7	439.5	453.6
-18	402.9	415.7	428.8
-17	381.5	393.4	405.6
-16	361.3	372.3	383.6
-15	342.2	352.5	363.0
-14	324.3	333.9	343.7
-13	307.5	316.4	325.5
-12	291.5	299.8	308.3
-11	276.6	284.3	292.2
-10	262.4	269.6	276.9
-9	249.0	255.7	262.5
-8	236.5	242.7	249.0
-7	224.5	230.3	236.2
-6	213.3	218.7	224.2
-5	202.7	207.7	212.8

-4	192.7	197.3	202.0
-3	183.2	187.5	191.9
-2	174.3	178.3	182.4
-1	165.8	169.5	173.3
0	157.7	161.2	164.7
1	150.2	153.4	156.7
2	142.9	145.9	148.9
3	136.1	138.9	141.7
4	129.7	132.3	134.93
5	123.6	126.0	128.4
6	117.8	120.0	122.3
7	112.2	114.3	116.4
8	107.1	109.0	111.0
9	102.1	103.9	105.7
10	97.42	99.08	100.8
11	92.97	94.51	96.06
12	88.74	90.17	91.61
13	84.73	86.05	87.38
14	80.92	82.14	83.37
15	77.29	78.42	79.56
16	73.84	74.89	75.95

17	70.57	71.54	72.51
18	67.46	68.35	69.25
19	64.49	65.32	66.15
20	61.68	62.44	63.20
21	59.00	59.70	60.40
22	56.44	57.09	57.74
23	54.02	54.61	55.20
24	51.70	52.25	52.80
25	49.50	50.00	50.50
26	47.37	47.87	48.37
27	45.34	45.84	46.34
28	43.41	43.91	44.41
29	41.59	42.08	42.57
30	39.84	40.33	40.82
31	38.18	38.66	39.15
32	36.59	37.07	37.55
33	35.07	35.55	36.03
34	33.64	34.11	34.58
35	32.27	32.73	33.20
36	30.95	31.41	31.87
37	29.70	30.15	30.61

38	28.50	28.95	29.40
39	27.37	27.81	28.25
40	26.29	26.72	27.16
41	25.24	25.67	26.10
42	24.25	24.67	25.09
43	23.31	23.72	24.14
44	22.41	22.81	23.22
45	21.53	21.93	22.33
46	20.71	21.10	21.50
47	19.92	20.30	20.69
48	19.16	19.54	19.92
49	18.44	18.81	19.18
50	17.75	18.11	18.48
51	17.08	17.44	17.80
52	16.44	16.79	17.14
53	15.84	16.18	16.53
54	15.26	15.59	15.93
55	14.69	15.02	15.35
56	14.16	14.48	14.81
57	13.65	13.96	14.28
58	13.15	13.46	13.77

59	12.69	12.99	13.30
60	12.23	12.53	12.83
61	11.80	12.09	12.39
62	11.39	11.67	11.96
63	10.98	11.26	11.54
64	10.60	10.87	11.15
65	10.23	10.50	10.77
66	9.880	10.14	10.41
67	9.537	9.792	10.05
68	9.211	9.460	9.715
69	8.897	9.141	9.391
70	8.595	8.834	9.078
71	8.306	8.539	8.778
72	8.028	8.256	8.490
73	7.759	7.983	8.212
74	7.501	7.720	7.944
75	7.254	7.468	7.687
76	7.016	7.225	7.440
77	6.786	6.991	7.201
78	6.565	6.765	6.971
79	6.352	6.548	6.749

80	6.147	6.339	6.536
81	5.950	6.138	6.331
82	5.761	5.944	6.133
83	5.578	5.757	5.942
84	5.401	5.577	5.758
85	5.231	5.403	5.580
86	5.069	5.237	5.410
87	4.912	5.076	5.245
88	4.760	4.921	5.087
89	4.615	4.772	4.934
90	4.474	4.628	4.787
91	4.338	4.489	4.645
92	4.207	4.354	4.506
93	4.081	4.225	4.374
94	3.958	4.099	4.245
95	3.840	3.978	4.121
96	3.726	3.861	4.001
97	3.616	3.748	3.885
98	3.509	3.639	3.773
99	3.407	3.534	3.665
100	3.308	3.432	3.560

101	3.212	3.333	3.459
102	3.119	3.238	3.361
103	3.030	3.146	3.267
104	2.942	3.056	3.174
105	2.858	2.970	3.086
106	2.778	2.887	3.000
107	2.699	2.806	2.917
108	2.623	2.728	2.837
109	2.549	2.652	2.758
110	2.479	2.579	2.683
111	2.410	2.508	2.610
112	2.343	2.439	2.539
113	2.279	2.373	2.471
114	2.216	2.308	2.404
115	2.156	2.246	2.340
116	2.097	2.186	2.278
117	2.040	2.127	2.217
118	1.985	2.070	2.158
119	1.932	2.015	2.102
120	1.880	1.962	2.047