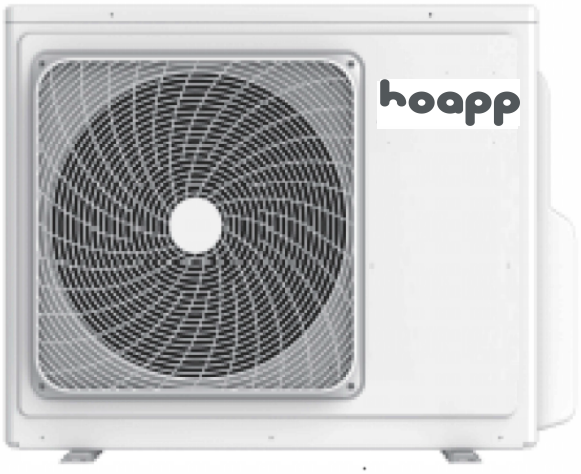
SERVICE MANUAL

Wall Mounted Type

ON/OFF Q-Series

Model No.HMC-HA28VA



⚠WARNING

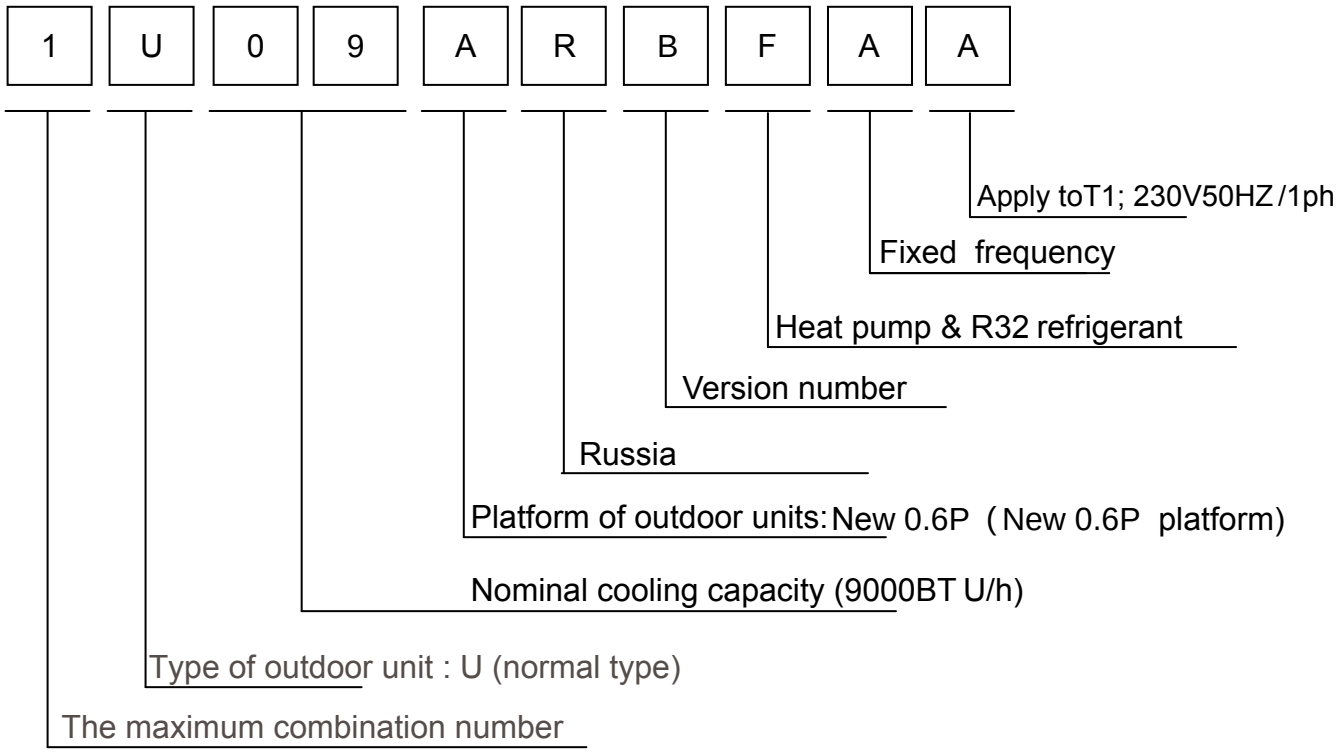
This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or Repair the product or products dealt with in this service information by anyone else could result in serious injury or death

Version：V1　　Date：2025-01-22

Contents

1 Introduction

1.1 Model name explanation



1.2 Safety Cautions

Be sure to read the following safety cautions before conducting repair work.

The caution items are classified into “Warning” and “Caution”. The “Warning” items are especially important since they can lead to death or serious injury if they are not followed closely. The “Caution” items can also lead

to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety

caution items described below.

About the pictograms

△ This symbol indicates an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.

○ This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.

● This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside or near the symbol.

After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates Normally, and explain the cautions for operating the product to the customer.

1.2.1 Caution in Repair

Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shook. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas .The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor , the refrigerant gas or cooling machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work . A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	

Warning	
Do not repair the electrical components with wet hands . Working on the equipment with wet hands can cause an electrical shock	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shock.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the cooling cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the cooling cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.2.2 Cautions Regarding Products after Repair

Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only

Warning	
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A / R22) in the refrigerant system. If air enters the cooling system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	. 
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	

Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	

1.2.3 Inspection after Repair

Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	

Warning	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances since it can cause an electrical shock, excessive heat generation or fire.	

Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	

Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 M ohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.2.4 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.2.5 Using Icons List

Icon	Type of Information	Description
 Note	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
 Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
 Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

2 Specifications

NOMINAL DISTRIBUTION SYSTEM VOLTAGE		
Phase	/	1
Frequency	Hz	50
Voltage	V	230

NOMINAL CAPACITY and NOMINAL INPUT			
		cooling	heating
Capacity rated	KW	2.5	2.5
	Btu/h	8530	8530
Power Consumption(Rated)	KW	0.958	0.779
EER/ COP	W/W	2.61	3.21
Annual energy consumption	KWh	/	/
Moisture Removal	m^3/h	$1.0*10^3$	

TECHNICAL SPECIFICATIONS-UNIT			
Dimensions	H*W*D	mm	660×245×463
Packaged Dimensions	H*W*D	mm	767x314x516
Weight	/	KG	20.9
Gross weight	/	KG	22.4
Sound level	Sound pr essure	dB	52
	Sound power	dB	/

ELECTRICAL SPECIFICATIONS			
		cooling	heating
Nominal running current	A	4.2	3.4

TECHNICAL SPECIFICATIONS-PARTS				
			cooling	heating
Compressor	Type		Rotary Compressor	
	Model		YZG-A089FY8T9	
	Motor output	W	620	
	Oil type		RmM68EA or equivalent	
	Oil charge volume	L	0.22	
Fan	Type		Axial fan	
	Motor output	W	30	
	Air flow rate(high)	m^3/h	/	
	Speed(high/low)	rpm	680	
Heat exchanger	Type		ML fin-ϕ7 HI-HX tube	
	Row*stage*fitch		1*11*1.3	

TECHNICAL SPECIFICATIONS-OTHERS				
Refrigerant circuit	Refrigerant type			R32
	Refrigerant charge		KG	0.35
	Maximum allowable distance between indoor an outdoor		m	15
	Maximum allowable level difference		m	10
	Refrigerant control		Capillary	
Piping connections (external diameter)		liquid	mm	Φ6.35
		gas	mm	Φ9.52
		drain	mm	Φ16
Heat insulation type			Both liquid and Gas pipes	
Max. piping Length			m	15
Max. Level Difference			m	10
Chargeless			m	7
Amount of Additional Charge of Refrigerant			g/m	20
International Protection degree			IP X4	

Note: the data are based on the conditions shown in the table below

cooling	heating	Piping length
Indoor: 27℃DB/19℃WB Outdoor: 35℃DB/24℃WB	Indoor:20℃DB Outdoor: 7℃DB/6℃WB	5m

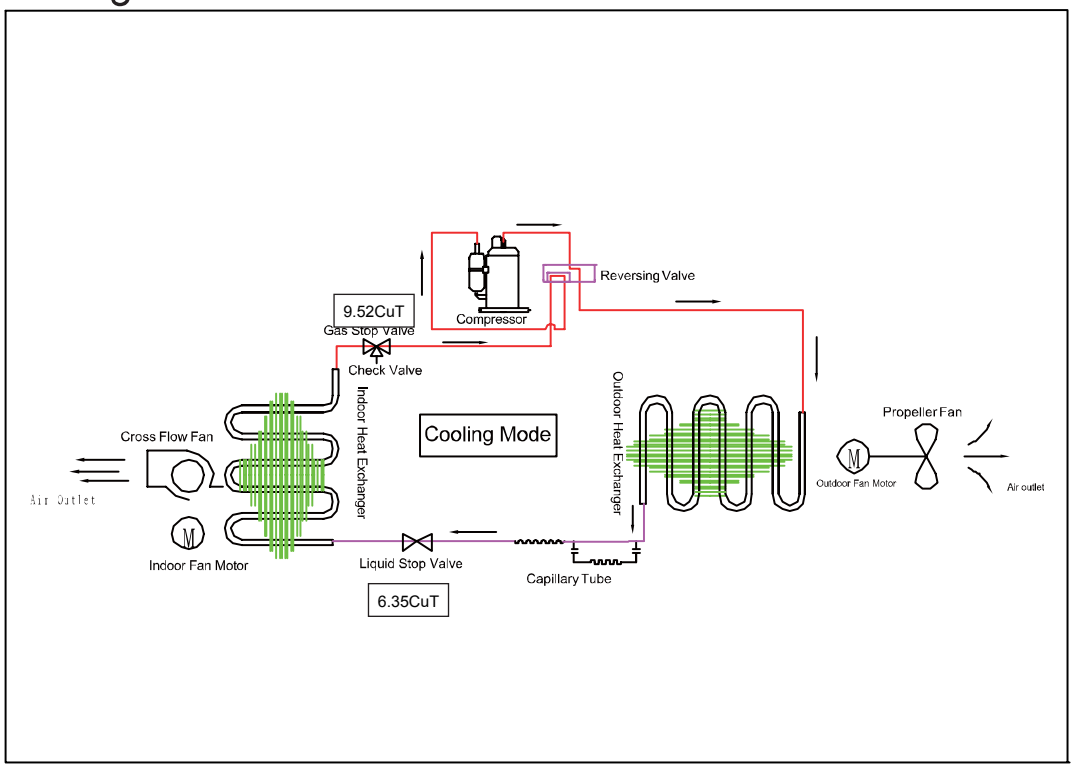
Conversation formulae
Kcal/h= KW×860
Btu/h= KW×3414
cfm=m³/min×35.3

3. Sensors list

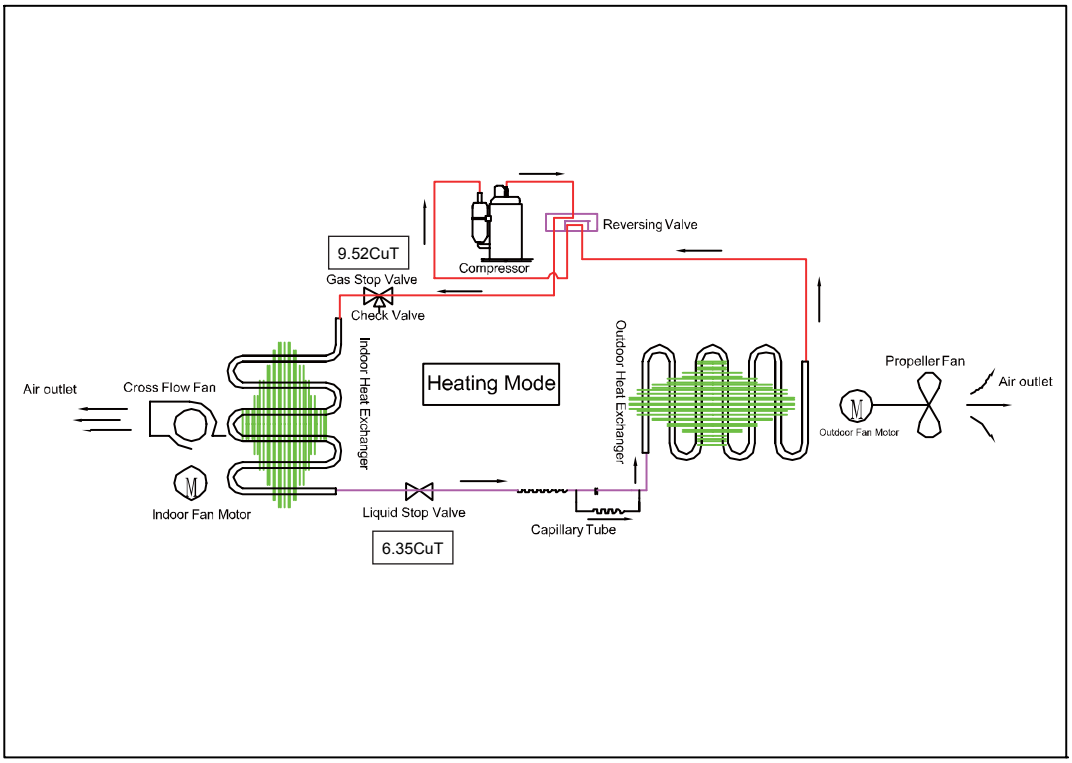
None

4. Piping diagrams

Cooling mode



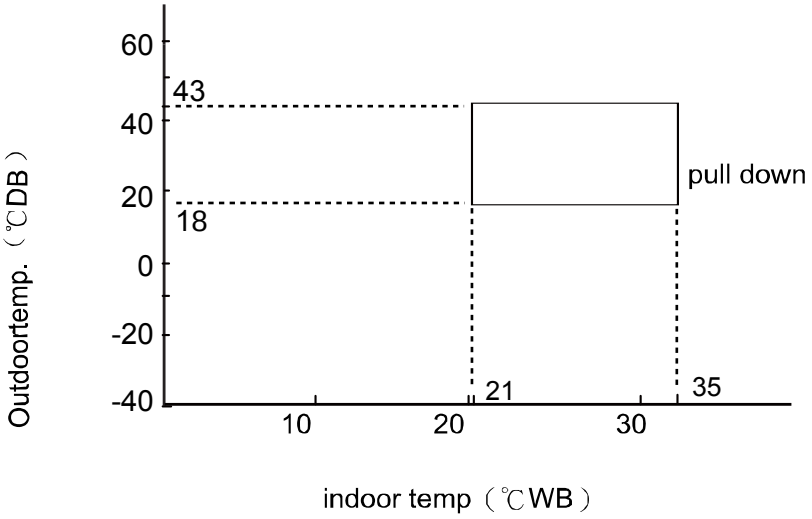
Heating mode

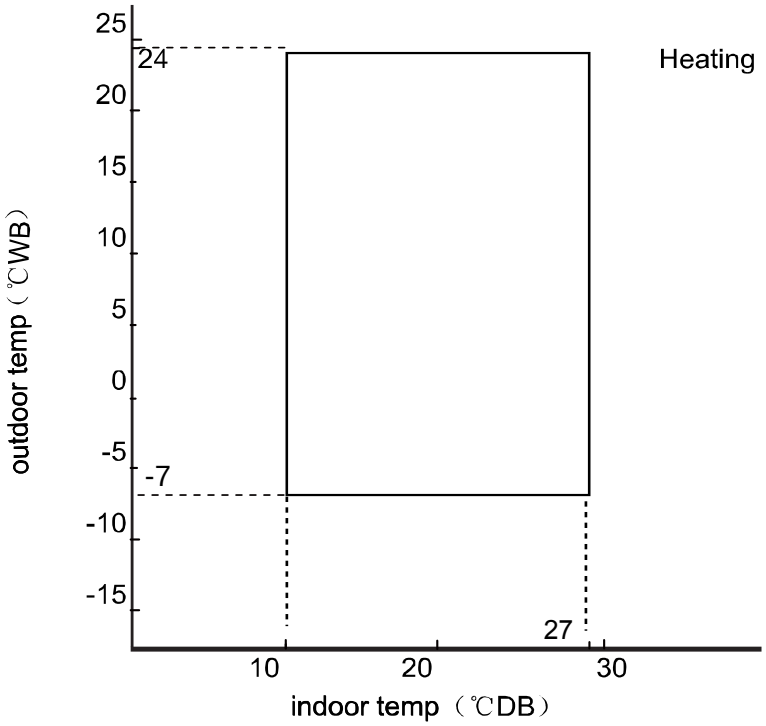


5.Operation range

The name of parts

Cooling



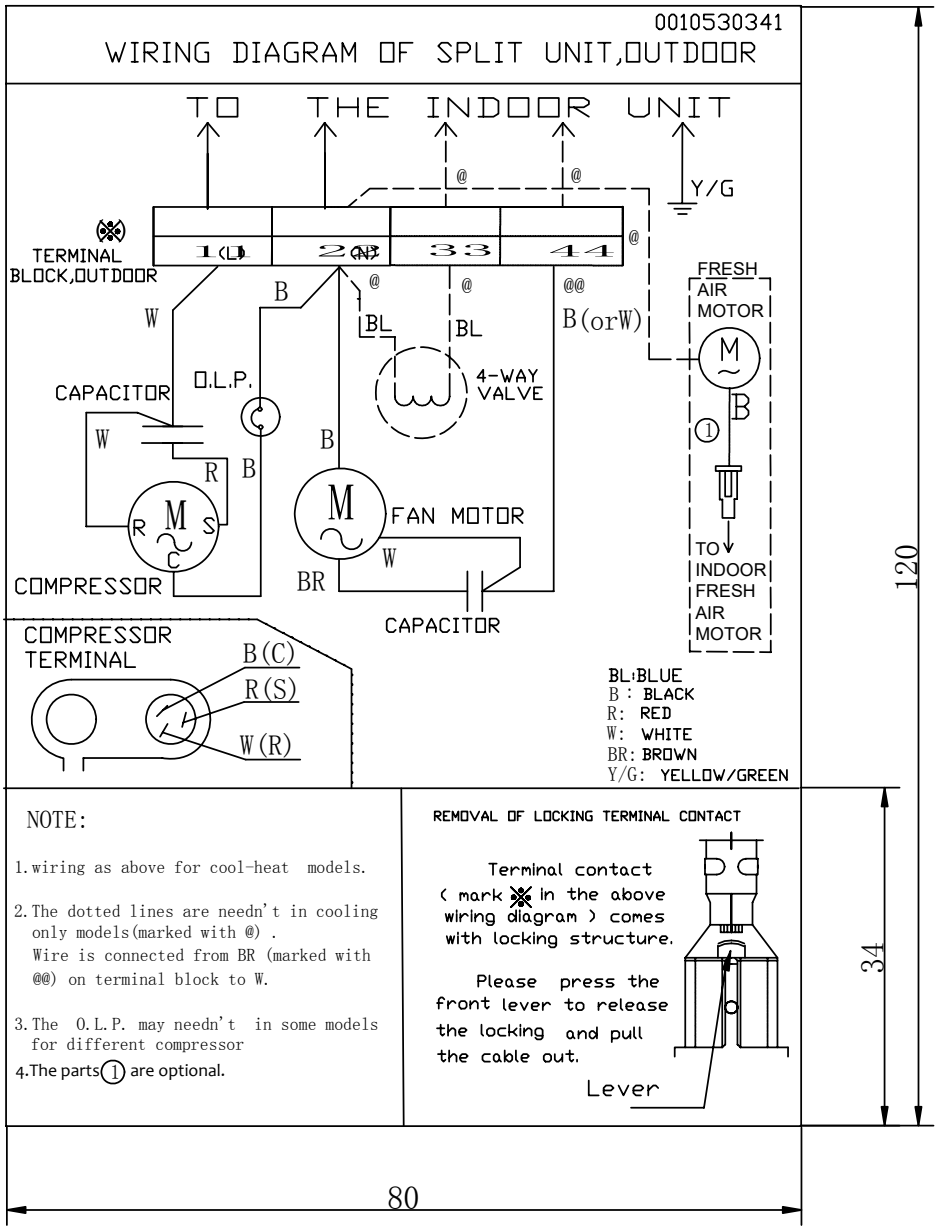


Notes：

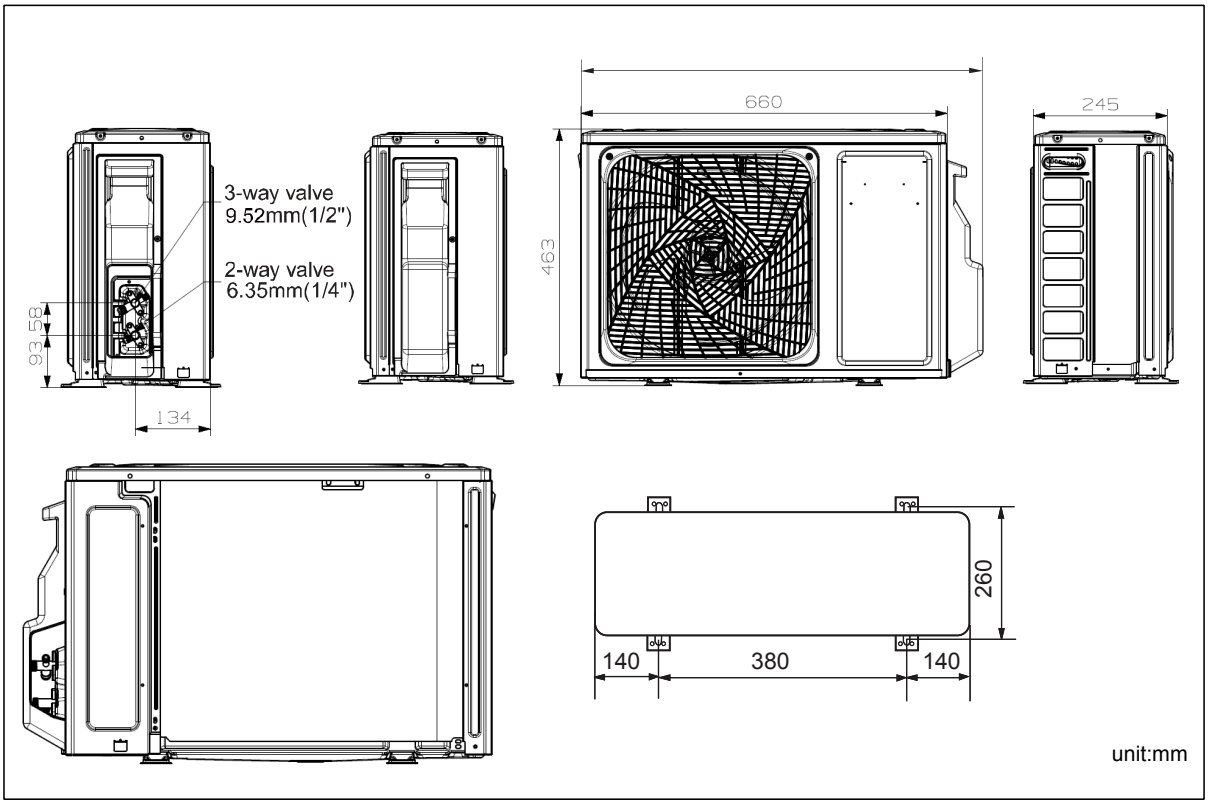
The graphs are based on the following condition：

Equivalent piping length	5m
Level difference	0m
Air flow rate	high

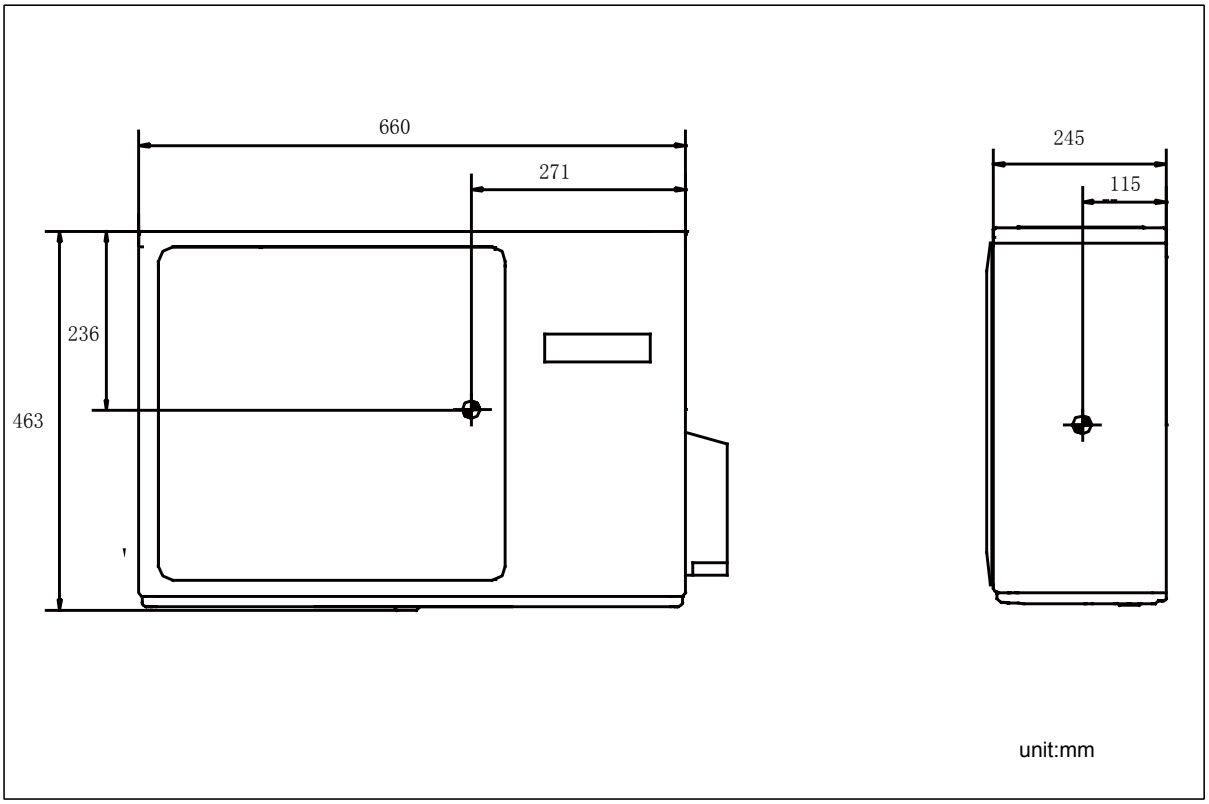
6.Wiring diagrams



7.Dimensional drawings



8.Center of gravity

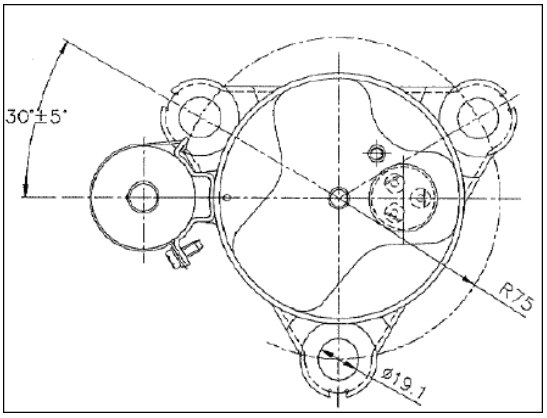
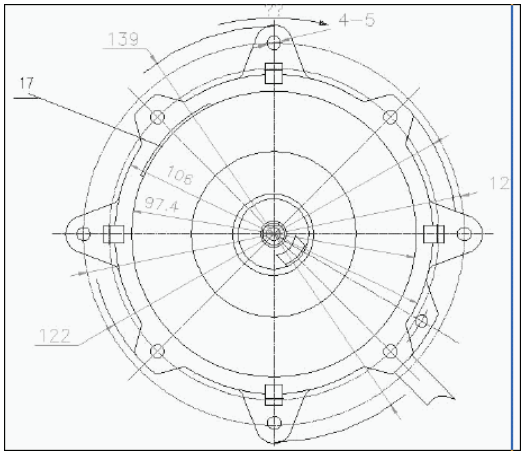
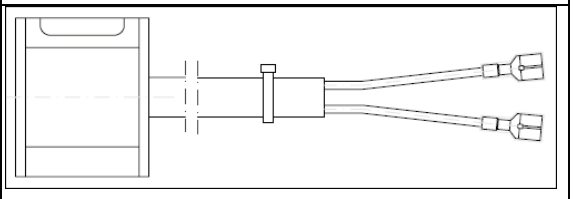


9. Service Diagnosis

9.1 Problem Symptoms and Measures

Symptom	Check Item	Details of Measure
None of the units operates	Check the power supply.	Check to make sure that the rated voltage is supplied.
	Check the indoor PCB	Check to make sure that the indoor PCB is broken
Equipment operates but does not cool, or does not heat (only for heat pump)	Diagnosis by service port pressure and operating current.	Check for insufficient gas.
Large operating noise and vibrations	Check the installation condition.	Check to make sure that the required spaces for installation (specified in the Technical Guide, etc.) are provided.

9.2 Parameter of primary electronic appliance

NO	Name	Parameter	Picture
1	Compressor	Rated voltage:220/240V Rated current:3.72A Rated frequency:50Hz Resistance:3.389	
2	Fan motor	Rated voltage:220-230V Rated current:0.24A Rated frequency:50Hz Rated power:16W	
3	4-way valve	Rated voltage:220V Rated frequency:50/60Hz Power :8/5W	

9.3 Error Codes and Description indoor display

	Code indication indoor	Description	Red/Green Time Run ○on ●off ◆flash	SPARE PART
Indoor Malfunction	E1	Room temperature sensor failure	◆ ● ●	Room temperature sensor Indoor PCB
	E2	Heat-exchange sensor failure	◆ ○ ○	Heat-exchange sensor Indoor PCB
	E4	Indoor EEPROM error	◆ ○ ◆	Indoor PCB
	E14	Indoor fan motor malfunction	● ○ ◆	Indoor fan motor Indoor PCB
	FE	Refrigerant leaking detection malfunction	● ◆ ●	Refrigerant

The code indication that is listed above is the main fault

9.3.1 Thermistor or Related Abnormality

Indoor Display

E1: Room temperature sensor failure
E2: Heat-exchange sensor failure

Method of Malfunction Detection

The temperatures detected by the thermistors are used to determine thermistor errors

Malfunction Detection Conditions

when the thermistor input is more than 4.92V or less than 0.08V during compressor operation.

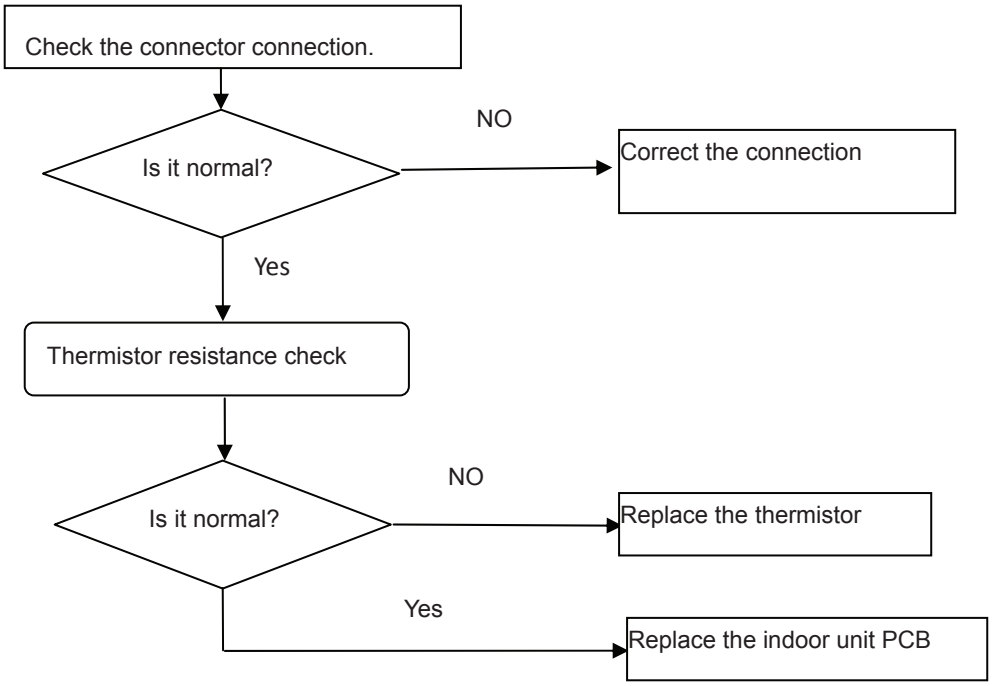
- Note: The values vary slightly in some models

Supposed Causes

- Faulty connector connection
- Faulty thermistor
- Faulty PCB

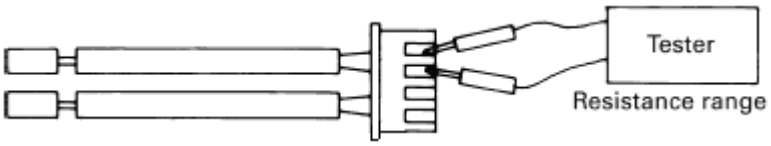
Troubleshooting

* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



Thermistor resistance check method:

Remove the connector of the thermistor on the PCB, and measure the resistance of thermistor using tester. The relationship between normal temperature and resistance is shown in the value of indoor thermistor.

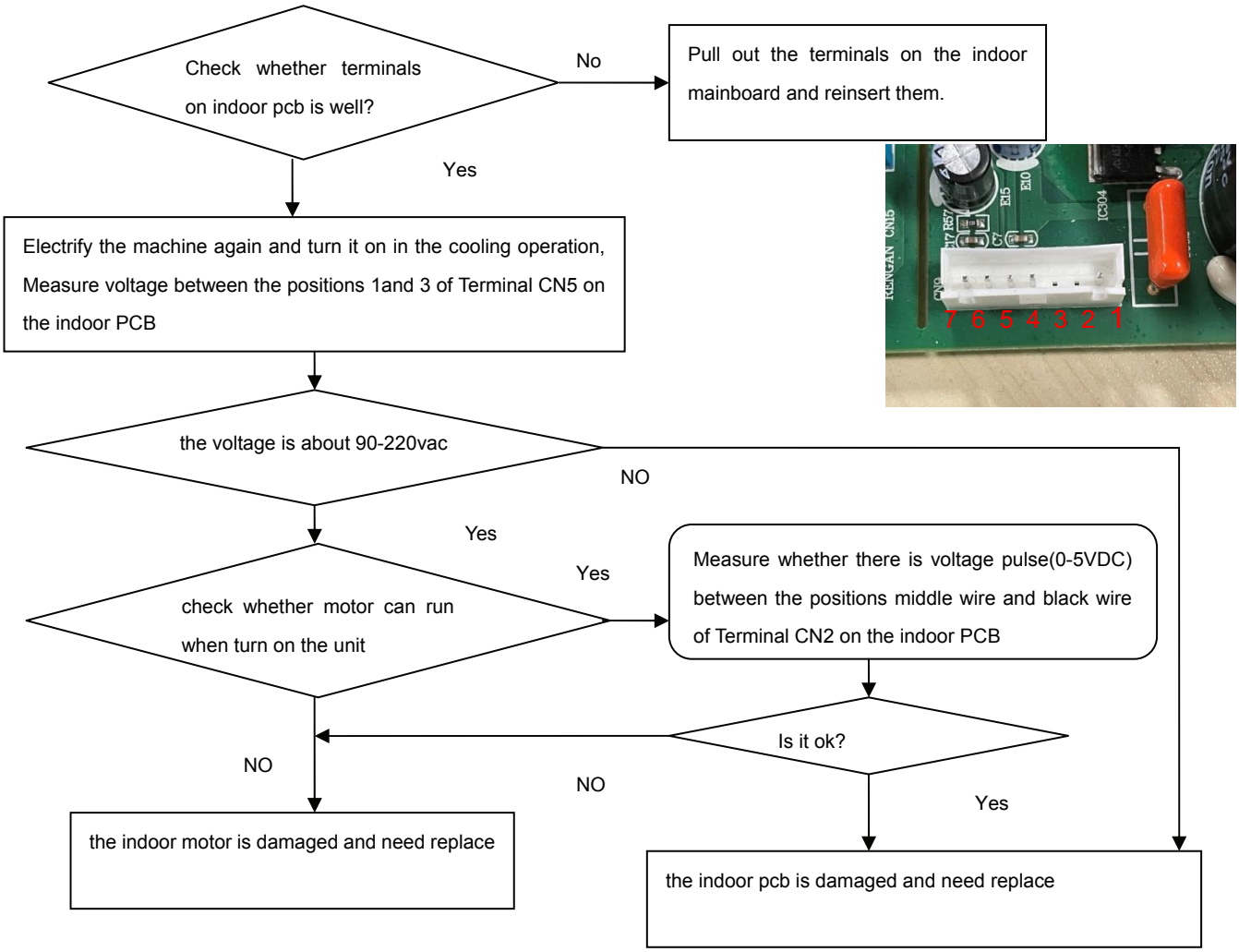


9.3.2 EEPROM abnormal

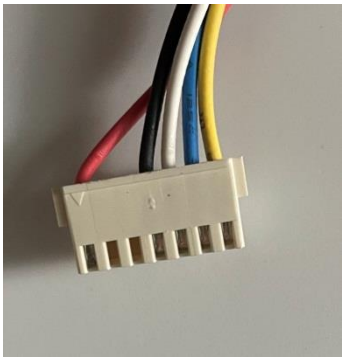
Indoor Display	E4: indoor EEPROM error
Method of Malfunction Detection	The Data detected by the EEPROM are used to determine MCU
Malfunction Decision Conditions	when the data of EEPROM is error or the EEPROM is damaged
Supposed Causes	■ Faulty EEPROM data ■ Faulty EEPROM ■ Faulty PCB
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred. Replace the indoor or outdoor mainboard

9.3.3 Indoor AC fa motor malfunction

Indoor Display	E14 Indoor DC fan motor malfunction
Method of Malfunction Detection	When the fan motor is running, the speed detected by the Hall IC is used to judge the abnormal operation of the fan motor
Malfunction Decision Conditions	When the detected rotation feedback signal don't received in 2 minutes
Supposed Causes	■ Operation halt due to breaking of wire inside the fan motor. ■ Operation halt due to breaking of the fan motor lead wires ■ Detection error due to faulty indoor unit PCB
Trouble shooting	* Caution: Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.

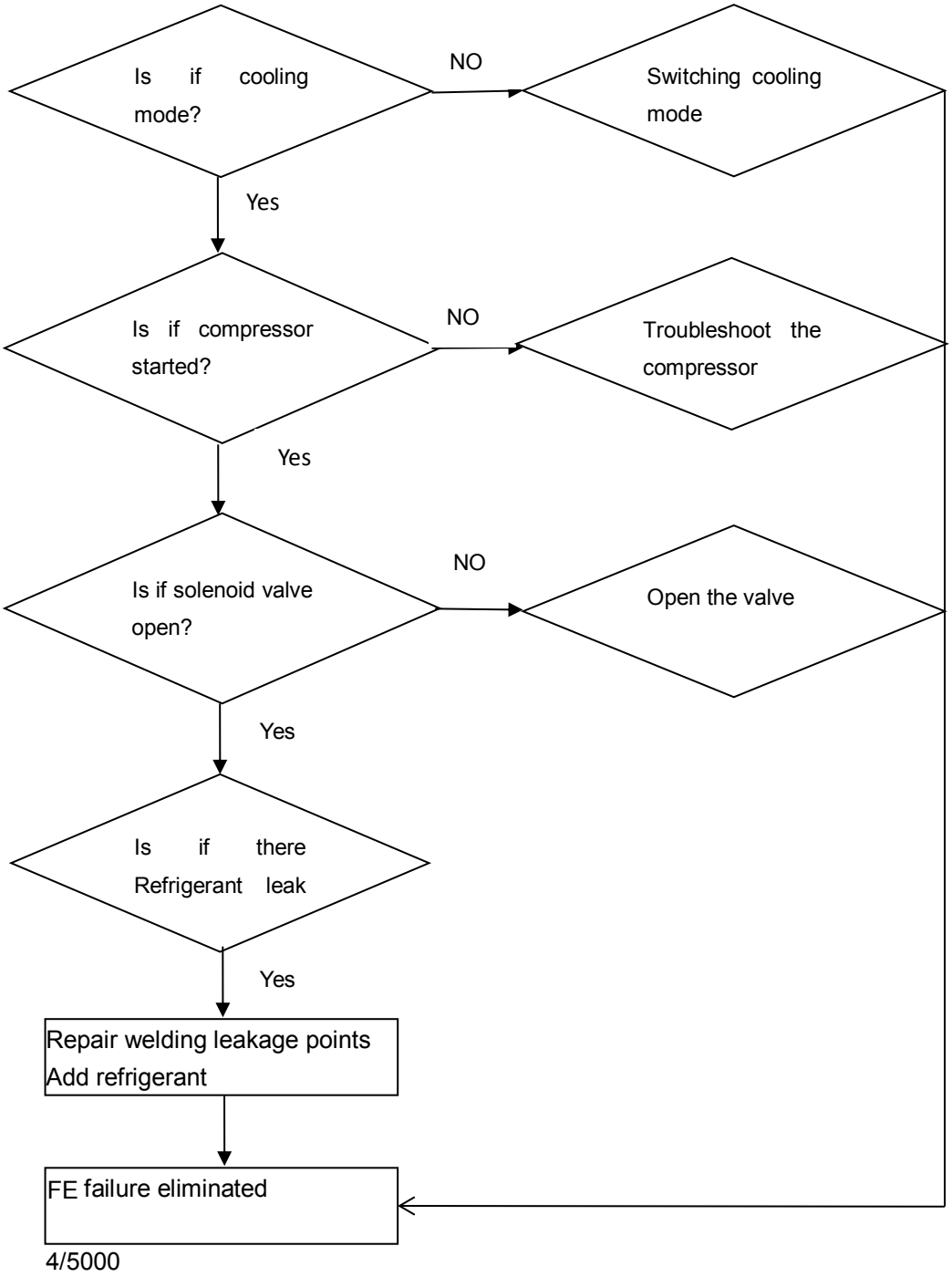


	Color	Signal	Voltage
1	Red	VDC	310V
2	---	---	---
3	---	---	---
4	Black	GND	0V
5	White	VCC	15v
6	Blue	FG	15V
7	Yellow	Vsp	0-6.5V



9.3.4 Refrigerant leaking detection

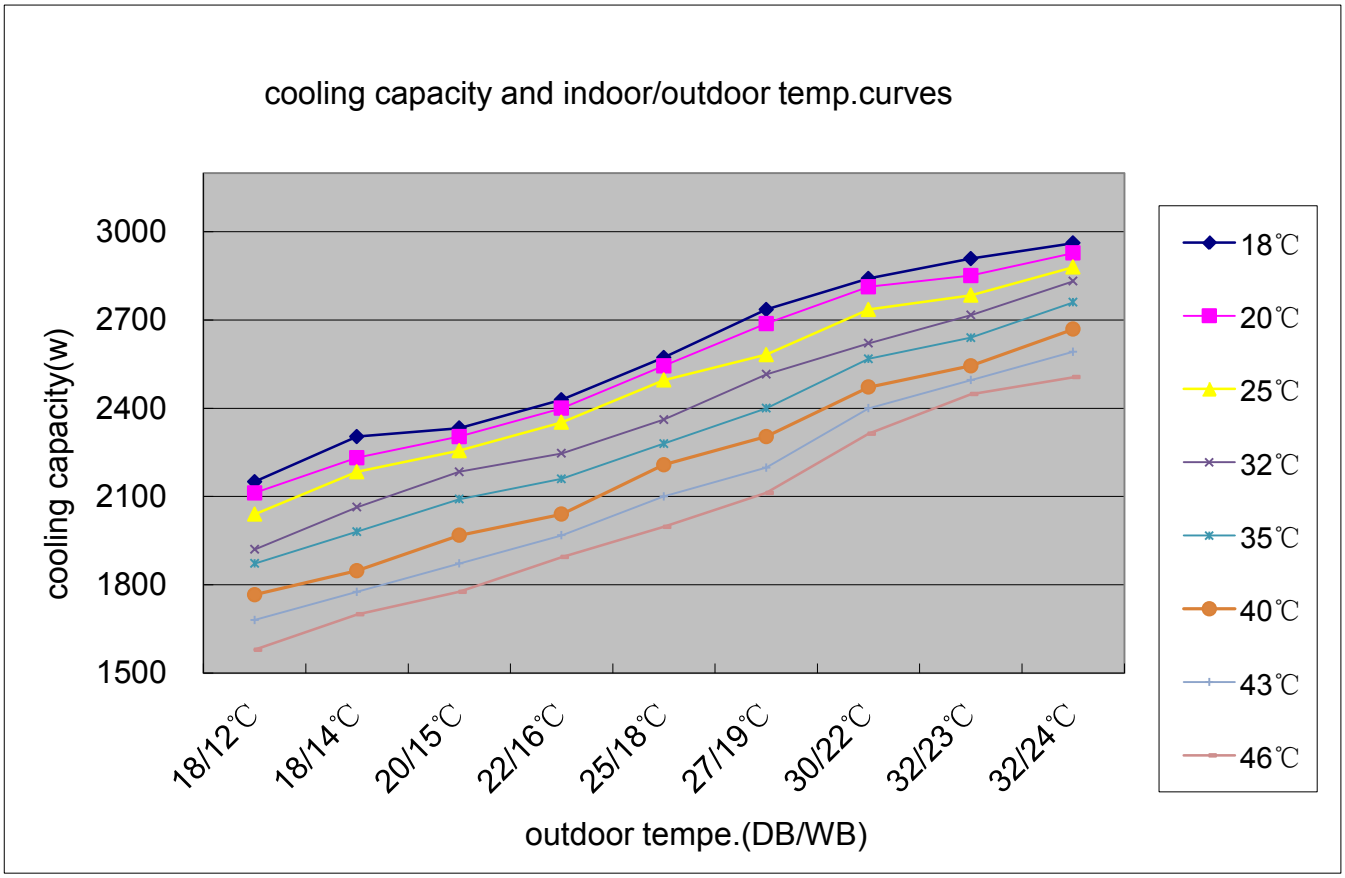
Indoor Display	FE : Refrigerant leaking detection malfunction
Method of Malfunction Detection	The temperatures variation detected by the thermistors are used to determine refrigerant leaking.
Malfunction Decision Conditions	On off model refrigerant leaking detection : this function only works under cooling mode. ■ Each time when entering cooling mode, the memorized beginning temperature for pipe is Tp1 when compressor starts to work, Tr is environmental Temperature detected by PCB, Tp is the current temperature. 1.Tp1-Tp Real result≤2 Centigrade and compressor keep running for 20mins 2.Tr-Tp1 Real result≤2 Centigrade and compressor keep running for 20mins 3.Tr≥25 Centigrade ■ All the conditions above meet together can be judged to refrigerant leakage and compressor stop,"FE" will display for 3mins.After 3 mins,compressor restart and make the same cycle.
Supposed Causes	■ Refrigerant leaking, need maintenance Engineer check whether cooling only function works well ■ The compressor may didn't start, need to start it for working.
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector,or else parts damage may be occurred.


Is if cooling mode?
NO
Switching cooling mode
Yes
Is if compressor started?
NO
Troubleshoot the compressor
Yes
Is if solenoid valve open?
NO
Open the valve
Yes
Is if there Refrigerant leak
Yes
Repair welding leakage points
Add refrigerant
FE failure eliminated

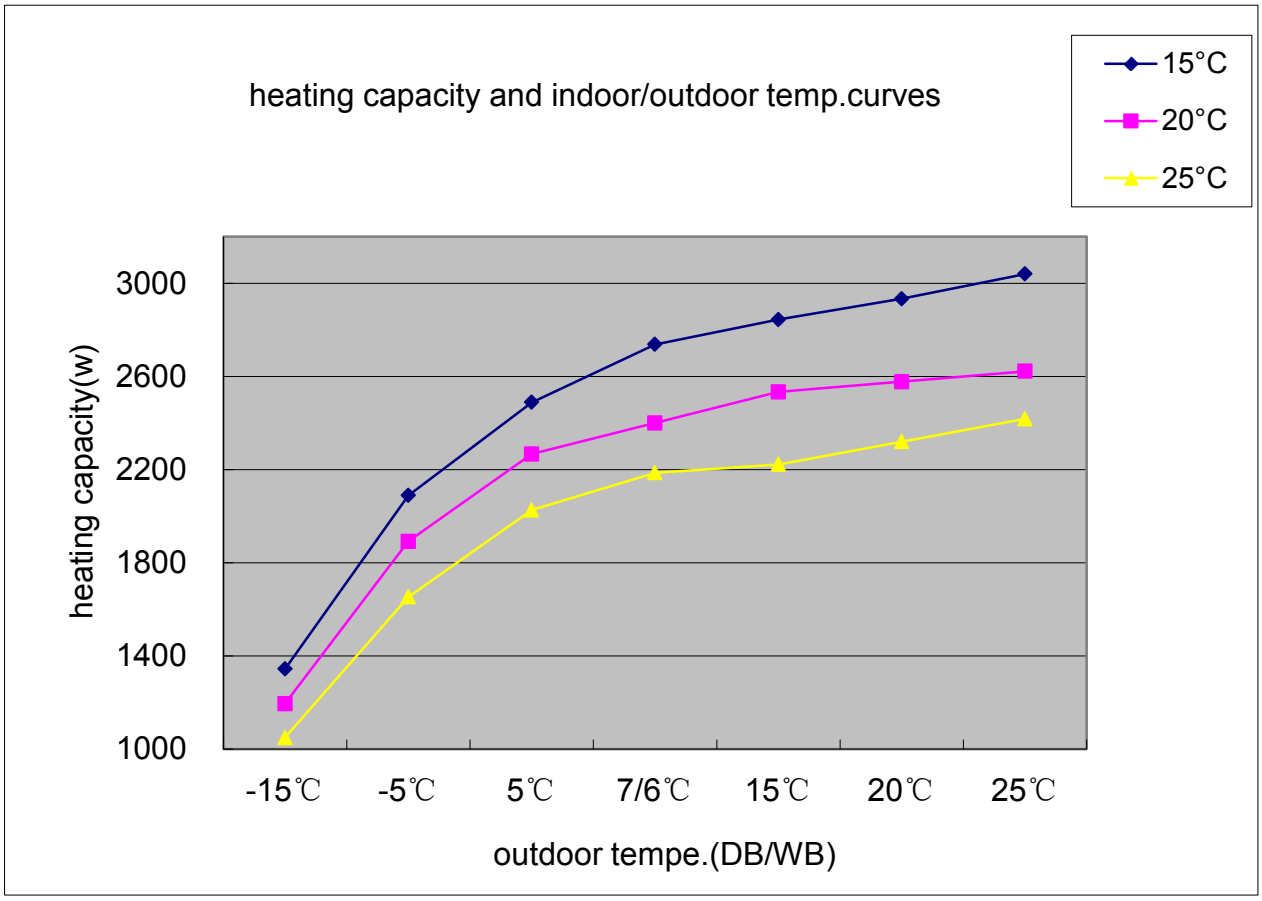
4/5000

10. Performance and curves diagrams

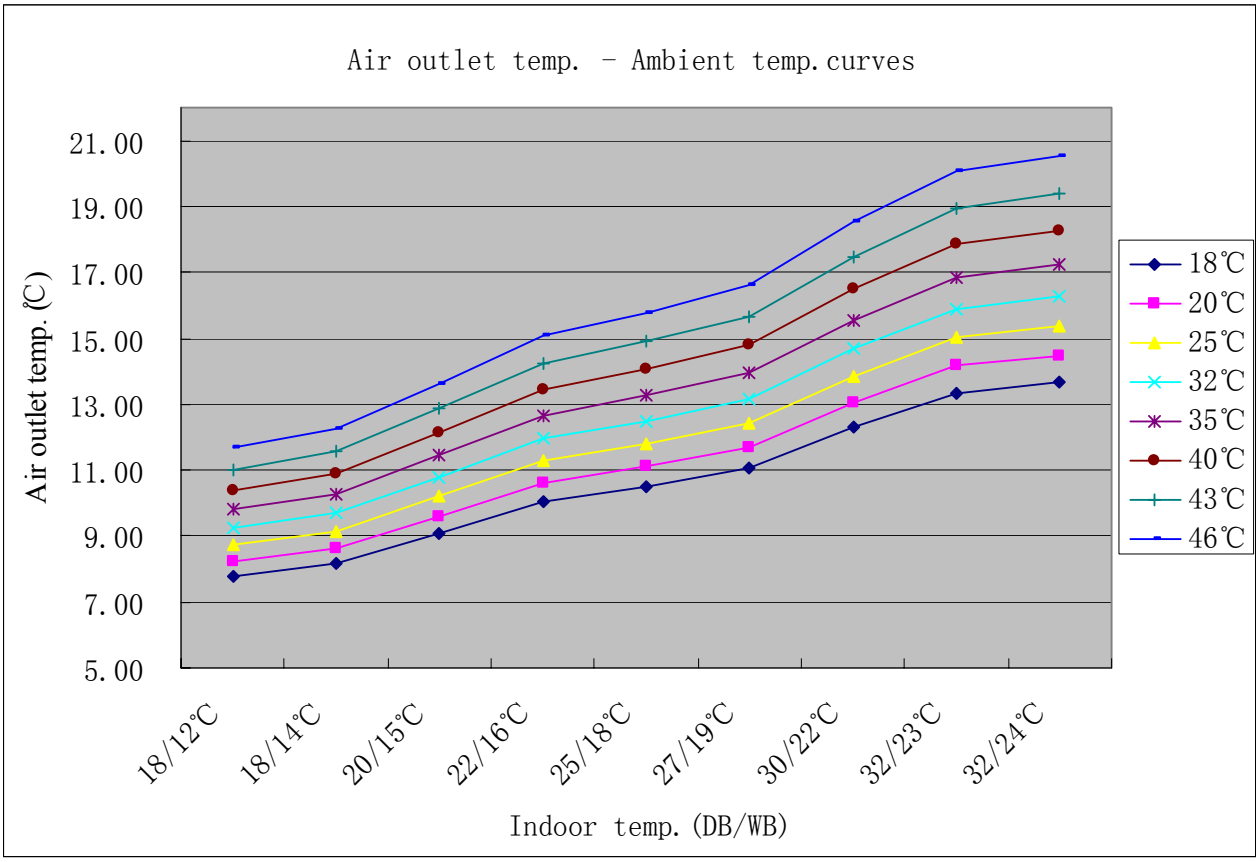
performance curves								
cooling value-temerature table								
indoor temp.	outdoor temp.(humidity 46%)							
DB/WB	18℃	20℃	25℃	32℃	35℃	40℃	43℃	46℃
18/12℃	2150	2112	2040	1920	1872	1766	1680	1579
18/14℃	2304	2232	2184	2064	1980	1848	1776	1699
20/15℃	2333	2304	2256	2184	2091	1968	1872	1776
22/16℃	2429	2400	2352	2246	2160	2040	1968	1894
25/18℃	2573	2544	2496	2362	2280	2208	2100	1997
27/19℃	2736	2688	2582	2515	2400	2304	2198	2112
30/22℃	2842	2813	2736	2621	2568	2472	2400	2314
32/23℃	2909	2851	2784	2717	2640	2544	2496	2448
32/24℃	2962	2928	2880	2832	2760	2669	2592	2506



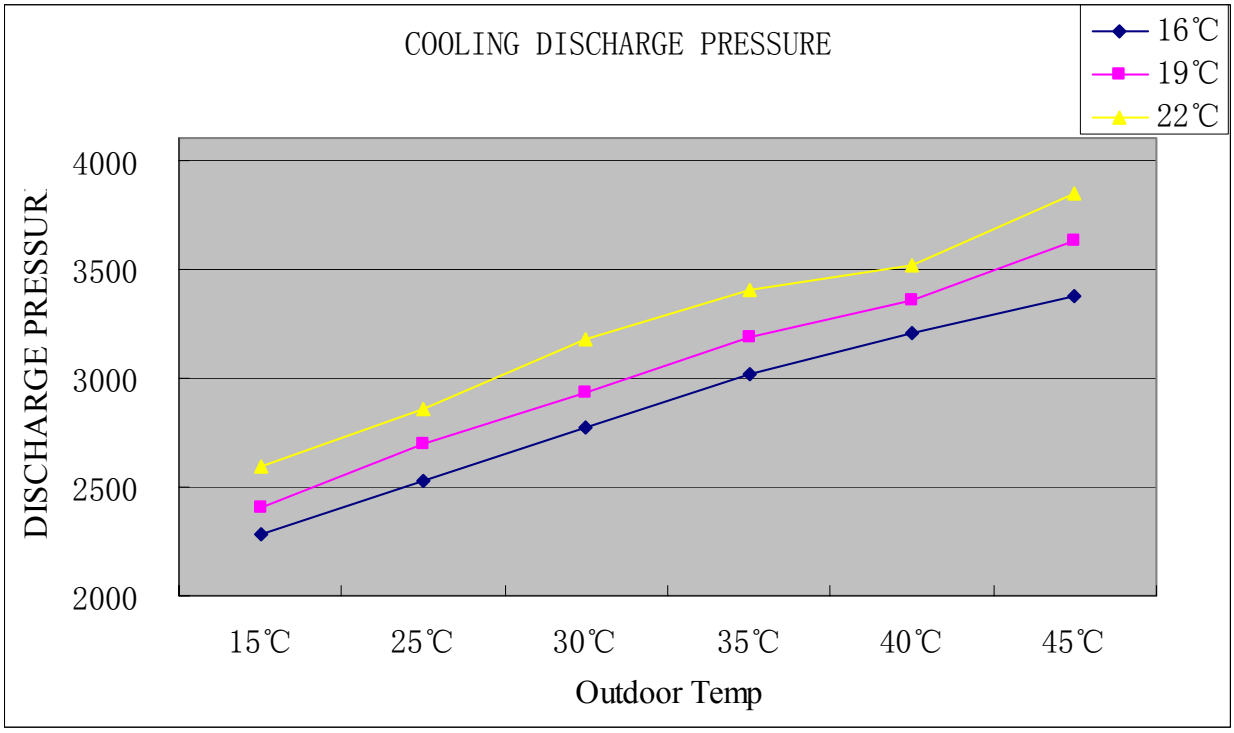
performance curves			
heating capacity and indoor/outdoor temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-15℃	1344	1195	1049
-5℃	2089	1892	1653
5℃	2489	2267	2027
7/6℃	2738	2400	2187
15℃	2844	2533	2222
20℃	2933	2578	2320
25℃	3040	2622	2418



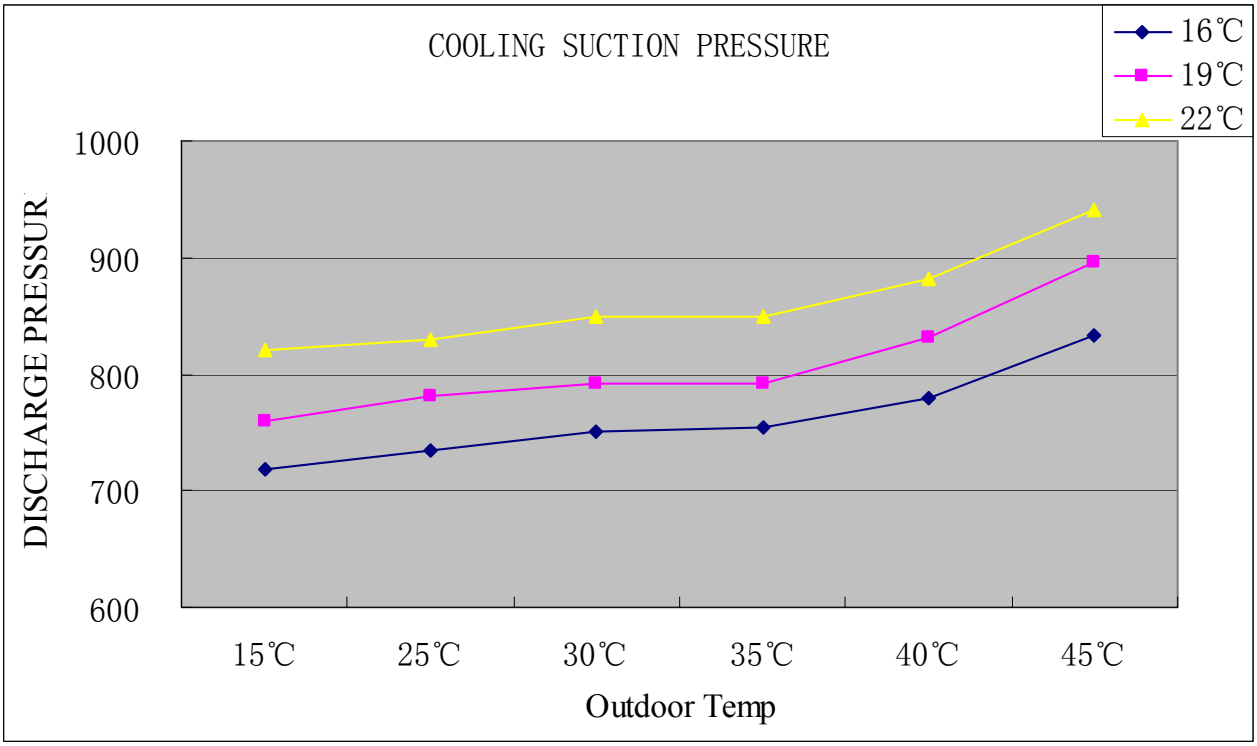
Air outlet temp. - Ambient temp. table								
Indoor temp.	Outdoor temp. (Humidity 46%)							
DB/WB	18℃	20℃	25℃	32℃	35℃	40℃	43℃	46℃
18/12℃	7.76	8.22	8.71	9.24	9.79	10.38	11.00	11.66
18/14℃	8.15	8.64	9.15	9.70	10.29	10.90	11.56	12.25
20/15℃	9.07	9.62	10.19	10.80	11.45	12.14	12.87	13.64
22/16℃	10.03	10.63	11.27	11.95	12.67	13.43	14.23	15.09
25/18℃	10.50	11.13	11.80	12.51	13.26	14.05	14.89	15.79
27/19℃	11.05	11.71	12.41	13.16	13.95	14.78	15.67	16.61
30/22℃	12.33	13.07	13.85	14.68	15.56	16.50	17.49	18.54
32/23℃	13.36	14.16	15.01	15.91	16.86	17.87	18.95	20.08
32/24℃	13.67	14.49	15.36	16.28	17.25	18.29	19.39	20.55



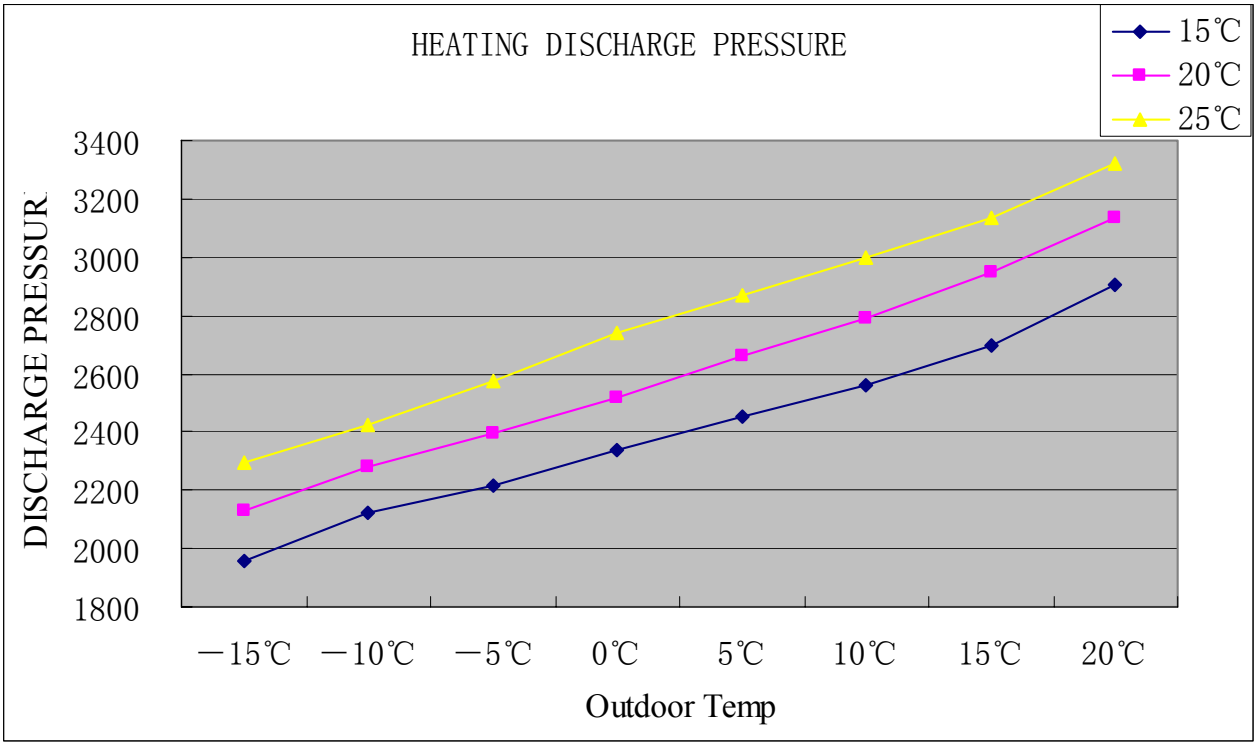
Cooling discharge pressure table			
Outdoor temp. (Humidity 46%)	Indoor temp.		
DB/WB	16℃	19℃	22℃
15℃	2285	2407	2591
25℃	2530	2693	2856
30℃	2770	2934	3173
35℃	3020	3183	3404
40℃	3202	3356	3519
45℃	3375	3625	3845



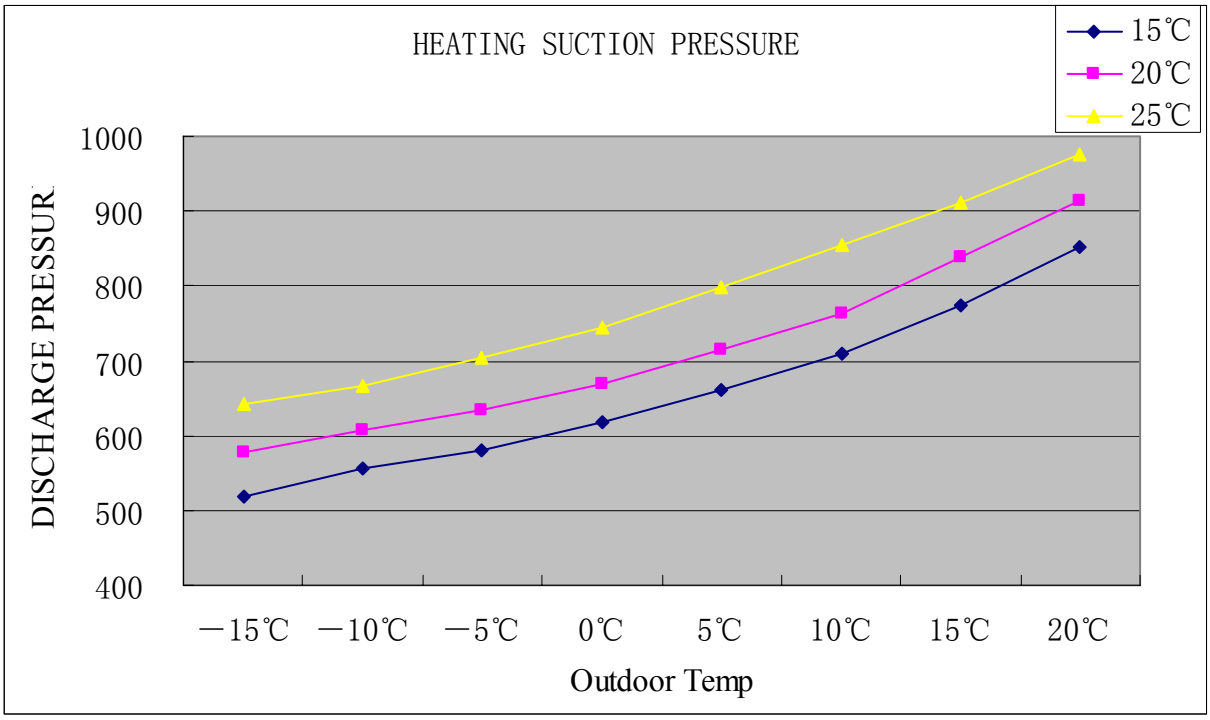
Cooling suction pressure table			
Outdoor temp. (Humidity 46%)	Indoor temp.		
DB/WB	16℃	19℃	22℃
15℃	689	764	799
25℃	722	783	833
30℃	738	798	848
35℃	778	843	896
40℃	806	874	934
45℃	851	914	985



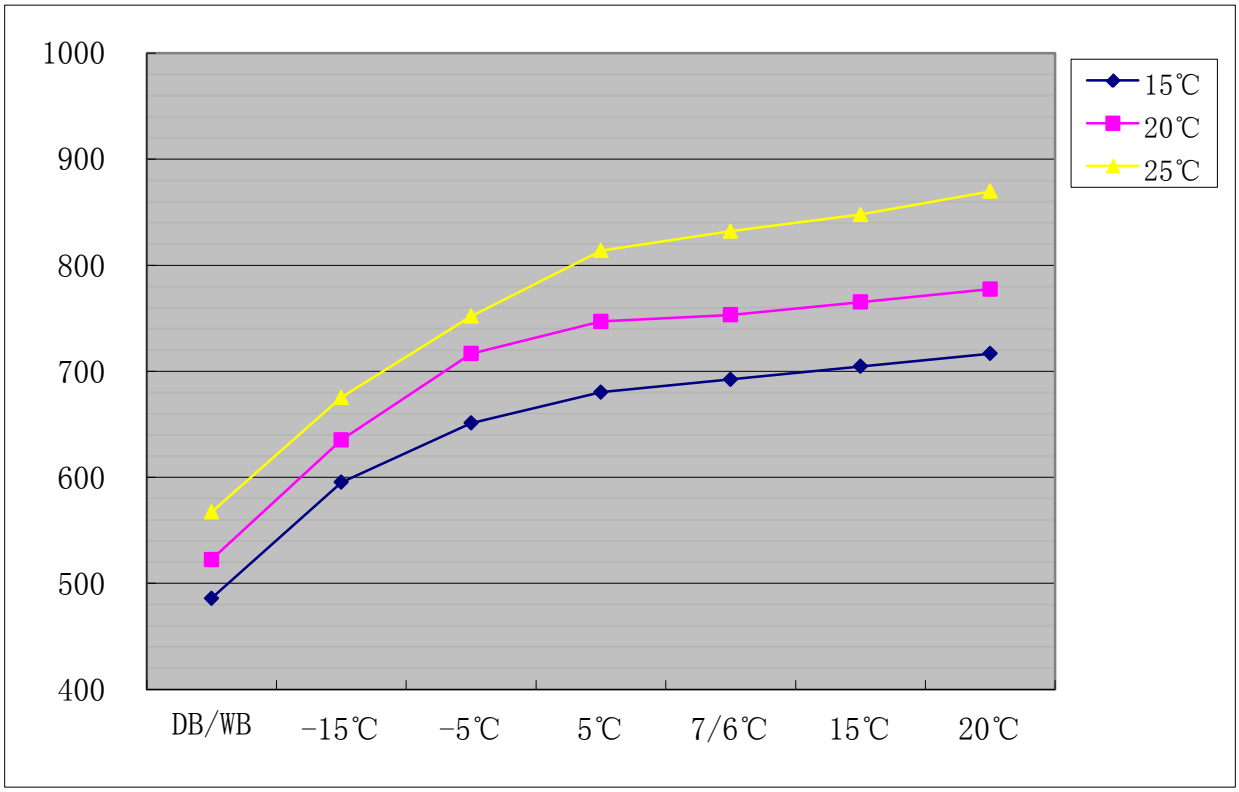
Heating discharge pressure table			
Outdoor temp. (Humidity 46%)	Indoor temp.		
DB/WB	15℃	20℃	25℃
-15℃	1960	2130	2295
-10℃	2120	2280	2424
-5℃	2216	2396	2575
0℃	2338	2520	2741
5℃	2453	2661	2869
10℃	2561	2788	3000
15℃	2694	2948	3135
20℃	2905	3135	3320



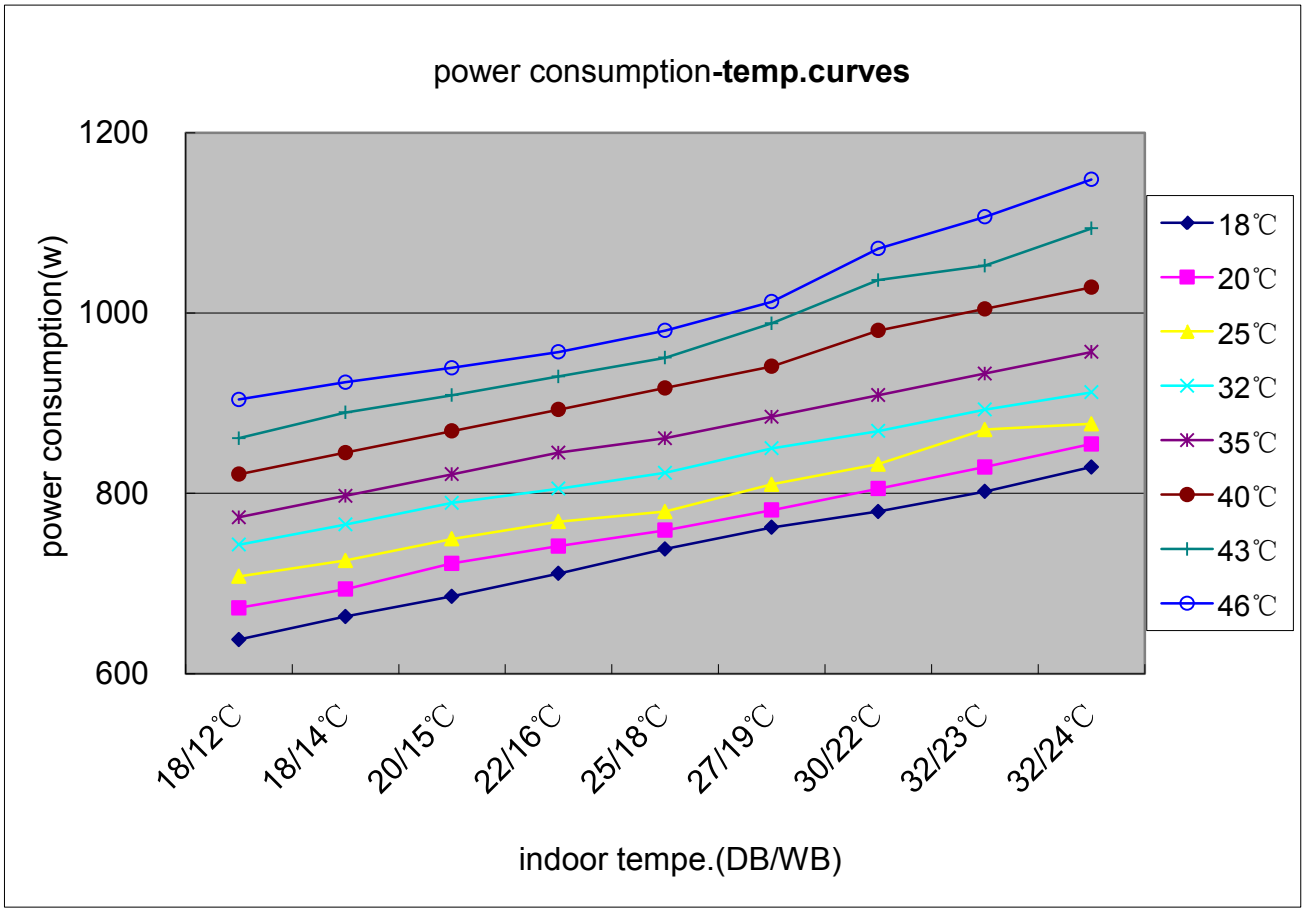
Heating suction pressure table			
Outdoor temp. (Humidity 46%)	Indoor temp.		
DB/WB	15℃	20℃	25℃
-15℃	518	578	643
-10℃	557	608	667
-5℃	580	635	703
0℃	618	669	743
5℃	660	715	798
10℃	710	763	855
15℃	774	839	911
20℃	852	915	975



performance curves			
power consumption value-temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-15℃	486	522	567
-5℃	595	635	675
5℃	651	717	752
7/6℃	680	747	814
15℃	692	753	832
20℃	704	765	848
25℃	717	777	870



performance curves								
power consumption value-temp.table								
indoor temp.	outdoor temp.(humidity 46%)							
DB/WB	18℃	20℃	25℃	32℃	35℃	40℃	43℃	46℃
18/12℃	638	673	708	743	773	821	861	904
18/14℃	663	694	726	765	797	845	890	923
20/15℃	686	722	749	789	821	869	909	939
22/16℃	711	741	769	805	845	893	930	957
25/18℃	738	759	780	823	861	917	950	981
27/19℃	762	781	810	850	885	941	989	1013
30/22℃	780	805	832	869	909	981	1036	1072
32/23℃	802	829	871	893	933	1005	1052	1107
32/24℃	829	855	877	912	957	1029	1094	1148

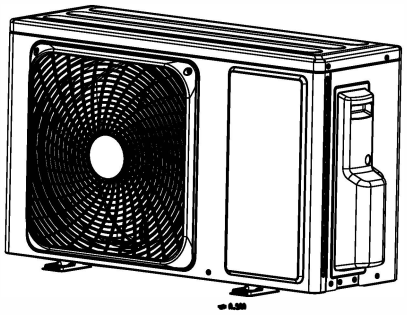
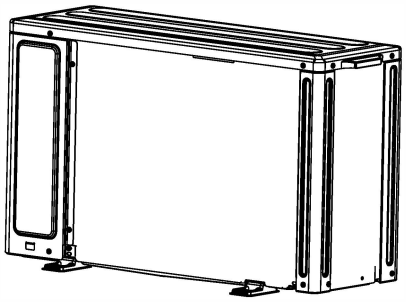
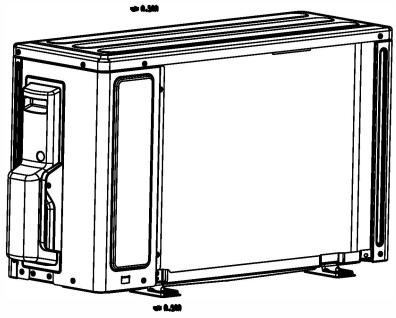


11. Removal Procedure

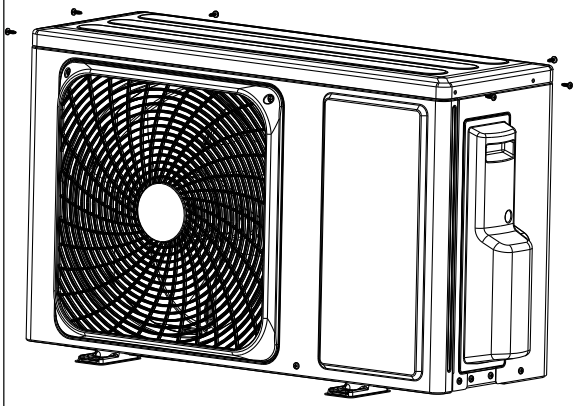
Outdoor Unit

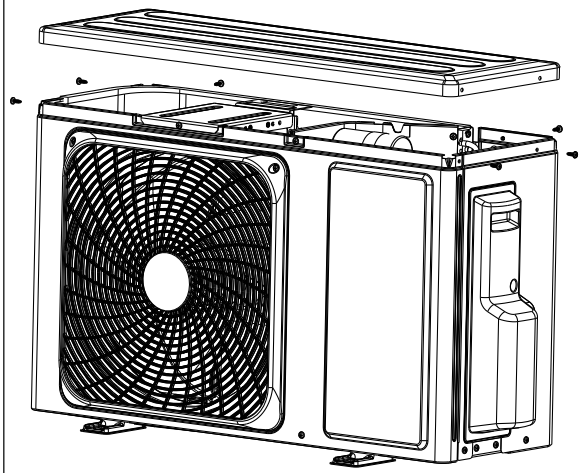
Procedure

⚠ Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

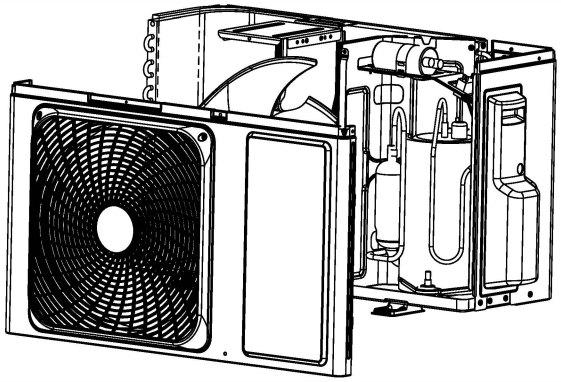
Step	Procedure	Points
1. Features		
1 Loosen the service cover screw and remove the service cover.	  	■ Be careful not to cut your finger by the fins of the heat exchanger.

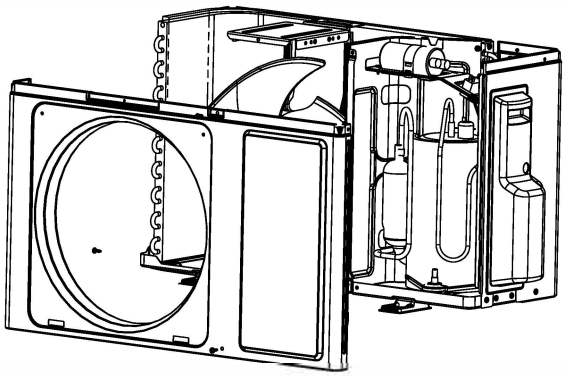
Step	Procedure	Points
2. Remove the panels.		
1	Loosen the 6 screws and lift the top panel	

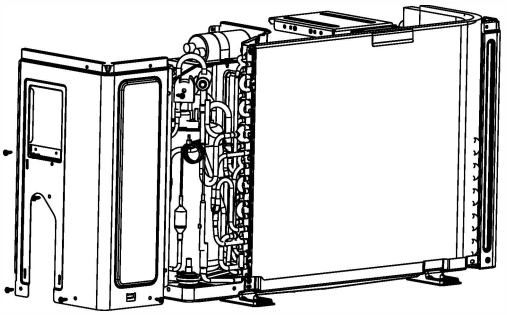
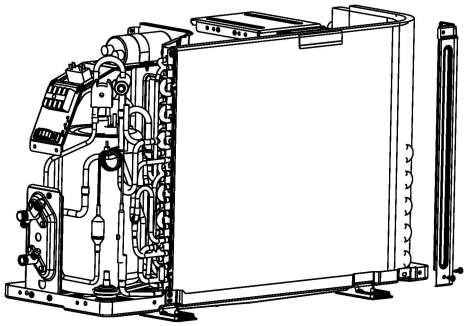
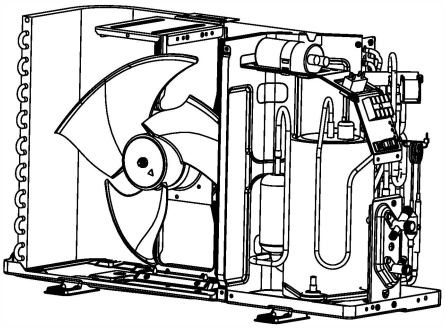




Step	Procedure	Points
2	Loosen the screws of the panel.	



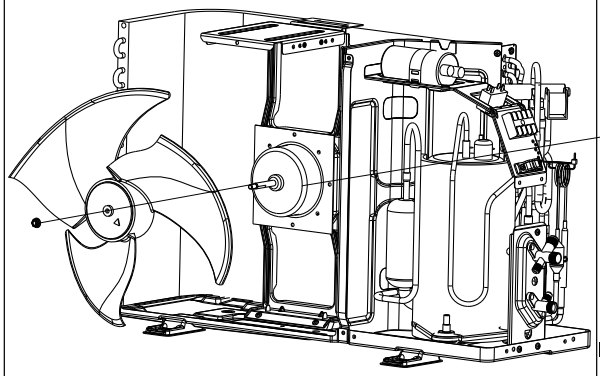
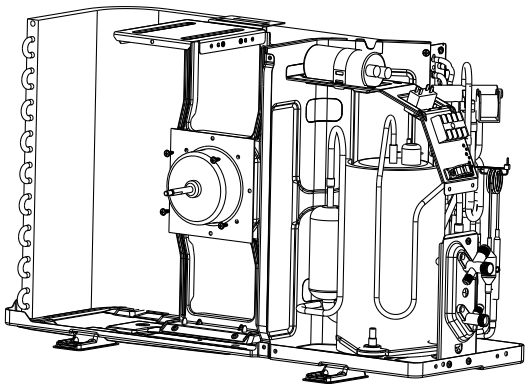
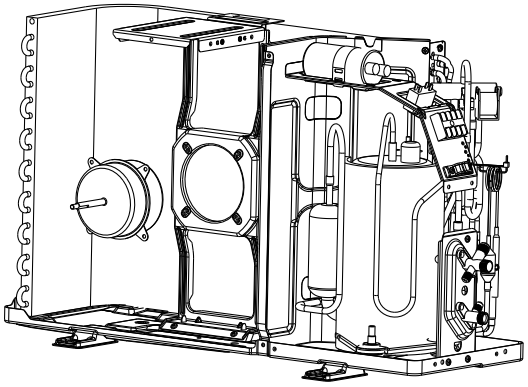
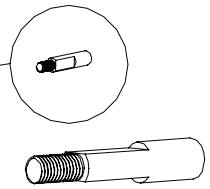


Step	Procedure	Points
3	Pull and remove the front panel.   	

2. Removal of Fan and Fan Motor

Procedure

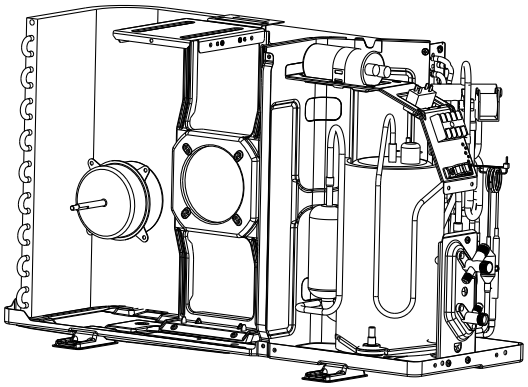
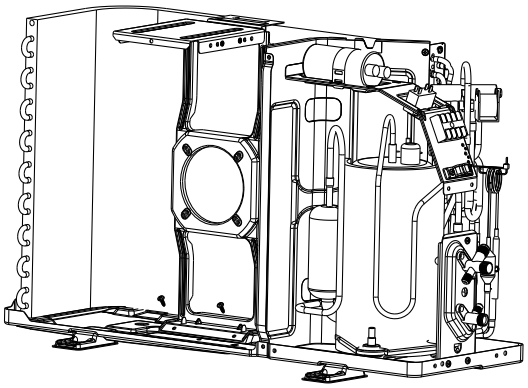
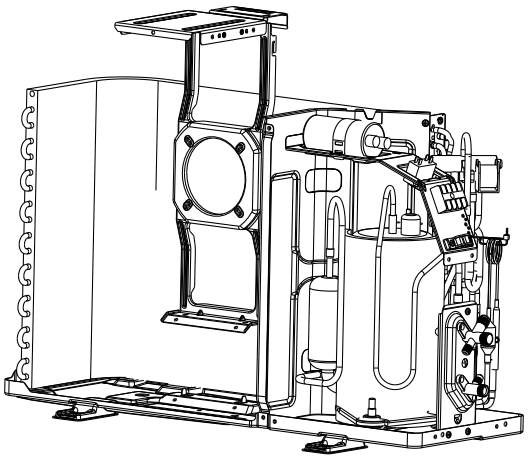
Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

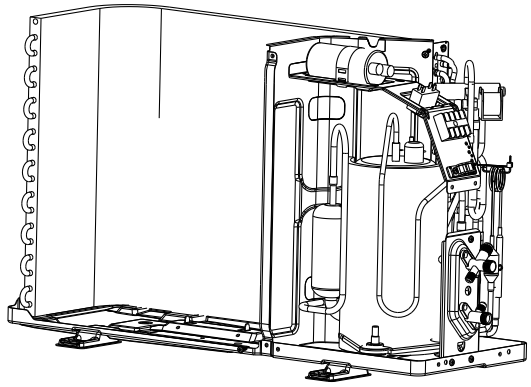
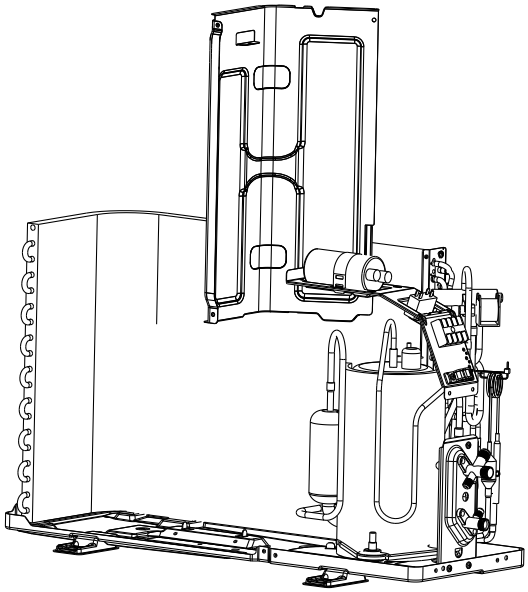
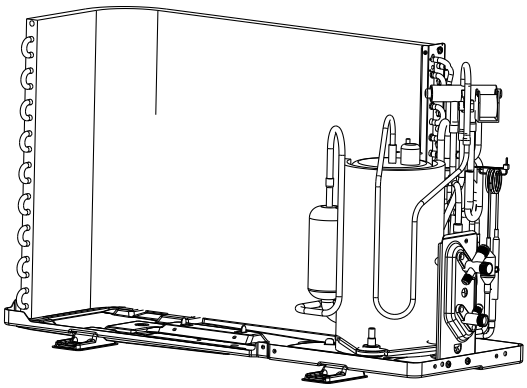
Step	Procedure		Points
1	Loosen the fixing screw and remove the fan	  	 ■ Put the lead wire through the back of the motor when assembling. (so as not to be entangled with the propeller fan)

3. Removal of fan motor bracket and partition

Procedure

Warning Be sure to wait 10 minutes or mo
before disassembling work.

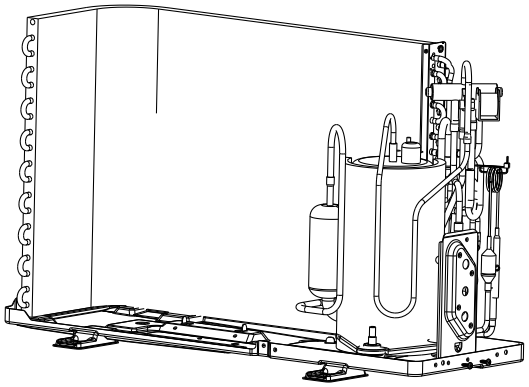
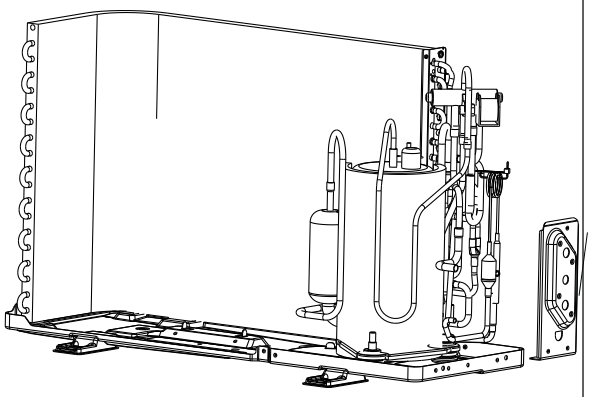
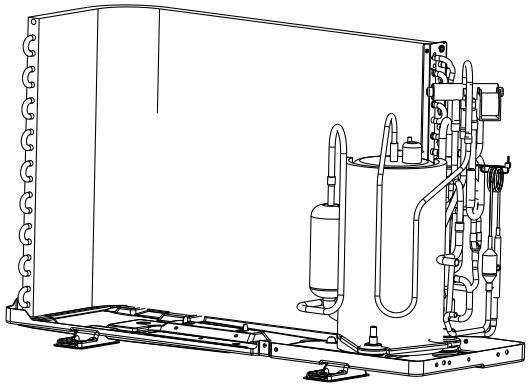
Step	Procedure	Points
1	Loosen the fixing screws and lift the fan motor bracket .   	

Step	Procedure	Points
2	Loosen the screws 	
3	The partition plate has a hook on the lower side.Lift and pull the 	■ When assembling ,fit the lower hook into the bottom frame .
4	Remove the fixing screws Then lift the electrical box 	

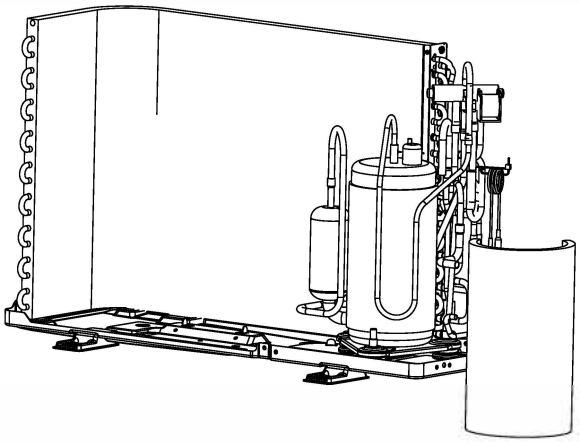
4. Removal of compressor and heat exchanger

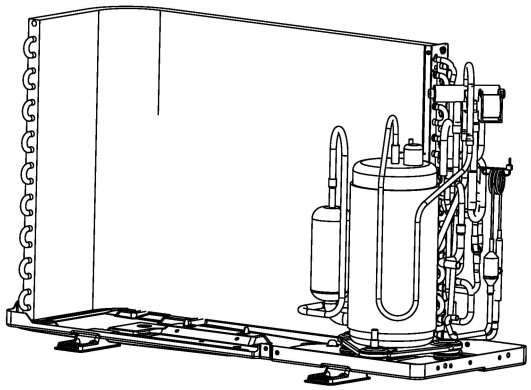
Procedure

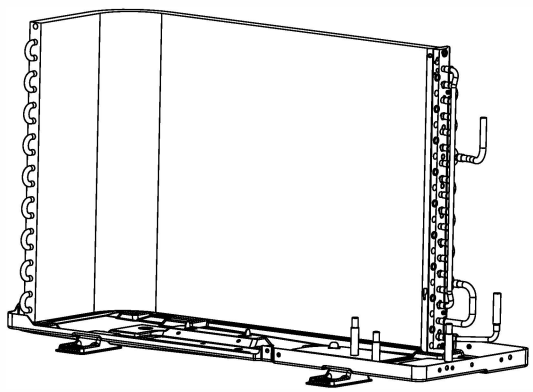
Warning Be sure to wait 10 minutes or more after tu
before disassembling work.

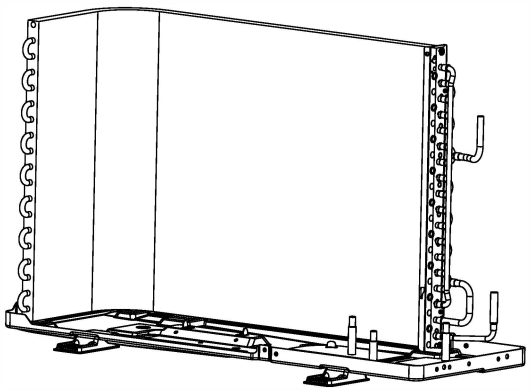
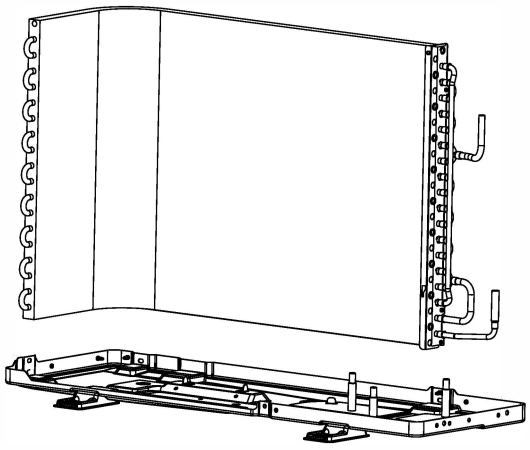
Step	Procedure		Points
1	Loosen the marked screw .	  	

Step	Procedure	Points
2	Cut down the conecting pipe and pull out the compressor and remove the valve bracket .	







Step	Procedure	Points
3	Loosen the marked fixing screw . 	
4	Loosen the fixing hook and remove the heat 	

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