Haier SERVICE MANAUL

Wall Mounted Type

D-Series

Model No.1U09JEDFRA
1U12JECFRA
1U25S2PJ1FA
1U35S2PJ1FA

⚠WARNING

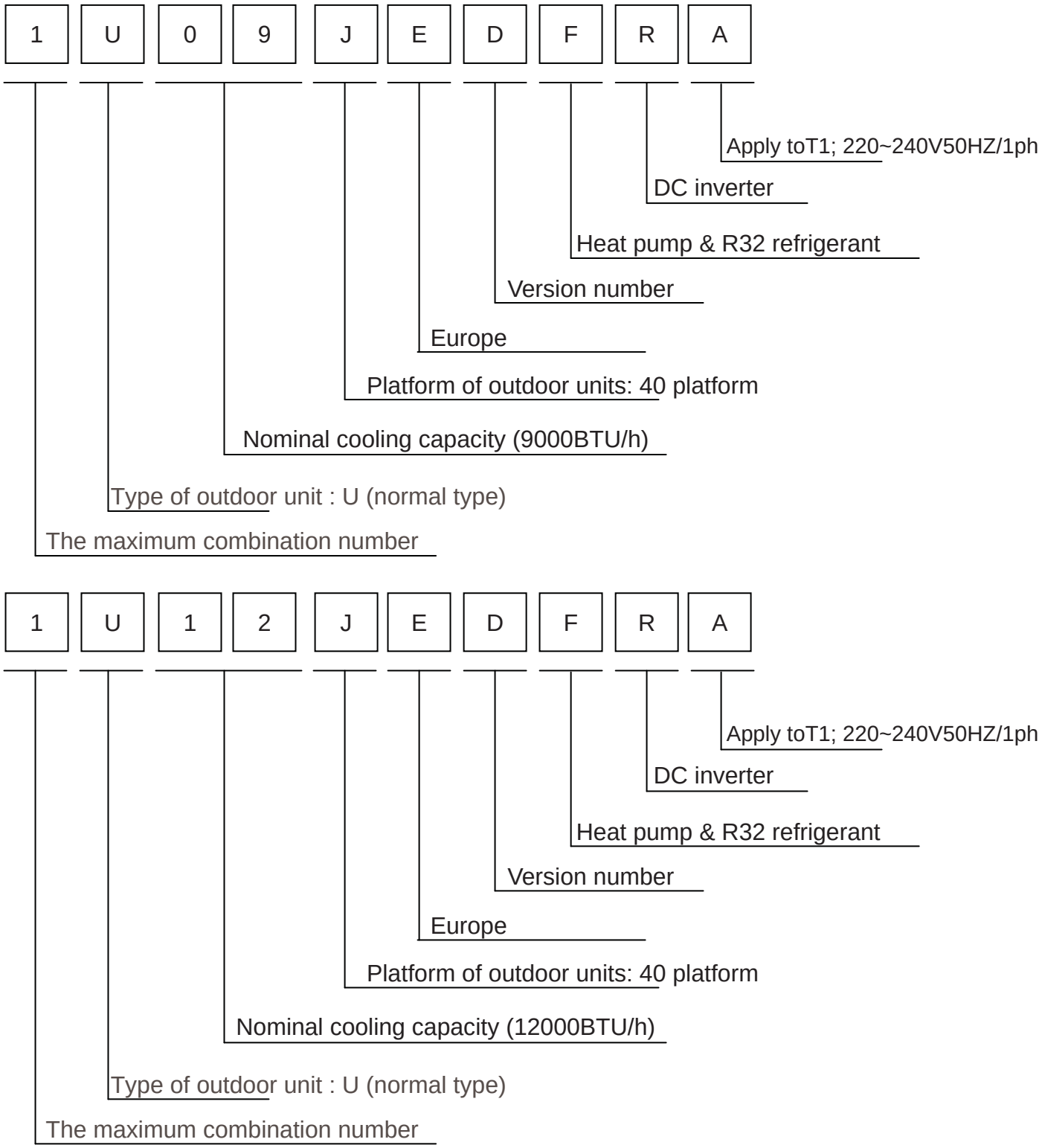
This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should 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

Haier Group **Version：V1** **Date：2016-11-02**

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(09K/12K)	heating(09K/12K)
Capacity rated	KW	2.60/3.50	2.60/4.20
	Btu/h	8870/11940	8870/14330
Power Consumption(Rated)	KW	0.65/0.87	0.64/1.05
SEER/SCOP	W/W	8.5/A+++	5.1/A+++(09K) 4.6/A++(12K)
Annual energy consumption	KWh	107/144	716/973
Moisture Removal	m³/h	1.2*10 - ³ /1.6*10 - ³	

TECHNICAL SPECIFICATIONS-UNIT			
Dimensions	H*W*D	mm	820×338×614
Packaged Dimensions	H*W*D	mm	963×413×685
Weight	/	KG	37.4
Gross weight	/	KG	41.1
Sound level	Sound peessure	dB	46
	Sound power	dB	62

ELECTRICAL SPECIFICATIONS			
		Cooling(09K/12K)	heating(09K/12K)
Nominal running current	A	2.9/3.9	3.5/4.7
Maximum running current	A	5.3/5.8	7.1/7.5
Starting current	A	6.0	6.0

TECHNICAL SPECIFICATIONS-PARTS				
			cooling	heating
Compressor	Type		Rotary Compressor	
	Model		GSD102UKQA6JT6	
	Motor output	W	695	
	Oil type		RM-LP56EG or equivalent	
	Oil charge volume	L	0.32	
Fan	Type		Axial fan	
	Motor output	W	50	
	Air flow rate(high)	m³/h	2100	
	Speed(high/low)	rpm	850/300	

Heat exchanger	Type	ML fin-φ7HI-HX tube	
	Row*stage*fitch	2*26*1.4	
TECHNICAL SPECIFICATIONS-OTHERS			
Refrigerant circuit	Refrigerant type		R32
	Refrigerant charge	KG	0.95
	Maximum allowable distance between indoor an outdoor	m	15
	Maximum allowable level difference	m	10
	Refrigerant control	EEV	
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	5
Amount of Additional Charge of Refrigerant		g/m	20

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

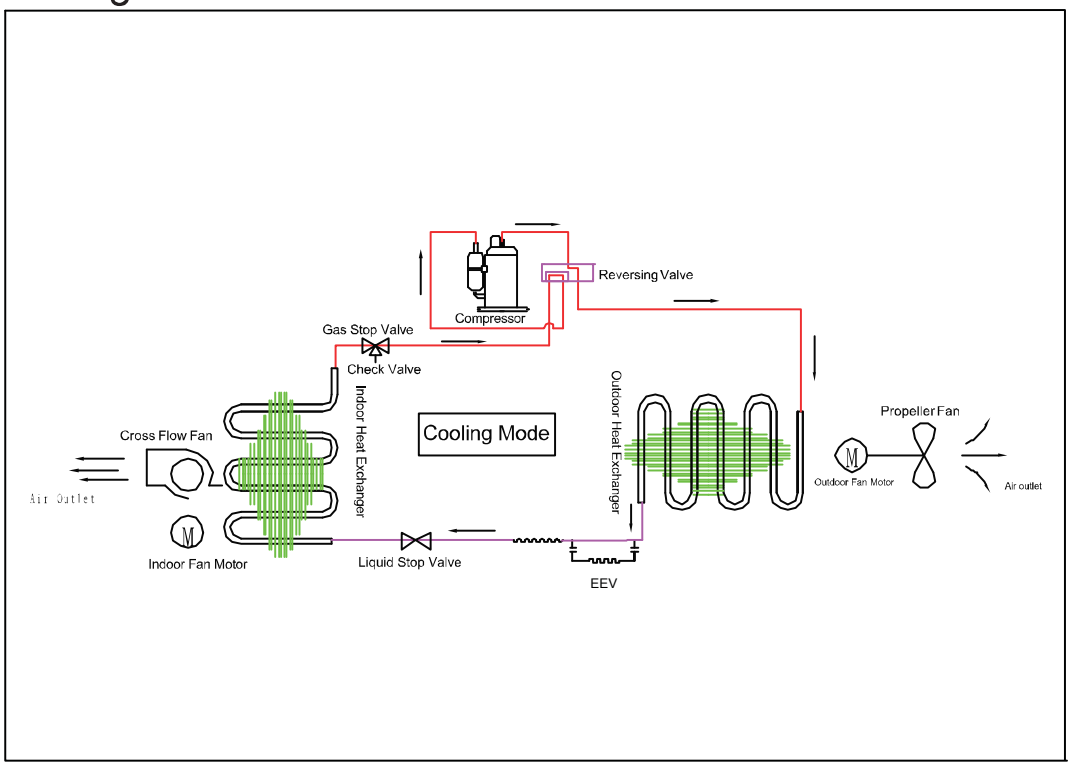
Conversation formulae
Kcal/h= KW×860
Btu/h= KW×3414
cfm=m³/min×35.3

3.Sensors list

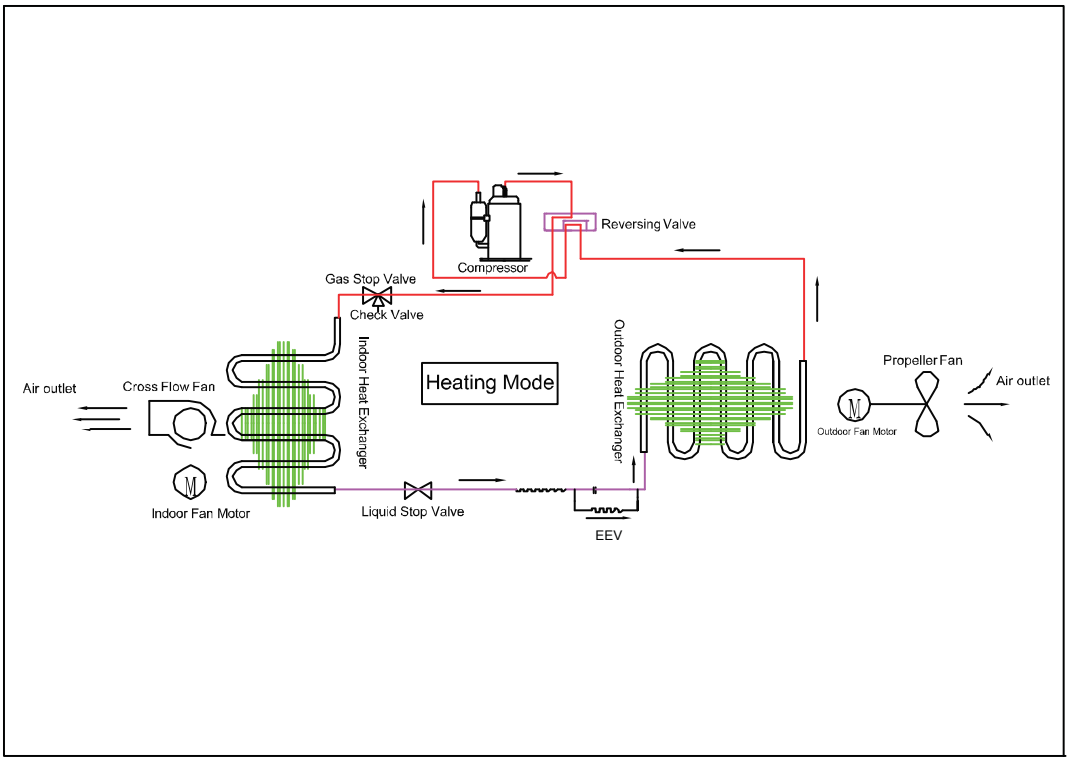
type	Description	Qty
Ambient sensor	Its used for detecting temperature of outdoor side	1
Suction sensor	Its used for detecting suction pipe temperature of compressor to adjust gas flowing	1
Defrosting sensor	Its used for controlling outdoor defrosting at heating mode	1
Descharging sensor	Its used for compressor in case of over-heat	1

4. Pinping diagrams

Cooling mode

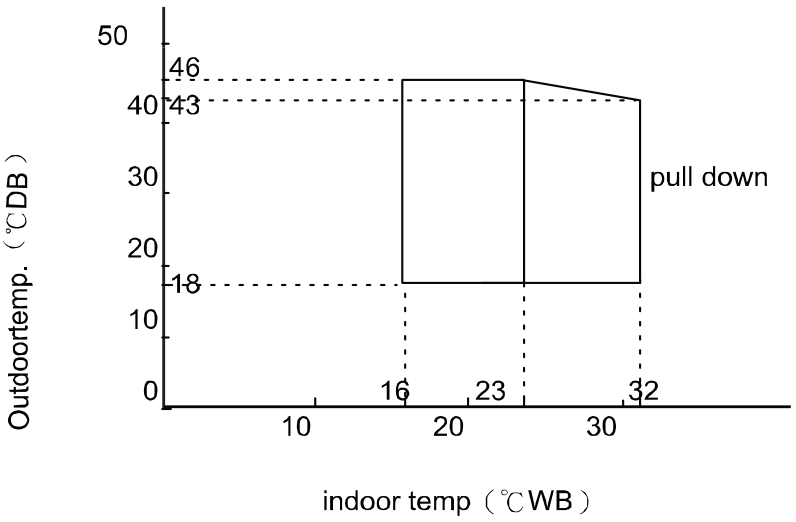


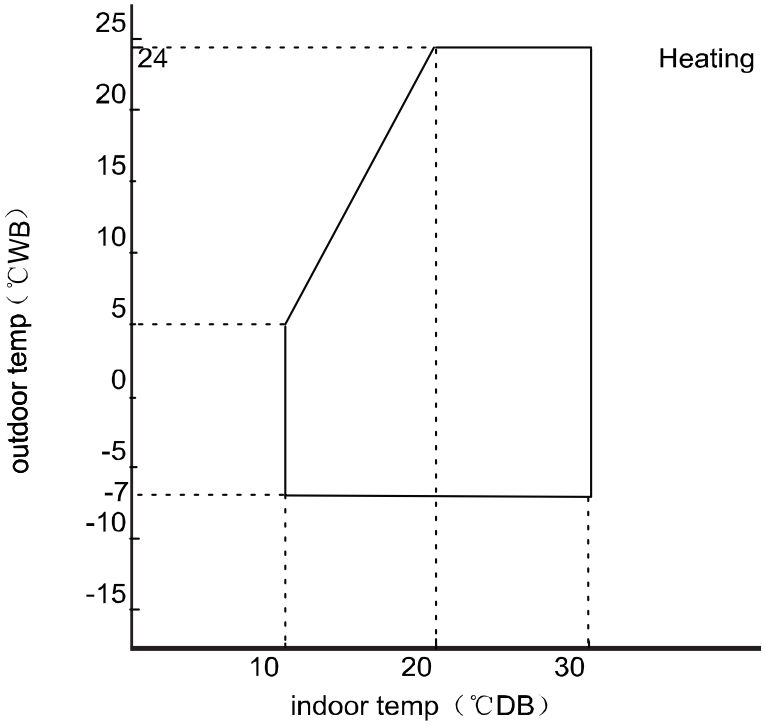
Heating mode



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.Printed Circuit Board Connector Wiring Diagram

Connectors

PCB (1) (Outdoor Control PCB)

1	CN1	Connector for power N and L
2	CN2	
3	CN3	Connector for ground
4	CN23	Connector for DC POWER 15Vand 5V to the module board
5	CN9	Connector for CN2,CN1 on the module board
6	CN10	
7	CN22	Connector for fan moto
8	CN11	Connector for four way valve coil
9	CN17	Connector for thermistors
10	CN47	
11	CN24	Connector for communicate between the control board and the module board
12	CN26	Connector to P and N of the module board
13	CN25	
14	CN36	Connector for communicate between indoor and outdoor unit
15	CN15	Connector for electric expansion valves
16	CN50	Connector for DRED-control
17	CN45	Connector for heating- protect wire of terminal block
18	CN48	underpan electric heating wire
19	CN49	compressor electric heating belt

Note: 09K -12Kseries needn’t connect with CN6 and CN7

Other Designations

1) FUSE 1, (25A, 250VAC); FUSE 2(1A, 250VAC)

2) LED 1 Keep light representative normal, if keep flash interval representative trouble Alarm

3) RV1, RV2, RV3 Varistor

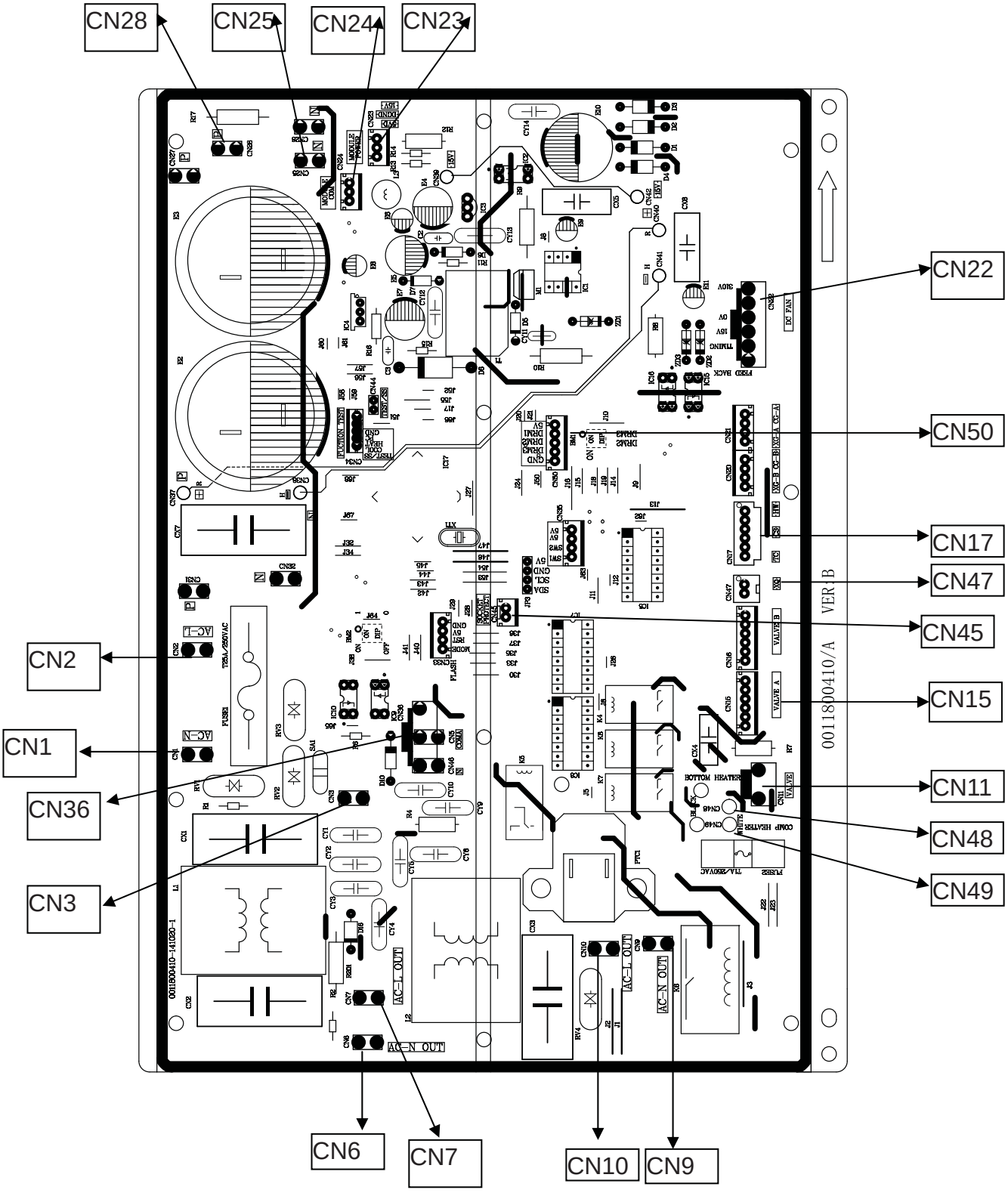
PCB (2) (Module PCB for 09-12K)

1	CN10	Connector for the DC power 5V and 15V form the control PCB
2	CN11	Connector for communicate between the control board and the module board
3	P (CN1)	Connector for capacitance board
4	N (CN5)	
5	LI (CN7),	Connector for reactor
6	LO (CN6)	
7	CN2	Connector for the U, V, W wire of the compressor
8	CN3	
9	CN4	

PCB (3) (Module PCB for 18-24K)

1	CN10	Connector for the DC power 5V and 15V form the control PCB
2	CN11	Connector for communicate between the control board and the module board
3	P (CN8)	Connector for capacitance board
4	N (CN9)	
5	LI (CN3)	Connector for reactor
6	LO (CN4)	
7	CN5	Connector for the U, V, W wire of the compressor
8	CN6	
9	CN7	

PCB (1)


CN28
CN25
CN24
CN23
CN22
CN50
CN17
CN47
CN45
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CN11
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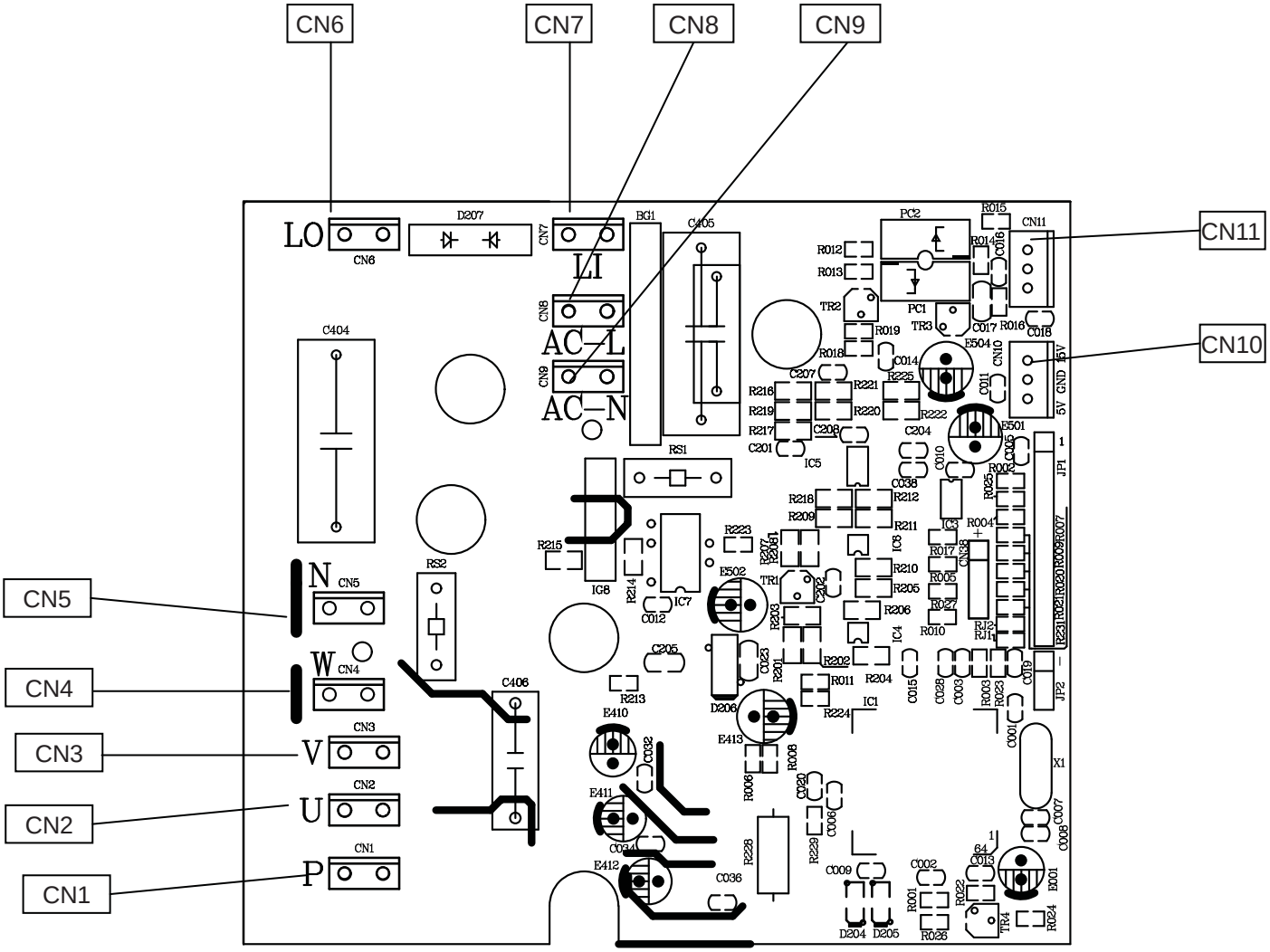
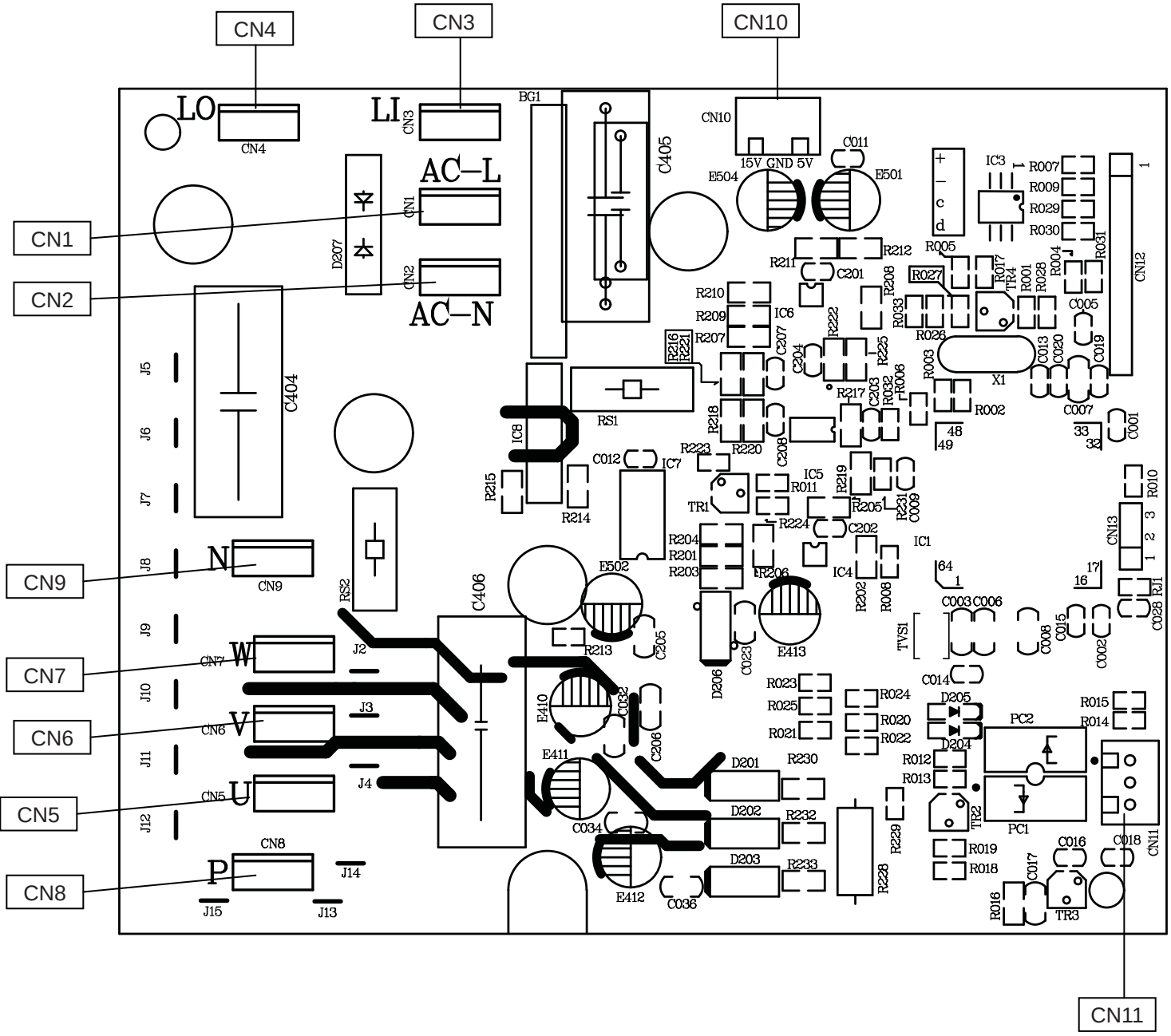
CN36
CN3
CN6
CN7
CN10
CN9
001180410/A VER:B

PCB (2)


CN6
CN7
CN8
CN9
CN11
CN10
CN5
CN4
CN3
CN2
CN1
LO
LI
AC-L
AC-N
N
W
V
U
P
5V
GND
15V

09-12K

PCB (3)


CN4
CN3
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CN1
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CN9
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CN8
CN11
LO
LI
AC–L
AC–N
N
W
V
U
P
15V GND 5V
C404
C405
C406
RS1
RS2
IC1
IC3
IC4
IC5
IC6
IC7
IC8
X1
TR1
TR2
TR3
TR4
PC1
PC2
E410
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TVS1
BG1
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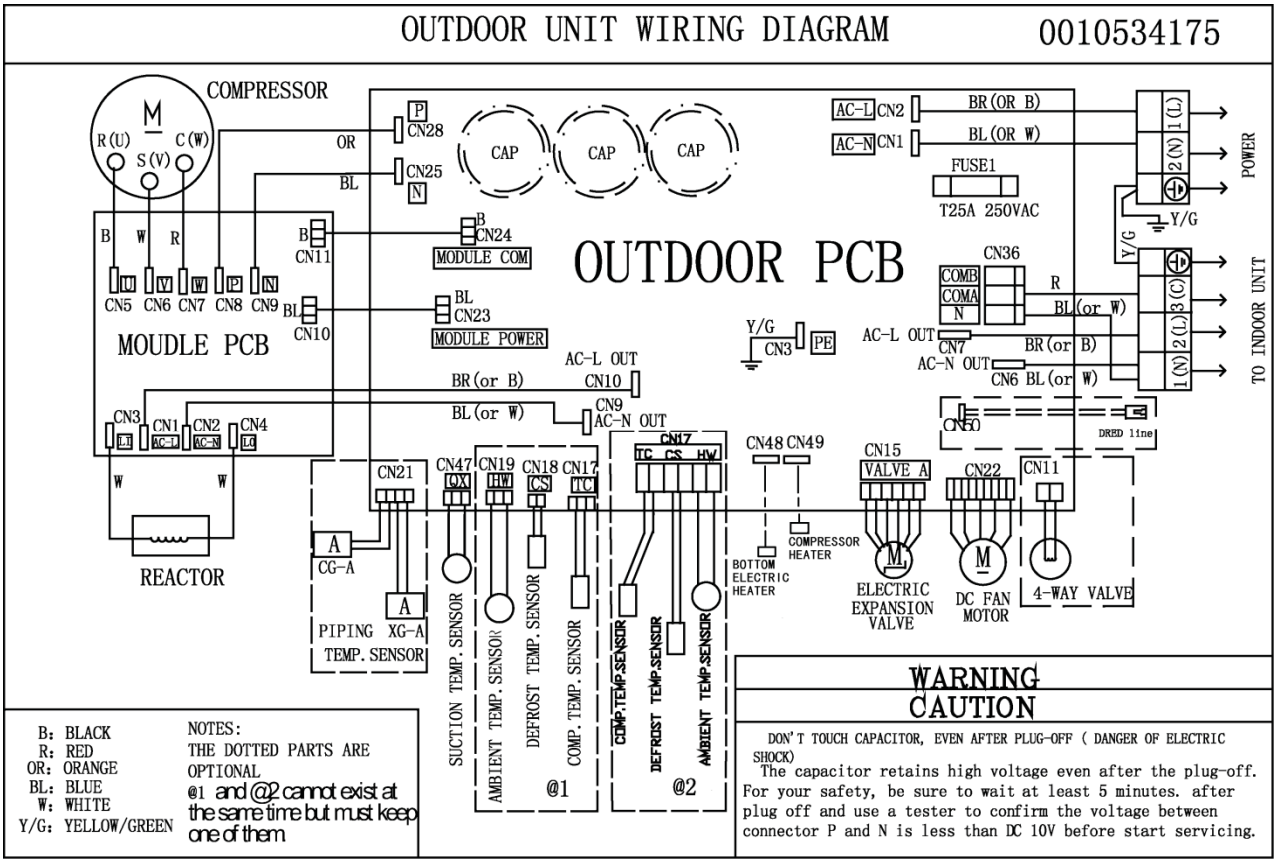
Wiring diagrams



7.Outdoor Functions and Control

7.1 Main functions and control specification

7.1.1 The operation frequency of outdoor unit and its control

7.1.1.1 The operation frequency control of compressor

The operation frequency scope of compressor：

Mode	Minimun operation frequency	Maximun operation frequency
Heating	25Hz	105Hz
Refrigeration	25Hz	69Hz

7.1.1.2 The starting of compressor

When the compressor is started for the first time, it must be kept under the conditions of 38Hz，58Hz,88Hz for one minute (the overheating protection of the outdoor unit air-blowing temperature, immediately decrease the frequency when the compressor is overflowing and releasing the pressure)，then it can be operated towards the target frequency. When the machine runs normally, there's no such process. After starting the compressor for operation, the compressor should run according to the calculated frequency, and every determined frequency for protection should be prior to the calculated frequency.

7.1.1.3 The speeds of increasing or decreasing the frequency of the compressor

The speed of increasing or decreasing the frequency rapidly 1 ----------1HZ/second

The speed of increasing or decreasing the frequency slowly 2 ----------1HZ/10seconds

7.1.1.4 The calculation of the compressor's frequency

1）The minimum/maximum frequency limitation

A．While refrigerating: F-MAX-r is the maximum operation frequency of the compressor; F-MIN-r is the minimum operation frequency of the compressor.

B．While heating: F-MAX-d is the maximum operation frequency of the compressor; F-MIN-d is the minimum operation frequency of the compressor.

2）The frequency limitation which is affected by the environment temperature.

(Wh_c= environment temperature)

Heating mode:

Serial No.	Temperature scope	Frequency limitation
1	Wh_c<-12	Max_hz8 105HZ
2	Wh_c<-8	Max_hz7 99HZ
3	Wh_c<-2	Max_hz4 90HZ
4	Wh_c<5	Max_hz5 80HZ
5	Wh_c<10	Max_hz1 80HZ
6	Wh_c<17	Max_hz2 75HZ
7	Wh_c<20	Max_hz6 54HZ
8	Wh_c>＝20	Max_hz3 35HZ

Remarks: The above are the maximum frequency limitations of the complete appliance which are

affected by the environment, and they have nothing to do with the ability of the indoor unit.

Refrigeration/dehumidification mode:

Serial No.	Temperature scope	Frequency limitation
1	Wh_c<16	Max_hz1 23HZ
1	Wh_c<22	Max_hz1 27HZ
1	Wh_c<28	Max_hz1 35HZ
2	Wh_c<32	Max_hz2 51HZ
3	Wh_c<40	Max_hz3 69HZ
4	Wh_c<48	Max_hz4 55HZ
5	Wh_c>=48	Max_hz5 40HZ

Remarks: the above are not only the maximum frequency limitations of the complete appliance which are affected by the environment, but also the maximum ability limitation of the system. When the starting ability is not the maximum, its maximum frequency limitation is calculated by the following equations:

The frequency limitation which is affected by the temperature and under the condition of actual ability＝the actual running system ability*the maximum frequency which is limited by the temperature and under the condition of maximum ability/the maximum designing ability of the system

ΔT=∑（ΔTi*Pi）/∑Pi （ΔTi=|Tst_i the setting temperature - Tnh_i the indoor environment temperature|; Pi＝i the ability of the indoor unit)

Refrigeration/dehumidification:

ΔT	<1	＝1	＝2	＝3	>=4
The percentage of the rated frequency P	60%	70%	80%	90%	100%

Heating mode：

ΔT	<1	＝1	＝2	＝3	>=4
The percentage of the rated frequency P	60%	70%	80%	90%	100%

The indoor setting airflow speed	Low	Medium	High	Strong	Quiet	Healthy airflow
The percentage of the rated frequency Ki	80%	90%	100%	115%	70%	60%

K=∑(Ki*Pi)/∑Pi

The calculation of the actual output frequency:

when there is no healthy airflow: F= F-ED-*(rated frequency)×P×K

When the healthy airflow has been set: F =F-ED-*×P×K（airflow speed）×K（healthy airflow）

Notes:

When refrigerating, it is needed to satisfy

F-MIN-d(compressor's Min_hz)< F<F-MAX-d(compressor's Max_hz)

When heating, it is needed to satisfy

F-MIN-r (compressor's Min_hz)< F<F-MAX-r (compressor's Max_hz)

7.1.2 The outdoor fan control (Exchange fan)

When the fan is changed among every airflow speed (including stop blowing), in order to avoid the airflow speed from skipping frequently, it must be kept under each mode for over 30 seconds, and then it can be changed to another mode (when refrigerating, the time is changed to 15 seconds).

7.1.2.1 The outdoor DC fan control

During the compressor is started for 3 seconds, the outdoor fan is controlled the airflow speed according to the temperature conditions of the outdoor environment.

Tao（℃）	Tao <22℃	22℃≤ Tao <29℃	Tao≥29℃
Cool/Dry	Level 3	Level 5	Level 7
Tao（℃）	Tao <10℃	10℃≤ Tao <16℃	Tao≥16℃
Heat	Level 7	Level 5	Level 3

After the compressor is started for 3 seconds, the outdoor fan is controlled the airflow speed according to the temperature conditions of the outdoor environment and frequency of compressor.

Frequency of cooling mode（Hz）		<51	51～70	≥70
Tao（℃）	≤22	Level 3	Level 5	Level 6
	22～29	Level 4	Level 6	Level 7
	≥29	Level 7		

Frequency of heat mode（Hz）		<51	51～90	≥90
Tao（℃）	≤10	Level 5	Level 7	Level 7
	10～16	Level 4	Level 5	Level 5
	>16	Level 2		

7.1.3 Four way control

For the details of defrosting four-way valve control, see the defrosting process.

Four way working in other ways:

Under the mode of heating, open the four-way valve, when the compressor is not started or changed to non-heating mode, make sure the compressor is stoped for 2 minutes, and then close the four-way valve.

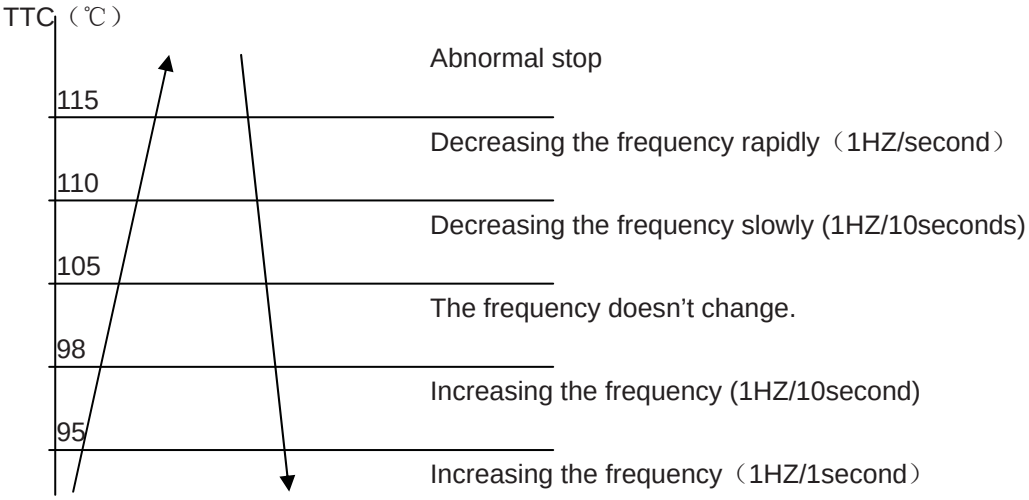
7.1.4Protection function

7.1.4.1 TTC high temperature-preventing protection

Once the machine is started, it can run TTC(air-blowing temp) overheating protection of air-blowing, but air-blowing sensor malfunction must alarm after 4 minutes during which the compressor is started (during the course of self-detection, there's no such limitation)

Sensor detection methods: 100 times (one cycle of procedure run is one time, and about 5ms, detection method for each time: continuously sampling for 8 times, then order them and take the mean

value of the middle 2 values), take the mean value.

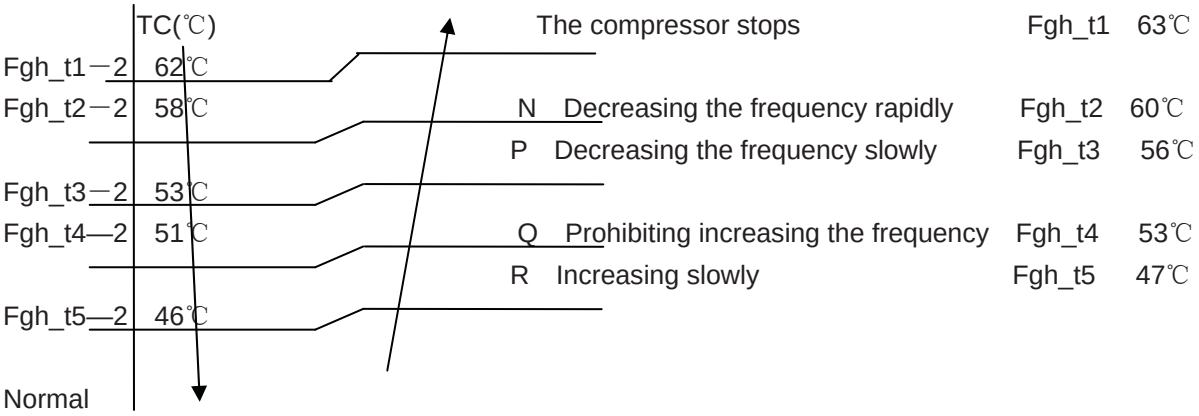


TTC>=115℃ lasts for 20 seconds. Overheating protection of air-blowing, alarm malfunction to the indoor, others don't last.

7.1.4.2 TC high temperature-preventing control of the indoor heating unit：

Tpg_indoor is the highest value of the effective indoor unit (start it and it is in accord with the running state). TC=indoor coil temp.

The indoor heat exchanger sensor tests the temperature of the indoor heat exchanger. If the temperature is higher than 55℃, decrease the rotate speed of the compressor and do the high temperature-preventing protection of the indoor heat exchanger; if the temperature of the indoor heat exchanger is lower than 47℃, recover to the normal control.



N：Decreasing at the speed of 1HZ/1 second

P：Decreasing at the speed of 1Hz/10 seconds

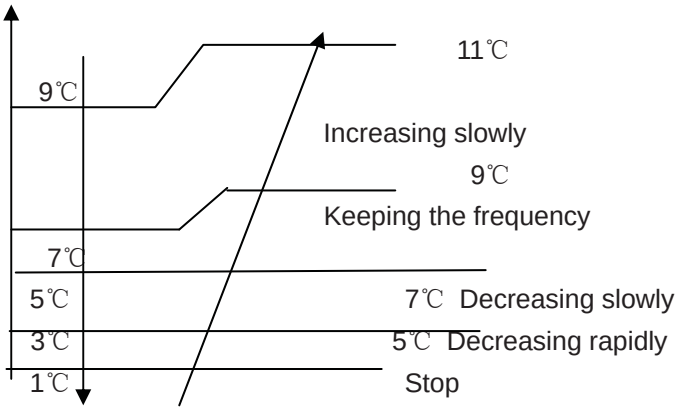
Q：Continue to keep the last-time instruction cycle

R：Increasing at the speed of 1Hz/10seconds

7.1.4.3 Anti-freezing protection of the indoor heat exchanger

When refrigerating/heating, prevent freezing.

Tpg_indoor is the minimum value of the effective indoor unit (start it and it is in accord with the running state).



The compressor stops for more than 3 minutes, Tpg_indoor> 9℃, the compressor recovers.

7.2 Value of Thermistor

Ambient Sensor, Defrosting Sensor, Pipe sensor

R25℃=10KΩ±3% B25℃/50℃=3700K±3%

Temp.(℃)	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(℃)	
-30	165.2170	147.9497	132.3678	-1.94	1.75
-29	155.5754	139.5600	125.0806	-1.93	1.74
-28	146.5609	131.7022	118.2434	-1.91	1.73
-27	138.1285	124.3392	111.8256	-1.89	1.71
-26	130.2371	117.4366	105.7989	-1.87	1.70
-25	122.8484	110.9627	100.1367	-1.85	1.69
-24	115.9272	104.8882	94.8149	-1.83	1.67
-23	109.4410	99.1858	89.8106	-1.81	1.66
-22	103.3598	93.8305	85.1031	-1.80	1.64
-21	97.6556	88.7989	80.6728	-1.78	1.63
-20	92.3028	84.0695	76.5017	-1.76	1.62
-19	87.2775	79.6222	72.5729	-1.74	1.60
-18	82.5577	75.4384	68.8710	-1.72	1.59
-17	78.1230	71.5010	65.3815	-1.70	1.57
-16	73.9543	67.7939	62.0907	-1.68	1.55
-15	70.0342	64.3023	58.9863	-1.66	1.54
-14	66.3463	61.0123	56.0565	-1.64	1.52
-13	62.8755	57.9110	53.2905	-1.62	1.51
-12	59.6076	54.9866	50.6781	-1.60	1.49
-11	56.5296	52.2278	48.2099	-1.58	1.47
-10	53.6294	49.6244	45.8771	-1.56	1.46
-9	50.8956	47.1666	43.6714	-1.54	1.44

-8	48.3178	44.8454	41.5851	-1.51	1.42
-7	45.8860	42.6525	39.6112	-1.49	1.40
-6	43.5912	40.5800	37.7429	-1.47	1.39
-5	41.4249	38.6207	35.9739	-1.45	1.37
-4	39.3792	36.7676	34.2983	-1.43	1.35
-3	37.4465	35.0144	32.7108	-1.41	1.33
-2	35.6202	33.3552	31.2062	-1.38	1.31
-1	33.8936	31.7844	29.7796	-1.36	1.29
0	32.2608	30.2968	28.4267	-1.34	1.28
1	30.7162	28.8875	27.1431	-1.32	1.26
2	29.2545	27.5519	25.9250	-1.29	1.24
3	27.8708	26.2858	24.7686	-1.27	1.22
4	26.5605	25.0851	23.6704	-1.25	1.20
5	25.3193	23.9462	22.6273	-1.23	1.18
6	24.1432	22.8656	21.6361	-1.20	1.16
7	23.0284	21.8398	20.6939	-1.18	1.14
8	21.9714	20.8659	19.7982	-1.15	1.12
9	20.9688	19.9409	18.9463	-1.13	1.09
10	20.0176	19.0621	18.1358	-1.11	1.07
11	19.1149	18.2270	17.3646	-1.08	1.05
12	18.2580	17.4331	16.6305	-1.06	1.03
13	17.4442	16.6782	15.9315	-1.03	1.01
14	16.6711	15.9601	15.2657	-1.01	0.99
15	15.9366	15.2770	14.6315	-0.98	0.96
16	15.2385	14.6268	14.0271	-0.96	0.94
17	14.5748	14.0079	13.4510	-0.93	0.92
18	13.9436	13.4185	12.9017	-0.91	0.90
19	13.3431	12.8572	12.3778	-0.88	0.87
20	12.7718	12.3223	11.8780	-0.86	0.85
21	12.2280	11.8126	11.4011	-0.83	0.83
22	11.7102	11.3267	10.9459	-0.81	0.80
23	11.2172	10.8634	10.5114	-0.78	0.78
24	10.7475	10.4216	10.0964	-0.75	0.75
25	10.3000	10.0000	9.7000	-0.75	0.75
26	9.8975	9.5974	9.2980	-0.76	0.76
27	9.5129	9.2132	8.9148	-0.80	0.80
28	9.1454	8.8465	8.5496	-0.84	0.83
29	8.7942	8.4964	8.2013	-0.87	0.86
30	8.4583	8.1621	7.8691	-0.91	0.90
31	8.1371	7.8428	7.5522	-0.95	0.93
32	7.8299	7.5377	7.2498	-0.98	0.97
33	7.5359	7.2461	6.9611	-1.02	1.00
34	7.2546	6.9673	6.6854	-1.06	1.04
35	6.9852	6.7008	6.4222	-1.10	1.07

36	6.7273	6.4459	6.1707	-1.13	1.11
37	6.4803	6.2021	5.9304	-1.17	1.14
38	6.2437	5.9687	5.7007	-1.21	1.18
39	6.0170	5.7454	5.4812	-1.25	1.22
40	5.7997	5.5316	5.2712	-1.29	1.25
41	5.5914	5.3269	5.0704	-1.33	1.29
42	5.3916	5.1308	4.8783	-1.37	1.33
43	5.2001	4.9430	4.6944	-1.41	1.36
44	5.0163	4.7630	4.5185	-1.45	1.40
45	4.8400	4.5905	4.3500	-1.49	1.44
46	4.6708	4.4252	4.1887	-1.53	1.47
47	4.5083	4.2666	4.0342	-1.57	1.51
48	4.3524	4.1145	3.8862	-1.61	1.55
49	4.2026	3.9686	3.7443	-1.65	1.59
50	4.0588	3.8287	3.6084	-1.70	1.62
51	3.9206	3.6943	3.4780	-1.74	1.66
52	3.7878	3.5654	3.3531	-1.78	1.70
53	3.6601	3.4416	3.2332	-1.82	1.74
54	3.5374	3.3227	3.1183	-1.87	1.78
55	3.4195	3.2085	3.0079	-1.91	1.82
56	3.3060	3.0989	2.9021	-1.95	1.85
57	3.1969	2.9935	2.8005	-2.00	1.89
58	3.0919	2.8922	2.7029	-2.04	1.93
59	2.9909	2.7948	2.6092	-2.08	1.97
60	2.8936	2.7012	2.5193	-2.13	2.01
61	2.8000	2.6112	2.4328	-2.17	2.05
62	2.7099	2.5246	2.3498	-2.22	2.09
63	2.6232	2.4413	2.2700	-2.26	2.13
64	2.5396	2.3611	2.1932	-2.31	2.17
65	2.4591	2.2840	2.1195	-2.36	2.21
66	2.3815	2.2098	2.0486	-2.40	2.25
67	2.3068	2.1383	1.9803	-2.45	2.29
68	2.2347	2.0695	1.9147	-2.49	2.34
69	2.1652	2.0032	1.8516	-2.54	2.38
70	2.0983	1.9393	1.7908	-2.59	2.42
71	2.0337	1.8778	1.7324	-2.63	2.46
72	1.9714	1.8186	1.6761	-2.68	2.50
73	1.9113	1.7614	1.6219	-2.73	2.54
74	1.8533	1.7064	1.5697	-2.78	2.58
75	1.7974	1.6533	1.5194	-2.83	2.63
76	1.7434	1.6021	1.4710	-2.88	2.67
77	1.6913	1.5528	1.4243	-2.92	2.71
78	1.6409	1.5051	1.3794	-2.97	2.75
79	1.5923	1.4592	1.3360	-3.02	2.80

80	1.5454	1.4149	1.2942	-3.07	2.84
81	1.5000	1.3721	1.2540	-3.12	2.88
82	1.4562	1.3308	1.2151	-3.17	2.93
83	1.4139	1.2910	1.1776	-3.22	2.97
84	1.3730	1.2525	1.1415	-3.27	3.01
85	1.3335	1.2153	1.1066	-3.32	3.06
86	1.2953	1.1794	1.0730	-3.38	3.10
87	1.2583	1.1448	1.0405	-3.43	3.15
88	1.2226	1.1113	1.0092	-3.48	3.19
89	1.1880	1.0789	0.9789	-3.53	3.24
90	1.1546	1.0476	0.9497	-3.58	3.28
91	1.1223	1.0174	0.9215	-3.64	3.33
92	1.0910	0.9882	0.8942	-3.69	3.37
93	1.0607	0.9599	0.8679	-3.74	3.42
94	1.0314	0.9326	0.8424	-3.80	3.46
95	1.0030	0.9061	0.8179	-3.85	3.51
96	0.9756	0.8806	0.7941	-3.90	3.55
97	0.9490	0.8558	0.7711	-3.96	3.60
98	0.9232	0.8319	0.7489	-4.01	3.64
99	0.8983	0.8088	0.7275	-4.07	3.69
100	0.8741	0.7863	0.7067	-4.12	3.74
101	0.8507	0.7646	0.6867	-4.18	3.78
102	0.8281	0.7436	0.6672	-4.23	3.83
103	0.8061	0.7233	0.6484	-4.29	3.88
104	0.7848	0.7036	0.6303	-4.34	3.92
105	0.7641	0.6845	0.6127	-4.40	3.97
106	0.7441	0.6661	0.5957	-4.46	4.02
107	0.7247	0.6482	0.5792	-4.51	4.07
108	0.7059	0.6308	0.5632	-4.57	4.12
109	0.6877	0.6140	0.5478	-4.63	4.16
110	0.6700	0.5977	0.5328	-4.69	4.21
111	0.6528	0.5820	0.5183	-4.74	4.26
112	0.6361	0.5667	0.5043	-4.80	4.31
113	0.6200	0.5518	0.4907	-4.86	4.36
114	0.6043	0.5374	0.4775	-4.92	4.41
115	0.5891	0.5235	0.4648	-4.98	4.45
116	0.5743	0.5100	0.4524	-5.04	4.50
117	0.5600	0.4968	0.4404	-5.10	4.55
118	0.5460	0.4841	0.4288	-5.16	4.60
119	0.5325	0.4717	0.4175	-5.22	4.65
120	0.5194	0.4597	0.4066	-5.28	4.70

Discharging Sensor

R80℃=50KΩ±3%

B25/80℃=4450K±3%

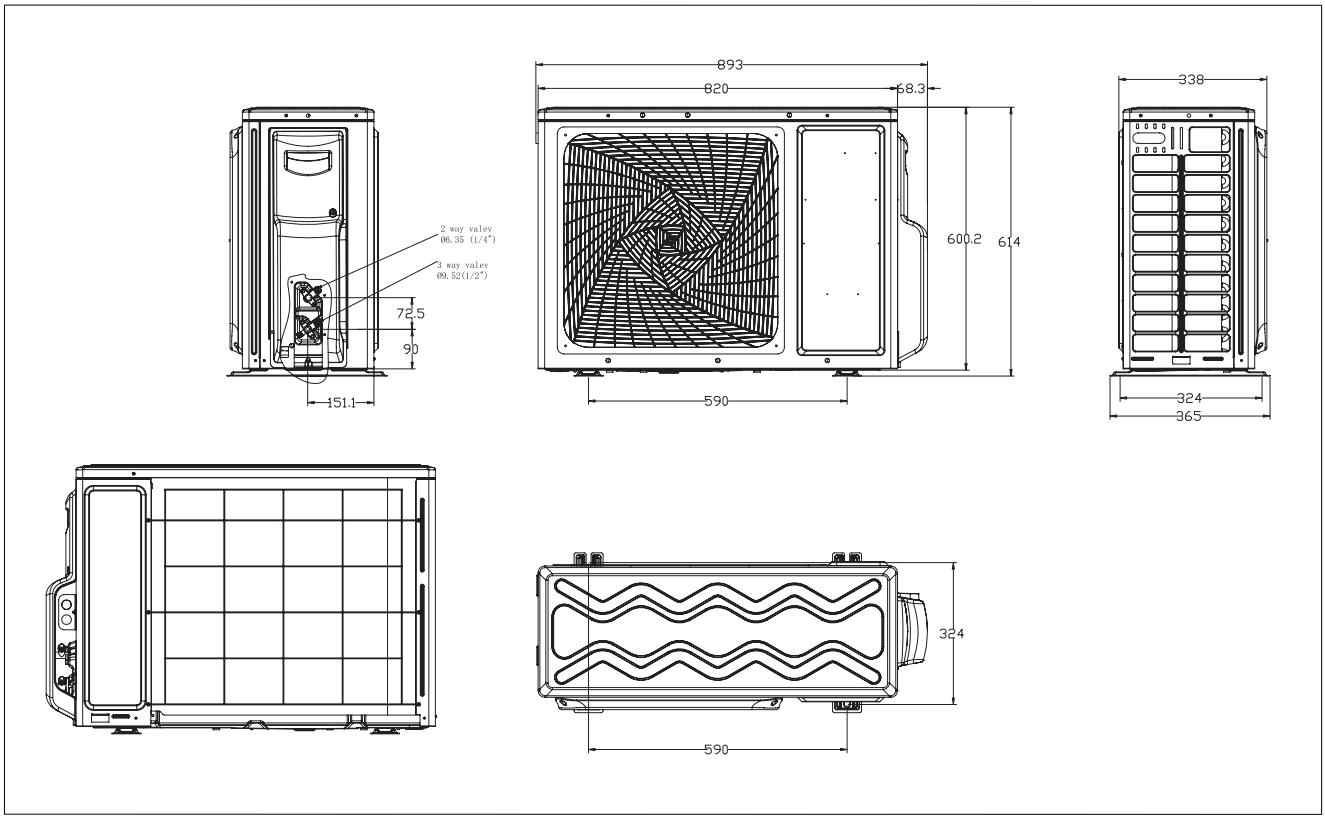
Temp.((℃))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(℃)	
-30	14646.0505	12061.7438	9924.4999	-2.96	2.45
-29	13654.1707	11267.8730	9290.2526	-2.95	2.44
-28	12735.8378	10531.3695	8700.6388	-2.93	2.44
-27	11885.1336	9847.7240	8152.2338	-2.92	2.43
-26	11096.6531	9212.8101	7641.8972	-2.91	2.42
-25	10365.4565	8622.8491	7166.7474	-2.90	2.42
-24	9687.0270	8074.3787	6724.1389	-2.88	2.41
-23	9057.2314	7564.2244	6311.6413	-2.87	2.41
-22	8472.2852	7089.4741	5927.0206	-2.86	2.40
-21	7928.7217	6647.4547	5568.2222	-2.84	2.39
-20	7423.3626	6235.7109	5233.3554	-2.83	2.39
-19	6953.2930	5851.9864	4920.6791	-2.82	2.38
-18	6515.8375	5494.2064	4628.5894	-2.80	2.37
-17	6108.5393	5160.4621	4355.6078	-2.79	2.37
-16	5729.1413	4848.9963	4100.3708	-2.77	2.36
-15	5375.5683	4558.1906	3861.6201	-2.76	2.35
-14	5045.9114	4286.5535	3638.1938	-2.75	2.34
-13	4738.4141	4032.7098	3429.0191	-2.73	2.34
-12	4451.4586	3795.3910	3233.1039	-2.72	2.33
-11	4183.5548	3573.4260	3049.5312	-2.70	2.32
-10	3933.3289	3365.7336	2877.4527	-2.69	2.31
-9	3699.5139	3171.3148	2716.0828	-2.67	2.30
-8	3480.9407	2989.2460	2564.6945	-2.66	2.29
-7	3276.5302	2818.6731	2422.6139	-2.64	2.28
-6	3085.2854	2658.8058	2289.2164	-2.63	2.28
-5	2906.2851	2508.9126	2163.9230	-2.61	2.27
-4	2738.6777	2368.3158	2046.1961	-2.60	2.26
-3	2581.6752	2236.3876	1935.5371	-2.58	2.25
-2	2434.5487	2112.5459	1831.4826	-2.56	2.24
-1	2296.6230	1996.2509	1733.6024	-2.55	2.23
0	2167.2730	1887.0018	1641.4966	-2.53	2.22
1	2045.9191	1784.3336	1554.7931	-2.52	2.21
2	1932.0242	1687.8144	1473.1460	-2.50	2.20
3	1825.0899	1597.0431	1396.2333	-2.48	2.19
4	1724.6540	1511.6468	1323.7551	-2.47	2.17
5	1630.2870	1431.2787	1255.4324	-2.45	2.16
6	1541.5904	1355.6163	1191.0048	-2.43	2.15
7	1458.1938	1284.3593	1130.2298	-2.41	2.14
8	1379.7528	1217.2282	1072.8813	-2.40	2.13
9	1305.9472	1153.9626	1018.7481	-2.38	2.12

10	1236.4792	1094.3200	967.6334	-2.36	2.11
11	1171.0715	1038.0743	919.3533	-2.35	2.09
12	1109.4661	985.0146	873.7359	-2.33	2.08
13	1051.4226	934.9440	830.6210	-2.31	2.07
14	996.7169	887.6792	789.8583	-2.29	2.06
15	945.1404	843.0486	751.3077	-2.27	2.04
16	896.4981	800.8922	714.8380	-2.26	2.03
17	850.6086	761.0603	680.3265	-2.24	2.02
18	807.3024	723.4134	647.6580	-2.22	2.00
19	766.4212	687.8205	616.7252	-2.20	1.99
20	727.8172	654.1596	587.4271	-2.18	1.98
21	691.3524	622.3161	559.6694	-2.16	1.96
22	656.8979	592.1831	533.3634	-2.14	1.95
23	624.3328	563.6604	508.4261	-2.12	1.93
24	593.5446	536.6540	484.7796	-2.10	1.92
25	564.4275	511.0760	462.3510	-2.09	1.90
26	536.9865	486.9352	441.1516	-2.07	1.89
27	511.0105	464.0500	421.0258	-2.05	1.87
28	486.4151	442.3499	401.9146	-2.03	1.86
29	463.1208	421.7683	383.7626	-2.01	1.84
30	441.0535	402.2430	366.5175	-1.99	1.83
31	420.1431	383.7151	350.1301	-1.97	1.81
32	400.3242	366.1295	334.5542	-1.95	1.80
33	381.5350	349.4341	319.7460	-1.93	1.78
34	363.7176	333.5801	305.6645	-1.90	1.76
35	346.8176	318.5216	292.2709	-1.88	1.75
36	330.7839	304.2151	279.5286	-1.86	1.73
37	315.5682	290.6199	267.4031	-1.84	1.71
38	301.1254	277.6976	255.8620	-1.82	1.70
39	287.4128	265.4119	244.8745	-1.80	1.68
40	274.3905	253.7288	234.4118	-1.78	1.66
41	262.0206	242.6161	224.4465	-1.76	1.64
42	250.2676	232.0436	214.9529	-1.74	1.63
43	239.0983	221.9825	205.9065	-1.71	1.61
44	228.4809	212.4060	197.2844	-1.69	1.59
45	218.3860	203.2887	189.0648	-1.67	1.57
46	208.7855	194.6066	181.2273	-1.65	1.55
47	199.6531	186.3369	173.7524	-1.63	1.54
48	190.9639	178.4584	166.6217	-1.60	1.52
49	182.6945	170.9508	159.8181	-1.58	1.50
50	174.8228	163.7951	153.3249	-1.56	1.48
51	167.3280	156.9733	147.1268	-1.53	1.46
52	160.1904	150.4683	141.2090	-1.51	1.44
53	153.3914	144.2641	135.5577	-1.49	1.42

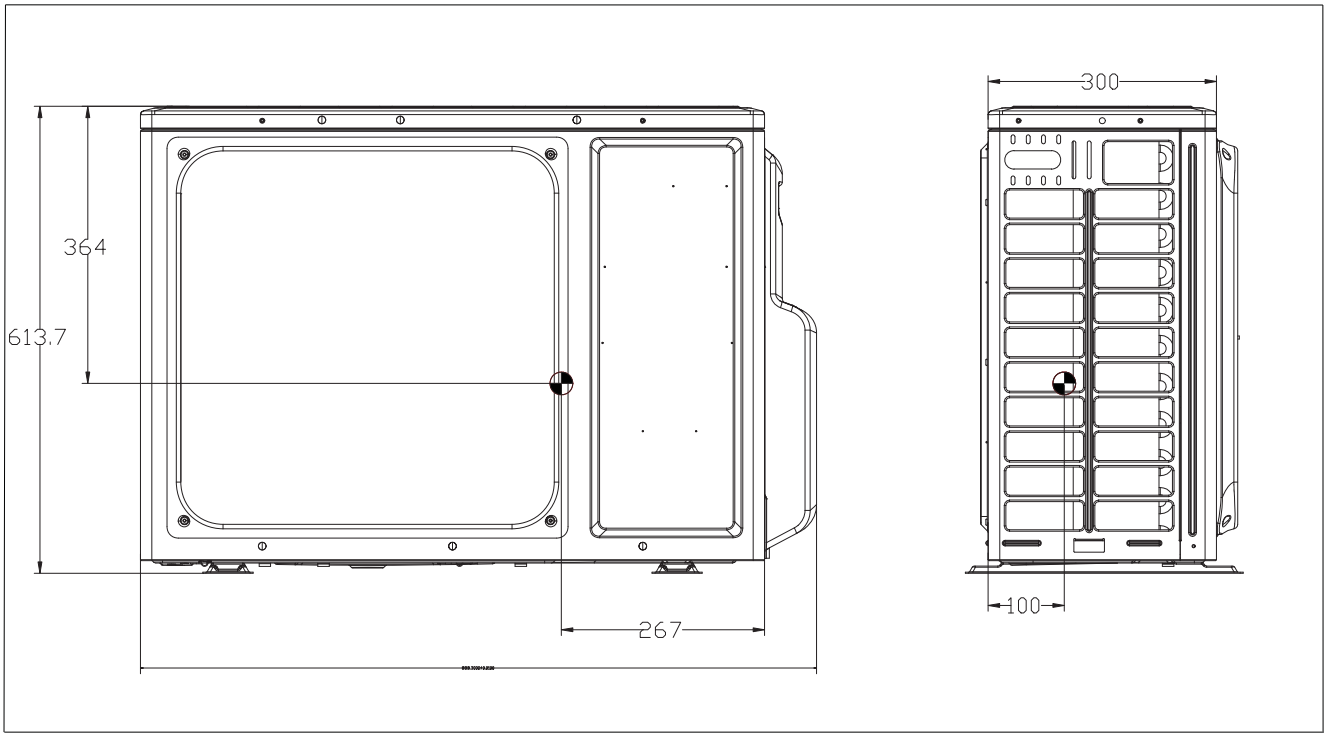
54	146.9136	138.3454	130.1598	-1.47	1.40
55	140.7403	132.6980	125.0027	-1.44	1.38
56	134.8559	127.3081	120.0746	-1.42	1.36
57	129.2457	122.1630	115.3645	-1.40	1.34
58	123.8956	117.2504	110.8618	-1.37	1.32
59	118.7926	112.5589	106.5564	-1.35	1.30
60	113.9241	108.0776	102.4388	-1.32	1.28
61	109.2784	103.7961	98.5000	-1.30	1.26
62	104.8443	99.7046	94.7315	-1.28	1.23
63	100.6112	95.7939	91.1253	-1.25	1.21
64	96.5692	92.0553	87.6735	-1.23	1.19
65	92.7088	88.4805	84.3690	-1.20	1.17
66	89.0211	85.0614	81.2048	-1.18	1.15
67	85.4976	81.7908	78.1744	-1.15	1.12
68	82.1303	78.6615	75.2715	-1.13	1.10
69	78.9116	75.6668	72.4902	-1.10	1.08
70	75.8343	72.8004	69.8249	-1.08	1.06
71	72.8916	70.0561	67.2703	-1.05	1.03
72	70.0770	67.4283	64.8213	-1.03	1.01
73	67.3844	64.9115	62.4731	-1.00	0.99
74	64.8080	62.5006	60.2211	-0.98	0.96
75	62.3423	60.1906	58.0609	-0.95	0.94
76	59.9821	57.9770	55.9885	-0.92	0.92
77	57.7223	55.8552	53.9998	-0.90	0.89
78	55.5583	53.8210	52.0912	-0.87	0.87
79	53.4856	51.8706	50.2591	-0.85	0.84
80	51.5000	50.0000	48.5000	-0.85	0.84
81	49.7063	48.2057	46.7083	-0.85	0.85
82	47.9835	46.4842	44.9911	-0.89	0.89
83	46.3286	44.8323	43.3452	-0.93	0.92
84	44.7385	43.2468	41.7672	-0.96	0.95
85	43.2105	41.7248	40.2540	-1.00	0.99
86	41.7386	40.2604	38.7996	-1.03	1.02
87	40.3241	38.8545	37.4048	-1.07	1.06
88	38.9643	37.5045	36.0668	-1.11	1.09
89	37.6569	36.2078	34.7831	-1.14	1.13
90	36.3996	34.9622	33.5513	-1.18	1.16
91	35.1903	33.7653	32.3689	-1.22	1.19
92	34.0269	32.6151	31.2338	-1.26	1.23
93	32.9075	31.5096	30.1438	-1.30	1.27
94	31.8302	30.4467	29.0970	-1.33	1.30
95	30.7933	29.4246	28.0915	-1.37	1.34
96	29.7950	28.4417	27.1254	-1.41	1.37
97	28.8337	27.4961	26.1970	-1.45	1.41

98	27.9078	26.5864	25.3048	-1.49	1.44
99	27.0160	25.7110	24.4470	-1.53	1.48
100	26.1569	24.8685	23.6222	-1.57	1.52
101	25.3290	24.0574	22.8291	-1.61	1.55
102	24.5311	23.2765	22.0662	-1.65	1.59
103	23.7620	22.5245	21.3323	-1.69	1.63
104	23.0205	21.8002	20.6261	-1.73	1.66
105	22.3055	21.1025	19.9465	-1.77	1.70
106	21.6159	20.4303	19.2924	-1.81	1.74
107	20.9508	19.7825	18.6626	-1.85	1.77
108	20.3091	19.1582	18.0563	-1.89	1.81
109	19.6899	18.5564	17.4723	-1.93	1.85
110	19.0924	17.9761	16.9098	-1.98	1.89
111	18.5157	17.4166	16.3680	-2.02	1.93
112	17.9590	16.8769	15.8458	-2.06	1.96
113	17.4214	16.3564	15.3427	-2.10	2.00
114	16.9023	15.8542	14.8577	-2.15	2.04
115	16.4010	15.3696	14.3902	-2.19	2.08
116	15.9167	14.9020	13.9394	-2.23	2.12
117	15.4489	14.4506	13.5047	-2.27	2.16
118	14.9968	14.0149	13.0855	-2.32	2.19
119	14.5599	13.5942	12.6811	-2.36	2.23
120	14.1376	13.1879	12.2909	-2.41	2.27
121	13.7294	12.7955	11.9144	-2.45	2.31
122	13.3347	12.4165	11.5510	-2.50	2.35
123	12.9531	12.0503	11.2003	-2.54	2.39
124	12.5840	11.6965	10.8617	-2.58	2.43
125	12.2270	11.3545	10.5348	-2.63	2.47
126	11.8817	11.0240	10.2191	-2.68	2.51
127	11.5475	10.7046	9.9142	-2.72	2.55
128	11.2242	10.3957	9.6197	-2.77	2.59
129	10.9112	10.0970	9.3352	-2.81	2.63
130	10.6084	9.8082	9.0602	-2.86	2.67
131	10.3151	9.5288	8.7945	-2.91	2.71
132	10.0312	9.2586	8.5378	-2.95	2.75
133	9.7563	8.9971	8.2895	-3.00	2.80
134	9.4901	8.7441	8.0495	-3.05	2.84
135	9.2322	8.4993	7.8175	-3.09	2.88
136	8.9824	8.2623	7.5931	-3.14	2.92
137	8.7404	8.0329	7.3760	-3.19	2.96
138	8.5059	7.8108	7.1660	-3.24	3.00
139	8.2787	7.5958	6.9629	-3.29	3.04
140	8.0584	7.3875	6.7664	-3.33	3.09

8.Dimensional drawings



9.Center of gravity



10.Service Diagnosis

10.1 Caution for Diagnosis

The operation lamp flashes when any of the following errors is detected.

1. When a protection device of the indoor or outdoor unit is activated or when the thermistor malfunctions, disabling equipment operation.

2. When a signal transmission error occurs between the indoor and outdoor units. In either case, conduct the diagnostic procedure described in the following pages.

10.2 Parameter of primary electronic appliance

Outdoor unit	2.compressor	Rated voltage:230V Rated current:2.7A Resistance:1.354Ω	
	3.fan motor	Rated voltage: 310VV Rated current:0.25A	
	4.reactor	Rated voltage: 2 4.5V ± 10% Rated current: AC 15A Rated frequency: 5 0Hz Resistance: 5.2mH±10%	
	5.4-way valve	Rated voltage:AC220-240V Rated frequency:50/60Hz Resistance:100MΩ	

10.3 Problem Symptoms and Measures

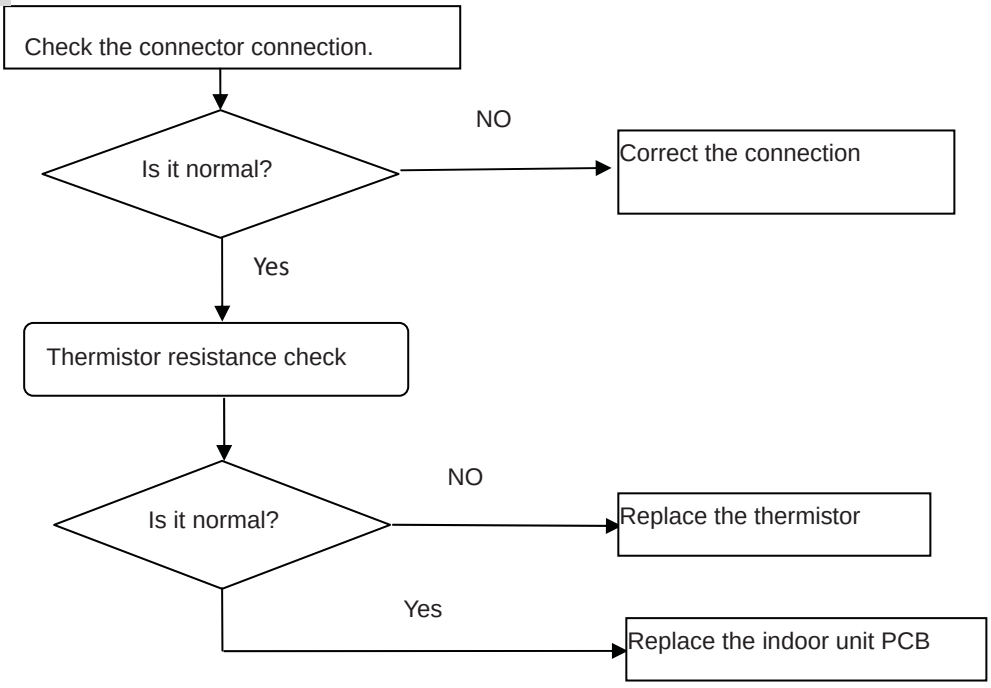
Symptom	Check Item	Details of Measure
None of the units operates	Check the power supply.	Check to make sure that the rated voltage is supplied.
	Check the indoor PCB	Check to make sure that the indoor PCB is broken
Operation sometimes stops.	Check the power supply.	A power failure of 2 to 10 cycles can stop air conditioner operation.
Equipment operates but does not cool, or does not heat (only for heat pump)	Check for faulty operation of the electronic expansion valve.	Set the units to cooling operation, and compare the temperatures of the liquid side connection pipes of the connection section among rooms to check the opening and closing operation of the electronic expansion valves of the individual units.
	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.

10.4 Error Codes and Description indoor display

	Code indication		fault description	Reference Page
	Indoor displaying panel code indication	Outdoor (LED1 flash times)		
Indoor and Outdoor	E7	15	Communication fault between indoor and outdoor units	Page .41
Indoor Malfunction	E1	--	Room temperature sensor failure	Page .33
	E2	--	Heat-exchange sensor failure	Page .33
	E4	--	Indoor EEPROM error	Page .34
	E14	--	Indoor fan motor malfunction	Page .34
Outdoor Malfunction	F12	1	Outdoor EEPROM error	Page .34
	F1	2	The protection of IPM	Page .35
	F22	3	Overcurrent protection of AC electricity for the outdoor model	Page .36
	F3	4	Communication fault between the IPM and outdoor PCB	Page.37
	F19	6	Power voltage is too high or low	Page .38
	F4	8	Overheat protection for Discharge temperature	Page .39
	F8	9	Outdoor DC fan motor fault	Page .34
	F21	10	Defrost temperature sensor failure	Page .33
	F7	11	Suction temperature sensor failure	Page .33
	F6	12	Ambient temperature sensor failure	Page .33
	F25	13	Discharge temperature sensor failure	Page .33
	F11	18	deviate from the normal for the compressor	Page .42
	F28	19	Loop of the station detect error	Page .42
	F2	24	Overcurrent of the compressor	Page .36
	F23	25	Overcurrent protection for single-phase of the compressor	Page .36
	-	27	DCCT protection	Page.-

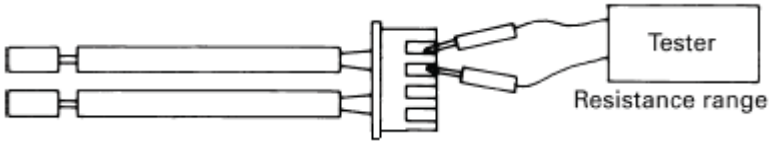
10.4.1 Thermistor or Related Abnormality

Indoor Display	E1: Room temperature sensor failure E2: Heat-exchange sensor failure
outdoor display	F21 LED1 flash 10 times：Defrost temperature sensor failure F7 LED1 flash 11 times：Suction temperature sensor failure F6 LED1 flash 12 times：Ambient temperature sensor failure F25 LED1 flash 13 times：Discharge temperature 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.



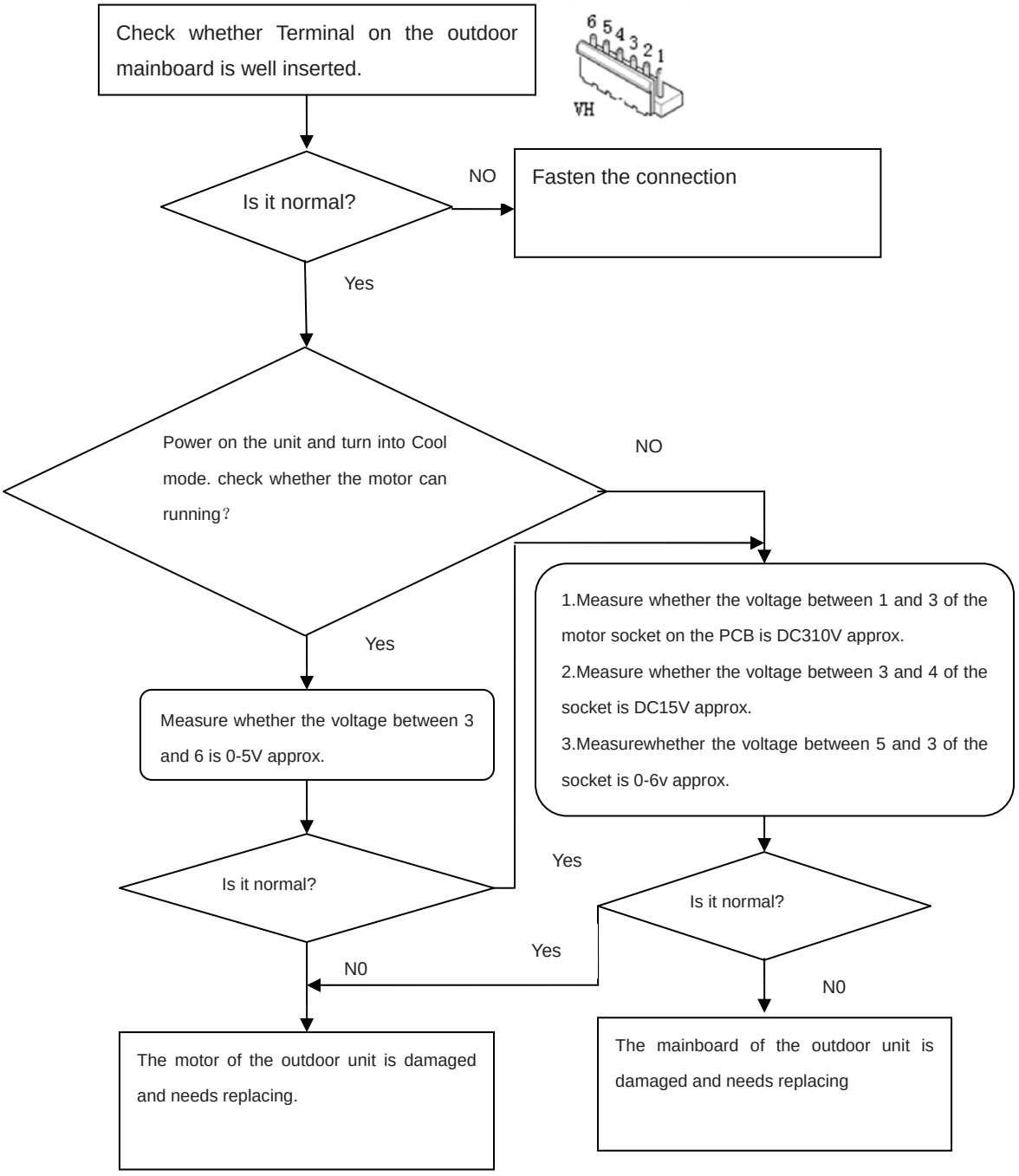
10.4.2 EEPROM abnormal

Indoor Display	E4: indoor EEPROM error
Indoor display	F12: Outdoor EEPROM error; Outdoor LED1 flash 1 times
Method of Malfunction Detection	The Data detected by the MCU are used to determine MCU
Malfunction Detection 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

10.4.4 Outdoor DC fan motor fault

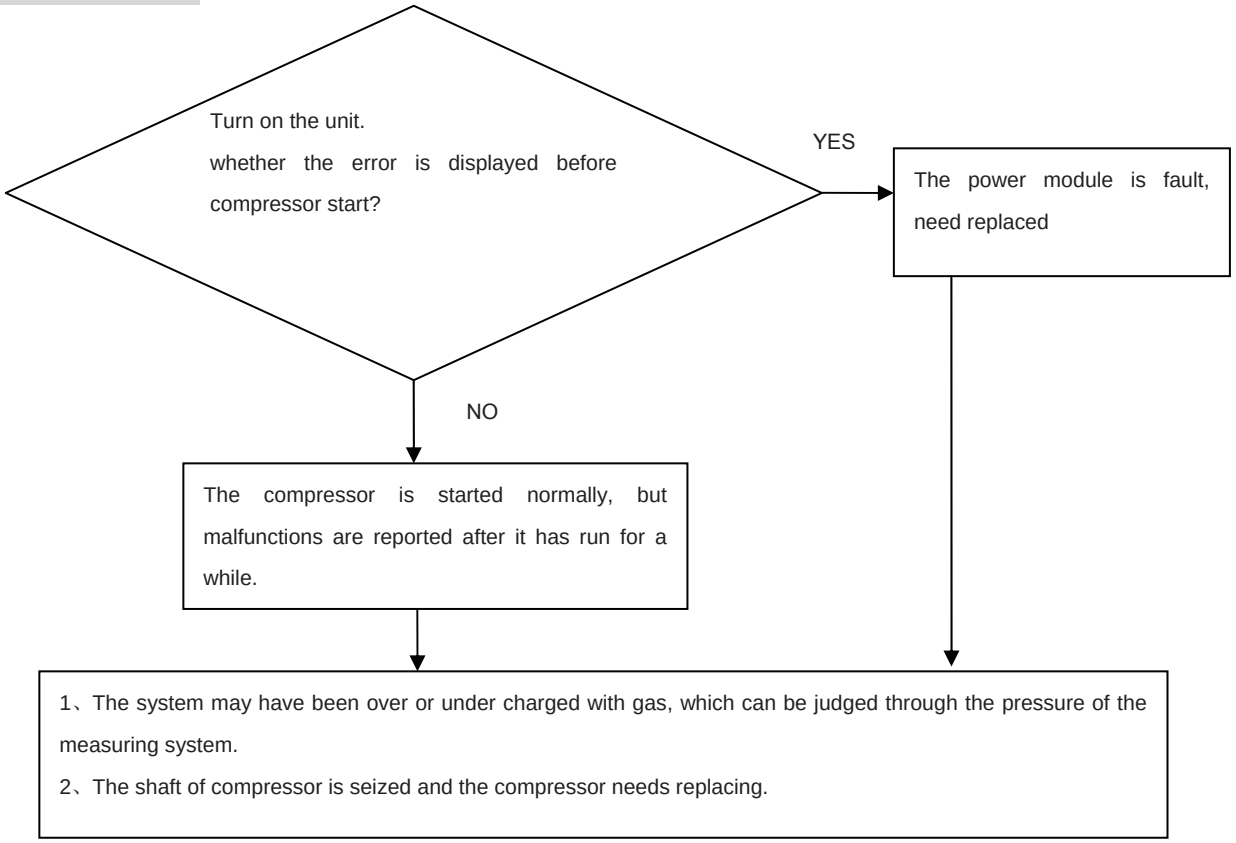
Outdoor display	F8：LED1 flash 9 times
Method of Malfunction Detection	DC fan motor is detected by checking the fan running condition and so on
Malfunction Detection Conditions	
Supposed Causes	■ DC fan motor protection dues to the DC fan motor faulty ■ DC fan motor protection dues to faulty PCB
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



10.4.5 IPM protection

Outdoor display	F1：LED1 flash 2 times
Method of Malfunction Detection	IPM protection is detected by checking the compressor running condition and so on
Malfunction Detection Conditions	■ The system leads to IPM protection due to over current ■ The compressor faulty leads to IPM protection ■ circuit component of IPM is broken and led to IPM protection

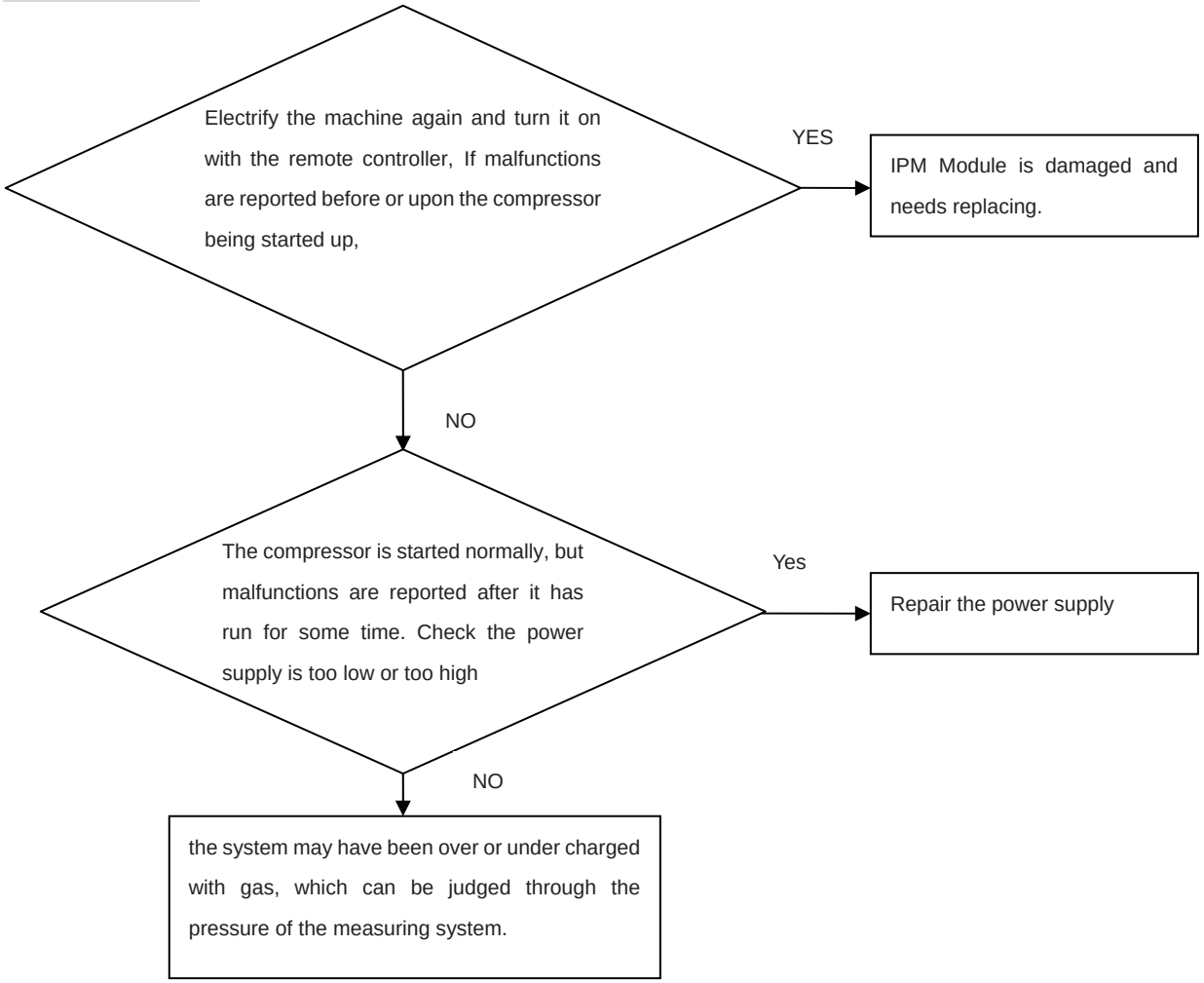
Supposed Causes	■ IPM protection dues to the compressor faulty ■ IPM protection dues to faulty PCB of IPM module ■ Compressor wiring disconnected
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



10.4.6 Over-current of the compressor

Outdoor Display	F22/F2/F23：LED1 flash 3 or 24 or 25 times
Method of Malfunction Detection	The current of the compressor is too high
Malfunction Detection Conditions	when the IPM Module is damaged or the compressor is damaged. power supply voltage is too low or too high

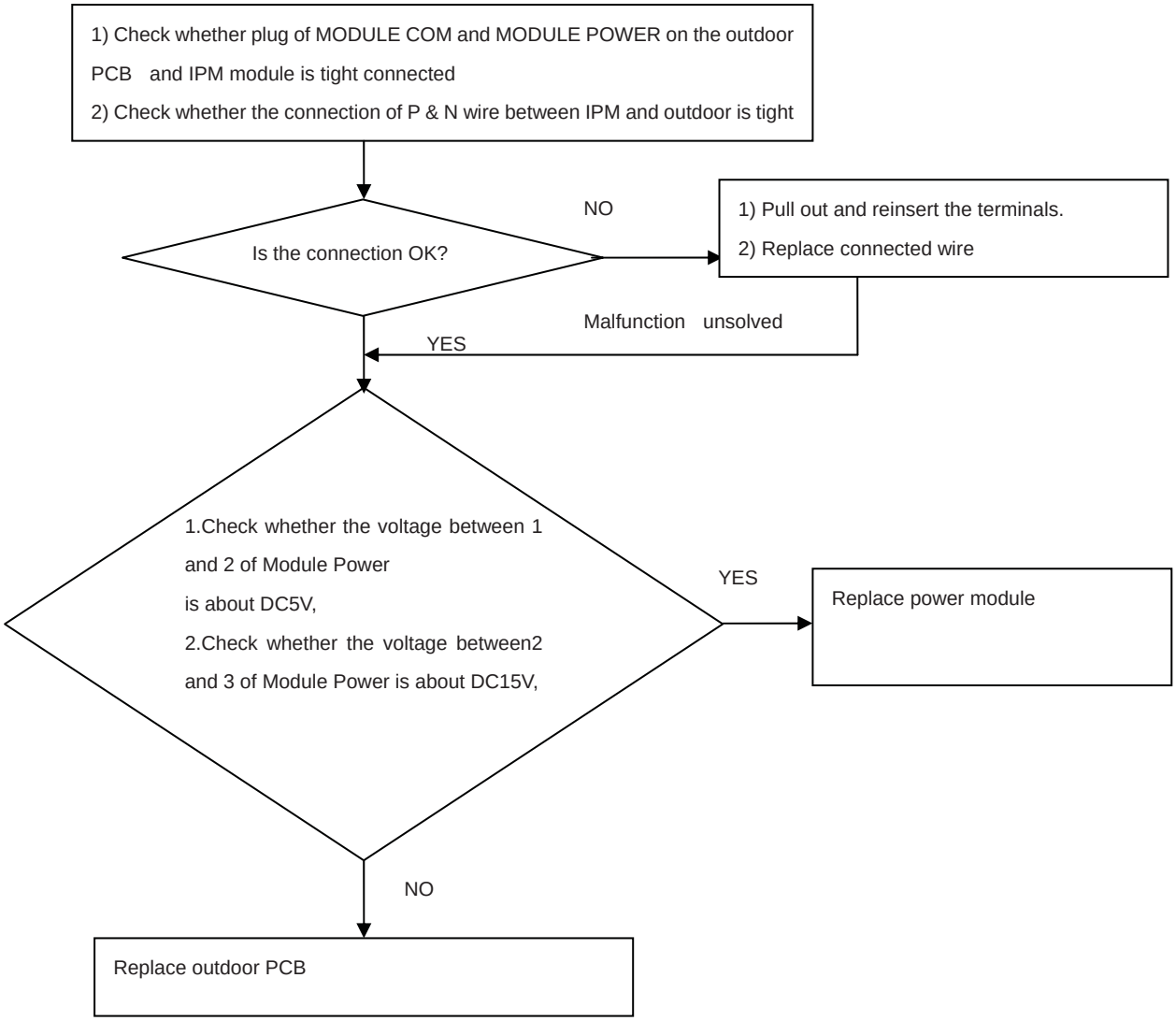
Supposed Causes	■ Faulty IPM Module ■ Faulty compressor ■ Faulty power supply
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



10.4.7 The communication fault between IPM and outdoor PCB

Outdoor display:	F3:LED1 flash 4 times
Method of Malfunction Detection	Communication is detected by checking the IPM module and the outdoor PCB
Malfunction Detection Conditions	■ The outdoor PCB broken leads to communication fault ■ The IPM module broken leads to communication fault

Supposed Causes	■ The outdoor PCB is broken ■ The IPM module is broken ■ Communication wiring disconnected
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.

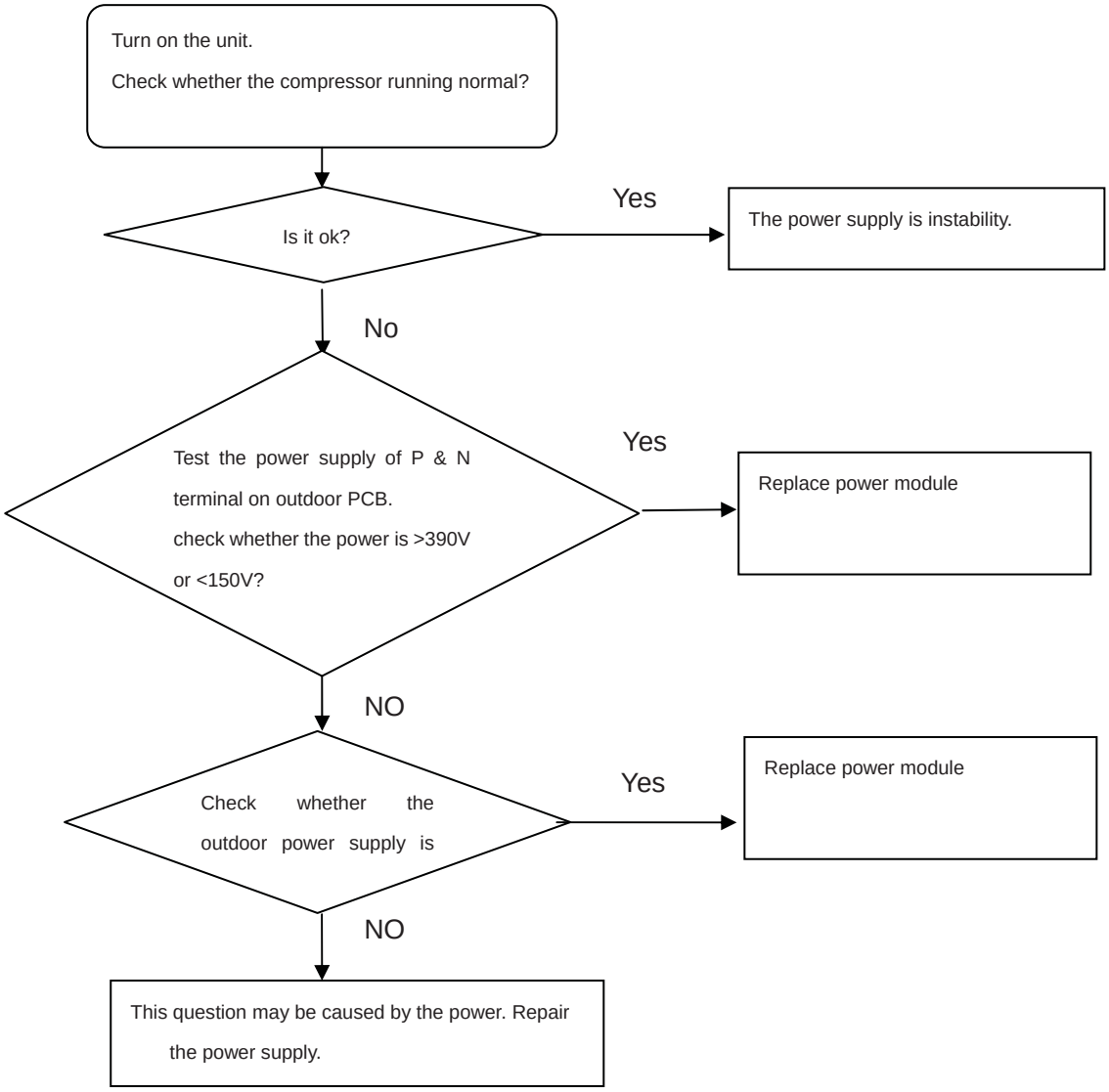


10.4.8 Power Supply Over or under voltage fault

Outdoor display: F19:LED1 flash 6 times The power supply is over voltage

Method of Malfunction Detection	An abnormal voltage rise or fall is detected by checking the specified voltage detection circuit.

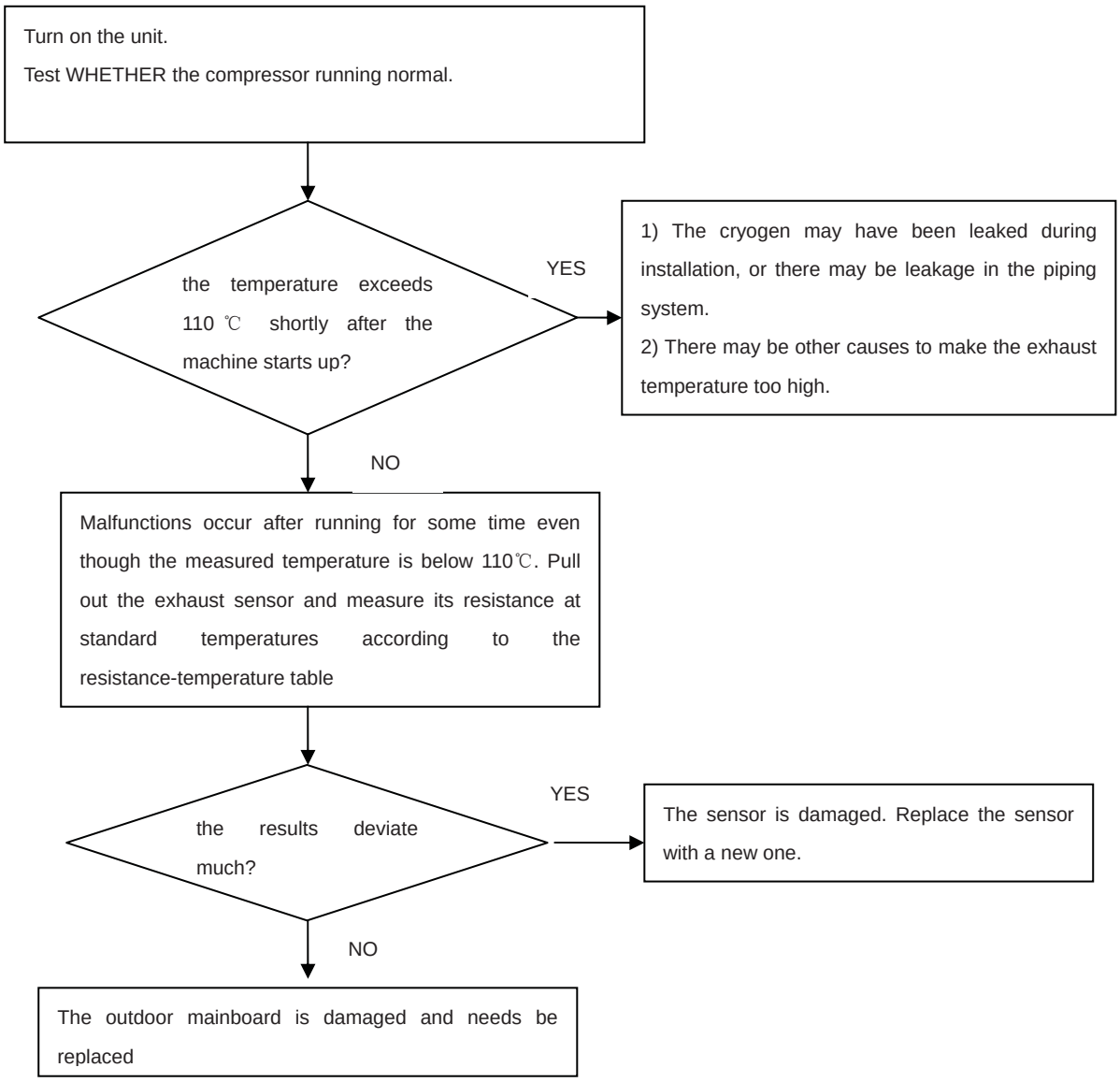
Malfunction Detection Conditions	An voltage signal is fed from the voltage detection circuit to the microcomputer
Supposed Causes	■ Supply voltage not as specified. ■ The IPM module is broken.
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



10.4.9 Overheat Protection For Discharge Temperature

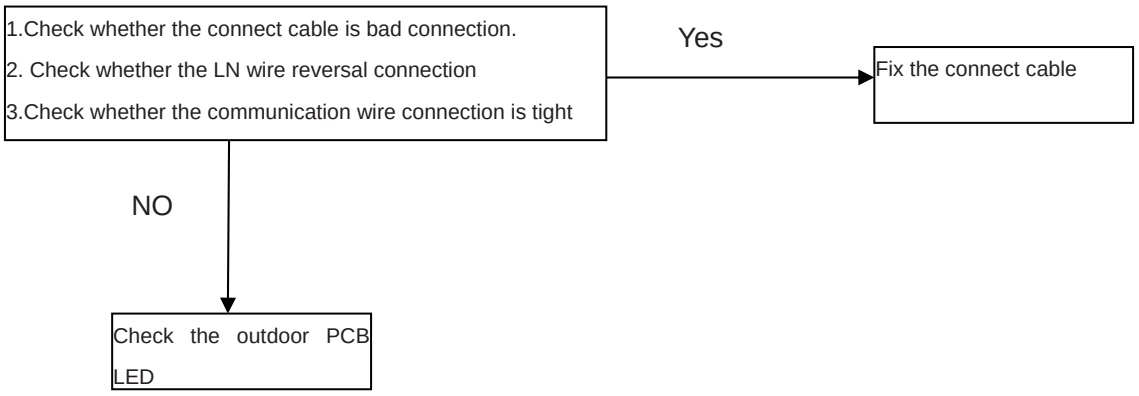
Outdoor display: F4:LED1 flash 8 times

Method of Malfunction Detection	The Discharge temperature control is checked with the temperature being detected by the Discharge pipe thermistor
Malfunction Detection Conditions	when the compressor discharge temperature is above 110℃
Supposed Causes	■ Electronic expansion valve defective ■ 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.



10.4.10 The communication fault between indoor and outdoor

Indoor display	E7:Outdoor display LED1 flash 15 times
Method of Malfunction Detection	Communication is detected by checking the indoor PCB and the outdoor PCB
Malfunction Detection Conditions	■ The outdoor PCB broken leads to communication fault ■ The indoor PCB broken leads to communication fault
Supposed Causes	■ Communication wiring disconnected ■ The indoor PCB is broken ■ The outdoor PCB is broken ■ The Module PCB is broken
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.

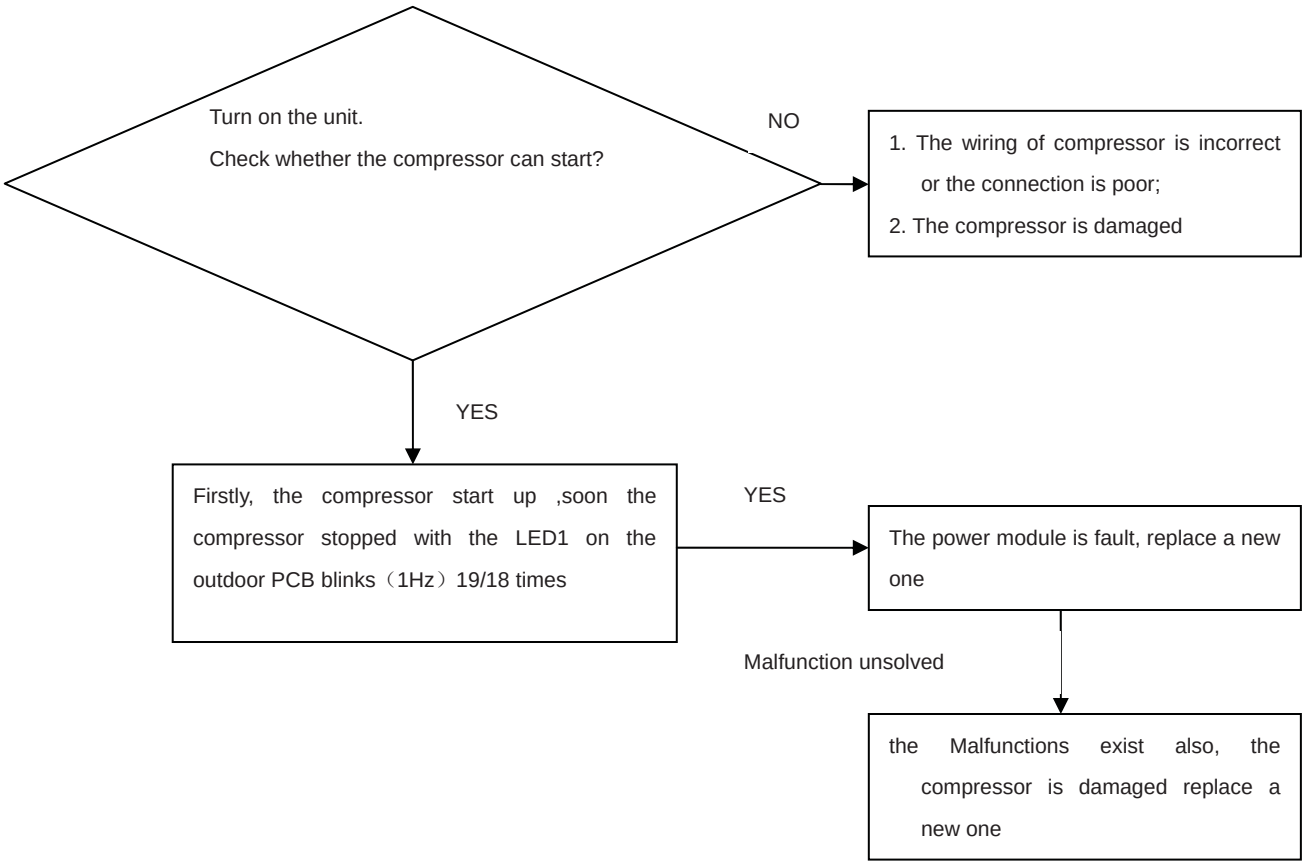


LED	LED 1	LED 2	Solution
ON/OFF	**OFF**	**ON**	Outdoor PCB fault
ON/OFF	**ON**	**ON**	This is caused by Outdoor PCB or Indoor PCB fault. Change one part firstly, if still unsolved, change another one
ON/OFF	**OFF**	**OFF**	This is caused by Outdoor PCB or Power module fault. Change one part firstly, if still unsolved, change another one

10.4.11 Loss of synchronism detection

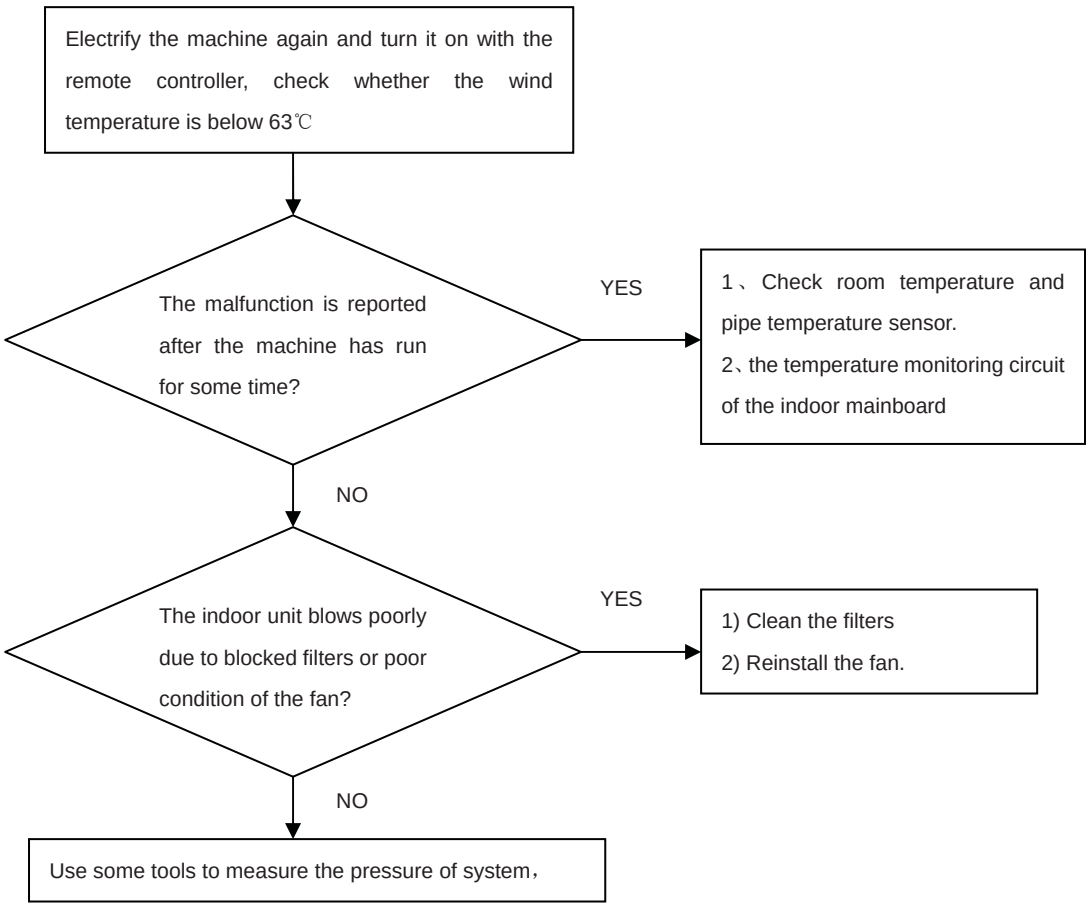
Inverter side current detection is abnormal

Outdoor Display	F11:LED1 flash 18 times F28:LED1 flash 19 times
Method of Malfunction Detection	The position of the compressor rotor can not detected normally
Malfunction Detection Conditions	when the wiring of compressor is wrong or the connection is poor; or the compressor is damaged
Supposed Causes	■ Faulty The wiring of compressor ■ Faulty compressor ■ Faulty PCB
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



10.3.12 High work-intense protection

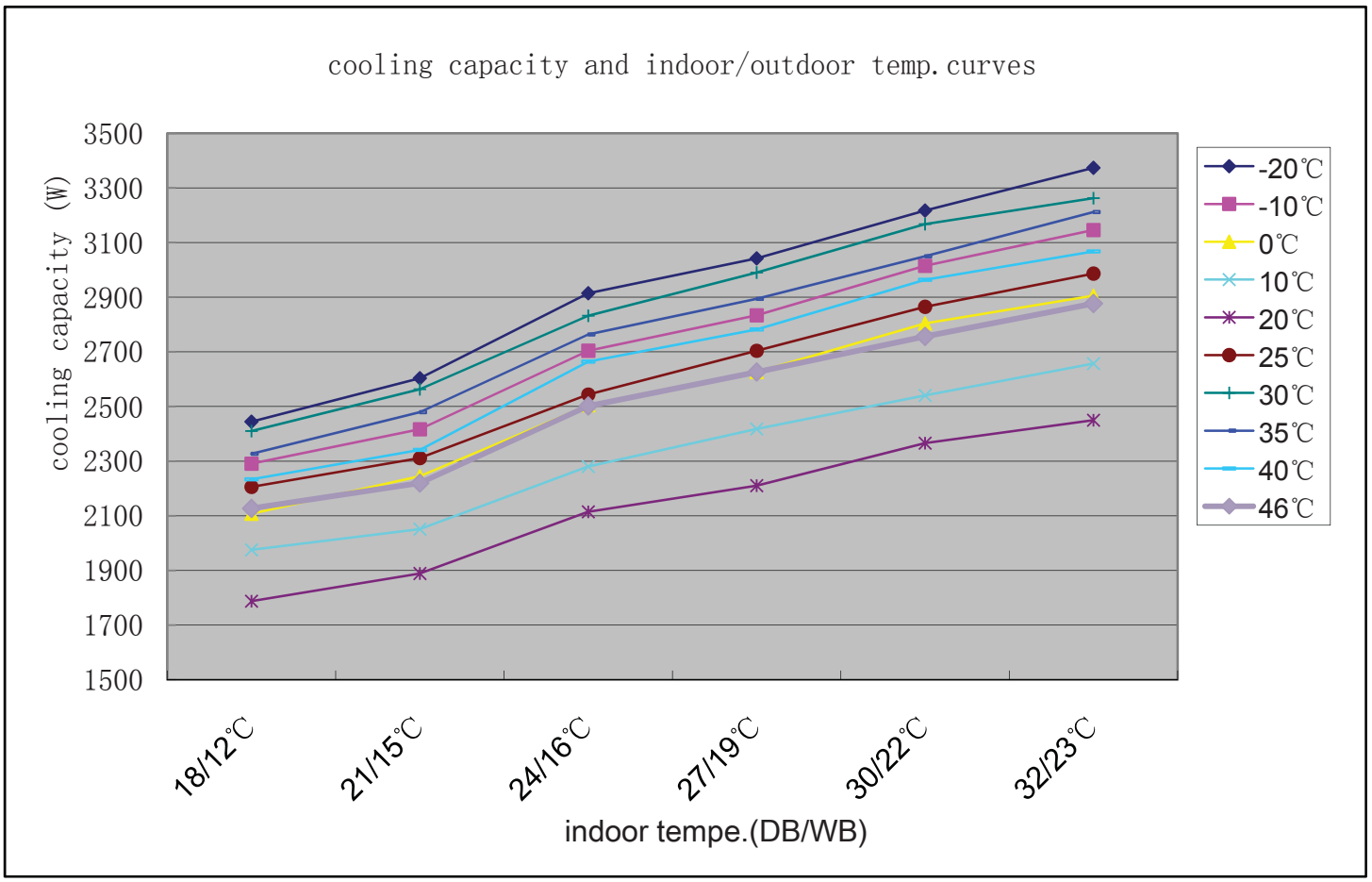
Outdoor display	LED1 flash 21 times
Method of Malfunction Detection	High work-intense control is activated in the heating mode if the temperature being sensed by the heat exchanger thermistor exceeds the limit.
Malfunction Detection Conditions	Activated when the temperature being sensed by the heat exchanger rises above 63℃ twice in 30 minutes.
Supposed Causes	■ Faulty electronic expansion valve ■ Dirty heat exchanger ■ Faulty heat-exchange sensor ■ Insufficient gas
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



11.Performence and cerves diagrams

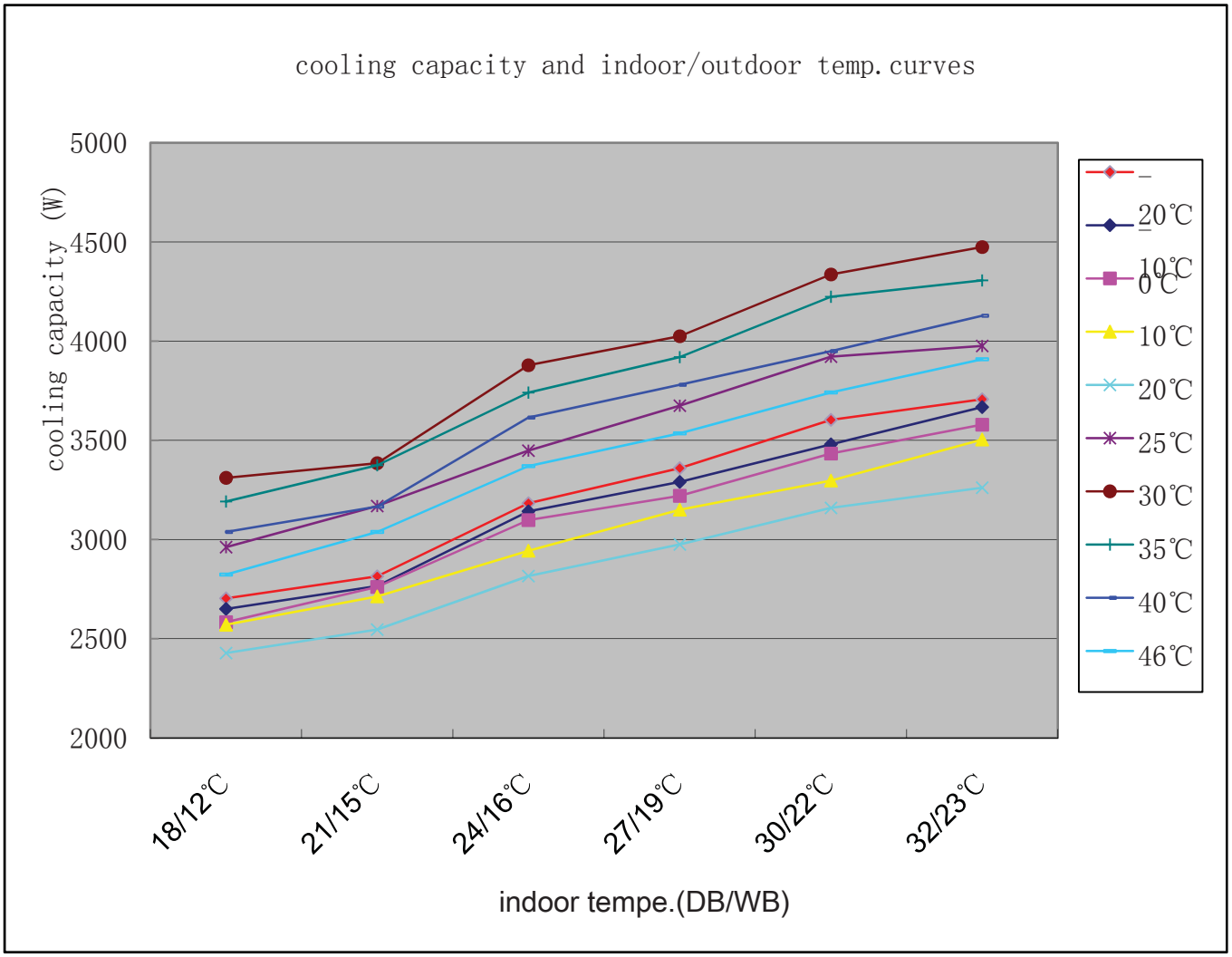
11.1 Cooling capacity-temperature curves（09K）

AS09DCAHRA 1U09JEDFRA performance curves										
cooling value-temerature table										
indoor temp.	outdoor temp.(humidity 46%)									
DB/WB	-20℃	-10℃	0℃	10℃	20℃	25℃	30℃	35℃	40℃	46℃
18/12℃	2440	2295	2121	1950	1776	2208	2403	2333	2235	2130
21/15℃	2562	2417	2247	2040	1888	2317	2518	2483	2380	2211
24/16℃	2884	2667	2504	2292	2104	2552	2823	2731	2654	2483
27/19℃	3042	2834	2626	2418	2210	2704	2990	2894	2782	2626
30/22℃	3234	3026	2794	2569	2342	2848	3143	3066	2974	2758
32/23℃	3373	3092	2911	2667	2455	2949	3319	3212	3072	2886



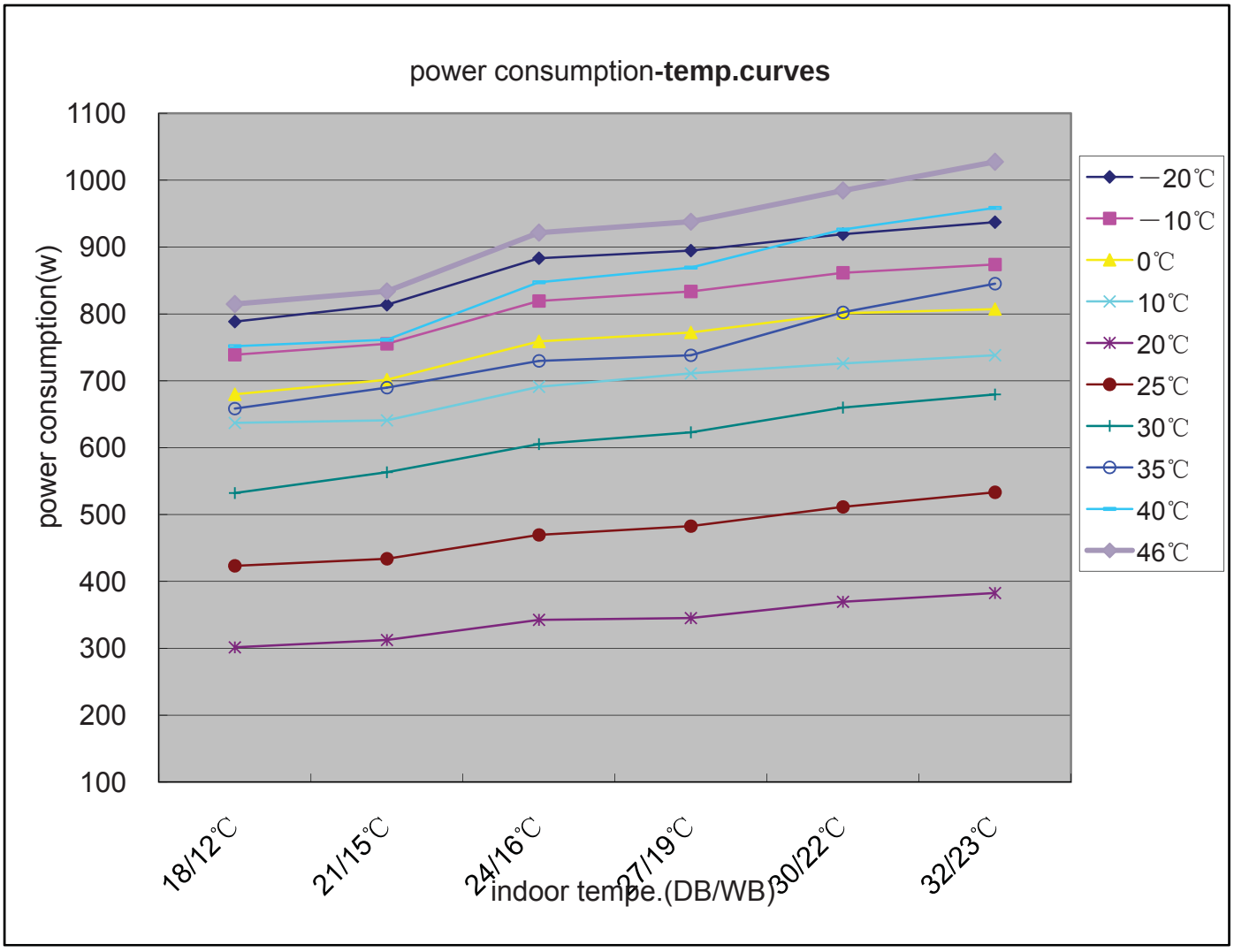
11.1 Cooling capacity-temperature curves（12K）

AS12DCAHRA 1U12JECFRA performance curves										
cooling value-temerature table										
indoor temp.	outdoor temp.(humidity 46%)									
DB/WB	-20℃	-10℃	0℃	10℃	20℃	25℃	30℃	35℃	40℃	46℃
18/12℃	2704	2650	2584	2570	2428	2961	3311	3192	3038	2823
21/15℃	2815	2765	2761	2713	2546	3169	3384	3374	3166	3038
24/16℃	3183	3142	3098	2943	2816	3448	3879	3740	3615	3370
27/19℃	3360	3290	3220	3150	2975	3675	4025	3920	3780	3535
30/22℃	3603	3480	3433	3297	3159	3922	4337	4223	3950	3741
32/23℃	3707	3668	3579	3504	3261	3976	4474	4307	4128	3909



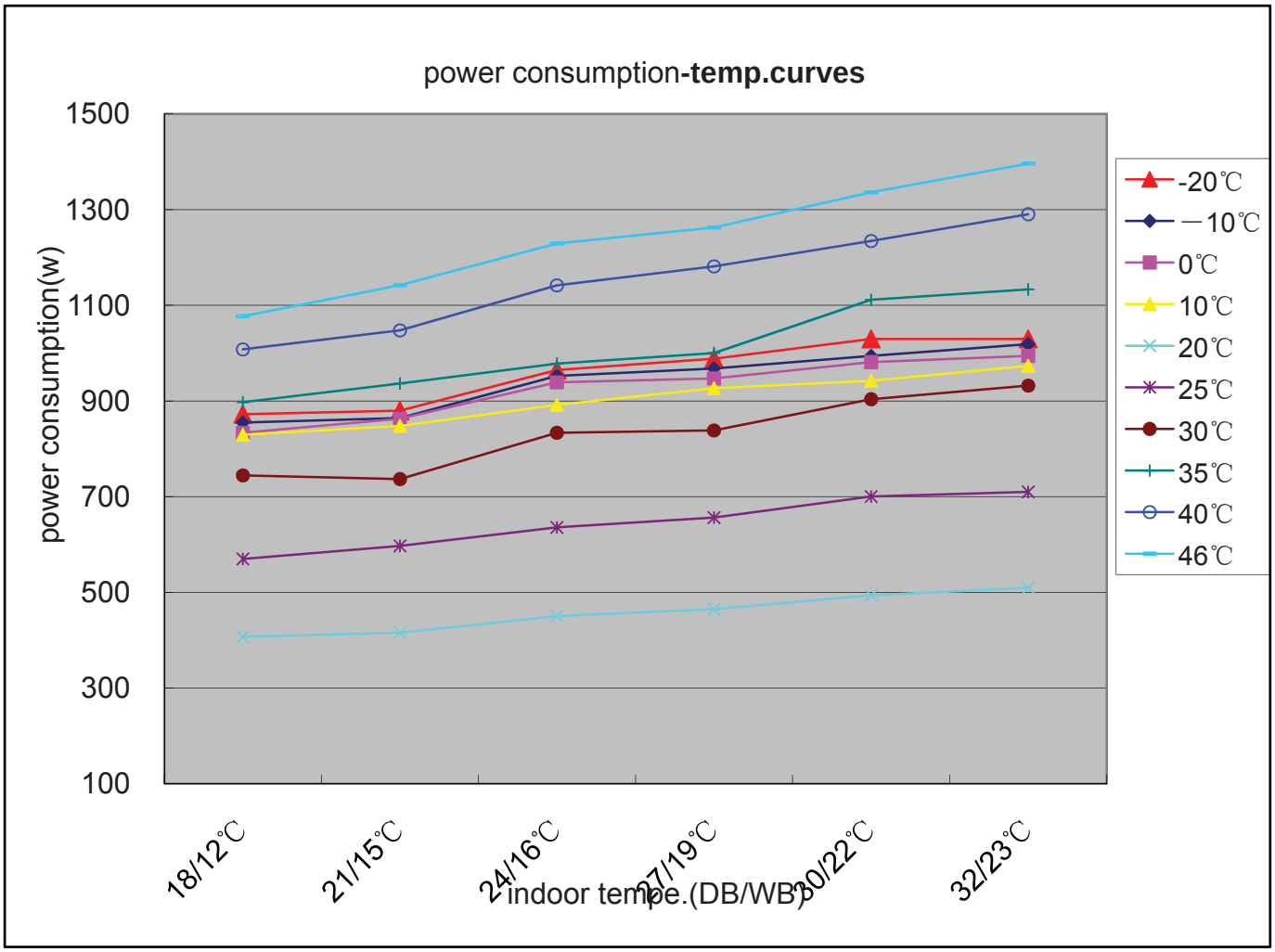
11.2 Cooling power consumption value- temperature curves（09K）

AS09DCAHRA 1U09JEDFRA performance curves										
power consumption value-temp.table										
indoor temp.	outdoor temp.(humidity 46%)									
DB/WB	－20℃	－10℃	0℃	10℃	20℃	25℃	30℃	35℃	40℃	46℃
18/12℃	793	739	683	637	304	418	549	666	755	812
21/15℃	812	754	698	648	306	425	554	679	772	833
24/16℃	873	808	751	698	338	476	615	722	846	926
27/19℃	895	834	772	711	345	483	623	738	869	938
30/22℃	928	864	793	733	364	513	665	811	924	997
32/23℃	936	862	807	740	377	535	691	834	956	1036



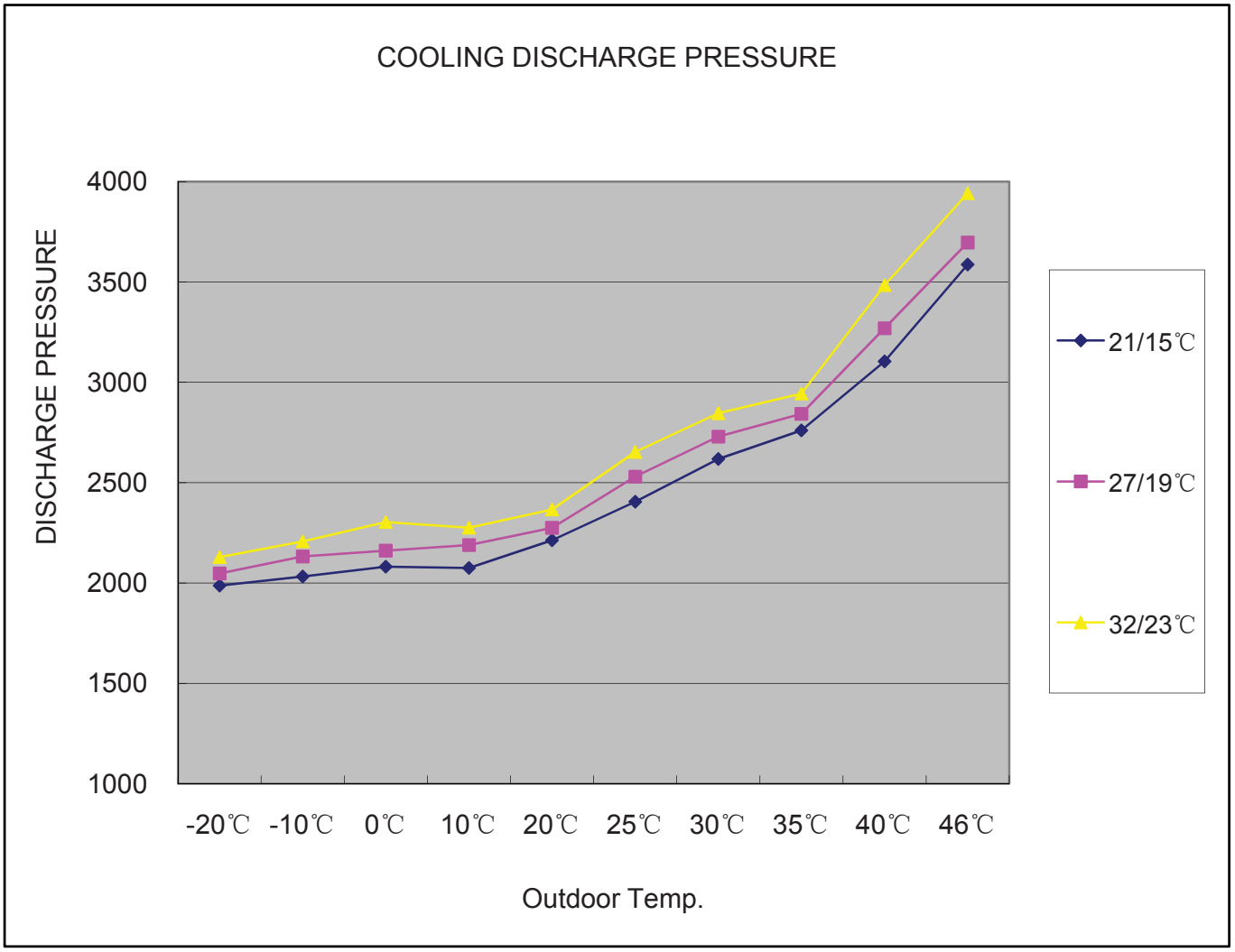
11.2 Cooling power consumption value- temperature curves（12K）

AS12DCAHRA 1U12JECFRA performance curves										
power consumption value-temp.table										
indoor temp.	outdoor temp.(humidity 46%)									
DB/WB	－20℃	－10℃	0℃	10℃	20℃	25℃	30℃	35℃	40℃	46℃
18/12℃	872	855	833	829	407	570	744	897	1008	1077
21/15℃	880	864	863	848	415	597	737	936	1047	1142
24/16℃	965	952	939	892	450	636	833	978	1142	1229
27/19℃	988	968	947	926	465	656	839	1000	1181	1263
30/22℃	1030	994	981	942	494	700	903	1111	1234	1336
32/23℃	1030	1019	994	973	510	710	932	1133	1290	1396



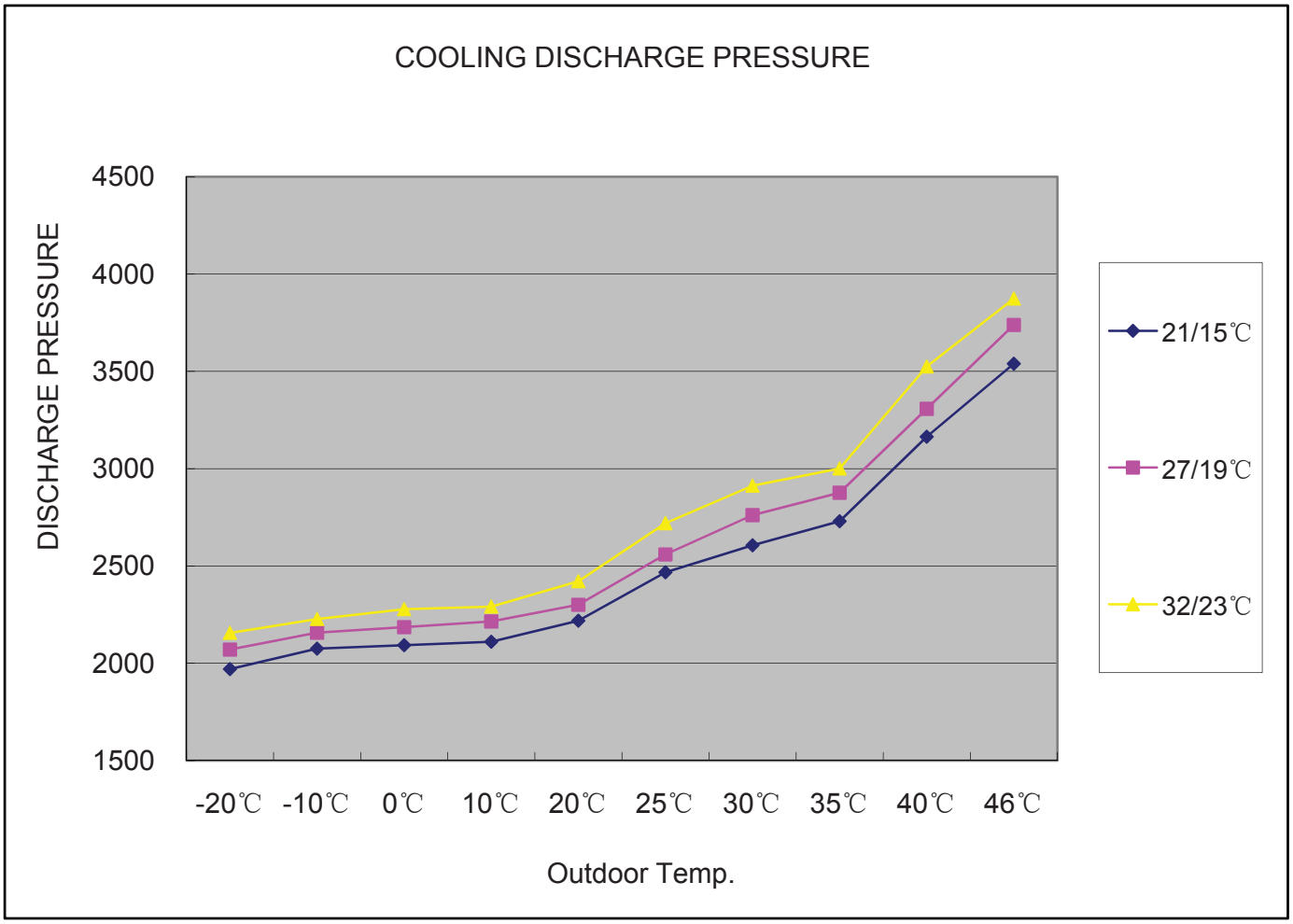
11.3 Cooling discharge pressure curves（09K）

AS09DCAHRA 1U09JEDFRA performance curves			
cooling discharge pressure.table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	21/15℃	27/19℃	32/23℃
-20℃	1990	2047	2127
-10℃	2050	2132	2211
0℃	2070	2161	2277
10℃	2115	2189	2327
20℃	2219	2274	2391
25℃	2458	2530	2684
30℃	2584	2729	2909
35℃	2698	2843	2954
40℃	3109	3269	3427
46℃	3497	3696	3825



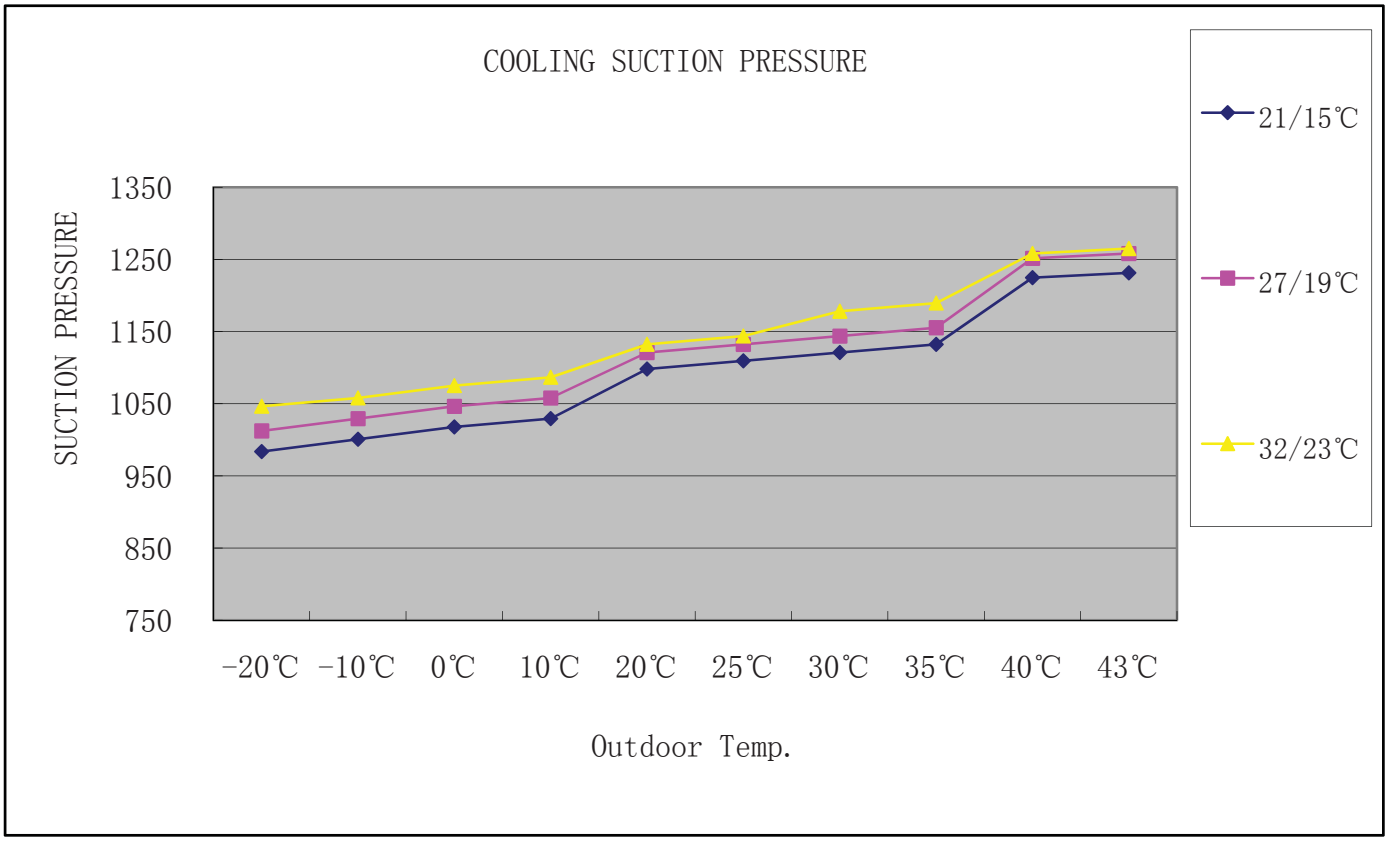
11.3 Cooling discharge pressure curves（12K）

AS12DCAHRA 1U12JECFRA performance curves			
cooling discharge pressure.table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	21/15℃	27/19℃	32/23℃
-20℃	1970	2071	2156
-10℃	2075	2157	2228
0℃	2093	2186	2278
10℃	2111	2215	2291
20℃	2219	2301	2421
25℃	2467	2560	2720
30℃	2606	2761	2913
35℃	2730	2876	3001
40℃	3164	3307	3525
46℃	3539	3739	3874



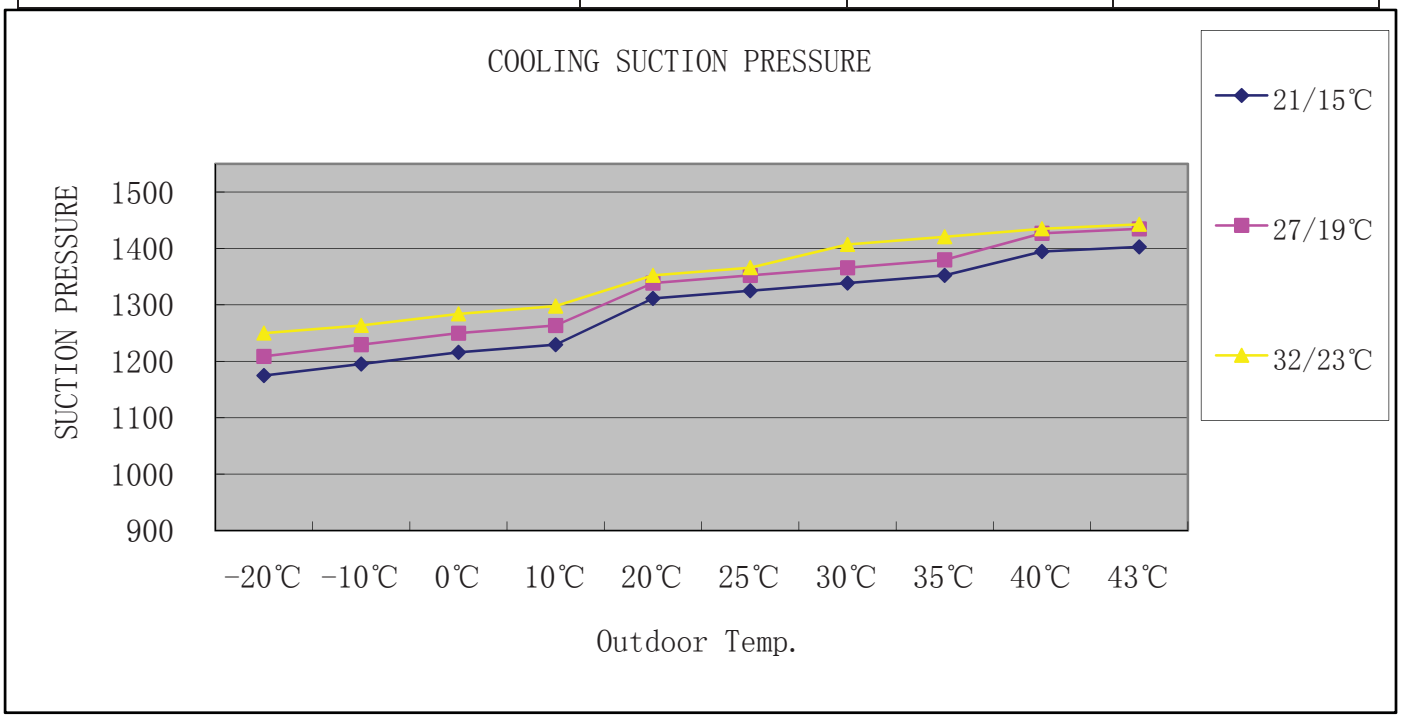
11.4 Cooling suction pressure curves（09K）

AS09DCAHRA 1U09JEDFRA performance curves			
cooling suction pressure.table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	21/15℃	27/19℃	32/23℃
-20℃	984	1012	1047
-10℃	1001	1029	1058
0℃	1018	1047	1075
10℃	1029	1058	1087
20℃	1098	1121	1132
25℃	1110	1132	1144
30℃	1121	1144	1178
35℃	1132	1155	1190
40℃	1225	1252	1258
43℃	1231	1258	1265



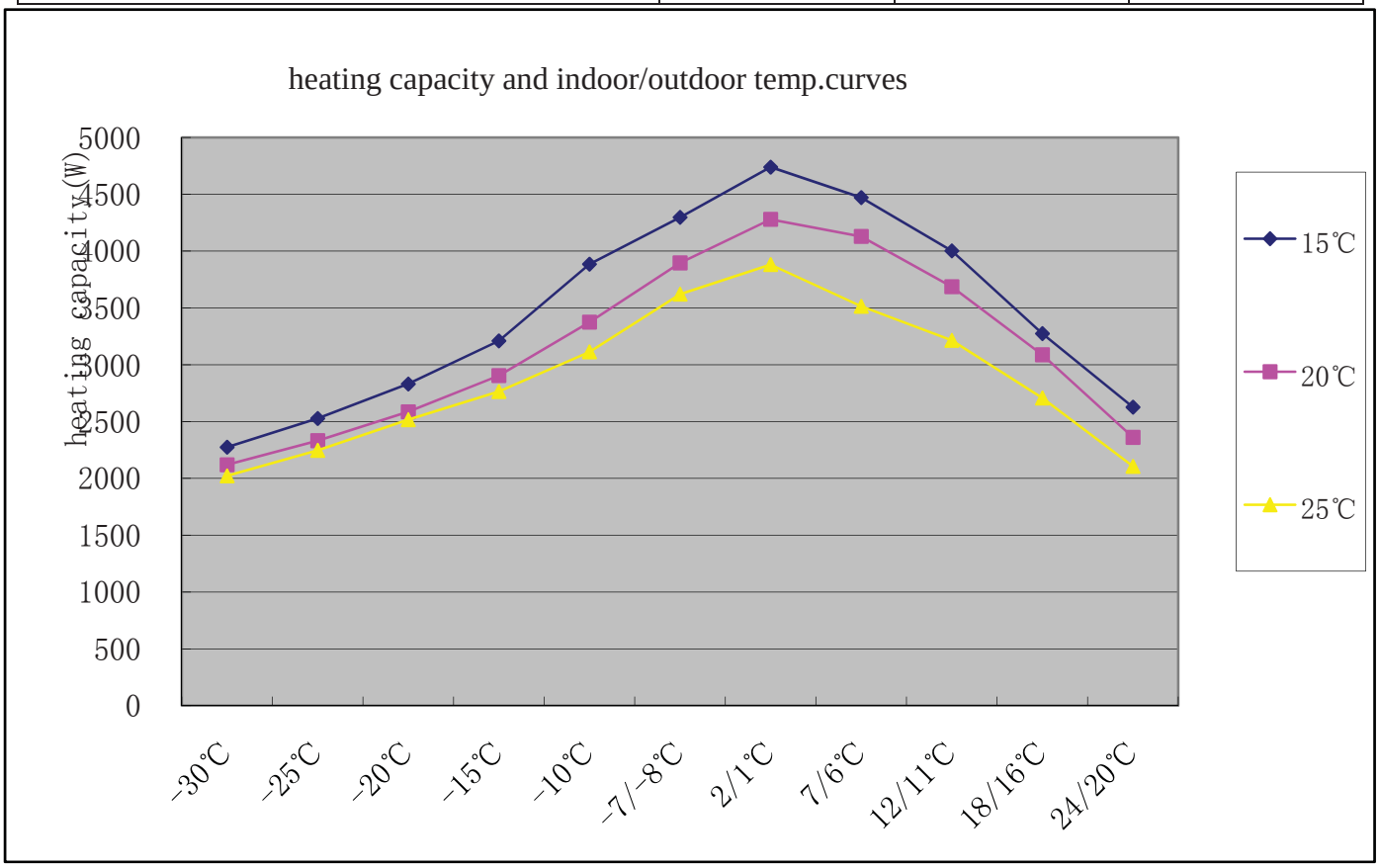
11.4 Cooling suction pressure curves（12K）

AS12DCAHRA 1U12JECFRA performance curves			
cooling suction pressure.table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	21/15℃	27/19℃	32/23℃
-20℃	1175	1209	1250
-10℃	1195	1229	1264
0℃	1216	1250	1284
10℃	1229	1264	1298
20℃	1311	1339	1352
25℃	1325	1352	1366
30℃	1339	1366	1407
35℃	1352	1380	1421
40℃	1395	1427	1435
43℃	1403	1435	1443



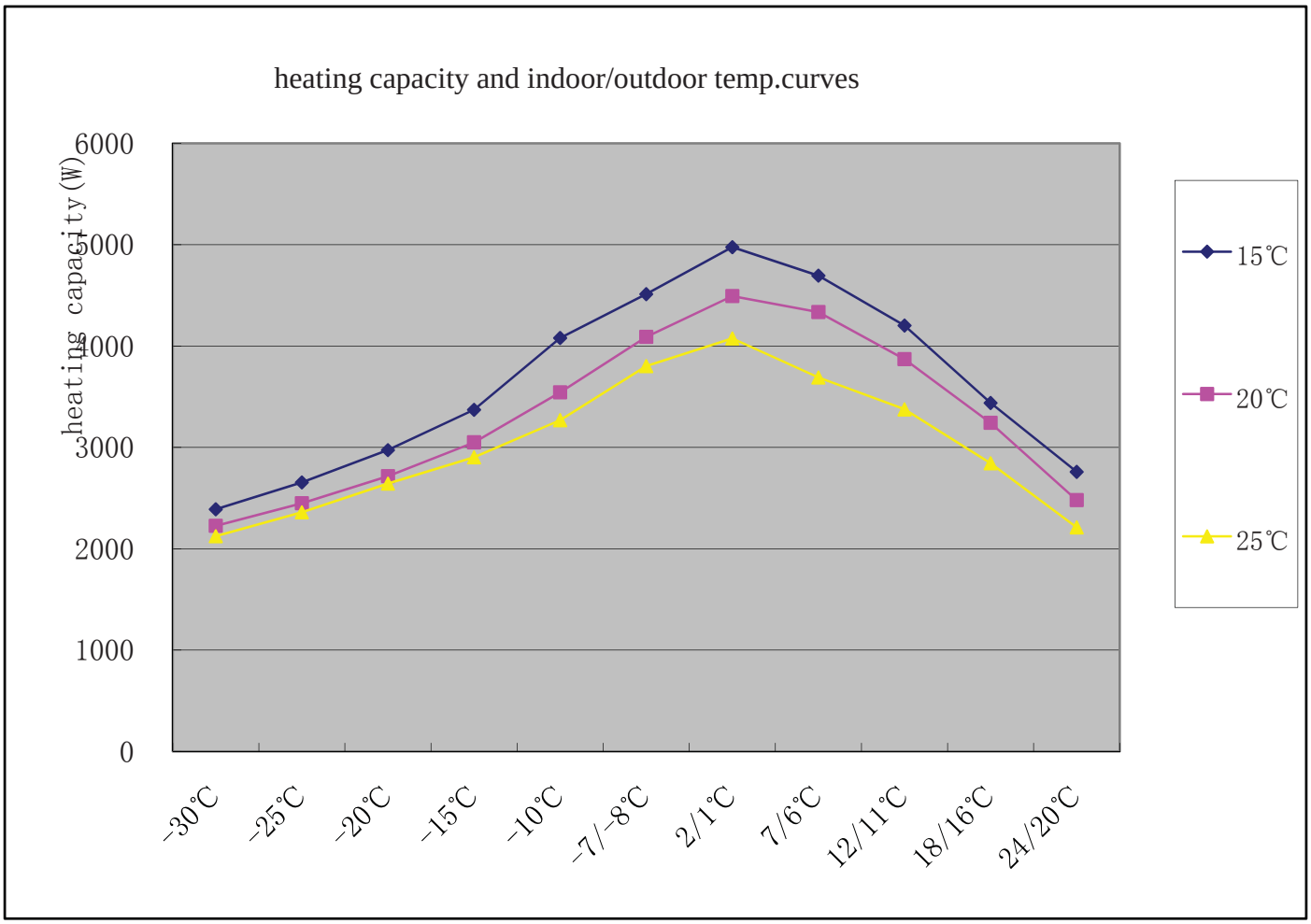
11.5 Heating capacity-temperature curves（09K）

AS09DCAHRA 1U09JEDFRAperformance curves			
heating capacity and indoor/outdoor temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-30℃	2275	2120	2022
-25℃	2528	2332	2247
-20℃	2831	2586	2517
-15℃	3210	2904	2764
-10℃	3885	3375	3113
-7/-8℃	4297	3896	3621
2/1℃	4739	4279	3881
7/6℃	4471	4129	3514
12/11℃	4002	3687	3214
18/16℃	3275	3088	2707
24/20℃	2627	2361	2106



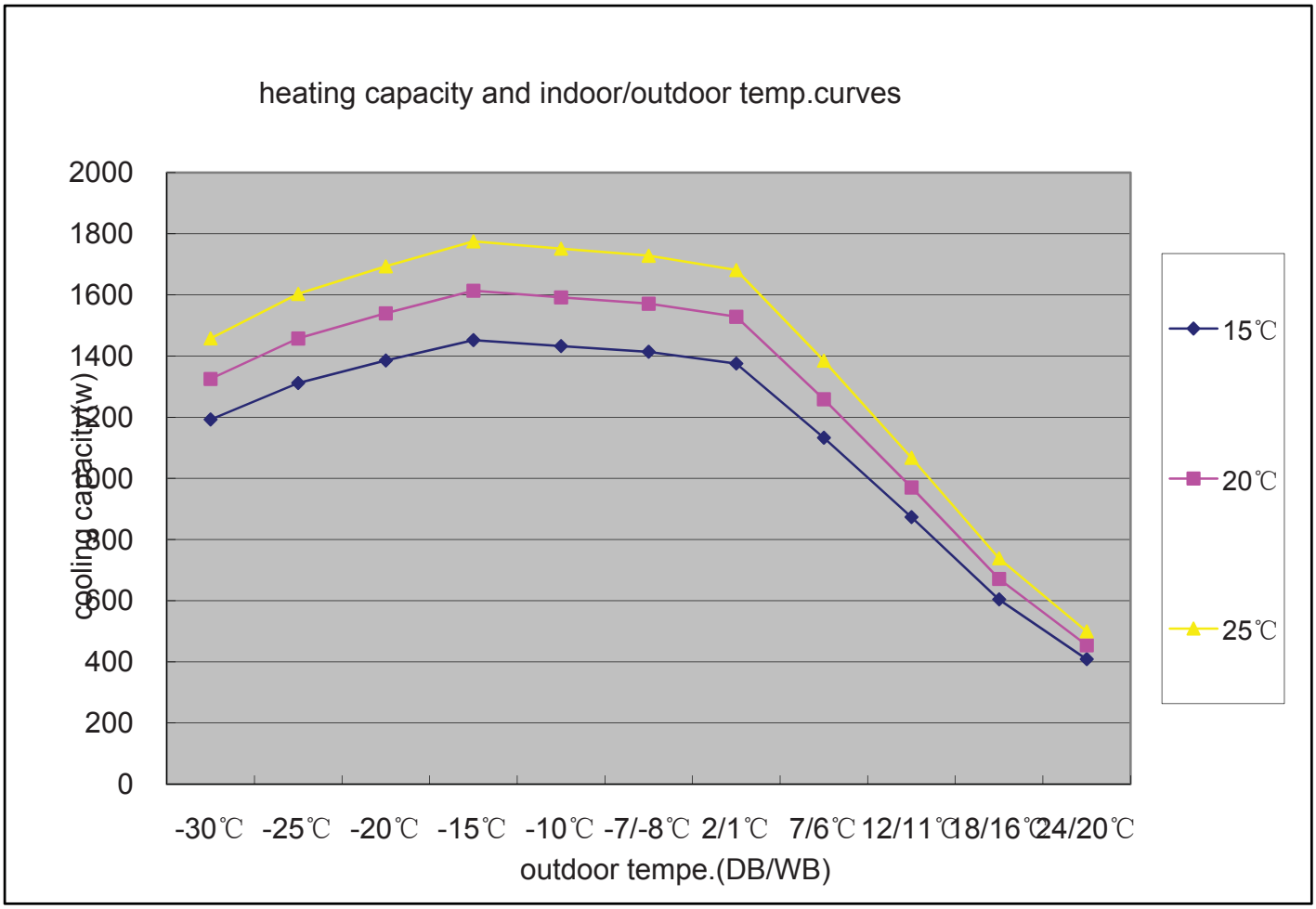
11.5 Heating capacity-temperature curves（12K）

AS12DCAHRA 1U12JECFRAperformance curves			
heating capacity and indoor/outdoor temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-30℃	2389	2226	2123
-25℃	2654	2449	2359
-20℃	2973	2716	2642
-15℃	3371	3050	2902
-10℃	4080	3544	3269
-7/-8℃	4512	4091	3802
2/1℃	4976	4493	4075
7/6℃	4695	4335	3690
12/11℃	4202	3871	3375
18/16℃	3438	3242	2843
24/20℃	2758	2479	2211



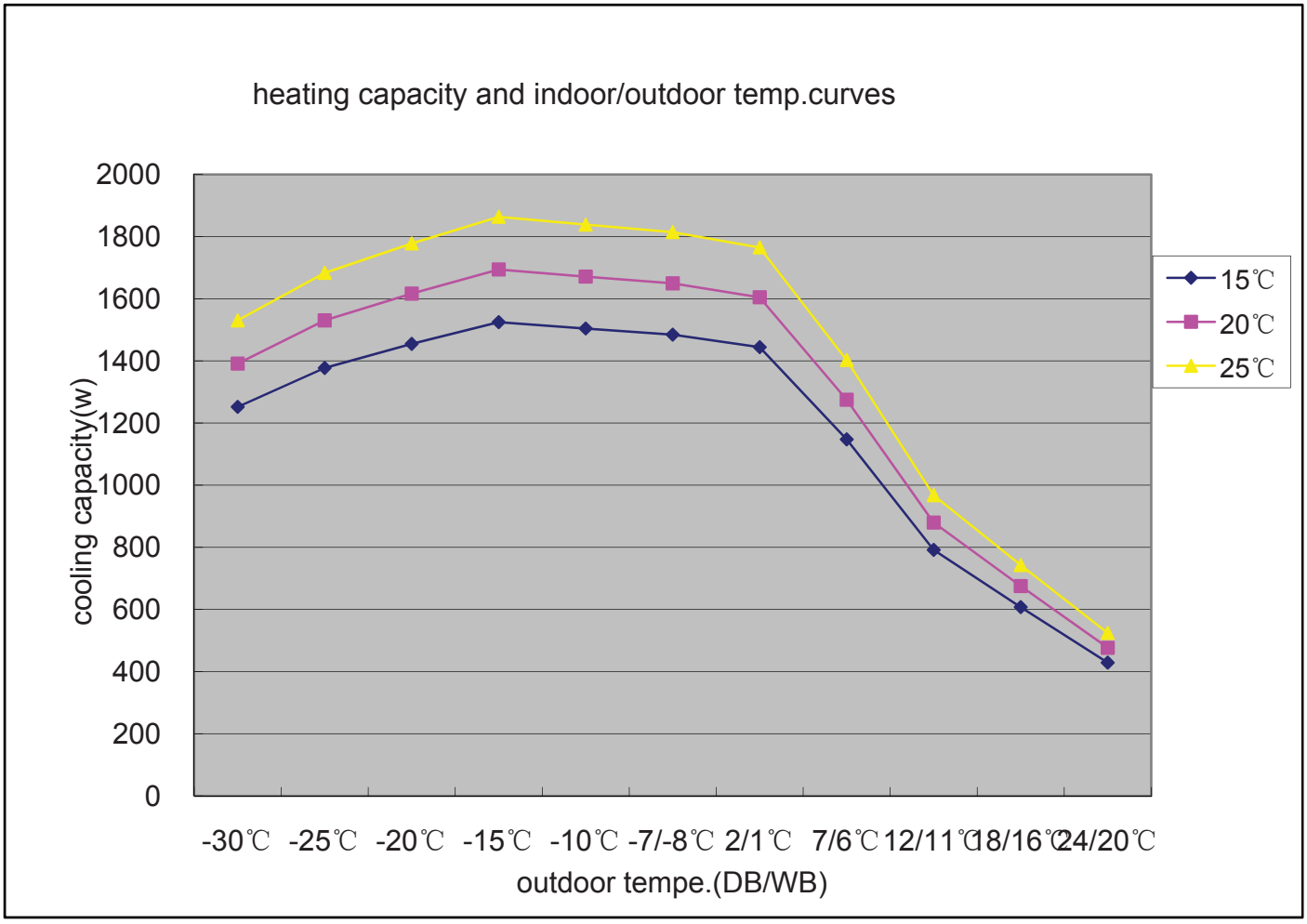
11.6 Heating power consumption value- temperature curves（09K）

AS09DCAHRA 1U09JEDFRA performance curves			
power consumption value-temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-30℃	1193	1325	1458
-25℃	1312	1458	1603
-20℃	1386	1540	1693
-15℃	1452	1614	1775
-10℃	1433	1592	1751
-7/-8℃	1414	1571	1728
2/1℃	1375	1528	1681
7/6℃	1133	1259	1385
12/11℃	873	970	1067
18/16℃	604	671	738
24/20℃	409	454	499



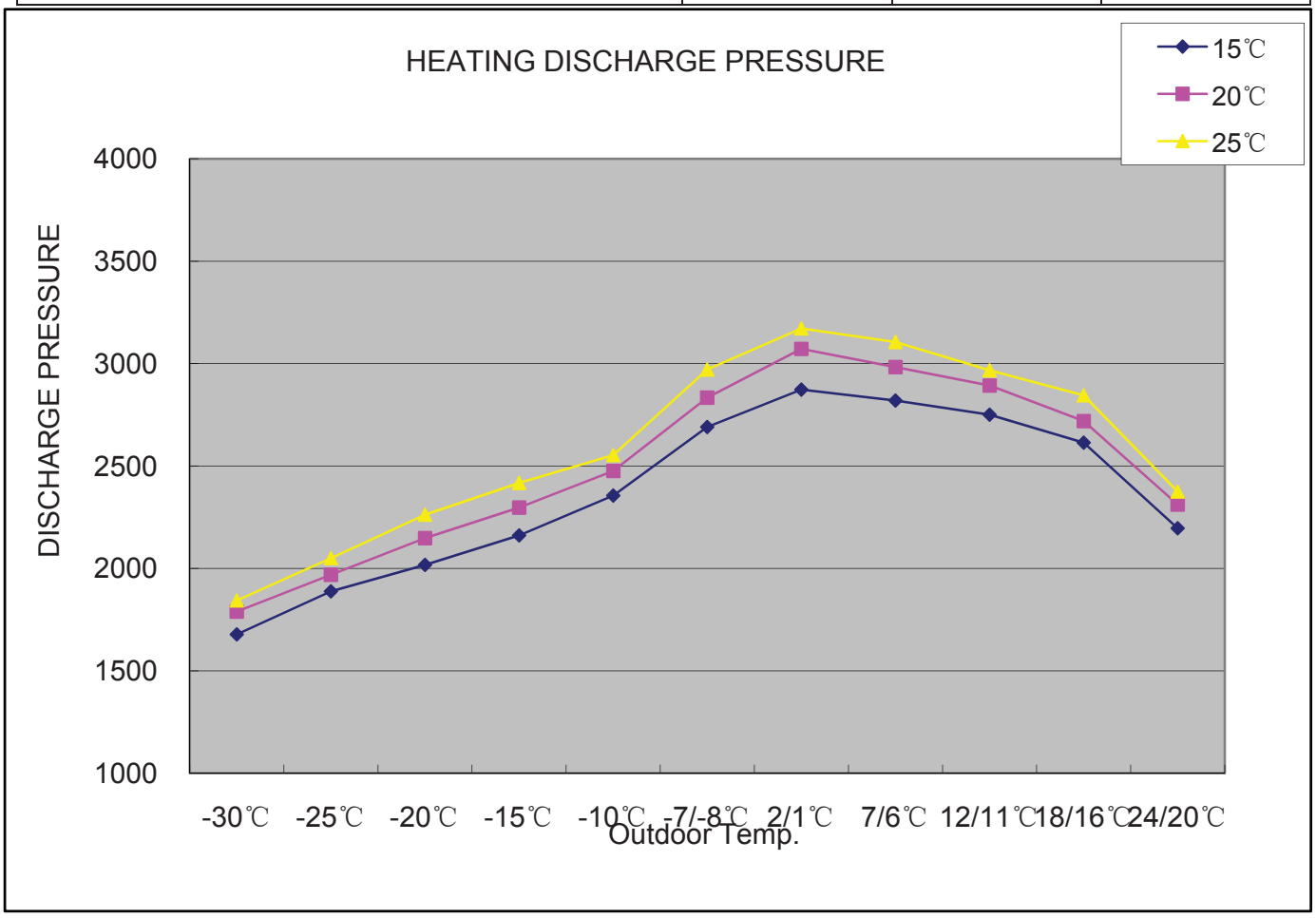
11.6 Heating power consumption value- temperature curves（12K）

AS12DCAHRA 1U12JECFRA performance curves			
power consumption value-temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-30℃	1252	1391	1530
-25℃	1377	1530	1683
-20℃	1455	1617	1778
-15℃	1525	1694	1864
-10℃	1504	1671	1839
-7/-8℃	1485	1650	1815
2/1℃	1444	1605	1765
7/6℃	1148	1275	1403
12/11℃	792	880	968
18/16℃	608	675	743
24/20℃	429	477	524



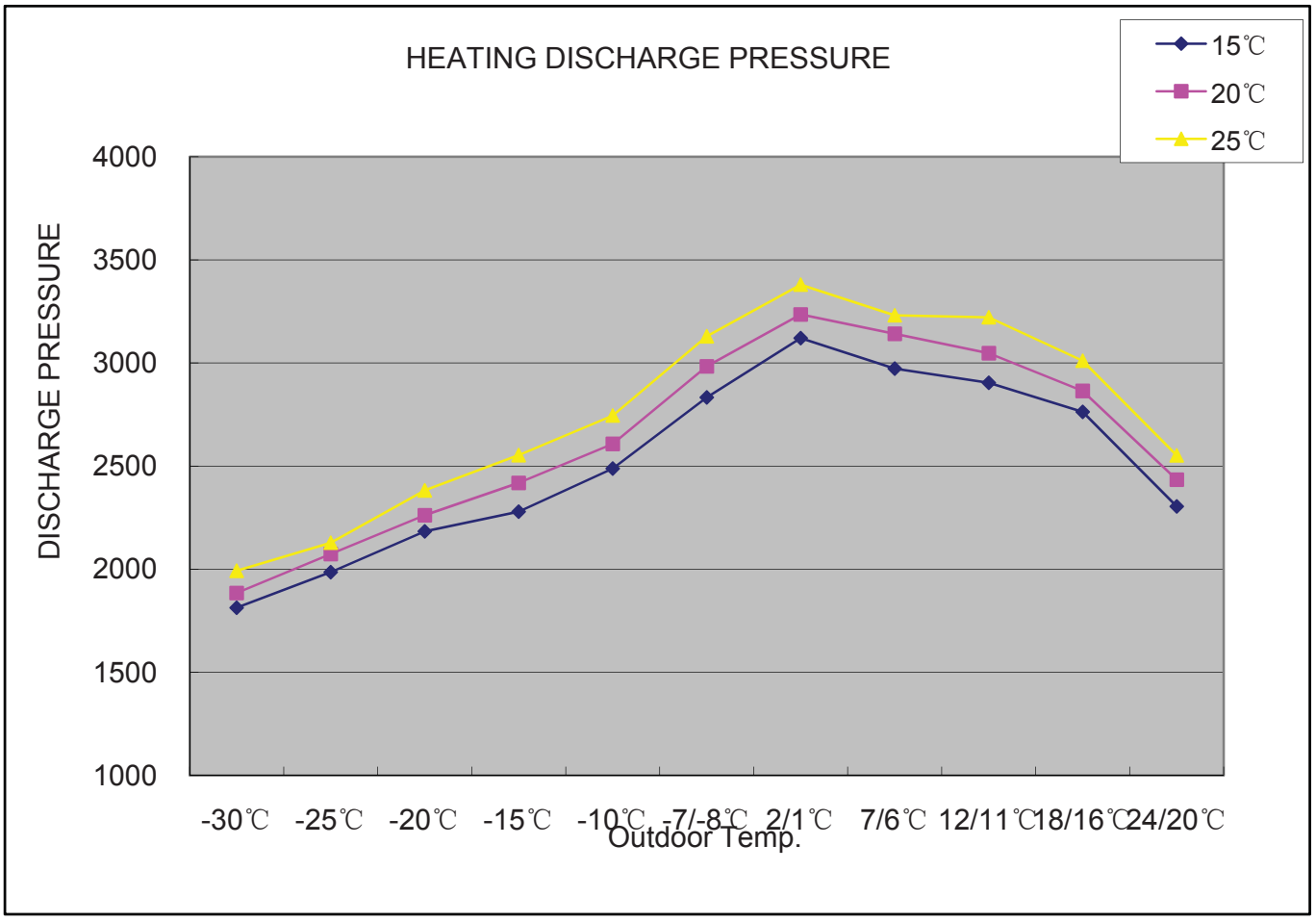
11.7 Heating discharge pressure curves（09K）

AS09DCAHRA 1U09JEDFRA performance curves			
Heating discharge pressure.table			
outdoor temp	indoor temp.		
DB/WB	15℃	20℃	25℃
-30℃	1710	1790	1859
-25℃	1880	1969	2047
-20℃	2035	2148	2210
-15℃	2186	2297	2388
-10℃	2351	2476	2594
-7/-8℃	2717	2834	2956
2/1℃	2916	3072	3193
7/6℃	2823	2983	3151
12/11℃	2733	2894	3007
18/16℃	2580	2720	2826
24/20℃	2163	2312	2370



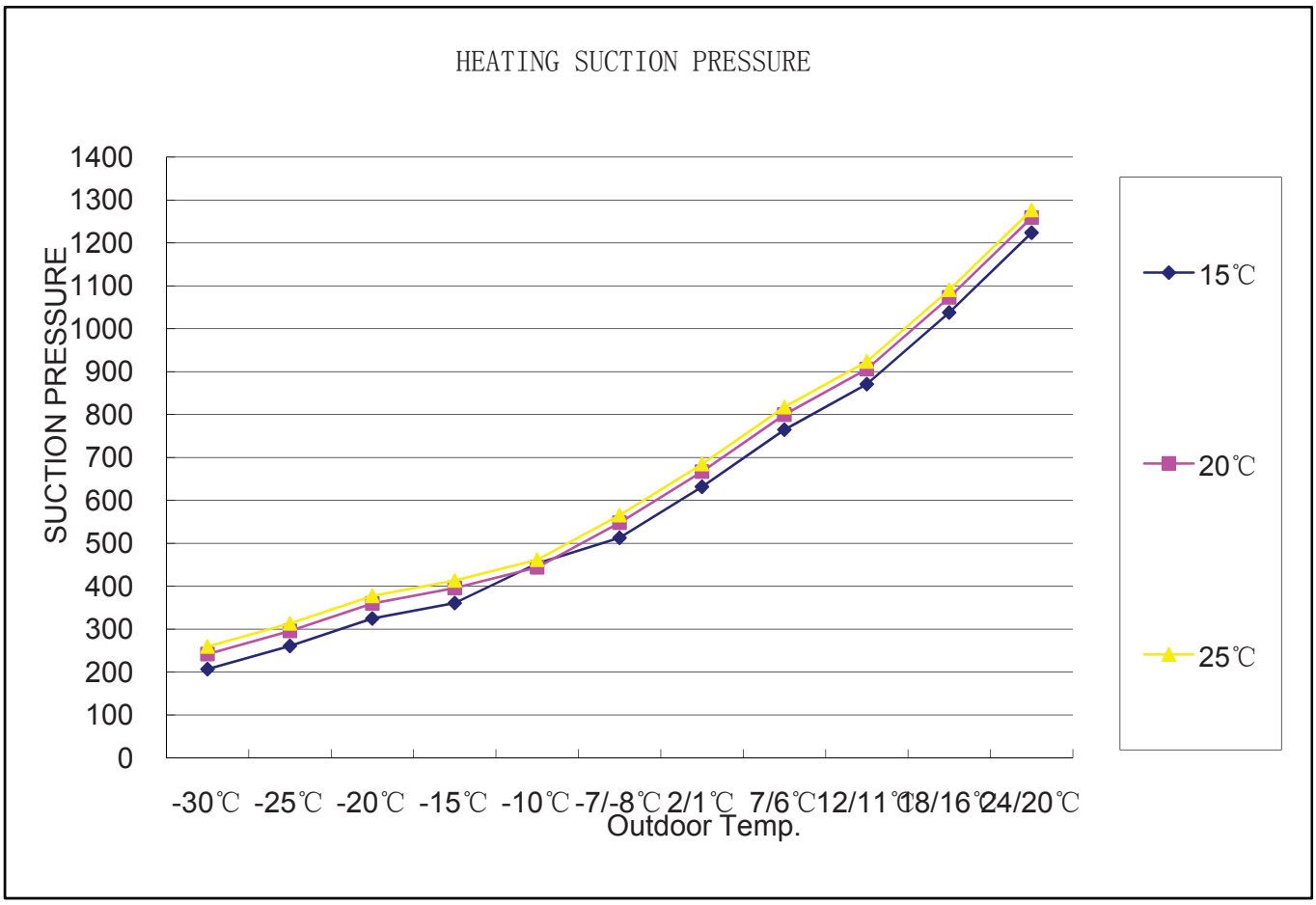
11.7 Heating discharge pressure curves（12K）

AS12DCAHRA 1U12JECFRA performance curves			
Heating discharge pressure.table			
outdoor temp	indoor temp.		
DB/WB	15℃	20℃	25℃
-30℃	1813	1885	1992
-25℃	1985	2073	2128
-20℃	2183	2262	2382
-15℃	2279	2419	2552
-10℃	2488	2607	2745
-7/-8℃	2832	2984	3129
2/1℃	3120	3235	3380
7/6℃	2972	3141	3231
12/11℃	2904	3047	3221
18/16℃	2763	2864	3011
24/20℃	2304	2434	2552



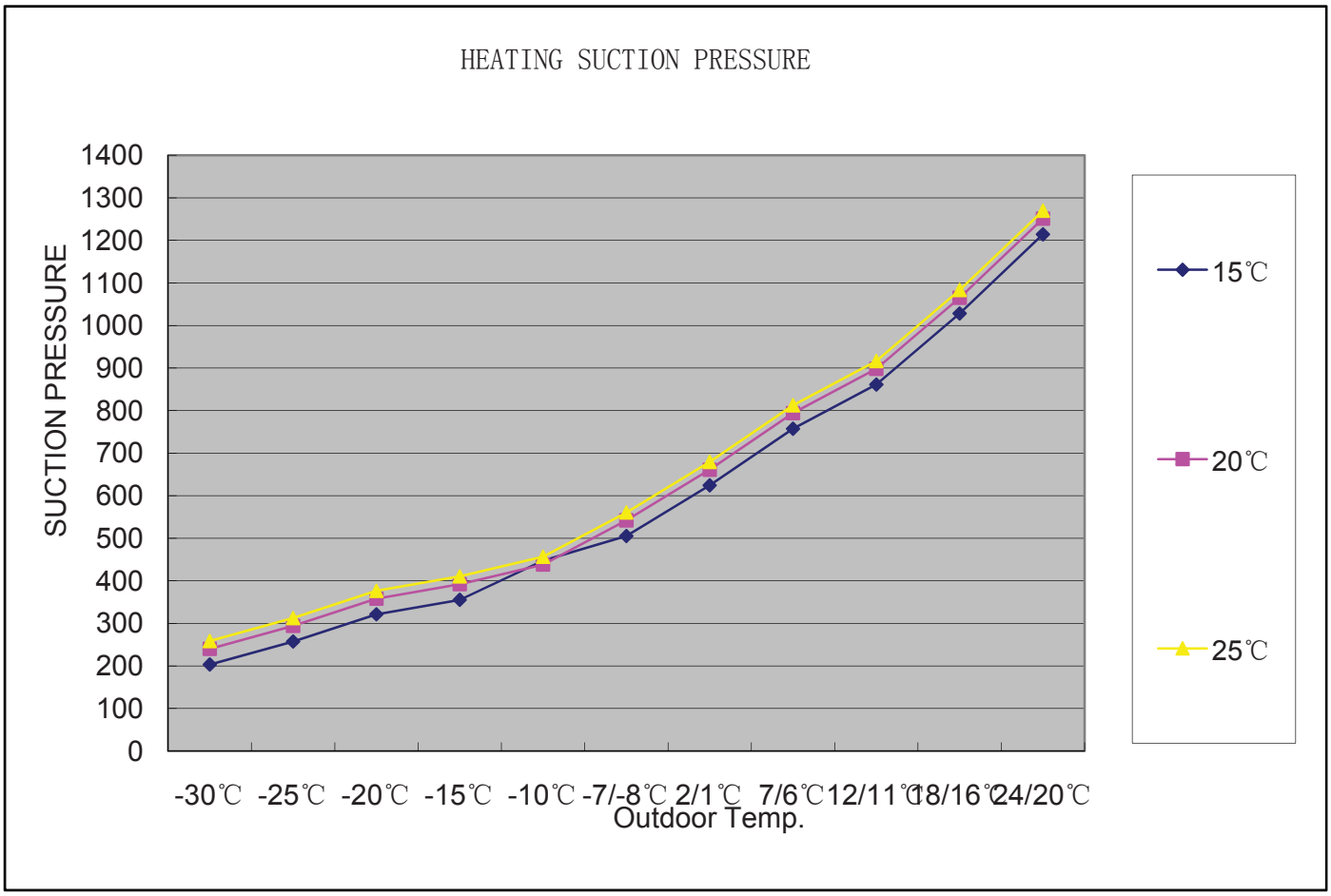
11.8 Heating suction pressure curves（09K）

AS09DCAHRA 1U09JEDFRA performance curves			
heating discharge pressure.table			
outdoor temp	indoor temp.		
DB/WB	15℃	20℃	25℃
-30℃	207	242	259.6
-25℃	261	296	313.6
-20℃	325	360	377.6
-15℃	361	396	414
-10℃	453	444	462
-7/-8℃	513	548	566
2/1℃	632	667	685
7/6℃	765	800	818
12/11℃	871	906	924
18/16℃	1038	1073	1091
24/20℃	1224	1259	1277

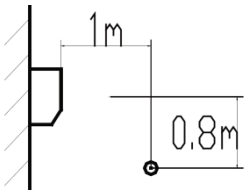


11.8 Heating suction pressure curves（12K）

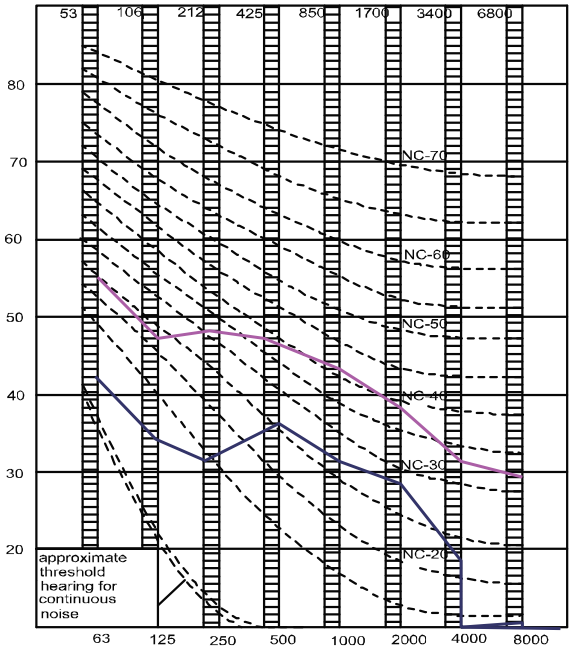
AS12DCAHRA 1U12JECFRA performance curves			
heating discharge pressure.table			
outdoor temp	indoor temp.		
DB/WB	15℃	20℃	25℃
-30℃	203.2	240	258.4
-25℃	257.2	294	312.4
-20℃	321.2	358	376.4
-15℃	355	392	410
-10℃	447	438	456
-7/-8℃	505	542	560
2/1℃	624	661	679
7/6℃	757	794	812
12/11℃	861	898	916
18/16℃	1028	1065	1083
24/20℃	1214	1251	1269



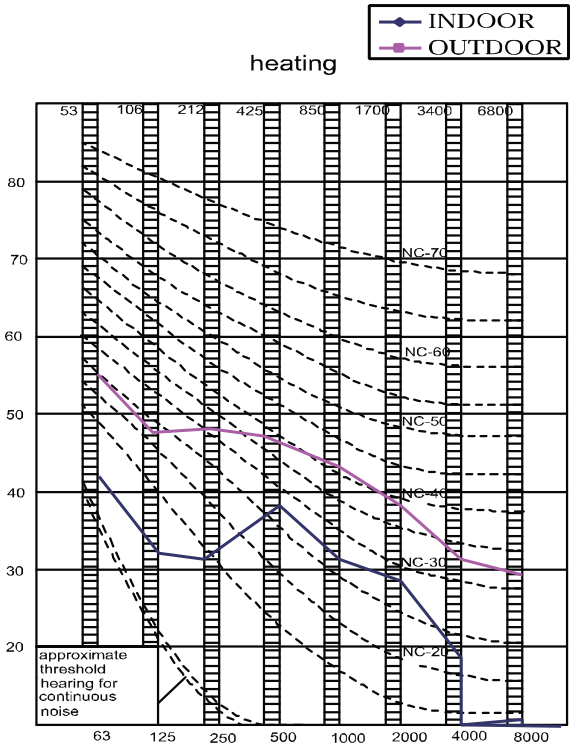
12.Sound level

Model	Sound pressure level			Measuring location of microphone	Sound power level (cooling/heating)
	230V,50HZ				
	Cooling/heating				
	H	L	SL		
1U09JEDFRA 1U12JECFRA	61				45

cooling

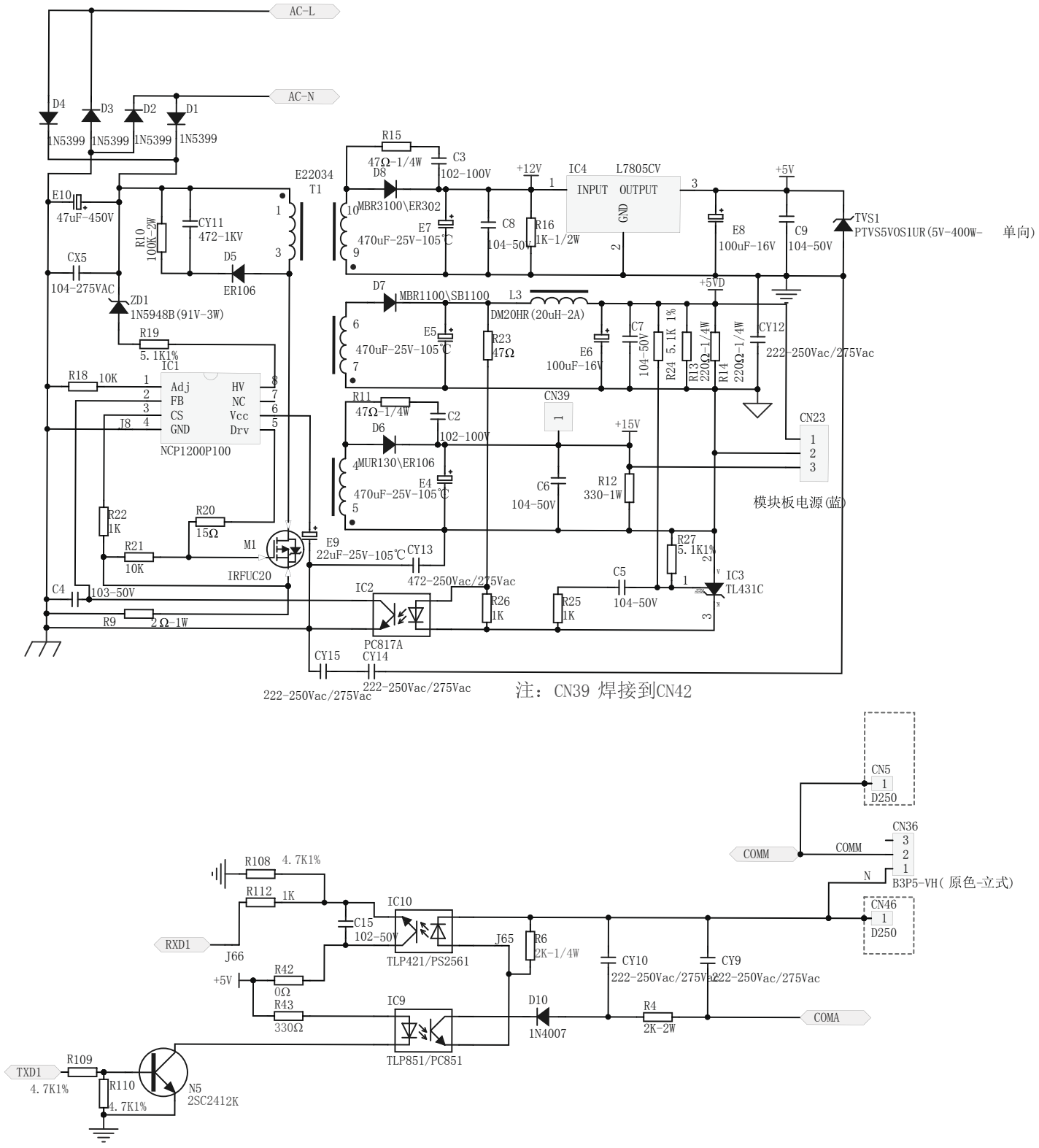


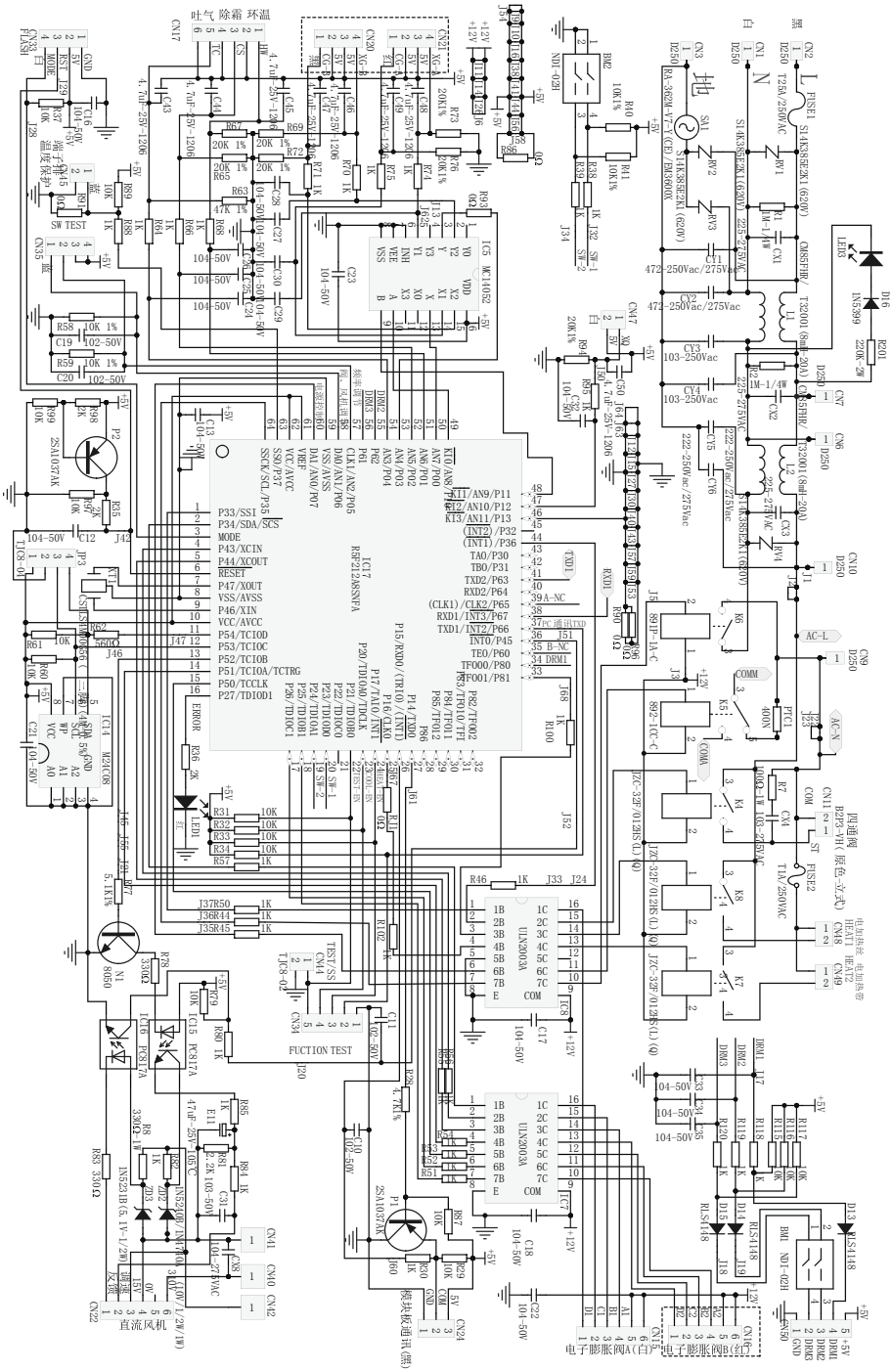
heating

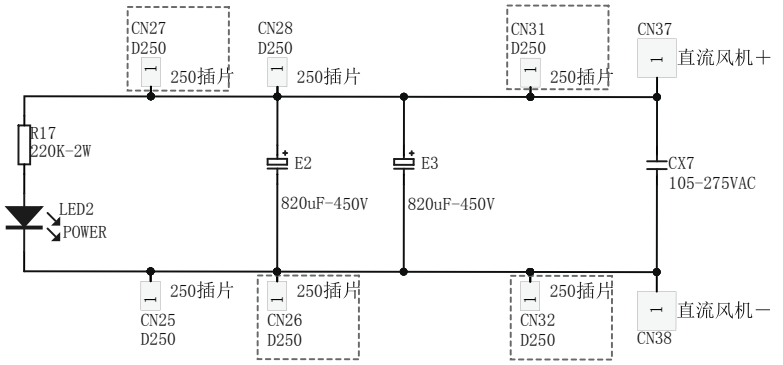


13.Circuit diagrams

13.1 Outdoor unit control board Circuit Diagrams

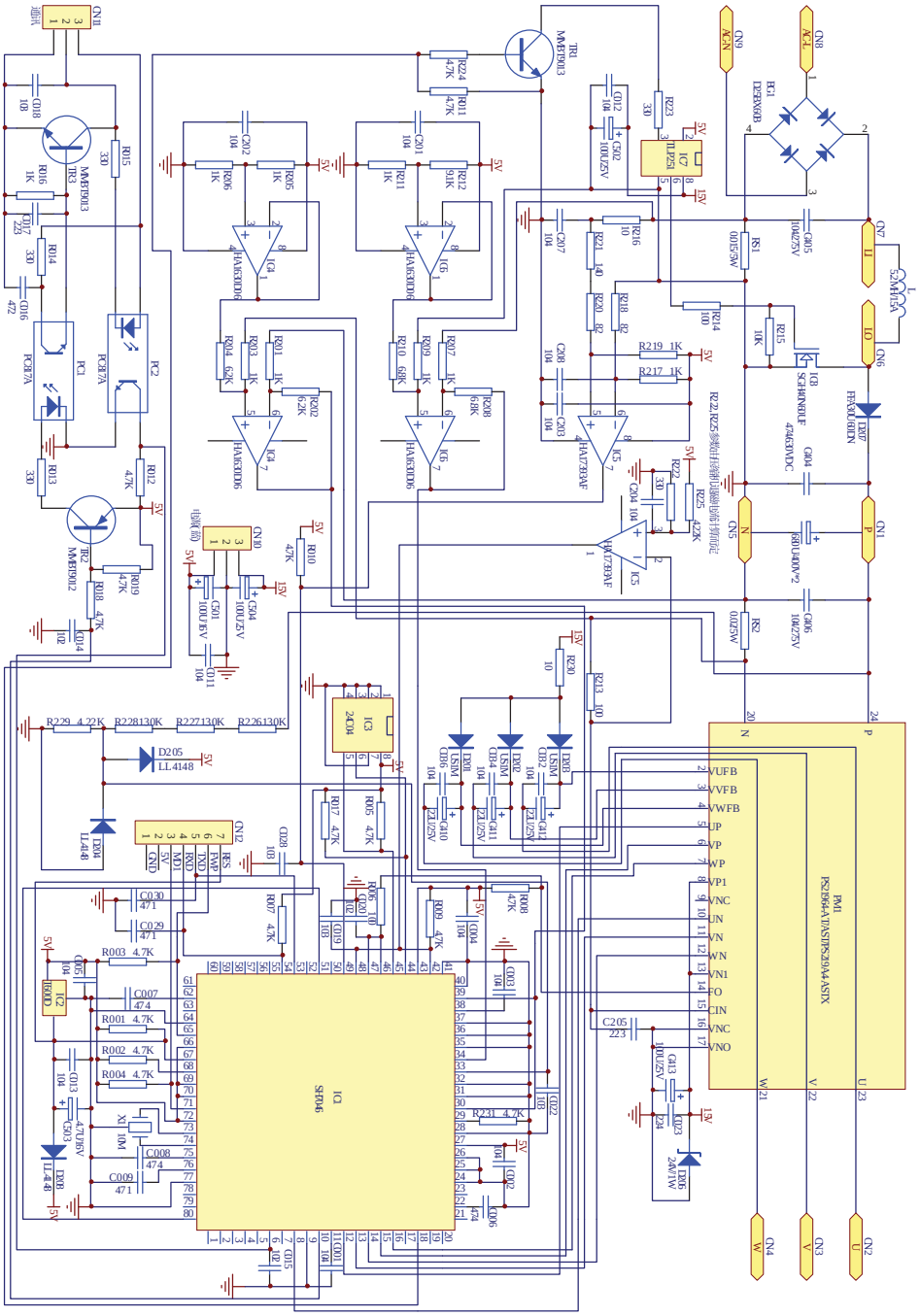






注：CN37 焊接到CN40, CN38 焊接到CN41

13.2 Module board Circuit Diagram



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Sincere Forever

Haier Group

Haier Industrial Park, No.1, Haier Road

266101, Qingdao, China_

Http：//www.haier.com

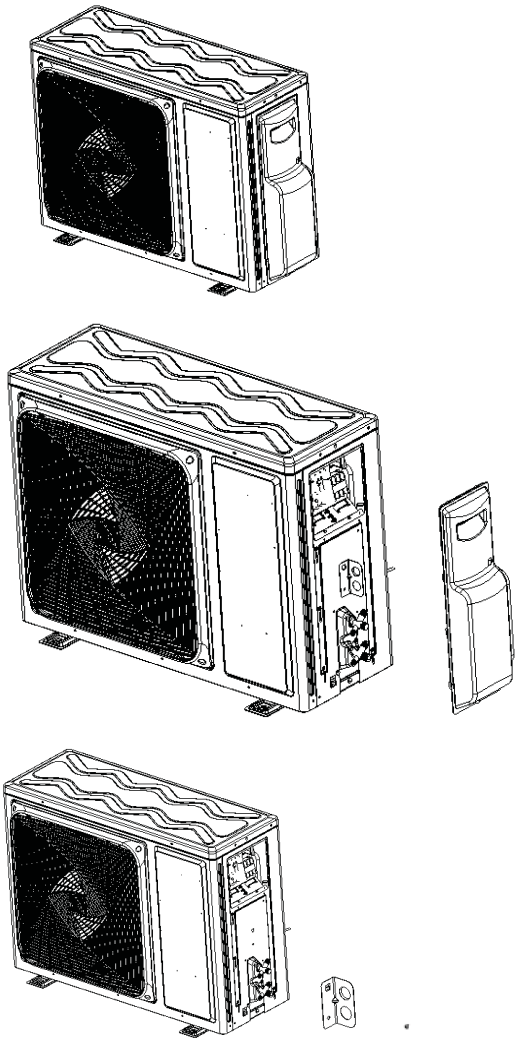
Edited by : Shi haiyan
Zhang chenglong
Signed by : wang caiping
Approved by: Yang wenjun

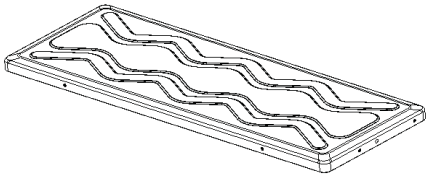
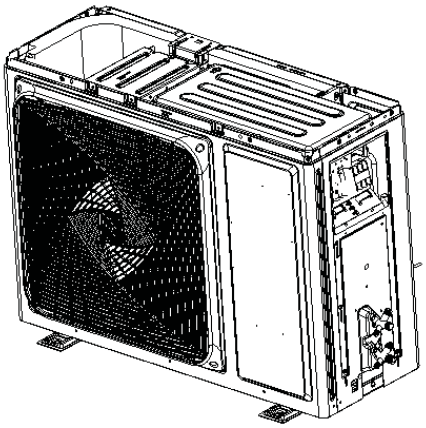
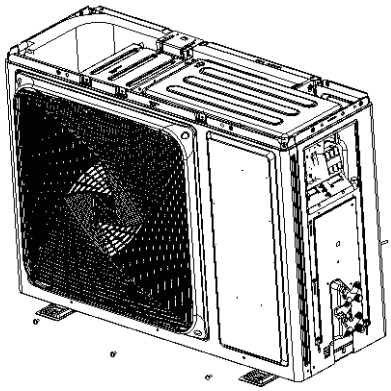
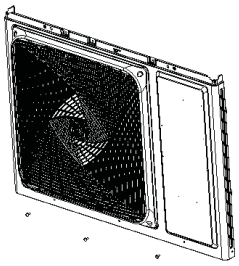
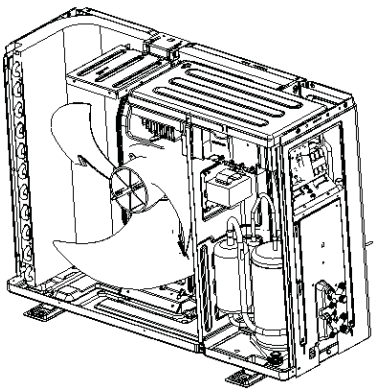
Haier REMOVAL PROCEDURE

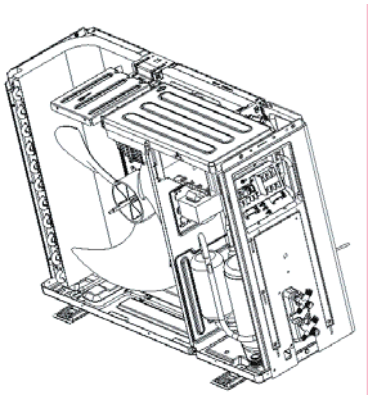
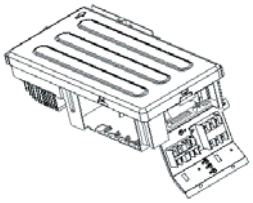
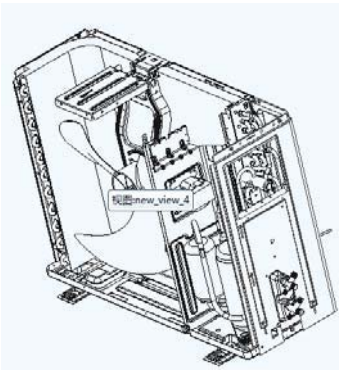
Wall Mounted Type
DC Inverter FREE MATCH NEW40-Series
SERIES:NEW40

Remove of front panel

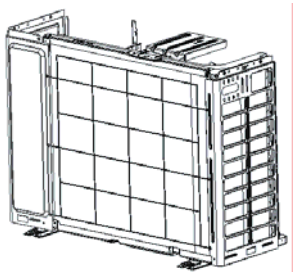
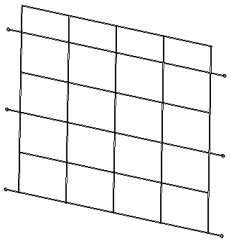
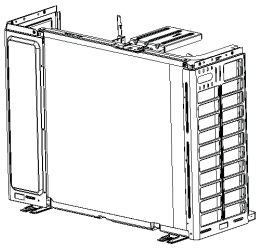
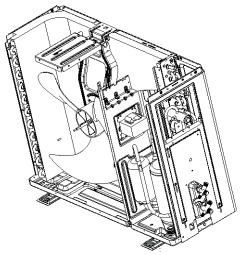
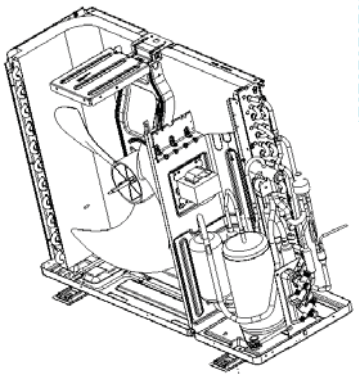
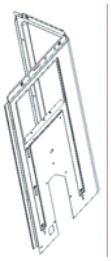
Outdoor unit

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

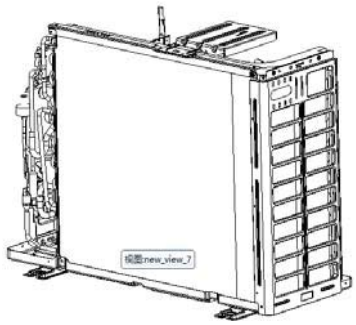
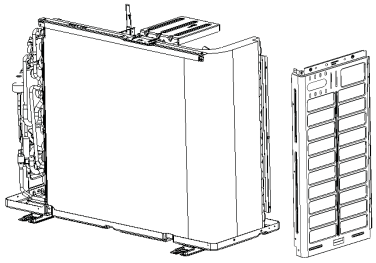
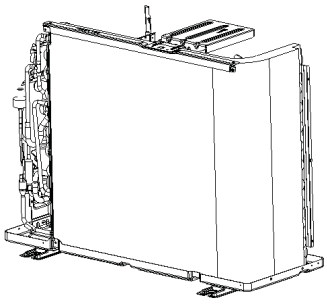
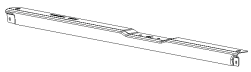
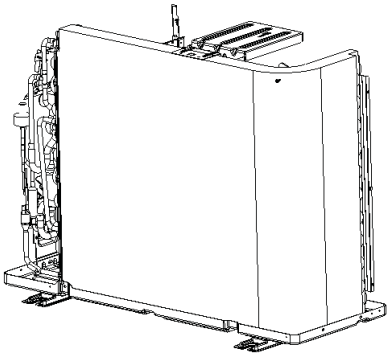
Step Procedure Points		Step Procedure Points	Step Procedure Points
2. Remove the panels.			
1	Loosen the 7 screws and lift the top panel	 	
2.	Loosen the screws of the panel.		
3	Pull and remove the front panel.	 	

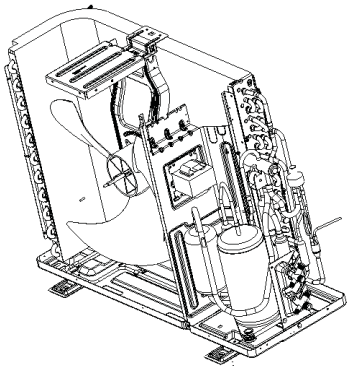
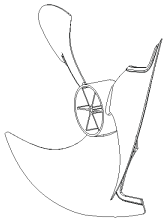
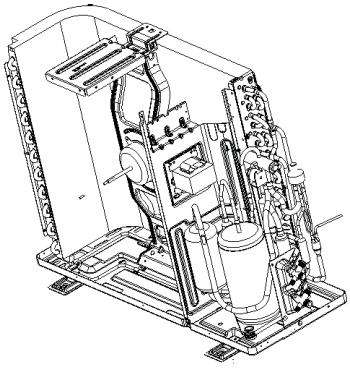
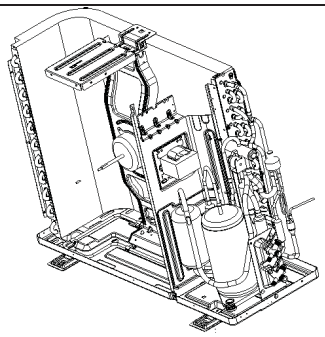
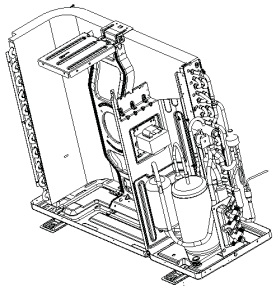
Step		Procedure	Points
	Remove the fixting screws, then lift the electrical box	  	

Remove the air filters and horizontal flap

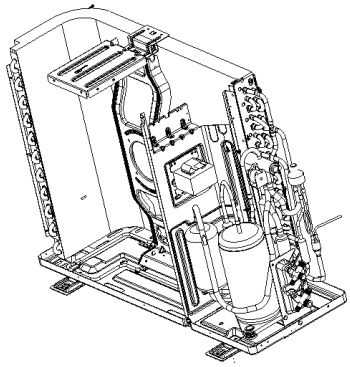
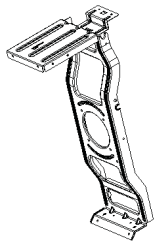
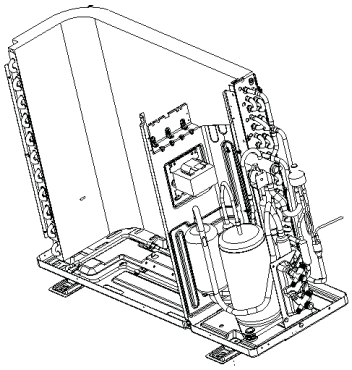
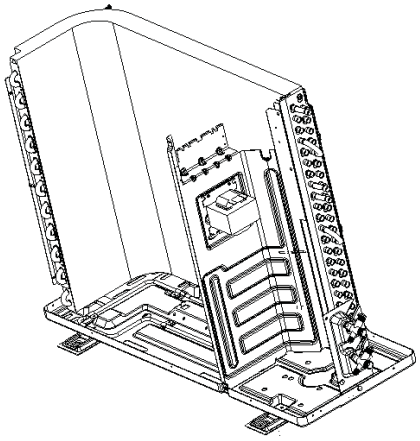
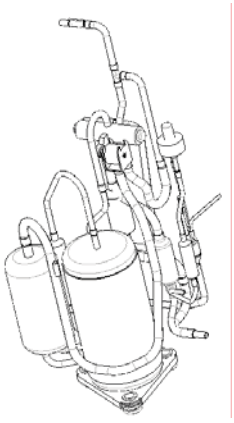
Step		Procedure	Points
1 2	Loosen the fixting screws and remove The back protect net .	  	
1	Loosen the fixting screws and remove the side panel.	  	■

Remove the casing

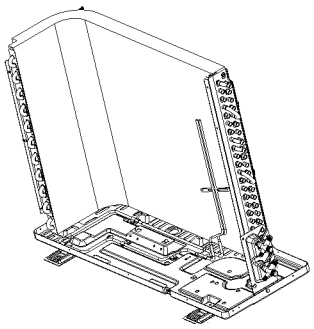
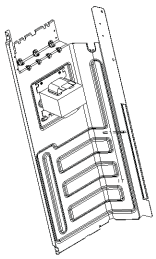
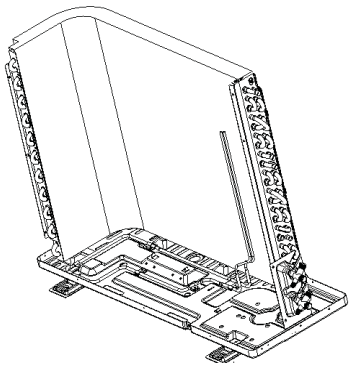
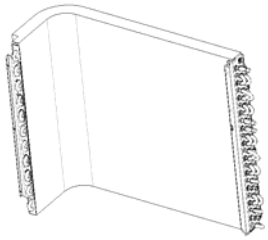
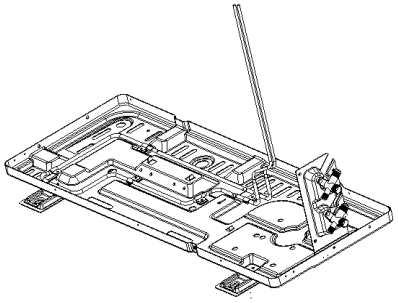
Step		Procedure	Points
1	Loosen the fixting screws and remove the side panel.	 	■
2	Loosen the fixting screws and remove the cross beam.	  	

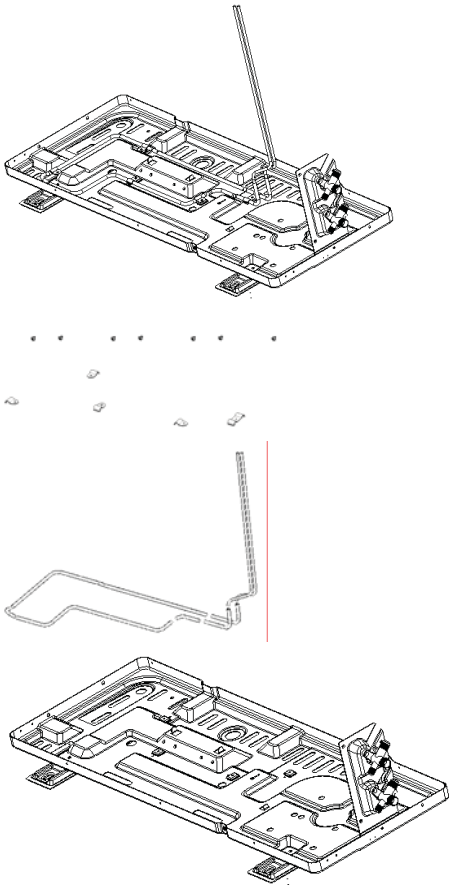
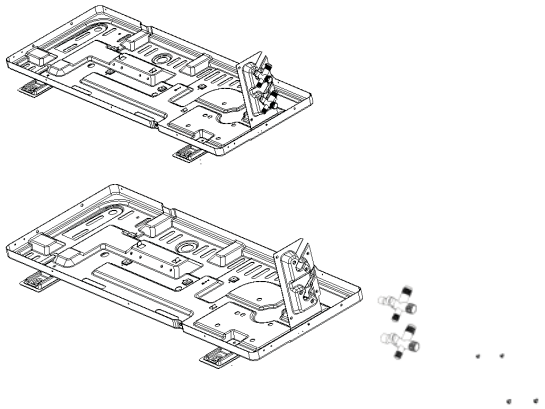
Step		Procedure	Points
3	Loosen the fixting screws remove the fan	  	
	Loosen the fixting screws and lift the fan motor.	  	

Release stepping motor (2type)

Step		Procedure	Points
1	Remove the fixing screws,then lift the fan motor bracket	  	
2	Cut down the and pull out the compressor and remove the	 	

Removal of Heat Exchanger

Step		Procedure	Points
	Loosen the marked fixing screws	 	
	Loosen the fixting hook and remove the heat exchanger	  	

Step		Procedure	Points
	Remove the fixing screws,then lift the heating pipe		
	Remove the fixing screws,then lift the valves		

Step		Procedure	Points
	Remove the fixing screw,then lift the valve set