HEIKO SERVICE MANUAL

Model JZ050-C2

⚠ 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

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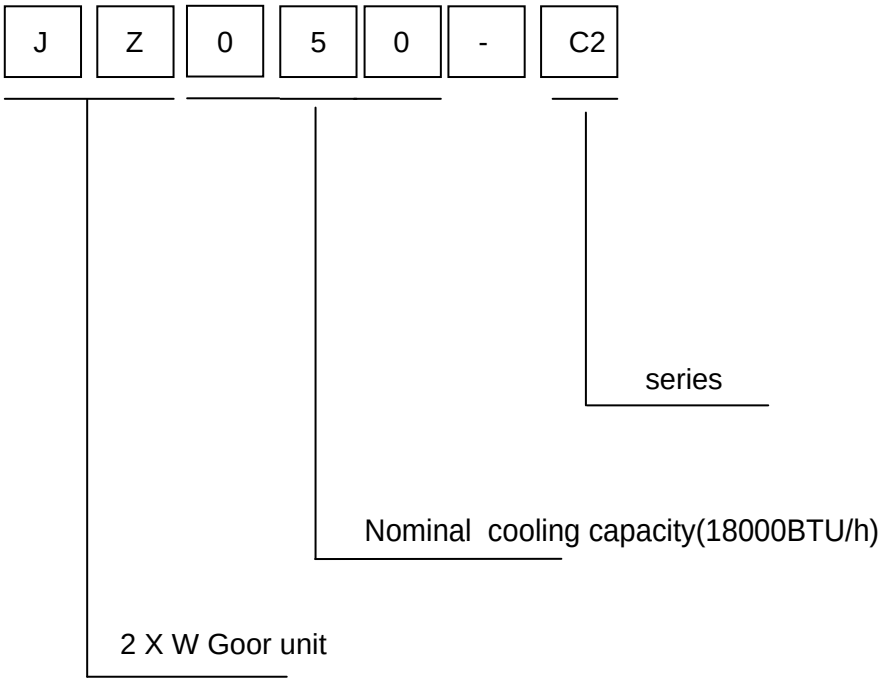
Contents

1.Introduction 1
2.Specifications 7
3.Sensors list 8
4.Pinping diagrams 9
5.Operation range 10
6.Printed Circuit Board Connector Wiring Diagram 11
7.Outdoor Functions and Control 14
8.Dimensional drawings 28
10.Service Diagnosis 29
11.Performence and cerves diagrams 45
12.Sound level 61
13.Circuit diagrams 62

1.Introduction

1.1 Model name explanation



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VLQFH WKH\ FDQ OHDG WR GHDWK RU VHULRXV LQMXU\ LI WKH\ DUH Q
WR VHULRXV DFFLGHQWV XQGHU VRPH FRQGLWLRQV LI WKH\ DUH QRW
FDXWLRQ LWHPV GHVFULEHG EHORZ
$ERXW WKH SLFWRJUDPV
¸ 7KLV V\PERO LQGLFDWHV DQ LWHP IRU ZKLFK FDXWLRQ PXVW EH H[
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" 7KLV V\PERO LQGLFDWHV DQ DFWLRQ WKDW PXVW EH WDNHQ RU DQ
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3RZHU VXSSO\ IURP LQGRRU NZ NZ•• PP• PP 3RZHU VXSSO\ IURP RXW
• PP
&KHFN WKH HPEHGGHG ZLUH DUH IRXU URRWV RU QRW 1 & 1 ' 1 'RHV
IURP SRZHU JULG ZLOO LPSDFW WR WKH SHUIRUPDQFH
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&DXWLRQ LQ 5HSDLU

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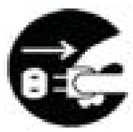
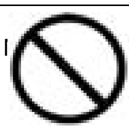
%H VXUH WR GLVFRQQHFW WKH SRZHU FDEOH SOXJ IURP WKH SOXJ VRFNHW EHIRU D UHSDLU :RUNLQJ RQ WKH HTXLSPHQW WKDW LV FRQQHFWHG WR D SRZ SO\ FDQ ,I LW LV QHFHVVDU\ WR VXSSO\ SRZHU WR WKH HTXLSPHQW W XFW WKH WRXFK DQ\ HOHFWULFDOO\ FKDUJHG VHFWLRQV RI WKH HTXLSPHQW	
,I WKH UHIULJHUDQW JDV GLVFKDUJHV GXULQJ WKH UHSDLU ZRU RW WRXF UHIULJHUDQW JDV FDQ FDXVH IURVWELWH	

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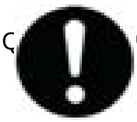
,I WKH UHIULJHUDQW JDV OHDNV GXULQJ WKH UHSDLU ZRUN YHQWLODWH WKH D WR[LF JDVHV ZKHQ LW FRQWDFWV IODPHV	
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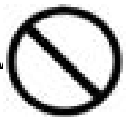
'R QRW VWDUW RU VWRS WKH DLU FRQGLWLRQHU RSHUDWLRQ E JLQJ RU X 3OXJJLQJ RU XQSOXJJLQJ WKH SRZHU FDEOH SOXJ WR RSHUDWH WKH HTXLSP ILUH	

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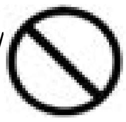
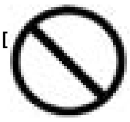
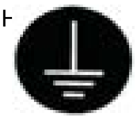
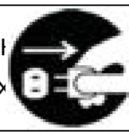
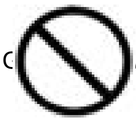
'R QRW UHSDLU WKH HOHFWULFDO FRPSRQHQWV ZLWK ZHW KDQGV FDXVH DQ HOHFWULFDO VKRFN	
'R QRW FOHDQ WKH DLU FRQGLWLRQHU E\ VSODVKLQJ ZDWHU :DWHU RQ WKH XQ VKRFN	
%H VXUH WR SURYLGH WKH JURXQGLQJ ZKHQ UHSDLULQJ WKH HTXLSPHQW LQ HOHFWULFDO VKRFN	
%H VXUH WR WXUQ RII WKH SRZHU VZLWFK DQG XQSOXJ WKH SRZHU FDEOH ZKHQ LQWHUQDO IDQ URWDWHV DW D KLJK VSHHG DQG FDXVH LQMXU\	
'R QRW WLOW WKH XQLW ZKHQ UHPRYLQJ WKH XQLW 7KH ZDWHU LQ WKH XQLW FDQ VSLOO DQG WKH IXUQ	
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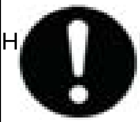
8VH WKH ZHOGHU LQ D ZHOO YHQWLODWHG SODFH 8VLQJ WKH ZHOGHU LQ DQ HQFORVHG URRP FDQ FDXVH R[\JHQ GHILFLHQF\	

&DXWLRQV 5HJDUGLQJ 3URGXFWV DIWHU 5HSDLU

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FRQGXFWLQJ WKH HTXLSPHQW 7KH XVH FDXVH DQ HOHFWULFDO VKRFN H[FHVVLYH KHDW JHQHUDWLRQ RU ILUH	
:KHQ UHORFDWLQJ WKH HTXLSPHQW PDNH VXUH WKDW WKH QHZ LQVWDOODWLR ZLWKVWDQG WKH ZHLJKW RI WKH HTXLSPHQW ,I WKH LQVWDOODWLRQ VLWH GRHV QRW KDYH VXIILFLHQW VWUHQJWK DQG LI VHFXUHO\ WKH HTXLSPHQW FDQ IDOO DQG FDXVH LQMXU\	
%H VXUH WR LQVWDOO WKH SURGXFW FRUUHFWO\ E\ XVLQJ WKH SURYLGHG VWDQ ,QFRUUHFW XVH RI WKH LQVWDOODWLRQ IUDPH DQG LPSURSHU LQVWDOODWL LQ LQMXU\	)RU LQWHJUDO XQLWV RQO\
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'R QRW PLJDV RU RKHU WKDQ WKH VSHFLILHG UHIULJHUDQW 5 LQ WKH UHIUL ,I DLUVWKHU WKH UHIULJHUDWLQJ V\VWHP DQ H[FHVVLYHOWV FDXVLQJ HTXLSPHQW DQG LQMXU\	
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LWVHOI LV KDUPOHVV EXW LW FDQ JHQHUDWH WR[LF JDVHV ZKHQ LW FRQWDFWV IOD VWRYHV DQG UDQJHV
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&DXRQ
,QVWUDWLRQ RI D OHDNDJH EUHDNHU LV QHFHVVDU\ LQ VRPH FDVHV GHSHQGL LQVWDOODWLRQ VLWH WR SUHYHQW HOHFWULFDO VKRFNV
'R QRW LQVWDOO WKH DSSOLDQFH ZKHUH WKHUH LV D SRVVLELOLW PEXVWLE ,I D FRPEXVWLEOH JDV OHDNV DQG UHPDLQV DURXQG WKH XQ FDQ FDX
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&KHFN WKH JURXQGLQJ DQG UHSDLU LW LI WKH HTXLSPHQW LV QI :SHUO\ JU FDXVH DQ HOHFWULFDO VKRFN
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8LVQJ ,FRQV

,FRQV DUH XVHG WR DWWUDFW WKH DWWHQWLRQ RI WKH UHDGHU WR VSH WKH WDEOH EHORZ

8VLQJ ,FRQV /LVW

,FRQ	7\SH RI ,QIRUPDWLRQ	
1RWH	1RWH	$ ³QRWH´ SURYLGHV LQIRUPDWLRQ WKDW LV Q QHYHUWKHOHVV EH YDOXDEOH WR WKH UHDGH
&DXWLRQL	&DXWLRQ	$ ³FDXWLRQ´ LV XVHG ZKHQ WKHUH LV GDQJHU LQFRUUHFW PDQLSXODWLRQ PD\ GDPDJH HTX DQ XQH[SHFWHG UHVXOW RU KDV WR UHVWDUW S
:DUQLQJ	:DUQLQJ	$ ³ZDUQLQJ´ LV XVHG ZKHQ WKHUH LV GDQJHU
	5HIHUHQFH	$ ³UHIHUHQFH´ JXLGHV WKH UHDGHU WR RWKH WKLV PDQXDO ZKHUH KH VKH ZLOO ILQG DGGL VSHFLILF WRSLF

2.Specifications

NOMINAL DISTRIBUTION SYSTEM VOLTAGE		
Phase	/	1
Frequency	Hz	50
Voltage	V	2

NOMINAL CAPACITY and NOMINAL INPUT			
		Cooling	heating
Capacity rated	kW	5	5.2
	Btu/h	17060	17740
Power Consumption(Rated)	kW	1.	1.40
SEER/SCOP	W/W	6.1/A++	4.0/A+
Annual energy consumption	kWh	287	1610
Moisture Removal	m³/h	2.0*10 μ³	

TECHNICAL SPECIFICATIONS-UNIT			
Dimensions	H*W*D	mm	800×2 ×55
Packaged Dimensions	H*W*D	mm	[[
Weight	/	KG	32.7
Gross weight	/	KG	36.5
Sound level	Sound peessure	dB	53
	Sound power	dB	

ELECTRICAL SPECIFICATIONS			
		Cooling	heating
Nominal running current	A		6.3
Maximum running current	A	8.9	11.3
Starting current	A	1	1

TECHNICAL SPECIFICATIONS-PARTS				
			cooling	heating
Compressor	Type		Rotary Compressor	
	Model		* 7 ' 5 . 5) / 9 %	
	Motor output	W		
	Oil type		$ & 6 5 R U H T X L Y D O H Q W	
	Oil charge volume	L	0.	
Fan	Type		Axial fan	
	Motor output	W	40	
	Air flow rate(high)	m³/h	2500	
	Speed(high/low)	rpm	950/300	
Heat	Type		ML fin- 37HI-HX tube	

exchanger	Row*stage*fitch	2*26*1.4	
TECHNICAL SPECIFICATIONS-OTHERS			
Refrigerant circuit	Refrigerant type		R32
	Refrigerant charge	KG	0.90
	Maximum allowable distance between indoor an outdoor	M	5
	Maximum allowable level difference	m	1
	Refrigerant control	capillary	
Piping connections (external diameter)	liquid	mm	-6.35
	gas	mm	-12.7
	drain	mm	-16
Heat insulation type		Both liquid and Gas pipes	
Max. piping Length		m	
Max. Level Difference		m	
Chargeless		m	
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

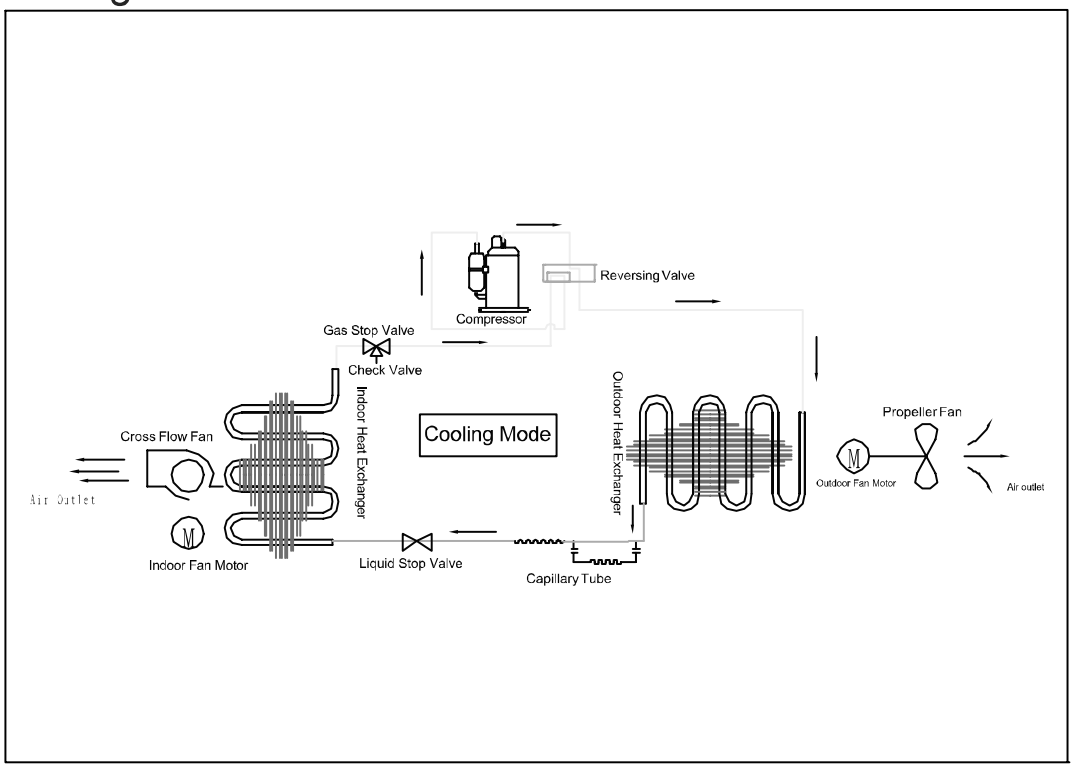
Conversation formulae
Kcal/h= kW×860
Btu/h= kW×3414
cfm=m³/min×35.3

3.Sensors list

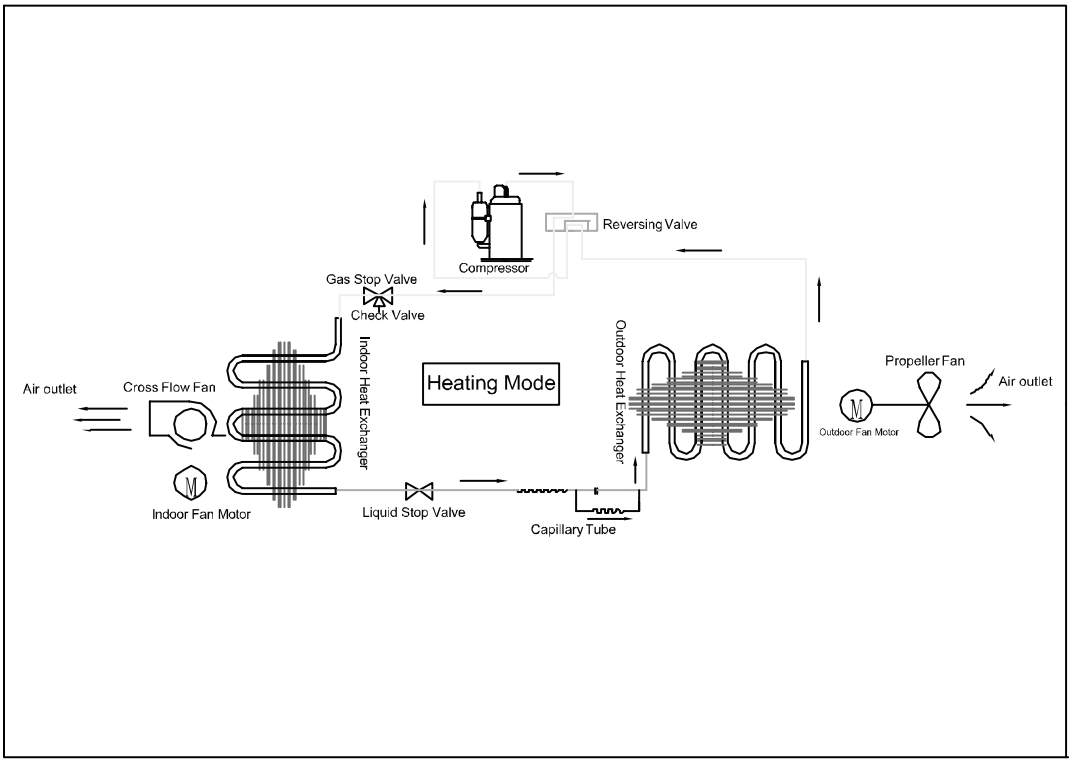
type	Description	Qty
Ambient sensor	Its used for detecting temperature of outdoor side	1
Defrosting sensor	Its used for controlling outdoor defrosting at heating mode	
Descharging sensor	Its used for compressor in case of over-heat	

4.Piping diagrams

Cooling mode

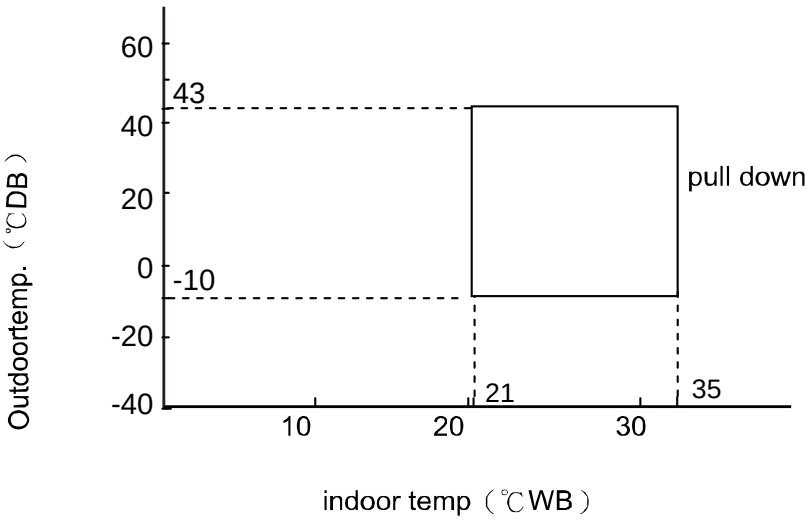


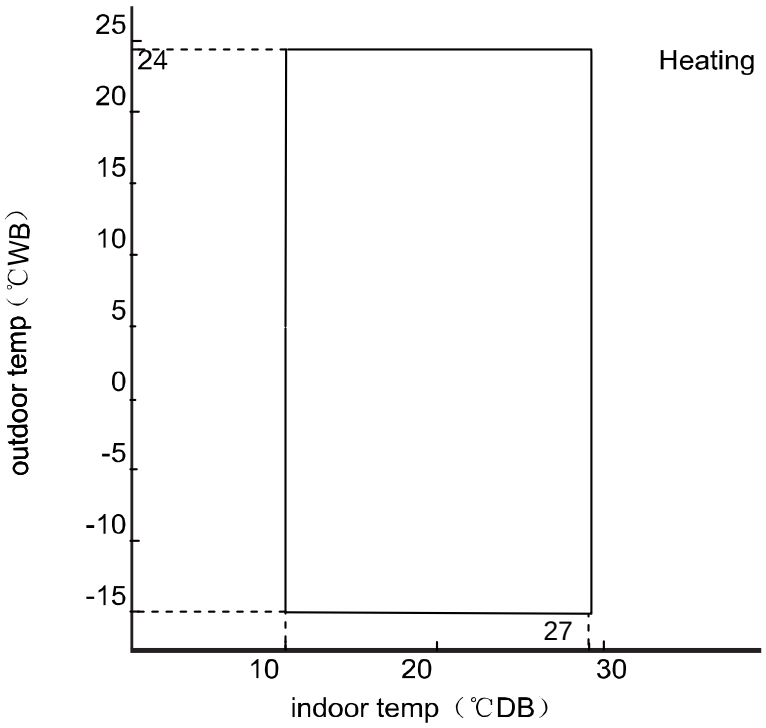
Heating mode



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.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	CN2’	Connector for the U, V, W wire of the compressor
5	CN3’	
6	CN4’	
7	LI (CN7)	Connector for reactor
8	LO (CN6)	
9	CN21	Connector for fan motor
10	CN10	Connector for four way valve coil
11	CN20	Connector for Temperature sensor
12	CN18	
13	CN5	Connector for Terminal Socket-protection
14	CN4	Connector for communicate between indoor and outdoor unit
15	CN16	Connector for electric expansion valves

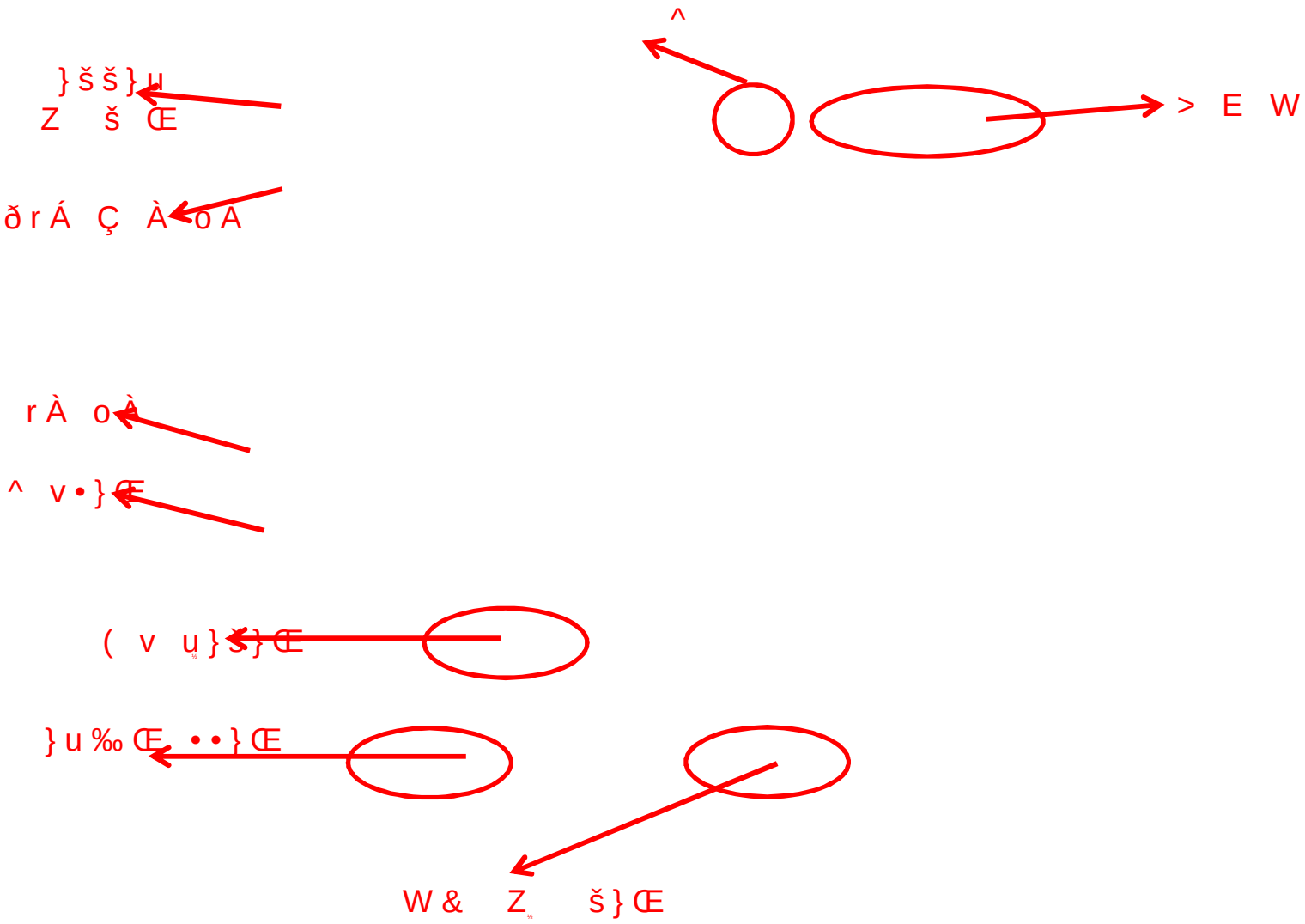
Note: Other Designations

1) FUSE 1, (20A, 250VAC); FUSE 2(3.15A, 250VAC)

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

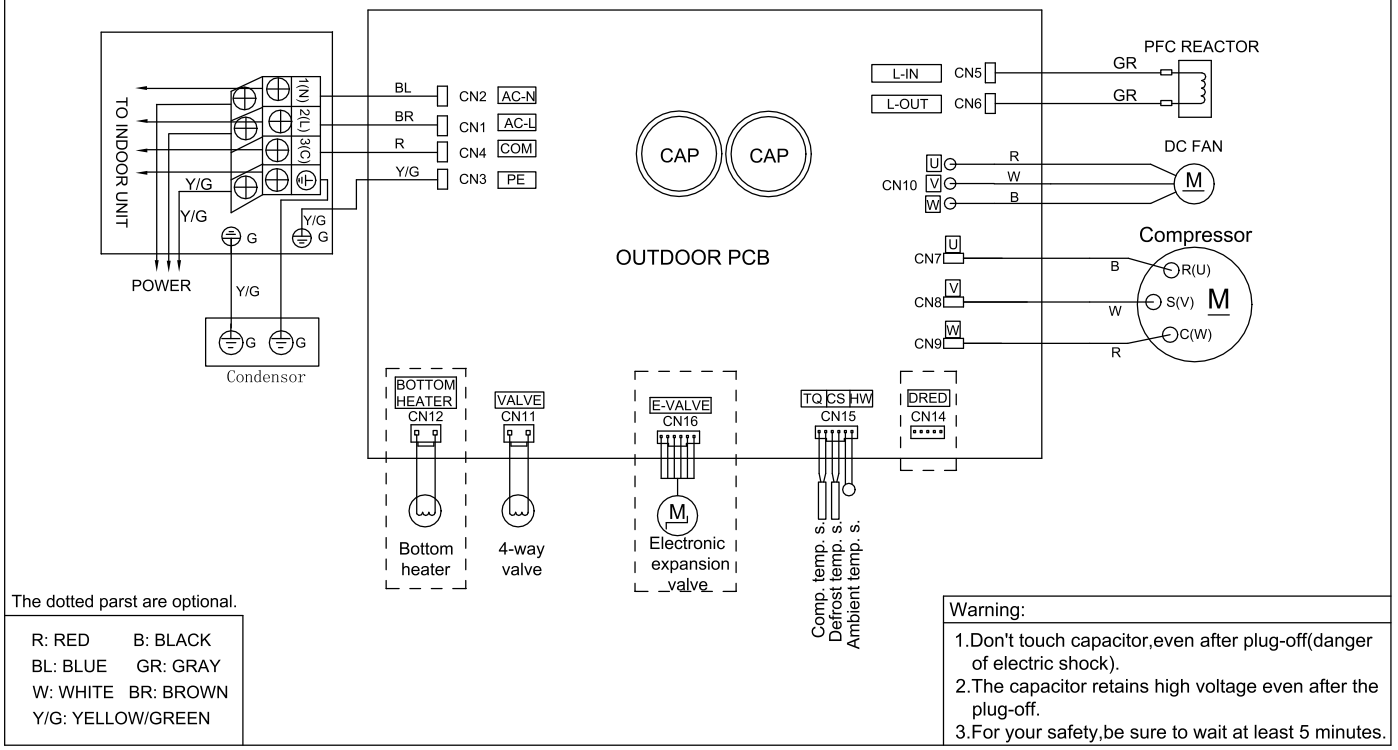
3) RV1, RV2, RV3, RV4 Varistor

PCB (1)



Wiring diagrams

OUTDOOR WIRING DIAGRAM 0011512410



The dotted parst are optional.

R: RED	B: BLACK
BL: BLUE	GR: GRAY
W: WHITE	BR: BROWN
Y/G: YELLOW/GREEN	

Warning:

1. Don't touch capacitor,even after plug-off(danger of electric shock).
2. The capacitor retains high voltage even after the plug-off.
3. For your safety,be sure to wait at least 5 minutes.

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 Ö

Mode	Minimum operation frequency	Maximum operation frequency
Heating	2 Hz	85Hz
Refrigeration	2 Hz	1 Hz

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 30second,one minute, 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) Èthen 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

Refrigeration/dehumidification mode:

Pn=(Nh_c- S_c)*10 150 outdoor environment control

Pn=(Nh_c- S_c) *10 Ø50 PID control

Heating mode:

Pn=(S_c -Nh_c) *10 1 60 outdoor environment control

Pn=(S_c -Nh_c) *10 Ø60 PID control

(Nh_c=indoor environment temperature S_c=setting temperature)

1 ÅThe minimum/maximum frequency limitation

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

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

2 ÅThe 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_hz1 HZ

2	Wh_c<-8	Max_hz2 HZ
3	Wh_c<-2	Max_hz3 HZ
4	Wh_c<5	Max_hz4 HZ
5	Wh_c<10	Max_hz5 HZ
6	Wh_c<17	Max_hz6 HZ
7	Wh_c<20	Max_hz7 HZ
8	Wh_c> Ù20	Max_hz8 HZ

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 3 HZ
2	Wh_c<22	Max_hz2 HZ
3	Wh_c<29	Max_hz3 HZ
4	Wh_c<32	Max_hz4 HZ
5	Wh_c<40	Max_hz5 HZ
6	Wh_c<48	Max_hz6 HZ
7	Wh_c>=48	Max_hz7 HZ

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 Ùthe 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

Refrigeration/dehumidification mode:

The indoor setting airflow speed	Low	Medium	Quiet
The percentage of the rated frequency K	70%	85%	5 %

Heating mode:

The indoor setting airflow speed	Low	Medium	Quiet
The percentage of the rated frequency K	%	90%	51%

The calculation of the actual output frequency:

F= F-ED-*(rated frequency) hK

F-ED-*(rated frequency)= The frequency which is limited by the outdoor environment temperature

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)

PID control :

The innital frequency Sn is determined by Pn . We can calculate Hzoutf according to the value of Kp ,Ki ,Kd, Out_gain,Pn.Then , Fn = Sn + Hzoutf. The value of Fn is calculated in each sample time (60 seconds),and Fn is adujusted according to previous frequency of Sn and filtered output of Hzoutf.

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

Within three minutes of compressor starting, the compressor is controled according to the ambient temperature.

Tao Ä Å	Tao <22	22 < Tao <29	Tao 129
Refrigeration/dehumidification	500rpm	600rpm	700rpm
Tao Ä Å	Tao <<10	10 < Tao <16	Tao 116
Heating	800rpm	760rpm	400rpm

After 3 minutes, the compressor is controled according to the ambient temperature and the frequency of the compressor.

Refrigeration/dehumidification frequency ÄHz Å		<51 Hz	51-70 Hz	1 70 Hz
Tao Ä Å	022	500rpm	600rpm	700rpm
	22-	500rpm	600rpm	760rpm
	29-38	600rpm	700rpm	800rpm
	138	800rpm		
Heating frequency ÄHz Å		<51 Hz	51-90 Hz	190 Hz
Tao Ä Å	010	760rpm	850rpm	950rpm
	10-17	400rpm	760rpm	800rpm
	117	400rpm		

7.1.4 Four way control

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

Four way working in other ways:

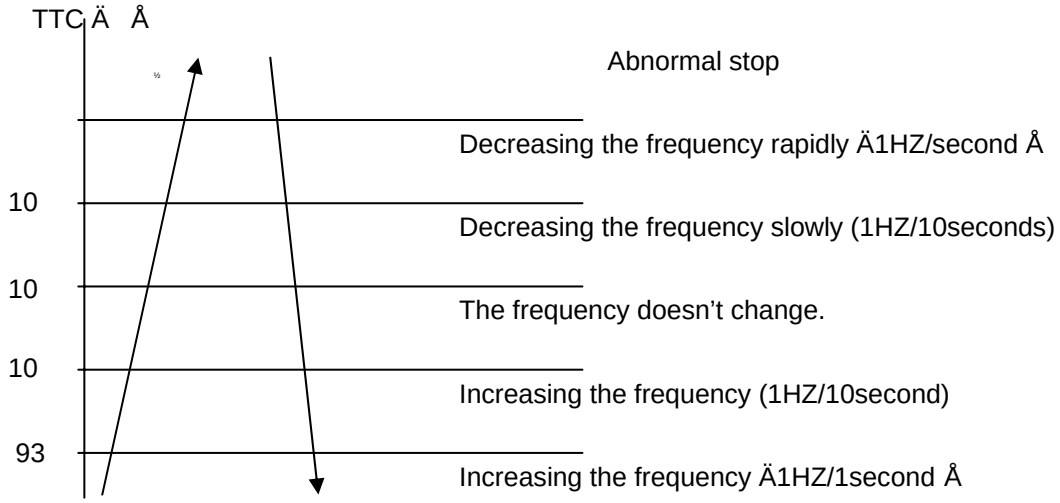
Under the mode of heating, open the four-way valve, when the compressor is not started or changed to non-heating mode, make sure the compressor is stoped for 2 minutes, and then close the four-way valve.

7.1.5 Protection function

7.1.5.1 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.



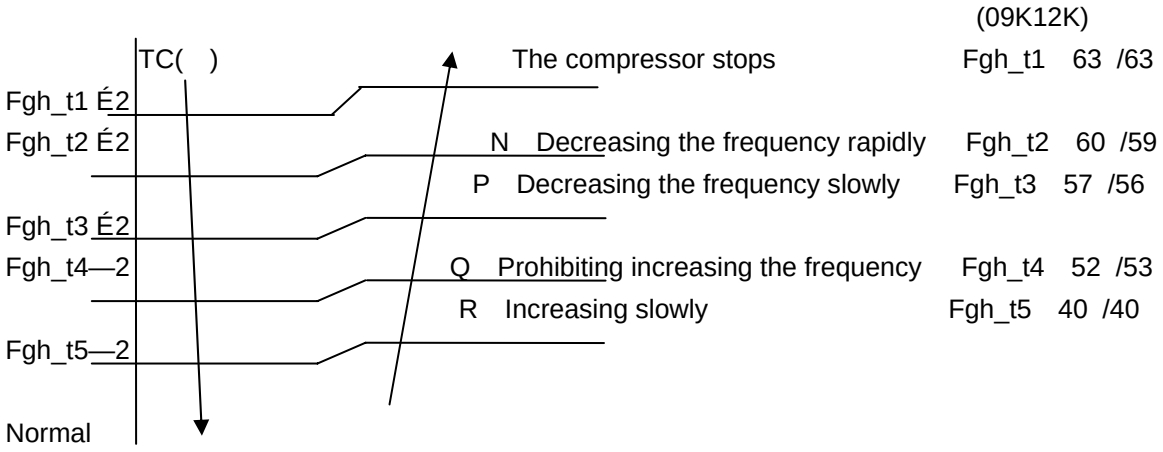
TTC>=110 lasts for 20 seconds. Overheating protection of air-blowing, alarm malfunction to the indoor, others don't last.

7.1.5.2 TC high temperature-preventing control of the indoor heating unit Ö

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 63 , 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 45 , recover to the normal control.



N ÖDecreasing at the speed of 1HZ/1 second

P ÖDecreasing at the speed of 1Hz/10 seconds

Q ÖContinue to keep the last-time instruction cycle

R ÖIncreasing at the speed of 1Hz/10seconds

Remarks: the outdoor unit

7.1.5.3 The control of preventing the over current of the compressor:

½During the starting process of the compressor, if the current of the compressor is greater than 12.5A for 3 seconds, stop the compressor and alarm, after 3 minutes, start it again, if such state appears 3 times in 20 minutes, stop the compressor and alarm, and confirm the malfunction. Then continue to run it only after the power is off.

½During the starting process of the compressor, if the AC current is greater than 9A, the frequency of the compressor decreases at the speed of 1HZ/second.

½During the starting process of the compressor, if the AC current is greater than 8A, the frequency of the compressor decreases at the speed of 0.1HZ/second.

½During the starting process of the compressor, if the AC current is greater than 7.5A, the frequency of the compressor increases at the prohibited speed.

½During the starting process of the compressor, if the AC current is greater than 6.5A, the frequency of the compressor increases at the speed of no faster than 0.1HZ/second.

7.1.5.4 The protection function of AC current:

During the starting process of the compressor, if the AC current is greater than 12.5A for 3 seconds, stop the compressor and alarm, after 3 minutes, start it again, if such state appears 3 times in 20 minutes, stop the compressor and alarm, and confirm the malfunction. Then continue to run it only after the the power is off.

During the starting process of the compressor, if the AC current is greater than 9A, the frequency of the compressor decreases at the speed of 1HZ/second.

During the starting process of the compressor, if the AC current is greater than 8A, the frequency of the compressor decreases at the speed of 0.1HZ/second.

During the starting process of the compressor, if the AC current is greater than 7.5A, the frequency of

the compressor increases at the prohibited speed.

During the starting process of the compressor, if the AC current is greater than 6.5A, the frequency of the compressor increases at the speed of no faster than 0.1HZ/second.

Remarks: when the outdoor temperature is high, there's compensation for AC current protection.

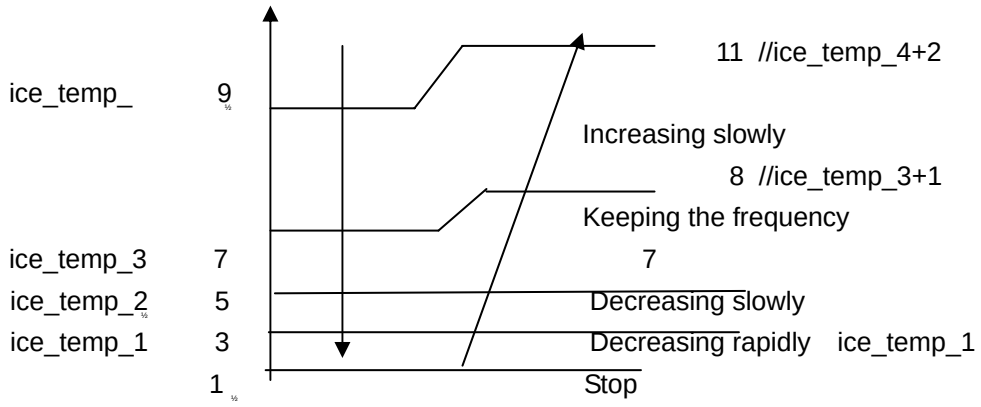
(1) When the outdoor environment temperature is higher than 40 , AC current protection value decreases by 2A/1A(09K/12K).

(2) When the outdoor environment temperature is higher than 50 , AC current protection value decreases by 3A/2A(09K/12K).

7.1.5.5 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).



When Tpg_indoor Ç ice_temp_1, the frequency of the compressor decreases at the speed of 1HZ/1second.

When Tpg_indoor Ç ice_temp_2, the frequency of the compressor decreases at the speed of 1HZ/10seconds.

When Tpg_indoor begins to rise again, and ice_temp_2 0Tpg_indoor 0 ice_temp_3, the frequency of the compressor doesn't change.

When ice_temp_3 ÇTpg_indoor Çice_temp_4 , the frequency of the compressor increases at the speed of 1HZ/10seconds.

For example, Tpg_indoor 00 Èlast for 2 minutes, and then the outdoor unit will stop, and report underload malfunction, but don't send malfunction report to the indoor.

The compressor stops for more than 3 minutes, Tpg_indoor> ice_temp_3+1 , the compressor recovers.

7.1.5.6 The frequency limitation of modification rate

In the field which is controlled by high frequency, if the modification rate is not high enough, the control-driven chip will enter into weak magnetic control, this will help to relieve the problem of modification rate. If during the course of weak magnetic control, the modification rate is still not high enough, enter into the control of decreasing frequency until the alarm of modification rate is relieved.

7.1.5.7 Temperature protection of the outdoor refrigerating coil

When the defrosting temperature and the sensor's temperature are higher than 68 , the frequency of

the compressor decreases 1hz/10seconds. Keep the frequency until it decreases to the lowest frequency. When the temperatures are lower than 68 and higher than 62 , keep the frequency of the compressor. When the temperatures are lower than 62 , relieve the defrosting temperature protection.

7.2 Value of Thermistor

Ambient Sensor, Defrosting Sensor, Pipe sensor

R25 =10K ¡ f3% B25 /50 =3700K f3%

Temp.( )	Max.(K)	Normal(K)	Min.(K)	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 =50K ¡ f3%

B25/80 =4450K f3%

Temp.(( ))	Max.(K)	Normal(K)	Min.(K)	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

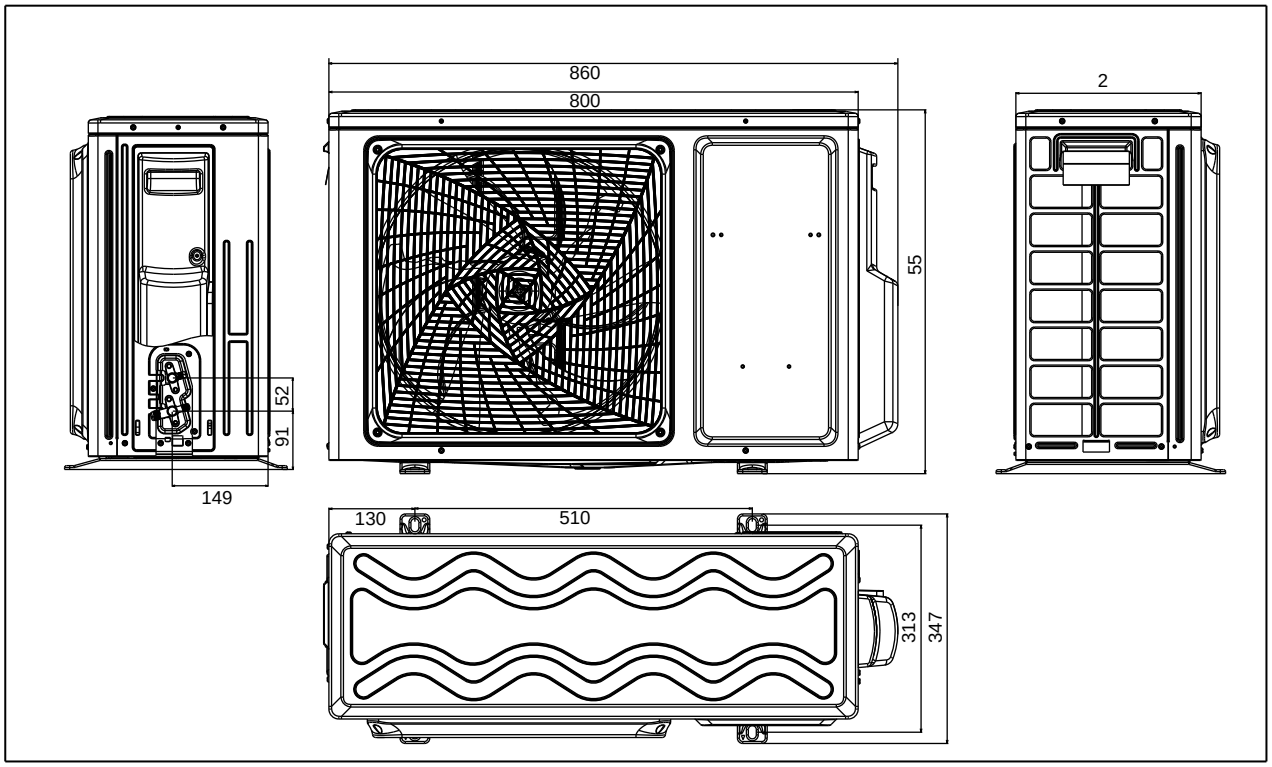
-21	7928.7217	6647.4547	5568.2222	-2.84	2.39
-20	7423.3626	6235.7109	5233.3554	-2.83	2.39
-19	6953.2930	5851.9864	4920.6791	-2.82	2.38
-18	6515.8375	5494.2064	4628.5894	-2.80	2.37
-17	6108.5393	5160.4621	4355.6078	-2.79	2.37
-16	5729.1413	4848.9963	4100.3708	-2.77	2.36
-15	5375.5683	4558.1906	3861.6201	-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	3699.5139½	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	1541.5904½	1355.6163	1191.0048	-2.43	2.15
7	1458.1938½	1284.3593	1130.2298	-2.41	2.14
8	1379.7528	1217.2282	1072.8813	-2.40	2.13
9	1305.9472½	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	896.4981½	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	41.7386½	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	32.9075½	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	25.3290½	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	21.6159½	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	19.6899½	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	14.5599½	13.5942	12.6811	-2.36	2.23
120	14.1376½	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	9.7563½	8.9971	8.2895	-3.00	2.80
134	9.4901	8.7441	8.0495	-3.05	2.84
135	9.2322½	8.4993	7.8175	-3.09	2.88
136	8.9824½	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 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.

10.3 Error Codes and Description indoor display

	Code indication				fault description	Reference Page
	Indoor displaying panel code indication			Outdoor (LED1 flash times)		
	Other display		Only For 498 and 498A display (Red/Green Time Run ¶On ¾Flash µ Off)			
Indoor and Outdoor	E7	Directly display	µ µ ¾	15	Communication fault between indoor and outdoor units	Page.42
Indoor Malfunction	E1	Directly display	¾ µ µ	/	Indoor temperature sensor failure	Page.31
	E2	Directly display	¾ ¶ ¶	/	Indoor coil sensor failure	Page.31
	E4	Directly display	¾ ¶ ¾	/	Indoor eeprom failure	Page.32
	E14	Directly display	µ ¶ ¾	/	Indoor fan failure	Page.33
Outdoor Malfunction	E5	Trouble record	¶ µ ¾	22	Internal unit antifreeze protection	/
	E9	Trouble record	¶ µ ¾	21	Internal unit overload	/
	F12	Directly display	µ ¾ µ	1	Eeprom failure	Page.32
	F1	Directly display	¶ ¾ ¾	2	IPM failure	Page.36
	F22	Directly display	¾ ¾ µ	3	AC current overcurrent protection	Page.37
	F3	Directly display	µ ¾ µ	4	Communication error between module board and main PCB board.	Page.39
	F20	Trouble record	µ ¾ ¶	5	High pressure protection	/
	F19	Trouble record	µ ¾ ¶	6	Power over/under voltage protection	Page.40
	F27	Directly display	µ ¾ µ	7	Compressor stall / press instantaneous stop	/
	F4	Directly display	µ ¾ µ	8	Compressor discarging temperature protection	Page.41
	F8	Trouble record	µ ¾ ¶	9	Abnormal of DC motor	Page.41
	F21	Directly display	¶ ¶ ¾	10	Abnormal of piping sensor	Page.31
	F7	Directly display	µ ¾ µ	11	Suction temperature sensor failure	Page.31
	F6	Directly display	¶ ¾ µ	12	Abnormal of outdoor ambient sensor	Page.31
	F25	Directly display	¾ ¶ µ	13	Abnormal of compressor discharge sensor	Page.31
	F13	Trouble record	µ ¾ ¶	16	Lack of refrigerant	/
	F14	Trouble record	µ ¾ ¶	17	4-way valve reverse failure	/
	F11	Directly display	µ ¾ µ	18	Compressor jam (only for spdu)	Page.44
	F28	Directly display	µ ¾ µ	19	Module PWM select circuit error	Page.44
	F15	Trouble record	µ ¾ ¶	20	Outdoor terminal block temperature protection	/
	F2	Trouble record	µ ¾ ¶	24	Instantaneous over-current protection of the compressor	Page.37
	F23	Trouble record	µ ¾ ¶	25	Compressor U-phase overcurrent Compressor V-phase overcurrent Compressor W-phase overcurrent	Page.42
	F9	Trouble record	/	26	Module reset	/
	F24	Trouble record	¾ µ ¾	27	CT disconnection	/
	F34	Trouble record	/	37	Outdoor coil protection	/
	F35	Trouble record	µ ¾ ¶	38	Compressor driver board failure	/
	F43	/	µ ¾ µ	46	Model matching abnormality	/

10.3.1 Thermistor or Related Abnormality

Indoor Display	E1: Room temperature sensor failure E2: Heat-exchange sensor failure
Outdoor display	LED1 flash 10 times ÖDefrost temperature sensor failure LED1 flash 11 times ÖSuction temperature sensor failure LED1 flash 12 times ÖAmbient temperature sensor failure LED1 flash 13 times ÖDischarge temperature sensor failure

Method of Malfunction Detection

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

Malfunction Decision Conditions

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

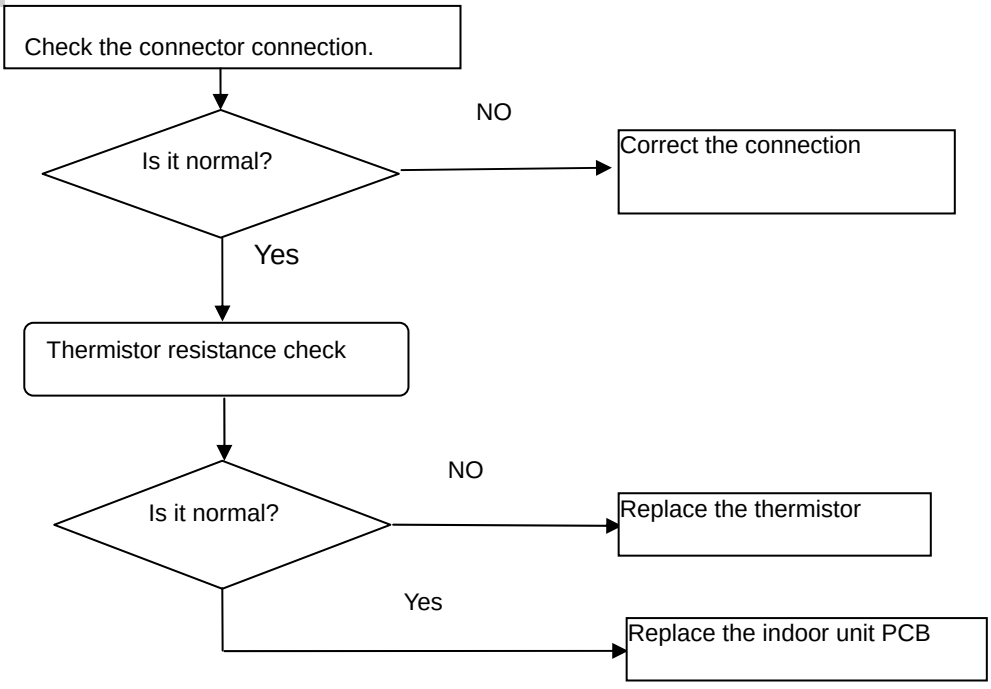
z Note: The values vary slightly in some models

Supposed Causes

v Faulty connector connection
v Faulty thermistor
v 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.

10.3.2 EEPROM abnormal

Indoor Display	E4: Indoor EEPROM error
Indoor display	F12: Outdoor EEPROM error; Outdoor LED1 flash 1 times

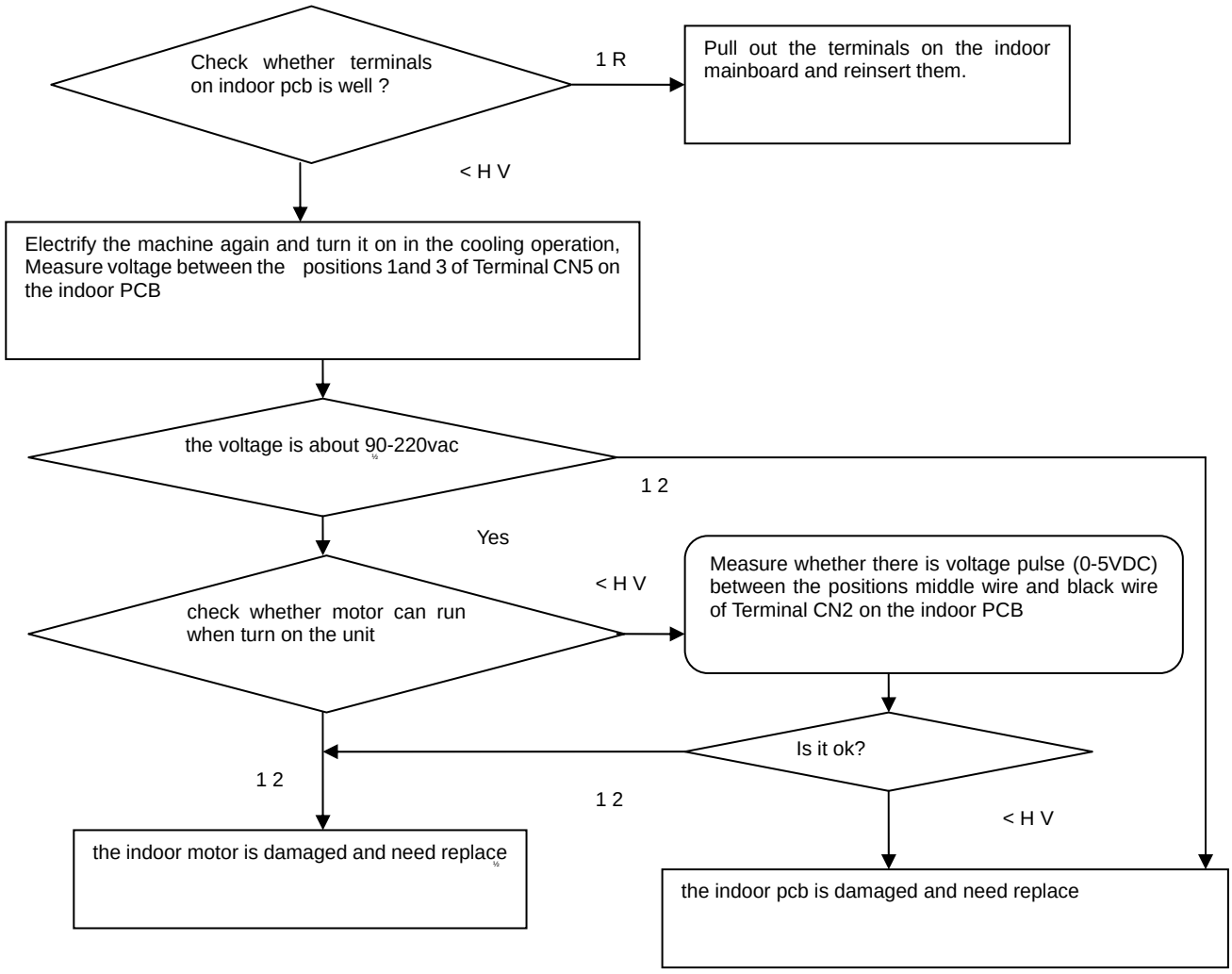
Method of Malfunction Detection	The Data detected by the EEPROM are used to determine MCU
Malfunction Decision Conditions	When the data of EEPROM is error or the EEPROM is damaged
Supposed Causes	v Faulty EEPROM data v Faulty EEPROM v Faulty PCB
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Replace the indoor or outdoor mainboard.

10.3.3 Indoor AC fan motor malfunction

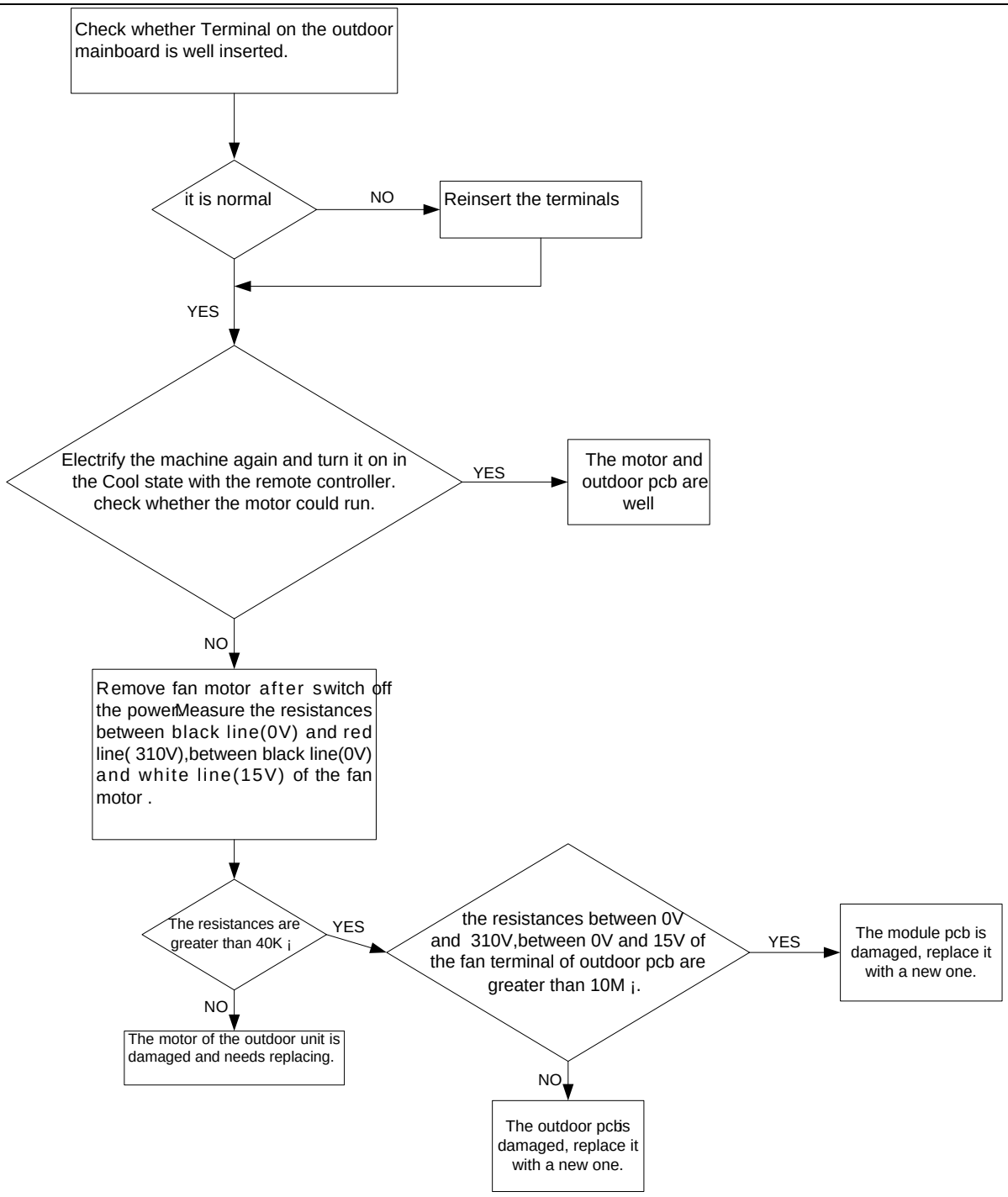
Indoor Display E14

Method of Malfunction Detection	The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor operation
Malfunction Decision Conditions	when the detected rotation feedback signal don't received in 2 minutes
Supposed Causes	vOperation halt due to breaking of wire inside the fan motor. vFan motor overheat protection vOperation halt due to breaking of the fan motor lead wires vDetection error due to faulty indoor unit PCB
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



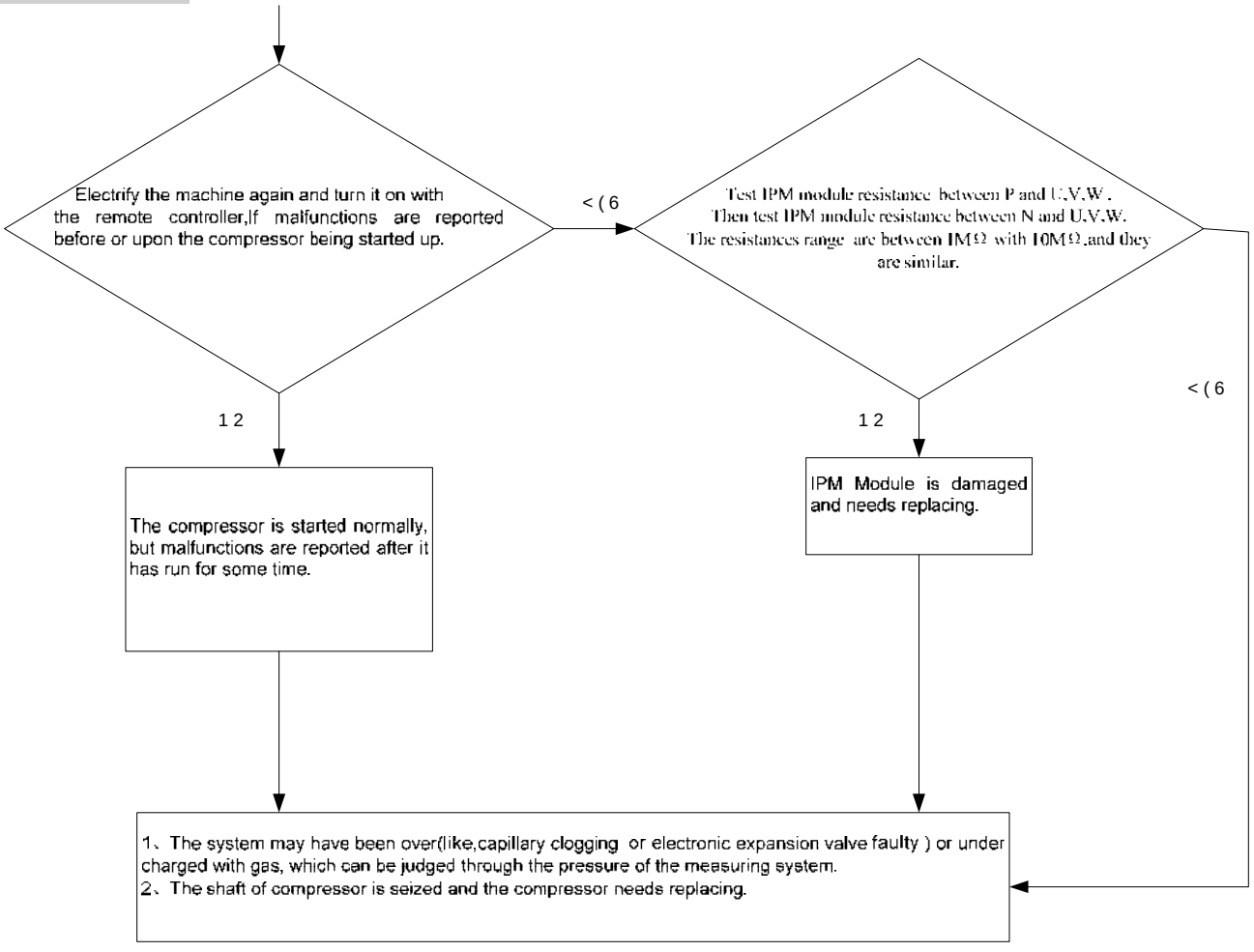
10.3.4 Outdoor DC fan motor fault

Outdoor display	LED1 flash 9 times
Method of Malfunction Detection	DC fan motor is detected by checking the fan running condition and so on
Malfunction Decision Conditions	when the data of EEPROM is error or the EEPROM is damaged
Supposed Causes	v DC fan motor protection dues to the DC fan motor faulty v 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.


Check whether Terminal on the outdoor mainboard is well inserted.
it is normal
NO
Reinsert the terminals
YES
Electrify the machine again and turn it on in the Cool state with the remote controller. check whether the motor could run.
YES
The motor and outdoor pcb are well
NO
Remove fan motor after switch off the power.Measure the resistances between black line(0V) and red line(310V),between black line(0V) and white line(15V) of the fan motor .
The resistances are greater than 40K ¡
YES
the resistances between 0V and 310V,between 0V and 15V of the fan terminal of outdoor pcb are greater than 10M ¡.
YES
The module pcb is damaged, replace it with a new one.
NO
The motor of the outdoor unit is damaged and needs replacing.
NO
The outdoor pcbis damaged, replace it with a new one.

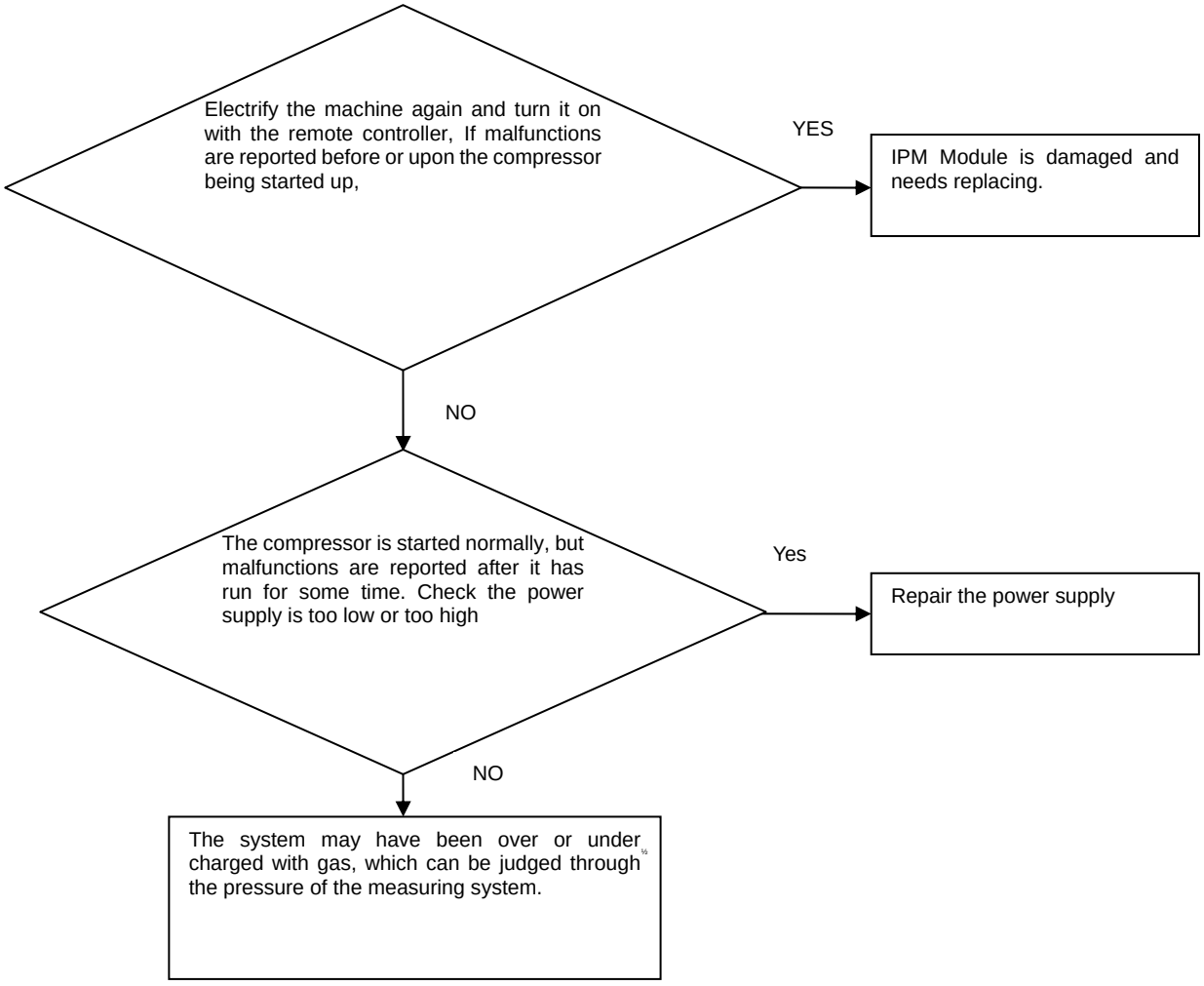
10.3.5 IPM protection

Outdoor display:	LED1 flash 2 times
Method of Malfunction Detection	IPM protection is detected by checking the compressor running condition and so on
Malfunction Decision Conditions	v The system leads to IPM protection due to over current v The compressor faulty leads to IPM protection v circuit component of IPM is broken and led to IPM protection
Supposed Causes	v IPM protection dues to the compressor faulty v IPM protection dues to faulty PCB of IPM module v Compressor wiring disconnected
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



10.3.6 Over-current of the compressor

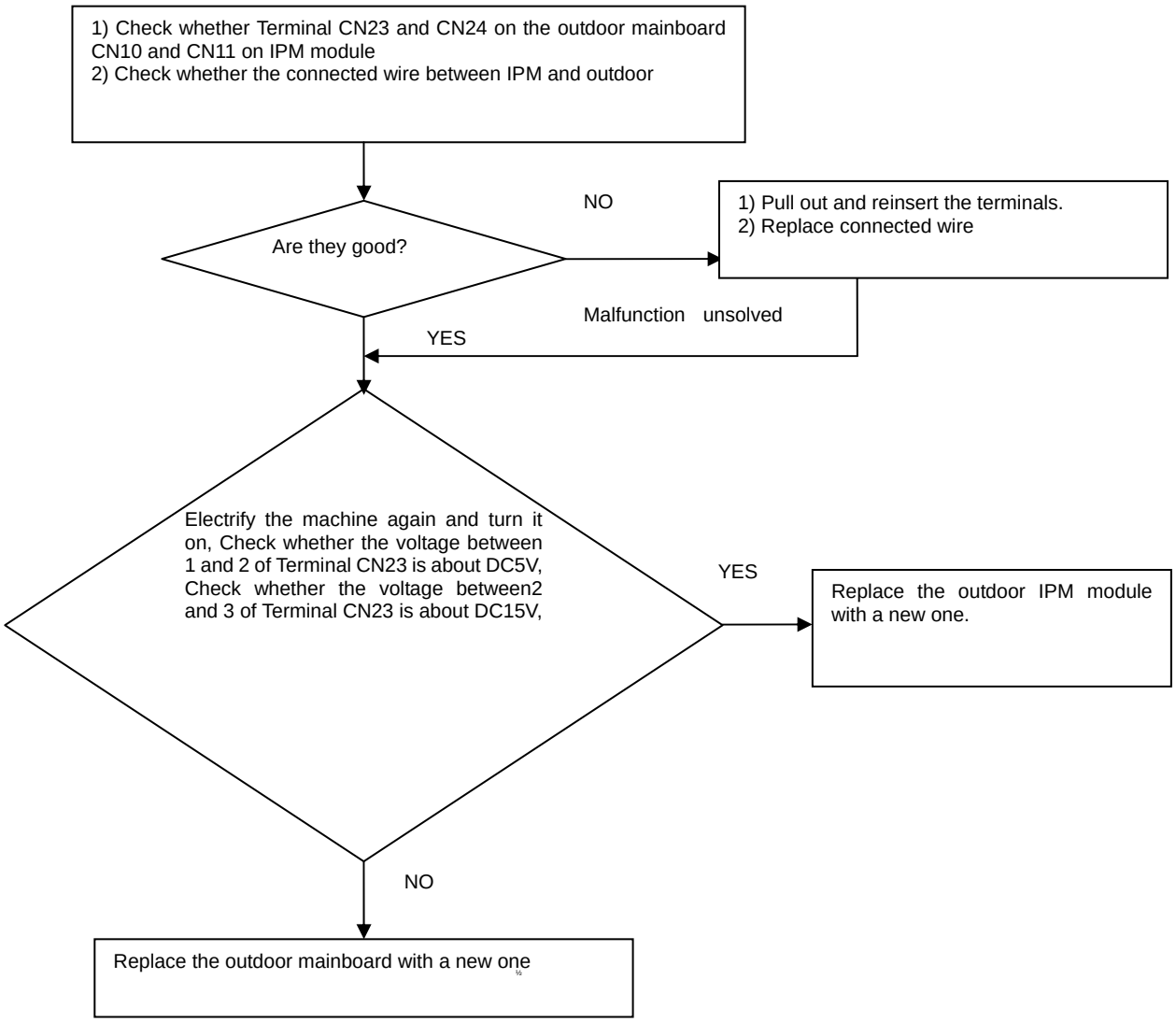
Outdoor Display:	LED1 flash 3 or 24 or 25 times
Method of Malfunction Detection	The current of the compressor is too high
Malfunction Decision Conditions	when the IPM Module is damaged or the compressor is damaged. power supply voltage is too low or too high
Supposed Causes	v Faulty IPM Module v Faulty compressor v Faulty power supply
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



10.3.7 The communication fault between IPM and outdoor PCB

Outdoor display: LED1 flash 4 times

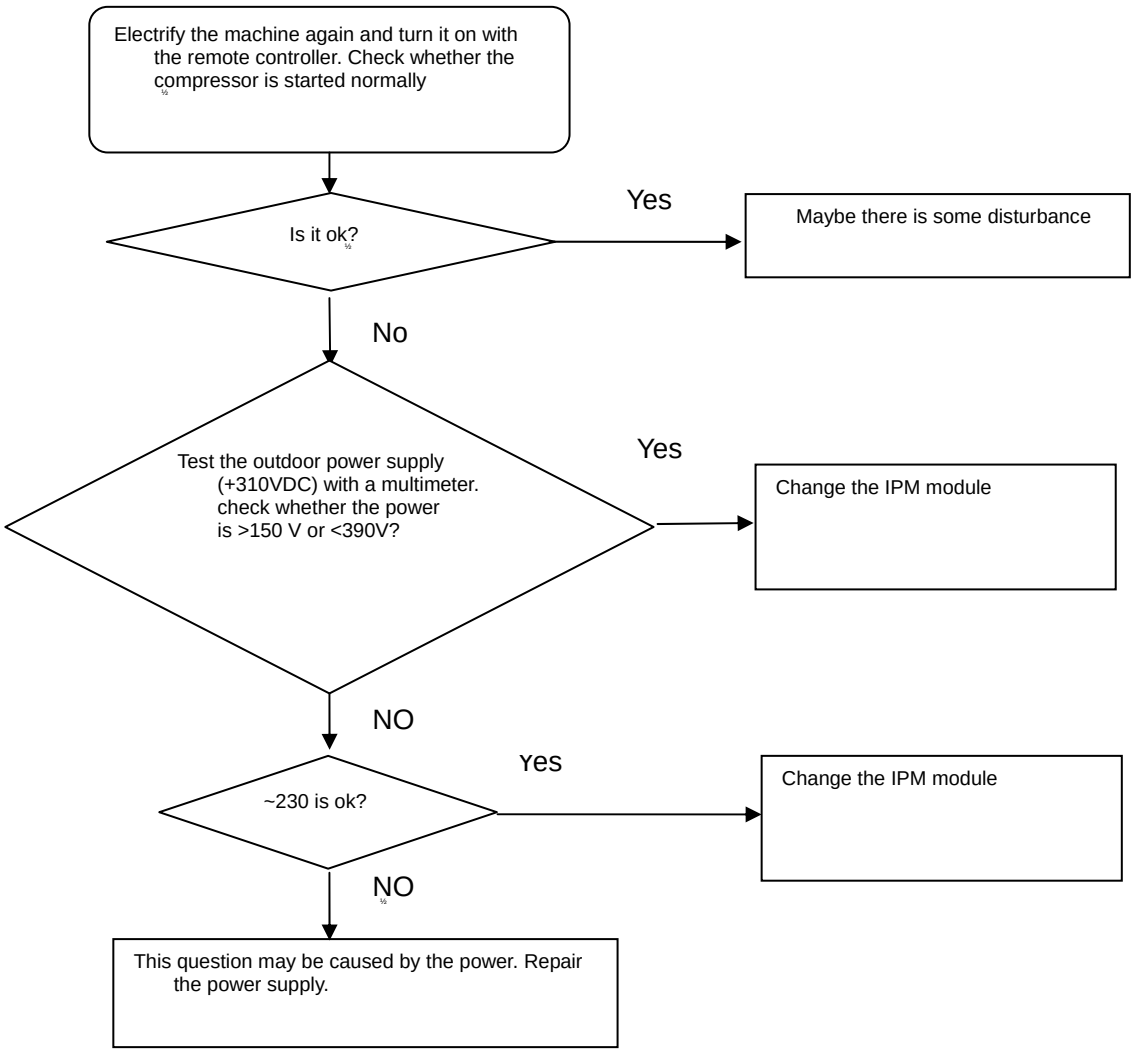
Method of Malfunction Detection	Communication is detected by checking the IPM module and the outdoor PCB
Malfunction Decision Conditions	v The outdoor PCB broken leads to communication fault v The IPM module broken leads to communication fault
Supposed Causes	v The outdoor PCB is broken v The IPM module is broken v Communication wiring disconnected
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



10.3.8 Power Supply Over or under voltage fault

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

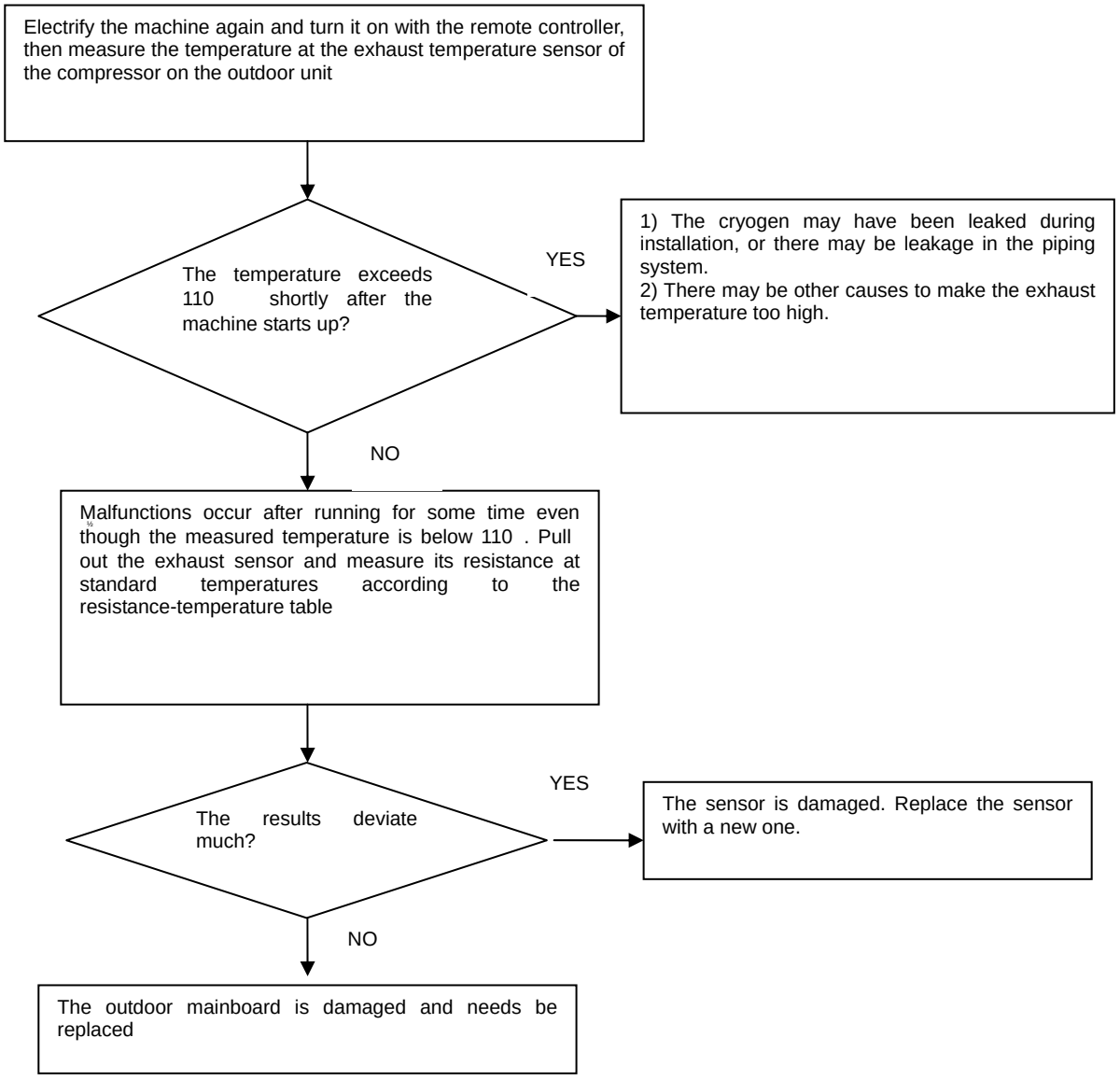
Method of Malfunction Detection	An abnormal voltage rise or fall is detected by checking the specified voltage detection circuit.
Malfunction Decision Conditions	An voltage signal is fed from the voltage detection circuit to the microcomputer
Supposed Causes	v Supply voltage not as specified v the IPM module is broken v the outdoor PCB is broken
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



10.3.9 Overheat Protection For Discharge Temperature

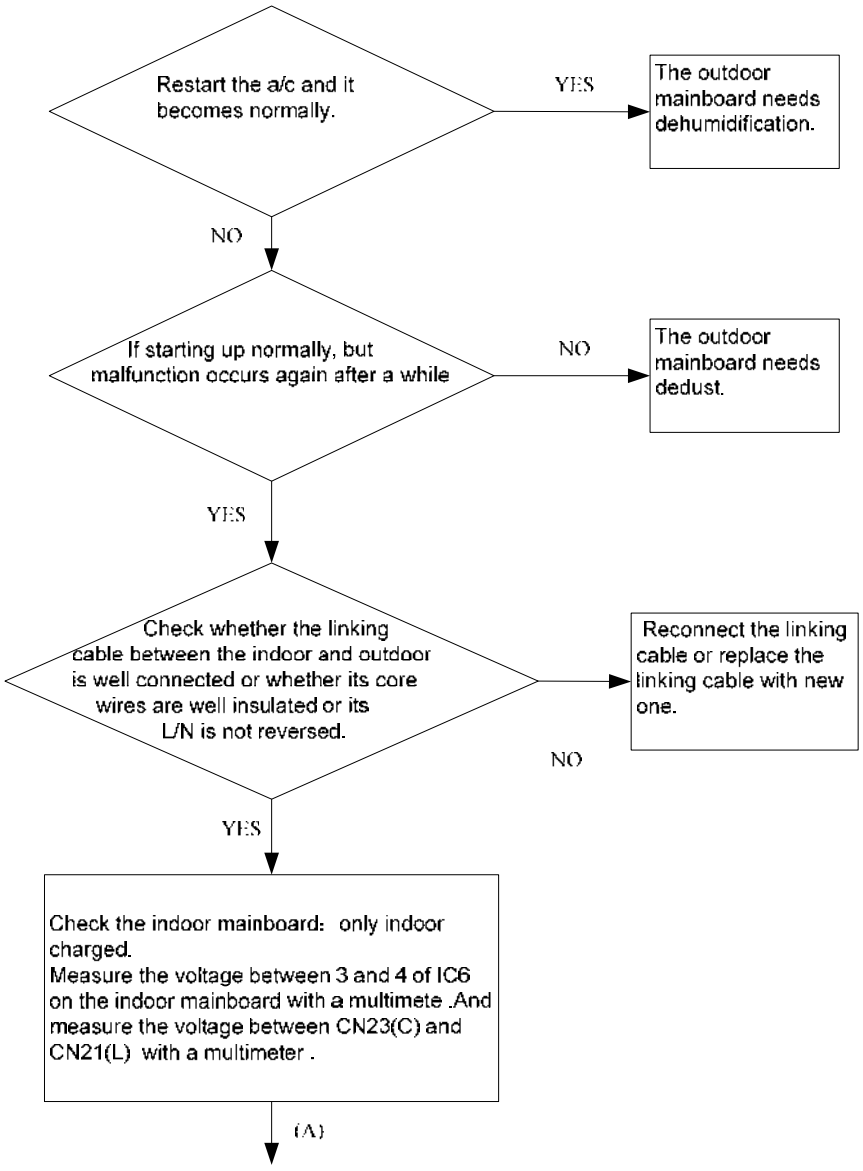
Outdoor display: LED1 flash 8 times

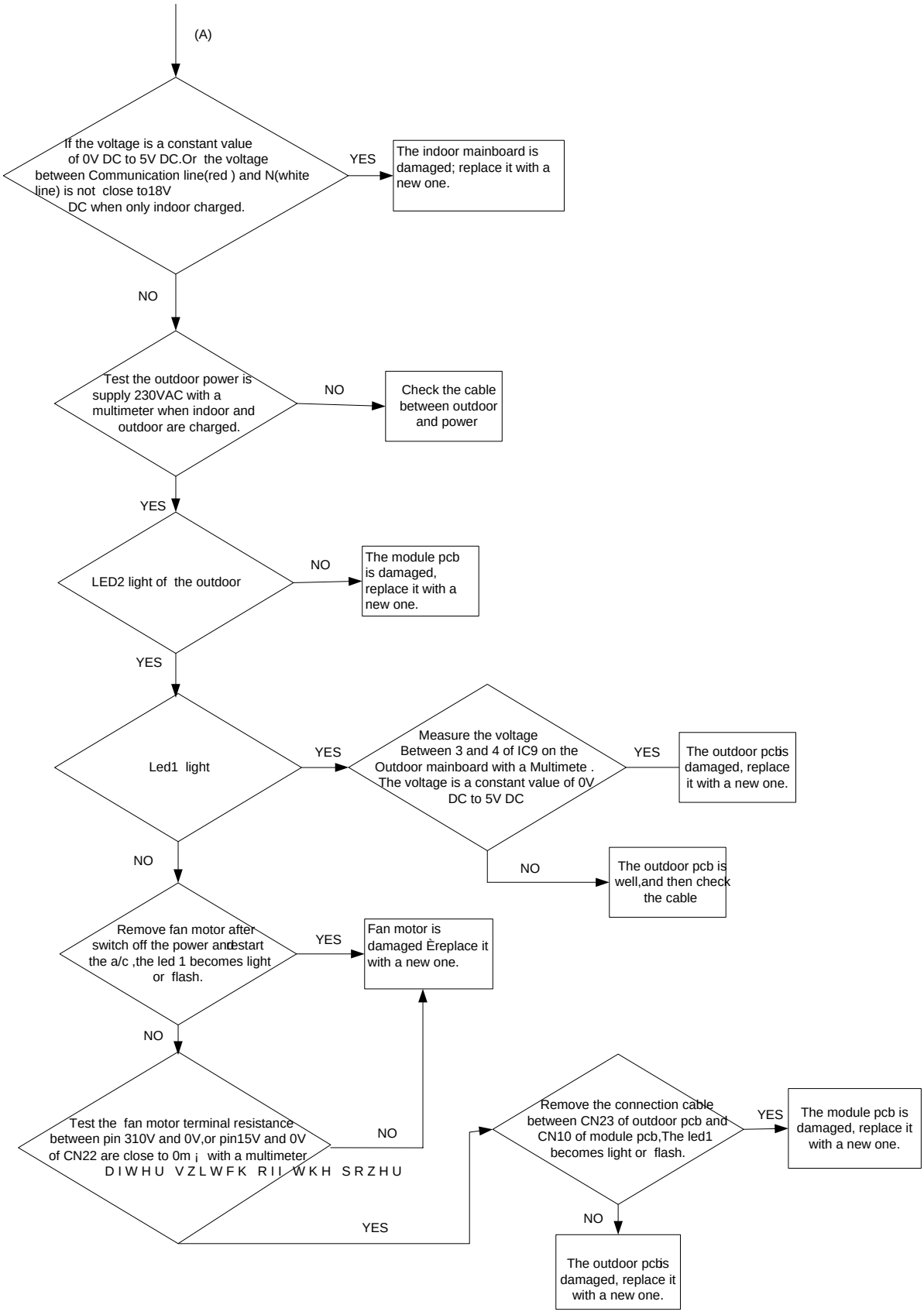
Method of Malfunction Detection	The Discharge temperature control is checked with the temperature being detected by the Discharge pipe thermistor
Malfunction Decision Conditions	when the compressor discharge temperature is above 110
Supposed Causes	v Electronic expansion valve defective v Faulty thermistor v Faulty PCB
Troubleshooting	* Caution Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.



10.3.10 The communication fault between indoor and outdoor

Indoor display outdoor display	E7 LED1 flash 15 times
Method of Malfunction Detection	Communication is detected by checking the indoor PCB and the outdoor PCB.
Malfunction Decision Conditions	v The outdoor PCB broken leads to communication fault. v The indoor PCB broken leads to communication fault.
Supposed Causes	v Communication wiring disconnected. v The indoor PCB is broken. v The outdoor PCB is broken. v 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.

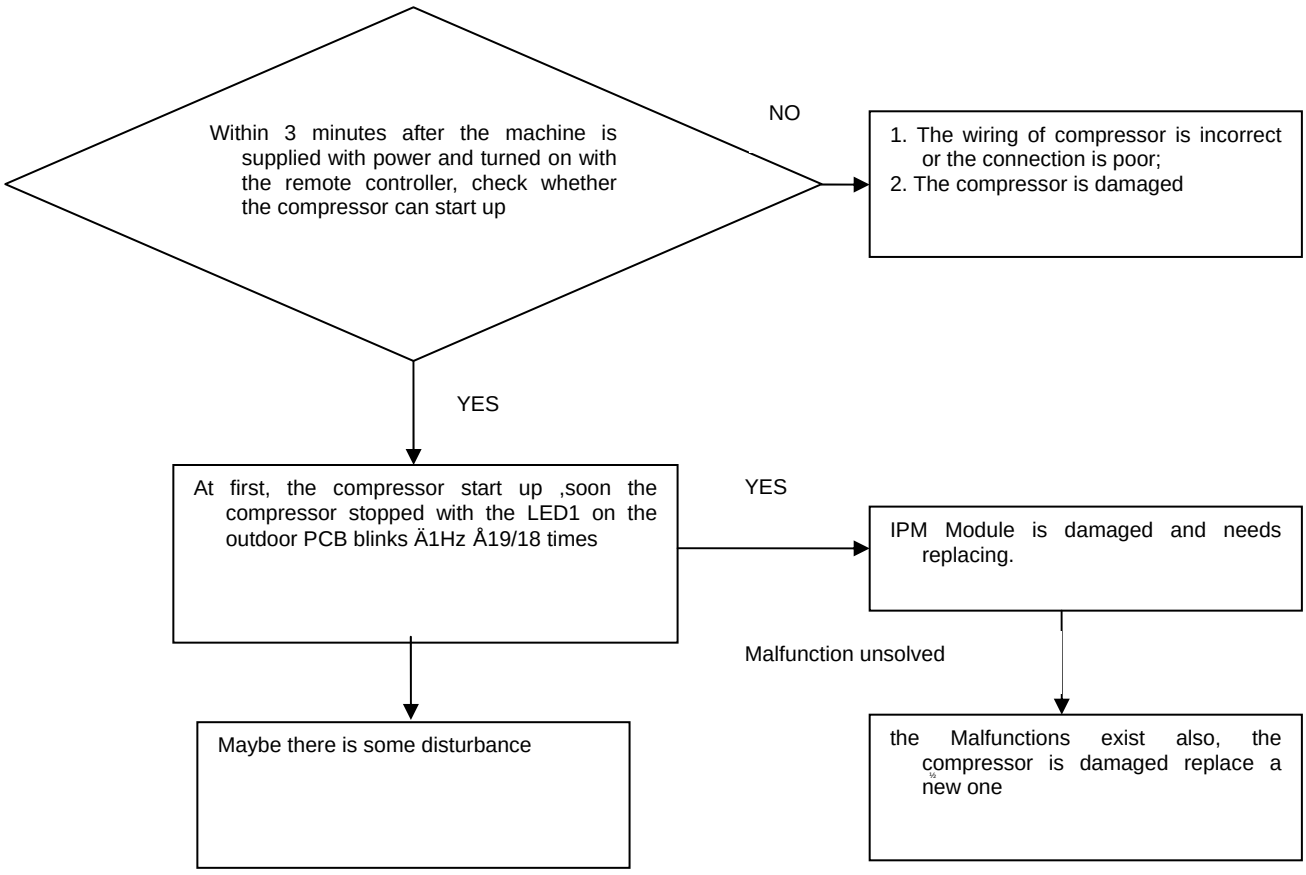



(A)
If the voltage is a constant value of 0V DC to 5V DC.Or the voltage between Communication line(red) and N(white line) is not close to18V DC when only indoor charged.
YES
The indoor mainboard is damaged; replace it with a new one.
NO
Test the outdoor power is supply 230VAC with a multimeter when indoor and outdoor are charged.
NO
Check the cable between outdoor and power
YES
LED2 light of the outdoor
NO
The module pcb is damaged, replace it with a new one.
YES
Led1 light
YES
Measure the voltage Between 3 and 4 of IC9 on the Outdoor mainboard with a Multimete . The voltage is a constant value of 0V DC to 5V DC
YES
The outdoor pcb is damaged, replace it with a new one.
NO
The outdoor pcb is well,and then check the cable
NO
Remove fan motor after switch off the power and restart the a/c ,the led 1 becomes light or flash.
YES
Fan motor is damaged Èreplace it with a new one.
NO
Test the fan motor terminal resistance between pin 310V and 0V,or pin15V and 0V of CN22 are close to 0m ¡ with a multimeter
D I W H U V Z L W F K R I I W K H S R Z H U
NO
YES
Remove the connection cable between CN23 of outdoor pcb and CN10 of module pcb,The led1 becomes light or flash.
YES
The module pcb is damaged, replace it with a new one.
NO
The outdoor pcb is damaged, replace it with a new one.

10.3.11 Loss of synchronism detection

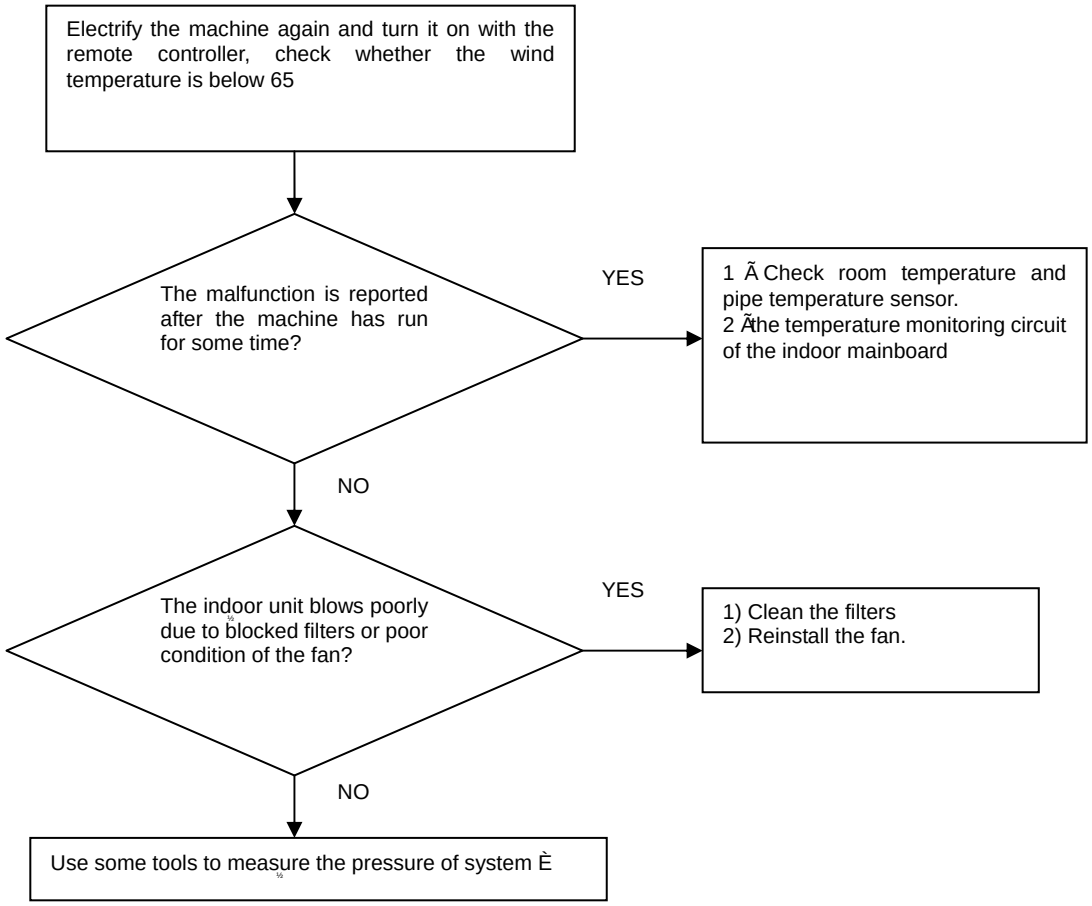
Inverter side current detection is abnormal

Outdoor Display	LED1 flash 18 times LED1 flash 19 times
Method of Malfunction Detection	The position of the compressor rotor can not detected normally
Malfunction Decision Conditions	when the wiring of compressor is wrong or the connection is poor; or the compressor is damaged
Supposed Causes	µ Faulty The wiring of compressor µ Faulty compressor µ 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

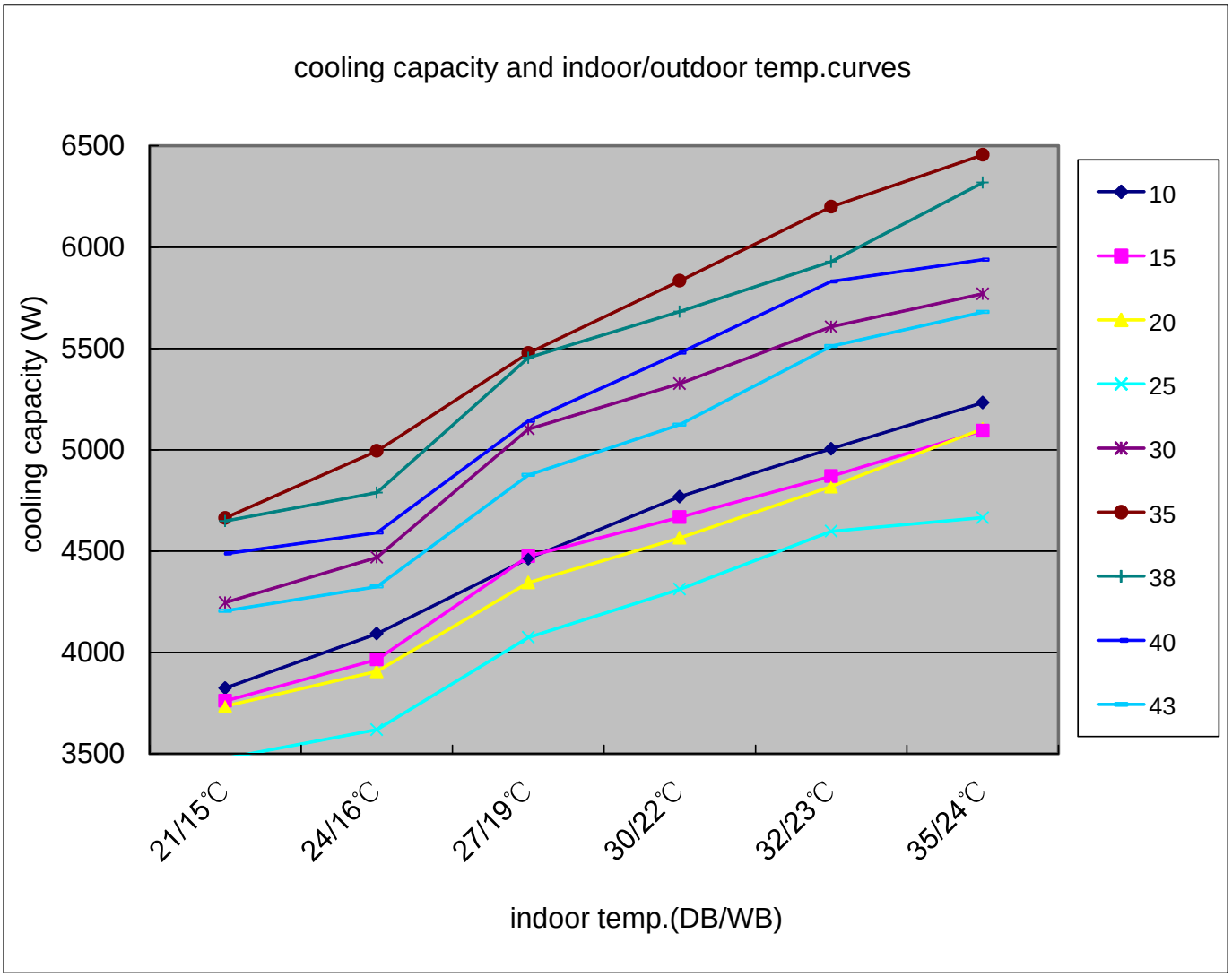
Outdoor display	LED1 flash 21 times
Method of Malfunction Detection	High work-intense control is activated in the heating mode if the temperature being sensed by the heat exchanger thermistor exceeds the limit.
Malfunction Decision Conditions	Activated when the temperature being sensed by the heat exchanger rises above 65 twice in 30 minutes.
Supposed Causes	µ Faulty electronic expansion valve µ Dirty heat exchanger µ Faulty heat-exchange sensor µ 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

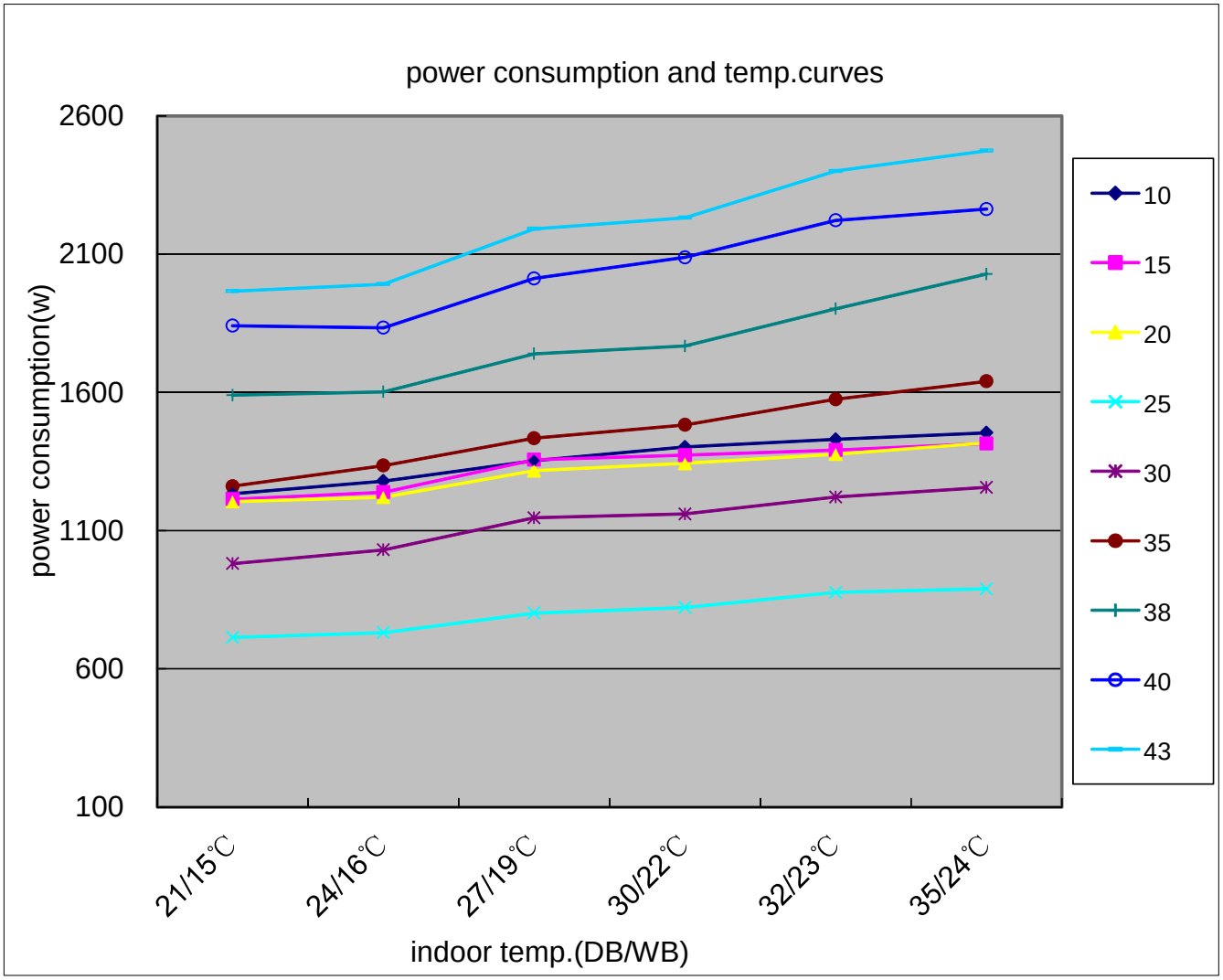
11.1 Cooling capacity-temperature curves

performance curves									
cooling value-temerature table									
indoor temp.	outdoor temp.								
DB/WB	10	15	20	25	30	35	38	40	43
21/15	3824	3761	3736	3478	4246	4664	4648	4487	4205
24/16	4092	3965	3906	3619	4469	4994	4789	4591	4324
27/19	4463	4475	4344	4074	5102	5477	5454	5142	4876
30/22	4769	4667	4566	4312	5327	5834	5682	5479	5124
32/23	5005	4870	4818	4598	5607	6199	5928	5830	5511
35/24	5232	5094	5103	4665	5770	6455	6318	5938	5680



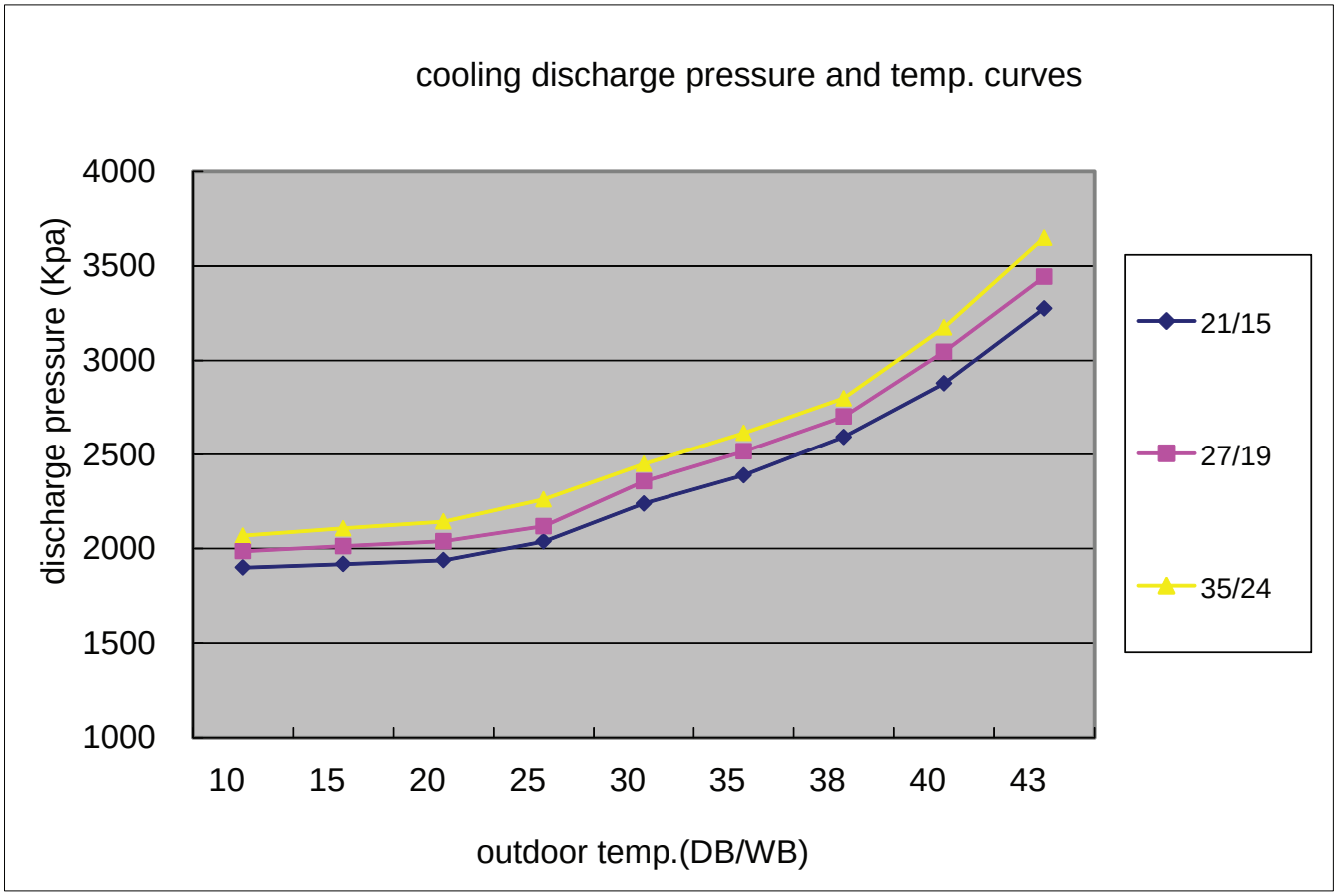
11.2 Cooling power consumption value- temperature curves

performance curves									
power consumption value-temp.table									
indoor temp.	outdoor temp.								
DB/WB	10	15	20	25	30	35	38	40	43
21/15	1234	1213	1205	713	981	1260	1589	1841	1966
24/16	1279	1239	1221	731	1030	1335	1602	1833	1991
27/19	1352	1356	1316	801	1146	1434	1739	2012	2191
30/22	1403	1373	1343	822	1160	1482	1768	2088	2232
32/23	1430	1391	1377	876	1221	1575	1902	2222	2400
35/24	1453	1415	1418	889	1256	1640	2028	2263	2474



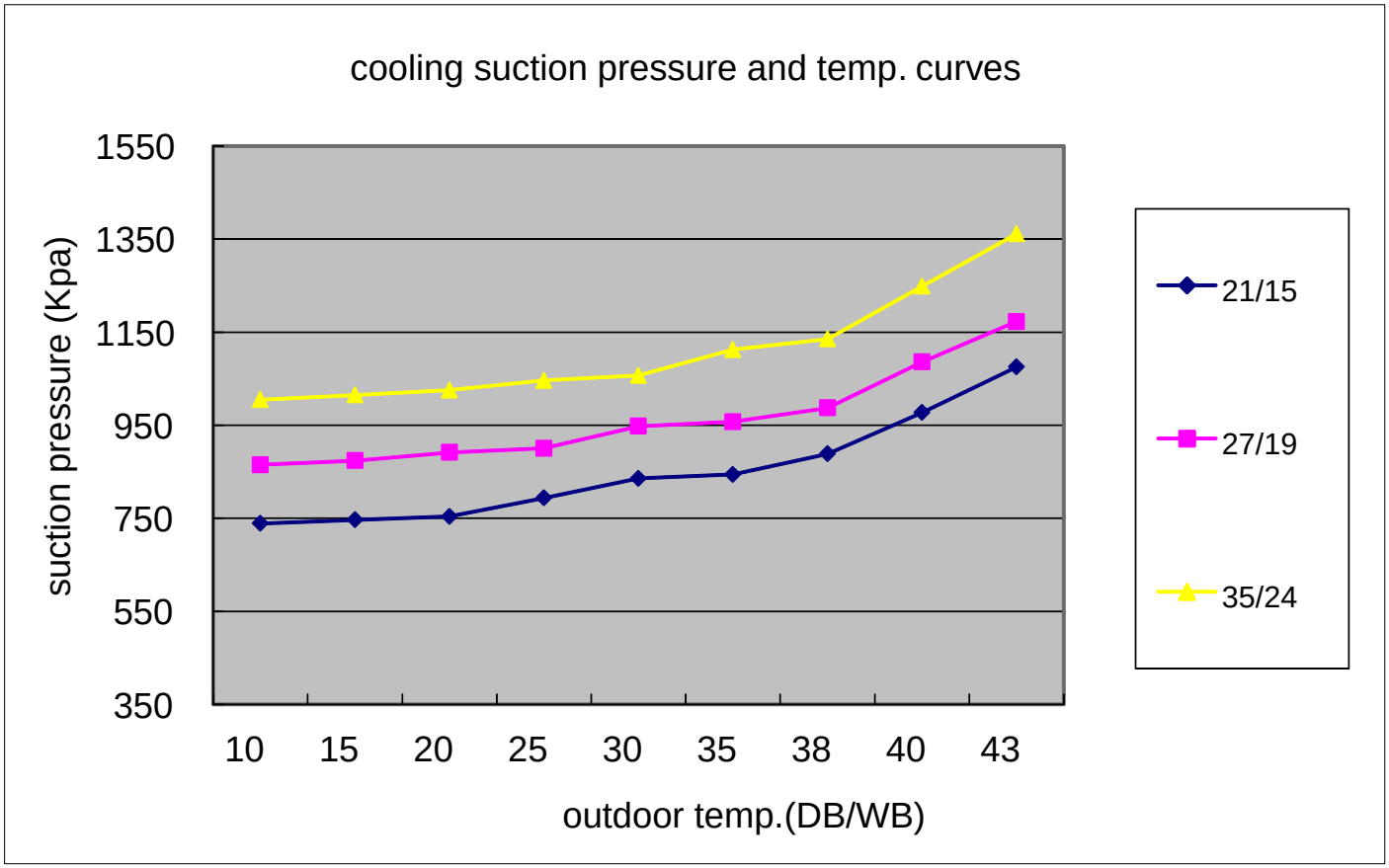
11.3 Cooling discharge pressure curves

performance curves			
cooling discharge pressure.table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	21/15	27/19	35/24
10	1899	1986	2068
15	1917	2012	2108
20	1938	2039	2144
25	2038	2118	2261
30	2239	2357	2450
35	2389	2516	2614
38	2593	2701	2799
40	2877	3045	3174
43	3275	3442	3649



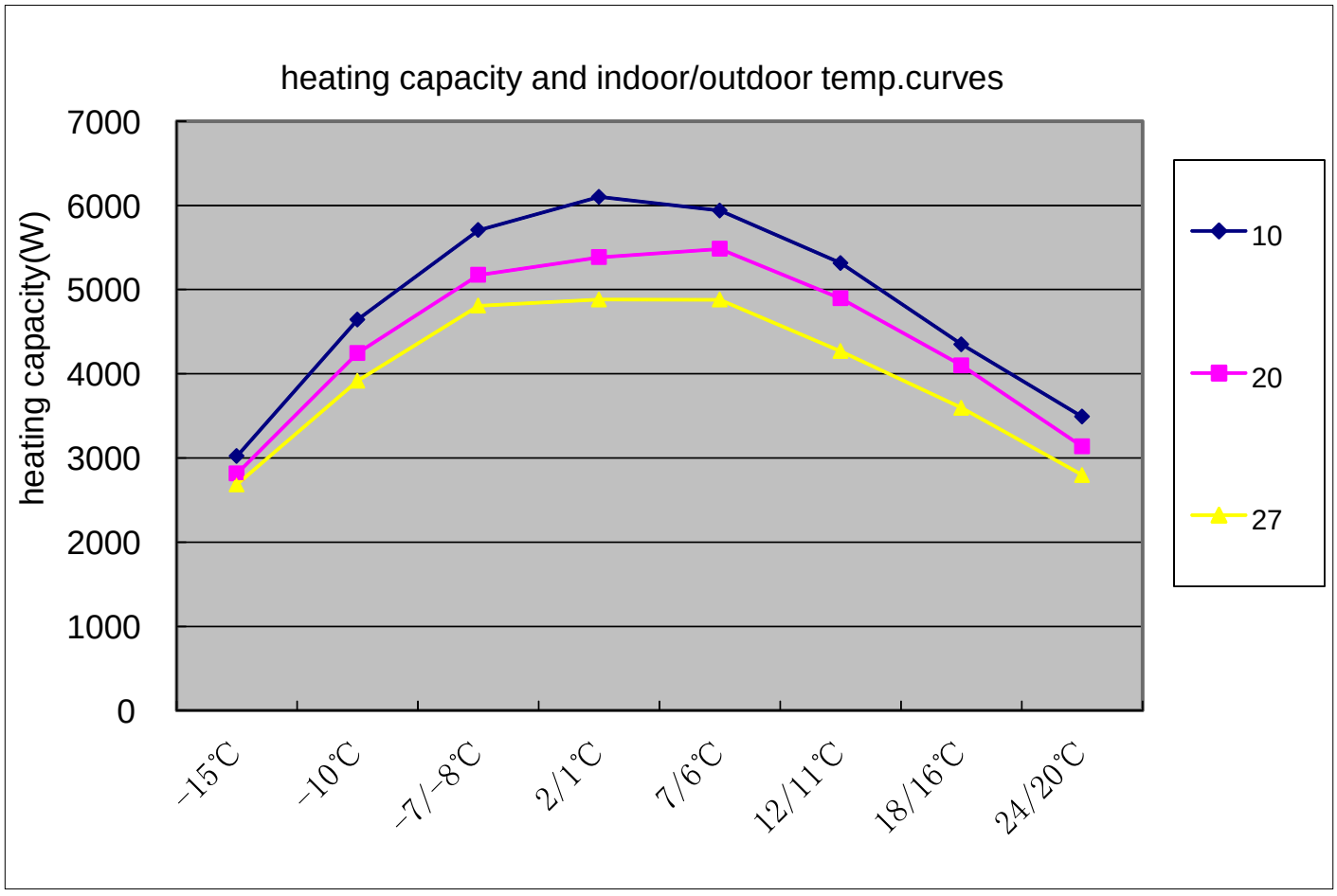
11.4 Cooling suction pressure curves

performance curves			
cooling suction pressure.table			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	21/15	27/19	35/24
10	739	865	1005
15	746	874	1015
20	754	891	1025
25	794	900	1046
30	835	948	1057
35	844	957	1112
38	888	987	1135
40	977	1086	1249
43	1075	1173	1361



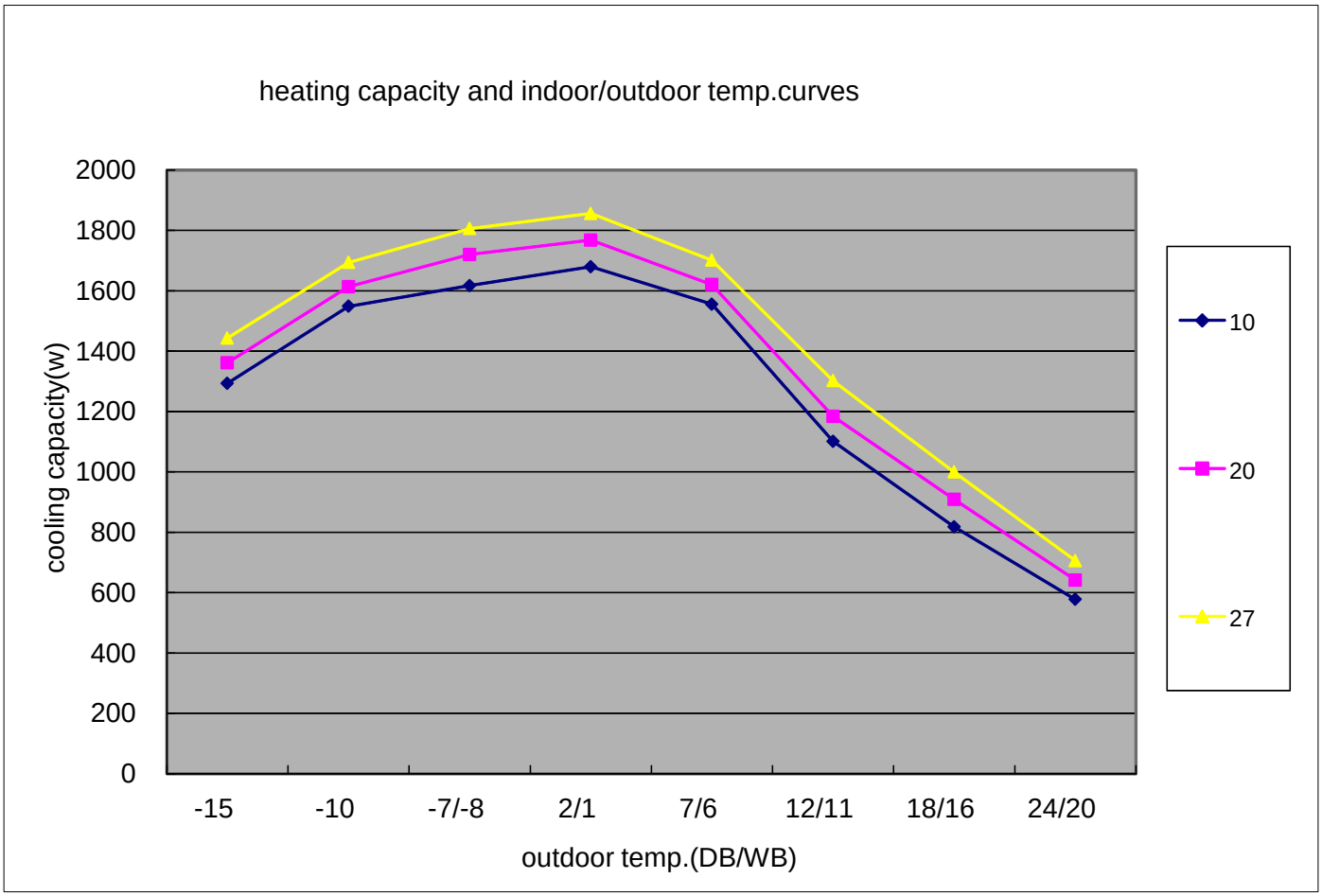
11.5 Heating capacity-temperature curves

performance curves			
heating capacity and indoor/outdoor temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	10	20	27
-15	3021	2815	2686
-10	4644	4246	3916
-7/-8	5707	5174	4808
2/1	6101	5384	4882
7/6	5938	5483	4879
12/11	5315	4896	4269
18/16	4349	4100	3595
24/20	3489	3136	2796



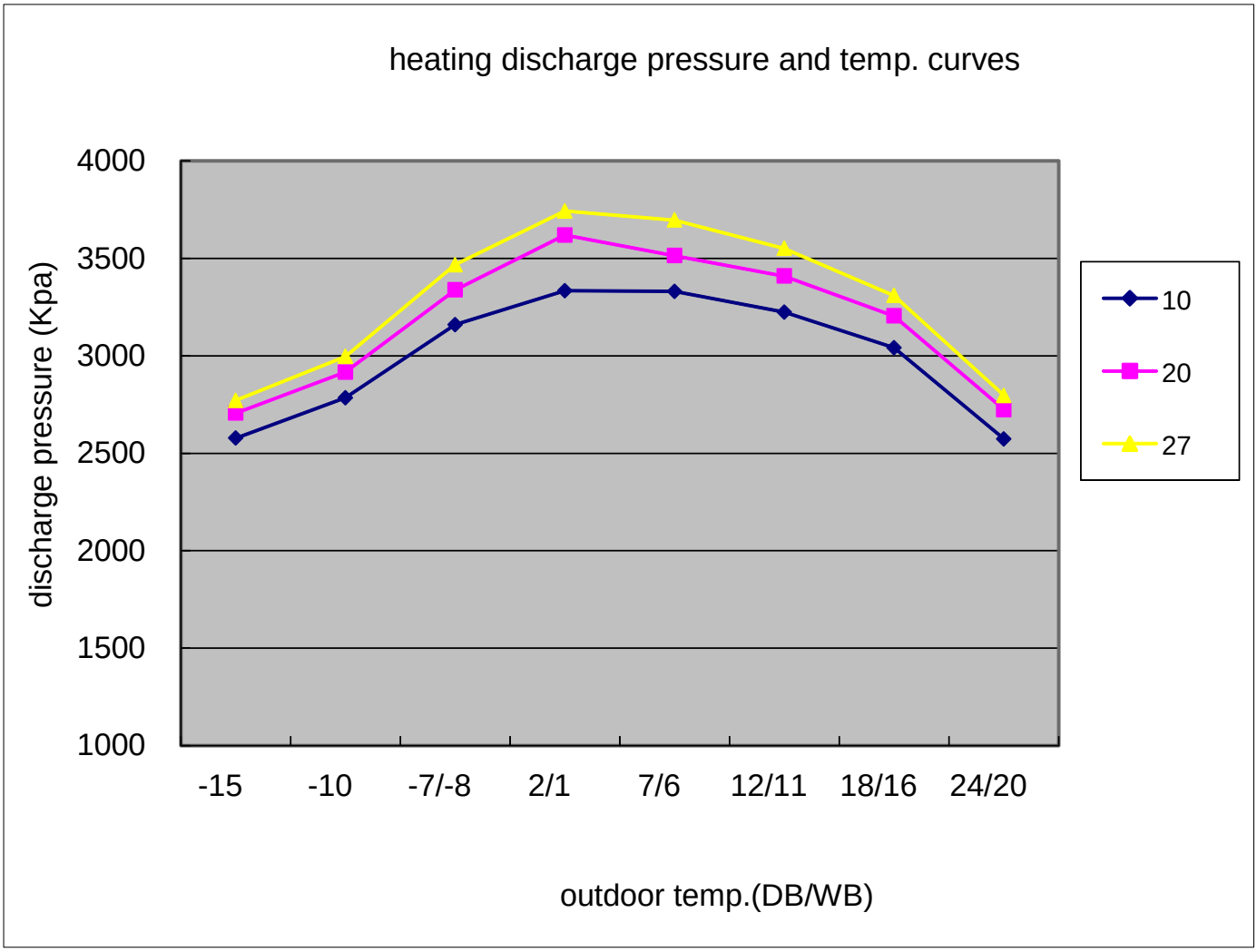
11.6 Heating power consumption value- temperature curves

performance curves			
power consumption value-temp.table			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	10	20	27
-15	1293	1361	1443
-10	1549	1613	1694
-7/-8	1617	1720	1806
2/1	1679	1768	1856
7/6	1555	1620	1701
12/11	1101	1184	1302
18/16	818	909	1000
24/20	577	641	706



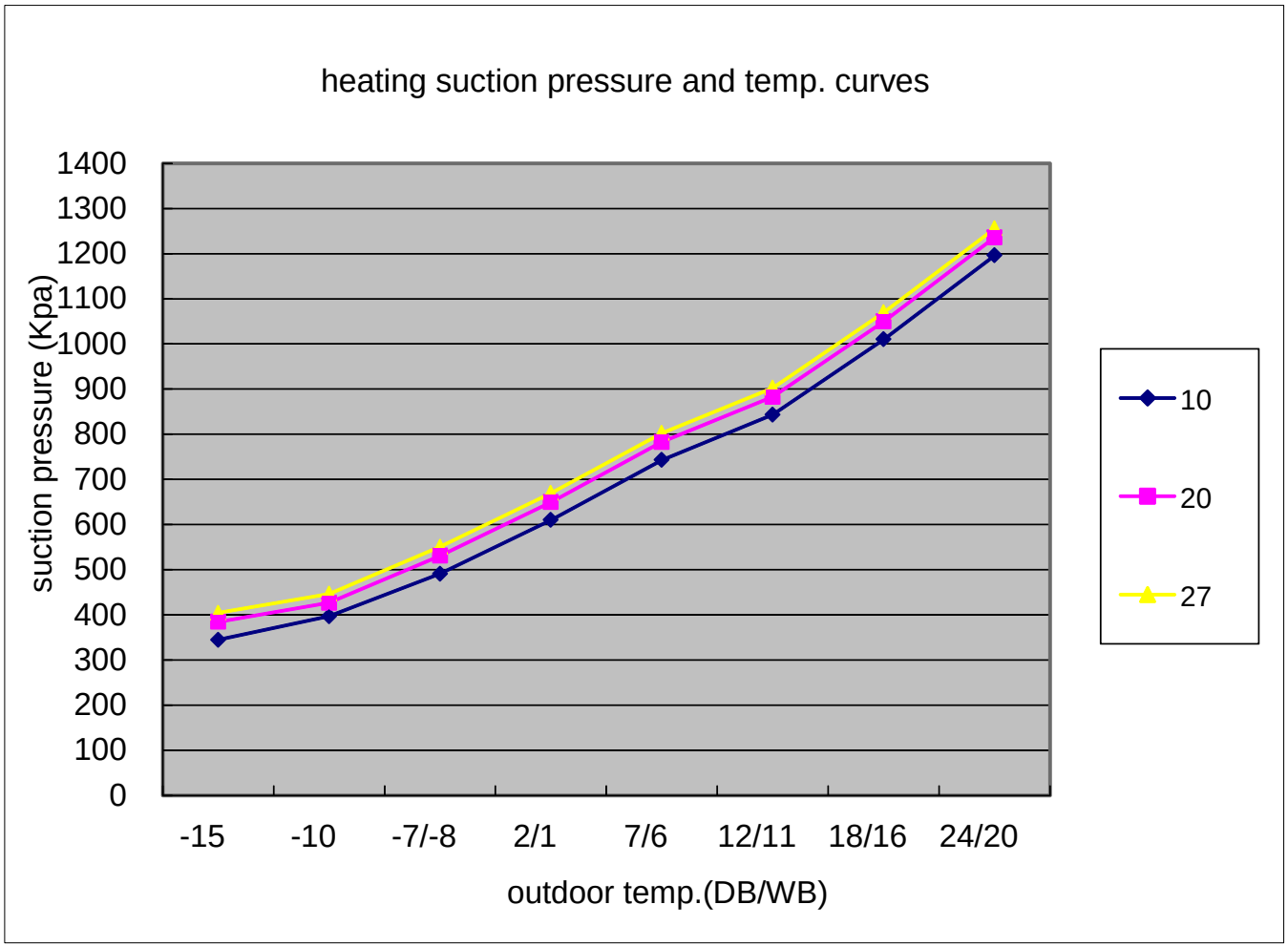
11.7 Heating discharge pressure curves

performance curves			
heating discharge pressure.table			
outdoor temp	indoor temp.		
DB/WB	10	20	27
-15	2578	2706	2771
-10	2784	2917	2997
-7/-8	3160	3338	3467
2/1	3334	3619	3743
7/6	3330	3514	3696
12/11	3224	3409	3551
18/16	3041	3204	3309
24/20	2573	2723	2796

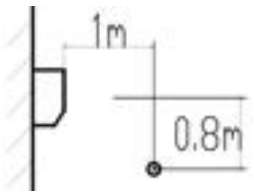


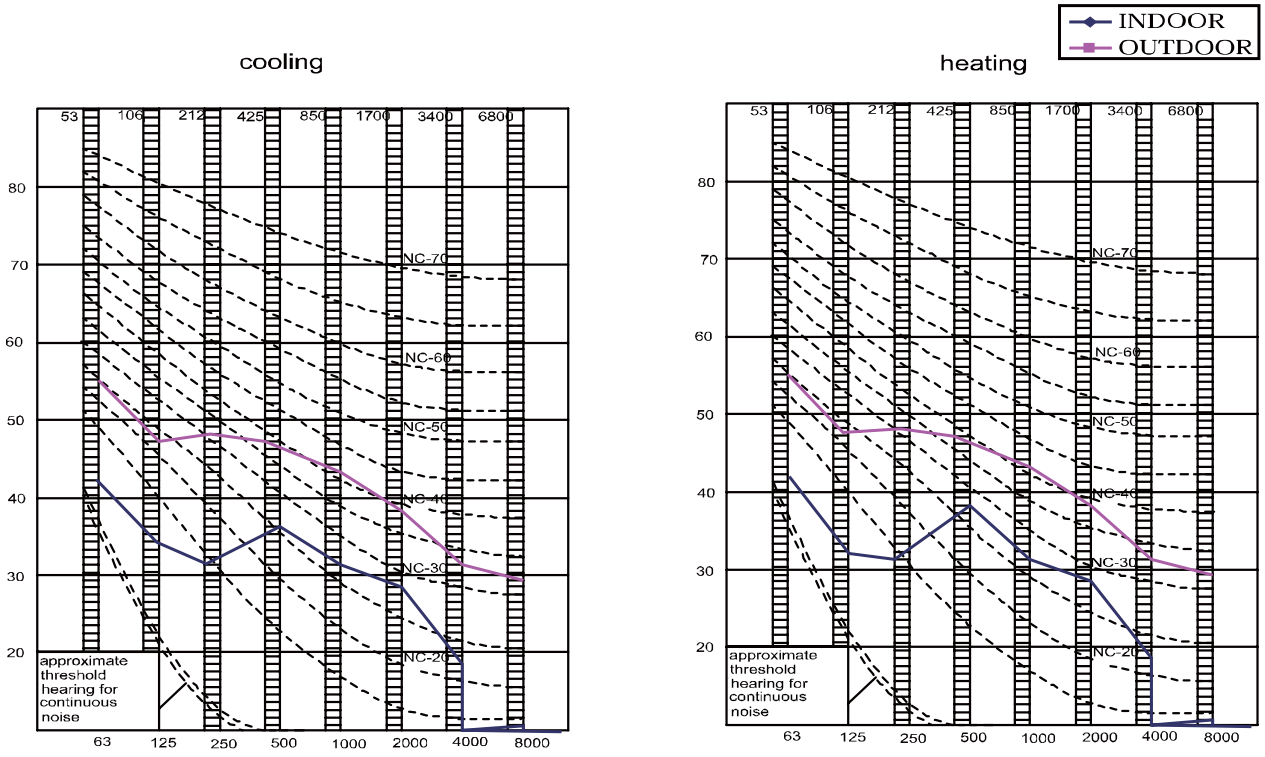
11.8 Heating suction pressure curves

performance curves			
heating suction pressure.table			
outdoor temp	indoor temp.		
DB/WB	10	20	27
-15	345	385	404
-10	397	427	447
-7/-8	491	531	551
2/1	610	650	670
7/6	743	783	803
12/11	843	883	903
18/16	1010	1050	1070
24/20	1196	1236	1256



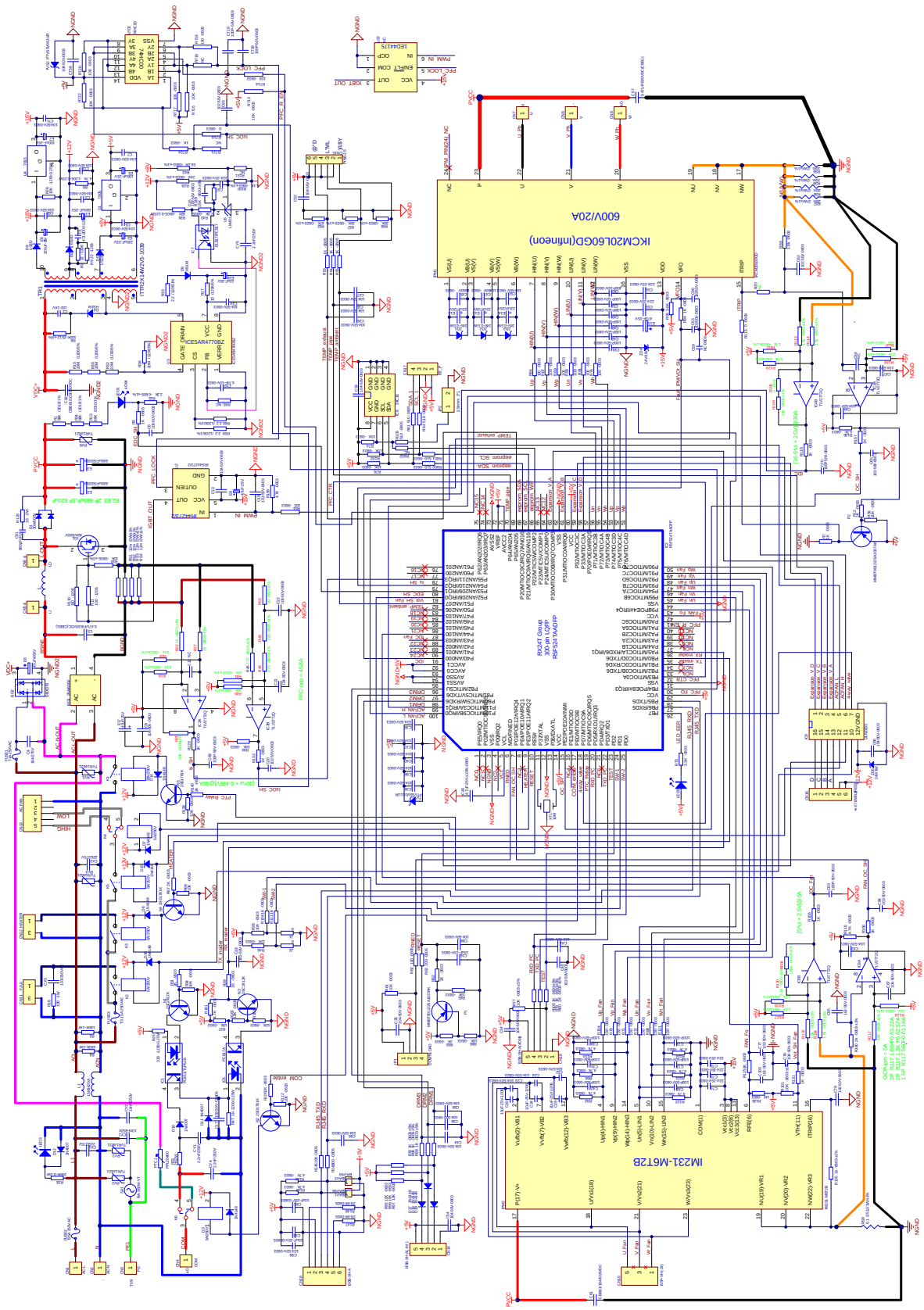
12.Sound level

Model	Sound pressure level			Measuring location of microphone	Sound power level (cooling/heating)
	230V,50HZ				
	Cooling/heating				
	H	L	SL		
- = &	6				53



13 Wiring Diagrams

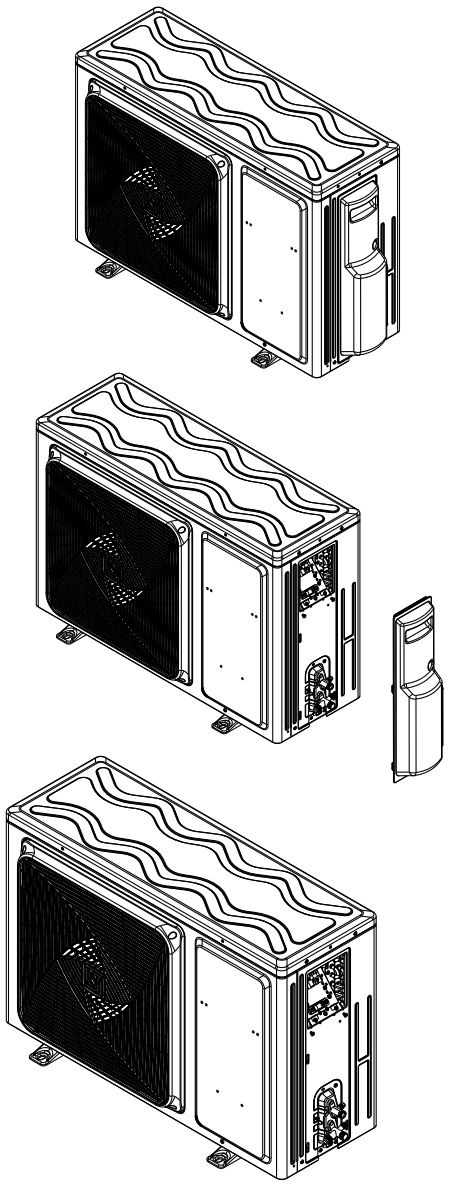
13.1 Outdoor unit control board circuit diagrams

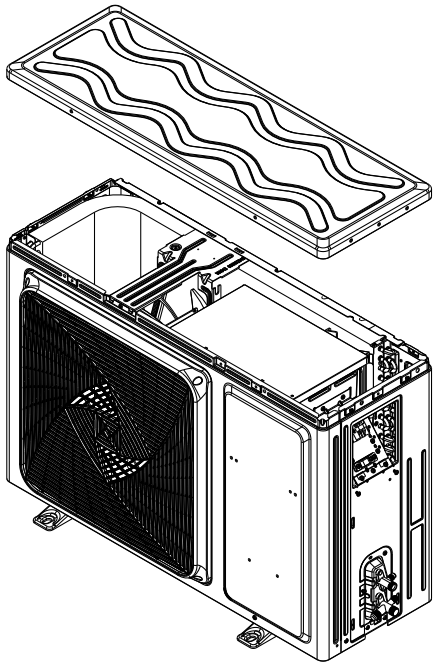
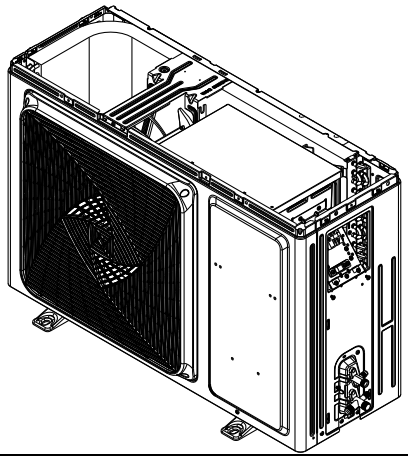
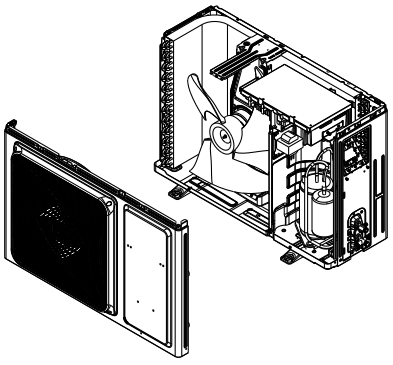
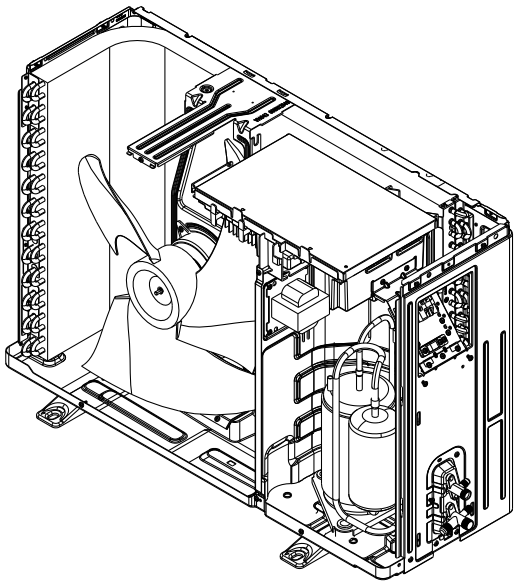
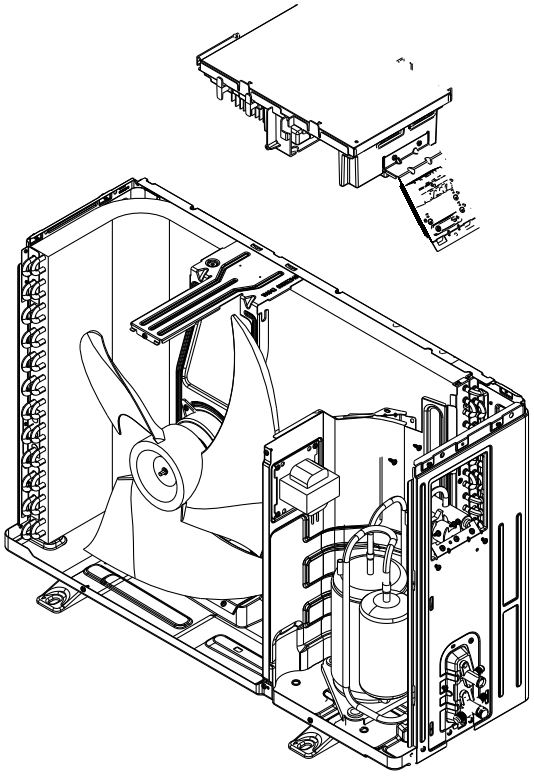


REMOVAL PROCEDURE

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