Haier
Inspired living

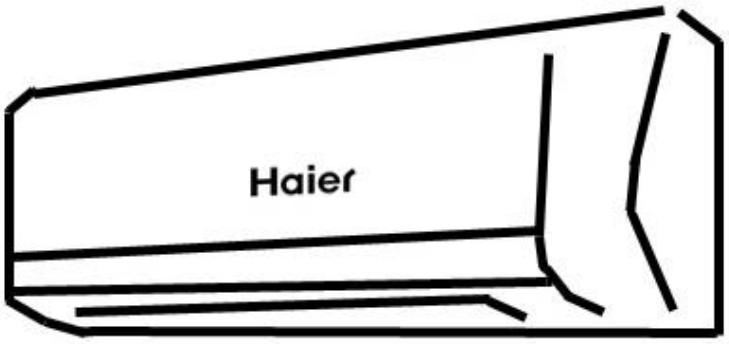
Domestic
Air conditioner

SERVICE MANUAL

H2SM-(9+9)RH03/R2(DB)
H2SM-(9+12)RH03/R2(DB)

CAUTION

- READ THIS MANUAL CAREFULLY TO DIAGNOSE TROUBLE CORRECTLY BEFORE OFFERING SERVICE.
- THIS MANUAL IS USED BY QUALIFIED APPLIANCE TECHNICIANS ONLY.
- HAIER DOES NOT ASSUME ANY RESPONSIBILITY FOR PROPERTY DAMAGE OR PERSONAL INJURY FOR IMPROPER SERVICE PROCEDURES DONE BY ONE UNQUALIFIED PERSON.



CONTENTS

1. General information

This Service Manual describes the operation, disassembly, troubleshooting, and repair of Haier Room Air Conditioners, etc. It is intended for use by authorized services who troubleshoot and repair these units.
It is assumed that users of this manual are familiar with the use of tools and equipment used to troubleshoot and repair electrical, mechanical, and refrigeration systems; and understand the terminology used to describe and discuss them.
Haier urges you read and follow all safety precautions and warnings contained in this manual. Failure to comply with safety information may result in severe personal injury or death.

Related Publications
This is a base service manual, covering a range of similar models. It is intended to be used in conjunction with the Parts Manual and Technical Sheet covering specific model being serviced.

NOTE: General Precautions and Warnings

WARNING

To avoid risk of personal injury or death due to electrical shock, disconnect electrical power to unit before attempting to service the unit.

WARNING

To avoid risk of personal injury or death due to electrical shock, DO NOT, under any circumstances, alter the grounding plug .Air conditioner must be grounded at all times. Do not remove warning tag from power cord. If a two-prong (non-grounding) wall receptacle is encountered, contact a qualified electrician and have the receptacle replaced with a properly grounder wall receptacle in accordance with the National Electrical Code.

WARNING

To avoid risk of heat exposure, which may cause death or severe illness, air conditioner must be monitored when failures or shuts down.

WARNING

To avoid risk of personal injury or death due to electrical shock, grounding wires and wires colored like grounding wires are NOT to be used as current carrying conductors. The standard accepted color coding for ground wires is green or green with a yellow stripe. Electrical components such as the compressor and fan motor are grounded through an individual wire attached to the electrical component and to another part of the air conditioner. Grounding wires should not to be removed from individual components while servicing, unless the component is to be removed and replaced. It is extremely important to replace all removed grounding wires before completing service.

MODEL:

H2SM-(9+9)RH03/R2(DB)

H2SM-(9+12)RH03/R2(DB)

Product Features

- Comfortable:wide-angle airflow
- Health air purifying
- Quiet operation
- Engergy efficient
- Wide variety of functions

2. Specification

Item		Unit	H2SM-(9+9)RH03/R2(DB)	H2SM-(9+12)RH03/R2(DB)
Power		PH, V, Hz	1, 230, 50	1, 230, 50
Climate Type			T1	T1
Starting Current		A	30	30
Cooling	Cooling Capacity	W	2600/5200	2600/3500/5300
	Rated Power	W	780/1560	780/1090/1650
	Rated Current	A	3.4	7.9
	Max Power	W	1230	1650
	Max Current	A	5.1	9.6
	EER	W/W	3.33/3.33	3.3/3.21
Heating	Heating Capacity	W	3200/6200	3200/3900/6300
	Rated Power	W	1300/1700	1300/1700/1740
	Rated Current	A	5.8	5.8/7.4/7.9
	Max Power	W	1700	2360
	Max Current	A	7.8	10.4
	COP	W/W	3.65	2.67
Operating temp. range	Cooling	℃	18~46	18~46
	Heating	℃	-10~24	-10~24
Indoor fan Velocity	H	rpm	1200	1250
	M	rpm	1075	1100
	L	rpm	950	950
Outdoor fan Velocity		rpm	860	860
Indoor Air Volume (High)		m^3	500	500
Max. pressure at warm side		MPa	4.15	3.8
Moisture Removal		$10^{-3}m^3/h$	1.2	1.5
Noise Level	Indoor (H/M/L)	dB(A)	42/39/35	42/39/35
	Outdoor	dB(A)	55	55
Indoor Weight	Net	Kg	8.6	8.6
	Gross	Kg	10.8	10.8
Outdoor Weight	Net	Kg	48.8	48.8
	Gross	Kg	52.7	52.7
Indoor Dimension	Net	mm	795*182*265	795*182*265
	Package	mm	865*272*330	865*272*330
Outdoor Dimension	Net	mm	810*288*680	810*288*680
	Package	mm	960*405*760	960*405*760
Compressor	Manufacture		panasonic	panasonic
	Type		5CS130XCC03	5CS130XCC03
	Oil Charge	ml	480	480

Refrigerant	Type		R410A	R410A
	Net Charge	g	700	950
	Charge if over standard pipe length	g/m	15	20
Refrigerant Pipe	Liquid pipe Diameter	mm	6.35	6.35
	Gas pipe Diameter	mm	9.35	9.35
	Standard length	m	5	5
	Max length	m	15	15
Drain Hose	Length	mm	580	580
	Diameter	mm	25.5	25.5
Remote Controller Model			YR-H76	YR-H76
Class of electric Shock Protection			I	I
Class of Water Proof			IP 24	IP 24
Power Cord (Model × Sectional Area)			H05VV-F 3G2.5mm^2	H05VV-F 3G2.5mm^2

3. ELECTRICAL CONTROL

1.The indoor system

1. 1Operation Mode

1.1.1 Automatic operation

When the system is under the automatic operation option, the appropriate operation mode will be decided according to the differences between the preset temperature and the indoor temperature after the system starts up. Then, the system will operate according to the chosen mode. In the following conditions, Tr stands for indoor temperature and Ts stands for outdoor temperature.

Under the automatic option, the system will switch between the cooling and warming modes according to the change of the indoor temperature. If the air conditionic is under the cooling mode, when the preset temperature for stopping the compressor is reached, the compressor will be stopped. The indoor temperature will be tested again 15 minutes after the stop of the compressor. At the moment, if the tested temperature is under the Tr＜Ts-3℃ condition, the system will be switched into the warming mode. If not, the system will remain in the cooling mode. If the air conditionic is under the warming mode, when the preset temperature for stopping the compressor is reached, the compressor will be stopped. The indoor temperature will be tested again 15 minutes after the stop of the compressor. At the moment, if the tested temperature is under the Tr ＞Ts+8℃ condition, the system will be switched into the cooling mode. If not, the system will remain in the warming mode.

1.1.2 Cooling operation mode

Temperature control range: 16℃---30℃

Temperature difference: ±1℃

* Control features: When Tr (input airflow) >Ts (set temperature) ℃, the compressor will be opened, the indoor fan will operate at the set speed and the mode signal will be sent to the outdoor system. When Tr (input airflow) < Ts (set temperature) ℃, the compressor will be opened, the indoor fan will operate at the set speed and the mode signal will be sent to the outdoor system. The system will keep the original status if Tr= Ts.

Airflow speed control: (temperature difference 1℃)

Automatic: When Tr>=Ts+3℃, high speed.

When Ts+1℃=<Tr<Ts+3℃, medium speed

When Tr<Ts+1℃, low speed

When the sensor is off, low speed

When the airflow speed has no delay from the high to low switching, the speed should be delayed for 3 minutes (remain at high speed for 3 minutes.) before the next switch.

Manul: When the system is operating, you can set the high, medium or low speed manually. (When the sensor is on or off, the system will change the speed 2 seconds after receiving the signal.)

*Airgate location control: the location for the airgate can be set according to your needs.

*Defrosting function: preventing the frosting on the indoor heat exchanger (when cooling or demoisture). When the compressor works continuously for 1/6 minutes (adaptable in EEPROM) and the temperature of the indoor coils has been below zero centigrade for 10 seconds, the

compressor will be stopped and the malfunction will be recorded in the malfunction list. The indoor system will continue to run. When the temperature of the indoor coil is raised to 7℃, the compressor will be restarted again (the prerequirement of 3 minutes' delay should be satisfied.)

* timing system on/off function.

* Dormant control function.

1.1.3 Demoisture mode.

* temperature control range: 16---30℃

* temperature difference: ±1℃

Control feature: send the demoisture signal to the outdoor system.

When Tr>Ts+2℃, the compressor will be turned on, the indoor fan will operate at the set speed.

When Tr is between the Ts and Ts+2℃, the outdoor system will operate at the high demoisture frequency for 10 minutes and then at the low demoisture mode for six minutes. The indoor fan will operate at low speed.

When Tr< Ts, the outsystem will be stopped, the indoor fan will be stopped for 3 minutes and then turned to the low speed option.

All the frequency converses have a ±1℃ difference.

* Wind speed control: Automatic:

When Tr >= Ts+ 5℃, high speed.

When Ts+3℃≤Tr< Ts+5℃, medium speed.

When Ts+2℃≤Tr< Ts+3℃, low speed.

When Tr<Ts+2℃, light speed.

If the outdoor fan stopped, the indoor fan will be paused for 3 minutes.

If the outdoor fan stopped for more than 3 minutes and the outdoor system still operates, the system will be changed into light speed mode.

When the airflow speed has no delay from the high to low switching, the speed should be delayed for 3 minutes (remain at high speed for 3 minutes.) before the next switch.

Manual: When the sensor is off or Tr< Ts+3℃, the manual operation can not be made. (obligatory automatic operation.)

*Airgate location control: the location for the airgate can be set according to your needs.

*Defrosting function: preventing the frosting on the indoor heat exchanger (when cooling or demoisture). When the compressor works continuously for 1/6 minutes (adaptable in EEPROM) and the temperature of the indoor coils has been below zero centigrade for 10 seconds, the compressor will be stopped and the malfunction will be recorded in the malfunction list. The indoor system will continue to run. When the temperature of the indoor coil is raised to 7℃, the compressor will be restarted again (the prerequirement of 3 minutes' delay should be satisfied.)

* coil protection (synchronic overheating protection) are installed for the four directions latch malfunctions when demoisturing.

* timing system on/off function.

* Dormant control function.

1.1.4 Heating operation mode.

* temperature control range: 16---30℃

* temperature difference: ±1℃

* control feature: the temperature compensation is automatically added and the system will send the heating signals to the outdoor system.

If Tr≤Ts, the outdoor compressor is turned on, the indoor fan will be at the cold air proof mode.

If Tr>Ts+, the outdoor system is turned off, the indoor fan will be at the heat residue sending mode.

If Tr<Ts+, the outdoor system will be turned on again, the indoor fan will be at the cold air proof mode.

*Indoor fan control

manual control: You can choose high, medium, low and automatic speed control.

Automatic: When Tr<Ts, high speed.

When Ts=<Tr=<Ts+2℃, medium speed.

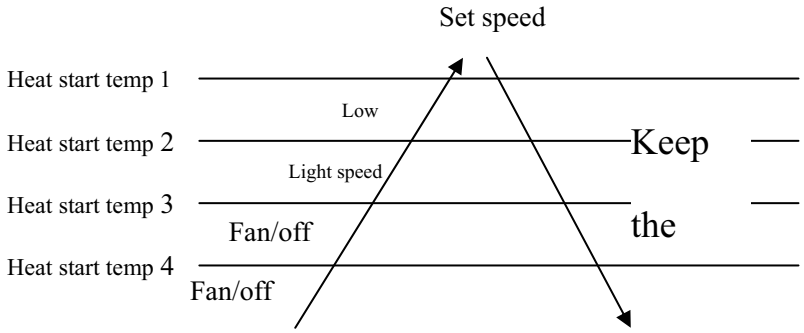
When Tr> Ts+2℃, low speed.

When the airflow speed has no delay from the high to low switching, the speed should be delayed for 3 minutes (remain at high speed for 3 minutes.) before the next switch.

*Airgate location control: the location for the airgate can be set according to your needs.

*Coldair proof operation

(1) he indoor operation within 4 minutes after the start up is as the following diagram the air speed can be raised only after the speed has reached a certain level.



(2) 4 minutes after the start up of the indoor fan, the light airflow and the low airflow will be turned to the set speed airflow.

(3) In the cold air proof operation, the fan won't stop after the start up.

(4) During the cold air proof operation, the indoor system will continuously send 'indoor high speed' signals to the outdoor system.

* Residue heat sending. The indoor fan will send the residue heat at a low speed for 12 seconds. If other conditions are satisified, when the compressor stops, the indoor system will operate at a light speed. The

indoor fan will stop when the coil temperature is below the ‘ heat start temp 4’ .

* Defrosting. When the system receives the defrosting signal from outdoors, the indoor fan will stop and the indoor temperature display won’t change. At the time, any indoor coil malfunctions will be neglected. When the outdoor defrosting finishes, the coil malfunction will still be neglected until the compressor has been started up for 30 seconds. The indoor temperature display will not change and the system operates at the cold air proof mode.

* Automatic heating temperature compensation: when the system enters the heating mode, the temperature compensation (4) will be added. When the status is switched off, the compensation will be erased.

1.2 strength operation

the system enters the mode after receiving the ‘strength signal’.

Send strength operation signal to the outdoor system.

Strength operation for 15 minutes.

The strength operation stops or finishes after the 15 minutes.

The mode change finishes the strength operation.

Entering ‘mute’, you can have normal operation or signal control such as timing to finish the strength operation.

When the system is at the automatic option with the strength/ mute function, if the system enters the cooling mode, the cooling strength/ mute function will be offered; if the system enters the heating mode, then the heating strength/ mute function will be offered; if the system enters the airflow mode, there will be no strength/ mute function.

1.3 Mute operation

the system enters the mode after receiving the ‘mute signal’.

3.1. Mute heating: the airflow speed is slight, the system sends the mute signal to the outdoor system.

3.2 mute cooling: the airflow speed is slight, the system sends the mute signal to the outdoor system.

When the compressor operates, the airflow speed is mute speed. EEPROM is adaptable.

Mute operation can not work under the demoisturing and airflow-sending operation.

1.4 Air refreshing

After receiving the signal from the remote control,(HV series: the background light of the ‘health’ logo is green. HS series: the ‘health’ indicator will be lighted). If the fan operates, the negative ion generator operates to realize the negative sending function.

If the indoor fan stops, the negative ion generator is turned off.

When the negative ion generator is turned off, if the air refreshing system is turned on, the negative ion generator will be turned on when the fan operates.

1.5 Timing.

You can set 24 hours’ on/off timing accordingly. After the setting, the timing indicator will be lightened. Also, the light will be turning off after the timing is finished. The followings are several timing methods.

5.1 system /on timing: The timing indicator will be lightened and the indoor system is under the waiting mode. The light will be turned off when the timing is finished and the rest of the system will operate under a normal condition. The timing starts since the last reception of the timing singal. You can have the dormacy setting under the timing mode, the order of your

settings will be operated according to the timing settings.

5.2 system /off timing: When the system is turned on, the timing indicator is lightened, the rest of the system will operated under a normal condition. When set time comes, the indicator light will be turned off and the system will be turned off. If you have set the dormant functions, the order of your settings will be operated according to the timing settings.

5.3 system /on and off timing: The settings will be completed according to the orders.

1.6 Dormant operation

The dormant timing is an eight hours unadaptable one. The timing signs are shown on the V series board. (RC series show the dormant signal, the timing light is lighted on the 6 lights board).

1.6.1 Under the cooling/ demoisture operation, after the setting of the dormant operation, the set temperature will be raised for 1 centigrade after 1 hour's operation and will be raised for 1 centigrade 1 hour later. The system will keep this status for 6 hours and then close.

1.6.2 Under the heating mode, after the setting of the dormant operation, the et temperature will fall 2 centigrades after 1 hour's operation and will fall 2 centigrades 1 hours later. 3 hours after the preceding operations, the set temperature will be raised for 1 centigrade and the system will keep this status for 3 hours and then close down.

1.6.3 During the dormant time, except the change of the system mode or a new press on the dormant setting keys, the timing of the 8 hours dormancy will take the first timing as the start time, any presses on other keys will not affect the original timing.

1.6.4 Indoor fan control under the dormant operation.

If the indoor fan is at the high speed before the dormant operation setting, the speed will be turned to medium after the setting. If the fan is at the medium speed before the dormant setting, the speed will be turned to low after the setting. If the fan is at the low speed before the dormant setting, the speed will not change.

1.7 Urgent on/off input

1.7.1 Press the urgency button the buzzer will ring. The system will enter the automatic mode if you don't press the button for more than 5 seconds.

Under the system off mode, if you press the urgency key for 5 to 10 seconds, the system will start the test operation.

Under the system off mode, If you press the urgency key for 10 to 15 seconds, the display screen will show the resume of the last malfunction.

If the system is under operation, the press on the urgency key will stop it.

Under the system off mode, the display screen will show automatic running sign.

Under the system off mode, the system will not receive the remote control signal if the press on the urgency key doesn't last for 15 seconds or if the key is loosened.

1.7.2 Urgency operation: If you press the urgency key for less than 5 seconds, the buzzer will ring when you press the on/off key. The system will enter the urgency operation when the urgency key is loosened. The urgency operation is fully automatic.

1.7.3 Test operation.

a. The inlet temperature sensor doesn't work, the indoor fan and the indoor air direction board motor works synchronically. High speed airflow, cooling, outdoor system on, etc, will send the ambient temperature 30 centigrade and coil temperature 16 centigrade information to the outdoor system.

b. Test operation

The defrost protection of the evaporator doesn’ t work.

The temperature control doesn’ t work.

c. The test operation will be finished in 30 minutes.

d. The test operation can be stopped by the relative commands from the remote control.

1.8 Low load protection control

In order to prevent the frosting of the indoor heat interaction device, the outdoor system will be stopped if the indoor heat interaction temperature is below zero centigrade for 5 minutes, but the fan will continue to operate. The outdoor system will be started again when the heat interaction temperature is above 7 centigrade and the system has been stopped for 3 minutes. The malfunction will be stored in the malfunction resume and will not be revealed.

1.9 High load protection control

The outdoor system will be stopped if the coil temperature is above 65℃ for 2 minutes. The indoor fan will be controlled by the thermostat. The outdoor system can be restarted when the coil temperature is below 42℃ and the system has been stopped for 3 minutes. The malfunction will be stored in the malfunction resume and will not be revealed.

1.10 abnormal operation of indoor system

When the outdoor system operates, if the indoor system operation differs from the outdoor system, the abnormal operation malfunction will be reported. 10s after the report, the indoor system will be closed.

Outdoor system mode	Indoor system mode	conflicts
cooling	heating	yes
cooling	cooling	no
cooling	airflow	no
heating	heating	no
heating	airflow	yes
heating	cooling	yes

1.11 alfunction list resume.

Nothing is presented if there is no code list.

The malfunction display will automatically finish in 10 seconds.

The remote control only receives the sigals for stop. According to the signals, the malfunction resume presentation finishes.

The resume restores after the power supply restores.

1.12 abnormality confirmation approaches.

1.12.1 indoor temperature sensor abnormality: under the operation, the normal temperature ranges from 120 degree to -30 degree. When the temperature goes beyond this range, the abnormality can be confirmed. If the temperature goes back into the range, the system will automatically resume.

1.12.2 indoor heat interaction sensor abnormality: under the operation, the normal temperature ranges from 120 degree to -30 degree. When the temperature goes beyond this range, the abnormality can be confirmed. If the temperature goes back into the range, the system will automatically resume.

1.12.3 indoor malfunction.

Out door malfunction: When the indoor system receives the outdoor malfunction codes, it will store the code into E2 for the malfunction list resume. The indoor system will continue to operate according to the original status, the malfunction code will not be revealed or processed.

1.12.4 transmission abnormality.

If the indoor system can’ t receive the outdoor systemfor 8 minutes, the communication abnormality can be

confirmed and reported and the outdoor system will be stopped.

1.13 Special features

1.13.1 Single indoor system operation

* Enter condition: First, set the high speed airflow and 30 centigrade set temperature, then press the dormant keys for 6 times within 7 seconds, the system will feedback with 6 rings.

* After the system enters the separate indoor system operation mode, the indoor system will operate according to the set mode and neglect the communication signals of the outdoor system. However, it has to send signals to the outdoor system.

* Quitting condition: This mode can be quitted after receiving the quitting signal from the remote control or urgency system. The indoor system thus can quit the single operation

1.13.2 Power cut compensation.

* Entering condition: Press dormant button 10 times within 7 second, the buzzer will ring 4 times and the present system status will be stored into the EEPROM of the indoor system.

* After entering the power cut compensation mode, the processing of the indoor system should be as the followings:

Remote control urgency singal: operate according to the remote control and the urgent conditions, the present status will be stored into the EEPROM of the indoor system.

* Quitting conditions: Press dormant button 10 times within 7 seconds and the buzzer will ring twic

1.13.3.Fixed frequency operation.

1.13.3.1Fixed cooling: a. under G code condition: high speed cooling, set 16℃, press temperature ‘- ‘ key and the set key at the same time. The system will enter the fixed frequency operation after the buzzer rings twice.

b. The proceeding programs are as the follows:

Entering the fixed frequency operation, you can set the fixed strength location 1 and send the coolng signal to the outdoor system. Meanwhile, you can fix the indoor system at high speed mode, the location of the airflow directin board can be switched to the maximal position.

c. Quitting condition: The fixed frequency cooling can be quitted after receiving the remote signal, and the system will enter the remote setting status.

1.13.3.2. Fixed heating: a. under G code condition: high speed heating, set 30℃, press temperature ‘+ ‘ key and the set key at the same time. The system will enter the fixed frequency operation after the buzzer rings twice.

b. The proceeding programs are as the follows:

Entering the fixed frequency operation, you can set the fixed strength location 1 and send the heating signal to the outdoor system. Meanwhile, you can fix the indoor system at high speed mode, the location of the airflow directin board can be switched to the maximal position.

c. Quitting condition: The fixed frequency heating can be quitted after receiving the remote signal, and the system will enter the remote setting status.

1.14. Other additional functions.

1.14.1 Test program

First, connect the test program terminal on the mainboard, then connect the system to the power circuit. The test program will operate as follows.

HV series display: The buzzer rings for one time—the signal will be sent to outdoor system for 0.5 second— the violet is sent for 0.5-- the background light turns to white—the back ground light turns to white—the background light turns to white—the background light is fully lighted for 0.5 second—LCD screen lights for 0.5 second— the step-in motor fully output for 0.5 second—then the motor doesn’t output for 0.5 second—the motor fully output again for

0.5 second. The test program finishes.

Time cutting function: connect the test program terminal on the mainboard after connecting the system to the power circuit. The CPU of the main control will be 60 times faster.

1.14.2 Display function

HV series and LCD display

When the system starts up, the background and the LCD will be fully lighted for 3 seconds. The background colour is white.

1) Three-color background

The multi-color indicator is not lighted when the system is off. The mode-switching will change the indicator colors. Red color is for heating mode, blue for cooling, water color for demoisturing, white for automatic mode, pink for airflow sending, green for health mode and yellow green for air refreshing. The colors health, refreshing colors are preferred to the mode colors. If different status exist at the same time, then the last set color will be shown. The lighting key of the control board can turn on or off the display.

2) LCD display

*Set timing to display timing signs, set dormant mode to display dormant sign.(The dormant signs will be shown on the G series panels.), set health mode to display health sign, set new airflow mode to display new airflow sign and set violet disinfection to display health sign.

*Set auto, heating, demoisturing, heating to display the relative signs. When you use a remote control to switch cooling, demoisturing and heating modes, the set temperature will be shown and the screen board will return to the room temperature 5 seconds later. If you choose the airflow sending mode, the screen board will show the room temperature directly.

*If the system is under malfunction status, the display will show the malfunction code. Please refer to the malfunction list.

1.15 Malfunction display

The indoor system only reports the E1, E2, E7, E14, E4 malfunction. But E5 and E9 can be shown in the malfunction resume.

The outdoor system displays the malfunction in the malfunction resume with a F in front. (HS series shows the malfunctions in how many times the indicator lights flash

2. The outdoor system

The outdoor system will decide the operation mode based on the principle of ‘first order preferred’ according to the startup signals of the two indoor systems.

a) cooling: Under the cooling operation, the four direction latch will not be closed. The outdoor fan will operate at the cooling mode. The compressor will operate under the cooling frequency.

b) heating: Under the heating operation, the four direction latch will be closed. The outdoor fan will operate at the heating mode. The compressor will operate under the heating frequency. When frosts appear at the outdoor system, the system will enter into the defrosting operation automatically. After the completion of the defrosting, the system will be resumed.

2.1 heat defrosting operation

2.1.1 Under the heating operation, when the indoor heat interaction temperature is below the ambient temperature and the heat interaction temperature is below zero centigrade, the frosts will appear on the heat exchanger. When the aggregated frost affects the heat interaction, the defrosting operation will begin.

2.1.2 frost confirmation condition. When either of the following condition appears, the system will enter the defrosting mode.

b) continuous operation for 47 minutes and Ta≥5℃, if Te ≤-3℃ for 2 minutes.

b) continuous operation for 47 minutes and Ta＜5℃, if Te≤-7℃ for 2 minutes.

c) continuous operation for 47 minutes and Ta＜-3℃, if Te≤-9℃ for 2 minutes.

d) If Ta≤-3℃ and the compressor worked for 3 hours without a defrosting operation, the system will process the defrosting for one time.

2.1.2.1 Defrosting process: After entering the defrosting operation, the compressor and the fan will be stopped. The four direction latch will be opened 30 seconds later. And the compressor will restart 10 seconds later. The system begins the defrosting operation.

2.1.2.2 defrosting quitting condition:

i) Time control: Defrosting time lasts 10 (EEPROM) minutes, the defrosting operation ends.

ii) Heat interaction control: When Te≥14℃(*EEPROM*), the defrosting operation ends.

2.1.2.3 Defrosting quitting process

After the completion of the defrosting, the compressor stops. 50 seconds later, the four direction latch changes direction. 10 seconds later, the compressor will start and the original heating operation resumes.

2.1.2.4 After the entering into the frosting mode, the compressor will operate at least for 1 minutes before stopping the defrosting. (The timing starts as the four direction latch starts.)

2.1.4.5 Outdoor main relay control

The outdoor main relay closure will be delayed for 2 seconds after connecting to the circuit.

2.1.4.6 Outdoor airflow control

2.1.4.7 airflow control at the cooling mode.

After the compressor is turned on for 5 seconds, the outdoor fan will start at a high speed. 10 seconds later, the speed will be controlled according to the outdoor ambient temperature. If the outdoor has only two option, M operates on H and L operates on L.

When the outdoor speed is M or L, the speed will change according to the heat interaction temperature. The status will be checked every minute.

Ta>28℃，high speed

26℃<Ta<28℃ ，high/ low speed

Ta<26℃： Te≧40℃，high speed

37℃≦Te<40℃，high/ medium speed

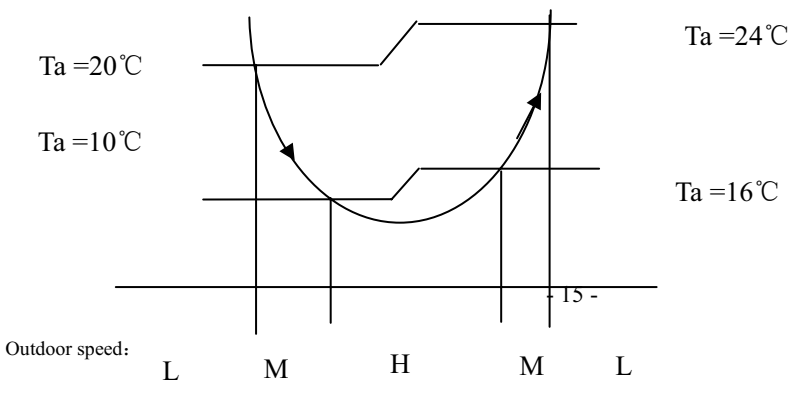
35℃≦Te ，medium speed

30℃≦Te<35℃，medium/ low speed

Te<30℃，low speed

2.1.4.8the speed control under the heating mode

The outdoor speed varies according to the outdoor ambient temperature. M operates on H under the two option mode.



Ta>24℃，low speed
24℃>Ta>20℃，low speed/ medium speed
Ta>16℃，medium speed
16℃>Ta>10℃，medium/high speed
Ta<10℃，high speed

2.1.5 Outdoor four direction control

Under the cooling mode, the outdoor four direction latch is not closed. Under the heating mode, the latch can be closed. When the heating compressor stops, the four direction latch will be closed 100 seconds later. The latch control under the defrosting operation has been discussed in the ‘defrosting operation’.

2.1.6compressor frequency control

2.1.6.1 fixed test frequency

There are two methods for the fixed test frequency operation of the outdoor system.

i) the indoor system can be controlled manually. (refer to the indoor system specification).

2.1.6.1.1 If the indoor system has the fixed frequency test operation function, then the outdoor system will calculate the fixed frequency according to the number of the turned on systems and operate on the calculated frequency until the indoor system quit the test operation. When the two indoor systems are turned on at the same time, the outdoor system will enter the operation mode if either of the indoor systems sends the fixed test frequency.

ii) The outdoor fixed frequency is set according to the indoor system signals. The operation is on the frequency stored in EEPROM

ii) The cooling and heating value under the double system operation

Under the single system fixed frequency test, the outdoor system will operate according to the turned-on indoor system status. The operation will on the frequency relative to the status. Under the double system operation test, the outdoor system will automatically operates on the double system fixed test frequency.

2.1.6.2Normal operation frequency control

Under the outdoor system normal operation, the fixed frequencies of different indoor systems should be tested according to the different capacity of the respective indoor systems. Then the outdoor system will decide the operation frequency according to the fixed frequencies, the difference between set temperature and the indoor temperature and the indoor fan speed.

2.1. 6. 2.1 When the system is turned on for the first time, the frequency will be raised to the maximal rating and operates on it for 30 minutes. Then, whether the present indoor temperature difference changes or not, the frequency will fall to the rate corresponding to the capacity of the indoor systems.

2.1.7 malfunction and protection

2.1.7.1 cooling frosting protection

i) If an indoor system Te≤0℃ for 5 minutes, then the indoor system will send the indoor off

signal to the outdoor system and the indoor frosting malfunction will be reported (the function can be completed within the indoor system.) After the outdoor system receives the off signal, the corresponding electronic latch will be closed. If the two indoor systems are both off, the outdoor compressor will be turned off. (when both systems are turned on, the lowest indoor coil will be preferred.)

ii) If indoor system Te≥7℃, the frosting protection operation and the frequency control will be quitted.

iii) If the indoor system Te≥T1℃, the rise of the compressor frequency will be allowed.

iv) If the indoor system T1-1℃≤Te≤T1℃, the compressor frequency will not change

v) If the indoor system Te<T1-1℃, the compressor frequency will begin to fall.

2.1.7.2 Cooling overloading protection

i) If the outdoor Te≥Tx ℃ for 10 seconds, the outdoor compressor will stop and the cooling overloading will be reported. Tx is adaptable in EEPROM.

ii) If the outdoor system Te≤50℃, cooling overloading protection will be quitted.

i) If the outdoor system Te≤T1－2℃, the rise of the compressor frequency will be allowed.

ii) If the outdoor system Te≤T1℃, the compressor frequency will not change

iii) If the outdoor system Te>T1℃, the compressor frequency will begin to fall.

2.1.7.3 heating overload protection

i) If an indoor system Te≤Tx ℃ for 10 seconds, the indoor system will send the indoor off signal to the outdoor system and the indoor heating overload will be reported. (the function is completed in the indoor system.) After the outdoor system receives the off signal, the corresponding electronic latch will be closed. If the two indoor systems are both off, the outdoor compressor will be turned off. (when both systems are turned on, the lowest indoor coil will be preferred.)

ii) if the indoor system Te≤50℃, the heating overloading protection will be quitted.

iii) if the indoor system Te≤T1－2℃, the rise of the compressor frequency will be allowed.

iv) If the indoor system Te≤T1℃, the compressor frequency will not change.

v) If the indoor system Te>T1℃, the compressor frequency will begin to fall.

2.1.7.4current overcharge

i) when the outdoor system current≥I_0＋2A, the outdoor system stops and the current charge is reported.

ii) When the outdoor system current≥I_0＋0.5A, the outdoor system begins frequency reducing.

iii) When the outdoor system current≥I_0－0.5A, the outdoor system frequency will not change.

iv) When the outdoor system current<I_0－0.5A, the outdoor system frequency will rise.

v) The difference between the heating mode I_0 and the cooling mode I_0 will stored in EEPROM.

2.1.7.5 Voltage over/under load protection.

i) The AC voltage operation range is between 175V-253V。, the compressor will be stopped

if the voltage surpasses this range.

ii) When the AC voltage returns to normal, the outdoor system return to the normal operation mode.

2.1.7.6 Compressor overheating protection

i) If the compressor outlet temperature Td≥120℃ for 10 seconds (adaptable in EEPROM), the outdoor compressor stops and the compressor overheating is reported.

ii) If Td≤90℃, the system quits the protection and returns to normal.

i) If the top switch of the compressor is opened by overheating, the outdoor system will be stopped. The system will resume if the switch is closed again.

ii) If Td≥T1+2℃, the compressor frequency falls.

iii) If Td≥T1℃, the compressor frequency will not change.

iv) If Td≥T1−2℃, the compressor frequency will rise.

2.1. 7. 7 Three minutes' waiting mode protection

1) No matter caused by which condition, the outdoor compressor is not allowed to be restart within 3 minutes after a compressor shut down.

2) If the compressor shut down is caused by malfunctions and the malfunction is corrected 3 minutes after, the compressor can restarted of the correction at once.

2.1.7.8 Intelligent power module protection.

i) Under the compressor operation, if the IPM protection happens under the voltage over/under loading, over heating or current overcharge, the compressor will stop and restart 3 minutes later.

ii) If the IPM protection happens 4 times continuously, the compressor will be totally turned off and can be restarted only by a second connection to the power supply.

2.1.7. 9 Sensor malfunction protection.

i) There are 6 sensors in the outdoor system. The outdoor system will stop if any of the six sensors has malfunctions. The malfunction will be reported respectively.

ii) After the malfunction has been corrected for 3 minutes, the system can be restarted.

Outdoor restriction condition codes display:

When the outdoor system operates, because of the various temperature or electrical device restrictions, the compressor has to ensure the maximal output within a safe frequency range. This restriction condition only represent the most possible condition at the time, can only be used as a reference in experiments.

1# Normal, no restriction

2# Power voltage restriction

3# outdoor heat interaction restriction under the cooling mode; indoor heat interaction under the heating mode.

4# main current restriction

5# outlet temperature restriction

6# indoor heat interaction temperature restriction. (frosting prevention)

7# Indoor fan speed restriction

8# Outdoor frequency conversing voltage restriction

Note: A adaptable potentiometer is connected to the CN15 pin of the PCB board. The compressor frequency can be controlled by the switching of the voltage of the system.

2.1.8 Outdoor electronic inflation latch control

2.1.8.1 There are two electronic latches in the outdoor system. When the outdoor system is connected to the power for the first time, the two latches will be closed and then be opened to the default width.

2.1.8.2 When the outdoor system is at the off status, the two latches will be both opened.

2.1.8.3 After the compressor startup, the outdoor system will decide the status of the two latches according to the different indoor system situation. The latch corresponding to the turned indoor system will be firstly opened to the default width and then be changed according to the temperature. The latch corresponding to the turned off indoor system will totally closed under the cooling mode. This latch will be opened and closed continuously under the heating mode. The opening and closing intervals can be controlled in E2.

4. Thermistor resistance chart

Room temperature sensor

T(℃)	R(KΩ)	Power input（V）
-20	281.34	0.33
-19	263.56	0.35
-18	247.84	0.37
-17	231.66	0.40
-16	217.35	0.42
-15	204.02	0.45
-14	191.61	0.47
-13	180.04	0.50
-12	169.24	0.53
-11	159.17	0.56
-10	149.77	0.59
-9	140.99	0.62
-8	132.78	0.65
-7	126.11	0.69
-6	117.93	0.73
-5	111.22	0.76
-4	104.93	0.80
-3	98.04	0.84
-2	93.52	0.88
-1	88.35	0.92
0	83.50	0.97
1	78.94	1.01
2	74.67	1.06
3	70.65	1.10
4	66.88	1.15
5	63.33	1.20
6	60.00	1.25
7	56.88	1.00
8	53.91	1.35
9	51.15	1.41
10	48.51	1.46
11	46.04	1.51
12	43.72	1.57
13	41.52	1.63
14	39.45	1.68
15	37.50	1.74
16	35.66	1.80
17	33.92	1.85

18	32.27	1.91
19	30.72	1.97
20	29.25	2.00
21	27.85	2.09
22	26.54	
23	25.30	2.21
24	24.12	2.27
25	23.00	2.33
26	21.94	2.38
27	20.94	2.44
28	19.99	2.50
29	19.09	2.56
30	18.23	2.62
31	17.42	2.67
32	16.65	2.73
33	15.92	2.78
34	15.22	2.84
35	14.56	2.89
36	13.93	2.95
37	13.04	3.00
38	12.77	3.05
39	12.23	3.10
40	11.71	3.15
41	11.22	3.20
42	10.76	3.25
43	10.31	3.30
44	9.89	3.35
45	9.46	3.39
46	9.10	3.44
47	8.74	3.48
48	8.39	3.52
49	8.05	3.57
50	7.73	3.51
51	7.43	3.65
52	7.14	3.68
53	6.86	3.72
54	6.60	3.76
55	6.34	3.80
56	6.10	3.83
57	5.87	3.37
58	5.65	3.90
59	5.44	3.93
60	5.24	3.96

61	5.04	3.99
62	4.86	4.02
63	4.68	4.05
64	4.51	4.08
65	4.35	4.11
66	4.13	4.13
67	4.04	
68	3.90	4.18
69	3.76	4.21
70	3.63	4.23
71	3.50	4.25
72	3.38	4.28
73	3.26	4.30
74	3.15	4.32
75	3.04	4.34
76	2.94	4.36
77	2.84	4.38
78	2.74	4.40
79	2.65	4.42
80	2.56	4.43

Indoor pipe temperature sensor

T(℃)	R(KΩ)	Power input（V）
-20	90.79	0.90
-19	85.72	0.95
-18	80.96	0.99
-17	76.51	1.04
-16	72.33	1.08
-15	68.41	1.13
-14	64.73	1.18
-13	61.27	1.23
-12	58.02	1.28
-11	54.97	1.33
-10	52.10	1.39
-9	49.40	1.44
-8	46.88	1.50
-7	44.46	1.55
-6	42.21	1.61
-5	40.08	1.66
-4	38.08	1.72
-3	36.19	1.78

-2	34.41	1.84
-1	32.73	1.90
0	31.24	1.98
1	29.84	2.01
2	28.22	2.07
3	26.88	2.13
4	25.61	2.19
5	24.41	2.25
6	23.27	
7	22.20	2.37
8	21.18	2.43
9	20.21	2.49
10	19.30	2.54
11	18.43	2.60
12	17.61	2.56
13	16.83	2.72
14	16.09	2.77
15	15.38	2.83
16	14.71	2.88
17	14.08	2.93
18	13.48	2.99
19	12.90	3.04
20	12.38	3.09
21	11.64	3.14
22	11.34	3.19
23	10.87	3.24
24	10.43	3.29
25	10.00	3.33
26	9.59	3.38
27	9.21	3.42
28	8.84	3.47
29	8.48	3.51
30	8.15	3.55
31	7.83	2.59
32	7.52	3.63
33	7.23	3.67
34	6.95	3.71
35	6.68	3.75
36	6.43	3.78
37	6.19	3.82
38	5.95	3.86
39	5.73	3.89
40	5.52	3.92

41	5.32	3.95
42	5.12	3.98
43	4.93	4.01
44	4.75	4.04
45	4.58	4.07
46	4.42	4.10
47	4.26	4.12
48	4.11	4.15
49	3.97	4.17
50	3.83	4.20
51	3.70	
52	3.57	4.24
53	3.45	4.26
54	3.33	4.28
55	3.22	4.31
56	3.11	4.33
57	3.00	4.35
58	2.90	4.37
59	2.81	4.38
60	2.72	4.40
61	2.63	4.42
62	2.54	4.44
63	2.45	4.45
64	2.36	4.47
65	2.30	4.48
66	2.23	4.50
67	2.15	4.51
68	2.09	4.53
69	2.03	4.54
70	1.96	4.55
71	1.90	4.57
72	1.85	4.58
73	1.79	4.59
74	1.73	4.60
75	1.68	4.61
76	1.63	4.62
77	1.58	4.63
78	1.54	4.64
79	1.49	4.65
80	1.45	4.66

5. Trouble shooting

Before asking for service, check the following first.

	Phenomenon	Cause or check points
Normal Performance inspection	The system does not restart immediately. 	● When unit is stopped, it won't restart immediately until 3 minutes have elapsed to protect the system. ● When the electric plug is pulled out and reinserted, the protection circuit will work for 3 minutes to protect the air conditioner.
	Noise is heard. 	● During unit operation or at stop, a swishing or gurgling noise may be heard. At first 2-3 minutes after unit start, this noise is more noticeable. (This noise is generated by refrigerant flowing in the system.) ● During unit operation, a cracking noise may be heard. This noise is generated by the casing expanding or shrinking because of temperature changes. ● Should there be a big noise from air flow in unit operation; air filter may be too dirty.
	Smells are generated.	● This is because the system circulates smells from the interior air such as the smell of furniture, cigarettes.
	Mist or steam is blown out.	● During COOL or DRY operation, indoor unit may blow out mist. This is due to the sudden cooling of indoor air.
Multiple check	Does not work at all.	● Is power plug inserted? ● Is there a power failure? ● Is fuse blown out?
	Poor cooling 	● Is the air filter dirty? Normally it should be cleaned every 15 days. ● Are there any obstacles before inlet and outlet? ● Is temperature set correctly? ● Are there some doors or windows left open? Is there any direct sunlight through the window during the cooling operation?(Use curtain) ● Are there too much heat sources or too many people in the room during cooling operation?

Sample: ■ the led off □ the led on ★ the led flashing

Indoor system malfunction codes

malfunction codes	malfunction	HV series	HS series		
			operation	heating	cooling
1#	Indoor temperature sensor system break	E1	★	■	■
2#	Indoor heat interaction temperature sensor system break	E2	★	□	□
7#	Inefficient communication between indoor and outdoor system	E7	■	■	★
14#	Indoor fan abnormality	E14	■	□	★
4#	Malfunction in reading or writing E2ROM	E4	★	□	★

outdoor system malfunction code（the indoor unit can show you some malfunction code, as follow）

malfunction codes	malfunction	HV series	HS series		
			operation	heating	cooling
1#	Ambient sensors circuit break	F1	□	★	■
2#	Hot temperature sensor circuit breaks or shorts	F2	★	□	□
3#	Outlet temperature sensor circuit breaks or shorts	F3	★	□	■
4#	DC compressor feedback.	F4	★	■	□
5#	Outdoor system communication malfunction.	F5	■	■	★
6#	Current overcharge.	F6	★	■	★
7#	No load.	F7	★	■	★
8#	Overloaded/ under loaded voltage.	F8	■	★	□
9#	DC compressor failure.	F9	★	■	□
10#	Refrigerating overload	F10	★	★	★
12#	IPM protection	F12	★	★	□
13#	E^2 ROM reading failure	F13	★	□	★
14#	E^2 ROM coining failure	F14	★	□	★
15#	DC fan malfunction	F15	-----		
16#	NO AC power	F16	★	■	★
17#	Aspiration sensor circuit breaks	F17	□	□	★
19#	DC compressor speed control failure	F19	★	■	□
21#	Coil 1 sensor circuit breaks or shorts	F21	□	□	★
22#	Coil 2 sensor circuit breaks or shorts	F22	□	□	★
31#	System A communication malfunction	F31	■	■	★
32#	System B communication malfunction	F32	■	■	★

4# Compressor feedback malfunction: Check the main board CN301 and the module jack CN3. Check the CN04 on the main board and test the output of 15V DC current between the pins of CN04. Check the location of the chip COM01 at the back of the mainborad, to see if there is any circuit shorts. Check the states of the 3 phases of the modules. If the feedbacks of all the checks and tests are normal, then replace COM01.

5#Outdoor system communication malfunction: check the module jack CN401 on the main board, to see if the conducts of the jack are normally connected with the terminal stripe. Test if there is a 5V DC current between the pin 8 and pin 16 of IC03 on the main board. Check if the pin 3 and pin 13 of this chip are correctly connected with the pin 44 and pin 45 of the IC01, to test if there is any circuit shorts. Test if there is any communication wave output at the pin 4 of PQ 404 and PQ 408 and at the pin 2 of PQ403 and PQ 407 and if there is any circuit shorts on the systems of the surrounding devices (the misconnect between the live line and the zero line.)

6#Current overcharge: Test if there is any circuit block on the system. Test the 4 diodes D501-D504 on the main board with a multimeter. Test if there is any 5v circuit shorts at R501-R503 and D-505. Replace device CT501.

7#No load: Test the 4 diodes D501-D504 on the main board with a multimeter. Test is there is any circuit short with GND at R501-R503 and D505(special focus on the possible circuit short condition the terminal A of D502 and terminal K of D504). To test if there is any formation of resistance or GND circuit short at the capacitor C501. Replace device CT501.

8#Overloaded/ under loaded voltage: Test if there is 310V DC between the terminal P and N of the program module. Test if there is any circuit short at R301-R304 , R324 and R325. Test if there is any formation of resistance or GND circuit short at the capacitor C304.

9#AC compressor start-up failure: Please restart. Check if the input and output at 7805(IC04) is correct. Check the status of the module on the module board. (the normal reading of the diode mode on the multimeter should be 0.45 at the P, N, U, V, W disconnect terminals.)

10# Refrigeration overload: let the system have a rest.

11#Defrosting condition: After the completion of the defrosting, the system will return to normal.

12# IPM protection: check if the system circuits are at normal condition. Check if there is any GND short at R08 on the main board, to test if there is any formation of resistance or GND circuit short at the capacitor C02, or any other protection modes caused by temporal current surge as a result of inappropriate operation or other reasons.

13#，14# malfunctions: Check if the installation of IC05 on the main is correct. (if the installation is reversed), and if there is any break at the back of the main board. Replace IC05 directly.

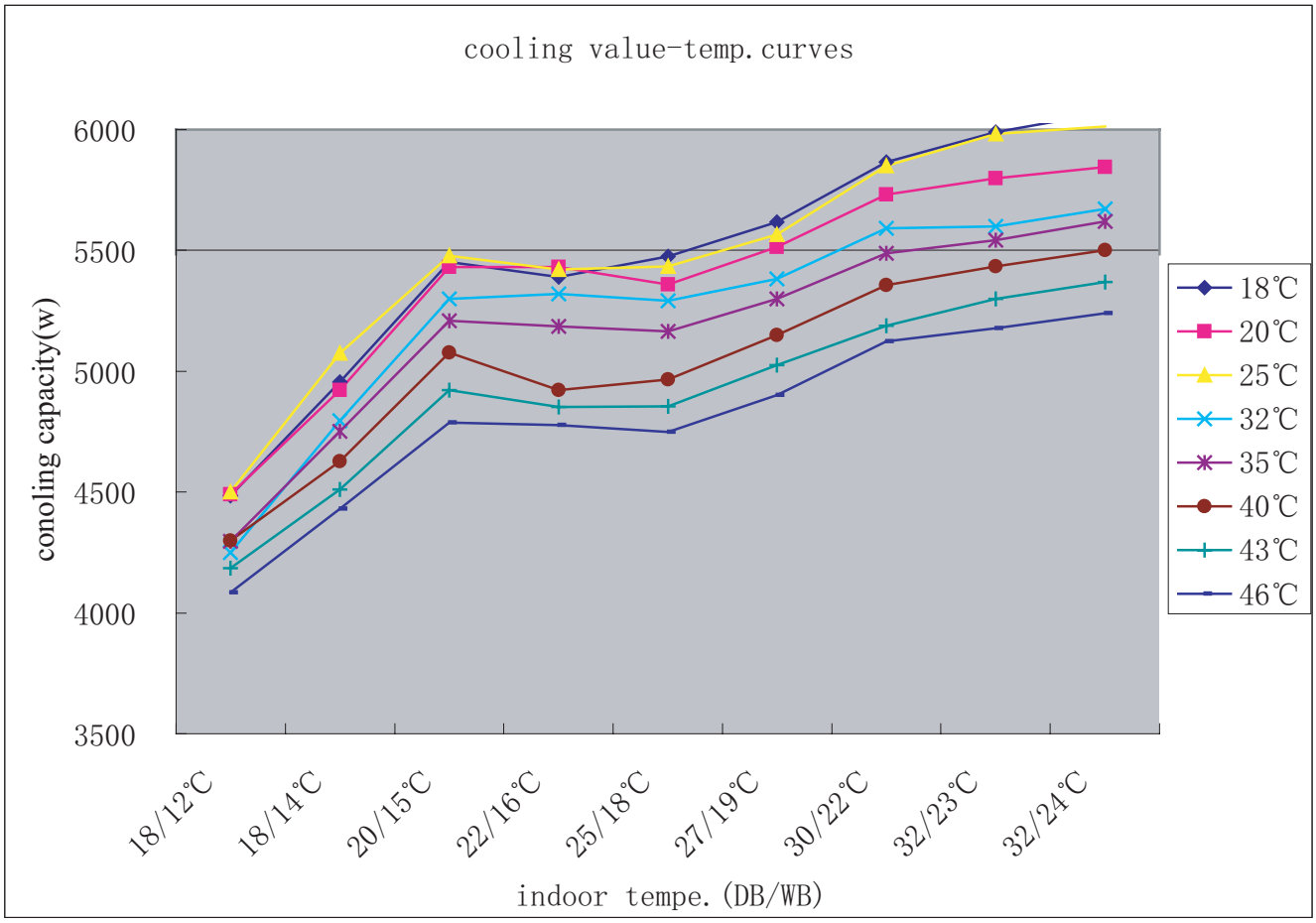
15#No such malfunctions.

16# No AC power: Check the power supply.

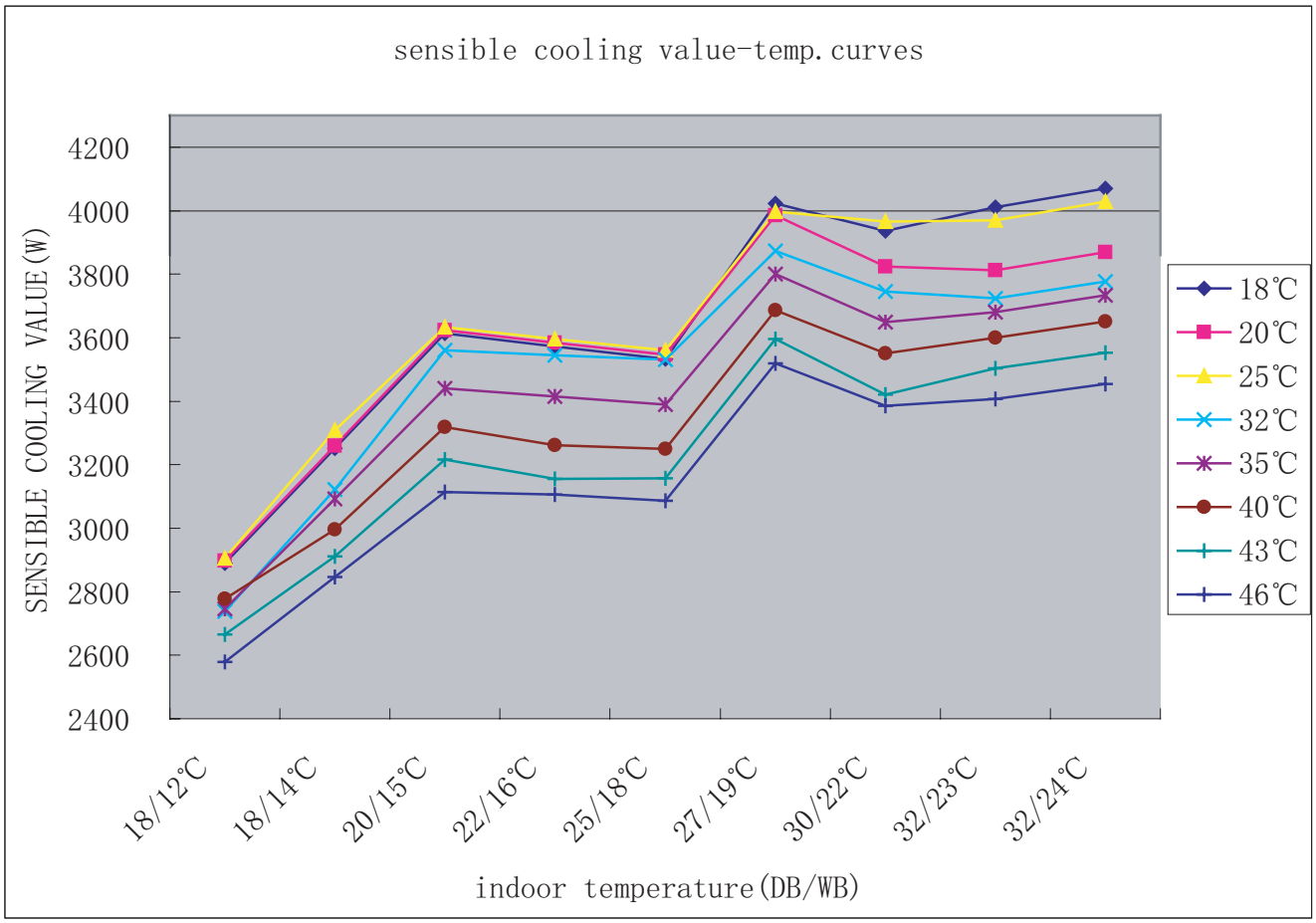
31#32# DC compressor speed control failure: Restart the compressor after it is turned of for a while. If the restart doesn’ t work,refer the suggestions of NO 9 and NO 4.

6. Performance Curves Diagram

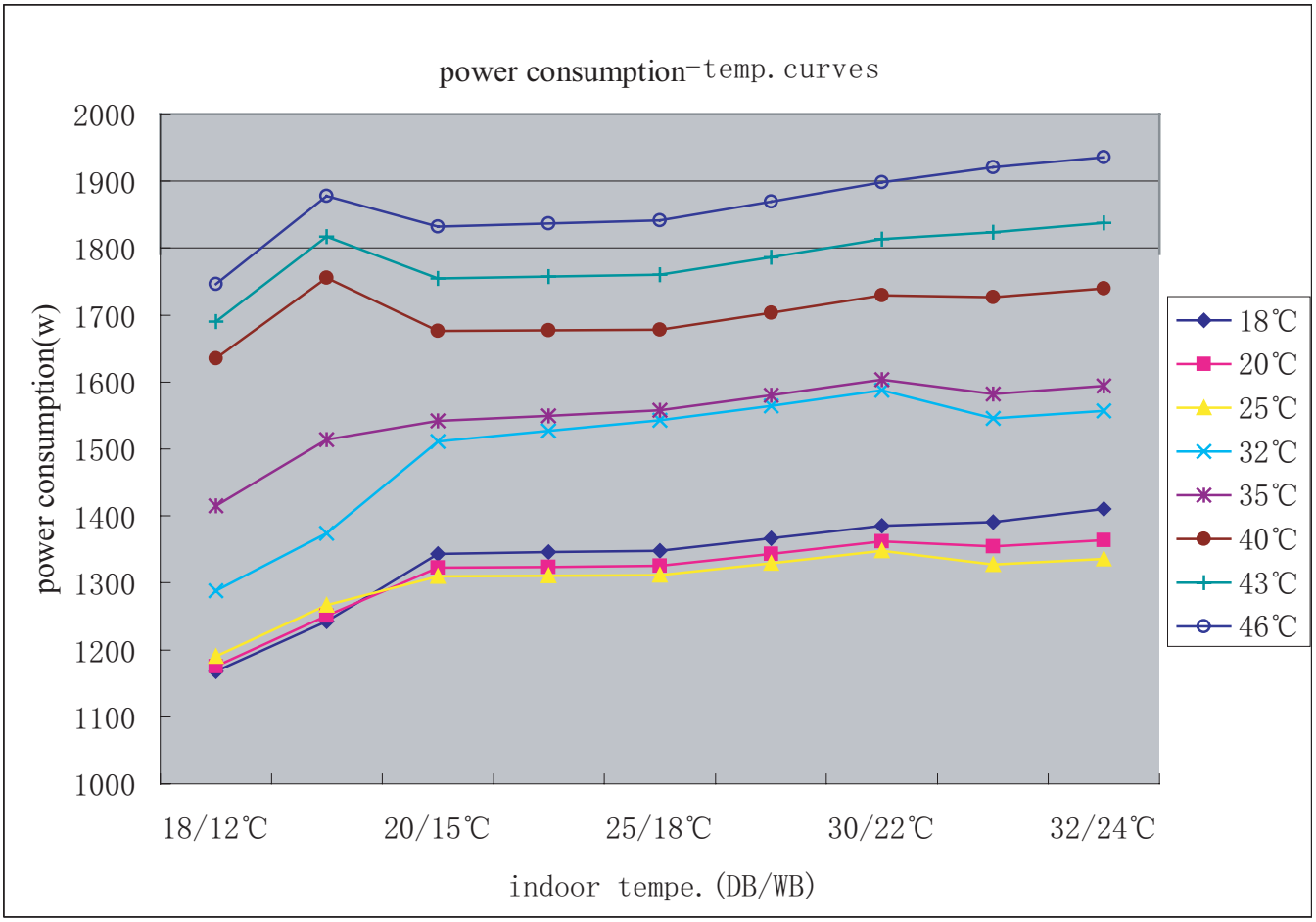
H2SM-(9+12)RH03/R2(DB) performance curves								
cooling value-temerature talbe								
indoor temp.	outdoor temp.(humidity 46%)							
DB/WB	18℃	20℃	25℃	32℃	35℃	40℃	43℃	46℃
18/12℃	4485	4490	4500	4251	4296	4300	4185	4084
18/14℃	4956	4921	5074	4795	4752	4628	4512	4430
20/15℃	5451	5432	5477	5300	5210	5078	4921	4787
22/16℃	5390	5430	5420	5321	5186	4921	4851	4778
25/18℃	5475	5358	5433	5292	5165	4965	4854	4750
27/19℃	5617	5515	5565	5383	5300	5149	5026	4902
30/22℃	5865	5732	5850	5592	5489	5356	5189	5123
32/23℃	5989	5798	5982	5599	5542	5433	5300	5177
32/24℃	6071	5846	6014	5671	5621	5501	5370	5240



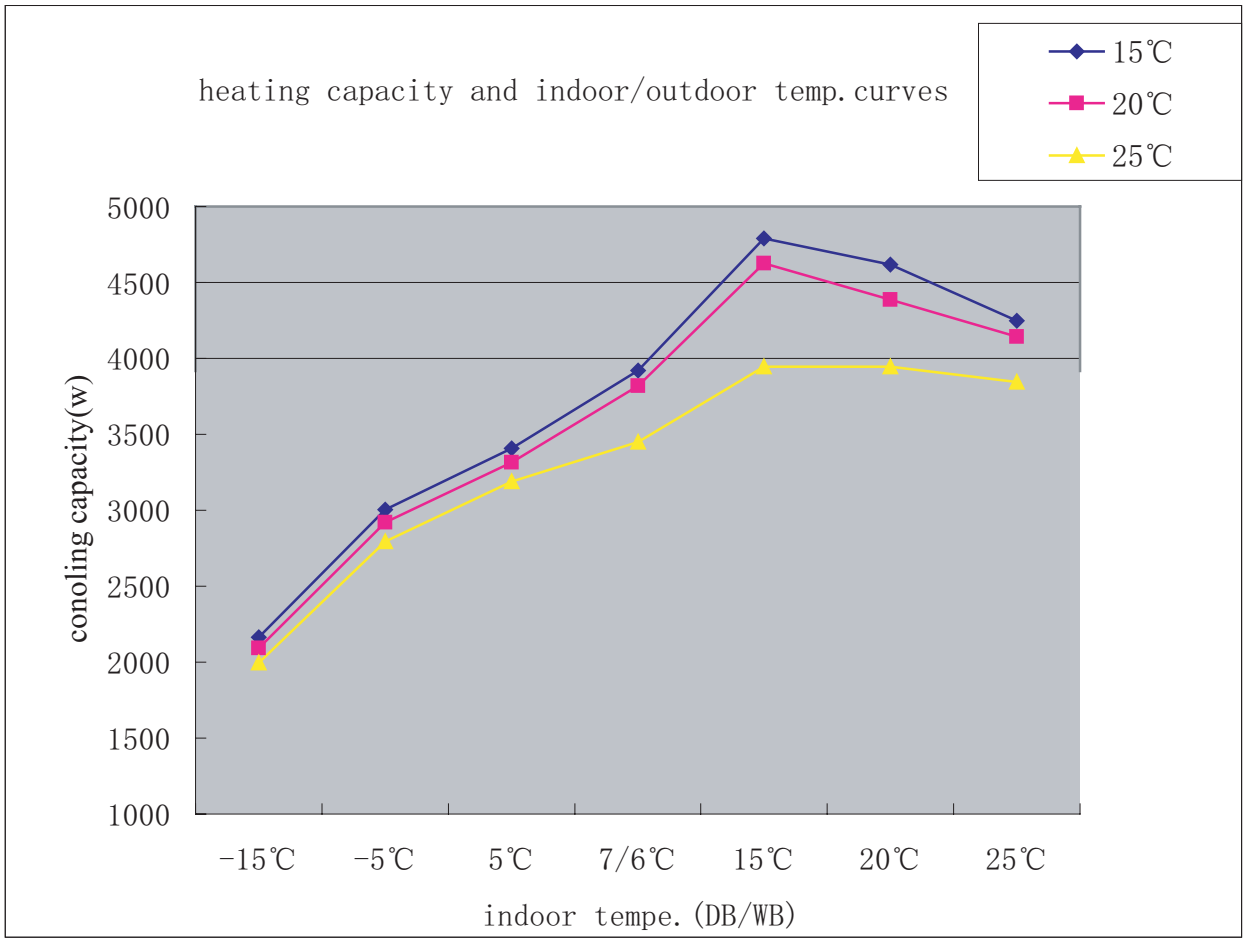
H2SM-(9+12)RH03/R2(DB)performance curves								
sensible cooling value-temerature talbe								
indoor temp.	outdoor temp.(humidity 46%)							
DB/WB	18℃	20℃	25℃	32℃	35℃	40℃	43℃	46℃
18/12℃	2889	2897	2905	2739	2746	2779	2666	2579
18/14℃	3251	3260	3310	3121	3093	2995	2911	2847
20/15℃	3613	3622	3632	3561	3440	3319	3217	3115
22/16℃	3573	3585	3597	3546	3415	3261	3156	3107
25/18℃	3532	3547	3561	3530	3390	3250	3158	3086
27/19℃	4023	3986	3998	3874	3800	3686	3596	3520
30/22℃	3936	3825	3966	3746	3648	3550	3421	3386
32/23℃	4011	3813	3970	3724	3681	3599	3503	3407
32/24℃	4070	3868	4029	3778	3734	3650	3552	3454



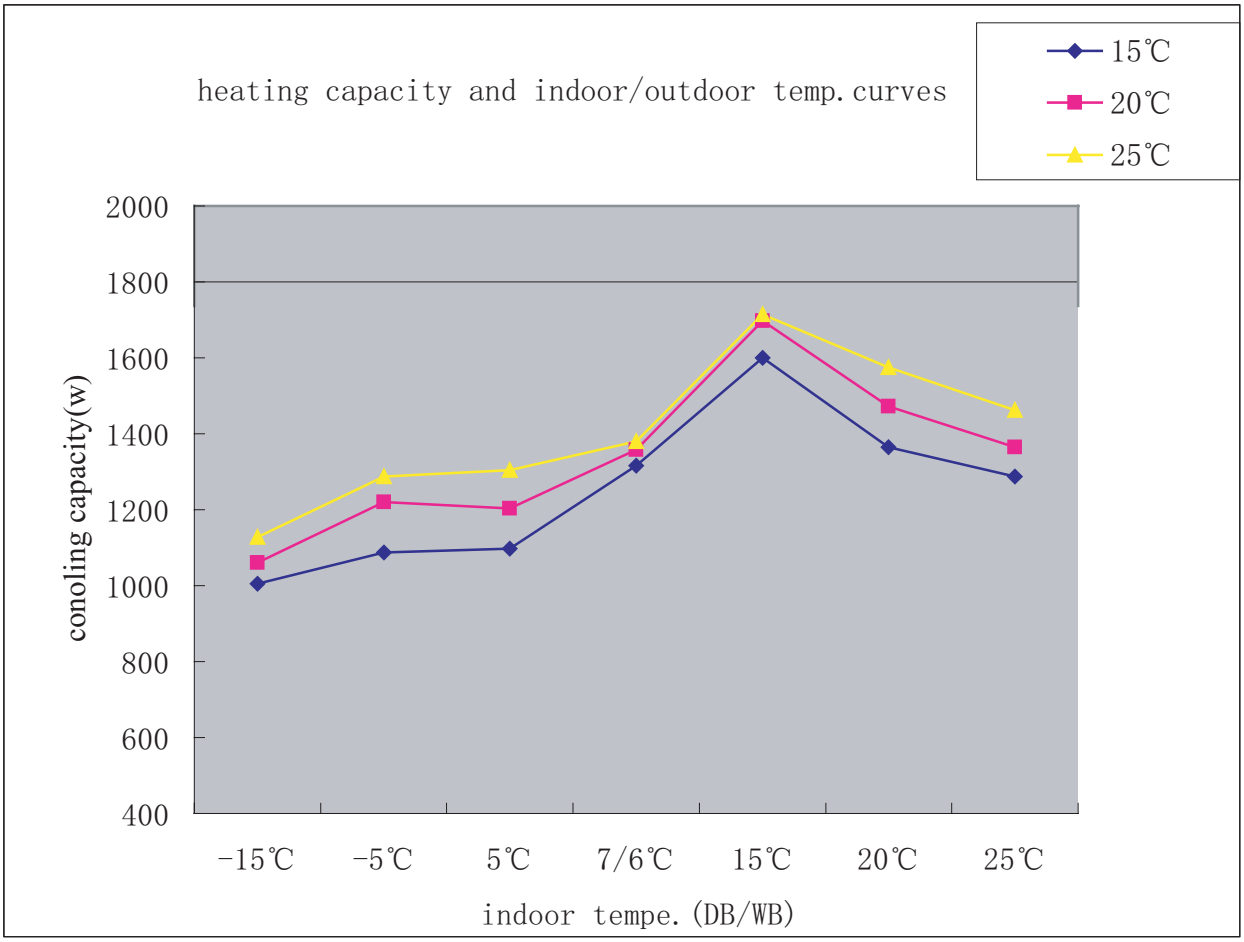
H2SM-(9+12)RH03/R2(DB) performance curves								
power consumption value-teme.talbe								
indoor temp.	outdoor temp.(humidity 46%)							
DB/WB	18℃	20℃	25℃	32℃	35℃	40℃	43℃	46℃
18/12℃	1268	1276	1291	1388	1515	1735	1791	1846
18/14℃	1342	1350	1367	1474	1614	1856	1917	1978
20/15℃	1443	1422	1410	1611	1642	1777	1854	1932
22/16℃	1446	1424	1411	1627	1650	1778	1857	1937
25/18℃	1448	1426	1412	1642	1658	1779	1860	1941
27/19℃	1466	1443	1430	1665	1680	1804	1887	1970
30/22℃	1485	1462	1448	1687	1703	1829	1914	1999
32/23℃	1491	1454	1427	1646	1682	1827	1924	2021
32/24℃	1510	1464	1436	1657	1694	1840	1938	2036



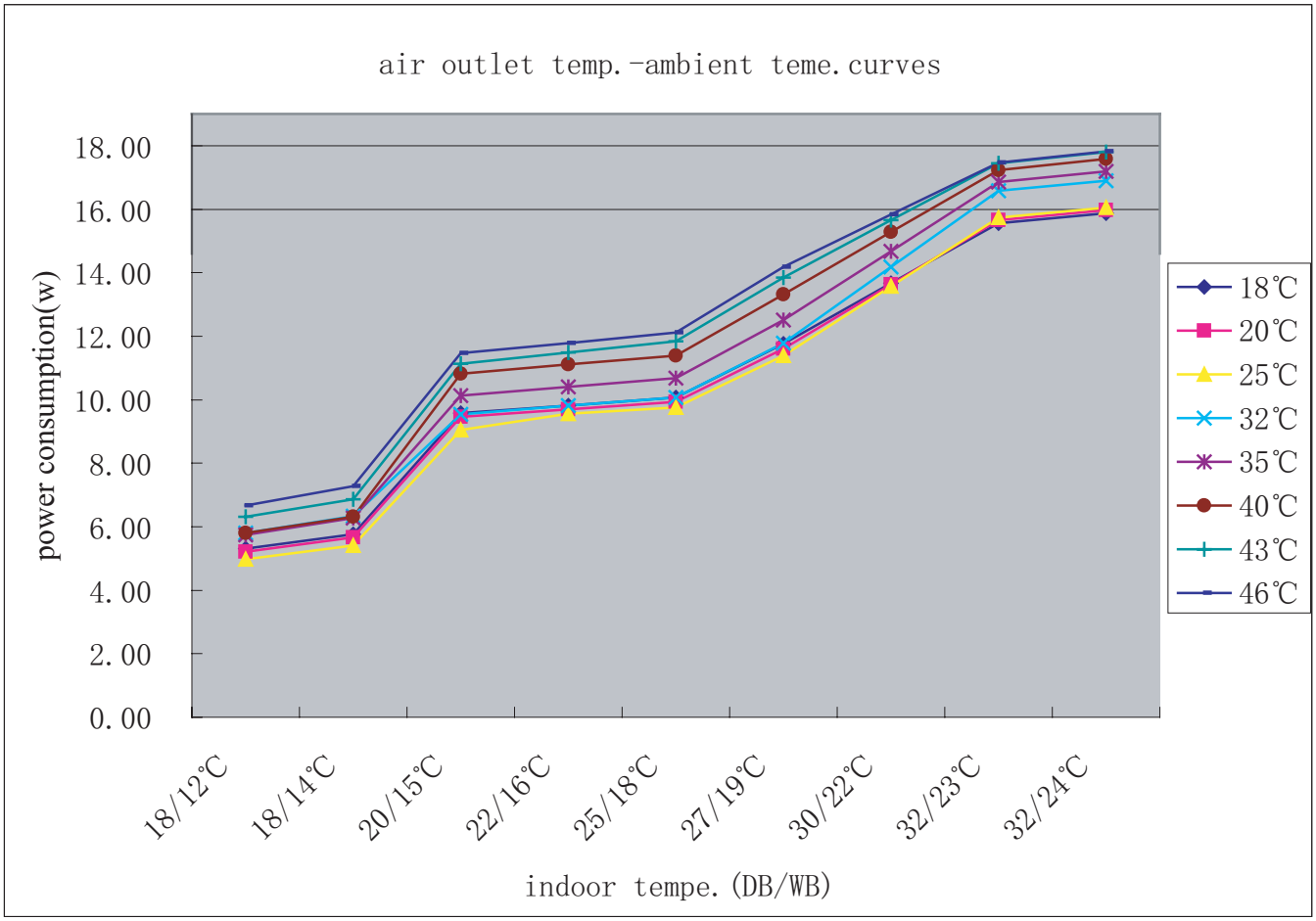
H2SM-(9+12)RH03/R2(DB)performance curves			
heating capacity and indoor/outdoor temp.curves			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-15℃	4345	4272	4175
-5℃	5184	5098	4975
5℃	5586	5494	5369
7/6℃	6099	6000	5628
15℃	6971	6806	6124
20℃	6796	6566	6125
25℃	6427	6322	6025



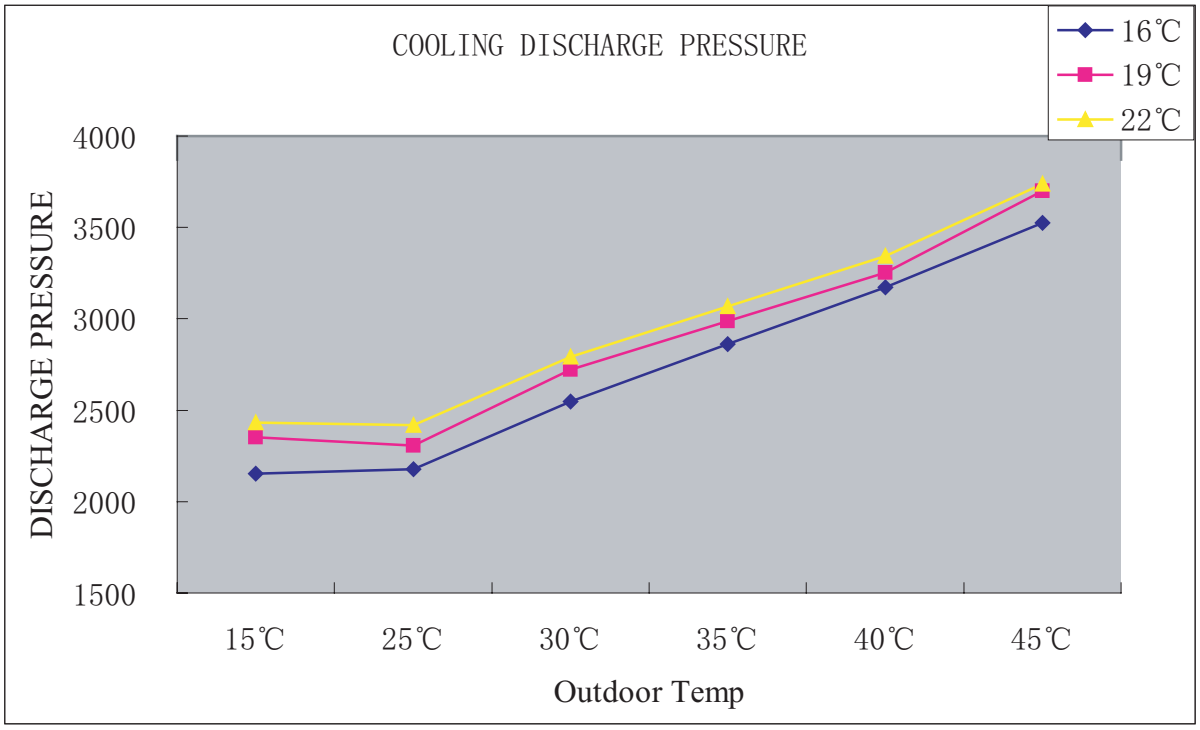
H2SM-(9+12)RH03/R2(DB)performance curves			
power consumption value-teme.talbe			
outdoor temp.	indoor temp.(humidity 46%)		
DB/WB	15℃	20℃	25℃
-15℃	1452	1507	1575
-5℃	1535	1668	1735
5℃	1545	1650	1751
7/6℃	1763	1800	1828
15℃	2047	2145	2161
20℃	1812	1919	2021
25℃	1734	1812	1909



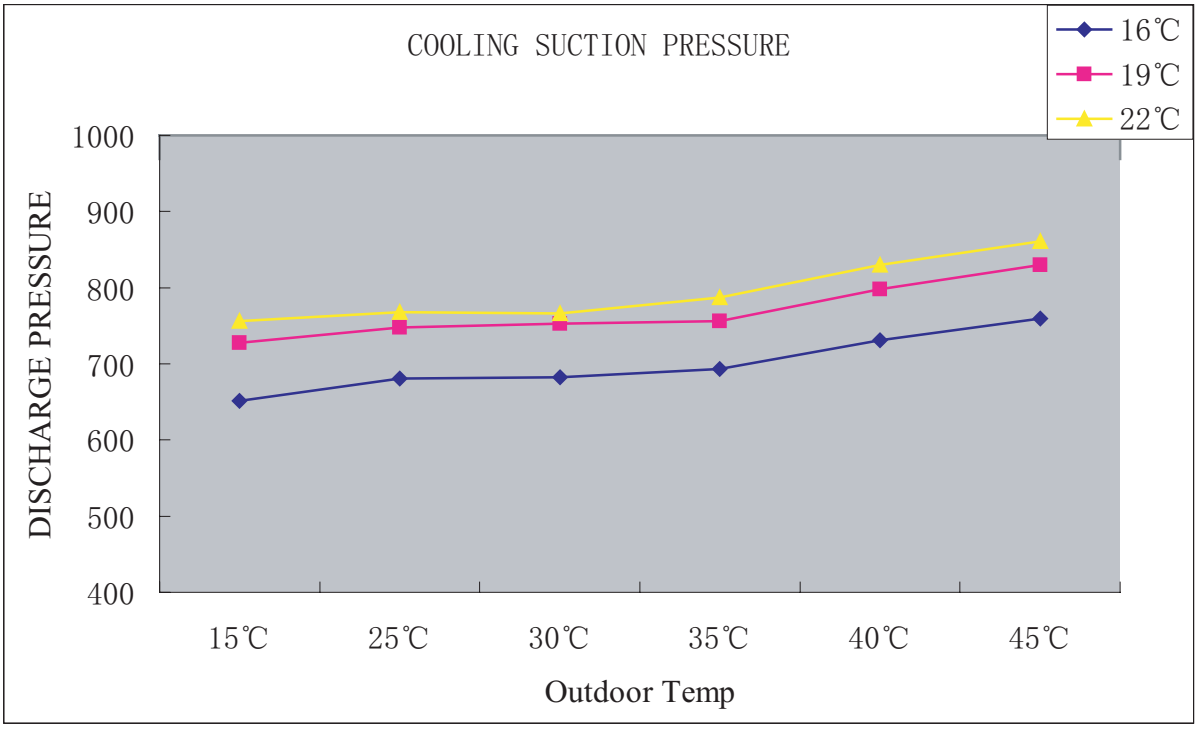
H2SM-(9+12)RH03/R2(DB) performance curves								
air outlet temp.-ambient teme.talbe								
indoor temp.	outdoor temp.(humidity 46%)							
DB/WB	18℃	20℃	25℃	32℃	35℃	40℃	43℃	46℃
18/12℃	5.30	5.21	4.97	5.81	5.75	5.80	6.31	6.68
18/14℃	5.76	5.66	5.40	6.33	6.27	6.31	6.87	7.28
20/15℃	9.58	9.47	9.04	9.54	10.14	10.82	11.14	11.46
22/16℃	9.82	9.70	9.55	9.81	10.41	11.10	11.49	11.79
25/18℃	10.07	9.94	9.75	10.08	10.69	11.39	11.84	12.11
27/19℃	11.75	11.60	11.39	11.78	12.50	13.32	13.85	14.19
30/22℃	13.66	13.63	13.56	14.18	14.68	15.28	15.65	15.83
32/23℃	15.57	15.67	15.74	16.57	16.86	17.24	17.45	17.47
32/24℃	15.87	15.97	16.04	16.90	17.19	17.58	17.79	17.81



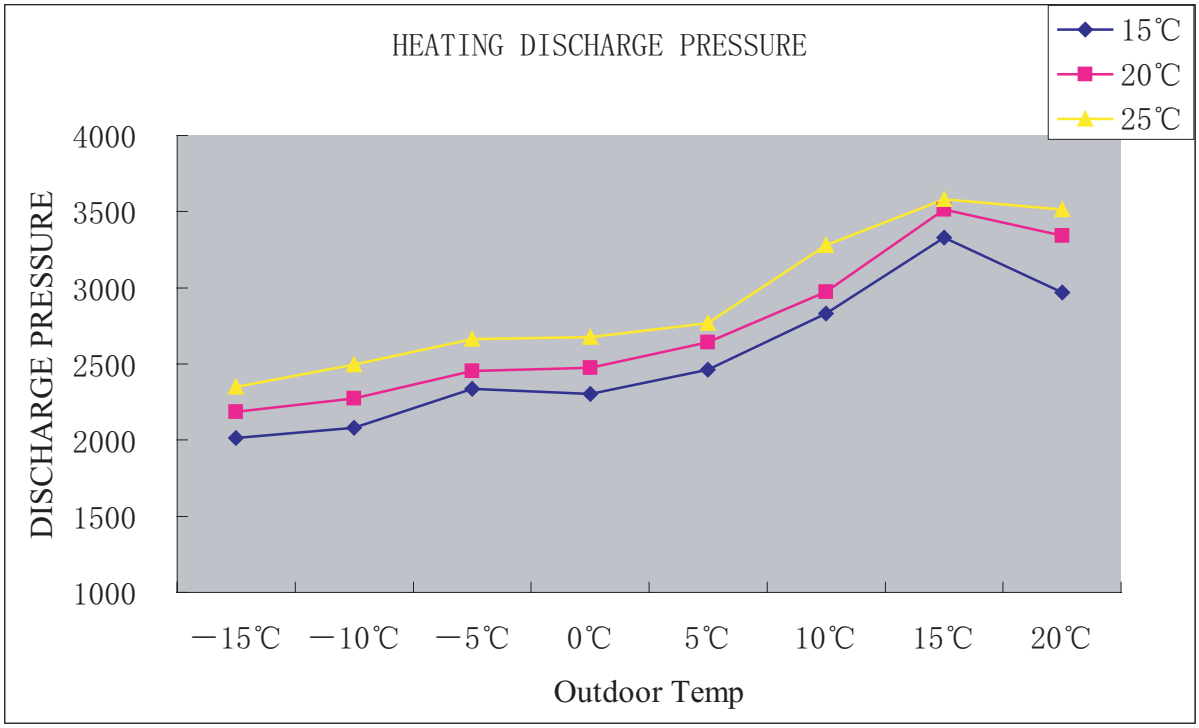
H2SM-(9+12)RH03/R2(DB)performance curves			
COOLING DISCHARGE PRESSURE. talbe			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	16℃	19℃	22℃
15℃	2151	2353	2434
25℃	2176	2308	2419
30℃	2549	2721	2792
35℃	2862	2988	3069
40℃	3173	3254	3345
45℃	3527	3698	3739



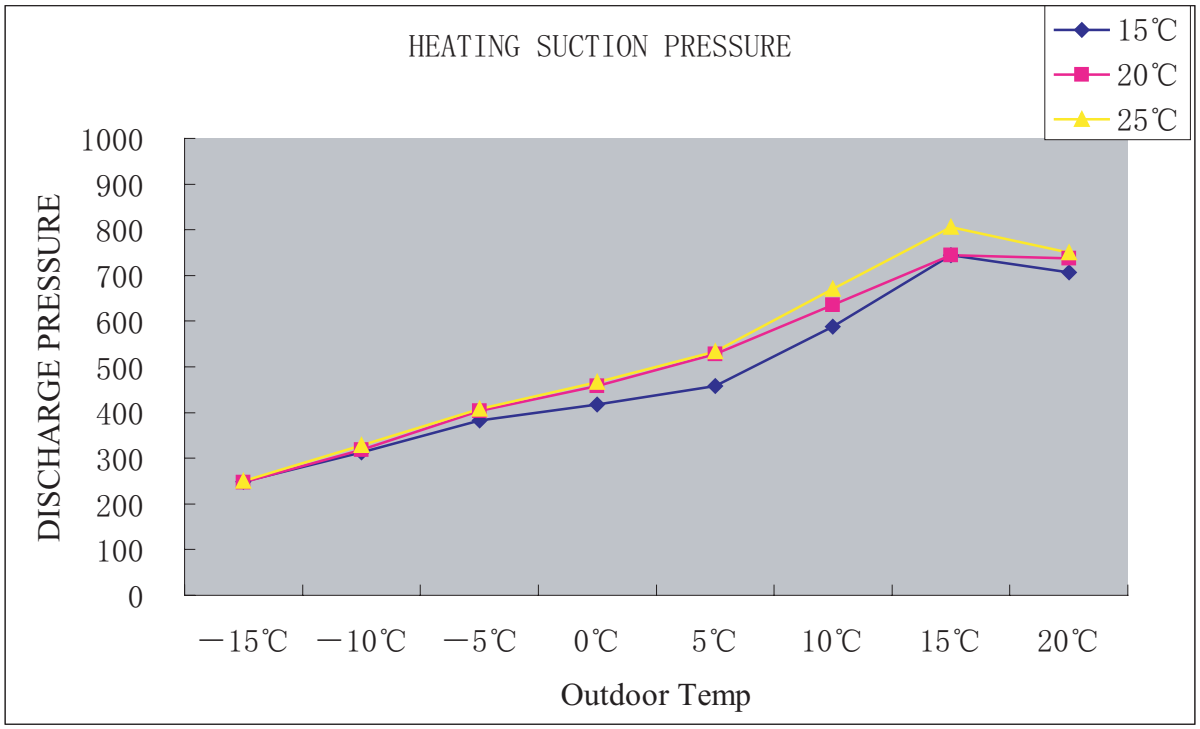
H2SM-(9+12)RH03/R2(DB)performance curves			
COOLING SUCTION PRESSURE. talbe			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	16℃	19℃	22℃
15℃	665	753	765
25℃	694	773	777
30℃	697	778	776
35℃	707	781	797
40℃	745	823	839
45℃	773	855	870



H2SM-(9+12)RH03/R2(DB) performance curves			
HEATING DISCHARGE PRESSURE. talbe			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	15℃	20℃	25℃
−15℃	2016	2184	2349
−10℃	2082	2273	2495
−5℃	2337	2453	2662
0℃	2303	2473	2674
5℃	2462	2643	2768
10℃	2830	2975	3280
15℃	3329	3512	3580
20℃	2970	3343	3513

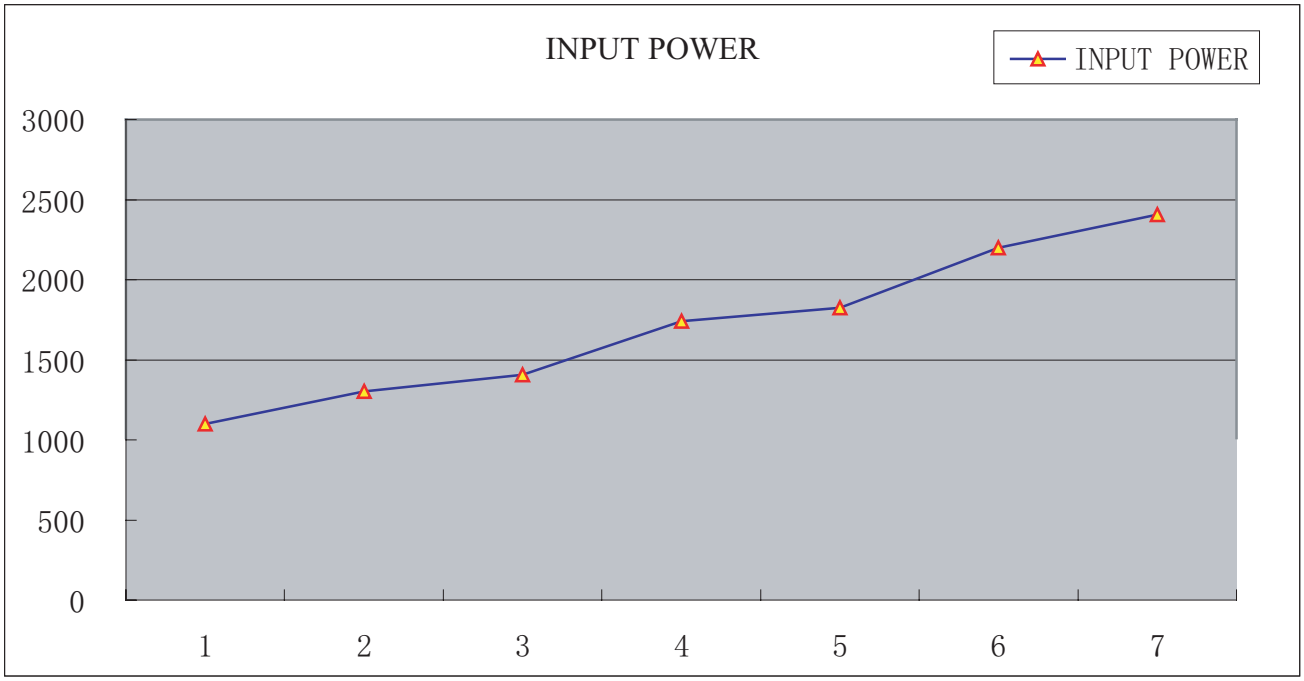


H2SM-(9+12)RH03/R2(DB) performance curves			
HEATING SUCTION PRESSURE. talbe			
outdoor temp. (humidity 46%)	indoor temp.		
DB/WB	15℃	20℃	25℃
−15℃	248	247	250
−10℃	313	318	328
−5℃	382	403	408
0℃	418	458	466
5℃	458	528	533
10℃	588	636	670
15℃	745	745	806
20℃	707	737	750



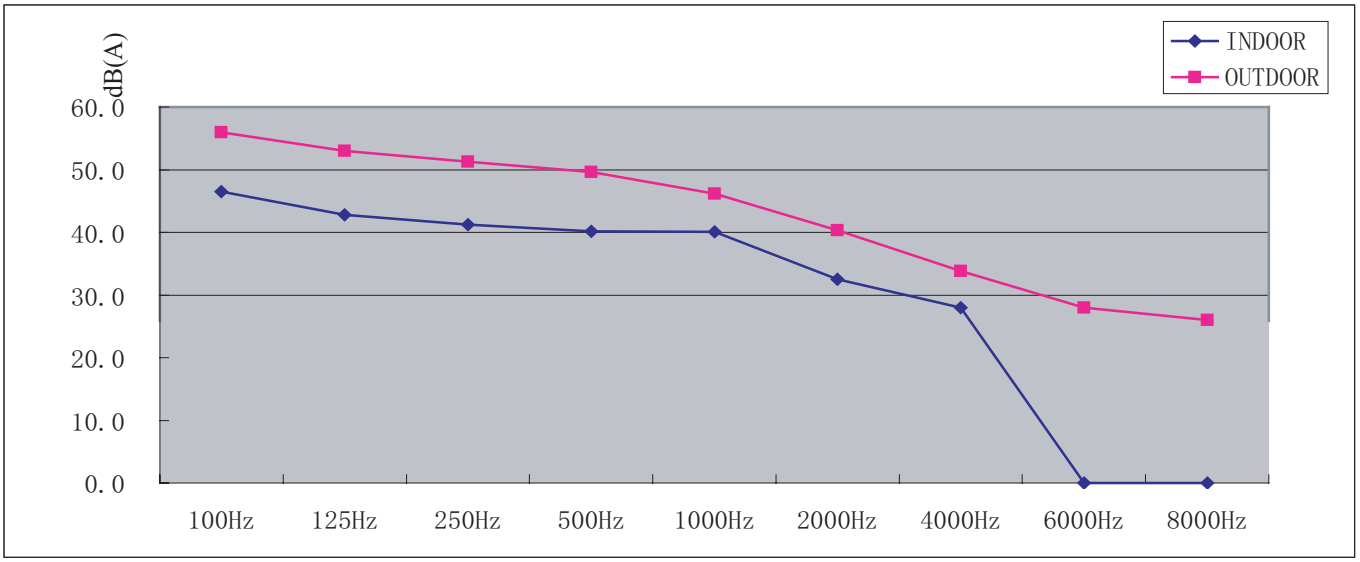
COMPRESSOR:5CS130XCC03

SERIAL NUMBER	1	2	3	4	5	6	7
FREQUENCY	30	50	60	80	90	110	120
INPUT POWER	1100	1302	1405	1740	1823	2200	2405

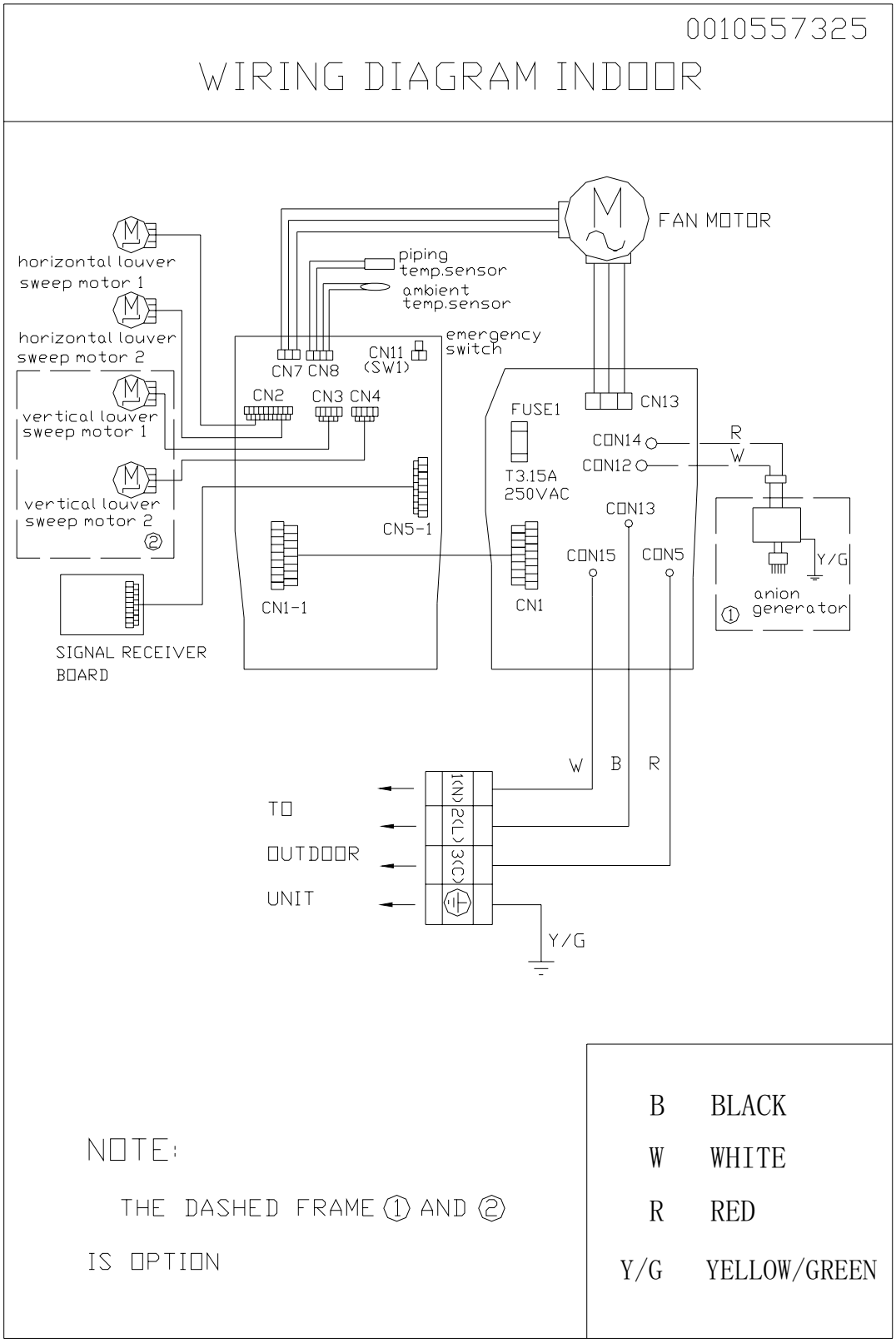


NOISE LEVEL TEST CHART

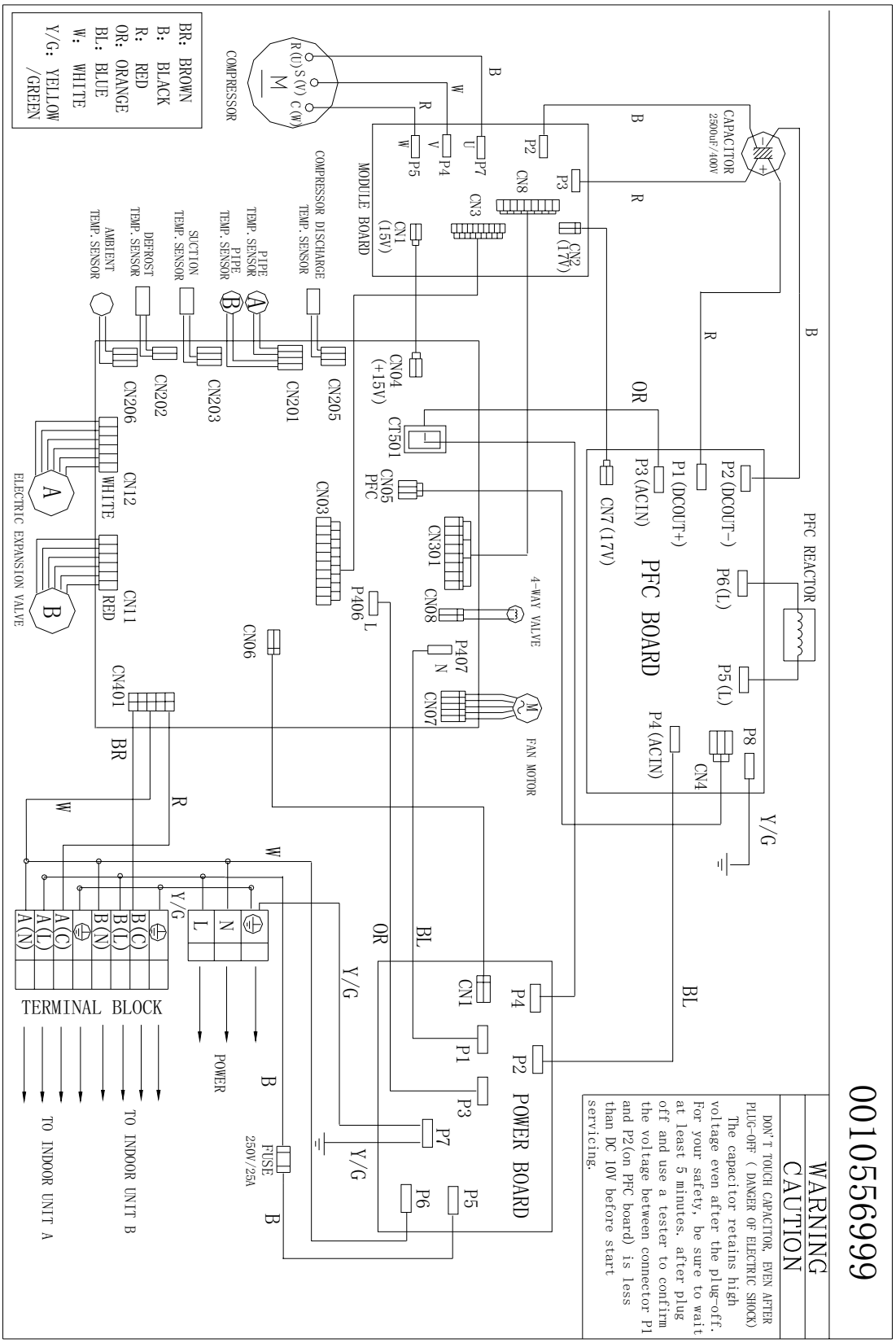
NOISE LEVEL	100Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	6000Hz	8000Hz
INDOOR	46.5	42.8	41.2	40.2	40.1	32.5	28.0	0.0	0.0
OUTDOOR	56.0	53.0	51.3	49.6	46.2	40.3	33.8	28.0	26.0



7. Wiring diagram

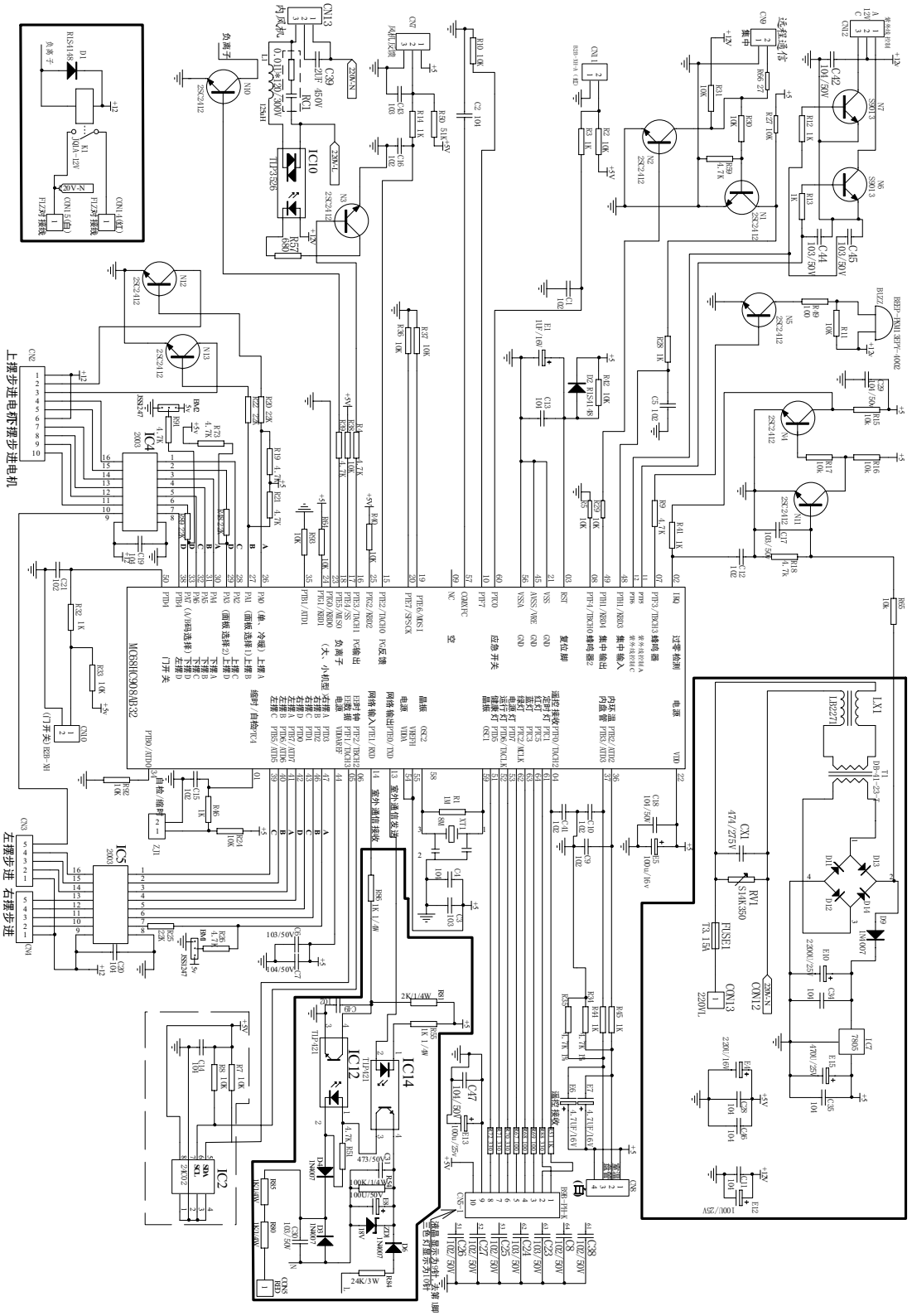


OUTDOOR'S WIRING DIAGRAM

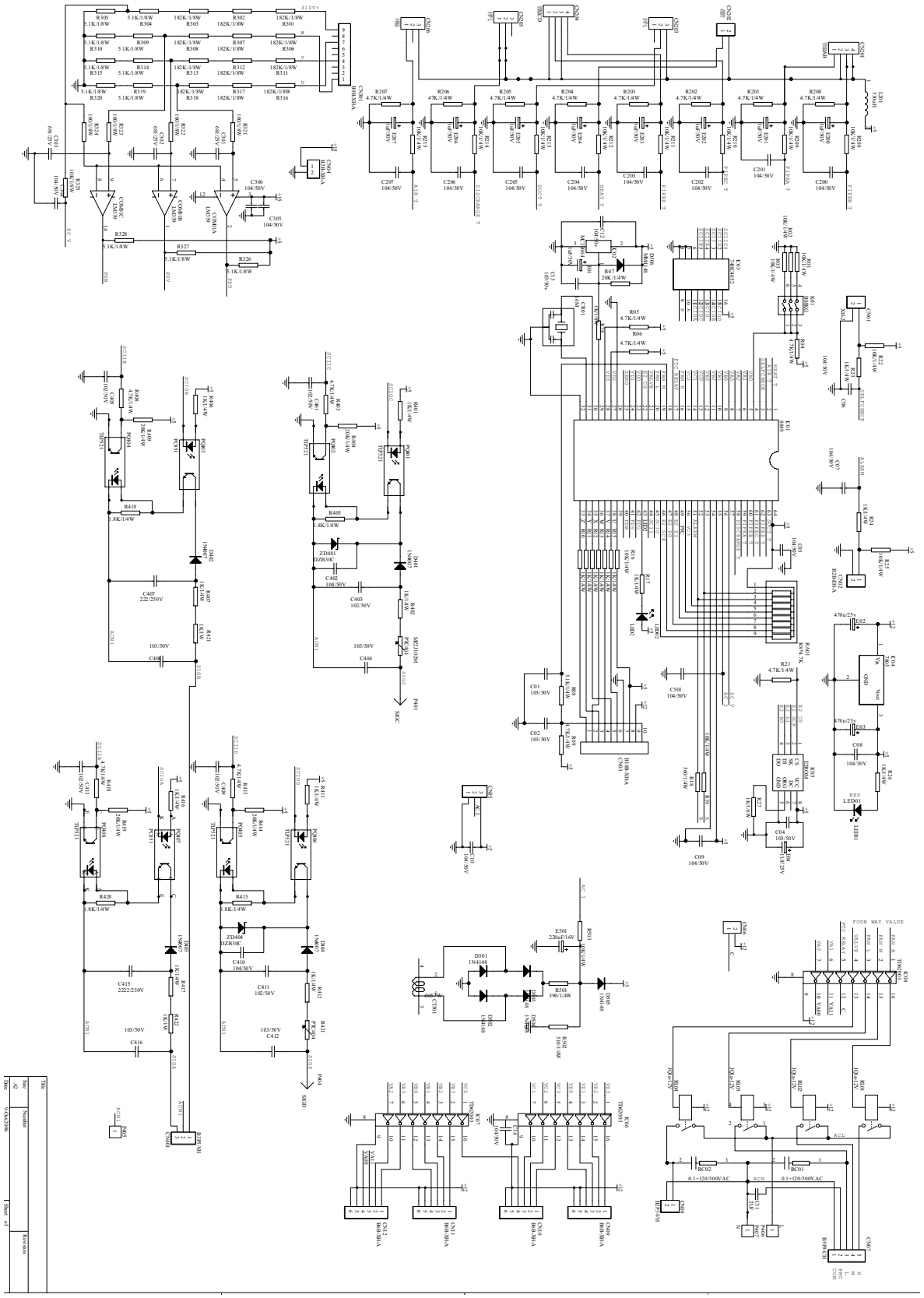


8. Schematic diagram of PCB

Indoor PCB



Outdoor PCB



9. Installation

- Read this manual before installation
- Explain sufficiently the operating means to the user according to this manual.

Necessary Tools for Installation

1.Driver
2.Hacksaw
3.Hole core drill
4.Spanner(17,19 and 26mm)
5.Torque wrench(17mm,22mm,26mm)
6.Pipe cutter
7.Flaring tool
8.Knife
9.Nipper
10.Gas leakage detector or soap-and-water solution
11.Measuring tape
12.Reamer

Drawing for the installation of indoor and outdoor units

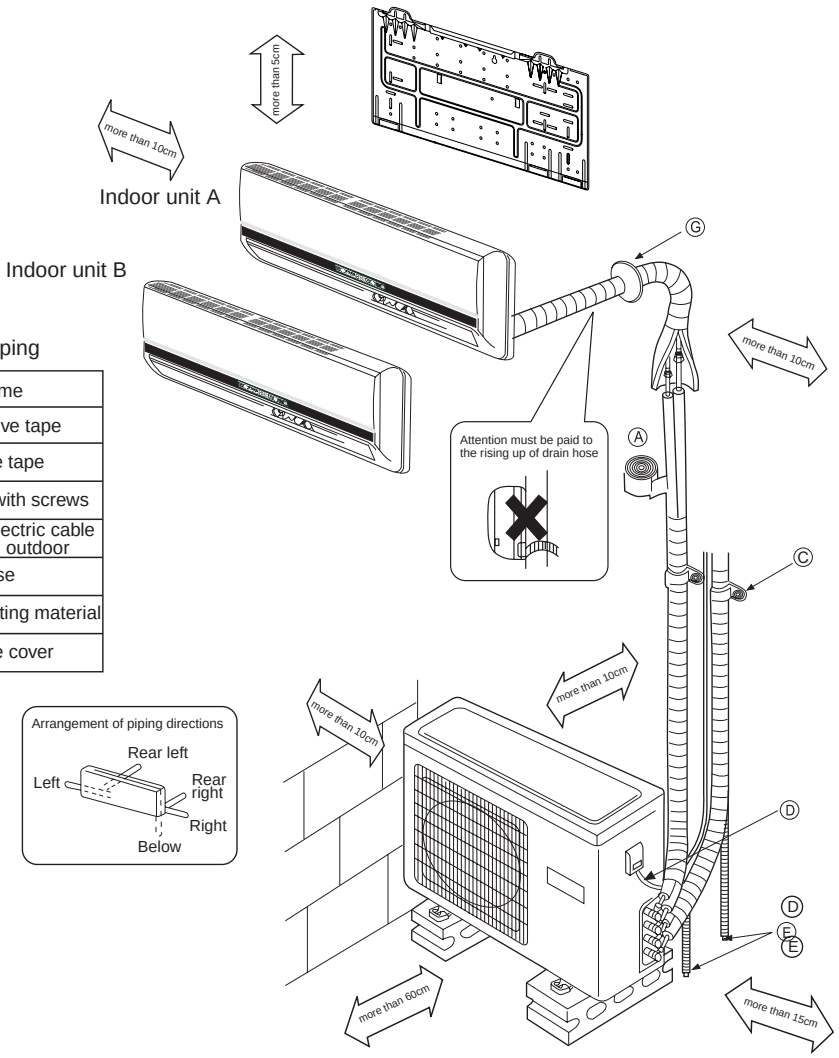
※ The models adopt HFC free refrigerant R410A

Accessory parts

No.	Accessory parts	Number of articles
①	Remote controller	2
②	R-03 dry battery	4
③	Mounting plate	2
④	Drain hose	2
⑤	ϕ4X25 Screw, Plastic cap	8
⑥	Drain-elbow	1
⑦	Cushion	4

Optional parts for piping

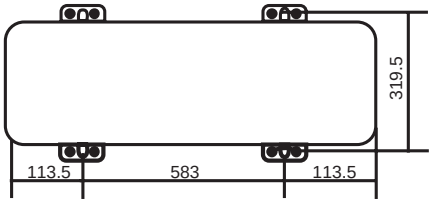
Mark	Parts name
Ⓐ	Non-adhesive tape
Ⓑ	Adhesive tape
Ⓒ	Saddle(L.S) with screws
Ⓓ	Connecting electric cable for indoor and outdoor
Ⓔ	Drain hose
Ⓕ	Heating insulating material
Ⓖ	Piping hole cover



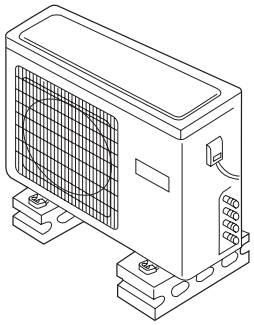
※ The marks from Ⓐ to Ⓖ in the figure are the parts numbers.

※ The distance between the indoor unit and the floor should be more than 2m.

No.00105



Floor fixing dimensions of the outdoor unit (Unit:mm)



Fixing of outdoor unit

- Fix the unit to concrete or block with bolts(ϕ10mm) and nuts firmly and horizontally.
- When fitting the unit to wall surface, roof or rooftop, fix a supporter surely with nails or wires in consideration of earthquake and strong wind.
- If vibration may affect the house, fix the unit by attaching a vibration-proof mat.

Selection of Installation Place

Indoor Unit

- Place, robust not causing vibration, where the body can be supported sufficiently.
- Place, not affected by heat or steam generated in the vicinity, where inlet and outlet of the unit are not disturbed.
- Place, possible to drain easily, where piping can be connected with the outdoor unit.
- Place, where cold air can be spread in a room entirely.
- Place, nearby a power receptacle, with enough space around. (Refer to drawings).
- Place where the distance of more than lm from televisions, radios, wireless apparatuses and fluorescent lamps can be left.
- In the case of fixing the remote controller on a wall, place where the indoor unit can receive signals when the fluorescent lamps in the room are lightened.

Outdoor Unit

- Place, which is less affected by rain or direct sunlight and is sufficiently ventilated.
- Place, possible to bear the unit, where vibration and noise are not increased.
- Place, where discharged wind and noise do not cause a nuisance to the neighbors.
- Place, where a distance marked ⇔is available as illustrated in the above figure.

Power Source

- Before inserting power plug into receptacle, check the voltage without fail. The power source is the same as the corresponding name plate.
- Install an exclusive branch circuit of the power.
- A receptacle shall be set up in a distance where the power cable can be reached. Do not extend the cable by cutting it.

Selection of pipe

- To this unit, both liquid and gas pipes shall be insulated as they become low temperature in operation.
- Use optional parts for piping set or pipes covered with equivalent insulation material.
- The thickness of the pipe must be 0.8 mm at least.

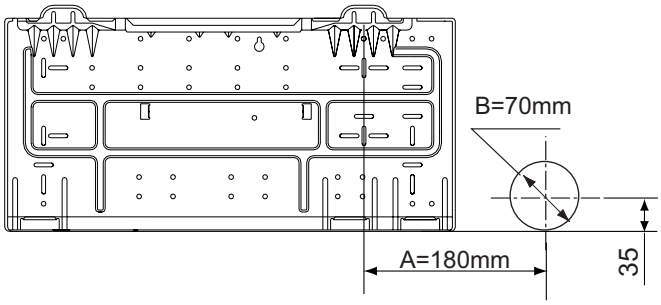
Liquid pipe(ϕ)	6.35mm(1/4")
Gas pipe(ϕ)	9.52mm(3/8")

Indoor unit

1.Fitting of the Mounting Plate and Positioning of the wall Hole

When the mounting plate is first fixed

1.Carry out, based on the neighboring pillars or lintels, a proper leveling for the plate to be fixed against the wall, then temporarily fasten the plate with one steel nail.
2. Make sure once more the proper level of the plate, by hanging a thread with a weight from the central top of the plate, then fasten securely the plate with the attachment steel nail.
3. Find the wall hole location A using a measuring tape



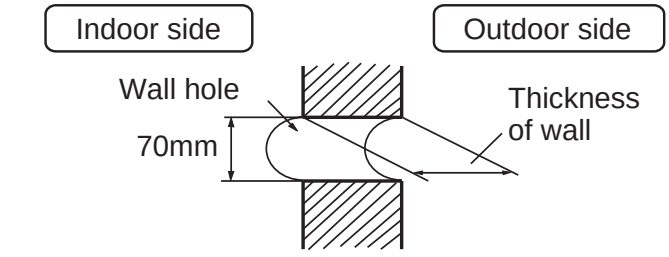
Find the level position

When the mounting plate is fixed side bar and lintel

- Fix to side bar and lintel a mounting bar, Which is separately sold, and then fasten the plate to the fixed mounting bar.
- Refer to the previous article, " When the mounting plate is first fixed ", for the position of wall hole.

2.Making a Hole on the Wall and Fitting the Piping Hole Cover

- Make a hole of 70 mm in diameter, slightly descending to outside the wall.
- Install piping hole cover and seal it off with putty after installation



(Section of wall hole) Ⓖ Piping hole pipe

3.Installation of the Indoor Unit

Drawing of pipe

[Rear piping]

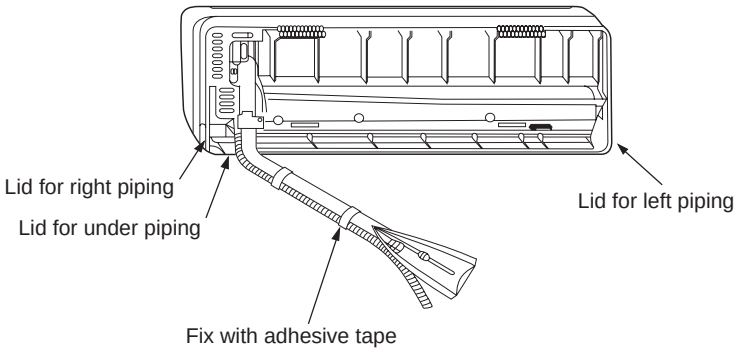
- Draw pipes and the drain hose, then fasten them with the adhesive tape

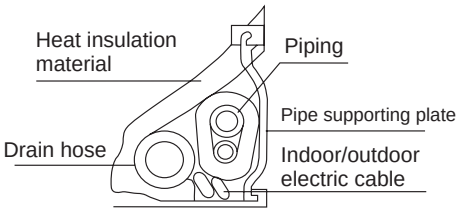
[Left • Left-rear piping]

- In case of left side piping, cut away, with a nipper, the lid for left piping.
- In case of left-rear piping, bend the pipes according to the piping direction to the mark of hole for left-rear piping which is marked on heat insulation materials.

Indoor unit

1. Insert the drain hose into the dent of heat insulation materials of indoor unit.
2. Insert the indoor/outdoor electric cable from backside of indoor unit, and pull it out on the front side, then connect them.
3. Coat the flaring seal face with refrigerant oil and connect pipes.
   Cover the connection part with heat insulation materials closely, and make sure fixing with adhesive tape





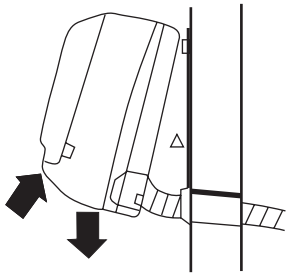
- Indoor/outdoor electric cable and drain hose must be bound with refrigerant piping by protecting tape.

[Other direction piping]

- Cut away, with a nipper, the lid for piping according to the piping direction and then bend the pipe according to the position of wall hole. When bending, be careful not to crash pipes.
- Connect beforehand the indoor/outdoor electric cable, and then pull out the connected to the heat insulation of connecting part specially.

Fixing the indoor unit body

- Hang surely the unit body onto the upper notches of the mounting plate. Move the body from side to side to verify its secure fixing.
- In order to fix the body onto the mounting plate,hold up the body aslant from the underside and then put it down perpendicularly.



4.Connecting the indoor/outdoor Electric Cable

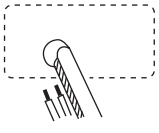
[Cautions]

1.Make sure it is unit A or unit B, when make wiring.
2.Unit to be connected to stop valve A on outdoor unit is unit A,while the one to be connected to stop valve B is unit B.
3.Refer to wiring diagram.

Removing the wiring cover

- Remove terminal cover at right bottom corner of indoor unit, then take off wiring cover by removing its screws.

When connecting the cable after installing the indoor unit



1. Insert from outside the room cable into left side of the wall hole, in which the pipe has already existed.
2. Pull out the cable on the front side, and connect the cable making a loop.

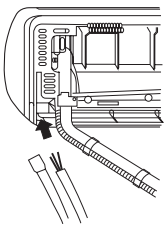
Indoor unit

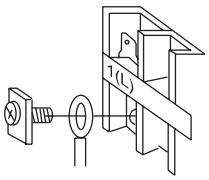
When connecting the cable before installing the indoor unit

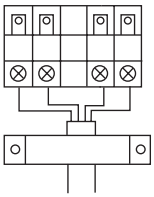
- Insert the cable from the back side of the unit, then pull it out on the front side.
- Loosen the screws and insert the cable ends fully into terminal block, then tighten the screws.
- Pull the cable slightly to make sure the cables have been properly inserted and tightened.
- After the cable connection, never fail to fasten the connected cable with the wiring cover.
- IMeans for disconnection from the supply mains having a contact separation in all poles must be incorporated in the fixed wiring in accordance with the wiring rules.
- The power plug is self-provided,the power plug must acquired the local attestation.

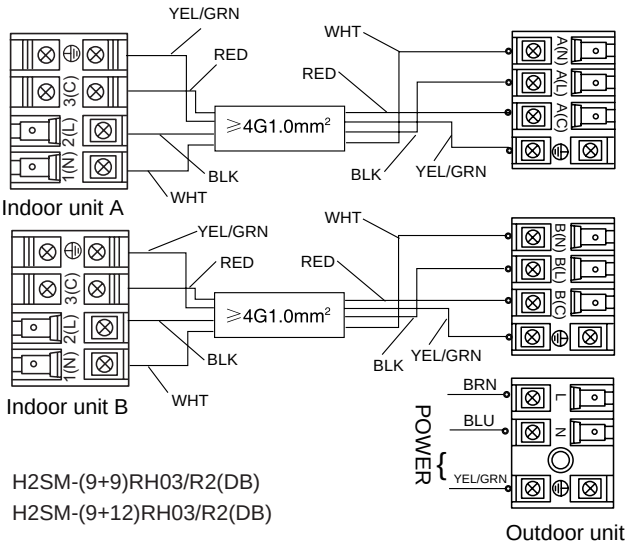
Note: When connecting the cable, confirm the terminal number of indoor and outdoor units carefully. If wiring is not correct, proper operation can not be carried out and will cause defect.

1. If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similar qualified person. The type of connecting wire is H05RN-F or H07RN-F.
2. If the fuse on PC board is broken please change it with the type of T. 3.15A/250V.
3. The wiring method should be in line with the local wiring standard.
4. After installation, the power plug should be easily reached.
5. A breaker should be incorporated into fixed wiring. The breaker should be all-pole switch and the distance between its two contacts should be not less than 3mm.



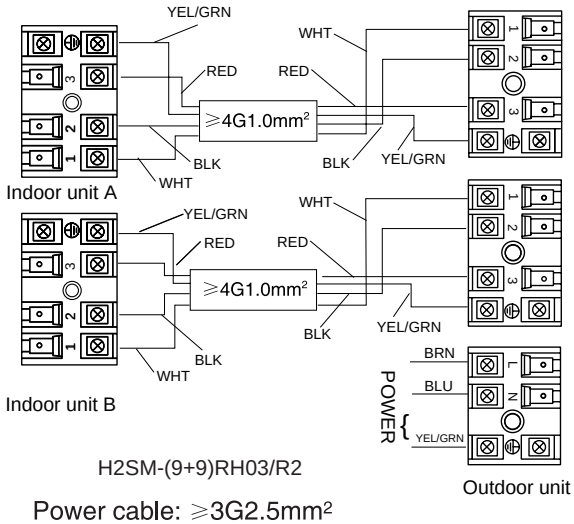






H2SM-(9+9)RH03/R2(DB)
H2SM-(9+12)RH03/R2(DB)

Power cable: ≥3G2.5mm²



H2SM-(9+9)RH03/R2

Power cable: ≥3G2.5mm²

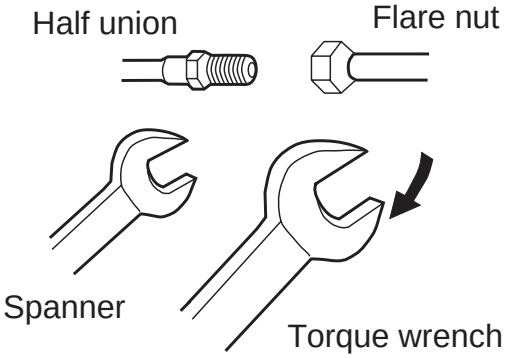
Outdoor unit

1.Installation of Outdoor Unit

Install according to Drawing for the installation of indoor and outdoor units

2.Connection of pipes

- To bend a pipe, give the roundness as large as possible not to crush the pipe ,and the bending radius should be 30 to 40 mm or longer.
- Connecting the pipe of gas side first makes working easier.
- The connection pipe is specialized for R410A.
- The max vertical distance between the indoor unit and the outdoor unit is 5 m.



Forced fastening without careful centering may damage the threads and cause a leakage of gas.

Pipe Diameter (ϕ)	Fastening torque
Liquid side 6.35mm(1/4")	18N.m
Gas side 9.52mm(3/8")	40N.m
Gas side 12.7mm(1/2")	55N.m

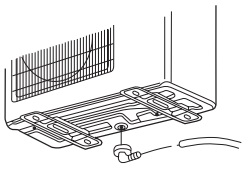
Be careful that matters, such as wastes of sands, etc. shall not enter the pipe.
The standard pipe length is 5m. If it is over 5m, the function of the unit will be affected. If the pipe has to be lengthened, the refrigerant should be charged, according to 20 g/m. But the charge of refrigerant must be conducted by professional air conditioner engineer. Before adding additional refrigerant, perform air purging from the refrigerant pipes and indoor unit using a vacuum pump,then charge additional refrigerant.

3.Connection

- Use the same method on indoor unit. Loosen the screws on terminal block and insert the plugs fully into terminal block, then tighten the screws.
- Insert the cable according to terminal number in the same manner as the indoor unit.
- If wiring is not correct, proper operation can not be carried out and controller may be damaged.
- Fix the cable with a clamp.

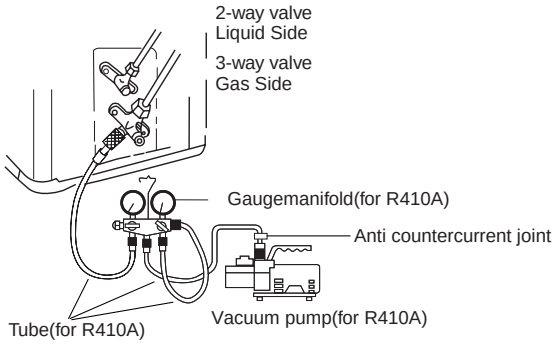
4.Attaching Drain-Elbow

- If the drain-elbow is used, please attach it as figure. (Note: Only for heat pump unit.)



Outdoor unit

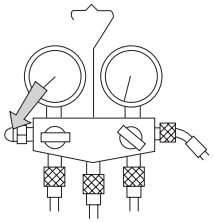
6.Purging Method:To use vacuum pump



① Detach the service port's cap of 3-way valve, the valve rod's cap for 2-way valve and 3-way's, connect the service port into the projection of charge hose (low) for gaugemanifold. Then connect the projection of charge hose (center) for gaugemanifold into vacuum pump.

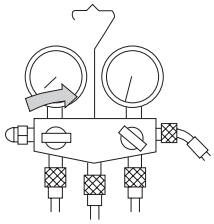
② Open the handle at low in gaugemanifold, operate vacuum pump. If the scale-moves of gause (low) reach vacuum condition in a moment, check ① again.

② Open

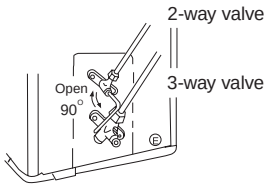


③ Vacuumize for over 15min. And check the level gauge which should read -0.1 MPa (-76 cm Hg) at low pressure side. After the completion of vacuumizing, close the handle 'Lo' in gaugemanifold and stop the operation of the vacuum pump.
Check the condition of the scale and hold it for 1-2min. If the scale-moves back in spite of tightening, make flaring work again, the return to the beginning of ③ .

③ Close



④ Open the valve rod for the 2-way valve to an angle of anticlockwise 90 degrees.
After 6 seconds, close the 2-way valve and make the inspection of gas leakage.

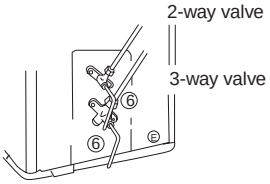


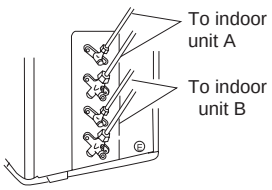
⑤ No gas leakage?

In case of gas leakage, tighten parts of pipe connection. If leakage stops, then proceed ⑥ steps.

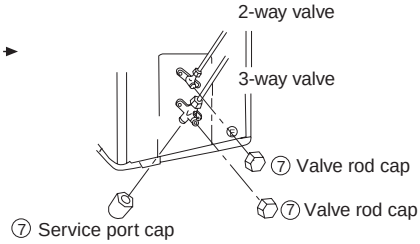
If it does not stop gas leakage, discharge whole refrigerants from the service port. After flaring work again and vacuumize, fill up prescribed refrigerant from the gas cylinder.

⑥ Detach the charge hose from the service port, open 2-way valve and 3-way. Turn the valve rod anticlockwise until hitting lightly.





⑦ To prevent the gas leakage, turn the service port's cap, the valve rod's cap for 2-way valve and 3-way's a little more than the point where the torque increases suddenly.



⑧ After attaching the each caps, check the gas leakage around the caps.

CAUTION:

1.If the refrigerant of the air conditioner leaks, it is necessary to discharge all the refrigerant. Vacuumize first, then charge the liquid refrigerant into air conditioner according to the amount marked on the name plate.

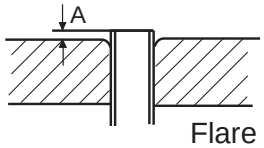
2.Please do not let other cooling medium, except specified one (R410A), or air enter into the cooling circulation system. Otherwise, there will be abnormal high pressure in the system to make it crack and lead to personal injuries.

1.Power Source Installation

- The power source must be exclusively used for air conditioner. (Over I0A)
- In the case of installing an air conditioner in a moist place, please install an earth leakage breaker.
- For installation in other places, use a circuit breaker as far as possible.

2.Cutting and Flaring Work of Piping

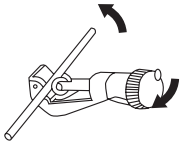
- Pipe cutting is carried out with a pipe cutter and burs must be removed.
- After inserting the flare nut, flaring work is carried out.



Flare tooling die

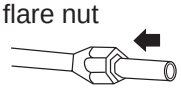
	Flare tool for R410A	Conventional flare tool	
	Clutch-type	clutch-type(Rigid-type)	Wing-nut type (Imperial-type)
A	0~0.5mm	1.0~1.5mm	1.5~2.0mm

1.Cut pipe

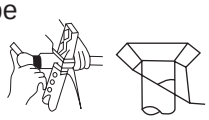


2.Remove burs

3.Insert the flare nut



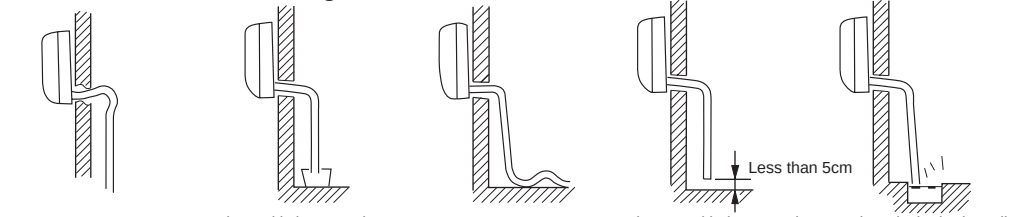
4.Flare pipe



Correct	Incorrect				
					
	Lean	Damage of flare	Crack	Partial	Too outside

3.On Drainage

Please install the drain hose so as to be downward slope without fail.
Please don't do the drainage as shown below.



It becomes high midway. | The end is immersed in water. | It waves. | The gap with the ground is too small | There is the bad smell from a ditch

- Please pour water in the drain pan of the indoor unit, and confirm that drainage is carried out surely to outdoor.
- In case that the attached drain hose is in a room, please apply heat insulation to it without fail.

Check for Installation and Test Run

- Please kindly explain to our customers how to operate through the instruction manual.

Check Items for Test Run

☐ Put check mark ✓ in boxes

☐ Gas leak from pipe connecting?
☐ Heat insulation of pipe connecting?
☐ Are the connecting wirings of indoor and outdoor firmly inserted to the terminal block?
☐ Is the connecting wiring of indoor and outdoor firmly fixed?
☐ Is drainage securely carried out?
☐ Is the earth line securely connected?
☐ Is the indoor unit securely fixed?
☐ Is power source voltage abided by the code?
☐ Is there any noise?
☐ Is the lamp normally lighting?
☐ Are cooling and heating (when in heat pump) performed normally?
☐ Is the operation of room temperature regulator normal?

Sincere Forever

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