Haier

CAUTION

READ THIS MANUAL CAREFULLY TO DIAGNOSE TROUBLE CORRECTLY BEFORE OFFERING SERVICE .

SERVICE MANUAL

Air Conditioners

MODEL: HSU-119,129M07
(HAIER: HSU-09/12LE03)

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.

IMPORTANT INFORMATION

●Features

- ●Comfortable: wide-angle airflow
- ●health air purifying
- ●quiet operation
- ●super energy efficient

MODEL: HSU-09LE03

●Main Specification

- ●Cooling Capacity： 2600W
- ●Rated Power/Current(cooling)： 940W/4.5A
- ●EER: 2.77
- ●Heating Capacity： -----
- ●Rated Power/Current(heating): -----
- ●COP: -----
- ●Air Volume(Indoor/outdoor): 450/----- m^3/h
- ●Power: 1PH 220V~ 50 Hz

IMPORTANT INFORMATION

●Features

- ●Comfortable: wide-angle airflow
- ●health air purifying
- ●quiet operation
- ●super energy efficient

MODEL: HSU-12LE03

●Main Specification

- ●Cooling Capacity： 3500W
- ●Rated Power/Current(cooling)： 1250W/5.9A
- ●EER: 2.80
- ●Heating Capacity： -----
- ●Rated Power/Current(heating): -----
- ●COP: -----
- ●Air Volume(Indoor/outdoor): 500/----- m^3/h
- ●Power: 1PH 220V~ 50 Hz

Safety Information

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 servicers who troubleshoot and repair these units.

NOTE: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.

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 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.

WARNING

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

CONTENTS

1.SPECIFICATION.....1
2.ELECTRI CAL CONTROL..... 3
3.TROUBLE SHOOTING.....8
4. INSTALLA TION.....10
5.WIRING DIAGRAM.....18
6. THERMISTER RESISTANCE CHART.....19
7.COMPRESSOR PERFORMANCE DIAGRAM.....24
8. SOUND PRESSURE LEVEL.....26
9.SCHEMATIC DIAGRAM OF PCB 27

SPECIFICATION

Model:	HSU-09LE03		Brand Mark:	-----	
Cooling	Cooling Capacity:	2600W	Frequency Range:	50Hz	
	Rated Power/Current:	940W/4.5A	Power	1PH 220V~ 50 Hz	
	Max Power/Current:	1200W/6.2A	Indoor motor power	1 1 W	
	EER	2.77	Outdoor motor power	2 0 W	
Heating	Heating Capacity:	-----			
	Rated Power/Current:	-----	Compressor manufacturer/Type	RECHI/44R233CF-5JSC	
	Max Power/Current:	-----	Compressor Oil charge	270CC	
	COP				
Power/Current of Electric Heating:		-----	Refrigerant	Type/Net Charge:	R22 440g
Operating temp. range		-7°C-43°C		Additional Charge for exhausting air.	50g
Indoor Velocity	H:	1150r/min		Charge if over Standrad Pipe Lenth	16g/m
	M:	1100r/min	Capilary	Lenth×Internal/External Diametre	900*φ1.4*φ2.7 mm
	L:	920r/min		Refer No.:	-----
Outdoor Velocity	H:	830r/min	Height of rising radiator slice	Indoor:	1.30 mm
	M:	----r/min		Outdoor:	1.30 mm
	L:	----r/min	Indoor Weight	Net:	7.6kg
				Gross:	9.5kg
Air Volume (High)	Indoor:	450m³/h	Outdoor Weight	Net:	24.2kg
				Gross:	26.6kg
	Outdoor:	-----m³/h	Indoor Dimension(L×W×H):		795×182×265 mm
Capacitor of Fan Motor:		2 u F / 4 5 0 V	Indoor Packaging Dimension(L×W×H)		863 x275x330 mm
Class of electric Shock Protection		I	Outdoor Dimension (L×W×H):		700×250×430 mm
Class of Water Proof:		IP 24	Outdoor Packaging dimension(L×W×H)		823×363×505 mm
Moisture Removal:		1.2×10⁻³m³/h	Refrigerant Pipe	liquid /Gas pipe Diametre	φ 6.35/9.52 mm
Remote Controller	Model:	YL-M07		standard Lenth	5m
	Refer. No.:	-----		Max Lenth	15m
Remote Controller Bracket:		-----	Lenth/Diametre of Drain Hose		
Appearance:		-----	Max. pressure at warm side:		2.65 MPa
Climate Type:		T1	Max.pressure at cool side:		0.65 MPa
Installation Bracket Type:		-----	Evaporator area		0.13 m²
Area available for clooling/heating		12-19 m²	Condenser area		0.20 m²
Max.running temperature(cooling):		Dry/Wet ball(indoor): 32℃/ 23 ℃	Max.running temperature(heating):		Dry/Wet ball(indoor): -----
		Dry/Wet ball(outdoor): 43 ℃/ 26 ℃			Dry/Wet ball(outdoor): -----

SPECIFICATION

Model:	HSU-12LE03		Brand Mark:	-----	
Cooling	Cooling Capacity:	3500W	Frequency Range:	50 Hz	
	Rated Power/Current:	1250W/5.9A	Power	1PH 220V~ 50 Hz	
	Max Power/Current:	1600W/7.5A	Indoor motor power	17 W	
	EER	2.80	Outdoor motor power	30 W	
Heating	Heating Capacity:	-----			
	Rated Power/Current:	-----	Compressor manufacturer/Type	RECHI/48R313NL-5ESF	
	Max Power/Current:	-----	Compressor Oil charge	410CC	
	COP				
Power/Current of Electric Heating:		-----	Refrigerant	Type/Net Charge:	R22 690g
Operating temp. range		-7°C-43°C		Additional Charge for exhausting air.	50g
Indoor Velocity	H:	1290r/min		Charge if over Standrad Pipe Lenth	18g/m
	M:	1150r/min	Capilary	Lenth×Internal/External Diametre	840*φ1.5*φ2.7 mm
	L:	1000r/min		Refer No.:	-----
Outdoor Velocity	H:	1060r/min	Height of rising radiator slice	Indoor:	1.30 mm
	M:	----r/min		Outdoor:	1.30 mm
	L:	----r/min	Indoor Weight	Net:	8.1kg
				Gross:	10.0kg
Air Volume (High)	Indoor:	500m³/h	Outdoor Weight	Net:	28.8kg
				Gross:	31.3kg
	Outdoor:	-----m³/h	Indoor Dimension(L×W×H):		795×182×265 mm
Capacitor of Fan Motor:		2.5uF/450V	Indoor Packaging Dimension(L×W×H)		863 x275x330 mm
Class of electric Shock Protection		I	Outdoor Dimension (L×W×H):		700×250×430 mm
Class of Water Proof:		IP 24	Outdoor Packaging dimension(L×W×H)		823×363×505 mm
Moisture Removal:		1.5×10⁻³m³/h	Refrigerant Pipe	liquid /Gas pipe Diametre	φ6.35/12.7 mm
Remote Controller	Model:	YL-M07		standard Lenth	5m
	Refer. No.:	-----		Max Lenth	15m
Remote Controller Bracket:		-----	Lenth/Diametre of Drain Hose		
Appearance:		-----	Max. pressure at warm side:		2.65 MPa
Climate Type:		T1	Max.pressure at cool side:		0.65 MPa
Installation Bracket Type:		-----	Evaporator area		0.13 m²
Area available for clooling/heating		16.5-26m²	Condenser area		0.40 m²
Max.running temperature(cooling):		Dry/Wet ball(indoor): 32℃/ 23 ℃	Max.running temperature(heating):		Dry/Wet ball(indoor): -----
		Dry/Wet ball(outdoor): 43 ℃/ 26 ℃			Dry/Wet ball(outdoor): -----

ELECTRICAL CONTROL

1-1. Indoor Fan Control

The indoor fan is operated by the slepss speed changer motor. For air flow level, speed of the indoor fan motor is controlled by the remote controller. If AUTO mode is selected , the fan motor speed is automatically controlled by the different between the presete temperature and the room temperature.

		HSU-09LE03 （r/min）	HSU-12LE03 (r/min)
COOLING	H	1150	1290
	M	1100	1150
	L	920	1000
	SL	—	—

1-2.Outdoor Fan Control

Although the outdoor fan motor drivers the outdoor fan by non-step variable systemof the revolution speed,the revolution speedis restrictedto eight stepon the convenience of controlling. The fan motor speed is automatically controlled according to the actual frequency and the outdoor air temperature.

2. Run mode:(Tr: inlet air temperature,Ts： the set temperature)

2.1 automatic run mode

The background lighting of the LCD is white

1) cooling only type automatic run mode:

When the system runs under "automatic" mode for the first time, it will determine the operating mode according to the follows,

Tr⩾Ts+3℃ Choose Cooling mode

Tr<Ts-3℃ Choolse Blowing Mode

The system will shift its operating mode between the above mentioned two to changes of the indoor temperature. If the system is currently under cooling mode, it will switch to blowing mode when Tr<Ts-3℃; if the system is currently under blowing mode, it will in turn switch to cooling mode when Tr > Ts+3℃. The switching mode as below,

2) cold/warm type run mode:

When the system runs under "automatic" mode for the first time, it will determine the operating mode according to the follows,

Tr⩾Ts-3℃ Choose Cooling Mode

Tr＜Ts-3℃ Choose Heating Mode

The system will shift its operating mode between the above mentioned two to changes of the indoor temperature. If the system is currently under cooling mode, the compressor will stop functioning if the temperature lowers to such a degree that requires so; then it will recheck the temperature 15 minutes later: it will switch to the heating mode if the temperature is Tr＜Ts-3℃,or it will still stay in cooling mode(including blowing mode). if the system is currently under heating mode, the compressor will stop running if the temperatur lowers to such a degree that requires so, then it will recheck teh temperatur 15 minutes later: it will switch to the cooling mode if the temperature is Tr＞Ts+3℃.

2.2 Cooling run mode: (Tr: inlet air temperature,Ts： the set temperature)

The background lighting of the LCD is blue

Temperature control range : 16℃ —30℃

Temperature control precision: ±1℃

Compressor can't be controlled by temperature sensor within 2 minutes after it starts.

Control character: when Tr> Ts, outdoor fan motor and compressor on, and indoor fan motor run at fixed wind speed. When Tr < Ts, outdoor fan motor and compressor off, and when Tr > Ts, outdoor fan motor and compressor are working again.

If Tr=Ts, the indoor fan motor,outdoor fan motor and the compressor's state will not change.

wind speed control: (the temperature difference is 1℃)

auto: when Tr>=Ts+3℃, the wind speed is high;

when Ts+1℃≤Tr<Ts+3℃, the wind speed is medium.

When Tr<Ts+1℃, the wind speed is low.

When temperature sensor is off, the fan motor runs at low speed.

when the wind speed changes from low to higher, there is no delay, and when it changes from high to lower, there is a 3-minutes delay before conversion.

Manual operation: When unit is on the wind speed can be set to high, medium, low or automatic as required (execute instruction 2 seconds later after receiving remote signal)

compressor control： The compressor can't be controlled by temperature sensor within 2 minutes after startup and can be only restarted at least 3 minutes later after shutdown. There is no 3-minute protection with power on for the first time (over 3 minutes with power off). The compressor must stands by for 3 minutes before it is restarted after shutdown.

There is no 2-minute limit when changing the temperature setting or shutting down the machine through the remote controller, and the machine can be shut down immediately.

Avoiding electrical shock: outdoor fan motor is available 2 seconds later after the compressor startup.

Controlling the position of air door: set the position of air door as required.

Protection of expiration of current peak value is available: Current cross detection is available in order to avoid burning out the compressor when the current is too big. The action character as follows:

The compressor can't be detected in 60 seconds after startup. when current is above "CT 1.6 V" and lasts 3 seconds, the system enter protection mode and shut off compressor with outdoor air blower and indoor fan motor controlled as the temperature sensor is off. After 3 minutes the machine can be started again.

Protection of frost is available (disable in test run or heating mode): In order to prevent the indoor heat exchanger from freezing (in refrigation or dehumidifying mode), the compressor will be shut off when the temperature of the indoor coil pipe is or below 0℃ and the compressor runs for over 5 minutes. When the temperature of the indoor coil pipe ascends to over 7℃, the compressor is restarted (must meet a 3-minutes delay)

Timer on, Timer off and sleep control are available.

2.3 Dehumidifying mode: (Tr: inlet air temperature,Ts： the set temperature)

The background lighting of the LCD is aquamarine blue

Temperature control range : 16℃ —30℃

Temperature control precision: ±1℃

control character:

- When Tr (indoor temperature) > Ts (temperature setting) +2℃, compressor and outdoor fan motor run continuosly with indoor fan motor runnig in accordance with the wind speed setting.
- When Tr ranges from Ts to Ts +2℃, outdoor fan motor and compressor are on for 10 minutes and off for 6 minutes, the indoor fan motor is off in 3 minutes after shutdown of compressor and gives breeze in other time.
- When Tr < Ts, outdoor fan motor and compressor are unavailable, and the indoor fan motor enter breeze mode 3 minutes later after shut down of compressor.
- When all the ranges alternate, there is ± 1℃ difference.

Wind speed control:

Automation: When Tr >= Ts + 5℃, the wind speed is high.

When Ts+3℃≤ Tr <Ts+5℃, the wind speed is medium.

When Ts+2℃≤ Tr <Ts+3℃, the wind speed is low.

When Ts≤ Tr <Ts+2℃, the machine gives breeze intermittently.

When Tr < Ts, the indoor fan motor is shut off. in 3 minutes

When Tr < Ts, the machine gives breeze after 3 minutes

Manual operation: When the temperation sensor is off or the Indoor fan motor runs intermittently, the indoor fan motor can not be operated by hand (compelling automatic operation), along with

the indoor fan motor can be operated in cooling mode. While controlling fan motor by hand in cooling mode, the cooling ranges include wind speed setting and refriferation range, others are the same as fan motor in automation mode.

compressor control : The compressor can't be controlled by temperature sensor in 2 minutes after startup and also can't be started again at least 3 minutes later after shutdown. There are 3-minutes protection with power on for the first time (over 3 minutes with power off). The compressor must be started again 3 minutes later after shutdown.

There is no 2-minutes limit when changing the temperature setting or shutting off the machine through the remote controller, and the machine can be shut down immediately.

Avoiding electrical shock: outdoor fan motor is available 2 seconds later after compressor startup.

Controlling the position of air door: set the position of air door as required.

Protection of expiration of current peak value is available: Current cross detection is available in order to avoid burning out the compressor when the current is too big. The action character as follows:

The compressor can't be detected in 60 seconds after startup. when current is above "CT 1.6 V" and lasts 3 seconds, the system enter protection mode and shut off compressor with outdoor air blower and indoor fan motor controlled as the temperature sensor is off. After 3 minutes the machine can be started again.

Protection of frost is available (disable in test run or heating mode): In order to prevent the indoor heat exchanger from freezing (in refrigation or dehumidifying mode), the compressor will be shut off when the temperature of the indoor coil pipe is or below 0℃ and the compressor runs for over 5 minutes. When the temperature of the indoor coil pipe ascends to over 7℃, the compressor is restarted (must meet a 3-minutes delay)

Timer on, Timer off and sleep control are available.

3.Control function:

3.1Timer function: You can set 24-hour timer on or timer off as required, and the minum time unit is 1 minute. After setting, a pattern of clock displaied on the LCD, and it is off when timer setting is completed. There are several timer mode as follows.

- Timer on: The pattern of clock displaied on the LCD,the background light is off, and unit behaves with halt status. Timer on is completed, and then unit starts running with the pattern of clock disappeared,and the background light is on. The unit starts with the last setting receiving timer signals, and sleep setting is not allowed.
- Timer off: Unit working, the pattern of clock displaied on the LCD; When reaching time setting, unit enters shutdown mode, and sleep function can be set. If timer off and sleep are set synchronously, the one which time is short run first. Executing shutdown instruction clear timer and sleep function.
- Timer on and timer off can be set synchronously. when they are completed,

3.2 Sleep function (saving function at night):. The pattern of clock displaied on the LCD

- In cooling/defrosting mode, the temp. setting increases 1℃ one hour later after startup. After another hour the temp. setting increase by more 1℃ and then run continuously for another 6 hours and then close.
- In heating mode, the temp. setting decrease 2℃ one hour after startup. After another hour the temp. setting decrease by more 2℃. After 3 hours the temp. setting rise by 1℃and then run continuously for another 3 hours and then close.

- If the wind speed is set to high or medium before going to bed, the wind speed shifts to medium or low. If the wind speed is set to low before going to bed, the wind speed keep unchanged.

3.3 Protection of malfunction of temperature sensitive resistance.

- The temperature sensitive resistor is short circuit or open circuit, the machine doesn't work.
- During defrosting, don't detect if the temperature sensor short circuit or open circuit.
- Detect the temperature of coil pipe is below -40℃, then think the temperation circuit of coil pipe is open.
- Detect the temperature of coil pipe is above 95℃, then think the temperation circuit of coil pipe is short .
- Detect the temperature of inlet air is below -20℃, then think the temperation circuit of inlet air is open.
- Detect the temperature of inlet air is above 90℃, then think the temperation circuit of inlet air is short.

3.4 Emergency switch imput:

- Press the switch of emergency operation, then buzzer rings once and unit enters the automatic operation mode. (emergency operation)
- If the switch is kept pressed for 5 seconds, buzzer ring two times and unit enter enter test run mode.
- Press the switch again, and then closes.
- The unit can receive remote control.
- Enter emergency operation from timer mode, then timer is cancelled.
- Test run:
  1) The temperature sensor of inlet air doesn't work, and compressor starts (but subject to the limit of 3 minute delay excluding the first time), and high wind, cooling, and air door is open.The indoor fan motor runs, running indicator lights up, compressor relay and the one of outdoor fan motor is closed
  2) During test run:
     - The prevention of freezing of evaporator doesn't work.
     - Over current control doesn't work.
     - The control of current peak expiration doesn't work.
     - Temperature control doesn't work.
     - Temperature expiration control doesn't work.
     - The test run is over after 30 minutes,then the unit turn off

3.5 Executive function after 2 seconds by remoter control:

After receiving remote control signal, the mainboard doesn't enter the corresponding instruction task until 2 seconds elapse.

- ♉ The memory function of power down is available, and the auto recovery function of power on is optional. (In auto, heating, cooling, or defrosting status, press the "sleeping" button 10 times within 5 seconds, and the auto recovery function of power on can be set on/off. If the buzzer rings 4 times, the the auto recovery function of power on is available; If the buzzer rings 2 times, the the auto recovery function of power on is unavailable.)

3.6 Alarm from indoor fan motor: 120 seconds later after the indoor fan motor is charged, and the impulse from fan motor is not detected, then stop outputting voltage to indoor fan motor, send alarm signals.

3. 7 Manual defrosting: when the wire controller is on, choose high wind, 30℃, and press the sleeping button for 6 times within 5 seconds, and after the buzzer rings 3 times, the air conditioner enter manual defrosting mode, which is the same as heating defrosting.

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 are 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?

TROUBLE SHOOTING

Table for Wrong Codes

lights indication			reasons	ways and means	solutions	tools
power	time	run				
★	■	■	Sensor is shorted out or opened circuit	Check the sensor of indoor ambient temperature , if the resistance value is 0 or ∞,the sensor is abnormal.	Change the sensor	Multimeter
★	□	□	Sensor is shorted out or opened circuit	Check the sensor of indoor coil pipe , if the resistance value is 0 or ∞,the sensor is abnormal.	Change the sensor	Multimeter
■	□	★	Indoor fan motor don't feed back	check whether indoor motor has 80~170V voltage, if it has, wiring board is normal, then check whether the optical SCR is good, replace it if it is has flaw; else check whether there are something wrong with connecting line, indoor fan motor cpacitor and coil assembly	Change the capacitor or optical SCR or connecting line or indoor PCB	Multimeter
★	□	★	Data error or no EEPROM	Check whether the EEPROM is installed properly	Change the EEPROM	Multimeter and electric iron

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

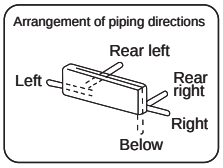
Drawing for the installation of indoor and outdoor units

Accessory parts

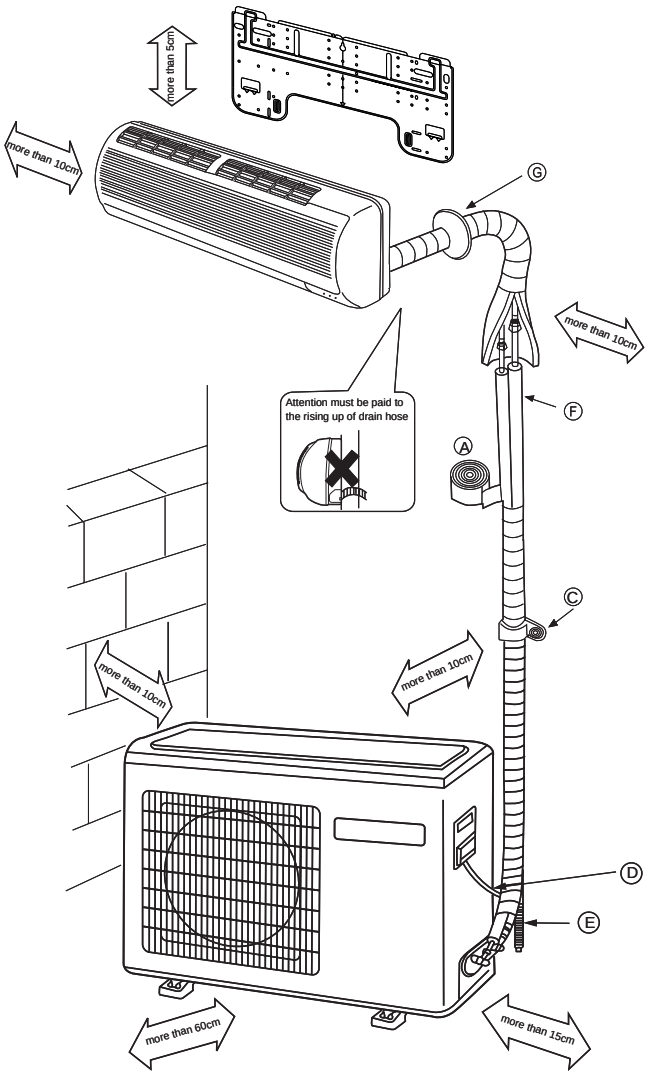
No.	Accessory parts	Number of articles
①	Remote controller	1
②	R-03 dry battery	2
③	Mounting plate	1
④	Drain hose	1
⑤	ϕ4X50 Steel nail, cement	6
⑥	ϕ4X25 Screw, Plastic cap	4
⑦	Drain-elbow	1
⑧	Cover	1
⑨	Cushion	4
⑩	Pipe supporting plate	1

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



Note:Cooling only units don't have Drain-elbow



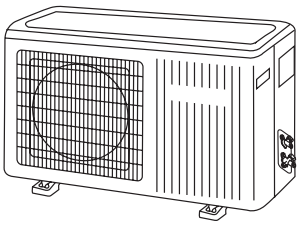
※ The marks from Ⓐ to Ⓖ in the figure are the parts numbers.

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

No.0010561651

INSTALLATION

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



HSU-09LE03
HSU-12LE03

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.

	HSU-09LE03	HSU-12LE03
Liquid pipe(ϕ)	6.35mm(1/4")	6.35mm(1/4")
Gas pipe(ϕ)	9.52mm(3/8")	12.7mm(1/2")

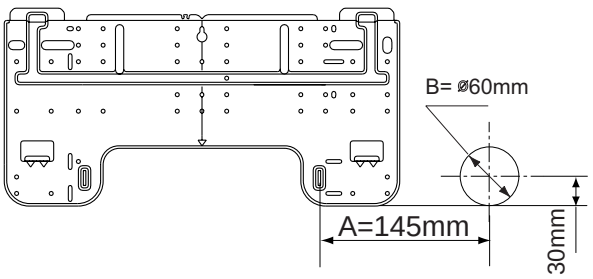
INSTALLATION

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

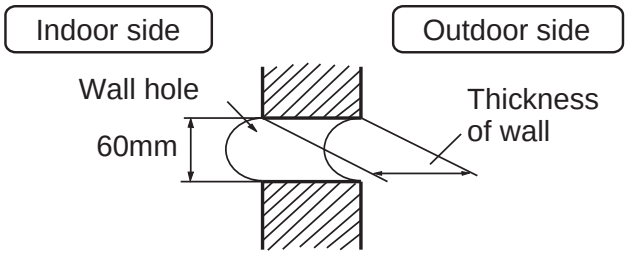


When the mounting plate is fixed side bar and lintel

- 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 60 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

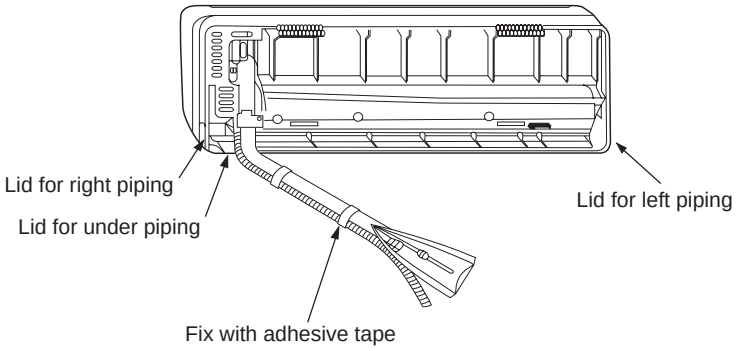
[Left • Left-rear piping]

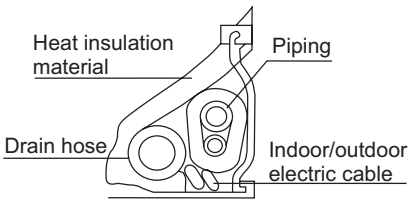
- In case of left side piping, cut away, with a nipper, the lid for left piping.
- In case of left-rear piping, bend the pipes according to the piping direction to the mark of hole for left-rear piping which is marked on heat insulation materials.

INSTALLATION

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





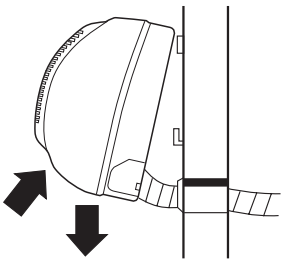
- Indoor/outdoor electric cable and drain hose must be bound with refrigerant piping by protecting tape.

[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.

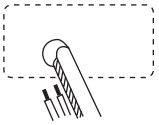


4.Connecting the indoor/outdoor Electric Cable

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.

INSTALLATION

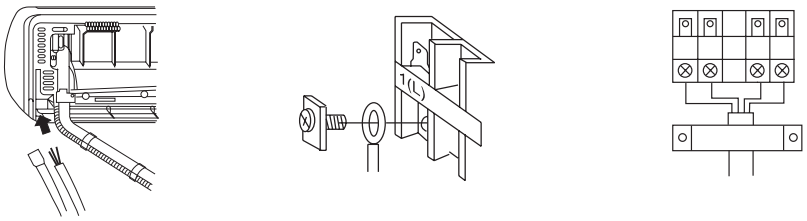
Indoor unit

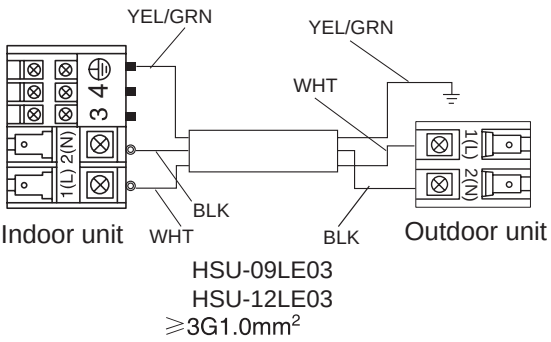
When connecting the cable before installing the indoor unit

- 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.

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.





HSU-09LE03
HSU-12LE03
⩾3G1.0mm²

Connecting wiring:
-mod 09-12: *3G1.0mm²

Power cable:
-mod 09-12: *3G1.0mm²

INSTALLATION

Outdoor unit

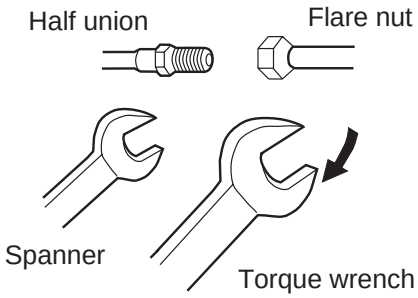
Outdoor unit

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
- Connecting the pipe of gas side first makes working easier.
- 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
Gas side 15.88mm(5/8")	60N.m

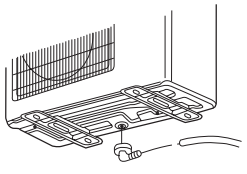
Be careful that matters, such as wastes of sands, etc. shall not enter the pipe.

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.)



INSTALLATION

Outdoor unit

5.Purging Method:

Push the air out of the indoor unit and piping as followes:

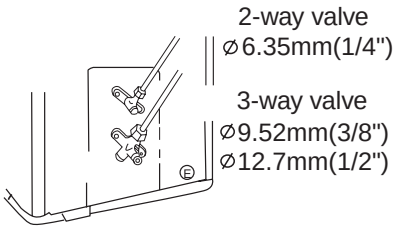
(1) Remove the valve cap on 2-way valve in outdoor unit.

(2) Loosen by 1/2 turn the flare nut of gas pipe, which is conneted to 3-way valve.

(3) Loosen 2-way valve by 90° using hexagon wrench, and after approx. 10 sec tighten it up. Gas comes out through flare nut on wide pipe. If no gas is discharged, tighten flare nut with specified torque.

(4) Open 2-way and 3-way valves using specified torque.

(5) Tighten the caps on the valves with specified torque.



HSU-09LE03
HSU-12LE03

	Tighten torque N.m
Valve rod	7-9
Valve cap	20-25

- When connecting pipe exceeds 5 meters, 16g refrigerant shall be added per exceeding meter. Charge according to the following list.

Piping length	5m	7m	10m
Additional amount	No need	32g	80g

- Note: When extending piping, air inside piping shall be removed by using external refrigerant gas, charge according to the following list.

Brand new outdoor unit is charged 50g more refrigerant than regulated weight. Only for first installation, this extra 50g can be used to purge air in pipes.

★ 1 During this procedure, 50g refrigerant will be discharged in piping. (This must be strictly controlled within 90° and 10 sec.)

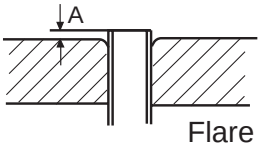
INSTALLATION

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.

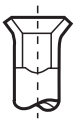
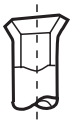
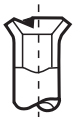
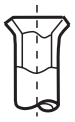
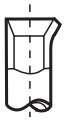
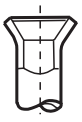
2.Cutting and Flaring Work of Piping

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



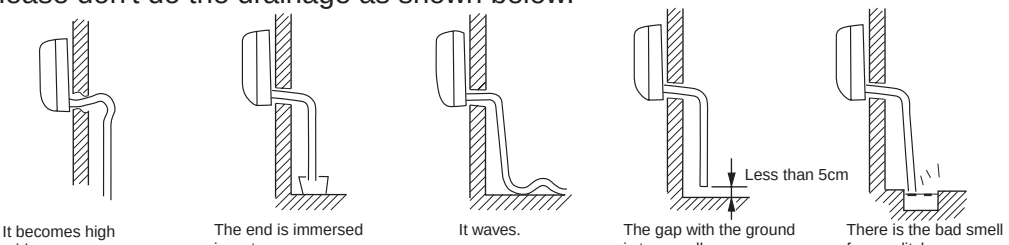
Flare tooling die

	Pipe diameter(ϕ)	Size A(mm)
Liquid side	6.35mm(1/4")	0.8~1.5
Gas side	9.52mm(3/8")	1.0~1.8
Gas side	12.7mm(1/2")	1.2~2.0
Gas side	15.88mm(5/8")	1.4~2.2

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.

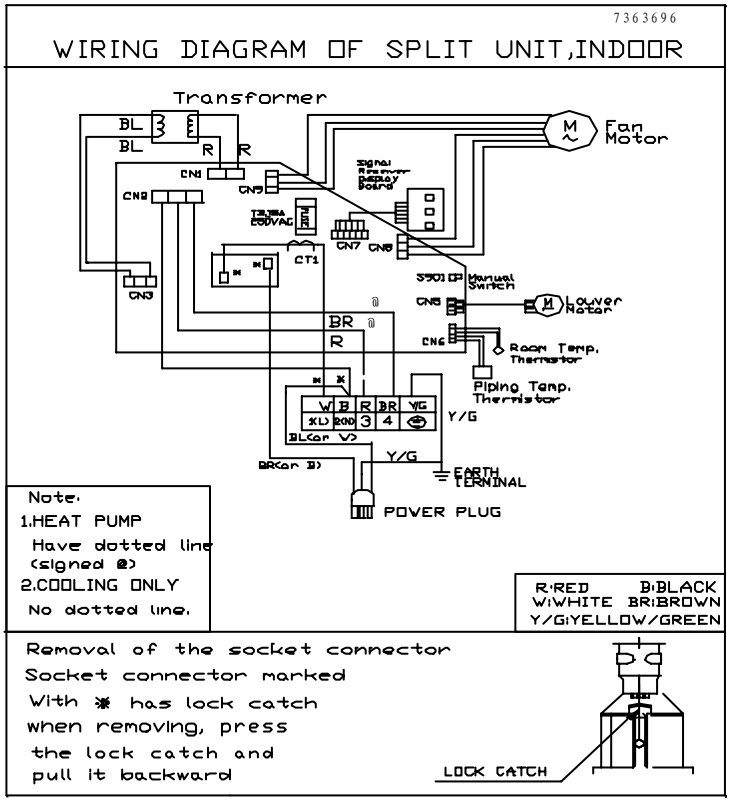
Check Items for Test Run

☐ Put check mark ✓ in boxes

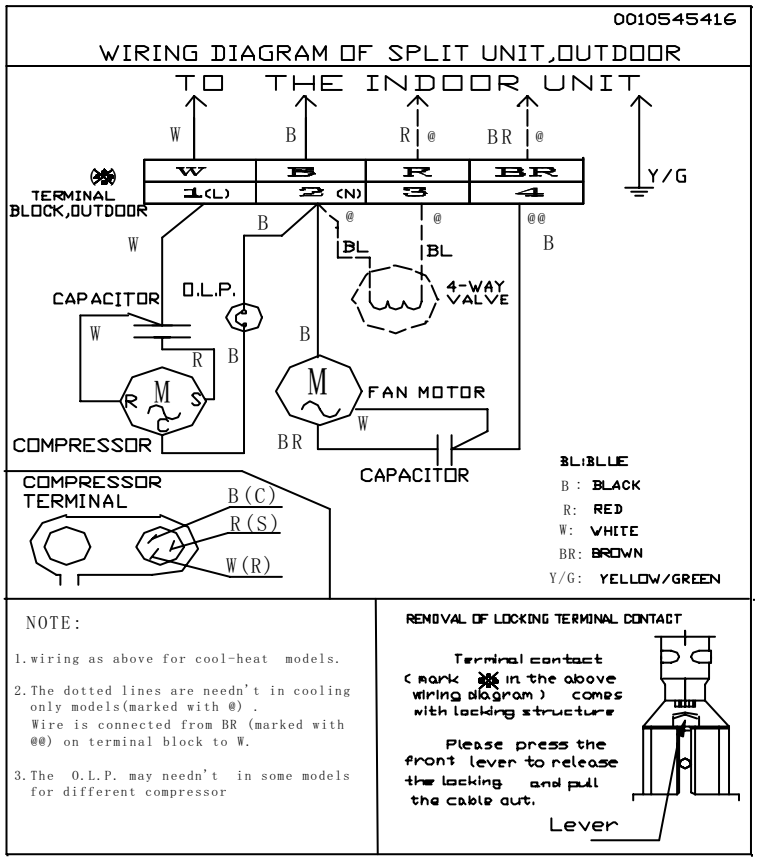
☐ Gas leak from pipe connecting?
☐ Heat insulation of pipe connecting?
☐ Are the connecting wirings of indoor and outdoor firmly inserted to the terminal block?
☐ Is the connecting wiring of indoor and outdoor firmly fixed?
☐ Is drainage securely carried out?
☐ Is the earth line securely connected?
☐ 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?

WIRING DIAGRAM

WIRING DIAGRAM FOR INDOOR UNITS:



WIRING DIAGRAM FOR OUDOOR UNITS:



THERMISTER RESISTANCE CHART

room temperature sensor

T(℃)	R(KΩ)	VOLTAGE(V)
-20	251.8	0.33
-19	236.9	0.35
-18	223.1	0.37
-17	210.1	0.40
-16	197.9	0.42
-15	186.5	0.45
-14	175.9	0.47
-13	165.9	0.50
-12	156.5	0.53
-11	147.7	0.56
-10	139.5	0.59
-9	131.8	0.62
-8	124.5	0.65
-7	117.7	0.69
-6	111.3	0.73
-5	105.3	0.76
-4	99.63	0.80
-3	94.3	0.84
-2	89.3	0.88
-1	84.58	0.92
0	80.14	0.97
1	75.96	1.01
2	72.02	1.06
3	68.31	1.10
4	64.81	1.15
5	61.51	1.20
6	58.39	1.25
7	55.45	1.00
8	52.68	1.35
9	50.06	1.41
10	47.58	1.46
11	45.24	1.51
12	43.02	1.57
13	40.93	1.63
14	38.95	1.68
15	37.08	1.74
16	35.31	1.80
17	33.63	1.85
18	32.04	1.91
19	30.53	1.97

THERMISTER RESISTANCE CHART

20	29.1	2.00
21	27.75	2.09
22	26.47	2.15
23	25.25	2.21
24	24.1	2.27
25	23.0	2.33
26	21.96	2.38
27	20.97	2.44
28	20.03	2.50
29	19.14	2.56
30	18.3	2.62
31	17.49	2.67
32	16.73	2.73
33	16.0	2.78
34	15.3	2.84
35	14.65	2.89
36	14.02	2.95
37	13.42	3.00
38	12.85	3.05
39	12.31	3.10
40	11.79	3.15
41	11.30	3.20
42	10.83	3.25
43	10.39	3.30
44	9.96	3.35
45	9.553	3.39
46	9.165	3.44
47	8.794	3.48
48	8.441	3.52
49	8.103	3.57
50	7.78	3.51
51	7.472	3.65
52	7.178	3.68
53	6.897	3.72
54	6.628	3.76
55	6.371	3.80
56	6.125	3.83
57	5.889	3.37
58	5.664	3.90
59	5.449	3.93
60	5.243	3.96
61	5.046	3.99
62	4.857	4.02

THERMISTER RESISTANCE CHART

63	4.676	4.05
64	4.502	4.08
65	4.336	4.11
66	4.177	4.13
67	4.024	4.16
68	3.878	4.18
69	3.738	4.21
70	3.603	4.23
71	3.474	4.25
72	3.35	4.28
73	3.231	4.30
74	3.117	4.32
75	3.008	4.34
76	2.903	4.36
77	2.802	4.38
78	2.705	4.40
79	2.611	4.42
80	2.522	4.43

INDOOR PIPE TEMPERATURE SENSOR

T(℃)	R(KΩ)	VOLTAGE(V)
-20	87.42	0.90
-19	82.71	0.95
-18	78.29	0.99
-17	74.12	1.04
-16	70.21	1.08
-15	66.52	1.13
-14	63.06	1.18
-13	59.79	1.23
-12	56.71	1.28
-11	53.81	1.33
-10	51.08	1.39
-9	48.5	1.44
-8	46.07	1.50
-7	43.77	1.55
-6	41.6	1.61
-5	39.55	1.66
-4	37.62	1.72

THERMISTER RESISTANCE CHART

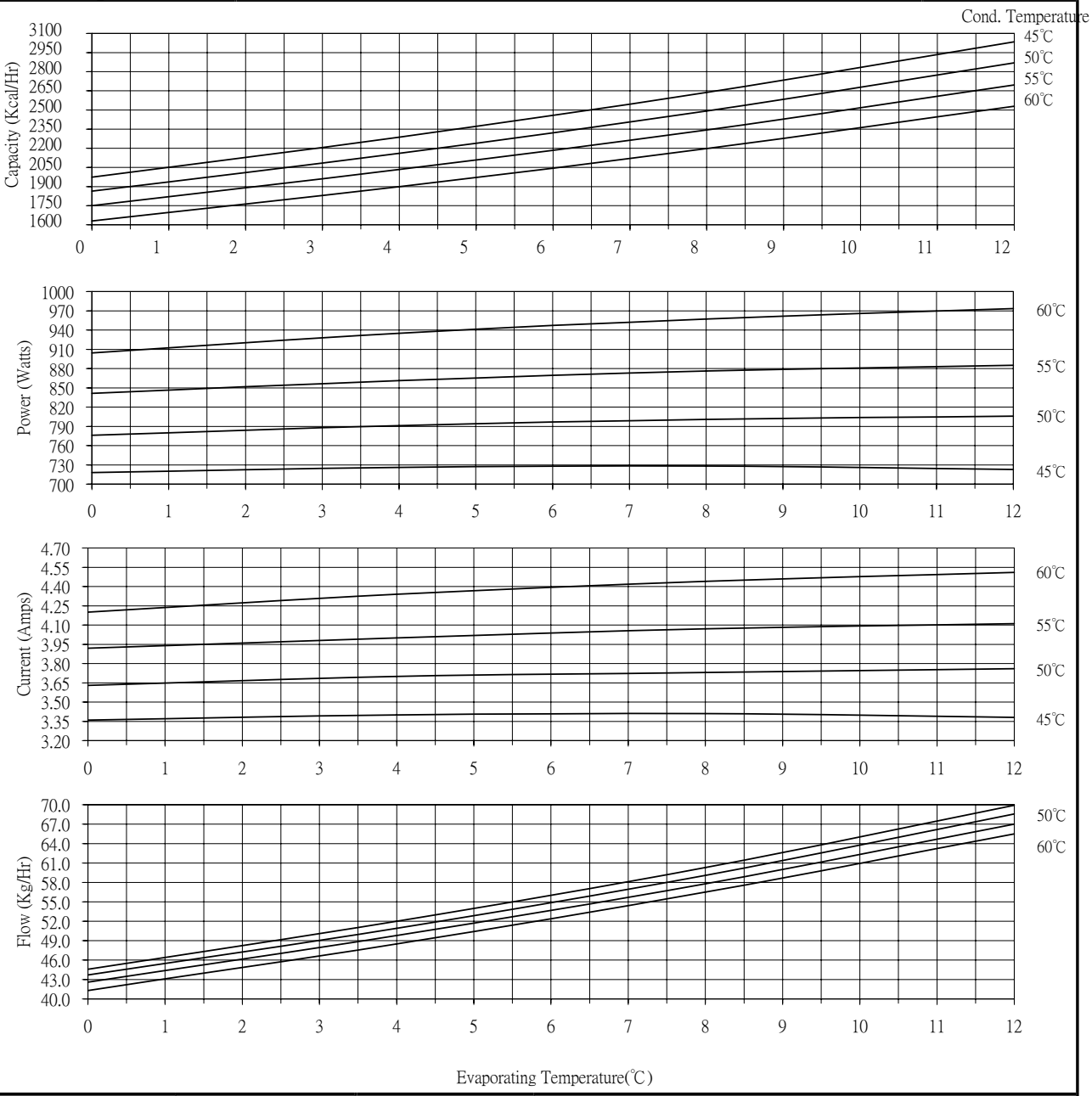
-3	35.79	1.78
-2	34.06	1.84
-1	32.43	1.90
0	30.88	1.98
1	29.42	2.01
2	28.03	2.07
3	26.72	2.13
4	25.48	2.19
5	24.3	2.25
6	23.18	2.31
7	22.12	2.37
8	21.12	2.43
9	20.17	2.49
10	19.26	2.54
11	18.4	2.60
12	17.59	2.56
13	16.81	2.72
14	16.08	2.77
15	15.38	2.83
16	14.71	2.88
17	14.08	2.93
18	13.48	2.99
19	12.91	3.04
20	12.36	3.09
21	11.84	3.14
22	11.35	3.19
23	10.88	3.24
24	10.43	3.29
25	10.00	3.33
26	9.59	3.38
27	9.20	3.42
28	8.833	3.47
29	8.479	3.51
30	8.141	3.55
31	7.819	2.59
32	7.511	3.63
33	7.217	3.67
34	6.936	3.71
35	6.668	3.75
36	6.411	3.78
37	6.166	3.82
38	5.931	3.86
39	5.707	3.89

THERMISTER RESISTANCE CHART

40	5.492	3.92
41	5.287	3.95
42	5.09	3.98
43	4.902	4.01
44	4.722	4.04
45	4.549	4.07
46	4.383	4.10
47	4.225	4.12
48	4.073	4.15
49	3.927	4.17
50	3.788	4.20
51	3.654	4.22
52	3.525	4.24
53	3.402	4.26
54	3.283	4.28
55	3.17	4.31
56	3.061	4.33
57	2.956	4.35
58	2.855	4.37
59	2.759	4.38
60	2.666	4.40
61	2.577	4.42
62	2.491	4.44
63	2.408	4.45
64	2.329	4.47
65	2.253	4.48
66	2.179	4.50
67	2.108	4.51
68	2.04	4.53
69	1.975	4.54
70	1.912	4.55
71	1.851	4.57
72	1.793	4.58
73	1.737	4.59
74	1.682	4.60
75	1.63	4.61
76	1.58	4.62
77	1.531	4.63
78	1.484	4.64
79	1.439	4.65
80	1.395	4.66

COMPRESSOR PERFORMANCE DIAGRAM

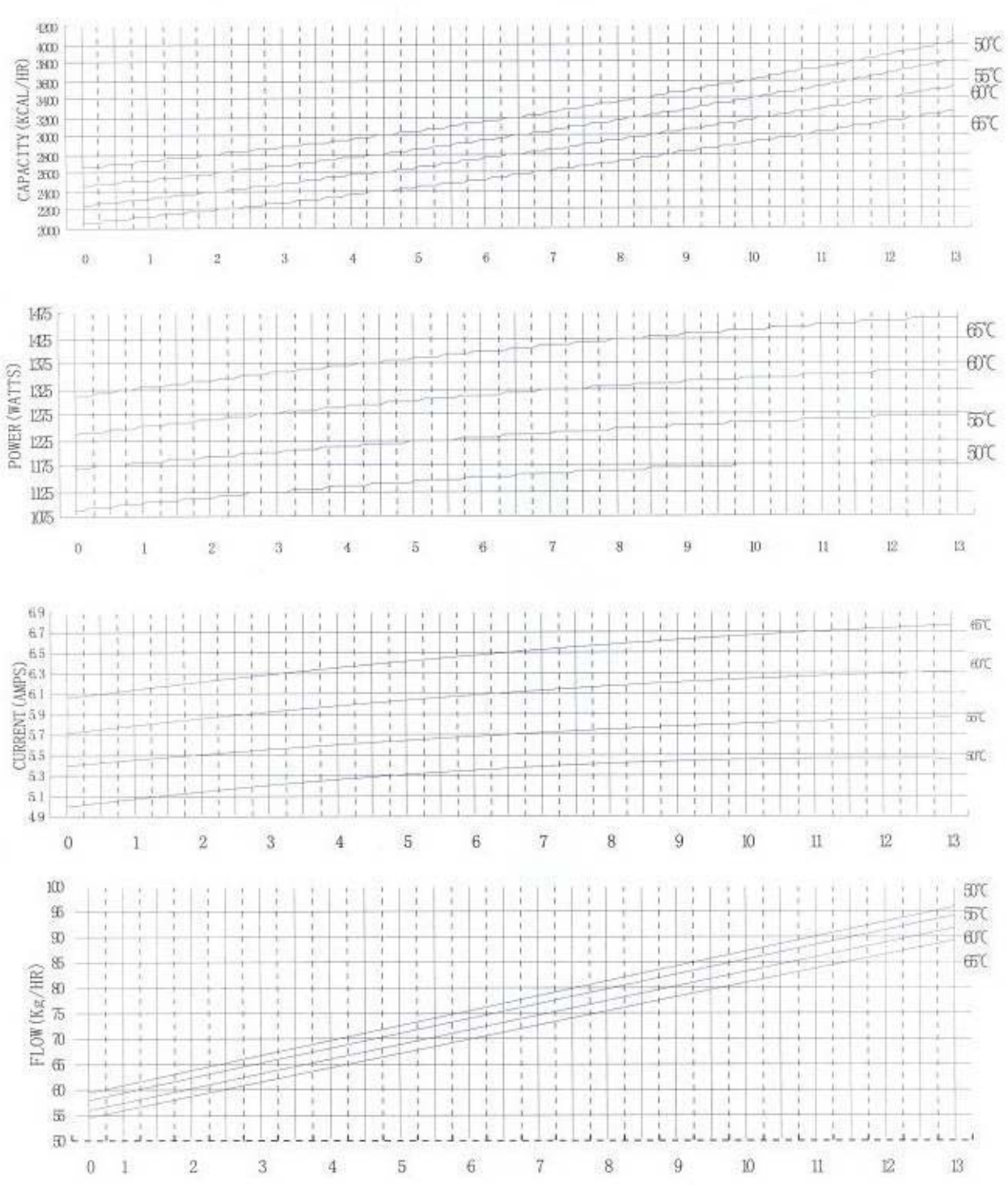
Performance Curve		Return Gas Temperature	35 ℃
Model	44R233C	Subcooling	8.3 ℃
Power Supply	220V / 50Hz / 1PH	Ambient Temperature	35 ℃
Run Capacitor	25 μF / 370 VAC		



			RECHI PRECISION CO., LTD	
			Dwg. Name	Dwg. No.
			Curves OF Compressor	**44R233C**

COMPRESSOR PERFORMANCE DIAGRAM

Performance Curve		Return Gas Temperature	35 ℃
Model	48R313N	Subcooling	8.3 ℃
Power Supply	220-240V / 50Hz / 1PH	Ambient Temperature	35 ℃
Run Capacitor	30 μF / 370 VAC		



SOUND PRESSURE LEVEL

MODEL: HSU-09LE03

INDOOR: 41.2/39.9/35.4 dB(A)

OUTDOOR: 49.7 dB(A)

MODEL: HSU-12LE03

INDOOR: 44.9/41.1/37.4 dB(A)

OUTDOOR: 55.7 dB(A)

NOTE:

The sound pressure level is based on the following conditions:

1 meter above the discharge grille and 1 meter from the front side.

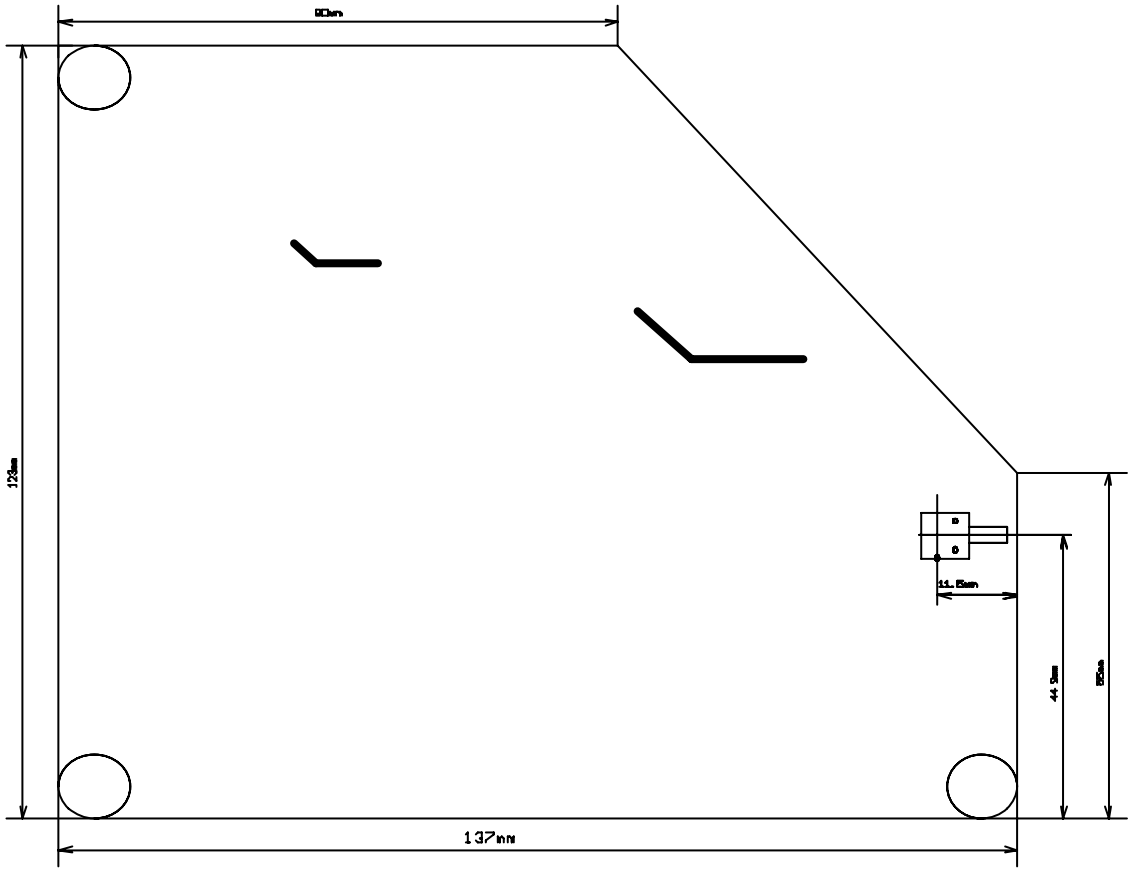
Voltage of the power source for the indoor fan motor is 220V.

In case of the power source of 240V, the sound pressure level increases by about 1 dB.

The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration when installing the unit.

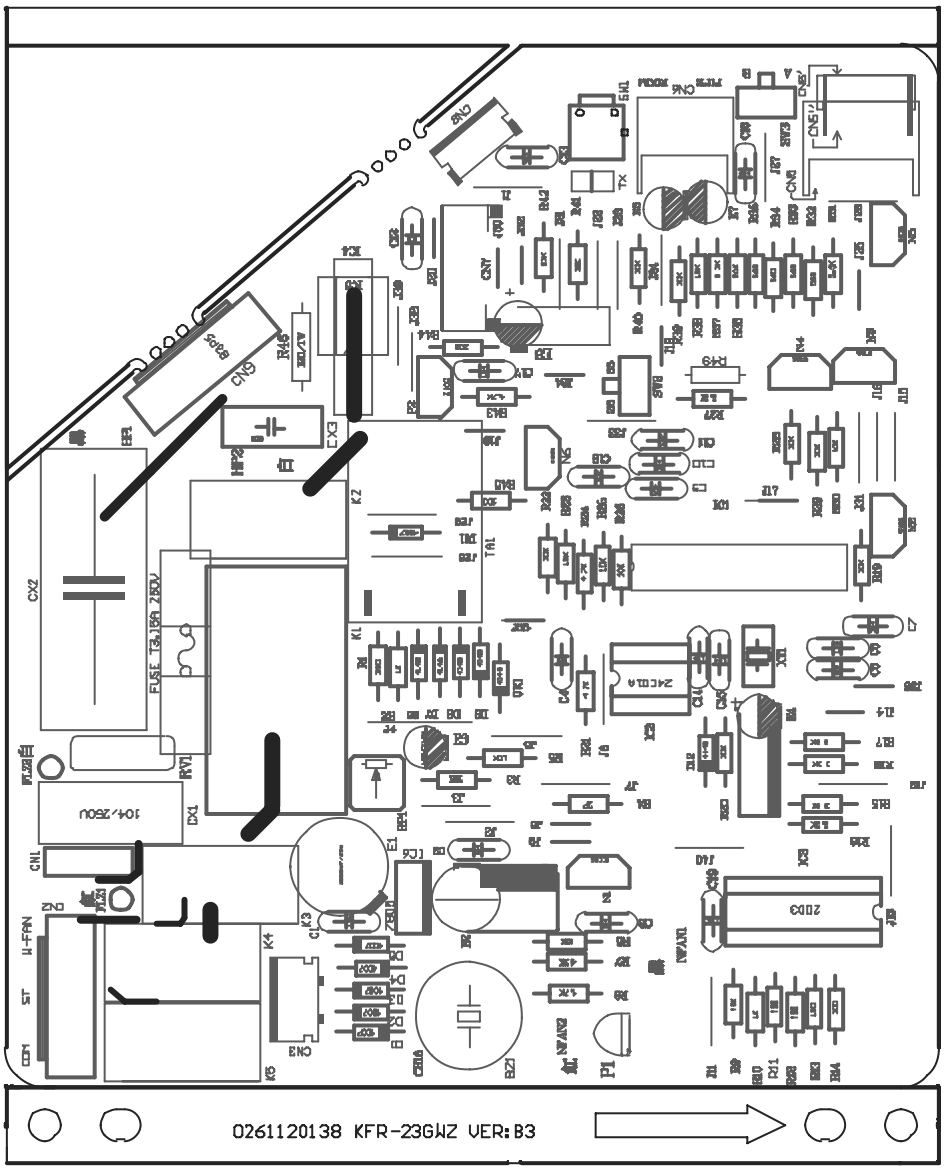
SCHEMATIC DIAGRAM OF PCB

SIZE



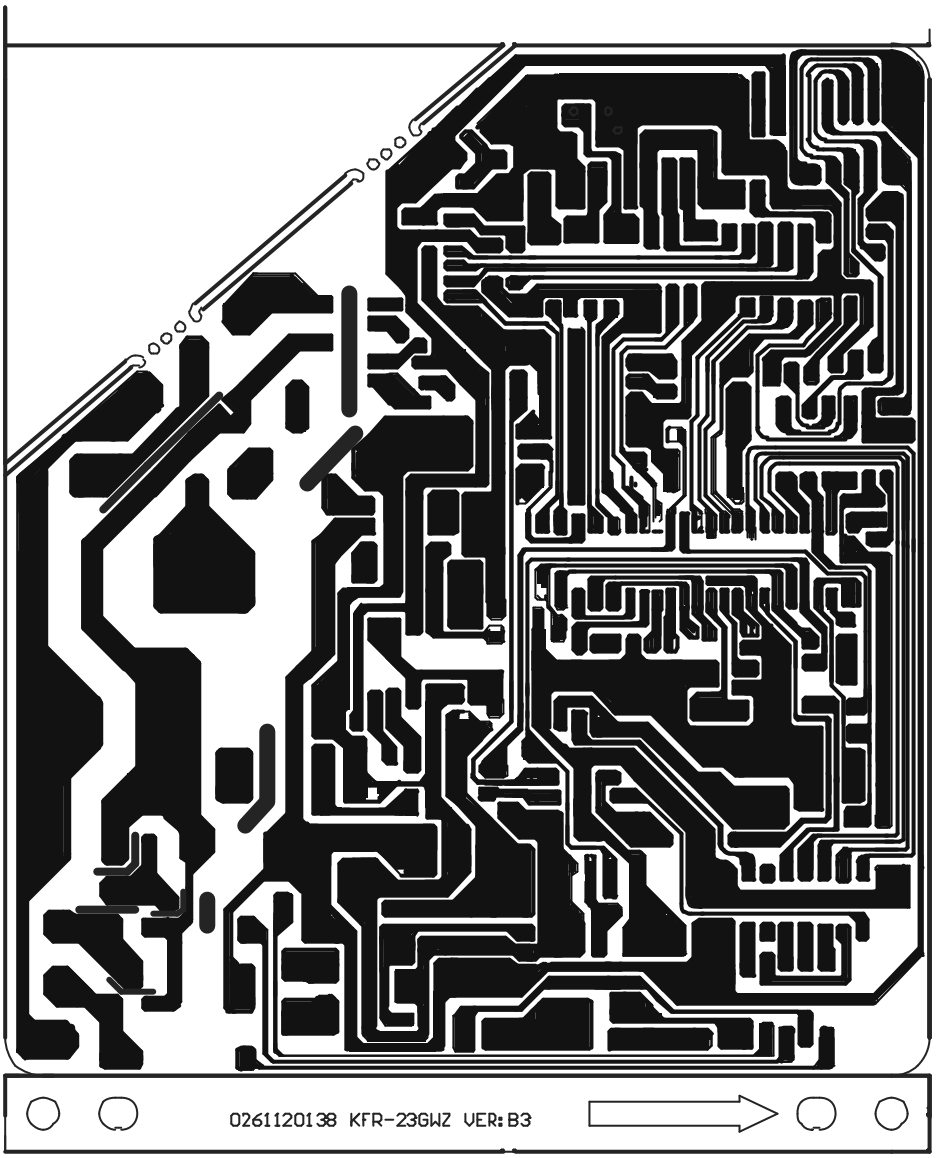
SCHEMATIC DIAGRAM OF PCB

TOP SILK SCREEN VIEW



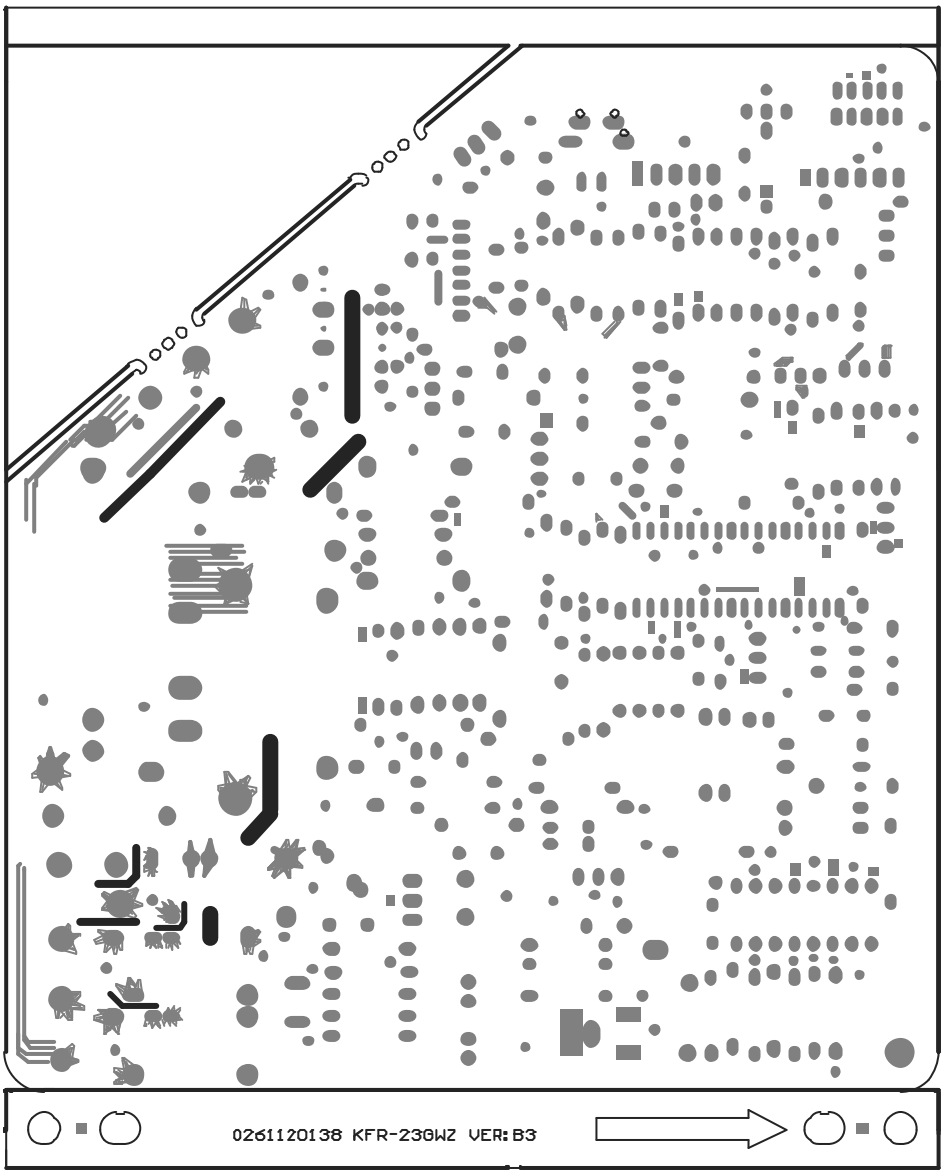
SCHEMATIC DIAGRAM OF PCB

BOTTOM WIRING VIEW



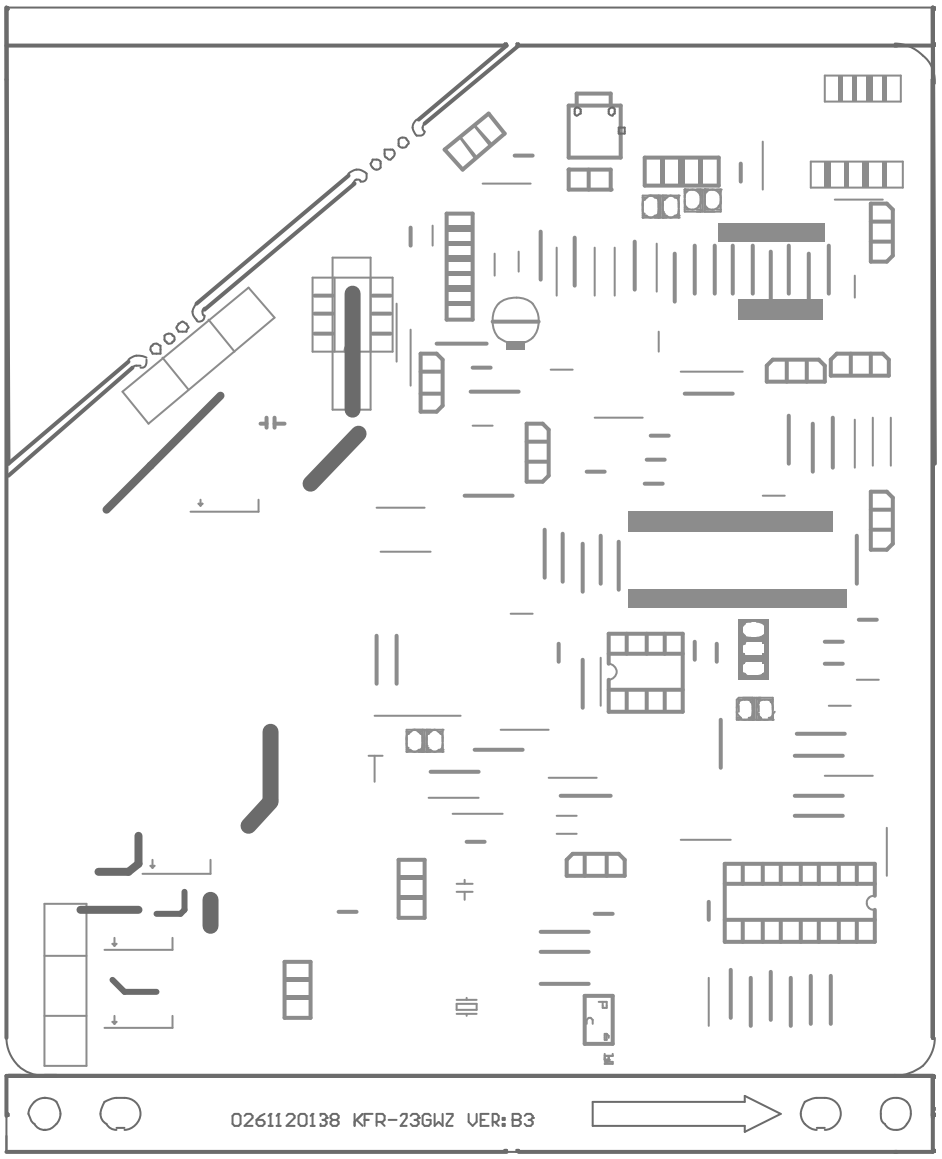
SCHEMATIC DIAGRAM OF PCB

WELDING VIEW



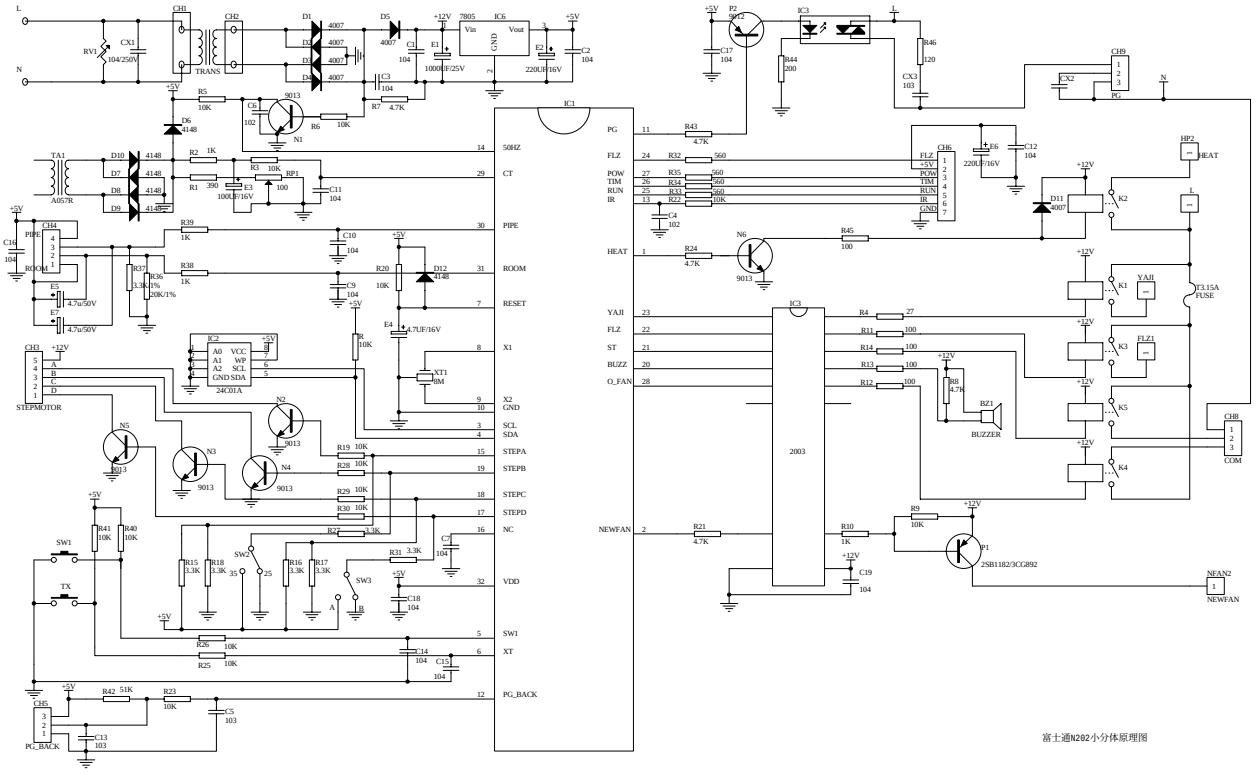
SCHEMATIC DIAGRAM OF PCB

BOTTOM SILK SCREEN VIEW



SCHEMATIC DIAGRAM OF PCB

CIRCUIT DIAGRAM



Sincere Forever

Haier Group

Haier Industrial Park, No.1, Haier Road

266101, Qingdao, China

http://www.haier.com

radiator slice