Energolux

TECHNICAL MANUAL

LIGHT COMMERCIAL AIR CONDITIONERS

Cabinet Type R410a

Designed in Switzerland

www.energolux.com

Energolux

Technical Manual

Light Commercial Air Conditioners

(R410a , 50Hz , T1)

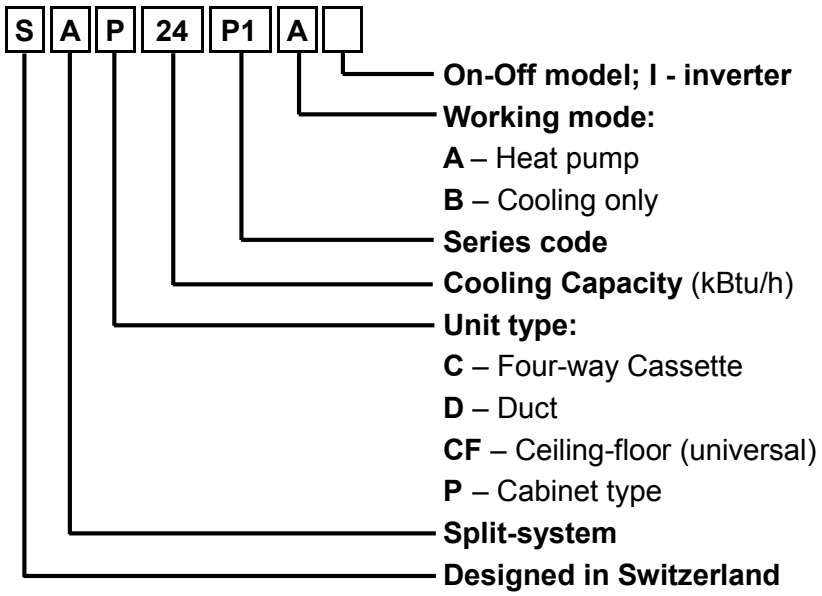
Version:01 2018/01

Content

Part 1. General description

1.Nomenclature

Indoor Unit



2.Unit appearance

Series	Picture of the indoor unit
Cabinet type	 24k Btu/h  48k Btu/h 60k Btu/h

Cooling capacity (Btu/h)	24 k Btu/h	48 k Btu/h	60 k Btu/h
Outdoor unit			

Outline Dimensions

SAP24P1-A

MODEL		Indoor SAP24P1-A	
		Net Dimension	Packing Dimension
W	mm	500	690
D	mm	300	450
H	mm	1780	1890

MODEL		Outdoor SAU24P1-A	
		Net Dimension	Packing dimension
W	mm	800	940
D	mm	300	420
H	mm	690	750

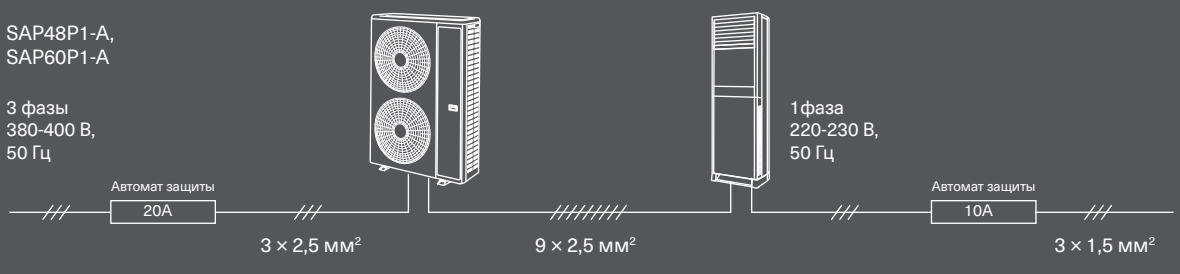
SAP48/60P1-A

MODEL		Indoor SAP48/60P1-A	
		Net Dimension	Packing Dimension
W	mm	560	680
D	mm	360	510
H	mm	1910	2020

MODEL		Outdoor SAU48/60P1-A	
		Net Dimension	Packing dimension
W	mm	945	1085
D	mm	340	430
H	mm	1255	1300

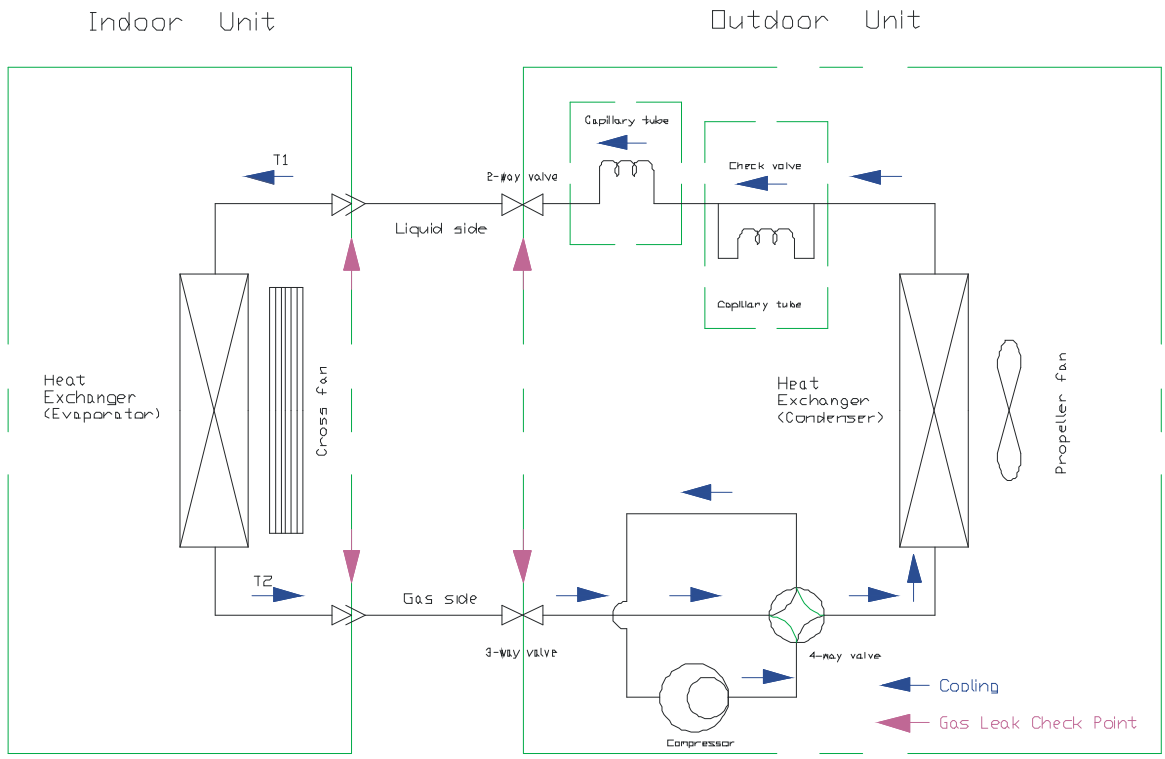
Модель			SAP24P1-A	SAP48P1-A	SAP60P1-A
Производительность, кВт	Охлаждение		7,2	14,0	17,0
	Обогрев		7,4 + 2,0	14,4 + 3,0	17,6 + 3,0
Потребляемая мощность, кВт	Охлаждение		2,35	5,1	5,74
	Обогрев		2,22 + 2,0	5,2 + 3,0	6,18 + 3,0
Энергоэффективность, кВт/кВт	Охлаждение	EER / Класс	3,06 / B	2,75 / D	2,96 / C
	Обогрев	COP / Класс	3,33 / C	2,76 / E	2,85 / D
Рабочий ток, А	Охлаждение		10,21	10,60	15,4
	Обогрев		9,78 + 8,6	10,9 + 7,9	15,3 + 7,9
Электропитание			1 фаза, 230 В, 50 Гц	3 фазы и нейтраль, 400 В, 50 Гц	
Сторона подключения			Наружный + внутренний блок		
Максимальная длина фреонопровода, м			15	25	25
Максимальный перепад высот, м			10	15	15
Диаметр жидкостной трубы, мм (дюймы)			9,52 (3/8)	9,52 (3/8)	9,52 (3/8)
Диаметр газовой трубы, мм (дюймы)			15,88 (5/8)	19,05 (3/4)	19,05 (3/4)
Внутренний блок			**SAP24P1-A**	**SAP48P1-A**	**SAP60P1-A**
Расход воздуха, м³/ч			1050	2100	2100
Уровень звукового давления, дБ(А)			39	52	52
Диаметр дренажной трубы, мм			18	18	18
Размеры (В х Ш х Г), мм	Без упаковки		1780×500×300	1910×560×360	1910×560×360
	В упаковке		1890×690×450	2020×680×510	2020×680×510
Вес, кг	Без упаковки		35	55	55
	В упаковке		41	71	71
Наружный блок			**SAU24P1-A**	**SAU48P1-A**	**SAU60P1-A**
Расход воздуха, м³/ч			2700	5800	5800
Уровень звукового давления, дБ(А)			53	62	62
Гарантированный диапазон рабочих температур наружного воздуха, °С	Охлаждение		+10 ~ +43		
	Обогрев		-7 ~ +24		
Заводская заправка хладагента R410a (до 5 м), г			1780	3500	3500
Дополнительная заправка хладагента, г/м			40	60	60
Размеры (В х Ш х Г), мм	Без упаковки		690×800×300	1255×945×340	1255×945×340
	В упаковке		750×940×420	1300×1085×430	1300×1085×430
Вес, кг	Без упаковки		48	105	106
	В упаковке		52	118	118

Внимание!
Минимальная допустимая длина трассы – 5 метров

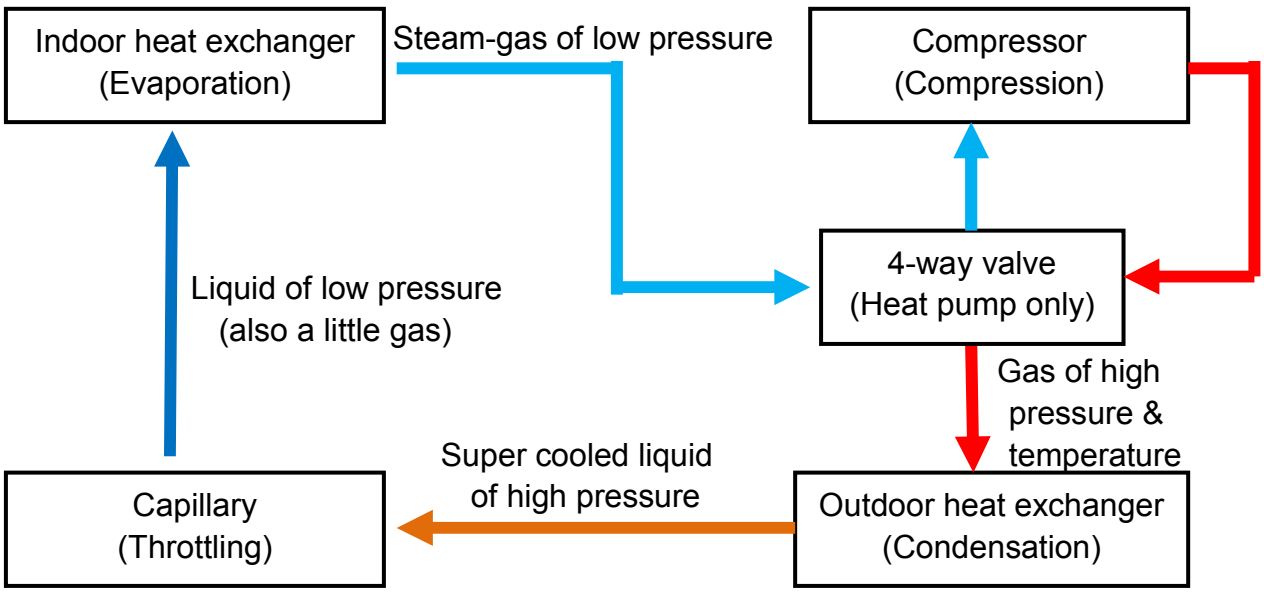


Refrigeration Diagrams

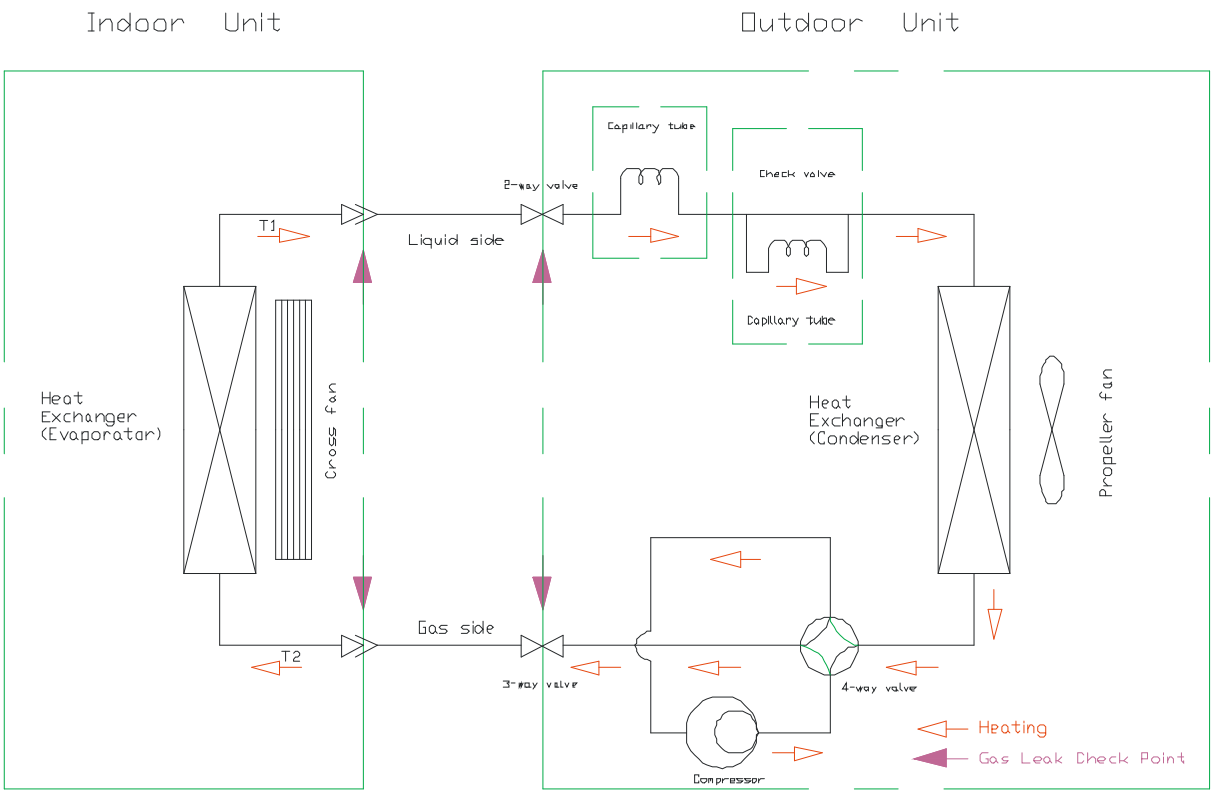
Cooling Mode



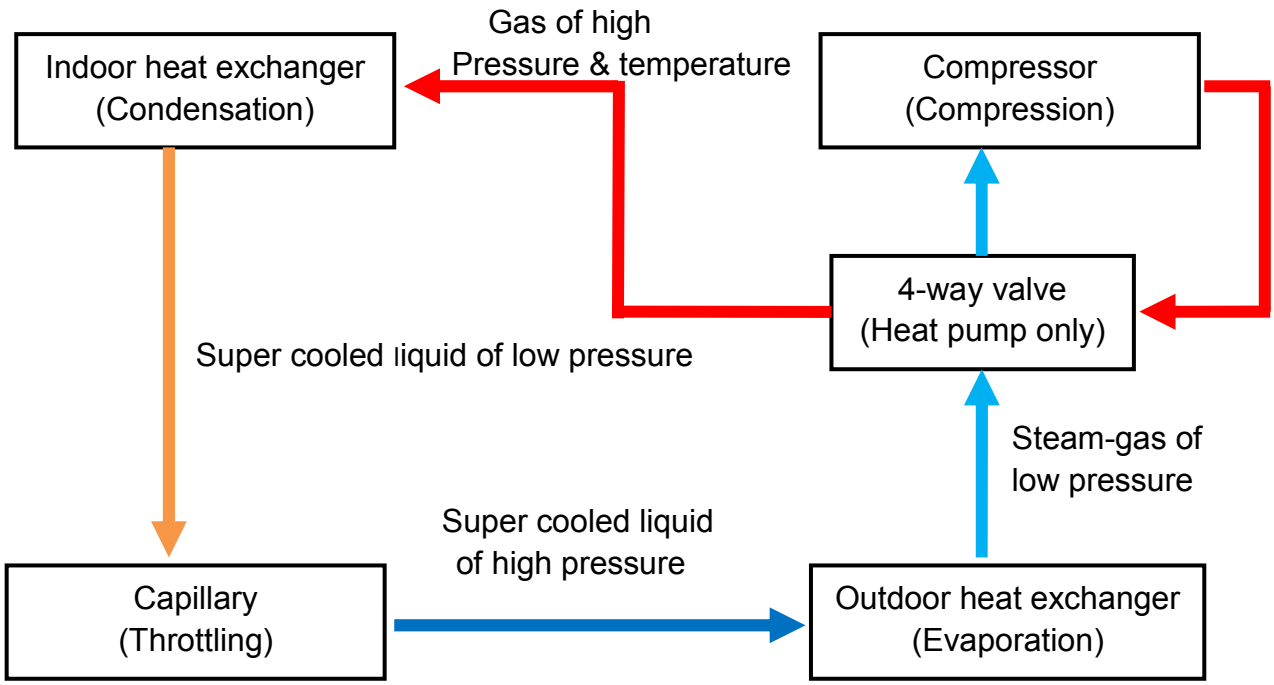
Cooling Cycle



Heating Mode



Heating Cycle



INTRODUCTIONS OF INSTALLATION

SPLIT TYPE FLOOR STANDING AIR-CONDITIONER INSTALLATION INSTRUCTIONS

The Installation Instructions is used to Split type floor standing air-conditioner installation.

※ Please read the instructions carefully before installation of the air-conditioner.
※ The installation should be carried out by specialists.
※ insallating the air-conditioner and connecting the pipe and wires must be strict to reference the instructions.
※ The machine power connections is X. If the power wires is destoried, electrical performance should be carried out by electrical specialists .
※ Make sure of grounding connection of the air-conditioner.
※ "N" expresses the zero line, it should not be connction point with ⏚ mark.

Warning

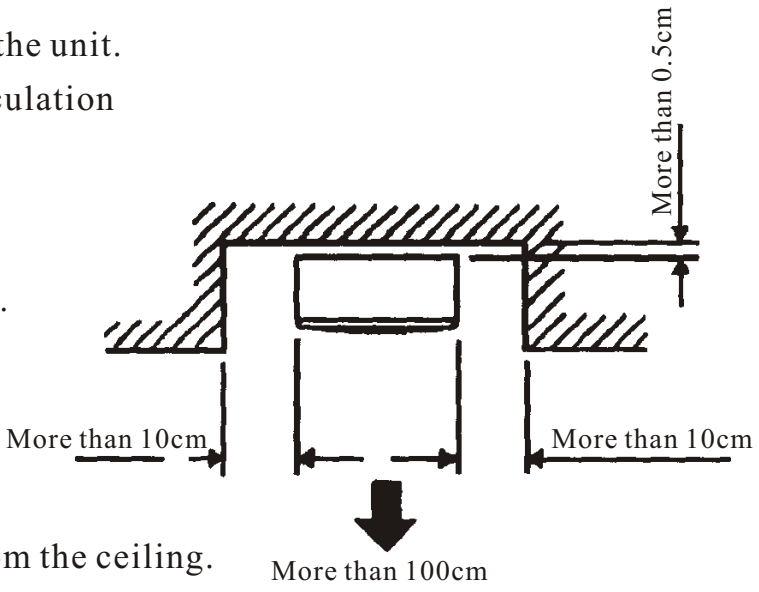
※Installation is forbidden in the stairs ,the exists and the corridors in the building.
※Make sure that the distance between the support of outdoor unit and the ground is 2.5m.

Installaiton order: Selection of the installing position→Installation the air-conditioner→connecting the pipes and wires→Expelling the air in the pipes and the indoor unit→Testing

Selection of the installing position

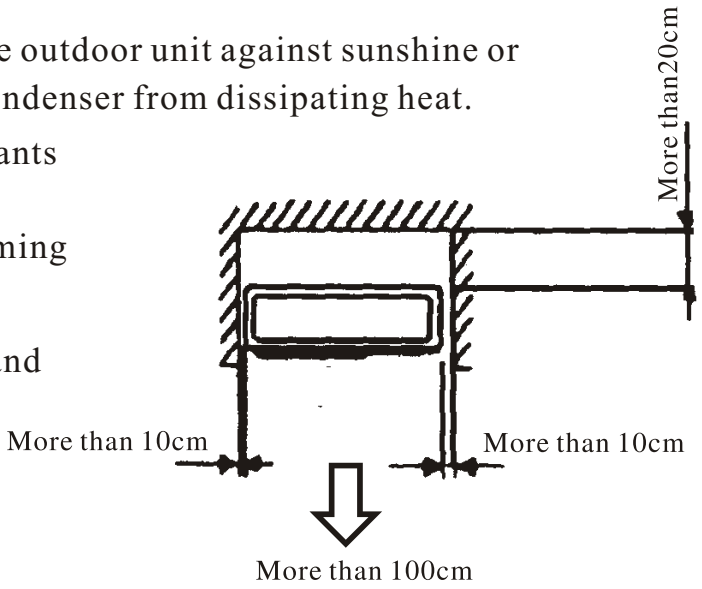
Indoor unit

- There is no heat or steam source near the unit.
- There is no blockage affecting air circulation at the installation position.
- Enable the air to circulate well.
- Easy to drain.
- Easy to take measures to reduce noise.
- Don't near the doorway.
- Enough distance between the unit and the wall,the ceiling,decoration and other blockages.
- Installation position is about 30cm from the ceiling.



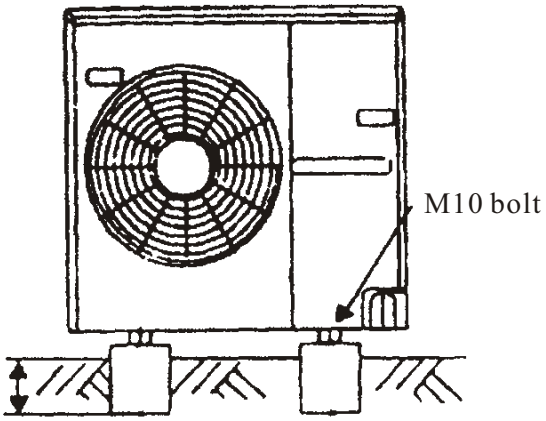
Outdoor unit

- If there is an awning protecting the outdoor unit against sunshine or rainfall,be sure not to block the condenser from dissipating heat.
- Don't keep animals or cultivate plants on the site,because they would be affected the cold or hot airflow coming out of the air-conditioner.
- Enough distance between the unit and the wall,the ceiling,decoration and other blockages.
- Install at location being 100cm above the blockages.

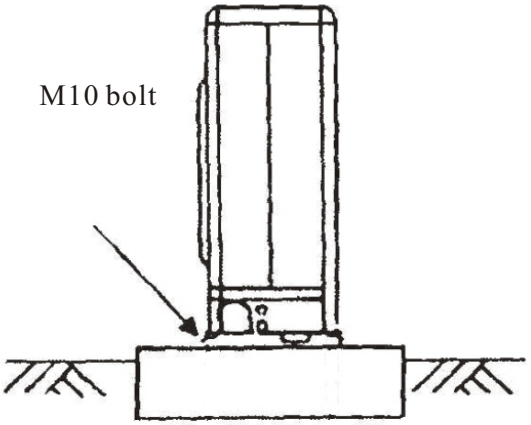


Installation the air-conditioner

- The outdoor unit must be firmly fixed to avoid falling in the the strong wind.
- Install on the cement base as the drawing below.
- The outdoor unit must be installed horizontally

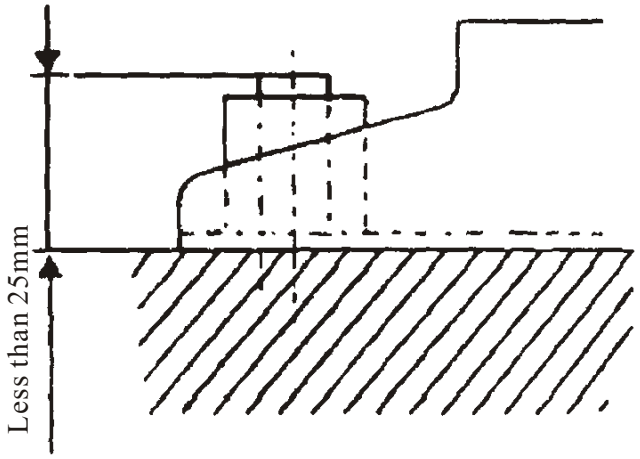


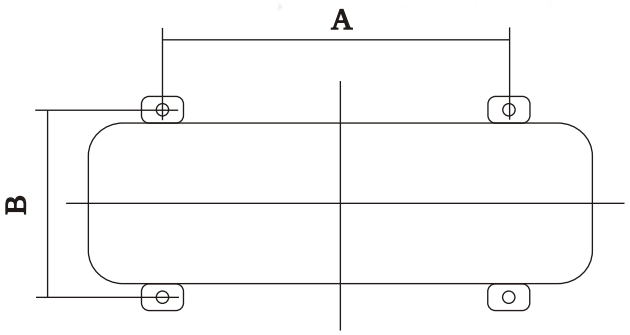
Deeply bury



Installation outdoor unit bolt

Attention :
make sure of the length of the screws at the bottom corners is 25mm.





Outdoor Unit Size of Shape (mm)	A (mm)	B (mm)
760x260x540	539	287
800x300x690(590)	540	326
900x330x860	606	354
945x340x1255	585	376

Indoor unit behind panel installation

NOTE:

To make sure the installation place of the air conditioner .

Installation behind panel before connect the pipeline and cable.

Basis indoor outdoor units installation place, choose the suitable roof outlet bore (back right left each one).

Behind panel must installation, or plate parts maybe rip the wire result short, even make fire.

1.Tap the roof outlet bore.

2.Put behind panel on roof bore , revolve to the screw hole , loosen screw, then tap the middle circle plastic panel.

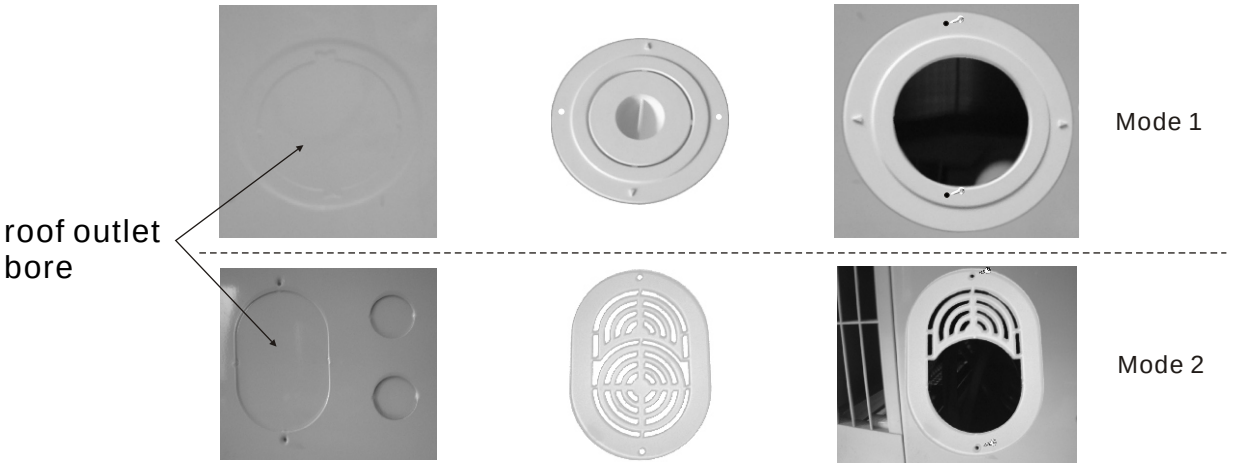


Fig 1 Fig 2 Fig 3

Pipe and Drain pipes Connection-Indoor Unit

Position of the pipes

※ Select suitable position to make according to the location of indoor and outdoor units.

Pipe connection

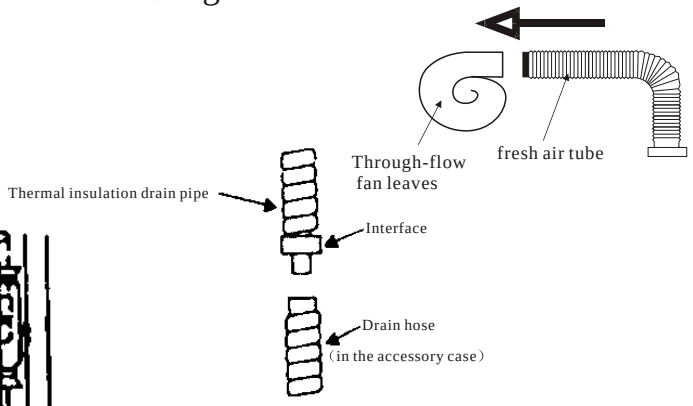
※Take the pipes out of the accessory case.
※Pull the pipes and cables from the holes and turn away the block things in the pipe.
※Turn away the stopper in the connection pipes of the indoor unit.
※Oiling bell-bottom of the pipe connection and the inner of sealing.
※Align the pipes,connected with the screw with a torsion wrench. The torque list in the table below.
※Wrap the connected position of thermal insulation pipes.

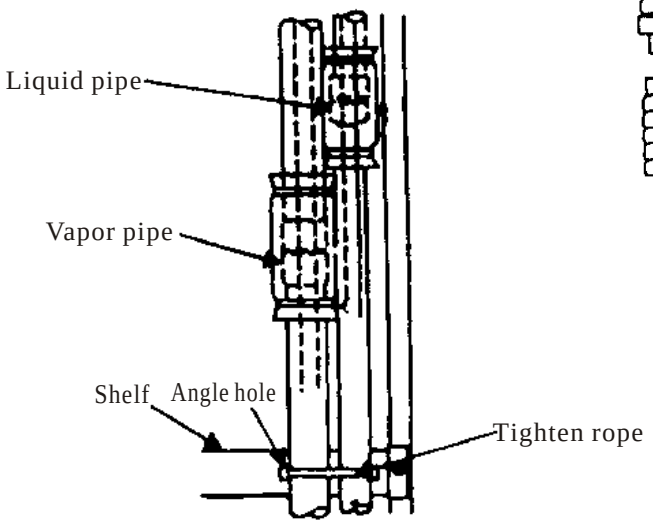
The size of pipe（mm）	Torque（N.m）
Φ6.35	15～25
Φ9.52	35～40
Φ12.7	45～60
Φ15.88	73～78
Φ19.05	75～80

Drain pipes connection

※The drain should be downwards.
※Tighten the interface.
※Wrapping from 10cm to the plug of indoor unit with plastic belt.
※Make the pipe,cable to power and cable to signals in order. Make sure of the streching direction and the smoothly surface of the drain.

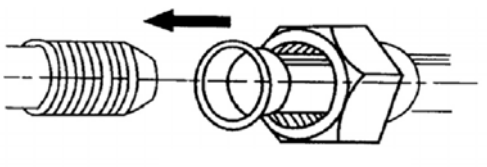
Attach:Wind pipe connection for ZV series
※ Side wind tube downward
※ Tighten tie-in



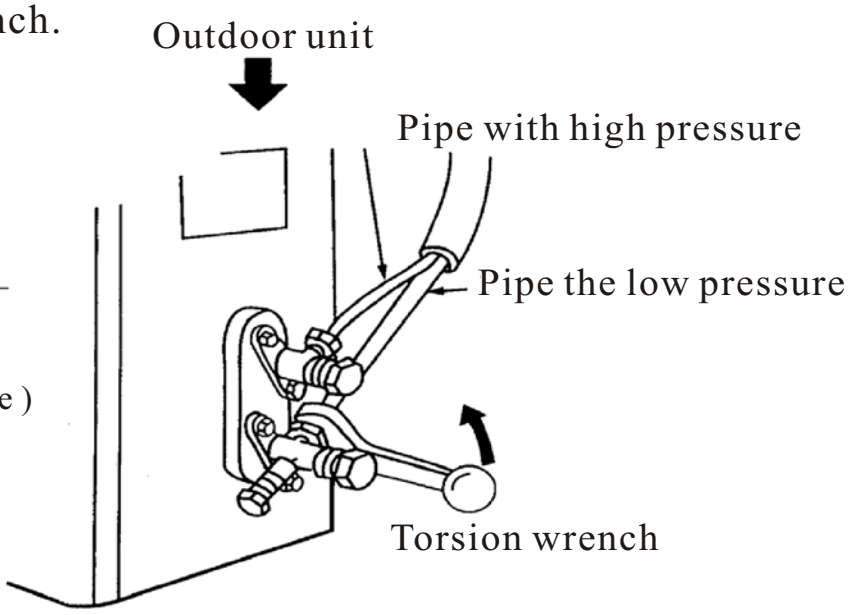


Pipe connection-Outdoor Unit

- Make the pipe align at the center of the stop valve.
- Turn away the block from the pipe and the cap from the stop valve.
- Aligning at the pipe,tighten the screw with your fingers.
- Tighten the nut with a torsion wrench until you hear “ka-ka” from the wrench.



(Refer the direction to the picture)

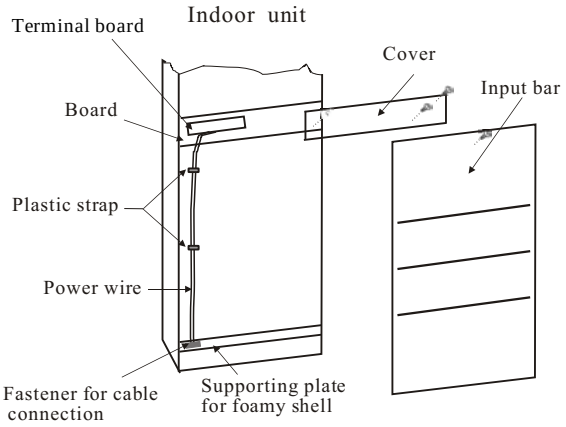


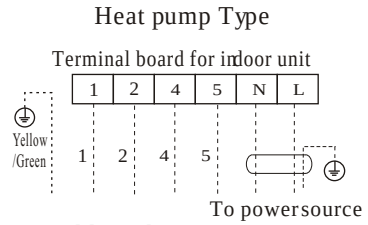
Wiring connection of Indoor Unit for SAP24P1-A

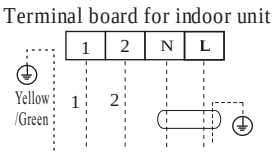
- Loosen the screw and dismount the input bar of the indoor unit; Loosen the screw and dismount the electrical cover of the indoor unit.
- Connect the power connection line to the terminal of controller board according to the different number.
- Wrap the wires with plastic belt refer the condition to the picture.
- The grounded wire connection:
  1.loosen the grounded screw of board
  2.Connect the grounded wire with the grounded screw then setscrew in the " ⏚ " mark formerly.
- Fix the cables to the supporting plate for foamy shell strongly with fastening piece.
- Reinstall the electrical cover with the screw.
- Reinstall the input bar with screw.

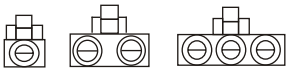
NOTE:

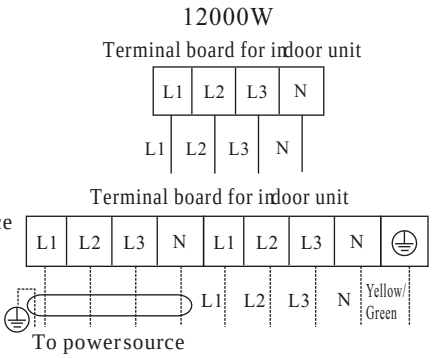
※Don't reverse the power polarity.
※The wrong connection lead to the malfunction of some electrical parts.
※Must fix the screwnail of the firmly wire, then drag the wire lightly, confirmation whether it's firmly.
※Must changed if the wire slide, the self-drive screw can't used to the electric connection.
※The connection mark should be agreed on for indoor unit and outdoor unit.
※If there is a connector, connect it directly.









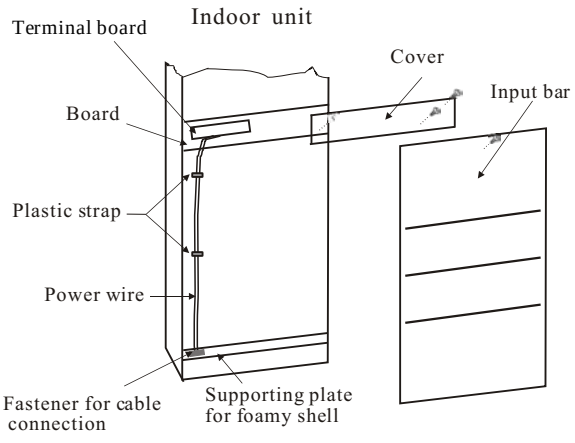


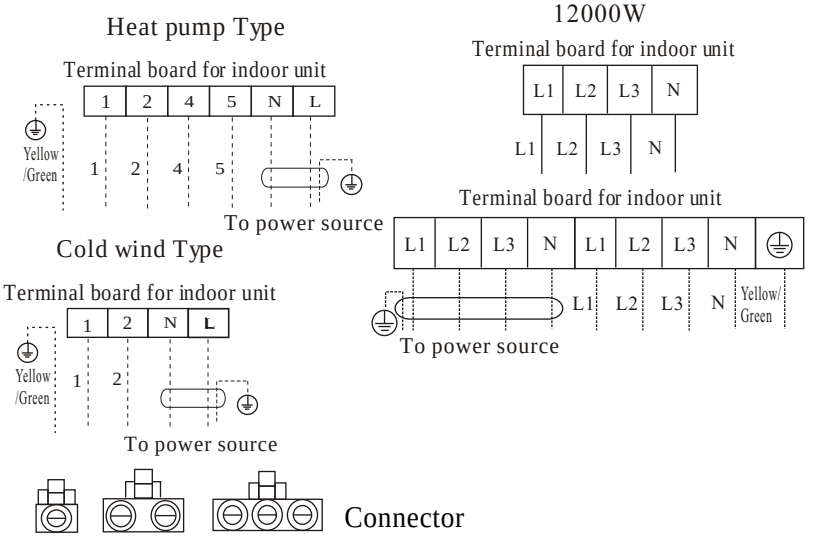
Wiring connection of Indoor Unit for SAP48/60P1-A

- Loosen the screw and dismount the input bar of the indoor unit; Loosen the screw and dismount the electrical cover of the indoor unit.
- Connect the power connection line to the terminal of controller board according to the different number.
- Wrap the wires with plastic belt refer the condition to the picture.
- The grounded wire connection:
  1.loosen the grounded screw of board
  2.Connect the grounded wire with the grounded screw then setscrew in the " ⏚ " mark formerly.
- Fix the cables to the supporting plate for foamy shell strongly with fastening piece.
- Reinstall the electrical cover with the screw.
- Reinstall the input bar with screw.

NOTE:

※Don't reverse the power polarity.
※The wrong connection lead to the malfunction of some electrical parts.
※Must fix the screwnail of the firmly wire, then drag the wire lightly, confirmation whether it's firmly.
※Must changed if the wire slide, the self-drive screw can't used to the electric connection.
※The connection mark should be agreed on for indoor unit and outdoor unit.
※If there is a connector, connect it directly.





Wiring connection of Outdoor Unit for SAU24P1-A

- Unscrew the screw, take off the control panel cover from the unit.
- Connect the cable to their terminals according to their number.
- The grounded wire connection:
  1.loosen the grounded screw of electrical shelf.
  2.Connect the grounded wire with the grounded screw then setscrew in the " ⏚ " mark formerly.
- Fix the cable to the terminal board with fastening piece.
- Reinstall the cover with the screw.

NOTE:

※Don't reverse the power polarity.
※The wrong connection lead to the malfunction of some electrical parts.
※Must fix the screwnail of the firmly wire, then drag the wire lightly, confirmation whether it's firmly.
※Must changed if the wire slide, the self-drive screw can't used to the electric connection.
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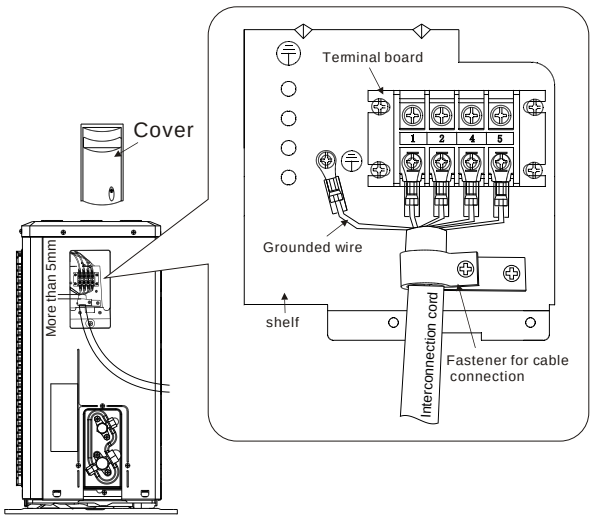
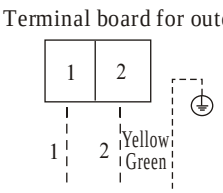
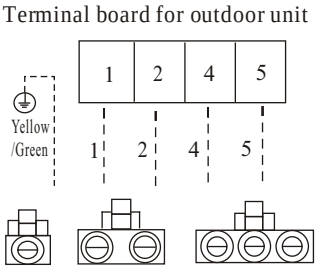


Cold wind Type

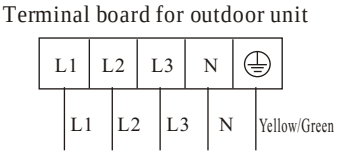


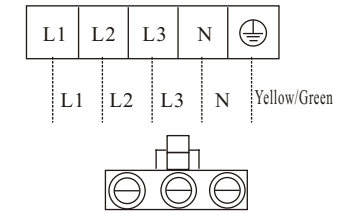
Heat pump Type



Connector

12000W





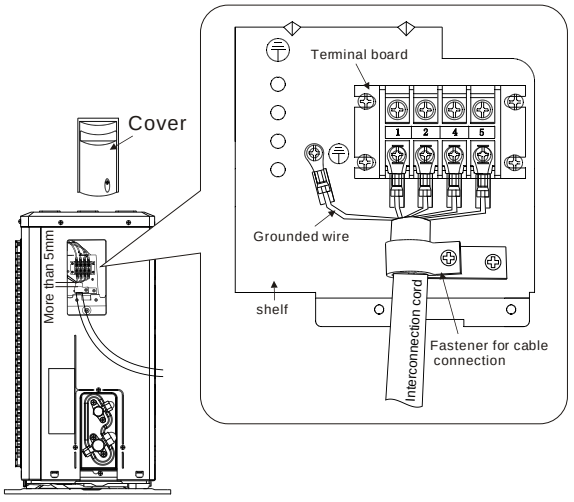
Connector

Wiring connection of Outdoor Unit for SAU48/60P1-A

- Unscrew the screw, take off the control panel cover from the unit.
- Connect the cable to their terminals according to their number.
- The grounded wire connection:
  1.loosen the grounded screw of electrical shelf.
  2.Connect the grounded wire with the grounded screw then setscrew in the " ⏚ " mark formerly.
- Fix the cable to the terminal board with fastening piece.
- Reinstall the cover with the screw.

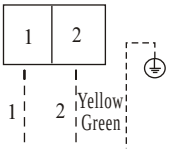
NOTE:

※Don't reverse the power polarity.
※The wrong connection lead to the malfunction of some electrical parts.
※Must fix the screwnail of the firmly wire, then drag the wire lightly, confirmation whether it's firmly.
※Must changed if the wire slide, the self-drive screw can't used to the electric connection.
※The connection mark should be agreed on for indoor unit and outdoor unit.
※If there is a connector, connect it directly.



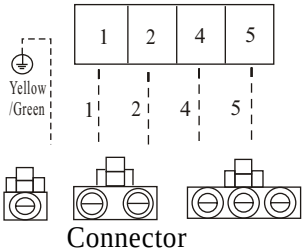
Cold wind Type

Terminal board for outdoor unit



Heat pump Type

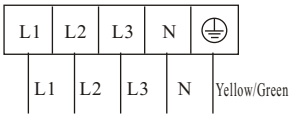
Terminal board for outdoor unit



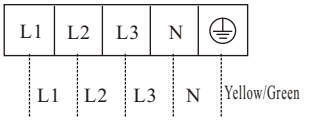
Connector

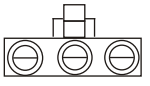
12000W

Terminal board for outdoor unit



Terminal board for outdoor unit



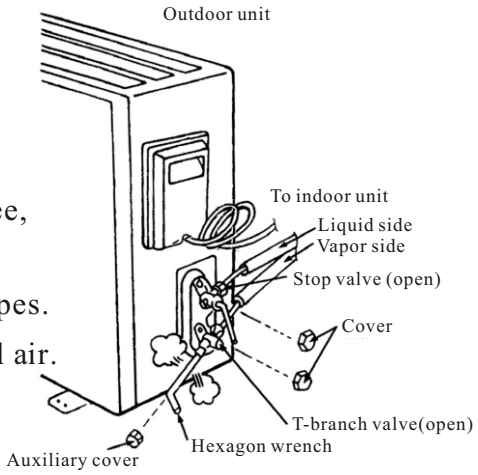


Connector

Expelling the pipes and the indoor unit

Expelling the air: humid air in the refrigerating system might cause trouble of compressor.

- Take off the cover from the stop valve and T-branch valve.
- Take off the auxiliary cover from the T-branch valve.
- Turn the stop valve rod anti-clock wise to an angle of 90 degree, keep it open for 8 seconds and close the valve.
- Check whether there is air leakage at all connection parts of pipes.
- Push the top rod of T-branch valve by hexagon wrench to expel air.
- Repeat the third and fifth steps.
- Open the stop value and T-branch valve with a hexagon wrench to make the unit operation.
- There is no leakage allowed,please check all the piping connection parts.You must test the leakage, generally,it can be tested by soap water.



Test running

- Make sure thast the pipes and wires are connected.
- Make sure that the liquid side valve and air side valve both are completely open.

1.The connection of power source

- Connect the wire to independent power source socket
- Preparation of remote controller.
- Run the air-conditioner in cooling operation mode for 30 minutes or longer.

2.Performance evaluation

- Test the out and in air temperature.
- Make sure whether the difference between the out and in air temperature large than 10 ℃.

Packing List

※Please check the following spare parts carefully,when some of spare parts don't use,please take care of them.

Packing list of the Indoor Unit

N0.	Name	Size/Model	Unit	Quantity	Remark
1	Indoor Unit		Set	1	
2	Remote Controller		PC	1	
3	Batteries	7#	PC	2	
4	Instructions		PC	1	
5	Certificate		PC	1	
6	Drain pipe	2m	PC	1	

Packing list of the Outdoor Unit

N0.	Name	Size/Model	Unit	Quantity	Remark
1	Outdoor Unit		Set	1	
2	Certificate		PC	1	
3	Low pressure connection pipe		PC	1	
4	High pressure connection pipe		PC	1	
5	Plastic Strap		ROLL	1	
6	Isolation Strap		ROLL	1	
7	Pipe Protection Ring		PC	1	
8	Luting (putty)	160g	PACKET	1	

REMOTE CONTROLLER INSTRUCTIONS

Safety Precautions

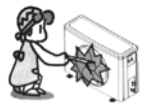
Read and understand thoroughly this safety awareness before use.
The items indicated here are very important safety precautions, which must be followed.

⚠ WARNING

- The air conditioner must be grounded .Incomplete grounding may result in electric shocks.Do not connect the earth wire to the gas pipeline,water pipeline,lightning rod,or telephone earth wire.After installment,earth leakage examination must be carried on through electrifying.

- An earth leakage breaker with rated capacity must be installed to avoid possible electric shocks.

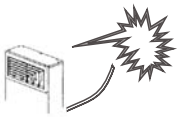
- **Don't install air conditioner in a place where there is flammable gas or liquid.**
  It may cause fire.



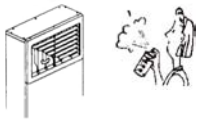
- **Don't put a finger, a rod or other object into the air outlet or inlet.**
  As a fan is rotating at a high speed, it will cause injury.

- **Don't touch the swinging wind vanes.**
  It may clamp your finger and damage the driving parts of the wind vanes.

- **Don't attempt to repair the air conditioner by yourself.**
  You may be hurt or cause further malfunctions.

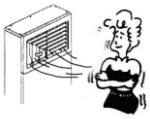


- In lighting storm weather, please cut off the primary power supply switch in order to prevent the machine from damage.

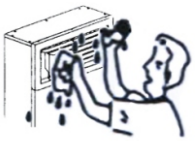


- Don't use liquid or corrosive detergent clean the appliance and don't splash water or other liquid onto it , otherwise, it may damage the plastic components, even cause electric shock.

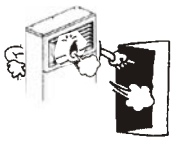
⊘ CAUTION



⊘ Don't apply the cold air to the body for a long time.It will deteriorate your physical conditions and cause health problems.



⊘ Clean the air conditioner with a piece of soft and dry cloth.Don't use these stuffs for cleaning: chemical solvent, insecticide,inflammable spraying materials which will damage the appearance of air conditioner .Don't sprinkle water directly on the indoor unit.



⊘ Close the windows and doors, otherwise,the cooling or heating capacity will be weakened.

⊘ If the air filter is very dirty, the cooling or heating capacity will be weakened.Please clean the air filter regularly .

Notice:

Don't let the child touch the air-conditioner to avoid the possible danger.

Keep the indoor unit and the remote controller dry to avoid short circuit ,even fire accident.

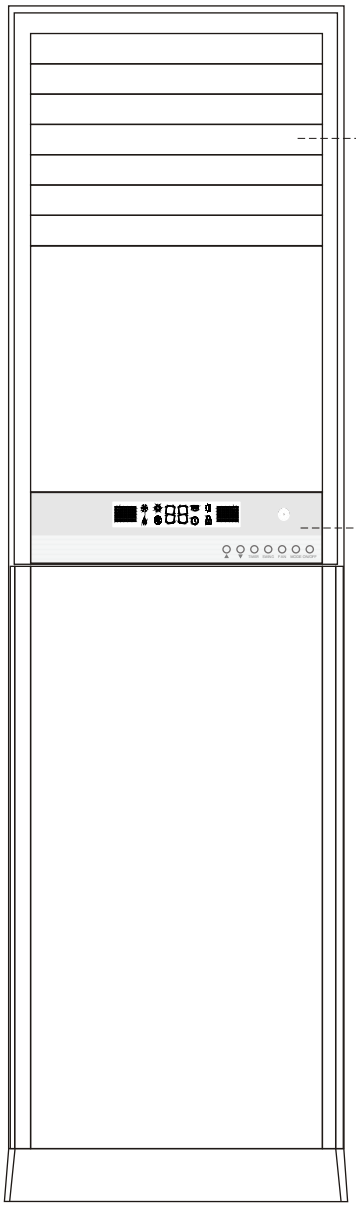
An all-pole disconnection device which has at least 3mm separation distance in all-pole shall be incorporated in the fixed wiring according to the safety rule.

Children should be supervised to ensure that they do not play with the appliance.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Parts Description

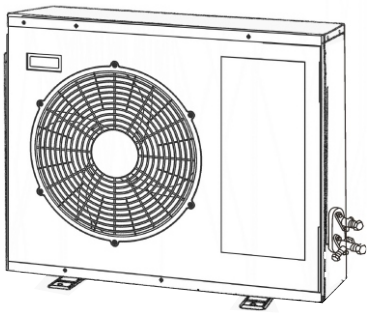
★ Indoor unit



Air outlet:
Discharge the regulated air

Control panel

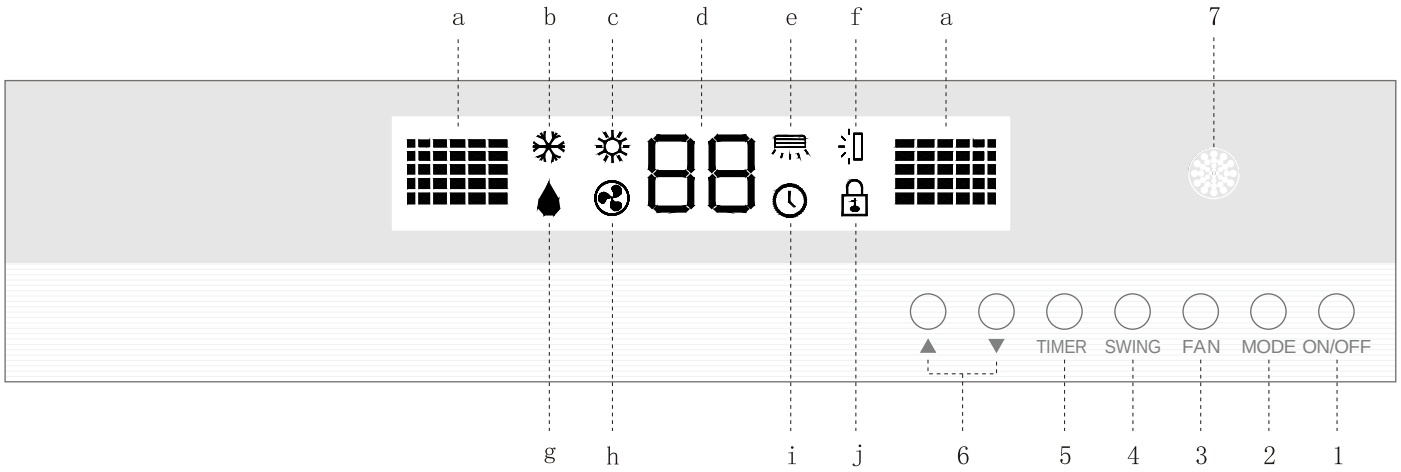
★ Outdoor unit



Notice:

Appearance of the indoor unit and outdoor unit may differ with some models.

★ Controlling panel



☆ Controlling panel

1.**ON/OFF BUTTON**

Start conditioner by touching this button and stop by pressing it.

2.**MODE SELECT BUTTON**

Each time you push the button, a mode is selected in a sequence.

Heat-pump type: → COOL → DRY → HEAT → CIRCULATION →

Cold only type: → COOL → DRY → CIRCULATION →

3.**FAN SPEED BUTTON**

You can select fan speed as following:

→ Low → Med → High →

4.**SWING BUTTON**

You can set the louver direction as you required.

5.**TIMER**

For Time ON or Time OFF the unit (for only 12000W machine).

6.**TEMP. BUTTON**

These two buttons can be used for setting room temperature.

Remark: In dry or fan operation mode, temperature setting is non-effective.

7.**INFRARED SENSOR**

Receive the signal of remote controller.

☆ Fluorescence Display

a－Fan speed	b－Cooling mode	c－Heating mode	
d－Temperature	e－Left/Right wind display	f－Fluctuate swing	
g－Drying mode	h－Circulating air	i－timing	J－Lock

Note: according to different models and operation modes, air conditioner under operation would only display parts of the above contents, please comply with actual article.

Other operations

★ Wind direction adjustment

In order to guarantee an even diffusion of the air in the room, you can choose one way as follows to control:

1.Press the swing button on the control panel to move the louver to the desired loction. The function see swing button introduction.

2.You can adjust the louver direction to desired direction by pressing the "Left/Right wind" or "swing" button on remote controller.

Please see the remote controller buttons description for function introduction.

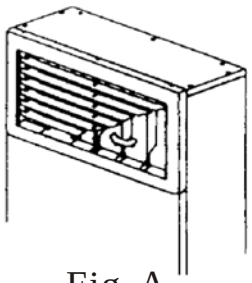


Fig. A

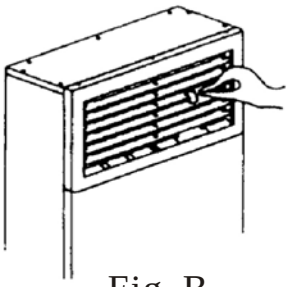


Fig. B

NOTE : Adjusting the vertical louvers manually in automatically-controlled operation may damage the servo-motor.

★ Remote controller usage

See *"air conditioner remote controller instruction"*.

Items of attention

Please read this instruction carefully before using the air conditioner, you are strict to operate according to the instruction. Otherwise, it may be damage to the air conditioner or to the other person's safety and property.

★ Checking Before usage

1.Make sure that the earth wire is connected safely and reliably.

2.Make sure the filter net is properly fixed.

3.Make sure that air outlet and inlet are not blocked.

4.Please clean the filter before starting the air-conditioner referring to page to 6 "Cleaning" for how to operate.

5.Check to see whether the outdoor install bracket is damage. if yes, please contact our Service center locally.

★ Optimal operation

- Pay attention to the following items so as to ensure optimal operation of the system, detailed operation see the relevant content.
- Set the suitable temperature for a comfortable environment. Don't make the room too cold or too hot.
- During the cooling operation, don't let the sunray into the room, please pull down the window shades or veils.
- Close the windows and doors. Otherwise, it decreases its cooling or heating capacity.
- Please set the scheduled operation time with the remote controller.
- Make sure that air outlet and inlet are not blocked,or it may decrease the efficiency of the air-conditioner,even stops the operation of the system.
- If the air filter is blocked, the cooling or heating capacity will be affected. Please regularly clean the air filter.

★ Safety tips

1.Installation should always be carried out by specialist. The customers should not install the air-conditioner by themselves. Otherwise, it may cause damage or injury.

2.In order to use the air conditioner properly, please refer to its working temperature range. Otherwise, indoor unit automatic protection function may be activated, cooling or heating efficiency will be weakened.

Working temperature range

Cooling	Indoor	Maximum: Minimum:	DB/WB DB/WB	32℃/23℃ 21℃/15℃
	Outdoor	Maximum: Minimum:	DB/WB DB/WB	43℃/26℃ 21℃/15℃
Heating	Indoor	Maximum: Minimum:	DB/WB DB/WB	27℃- 20℃-
	Outdoor	Maximum: Minimum:	DB/WB DB/WB	24℃/18℃ -5℃/-6℃

1.Set the suitable temperature, especially there are old people, children and patients in the room. Generally, keep the temperature difference for 5℃ between the inside and outside.

2.In case that the unit occurs closing down due to the severe interference from outer environments such as mobile phone, please cut off the plug and plug in to restart the air conditioner after several seconds .

3.Never expose animals or plants to direct air flow, and adjust the air flow to avoid air blowing directly at people.

4.It is forbidden to let the air conditioner blow wind to the cookers, or it may effect the normal cooking and even cause danger!

Maintenance

★ Failure type and methods of resolution

In case the following situation, please immediately stop the operation of the air-conditioner and cut off the power supply, then contact with distributor.	
Failure type	The RUN light or other display light flashes rapidly and keep flashing after the plug is taken off and then plugged in.
	The fuse blows repeatedly or the circuit breaker is activated repeatedly.
	Outside object or water comes into the air-conditioner.
	The remote controller doesn't work or the switch operates unusually .
	Other abnormal phenomenon.

In case that following situations, please deal with it according to the following methods, if it does not work, please contact with distributor and inform the detailed failure.

Failure	Causes	Methods of resolution
Startup failure	Power supply failure	Wait for the recovery of power supply
	The power switch is released	Switch on the power
	The fuse is burnt	Replace the fuse
	The battery is exhausted	Replace the battery
	It doesn't reach the set time for start up	Wait or eliminate the original setting
The wind blowing out, but the cooling or heating effect is bad	Mistakes in temperature setting	Set a proper temperature, see the methods of application
	The air filter is blocked by dust	Clean the air filter
	The air inlet or outlet of machine is blocked	Remove the obstruction
	The doors or windows are open	Close the doors and windows
The wind blowing out, but it doesn't refrigerate	The air inlet or outlet of machine is blocked	Remove the obstruction, then restart it
	Compressor has three minutes protection	Wait
	Mistakes in temperature setting	Set a proper temperature

⚠ **Note :** Don't repair the air-conditioner or change the power conductor by yourself to avoid the possible danger.

★ Non-air-conditioner trouble

The normal protections of the air-conditioner

1.Compressor protection

The compressor don t restart after stop operating in 3 minutes.

- Cold wind prevention (heat pump type)

  In the heating mode, the indoor unit won t send wind or operate in low wind ,if the heat exchanger of indoor unit hasn't reached the stipulated temperature in the following three states, so as to prevent the cold wind.

  ①The heating operation just starts ②Frost dissolving operation
  ③Operating under low temperature

- Frost dissolving operation (heat pump type)

  When the temperature is low and humidity is high outdoors, the heat exchanger of outdoor unit may frost, which may decrease the heating capacity. In such case, the air-conditioner will stop the heating operation and convent to automatic frost dissolving, and then resume heating after the frost dissolving finished.

(1) The fan of the indoor and outdoor unit will stop under frost dissolving operation.
(2) The time for frost dissolving varies in range of 4 to 10 minutes according to the out-door temperature and the frost extent.
(3) It is normal phenomenon that there may be steam coming out from the outdoor unit during the frost dissolving operation.

2.White steam comes out from the indoor unit

During the cooling operation ,under high relative humidity indoors, white steam may come out due to the high humidity and temperature difference of air inlet and outlet. The air-conditioner convert to heating operation after the frost dissolving, the moisture due to frost dissolving is discharged in form of steam.

3.High noise during operation

When the compressor is operating or just stops running, fizzle may be heard because of the refrigerant flow or stop flowing.
After the air-conditioner operates or stops for a while, crackle from the naturel expansion and contraction of the plastic components may be heard because of temperature variation.
When the air-conditioner is energized for the first time, sound from friction may be heard because of the reposition rotating of wind wave.

4.Dust is blown out from the indoor unit

When the air-conditioner uses the first time after being left unused for a long time,the dust inside the indoor unit will be blown out.

5.The peculiar smell emanates from indoor unit

The smell which absorbed from room, furniture, clothing or cigarette emanates during the air-conditioner is operating.

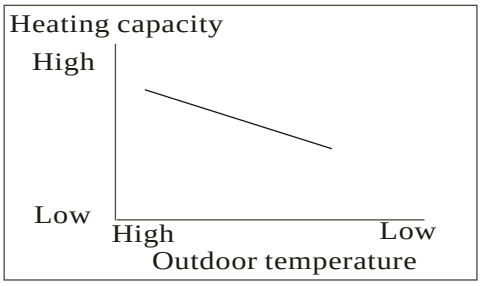
6.Cooling /Heating (not for cold wind type) operation converts to only wind mode.

When the indoor unit reaches the stipulated temperature, the air-conditioner will stop the operation of compressor and convert to only wind mode. The compressor will restart cooling or heating after the room temperature rise or drop to a certain degree.

7.If you select the cooling operation in a relatively damp environment (relative humidity is higher than 80%),dew may be formed over the surface of indoor unit and drop. In such a case, please adjust the vertical wind vanes to its maximum ventilation Position and choose “high” to reduce the dew.

8.Heating operation (heat pump type)

During the heating operation ,the heat pump airconditioner operates with the princ iple of absorbing heat from outdoor and release heat into indoor. When the outdoor temperature falls, the heating capacity decrease accordingly because the heat absorbed from outdoor decreases (See the figure on the right).At the same time, the temperature difference between indoors and outdoors is enlarged, so that the heating load increase accordingly. If the air-conditioner can not reach a satisfactory effect, it is recommended that other heating devices beused together.



★ Clean

⚠**WARNING:** For the purpose of safely, please turn off the air-conditioner and cut off the power supply before cleaning.

☆Cleaning the indoor unit

1.Wipe the indoor unit with dry cloth .

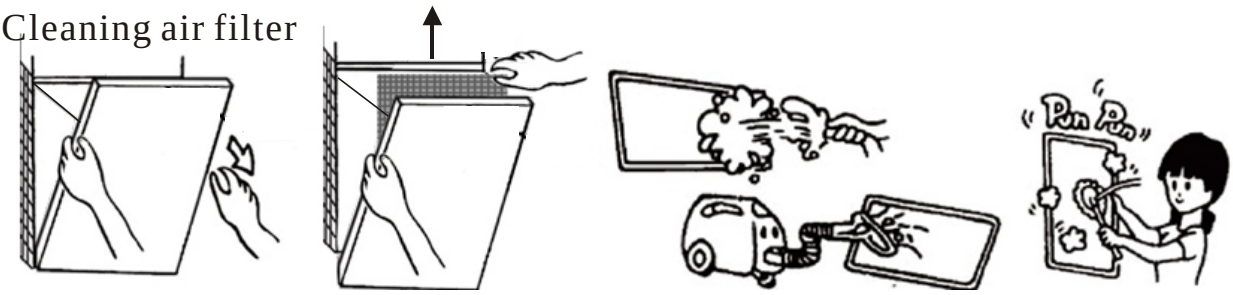
2.If the indoor unit is very dirty, please wipe with wet cloth dipped by cold water.

3.The panel of indoor machine may be taken off. Dry it after cleaning with dry cloth.

⚠**NOTE :** ● Don't use dedusting products by chemicals or place close to the machine.

● Don't use benzine, thinner or other similar solvent.

☆Cleaning air filter



If the air filter is covered by dust, the cooling effect will be affected. Please regularly clean the air filter.

1.Remove the screw on the top of the inlet panel. Grasp the inlet panel and gently pull forward to yourself, then pull out the air filter.

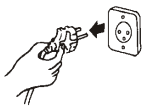
2.Remove the dust on the filter by patting or with a vacuum cleaner. Please wash in warm soapy water if too dirty, rinse and shake dry.

3. Dry the filter thoroughly then replace it.

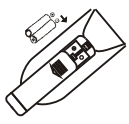
★ Maintenance

1. Select "FAN" operation mode, make the air conditioner run a long time to dry.

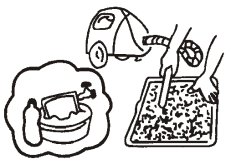
2. Turn off the air conditioner and cut off the power supply.



3. Take out the batteries from the remote controller.



4. Clean air filters and other parts.



Installation

▲ The installation of air-conditioner should meet "*Installation Instruction*".

▲ The machine must be installed correctly by professional technicians according to the "*Installation Instruction*"..

★ Installation position

See "*Installation Instruction*"

★ Guide for customer

- The installation must be done by professional referring to the *"Installation instructions"*.
- The wiring must be done by qualified electrician according to the electrical safety requirements.
- The customer should have a qualified power supply which coincides with the tag of air conditioner, the normal voltage should be in the range of 90-110% of its rated voltage.
- The air conditioner must be well grounded, the switch of the main power of air-conditioner must be reliably grounded.
- If your air conditioner is not fitted with a supply cord and a plug, an all-pole switch must be installed in the fixed wiring and the distance between contacts should be no less than 3.0 mm.
- If your air conditioner is permanently connected to the fixed wiring and have a leakage current that may exceed 10 mA, leakage protector must be installed in the fixed wiring, operating current of which shall not exceed 30 mA.
- The power supply circuit should have leakage protector and air switch of which the capacity should be more than 1.5 times of the maximum current.

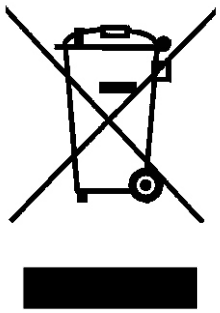
★ Notices

- The air conditioner must be installed on well strong supporter.
- The appliance shall be installed in accordance with national wiring regulations.
- Fix the machine firmly, otherwise it will produce abnormal noise and vibration.
- Install the outdoor unit in the place where it wouldn't disturb your neighbour.
- The method of connection of the appliance to the electrical supply and inter connection of separate somponents, please see the electric connection elements shart which stick on the machine.
- Is the power supply cord is damaged, it must be replaced by the manufacture or its service agent or a similar qualified person.
- After installation, the power plug should be easily reached.

WEEE Warning

Meaning of crossed out wheeled dustbin:

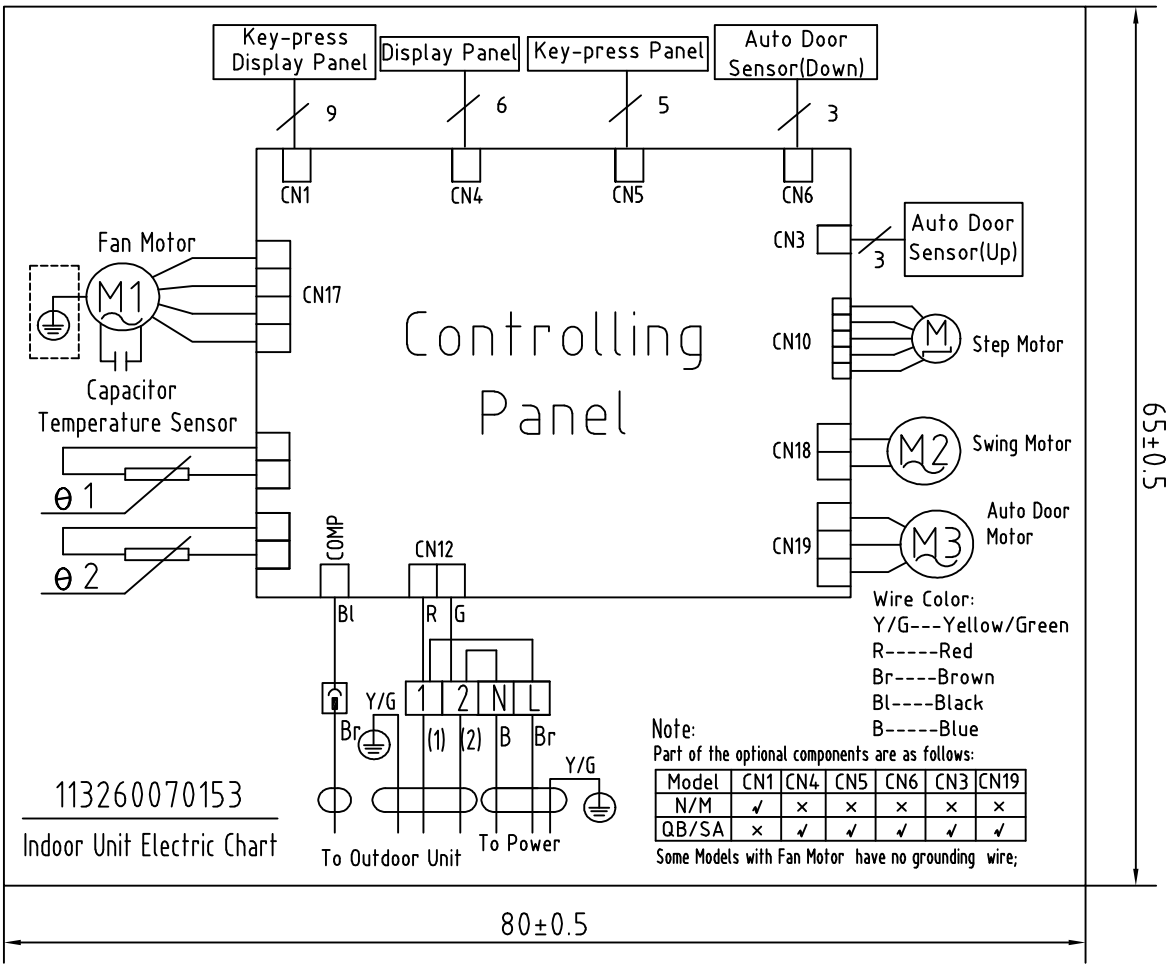
Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.
Contact you local government for information regarding the collection systems available.
If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.
When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposals at least free of charge.



Wiring Diagram

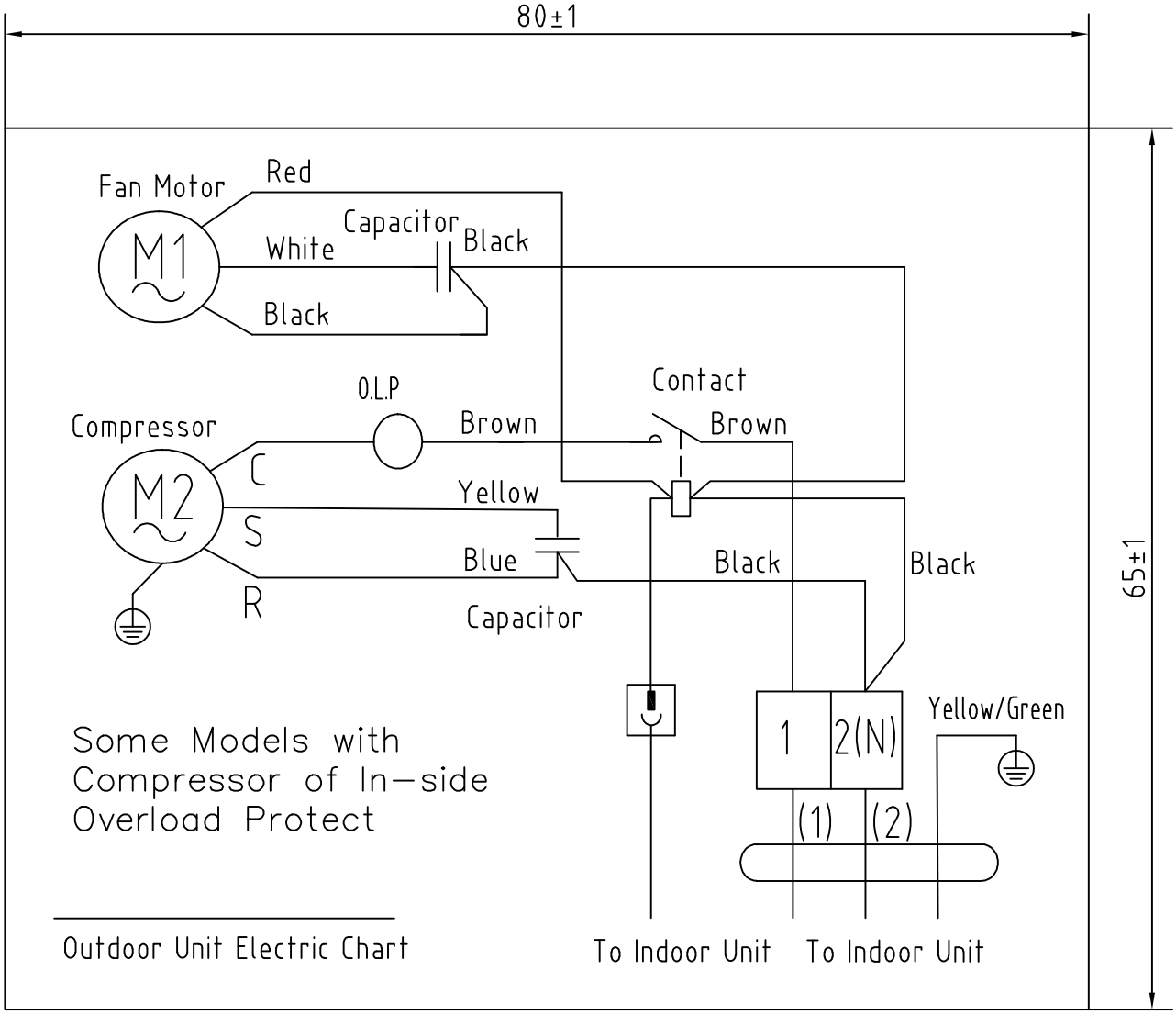
Electric chart for SAP24P1-A (Cooling only)

Indoor unit



Model	CN1	CN4	CN5	CN6	CN3	CN19
N/M	√	×	×	×	×	×
QB/SA	×	√	√	√	√	√

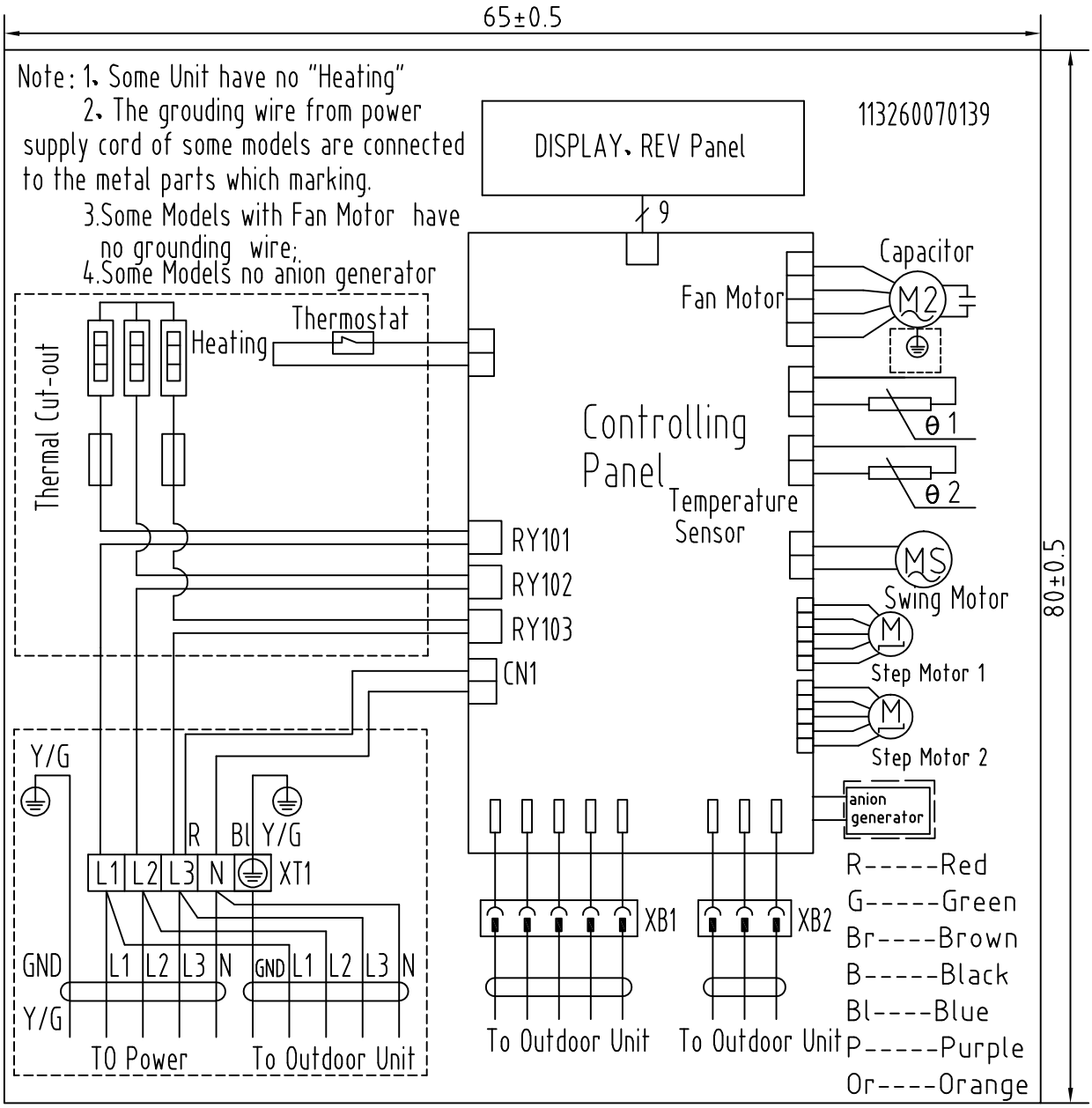
Outdoor unit SAU24P1-A



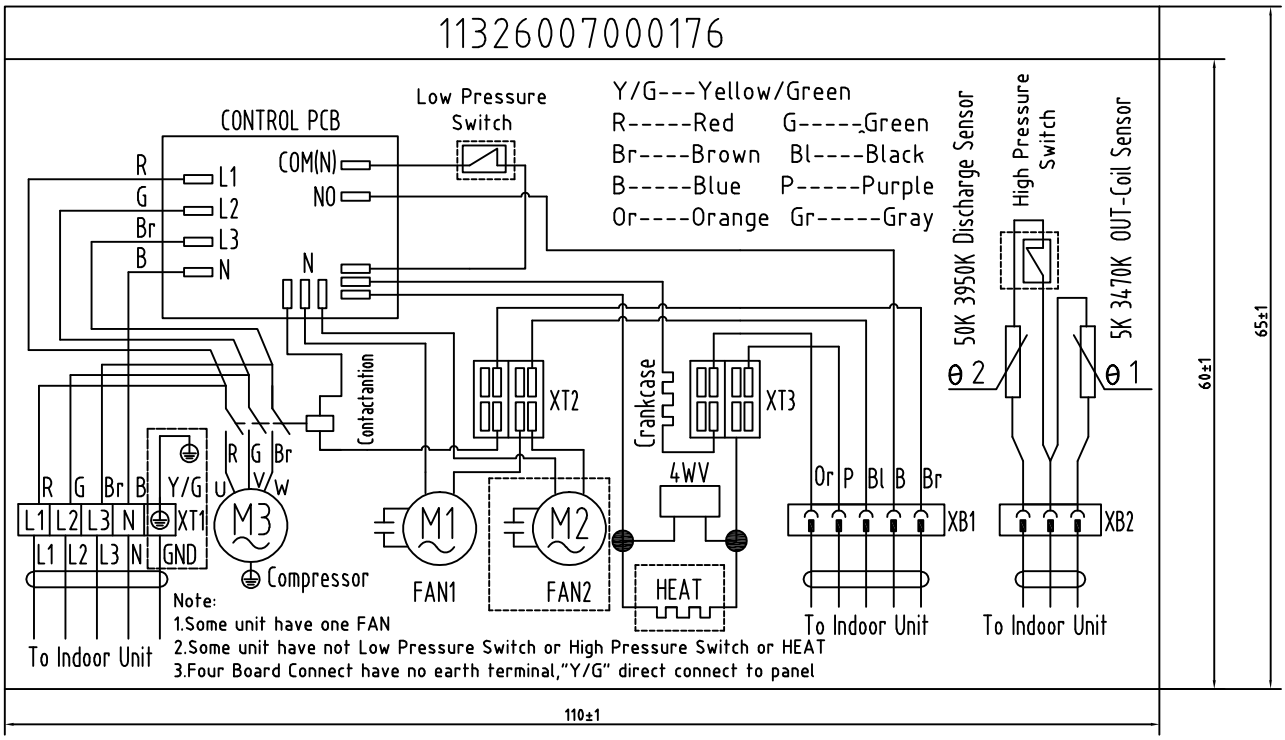
Wiring Diagram

Electric chart for SAP48/60P1-A

Indoor unit



Outdoor unit SAU48/60P1-A



Troubleshooting Guide

Error Code

Fault code	The definition of the fault code number	Troubleshooting
E1	The fault of the indoor ambiance temperature sensor	Replace the indoor ambiance temperature sensor (Plastic material)
E3	The fault of the indoor coil tube temperature sensor	Replace the indoor coil tube temperature sensor (Copper material)
E4	The fault of the outdoor exhaust temperature sensor of the compressor	Replace the outdoor exhaust temperature sensor
E5	indoor & outdoor communication fault	1.check whether the plug is in right position 2.turn on the AC and check whether it will display the ambient temperature correctly, if display "0",replace the PCB, otherwise replace the display board.
E9	DC motor fault	1.Check whether the fan motor is locked by fan blade 2.replace the motor or PCB
F1	The lack-phase protection Outdoor phase-sequence protection (Most frequently happen) Low-pressure switch protection	1. Check to see whether the power supply type meets the requirement of the air-conditioner or not; 2. Replace any two of the outdoor three phases (Most frequently happen) 3. Check the pressure of the Refrigerant (The system pressure value is about 1.0Mpa when air-conditioner stops.) 4. Check the pressure switch if there is no problem with the above items 1,2 and 3.
F2	The compressor's exhaust-gas temperature protection	1. Check to see whether the refrigerant is enough or not; 2. Check to see whether the installation site of the Air-conditioner is correct or not; 3. Check to see whether the voltage of the power source of the Air-conditioner is normal or not; 4. Check to see whether the spare parts (like the motor) of the Air-conditioner are damaged or not, or the rotating speed is lower or not; 5. Other aspects.

Troubleshooting Guide

Error Code

Fault code	The definition of the fault code number	Troubleshooting
E1	The fault of the indoor ambiance temperature sensor	Replace the indoor ambiance temperature sensor (Plastic material)
E3	The fault of the indoor coil tube temperature sensor	Replace the indoor coil tube temperature sensor (Copper material)
E4	The fault of the outdoor exhaust temperature sensor of the compressor	Replace the outdoor exhaust temperature sensor
F1	The lack-phase protection Outdoor phase-sequence protection (Most frequently happen) Low-pressure switch protection	1. Check to see whether the power supply type meets the requirement of the air-conditioner or not; 2. Replace any two of the outdoor three phases (Most frequently happen) 3. Check the pressure of the Refrigerant (The system pressure value is about 1.0Mpa when air-conditioner stops.) 4. Check the pressure switch if there is no problem with the above items 1,2 and 3.
F2	The compressor's exhaust-gas temperature protection	1. Check to see whether the refrigerant is enough or not; 2. Check to see whether the installation site of the Air-conditioner is correct or not; 3. Check to see whether the voltage of the power source of the Air-conditioner is normal or not; 4. Check to see whether the spare parts (like the motor) of the Air-conditioner are damaged or not, or the rotating speed is lower or not; 5. Other aspects.

Troubleshooting Guide

The preferential items for inspection

1. The input voltage shall be not beyond the limit of: rating voltage value × (1+10%). Otherwise the air-conditioner may not work normally (The sufficient power supply is in need for normally working condition).
2. Be sure of the correct connection of the indoor & outdoor interconnection wires of the air-conditioner ;The connecting mode for wires of the indoor & outdoor unit shall be in compliance with the electric wiring Diagram. The connecting wires at the same specification may be applied for different air-conditioners models. Be sure the code numbers on the connecting terminal board of the indoor & outdoor connecting wires are same as those on the body of connecting wires, otherwise the air-conditioner may not work normally.
3. The electricity source of the air-conditioner shall be at 3phase-380V-50Hz, and the Neutral cable (N) shall not be connected together with the protective earthing cable.
4. The phenomenon listed in the following form is not the fault of the air-conditioner:

No.	Phenomenon	Explanation
1	A sound can be heard but the air-conditioner doesn't work at the moment of plugging the plug of the power cable into the socket for the first time.	It shows the air-conditioner is with electricity then. The air-conditioner will enter into the working status once receiving the signal by pressing down the on/off button on the remote controller.
2	Under the Cooling mode, the indoor air temperature is higher than the setting temperature, the compressor doesn't work but the indoor fan motor is running.	There is 3 minutes delay if restarting the air-conditioner once after its being turned off. The same phenomenon may also happen when the air-conditioner is re-electrified. After the 3 minutes delay of the air-compressor, the air-conditioner will adjust the speed of the indoor fan according to the setting fan speed.
3	Under the Dehumidifying mode, the compressor works discontinuously.	The working status of the compressor is regulated automatically according to the variety of the indoor air temperature when the unit is working under Dehumidifying.

4	Timing LED light is on but the air-conditioner doesn't work.	It shows that the unit is under Timing status and the air-conditioner is under waiting status; After the timing operation being cancelled, the air-conditioner will resume the normal working status.
5	Under the Cooling and Dehumidifying mode, the compressor runs discontinuously and the rotation speed of the indoor fan motor is slowed down.	It's actually a protection action for the indoor heat exchanger (Evaporator) by the way of intermittent stops or fan speed's reduction against being frozen.

No-electricity (No work absolutely) - preliminary troubleshooting

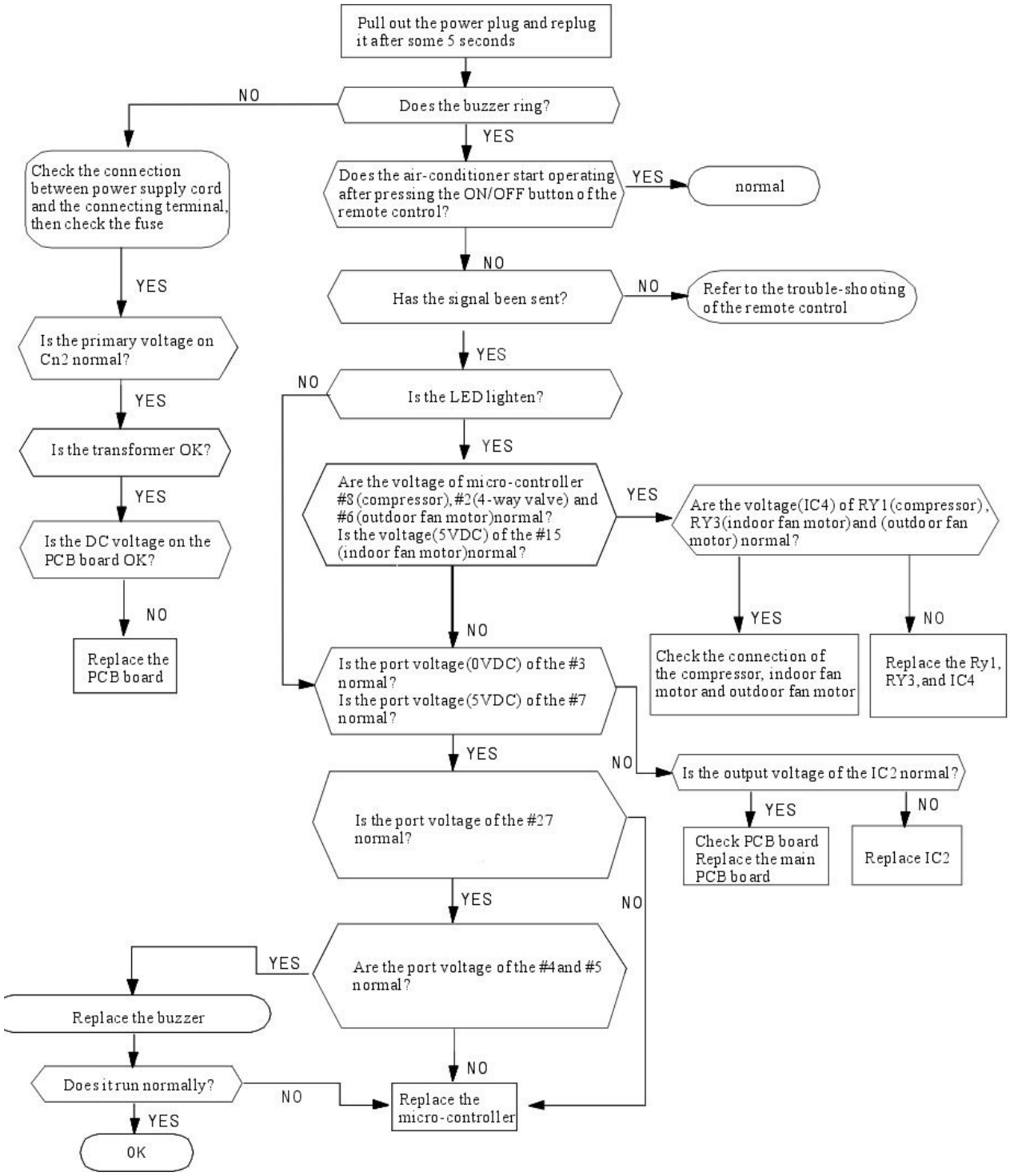
1. The items to be checked:

1) Is the power supply input voltage correct?

2) Is the connection of the AC electricity wiring correct?

3) Is the primary socket voltage of the transformer normal? Is the output voltage of the voltage regulator (manostat) L7805 correct?

2. Troubleshooting flow:



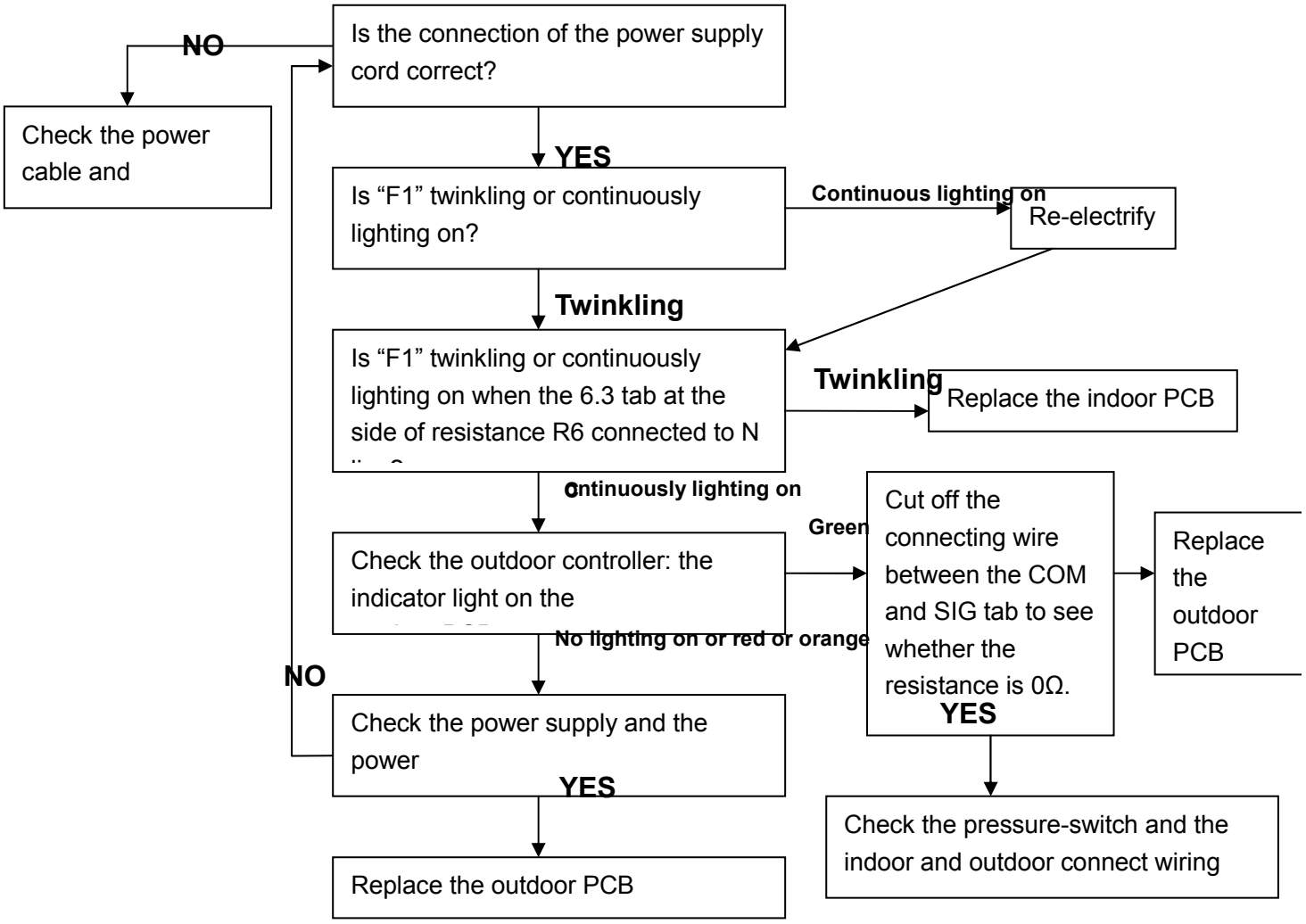
Troubleshooting for communication fault

1. The items to be checked:

1) Be sure of the cause of the fault, from indoor unit or outdoor unit?

2) Is the fault with low pressure switch or other parts?

2. The troubleshooting flow:



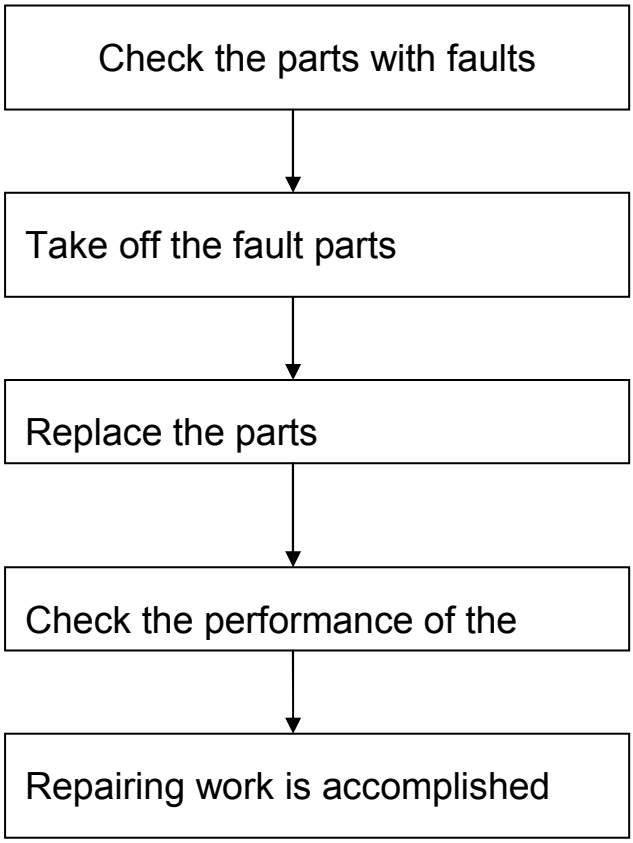
PCB check

The cautions during the spare parts replacement process

1. In case of the static-electricity of the human body may affect the safety operation, be sure of the earthing cable is well connected before starting service and spare parts replacement. Make sure that the static-electricity of the operator's body is released completely (confirm whether the wrists are with the effective earthing ring) before touching any microcomputers or integrated circuits.
2. Make sure there is a insulation mat available when repairing the spare parts with electricity on
the workbench, and prohibit any metal scrap on the insulation mat. Any contact between the metal scrap may lead to damage of the electric component.
3. Before replacing any components, be sure the power is cut off. Any operation with electricity
may cause the electricity shock, short circuit and other accidents.
4. Make sure whether there is jump line or not on the surface of the circuit board and the position
of the diode is proper during the electric components' replacement or repairing process. Any
roughness treatment on the circuit board may cause the damage of the leads and components
because of the force bending and shaking.
5. Make sure to clean the leads and substitute parts well by sandpaper or same kind of materials
before welding, otherwise the welding materials may fail to stick to the leads and spare parts
because of the oxidized surface.
6. Please don't weld the leads and parts using the large power electric-iron for long time, otherwise the parts with low heat-resistance value may easily be damaged.
7. Make sure the heat of the electric iron be transmitted to the whole body of the object to be
welded, otherwise the welding work may not be done properly.
8. The quantity of the welding material shall be used as less as possible to avoiding the faults happen to the circuit.

Process

Replace the electric components in compliance with the following process:



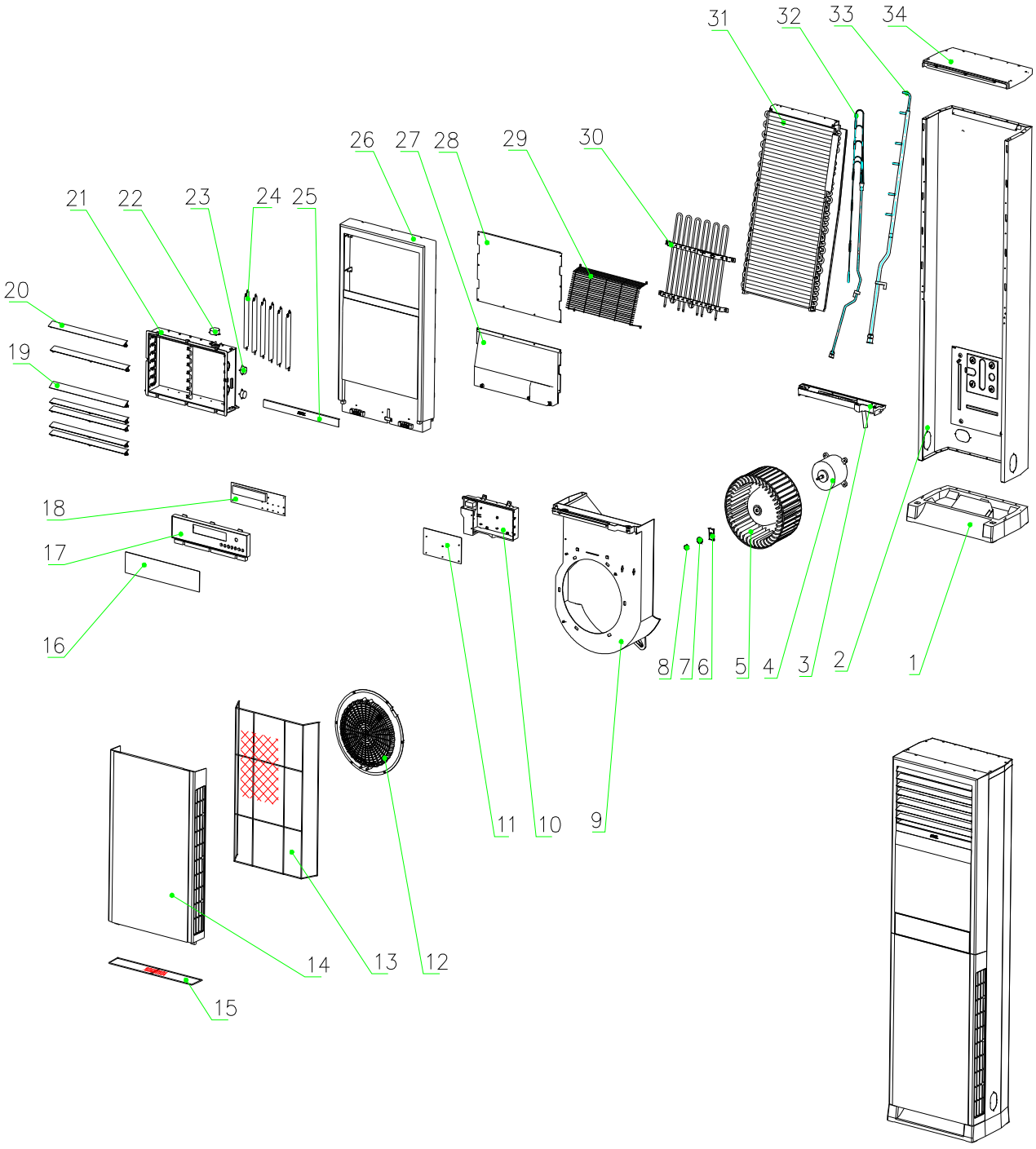
The troubleshooting, analysis and measurement of the main spare parts

<table>
<tr><th>SPARE PARTS</th><th colspan="9">ANALYSIS</th></tr>
<tr><td rowspan="4">Indoor ambient temperature sensor (plastic material)
Indoor coil tube temperature sensor (copper material)
Outdoor coil tube temperature sensor (copper material)</td><td colspan="9">Measured résistance</td></tr>
<tr><td rowspan="2">Normal</td><td>Ambient temp.</td><td>15ºC</td><td>20ºC</td><td>25ºC</td><td>30ºC</td><td>35ºC</td><td>40ºC</td></tr>
<tr><td>Resistance of the sensor (KΩ)</td><td>7.45</td><td>6.08</td><td>5.0</td><td>4.13</td><td>3.43</td><td>2.86</td></tr>
<tr><td>Abnormal</td><td colspan="8">∞: Circuit break: 0 Ω : Short circuit</td></tr>
<tr><td rowspan="4">Outdoor exhaust-gas temperature sensor</td><td colspan="9"></td></tr>
<tr><td rowspan="2">Normal</td><td>Ambient temp.</td><td>15ºC</td><td>20ºC</td><td>25ºC</td><td>30ºC</td><td>35ºC</td><td>40ºC</td></tr>
<tr><td>Resistance of the sensor (KΩ)</td><td>78</td><td>62</td><td>50</td><td>40</td><td>32</td><td>26</td></tr>
<tr><td>Abnormal</td><td colspan="8">∞: Circuit break: 0 Ω : Short circuit</td></tr>
<tr><td rowspan="3">Indoor unit
Fan motor</td><td colspan="9">Measure the resistance between the two electric terminals of the motor</td></tr>
<tr><td>Normal</td><td colspan="8">When the ambiance temperature is 20ºC ~30ºC, the resistance is about
200Ω</td></tr>
<tr><td>Abnormal</td><td colspan="8">∞: Circuit break: 0 Ω : Short circuit</td></tr>
<tr><td rowspan="3">Step motor
(Swing motor)</td><td colspan="9">Measure the resistance between the two electric terminals of the motor</td></tr>
<tr><td>Normal</td><td colspan="8">When the ambiance temperature is 20ºC ~30ºC, the resistance is about 8.1KΩ</td></tr>
<tr><td>Abnormal</td><td colspan="8">∞: Circuit break: 0 Ω : Short circuit</td></tr>
<tr><td rowspan="3">Compressor</td><td colspan="9">Measure the resistances between the random two connecting terminals of the
compressor</td></tr>
<tr><td>Normal</td><td colspan="8">When the ambiance temperature is 20ºC ~30ºC, the resistance is about
3~5Ω</td></tr>
<tr><td>Abnormal</td><td colspan="8">∞: Circuit break: 0 Ω : Short circuit</td></tr>
<tr><td rowspan="3">Four-way valve
(Reversing valve)</td><td colspan="9">Measure the resistance between the two terminals of the electromagnetic coil</td></tr>
<tr><td>Normal</td><td colspan="8">When the ambiance temperature is 20ºC ~30ºC, the resistance is about
1.3KΩ</td></tr>
<tr><td>Abnormal</td><td colspan="8">∞: Circuit break: 0 Ω : Short circuit</td></tr>
<tr><td rowspan="2">Outdoor unit
Fan motor</td><td colspan="9">Measure the resistance between the two electric terminals of the motor</td></tr>
<tr><td>Normal</td><td colspan="8">When the ambiance temperature is 20ºC ~30ºC, the resistance</td></tr>
</table>

		is about 50~120Ω
	Abnormal	∞: Circuit break: 0 Ω : Short circuit

Exploded Views & Parts List

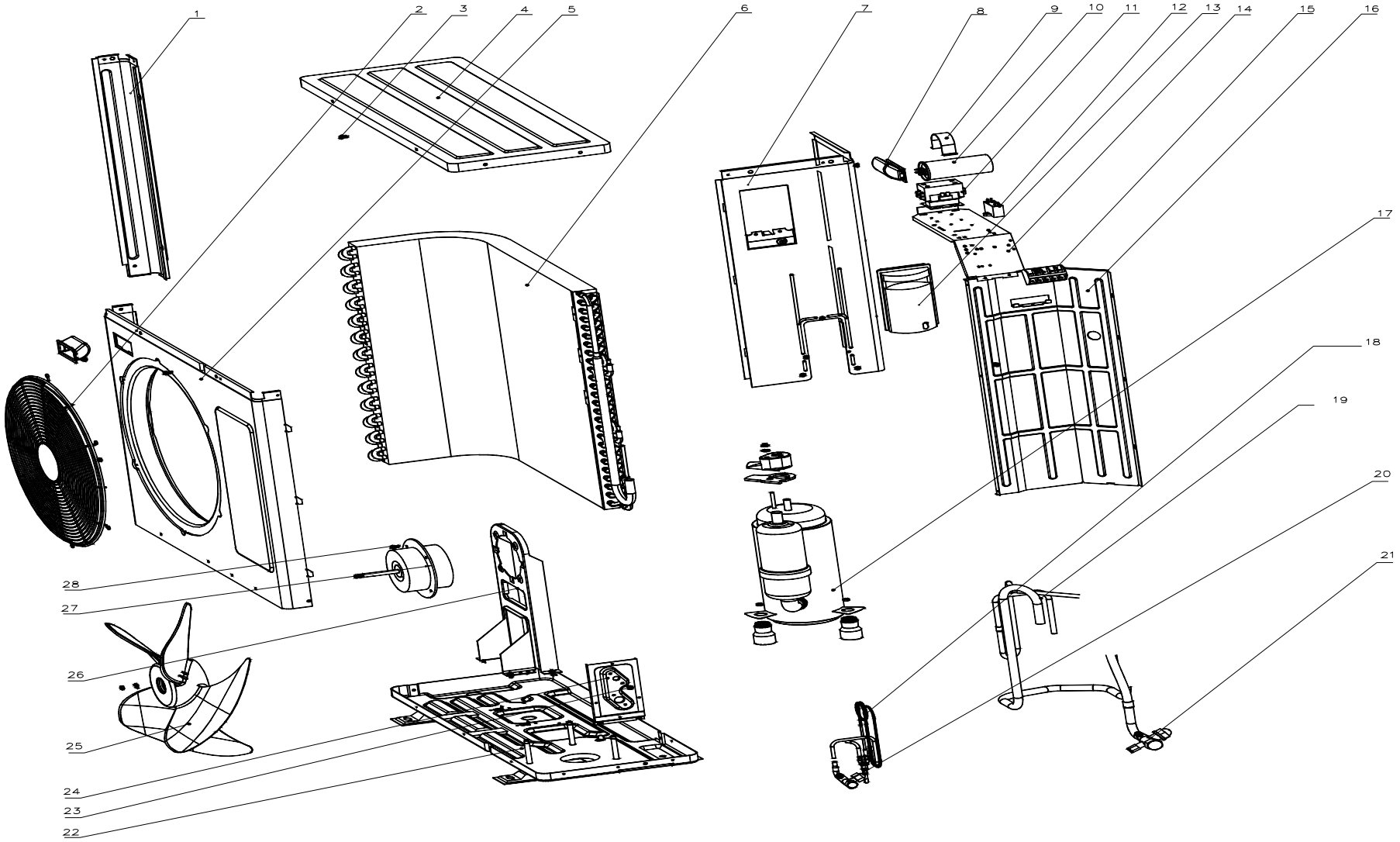
Indoor unit for 24K (Cooling only)



INDOOR UNIT PARTS LIST (Cooling only)

Exploded View No	Chinese Name	Name	Pcs	Remark
1	底座组件	Bottom subassembly	1	
2	后围板总成	rear barrier subassembly	2	
3	集水槽组件		3	
4	室内电机	Indoor motor	1	
5	室内枫叶组件（离心）	Indoor flow-fan subassembly(centrifugal)	1	
6	风机垫片	Fan motor gasket	2	
7	标准型弹簧垫圈	Standard spring washer	1	
8	I 型六角螺母	I hex nut	1	
9	蜗牛壳组件	Snail shell subassembly	1	
10	电控盒	Controller box	1	
11	主控板	Main board	1	
12	导风圈		1	
13	过滤网组件 A	Filter subassembly A	1	
14	下面板	Under panel	1	
15	过滤网组件 B	Filter subassembly B	1	
16	面板装饰板	Decoration board for panel	1	
17	显示面板	Display panel	1	
18	显示板	Display board	1	
19	水平导风叶片 A	Horizontal airflow vane A	1	
20	水平导风叶片 B	Horizontal airflow vane B	1	
20.1	出风窗	Air out-let window	1	
20.2	摇风电机		1	
20.3	步进电机	Stepping motor	1	
20.4	垂直导风叶片	Vertical airflow vanes	1	
20.5	装饰条	decoration strip	1	
20.6	上面板	Top panel	1	
20.7	下保温盖板组件	Under Insulate board	1	
20.8	上保温盖板组件	Top Insulate board	1	
23	蒸发器组件	Vaporizer subassembly	1	
24	蒸发器进液管组件	Liquid input pipe, vaporizer , subassembly	1	
25	蒸发器出气管组件	gas output pipe, vaporizer , subassembly	1	
26	顶盖板组件	Top cover subassembly	1	

8.2 Outdoor unit for 42K (Cooling only)



OUTDOOR UNIT PARTS LIST (Cooling only)

Exploded View No	Chinese Name	Name	Pcs	Remark
1	左侧支撑板	Left side plate	1	
2	面板网罩	Panel net	1	
3	大扁头自攻螺钉	Screw	9	
4	顶盖板	Top cover	1	
5	面板	Panel	1	
6	冷凝器组件	Condenser assembly	1	
7	右侧板	Right side plate	1	
8	小挖手	Handle	2	
9	电容抱攀	Capacitor clamp	1	
10	压缩机电容	Compressor capacitor	1	
11	交流接触器	AC contactor	1	
12	风机电容	Fan capacitor	1	
13	电器盖板	Handle	1	
14	电器架	Holder for wiring unit	1	
15	端子板	Terminal board	1	
16	隔风立板	Partition plate	1	
17	压缩机组件	Compressor assembly	1	
18	毛细管管路组件	Capillary assembly	1	
19	压缩机管路组件	Compressor tubing	1	
20	液阀	Liquid valve	1	
21	气阀	Gas valve	1	
22	底盘	Chassis	1	
23	泵脚螺栓	bolt	3	
24	阀板	Valve plate	1	
25	轴流风叶	Axial-flow fan	1	
26	电机架	Motor bracket	1	
27	风叶电机	Fan motor	1	
28	螺钉	screw	4	