Floorstanding Air-Conditioning Unit

MODELS NBFS-48IDU/NBFS-48ODU

Floorstanding Air-Conditioning Unit

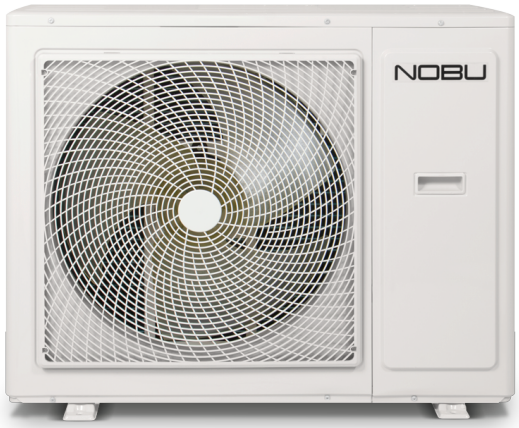
Service Manual

NOBU

English

Table of Contents

1、Summary



2、INSTALLATIO N

BASIC ACCESSORIES

This Installation section explains how and where to connect this new air conditioner. Please read make sure all acces-sories are included as shown below and read manual thoroughly. This Installation section is provided to assist the per-son knowledgeable in air conditioner installation and should not be installed by anybody who is not thoroughly familiar with this type of installation. Please contact a professional installer if necessary.

ACCESSORIES SUPPLIED WITH THE UNIT:

No	Part Name	Q'ty	Remark	No	Part Name	Q'ty	Remark
1	Installation Plate	1		6	Battery	2	
2	Remote Controller	1		7	Nail	4	
3	Remote Holder	1		8	Screw	4	

O P T I O N A L ACCESSORIES

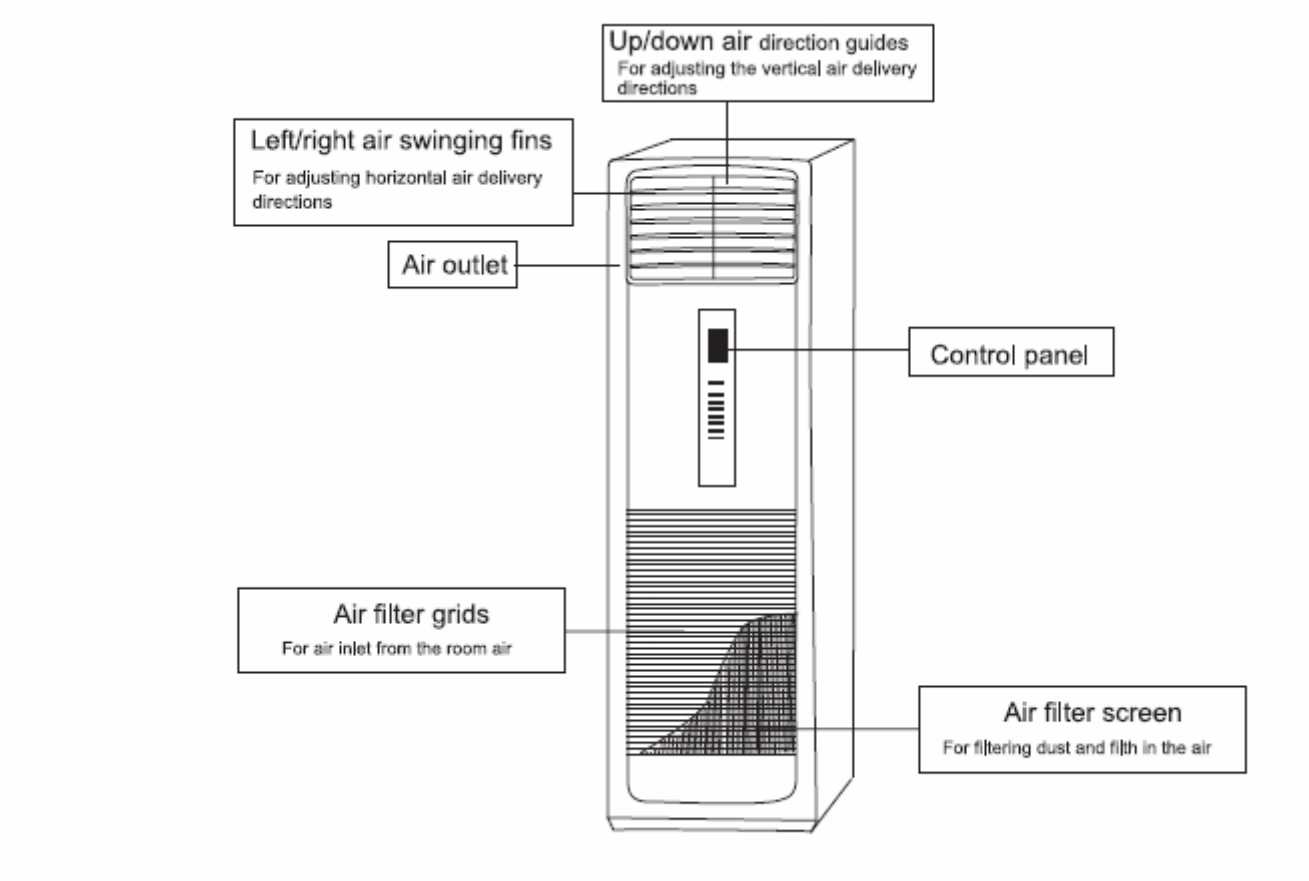
ACCESSORIES NOT SUPPLIED WITH THE UNIT:

No	Part Name	Q'ty	Description	Remark
1	Drain Hose Extension	1	PVC, 20mm x 2M	
2	Tape Finish	1	PVC, W80mm x 25M	
3	Insulat r Plate	1	PE, T8.0	
4	Putty	1	Gray, 80g	

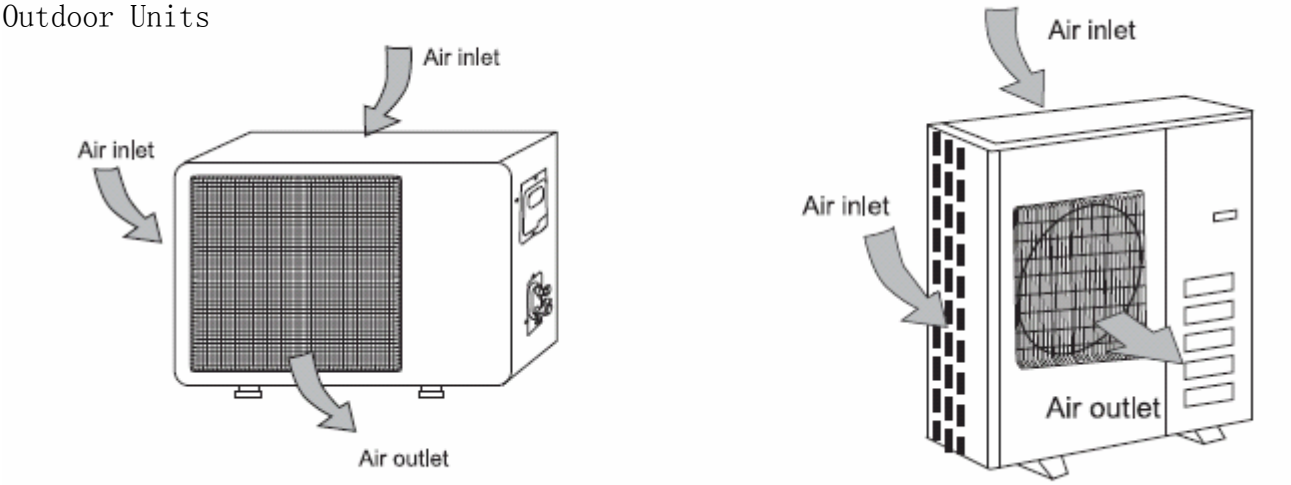
NOMENCLATURE AND FUNCTIONS OF VARIOUS PARTS

Because there are many models,features and appearance will vary,only introduce the follow pattern,Others please refer to using

Indoor Units

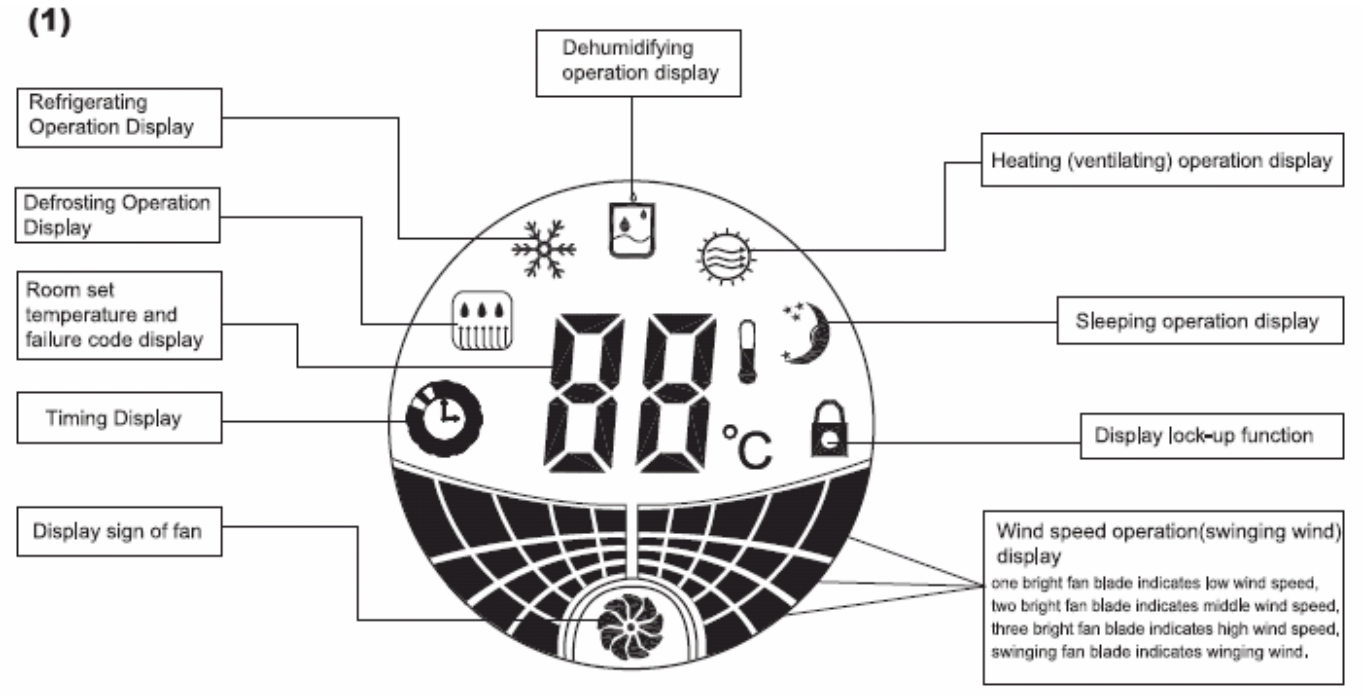


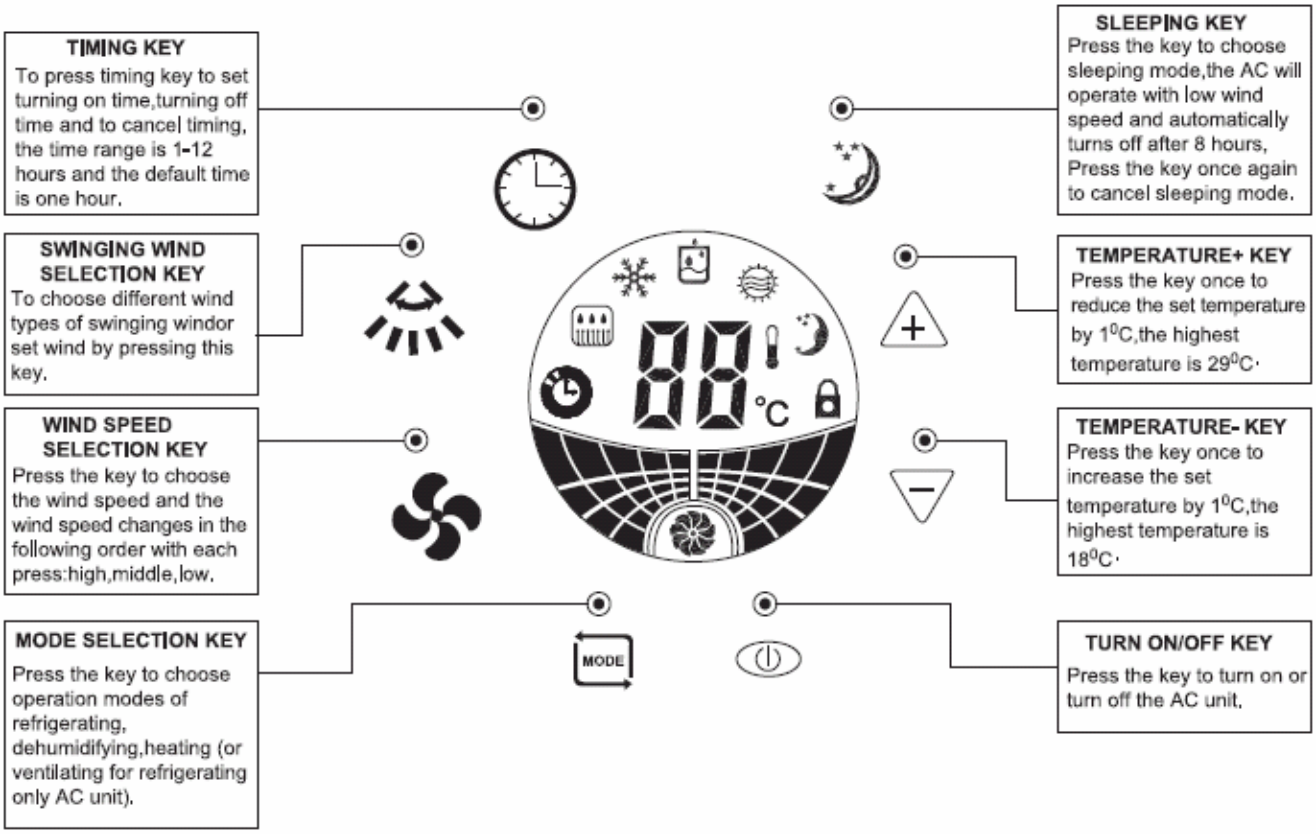
Outdoor Units



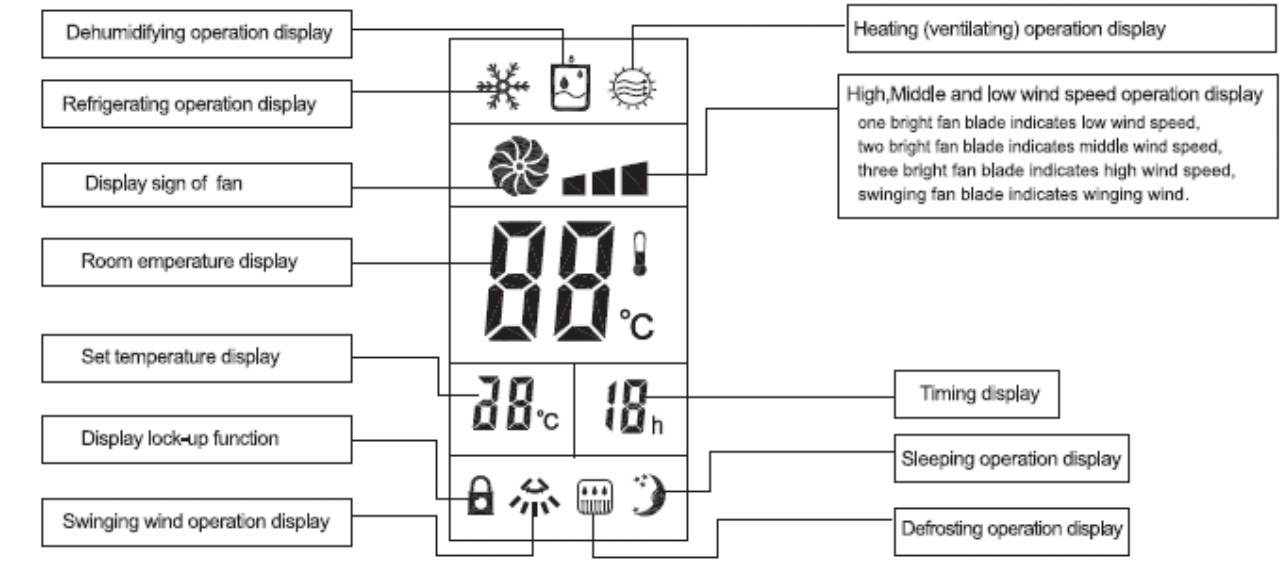
Features and appearance will vary,all the figure give a demonstration to introduce the function

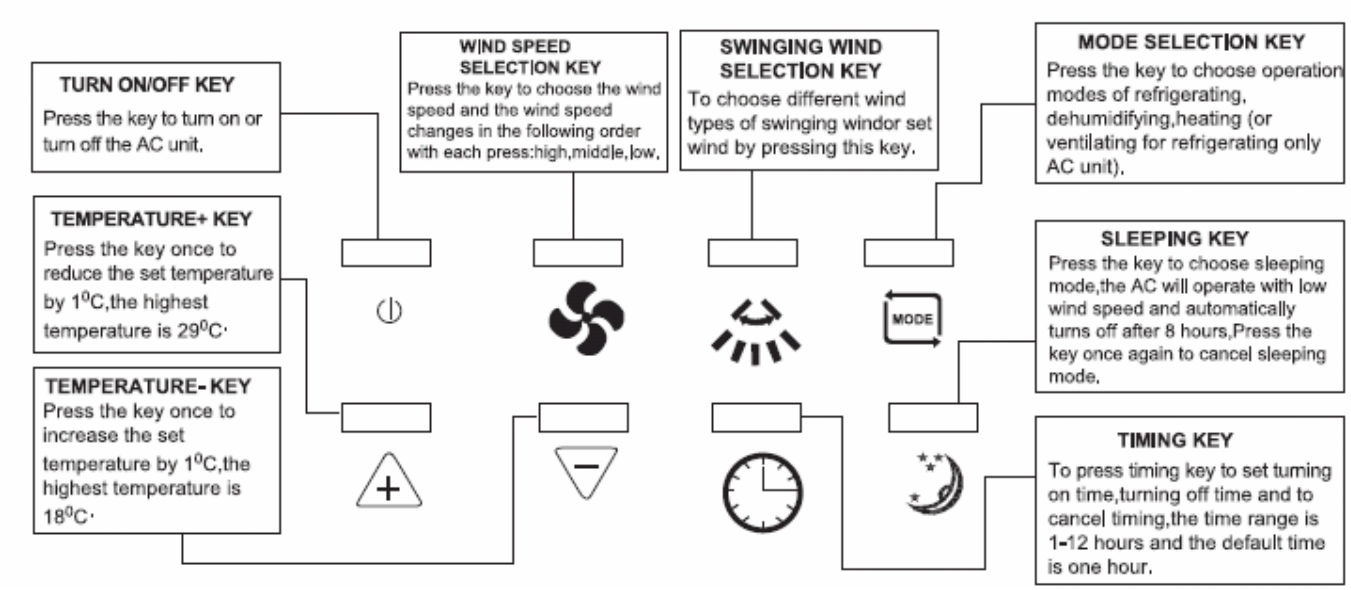
Operation Panel




TIMING KEY
To press timing key to set turning on time,turning off time and to cancel timing, the time range is 1-12 hours and the default time is one hour.
SWINGING WIND SELECTION KEY
To choose different wind types of swinging windor set wind by pressing this key.
WIND SPEED SELECTION KEY
Press the key to choose the wind speed and the wind speed changes in the following order with each press:high,middle,low.
MODE SELECTION KEY
Press the key to choose operation modes of refrigerating, dehumidifying,heating (or ventilating for refrigerating only AC unit).
SLEEPING KEY
Press the key to choose sleeping mode,the AC will operate with low wind speed and automatically turns off after 8 hours, Press the key once again to cancel sleeping mode.
TEMPERATURE+ KEY
Press the key once to reduce the set temperature by 1°C,the highest temperature is 29°C.
TEMPERATURE- KEY
Press the key once to increase the set temperature by 1°C,the highest temperature is 18°C.
TURN ON/OFF KEY
Press the key to turn on or turn off the AC unit.
MODE

(2)

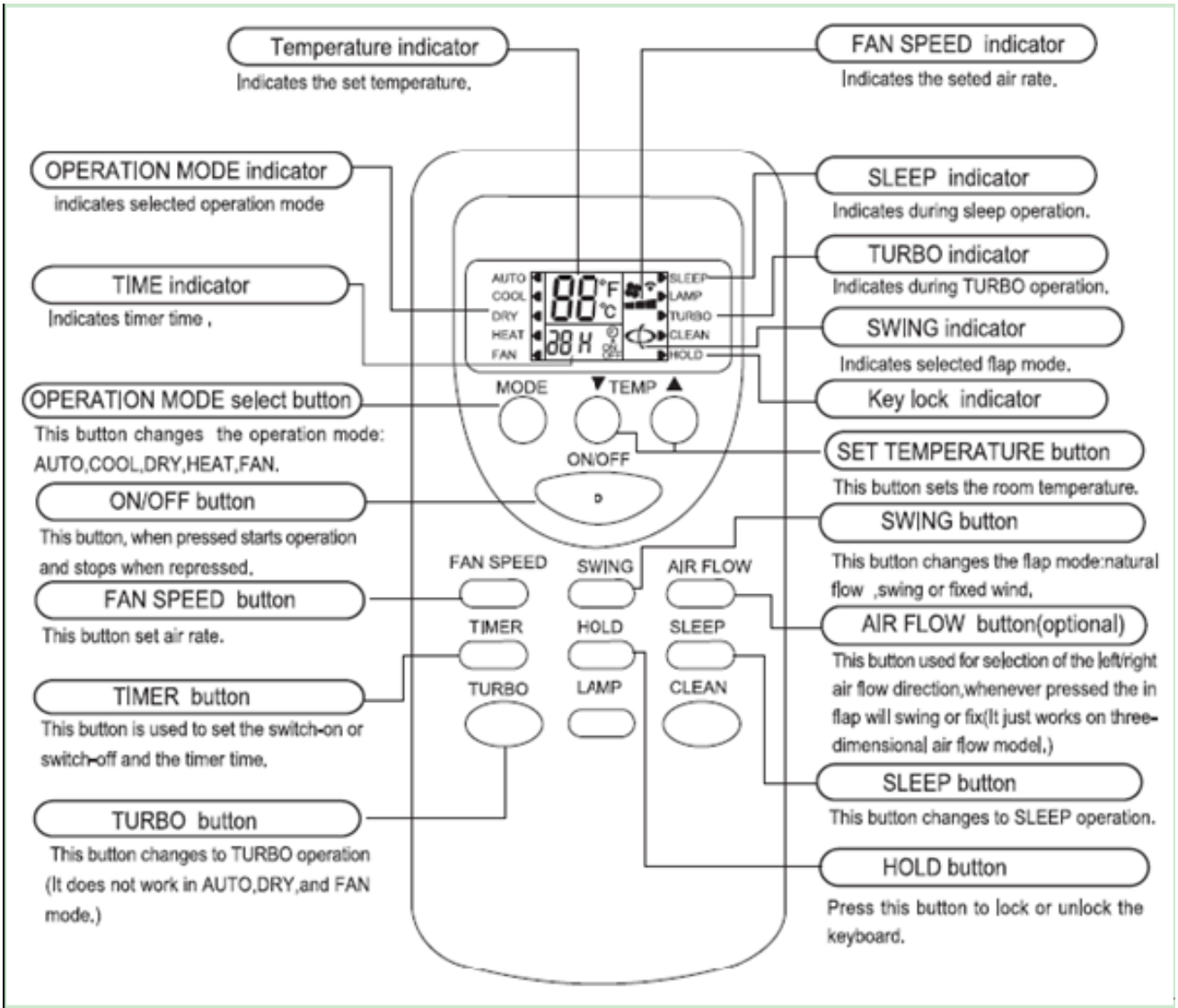

Dehumidifying operation display
Refrigerating operation display
Display sign of fan
Room emperature display
Set temperature display
Display lock-up function
Swinging wind operation display
Heating (ventilating) operation display
High,Middle and low wind speed operation display
one bright fan blade indicates low wind speed,
two bright fan blade indicates middle wind speed,
three bright fan blade indicates high wind speed,
swinging fan blade indicates winging wind.
Timing display
Sleeping operation display
Defrosting operation display



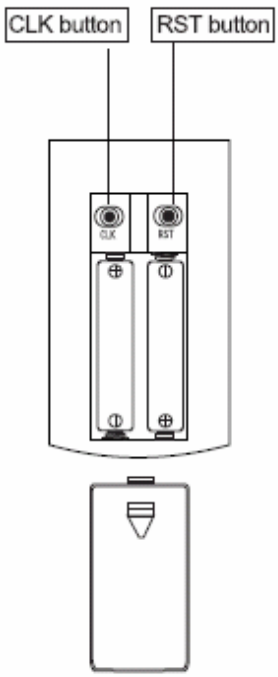
Specification:

- ◆ Usually,the display screen shows only the function mode and operation status you choose.
- ◆ When room temperature equals to or is lower than 18°C,the function of dehumidifying cannot be used.
- ◆ When room temperature equals to or is lower than set temperature,the AC unit stops for a period of time to save energy.
- ◆ The AC unit is equipped with automatic defrosting function and the defrosting operation display on the display screen is bright when the machine defrosts.
- ◆ The AC unit with heat pump has auxiliary electric heating function,which will automatically turns on or off according to room temperature during heating operation to achieve the best heating result.
- ◆ If you turn on the machine immediately after it is turned off,the machine with time-lapse starting function will automatically turns on the machine after 3 minutes to protect it.

use of remote controller



Operating Machine In selected modes



1. Point the remote controller at the unit,press the "MODE" button,select the needed mode cooling,heating (ventilating for cooling-only model) and dry.
2. Press the temperature setting button to increase or decrease the readings until the needed temperature is displayed;
- In cooling/heating operations,the temperature difference of 5^0C between the selected temperature and the ambiend temperature is most suitable for your health.

3. Press the air volume selection button to choose the air volume you want;
4. Press the air direction button or swinging air selection button to choose the left/right air direction you want.

PRESENT TIME SETTING PROCEDURE

When cells are inserted,the present is automatically set to AM 12:00.
Ex: set to AM 10:30.

1. Unload the back cover push the lock button with the tip of a ball pen,etc.The time indicator is flickering and can set the present time.
2.Press the Hour button,(Set to AM 10:)
3.Press the MIN button.(set to 30)
4. Press the CLK button again, then reatach the back cover.

NOTE: The timer is set on the basis of the present time.So set the present time correctly.

SLEEP OPERATION PROCEDURE

Use this mode to reduce operation sound when sleeping,etc.
Press the SLEEP button,the air flow sound from the indoor unit is decreased.
Press the SLEEP button again can release the mode.
and the air conditioner will be stopped automatically in 8 hours.

NOTE:
- Use the sleep mode when you are going to bed,If this mode is used in the day,the capacity is reduced since the ambient temperature is too high.(COOL MODE).
- During the operation of cooling,the room temperature will be raised by 1^0C higher than the setting after the machine begins to operate in the sleeping mode.
- During the operation of heating mode,the room temperature will be dropped 2^0C lower than the setting after the inachine begins to operate in the sleeding mode.

TIMER OPERATION PRODEDURE

Timed switch-off

1.Duing the operation of the air conditioner,press the TIMER button and the air conditioner will enter the timed switch-off mode.
2. Press the HOUR button to set the needed time.Every the button is pressed,indication change is the following sequence.
1 → 2 → ,,,,,,, → 12→1
3.After the setting,the digits shown on the display screen will go down by 1 for every elapsed hour.

Timed switch-on

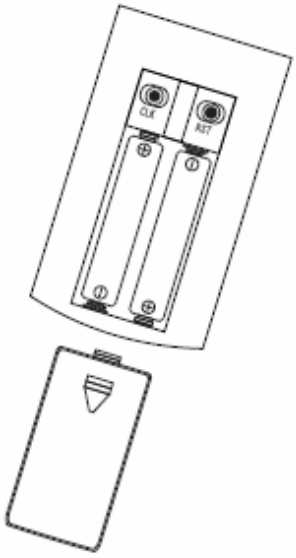
1.When the air conditioner is in the standby mode,press the TIMER button and the air conditioner will enter the timed switch-on mode.
2.Press the HOUR button to set the needed time,The timer can make the setting in the range from 1-12 hours.
3. After the setting.the digits shown on the display screen will go down by 1 for evey elapsed hour.

Releasing procedure

Press the TIMER button again to release the mode.

REPLACEMENT OF BATTERIES

- When the signal from the remote controller become weak and the indoor unit can not receive it properly;or the indications on the display screen becomes blurred,please replace with two new batteries.
- The positive and negative poles must match the installation positions.
- The positive and negative poles must match the installation positions,
- New batteries of the same type have to be used for replacement.
- If the remote controller is not to be used for long time,take out the batteries so as to prevent the leakage of the electrolyte from damaging the controller.



NOTE:

1, Do not use an old battery with together with a new one,
2.The life of cell made in conformity to JIS or IEC is 6 to 12 moths in normal use,If it is used longer or an unspecified cell is used,a liquid leaks from the cell,causing the remote controller inperative.
3,Guideline of the life time is printed on the battery,The battery life may be shorter than of air conditioner depending on the date of manufacture,However,the battery may be alive ever after the norminal life time expired.

Setting of Present Time

This remote controller has the clock function and time setting is available: 1 Remove the back cover of remote controller and press "CLOCK" button, and it displays "0: 00", Press "HOUR" button once to increase 1 hour,
After setting the hour, press "MIN" button once to increase 1 minute,
After setting, press "CLOCK" button again to complete setting. To set again, repeat the above steps.
When the remote controller doesn't work, press "RESET" button to cancel the display.

Set SLEEP Mode with Remote Controlle

Use this mode for quiet environment. In running of air conditioner, operate as the following: Press SLEEP button

The air noise from the indoor unit will be lower,

In the SLEEP mode, press SLEEP button again to cancel the sleep mode.

Note:

After setting the SLEEP mode, if the air conditioner is in COOL or DEHUMIDIFY mode ,the set temperature will automatically increase 1 °C after 1 hours, If the air conditioner is in HEAT mode while setting SLEEP mode, the **set** temperature will decrease 2°C after 1 hour ,

Timing OFF operation:Set theOFF time and the air conditioner will automaticall A b pat the set time,

While the air conditioner is running, press the TIMING button, and the air conditioner enters timing OFF state, and " TIMING OFF" and "TIMING" lamps will be on.

Press + or - button to set the desired timing OFF time. The set time ranges from 1 to 12 hours. The green lamps on the display area show the set OFF time, that is, the time left to turn the unit off. The number of green lamps will decrease 1 hour every hour, and the rest amps indicate the left hours.

To cance the setting, press the TIMING button again. Under standby state, only TIMING OFF function can beset,

Timing ON operation: Set the ON time and the air conditioner will automatically start at the set time.

Whi e the air conditioner is at standby state, press TIMING button , and the air conditioner enters timing OFF state, and "TIMING ON" and "TIMING" lamps will be on.

Press + or - button to set the desired timing ON time The set time ranges from 1 to 12 hours The green lamps on the display area show the set ON time , that is , the time left to turn the unit off . The number of green lamps will decrease 1 hour every hour, and the rest lamps indicate the left hours.

To cance the setting, press the TIMING button again. Under standby state, only TIMING OFF function can beset.

Before installation:

Selection of installation positions for indoor unit

To be installed at the position where the air delivered from the unit can reach every corner of the room

Avoid to biockage the air inlet or outlet of the indoor nit

To avoid too much oil smoke or steam

Avoid possible generation,infiow,lingering or leakage of flamm gasee

Avoid high-frequency facilities (such as high frequency arc welders,etc.)

Not to install a fire alarm near the air outlet.

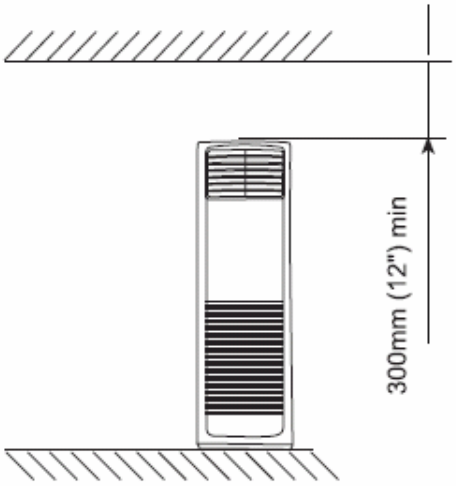
To avoid the places where acid solutions are frequently used

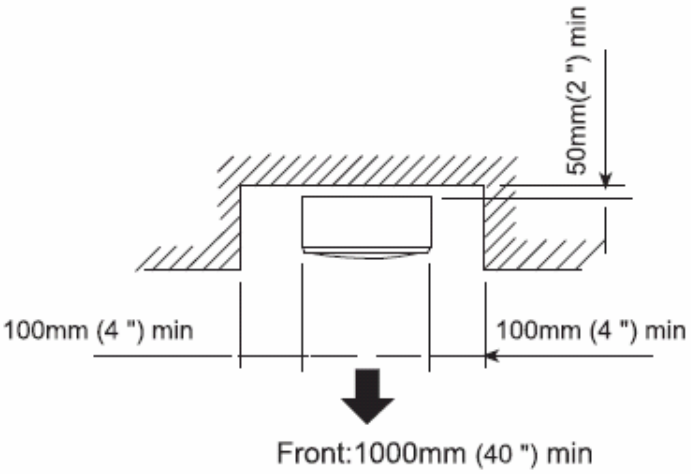
【Selection of installation positions for indoor unit】

- To be installed at the position where the air delivered from the unit can reach every corner of the room;
- To avoid being affected by the outdoor air;
- To avoid blockage to the air inlet or outlet of the unit;
- To avoid too much oil smoke or steam;
- To avoid possible generation, inflow, lingering or leakage of flammable gases;
- To avoid high-frequency facilities (such as high frequency arc welders, etc.);
- To avoid the places where acid solutions are frequently used;
- To avoid the places where some special sprayers (sulfides) are frequently used.
- Not to install a fire alarming device near the air outlet of the unit (during operation, the fire alarm device might be erroneously triggered by the warm air from the unit);

■ Make sure of enough space for installation and maintenance.

- To take into consideration the operational convenience and safety in installation, it is recommended to ensure enough space between the unit and the walls.



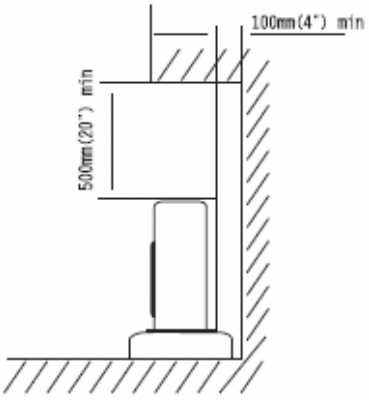


【Selection of installation positions for outdoor unit】

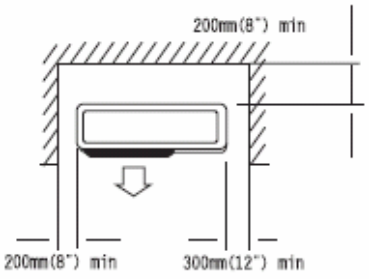
- To install the outdoor unit at the places which can stand the load of the machine weight and will not cause big vibrations and noises;
- To install the unit at the places not to be exposed to rain or direct sunshine, and the places with good ventilation;
- When installing by the sea or at the site with strong air,to ensure the fan can operate normally,the air conditioner need be installed close to a wall and use baffle plate.
- The noises generated from the unit will not affect the neighboring places;
- Do not install the unit on non-metal frame.
- Not to install the unit at the places where there might occur the generation, inflow, stay or leakage of inflammable gases;
- Pay attention to the drainage of the condensed water from the base plate during operations;
- To avoid the air outlet being directly against the wind.

Detailed space requirements around the outdoor unit

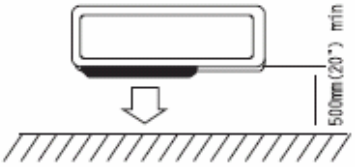
1. When there are obstacles above the unit



2. When the front (air outlet) is open

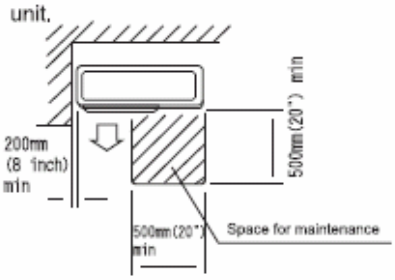


3. When there are obstacles only in the front (air outlet)

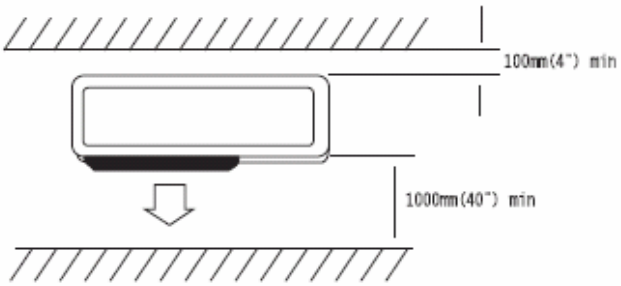


Space for maintenance

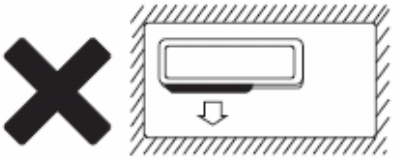
Shown as in the following figure. Keep the maintenance space in front of the unit.



4. When there are obstacles at the front and rear sides



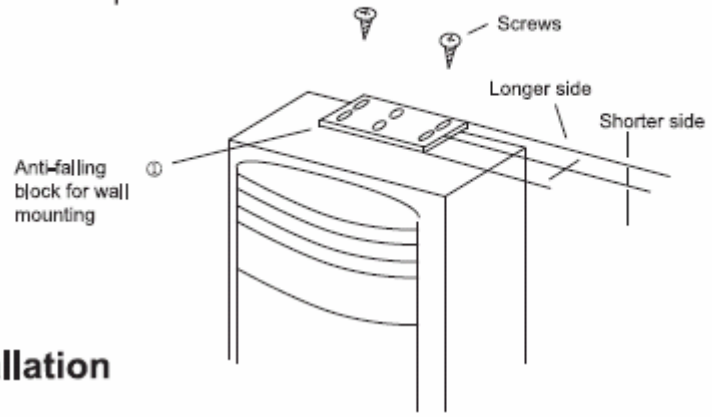
5, When there are obstacles all around the unit on four sides,
Although the top side is open, the installation is not to be done if there are obstacles all around.



- At least two sides should be kept open,

【Installation fixture of indoor unit】

As the gravity center of the unit is rather high, you have to make sure that anti-falling measures are taken after the installation position is determined so as to ensure safety.



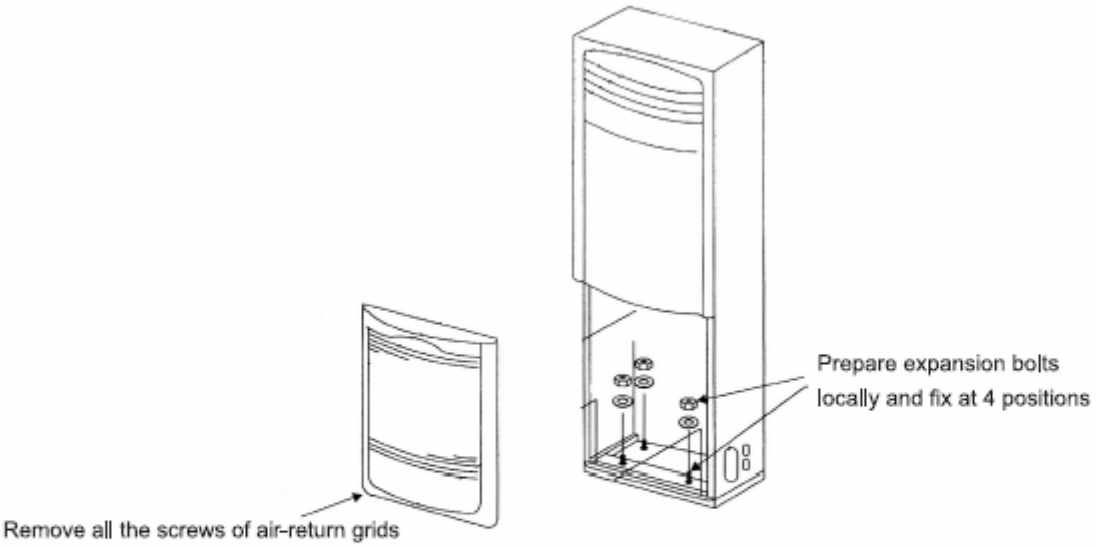
■ Anti-falling blocks Installation

● The anti-falling block (1) is to be preset on top of the unit. When installing, loosen the screws and remove it from the unit. Turn the block upside down, aligning it to the corresponding dimension on the wall and fix it firmly.

● If the top cover of the indoor unit is made of plastics, please insert the longer side of the anti-falling block into the gap between the top board and the unit body, while fixing the shorter side to the wall.

■ Indoor floor fixing (optional procedure)

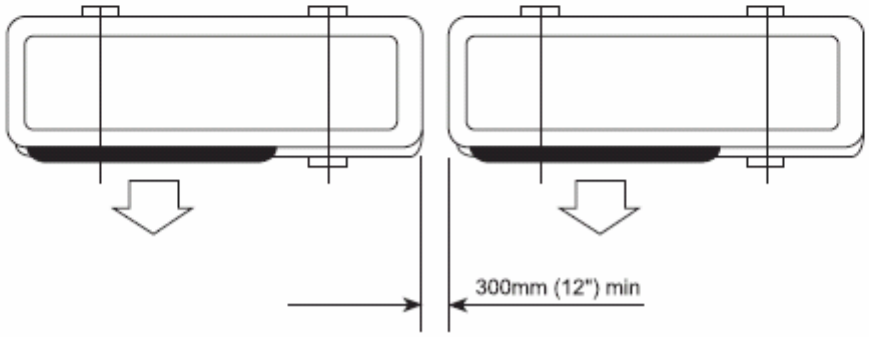
Remove the air-return grids, drill holes on the base for floor fixing. Use expansion bolts on the floor for fixing. (You have to prepare the needed expansion bolts locally).



When the walls and floor are made of materials other than wood boards, please use M8 x 60 expansion bolts for fixing.

【Installation fixture of outdoor unit】

- Try to ship the product to the installation location in its original package;
- As the gravity center of the unit is not at the installation center, special caution should be taken when using hoisting cables to lift it up;
- During shipping, the outdoor unit must not be slanted to over 45 degrees (Do not store the unit in a horizontal way).
- Use expansion bolts to fix the mounting supports on the wall;
- Use bolts and nuts to fix the outdoor unit firmly on the supports and keep on the same level;
- If the unit is installed on the wall or at the rooftop, the supports have to be firmly fixed so as to resist earthquake or strong wind.



【Installation of refrigerant pipe and drainage tube】

- In some special cases, it is needed to buy thermal insulation materials with a thickness of 12mm minimum and the thermal sheath with good property so as to prevent from dew-dropping.
- When the installation of the drainage tube passes the indoor space, thermal-keeping measures should be taken to prevent from dew-dropping.
- Our Co. accessories for piping lines are recommended in general.

I Dimensions of refrigerant pipe and drainage tube (outer diameter)

In the case that there is the need to purchase additional refrigerant pipe or drainage tube, please refer to the following table: (unit: mm)

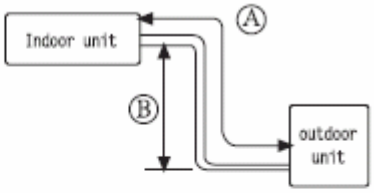
Item \ Cooling capacity		4100~5100W	6000~7500W	10000~14500W
Refrigerant pipe	Liquid pipe	Ø6.35(1/4")	Ø9.52(3/8")	Ø9.52(3/8")/Ø12.7(1/2")
	Gas pipe	Ø12.7(1/2")	Ø15.88(5/8")	Ø19.05(3/4")
Drainage tube		PVC tubes ...VP-20 [Outer diameter 26(1")]		

II High differences of the indoor and outdoor units, length limits to the refrigerant piping lines

Cooling capacity	A. Length of Piping Line (one-way)	B. Height Differences
4100~5100W	10m(32'10")max.	5m(16'5")max.
6000~7500W	15m(49'2")max.	5m(16'5")max.
10000~14500W	20m(65'7")max.	5m(16'5")max.

● Either the indoor unit or the outdoor unit can be higher, but the height difference must comply the above-stated requirements.

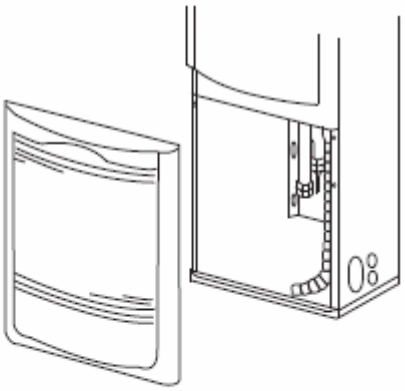
● Try to reduce the bending of the piping line as much as possible so as to avoid possible negative impacts upon the performances of the units.



III Refrigerant pipes installation

■ Prior to connect the refrigerant pipes

1.Remove all the screws on the handle of the air-return grids ,or the screws on both top sides of bottom panel,for the machine which need not be fixed by the screws,you can directly pull out the air-return grids or the bottom panel.



■ Connect the refrigerant pipes

1.Keep the stop-valve or ball-valve of the outdoor unit in the original closed state ,Remove the screws nuts,dust-resistance caps and pipe end screw blocks from the indoor and outdoor pipes.

2.Do the bell-mouth connections quickly,connect all the refrigerant pipes.

■ Schematic diagram for the installation of the outdoor unit refrigerant piping system

Fig 1

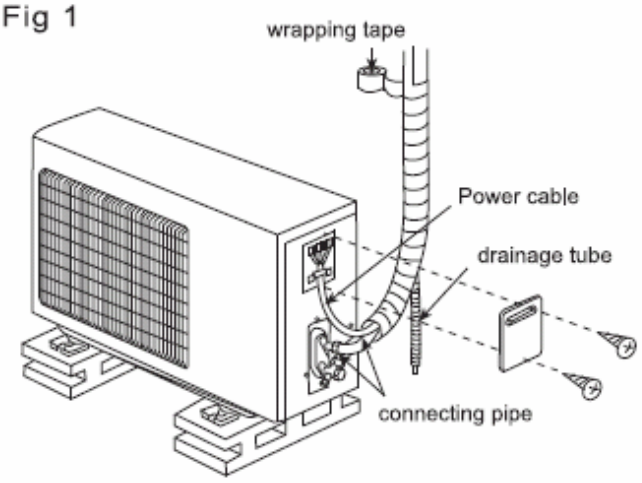
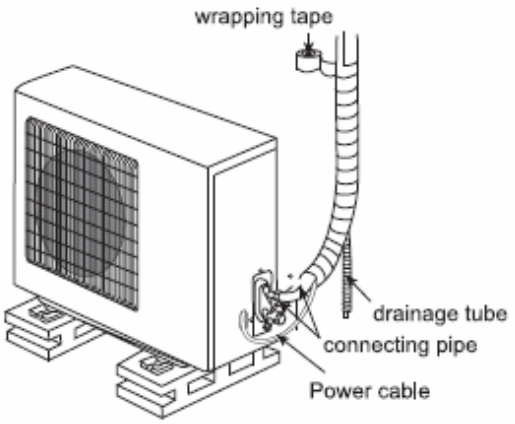


Fig 2



Note:

1.Connect the indoor pipes first,then the outdor pipes.

2.When bending the equipped pipes,please be careful not to damage the connection pipes.

3.Before tightening the bell-mouth nuts,a thin layer of anti-freezing grease should be placed on the surface of the connection between the pipe and the join.

4.Do not screw the connector nut too tightly,or it is possible to cause leakeage.

Please refer to the below Table 1for the related torque

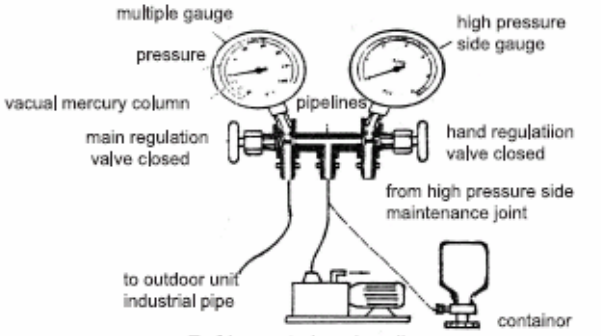
Outer diameter of copper pipe	Tightening torque	Strengthened tightening torque
∅ 6.35(1/4")	160kgf·cm(63kgf.inch)	200kgf·cm(79kgf.inch)
∅ 9.52(3/8")	300kgf·cm(118kgf.inch)	350kgf·cm(138kgf.inch)
∅ 12.7(1/2")	500kgf·cm(197kgf.inch)	550kgf·cm(216kgf.inch)
∅ 15.88(5/8")	750kgf·cm(295kgf.inch)	800kgf·cm(315kgf.inch)
∅ 19.05(3/4")	1200kgf·cm(472kgf.inch)	1400kgf·cm(551kgf.inch)

IV. Installation of drainage tubes

- The drainage tubes must be slanted downwards to ensure that water is not accumulated;
- There might be condensing water on the surface of the drainage tubes. Please purchase thermal insulation sheath as needed;
- The joints must be firmly adhered together by applying polyvinyl adhesives to prevent from leakage;
- Do not directly insert the drainage tube into the sewer tunnel which might generate sulfate gases or into the places which might generate unpleasant smell.

【Exhaust air and leakage detection】

■ If possible,it is better to use pump vacuum to exhaust the air.The procedures must be operated by professional technicians.



Refrigerant charging diagram

■ If the refrigerant is for R22,you can choose the suitable methods to exhaust air according to following table:

Remark: if have moved the air conditioner unit that have installed and operated to another place, then need refrigerant pot to exhaust the air.

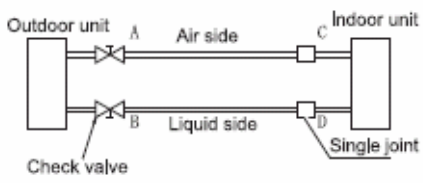
Pipe length	Exhaust air methods	Add refrigerant volume	
<5m(16'5")	Use the refrigerant in outdoor unit	——	
5-10m (16'5"-32'10")	Use refrigerant pot	Liquid pipe diameter Ø6.35(1/4")	(Connecting pipe length-5m)x30g or (Connecting pipe length-16'5")x0.76g
		Liquid pipe diameter:Ø9.52(3/8")	(Connecting pipe length-5m)x65g or (Connecting pipe length-16'5")x1.65g
		Liquid pipe diameter:Ø12.7(1/2")	(Connecting pipe length-5m)x100g or (Connecting pipe length-16'5")x2.54g

■use refrigerant in outdoor unit to exhaust the air

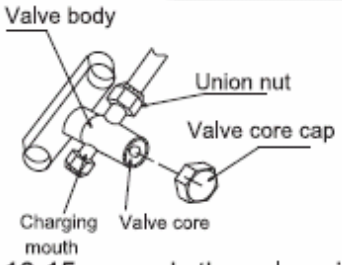
1.Tighten the union nut B,C,D with wrenchs according to torque Table 1,then loose half-circle after tightening union nut A

2.Turn the valve core of valve B about 6-7 seconds with an angle of 45 anti-clockwisely to exhaust the air from valve A,then tighten the union nut A.

3.Open the valve core of check valve B and A completely,then tighten the valve core cap of the check valve.



■use refrigerant pot to exhaust the air



1.Tighten the union nut C and D of indoor unit ,also for union nut A of outdoor unit(refer to above torqueTable1).
2.Connect the charging hose of refrigerant pot with the charging mouth of valve A
3.Loose the union nut B of outdoor unit slightly.
4.Open the valve of refrigerant pot,charge the refrigerant about 10-15 seconds,then close it completely.
5.Wait until the sound of air flowing in union nut B was decreased obviously,then tighten the union nut B.
6.Remove the charging hose from the charging mouth of valve A,then push the needle valve of charging mouth with the tool like hexagon spanner to outlet the remain refrigerant from the pipe,until no sound of air flowing be heard,then tighten the valve cap of charging mouth.
7.Open the valve core of check valve Band A of outdoor unit completely,then tighten the valve core cap of check valve.

■After exhaust air have done, should detect leakage according to the possible leakage points during the installation of air conditioner units.
1. To scribble the suds or bubble evenly on the possible leakage points, to see if have bubbles comes out.
2. Use the probe of leakage detection instrument to check the possible leakage points.

【Connections of power cables】

● Special purpose power source should be utilized along with proper breaker installation;

● Make sure of the applicable voltage and cables or wires for the specific model to be used, before doing the connections;

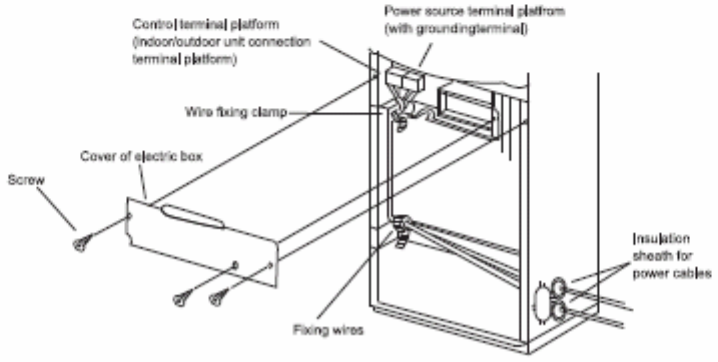
● The cable connections must be done in accordance with the requirements specified in the drawings. The screws have to be tightened firmly to prevent from being loose;

● Check carefully the wiring codes at the terminal platform. Both the indoor and outdoor units have wiring codes, which should be matched one by one to avoid wrong connections;

● The wiring terminals of the indoor and outdoor units must not be connected to the 220V power source, otherwise faulty performances or hazards might be incurred.

Cable connections for indoor unit(Please tighten the screws at the terminals firmly)

1. Remove the fixing screws of the electric box and take the box down;
2. Connect the power cables and control cables;
3. Fix the connected cables by clamps;
4. The grounding wire must be connected firmly;
5. If the cables contact the piping lines, there might be dew drops. Please make proper treatment for the wires.

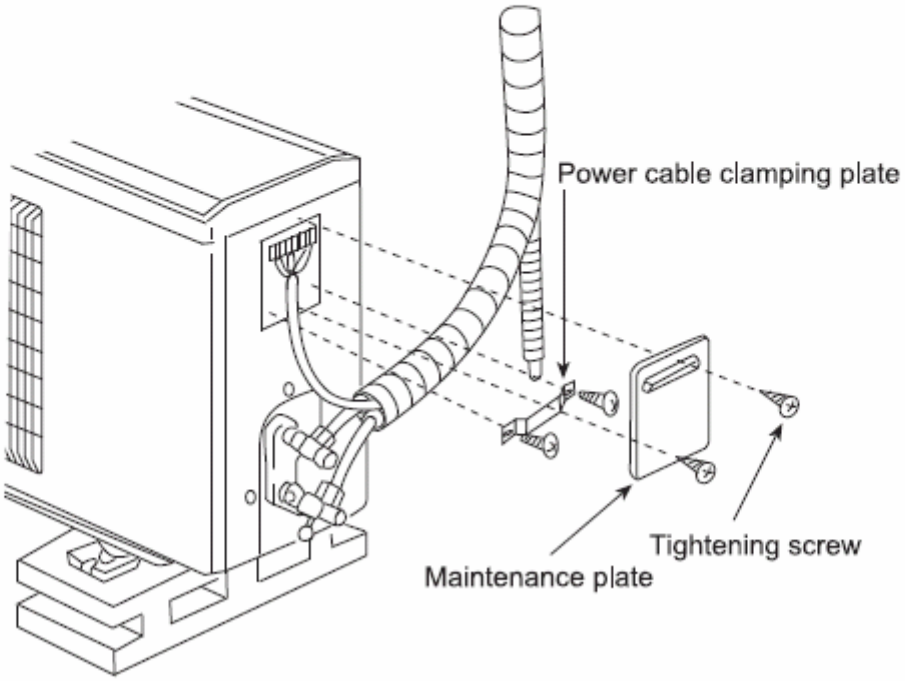


● **After the cable connection is completed, the removed parts must be installed back to their original places.**

Cable connections for outdoor unit

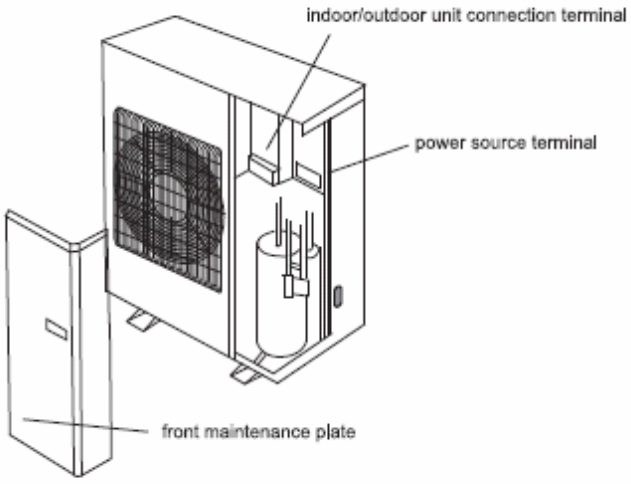
● Outdoor unit as shown below figure

1. Remove the screws of the maintenance plate and take the plate off;
2. Remove the screws of the cable clamping plate to loosen the clamping plate;
3. Connect the power cables and control wires;
4. Install the clamping plate, tighten the cables and wires and then place the maintenance plate back.

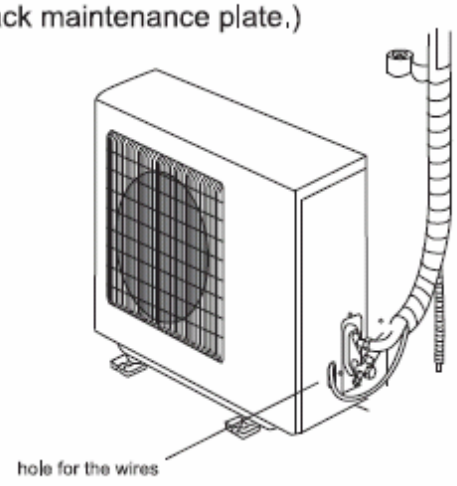


● Outdoor unit as shown below figure

1. Remove the front maintenance plate



2. Connect the power cables and control wires. (There is a hole for the wires on the back maintenance plate.)



Note:Firmly tighten the screws of the terminal platform

【Finishing touches 】

- wrap the piplines tightly with ethylene tapes.
- Fix the wrapped pipelines on the exterior wall with clamps.
- Fill in the gaps left over by the pipeline hole and wall hole to prevent rain-water from entering.

【Test running】

- Connect to the power source,check if the function selection keys on the remote controller are working properly.
- Check if the room temperature adjustments and timer settings are working properly.
- Check if the drain is smooth.
- Check if there is any abnormal noise or vibration during operation.
- Check if there is leakage of refrigerant.

【Is the unit installed correctly? 】

■Suitable Installation Position

● Isn't there anything which prevents ventilation or obstructs operation in front of the indoor unit ? Do not install the unit following place .

● Inflammable gases may leak .

● Oil splashes a lot .

● In case where the unit is used in such places as poisonous or sultry gases are generated or seaside district exposed to sea breezes corrosion may cause malfunction . Consult with your distributor .

● Air conditioner body and remote controller must be I m(39-3/4") or more away from a TV or a radio. Drain the dehumidified water from the indoor unit to a place which drains well .

■Pay attention to operation noise

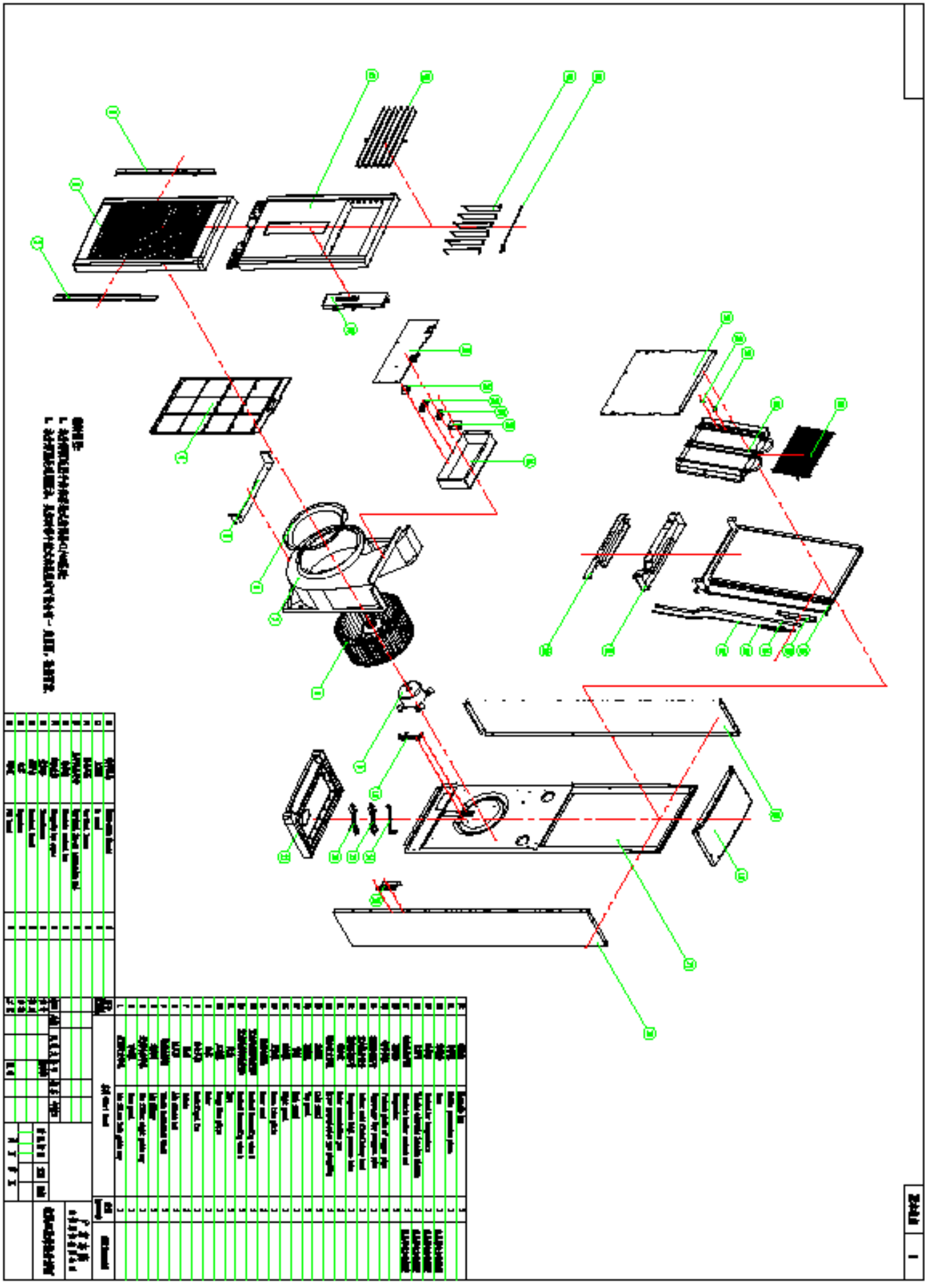
● When installing the unit , choose a place which can stand the weight of the unit well and does not increase the operation noise or vibration . Especially where there is a possibility that vibration be transmitted to the house , fix the unit by inserting attached vibration -proof pads between the unit and fittings .

● Choose the place where hot air and operation noise from the outlet of the outdoor unit do not annoy the neighborhood .

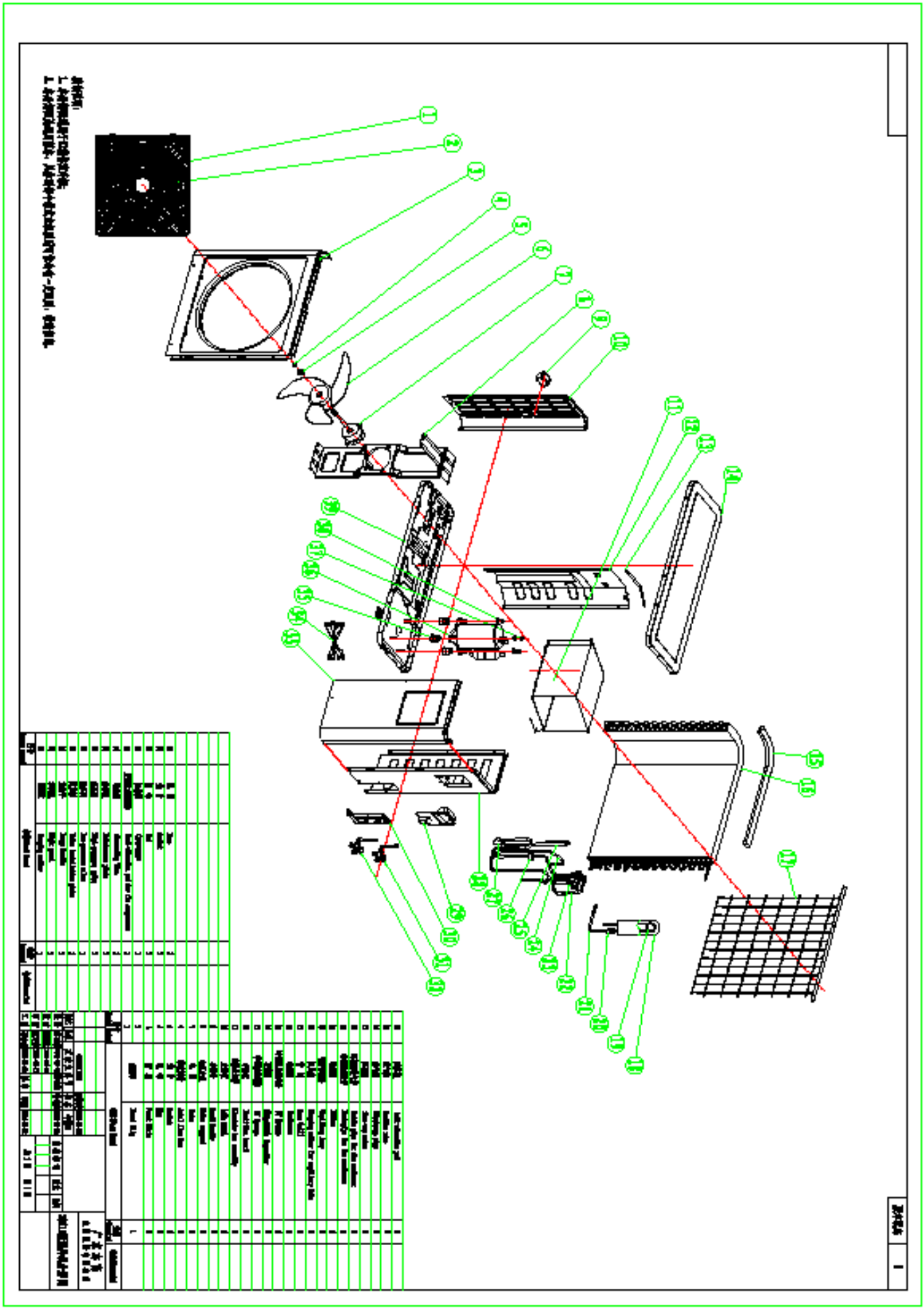
● Things left near the outlet and inlet of the outdoor unit cause malfunction or increased operation noise . Do not leave obstacles near the outlet and inlet .

● If irregular sound is heard during operation , consult with your distributor .

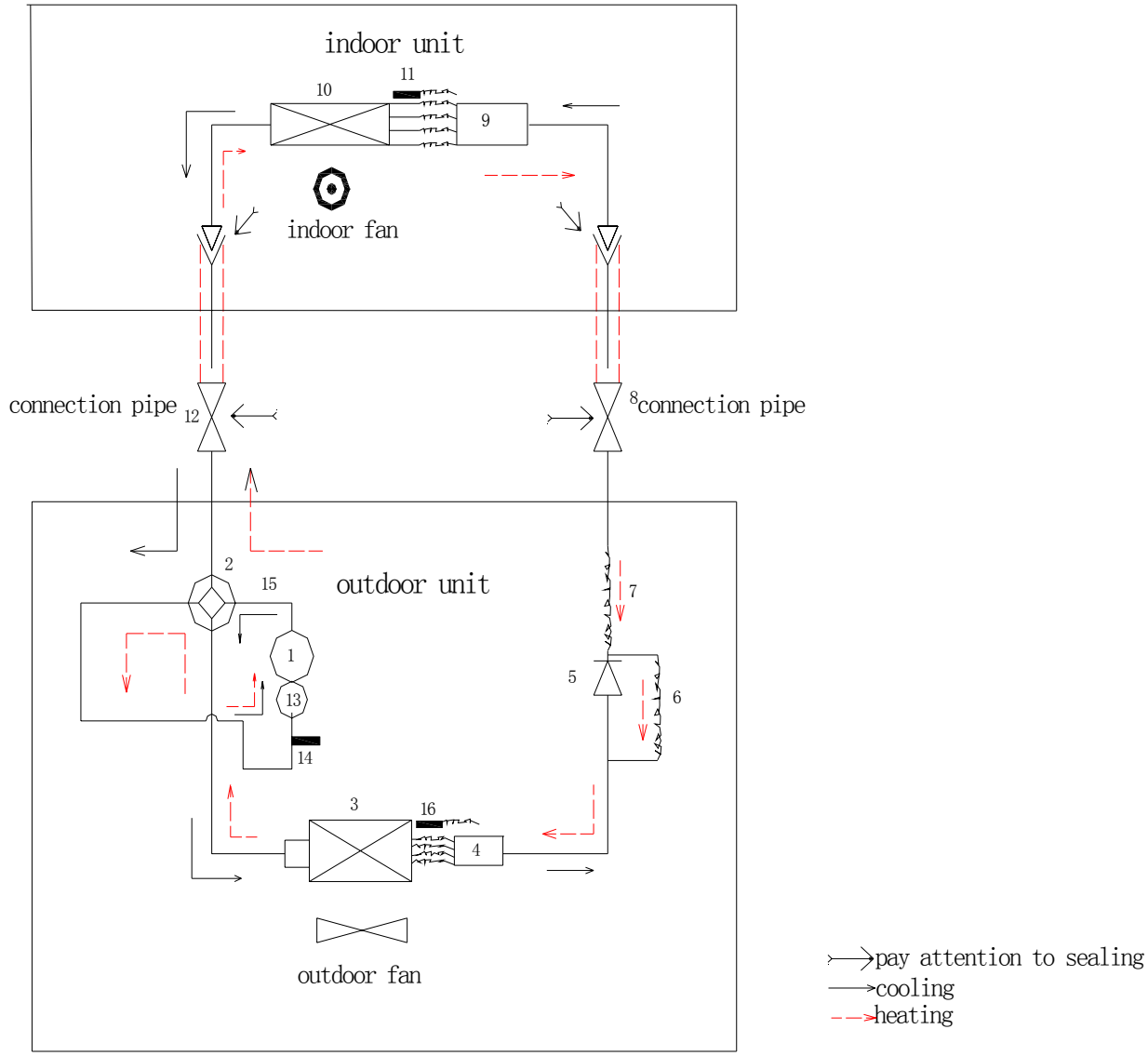
3. indoor explosive view for 40k



outdoor explosive view for 40k



4. Operation principle



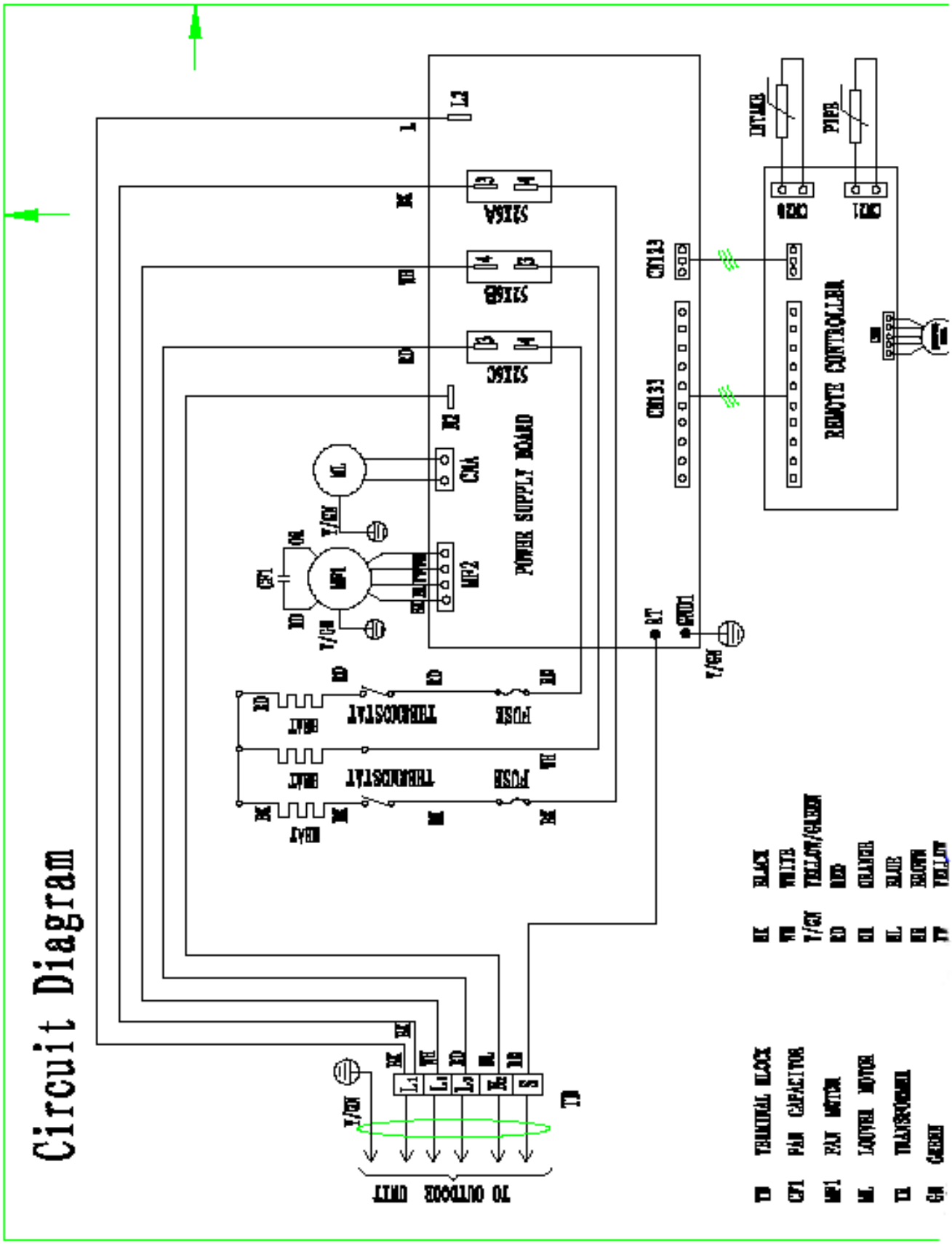
1.compressor 2. 4-way value 3.condenser 4.flow divider for condenser 5.Non-return valve 6.auxiliary capillary 7.cooling capillary 8.high-pressure valve 9.flow divider for evaporator 10.evaporator 11. pipe temp. sensor for evaporator 12.low-pressure valve 13.Vapor liquid separator 14.low-pressure switch 15. high-pressure switch 16、pipe temp. sensor for condenser

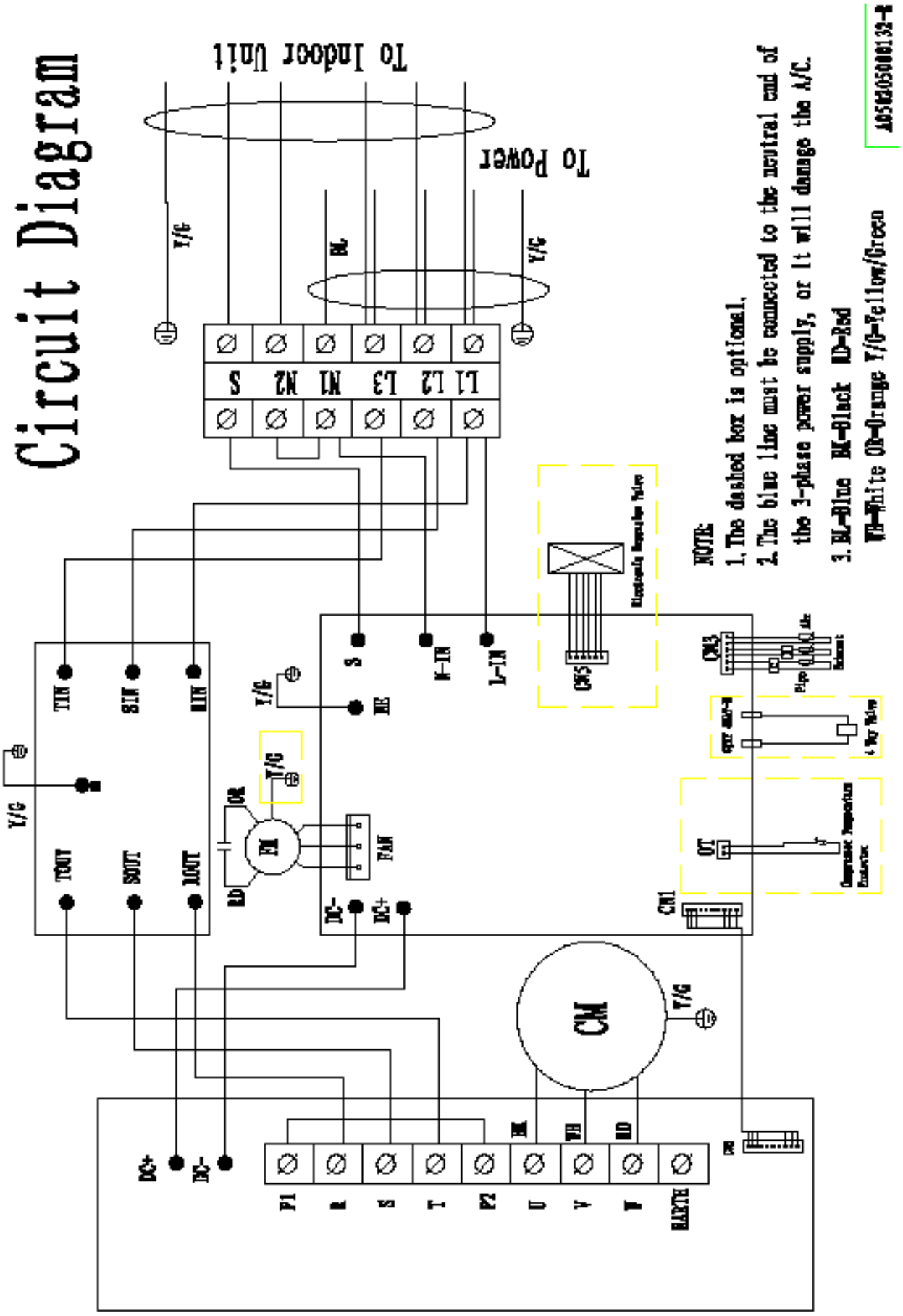
Cooling cycly ： compressor→4-way value→condenser→flow divider for condenser→Non-return valve→cooling capillary→high-pressure valve→flow divider for evaporator→evaporator→low-pressure valve→4-way value→Vapor liquid separator→compressor.

Heating cycly：compressor→4-way value→low-pressure valve→evaporator→flow divider for evaporator→high-pressure valve→cooling capillary→auxiliary capillary→flow divider for condenser→condenser→4-way value→Vapor liquid separator→compressor.

Note：To the model of RF or LF beginning, use outdoor unit model to express the whole unit.

5. CIRCUIT DIAGRAM
43K INDOOR



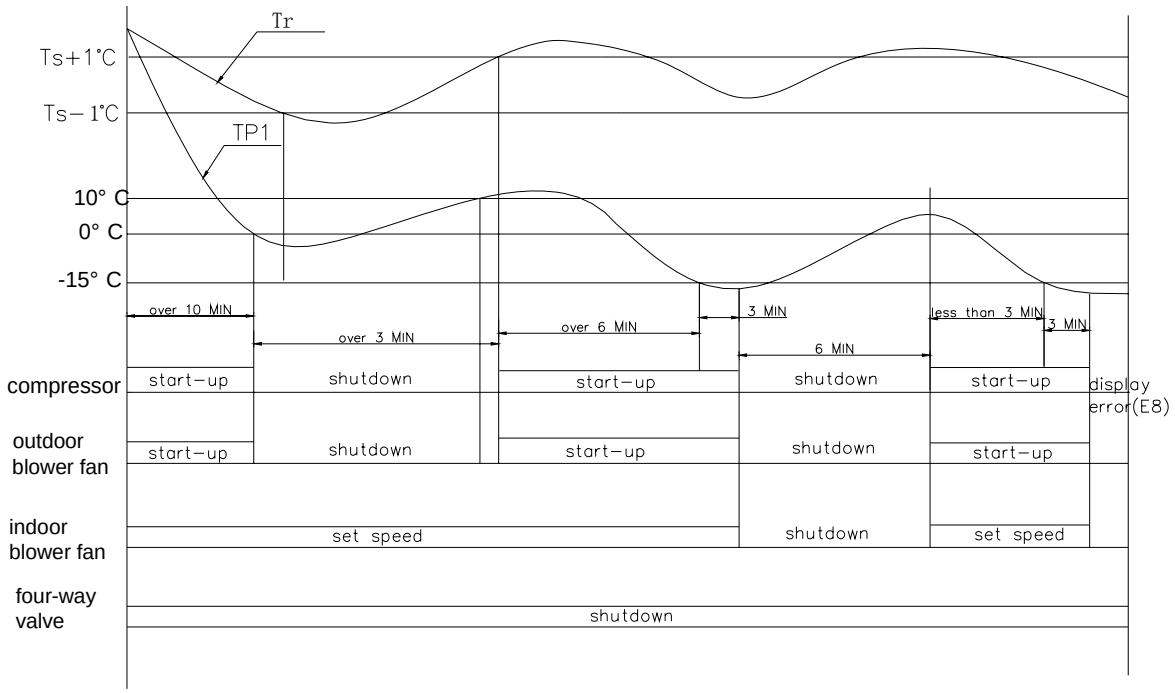

Circuit Diagram
To Indoor Unit
To Power
L1 L2 L3 N1 N2 S
Y/G
BL
NOTE:
1. The dashed box is optional.
2. The blue line must be connected to the neutral end of the 3-phase power supply, or it will damage the A/C.
3. BL=Blue BK=Black RD=Red
WH=White OR=Orange Y/G=Yellow/Green
TIN
SIN
RIN
TOUT
SOUT
ROUT
S
N-IN
L-IN
CN5
CN3
CN4
OT
CN1
OR
FM
RD
FAN
DC-
DC+
CM
DC+
DC-
P1
R
S
T
P2
U
V
W
EARTH
WH
RD
BK
CN2

6. PCB function:

NOTE: Ts is the set temperature, Tr is indoor room temperature, TP1 is indoor coil pipe temperature, TP2 is outdoor coil pipe temperature.

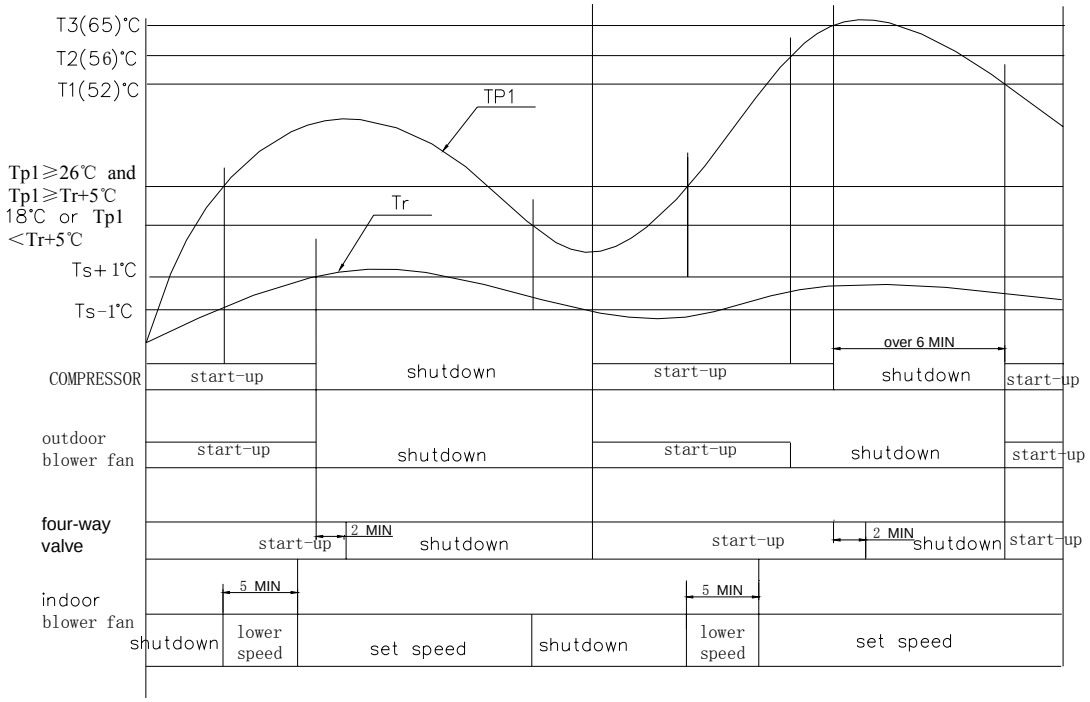
Cooling

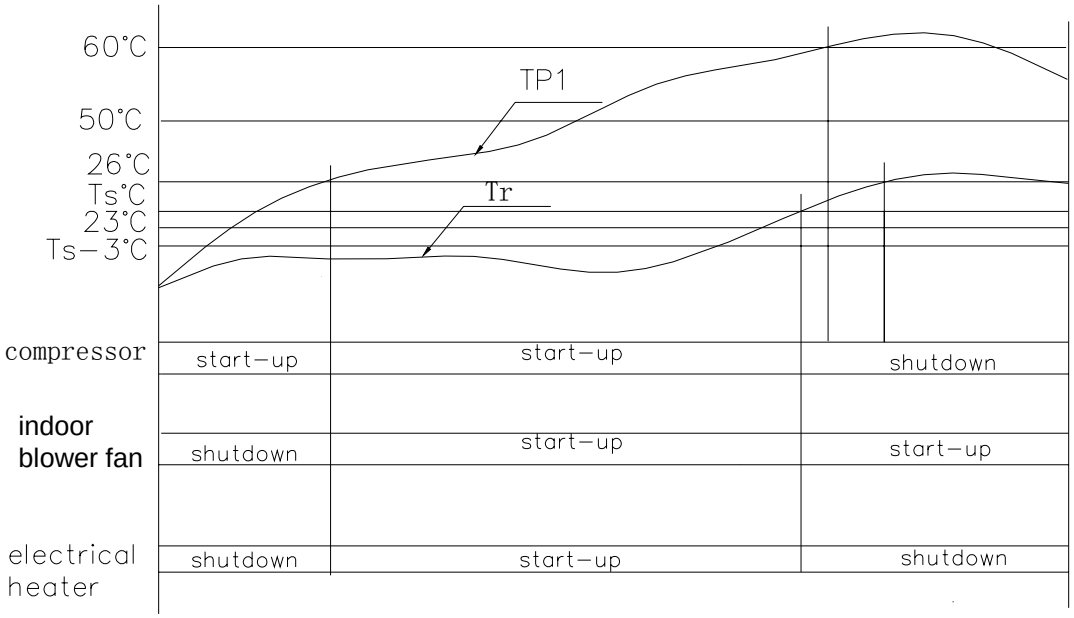
- Start up the compressor: when the room temperature is more than or equal to Ts+1℃, compressor → start-up
- Shut down the compressor: when the room temperature is equal to or less than the set temperature Ts-1℃, compressor → shutdown
- When the temperature of coil pipe of the indoor units is less than or equal to 0℃ and the compressor has continuous run for more than ten minutes, the compressor and outdoor blower fan shut down through the electric control board and the indoor blower fan is running at set speed.
- When the temperature of coil pipe of the indoor units is more than 10℃ or room temperature less than or equal to set temperature and the compressor has shutdown for more than three minutes, the compressor and outdoor blower fan start to run and the indoor blower fan is running at set speed.
- When the temperature of coil pipe of the indoor units is equal to or less than －15℃ for three minutes in the compressor has continuous run for six minutes, the compressor, indoor and outdoor blower fans and swinging wind shut down. Restart up six minutes later; if the above situations appear again within six minutes, all the outputs are shut down through the electric control board and the display failure.



Heating (only applicable to dual temperature units)

- Start up the compressor: when the room temperature is less than or equal to Ts-1℃, compressor → start-up
- Shut down the compressor: when the room temperature is more than or equal to the set temperature Ts+1℃, compressor → shutdown
- The electric heating start-up in the heating mode shall meet the following conditions: ① start up the compressor for three minutes and indoor blower fan ② Tr ≤ Ts－3℃ ③ TP1< 46℃ ④Tr ≤23℃.
- The electric heating shutdown in the heating mode shall meet one of the following conditions: ① shutdown the indoor blower fan ② Tr ≥ 26℃ ③ TP1≥50℃ ④change mode.
- When the temperature of coil pipe of indoor units is more than or equal to 56℃, the outdoor blower fan shuts down and it enters the overload protection; when the temperature of coil pipe of indoor units is less than or equal to 52℃, the outdoor blower fan starts up and it exit the overload protection.
- When the temperature of coil pipe of indoor units rises to 65℃, the compressor and outdoor blower fan are closed and two minutes later, the change valve is closed. The indoor blower fan is running at the set speed. Restart up six minutes later; if the above situations appear again within ten minutes, all the outputs are shut down through the electric control board and the display failure.


T3(65)℃
T2(56)℃
T1(52)℃
TP1
Tp1≥26℃ and
Tp1≥Tr+5℃
18℃ or Tp1
<Tr+5℃
Tr
Ts+1℃
Ts-1℃
over 6 MIN
COMPRESSOR
start-up
shutdown
start-up
shutdown
start-up
outdoor
blower fan
start-up
shutdown
start-up
shutdown
start-up
four-way
valve
start-up
2 MIN
shutdown
start-up
2 MIN
shutdown
start-up
5 MIN
5 MIN
indoor
blower fan
shutdown
lower
speed
set speed
shutdown
lower
speed
set speed


60℃
TP1
50℃
26℃
Ts℃
Tr
23℃
Ts-3℃
compressor
start-up
start-up
shutdown
indoor
blower fan
shutdown
start-up
start-up
electrical
heater
shutdown
start-up
shutdown

Defrosting (only applicable to the heating mode)

1. the intelligent defrost

In the heating mode, the electric control board checks and compares the temperature of indoor room and indoor coil pipe after the compressor works for a while; judge whether the outdoor heat exchanger part is frosted or not according to conditions such as the change of indoor coil pipe temperature; if it is judged as frosted, it automatically enters defrosting process. When defrosting, close the indoor and outdoor blower fan and four-way valve.

2. Outdoor PCB for defrost.

In the heating mode, the unit defrost by outdoor control board：

①unit start defrost shall all meet the following conditions：

a、compressor continuous running over 7 minutes；

b、defrost relay shut off；（-5℃）

c、compressor cumulate running time over 50 minutes.；

②first defrost interval time is 50 minutes, later defrost interval time decided by last defrost time.

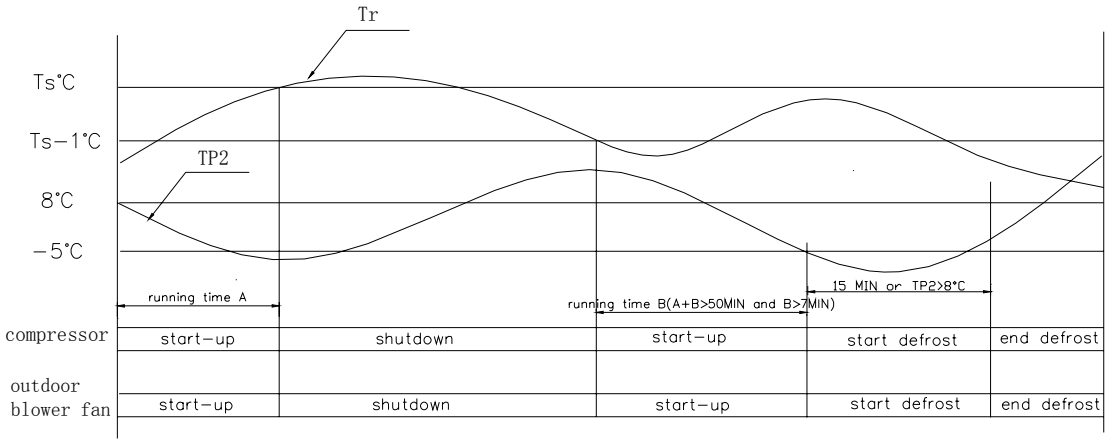
Defrost time(minute)	Next defrost interval time(minute)
15	30
10--15	40
7--10	60
3--7	70
≤3	80

（2）end defrost condition(meet one of follows)

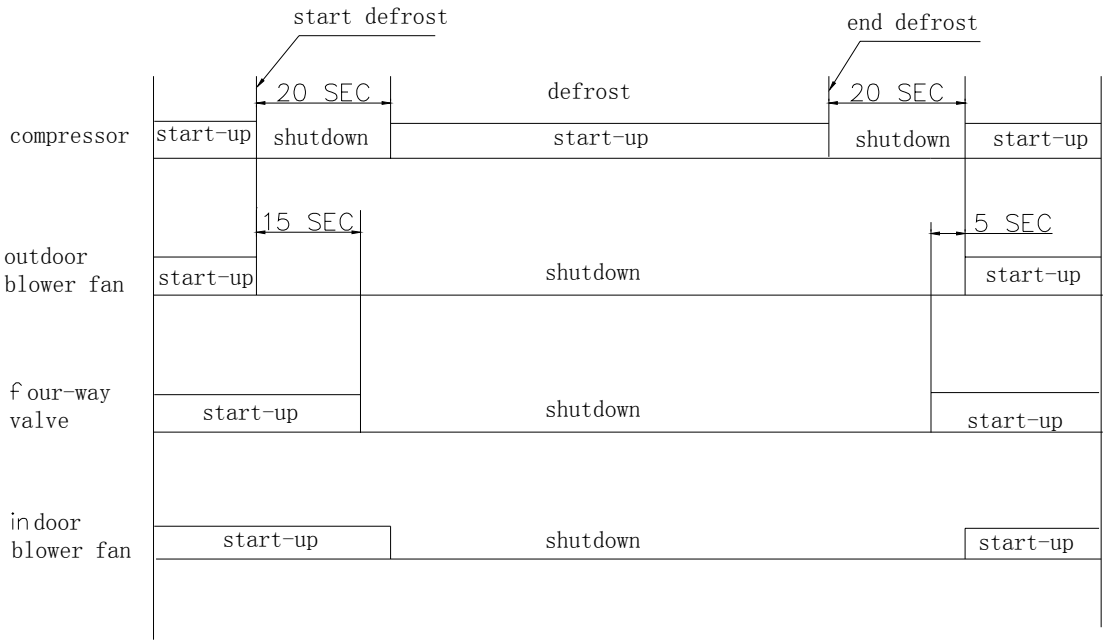
a、defrost time have fifteen minutes.

b、defrost relay turn on；（＞8℃）

c、press ON/OFF key in defrost process.

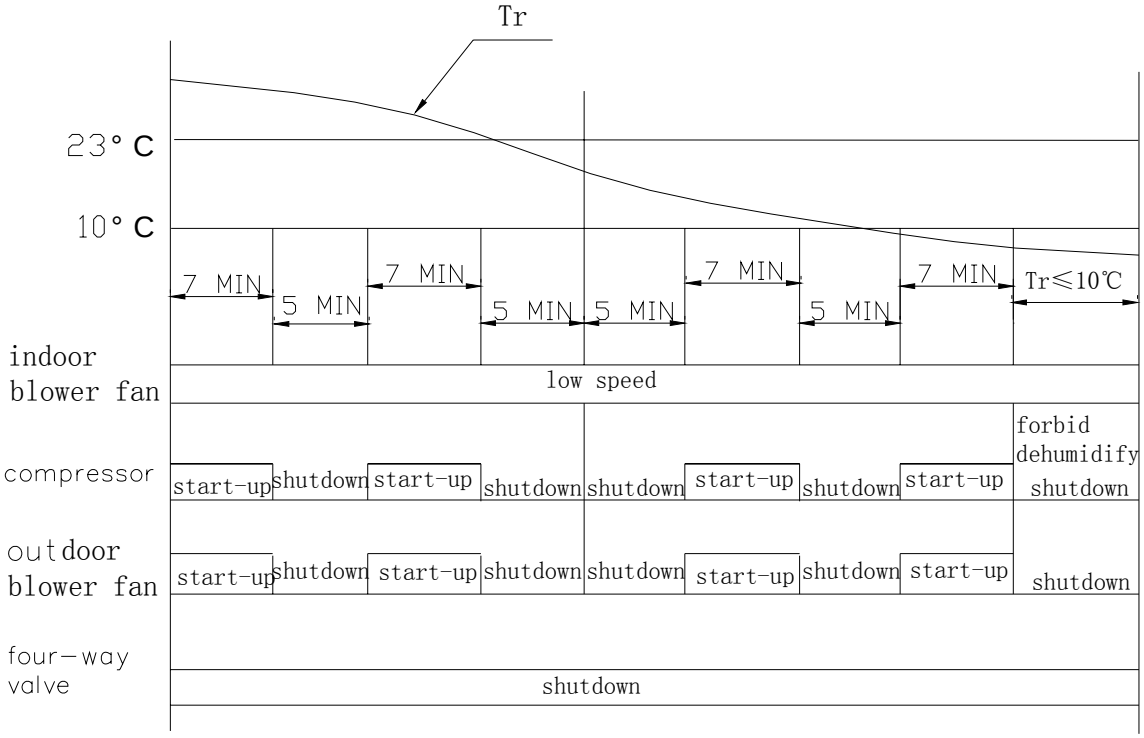


■ Sequence chart in defrosting mode



Dehumidification

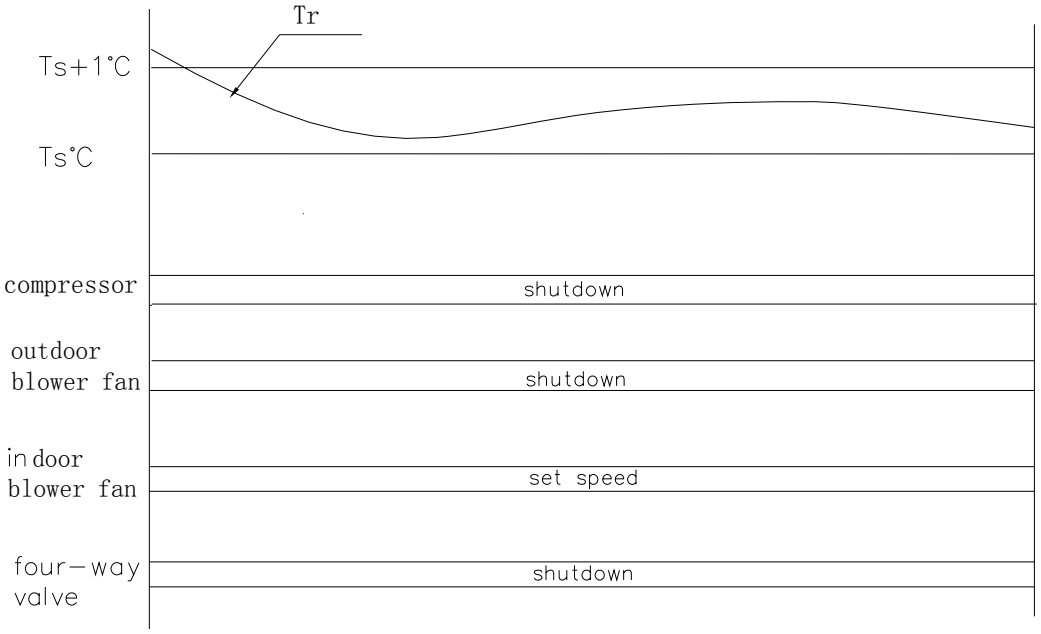
Dehumidification running is to eliminate the water vapor in the air by using the cool circulating capacity, but the dehumidification will not decrease the indoor temperature in great deal. The air conditioner automatically repeats on and off circulation according the room temperature, which is shown in the following figure.



- In the dehumidification mode, the indoor fan is running at the low speed for twenty seconds at first, then it select working mode.

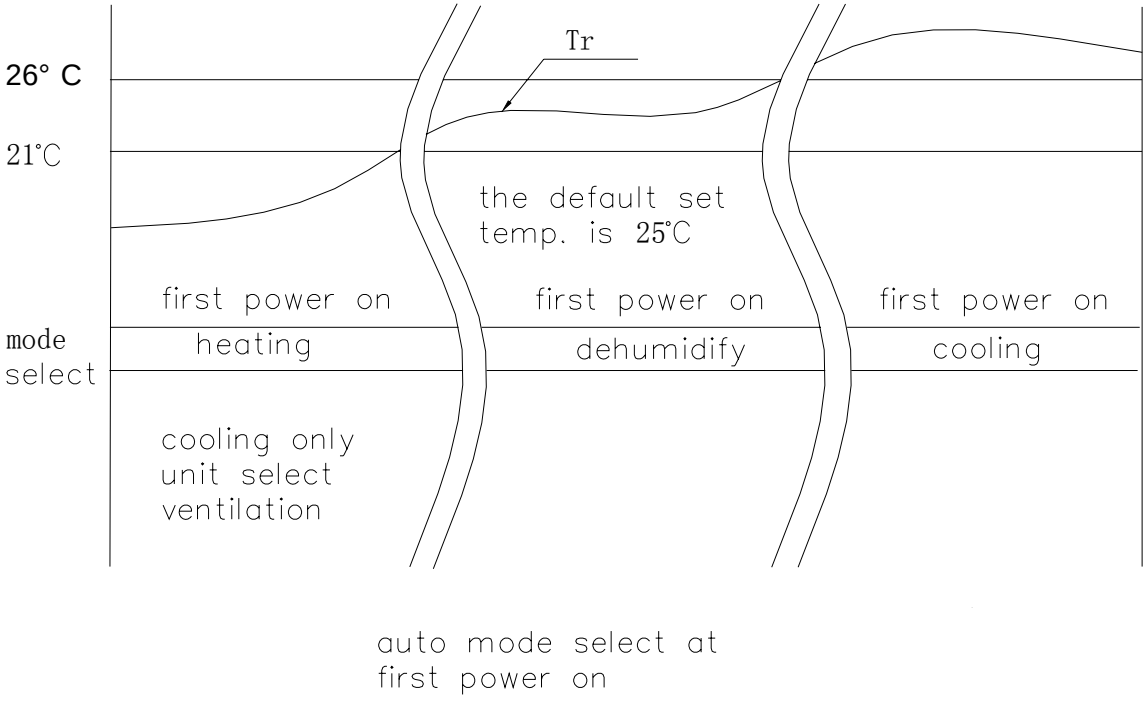
Ventilation working mode (only applicable to single cooling unit)

In the ventilation mode, the set temperature range is 17℃~31℃. When ventilating, the compressor, outdoor blower fan, four-way valve and electric heating are all closed and the indoor blower fan is running at the set speed.



Automatic mode

- Conditions for entering the automatic running mode are: After power-up for the first time or shutdown for two hours, start up and select the automatic operating mode, the working mode depends on Tr and if the working mode had set , it doesn't change by Tr and the default set temperature is 25 ℃.



Time on and time off

When the time on or time off is used, the clock of remote controller shall be corresponding to the current clock and the timing times is less than or equal to 24 hours, when the timing time is reached, unit will start-up or shutdown.

Emergency key function

There is a forcible execution key on the panel of indoor units and the air conditioner can running by pressing the key when the remote controller is out of work or missing.

When pressing down the forcible execution key, then power up and enter the self-check program.

low pressure switch control function(for 7.5KW and 12kw unit)

1. low pressure switch didn't detect for three minutes after compressor start up.
2. if low pressure switch continuous act three minutes during compressor start up, unit stop running.
3. if low pressure switch continuous act three minutes in wait state, unit enter protect state.
4. low pressure switch didn't detect during defrost process and within six minutes.

7. Failure display

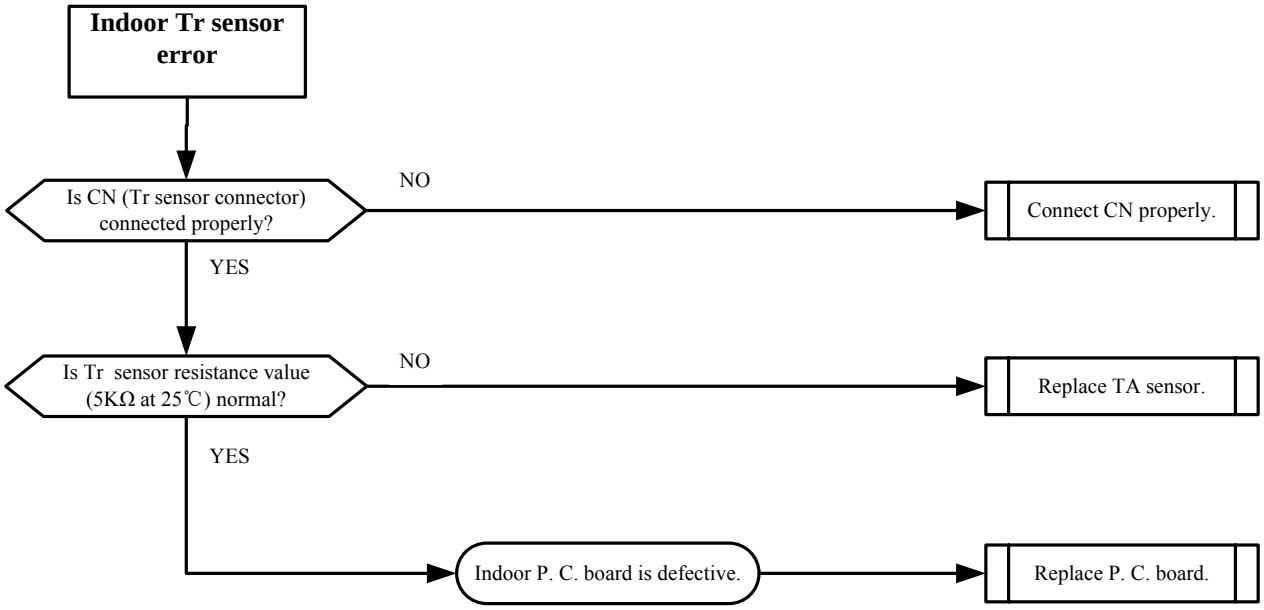
LED	running lamp(flicker times)	timer lamp(flicker times)	Fault content	The reason of fault and solution
F1	1	light	communication fault	1、Check whether the connection of the outdoor unit and indoor unit is one to one, otherwise connect the L, N and communication line of the indoor unit and outdoor unit one to one. 2、Measure whether the voltage between the zero line and the communication line is 18V-30AC half-wave signal, check whether the communication circuit on the indoor and outdoor electric control board has been damaged, otherwise replace it. 3、Check whether the LED on the outdoor power board has been on, otherwise replace the electric control board. 4、Check whether the unit is abnormal caused by the external interference, if it is, then find the interfering source, and removes it.
F2	2	light	The indoor ambient temp. sensor fault	1、Check whether the resistance of sensor is normal, otherwise replace it. 2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board, repair it if there is any above. 3、When the 1 and 2 are both normal, then the components or integrated circuit is damaged, the electric control board should be replaced.
F3	3	light	The coil pipe temp. sensor of indoor unit fault(include : inlet, middle, outlet)	1、Check whether the resistance of sensor is normal, otherwise replace it. 2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board, repair it if there is any above. 3、When the 1 and 2 are both normal, then the components or integrated circuit is damaged, the electric control board should be replaced.
F4	4	light	indoor fan fault	1、 Check whether the contact of the plug of the motor wire and socket is well, making sure well contact. 2、Check whether the indoor motor has damaged,

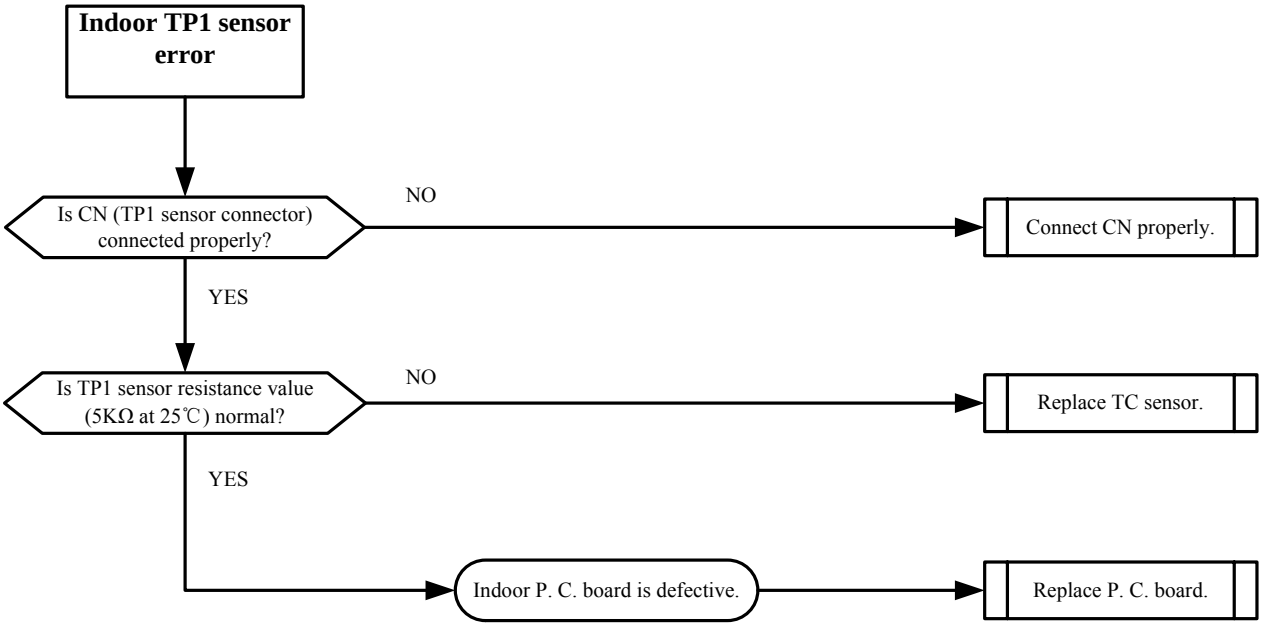
				the motor should be replaced when it is damaged. 3、Check whether the controllable silicon and other components on the electric control board have damaged, replace the controllable silicon or electric control board when they are damaged.
F5	5	light	module of outdoor unit fault	1、Check whether the connection of the compressor is reliable, otherwise connect firmly again. 2、Check whether the fixation between the IPM module and the radiator is firm. 3、Check whether the compressor is well, otherwise replace it. 4、Check whether the IPM module is abnormal, otherwise replace it.
F6	6	light	The outdoor ambient temp. sensor fault	1、Check whether the resistance of sensor is normal, otherwise replace it. 2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board, repair it if there is any above. 3、When the 1 and 2 are both normal, then the components or integrated circuit is damaged, the electric control board should be replaced.
F7	7	light	The outdoor unit coil pipe temp. sensor fault	1、Check whether the resistance of sensor is normal, otherwise replace it. 2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board, repair it if there is any above. 3、When the 1 and 2 are both normal, then the components or integrated circuit is damaged, the electric control board should be replaced.
F9	9	light	The compressor discharge temp. sensor fault	1、Check whether the resistance of sensor is normal, otherwise replace it. 2、Check whether the sensor wire is short circuit or open circuit, and whether the plug is well contacted, whether there is welding off or rosin joint on the electric control board, repair it if there is any above. 3、When the 1 and 2 are both normal, then the

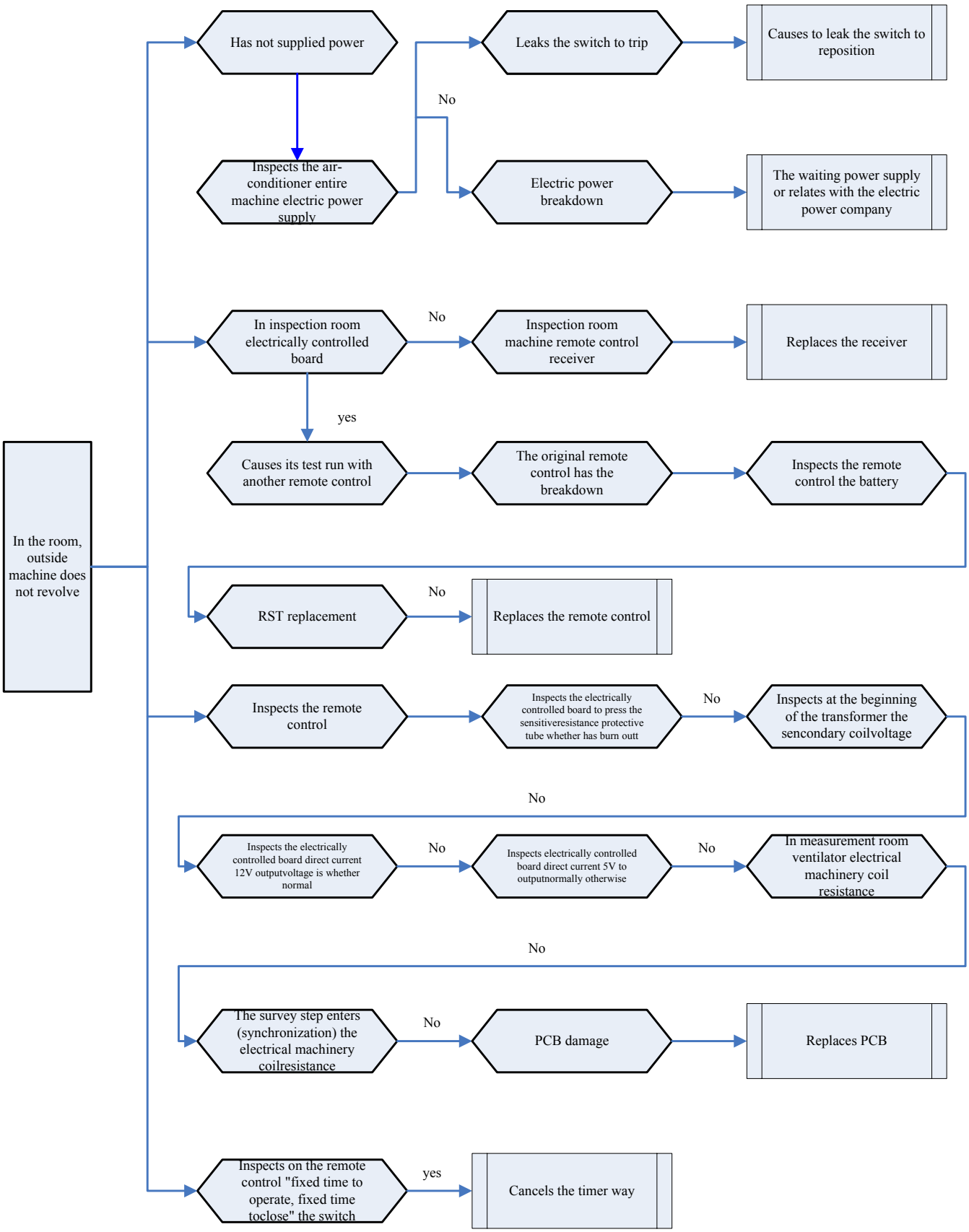
				components or integrated circuit is damaged, the electric control board should be replaced.
FC	11	light	compressor drive fault	1、Power on again, and check the operation of the compressor is normal. 2、Check whether the connection of the compressor is reliable, otherwise repair. 3、Check whether the components on the electric control board have been damaged, if they are damaged, the components or the electric control board should be replaced.
FD	13	light	Phase fault	1、 check whether power wire of phase is correct 2、 check outdoor of PCB whether fault
FH	14	light	Outdoor DC fan fault	1 check whether the system pressure is normal, whether to have the broken tube result in the leakage of refrigerant. 2 check whether the indoor coil temperature sensor is installed in place. 3 check whether the four-way valve runs abnormally.
P1	light	1	The evaporator temp. protection	1、Check whether the filter of indoor unit is too dirty, and it should be cleaned when it is too dirty. 2、Check whether it has barrier around indoor unit, it should be remove if it has. 3、Check whether the indoor motor is damaged, it should be replaced motor or electrical control board when it is damaged.
P2	light	2	overheat, over current protection of inverter module	1、Check whether the fixation between the IPM module and the radiator is firm. 2、Check whether the compressor is well, otherwise replace it. 3、Check whether the IPM module is abnormal, otherwise replace it.
P3	light	3	AC input current over large protection	1、Check whether the ambient temperature exceeds the operation range for the air conditioner 2、Check whether the current detection circuit is abnormal, the electric control should be replaced when it is abnormal.
P4	light	4	The discharge temp. of compressor protection	1、Check whether the air condition system and pressure are normal. 2、Check whether the sensor, connecting wire of

				the sensor and the detection circuit are abnormal.
P7	light	7	low or high voltage protection	1、Check whether the supply voltage is out of rang from 150 to 270V 2、Check the voltage detection circuit of the IPM base board is abnormal, if it is abnormal, the IPM base board or the electric control board should be replaced.
PA	light	10	The evaporator coil high temp. protection	1、Check whether the condenser of outdoor unit is too dirty, and it should be cleaned when it is too dirty. 2、Check whether it is running at bad condition long time. 3、Check whether senor and wire are normal.
PC	light	11	The outdoor ambient high temp. protection	1、Check the outdoor ambient temperature is too high or there is heat source around the outdoor unit. 2、Check whether the sensor and sensor wire are normal.

8. TROUBLE SHOOTING



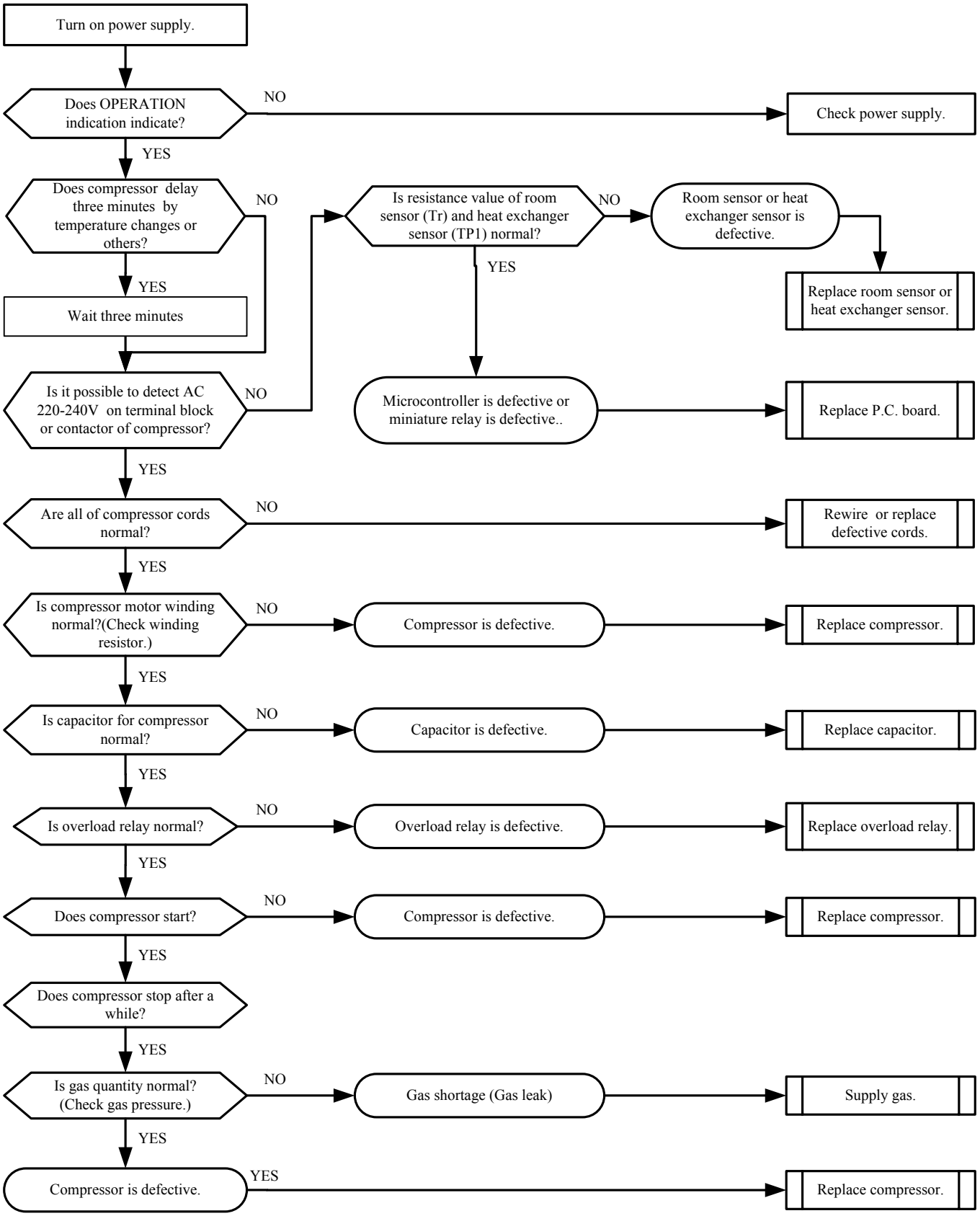


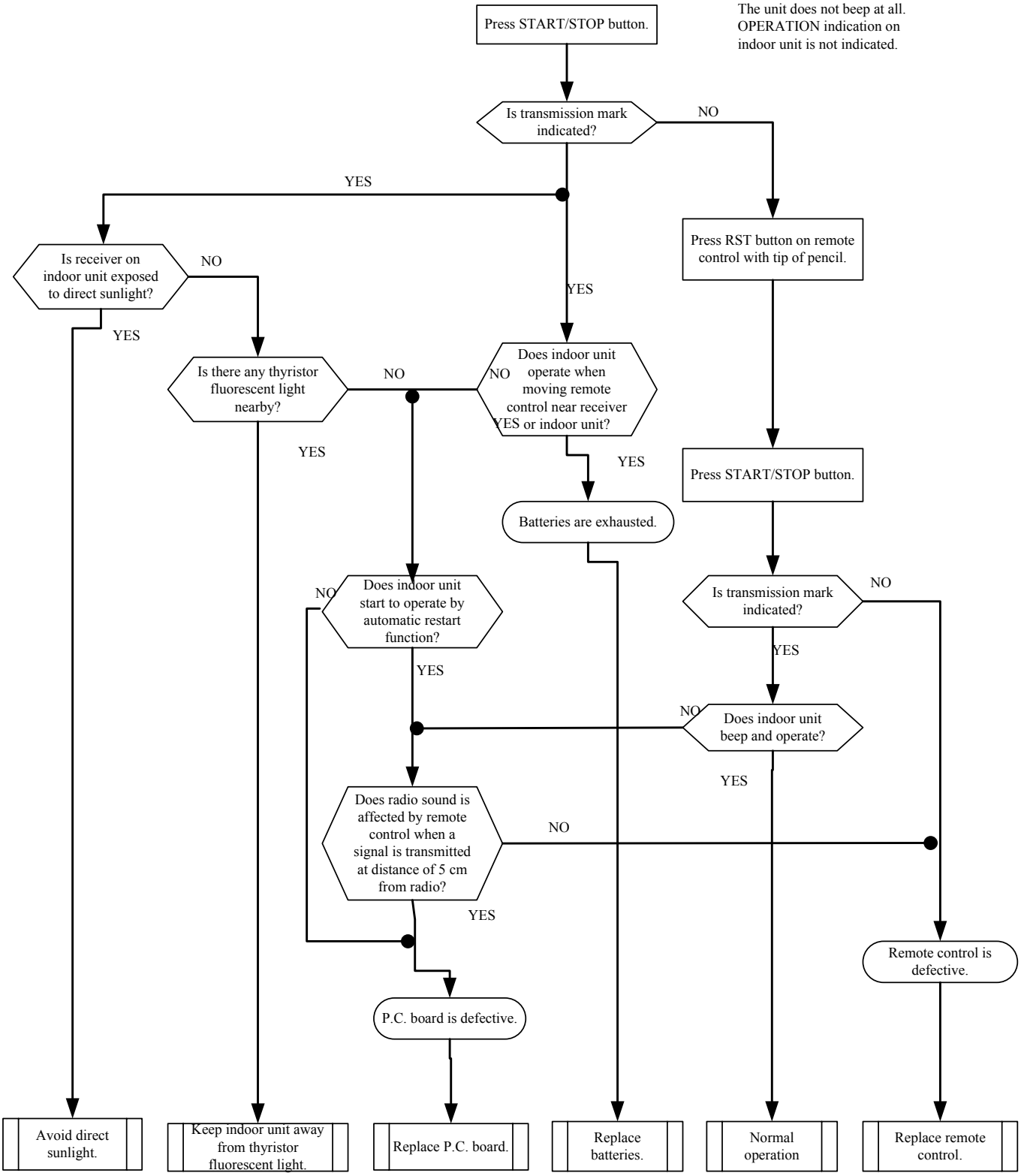

In the room, outside machine does not revolve
Has not supplied power
Leaks the switch to trip
Causes to leak the switch to reposition
No
Inspects the air-conditioner entire machine electric power supply
Electric power breakdown
The waiting power supply or relates with the electric power company
In inspection room electrically controlled board
No
Inspection room machine remote control receiver
Replaces the receiver
yes
Causes its test run with another remote control
The original remote control has the breakdown
Inspects the remote control the battery
RST replacement
No
Replaces the remote control
Inspects the remote control
Inspects the electrically controlled board to press the sensitiveresistance protective tube whether has burn outt
No
Inspects at the beginning of the transformer the sencondary coilvoltage
No
Inspects the electrically controlled board direct current 12V outputvoltage is whether normal
No
Inspects electrically controlled board direct current 5V to outputnormally otherwise
No
In measurement room ventilator electrical machinery coil resistance
No
The survey step enters (synchronization) the electrical machinery coilresistance
No
PCB damage
Replaces PCB
Inspects on the remote control "fixed time to operate, fixed time toclose" the switch
yes
Cancels the timer way

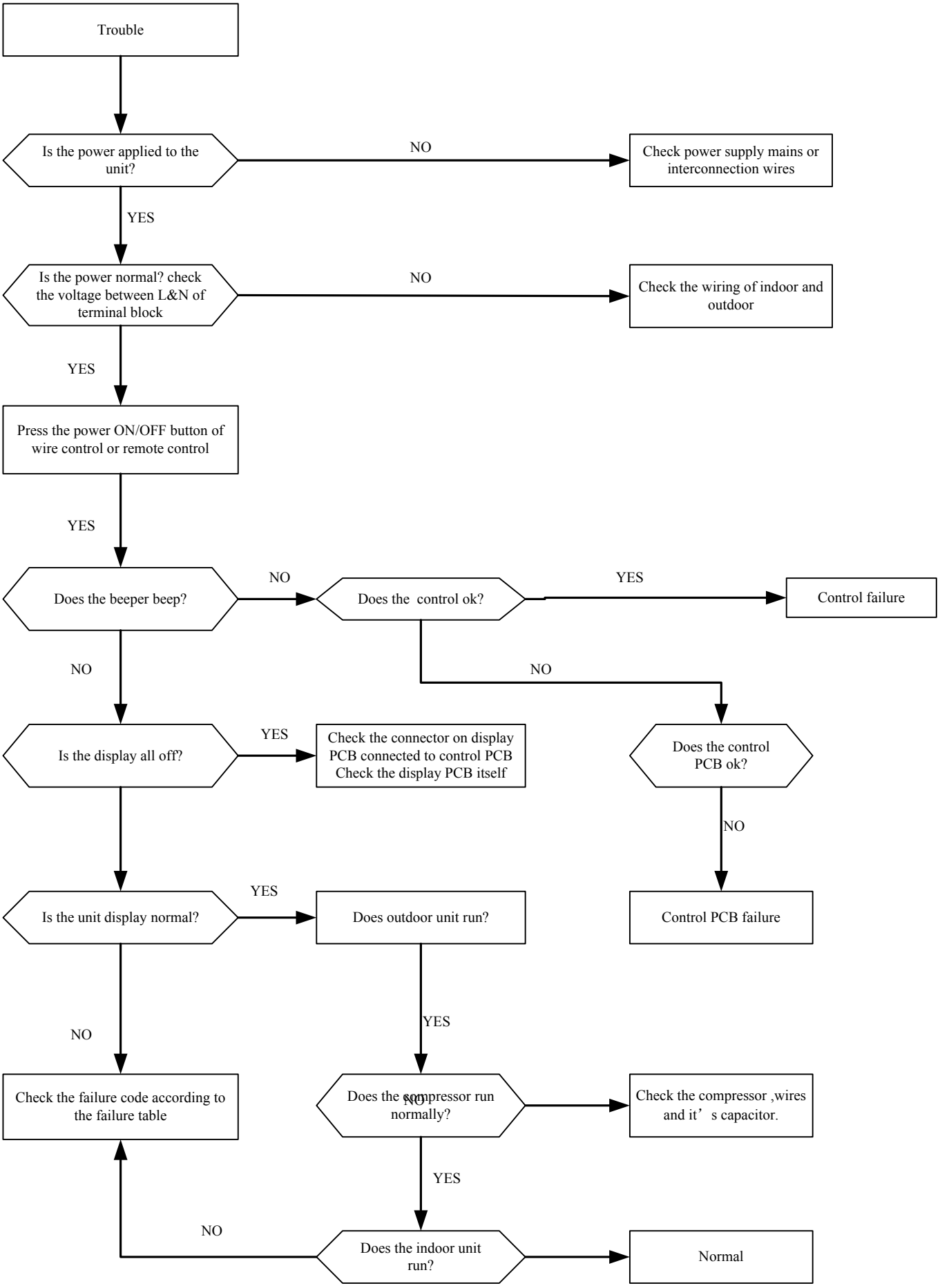
<Primary check>

(1) Is the room temperature higher than the preset temperature in cooling operation?

(2) Is the crossover cable connected properly?




Press START/STOP button.
The unit does not beep at all.
OPERATION indication on
indoor unit is not indicated.
Is transmission mark indicated?
NO
YES
Is receiver on indoor unit exposed to direct sunlight?
NO
YES
Press RST button on remote control with tip of pencil.
YES
Is there any thyristor fluorescent light nearby?
NO
NO
Does indoor unit operate when moving remote control near receiver or indoor unit?
YES
YES
Press START/STOP button.
Batteries are exhausted.
NO
Does indoor unit start to operate by automatic restart function?
Is transmission mark indicated?
NO
YES
YES
NO
Does indoor unit beep and operate?
YES
Does radio sound is affected by remote control when a signal is transmitted at distance of 5 cm from radio?
NO
YES
Remote control is defective.
P.C. board is defective.
Avoid direct sunlight.
Keep indoor unit away from thyristor fluorescent light.
Replace P.C. board.
Replace batteries.
Normal operation
Replace remote control.


Trouble
Is the power applied to the unit?
NO
Check power supply mains or interconnection wires
YES
Is the power normal? check the voltage between L&N of terminal block
NO
Check the wiring of indoor and outdoor
YES
Press the power ON/OFF button of wire control or remote control
YES
Does the beeper beep?
NO
Does the control ok?
YES
Control failure
NO
NO
Is the display all off?
YES
Check the connector on display PCB connected to control PCB Check the display PCB itself
Does the control PCB ok?
NO
Control PCB failure
Is the unit display normal?
YES
Does outdoor unit run?
NO
YES
Check the failure code according to the failure table
Does the compressor run normally?
NO
Check the compressor ,wires and it’s capacitor.
YES
NO
Does the indoor unit run?
Normal

NOBU

Floorstanding Air-Conditioning Unit