ComfortStar®

AHE SERIES

Service Manual 2016

AHE36-1, AHE60-1

※The specifications, designs, and information in this book are subject to change without notice for product improvement.

Part 1
General Information

1. Model lists

Sale Model		CCU36-410-S	CCU60-410	CCU60-410-3
Code		AHE36-1	AHE60-1	AHE60-1
Power supply	V-Ph-Hz	220~1-60	220~1-60	220~3-60

2. External Appearance

Air Handler

2.2 Outdoor Units

3. Nomenclature

Part 2
Indoor Units

Air Handler Indoor Unit

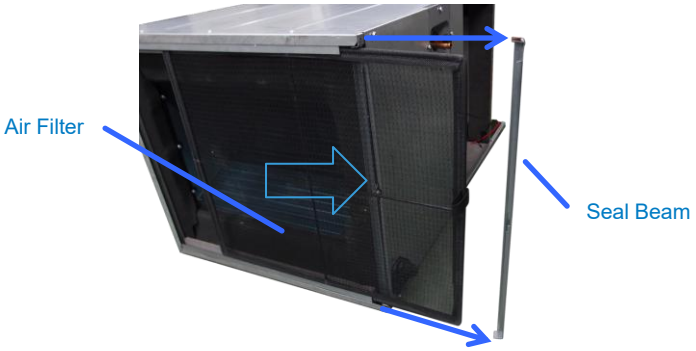
1. Features

Cabinet

The enclosure is built with galvanized steel and coated with a protective paint. It is convenient for transportation and installation and fully insulated from high temperature and high voltage, in order to avoid hazardous risks.

Filter

Factory installed filter can be cleaned and reinstalled for air filtration.



Drainage

Enhancing primary and second drainage design allows complete drainage to improve in-house air quality.

Protection

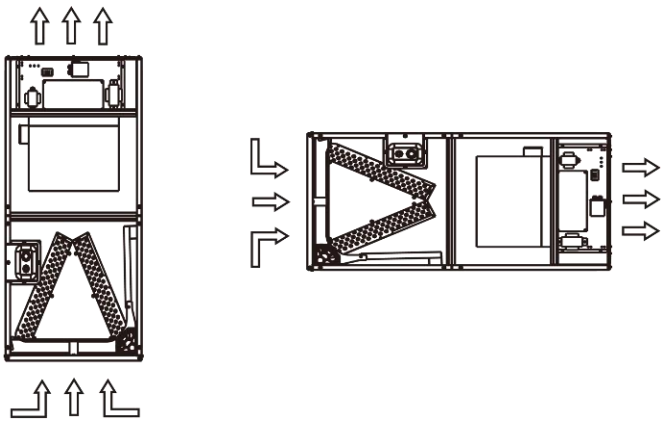
Factory installed coil temperature sensor providing effective protection of the system.

Expansion Device

The Valve Expansion Device is durable and guarantees stable operation.

Application

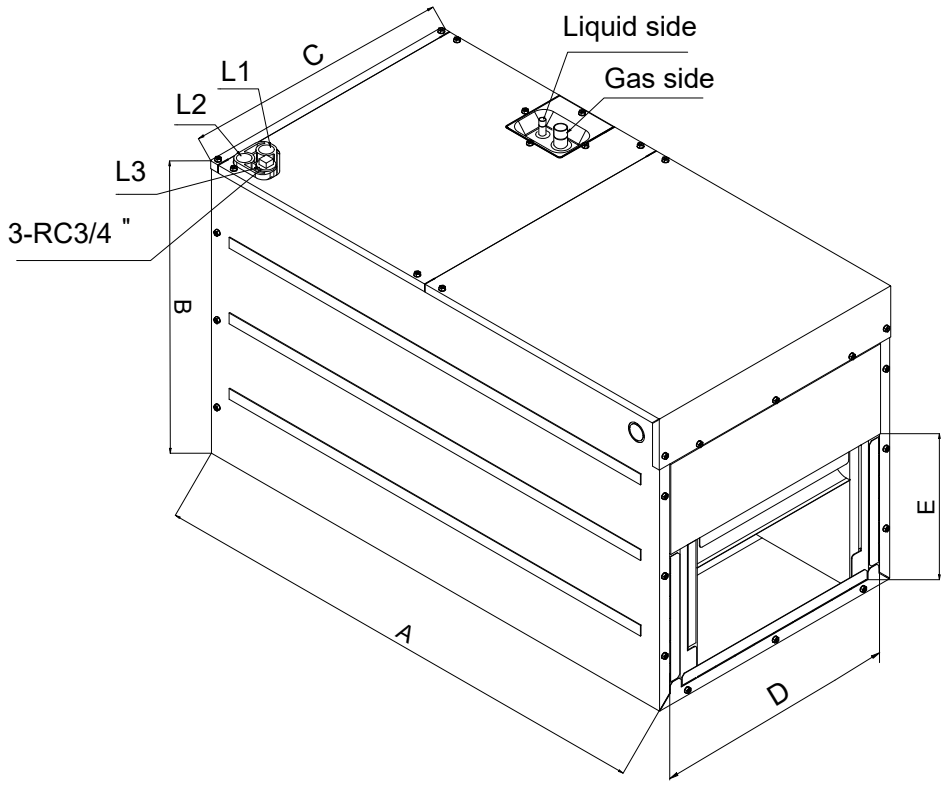
Multiple airflow positions design, which includes up-flow, horizontal, enables an extensive share of the air exchanged.



Performance

This series is designed and tested by ARI 210/240 standard.

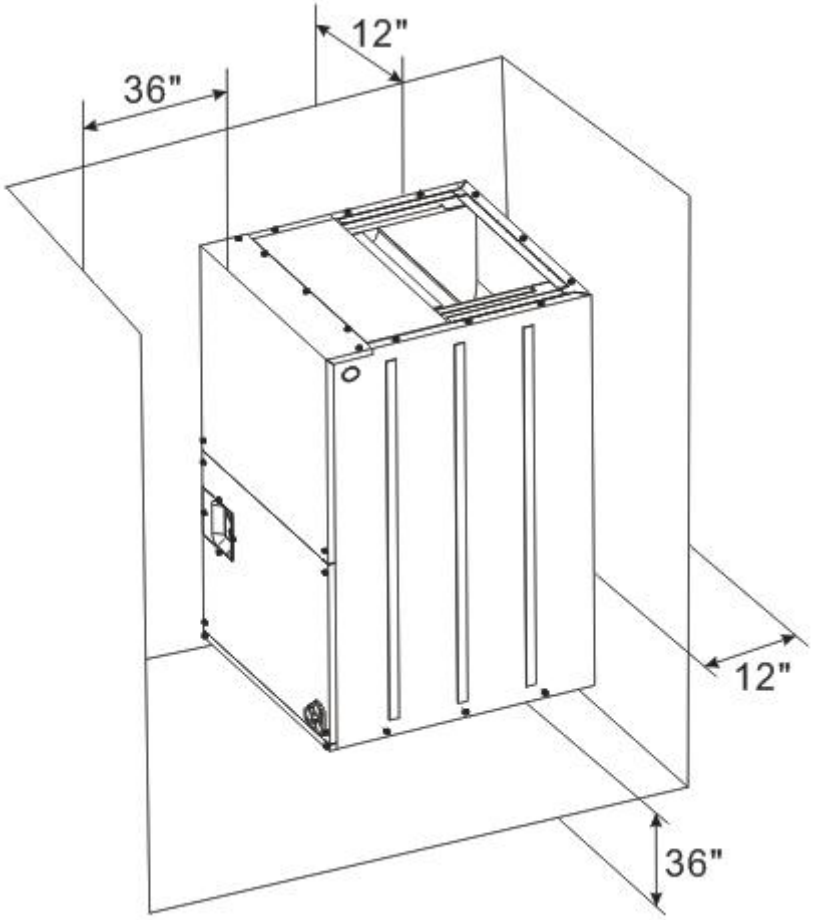
2. Dimensions



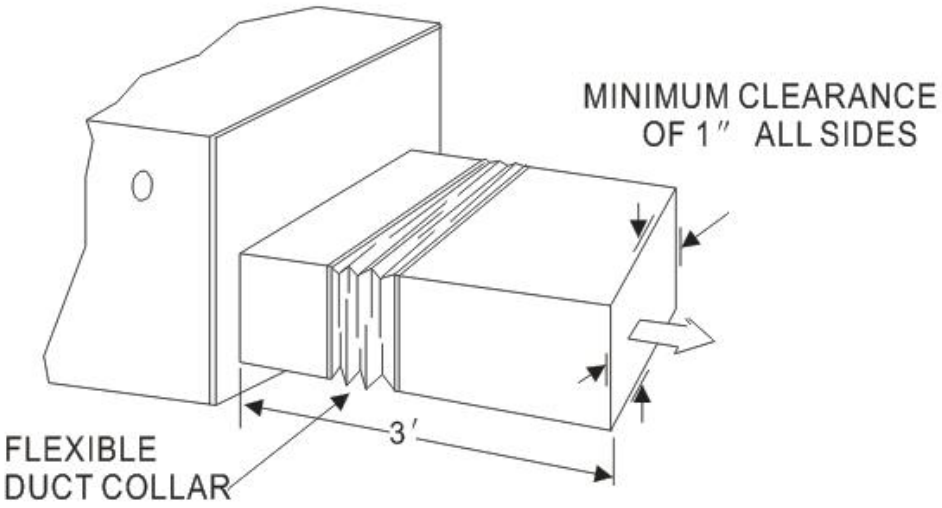
Model	Dimensions inch(mm)					Drain hole		
	A (Height)	B (Depth)	C (Width)	D (Duct)	E (Duct)	L1	L2	L3
36K	30-1/2 (774)	20-1/2 (520)	18-1/8 (460)	16-1/4 (414)	9-5/8 (245)	Primary drain (for upflow)	Primary drain (for horizon) Secondary drain (for upflow)	Secondary drain (for horizon)
48~60K	38-3/16 (970)	21-5/8 (550)	20 (500)	17-7/8 (454)	10-1/2 (266)			

3. Service Space

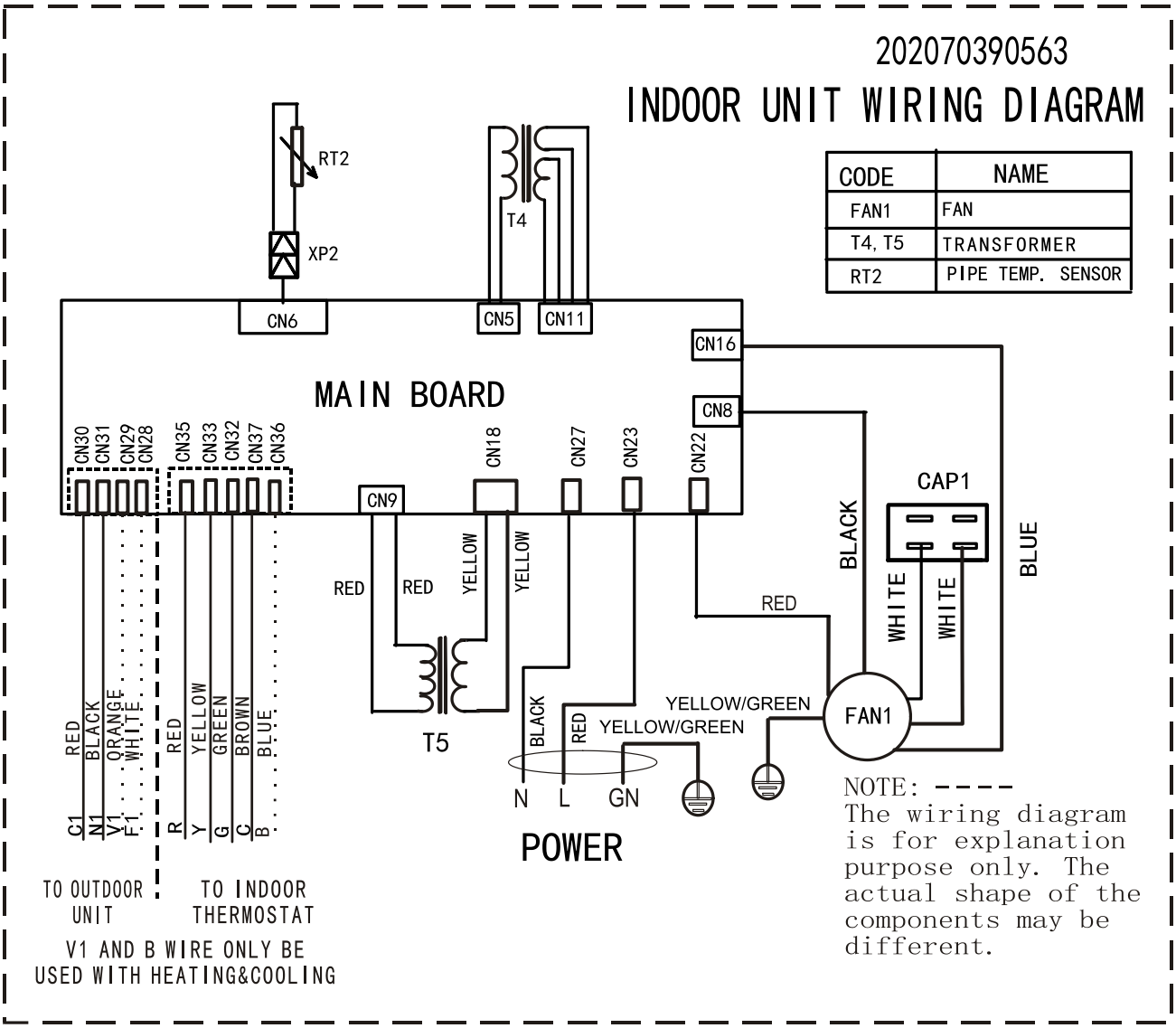
1. Refrigerant piping and connections- minimum12" recommended.
2. Maintenance and servicing access - minimum36" from front of unit recommended for blower motor/coil replacement.
3. Filter removal - minimum 36" recommended.



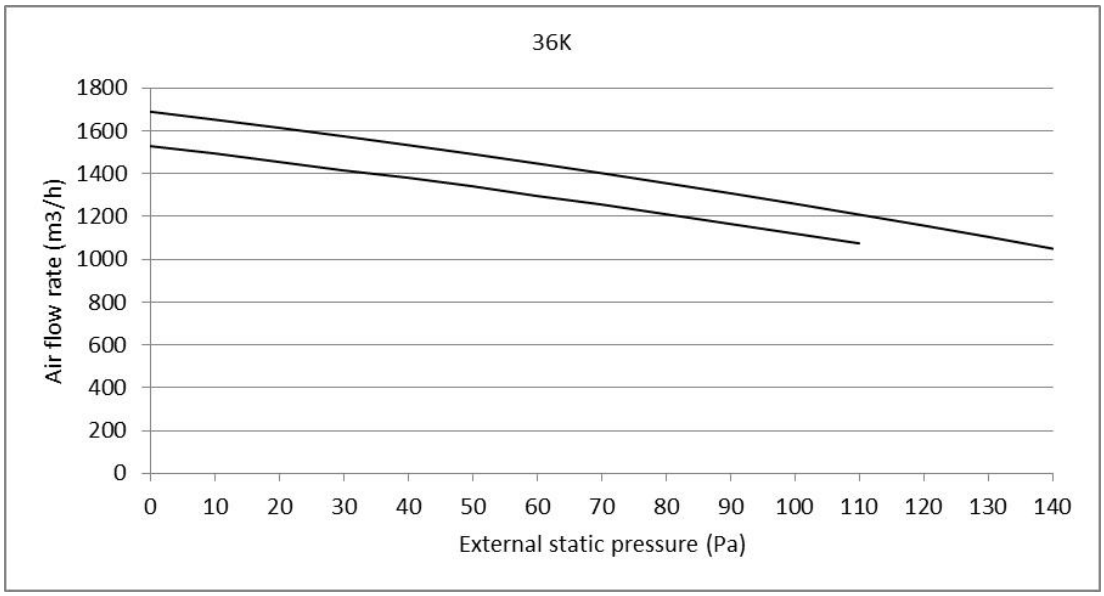
Plenum Clearances:

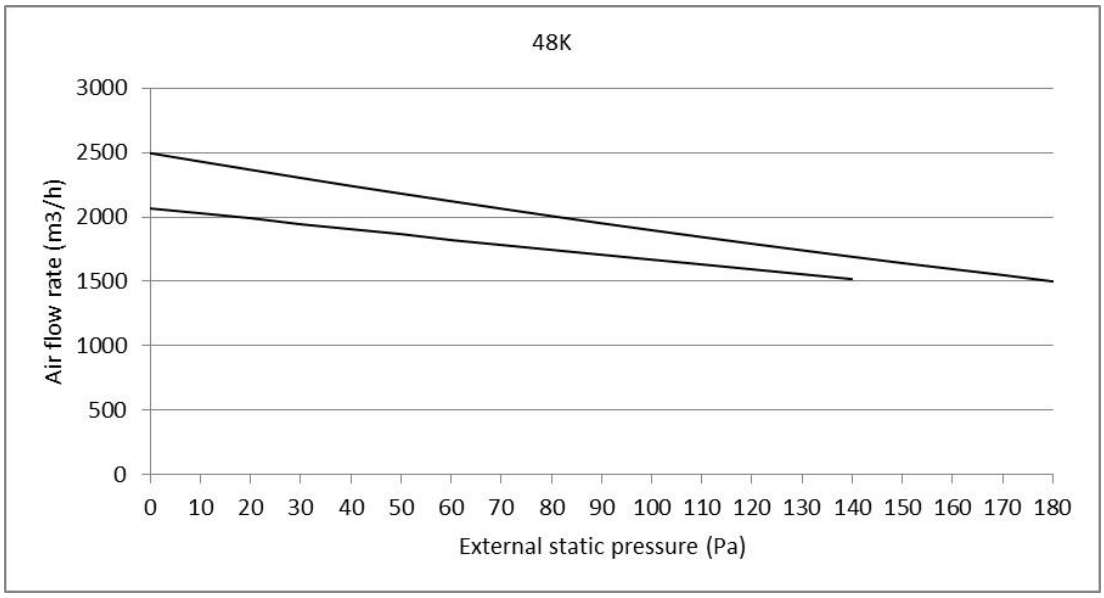


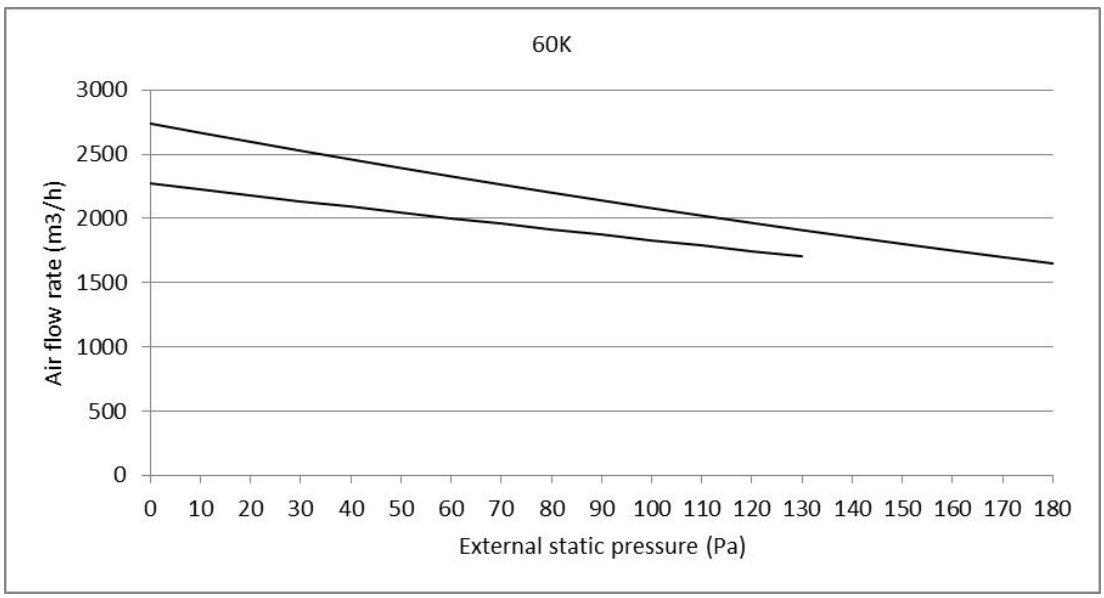
4. Wiring Diagrams



5. Static Pressure





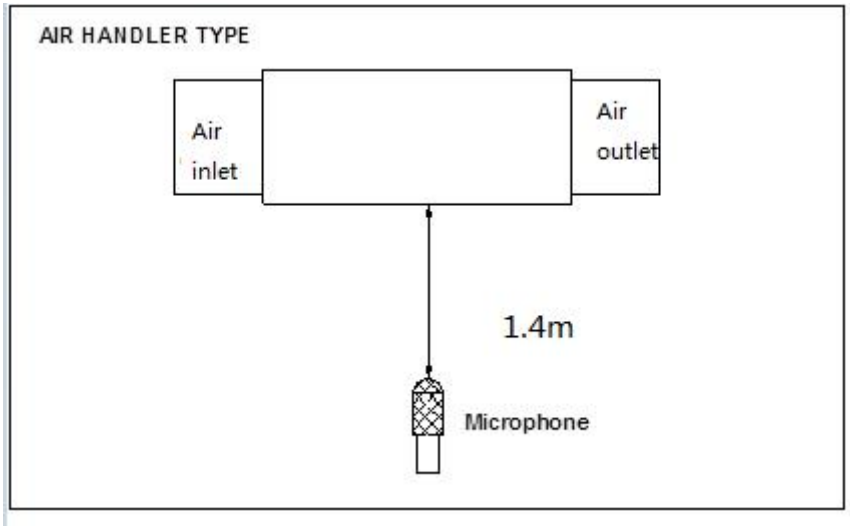


6. Electric Characteristics

Model	Indoor Units				Power Supply
	Hz	Voltage	Min.	Max.	MFA
36K	60	220-230V	198V	242V	16
48K	60	220-230V	198V	242V	16
60K	60	220-230V	198V	242V	16

Note:
MFA: Max. Fuse Amps. (A)

7. Sound Levels

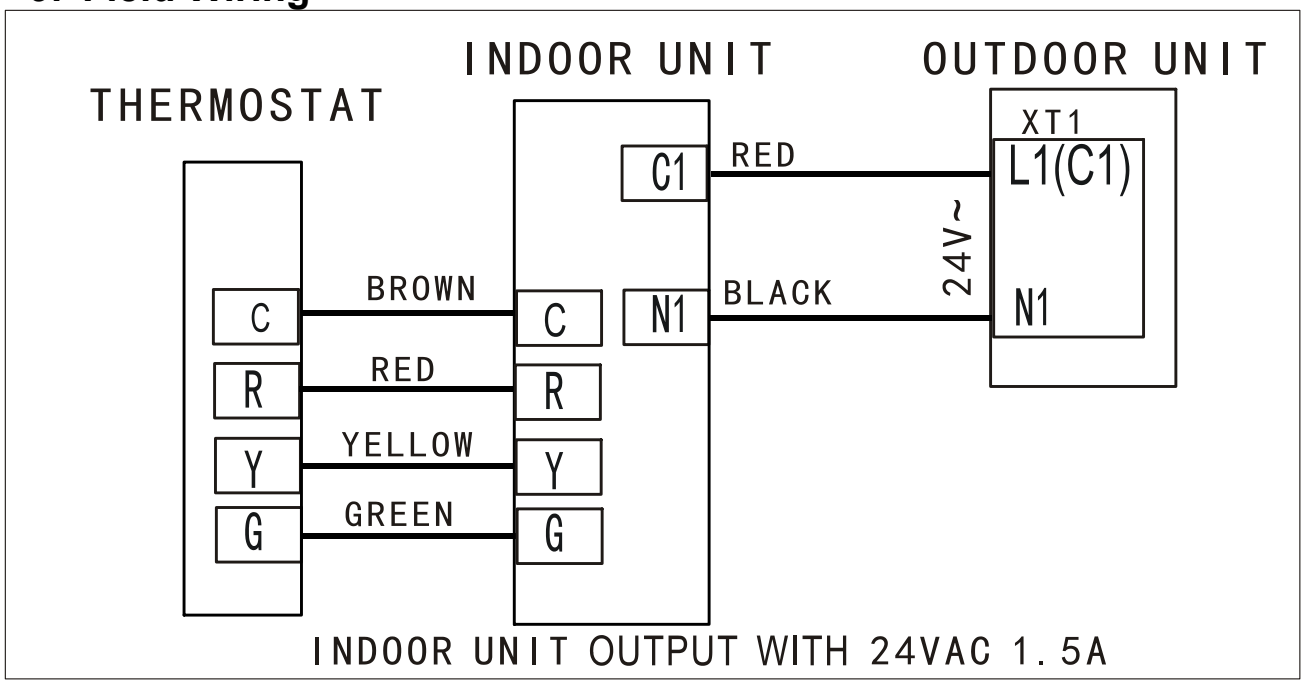


Model	Noise level dB(A)
	H
36K	55
48K	54
60K	55

8. The Specification of Power

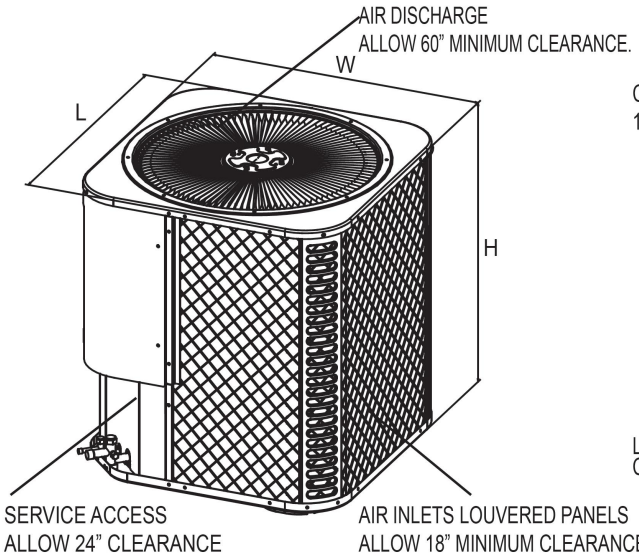
Capacity(Btu/h)				36K	48K	60K	60K
Power		Indoor	Phase	1PH			1PH
			Frequency/Voltage	220-230V, 60Hz			220-230V, 60Hz
		Outdoor	Phase	1PH			3PH
			Frequency/Voltage	220-230V, 60Hz			220-230V, 60Hz
Input Current Fuse		Indoor unit(A)		5A	5A	5A	5A
Lines Gauge	Indoor Unit Power Line	Line Quantity		3	3	3	3
		Line Diameter(AWG)		18	18	18	18
	Outdoor Unit Power Line	Line Quantity		3	3	3	5
		Line Diameter(AWG)		12	10	10	10
	Outdoor-Indoor Signal Line	Lines Quantity		2	2	2	2
		Line Diameter(AWG)		18	18	18	18
	Thermostat Signal Line	Lines Quantity		4	4	4	4
		Line Diameter(AWG)		18	18	18	18

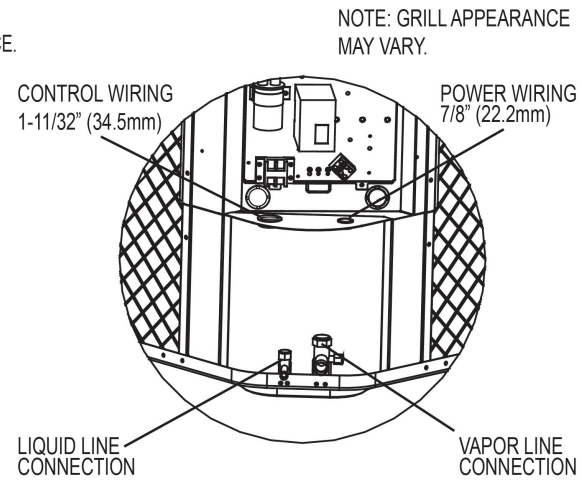
9. Field Wiring



Part 3
Outdoor Units

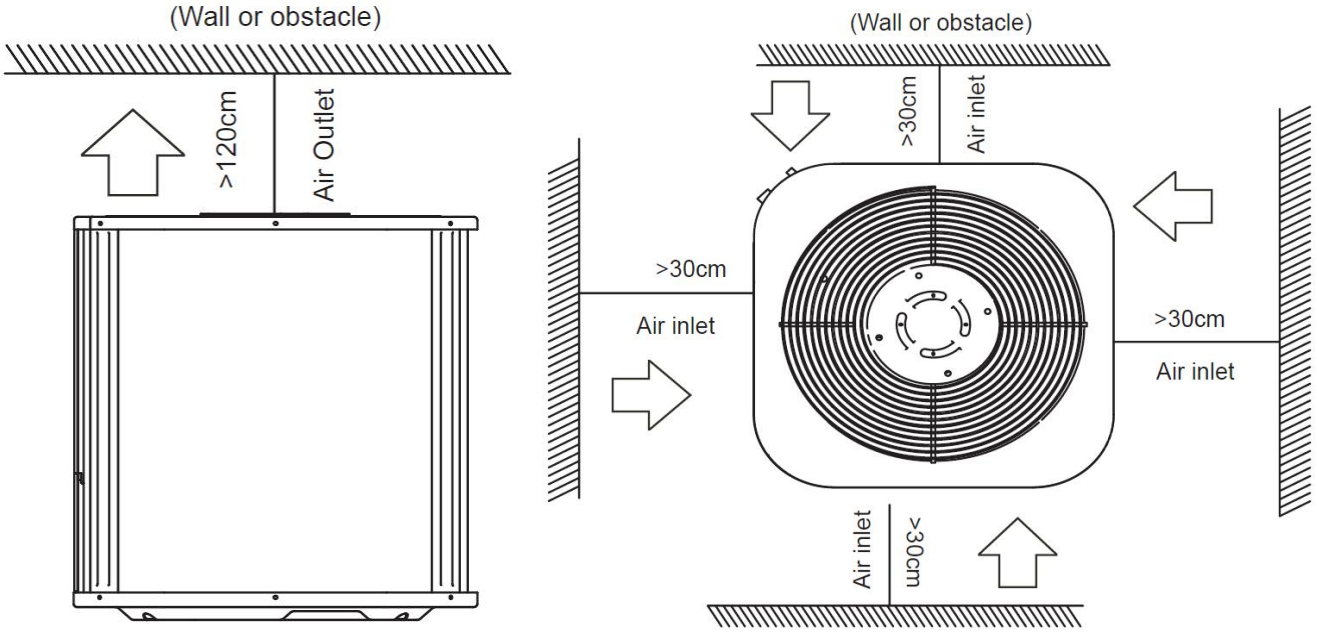
1. Dimensions





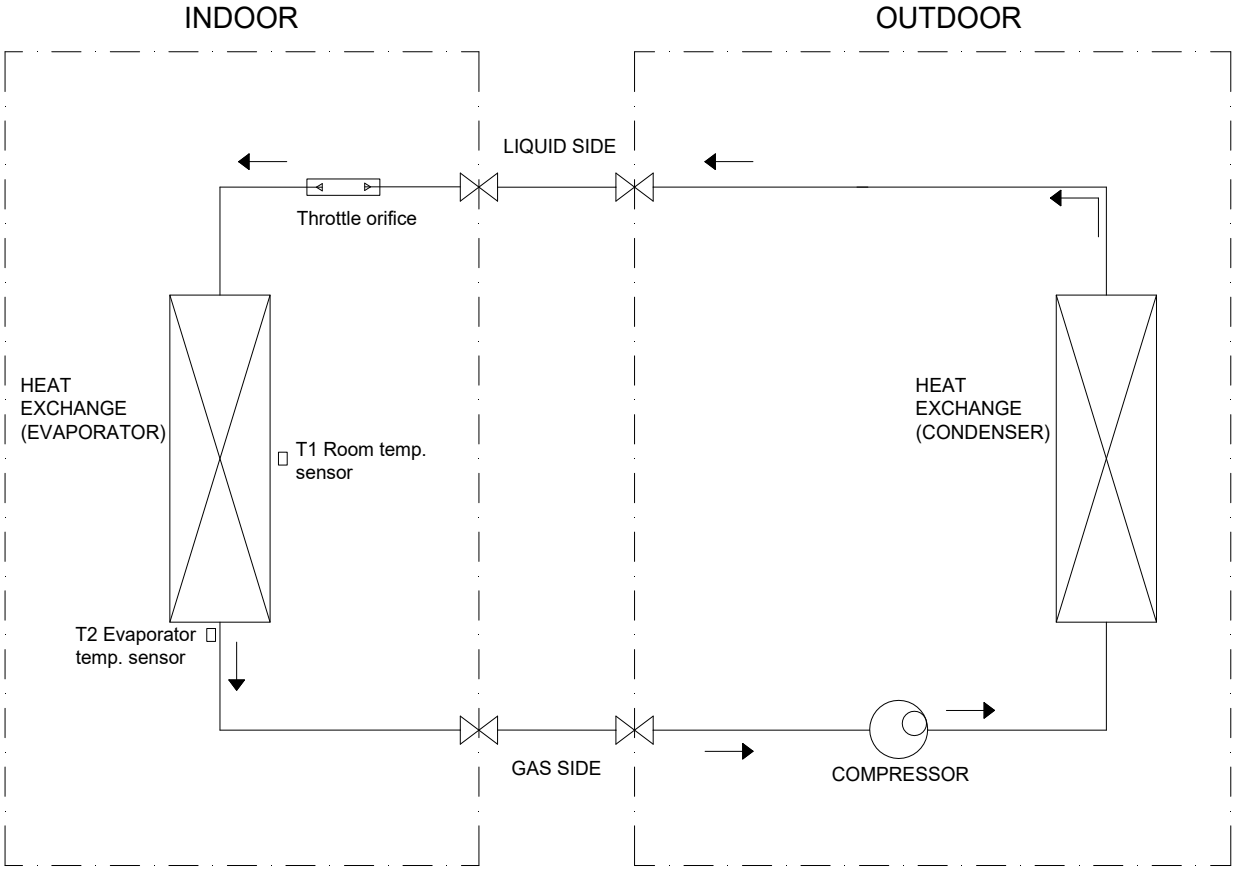
Sale Model			**CCU36-410-S**	**CCU48-410**	**CCU60-410**	**CCU60-410-3**
Outdoor unit	Dimension(WxDxH)	mm	600x600x759	710x710x759	710x710x843	710x710x843
Refrigerant piping	Liquid side/ Gas side	mm	Φ9.52/Φ19 (3/8"/3/4")	Φ9.52/Φ19 (3/8"/3/4")	Φ9.52/Φ19 (3/8"/3/4")	Φ9.52/Φ19 (3/8"/3/4")
	Max. refrigerant pipe length	m	30	50	50	50
	Max. difference in level	m	20	30	30	30

2. Service Space

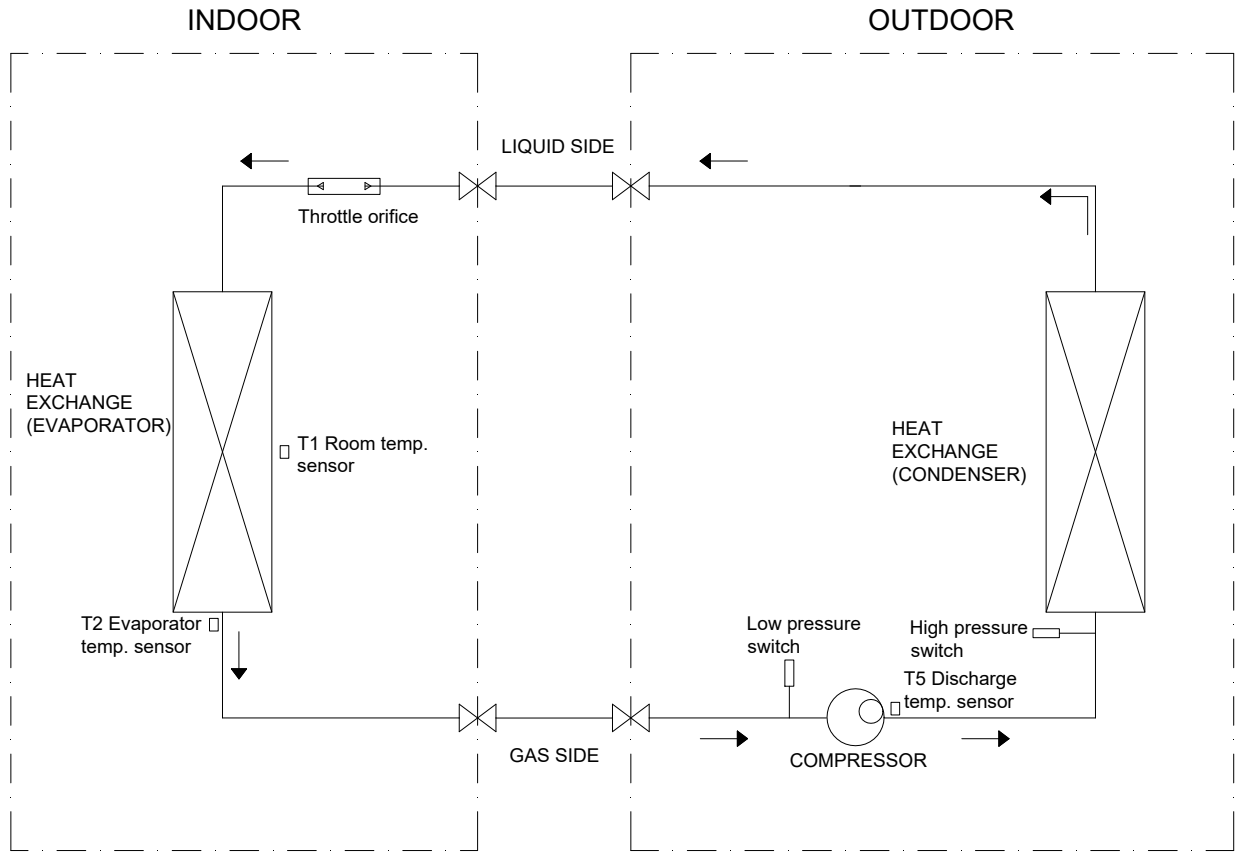


3. Piping Diagrams

24K, 36K

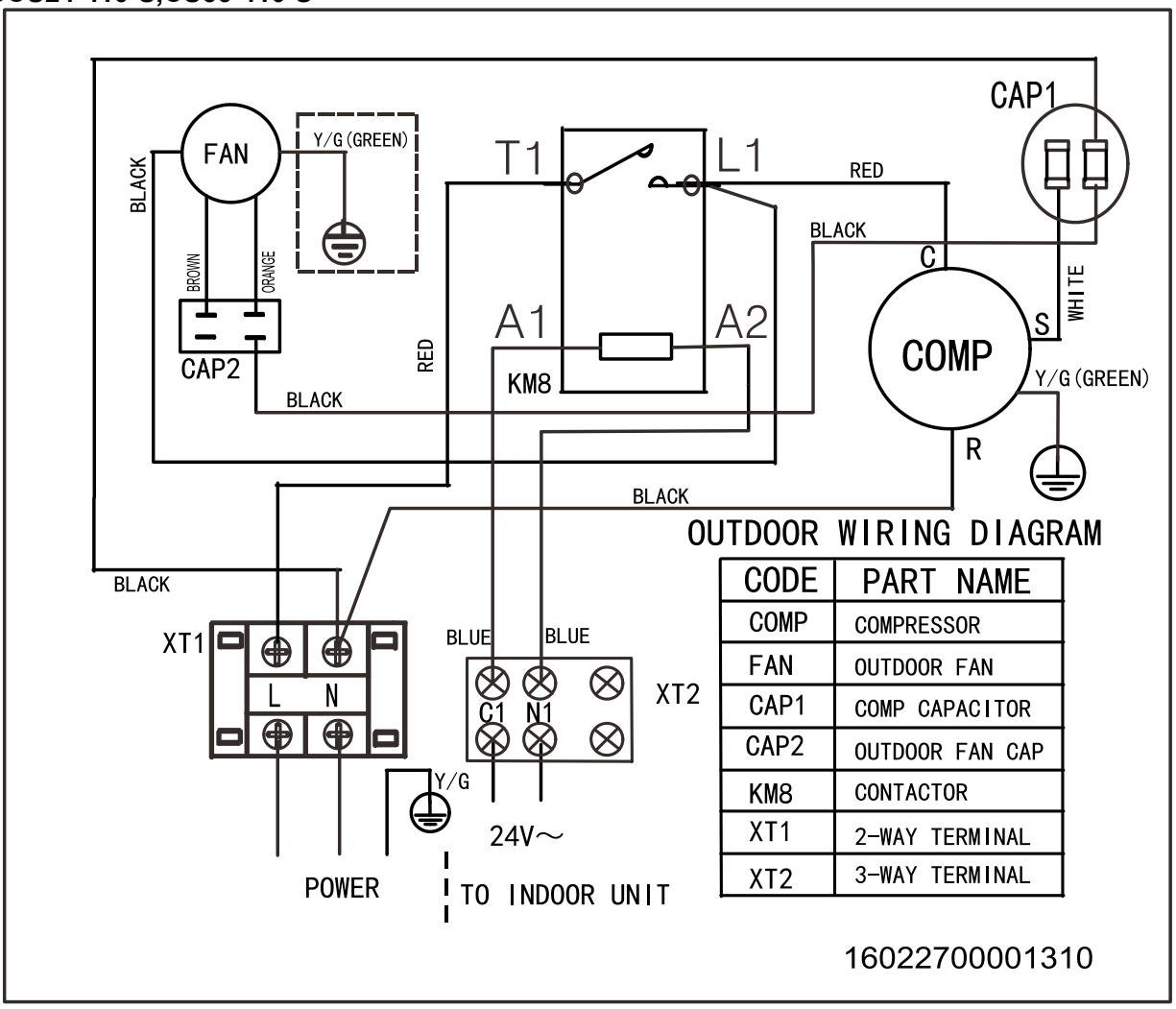


48K, 60K



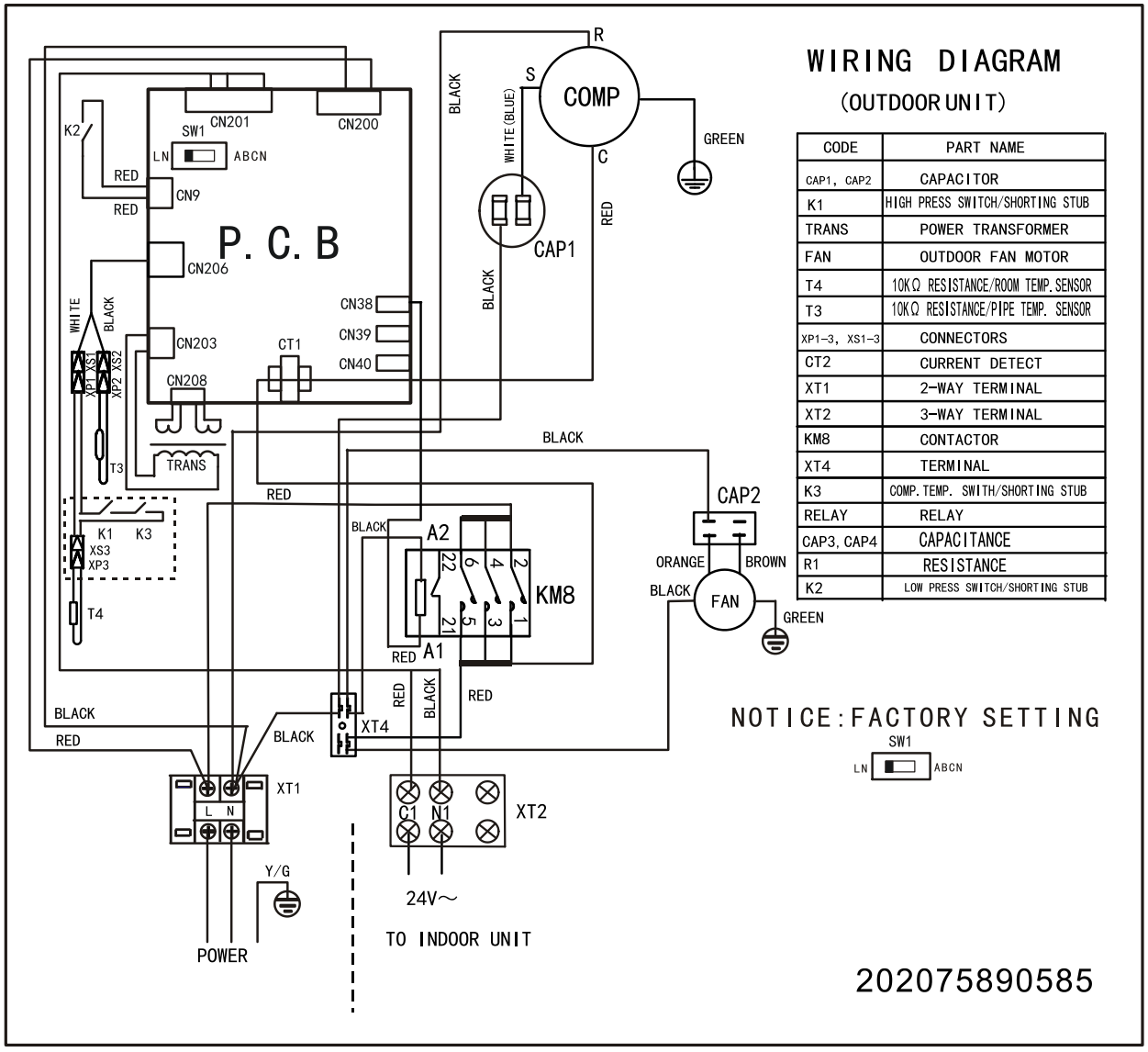
4. Wiring Diagrams

CCU24-410-S,CU36-410-S

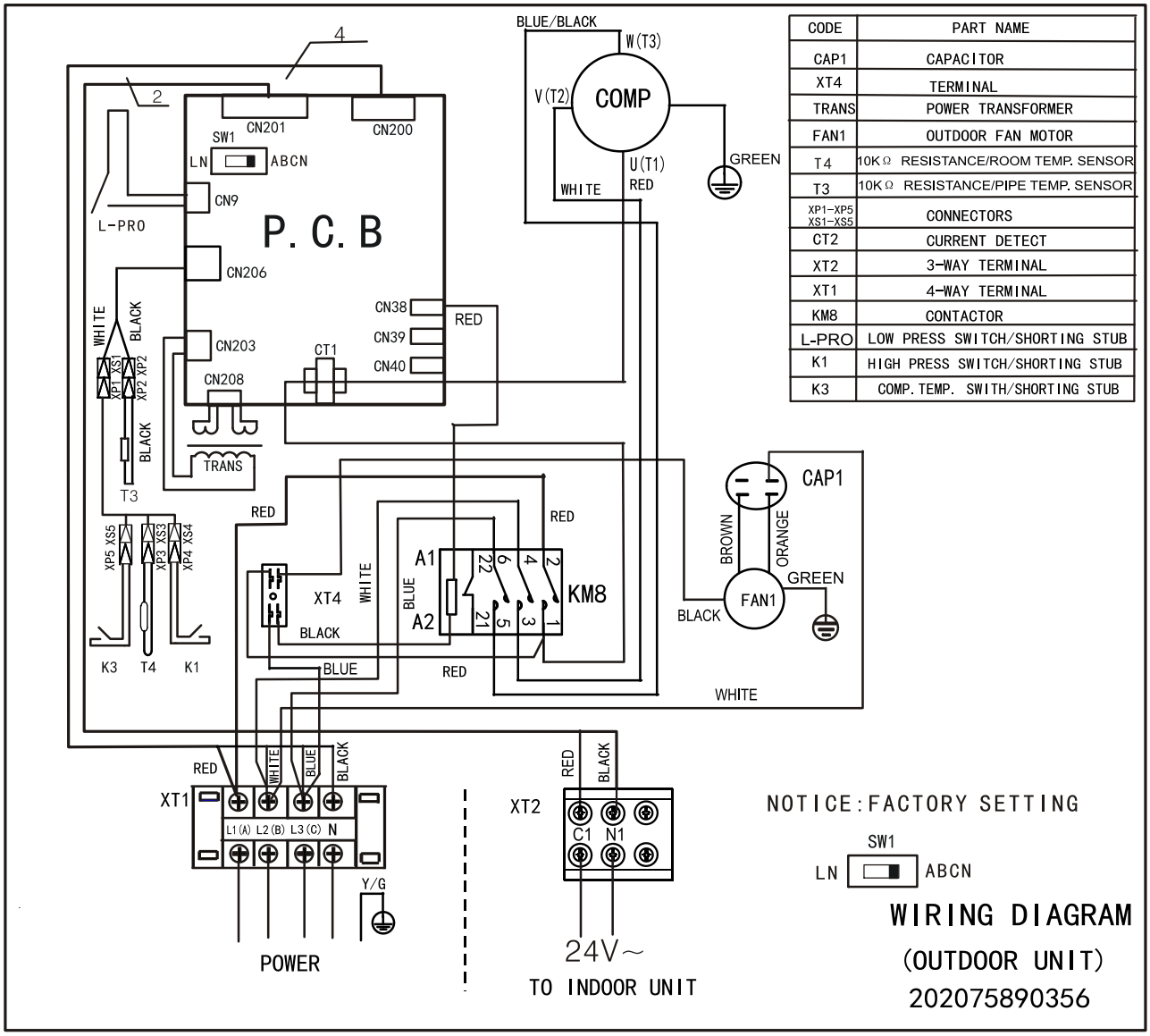


CODE	PART NAME
COMP	COMPRESSOR
FAN	OUTDOOR FAN
CAP1	COMP CAPACITOR
CAP2	OUTDOOR FAN CAP
KM8	CONTACTOR
XT1	2-WAY TERMINAL
XT2	3-WAY TERMINAL

CCU36-410-S,
CCU60-410-S



CCU60-410-3-S



CODE	PART NAME
CAP1	CAPACITOR
XT4	TERMINAL
TRANS	POWER TRANSFORMER
FAN1	OUTDOOR FAN MOTOR
T4	10KΩ RESISTANCE/ROOM TEMP. SENSOR
T3	10KΩ RESISTANCE/PIPE TEMP. SENSOR
XP1-XP5 XS1-XS5	CONNECTORS
CT2	CURRENT DETECT
XT2	3-WAY TERMINAL
XT1	4-WAY TERMINAL
KM8	CONTACTOR
L-PRO	LOW PRESS SWITCH/SHORTING STUB
K1	HIGH PRESS SWITCH/SHORTING STUB
K3	COMP. TEMP. SWITH/SHORTING STUB

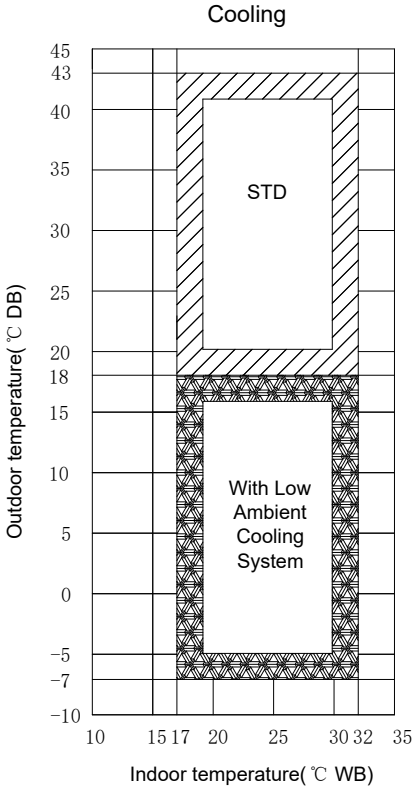
5. Electric Characteristics

Model	Power Supply					Power Supply
	Hz	Phase	Voltage	Min.	Max.	MFA
CCU24-410-S	60	1	220-230V	198V	242V	25
CCU36-410-S	60	1	220-230V	198V	242V	40
CCU48-410-S	60	1	220-230V	198V	242V	55
CCU60-410-S	60	1	220-230V	198V	242V	60
CCU60-410-3-S	60	3	220-230V	198V	242V	25

Note:
MFA: Max. Fuse Amps. (A)

6. Operation Limits

Mode \ Temperature	Cooling operation
Room temperature	17℃～32℃
Outdoor temperature	18℃～43℃
	（-7℃～43℃：For the models with low temperature cooling system）

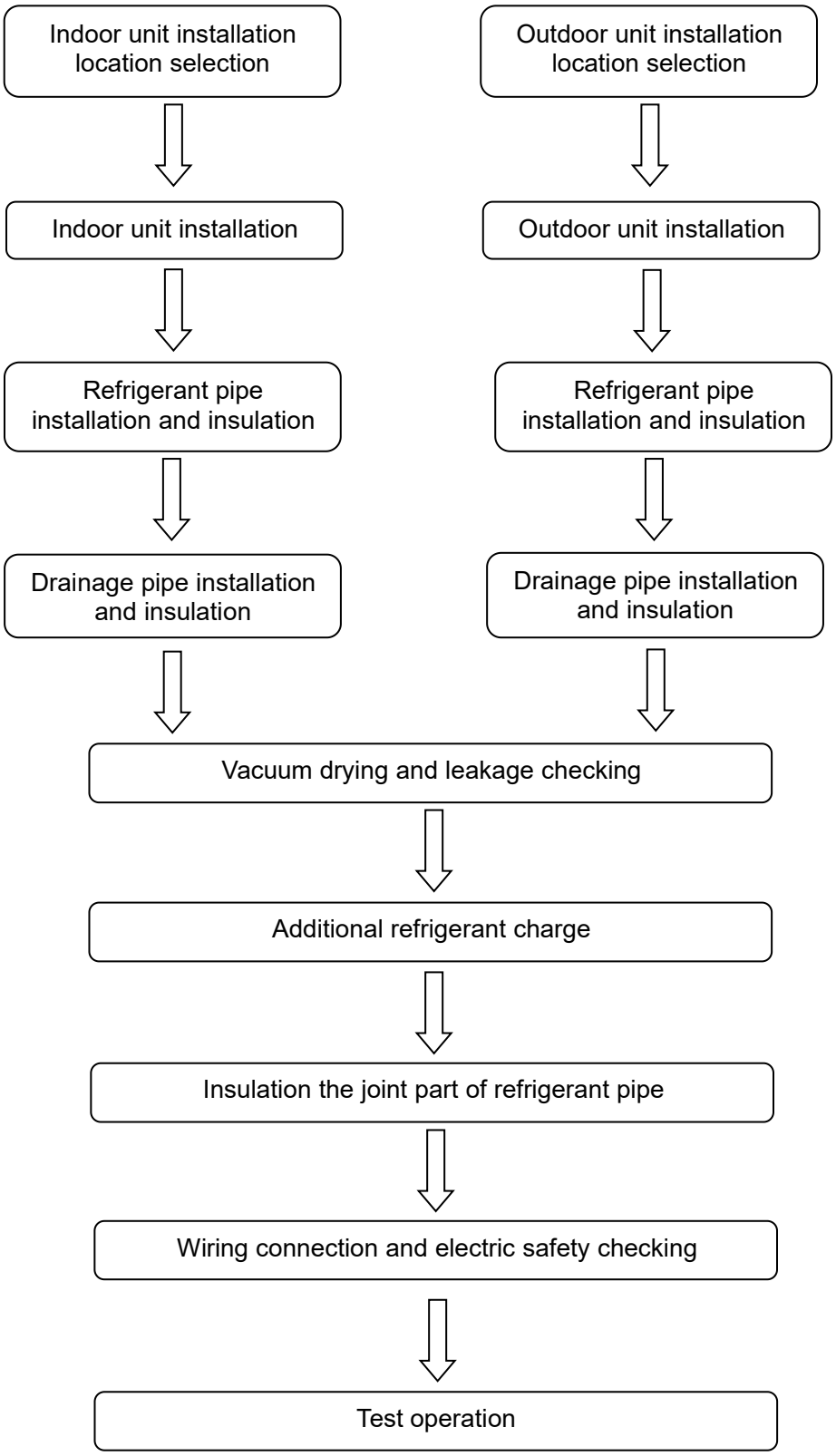


7. Sound Levels

Model	Noise level dB(A)
CCU36-410-S	63
CCU48-410-S	63
CCU60-410-S	65
CCU60-410-3-S	65

Part 4
Installation

1. Installation Procedure



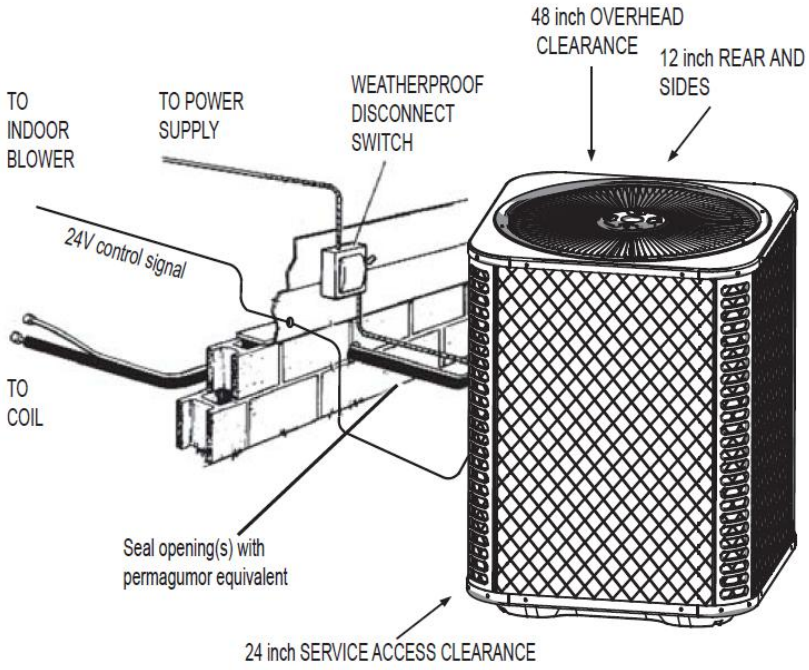
2. Location selection

2.1 Indoor unit location selection

- The place shall easily support the indoor unit's weight.
- The place can ensure the indoor unit installation and inspection.
- The place can ensure the indoor unit horizontally installed.
- The place shall allow easy water drainage.
- The place shall easily connect with the outdoor unit.
- The place where air circulation in the room should be good.
- There should not be any heat source or steam near the unit.
- There should not be any oil gas near the unit
- There should not be any corrosive gas near the unit
- There should not be any salty air neat the unit
- There should not be strong electromagnetic wave near the unit
- There should not be inflammable materials or gas near the unit
- There should not be strong voltage vibration.

2.2 Outdoor unit location selection

- The place shall easily support the outdoor unit's weight.
- Locate the outdoor unit as close to indoor unit as possible
- The piping length and height drop can not exceed the allowable value.
- The place where the noise, vibration and outlet air do not disturb the neighbors.
- There is enough room for installation and maintenance.
- The air outlet and the air inlet are not impeded, and not face the strong wind.
- It is easy to install the connecting pipes and cables.
- There is no danger of fire due to leakage of inflammable gas.
- It should be a dry and well ventilation place
- The support should be flat and horizontal
- Do not install the outdoor unit in a dirty or severely polluted place, so as to avoid blockage of the heat exchanger in the outdoor unit.
- If is built over the unit to prevent direct sunlight, rain exposure, direct strong wend, snow and other scraps accumulation, make sure that heat radiation from the condenser is not restricted.



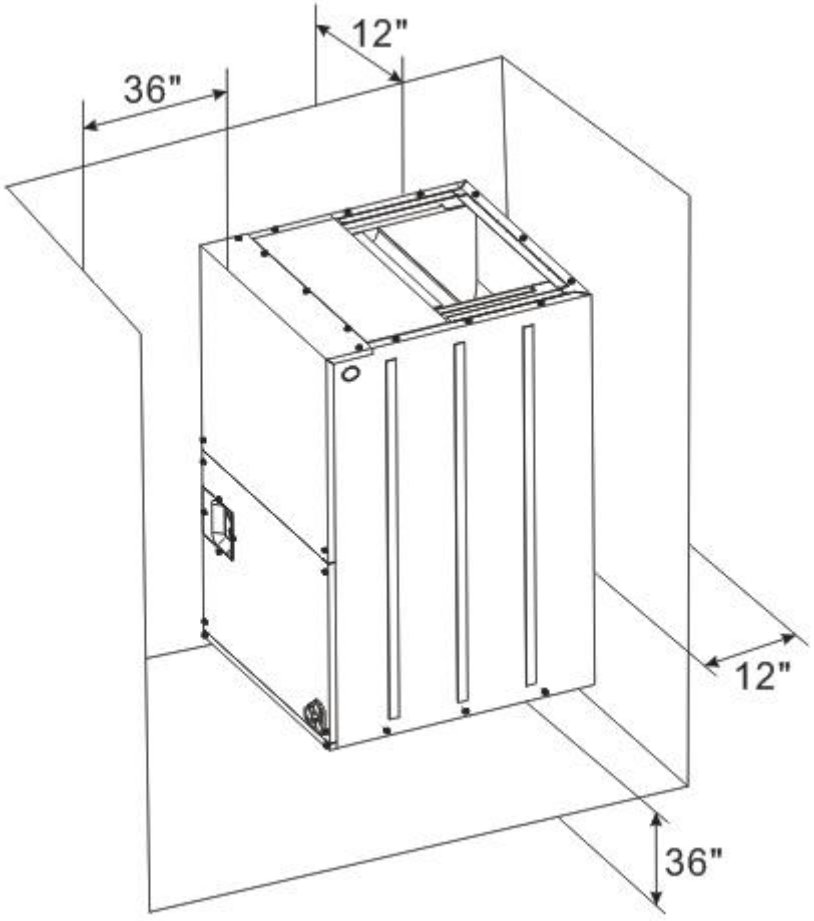
NOTE:All outdoor wiring must be weatherproof

3. Indoor unit installation

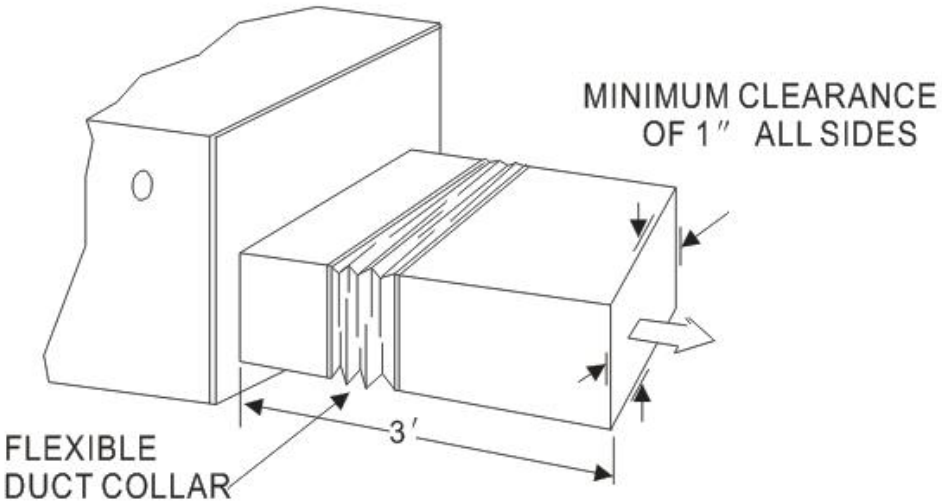
3.1 Air handler indoor unit installation

3.1 Service space for indoor unit

Refrigerant piping and connections- minimum12" recommended.
Maintenance and servicing access - minimum36" from front of unit recommended for blower motor/coil replacement.
Filter removal - minimum 36" recommended.

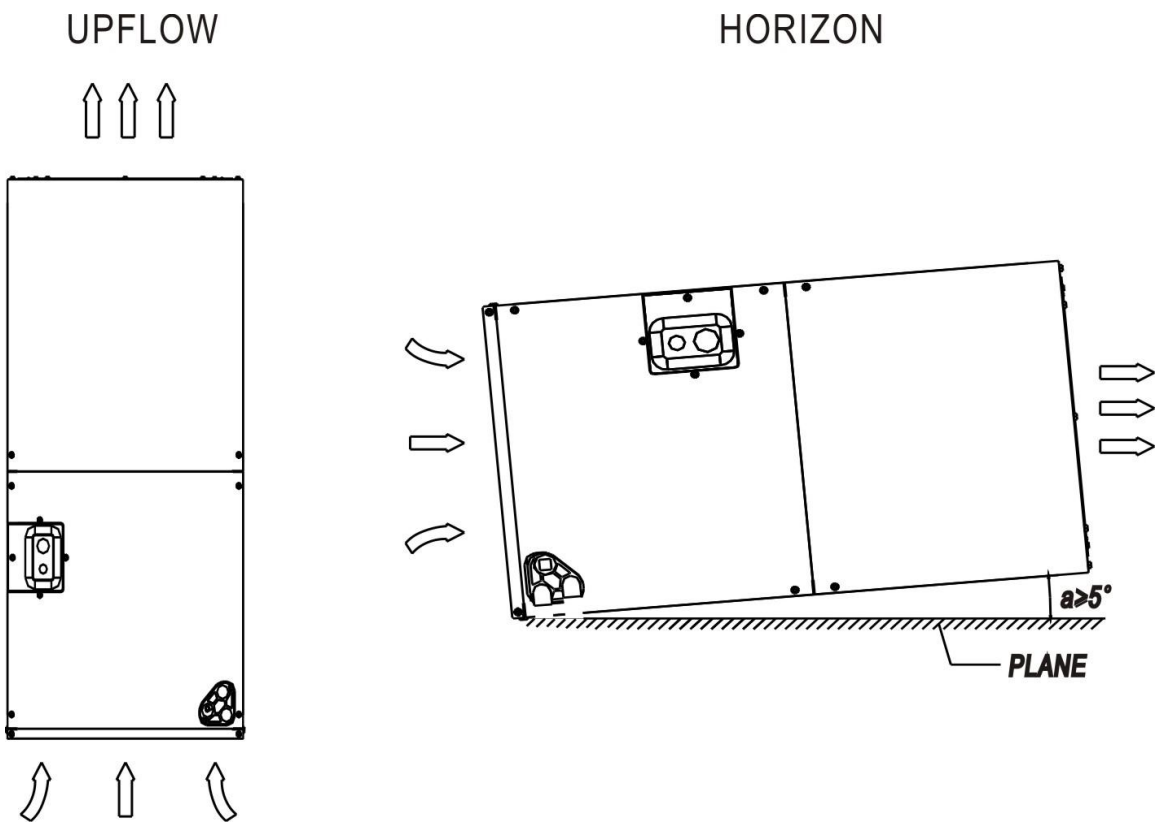


Plenum Clearances:



3.2 Install the main body

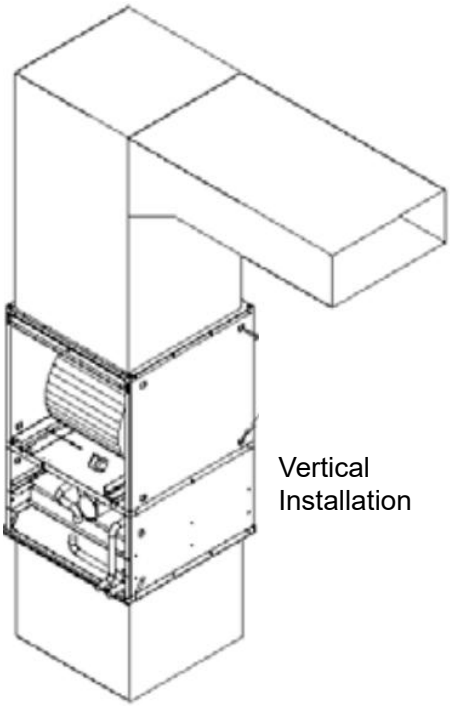
You can choose vertical or horizontal installation in accordance with the applications.



Note: *For drain the condensate out of the unit smoothly, please place the unit with a small angle when horizontal installation.*

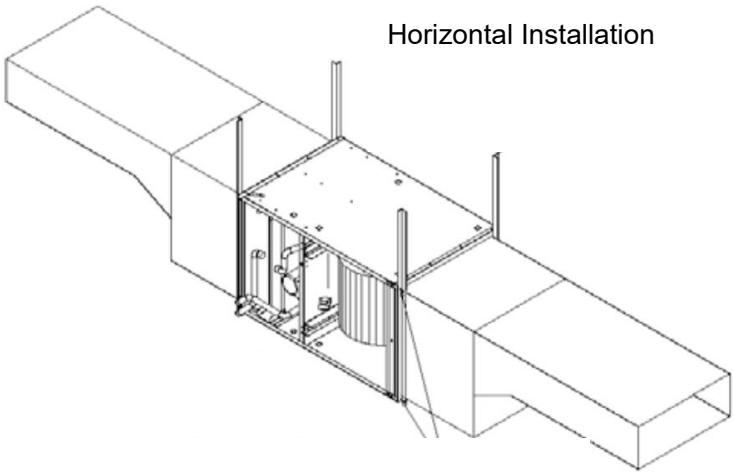
3.3 Install the air duct

Typical air duct design:



Vertical Installation

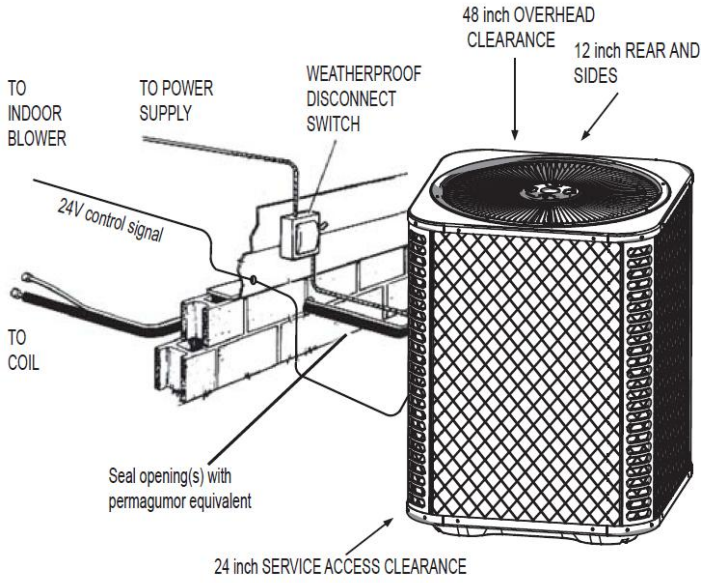
Horizontal Installation



Outdoor unit installation (Top Discharge Unit)

4.1 Location selection

Before starting the installation, select and check the suitability of the location for both the indoor and outdoor unit. Observe all limitations and clearance requirements. The outdoor unit must have sufficient clearance for air entrance to the condenser coil, for air discharge and for service access.



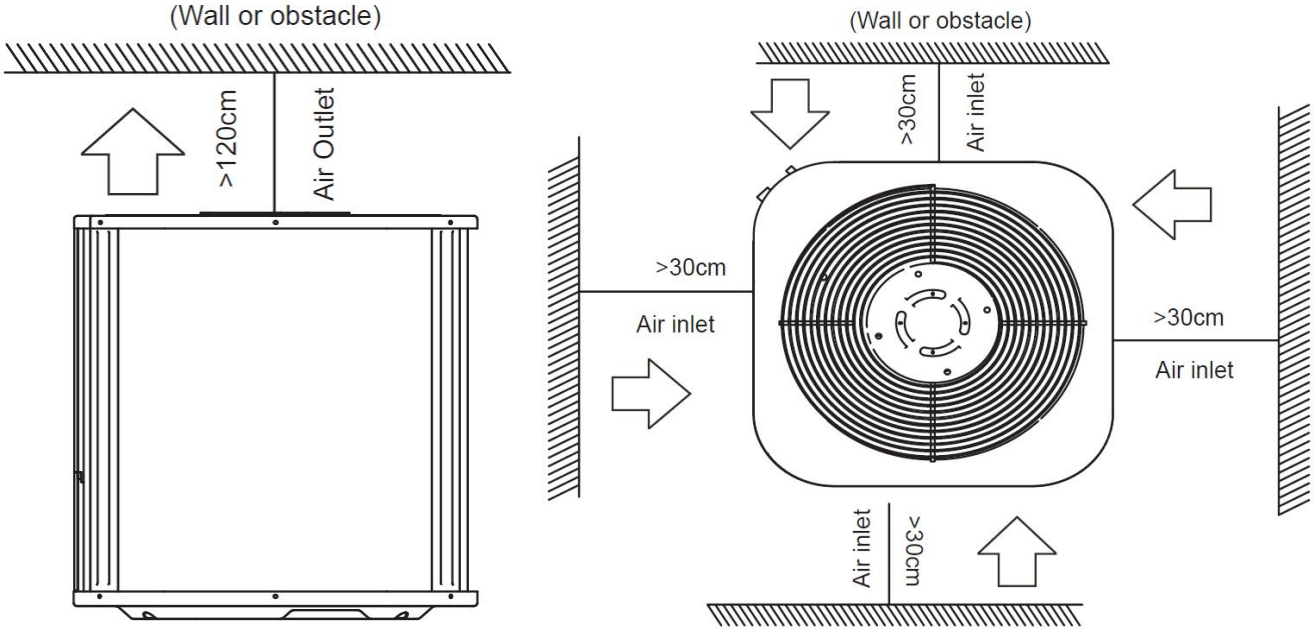
NOTE:All outdoor wiring must be weatherproof

Note: For multiple unit installations, units must be spaced a minimum of 18 inches apart. (Coil face to coil face.)

If the unit is to be installed on a hot sun exposed roof or a black-topped ground area, the unit should be raised sufficiently above the roof or ground to avoid taking the accumulated layer of hot air into the outdoor unit.

Provide an adequate structural support.

4.2 Service space for outdoor unit



4.3 Install the Unit

On ground installation

The unit may be installed at ground level on a solid base that will not shift or settle, causing strain on the refrigerant lines and possible leaks. Maintain the clearances shown in Fig.5 and install the unit in a level position.

Normal operating sound levels may be objectionable if the unit is placed directly under windows of certain rooms (bedrooms, study, etc.).

Top of unit discharge area must be unrestricted for at least 6 feet above the unit.

Warning: The outdoor unit should not be installed in an area where mud or ice could cause personal injury. Elevate the unit sufficiently to prevent any blockage of the air entrances by snow in areas where there will be snow accumulation. Check the local weather bureau for the expected snow accumulation in your area. Isolate the unit from rain gutters to avoid any possible wash out of the foundation.

On roof installation

When installing units on a roof, the structure must be capable of supporting the total weight of the unit, including a padded frame unit, rails, etc., which should be used to minimize the transmission of sound or vibration into the conditioned space.

Factory preferred tie-down method (Optional)

Note:

These instructions are intended as a method to tie-down system to cement slab as a securing procedure for high and areas. It is recommended to check Local codes for tie-down methods and protocols.

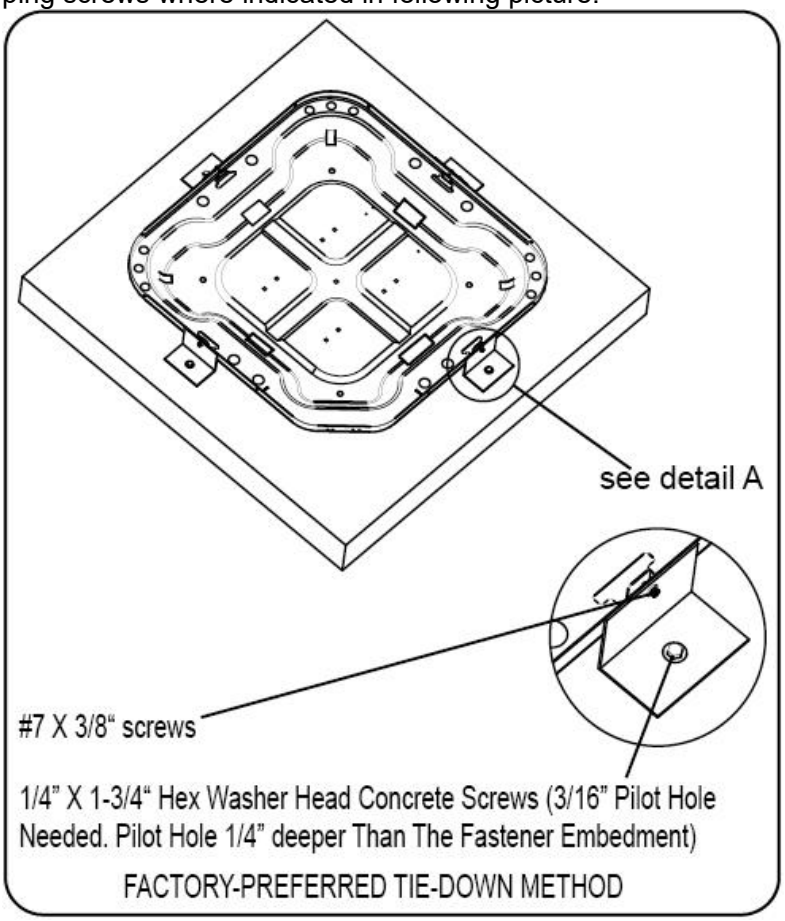
Step 1: Prior to installing clear pad of debris.

Step 2: Ensure cement pad is level.

IMPORTANT: Then cement pad must be made of HVAC-approved materials and must be the proper thickness to accommodate fasteners.

Step 3: Center unit onto pad.

Step 4: Fasten 4 L-shaped stainless steel braces onto cabinet base using 4 1/4" * 1/2" Hex washer head stainless steel self-tapping screws where indicated in following picture.



IMPORTANT: Do not use screws longer than indicated 1/4" * 2/3" and make sure that the brace is attached on center of base ban where indicated in Fig.7. Damage will occur to system.

Step 5: Drill 4 holes into cement base ensuring holes are 2 1//2"dp.

Step 6: Assemble unit to cement pad using 4 1/4" * 2" Hex washer head cement screws make sure not to over tighten.

Step 7:Finish unit assembly process as indicated in installation manual.

REQUIRED PARTS LIST NOTE: ALL PARTS ACAILABLE THROUGH LOCAL HARDWARE SUPPL.	
DESCRIPTION	QUANTITY
1/4" X 3/8" Hex Washer Head Concrete Screws	4
1/8" X 1-1/2" X W (width of unit +4") Metal straps	4
3/8" Washers	4

4. Refrigerant pipe installation

5.1 Maximum pipe length and height drop

Considering the allowable pipe length and height drop to decide the installation position. Make sure the distance and height drop between indoor and outdoor unit not exceeded the date in the following table.

Model	Max. Length	Max. Elevation
24,000Btu/h	25m	15m
36,000Btu/h	30m	20m
>36,000Btu/h	50m	30m

5.2 The procedure of connecting pipes

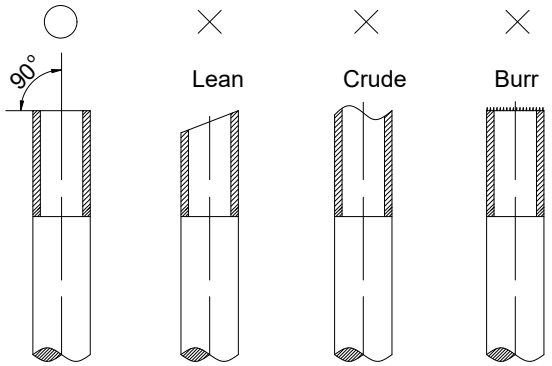
5.2.1 Choose the pipe size according to the specification table.

5.2.2 Confirm the cross way of the pipes.

5.2.3 Measure the necessary pipe length.

5.2.4 Cut the selected pipe with pipe cutter

- Make the section flat and smooth.

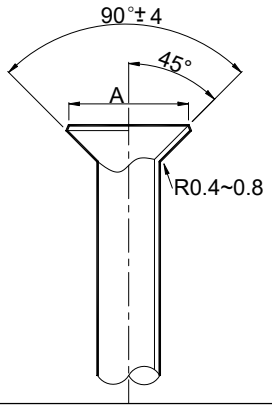


5.2.5 Insulate the copper pipe

- Before test operation, the joint parts should not be heat insulated.

5.2.6 Flare the pipe

- Insert a flare nut into the pipe before flaring the pipe
- According to the following table to flare the pipe

Pipe diameter	Flare dimension A (mm)		Flare shape
	Min	Max	
1/4" (6.35)	8.3	8.7	
3/8" (9.52)	12.0	12.4	
1/2" (12.7)	15.4	15.8	
5/8" (15.9)	18.6	19.1	
3/4" (19)	22.9	23.3	

- After flared the pipe, the opening part must be seal by end cover or adhesive tape to avoid duct or exogenous impurity come into the pipe.

5.2.7 Drill holes if the pipes need to pass the wall.

5.2.8 According to the field condition to bend the pipes so that it can pass the wall smoothly.

5.2.9 Bind and wrap the wire together with the insulated pipe if necessary.

5.2.10 Set the wall conduit

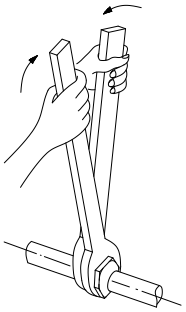
5.2.11 Set the supporter for the pipe.

5.2.12 Locate the pipe and fix it by supporter

- For horizontal refrigerant pipe, the distance between supporters should not be exceed 1m.
- For vertical refrigerant pipe, the distance between supporters should not be exceed 1.5m.

5.2.13 Connect the pipe to indoor unit and outdoor unit by using two spanners (Side discharge outdoor unit).

- Be sure to use two spanners and proper torque to fasten the nut, too large torque will damage the flare, and too small torque may cause leakage. Refer the following table for different pipe connection.

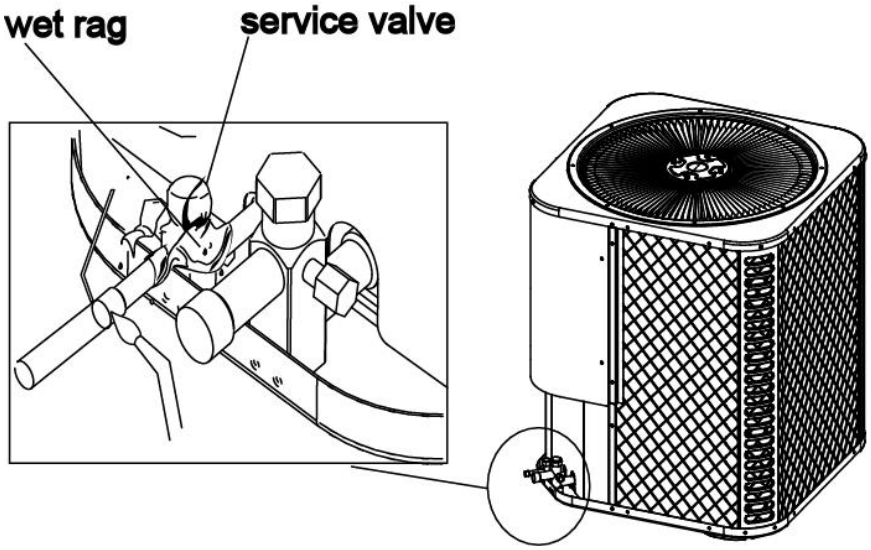
Pipe Diameter	Torque		Sketch map
	(kgf.cm)	(N.cm)	
1/4" (6.35)	144~176	1420~1720	
3/8" (9.52)	333~407	3270~3990	
1/2" (12.7)	504~616	4950~6030	
5/8" (15.9)	630~770	6180~7540	
3/4" (19)	990~1210	9270~11860	

5.2.14 Connect the pipe to indoor unit and outdoor unit by brazing (Top discharge outdoor unit and Air Handler indoor units)

- Top discharge outdoor unit and air handler indoor units connections are copper-to-copper and should be brazed with a phosphorous-copper alloy material such as Silfos-5 or equivalent. DO NOT use soft solder. The outdoor units have reusable service valves on both the liquid and vapor connections. The total system refrigerant charge is retained within the outdoor unit during shipping and installation. The reusable service valves are provided to evacuate and charge per this instruction.
- Serious service problems can be avoided by taking adequate precautions to assure an internally clean and dry system.

CAUTION: Dry nitrogen should always be supplied through the tubing while it is being brazed, because the temperature required is high enough to cause oxidation of the copper unless an inert atmosphere is provide. The flow of dry nitrogen should continue until the joint has cooled. Always use a pressure regulator and safety valve to insure that only low pressure dry nitrogen is introduced into the tubing. Only a small flow is necessary to displace air and prevent oxidation.

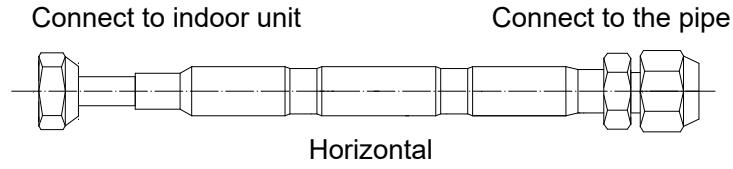
- Precautions should be taken to prevent heat damage to service valve by wrapping a wet rag around it as shown in following picture. Also, protect all painted surfaces, insulation, during brazing. After brazing cool joint with wet rag.

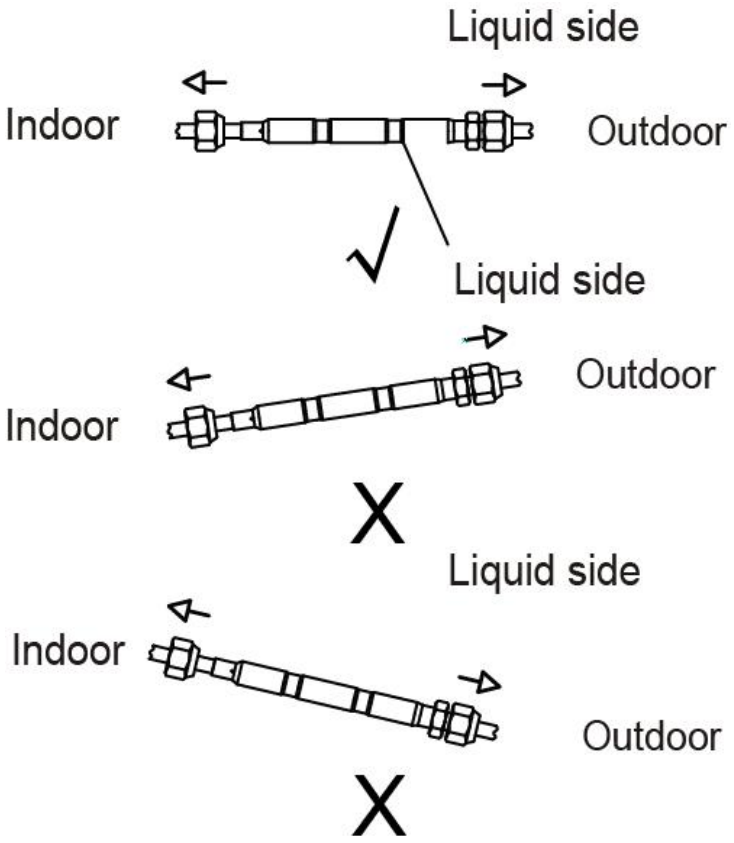


- Valve can be opened by removing the plunger cap and fully inserting a hex wrench into the stem and backing out counter-clockwise until valve stem just touches the chamfered retaining wall.

5.2.15 Connect the throttle part

- If the throttle part of indoor unit is separate design, it must be connected before connecting the pipe to indoor unit. Make sure the throttle part is horizontally installed.





5. Drainage pipe installation

Install the drainage pipe as shown below and take measures against condensation. Improperly installation could lead to leakage and eventually wet furniture and belongings.

6.1 Installation principle

- Ensure at least 1/100 slope of the drainage pipe
- Adopt suitable pipe diameter
- Adopt nearby condensate water discharge

6.2 Key points of drainage water pipe installation

6.2.1 Considering the pipeline route and elevation

- Before installing condensate water pipeline, determine its route and elevation to avoid intersection with other pipelines and ensure slope is straight.

6.2.2 Drainage pipe selection

- The drainage pipe diameter shall not small than the drain hose of indoor unit
- According to the water flowrate and drainage pipe slope to choose the suitable pipe, the water flowrate is decided by the capacity of indoor unit.

Relationship between water flowrate and capacity of indoor unit

Capacity (x1000Btu)	Water flowrate (l/h)
12	2.4
18	4
24	6
30	7
36	8
42	10
48	12
60	14

According to the above table to calculate the total water flowrate for the confluence pipe selection.

For horizontal drainage pipe (The following table is for reference)

PVC pipe	Reference value of inner diameter of pipe (mm)	Allowable maximum water flowrate (l/h)		Remark
		Slope 1/50	Slope 1/100	
PVC25	20	39	27	For branch pipe
PVC32	25	70	50	
PVC40	31	125	88	Could be used for confluence pipe
PVC50	40	247	175	
PVC63	51	473	334	

Attention: Adopt PVC40 or bigger pipe to be the main pipe.

For Vertical drainage pipe (The following table is for reference)

PVC pipe	Reference value of inner diameter of pipe (mm)	Allowable maximum water flowrate (l/h)	Remark
PVC25	20	220	For branch pipe
PVC32	25	410	
PVC40	31	730	Could be used for confluence pipe
PVC50	40	1440	
PVC63	51	2760	
PVC75	67	5710	
PVC90	77	8280	

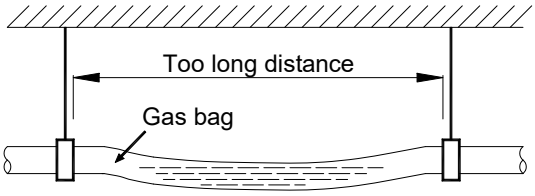
Attention: Adopt PVC40 or bigger pipe to be the main pipe.

6.2.3 Individual design of drainage pipe system

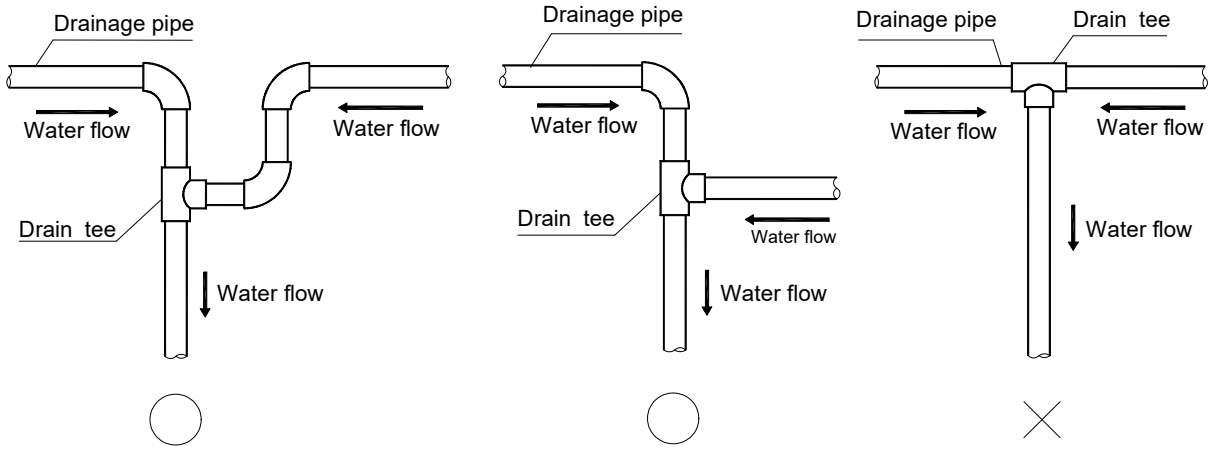
- The drainage pipe of air conditioner shall be installed separately with other sewage pipe, rainwater pipe and drainage pipe in building.
- The drainage pipe of the indoor unit with water pump should be apart from the one without water pump.

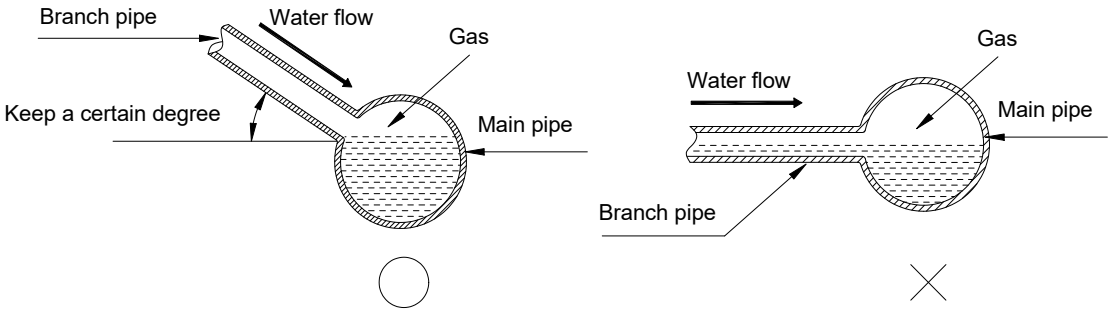
6.2.4 Supporter gap of drainage pipe

- In general, the supporter gap of the drainage pipe horizontal pipe and vertical pipe is respectively 1m~1.5m and 1.5m~2.0m.
- Each vertical pipe shall be equipped with not less than two hangers.
- Overlarge hanger gap for horizontal pipe shall create bending, thus leading to air block.



6.2.5 The horizontal pipe layout should avoid converse flow or bad flow

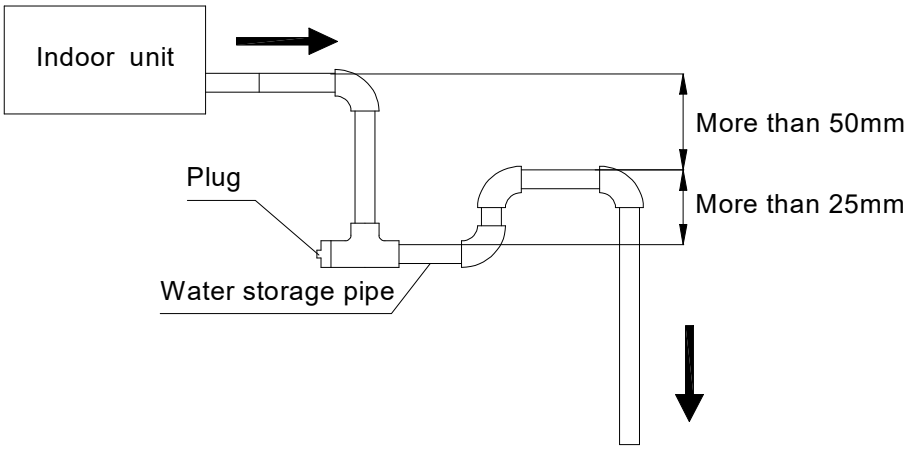




- The correct installation will not cause converse water flow and the slope of the branch pipes can be adjusted freely
- The false installation will cause converse water flow and the slope of the branch pipe can not be adjusted.

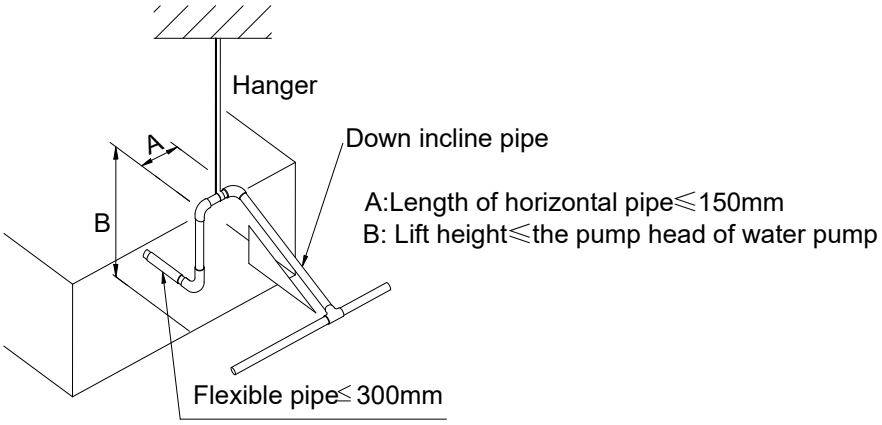
6.2.6 Water storage pipe setting

- If the indoor unit has high extra static pressure and without water pump to elevate the condensate water, such as high extra static pressure duct unit , the water storage pipe should be set to avoid converse flow or blow water phenomena.



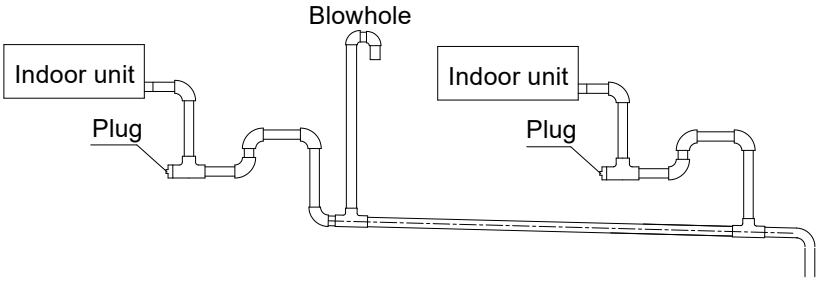
6.2.7 Lifting pipe setting of indoor unit with water pump

- The length of lifting pipe should not exceed the pump head of indoor unit water pump.
  Pump head of big four way cassette: 750mm
  Pump head of compact four way cassette: 500mm
- The drainage pipe should be set down inclined after the lifting pipe immediately to avoid wrong operation of water level switch.
- Refer the following picture for installation reference.



6.2.8 Blowhole setting

- For the concentrated drainage pipe system, there should design a blowhole at the highest point of main pipe to ensure the condensate water discharge smoothly.
- The air outlet shall face down to prevent dirt entering pipe.
- Each indoor unit of the system should be installed it.
- The installation should be considering the convenience for future cleaning.



6.2.9 The end of drainage pipe shall not contact with ground directly.

6.3 Drainage test

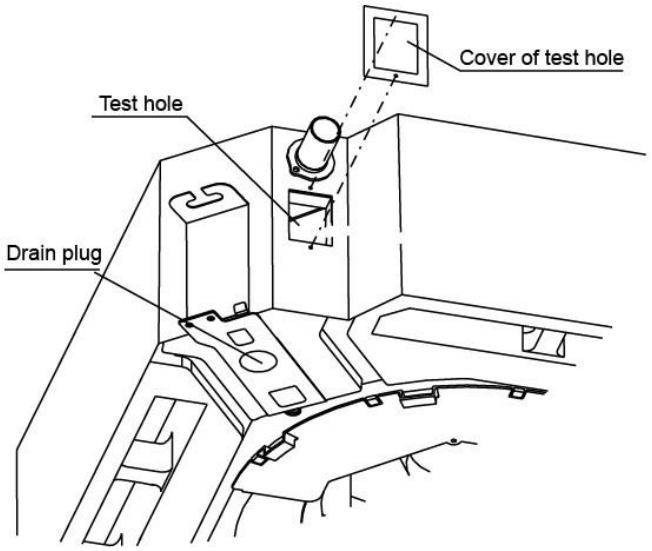
6.3.1 Water leakage test

After finishing the construction of drainage pipe system, fill the pipe with water and keep it for 24 hours to check whether there is leakage at joint section.

6.3.2 Water discharge test

1. Natural drainage mode(the indoor unit with outdoor drainage pump)
   Infuse above 600ml water through water test hole slowly into the water collector, observe whether the water can discharge through the transparent hard pipe at drainage outlet.
2. Pump drainage mode

2.1 Disconnect the plug of water level switch, remove the cover of water test hole and slowly infuse about 2000ml water through the water test hole, be sure that the water will not touch the motor of drainage pump.



2.2 Power on and let the air conditioner operate for cooling. Check operation status of drainage pump, and then connect the plug of water level switch, check the operation sound of water pump and observe whether the water can discharge through the transparent hard pipe at drainage outlet. (In light of the length of drainage pipe, water shall be discharged about 1 minute delayed)

2.3 Stop the operation of air conditioner, power off the power supply and put the cover of water test hole back to the original place.

a. After stopped the air conditioner 3 minutes, check whether there is anything abnormal. If drainage pipes have not been distributed properly, over back-flow water shall cause the flashing of alarm indicator at remote-controlled receiving board and even water shall run over the water collector.

b. Continuously infusing water until water level alarmed, check whether the drainage pump could discharge water at once. If water level does not decline under warning water level 3 minutes later, it shall cause shutdown of unit. When this situation happens, the normal startup only can be recovered by turning down power supply and eliminating accumulated water.

Note: Drain plug at the main water-containing plate is used for eliminating accumulated water in water-containing plate when maintaining air conditioner fault. During normal operation, the plug shall be filled in to prevent leakage.

6.4 Insulation work of drainage pipe

Refer the introduction to the insulation engineering parts.

6. Vacuum Drying and Leakage Checking

7.1 Purpose of vacuum drying

- Eliminating moisture in system to prevent the phenomena of ice-blockage and copper oxidation. Ice-blockage shall cause abnormal operation of system, while copper oxide shall damage compressor.
- Eliminating the non-condensable gas (air) in system to prevent the components oxidizing, pressure fluctuation and bad heat exchange during the operation of system.

7.2 Selection of vacuum pump

- The ultimate vacuum degree of vacuum pump shall be -756mmHg or above.
- Precision of vacuum pump shall reach 0.02mmHg or above.

7.3 Operation procedure for vacuum drying

Due to different construction environment, two kinds of vacuum drying ways could be chosen, namely ordinary vacuum drying and special vacuum drying.

7.3.1 Ordinary vacuum drying

1. When conduct first vacuum drying, connect pressure gauge to the infusing mouth of gas pipe and liquid pipe, and keep vacuum pump running for 1hour (vacuum degree of vacuum pump shall be reached -755mmHg).
2 If the vacuum degree of vacuum pump could not reach -755mmHg after 1 hour of drying, it indicates that there is moisture or leakage in pipeline system and need to go on with drying for half an hour.
3 If the vacuum degree of vacuum pump still could not reach -755mmHg after 1.5 hours of drying, check whether there is leakage source.
4 Leakage test: After the vacuum degree reaches -755mmHg, stop vacuum drying and keep the pressure for 1 hour. If the indicator of vacuum gauge does not go up, it is qualified. If going up, it indicates that there is moisture or leak source.

7.3.2 Special vacuum drying

The special vacuum drying method shall be adopted when:

1. Finding moisture during flushing refrigerant pipe.
2. Conducting construction on rainy day, because rain water might penetrated into pipeline.
3. Construction period is long, and rain water might penetrated into pipeline.
4. Rain water might penetrate into pipeline during construction.

Procedures of special vacuum drying are as follows:

1. Vacuum drying for 1 hour.
2. Vacuum damage, filling nitrogen to reach 0.5Kgf/cm2 .
   Because nitrogen is dry gas, vacuum damage could achieve the effect of vacuum drying, but this method could not achieve drying thoroughly when there is too much moisture. Therefore, special attention shall be drawn to prevent the entering of water and the formation of condensate water.
3. Vacuum drying again for half an hour.
   If the pressure reached -755mmHg, start to pressure leakage test. If it can not reached the value, repeat vacuum damage and vacuum drying again for 1 hour.
4 Leakage test: After the vacuum degree reaches -755mmHg, stop vacuum drying and keep the pressure for 1 hour. If the indicator of vacuum gauge does not go up, it is qualified. If going up, it indicates that there is moisture or leak source.

7. Additional refrigerant charge

- After the vacuum drying process is carried out, the additional refrigerant charge process need to be performed.
- The outdoor unit is factory charged with refrigerant. The additional refrigerant charge volume is decided by the diameter and length of the liquid pipe between indoor and outdoor unit. Refer the following formula to calculate the charge volume.

Diameter of liquid pipe (mm)	Φ6.35	Φ9.52	Φ12.7
Formula	V=30g×(L-5)	V=65g×(L-5)	V=115g×(L-5)

V: Additional refrigerant charge volume (g).
L : The length of the liquid pipe (m).

Note:

- Refrigerant may only be charged after performed the vacuum drying process.
- Always use gloves and glasses to protect your hands and eyes during the charge work.
- Use electronic scale or fluid infusion apparatus to weight refrigerant to be recharged. Be sure to avoid extra refrigerant charged, it may cause liquid hammer of the compressor or protections.
- Use supplementing flexible pipe to connect refrigerant cylinder, pressure gauge and outdoor unit. And The refrigerant should be charged in liquid state. Before recharging, The air in the flexible pipe and manifold gauge should be exhausted.
- After finished refrigerant recharge process, check whether there is refrigerant leakage at the connection joint part.(Using gas leakage detector or soap water to detect).

8. Engineering of insulation

9.1 Insulation of refrigerant pipe

9.1.1 Operational procedure of refrigerant pipe insulation

Cut the suitable pipe → insulation (except joint section) → flare the pipe → piping layout and connection→ vacuum drying → insulate the joint parts

9.1.2 Purpose of refrigerant pipe insulation

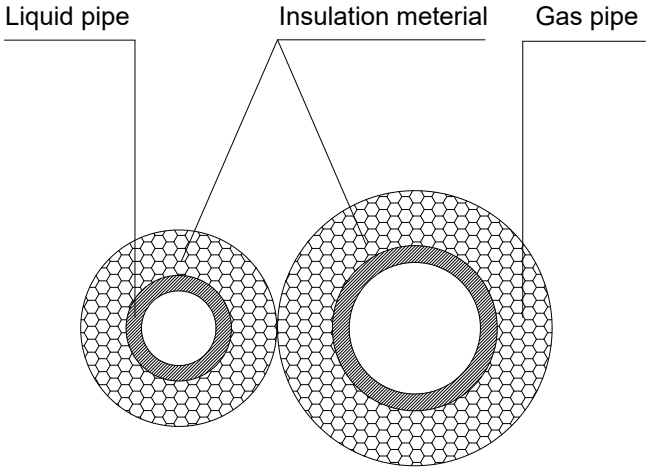
- During operation, temperature of gas pipe and liquid pipe shall be over-heating or over-cooling extremely. Therefore, it is necessary to carry out insulation; otherwise it shall debase the performance of unit and burn compressor.
- Gas pipe temperature is very low during cooling. If insulation is not enough, it shall form dew and cause leakage.
- Temperature of gas pipe is very high (generally 50-100℃) during heating. Insulation work must be carried out to prevent hurt by carelessness touching.

9.1.3 Insulation material selection for refrigerant pipe

- The burning performance should over 120℃
- According to the local law to choose insulation materials
- The thickness of insulation layer shall be above 10mm.If in hot or wet environment place, the layer of insulation should be thicker accordingly.

9.1.4 Installation highlights of insulation construction

- Gas pipe and liquid pipe shall be insulated separately, if the gas pipe and liquid pipe were insulated together; it will decrease the performance of air conditioner.



- The insulation material at the joint pipe shall be 5~10cm longer than the gap of the insulation material.
- The insulation material at the joint pipe shall be inserted into the gap of the insulation material.
- The insulation material at the joint pipe shall be banded to the gap pipe and liquid pipe tightly.
- The linking part should be use glue to paste together
- Be sure not bind the insulation material over-tight, it may extrude out the air in the material to cause bad insulation and cause easy aging of the material.

9.2 Insulation of drainage pipe

9.2.1 Operational procedure of refrigerant pipe insulation

Select the suitable pipe → insulation (except joint section) → piping layout and connection→ drainage test→ insulate the joint parts

9.2.2 Purpose of drainage pipe insulation

The temperature of condensate drainage water is very low. If insulation is not enough, it shall form dew and cause leakage to damage the house decoration.

9.2.3 Insulation material selection for drainage pipe

- The insulation material should be flame retardant material, the flame retardant of the material should be selected according to the local law.
- Thickness of insulation layer is usually above 10mm.
- Use specific glue to paste the seam of insulation material, and then bind with adhesive tape. The width of tape shall not be less than 5cm. Make sure it is firm and avoid dew.

9.2.4 Installation and highlights of insulation construction

- The single pipe should be insulated before connecting to another pipe, the joint part should be insulated after the drainage test.
- There should be no insulation gap between the insulation material.

9. Engineering of electrical wiring

10.1 Highlights of electrical wiring installation

- All field wiring construction should be finished by qualified electrician.
- Air conditioning equipment should be grounded according to the local electrical regulations.
- Current leakage protection switch should be installed.
- Do not connect the power wire to the terminal of signal wire.
- When power wire is parallel with signal wire, put wires to their own wire tube and remain at least 300mm gap.
- According to table in indoor part named “the specification of the power” to choose the wiring, make sure the selected wiring not small than the date showing in the table.
- Select different colors for different wire according to relevant regulations.
- Do not use metal wire tube at the place with acid or alkali corrosion, adopt plastic wire tube to replace it.
- There must be not wire connect joint in the wire tube If joint is a must, set a connection box at the place.
- The wiring with different voltage should not be in one wire tube.
- Ensure that the color of the wires of outdoor and the terminal No. are same as those of indoor unit respectively.

10.Test operation

11.1 The test operation must be carried out after the entire installation has been completed.

11.2 Please confirm the following points before the test operation.

- The indoor unit and outdoor unit are installed properly.
- Tubing and wiring are correctly completed.
- The refrigerant pipe system is leakage-checked.
- The drainage is unimpeded.
- The ground wiring is connected correctly.
- The length of the tubing and the added stow capacity of the refrigerant have been recorded.
- The power voltage fits the rated voltage of the air conditioner.
- There is no obstacle at the outlet and inlet of the outdoor and indoor units.
- The gas-side and liquid-side stop values are both opened.
- The air conditioner is pre-heated by turning on the power.

11.3 Test operation

Set the air conditioner under the mode of "COOLING" by remote controller, and check the following points.

Indoor unit

- Whether the switch on the remote controller works well.
- Whether the buttons on the remote controller works well.
- Whether the air flow louver moves normally.
- Whether the room temperature is adjusted well.
- Whether the indicator lights normally.
- Whether the temporary buttons works well.
- Whether the drainage is normal.
- Whether there is vibration or abnormal noise during operation.

Outdoor unit

- Whether there is vibration or abnormal noise during operation.
- Whether the generated wind, noise, or condensed of by the air conditioner have influenced your neighborhood.
- Whether any of the refrigerant is leaked.

Part 5
Electrical Control System

1. Electrical Control Function

1.1 Definition

T1: Indoor room temperature

T2: Coil temperature of evaporator

T3: Coil temperature of condenser

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

1.2 Main Protection

1.2.1 3 minutes Delay at restart for compressor.

1.2.2 Sensor protection at open circuit and breaking disconnection.

1.2.3 Phase check function

If the phase sequence is detected wrong or lack of 1 or 2 phase, the unit won't start and there is error code displayed on outdoor PCB.

1.2.4 Low pressure check function

The low pressure switch should be always closed. If it is open, the system will stop until the fault is cleared. During defrosting procedure , 4 minutes after defrosting ends and 5 minutes after compressor is on in heating mode, low pressure switch won't be checked.

Note: The system will not check if the protection could be cleared in 30 seconds after the protection occurs. If this protection occurs 3 times, it won't recover automatically until the main power is cut off.

1.2.5 Over-current protection

When compressor is running, if the current is over twice of the rated for 3 seconds, the compressor will stop and an error code will be displayed on the outdoor PCB. If the current becomes normal, the compressor will restart after 3 minutes.

Note: The current won't be checked within 3 seconds after the compressor starts. The system will not check if the protection could be cleared in 30 seconds after the protection occurs.

1.2.6 Fan Speed Malfunction(55K)

If the indoor fan speed is lower than 300 RPM for 50 seconds or more, it shuts off and restarts in 30 seconds. If this happens 3 times, the unit stops and the LED displays the failure code.

1.3 Operation Modes and Functions

1.3.1 Fan mode

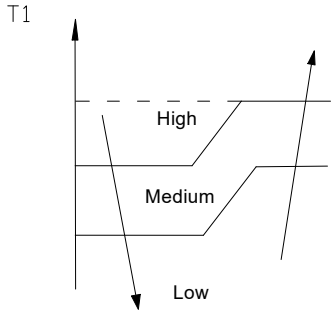
(1) Outdoor fan and compressor stop.

(2) Temperature setting function is disabled, and no setting temperature is displayed.

(3) Indoor fan can be set to high/med/low/auto.

(4) The louver operates same as in cooling mode.

(5) Auto fan:

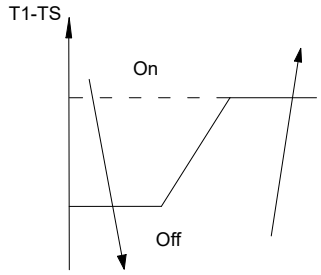


1.3.2 Cooling Mode

1.3.2.1 Compressor running rules

Once the compressor starts up, it will follow the below rules:

When indoor room temperatureT1 is lower than Ts, the compressor and outdoor fan will shut off. When T1 is higher than Ts+1, the compressor and outdoor fan will start up.

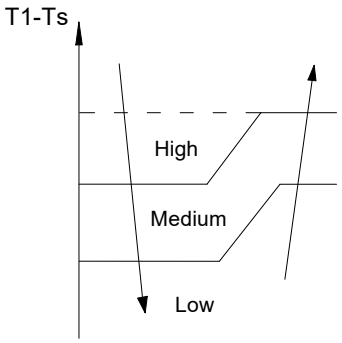


1.3.2.2 Outdoor fan running rules

The On-off outdoor units have single fan speed. The outdoor fan will run following the compressor except when AC is in evaporator high temperature protection in heating mode, condenser high temperature protection in cooling mode, defrosting mode and the current protection.

1.3.2.3 Indoor fan running rules

In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low and auto. The auto fan:

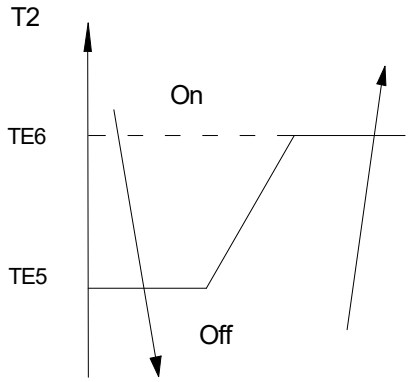


1.3.2.4 Low evaporator coil temperature T2 protection

For ceiling& floor and super-slim cassette:

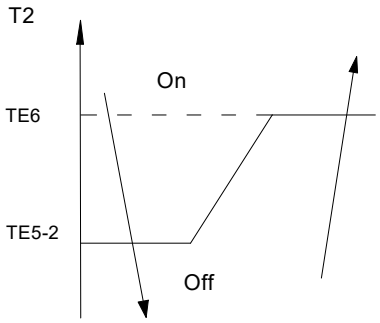
AC will enter T2 protection if any of the following conditions is satisfied.

Condition 1:



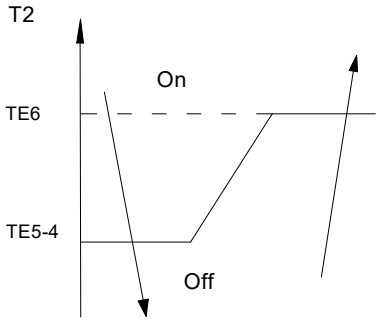
When the evaporator coil temp.T2 keeps lower than TE5 for 30 minutes, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart up.

Condition 2:



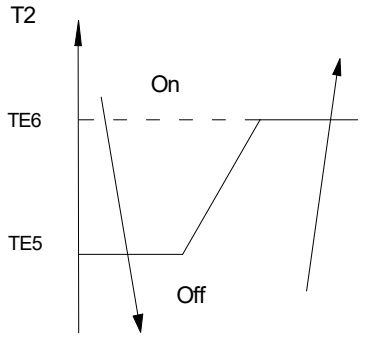
When the evaporator coil temp.T2 keeps lower than TE5-2 for 20 minutes, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart up.

Condition 3:



When the evaporator coil temp.T2 keeps lower than TE5-4 for 8 minutes, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart up.

For A5 duct:

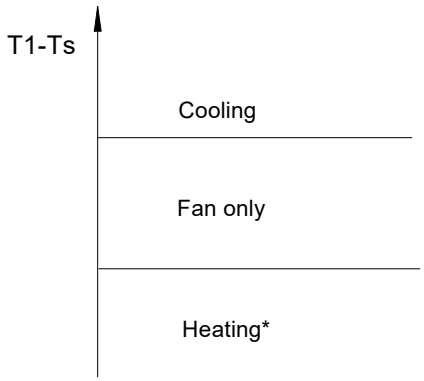


When.T2≤TE5 for Time0, the compressor and outdoor fan will shut off. When T2>TE6, the compressor and outdoor fan will restart up.

1.3.3 Auto-mode

This mode can be chosen with remote controller and the setting temperature can be changed between 17~30℃.

In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT (ΔT =T1-Ts).



Heating*: For cooling only models, they will run at fan mode

Indoor fan will run at auto fan of the relevant mode.

The louver operates same as in relevant mode.

If the machine switches mode between heating and cooling, the compressor will keep stopping for 15 minutes and then choose mode according to T1-Ts.

If the setting temperature is modified, the machine will choose running function again.

1.3.4 Drying mode

1.3.4.1 The indoor fan will keep running at low speed.

1.3.4.2 All protections are active and the same as that in cooling mode.

1.3.4.3 The louver operates the same as in cooling mode.

1.3.5 Timer function

1.3.5.1 Timing range is 24 hours.

1.3.5.2 Timer on. The machine will turn on automatically when reaching the setting time.

1.3.5.3 Timer off. The machine will turn off automatically when reaching the setting time.

1.3.5.4 Timer on/off. The machine will turn on automatically when reaching the setting “on” time, and then turn off automatically when reaching the setting “off” time.

1.3.5.5 Timer off/on. The machine will turn off automatically when reaching the setting “off” time, and then turn on automatically when reaching the setting “on” time.

1.3.5.6 The timer function will not change the AC current operation mode. Suppose AC is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer LED will be off and the AC running mode has not been changed.

1.3.5.7 The setting time is relative time.

1.3.6 Economy function

1.3.6.1 It is valid in cooling, heating and auto mode.

1.3.6.2. Turning off, changing mode or setting fan speed will cancel economy function.

1.3.6.3 Operation process in sleep mode is as follow:

After pressing ECONOMIC or SLEEP button on the controller, the machine will go into economy mode.

When cooling, the setting temperature rises 1℃(be lower than 30℃) every hour, 2 hours later the setting temperature stops rising.

For heat pump models, when they are in heating, the setting temperature reduces 1℃(be higher than 17℃) every hour, 2 hours later the setting temperature stops reducing.

1.3.6.4 In this mode, the fan speed is forced into AUTO mode.

1.3.7 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including Swing function) automatically after 3 minutes when power returns.

2. Electrical Control Function (Air Handler)

2.1 Definition

T1: Indoor room temperature

T2: Coil temperature of evaporator

T3: Coil temperature of condenser

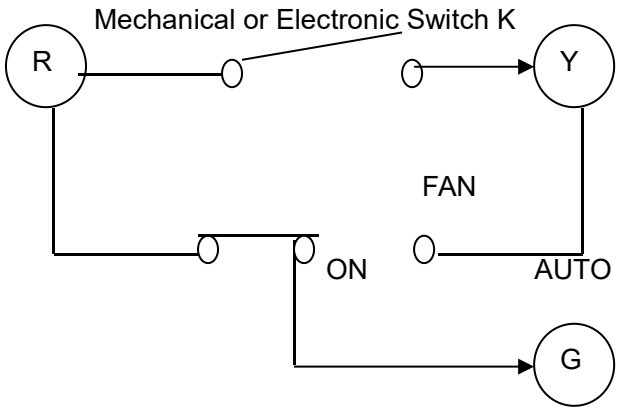
T4: Outdoor ambient temperature

T5: Compressor discharge temperature

2.2 Cooling Mode

2.2.1 When low level input from the wired controller portals G and Y, the system goes into cooling mode. Now on the wired controller, mode switch is in “Cool” and fan switch is in “ON” or “AUTO” position.

2.2.2 The compressor is controlled by the wired controller and the control sketch is as following:



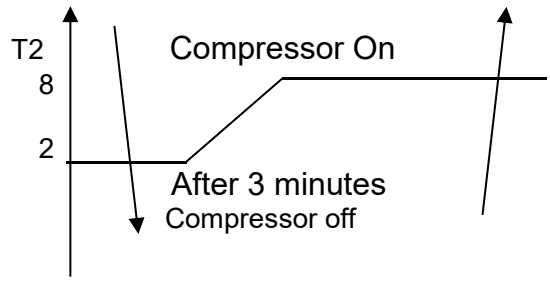
(When the temperature reaches the setting, switch K is open)

2.2.3 The indoor fan motor works as following rules:

When the fan switch of the wired controller is in “ON” position, the fan signal G is low so that the indoor fan is always on;

When the fan switch of the wired controller is in “AUTO” position, the fan signal G and the compressor signal Y is synchronal.

2.2.4 Evaporator low-temperature protection



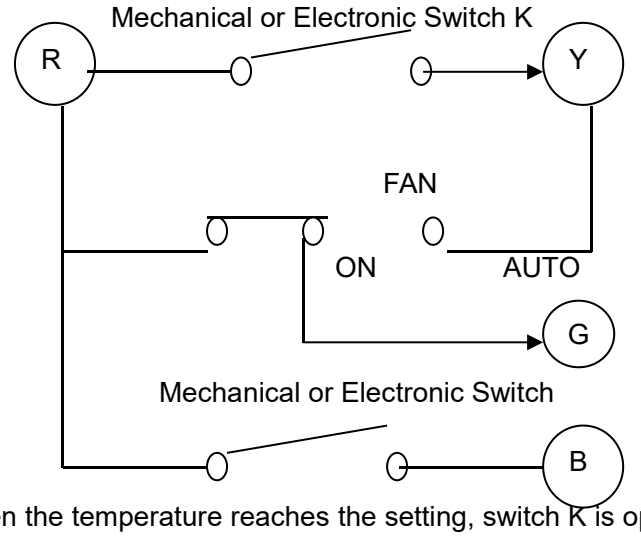
If T2≤2℃ for 3 minutes, the compressor will stop and the indoor fan will works as usual; if T2>8℃, the protection is invalid and the compressor will restart.

2.3 Heating Mode

2.3.1 In heating mode, the four-way valve is on

2.3.2 The compressor and the four-way valve are controlled by the wired controller. As long as the four-way valve signal B and compressor signal Y is low level, the system goes into heating mode. Now on the wired controller, mode switch is in “Heat” and fan switch is in “ON” or “AUTO” position.

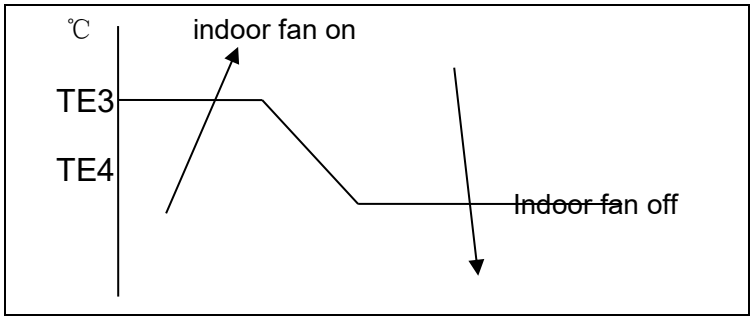
2.3.3 The control sketch is as following picture:



(When the temperature reaches the setting, switch K is open)

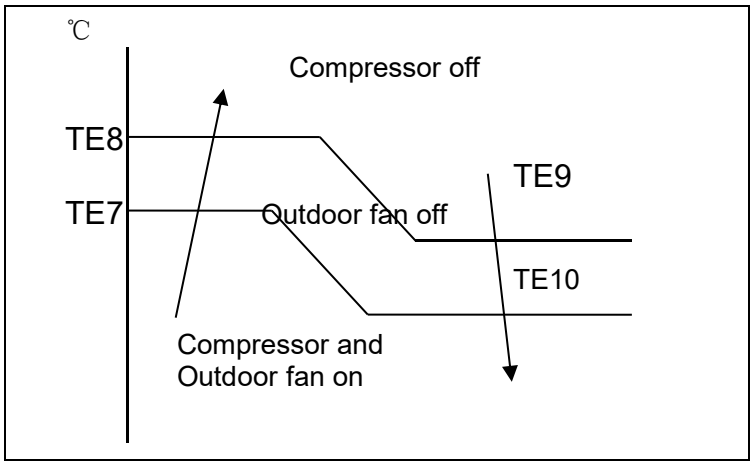
2.3.4 Anti-cold wind protection (Optional)

This function can be active by set the jumper JR1 on the indoor PCB



When T2≤TE4, indoor fan will stop; when T2≥TE3, indoor fan will re-start. In this protection, compressor and outdoor fan still work.

2.3.5 Indoor coil high-temperature protection



The temperatures in bracket is the setting temperature when JR1 is connected (the anti-cold wind function is

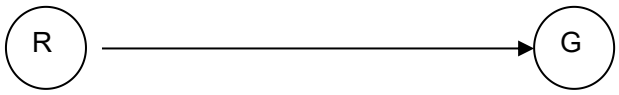
active).

2.4 Fan Only Mode

2.4.1 When the unit is in fan only mode, the outdoor fan and compressor are off.

2.4.2 On the wired controller, “Mode” switch is in “OFF” position and “Fan” switch is in “ON” position.

2.4.3 The control sketch is as following:



2.5 Indoor PCB Display

There are 3 LEDs on indoor PCB, which can display some information.

2.5.1 When the unit is initial electrified, all LED will flash for 1 second. When the unit is standby, LED1 will flashes at 0.5 Hz. When the unit is running normally, LED1 will be always on and LED2, LED3 are off.

2.5.2 When there is an error, these LEDs will display as following:

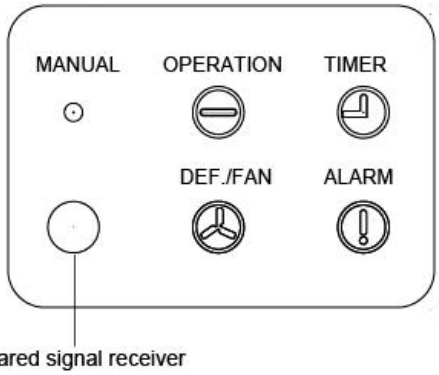
No	Information	LED1	LED2	LED3	Recover when
1	T2 sensor fault	X	☆	X	T2 is normal
2	Input signal of wired controller error	☆	X	☆	Input is right

（X means “OFF”, ☆ means “flash at 5 Hz”）

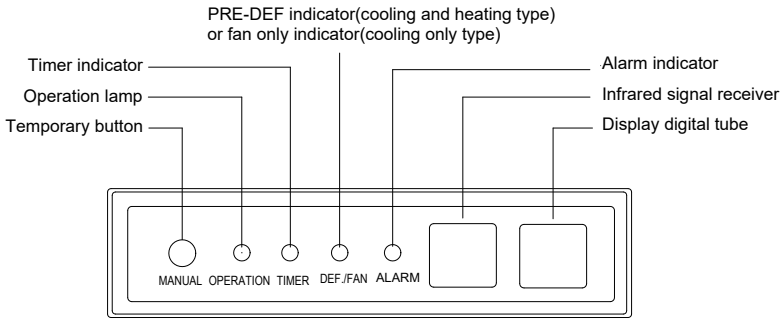
3. Troubleshooting

3.1. Display board

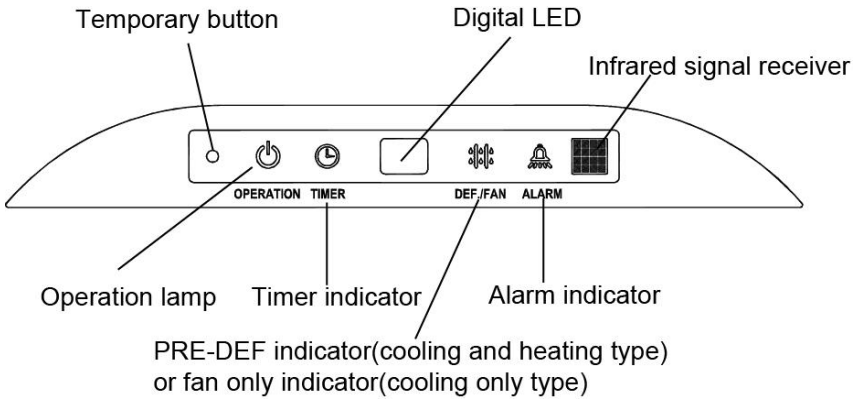
3.1.2 Icon explanation on indoor display board(Ceiling & Floor)



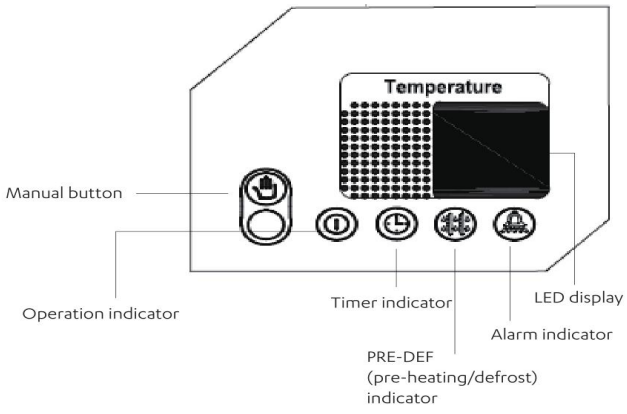
3.1.2 Icon explanation on indoor display board (A5 Duct)



3.1.3 Icon explanation on indoor display board (Super-slim cassette).



3.1.4 Display board of auto-lifting panel of 4 way cassette



3.2. Self-diagnosis

Indoor unit's LED indication

During malfunction or protection, the indicators and digital LED displays as follow:

For A5 duct and ceiling &floor:

No	Operation	Timer	Def/Fan	Alarm	Digital LED Display	Malfunction or protection
1	X	☆	X	X	E2	Indoor temperature sensor is abnormal
2	☆	X	X	X	E3	Evaporator temperature sensor is abnormal
4	☆	☆	X	X	E7	EEPROM malfunction
5	X	X	X	☆	E8	Full-water malfunction
O (on) X(off) ☆(flash at 5Hz)						

For Super-slim 4-way Cassette:

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display(digital tube)
1	Open or short circuit of T1 temperature sensor	X	☆	X	X	E2
2	Open or short circuit of T2 temperature sensor	☆	X	X	X	E3
3	Indoor EEPROM malfunction	☆	☆	X	X	E7
4	Full-water malfunction	X	X	X	☆	E8
5	Indoor fan speed malfunction	X	☆	X	☆	Eb
6	Protection of Low pressure	☆	☆	☆	X	Ed
7	Refrigerant leakage detection	☆	X	X	☆	EC
8	Communication malfunction between main PCB and up-down panel PCB	☆	X	☆	☆	F0
9	Up-down panel malfunction	X	☆	☆	☆	F1
10	Up-down panel is not closed	X	O	☆	☆	F2
O (on) X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)						

LEDs' for the indication of outdoor trouble

Type	Contents	LED1	LED2	LED3
Trouble	Phase sequence	Flash	Off	Off
Trouble	Lack of phase(A,B)	Flash	Off	Off
Trouble	Lack of phase	Off	Off	Off
Trouble	Protection of Low pressure(for 48k-60k models)	Flash	Flash	Off
Trouble	Overload of current	Off	Off	Flash
Trouble	Communication malfunction	Flash	Off	Flash
Trouble	Open-circuit and short-circuit trouble of T5 or protection of high pressure(for 48k-60k models)	Off	Flash	Off

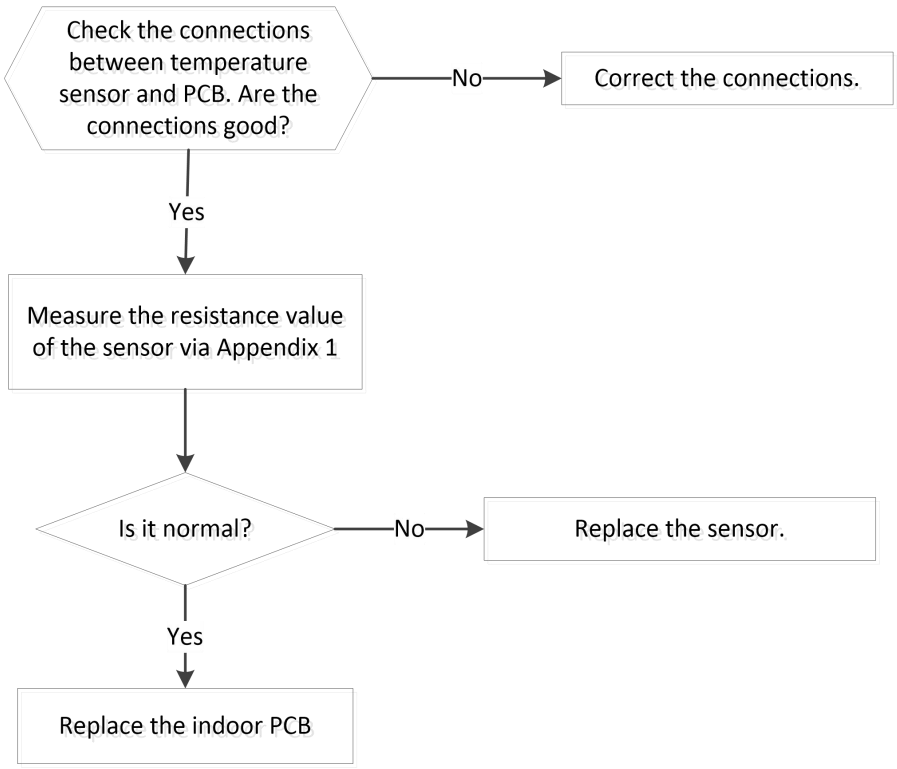
Note:

1. If the LED1-LED3 are flashing slowly, means the system is stand-by.
2. T3: Outdoor condenser temperature sensor
3. T4: Outdoor ambient temperature sensor

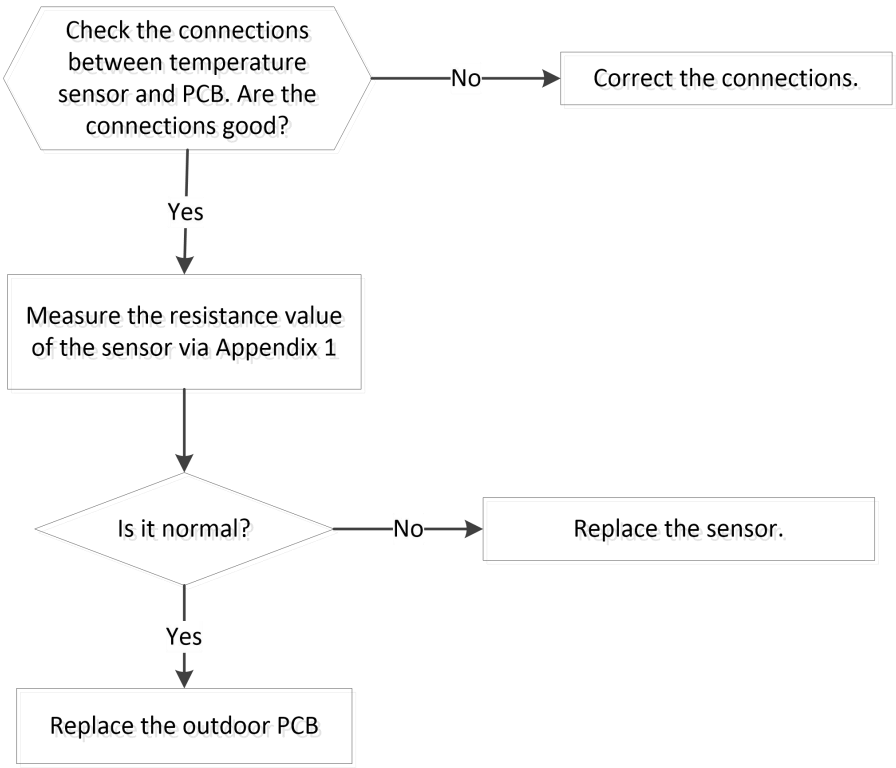
3.3. Solving steps for typical malfunction

(1) For indoor unit

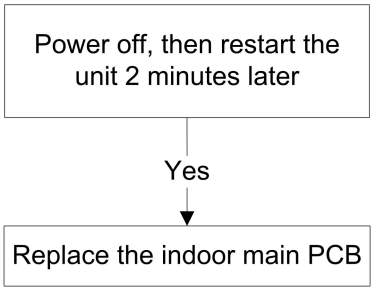
a. Open or short circuit of T1 or T2 temperature sensor



b. Open or short circuit of T3 temperature sensor

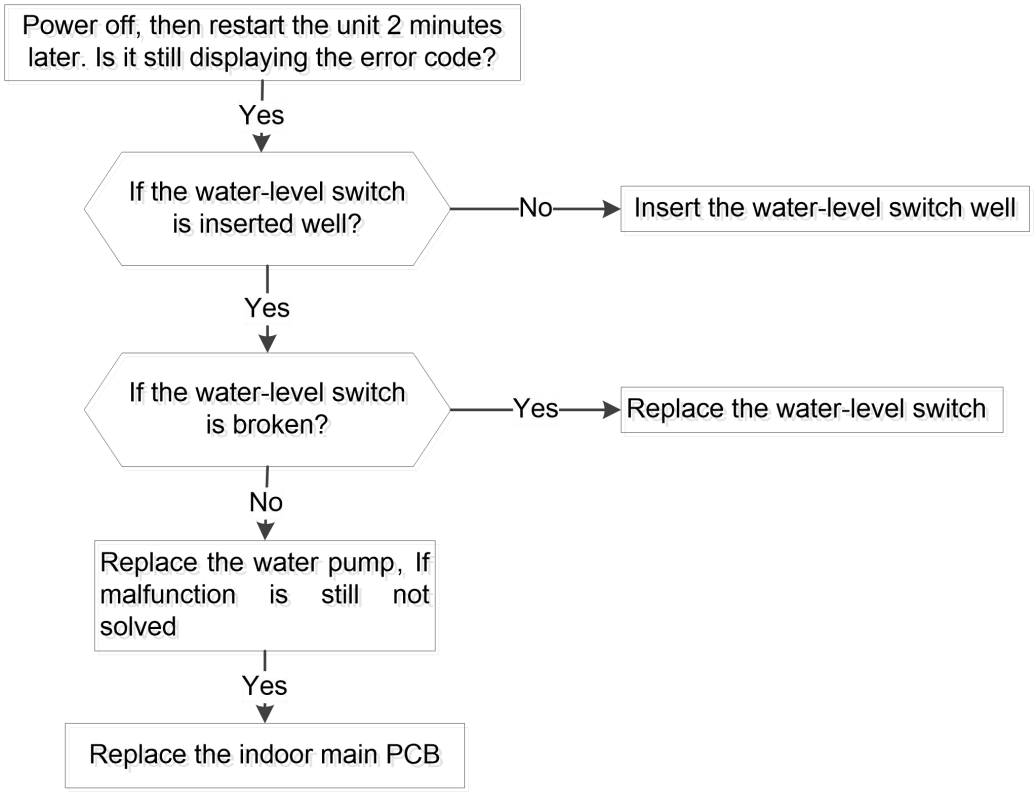


c. EEPROM malfunction

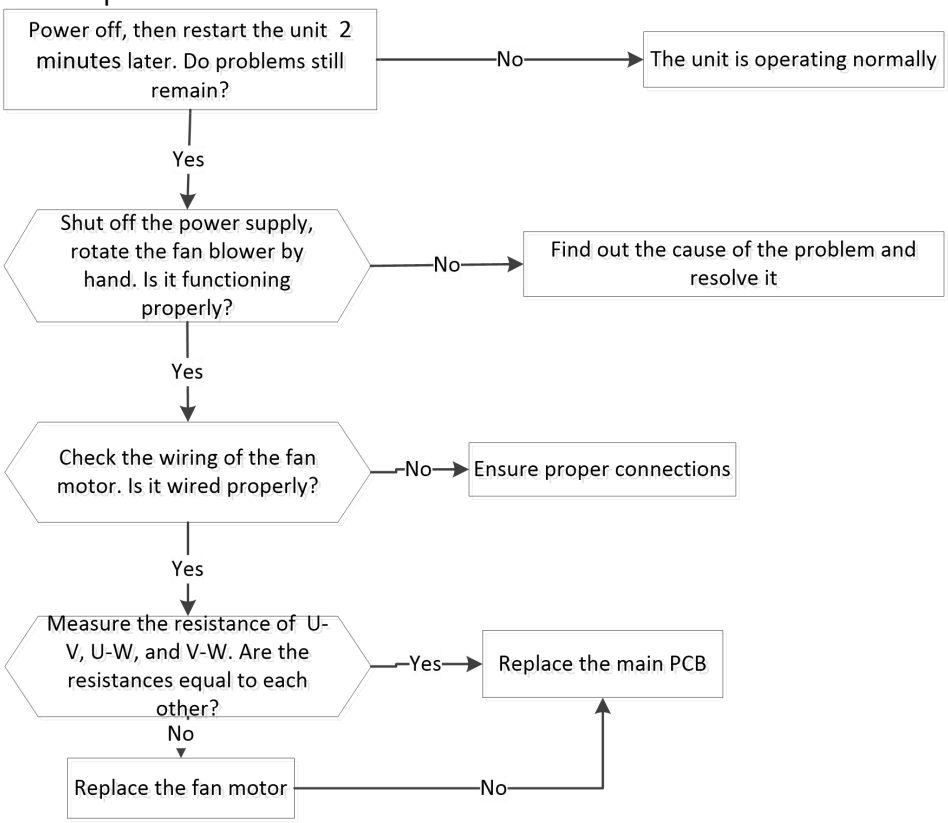


EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

d. Water-level alarm malfunction

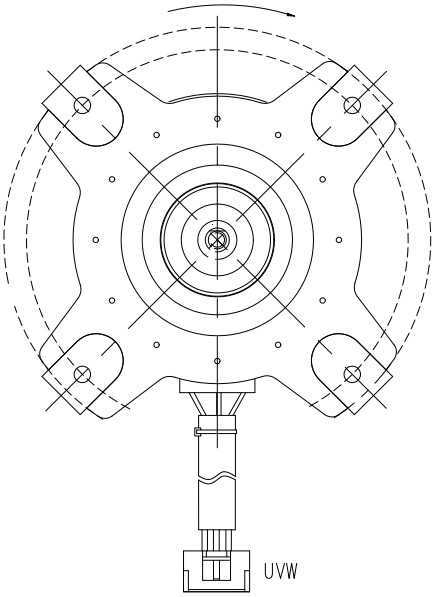


e. Fan Speed Malfunction

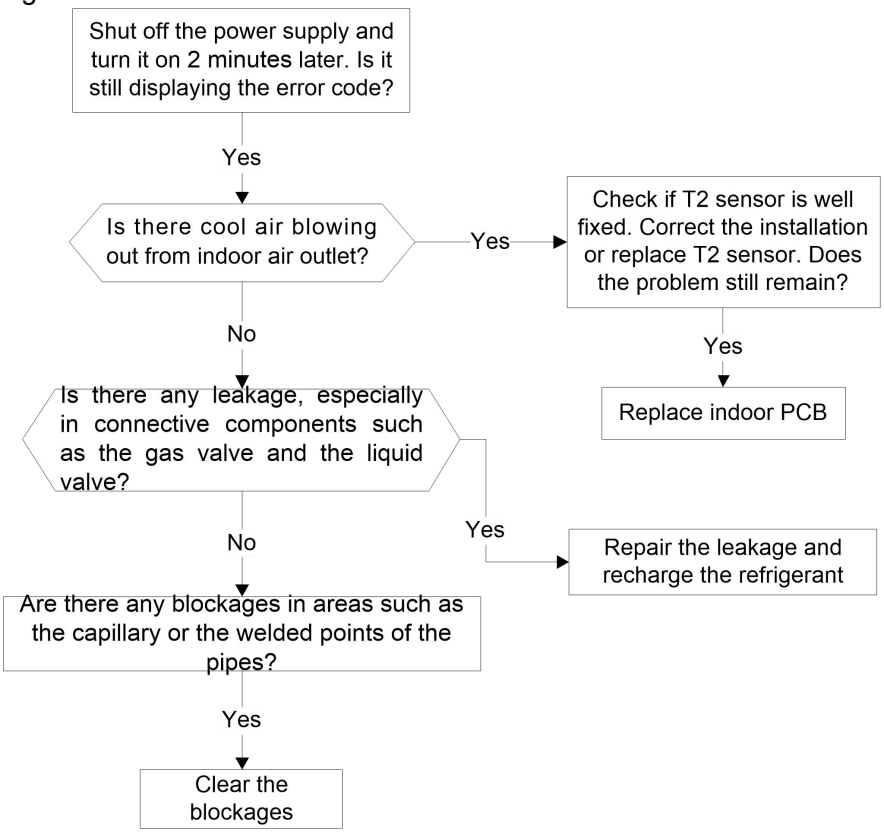


Index 1:

1. Release the UVW connector. Measure the resistance of U-V, U-W, and V-W. If the resistances are not equal to each other, the fan motor may be experiencing problems and may need to be replaced. Otherwise, return to step 2.

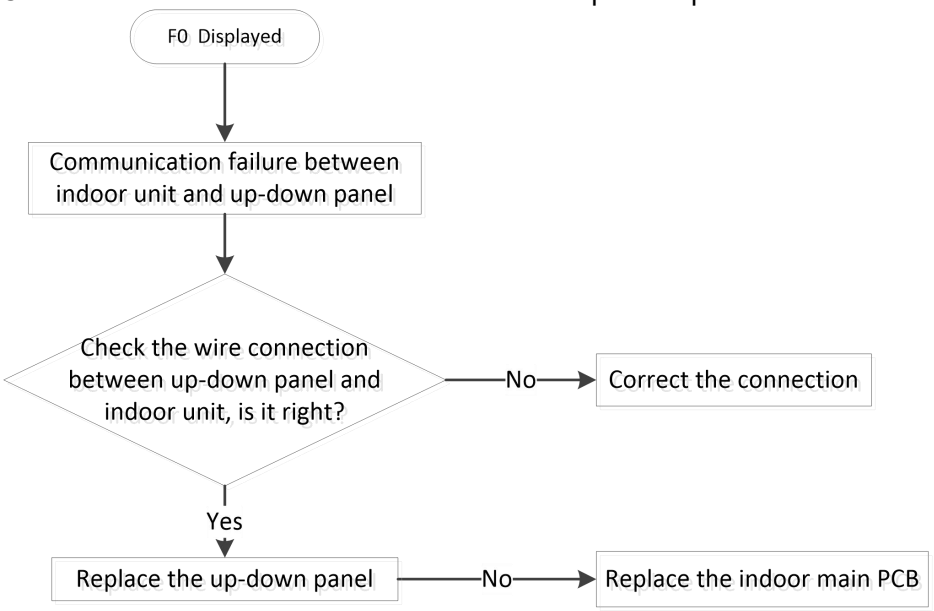


f. Refrigerant Leakage Detection

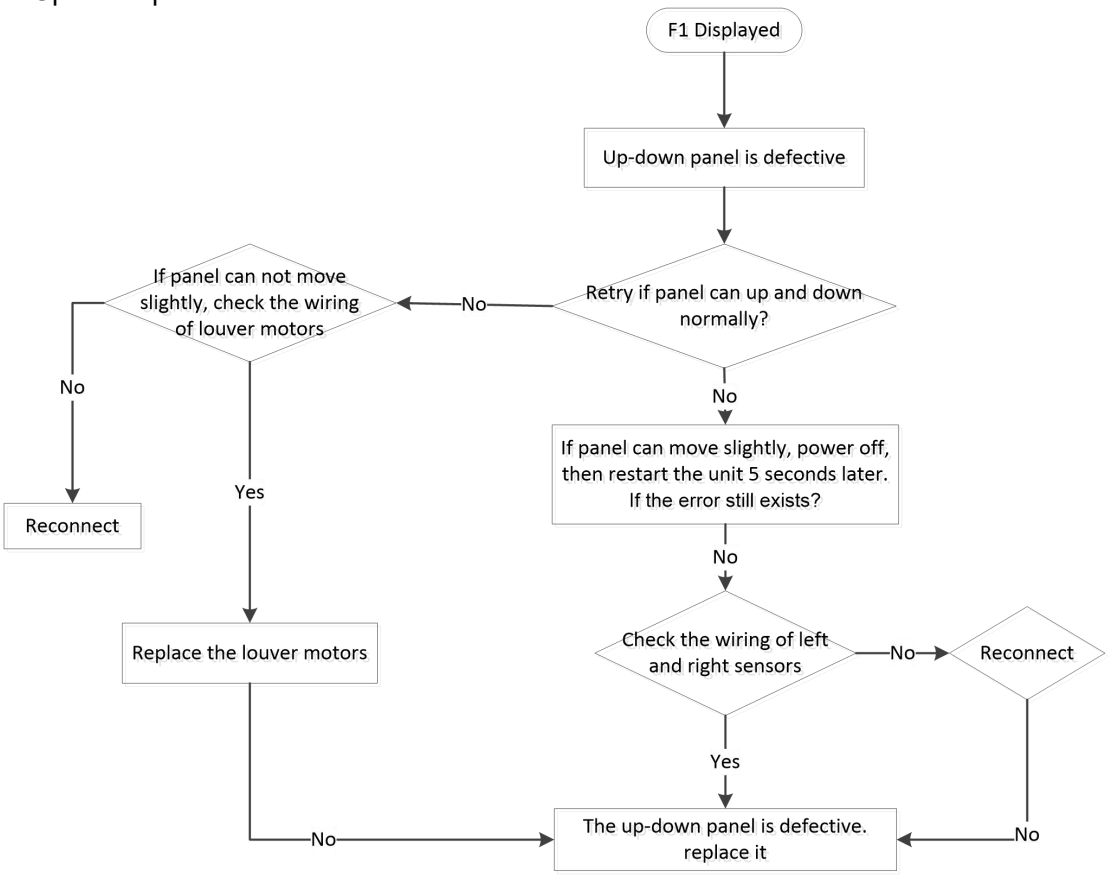


For the super-slim cassette with up-down panel

a. Communication error between indoor unit and up-down panel

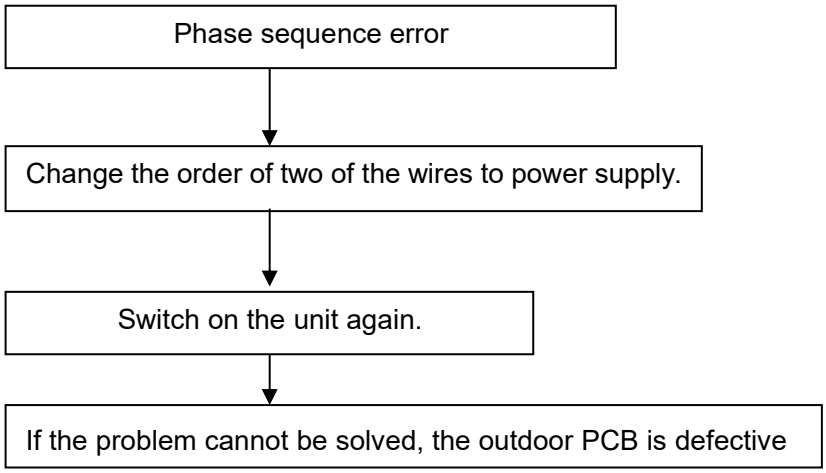


b. Up-down panel is defective

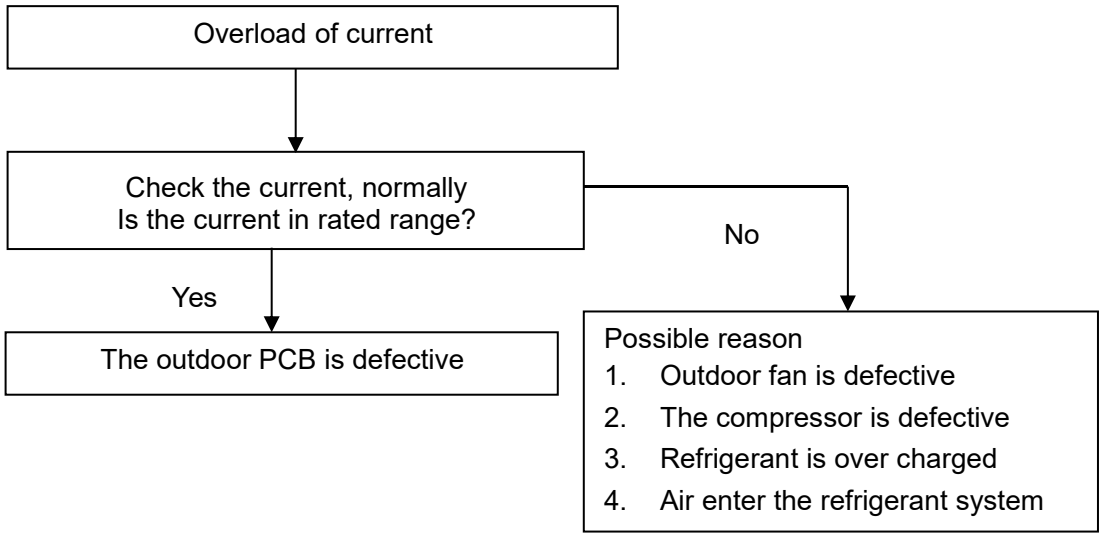


(2) For the outdoor unit

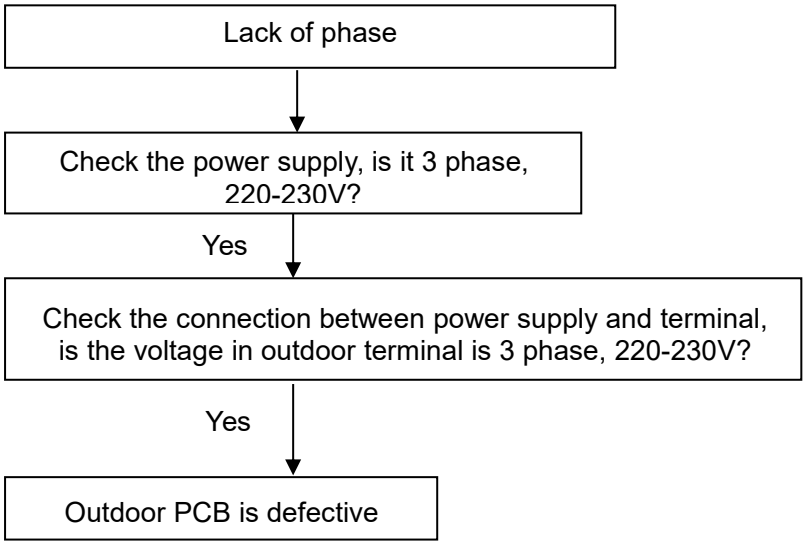
a. Phase sequence error:



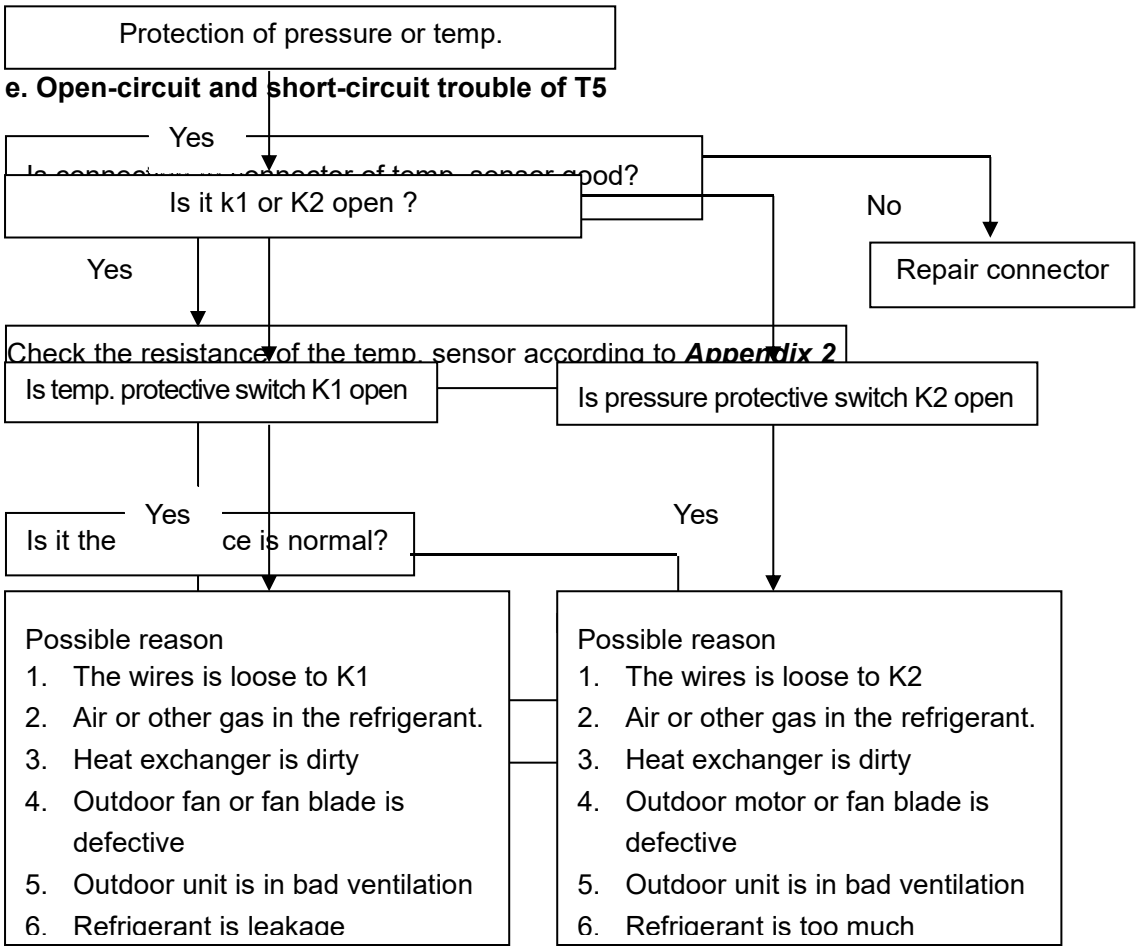
b. Overload of current



c. Lack of phase



d. Protection of pressure or temp.



Appendix 1 Temperature Sensor Resistance Value Table (℃--K)

℃	K Ohm	℃	K Ohm	℃	K Ohm	℃	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5000	62	2.19073	102	0.59386
-17	96.3423	23	10.9731	63	2.11241	103	0.57683
-16	89.5865	24	10.4736	64	2.03732	104	0.56038
-15	84.2190	25	10.000	65	1.96532	105	0.54448
-14	79.3110	26	9.55074	66	1.89627	106	0.52912
-13	74.5360	27	9.12445	67	1.83003	107	0.51426
-12	70.1698	28	8.71983	68	1.76647	108	0.49989
-11	66.0898	29	8.33566	69	1.70547	109	0.48600
-10	62.2756	30	7.97078	70	1.64691	110	0.47256
-9	58.7079	31	7.62411	71	1.59068	111	0.45957
-8	56.3694	32	7.29464	72	1.53668	112	0.44699
-7	52.2438	33	6.98142	73	1.48481	113	0.43482
-6	49.3161	34	6.68355	74	1.43498	114	0.42304
-5	46.5725	35	6.40021	75	1.38703	115	0.41164
-4	44.0000	36	6.13059	76	1.34105	116	0.40060
-3	41.5878	37	5.87359	77	1.29078	117	0.38991
-2	39.8239	38	5.62961	78	1.25423	118	0.37956
-1	37.1988	39	5.39689	79	1.21330	119	0.36954
0	35.2024	40	5.17519	80	1.17393	120	0.35982
1	33.3269	41	4.96392	81	1.13604	121	0.35042
2	31.5635	42	4.76253	82	1.09958	122	0.3413
3	29.9058	43	4.57050	83	1.06448	123	0.33246
4	28.3459	44	4.38736	84	1.03069	124	0.32390
5	26.8778	45	4.21263	85	0.99815	125	0.31559
6	25.4954	46	4.04589	86	0.96681	126	0.30754
7	24.1932	47	3.88673	87	0.93662	127	0.29974
8	22.5662	48	3.73476	88	0.90753	128	0.29216
9	21.8094	49	3.58962	89	0.87950	129	0.28482
10	20.7184	50	3.45097	90	0.85248	130	0.27770
11	19.6891	51	3.31847	91	0.82643	131	0.27078
12	18.7177	52	3.19183	92	0.80132	132	0.26408
13	17.8005	53	3.07075	93	0.77709	133	0.25757
14	16.9341	54	2.95896	94	0.75373	134	0.25125
15	16.1156	55	2.84421	95	0.73119	135	0.24512
16	15.3418	56	2.73823	96	0.70944	136	0.23916
17	14.6181	57	2.63682	97	0.68844	137	0.23338
18	13.9180	58	2.53973	98	0.66818	138	0.22776
19	13.2631	59	2.44677	99	0.64862	139	0.22231

Appendix 2

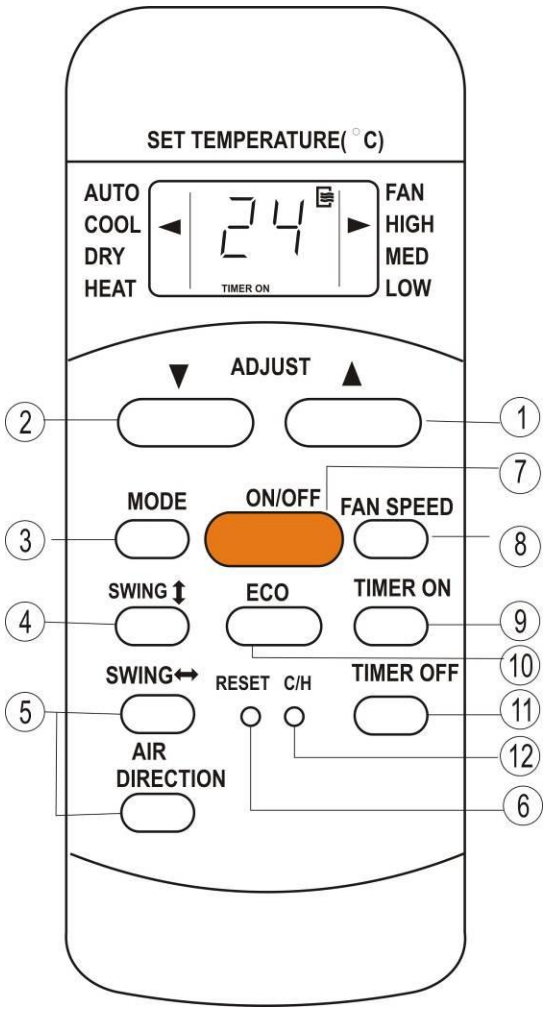
Unit: ℃---K			Discharge temp. sensor table				
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.86
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.94	112	2.63
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.3	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.82	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28	81	6.641	121	2.061
2	163.3	42	26.9	82	6.43	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.1	87	5.488	127	1.762
8	121	48	21.26	88	5.32	128	1.717
9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294	B(25/50)=3950K	
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045	R(90℃)=5KΩ±3%	
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

4. Controller

3.1 Wireless Remote Controller

RG51Q1/BGE

The R51Q1/BGE wireless remote controller is standard for Four-way cassette type and the Ceiling& floor type.



General Function for wireless remote controller:

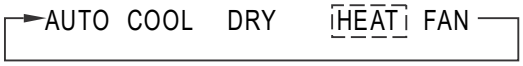
Model	RG51Q1/BGE
Rated voltage	3.0V(2pieces of LR03 7 # batteries)
Min voltage for sending signal of CPU	2.4V
Effective receiving distance	8m~11m
Operation condition	-5~60℃

Buttons and functions:

1. Adjust ▲ : Increase the set temp. Keeping pressing will increase the temp with 1℃ per 0.5s.

2. Adjust ▼: Reduce the set temp. Keeping pressing will reduce the temp. with 1℃ per 0.5s.

3. MODE: Once pressing, running mode will be selected in the following sequence:



NOTE: No heating mode for cool only type unit.

4. SWING ↕**:** Activate or turn off horizontal swing function. (Only available when remote controller is used with corresponding unit, i.e. Ceiling & floor type)

5. SWING ↔**:** Activate or turn off vertical swing function.

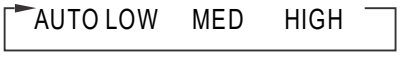
(Only available when remote controller is used with corresponding unit.)

AIR DIRECTION: Activate swing function of air deflector. Once pressing, air deflector will turn 6°. For normal operation and better cooling and heating effect, deflector will not turn to the degree which is the state of deflector when the unit is turned off.(Only available when remote controller is used with corresponding unit.)

6. RESET (inner located)**:** Press this button with a needle of 1mm to cancel the current setting and reset remote controller.

7. ON/OFF: For turning on or turning off the air conditioner.

8. FAN SPEED: Fan speed will be selected in following sequence once pressing this button:



9. TIME ON: For time ON setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour. Adjusting the figure to 0.00 will cancel time ON setting.

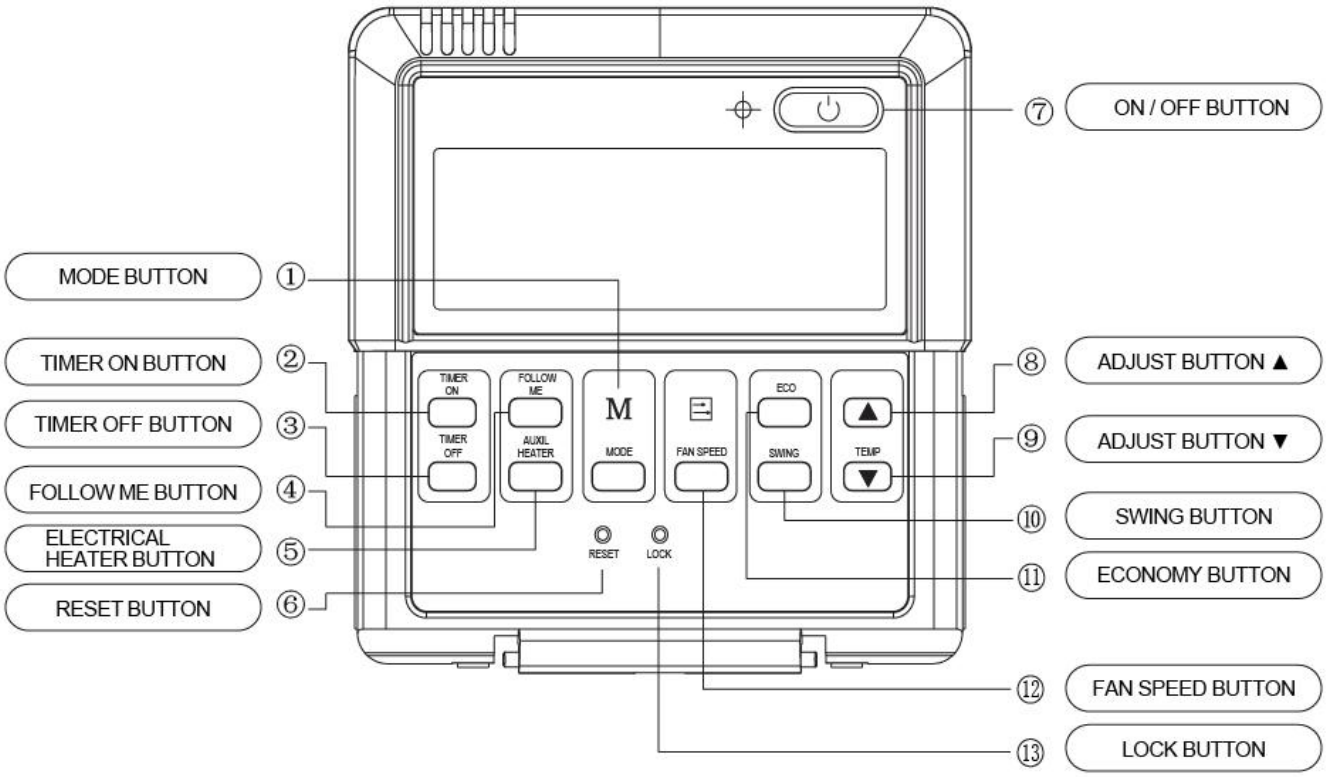
10. ECO: Activate or turn off economic operation mode. It is suggested to turn on this function when sleeping. (Only available when remote controller is used with corresponding unit.)

11. TIME OFF: For time OFF setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour.

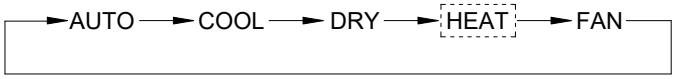
12. C/H (inner located)**:** Press this button with a needle of 1mm to shift mode between COOL only and COOL&HEAT. During setting, background light will be lightened. Factory default mode is COOL &HEAT.

3.2 Wired Remote Controller
3.2.1 Wired Controller

Name and functions of buttons on the wire controller



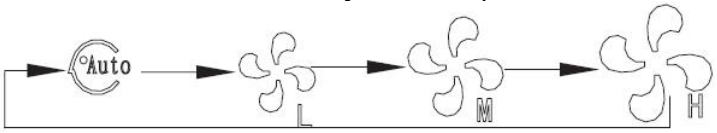
1. Mode button: When press this button, the operation mode change as the following sequence:



Remark: For the cooling only model, the heating mode is skipped.

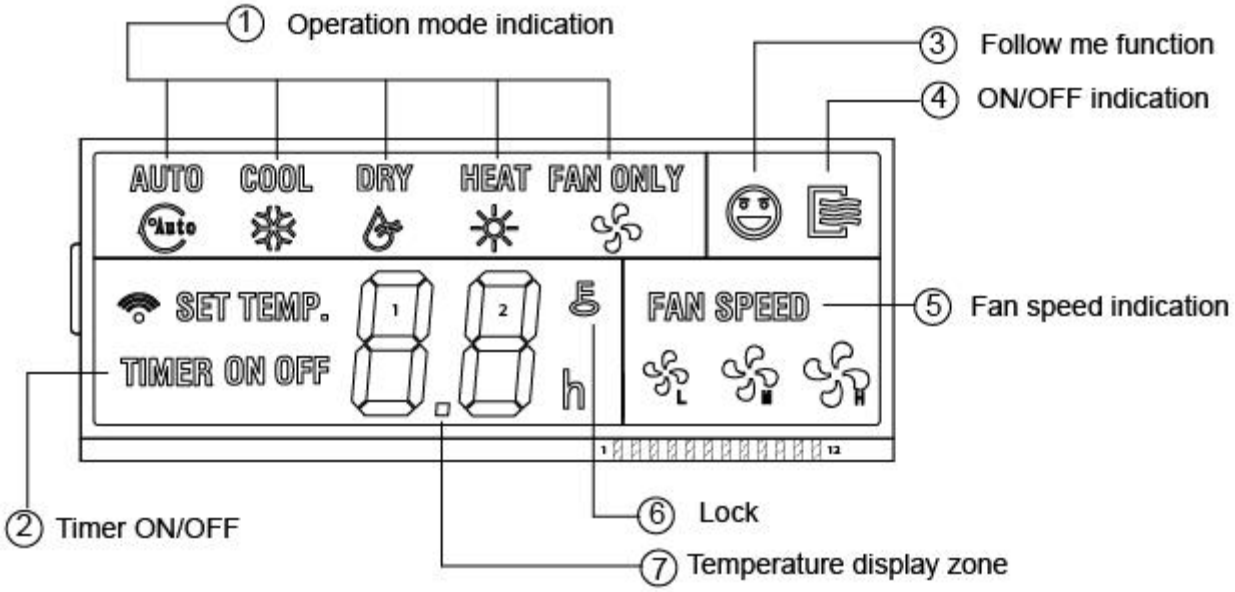
2. Timer on button: Press this button, timer on function is active. Then every press, the time increase 0.5h, after 10h, 1h increment after each press. If cancel this Function, just set it to "0.0"
3. Timer off button: Press this button, timer off function is active. Then every press, the time increase 0.5h, after 10h, 1h increment after each press. If cancel this function, just set it to "0.0" .
4. Follow me button: When under cool, heat and auto mode, press this button, follow me function is active. Press again, this function is ineffective.
5. Electrical heater button: If press this button in heat mode, electrical heater function become ineffective.
6. Reset button (hidden): Use a 1mm stick to press in the little hole , then the current setting is canceled . The wire controllers enter into original state.
7. ON/OFF button: When in off state, press this button, the indicator is on, the wire controller enter into on state, and send setting information to indoor PCB. When in on state, press this button, the indicator is off, and send instruction. If timer on or timer off has been set, it cancel this setting then send instruction to stop the machine.

8. Adjust button: Set indoor temperature up. If press and hold on, it will increase at 1degree per 0.5 second.
9. Adjust button: Set indoor temperature down. if press and hold on, it will decrease at 1degree per 0.5 Second.
10. Swing button: First press, start swing function; second press, stop swing. (Match to some model with swing function).
11. Economy operation button: press this button, the indoor unit operates in economy mode, press again, exit this mode (it may be ineffective for some models)
12. Fan speed button: press this button consecutively; the fan speed will circle as follow:



13. Lock button (hidden): When you push the LOCK button, all current settings are locked in and the wire controller does not accept any operation except that of the LOCK button. Use the lock mode when you want to prevent setting from being changed accidentally or play fully. Push the LOCK button again when you want to cancel the LOCK mode.

Name and function of LCD on the wire controller

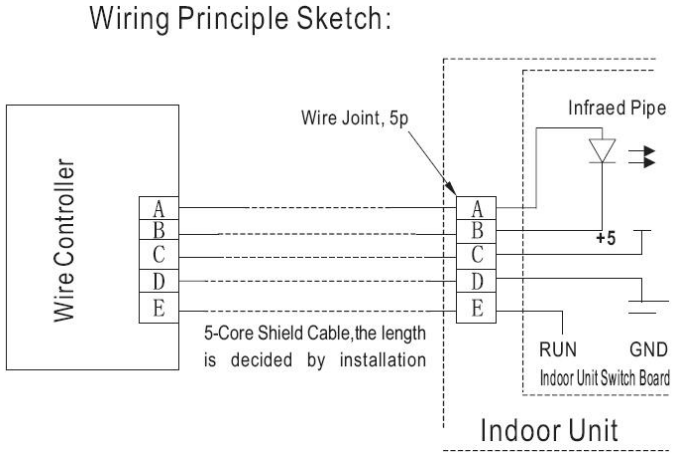


1. Operation mode indication: When press" MODE" button, the following mode can be selected in circle. Auto Cool Dry Heat Fan only Auto.
   Auto→ Cool→ Dry →Heat→ Fan only →Auto
   For cooling only model, heat mode is skipped.
2. Timer: When adjust setting on time or only on time is set, the "ON" is lighted. When adjust setting off time or only off time is set, the" OFF" is lighted. If on and off timer are both set, the "ON" and "OFF" are both lighted.
3. Follow me function: There is a temperature sensor inside the wire controller, after setting temperature, it will compare the two temperatures, and the space of wire controller will be the same as setting temperature. It is available under cooling, heating, auto mode.
4 ON/OFF indication: When it is on, the icon display, otherwise it is extinguished.
5. Fan speed indication: There are four fan modes: low, middle, high, auto. For some models, no middle fan then the middle fan is seen as high speed.
6. Lock: When the "LOCK" button is pressed, the icon appears and other buttons is unable, press again, the icon disappears.
7. Temperature display zone: Generally it displays setting temperature; it can be adjusted by press temperature button▲and▼ .But in fan mode, no display here.

Remark:

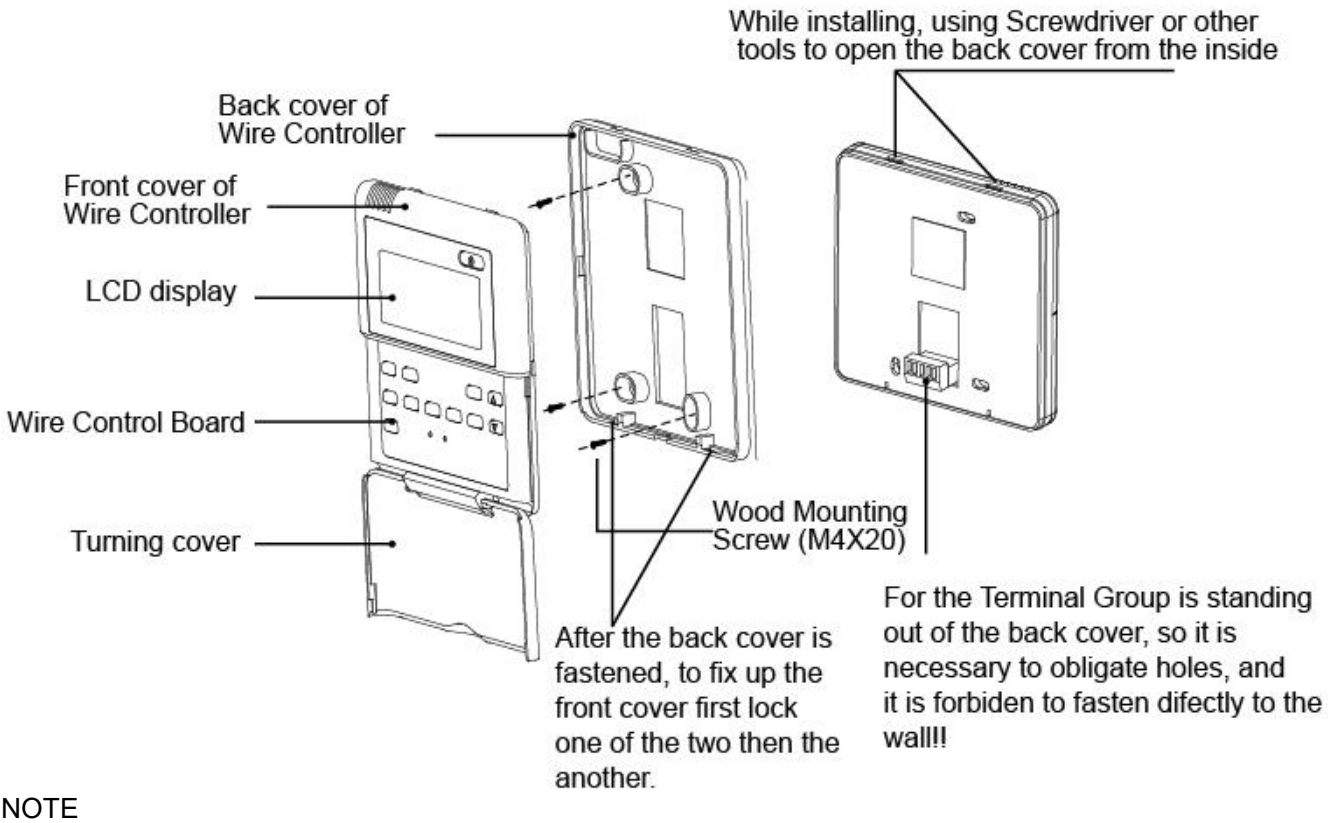
The wired controller will reset to factory setting with auto mode, auto fan and 24℃ setting temperature when the air conditioner restarts after power failure.
And this may cause inconsistent displays on the wired controller and on the air conditioner. You need to readjust the running status through the wired controller.

Installation



Installation Notice:

When the air conditioner needs the constant frequency wire controller, be sure adding a wire joint with 5 terminal named A, B, C, D, E in indoor unit, and fixing an infrared emitter whose anode and cathode connecting with A and B near the receiver in the indoor unit switch board, then connecting the terminal +5v, GND, Run in the switch board to C,D,E respectively.



NOTE
●The connecting wire should be a little longer as to take away the switch board easily for maintenance.
●The connecting wire should be a little longer as to take away the controller easily for maintenance.