



LIGHT COMMERCIAL

Service Manual

CONTENTS

Part 1 General Information	1
Part 2 Indoor Units	5
Part 3 Outdoor Units.....	23
Part 4 Installation.....	29
Part 5 Electrical Control System	63

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

Part 1

General Information

1. Model Lists	3
1.1 Indoor Units	
1.2 Outdoor Units	
2. Nomenclature	4

1.1 Indoor Units

R410A (Capacity x 1000 Btu/h)

Type	Function	12	18	24
KTIM 4-way cassette	Cooling and heating	●	●	●
KDIM Duct	Cooling and heating	●	●	●
KUIM Ceiling-floor	Cooling and heating	●	●	●
KFIM Console	Cooling and heating	●		

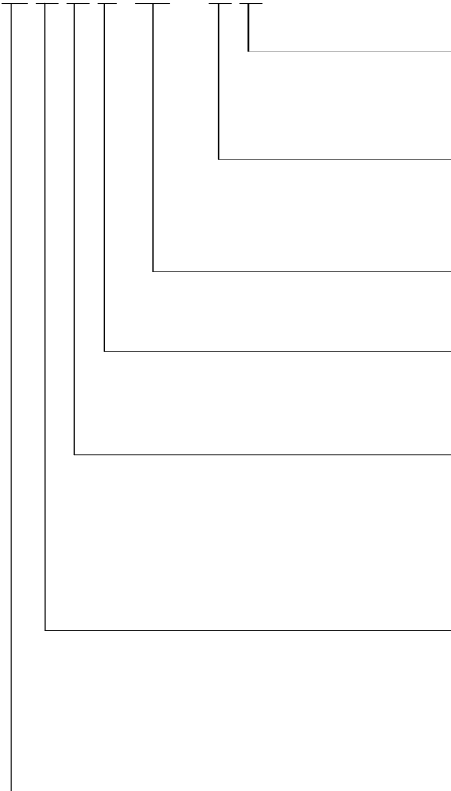
1.2 Outdoor Units

Universal Outdoor unit Model	Compressor type	Compressor Brand	Matched indoor units
KSIL012-H219-0	Rotary	TOSHIBA	KDIM012-H2 KFIM012-H2 KTIM012-H2 KUIM012-H2
KSIL018-H219-0	Rotary	TOSHIBA	KDIM018-H2 KTIM018-H2 KUIM018-H2
KSIL024-H219-0	Rotary	TOSHIBA	KDIM024-H2 KTIM024-H2 KUIM024-H2

2. Nomenclature

2.1 Indoor Unit

K T I M 012 - H 2



Power Supply

1: 115 V / 1 ph /60 Hz
2: 208-230 V / 1 ph / 60 Hz

Operational Information

C: Cooling only
H: Heat pump

Nominal Capacity (kBtu/h)

Product Series

M

Unit Type

I: Inverter

Model

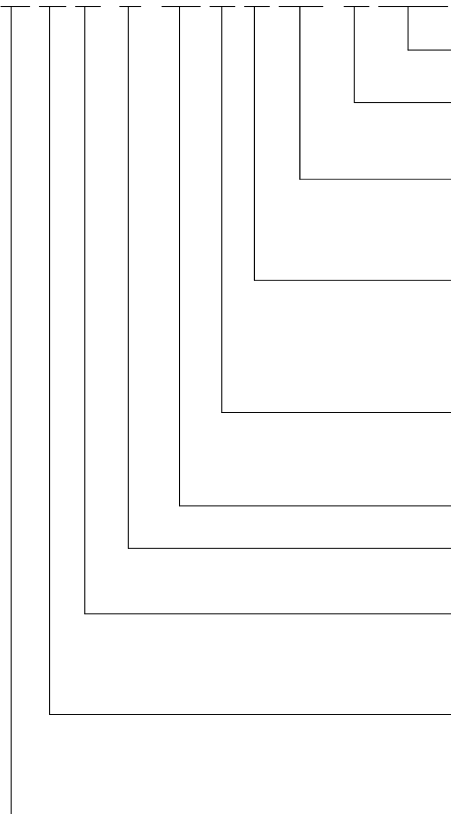
D: Ceiling recessed
F: Console
T: Ceiling cassette
U: Floor-ceiling

Brand

K: Klimaire

3.2 Outdoor Unit

K S I M 024-H 2 19 -O C



Application

C: Commercial

Usage

O: Outdoor

Efficiency SEER

Power Supply

1: 115 V / 1 ph / 60 Hz
2: 208-230 V / 1 ph / 60 Hz

Operational Information

C: Cooling only
H: Heat pump

Nominal Capacity (kBtu/h)

Product Series

Unit Type

I: Inverter

Model

S: System

Brand

K: Klimaire

Part 2

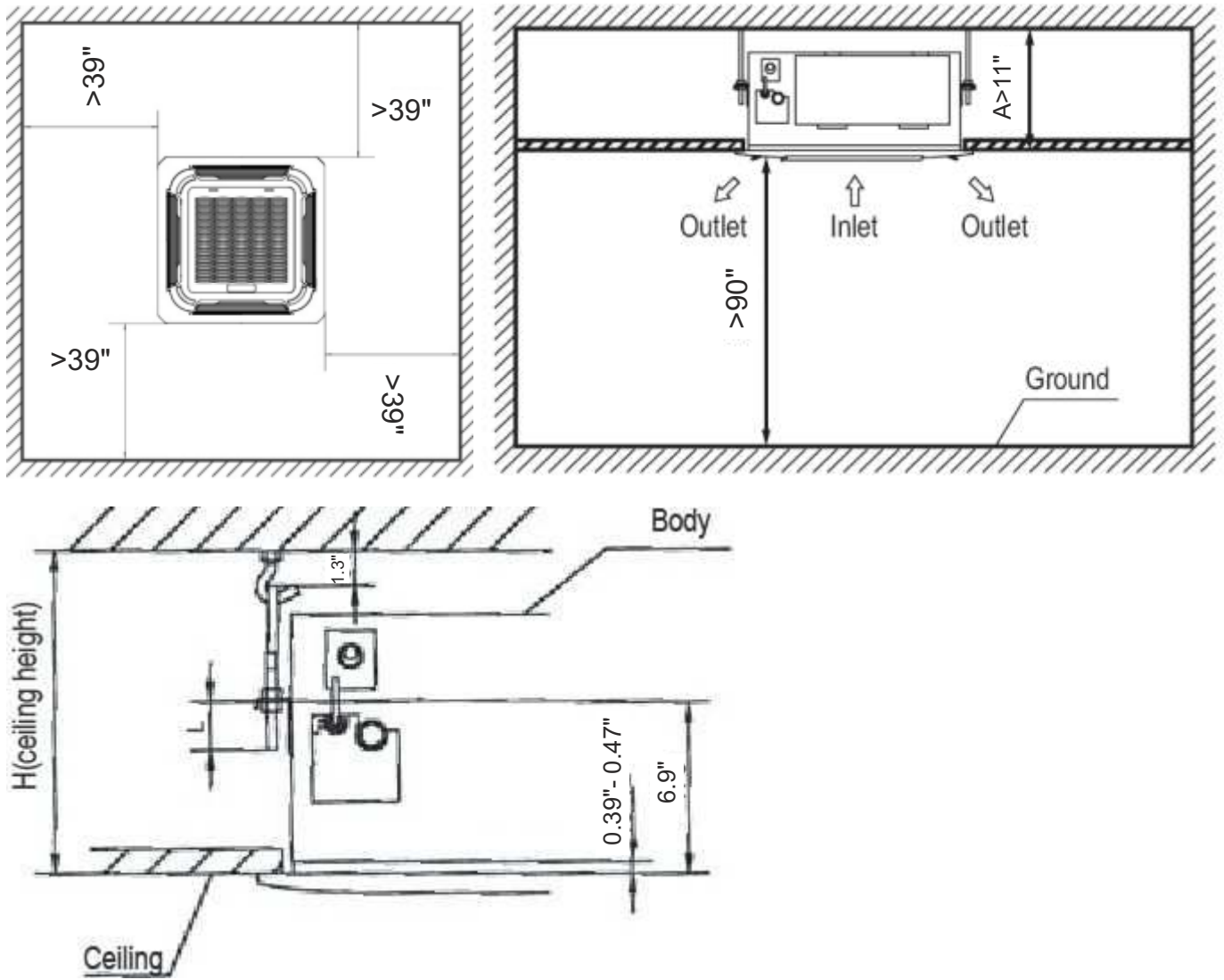
Indoor Units

4-way Cassette Type	7
Duct Type	10
Ceiling & Floor Type	16
Console Type	21

4-way Cassette Type

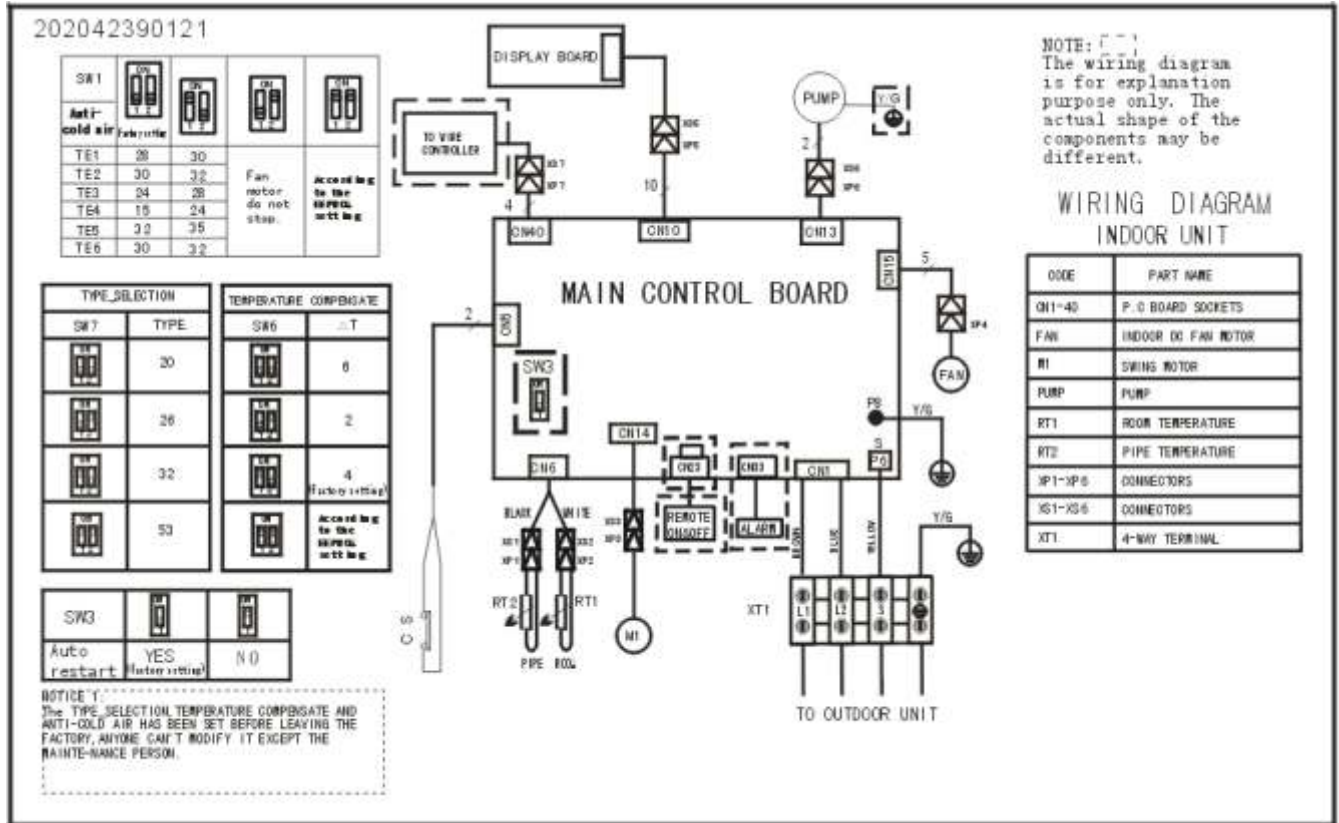
1. Service Space	7
2. Wiring Diagrams	8
3. Field Wiring	9

1. Service Space

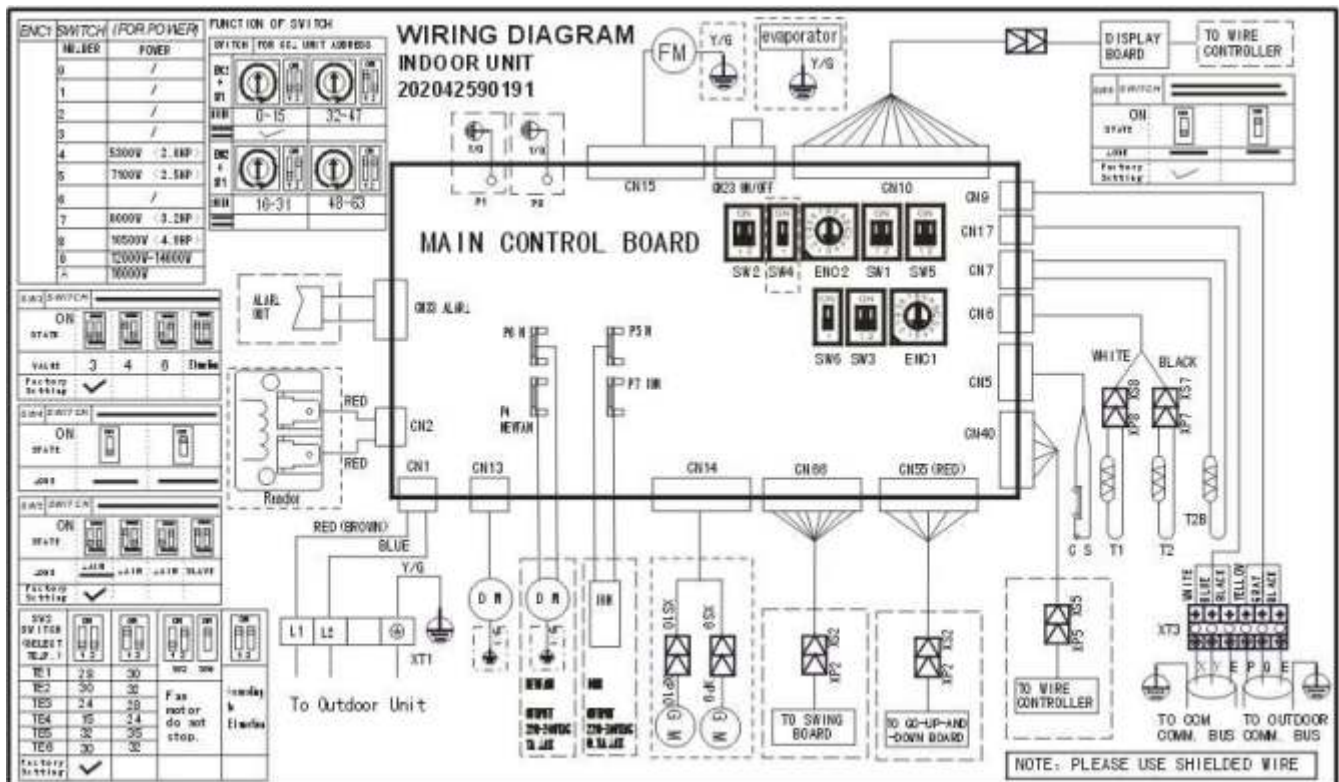


2. Wiring Diagrams

KTIM012-H2 KTIM018-H2

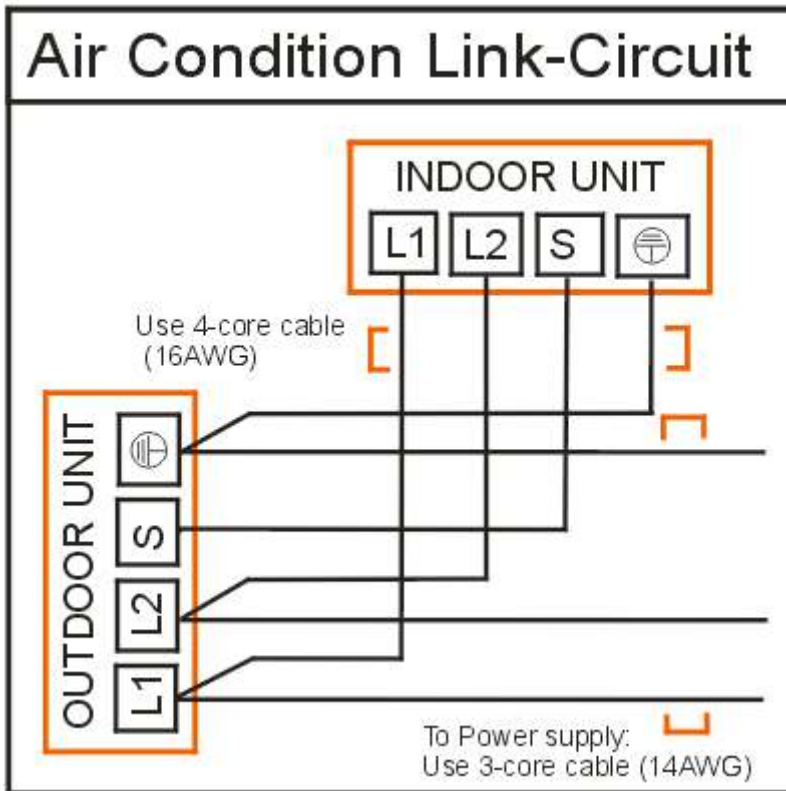


KTIM024-H2

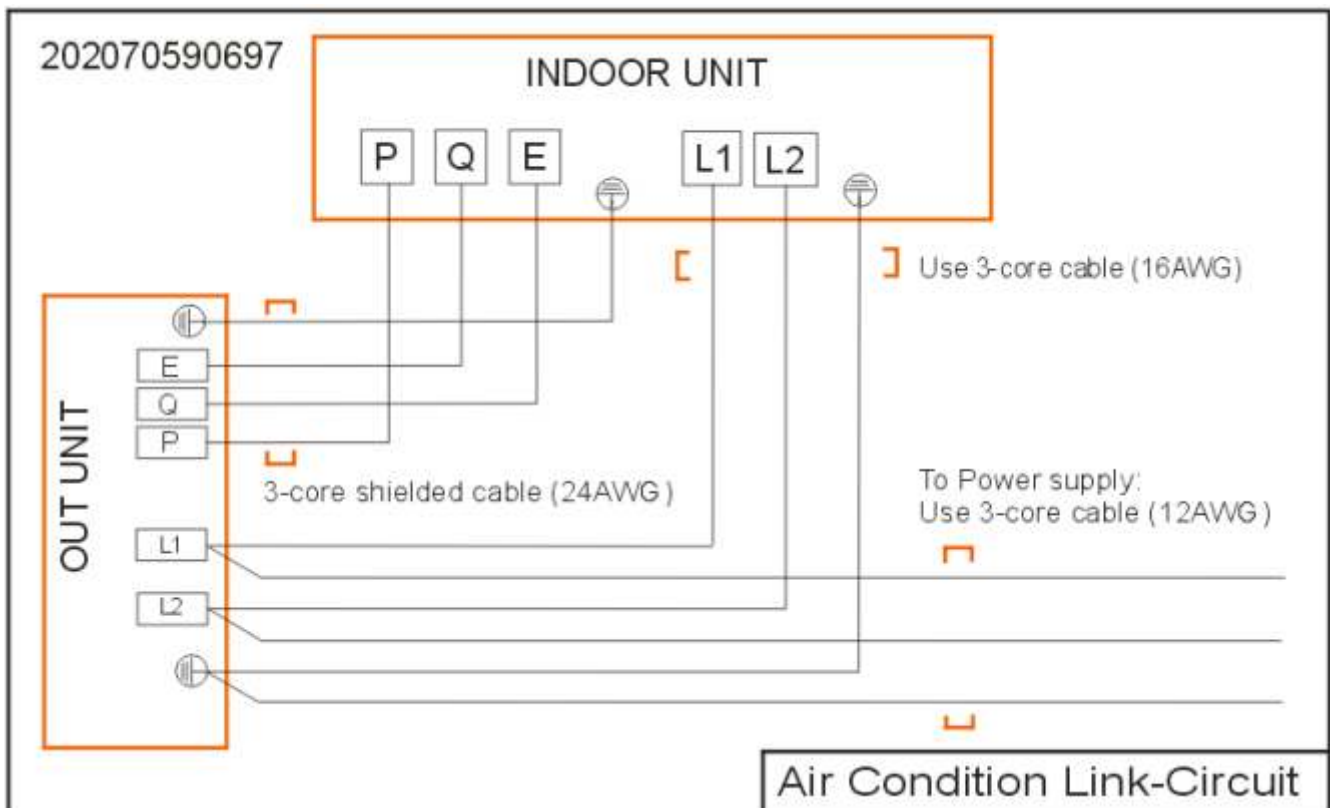


3. Field Wiring

KTIM012-H2 KTIM018-H2



KTIM024-H2

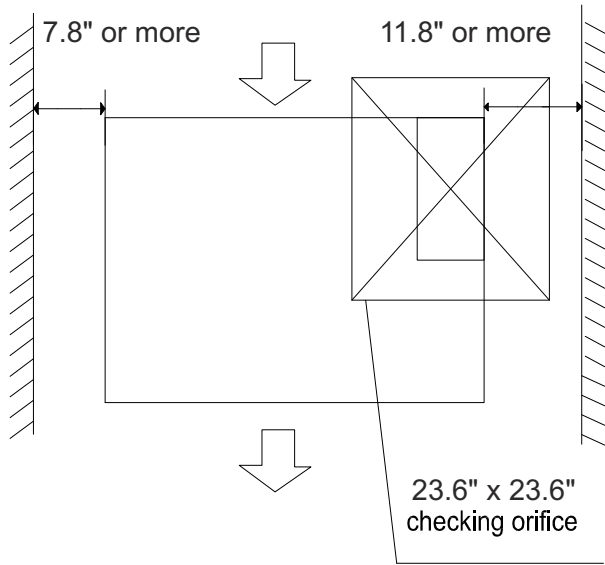


Duct Type

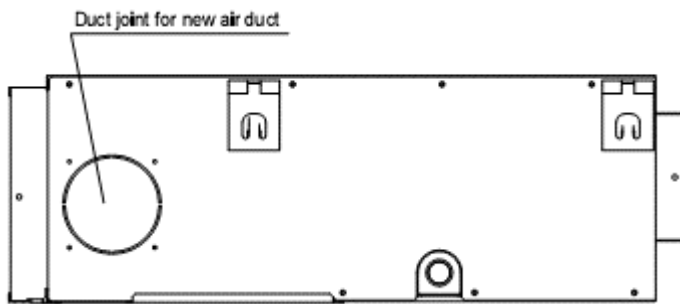
1. Service Space.....	11
2. Wiring Diagrams	12
3. Static Pressure.....	14
4. Field Wiring	15

3. Service Space

Ensure enough space required for installation and maintenance.



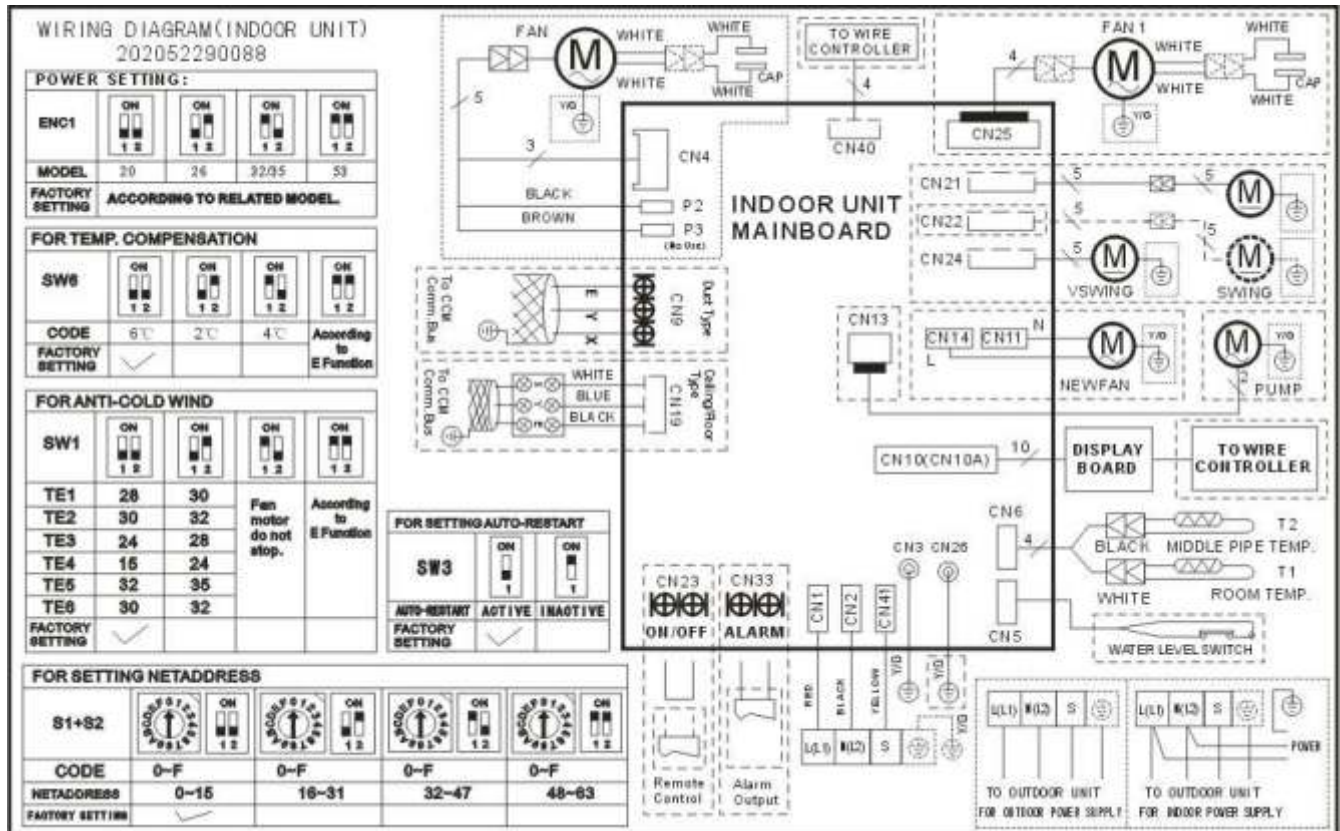
All the indoor units reserve the hole to joint the fresh air pipe. The hole size as following:



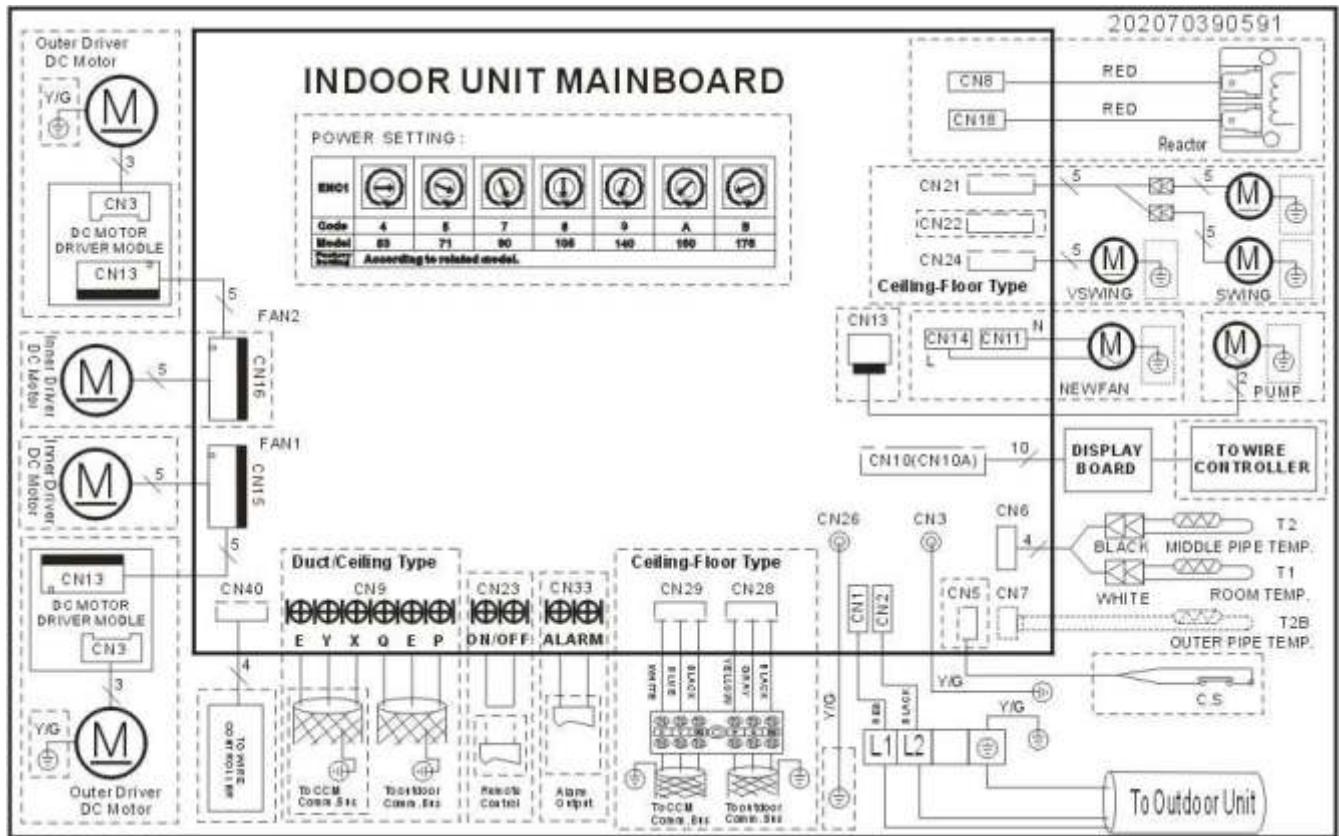
MODLE	
12-24	30-60

2. Wiring Diagrams

KDIM012-H2 KDIM018-H2



KDIM024-H2



For Setting NET Address

81+82								
Code	0-F	00	0-F	01	0-F	10	0-F	11
NET Address	0-15		16-31		32-47		48-63	
Factory Setting	✓							

For Setting POWER

ENC1							
Code	4	5	7	8	9	A	B
POWER	53	71	90	105	140	180	175
Factory Setting	According to related model.						

For Setting static pressure

ENC2					
Code	0	1	2	3	4
high static pressure	0-50	51-80	81-120	121-150	>150
Middle static pressure	0-25	26-37	38-50	51-100	>100
Factory Setting	✓				

For temp. compensation

SW6				
TYPE	/	/	/	/
DUCT TYPE	3℃	4℃	6℃	According to E Function
CEILING AND FLOOR TYPE	1℃	4℃	6℃	
For Setting CEILING TYPE OF FLOOR TYPE	FLOOR TYPE	CEILING TYPE		
Factory Setting	✓			

For Setting Fan Motor Control then No Power Request

SW2		
Mode	Fan OFF	Fan ON
Factory Setting	✓	

For Setting Auto-Restart

SW3		
Mode	ON	OFF
Factory Setting	✓	

For Setting Fan Quantity (optional)

SW4		
Mode	Single Fan	Double Fan
Factory Setting	✓	

For Setting TE

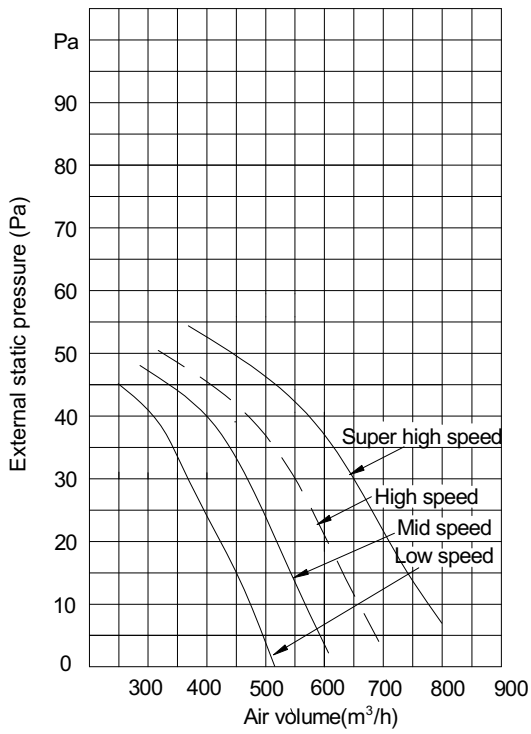
SW1					
TE1	28	30	Fan motor do not stop.	According to E Function	-
TE2	30	32			
TE3	24	28			
TE4	15	24			
TE5	32	36			
TE6	30	32			
Factory Setting	✓				

FUNCTION SETTING INDICATION

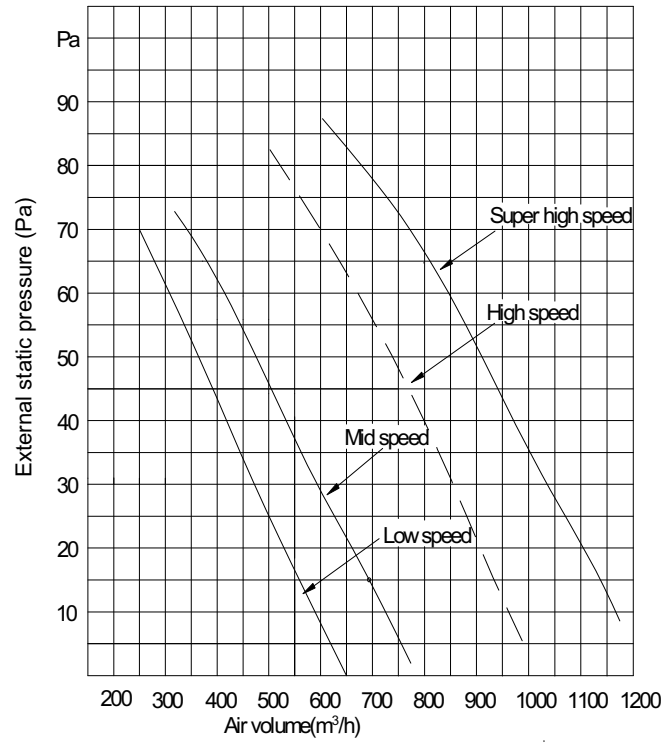
202070590737

3. Static Pressure

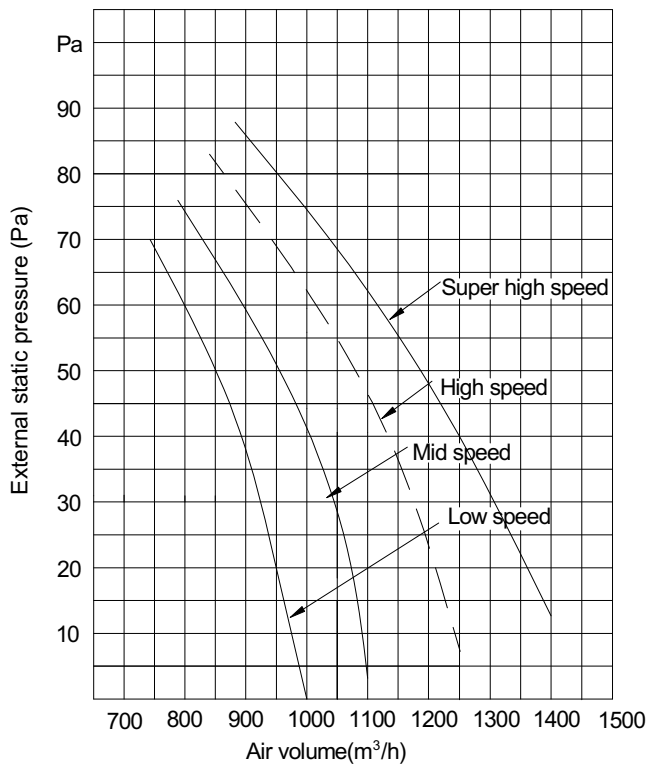
12,000 Btu/h



18,000 Btu/h

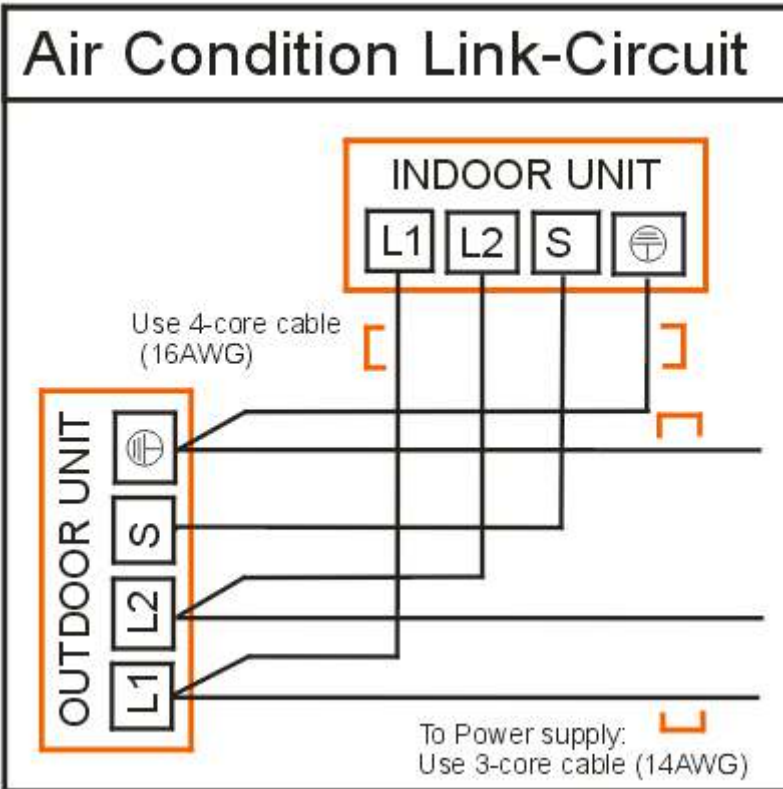


24,000 Btu/h

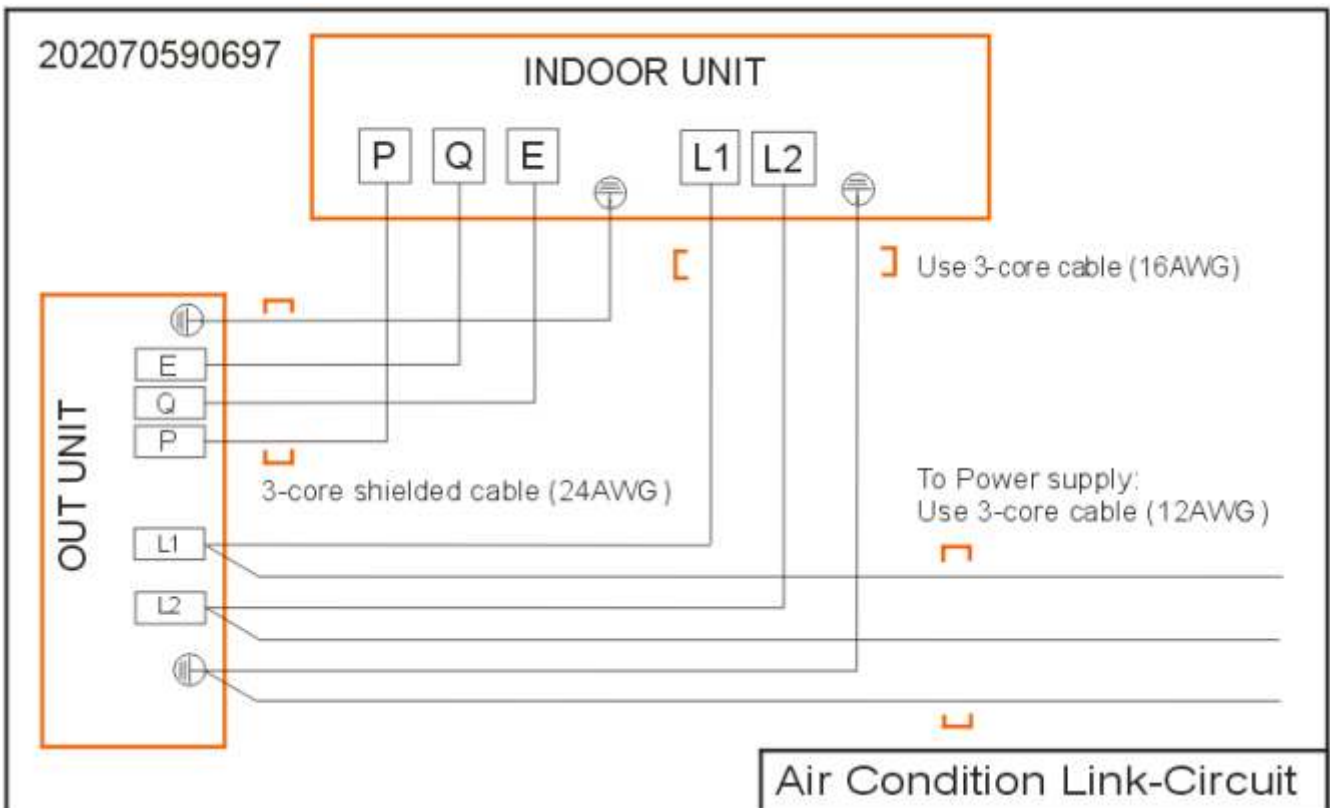


4. Field Wiring

KDIM012-H2 KDIM018-H2



KDIM024-H2

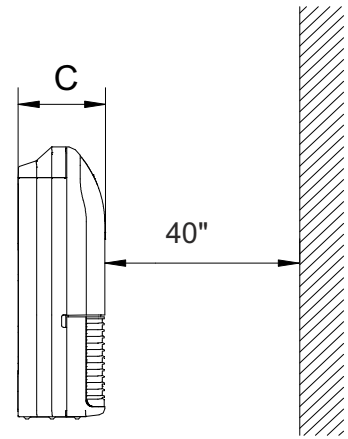
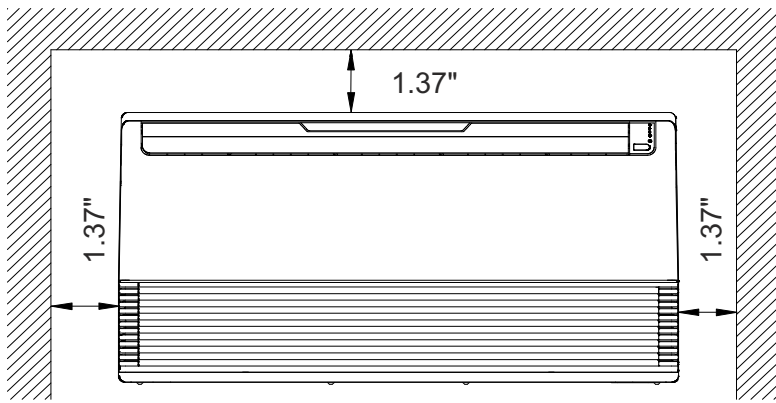


Ceiling & Floor Type

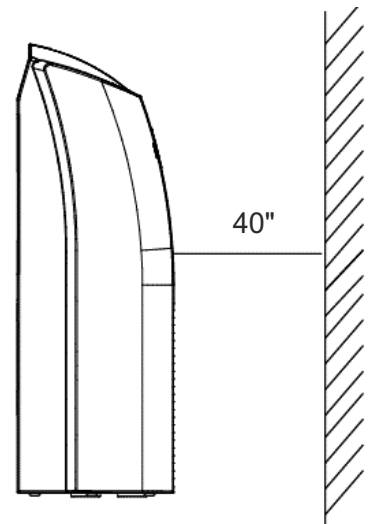
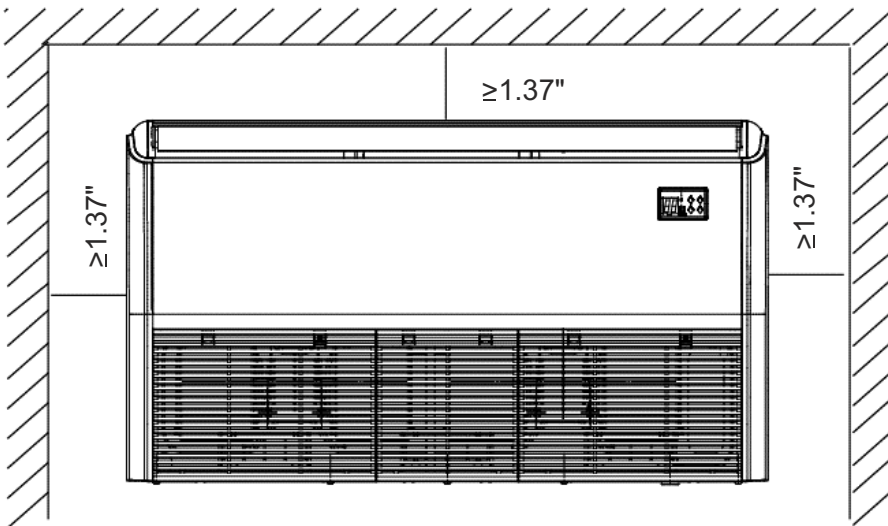
1. Service Space.....	17
2. Wiring Diagrams	18
3. Field Wiring	20

1. Service Space

12K,18K

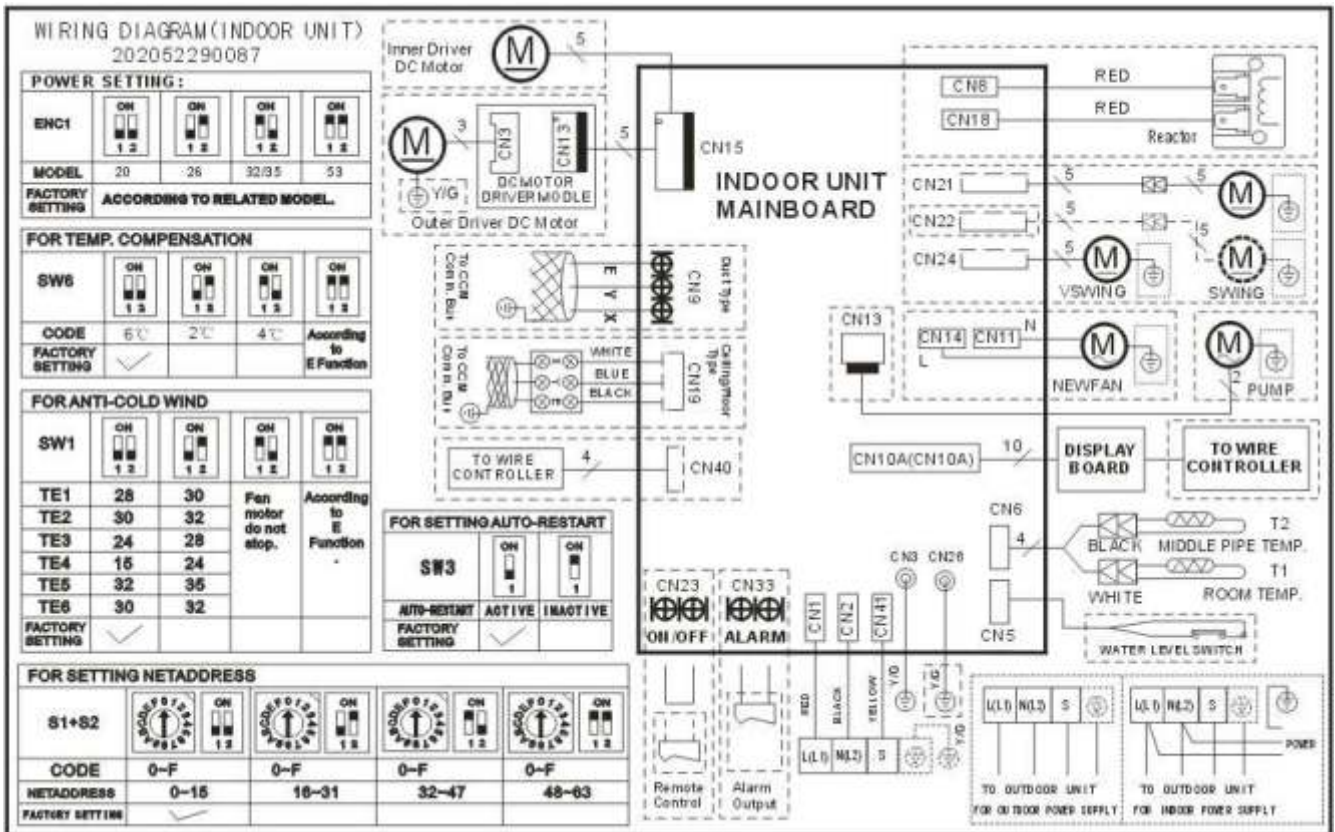


24K~48K

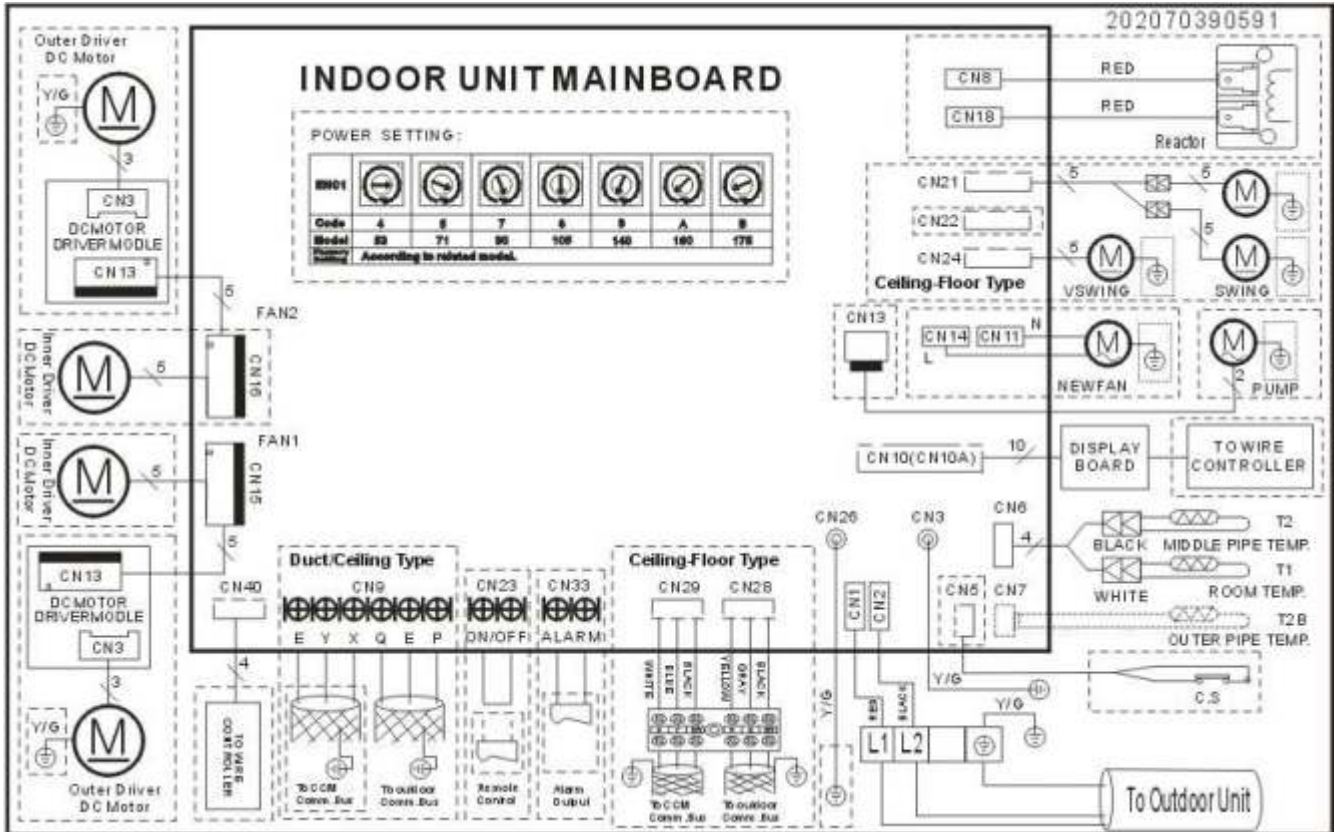


2. Wiring Diagrams

KUIM012-H2 KUIM018-H2



KUIM024-H2



For Setting NETAddress

S1+S2								
Code	0-F	00	0-F	01	0-F	10	0-F	11
NETAddress	0-15	16-31	32-47	48-63				

Factory Setting:

For Setting POWER

ENC1							
Code	4	5	7	8	9	A	B
POWER	53	71	90	105	140	160	175

Factory Setting: According to related model.

For Setting static pressure

ENC2					
Code	0	1	2	3	4
High static pressure	0-50	51-80	81-120	121-150	>150
Middle static pressure	0-25	26-37	38-50	51-100	>100

Factory Setting:

For temp. compensation

SW6				
TYPE	/	/	/	/
DUCTTYPE	3℃	4℃	6℃	According to B Function
DELTA/D FLOORTYPE	1℃	4℃	6℃	
Per setting DELTA/D TYPE or FLOORTYPE	FLOOR TYPE	DELTA/D TYPE		

Factory Setting:

For Setting Fan Motor Control then No Power Request

SW2		
Mode	Fan OFF	Fan ON

Factory Setting:

For Setting Auto-Restart

SW5		
Mode	ON	OFF

Factory Setting:

For Setting Fan Quantity (optional)

SW4		
Mode	Single Fan	Double Fan

Factory Setting:

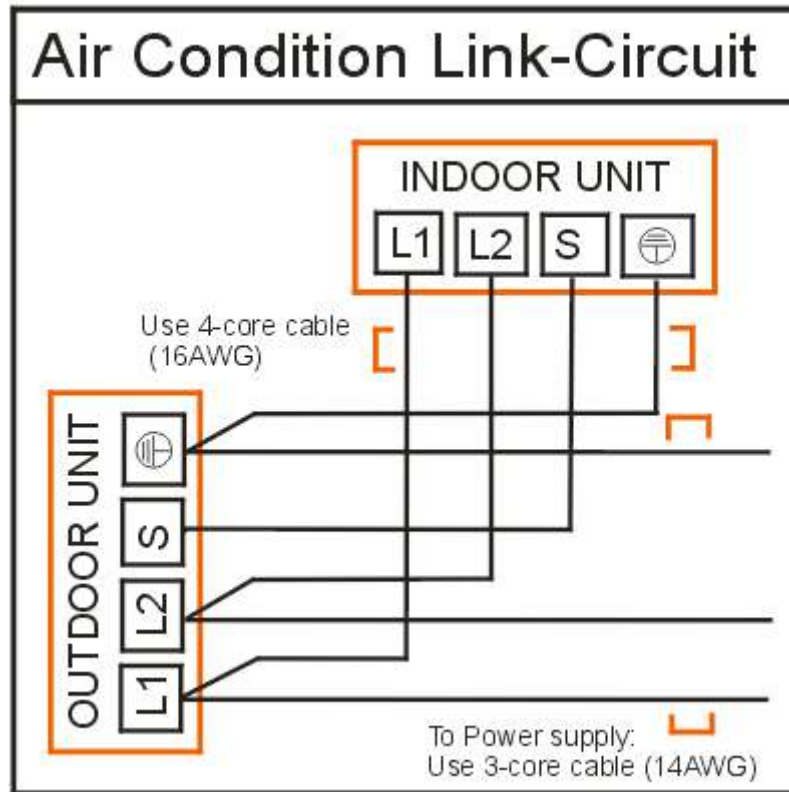
FUNCTION SETTING INDICATION

202070590737

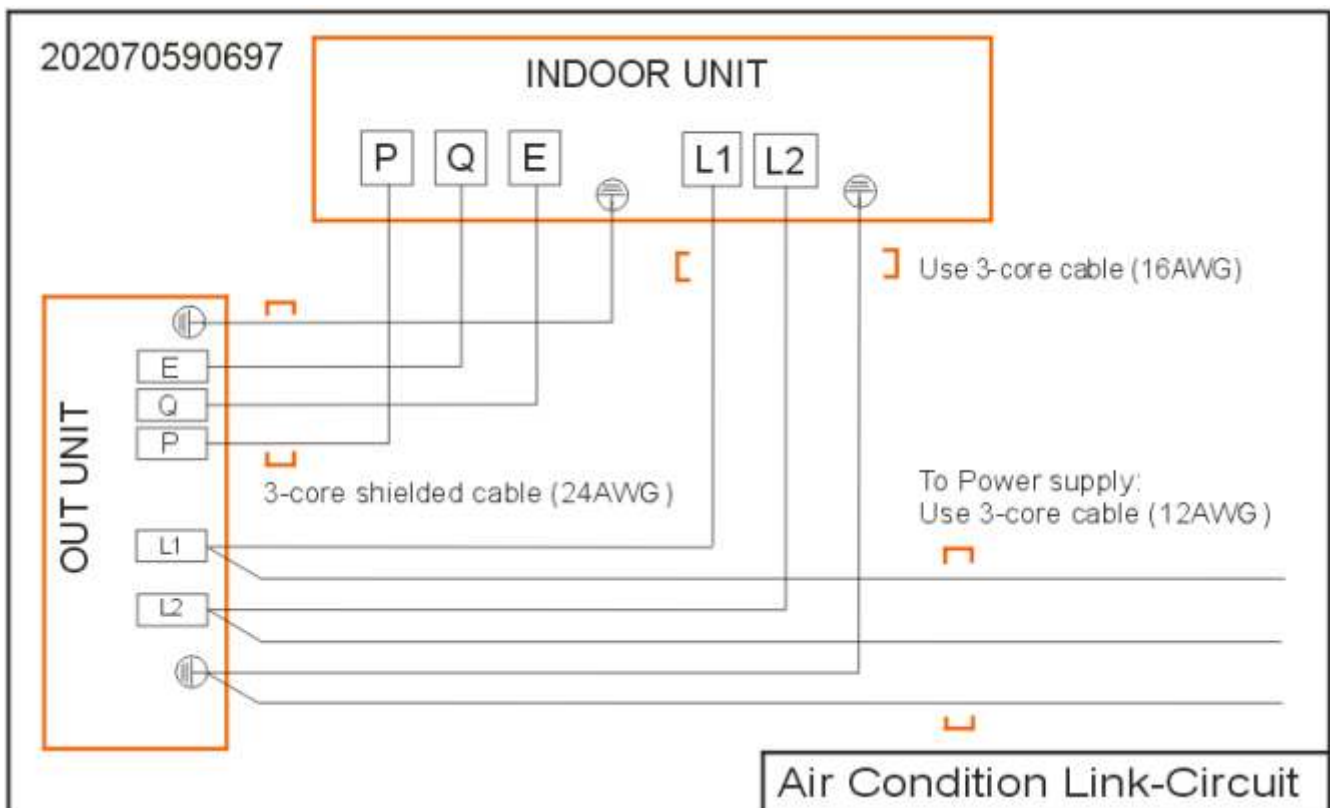
3. Field Wiring

KUIM012-H2

KUIM018-H2



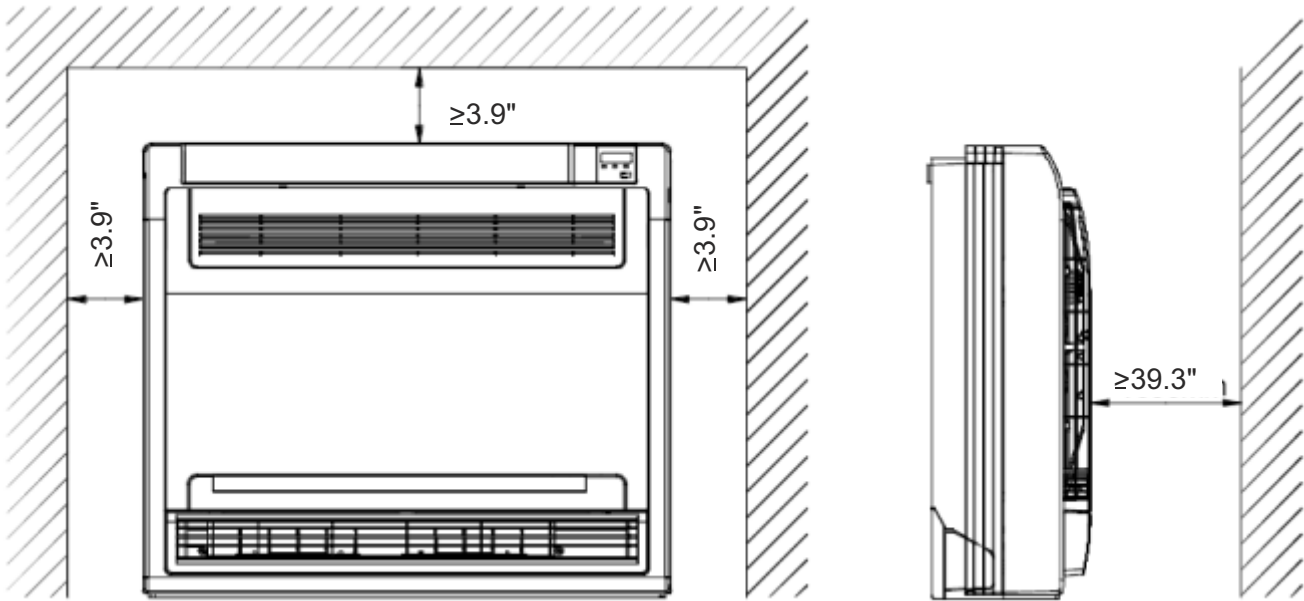
KUIM024-H2



Console Type

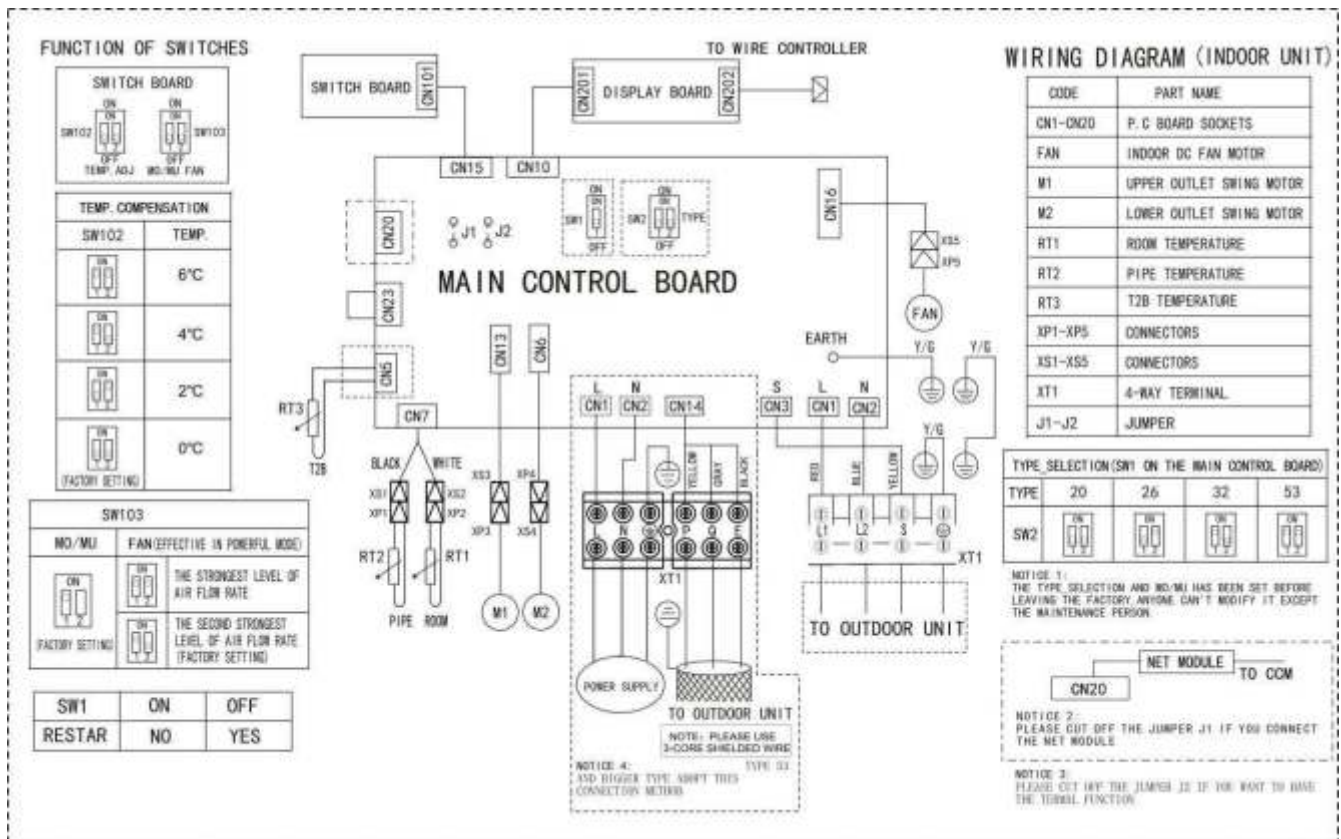
1. Service Space.....	22
2. Wiring Diagrams	23
3. Field Wiring	24

1. Service Space



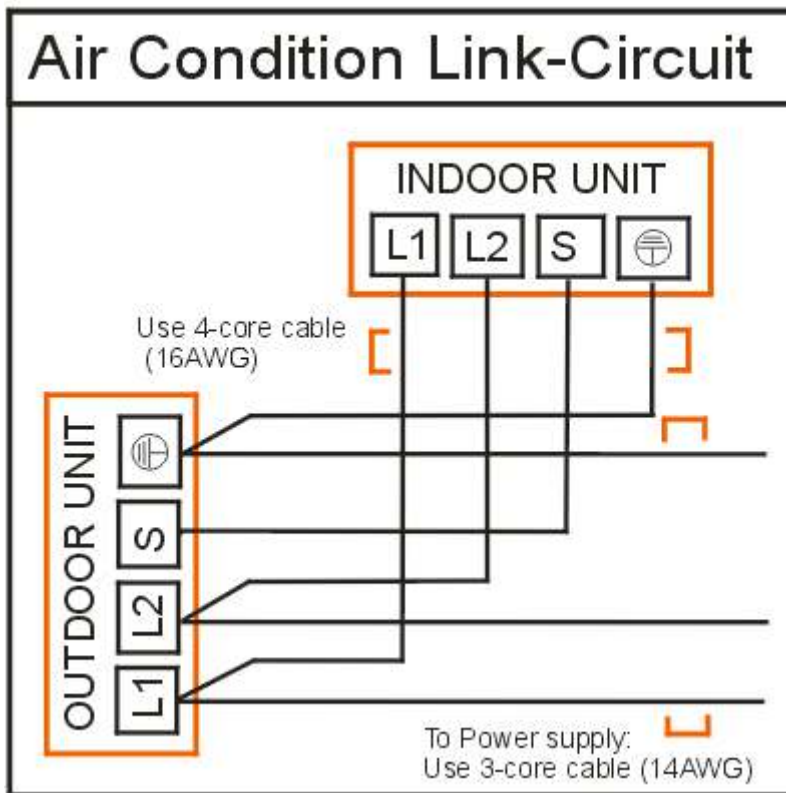
2. Wiring Diagrams

KFIM012-H2



3. Field Wiring

KFIM024-H2

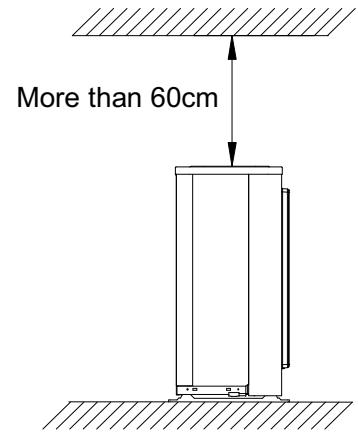
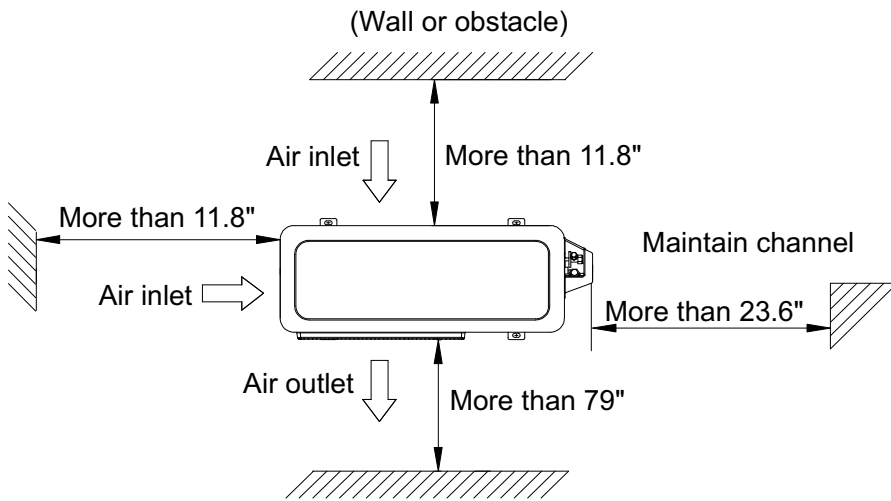


Part 3

Outdoor Units

1. Service Space.....	26
2. Piping Diagrams.....	27
3. Wiring Diagrams.....	28

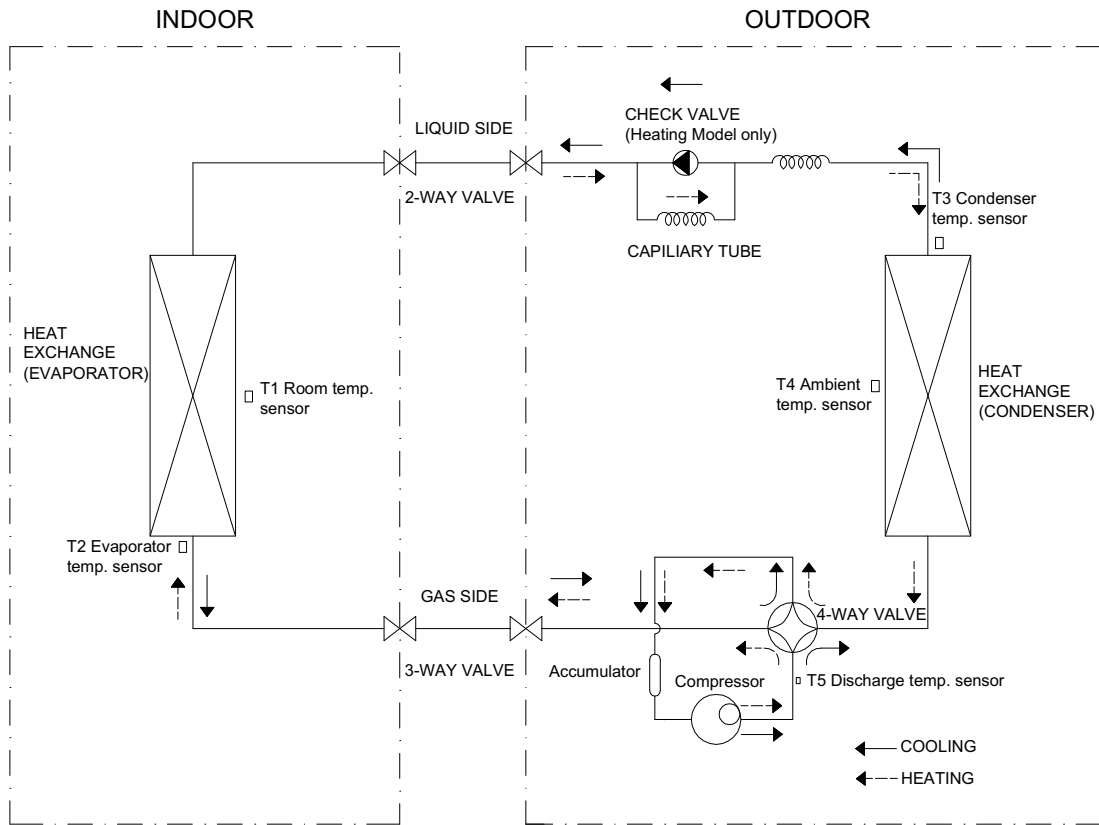
1. Service Space



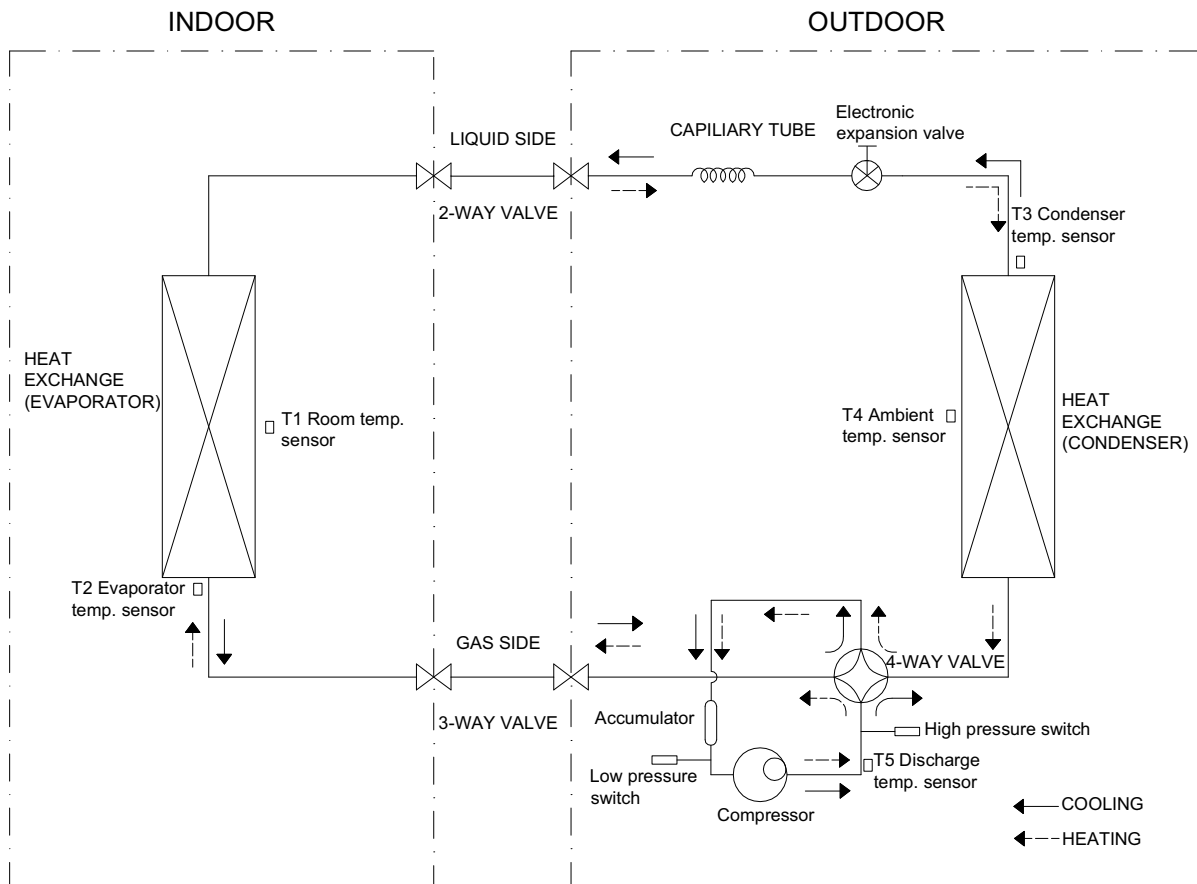
2. Piping Diagrams

KSIM012-H219

KSIM018-H219

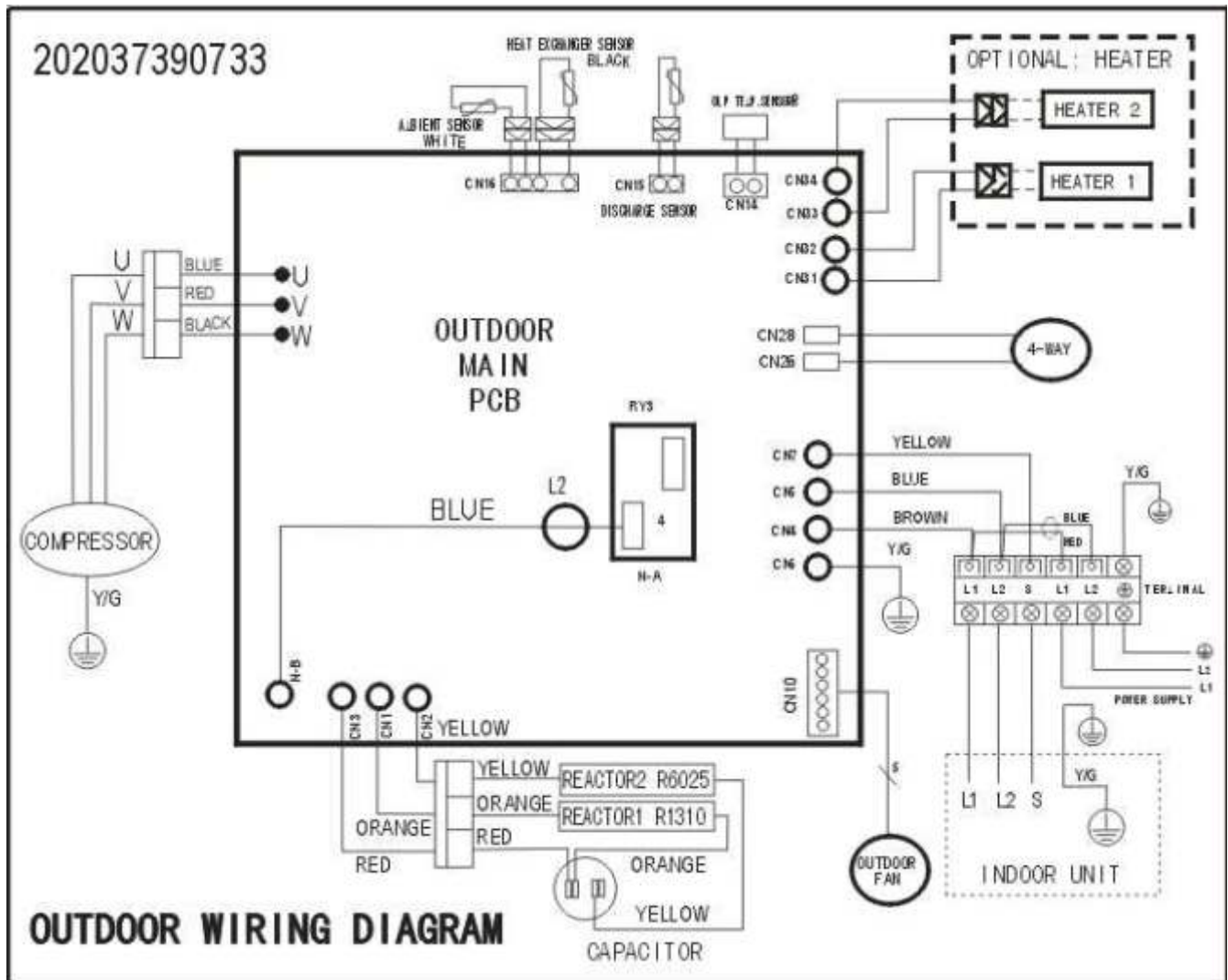


KSIM024-H219

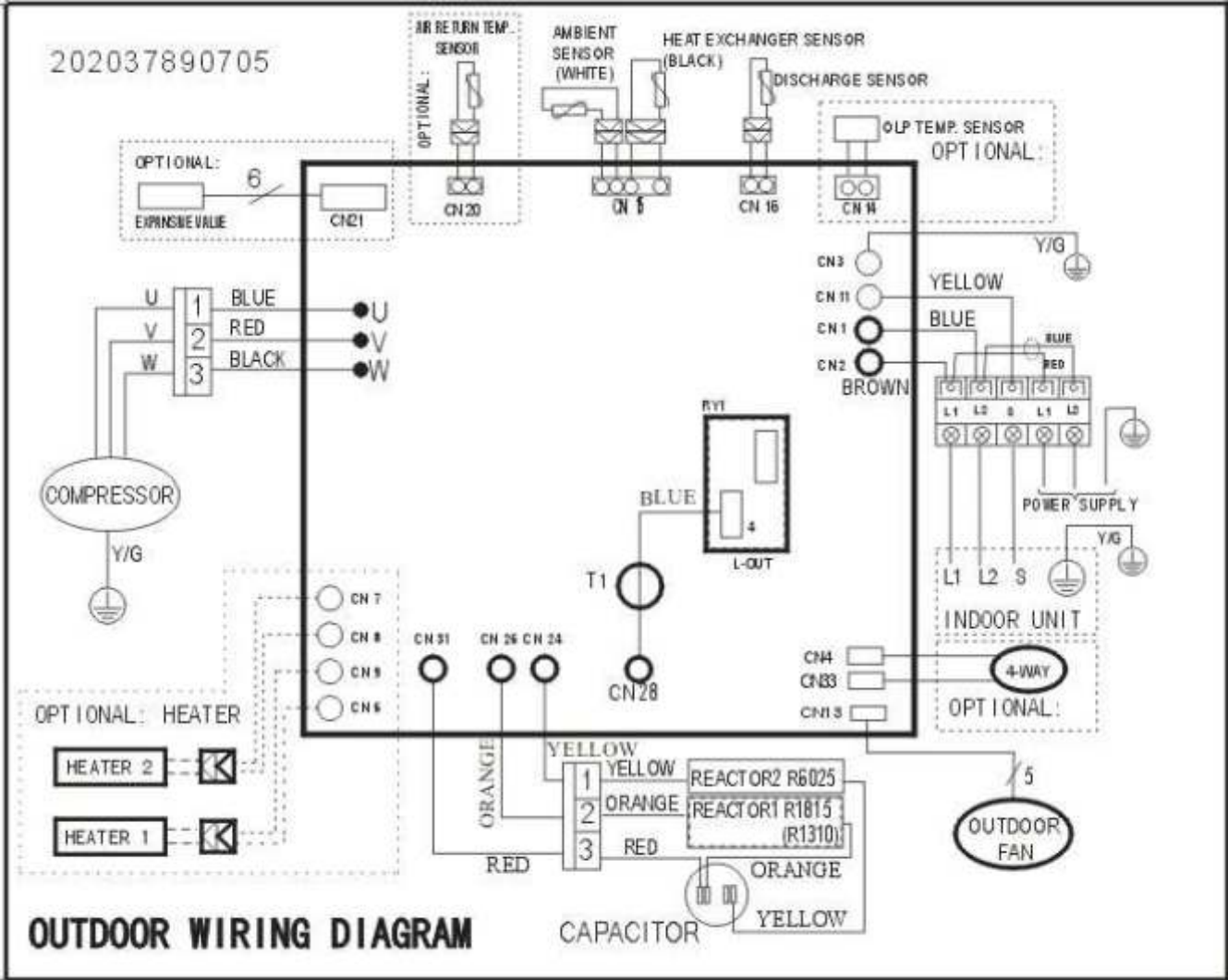


3. Wiring Diagrams

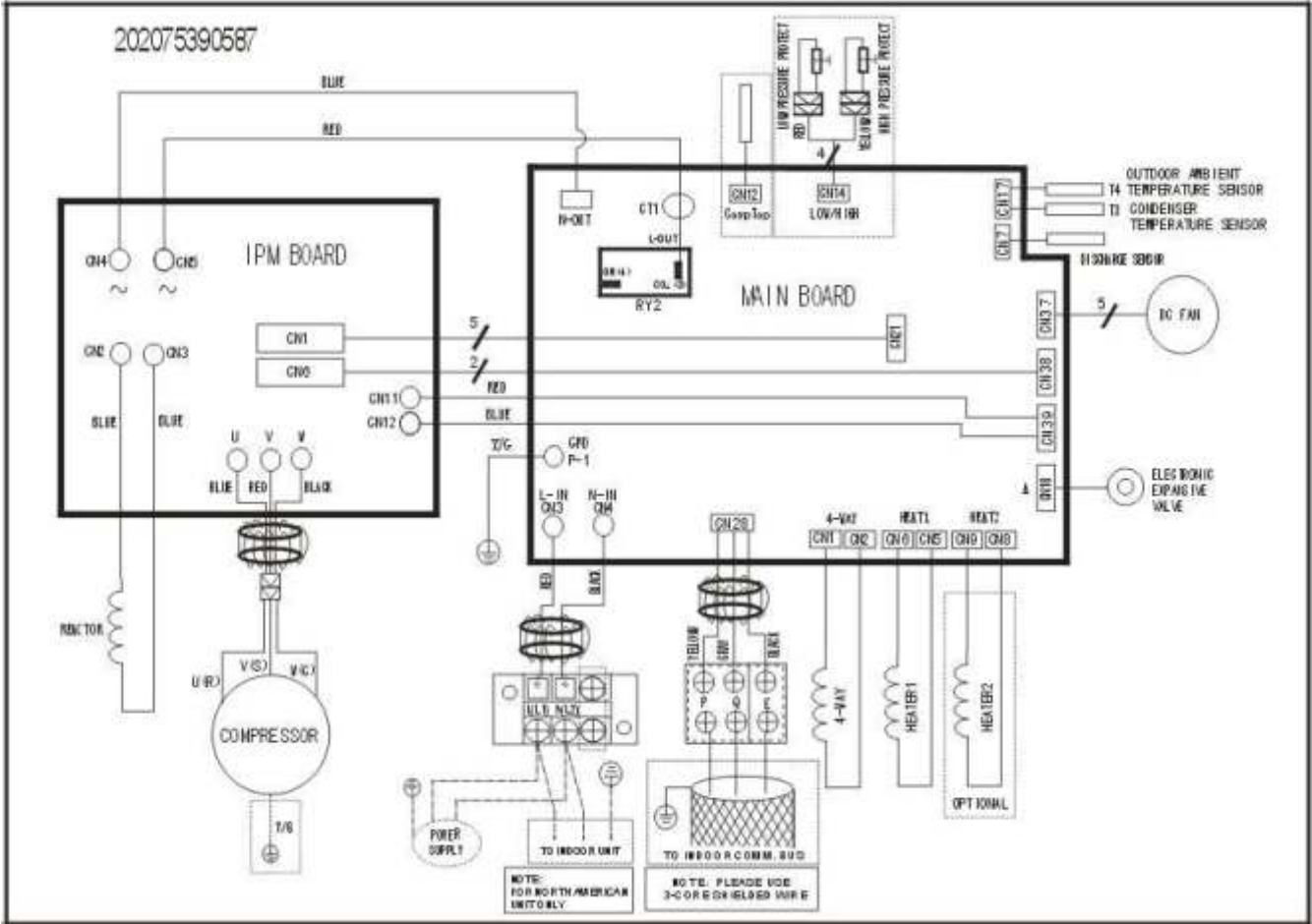
KSIM012-H219



KSIM018-H219



KSIM024-H219

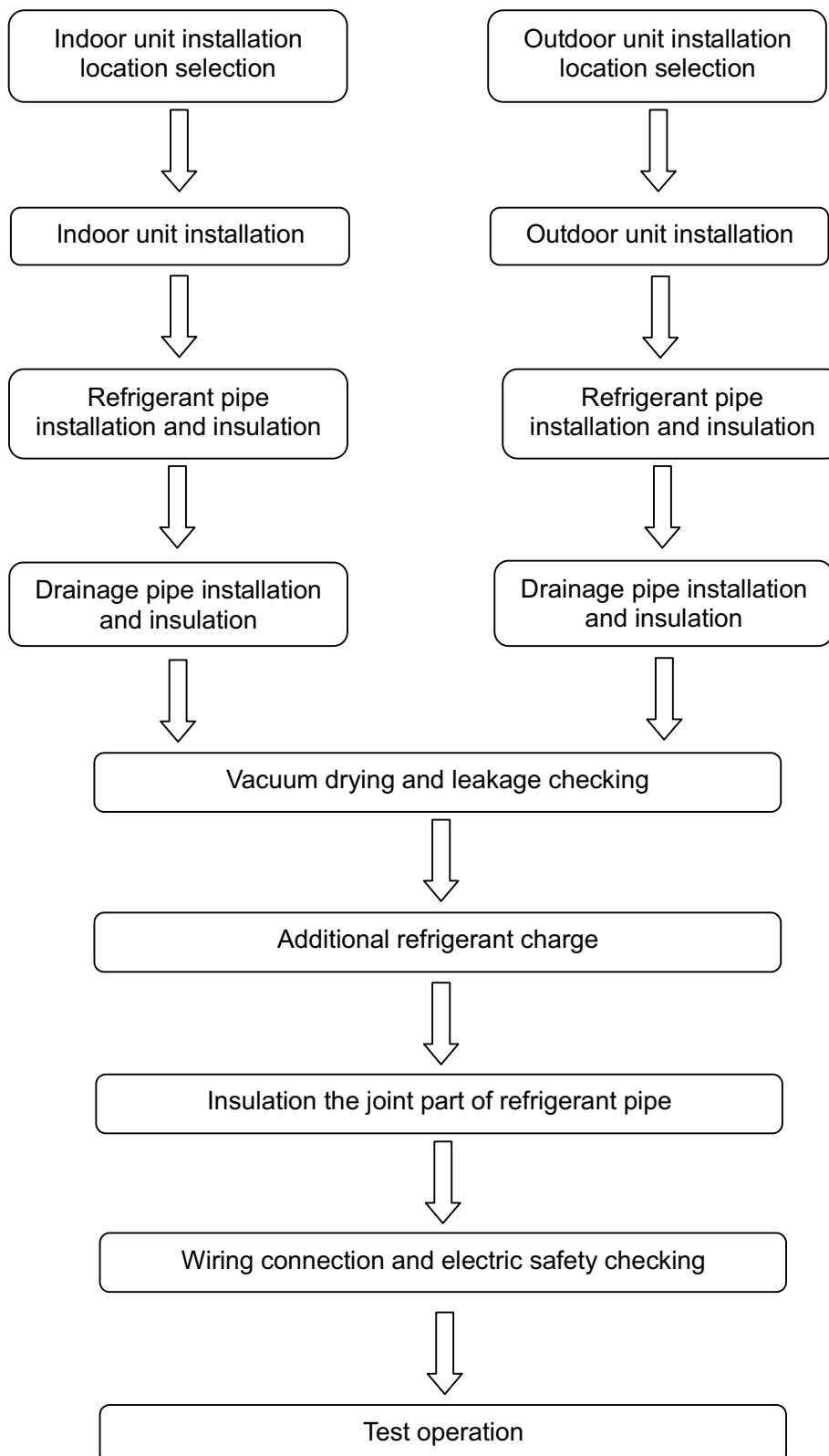


Part 4

Installation

1. Installation Procedure	32
2. Location selection	33
3. Indoor unit installation	34
4. Outdoor unit installation (Side Discharge Unit).....	52
5. Refrigerant pipe installation.....	53
6. Drainage pipe installation	56
7. Vacuum Drying and Leakage Checking	60
8. Additional refrigerant charge.....	61
9. Engineering of insulation.....	62
10. Engineering of electrical wiring.....	63
11. Test operation	64

1. Installation Procedure



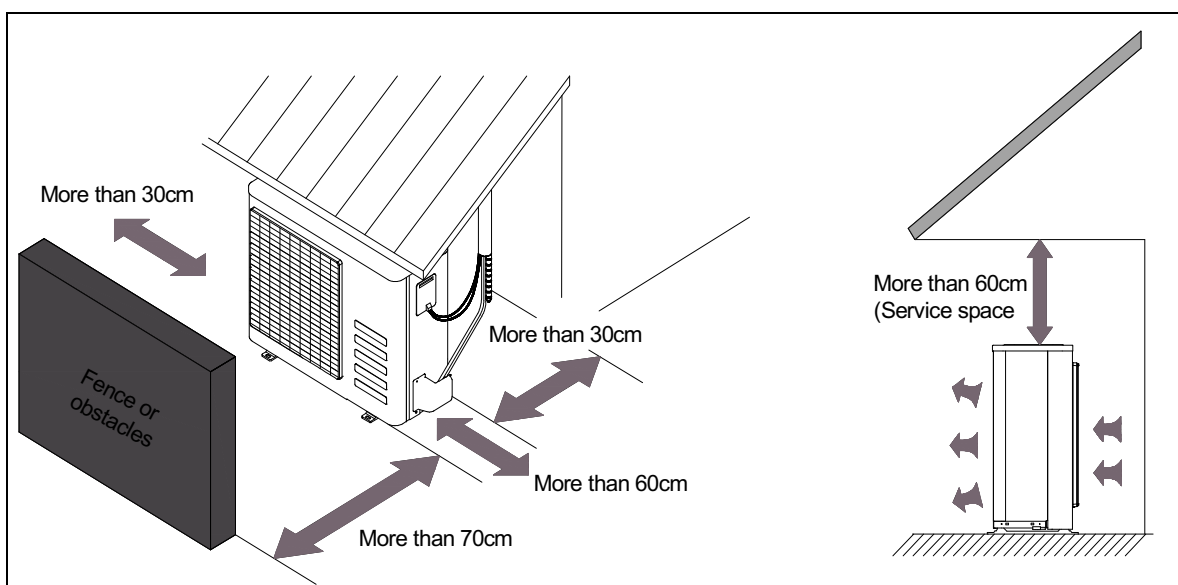
2. Location selection

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 near 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

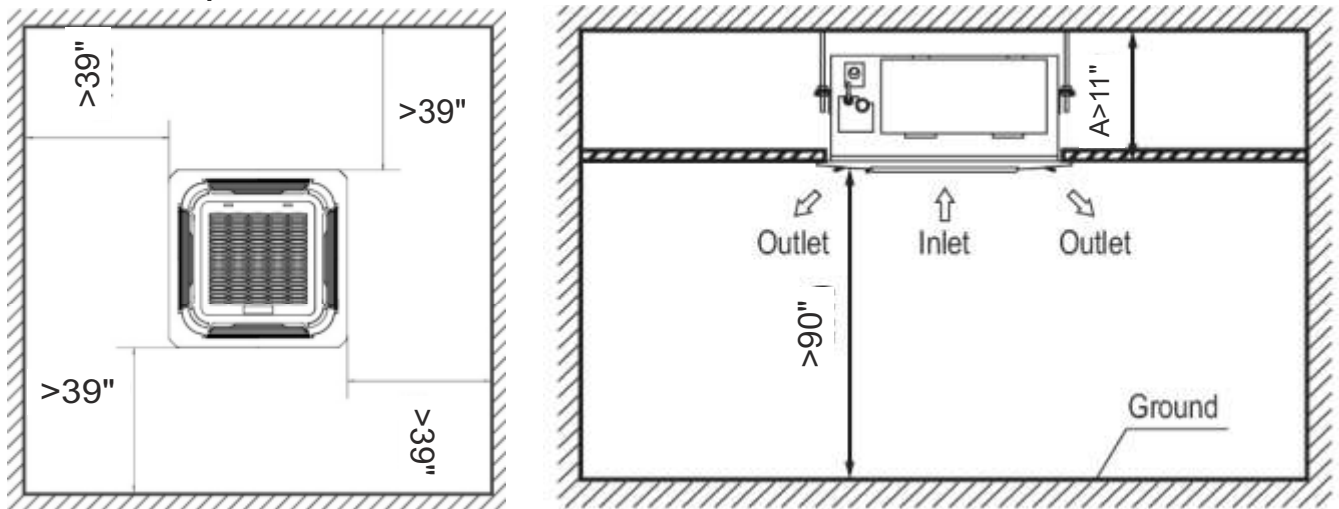
- The place shall easily support the outdoor unit's weight.
- Locate the outdoor unit as close to indoor unit as possible
- The piping length and height drop can not exceed the allowable value.
- The place where the noise, vibration and outlet air do not disturb the neighbors.
- There is enough room 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 wind, snow and other scraps accumulation, make sure that heat radiation from the condenser is not restricted.



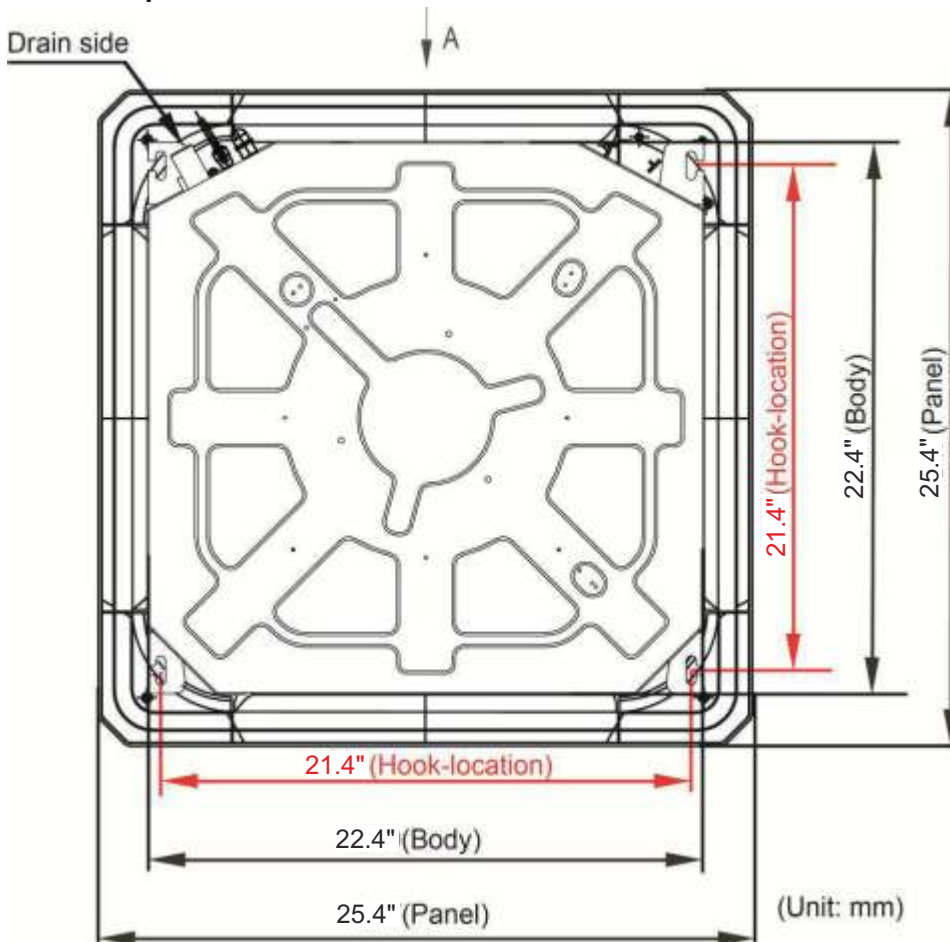
3. Indoor unit installation

3.1 Compact cassette indoor unit installation

3.1.1 Service space for indoor unit



3.1.2 Bolt pitch



3.1.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\text{Ø}12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).

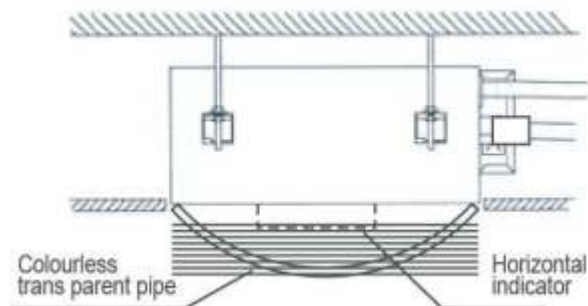


Face the concave side of the installation hooks toward the expansible hooks. Determine the length of the installation hooks from the height of ceiling, then cut off the unnecessary part.

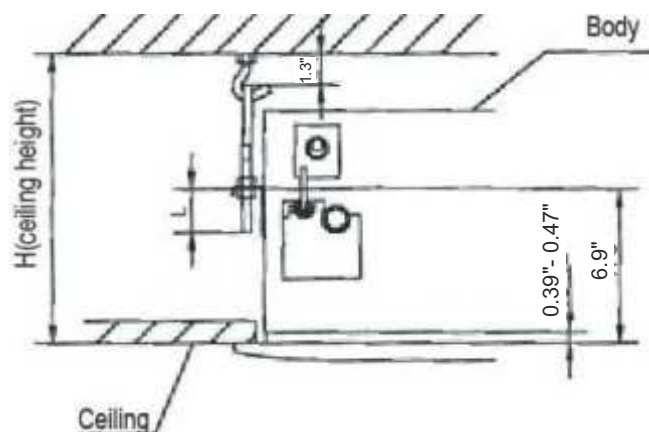
If the ceiling is extremely high, please determine the length of the installation hook depending on the real situation.

3.1.4 Install the main body

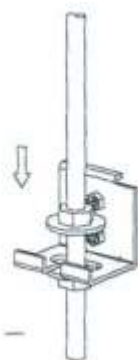
Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within $\pm 1\%$.



Adjust the position to ensure the gaps between the body and the four sides of ceiling are even. The body's lower part should sink into the ceiling for 10~12 mm. In general, L is half of the screw length of the installation hook.

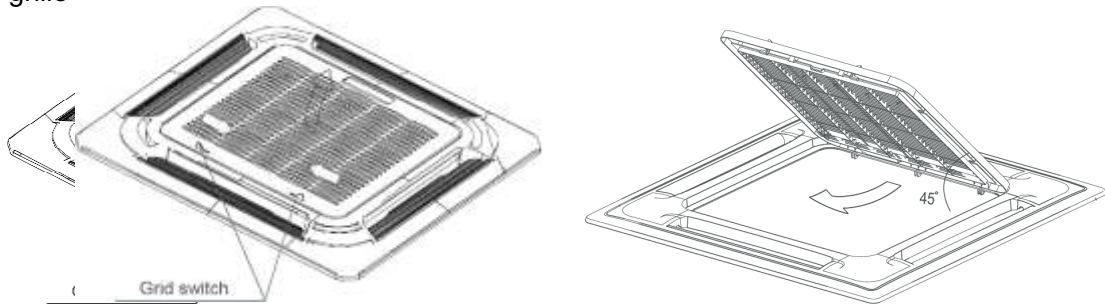


Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position well.

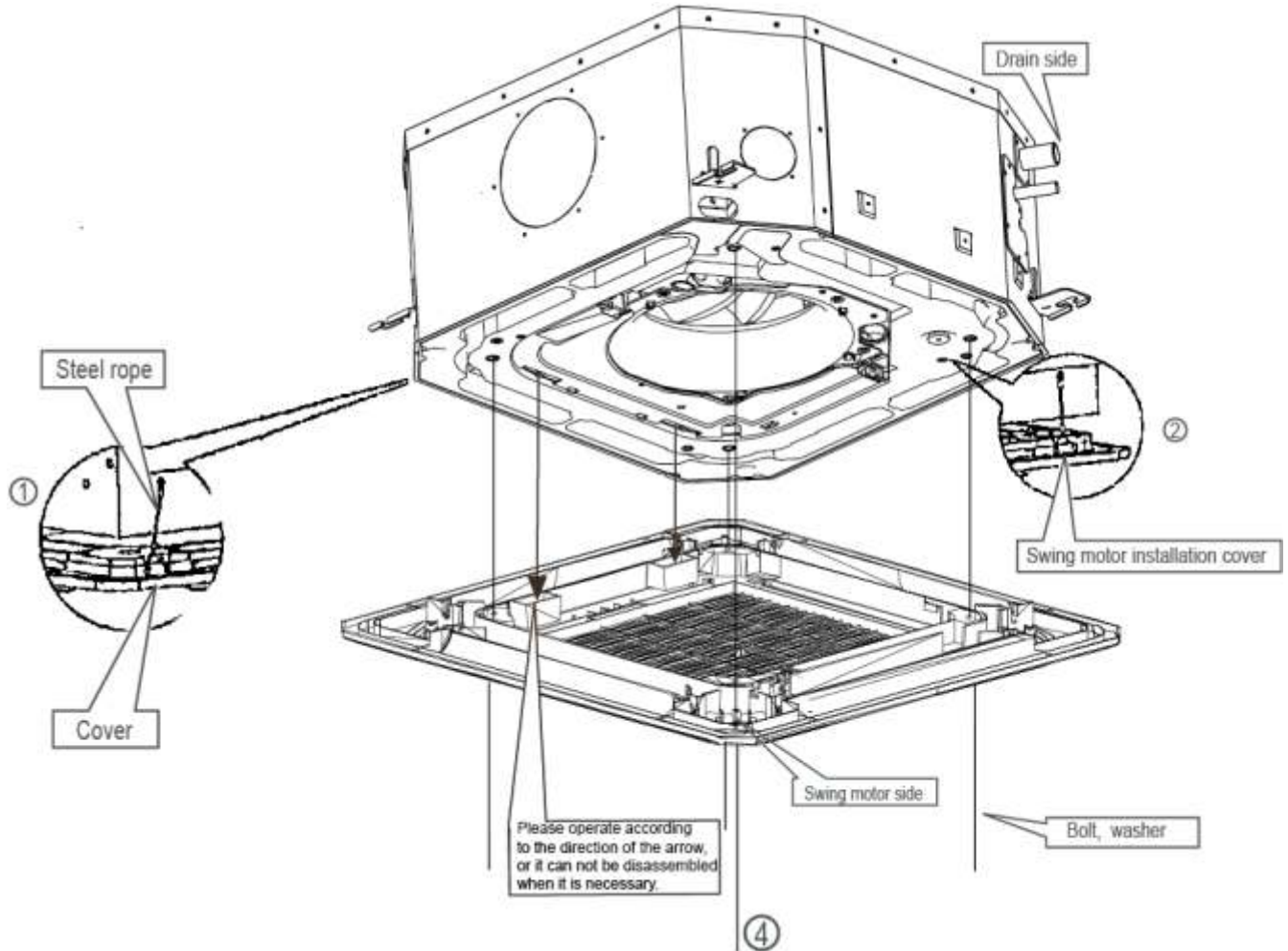


3.1.5 Install the panel

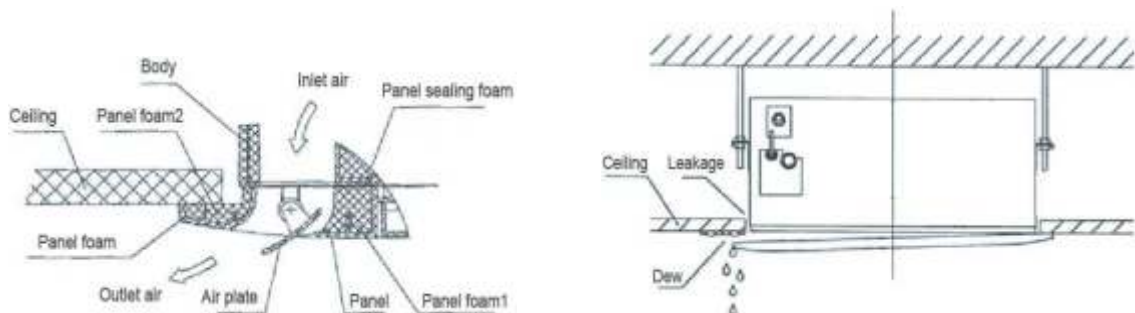
Remove the grille



Hang the panel to the hooks on the mainbody.



Tighten the screws under the panel hooks till the panel closely stick on the ceiling to avoid condensation water.

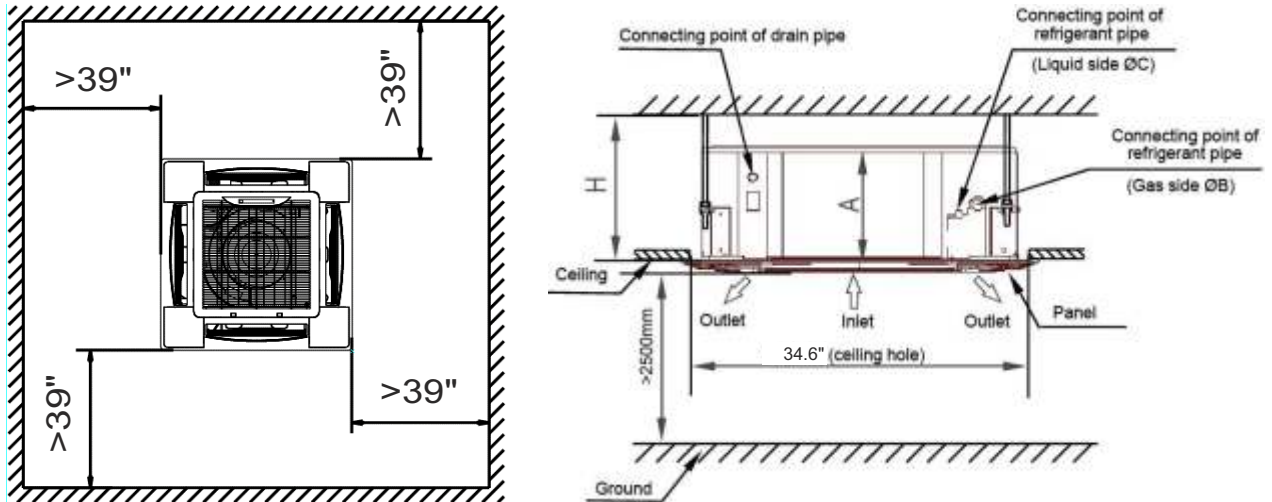


Hang the air-in grill to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.

Note: The panel shall be installed after the wiring connected.

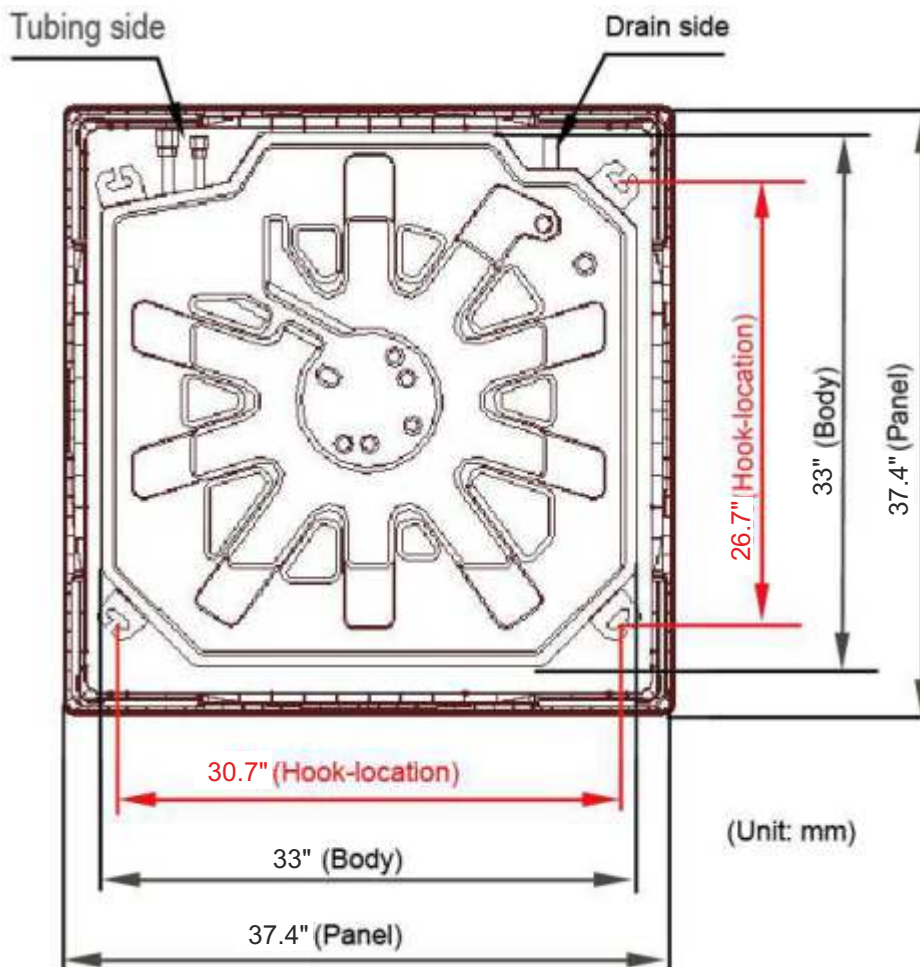
3.2 Super slim cassette indoor unit installation

3.2.1 Service space for indoor unit



Model	A	H		Remark
24	8	>9.2"	R410A	Cooling / Cooling & Heating

3.2.2 Bolt pitch



3.2.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of Ø12mm, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).

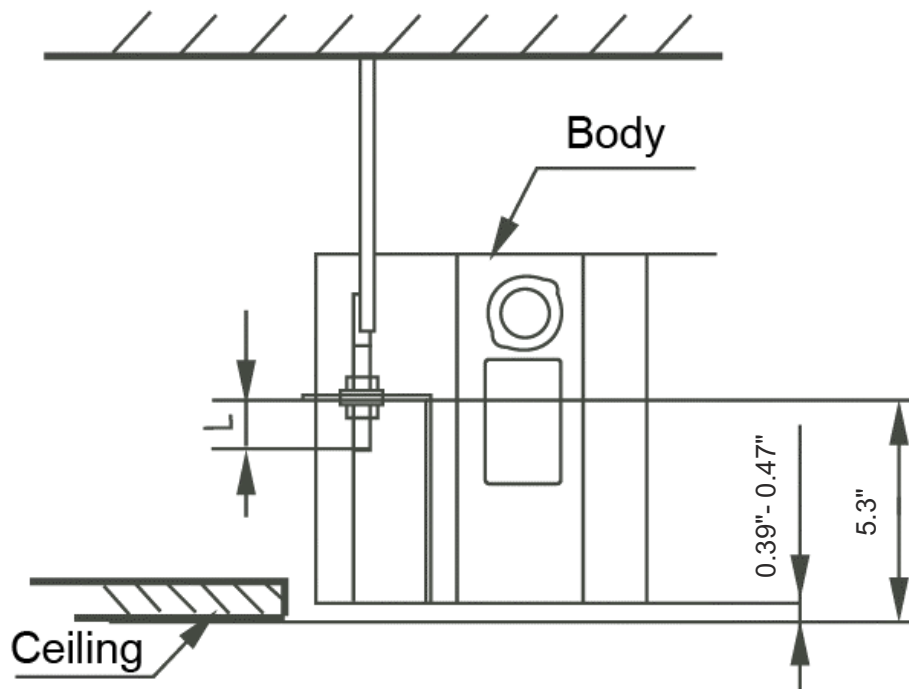


3.2.4 Install the main body

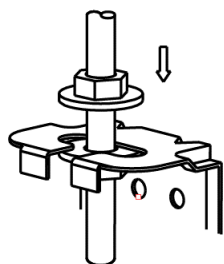
Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within 1 e .



Adjust the position to ensure the gaps between the body and the four sides of ceiling are even. The body's lower part should sink into the ceiling for 10~12mm in general, L is half of the screw length of the installation hook.

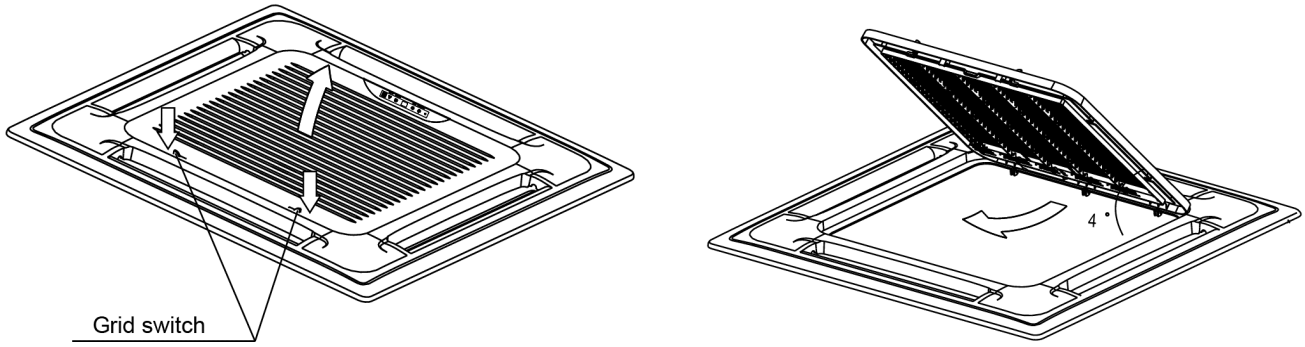


Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position well .



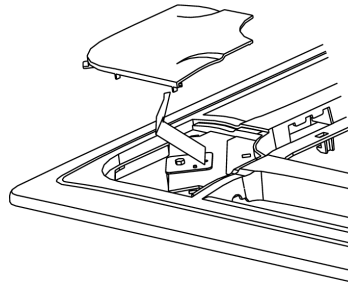
3.2.5 Install the panel

Remove the grille

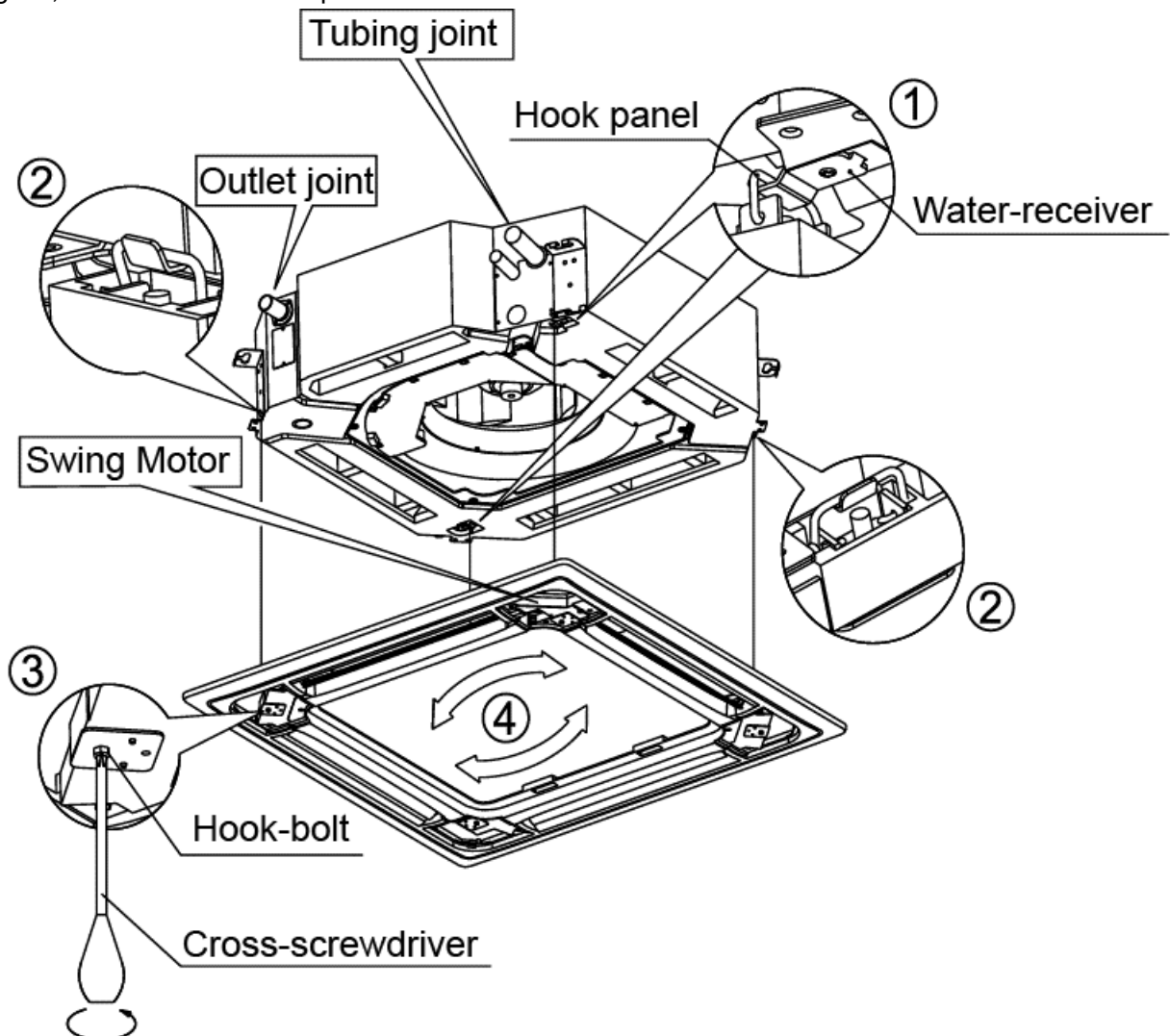


Grid switch

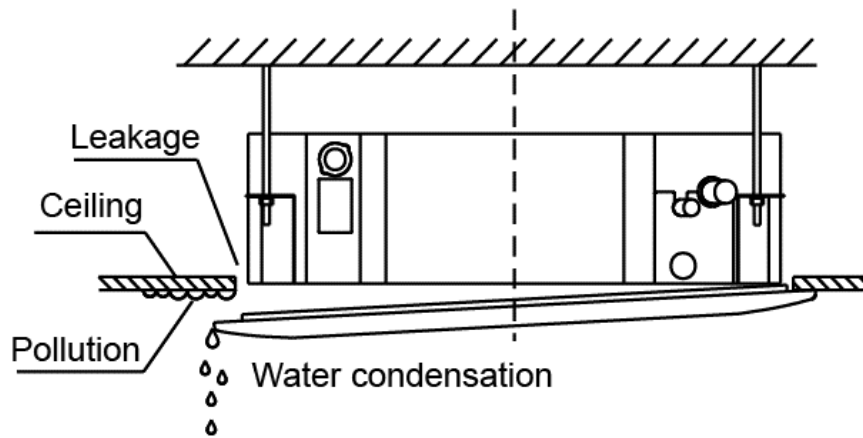
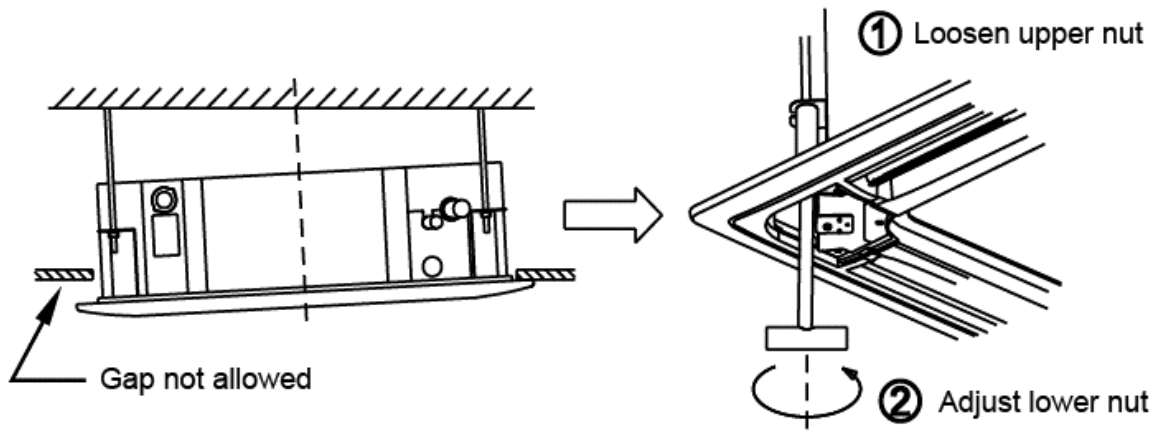
Remove the 4 corner covers.



Hang the panel to the hooks on the mainbody. If the panel is with auto-lift grille, please watch the ropes lifting the grille, DO NOT make the ropes entwined or blocked.

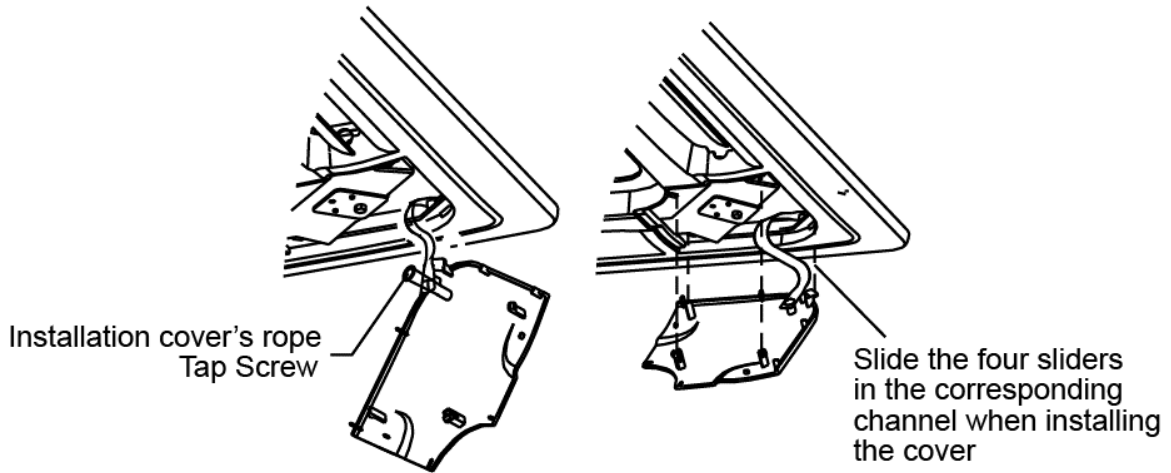


Tighten the screws under the panel hooks till the panel closely stick on the ceiling to avoid condensate water.



Hang the air-in grill to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.

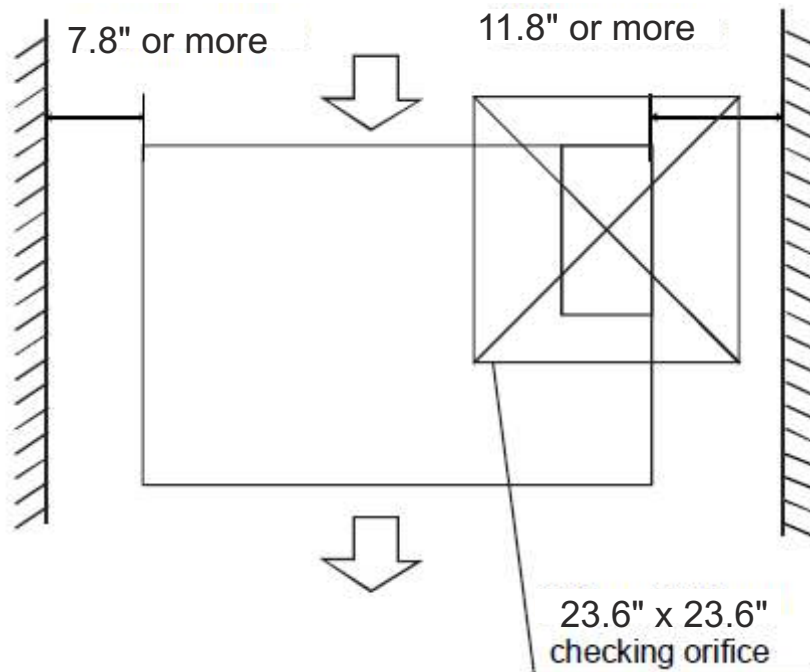
Install the 4 corner covers back.



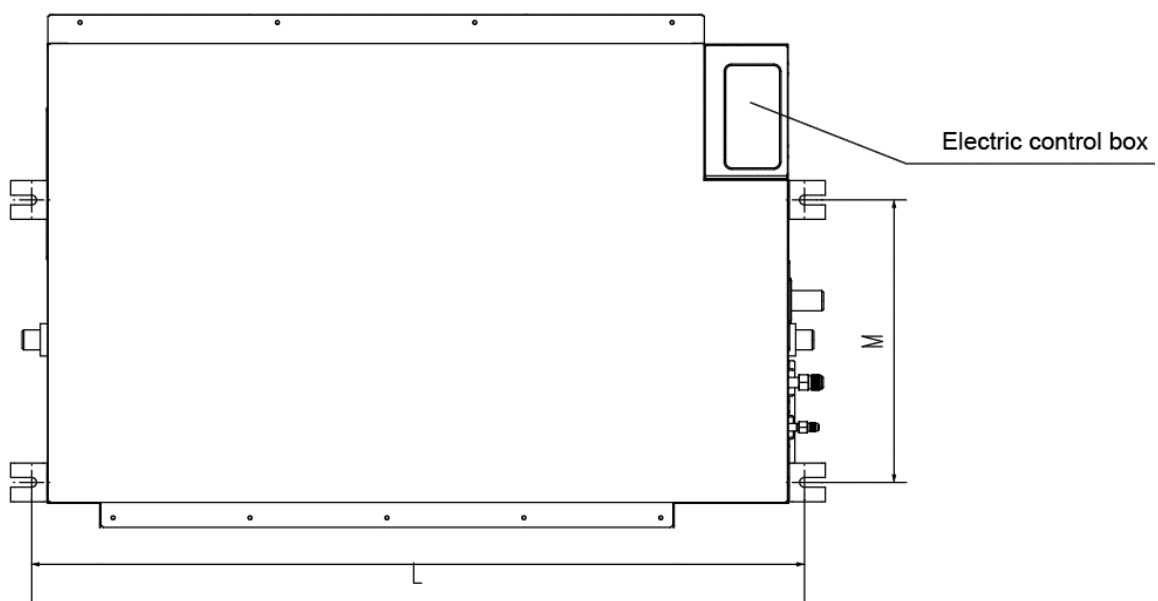
Note: The panel shall be installed after the wiring connected.

3.3 A5 duct indoor unit installation

3.3.1 Service space for indoor unit



3.3.2 Bolt pitch



Capacity(KBtu)	Size of outline dimension mounted plug	
	L (in)	M (in)
24	37.7	13.7
30/36	46.4	19.2
48	48.8	19.6

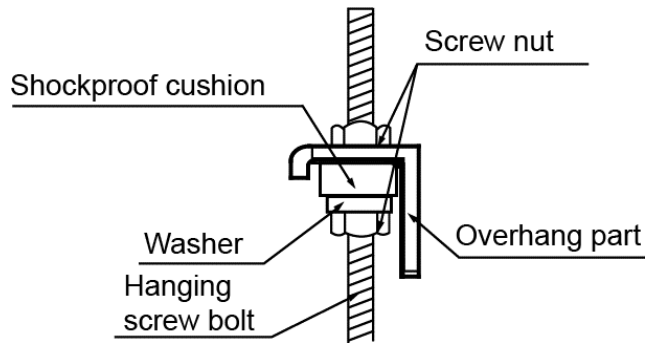
3.3.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\varnothing 12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



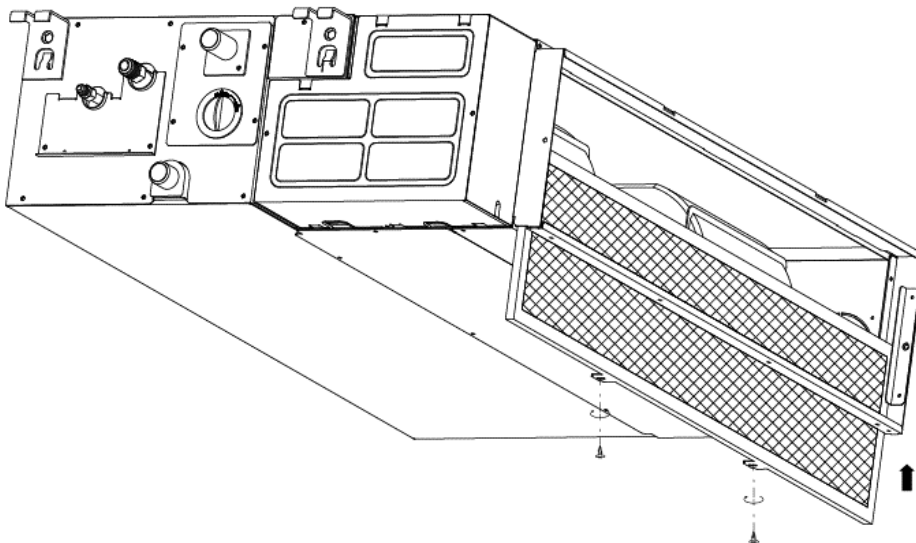
3.3.4 Install the main body

Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within $\pm 1\%$.



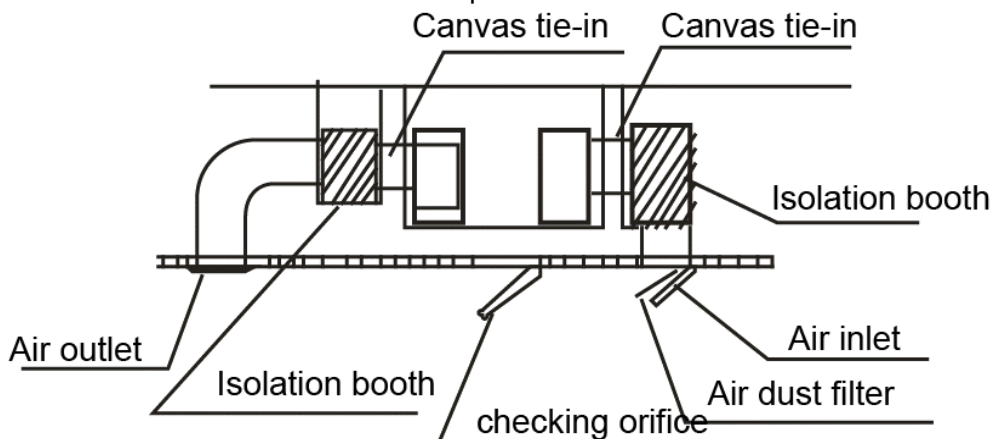
3.3.5 Install the air filter

Insert the air filter through the filter slot and fix it with 2 screws.



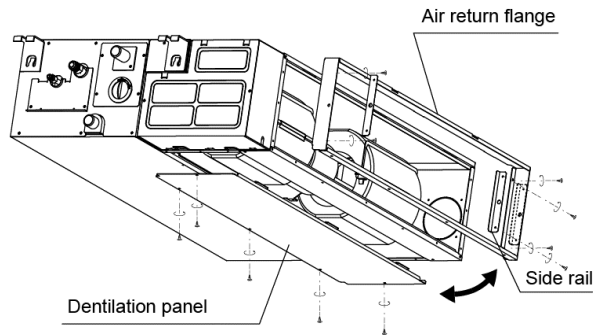
3.3.6 Install the air duct

Please design the air duct as below recommended picture

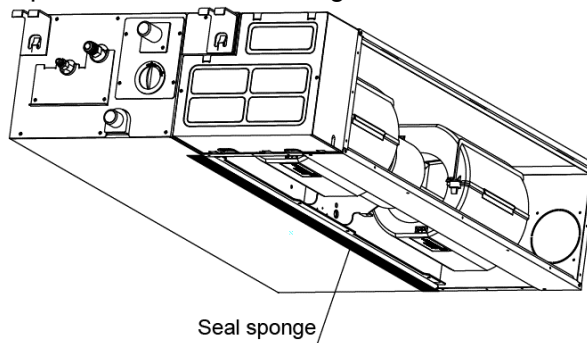


3.3.7 Change the air inlet direction

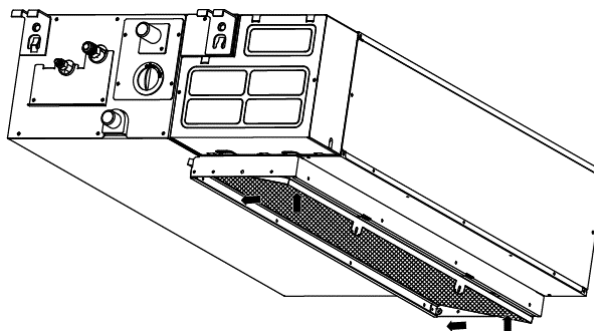
- ① Take off ventilation panel and flange, cut off the staples at side rail.



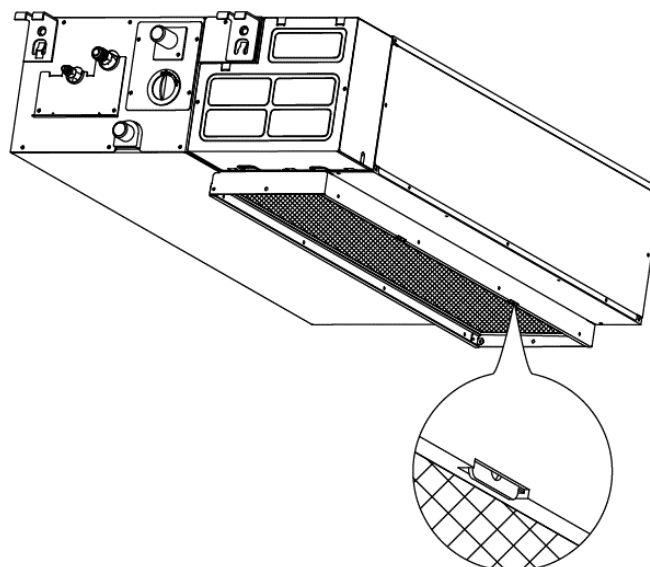
- ② Stick the attached seal sponge as per the indicating place in the following fig, and then change the mounting positions of air return panel and air return flange .



- ③ When install the filter mesh, please plug it into flange inclined from air return opening, and then push up.

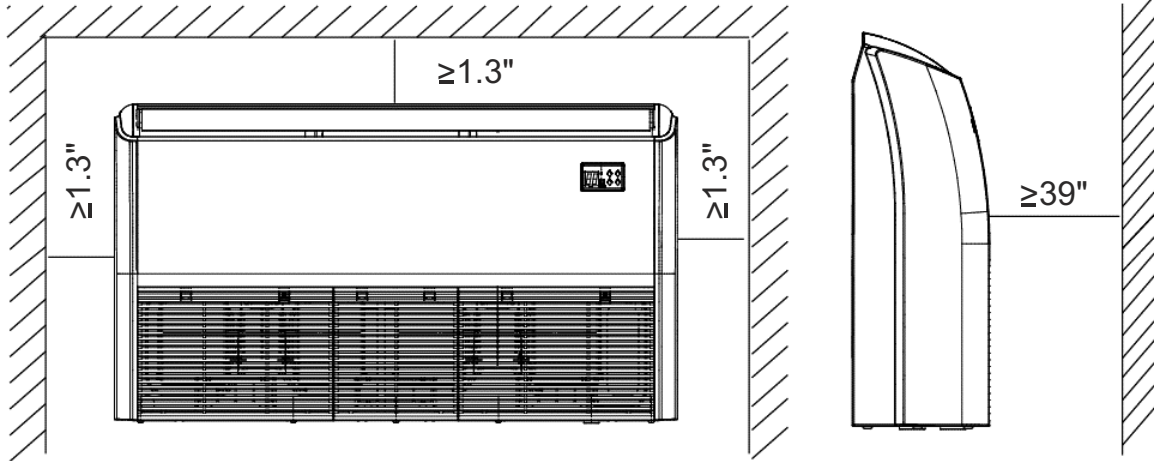


- ④ The installation has finish, upon filter mesh which fixing blocks have been insert to the flange postional holes.



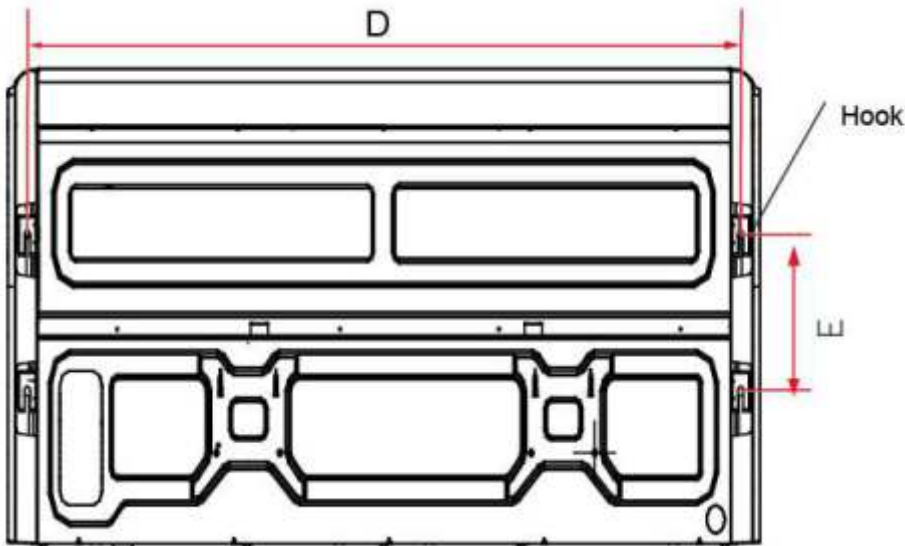
3.4 Ceiling & floor indoor unit installation (24K~48K)

3.4.1 Service space for indoor unit



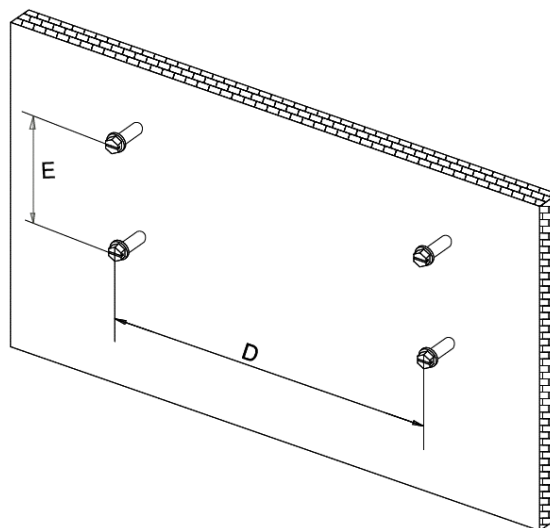
3.4.2 Bolt pitch

① Ceiling installation



Capacity (Btu/h)	D	E
18K, 24K	38.7	8.6

② Wall-mounted installation



3.4.3 Install the pendant bolt

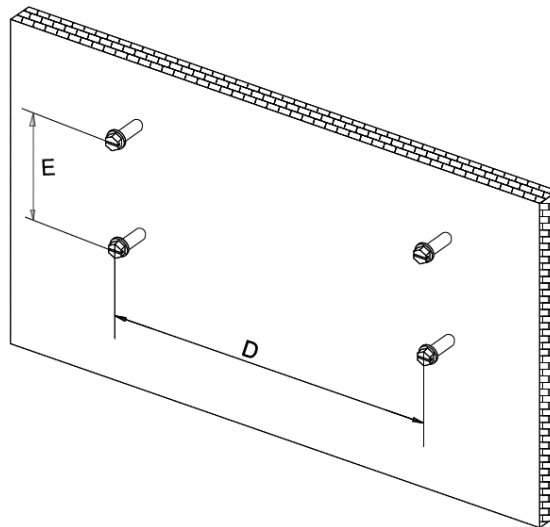
① Ceiling installation

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\varnothing 0.47"$, 1.7"~1.9" deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



② Wall-mounted installation

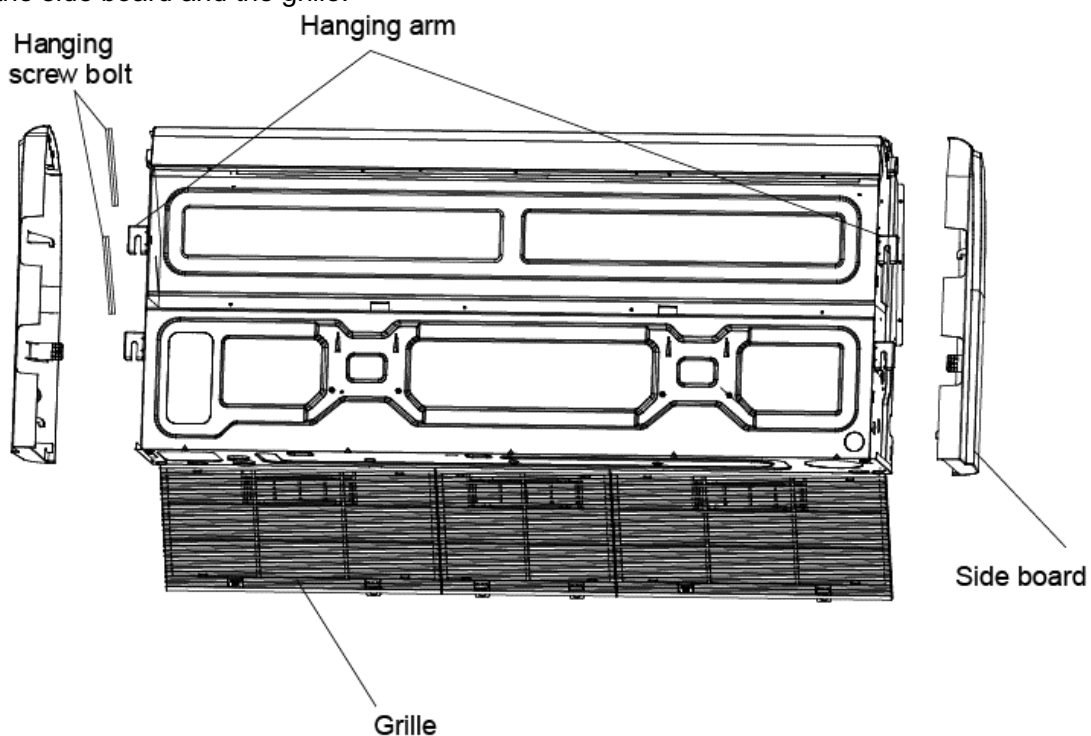
Install the tapping screws onto the wall.(Refer to picture below)



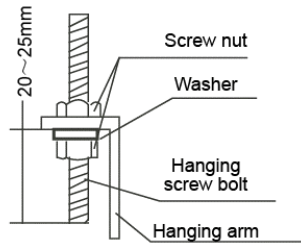
3.4.4 Install the main body

① Ceiling installation (The only installation method for the unit with drain pump)

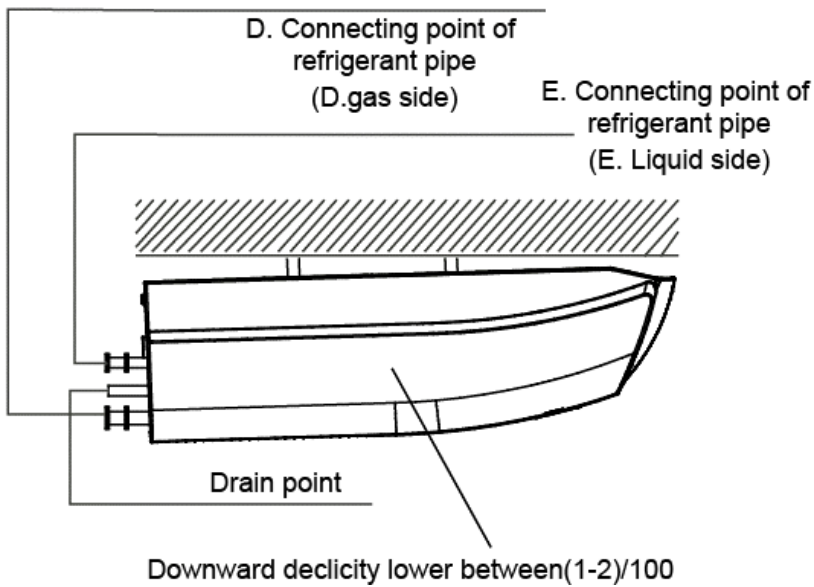
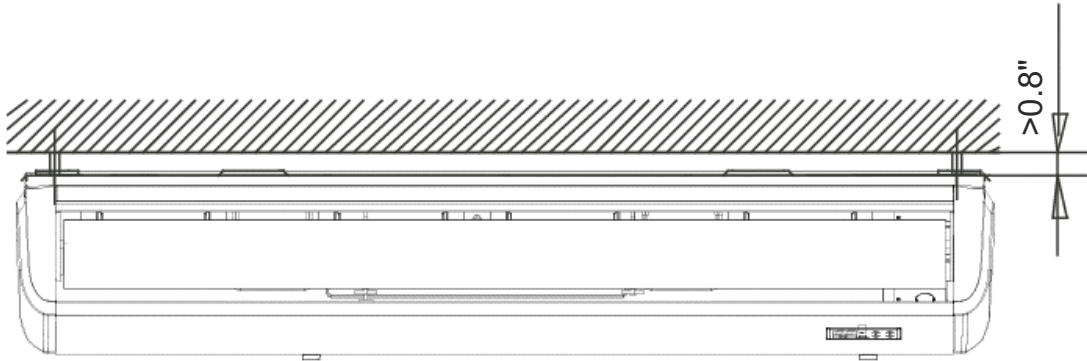
Remove the side board and the grille.



Locate the hanging arm on the hanging screw bolt. Prepare the mounting bolts on the unit.

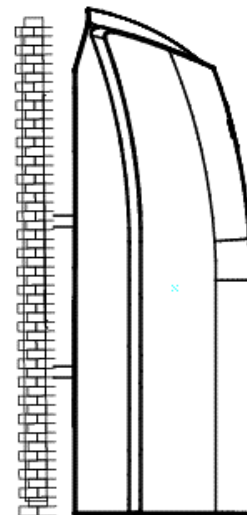
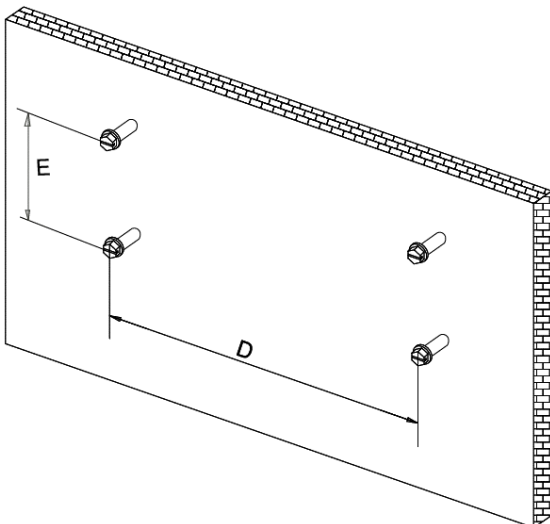


Put the side panels and grilles back.



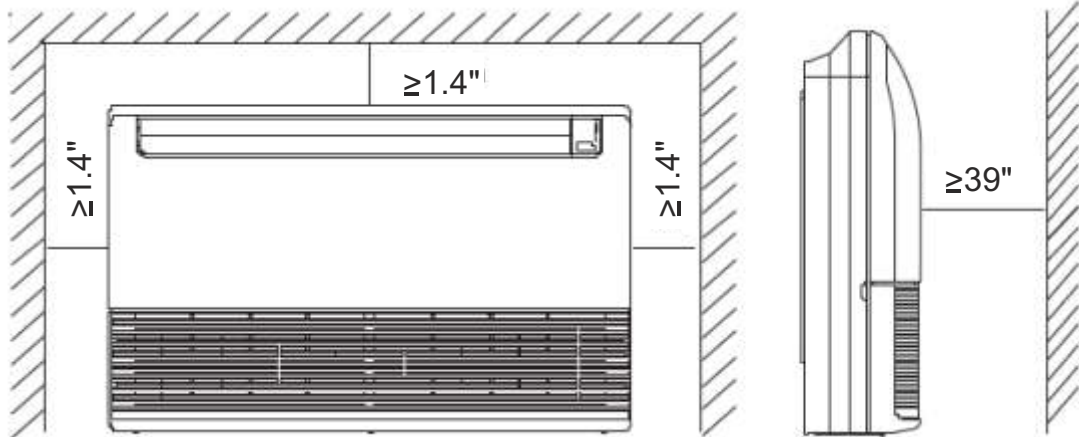
② Wall-mounted installation

Hang the indoor unit by insert the tapping screws into the hanging arms on the main unit. (The bottom of body can touch with floor or suspended, but the body must install vertically.)



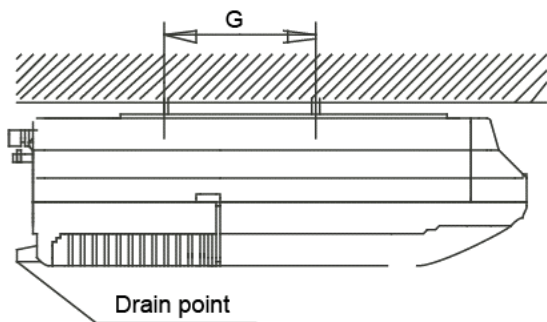
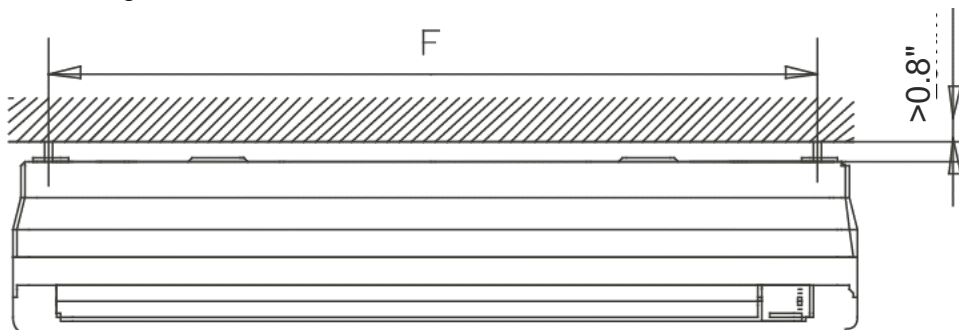
3.5 Ceiling & floor indoor unit installation (12K, 18K)

3.5.1 Service space for indoor unit



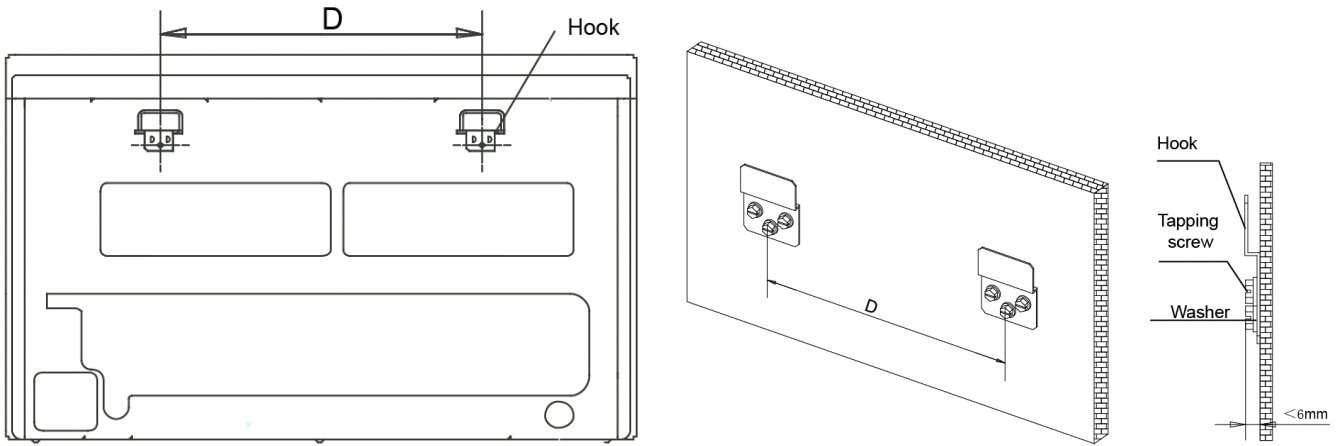
3.5.2 Bolt pitch

① Ceiling installation



Capacity (Btu/h)	D	F	G
12~24K	19.8	35.7	7.8

② Floor standing installation



3.5.3 Install the pendant bolt

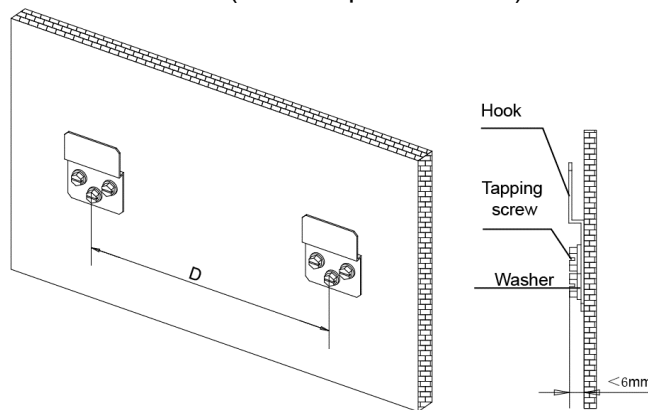
① Ceiling installation

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\varnothing 0.47"$, 1.7"~1.9" deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



② Floor standing installation

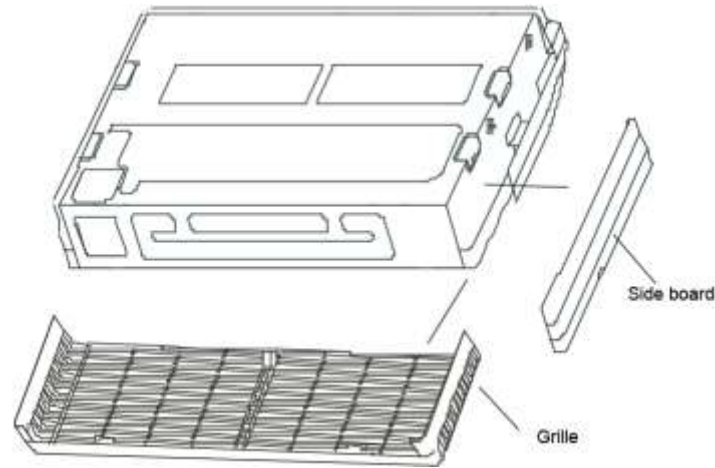
Fix the hook with tapping screw onto the wall.(Refer to picture below)



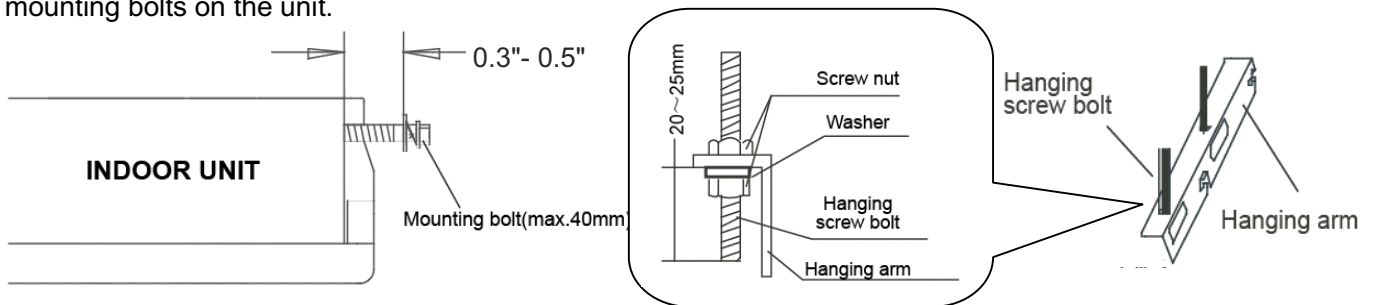
3.5.4 Install the main body

① Ceiling installation (The only installation method for the unit with drain pump)

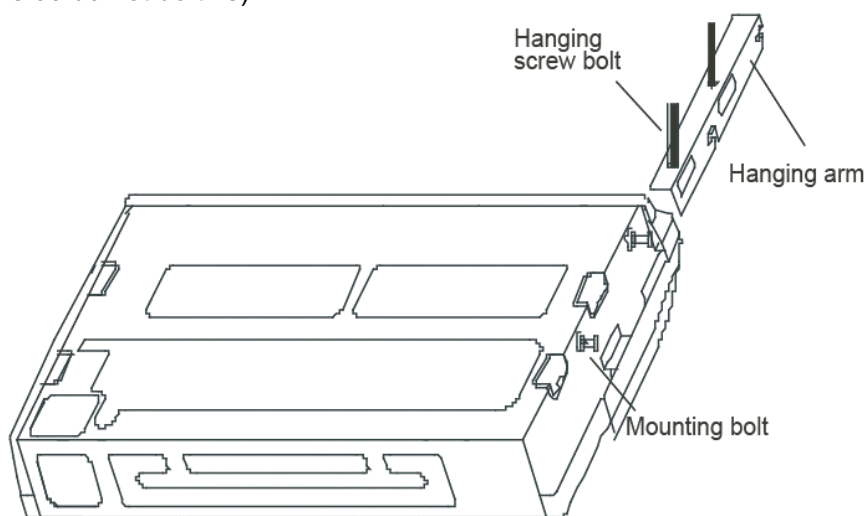
Remove the side board and the grille. (For models 48 and 60, do not remove the grille.)



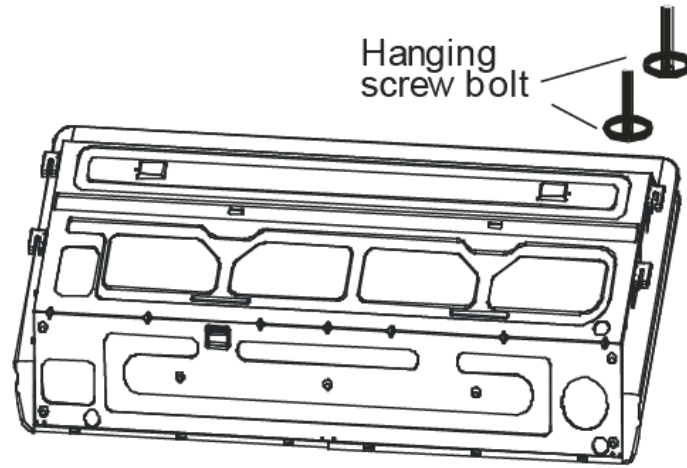
Locate the hanging arm on the hanging screw bolt. (for some of the models 60, do not do this). Prepare the mounting bolts on the unit.



Hang the unit on the hanging arm by sliding backward. Securely tighten the mounting bolts on both sides. (some of the models 60 do not do this)



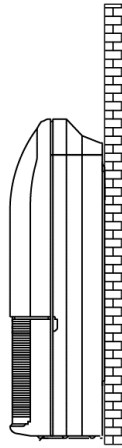
For some of the models 60 please securely tighten the mounting bolts on both sides.



Then install the side panels and grilles back to the main unit.

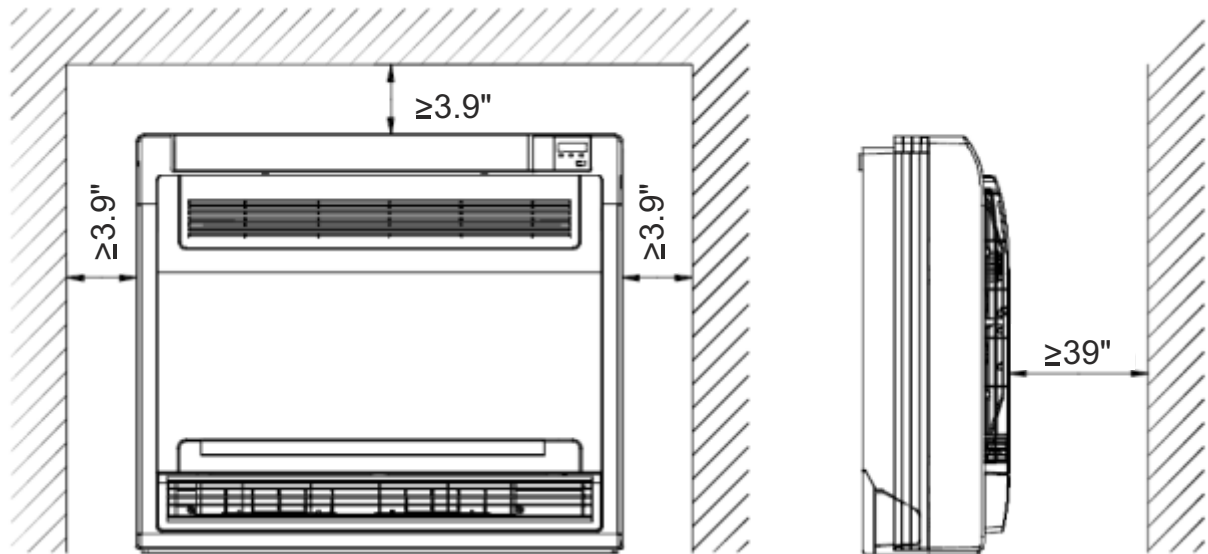
② Floor standing installation

Hang the indoor unit on the hook. (The bottom of body can touch with floor or suspended, but the body must install vertically.)



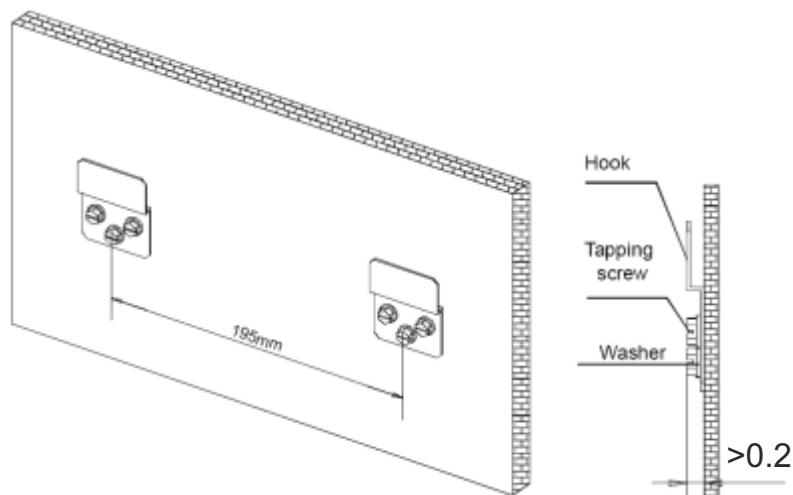
3.6 Console indoor unit installation

3.6.1 Service space for indoor unit



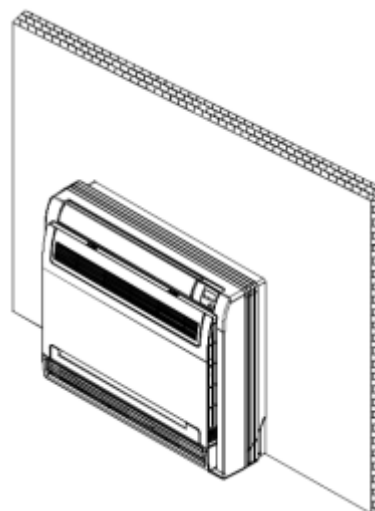
3.6.2 Install the main body

Fix the hook with tapping screw onto the wall



Hang the indoor unit on the hook.

(The bottom of body can touch with floor or suspended, but the body must install vertically.)



4 Outdoor unit installation (Side Discharge Unit)

4.1 Service space for outdoor unit

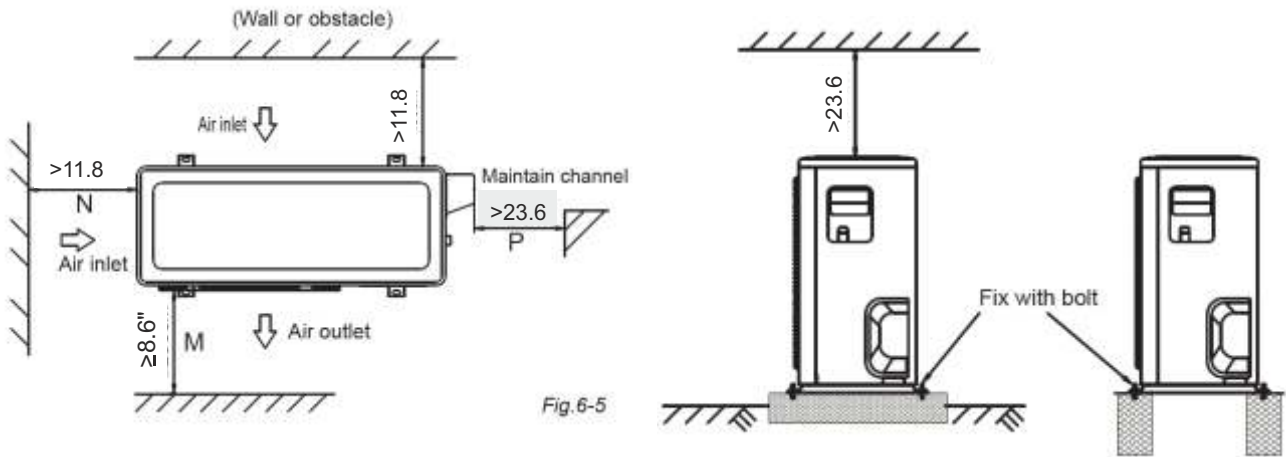
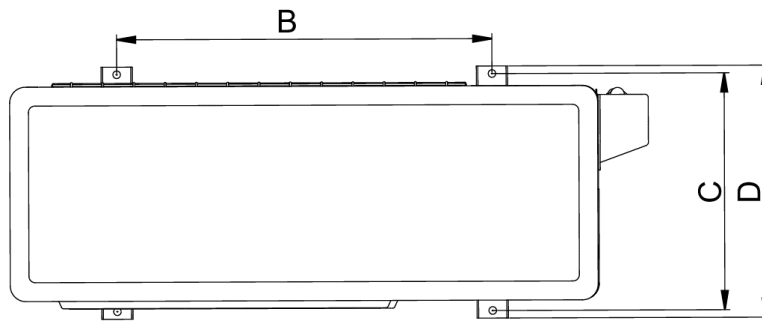


Fig. 6-5

4.2 Bolt pitch



Model	B	C	D
12K	20.8	11.4	12.4
18K	22	13.1	14.2
24K	23.2	13.1	13.9

4.3 Install the Unit

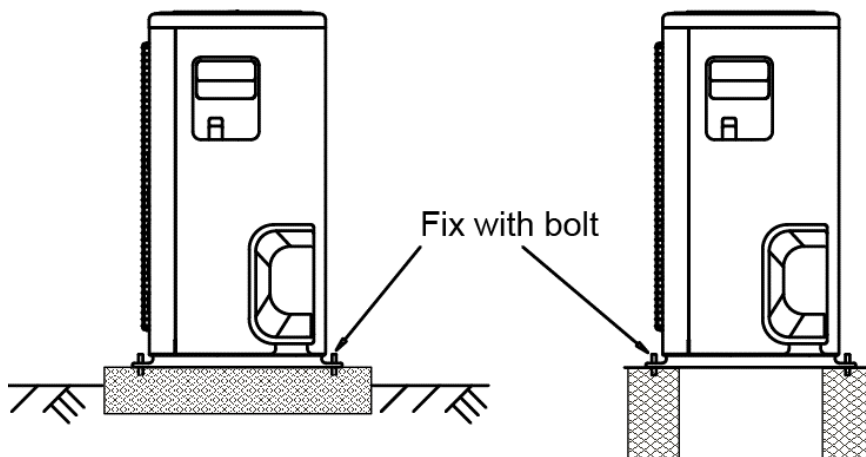
Since the gravity center of the unit is not at its physical center, so please be careful when lifting it with a sling. Never hold the inlet of the outdoor unit to prevent it from deforming.

Do not touch the fan with hands or other objects.

Do not lean it more than 45°, and do not lay it side-long.

Make concrete foundation according to the specifications of the outdoor units.

Fasten the feet of this unit with bolts firmly to prevent it from collapsing in case of earthquake or strong wind.



5 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
12,000Btu/h	65 ft	28 ft
18,000Btu/h-24,000Btu/h	82 ft	32 ft

5.2 The procedure of connecting pipes

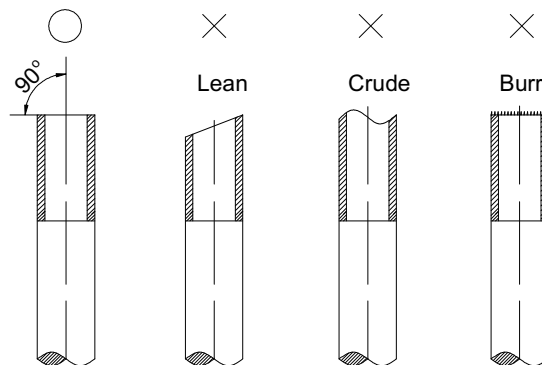
5.2.1 Choose the pipe size according to the specification table.

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)	0.3	0.34	
3/8" (9.52)	0.47	0.48	
1/2" (12.7)	0.6	0.62	
5/8" (15.9)	0.73	0.75	
3/4" (19)	0.9	0.91	

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.

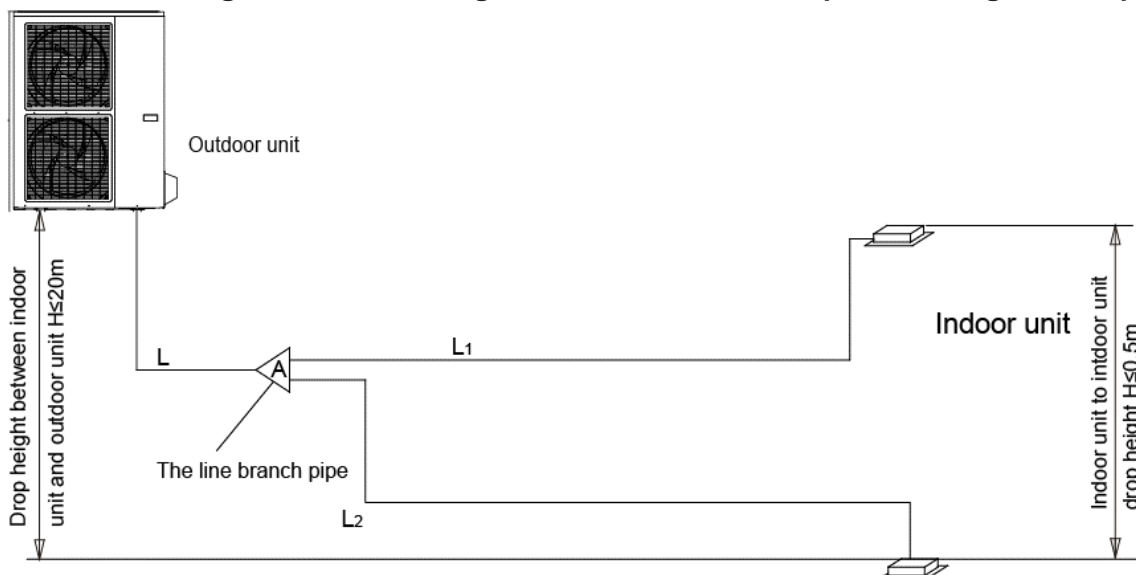
Be sure to use two spanners and proper torque to fasten the nut, too large torque will damage the bellmouthing, and too small torque may cause leakage. Refer the following table for different pipe connection.

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	

5.3 For Units with Twins Function

5.3.1 Length and drop height permitted of the refrigerant piping

Note: Reduced length of the branching tube is the 1.6ft of the equivalent length of the pipe.



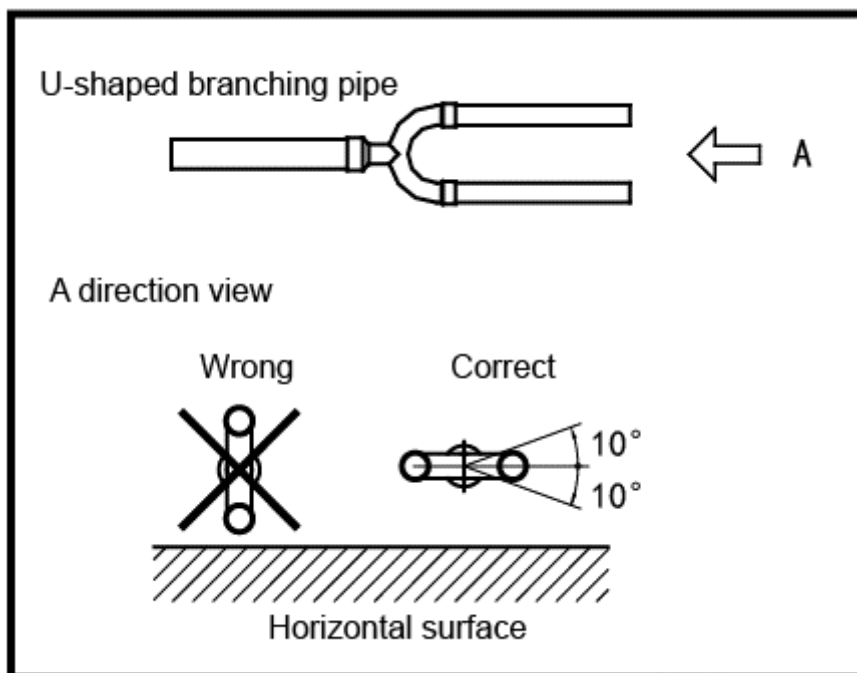
Note: All used branch pipe must be produced by Klimaire, otherwise it causes malfunction. The indoor units should be installed equivalently at the both side of the U type branch pipe.

		Permitted Value	Piping
Pipe Length	18K+18K	98.4ft	L+L1+L2
	24K+24K	164 ft	
	Max. branch pipe length	49 ft	L1, L2
	Max. branch pipe length difference	32.8 ft	L1-L2
Drop Height	Max. height difference between indoor unit and outdoor unit	65.6 ft	H1
	Max. height difference between indoor units	1.6 ft	H2

5.3.2 Size of joint pipes for indoor unit (R410a)

Capacity of indoor unit (A)	Size of main pipe(mm)		
	Gas side	Liquid side	Available branching pipe
18K	Φ12.7	Φ6.35	CE-FQZHN-01C
24K	Φ15.9	Φ9.5	CE-FQZHN-01C

5.3.4 The branching pipe must be installed horizontally, error angle of it should not be larger than 10°. Otherwise, malfunction will be caused.



6 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 (gpm)
12	2.4
18	4
24	6

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 (in)	Allowable maximum water flowrate (gpm)		Remark
		Slope 1/50	Slope 1/100	
PVC25	25/32	0.17	0.1	For branch pipe
PVC32	34/35	0.3	0.2	
PVC40	1" 11/50	0.5	0.4	Could be used for confluence pipe
PVC50	1" 14/25	1.1	0.7	
PVC63	2"	2.2	1.5	

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 (in)	Allowable maximum water flowrate (gpm)	Remark
PVC25	25/32	1	For branch pipe
PVC32	34/35	1.8	
PVC40	1" 11/50	3.4	Could be used for confluence pipe
PVC50	1" 14/25	6.4	
PVC63	2"	12.1	
PVC75	2" 16/25	25.1	
PVC90	3"	36.5	

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.

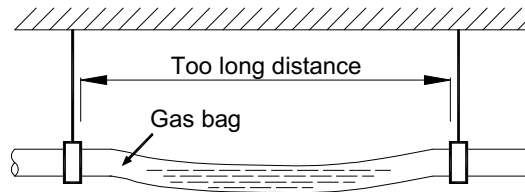
The drainage pipe of the indoor unit with water pump should be apart from the one without water pump.

6.2.4 Supporter gap of drainage pipe

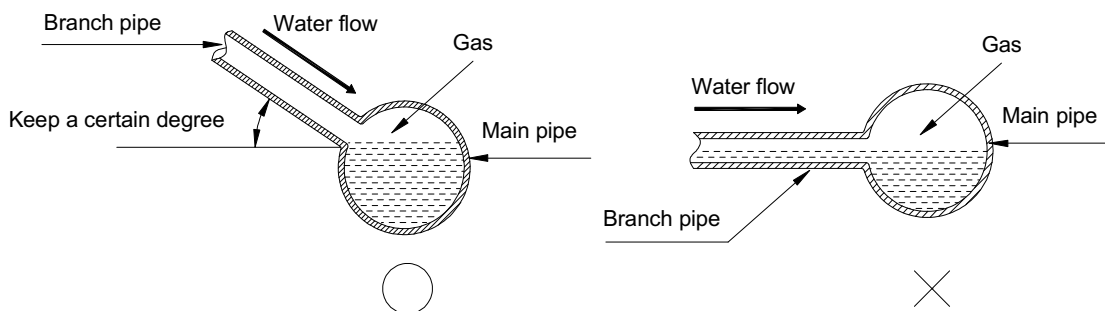
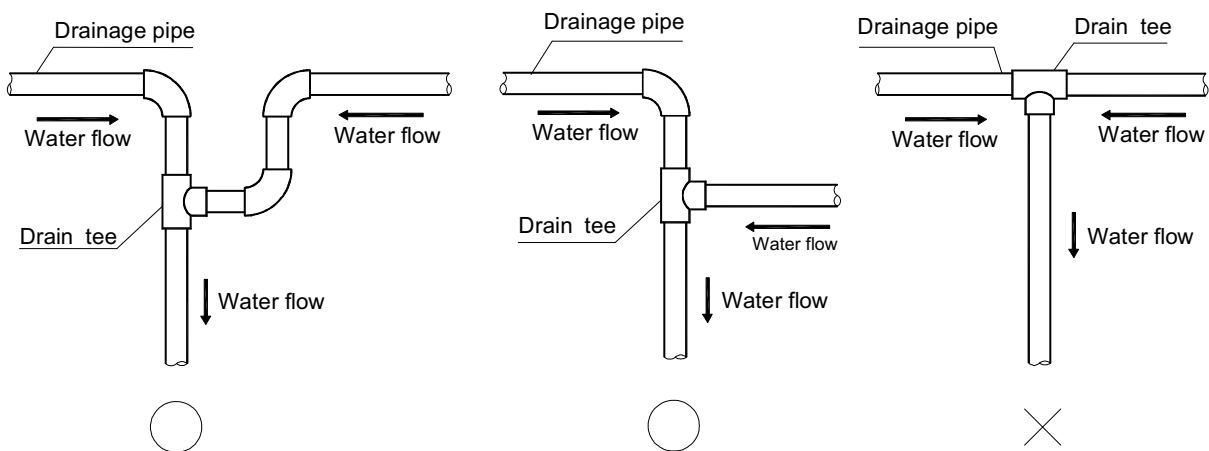
In general, the supporter gap of the drainage pipe horizontal pipe and vertical pipe is respectively 1m~1.5m and 1.5m~2.0m.

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

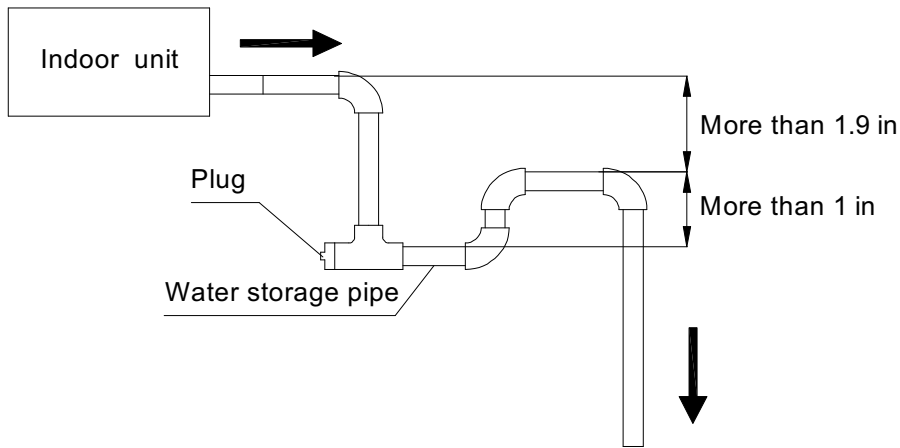


The correct installation will not cause converse water flow and the slope of the branch pipes can be adjusted freely

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

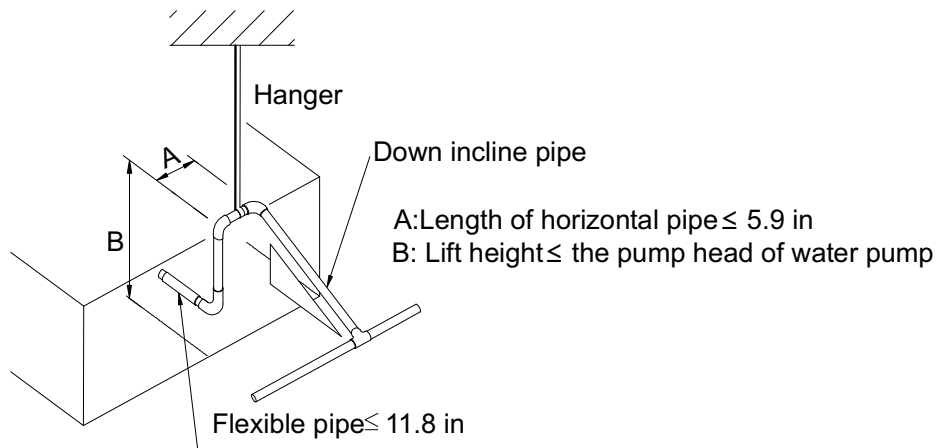
The length of lifting pipe should not exceed the pump head of indoor unit water pump.

Pump head of big four way cassette: 29.5"

Pump head of compact four way cassette: 19.8"

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.



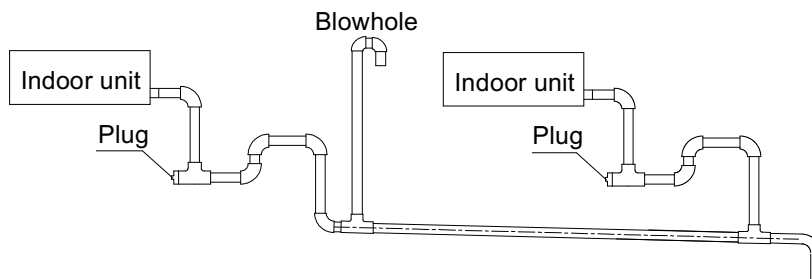
6.2.8 Blowhole setting

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.

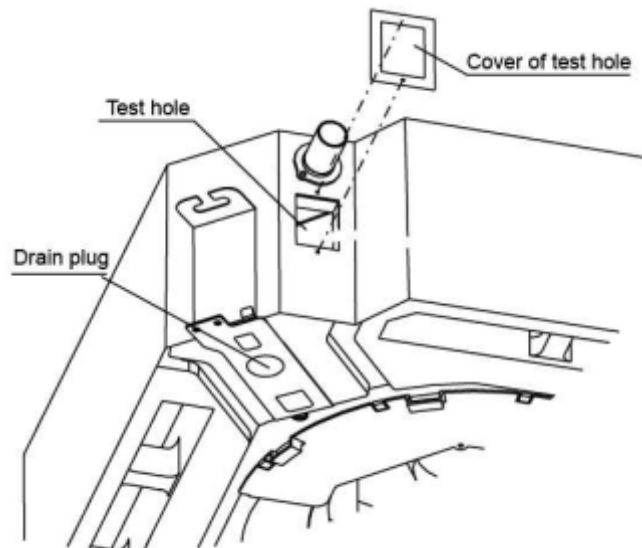
6.3 Drainage test

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 a bout 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-flowwater 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.

7 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 1 hour (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 0.5 Kg f/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.

8 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	$V=11g/m \times (L-5)$	$V=30g/m \times (L-5)$	$V=60g/m \times (L-5)$

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 connect ion joint part.(Using gas leakage detector or soap water to detect).

9 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 122-212°F) during heating. Insulation work must be carried out to prevent hurt by carelessness touching.

9.1.3 Insulation material selection for refrigerant pipe

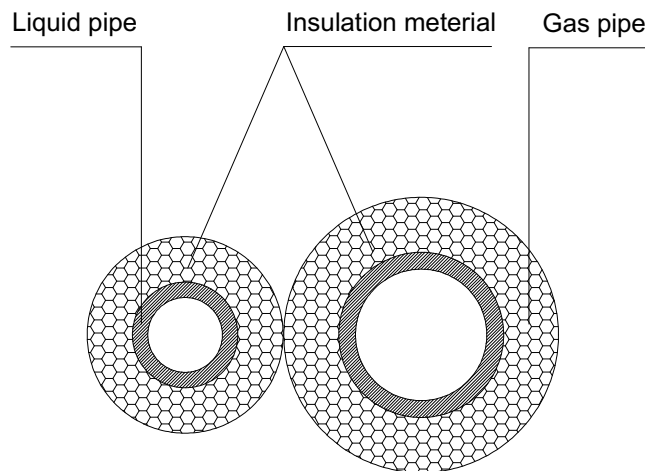
The burning performance should over 248 °F

According to the local law to choose insulation materials

The thickness of insulation layer shall be above 0.39" 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 0.19"~0.39" 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 gas 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 retardancy 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.

10 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 300 mm 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 data 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.

11 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 storage 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 valves 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

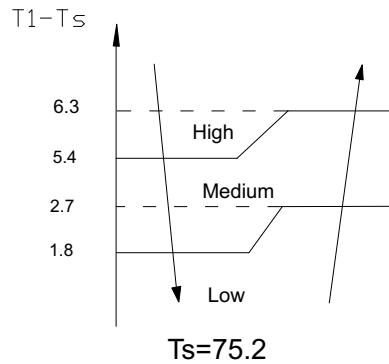
1. Electrical Control Function	65
2. Troubleshooting	79
3. Controller	111

1.3 Operation Modes and Functions

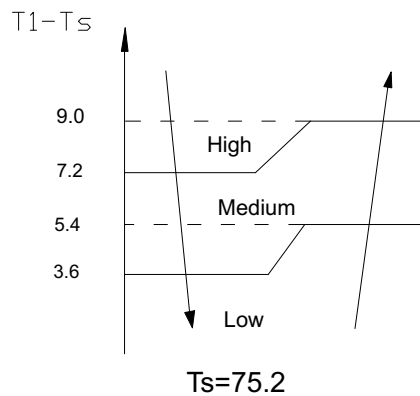
1.3.1 Fan mode

- (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:

For 12-18K units:



For other units:



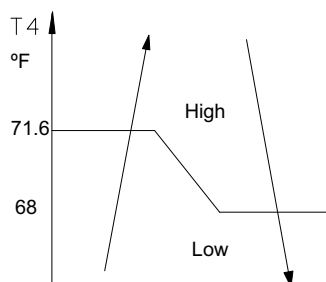
1.3.2 Cooling Mode

1.3.2.1 Outdoor PMW open angle control

The unit is working in cooling mode with the EXV open 300P for 3 minutes, then adjusting PMW open angle according to the temperature of compressor discharge every 2 minutes.

1.3.2.2 Outdoor fan running rules

For 12K units:



1. Electrical Control Function

Definition

T1: Indoor room temperature

T2: Coil temperature of indoor heat exchanger middle.

T2B: Coil temperature of indoor heat exchanger outlet.

T3: Coil temperature of condenser

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

1.2 Main Protection

1.2.1 Time delay at restart for compressor.

1.2.2 Temperature protection of compressor top

The unit will stop working when the compressor top temp. protector cut off, and will restart after the compressor top temp. protector restart.

1.2.3 Temperature protection of compressor discharge

When the compressor discharge temp. is getting higher, the running frequency will be limited as below rules:

For 12K-18K units :

---Compressor discharge temp. $T5 > 239\text{ }^{\circ}\text{F}$ for 5s, compressor stops.

--- $226\text{ }^{\circ}\text{F} < T5 < 239\text{ }^{\circ}\text{F}$, decrease the frequency to the lower level every 3 minutes till F1.

--- $194\text{ }^{\circ}\text{F} < T5 < 221\text{ }^{\circ}\text{F}$, keep running at the current frequency.

--- $T5 < 194\text{ }^{\circ}\text{F}$, no limit for frequency.

For other units:

---If $216\text{ }^{\circ}\text{F} < T5 < 239\text{ }^{\circ}\text{F}$, decrease the frequency to the lower level every 2 minutes till to F1.

---If $T5 > 239\text{ }^{\circ}\text{F}$ for 10 seconds, the compressor will stop and restart till $T5 < 194\text{ }^{\circ}\text{F}$.

1.2.4 Sensor protection at open circuit and breaking disconnection.

1.2.5 Indoor fan delayed open function

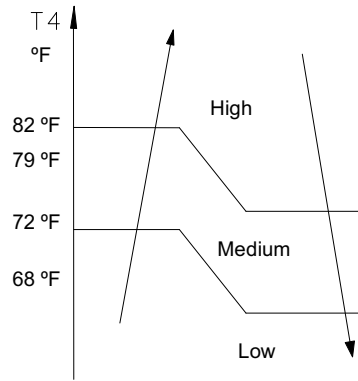
When the unit starts up, the louver will be active immediately and the indoor fan will open 10s later.

If the unit runs in heating mode, the indoor fan will be also controlled by anti-cold wind function.

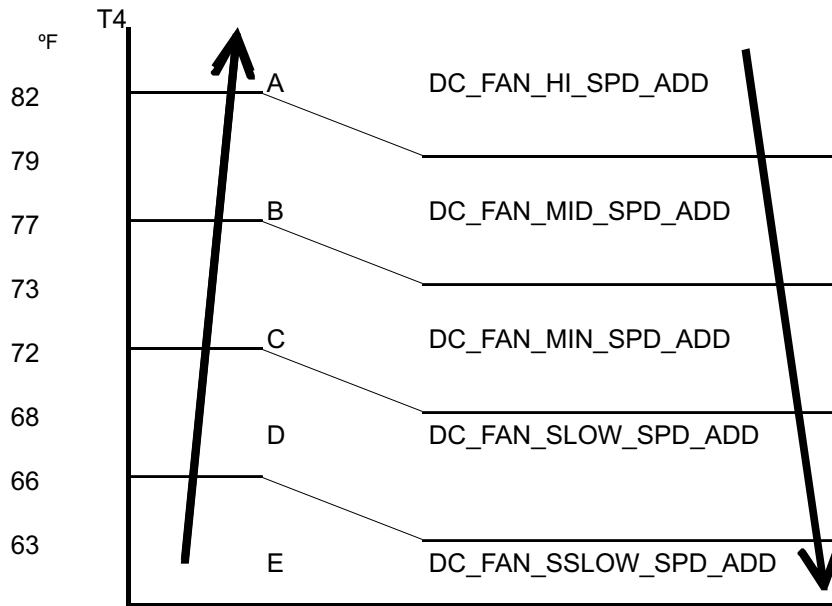
1.2.6 Fan Speed is out of control

When Indoor Fan Speed keeps too low (For Super slim cassette, less than 200RPM, for other units, less than 300RPM) for 50s, the unit will stop and the LED will display the failure

For 18K units:



For other units:

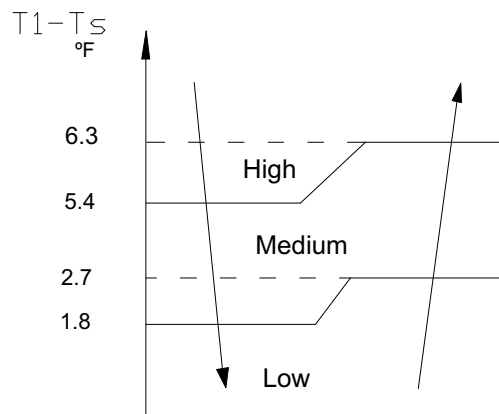


1.3.2.3 Indoor fan running rules

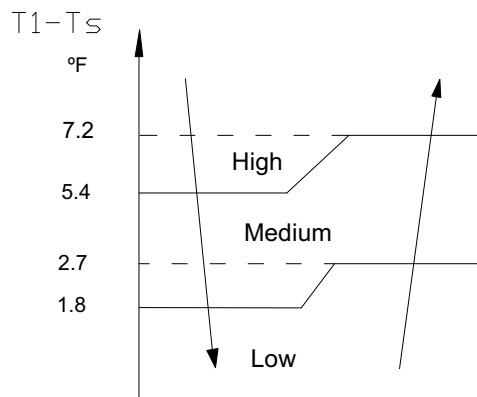
In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low and a auto.

The auto fan:

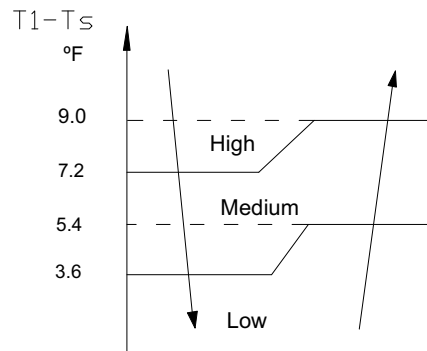
For Console 12k:



For 2rd Ceiling-floor & Compact cassette & Duct(12-18K)



For other units:



1.3.2.4 Evaporator low temperature T2 protection.

For 12K-18K units :

--- $T_2 < 32^\circ\text{F}$, the compressor will stop and restart when $T_2 \Rightarrow 41^\circ\text{F}$

--- $32^\circ\text{F} \leq T_2 < 39.2^\circ\text{F}$, the compressor frequency will be limited and decreased to the lower level every 1 minute till off.

--- $39.2^\circ\text{F} \leq T_2 \leq 44.6^\circ\text{F}$, the compressor will keep the current frequency.

--- $T_2 > 44.6^\circ\text{F}$, the compressor frequency will not be limited.

For other units: When $T_2 < 35.6^\circ\text{F}$ and lasts for 3 minutes, the indoor has no capacity demand and resume till $T_2 \geq 44.6^\circ\text{F}$.

1.3.2.5 Condenser high temperature T3 protection

For 12K-18K units :

--- $131^\circ\text{F} < T_3 < 140^\circ\text{F}$, the compressor frequency will decrease to the lower level every 3 minutes till F1 and then runs at F1. If $T_3 < 129.2^\circ\text{F}$, the compressor will keep running at the current frequency.

--- $T_3 < 125.6^\circ\text{F}$, the compressor will not limit the frequency and resume to the former frequency.

--- $T_3 > 140^\circ\text{F}$ for 5 seconds, the compressor will stop until $T_3 < 125.6^\circ\text{F}$

For other units: When $T_3 \geq 149^\circ\text{F}$ for 3 seconds, the compressor will shut off. When $T_3 < 125.6^\circ\text{F}$, the compressor will restart.

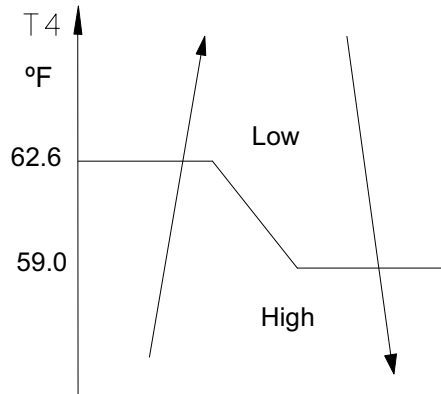
1.3.3 Heating Mode

1.3.2.1 Outdoor PMW open angle control

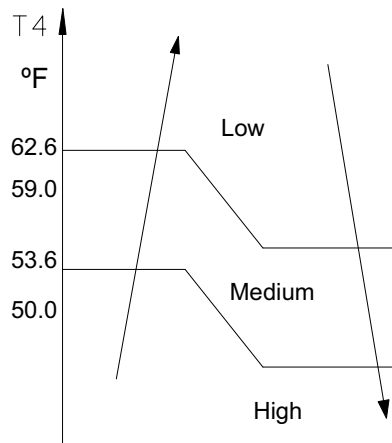
The unit is working in heating mode with the EXV open 300P for 3 minutes, then adjusting PMW open angle according to the temperature of compressor discharge every 2 minutes.

1.3.3.2 Outdoor fan running rules:

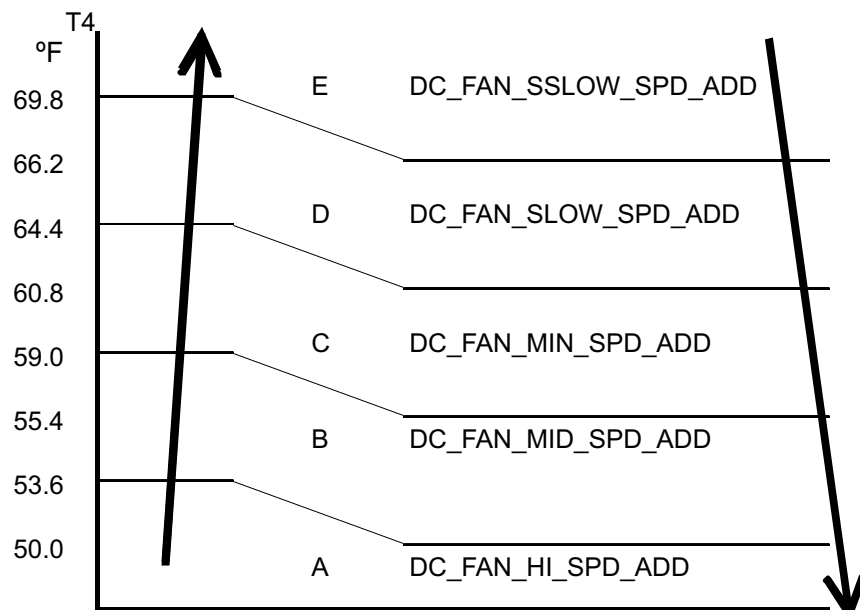
For 12k units:



For 18K units:



For other units :

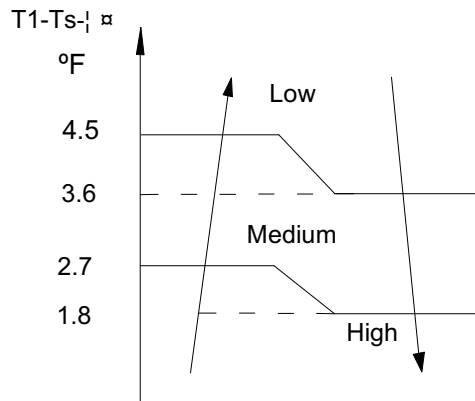


1.3.3.3 Indoor fan running rules:

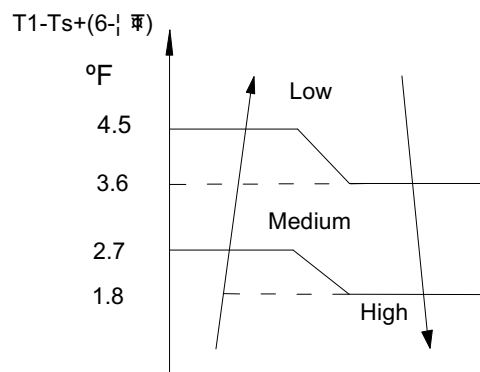
When the compressor is on, the indoor fan can be set to high/med/low/auto. And the anti-cold wind function has the priority.

Auto fan action:

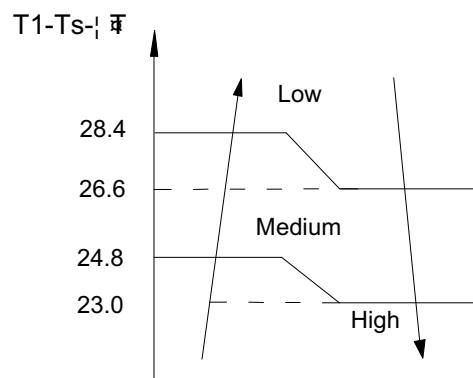
For Console 12K



For 2rd Ceiling-floor & Compact cassette & A5 Duct(12-18K)



For other units:



1.3.3.4 Defrosting mode :

For 12K-18K units:

Condition of defrosting:

--- $T_4 > 32\text{ }^\circ\text{F}$

Defrosting starts when either of the following ①&② :

①The units run with $T3 < 37.4\text{ }^{\circ}\text{F}$ for 40 minutes and $T3$ keeps lower than $\text{TCDI}^{\circ}\text{F}$ for more than 3 minutes.

②:The units run with $T3 < 37.4\text{ }^{\circ}\text{F}$ for 80 minutes and $T3$ keeps lower than $(\text{TCDI}+3.6)\text{ }^{\circ}\text{F}$ for more than 3 minutes..

--- $T4 < 0^{\circ}\text{C}$,

If ①and ② are satisfied, then the program judges if $T2$ has decreased more than 5°C .When $T2$ has decreased more than $9\text{ }^{\circ}\text{F}$, enter the defrosting mode.

---No matter what value of the $T4$ is and whether the $T2$ drops more than 9°F or not, if the machine runs with $T3 < 5.4\text{ }^{\circ}\text{F}$ for more than 120 minutes and $T3$ keeps lower than $(\text{TCDI}+7.2)\text{ }^{\circ}\text{F}$ for more than 3 minutes, the machine will enter defrosting mode.

Condition of ending defrosting:

If any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.

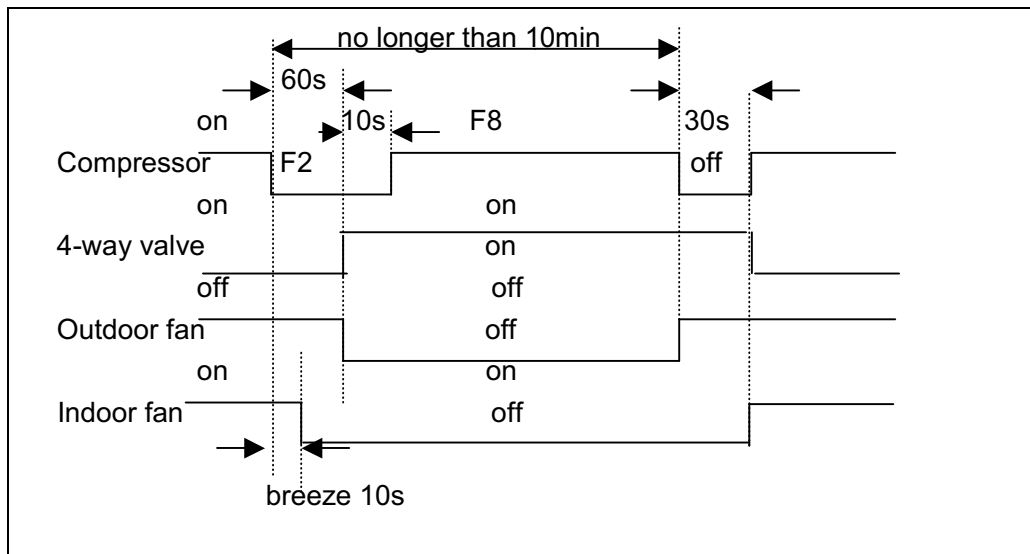
--- $T3$ rises to be higher than $\text{TCDE}1.8\text{ }^{\circ}\text{F}$.

--- $T3$ keeps to be higher than $\text{TCDE}3.6\text{ }^{\circ}\text{F}$ for 80 seconds.

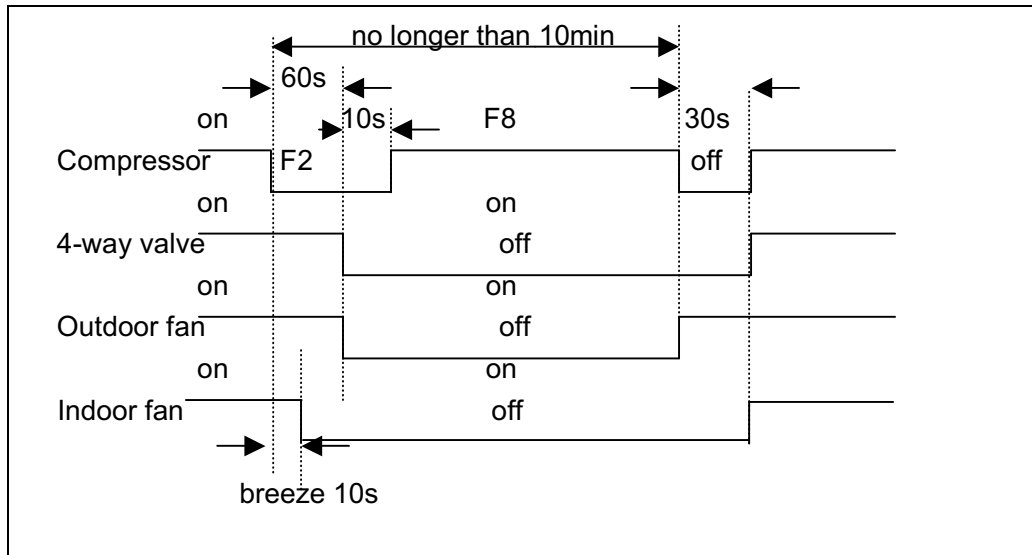
---The machine has run for 10 minutes in defrosting mode.

Defrosting action :

For 12K units :

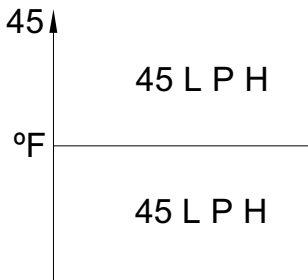


For 18K units:



For 24K & 48K units:

Condition of defrosting:



Time conditions:

time1

Time conditions (Meet the following conditions)

1. Running in heating mode
2. $T4 \geq 37.4 \text{ } ^\circ\text{F}$
3. Compressor is on
4. $T3 \leq \text{TempEnterDefrost_ADD } ^\circ\text{F}$

Cleared conditions (Meet any one of the following conditions)

1. Compressor is off.
2. $T3 > \text{TempEnterDefrost_ADD } ^\circ\text{F}$

Time2

Time conditions (Meet the following conditions)

1. Running in heating mode
2. $T4 < 37.4 \text{ } ^\circ\text{F}$
3. Compressor is on
4. $T3 \leq \text{TempEnterDefrost_ADD } ^\circ\text{F}$

Cleared conditions (Meet any one of the following conditions)

1. Compressor is off and $T3 > \text{TempEnterDefrost_ADD} + 3.6 \text{ } ^\circ\text{F}$ last for 20 minutes
2. Running in cooling mode.
3. Compressor is off for 1 hour.

Condition of entry defrosting:

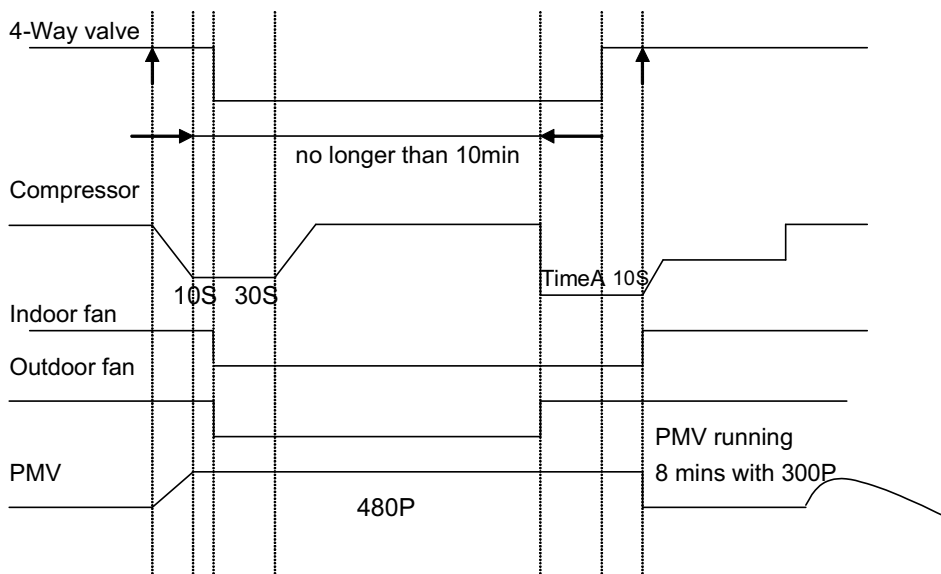
$time1 + time2 \geq 40$ minutes, When defrosting is end, $time1$ and $time2$ are cleared.

Condition of ending defrosting:

If any one of following items is satisfied, defrosting will stop and the machine will turn to normal heating mode.

- ① The defrosting time achieves 10min;
- ② $T3 \geq TempQuitDefrost_ADD^{\circ}F$
- ③ $T3 \geq 45^{\circ}F$ for 60seconds.

Defrosting action :



1.3.3.5 High evaporator coil temp.T2 protection:

For 12K-18K units :

--- $T2 > TEH35.6^{\circ}F$, the compressor running frequency decreases to the lower level every 20s.

When the frequency decreases to F2 and the $T2$ is still over $THE35.6^{\circ}F$ for 3 minutes, the compressor will stop.

--- $T2 < 118.4^{\circ}F$ or $THE35.6^{\circ}F < T2 < 118.4^{\circ}F$ for 6 minutes , the frequency will not be limited.

--- $T2 > 140^{\circ}F$, the compressor will stop and restart when $T2 < 118.4^{\circ}F$

For other units: $T_2 > 140$ °F, the compressor will stop and restart when $T_2 < 129.2$ °F

1.3.4 Auto-mode

This mode can be chosen with remote controller and the setting temperature can be changed between 63~86 °C .

In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT ($\Delta T = T_1 - T_s$).

For 12K-18K units:

$\Delta T = T_1 - T_s$	Running mode
$\Delta T > 1.8$ °F	Cooling
-1.8 °F $< \Delta T \leq 1.8$ °F	Fan-only
$\Delta T \leq -1.8$ °F	Heating

For other units:

$\Delta T = T_1 - T_s$	Running mode
$\Delta T \geq 3.6$ °F	Cooling
-1.8 °F $\leq \Delta T < 3.6$ °F	Fan-only
$\Delta T < -1.8$ °F	Heating

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 $T_1 - T_s$.

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

1.3.5 Drying mode

For 12K-18K units:

1.3.5.1 Indoor fan speed is fixed at low and can't be changed. The louver angle is the same as in cooling mode.

1.3.5.2 Low indoor room temperature protection

In drying mode, if room temperature is lower than 50 °F, the compressor will stop and not resume until room temperature exceeds 54 °F

1.3.5.3 Evaporator anti-freezing protection, condenser high temperature protection and outdoor unit frequency limit are active and the same as that in cooling mode.

1.3.5.4 The outdoor fan operates the same as in cooling mode.

For other units:

Drying mode works the same as cooling mode in low speed.

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

1.3.6 Timer function

1.3.6.1 Timing range is 24 hours.

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

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

1.3.6.4 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.

1.3.6.5 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.

1.3.6.6 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.

1.3.6.7 The setting time is relative time.

1.3.7 Economy function

For console:

1.3.7.1 The sleep function is available in cooling, heating or auto mode.

1.3.7.2. Operation process in sleep mode is as follow:

When cooling, the setting temperature rises 1.8 °F (be lower than 80 °F) every one hour, 2 hours later the setting temperature stops rising and the indoor fan is fixed at auto speed.

When heating, the setting temperature decreases 1.8 °F (be higher than 63°F) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed at auto speed. (Anti-cold wind function has the priority).

1.3.7.3 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode and turns off

1.3.7.4 Shutdown, change the mode or speed setting will cancel the economic operation.

1.3.7.5 When user uses timer off function in sleep mode (or sleep function in timer off mode), if the timing is less than 7 hours, sleep function will be cancelled when reaching the setting time. If the timing is more than 7 hours, the machine will not stop until reaches the setting time in sleep mode.

For other units:

1.3.7.1 The sleep function is available in cooling, heating or auto mode.

1.3.7.2. Operation process in sleep mode is as follow:

When cooling, the setting temperature rises 1.8 °F (be lower than 80 °F) every one hour, 2 hours later the setting temperature stops rising and the indoor fan is fixed at low speed.

When heating, the setting temperature decreases 1.8 °F (be higher than 63 °F) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed at low speed. (Anti-cold wind function has the priority).

1.3.7.3 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode but doesn't turn off

1.3.7.4 Timer setting is available

1.3.8 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.

1.3.9 Drain pump control (For Duct & Cassette)

Adopt the water-level switch to control the action of drain pump.

Main action under different condition : (every 5 seconds the system will check the water level one time)

1. When the A/C operates with cooling (including auto cooling), dehumidifying, and forced cooling mode , the pump will start running immediately and continuously, till stop cooling.
2. Once the water level increase and up to the control point, LED will alarm and the drain pump open and continue checking the water level. If the water level fall down and LED disarmed (drain pump delay close 1 minute) and operate with the last mode. Otherwise the entire system stop operating (including the pump) and LED remain alarming after 3 minutes,

1.3.10 Point Check Function (For 24K units only)

There is a check switch in outdoor PCB.

Press the switch SW1 to check the states of unit when the unit is running.

Press the switch N times it will display the content corresponding to No. N. After getting into the check function, it will display No. N with 1.5s, meanwhile the low bit decimal of digit display flashing, indicated to get into the check function display. After 1.5s, it will display the content corresponding to No. N. the digital display tube will display the follow procedure when push SW1 each time.

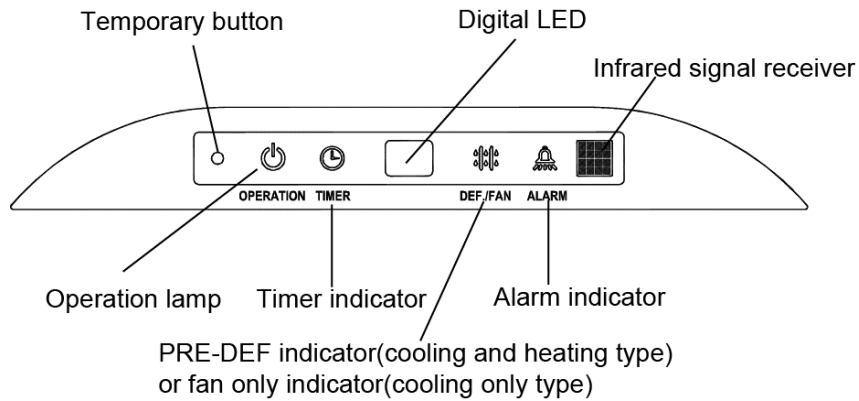
N	Display	Remark
00	Normal display	Display running frequency, running state or malfunction code
01	Indoor unit capacity demand code	Norm code *HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "5.0",it means the capacity demand is 15. the digital display tube show "60",it meansthe capacity demand is 6.0)
02	Amendatory capacity demand code	
03	The frequency after the capacity requirement transfer	
04	The frequency after the frequency limit	
05	The frequency of sending to 341	
06	Indoor unit evaporator outlet temp.(Cooling:T2, heating:T2B)	If the temp. is lower than 32 degree, the digital display tube will show "32".If the temp. is higher than 158 degree, digital display tube will show "158".
07	Condenser pipe temp.(T3)	If the temp. is lower than -15 degree, the digital display tube will show "-15".If the temp. is higher than 158 degree digital display tube will show "158". If the indoor unit is not connected, the digital display tube will show: "____"
08	Outdoor ambient temp.(T4)	
09	Compressor discharge temp.(Tp)	The display value is between 55~264 degree. If the temp. is lower than 55 degree, the digital display tube will show "55".If the temp. is higher than 210 degree, the digital display tube will show single digit and tens digit. (For example, digital display tube show "0.5",it means the compressor discharge temp. is 221 degree. the digital display tube show "1.6",it means the compressor discharge temp. is 241 degree)
10	AD value of current	The display value is hex number.
11	AD value of voltage	
12	Indoor unit running mode code	Off:0, Fan only 1, Cooling:2, Heating:3
13	Outdoor unit running mode code	Off:0, Fan only 1, Cooling:2, Heating:3, Forced cooling:4
14	EXV open angle	Actual data/4. If the value is higher than 99, the digital display tube will show single digit and tens digit.

		For example ,the digital display tube show “2.0”,itmeans the EXV open angle is $120 \times 4 = 480p.$)		
15	Frequency limit symbol	Bit7	Frequency limit caused by IGBT radiator	The display value is hex number. For example, the digital display tube show 2A,then Bit5=1, Bit3=1, Bit1=1. It means frequency limit caused by T4,T3 and current.
		Bit6	Frequency limit caused by PFC	
		Bit5	Frequency limit caused by T4.	
		Bit4	Frequency limit caused by T2.	
		Bit3	Frequency limit caused by T3.	
		Bit2	Frequency limit caused by Tp.	
		Bit1	Frequency limit caused by current	
		Bit0	Frequency limit caused by voltage	
16	DC fan motor speed			
17	IGBT radiator temp.(Reserved)	The display value is between 86~248 degree. If the temp. is lower than 86 degree, the digital display tube will show “86”.If the temp. is higher than 210 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show “0.5”,it means the IGBT radiator temp. is 221 degree. the digital display tube show “1.6”,it means the IGBT radiator temp. is 241 degree)		
18	Indoor unit number	The indoor unit can communicate with outdoor unit well.		
19	Condenser pipe temp. of 1# indoor unit	If the temp. is lower than 0 degree, the digital display tube will show “32”.If the temp. is higher than 158 degree, the digital display tube will show “158”. If the capacity demand is 32, , the digital display tube will show “32. If the indoor unit is not connected, the digital display tube will show: “——”		
20	Condenser pipe temp. of 2# indoor unit			
21	Condenser pipe temp. of 3# indoor unit			
22	1# Indoor unit capacity demand code	Norm code *HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show “5.0”,it means the capacity demand is 15. the digital display tube show “60”,it means the capacity demand is 6.0). If the indoor unit is not connected, the digital display tube will show: “——”		
23	2# Indoor unit capacity demand code			
24	3# Indoor unit capacity demand code			

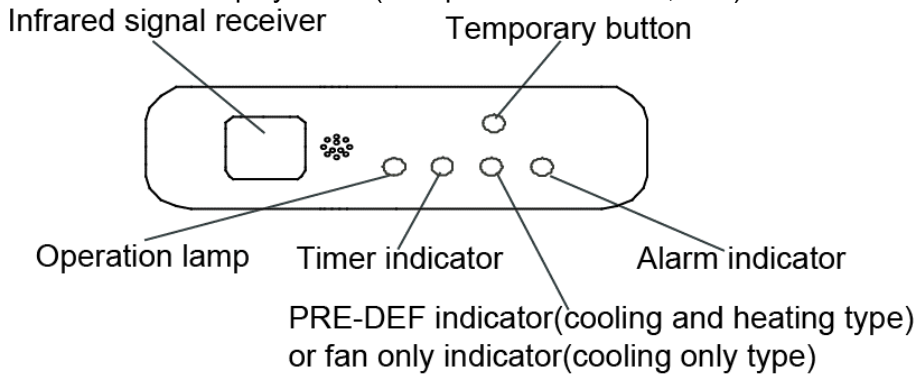
2. Troubleshooting

2.1 Display board

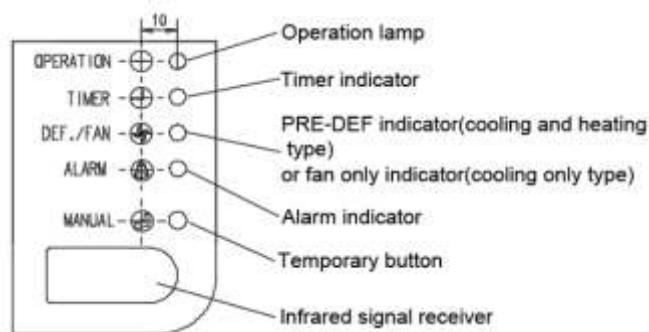
2.1.1 Icon explanation on indoor display board (Super slim cassette 24K).



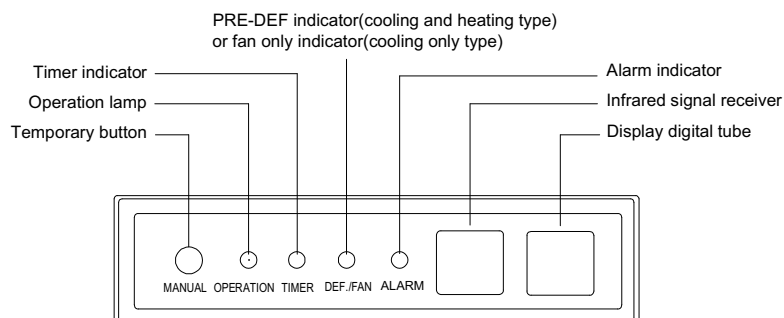
2.1.2 Icon explanation on indoor display board (Compact cassette 12K, 18K).



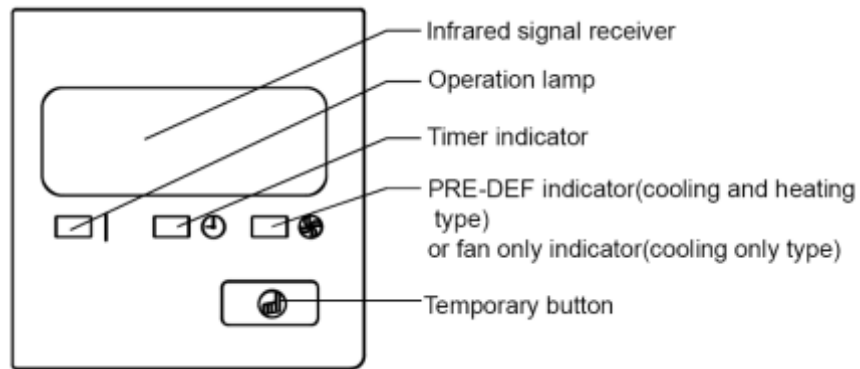
2.1.3 Icon explanation on indoor display board (Ceiling & Floor, 12K, 18K)



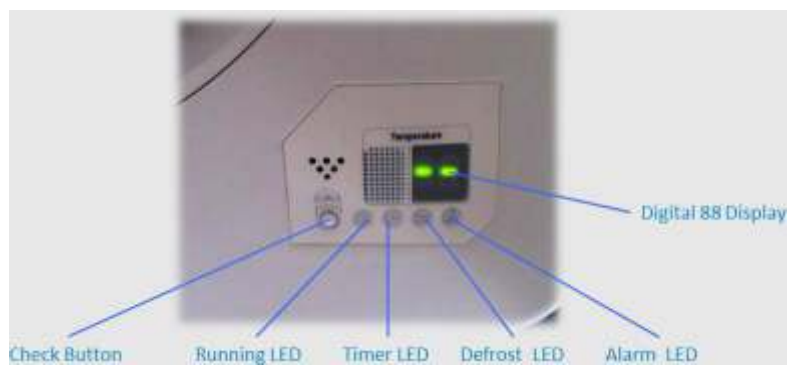
2.1.4 Icon explanation on indoor display board (Duct)



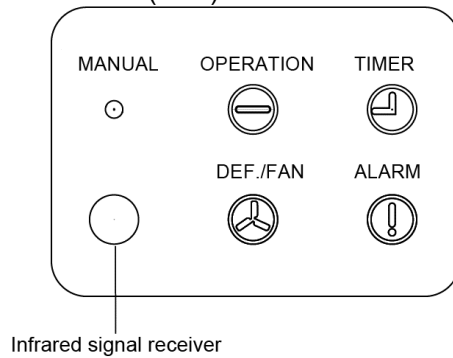
2.1.5 Icon explanation on indoor display board (Console)



2.1.6 Display board of auto-lifting panel of 4 way cassette (24K Cassette)



2.1.7 Display board of Ceiling-floor indoor unit (24K)



2.2 Indoor unit malfunction

For Console(12K)

NO.	Malfunction	lamp	Running lamp	Timer lamp	Defrosting
1	Open or short circuit of T1 temperature sensor		☆	X	X
2	Open or short circuit of T2 temperature sensor		X	X	☆
3	Communication malfunction between indoor and outdoor units.		X	☆	X
4	Outdoor fan speed has been out of control		X	☆	O
5	Indoor EEPROM malfunction		☆	☆	X
6	IPM module protection		☆	X	☆
7	Open or short circuit of T3 or T4 temperature sensor Outdoor unit EEPROM parameter error		☆	☆	☆
8	Over voltage or over low voltage protection		☆	☆	O
9	Top temperature protection of compressor		☆	O	X
10	Inverter compressor drive protection		☆	◎	X
11	Indoor fan Speed has been out of control.		☆	O	☆
O(light) X(off) ☆(flash at 5Hz) ◎(flash at 0.5Hz)					

For 12K & 18K units(except console)

NO.	Malfunction	Running lamp	Timer lamp	Defrosting lamp	Alarm lamp	Display(nixie tube)
1	Open or short circuit of T1 temperature sensor	☆	X	X	X	E0
2	Open or short circuit of T2 temperature sensor	X	X	☆	X	E1
3	Communication malfunction between indoor and outdoor units.	X	☆	X	X	E2
4	Full-water malfunction	X	X	X	☆	E3
5	Indoor EEPROM malfunction	☆	☆	X	X	E4
6	IPM module protection	☆	X	X	O	E5
7	Open or short circuit of T3 or T4 temperature sensor or outdoor EEPROM is malfunction	☆	O	X	X	E6
8	Outdoor fan is out of control	☆	O	☆	X	E7
9	Indoor fan speed is out of control	☆	O	O	X	F5
10	Outdoor unit voltage protection	☆	O	X	O	P0
11	Compressor top temperature protection	☆	X	O	X	P1
12	Outdoor unit over-current protection	☆	☆	X	☆	P2
13	Inverter compressor drive error	☆	◎	X	X	P4
O(light) X(off) ☆(flash at 2.5Hz) ◎(flash at 0.5Hz)						

For 24K Units

NO.	Malfunction	Defrosting lamp	Alarm lamp	Running lamp	Timer lamp	Display(digital tube)
1	Communication malfunction between indoor and outdoor units.	X	X	X	☆	E1
2	Open or short circuit of T1 temperature sensor	X	X	☆	X	E2

3	Open or short circuit of T2 temperature sensor	X	X	☆	X	E3
4	Open or short circuit of T2B temperature sensor	X	X	☆	X	E4
5	Indoor EEPROM malfunction	☆	X	X	X	E7
6	Indoor fan speed is out of control	☆	☆	X	X	E8
7	Refrigerant Leakage Detection	☆	☆	O	X	EC
8	Outdoor unit malfunction	X	◎	X	X	Ed
9	Full-water malfunction	X	☆	X	X	EE
10	Communication malfunction between main PCB and up-down panel PCB	☆	☆	☆	X	F0
11	Up-down panel malfunction	☆	☆	X	☆	F1
12	Up-down panel is not closed	☆	☆	X	O	F2
13	Communication malfunction between master unit and slave unit	X	☆	X	☆	F3
14	Other malfunction of master unit or slave unit	X	☆	☆	X	F4
O (on) X(off)☆(flash at 5Hz) ◎(flash at 0.5Hz) F0,F1,F2 is only available for super-slim cassette						

2.3 Outdoor unit malfunction (for 24K)

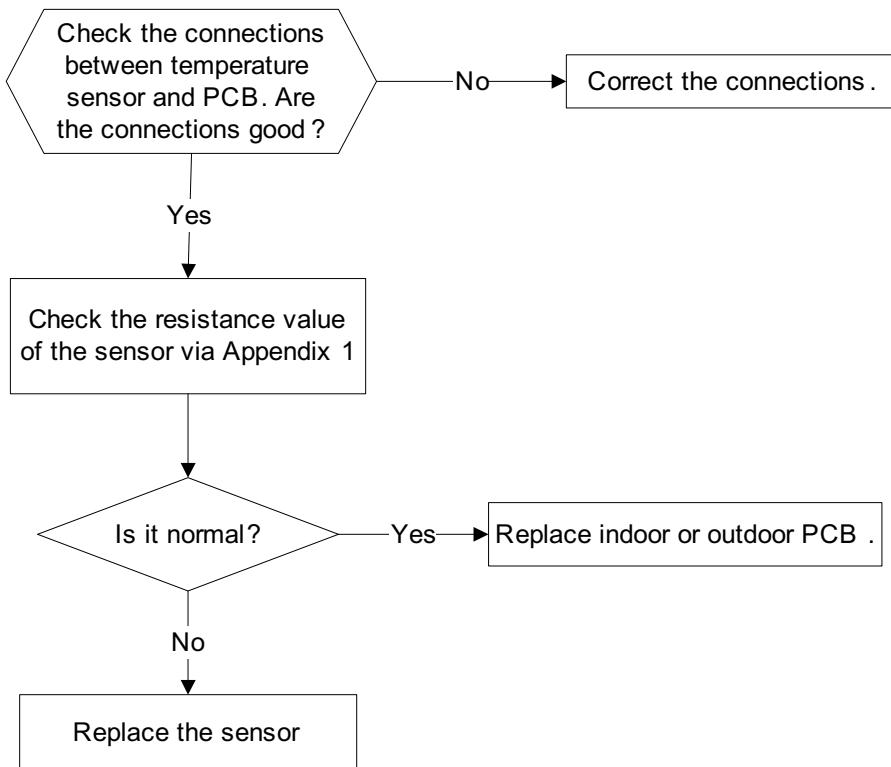
Display	Malfunction or Protection
E0	Outdoor EEPROM malfunction
E2	Indoor / outdoor units communication error
E3	Communication malfunction between IPM board and outdoor main board
E4	Open or short circuit of T3 or T4 temperature sensor
E5	Voltage protection of compressor
E6	PFC module protection (For 36K-48K)
E8	Outdoor fan speed has been out of control
P0	Top temperature protection of compressor
P1	High pressure protection
P2	Low pressure protection
P3	Current protection of compressor
P4	Discharge temperature protection of compressor
P5	High temperature protection of condenser
P6	IPM module protection
P7	High temperature protection of evaporator

In low ambient cooling mode, the LED displays “LC” or alternative displays between running frequency and “LC”(each displays 0.5s)

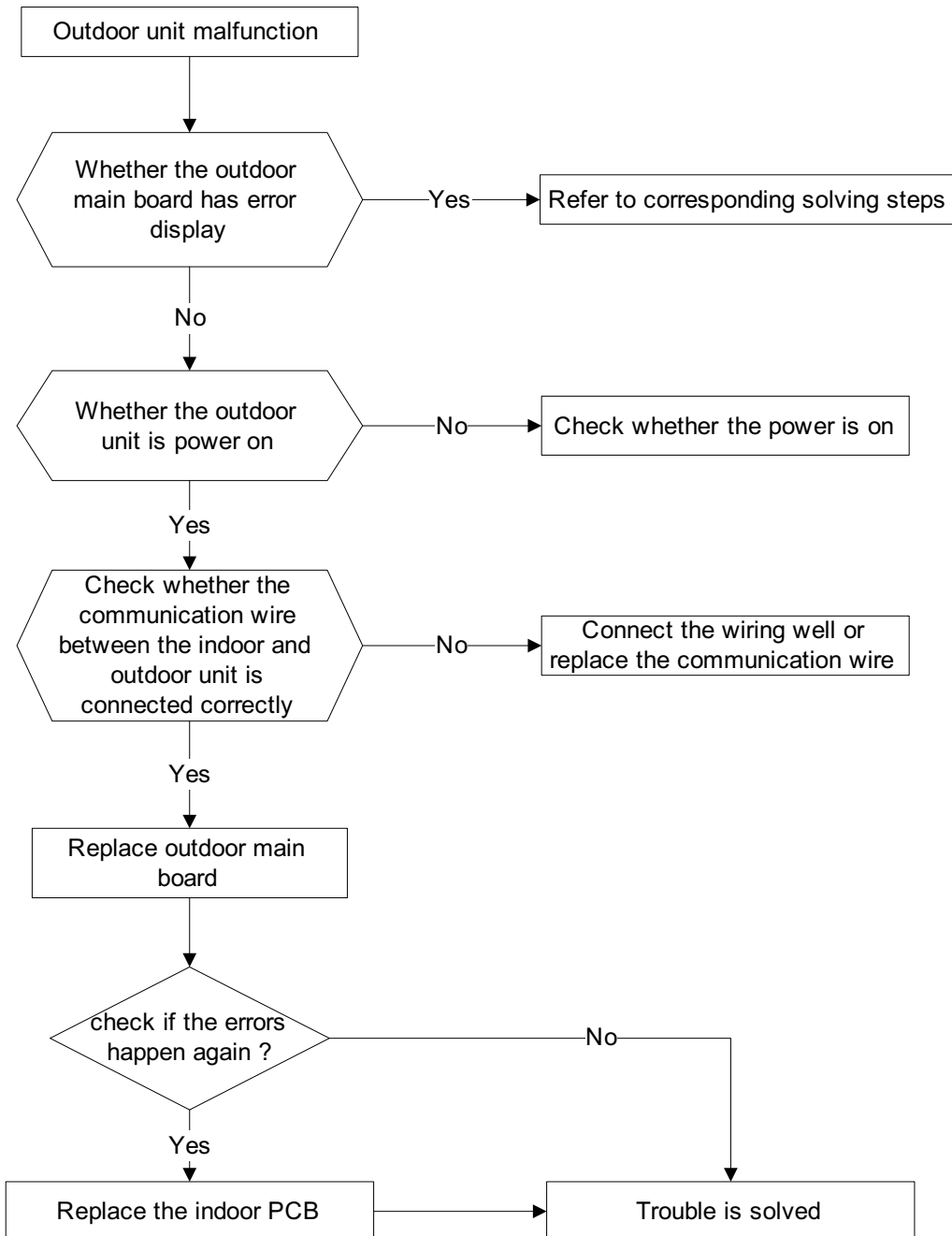
2.4 Solving steps for typical malfunction

2.4.1 For the indoor unit

2.4.1.1 Open or short circuit of temperature sensor

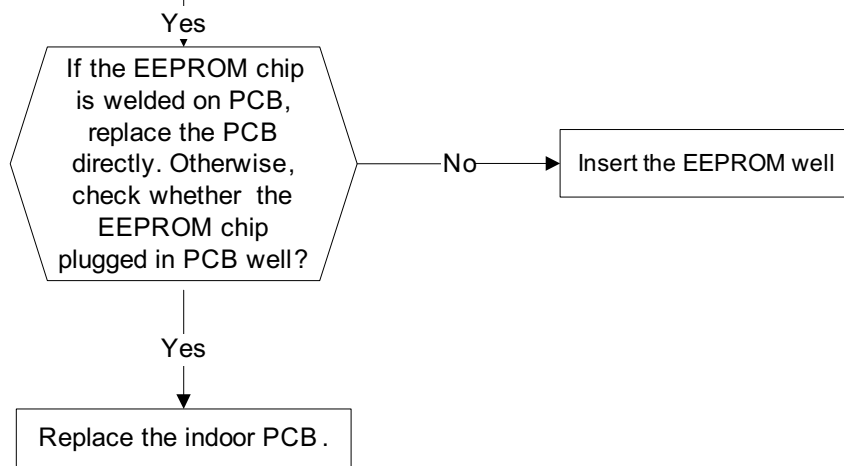


2.4.1.2. Outdoor unit malfunction

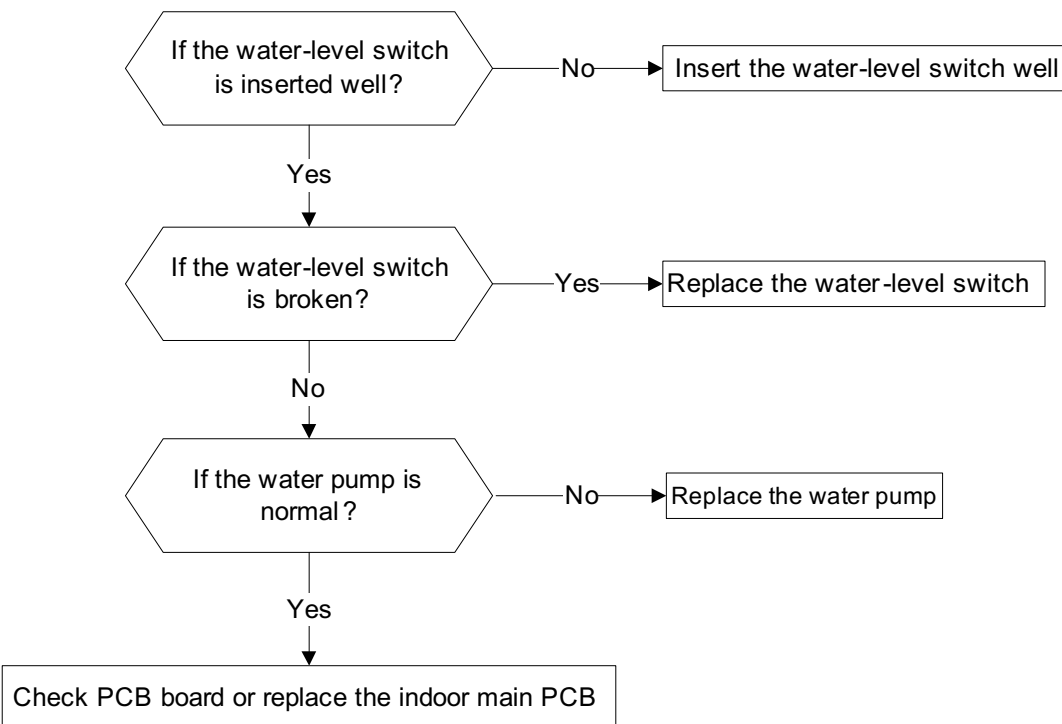


2.4.1.3. Indoor EEPROM malfunction

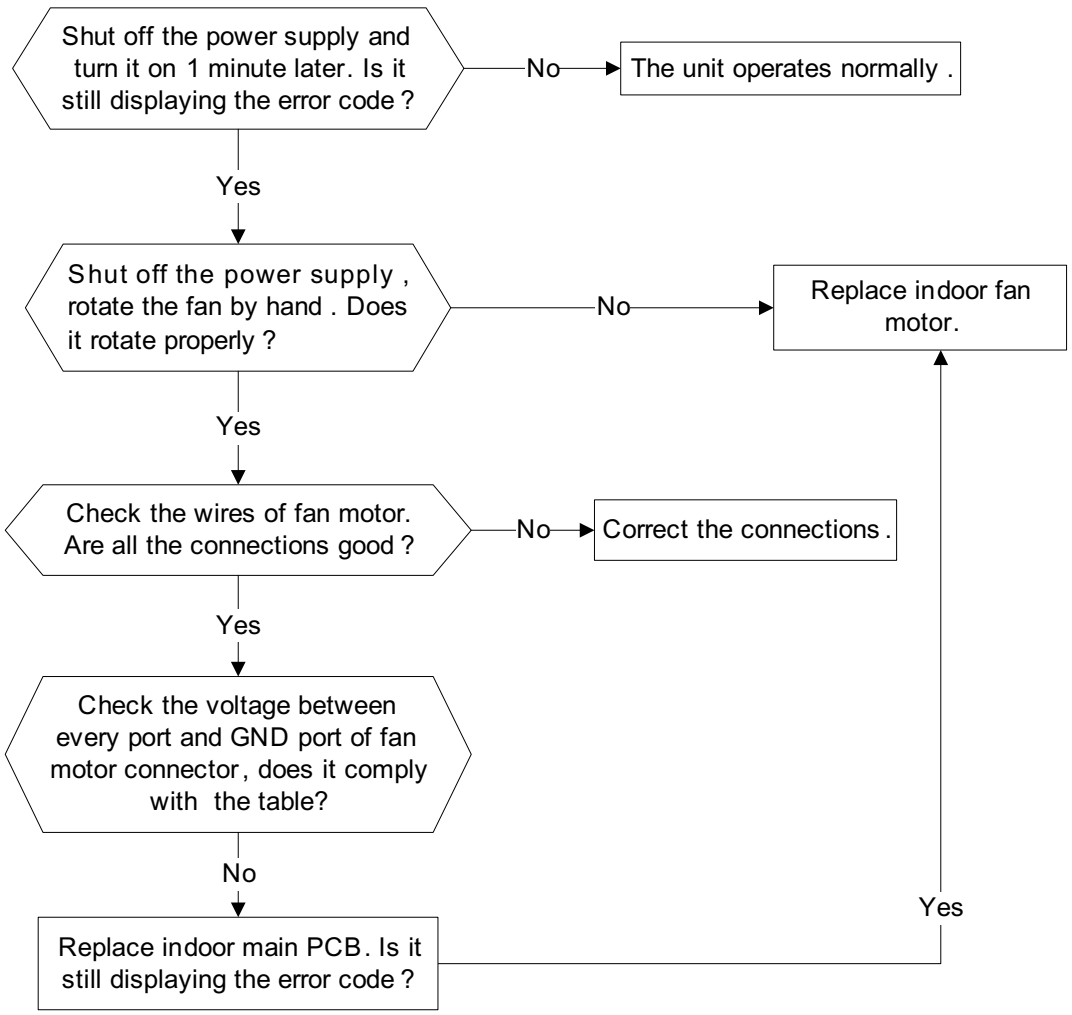
Shut off the power supply and turn it on 5 seconds later. Is it still displaying the error code ?



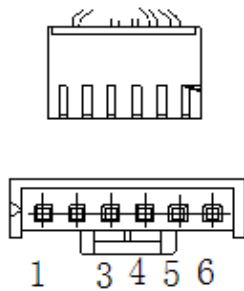
2.4.1.4. Full-water malfunction



2.4.1.5. Indoor fan Speed has been out of control. (Only for the units used DC motor)



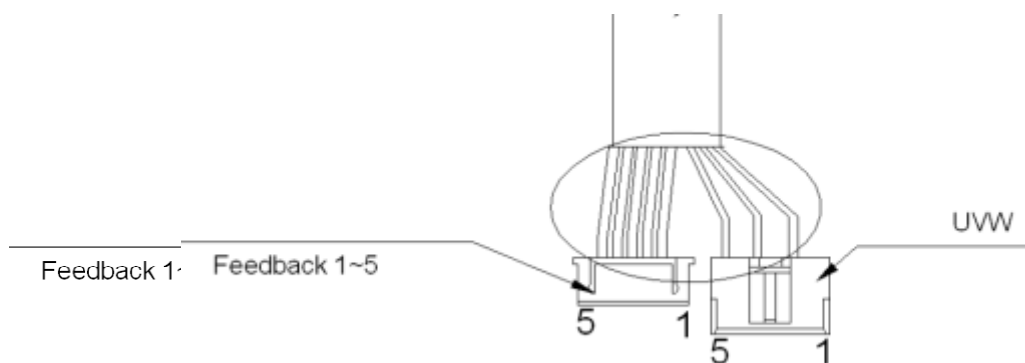
DC motor voltage input and output (control chip is inside the motor)



DC motor voltage input and output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	280V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14-17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14-17.5V

Control chip is in main PCB



NO.	1	2	3	4	5
Color	Orange	Grey	White	Pink	Black
Signal	Hu	Hv	Hw	Vcc	GND

Color	Red	Blue	Yellow
Signal	W	V	U

- 1) Release the UVW connector. Measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other, the fan motor must have problems and need to be replaced. Otherwise, go to step 2.
- 2) Power on and when the unit is in standby, measure the voltage of pin4-5 in feedback signal connector. If the value is not 5V, change the PCB. Otherwise, go to step 3.
- 3) Rotate the fan by hand, measure the voltage of pin1-5, pin 2-5 and pin 3-5 in feedback signal connector. If any voltage is not positive voltage fluctuation, the fan motor must have problems and need to be replaced.

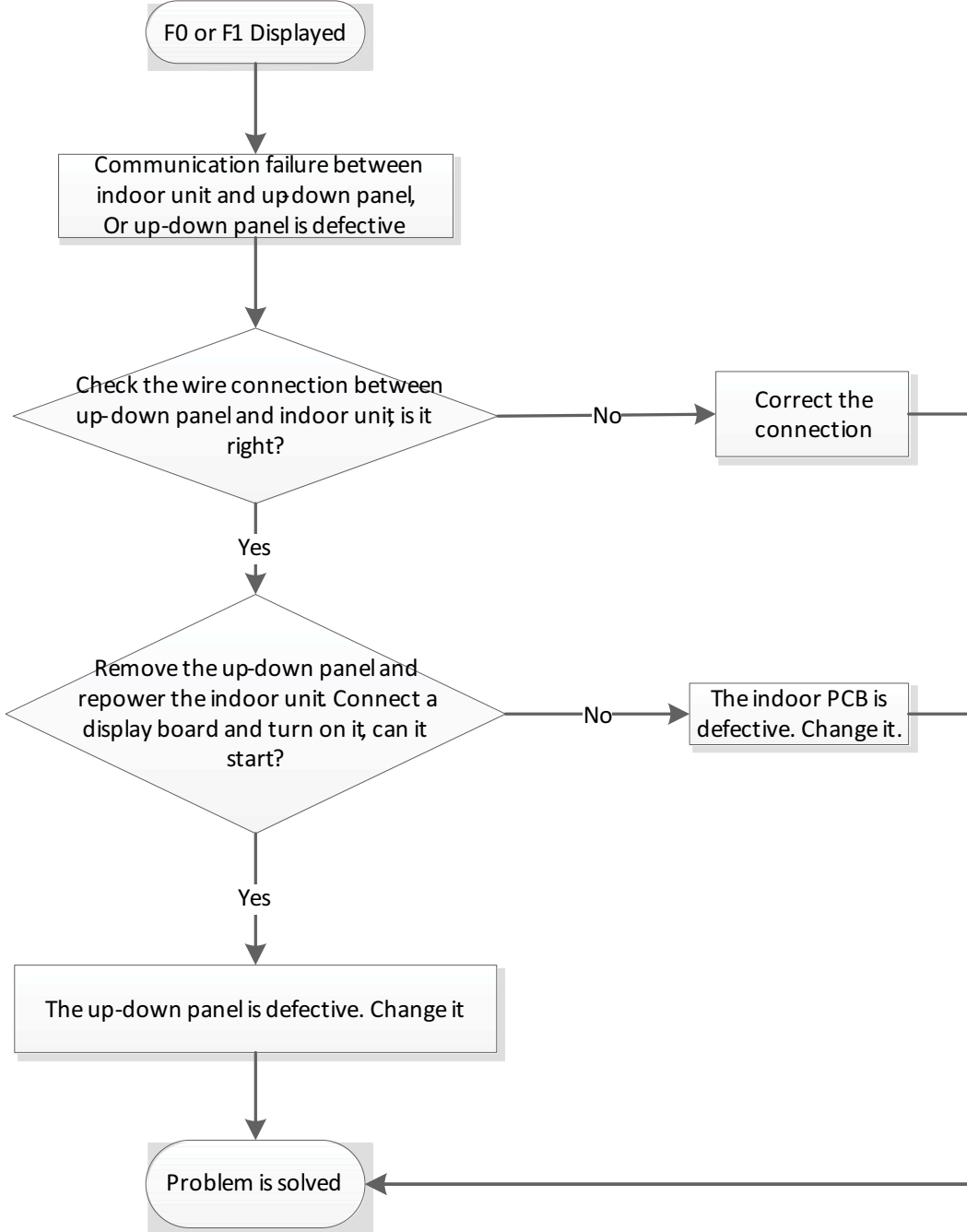
2.4.1.6. Inverter compressor drive protection (Only for compact cassette 12k & console 12k)

Refer to the outdoor unit P6 malfunction part to solve this problem.

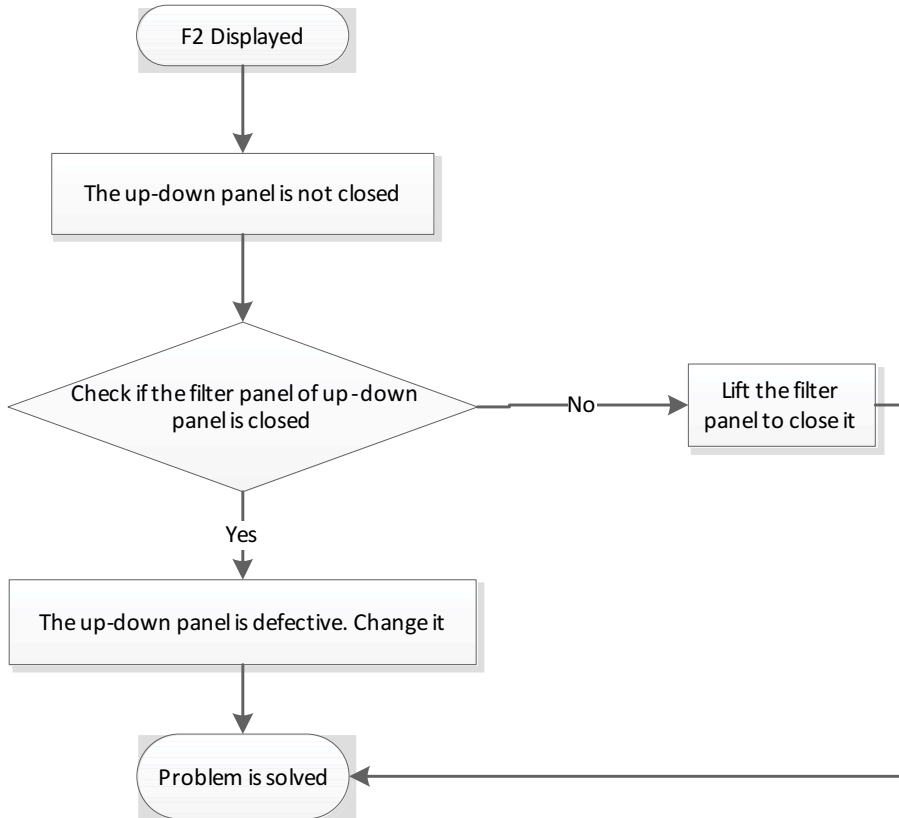
2.4.2 For the super-slim cassette with up-down panel

2.4.2.1 Communication error between indoor unit and up-down panel

2.4.2.2 Up-down panel is defective

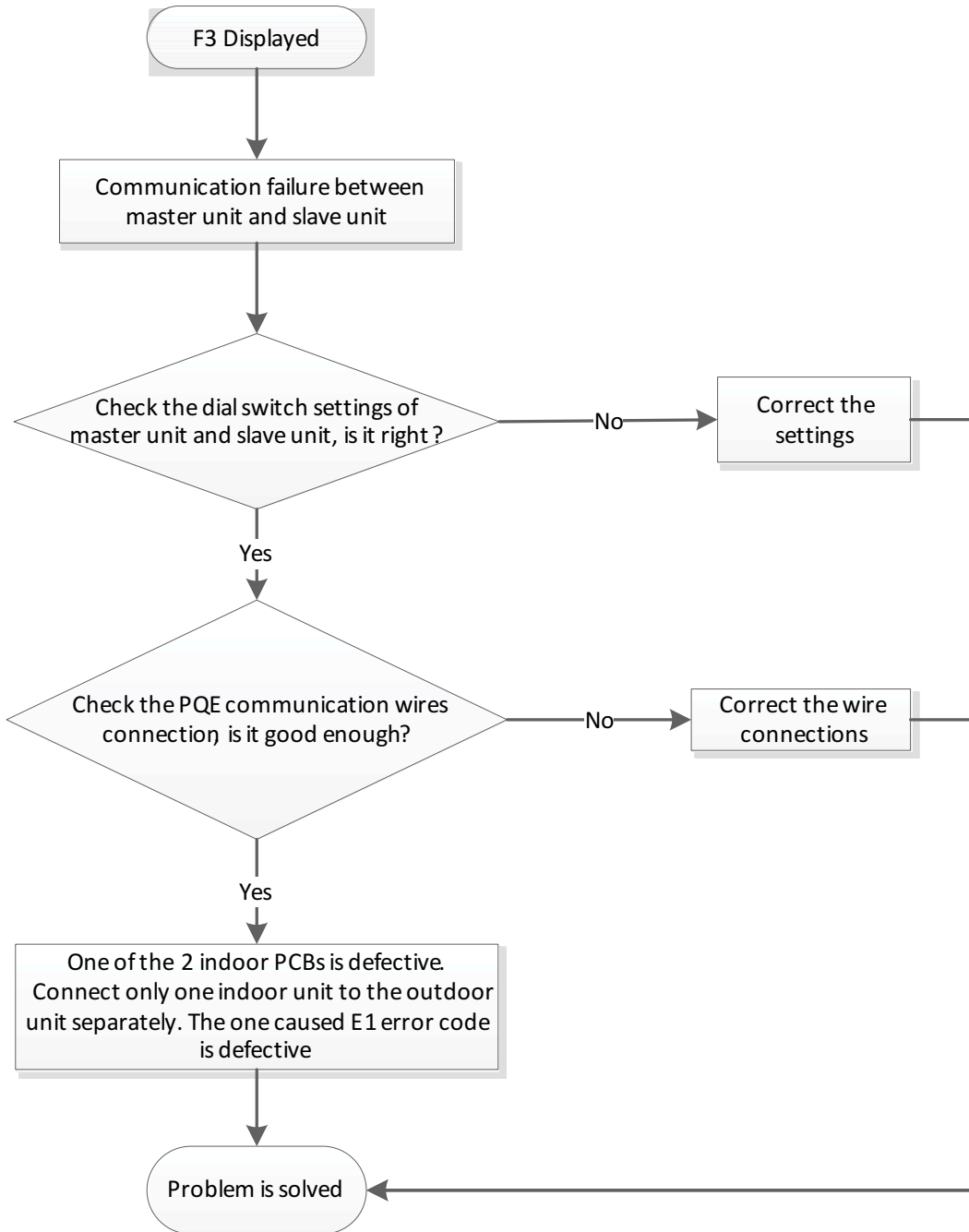


2.4.2.3 Up-down panel is not closed



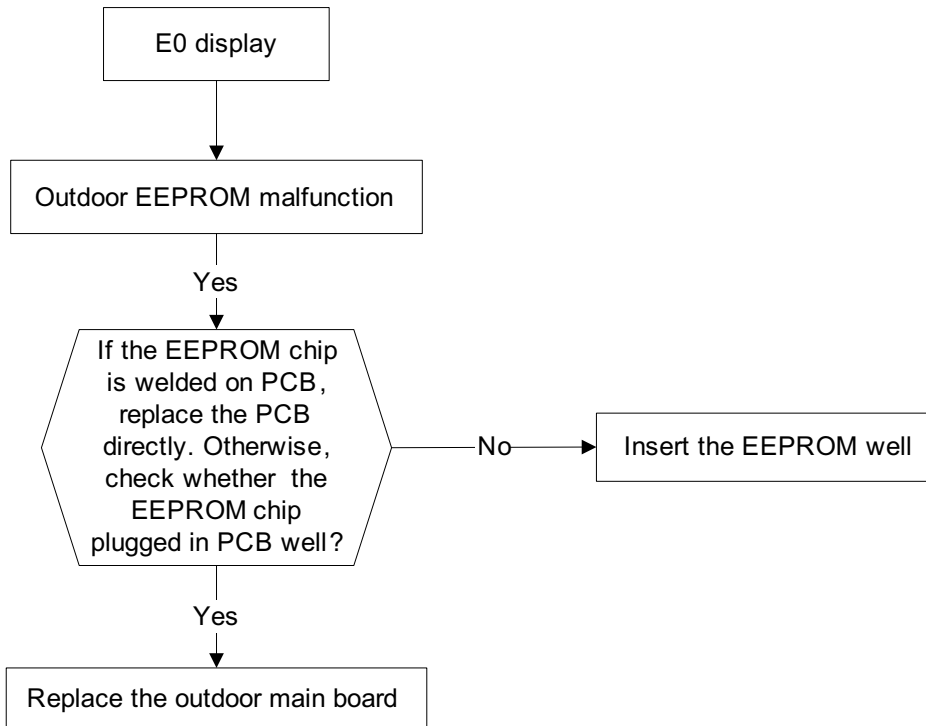
2.4.3 For the unit with TWINS function

2.4.3.1 Communication failure between master unit and indoor unit

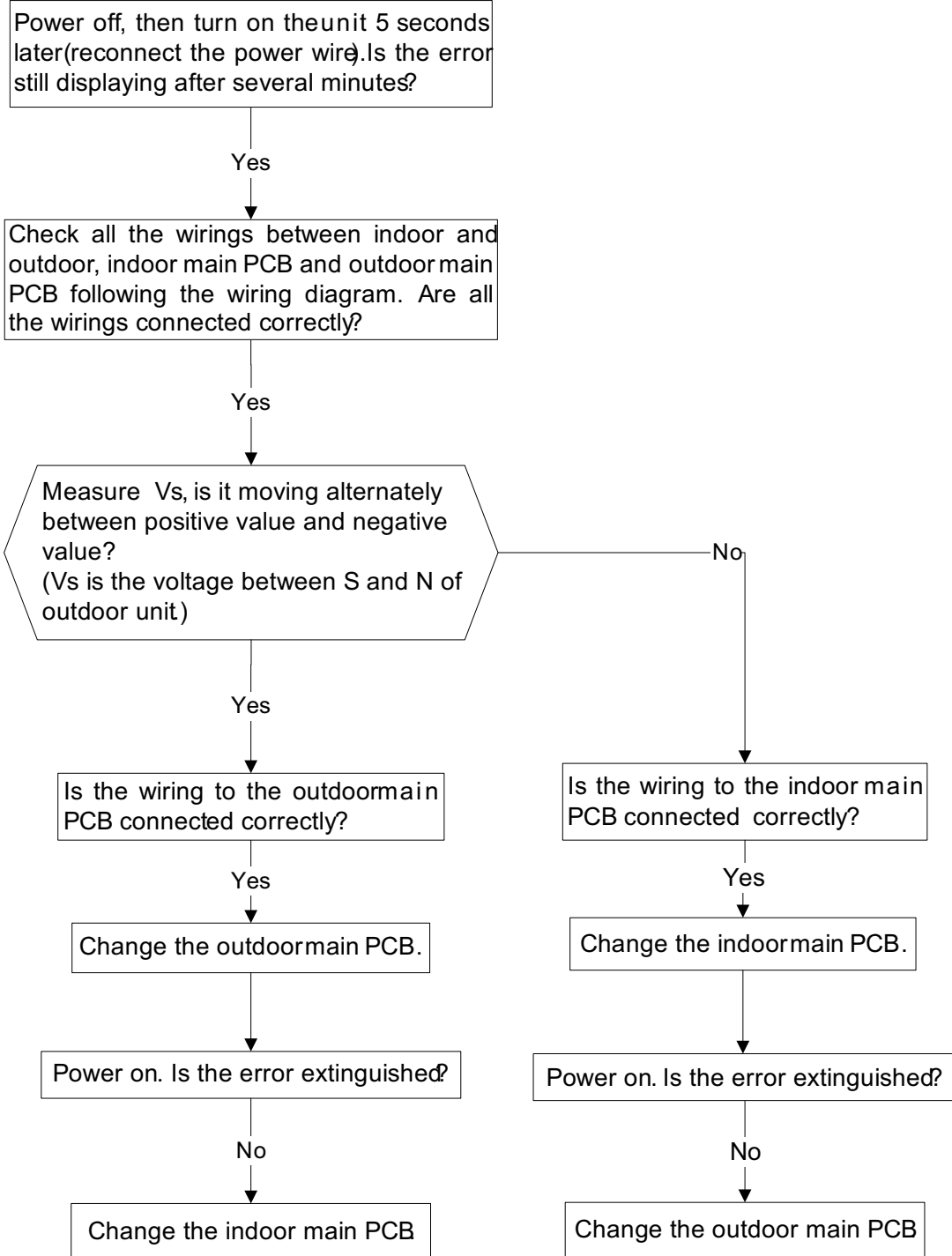


2.4.4 For the outdoor unit

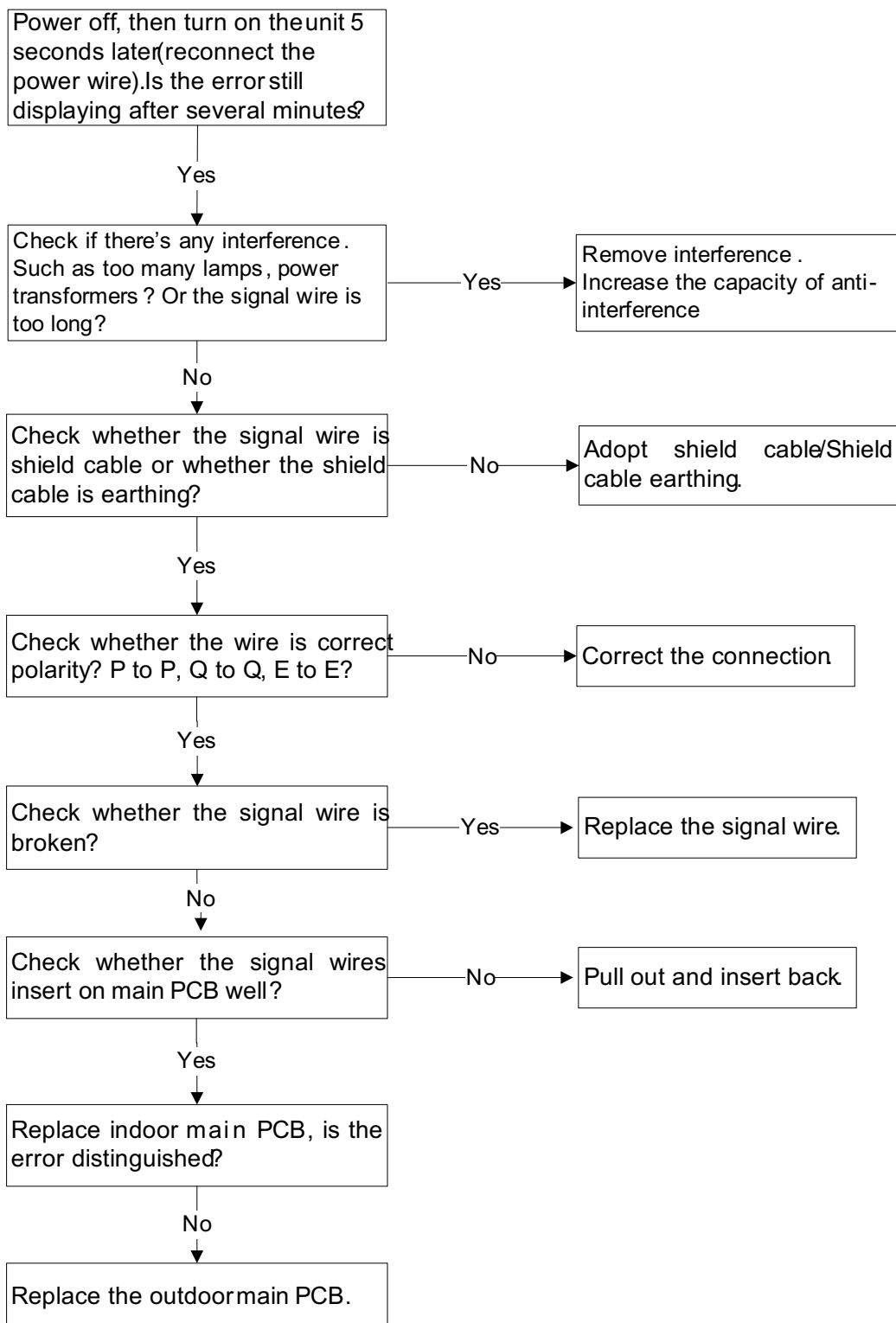
2.4.4.2. E0 malfunction



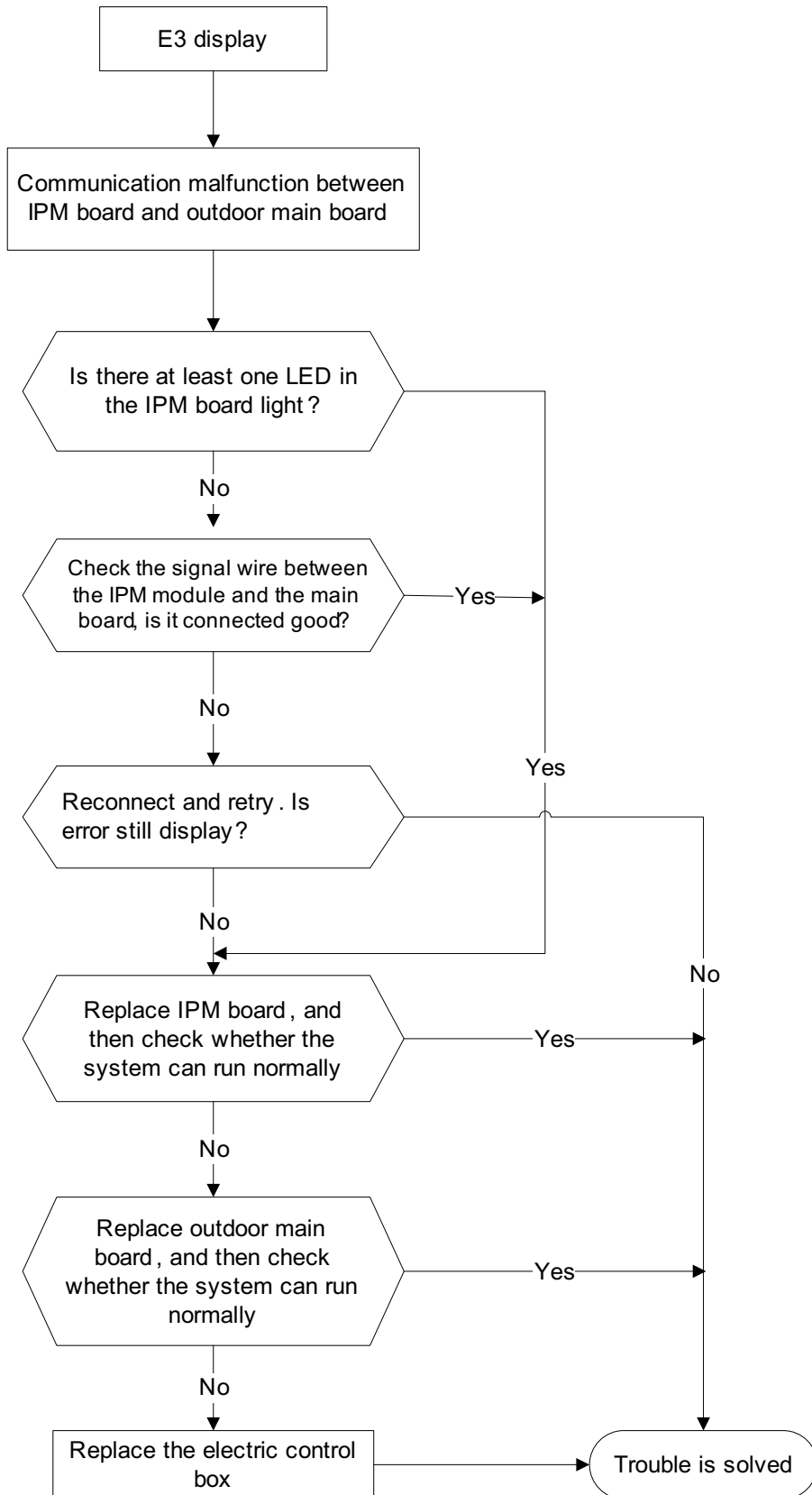
2.4.4.3. E2 malfunction (Only for 12k)



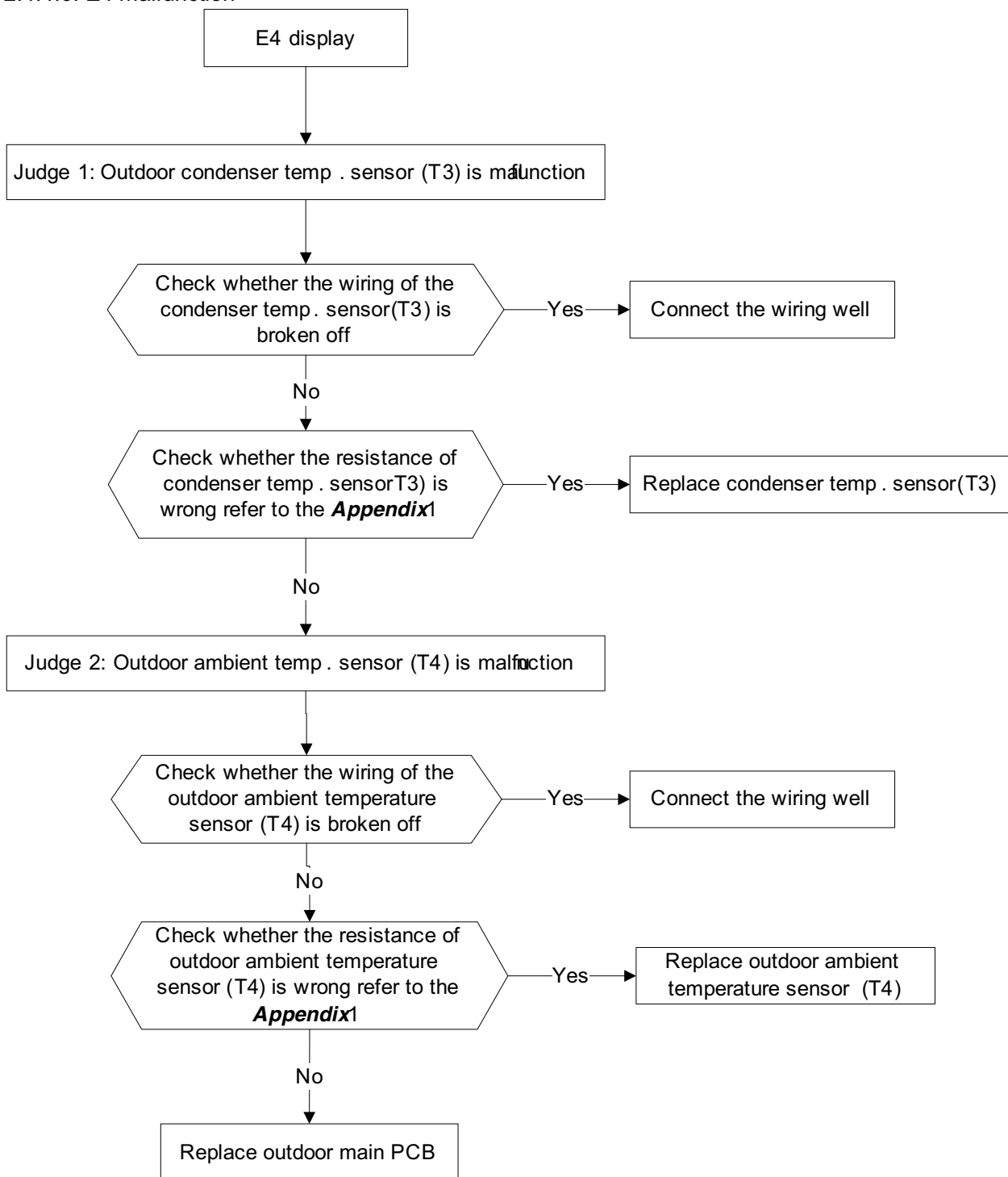
2.4.4.4. E2 malfunction (For 18-60k)



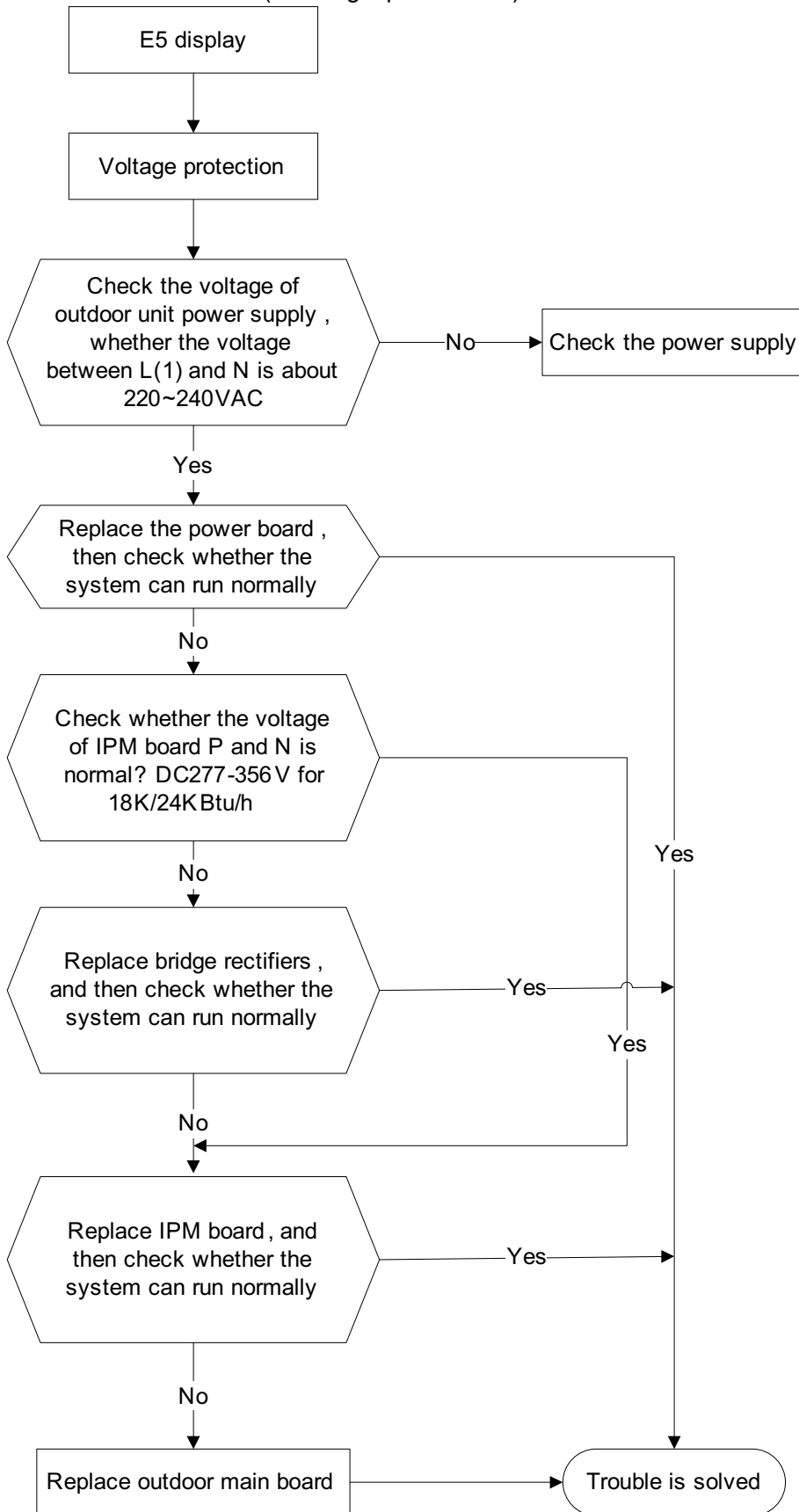
2.4.4.5. E3 malfunction



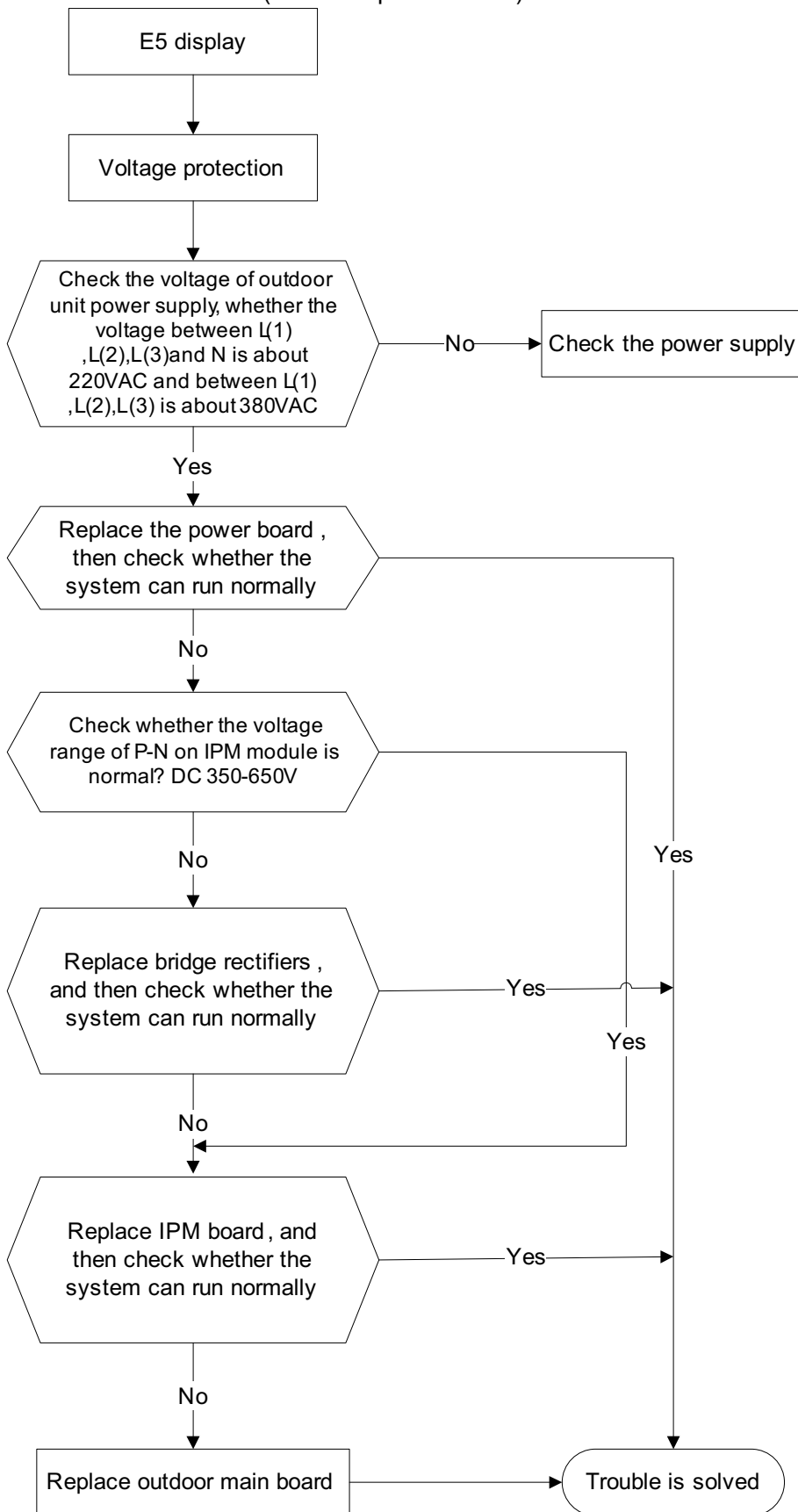
2.4.4.6. E4 malfunction



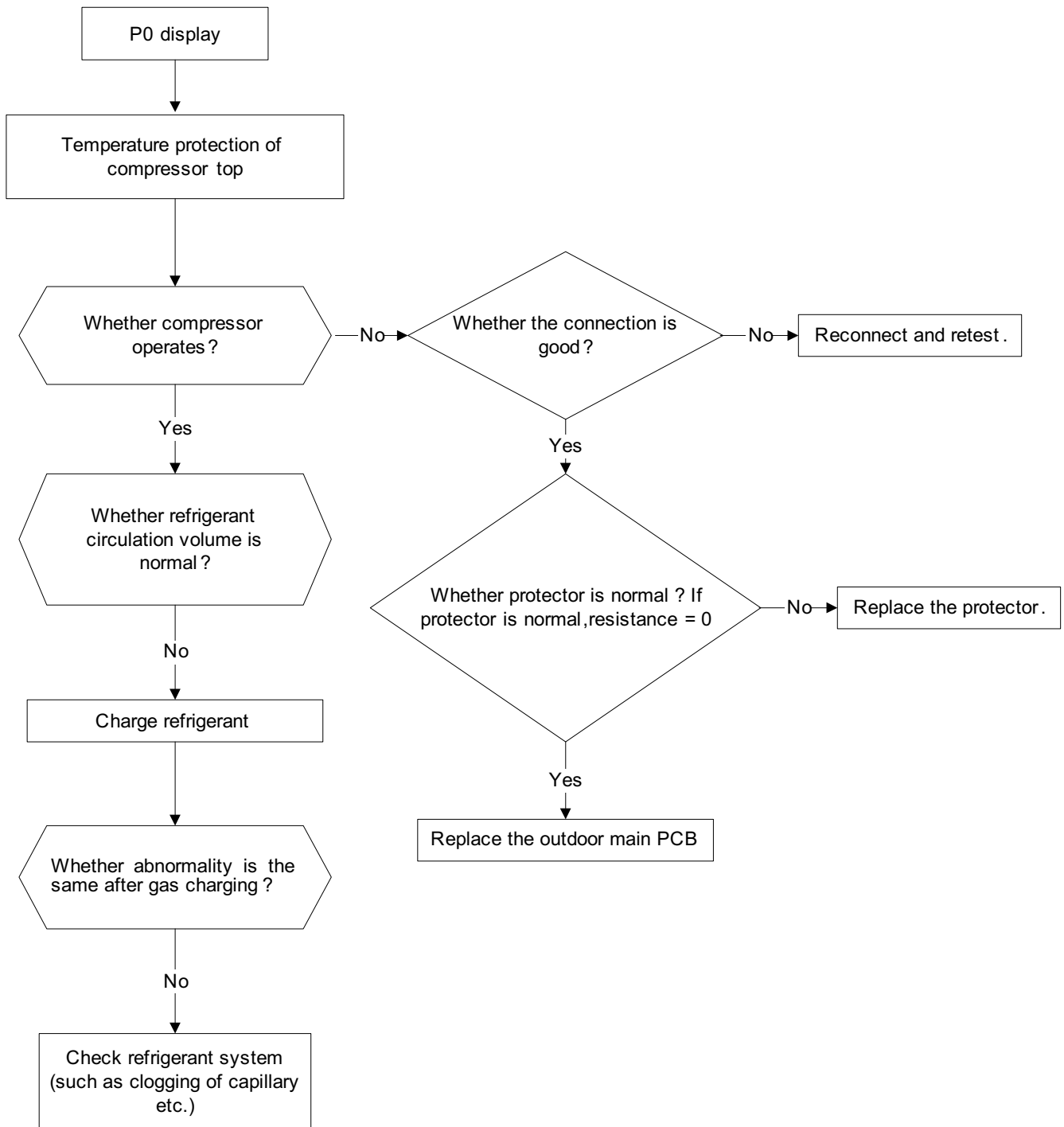
2.4.4.7. E5 malfunction (For single phase units)



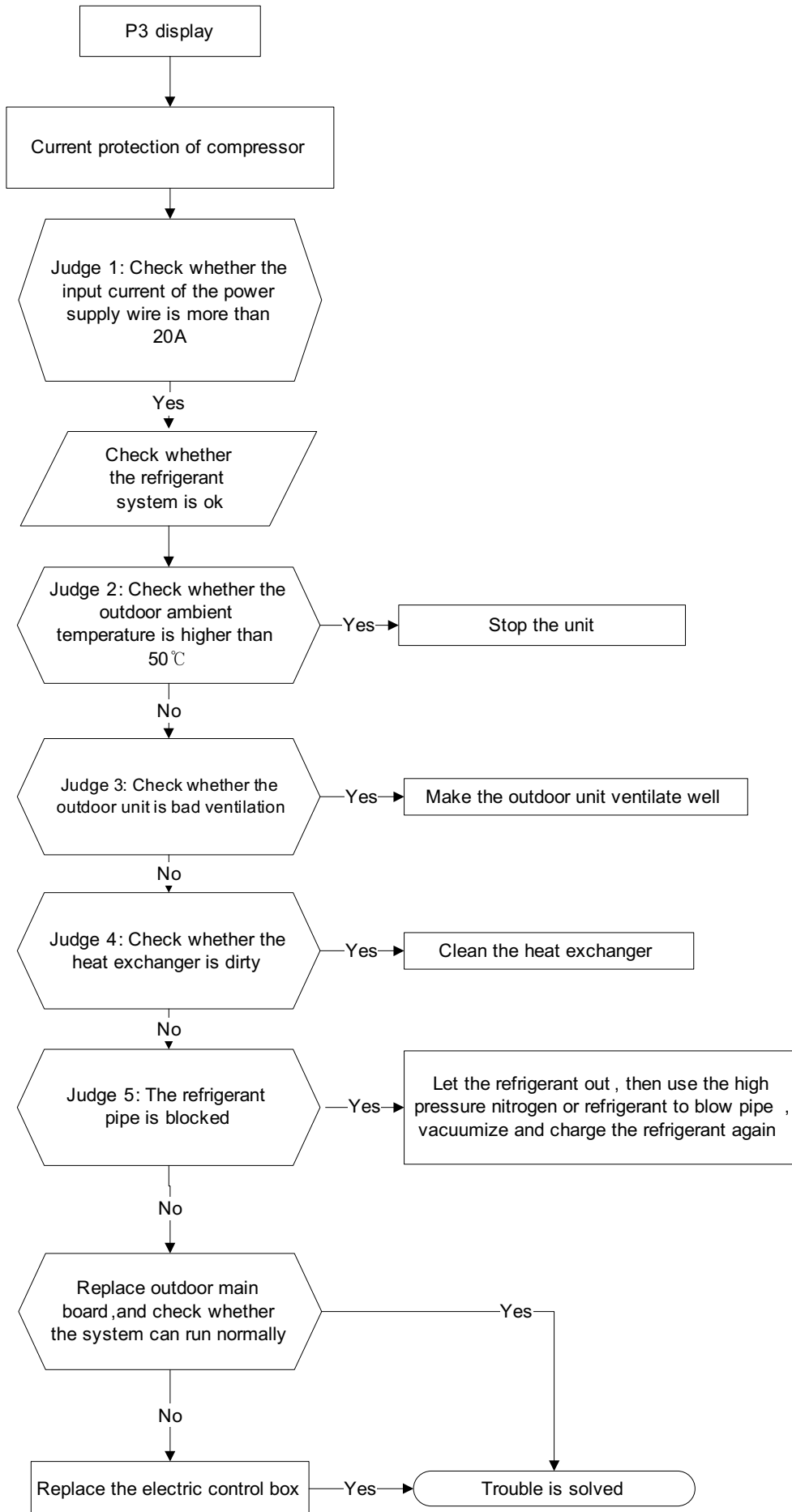
2.4.4.8. E5 malfunction (For three phases units)



2.4.4.10. P0 malfunction

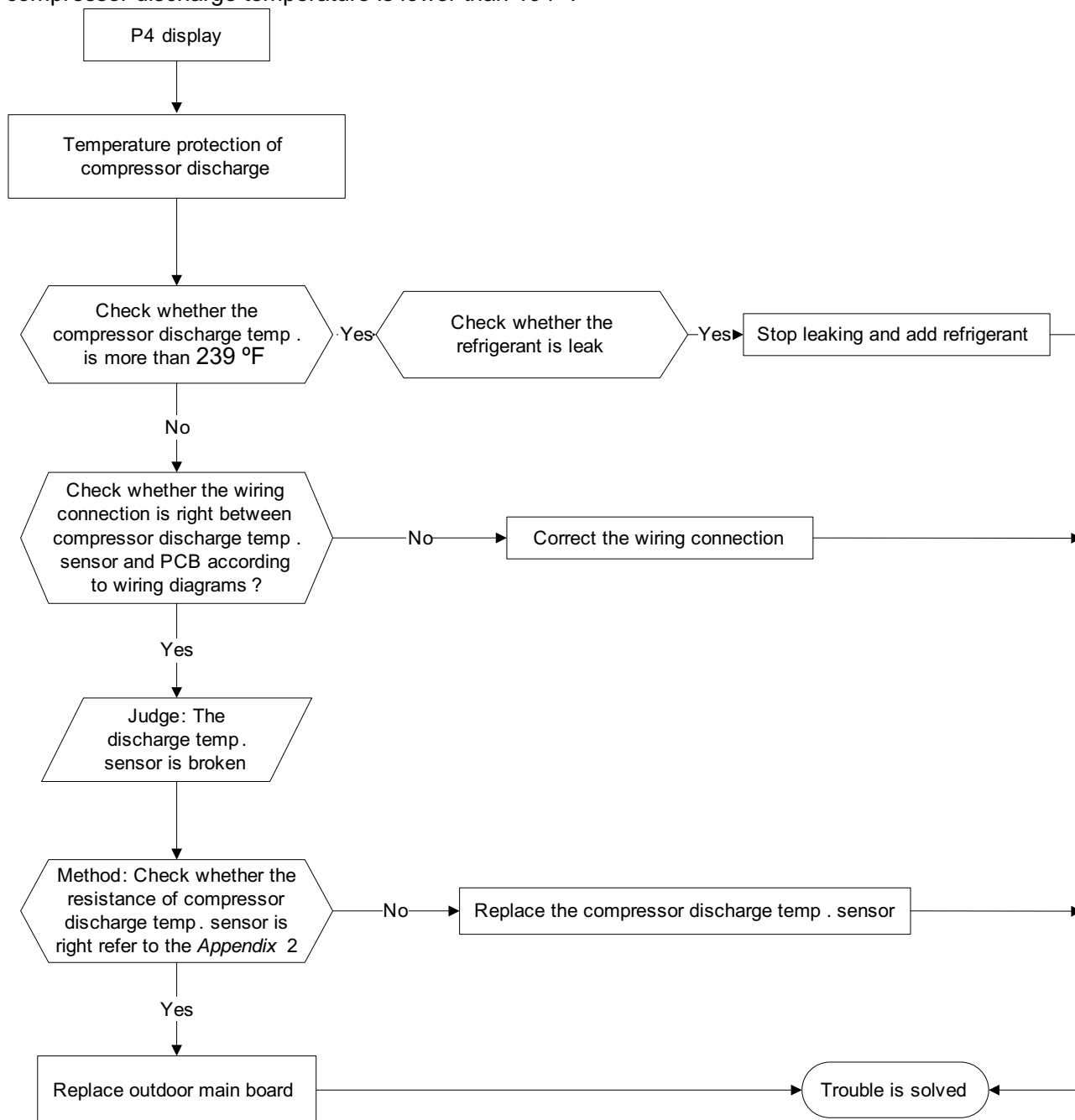


2.4.4.13. P3 malfunction



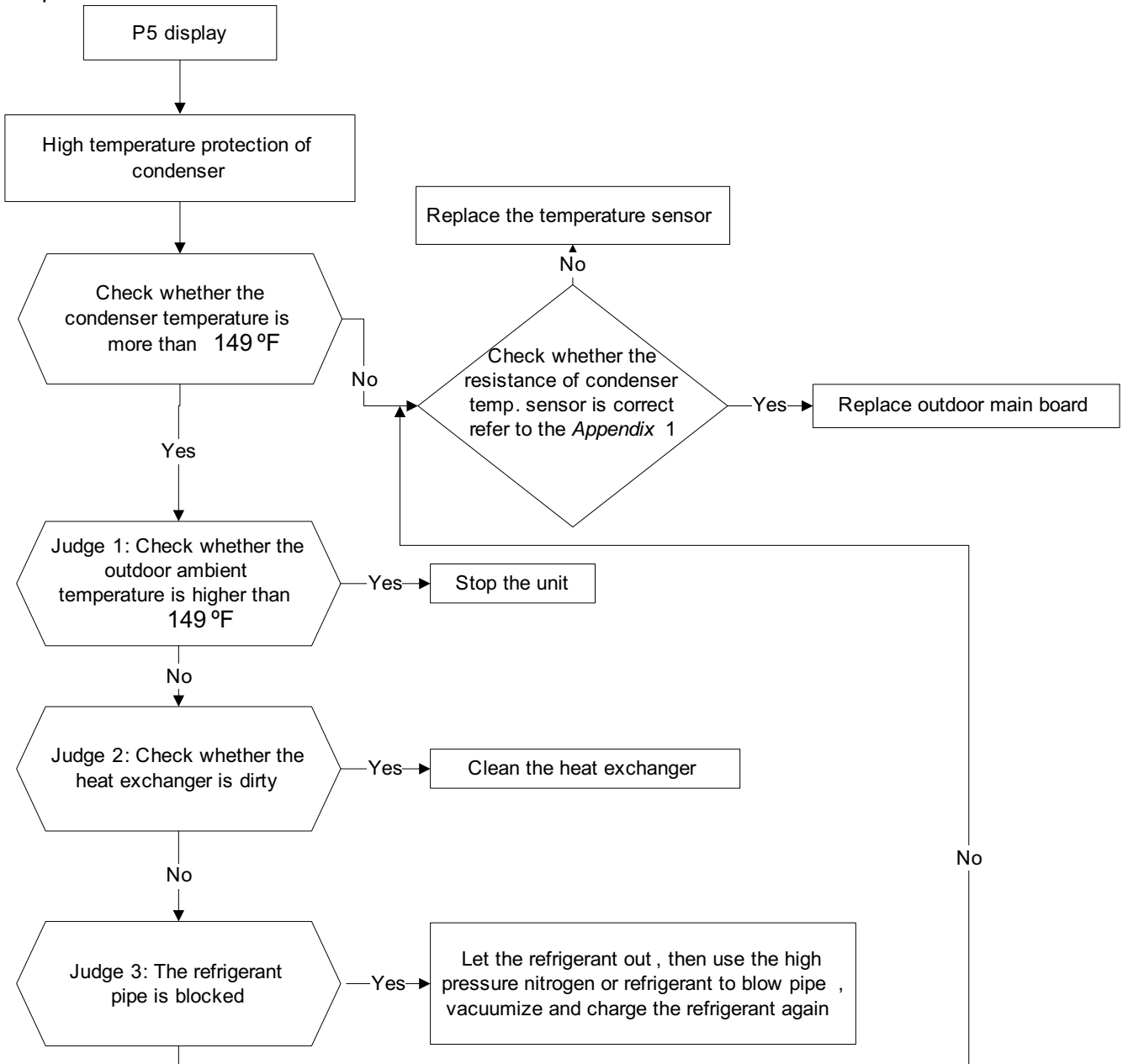
2.4.4.14. P4 malfunction

When compressor discharge temperature is higher than 239 °F, the unit will stop, and unit runs again when compressor discharge temperature is lower than 194 °F



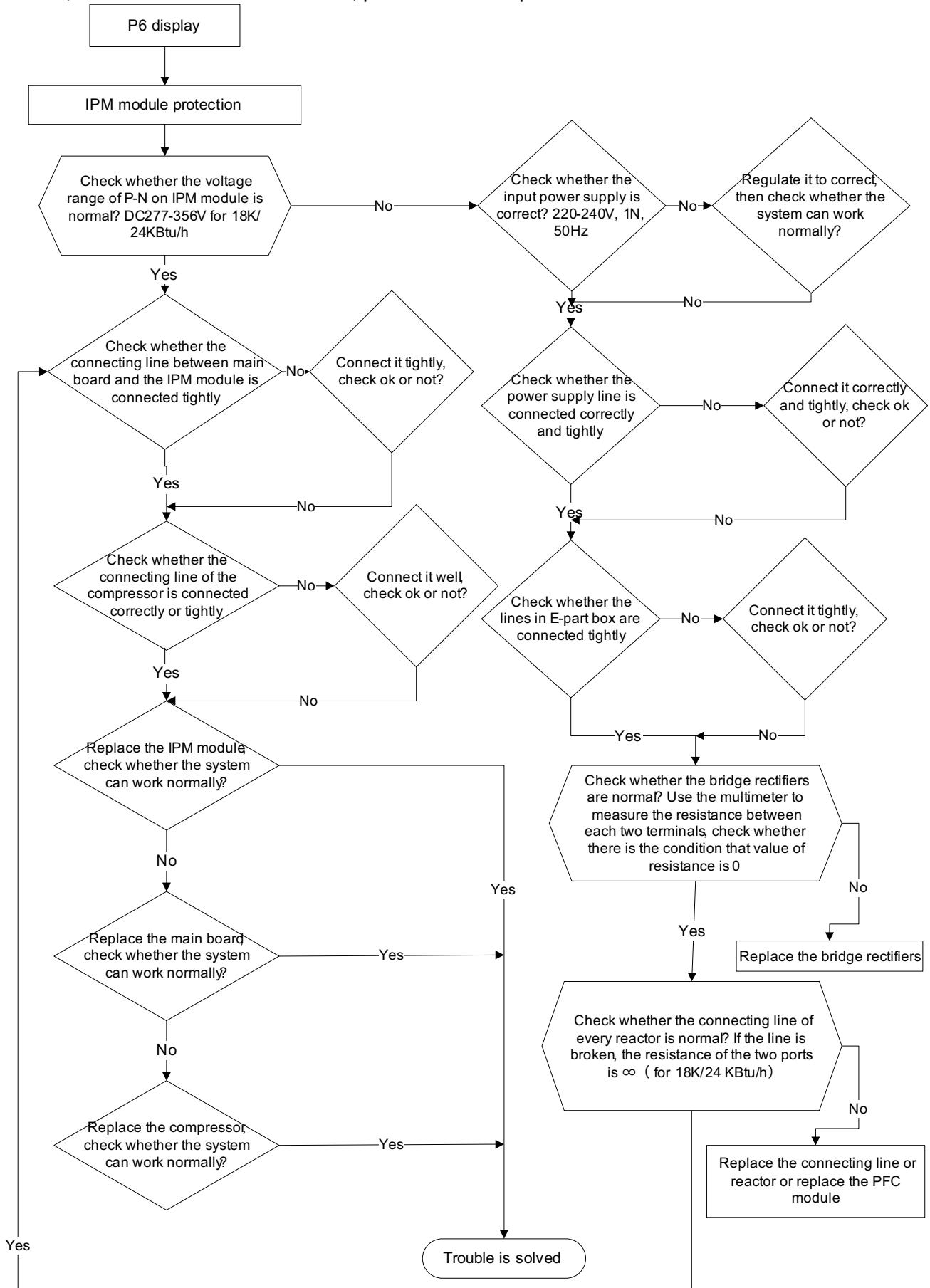
2.4.4.15. P5 malfunction

When condenser high temp. is more than 149 °F , the unit will stop, and unit runs again when outdoor pipe temp. less than 125 °F

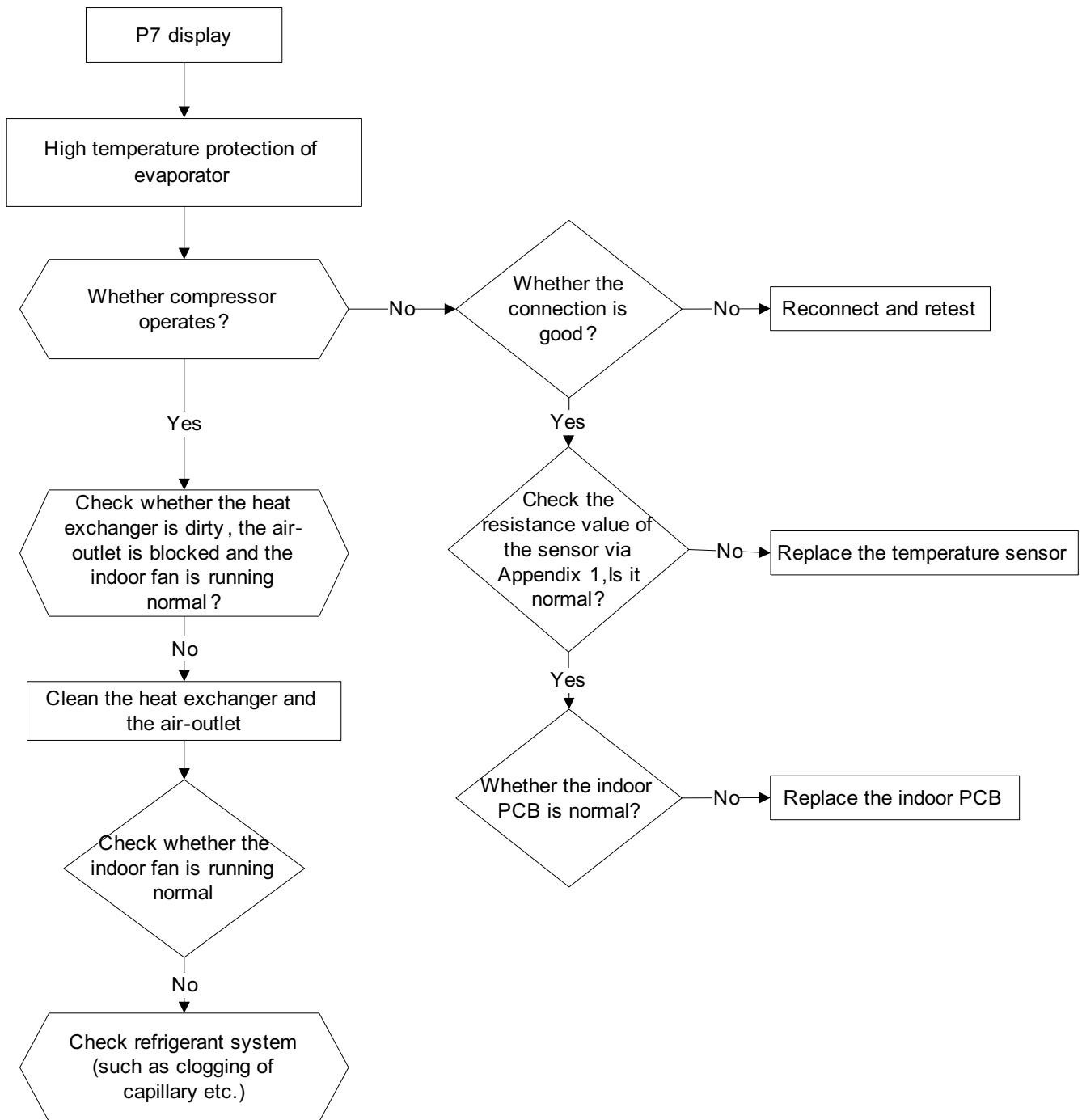


2.4.4.16. P6 malfunction (For single phase units)

At first test the resistance between every two ports of U, V, W of IPM and P, N. If any result of them is 0 or close to 0, the IPM is defective. Otherwise, please follow the procedure below:



2.4.4.18. P7 malfunction



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

°C	K Ohm	°C	K Ohm	°C	K Ohm	°C	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	10.0000	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: °C---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°C)=5KΩ±3%	
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

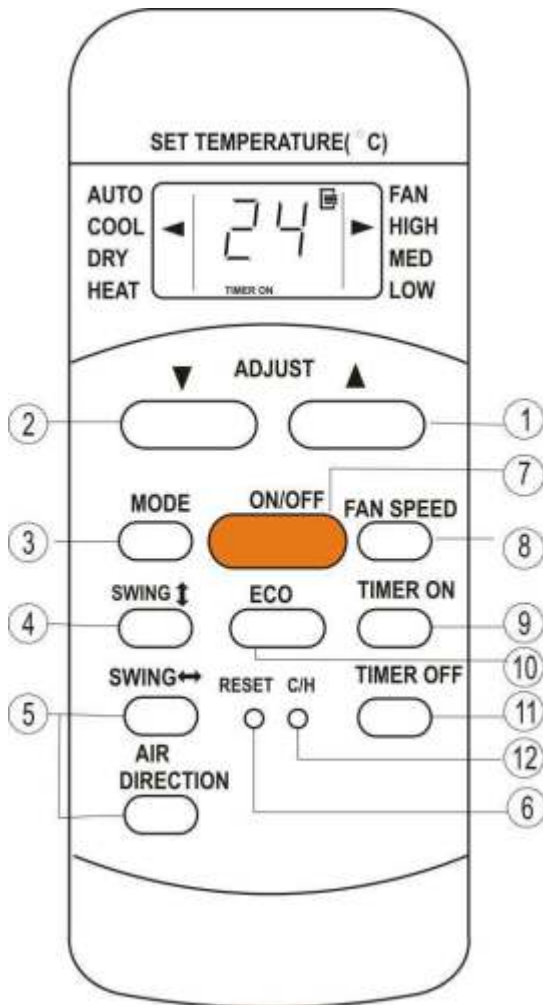
Appendix 3:

°C	10	11	12	13	14	15	16	17	18	19	20	21	22
°F	48	50	52	54	56	58	60	62	64	66	68	70	72
°C	23	24	25	26	27	28	29	30	31	32	33	34	35
°F	74	76	78	80	82	84	86	88	90	92	94	96	98

3. Controller

3.1 Wireless Remote Controller

3.1.1 RG51Q1/BGE

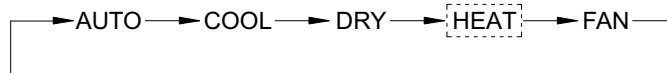


General Function for wireless remote controller:

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	23~140°F(--5~60℃)

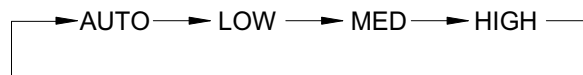
Buttons and functions

- 1. **Adjust ▼** : Decrease the set temp. Keeping pressing will decrease the temp with 1 °C per 0.5s.
- 2. **Adjust ▲** : Increase the set temp. Keeping pressing will increase the temp with 1 °C 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. **VERT SWING**: Used to stop or start horizontal louver movement or set the desired up/down air flow direction. The louver changes 6 degree in angle for each press. If keep pushing more than 2 seconds, the louver will swing up and down automatically.
- 5. **HORIZ SWING**: Used to stop or start vertical louver movement.
- 6. **AIR DIRECTION**: Used to set the desired up/down air flow direction. The louver changes 6 degree in angle for each press.
- 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.

Adjust the figure to 0.00 will cancel time ON setting.

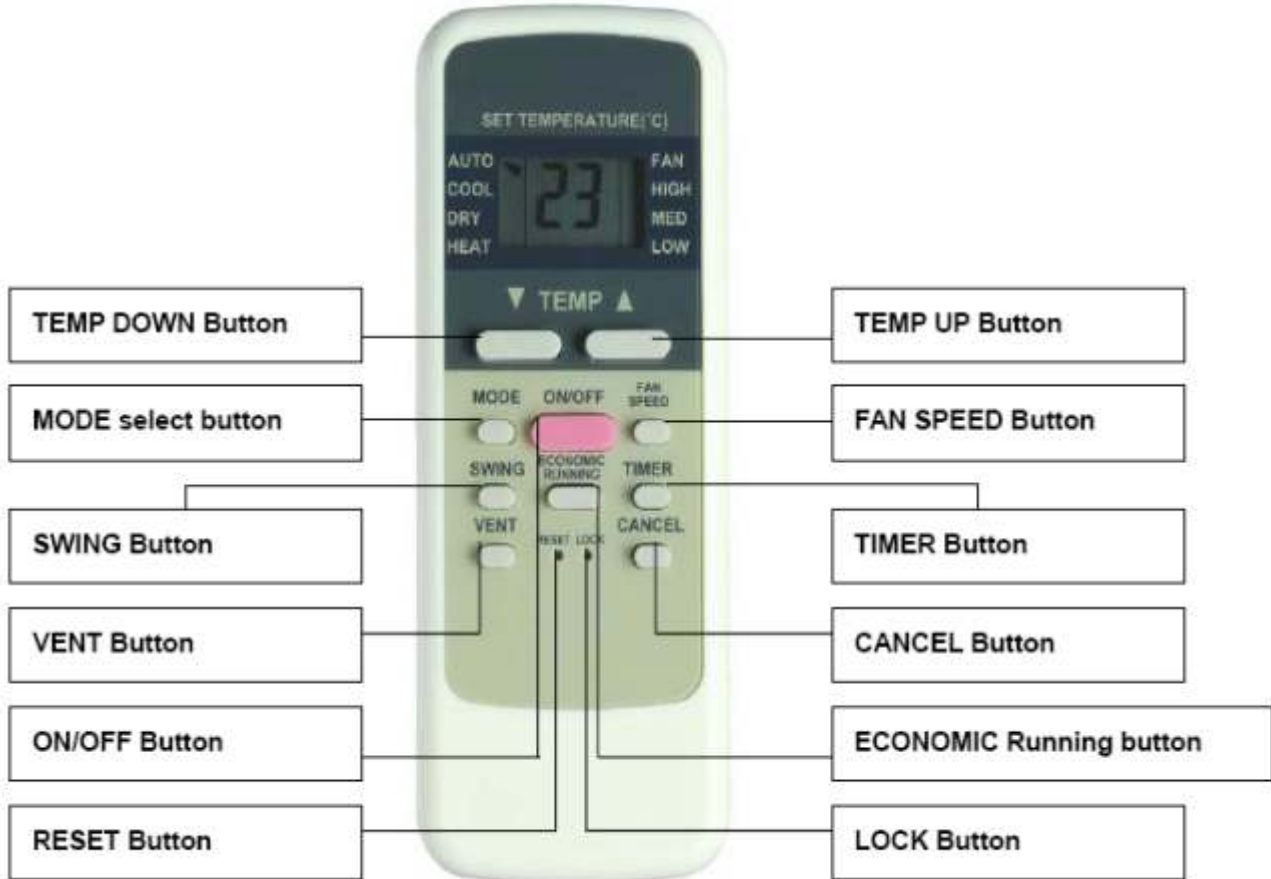
- 12. **C/H** (inner located): Press this button with a needle of 1mm to shift the mode between Cooling only and Cooling & Heating according to the feature of the machine.
- 13. **RESET** (inner located): Press this button with a needle of 1mm to cancel the current setting and reset remote controller.

3.1.2 R51/E

Remote Controller Specifications

Model	R51/E
Rated Voltage	3.0V
Lowest Voltage of CPU Emitting Signal	2.0V
Reaching Distance (n get 11m)	8m (when using 3.0 voltage, it can get 11m)
Environment Temperature Range	23°F~140°F(-5~60°C)

Introduction of Function Buttons on the Remote Controller



1. TEMP DOWN Button: Push the TEMP DOWN button to decrease the indoor temperature setting or to adjust the timer in a counter-clockwise direction.

2. MODLE SELECT Button: Each time you push the button, a mode is selected in a sequence that goes from AUTO, COOL, DRY, HEAT and FAN as the following figure indicates:



▲ NOTE: HEAT only for Heat Pump

3. SWING Button: Push this switch button to change the louver angle.

4. RESET Button: When the RESET button is pushed, all of the current settings are cancelled and the control will return to the initial settings.

5. ECONOMIC RUNNING Button: Push this button to go into the Energy-Saving operation mode.

6. LOCK Button: Push this button to lock in all the current settings. To release settings, push again.

7. CANCEL Button: Push this button to cancel the TIMER settings.

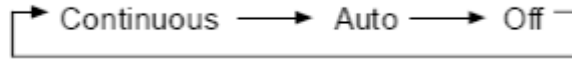
8. TIMER Button: This button is used to preset the time ON (start to operate) and the time OFF (turn off the operation)

9. ON/OFF Button: Push this button to start the unit operation. Push the button again to stop the unit operation.

10. FAN SPEED Button: This button is used for setting fan speed in the sequence that goes from AUTO, LOW, MED to HIGH, and then back to Auto.

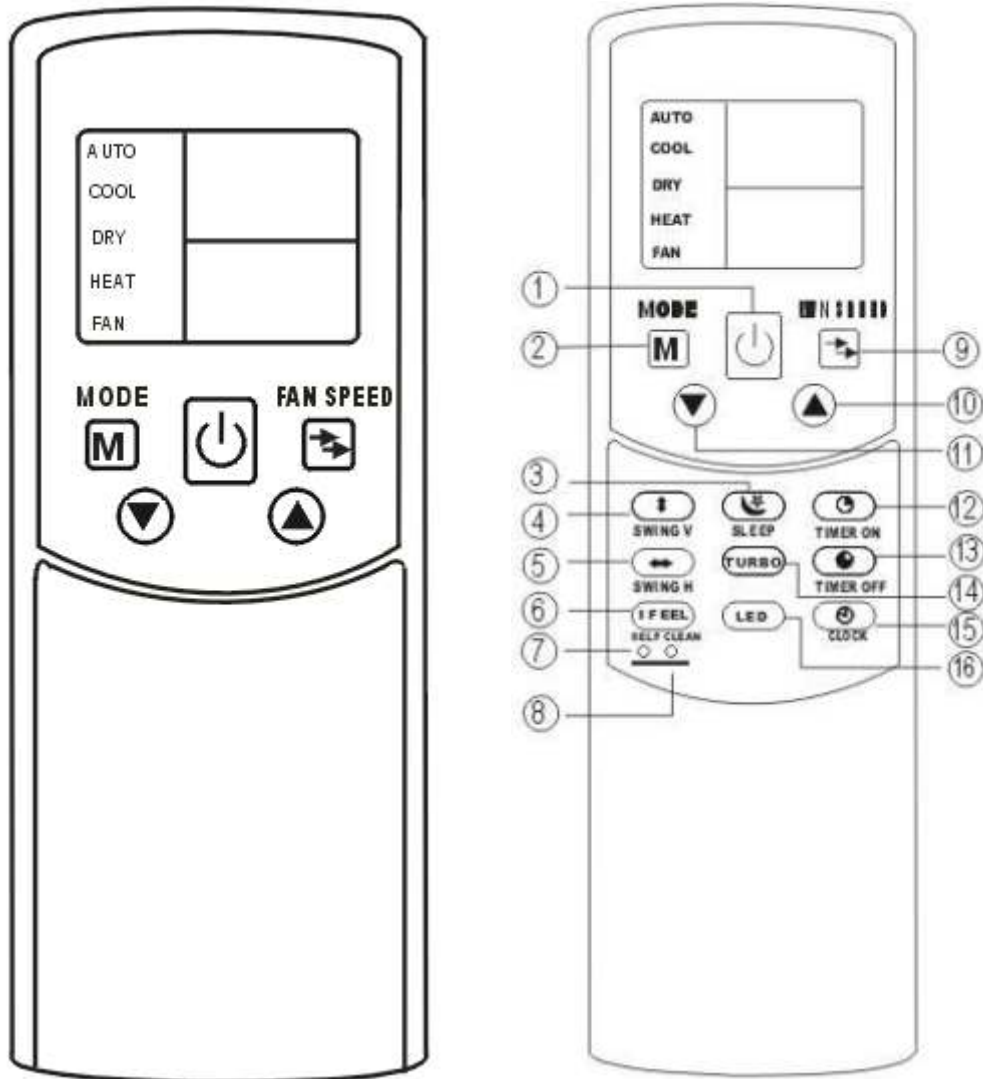
11. TEMP UP Button: Push this button to increase the indoor temperature setting or to adjust the timer in a counter-clockwise direction.

12. VENT Button: Push this button to set the ventilating mode. The ventilating mode will operate in the following sequence:



Ventilation Function is available for the Fresh Star Series.

3.1.3 RG05F2/BGEU1



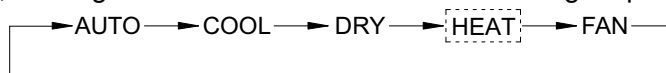
General Function for wireless remote controller:

Model	RG05F2/BGEU1
Rated voltage	3.0V(Dry batteries R03/LR03×2)
Min voltage for sending signal of CPU	2.4V
Effective receiving distance	8m
Operation condition	23°F~140°F(-5~60℃)

Buttons and functions

1. ON/OFF Button: Push this button to start the unit operation. Push the button again to stop the unit operation.

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



NOTE: No heating mode for cool only type unit.

3. SLEEP Button: Active/Disable sleep function. It can maintain the most comfortable temperature and save energy. This function is available on COOL, HEAT or AUTO mode only .

NOTE: While the unit is running under SLEEP mode, would be cancelled if MODE, FAN SPEED or ON/OFF button is pressed.

4. VERT SWING: Used to stop or start horizontal louver movement and set the desired up/down air flow direction. The louver changes 6 degree in angle for each press. If keep pushing more than 2 seconds, the louver will swing up and down automatically.

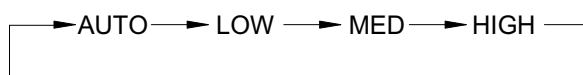
5. HORIZ SWING: Used to stop or start vertical louver movement and set the desired left/right air flow direction. The louver changes 6 degree in angle for each press. If keep pushing more than 2 seconds, the vertical louver swing feature is activated..

6. I FEEL /SELF CLEAN Function : Press this button less than 2 seconds will initiate I FEEL function. And if keep pressing this button more than 2 seconds, the SELF CLEAN function is initiated.

7. RESET Button: When the RESET button is pushed, all of the current settings are cancelled and the control will return to the initial settings.

8. LOCK Button: Push this button to lock in all the current settings. To release settings, push again.

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



10. UP Button: Push this button to increase setting temperature or to increase Hour during Clock time setting.

11. DOWN Button: Push this button to decrease setting temperature or to decrease Hour during Clock time setting.

NOTE: Press and hold UP and DOWN buttons together for 3 seconds will alternate the temperature display between the OC & OF scale.

12. TIME ON: Press this button to activate the Auto-on time setting. Each press will increase the time setting in 30 minutes increments, up to 10 hours, then at 1 hour increments up to 24 hours. To cancel the Auto-on time setting, just press the button until the time setting is 0.0.

13. TIME OFF: Press this button to activate the Auto-off time setting. Each press will increase the time setting in 30 minutes increments, up to 10 hours, then at 1 hour increments up to 24 hours. To cancel the Auto-off time setting, just press the button until the time setting is 0.0.

14. TURBO: Active/Disable Turbo function. Turbo function enables the unit to reach the preset temperature in the shortest time. When press this button on heating mode (applicable to the unit adopts PTC only), the PTC will be energized and bring fast heating operation.

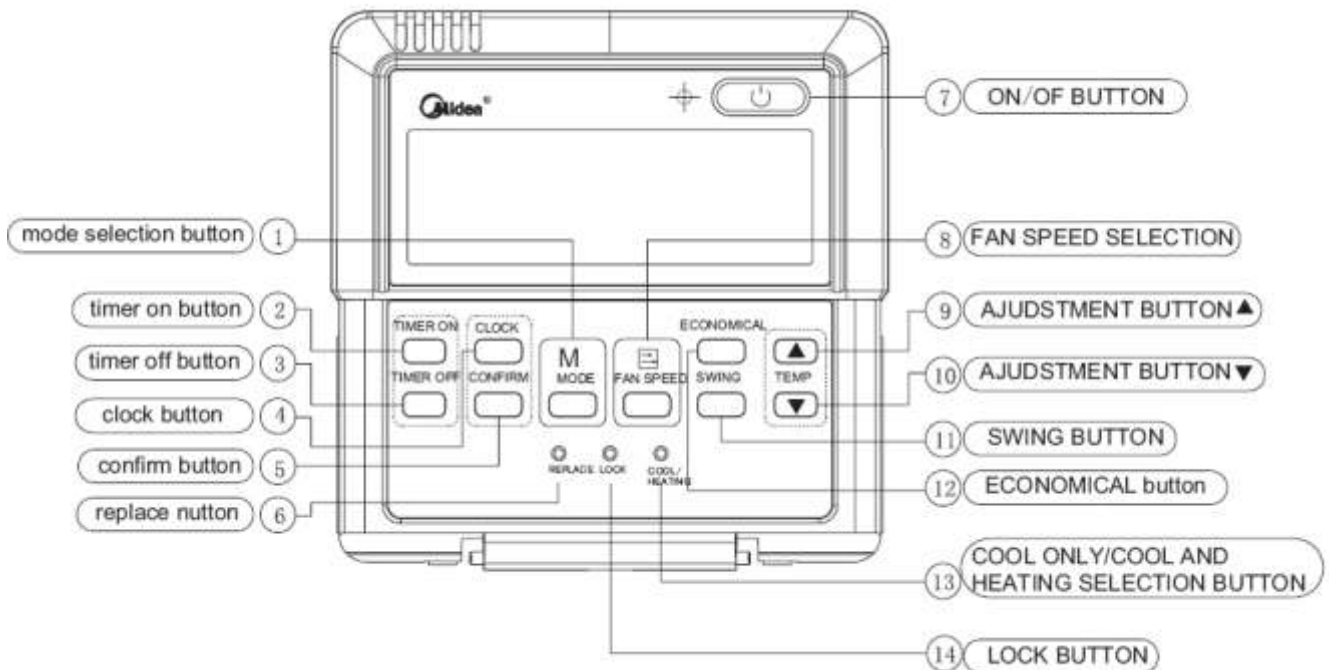
15. CLOCK Button: Used to set the remote clock.

16. LED Button: Disable/Active indoor screen Display.

3.2 Wired Remote Controller

3.2.1 KJR-10B

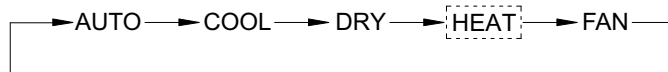
Name and functions of buttons on the wire controller



1 mode selection button:

It is used to select mode, push the button one time , then the operation modes will change

In turn as follows:



Remark: no heating mode if wire controller is set as the cool only.

2 Timer on button:

Push the button to set TIMER ON, each time you push the button the time moves forward by 0.5 hours. When the set time is over 10 hours, each time you push the button the time moves forward by 1 hour. If want to cancel the TIMER ON, then adjust the time of TIMER ON as 0.0

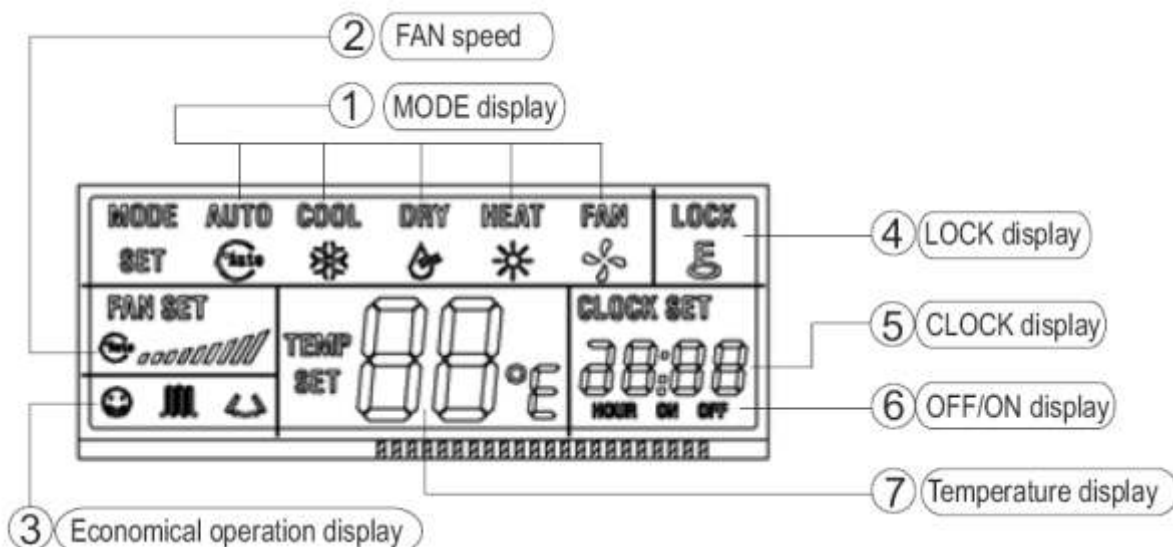
3 Timer off button:

Push the button to set TIMER OFF, each time you push the button the time moves forward by 0.5 hours. When the set time is over 10 hours, each time you push the button the time moves forward by 1 hour. If want to cancel the TIMER OFF, then adjust the time of TIMER OFF as 0.0

4 CLOCK button:

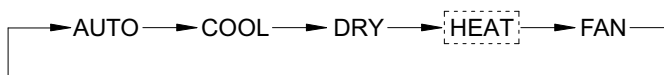
Normally display the clock set currently (display 12:00 for the first electrifying or resetting). When push the button for 4 seconds, the hour part on the clock display flashes every 0.5 seconds, then push button and to adjust hour; push the button CLOCK again, the minute part flashes every 0.5 seconds, then push button and to adjust minute. When set clock or alter clock setting, must push the confirm button to complete the setting

Name and function of LCD on the wire controller



1 Mode select button (MODE):

Press MODE button to select "COOL", "DRY", "HEAT", or "FAN ONLY" mode. (HEAT is invalid for COOL ONLY wire controller.)



2 Fan speed button (FAN SPEED)

Press FAN SPEED to select fan speed from "AUTO", "LOW", "MED", and "HIGH". NOTE: some air conditioners have no MED fan speed, and then the MED is regarded as HIGH.

3 Economical operation displays:

Press ECONOMICAL to display economical operation, if press ECONOMICAL again then the display disappears

4 Lock display

Press LOCK to display the icon of LOCK. Press the button again then the icon of LOCK disappears. In the mode of LOCK, all the buttons are invalid except for LOCK button.

5 CLOCK display.

Usually display the clock set currently. Press the button CLOCK for 4 seconds, the HOUR part will flash, press button ▲ and ▼ to adjust HOUR. Press the button CLOCK again, the minute part flash, press button▲ or▼ to adjust MINUTE. After clock set or clock operation, it must press CONFIRM to complete the set.

6 TIMER ON/OFF display:

Display ON at the state of TIMER ON adjustment or after only set the TIMER ON; Display OFF at the state of TIMER OFF adjustment or after only set the TIMER OFF; Display ON/OFF if simultaneously set the mode of TIMER ON and TIMER OFF.

7 Temperature display area:

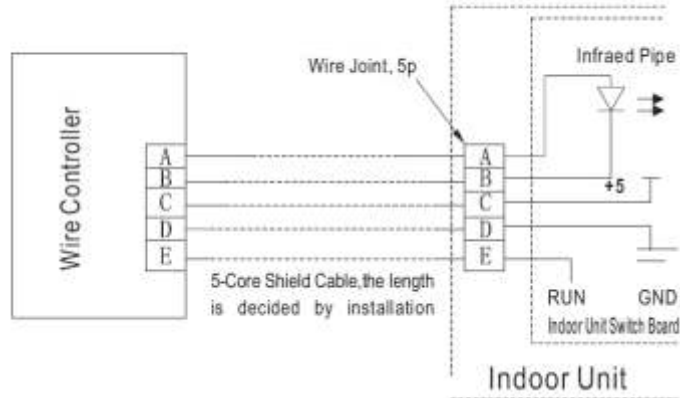
Usually display the set temperature. Press the buttons of and to set temperature, at the mode of FAN, there is no figure display in the area.

Remark:

The wired controller will reset to factory setting with auto mode, auto fan and 75°F setting temperature. 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.

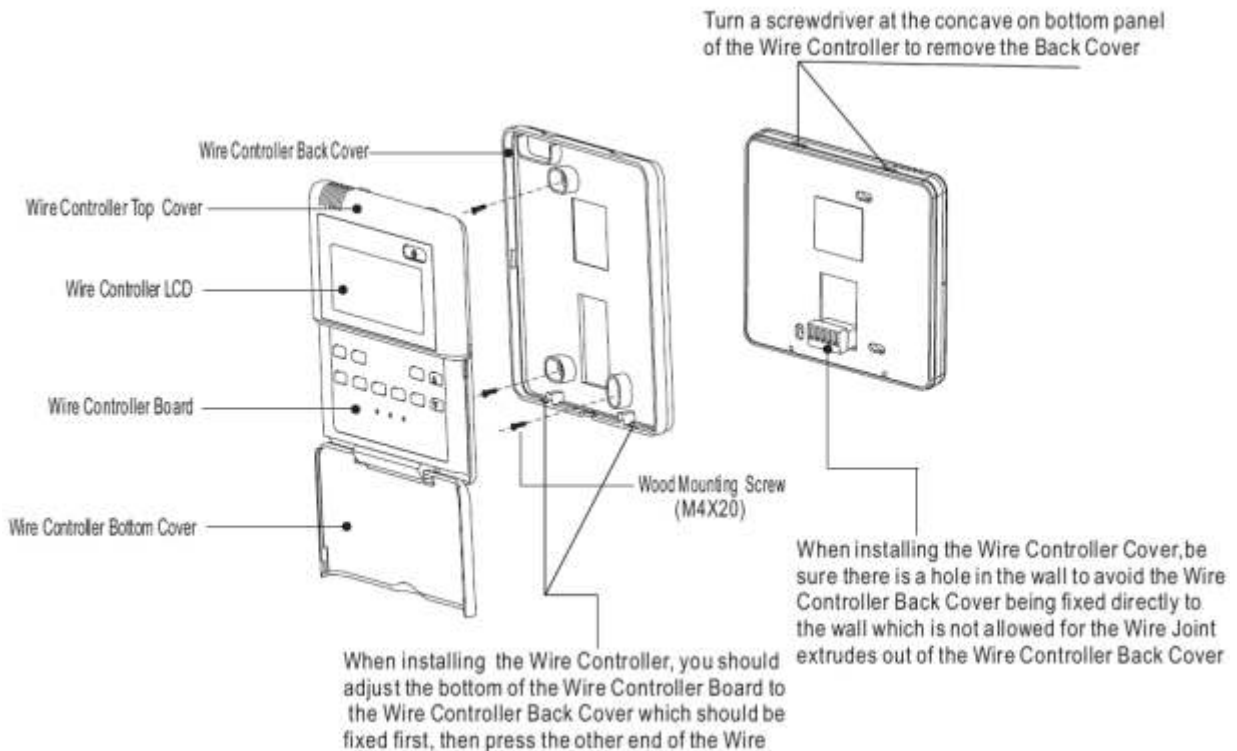
Installation

Wiring Principle Sketch:



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 a 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.



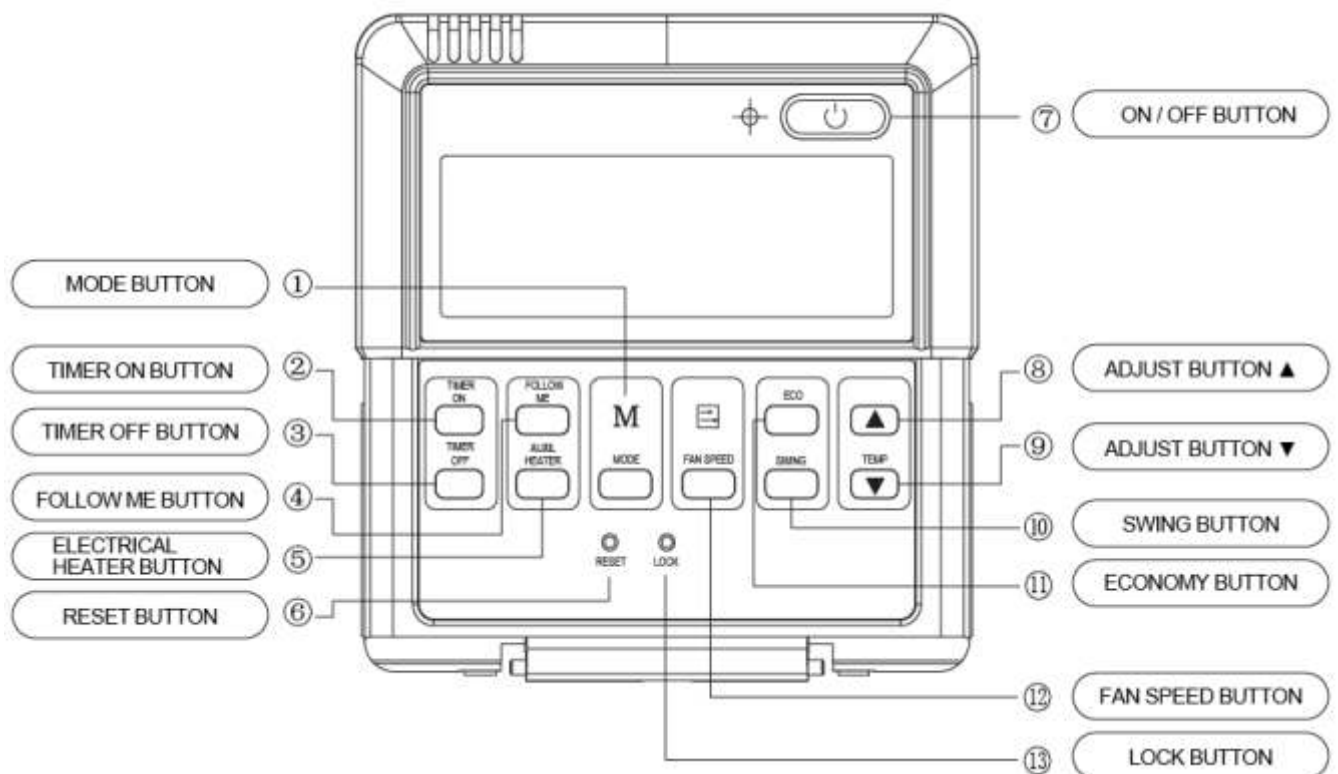
NOTE

Never turn screws too tightly, or else the cover would be dented or the Liquid Crystal breaks. Please leave enough long cable for maintenance of the Wire Controller Board.

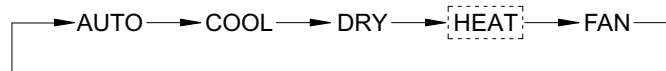
3.2.2 KJR-12B



Name and functions of buttons on the wire controller



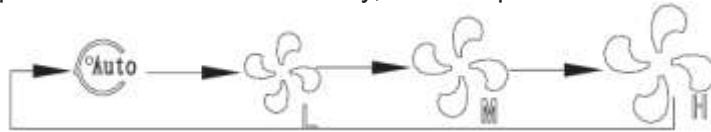
1. Mode button: When press this button, the operation mode change as the following sequence:



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

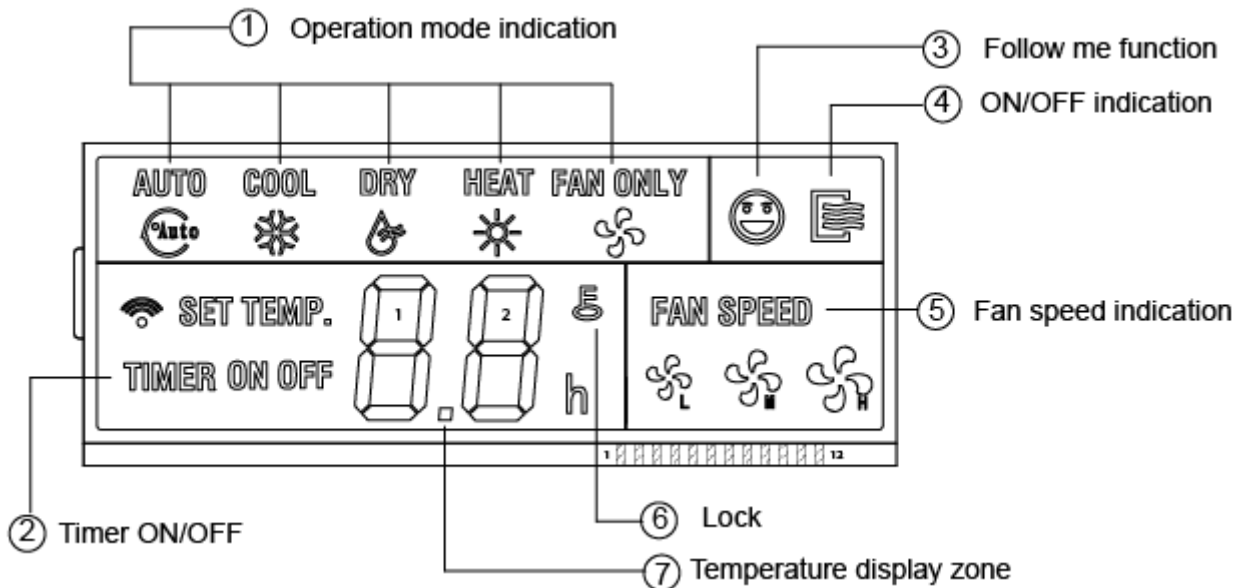
2. Timer on button: Press this button, timer on function is active. Then every press, the time increases 0.5h, after 10h, 1h increment after each press. If cancel this function, just set it to "0.0"
3. Timer off button: Press this button, timer off function is active. Then every press, the time increase 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. ifrpress 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 consecutivdy; 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 accident ally 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" butto, 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 temperatu re, 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.

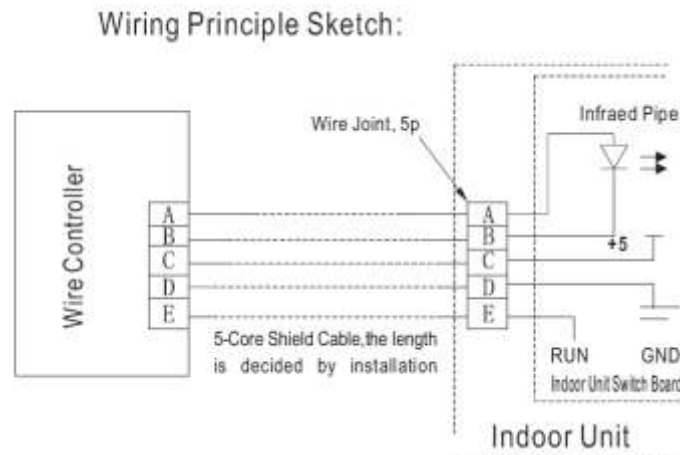
6. Lock: When the "LOCK" button is pressed, the icon appears and other buttons is unable, press again, the icon disappears.
7. Temperature display zone: Generally it displays setting temperature; it can be adjusted by press temperature button▲and▼ .But in fan mode, no display here.

Remark:

The wired controller will reset to factory setting with auto mode, auto fan and 75°F setting temperature when the air conditioner restarts after power failure.

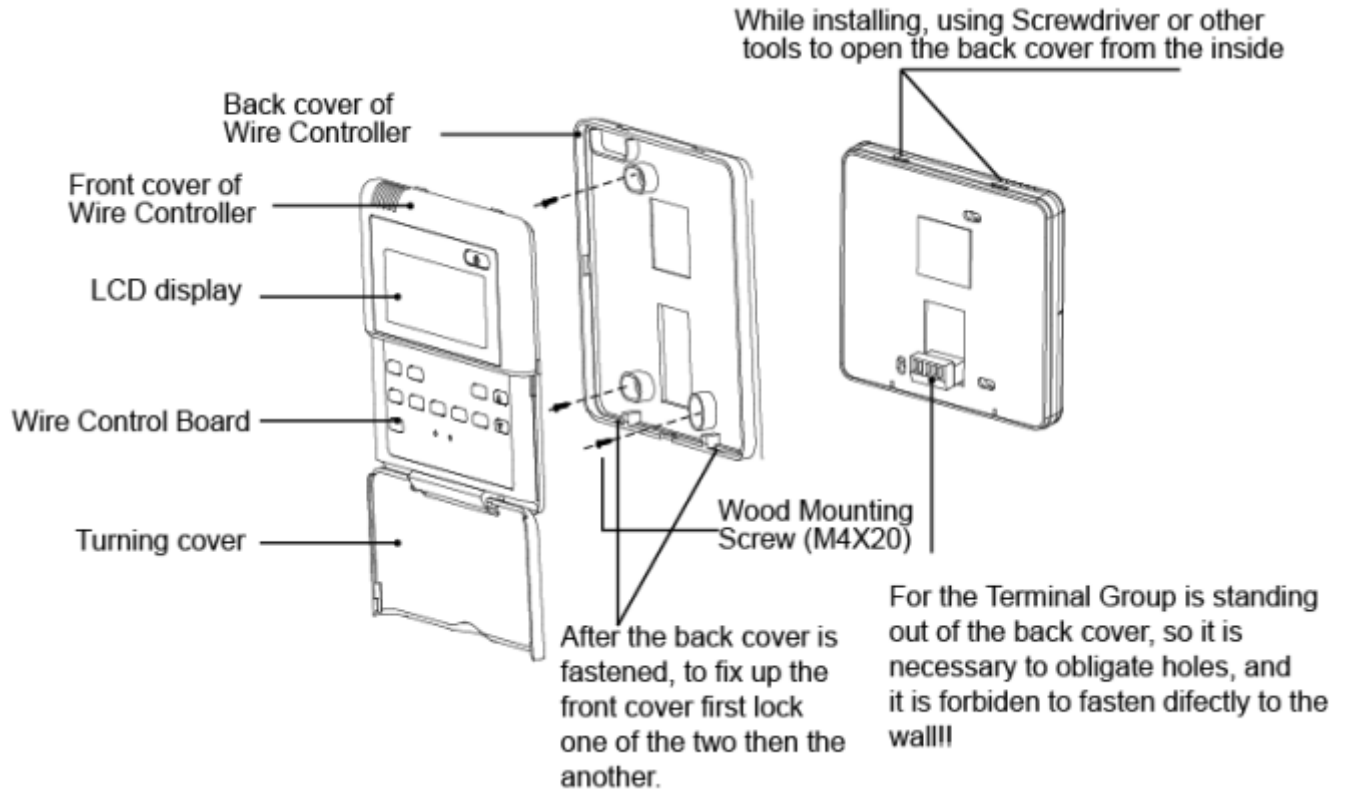
And this may cause inconsistent displays on the wired controller and on the air conditioner. You need to readjust the running status through the wired controller.

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 a infrared emitter whose anode and cathode connecting with A and B near the receiver in the In door Unit Switch Board, then connecting the termina l +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.

KLIMAIRE® ≈

2190 NW 89 Place
Doral, FL 33172 – USA
Tel: (305)594-4972 - Fax (305) 499-4378
www.klimaire.com - sales@klimaire.com

The design and specifications are subject to change without prior notice for product improvement. Consult with the sales agency or manufacturer for details
