

CCA - CEA 4 WAY CASSETTE UNIT



INSTALLATION & OPERATION MANUAL

Four-way Cassette

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Features

Four-way cassette type air conditioner (Cooling-only or heat pump), is installed under the ceiling, compared with Floor & Standing type A/C, it has following advantages: saving room space; ceiling installation combining with the decoration, makes the room more elegant; Flexible installation in anywhere in the ceiling and 4-direction blowing, makes the indoor temperature is even and makes you feel more comfortable, so Cassette type A/C is a perfect replacing Product of Floor & Standing type A/C.

Application occasions:

Small super market, restaurant, office, meeting room, villa meeting room, family bedroom and so on, and it can even be used as the updating Product for modern residential A/C.

Features:

- ◇ Concealed design, ceiling installation, room space saving, it is very suitable for family or office occasion;
- ◇ With Setting or Auto two operation modes, four-way blowing, strong circulating wind, multi wind speed, the cooling or heating capacity can reach to each corner of the room;
- ◇ One-step formed shell by mold, appearance is elegant;
- ◇ Special insulation design, achieves high heat insulation efficiency, and no condensation on shell;
- ◇ Built-in drain pump, drain-head height is up to 1.2meters, creating the ideal solution for perfect water drainage, also construction and installation is much easier and convenient;
- ◇ Long term air filter, wash period is two times longer than normal filter, and maintenance is free;
- ◇ 3D helix air blade ensures the air flow sufficiently, reduces the unit thickness, and reduces the operation noise greatly;
- ◇ Plastic drip tray adopts innovative foam-PS combined with plastic technical, the thickness of plastic reaches 1mm, avoid any leakage;
- ◇ 6 segments heat exchanger, increase exchanging area, the efficiency of heat exchanging increased by 10%~15%;
- ◇ Ingenious hook design, the panel is convenient to install or remove;
- ◇ Fresh air intake design, leading in fresh air to improve indoor air quality anytime;
- ◇ 3-phase power supply type units with low ambient temperature cooling function, which makes the unit can run normally on the condition that the ambient temperature falls down to -15℃;
- ◇ Auto-restart function;
- ◇ Standard remote controller and optional wired controller;
- ◇ Auxiliary electric heater for heat pump unit, with fast heating and low ambient temperature heating functions;
- ◇ Failure automatic detection, if there is a failure, the indicator will flash and the failure code will display on the wired controller, the failure cause is easier to be found.

Function introduction

Type	Item	CCA - CEA					
		12/4	18/4	24/4	36/4	48/5	60/5
Protection	High pressure protection	—	—	—	●	●	●
	Low pressure protection	—	—	—	●	●	●
	Compressor overloading protection	●	●	●	●	●	●
	High exh. temperate protection	—	—	—	●	●	●
	Phase protection(Phase-loss, phase- reverse)	—	—	—	●	●	●
	Over-heating protection	●	●	●	●	●	●
	Anti-freezing protection	●	●	●	●	●	●
	Sensor failure alarm	●	●	●	●	●	●
	Failure code display	●	●	●	●	●	●
Comfort	Cooling	●	●	●	●	●	●
	Heating	●	●	●	●	●	●
	3-Speed	●	●	●	●	●	●
	Adjustable ESP	—	—	—	—	—	—
	Auto-restart(Optional)	●	●	●	●	●	●
	Anti-cold wind	●	●	●	●	●	●
	Afterheat wind blowing	●	●	●	●	●	●
	Timing ON/OFF	●	●	●	●	●	●
Operation	Time display	●	●	●	●	●	●
	Operation mode display	●	●	●	●	●	●
	Fan speed display	●	●	●	●	●	●
	Defrost display	●	●	●	●	●	●
	Timing ON/OFF display	●	●	●	●	●	●
	Wind angle display	●	●	●	●	●	●
	Sleeping mode display	●	●	●	●	●	●
Running	Auto start	●	●	●	●	●	●
	Dehumidifying	●	●	●	●	●	●
	Auto defrost	●	●	●	●	●	●
	Ventilation function	●	●	●	●	●	●
	Low ambient temperature cooling	●	●	●	●	●	●
Health	Washable air filter	●	●	●	●	●	●
	Fresh air interface	●	●	●	●	●	●
Installation	Left/right drainage(optional)	—	—	—	—	—	—
	Left/right pipe connection(optional)	—	—	—	—	—	—
	Down/back air suction(optional)	—	—	—	—	—	—
	Installation indicating board	●	●	●	●	●	●






Remarks: ● Stands for “YES”

— Stands for “NO”

Controller


General information

Remote controller, wired controller, display panel and receiver

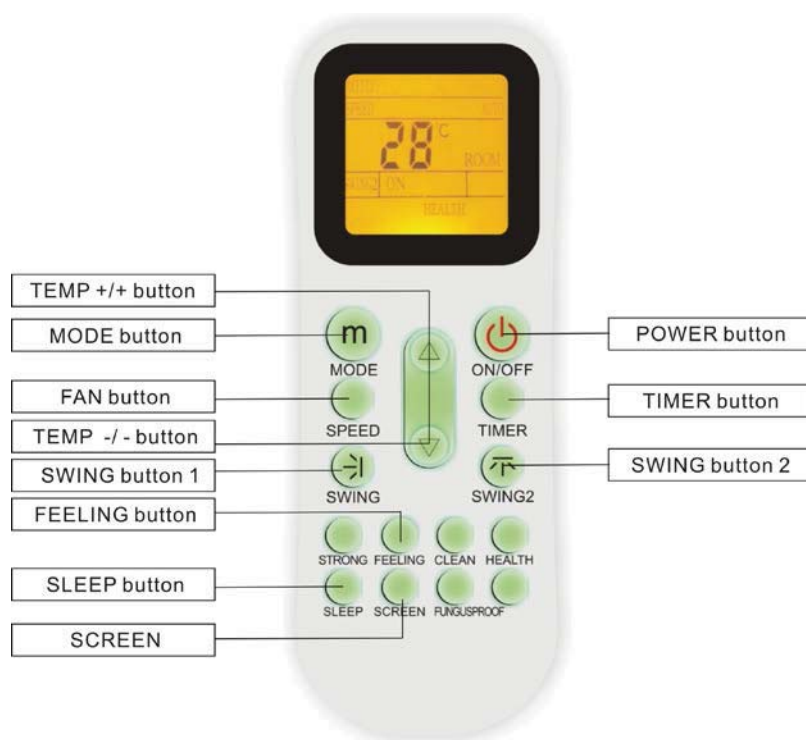
Remote controller, wired controller, display panel and receiver					
	Available for all models above	Available for all models above	Available for Cassette indoor unit	Available for Ceiling&Floor indoor unit	Available for Duct indoor unit
Note	For Cassette and Ceiling & Floor indoor unit, remote controller is standard and wired controller is optional. For Duct indoor unit wired controller is standard,remote controller is optional(remote controller receiver will be necessary).				

Remote controller's operation introduction


Basic condition of remote controller

Name	Figure	Basic condition for operation
Remote controller		1.Power source Use 2 pcs No 7 batteries,working voltage:2.0V-5.0V; 2. Signal frequency:infrared frequency 38kHz; 3. Remote distance:max working distance is7m.
		Key operation introduction: 1.Temperature setting range 16℃-32℃; 2. when heating:When indoor coil temp. is lower than request, the fan will change into low speed,. After the temp. reach to the request temp.,it will change into setting fan speed.

Function



POWER button: Switch the unit ON/OFF.

MODE button: Select mode , push the button one time, then the operation modes will change in turn as Auto-Cooling-Dehumidify-Heating 

TEMP + button and TEMP - button: Temperature adjustment range: 16~32

FAN button: Change the fan speed will change in turn as: Low-Medium-High-Auto

SWING button 1: Press this button for the first time when operation, it will start the up and down swing function. Push the button for the second time, cancel the swing function.

SWING button 2: Press this button for the first time when operation, it will start the right and left swing function. Push the button for the second time, cancel the swing function.

Feeling button: Press this button for setting the feeling function. The LCD shows the actual room temperature when the function set and it shows the setting temperature when the function cancelled. The function is invalid when the appliance at the fan mode.

TIMER/CLOCK button:

Clock Setting: Normally display the clock set currently (display 12:00 for the first electrifying or resetting). When press the button for 5 seconds, the time display zone will flicker, then press **【+】** and **【-】** button and to adjust hour that uses 12-hour clock including “A.M.” and “P.M.” time; press the button again

to complete the setting.

Timer setting: Press the button to set TIMER ON/OFF , press the button then “ON” will flicker on the display screen. then press **【+】** and **【-】** button and to adjust hour that uses 12-hour clock including “A.M.” and “P.M.” time; press the button again to complete the setting. The “OFF” setting is the same methods.

Remark: When setting functions such as mode, temperature, air port and air velocity, display screen displays all presetting parameters and remains constant; after reaching presetting time, air conditioner will automatically start as per presetting state.

After setting timing ON and OFF function, pressing button of **【Timer/Clock】** can cancel timing setting.

SLEEP button:


1. Press the button to the sleeping indicator light of indoor unit flashes on;
2. After the setting of sleeping mode, the cooling operation enables the set temperature to increase 1℃ after 1 hour and another 1℃ automatically after 1 hour.
3. After the setting of sleeping mode, the heating operation enables the set temperature to drop 2℃ after 1 hour and another 2℃ automatically after 1 hour.
4. The air condition runs in sleeping mode for 7 hours and stops automatically.

Remark: Press the mode or ON/OFF button, the remote controller clears sleeping mode away.

SCREEN button: Press the button to let the LCD display working or not by pressing the button.

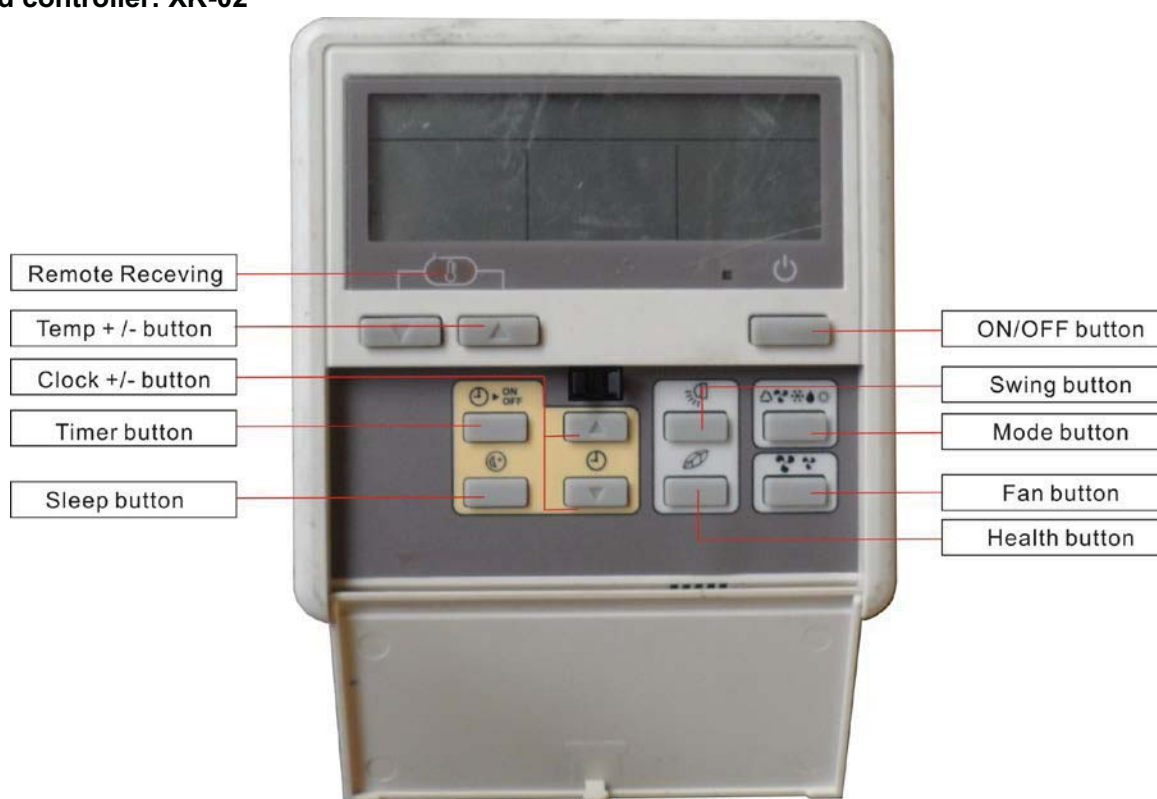
Wired controller

Basic condition of wired controller

Name	Figure	Basic condition for operation
Wired controller		<ol style="list-style-type: none"> 1. Power source:voltage DC 12V; 2. Work temperature range of PCB:(-10~+70)°C; 3. Work humidity range of PCB:RH20%~RH90%;

Function

Wired controller: XK-02



ON/OFF button: Switch the unit ON/OFF.

Mode button: Select mode , push the button one time, then the operation modes will change in turn as below: Auto-Cooling-Dehumidify-Heating

Temp +/- button: Press the button can adjust temperature. Temperature adjustment range: 16~32°C.

Fan button: Change the fan speed will change in turn as :Auto-Low-Medium-High-Auto

Swing button: Press this button for the first time when operation, it will start the swing function. Push the button for the second time, cancel the swing function. (The function is available matched with the concerned unit)

Health button: Press this button change to switch mode: Health mode.

SLEEP button:

1. Press the button to the sleeping indicator light of indoor unit flashes on;
2. After the setting of sleeping mode, the cooling operation enables the set temperature to increase 1°C after 1 hour and another 1°C automatically after 1 hour.
3. After the setting of sleeping mode, the heating operation enables the set temperature to drop 2°C after 1 hour and another 2°C automatically after 1 hour.
4. The air condition runs in sleeping mode for 7 hours and stops automatically.

Remark: Press the mode or ON/OFF button, the remote controller clears sleeping mode away.

Timer button: Press the button to set Timer ON/OFF, press the button then "ON" will flicker on the display screen. then press **【Clock +/- button】** and to adjust hour that uses 12-hour clock including "A.M." and "P.M." time; press the button again to complete the setting. The "OFF" setting is the same methods.

Remark: When setting functions such as mode, temperature, swing and fan speed, display screen displays all presetting parameters and remains constant; after reaching presetting time, air conditioner will automatically start as per presetting state.

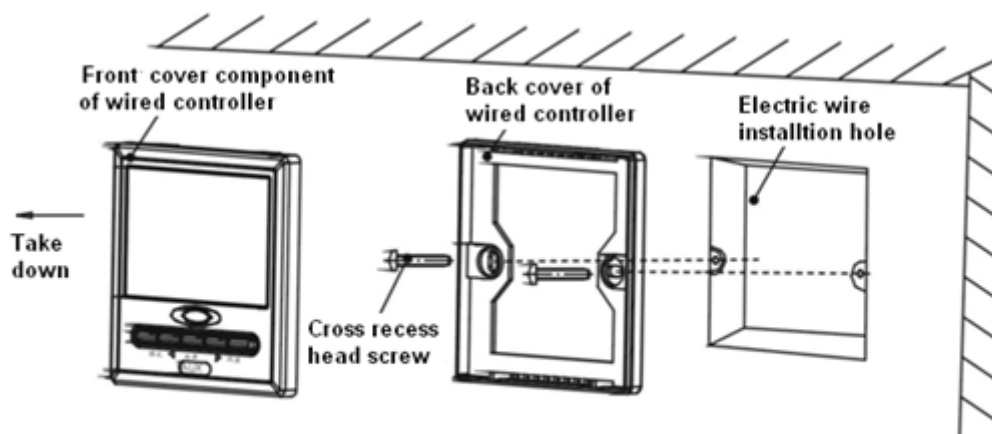
After setting timing ON and OFF function, pressing button of **【Timer】** can cancel timing setting.

Notes:

1. Time sequence of timing ON and OFF determines the order of "Timing ON-Timer OFF" and "Timer OFF- Timing ON". If the both are the same or either one is the same as time of current clock, it is invalid to press "Timer" button to confirm presetting time; after it reaches the presetting time, it will implement corresponding timing operation.
2. After setting time of timing ON and OFF, pressing "Timer" button can cancel timing.
3. Enter into time setting state of timing function; if there is no input related to time within consecutive 10 seconds, cancel the operation, return to previous state and go on with current time.
4. Default time of timer ON is 08:00 and default time of timer OFF is 18:00.

3.3 Installation of wired controller

- ◇First, take apart the base panel from the wired controller.;
- ◇According to the two installation holes on the install board, use two screws to fix the base panel to the wall as shown below;
- ◇Ensure that the connecting cable of the controller is accessible before connecting the wired controller to the base panel.;
- ◇Join the wired controller connection cable to the indoor unit using the cable provided.



Capacity Amendment

Running range

Cooling capacity (Btu/h)		12000	18000	24000	36000	48000	60000
Power supply		220-240V~/50Hz			380-415V 3N~/50Hz		
Voltage		187~242V			320~420V		
Ambient temperature	Cooling	-5~49℃			-5~47℃		
	Heating	-15~24℃					

Amendment coefficient of cooling capacity under different indoor/outdoor DB/WB temperature

Indoor air inlet temperature℃		Outdoor air inlet DB temperature℃							
DB	WB	25	30	35	40	43	45	47	49
23	16	0.98	0.94	0.89	0.85	0.82	0.79	0.74	0.71
25	18	1.05	1	0.95	0.90	0.87	0.82	0.77	0.72
27	19	1.1	1.05	1	0.95	0.91	0.87	0.84	0.79
28	20	1.12	1.07	1.02	0.96	0.93	0.90	0.86	0.81
30	22	1.19	1.13	1.08	1.02	0.99	0.96	0.91	0.88
32	24	1.26	1.20	1.15	1.08	1.05	1.02	0.97	0.92

Actual cooling capacity calculation:

Actual cooling capacity=amendment coefficient of cooling capacity × nominal cooling capacity

——nominal cooling capacity could be found from the performance parameters list

——amendment coefficient of cooling capacity could be found from table above.

Amendment coefficient of heating capacity under different indoor/outdoor DB/WB temperature

Indoor air inlet DB temperature ℃	Outdoor air inlet WB temperature ℃						
	-15	-10	-5	0	6	10	15
16	0.45	0.53	0.65	0.80	1.02	1.13	-
18	0.47	0.55	0.61	0.76	1.02	1.12	-
20	0.46	0.54	0.6	0.75	1	1.11	1.25
21	0.42	0.49	0.59	0.72	0.99	1.1	1.24
22	0.41	0.49	0.58	0.71	0.97	1.09	1.23
24	0.39	0.45	0.56	0.7	0.96	1.08	1.22

Actual heating capacity calculation:

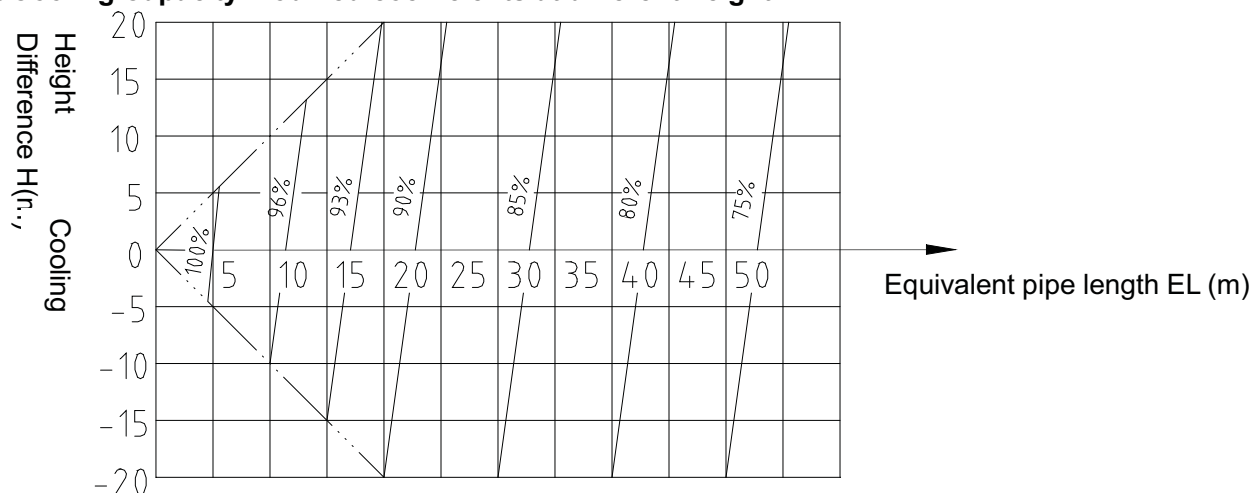
Actual heating capacity = amendment coefficient of heating capacity × nominal heating capacity

—— nominal heating capacity could be found from the performance parameters list

—— amendment coefficient of heating capacity could be found from table above.

Amendment coefficients of heating and cooling capacity under different height drop

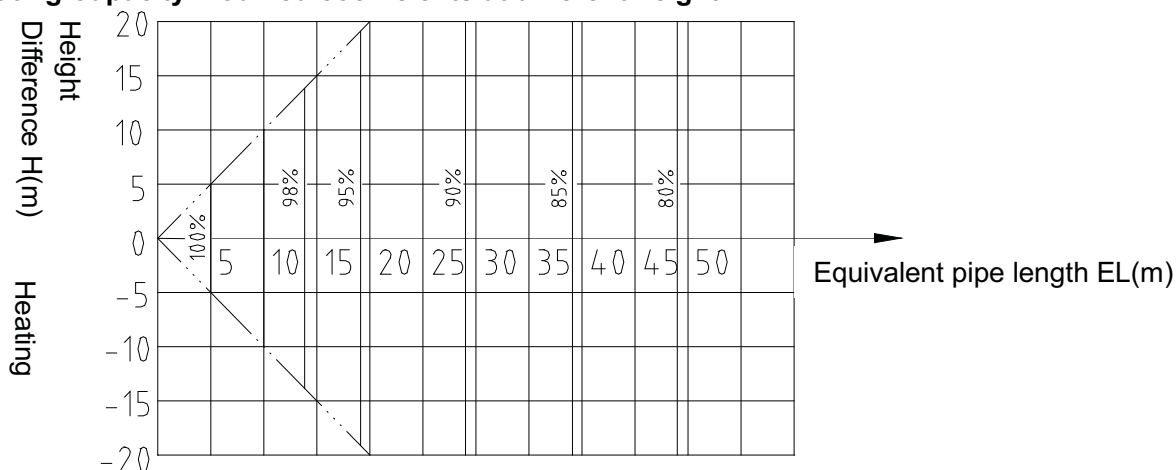
Different Cooling Capacity modified coefficients at different height:



Note:

H = Height of Outdoor Unit — Height of Indoor Unit

Different Heating Capacity modified coefficients at different height:

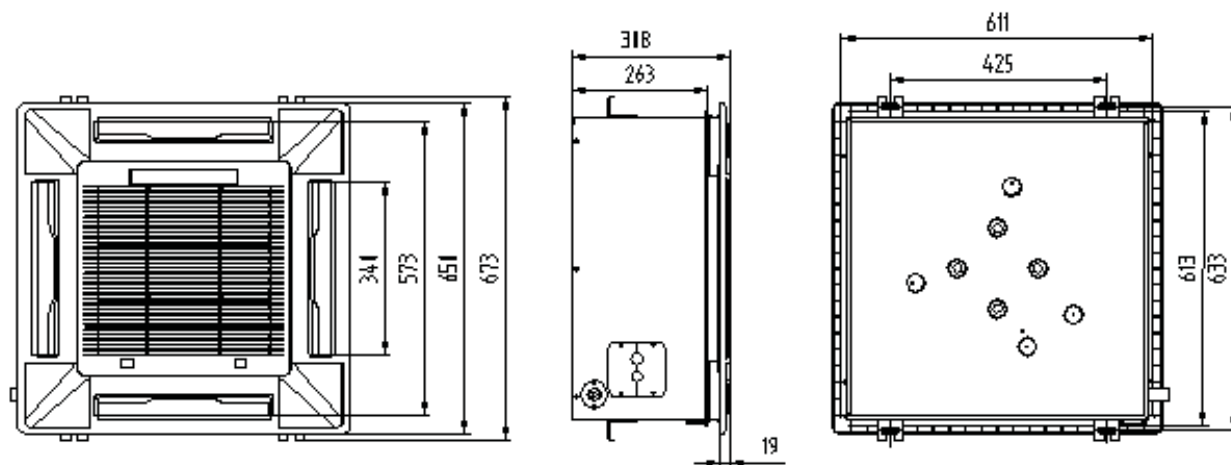


Note:

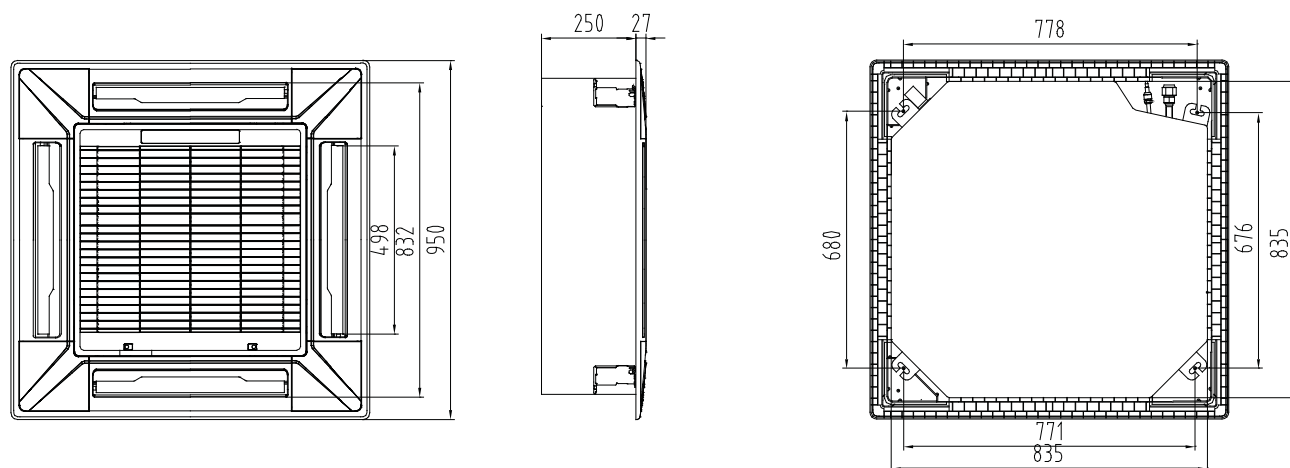
H = Height of Outdoor Unit — Height of Indoor Unit

Dimension

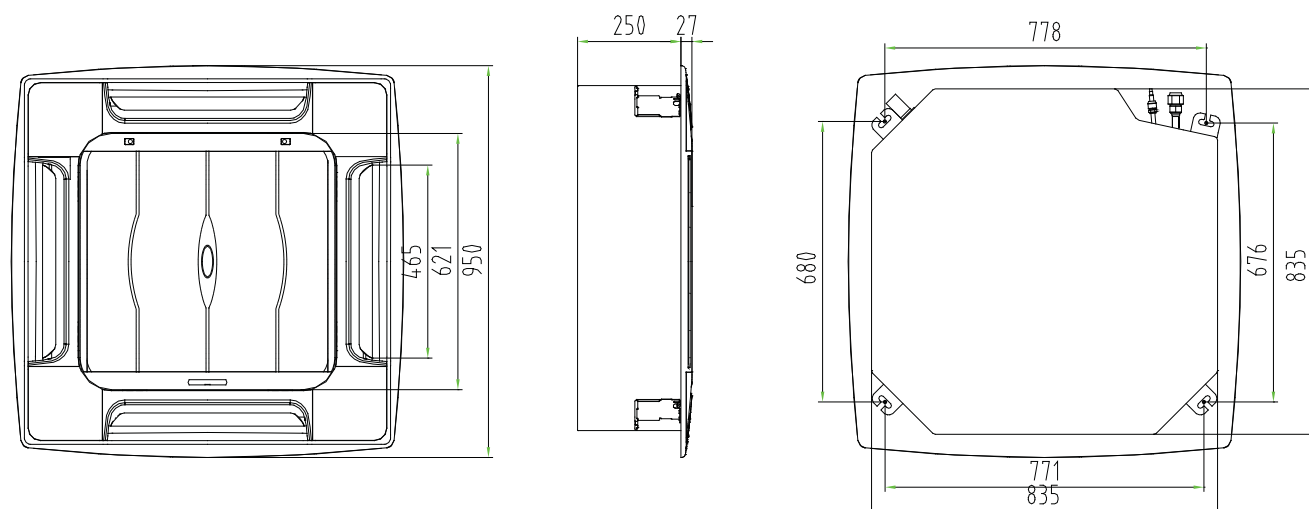
CEA12 / CEA18



CEA24

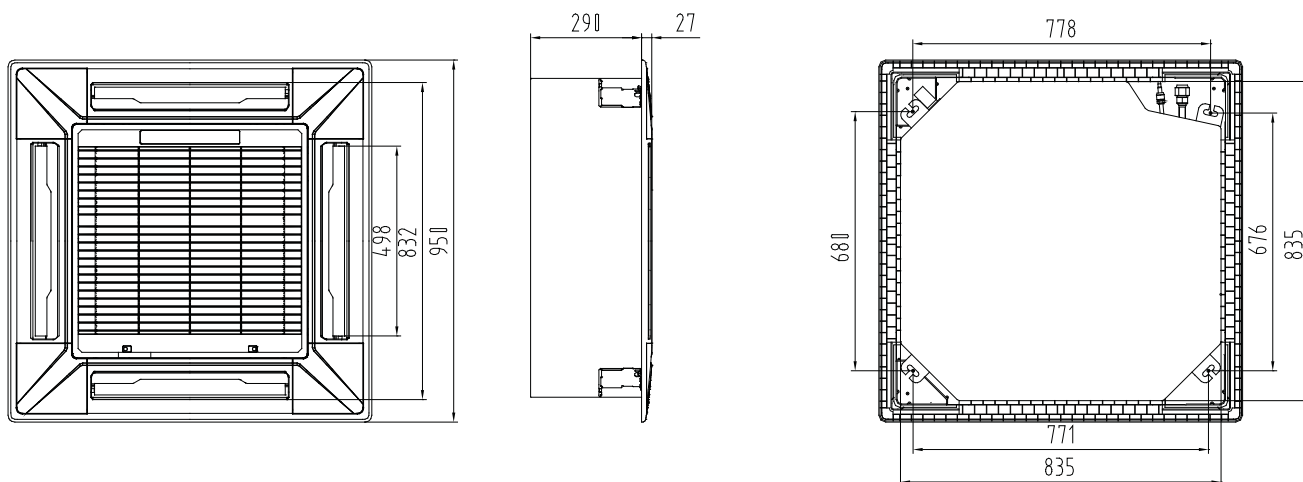


CEA36



Dimension

CEA48 / CEA60

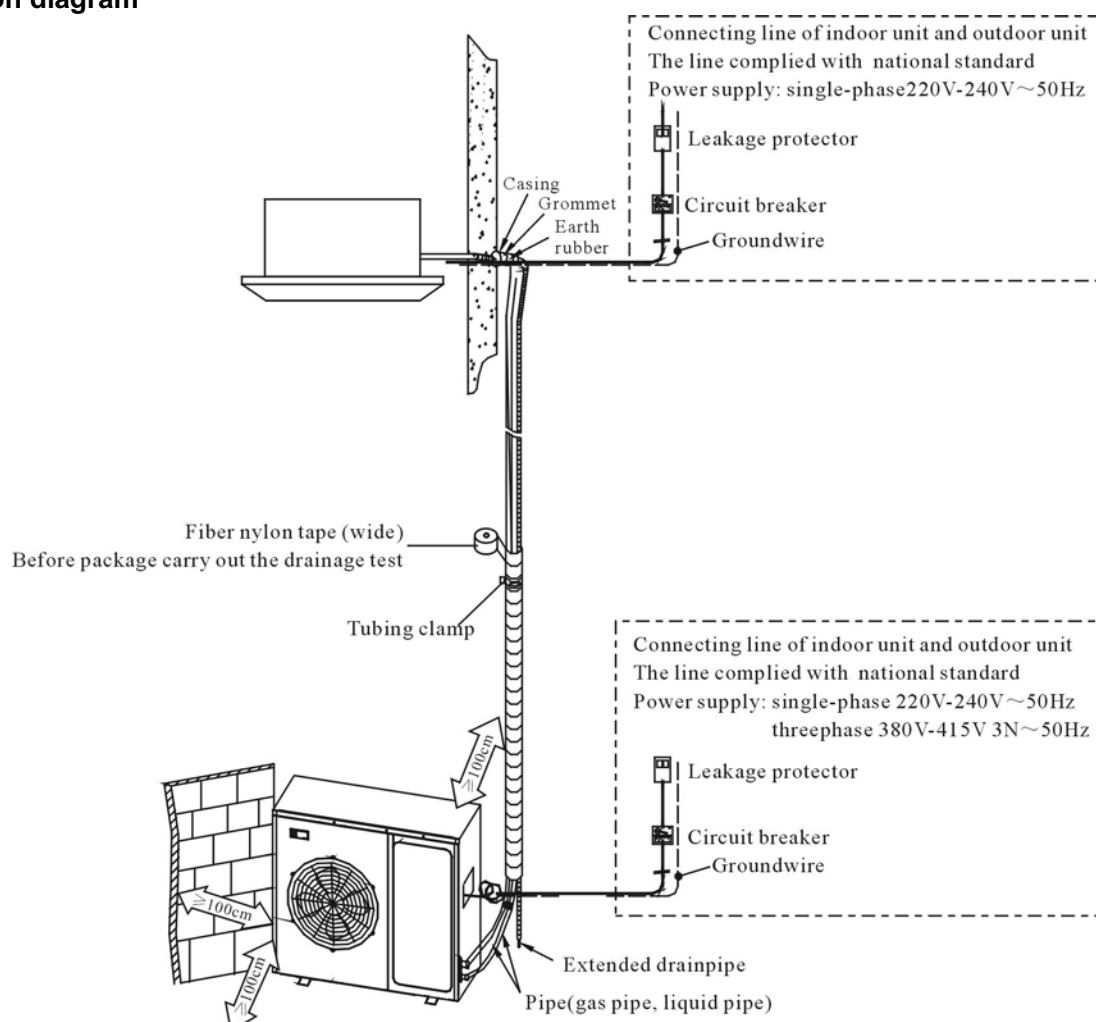


Installation

Preparation before installation

Please buy following spare parts from your local market before installation	Besides general implements, other implements are needed when connecting the pipe
Hung bolts M12, 4 pcs	Acetylene cylinders, oxygen cylinders (when longer pipe used it should be welded)
Drainage pipe PVC	One set pipe cut machine. (cut copper pipe)
Copper connecting pipe	Refrigerant cans, electronic balance (when longer pipe used additional gas should be charged)
Adhesive belt (big size) 5 pcs, (small size) 5 pcs	Pressure gauges, pipe clamp, welding torch, 2B silver electrode
Heat insulation material used to connect copper pipe (PE foam material, its thickness is more than 8mm)	Wrench 2 pcs, one of them is with adjustable torque wrench (42N.m, 65N.m, 100N.m)
Power cable, electrical wire between indoor and outdoor unit (Must be in accordance with the wire diameter in the wiring diagram)	Nitrogen cylinder (in order to prevent oxidation when welding, using Nitrogen to replace the air)

Installation diagram

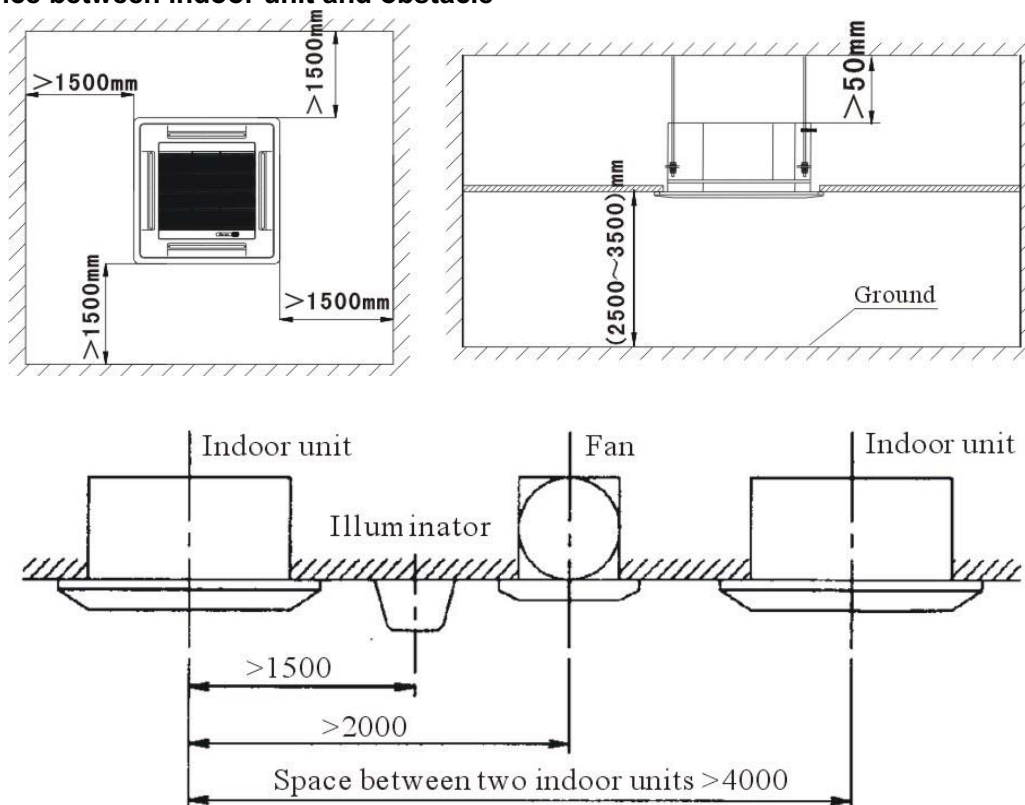


Installation precaution

- ◇ Hanging location should be able to support the unit's weight, there should be no increase in noise and vibration. If the hanging location needs reinforcement, it should be reinforced before installation;
- ◇ Choose the space above the ceiling that can put the indoor unit inside;
- ◇ The location should be easy for drainage;

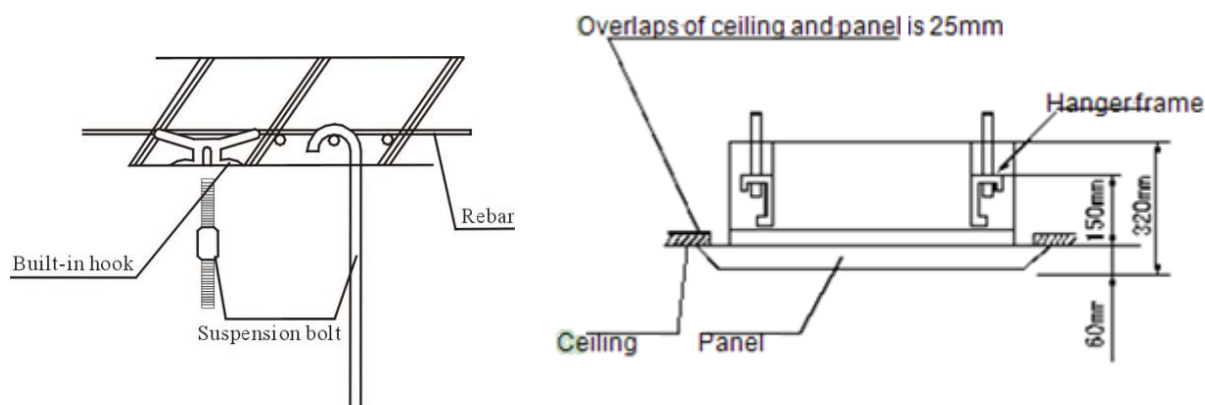
- ◇ The unit should not be installed in the heat source, steam source oil mist places (such as machine room, kitchen, laundry room, mechanical workshop, etc.) in order to avoid performance degradation, electric shock, plastic parts corrosion which lead to unit broken;
- ◇ Choose the location at least 1 meter away from TV and radio, in order to avoid interference to them
- ◇ There is no obstacles getting in the way of air circulation, cold air can evenly spread to all corners of the room;
- ◇ In order to facilitate maintenance and repair, there should be certain distance between indoor unit and obstacles;
- ◇ Refrigerant R22 is used for this unit, which is non-flammable and non-toxic gas. As the proportion of refrigerant is bigger than air, so if it leaks the gas will be filled on the ground. Therefore, if the units mounted on a closed room there must be good ventilation to prevent suffocation. In case of leakage of refrigerant, units should immediately stop running, and contact with maintenance personnel in time. There must be no fire at the site, because the refrigerant will turn to harmful gas when get to the fire.

The distance between indoor unit and obstacle

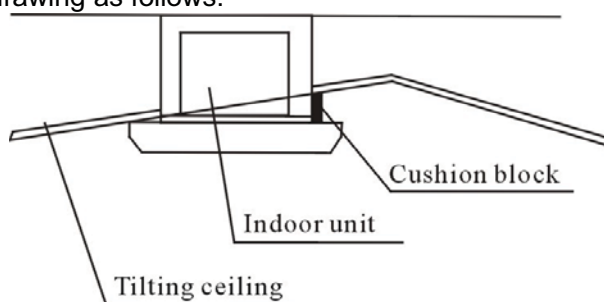


Indoor unit suspension

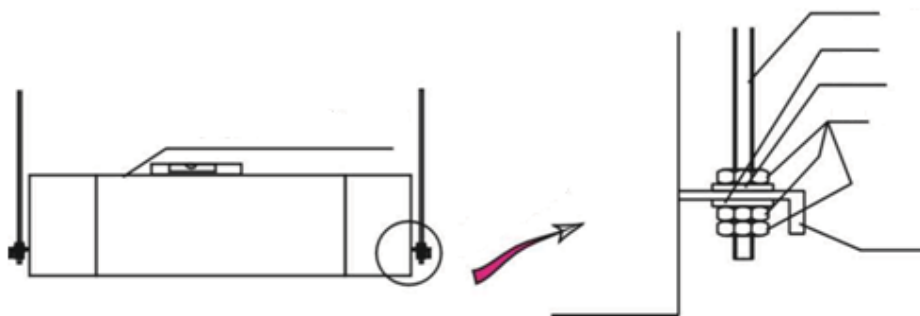
- ◇ Select the suspension foundation:
The suspension foundation is a structure of either wooden frame or reinforced concrete. It must be firm and reliable to bear at least 4 times weight of itself and capable of bearing vibration for long periods.
- ◇ Fixing of suspension foundation:
- ◇ Fix the suspension bolts either as shown in the picture or by a steel or wooden bracket.



- ◇ If this unit is installed on a sloping ceiling, a cushion block should be installed between the ceiling and the air outlet panel, in order to ensure that the unit is installed on a level surface. This is as shown in the drawing as follows:

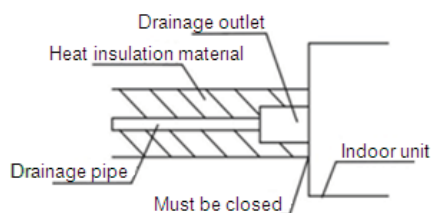


- ◇ Adjust the relative position of the suspension hook on the suspension bolt so that the unit can be in level position in all directions. Check with a level gauge after the installation is complete in order to ensure that the indoor unit is horizontal, otherwise it will cause water leakage, air leakage etc.
- ◇ Tighten the bolt and ensure that four hooks are in close contact with the nuts and washers, and the unit is suspended firmly and reliably onto the hooks.
- ◇ After the unit is installed ensure it is secure and does not shake or sway.
- ◇ Ensure that the centre of the indoor unit is in alignment with the centre of the opening in the ceiling.



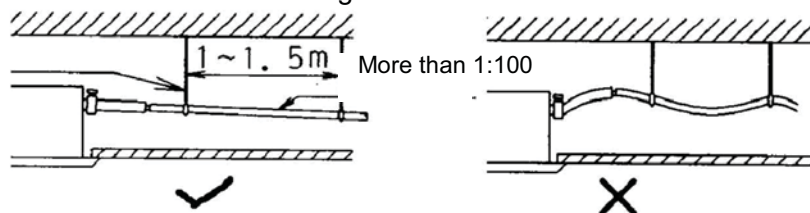
Drainage pipe installation

The drain pipe should be properly insulated to prevent the generation of condensation. Heat insulation material: the thickness of rubber insulation pipe should be more than 8mm

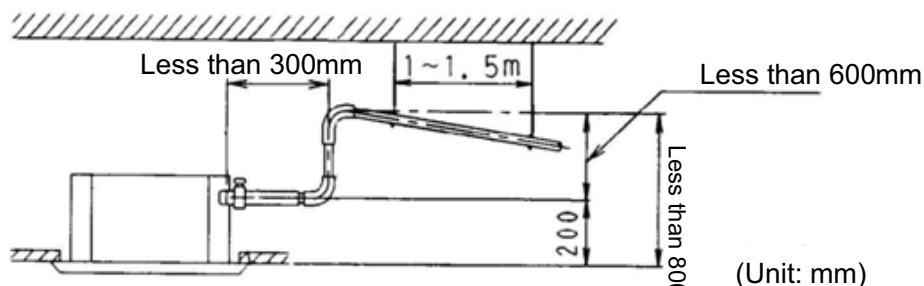


- ◇ Drainage pipe must have a downward gradient (1 / 50 1 / 100). If the drain pipe is installed ups and

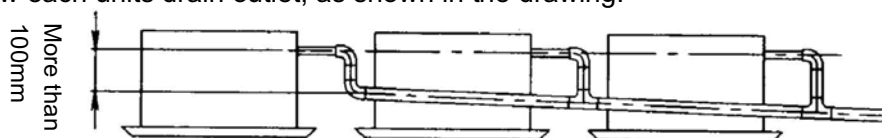
downs, it will cause water backflow or leakage etc.



- ◇ The unit has a drain pump which will lift up to 1200mm. However after the pump stops the water still in the pipe will drain back and may overflow the drain tray causing a water leak. For this reason please install the drain pipe as shown



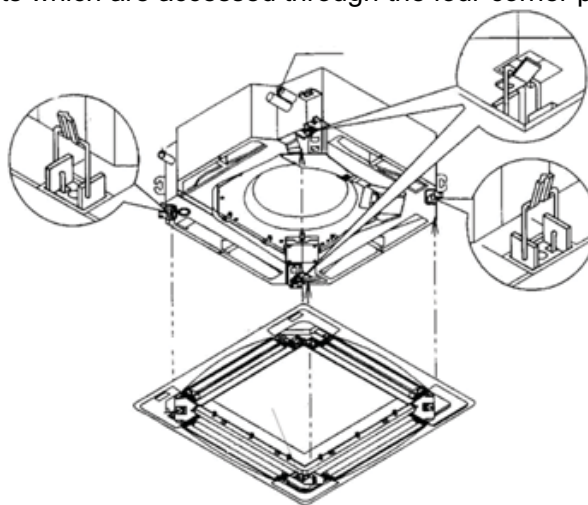
- ◇ When draining multiple units into a common drain line, this common drain should be installed about 100mm below each units drain outlet, as shown in the drawing.



- ◇ When finish installation please carry out the drainage test to ensure that the water flow through the pipeline fluently, and carefully observe the junction to ensure that there is no water leakage. If the unit is installed in the newly built house, strongly recommend that this test taken before the ceiling installation. Even it is the heating only unit, this test is unavoidable.

Panel installation

As to the MB12 panel please refer to the following picture, the panel has four hooks which attach to corresponding hangers on the unit and the panel should be positioned using these first. The panel is then fixed into position by four bolts which are accessed through the four corner panels on the grille.

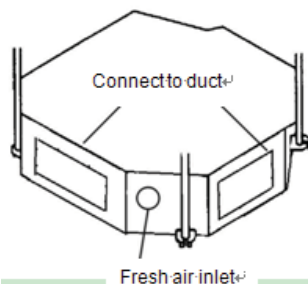


Notes:

When installing please ensure that the position of swing motor is in accordance with the position of the pipes of the unit.

Connect duct, fresh air ventilation

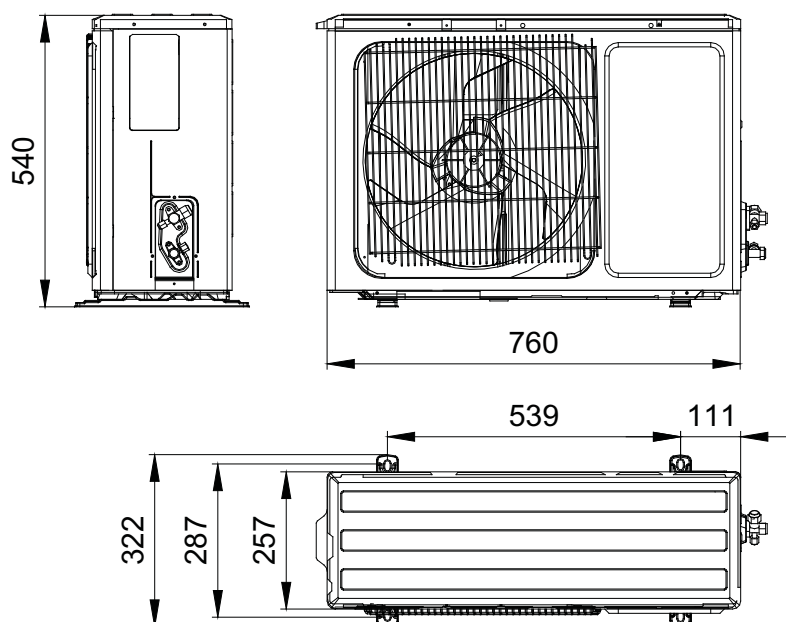
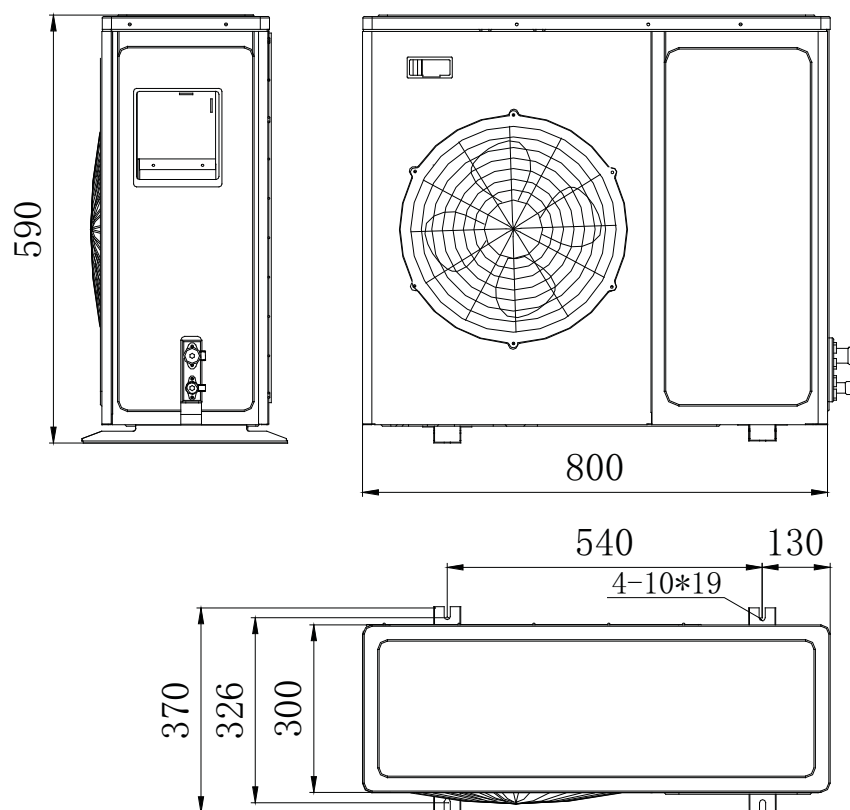
In order to meet different customers' requirements and their different usage environment, 3hp and 5 hp indoor unit reserves one fresh air ventilation hole and four duct connection holes. The fresh air can be introduced from outside or through duct.



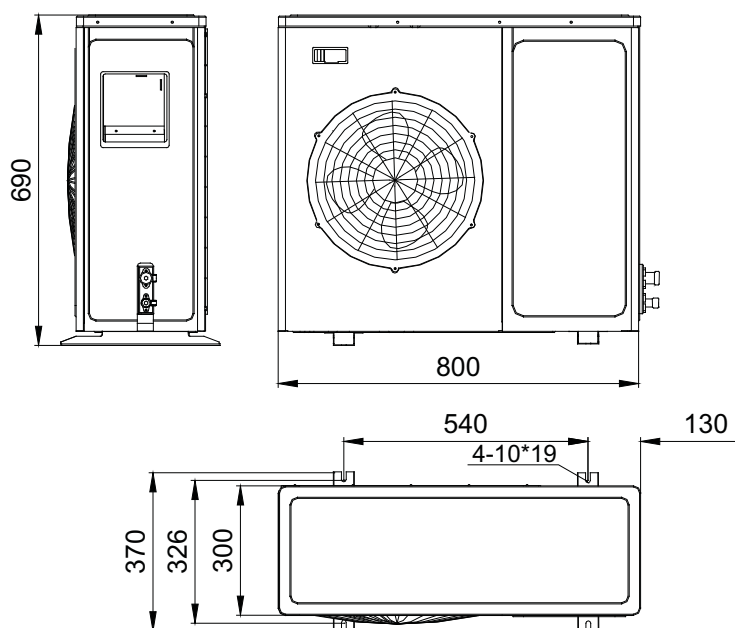
- ◇ Fresh air ventilation: In the corner of the unit there is a circular fresh air connection hole, if users want this feature, please cut down the circular metal sheet and connect it to the duct. Fresh air replacement hole is connected to the return air inlet of the indoor unit, when in the process of operation due to the negative pressure, the fresh air can be introduced from outside.
- ◇ Connect to duct: There are four rectangular connection holes on the four sides of the unit. If users want to connect it to the duct, please close the outlet to the side which needs connecting to the duct as well as cut down the rectangular metal sheet.

Notes:

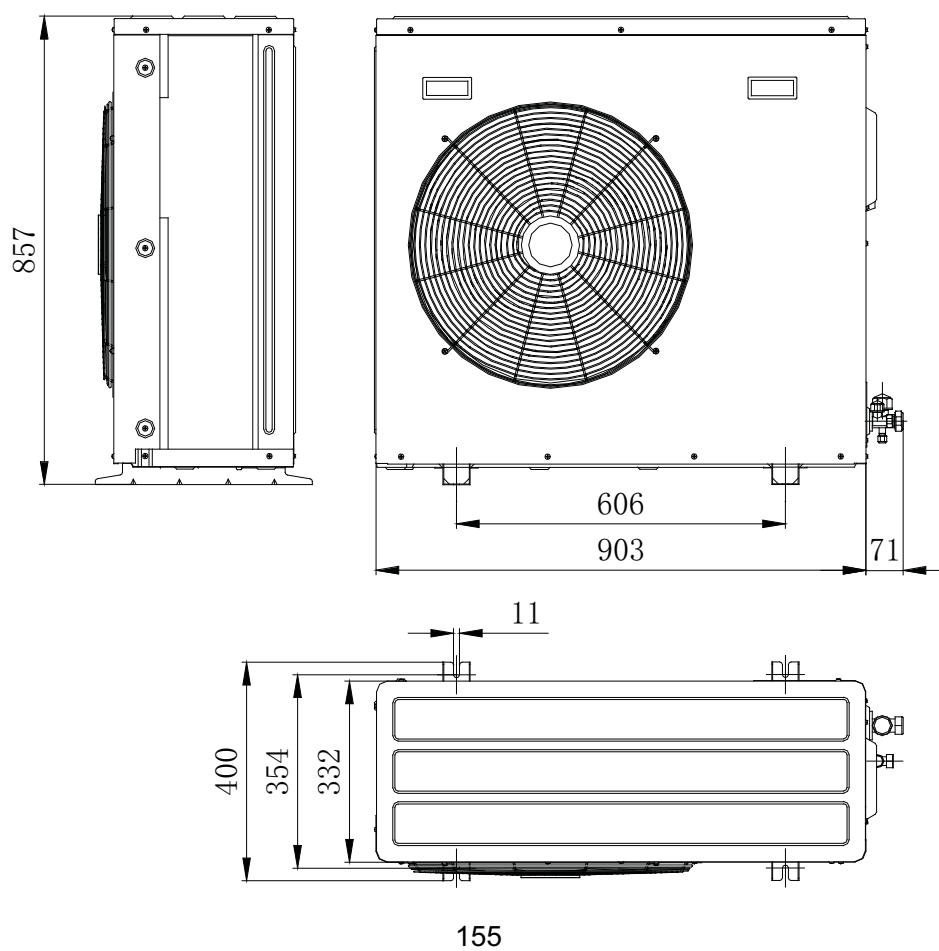
1. Only under special usage that it is allowed to connect to duct pipe and the length of the duct pipe should be less than 5 meters.
2. Using the duct that can prevent frost and noise.
3. Using heat insulation material to seal the junction between duct and the unit.

Dimension**CCA12****CCA18**

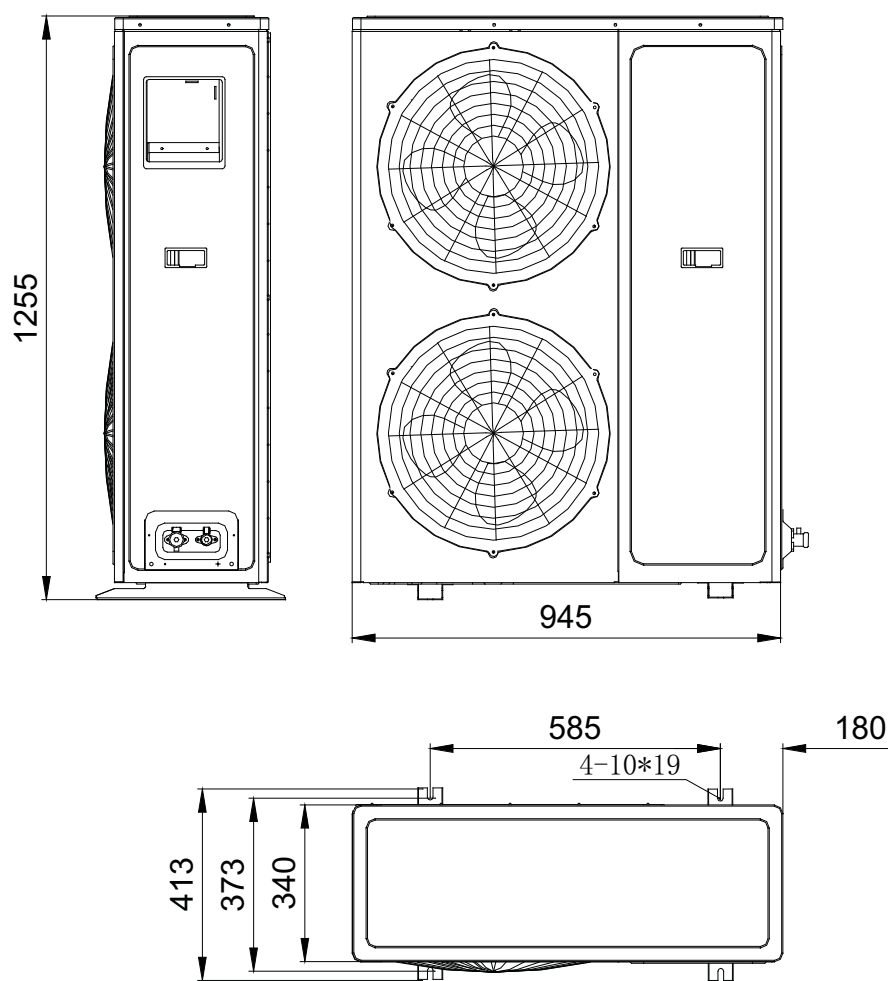
CCA24



CCA36



CCA48 / CCA60



Installation

Preparation and equipments before installation

Please buy following spare parts from your local market before installation	Besides general implements, other implements are needed when connecting the pipe
Hung bolts M12, 4 pcs	Acetylene cylinders, oxygen cylinders (when longer pipe used it should be welded)
Drainage pipe PVC	One set pipe cut machine. (cut copper pipe)
Copper connecting pipe	Refrigerant cans, electronic balance (when longer pipe used additional gas should be charged)
Adhesive belt (big size) 5 pcs, (small size) 5 pcs	Pressure gauges, pipe clamp, welding torch, 2B silver electrode
Heat insulation material used to connect copper pipe (PE foam material, its thickness is more than 8mm)	Wrench 2 pcs, one of them is with adjustable torque wrench (42N.m, 65N.m, 100N.m)
Power cable, electrical wire between indoor and outdoor unit (Must be in accordance with the wire diameter in the wiring diagram)	Nitrogen cylinder (in order to prevent oxidation when welding, using Nitrogen to replace the air)

Select installation position of outdoor unit

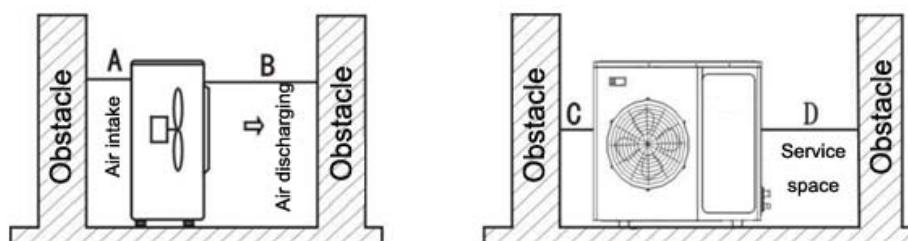
- ◇ The site shall be strong enough to bear its weight, prevent noise and vibration.
- ◇ The site shall be ensured to avoid direct sunshine, if necessary set a Havelock above the outdoor unit.
- ◇ The site shall be easy to drainage the rain water and the frost water.
- ◇ The site shall be ensured that the outdoor unit will not be covered by snow during the winter season.
- ◇ The site shall be ensured that the outlet is not facing the strong wind.
- ◇ The site shall be ensured that outlet air and operation noise will not affect the neighbors' daily life.
- ◇ The site shall be ensured that the outdoor unit will not be affected by the garbage and oil mist.

Warning :

If outdoor unit working under such environment which contains oil (including machine oil) salt (marine areas), sulfide gas (hot springs and oil refinery areas), those substance may lead to the failure work of the outdoor unit.

Maintenance and ventilation space

- ◇ The site shall be easy for ventilation then the outdoor unit can inhale and discharge air easily. What's more please reserve enough space for maintenance.



Note: Require A>300mm; B>1500mm; C>300mm; D>500mm;

Outdoor unit installation

- ◇ Use size M10 bolt and nut to fasten the outdoor unit tightly on the bracket, keep it in the horizontal level.

The suitable length for bolt shall 20mm over the base level, in order to minimize vibration please do set a rubber shock absorber.

- ◇ If the outdoor unit is mounted on the wall or on the rooftop, in order to prevent earthquake and strong wind please fasten it as tightly as possible.
- ◇ Set a drainage channel to ensure the condensing water can drain out smoothly.
- ◇ To avoid that only four angles metal sheet to support the outdoor unit.

Connection piping installation

Piping installation precaution

Please choose the phosphorus deoxidation seamless copper pipe as the piping.

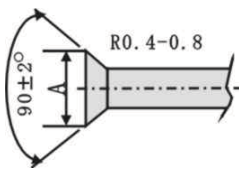
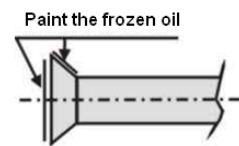
- ◇ If use the lengthen piping needs welding:

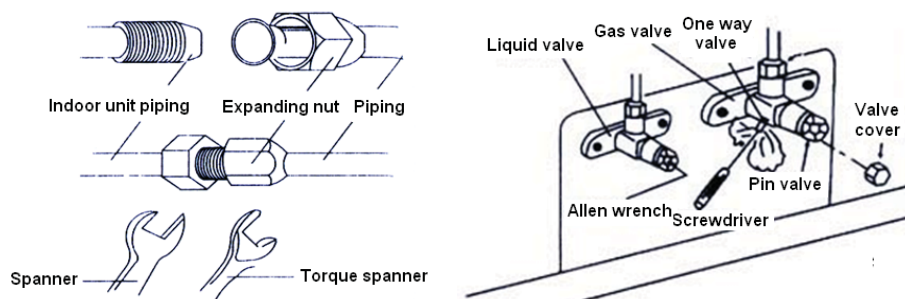
Please welding before fasten the nut, when welding using nitrogen gas to replace the air in the pipe in order to prevent oxidation.

- ◇ If there are many points to be welded when installing the lengthen piping, please set a filter in the pipe(buy from local market)
- ◇ Please use nitrogen gas or air to remove the dust and water in the pipe,
- ◇ Please lay out the piping according to the tend towards of the piping, but it is not allowed more than 3 times curved at the same point of the pipe(if do like this the pipe will become rigid)
- ◇ Pipe bending machine is used during the process of bending the pipe, the curvature shall not be too small or it will affect the refrigerant flow.

Piping specification selection

As to the detail selection please take reference to the cooling capacity adjust index figure during different installation situations.

Piping diameter	Tighten torque	Expanding size	Expanding shape	Paint the frozen oil
1/4in(φ6.35mm)	15-19(N·m)	8.3-8.7mm		
3/8in(φ9.52mm)	35-40(N·m)	12.0-12.4mm		
1/2in(φ12.7mm)	50-60(N·m)	15.4-15.8mm		
5/8in(φ15.88mm)	62-76(N·m)	18.6-19.0mm		
3/4in(φ19.05mm)	70-75(N·m)	22.9-23.3mm		



Piping connection

- ◇ Using expanding machine to expand accessories, the size of horn shown in the above figure:
- ◇ Paint a thin layer of frozen oil at both inside and outside part of the expanding.
- ◇ Make the expanding right to the screw thread shape connection of the indoor unit, using hands to

tighten the nut then using a wrench to tighten the nut again, the tighten torque as follows figure.

- ◇Take out the cover of the indoor unit gas valve and liquid valve, make the expanding right to the stop valve of outdoor unit, using hands to tighten the nut then using a wrench to tighten the nut again, the tighten torque as follows figure.

Equivalent pipe length conversion

Equivalent pipe length means converting pipe elbow to straight pipe length after considerate the pressure loss.

Elbow and Oil loop conversion tablet

Type Pipe Dia.(mm)	Bend	Oil Loop
6.35	0.10	0.7
9.52	0.18	1.3
12.70	0.20	1.5
15.88	0.25	2.0
19.05	0.35	2.4
22.02	0.40	3.0

Equivalent pipe length $L = \text{Actual Pipe length} + \text{Bend Qty} \times \text{Equivalent pipe bend length} + \text{Oil Loop Qty} \times \text{Equivalent Oil Loop length}$

Sample:

ALCA-H42A5/C5 Actual Pipe length is 25 meters, Gas pipe diameter is 19.05mm. If there's 5 bends and 2 oil loops during the installation, then the equivalent pipe length should be:

$$L = 25 + 0.35 \times 5 + 2.4 \times 2 = 31.5(\text{m})$$

◇Specification of connection pipe for indoor unit and outdoor unit

Cooling Capacity(Btu/h)		12000	18000	24000	36000	48000	60000
Connection Pipe (mm)	Liquid Pipe	Φ6.35	Φ6.35	Φ9.52	Φ9.52		
	Gas Pipe	Φ12.7	Φ12.7	Φ15.88	Φ19.05		
Max. Length(m)	Liquid Pipe Dia.	Φ6.35	Φ6.35	Φ9.52	Φ9.52		
	Gas Pipe Dia.	Φ12.7	Φ12.7	Φ15.88	Φ19.05		
	Max. Length	15	20	30	50		
Max. Height (m)		10	15	15	30		
Max. Bend Qty		4	4	4	10		
Extra R410a per meter when the pipe length is more than 5 meter (kg)		0.05	0.05	0.07	0.09		

Caution:

- 1.The standard Pipe length is 5 m, if the pipe length is less than this then no additional charging is necessary. If the pipe length is more than this then you should charge more refrigerant into the system according to the above Charging Data
- 2.The thickness of the pipe is 0.5-1.0, bearing pressure is 3.040MPa;
- 3.If the connection pipe is too long, the cooling capacity and stability would be decreased. And the more bend quantity, the resistance in the piping system would be bigger, then the cooling and heating capacity would be decreased even lead to compressor broken. We suggest you to use the shortest connection

pipe according to the pipe length parameter in this manual.

Emptying or vacuum

Before charging the refrigerant to the system, to ensure that there is no impurities, water or non-condensable gas. So, emptying and vacuum operation should be carried out.

◇ Vacuum: when process this operation please be sure that the connection pipe is tightened up.

1. Screw off the cover of maintenance valve connection, connect the pressure gauge to the connection of maintenance valve
2. Connect the vacuum pump to the pressure gauge, turn on the vacuum pump and pressure gauge to process the vacuum operation toward the indoor unit and piping, while to ensure that the absolute pressure is no less than 50Pa after this operation.
3. Turn off the pressure gauge and vacuum pump to keep the pressure in the same level in 20 minutes.

◇ Emptying: when process this operation, please disconnect the high pressure valve with liquid valve.

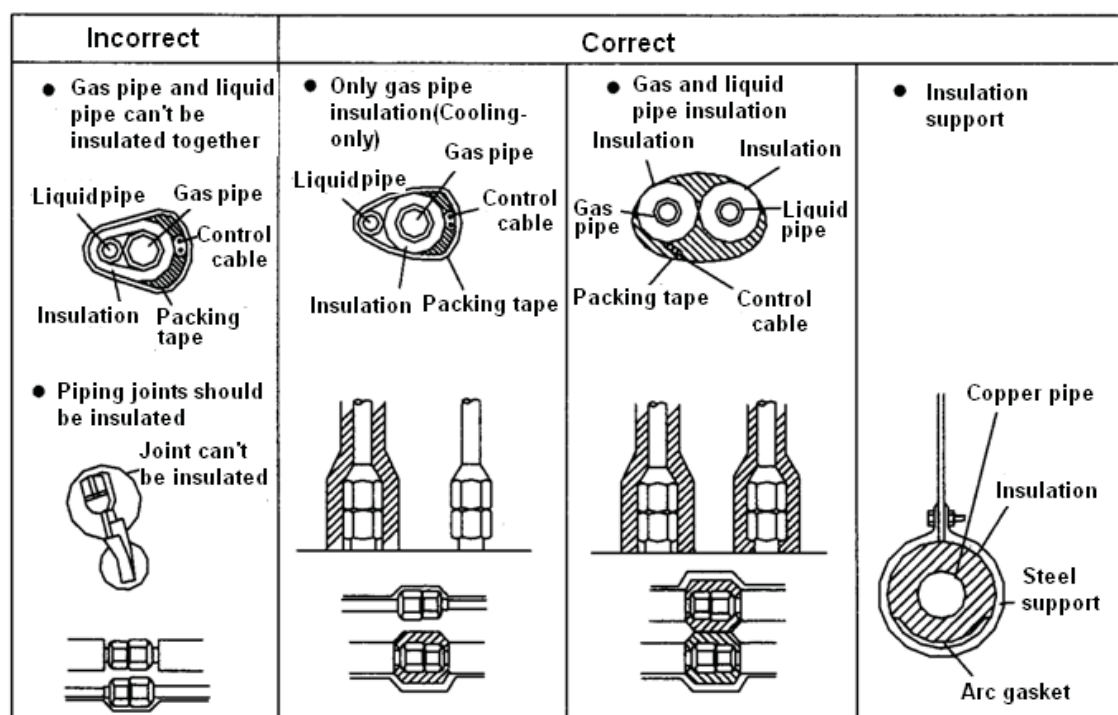
1. Connect the gas valve of the stop valve to the thimble side of the rubber hoses, the other side of rubber hoses should be connected to the refrigerant tank.
2. Open the refrigerant tank valve, using the refrigerant inside the tank with high speed to empty the air in the indoor unit and the connection piping. When the outlet air becomes mist (it feels cold by touching it), then the air is emptied.
3. When ensure that the air is emptied, connect and tighten the high pressure valve of outdoor unit stop valve and liquid side connection pipe, keep this state more than 10 seconds.
4. Use soapy what to test each connection junctions (including lengthen piping welding junction)
5. Confirmed that there is no leakage, turn off the valve of refrigerant tank, take down the rubber hose as well.

◇ Turn on the high-low pressure valve of the outdoor unit.

After vacuum and emptying, screw back the cover of the maintenance valve of outdoor unit low pressure valve, screw off the high-low pressure valve of the outdoor unit (note: shall totally turned off). Connect the refrigerant to the system.

Heat insulation package of piping

- ◇ Use heat insulation material with good insulation performance to wrap the pipe.



Notes

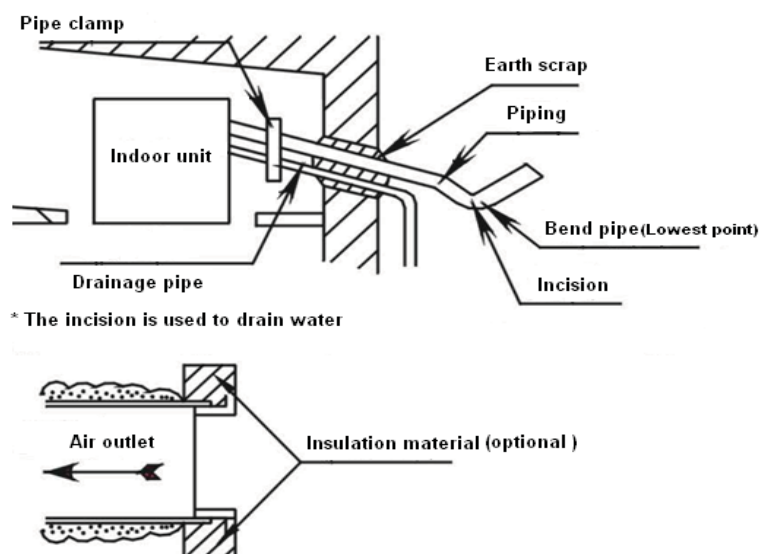
Drainage pipe and connection piping should be wrapped by heat insulation material respectively or there will be dew or leakage

During the high temperature working environment, our air conditioner is proved by dew conditioner experiment. But if it keeps on working during the high humidity (the dew temperature is more than 23°C) environment which may lead to water leakage, in such condition please use following additional insulation material:

- ◇ Glass fiber insulation material with the thickness between 10~20mm can be used.
- ◇ The part of indoor unit which get in touch with the back side of ceiling should be pasted with insulation material.
- ◇ Besides the previously more than 8mm thick insulation material, connection piping (both gas pipe and liquid pipe), drainage pipe should be wrapped by additional 10~30 mm thick insulation material.

To seal the hole on the wall.

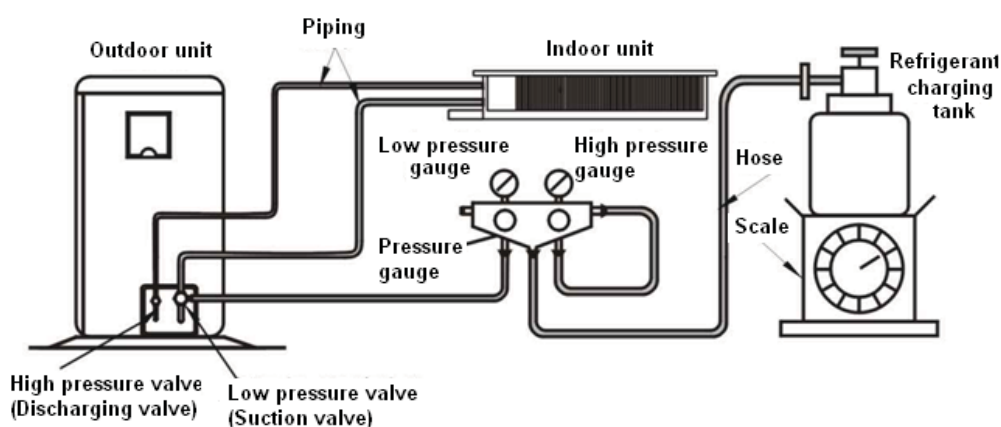
- ◇ To prevent rainwater or other foreign bodies from entering the room and air-conditioner after installing the tubing and drain pipe, the gap between wall hole and tubing, drain pipe and electric wire should be sealed with mastic, sealant rubber or putty, or poor performance or leakage will result
- ◇ If the outdoor unit is higher than indoor unit, tubing should be bent to ensure that the lowest point of the tubing is lower than the wall hole to prevent rainwater entering the room or air-conditioner along the piping system.



Additional refrigerant charge

When pipe length exceeds 5m, please add refrigerant according to the table below:

Connection piping	Piping size)		Additional refrigerant charge amount (kg/m)
	Gas pipe	Liquid pipe	
Piping between indoor and outdoor unit	$\phi 9.52 \times 0.75 \text{mm}$	$\phi 6.35 \times 0.75 \text{mm}$	0.02
	$\phi 12.7 \times 1 \text{mm}$	$\phi 6.35 \times 0.75 \text{mm}$	0.02
	$\phi 15.88 \times 1 \text{mm}$	$\phi 9.52 \times 0.75 \text{mm}$	0.05
	$\phi 19.05 \times 1 \text{mm}$	$\phi 9.52 \times 0.75 \text{mm}$	0.07
	$\phi 19.05 \times 1 \text{mm}$	$\phi 12.7 \times 1 \text{mm}$	0.09



Others

Users to install the air conditioner at site shall ensure that the oil can return to the unit smoothly.

- ◇ Horizontal pipes should incline toward the outdoor unit using a 20:1 slope
- ◇ If there is a height difference between the indoor and outdoor unit, oil loops should be installed in the inter connecting gas (large) pipe;

When the vertical pipe height difference is less than 5 meters, an oil loop should be installed at the bottom of

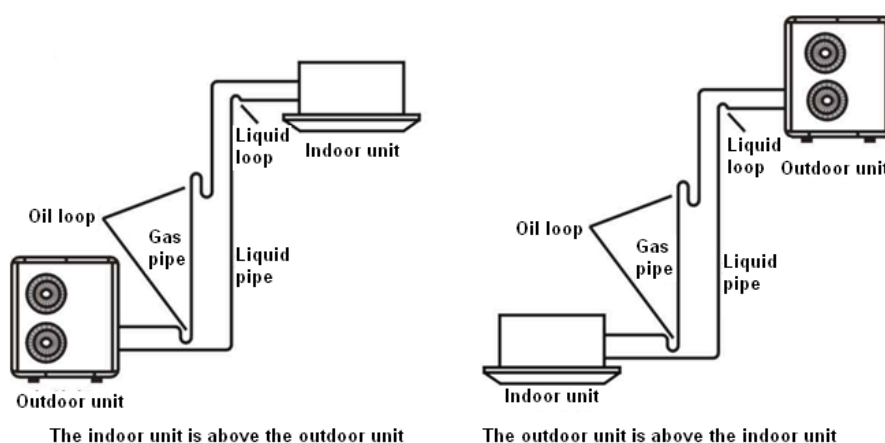
the gas (large) pipe;

When the vertical pipe height difference is more than 5 meters, then for every 5 meters an oil loop must be installed at the bottom of the gas (large) pipe, and a short loop (liquid ring) should be installed at the exit of the indoor unit liquid (small) pipe;

When the connecting gas pipe vertical height difference is less than 5 meters but the constant rise distance is too long, an oil loop should be installed in the gas (large) pipe every 10 meters.

◇When the outdoor and indoor units are at the same elevation, the oil deposit bend and liquid ring do not need to be installed, if the horizontal connecting pipe length is less than 10 meters.

When the horizontal connecting pipe length is more than 10 metres, install an oil loop in the gas (large) pipe every 10 metres.



Note:

This chart is for explanation purposes. An actual installation will differ from this according to the site conditions. When making an oil trap the radius of the bend should be between 1.5 and 2 times the pipe diameter.

Electrical connection

Electrical connection precaution

Warning	Installation of electric items must be carried out by qualified, professional technicians. An isolated circuitry should be fixed with whole-pole disconnection devices, which is with at least 3mm gap of touch point. . Power supply and indoor to outdoor connection should use special cable. Providing the necessity of installation or replacement, the professional technician of service store appointed by manufacturer must be required, while self-operation by users is prohibited.
	In case of any electric shock accident, the creepage protection devices /power supply on-off and breaker must be required with power supply.
	The specification of fuse for single phase control board is F5AL 250V, while for 3 phase control board, both indoor and outdoor unit, it is F3.15AL 250V.
	Machine must be earthed surely. If not, it'll be probably caused creepage.
	Equivalent 227IEC53(RVV) type of power cord of GB5023 or the excelled must be required. The cords should be f ixed pr operly agai nst br oken, wh ile en ds/joints of c ords i s und er out side f orce. I mproper connection or fixation will cause disaster like fire....etc. Equivalent 245IEC57(YZW) type of power cord of GB5023 or the excelled must be used as connection line of indoor and outdoor.

Notice	The earth line is neither allowed to connect to gas pipe, water pipe or circuitry of telephone or lighting rod, nor to the earth line of other devices.
Others	<p>Please fix power supply cord and connection wires of indoor and outdoor, in accordance with circuit diagram</p> <p>Fix the cords into terminal boards properly and safely with cable fixation tools to avoid any danger caused by the power cord under outside forces.</p> <p>After fixation, use bind tape (affixed) to bind wires avoiding any collision with other components like compressor, copper pipes...etc</p>

Electrical connection

Wiring diagram of indoor & outdoor, refer to the section of part 1

Recommendation of power supply cord

Power supply:220V-240V~,50Hz

Cooling capacity (Btu/h)	Model	Power supply spec.	Power supply side	Power supply cord	Connection wires
12000	CCA12 / CEA12	220-240V~50Hz	Indoor side	3×1.5mm ²	3×1.5mm ²
18000	CCA18 / CEA18	220-240V~50Hz	Indoor side	3×2.5mm ²	3×2.5mm ²
24000	CCA24 / CEA24	220-240V~50Hz	Outdoor side	3×4mm ²	4×1mm ²
36000	CCA36 / CEA36	220-240V~50Hz	Outdoor side	3×4mm ²	4×1mm ²

Power supply 380V-415V~,3N,50Hz

Cooling capacity (Btu/h)	Model No.	Power supply spec.	Power supply cord of indoor unit	Power supply cord of outdoor unit	Connection wires
48000	CCA48 / CEA48	Outdoor unit 380-415V 3N~50Hz Indoor unit 220-240V~50Hz	3×1 mm ²	5×2.5 mm ²	2×1 mm ²
60000	CCA60 / CEA60	Indoor and outdoor input separately			

- ◇ Above mentioned power supply cord is the cable which connect air on-off of indoor to indoor/outdoor unit. Power supply cord of indoor/outdoor unit is the power supply cable connecting indoor and outdoor unit

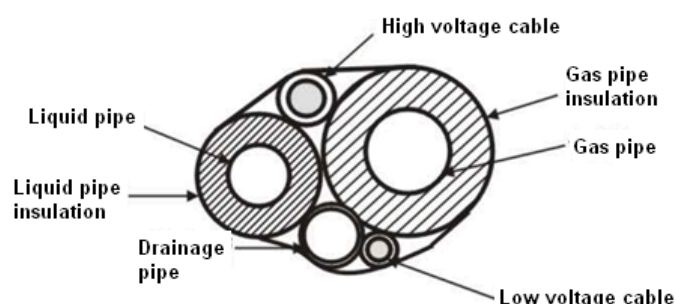
- ◇ The section area of power supply cord core is minimized one. To avoid voltage pressure dropped down, while longer power supply cord needed, the section area should be enlarged for one gauge.
- ◇ The connection wires to indoor unit is the cable of 27IEC53(RVV) type, 300/500V; while the connection wires to outdoor unit and the connection wires from outdoor to indoor unit is the multi-end of cable (neoprene) of 245IEC57(YZW) type, 300/500V. if the single core with double skin type of cable is chosen for installation, please choose 1# gauge of section area and wrapped with special jacket for electrician.
- ◇ All of the ceiling/floor type unit is without accessorial electric heating

Wire connection

Remove electric control box cover of indoor unit, connect the wires in accordance with the electric diagram mentioned on the back of the cover. The wire ends must be tightly fixed into terminal boards without ease. The earth wire must be fixed into appointed position.

Outdoor wire connection

- ◇ Remove the electric item cover, which is positioned in the right side of outdoor unit, connect the wires in accordance with the electric diagram on the back of the cover.
- ◇ Be sure that pressing the wires tightly with the terminal boards while it through the board, the wire ends must be tightly fixed into terminal boards. The earth wire must be fixed into appointed position.
- ◇ After all the wire connected, bundle connection pipe, connection wires and drainage pipe with strips like mentioned drawing below:



Notice:

- ◇ Compressor of CCA48 & CCA60 are 3 phase power supply with phase sequence protection in its outdoor control board. Please be careful with wire connection.
- ◇ Be sure don't make the drainage pipe flat while bundled.

Commissioning

After installation, machine can be started commissioning.

Check installation condition

- ◇ Check indoor/outdoor unit installation and wire connection in accordance with the requirement of service manual.
- ◇ Check the power supplying, diameter of wires, air on-off and make it sure that the items can be matched with machines and, earth wire connection safety.
- ◇ Check air inlet/outlet duct and make it sure that the items is clean, operating smoothly.

Commissioning

- ★ During winter, the first run of performance should be supplied power 8 hours in advance to warm-up

the crankcase.

- ★ During winter, while after 8 hours power off, the performance test should be 2 and half hours power on later:
 - ◇ Power on, run machine with cooling mode.
 - ◇ After 3 minutes compressor protection, check if there is normal cooling air come from indoor unit and if there is abnormal noise come from indoor/outdoor units
 - ◇ Configure the mode with “fan” and check if there is high air come from indoor unit.
 - ◇ Operate “swing” mode, check if the louver is properly swaying.
 - ◇ Press the other buttons on the remote controller and check if the complete unit is on proper working condition
 - ◇ Operate machine 1 hour with “cooling” mode and check if the drainage system is on proper condition
 - ◇ Switch the mode for “heating” and check if there is warm air come from indoor, if there is abnormal noise come from indoor/outdoor units
 - ◇ After confirmation of normal working condition, press the “on-off” to stop running machine.
 - ◇ Then and there, train the end users with operation, maintaining and special notice.

Compressor freezing oil brand and standard oil charge

Outdoor model	Brand	Compressor Model	Compressor Lubricating Oil Model	Oil charge (cm ³)
CCA12	TOSHIBA	PA150X2C-4FT	ESTER OIL VG74	480
CCA18	TOSHIBA	PA215X2CS-4KU1	ESTER OIL VG74	750
CCA24	TOSHIBA	PA290X3CS-4MUI	ESTER OIL VG74	950
CCA36	HITACHI	ATH420MV-C9EU	HAF68D1	840
CCA48	HITACHI	E504DH-49D2G	FVC68D	1300
CCA60	HITACHI	E604DH-59D2G	FVC68D	1300

Daily maintenance

Clean inhaled

- ◇ Before cleaning the filter, ensure the unit is switched off and the power is off;
- ◇ Forbidden to use water clean the filter , it will hurt PCB or get an electric shock;
- ◇ When cleaning filter net , be s ure you are s tanding s teady, i f y ou use l adder or o thers, pl ease be careful.

Washing filter net

- ◇ Use vacuum or water to clean the net;
- ◇ In order to ensure the best performance from your air conditioner clean the air filter regularly
- ◇ We recommend cleaning once a month or more frequently if required.
- ◇ When the filter is very dirty it can be washed in detergent and hot water (below 45°C);
- ◇ Ensure the filter is fully dry before reinstallation to avoid risk of electric shock or short circuiting;
- ◇ Do not dry the filter using direct sunlight;



Check at the beginning of each season

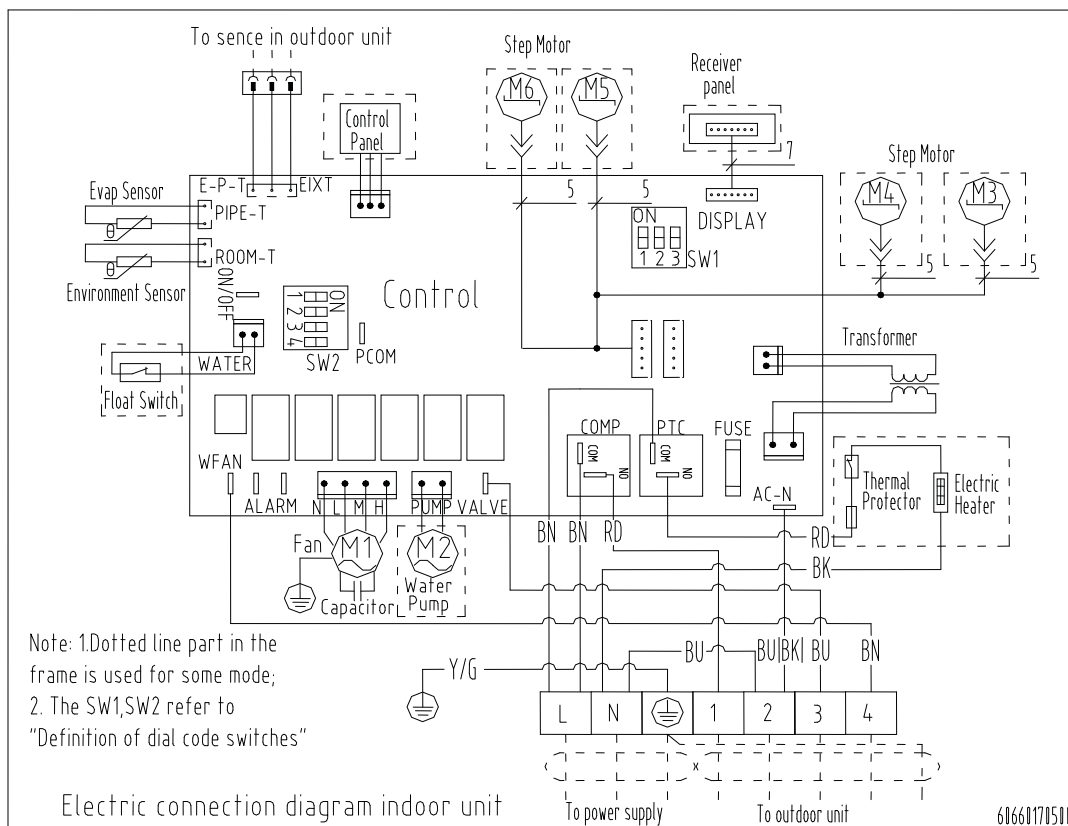
- ◇ Check whether there are no physical obstructions at the air inlet or outlet of either indoor or outdoor unit;
- ◇ Check whether there are some garbage at the water outlet;
- ◇ Check whether electrical cables are in good condition, particularly the earth cable;
- ◇ When power on, check weather letters display on the screen of the wired controller.
- ◇ When working in winter,must connect power for 8 hours before switch on unit.

Check at the end of service season

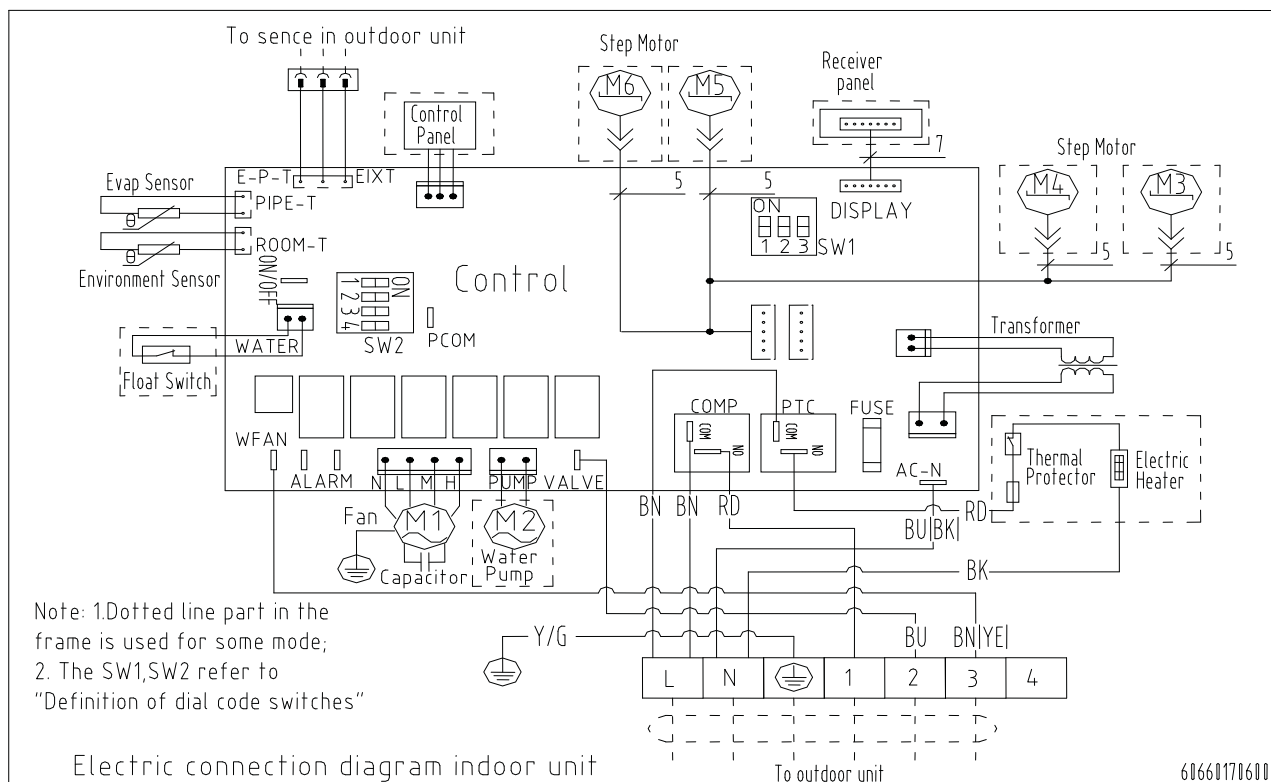
- ◇ Operate for 2 3 hours under the ventilation condition; remove the moisture of the indoor unit.;
- ◇ If not use air conditioner in a long time, please close the power to save energy, the letter will disappear on wired controller;
- ◇ Take the batteries out of remote controller;
- ◇ Suggest that use dustproof to cover the outdoor unit;

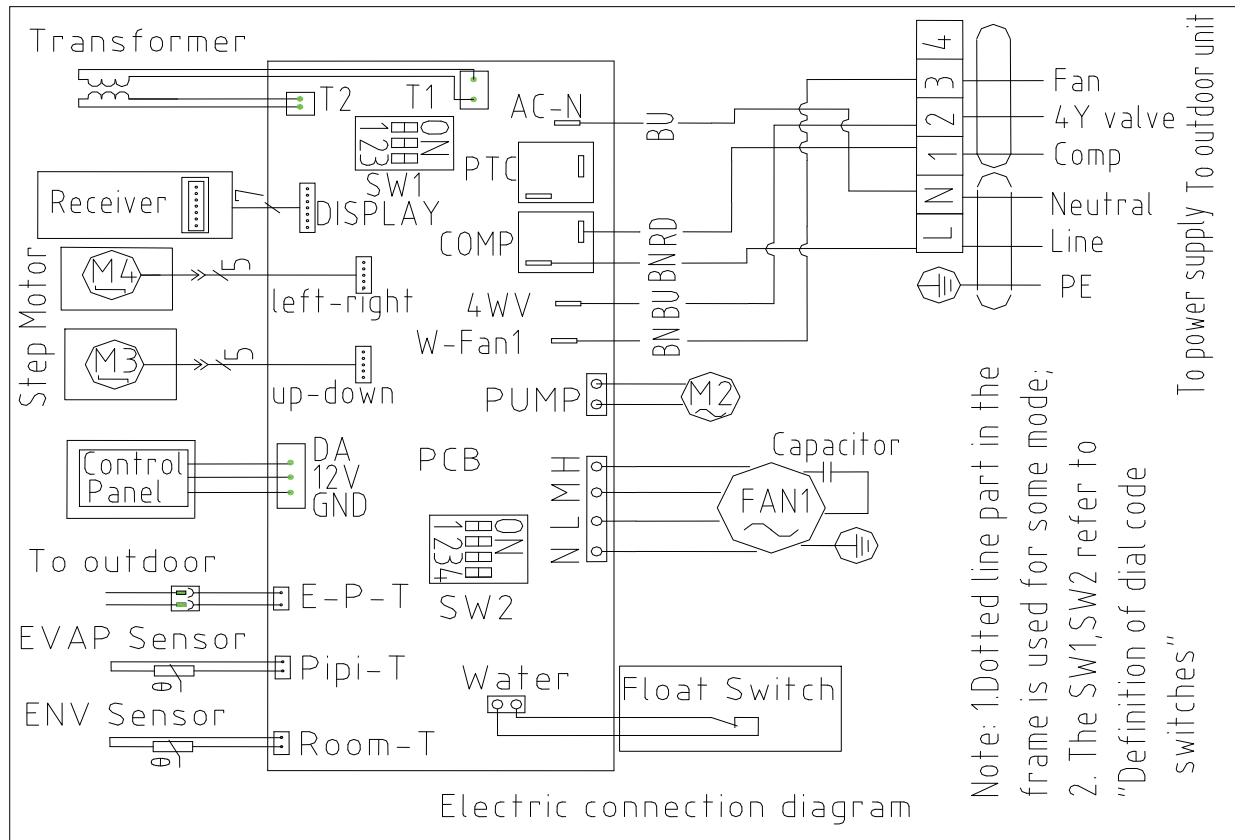
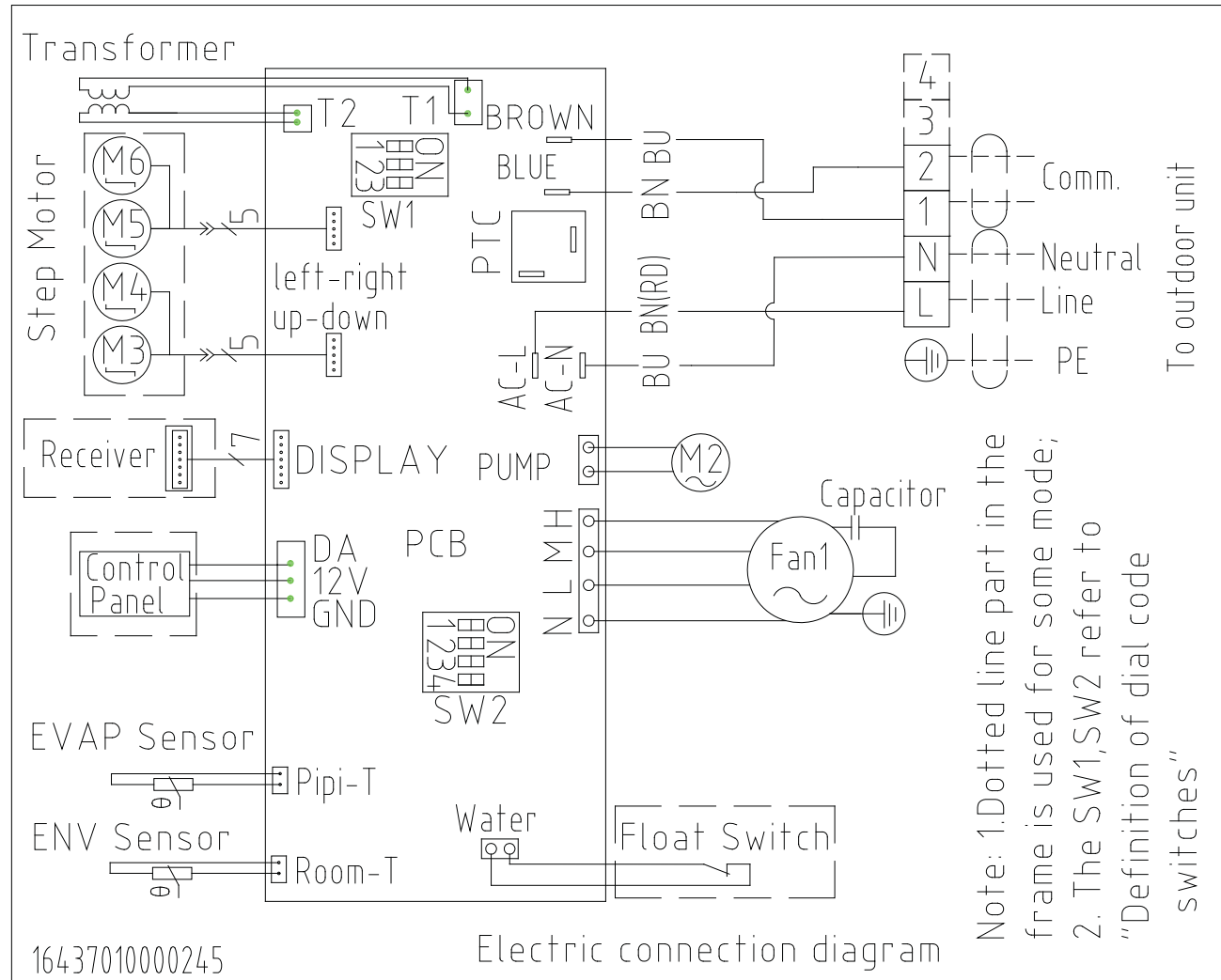
Electrical wiring and connection

CEA12 / CEA18



CEA24



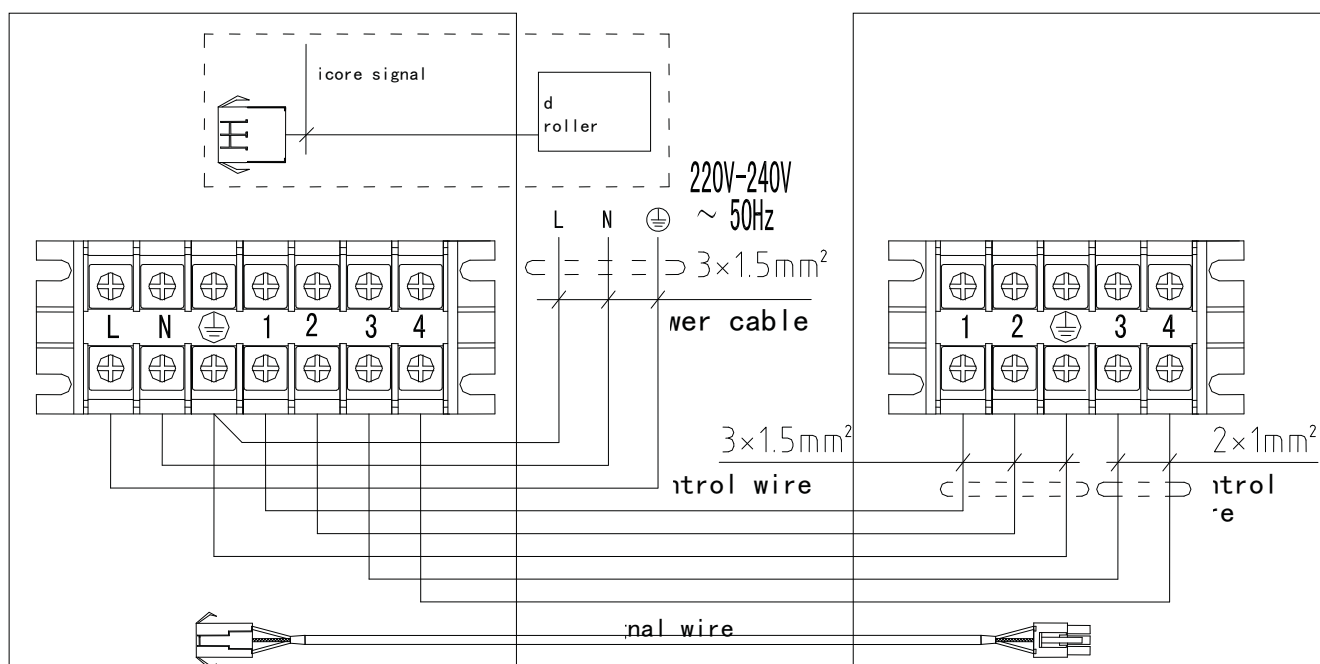
CEA24**CEA48 / CEA60**

Electrical connection

CEA12

indoor unit

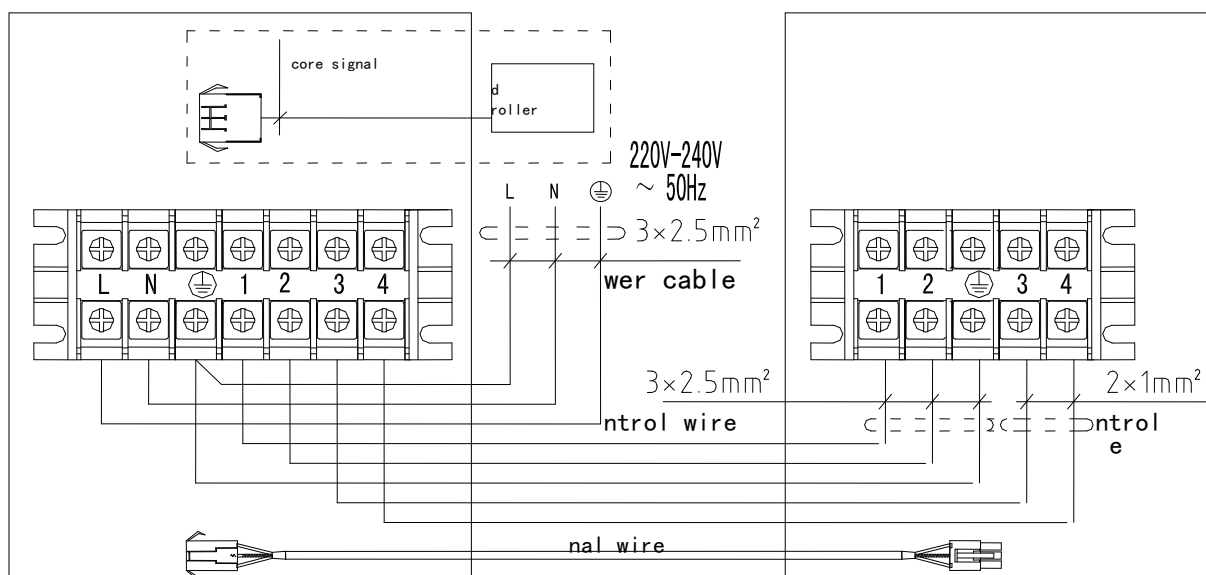
outdoor unit

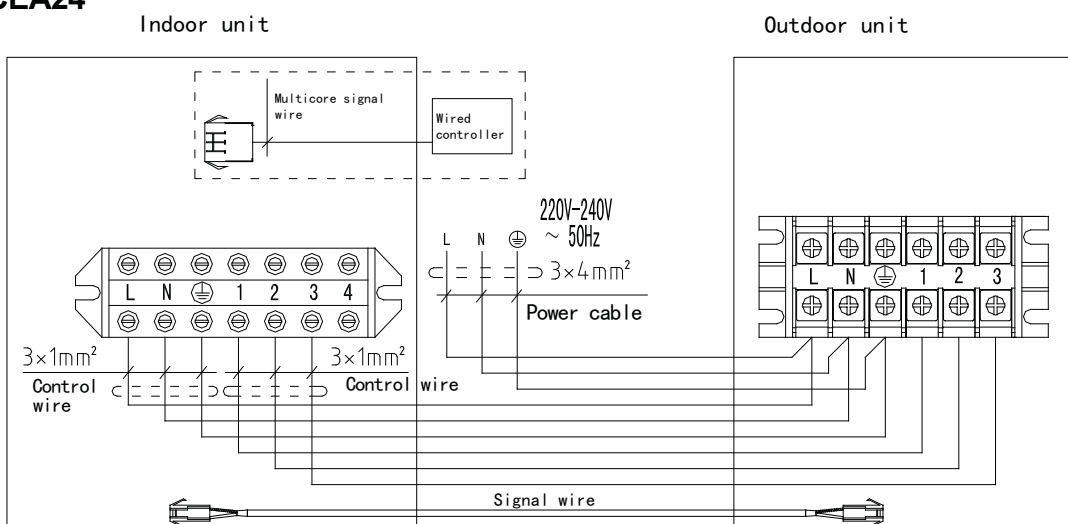
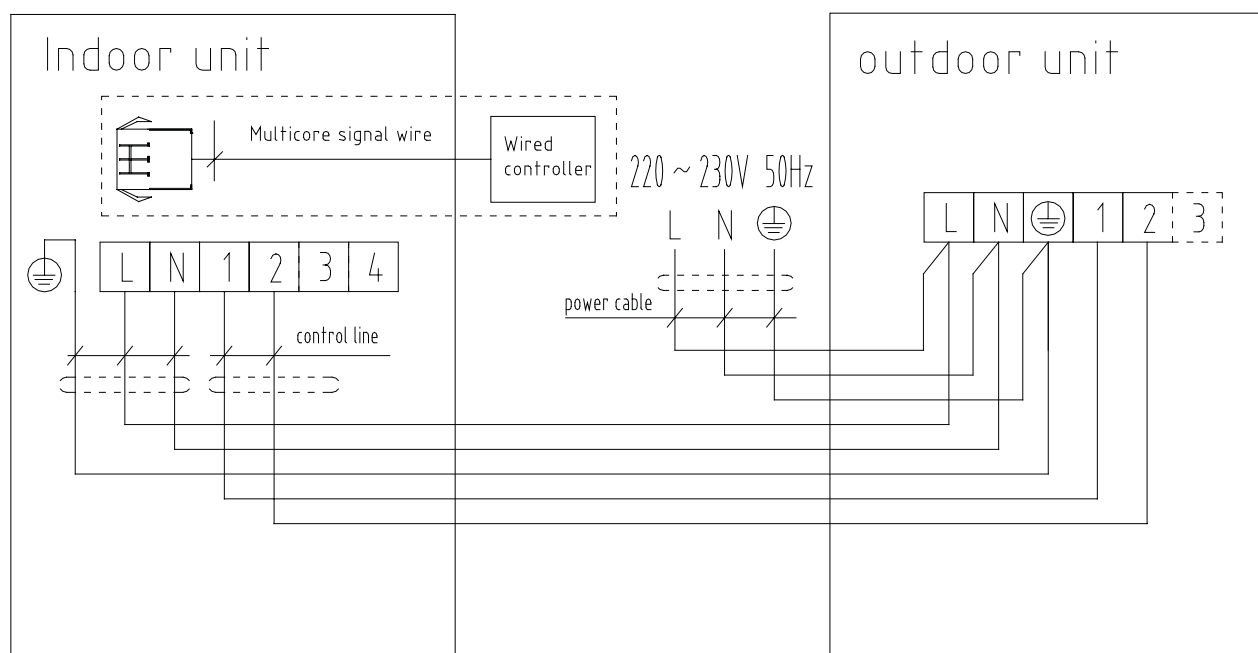
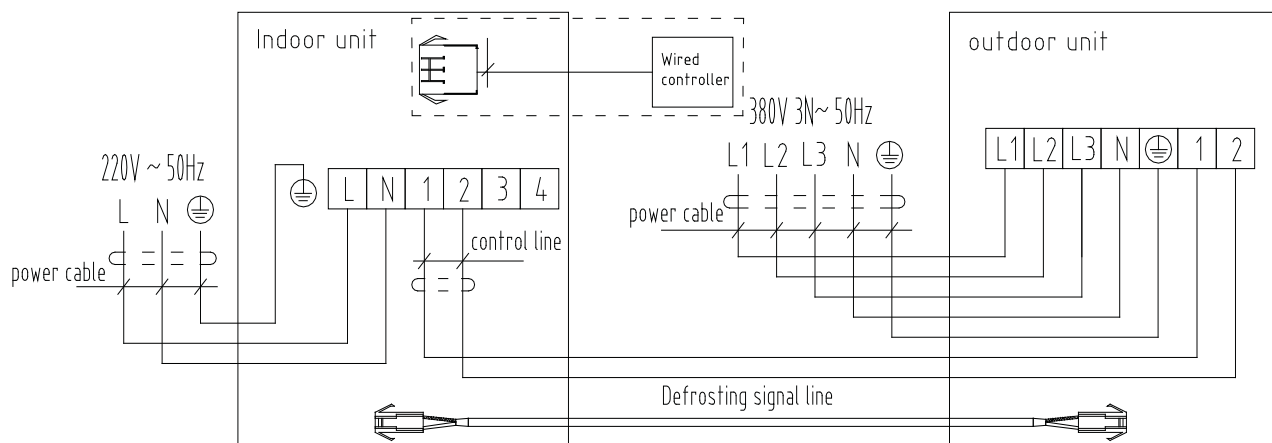


CEA18

indoor unit

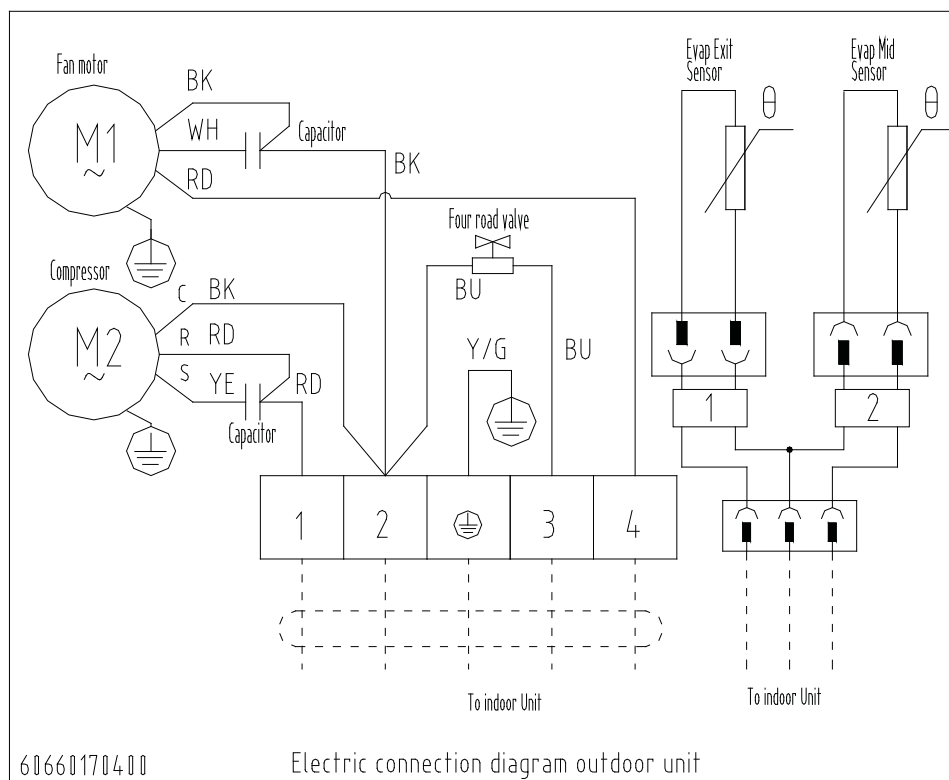
outdoor unit



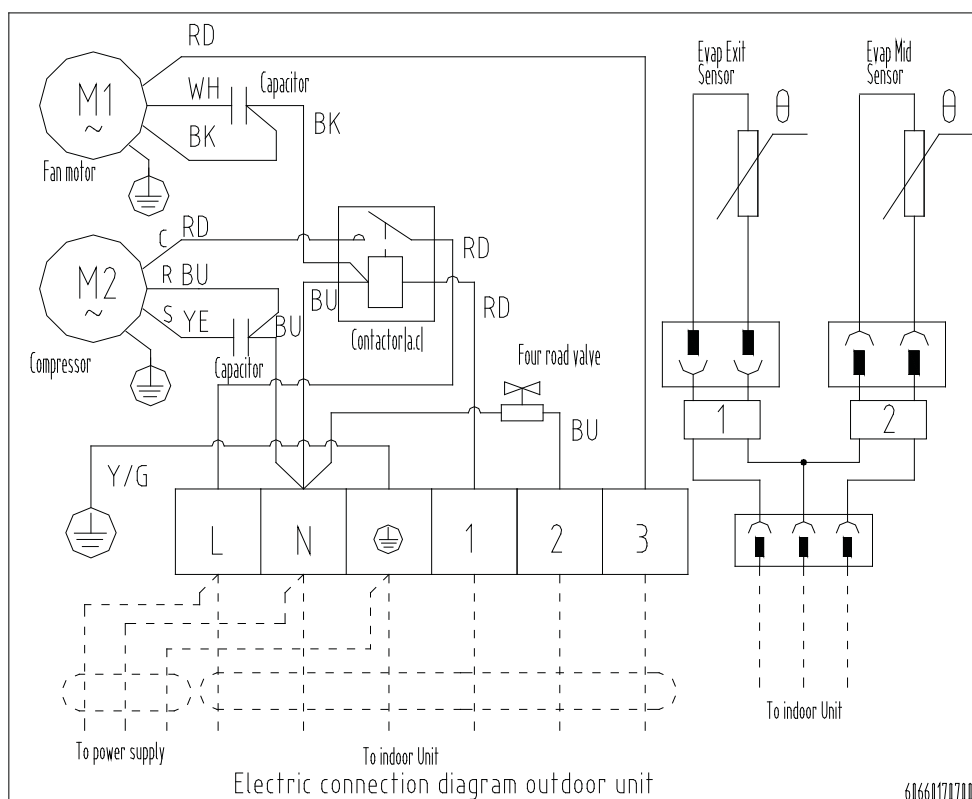
CEA24**CEA36****CEA48 / CEA60**

5. Electrical wiring and connection

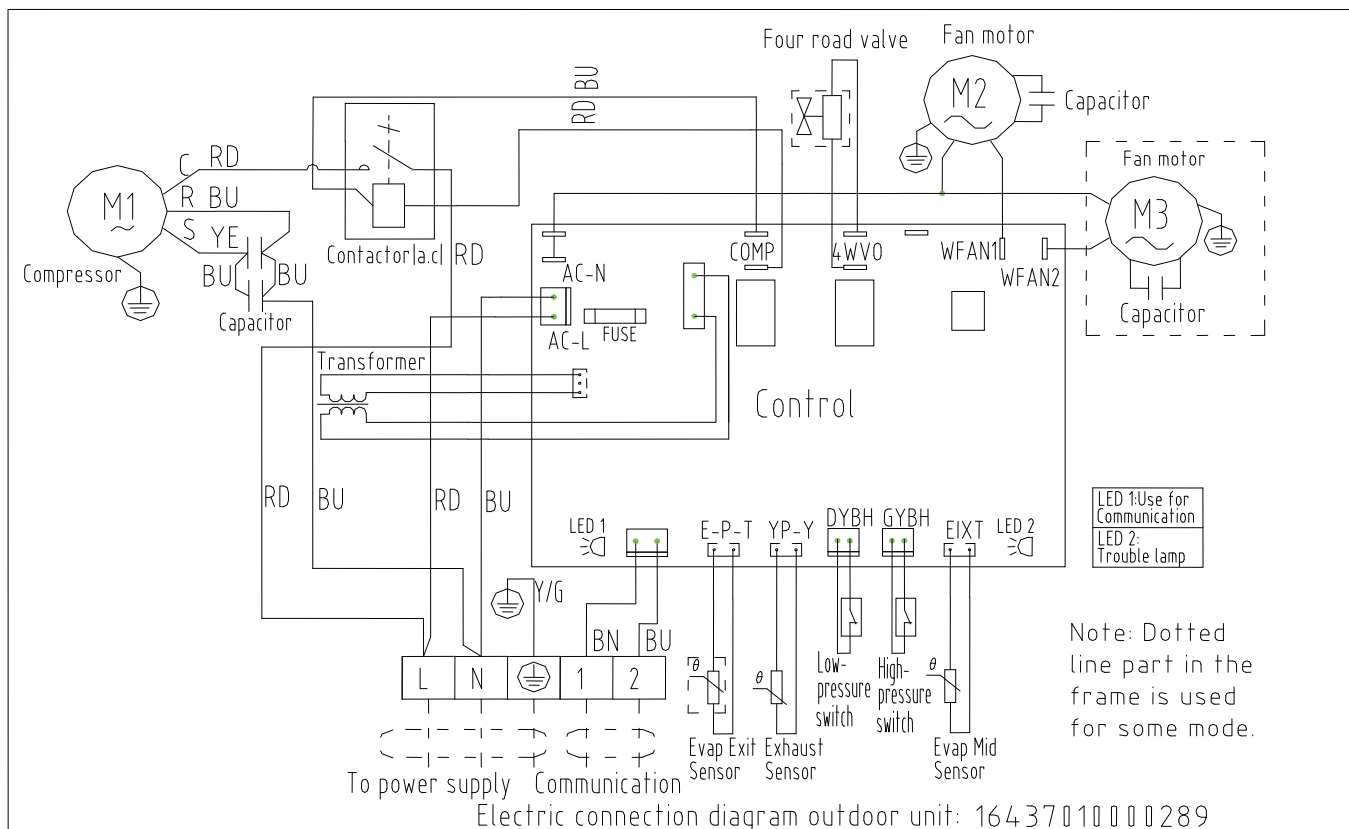
CCA12 / CCA18



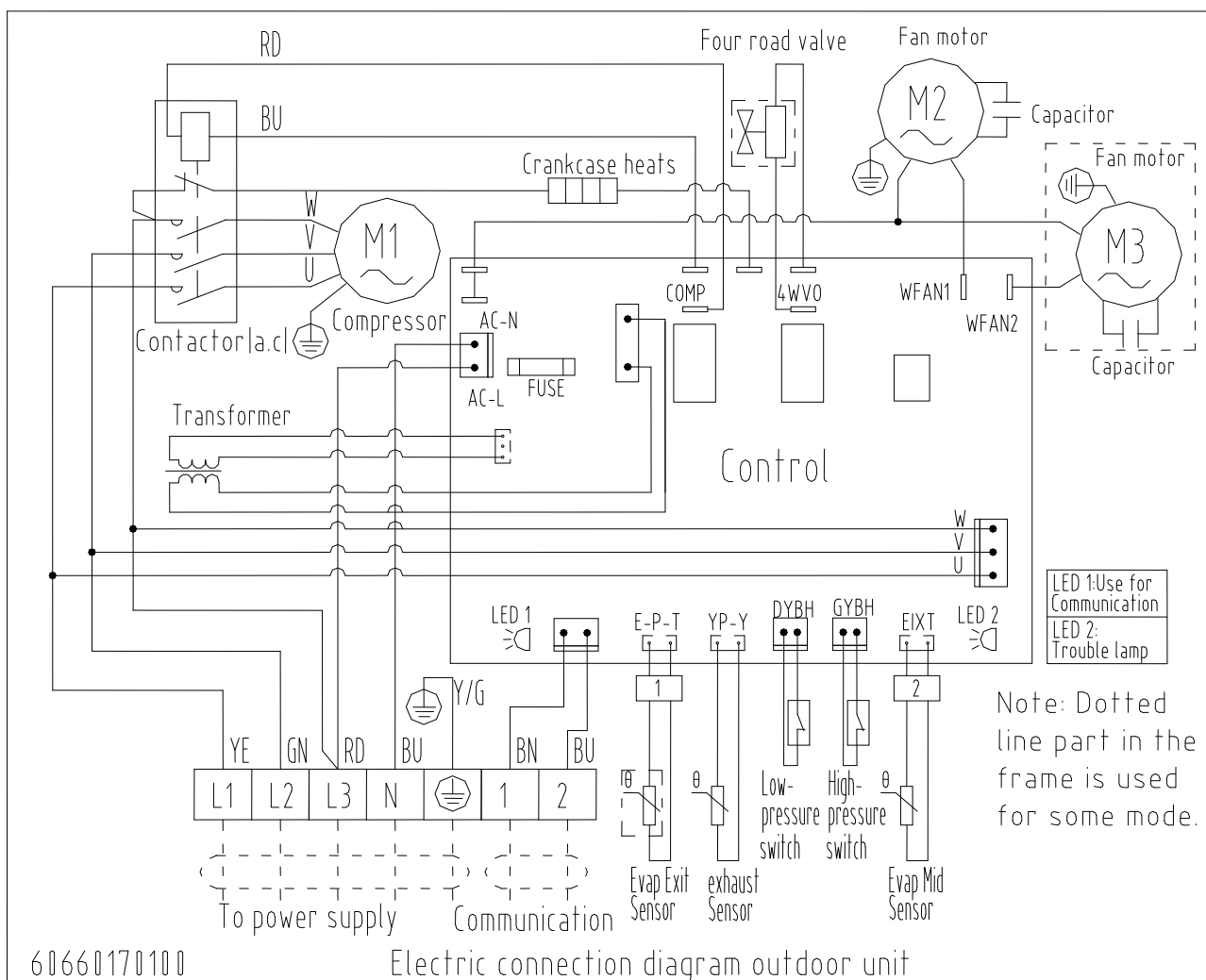
CCA24



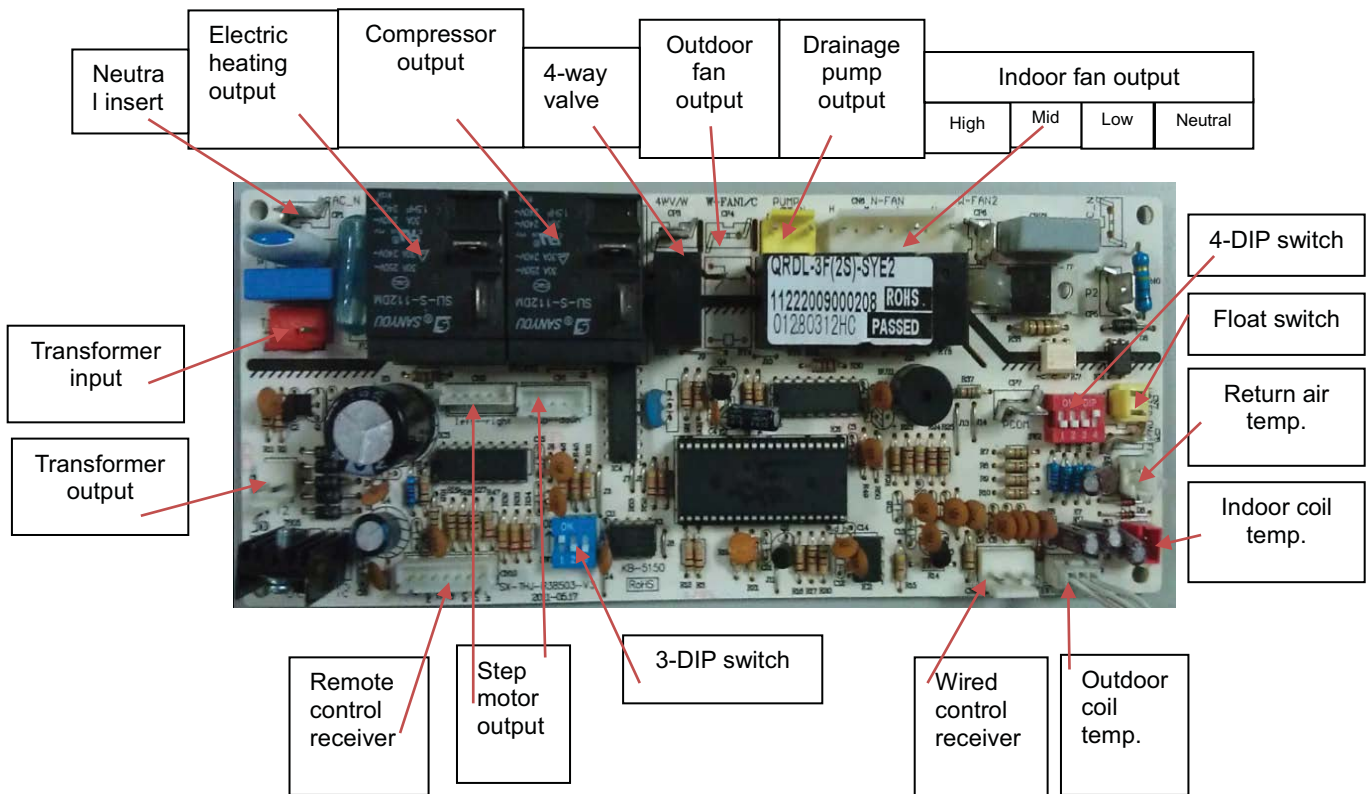
CCA36



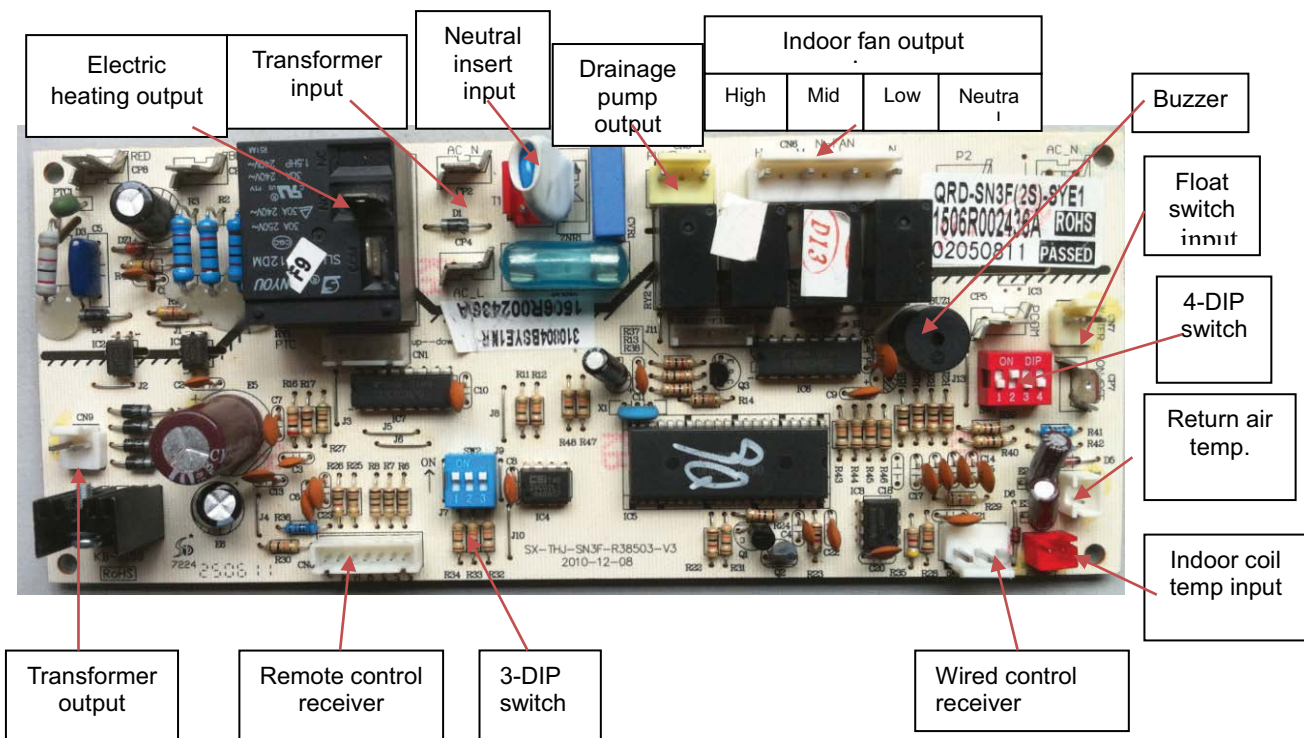
CCA48 / CCA60



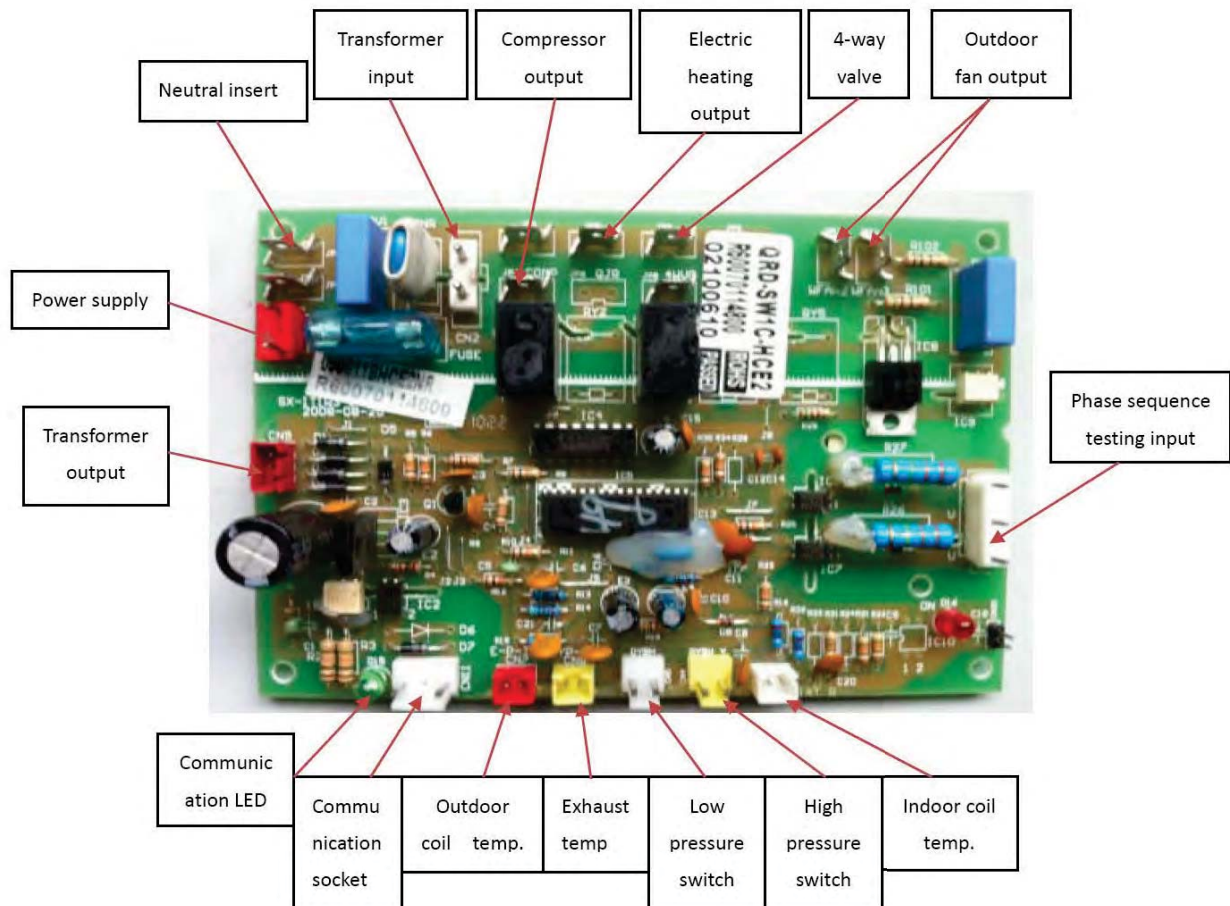
Introduction of Control Board sockets QRDL-3F(2S)-SYE1 (indoor unit) (match with the outdoor unit which the Power supply is 220V-240V, 1PH)



Introduction of control board QRD-SN3F(2S)-SYE1 sockets (Indoor unit) (match with the outdoor unit which the Power supply is 380V-415V, 3PH)



Introduction of Control Board QRD-SW3F-HCE1 (outdoor unit board) sockets .The model includes CCA36, CCA48 & CCA60



Poor efficiency explanation

During the process of using air conditioner, some phenomenon seems to be malfunction but actually not. Thus when cooling effect does not achieve to your expectation, the following factors have to be ruled out

Phenomenon	Causing explanation
High outside temperature and too many indoor individuals, even air conditioner runs at full-load operation, the wind blowing out from air outlet is cold, but it is difficult to lower the indoor temperature, this is not malfunction.	When the outdoor temperature is higher, more heat penetrates into indoor space, which increases the cooling load of AC. If there are too many individuals (for example 10 individuals) and every individual gives off 120 W, totally 1200W, this will run out of half of AC cooling capacity, and the unit's cooling capacity this time is far from enough, indoor temperature is hard to lower down. It is normal phenomenon and do not mean useless of AC.
Power voltage is too low, causing AC uneasy to start and shut down after starting, or fuse be burned out etc.	It is not malfunction, need to find out the causing, if the causing is the electricity net voltage is too low, user should load a power manostat to keep voltage between 220V-380V for AC normally running
Select high wind speed but indoor temperature still at high side, air flow from the air outlet is too weak.	It is because air filter is too dirty or blocked making cooling capacity fail to be brought by air flow, causing cooling capacity inadequate. Take out filter and wash, the problem will be solved.
Select high wind speed, the vibration and sound of unit are severe.	Fan runs at high speed, severe vibration and sound of unit is normal phenomenon
Temperature controller adjusts improper and max cooling capacity is not utilized completely, thus indoor temperature can't lower down.	Adjust the temperature controller, and problem will be solved.
As for Heat pump air conditioner heating effect is not ideal during cold winter, this is normal phenomenon.	The lowest temperature is -7°C when heating, below this temperature unit cannot heat effectively.
Improper installation will lead to indoor temperature uneven or bad cooling effect.	It is necessary to adjust AC installation position

Failure phenomenon

Phenomenon	Causing explanation
Mirage comes out from indoor unit	When the cold air from AC cools the indoor air
Noise	<ol style="list-style-type: none"> 1. When air conditioner stops running, there will be some noise, and this is because the refrigerant flows contrarily. 2. AC expand or shrink according to temperature, causing harsh sounds 3. Liquid sound is from refrigerant flowing
Sometimes, the room is smelly	<ol style="list-style-type: none"> 1. The AC itself will not be smelly, if it is smelly, it is because environment smell accumulated 2. Solution: clean the filter
when heating, there is no wind at the beginning of starting unit	<ol style="list-style-type: none"> 1. It is to prevent cold air blowing, please be patient 2. The unit has auto-restart function, when it is repowered again, unit will run according to the mode which is set before the power off. (Note: default is closed)

Electric components malfunction inspection

No	Component name	Inspection methods
1	Compressor	Using multi-meter ohm phase, there is correct resistance value among windings (single phase compressor refers to specification, three phase compressor resistance approximately equal), resistance of winding should be infinite.
2	Control board	<ol style="list-style-type: none"> 1 Check if any connection part of PCB loosen or drop off, printed tinsel and components have any burn, fade, breaking off or aging phenomenon, all joints exist short circuit phenomenon etc. 2 Test the circuit board system in the term of voltage, pulse on, resistance variation, by using testing meter. 3 Judge the output and input is normal or not according to electric principle diagram
3	Contactor	<ol style="list-style-type: none"> 4 Press the contactor by hand, the contactor reacts immediately and without question 5 The contacting point of contactor has no burn and melt phenomenon 6 The winding has resistance value below 1000, but cannot be nil or infinite
4	4-ways valve winding	The winding has resistance value below 1000, but cannot be nil or infinite
5	Capacitor	<ol style="list-style-type: none"> 7 No expansion phenomenon apparently 8 Measure capacitor by using capacitor phase of multi-meter(if the multi-meter has no capacitor phase, use ohm phase, contact the two terminal of meter to two feet of capacitor, and quickly switch positive pole and negative pole and reconnect, the resistance should display from nil to infinite quickly. The resistance can't change is always nil or infinite).
6	Sensor	<ol style="list-style-type: none"> 9 Using multi-meter to measure resistance, find out temperature according to resistance table, the temperature should accord with sensor temperature. 10 Resistance cannot be nil or infinite
7	Motor	<ol style="list-style-type: none"> 11 No burning trace apparently 12 Using multi-meter ohm phase, there is correct resistance value among windings (single phase compressor refers to specification, three phase compressor resistance approximately equal), resistance of winding should be infinite.

Failure code display

When air condition has failure, the timing lamp on light board of controller will display different code according to different failure case.

Unit failure code for unit power supply is 220-240V

Failure causing	Display mode 1 (indication lamp on display lamp board)	Display mode 2 (wired controller)	Display priority	Phenomenon
Communication failure	none	E5	1	shutdown
Drainage system failure	Timing lamp flash 4 times/8s	E4	2	shutdown
Phase failure, phase-loss or low voltage failure	Timing lamp flash 6 times/8s	E6	3	shutdown
Indoor temperature sensor abnormal (TA)	Timing lamp flash 1 times/8s	E1	4	shutdown
Indoor coil sensor abnormal(TE)	Timing lamp flash 2 times/8s	E3	5	shutdown
Outdoor coil sensor abnormal(TW)	Timing lamp flash 2 times/1s	E2	6	non-stop
Indoor heating over-load protection		None	7	shutdown
Defrosting(not failure)	Operation lamp flash	None	8	non-stop

Unit failure code for unit power supply is 380-415V

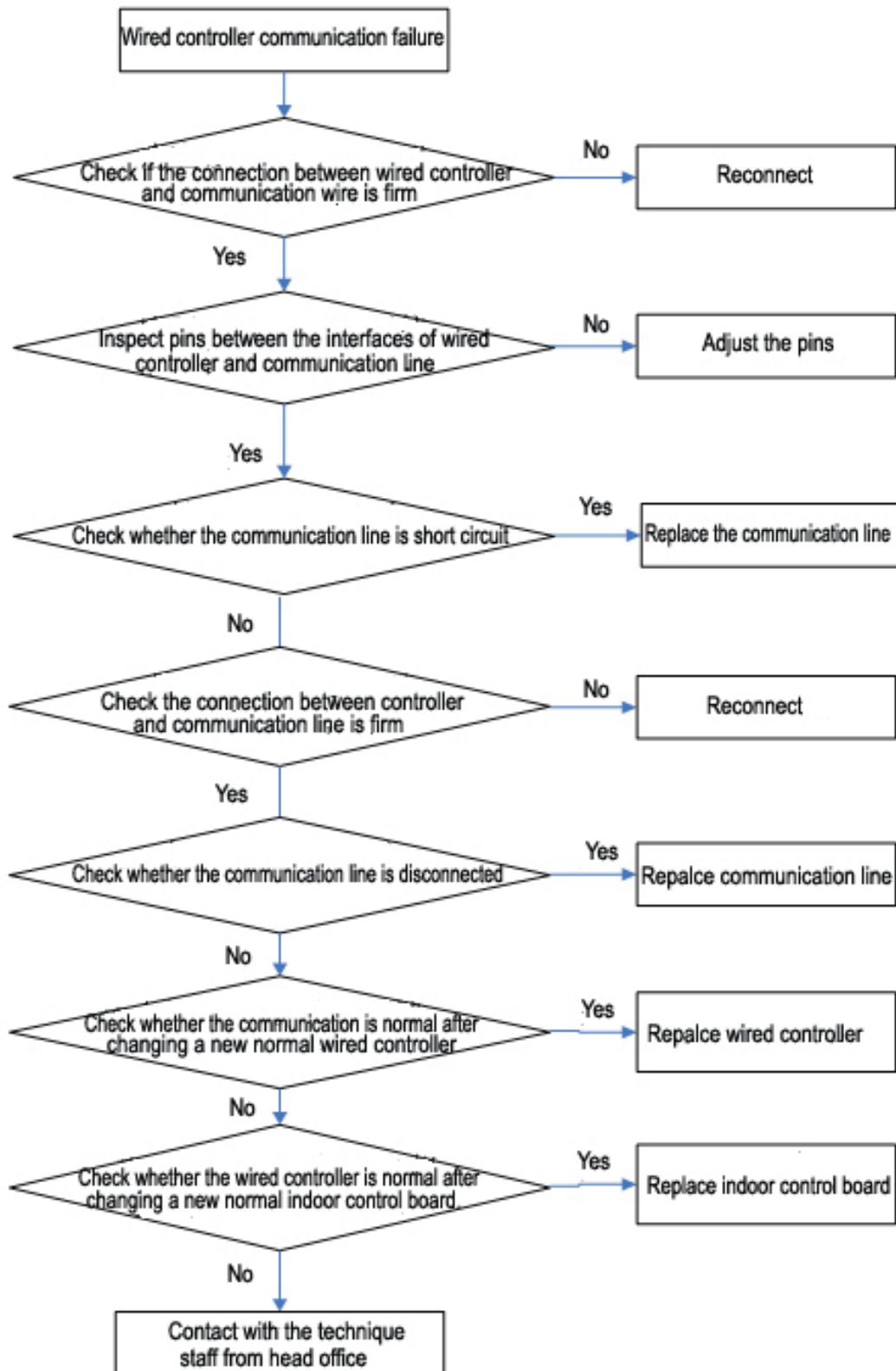
Failure causing	Display mode1 (indication lamp on display lamp board)	Display mode1 (failure lamp on control board)	Display mode3 (wired controller)	Display priority	Phenomenon
Communication failure	Flash 5 times and go out 2S	Flash 2 times and go out 2S	F1	1	shutdown
Wired controller communication failure	—	—	E5	1	shutdown
Drainage system failure	Flash 4 times and go out 2S	—	E4	3	shutdown
Outdoor protection(Phase failure)	Flash6 times and go out 2S	—	E6	2	shutdown
Outdoor protection (discharging over-temperature)	Flash 10 times and go out 2S	Flash 10 times and go out 2S	EA	7	shutdown
High pressure protection	Flash 9 times and go out 2S	Flash 1 times and go out 2S	E9	6	shutdown
Low pressure protection	Flash 9 times and go out 2S	Flash 3 times and go out 2S	E9	6	shutdown

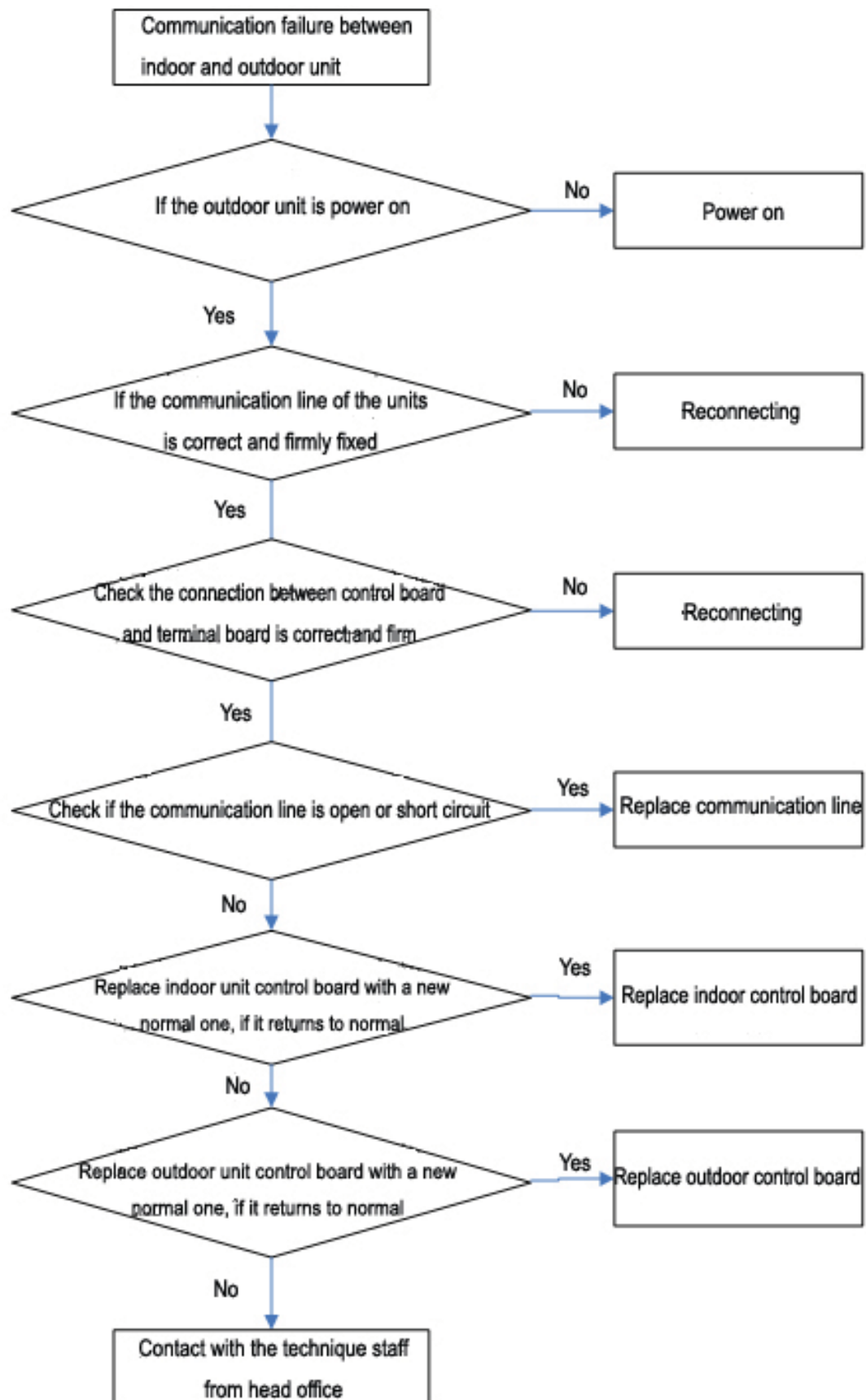
Indoor temp. sensor abnormal(TA)	Flash 1 times and go out 2S	—	E1	4	shutdown
Indoor coil sensor abnormal(TE)	Flash 3 times and go out 2S	—	E3	5	shutdown
Outdoor coil sensor abnormal(TW)	Flash 2 times and go out 2S	Flash 2 times and go out 2S	E2	8	non-stop
Outdoor condensate temp. Sensor abnormal(TL)	Flash 7 times and go out 2S	Flash 7 times and go out 2S	E7	9	non-stop
Discharging temp. sensor abnormal(TP)	Flash 8 times and go out 2S	Flash 8 times and go out 2S	E8	10	non-stop

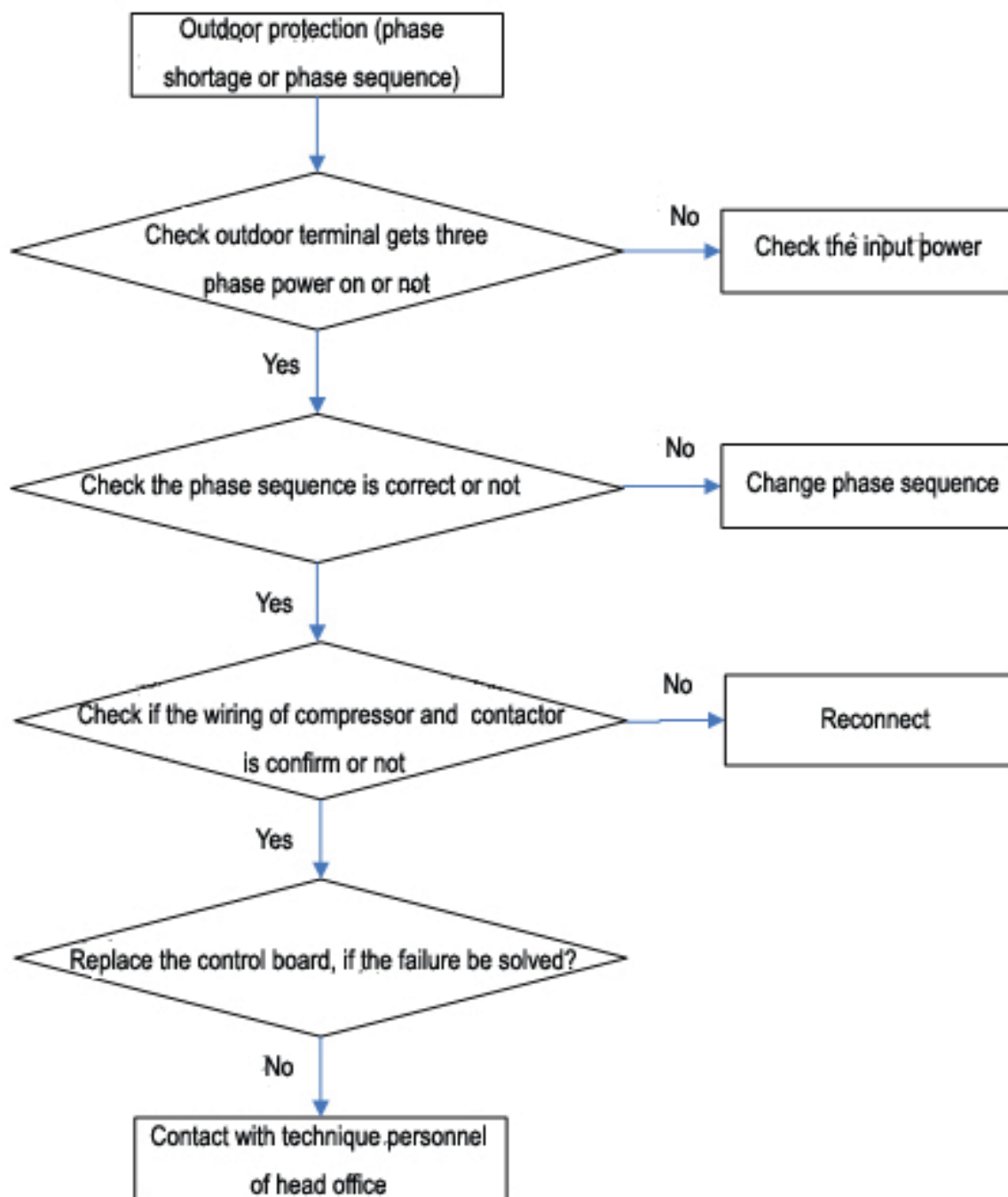
Note: When correct signal has not been received by wired control or main control board in 2 consecutive min, then the unit turns off and indicates relative failure code, once communication renew and failure code disappears automatically.

Failure analysis

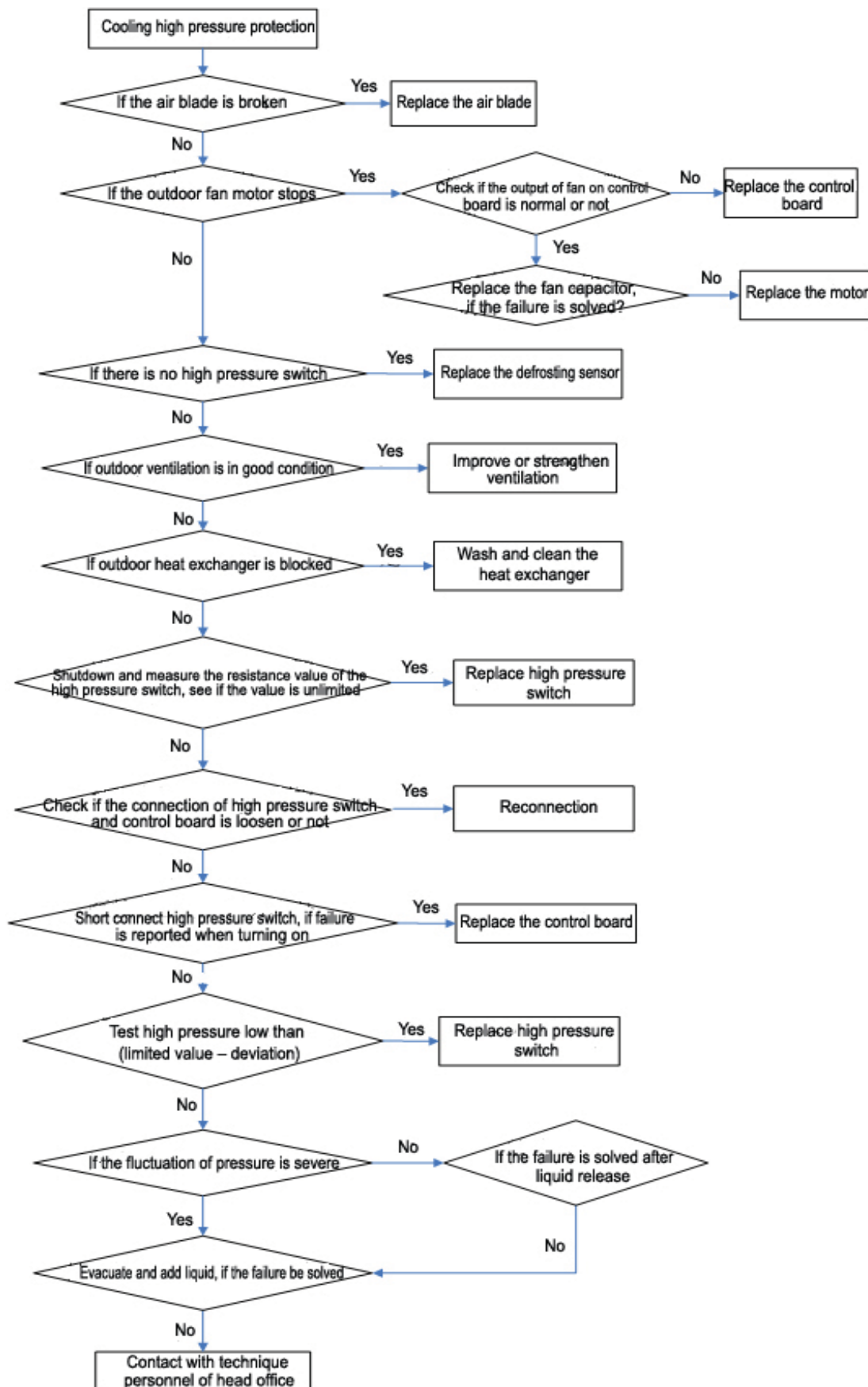
Wired controller communication failure



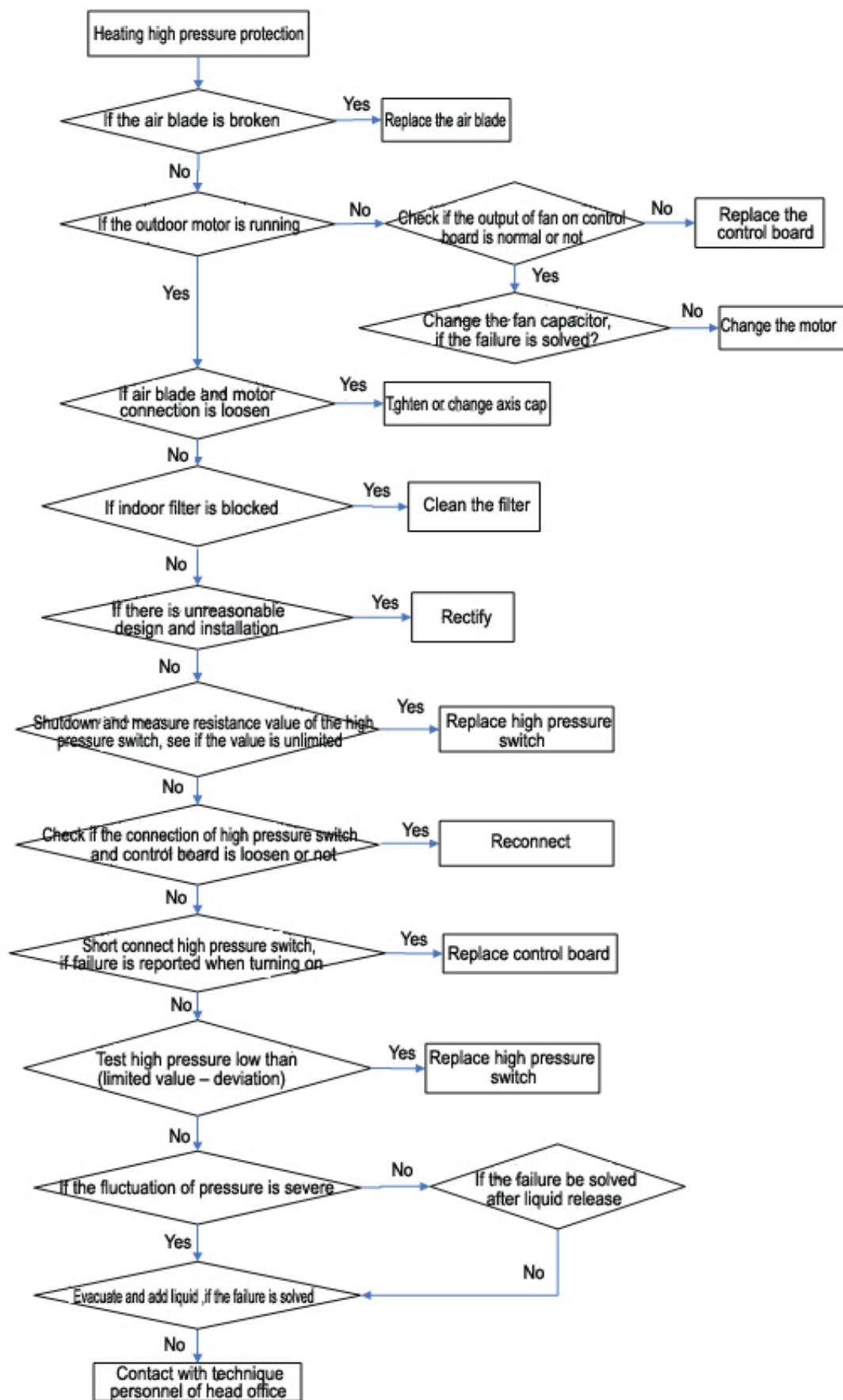
Communication failure between indoor and outdoor unit

Outdoor protection(phase sequence)

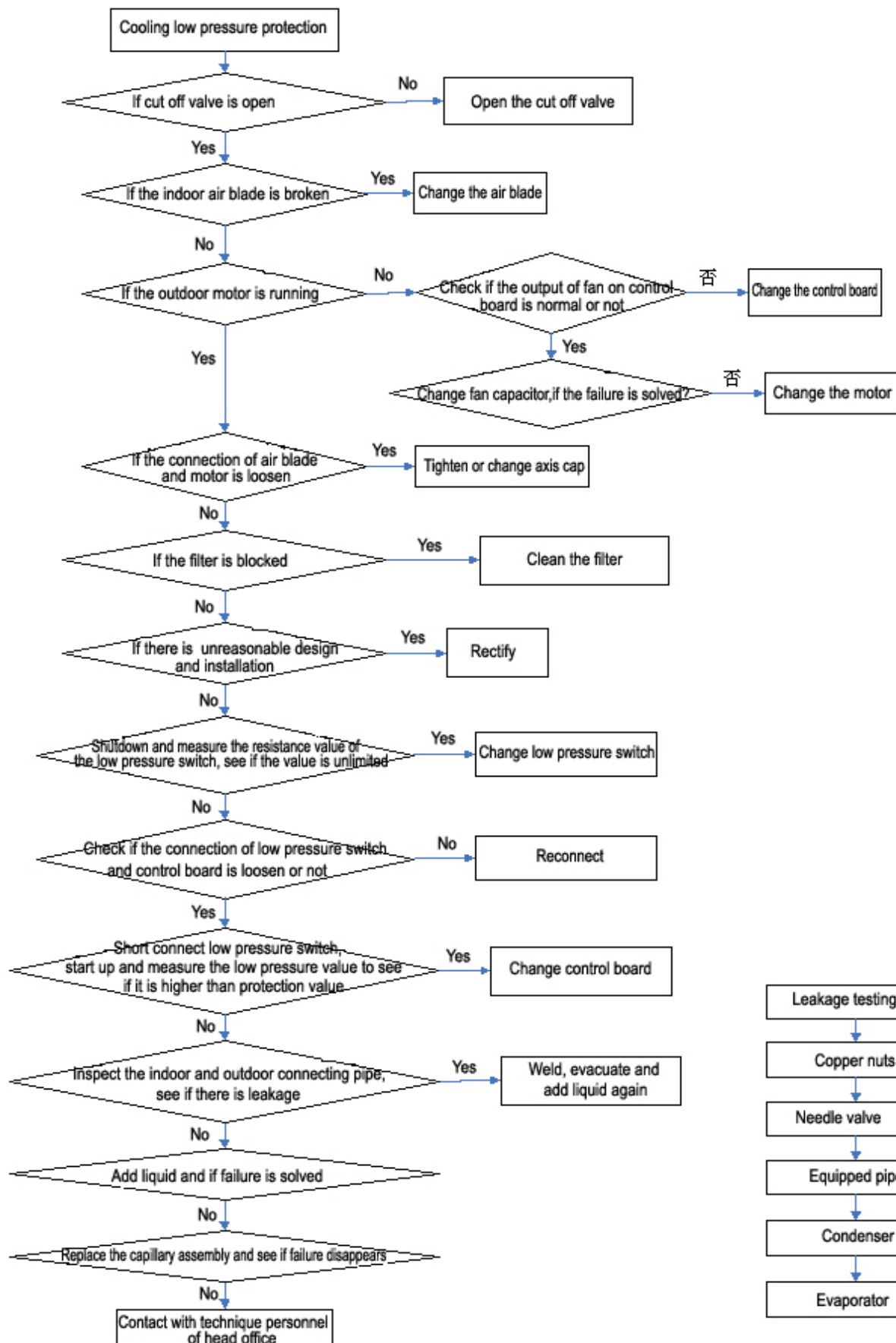
Cooling high pressure protection



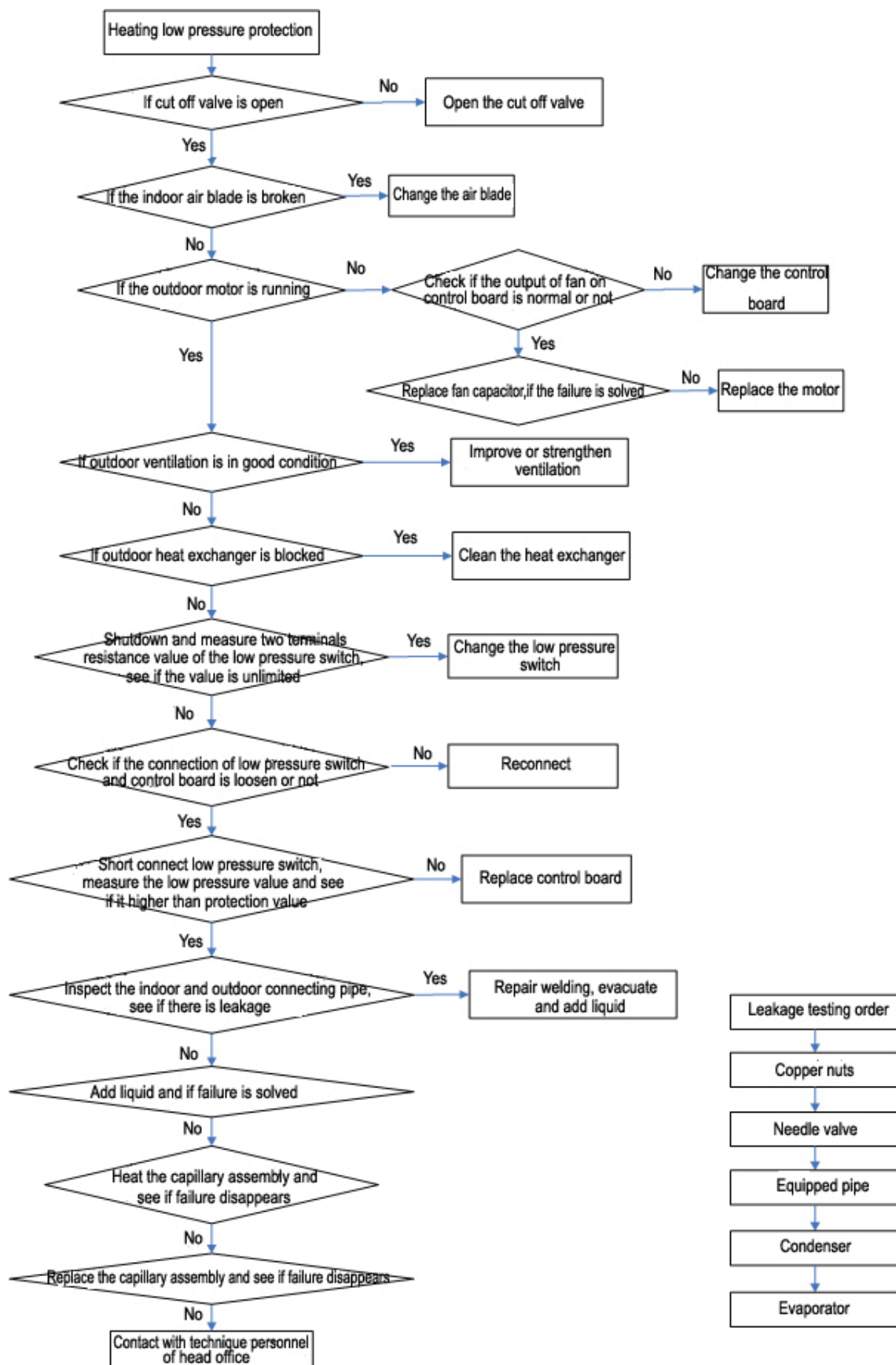
Heating high pressure protection



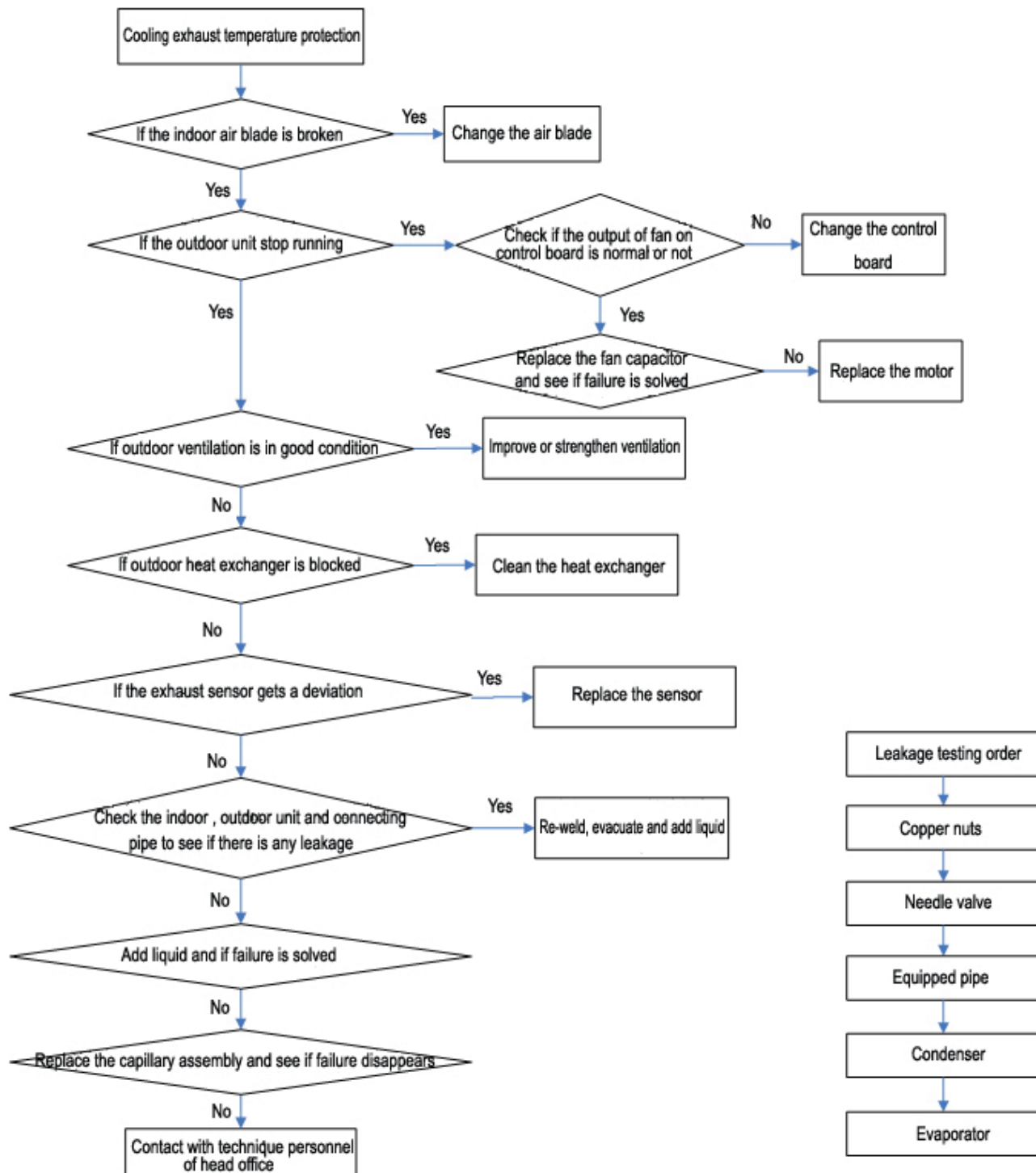
Cooling low pressure protection



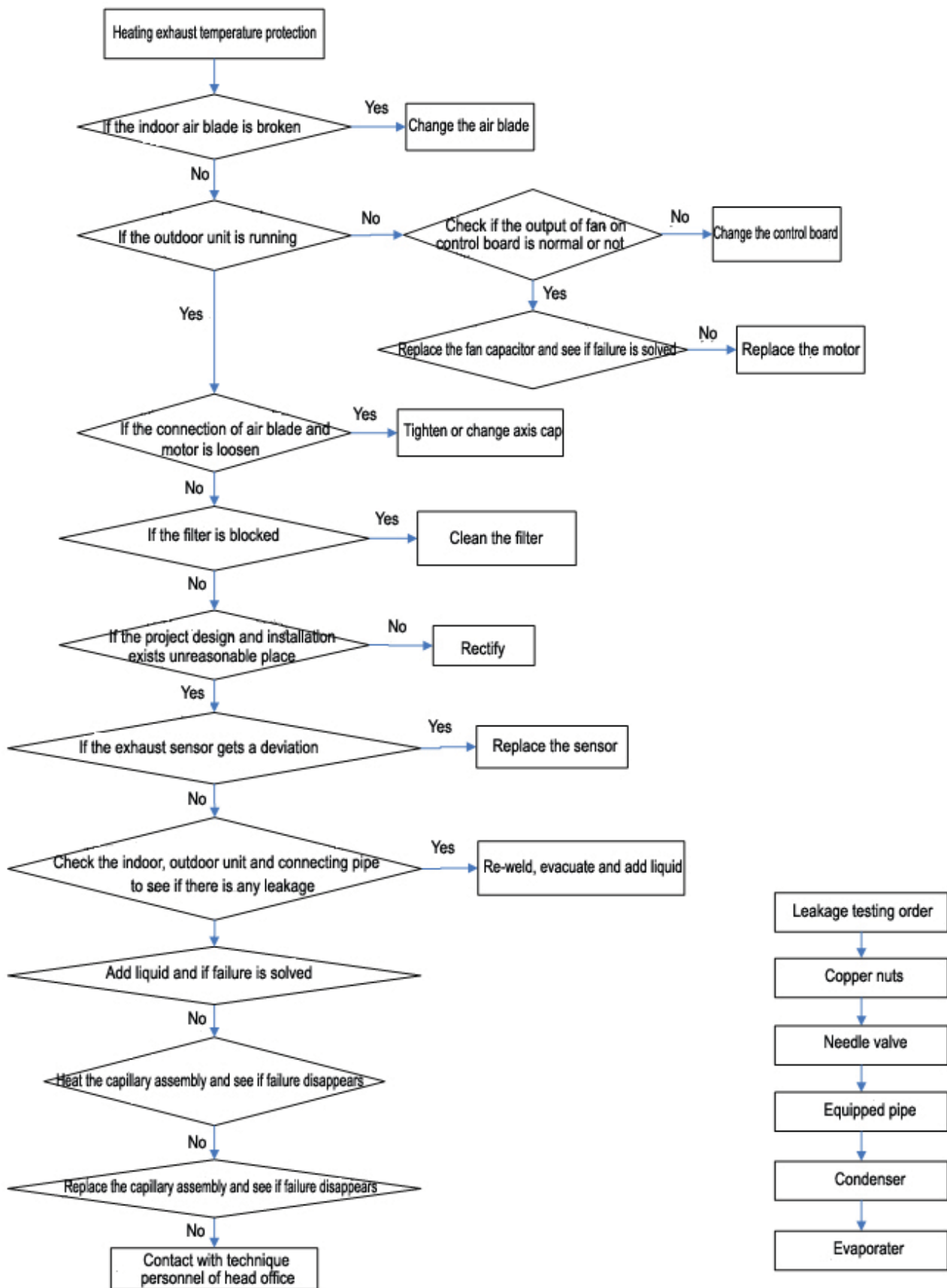
Heating low pressure protection



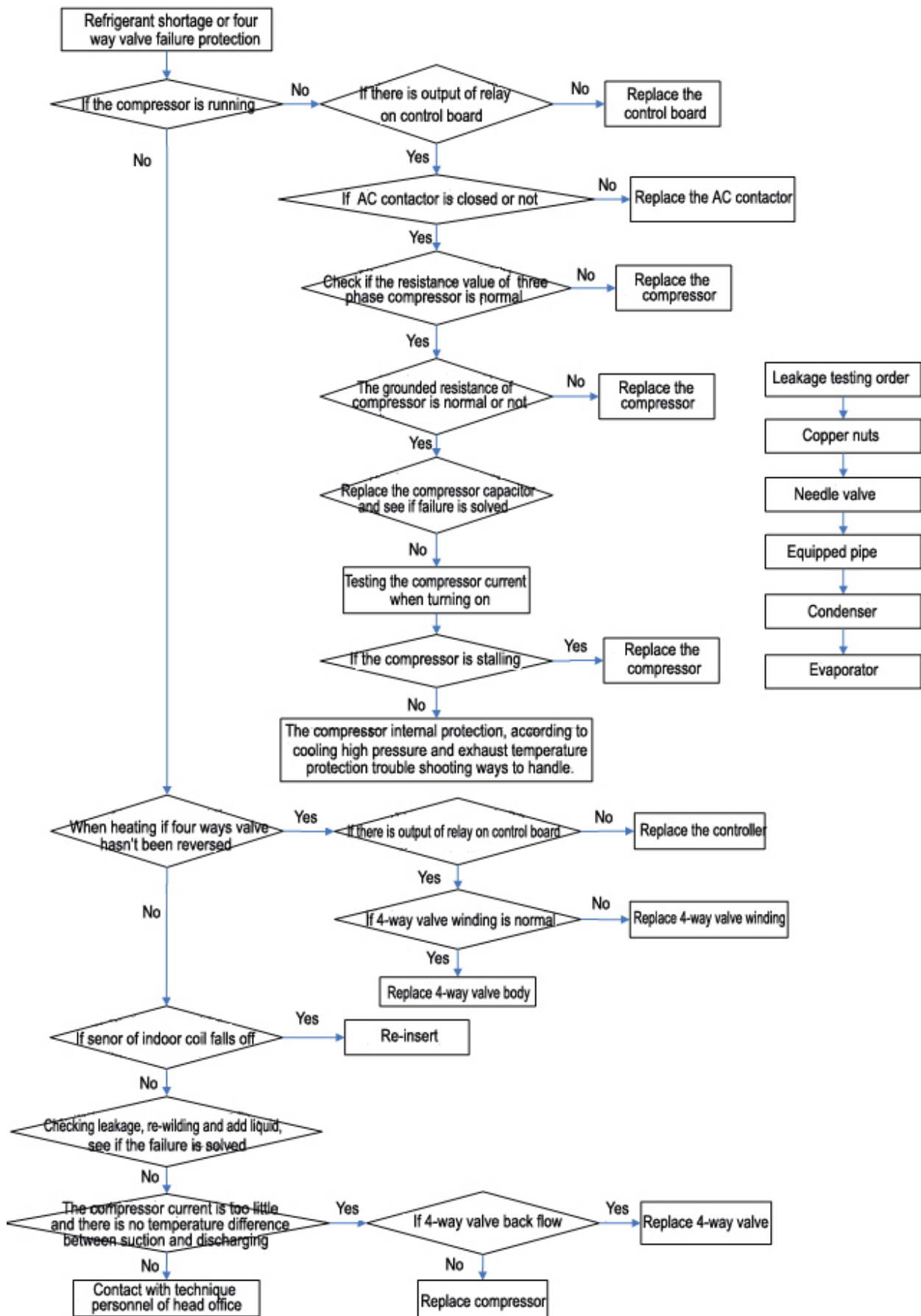
Cooling exhaust temperature protection

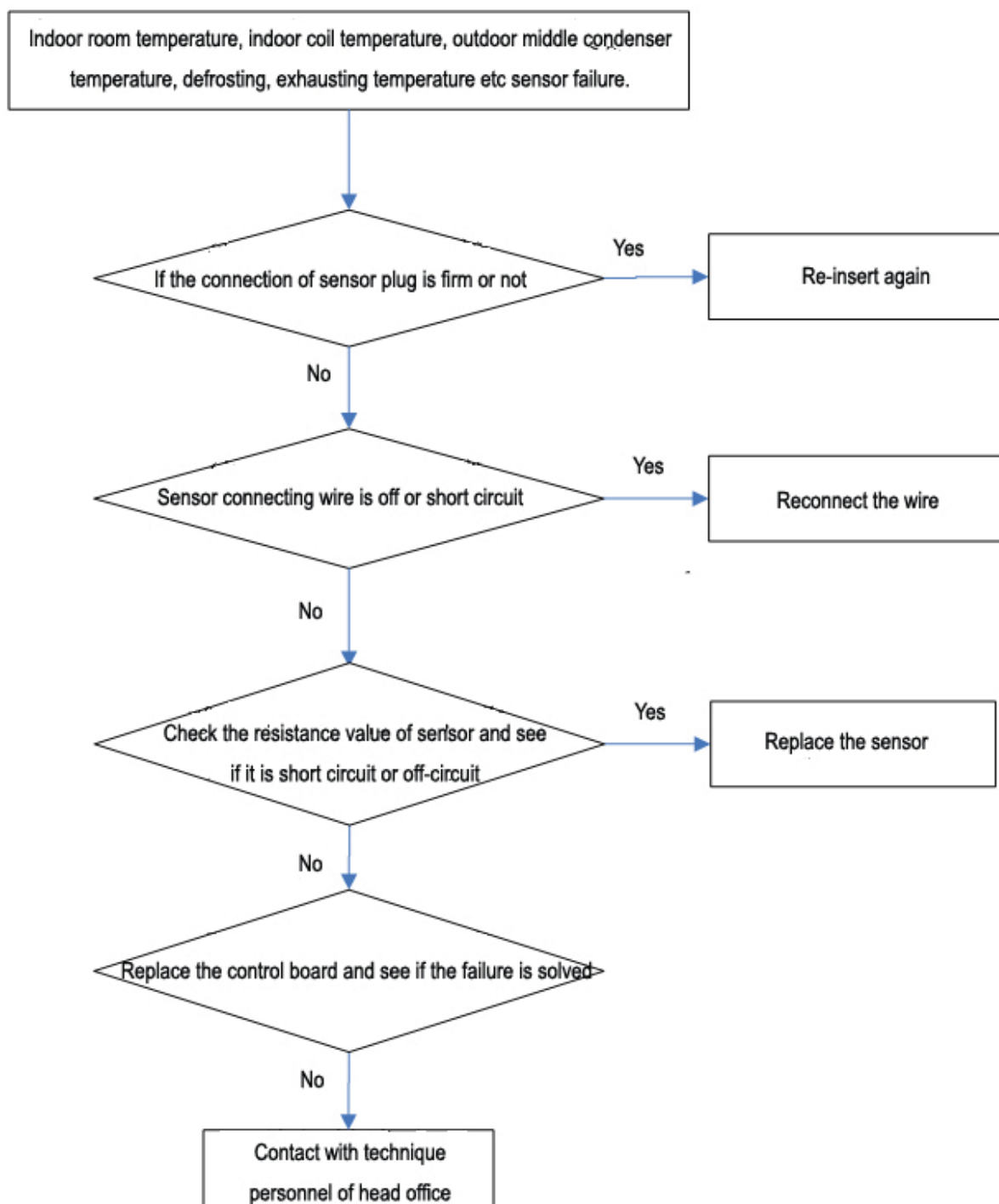


Heating exhaust temperature protection

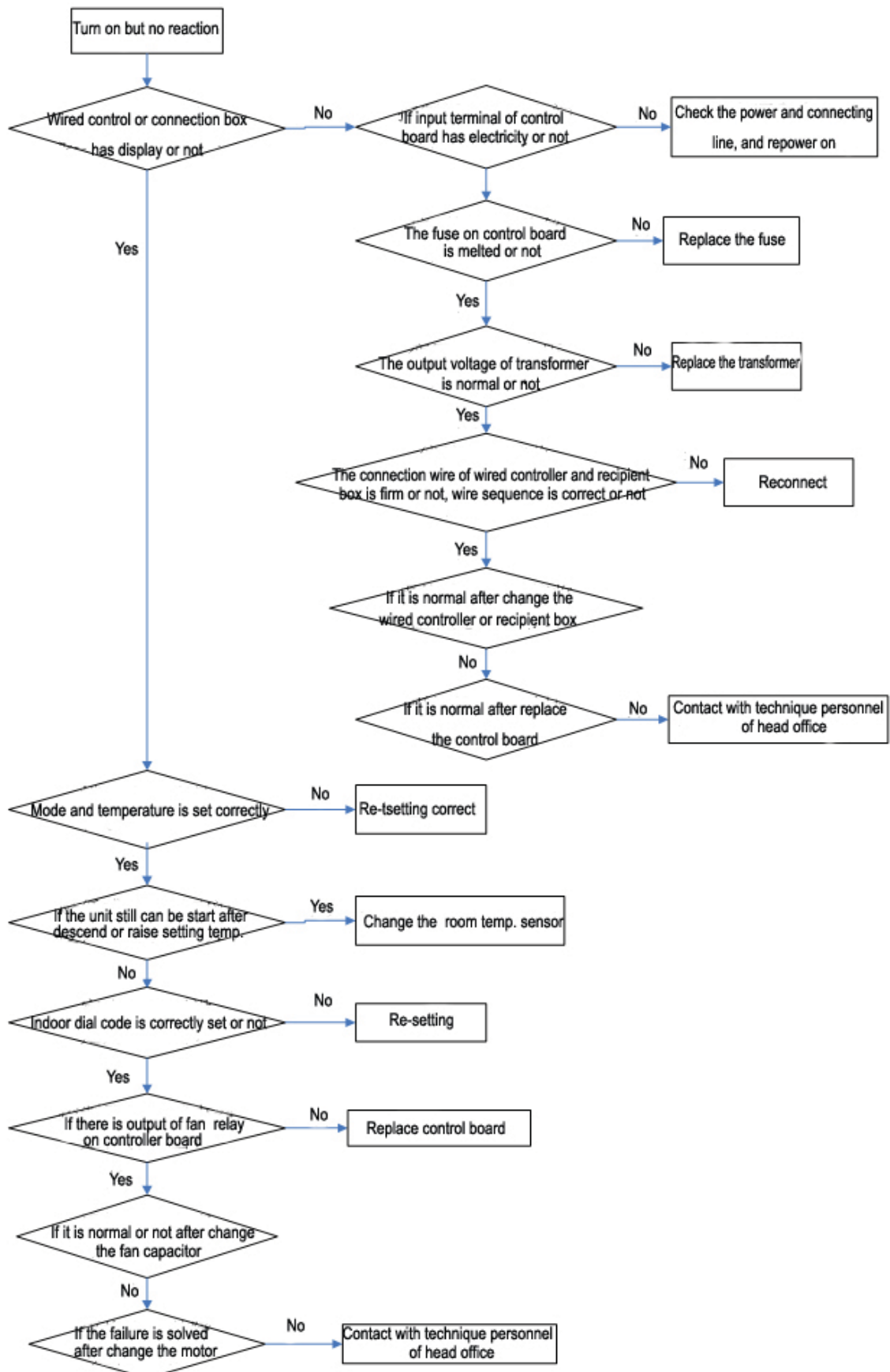


Refrigerant shortage or four way valve failure protection

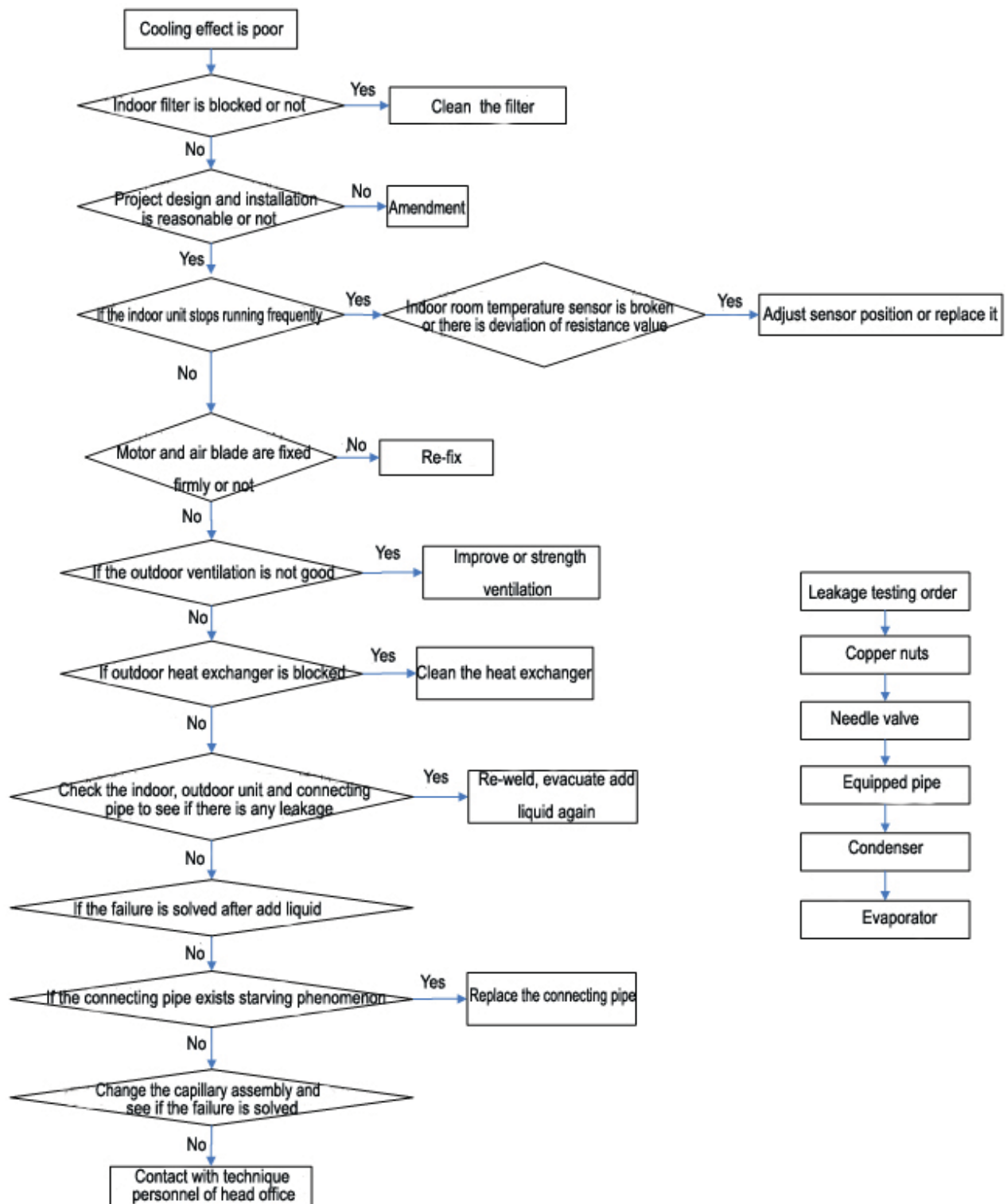


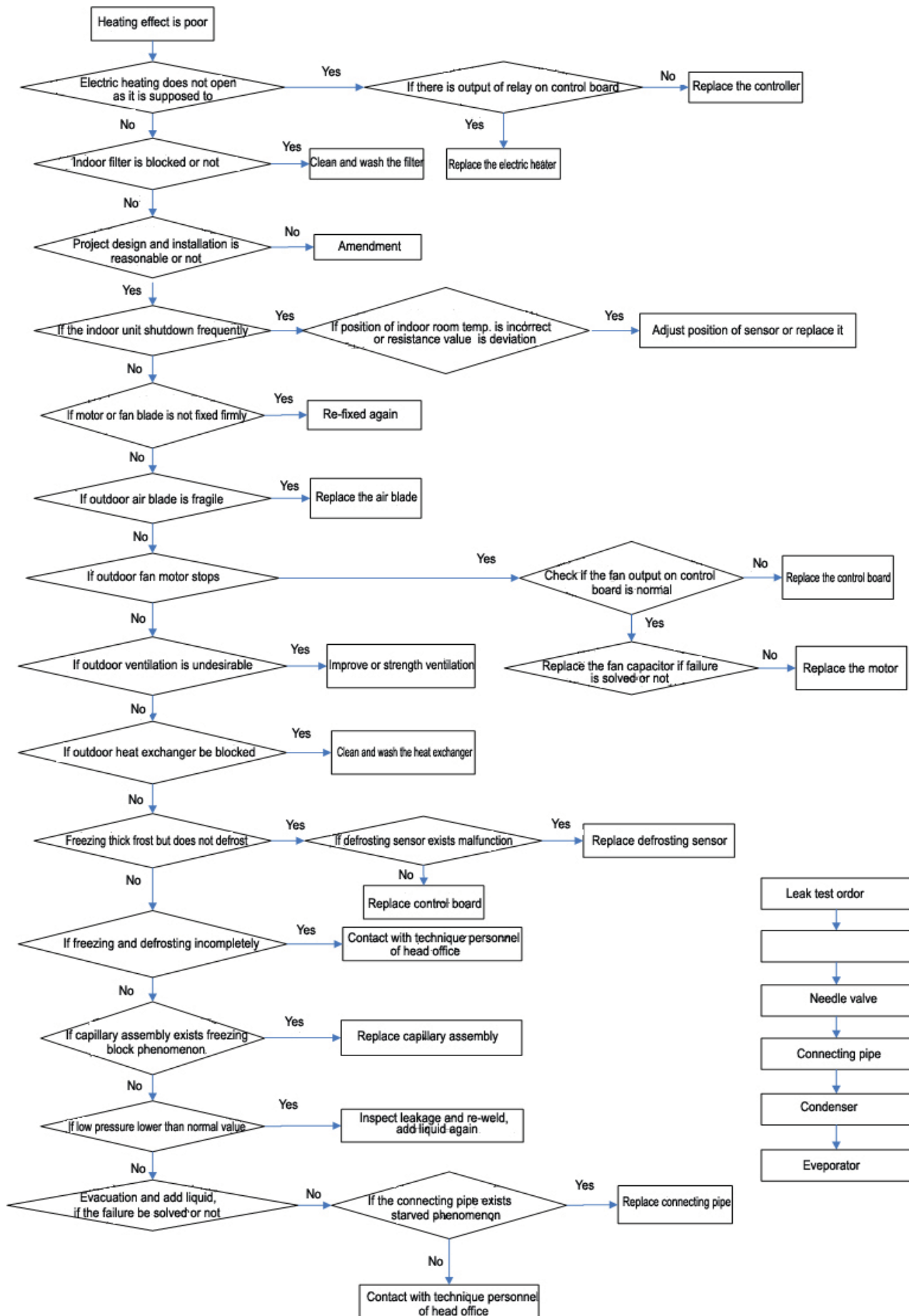
Sensor failure protection

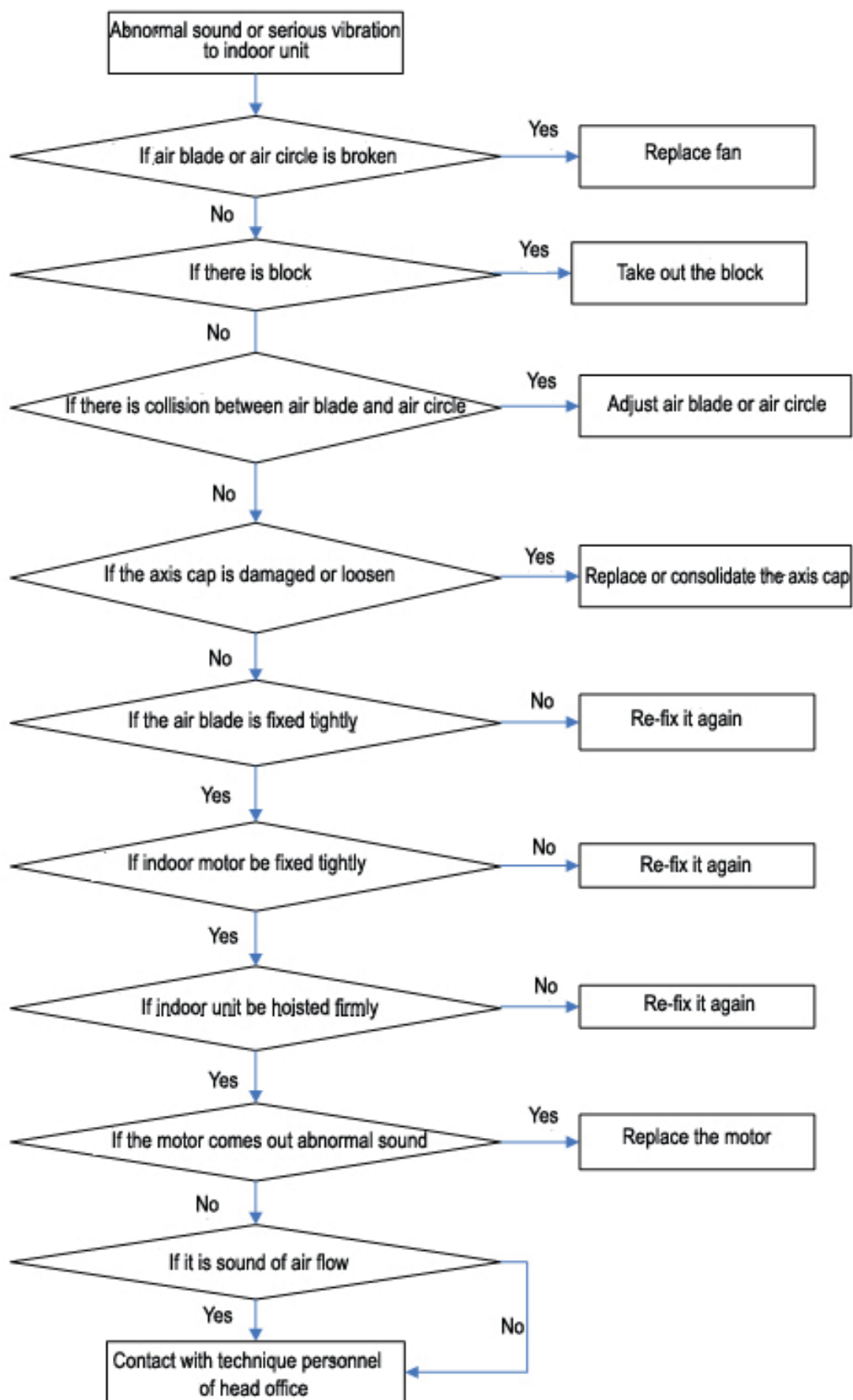
No action after power-on

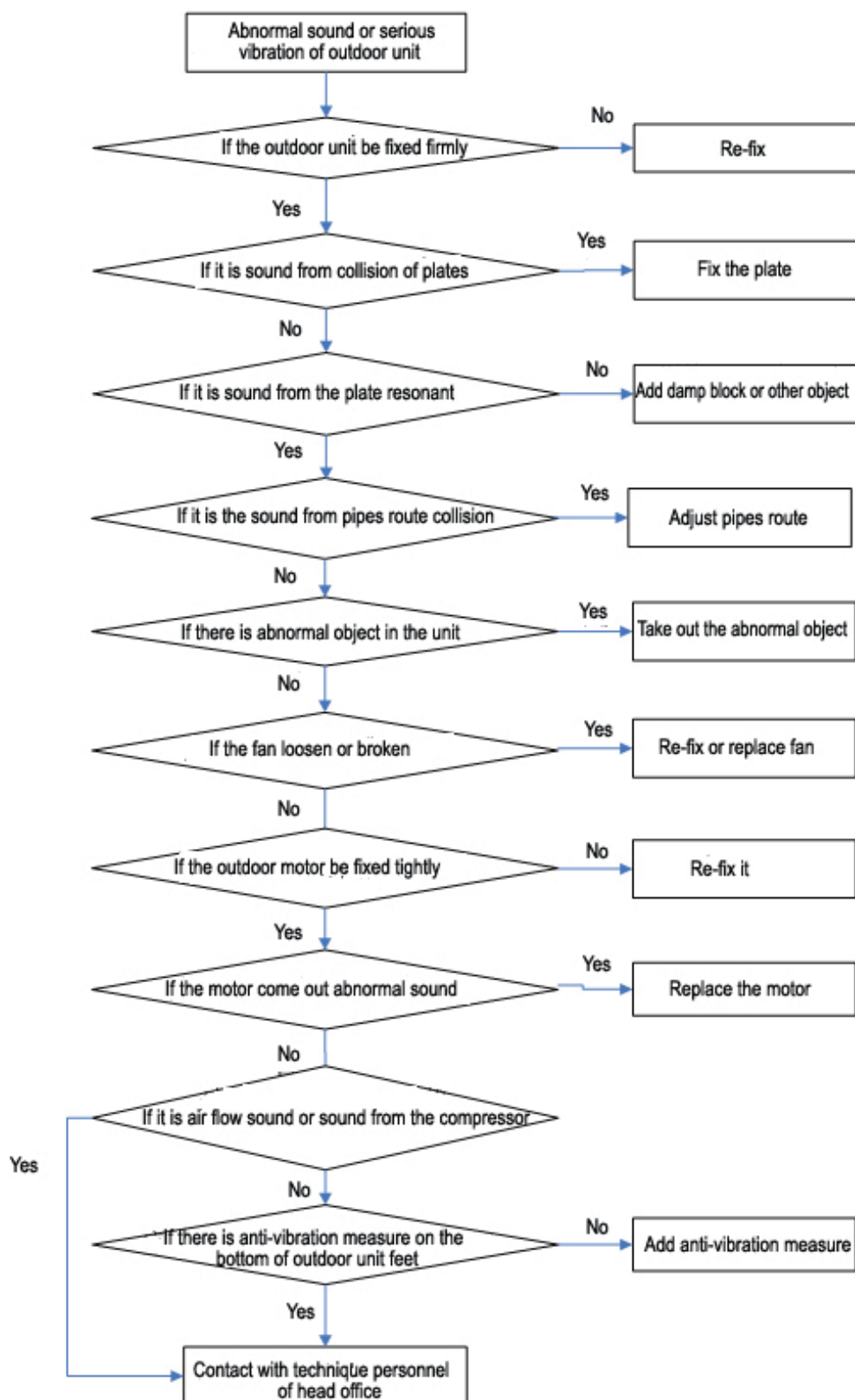


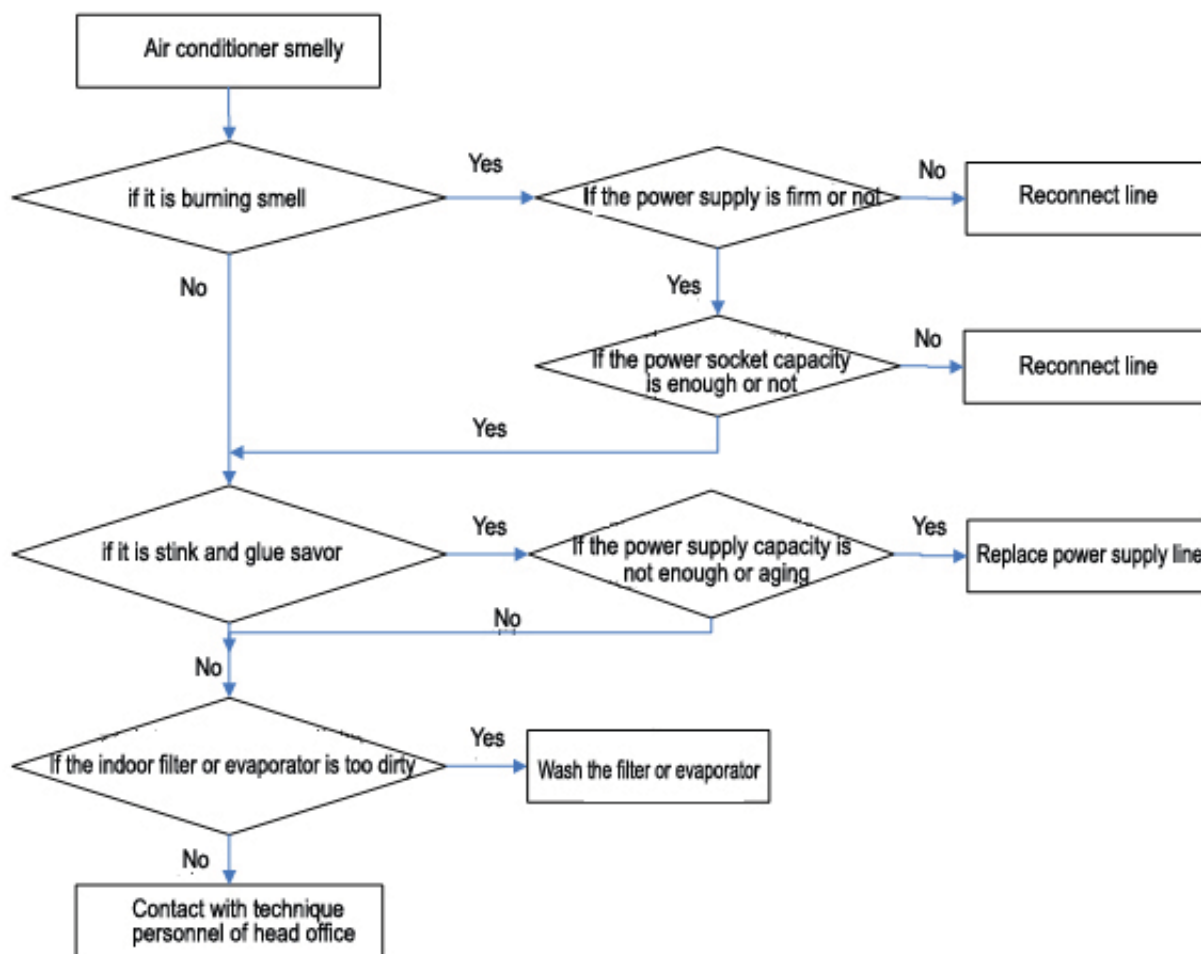
Poor effect

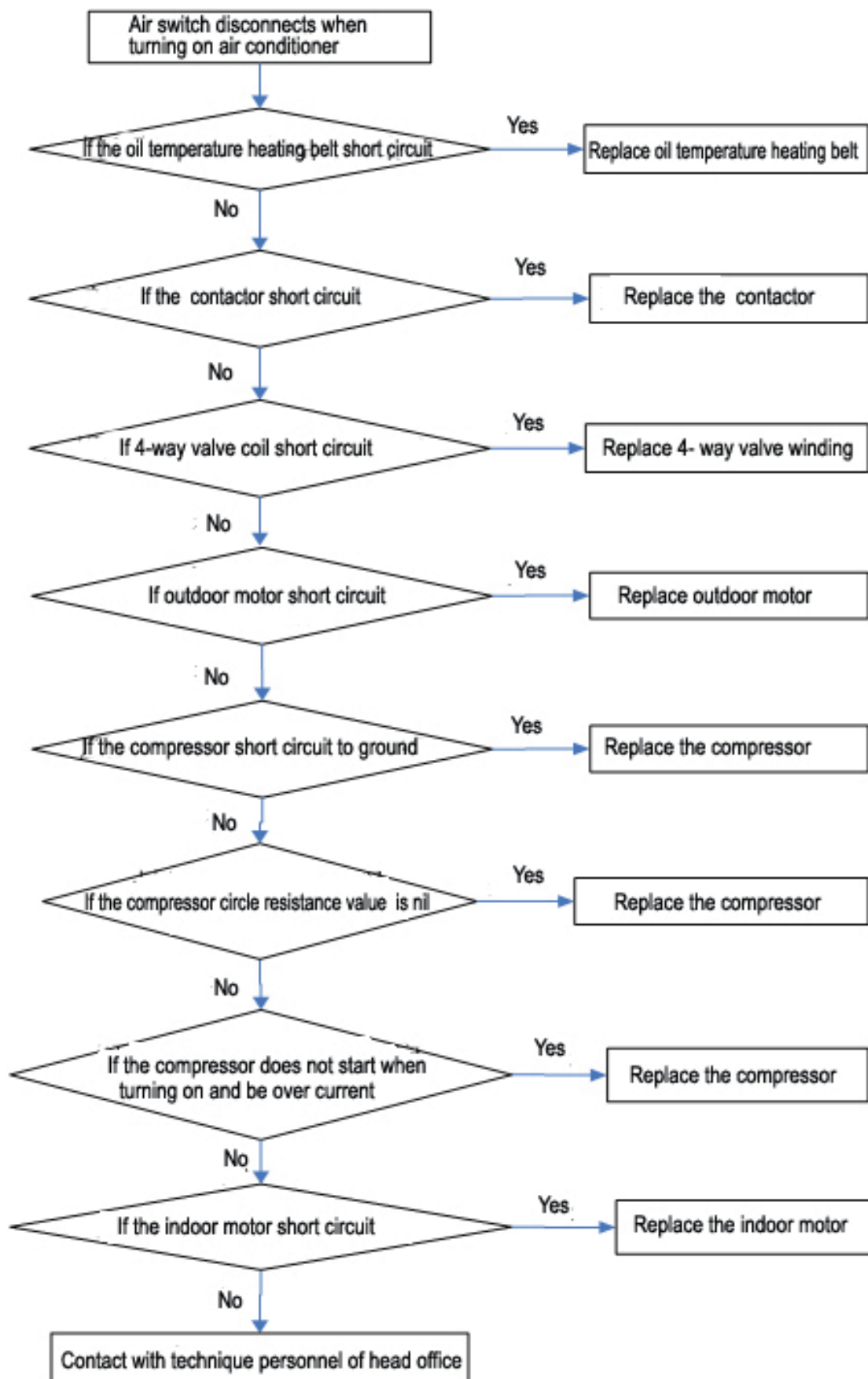




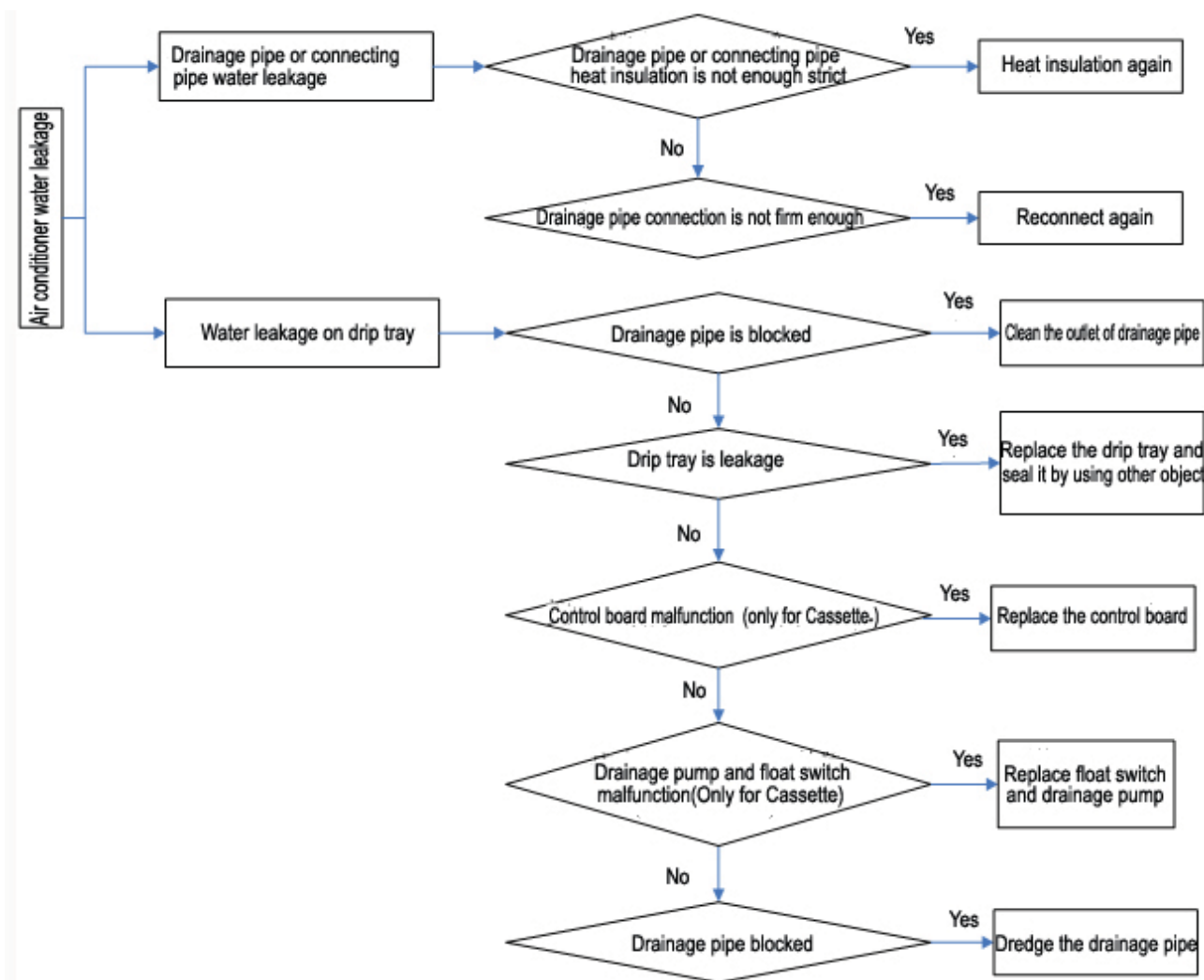
Abnormal sound or vibration



Abnormal odor

Air switch action when air conditioner starting up

Air conditioner water leakage



Sensor resistance table

Coil and environment temperature sensor 5K3470 resistance reference table

Coil and environment temperature sensor 5K3470					
Tx(°C)	Average (KΩ)	Tx(°C)	Average (KΩ)	Tx(°C)	Average (KΩ)
-20	72.99	21	5.854	61	1.421
-19	35.16	22	5.626	62	1.376
-18	33.43	23	5.408	63	1.334
-17	31.80	24	5.199	64	1.293
-16	30.26	25	5.000	65	1.254
-15	28.80	26	4.811	66	1.215
-14	27.42	27	4.630	67	1.179
-13	26.12	28	4.456	68	1.143
-12	24.88	29	4.291	69	1.109
-11	23.71	30	4.132	70	1.076
-10	22.60	31	3.980	71	1.044
-9	21.55	32	3.835	72	1.013
-8	20.56	33	3.695	73	0.9837
-7	19.61	34	3.562	74	0.9550
-6	18.72	35	3.434	75	0.9273
-5	17.87	72	3.311	76	0.9005
-4	17.06	37	3.193	77	0.8746
-3	16.30	38	3.081	78	0.8496
-2	15.57	39	2.972	79	0.8254
-1	14.88	40	2.869	80	0.8021
0	14.23	41	2.769	81	0.779
1	13.60	42	2.673	82	0.758
2	13.01	43	2.581	83	0.737
3	12.45	44	2.493	84	0.716
4	11.91	45	2.409	85	0.696
5	11.40	46	2.307	86	0.677
6	10.92	47	2.249	87	0.658
7	10.46	48	2.174	88	0.641
8	10.02	49	2.102	89	0.623
9	9.596	50	2.032	90	0.606
10	9.197	72	1.965	91	0.590
11	8.817	52	1.901	92	0.574
12	8.454	53	1.839	93	0.559
13	8.108	54	1.780	94	0.544
14	7.779	55	1.722	95	0.530
15	7.464	56	1.667	96	0.726
16	7.164	57	1.614	97	0.502

17	6.877	58	1.563	98	0.489
18	6.603	59	1.724	99	0.476
19	6.342	60	1.466	100	0.464
20	6.092				

Exhaust temperature sensor 6.339K3954

Exhaust temperature sensor R80: 6.339K Ω ±1% B25/80=3954K±1%							
T [°C]	Rmin [K Ω]	T [°C]	Rmin [K Ω]	T [°C]	Rmin [K Ω]	T [°C]	Rmin [K Ω]
-20	440.7	20	60.42	60	12.32	100	3.377
-19	417.0	21	57.79	61	11.89	101	3.279
-18	394.7	22	55.29	62	11.48	102	3.184
-17	373.7	23	52.91	63	11.08	103	3.093
-16	353.9	24	50.65	64	10.70	104	3.003
-15	335.2	25	48.49	65	10.34	105	2.918
-14	317.7	26	46.44	66	9.992	106	2.836
-13	301.2	27	44.49	67	9.652	107	2.755
-12	285.6	28	42.64	68	9.328	108	2.678
-11	271.0	29	40.88	69	9.017	109	2.603
-10	257.1	30	39.19	70	8.717	110	2.530
-9	244.0	31	37.59	71	8.428	111	2.460
-8	231.7	32	36.06	72	8.152	112	2.392
-7	220.0	33	34.59	73	7.885	113	2.326
-6	209.0	34	33.21	74	7.628	114	2.262
-5	198.6	35	31.88	75	7.381	115	2.201
-4	188.7	36	30.60	76	7.143	116	2.141
-3	179.4	37	29.39	77	6.914	117	2.083
-2	170.7	38	28.23	78	6.693	118	2.026
-1	162.4	39	27.13	79	6.480	119	1.972
0	154.5	40	26.07	80	6.276	120	1.920
1	147.1	41	25.06	81	6.075	121	1.868
2	140.0	42	24.09	82	5.881	122	1.819
3	133.3	43	23.17	83	5.694	123	1.772
4	127.1	44	22.29	84	5.514	124	1.725
5	121.1	45	21.44	85	5.340	125	1.680
6	115.4	46	20.64	86	5.175	126	1.636
7	109.9	47	19.86	87	5.014	127	1.594
8	104.9	48	19.13	88	4.859	128	1.552
9	100.0	49	18.42	89	4.711	129	1.513
10	95.43	50	17.74	90	4.567	130	1.475
11	91.07	51	17.09	91	4.429	131	1.437
12	86.93	52	16.46	92	4.294	132	1.401
13	83.00	53	15.87	93	4.166	133	1.365

14	79.26	54	15.30	94	4.040	134	1.331
15	75.71	55	14.74	95	3.920	135	1.297
16	72.33	56	14.22	96	3.803	136	1.266
17	69.13	57	13.71	97	3.691	137	1.234
18	66.08	58	13.23	98	3.583	138	1.204
19	63.18	59	12.77	99	3.478	139	1.174

System principle diagram

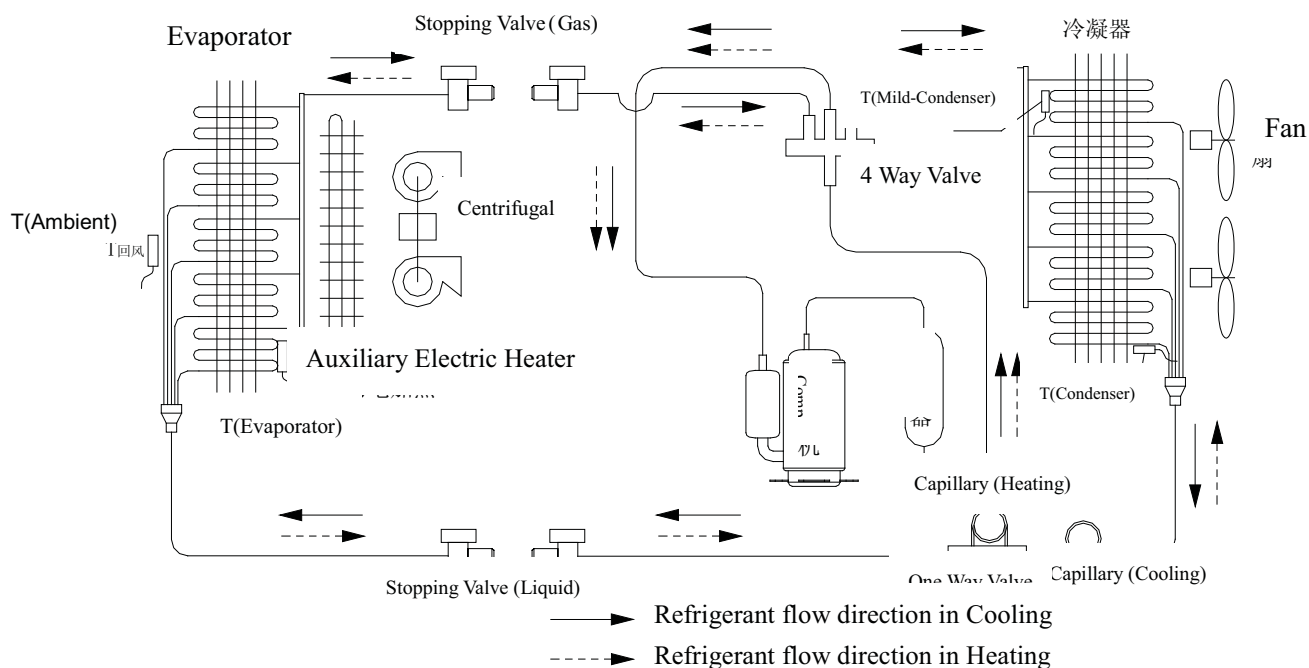
Cooling circle:

the Compressor inhales the low-temperature and low-pressure refrigerant vapor from the evaporator, and vapor be turned into high-temperature and high-pressure gas then enters into condenser, the high-temperature and high-pressure refrigerant gas and outdoor air make heat exchange in the condenser, the compressed vapor is then cooled by heat exchange with the outside air, so that the vapor condenses to be a high-temperature and high-pressure fluid, and then through capillary throttling to cooled, low pressure, then the liquid enters into the evaporator and two-phase of gas and liquid refrigerant in the evaporator completely evaporate, thereby cooling the indoor air; from evaporator the vapor is inhaled into compressor again, so it runs continuously cycle to cycle, cooled air is continuous supplied to the air-conditioned area though Duct by fan motor.

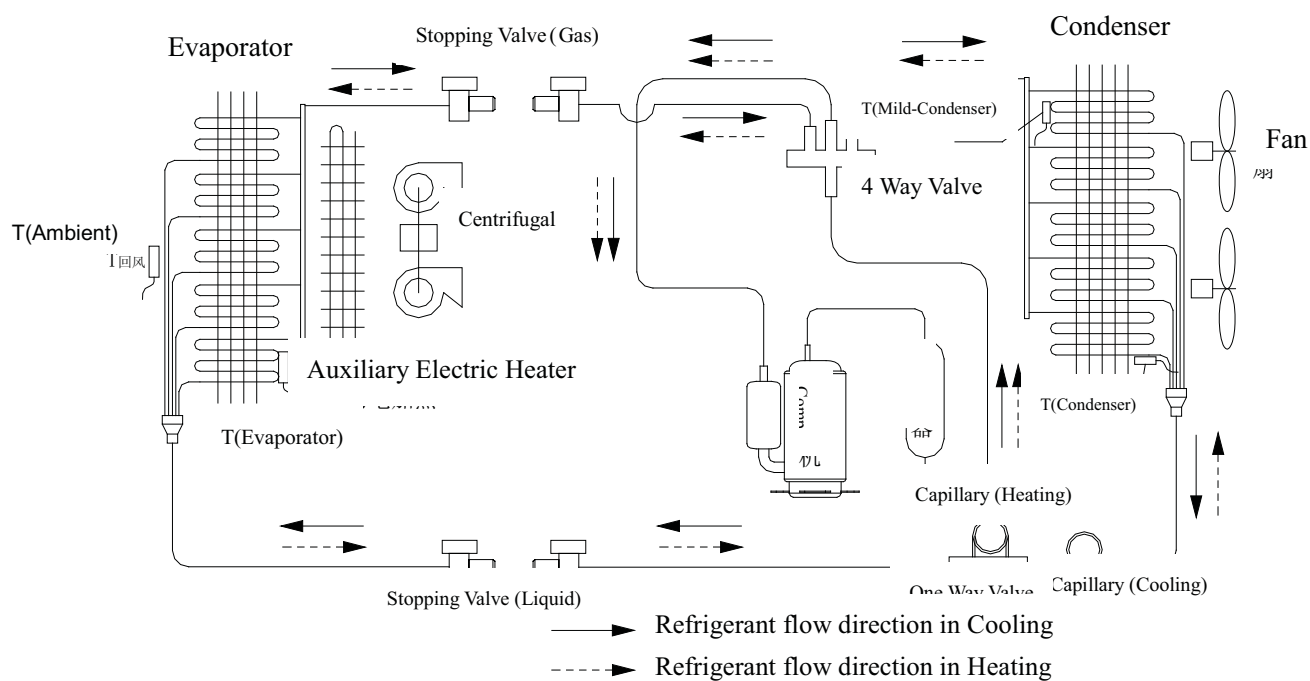
Heating cycle:

It is the contrary cycle of cooling cycle, at this moment the 4-way valve changes direction, and make refrigerant flow to direction changer, that is, the vapor discharged from the compressor enters into the indoor heat exchanger to condense, the condensation of refrigerant after the capillary expenditure, evaporates in the outdoor heat exchanger, and then inhaled by the compressor after evaporation, so it runs continuously periodically, the heated air is continuous supplied to the air-conditioned area though duct by fan motor.

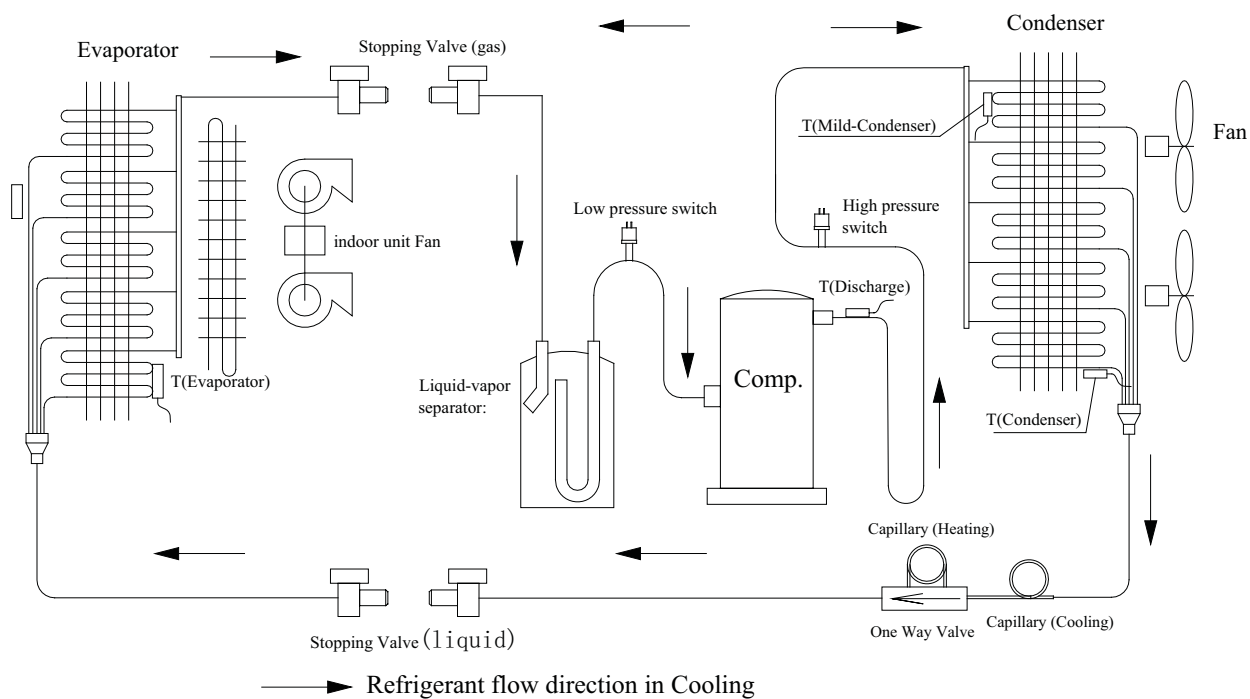
CCA12 / CCA18



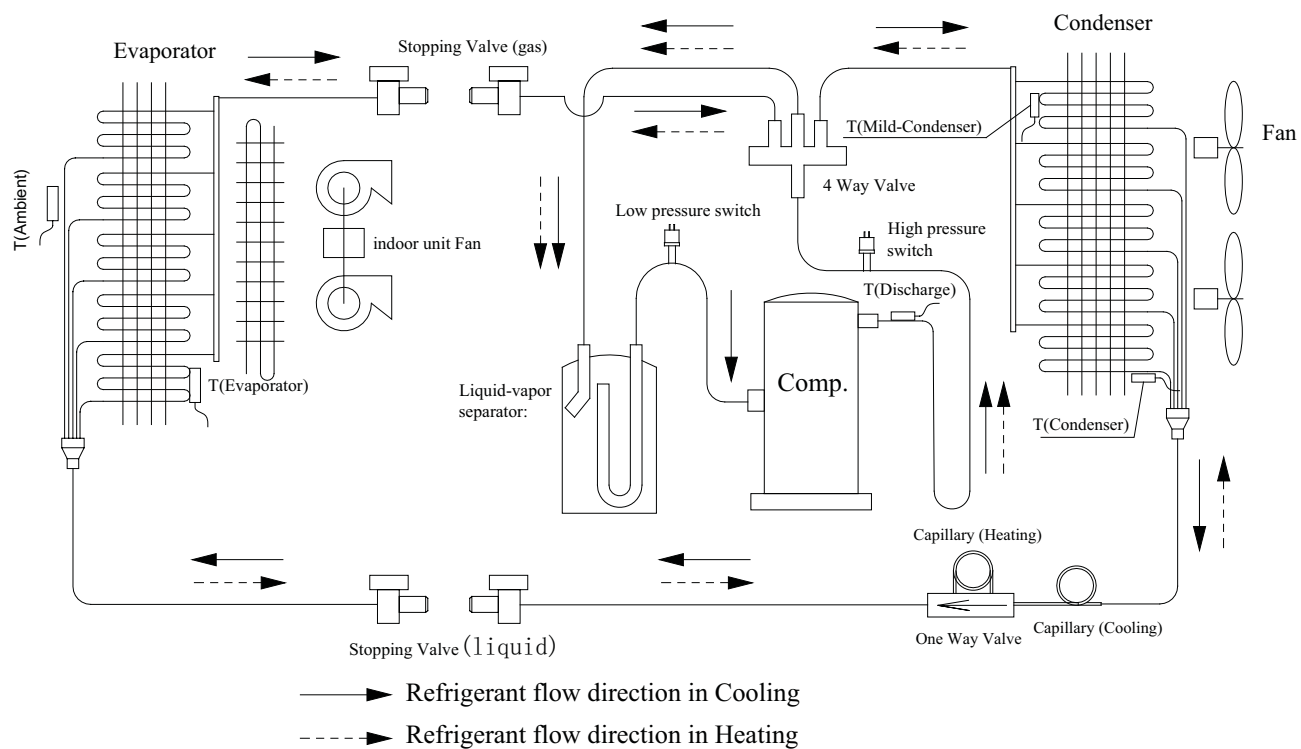
CCA24



CCA36

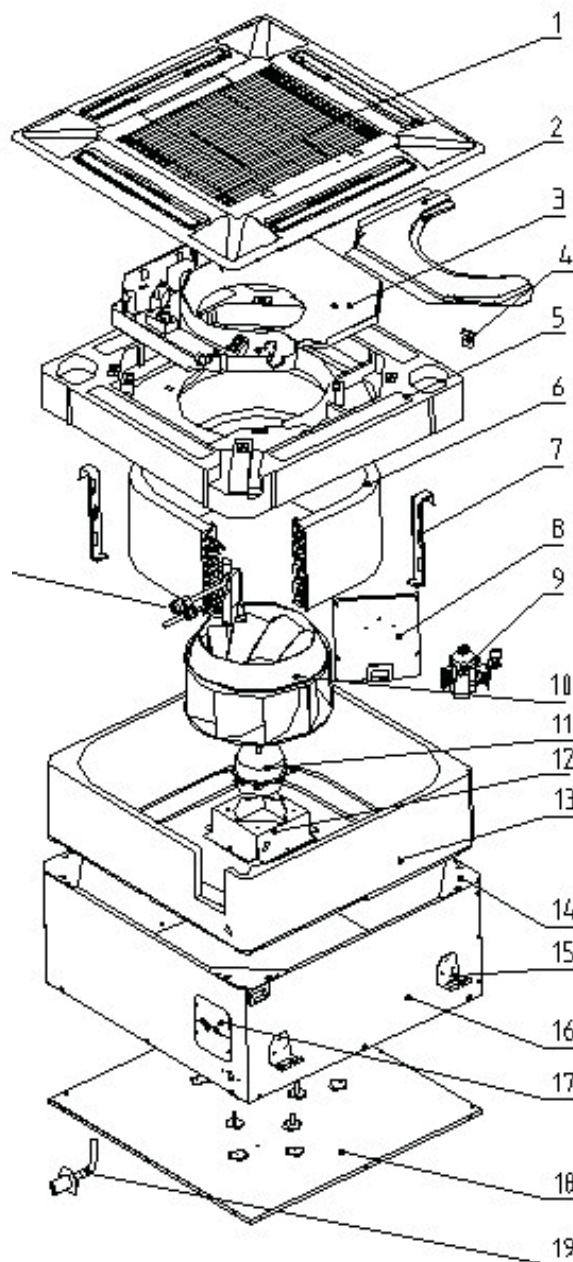


CCA48 / CCA60



Exploded view

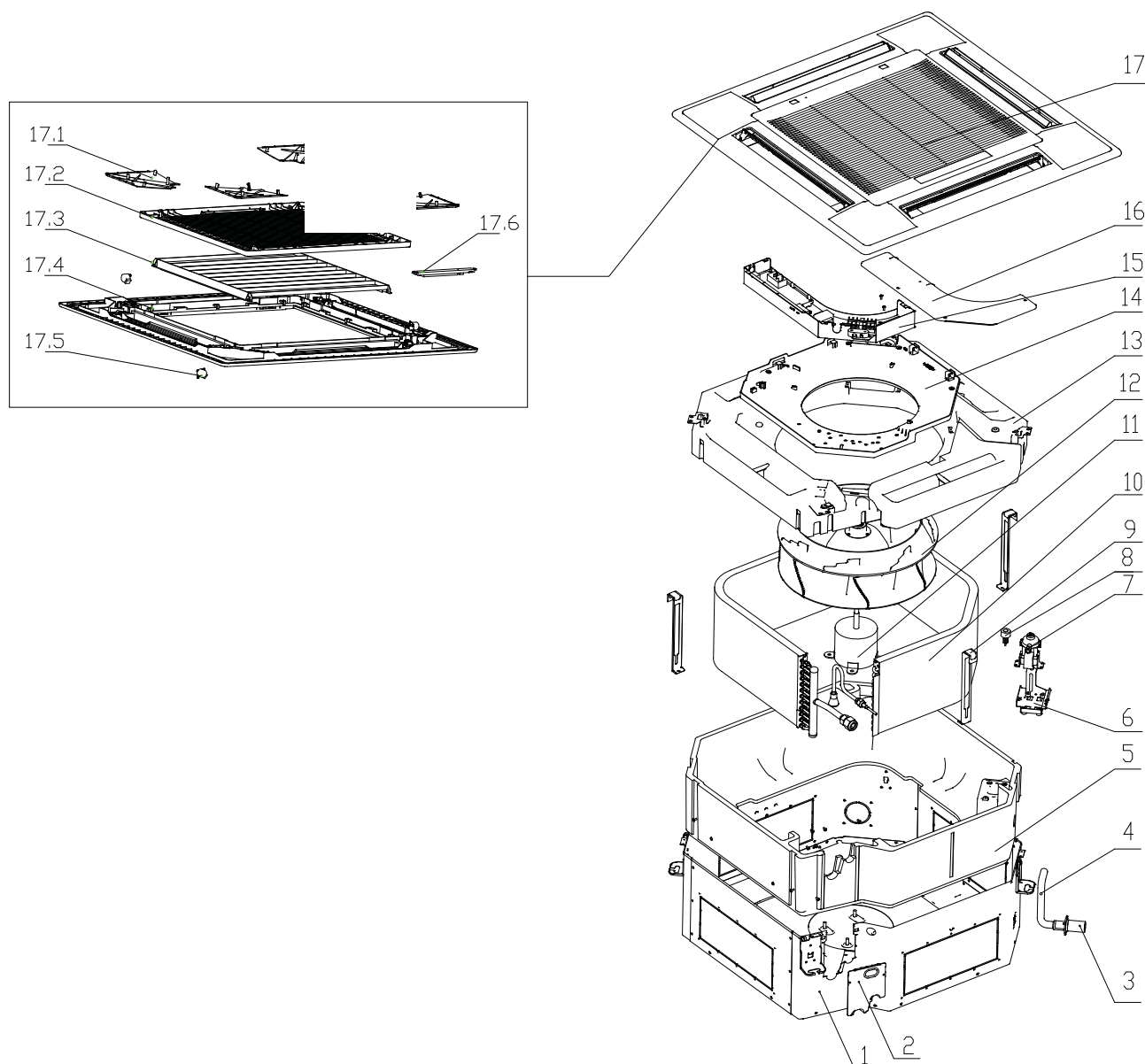
CEA12 / CEA18



N0.	Part Name	Quantity	Remark
1	Panel MB13	1	
1.1	Return-air grille assembly	1	
1.2	Air filter net	1	
1.3	guide wind vane	4	
1.4	Step motor	4	24BYJ48-2
1.5	Display board	1	SX-DISP-01
1.6	Panel frame assembly	1	
2	Cover for electric components	1	
3	Electric assembly	1	
3.1	capacitance	1	2.5 μ F/450V a.c

3.2	PCB board	1	QRDL-3F(2S)-SYE1
3.3	Transformer	1	TDB-8-B(PTC)
3.4	Terminal board	1	600V 2.5mm ²
3.5	Sensor 1	1	
3.6	Sensor 2	1	
4	Rubber plug	1	
5	Water pan	1	
6	Evaporator assembly	1	
6.1	Evaporator part	1	
6.2	Evaporator outlet tube assembly	1	
6.3	Evaporator inlet tube assembly	1	
7	Evaporator Pothook	2	
8	Evaporator connect board	1	
9	Drain pump	1	PLD-700
9.1	Bodder switch	1	
9.2	Drain pump support	1	
10	Wind wheel	1	Φ283×166
11	Fan motor	1	YSK30-6E1
12	motor holder	1	
13	Air passage	1	
14	Water pan holder	4	
15	Pothook	4	
16	Boarding A	1	
16.1	Boarding B	1	
17	Valve board A	1	
17.1	Valve board B	1	
18	Chassis	1	
19	Plastic drainage pipe	1	
19.1	Plastic drain hose	1	

CEA24 / CEA36



CEA24

N0.	Part Name	Quantity	Remark
1	Sheet metal suite	1	
1.1	Coaning A	2	
1.2	Coaning B	1	
1.3	Coaning C	1	
1.4	Chassis assembly	1	
1.5	hook	4	
1.6	Wire fastener	5	
1.7	Power line fixed plate	1	
2	Valve plate	1	
3	Drain pipe	1	

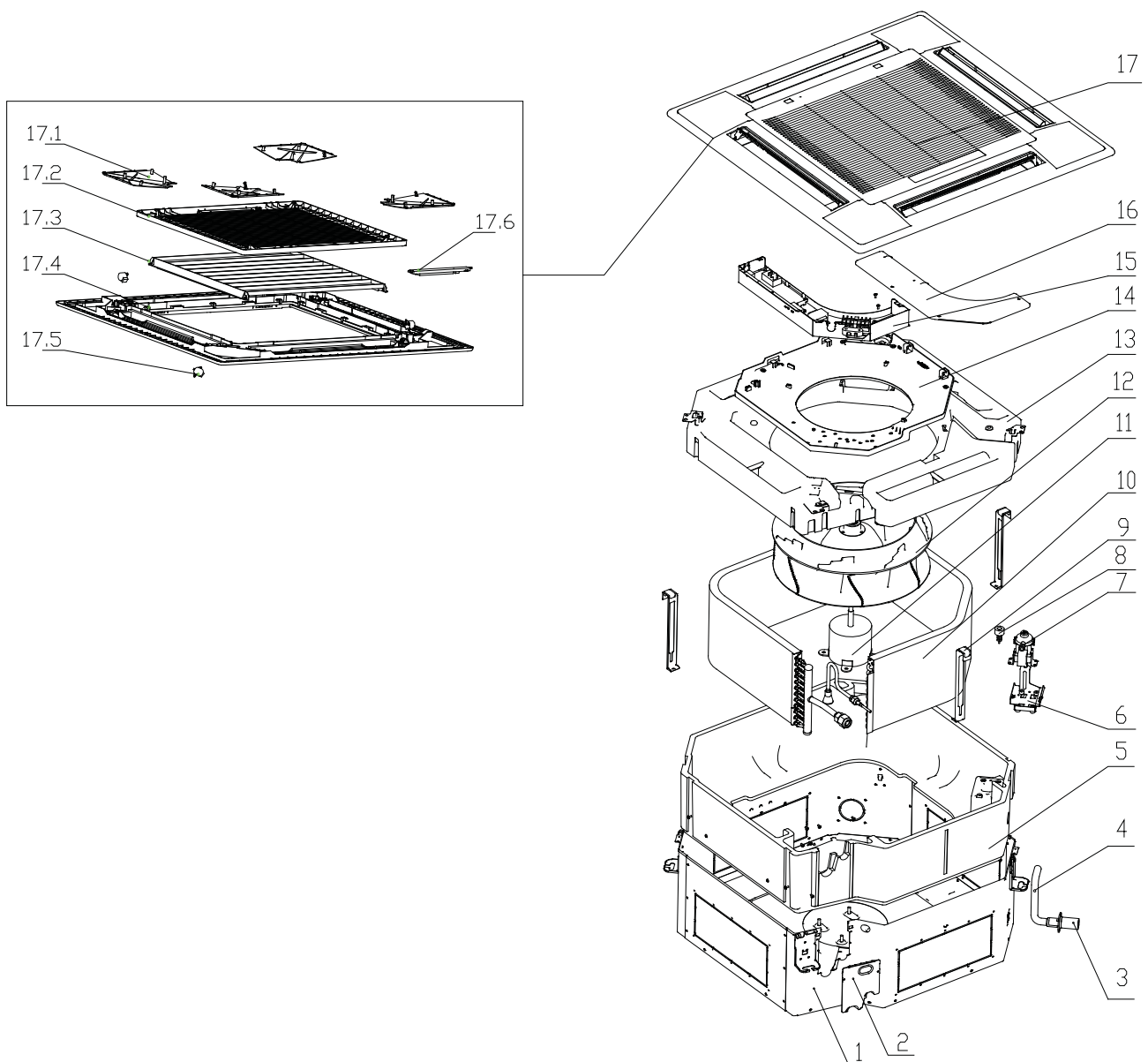
4	Drain flexible pipe (Drain pump)	1	
5	Chassis foam assembly	1	
6	Drain pump support	1	
7	Drain pump	1	PLD-1200
8	Float switch	1	
9	Evaporator hook	3	
10	Evaporator assembly	1	
11	Fan motor	1	XD30A
12	Wind wheel	1	φ 470×147(3P)
13	Defrosting pan	1	
14	Guide wind loop assembly	1	
15	Electric box assembly	1	
15.1	Electric box	1	
15.2	PCB board	1	QRD-3F(2S)-SYE1
15.3	Transformer	1	TDB-8-B(PTC)
15.4	capacitance	1	3.0μF/450VAC/70/2000h
15.5	TerminAL board	1	
16	Electric control box cover	1	
17	Panel MB06	1	
17.1	Panel cover board	2	
17.2	Return-air grille assembly	2	
17.3	Air filter	1	
17.4	Panel frame assembly	1	
17.4.1	Panel frame	1	
17.4.2	Wind-guiding blade	4	
17.5	Step motor	1	24BYJ48-2

CEA36

N0.	Part Name	Quantity	Remark
1	Sheet metal suite	1	
1.1	Coaning A	2	
1.2	Coaning B	1	
1.3	Coaning C	1	
1.4	Chassis assembly	1	
1.5	hook	4	
1.6	Wire fastener	5	
1.7	Power line fixed plate	1	
2	Valve plate	1	
3	Drain pipe	1	
4	Drain flexible pipe (Drain pump)	1	
5	Chassis foam assembly	1	
6	Drain pump support	1	

7	Drain pump	1	PLD-1200
8	Float switch	1	
9	Evaporator hook	3	
10	Evaporator assembly	1	
11	Fan motor	1	YDK-35A-6Q
12	Wind wheel	1	φ 470×147(3P)
13	Defrosting pan	1	
14	Guide wind loop assembly	1	
15	Electric box assembly	1	
15.1	Electric box	1	
15.2	PCB board	1	QRD-3F(2S)-SYE1
15.3	Transformer	1	TDB-8-B(PTC)
15.4	capacitance	1	3.0μF/450VAC/70/2000h
15.5	TerminAL board	1	
16	Electric control box cover	1	
17	Panel MB12	1	
17.1	Panel cover board	2	
17.2	Return-air grille assembly	2	
17.3	Air filter	1	
17.4	Panel frame assembly	1	
17.4.1	Panel frame	1	
17.4.2	Wind-guiding blade	4	
17.5	Step motor	1	24BYJ48-2

CEA48 / CEA60

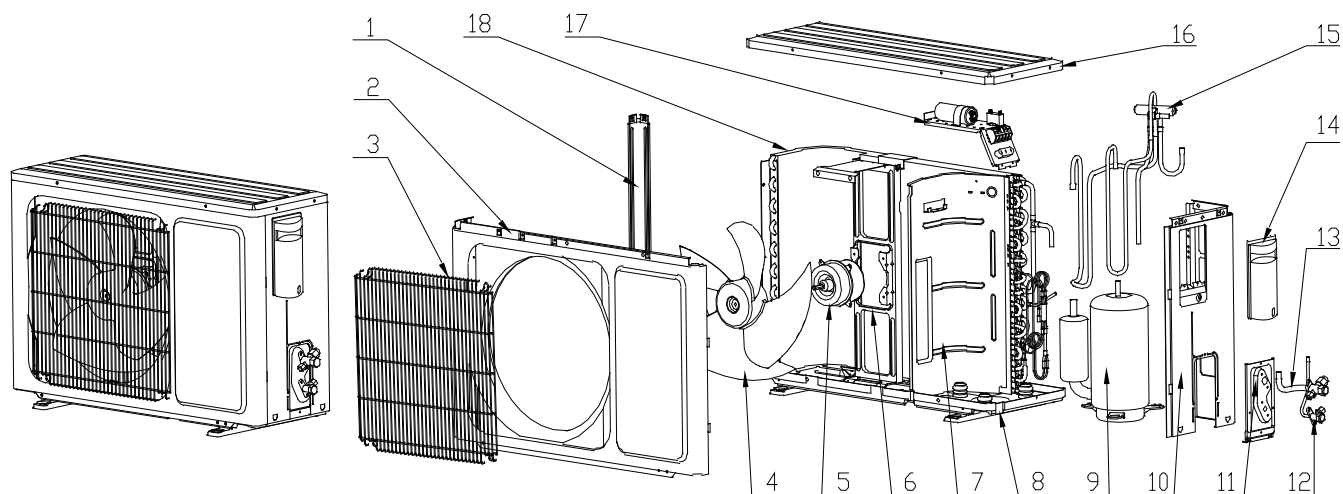


CEA48 / CEA60

N0.	Part Name	Quantity	Remark
1	Sheet metal suite	1	
1.1	Coaning A	2	
1.2	Coaning B	1	
1.3	Coaning C	1	
1.4	Chassis assembly	1	
1.5	hook	4	
1.6	Wire fastener	5	
1.7	Power line fixed plate	1	
2	Valve plate	1	
3	Drain pipe	1	
4	Drain flexible pipe (Drain pump)	1	
5	Chassis foam assembly	1	
6	Drain pump support	1	
7	Drain pump	1	PLD-1200
8	Float switch	1	
9	Evaporator hook	3	
10	Evaporator assembly	1	
11	Fan motor	1	XD80A
12	Wind wheel	1	Φ 470×170 (3P)
13	Defrosting pan	1	
14	Guide wind loop assembly	1	
15	Electric box assembly	1	
15.1	Electric box	1	
15.2	PCB board	1	QRD-3F(2S)-SYE1
15.3	Transformer	1	TDB-8-B(PTC)
15.4	capacitance	1	6.0μF/450VAC/70/2000h
15.5	TerminAL board	1	
16	Electric control box cover	1	
17	Panel MB12	1	
17.1	Panel cover board	2	
17.2	Return-air grille assembly	2	
17.3	Air filter	1	
17.4	Panel frame assembly	1	
17.4.1	Panel frame	1	
17.4.2	Wind-guiding blade	4	
17.5	Step motor	1	24BYJ48-2

Exploded View

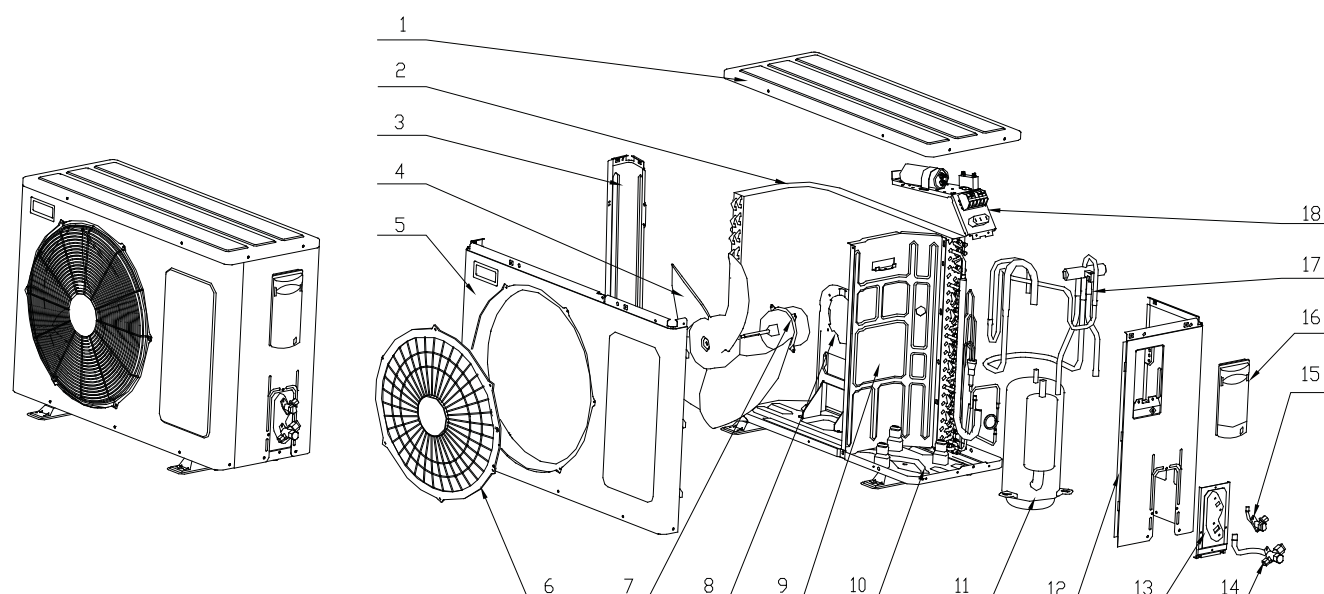
CCA12



CCA12

N0.	Part Name	Quantity	Remark
1	Left-hand board	1	
2	Big panel	1	
3	Net for big panel	1	
4	Axial-flow wind leaves	1	Φ400
5	Outdoor Motor	1	
6	Motor bracket	1	
7	Wind-defending vertical board	1	
8	Chassis assembly	1	
9	Compressor	1	PA150X2C-4FT
10	Right-hand board	1	
11	Stop valve board	1	
12	Stop valve 1/4in	1	
13	Stop valve 1/2in	1	
14	Cover for electric components	1	
15	Four-way valve assembly	1	
15.1	Four-way valve loop	1	Not including Cooling
15.2	Four-way valve loop	1	
16	Top cover board	1	
17	Electric assembly	1	
17.1	Capacitor for Compressor	1	35μF
17.2	Capacitor for fan motor	1	2.5μF
17.3	Terminal board	1	
17.4	Electric components box	1	
17.5	Sensor 0.5m	1	5K3470 EL2A

17.6	Sensor 1m	1	5K3470 EL2A
18	condenser assembly	1	
18.1	condenser part	1	
18.2	Cooling capillary	1	
18.3	Heating capillary	1	

CCA18 / CCA24**CCA18**

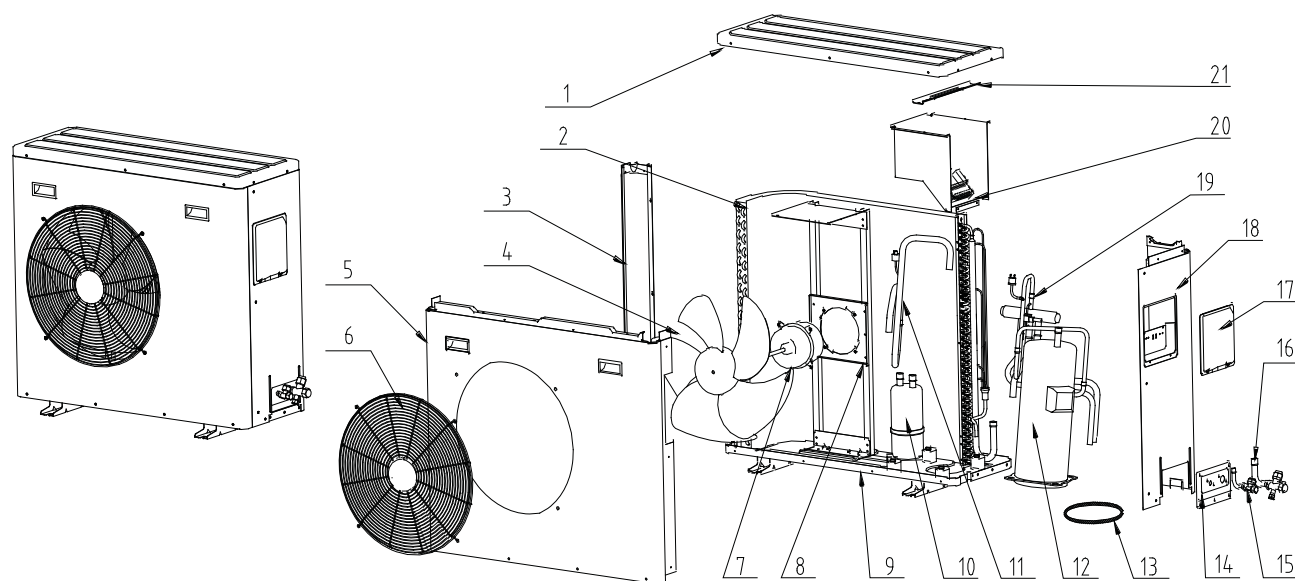
N0.	Part Name	Quantity	Remark
1	Top cover board	1	
2	condenser assembly	1	
2.1	condenser part	1	
2.2	Cooling capillary	1	
2.3	Heating capillary	1	
3	Left-hand board	1	
4	Axial-flow wind leaves	1	Φ420×150
5	Big panel	1	
6	Net for big panel	1	
7	Outdoor Motor	1	
8	Motor bracket assembly	1	
9	Wind-defending vertical board	1	
10	Chassis assembly	1	
11	Compressor	1	PA215X2CS-4KU1
12	Right-hand board	1	
13	Stop valve board	1	
14	Stop valve 1/4in	1	
15	Stop valve 1/2in	1	
16	Cover for electric components	1	
17	Four-way valve assembly	1	
17.1	Four-way valve loop	1	Not including Cooling mode
17.2	Four-way valve loop	1	
18	Electric assembly	1	
18.1	Capacitor for Compressor	1	50μF

18.2	Capacitor for fan motor	1	4μF
18.3	Terminal board	1	
18.4	Electric components box	1	
18.5	Sensor 0.5m	1	5K3470 EL2A
18.6	Sensor 1m	1	5K3470 EL2A

CCA24

N0.	Part Name	Quantity	Remark
1	Top cover board	1	
2	condenser assembly	1	
2.1	condenser part	1	
2.2	Cooling capillary	1	
2.3	Heating capillary	1	
3	Left-hand board	1	
4	Axial-flow wind leaves	1	Φ440
5	Big panel	1	
6	Net for big panel	1	
7	Outdoor Motor	1	YDK85-6-50
8	Motor bracket assembly	1	
9	Wind-defending vertical board	1	
10	Chassis assembly	1	
11	Compressor	1	PA290X3CS-4MUI
12	Right-hand board	1	
13	Stop valve board	1	
14	Stop valve 3/8in	1	
15	Stop valve 5/8in	1	
16	Cover for electric components	1	
17	Four-way valve assembly	1	
17.1	Four-way valve loop	1	Not including Cooling
17.2	Four-way valve loop	1	
18	Electric assembly	1	
18.1	Capacitor for Compressor	1	50μF
18.2	Capacitor for fan motor	1	4μF
18.3	Terminal board	1	
18.4	Electric components box	1	
18.5	AC contactor	1	
18.5	Sensor 0.5m	1	5K3470 EL2A
18.6	Sensor 1m	1	5K3470 EL2A

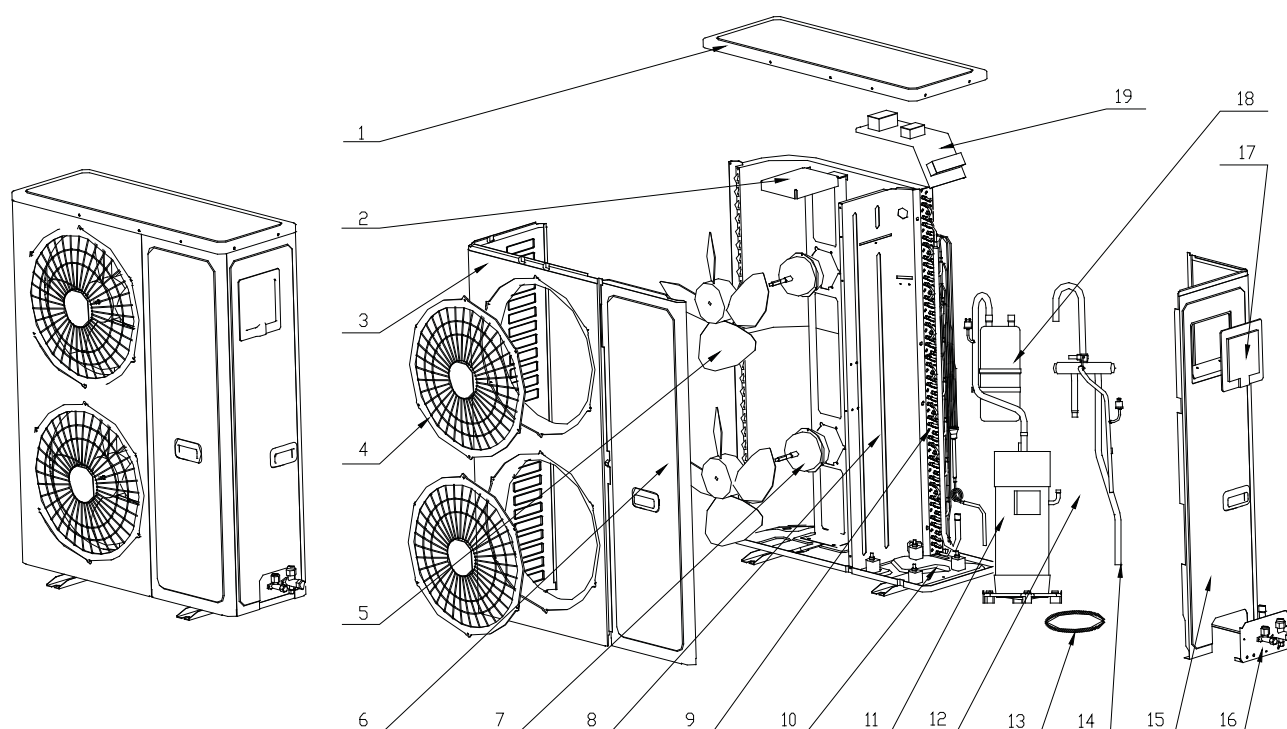
CCA36



CCA36

N0.	Part Name	Quantity	Remark
1	Top cover board	1	
2	condenser assembly	1	
2.1	condenser part	1	
2.2	Cooling capillary	1	
2.3	Heating capillary	1	
3	Left-hand board	1	
4	Axial-flow wind leaves	1	Φ490×130
5	Big panel	1	
6	Net for big panel	1	
7	Outdoor Motor	1	YDK150-6C
8	Motor bracket assembly	1	
9	Chassis assembly	1	
10	Flash chamber assembly	1	
11	Return air pipe assembly	1	
11.1	Low Pressure Switch	1	
12	Compressor	1	C-SBP130H38A
13	Oil heat strap	1	
14	Stop valve board	1	
15	Stop valve 3/8in	1	
16	Stop valve 5/8in	1	
17	Cover for electric components	1	
18	Right-hand board	1	
19	Four-way valve assembly	1	
19.1	Four-way valve loop	1	Not including

19.2	Four-way valve loop	1	Cooling-only units
19.3	Muffler	1	
19.4	High Pressure Switch	1	
20	Electric assembly	1	
20.1	Capacitor for fan motor	1	6 μ F
20.2	Terminal board	1	
20.3	Electric components box	1	
20.4	AC contactor	1	
20.5	PCB board	1	QRD-SW1C-SEY1
20.6	Transformer	1	
20.7	Sensor 1.3m	1	5K3470 XH2
20.8	Sensor 0.9m	1	6.3K3954 XH2
20.9	Sensor 0.9m	1	5K3470 XH2
21	Electric components bracket	1	

CCA48 / CCA60**CCA4**

N0.	Part Name	Quantity	Remark
1	Top cover board	1	
2	Motor bracket assembly	1	
3	Big panel	1	
4	Net for big panel	2	
5	Axial-flow wind leaves	2	
6	Small panel	1	
7	Outdoor Motor	2	YDK68-6-359

8	Wind-defending vertical board	1	
9	Condenser assembly	1	
9.1	Upside condenser part	1	
9.2	Underside condenser part	1	
9.3	Cooling capillary	1	
9.4	Heating capillary	1	Not including Cooling-only units
10	Chassis assembly	1	
11	Compressor	1	E504DH-49D2G
12	Return air pipe assembly	1	
12.1	Low Pressure Switch	1	
13	Oil heat strap	1	
14	Four-way valve assembly	1	
14.1	High Pressure Switch	1	
14.2	Four-way valve	1	Not including Cooling-only units
14.3	Four-way valve loop	1	
14.4	Muffler	1	
15	Right-hand board	1	
16	Stop valve assembly	1	
16.1	Stop valve 3/8in	1	
16.2	Stop valve 3/4in	1	
17	Cover for electric components	1	
18	Flash chamber	1	
19	Electric assembly	1	
19.1	PCB board	1	
19.2	AC contactor	1	
19.3	Capacitor for fan motor	1	3 μ F
19.4	Terminal board	1	
19.5	transformer	1	
19.6	Sensor 1.3m	1	5K3470 XH2
19.7	Sensor 0.9m	1	6.3K3954 XH2
19.8	Sensor 0.9m	1	5K3470 XH2
19.9	Electric components box	1	

CCA60

N0.	Part Name	Quantity	Remark
1	Top cover board	1	
2	Motor bracket assembly	1	
3	Big panel	1	
4	Net for big panel	2	
5	Axial-flow wind leaves	2	
6	Small panel	1	
7	Outdoor Motor	2	YDK68-6-359

8	Wind-defending vertical board	1	
9	Condenser assembly	1	
9.1	Upside condenser part	1	
9.2	Underside condenser part	1	
9.3	Throttle capillary	1	
10	Chassis assembly	1	
11	Compressor	1	E604DH-59D2G
12	Return air pipe assembly	1	
12.1	Low Pressure Switch	1	
13	Oil heat strap	1	
14	Four-way valve assembly	1	
14.1	High Pressure Switch	1	
14.2	Four-way valve	1	Not including Cooling-only units
14.3	Four-way valve loop	1	
14.4	Muffler	1	
15	Right-hand board	1	
16	Stop valve assembly	1	
16.1	Stop valve 3/8in	1	
16.2	Stop valve 3/4in	1	
17	Cover for electric components	1	
18	Flash chamber	1	
19	Electric assembly	1	
19.1	PCB board	1	
19.2	AC contactor	1	
19.3	Capacitor for fan motor	1	3 μ F
19.4	Terminal board	1	
19.5	transformer	1	
19.6	Sensor 1.3m	1	5K3470 XH2
19.7	Sensor 0.9m	1	6.3K3954 XH2
19.8	Sensor 0.9m	1	5K3470 XH2
19.9	Electric components box	1	