GREE
Change for life

ALL-MATCH INVERTER SERIES_R32

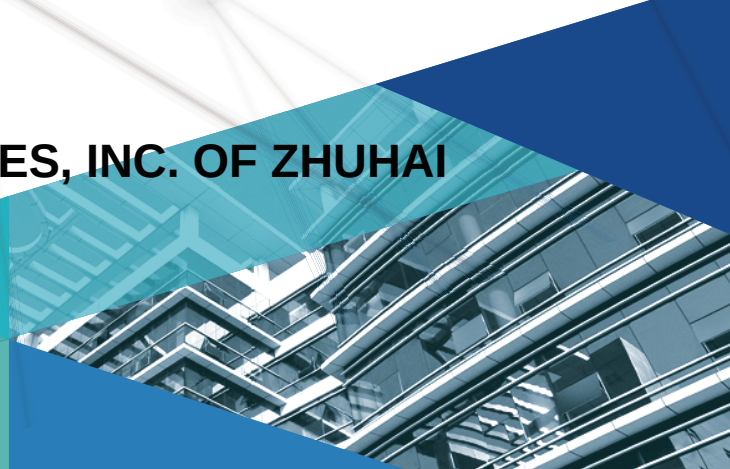
Service Manual

FLR09HP230V1R32AH

FLR12HP230V1R32AH

FLR18HP230V1R32AH

FLR20HP230V1R32AH



GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI

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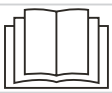
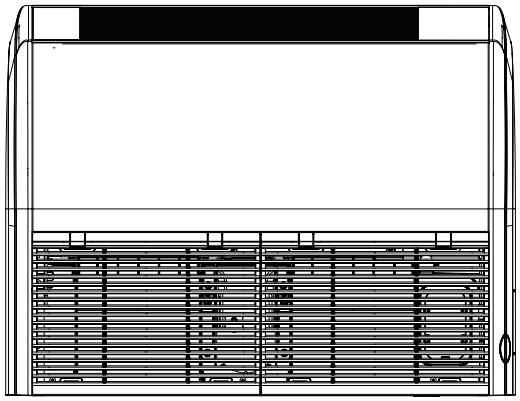
Symbol	Explanation
	This symbol shows that this appliance uses a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire. Appliance filled with flammable magas R32
	This symbol shows that the operation manual should be read carefully.
	This symbol shows that information is available such as the operating manual or installation manual.
	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.

1. Summary

Indoor Unit:

FLR09HP230V1R32AH
FLR12HP230V1R32AH
FLR18HP230V1R32AH
FLR24HP230V1R32AH



Remote Controller:

YBE1FB5F

Model list:

No.	Indoor model	Indoor product code	Remote Controller
1	FLR09HP230V1R32AH	CN610N0340	YBE1FB5F
2	FLR12HP230V1R32AH	CN610N0350	
3	FLR18HP230V1R32AH	CN610N0360	
4	FLR24HP230V1R32AH	CN610N0370	

2. Specifications

2.1 Specification Sheet

Model			FLR09HP230V1R32AH	FLR12HP230V1R32AH
Product Code			CN610N0340	CN610N0350
Power Supply	Rated Voltage	V~	208/230	208/230
	Rated Frequency	Hz	60	60
	Phases		1	1
Cooling Capacity		Btu/h	8500	11900
Heating Capacity		Btu/h	9500	13100
Cooling Power Input		W	40	40
Heating Power Input		W	40	40
Cooling Current Input		A	0.17	0.17
Heating Current Input		A	0.17	0.17
Air flow volume		CFM	412/359/318/247	412/359/318/247
Dehumidifying Volume		Pint/h	1.69	2.96
Fan Type			Centrifugal	Centrifugal
Fan Diameter-height		inch	Φ6 3/32–7 9/32	Φ6 3/32–7 9/32
Fan Motor Speed		rpm	790/690/610/480	790/690/610/480
Fan Motor Power Output		W	15	15
Fan Motor Power Input		W	/	/
Motor Full Load Amp(FLA)		A	0.28	0.28
Fan Motor Capacitor		μF	/	/
Evaporator Material			Aluminum fin-copper tube	Aluminum fin-copper tube
Evaporator Pipe Diameter		inch	Φ3/16	Φ3/16
Evaporator Number of Rows-Fin Pitch		inch	2-1 9/64	2-1 9/64
Evaporator Length(L)XHeight(H)XWidth(W)		inch	21 29/32X11 31/32X 29/32	21 29/32X11 31/32X 29/32
Fuse Current		A	5	5
Sound Pressure Level		dB (A)	38/35/30/26	38/35/30/26
Sound Power Level		dB (A)	52/49/44/40	52/49/44/40
Dimension of Outline(LXWXH)		mm	34 1/4 X 9 1/4 X 26 3/16	34 1/4 X 9 1/4 X 26 3/16
Dimension of Carton Box(LXWXH)		mm	40 9/16X30 3/16X11 1/8	40 9/16X30 3/16X11 1/8
Dimension of Package(LXWXH)		mm	40 11/16X30 5/16X11 13/16	40 11/16X30 5/16X11 13/16
Net Weight		lb	55.1	55.1
Gross Weight		lb	66.2	66.2
Liquid pipe		inch	1/4	1/4
Gas Pipe(to indoor unit)		inch	3/8	1/2

The above data is subject to change without notice. Please refer to the nameplate of the unit.

Model			FLR18HP230V1R32AH	FLR24HP230V1R32AH
Product Code			CN610N0360	CN610N0370
Power Supply	Rated Voltage	V~	208/230	208/230
	Rated Frequency	Hz	60	60
	Phases		1	1
Cooling Capacity		Btu/h	17000	22800
Heating Capacity		Btu/h	18700	27400
Cooling Power Input		W	40	60
Heating Power Input		W	40	60
Cooling Current Input		A	0.17	0.26
Heating Current Input		A	0.17	0.26
Air flow volume		CFM	400/347/306/241	559/512/471/424
Dehumidifying Volume		L/h	1.8	2.5
Fan Type			Centrifugal	Centrifugal
Fan Diameter-height		inch	Φ6 3/32–7 9/32	Φ6 1/8–7 1/4
Fan Motor Speed		rpm	790/690/610/480	760/700/640/580
Fan Motor Power Output		W	15	20
Fan Motor Power Input		W	/	/
Motor Full Load Amp(FLA)		A	0.28	0.3
Fan Motor Capacitor		μF	/	/
Evaporator Material			Aluminum fin-copper tube	Aluminum fin-copper tube
Evaporator Pipe Diameter		inch	Φ15/16	Φ3/16
Evaporator Number of Rows-Fin Pitch		inch	3-1/16	3-1/16
Evaporator Length(L)XHeight(H)XWidth(W)		inch	21 29/32X11 31/32X1 3/8	35 5/8X12X1 3/8
Fuse Current		A	5	5
Sound Pressure Level		dB (A)	38/35/30/26	38/35/30/26
Sound Power Level		dB (A)	52/49/44/40	52/49/44/41
Dimension of Outline(LXWXH)		inch	34 1/4 X 9 1/4 X 26 3/16	47 1/4X9 1/4X26 3/16
Dimension of Carton Box(LXWXH)		inch	40 9/16X30 3/16X11 1/8	53 1/2X30 3/16X11 13/16
Dimension of Package(LXWXH)		inch	40 11/16X30 5/16X11 13/16	53 11/16X30 5/16X11 13/16
Net Weight		lb	56.2	72.8
Gross Weight		lb	67.3	88.2
Liquid pipe		inch	1/4	3/8
Gas Pipe(to indoor unit)		inch	1/2	5/8

The above data is subject to change without notice. Please refer to the nameplate of the unit.

Note: Nominal capacities are based on the follow conditions.

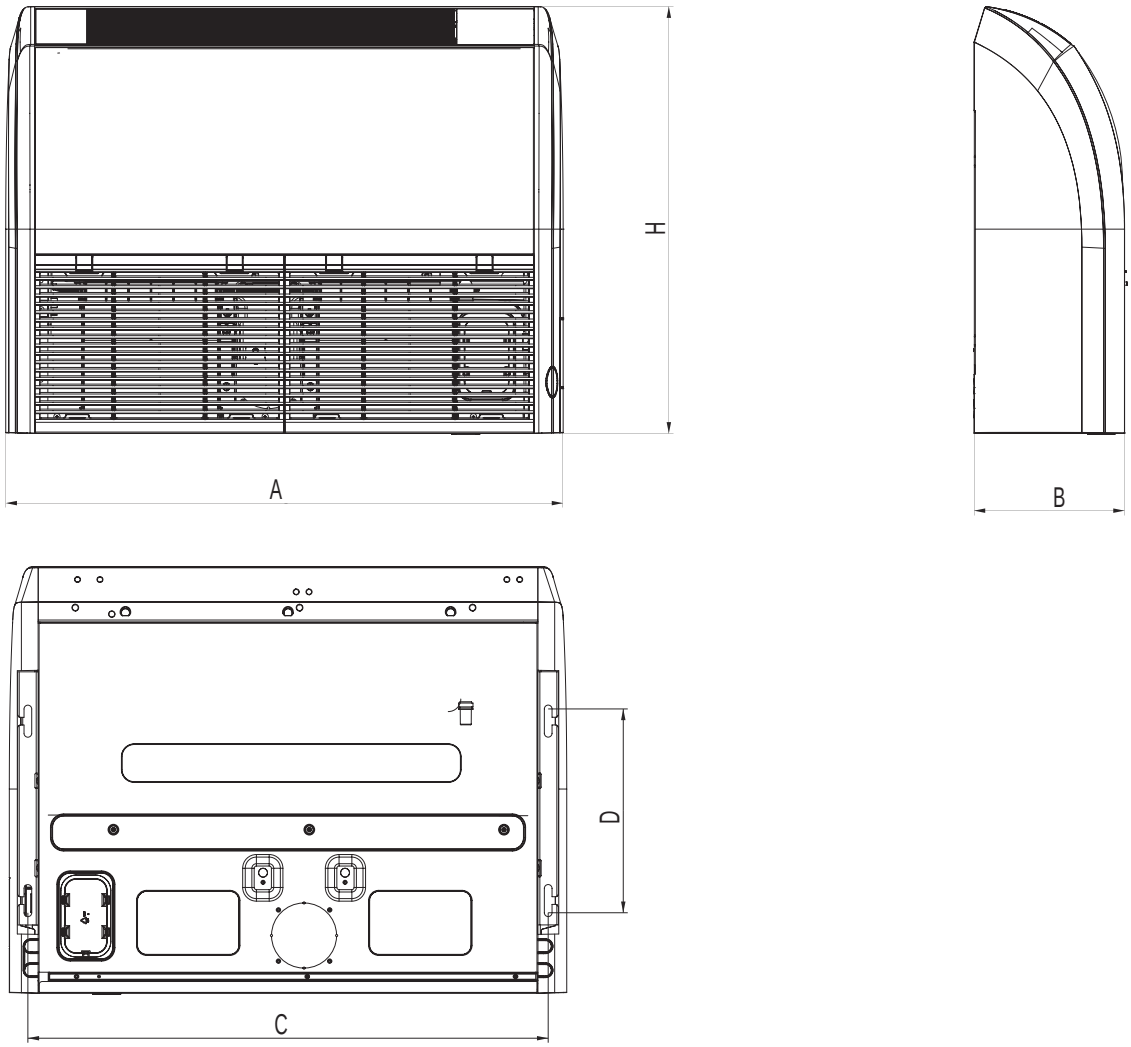
Model		Indoor°C(°F)	Outdoor°C(°F)
Cooling		DB:27(80.6)	DB:35(95)
		WB:19(66.2)	WB:24(75.2)
Heating		DB:20(68)	DB:7(44.6)
		WB:--(--)	WB:6(42.8)
Piping Length	Duct type、 Cassette type、 Floor ceiling type	196 27/32 inch	

The air volume is measured at the relevant standard external static pressure.
Noise is tested in the semianechoic room, so it should be slightly higher in the actual operation due to environmental change.

Model	Range of Outdoor Temperature°C(°F)
Cooling	-15(5)-43(109.4)
Heating	-15(5)-24(75.2)

3. Outline Dimension Diagram

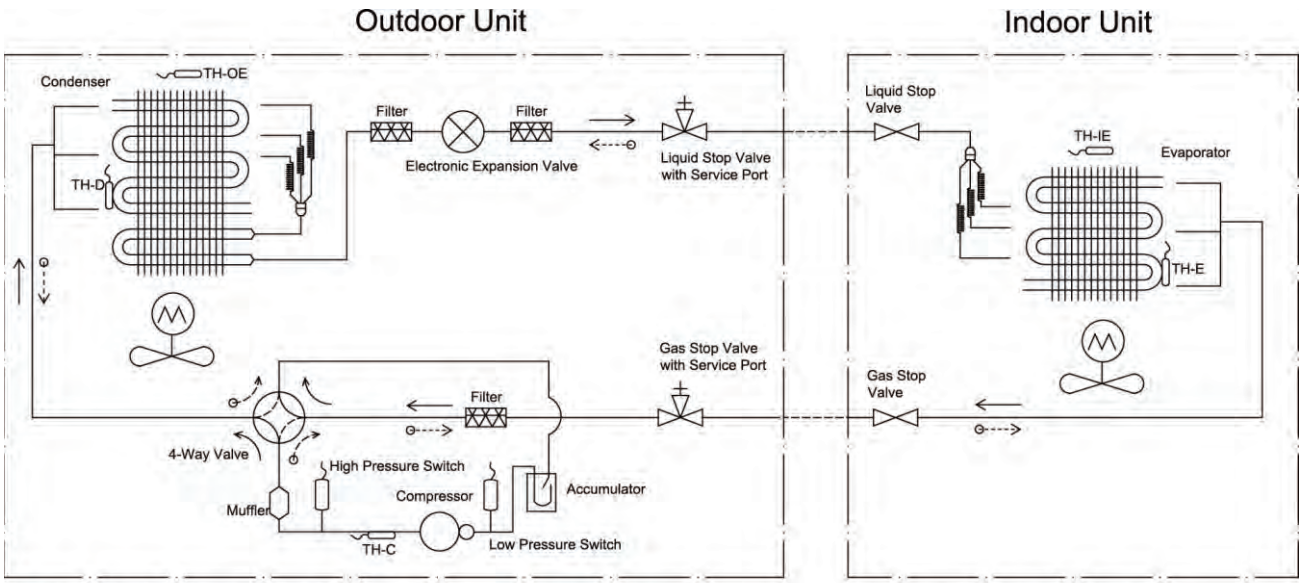
3.1 Indoor Unit



Unit:inch

Model	A	B	C	D	H
09/12/18K	34 1/4	9 1/4	31 31/32	12 33/64	26 3/16
24K	47 1/4	9 1/4	44 61/64	12 17/32	26 3/16

4. Refrigerant System Diagram



Note:

1.it is just a schematic diagram and some parts may differ from the real objects inside the unit.

5. Electrical Part

5.1 Wiring Diagram

● Instruction

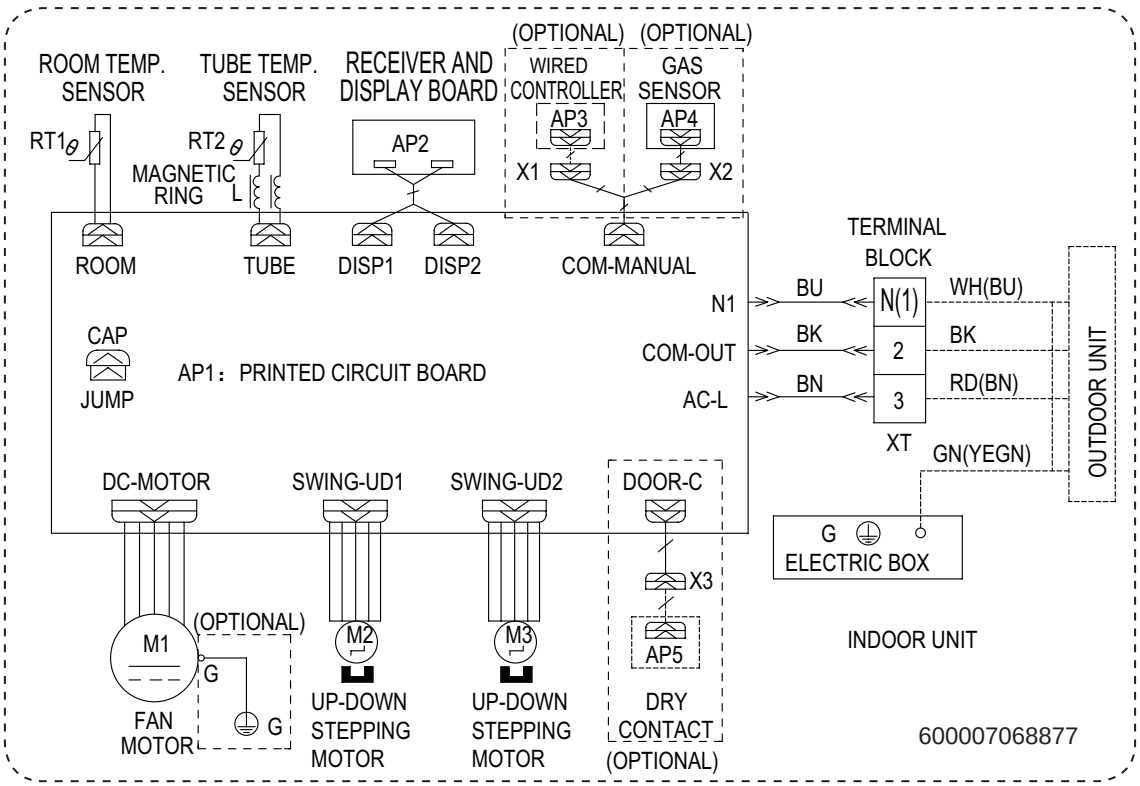
Symbol	Symbol Color
YE	Yellow
RD	Red
YEGN	Yellow/Green

Symbol	Symbol Color
BN	Brown
BU	Blue
BK	Black

Symbol	Name
COMP	Compressor
⏚	Grounding wire
/	/

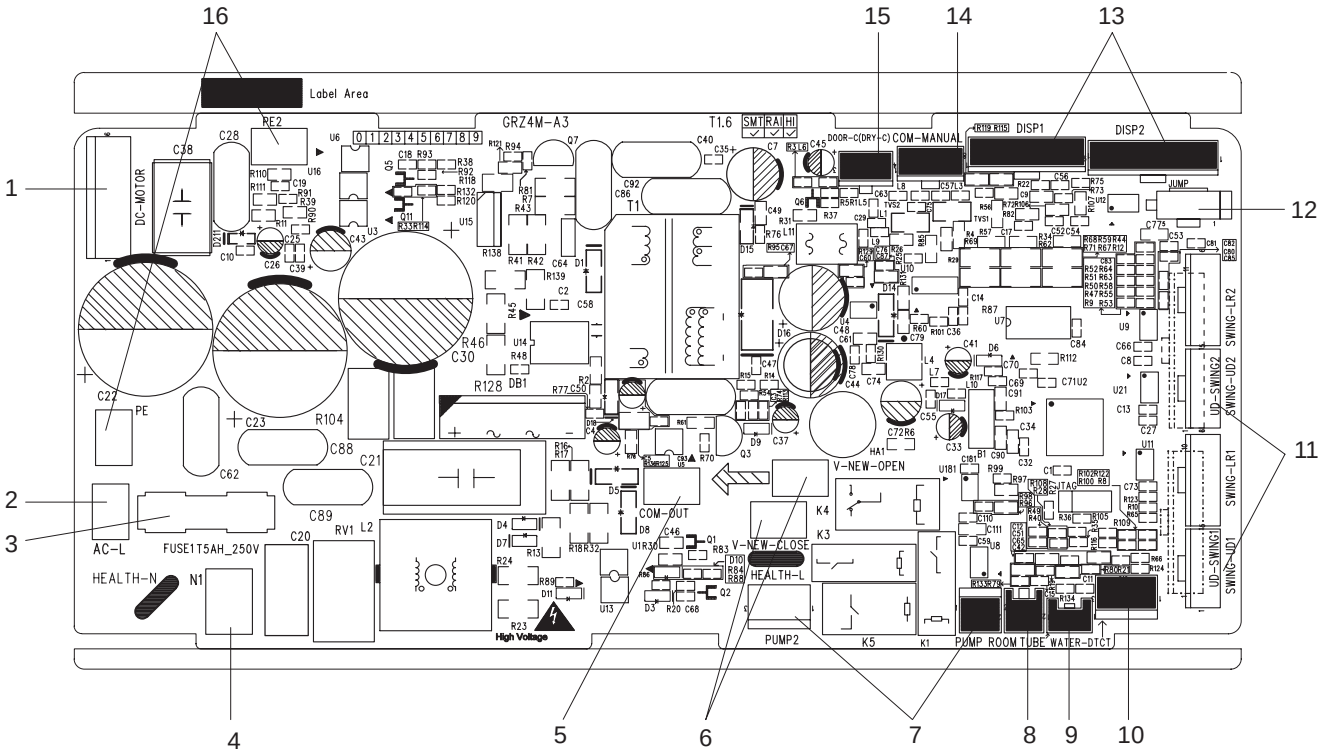
Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

● Indoor Unit



5.2 PCB Printed Diagram

● Indoor Unit



No.	Name
1	Interface of fan
2	Interface of live wire
3	Fuse
4	Interface of netural wire
5	Terminal with outdoor unit communication wire
6	Air terminal
7	Water pump control
8	Interface of ambient temperature sensor

No.	Name
9	Interface of tube temperature sensor
10	Water full detection terminal
11	Up & down swing motor
12	Jumper cap terminal
13	Display interface
14	Wired controller
15	Interface of gate-control detection
16	Grounding wire

6. Function and Control

6.1 Remote Controller Introduction

Introduction for icons on display screen

Introduction for icons on display screen

	Quiet
FAN AUTO	Set fan speed
	Turbo mode
	Send signal
Operation mode	Auto mode
	Cool mode
	Dry mode
	Fan mode
	Heat mode
	X-FAN function
	Power limiting operation
88	Set temperature
	Indoor ambient temp.
ONOFF	TIMER ON / TIMER OFF
88:88	Set time
	Left & right swing
	Up & down swing
	Child lock
	Air function
	Health function
WIFI	WiFi function
	LED
	I feel
	Sleep mode

Introduction for buttons on remote controller

NOTE:

● This is a general use remote controller. It could be used for the air conditioner with multifunction. For the functions which the model doesn't have, if press the corresponding button on the remote controller, the unit will keep the original running status.

● After putting through the power, the air conditioner will give out a sound. Power indicator " ⏻ " is ON. After that, you can operate the air conditioner by using remote controller.

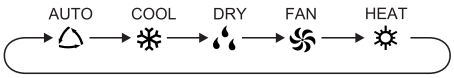
● Under on status, pressing the button on the remote controller, the signal icon " ((•)) on the display of remote controller will blink once and the air conditioner will give out a "di" sound, which means the signal has been sent to the air conditioner.

On/Off button

Press this button to turn on the unit. Press this button again to turn off the unit.

Mode button

Press this button to select your required operation mode.



● When selecting auto mode, air conditioner will operate automatically according to the sensed temperature. Press "Fan" button can adjust fan speed. Press " ≋ " / " ≋ " button can adjust fan blowing angle.

● After selecting cool mode, air conditioner will operate under cool mode. Press " + " or " - " button to adjust set temperature. Press "Fan" button to adjust fan speed. Press " ≋ " / " ≋ " button to adjust fan blowing angle.

● When selecting dry mode, the air conditioner operates at low speed under dry mode. Under dry mode, fan speed can't be adjusted. Press " ≋ " / " ≋ " button to adjust fan blowing angle.

● When selecting fan mode, the air conditioner will only blow fan, no cooling and no heating. Press "Fan" button to adjust fan speed. Press " ≋ " / " ≋ " button to adjust fan blowing angle.

● When selecting heat mode, the air conditioner operates under heat mode. Press " + " or " - " button to adjust set temperature. Press "Fan" button to adjust fan speed. Press " ≋ " / " ≋ " button to adjust fan blowing angle.

NOTE:

● For preventing cold air, after starting up heat mode, indoor unit will delay 1~5 minutes to blow air (Actual delay time depends on indoor ambient temperature).

● Set temperature range from remote controller: 16~30°C(61-86°F).

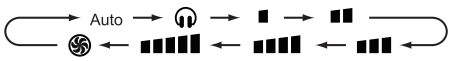
● This mode indicator is not available for some models.

● Cooling only unit won't receive heat mode signal. If setting heat mode with remote controller, press " ON/OFF " button can't start up the unit.

Fan button

This button is used for setting Fan Speed in the sequence that goes

from AUTO, , , , , , , to , then back to Auto.



Low speed Low-Medium speed Medium speed
Medium-High speed High speed
Turbo speed Quiet speed

NOTE:
● It's low fan speed under dry mode.
● X-FAN function Hold fan speed button for 2s in cool or dry mode, the icon " " is displayed and the indoor fan will continue operation for a few minutes in order to dry the indoor unit even though you have turned off the unit. After energization, X-FAN OFF is defaulted. X-FAN is not available in auto, fan or heat mode.
This function indicates that moisture on evaporator of indoor unit will be blowed after the unit is stopped to avoid mould.
● Having set X-FAN function on: After turning off the unit by pressing " On/Off " button indoor fan will continue running for a few minutes. at low speed. In this period, hold fan speed button for 2s to stop indoor fan directly.
● Having set X-FAN function off: After turning off the unit by pressing " On/Off " button, the complete unit will be off directly.

+ / - button

Press " + " or " - " button once increase or decrease set temperature 1°C(°F). Holding " + " or " - " button, 2s later, set temperature on remote controller will change quickly. On releasing button after setting is finished, temperature indicator on indoor unit will change accordingly.

Wifi button

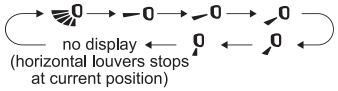
Press "Wifi" button to turn on WiFi function, "Wifi" icon will be displayed on the remote controller;
Hold "Wifi" button for 5s to turn off WiFi function and "Wifi" icon will disappear.(This function is only available for some models.)
Under off status, press "Mode" and "Wifi" buttons simultaneously for 1s, WiFi module will restore factory settings.
NOTE:
● This function is only available for some models.

Health button

Press this button to turn on or turn off the health and air functions in operation status. Press this button for the first time to start air function; LCD displays " ". Press the button for the second time to start health and air functions simultaneously; LCD displays " " and " ". Press this button for the third time to quit health and air functions simultaneously. Press the button for the fourth time to start health function; LCD display " ". Press this button again to repeat the operation above.
NOTE:
● This function is only available for some models.

UD-swing button

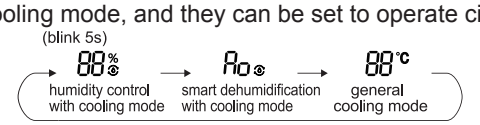
Press this button can select up & down swing angle.
Fan blow angle can be selected circularly as below:



● When selecting " ", air conditioner is blowing fan automatically. Horizontal louver will automatically swing up & down at maximum angle.
● When selecting " " , a ir conditioner is blowing fan at fixed position. Horizontal louver will stop at the fixed position.
● Hold " " button above 2s to set your required swing angle. When reaching your required angle, release the button.
NOTE:
● Press this button continuously more than 2s, the main unit will swing back and forth from up to down, and then loosen the button, the unit will stop swinging and present position of guide louver will be kept immediately.
● Under swing up and down mode, when the status is switched from off to , if press this button again 2s later, status will switch to off status directly; if press this button again within 2s, the change of swing status will also depend on the circulation sequence stated above.

Humidity button

Under cooling mode, press this button can select humidity control with cooling mode, smart dehumidification with cooling mode, and general cooling mode, and they can be set to operate circularly.



● When humidity control with cooling mode is set, the remote controller will display " " , and humidity value "88" and "%" icon will blink for 5s; you can press "+" and "-" buttons to set the humidity value within 5s.
Under humidity control with cooling mode, humidity setting range for the remote controller: 40%-80%.
Temperature can be adjusted under humidity control with cooling mode.
● When smart dehumidification with cooling mode is set, the remote controller will display " " ; the remote controller and indoor unit will display "Ao" for 5 seconds.
Temperature can be adjusted under smart dehumidification with cooling mode.
● The humidity for smart dehumidification is automatically adjusted according to human body comfort; no need to set the humidity manually.
Under dry mode, press this button can select humidity control with dehumidification mode, continuous dehumidification mode, general dehumidification mode, and they can be set to operate circularly.

● When humidity control with dehumidification mode is set, the remote controller will display " ", "%" and humidity value "88"; you can press "+" and "-" buttons to set the humidity value.
Humidity setting range for the remote controller: 30%-70%.
Temperature can't be adjusted under humidity control with dehumidification mode.
● When continuous dehumidification is set, the remote controller will display " " ; the remote controller and indoor unit will display "Co".

Temperature can't be adjusted under continuous dehumidification mode.

● Under continous dehumidification mode, the unit always works under dehumidification status; no need to set temperature and humidity.

NOTE:

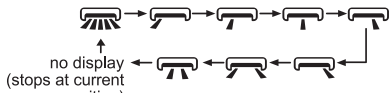
● The air conditioner is mainly used for controlling the temperature, while the humidity control is the auxiliary function.
The humidity will be affected by the factors such as indoor and outdoor environment, degree of indoor sealing and indoor flow.

● When the set humidity is higher than current atmospheric humidity, the set humidity can't be reached.

● If the humidity sensor is with malfunction, humidity setting under cooling mode or dehumidification mode will stop and the unit operates under general cooling mode or dehumidification mode.

LR-swing button

Press this button can select left & right swing angle.
Fan blow angle can be selected circularly as below:



NOTE:

● Press this button continuously more than 2s, the main unit will swing back and forth from left to right, and then loosen the button, the unit will stop swinging and present position of guide louver will be kept immediately.

● Under swing left and right mode, when the status is switched from off to , if press this button again 2s later, status will switch to off status directly; if press this button again within 2s, the change of swing status will also depend on the circulation sequence stated above.

● This function only applicable for some models.

Timer button

● At ON status, press this button once can set TIMER OFF. The character of HOUR and OFF will flash. Press "+" or "-" button within 5s can adjust the time of TIMER OFF. After each pressing of "+" or "-" button, time will increase or decrease half an hour. When holding "+" or "-" button, 2s later, the time will change quickly until to reach to your required time. After that, press "Timer" button to confirm it. The character of HOUR and OFF won't flash again.
Cancel TIMER OFF: Press "Timer" button again under TIMER OFF status.

● At OFF status, press this button once can set TIMER ON. Please refer to TIMER off for detailed operation.
Cancel TIMER ON: Press "Timer" button again under TIMER ON status.

NOTE:

● Time setting range: 0.5-24 hours.

●Time interval between two operations can't exceed 5s. Otherwise, remote controller will exit the setting status automatically.

Clock button

Press this button to set clock time. " " icon on remote controller will blink. Press "+" or "-" button within 5s to set clock time. Each pressing of "+" or "-" button, clock time will increase or decrease 1 minute. If hold "+" or "-" button, 2s later, time will change quickly. Release this button when reaching your required time. Press "Clock" button to confirm the time. " " icon stops blinking.

NOTE

● Clock time adopts 24-hour mode.

●The interval between two operations can't exceed 5s. Otherwise, remote controller will quit setting status.
Operation for TIMER ON/TIMER OFF is the same.

/ Timer on / Timer off button

●TIMER ON button
"TIMER ON" button can set the time for timer on. After pressing this button, " " icon disappears and the word "ON" on remote controller blinks. Press " + " or " - " button to adjust TIMER ON setting. After each pressing " + " or " - " button. TIMER ON setting will increase or decrease 1min. Holding " + " or " - " button, 2s later, the time will change quickly until reaching your required time. Press "TIMER ON" to confirm it. The word "ON" will stop blinking. " " icon resumes displaying. Cancel TIMER ON: Under the condition that TIMER ON is started up, press "TIMER ON" button to cancel it.

● TIMER OFF button
"TIMER OFF" button can set the time for timer off. After pressing this button, " "icon disappears and the word "OFF" on remote controller blinks. Press " + " or " - " button to adjust TIMER OFF setting. After each pressing " + " or " - " button, TIMER OFF setting will increase or decrease 1min. Holding " + " or " - " button, 2s later, the time will change quickly until reaching your required time. Press "TIMER OFF" and the word "OFF" will stop blinking. " " icon resumes displaying.
Under the condition that TIMER OFF is started up, press "TIMER OFF" button to cancel it.

NOTE:

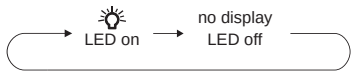
● Under on and off status, you can set TIMER OFF or TIMER ON simultaneously.

● Before setting TIMER ON or TIMER OFF, please adjust the clock time.

● When turning on TIMER ON or TIMER OFF function , set this function valid all the time and the air conditioner will be turned on or turned off at set temperat ure every day. On/Off button has no affect to se tting. If this function is not required, use the remote controller to cancel it.

Light button

Press this button to control the LED status on the displayer, the circulation change is as follow:



Function introduction for combination buttons

Energy-saving function

Under cooling mode, press "Mode" and "Timer" buttons simultaneously to start up or turn off energy-saving function. When energy-saving function is started up, "SE" will be shown on remote controller, and air conditioner will adjust the set temperature automatically according to ex-factory setting to reach to the best energy-saving effect.
Press "Mode" and "Timer" buttons simultaneously again to exit energy-saving function.

NOTE:

● Under energy-saving function, fan speed is defaulted at auto speed and it can't be adjusted.
● Under energy-saving function, set temperature can't be adjusted.
● Sleep function and energy-saving function can't operate at the same time. If energy-saving function has been set under cool mode, press "Sleep" button will cancel energy-saving function. If sleep function has been set under cool mode, start up the energy-saving function will cancel sleep function.

Child lock function

Hold " On/Off " and " - " buttons simultaneously for 3s to turn on or turn off child lock function. When child lock function is on, " " icon is displayed on remote controller. If you operate the remote controller, the " " icon will blink three times without sending signal to the unit.

Temperature display switchover function

Under OFF status, hold "Mode" and " - " buttons simultaneously for 3s to switch temperature displaybetween °C and °F.

function

function is for limiting power of the whole unit. Press "Mode" and "Sleep" buttons simultaneously, the remote controller will circularly display as the following:

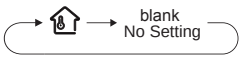
● Maximum power limited under the mode is lower than that of mode.
● If you want to cancel the power limiting function, press "Mode" and "Sleep" buttons simultaneously till the icon in remote controller is not displayed.
● When the remote controller is turned off, power limiting function is cancelled. If you want to activate the function, please repress "Mode" and "Sleep" buttons simultaneously.
● If the current power is lower than the maximum power of mode, then the power will not be limited after entering into such mode.
● For the model with one outdoor unit and two indoor units, if any one of indoor units enters into power limiting function, the outdoor unit will enter into the set limiting power mode of indoor unit; when two indoor units enter into power limiting mode, then the power of outdoor unit will be limited according to the lower power of the two indoor units.

NOTE:

● This button is only available for the model with such function.

Indoor ambient temperature

By holding " On/Off " and " " buttons simultaneously , you can see indoor ambient temperature or indoor ambient humidity on indoor unit's display. The setting on remote controlleris selected circularly as below:



● When selecting " " with remote controller, temperature indicator on indoor unit displays indoor ambient temperature.

Clean reminder function of filter

The reminder function is defaulted to be OFF. Hold " On/Off " and " " buttons simultaneously for 5s to turn it on. The buzzer will give out sound for 0.5s and the dual-8 nixie tube on the display will be on for 3s; Once the reminder function is turned on, when the air conditioner has reached to the set time, the dual-8 nixie tube will flash about 30s when the unit is turned on each time to remind the user to clean the filter; you can turn off this cycle reminder by holding " On/Off " and " " buttons simultaneously for 5s and then the air conditioner will count time again.

NOTE:

● Once the reminder function is turned on, only this cycle reminder can be cleared.
● This function is only available for some models.

Volume control of IDU Buzzer

Press "Mode" and " " buttons simultaneously to reduce the sound level of the indoor unit' buzzer.

NOTE:

● This function is only available for some models.

Fast cool function

Press " On/Off " and " + " buttons simultaneously under cooling mode can select 25°C(77°F) fast cooling mode, 16°C(61°F) fast cooling mode and normal cooling mode circularly. " " icon will be displayed on the remote controller under fast cooling mode.
Once it enters into fast cooling mode, the fan speed is auto fan and the set temperature is 25°C(77°F) or 16°C(61°F). At this time, the set temperature flashes to display for 5s. In the flashing period, press " + " or " - " button to adjust the set temperature.
Press "Fan" button to adjust the fan speed. If the set temperature and the fan speed haven't been adjusted during that time, the remote controller and the indoor unit will operate under current set temperature and fan speed for 20 minutes. 20 minutes later, the set temperature and the fan speed for the remote controller and the indoor unit will turn to the status before quick cooling.

NOTE:

● If the set temperature and the fan speed have been adjusted during the operation under fast cooling mode, the unit will exit from the fast cooling mode. Then the indoor unit operates continuously under the adjusted status.
● Fast cooling function is only applicable for some models. If this function is unavailable for this indoor unit, 20 minutes later, the remote controller will turn back to the status before fast cooling. Indoor unit operates continuously according to current status. At this time, status of indoor unit and the display status on the remote

controller may be different.
● This function is only available for some models.

Auto clean function

Under unit off status, hold "Mode" and " " buttons simultaneously for 5s to turn on or turn off the auto clean function. When the auto clean function is turned on, indoor unit displays "CL" . During the auto clean process of evaporator, the unit will perform fast cooling or fast heating. There may be some noise, which is the sound of flowing liquid or thermal expansion or cold shrinkage. The air conditioner may blow cool or warm air, which is a normal phenomenon. During cleaning process, please make sure the room is well ventilated to avoid affecting the comfort.

NOTE:

● The auto clean function can only work under normal ambient temperature. If the room is dusty, clean it once a month; if not, clean it once every three months. After the auto clean function is turned on, you can leave the room. When auto clean is finished, the air conditioner will enter standby status.
● This function is only available for some models.

Night mode

Under cooling or heating mode, when turning on sleep mode and turn to low speed or quiet notch, the outdoor unit would enter into night mode.

NOTE:

● When you feel that the cooling and heating effect is poor, please press "Fan" button to other fan speed or press "Sleep" button to exit the night mode.
● The night mode can only work under normal ambient temperature.
● This function is only available for some models.

I FEEL function

Press "Health" and " + " buttons simultaneously to start I FEEL function and " " will be displayed on the remote controller. After this function is set, the remote controller will send the detected ambient temperature to the controller and the unit will automatically adjust the indoor temperature according to the detected temperature. Press "Health" and " + " buttons simultaneously again to turn off I FEEL function and " " will disappear.

● Please put the remote controller near user when this function is set. Do not put the remote controller near the object of high temperature or low temperature in order to avoid detecting inaccurate ambient temperature.When I FEEL function is turned on, the remote controller should be put within the area where indoor unit can receive the signal sent by the remote controller.

Sleep function

Press "Clock" and "Light" buttons simultaneously, can select Sleep 1 ( ), Sleep 2( ), Sleep 3 ( ) and cancel the Sleep, circulate between
these, after electrified, Sleep Cancel is defaulted.

● Sleep 1 is Sleep mode 1, in Cool modes: sleep status after run for one hour, the main unit setting temperature will increase 1 , two hours, setting temperature increased 2 , then the unit will run at this setting temperature; In Heat mode: sleep status after run for one hour, the setting temperature will decrease 1 , two hours, setting temperature will decrease 2 , then the unit will run at this setting temperature.
● Sleep 2 is sleep mode 2, that is air conditioner will run according to the presetting a group of sleep temperature curve.
● Sleep 3 the sleep curve setting under Sleep mode by DIY;
(1) Under Sleep 3 mode, press "Health" button for a long time, remote controller enters into user indivi duation sleep setting status, at this time, the time of remote controller will display "1HOUR", the setting temperature "88" will display the corresponding temperature of last setting sleep curve and blink (The first entering will display according to the initial curve setting value of original factory);
(2) Adjust " + " and " - " button, could change the corresponding setting temperature, after adjusted, press "Health" button for confirmation;
(3) At this time, 1hour will be automatically increased at the timer position on the remote control, (that are "2HOUR" or "3HOUR" or "8HOUR"), the place of setting temperature "88" will display the corresponding temperature of last setting sleep curve and blink;
(4) Repeat the above step (2)~(3) operation, until 8 hours temperature setting finished, sleep,curve setting finished, at this time, the remote controller will resume the original timer display; temperature display will resume to original setting temperature.
Sleep 3 the sleep curve setting under Sleep mode by DIY could be inquired: The user could accord to sleep curve setting method to inquire the presetting sleep curve, enter into user individuation sleep setting status, but do not change the temperature, press "Health" button directly for confirmation. Note: In the above presetting or enquiry procedure, if continuously within 10s, there is no button pressed, the sleep curve setting within 10s, there is no button pressed, the sleep curve setting status will be automatically quit and resume to display the original displaying. In the presetting or enquiry procedure, press " On/Off " button, "Mode" button, "Clock" and "Light" buttons simultaneously, the sleep curve setting or enquiry status will quit similarly.

8°C heating function

Under heat mode, press "Mode" and "Clock" buttons simultaneously to start up or turn off 8°C heating function. When this function is started up, " " and "8°C" will be shown on remote controller, and the air conditioner keep the heating status at 8°C. Press "Mode" and "Clock" buttons simultaneously again to exit 8°C heating function.

NOTE

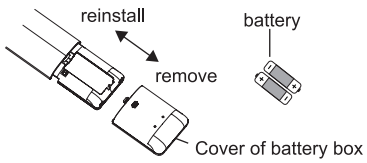
● Under 8°C heating function, fan speed is defaulted at auto speed and it can't be adjusted.

● Under 8°C heating function, set temperature can't be adjusted.

Sleep function and 8°C heating function can't operate at the same time. If 8°C heating function has been set under heat mode, press "Clock" and "Light" buttons simultaneously will cancel 8°C heating function. If sleep function has been set under heat mode, start up the 8°C heating function will cancel sleep function.

● Under °F temperature display, the remote controller will display 46°F heating.

Replacement of batteries in remote controller



1. Press the back side of remote controller marked with " ", as shown in the fig, and then push out the cover of battery box along the arrow direction.
2. Replace two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar are correct.
3. Reinstall the cover of battery box.

NOTICE:

● During operation, point the remote control signal sender at the receiving window on indoor unit.

● The distance between signal sender and receiving window should be no more than 8m, and there should be no obstacles between them.

● Signal may be interfered easily in the room where there is fluorescent lamp or wireless telephone; remote controller should be close to indoor unit during operation.

● Replace new batteries of the same model when replacement is required.

● When you don't use remote controller for a long time, please take out the batteries.

● If the display on remote controller is fuzzy or there's no display, please replace batteries.

6.2 Brief Description of Modes and Functions

1.Basic function of system

(1)Cooling mode

(1) Under this mode, fan and swing operates at setting status. Temperature setting range is 16~30^{O}C.

(2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.

(2)Drying mode

(1) Under this mode, fan operates at low speed and swing operates at setting status. Temperature setting range is 16~30^{O}C.

(2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.

(3) Protection status is same as that under cooling mode.

(4) Sleep function is not available for drying mode.

(3)Heating mode

(1) Under this mode, Temperature setting range is 16~30^{O}C.

(2) Working condition and process for heating mode:

When turn on the unit under heating mode, indoor unit enters into cold air prevention status. When the unit is stopped or at OFF status, and indoor unit has been started up just now, the unit enters into residual heat-blowing status.

(4)Working method for AUTO mode:

1.Working condition and process for AUTO mode:

a.Under AUTO mode, standard heating Tpreset=20^{O}C and standard cooling Tpreset=25^{O}C. The unit will switch mode automatically according to ambient temperature.

2.Protection function

a. During cooling operation, protection function is same as that under cooling mode.

b. During heating operation, protection function is same as that under heating mode.

3. Display: Set temperature is the set value under each condition. Ambient temperature is (Tamb.-Tcompensation) for heat pump unit and Tamb. for cooling only unit.

4. If theres I feel function, Tcompensation is 0. Others are same as above.

(5)Fan mode

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 16~30^{O}C.

2. Other control

(1) Buzzer

Upon energization or availably operating the unit or remote controller, the buzzer will give out a beep.

(2) Auto fan

Heating mode: During auto heating mode or normal heating ode, auto fan speed will adjust the fan speed automatically according to ambient temperature and set temperature.

(3) Sleep

After setting sleep function for a period of time, system will adjust set temperature automatically.

(4) Timer function:

General timer and clock timer functions are compatible by equipping remote controller with different functions.

(5) Memory function

memorize compensation temperature, off-peak energization value. Memory content: mode, up&down swing, light, set temperature, set fan speed, general timer (clock timer cant be memorized).

After power recovery, the unit will be turned on automatically according to memory content.

(6) Health function (Health function is not available for this unit.)

During operation of indoor fan, set health function by remote controller. Turn off the unit will also turn off health function.

Turn on the unit by pressing auto button, and the health is defaulted ON.

(7)I feel control mode

After controller received I feel control signal and ambient temperature sent by remote controller, controller will work according to the ambient temperature sent by remote controller.

(8)Compulsory defrosting function

(1) Start up compulsory defrosting function

Under ON status, set heating mode with remote controller and adjust the temperature to 16^{O}C. Press “+, -, +, -, +,-” button successively within 5s and the complete unit will enter into compulsory defrosting status. Meanwhile, heating indicator on indoor unit will ON 10s and OFF 0.5s successively. (Note: If complete unit has malfunction or stops operation due to protection, compulsory defrosting function can be started up after malfunction or protection is resumed.

(2) Exit compulsory defrosting mode

After compulsory defrosting is started up, the complete unit will exit defrosting operation according to the actual defrosting result, and the complete unit will resume normal heating operation.

(9)Refrigerant recovery function:

(1) Enter refrigerant recycling function

Within 5min after energizing (unit ON or OFF status is ok), continuously press LIGHT button for 3 times within 3s to enter refrigerant recycling mode; Fo is displayed and refrigerant recycling function is started. At this moment, the maintenance people closes liquid valve. After 5min, stick the thimble of maintenance valve with a tool. If there is no refrigerant spraying out, close the gas valve immediately and then turn off the unit to remove the connection pipe.

(2) Exit refrigerant recycling function

After entering refrigerant recycling mode, when receive any remote control signal or enter refrigerant recycling mode for 25min, the unit will exit refrigerant recycling mode automatically If the unit is in standby mode before refrigerant recycling, it will be still in standby mode after finishing refrigerant recycling; if the unit

is in ON status before refrigerant recycling, it will still run in original operation mode.

(10)Ambient temperature display control mode

1. When user set the remote controller to display set temperature (corresponding remote control code: 01), current set temperature will be displayed.

2. Only when remote control signal is switched to indoor ambient temperature display status (corresponding remote control code: 10) from other display status (corresponding remote control code: 00, 01,11),controller will display indoor ambient temperature for 3s and then turn back to display set temperature.

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 16~30^{O}C.

(11)Off-peak energization function:

Adjust compressors minimum stop time. The original minimum stop time is 180s and then we change to:

The time interval between two start-ups of compressor cant be less than 180+T s(0≤T≤15). T is the variable of controller. Thats to say the minimum stop time of compressor is 180s~195s. Read-in T into memory chip when refurbish the memory chip each time. After power recovery, compressor can only be started up after 180+T s at least.

(12) SE control mode

The unit operates at SE status.

(13) X-fan mode

When X-fan function is turned on, after turn off the unit, indoor fan will still operate at low speed for 2min and then the complete unit will be turned off. When x-fan function is turned off, after turn off the unit, the complete unit will be turned off directly.

(14) 8ºC heating function

Under heating mode, you can set 8ºC heating function by remote controller. The system will operate at 8ºC set temperature.

(15) Turbo fan control function

Set turbo function under cooling or heating mode to enter into turbo fan speed. Press fan speed button to cancel turbo wind.

No turbo function under auto, dry or fan mode.

3.Instructions to the Error Indicating Lamps on the Panel of the Floor Ceiling Type Unit

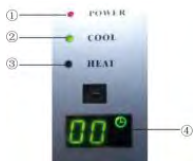


Fig.1

States of the Indicating Lamps:

① Indicating Lamp of “POWER”:

The indicating lamp will shine when power on, while it will go out when power off.

② Indicating Lamp of “COOL” :

The indicating lamp will shine when “COOL” is activated, while it will go out when “COOL” is deactivated.

③ Indicating Lamp of “HEAT”:

The indicating lamp will shine when “HEAT” is activated, while it will go out when “HEAT” is deactivated.

④ Indicating Lamp of “TIMER":

Timer indicator on indoor unit will be on when timer ON is set under off status and timer OFF is set under on status.

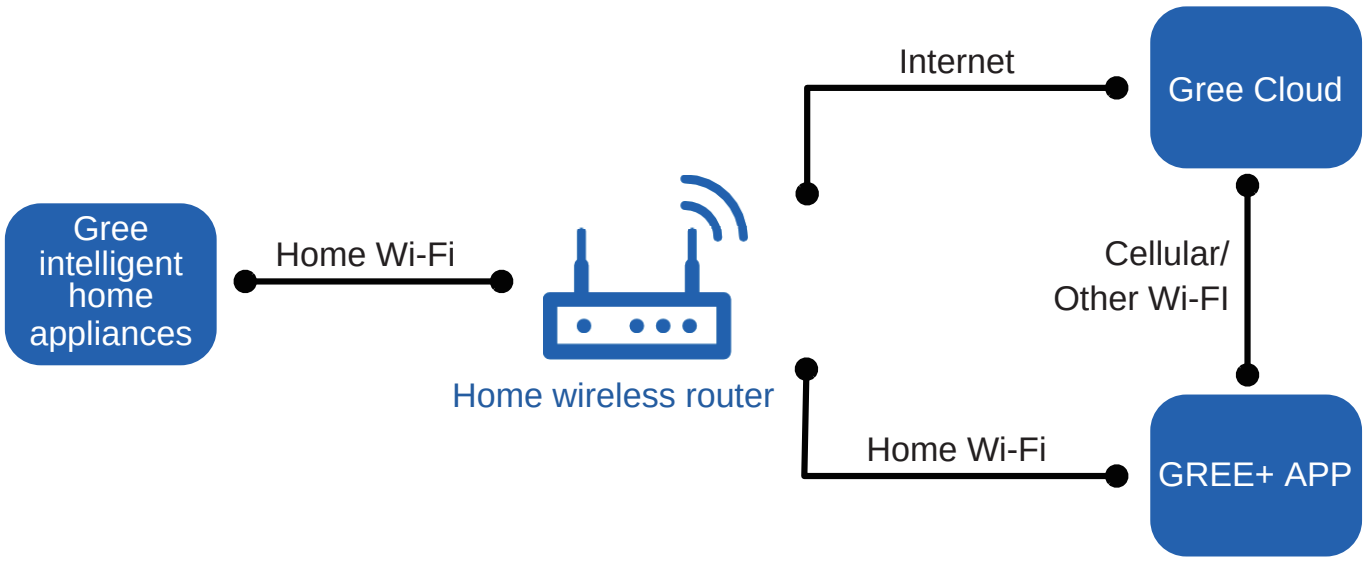
Note:

(1) If the light of indoor unit is turned off, when operating the remote controller to send command,the display will be on,for 3s and then off.

(2) When the wired controller is connected, the indoor unit display is invalid and the unit won’t receive the remote control command.

6.3 GREE+ App Operation Manual

Control Flow Chart



Operating Systems

Requirement for User's smart phone:

iOS system
Support iOS7.0 and above version

Android system
Support Android 4.4 and above version

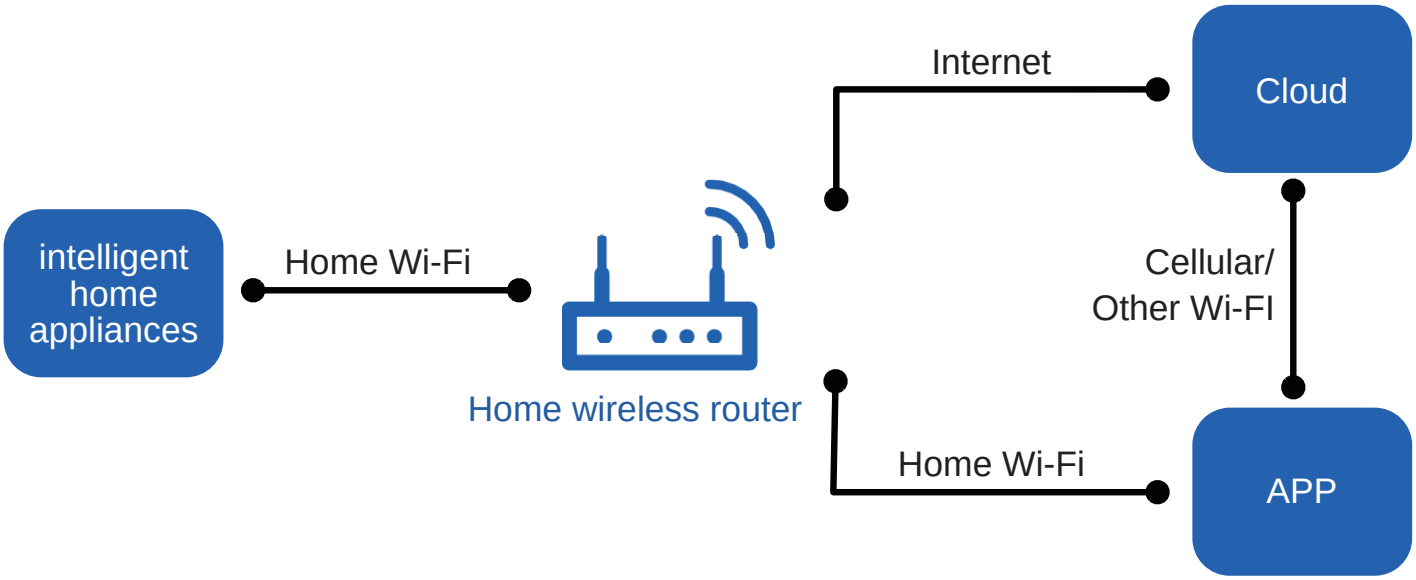
Download and installation

GREE+ App Download Linkage

Scan the QR code or search "GREE+" in the application market to download and install it. When "GREE+" App is installed, register the account and add the device to achieve long-distance control and LAN control of Gree smart home appliances.
For more information, please refer to "Help" in App.

6.4 Ewpe Smart App Operation Manual

Control Flow Chart



Operating Systems

Requirement for User's smart phone:

iOS system
Support iOS7.0 and above version

Android system
Support Android 4.4 and above version

Download and installation

App Download Linkage

Scan the QR code or search "Ewpe Smart" in the application market to download and install it. When "Ewpe Smart" App is installed, register the account and add the device to achieve long-distance control and LAN control of smart home appliances.
For more information, please refer to "Help" in App.

7. Notes for Installation and Maintenance

Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.

The following contents are very important for installation and maintenance.

Caution: Installation Must be Performed in Accordance with the NEC/CEC by Authorized Personnel Only.

Please follow the instructions below.

●The installation or maintenance must accord with the instructions.

●Comply with all national electrical codes and local electrical codes.

●Pay attention to the warnings and cautions in this manual.

●All installation and maintenance shall be performed by distributor or qualified person.

●All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.

●Be caution during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.

⚠ WARNINGS

Electrical Safety Precautions:

1. Cut off the power supply of air conditioner before checking and maintenance.

2. The air condition must apply specialized circuit and prohibit share the same circuit with other appliances.

3. The air conditioner should be installed in suitable location and ensure the power plug is touchable.

4. Make sure each wiring terminal is connected firmly during installation and maintenance.

5. Have the unit adequately grounded. The grounding wire can't be used for other purposes.

6. Must apply protective accessories such as protective boards, cable-cross loop and wire clip.

7. The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the air conditioner.

8. The power cord and power connection wires can't be pressed by hard objects.

9. If power cord or connection wire is broken, it must be replaced by a qualified person.

10. If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacture or distributor. Prohibit prolong the wire by yourself.

11. For the air conditioner without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.

12. Make sure all wires and pipes are connected properly and the valves are opened before energizing.

13. Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.

14. Replace the fuse with a new one of the same specification if it is burnt down; Don't replace it with a cooper wire or conducting wire.

15. If the unit is to be installed in a humid place, the circuit breaker must be installed.

Installation Safety Precautions:

1. Select the installation location according to the requirement of this manual.(See the requirements in installation part)

2. Handle unit transportation with care; the unit should not be carried by only one person if it is more than 44.09 lb.

3. When installing the indoor unit and outdoor unit, a sufficient fixing bolt must be installed; make sure the installation support is firm.

4. Ware safety belt if the height of working is above 2m.

5. Use equipped components or appointed components during installation.

6. Make sure no foreign objects are left in the unit after finishing installation.

Refrigerant Safety Precautions:

1. When refrigerant leaks or requires discharge during installation, maintenance, or disassembly, it should be handled by certified professionals or otherwise in compliance with local laws and regulations.

2.Avoid contact between refrigerant and fire as it generates poisonous gas; Prohibit prolong the connection pipe by welding.

3. Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant line as it may lead to rupture or other hazards.

4. Make sure no refrigerant gas is leaking out when installation is completed.

5. If there is refrigerant leakage, please take sufficient measure to minimize the density of refrigerant.

6. Never touch the refrigerant piping or compressor without wearing glove to avoid scald or frostbite.

Improper installation may lead to fire hazard, explosion, electric shock or injury.

Safety Precautions for Installing and Relocating the Unit:

To ensure safety, please be mindful of the following precautions.

⚠ WARNINGS

1. When installing or relocating the unit, be sure to keep the refrigerant circuit free from air or substances other than the specified refrigerant.

Any presence of air or other foreign substance in the refrigerant circuit will cause system pressure rise or compressor rupture, resulting in injury.

2.When installing or moving this unit, do not charge the refrigerant which is not comply with that on the nameplate or unqualified refrigerant.

Otherwise, it may cause abnormal operation, wrong action, mechanical malfunction or even series safety accident.

3.When refrigerant needs to be recovered during relocating or repairing the unit, be sure that the unit is running in cooling mode.Then, fully close the valve at high pressure side (liquid valve).About 30-40 seconds later, fully close the valve at low pressure side (gas valve), immediately stop the unit and disconnect power. Please note that the time for refrigerant recovery should not exceed 1 minute.

If refrigerant recovery takes too much time, air may be sucked in and cause pressure rise or compressor rupture, resulting in injury.

4.During refrigerant recovery, make sure that liquid valve and gas valve are fully closed and power is disconnected before detaching the connection pipe.

If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.

5.When installing the unit, make sure that connection pipe is securely connected before the compressor starts running.

If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.

6.Prohibit installing the unit at the place where there may be leaked corrosive gas or flammable gas.

If there leaked gas around the unit, it may cause explosion and other accidents.

7.Do not use extension cords for electrical connections. If the electric wire is not long enough, please contact a local service center authorized and ask for a proper electric wire.

Poor connections may lead to electric shock or fire.

8.Use the specified types of wires for electrical connections between the indoor and outdoor units. Firmly clamp the wires so that their terminals receive no external stresses.

Electric wires with insufficient capacity, wrong wire connections and insecure wire terminals may cause electric shock or fire.

R32 refrigerant warning

• To realize the function of the air conditioner unit, a special refrigerant circulates in the system. The used refrigerant is the fluoride R32, which is specially cleaned. The refrigerant is flammable and inodorous. Furthermore, it can lead to explosion under certain conditions. But the flammability of the refrigerant is very low. It can be ignited only by fire.

• Compared to common refrigerants, R32 is a nonpolluting refrigerant with no harm to the ozonosphere. The influence upon the greenhouse effect is also lower. R32 has got very good thermodynamic features which lead to a really high energy efficiency. The units there fore need a less filling.

• This product uses R32 difluoromethane refrigerant, which is a mildly flammable gas class A2L according to ISO 817 or ANSI/ASHRAE 34.

• "ANSI/ASHRAE 15 (USA) and CSA 852 (Canada)" stipulate that it must be handled by a refrigeration mechanic with an appropriate refrigerant handling licence.

•The appliance shall be stored in a room without continuously operating ignition sources.(for example:open flames,an operating gas appliance or an operating electric heater.)

•The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.

•The appliance shall be stored so as to prevent mechanical damage from occurring.

•Ducts connected to an appliance shall not contain an ignition source.

•Keep any required ventilation openings clear of obstruction.

•Do not pierce or burn.

•Be aware that refrigerants may not contain an odour.

•Do not use means to accelerate the defrosting process or to clean,other than those recommended by the manufacturer.

•Servicing shall be performed only as recommended by the manufacturer.

•Should repair be necessary,contact your nearest authorized

•Service Centre. Any repairs carried out by unqualified personnel may be dangerous.

•Compliance with national gas regulations shall be observed.

Read specialist's manual.

•That pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15,ASHRAE15.2,IAPMO Uniform Mechanical Code,ICC International Mechanical Code,or CSA B52.All field joints shall be accessible for inspection prior to being covered or enclosed.

Safety Operation of Flammable Refrigerant

Aptitude requirement for maintenance man(repairs should be done only be specialists).

•Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority,which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.

•Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants

Safety preparation work

This product uses mildly flammable R32 refrigerant. Certain levels of refrigerant require minimum room sizes. Please ensure that these minimum room sizes are adhered to for standard installations.(Note: Please refer to the nameplate for the charging quantity of R32).

Appliance shall be installed, operated and stored in a room with a floor area larger than Xm^2 . (Please refer to table "a")

Table a - Minimum room area (m^2)

Charge amount (kg)	Height of ventilation opening(m)				
	0.6	1.8	2.2	2.5	3
	Minimum room area (m^2)				
1.836	/	/	/	/	/
1.85	29.39	6.72	5.50	4.84	4.04
1.9	31.01	6.90	5.65	4.97	4.14
1.95	32.66	7.09	5.80	5.10	4.25
2	34.35	7.27	5.95	5.23	4.36
2.05	36.09	7.45	6.10	5.36	4.47
2.1	37.87	7.63	6.24	5.50	4.58
2.15	39.70	7.81	6.39	5.63	4.69
2.2	41.57	7.99	6.54	5.76	4.80
2.3	45.43	8.36	6.84	6.02	5.02
2.4	49.47	8.72	7.14	6.28	5.23
2.5	53.68	9.08	7.43	6.54	5.45
2.6	58.05	9.45	7.73	6.80	5.67
2.7	62.61	9.81	8.03	7.06	5.89
2.8	67.33	10.17	8.32	7.33	6.11
2.9	72.22	10.54	8.62	7.59	6.32
3	77.29	10.90	8.92	7.85	6.54
3.1	82.53	11.26	9.21	8.11	6.76
3.2	87.94	11.62	9.51	8.37	6.98
3.3	93.52	11.99	9.81	8.63	7.19
3.4	99.27	12.35	10.11	8.89	7.41
3.5	105.20	12.71	10.40	9.16	7.63

Information on servicing

Checks to the area

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, Safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the REFRIGERATING SYSTEM, the following precautions shall be completed prior to conducting work on the system.

Work procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically sate.

Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts,appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

No ignition sources

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks.“No Smoking” signs shall be displayed.

Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Checks to the refrigerating equipment

Where electrical components are being changed,they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer’s technical department for assistance.

The following checks Shall be applied to installations using FLAMMABLE REFRIGERANTS:

-the actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed.

-the ventilation machinery and outlets are operating adequately and are not obstructed;

-if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

-marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.

-refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are Suitably protected against being so corroded.

Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety,then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation,an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

•that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;

•that no live electrical components and wiring are exposed while charging, recovering or purging the system;

•that there is continuity of earth bonding.

Repairs to sealed components

Sealed electrical components shall be replaced.

Repair to intrinsically safe components

Intrinsically safe components must be replaced.

Cabling

Check that cabling will not be subject to wear,corrosion,excessive pressure,vibration,sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch(or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS,the sensitivity may not be adequate,or may need re-calibration.(Detection equipment shall be calibrated in a refrigerant-free area.)Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25%maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

NOTE Examples of leak detection fluids are

-bubble method,

-fluorescent method agents

If a leak is suspected,all naked flames shall be removed/ extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system,or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to Clause "Removal and evacuation".

Removal and evacuation

When breaking into the refrigerant circuit to make repairs -or for any other purpose -conventional procedures shall be used. However,for flammable refrigerants it is important that best practice be followed,since flammability is a consideration. The following procedure shall be adhered to:

-Safely remove refrigerant following local and national regulations;

-evacuate;

-purge the circuit with inert gas (optional for A2L);

-evacuate (optionalforA2L);

-continuously flush or purge with inert gas when using flame to open circuit;and

-open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants,the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants,refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved,then venting to atmosphere,and finally pulling down to a vacuum (optional for A2L).This process shall be repeated until no refrigerant is within the system (optional for A2L).When the final oxygen-free nitrogen charge is used,the system shall be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall not be close to any potential ignition sources,and ventilation shall be available

Charging procedures

In addition to conventional charging procedures,the following requirements shall be followed.

•Ensure that contamination of different refrigerants does not occur when using charging equipment.

Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.

•Cylinders shall be kept in an appropriate position according to the instructions.

•Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.

•Label the system when charging is complete(if not already).

•Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Decommissioning

Before carrying out this procedure,it is essential that the technician is completely familiar with the equipment and all its detail.It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out,an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically

c) Before attempting the procedure,ensure that:

•mechanical handling equipment is available, if required,for handling refrigerant cylinders;

•all personal protective equipment isavailable and being used correctly;

•the recovery process is supervised at all times by a competent person;

•recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system,if possible

e) If a vacuum is not possible,make a manifold so that refrigerant can be removed from various parts of the system.

f) Make sure that cylinder is situated on the scales before recovery takes place

g) Start the recovery machine and operate in accordance with instructions

h) Do not overfill cylinders (no more than 80 % volume liquid charge.

i) Do not exceed the maximum working pressure of the cylinder even temporarily.

j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS,ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders,ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and,if possible cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt,the manufacturer should be consulted. In addition,a equipment shall be calibrated in a refrigerant-free area.)Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25%maximum) is confirmed.

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The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants,the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

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a) Become familiar with the equipment and its operation.

b) Isolate system electrically

c) Before attempting the procedure,ensure that:

•mechanical handling equipment is available, if required,for handling refrigerant cylinders;

•all personal protective equipment isavailable and being used correctly;

•the recovery process is supervised at all times by a competent person;

•recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system,if possible

e) If a vacuum is not possible,make a manifold so that refrigerant can be removed from various parts of the system.

f) Make sure that cylinder is situated on the scales before recovery takes place

g) Start the recovery machine and operate in accordance with instructions

h) Do not overfill cylinders (no more than 80 % volume liquid charge.

i) Do not exceed the maximum working pressure of the cylinder even temporarily.

j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

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The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt,the manufacturer should be consulted. In addition,a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system,it Shall be carried out safely.

Main Tools for Installation and Maintenance

Level meter

Measuring tape

Screw driver

Impact drill

Drill head

Electric drill

Electroprobe

Universal meter

Torque wrench

Open-end wrench

Inner hexagon spanner

Electronic leakage detector

Vacuum pump

Pressure meter

Pipe pliers

Pipe pliers

Pipe cutter

Pipe expander

Pipe bender

Soldering appliance

Refrigerant container

Electronic scale

8. Preparative for Installation

8.1 Selection of the Installation Location

WARNING!

The unit must be installed where strong enough to withstand the weight of the unit and fixed securely otherwise the unit would topple or fall off.

CAUTION!

1. Do not install where there is a danger of combustible gas leakage.
2. Do not install the unit near heat source, steam, or flammable gas.

Decide the installation location with the customer as follows:

WARNING!

1.Install the indoor unit in a location which can withstand a load of at least five times the weight of the main unit and which will not amplify sound or vibration.

2.If the installation location is not strong enough, the indoor unit may fall and cause injuries.

3.If the job is done with the panel frame only, there is a risk that the unit will come loose.
Please take care.

8.2 Connection Pipe Requirement

CAUTION!

The maximum length of the connection pipe is listed in the Table below. Do not place the units between which the distance exceeds the maximum length of the connection pipe.(See outdoor)

Table 1

Item / Model	Size of Fitting Pipe(Inch)		Indoor unit Drainage pipe(Outer Diameter x wall thickness)(mm)
	Liquid	Gas	
09K	1/4	3/8	Φ17X1.75
12K	1/4	1/2	Φ17X1.75
18K	1/4	1/2	Φ17X1.75
24K	3/8	5/8	Φ17X1.75

(1). The connecting pipe should be thermally insulated properly.
(2). The pipe wall thickness shall be 0.5-1.0 mm and the pipe wall shall be able to withstand the pressure of 6.0MPa.The longer the connecting pipe,the lower the cooling and heating effect performs.
(3). The pipe wall thickness shall be 0.5-1.0mm and the pipe wall shall be able to withstand the pressure of 6.0MPa.The longer the connecting pipe,the lower the cooling and heating effect performs.

8.3 Electrical Requirement

Electric Wire Size and Fuse Capacity.
Table 2

Indoor Units	Power Supply	Fuse Capacity	Min. Power Supply Cord
	V/Ph/Hz	A	mm^2
09~24K	208/230V~ 60Hz	5	4xAWG18

Notes:

① . The fuse is located on the main board.

② . Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units (Both indoor unit and outdoor unit). The appliance must be positioned so that the plug is accessible.

③ . The specifications of the power cable listed in the Table above are determined based on the maximum power (maximum amps) of the unit.

④ . The specifications of the power cable listed in the Table above are applied to the conduit-guarded multi-wire copper cable (like, YJV copper cable, consisting of PE insulated wires and a PVC cable jacket) used at 40°C and resistible to 90°C(see IEC 60364-5-52). If the working condition changes, they should be modified according to the related national standard.

9. Installation of the Unit

9.1 Installation of the Indoor Unit

9.1.1 Preparation for Installing the Indoor Unit

(1). Open the air inlet grille and the screw cover, and remove the screws.
(2). Release the claws in the 3 places indicated.
(3). Release the center hook and remove the front panel.
(4). Release the claws in the 2 or 3 places indicated and remove the electric component cover.

9.1.2 Indoor Unit Installation

(1). Determine the location of the hanger through the paper template, and then remove the paper template.

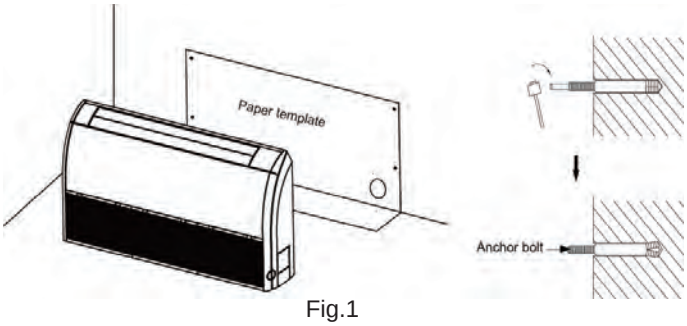


Fig.1

(2). Insert the anchor bolts into the drilled holes, and drive the pins completely into the anchor bolts with a hammer.
(3). Remove the right and left side panels.
(4). Put the hanger bolt into the clasp of the indoor unit and tighten screws on the hanger to prevent the indoor unit from moving.
(5). Adjust the height of the unit to make the drain pipe slant slightly downward so that the drainage will become much smoother.

◆ Floor type

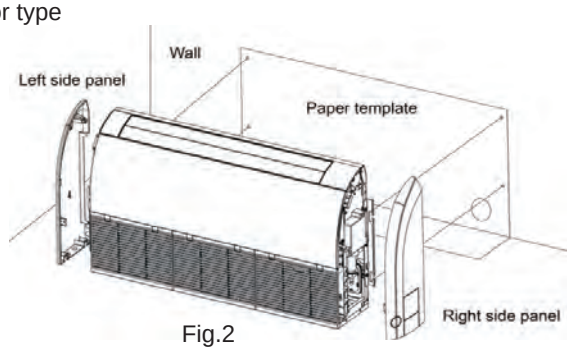
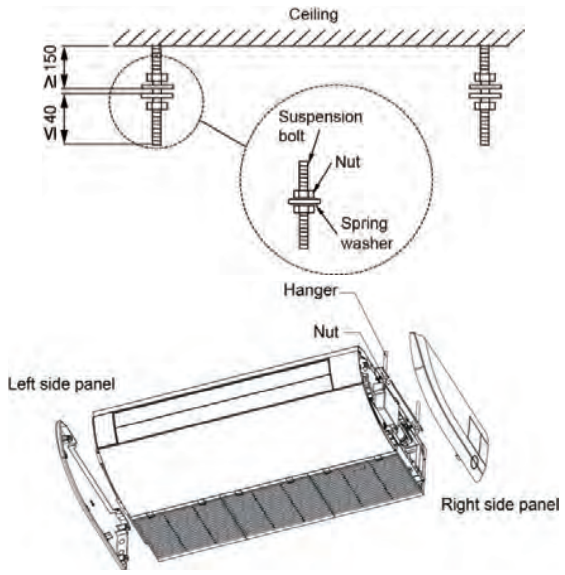


Fig.2

◆ Ceiling type



(6). Reinstall and tighten the right and left side panel.

9.1.3 Leveling

The water level test must be done after installing the indoor unit to make the unit is horizontal, as shown below.

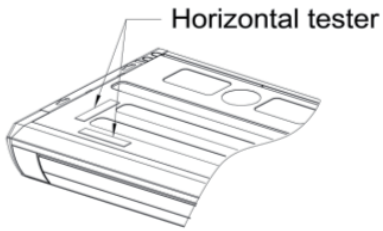


Fig.4

9.2 Installation of the Connection Pipe

9.2.1 Flare Processing

(1). Cut the connection pipe with the pipe cutter and remove the burrs.
(2). Hold the pipe downward to prevent cuttings from entering the pipe.
(3). Remove the flare nuts at the stop valve of the outdoor unit and inside the accessory bag of the indoor unit, then insert them to the connection pipe,after that, flare the connection pipe with a flaring tool.
(4). Check if the flare part is spread evenly and there are no cracks.

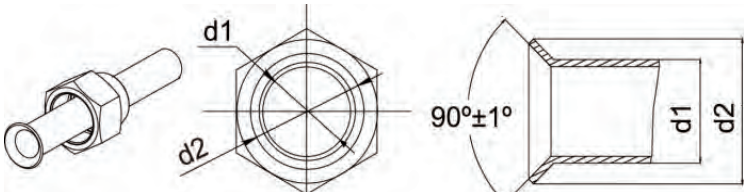


Fig.5

9.2.2 Bending Pipes

(1). The pipes are shaped by your hands. Be careful not to collapse them.

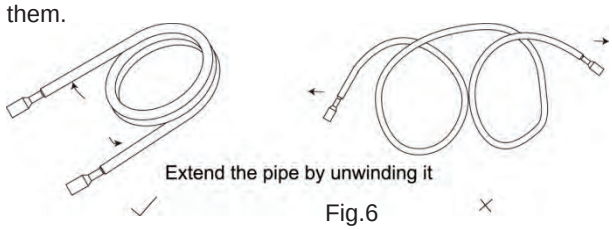


Fig.6

(2). Do not bend the pipes in an angle more than 90°.
(3). When pipes are repeatedly bent or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.
(4). When bending the pipe, do not bend it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown in Fig.7, and bend it after exposing the pipe. After bending the pipe as you want, be sure to put the heat insulating pipe back on the pipe, and secure it with tape.

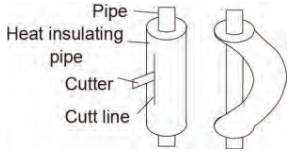


Fig.7

CAUTION!

① . To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.

② .If the pipe is bent repeatedly at the same place, it will break.

9.2.3 Connecting the Pipe at the Indoor Unit Side

Detach the caps and plugs from the pipes.

CAUTION!

① . Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.

② .Do not remove the flare nut until the connection pipe is to be connected so as to prevent dust and impurities from coming into the pipe system.

When connecting the pipe to the unit or removing it from the unit, please do use both the spanner and the torque wrench. (Fig.8)

When connecting, smear both inside and outside of the flare nut with refrigeration oil, screw it hand tight and then tighten it with the spanner. Refer to Table 7 to check if the wrench has been tightened properly (too tight would mangle the nut and lead to leakage).

Examine the connection pipe to see if it leaks, then take the treatment of heat insulation, as shown in the Fig.9.

Use the medium-sized sponge to insulate the coupler of the gas pipe.

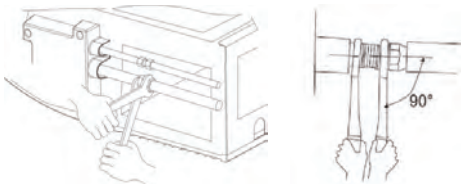


Fig.8

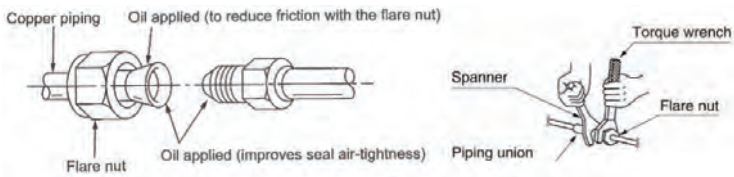


Fig.9

Table 5 Flare nut tightening torque

Pipe Diameter	Tightening Torque
1/4" (Inch)	15-30 (N·m)
3/8" (Inch)	35-40 (N·m)
1/2" (Inch)	45-50 (N·m)
5/8" (Inch)	60-65 (N·m)
3/4" (Inch)	70-75 (N·m)
7/8" (Inch)	80-85 (N·m)

CAUTION!

Be sure to connect the gas pipe after connecting the liquid pipe completely.

9.2.4 Heat Insulation on the Pipe Joints (Indoor Side Only)

Stick coupler heat insulation (large and small) to the place where connecting pipes.

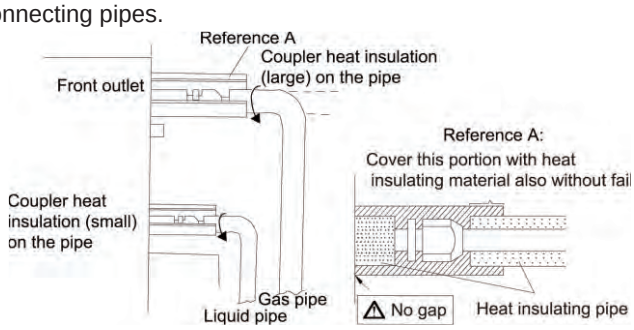


Fig.10

9.3 Installation of the Drain Pipe

9.3.1 Precautions When Doing the Piping Work

CAUTION!

Install the drain hose in accordance with the instructions in this installation manual and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.

(1). Keep piping as short as possible and slope it downwards at a gradient of at least 1/100 so that air may not remain trapped inside the pipe.

(2). Keep pipe size equal to or greater than that of the connecting pipe.

(3). Install the drain piping as shown and take measures against condensation. Improperly rigged piping could lead to leaks and eventually wet furniture and belongings.

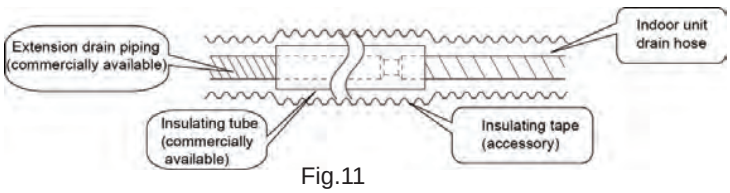


Fig.11

(4). Connect the drain hose.

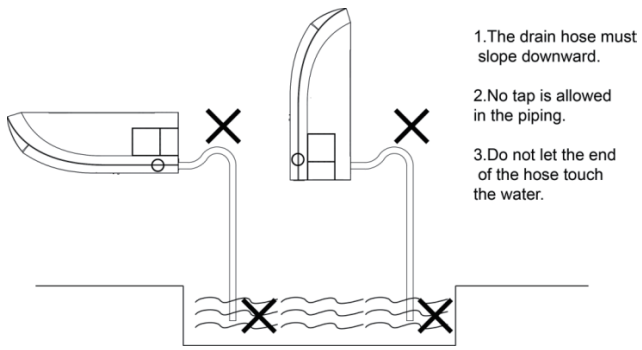


Fig.12

9.3.2 Installing the Drain Pipes

(1). For determining the position of the drain hose, perform the following procedures.

(2). Insert the drain pipe to the drain outlet of the unit and then tighten the clamp securely with tape. (Fig. 13)

(3). Connect the extension drain pipe to the drain pipe and then tighten the clamp with tape.

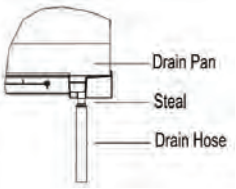


Fig.13

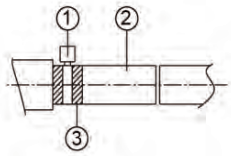


Fig.14

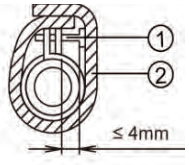


Fig.15

Tighten the clamp until the screw head is less than 4 mm from the hose. (Fig.14)

① - Metal clamp ② - Drain hose ③ - Grey tape

Insulate the pipe clamp and the drain hose using heat insulation sponge. (Fig.15)

① - Metal clamp ② - Insulation sponge

(1). When drain hose requires extension, obtain an extension hose commercially available.

(2). After connecting the local drain hose, tape the slits of the heat insulation tube.

(3). Connect the drain hose to the local drain pipe. Position the inner connecting wire in the same direction as the piping.

9.3.3 Connecting the Drain Hose

(1). Connect the extension auxiliary pipe to the local piping.

(2). Prepare the local piping at the connection point for the drain pipe, as shown in the installation drawings.

Note: Be sure to place the drain hose as shown in the diagram below, in a downward sloping direction.

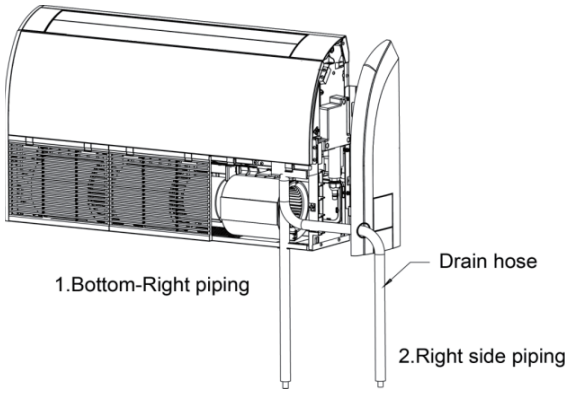


Fig.16

9.3.4 Testing of Drain Piping

(1). After piping work is finished, check if drainage flows smoothly.

(2). As shown in the Figure, pour water into the drain pan from the right side to check that water flows smoothly from the drain hose.

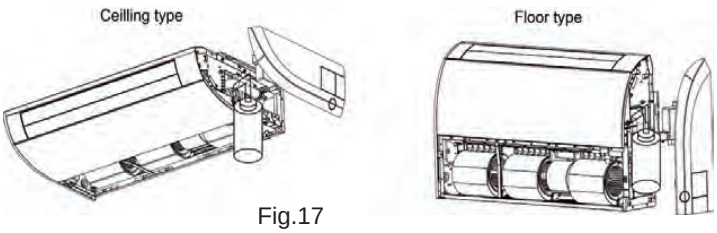


Fig.17

9.4 Electrical Wiring

9.4.1 Wiring Precautions

WARNING!

1.Before obtaining access to terminals, all supply circuits must be disconnected.
2.The rated voltage of the unit is as shown as Table 3
3.Before turning on, verify that the voltage is within the 185~264V range (for single phrase unit) or 342~457V range (for three-phrase unit).
4.Always use a special branch circuit and install a special receptacle to supply power to the air conditioner.
5.The special branch circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3 mm between the contacts of each pole.
6.Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
7.Install a leakage special branch circuit breaker in accordance with the related laws and regulations and electric company standards.

Wiring Precautions

CAUTION!

1.The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.
2.When the voltage is low and the air conditioner is difficult to start, contact the power company to raise the voltage.

9.4.2 Electrical Wiring

(1). For solid core wiring (Fig.18)

1). Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation about 25 mm (15/16”).

2). Using a screwdriver, remove the terminal screw(s) on the terminal board.

3). Using pliers, bend the solid wire to form a loop suitable for the terminal screw.

4). Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

(2). For strand wiring (Fig.18)

1). Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation about 10 mm (3/8”).

2). Using a screwdriver, remove the terminal screw (s) on the terminal board.

3). Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.

4). Position the round terminal wire, and replace and tighten the terminal screw with a screwdriver.(Fig.19)

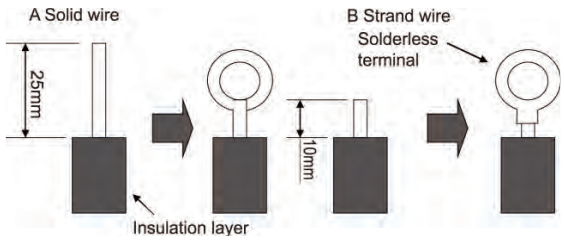


Fig.18

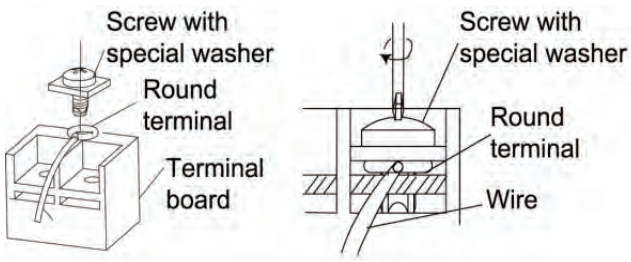


Fig.19

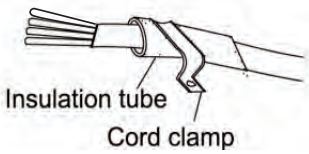


Fig.20

(3). How to fix connection cord and power cord by cord clamp After passing the connection cord fasten it with the cord clamp.(Fig.20)

WARNING!

1.Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.
2.Match the terminal block numbers and connection cord colors with those of the indoor unit side.
3.Erroneous wiring may cause burning of the electric parts.
4.Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.
5.Always fasten the outside covering of the connection cord with cord clamps. (If the insulator is not clamped, electric leakage may occur.)
6.Always connect the ground wire.

(4). Electric wiring between the indoor and outdoor units Single-phase units (09~24K)

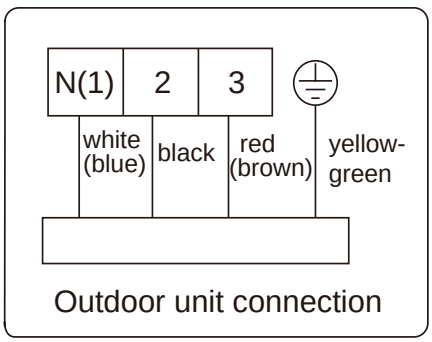
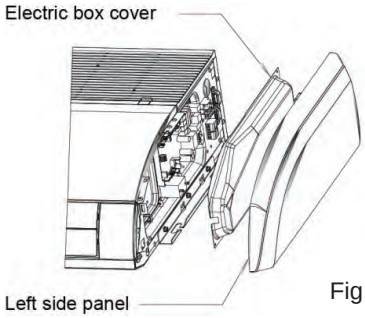


Fig.21

(5). Electric wiring of indoor unit side

Remove the left cover plate and the electric box cover then insert the end of the communication cord and the power cable into the terminal board.



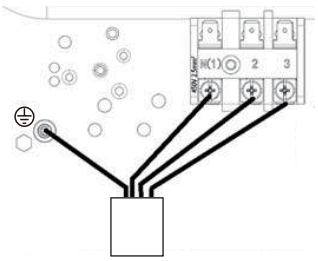


Fig.22

CAUTION!

1.Tighten the power cord respectively on the terminal boards with screws. Faulty connection may cause a fire.
2. If the power supply are wired incorrectly, the air conditioner may be damaged.
3. Connect the indoor unit connection cord properly based on the corresponding marks as shown in Fig.21.
4. Ground both the indoor and outdoor units by attaching a ground wire.
5. Unit shall be grounded in compliance with the applicable local and national codes.

10. Maintenance

10.1 Error Code List

NO.	Malfunction Name	Display Method of Indoor Unit Dual-8 Code Display	A/C status	Possible Causes
1	High pressure protection of system	E1	During cooling and drying operation, except indoor fan operates, all loads stop operation. During heating operation, the complete unit stops.	Possible reasons: 1. Refrigerant was superabundant; 2. Poor heat exchange (including filth blockage of heat exchanger and bad radiating environment); Ambient temperature is too high.
2	Antifreezing protection	E2	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates.	1. Poor air-return in indoor unit; 2. Fan speed is abnormal; 3. Evaporator is dirty.
3	System block or refrigerant leakage	E3	The Dual-8 Code Display will show E3 until the low pressure switch stop operation.	1.Low-pressure protection 2.Low-pressure protection of system 3.Low-pressure protection of compressor
4	High discharge temperature protection of compressor	E4	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	Please refer to the malfunction analysis (discharge protection, overload).
5	Overcurrent protection	E5	During cooling and drying operation, compressor and outdoor fan stop while indoor fan operates. During heating operation, all loads stop.	1. Supply voltage is unstable; 2. Supply voltage is too low and load is too high; 3. Evaporator is dirty.
6	Communi-cation Malfunction	E6	During cooling operation, compressor stops while indoor fan motor operates. During heating operation, the complete unit stops.	Refer to the corresponding malfunction analysis.
7	High temperature resistant protection	E8	During cooling operation:compressor will stop while indoor fan will operate. During heating operation, the complete unit stops.	Refer to the malfunction analysis (overload, high temperature resistant).
8	EEPROM malfunction	EE	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
9	Limit/ decrease frequency due to high temperature of module	EU	All loads operate normally, while operation frequency for compressor is decreased	Discharging after the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
10	Malfunction protection of jumper cap	C5	Wireless remote receiver and button are effective, but can not dispose the related command	1. No jumper cap insert on mainboard. 2. Incorrect insert of jumper cap. 3. Jumper cap damaged. 4. Abnormal detecting circuit of mainboard.

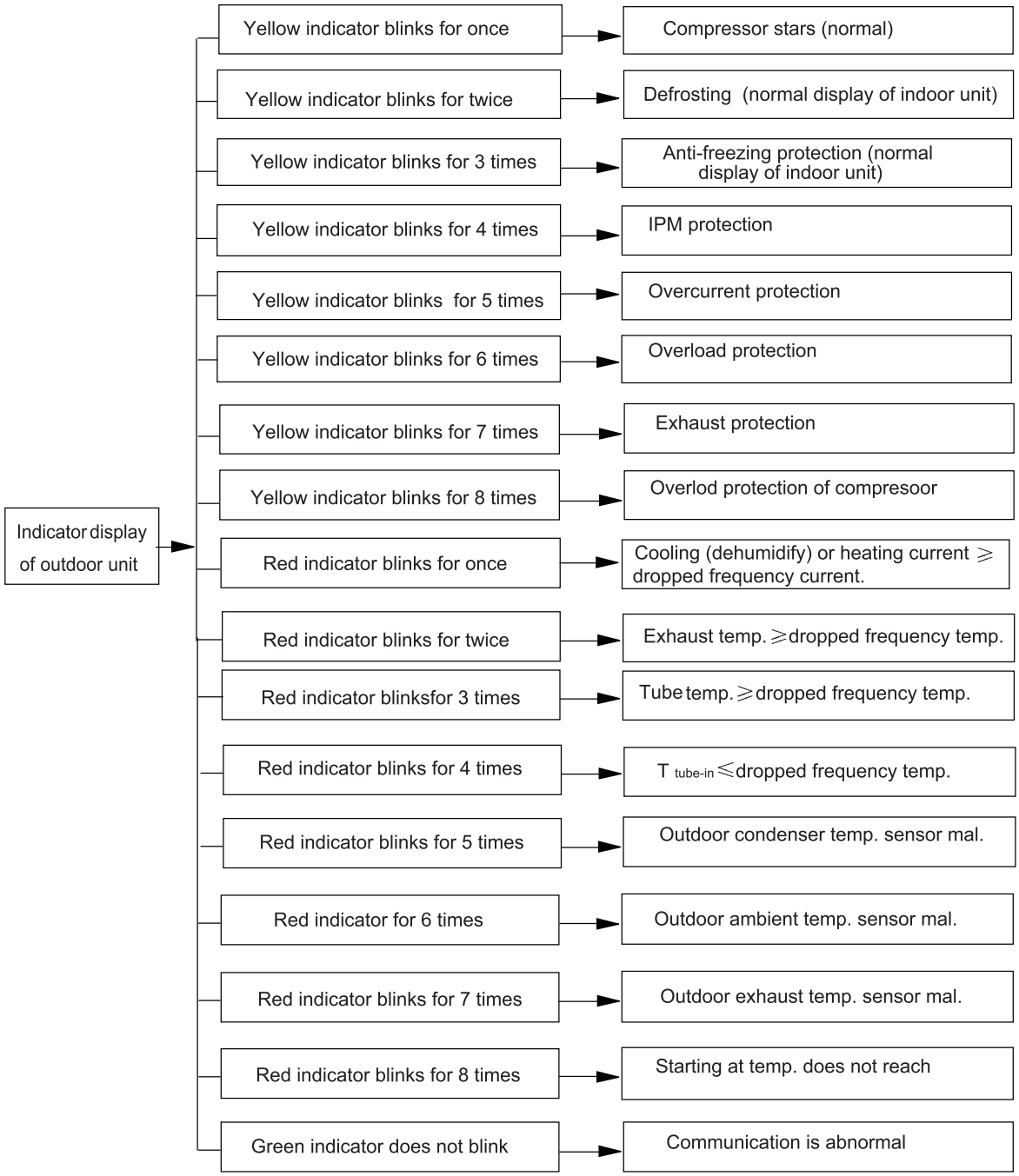
NO.	Malfunction Name	Display Method of Indoor Unit Dual-8 Code Display	A/C status	Possible Causes
11	Refrigerant insufficient protection,cut off protection of refrigerant	F0	Cool:compressor and outdoor fan stops operation while indoor fan operates; Heat:Compressor,outdoor fan and indoor fan stops operation	1.Is system cooling under high humidity environment,thus temperature difference of heat transfer is small; 2.Check whether the big valve and small valve of outdoor unit are opened completely; 3.Is the temperature sensor of evaporator of indoor unit loose? 4.Is the temperature sensor of condenser of outdoor unit loose? 5.Is the capillary or the electronic expansion valve blocked? 6.Is refrigerant leaking?
12	Indoor ambient temperature sensor is open/short circuited	F1	During cooling and drying operation, indoor unit operates while other loads will stop; during heating operation, the complete unit will stop operation.	1. Loosening or bad contact of indoor ambient temp. sensor and mainboard terminal. 2. Components in mainboard fell down leads short circuit. 3. Indoor ambient temp. sensor damaged. (check with sensor resistance value chart) 4. Mainboard damaged.
13	Indoor evaporator temperature sensor is open/short circuited	F2	AC stops operation once reaches the setting temperature. Cooling, drying: internal fan motor stops operation while other loads stop operation; heating: AC stop operation	1. Loosening or bad contact of Indoor evaporator temp. sensor and mainboard terminal. 2. Components on the mainboard fall down leads short circuit. 3. Indoor evaporator temp. sensor damaged.(check temp. sensor value chart for testing) 4. Mainboard damaged.
14	Outdoor ambient temperature sensor is open/short circuited	F3	During cooling and drying operating, compressor stops while indoor fan operates; During heating operation, the complete unit will stop operation	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
15	Outdoor condenser temperature sensor is open/short circuited	F4	During cooling and drying operation, compressor stops while indoor fan will operate; During heating operation, the complete unit will stop operation.	Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor)
16	Outdoor discharge temperature sensor is open/short circuited	F5	During cooling and drying operation, compressor will sop after operating for about 3 mins, while indoor fan will operate; During heating operation, the complete unit will stop after operating for about 3 mins.	1.Outdoor temperature sensor hasnt been connected well or is damaged. Please check it by referring to the resistance table for temperature sensor) 2.The head of temperature sensor hasnt been inserted into the copper tube
17	Limit/decrease frequency due to overload	F6	All loads operate normally, while operation frequency for compressor is decreased	Refer to the malfunction analysis (overload, high temperature resistant)
18	Decrease frequency due to overcurrent	F8	All loads operate normally, while operation frequency for compressor is decreased	The input supply voltage is too low; System pressure is too high and overload

NO.	Malfunction Name	Display Method of Indoor Unit Dual-8 Code Display	A/C status	Possible Causes
19	Decrease frequency due to high air discharge	F9	All loads operate normally, while operation frequency for compressor is decreased	Overload or temperature is too high; Refrigerant is insufficient; Malfunction of electric expansion valve (EKV)
20	Limit/decrease frequency due to antifreezing	FH	All loads operate normally, while operation frequency for compressor is decreased	Poor air-return in indoor unit or fan speed is too low
21	Voltage for DC bus-bar is too high	PH	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 265VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
22	Voltage of DC bus-bar is too low	PL	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	1. Measure the voltage of position L and N on wiring board (XT), if the voltage is higher than 150VAC, turn on the unit after the supply voltage is increased to the normal range. 2.If the AC input is normal, measure the voltage of electrolytic capacitor C on control panel (AP1), if its normal, theres malfunction for the circuit, please replace the control panel (AP1)
23	Compressor Min frequence in test state	P0		Showing during min. cooling or min. heating test
24	Compressor rated frequence in test state	P1		Showing during nominal cooling or nominal heating test
25	Compressor maximum frequence in test state	P2		Showing during max. cooling or max. heating test
26	Compressor intermediate frequence in test state	P3		Showing during middle cooling or middle heating test

NO.	Malfunction Name	Display Method of Indoor Unit Dual-8 Code Display	A/C status	Possible Causes
27	Overcurrent protection of phase current for compressor	P5	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
28	Charging malfunction of capacitor	PU	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Refer to the part three—charging malfunction analysis of capacitor
29	Malfunction of module temperature sensor circuit	P7	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
30	Module high temperature protection	P8	During cooling operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	After the complete unit is de-energized for 20mins, check whether the thermal grease on IPM Module of outdoor control panel AP1 is sufficient and whether the radiator is inserted tightly. If its no use, please replace control panel AP1.
31	Overload protection for compressor	H3	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	1. Wiring terminal OVC-COMP is loosened. In normal state, the resistance for this terminal should be less than 1ohm. 2.Refer to the malfunction analysis (discharge protection, overload)
32	IPM protection	H5	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
33	Desynchro-nizing of compressor	H7	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis (IPM protection, loss of synchronism protection and overcurrent protection of phase current for compressor.
34	PFC protection	HC	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Replace outdoor control panel AP1 or Reactor
35	Outdoor DC fan motor malfunction	L3	Outdoor DC fan motor malfunction lead to compressor stop operation,	DC fan motor malfunction or system blocked or the connector loosed

NO.	Malfunction Name	Display Method of Indoor Unit Dual-8 Code Display	A/C status	Possible Causes
36	power protection	L9	compressor stop operation and Outdoor fan motor will stop 30s latter , 3 minutes latter fan motor and compressor will restart	To protect the electronical components when detect high power
37	Indoor unit and outdoor unit doesnt match	LP	compressor and Outdoor fan motor cant work	Indoor unit and outdoor unit doesnt match
38	Failure start-up	LC	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop operation.	Refer to the malfunction analysis
39	Defrosting		Defrosting will occur in heating mode. Compressor will operate while indoor fan will stop operation.	Its the normal state
40	Malfunction of phase current detection circuit for compressor	U1	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Replace outdoor control panel AP1
41	Malfunction of voltage dropping for DC bus-bar	U3	During cooling and drying operation, compressor will stop while indoor fan will operate; During heating operation, the complete unit will stop	Supply voltage is unstable
42	Malfunction of complete units current detection	U5	During cooling and drying operation, the compressor will stop while indoor fan will operate; During heating operating, the complete unit will stop operation.	Theres circuit malfunction on outdoor units control panel AP1, please replace the outdoor units control panel AP1.
43	The four-way valve is abnormal	U7	If this malfunction occurs during heating operation, the complete unit will stop operation.	1.Supply voltage is lower than AC175V; 2.Wiring terminal 4V is loosened or broken; 3.4V is damaged, please replace 4V.
44	Water overflow protection	E9	The complete unit stops	If the condition of full of water is detected for 8s, water overflow protection will be enabled and wired controller will display E9 and give an alarm; in each mode, if system enters water overflow protection, indoor units will shut down except the water pump and alarm. The capacity output of outdoor units should be adjusted correspondingly.

If malfunction occurs,corresponding code will display and the unit will resume normal until protection or malfunction disappears.



Analysis or processing of some of the malfunction display:

1. Compressor discharge protection

Possible causes: shortage of refrigerant; blockage of air filter; poor ventilation or air flow short pass for condenser; the system has noncondensing gas (such as air, water etc.); blockage of capillary assy (including filter); leakage inside four-way valve causes incorrect operation; malfunction of compressor; malfunction of protection relay; malfunction of discharge sensor; outdoor temperature too high.

Processing method: refer to the malfunction analysis in the above section.

2. Low voltage overcurrent protection

Possible cause: Sudden drop of supply voltage.

3. Communication malfunction

Processing method: Check if communication signal cable is connected reliably.

4. Sensor open or short circuit

Processing method: Check whether sensor is normal, connected with the corre sponding position on the controller and if damage of lead wire is found.

5. Compressor over load protection

Possible causes: insufficient or too much refrigrant; blockage of capillary and increase of suction temp.; improper running of compressor, burning in or stuck of bearing, damage of discharge valve; malfunction of protector.

Processing method: adjust refrigerant amount; replace the capillary; replace the compressor; use universal meter to check if the contactor of compress or is fine when it is not overheated, if not replace the protector.

6. System malfunction

i.e.overload protection.When tube temperature(Check the temperature of outdoor heat exchanger when cooling and check the temperatur e of indoor heat exchanger when heating) is too high, protection will be activated.

Possible causes: Outdoor temperature is too high when cooling; insufficient outdoor air circulation; refrigerant flow malfunction.

please refer to the malfunction analysis in the previous section for handling method .

7. IPM module protection

Processing method:Once the module malfunction happens,if it persists for a long time and can not be selfcanceled, cut off the power and turn off the unit,and then re-energize the unit again after about 10 min.After repeating the procedure for sever times, if the malfunction still exists,replace the module.

10.2 Procedure of Troubleshooting

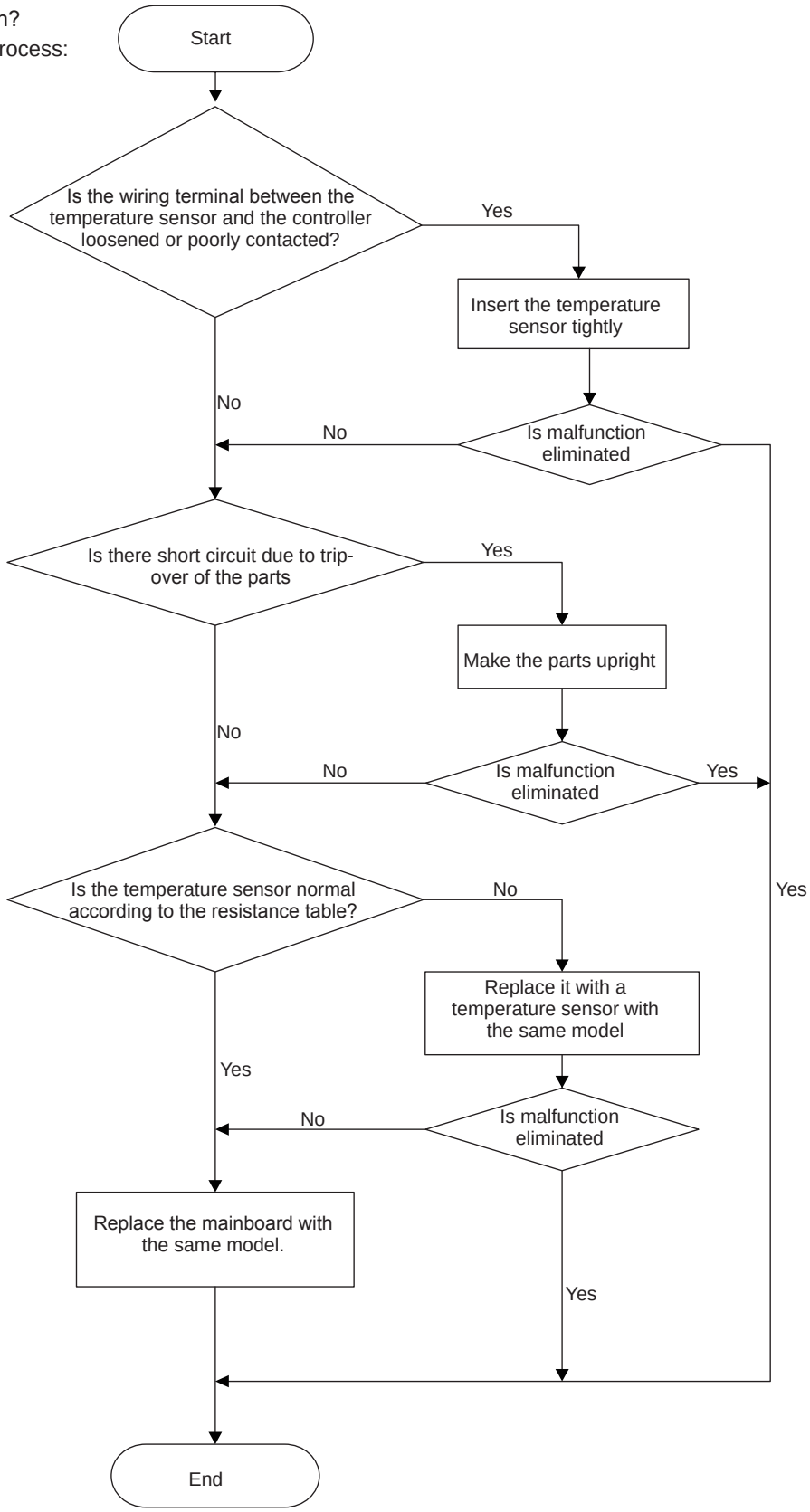
Indoor unit:

1. Malfunction of Temperature Sensor F1, F2

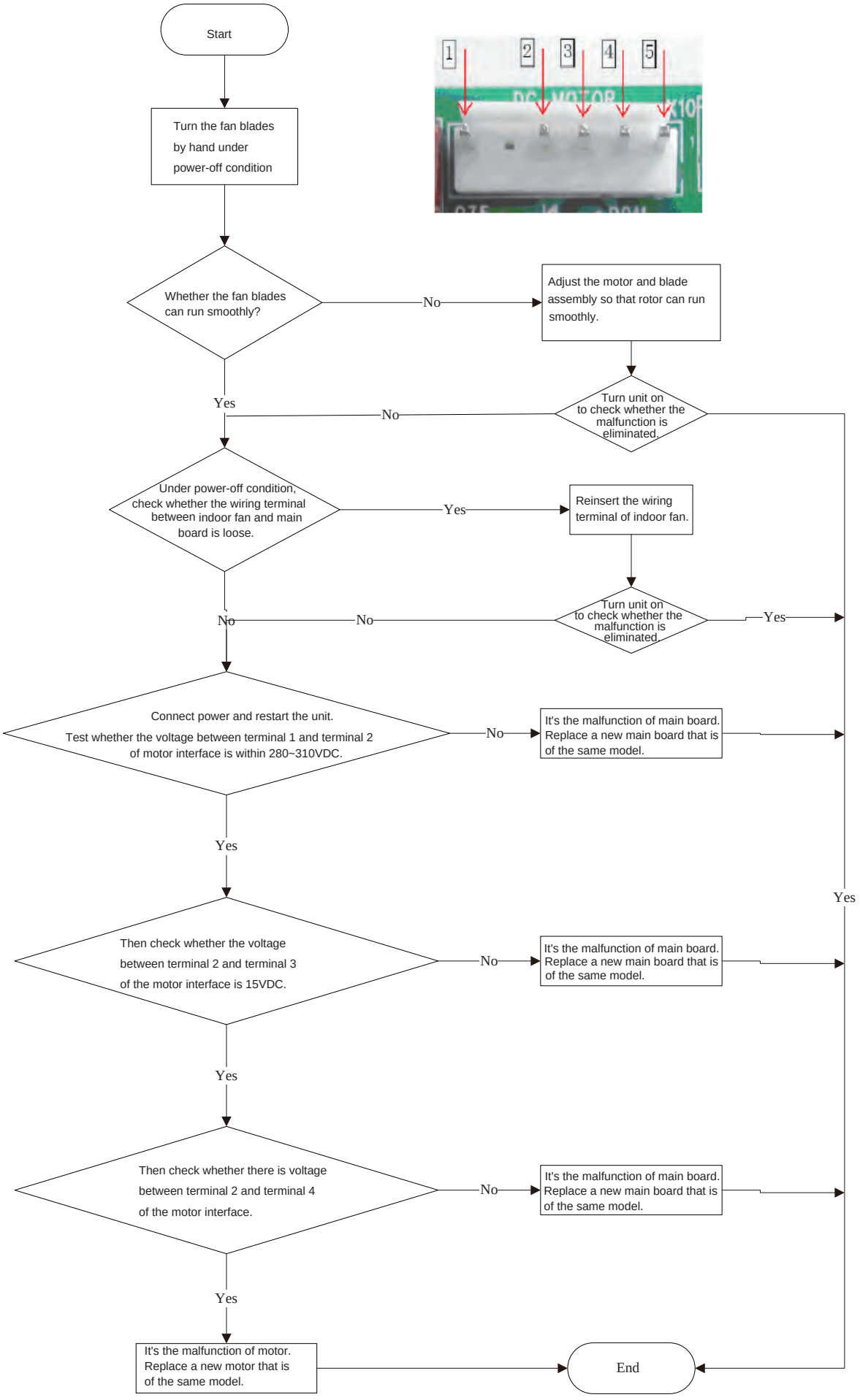
Main detection points:

- Is the wiring terminal between the temperature sensor and the controller loosened or poorly contacted?
- Is there short circuit due to trip-over of the parts?
- Is the temperature sensor broken?
- Is mainboard broken?

Malfunction diagnosis process:



2. Malfunction of Blocked Protection of IDU Fan Motor H6

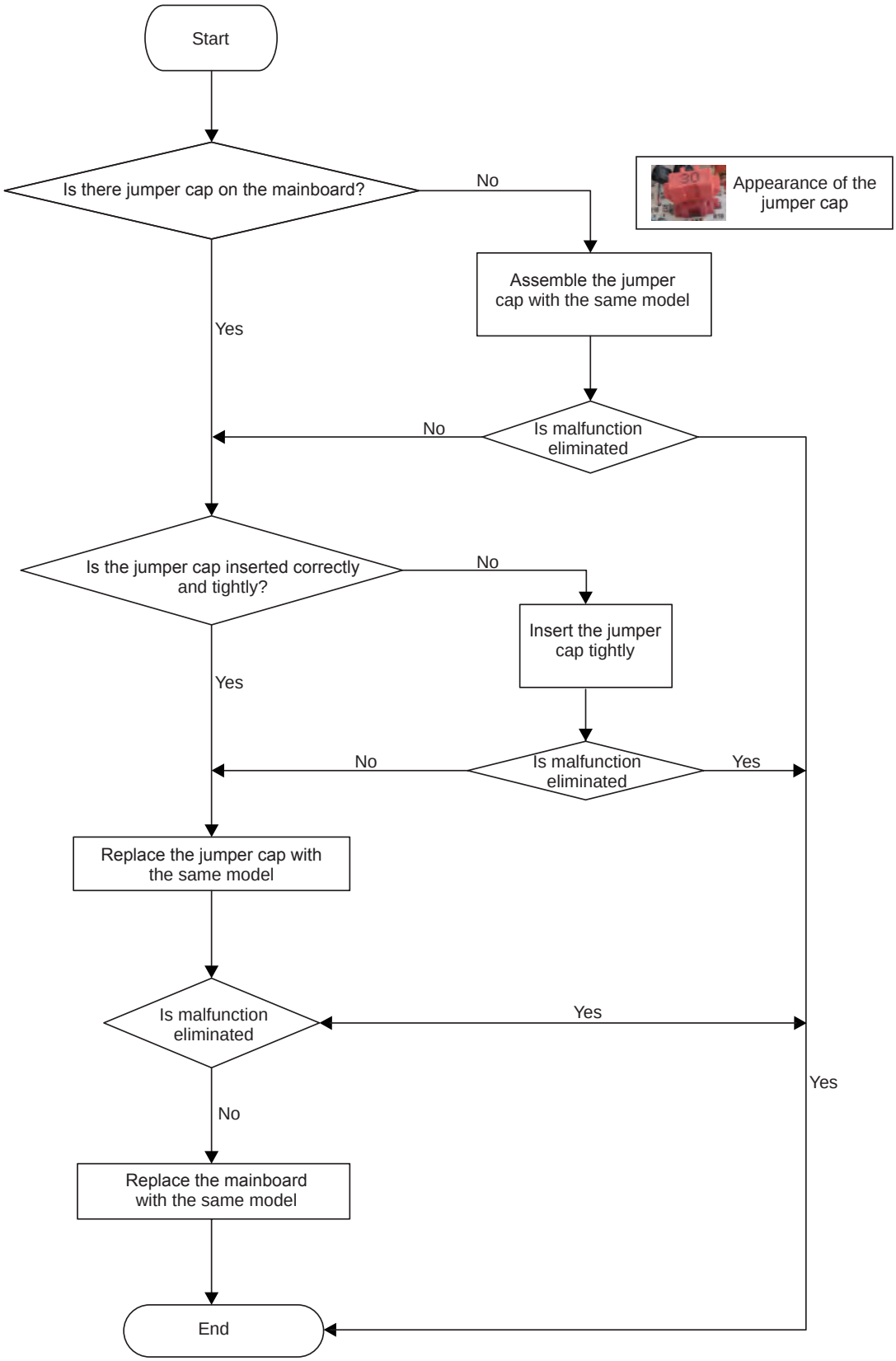


3. Malfunction of Protection of Jumper Cap C5

Main detection points:

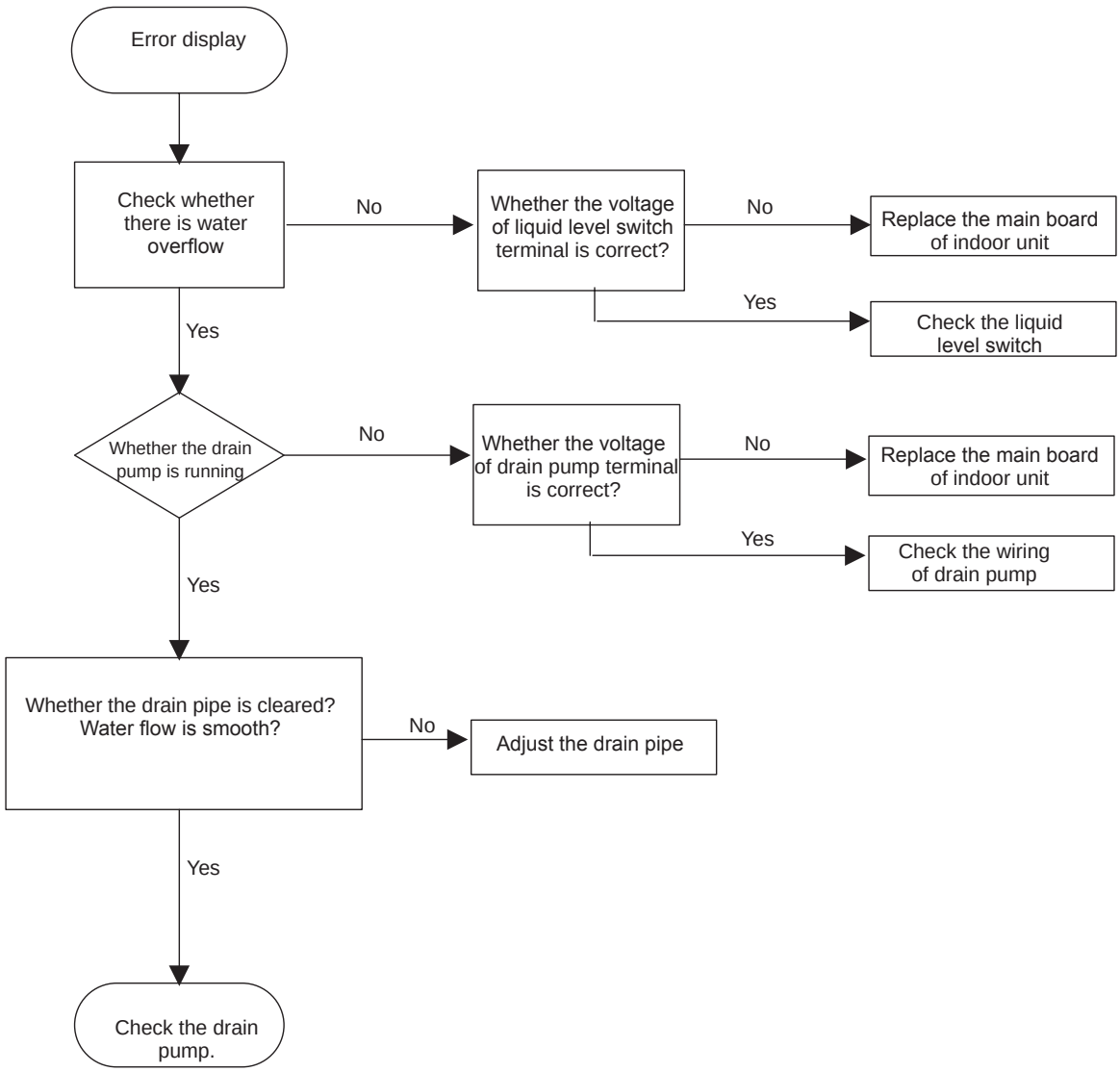
- Is there jumper cap on the mainboard?
- Is the jumper cap inserted correctly and tightly?
- The jumper is broken?
- Detectioncircuit of the mainboard isdefined abnormal?

Malfunction diagnosis process:



4. Water overflow protection E9

Malfunction diagnosis process:



10.3 Troubleshooting for Normal Malfunction

1. Air Conditioner can't be Started Up

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
No power supply, or poor connection for power plug	After energization, operation indicator isn't bright and the buzzer can't give out sound	Confirm whether it's due to power failure. If yes, wait for power recovery. If not, check power supply circuit and make sure the power plug is connected well.
Wrong wire connection between indoor unit and outdoor unit, or poor connection for wiring terminals	Under normal power supply circumstances, operation indicator isn't bright after energization	Check the circuit according to circuit diagram and connect wires correctly. Make sure all wiring terminals are connected firmly
Electric leakage for air conditioner	After energization, room circuit breaker trips off at once	Make sure the air conditioner is grounded reliably Make sure wires of air conditioner is connected correctly Check the wiring inside air conditioner. Check whether the insulation layer of power cord is damaged; if yes, place the power cord.
Model selection for air switch is improper	After energization, air switch trips off	Select proper air switch
Malfunction of remote controller	After energization, operation indicator is bright, while no display on remote controller or buttons have no action.	Replace batteries for remote controller Repair or replace remote controller

2. Poor Cooling (Heating) for Air Conditioner

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Set temperature is improper	Observe the set temperature on remote controller	Adjust the set temperature
Rotation speed of the IDU fan motor is set too low	Small wind blow	Set the fan speed at high or medium
Filter of indoor unit is blocked	Check the filter to see its blocked	Clean the filter
Installation position for indoor unit and outdoor unit is improper	Check whether the installation postion is proper according to installation requirement for air conditioner	Adjust the installation position, and install the rainproof and sunproof for outdoor unit
Refrigerant is leaking	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Units pressure is much lower than regulated range	Find out the leakage causes and deal with it. Add refrigerant.
Malfunction of 4-way valve	Blow cold wind during heating	Replace the 4-way valve
Malfunction of capillary	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unitt pressure is much lower than regulated range. If refrigerant isn't leaking, part of capillary is blocked	Replace the capillary
Flow volume of valve is insufficient	The pressure of valves is much lower than that stated in the specification	Open the valve completely
Malfunction of horizontal louver	Horizontal louver can't swing	Refer to point 3 of maintenance method for details
Malfunction of the IDU fan motor	The IDU fan motor can't operate	Refer to troubleshooting for H6 for maintenance method in details
Malfunction of the ODU fan motor	The ODU fan motor can't operate	Refer to point 4 of maintenance method for details
Malfunction of compressor	Compressor can't operate	Refer to point 5 of maintenance method for details

3. Horizontal Louver can't Swing

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Stepping motor is damaged	Stepping motor can't operate	Repair or replace stepping motor
Main board is damaged	Others are all normal, while horizontal louver can't operate	Replace the main board with the same model

4. ODU Fan Motor can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Capacity of the ODU fan motor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.	Replace the capacity of fan
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator
Motor of outdoor unit is damaged	When unit is on, cooling/heating performance is bad and ODU compressor generates a lot of noise and heat.	Change compressor oil and refrigerant. If no better, replace the compressor with a new one

5. Compressor can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Wrong wire connection, or poor connection	Check the wiring status according to circuit diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly
Capacity of compressor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.	Replace the compressor capacitor
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator
Coil of compressor is burnt out	Use universal meter to measure the resistance between compressor terminals and it's 0	Repair or replace compressor
Cylinder of compressor is blocked	Compressor can't operate	Repair or replace compressor

6. Air Conditioner is Leaking

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
Drain pipe is blocked	Water leaking from indoor unit	Eliminate the foreign objects inside the drain pipe
Drain pipe is broken	Water leaking from drain pipe	Replace drain pipe
Wrapping is not tight	Water leaking from the pipe connection place of indoor unit	Wrap it again and bundle it tightly

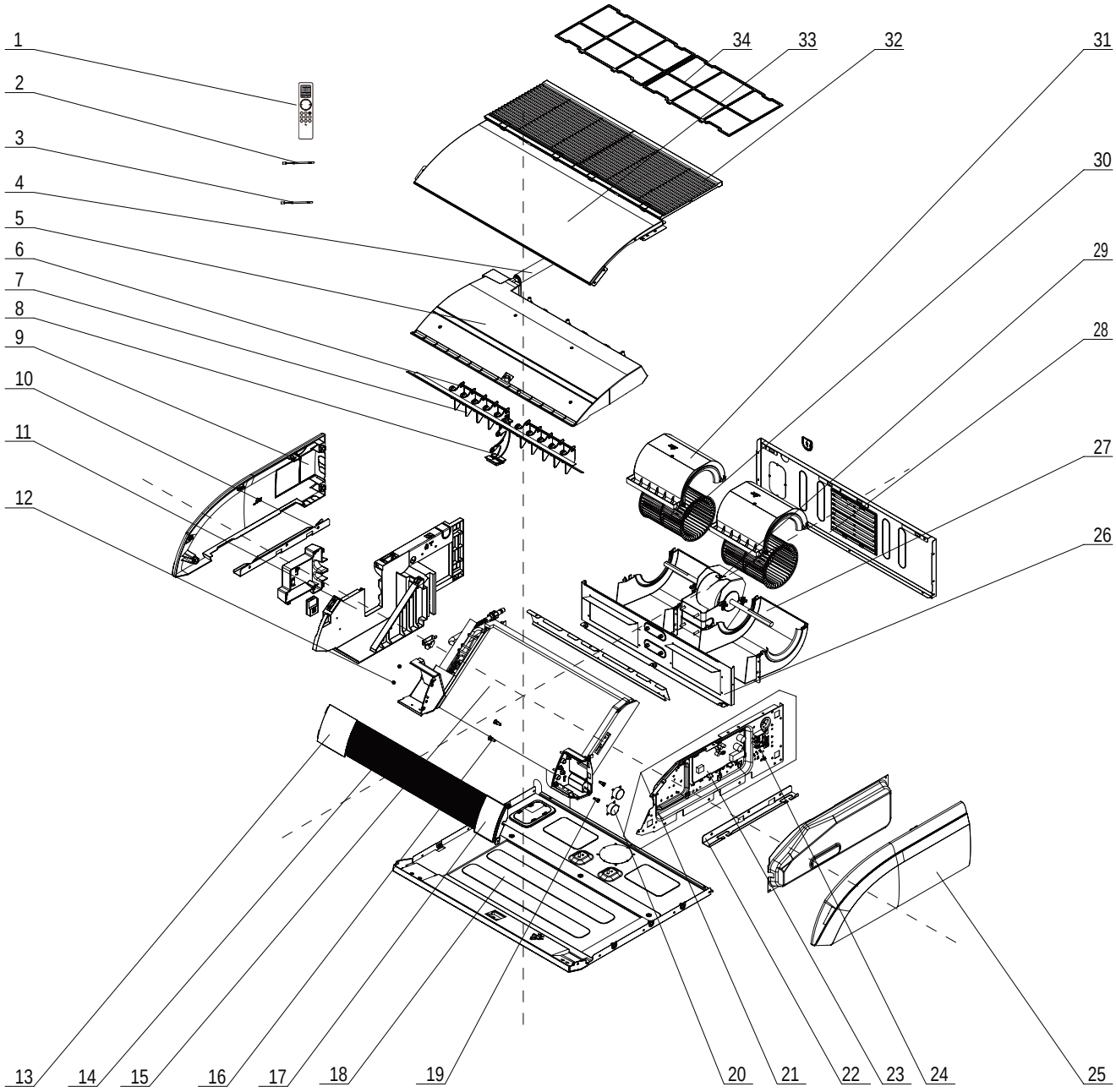
7. Abnormal Sound and Vibration

Possible causes	Discriminating method (air conditioner status)	Troubleshooting
When turn on or turn off the unit, the panel and other parts will expand and theres abnormal sound	Theres the sound of "PAPA"	Normal phenomenon. Abnormal sound will disappear after a few minutes.
When turn on or turn off the unit, theres abnormal sound due to flow of refrigerant inside air conditioner	Water-running sound can be heard	Normal phenomenon. Abnormal sound will disappear after a few minutes.
Foreign objects inside the indoor unit or therere parts touching together inside the indoor unit	Theres abnormal sound fro indoor unit	Remove foreign objects. Adjust all parts position of indoor unit, tighten screws and stick damping plaster between connected parts
Foreign objects inside the outdoor unit or therere parts touching together inside the outdoor unit	Theres abnormal sound fro outdoor unit	Remove foreign objects. Adjust all parts position of outdoor unit, tighten screws and stick damping plaster between connected parts
Short circuit inside the magnetic coil	During heating, the way valve has abnormal electromagnetic sound	Replace magnetic coil
Abnormal shake of compressor	Outdoor unit gives out abnormal sound	Adjust the support foot mat of compressor, tighten the bolts
Abnormal sound inside the compressor	Abnormal sound inside the compressor	If add too much refrigerant during maintenance, please reduce refrigerant properly. Replace compressor for other circumstances.

10. Exploded View and Parts List

10.1 Indoor Unit

09/12/18K



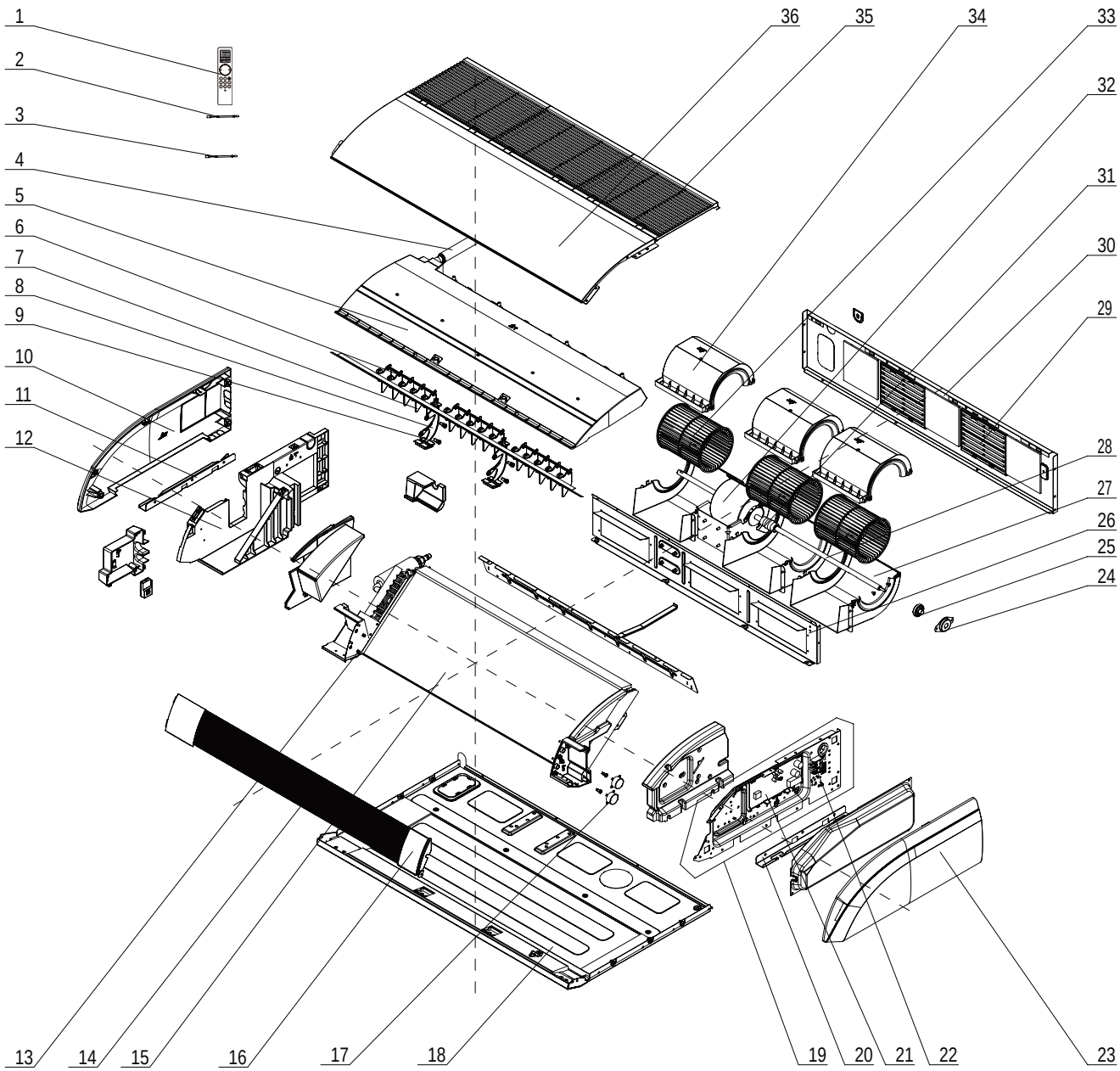
The component picture is only for reference; please refer to the actual product.

NO.	Description
1	Remote Controller
2	Temperature Sensor
3	Room Sensor
4	Drainage Pipe Sub-assy
5	Water Tray
6	Swing Lever
7	Air Louver
8	Supporter(Guide Louver)
9	Right Cover Plate
10	Installation Supporting Frame(right)
11	Right Side Plate
12	Axile Bush
13	Front Panel
14	Guide Louver
15	Evaporator Assy
16	Rotating Shaft 3
17	Display Board

NO.	Description
18	Base Plate Assy
19	Crankshaft
20	Stepping Motor
21	Electric Box Assy
22	Installation Supporting Frame(left)
23	Main Board
24	Terminal Board
25	Left Cover Plate
26	Clapboard Sub-Assy
27	Propeller Housing(Lower)
28	Rear Side Plate Sub-Assy
29	Brushless DC Motor
30	Centifugal Fan
31	Propeller Housing(Upper)
32	Front Grill
33	Top Cover
34	Filter Sub-Assy

Some models may not contain some parts, please refer to the actual product.

24K



The component picture is only for reference; please refer to the actual product.

NO.	Description
1	Remote Controller
2	Temperature Sensor
3	Room Sensor
4	Drainage Pipe Sub-assy
5	Water Tray
6	Swing Lever
7	Air Louver
8	Supporter(Guide Louver)
9	Rotating Shaft 3
10	Right Cover Plate
11	Installation Supporting Frame(right)
12	Right Side Plate
13	Axile Bush
14	Guide Louver
15	Evaporator Assy
16	Display Board
17	Stepping Motor
18	Base Plate Assy

NO.	Description
19	Electric Box Assy
20	Installation Supporting Frame(left)
21	Main Board
22	Terminal Board
23	Left Cover Plate
24	Support Of Motor Bearing
25	O-Gasket of Bearing
26	Clapboard Sub-Assy
27	Propeller Housing(Lower)
28	Roller Wheel
29	Filter Sub-Assy
30	Rear Side Plate Sub-Assy
31	Joint Slack
32	Brushless DC Motor
33	Centifugal Fan
34	Propeller Housing(Upper)
35	Front Grill Sub-assy
36	Top Cover

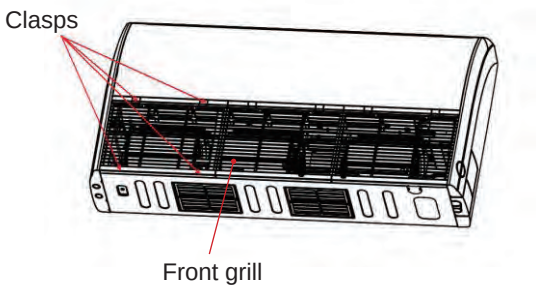
Some models may not contain some parts, please refer to the actual product.

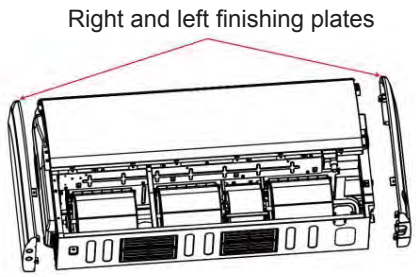
11. Removal Procedure

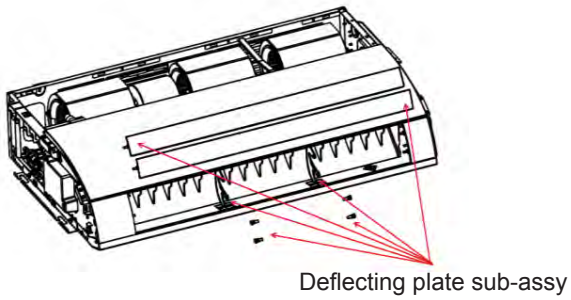
11.1 Removal Procedure of Indoor Unit

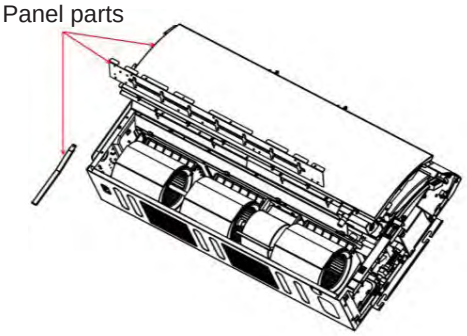
Caution: discharge the refrigerant completely before removal.

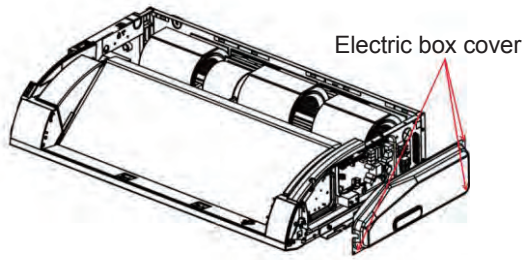
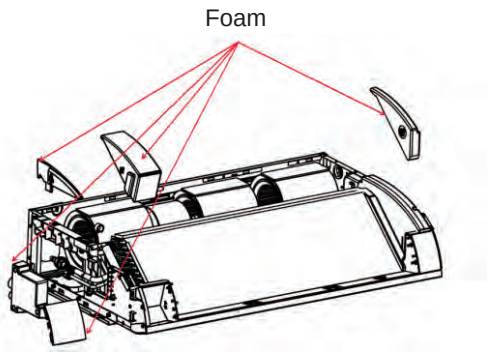
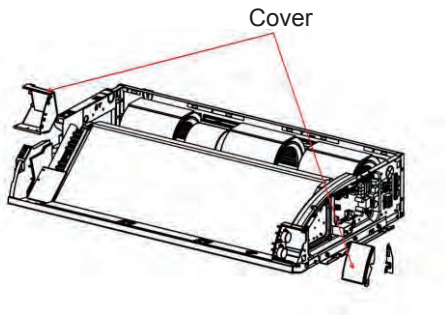
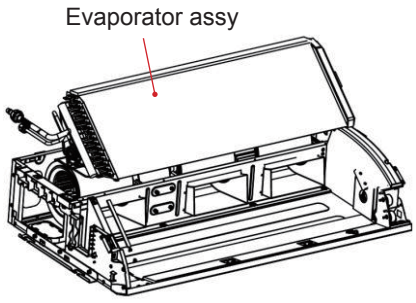
Step	Procedure
1. Remove front grill sub-assy	
	● Unscrew the 2 clasps of the upper grill and the 2 screws of the clasps. ●Open the grill,dissassemble the 2 down clasps to remove the grill.
2. Remove right and left finishing plates	
	Disassemble the screws as shown in the graph with screw driver and the push upward to remove the right and left finishing plates.(As is shown in the graph,arrow represents the position of screws.)
3. Remove air deflecting plate sub-assy and panel parts	
a	Remove the air deflecting plates from the air deflecting plate support assembly.
b	Unscrew the sides,screws on the cover to remove the cover.

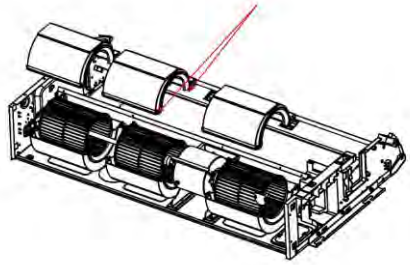
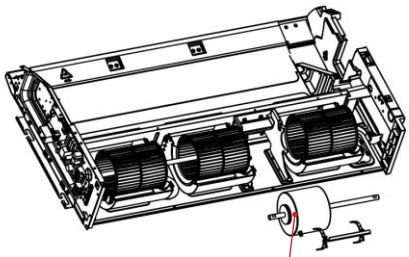
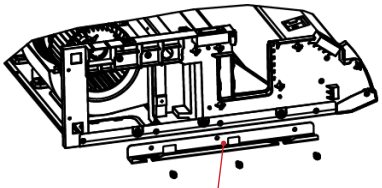








Step	Procedure
4. Remove electric box cover	
	● Remove 3 screws as shown by the arrow in the graph on left and remove the electric box cover.
	
5. Remove foam and cover	
a	Remove the foam.
	
b	Remove the screws on the cover to remove the cover.
	
6. Remove evaporator assy	
	Remove the screws on the evaporator to remove the evaporator assy.
	

Step	Procedure
7. Remove front and back scroll cases of motor	Front and back scroll cases 
a	Press the buckle at the joints of front and back scroll cases with hands and front scroll case.Then remove the screws on the back scroll case.Lift the buckle of back scroll case with hands and remove it.(As is shown in the graph,circle represents 2 screws on left and right.
b	Loosen the 2 screws of the motor attaching clamp,remove the motor attaching clamp and motor attching clamp subassembly to remove the motor.  Motor
8. Remove right and left fixing plates	 Right and left fixing plates
	Disassemble the bolts on right and left fixing plates wiht tools.(As is shown by the arrow in the graph.)

Appendix:

Appendix 1: Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: Tf=Tcx1.8+32

Set temperature

Fahrenheit display temperature（˚F）	Fahrenheit（˚F）	Celsius（℃）	Fahrenheit display temperature（˚F）	Fahrenheit（˚F）	Celsius（℃）	Fahrenheit display temperature（˚F）	Fahrenheit（˚F）	Celsius（℃）
61	60.8	16	69/70	69.8	21	78/79	78.8	26
62/63	62.6	17	71/72	71.6	22	80/81	80.6	27
64/65	64.4	18	73/74	73.4	23	82/83	82.4	28
66/67	66.2	19	75/76	75.2	24	84/85	84.2	29
68	68	20	77	77	25	86	86	30

Ambient temperature

Fahrenheit display temperature（˚F）	Fahrenheit（˚F）	Celsius（℃）	Fahrenheit display temperature（˚F）	Fahrenheit（˚F）	Celsius（℃）	Fahrenheit display temperature（˚F）	Fahrenheit（˚F）	Celsius（℃）
32/33	32	0	55/56	55.4	13	79/80	78.8	26
34/35	33.8	1	57/58	57.2	14	81	80.6	27
36	35.6	2	59/60	59	15	82/83	82.4	28
37/38	37.4	3	61/62	60.8	16	84/85	84.2	29
39/40	39.2	4	63	62.6	17	86/87	86	30
41/42	41	5	64/65	64.4	18	88/89	87.8	31
43/44	42.8	6	66/67	66.2	19	90	89.6	32
45	44.6	7	68/69	68	20	91/92	91.4	33
46/47	46.4	8	70/71	69.8	21	93/94	93.2	34
48/49	48.2	9	72	71.6	22	95/96	95	35
50/51	50	10	73/74	73.4	23	97/98	96.8	36
52/53	51.8	11	75/76	75.2	24	99	98.6	37
54	53.6	12	77/78	77	25			

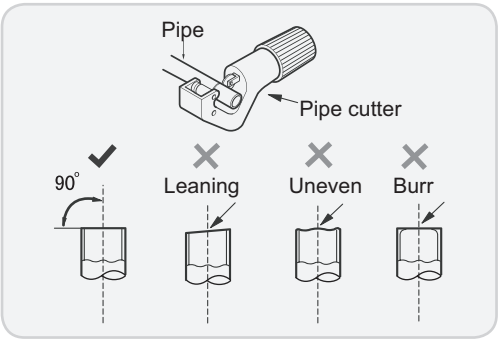
Appendix 2: Pipe Expanding Method

⚠ **Note:**

Improper pipe expanding is the main cause of refrigerant leakage.Please expand the pipe according to the following steps:

A:Cut the pip

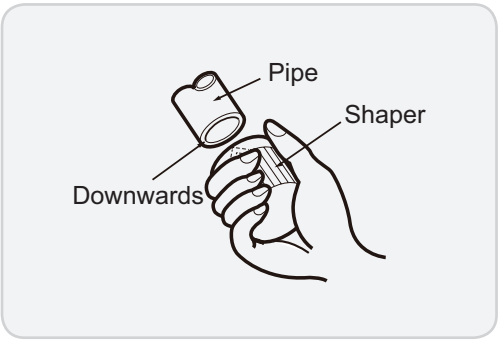
- Confirm the pipe length according to the distance of indoor unit and outdoor unit.
- Cut the required pipe with pipe cutter.



B:Remove the burrs

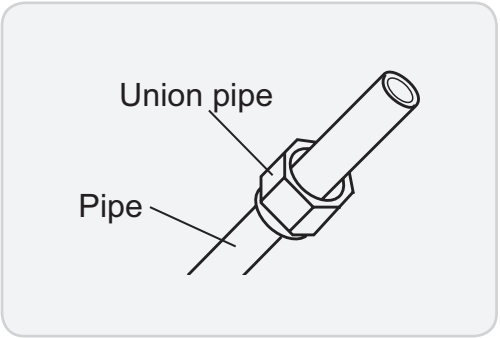
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.

C:Put on suitable insulating pipe.



D:Put on the union nut

- Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



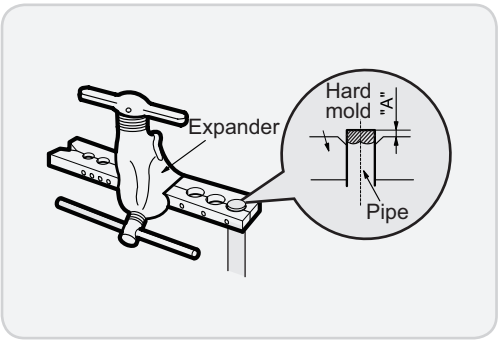
E:Expand the port

- Expand the port with expander.

⚠ **Note:**

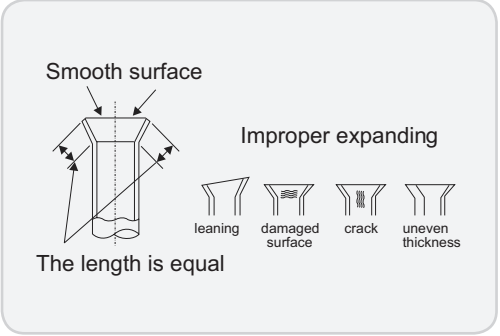
- "A" is different according to the diameter, please refer to the sheet below:

Outer diameter(mm)	A(mm)	
	Max	Min
Φ6 - 6.35 (1/4")	1.3	0.7
Φ9.52 (3/8")	1.6	1.0
Φ12 - 12.70 (1/2")	1.8	1.0
Φ16 - 15.88 (5/8")	2.4	2.2



F:Inspection

- Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.



Appendix 3: List of Resistance for Temperature Sensor

Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units (15K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)
-19	138.10	0	49.02	20	18.75	40	7.97
-18	128.60	2	44.31	22	17.14	42	7.35
-16	115.00	4	40.09	24	15.68	44	6.79
-14	102.90	6	36.32	26	14.36	46	6.28
-12	92.22	8	32.94	28	13.16	48	5.81
-10	82.75	10	29.90	30	12.07	50	5.38
-8	74.35	12	27.18	32	11.09	52	4.99
-6	66.88	14	24.73	34	10.20	54	4.63
-4	60.23	16	22.53	36	9.38	56	4.29
-2	54.31	18	20.54	38	8.64	58	3.99

Resistance Table of Tube Temperature Sensors for Indoor and Outdoor (20K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)
-19	181.40	20	25.01	60	4.95	100	1.35
-15	145.00	25	20.00	65	4.14	105	1.16
-10	110.30	30	16.10	70	3.48	110	1.01
-5	84.61	35	13.04	75	2.94	115	0.88
0	65.37	40	10.62	80	2.50	120	0.77
5	50.87	45	8.71	85	2.13	125	0.67
10	39.87	50	7.17	90	1.82	130	0.59
15	31.47	55	5.94	95	1.56	135	0.52

Resistance Table of Discharge Temperature Sensor for Outdoor (50K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)
-30	911.400	10	98	50	17.65	90	4.469
-25	660.8	15	77.35	55	14.62	95	3.841
-20	486.5	20	61.48	60	12.17	100	3.315
-15	362.9	25	49.19	65	10.18	105	2.872
-10	274	30	39.61	70	8.555	110	2.498
-5	209	35	32.09	75	7.224	115	2.182
0	161	40	26.15	80	6.129	120	1.912
5	125.1	45	21.43	85	5.222	125	1.682

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