

说明书技术要求

技术要求

- 纸张边角应裁剪整齐；印刷字迹清晰整洁、内容正确，没有明显的拖墨和重影等缺陷；
- 纸质为 $80\text{g}/\text{m}^2$ ；
- 未注公差按GB/T1804-c级；
- 版面为A5；
- 颜色要求:黑色K100；

C	GG. 2407-0342	焦裕坤	20240705	TCC-24ZHRH/DVI(02) (功能升级)	85008-010178		
B	GG. 2406-1320	焦裕坤	20240624				
A	GG. 2403-1918	焦裕坤	20240327	变频座吊机说明书	阶段标记	质量	比例
版次	更改文件号	签字	日期				
设计	焦裕坤	20240305	工艺	崔中良	A5纸		
校对	潘卫琼		标准化	林东运			
审核	林国游		批准	刘健	共 1 张	第 1 张	TCL空调器(中山)有限公司

Safety Notice

	The air conditioner is charged with inflammable refrigerant R32.
	Before using the air conditioner, please first read the instruction manual.
	Before installing the air conditioner, please first read the instruction manual.
	Before repairing the air conditioner, please first read the technical service manual.

Compared with common refrigerant, R32 is an environmental-friendly refrigerant that has no harm to the ozone layer and weak greenhouse effect. Its GWP is 675. Because of its thermodynamic characteristics, R32 requires a smaller charging quantity to reach high energy efficiency. It is inflammable and odourless, but may cause explosion under certain circumstances.

CONTENTS

PRECAUTION	1
PARTS AND FUNCTIONS	4
REMOTE CONTROLLER OPERATION	5
TROUBLES AND CAUSES	14
IMPORTANT SAFETY INFORMATION	15
INDOOR UNIT INSTALLATION	16
FIGURE OF BODY SIZE	21
OUTDOOR UNIT INSTALLATION	22
REFRIGERANT PIPE INSTALLATION	24
ELECTRIC WIRING	27
TRY TEST	30
DISPLAY PANEL	31
TROUBLESHOOTING	32
REFRIGERANT NOTICE/CONCENTRATION	34

PRECAUTION

- Read the following " PRECAUTIONS" carefully before installation.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below.
Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

 WARNING	This indication shows the possibility of causing death or serious injury.
 CAUTION	This indication shows the possibility of causing injury or damage to properties only.

NOTE :

1. Injury means causing harmed, burned, electrical shocked, but not serious for hospitalization.
 2. Damage of property means disrepair of property, material.
- Carry out test running to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

 WARNING
● Engage dealer or specialist for installation. If installation done by user is defective, it will cause water leakage, electrical shock or fire.
● Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.
● Use the attached accessories parts and specified parts for installation. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.
● Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
● For electrical work, follow the local national wiring standard, regulation and this installation instructions. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.
● When carrying out piping connection, take care not to let air or other substances other than the specified refrigerant go into refrigeration cycle. Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion and injury.
● Grounding is necessary. It may cause electrical shock if grounding is not perfect.
● Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.

The appliance is not to be used by persons (including children) with reduced physical, ● sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
● Children being supervised not to play with the appliance.
● The appliance shall be installed in accordance with national wiring regulations.
This appliance can be used by children aged from 8 years and above and persons with ● reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
● Children shall not play with the appliance.
● Cleaning and user maintenance shall not be made by children without supervision.

Operating condition

The protective device maybe trip and stop the unit within temp range listed below:

HEATING	Outdoor air temperature is over 24℃
	Outdoor air temperature is below -15℃
	Room temperature is over 30j
COOLING	Outdoor air temperature is over 52℃
	Outdoor air temperature is below -15℃
	Room temperature is below 17℃
DRY	Room temperature is below 17℃

If the air conditioner runs for a long time in "COOLING" or "DRY" mode at air relative humidity higher than 80% (doors or windows opened), dew may generate and drip near air outlet.

Noise pollution

- Install the air conditioner in a place that can bear its weight in order to operate more quietly.
- Install the outdoor unit in a place where the air discharged and the operation noise do not annoy your neighbors.
- Do not place any obstacles in front of the outlet of the outdoor unit for fear it affects operation and increases the noise level.

Features of Protector

- ① The protective device will trip at following cases.
 - Stop the appliance and restart it at once or change other modes during operation, you have to wait 3 minutes before restarting.
 - After switching on the power circuit breaker and then turn on the air conditioner at once, you have to wait about 20 seconds.
- ② In case all operations have stopped, you need
 - Press "ON/OFF" button again to restart it.
 - Set TIMER once again if it has been canceled.

Inspection

After a long time of operation, the air conditioner should be inspected for the following items.

- Abnormal heating of the power supply cord and plug or even a burnt smell.
 - Abnormal operating noise or vibration.
 - Water leakage from indoor unit.
 - Metal cabinet electrified .
-  Stop using the air conditioner if above problem happened.
- It is advisable that the air conditioner should be given a detail check-up after using for five years even if none of the above happen.

Feature of HEATING mode

Preheat

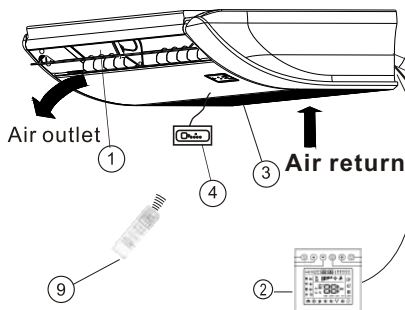
2-5 minutes are necessary to preheat the indoor heat exchanger at the beginning of "HEATING" operation, lest cold air be discharged.

Defrost

In "HEATING" operation the appliance will defrost automatically. This procedure lasts 2~10 minutes, then returns to "HEATING" mode automatically. During defrosting, indoor fan stop running and return to heating mode operation automatically when defrosting has finished.

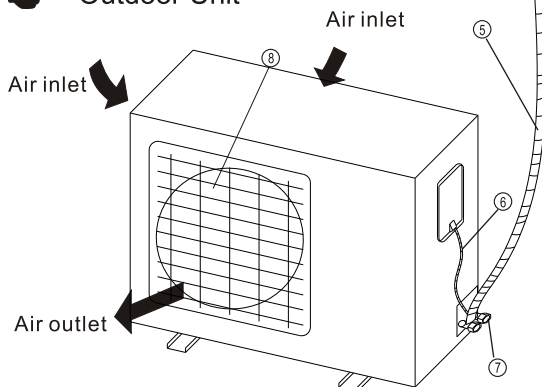
PARTS AND FUNCTIONS

Indoor Unit



- ① Air Outlet
- ② Wire controller
- ③ Filter
- ④ Remote controller receiver
- ⑤ Refrigerant connection pipe
- ⑥ Connecting cord
- ⑦ Cut-off valve
- ⑧ Air Outlet grille
- ⑨ Remote controller

Outdoor Unit



Requirements

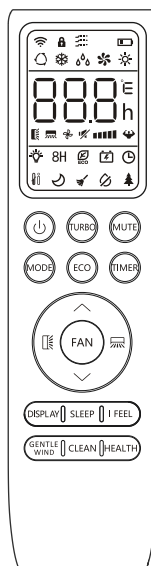
- The air conditioner cannot be started up until it is powered on for 2 hours. Furthermore, in case of a shutdown lasting for about one day only, please do not cut off the electricity supply. (it is necessary to heat the crankcase heater so as to avoid force start of compressor.)
- Notice that the air inlet/outlet must not be choked up. If chokeup takes place, the air conditioner behavior may be affected, or air conditioner cannot run because of actuation of protector.

REMOTE CONTROL

EN

Remote control DISPLAY

No.	Symbols	Meaning
1		Battery indicator
2		Auto Mode
3		Cooling Mode
4		Dry Mode
5		Fan only Mode
6		Heating Mode
7		ECO Mode
8		Timer
9		Temperature indicator
10		Fan speed: Auto/ low/ low-mid/ mid/ mid-high/ high
11		Mute function
12		TURBO function
13		Up-down auto swing
14		Left-right auto swing
15		SLEEP function
16		Health function
17		I FEEL function
18	8H	8°C heating function
19		Signal indicator
20		Gentle wind
21		Child-Lock
22		Display ON/OFF
23		GEN function
24		Self-Clean function
25		Anti-Mildew



The display and some functions of the remote control may vary according to the model.

REMOTE CONTROL

EN

No.	Button	Function
1		To turn on/off the air conditioner .
2		To increase temperature, or Timer setting hours.
3		To decrease temperature, or Timer setting hours.
4	MODE	To select the mode of operation (AUTO, COOL, DRY, FAN, HEAT).
5	ECO	To activate/deactivate the ECO function.
		Long press to activate/deactivate the 8°C heating function (depending on models).
6	TURBO	To activate/deactivate the TURBO function.
7	FAN	To select the fan speed of auto/mute/low/low-mid/mid/mid-high/high/turbo.
8	TIMER	To set the time for timer on/off.
9	SLEEP	To switch-on/off the function SLEEP.
10	DISPLAY	To switch-on/off the LED display.
11		To stop or start horizontal flaps louver movement or set the desired up/down air flow direction.
12		To stop or start vertical deflectors louver movement or set the desired left/right air flow direction.
13	I FEEL	To switch-on/off the I FEEL function.
14	MUTE	To switch-on/off the MUTE function.
		Long press to activate/deactivate the GEN function (depending on models).
15	MODE + TIMER	To activate/deactivate the CHILD-LOCK function.
16	CLEAN	To activate/deactivate the SELF-CLEAN function (depending on models).
17	FAN + MUTE or GENTLE WIND	To activate/deactivate the GENTLE WIND function (depending on models).
18	HEALTH	To activate/deactivate the HEALTH function (depending on models).

⚠ The display and some functions of the remote control may vary according to the model.

⚠ The shape and position of buttons and indicators may vary according to the model, but their function is the same.

⚠ The unit confirms the correct reception of each button with the beep.

REMOTE CONTROL

EN

Replacement of Batteries

Remove the battery cover plate from the rear of the remote control, by sliding it in direction as the arrow.

Install the batteries according the direction (+ and -) shown on the Remote Control.

Reinstall the battery cover by sliding it into place.

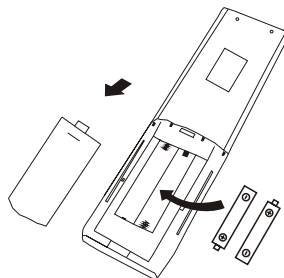
⚠ Use 2 pieces LRO3 AAA (1.5V) batteries.

Do not use rechargeable batteries.

Replace the old batteries with new ones of the same type when the display is no longer legible.

Do not dispose batteries as unsorted municipal waste.

Collection of such waste separately for special treatment is necessary.



⚠ For some models of the remote controller, you can program the temperature display between °C and °F.

1. Press and hold the **TURBO** button over 5 seconds to get into the change mode;
2. Press and hold the **TURBO** button, until it switch to °C and °F;
3. Then release the pressing and wait for 5 seconds, the function will be selected.

Note:

1. Direct the remote control toward the Air conditioner.
2. Check that there are no objects between the remote control and the Signal receptor in the indoor unit.
3. Never leave the remote control exposed to the rays of the sun.
4. Keep the remote control at a distance of at least 1m from the television or other electrical appliances.

REMOTE CONTROL

EN

COOLING MODE

COOL ❄️

The cooling function allows the air conditioner to cool the room and reduce Air humidity at the same time.

To activate the cooling function (COOL), press the **MODE** button until the symbol ❄️ appears on the display.

With the button ▼ or ▲ set a temperature lower than that of the room.

FAN MODE (Not FAN button)

FAN 🌀

Fan mode, air ventilation only.

To set the FAN mode, press **MODE** until 🌀 appears on the display.

DRY MODE

DRY 💧

This function reduces the humidity of the air to make the room more comfortable.

To set the DRY mode, Press **MODE** until 💧 appears in the display. An automatic function of pre-setting is activated.

AUTO MODE

AUTO 🔄

Automatic mode.

To set the AUTO mode, press **MODE** until 🔄 appears on the display.

In AUTO mode the run mode will be set automatically according to the room temperature.

HEATING MODE

HEAT 🔥

The heating function allows the air conditioner to heat the room.

To activate the heating function (HEAT), press the **MODE** button until the symbol 🔥 appears on the display.

With the button ▼ or ▲ set a temperature higher than that of the room.

⚠️ In HEATING operation, the appliance can automatically activate a defrost cycle, which is essential to clean the frost on the condenser so as to recover its heat exchange function. This procedure usually lasts for 2-10 minutes. During defrosting, indoor unit fan stop operation. After defrosting, it resumes to HEATING mode automatically.

⚠️ **(For North American market)**

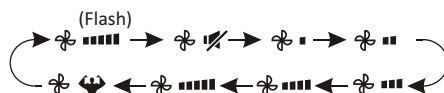
If necessary, you can press ECO button 10 times within 8 seconds under heating mode to start the forced defrosting. It will defrost the outdoor ice much faster.

FAN SPEED function (FAN button)

FAN 🌀

Change the operating fan speed.

Press **FAN** button to set the running fan speed, it can be set to AUTO/ MUTE/ LOW/ LOW-MID / MID/ MID-HIGH/ HIGH/ TURBO speed circularly.



Child-Lock function

1. Long press **MODE** and **TIMER** button together to active this function, and do it again to deactivate this function.
2. Under this function, no single button will active.

REMOTE CONTROL

TIMER function ---- TIMER ON



To automatically switch on the appliance.

When the unit is switch-off, you can set the TIMER ON.

To set the time of automatic switch-on as below:

1. Press **TIMER** button first time to set the switch-on, and will appear on the remote display and flashes.
2. Press $\wedge$ or $\vee$ to button to set desired Timer-on time. Each time you press the button, the time increases/decreases by half an hour between 0 and 10 hours and by one between 10 and 24 hours.
3. Press **TIMER** button second time to confirm.
4. After Timer-on setting, set the needed mode (Cool/ Heat/ Auto/ Fan/ Dry), by press the **MODE** button. And set the needed fan speed, by press **FAN** button. And press $\wedge$ or $\vee$ to set the needed operation temperature.

CANCEL it by press **TIMER** button.

TIMER function ---- TIMER OFF



To automatically switch off the appliance.

When the unit is switch-on, you can set the TIMER OFF.

To set the time of automatic switch-off, as below:

1. Confirm the appliance is ON.
2. Press the **TIMER** button at first time to set the switch-off.
Press $\wedge$ or $\vee$ to set the needed timer.
3. Press **TIMER** button at the second time to confirm.

CANCEL it by press **TIMER** button.

Note: All programming should be operated within 5 seconds, otherwise the setting will be cancelled.

SWING function



1. Press the button **SWING** to activate the louver,
 - 1.1 Press to activate the horizontal flaps to swing from up to down, the will appear on the remote display.
 - 1.2 Press to active the vertical deflectors to swing from left to right, the will appear on the remote display.
 - 1.3 Do it again to stop the swing movement at the current angle.
2. If the vertical deflectors are positioned manually which placed under the flaps, they allow to move the air flow direct to rightward or leftward.

- Never position “Flaps” manually, the delicate mechanism might get seriously damaged!
- Never put fingers, sticks or other objects into the air inlet or outlet vents. Such accidental contact with live parts might cause unforeseeable damage or injury.

TURBO function



To activate turbo function, press the **TURBO** button, and will appear on the display.

Press again to cancel this function.

In COOL/ HEAT mode, when you select TURBO feature, the appliance will turn to quick COOL or quick HEAT mode, and operate the highest fan speed to blow strong airflow.

REMOTE CONTROL

EN

MUTE function

MUTE

1. Press **MUTE** button to activate this function, and  will appear on the remote display. Do it again to deactivate this function.
2. When the MUTE function runs, the remote controller will display the auto fan speed, and the indoor unit will operate at lowest fan speed to help experience a quiet feeling.
3. When press FAN/ TURBO button, the MUTE function will be cancel. MUTE function can not be activated under dry mode.

SLEEP function

SLEEP

Pre-setting automatic operating program.

Press **SLEEP** button to activate the SLEEP function, and  appears on the display. Press again to cancel this function.

After 10 hours running in sleep mode, the air conditioner will change to the previously set mode.

I FEEL function (Optional)

I FEEL

Press **I FEEL** button to activate the function, the  will appear on the remote display. Do it again to deactivate this function.

This function enables the remote control to measure the temperature at its current location, and send this signal to the air conditioner to optimize the temperature around you and ensure the comfort.

It will automatically deactivate 2 hours later.

ECO function

ECO

In this mode the appliance automatically sets the operation to save energy.

Press the **ECO** button, the  appears on the display, and the appliance will run in ECO mode. Press again to cancel it.

Note: The ECO function is available in both COOLING and HEATING modes.

DISPLAY function (Indoor display)

DISPLAY

Switch ON/OFF the LED display on panel.

Press **DISPLAY** button to switch off the LED display on the panel. Press again to switch on the LED display.

GEN function (Optional)



1. Turn on the indoor unit at first, and long press **MUTE** button 3 seconds to activate, and do it again to deactivate this function.
 2. Under this function, short press **MUTE** button to select the General type L3 - L2 - L1 - OF.
 3. Select OF and wait 2 seconds to exit it.
- * If the indoor unit displays "OA", please use the remote to raise the operating gear of the GEN mode, and the compressor will restart after stopping for 3 minutes.

REMOTE CONTROL

EN

SELF-CLEAN function (Optional)

Only optional for some heating pump inverter appliance.

To active this function, turn off the indoor unit at first, then press **CLEAN** button then you will hear a beep, [AC] will appear on the indoor LED, and  will appear on the remote display .

1. This function helps carry away the accumulated dirt, bacteria, etc from the indoor evaporator.
2. This function will run about 30 minutes, and it will return to the pre-setting mode. You can press  button to cancel this function during the process.

You will hear 2 beeps when it's finished or cancelled.

 It's normal if there is some noise during this function process, as plastic materials expand with heat and contract with cold.

 We suggest operating this function at the following ambient conditions to avoid certain safety protection features.

Indoor unit	Temp < 86°F (30°C)
Outdoor unit	41°F (5°C) < Temp < 86°F (30°C)

 It's suggested to utilize this function every 3 months.

8°C heating function (Optional)

1. Long press **ECO** button over 3 seconds to active this function, and [8°C] ([46°F]) will appear on the remote display.
Do it again to deactivate this function.
2. This function will auto start the heating mode when the room temperature is lower than 8°C (46°F), and it will return to standby if the temperature reaches 9°C (48°F).
3. If the room temperature is higher than 18°C (64°F), the appliance will cancel this function automatically.

Gentle Wind function (Optional)

1. Turn on the indoor unit, and change to COOL mode, then press **GENTLE WIND** button or long press **FAN** and **MUTE** button together 3 seconds to active this function,  will appear on the display.
Do it again to deactivate it.
2. This function will auto close the vertical flaps, and give you the comfortable gentle wind feeling.

Health function (Optional)

1. Turn on the indoor unit at first, press **HEALTH** to active this function,  will appear on the display.
Do it again to deactivate it.
2. When the HEALTH function is initiated, the Ionizer/ Plasma/ Bipolar Ionizer/ UVC Lights (depending on models) will be energized and running.

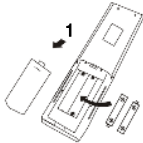
■ Remote controller handling procedure

Batteries replacing procedure

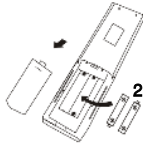
Following cases signify dead batteries. Replace the dead batteries with new ones.

- Receiving sound is not emitted from the unit when signal is transmitted.
- Indicator becomes indistinct.

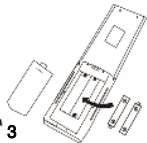
- 1** Please slide and remove the cover.



Slide the cover upwardly in the direction of the arrow.
- 2** Exchange the batteries.



Attention to the  and  marks.
- 3** Install the cover.

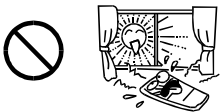
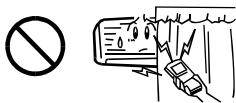

- 4** Set it to the present time.

NOTE

- Do not use an old battery together with a new one.
- Remove batteries when the remote controller is not used for a long period.
- The life of a battery made in conformity to JIS or IEC is 6 to 12 months in normal use. If it is used longer or an unspecified cell is used, a liquid leaks from the battery, causing the remote controller to become inoperative.

- Guideline of the life time is printed on the battery. The battery life may be shorter than that of the air conditioner depending on the date of manufacture.
- However, the battery may be alive even after the nominal life time expired.

Note of remote controller handling

• A place with high temperature such as near an electric carpet or a stove. 	• A place unprotected from direct sunlight or strong lighting. 	• It will be damaged if fallen. Be careful. 
• Do not put obstacles between the remote controller and the unit. 	• Protect the remote controller from being splashed with water, etc. 	• Do not put weights on the remote controller. 

■ About SLEEP operation

About SLEEP Operation

When the SLEEP operation is selected, the room temperature is automatically controlled with elapsed time so that the room isn't too cool during cooling or too warm during heating.

■ About power-off memory function

- When the air conditioner disconnect the power suddenly, restart it, the air conditioner operates at the mode it did before power suddenly failed.

These are not failures

Room air is smelly.

A bad odor comes from the air conditioner.

- Smells impregnated in the wall, carpet, furniture, clothing, or furs, are coming out. A white mist of chilled air or water is generated from the outdoor unit.

CAUTION

If any of the following conditions occur, stop the air conditioner immediately, set off the power switch, and contact the dealer.

- The indicator lamps flash rapidly (five times per second), you disconnect the unit with the power and then connect the unit with the power again after two or three minutes but the lamps still flash.
- Switch operations are erratic.
- The fuse is blown frequently or the circuit breaker is tripped frequently.
- Foreign matter or water has fallen inside the air conditioner.
- Any other unusual condition is observed.

TROUBLES AND CAUSES

(ABOUT REMOTE CONTROLLER)

Before you ask for service or repairs, check the following points.

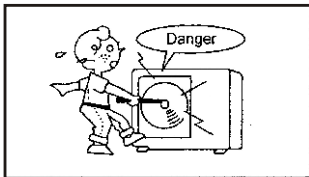
Setting change is impossible.		
Symptoms	Causes	Reason and Disposal
The fan speed can not be changed.	● Check whether the MODE indicated on the display is "AUTO".	When the automatic mode is selected, the air conditioner automatically selects the fan speed.
	● Check whether the MODE indicated on the display is "DRY".	When dry operation is selected, the air conditioner automatically select the fan speed. The fan speed can be selected during "COOL" and "FAN ONLY," and "HEAT."
The Transmission Indicator ▲ never comes on		
Symptoms	Causes	Reason and Disposal
The remote control signal is not transmitted even when the ON/FF button is pushed.	● Check whether the batteries in the remote controller are exhausted.	The remote control signal is not transmitted, because the power supply is off.
The Display never comes On		
Symptoms	Causes	Reason
The TEMP. indicator does not come on.	● Check whether the MODE indicated on the display is "FAN ONLY."	The temperature cannot be set during fan only operation.

HAND OVER TO CUSTOMERS

INSTALLATION MANUAL of indoor and outdoor unit must be handed over to the customers.

Please narrate the manual to the customers in details.

IMPORTANT SAFETY INFORMATION

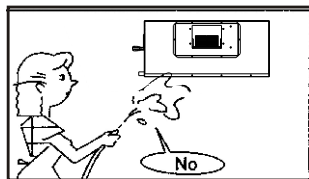


▲CAUTION

Do not attempt to install this unit by yourself. This unit requires installation by qualified persons.

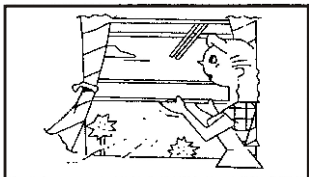
▲DANGER

Do not attempt to service the unit yourself. This unit has no user serviceable components. Opening or removing the cover will expose you to dangerous voltage. Turning off the power supply will not prevent potential electric shock.



▲DANGER

Never put hands or objects into the air outlet of indoor or outdoor units. These units are installed with a fan running at high speed. To touch the moving fan will cause serious injury.

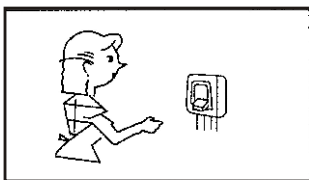


▲DANGER

To avoid the risk of serious electrical shock. Never sprinkle or spill water or liquids on unit.

▲WARNING

Ventilate the room regularly while the air conditioner is in use, especially if there is also a gas appliance in use in this room. Failure to follow these directions may result in a loss of oxygen in the room.

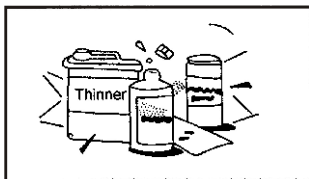


▲WARNING

To prevent electric shock, turn off the power or disconnect the power supply plug before beginning any cleaning or other routine maintenance.

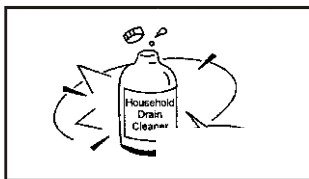
▲WARNING

Do not use liquid cleaners or aerosol cleaners, use a soft and dry cloth for cleaning the unit. To avoid electric shock, never attempt to clean the units by sprinkling water.



▲CAUTION

Do not use caustic household drain cleaners in the unit. Drain cleaners can quickly destroy the unit components (drain pan and heat exchanger coil etc).



▲NOTE

For proper performance, operate the unit in temperature and humidity ranges indicated in this owner's manual. If the unit is operated beyond these conditions, it may cause malfunctions of the unit or dew dripping from the unit.

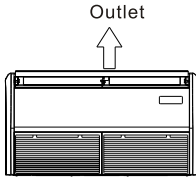
INDOOR UNIT INSTALLATION

Installation Space

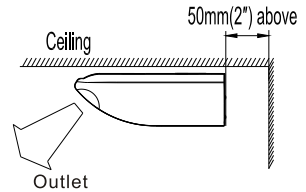
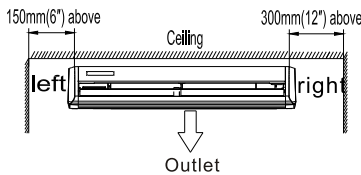
Ensure sufficient space for installation and repair.

GENERAL: This INSTALLATION INSTRUCTION SHEET briefly outlines where and how to install the air conditioning system. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the system before beginning.

● Floor console

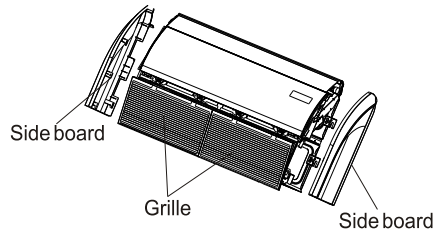


● Under ceiling



Installation procedure

Please remove the grille and the side board.



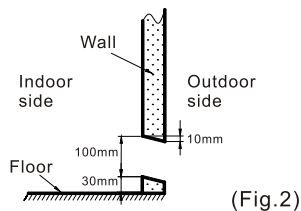
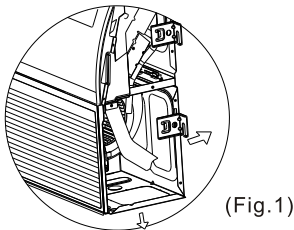
FLOOR CONSOLE TYPE

1. Select the piping and drainage directions.

The piping and drain can be made in two directions as shown below(fig.1).

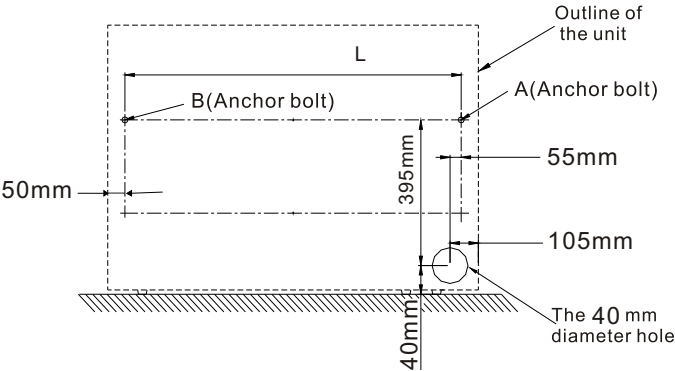
NOTE:After the pipeline is connected, the tapping hole should be sealed with tape or sponge.

When the direction is selected, please drill a 100mm(4") diameter hole on the wall, and the hole must be tilted downward towards the outdoor for smooth water flow. When the pipe is led out from the rear, make a hole in figure, at the position shown(fig.2).



2.Drilling holes for anchor bolts and installing the anchor bolts(m10)

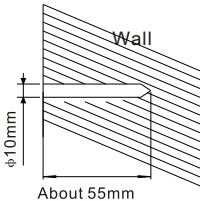
According to the position of the hole, install two expansible anchor bolts(A and B) at the position shown in the figure.



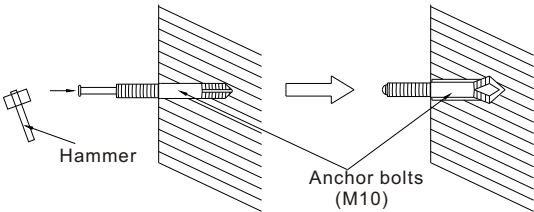
NOTE:

Cooling Capacity	12/18/24K Btu/hr	30-36K Btu/hr	42-55K Btu/hr
Dimension			
L	980mm	1200mm	1560mm

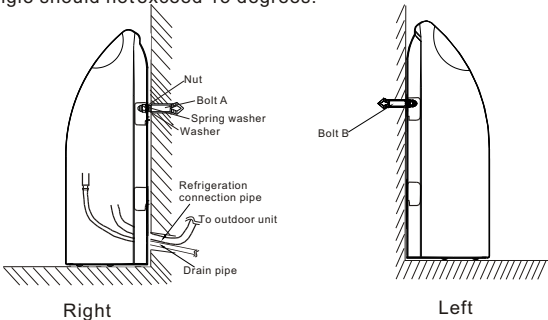
With a concrete drill, drill two 10mm diameter holes at the position(A and B) on the wall.



Insert the anchor bolts into the drilled holes, and drive the pins completely into the anchor bolts with a hammer.

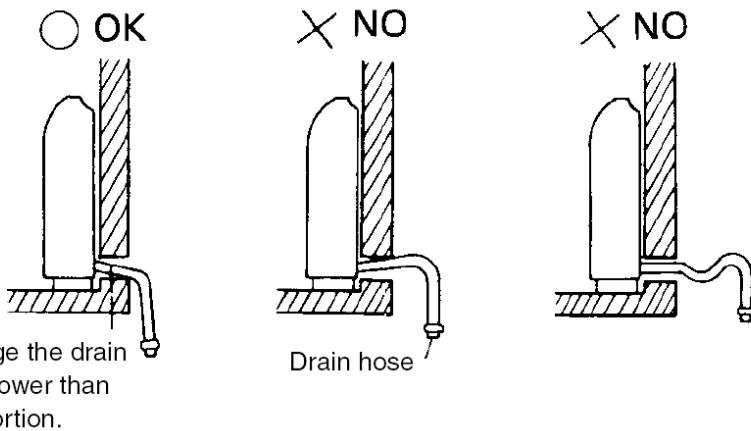


Install the unit to them with nuts, washers and spring washers
NOTE: The installation angle should not exceed 15 degrees.



⚠ CAUTION

Be sure to arrange the drain hose so that it is leveled lower than the drain hose connecting port of the indoor unit.

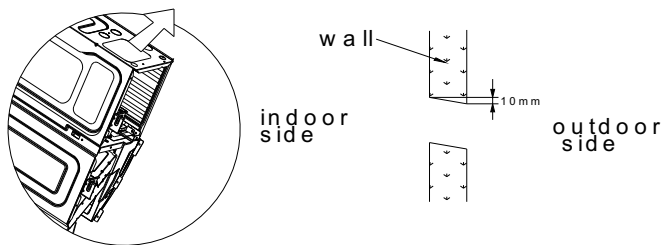


UNDER CEILING TYPE

1. Select piping and drain directions.

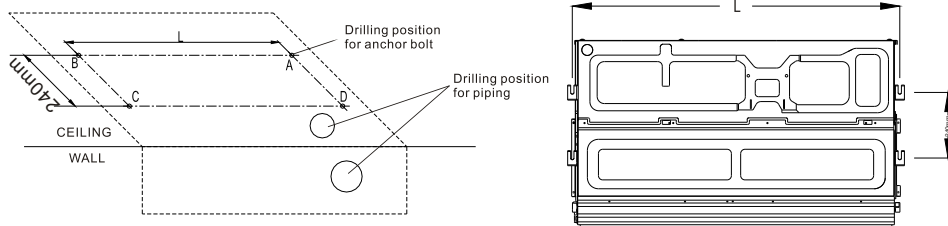
CAUTION: Install the drainage hose at the rear, it should not be installed on the top.

When the directions are selected, drill 80 mm (3-1/8") and 50 mm (2") or 150 mm (6") dia. hole on the wall so that the hole is tilted downward toward the outdoor for smooth water flow.



2. Drilling holes for anchor bolts and installing the anchor bolts(m10).

Please drill four holes for anchor bolts at the position A,B,C and D.



NOTE:

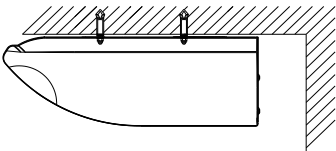
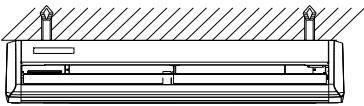
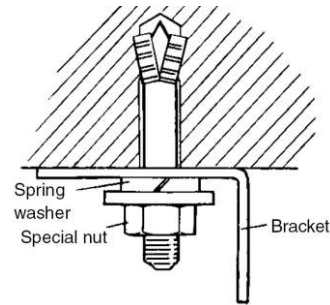
Cooling Capacity Dimension	12/18/24K Btu/hr	30-36K Btu/hr	42-55K Btu/hr
L	980mm	1200mm	1560mm

3. Installing indoor unit

Now,securely tighten nuts to each bolt with washers and spring washers.

NOTE: The installation angle should not exceed 10 degrees.

Mount the unit to the anchor bolts



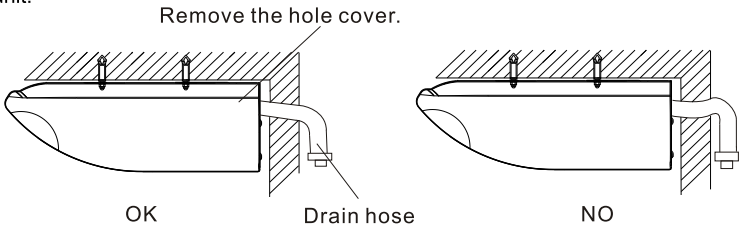
DRAINAGE PIPE CONNECTION

1.Installing the drain hose

Insert the drain hose into the drain pan, then secure the drain hose with a nylon fastener(we have connected the drain hose to the drain pan in the factory,you just need connect the drain pipe.).

Wrap the insulation (drain hose) around the drain hose connection.

Be sure to arrange the drain hose so that it is leveled lower than the drain hose connecting port of the indoor unit.



2.Drainage test

A.Check whether the drain pipe is unhindered and each joint is airtproof.

B.Inject 2000ml water into the drain pan to test whether the water flows smoothly.

Choose installation location

🏠 INDOOR UNITS

- 1、A place where there are sufficient space for repair
- 2、 Hung ceiling that can bear the weight of the machine.
- 3、 A place without air inlet and outlet is not hindered and without influence from outdoor air
- 4、 A place without heat source like smoke, fire or toxic pollution.
- 5、 A place where air flow can be transmitted everywhere in the room.
- 6、 A place convenient for installation.

🏠 OUTDOOR UNITS

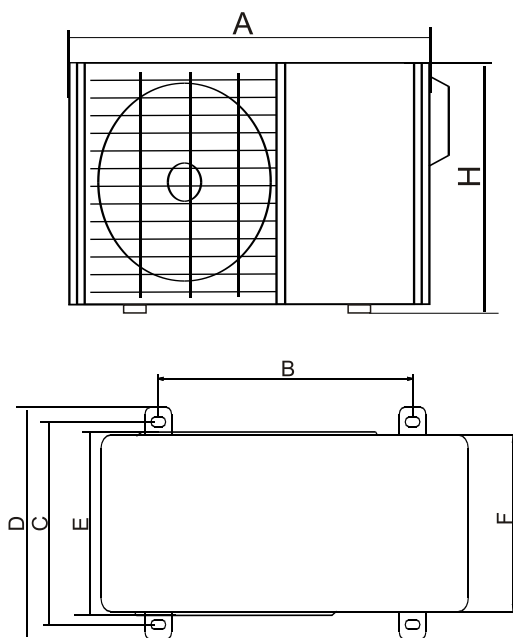
- 1.A place where there is sufficient space for installation and repair.
- 2.A place where the air inlet and outlet are not hindered , without strong air flowing.
- 3.A dry and ventilated place.
- 4.A place where the overhanging is level and bear the weight of the outdoor unit, without much noise.
- 5.A place where neighbours are not annoyed by noise and exhausted air.
- 6.A place without leakage of flammable gas.
- 7.A place convenient for installation.

Caution:(location in the following places may cause malfunction of the machine).

- 1.A place where there is flammable gas leakage.
- 2.There is salty air surrounding(near the coast)
- 3.There is caustic gas(the sulfide, for example) existing in the ai.
- 4.A place where can not bear the weight of the machine
- 5.In kitchen where it is full of oil gas.
- 6.There is strong electromagnetic wave existing.
- 7.There is acid or alkaline liquid evaporating
- 8.A place where air circulation is not enough.
- 9.Other special surroundings.

Figure of body size

Split type outdoor unit

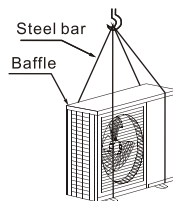


MODE	A	B	C	D	E	F	H
12/18K	780	516	314	350	321	307	605
24/30K	845	586	348	375	358	342	700
36/42K	910	607	390	421	387	375	804
48/55K	1010	660	462	494	440	436	858

OUTDOOR UNIT INSTALLATION

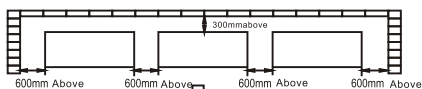
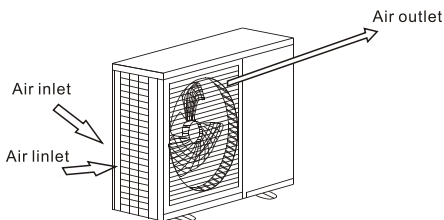
Move outdoor unit

1. Please use 4 pieces of 6mm steel wire hanging the outdoor unit up and move in.
2. To avoid the outdoor unit is out of shape, please add the baffles at the surface of outdoor unit where the steel wire rope may touch.
3. After moving, please remove the tray wood on the bottom.



INSTALLATION SPACE

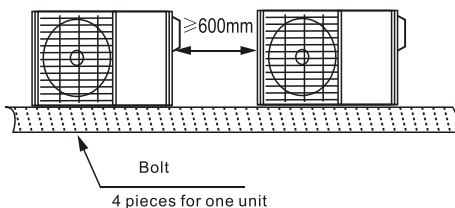
1. After leaving repair space as illustrated below, install the outdoor unit with power supply equipment installed at the side of the outdoor unit. Please refer to ELECTRIC SUPPLY INSTALLATION MANUAL for the installation method.
2. Please make sure necessary space for installation and repair.



Air outlet of the outdoor unit
Overview of the outdoor unit

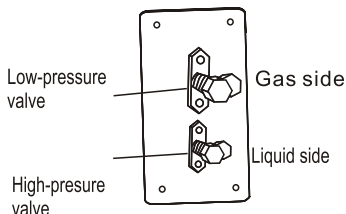
⚠ No obstruction from the air outlet of outdoor unit

- At least 600mm space must be left between outdoor units as the sketch indicated.



Refrigerant pipe

1. The junction is inside the cover of the right panel, please take off the cover first.
2. The pipe gets out of the side gap of the cover.
3. After connecting from the valve gap, reinstall it from left, right or backwards for installation.
4. The right picture is the sketch map of valve installation board of outdoor. Gas-side (low pressure) is the one upward, liquid side is the one downward.



INSTALLATION

Pre-installation precautions

- Please confirm that the installation personnel are qualified in relevant installation service. If the air conditioner was installed by persons without special skills, normal operations would not be ensured, even the personal and estate safety would be affected.

User guideline

- The user's installation site should be provided with regular power supply in conformity with that indicated in nameplate of the air conditioner, and its voltage should be within a range 90 %~ 110 % of the rated voltage value.
- Power circuit should be equipped with protector, such as electricity leakage protector or air switch, which should possess a capacity greater than 1.5 times the maximum current value of the air conditioner.
- Never fail to adopt personal circuit and effectively-grounded socket compatible with the attached plug of the air conditioner. The attached plug is equipped with grounding pin, and it must not be modified as desired.
- Please adopt the fuse or circuit breaker prescribed in Installation Instructions.
- Only qualified electrician is allowed to carry out wiring tasks strictly according to electric safety requirements.
- Do ensure good earth of air conditioner, in other words, the main power switch of air conditioner must be connected to reliable ground wire.

Precautions

- The air conditioner should be installed securely; otherwise poor installation may lead to abnormal noises and vibration.
- Outdoor unit should be installed at a spot ensuring that its air outlet noises and hot exhaust will not violate your neighbors.

Unit body installation

Please confirm the indoor unit dimension according to the picture below
M10 whorl is to be installed.(4 sets)

- ◆ please refer to the following for the center distance between the bolts
 - ◆ M 10 whorl is used
 - ◆ please consult professional for your specific ceiling arrangement.
1. Dismantle scale of the ceiling please keep ceiling its level. Strengthen the beam to avoid vibration.
 2. Break the beam of the ceiling.
 3. Strengthen the breaking point of the ceiling and reinforce the ceiling beam.
- ◆ After the main body hanging is finished, arrangement of pipe and line will be done in the ceiling. The direction of the pipe is determined after the installation location is chosen.If the ceiling has existed, please arrange the refrigerant pipe, drainage pipe, indoor and outdoor connecting line.
 - ◆ Installation of the hanging screw bolt.

REFRIGERANT PIPE INSTALLATION

Pipe dimension and ways of installation

Outdoor pipe dimension and ways of install (in sequence of cooling capacity)

Pipe Material		Copper Pipe for Air Conditioner		
Model		12/18K	24K	30/36/42/48/55K
Size(mm)	Liquid side	φ 6.35(1/4 inch)	φ 6.35(1/4 inch)	φ 9.52(3/8 inch)
	Gas side	φ 9.52(3/8 inch)	φ 12.7(1/2 inch)	φ 15.88(5/8 inch)

Conventional pipe, cooling capacity18000-30000Btu/h		Allowed value
Longest pipe(L)		30m
Maximum height drop	Height drop between indoor and outdoor unit H	15m

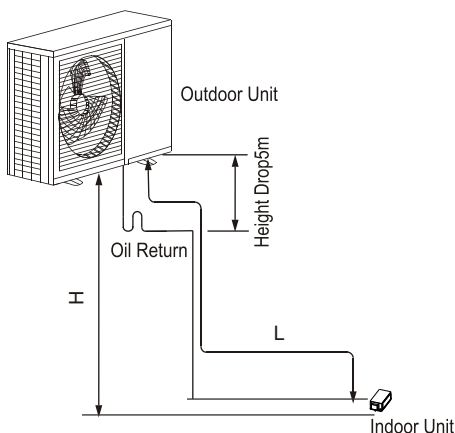
Conventional pipe, cooling capacity36000-42000Btu/h		Allowed value
Longest pipe (L)		50m
Maximum height drop	Height drop between indoor and outdoor unit H	25m

Conventional pipe, cooling capacity48000-55000Btu/h		Allowed value
Longest pipe(L)		60m
Maximum height drop	Height drop between indoor and outdoor unit H	30m

Please refer to refrigerant pipe connection for detail

Allowed length and height drop

Remove objects and water



- Use high-pressure nitrogen to clean the pipe instead of outdoor refrigerant.
- Before installing refrigerant pipe, please clean the pipe in case of foreign objects.

Additional refrigerant charge

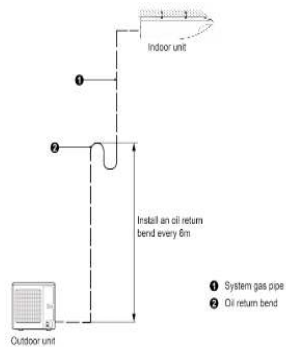
The additional charge is base on the diameter and length of outlet/inlet liquid type .
This AC has been charged with that for 5m pipe, those beyond 5 m should recharge as follows.

Liquid pipe diameter	φ 1/4"	φ 3/8"	φ 5/8"
Additional charge for 1m pipe(R32)	0.016kg	0.040kg	0.096Kg

Non-return bend and oil return bend

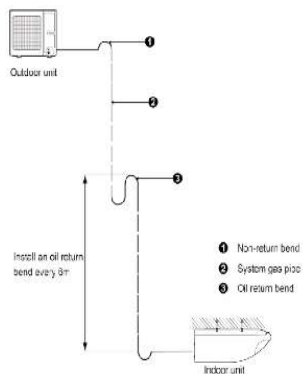
(1) Outdoor unit is beneath the indoor unit.

There's no need to add non-return bend at the lowest or highest position of the vertical pipe, as shown below:

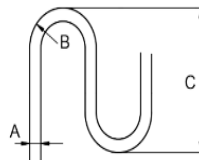


(2) Outdoor unit is above the indoor unit.

It's necessary to add oil return bend and non-return bend at the lowest and highest position of the vertical pipe, as shown below:



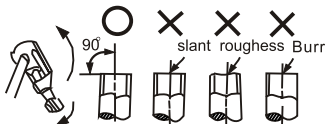
Dimensions for the making of oil return bend are as follows:



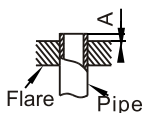
A(inch)	B(mm)	C(mm)
$\Phi 3/8$	≥ 20	≤ 150
$\Phi 1/2$	≥ 26	≤ 150
$\Phi 5/8$	≥ 33	≤ 150

FLARING

- ① Cut the refrigerant pipe off with pipe cutter.



- ② Flaring after putting the pipe into connection nut.



Outside Diameter	A (mm)	
	MAX	MIN
φ1/4"	8.7	8.3
φ3/8"	12.4	12.0
φ1/2"	15.8	15.4
φ5/8"	19.0	18.6
φ3/4"	23.3	22.9

Stop valve operation item

- Open the valve rod til to the position rod.
Do not try to open larger.
- Fasten the bonnet with spanner or similar tools.
- Fasten the bonnet of valve rod.

Liquid side(φ3/8" , φ1/2"): 1180N·cm(120kgf·cm)

gas side(φ5/8" , φ3/4"): 1180N·cm(120kgf·cm)

- When vacuum pump is used, each low-pressure valve must be manipulated as follow
Please refer to operation manual for the usage of manifold valve.

1. Connect the recharged hose to lower pressure valve junction (low/high pressure valve must be tightened.)
2. Connect the charged hose junction with vacuum pump.
3. Open the low pressure handler of manifold fully.
4. Start vacuumizing with vacuum pump. when vacuumizing begins, loosen the nut of low pressure valve a bit. Check is the air enters(noise of vacuum pump changes, the all-purpose meter indication change from negative to zero), then tighten the nut of connection pipe.
5. After vacuumizing finishing, tighten the low pressure handler of manifold valve fully and stops the vacuum pump. When vacuumizing is carried out for over 15 minutes, please confirm if the all-purpose meter points at -1.0×10^5 Pa(-76cmHg).
6. Open the high/low pressure valve fully.
7. Dismantle the recharged hose from charge gap of low pressure valve.
8. Tighten the bonnet of low-pressure valve.

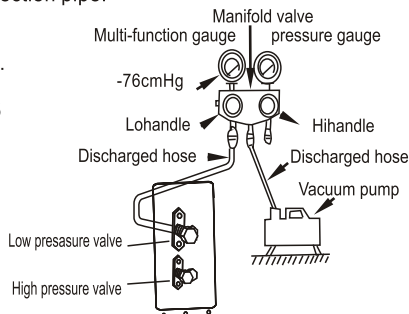
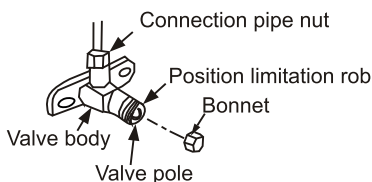
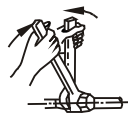
Junction fixture

- Aim at connection pipe
fix the nut of connection pipe, then tighten]
as the following diagram with spanner

Notice

- According to installation conditions, overlarge wrenched
torch will destroy the nut. (Unit. N·cm)

Outside diameter	Stengthen to fasten the torch
φ1/4"	1420~1720N·cm (144~176kgf·cm)
φ3/8"	3270~3990N·cm (333~407kgf·cm)
φ1/2"	4950~6030N·cm (504~616kgf·cm)
φ5/8"	6180~7540N·cm (630~770kgf·cm)
φ3/4"	9720~11860N·cm (990~1210kgf·cm)



ELECTRIC WIRING



WARNING

Specified power cables should be used. Do not apply any pressure on the terminals used to connect.

Improper connection may cause fire.



Grounding must be properly done.

The grounding wire should be away from gas pipes, water pipes, telephone, lightening rods or other grounding wires. Improper grounding may cause electric shock.



Electric Wiring must be done by professionals. Use a separate circuit according to national regulations.



The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.

If the wiring capacity is not enough, electric shock or fire may occur.

If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.

An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.

CAUTION

Be sure to Install Current Leakage Protection Switch. Or electric shock may occur.

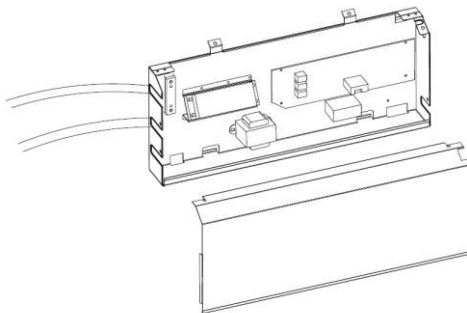
- Power cord is to be selected according to national regulations.
- Outdoor unit power cord should be selected and connected according to the outdoor unit installation manual.
- Wiring should be away from high temperature components, or the insulation layer of the wires may melt down.
- Use wire clamp to fix the wires and terminal block after connection.
- Control wire should be wrapped together with heat insulated refrigerant pipes.
- Connect the indoor unit to power only after the refrigerant has been vacuumed.
- Don't connect the power wire to the signal wire connection end.



Notice

1. Power cord indicates the supply cable from indoor air switch to indoor unit or outdoor unit. Indoor/outdoor power connecting wire indicates the supply cable connecting indoor unit and outdoor unit.
2. Cross-section area of power cord wire is the minimum value here. In case power-connecting wire is longer than usual, just select the conductor cross-section a level higher than the specified one to avoid voltage drop.
3. The cross section of ground wire for the whole set of air conditioner should be 2 mm^2 at least.
Power cord connected to indoor unit should be cable RVV (300 / 500); the power cord connected to outdoor unit and the indoor/outdoor power connecting wire should be multi-wire strand cable (neoprene) YZW (300 / 500V).
4. In case single-core double-layer wire is adopted, its cross section should be one level bigger than the specified one, and the wire should be covered with dedicated electric sheath.

1. Wiring method for indoor unit: Open the electric junction box to carry out wire connection. Notice that the connecting wire should be passed through wire-inlet rubber ring of the box. Connect the wires according to stipulations in the wiring diagram, and the wire splices at connecting terminal should be tightly compacted, free of looseness.



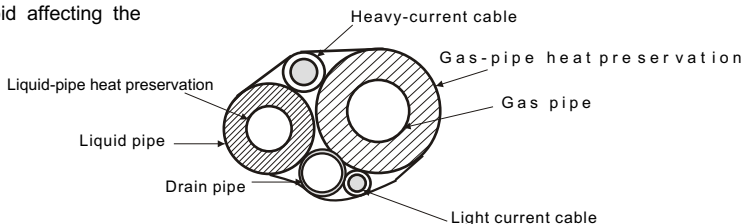
2. Binding treatment

Once the connecting wires have been properly connected, bind the connecting tubing, connecting wire and drain pipe by binding tapes

After binding treatment, the cross section is shown in the figure below:

Notice: Drain pipe must not be flattened during binding treatment.

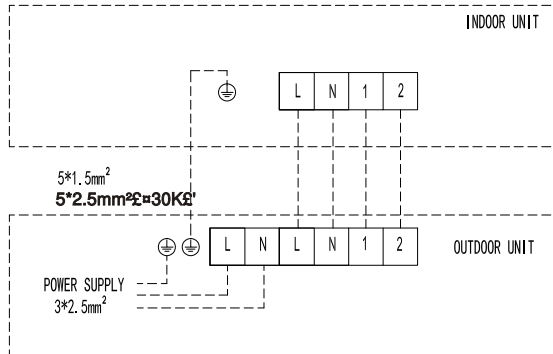
Drain pipe outlet should be led to a place that can avoid affecting the environment.



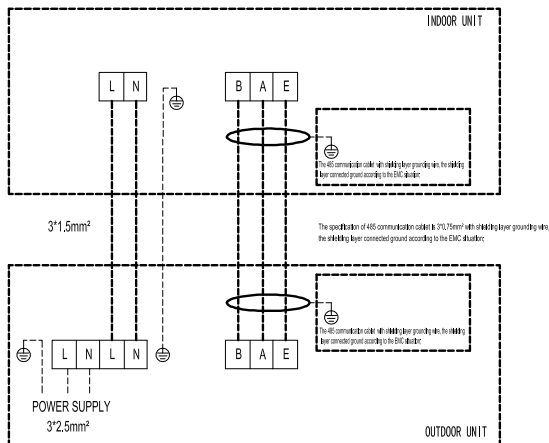
If situations as follow occur, please cut off the electric power before contacting the dealer

- Open or close incorrectly
- Fuse or electric leakage protector breaks for several times.
- Objects or water into the AC

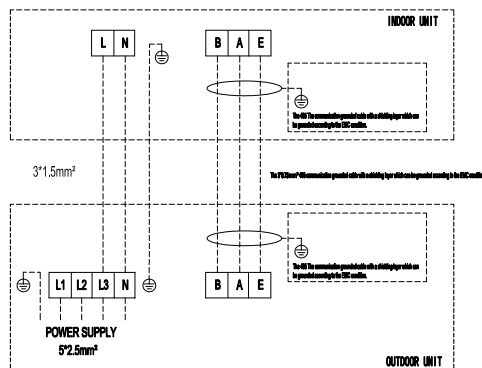
The following wiring diagram is for use with 12/18/24/30K models.



The following wiring diagram is suitable for 36/42K single-phase models.

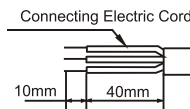


The following wiring diagram is suitable for 48/55K three-phase models.



4. Outdoor unit wiring

1. Copper-cored wire should be selected.
2. As the electric control box is inside the unit body, dismantle the valve installation cover, top cover right front board sequenly when connecting wires. Then connect the responding wires from the hole of the electric of the right back board.
3. Mate series number according to junction box of outdoor unit. (Disposed length of connection wire is good enough for inserting the conenction pole completely as the right picture shows.)
4. Wrap the electric wire(conductor),which is not inserted into the connection pole, with PVC belt and make it avoid any electric appliance or metal elements.
5. After installing cable connection lug on the main power wire, then connect to the terminal row.
6. Connection lug should be installed on the grounded wire of all cables.
Only finishing that all cables can be connected to grounded bolt.
7. The electric wire from wire terminal should be through wire clips.
8. Please refer to the right illustration.



NOTICE

The indoor unit should be connected correctly with the high-pressure and low-presurre stop valve of the outdoor unit as well as the signal line. Otherwise, some electrical componets and system may suffer damages.

TRY TEST

Before testing

- a. Check if piping, drainage and external wiring have been finished correctly.
- b. Check if the power supply complies with requirements; if there is refrigerant leakage; if the all wires and cables are correctly connected and well fixed.

Function test

- a. After checking, energize your appliance and press the buttons on the control panel to see if the buttons function;
- b. If LCD screen displays normally.

Notes

1. Please read this operating and installation instructions carefully.
2. Do not let air in or refrigerant out during installing or reinstalling the appliance.
3. Test run the air conditioner after finishing installation and keep the record .
4. Type of fuse for controller of indoor unit is 50T, rated specification is T 5 A, 250V. Fuse for the whole unit is not supplied by the manufacturer, so the installer must employ a suitable fuse or other over-current protective device for the power supply circuit according to the maximum power input as required.
5. The air conditioner operates safely when ambient static pressure is 0.8~1.05 standard atmosphere pressure.

DISPLAY PANEL

1. Trouble display of indoor display panel

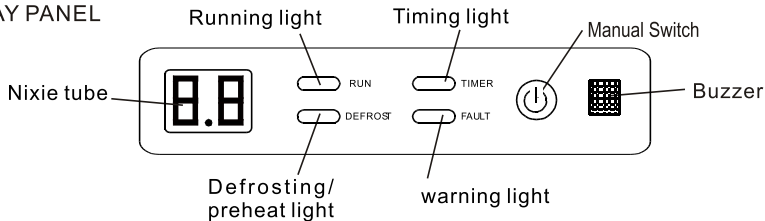
Infrared signal receiver: receive the signal from the remote controller.

To make your remote controller operation more efficient, please let remote controller emitter aim at infrared signal receiver.

Buzzer: firstly power supplied or any of remote controller operations will make the buzzer sound once.

Some obstacles occurring in the system will be recognized by intelligent recognition system of unit, lighting on the DISPLAY PANEL flashing show the type of obstacles.

◇ DISPLAY PANEL



Display function declaration :

LED light the state of running light

When powered-on the first time, the running light twinkles, while the double-8 does not lit.

When started-up normally, the running light lights on, while the double-8 shows the designed temperature.

When operated normally, the running light lights on, while the double-8 shows the designed temperature.

When closed down, both LED and double-8 are gone out.

LED light the state of Timing light

When timing set, the timing light lights on, and the double-8 flash shows the time setting within 5 seconds, then shows the designed temperature.

When without time setting, the timing light gone out, while the double-8 back to the original state.

LED light the state of defrosting/preheat light

When in the state of defrost, oil return, cold-wind proof, the defrosting/preheat light lights on, while the double-8 shows the designed temperature. (One-driven-one does not show the oil return state).

When out of the state of defrost, oil return, cold-wind proof, the defrosting/preheat light gone out, while the double-8 shows the designed temperature. (One-drive-one does not show the oil return state).

LED light the state of warning light

When double-8 shows E* or P*, the running lights gone out, while the warning light lights on

TROUBLESHOOTING

Error Code	Error Content	Error History Times	Error Definition and Protection
E0	Indoor and outdoor communication failure	1	Hardware Error
E1	Indoor ambient temperature sensor failure	2	Hardware Error
E2	Indoor fancoil temperature sensor failure	3	Hardware Error
E3	Outdoor fancoil temperature sensor failure	4	Hardware Error
E4	Abnormal system malfunction (lack of fluorine)	5	Hardware Error
E5	Model configuration error	6	Hardware Error
E6	Indoor PG/DC fan failure	7	Hardware Error
E7	Outdoor ambient temperature sensor failure	8	Hardware Error
E8	Outdoor exhaust temperature sensor failure	9	Hardware Error
E9	Outdoor IPM module failure/compressor drive failure	10	Hardware Error
EA	Outdoor current sensor failure	11	Hardware Error
Eb	PCB and display screen communication failure	12	Hardware Error
EC	Outdoor modules Communication failure	13	Hardware Error
EE	Outdoor EEPROM fault	14	Hardware Error
EF	Outdoor DC fan failure	15	Hardware Error
EH	Outdoor suction sensor failure	16	Hardware Error
EP	Outdoor compressor casing top failure	17	Hardware Error
EU	Outdoor voltage sensor failure	18	Hardware Error
Ej	Outdoor central coil temperature sensor failure	30	Hardware Error
En	Outdoor air pipe temperature sensor failure	31	Hardware Error
Ey	Outdoor liquid pipe temperature sensor failure	32	Hardware Error
P0	IPM module protection	19	Others Error
P1	Overvoltage and undervoltage protection	20	Others Error
P2	Overcurrent protection	21	Others Error
P3	Other protections	22	Others Error
P4	Protection against excessive outdoor exhaust temperature	23	Others Error
P5	Cooling protection against overcooling	24	Others Error
P6	Cooling and anti overheating protection	25	Others Error
P7	Heating and anti overheating protection	26	Others Error
P8	Protection against high or low outdoor temperature	27	Remote control display adjustment
P9	Compressor drive protection (abnormal load)	28	Others Error

PA	Communication failure/mode conflict	29	Others Error
F0	Infrared human sensing sensor failure	33	Remote control display adjustment
F1	Battery module failure	34	Remote control display adjustment
F2	Exhaust temperature sensor failure protection	35	Others Error
F3	Failure protection of outer tube temperature sensor	36	Others Error
F4	Abnormal protection of refrigerant circulation	37	Others Error
F5	PFC protection	38	Others Error
F6	Compressor missing/reverse phase protection	39	Others Error
F7	Module temperature protection	40	Others Error
F8	Abnormal commutation of four-way valve	41	Others Error
F9	Module temperature sensor circuit malfunction	42	Hardware Error
FA	Compressor phase current detection fault	43	Hardware Error
Fb	Cooling and heating overload protection limit frequency reduction	44	Remote control display adjustment
FC	High power protection limit/frequency reduction	45	Remote control display adjustment
FE	Module current (compressor phase current) protection limit/frequency reduction	46	Remote control display adjustment
FF	Module temperature protection limit/ frequency reduction	47	Remote control display adjustment
FH	Drive protection limit/frequency reduction	48	Remote control display adjustment
FP	Anti condensation protection limit/ frequency reduction	49	Remote control display adjustment
FU	Anti freezing protection limit/frequency reduction	50	Remote control display adjustment
Fj	Exhaust protection limit/frequency reduction	51	Remote control display adjustment
Fn	External AC current protection limit/ frequency reduction	52	Remote control display adjustment
Fy	Fluorine deficiency protection	53	Others Error
H1	High pressure switch malfunction	54	Hardware Error
H2	Low pressure switch malfunction	55	Hardware Error
bf	TVOC sensor failure	56	Remote control display adjustment
bc	PM2.5 sensor failure	57	Remote control display adjustment
bj	Humidity sensor failure	58	Remote control display adjustment
bE	CO2 sensor malfunction	59	Hardware Error
bd	Fresh air fan failure	60	Hardware Error
d4	Water full protection	61	Others Error
d5	Access control protection	62	Hardware Error

REFRIGERANT NOTICE/CONCENTRATION

This air conditioner uses R32 refrigerant. The construction area for installation, operation and storage of the air conditioner must be larger than the minimum construction area. The minimum area for installation is determined by:

1.Refrigerant charging quantity for the entire system (ex-factory charging quantity + additional charging quantity);

2.Checking out in the applicable tables:

(1) For indoor unit, confirm the model of indoor unit and check the corresponding table.

(2) For outdoor unit that is installed or placed indoors, select the corresponding table according to the height of the room.

Height of the room	Select the applicable table
<1.8m	Floor standing type
≥ 1.8m	Wall mounted type

3.Refer to the following table to check out the minimum construction area.

Ceiling type		Wall mounted type		Floor standing type	
Weight (kg)	Area (m ²)	Weight (kg)	Area (m ²)	Weight (kg)	Area (m ²)
<1.224	—	<1.224	—	<1.224	—
1.224	0.956	1.224	1.43	1.224	12.9
1.4	1.25	1.4	1.87	1.4	16.8
1.6	1.63	1.6	2.44	1.6	22.0
1.8	2.07	1.8	3.09	1.8	27.8
2.0	2.55	2.0	3.81	2.0	34.3
2.2	3.09	2.2	4.61	2.2	41.5
2.4	3.68	2.4	5.49	2.4	49.4
2.6	4.31	2.6	6.44	2.6	58.0
2.8	5.00	2.8	7.47	2.8	67.3
3.0	5.74	3.0	8.58	3.0	77.2
3.2	6.54	3.2	9.76	3.2	87.9
3.4	7.38	3.4	11.0	3.4	99.2
3.6	8.27	3.6	12.4	3.6	111
3.8	9.22	3.8	13.8	3.8	124
4.0	10.2	4.0	15.3	4.0	137
4.2	11.3	4.2	16.8	4.2	151
4.4	12.4	4.4	18.5	4.4	166
4.6	13.5	4.6	20.2	4.6	182
4.8	14.7	4.8	22.0	4.8	198
5.0	16.0	5.0	23.8	5.0	215
5.2	17.3	5.2	25.8	5.2	232
5.4	18.6	5.4	27.8	5.4	250
5.6	20.0	5.6	29.9	5.6	269
5.8	21.5	5.8	32.1	5.8	289
6.0	23.0	6.0	34.3	6.0	309
6.2	24.5	6.2	36.6	6.2	330
6.4	26.1	6.4	39.1	6.4	351
6.6	27.8	6.6	41.5	6.6	374
6.8	29.5	6.8	44.1	6.8	397
7.0	31.3	7.0	46.7	7.0	420
7.2	33.1	7.2	49.4	7.2	445
7.4	34.9	7.4	52.2	7.4	470
7.6	36.9	7.6	55.1	7.6	496
7.8	38.8	7.8	58.0	7.8	522
8.0	40.8	8.0	61.0	8.0	549