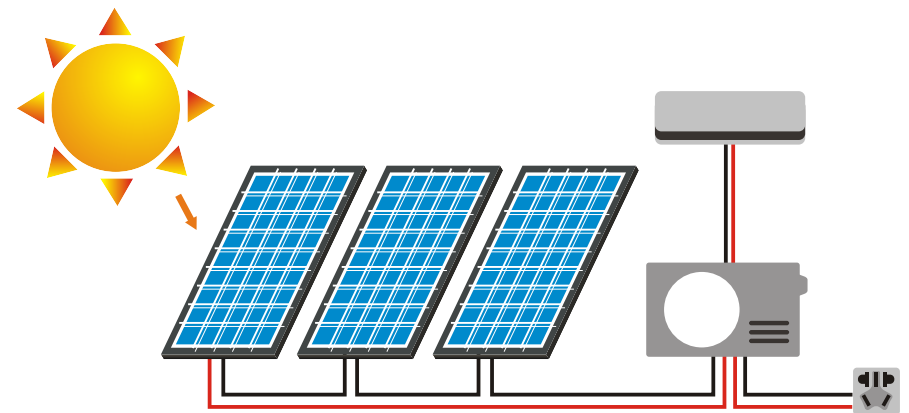


AC/DC HYBRID SOLAR AIR CONDITIONER

INSTALLATION MANUAL OF A SERIES



To use this unit correctly and safely, be sure to read this installation manual before use and installation.

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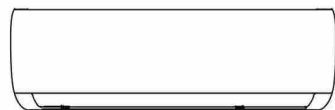
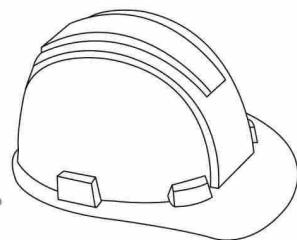
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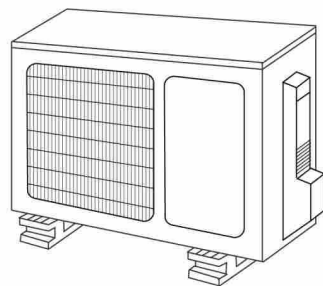
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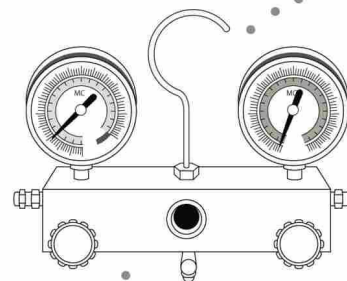
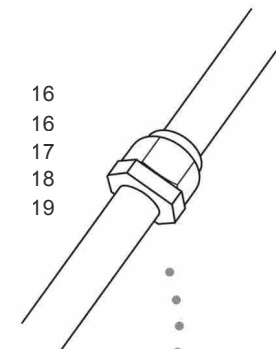
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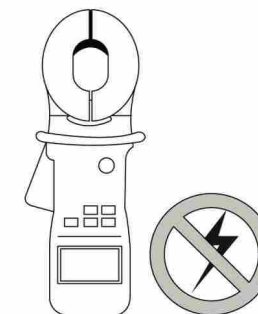
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Safety Precautions

Read Safety Precautions Before Installation

Incorrect installation due to ignoring instructions can cause serious damage or injury. The seriousness of potential damage or injuries is classified as either a **WARNING** or **CAUTION**.



WARNING

This symbol indicates that ignoring instructions may cause death or serious injury.



CAUTION

This symbol indicates that ignoring instructions may cause moderate injury to your person, or damage to your unit or other property.



This symbol indicates that you must never perform the action indicated.



WARNING

- ⓘ **Do not** modify the length of the power supply cord or use an extension cord to power the unit. **Do not** share the electrical outlet with other appliances. Improper or insufficient power supply can cause fire or electrical shock.
- ⓘ When connecting refrigerant piping, **do not** let substances or gases other than the specified refrigerant enter the unit. The presence of other gases or substances will lower the unit's capacity, and can cause abnormally high pressure in the refrigeration cycle. This can cause explosion and injury.
- ⓘ **Do not** allow children to play with the air conditioner. Children must be supervised around the unit at all times.
 1. Installation must be performed by an authorized dealer or specialist. Defective installation can cause water leakage, electrical shock, or fire.
 2. Installation must be performed according to the installation instructions. Improper installation can cause water leakage, electrical shock, or fire.
(In North America, installation must be performed in accordance with the requirement of NEC and CEC by authorized personnel only.)
 3. Contact an authorized service technician for repair or maintenance of this unit.
 4. Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.
 5. Install the unit in a firm location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and damage.



WARNING

6. For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. You must use an independent circuit and single outlet to supply power. Do not connect other appliances to the same outlet. Insufficient electrical capacity or defects in electrical work can cause electrical shock or fire.
7. For all electrical work, use the specified cables. Connect cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock.
8. All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.
9. In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.
10. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
11. 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.



CAUTION

- ⓘ For units that have an auxiliary electric heater, **do not** install the unit within 1 meter (3 feet) of any combustible materials.
- ⓘ **Do not** install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause fire.
- ⓘ **Do not** operate your air conditioner in a wet room such as a bathroom or laundry room. Too much exposure to water can cause electrical components to short circuit.
 1. The product must be properly grounded at the time of installation, or electrical shock may occur.
 2. Install drainage piping according to the instructions in this manual. Improper drainage may cause water damage to your home and property.

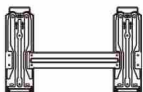








Note about Fluorinated Gasses



1. This air-conditioning unit contains fluorinated gasses. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself.
2. Installation, service, maintenance and repair of this unit must be performed by a certified technician.
3. Product uninstallation and recycling must be performed by a certified technician.
4. If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months.
5. When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

Accessories

1

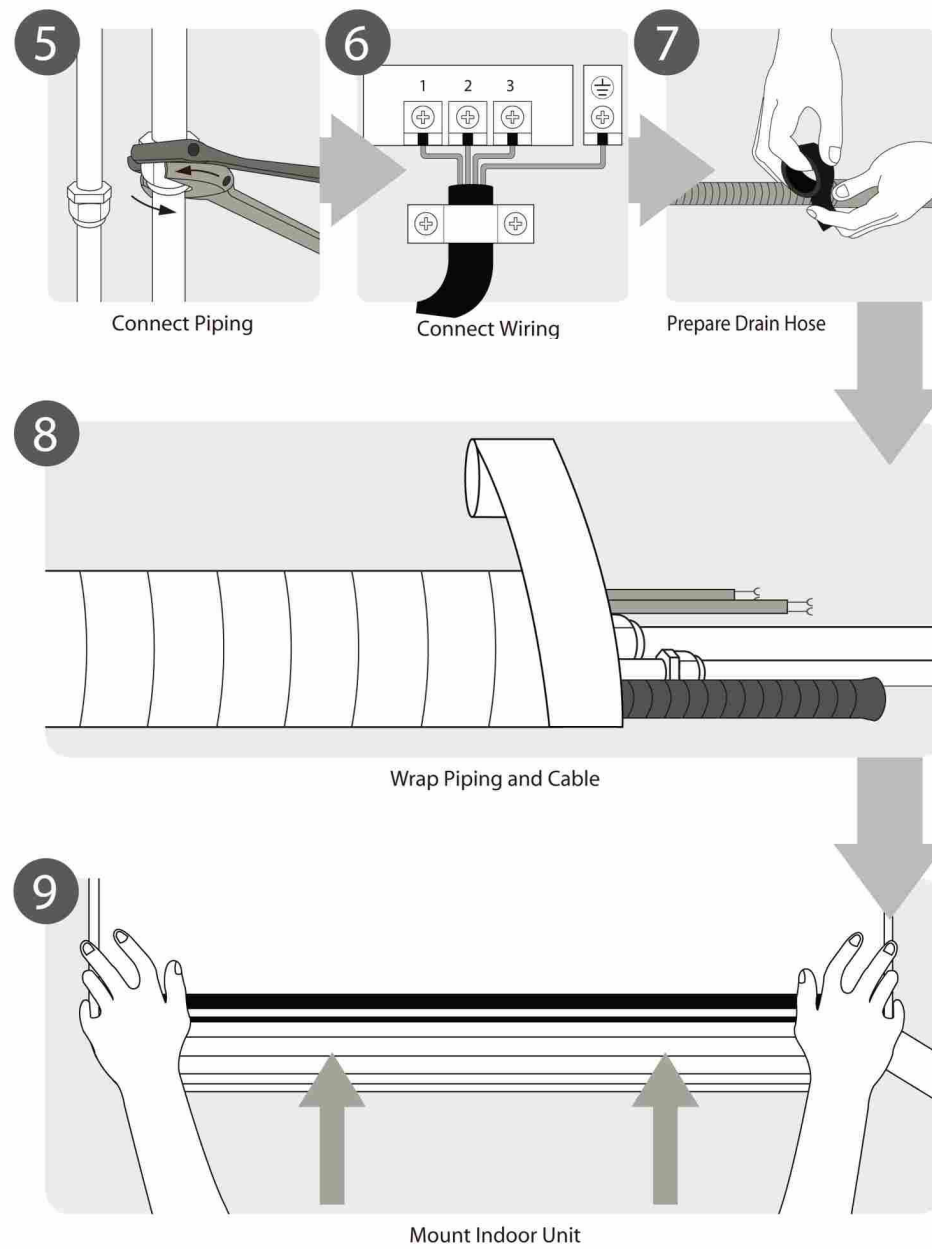
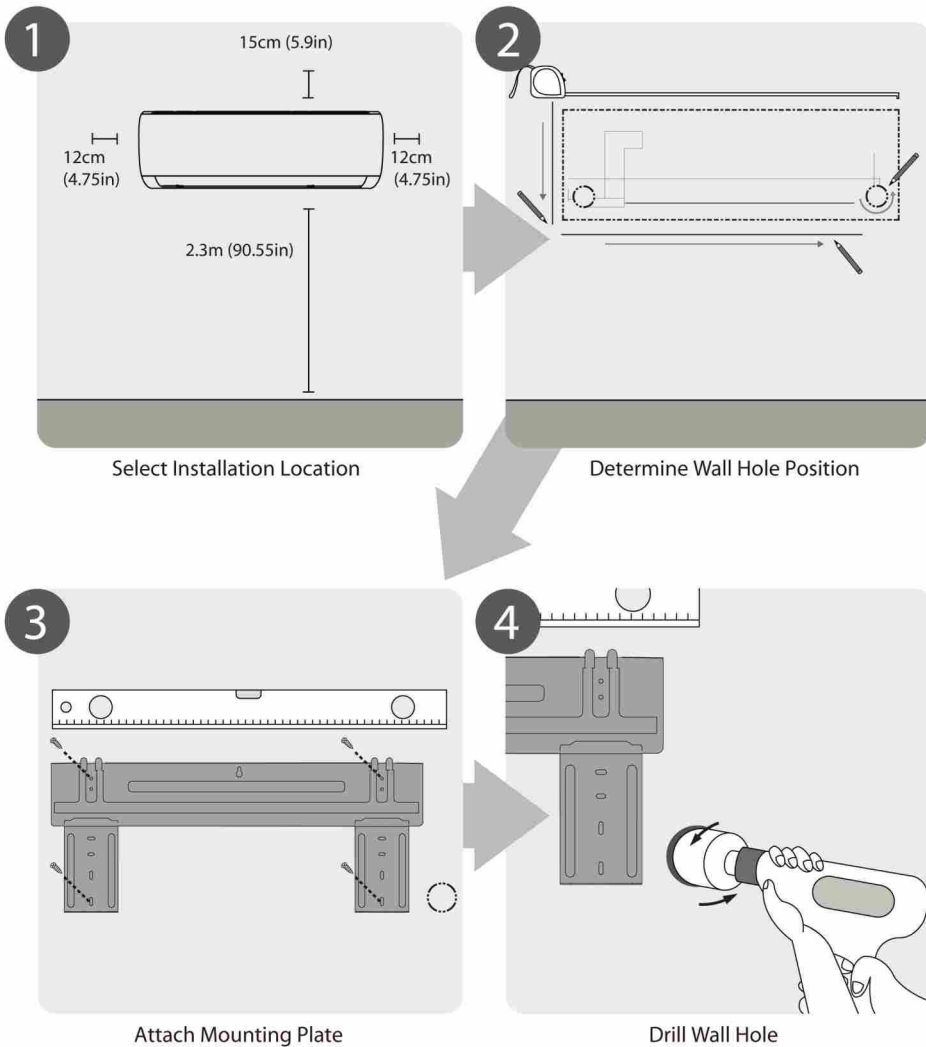
The air conditioning system comes with the following accessories. Use all of the installation parts and accessories to install the air conditioner. Improper installation may result in water leakage, electrical shock and fire, or cause the equipment to fail.

Name	Shape	Quantity	
Mounting plate		1	
Clip anchor		5	
Mounting plate fixing screw ST3.9 X 25		5	
Remote controller		1	
Fixing screw for remote controller holder ST2.9 x 10		2	Optional Parts
Remote controller holder		1	
Dry battery AAA.LR03		2	
Seal		1 (for cooling & heating models only)	
Drain joint			

Name	Shape		Quantity
Installation manual			1
Remote controller illustration			1
Connecting pipe assembly	Liquid side	Φ 6.35 (1/4in)	Parts you must purchase. Consult the dealer about the pipe size.
		Φ 9.52 (3/8in)	
	Gas side	Φ 9.52 (3/8in)	
		Φ 12.7 (1/2in)	
		Φ 16 (5/8in)	

Installation Summary - Indoor Unit

2



Unit Parts

3

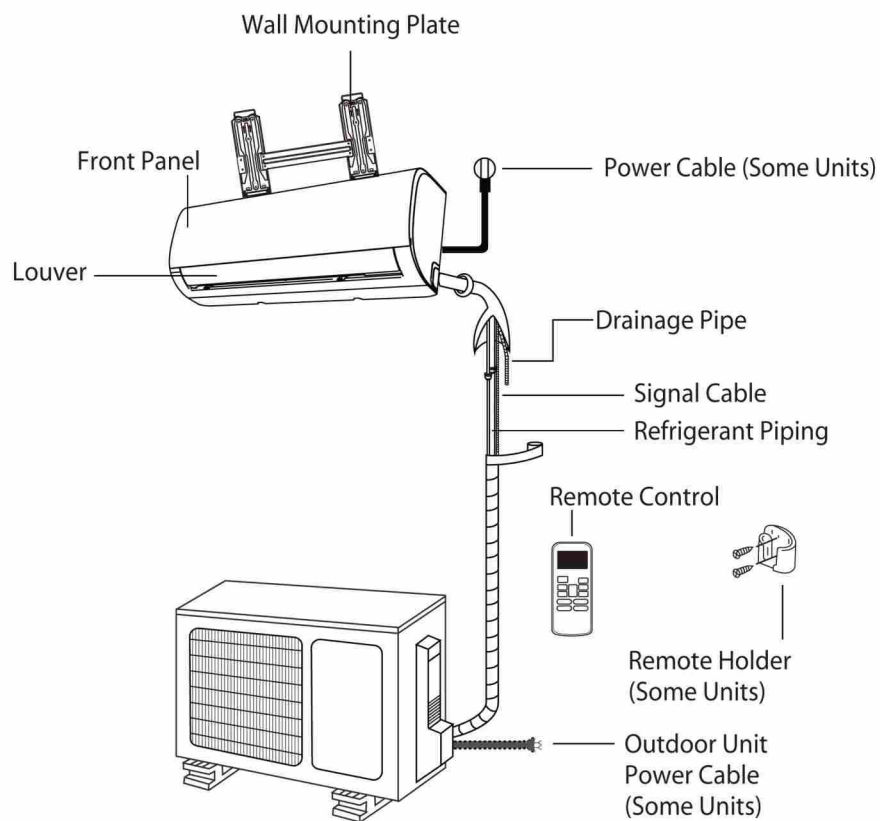


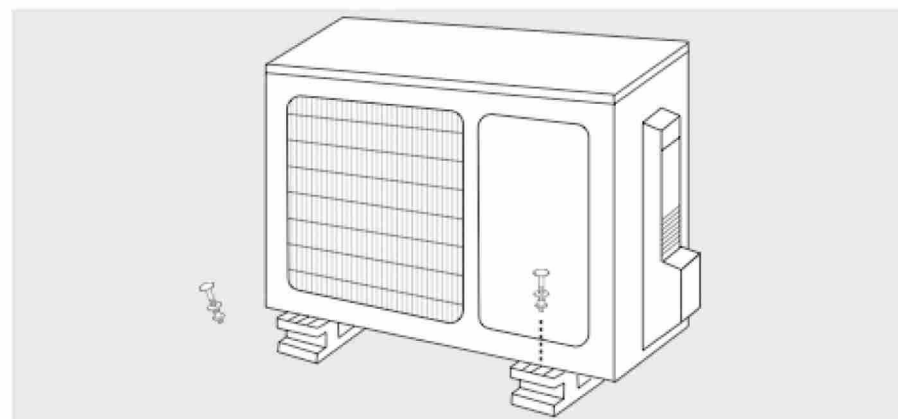
Fig. 3.1

NOTE ON ILLUSTRATIONS

Illustrations in this manual are for explanatory purposes. The actual shape of your indoor unit may be slightly different. The actual shape shall prevail.

Outdoor Unit Installation

4



Installation Instructions – Outdoor Unit

Step 1: Select installation location

Before installing the outdoor unit, you must choose an appropriate location. The following are standards that will help you choose an appropriate location for the unit.

Proper installation locations meet the following standards:

- ☑ Meets all spatial requirements shown in Installation Space Requirements (Fig. 4.1)
- ☑ Good air circulation and ventilation
- ☑ Firm and solid—the location can support the unit and will not vibrate
- ☑ Noise from the unit will not disturb others
- ☑ Protected from prolonged periods of direct sunlight or rain

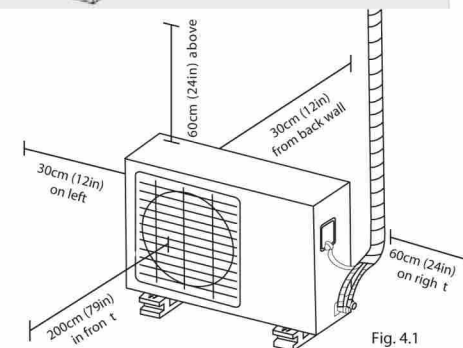


Fig. 4.1

DO NOT install unit in the following locations:

- ⊘ Near an obstacle that will block air inlets and outlets
- ⊘ Near a public street, crowded areas, or where noise from the unit will disturb others
- ⊘ Near animals or plants that will be harmed by hot air discharge
- ⊘ Near any source of combustible gas
- ⊘ In a location that is exposed to large amounts of dust
- ⊘ In a location exposed to a excessive amounts of saltv air

Step 2: Install drain joint

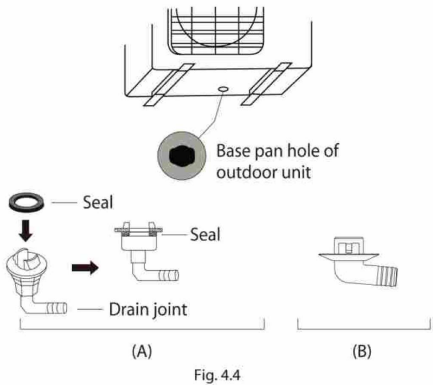
Heat pump units require a drain joint. Before bolting the outdoor unit in place, you must install the drain joint at the bottom of the unit. Note that there are two different types of drain joints depending on the type of outdoor unit.

If the drain joint comes with a rubber seal (see Fig. 4.4 - A), do the following:

1. Fit the rubber seal on the end of the drain joint that will connect to the outdoor unit.
2. Insert the drain joint into the hole in the base pan of the unit.
3. Rotate the drain joint 90° until it clicks in place facing the front of the unit.
4. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit during heating mode.

If the drain joint doesn't come with a rubber seal (see Fig. 4.4 - B), do the following:

1. Insert the drain joint into the hole in the base pan of the unit. The drain joint will click in place.
2. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit during heating mode.



! IN COLD CLIMATES

In cold climates, make sure that the drain hose is as vertical as possible to ensure swift water drainage. If water drains too slowly, it can freeze in the hose and flood the unit.

Step 3: Anchor outdoor unit

The outdoor unit can be anchored to the ground or to a wall-mounted bracket.

UNIT MOUNTING DIMENSIONS

The following is a list of different outdoor unit sizes and the distance between their mounting feet. Prepare the installation base of the unit according to the dimensions below.

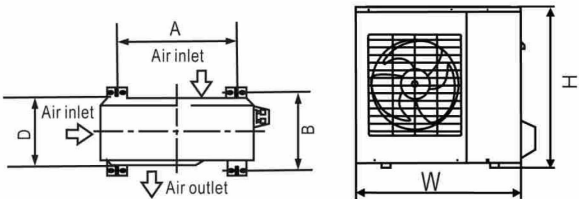


Fig. 4.5

Outdoor Unit Dimensions (mm/in) W x H x D	Mounting Dimensions	
	Distance A (mm/in)	Distance B (mm/in)
681x434x285 (26.8"x17"x11.2")	460 (18.10")	292 (11.49")
700x550x270 (27.5"x21.6"x10.62")	450 (17.7")	260 (10.24")
780x540x250 (30.7"x21.25"x9.85")	549 (21.6")	276 (10.85")
845x700x320 (33.25"x27.5"x12.6")	560 (22")	335 (13.2")
810x558x310 (31.9"x22"x12.2")	549 (21.6")	325 (12.8")
700x550x275 (27.5"x21.6"x10.82")	450 (17.7")	260 (10.24")
770x555x300 (30.3"x21.85"x11.81")	487 (19.2")	298 (11.73")
800x554x333 (31.5"x21.8"x13.1")	514 (20.24")	340 (13.39")
845x702x363 (33.25"x27.63"x14.29")	540 (21.26")	350 (13.8")
900x860x315 (35.4"x33.85"x12.4")	590 (23.2")	333 (13.1")
912x712x373 (35.91"x28.03"x14.69")	625 (24.61")	425 (14.76")
945x810x395 (37.2"x31.9"x15.55")	640 (25.2")	405 (15.95")
946x810x420 (37.21"x31.9"x16.53")	673 (26.5")	403 (15.87")
946x810x410 (37.21"x31.9"x16.14")	673 (26.5")	403 (15.87")

If you will install the unit on the ground or on a concrete mounting platform, do the following:

1. Mark the positions for four expansion bolts based on dimensions in the Unit Mounting Dimensions chart.
2. Pre-drill holes for expansion bolts.
3. Clean concrete dust away from holes.
4. Place a nut on the end of each expansion bolt.
5. Hammer expansion bolts into the pre-drilled holes.

6. Remove the nuts from expansion bolts, and place outdoor unit on bolts.
7. Put washer on each expansion bolt, then replace the nuts.
8. Using a wrench, tighten each nut until snug.

! WARNING

WHEN DRILLING INTO CONCRETE, EYE PROTECTION IS RECOMMENDED AT ALL TIMES.

If you will install the unit on a wall-mounted bracket, do the following:

! CAUTION

Before installing a wall-mounted unit, make sure that the wall is made of solid brick, concrete, or of similarly strong material. The wall must be able to support at least four times the weight of the unit.

1. Mark the position of bracket holes based on dimensions in the Unit Mounting Dimensions chart.
2. Pre-drill the holes for the expansion bolts.
3. Clean dust and debris away from holes.
4. Place a washer and nut on the end of each expansion bolt.
5. Thread expansion bolts through holes in mounting brackets, put mounting brackets in position, and hammer expansion bolts into the wall.
6. Check that the mounting brackets are level.
7. Carefully lift unit and place its mounting feet on brackets.
8. Bolt the unit firmly to the brackets.

TO REDUCE VIBRATIONS OF WALL-MOUNTED UNIT

If allowed, you can install the wall-mounted unit with rubber gaskets to reduce vibrations and noise.

Step 4: Connect signal and power cables

The outside unit's terminal block is protected by an electrical wiring cover on the side of the unit. A comprehensive wiring diagram is printed on the inside of the wiring cover.

! BEFORE PERFORMING ELECTRICAL WORK, READ THESE REGULATIONS

1. All wiring must comply with local and national electrical codes, and must be installed by a licensed electrician.
2. All electrical connections must be made according to the Electrical Connection Diagram located on the side panels of the indoor and outdoor units.
3. If there is a serious safety issue with the power supply, stop work immediately. Explain your reasoning to the client, and refuse to install the unit until the safety issue is properly resolved.
4. Power voltage should be within 90-100% of rated voltage. Insufficient power supply can cause electrical shock or fire.
5. If connecting power to fixed wiring, install a surge protector and main power switch with a capacity of 1.5 times the maximum current of the unit.
6. If connecting power to fixed wiring, a switch or circuit breaker that disconnects all poles and has a contact separation of at least 1/8in (3mm) must be incorporated in the fixed wiring. The qualified technician must use an approved circuit breaker or switch.
7. Only connect the unit to an individual branch circuit outlet. Do not connect another appliance to that outlet.
8. Make sure to properly ground the air conditioner.
9. Every wire must be firmly connected. Loose wiring can cause the terminal to overheat, resulting in product malfunction and possible fire.
10. Do not let wires touch or rest against refrigerant tubing, the compressor, or any moving parts within the unit.
11. If the unit has an auxiliary electric heater, it must be installed at least 1 meter (40in) away from any combustible materials.

! WARNING

BEFORE PERFORMING ANY ELECTRICAL OR WIRING WORK, TURN OFF THE MAIN POWER TO THE SYSTEM.

1. Prepare the cable for connection:

USE THE RIGHT CABLE

- Indoor Power Cable (if applicable): H05VV-F or H05V2V2-F
- Outdoor Power Cable: H07RN-F
- Signal Cable: H07RN-F

Minimum Cross-Sectional Area of Power and Signal Cables

North America

Appliance Amps (A)	AWG
10	18
13	16
18	14
25	12
30	10

Other Regions

Rated Current of Appliance (A)	Nominal Cross-Sectional Area (mm ²)
> 3 and ≤ 6	0.75
> 6 and ≤ 10	1
> 10 and ≤ 16	1.5
> 16 and ≤ 25	2.5
> 25 and ≤ 32	4
> 32 and ≤ 40	6

- a. Using wire strippers, strip the rubber jacket from both ends of cable to reveal about 40mm (1.57in) of the wires inside.
- b. Strip the insulation from the ends of the wires.
- c. Using a wire crimper, crimp u-lugs on the ends of the wires.

PAY ATTENTION TO LIVE WIRE

While crimping wires, make sure you clearly distinguish the Live ("L") Wire from other wires.

! WARNING

ALL WIRING MUST PERFORMED STRICTLY IN ACCORDANCE WITH THE WIRING DIAGRAM LOCATED INSIDE THE OUTDOOR UNIT'S WIRE COVER.

2. Unscrew the electrical wiring cover and remove it.
3. Unscrew the cable clamp below the terminal block and place it to the side.
4. Match the wire colors/labels with the labels on the terminal block, and firmly screw the u-lug of each wire to its corresponding terminal.
5. After checking to make sure every connection is secure, loop the wires around to prevent rain water from flowing into the terminal.
6. Using the cable clamp, fasten the cable to the unit. Screw the cable clamp down tightly.
7. Insulate unused wires with PVC electrical tape. Arrange them so that they do not touch any electrical or metal parts.
8. Replace the wire cover on the side of the unit, and screw it in place.

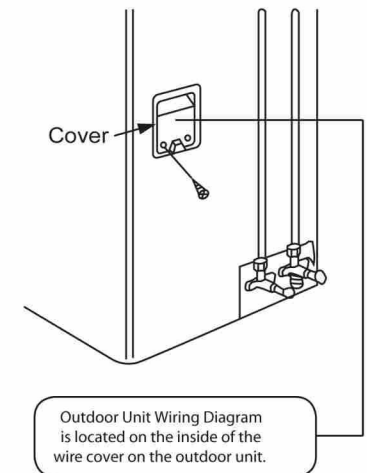
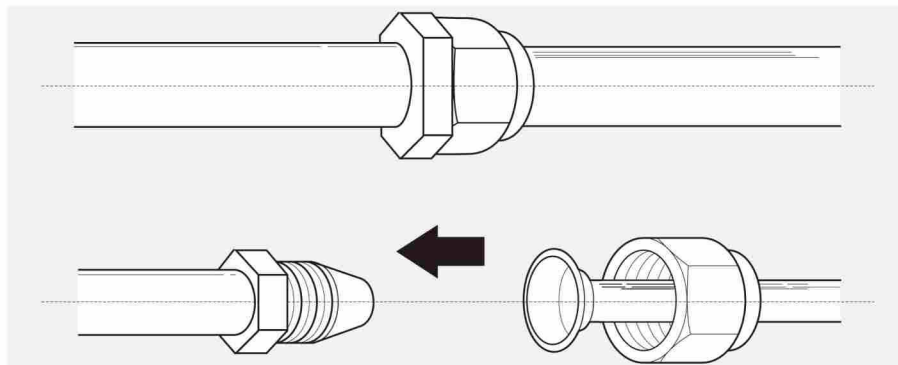


Fig. 4.6

Refrigerant Piping Connection

5



Note on Pipe Length

The length of refrigerant piping will affect the performance and energy efficiency of the unit. Nominal efficiency is tested on units with a pipe length of 5 meters (16.5ft).

Refer to the table below for specifications on the maximum length and drop height of piping.

Maximum Length and Drop Height of Refrigerant Piping per Unit Model

Model	Capacity (BTU/h)	Max. Length (m)	Max. Drop Height (m)
R410A Inverter Split Air Conditioner	< 15,000	25 (82ft)	10 (33ft)
	≥ 15,000 and < 24,000	30 (98.5ft)	20 (66ft)
	≥ 24,000 and < 36,000	50 (164ft)	25 (82ft)
	≥ 36,000 and ≤ 60,000	65 (213ft)	30 (98.5ft)

Connection Instructions – Refrigerant Piping

Step 1: Cut pipes

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will ensure efficient operation and minimize the need for future maintenance.

1. Measure the distance between the indoor and outdoor units.

2. Using a pipe cutter, cut the pipe a little longer than the measured distance.
3. Make sure that the pipe is cut at a perfect 90° angle. Refer to Fig. 5.1 for bad cut examples.

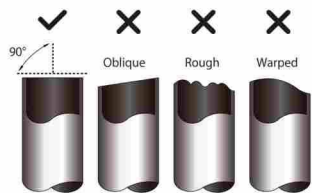


Fig. 5.1

! DO NOT DEFORM PIPE WHILE CUTTING

Be extra careful not to damage, dent, or deform the pipe while cutting. This will drastically reduce the heating efficiency of the unit.

Step 2: Remove burrs

Burrs can affect the air-tight seal of refrigerant piping connection. They must be completely removed.

1. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
2. Using a reamer or deburring tool, remove all burrs from the cut section of the pipe.

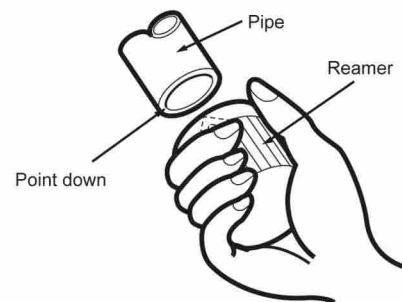


Fig. 5.2

Step 3: Flare pipe ends

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
2. Sheath the pipe with insulating material.
3. Place flare nuts on both ends of pipe. Make sure they are facing in the right direction, because you can't put them on or change their direction after flaring. See Fig. 5.3.

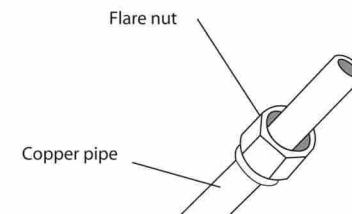


Fig. 5.3

4. Remove PVC tape from ends of pipe when ready to perform flaring work.
5. Clamp flare form on the end of the pipe. The end of the pipe must extend beyond the edge of the flare form in accordance with the dimensions shown in the table below.

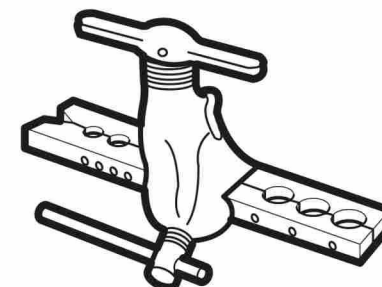


Fig. 5.4

PIPING EXTENSION BEYOND FLARE FORM

Outer Diameter of Pipe (mm)	A (mm)	
	Min.	Max.
Ø 6.35 (Ø 0.25")	0.7 (0.0275")	1.3 (0.05")
Ø 9.52 (Ø 0.375")	1.0 (0.04")	1.6 (0.063")
Ø 12.7 (Ø 0.5")	1.0 (0.04")	1.8 (0.07")
Ø 16 (Ø 0.63")	2.0 (0.078")	2.2 (0.086")

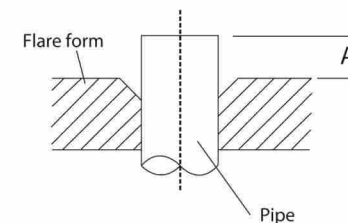


Fig. 5.5

6. Place flaring tool onto the form.
7. Turn the handle of the flaring tool clockwise until the pipe is fully flared.
8. Remove the flaring tool and flare form, then inspect the end of the pipe for cracks and even flaring.

Step 4: Connect pipes

When connecting refrigerant pipes, be careful not to use excessive torque or to deform the piping in any way. You should first connect the low-pressure pipe, then the high-pressure pipe.

MINIMUM BEND RADIUS

When bending connective refrigerant piping, the minimum bending radius is 10cm. See Fig.5.6

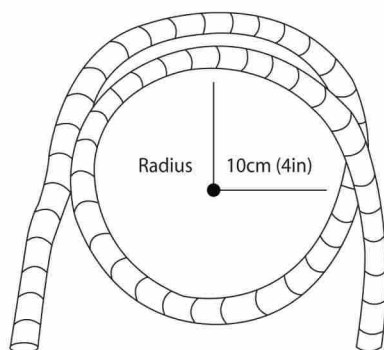


Fig. 5.6

TORQUE REQUIREMENTS

Outer Diameter of Pipe (mm)	Tightening Torque (N·cm)	Add. Tightening Torque (N·m)
Ø 6.35 (Ø 0.25")	1,500 (11lb · ft)	1,600 (11.8lb · ft)
Ø 9.52 (Ø 0.375")	2,500 (18.4lb · ft)	2,600 (19.18lb · ft)
Ø 12.7 (Ø 0.5")	3,500 (25.8lb·ft)	3,600 (26.55lb·ft)
Ø 16 (Ø 0.63")	4,500 (33.19lb·ft)	4,700 (34.67lb·ft)

! DO NOT USE EXCESSIVE TORQUE

Excessive force can break the nut or damage the refrigerant piping. You must not exceed torque requirements shown in the table above.

Instructions for Connecting Piping to Indoor Unit

1. Align the center of the two pipes that you will connect. See Fig. 5.7 .

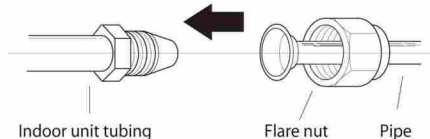


Fig. 5.7

2. Tighten the flare nut as tightly as possible by hand.
3. Using a spanner, grip the nut on the unit tubing.
4. While firmly gripping the nut on the unit tubing, use a torque wrench to tighten the flare nut according to the torque values in the Torque Requirements table below. Loosen the flaring nut slightly, then tighten again.

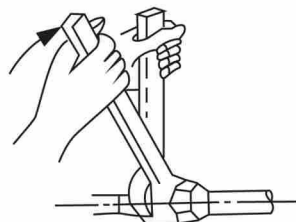


Fig. 5.8

Instructions for Connecting Piping to Outdoor Unit

1. Unscrew the cover from the packed valve on the side of the outdoor unit. (See Fig. 5.9)

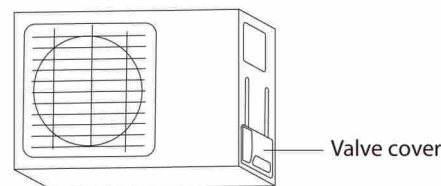


Fig. 5.9

2. Remove protective caps from ends of valves.
3. Align flared pipe end with each valve, and tighten the flare nut as tightly as possible by hand.
4. Using a spanner, grip the body of the valve. Do not grip the nut that seals the service valve. (See Fig. 5.10)

! USE SPANNER TO GRIP MAIN BODY OF VALVE

Torque from tightening the flare nut can snap off other parts of valve.

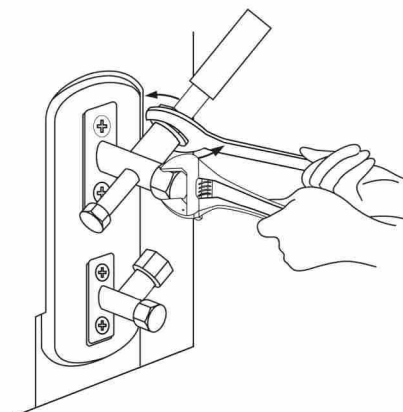
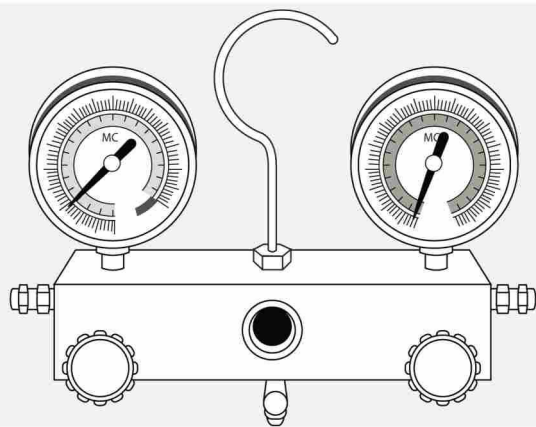


Fig. 5.10

5. While firmly gripping the body of the valve, use a torque wrench to tighten the flare nut according to the correct torque values.
6. Loosen the flaring nut slightly, then tighten again.
7. Repeat Steps 3 to 6 for the remaining pipe.

Air Evacuation

6



Preparations and Precautions

Air and foreign matter in the refrigerant circuit can cause abnormal rises in pressure, which can damage the air conditioner, reduce its efficiency, and cause injury. Use a vacuum pump and manifold gauge to evacuate the refrigerant circuit, removing any non-condensable gas and moisture from the system.

Evacuation should be performed upon initial installation and when unit is relocated.

BEFORE PERFORMING EVACUATION

- ☑ Check to make sure that both high-pressure and low-pressure pipes between the indoor and outdoor units are connected properly in accordance with the Refrigerant Piping Connection section of this manual.
- ☑ Check to make sure all wiring is connected properly.

Evacuation Instructions

Before using the manifold gauge and vacuum pump, read their operation manuals to familiarize yourself with how to use them properly.

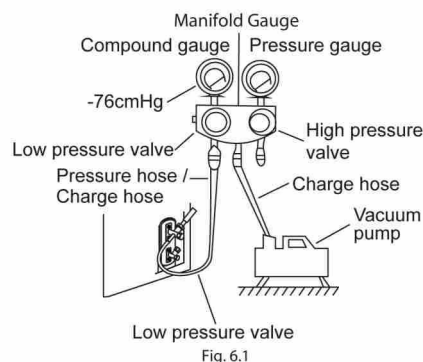


Fig. 6.1

1. Connect the charge hose of the manifold gauge to service port on the outdoor unit's low pressure valve.
2. Connect another charge hose from the manifold gauge to the vacuum pump.

3. Open the Low Pressure side of the manifold gauge. Keep the High Pressure side closed.
4. Turn on the vacuum pump to evacuate the system.
5. Run the vacuum for at least 15 minutes, or until the Compound Meter reads -76cmHg (-10⁵ Pa).
6. Close the Low Pressure side of the manifold gauge, and turn off the vacuum pump.
7. Wait for 5 minutes, then check that there has been no change in system pressure.
8. If there is a change in system pressure, refer to Gas Leak Check section for information on how to check for leaks. If there is no change in system pressure, unscrew the cap from the packed valve (high pressure valve).
9. Insert hexagonal wrench into the packed valve (high pressure valve) and open the valve by turning the wrench in a 1/4 counterclockwise turn. Listen for gas to exit the system, then close the valve after 5 seconds.
10. Watch the Pressure Gauge for one minute to make sure that there is no change in pressure. The Pressure Gauge should read slightly higher than atmospheric pressure.

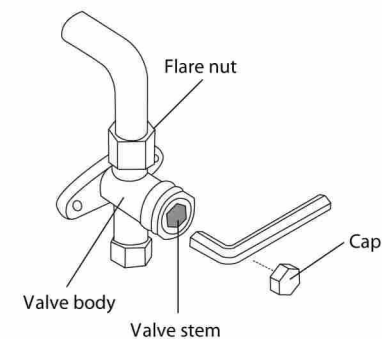


Fig. 6.2

11. Remove the charge hose from the service port.
12. Using hexagonal wrench, fully open both the high pressure and low pressure valves.
13. Tighten valve caps on all three valves (service port, high pressure, low pressure) by hand. You may tighten it further using a torque wrench if needed.

! OPEN VALVE STEMS GENTLY

When opening valve stems, turn the hexagonal wrench until it hits against the stopper. Do not try to force the valve to open further.

Note on Adding Refrigerant

Some systems require additional charging depending on pipe lengths. The standard pipe length varies according to local regulations. For example, in North America, the standard pipe length is 7.5m (25'). In other areas, the standard pipe length is 5m (16'). The additional refrigerant to be charged can be calculated using the following formula:

ADDITIONAL REFRIGERANT PER PIPE LENGTH

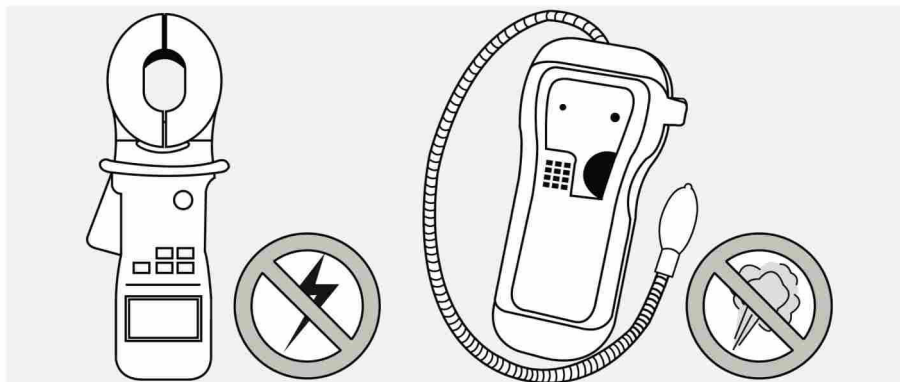
Connective Pipe Length (m)	Air Purging Method	Additional Refrigerant	
≤ Standard pipe length	Vacuum Pump	N/A	
> Standard pipe length	Vacuum Pump	Liquid Side: Ø 6.35 (ø 0.25")	Liquid Side: Ø 9.52 (ø 0.375")
		R22: (Pipe length – standard length) x 30g/m (Pipe length – standard length) x 0.32oz/ft	R22: (Pipe length – standard length) x 60g/m (Pipe length – standard length) x 0.64oz/ft
		Inverter R410A: (Pipe length – standard length) x 15g/m (Pipe length – standard length) x 0.16oz/ft	Inverter R410A: (Pipe length – standard length) x 30g/m (Pipe length – standard length) x 0.32oz/ft
		Fixed-frequency R410A: (Pipe length – standard length) x 20g/m (Pipe length – standard length) x 0.21oz/ft	Fixed-frequency R410A: (Pipe length – standard length) x 40g/m (Pipe length – standard length) x 0.42oz/ft

! CAUTION

DO NOT mix refrigerant types.

Electrical and Gas Leak Checks

7



Electrical Safety Checks

After installation, confirm that all electrical wiring is installed in accordance with local and national regulations, and according to the Installation Manual.

BEFORE TEST RUN

Check Grounding Work

Measure grounding resistance by visual detection and with grounding resistance tester. Grounding resistance must be less than 4.

Note: This may not be required for some locations in the US.

DURING TEST RUN

Check for Electrical Leakage

During the Test Run, use an electroprobe and multimeter to perform a comprehensive electrical leakage test.

If electrical leakage is detected, turn off the unit immediately and call a licensed electrician to find and resolve the cause of the leakage.

Note: This may not be required for some locations in the US.

⚠ WARNING – RISK OF ELECTRIC SHOCK

ALL WIRING MUST COMPLY WITH LOCAL AND NATIONAL ELECTRICAL CODES, AND MUST BE INSTALLED BY A LICENSED ELECTRICIAN.

Gas Leak Checks

There are two different methods to check for gas leaks.

Soap and Water Method

Using a soft brush, apply soapy water or liquid detergent to all pipe connection points on the indoor unit and outdoor unit. The presence of bubbles indicates a leak.

Leak Detector Method

If using leak detector, refer to the device's operation manual for proper usage instructions.

AFTER PERFORMING GAS LEAK CHECKS

After confirming that the all pipe connection points DO NOT leak, replace the valve cover on the outside unit.

Test Run

8

Before Test Run

Only perform test run after you have completed the following steps:

- Electrical Safety Checks – Confirm that the unit's electrical system is safe and operating properly
- Gas Leak Checks – Check all flare nut connections and confirm that the system is not leaking
- Confirm that gas and liquid (high and low pressure) valves are fully open

Test Run Instructions

You should perform the Test Run for at least 30 minutes.

1. Connect power to the unit.
2. Press the ON/OFF button on the remote controller to turn it on.
3. Press the MODE button to scroll through the following functions, one at a time:
 - COOL – Select lowest possible temperature
 - HEAT – Select highest possible temperature
4. Let each function run for 5 minutes, and perform the following checks:

List of Checks to Perform	PASS/FAIL	
No electrical leakage		
Unit is properly grounded		
All electrical terminals properly covered		
Indoor and outdoor units are solidly installed		
All pipe connection points do not leak	Outdoor (2):	Indoor (2):
Water drains properly from drain hose		
All piping is properly insulated		
Unit performs COOL function properly		
Unit performs HEAT function properly		
Indoor unit louvers rotate properly		
Indoor unit responds to remote controller		

DOUBLE-CHECK PIPE CONNECTIONS

During operation, the pressure of the refrigerant circuit will increase. This may reveal leaks that were not present during your initial leak check. Take time during the Test Run to double-check that all refrigerant pipe connection points do not have leaks. Refer to Gas Leak Check section for instructions.

5. After the Test Run is successfully complete, and you confirm that all checks points in List of Checks to Perform have PASSED, do the following:
 - a. Using remote control, return unit to normal operating temperature.
 - b. Using insulation tape, wrap the indoor refrigerant pipe connections that you left uncovered during the indoor unit installation process.

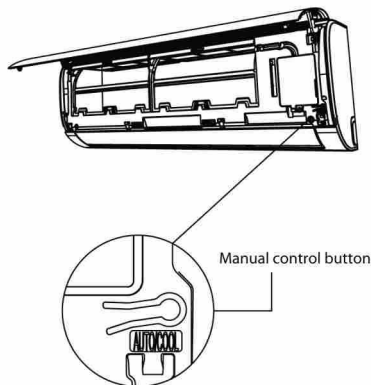


Fig. 8.1

IF AMBIENT TEMPERATURE IS BELOW 17°C (63°F)

You can't use the remote controller to turn on the COOL function when the ambient temperature is below 17°C. In this instance, you can use the MANUAL CONTROL button to test the COOL function.

1. Lift the front panel of the indoor unit, and raise it until it clicks in place.
2. The MANUAL CONTROL button is located on the right-hand side of the unit. Press it 2 times to select the COOL function. See Fig.8.1
3. Perform Test Run as normal.

ELECTRICAL WORK

- When disconnecting wires from a photovoltaic module that is exposed to sunlight, an electric arc may result. Such arcs may cause burns, combustion and may otherwise create problems. Therefore, be extremely careful!
- Photovoltaic solar modules convert light energy to direct-current electrical energy. They are designed for outdoor use. Modules may be ground mounted, mounted on rooftops, vehicles, or boats. Proper design of support structures is the responsibility of the system designer and installer. Proper use of mounting holes is suggested in a following paragraph.
- Do not attempt to disassemble the module, and do not remove any attached nameplates or components.



Fig.9.1

- Do not apply paint or adhesive to module top surface.
- Do not use mirrors or other magnifiers to artificially concentrate sunlight on the module.



Fig.9.2

- When installing the system, abide with all local, regional and national statutory regulations.
- Obtain a building permit where necessary. Abide with any local and national regulations when mounting on vehicles or boats.

Safety precaution for installing a solar photovoltaic system

- When installing the solar modules or repairing the air conditioner, ensure the circuit breaker on the solar panel of the outdoor unit is in the "OFF" state(push the switch to "OFF" position). During normal operation, the circuit breaker should be in the "ON" state(push the switch to "ON" position).

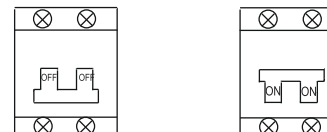


Fig.9.3

ELECTRICAL WORK

- Solar modules produce electrical energy when light strikes on their front surface. If the modules are connected in series, the total voltage is equal to the sum of the individual module voltages. (If the modules are connected in series, the total voltage can not over DC300V). Please do not use modules of different configurations in the same system.

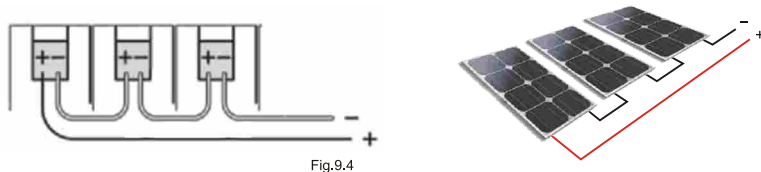


Fig.9.4

- Keep children well away from the system while transporting and installing mechanical and electrical components.



Fig.9.5

- Completely cover the module with an opaque material during installation to keep electricity from being generated. Do not touch the components or the end of live wires. However, if appropriate protections has been taken during the operation according to the local safety regulations, the above requirement is unnecessary.



Fig.9.6

- Do not wear metallic rings, watchbands, ear, nose, lip rings or other metallic devices while installing or troubleshooting photovoltaic systems.
- Use only insulated tools that are approved for working on electrical installations.



Fig.9.7

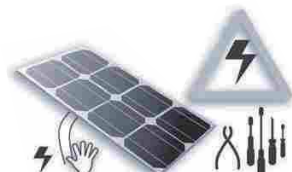


Fig.9.8

ELECTRICAL WORK

- When performing installation in dry conditions, please ensure the tools used in the dry.



Fig.9.9

- Abide with the safety regulations for all other components used in the system, including wiring and cables, connectors, charging regulators, inverters, storage batteries and rechargeable batteries, etc.
- Use only equipment, connectors, wiring and support frames suitable for use in a solar electric systems. Always use the same type of module within a particular photovoltaic system.
- The module frame must be properly grounded. The grounding wire must be properly fastened to the module frame to assure good electrical contact. Use the recommended type, or an equivalent, connector for this wire.

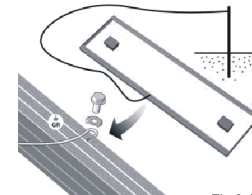


Fig.9.10

- Under normal outdoor conditions the module will produce current and voltages that are different than those listed in the data sheet. Data sheet values are values expected at standard test conditions. Accordingly, during system design, values of short-circuit current (Isc) and open-circuit voltage (Voc) marked on UL series modules should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor ampacity, fuse size and size of controls connected to the module or system output.
- The hole in the back of the module frame is used to drain the water, ensure not to be blocked.

Mechanical installation

1. Selecting installation place

Select a suitable place for installation of the module.
time of the day.

- The module should not be shaded at any
- The module should be facing due south in northern latitudes and due north in southern latitudes for best power production.
- For detailed information on the best elevation tilt angle for the installation, please consult with the solar photovoltaic system supplier.
- Do not use module near the place where the flammable gas may be generated or collected.



Fig.9.11

2. Selecting the proper support frame

- Always observe the instructions and safety precautions included with the support frame to be used with the module.
- Never attempt to drill holes in the glass surface of the module, it will void the warranty.
- Do not drill additional mounting holes in the frame of the module, it will void the warranty.

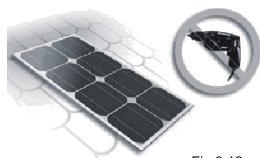


Fig.9.12

- Modules must be securely attached to the mounting structure using four mounting points for normal installation. If additional wind or snowloads are considered for the installation, additional mounting points are also used.
- The support frame must be made of durable, corrosion-resistant and UV-resistant material.
- The heat expansion and cold contraction of the support frame should have no affection to its usage and performance.

3. Ground mount

- Select the height of the mounting system to prevent the lowest edge of the module from being covered by snow for a long time in winter in areas that experience heavy snowfalls. In addition, assure the lowest portion of the module is placed high enough so that it is not shaded by plants or trees or damaged by sand and stone driven by wind.



Fig.9.13

4. Roof mount

- When installing a module on a roof or building, ensure that it is securely fastened and cannot fall as a result of wind or snow loads.



Fig.9.14

- Provide adequate ventilation under a module for cooling (5cm minimum air space between module and mounting surface).



Fig.9.15

- When installing module on a roof, ensure that the roof construction is suitable. In addition, any roof penetration required to mount the module must properly sealed to prevent leaks. In some cases, a special support frame may be necessary.
- The roof installation of solar modules may affect the fireproofing of the house construction, so it is necessary to use an earth ground fault circuit breaker. Any improper installation may cause accidental injuries.

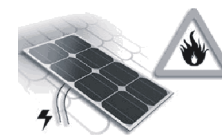


Fig.9.16

- When installing the module on a roof or building, do so in calm winds. Installing a module during strong winds may cause accidents.

5. Pole mount

- When installing a module on a pole, choose a pole and module mounting structure that will withstand anticipated winds for the area. The pole must have a solid foundation.

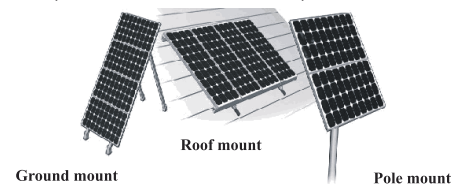


Fig.9.17

ELECTRICAL WORK

6. General installation

- Module mounting must use the pre-drilled mounting holes in the frame.
- The most common mounting is achieved by mounting the module using the four symmetry points closed to the inner side on the module frame.
- If excessive wind or snow loads are expected, all eight mounting holes must be used.
- If you want to install the module without using the pre-drilled mounting holes in the frame, please consult with the supplier.
- Do not install in the rainy weather, it may cause insulation failure due to moisture, and there is a risk of electric shock.



Fig.9.18

- Do not attempt to lift the module by grasping the module's junction box while moving.

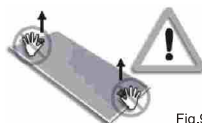


Fig.9.19

- Do not stand or step on the module.



Fig.9.20

- Do not throw the module or drop any thing on the module.



Fig.9.21

To avoid glass breakage, do not place any heavy objects on the module.
Do not set the module down hard on any surface.
Inappropriate transport and installation may break the glass of the module.

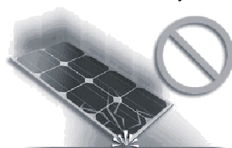


Fig.9.22

ELECTRICAL WORK

- Between the series connected modules and air conditioner, please install an individual circuit breaker, it is to protect the air conditioner when the PV voltage and current big fluctuates. For air conditioner 9000btu and 12000btu, please choose the 40A circuit breaker, for 18000btu and 24000btu, please choose 63A circuit breaker, for 36000btu and above, please choose 100A circuit breaker.

9000-12000 BTU 40A, 18000-24000BTU 63A, 36000BTU and above 100A

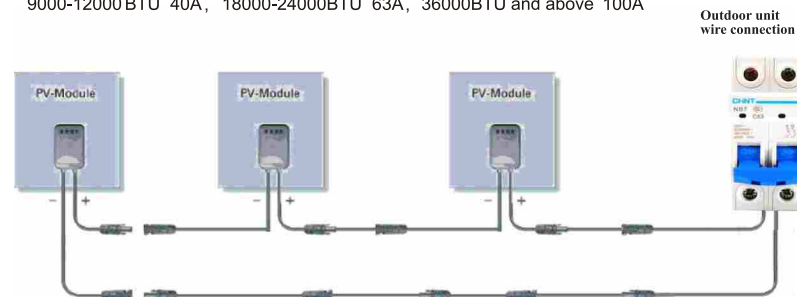


Fig.9.23

- If you want to connect the photovoltaic modules by using the cables purchased by yourself, the following requirements must be complied:
 - Cable installation should comply with all local regional and national regulations.
 - In some countries, an individual circuit breaker used between the solar panel and air conditioner must be installed. So select an circuit breaker in accordance with local regulations, and the rated current is more than 30A.
 - Cable installation need to distinguish the positive pole and negative pole, reverse connection may cause permanent damage to the air conditioner. Use qualified photovoltaic cables only.
 - The cable can resist UV rays and climate of rapid change.
 - The rated voltage of the cable is more than 600V.
 - The cross section area of the cable depends on the maximum short circuit current and the length of wire.
 - Be very careful when install the cable at extremely low temperature.
 - Recommended to use the cable of cross section area of 4mm or greater, and the wire should be as short as possible to reduce the energy consumption.
- When the modules are connected in parallel, cables must be securely fastened on the support frame which is used for mounting the modules to avoid wire slack.

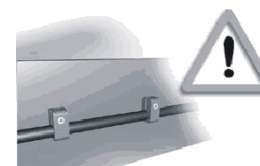


Fig.9.24

ELECTRICAL WORK

- Do not place the cable on the sharp edge of the things.



Fig.9.25

- Attention to the minimum bending radius of the wire.

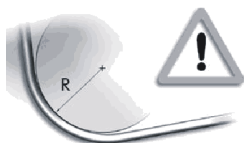


Fig.9.26

- Do not unplug the connector when the power is on.

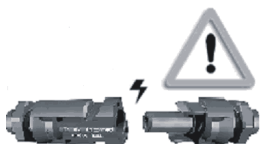


Fig.9.27

- The protecting sheath must be used on the cable if there is a possible for the animals or childrens easy to touch it.

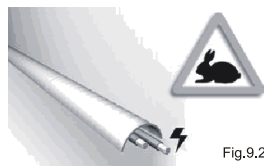


Fig.9.28

- The manufacturer of the solar photovoltaic system can supply cables suitable for use in a solar electric systems.

ELECTRICAL WORK

If you want to use the connector purchased by yourself, the following requirements must be complied:

- Use only connector special designed for solar electric systems.
- Use the recommended or specified tools when install the connectors.
- Do not unplug the connectors when the power is on.
- The connector suitable for the solar photovoltaic system can obtain from the manufacturer.

Electrical connection:

- Completely cover the module with an opaque material during mechanical installation and electrical installation.
- Protect the cables from being damaged.
- Ground mounting must abide with all local regulations.
- Storage battery can not be connected with the solar photovoltaic system.

Grounding:

- The module frame must be properly grounded. The grounding wire must be properly fastened to the module frame to assure good electrical contact.
- If the support frame is made of metal, the surface of the frame must be electroplated and have excellent conductivity. The grounding wire must be properly fastened to the support frame.
- There are two pre-drilled mounting holes in the frame, used to install the grounding cable. Each module should connect with the grounding cable.
- We recommend the closed lug when grounding. First insert the ground cable into the jack of the closed lug and weld, then insert the stainless steel bolt (M3) into the tab of the lug, the grounding hole on the frame and finally a nut to secure the entire assembly. The springwasher is required in order to prevent screw loosening and cause improper grounding.
- The grounding resistance must be less than 10 ohms.

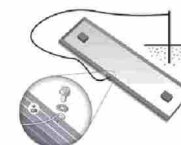


Fig.56

Fig.9.29

Junction box installation:

- All modules come with a permanently attached junction box and provide with fitted cables.
- The junction box do not need the customer to install, please contact the manufacturer if there is any problem with the module.

Disclaimer of liability

Because the use of this manual and the conditions or methods of installation, operation, use and maintenance of photovoltaic(PV) product are beyond our control, we do not take any responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with such installation, operation, use or maintenance. No responsibility is assumed by us for any infringement of patents or other rights of third parties, which may result by using the PV product. No license is granted by modification or otherwise under any patent or patent rights.

The information in this manual is based on company's knowledge and experience and is believed to be reliable; but such information including product specification (without limitations) and suggestions do not constitute a warranty, expressed or implied. We reserves the right to change the manual, the PV product, the specifications, or product data sheets without prior notice.

⚠ Warning

- 1: The air conditioner must be connected to AC power. Air conditioner works if no DC power supply, but does not work properly if no AC power supply.
- 2: Connect air conditioner DC power positive pole “+” to solar panel positive pole “+”, connect DC power negative pole “-” to solar panel negative pole “-”, wrong connection is not allowed, it causes air conditioner does not work properly and damage the control system.
- 3: The access voltage of DC power supply is less than 300VDC, exceed 50VDC;
- 4: Indoor and outdoor machine wiring is required to connect one to one, Wrong connection is not allowed, the air conditioner control circuit will be burned out and could not be repaired.
- 5: Once indoor and outdoor connecting pipe is connected, the system must be pumped vacuum, otherwise it will affect the performance of the air conditioner.

Technical Data Parameters

Model			KFR-26GW/BPACDC-TWA1	KFR-35GW/BPACDC-TWA1	KFR-50GW/BPACDC-TWA1	KFR-70GW/BPACDC-TWA1
Power supply	AC	Ph-V-Hz	1Ph/220-240V/50-60HZ			
	DC	V	50-350V			
Cooling	Rated Capacity	W	2600(1000-3500)	3500(1000-4100)	5275(1200-6000)	7000(2500-8200)
		Btu/h	9000(3400-12000)	12000(3400-14000)	18000 (4100-20400)	24000 (8500-28000)
	Power Input	W	630(200-980)	860(190-1250)	1550(185-2000)	2050(450-3300)
Heating	Rated Capacity	W	3800(800-4000)	4300(1000-4500)	6200(1200-6800)	7800(2000-9000)
		Btu/h	13000(2700-13400)	14600(3400-15300)	21000 (4100-23000)	26600 (10200-30800)
	Power Input	W	1030(160-1300)	1080(150-1700)	1650(220-2500)	2350(390-3500)
Indoor air flow (Turbo/HI/MI/Lo)		m3/h	950/900/750/600	1050/1000/860/750	1060 /1030/ 860/750	1260 /1200/900/800
Indoor noise level (Turbo/HI/MI/Lo)		dB(A)	41/39/35/27	42.5/42/37/29	46/46/42/35	50/50/45/39
Indoor unit	Dimension(W*D*H)	mm	823*300*244	823*300*244	1150*300*260	1150*300*260
	Packing (W*D*H)	mm	890*360*300	890*360*300	1230*360*320	1230*360*320
	Net/Gross weight	Kg	10.8/13	10.8/13	14/18	15/18.5
Outdoor unit	Dimension(W*D*H)	mm	800*325*550	800*325*550	800*325*550	912*375*712
	Packing (W*D*H)	mm	900*400*610	900*400*610	900*400*610	1040*465*768
	Net/Gross weight	Kg	30/34	32.5/36.5	35.5/40	51/61
Refrigerant type			R410A	R410A	R410A	R410A
Operation temperature		℃	16-32			
Ambient temp (cooling/heating)		℃	16-55/-20-31			
Application area		m2	8-15	15-20	20-30	32-42
Loading capacity(20GP/40HQ)		set	80/210	80/210	70/180	50/125

The design and specifications are subject to change without prior notice for product improvement.

Consult with the sales agency or manufacturer for details.