



## Photovoltaic DC/AC Split System Air Conditioner

### Installation Manual



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## Table of Revisions

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Revision Date	Reason for revision	Revision By
10 November	Initial writing	George Abernathy
14 December	Update ISC Specification	George Abernathy

## Model Applicability

This manual applies to the following models.

Table of Models			
Model	NOWA2-ACDCBLW-12K	NOWA1-ACDCBLW-18K	NOWA1-ACDCBLW-24K
Indoor unit	NOA2-ACDCBLW-12K	NOA1-ACDCBLW-18K	NOA1-ACDCBLW-24K
Outdoor unit	NOA3-ACDCBLW-12K	NOA3-ACDCBLW-18K	NOB2-ACDCBLW-24K

## Included in the set

Quantity	Name
1	Indoor unit
1	Indoor unit mounting plate
1	Remote
2	Remote's AAA batteries
1	Three-meter connecting cord
1	Outdoor unit
1	Three-meter connecting pipe
1	Three-meter connecting wire
1	Weather protection wrapping tape
1	1.5-meter drainpipe with a 15mm diameter
1	Wall sleeve
1	Sealant putty
1	User manual
1	Installation manual
1	Outdoor unit MC4 connector set

# Description of Equipment

The equipment comprises an indoor unit and an outdoor unit air conditioning system designed to provide heating or cooling as needed.

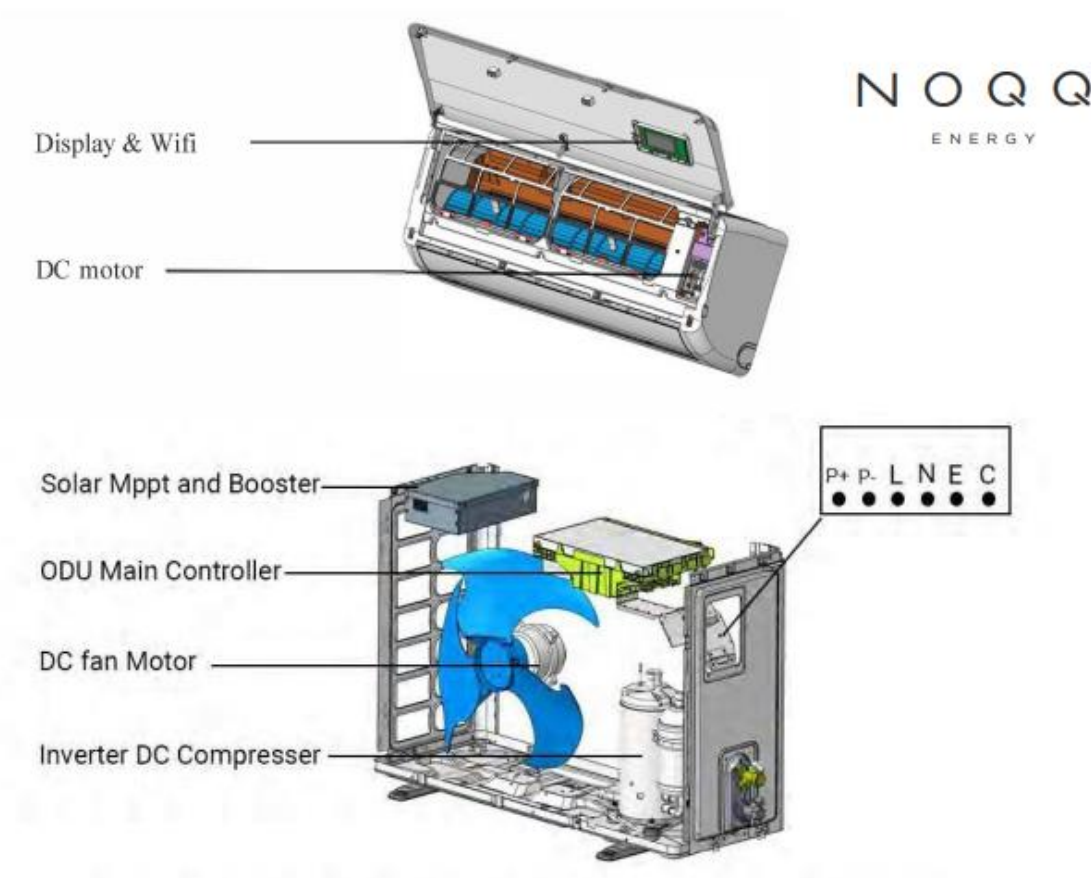
This system offers multiple power options:

- Solely powered by DC solar energy, enabling operation solely on solar power.
- Utilizing both DC solar energy and a minimal amount of AC 240 Volt power.
- Operating solely on AC 240 Volt power, suitable for nighttime use.

Installation follows the standard split system air conditioner setup, with the inclusion of Solar PV modules to provide the necessary DC input.

Control of the system is managed through an optical remote control or app.

This system is referred to as a Solar ACDC Hybrid Inverter Solar Air Conditioner.



# Reference to Standards

The listed standards may not encompass all applicable regulations. Please consult local and national standards for further relevance, and ensure to verify the latest revisions and clauses.

Standards
AS/NZS 1319
AS/NZS 1571
AS/ NZS 3000
As/ NZS 3500
AS/NZS 4777
AS/NZS 5033
AS/NZS 5149
IEC 62109
National construction code volume 3 plumbing code of Australia.
Australia and New Zealand Refrigerant Handling code of practice part 2.
US Electrical code NEC 2005 Article 690.5 Ground fault protection.
EN 60335-2-40:2003
A11:2004
A12:2005
A1:2006
A2:2009
A13:2012
EN 60335-1:2012
A11:2014
A13:2017
A1:2019
A14:2019
A2:2019
A15:2021
EN 62233:2008

## Disclaimer

This equipment involves the handling and installation of high-pressure gases and poses potential hazards due to AC and DC voltage levels.

Installation of this equipment is permissible only by fully qualified and licensed personnel. The use of Personal Protective Equipment (PPE) is mandatory during the installation process, and strict adherence to all required PPE and safety precautions is essential.

It is important to note that neither the manufacturer nor the resellers of this equipment assume responsibility for any failure to adequately protect personnel, as any recommendations provided are solely for advisory purposes.

The references to standards in this manual serve as advisory guidelines, and failure to adhere to all relevant standards may result in the voiding of the equipment warranty. All electrical work must be carried out by a licensed technician in compliance with local regulations and the instructions outlined in this manual.

Please be aware that the illustrations in this manual are for explanatory purposes, and the actual appearance of your units may slightly differ.

## Symbols used



General Warnings beware of a hazard and take preventative measures



Freezing and frost bite, beware escaping refrigerant and take preventative measures



High voltage or Electric Shock. Make certain that all electrical circuits are not energized



Explosion risk, High pressure gasses used in testing and operation



High pressure gas bottle



Caution risk of electric shock

## Safety Precautions

### Warning

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

Installation must be performed by an authorized dealer or specialist. Defective installation can cause water leakage, electrical shock, or fire.

Before installing, modifying, or servicing this appliance, the main electrical disconnect switch must be in the OFF position. There may be more than one disconnection switch. Lock out and tag with a suitable warning label.

Never supply power to the unit unless all wiring and tubing are completed, re-connected and checked.

This system has hazardous electrical voltages. Ensure that all wiring is compliant with this manual and local regulations.

The unit and the solar system must be earthed in accordance with local electrical and building codes.

Compatible MC 4 type connectors must be used.

Do not allow children to play with the air conditioner. Children must always be supervised around the unit.

Contact an authorized service technician for repair or maintenance of this unit.

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.

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 fall and cause serious injury and damage.

For all electrical work, follow all local and national wiring standards, regulations, and the Installation manual.

The unit must be powered by a dedicated circuit with a residual current and leakage device.

For all electrical work, use the specified cables. Connect cables properly and clamp them securely to prevent external forces from damaging the electrical connections. Improper electrical connections can overheat and cause fire and may also cause electric shock.

All wiring must be properly arranged to ensure that 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 strip to heat up, catch fire or cause electrical shock.

In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.

For units that have an auxiliary electric heater, do not install the unit within 1 meter 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 install this air conditioner in a wet location such as a bathroom or laundry room. Too much exposure to water can cause electrical components to short circuit.

This product must be properly earthed and installed with an earth leakage circuit breaker. Failure to do so may result in injury, electric shock, or death.

Install drainage piping in accordance with local and national regulations and meet the requirements of the National construction code.

This air-conditioning unit contains fluorinated gases. For specific information on the type of gas please refer to the label(s) on the outdoor unit.

De-commissioning and disposal of this unit must be performed by a certified technician, in accordance with the Refrigerant Handling code of practice.

When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.



## Indoor unit mounting instructions

Prior to installation:

Prior to indoor unit installation, verify that the model number on the product box matches that of the outdoor unit. Additionally, carefully select a suitable location for indoor unit installation using the guidelines provided below.

Appropriate installation locations should satisfy the following criteria:

- Adequate air circulation.
- Convenient drainage.
- Minimal noise emissions to avoid disturbing others.
- A stable and vibration-free environment.
- Sufficient structural strength to support the unit's weight.
- A minimum distance of at least one meter from all other electrical devices (e.g., TV, radio, computer).

Do not install the unit in the following locations:

- In close proximity to heat sources, steam, or combustible gas.
- Near flammable materials like curtains or clothing.
- Close to any obstructions that could impede air circulation.
- In the vicinity of doorways.
- In a position exposed to direct sunlight.

Important Consideration Regarding the Wall Opening:

If there is no pre-installed refrigerant piping:

- When selecting a location, ensure that you provide sufficient space within the wall opening for the refrigerant piping, its insulation, the drainpipe, and signal wiring. By default, all piping should be positioned on the right side of the indoor unit (when facing the unit).



The indoor unit contains a pre-charge of inert gas. Take care when bending tubing and discharging this gas.



Select the location for the indoor unit. Check that the location is suitable for pipe penetration through the wall. Check that no wiring or piping will be affected by the pipe penetration location.

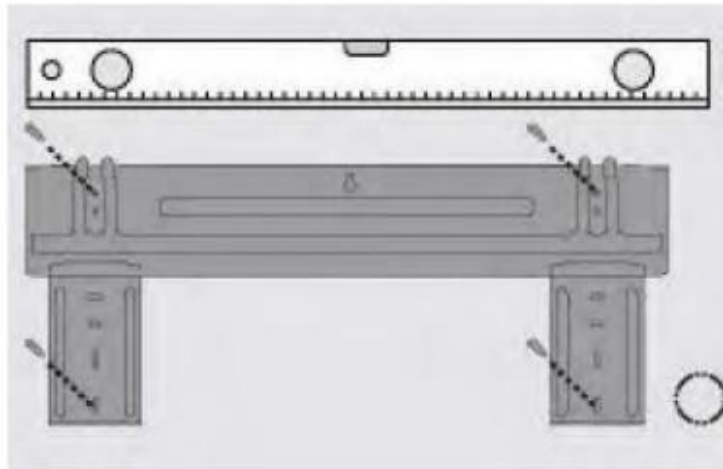
Use a stud finder to locate studs to prevent unnecessary damage to the wall. Copper pipe must be insulated independently.

Select a location that is not next to a heat source and that will allow sufficient airflow throughout the room. The indoor unit requires the following clearances

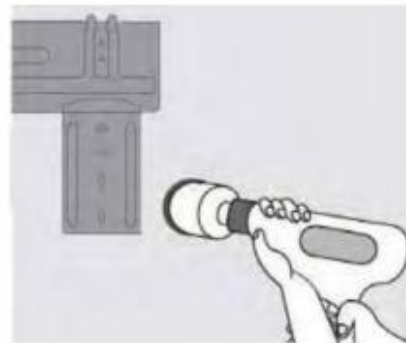
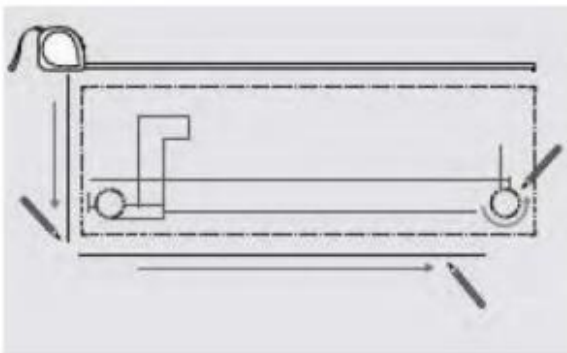
Indoor unit clearances	
Above	150 mm
Left Side	120 mm
Right side	120 mm
Below	230 mm

Mount the indoor unit mounting plate on a secure surface that is sufficiently dense to prevent unwanted noise and vibration.

Level the mounting plate and secure with appropriate anchors.



Measure and drill the pipe penetration hole.



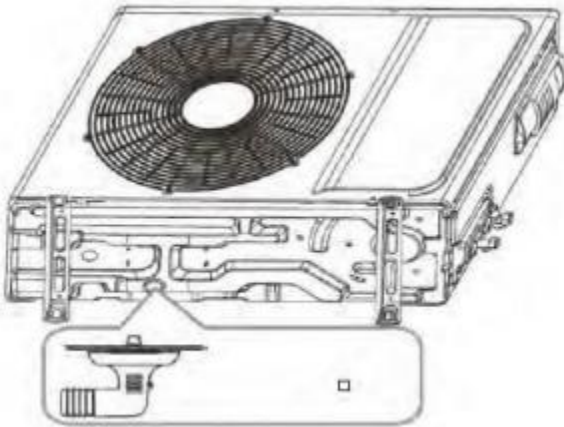
The indoor hole must be higher than the outdoor hole so that condensate water will drain.



## Outdoor unit mounting instructions

Install the condensate drain as necessary. When the system operates in heating mode, the outdoor unit may produce condensation. Please refer to local regulations for proper drainage connections.

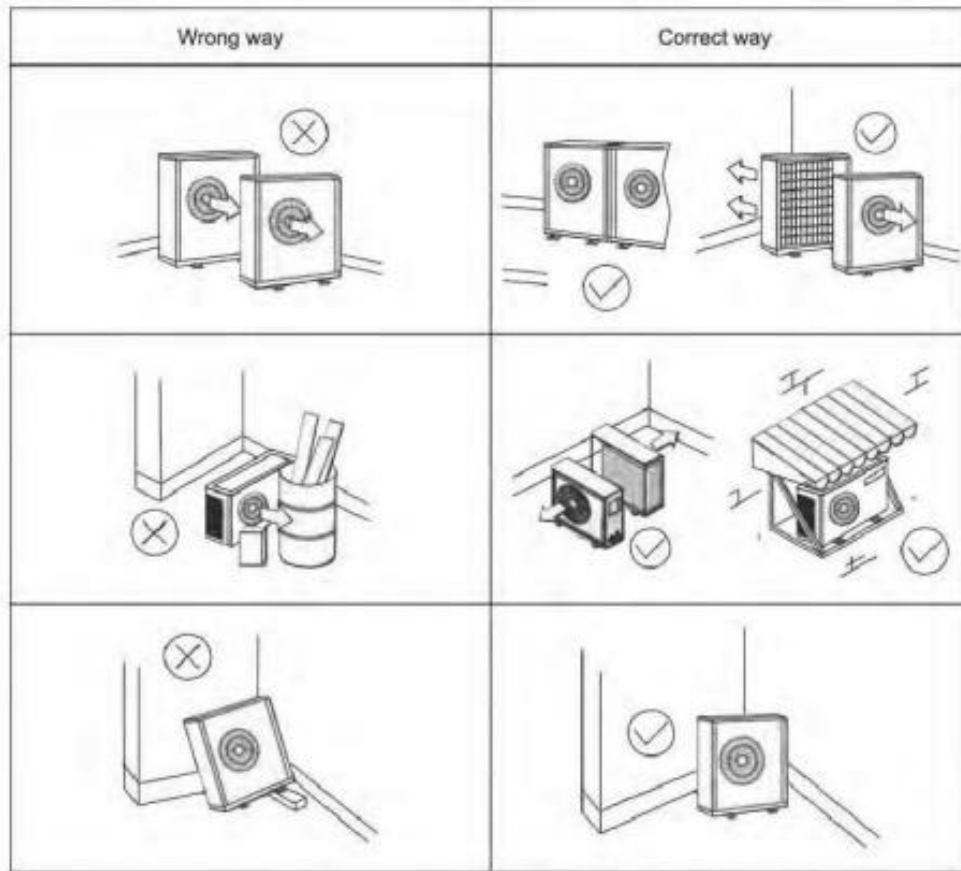
Securely mount the unit on an approved wall mounting bracket or a stable, waterproof surface.



## Outdoor unit required clearances

Outdoor unit Clearances	
Above	500 mm
Left	300 mm
Right	60 mm
Below	200 mm
Behind	300 mm

Select a location that allows for sufficient air flow, that is free of obstructions.



## Refrigerant pipe Specifications

The system is designed to operate within a maximum ambient temperature of 58 degrees Celsius and can withstand a maximum pressure of 3541 Kpa / 514 Psig.

Piping specifications must adhere to AS/NZS 1571 standards, with a minimum wall thickness of 0.81 mm for tubing ranging from 6.35mm / 1/4 inch to 12.7mm / 1/2 inch, and 0.91 mm for 15.88 mm / 5/8-inch tubing.

## Refrigerant fill capacity

<b>Refrigerant fill capacity charge volume and pressure</b>				
Unit		NOWA2- ACDCBLW-12K	NOWA1- ACDCBLW-18K	NOWA1- ACDCBLW-24K
Indoor unit		NOA2- ACDCBLW-12K	NOA1- ACDCBLW-18K	NOA1- ACDCBLW-24K
Outdoor unit		NOA3- ACDCBLW-12K	NOA3- ACDCBLW-18K	NOB2- ACDCBLW-24K
Refrigerant type		<b>R32</b>	<b>R32</b>	<b>R32</b>
Charge Volume	<b>g</b>	<b>830</b>	<b>950</b>	<b>1150</b>
Max Design pressure Discharge side	<b>Kpa</b>	<b>4300</b>	<b>4300</b>	<b>4300</b>
Max design pressure Suction side	<b>Kpa</b>	<b>1500</b>	<b>1500</b>	<b>1500</b>

## Maximum Length of piping

<b>Maximum pipe Length, Pipe sizes, Maximum head</b>				
Unit		NOWA2- ACDCBLW-12K	NOWA1- ACDCBLW-18K	NOWA1- ACDCBLW-24K
Indoor unit		NOA2- ACDCBLW-12K	NOA1- ACDCBLW-18K	NOA1- ACDCBLW-24K
Outdoor unit		NOA3- ACDCBLW-12K	NOA3- ACDCBLW-18K	NOB2- ACDCBLW-24K
Max pipe length	<b>M</b>	<b>15</b>	<b>20</b>	<b>25</b>
Pipe sizes	<b>inch</b>	<b>1<sub>#4</sub> &amp; 3<sub>#8</sub></b>	<b>1<sub>#4</sub> &amp; 1<sub>#2</sub></b>	<b>1<sub>#4</sub> &amp; 1<sub>#2</sub></b>
Maximum Head (vertical)		<b>8</b>	<b>10</b>	<b>10</b>

## Addition of refrigerant per pipe length

Pipe length more than 5 meters requires the addition of refrigerant.

Refrigerant to be added if pipe length is greater than 5 meters				
Unit		NOWA2-ACDCBLW-12K	NOWA1-ACDCBLW-18K	NOWA1-ACDCBLW-24K
Indoor unit		NOA2-ACDCBLW-12K	NOA1-ACDCBLW-18K	NOA1-ACDCBLW-24K
Outdoor unit		NOA3-ACDCBLW-12K	NOA3-ACDCBLW-18K	NOB2-ACDCBLW-24K
Grams per meter	<b>g</b>	<b>15</b>	<b>20</b>	<b>20</b>

## Connecting the Refrigerant piping



The indoor unit contains an inert gas. Use caution when loosening the flared fittings to vent the gas.

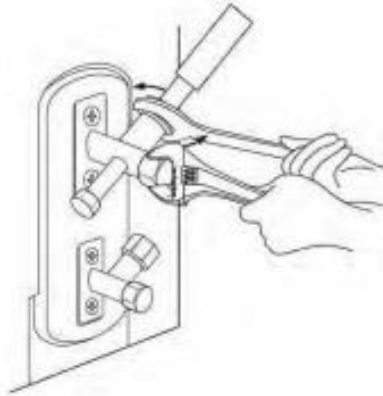
Trim the piping to the desired length, ensuring that no foreign materials enter the pipes. Slide the flare nuts onto the piping, and use a refrigerant piping flaring tool to create flares on the piping.

Examine the flares carefully to ensure they are uniform and free of cracks or rough edges.

Flaring Torque specifications				
Pipe size	Torque	Flared width (A)	Flaring shape	Apply refrigerant oil or sealant
6mm / ¼ inch	15-19 Nm	8.3 / 8.7 mm		
9 mm / 3/8 inch	35-40 Nm	12.0 / 12.4 mm		
12 mm / ½ inch	50-60 Nm	15.4 / 15.8 mm		
15 mm / 5/8 inch	62-76 Nm	18.6 / 19.0 mm		
19 mm / ¾ inch	90-120 Nm	22.9 / 23.3 mm		

Remove the protective caps from the valves.

Align the flared ends of the pipes with the valves and hand-tighten them. To support the valve, use a wrench (as shown in the illustration below). While holding the valve body steady with the wrench, use a torque wrench to securely tighten the nuts. Repeat this process for the indoor unit connections.



## Pressure Testing the System



Fluorocarbons refrigerant must not be put into a system for the purposes of pressure leak testing. Australian refrigerant handling code of practice 5.29



High pressure nitrogen gas bottle handling. Wear appropriate PPE including eye, ear, protection, leather gloves.

### Precautions:



Air and foreign matter in the refrigerant circuit can cause abnormal rises in pressure and could cause damage to the air conditioner. Care must be taken to ensure that the refrigerant lines are free of foreign matter.

Use Dry nitrogen for leak testing.

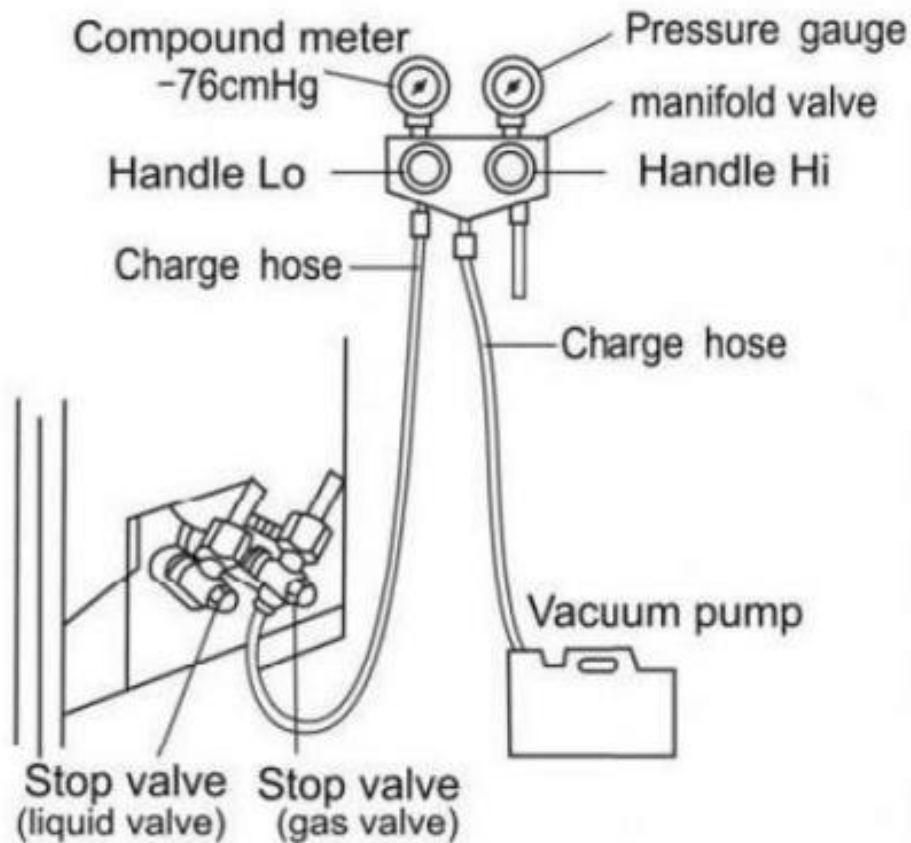
Pressurize the system to 3500 KPA/ 508 Psig and allow it to stand for one hour. Monitor for any pressure fluctuations during this time. It is essential to observe the system continuously for one hour to ensure that no pressure drop occurs, taking into account temperature variations throughout the system.

This procedure is in accordance with the Australian Refrigerant Handling Code of Practice 5.33.

## Evacuate the System

Attach the low-pressure hose from the gauge set to the Low-pressure connection on the outdoor unit. Proceed to vacuum the system down to 500 Microns of mercury. Allow the system to stand for one hour to detect any potential leakage. A slight increase in pressure may suggest the presence of water boiling off within the system, while a substantial rise above 600 microns may indicate possible piping leakage.

This procedure adheres to the guidelines outlined in the Australia and New Zealand Refrigerant Handling Code of Practice 6.4.



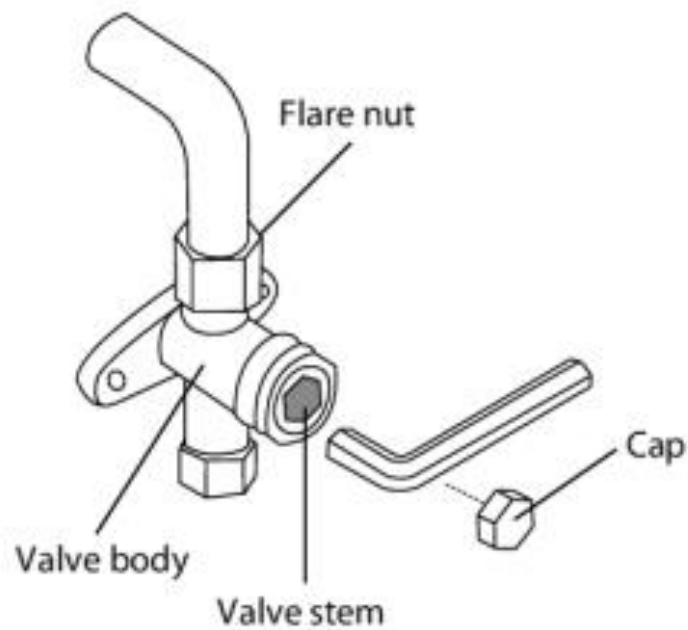


## Releasing the refrigerant into the system

Ensure that the low-pressure hose is properly connected to the low-pressure side of the outdoor unit. Confirm that the system has been evacuated to 500 microns. Remove the Vacuum micron gauge to avoid potential damage.

Now, proceed to open the low-pressure and high-pressure valves by turning them counterclockwise until they are fully seated.

The low-pressure gauge should display a reading of approximately 150 PSI.



## Electrical Connections

<b>Maximum input power AC Circuit Breaker size DC input parameters</b>				
Unit		NOWA2- ACDCBLW-12K	NOWA1- ACDCBLW-18K	NOWA1- ACDCBLW-24K
Indoor unit		NOA2- ACDCBLW-12K	NOA1- ACDCBLW-18K	NOA1- ACDCBLW-24K
Outdoor unit		NOA3- ACDCBLW-12K	NOA3- ACDCBLW-18K	NOB2- ACDCBLW-24K
Power AC	Hz	1Ph 208V- 240V/50-60HZ	1Ph 208V- 240V/50-60HZ	1Ph 208V- 240V/50-60HZ
Max input power	W	1700	2500	3500
Circuit breaker RCBO Type A or B	A	16	16	20
Power DC		VDC	80-380	80-380
		ISC	<= 16 Adc	<= 18 Adc
DC MAX VOLTAGE	Voc	380	380	380
Max DC input current draw	A	12	12	12
Max number of arrays	#	2	2	2



Before performing electrical Work, Read these cautions.

Please adhere to the following electrical guidelines:

- All electrical work must comply with local and national electrical codes and regulations.
- All electrical tasks must be executed by a licensed electrician.
- Electrical connections must align with the Electrical Connection Diagram.
- In the event of a significant safety concern regarding the power supply, immediately halt work. Explain the issue to the client and refrain from unit installation until the safety concern is properly resolved.
- Ensure that the power voltage falls within the range of 90-100% of the rated voltage. Inadequate power supply can lead to malfunctions, electrical shocks, or fires.

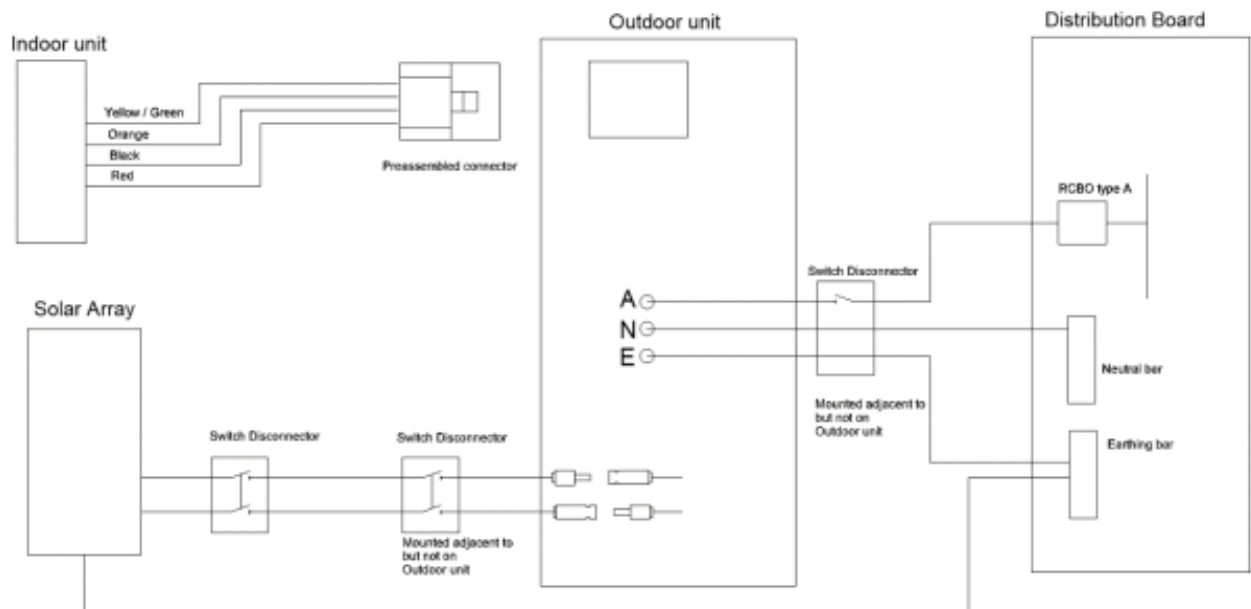
- Connect the unit exclusively to an individual branch circuit. Avoid connecting other appliances to the same outlet.
- Properly ground the units.
- Verify all wiring connections for tightness. Loose wiring can lead to failures, product malfunctions, and potential fires.
- Ensure that wires do not come into contact with refrigerant tubing, the compressor, or any moving parts within the unit.
- When the unit includes an auxiliary electric heater, maintain a minimum one-meter distance from combustible materials.



Before performing any electrical or wiring work, turn off the main power to the system.

Follow these steps for electrical connections:

- Link the cable from the indoor unit to the outdoor unit using the four-conductor cable, with a prefabricated plug on the outdoor end.
- Connect a 230 Volt AC power supply to a dedicated circuit originating from the distribution board. Ensure that the circuit breaker includes Residual Current Device (RCD) protection as per AS/NZS 3000 clause 2.6.3.2.3.3.
- Comply with AS/NZS 3000 clause 4.19, which mandates the installation of an isolation switch adjacent to the outdoor unit to isolate AC power for both the indoor and outdoor units.
- Connect the solar DC power to the provided DC connections via a solar isolator mounted adjacent to the outdoor unit.



## Installation of Solar Modules

Solar modules must be installed in strict compliance with all relevant codes, including but not limited to local building codes.

This installation should be carried out by a licensed and competent professional.

## Solar Array Maximum Voltage

The calculation of the Maximum Voltage Open Circuit (VOC) is crucial, accounting for voltage fluctuations due to low temperatures. Failing to perform this calculation may result in equipment damage and void the warranty.

The maximum VOC for this equipment is specified as 380 Vdc.

For instance, if the recorded temperature falls as low as 0 to 4 degrees Celsius, and the VOC of a module is 44.2 Vdc, one should multiply 44.2 by 1.1, resulting in 4.42 volts.

Adding 44.2 and 4.42 together gives a low-temperature VOC of 48.62 Vdc.

Dividing the maximum VOC input of 380 Vdc by 48.62 Vdc results in a maximum number of solar modules of 7.81. Rounding down, this means a maximum of 7 modules at that low temperature.

## VOLTAGE CORRECTION FACTORS FOR CRYSTALLINE AND MULTI-CRYSTALLINE SILICON PV MODULES

Lowest expected operating temperature °C	Correction factor
24 to 20	1.02
19 to 15	1.04
14 to 10	1.06
9 to 5	1.08
4 to 0	1.10
-1 to -5	1.12
-6 to -10	1.14
-11 to -15	1.16
-16 to -20	1.18
-21 to -25	1.20
-26 to -30	1.21
-31 to -35	1.23
-36 to -40	1.25

### Solar Arrays in Parallel

If you intend to utilize smaller solar panels in parallel arrays, it's important to note that the maximum allowable number of arrays is 2. Adding more parallel arrays beyond this limit may not enhance performance and could potentially lead to damage to either the arrays or the air conditioner.

### Galvanic considerations outdoor unit

The outdoor unit should be regarded as a non-galvanically isolated regulator. Therefore, the solar isolation switches must be appropriately rated to handle the full array voltage and current. If the outdoor unit is connected to the AC supply, it should be linked to the 230-volt AC distribution board through a type A or B residual current and overcurrent device.

## Solar Module installation

This manual provides essential information regarding the installation and safe handling of solar photovoltaic module(s). It is imperative that all instructions are thoroughly read and comprehended before initiating the installation process. If any queries arise, please do not hesitate to reach out to our sales department for additional clarification.

Installers must strictly adhere to all safety precautions detailed in this guide during the module installation. Furthermore, it is crucial to comply with local codes and regulations governing such installations.

This manual does not provide detailed information on specific structures and installation procedures. It is imperative to consult with a certified solar technician to ascertain the following:

The specifications of the solar photovoltaic system, including:

- Cable material
- Connecting components
- Bracket and support
- Supporting parts
- Switching and circuit protection

should be determined in consultation with an approved solar technician.



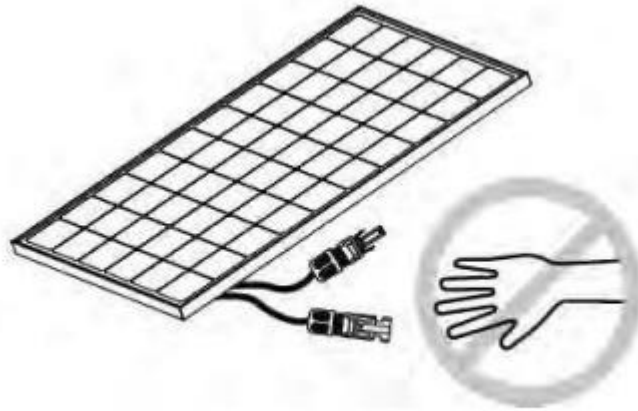
**Solar modules are large and require careful handling. Only a qualified technician should install Solar Modules. Solar arrays are current limited sources. Use appropriate protection measures when working on them. They contain hazardous DC voltages.**

The installation of Solar Modules should be exclusively carried out by qualified individuals who possess a deep understanding of both the mechanical and electrical requirements.

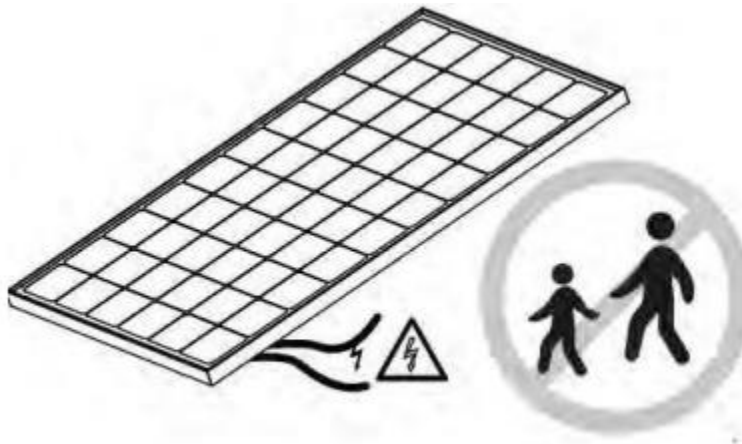
Each individual solar module generates a DC voltage exceeding 30V when exposed to sunlight. Contact with a DC voltage of 30V or higher can pose potential hazards. Therefore, it is imperative not to touch the contacts of electrical terminals.



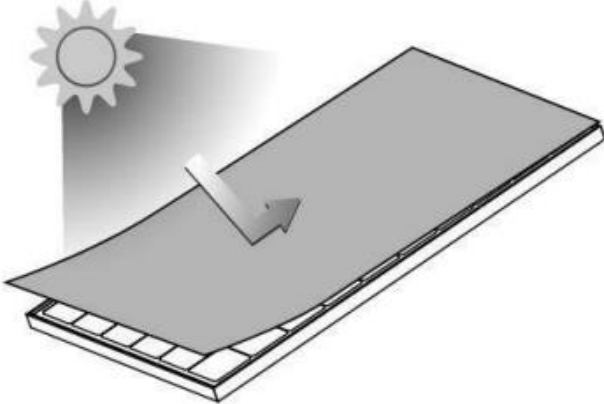
Do not touch the module contacts.



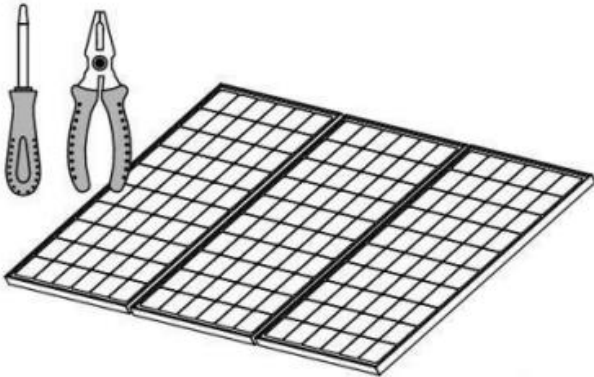
Keep children away from the system while transport and installing mechanical and electrical components.



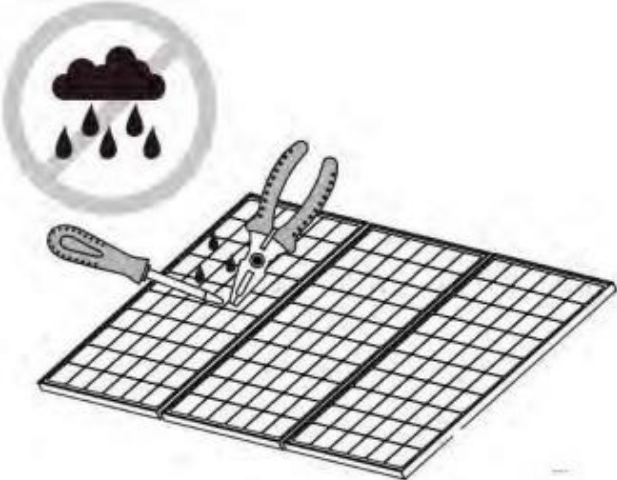
During installation, it is essential to completely cover the module with an opaque material to prevent electricity generation. Additionally, avoid touching the ends of live wires. Furthermore, it is crucial to refrain from wearing metallic rings, watchbands, ear, nose, lip rings, or any other metallic devices while installing or troubleshooting photovoltaic systems.



Use only insulated tools that are approved for electrical installations.

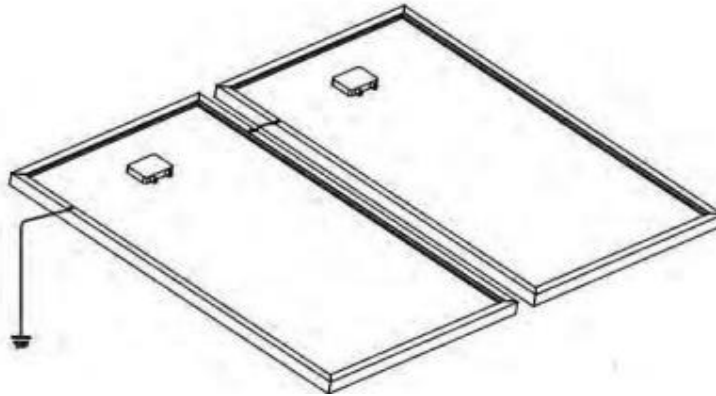


Do not work on solar modules in wet conditions.





The module frame must be properly earthed. Removal on any one module must not interrupt the earthing of the remaining modules.



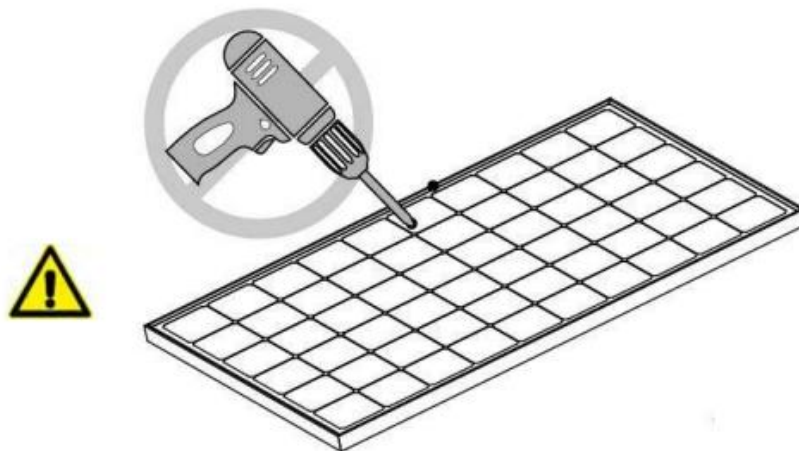
## Solar Array Mechanical installation

Selecting an installation location:

- Choose an appropriate location for the solar modules, ensuring they remain unshaded during the solar window period of the day.
- In southern latitudes, position the modules facing north for optimal power generation.
- It is advisable to seek guidance from an approved solar technician to determine the ideal orientation for the solar panels.

Selecting the appropriate support frame:

- Always adhere to the instructions and safety guidelines provided with the support frame intended for use with the modules.
- Never attempt to drill holes in the glass surface of the module, as this action will void the warranty.
- Avoid drilling additional mounting holes in the frame of the module, as it will also void the warranty.



- Modules should be firmly fastened to the mounting structure, typically using four mounting points for standard installations. If the installation is subject to additional wind or snow loads, it is advisable to incorporate additional mounting points for added stability.
- The support frame must be constructed from robust, corrosion-resistant, and UV-resistant materials to ensure long-term durability and performance.
- The support frame should be designed in a way that heat expansion and cold contraction do not negatively impact its functionality or performance over time.

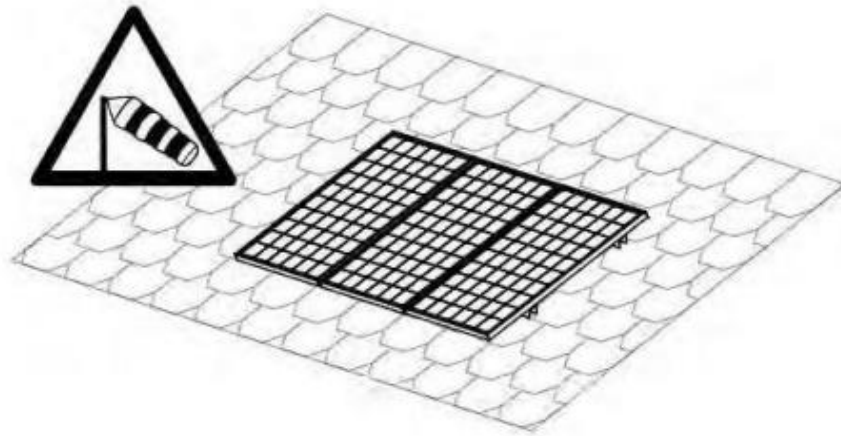
For ground mounting:

- When determining the height of the mounting system, it's crucial to prevent the lowest edge of the module from being covered by snow during heavy snowfall in winter.
- Additionally, ensure that the lowest portion of the module is positioned at a height that avoids shading from plants or trees and is shielded from the impact of sand and stones carried by the wind.

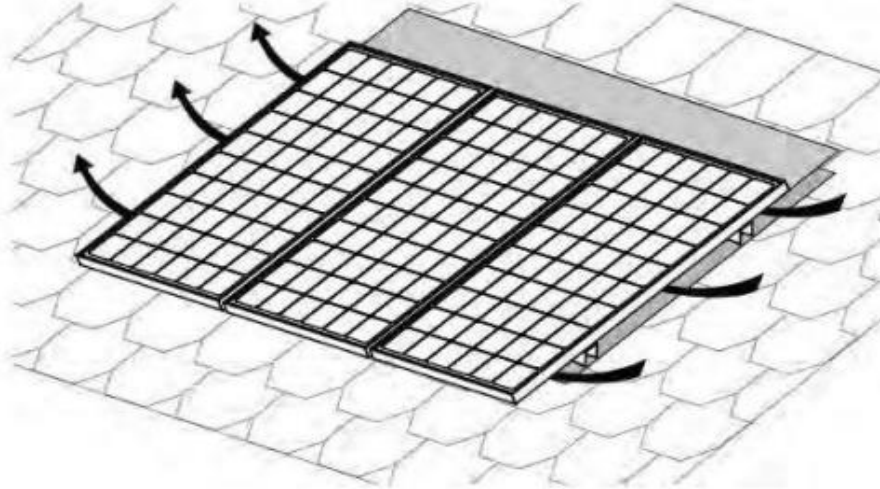


For roof mounting:

- Ensure that the modules are securely fastened to the roof structure to prevent them from dislodging due to wind or snow loads.
- When installing modules on a roof, confirm that the roof construction is appropriate for the additional weight and consider any necessary structural reinforcement.
- Any roof penetrations required for module mounting must be adequately sealed to prevent water leaks.
- Be aware that the roof installation of solar modules might impact the fireproofing of the house construction, and it may be necessary to incorporate an earth ground fault circuit breaker for safety.

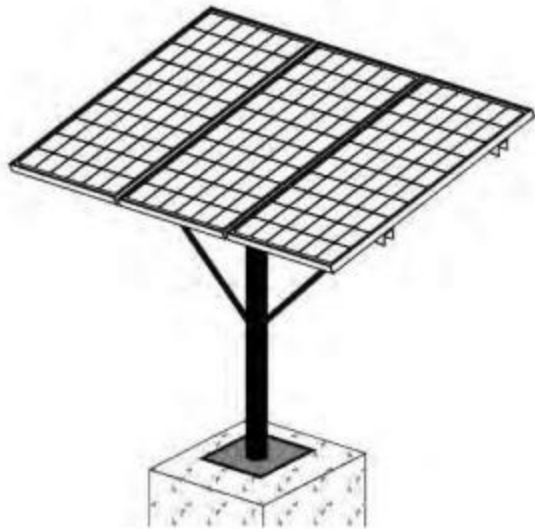


Provide adequate ventilation under a module for cooling. 50 mm minimum between the module and the mounting surface.



For pole mounting:

- When installing modules on a pole, select a suitable pole and module mounting structure capable of withstanding the expected wind conditions for the specific area.
- Ensure that the pole has a sturdy and well-established foundation to provide stable support for the modules.



## Solar Array Wiring

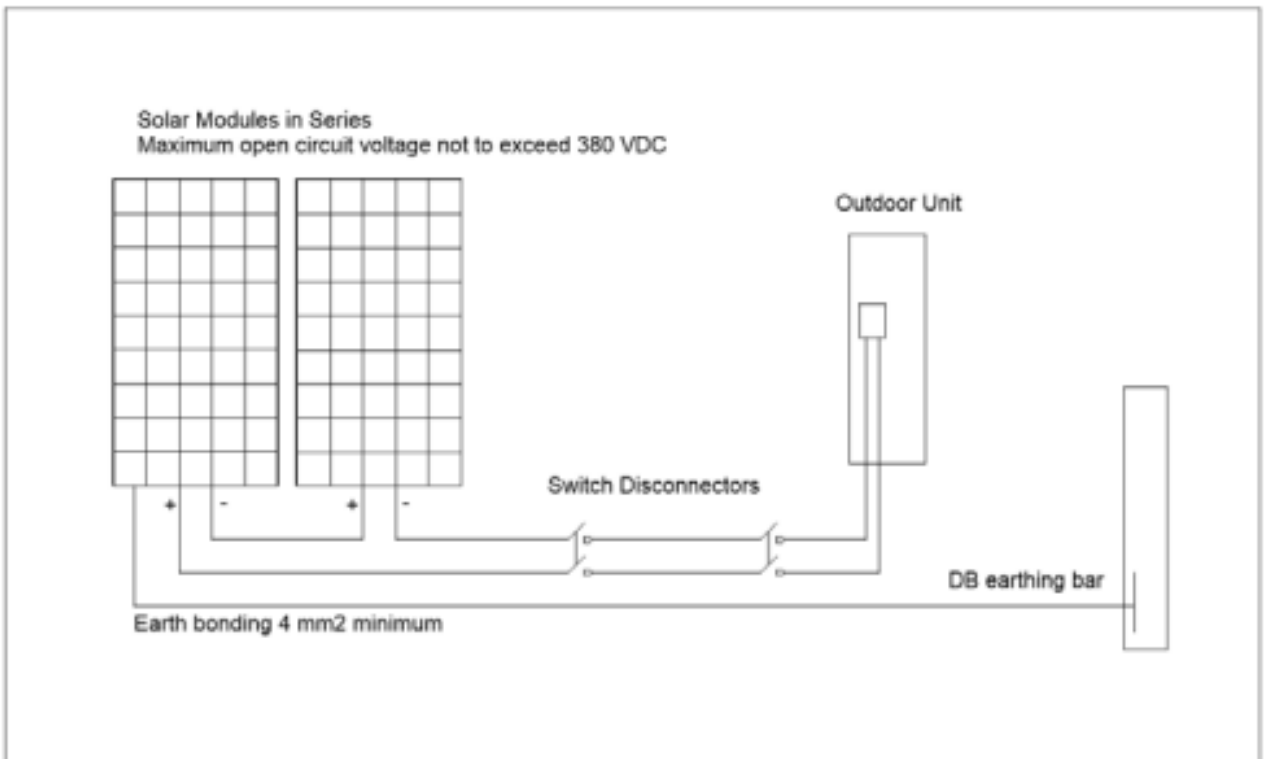
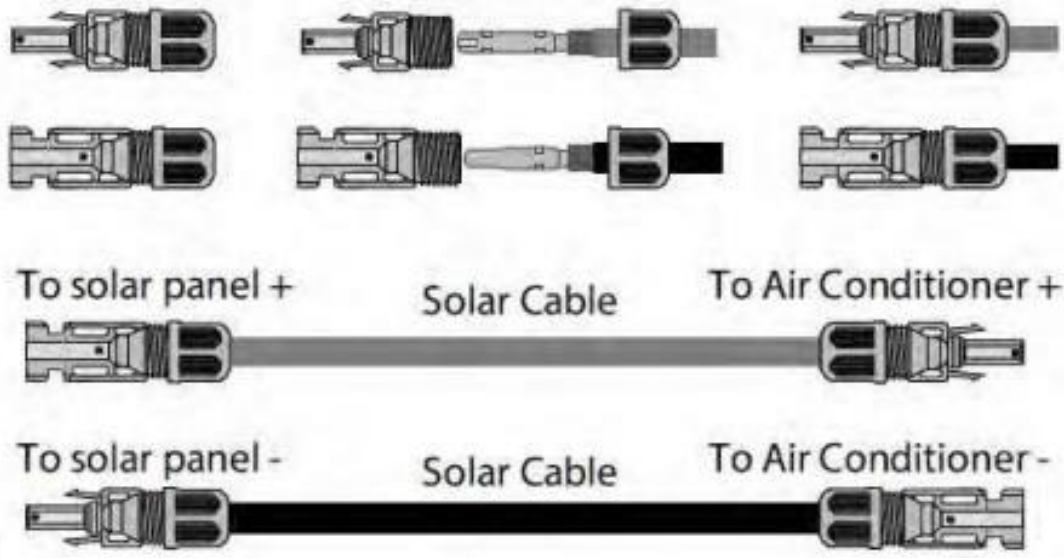
In an array consisting of modules connected in series:

Utilize switch disconnectors that are specifically approved for disconnecting solar DC under load.

Ensure that the MC 4 connectors used are not only approved but also sourced from the same manufacturer at each connection point. Mismatched connectors can result in system failure and pose a potential fire hazard.

General installation guidelines:

- Do not mix modules with different configurations within the same system.
- The solar photovoltaic array should consist of a maximum of 10 modules of 270 watts or 8 modules of 370 watts.
- Ensure that the total system voltage of the solar array does not exceed 380 volts DC open circuit. If the installation is in an area with temperatures below 20 degrees Celsius, the open circuit voltage may rise, and a calculation by a qualified technician should be performed.
- When using MC 4 type connections, both sides of the connection must be of the same type and from the same manufacturer.
- Use multistrand solar wire with a minimum cross-section of 2.5 sq mm or larger.
- Cable installation must adhere to all local and national codes and regulations.
- Install a switch disconnector rated for DC between the array and the outdoor unit. If the switch is not adjacent to the array, a separate switch must be installed at the array.



## Earth Fault Protection Solar DC

For roof-mounted DC PV arrays on residential buildings, it is necessary to incorporate DC earth fault protection in accordance with the US Electrical Code NEC 2005 Article 690.5. This earth fault protection is designed to isolate the Neutral conductor (typically the negative wire) from earth in the event of a ground fault occurrence. This safety measure is essential for electrical safety and compliance with code requirements.

## Solar Disclaimer

Due to the fact that the utilization of this manual, as well as the conditions or methods of installation, operation, use, and maintenance of the photovoltaic (PV) product, are beyond our direct control, we explicitly disclaim any responsibility and liability for any loss, damage, or expenses incurred in connection with such installation, operation, use, or maintenance. Furthermore, we do not assume any responsibility for potential infringements of patents or other rights of third parties that may result from the use of the PV product. No license is granted, whether through modification or otherwise, under any patent or patent rights.

The information provided in this manual is based on our company's knowledge and experience and is believed to be reliable. However, this information, including product specifications and suggestions, should not be considered as a warranty, whether expressed or implied.

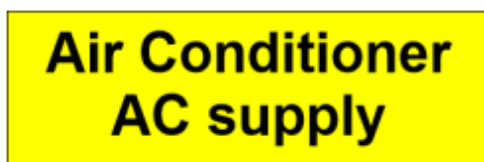
We reserve the right to modify the manual, the PV product, the specifications, or product data sheets without prior notice.

## Signage

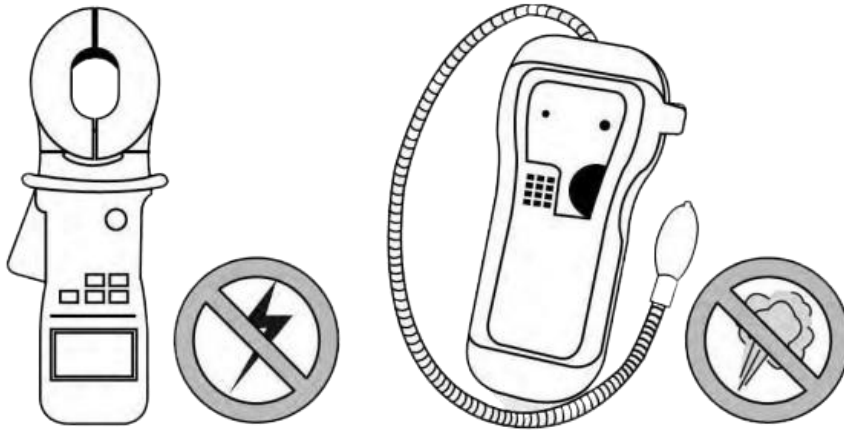
Additional Solar signage to be posted on the outdoor unit.



To be posted adjacent to the AC and DC isolating Switches.



## Electrical and Gas Leak checks



1. Soap and Water Method: Using a soft brush, apply soapy water or liquid detergent to all pipe connection points on both the indoor and outdoor units. The presence of bubbles indicates a gas leak. Any identified leaks should be repaired before proceeding with the unit's test run.
2. Leak Detector Method: If employing a leak detector, consult the device's operation manual for precise instructions on how to use it correctly.

## Electrical Safety checks

After installation, it is crucial to verify that all electrical wiring has been correctly installed in compliance with both local and national regulations, as well as the guidelines specified in the installation manual.

Before initiating the test run, the following steps should be taken:

1. Check Earthing: Measure the earthing resistance, ensuring that it falls below the threshold required to trigger any protection devices.
2. Perform an Insulation Resistance Test: Conduct an insulation resistance test to verify the integrity of the insulation within the system.

During the test run, it is important to:

- Check for Electrical Leakage: Utilize a low-current tong meter to identify any instances of electrical leakage. This step helps ensure the safety and proper functioning of the system during the test run.

## Test Run

Before conducting the test run, it's crucial to verify the following:

- Ensure the unit's electrical system is safe and configured for proper operation.
- Confirm that gas leak checks have been successfully performed.
- Check that the low- and high-pressure valves are fully open.
- The test run should be conducted for a minimum duration of 30 minutes.

To start the test run, follow these steps:

Connect power to the unit.

Point the remote control at the indoor unit and press the On/Off button. The indoor unit will respond.

Use the MODE button to cycle through the available functions:

For COOL mode, select the lowest temperature and allow it to run for 5 minutes.

For HEAT mode, select the highest possible temperature and allow it to run for 5 minutes.

After completing the test run, return the unit to its normal operating temperature.

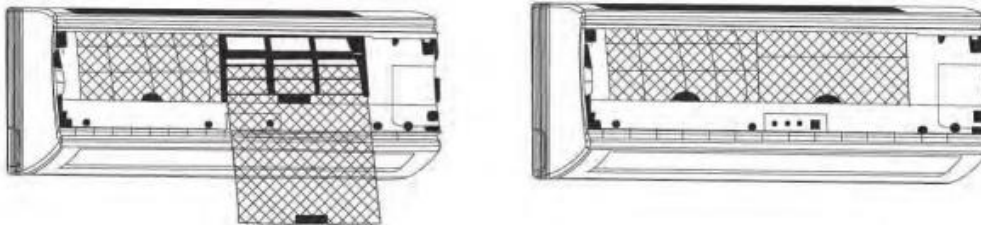
Finally, wrap the pipe connections with insulation to ensure proper thermal efficiency and safety.

## Maintenance

Indoor unit:

Turn off the air conditioner.

Open the indoor unit cover and remove the air filters.

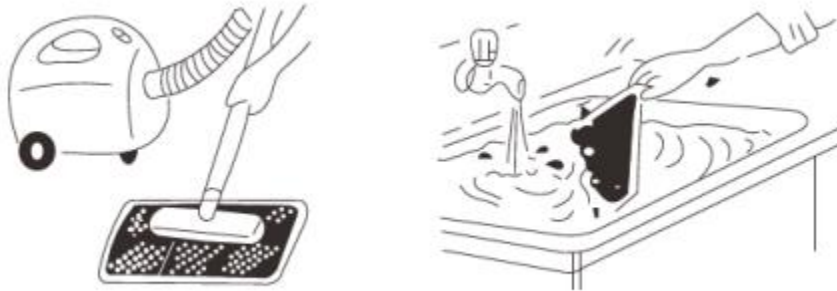




### Cleaning the Air Filter:

1. Remove the air filter from the unit.
2. Vacuum the air filter to remove loose dirt and debris.
3. Wash the air filter in warm soapy water. Ensure that the water temperature is below 40 degrees Celsius to prevent deformation of the air filter.
4. Rinse the filter thoroughly with clean water.
5. Allow the filter to dry naturally. To prevent deformation, do not place it in direct sunlight.
6. Once the filter is completely dry, reinstall it in the unit.

### Outdoor unit:



To ensure the outdoor unit operates efficiently and safely, perform the following checks and maintenance tasks:

1. **Airflow Check:** Verify that there are no objects or vegetation obstructing the airflow around the outdoor unit. Adequate airflow is essential for proper operation.
2. **General Condition Examination:** Inspect the overall condition of the outdoor unit. Look for signs of damage, wear, or corrosion. Ensure that it is properly secured and level.
3. **Fan Inspection:** Check the fan for any foreign objects that may have lodged in it. Remove any debris to prevent interference with the fan's operation.
4. **Fins Examination:** Examine the fins on the outdoor unit for any deformation. Bent or damaged fins can impede airflow and affect efficiency. If you find any bent fins, carefully straighten them.
5. **Insulation Inspection:** Inspect the insulation of the piping connecting the indoor and outdoor units. Ensure that it is secure and undamaged. Replace any insulation that is damaged or deteriorated.
6. **Conduit and Wiring Check:** Check the condition of electrical conduits and wiring. Replace any damaged or frayed wiring or conduits to maintain electrical safety and functionality.