



Elec&Co.

Electricians | Solar Power | Maintenance

elecandco.com.au
1800 776 546

Solar Power Owner's Manual



Photo Voltaic Systems

Introduction

Congratulations on the purchase of your solar power photo-voltaic (PV) system. Not only are you protecting yourself from future rises in the cost of electricity, you are also lowering your carbon footprint which helps reduce global warming and climate change.

Your system is designed to meet all Australian conditions, regulations and codes. Although it is very low maintenance, it must always be remembered that the system generates electricity and we strongly recommend that you do not attempt to service it yourself unless you are suitably qualified. Your safety is our primary concern.

IMPORTANT NOTE:

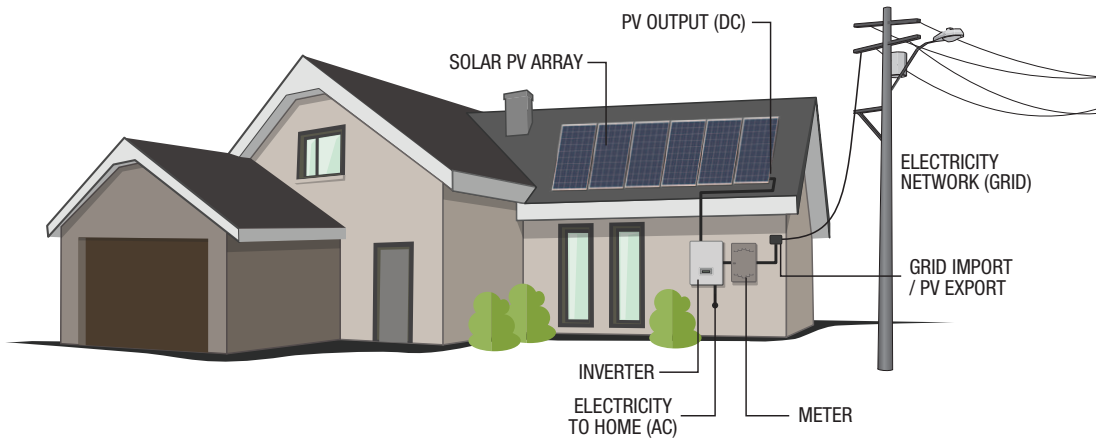
Disclaimer of liability: Despite the instructions and recommendations provided in this manual, the actual use and maintenance of the solar PV system is beyond the control of Elec&Co. Therefore, Elec&Co does not assume any responsibility and expressly disclaims liability for loss, damage or expense associated in any way with the installation, use, or maintenance of the solar PV system.

Please keep this manual in a safe & easily locatable place together with all other documentation supplied.

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How Your Elec&Co System Works



Solar PV panels, usually fitted to the roof, convert sunlight into direct current (DC) electricity. The number of panels installed will depend on the nominal size of your system. Collectively groups of these panels are referred to as a solar array.

The DC electricity generated is converted into alternating current (AC) via the inverter (generally accessible at ground level, often located inside the garage). The converted electricity (AC) is now suitable for consumption by your home's appliances. Most inverters include a digital display so you can monitor the system's information such as the amount of solar electricity produced, etc. Please refer to the separate inverter manual for further information.

Depending on local regulations, your solar PV system may be connected to the grid on either a net or a gross metering system. With net metering, the surplus electricity only will be exported to the grid. While with gross, all generated electricity is exported to the grid.

If you already have a Smart meter installed, this may need to be reprogrammed to be able to measure both your electricity imported and electricity exported. If you have an old electro - mechanical meter (the one with the spinning disk), this will need to be replaced with a bidirectional meter able to record the electricity you both import and export.

Your electricity retailer will continue to read your meter at regular intervals (i.e. quarterly) and bill you for the electricity you consume from the grid. Any solar generated electricity exported to the grid will be applied as a credit on your account at the rate you negotiate with your electricity retailer. This is known as a **Feed-in Tariff**.

IMPORTANT:

Please note it is your responsibility to contact your electricity retailer and arrange for a feed-in tariff contract.

Energy Conservation

Your solar PV system represents an investment in your future energy needs as well as a benefit to the environment. Unlike conventional generators of electricity that have been causing major environmental problems such as smog, acid rain and global warming, your solar PV system does not produce any air or water pollution while it is generating electricity.

Home Energy Saving Tip Ideas

Extend the savings beyond your solar PV system with these handy power saving tips

- Install an energy efficient hot water system, such as solar or heat pump
- Replace incandescent and halogen lights with energy efficient LED lighting
- Make sure your home is well insulated
- Manage the use of your air conditioner pro actively
- Minimise draughts in the home during winter
- Maximise cross-flow ventilation in the home during summer
- When purchasing new appliances check the Star rating & choose the most energy efficient, especially for heaters, washing machines, dryers, fridges
- Switch off lights and other appliances when not needed
- Wash clothes in cold water and always ensure a full load
- Dry clothes on a clothes line whenever possible
- Ensure all your appliances are in good working order and turn them off at the wall when not in use or alternatively use ESPD's (Energy Saving Power Devices);
- Regulate the timing of your pool filter pump or connect to an off peak supply



System Performance

During daylight hours, your solar PV system will be generating electricity at varying rates depending on the amount of sunshine. The more sunlight falling on the solar array the more electricity is generated. Variable factors such as cloud cover, seasonal solar angle variations, shading or soiling of the solar array will have an effect on the electricity output.

The following tables indicate the expected average daily generation (in kWh) based on a 1 kilowatt (1kW) PV array at the specified orientation with a 22.5° tilt angle, without shading.

Calculating the average daily generation

Use the following calculation to determine the expected average daily generation for your system.

System size in kW x Specific value from following tables = Average daily kWh generated

For example: A PV system in **Melbourne** with panels facing **North West** during the month of **March** would generate an average of **4kWh's** of electricity per day per kW installed

Therefore for a 3kW system installed as per the scenario above would generate:

$$3 \text{ (system size in kW)} * 4 \text{ (kWh value from following table - based on city, orientation \& month)} \\ = 12\text{kWh on average per day for the month of March.}$$

Brisbane

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
No. of Days	31	28	31	30	31	30	31	31	30	31	30	31
West	5	5	4	4	3	3	3	4	4	5	5	5
North West	5	5	5	4	4	3	4	4	5	5	5	5
North	5	5	5	4	4	3	4	4	5	5	5	5
North East	5	5	4	4	4	3	4	4	5	5	5	5
East	5	4	4	4	3	3	3	3	4	5	5	5

Sydney

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
No. of Days	31	28	31	30	31	30	31	31	30	31	30	31
West	5	4	4	3	2	2	2	3	4	5	5	5
North West	5	5	4	4	3	3	3	4	4	5	5	5
North	5	5	4	4	3	3	3	4	4	5	5	5
North East	5	4	4	4	3	3	3	4	4	5	5	5
East	5	4	4	3	2	2	2	3	4	4	5	5

Melbourne

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
No. of Days	31	28	31	30	31	30	31	31	30	31	30	31
West	5	4	4	3	2	2	2	2	3	4	5	5
North West	5	5	4	3	2	2	2	3	3	4	5	5
North	5	5	4	3	2	2	2	3	3	4	5	5
North East	5	4	4	3	2	2	2	3	3	4	5	5
East	5	4	3	2	2	1	2	2	3	4	4	5

Adelaide

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
No. of Days	31	28	31	30	31	30	31	31	30	31	30	31
West	6	5	4	3	2	2	2	3	4	5	5	6
North West	6	5	5	4	3	2	3	3	4	5	5	6
North	6	5	5	4	3	3	3	3	4	5	5	5
North East	6	5	4	4	3	2	2	3	4	5	5	5
East	6	5	4	3	2	2	2	3	3	4	5	5

Perth

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
No. of Days	31	28	31	30	31	30	31	31	30	31	30	31
West	6	5	4	3	3	2	2	3	4	5	6	6
North West	6	5	5	4	3	3	3	3	4	5	6	6
North	6	5	5	4	3	3	3	4	4	5	6	6
North East	6	5	5	4	3	3	3	3	4	5	6	6
East	6	5	4	3	3	2	2	3	4	5	5	6

Operating Instructions

Your solar PV system is designed for automatic operation without need for user intervention. There are no moving parts or need for the owner to interact with its operation.

In the case of **mains grid supply failure** the inverter will immediately and automatically be disabled. This is known as “**anti-islanding**” and it protects linesmen from an electric shock from your system when they assume the grid is “dead”. Once the grid power has been restored, the inverter will be automatically re-enabled.

Safety Notes

IMPORTANT:

Do not attempt to service the system unless you are **fully qualified** to do so.
To service any electrical connection you **MUST** be a licensed electrician.

- All service work must be carried out in strict compliance with all local and national electrical regulations and standards.
- Review and follow all safety instructions supplied with all components of your solar PV system. Further information can be found at <http://www.cleanenergycouncil.org.au>
- Do not attempt to clean or come in contact with the surface of a solar PV panel with broken glass. This could result in a dangerous electric shock.
- Be aware that power may be present at any point in electrical circuits despite the opening of circuit breakers or isolators.
- Circuit breakers can trip automatically if problems occur. If the circuit breaker is switched back to the closed or “on” position and it immediately trips back to the open or “off” position there is a problem.
- Do not substitute materials supplied with the Elec&Co solar PV system.
- Appropriate precautions must be taken when working on rooftops or at heights in accordance with local and national occupational health and safety regulations.
- To avoid risk of injury, Elec&Co strongly recommend the services of a qualified professional who is trained in occupational health and safety procedures, to clean solar PV panels.

Owner Maintenance

The solar PV panels work best when clean. Regular rainfall or washing with a hose will maintain their cleanliness. If they do become excessively soiled they can be cleaned with cold water. Elec&Co strongly recommend that you avoid climbing onto the roof and use the services of a qualified professional who is trained in occupational health and safety procedures.

Shading of the solar PV panels will affect efficiency and performance. Plant and tree growth that may cause shading at various times of the year, should be monitored and dealt with as required. Likewise, leaves, bird droppings and other debris coming to rest either on or around the solar PV panels should be carefully removed.

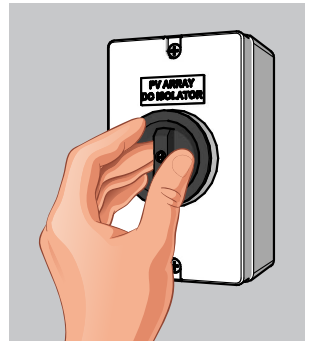
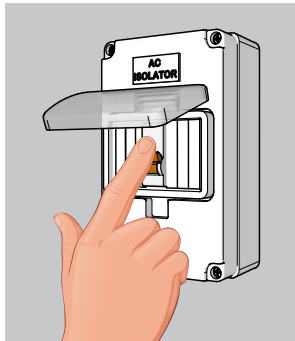
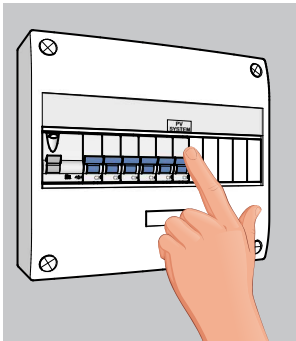
If you notice your solar PV system is not operating correctly, please check the **TROUBLESHOOTING** chapter on page 7.

If necessary contact our service department on 1800 776 546 immediately and we will help you to diagnose your problem and can arrange to send a technician to resolve it if necessary.

If you need to shut down the solar PV system, please follow these steps in this order –

1. Switch off the **Solar Supply Main Switch** in the main switchboard or meter box
2. Switch off the **AC isolator** adjacent to the inverter
3. Switch off the **DC isolator** adjacent to the inverter

Following these steps will safely isolate the solar array. To switch it back on, you simply reverse the procedure.



Always remember that your solar PV system will be generating electricity during daylight hours and care should always be taken to eliminate the risk of electric shock. Refer to the **OPERATING INSTRUCTIONS** on page 5 for more information.

Troubleshooting

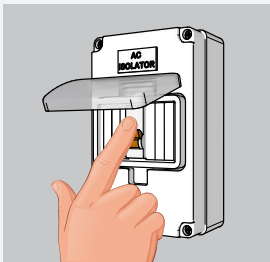
The inverter displays LED lights and/or screen displays to monitor the normal operation and fault conditions of the system. The occurrence of a problem within the solar PV system will usually be indicated by the inverter.

The inverter user manual will contain a troubleshooting chapter to explain these lights and displays. Please read this chapter carefully and precisely follow the instructions given. If these fail, please call **1800 776 546** immediately so we can assist resolve your problem.

Earth fault alarm procedure:

In case of an earth fault alarm,

1. Follow the same shut down procedure as described on the previous page
2. Please call 1800 776 546 immediately and we can assist to locate a qualified
3. Do not re-start the solar PV system until advised by your installer or a Elec&Co representative technician to resolve your problem.

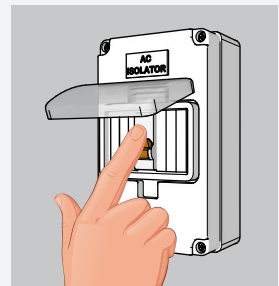
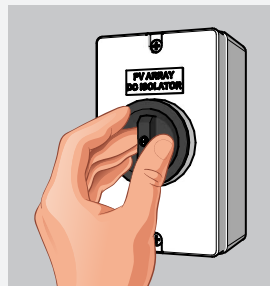
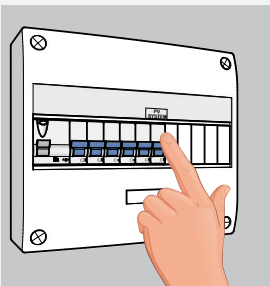


Turning system on procedure:

If it appears that your system is not turned on (i.e. the LED light / screen on the inverter is blank and is not making any sound) then you may be required to turn the system on.

To turn on the solar PV system, please follow these steps in this order –

1. Ensure the **Solar Supply Main Switch** in the main switchboard or meter box is on
2. Switch on the **DC isolator** adjacent to the inverter (Some inverters have built in DC isolators)
3. Switch on the **AC isolator** adjacent to the inverter (if required)



Supplied Documentation

in accordance with AS/NZS5033 (2011)

1. Solar panel specifications and warranty

 2. Inverter user manual and warranty

 3. Array frame mounting kit user manual and warranty

 4. Array frame engineering certificate

 5. Commissioning and installation checklist including:
 - A list of all equipment supplied
 - Circuit diagram including electrical ratings
 - Installer/designer's declaration of compliance

 6. Solar Power Owners Manual including:
 - Action on Earth Fault alarm being activated
 - Shutdown and isolation procedure
 - System performance estimate
 - Recommended maintenance procedure and timetable
-

Accredited installer Details:

Installer: Blake Roberts

Accreditation number: A6682439

Contact: 0422 064 863

Email: blake@elecandco.com.au

Maintenance Schedule

Inspection of...	Maintenance Process	Suggested frequency
Solar array & overall system	<p>Perform visual check of general cleanliness and visual defects of the overall solar PV system.</p> <p>Remove any built up debris near & under the array and around the inverter location.</p> <p>Report any found defects to a trained technician.</p>	Every Three Months
Potential shading issues	<p>Check the solar array for any potential shading issues, ideally at different times through out the day. Prune or remove any foliage that may cause a shading issue to any part of the solar array.</p>	Every Three Months
Junction boxes	<p>Perform check on the tightness of connections and the integrity of seals and cable entrances for any signs of damage.</p>	Every Year <i>(By Qualified Technician)</i>
Installation wiring	<p>Perform check on all electrical connections for any signs of damage and/or water ingress.</p>	Every Year <i>(By Qualified Technician)</i>
Electrical voltages and currents	<p>Measure open circuit voltage and short circuit currents. Suitably record details.</p>	Every Year <i>(By Qualified Technician)</i>
Protective devices	<p>Perform check and verify suitable operation of all DC and AC Circuit breakers (CB) and residual current devices (RCD) along with all solar array isolators.</p>	Every Year <i>(By Qualified Technician)</i>
Mounting structures	<p>Perform check and verify the integrity of the entire solar array mounting structure.</p>	Every Year <i>(By Qualified Technician)</i>

Actual System Performance *(to be completed by owner)*

Date of connection to the grid

E-Total reading on inverter at end of year 1	Daily average	kWh
E-Total reading on inverter at end of year 2	Daily average	kWh
E-Total reading on inverter at end of year 3	Daily average	kWh
E-Total reading on inverter at end of year 4	Daily average	kWh

Maintenance & Fault Log

Copies of reports / invoices must be kept for proof of proper maintenance to claim under the supplied warranty

Please do not climb above 2 metres to maintain solar PV panels without observing all OH&S regulations. Do not use detergents or solvents, use clean water only.

Date	Problem	Remedy	Electrician

Notes:

Warranty

In the case of a service being required, please make available all the documentation to the service technician. System must be maintained in accordance with the Solar Power Owners Manual. Note that the manufacturers' warranties may be voided if the solar PV system is serviced or interfered with by an unqualified person.

If warranty is required please call 1800 776 546 or email blake@elecandco.com.au

Installation Report & Warranty

Please provide the following details

Customer Details:

Surname:	First name:	
Installation Address:		
Town /Suburb:	State:	Postcode:
Country:		
Telephone: Home:	Work:	Mob:

System details:

Date of Installation:	Installed by:
System Size:	S/No:

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Warranty

To request your warranty please ensure to fill out the information above and email to blake@elecandco.com.au.