



GRID CONNECT SOLAR SYSTEM USER MANUAL

ALSO APPLIES TO BATTERY SYSTEMS INCLUDING OFF GRID



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1. Introduction

Congratulations on your decision to install a Sunergy Solar Photovoltaic (PV) system. By making this choice you are reducing greenhouse emissions by reducing your reliance on conventional fossil fuel power generation. Over the lifetime of the system, considerable amounts of CO2 emissions will be saved as well as significant savings on your power bill. Your Solar PV system is comprised of high quality components to ensure many years of safe, reliable power production at your home.

1.1 Installation Steps

1. Our installer will have explained to you how your installation was to take place and will have carried the installation out to the required Australian Standards and Clean Energy Council guidelines.
2. They will also have tested and commissioned the system operation and will have taken you through the basic operation of the PV Solar System and answered any questions you may have regarding that.

1.2 Grid Connection (Does not Apply to Off Grid)

1. Powercor have an online solar metering process. We submit the application once we have received the PCES and you have paid in full for your system.
2. Other DNSPs (e.g. SP-Ausnet), are moving to an online process.
3. If you have not paid in full for your system, we reserve the right to not complete this step and accept no responsibility for loss of FIT or for rework or costs that may be incurred due to (for example) your PCES expiring or your solar pre-approval expiring.
4. When your solar metering paperwork has been submitted, you will be notified. Some DNSPs (example Powercor) will update you on progress.
5. The timeframe from Solar Installation by our technicians and having your meter installed by your Distributor does vary (other than timely submission by us) and cannot be influenced by us, please refer to your DNSP.
6. Your new PV Solar Power System will have been wired to the existing meter set up and is required by ESV regulation to not be switched on until it has been inspected.

1.3 Questions or Feedback?

Your feedback is important to us so we may contact you in the near future to understand more about your experience of our services.

Please take your time to read the following information. Should you have further questions not answered in this folder and / or wish to discuss any aspect of the installation please contact us on 03 5443 3664 or service@sunergysolar.com.au

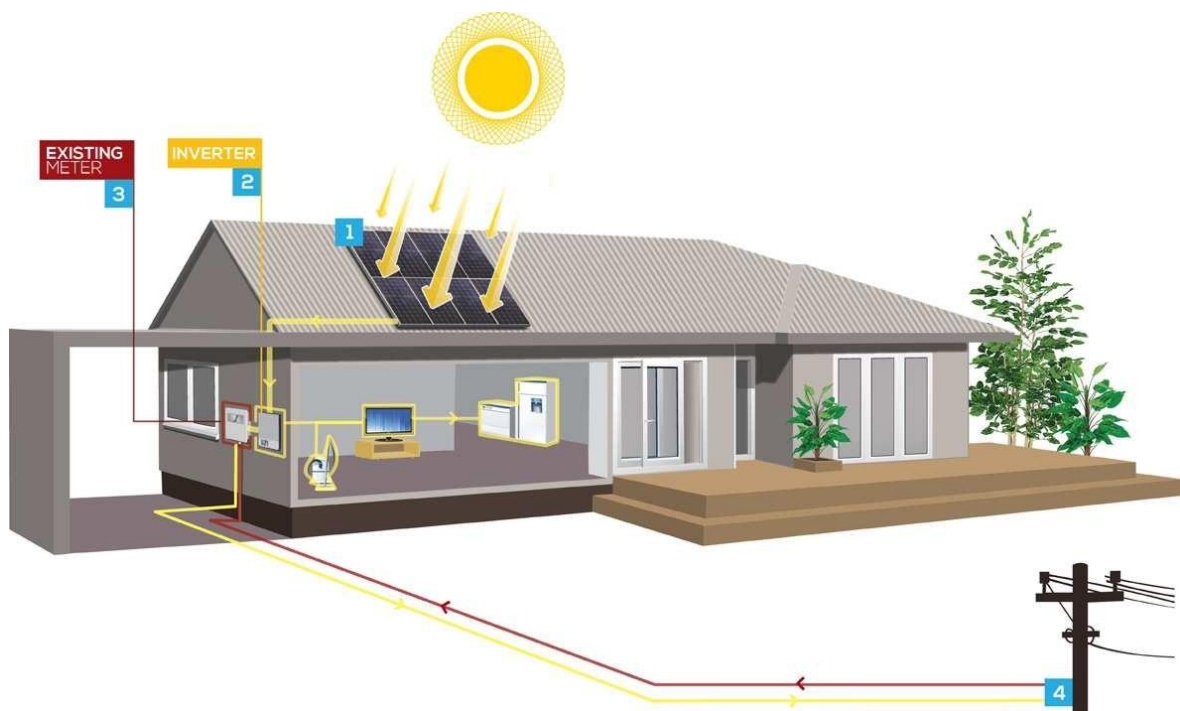


Yours faithfully,
Sunergy Solar

2. System Description

Your Solar PV system is designed to automatically convert sunlight to electricity. Your solar modules are connected in series, creating voltages of up to 600V DC (depending on the configuration and sunlight intensity), which is converted to 230V AC by your inverter. This electricity is then fed into your household switchboard/meter. The converted power will then flow to the household loads and appliances. If more power is produced than what is consumed in the house, the excess power will flow back into the grid. If more power is required than what the Solar PV system can produce, the balance is made up from the grid.

The solar system generates electricity in proportion to the amount of sunlight on the solar modules and the module temperature. There is no generation at night. The peak power generation is on a clear cool day when the sun is at a perpendicular angle to the solar modules. Clouds, seasonal variation of solar angle, array soiling, non-optimum orientation and any incidental shading decreases that performance.



Please note that the inverter includes safety protection devices, which will isolate your solar system, should the grid voltage or frequency fall outside a specific range. This feature protects the inverter from grid spike or surges and also protects the grid line workers who may periodically need to carry out maintenance work on nearby power lines.

3. Performance Estimate

Your original quotation includes a system performance estimate. Please insert your original quotation in the section provided as Appendix D.

Please note that actual system output is dependent upon you maintaining shade creating obstacles and ensuring that your panels do not become overly dirty. It will also vary with climatic conditions including temperature, solar radiation, humidity, cloud, haze etc.

To lodge a claim for poor performance it is necessary for you to have maintained your system and then follow the steps outlined in:

<https://www.sunergysolar.com.au/sunergy-warranty-documents/>

4. How Much Can I Save?

The range of savings very much depends on your self-consumption to export ratio. The more solar power you consume yourself, the more you will save. The more you export, the less you will save.

Timing discretionary consumption such as pumps, washing machines, dish washers, swimming pools and spas etc. to times when the sun is shining will help maximise your self-usage.

Sunergy offers in home energy monitors to assist your goal to maximise self-usage and savings.

5. Installation, Product & Warranty Information

All products supplied meet the necessary Australian standards and are approved by the Clean Energy Council (CEC). Warranty information specific to your system components may be found at <https://www.sunergysolar.com.au/sunergy-warranty-documents/>

We recommend you print these and insert as Appendix B

5.1 Warranty Claims

In the unlikely event that you need to make a warranty claim please contact Sunergy.

Alternatively, you may contact the manufacturer per the information provided.

5.2 Warranty Documents

Warranty documents including:

- Manufacturer warranty and specification sheets
- Sunergy installation warranty
- Sunergy solar output warranty

<https://www.sunergysolar.com.au/sunergy-warranty-documents/>

For further information, please refer manufacturer web sites.

6. Other Documents

6.1 Supply of Goods Terms & Conditions

Sunergy's terms and conditions for the supply of goods may be found here: <https://www.sunergysolar.com.au/solar-documents>

6.2 Privacy Policy

Sunergy's privacy policy may be found here: <https://www.sunergysolar.com.au/solar-documents>

6.3 Data Disclaimer

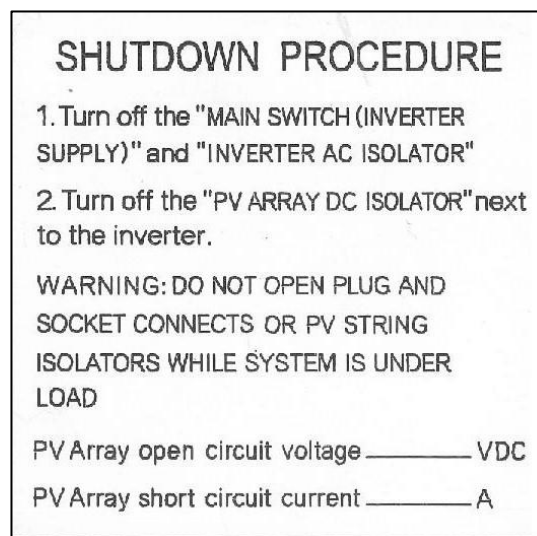
Sunergy's data disclaimer may be found here: <https://www.sunergysolar.com.au/solar-documents>

7. System operation

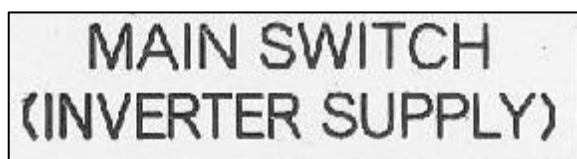
7.1 Shut Down Procedure

WARNING: You must follow the shutdown procedure in the order of the steps noted. Failure to follow the sequence of steps can result in arcing and damage to your system. A fire is possible.

On or adjacent to your inverter is a shutdown procedure label.



STEP 1: Turn off the "MAIN SWITCH (INVERTER SUPPLY)" and "INVERTER AC ISOLATOR" These are located in your switchboard and/or adjacent to you inverter



STEP 2: Turn off the "PV ARRAY DC ISOLATOR(S)" next to the inverter



ADDITIONAL STEP FOR OFF GRID SYSTEMS: Pull down battery isolator fuse. Do this sharply and smoothly to avoid arcs.

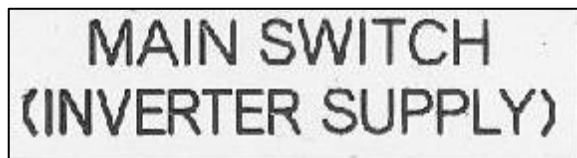
7.2 Start-up Procedure

WARNING: Follow this procedure in the order of the steps noted. Failure to follow the sequence of steps can result in arcing and damage to your system.

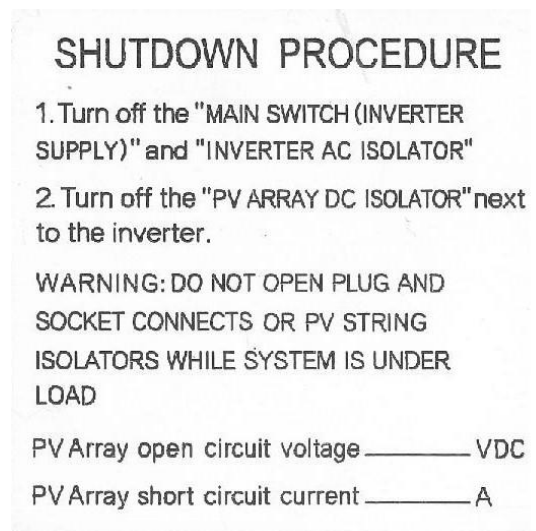
STEP 1: Turn off the "PV ARRAY DC ISOLATOR(S)" next to the inverter



STEP 2: Turn off the "MAIN SWITCH (INVERTER SUPPLY)" and "INVERTER AC ISOLATOR" These are located in your switchboard and/or adjacent to your inverter



This is the **reverse of the steps** on the SHUTDOWN PROCEDURE label on or adjacent to your inverter



7.3 Verifying Correct System Operation

To check that the system is functioning correctly, attend the inverter at mid-day and check if the green LED is illuminated and display is working. If there is a problem, an error message will be shown on the display and the red LED illuminated.

Further information can be found in the supplied inverter user manual.

If functioning correctly, the display will also show current power output and array voltages. If any value is zero there may be a problem. Please restart the inverter by following the shut-down procedure, wait 10 minutes and then follow the start-up procedure.

If this fails to resolve the problem please contact Sunergy.

7.4 System Monitoring

All inverter solutions sold by Sunergy come with inverter manufacturer monitoring as standard. These require a strong and stable WiFi signal to function properly. Weak signals can be boosted via a WiFi extender available online or your local electronics store.

If there was a strong and stable WiFi connection available to our installers on the day of installation AND you made the WiFi SSID and password available to them, they will set your monitoring up for you.

If either of these are not available, DIY connection is relatively simple – please refer the SUPPORT menu item on our website and follow the instructions.

Similarly, changes to your internet provider, your router, change to NBN or changes your WiFi SSID or password, your monitoring will cease to operate. DIY connection is relatively simple – please refer the SUPPORT menu item on our website and follow the instructions.

A call out for Sunergy to resolve monitoring reconnection is a service call out.

Please note that Sunergy does not have home IT infrastructure diagnostic or support capability.

The monitoring platform itself is supplied and supported by the inverter manufacturer. Please direct questions or issues regarding the monitoring platform to the manufacturer.

7.5 Earth fault alarm

In the event of an earth fault alarm, you may see some or all of the following:

- The red LED may be illuminated
- A message displaying “Earth Fault” will be shown on the display
- An audible tone may also be heard

If you see these symptoms, immediately shut down the PV system as per the shut-down procedure (refer section 7.2) and contact Sunergy.

7.6 System Failure

If the system appears to be not functioning, i.e. blank screen and no LED lights:

- Please verify that all isolators are in the on position.
- If the screen remains blank, switch all isolators off by following the shut-down procedure. Leave inverter in the off position for 10 minutes then re-energise by following the start-up procedure.
- If the inverter is still not functioning please shut the system down (refer section 7.2) and contact Sunergy

Please note that this situation may occur if the grid falls outside the tolerances specified in AS4777 in which case it is not a fault of the system

8. On Going Maintenance

Regulations require that your system be maintained by you. Failing to maintain your system can also result in loss of warranty coverage. Please refer section 8.3 and 8.4 for maintenance requirements and your maintenance logbook.

8.1 Maintenance Warnings

WARNING: Do not attempt to clean or come in contact with the surface of a solar module with broken glass. This could result in a dangerous electric shock.

WARNING: Solar modules remain live during daylight hours, even when the DC isolator is off. Therefore, wiring and etc. will still be energised even when the DC isolators are off. Hazardous voltages are present whenever solar panels are exposed to light.

WARNING: The system should be shut down following the shut down procedure (refer section 7.2) before performing any maintenance.

WARNING: Read and obey all warning signs before performing any maintenance

CAUTION: Appropriate precautions must be taken when working at heights. Do not attempt to access the roof unless the precautions to prevent falling from heights are in place. Sunergy recommends that only a CEC Accredited Electrician who has been trained to work at heights conduct all solar system maintenance.

8.2 Maintenance Guidelines

Australian Standard AS/NZS 5033:2012 recommends your PV Solar power system be maintained on an annual basis. Solar systems are low maintenance, partly due to the lack of moving parts. Regular periodic inspection will help ensure your system continues to operate safely and performs efficiently. You should also consult your inverter manual for any additional requirements.

Installation of a roof mounted PV system may also require additional maintenance for the roof and / or measures for access to conduct maintenance tasks. Please refer to your roofing manufacturers guidelines.

Energy production may lose 4-8% output from dirty panels if allowed to become excessively dirty. Normally cleaning is not required as rain should keep your panels adequately clean.

If, however panels become very dirty (including excessive bird droppings) wash down with a water hose or clean with a sponge and water **when the panels are cool**.

Detergents should not be used. Once clean, a visual inspection of the modules for defects such as cracks, chips or discolouration should occur. The array frame should be inspected for rust, corrosion and rigidity and the logbook completed after every inspection.

Pressure washers must not be used.

Sunergy offers cleaning and inspection services as required. Please refer our website (www.sunergysolar.com.au) or contact Sunergy for more information.

8.3 Periodic Maintenance Schedule

COMPONENT	CHECK	FREQUENCY	
		SIX MONTHS	2 YEARS
SOLAR PANELS	Clean debris from around and under array		✓
	Check trees and shading – trim as required		✓
	Verify cleanliness of solar panels (dirt, bird droppings, fungus). We recommend against cleaning of solar panels unless badly fouled. Refer section 8.2 of this manual	✓	✓

COMPONENT	CHECK	FREQUENCY	
		SIX MONTHS	2 YEARS
	Visual check PV Modules (fractures, browning, moisture penetration, frame corrosion etc.) Modules with visual defects should be further inspected for performance and safety and replaced if needed		✓
	Check PV Module junction boxes, tightness of connections, integrity of lid seals, integrity of cable glands and clamping devices		✓
WIRING INSTALLATION	Verify mechanical integrity of conduits and replace damaged conduit.		✓
	Cables and wiring remain properly secured		✓
	Verify insulation integrity of cables installed without conduit and replace damaged cable		✓
	Check junction boxes: (a) tightness of connections (b) water accumulation/build-up (c) integrity of lid seals (d) integrity of cable entrance and/or conduit sealing; and (e) integrity of clamping devices. Replace defective seals and clamps		✓
	Check all electrical connections for tightness and corrosion.		✓
ELECTRICAL CHARACTERISTICS	Measure and record open circuit voltages		✓
	Measure and record short circuit currents		✓
PROTECTIVE DEVICES	Verify integrity of fuses and fuse holders (where fitted)		✓
	Verify operation of Circuit Breakers and RCDs		✓
	Verify operation of solar array isolation devices		✓
	Verify function of earth fault protection		✓
MOUNTING SYSTEM	Verify tightness and integrity of bolts and other fastening devices. Tighten clamps and replace components as required		✓
	Check for corrosion		✓

COMPONENT	CHECK	FREQUENCY	
		SIX MONTHS	2 YEARS
OTHER	Confirm warning and operational labels are in place and rectify as required		✓
BATTERIES	Please refer manufacturer battery maintenance manual and logbook		

NOTE: Please also refer the component manufacturer's documentation supplied.

Appendix A: Framing System Engineering Certificate

Engineering certificate: Red Dot (Used from February 2017)



15 September 2016
 Project number: R140_01A
 Red Dot Rack Pty Ltd.
 Level 19, 144 Edward St
 Brisbane Qld 4000

Attention : Peter Secombe.

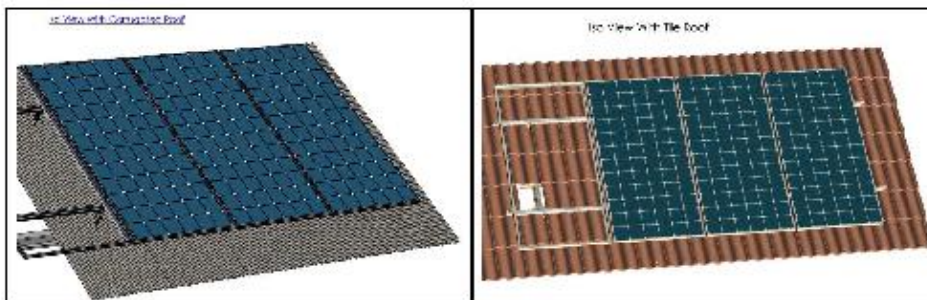
Dear Sir,

RE: REDDOT SOLAR PANEL SUPPORT FRAME STANDARD KIT FOR TILED AND METAL CLAD PITCHED ROOF

As requested, we have reviewed the structural adequacy of the Aluminum support framing components as detailed in the drawings issued by Red Dot Rack Pty Ltd. We have design investigated for the Aluminum Railing as shown below. The section of the railing is shown below.

The panels are supported by two rows of railing. The railings are fixed directly to the rafters or to the purlins.

The spacing of the fixing of the Railing to the rafter/purlin in terrain category 2 shall be limited as tabulated below in tables 1.0, 1.1, 2.0 & 2.1. Refer to Figure A on page 5 for wind regions as shown in AS1170.2. The central and end zones referred to in the tables are depicted in figures B & C on page 6.

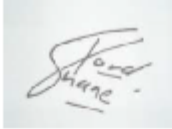


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Director: Pehaar C Peharathen
 BScEng, MEngSc, FEAust, CPEng,
 NPER (CIVIL & Structure)

Engineering certificate: DPA (Used until April 2017)

SHANE FORD CONTRACTING P/L SHANE MICHAEL FORD (Bachelor of Building Engineering) Mobile: 0419 886 207 Address: 60 Clark St, Port Melbourne	ACN 11110402723 EC – 24576
Regulation 1507 Building Act 1993 Building Regulations 2006 CERTIFICATE OF COMPLIANCE - DESIGN	
To THE RELEVANT BUILDING SURVEYOUR	
From Shane Ford	of Shane Ford Contracting P/L 60 Clarke St, Port Melbourne 3207
I certify that the part of the design described as structural rails and roof mount connections for:	
ROOF MOUNT INSTALLATION GUIDE WIND REGIONS A,B,C AUSTRALIA	Project No: 0429
Complies with Part 3.2 of the Building code of Australia (2012) and following standards:	
<ul style="list-style-type: none">• AS 1170.1 – Loading Code – Dead and Live Loads• AS 1170.2 – Loading Code – Wind Loads• AS 1684 – Residential Timber-framed Construction• AS 1720 – Timber Structures Code	
Drawing No's: NA	
Documents: <ul style="list-style-type: none">• DPA Solar Racking Solutions "Roof Mount Installation Guide", version 1.4• DPA Solar Racking Solutions "Transition to an improved rail design" dated 3 March 2011	
Computations: <ul style="list-style-type: none">• Spreadsheet titled "DPA Solar Racking Worksheet v1.9 dated JAN 2012"	
Prepared by: Shane Ford Contracting P/L	
Building Practitioner No: EC – 24576	
Signed: 	Date: 1 FEB 2013

Appendix B: Warranty & Specifications of Major Components

This section contains important information on the major components of your system including:

- Sunergy warranty information
- Manufacturer specifications for panels and inverters
- Manufacturer warranty information

PLEASE TAKE THE TIME TO READ THIS – ESPECIALLY YOUR WARRANTY INFORMATION. PLEASE NOTE THAT SOME WARRANTY RIGHTS REQUIRE YOU TO REGISTER YOUR PRODUCT WITH THE MANUFACTURER

PLEASE ALSO REFER SECTIONS 5 AND 6 OF THIS MANUAL

Appendix C: Sunergy Invoice (Customer to Insert)

Dear Customer,

We have provided this section for you to insert a copy of your invoice as provided to you by the installers on your installation date.

Please insert your sales invoice into this section

Appendix D: Sales Agreement & Output Estimate (Customer to Insert)

Dear Customer,

We have provided this section for you to insert your original quote information – that way it’s together with your other system information!

Please insert your original quote and contract in this section including:

- **Covering email/letter**
- **System performance estimate**
- **Quotation**
- **Sales contract**

Appendix E: Installation Documents (Customer to Insert)

Dear Customer,

Following installation, we will send you some additional documentation.

This section has been provided for you to insert and store this information – that way it’s together with your other system information!

This documentation may include:

- **Installation commissioning checklist**
- **Serial numbers for key components**
- **PV pre-approval document (where applicable)**
- **Network connection documentation; i.e. PV connection forms and EWR or equivalent**
- **Single Line Connection Diagram**
- **Prescribed Certificate of Electrical Safety or equivalent**

Appendix F: Manufacturer User Manuals (Customer to Insert)

Dear Customer,

This section has been provided for you to insert and store manufacturer manuals for your inverter and if available, other components.

Please insert these into this section – that way it’s together with your other system information!

**Appendix GI: Battery Log Book
(OFF GRID & GRID HYBRID)
(Customer to Insert)**

Dear Customer,

This section has been provided for you to insert and store the battery manufacturer log book. Alternatively, please place this log book adjacent to your battery bank to record battery maintenance activity and results.

**BATTERY SYSTEMS
INCLUDING OFF GRID ONLY**