Solar Power – O&M Manual

Supplier	Energy Aware Pty Ltd
Site	B2 S66 Strathnairn - 2kW - O&M Manual
Date	03/11/2022
Project #	PM692

Energy Aware

Level 9, 627 Chapel Street, South Yarra VIC 3141
www.energyaware.com.au

1. Introduction

Thank you for selecting Energy Aware to supply and install your solar power system. You have made a very smart investment for your future energy needs, as well as taken a positive step towards helping the environment.

This manual and Schedules contain important information regarding the solar power system.

Please keep this manual in a safe place together with all other documentation supplied by Energy Aware.

Schedule A	System Overview
Schedule B	Project Documentation
Schedule C	Safety Overview
Schedule D	Shutdown & Restart Procedure
Schedule E	Warranties
Schedule F	Forecast Energy Production
Schedule G	System Monitoring
Schedule H	Electricity Metering
Schedule I	Maintenance

Energy Aware's contact details are below should you have any queries regarding this manual:

Webite	www.energyaware.com.au
Phone	1300 658 411
Email	installs@energyaware.com.au

Schedule A: System Overview

System Size	2 kW DC	
Installation Date	14/09/2022	
Panels	4	Trina 500W
Inverter(s)	1	Sungrow 2kW
Mounting System	Clenegy PV-ezRack SolarRoof	
Accessessories	- DC and AC cabling and switchgear - Junction boxes - Switchboards - Conduits - Cable tray - Mounting brackets - Labelling	

The solar power system converts energy from the sun into electricity. As sunlight hits the solar panels, they produce direct current (DC) electricity. The DC electricity feeds into the solar inverter(s) which converts it to alternating current (AC) electricity suitable for use inside the property.

Electricity produced by the solar power system is first consumed inside the property, lowering the amount of electricity purchased from the electricity provider. Any excess power will be exported to the electricity grid via the digital meter. The is known as a “feed-in” tariff.

When there is no sunlight, the property will source power from the electricity grid as per normal.

For safety reasons, the solar power system will not operate when there is a disconnection from the electricity grid.

Schedule B: Safety Overview

The following safety instructions are important for your personal safety and for the optimum performance of the solar power system. These instructions must not be ignored.

- Observe all safety signs installed as part of the system.
- The service and maintenance of the solar power system should be carried out by a licensed electrical contractor in strict compliance with the Australian building and electrical safety rules.
- If you are not a licensed electrical contractor or a qualified person, do not attempt to make any electrical modification and/or perform maintenance work on the solar power system. Doing so may put you in danger and may also void component warranties.
- Do not attempt to clean or come into contact with the surface of a solar panel if the glass is broken. This could result in a dangerous electric shock.
- Never pour cold water on solar panel surfaces when the sun is shining and they are hot. Doing so can shatter the solar panel glass. This type of damage will not be covered by the solar panel warranty. This activity could also expose you to the danger of electrocution.
- Never walk on the surface of the solar panels. Doing so will damage the solar panel.
- Avoid working in the vicinity of the installed solar panel area when raining or wet.
- The installed solar power system generates electricity when exposed to the sun. The generated voltage is dangerous and can be fatal. The whole surface must be covered by black sheets prior to working on the system, in order to ensure that no electricity is being generated.
- Note that DC voltages will be present on the DC side of the inverter even if the isolating circuit breakers are completely switched off.
- Exercise caution when touching the inverter housing. The inverter can become hot during use. Never cover the inverter's heat sinks or vents when it is in use. Please observe the distances around the inverter as laid out in the operating instructions.
- Reoccurring tripping of the AC circuit breaker indicates a fault. Please report this fault to Energy Aware immediately.
- Do not disconnect DC plugs from the sockets of the solar panels as long as the system is feeding power into the mains. Before disconnecting the DC plug you must always disconnect AC power to the inverter.
- One of the most common causes of system breakdown is damage to the solar cables. If you come across a damaged cable or any other system defect, please report it to Energy Aware immediately so that it can be repaired.

Ground Faults

A ground fault is an accidental electrical short circuit involving the ground and one or more current-carrying conductors. Ground faults are a safety risk because they can lead to fire hazards if not cleared properly.

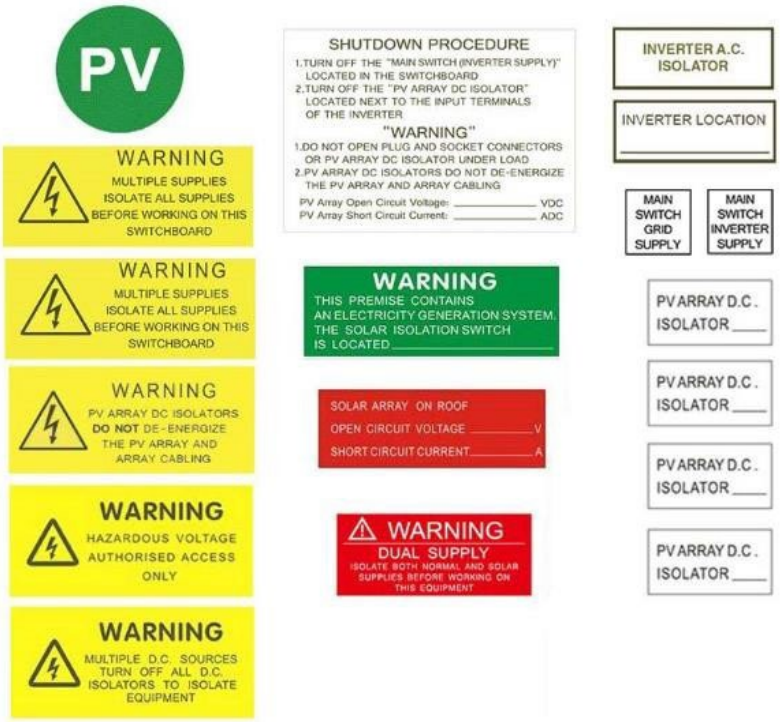
Common causes of ground faults include:

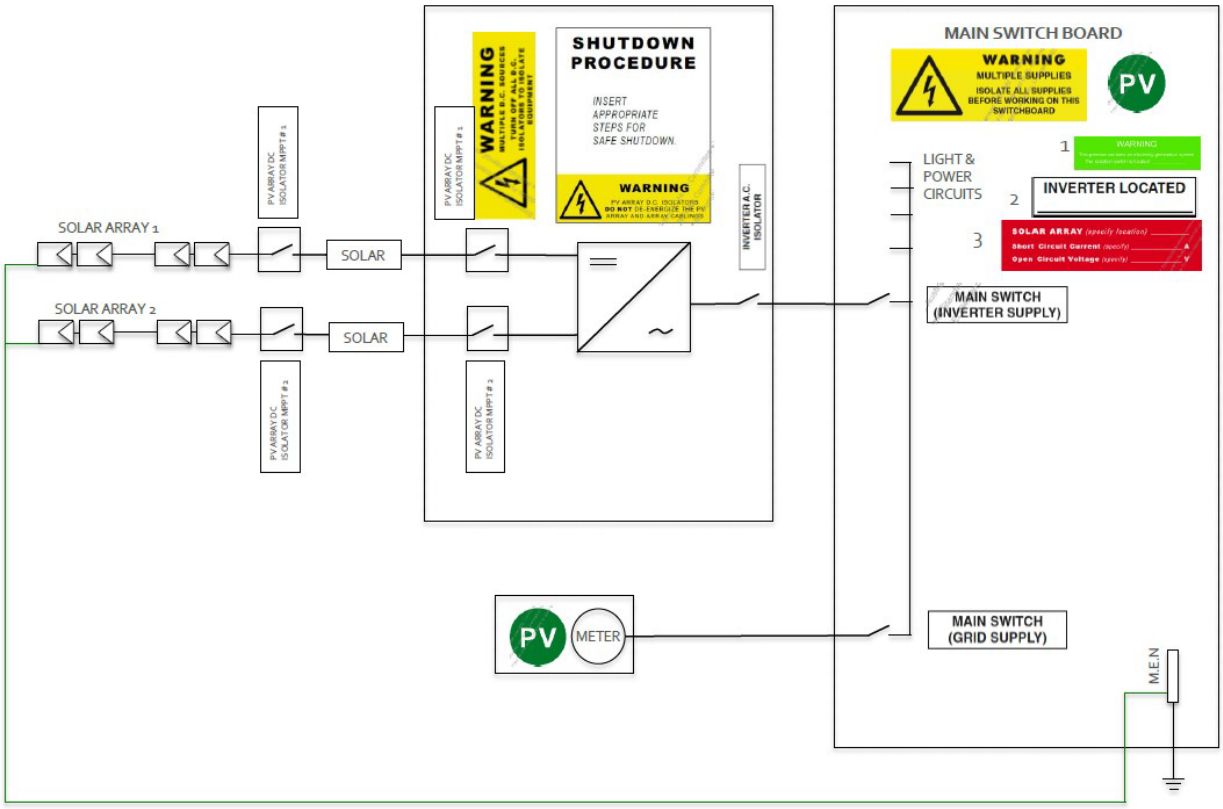
- Insulation failure of cables (eg. rodents chewing through cable insulation).
- Incidental short circuit between normal conductor and ground (eg. a cable in a junction box contacting a grounded conductor incidentally).
- Ground-faults within PV panels (eg. a solar cell short circuiting to grounded panel frames due to deteriorating encapsulation, impact damage or water corrosion).

Please refer to your inverter user manual for the error message that will be displayed in the event of a ground fault. Shutdown the system and contact Energy Aware immediately if this error message appears.

Safety Labels

Please pay attention to the following safety labels installed on site:





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Schedule C: Shutdown & Restart Procedure

To shut down your system, please follow these steps:

Step 1

Go to your switchboard and open it. Locate the 

switch and flick it to the OFF position

Step 2

If your solar power inverter is more than 3 metres away from your switchboard, you must locate the 

switch located next to your inverter. Flick it to the OFF position.

If your inverter and switchboard are within 3 metres of each other, disregard this step.

Step 3

Go to your inverter and find the 

switch (in some cases there will be two switches). Flick this switch to the OFF position.

Your solar system should be completely OFF. The inverter lights and screen displays will be dead

To active your system, please follow these steps:

Step 1

Go to your inverter and find the 

switch (in some cases there will be two switches). Flick this switch to the ON position.

Step 2

If your solar power inverter is more than 3 metres away from your switchboard, you must locate the 

switch located next to your inverter. Flick it to the ON position.

If your inverter and switchboard are within 3 metres of each other, disregard this step.

Step 3

Go to your switchboard and open it. Locate the 

switch and flick it to the ON position

Your solar system should be ON. The inverter lights and screen displays will be functioning

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Schedule D: Warranties

Equipment product sheets, user manual(s) and warranty terms and conditions can be accessed via the following link:

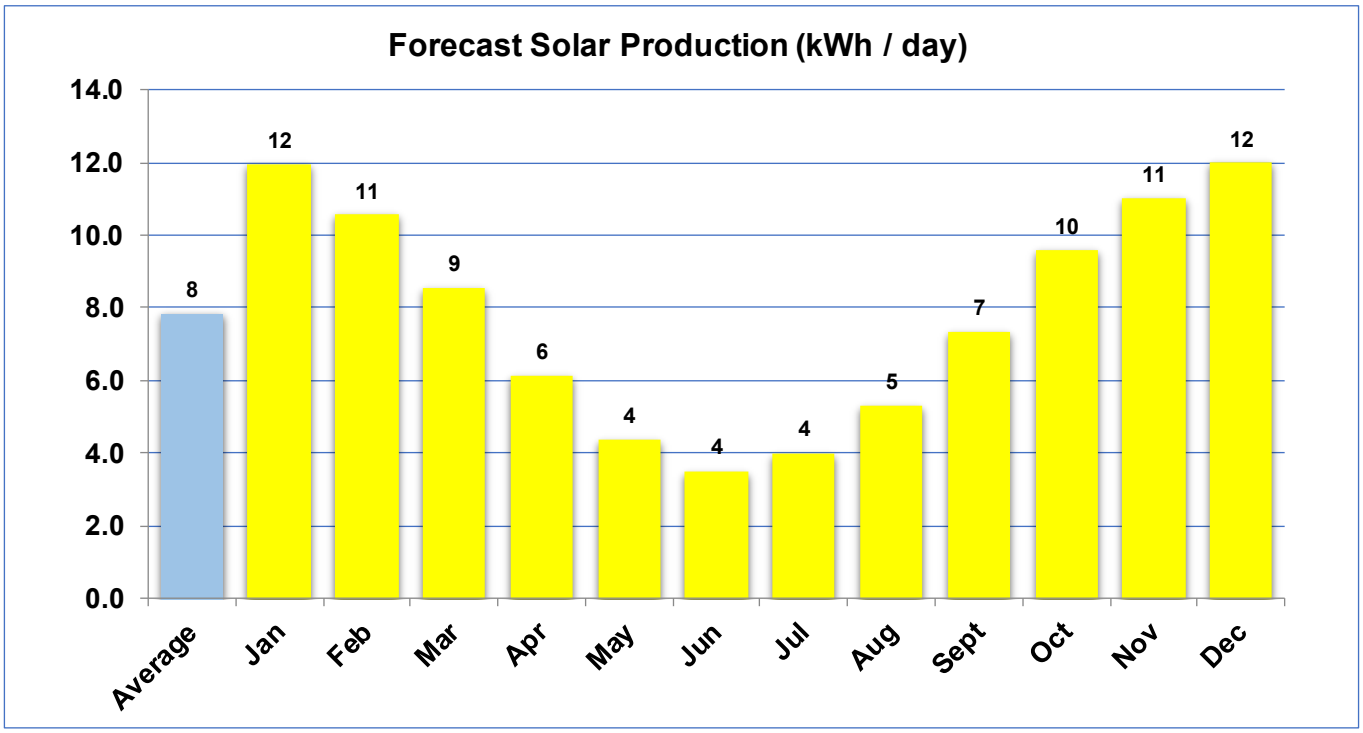
https://energyaware365.sharepoint.com/:f:/g/EiZpxzpLahxHpW6hD_X498QBSNRwewnS7GAtSZ0OAHcdqA?e=Yb28NE

The table below summarizes the warranties applicable to the solar power system.

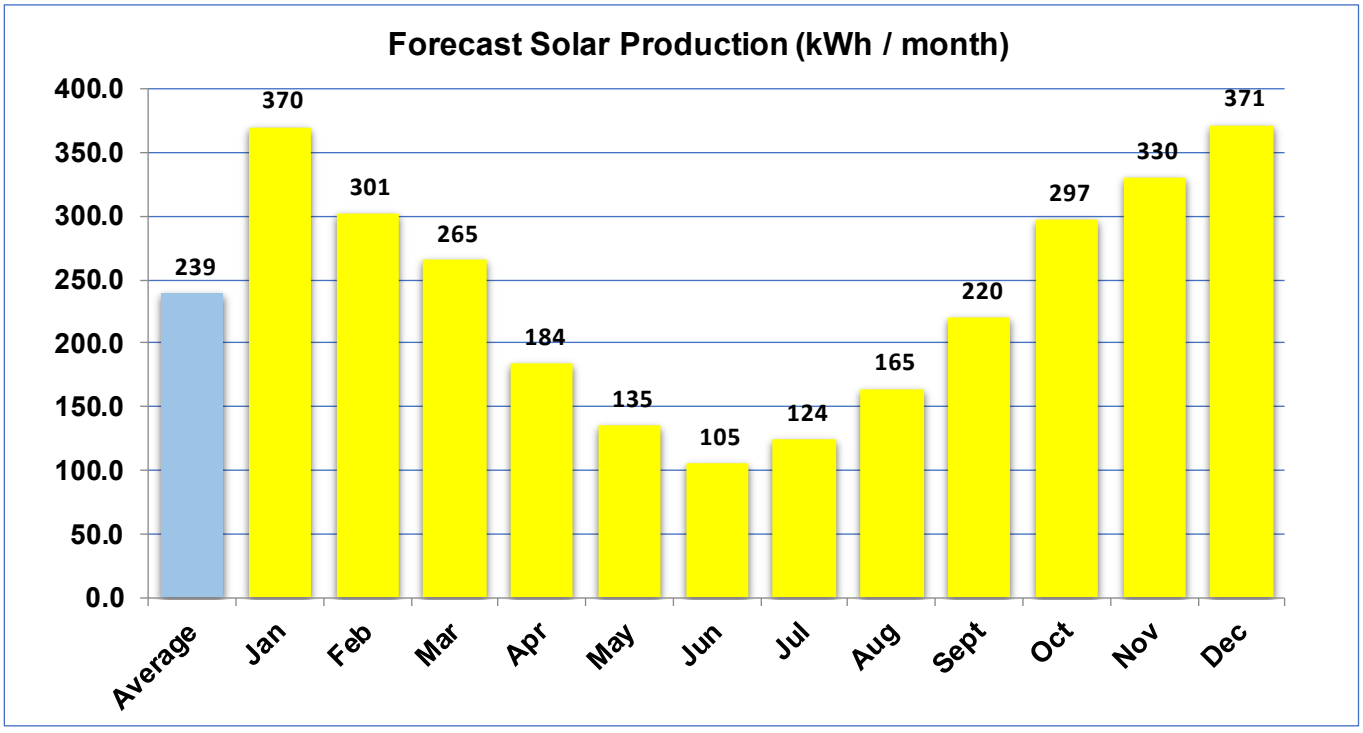
Energy Aware	Energy Aware Pty Ltd (ABN 91 712 202 060) **Phone:** 1300 658 411 **Email:** installs@energyaware.com.au **Address:** Level 2, 230 Balaclava Road Caulfield North VIC 3161	
	Whole of System Warranty	5 Years
Panels	Trina Solar Australia Pty Ltd (ABN 24 150 695 524) **Phone:** 1300 874 627 **Email:** australiaservice@trinasolar.com **Address:** Level 35, 60 Margaret Street Sydney NSW 2000	
	Power Performance Warranty	25 Years
	Product Warranty	12 Years
Inverters	Sungrow Australia Pty Ltd (ABN 73 108 633 227) **Phone:** 03 9239 8082 **Email:** tech@clenergy.com.au **Address:** Level 1, 10 Duerdin Street Clayton VIC 3168	
	Product Warranty	10 Years
Mounting System	Clenergy Australia Pty Ltd (ABN 73 108 633 227) **Phone:** 03 9239 8082 **Email:** tech@clenergy.com.au **Address:** Level 1, 10 Duerdin Street Clayton VIC 3168	
	Product Warranty	10 Years

Schedule E: Forecast Energy Production

The chart below outlines forecast daily solar production throughout the year:



The chart below outlines forecast monthly total solar production throughout the year:



Schedule F: System Monitoring

The solar power system is equipped with internet montiotring via the solar inverter(s).

The table below contains access details for the remote montoring:

Web Portal	https://service.sungrowpower.com.au/Knowledge%20Base/Monitoring-System
User Name	To be created by client. Contact engineering@energyaware.com.au to receive setup instructions
Password	To be created by client. Contact engineering@energyaware.com.au to receive setup instructions

You can also monitor the performance of your solar system by observing the LCD screen(s) on the front of the inverter(s).

Key information displayed by the inverter(s) includes:

- Current energy production
- Energy produced last 24 hours / weekly / monthly
- Energy produced since the inverter(s) has been in operation

Please refer to the inverter user manual for detailed information regarding its display contents.

With time and experience you should become familiar with the normal operating performance of the solar power system. If you suspect the system power system is underperforming (*refer Schedule F*) please contact Energy Aware.

Trouble Shooting

To trouble shoot the system please refer to the inverter user manual (*refer link in Schedule E).* In the event the inverter(s) display an error message, please follow the steps below to restore normal operations:

1. Make sure everything is switched ON (a common reason for an inverter to display an error message is because a switch or circuit breaker has been turned OFF); and
2. Shut down and then reactive the system (refer *Schedule D)*

In the event the above steps do not remove the error message, please shut down the system and contact Energy Aware.

Schedule G: Metering

Energy produced by the solar system will first be used inside the property, lowering the amount of electricity purchased from the electricity provider, and any excess energy will be exported to the electricity grid via the digital meter.

Energy Aware will arrange with the network provider for a digitial meter to be installed at the property and/or the existing digital meter to be configured to measure the amount of electricity export to the electricity grid.

Metering details are contained in the table below:

National Meter Identifier	70013550430
Network Provider	Evo Energy

The amount of electricity exported to the electricity grid can be observed from the LCD screen on the front of the meter. Key information displayed on the screen will include:

- Total energy exported to the electricity grid.
- Total energy imported from the electricity grid

Please contact the network provider for information regarding the use and operation of the digital meter.

Schedule H: Maintenance

Frequency of maintenance as per *AS/NZ 5033:2021* is recommended:

Component	Maintenance Action	Frequency	Remarks
Site	Verify: (a) Cleanliness (accumulation of debris around and/or under array (b) No shading of array	Quarterly	Clean site as required Trim Trees
PV Modules	Verify cleanliness (accumulation of dust or fungus on array)	Quarterly	Clean if necessary
	Check for visual defects including: (a) Fractures (b) Browning (c) Moisture Penetration (d) Frame corrosion	1 year	Modules with visual defects should be further inspected for performance and safety to determine the need for replacement.
	Inspect junction boxes for: (a) tightness of connections (b) water accumulation/build up (c) integrity of lid seals (d) integrity of cable entrance, glands and / or conduit sealing; (e) integrity of clamping devices Verify bypass diodes	1 year	Any defective seals, clamps and bypass diodes should be replaced
Wiring Installation	Verify mechanical integrity of conduits.	5 year	Any damaged conduit should be replaced
	Verify insulation integrity of cables installed without conduit.	5 year	Any damaged cable should be replaced
	Check junction boxes for: (a) tightness of connections (b) water accumulation/build up (c) integrity of lid seals (d) integrity of cable entrance, glands and/or conduit sealing (e) integrity of clamping devices Verify : (a) blocking diodes (b) surge arrestors for degradation		Any defective seals, clamps and bypass diodes should be replaced
	Check connections for: (a) tightness of connections (b) corrosion		
Electrical Characteristics	Measure open circuit voltages	1 year	
	Measure short circuit voltages	1 year	
Protective Devices	Verify integrity of fuses	1 year	
	Verify operation of CB and RCD's	1 year	
	Verify operation of earth fault protection system	1 year	
	Verify operation of solar array isolation device	1 year	
Mounting Structures	Verify tightness and integrity of bolts and other fastening devices	1 year	
	Inspect for corrosion	5 year	

Below are sample Checklists that can be kept on file and provided to any electrician engaged to perform system maintenance:

Maintenance Checklist (1)

1. Maintenance Technician(s)

CEC Number:

Name:

_____

Signature

Electrician Number:

Name:

_____

Signature

Date:

2. System Description

Customer:

Address:

Modules

Type: _____

Size: _____W

Total Qty: _____ modules

Total Capacity: _____ kW

Inverters

Type: _____

Size: _____kW

Total Qty: _____ inverters

3. Site

	Check
Cleanliness	☐
No Shading	☐
Maintenance Photos	☐

4. Mounting Structures

	Check
Secure to Roof	☐
Panels Level	☐
Clamps Secure	☐
Earthing	☐
No Corrosion	☐
Penetrations Waterproofed	☐
Cabling Secured	☐
Mechanical Protection	☐

Maintenance Checklist (2)

Multiple sheets if multiple inverters

Time of Day:

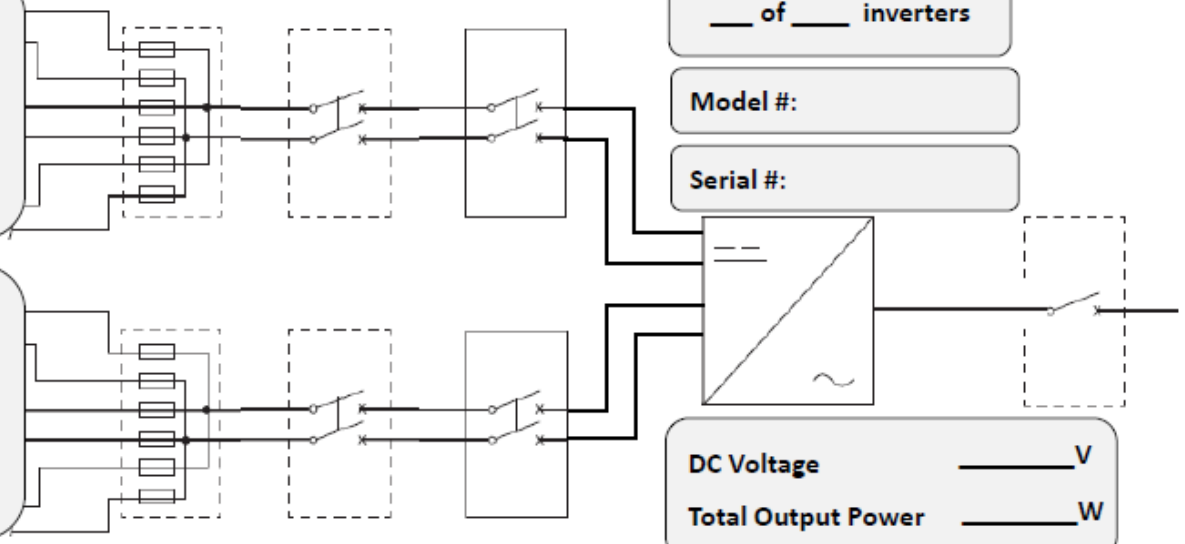
Weather:

	6. String Fuses	7. Array DC Isolator(s)	8. Main DC Isolator(s)	9. Solar Inverter	10. AC Isolator(s)
	Check	Check	Check	Check	Check
Operation	☐	☐	☐	☐	☐
Weatherproof	☐	☐	☐	☐	☐
No heat stress	☐	☐	☐	☐	☐
Ventilation	☐	☐	☐	☐	☐
Labelling	☐	☐	☐	☐	☐

5. Solar PV Arrays

MPPT 1	Open Circuit Voltage	Open Circuit Current
String 1	_____V	_____A
String 2	_____V	_____A
String 3	_____V	_____A

MPPT 2	Open Circuit Voltage	Open Circuit Current
String 1	_____V	_____A
String 2	_____V	_____A
String 3	_____V	_____A



___ of ___ inverters

Model #:

Serial #:

DC Voltage _____V

Total Output Power _____W

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Maintenance Checklist (3)

11. PV-DB

	Check
Operation AC Isolator(s)	☐
Operation Main Switch	☐
Operation Mains Relay	☐
Operation Export Meter	☐
Weatherproof	☐
No heat stress	☐
Ventilation	☐
Labelling	☐

12. DB

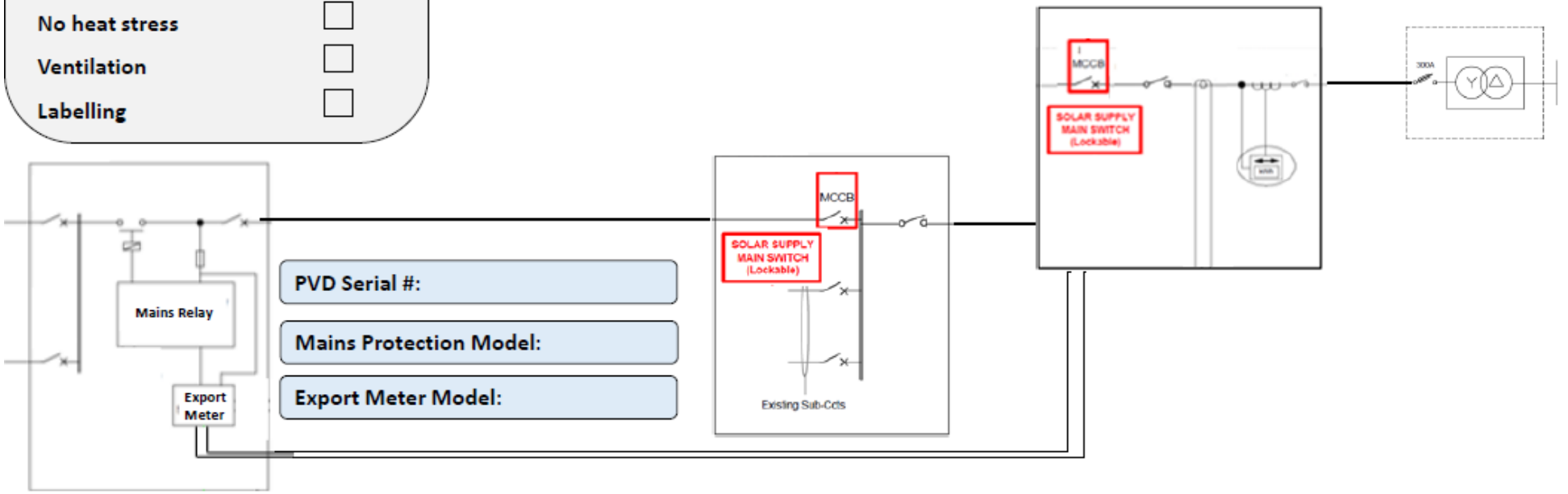
13. MSB

	Check	Check
Operation Solar Switch	☐	☐
No heat stress	☐	☐
Labelling	☐	☐

14. Meter Panel

NMI #:

15. Transformer



PVD Serial #:

Mains Protection Model:

Export Meter Model:

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Maintenance Checklist (4)

17. Comments

Fault Description	Action Description	Completion Date	Notes

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Maintenance Checklist (5)

16. Comments

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