INSTALLATION REQUIREMENTS FOR ALTERATIONS, ADDITIONS, REPAIRS AND UPGRADES TO EXISTING GRID-CONNECTED PV ARRAYS

CLEAN ENERGY COUNCIL ACCREDITED INSTALLER

CLEAN ENERGY COUNCIL
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1 GENERAL

The requirements set out in this document address typical alterations to solar installations and are not intended to address every example.

New solar power installations must be compliant with AS/NZS 3000:2007 A1+A2 and the additional requirements of AS/NZS 5033 and AS/NZS 4777 as in force.

Alteration, addition or repair must be compliant with AS/NZS 3000:2007 A1 + A2 Clause 1.9.3.

The electrical worker/contractor must always assess the installation they are working on and:

- apply all relevant requirements within the applicable standards
- install equipment in line with manufacturer requirements
- follow state WorkSafe requirements
- issue the appropriate electrical safety certificate

Please be aware that existing PV systems may not be installed correctly or compliant with standards.

Note: The information provided here is intended to provide guidance on the electrical safety requirement associated with additions, alterations, repairs and upgrades to existing systems.

It does not provide information regarding the implications to Feed In Tariffs (FiTs), DNSP requirements, and STC eligibility.

For FiTs see your state based administrator.

For DNSP requirements contact the DNSP that is supplying the property where the work will be performed.

For STC eligibility contact the Clean Energy Regulator.

This document has been compiled with input of all state and territory electrical regulators.

Some state or territory regulators may put out their own guidance on PV systems upgrade. Please refer to you specific regulator if your situation is not covered.

- **Tasmania - http://www.justice.tas.gov.au/**
- **Victoria - http://www.esv.vic.gov.au/Electricity-Professionals**
- **NSW - http://www.fairtrading.nsw.gov.au**
- **Qld - https://www.worksafe.qld.gov.au/electricalsafety**
- **SA - https://www.sa.gov.au/**
- **WA - https://www.commerce.wa.gov.au/energysafety**
- **NT - http://www.worksafe.nt.gov.au/**

2 COMMON REQUIREMENTS THAT APPLY TO EXISTING SOLAR INSTALLATIONS WHEN ALTERED, ADDED TO OR RE-CONFIGURED

a. All existing and new panels shall be connected to the installation's earthing system. This requirement is to prevent the possibility of voltage gradients and creates a safer installation. Reference Equipotential Bonding – Clause 5.6 of AS/NZS 3000:2007 – Wiring Rules.

b. String wiring must be installed as per AS/NZS 5033:2014 – Installation and safety requirements for photovoltaic (PV) arrays.

c. Plastic cable ties cannot be used as primary support to new and existing work as per AS/NZS 5033:2014 – Installation and safety requirements for photovoltaic (PV) arrays.

d. Remedial action is to be taken where existing isolating devices are identified as:

   i) not having the correct voltage rating as per clause 4.3.1 of AS/NZS 5033:2014
   ii) not correctly wired for a polarised circuit breaker or rated for ac voltage only
   iii) having an enclosure not protected against UV or has degraded
   iv) having an enclosure not installed as required by the manufacturer to maintain the IP rating
   v) not having the correct current rating (ISC x 1.25).
   vi) verify the isolator is correct and rated accounting for temperature de-rating
   vii) recalled products shall be replaced
      (1) https://www.productsafety.gov.au/recalls
      (2) http://www.solaraccreditation.com.au/products/product-recalls.html

e. Existing cables that are suitably rated for purpose, and cables that complied with the minimum requirements of the standard at the time of installation that are not relocated, are not required to be reinstalled in heavy duty (HD) conduit.

f. When existing wiring is relocated or upgraded, the requirements of AS/NZS 5033:2014 – Installation and safety requirements for photovoltaic (PV) arrays and AS/NZS 3000:2007 – Wiring Rules apply.

g. Where TPS cables are installed between the solar array and the inverter, and the solar array is reconfigured or added to, or relocated or upgraded, the TPS cable shall be replaced with suitably rated dc cable, tinned copper, installed in accordance with AS/NZS 5033:2014 – Installation and safety requirements for photovoltaic (PV) arrays.

3 SOLAR PANEL REQUIREMENTS

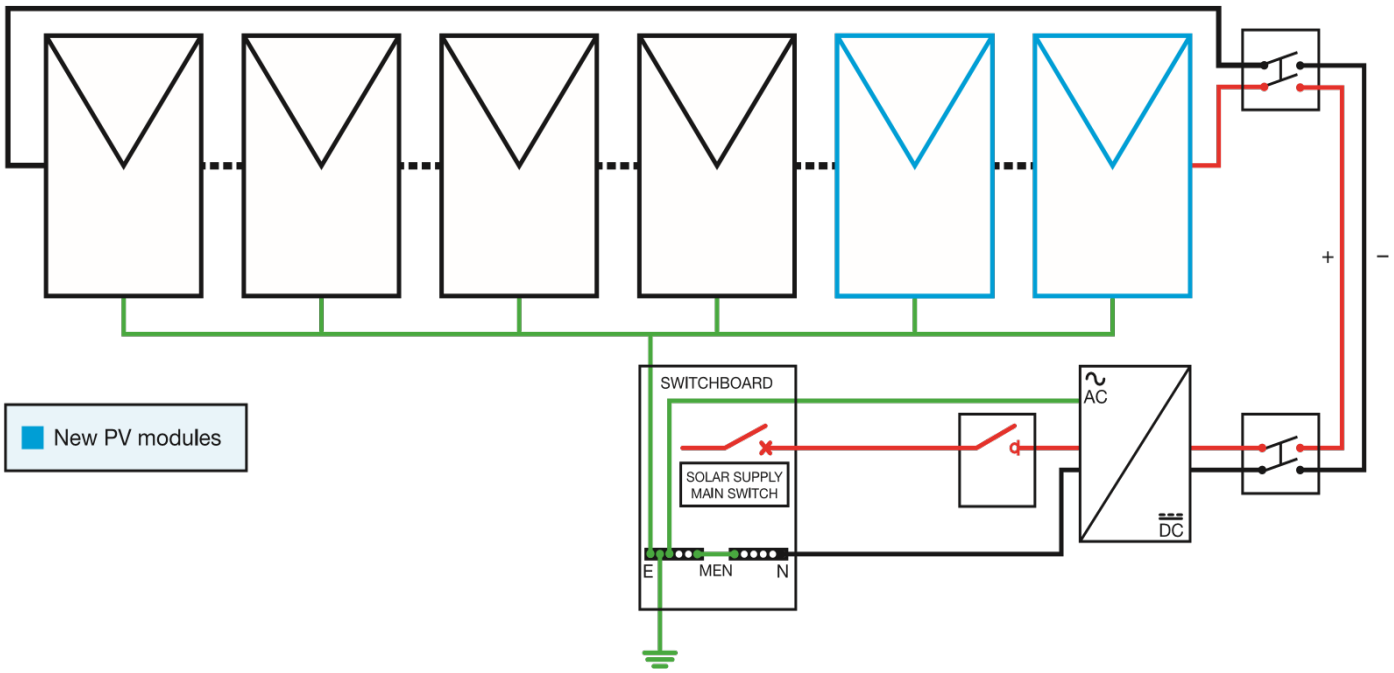
This section relates to alterations of the PV modules. If the inverter is also replaced / upgraded; the requirements in the inverter section will also need to be followed.

When the size of the array is changed the electrical contractor shall ensure:

- all components that are not upgraded shall be rated correctly for the voltage and / or current (e.g. wiring)
- Voltage drop should not exceed 3%

3.1 EXAMPLE 1 – Extending existing array

Adding PV modules to an existing PV array (e.g. 2 new PV modules are connected in series to an existing string of 4 PV modules).



This is an alteration/addition in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

- The new PV modules shall have a Fire Safety Class C or higher rating (i.e. for building mounted modules) in accordance with clause 4.3.2.1 of AS/NZS 5033:2014.

- The ‘existing’ and ‘new’ PV modules shall be earthed in accordance with clause 4.4.2.1 of AS/NZS 5033:2014.

- If there is an existing switch-disconnector it is shall be verified that it is rated correctly in accordance with Appendix B2 of AS/NZS 5033:2014.

- A PV array switch disconnector shall be installed adjacent to the PV array in accordance with clause 4.4.1.5 of AS/NZS 5033:2014. The PV array switch-disconnector shall be correctly rated for the new PV array maximum voltage in accordance with Appendix B2 of AS/NZS 5033:2014.

  Ensure all existing switch-disconnectors (if used) are rated correctly.

  New PV array switch disconnector shall be installed in accordance with CEC installation guidelines section 7.10 (e.g. additional shroud, no open ends of conduit, etc.).

- All new cables shall comply with the installation requirements of clause 4.3.6 of AS/NZS 5033:2014 (e.g. cables certified to PV1-F, UL 4703 or VDE-AR-E 2283-4, UV-resistant, flexible multi-stranded, durable cable support systems etc.).

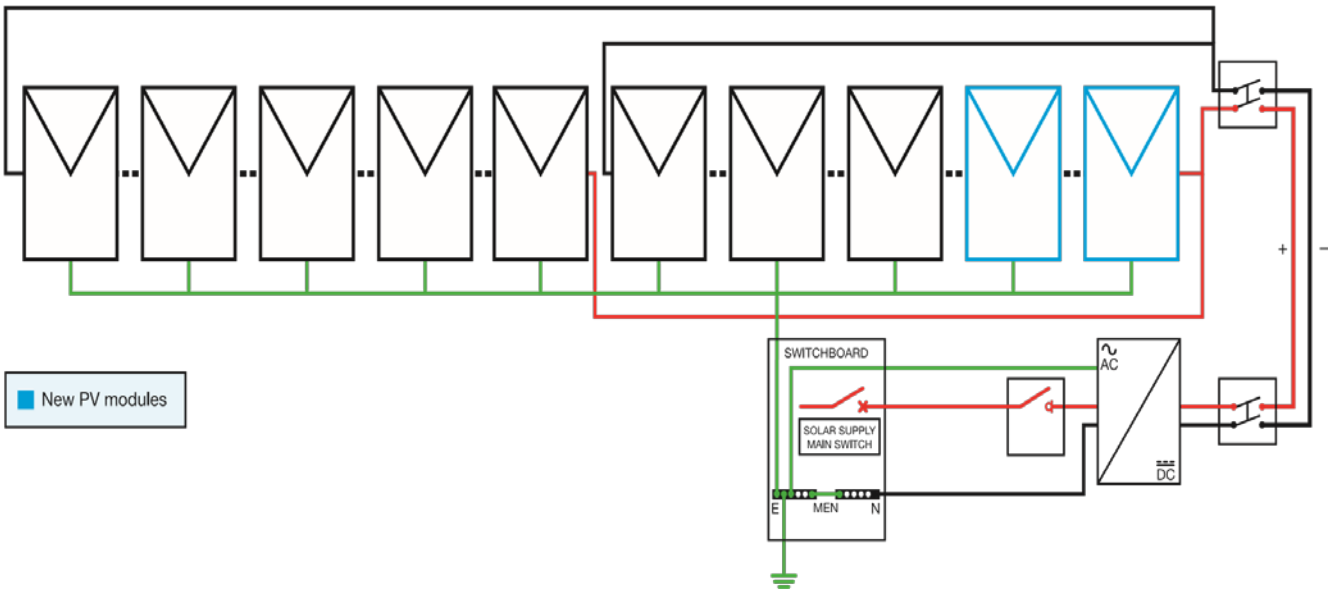
  Note: If the existing PV array cable was installed in accordance with AS/NZS 5033:2005 (i.e. previous PV array standard) and will still be operating within its maximum voltage and current rating following the upgrade, it does not necessarily need to be upgraded, or installed in HD conduit within the building (however it should be recommended to the customer).

  Where cable is not DC rated, tinned copper it is shall be upgraded and installed in accordance with AS/NZS 5033:2014.

- The Fire Emergency Information (i.e. open circuit voltage/short circuit current) shall be updated – see clause 5.4 of AS/NZS 5033:2014. The open circuit voltage has increased in this example.

3.2 EXAMPLE 2 – Adding panels and re-configuring array

An existing string of 8 PV modules is reconfigured with an additional 2 PV modules, then divided into two strings of 5 PV modules connected in parallel at the array.



This is an alteration/addition in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

- The new PV modules shall have a Fire Safety Class C or higher rating (i.e. for building mounted modules) in accordance with clause 4.3.2.1 of AS/NZS 5033:2014.
- If there is an existing switch-disconnector it is shall be verified that it is rated correctly in accordance with Appendix B2 of AS/NZS 5033:2014.
- The ‘existing’ and ‘new’ PV modules shall be earthed in accordance with clause 4.4.2.1 of AS/NZS 5033:2014.
- A PV array switch disconnector shall be installed adjacent to the PV array in accordance with clause 4.4.1.5 of AS/NZS 5033:2014. The PV array switch-disconnector shall be correctly rated for the new PV array maximum voltage in accordance with Appendix B2 of AS/NZS 5033:2014.

  Ensure all existing switch-disconnectors (if used) are rated correctly.

  New PV Array switch disconnector shall be installed in accordance with CEC installation guidelines section 7.10 (e.g. additional shroud, no open ends of conduit, etc.).

- All new cables shall comply with the installation requirements of clause 4.3.6 of AS/NZS 5033:2014 (e.g. cables certified to PV1-F, UL 4703 or VDE-AR-E 2283-4, UV-resistant, flexible multi-stranded, durable cable support systems etc.).

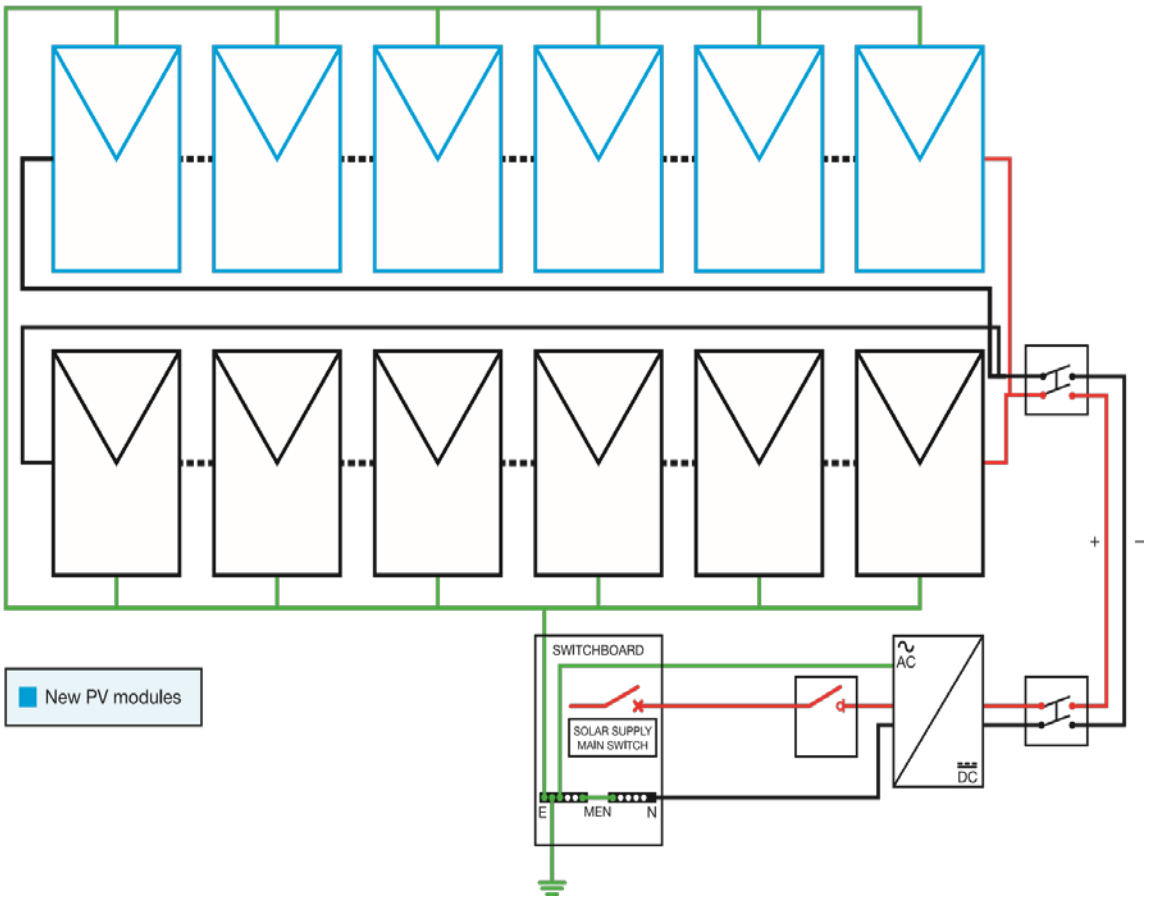
  Note: If the existing PV array cable was installed in accordance with AS/NZS 5033:2005 (i.e. previous PV array standard) and will still be operating within its maximum voltage and current rating following the upgrade, it does not necessarily need to be upgraded, or installed in HD conduit within the building (it should be recommended to the customer).

  Where cable is not DC rated, tinned copper it is shall be upgraded and installed in accordance with AS/NZS 5033:2014

- The Fire Emergency Information (i.e. open circuit voltage/short circuit current) shall be updated – see clause 5.4 of AS/NZS 5033:2014. The open circuit voltage has decreased and short circuit current has increased in this example.

3.3 EXAMPLE 3 – Adding a parallel string

A new string of PV modules is connected in parallel (at the array) to an existing string of PV modules.



This is an alteration/addition in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

- The new PV modules shall have a Fire Safety Class C or higher rating (i.e. for building mounted modules) in accordance with clause 4.3.2.1 of AS/NZS 5033:2014.
- The ‘existing’ and ‘new’ PV modules shall be earthed in accordance with clause 4.4.2.1 of AS/NZS 5033:2014.
- If there is an existing switch-disconnector it is shall be verified that it is rated correctly in accordance with Appendix B2 of AS/NZS 5033:2014.
- A PV array switch disconnector shall be installed adjacent to the PV array in accordance with clause 4.4.1.5 of AS/NZS 5033:2014. The PV array switch-

disconnector shall be correctly rated for the new PV array maximum voltage in accordance with Appendix B2 of AS/NZS 5033:2014. Ensure all existing switch-disconnectors (if used) are rated correctly.

New PV Array switch disconnector shall be installed in accordance with CEC installation guidelines section 7.10 (e.g. additional shroud, no open ends of conduit, etc.).

- All new cables shall comply with the installation requirements of clause 4.3.6 of AS/NZS 5033:2014 (e.g. cables certified to PV1-F, UL 4703 or VDE-AR-E 2283-4, UV-resistant, flexible multistranded, durable cable support systems etc.).

  Note: If the existing PV array cable was installed in accordance with AS/NZS 5033:2005 (i.e. previous PV array standard) and will still be operating within its maximum voltage and current rating following the upgrade, it does not necessarily need to be upgraded, or installed in HD conduit within the building (it should be recommended to the customer).

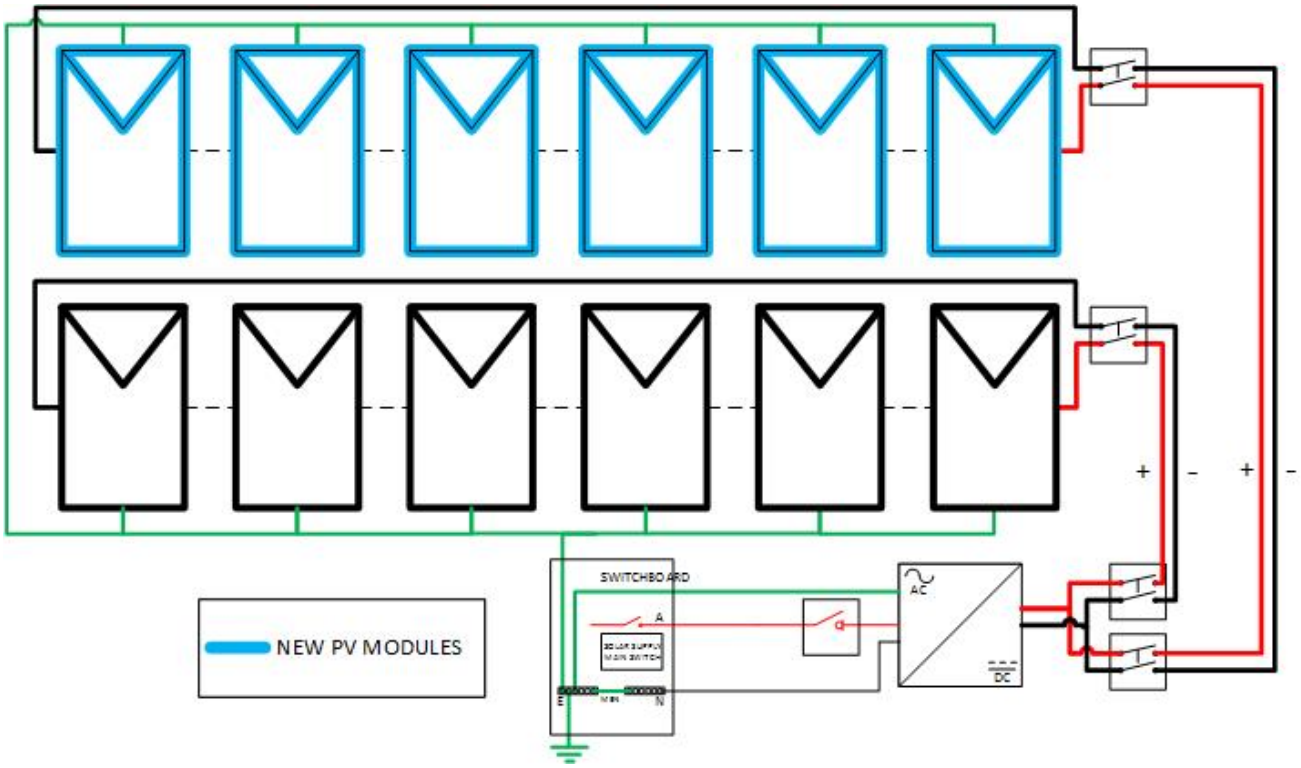
  Where cable is not DC rated, tinned copper it is shall be upgraded and installed in accordance with AS/NZS 5033:2014

- The Fire Emergency Information (i.e. open circuit voltage/short circuit current) shall be updated – see clause 5.4 of AS/NZS 5033:2014. The short circuit current has increased in this example.

- Voc of each string is within 5% (Cl. 2.1.6 AS/NZS5033:2014)

3.4 EXAMPLE 4 – New string to a single MPPT inverter

A new string of PV modules is connected directly to an existing single MPPT inverter.



This is an alteration/addition in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

- The new PV modules shall have a Fire Safety Class C or higher rating (i.e. for building mounted modules) in accordance with clause 4.3.2.1 of AS/NZS 5033:2014.
- The 'existing' and 'new' PV modules shall be earthed in accordance with clause 4.4.2.1 of AS/NZS 5033:2014.
- If there is an existing switch-disconnector is shall be verified that it is rated correctly in accordance with Appendix B2 of AS/NZS 5033:2014.
- A switch-disconnector shall be installed adjacent to the new PV array and the inverter in accordance with clause 4.4.1 of AS/NZS 5033:2014. The PV array switch-disconnectors shall be correctly rated for the new PV array maximum voltage in accordance with Appendix B2 of AS/NZS 5033:2014.

  New PV Array switch disconnector shall be installed in accordance with CEC

installation guidelines section 7.10 (e.g. additional shroud, no open ends of conduit, etc.).

Note: If the existing array does not have a switch disconnector installed adjacent to the array one shall be installed. The PV array switch-disconnectors shall be correctly rated for the new PV array maximum voltage in accordance with Appendix B2 of AS/NZS 5033:2014.

- All new cables shall comply with the installation requirements of clause 4.3.6 of AS/NZS 5033:2014 (e.g. cables certified to PV1-F, UL 4703 or VDE-AR-E 2283-4, UV-resistant, flexible multistranded, durable cable support systems etc.).

  Note: If the existing PV array cable was installed in accordance with AS/NZS 5033:2005 (i.e. previous PV array standard) it does not necessarily need to be upgraded, or installed in HD conduit within the building (it should be recommended to the customer).

  Where cable is not DC rated, tinned copper it is shall be upgraded and installed in accordance with AS/NZS 5033:2014.

- All new cables installed within the building, shall be installed in accordance with clause 4.3.6.3.2 of AS/NZS 5033:2014 (i.e. cables enclosed within heavy-duty insulating conduit).

  Note: If the existing PV array cable (i.e. existing PV string) was installed in accordance with AS/NZS 5033:2005 (i.e. previous PV array standard) and will still be operating within its maximum voltage and current rating following the upgrade, it does not necessarily need to be upgraded and installed in HD conduit within the building (it can be recommended to the customer).

- If the existing D.C. isolating switches are polarity sensitive and are connected to the same MPPT input as the new PV string, then the polarity sensitive switches shall be replaced with switch disconnectors in accordance with clauses 4.4.1 & 4.3.5.2 of AS/NZS 5033:2014 that are not polarity sensitive.

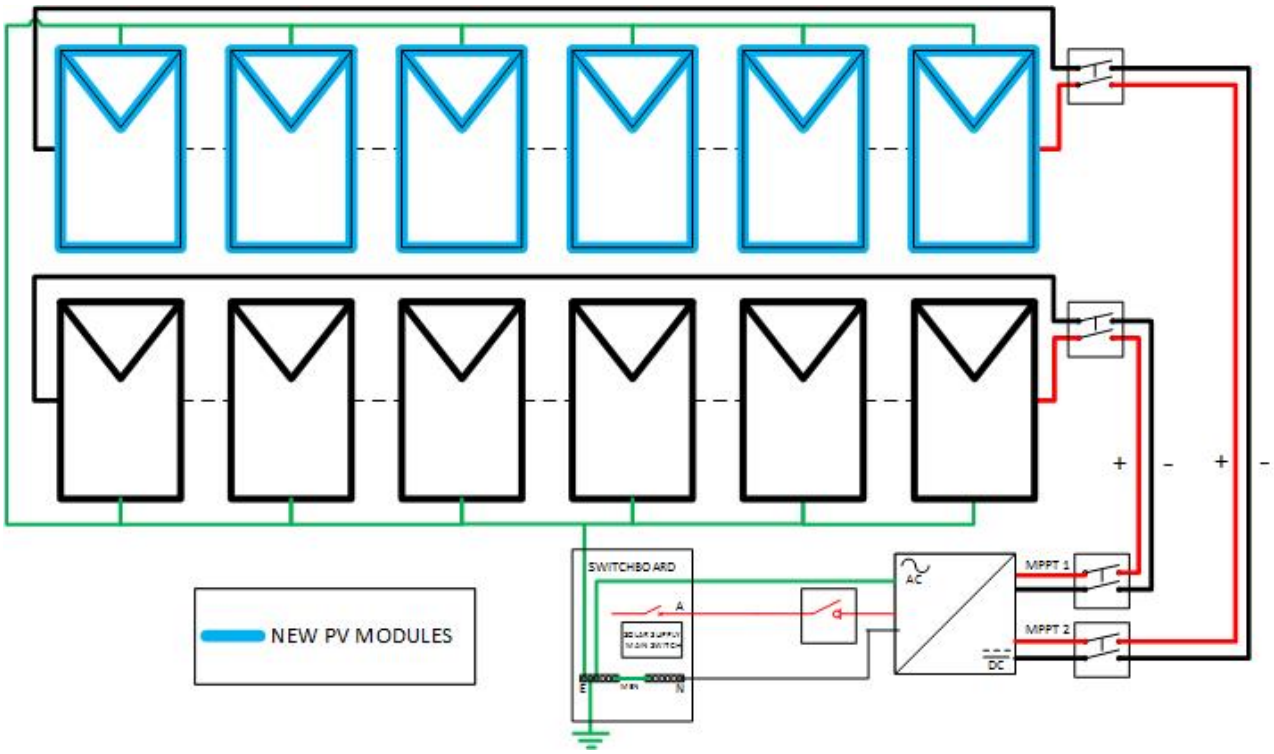
- Where the addition of a new PV string results in 3 or more PV strings connected in parallel (e.g. via the same MPPT input), then the ‘minimum current carrying capacity’ of all components (e.g. existing cabling, switches etc.) in the PV array must be reassessed in accordance with clause 4.3.1(c) and Table 4.2 of AS/ NZS 5033:2014 and upgraded accordingly where required. String overcurrent protection shall be installed if required in accordance with clause 3.3.4 of AS/NZS 5033:2014.

- The Fire Emergency Information (i.e. short circuit current) shall be updated – see clause 5.4 of AS/NZS 5033:2014.

- Voc of each string is within 5% (Cl. 2.1.6 AS/NZS 5033:2014)

3.5 EXAMPLE 5 – New string to new MPPT input

A new string of PV modules is connected directly to an existing inverter to an unused MPPT



This is an alteration/addition in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

- The new PV modules shall have a Fire Safety Class C or higher rating (i.e. for building mounted modules) in accordance with clause 4.3.2.1 of AS/NZS 5033:2014.

- The 'existing' and 'new' PV modules shall be earthed in accordance with clause 4.4.2.1 of AS/NZS 5033:2014.

- If there is an existing switch-disconnector is shall be verified that it is rated correctly in accordance with Appendix B2 of AS/NZS 5033:2014.

- A switch-disconnector shall be installed adjacent to the new PV array and the inverter in accordance with clause 4.4.1 of AS/NZS 5033:2014. The PV array switch-disconnectors shall be correctly rated for the new PV array maximum voltage in accordance with Appendix B2 of AS/NZS 5033:2014.

  New PV Array switch disconnector shall be installed in accordance with CEC installation guidelines section 7.10 (e.g. additional shroud, no open ends of conduit, etc.).

  Note: If the existing array does not have a switch disconnector installed adjacent to the array one shall be installed. The PV array switch-disconnectors shall be correctly rated for the new PV array maximum voltage in accordance with Appendix B2 of AS/NZS 5033:2014.

- All new cables shall comply with the installation requirements of clause 4.3.6 of AS/NZS 5033:2014 (e.g. cables certified to PV1-F, UL 4703 or VDE-AR-E 2283-4, UV-resistant, flexible multistranded, durable cable support systems etc.).

  Note: If the existing PV array cable was installed in accordance with AS/NZS 5033:2005 (i.e. previous PV array standard) it does not necessarily need to be upgraded, or installed in HD conduit within the building (it should be recommended to the customer).

  Where cable is not DC rated, tinned copper it is shall be upgraded and installed in accordance with AS/NZS 5033:2014.

- If the new cables are installed within the building, they shall be installed in accordance with clause 4.3.6.3.2 of AS/NZS 5033:2014 (i.e. cables enclosed within heavy-duty insulating conduit).

  Note: If the existing PV array cable (i.e. existing PV string) was installed in accordance with AS/NZS 5033:2005 (i.e. previous PV array standard) and will still be operating within its maximum voltage and current rating following the upgrade, it does not necessarily need to be upgraded and installed in HD conduit within the building (it can be recommended to the customer).

- The Fire Emergency Information (i.e. open circuit voltage/short circuit current) shall be updated – see clause 5.4 of AS/NZS 5033:2014. In the this example, if each string is connected to a separate MPPT input, then each string is treated as a separate PV array; therefore the open circuit voltage/short circuit current details must be provided for each PV array.

3.6 EXAMPLE 6 – Replacement module

PV module replacement using an equal/higher wattage rated module.

This work can be treated as a repair in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

If a higher wattage rated PV module is used to replace a faulty module (e.g. 175 watt module is replaced with a 180 watt module with similar electrical specifications) then no further works are necessarily required.

Note: Clause 2.1.6 of AS/NZS 5033:2014 requires that all PV modules connected to the same PCE MPPT input 'should' have similar rated electrical characteristics including; short circuit current, open circuit voltage, maximum power current, maximum power voltage, rated power, temperature coefficients etc.

Install PV module/s in accordance with manufacturer's instructions, as required by clause 1.7.1(c) of AS/NZS 3000:2007 Wiring Rules. Refer to manufacturer's instructions/recommendations where different brands/models of PV modules are connected to the same MPPT input.

3.7 EXAMPLE 7 – Removing modules and re-instating in the same location

PV modules removed from roof and then reinstalled in same location (e.g. where roofing material is replaced/repaired).

This work can be treated as a repair in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

Where the existing PV system was originally installed in accordance with a now superseded standard (e.g. AS/NZS 5033:2005), the electrical contractor should inform the customer of the latest technical and safety requirements of the current AS/NZS 5033:2014 standard, and adopt all relevant installation requirements where possible.

VICTORIAN ONLY REQUIREMENT

This work is an alteration in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

Where the existing PV system was originally installed in accordance with a now superseded standard (e.g. AS/NZS 5033:2005), the electrical contractor shall reinstall using the latest technical and safety requirements of the current AS/NZS 5033:2014 standard, and adopt all relevant installation requirements.

3.8 EXAMPLE 8 – Removing modules and relocating in a different location on the same building

Relocation on the same building of existing PV modules that do not have a Fire Safety Class C or higher rating.

This work is an alteration in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

The alteration works shall comply with all the relevant requirements of AS/NZS 5033:2014 (e.g. earthing, cabling requirements, isolation etc.).

The existing PV modules may be used on the same building only, provided the electrical contractor can ensure that the risk of fire propagation is minimal. The following are some factors that need to be considered:

- Type of roofing material – PV modules mounted on a tiled roof would be considered lower risk versus a tin roof with timber battens.

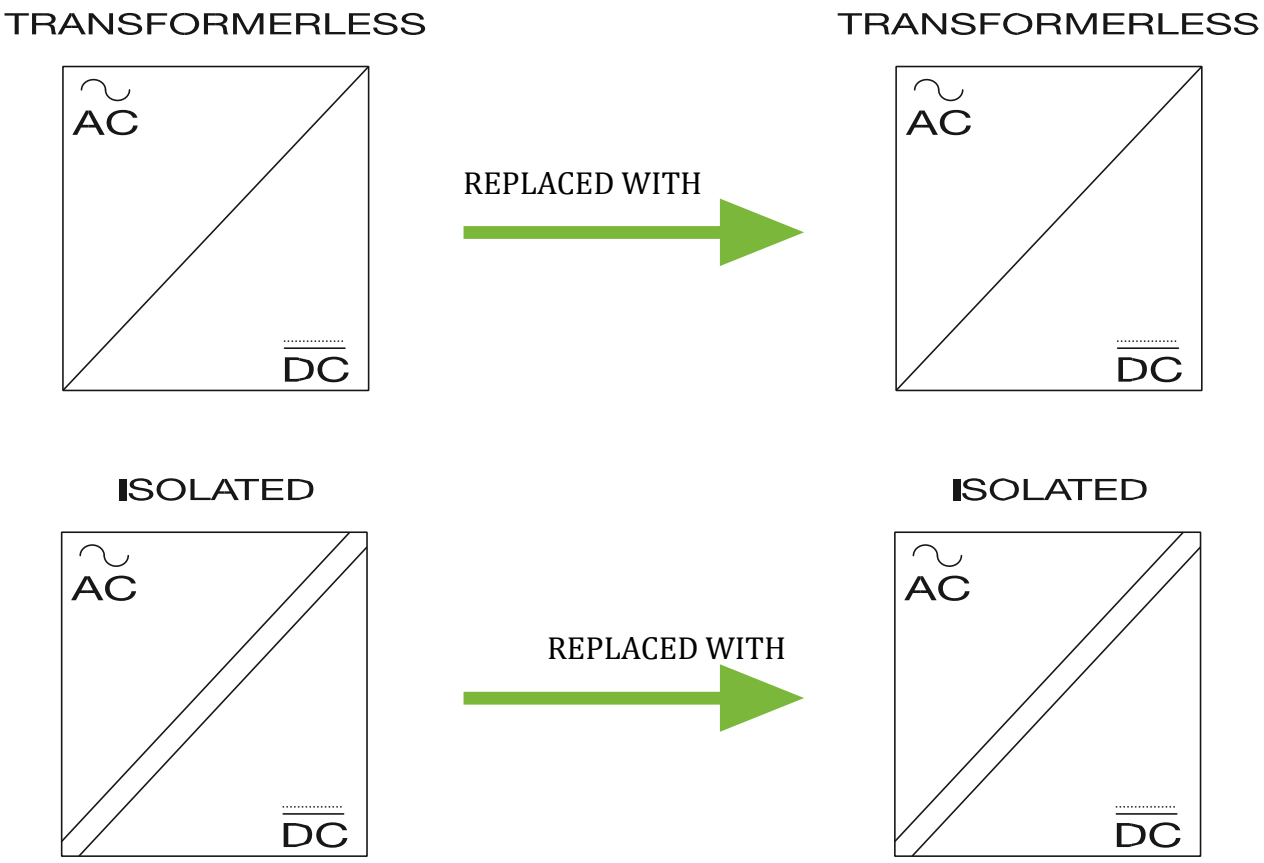
- PV module wiring configuration – multiple strings of PV modules connected in parallel would be considered higher risk under fault conditions (e.g. reverse currents back-feeding into damaged PV module).

Build-up of combustible materials – e.g. regular build-up of leaves/combustible debris on the roof would be considered higher risk.

4 INVERTER REQUIREMENTS - REPAIRING OR UPGRADES

This section relates to alterations of the inverter. If the PV modules are also replaced / upgrades the requirements in the PV modules section will also need to be followed.

4.1 EXAMPLE 1 – Inverter has failed and needs to be replaced with invertor of same topology



This is repair in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

- If an existing inverter is replaced with an inverter with the same electrical specification (power output, topology as, equal to or greater than input voltage and input current) it can be replaced without any additional requirement provided the replacement inverter is installed as per the requirements and installation instructions of the new inverter manufacturer as required by clause 1.7.1(c) of AS/NZS 3000:2007 Wiring Rules.

Does the installer need to implement an external earth fault alarm?

No, the replacement would not be inferior to what was installed although if the functionality is available it should be recommended to the customer.

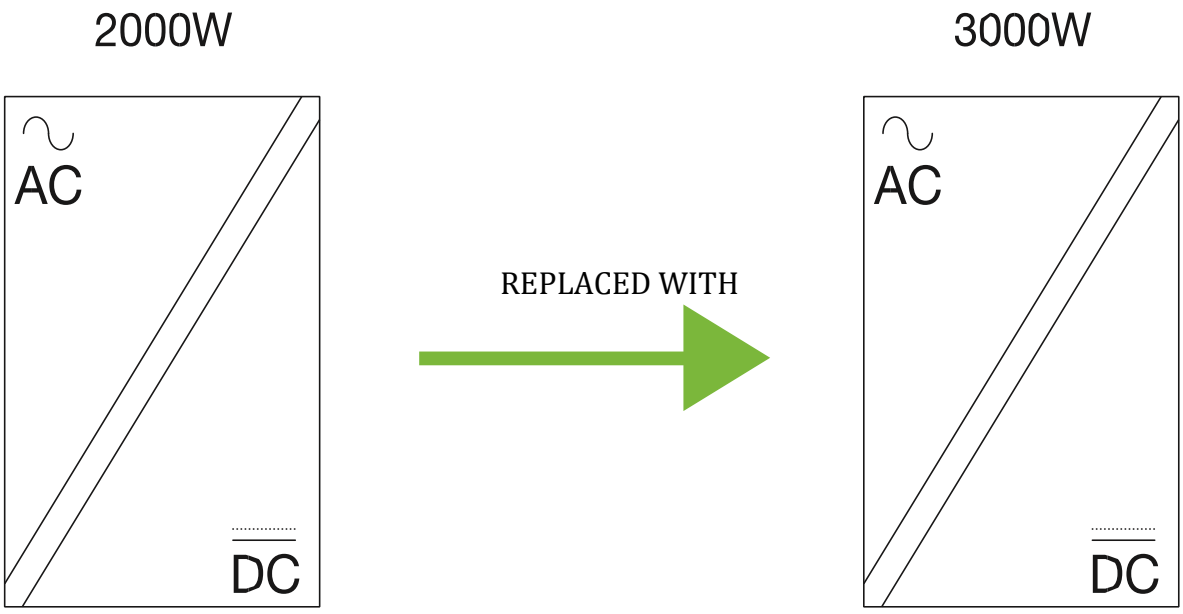
Note: Same topology is defined as: (1) transformer/isolated replaced with transformer/isolated or (2) transformerless/non isolated replaced with transformerless/non isolated)

VICTORIAN ONLY REQUIREMENT

A repair is where the inverter is replaced by an inverter that has the same manufacturer, model number and specifications or the manufactures recommended replacement.

If the above requirements are not met. This is an alteration in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules. Follow requirements in Example 3 below.

4.2 EXAMPLE 2 – Inverter replacement due to inverter failure – same topology but higher power rating (i.e. higher D.C. voltage and/or current input ratings)



Inverter failure - This is a repair in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

- If an existing inverter is replaced with a new inverter of the same topology (e.g. isolated inverter is replaced with another isolated inverter) with a higher power rating, then no further works are necessarily required.

- Install inverter in accordance with manufacturer's instructions, as required by clause 1.7.1(c) of AS/NZS 3000:2007 Wiring Rules.

Does the new inverter need to comply with IEC 62109?

No - Deemed to be a repair.

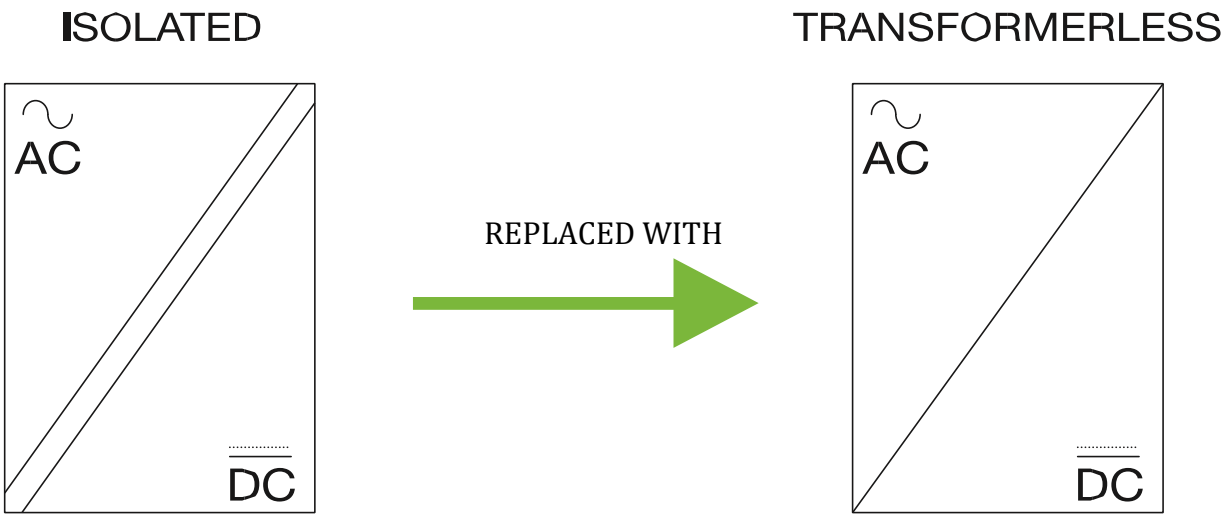
Note: Same topology is defined as (defined as (1) transformer/isolated replaced with transformer/isolated or (2) transformerless/non isolated replaced with transformerless/non isolated).

VICTORIAN ONLY REQUIREMENT

A repair is where the inverter is replaced by an inverter that has the same manufacturer, model number and specifications or the manufactures recommended replacement.

If the above requirements are not met. This is an alteration in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules. Follow requirements in Example 3 below.

4.3 EXAMPLE 3 – If an existing system is being altered with a new upgraded inverter (inverter has different electrical specification/topology)



Inverter replacement - This is an alteration in accordance with clause 1.9.3 of AS/NZS 3000:2007 Wiring Rules.

If an existing inverter is replaced with a new inverter of a different topology (e.g. isolated inverter is replaced with a transformerless inverter), then the following is required:

- All PV modules connected to the inverter shall be earthed in accordance with clause 4.4.2.1 of AS/NZS 5033:2014.
- All PV array switch disconnectors are required to be correctly rated in accordance with Appendix B2(d) of AS/NZS 5033:2014. That is, the voltage rating of each isolator/switch disconnector pole shall be at least the PV array maximum voltage.
- Install inverter in accordance with manufacturer's instructions, as required by clause 1.7.1(c) of AS/NZS 3000:2007 Wiring Rules.
- Where the existing array does not have a rooftop isolator installed, one is not required to be installed.

Does the new inverter need to comply with IEC 62109?

Yes – this is deemed to be an alteration and the inverter will need to comply with IEC 62109.

Does the installer need to implement an external earth fault alarm?

Yes – this is deemed to be an alteration and the current standard is applicable.

4.4 EXAMPLE 4 – Can panel(s) be added to a non 62109 inverter (will it require an earth fault alarm?)

When adding panel(s) to an existing string and the string remains within the design parameters of the inverter – no need to change the inverter and so no need to fit an earth fault alarm.

When adding new string and this addition remains within the design parameters of the existing inverter (existing inverter doesn't need to be changed) – No requirement for earth fault alarm – the new string shall comply with the standard in force at the time of the alteration.

Note: For details regarding the requirements for adding of solar panels see the Solar Panel Installation section of this document.

If generation capacity changes to be outside the design capacity of the inverter then it's an alteration and the entire system must comply with the standard in force at the time of the alteration.

4.5 EXAMPLE 5 – Replacement panel(s) on a non 62109 inverter (will it require an earth fault alarm?)

This is deemed to be a repair – no additional requirements.

4.6 EXAMPLE 6 – Non 62109 inverter is removed for building works and put back in the same location (will it require an earth fault alarm?)

This is deemed to be a repair – no additional requirements.

4.7 EXAMPLE 7 – Non 62109 inverter is moved to a different location at the same building due to renovation

Contact individual state regulators.

If a system is being moved, even to a different part of the same building, a non-compliant inverter cannot be used. Moving the system is deemed an alteration, therefore the parts are to comply with current requirements. Compliant panels, earthing, cables in conduit, inverter with earth fault warning alarm, should be installed.

4.8 EXAMPLE 8 – Non 62109 inverter is moved to a different building due to renovation

If a system is being moved, to a different building, even on the same property, a non-compliant inverter cannot be used. Moving the system is deemed an alteration, therefore the parts are to comply with current requirements. Compliant panels, earthing, cables in conduit, inverter with earth fault warning alarm, shall be installed.

4.9 EXAMPLE 9 – Earth Fault indication requirements

The alarm shall be of a type that would initiate an action by the operator or owner.

If online – have it in the documentation how the online reporting was configured.

Notification must be hourly as per the requirements specified in clause 3.4.3 of AS/NZS 5033:2014.

In all cases an installer needs to assess the location of the inverter and likelihood that the system owner or operator would be aware of the earth fault indication.

In the instance that it is apparent that the owner or system operator may not be aware of the indication, a suggestion should be made to relocate the indication device to a more appropriate location.