

Technical Note

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Project: Volt Planum and Lodge Protective Earthing Methodology

Drafted

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Approved

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Purpose

Explanation of the Protective Earthing methodology of Volt Solar Tiles for Volt Partners and Installers

Description of completed Protective Earthing

Each array is connected to the earthing system of the building via an earthing cable that originates at the electrical switchboard/distributor of the building, preferably the switchboard that the solar inverter AC supply is connected to.

This earthing cable (Trunking cable) is installed from the earthing location in the switchboard to above the highest Volt Solar Tiles installed on each of the roof planes. This Trunking cable can be one single cable that loops from roof plane to roof plane, or an individual cable from the switchboard to each roof plane.

The Volt Solar Tiles are electrically connected to this Trunking cable with Branch cables that are connected to each Volt Solar Tile during manufacturing. This method ensures that if one Volt module is removed the remaining Volt modules are still earthed as per AS/NZS 5033:2021 Clause 4.6.3

Earthing Cable requirements

Earthing cables installed in Australia and New Zealand must meet the requirements of AS/NZS 3000:2018. The earthing cable insulation shall be a combination of green and yellow in colour.

The conductor shall be of high conductivity copper, aluminium is not allowed. They must be stranded conductors with a minimum cross sectional area of 4mm.

To satisfy the requirements of AS/NZS 5033:2021 clause 4.6.5; If the inverter is transformerless and has voltage balancing capabilities, and there is **NO** DC overcurrent protection, the cross sectional area of the earthing conductor must increase to whichever is the greater of the size of the array DC cables or the required size of the earthing cable associated with the inverter AC supply in accordance with AS/NZS 3000:2018

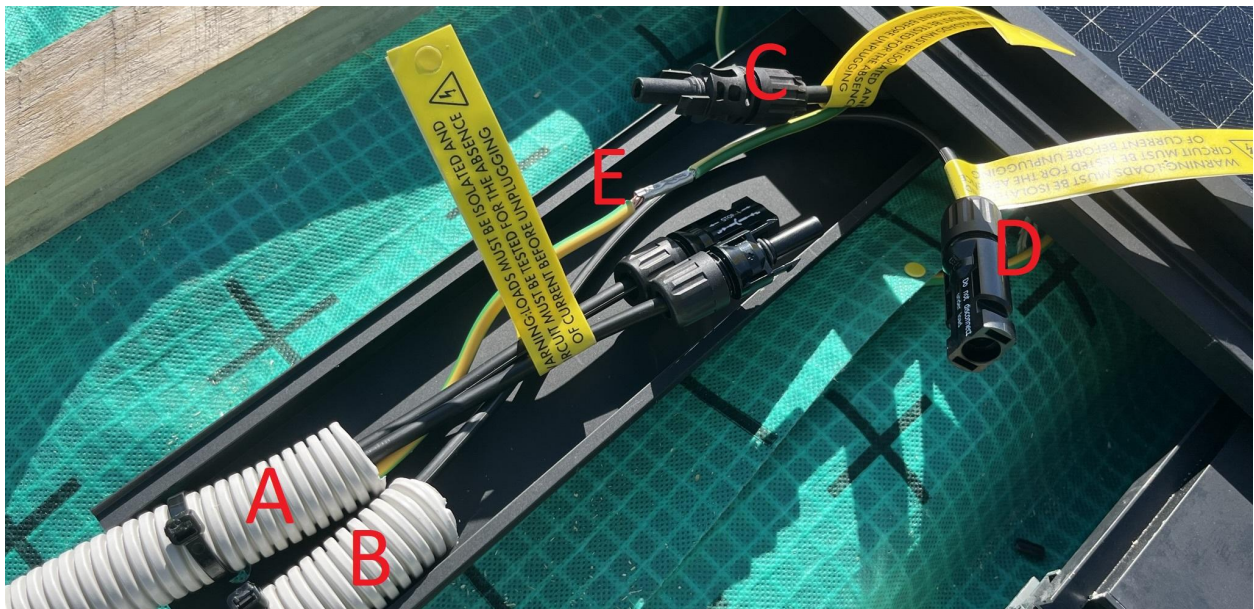
If there **IS** DC overcurrent protection the earthing cable must be equal to or larger than the DC cables associated with the array it is protecting.

Installation Methodology

- 1- Run a continuous earth from the electrical switchboard along the top row of solar tiles.
- 2- Install the first row of solar tiles, route the earth cables attached to the solar tiles under the roof batten so it is sitting in between the battens in the row above the first row of solar tiles.
- 3- The earthing crimps on the first row of solar tiles are placed over the earth cables from the second row of tiles and crimped into place so that the housing is correctly seated.
- 4- There is no need to remove any cable insulation, the crimp will displace the insulation and provide adequate bonding to the next conductor.
- 5- Check the lugs on the side of the factory fitted section of the earth crimp to ensure they have not become loose in transit or installation.
- 6- Perform a pull test on the joint to check it is tight.
- 7- Repeat this process at each solar tile.
- 8- Complete earth continuity testing of each solar tile to ensure they are adequately earthed to the local legislative requirements.

Earth Cable Installation

For simplicity of installing the array cabling, the protective earthing cable can be brought onto the roof in the same location as the DC cabling at the DC Disconnection Point, and then joined with a permanent cable jointing method to another earthing cable that continues to the highest row of Volt Solar Tiles to be installed on that roof plane. The image below shows the DC Disconnection Point along with the earth cable joined with a crimped tunnel lug.



“A” is the conduit bringing the DC cabling and earth from the inverter to the Disconnection Point at the array

“B” is the conduit bringing the negative DC cable from the other end of the array

“C” is the positive array cable MC4 from the junction box on the solar tile adjacent the Disconnection Point

“D” is the negative array cable MC4

“E” is the crimped lug joining the earth cable originating at the switchboard to the array earthing cable that runs along the top row of solar tiles.