

# Three Phase Residential Solution for Australia, System Design and Installation Guidelines

## Version History

- 1.0 - initial release
- 1.1 - modified design guidelines and figure 1.
- 1.2- changed pictures in the Design Guidelines section.
- 1.3 - added P505 power optimizer to PV Array Length in Design Guidelines
- 1.4 – added note regarding design guidelines
- 1.5 - July 2019 – replaced image of inverter with display

## Design Guidelines



### WARNING!

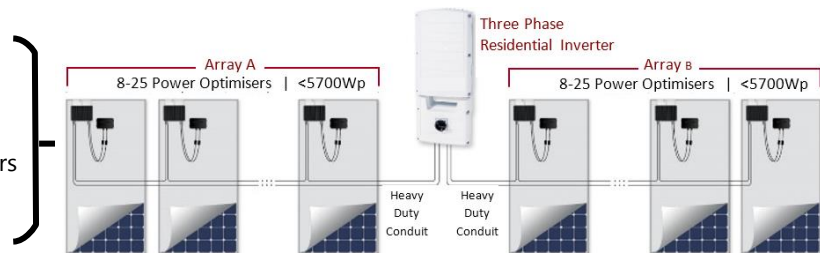
To balance the system arrays, ensure that the system you are connecting is designed according to guidelines herein



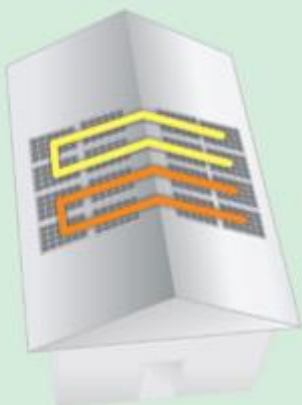

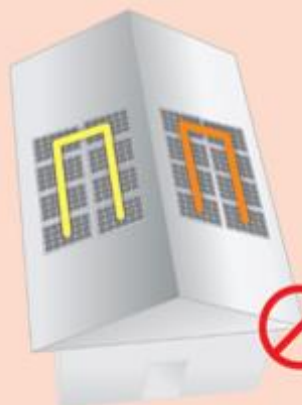
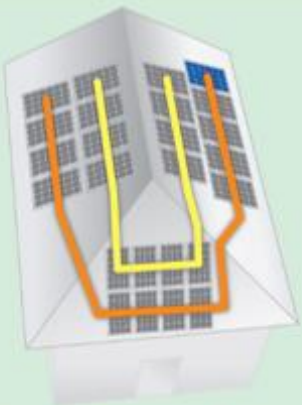
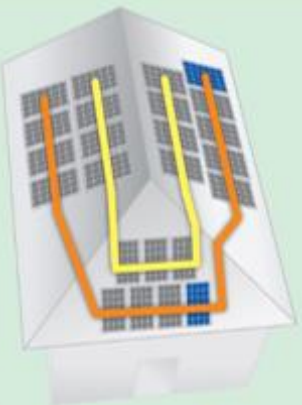

### NOTE

These guidelines are applicable only for installations with more than 10 power optimisers models P320, P370, and P500 or more than 7 power optimisers models P404, P405, and P505.

- No. of PV Arrays: 2
- **PV Array Length:** 8\*-25 power optimisers, max. 5,700kWp  
\*7 when using P404/P405/ P505 power optimisers
- **Max. Difference of PV Array Length:**  $\leq 2$  modules
- **Mix of Modules from Each Facet:** In case of  $\geq 2$  facets - each array should include a similar mix of modules from each facet with a difference of up to 2 modules in total.



## Examples of Balancing Two PV Arrays\*

CORRECT		INCORRECT
 <ul style="list-style-type: none"> <li>✓ Arrays equal in length</li> <li>✓ Mix of modules from each facet is identical</li> </ul>	 <ul style="list-style-type: none"> <li>✓ Arrays differ in length by 2 modules</li> <li>✓ Mix of modules from each facet is similar with a difference of 2 modules</li> </ul>	 <ul style="list-style-type: none"> <li>✓ Arrays equal in length</li> <li>✗ Mix of modules from each facet is different by more than 2 (total of 8)</li> </ul>
 <ul style="list-style-type: none"> <li>✓ Arrays differ in length by 1 module</li> <li>✓ Mix of modules from each facet is similar with a difference of 1 module</li> </ul>	 <ul style="list-style-type: none"> <li>✓ Arrays differ in length by 2 modules</li> <li>✓ Mix of modules from each facet is similar with a difference of 2 modules</li> </ul>	 <ul style="list-style-type: none"> <li>✓ Arrays differ in length by 1 module</li> <li>✗ Mix of modules from each facet is different by more than 2 (total of 3)</li> </ul>

\* Blue modules represent the difference in the mix of modules from each facet.



**NOTE**

The DC voltage displayed on the inverter refers to the internal inverter voltage.

## Connection Guidelines

This section is a supplement to the SolarEdge Installation Guide version 3.1 (P/N MAN-01-00057-3.1: <http://www.solaredge.com/sites/default/files/se-inverter-installation-guide.pdf>)

It describes how to connect DC and AC cables to the DC Safety Unit via conduits (instead of cable glands and connectors), in SolarEdge three phase residential inverters for Australia.



**NOTE**

The SolarEdge DC Safety Unit is an integral part of the SolarEdge inverter and complies with AS/NZS 5033:2014.

Do not install additional external PV array DC isolators adjacent to the inverter.

The DC Safety Unit terminals are suitable for connection of copper conductors only.

→ To open conduit knockouts:

The conduit knockouts may be opened before or after mounting the inverter.

1. Turn OFF the following:
  - The inverter ON/OFF switch
  - The AC circuit breaker
  - The DC Safety Unit

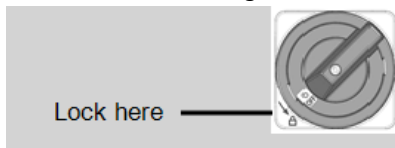


**NOTE**

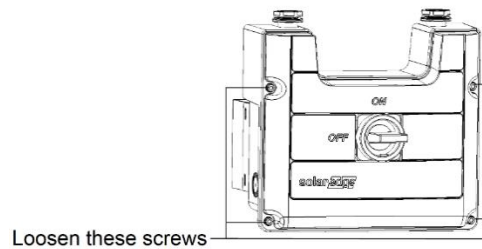
The DC switch in the DC Safety Unit is mechanically interlocked with the front cover. Do not remove the cover unless the switch is in the OFF position.

When the DC Safety Unit is OFF it may be locked:hen the DC Saftey Unit is OFF (for example during maintenance) it may be locked:

1. Rotate the DC Saftey switch to the Lock position.
2. Insert the lock through the knob opening.



2. Loosen the screws on the front cover of the DC Safety Unit, as shown in Figure 2.



**Figure 1: Opening the DC Safety Unit**

3. Remove the DC Safety Unit cover. The following figure shows an example of the internal components in the DC Safety Unit of a three phase residential inverter. Components may differ depending on inverter models.

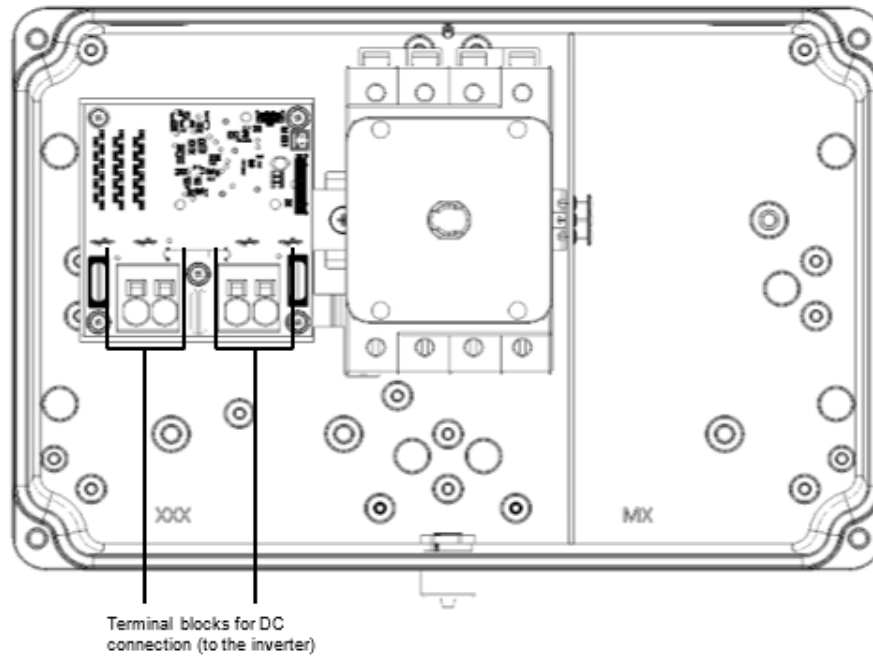


Figure 2: Inside the DC Safety Unit

4. Open the required AC and DC conduit knockouts according to the conduits used in the installation: The knockouts are located at the bottom and sides of the enclosure. Open the required knockouts – two for the DC connections and one for the AC connection, taking care not to interfere with any of the internal components. A step drill bit may be used.

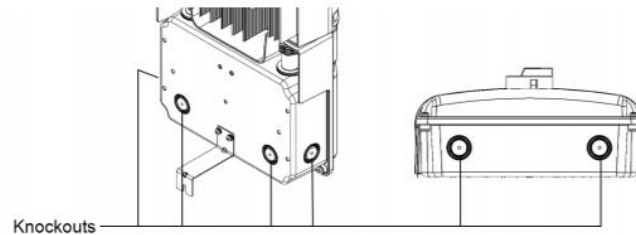


Figure 3: DC Safety Unit knockouts



**NOTE**

Unused conduit openings should be sealed with appropriate seals.

5. Open the inverter cover: Release the Allen screws and carefully pull the cover towards you before lowering it.



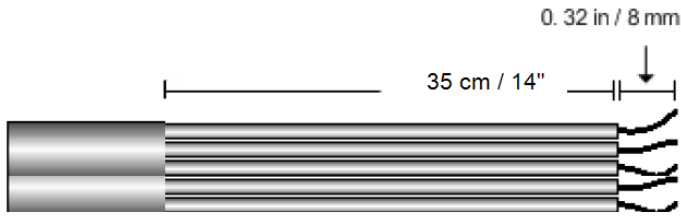
**CAUTION!**

When removing the cover, make sure not to damage internal components. SolarEdge will not be held responsible for any components damaged as a result of incautious cover removal.

→ **To open conduit knockouts:**

Use a five-wire (four core + earth) cable. The maximum wire size for the input terminal blocks is 16mm

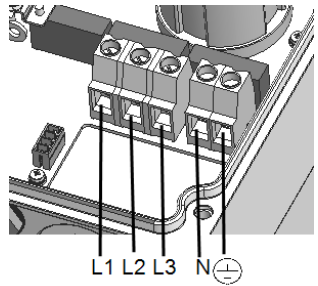
- Strip 35 cm of the external cable insulation and strip 8-10mm of the internal wire insulation.



**Figure 4: Insulation stripping – AC**

- Insert the AC conduit into the AC-side knockout that was opened.
- Insert the AC cable through the conduit towards the AC terminals in the inverter.
- Connect the AC wires as follows. Connect the PE (grounding) wire first.

Wire type	Connect to terminal
Line 1	L1
Line 2	L2
Line 3	L3
PE (grounding)	
Neutral	N



**Figure 5: Three Phase Inverter AC Terminals**

- Tighten the screws of each terminal with a torque of 1.2-1.5 N\*m / 0.88-1.1 lb\*ft.
- Check that the wires are fully inserted and cannot be pulled out easily.
- Verify that there are no unconnected wires to the inverter and that unused terminal screws are tightened.

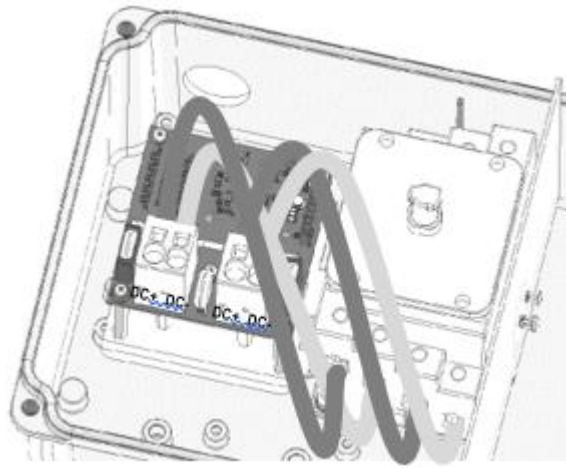
→ **To connect the arrays to the DC Safety Unit:**

- Strip 8 mm of the DC wire insulation.
- Insert the DC conduits into the DC-side knockouts that were opened.
- Connect the DC wires according to the DC+ and DC- labels: Use a standard flat-blade screwdriver to connect the wires to the spring-clamp terminals as shown in Figure 7.
  - The screwdriver blade should fit freely in the terminal opening. Too large a blade can crack the plastic housing.
  - Insert the screwdriver and press the release mechanism and open the clamp.
  - Insert the conductor into the round opening and remove the screwdriver – the wire is automatically clamped.



**NOTE**

Ensure each array is connected to a different terminal block.



**Figure 6: Spring-clamp terminals**

4. Verify that there are no unconnected wires.
5. Close the DC Safety Unit cover. Attach the cover and secure it by tightening the four screws with a torque of 1.2 N\*m / 0.9 ft.\*lb.
6. Ensure proper cable entry sealing: inspect the entire cable run and use standard sealants to avoid water penetration.

## Mechanical Specifications

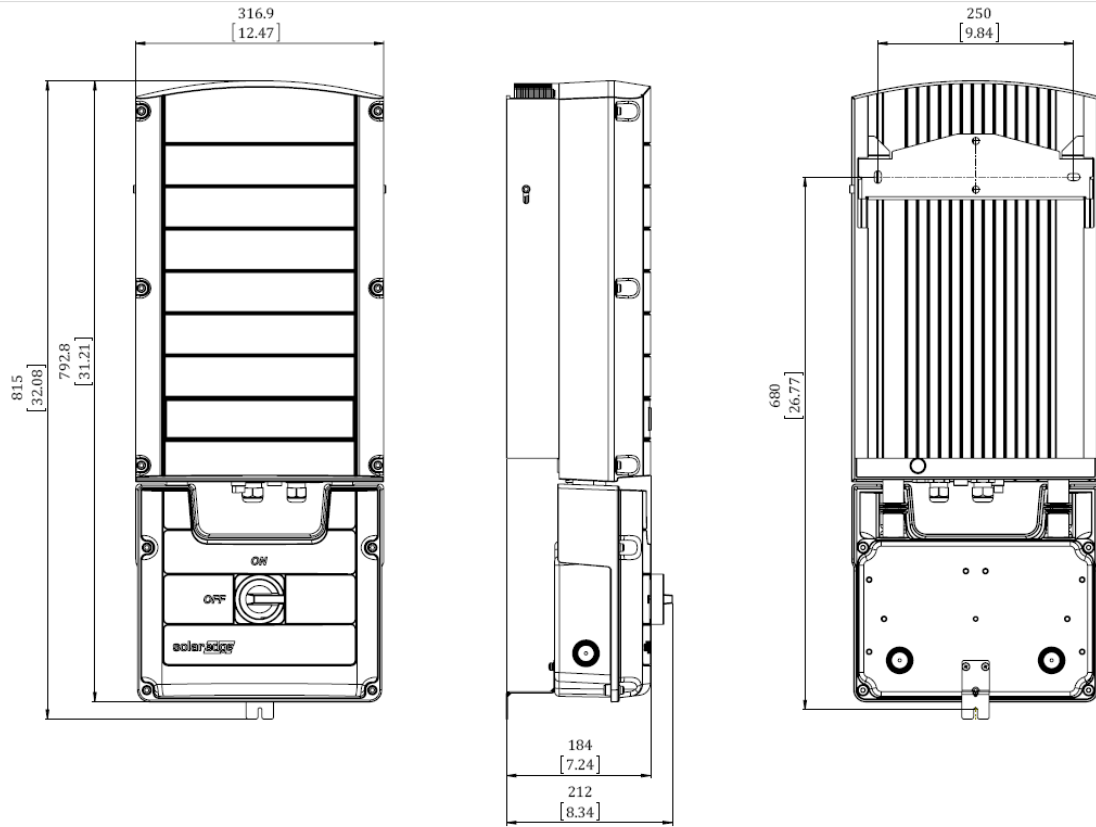


Figure 8: Residential three phase inverter dimensions