

The MultiGrid has been certified by Australian certification body SAA Approvals. For our certificates see: <https://www.victronenergy.com.au/inverters-chargers/multigrid#certificates>

In addition to the certificate we have recently asked SAA Approvals to look in depth at the various local standards. This after we had received enquiries about the way the MultiGrid switches the Neutral and breaks or makes the MEN connection.

SAA Approvals advised us of the following:

According to AS/NZS 3000 & 3010 as a “generator” both Actives and Neutral must be able to be disconnected.

With the ones [sic] that now can act as a “stand alone generator” when the grid is down it introduces different requirements to meet this and both AS/NZS 3000 & AS/NZS 3010 have specific requirements and 4777 is aligning with these.

Rationale

The reason why the MultiGrid switches its live conductors (Active and Neutral) during a grid failure is because the moment the grid fails, the MultiGrid will become a generating set. For generating sets the AS/NZ 3010 standard applies. This standard requires that: “Each generating set shall be provided with an isolating switch operating in all live conductors”.

This also reinforced in the AS/NZ 4777.2 standard. This standard requires that: “The automatic disconnection device shall provide isolation in all live conductors”

AS/NZS 3010:2017 - Electrical installations - Generating sets

2.6.3 Generator output isolator

Each generating set shall be provided with an isolating switch operating in all live conductors, that is installed adjacent to, or on, the generating set so that a person working on the generating set has a clear view of the isolating device, and may be combined with overcurrent protection required by Clause 2.6.3.

Exception 1: The isolating switch may be located in the generator switchboard.

Exception 2: Where the generating set is the sole source of supply, the isolating switch shall not operate in the neutral conductor.

AS/NZS 4777.2:2015 - Grid connection of energy systems via inverters Inverter requirements

7.2 Automatic disconnection device

The automatic disconnection device shall prevent power (both a.c. and d.c.) from entering the grid when the automatic disconnection device operates.

NOTE: The automatic disconnection device need not disconnect sensing circuits.

The automatic disconnection device shall provide isolation in all live conductors.

Automatic disconnection devices for isolation shall comply with the following requirements:

- (a) They shall be capable of withstanding an impulse voltage likely to occur at the point of installation, or have an appropriate contact gap.
- (b) They shall not be able to falsely indicate that the contacts are open.
- (c) They shall be designed and installed so as to prevent unintentional closure, such as might be caused by impact, vibration or the like.
- (d) They shall be devices that disconnect all live conductors (active and neutral) of the inverter from the grid-interactive port.

Exception: For multiple mode inverters with stand-alone function, which comply with AS 62040.1.1, the automatic disconnection device for isolation shall be a device that disconnects active conductors of the multiple mode inverter from the grid-interactive port.

Operation of a Multigrad during a grid failure.

The Active and Neutral are disconnected from the Grid during a grid failure. At the same instance, an internal Neutral to Earth link (MEN-link) is made via a relay to ensure the continuity of the Neutral-Earth connection. This so an RCD can be used to protect loads connected the no-break circuit.

MEN relay safety check

Each time before the MultiGrid connects to the grid, a MEN relay test is performed. When the relay test has failed, the unit shuts down and error 11 is generated. Error 11 can mean that there is relay failure, but it can also signal an installation error. These are the most common installation errors that will also generate an error 11:

- Active and Neutral have been swapped
- There is an external connection between no-break Neutral and GND
- The input Neutral is connected to the no-break Neutral

Wiring diagrams

Multigrad internal wiring diagram

