

Periodic inverter testing

Process for anti-islanding testing of >30kVA inverter installations

This document outlines a simple testing process to confirm the operation of the AC inverter main switch and testing of the anti-islanding protection of the installation. It is only required for inverters >30kVA.

Testing methodology

Warning: Carrying out these tests involves working with live DC and AC voltages. The testing must only be carried out by an ACT licensed electrician.

For inverters with PV panels connected, the tests must be conducted at a time of day when weather conditions allow the PV system to be producing a minimum power output. This must be greater than 20 per cent of the rated output of the PV array or the inverter, whichever is less.

The DC supply from the solar array is to remain connected to the inverter for the duration of all tests.

For battery inverters, you may need to ensure other PV inverters are switched OFF during the tests to allow an export to be measured.

For battery only inverters, (including hybrid inverters without panels connected), the DC supply from the battery is to remain connected to the inverter for the duration of all tests. For hybrid inverters with panels connected, in order to measure an export, it may be required to disconnect the DC battery supply. Appropriate shutdown procedures must be followed if disconnecting the DC battery supply.

The inverter main switch is the AC isolation point immediately upstream of the inverter. For battery inverters with backup circuits, two tests may be required depending on the site-specific arrangement. Battery systems sometimes have another device such as Tesla Backup Gateway that will prevent the system from islanding while allowing some circuits to remain energised. The AC isolation point immediately upstream of any such device will be referred to as the backup system main switch. Both the inverter main switch and backup main switch (if present) are required to be tested.

When testing the backup main switch, there is a chance that backup loads may become deenergised depending on battery charge level, and if there is a fault within the battery system.

The tester shall communicate these risks to the customer before commencing testing and only proceed with consent. In most cases backup circuits will remain energised during testing.

If there is more than one inverter, you must use separate forms for each. The exception to this is if there are multiple inverters 1kVA or less (micro inverters) that are connected to the same inverter main switch, these can use the same form.

Test 1a Inverter Main Switch: inverter must cease supplying power within two seconds of a loss of mains

The inverter main switch is to be turned OFF. The time taken for the inverter to cease attempting to export power is to be measured with a timing device and recorded. A voltage probe placed on the installation side of the inverter main switch is to be used to determine when the inverter has ceased attempting to export power.

Test 1b Inverter Main Switch: inverter must not resume supplying power until mains have been present for more than 60 seconds.

The time taken for the inverter to resume power supply after installation has been re-energised is to be measured and recorded. A current probe is to be placed on the installation side of the inverter main switch to determine when the inverter recommences exporting power.

Test 2a Backup Main Switch: backup system must cease supplying power within two seconds of a loss of mains

This test is only applicable to battery systems that contain both an inverter main switch and backup main switch.

The backup main switch is to be turned OFF. The time taken for the backup system to cease attempting to export power is to be measured with a timing device and recorded. A voltage probe placed on the installation side of the backup main switch is to be used to determine when the backup system has ceased attempting to export power.

Test 2b Backup Main Switch: backup system must not resume supplying power until mains have been present for more than 60 seconds.

This test is only applicable to battery systems that contain both an inverter main switch and backup main switch.

The time taken for the backup system to resume power supply after installation has been re-energised is to be measured and recorded. A current probe is to be placed on the installation side of the backup main switch to determine when the backup system recommences exporting power.

Records

The tester must fill in the relevant sections of the Inverter anti-islanding test declaration form. This form has multiple pages. Multiple copies of the second page are required if there are multiple inverters being tested. The third page titled 'Inverter backup system anti-islanding test declaration' is only required if tests 2a and 2b are performed.

The tester must make copies of the test record. The original must be kept by the tester, a copy must be provided to the owner of the installation and a third copy must be emailed to:
distribution@evoenergy.com.au

For more information

Please call Evoenergy on **13 23 86**