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ELECTRICAL NOTE

PHOTOVOLTAIC – EARTH FAULT ALARMS

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Since the introduction of the current version of AS/NZS5033 in 2014, there has been differing interpretations on the location of invertors and their earth fault alarms as per clause 3.4.3 below.

3.4.3 Earth fault alarm

In systems where the PV array is operating at low voltage (LV), an earth fault alarm system shall be installed which, on an earth fault, causes an action to be initiated to correct the earth fault.
The alarm system is to continue repeating its operation at least at hourly intervals until the earth fault is corrected.

The alarm system may be an audible signal placed in an area where operational staff or system owners will be aware of the signal or another form of fault communication, for example fax, email, SMS or similar, shall be applied to inform to the system operator.

A set of operational instructions shall be provided to the system owner that includes the actions to take when the alarm operates.

NOTE: Many inverters have earth fault detection and indication in the form of indicator lights.
This indication is generally not in an area that will be noticed. IEC 62109-2 requires that inverters have a local indication and also a means of signalling an earth fault externally. The external alarm function should be used to 'cause an action to be initiated to correct the earth fault' (i.e. by placing a light or audible signal where it will be noticed).

The Access Canberra electrical inspectorate has reviewed industry comment on this clause, and the differing views of the electrical industry, to provide this guide to designers, installers and inspectors of PV installations on our interpretation and enforcement of this clause.

Residential Photovoltaic (PV) (NCC Building Class 1 and 10)

For the purpose of Clause 3.4.3 of AS/NZS 5033:2014, an inverter and/or earth fault alarm mounted on any of the external walls of a residence would deem to comply, where;

- The location is readily assessable.
- The location is accessible without entering a neighbouring property.
- The inverter is mounted at a height the alarm display can be read. (Not higher than 2 metres)
- The location meets the manufactures instructions.
- The location and installation complies with all the relevant requirements of AS/NZS 3000.

Where the inverter and/or earth fault alarm is mounted inside any remote shed or uninhabited area of a residence (ie basement or storeroom under the house) it is to have a remote alarm indication.

The standard provides for minimum acceptable requirements, and we would encourage the use of any additional method that provides a quick indication to the installation owner of an earth fault alarm. For the safety outcomes that quick a response provides and for the prevention of losing energy input to the electrical installation while the fault is active.

Commercial and non residential (NCC Building Class 2 to 9)

For the purpose of Clause 3.4.3 of AS/NZS 5033:2014, an inverter and/or earth fault alarm mounted in a location that is not normally accessed in the course of day to day business, is to have a remote alarm indication.

For example, and not limited to areas that are not normally accessed unless to repair a known fault could be;

- The plant room of a building.
- A closed off basement area.
- A storeroom.
- Restricted locations. (Main Switchboard room, Secure Communications room, on the roof of the building, etc)

An area that is accessed only during business hours, and closed during a weekend or holidays is an acceptable location. We would recommend that remote alarm indication be provided for buildings that regularly close for extended periods, such as schools.

The standard provides for minimum acceptable requirements, and we would encourage the use of any additional method that provides a quick indication to the installation owner of an earth fault alarm. For the safety outcomes that quick a response provides and for the prevention of losing energy input to the electrical installation while the fault is active.

Comments and further information are available from the Access Canberra electrical team on 02 6207 7775 or email: Electrical.Inspections@act.gov.au.