SolarEdge Systems with Power Optimizer Input >350Wp – AS5033:2014 2.15 Declaration of Compliance

In SolarEdge systems, one or two photovoltaic modules are connected to a DC/DC power optimizer. A group of power optimizers is then connected in series in a string which is then connected to the input of a SolarEdge inverter.
As module power ratings grow, and with large commercial installations, the question is now arising on how to install optimizers with a rated input power higher than 350Wp, while still complying with AS5033. The purpose of this document is to clarify how this shall be done.

Clause 2.1.5 of ASAS5033:2014 states the following:

> ***2.1.5 Strings constructed using d.c. conditioning units***
> *In some array designs, d.c. conditioning units may be connected to individual PV modules or small groups of PV modules to allow d.c. conditioning of the PV output or allow for automatic shutdown of the output under certain defined conditions.*
> *The output circuits of the d.c. conditioning units are arranged in series to form a string. Figure 2.7 shows an example of this type of configuration.*
> *The input circuits between the PV modules and the d.c. conditioning units are not required to have load break switch-disconnectors provided the input to the d.c. conditioning units is arranged so that the following applies:*
>
> > *(a)The cable length from the PV module to the d.c. conditioning unit is no longer than 1.5 m.*
> > *(b)There are no extension cables used.*
> > *(c)Each input is limited to 350 W maximum PV power at STC and a maximum input voltage no greater than ELV.*

This clause does not state a module or DC conditioning unit (DCU) rated power, in fact it specifically targets the power flowing through the input circuits of the DCU. The clause states a power limit for which an isolator is not required in order to unplug modules from the DCU: ≤350Wp. Therefore, as long as each input's power is limited to 350W or less at the time of dis/connection, an isolator is not required.

SolarEdge (as well as many module manufacturers) requires the following operations to be performed before dis/connecting the DCU input connectors:

1. Ensure the inverter has been switched off prior to any work being carried out on the system's PV Arrays - including handling modules, optimizer connections and string wiring.
2. Test for current flow within the input circuits of the optimizer with a suitable DC clamp meter to confirm the circuit has been de-energized.
    a. If current flow is not detected, there is no power in the circuits and the DC inputs are safe to dis/connect.
    b. If current flow is detected (or if a DC clamp meter is unavailable), cover the associated module(s) with an opaque material before breaking the DC input connections, to de-energize the circuits.

   Exception: when the power rating of module(s) connected to the optimizer is below 350Wp and open circuit voltage is below ELV, this step may be skipped.

Since the optimizer input dis/connection is done with the modules covered (as required above), the optimizer input power is limited to 350W or below, and therefore no additional switch-disconnector is needed between the module(s) and the optimizer (DCU).

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