October 17, 2018

MANUFACTURER DECLARATION:

Determining PV Array Maximum Voltage

Tigo Energy Inc. hereby declares that the output voltage range of all the TS4 Platform units is 0V to $V_{OC \text{ (buck only)}}$. This rating is shown in each Tigo TS4 datasheet. Therefore, the correct method for determining PV Array Maximum Voltage based on AS/NZS 5033:2014 is Section 4.2 of this standard.

Tigo TS4 Platform as it relates to AS/NZS 5033:2014, Clause 2.1.5

*"In considering the voltage and current rating of equipment downstream of this circuit, **if** the d.c. conditioning unit is failsafe so that no greater voltage than the rating of the PCE to which it is connected can be produced under normal operating or single fault conditions, the d.c. switch-disconnector and cabling **may** be rated to the PCE maximum rated input voltage and maximum rated input current.*

In this case, for the purpose of this standard, the following applies:

> *(i) PV array maximum voltage = PCE maximum rated input voltage*

> *(ii) Where the d.c. conditioning unit is used as shown in Figure 2.7, the output circuit of these units shall be considered to be the PV string for purposes of this standard. "*

The d.c. conditioning equipment and PCE described in the above statement is not a description of Tigo's TS4 units noted by the **IF**. Therefore, section (i) and (ii) are not relevant to Tigo TS4 units. **Tigo TS4 units and integrated modules are fail safe in relation to maximum array voltage when designed based on the modules name-plate V_{OC} as described in Clause 4.2 of the standard.**

Tigo's TS4 Platform complies with all the statements made in AS/NZS 5033:2014, Clause 2.1.5 - Strings constructed using d.c. conditioning units.

Tigo's TS4 (Integrated) units include:
- TS4-D (Diode)
- TS4-M (Monitoring)
- TS4-F (Fire Safety)
- TS4-S (Safety)
- TS4-O (Optimization)
- TS4-L (Long String)

Tigo's TS4 datasheets clearly indicate that the maximum voltage of each Tigo TS4 unit - the d.c. conditioning unit - is the PV module V_{OC}. In this case, string design is always such that the sum of the PV modules' V_{OC} in series is lower than the maximum determined by the PCE maximum voltage. Therefore, Tigo's TS4 units listed above comply with all the requirements of this standard.

Download the TS4 Platform brochure here:
tigoenergy.com/library/view/TS4-B+%28Integrated+Jbox%29+Brochure.pdf/

Tigo's TS4-L (Long Strings) datasheet clearly indicates that the maximum voltage of each TS4 unit is the V_{MAX}. The V_{MAX} is defined per the PV module manufacturers' specific factory settings where it appears on each PV module specification sheet. The V_{MAX} is also on the module name-plate as the maximum output voltage (V_{OC}). In this case, string design is always such that the sum of PV modules V_{MAX} in series is determined by the PCE maximum voltage. Therefore, Tigo's TS4-L complies with the requirements of the standard.

Download the TS4-L datasheet here:
tigoenergy.com/library/view/TS4-L+-+Long+Strings.pdf/