

# The max voltage calculated in the inverter task doesn't match the Voc from the panel datasheet, why is this?

The max voltage factors in both the **open circuit voltage** ( $V_{oc}$ ) and the **temperature coefficient** ( $\Delta V_{oc}/^{\circ}C$ ) of the panel. The value on the datasheet is measured at standard test conditions (STC) but the actual  $V_{oc}$  of the panels will depend on the ambient temperature. As the temperature decreases, the  $V_{oc}$  increases, so it is important to factor this into sizing the inverter.

In Easy PV, we do a calculation at  $-10^{\circ}C$ , since the voltage increases at lower temperatures, the max voltage given in Easy PV will be **higher** than the number of panels multiplied by the open circuit voltage of the panels.

## Example calculation

### Max voltage

The maximum input voltage of the inverter input is **1000V**.

The open circuit voltage for a string of 8 panels at  $-10^{\circ}C$  is **330V**.

In the above case, the  $V_{oc}$  is 37.45V and the temperature coefficient is  $-0.276\%$ . This means for every increase in  $^{\circ}C$ , the  $V_{oc}$  decreases by 0.276%.

For standard test conditions (STC), the panel temperature is  $25^{\circ}C$  so the change in temperature to  $-10^{\circ}C$  is  $35^{\circ}C$ , meaning we have

$$37.45 * (1 + (|-0.00276| * 35)) * 8 = 328.5 \text{ V}$$

Easy PV does a slightly more conservative calculation:

$$37.45 * (1 - (-0.00276))^{35} * 8 = 329.94 \text{ V}$$

where in each case 0.276% is divided by 100 to convert it 0.00276 per  $^{\circ}C$ . This is then rounded to give 330V.

Revision #10

Created 29 October 2025 13:56:07 by Daisy

Updated 12 February 2026 15:04:47 by Daisy