

1.1.1 PV1IsoFault/ PV2IsoFault

Description

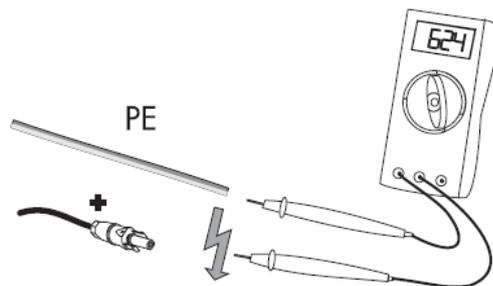
Reason: Before connecting to the grid, the inverter measures the insulation resistance of the PV string1 or PV string2 compared to ground. If the insulation resistance measured by the inverter is less than 1000 kohm, the inverter does not connect to the grid. The causes may be:

- Damaged PV panels.
- Junction boxes of the panels not properly sealed, so allowing water and/or damp seepage.
- Problems in the connections between panels (not perfectly connected).
- Poor quality cable junctions.
- Presence of unsuitable (trigger voltage lower than the characteristics of the PV generator strings) or damaged overvoltage surge arresters outside the inverter in the DC section.
- Presence of damp inside the field panel (damp increases leakage and can therefore be the cause of a reduction in insulation resistance)

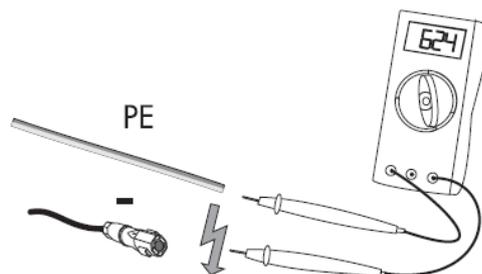
Recovery: If the insulation resistance measured by the inverter is greater than 1000 kohm, the alarm disappears and the inverter starts to connect to the grid.

Solution 1

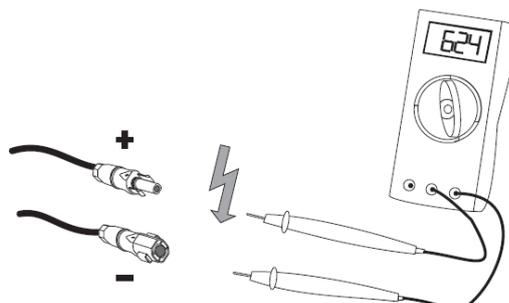
- ① Disconnect the strings from the inverter and prepare a multimeter (Only use multimeters with a DC input voltage range up to at least 1,000 V. **Excessive voltages can destroy the multimeter**)
- ② Measure the voltages between the positive pole of each string and the earth potential (PE).



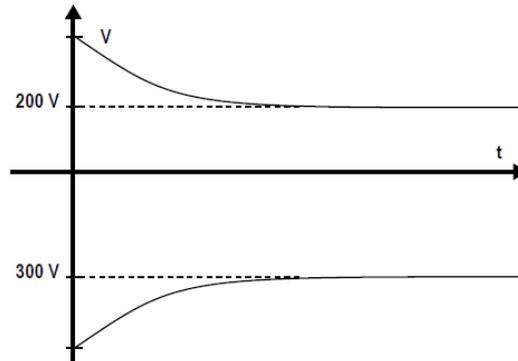
- ③ Measure the voltages between the negative pole of each string and the earth potential (PE).



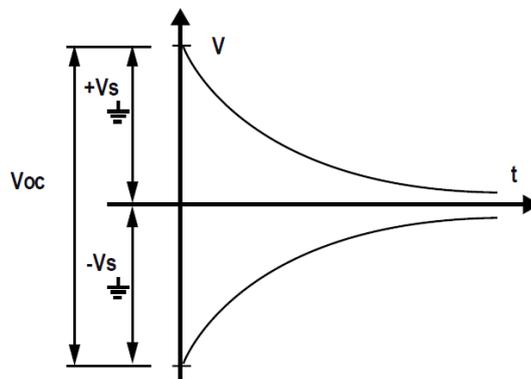
- ④ Measure the voltages between the positive and negative poles of each string.



- ⑤ If the voltage measured between one of the two poles and ground does not tend to 0V and stabilizes on a value (see picture below as example), and/or if the sum of the voltages of the positive pole against earth potential and the negative pole against earth potential of a string is approximately equal to the voltage between the positive and negative poles, it can be concluded that an earth fault is present. If not, it might be caused by inverter internal malfunction.



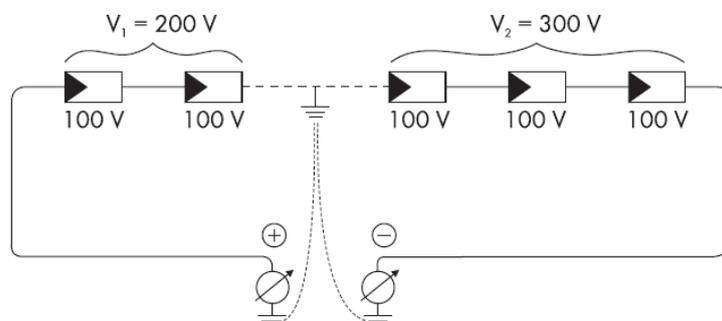
Example with earth fault



Example without earthing fault

Note: Due to the capacitive effect of the PV generator, during the first moments that the voltmeter is connected between one of the two poles and ground, it will measure a voltage of about $V_{oc}/2$, which will tend to stabilize around 0V if there is no ground leakage

- ⑥ The installer must remedy the earth fault in the affected string. You can determine the location of the earth fault as described at point ⑦ below.
- ⑦ The approximate location of the earth fault can be calculated from the ratio of the voltages measured between positive and earth potential and negative and earth potential. Take the picture below as an example. In this case, the earth fault is between the 2nd and 3rd PV modules.



Note: The insulation resistance is affected by the environmental conditions as the PV generator is somewhere grounded. (E.g.: photovoltaic module wet from dump or rain), and therefore the measurement must be made during the anomaly.

If all above is no problem, we offer exchange unit.

In case of good unit replaced, the customer will be billed for our cost.