



AFCI Function

Ginlong Technologies Co., Ltd.

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Revision History

- Version 1.0- July 20 2020: Initial release

1. Background

Safety of the PV systems draws a lot of attentions recently as the aging of the DC wiring and improper installations can cause DC arcs in the DC circuit. Due to the nature of DC arcs, it will not fade away by itself and long-time arcing can significantly increase the temperature and leads to fire on the wires. It is even more dangerous for rooftop systems because of the additional damages.

2. Solis IEC AFCI Solution

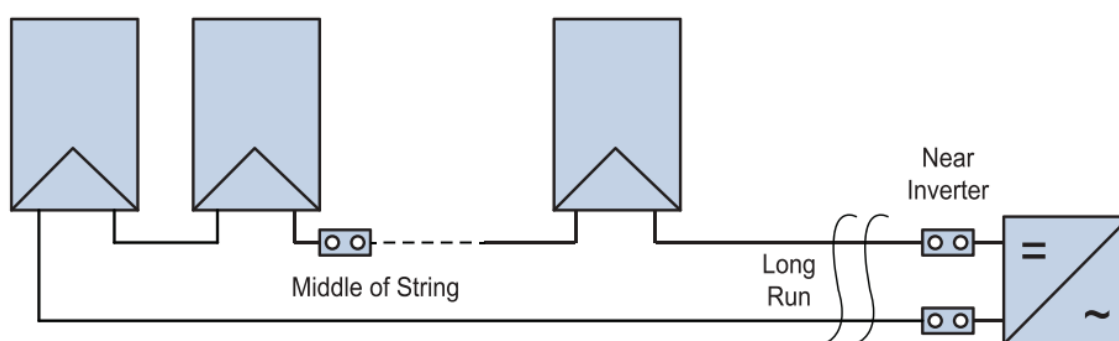
Currently, UL1699B defines the testing requirements on AFCI function of PV inverters but there is not an officially published IEC standard. Despite this, Solis AFCI solution on IEC models can still fully meet the UL standard.

It is a pure software solution. All the measurements and analysis are using the existing sensors and the digital signal processor within the Solis inverter.

The inverter is able to use Fourier transform to detect the fundamental wave and harmonics, once there is a series DC arcing in the DC circuit, the changes on the measuring results will be identified and recognized by the DSP. Correspondingly, the inverter will shut down the generation and cut off the DC current.

With no current flowing through the arcing point, the arc will be extinguished eventually.

One thing to mention is all the AFCI function can only detect and protecting the series arcing in line, and it is not able to detect the arcing between the positive and negative poles.



The main issue about arc detection is the false alarm. There is possibility that the normal operation will trigger the arc protection which is not what we want (as this will affect the overall system yield). The only way to avoid this is to collect as much arc characteristic as possible to achieve a more accurate detection. Solis solution is based on over 40000+ Solis UL model installation experience in US with less than 0.1% of false alarm rate.

How to activate AFCI Function

AFCI function

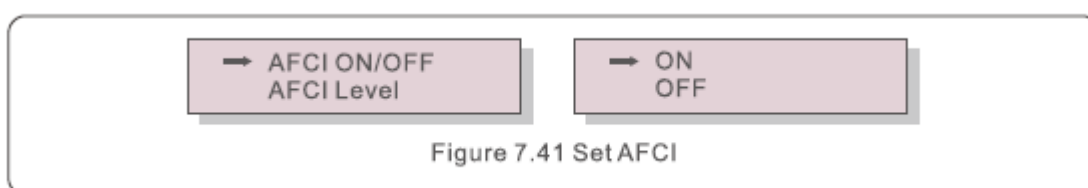
Solis inverters have the built-in function which can detect tge arc fault on the DC circuit and shut down the inverter to prevent fire disasters.

Enabling the AFCI function

The AFCI function can be activated on the inverter's display as follows.

Menu Path:

Advanced Settings -> Password: 0010 ->Special Settings -> AFCI Set ->AFCI ON/OFF -> ON



WARNING!

The "AFCI level" setting is ONLY permitted for technicians. Don't change the Sensitivity value, as this may cause frequent false alarms or malfunctions. The manufacturer is not responsible for any further damage caused by unauthorized changes have been made.

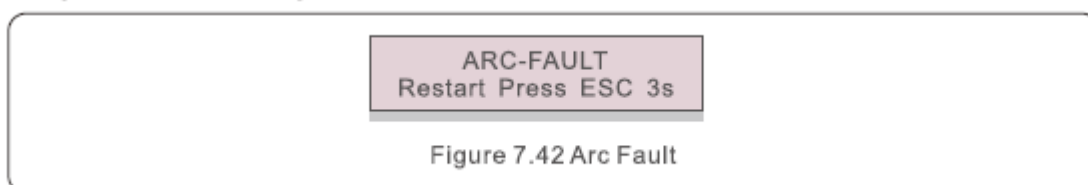
NOTE

If you find that the user interface of your inverter differs from the information above, please contact a service engineer or technical support.

WARNING!

The setting also corresponds to the current status, which can be used to check the ON/OFF status of the AFCI function.

If a DC arc is detected during normal operation, the inverter will shut down and issue the following alarm: ARC-FAULT



The installer must thoroughly check the DC circuit to ensure that all cables are correct are attached.

Once the DC circuit problem is resolved or confirmed to be OK, press "ESC" for 3s and wait for the inverter to restart.