

Photovoltaic inverter arc self-test

Can arc detection be integrated in PV inverter equipment and installations?

This article describes what has created the need for arc detection, an analysis of detection methods, and a possible solution to integrate arc detection in PV inverter equipment and installations. There are two types of inverters used in solar PV installations today--microinverters and string inverters.

How to detect arc in a solar inverter?

Figure 5: A simple arc detection circuit for a solar inverter consists of an analog front end (SM73307/73308), ADC (SM73201) and microcontroller with an integrated CPU or digital signal processor (Piccolo F2803x microcontroller). To accurately and reliably detect an arc requires a fast, high-resolution ADC. Without enough resolution,

How does an inverter detect an arc fault?

The inverter displays an error message indicating that an arc-fault has been detected, and also transmits an error message through its remote monitoring communications interfaces. A manual restart process is required to resume system operations.

Can arc detection be used in high-voltage applications?

Figure 9: Arc detection can be added into a variety of high-voltage applications to mitigate the risks associated with high voltages. In an electrical vehicle, for example, arc detection can monitor the high-voltage DC busses between the primary batteries and inverter stages that are known to be a common cause of catastrophic vehicle fires.

Can arc flash be used in photovoltaic systems?

These approaches are backed by a wide range of industry tests. Arc flash on dc systems such as photovoltaic systems is relatively unknown. Several calculation approaches have been proposed, but these have not been backed by any industry tests on equipment.

What is PV arc detection?

The PV current contains high frequency components when an arc occurs. The DC component is eliminated when the current passes the current sensor, leaving only the AC components. The arc can be quickly identified with the help of FFT and AI analysis. The arc detection signal is also instantly switched from low to high level.

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