

ContainerPower Energy Solutions

Solar inverter current limiting operation



Overview

How do inverter current limiters work?

The design of the current limiter greatly dictates the inverter's overall fault behavior. A well-established method to limit the inverter currents during faults is the current-reference saturation limiter, which curtails the reference signals feeding into the inner-current control loop .

Does a two-phase and three-phase dip in grid voltage limit inverter current?

The results under two-phase and three-phase dip in the grid voltage shows that the proposed control strategy injects maximum reactive and active power and limits the inverter current by quickly activating the APC control loop during fault-ride-through period.

Can an inverter remain in current limiting after a fault clearing?

Also note that, equipped with an integrator antiwindup, the inverter can still remain in current limiting after the fault clearing due to latch-up, resulting from the primary controller behavior (see Section V-A), which prevents the inverter from a successful fault recovery .

What are the goals of grid-connected PV inverters?

Under grid voltage sags, over current protection and exploiting the maximum capacity of the inverter are the two main goals of grid-connected PV inverters. To facilitate low-voltage ride-through (LVRT), it is imperative to ensure that inverter currents are sinusoidal and remain within permissible limits throughout the inverter operation.

Can fault induced voltage sags lead to overcurrents in grid forming inverters?

Fault induced voltage sags will lead to overcurrents in grid forming inverters. Current limiting strategies are classified into voltage and current-based strategies. Transient current, current contribution and stability will depend on the strategy. Transient enhancing strategies are used to ensure the stability

during faults.

How to provide voltage support in PV inverter?

To provide voltage support at the PCC, reactive power is injected into the grid under fault conditions as per the specified grid codes. As previously discussed, the simultaneous injection of peak active power from PVs and reactive power into the grid for voltage support can trigger the over current protection mechanism in PV inverter.

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