Solar inverter dual-loop control

Overview

The converter is integrated into a PV-based energy system and regulated by a dual-loop control strategy consisting of a Proportional-Integral (PI) voltage controller and an inner Sliding-Mode Controller (SMC) for current regulation. This paper presents a novel partial-power DC-DC converter architecture specifically designed for Photovoltaic (PV) energy systems. To address the issue of high Total Harmonic Distortion (THD) in three-phase grid-tied. Traditional control methods, like single-sequence double-loop control, often fail to address negative-sequence voltages, resulting in asymmetric outputs. In this article, we explore a dual-sequence control strategy that effectively mitigates voltage asymmetry by incorporating negative-sequence. An international research team has conceived a dual-component controller for three-phase inverters that can reportedly achieve faster settling times, reduced overshoot and more stable current tracking compared to conventional controllers. A group of researchers led by the Jouf University in Saudi.

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Adaptive robust dual-loop control for voltage and current in parallel

Considering that parallel inverters systems often face with various disturbances, this study proposes a new adaptive robust control strategy for a voltage-current dual-loop to enhance system ...

Dual-component controller for three-phase solar inverters can reduce

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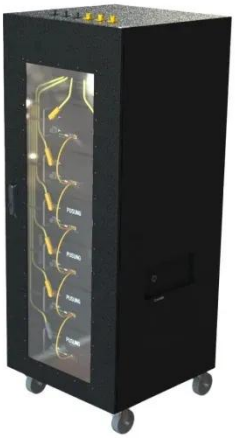
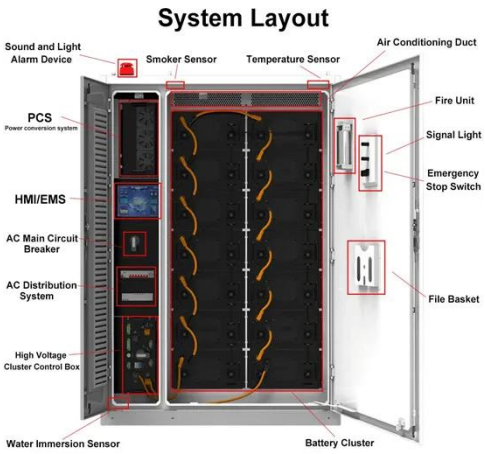




Modeling and Analysis of Multiple Inverters With Dual-Loop-Based

A complete small-signal model for a multiple inverter-based microgrids with the proposed control structure is presented in order to assess system stability using eigenvalue and participation ...

Dual-Sequence Control for Off-Grid Solar Inverters Under Unbalanced

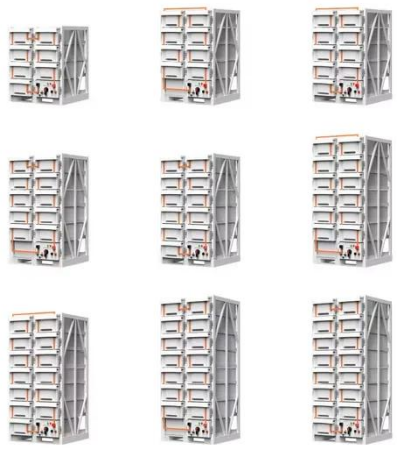
In this article, we explore a dual-sequence control strategy that effectively mitigates voltage asymmetry by incorporating negative-sequence decoupling, enhancing the reliability of off ...

SVPWM based double loop control method of a three phase ...

A distribution generator (DG) is considered in this paper for connecting to utility grid through an inverter controlled by proposed double loop control technique. One voltage controlled loop and one current ...

Research on Dual-Closed-Loop Control Strategy for LCL-Type

This paper has analyzed in detail the implementation principles and process of the three-phase LCL grid-tied inverter, and has adopted the dual closed-loop feedforward control method of ...



Dual Closed-Loop Inverter Control System Based on Quasi-PR and PI

At present, photovoltaic power generation has been appreciated by all countries, and the inverter, as an equipment to convert direct current into alternating cu

The Reactive Power Support Strategy based on Dual-loop ...

This paper presents a reactive power and voltage (Q/V) control strategy of three-phase photovoltaic (PV) system to offering reactive power based on the typical dual-loop control topology.

High-Efficiency Partial-Power Converter with Dual-Loop PI

To address the aforementioned ideas and propose an efficient alternative for PV power processing, this paper presents the design, control, and validation of a partial-power converter ...

A Unified Control Design of Three Phase Inverters Suitable for Both

This article proposes a unified control for

such inverters with current control, voltage control, and power control loops, including the PLL impact on a b c - d q transformations as the ...

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