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Single-phase inverter DC component suppression

Overview

How a DC component suppression scheme is applied to a NPC inverter?

On the basis of the original current loop, a PI control is used to minimize the intrinsic DC components. The Kalman filter is creatively introduced to narrow the random components caused by measurement errors. Mathematical analysis proves the feasibility of the DC component suppression scheme applied to the NPC inverter.

What is DC suppression in a step-up transformer?

In the design process of various inverters, the suppression of the output DC component is an important research topic. The DC component will be injected into the primary winding of the step-up transformer, as shown in Fig. 2, resulting in a DC bias of the iron core, leading to transformer vibration, temperature rising, and inverter overcurrent.

What does U Mean in a single-phase inverter?

When the DC link voltage of the inverter is u, the modulation waves u and u can be taken as (1), (2) (1) (2) where M is the modulation index (0 M 1); is the angular frequency of AC side output voltage. u is the DC link voltage. Fig. 1. The structure of single-phase inverter. 2.2. Influence of second harmonic of DC link on AC side.

Why does a two-stage single-phase inverter have a second harmonic current?

1. Introduction In the two-stage single-phase inverter, the second harmonic current with twice output voltage frequency exists in the former DC converter because the instantaneous output power of the latter inverter contains the pulsating power of twice the output voltage frequency.

Is DC component suppression a problem in NBI accelerating grid power supply?

The problem of DC component suppression plays a key role in the design of

NBI accelerating grid power supply. An optimized control scheme to minimize DC component injected into the isolated transformer for TPTL NPC inverter is discussed in this paper.

How to minimize DC offset for TPTL-NPC inverter?

Therefore, it is necessary to narrow the current-output DC component of the NPC inverter within 1% of the rated current. This paper put forward an advanced control scheme to minimize DC offset for TPTL-NPC inverter. A mathematical model for the DC suppression scheme is developed in Section 2.

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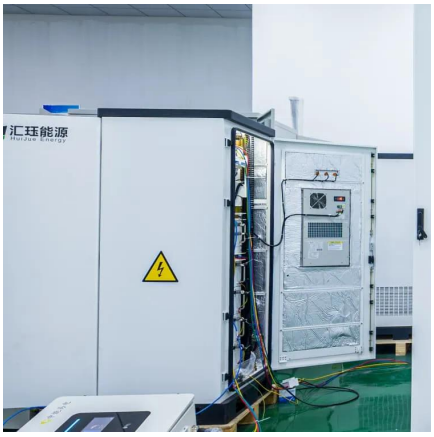

Coordination optimization control of DC component and ...

The latest solutions for DC component reduction can be summarized by four methods: (1) DC suppression inverters with or without auxiliary circuit [15], [16]. (2) Detection ...

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Evaluation of DC Voltage Ripple in Single-Phase H-Bridge ...

The analysis and minimization of the harmonic components of the dc-link current and voltage for three-phase voltage source pulse width modulated inverters are presented in [12] and [13], ...

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Grid Connected Single -Phase PV inverter with Novel Control ...

However, it may exist DC offset current problem and is critical to the power system. In this paper a novel control strategy of suppressing DC current inject ion to the grid for PV inverters is ...

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Leakage current suppression methods for single-phase photovoltaic inverters

At present, the topology of three-phase inverter and the optimization of filters to improve the reliability of the power supply of DC distribution

systems have also been researched.

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DC component suppression strategy for single-phase grid-connected inverter

This paper proposes the mechanism that the DC component in the output voltage modulation wave will lead to a DC bias of the current on the SSSC valve-side, and a real-time digital ...

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Conducted commonâ mode electromagnetic interference ...

Abstract: Electromagnetic interference (EMI) filters are inevitable parts of power electronic systems. A novel EMI filter for single-phase grid-inverter is proposed in this study, to suppress ...

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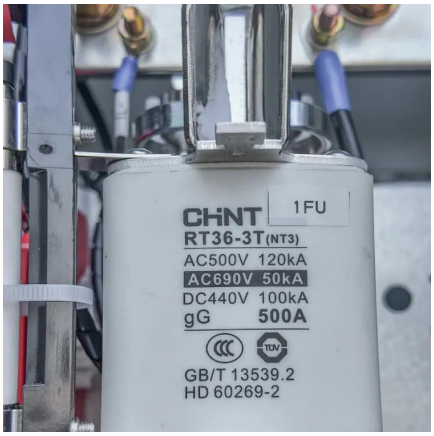

Cost-Effective DC Current Suppression for Single-Phase Grid ...

The dc current injection may cause magnetic saturation of the power transformers. To solve this issue, this article thus proposes an effective current control strategy and ...

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Conducted common-mode electromagnetic interference suppression ...

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(PDF) Simulation and implementation of a harmonics suppression

Abstract and Figures This paper presents a harmonic suppression technique for a single-phase full-bridge converter, and the mathematical principles underlying a modified ...

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Low Frequency Current Ripple Suppression for Two-Stage Single ...

To address the issue, a control strategy based on port-impedance editing, where inductor current feedforward (ICFF) and bus voltage feedforward paths are employed, is proposed to reduce ...

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An intelligent dc current minimization method for transformerless ...

The method of applying inverter topology with dc component suppression ability used an inherent structure of the inverter topology, which can prevent dc current from injecting ...

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The strategy of second harmonic voltage match suppression for the DC

This paper analyzes the generation and propagation process of the second harmonic in DC chain, establishes the mathematical model of single-phase inverter, and the ...

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The strategy of second harmonic voltage match suppression for ...

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Research on DC Component Suppression Method of Non ...

In this paper, the proportional integral resonant controller is used to control the DC component and the fundamental component to realize the suppression of the DC component and the ...

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[PDF] Cost-Effective DC Current Suppression for Single-Phase ...

A novel control strategy of suppressing dc current injection to the grid for a three- phase inverter by accurately sensing the dc component of line voltages of three-phase inverter and adding a ...

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Third-order current harmonic suppression and neutral-point ...

In response to these problems, researchers focus on optimizing hardware and software control, software control is mainly the study of regulation strategies. In Ref. [4], a ...

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Leakage current suppression methods for single-phase ...

At present, the topology of three-phase inverter and the optimization of filters to improve the reliability of the power supply of DC distribution systems have also been researched.

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DC component suppression strategy for single-phase grid ...

Aiming at the DC injection of grid-connected inverter, the grid-connected inverter with LCL filter is studied and a strategy of current tracking control is presented to suppress its ...

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Harmonic Distortion Analysis of the Output Voltage in SPWM ...

A 5 kw 0.8 lag pf load is connected to a 240V DC sources supplied single phase spwm fed unipolar full bridge inverter. For different values of carrier frequency THD analysis of the output ...

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An improved DC component suppression control strategy applied ...

In this paper, the independent DC component suppression method of each phase is adopted. For the convenience of modeling, a single-phase inverter is used to construct a ...

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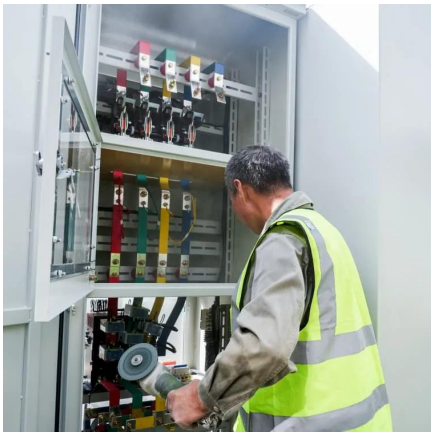

Cost-Effective DC Current Suppression for Single-Phase Grid-Connected

The dc current injection may cause magnetic saturation of the power transformers. To solve this issue, this article thus proposes an effective current control strategy and ...

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Cost-Effective DC Current Suppression for Single-Phase ...

Firstly, the root-cause of dc current injection is comprehensively analyzed. Subsequently, a proportional-integral-resonant (PIR) controller is proposed to eliminate the dc component ...

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Low Frequency Current Ripple Suppression for Two-Stage Single-Phase

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