SolarHybrid Solutions

Inverter current and voltage dual closed loop

Overview

Is there a dual closed-loop repetitive control strategy for single-phase grid-connected inverters?

In this paper, a novel dual closed-loop repetitive control strategy based on grid current feedback is proposed for single-phase grid-connected inverters with LCL filters. The proportional-integral inner loop is stabilized by using an inherent one-beat delay achieved by digital controller.

How to control an inverter?

trategy of the inverter must guarantee its output waveforms to be sinusoidal with fundamental harmonic. For this purpose, close loop current control strategies such as H∞ repetitive controller, dual closed-loop feedback control, Adaptive Voltage Control, SRFPI controller, Optimal Neural Controlle.

Can Dual-loop control improve steady-state performance of single-phase inverter power supply?

Secondly, using the pole configuration method, the parameters of the double closed-loop PI can be obtained. Finally, the model is built by SIMULINK. The simulation results verify that the dual-loop control can improve and improve the steady-state performance and dynamic performance of single-phase inverter power supply.

Is dual closed-loop control method better than other control methods?

Shown in Fig. 25 (d), harmonic content is very low and the output is 15.009A when using the dual closed-loop control method proposed in this paper. The steady-state error is 0.18%. It is clear that the proposed control method has better steady performance than the other methods, and the THD is only 0.9%.

What is the circuit topology of a single-phase grid-connected inverter?

The main circuit topology is a single-phase grid-connected inverter with LCL

filter. The repetitive dual-loop control method is adopted. The outer loop is controlled by the RC, which makes the grid-connected current ig track the sinusoidal reference iref without a steady-state error.

What is a dual loop control method?

The repetitive dual-loop control method is adopted. The outer loop is controlled by the RC, which makes the grid-connected current ig track the sinusoidal reference iref without a steady-state error. The PI control method is applied in the inner loop, which can increase the damping of the system to suppress the resonance peak.

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[Multiple feedback-control-loops for single-phase full-bridge ...]

Multiple feedback consists of two control-loops; one for capacitor voltage and other for inductor current-control. Output voltage and load curren-feedforward-control is used. This technique ...

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[Design of voltage and current controller parameters using]

Hence, the design of effective closed-loop voltage and current (V/I) controllers is highly desired to control the inverter output against the disturbances. The V/I controllers are ...

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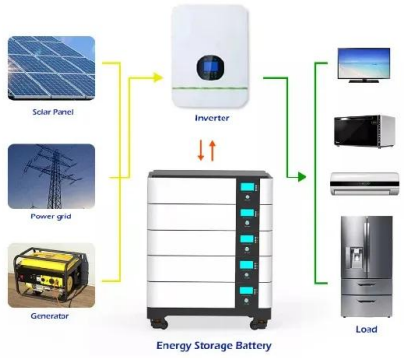

[Modelling, control design, and analysis of the inner control's ...]

Thus, the mathematical closed-loop models of designed outer voltage and inner current con-trol schemes based on PI, P, and feedforward controllers with and without compensation are, first, ...

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[Double Closed-Loop Control Strategy for Photovoltaic Inverter ...]

Aiming at the resonance peak problem existing in the LCL type three-phase photovoltaic inverter grid-connected system, this paper proposes a dual current contro

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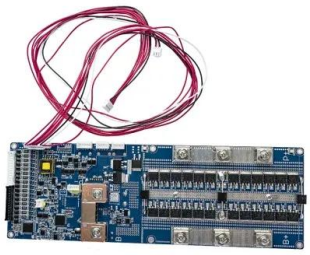

Design of a Dual-Loop Controller with Two Voltage-Dependent Current

It proposes modifying the inner current loop to maintain stable operation over a wide input and output range--the proposed internal loop control switches intelligently between two current ...

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Dual-loop Control Strategy for Grid-connected Inverter with LCL Filter

dual-loop control strategy for grid-connected inverter with LCL filter was proposed, the system stability was analyzed

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Dual Closed-Loop Linear Active Disturbance ...

This new dual closed-loop control includes current inner loop decoupling control and DC bus voltage outer loop control with first-order ...

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A current decoupling parallel control strategy of single phase inverter

Abstract: The output characteristics of a single phase inverter with voltage and current dual closed-loop feedback control are analyzed and the equivalent model of the ...

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A novel voltage and current double closed-loop control method ...

Performance of DC/AC Inverters is decreased due to variable load parameters. Based on a voltage and current double closed-loop control inverter model, a novel load on-line parameter ...

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Dual-loop Control Strategy for Grid-connected Inverter with ...

The dual-loop control strategy for grid-connected in-verter with LCL filter in this paper can be used to control the currents of three phase grid-connected inverter, and it will let grid-connected ...

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Research on PI-PI dual-loop digital control technique for inverters

Dual-loop control of the instantaneous values plays an important role in inverters whose output waveform has fast dynamic response, high steady-state accuracy, and strong ...

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[Research on Single-Phase Inverter Dual Loop Control Technology ...]

A new approach of dual closed-loop control strategy is proposed, and the internal cause of the inverter output voltage waveform distortion is analyzed in this paper. The ability to resist load ...

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[A High-Frequency Inverter Based on Double Closed-Loop Control]

In order to improve the dynamic performance of inverter and the output voltage waveform quality, the double-loop control combination with internal current loop and external voltage loop is ...

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[Adaptive robust dual-loop control for voltage and current in ...]

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 ...

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[A novel dual closed-loop control scheme based on repetitive ...]

In this paper, a novel dual closed-loop repetitive control strategy based on grid current feedback is proposed for single-phase grid-connected inverters with LCL filters.

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Abstract. Though there are many strategies to control single-phase uninterruptible power supply (UPS) inverters, they suffer from some drawbacks, the main being complexity. This paper ...

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A Current Decoupling Parallel Control Strategy of Single-Phase Inverter

The output characteristics of a single phase inverter with voltage and current dual closed-loop feedback control are analyzed and the equivalent model of the parallel operating ...

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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 ...

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Double closed-loop control strategy of LCL three-phase grid ...

Grid-connected inverter is an important part of the grid-connected system. Compared with the traditional L or LC filter, LCL filter has a better high-frequency harmonic attenuation ...

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A novel dual closed-loop control scheme based on repetitive control ...

In this paper, a novel dual closed-loop repetitive control strategy based on grid current feedback is proposed for single-phase grid-connected inverters with LCL filters.

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

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 ...

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Research on Double Closed Loop Control Method of Single ...

This paper presents a double-closed-loop PWM design and control method for single-phase inverter current inner loop and voltage outer loop.

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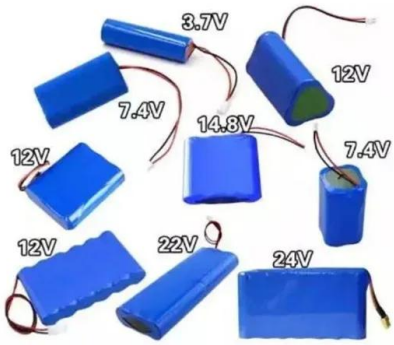

The Design and Research of Three-Phase Inverter Dual-Loop Control

A dual-loop (inner current loop and outer voltage loop) control scheme for micro electric source inverters in microgrid is improved in this paper. In order to make dual-loop control analysis ...

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Research on Double Closed Loop Control Method of Single-Phase Inverter

This paper presents a double-closed-loop PWM design and control method for single-phase inverter current inner loop and voltage outer loop.

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Implementation of closed loop control technique for ...

trategy of the inverter must guarantee its output waveforms to be sinusoidal with fundamental harmonic. For this purpose, close loop current control strategies such as H? repetitive ...

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

In this article, a voltage and current dual-loop control structure augments the VOC to compensate for these voltage deviations and regulate the inverter output variables directly.

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