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Carrier Based Synchronous control and performance analysis of an S-PSI using PV for Microgrid Applications (Conference Paper)

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Abstract

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A carrier-based synchronous type single phasephase synchronous inverter (S-PSI) is proposed to develop the inverter output phase and voltage waveform. The major problem of the microgrid connected inverter is unbalanced DC supply, high switching loss, power quality and phase error. Therefore, to overcome those issues, a phase synchronous technique can perception not only conventional DC to AC inverter but also low-frequency inverter source ripple current reduction with lower switches of the inverter. However, a carrier-based synchronous PWM control technique is proposed for capable of regulating both side of the inverter input and output performance. The working performance of the S-PSI is analyzed, including steady-state behavior, efficiency, and circuit parameters. As well, the equivalence of the switching control technique and the similarity of inverter evaluate circuit parameters are exposed between this S-PSI and a traditional two-level inverter. In addition, lowpass LCL filters are utilized to convert squire wave to sine wave with same frequency and to reduce the higher harmonic distortion of the microgrid voltage. Balanced resistive load of = 11 Omega for star configuration and input DC voltage, ± 340V have assume to design the inverter. From the simulated results, the carrier-based S-PSI systems are developed the phase error of 55%, reduced 11% of THD and the conversion efficiency of 97.02%. Finally, it highly appreciated that the proposed design will improve the microgrid system. © 2018 IEEE.

SciVal Topic Prominence

Topic: Capacitors | Electrolytic capacitors | ripple power

Prominence percentile: 92.553

Author keywords

Carrier-based synchronous control | Microgrid. | Output LCL filter | PWM | Single phase PSI

Indexed keywords

Engineering controlled terms: Efficiency | Electric network parameters | Pulse width modulation

Engineering uncontrolled terms: LCL filters | Micro grid | Performance analysis | Single phase | Steady-state behaviors | Synchronous control | Two-level inverters | Working performance

Engineering main: Electric inverters

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