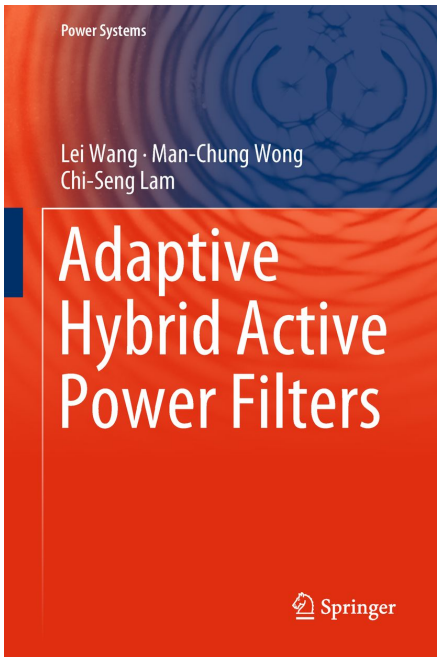

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Adaptive Hybrid Active Power Filters

- Offers a systematic summary of the state-of-the-art research on this thyristor based HAPF
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This book introduces advanced thyristor-based shunt hybrid active power filters (HAPFs) for power quality improvement in power grids, which are characterized by a low dc-link operating voltage and a wide compensation range. This means they can overcome the high dc-link voltage requirement of conventional active power filters and the narrow compensation range problem of LC-coupling hybrid active power filters. Consisting of 10 chapters, the book discusses the principle, design, control and hardware implementation of thyristor-based hybrid active power filters. It covers 1) V-I characteristics, cost analysis, power loss and reliability studies of different power filters; 2) mitigation of the harmonic injection technique for thyristor-controlled parts; 3) nonlinear pulse width modulation (PWM) control; 4) parameter design methods; 5) minimum inverter capacity design; 6) adaptive dc-link voltage control; 7) unbalanced control strategy; 8) selective compensation techniques; and 9) the hardware prototype design of thyristor-based HAPFs, verified by simulation and experimental results. It enables readers to gain an understanding of the basic power electronics techniques applied in power systems as well as the advanced techniques for controlling, implementing and designing advanced thyristor-based HAPFs.

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