

1. Record Nr.	UNINA9911007123803321
Autore	Bendaoud Mohamed
Titolo	Intelligent Control of Medium and High Power Converters
Pubbl/distr/stampa	Stevenage : , : Institution of Engineering & Technology, , 2023 ©2023
ISBN	1-83724-438-3 1-5231-5541-8 1-83953-741-8
Edizione	[1st ed.]
Descrizione fisica	1 online resource (185 pages)
Collana	Energy Engineering Series
Altri autori (Persone)	MalehYassine PadmanabanSanjeevikumar
Disciplina	621.3126
Soggetti	Electric current converters
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- Title -- Copyright -- Contents -- About the editors -- Preface -- 1 Power electronics converters-an overview -- 1.1 Introduction -- 1.2 DC-DC converters -- 1.2.1 Non-isolated DC-DC converters -- 1.2.2 Isolated DC-DC converters -- 1.2.3 Resonant converters -- 1.3 DC-AC converters -- 1.3.1 Two-level single-phase and three-phase inverters -- 1.3.2 Classification of two-level three-phase inverters -- 1.3.3 Multilevel inverters -- 1.3.4 Review of a novel proposed MLIs -- 1.4 Conclusion -- References -- 2 Sliding mode control of bidirectional DC-DC converter for EVs -- 2.1 Introduction -- 2.2 Sliding mode control of bidirectional DC-DC converter -- 2.2.1 Modeling of the converter -- 2.2.2 Choice of sliding surface -- 2.2.3 Derivation of control law -- 2.2.4 Derivation of existence and stability conditions -- 2.2.5 Sliding mode parameter selection using HHO algorithm -- 2.3 Simulation and experimental verifications -- 2.4 Conclusion -- References -- 3 High-gain DC-DC converter with extremum seeking control for PV application -- 3.1 Introduction -- 3.2 System description -- 3.2.1 Photovoltaic array -- 3.2.2 Suggested high-gain DC-DC converter -- 3.3 Proposed AESC technique -- 3.3.1 Line search-based optimization methods -- 3.3.2 Control scheme -- 3.3.3 Extremum seeking control approach -- 3.3.4 Convergence analysis of the AESC

approach -- 3.4 Simulation and comparison results -- 3.4.1 Scenario 1
 -- 3.4.2 Scenario 2 -- 3.5 Conclusion -- References -- 4 A control
 scheme to optimize efficiency of GaN-based DC-DC converters -- 4.1
 Introduction -- 4.2 Proposed control scheme -- 4.3 Simulation and
 experimental verification -- 4.4 Conclusions -- References -- 5
 Control design of grid-connected three-phase inverters -- 5.1
 Introduction -- 5.2 Inverter topologies -- 5.2.1 Grid forming inverters
 -- 5.2.2 Grid following inverters -- 5.3 Control strategies.
 5.3.1 Control architecture of GFL inverters -- 5.3.2 PLL -- 5.3.3 Power
 controller -- 5.3.4 Current controller -- 5.4 Results and discussion --
 5.4.1 Real-time co-simulation testbed -- 5.4.2 Power hardware-in-
 loop testbed -- 5.5 Conclusion -- References -- 6 Sliding mode
 control of a three-phase inverter -- 6.1 Introduction -- 6.2 Modeling
 description and control of the inverter -- 6.2.1 Mathematical model of
 the DC/AC converter -- 6.2.2 Proposed SMA -- 6.3 SMA for
 performance improvement of WPS fed by VSI -- 6.3.1 Modeling
 description of the WECS -- 6.3.2 SMA of the rectifier and MPP tracking
 approach -- 6.4 Simulation and evaluation of performance -- 6.5
 Conclusions -- References -- 7 Sliding-mode control of a three-level
 NPC grid-connected inverter -- 7.1 Introduction -- 7.2 Three-phase
 grid-connected NPC inverter -- 7.3 Reaching law in SMC -- 7.3.1
 Sliding surface design -- 7.4 Super twisting SMC -- 7.4.1 Control
 design -- 7.4.2 Stability of the super twisting SMC -- 7.5 Results and
 discussion -- 7.6 Conclusion -- References -- 8 Neuro control of grid-
 connected three-phase inverters -- 8.1 Introduction -- 8.2 System
 description -- 8.3 Control design -- 8.3.1 Neural network
 approximation -- 8.3.2 Neuro sliding mode control design -- 8.4
 Simulation results -- 8.5 Conclusion -- References -- 9 Low switching
 frequency operation of multilevel converters for high-power
 applications -- 9.1 Introduction -- 9.2 Selective harmonic minimization
 problem formulation -- 9.3 Solving techniques -- 9.3.1 Numerical
 techniques -- 9.3.2 Algebraic methods -- 9.3.3 Intelligent algorithms
 -- 9.4 Results and discussion -- 9.5 Comparative analysis -- 9.6
 Conclusion and future work -- References -- 10 Comparison and
 overview of power converter control methods -- 10.1 Introduction --
 10.2 Nonlinear controllers for power converters -- 10.2.1 Sliding
 mode.
 10.2.2 Model predictive control -- 10.3 Intelligent controllers for power
 converter -- 10.3.1 Fuzzy logic controller (FLC) -- 10.3.2 Artificial
 neural network -- 10.3.3 Metaheuristic optimization -- 10.4
 Comparative performance analysis -- 10.5 Conclusion -- References
 -- Index.

Sommario/riassunto

Power converters are vital for clean power, and so is their control. This
 book covers recent advances in converter control, comparing control
 methods for different converters. Chapters present control of DC-DC
 and AC-DC converters, for example using sliding mode and robust
 control.