

Call for Papers for the Special Session on

Next-Generation Power Converters and Control Strategies for AC/DC Microgrids

Organizers and Co-chairs

Abdelbasset Krama, Hamad Bin Khalifa University

akrama@hbku.edu.qa

Abderezak Lashab, Alborg University

abl@energy.aau.dk

Josep M. Guerrero, Alborg University / Technical University of Catalonia

joz@energy.aau.dk

Technical Outline of the Session and Topics

As microgrids are becoming more prominent in modern power systems, the need for advanced power converters and advanced control strategies is growing. This session delves into the latest innovations in power converter technologies and control methods specifically designed for AC/DC microgrid applications. Emphasis will be placed on enhancing grid stability, efficiency, and flexibility through cutting-edge converter designs and intelligent control techniques. Presentations will highlight the integration of new technologies into microgrid systems, providing a platform for discussing challenges, solutions, and future directions. Your work is crucial in enhancing grid stability, efficiency, and flexibility. Power converters are pivotal components in modern AC/DC microgrids, driving the integration of renewable energy sources and energy storage systems. This session will explore the complexities of power converters, their types, control strategies, advantages, drawbacks, and applications. The discussion will encompass diverse converter topologies and controls, incorporating new wide-band gap semiconductors and intelligent algorithms. The session aims to provide a comprehensive understanding of how these technologies contribute to efficient, reliable, and resilient microgrid operations.

Topics of this Special Session Include but are not limited to

- Innovative Power Converter Designs.
- Converters for solar PV and wind energy systems.
- Utilization of SiC and GaN devices in next-generation converters.
- Advanced Control Strategies for power converters.
- Techniques for harmonics reduction and power quality improvement.
- Fault detection, mitigation strategies, and fault-tolerant control.
- Low voltage ride-through capabilities and solutions.
- Advanced grid forming and grid following strategies and virtual inertia emulation techniques.
- Role of power converters in microgrid and nanogrid systems.
- Interface converters for battery energy storage systems.
- Application of artificial intelligence and optimization techniques in Microgrids.
- Cybersecurity considerations for power converters in microgrids.

Timeline for Author

Deadline for submission of special session papers January 10, 2025

Notification of acceptance March 10, 2025

Deadline for submission of final manuscripts April 15, 2025

All the instructions for paper submission are available on the conference website.

