

Fuel cell Uninterrupted Power Supply (UPS)

Abstract

The architecture of The UPS based on PEM fuel cell stack is investigated. Firstly the output characteristics of PEM fuel cell stack is studied. High efficiency power conversion from Hydrogen energy to electric power is emphasized. In addition, matching between PEM fuel cell and load characteristics is another key issue. Energy & power management will be explored to satisfy both the load dynamics and the optimal condition of PEM fuel cell. A seamless transfer amongy UPS operating states is also investigated. To increase the reliability, a new design without usage of the Electrolytic capacitor is investigated. A 10 kW 3-phase FC-UPS prototype is implemented to verify the design methods. Finally a Super UPS concept is proposed and explained, which is facing extremely reliable applications.

Prof. Dehong Xu biography



Dehong Xu (M'94) received the B.S., M.S., and Ph.D. degrees from the Department of Electrical Engineering, Zhejiang University, Hangzhou, China, in 1983, 1986, and 1989, respectively.

Since 1996, He becomes a full professor in College of Electrical Engineering of Zhejiang University, China. He was a visiting scholar in University of Tokyo, Japan from June of 1995 to May of 1996. From June to Dec. of 2000, he was a visiting professor in CPES of Virginia Tech in United State. From Feb. 2006 to April 2006, he was a visiting professor in ETH, Switzerland. He is interested in power electronics topology and control, power conversion for energy saving and renewable energy. He has authored five text books and more than 350 papers. He owns 20 patents.

Presently he is a board member of Electrical Engineering Discipline of China State Department Education Degree Committee. He is vice president of China Power Electronics Society. He is at-large Adcom member of IEEE power electronics society from 2006-2008. He is an associate editor of both IEEE transaction on power electronics and

IEEE transaction on Sustainable Energy. He was general chair of IEEE International Symposium on Industrial Electronics (ISIE2012, Hangzhou) and general chair of IEEE International Symposium on Power Electronics for Distributed Generation Systems (PEDG2013, Arkansas). He is IEEE Fellow.