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Active Power Control Strategy for a Fuel Cell Battery Hybrid System
고분자 전해질 연료전지 축전지 하이브리드 시스템의 제어 전략

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This paper presents study on control strategies for active power sharing in a hybrid fuel cell/battery power source to improve an efficient and battery life with acceptable load following capability. Fuel cells are inefficient to respond the fast load and high peak power demanded. Fuel cell/ battery hybrid systems can combine the high energy density of fuel cells and the high power density of batteries. A proper load management strategy is important to better system efficiency in the hybrid system.

The method proposed in this paper provides the strategies for fuel cell load changes, and steady state load sharing conditions as a function of external load demanded and battery soc using fuzzy logic algorithms. The fuzzy controller output is power of DC/DC converter which is directly proportional to Fuel cell out put. IF-Then rules are derived to make control strategies. If the required power of the hybrid system is small and the SoC is small, then the greater part of the fuel cell power is used to charge the battery pack. If the required power is relatively big and the SoC is big, then the fuel cell and the battery are concurrently used to supply the required power.

The strategy is evaluated using simulation and experimental results. The results show that the operation efficiency of hybrid system was improved, and the battery SoC maintained at reasonable level.