Abstract

Battery bank is used in many applications such as Electric vehicles, Hybrid Electric Vehicles and Plug in Electric Vehicles. These battery banks are of high-capacity and configured in series using multiple low or medium capacity batteries. These battery banks are expected to perform in the most challenging environmental conditions. Due to harsh environmental and operating conditions, the configured batteries tend to develop an imbalance in their charge levels. This imbalance may cause a normal variation or abnormal (large) variation in their state of charge. This imbalance of charge among batteries reduces the efficiency, reliability and life span of the battery bank. Hence, a technique called charge balancing and equalization is adapted to ensure the batteries are maintained at the optimum charge level in a battery bank so as to extend battery life span with reliability. Much topology on the cell balancing/equalization has been proposed in the past. The main topologies are passive and active balancing/equalizing. This paper presents a unique non dissipative 4 steps balancing and equalizing process for Lead acid batteries and a unique three step balancing and equalization process for other battery types. Both the process is so devised, to handle the batteries having normal or abnormal variations in
their state of charge. The proposed 4 step method has been validated by developing the experimental setup.

References

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**Index Terms**

Computer Science  
Circuits and Systems

**Keywords**

State of Charge (SOC); State of Health (SOH); Equalization Step, MOSFET; Battery; Over Charging Current.