

Automatic Battery Thermal Management System by Liquid Control Method

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Abstract

The ability to store electricity is critical for modern applications, and batteries are necessary for this purpose. Batteries tend to heat up significantly when kept in isolation or a small, enclosed environment, such as a power plant or an electric vehicle, which reduces the battery's lifetime and efficiency. Two things have the most influence on the battery's temperature. The battery's charging and discharging processes are what cause the heat to build up inside the battery. The battery generates heat as it is being charged and discharged, and heat is managed by a liquid cooling system with a water pump. The battery system's motor, which was previously used to pump liquid externally around the battery layer, now pumps the fluid. The ideal operating temperature of the battery is from 25 to 30 °C. The effectiveness of a battery thermal management system that controls the battery temperature will be greatly increased. Increase battery life and charge holding capacity while reducing power consumption. Using a MATLAB Simulink model, the battery thermal management system utilised in this project is validated, and an efficient hardware for the battery cooling system is constructed.

Keywords

Lead Acid Battery/Lithium Ion Battery, ESP32 Controller, Temperature Sensor, Cooling System, Motor Pump.

Biographies

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