

### **Development and Evaluation of the Traction Circuit for Battery-Powered and AC-Fed Hybrid Train**

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Battery powered trains have been developed for further energy saving and less maintenance. We have developed a battery-powered and AC-fed hybrid train, series BEC819, loaded with the lithium-ion battery system of 360-kW large capacity and 1598-V high voltage. This train started commercial operation in Oct. 2016, on AC-electrified Chikuho main line and non-electrified Wakamatsu line. In this paper, we describe characteristics and important design aspect of the BEC819's traction circuit, focusing on electrical protection and cooling performance of the battery, in comparison with the previously developed test train, series 817. Then, evaluation of the traction circuit is presented based on the running test conducted before the revenue operation.