

***Lithium-Ion Battery Cooling Thermal Management Analysis With Electric Vehicle
Liquid Immersion***

by

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ABSTRACT

The efficient Lithium-Ion battery so far, in the thermal management system, the efficient way to cool the Lithium-Ion module will be very helpful, besides that, the lithium-ion battery can be operated in a wide range of temperatures, fast charging capability, has no memory effect, and self level. low discharge. In this case, the researcher plans to make a battery temperature detector for the thermal management of Lithium-ion battery cooling batteries with electric vehicle liquid immersion which will be carried out from July 2022 to August 2022 POLIJE Automotive Machinery Laboratory. The method used in this research is the experimental method by testing the charging and discharging of Lithium-ion batteries. Tests in this study include time, current, voltage, and temperature at the time of charging and also at the time of discharging, after which data analysis was carried out. The process of assembling the 13 series 3 parallel batteries requires 39 Lithium-Ion 18650 battery cells. The results show that the charging time or charging takes 17 minutes and the discharging time takes 12 minutes without VCO and 16 minutes using VCO. In the Immersion Cooling test when charging, the highest temperature value is 31.32 °C and the lowest is 27.56 °C while the Immersion Cooling test at the time of discharging has the highest temperature value of 29.95 °C and the lowest is 28.78 °C. This is because the VCO has a value of 0 Resistivity, so it can reduce the temperature of the battery without an electrical short and is safe to use.

Keywords: *Thermal Management, Immersion Cooling, VCO, Liquid Immersion*