

SIMULATING OF ELECTRICAL PARAMETERS OF A POWER SUPPLY WHEN USING NON-STANDARD STARTER BATTERIES

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The most important aspect in the operation of transport and technological machines is the control of battery (GB) parameters, as well as the diagnosis and prediction of their condition. The operation of GBs form the power source involves the widespread use of automation systems for the technological process of their operation.

When it is necessary to use non-standard batteries, the study of the power source parameters formed in such conditions becomes relevant.

The goal of the report is to provide a mathematical description of the relationship between the main parameters of rechargeable batteries for different operating modes.

From the analysis of experimental data obtained for batteries of different manufacturers, it follows that to determine the remaining battery life, it is necessary to take into account not only the influence of external factors on its selected elements, but also the influence of previous operating modes.

Using basic computational theories for estimating battery parameters and based on the results of the analysis of the mathematical apparatus, an algorithm for parametric estimation of battery performance was developed, statistical series of density dynamics were obtained, and a distribution function was determined, which is characteristic of the Gaussian curve [1].

In the simulation model of the main operating modes when forming a power source from batteries of different manufacturers, the basic parameters of battery charge, discharge and storage mode are taken as [2,3].

References

1. Tremblay, O.; Dessaint, L.-A.; Dekkiche, A.-I., A Generic Battery Model for the Dynamic Simulation of Hybrid Electric Vehicles, Vehicle Power and Propulsion Conference, 2007. VPPC 2007. IEEE, pp. 284–289, 9–12 Sept. 2007.
2. Zhu, C., X. Li, L. Song, and L. Xiang, “Development of a theoretically based thermal model for lithium ion battery pack”. *Journal of Power Sources*. Vol. 223, pp. 155–164.
3. Saw, L.H., K. Somasundaram, Y. Ye, and A.A.O. Tay, “Electro-thermal analysis of Lithium Iron Phosphate battery for electric vehicles”. *Journal of Power Sources*. Vol. 249, pp. 231–238.