

The Research of Axel-Box 24-pole Generators for Communications Systems of Freight Railway Wagons

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Actuality: the growth of railway transportation is currently placing strict requirements to safety level and automation and is demanding the increase in the average speed of freight trains. These requirements can be met by the introduction of modern GSM-communication and geo-location systems. However, at present, there is a problem of not having enough independent power sources for communication and diagnostics. The article deals with the issues of designing and researching of axel-box generators for communications systems of freight railway wagons. Since the wire system has a number of shortcomings, the paper discusses the creation of the power supply on the basis of a generator with permanent magnets. This 24-pole generator is driven by energy from the wheel set. The article presents the results of a numerical experiment concerning the magnetic system of the axle generators using ElCut software. The results of numerical experiment and calculations showed that the effective value of the EMF generator is 9.12 V. The article presents map of the magnetic induction field and distribution of the magnetic induction along the pole of axel-box generators. Conclusion: calculations show acceptable results (rated generator power $P = 1.204$ W), even at relatively low average speed of the wagon