

Urban electric vehicles traction: Achievements and trends

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Abstract

This paper presents the recent achievements and the progress tendencies of the traction system of public urban electric vehicles (UEV) with reference to trolleybuses and tram cars. The current state of the domain is in full compliance to modern achievements of electro mechanics, power electronics and I. T. The development of the traction systems is focused on increasing the control's efficiency, reducing the energy consumption, increasing reliability and travel comfort. The comparative analysis of the traction motors shows a decrease in popularity of the DC motor usage in favor to AC, permanent magnet, increased phase number and switched reluctance motors. The traction electronic converters are developed basing on IGBT technologies with multifunctional digital systems of control, which functions as diagnosis, control of the component elements and fiber wire communication. FOC, DTC and AI methods are used to control the traction motors. The topological structure with individual control of each wheel is the future of the urban electric vehicles.