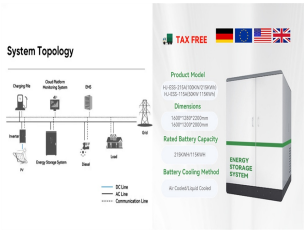
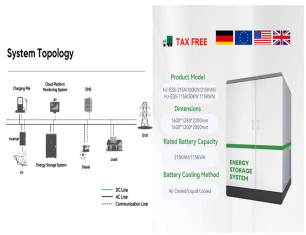
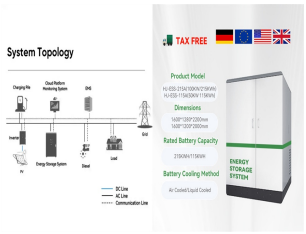
TRAMS AND TRAM ENERGY STORAGE



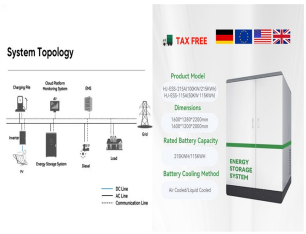
Why are trams with energy storage important? Trams with energy storage are popular for their energy efficiency and reduced operational risk. An effective energy management strategy is optimized to enable a reasonable distribution of demand power among the storage elements,efficient use of energy as well as enhance the service life of the hybrid energy storage system (HESS).



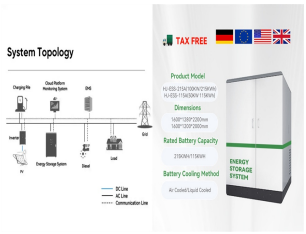
How do energy trams work? At present,new energy trams mostly use an on-board energy storage power supply method,and by using a single energy storage component such as batteries,or supercapacitors.



What is the energy storage system of catenary free trams? On the basis of the research on the energy storage system of catenary free trams,the technology of on-board energy storage,high current charging and discharging and capacity management system has been broken through. The trams with the energy storage system have been assembled and have completed the relative type tests.



Can supercapacitor-based energy storage system be used on trams? To solve technical problems of the catenary free application on trams,this chapter will introduce the design scheme of supercapacitor-based energy storage system application on 100% low floor modern tram,achieving the full mesh,the high efficiency of supercapacitor power supply-charging mode,finally passed the actual loading test [8,9].



What is a hybrid energy storage system in Guangzhou Haizhu Tram? The optimal HESShas less mass,size,cost and minimum charging state than original one in Guangzhou Haizhu tram. A hybrid energy storage system (HESS) of tram composed of different energy storage elements (ESEs) is gradually being adopted,leveraging the advantages of each ESE.

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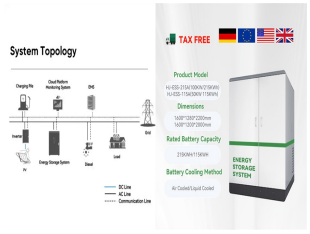
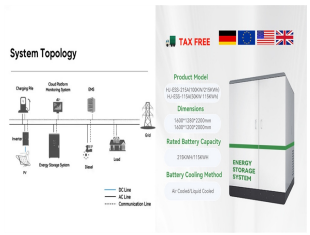


How much energy does a tram use? The greater the distance between stations, the greater the demand energy. The first interval has the largest distance and maximum energy consumption. If the recovered braking energy is not included, the energy consumption is 7.012 kwh. Fig. 3. DC bus demand energy curve. The tram adopts the power supply mode of catenary free and on-board SESS.



This paper investigates the benefits of using the on-board energy storage devices (OESD) and wayside energy storage devices (WESD) in light rail transportation (metro and tram) systems. The analysed benefits are the use of OESD and ???

In order to design a well-performing hybrid storage system for trams, optimization of energy management strategy (EMS) and sizing is crucial. This paper establishes a mathematical ???

Since a shared electric grid is suffering from power superimposition when several trams charge at the same time, we propose to install stationary energy storage systems (SESSs) for power ???

This paper introduces an optimal sizing method for a catenary-free tram, in which both on-board energy storage systems and charging infrastructures are considered. To quantitatively analyze the trade-off between available ???

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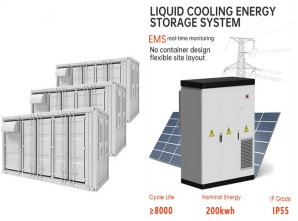
Preserving the charm of historical areas, reducing interfaces with civil works, simplifying underground network deviations, easing access to fire brigades and maintenance employees??? catenary-free systems offer a promising future for ???

Energy conservation running for vehicle has been a promising research hotspot in the many universities and research institutions. In order to improve the energy utilization rate ???



The new tramway in Li?ge, Belgium, will feature trams equipped with onboard battery energy storage for off-wire operation; a mock-up of a CAF Urbos unit on display in the city's transport museum. Image courtesy ???