Modified solar power pump

Are solar-powered water pumps efficient?

Therefore,solar-powered water pumps are the most efficientway to utilise the available abundant solar power [4,5]. Innumerable research has been carried out to develop an efficient solar-powered water pumping system (SPWPS) using various electric motor drives [4 - 7].

What is a solar photovoltaic-fed water pump?

This work deals with the development of an efficient and reliable solar photovoltaic-fed water pump with a battery energy storage (BES). This system ensures a continuous and rated supply of water in all working conditions. A new control logic for BES is developed, which significantly improves the overall response of the system.

Can solar power be used in water pumping systems?

The drive towards sustainable and renewable energy solutions has driven advancements in solar PV technology, particularly in water pumping systems . SPV array-fed WPSs, incorporating SEPIC converter-based BLDC motor drives, represent a cutting-edge approach to harnessing solar power for water supply.

How can we improve the efficiency of solar water pumping systems?

To improve the efficiency of solar water pumping systems,Ref. 21 provided a novel fractional-order fuzzy-MPPT approach. By covering parts,system viewpoints,and sophisticated control techniques for increased efficiency,these publications together boost our knowledge and development of solar water pumping systems.

What types of motors are used in solar water pumping systems?

Prominent hybrid techniques include PO-PSO, PO-GWO, INC-PSO, INC-GWO, and others [22, 23, 24, 25]. Various types of motors, including DC motors, induction motors (IM), permanent magnet motors, switched reluctance motors (SRM), and brushless DC (BLDC) motors have been utilized in solar water pumping systems (SWPS).

Which MPPT methods are used in a solar water pump system?

In the evaluation of the three MPPT methods [Perturb and Observe (P and O),Incremental Conductance (IC),and beta]for a solar water pump system,the following key findings have been observed: Results in noticeable oscillations in operating voltage and current. High ripple in DC link voltage.

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