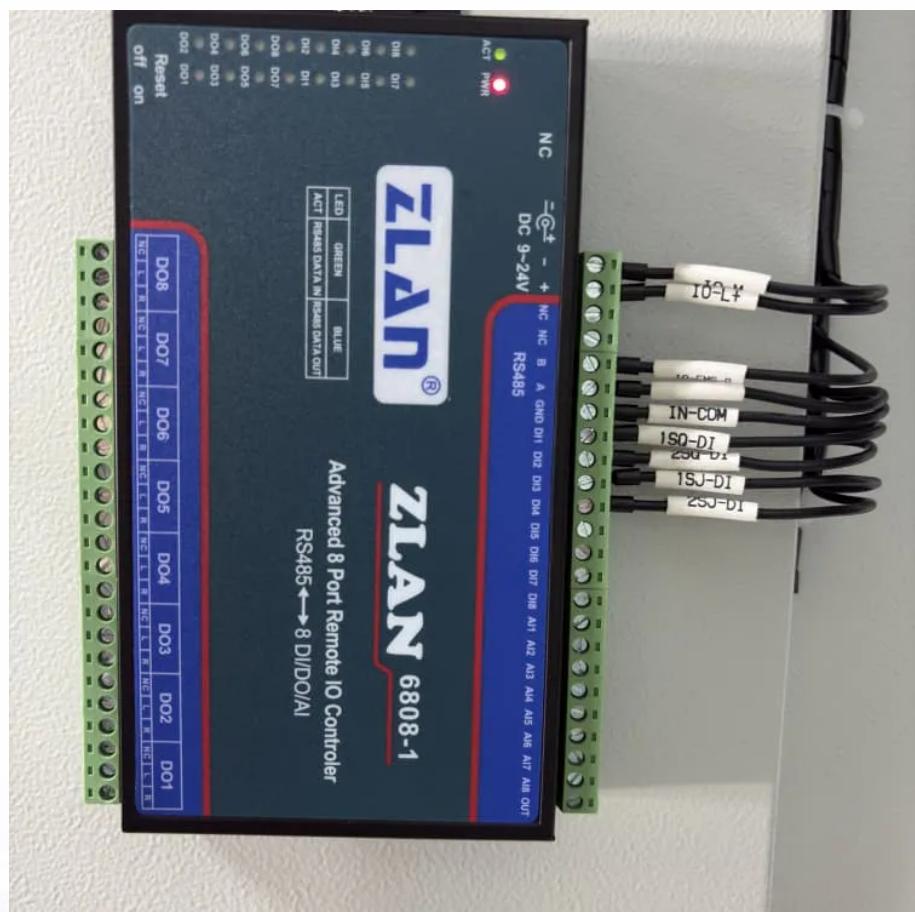




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# Vanadium liquid flow battery field expansion





## Overview

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Do flow field designs improve the practicality and efficiency of vanadium redox flow batteries?

In conclusion, this study underscores the importance of innovative flow field designs in enhancing the practicality and efficiency of vanadium redox flow batteries, providing a more reliable reference for their large-scale energy storage applications. Zebo Huang: Writing – review & editing, Resources. Yilin Liu: Writing – original draft, Software.

What is vanadium redox flow battery (VRFB)?

Vanadium redox flow battery (VRFB) is an essential technology for realizing large-scale, long-term energy storage. Among its components, the flow field structure plays a crucial factor affecting the battery performance. So far, there still exists uneven electrolyte distribution leading to low efficiency.

How does flow field geometry affect redox flow batteries?

Author to whom correspondence should be addressed. In vanadium redox flow batteries, the flow field geometry plays a dramatic role on the distribution of the electrolyte and its design results from the trade-off between high battery performance and low pressure drops.

Are vanadium redox flow batteries a key technology for a low-carbon energy transition?

Vanadium redox flow batteries (VRFBs) are receiving increasing interest as pivotal electrochemical technologies for a 21st century low-carbon energy transition .



## Vanadium liquid flow battery field expansion



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[Numerical Simulation of Flow Field Structure of Vanadium Redox Flow](#)

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[Flow field design and performance analysis of vanadium ...](#)

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[Flow field designs developed by comprehensive CFD ...](#)

CFD Model  
Model Setup and Mesh  
Governing Equations  
Cost Model  
VfB System Costs  
Nominal Power and Depth of Discharge  
Component and Production Costs  
For this study, the model is set up in the commercial engineering software



package Simcenter STAR-CCM+ Version 15.06.007-R8 from Siemens Digital Industries Software. For the CFD model, the fluid volume is generated as CAD designs, which geometries are sketched within the software. For all investigated designs, the inlet and outlet position as well See more on link.springer

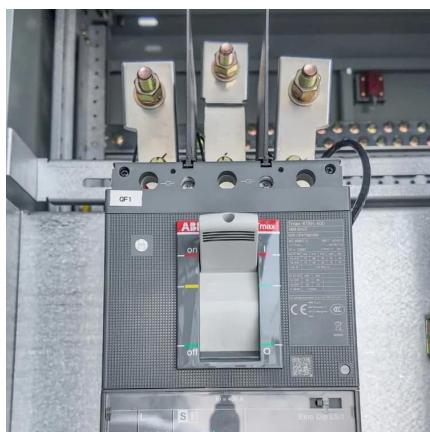
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performance was improved by applying a pulsating flow regime, with both pulse volume and frequency having an influence. A 38.7 % increase in ...



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...

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