



Pacific Electric 太電

Vanadium Redox Flow Battery System



Pacific Electric 太電

HEAD OFFICE YANGMEI PLANT

No.858,Sec.5, Kuaisu Rd., Yangmei Dist.,
Taoyuan City 326017, Taiwan (R.O.C)

TEL : +886-3-4202555

DAXI PLANT

No.269, Sec.2, Renhe Rd., Daxi Dist.,
Taoyuan City 335005, Taiwan (R.O.C)

TEL : +886-3-3801121

TAIPEI OFFICE

26F.,No.95, Sec.2, Dunhua S. Rd., Da-an Dist.,
Taipei City 106046, Taiwan (R.O.C)

TEL : +886-2-66366100

TAICHUNG OFFICE

No.13, Gongyequ 10th Rd., Xitun Dist.,
Taichung City 407019, Taiwan (R.O.C.)

TEL : +886-4-23595135

KAOHSIUNG OFFICE

3 F., No. 693, Mingcheng 3rd Rd., Gushan Dist.,
Kaohsiung City 804613, Taiwan (R.O.C.)

TEL : +886-7-3348188



*Discover more with Pacific Electric

service@pewc.com.tw

Vanadium Redox Flow Battery System



Renewable energy generation is crucial for sustainable development, making energy storage systems essential for stabilizing green energy integration into the grid. Vanadium redox flow battery (VRFB) systems, known for their high safety, 20-year lifespan, and flexible performance, can regulate load, shave peaks, fill valleys, and smooth power output to maintain grid balance and stability. They also contribute to mitigating grid impact and provide black start capabilities.

Pacific Electric has partnered with Sumitomo Electric Industries, Ltd. (SEI) to introduce SEI's VRFB technology. Pacific Electric aims to develop safe, long-lasting energy storage systems for both outdoor and indoor applications, addressing electricity backup and usage needs.

■ APPLICATIONS

Grid

- Expanding grid integration
- Reducing peak load
- Regulating frequency and voltage
- Responding to extreme weather emergencies

Transmission & Distribution

- Frequency regulation
- Black start capabilities
- Deferring transmission and distribution investments
- Voltage stabilization
- Emergency weather response



Behind the Meter

- Frequency regulation
- Black start capabilities
- Voltage stabilization
- Emergency weather response

■ FEATURES

High Safety

- Non-flammable electrolyte, no hazard management equipment is required

Long Lifespan

- Over 20 years (> 20,000 cycles)

Flexible Discharge

- Intra-day and multi-day flexibilities

Deep Discharge Capability

- 100% depth of discharge

Environmental Friendliness

- Recyclable and reusable vanadium electrolyte

Low Life-Cycle Cost (LOCE)

- No battery replacement necessary

Easy Operation & Maintenance

- Unlimited charging /discharging cycles
- Accurate state-of-charge estimation

Scalable Design

- Independent modules for power or capacity expansion, suitable for outdoor and indoor use



■ PRINCIPLE

A redox flow battery charges and discharges by circulating vanadium sulfate electrolyte between a tank and battery cells. The stack, composed of multiple cells in series, achieves high voltages.

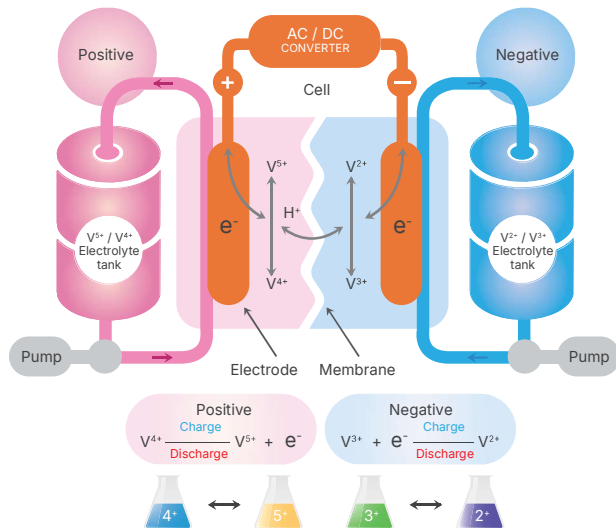


Fig. Schematic structure of VRFB

Redox: Reduction/Oxidation of active materials

Flow: Flowing active materials with pumps and tanks

■ STRUCTURAL DIAGRAM OF THE VANADIUM REDOX FLOW BATTERY SYSTEM

The battery unit includes a cabinet with positive and negative electrodes, a stack, a pump, and a heat exchanger. Integrated with a battery management system (BMS) and a power conversion system (PCS), forming a vanadium redox flow battery (VRFB).

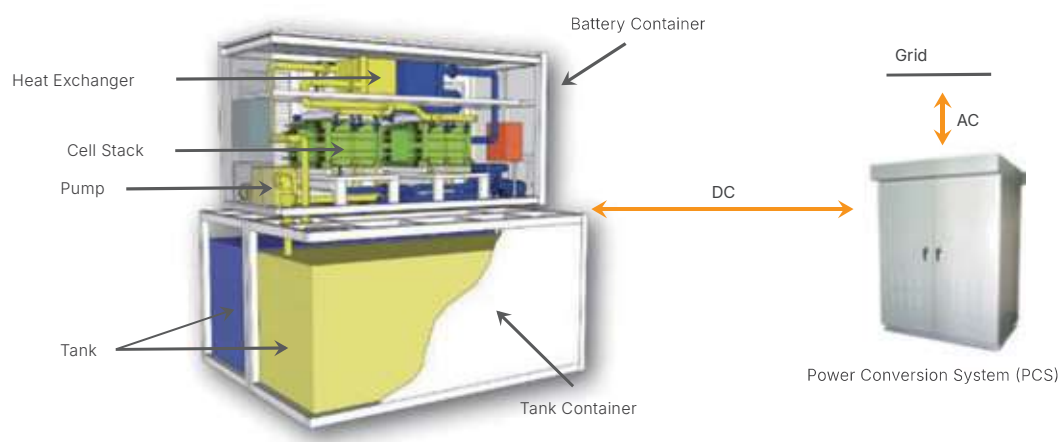
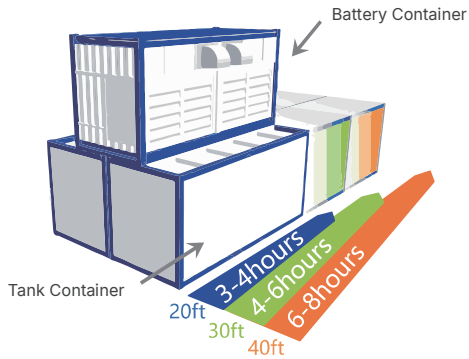


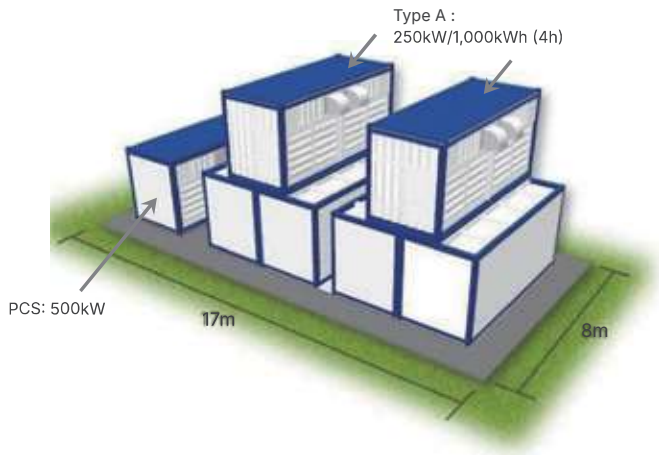
Fig. Structural diagram of container type energy storage system



■ BATTERY SYSTEM SPECIFICATIONS AND SPACE REQUIREMENTS



Type	Output	Hours	Capacity	Dimension (L x W x H)
Type A: 20 feet	250kW	3 - 4hour	750kWh-1,000kWh	6.1m x 4.9m x 6m
Type B: 30 feet	250kW	4 - 6hour	1,000kWh-1,500kWh	9.1m x 4.9m x 6m
Type C: 40 feet	250kW	6 - 8hour	1,500kWh-2,000kWh	12.2m x 4.9m x 6m



Output	Hours	Capacity	L x M
1MW	4hour	4MWh	15m x 17m
1MW	6hour	6MWh	21m x 17m
1MW	8hour	8MWh	27m x 17m
10MW	4hour	40MWh	85m x 27m
10MW	6hour	60MWh	103m x 27m
10MW	8hour	80MWh	131m x 27m