

UK MANUFACTURED HIGH PERFORMANCE BATTERY MODULE



With aerospace and defence applications requiring safe and reliable means of high-power cycling, Ricardo, working with Volklec, have developed a powerful battery module that utilises immersion cooling technology.

The *Integrated Battery Management System* monitors cell voltage and temperatures, balancing cell charge to optimise module performance and maximise operational life.

Applications include autonomous vessels, submarines, drones and high-energy systems, or as a mobile power base for recharging equipment in forward positions.

FEATURES

- **High Power Output:** For performance with a peak discharge of 12C.
- **Wide Operating Range:** Discharge from 30°C to +60°C, charge from 0°C to +45°C.
- **Low Internal Resistance:** DCIR of 12 mΩ at 50% SOC, enabling optimal efficiency.

DEVELOPED AND MANUFACTURED IN THE UK



Production of the module is managed within the UK's own specialist supply chain of high-performance carbon composite materials and precision machining.



The module uses cell technology supplied by Coventry-based manufacturer, Volklec, which will scale up production in the UK from 2026, with cells available now.

Final assembly of the module is undertaken at Ricardo's facilities in West Sussex.

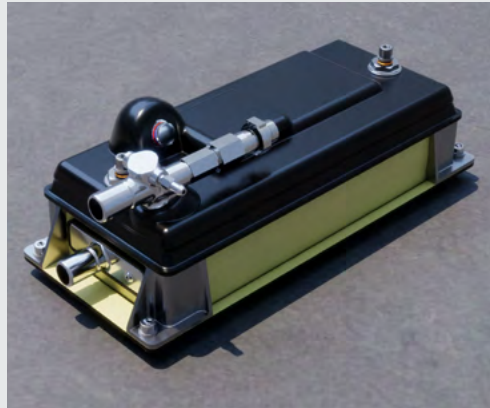
Specifications: Immersion Cooled Battery Module

SPECIFICATION	VALUE	UNIT
Capacity	864	Wh
Voltage range	30-51	V
Maximum discharge ⁽¹⁾	240	A
Maximum charge ⁽¹⁾	100	A
Continuous discharge	120	A
Continuous charge	60	A
Mass	5.2	kg
Dimensions	330x139x128	mm
Dielectric Fluid Temperature ⁽²⁾	-40 to +60	°C
Dielectric Fluid Flow Rate	3-6	LPM
Cycle life ⁽³⁾	>1,000	Cycles
Dust/water ingress	IP68	-

1. Temperature limited

2. Charging limited to 0-60°C. Consult Ricardo Engineering for information on compatible dielectric fluids

3. Down to 80% capacity with 1C/1C charge/discharge



DESIGNED TO MEET THE NEEDS OF UK MILITARY

- **High Power in a small package:** enabling high power loads and propulsion on land, air, and sea.
- **Low thermal signature:** thanks to innovative cooling approaches and low cell resistance.
- **Stealth operation:** under electric propulsion with a battery cell and module that offers a good mix of high power and energy density.
- **Improved safety and robustness** against thermal runaway through immersion cooling.
- **Uniform operating temperature:** advanced thermal management reduces cell degradation and increases battery life.
- **Trusted battery state:** drawing from 15 years of British innovation in battery management systems, giving state of charge and health that you can depend on.
- **UK supply chain:** independent cell manufacturing and module assembly in the UK.

DESIGN, DEVELOPMENT & MANUFACTURE OF BATTERY SYSTEMS TO MEET YOUR REQUIREMENTS

Our experts can support you with bespoke design and development capabilities for a wide range of applications, including:

- Battery Module and Pack Design
- Battery Management Systems
- Traction inverters and electric motors
- Fuel Cell Systems
- DC/DC Power Converters
- Charging Systems and On-Board Chargers

All design and development services are underpinned by specialist engineering advisory teams, including architecting, requirements management, digital twin simulation, testing, root cause analysis and solution implementation.

In addition, we can uniquely offer in-house niche manufacturing services including DFM/DFA analysis, integrated quality planning, and supply chain management.

Contact us www.ricardo.com Email: info@ricardo.com

