

Heating and Charging at Low Ambient Temperature (-20°C)

L.Pack Lithium-ion Battery 48VDC – 42Ah – 2kWh

Optimized charging, longer lifespan, ready for work

Fast charging a battery at cold temperature shortens its lifespan. Calogy addresses this issue by combining its **smart battery management system (BMS)** with a **proprietary thermal management technology** in its L.Pack battery. This test demonstrates how L.Pack **automatically** warms the battery to start charge at 0°C and fast charge when reaching the ideal 15°C , **protecting cell health and minimizing charge time**. We offer the perfect fit for commercial and vocational vehicles that demand **durability, readiness and efficiency** when temperatures drop. L.Pack - made for **real work environments**. **Dare us.**



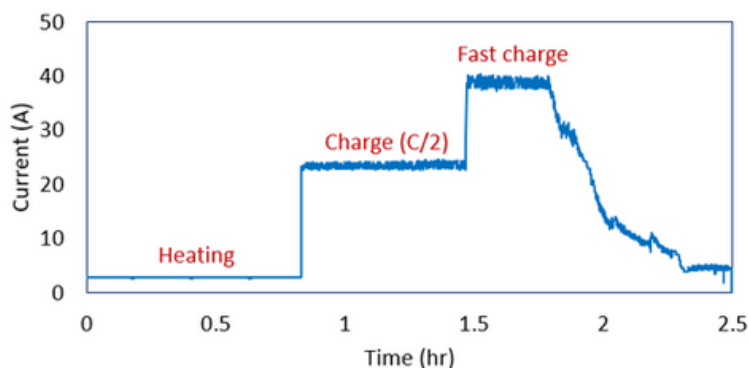
Objectives

- Demonstrate the charging behavior of the module at low temperature

Test conditions

- Initial and ambient temperature: -20°C
- Initial SOC: 5%
- Target charging SOC: 95%
- Charge profile: Constant Current – Constant Voltage (CC-CV)
 - $\text{C}/2$: $0^{\circ}\text{C} < \text{Temperature} < 15^{\circ}\text{C}$
 - 1C : $15^{\circ}\text{C} < \text{Temperature} < 35^{\circ}\text{C}$
- Heater: Activated during charging under 15°C

Current profile



Results and conclusions

- Enabled preheating, charging, and fast charging at low ambient temperatures
- Charging ($\text{C}/2$) is possible above 0°C
- Fast charging (1C) is possible above 15°C
- Active temperature control in fast charge to maintain temperature above 15°C

Minimum temperature of the module

