

# BAC-90AE

## Small Battery Adiabatic Calorimeter



Advanced Technology



High Efficiency



Safety



The BAC-90AE is an adiabatic calorimeter designed for small battery safety testing, based on adiabatic accelerating rate calorimetry principles. It synchronously collects data on battery voltage, current, charge, temperature, pressure, and time under various abuse conditions, assisting battery and battery pack R&D and testing personnel in conducting comprehensive safety performance assessments.

Hangzhou Zeal Instruments Science & Technology Co., Ltd.

marketing@zeal-instruments.com    www.zealinstruments.com

No. 260, 6th Street, Hangzhou, Zhejiang Province, China



## Product Features

- Simulates an ideal adiabatic environment, enabling direct measurement of accurate thermal behavior parameters such as battery thermal runaway onset temperature, maximum temperature rise rate, and adiabatic temperature rise.
- Integrated battery charge/discharge module for mode switching, constant current/voltage charging settings, charge/discharge current settings, and real-time battery capacity calculation.
- Simultaneous data acquisition of battery voltage, current, temperature, pressure for thermal runaway analysis.
- Features charge/discharge heat release mode to accurately reflect heat release amount and rate during battery charging and discharging.
- Provides constant power and constant rate specific heat test modes, enhancing the accuracy of battery specific heat measurements through a unique testing process.
- Safety features include overpressure and overtemperature alarms, and automatic furnace lid lifting for secure, easy operation.

## Technical Specifications

### Calorimeter Main Unit

Operating Environment	5 °C – 40 °C, ≤85% RH
Temperature Control Range	RT – 500 °C
Temperature Control Modes	Isothermal, Scanning Mode, HWS Mode, Specific Heat Capacity - Constant Power Mode, Specific Heat Capacity - Constant Rate Mode, Charge/Discharge Heat Release Mode
Temperature Detection Threshold	0.005 – 0.02 °C/min
Temperature Tracking Rate	0.005 – 40 °C/min
Temperature Display Resolution	0.001 °C
Furnace Dimensions	90 mm (Diameter) × 110 mm (Depth)
Interface	USB or RJ45
Rated Voltage	AC 220 V, 50 Hz
Rated Power	≤ 3000 W

### Specific Heat Capacity Test Module

Testing Method	Supports comparative method
Test Modes	Supports constant power and constant rate modes
Calibration Mass Block	Equipped with a specific heat test calibration mass block for periodic calibration

### Data Analysis Software

Data Transmission Method	Implemented through network for remote control, ensuring the safety of experimental personnel
Data Recording	Multi-dimensional data are recorded synchronously, facilitating the study of thermal runaway mechanisms under various inducements
Specific Heat Capacity Calculation	Available
Thermal Analysis Functions	Including thermodynamic and kinetic calculation capabilities

## Test Standards

ASTM E1981-98    SN/T3078.1

## Application Fields



New Energy Vehicles



Energy



Consumer Electronics



Energetic Material



# Technical Specifications

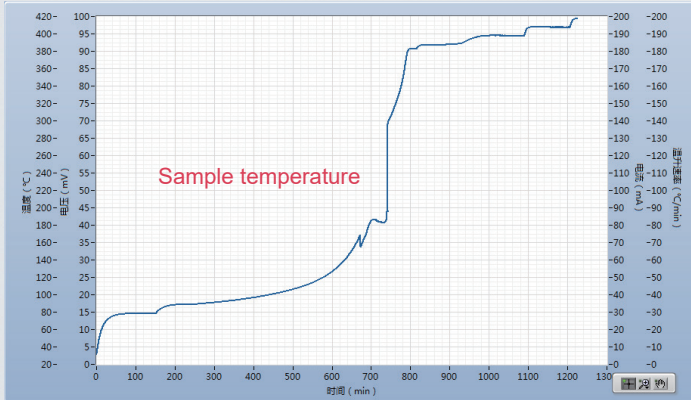
## Pressure Measurement and Gas Collection Module (Optional)

Sealed Canister Types	18650 cell, Small battery pressure vessel (sealed)
Sealed Canister Pressure Range	Better than 10 bar
Pressure Measurement Range	0–20000 kPa
Pressure Resolution	1 kPa
Pressure Measurement Accuracy	≤ 0.05%
Gas Collection Function	Capable of collecting battery thermal runaway exhaust at different stages for component and combustion characteristic measurement

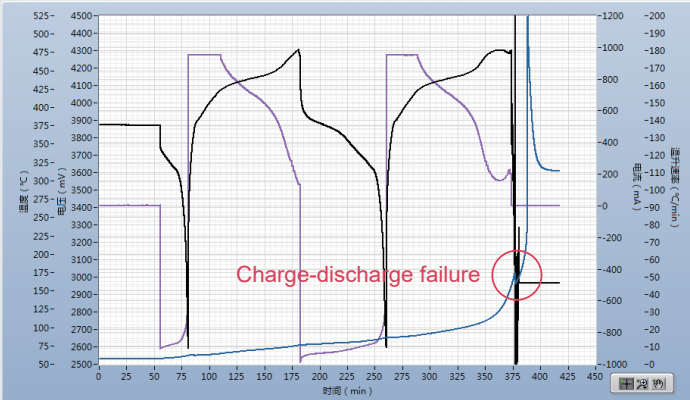
## Charge/Discharge Management Module (Optional)

Charging Voltage	Up to 5 V
Charge/Discharge Current	Up to 20 A
Testing Channels	8 channels (simultaneous)
Charge/Discharge Modes	Equipped with constant voltage and constant current modes
Voltage and Current Monitoring Function	Available
Voltage Measurement Accuracy	±0.1% FS
Current Measurement Accuracy	±0.1% FS
SOC Calculation Function	Available
Data Collection Interface	RJ45

Experiments on thermal runaway of 18650 lithium batteries in HWS mode



Adiabatic mode experiments of 0.2C current charging and discharging cycling



Sample temperature — Voltage — Current

## Auxiliary Test Accessories

