

IEC 62133 Battery Low Pressure Test Chamber

Battery Altitude Simulation / Low Pressure Test Chamber (UN38.3 & IEC 62133)



Standards: UN38.3, IEC 62133 Clause 7.3.7, UL 1642

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1. Product Overview

The KingPo Battery Low Pressure Test Chamber is a professional environmental test system designed to simulate high-altitude low-pressure conditions for lithium battery safety testing. It is primarily used to evaluate the safety performance of batteries under reduced atmospheric pressure, such as during air transport or high-altitude storage.

This chamber helps manufacturers and testing laboratories verify that batteries remain safe without fire, explosion, leakage, venting, rupture, or other abnormal behavior under low-pressure conditions, in full compliance with UN38.3 and IEC 62133 requirements.

2. Applicable Standards

Standard	Description
UN38.3	Altitude Simulation Test – Low pressure (11.6 kPa) for 6 hours
IEC 62133 Clause 7.3.7	Low pressure (altitude simulation) test for secondary cells and batteries
UL 1642	Standard for Lithium Batteries – Low pressure test requirements

Note: This equipment is designed to support the test methods described in the above standards. Final compliance judgment should be made according to the latest official edition of the applicable standard.

3. Test Purpose

The purpose of this test is to simulate the low-pressure environment encountered during air transportation or high-altitude storage to evaluate the safety of lithium batteries.

The test verifies that batteries do not exhibit fire, explosion, leakage, venting, rupture, or other hazardous conditions when subjected to reduced atmospheric pressure. It is a critical safety requirement for lithium battery transportation and certification.

4. Main Features

- Designed for UN38.3 and IEC 62133 low pressure (altitude simulation) testing
- Automatic vacuum control system for precise and stable pressure regulation
- Real-time battery voltage monitoring during testing
- Stainless steel inner chamber with protective Teflon lining (corrosion and fire resistant)
- Integrated safety features: pressure relief valve, pre-overpressure protection, fault alerts
- LED timer with automatic test duration control
- Compact standard internal dimensions (300×300×300 mm), customizable
- Suitable for cells, battery packs, and modules

5. Technical Specifications

Parameter	Specification	Notes
Applicable Standards	UN38.3, IEC 62133 Clause 7.3.7, UL 1642	Low pressure / altitude simulation
Test Pressure	11.6 kPa absolute pressure	Standard UN38.3 condition
Pressure Range	0.5 kPa – 100 kPa	Wide altitude simulation range
Test Duration	6 hours (standard)	Automatically controlled
Internal Dimensions	W300 × H300 × D300 mm	Standard size; customizable
Inner Chamber Material	Stainless steel + Teflon lining	Corrosion and fire resistant
Control System	Automatic vacuum control + LED timer	Precise and easy operation
Monitoring	Real-time battery voltage monitoring	Early detection of abnormal conditions
Safety Features	Pressure relief valve, pre-overpressure protection, fault alerts	Enhanced operator and equipment safety

Power Supply

AC 380V, 50Hz, 2.2kW

Standard industrial power

6. Testing Principle

The chamber simulates the low-pressure environment of high altitude by reducing the internal pressure to a specified level (typically 11.6 kPa absolute pressure).

The battery is placed inside the chamber, and the pressure is automatically controlled and maintained for the required duration (usually 6 hours). During the test, battery voltage is continuously monitored to detect any abnormal behavior such as leakage, venting, or thermal runaway.

This test is critical for ensuring battery safety during air transportation, where reduced atmospheric pressure can cause internal gas expansion and potential hazards.

7. Typical Test Procedure

1. Place the battery sample inside the test chamber and connect voltage monitoring leads if required.
2. Close and seal the chamber door securely.
3. Set the target pressure (typically 11.6 kPa) and test duration (6 hours) on the control system.
4. Start the automatic vacuum control system.
5. Monitor real-time battery voltage and chamber pressure throughout the test.
6. At the end of the test duration, the system will automatically stop or alert the operator.
7. Open the chamber, remove the sample, and inspect/record any abnormal conditions (leakage, venting, rupture, fire, etc.).

8. Applications

- Lithium battery manufacturers — Altitude simulation testing for cells and battery packs
- Testing laboratories — UN38.3 and IEC 62133 compliance testing services
- Transportation and logistics companies — Battery safety verification for air transport
- Certification bodies — Low-pressure test execution and evaluation
- Research institutions — Battery performance studies under simulated high-altitude conditions

9. Standard Configuration

- Stainless steel inner chamber with Teflon protective lining
- Automatic vacuum control system
- LED timer and control panel
- Real-time voltage monitoring interface
- Pressure relief valve and safety interlocks
- Basic operating manual

Note: Chamber size and configuration can be customized according to specific test requirements. Third-party calibration of the pressure measurement system is available upon request.

10. Ordering Information

To provide the correct configuration, please confirm the following information before quotation:

- Applicable test standard (UN38.3, IEC 62133, UL 1642, or others)
- Required internal chamber dimensions
- Battery sample size and type (cell, module, or pack)
- Whether real-time voltage monitoring is required
- Whether third-party calibration certificate is needed
- Any special safety features or customization requirements

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