High Low Temperature Test Chamber Constant Temperature Humidity Chamber

Item Number: DA02

Introduction

High low temperature test chamber for battery cells automotive components and electronic products provides controlled testing from minus 40 to plus 150 degrees C with precise stability robust protection and dependable environmental reliability evaluation in laboratory and industrial programs.

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Application	Description	Key Benefit
Battery Cell Reliability Testing	Exposes battery cells to programmed high-temperature, low-temperature, and alternating-temperature conditions during R&D and qualification work.	Helps evaluate thermal environmental resilience before cell design release or process scale-up.
Automotive Component Validation	Tests sensors, connectors, housings, switches, modules, and other vehicle components under simulated thermal extremes.	Supports environmental reliability evidence for automotive component development and supplier quality review.
Electrical and Electronic Product Testing	Conditions electrical and electronic products, assemblies, and parts at controlled temperatures to assess functional stability.	Identifies temperature-related performance risk before field deployment.
Materials Thermal Evaluation	Evaluates materials and individual parts for response to high temperature, low temperature, and temperature change.	Provides a controlled basis for comparing material behavior across repeatable conditions.
Incoming Quality Inspection	Applies thermal exposure tests to purchased components and materials as part of supplier verification procedures.	Helps procurement and quality teams screen for inconsistent environmental performance.
Product Design Verification	Supports engineering teams performing environmental simulation tests during prototype iteration and design verification.	Brings thermal-stress testing into the development cycle before costly downstream changes.
Academic and Research Laboratory Studies	Provides a defined thermal environment for research involving advanced materials, electrical products, automotive parts, and battery-related samples.	Delivers a compact 80 L test volume with controlled performance for recurring experimental work.

Parameter	Specification
Product Item Number	DA02
Applicable Test Scope	Battery cells, various automotive components, electrical and electronic products, other products, parts, and materials; high-temperature, low-temperature, and high-low temperature alternating environmental simulation reliability tests
Effective Volume	80L
Inner Chamber Dimensions	W400mm*H500mm*D400mm
Outer Chamber Dimensions	W650mm*H1700mm*D1270mm
Test Ambient Temperature	5□ 30℃
Test Ambient Humidity	≤85%RH
Sample Weight	None
Sample Heat Generation	None
Temperature Range	-40℃□ +150℃(full-range controllable)
Temperature Fluctuation	≤±0.5℃ (after temperature stabilization, the temperature variation at any point in the chamber within the specified time)

Parameter	Specification
Temperature Deviation	≤±2.0℃ (after temperature stabilization, the difference between the maximum/minimum temperature and nominal temperature at any time)
Temperature Gradient	≤±2℃ (after temperature stabilization, the maximum difference between average values of any two points in the chamber over any time interval)
Heating Rate	Full-range average 1~3℃/minute (non-linear, no-load)
Cooling Rate	Full-range average 0.75~1℃/minute (non-linear, no-load)
Heating/Cooling Overshoot	≤±2.0℃
Conforming Test Standard	GB/T 2423.1 2008 Test A High Temperature Test Method
Conforming Test Standard	GB/T 2423.2-2008 Test B Low Temperature Test Method
Noise Level	≤70dB (A sound level)
Equipment Weight	450KG
Equipment Power	3.85KW
Power Supply	AC 220V,50Hz
Support Structure	Steel frame structure
Outer Enclosure	Cold-rolled steel plate with high-temperature spray coating
Inner Enclosure	1.0MM SUS#304 heat- and cold-resistant stainless steel, sealed welding
Insulation Layer	100MM fire-resistant, high-strength PU polyurethane foam insulation; insulation coefficient less than 0.0212kcal/m•hr
Door	Single-opening door
Observation Window	W220 mm*H350mm multilayer vacuum viewing window with automatically regulated electric anti-frost and anti-condensation device
Test Ports	2 × Ø50mm, with silicone plugs and stainless-steel covers
Door Seal	Imported silicone sealing strip at the interface of the door frame and insulated door
Test Racks	2 layers of insulated shelving; load capacity ≥20KG/layer
Pressure Balance Port	Mechanical, non-powered, maintenance-free; opening pressure adjustable according to actual requirements; automatically opens rapidly at operating pressure to balance internal and external pressure difference
Chamber Lighting	1 group of high-brightness energy-saving lights inside the observation window
Casters	4 groups of adjustable fixed movable wheels with locking function for positioning and leveling
Explosion Protection	1 smoke exhaust port; 2 explosion-proof chains on each side of the door; 1 three-color audible and visual alarm light
Heating Method	Electric heating tubes; stainless-steel finned nickel-chromium alloy electric heat-radiating tubes
Heating Control	Controller output signal uses SSR solid-state relay for high-precision contactless switching control
Air Supply Method	High-uniformity upper static-pressure air supply with lower circulating return air
Circulation Motor	Circulates chamber airflow to improve temperature uniformity
Circulation Fan	Multi-blade centrifugal circulation fan with high- and low-temperature-resistant aluminum-alloy blades
Airflow Control	Controller output signal regulates fan speed through variable-frequency control for stable control of chamber temperature fluctuation and uniformity
Temperature Sensor	PT100 dry-bulb temperature sensor
Refrigeration Method	Compressor refrigeration system
Compressor	Specified compressor or equivalent grade
Refrigerant	R404A
Condenser	Air-cooled high-efficiency shell-and-tube condenser
Heat Exchanger	High-efficiency ST plate heat exchanger
Evaporator	High-efficiency multi-stage hydrophilic-film fin evaporator with thickened fins
Other Refrigeration Components	Oil separator and related components
Sample Over-Temperature Protection	Independent adjustable temperature protector
Electrical Protection	No-fuse protection switch and system overcurrent protection device

Parameter	Specification
Heater Protection	Heater over-temperature protection switch
Compressor Protection	Compressor overload and overheat protection; compressor high- and low-pressure protection
Controller Protection	Fault self-diagnosis and display function
Power Protection	Phase-sequence protection function