Presto Enviro
ENVIROMENTAL SIMULATION CHAMBERS | A PRESTO GROUP COMPANY

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Battery Test Chamber



A battery test chamber is a testing device to maintain controlled environmental conditions for evaluating different types of batteries during development and quality checks.
The testing environment provided by battery testing equipment is stable and consistent which enables manufacturers to observe how batteries react when subjected to real-world conditions. During the evaluation process, the chamber makes sure that the batteries meet the required performance, safety, and quality standards by putting them through specific tests.

Features

Advanced Airflow Management

- Rear-mounted or top mounted high-temperature circulation fan motor.
- Optimized airflow distribution for superior uniformity
- Reduced thermal stratification inside workspace
- Air velocity ranges from 1-3 m/s

- **High Performance Refrigeration system**
- Hermetically sealed compressor technology
- Energy-efficient refrigeration design
- Eco-friendly refrigerants available
- First pull-down and recovery performance

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- **Robust Chamber Construction**
- Interior made of SS304 stainless steel
- Exterior powder-coated GI or stainless steel finish
- High density polyurethane insulation
- Corrosion-resistant construction
- Heavy-duty door hinges and locking system
- **Intelligent Control System**
- 7-inch / 10-inch touchscreen HMI Controller
- PLC-based automation system
- Multi-step Programmable profiles
- Real-time trend graph display
- USB/Ethernet/ RS485 Communication
- Data Logging and export capability
- **Safety Protection System**
- Over Temperature protection
- Compressor overload protection
- Refrigeration pressure safety switch
- sensor failure indication
- Emergency stop provision
- Leakage current protection
- Door limit switch provision
- MCB & MPCB protection for single and 3 phase devices
- SPP Protection
- EMI Filter
- **Optional accessories (Chargeable)**
- Port caps
- PT 100 sensor
- Legri tubing-5m

Highlights

- **Additional Features Unique to a Battery Test Chamber**

I. Thermal Runway Management

Battery chambers are designed with features to help contain or mitigate the consequences of a battery thermal event, such as:

- Pressure relief vents
- Explosion relief panels(where required)
- Fire resistant insulation
- Thermal Shielding
- Reinforced Chamber Structure

• **2. Gas Management**

During Battery failure, gases such as hydrogen, carbon monoxide, and volatile organic compounds may be released.

Battery chamber may include:

• Gas detectors
• Exhaust ports
• Purge systems
• Controlled ventilation

3. Fire Protection

Battery chambers often provide optional:

• Co2 Suppression
• Nitrogen inerting
• water mist systems
• Aerosol fire suppression
• Automatic shutdown on fire detection

4. Enhanced Safety Logic

Battery Chambers generally incorporate interlocks that can:

• Stop charging/discharging during abnormal conditions
• Disable heaters
• Activate purge or suppression systems
• Trigger emergency alarms
• Log fault events for analysis

Touch Screen Interface- Tech Master

• HMI based Intuitive Touch screen interface with Programmable software.
• Online Graphical Report Generation
• Rapid Ethernet Connectivity for fast result transmission
• Quick data transmission with USB Port Facility
• In built Alarm Notification system with Auto Tuning Facility Secure Socket Layer (SSL) Protocol
• Password protection facility
• Interchangeable Languages - English & Hindi
• Easy Setup of User Profile for Automated report generation
• Programmable with Multiple Cyclic conditioning
• Pass/Fail Report Criteria in System Generated Report
• Viewable Fault History/ Past Reports
• Email Notification Facility for user ease
• Remote Monitoring facility for easy data Management
• In built LED light Control System
• Option available to set PV and SV value
• Knox system integrated for data security
• Assessing CO, H2, O2, and temperature inside the testing ara
• On screen graphical representation of run time vs temperature

Safety -Test Guardian

- Test chamber equipped with MP10 module which consists of multiple safety functions like:
- Motor over-heating protection (with LED indicator)- To ensure Safety of Motor which controls the entire
- operating System.
- Exhaust temperature over-heating protection- This safety Facility is able to monitor any overheating.
- Enhanced Door Locking with Reinforced brackets are available outside the door of the machine to make sure safety and security in case of any unexpected explosion.
- In built Power Indicator to provide live reading of Power
- Seven-point alarm function which consists of multiple alarms which provide the user with live notification of any faults in the Chamber.
- Explosion Proof Design: Ergonomic design ensures that the chamber is leak proof and Explosion proof in case of any uncertain events.
- Remote Monitoring Alarm System: User shall receive all notifications regarding any fluctuation in parameters or settings to ensure immediate rectifications.
- Emergency Shutdown Mechanism: Manual/ Automatic Shutdown mechanism
- Insulation: Insulating materials and coatings to prevent electrical contact and reduce the risk of electric shock.
- CO2 fire suppression system - Inbuilt Fire Extinguisher system with automation to prevent from damage.
- Secure locking system as per Standard to ensure Zero Leakage
- Micro Safe Gas Detection system

Smoke Monitoring Device for quick detection

Advanced Technology Refrigeration System

- Compressors equipped with world famous brand equipped in Battery Test chamber to ensure Precision and accuracy.
- Shock Absorbers and Noise Cancellation system to minimize vibration and ensure protection of compressor
- With Advanced bending process, the chamber can minimize the connector point and make refrigerant flow
- more effciently.

Specifications

	Model	PT-150 BTC	PT-300 BTC	PT-600 BTC	PT-1000 BTC	PT-1500 BTC
	Humidity control range	-70°C to 180°C				
	Temperature Accuracy	±0.1°C to +1.2°C measured at control sensor Resolution: 0.1°C				
	Humidity uniformity	< 1000 Litres: ≤1.5°C. 1000 to 2000 Litres: ≤2.0°C. > 2000 Litres: ≤2.5°C.				
Temperatures sensor	Temperatures sensor	PT 100 class A temperature sensor				
	Temperature Rate of Change	Heating & Cooling: 5°C/min average as per IEC 60068 3-5 for above temperature range Measured at control sensor between +155°C to -45°C in an empty chamber Heating & Cooling: 3°C/min linear from +120°C to -40°C in an empty chamber				
	Humidity control range	10.0% RH ~ 98.0% RH				
	Humidity fluctuation	± 1.0% RH				
	Humidity uniformity	± 2.0%RH				
Humidity	Internal material	Adopts 1.2mm thickness stainless steel(SUS304)				
	External material	Adopts 1.2mm thickness Cold rolled steel sheet / powder spraying				
	Heat insulating material	125mm thickness polyurethane plate + 10mm thickness mineral wool				
	Fan	Centrifugal blower				
	Compressor	Semi-closed Germany Bock, Germany Bitzer				
	Condenser	Air cooling/water cooling (for 10K, 15K,20K chambers)				
	Refrigerant	R449, R23, R508				
Material Component	Evaporator	Fin - and - Tube Heat Exchanger				
	Heater	Nickel chromium alloy heating wire				
	Humidifier	Steam humidifier				
	Standard configuration	2 100MM pressure relief port, 4 explosion-proof chains				
	Multipoint temperature monit	or Adopts Presto developed controller, which can be used to acquire surface temperature points of multiple products				
	C02 fire extinguisher	Automatic fire extinguishing and automatic shutdown of the machine to protect the equipment from burning				
	CO, H2 gas detector	When the battery will produce gas, it will detect gas solubility and discharge to outdoor when it exceeds the standard				
Options	Exhaust valve	When the test sample produces harmful gas, ventilate and exhaust internally				
	Interior size(mm) W*H*D	500*400*700	600 x 600 x 800	800 x 850 x 900	1000 x 1000 x 1000	1500 x 1000 x 1000
	Outer size(mm) W*H*D	805*1535*2000	1000 x 1735 x 2000	1055 x 1985 x 2200	1255 x 2135 x 2300	
Size	Volume (L)	150L	300L	600L	1000L	1500L
Operating ambient temperature	+5-35°C					
controller	Adopting Presto Self-developed controller it can test the surface temperature of the sample with multiple temperature sensors					

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