Presto Enviro
ENVIROMENTAL SIMULATION CHAMBERS | A PRESTO GROUP COMPANY

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Humidity Freeze Test Chamber



A Humidity Freeze Test Chamber is a precision testing instrument designed to simulate alternating cycles of freezing tempe -ratures and controlled humidity levels within a sealed environment.

The humidity freeze tester is an advanced environmental testing system to evaluate the reliability, durability, and performance consistency of materials or products when exposed to repetitive freezing and humid conditions. The chamber helps analyze how variations in temperature and relative humidity impact the physical, mechanical, and structural integrity of the specimen after multiple test cycles.

Utilizing sophisticated microprocessor-based controls, this highly programmable chamber enables users to program numerous test sequences, including freeze-thaw cycles, humidity ramping, condensation to exposure and temperature-humidity combined stress. Regular testing can identify changes in dimensional stability, surface Onish, electrical performance, and product quality.

The Humidity Freeze Test Chamber is manufactured in accordance with internationally prominent standards including IEC, JIS, AST, ISO, and DIN to ensure reliable testing with worldwide acceptance.

Also known as a Climatic Humidity and Freeze Chamber, it determines how combined low temperature and high humidity cycles affect the durability and operational characteristics of components and finished goods.

Upon test completion, results help engineers identify design weaknesses and improve material formulations for enhanced performance, long-term stability, and environmental resistance.

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Features

- No frost or condensation accumulation during prolonged freeze–humidity cycles.
- Integrated refrigeration and dehumidi cation control system for smooth and energy-ef cient operation.
- Fully programmable test cycles with an intuitive, user-friendly interface.
- Built-in timer (up to 999 hours) for automatic cycle completion and shut-off.
- Multi-tiered safety mechanisms to prevent deviation from preset limits.
- Touchscreen HMI display for real-time monitoring of temperature, humidity, and cycle duration.
- Compact, mobile design with castor-mounted base for easy laboratory movement.
- Double-layer insulated observation window for airtight sealing and clear visibility.
- Adjustable stainless-steel sample trays to accommodate multiple test specimens simultaneously.
- Inner chamber constructed from corrosion-resistant stainless steel (SS 304) for extended service life.
- High-ef ciency air circulation fans ensure uniform temperature and humidity distribution.
- Precision-grade sensors for accurate humidity and temperature feedback.
- Advanced polyurethane foam insulation (Japanese technology) for thermal stability and energy retention.
- In-built data recording and alarm systems for safe, reliable operation.
- LED lighting for interior illumination during testing procedures.

Touch Screen Interface - TechMaster

- The TechMaster Touch Interface integrates an intelligent auto-control system for precise management of humidity and freeze conditions.
- Provides real-time graphical display of temperature and humidity trends against elapsed time.
- Continuous data logging and internal memory for long-duration testing.
- Supports USB and Pen Drive connectivity for data export and backup.
- Adjustable Process Value (PV) and Set Value (SV) parameters with advanced calibration options.
- Built-in security system with encrypted user access and admin-level control.
- Password-protected con guration to prevent unauthorized changes.
- PID parameter tuning via the advanced con guration menu for process optimization.
- Integrated alarm system with instant noti cations for any fault or deviation.
- Supports multilingual operation (English and Hindi).
- System-generated analytical reports with Pass/Fail status based on user-de ned thresholds.
- Direct access to stored test histories and fault logs for improved traceability.
- Optional email noti cation for remote test status updates.
- Remote access feature for monitoring and control from any connected device.
- Independent LED control system for internal illumination management.

Safety- Test Guardian

The Humidity Freeze Test Chamber comes with a comprehensive Test Guardian Protection System, ensuring
- operator safety and instrument reliability at all times:
- Seven-point alarm protection provides immediate alerts for any operational anomaly.
- Temperature and Humidity Overshoot Alarms activate if set limits are exceeded.
- Cycle Completion Noti cation ensures operator awareness upon test conclusion.
- Low Water/Coolant Level Indicator maintains proper cooling and humidi cation balance.
- Remote Monitoring Alert System warns of any parameter drift for timely corrective action.
- Emergency Shutdown Mechanism (manual and automatic) for immediate power isolation during faults.
- Electrical leakage protection and insulated housing for safe operation under all conditions.
- Integrated Solid State Relay (SSR) ensures smooth, noise-free switching during high-frequency test cycles.

Specificaations

	Model	PT-150-BTC	PT-300-BTC	PT-600-BTC	PT-1000-BTC
Temperature	Temperature range	-70℃ ~ 180℃ (A - 40℃ ~ 180℃; B - 70℃ ~ 180℃)			
	Temperature Accuracy	±0.1°C to ±1.2°C measured at control sensor Resolution: 0.1°C			
	Temperature Uniformity	< 1000 Litres: ≤1.5°C. 1000 to 2000 Litres: ≤2.0°C. > 2000 Litres: ≤2.5°C.			
	Ramp rate	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			
	Temperature	Heating & Cooling: 3°C/min linear from +120°C to -40°C in an empty chamber			
Humidity	Humidity control range	10.0%RH ~ 98.0%RH			
	Humidity fluctuation	± 1.0% RH			
	Humidity uniformity	± 2.0%RH			
Material / components	Internal material	SUS304 stainless steel(1.2mm)			
	External material	Cold-rolled plate(1.2mm), powder coating			
	Heat insulation	Poly urethane foam(100mm) +glass wool(10mm)			
	Heat insulation	Poly urethane foam(100mm) +glass wool(10mm)			
	Fan	Centrifugal fan (Impeller Fan)			
	Refrigeration compressor	Hermetic compressor			
	Cooling mode	Air cooling or Water cooling			
	Refrigerant	R449, R23, R508			
	Evaporator	Fin - and - Tube Heat Exchanger			
	Heater	Nickel chromium alloy heating wire			
	Humidifier	Steam humidifier			
Size	Interior size(mm) W*H*D	500*400*700	650*600*800	800*850*900	1000*1000*1000
	Outer size(mm) W*H*D	700*1670*1275	700*1880*1290	1000*1950*1400	1200*2050*1780
	Volume (L)	150L	300L	600L	1000L
	Weight (kg)	380	450	680	840
Working Temperature	+5 ~ 35℃				
Power supply		220V AC 50/60Hz 31A	220V AC 50/60Hz 33A	380V AC 50/60Hz 25A	380V AC 50/60Hz 27A

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