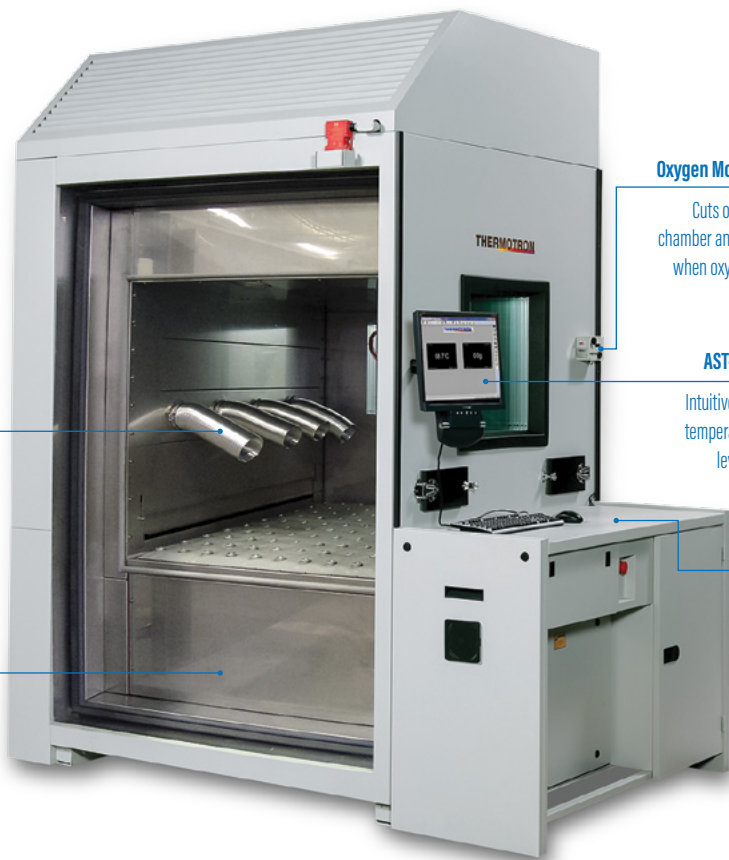


## HALT AND HASS IMPROVE PRODUCT RELIABILITY



Thermotron's innovative Accelerated Stress Testing systems for Highly Accelerated Life Testing (HALT) and Highly Accelerated Stress Screening (HASS) find product failures fast with patented industry-leading technology. Performing HALT and HASS improves product reliability by maximizing lab efficiencies, all while reducing costs associated with warranties and recalls.

# FEATURES



## Adjustable Air Ducts

Allows users to force air directly onto the product under test.

## Individual Impactor Monitoring and Control

Maximizes vibration effectiveness.

## Oxygen Monitor and Alarm

Cuts off LN<sub>2</sub> supply to the chamber and sounds an alarm when oxygen levels are low.

## AST-8800 Controller

Intuitive program displays temperature and vibration levels on one screen.

## Ergonomic Workstation

Ideal for standing or sitting.

## Adjustable Air Ducts

optimizes airflow to the product(s) under test

## Convenient Product Access

maintain visual and physical access to products under test through windows, doors, and ports

## Data Acquisition (DAQ) System

optional, allows control and monitoring of product under test

## Door Interlocks

prevent the door(s) from opening while operating, and prevents operation when the doors are open

## Internal Thermocouple Junction Box

enables convenient multi-point temperature monitoring

## Oxygen Monitor and Alarm

interfaces with the chamber's LN<sub>2</sub> system to ensure safe oxygen levels

## Product Temperature Change Rates

up to 70°C/minute heating and cooling

## Proportional Control Liquid Nitrogen System

maximizes cooling change rates while reducing LN<sub>2</sub> consumption

## Safety Stop Mode

automatic purge and reset protects operators, products, and the equipment

## Sound-deadening Insulation

minimizes noise during operation

## Additional Optional Features

- Accumulated Fatigue, Transmissibility, and Peak Probability Distribution Software
- Additional Accelerometers
- Additional Access Ports
- Custom Finishes
- Data Acquisition System
- Gaseous Nitrogen (GN<sub>2</sub>) Injection System
- Mechanical Refrigeration Options
- Multi-Zone Control, *patented*
- TestTools Communication Boards
- Vacuum Jacketed Valves
- Vibration Fixtures

# REPETITIVE SHOCK TABLE

HALT and HASS are powered by repetitive shock vibration, which is achieved through a shaker table. Pneumatic impact hammers strike the bottom of the table, providing vibration in 3 axes and 3 rotations, simultaneously.

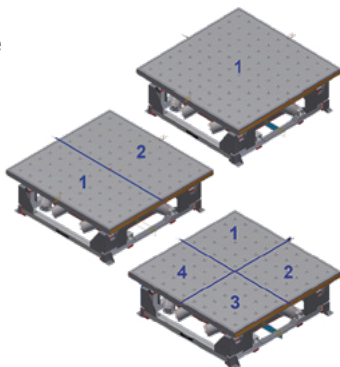
Thermotron's patented repetitive shock tables have a unique thermal isolation system that minimizes thermal loading on the chamber and provides a stable condition for impactor operation. Impactor cooling mechanisms help impactors last longer and reduce maintenance downtime for more effective and efficient testing. The shaker's standoff mounting design maximizes vibration transmissibility and provides accurate test results.



# MULTI-ZONE CONTROL

By nature, repetitive shock shakers are not uniform across the table's entire surface, nor can it control to one Grms level; this can produce inaccurate results because the vibration level the product actually experiences can be higher or lower, depending on accelerometer location.

Thermotron's exclusive, patented Multi-Zone Control fixes this problem. This optional feature controls the repetitive shock table in one, two, or four table zones. Through the AST-8800, Multi-Zone Control automatically makes dynamic adjustments to each zone, compensating for system variability including table inconsistencies, impactor wear, air supply, fixtures, and product mounting to accurately test multiple products simultaneously. Multi-Zone Control guarantees superb uniformity to test products within 5% of each zone's control Grms making HALT and HASS testing more controllable and consistent.

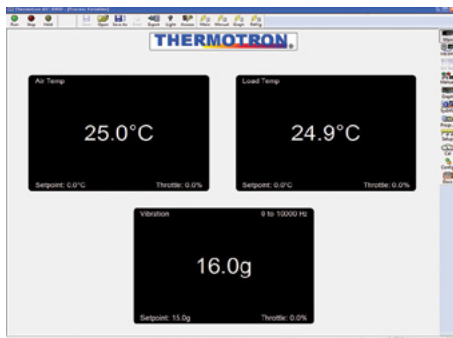


Each zone can also be set to a different Grms level or Multi-Zone Control can be turned off to control the entire table to one Grms level.

# AST-8800 CONTROLLER

The AST-8800 Controller features an intuitive Windows®-based graphical user interface. The color monitor displays power spectral density, temperature, and vibration data on one screen. Users define how multiple accelerometers and thermocouples are used to control and monitor stresses delivered to the product under test.

The AST-8800 Controller can be configured to monitor run-time on wear items and automatically alert the operator when periodic maintenance is required. The system is Ethernet-compatible and web-enabled for virtual anytime/anywhere access. Thermotron's multi-level, password-based security system protects sensitive data.



## ThermAlarm®

Independently prevents temperature from exceeding user-defined limits.

## Product Temperature Control

Controls air temperature based on the temperature of the product.

## Data Logging

Reports system events, temperature, and vibration levels.

## Program and Data Storage

Available on a hard drive, DVD, USB, or a network drive.

## Built-In Vibration Spectrum Analyzer

Displays table and product vibration response.

## Product Vibration Control

Allows vibration control of up to 16 product locations.

## System Monitor

Monitors the chamber's refrigeration pressures (*mechanical refrigeration only*).

## Power Spectral Density Abort Limits

Prevents inconsistent vibration during HASS.

## Multi-Channel Vibration Control

Monitors and controls accelerometers using maximum, minimum, mean, or median readings.

## Vibration Alarm and Abort Limits

Prevents vibration levels from exceeding user-defined limits.

## On-Board Signal Generator Verification

Simplifies vibration calibration.

## Impactor Monitor System (*patented*)

Illustrates the impactors' status on the screen.

The controller monitors the air pressure of each impactor during tests, adjusting air pressure for more consistent and accurate results.

# GENERAL SPECIFICATIONS

	AST-8	AST-18	AST-35	AST-70
<b>Interior Dimensions— WxDxH Inches Centimeters (approx.)</b>	24 x 23.5 x 24 61 x 60 x 61	33 x 34 x 30 84 x 86 x 76	42 x 42 x 40 107 x 107 x 102	54 x 56 x 40 137 x 142 x 102
<b>Exterior Dimensions— WxDxH Inches Centimeters (approx.)</b>	78 x 34 x 78 198 x 86 x 198	90 x 57 x 87 229 x 145 x 221	89 x 61 x 105 226 x 155 x 267	104 x 69 x 104 264 x 175 x 264
<b>Temperature Range</b>	-100°C to 200°C (-148°F to 392°F)	-100°C to 200°C (-148°F to 392°F)	-100°C to 200°C (-148°F to 392°F)	-100°C to 200°C (-148°F to 392°F)
<b>Temperature Change Rate</b>	Greater than 50°C/min (90°F/min) on products <sup>1</sup>		Greater than 70°C/min (125°F/min) on products <sup>1</sup>	
<b>Blower HP</b>	3/4 HP	3 HP	7.5 HP (5 HP CE)	10 HP
<b>Airflow</b>	370 SCFM (175 liters/sec)	1,400 SCFM (660 liters/sec)	4,000 SCFM (1,880 liters/sec)	6,000 SCFM (2,830 liters/sec)
<b>Heater Size</b>	20 kW <sup>2</sup>	40 kW <sup>2</sup>	96 kW <sup>2</sup>	108 kW <sup>2</sup> (102 kW at 400V)
<b>Power<sup>1</sup> (Full Load/ Minimum Service)</b>				
<b>230 / 3 / 60<sup>2,3</sup></b>	53 Amps / 60 Amps	114 Amps / 125 Amps		
<b>400 / 3 / 50<sup>2,3</sup></b>	33 Amps / 40 Amps	65 Amps / 70 Amps	153 Amps / 175 Amps	164 Amps / 175 Amps
<b>460 / 3 / 60<sup>2,3</sup></b>	29 Amps / 30 Amps	57 Amps / 60 Amps	134 Amps / 150 Amps	152 Amps / 175 Amps
<b>REPETITIVE SHOCK TABLES</b>				
<b>Repetitive Shock Table Inches / Centimeters (Number of Impactors)</b>	18 x 18 / 46 x 46 (4)	18 x 18 / 46 x 46 (4) 26 x 26 / 66 x 66 (4) 30 x 30 / 76 x 76 (5)	26 x 26 / 66 x 66 (4) 30 x 30 / 76 x 76 (5) 34 x 34 / 86 x 86 (9) 38 x 38 / 97 x 97 (9)	46 x 46 / 117 x 117 (16) 50 x 50 / 127 x 127 (16)
<b>Frequency Range</b>	2 to >20,000 Hz			
<b>Acceleration Levels</b>	50 Grms 2-10,000 Hz			
<b>Maximum Air Consumption</b>	90 PSI (6.2 BAR) Compressed Air 9.5 SCFM / Impactor Maximum (5.5 SCFM / Impactor Typical)			
<b>Axes Excited</b>	3 Linear, 3 Rotational			
<b>Grid Pattern</b>	4" x 4" Grid (100 mm available)			
<b>Control/Monitor Channels</b>	8 Accelerometer Input Channels (Up to 16 Available)			

Custom sizes and performance configurations available. The addition of accessories may impact performance.

General specifications subject to change without notice. Certain export limitations may apply, consult factory for details.

<sup>1</sup> Dependent on range and chamber loading.

<sup>2</sup> Smaller-size heating systems available, which reduces electrical service.

<sup>3</sup> Other input voltages and frequencies available.

For more than 55 years, Thermotron has provided quality environmental test equipment. We've worked to establish a trusted reputation among our peers, and when people hear the name *Thermotron*, they have confidence in the testing of their own product. We've been building our name since 1962; now it's your turn.

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