

## Star Series™

- > Galaxy 28/44
- > Galaxy 28/44 Deluxe
- > Galaxy 28/44 Premier

Integrated Star28 or Star44  
Pneumatic Vibration Table  
& Temperature Test Chamber  
HALT/HASS System



### Star Series Galaxy™ HALT/HASS System •

Envirotronics Star Galaxy™ HALT/HASS Systems are integrated Test Chamber/Vibration Table packages. The mounting areas of the 44 in. and 28 in. tables, comprised of a product mounting configuration of 3/8 in. holes in a 4 in. by 4 in. mounting pattern, allow great flexibility in mounting your product or fixturing. Our improved-efficiency pneumatic vibrators deliver your required vibration energy while utilizing 20% less air. This translates into savings for you.

The Envirotronics Star Galaxy chambers are equipped with a Liquid Nitrogen (LN<sub>2</sub>) cooling system. The LN<sub>2</sub> cooling system, with modulating valve and directed air flow to the product, provides the rapid thermal change rates required to achieve maximum product stress. Additionally, these rates are accomplished with smaller space

requirements, lower audible noise, no water requirement, and lower maintenance costs than a typical refrigeration system.

The combination of Envirotronics' control system, which gives the user the flexibility to control via one accelerometer or any combination of 4 accelerometers, our adjustable air flow package that allows the user to redirect airflow to the product under test, the powerful StarView Software and Envirotronics' exclusive new Component Control (on Premier model) put unparalleled flexibility and control in the hands of the Galaxy user. It's time to shoot for something better - Shoot for the Stars!



## Vibration Table

- Shaker table dimensions:
  - Galaxy 44:** 44" x 44" (1118mm x 1118mm) clear, usable table space.
  - Galaxy 28:** 28" x 28" (711mm x 711mm) clear, usable table space.*The Star Galaxy System utilizes an anodized aluminum table top which eliminates aluminum oxidation seen on other, non-anodized tables.*
- Shaker table access height: approximately 30" (762mm). *The 30" clearance allows easy access to the vibrator section beneath the shaker table.*
- Vibration compartment quiet package
- **Galaxy 44** utilizes sixteen (16) pneumatic vibrators\*  
**Galaxy 28** utilizes eight (8) pneumatic vibrators.  
*Star Galaxy System vibrators are constructed with aluminum housings.*

## >Vibration Table Performance

### Maximum Vibration Levels

(load dependent)

- 100 lb. Load: 30 gRMS, multi-axial average (X,Y,Z)
- 250 lb. Load: 20 gRMS, multi-axial average (X,Y,Z)
- 375 lb. Load: 15 gRMS, multi-axial average (X,Y,Z)
- 500 lb. Load: 10 gRMS, multi-axial average (X,Y,Z)

NOTE: Acceleration levels in excess of 50 g RMS can be achieved in the Z-axis under certain conditions.

### Minimum Vibration Levels

(load dependent)

- 100 lb. Load: 3 gRMS, multi-axial average
- 250 lb. Load: 2 gRMS, multi-axial average

### Noise Levels

(measured one meter external to vibration enclosure)

78 dBa at a vibration level of 25 gRMS

### Vibration Uniformity Across Table\*

(i.e. mounting hole to mounting hole)

- X axis: Standard deviation less than 0.7 gRMS
  - Y axis: Standard deviation less than 0.7 gRMS
  - Z axis: Standard deviation less than 1.2 gRMS
  - X,Y,Z average: Standard deviation less than 0.5 gRMS
- \*measured on an empty table at 10 gRMS*

### Product Mounting Configuration

**Galaxy 44:** 3/8" holes in a 4" x 4" mounting pattern (3" mounting patterns are available upon request);

**Galaxy 28:** 3/8" holes in a 3" x 3" pattern.

*M10-15 threaded holes will be provided on exported equipment.*

### Vibration Frequency

The pneumatic vibration system produces quasi-random, six degree-of-freedom (6DoF), six axis, three linear and three angular vibration accelerations in the frequency range of 20 Hz to 10 kHz.

*\*12 hammer system is also available.*

*Note: Specifications for export models may vary.*

## >Star Galaxy™ System Core Features

### Test Chamber

#### Galaxy 44

- Chamber interior workspace dimensions: 54" W x 54" D x 49" H (1371mm W x 1371mm D x 1245mm H)
- LN<sub>2</sub> cooling system with proportionately actuated control valve and a vacuum-jacketed LN<sub>2</sub> inlet
- Front and rear doors: Full-opening, left-hand hinged on Galaxy model, Bi-parting on Deluxe and Premier models.
- 20" x 20" (508mm x 508mm) multi-pane, heated viewing windows
- Interior light
- ETL (UL STD 508A) approved main power panel
- One (1) 6" x 12" (152mm x 305mm) access port with insulating plug and phenolic cover (located in right-hand side wall)

#### Galaxy 28

- Chamber interior workspace dimensions: 38" W x 51" D x 44" H (965mm W x 1295mm D x 1117mm H)
- LN<sub>2</sub> cooling system with proportionately actuated control valve and a vacuum-jacketed LN<sub>2</sub> inlet
- Front and rear doors: Full-opening, left-hand hinged on Galaxy model, Bi-parting on Deluxe and Premier models.
- 12" x 18" (305mm x 457mm) multi-pane, heated viewing windows
- Interior light
- ETL (UL STD 508A) approved main power panel
- One (1) 4" x 12" (101mm x 305mm) access port with insulating plug and phenolic cover (located in right-hand side wall)



## Star Galaxy™ System

### > Test Chamber Performance

#### Temperature Range

-100°C to +200°C +/-1.1°C control accuracy as measured at control sensor after stabilization has been reached. Stabilization has occurred after the temperature of the chamber liner changes 2°C or less per hour.

#### Heating and Cooling Performance

The chamber, utilizing only liquid nitrogen and electrical heating, is capable of average air temperature change rates, not linear rates of change, as measured at the control thermocouple, of up to 70°C per minute, empty. Actual rate changes may vary according to your product load and temperature range.

*Note: Specifications for export models may vary.*

### > StarView Software

#### Program Editing

StarVIEW is a user-friendly Microsoft Windows™-based operating system that provides easy “point and click” program writing. The test profile is drawn on a graph as the program is written, allowing the user to check for errors as they work. *Ideal for creating your custom HALT tests and HASS Profiles.*

#### Test Chamber Control

The StarVIEW software works in conjunction with a Watlow F4 chamber controller to monitor the air temperature and product temperature. *Used to monitor your HALT Hot/Cold Stress Step Test. 14 additional thermocouples and Thermocouple Patch Bridge are included with the Star Galaxy Deluxe and Premier Models.*

#### Vibration Table Control

The StarVIEW software also controls the repetitive shock shaker table. The vibration gRMS level can be driven by the X, Y or Z-axis; or by an average of the three values. *Used to monitor your HALT Vibration Stress Step Test. The unique StarView Control Software allows you to control from a single axis OR from an average of multiple axes. This is a definite advantage over other control software packages currently on the market. Star Galaxy Deluxe and Premier models include one additional four (4) channel vibration system input module with cables (customer to supply additional accelerometers).*

#### Auto Spectrum

The vibration waveform is captured and the fast Fourier transform applied, resulting in the PSD graph which shows where the vibration energy lies in the spectrum. *The resonant frequency of the Star Galaxy vibration table is tuned to the optimal frequency range for small electronics components.*

#### Accumulated Fatigue

The rainfall analysis is used to apply Miner's rule and calculate a mechanical fatigue factor. The fatigue factor measured over time will give the accumulated (total) fatigue applied to the product. *This is used in HASS to determine the amount of life removed from a product and in both HALT and HASS for analysis of premature failures.*

#### Vibration Waveform

A histogram of the acceleration vs. time shows the vibration g-levels that were reached on the table during that period.

### > Control Package

- **StarView™** Control Software
- Monitor, keyboard and mouse.
- PC includes a system with a minimum of: 2.8 GHz processor; 512 MB RAM; 80 GB hard drive; 48x DVD/RW; integrated audio, video, and 10/100; and Windows XP or Microsoft Vista Operating system\*

\* The capability of the PC provided may be greater than the values shown, based upon the current technology and availability of the PC components at the time of purchase.

\* Customer may opt to provide Envirotronics with their own PC. In this case, Envirotronics will specify the minimum system requirements.

- Galaxy “Core” model provides a swing-arm mounted PC monitor. The PC is housed in a lower electrical box enclosure. Deluxe and Premier models include a free-standing console to house the PC Workstation.
- One (1) four-channel input module for IOtech input system. Envirotronics provides one (1) single-axis accelerometer with mounting block, for control of table vibration. More accelerometers can be added (optional) for multiple axis control and/or product vibration monitoring.

#### **Deluxe and Premier Models include:**

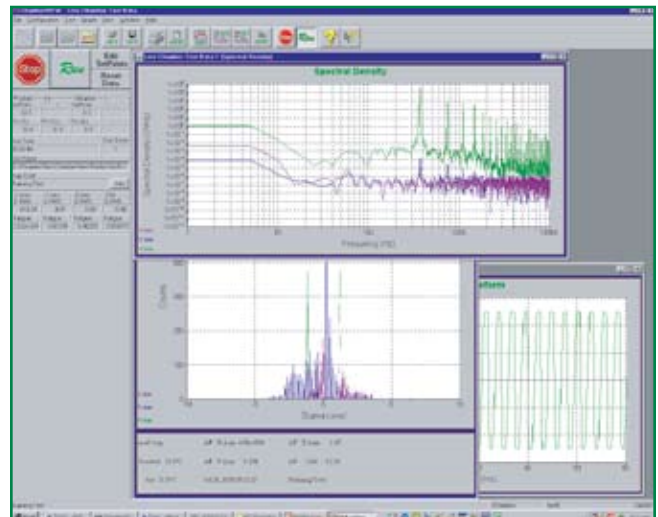
*Two (2) four-channel input modules (8 inputs) for Vibration Monitoring/Control,*

- DBK-18 four-channel low pass filter card
- PCB signal conditioner
- DBK10 expansion card and CA37-2 cable
- Integration into the data acquisition system
- Accelerometer(s) must be purchased separately

*NOTE: A maximum of 12 channels (or 3 modules) is available.*

- One (1) Running Time Meter to monitor vibration run-time
- Adjustable air flow package to allow user to redirect airflow to product under test
- Set of installation drawings and operator maintenance manuals (electronic copies)
- Standard Envirotronics warranty

NOTE: Customer is responsible for all building alterations, shipping costs, rigging of equipment to installation site and all necessary utilities to equipment where required.





## > Star Galaxy™ System Individual Model Features

### Features

	Star Galaxy 28	Star Galaxy 44	Star Galaxy Deluxe 28	Star Galaxy Deluxe 44	Star Galaxy Premier 28	Star Galaxy Premier 44
44" x 44" (1118mm x 1118mm) random vibration table with 16 hammers			•		•	•
28" x 28" (711mm x 711mm) random vibration table with 8 hammers	•				•	
Two full opening doors (one front - left hand hinged, one rear - right hand hinged)	•	•				
Two bi-parting doors (one front, one rear)				•	•	•
Pneumatically actuated door latches with thermal limit door interlocks				•	•	•
Four 20" x 20" (508mm x 508mm) windows - two front, two rear			•		•	•
Four 12" x 18" (305mm x 457mm) windows - two front, two rear	•			•		•
One 6" x 12" (152mm x 305mm) access port with plug and phenolic cover		•			•	•
One 4" x 12" (101mm x 304mm) accessport with plug and phenolic cover	•				•	
LN <sub>2</sub> cooling with proportionately actuating control valve	•	•	•	•	•	•
LN <sub>2</sub> inlet vacuum jacketed	•	•				
Full LN <sub>2</sub> piping assembly vacuum jacked				•	•	•
Interior lights	•	•	•	•	•	•
ETL (UL STD 508A) approved main power panel	•	•	•	•	•	•
Chamber-mounted PC with StarView control software	•	•				
Free standing console to house PC with StarView control software				•	•	•
<b>StarView</b> software and control package with 4 input spectrum analyzer for vibration data, including one accelerometer for control of the vibration table	•	•	•	•	•	•
Additional four input vibration system module with cables (customer to supply additional accelerometers)				•	•	•
14 additional thermocouples for monitoring product temperature with thermocouple patch bridge on chamber interior. Omega brand "High temperature miniature connectors" HMP-J-M/F are used					•	•
Temperature Sentry high/low safety limit					•	•
GN2 purge						•
Dwyer pressure differential switch - <i>additional heater/plenum safety device</i>					•	•
One running time meter for vibration monitoring	•	•	•	•	•	•
Powder coat finish for chamber exterior					•	•
Envirotronics exclusive Component Control feature						•
Onsite installation and startup*	•	•	•	•	•	•

\*Installation and startup is included in the purchase price of your Galaxy System. Other charges such as travel, lodging and other expenses may apply.

## Star Galaxy™ 28/44 Premier > Exclusive Component Control Feature

Envirotronics is the first HALT chamber manufacturer to successfully provide customers with a unique diagnostic component control feature.

During HALT testing, test engineers must perform temperature step stress tests on products until failures occur. Certain components may limit the engineer's ability to test beyond a temperature extreme. With the dynamic Envirotronics Component Control feature you can keep these limiting components at an ambient temperature in order to continue your temperature stress step testing beyond the point where testing would normally cease. The Component Control feature includes a separate controller and thermocouple. With staged heating and a proportional control valve your component control provides accurate temperature control to allow you to test beyond normal product limitations. Flexible ducting allows you to utilize this optional feature on a wide variety of products.

