



Custom Product

Vertical/Horizontal Vibration Combined Environmental Test System

Temperature (& humidity) and vibration (vertical or horizontal) combined environmental test system

A single-axis vertical and horizontal switching excitation model for large displacement and high speed vibration testing

Today, the automotive industry accelerates electronic multi-functions. According to this trend, safety standards such as ISO26262 and IEC61508 require high environmental stress that is generated by thermal shock chambers for higher reliability of vehicle equipments.

The Vertical/Horizontal Vibration Combined Environmental Test System is a chamber located above the vibration test system, which is equipped with a vertical and horizontal table in front of and behind the vibration test equipment, to allow the chamber to slide and move up and down to perform vertical excitation combined testing and conventional horizontal excitation combined testing at ambient temperature in a single unit.

The vertical and horizontal tables are separated, enabling large displacement and high speed vibration, which is ideal for combined environmental testing of automotive parts, car electronics, wire harnesses, plastic molded parts, and more.

Enables large displacement and high speed vibration

Features a maximum displacement of 51 mmp-p, a maximum velocity of 2.0 m/s, and a maximum acceleration of 1250 m/s². This model enables large displacement and high speed vibration testing, which cannot be achieved with a multi-axis vibration test system.

* Maximum performance depends on the excitation device type.

Independent testing of temperature/humidity and single axis vibration (vertical/horizontal)

In combined environmental testing, the temperature and humidity chamber and vibration test system operate sequentially, but each function can also be operated independently. This model enables temperature characteristic testing with the temperature and humidity chamber and vibration testing at ambient temperature.

An unique direct coupling to the chamber floor method

To improve the temperature and humidity performance, the temperature and humidity chamber and vibration test equipment must have a good seal. With this model, in particular, the temperature and humidity chamber slides over the vertical and horizontal tables, so this is even more of an issue. ESPEC's unique direct coupling to the chamber floor method ensures a good seal not only vertically but also when connected horizontally. (See "Device mechanism" below)

Custom excitation jigs

A custom excitation jig to secure samples is available. Contact us for details.

Safety devices

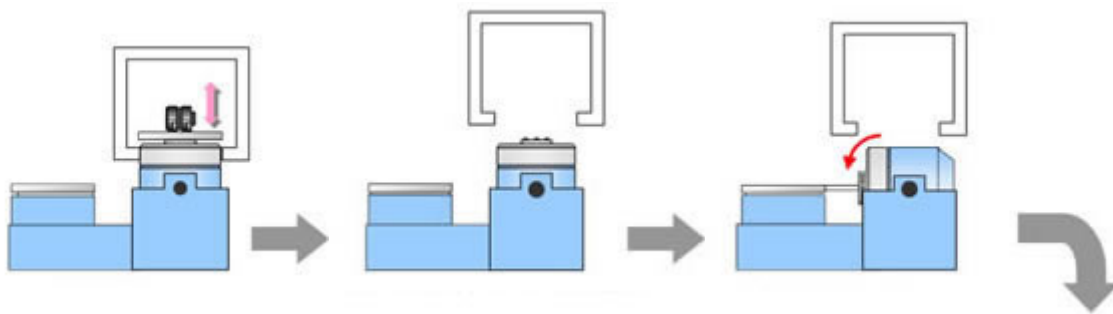
It is possible to equip the system with safety devices for testing flammable or gaseous specimens, including rechargeable batteries and fuel cells.

Typical devices:

- Pressure release vent
- Gas detector
- Forced ventilation system
- CO₂ gas extinguisher
- Safety lock mechanism

* Be sure to install the safety device if the specimens are Li-ion battery packs or Li-ion battery modules.

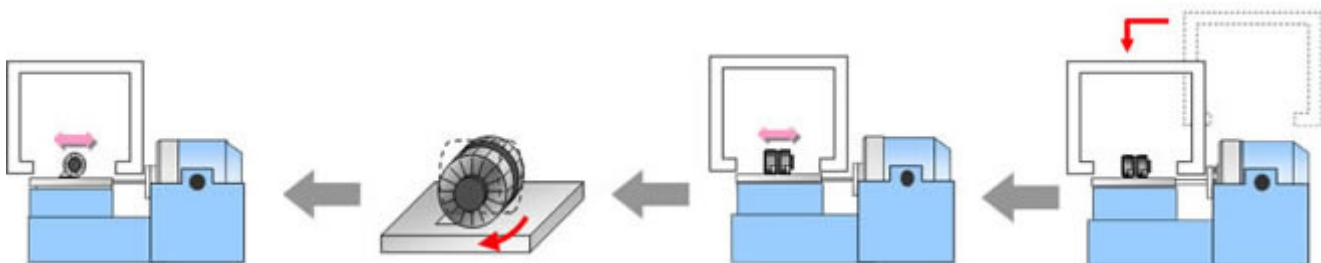
Device mechanism



Z-direction excitation

The specimen and vertical auxiliary table are removed, and the vibration device and chamber are separated.

The excitation device is lowered 90 degrees, and the horizontal vibration table is connected using a connecting jig.



Y-direction
excitation

The specimen is rotated
90 degrees.

X-direction
excitation

The specimen is set, and
the horizontal vibration
table and chamber are
docked.

Main specifications

Model		T-1V	
Temperature and humidity chamber	Performance	Temperature range	-70°C to +150°C
		Humidity range	20 to 98%rh
		Temperature heat-up time	From -70 to +150°C within 150 minutes
		Temperature pull-down time	From +20 to -70°C within 140 minutes
	Dimensions	Inside dimensions	W1000×H1000×D1000mm
Combination	Combined system		Vertical/horizontal direct coupling to the chamber floor method
	Combination range		Vibration test system 2.9 kN to 80 kN
Vibration device (example)	Performance	Force	24 kN sine
		Frequency range	0 to 500 Hz (vertical)* 0 to 2000 Hz (horizontal)*
		Maximum displacement	51mmp-p
		Maximum velocity	2.2 m/s
		Maximum acceleration	1,200 m/s ² (SINE)
		* Vibration table	When installed at 500 × 500 mm (vertical/horizontal)

* The model is for operational purposes and may be changed after order.

* The specifications of vibration devices (sign wave vibration test(fixed-frequency vibration, sweep vibration), random vibration test, shock test) will be adjusted according to the requirements of individual customers.

* The requirements for coupling the system with the vibration generator (method: direct coupling to the chamber floor/coupling shaft, vibration: horizontal/vertical) will be examined based on the testing requirements, and the most suitable method will be proposed together with a layout drawing created according to the installation requirements of the customer.

Examples

- T-11V + Safety devices (CO gas detector, H2 gas detector, Pressure release vent, Forced ventilation system, Electromagnetic door lock) Specimen: In-vehicle battery pack
- T-2V + Safety devices (Heat detector, Air supply and exhaust damper) Specimen: In-vehicle battery pack
- T-16V -20°C ⇔ +80°C
Test area temperature change rate 22°C/min Specimen: In-vehicle body

Recommended products for customers viewing this product

Combined
Temperature &
Humidity Chamber



Multi-Vibration
Combined Standard
Environmental Test
System

