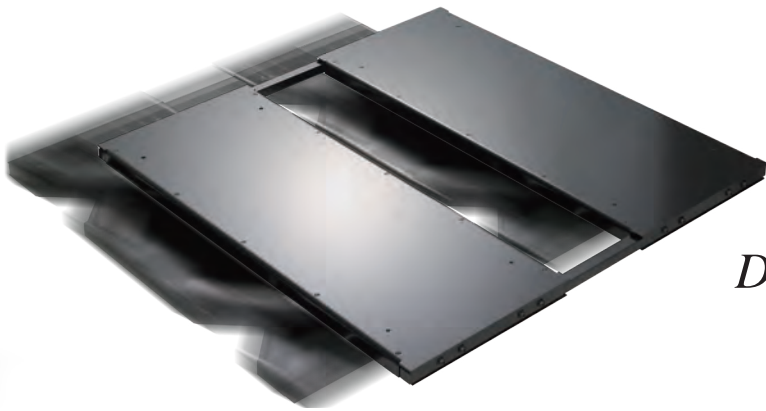




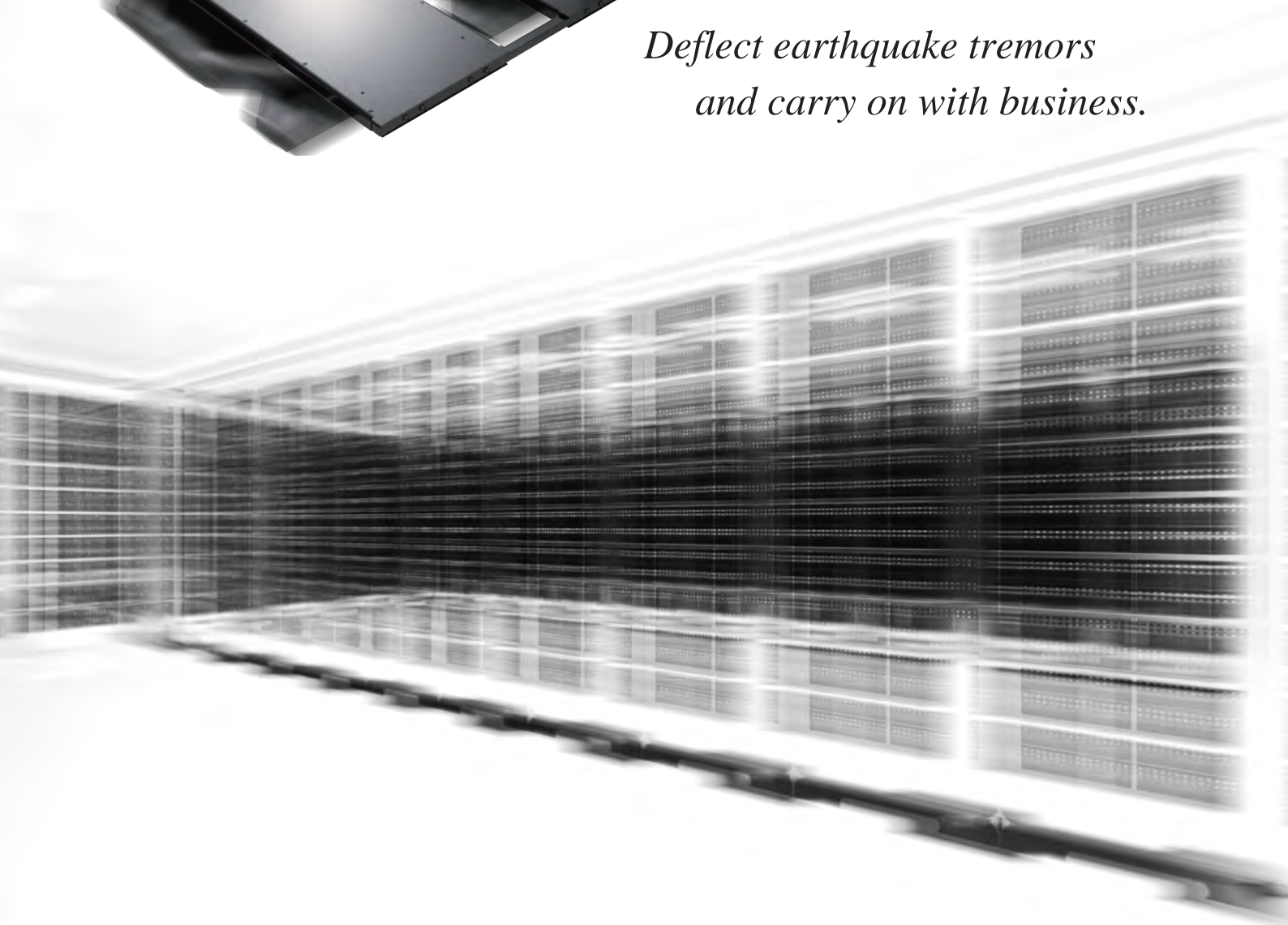
Seismic Isolation for Servers and Devices

# Seismic Isolation Table Model TSD

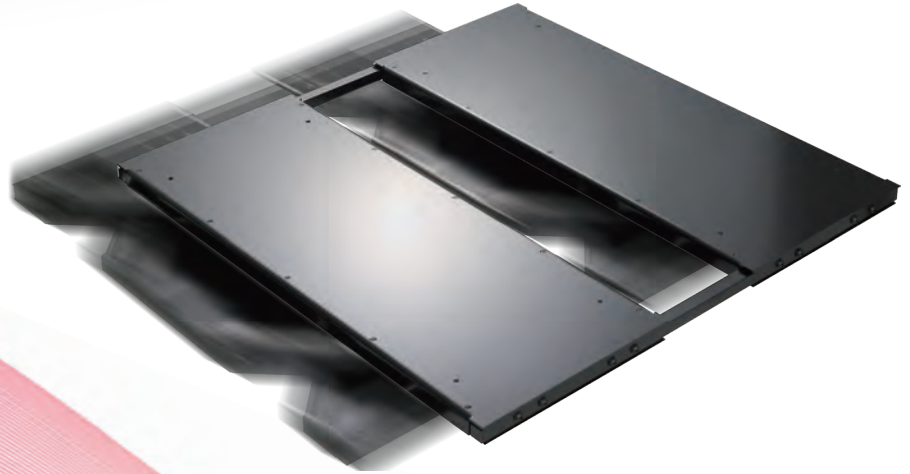
Business continuity measure for when earthquakes strike



*Deflect earthquake tremors  
and carry on with business.*

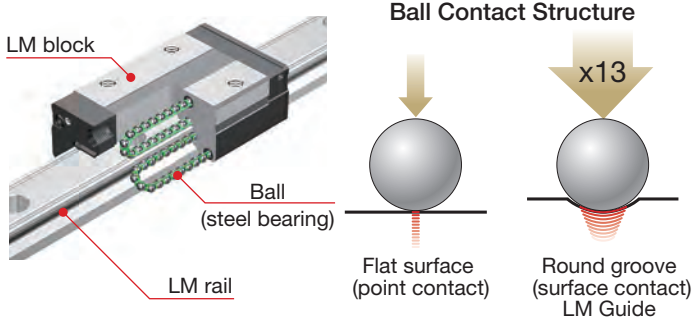


# *Deflect earthquake tremors and carry on with business.*



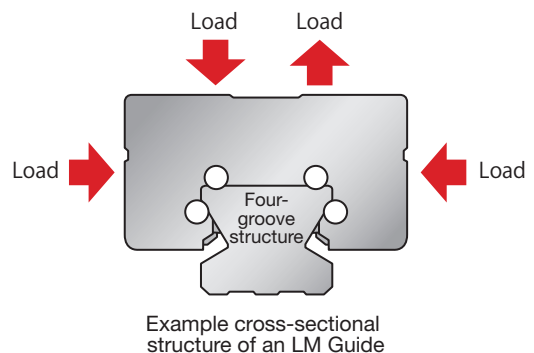
## **Superior stability and high load capacity**

Stable movement is achieved by having balls roll through grooves in the rail. This structure can support loads approximately 13 times higher than mechanisms utilizing contact with a flat surface.



## **A table that stays on**

The table is kept in place by LM Guide units that can withstand pulling loads, so it will not come off.

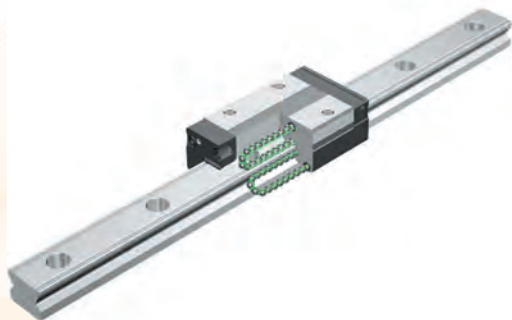


## Featuring the LM Guide Prized for Its Success in Industrial Machinery, THK's Seismic Isolation Table Easily Deflects Earthquake Tremors.

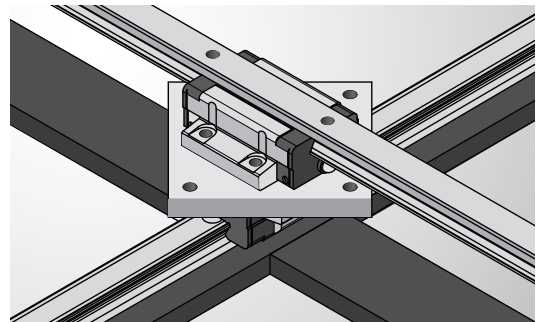
THK's seismic isolation table is a type of rolling seismic isolation system that combines perpendicular LM Guide units, which achieve smooth linear motion. By deflecting earthquake tremors with its smooth, 360° movement, this product provides superior seismic isolation and maintains a consistent position relative to the floor even during intense or prolonged tremors.

Earthquakes last around 30 seconds along plate boundaries, and even local earthquakes continue for around 10 seconds. Torsion would be applied to the table if the loaded object's center of gravity were not completely aligned with the center of the seismic isolation table, but LM Guide units are used in the drive portion to prevent this from happening.

By deflecting tremors when the worst happens, seismic isolation systems allow you to continue running your business. That's why it's important to choose an earthquake-proofing system that will always demonstrate a stable seismic isolation effect.



The LM Guide is a core component of the system.

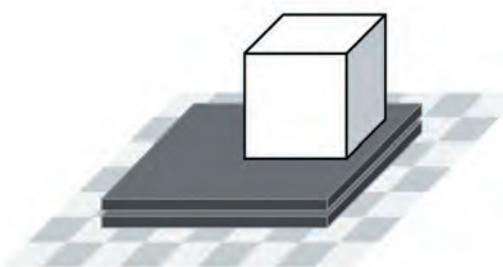


Perpendicular LM Guide units provide smooth movement in every direction for a range of 360°. This product also handles drawing force and twisting, protecting the loaded items from earthquakes with stable, smooth motion.

### Stable seismic isolation with no tilting or twisting

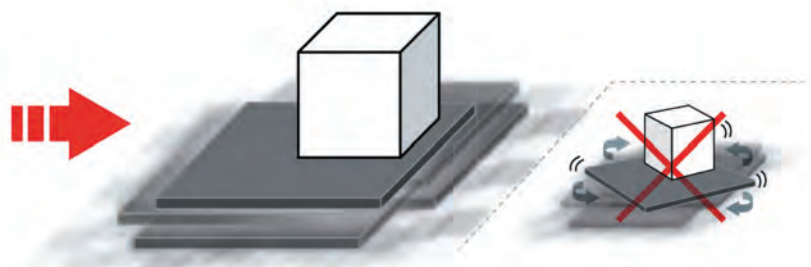
The system moves smoothly and demonstrates stable seismic isolation performance even if the loaded weight changes or objects are placed off-center.

Before an earthquake



Even with an eccentric load...

During an earthquake



...it slides smoothly.

No wobbling or turning!



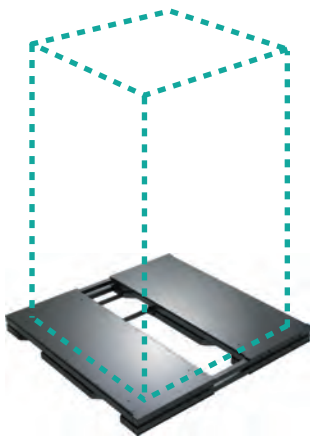
# Deflect tremors with THK technology

## Special Features of the Seismic Isolation Table Model TSD

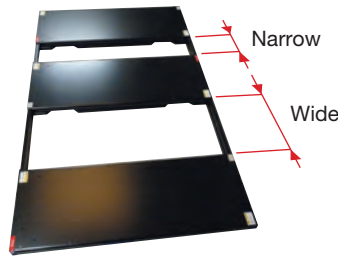
### Flexible Options to Suit the Application

Model	Stroke	Mounted load	Damping function
TSD-1000/1200	±200 mm	300 kg to 1200 kg	Available as an option
TSD-1200L	±250 mm	400 kg to 1200 kg	Standard equipment

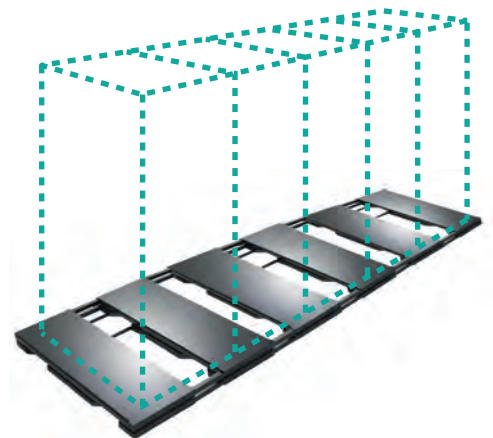
- Modules can be connected and added to carry increasingly heavy loads.
- The pitch between modules can be changed depending on the number and size of loaded objects.



Two-module configuration



Example difference in pitch between modules  
Three-module configuration

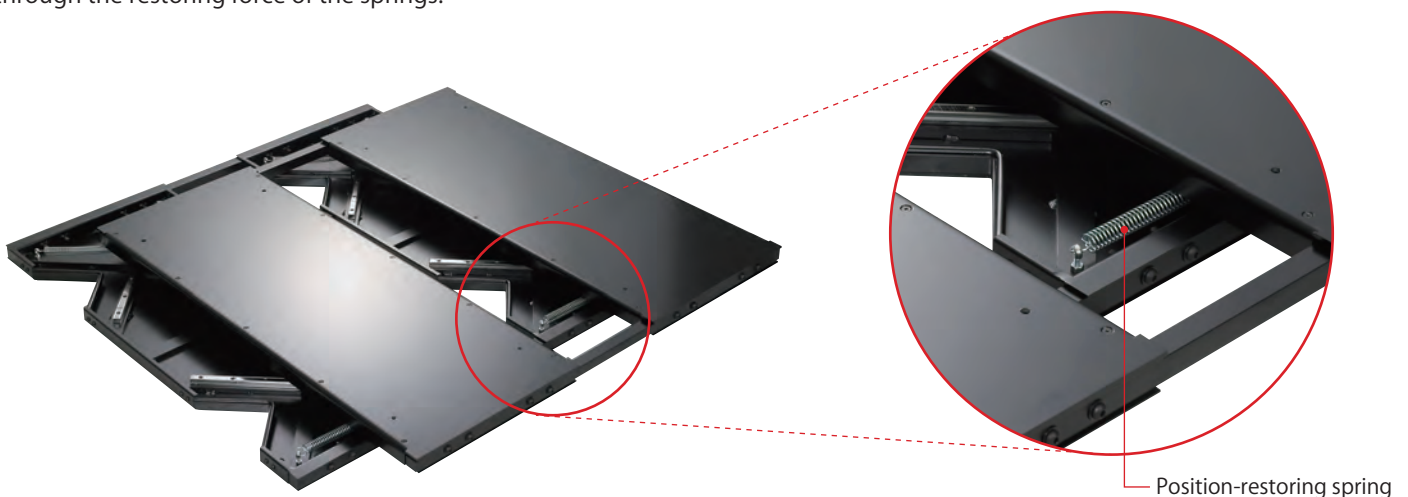


Six-module configuration  
(connecting and adding modules)

This easy-to-install earthquake protection is also easy to add onto later.

### Easy Home Return with Built-In Restoring Function

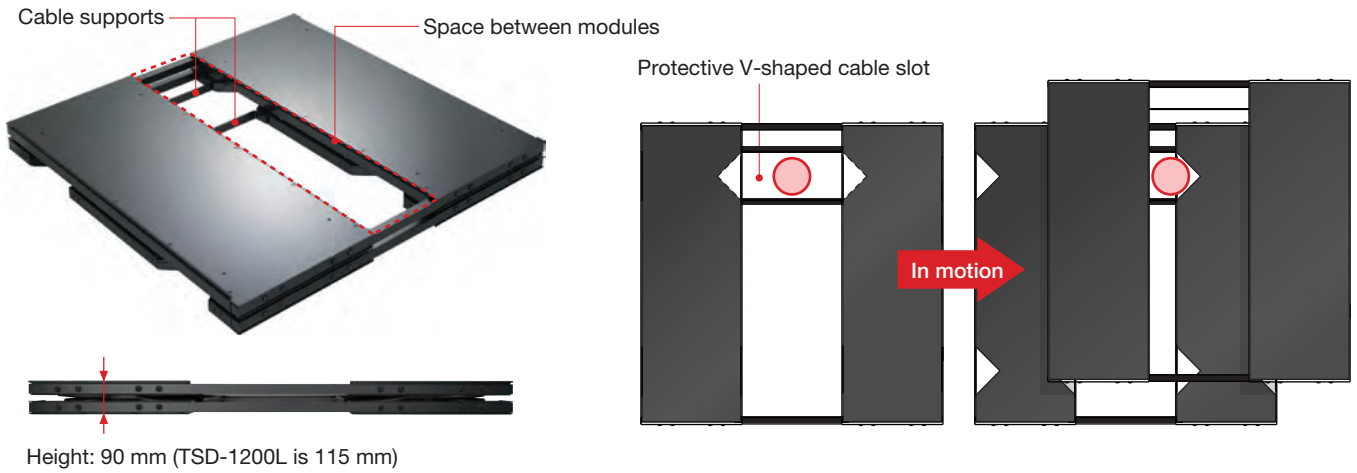
Position-restoring springs are built into all four corners, enabling the system to move back to home position through the restoring force of the springs.



Position-restoring spring

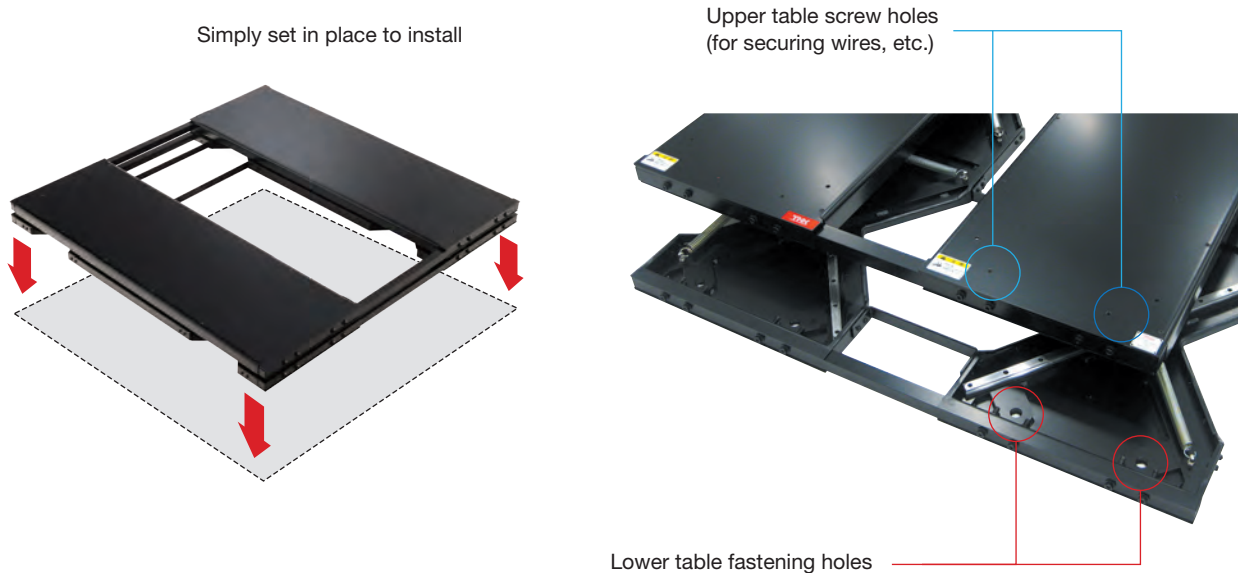
## Simple Construction and Restoration

- The low height of the device makes it easy to secure clearance between the loaded object and the ceiling.
  - The space between the modules can be used to provide underfloor wiring and air intake/exhaust for loaded devices.
- Protective V-shaped cable slots are provided so you can use the cable supports for wiring and keep cables from breaking.



## Safe and Secure

The system can be installed simply by placing it on the floor, with no need for securing. However, it can be secured to the floor if needed, and loaded objects can also be fastened.



## Environmentally Friendly

### RoHS Compliance

The steel plate coating has a baked finish, and there are no components with electrolytic zinc plating. The position-restoring springs have anti-whisker plating.

# Installation Examples

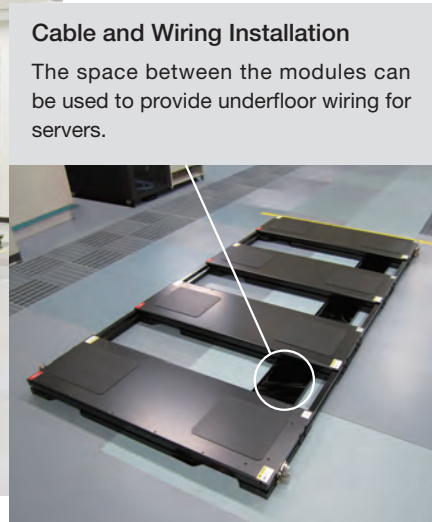
## Server Computers

The Seismic Isolation Table Model TSD has been extremely successful as an earthquake-proofing measure for server racks.

### Data Centers



Six-module configuration (front) and five-module configuration (right)



Four-module configuration



Seven-module configuration



Five-module configuration

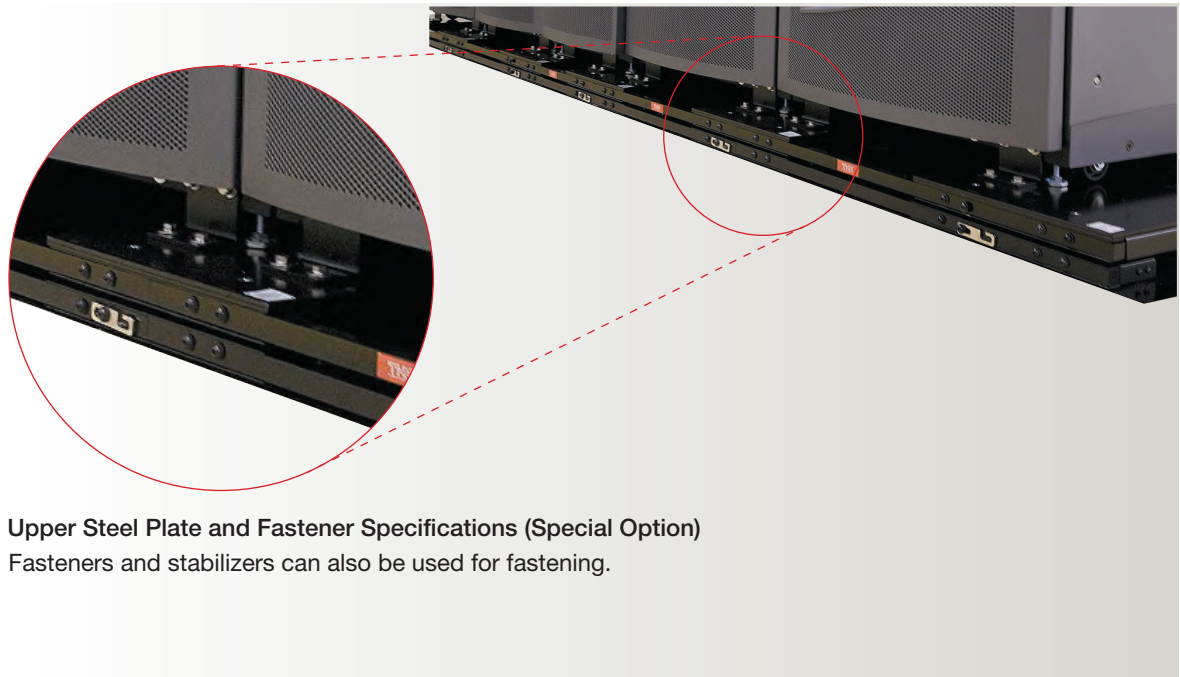
Modules are structured for connection, so they can be added or built onto existing units without having to remove any wiring.



Examples of Loaded Object Fastening



**Rack Adjuster Wire-Fastening Specifications**  
Loaded racks can be secured with wires that are provided as standard.



**Upper Steel Plate and Fastener Specifications (Special Option)**  
Fasteners and stabilizers can also be used for fastening.

# Installation Examples

## Medical Devices

The Seismic Isolation Table Model TSD has been highly effective at earthquake-proofing devices in medical and research facilities that provide emergency and life-saving services during earthquakes.

Dialyzer (six-module configuration)



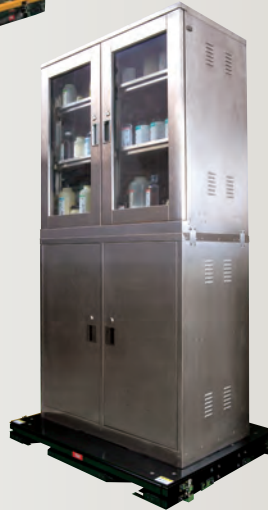
Clinical diagnostic analyzer



Tabletop microscope



Medicine shelf

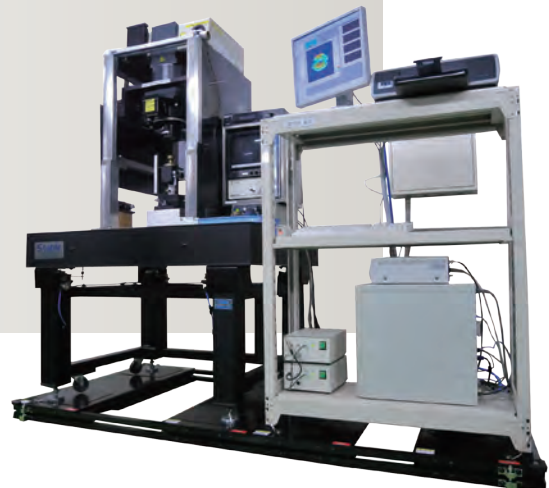


## Precision Equipment

Earthquake-proofing is an important factor in maintaining supply chains. The Seismic Isolation Table Model TSD demonstrates results as an earthquake-proofing measure that is easy to install.



Optical measuring instrument



Optical measuring instrument (four-module configuration)

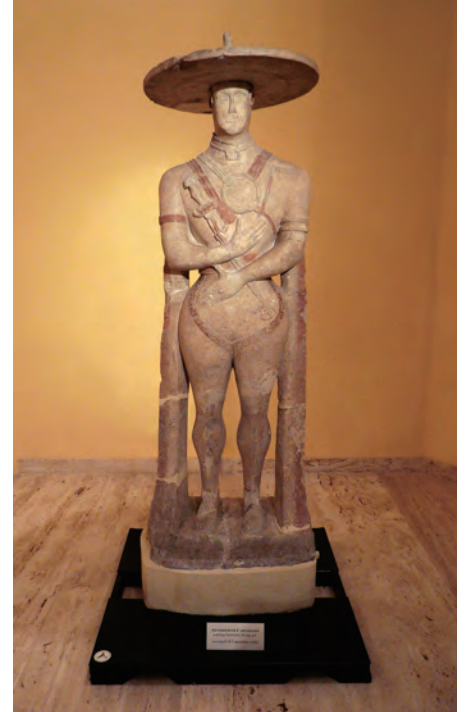


# Art Museums

The greatest threat to important cultural assets and works of art with historical value is the risk of toppling or breaking from an earthquake. The Seismic Isolation Table Model TSD works the moment you install it on the floor and provides major protection.



National treasures (from left): wooden statues of Fudo Myo-o and two youths, wooden statue of Amida Nyorai, and wooden statue of Bishamonten (sculpted by Unkei), Ganjoju-in Temple (Izunokuni, Shizuoka Prefecture)



The Warrior of Capestrano  
National Archaeological Museum of Abruzzo, Italy



Statues of Amida Nyorai and Two Flanking Attendants, Kannami Buddha Statues Museum (Tagata District, Shizuoka Prefecture)



Yakushi Nyorai Seated Statue  
Kannami Buddha Statues Museum (Tagata District, Shizuoka Prefecture)

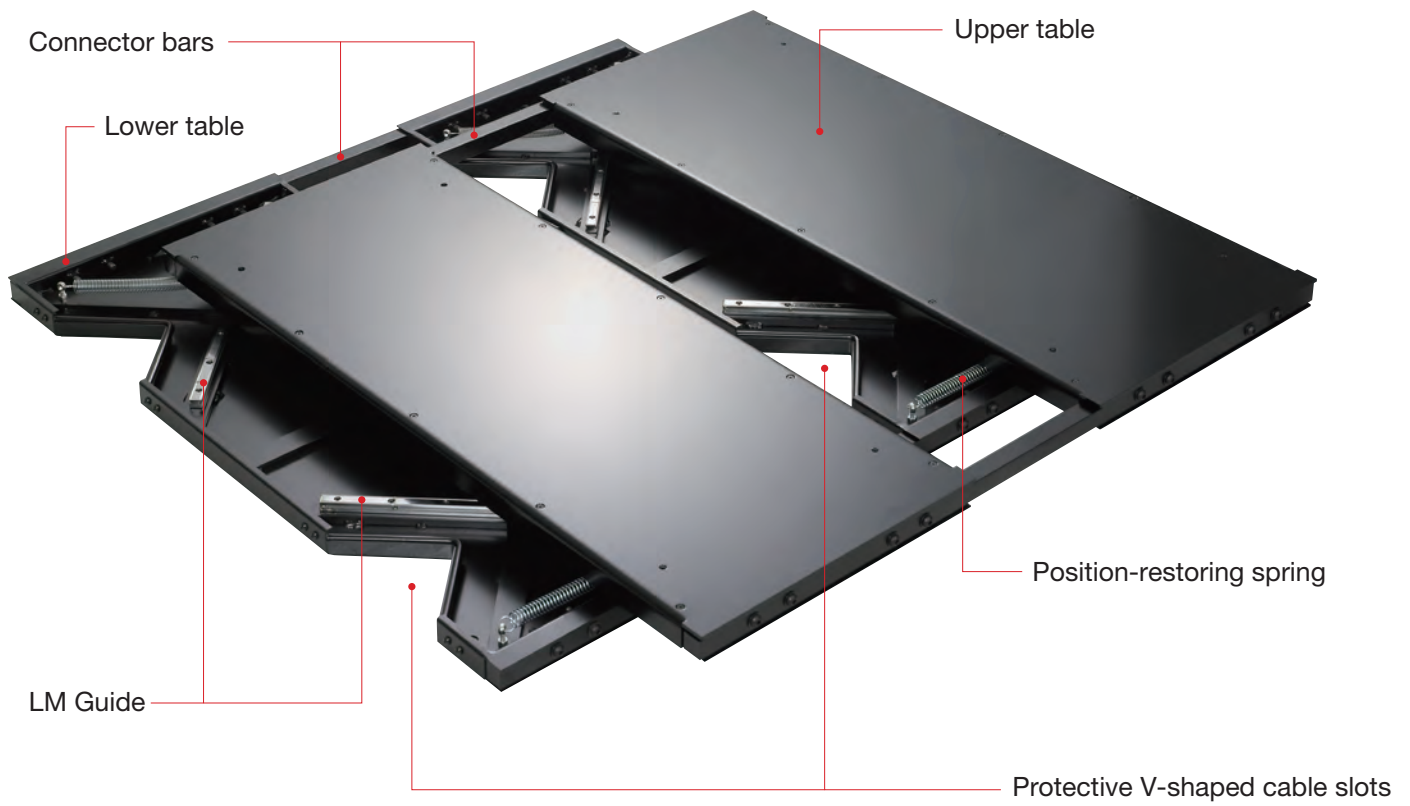


Xerox Alto

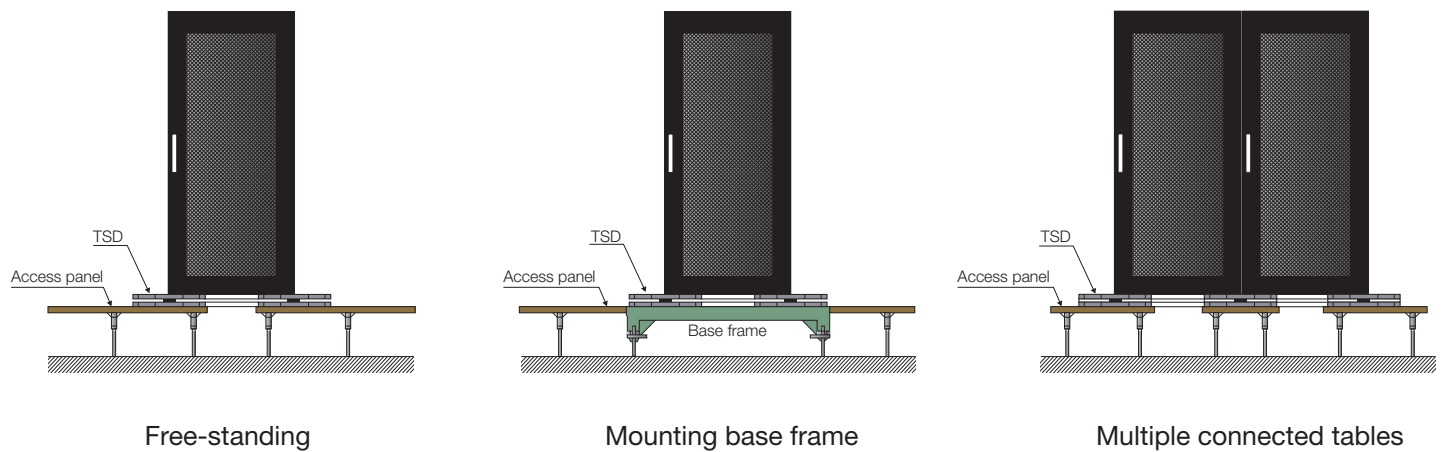


Jomon Goddess

# Structure



# Example Configurations

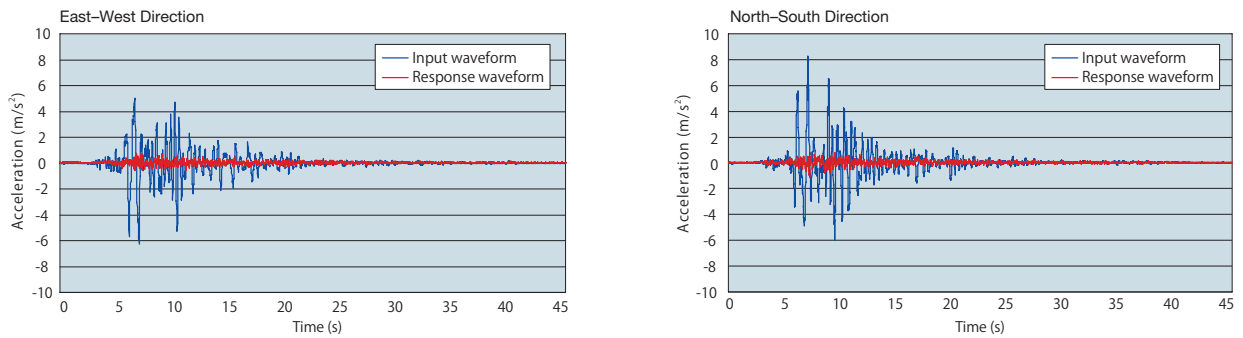


# Demonstration Test Data

Full-scale testing of the Seismic Isolation Table Model TSD was conducted with multiple patterns of earthquake motion.  
 • The following is example test data. (Input waveform: Acceleration of upper part of vibration table, Response waveform: Acceleration of TSD upper surface)

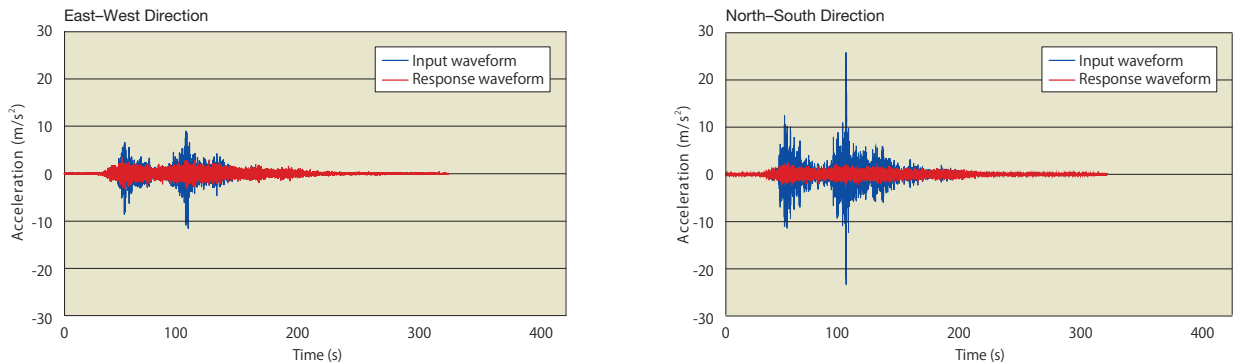
## TSD-1200 Sample of Great Hanshin-Awaji Earthquake (wave measured at Kobe Marine Meteorological Observatory)

Loaded device: One server rack (W 650 × D 1100 × H 2080, 800 kg)



## TSD-1200L Great East Japan Earthquake (Tsukidate wave)

Loaded device: Two server racks (W 700 × D 1050 × H 2000, 500 kg)



# Model Number Coding

Modules can be added or connected to the Seismic Isolation Table Model TSD in accordance with the loaded device. In addition, the pitch between modules can be adjusted between 0 mm to 400 mm (in 50 mm pitch intervals).

Model Number Coding

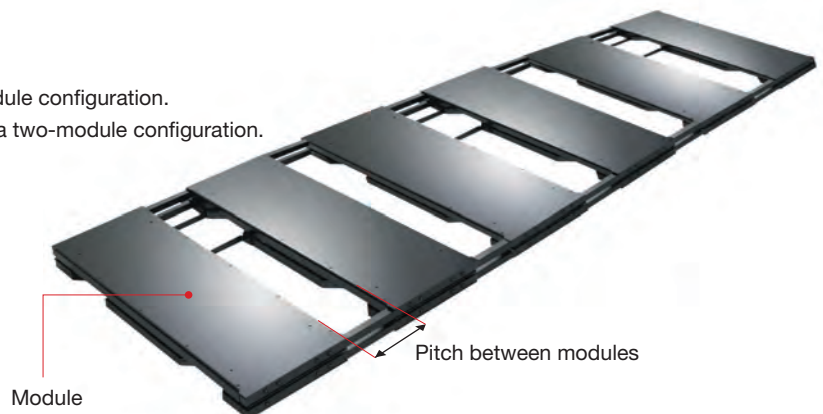
## TSD-1200L-M6

Model No.

No. of modules

\* M6 indicates a six-module configuration.

\* No symbol is used for a two-module configuration.





# Dimensions\* and Specifications

\*Dimensional diagrams show a two-module configuration

		Connectable model	
Model		TSD-1000	TSD-1200
Main unit dimensions (Unit: mm)			
	Module size	400 (W) x 1000 (D) x 90 (H)	400 (W) x 1190 (D) x 90 (H)
Table mass		90 kg/2 modules	110 kg/2 modules
Seismic isolation effect	Acceleration of 0.2 G or less in response to input acceleration of 0.8 G		
Direction	Horizontal (X/Y direction)		
Maximum displacement	±200 mm		
Load	300 kg to 1200 kg/2 modules		
Trigger	Selectable (choose from Trigger-A, B, or C)		
Fastening	None (can be anchored)		

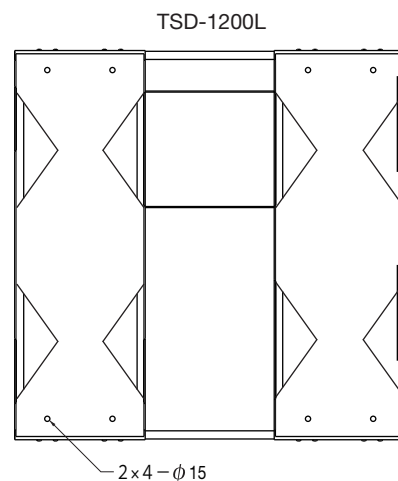
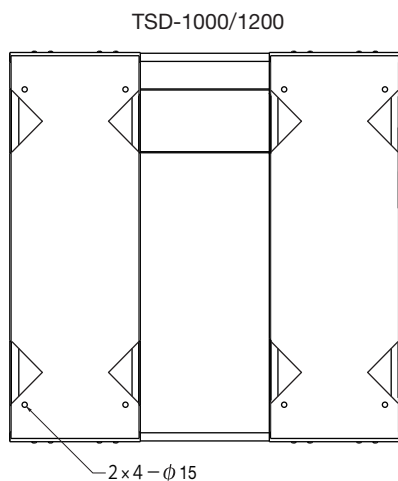
★ Pitch between modules can be adjusted between 0 mm to 400 mm (in 50 mm pitch intervals).

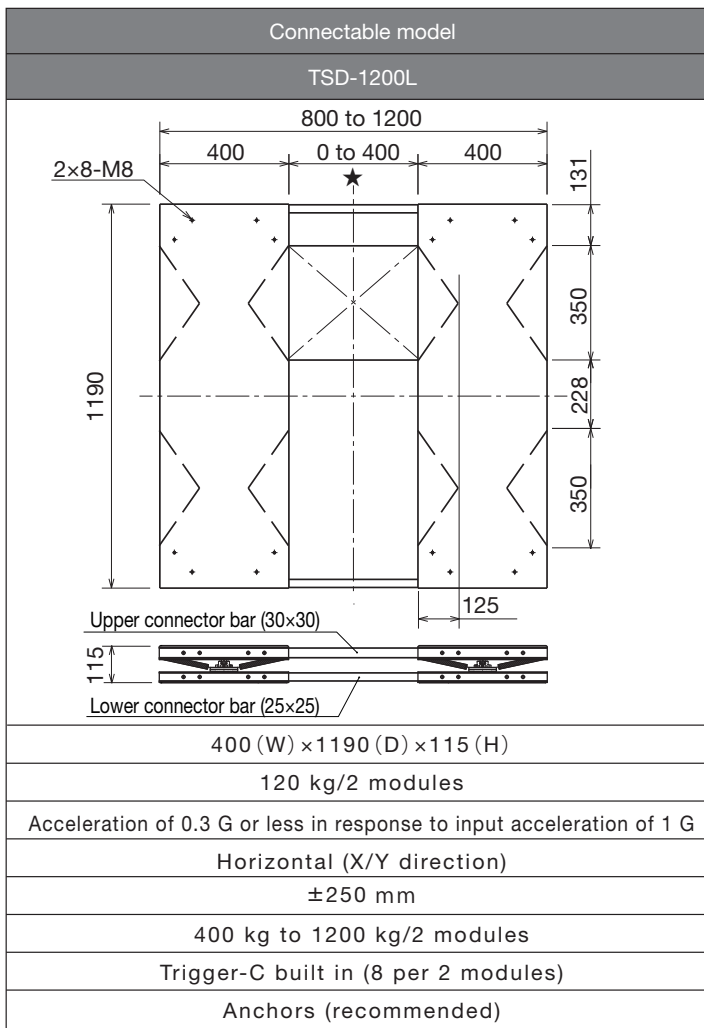
Standard pitch is 200 mm for TSD-1000 and 400 mm for TSD-1200/1200L.

## Seismic Isolation Table Fastening Methods

The Seismic Isolation Table Model TSD can be fastened to a base frame or supporting surface.

Use the mounting holes on the lower table to secure the unit with bolts. (4 locations per module)



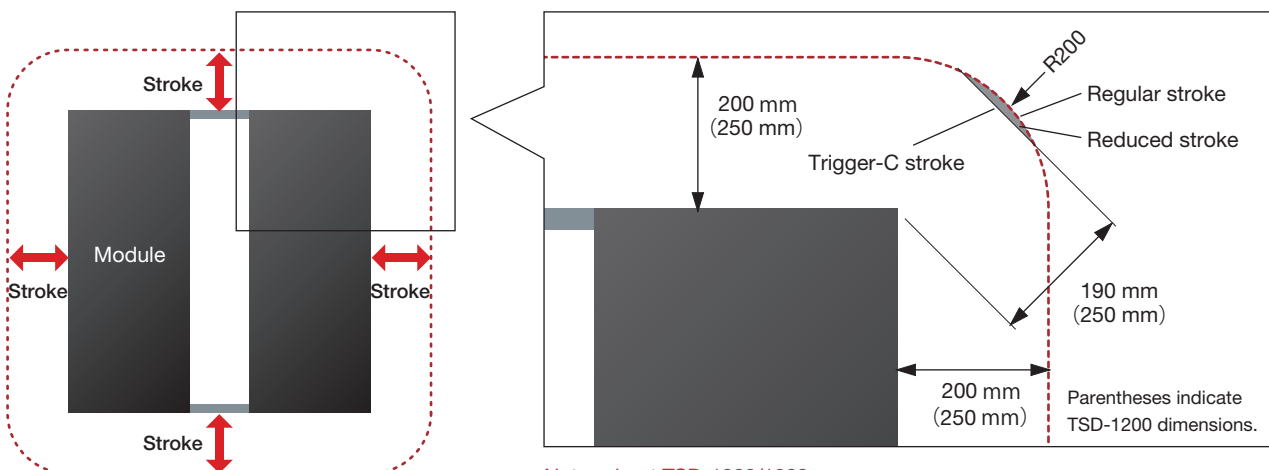


Product Photo



## Installation Area and Stroke

The Seismic Isolation Table Model TSD deflects tremors in a horizontal direction by allowing the table to move within the maximum displacement range. Therefore, you must leave an empty space equal to or greater than the maximum displacement in all four directions when installing the system. Reference the diagram below when securing the area.



Notes about TSD-1000/1200:

When using Trigger-C, the stroke in the R direction only will be reduced to ±190 mm.

When using Trigger-A, the trigger has a protruding part, so please secure a 235 mm space.



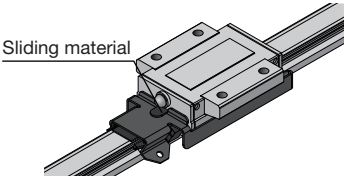
# Standard Options

## Seismic Isolation Table Model TSD Triggers

Triggers are optional components that hold the seismic isolation table in place when no earthquakes are happening. Two main types are available: an external attachment type (Trigger-A or Trigger-B) and a built-in type with a damping effect (Trigger-C).

\* The standard TSD-1200L comes with Trigger-C. (Trigger-A or B cannot be selected.)

Recommended

Name	External attachment type		Built-in type
	Trigger-A	Trigger-B	Trigger-C
Specifications	 Earthquake-detecting lock release function	 Single-use	 Built-in sliding function
Features	Lock automatically releases when an earthquake is detected	Single-use resin trigger	Built-in sliding mechanism acts as a trigger when idle (holds the system in place) and provides a damping effect when activated
Operating conditions	Minimum number used is 2. After activation, can be manually reset repeatedly.	Minimum number used is 4. Must be replaced once activated.	Minimum number used is 2. (No action required after an earthquake.)
Holding force	Approx. 50 N/1 trigger	Approx. 75 N/1 trigger	Approx. 100 N/1 trigger

Note 1: Each type of trigger can be retrofit onto existing Seismic Isolation Model TSD units. Contact us for details.

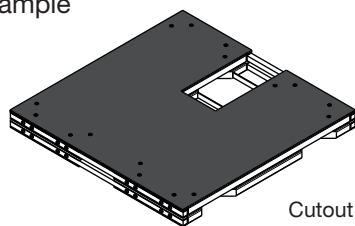
Note 2: The number of triggers used varies depending on the number of modules and mounted load. Contact us for details.

## Special Options (Build-to-Order) Upper Steel Plates, Base Frames, and More

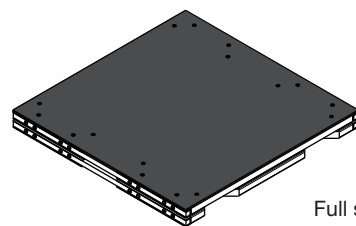
A steel plate can be added to suit the application and specifications of the loaded object.

Fasteners for loaded objects and underfloor base frames are also available for manufacture. Contact us for details.

### Upper Steel Plate Example



Cutout type (one side)



Full surface type

### Base Frame Example



Base frame



With seismic isolation tables installed



# Components and Accessories



- ① Module (with fasteners and mounting bolts)
- ② Connector bars

\* Please use bolts to fasten the modules and connector bars together during installation.

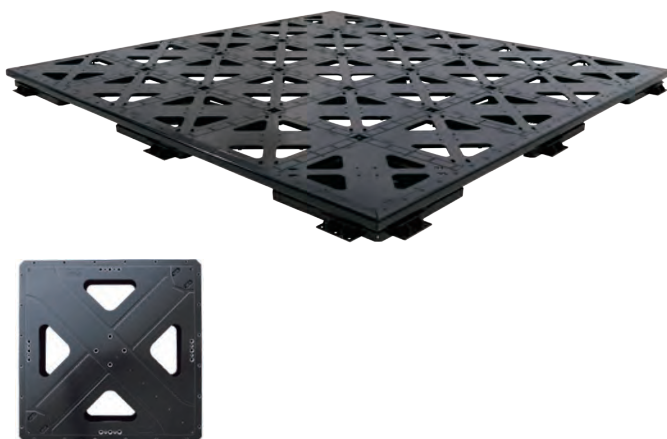


- ③ Rubber sheets
- ④ User manual
- ⑤ Hex wrenches
- ⑥ Floor-marking tape
- ⑦ Cable supports and mounting bolts
- ⑧ Wire-fastening bolts
- ⑨ Wires (with sleeves)

## Related Products

### Seismic Isolation Module Model TGS

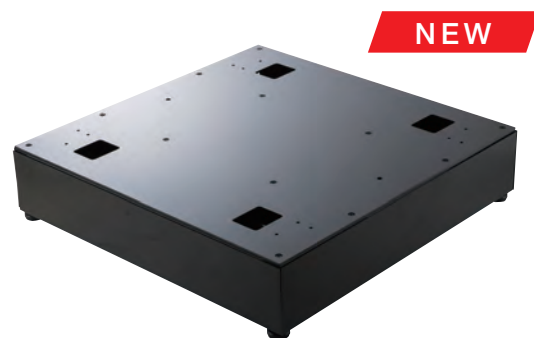
The Seismic Isolation Module Model TGS can be arranged in any configuration. It can support heavy loads, covering an entire floor or one specific area. (Load capacity: 3000 kg/1 m<sup>2</sup> max.)



### THK's Seismic Isolation Table Model VIT for Display Cases

This thin product only needs to be set in place to function, no fastening required. Four sizes are available to match standard display case dimensions. It can be used for a variety of other applications, too.

Sizes range from 600×600 to 1200×1200.



# THK Seismic Isolation Table Model TSD

## Precautions on Use

- This product is designed to attenuate horizontal seismic motion; it is not intended to be effective against vertical seismic motion. This table will reduce the effect of tremors on an object loaded onto it, but there is no guarantee that the object will not move or topple.
- In the event of seismic motion stronger than this product is designed to absorb, the module can be expected to strike the stopper, exerting an impact on any object atop the module.
- Injuries may occur if people enter or objects are placed within the seismic isolation table's range of motion (the maximum displacement given in the catalog) and the seismic isolation table activates during an earthquake.
- Please read the instruction manual carefully before using the Seismic Isolation Table.

- "LM Guide" and "Caged Ball" are registered trademarks of THK CO., LTD.
- Discrepancies may exist between photographic representations of products and the products themselves.
- Modifications may be made, without prior notice, to a product's appearance and specifications; please consult THK before using the product.
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See our seismic isolation website for more details.

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