SHINKEN

Vibration Test Systems

Single-axis Vibration Test Systems
Multi-axis Vibration Test Systems
Combined Environmental Test Systems
Vibration Controllers

Upon birth of a new innovative Product or occurrence of a large disaster, the new requirement for vibration tests may come out.

Just after the Great Hanshin-Awaji Earthquake in 1995,
there came a request that a more reliable system of providing earthquake
information more accurately and quickly be built.

At that time there was no Vibration Test System which could calibrate several
seismometers at a time quickly and accurately in Japan.
Then SHINKEN started to develop the 3-axis simultaneous Vibration Test System
with a relatively large table for calibrating ten seismometers
at a time more accurately and quickly.

Every new Product is developed and comes out hoping
for making people's lives safer, more convenient and comfortable.

Everyday SHINKEN strives to challenge for 'Any Applications related to Vibration'
hoping that the Product can function properly as its manufacturer intends it to do so.

CONTENTS

CATEGORY

Automotive

Bodies, Chassis / ECU / Audio Systems / Tires, Suspensions / Battery Modules & Packs / Radiators / Engines / Seats / etc.

P16	G-6 ／ G-8
P18	H ／ G-0 ／ G-9
P20	G-5 ／ G-4 ／ G-2

Electricity & Electronics

Small Electric, Electronic Parts, PC Boards / Sensors / Home Appliances / PC, Computer Terminals / Batteries / Precision Equipment / Generators / etc.

P16	G-6 ／ G-8
P18	H ／ G-0 ／ G-9
P20	G-5 ／ G-4 ／ G-2

Transportation

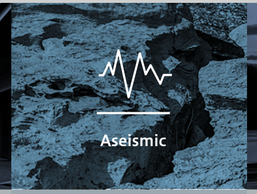
Packaged Goods / Packing Materials & Containers / Transportation Actual Travelling Simulation / Shock Simulation during Transportation / etc.

P16	G-6 ／ G-8
P18	H ／ G-0 ／ G-9

Laboratories, Organizations& Institutions

Accredited Test Laboratories / Testing Organizations / Calibration Organizations / Research Institutions / Educational Institutions / Evaluation Organizations / etc.

P16	G-6 ／ G-8
P18	H ／ G-0 ／ G-9
P20	G-5 ／ G-3 G-4 ／ G-2



Aseismic

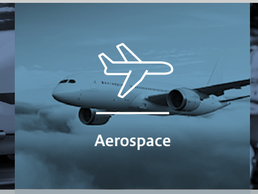
Anti-seismic Simulation for Structure Models / Seismic Simulation for Furniture Fall Prevention / Performance Check for Seismic-related Sensors / etc.

P16	G-6 ／ G-8
P18	G-9
P20	G-5 ／ G-3

Railway & Ship

Instruments, Electrical Equipment / Motors, Inverters / Compressors / Seats / etc.

P16	G-6 ／ G-8
P18	H ／ G-0 ／ G-9



Aerospace

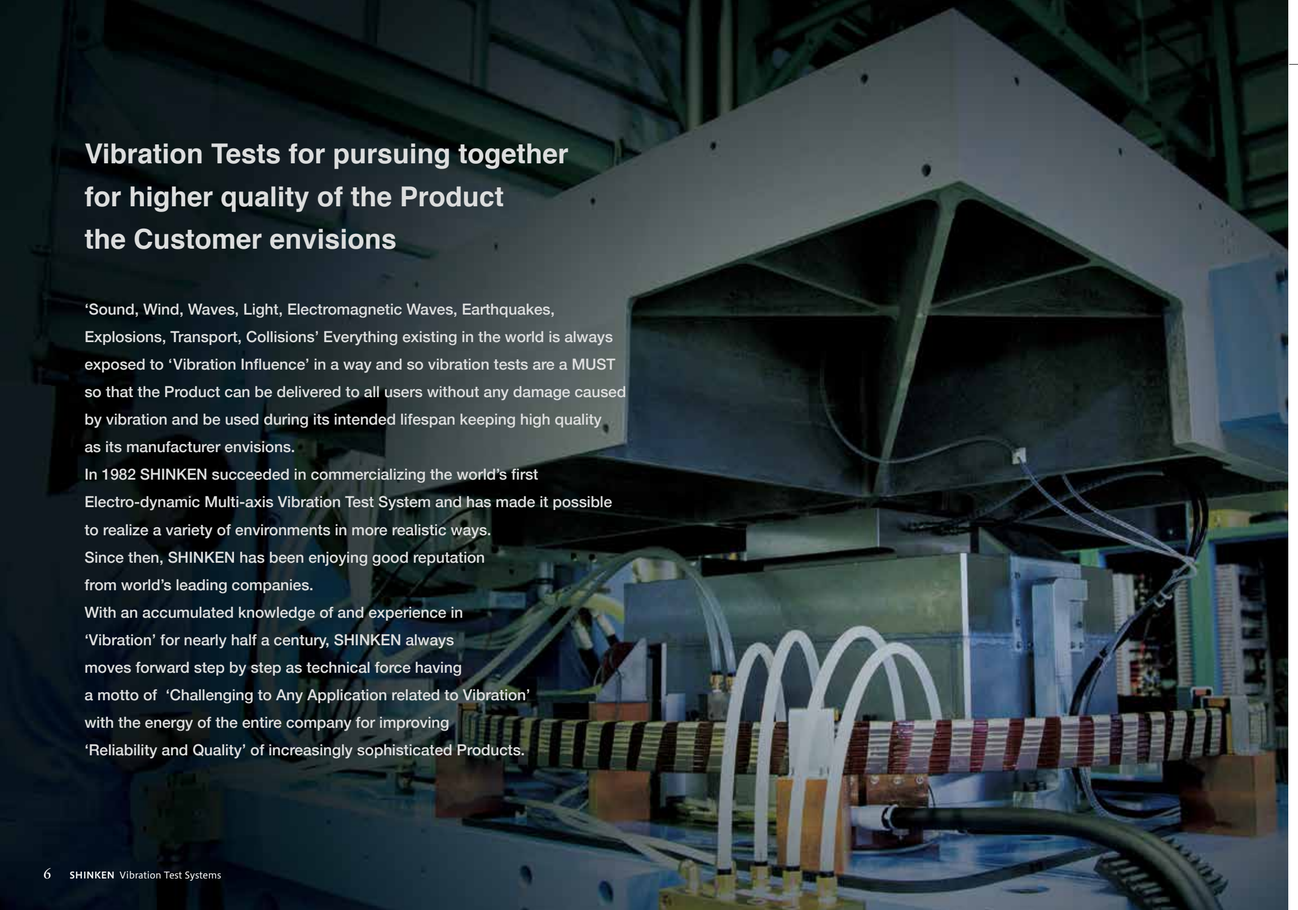
Sensors, Communications Systems / Instruments, Electrical Equipment / Engine Parts, Propulsion Systems / etc.

P18	H ／ G-0 ／ G-9
P20	G-4

Others

Calibration for Sensors and Instruments / Educational Purposes / Experiment with Models / Powder Filling, Fluid Facilitation / Production Process Assistance / etc.

P16	G-6 ／ G-8
P18	H ／ G-0 ／ G-9
P20	G-5 ／ G-3 G-4 ／ G-2



Vibration Tests for pursuing together for higher quality of the Product the Customer envisions

‘Sound, Wind, Waves, Light, Electromagnetic Waves, Earthquakes, Explosions, Transport, Collisions’ Everything existing in the world is always exposed to ‘Vibration Influence’ in a way and so vibration tests are a MUST so that the Product can be delivered to all users without any damage caused by vibration and be used during its intended lifespan keeping high quality as its manufacturer envisions.
In 1982 SHINKEN succeeded in commercializing the world’s first Electro-dynamic Multi-axis Vibration Test System and has made it possible to realize a variety of environments in more realistic ways.
Since then, SHINKEN has been enjoying good reputation from world’s leading companies.
With an accumulated knowledge of and experience in ‘Vibration’ for nearly half a century, SHINKEN always moves forward step by step as technical force having a motto of ‘Challenging to Any Application related to Vibration’ with the energy of the entire company for improving ‘Reliability and Quality’ of increasingly sophisticated Products.

Hydrostatic Bearing System /
Air Bearing System

SHINKEN’s technology is typified by “Guide Bearing Systems”

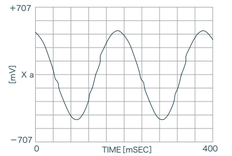
“Guide Bearing Systems” as a Core of Vibration Generators, playing a main role making movements of the Moving Mass of the Vibration Generator smooth! One of the main reasons of high reputation of SHINKEN’s technology is “Guide Bearing Systems” with SHINKEN only able to employ “Hydrostatic Bearing” and “Air Bearing” for guiding the Moving Mass of the Vibration Generator. Different from the conventional Mechanical Guide Systems, both Guide Bearing Systems involve little mechanical friction thus achieving high waveform fidelity and reduction in consumable parts contributing to cut in maintenance cost.

High waveform fidelity leading to high repeatability of vibration test results

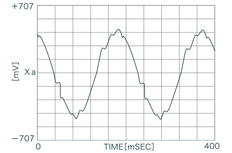
High waveform fidelity of the Hydrostatic Bearing System and Air Bearing System permits for high repeatability of vibration test results thus making it easier to find quality problems.

In-company Comparison of Acceleration Waveforms between the Hydrostatic Bearing System and the Conventional Mechanical Bearing System

Hydrostatic Bearing System



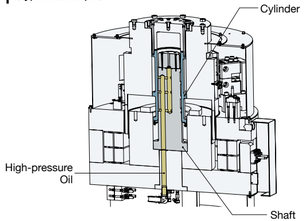
Conventional Mechanical Bearing System



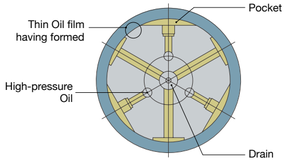
Little frictional wear allowing for high waveform fidelity for a long time

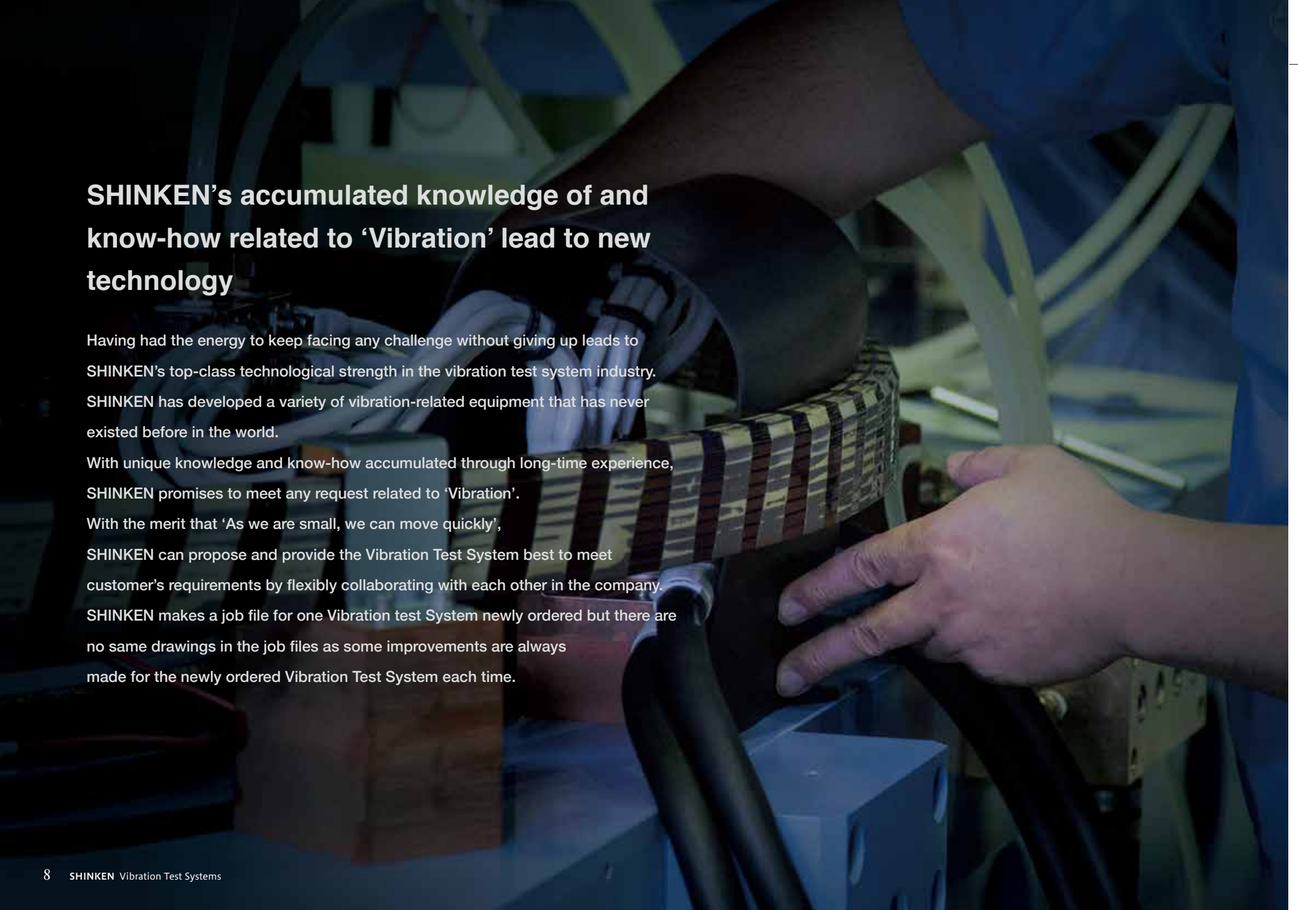
Supplying high-pressure oil or high-pressure air to the sliding part can get rid of mechanical friction wear thus keeping high waveform fidelity for a long time.

Internal Structure of Vibration Generator
〈Typical Example〉



Cross Section of Hydrostatic Bearing System





SHINKEN's accumulated knowledge of and know-how related to 'Vibration' lead to new technology

Having had the energy to keep facing any challenge without giving up leads to SHINKEN's top-class technological strength in the vibration test system industry. SHINKEN has developed a variety of vibration-related equipment that has never existed before in the world.
With unique knowledge and know-how accumulated through long-time experience, SHINKEN promises to meet any request related to 'Vibration'.
With the merit that 'As we are small, we can move quickly', SHINKEN can propose and provide the Vibration Test System best to meet customer's requirements by flexibly collaborating with each other in the company.
SHINKEN makes a job file for one Vibration test System newly ordered but there are no same drawings in the job files as some improvements are always made for the newly ordered Vibration Test System each time.

Specially Customized Vibration Test systems

SHINKEN has developed various Vibration-related Test Systems specialized in one particular purpose to meet customer's requirements.

Electromagnetic Shakers for Dynamic Centrifuge Model Test Systems

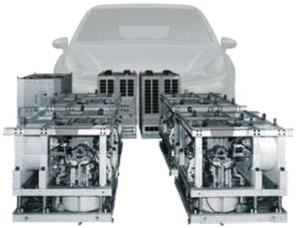
The Electromagnetic Shakers are employed in the Dynamic Centrifuge Model Test System for simulating deformation and destruction of soil structures or the like with vibration being given while applying large gravity.

♦ **G-3220M**

Vibration Test Systems for Dynamic Characteristic Measurement

The System is mainly used for measurement of dynamic characteristics and vibration durability tests for the Product required to be preloaded .

♦ **G-9215L**



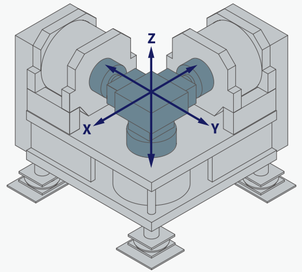
4-wheel·3-axis Vibration Test Systems

Featured by electro-dynamic shaker's high waveform fidelity and a wide frequency range, which can't be achieved with hydraulic shakers, the System, comprising 4 sets of 3-axis Vibration Generators, is aimed at simulating road-surface excitation conditions experienced by vehicles. 2-wheel·3-axis Vibration Test Systems for motorbikes are also available.

♦ **G-6220S-3HB-032-4**

MULTI-AXIS VIBRATION TEST SYSTEMS

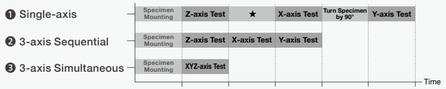
SHINKEN succeeded in commercializing the world's first Electro-dynamic Multi-axis Vibration Test System. Since then, SHINKEN has been enjoying the world top-class installation record of Multi-axis Vibration Test Systems with accumulated knowledge and nearly 40-year experience as well as SHINKEN's uniquely-designed Hydrostatic Bearing System which minimizes cross-talks among axes and also makes the Multi-axis Vibration Generators compact. In addition to simultaneous excitation, Multi-axis Vibration Test Systems have been used for the sequential test of each axis thus contributing to time saving and labor elimination as no troublesome vertical & horizontal tables handling and also no specimen unloading & loading are needed. 2-axis and 3-axis Vibration Test Systems are available.



MERIT

1 Reduction in Test Time and Labor

With the 3-axis Sequential Vibration Test Systems, vibration directions can be changed with one-touch switch operation or automatic direction change setting thus contributing to time saving and labor elimination as no troublesome vertical & horizontal tables handling and also no specimen unloading & loading are needed. With the 3-axis Simultaneous Vibration Test Systems, 3-axis simultaneous excitation can be carried out thus eliminating the test time drastically to less than 1/3.



★ Specimen Removal → Vertical Table Removal → Change in Vibration Directions → Horizontal Table Setting → Specimen Mounting

2 More Real-world Vibration Simulation

Vibration actually given to the Product is multi-dimensional vibration and vibration waveforms are Random waveforms in most cases. With the 3-axis Simultaneous Vibration Test Systems, real-world waveforms recorded with a Field Data Recorder or the like and also spectra converted from the real-world waveforms can be simulated in 3 directions simultaneously.

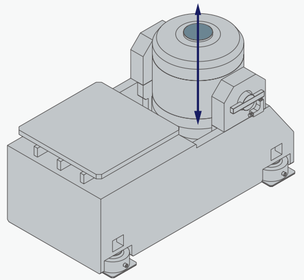
3 Minimizing 'Cross-talks (Unnecessary Vibration)'

Long-experienced technology for the unique Multi-axis Hydrostatic Bearing Systems (→P6) allows for restraint on 'Cross-talks' among axes thus making it easy to well control in accordance with the set 3-axis vibration test conditions.

SINGLE-AXIS VIBRATION TEST SYSTEMS

The Single-axis Vibration Test Systems, the most common, have been widely used for many years. Even for Conventional Single-axis Vibration Test Systems, SHINKEN has been meeting various customer's requirements with the unique technology such as the Air Bearing and Hydrostatic Bearing Systems for guiding the Movable Mass and Bellows-free Air Suspension*1 for axial support using back air pressure from the Air Bearing System. *N Type*: Air Bearing & Air Suspension*2 featured by high fidelity, low cross-talks, cleanness and fewer consumable parts *L Type*: Hydrostatic Bearing featured by high eccentric moment, low cross-talks and high durability.

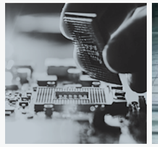
*1 Mechanism using back air pressure from the Air-bearing system instead of conventional Bellows (Air Spring) *2 used to be patented

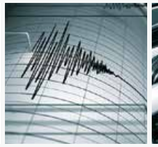


MERIT

1 Supporting a Wide Range of Tests

There are a variety of Single-axis Vibration Test Systems available widely to meet customer's requirements: General-Purpose (G-0 Series) / For Transportation Tests (G-9 Series) / For Shock & Vibration & Seismic Tests (G-5 Series) / For Large Displacement Horizontal Tests (G-3 Series) / For High-frequency Tests (G-4 series) / Miniature Systems (G-2 Series)


Electronic Devices

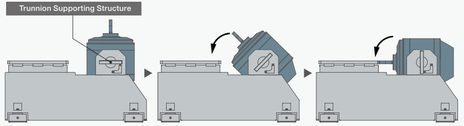

Seismometers


Automobile Engines

2 Change in Directions (Vertical ↔ Horizontal)

The Geared Motor and Trunnion Supporting Structure* make it relatively easy to change vibration directions with one-touch switch operation. In addition, for the large Air-cooled Vibration Generators, the hinge-type rotating mechanism at the attaching part of the Duct Hose for the Cooling Blower eliminating the troublesome job to change the attaching positions of the Duct Hose is available and for the large Aux. Vertical Tables, the Vertical Table UP-DOWN Device is available(→P29).

*Structure to support and rotate the heavy Vibration Generator



SYSTEM CONFIGURATIONS

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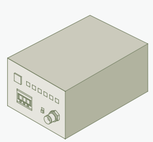
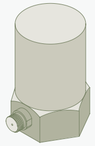
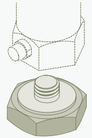
The Vibration Test System is basically configured with Vibration Generator, Cooling Device, Power Amplifier and Vibration Controller. With other device(s) optionally available being added, vibration tests can be carried out to meet a variety of vibration test purposes.



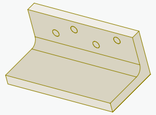
Charge Amplifier
▶ P29



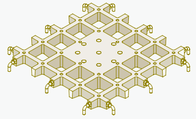
Accelerometers
▶ P29



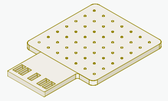
Insulation Adapters
▶ P29



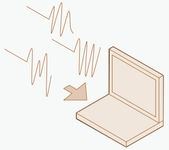
Jigs*3



Aux. Vertical Tables ▶ P28



Horizontal Tables ▶ P28

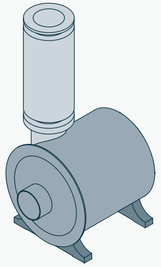


Field Data Recorders*1

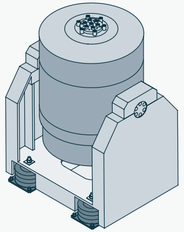
Vibration Controllers
▶ P24-25

System Configurations

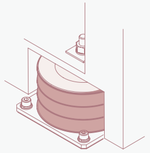
Power Amplifiers



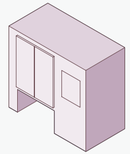
Cooling Devices*2



Vibration Generators



Vibration-proof Devices*4



Environmental Chambers ▶ P22-23

Others*5

***1 Field Data Recorders**
For recording environmental field data (Acceleration, Temperature and Humidity). The recorded data (in CSV format) can be imported into the Vibration Controller (→ P24).

***2 Cooling Devices**
For cooling down the Vibration Generator
- Cooling Blower with Silencer〈Air-cooled〉
- Heat Exchanger〈Water-cooled〉

***3 Jigs**
Please contact us for advice & design for and manufacturing of Jigs suited for your Product.

***4 Vibration-proof Devices**
For reducing vibration leaked from the Vibration Generator to be transmitted to the floor.
- Pneumatic Isolators
- Foundation Setting

***5 Others**
Please contact us about combined tests with the following equipment.
- Oven
- Gas Burner
- Centrifugal Machine
- Sound-proof Box
- Explosion-proof Enclosure

TYPICAL SYSTEM LAYOUT PLANS

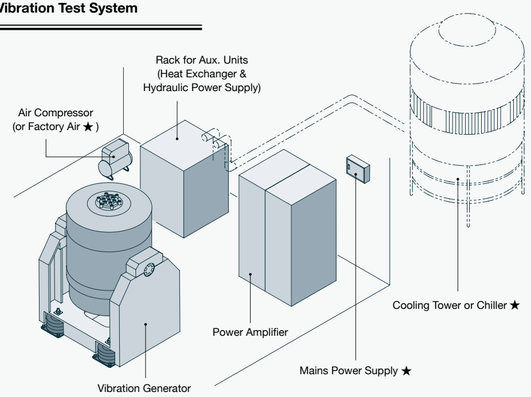
TYPICAL SYSTEM LAYOUT PLANS

Here are 4 typical layout plans of standard Vibration Test Systems:

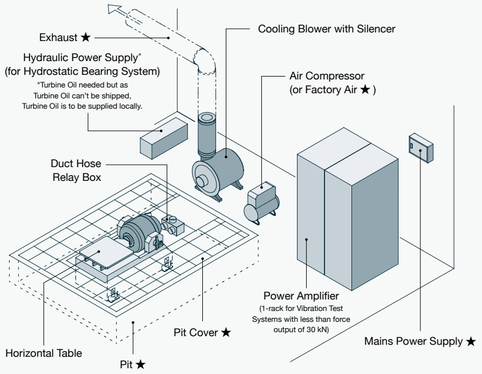
Please contact us for an optimum layout plan to meet your installation site conditions.

*Marked with ' ★ ' : Scope of the Customer

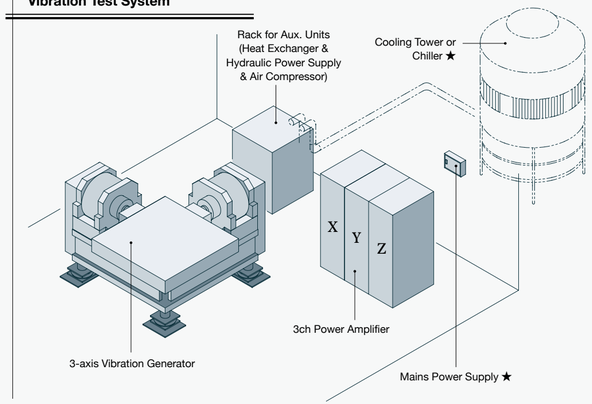
Water-cooled Large Single-axis Vibration Test System



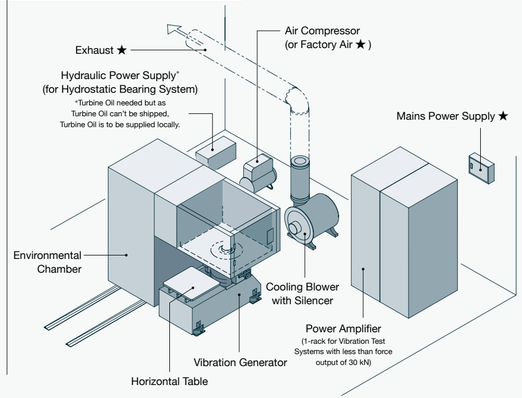
Single-axis Vibration Test System with Vibration Generator in a pit



Water-cooled 3-axis Simultaneous Vibration Test System



Single-axis Vibration Test System with Environmental Chamber



3-AXIS
VIBRATION TEST SYSTEMS

‘More Real-world Vibration’ with 3-axis simultaneous excitation

■ 3-axis Simultaneous Vibration Test Systems

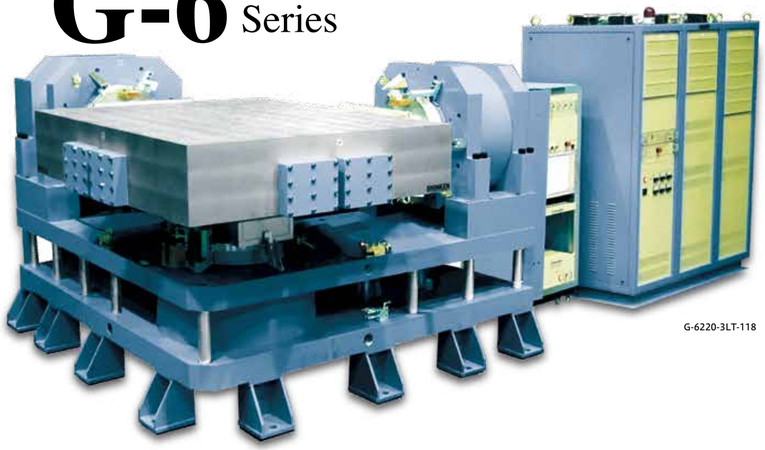
The Systems are capable of 3-axis simultaneous excitation; horizontal 2-axis (X&Y) and vertical 1-axis (Z), simulating ‘More Real-world Vibration’ thus most suited to seismic simulation, transportation PSD simulation, actual vehicle running simulation etc. and also usable for 3-axis sequential tests.

■ 3-axis Sequential Vibration Test Systems

The Systems are capable of 3-axis sequential tests with one-touch switch operation contributing to time saving and labor elimination as no troublesome vertical & horizontal tables handling and also no specimen unloading & loading are needed thus most suited to vibration tests of large, heavy specimens. Also the Series Test Unit is optionally available for automatic 3-axis series tests in the order of Z→X→Y.

System Model (Typical Examples)	Max. Force Output		Max. Acceleration	Max. Velocity	Max. Displacement
	Sine kN (kgf)	Random kN rms (kgf rms)	m/s²(G)	m/s	mm p-p
G-6210-3HT-040	9.8(1000)	6.8(700)	108(11)	1.2	51
G-6230-3LT-115	29.4(3000)	20.5(2100)	48(4.9)	1	51
G-6265-3LT-118	63.7(6500)	44.5(4550)	71(7.2)	1	51

G-6 Series



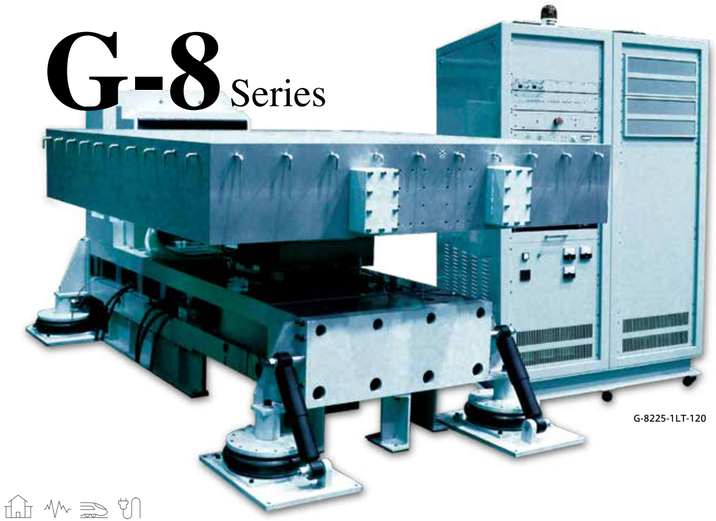
G-6220-3LT-118

2-AXIS
VIBRATION TEST SYSTEMS

For More Effective Vertical & Horizontal Tests

The 2-axis (horizontal axis and vertical axis) Simultaneous Vibration Test systems and Sequential Vibration Test systems are available. The Systems are most suited to vibration tests for large, heavy specimens as troublesome jobs of vertical & horizontal tables handling and also specimen unloading & loading which are a MUST with the conventional Single-axis Vibration Test Systems can be eliminated. In addition, specialized 2-axis Vibration Test Systems with larger displacement and larger force are also available. Please contact us for more information if needed.

G-8 Series



G-8225-1LT-120

System Model (Typical Examples)	Max. Force Output		Max. Acceleration	Max. Velocity	Max. Displacement
	Sine kN (kgf)	Random kN rms (kgf rms)	m/s²(G)	m/s	mm p-p
G-8210L-1LT-112	9.8(1000)	6.8(700)	30(3.1)	1	80
G-8225-1LT-120	24.5(2500)	17.1(1750)	20.4(2)	1	51
G-8265-1HT-080	63.7(6500)	44.5(4550)	325(33)	1.4	51

* The Special Systems with the other specifications than in the Specifications and Catalog are also available. Please contact us for further information.
  – Systems with larger displacement: Horizontal up to 400mmp-p & Vertical up to 300mmp-p
  – Larger Systems with force output of larger than 63kN
  – Systems with 2m square Table or larger
* The Hydrostatic Bearing System is employed for all Multi-axis Vibration Generators.
* All the Power Amplifiers are cooled down with built-in cooling fans.
* For the air-cooled Vibration Test Systems, it is recommended that the hot air from the Cooling Blower(s) be sent to outside.
* Mains Power Supply required is 3-phase 200/220/380/415V, 50/60Hz.
* The Upper Frequency for Sine is a frequency up to which the max. force output can be achieved while that for Random is a frequency up to which a PSD random pattern having a -6dB/oct or steeper roll-off over the upper frequency for sine (or lower) can be controlled.
* The Lower Frequencies for control and for excitation are 2Hz and 1Hz, respectively unless especially requested.
* The 1ch Power Amplifiers are employed for the 2-axis/3-axis Sequential Vibration Test Systems.
* For better acceleration distribution on the vibration table, the movable weight will be heavier by 10 to 30kg for addition of proper balance weights.
* When conducting low-frequency tests, it is recommended that the Vibration Generators be fixed onto a proper vibration-proof foundation.

New

SINGLE-AXIS
VIBRATION TEST SYSTEMS

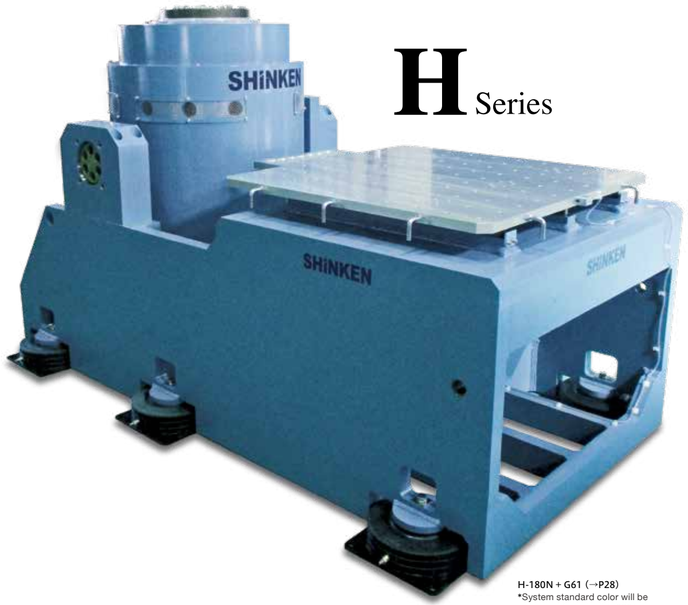
New Series Superior to the Conventional G-Series

'High Frequency', 'High Acceleration' and 'High Velocity' have been achieved with reduction in the weight of the Movable Mass of the Vibration Generator owing to the employment of the newly-designed Air Bearing System* and design changes in some main parts with some Systems having a large displacement of 100mmp-p available. In addition, durability of the Vibration Generator has been improved with the newly-designed Movable Mass Rotation Stop Mechanism.

*Patent Pending

System Model (Typical Examples)	Max. Force Output Sine kN(kgf)	Max. Acceleration Sine m/s² (G)	Max. Velocity m/s	Max. Displa-cement mm p-p	Frequency Range* Hz	Table Size mm
H-180N	8(816)	1000(102)	2.3	51	3–5000	Φ200
H-212	12(1224)	1000(102)	2.3	51	3–4500	Φ240
H-216N	16(1632)	1066(108)	2.3	51	3–4000	Φ300
H-216NS	16(1632)	1000(102)	2.3	100	3–3500	Φ300
H-224NS	24(2448)	1000(102)	2.3	51	3–3500	Φ360
H-228N	28(2856)	1076(109)	2.3	51	3–3500	Φ360
H-240N	42(4286)	1049(107)	2.3	51	3–3200	Φ360
H-265	63.7(6500)	980(100)	2.3	100	3–2600	Φ360

*Some roll-off at high frequencies



H Series

H-180N + G61 (→P28)
*System standard color will be changed from April 1, 2021

GENERAL PURPOSE
VIBRATION TEST SYSTEMS

Usable for a Wide Range of Vibration Tests

The G-0 Series Vibration Test Systems have a variety of choices according to customer's requirements with Force Output ranging from 1kN to 200kN and a choice of the Guide Bearing Systems from Mechanical Bearing, Air Bearing and Hydrostatic Bearing. Horizontal Tables with Linear-guide Bearing and Hydrostatic Bearing Guide Systems are also optionally available.

System Model (Typical Examples)	Max. Force Output Sine kN(kgf)	Max. Acceleration Sine m/s² (G)	Max. Velocity m/s	Max. Displa-cement mm p-p	Frequency Range Hz	Table Size mm
G-0130N	3(306)	908(92)	2	51	3–3000	Φ120
G-0220NS	20(2040)	769(78)	2	100	3–2000	Φ300
G-0320L	196(20000)	980(100)	1.8	100	3–2000	Φ630

G-0 Series

G-0130N

G-9 Series

G-9150 + G61(→P28)

FOR TRANSPORTATION TESTS
VIBRATION TEST SYSTEMS

Suitable for Vibration Tests for Heavy, Large Specimens

The main features of large, robust Movable Mass and high eccentric moment make the G-9 Series Vibration Test Systems suitable mainly for transportation vibration tests for large, heavy specimens such as packaged cargos and large automobile parts. With the Aux. Vertical Table and Horizontal Table being added, the employment of the optional Geared-Motor for rotating the Vibration Generator's body and the Aux. Vertical Table UP-DOWN Device with 4 cylinders makes a changeover of vibration directions relatively safe and easy.

System Model (Typical Examples)	Max. Force Output Sine kN(kgf)	Max. Acceleration Sine m/s² (G)	Max. Velocity m/s	Max. Displa-cement mm p-p	Frequency Range Hz	Eccentric Moment N·m
G-9150	4.9(500)	245(25)	2	60	2–800	1000
G-9220L	20(2040)	285(29)	2	100	2–500	2250
G-9230N	30(3061)	545(55)	2	100	2–500	500

* The Special Systems with the other specifications are also available. Please contact us for further information.
* It's recommended that the hot air from the Cooling Blower be sent to outside.
* The last capital letter stands for:
N: Air Bearing L: Hydrostatic Bearing No letter: Mechanical Bearing

SHOCK & VIBRATION
TEST SYSTEMS

For High Acceleration Shock & Vibration Tests and Seismic Tests

Featured by high acceleration and large displacement owing to the Air Bearing System and the unique structure of the light Movable Mass, G-5 Series Shock & Vibration Test Systems can be used for not only shock & vibration tests but also seismic tests.

■ Up to 4,900m/s² (500G) Shock Tests Possible

A wide range of shock tests from low to high acceleration and narrow to wide pulse width can be carried out with high control accuracy as well as a wide range of vibration tests including JEDEC Standard Random test Service A*1 and Seismic Simulation of NEBS (Bellcore) GR-63-CORE Standard*2.

*1 Displacement of about 140mmp-p required
*2 Displacement of about 260mmp-p required

■ Bump Tests Easily Achieved

Easy setting of the number of times of shock waveforms and interval time makes Bump Tests easily to be carried out thus beating conventional Shock Test Machines in a way.

G-5 Series

System Model (Typical Examples)	Max. Force Output		Max. Acceleration		Max. Velocity	Max. Displacement	Frequency Range	Table Size
	Sine kN(kgf)	Shock kN peak (kgf peak)	Sine kN(kgf)	Shock kN peak (kgf peak)	m/s	mmp-p	Hz	mm
G-5125N	1.8(179)	7.5(765)	706(71)	4900(500)	2	150	3–2000	65×65
G-5220N	14(1428)	35(3570)	1078(110)	2691(274)	2	100	3–1400	200×200
G-5250NS	34(3500)	85.7(8750)	647(66)	1649(168)	2	260	0.4–1000	Φ360

* For low-frequency tests such as seismic simulation
  - A relevant accelerometer or servo sensor and a low-frequency use charge amplifier are required
  - For large displacement tests, the air in the Pneumatic Isolators is to be let out or the Vibration Generator is to be installed onto relevant vibration-proof foundation.
* Compressed Air of over 0.5 MPa (5 kg/cm²), 50 liters/min. is required.
* It is recommended that the hot air from the Cooling Blower be sent to outside.

G-5125N

G-3010

G-3 Series

LARGE DISPLACEMENT HORIZONTAL
VIBRATION TEST SYSTEM

Specialized in Seismic Simulation

The G-3 Series Vibration Test Systems are used mainly for performance tests and calibration of various seismic-related sensors as well as for seismic simulation with small structure models or the like.

■ Large Displacement of up to 600mmp-p

Large displacement of up to 600mmp-p makes seismic-related tests possible.

■ Large Table of up to 1.2m x 1.2m

Plural sensors, seismic-related instruments and the like can be mounted and tested at once.

System Model (Typical Examples)	Max. Force Output	Max. Acceleration	Max. Displacement	Frequency Range	Table Size
	Sine N (kgf)	Sine m/s² (G)	mm p-p	Hz	mm
G-3010	100(10)	20(2)	30	0.5–50	325×300
G-3030S	300(30)	11.9(1.2)	600	0.2–10	500×500
G-3170S	7000(714)	20(2) ※150kg load	600	0.5–10	1200×1200

* Mains Power Supply: Single-phase 100/110/200/220V except G-3170S (3-phase 200/220/380/415V)

HIGH FREQUENCY
VIBRATION TEST SYSTEMS

Up to 25,000Hz

The G-4 Series Vibration Test Systems are used for performance tests and calibration of various sensors corresponding to high frequencies such as car knock sensors as well as resonance search.

■ High Frequency

The natural frequency of the G-4 Series Vibration Generators is high with the G-4003 usable up to 25kHz.

■ High Acceleration

The high acceleration of up to 980m/s²(100G) can be achieved with the G-4 Series Vibration Test Systems with a force output of 3kN or more.

System Model (Typical Examples)	Max. Force Output	Max. Acceleration	Max. Velocity	Max. Displacement	Frequency Range	Table Size
	Sine N (kgf)	Sine m/s² (G)	m/s	mm p-p	Hz	mm
G-4003	30(3)	60(6.1)	2	0.5	200–25000	Φ50
G-4130	3000(306)	980(100)	2	10	50–7000	Φ120
G-4210NS	10k(1020)	980(100)	2	15	5–5000	Φ200

G-4 Series

G-4130

G-2 Series


G-2005D

MINIATURE
VIBRATION TEST SYSTEMS

Compact and Usable even on a desk

Usable with Single-phase Household Power Supply

■ Usable even on a desk

The G-2 Series Miniature Vibration Test Systems are featured by compact size and light weight thus allowing for use even on a desk or the like and no Cooling Blower is needed except Model G-2050.

■ Usable for Various Applications

The G-2 Series Miniature Vibration Test Systems, consisting of Power Amplifier with built-in Sine Controller and Vibration Generator as standard, can be used for a variety of applications: calibration of sensors, standard vibration tests for small parts, school teaching materials, modal analysis etc.

System Model (Typical Examples)	Max. Force Output	Max. Acceleration	Max. Displacement	Frequency Range	Table Size
	Sine kN(kgf)	Sine m/s² (G)	mm p-p	Hz	mm
G-2005D	49(5)	61(6.2)	2	10–8000	Φ80
G-2020L	196(20)	245(25)	10	5–5000	Φ63
G-2050	490(50)	408(41)	25	5–5000	Φ100

*The Special Systems with the other specifications are also available. Please contact us for further information.

COMBINED ENVIRONMENTAL TEST SYSTEMS

CS Series

Combined Environmental Test Systems with Vibration Test Systems and Environmental Chambers

Combined Environmental Test Systems are used for combination tests of Vibration, Temperature and Humidity with Vibration Test Systems and Environmental Chamber being combined thus realizing more realistic environment during products in use or transportation and leading to enhancing the quality of the Product. Combined Environmental Test Systems with not only Vertical Single-axis Vibration Generators but also Single-axis Vibration Generators with Horizontal Tables and Multi-axis Vibration Generators are available.

The Special Systems with the other specifications are also available. Please contact us for further information.

For Multi-axis Vibration Generator

CS-418P-2C

For Single-axis Vibration Generator with Horizontal Table

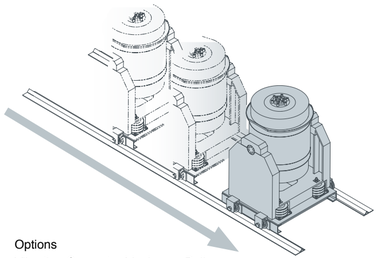
CS-718P-3C

〈For Vertical Use〉

〈For Horizontal Use〉

For Single-axis Vibration Generator for Vertical Only

CS-418P-3V

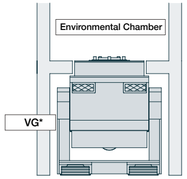


Options
Vibration Generator Moving on Rails

Docking Methods with Vibration Generators

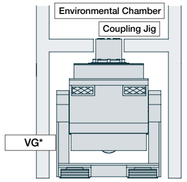
■ Piggy-back Docking

With the upper part of the Vibration Generator modified with stainless steel for heat isolation, no additional Coupling Jig is needed thus keeping the max. acceleration and upper frequency as the Vibration Test System is used independently.



■ Coupling Jig Docking

The Coupling Jig is generally used for docking the Vibration Generator and the Chamber but the max. acceleration becomes smaller and upper frequency becomes lower.



*VG stands for Vibration Generator

DIGITAL VIBRATION CONTROLLERS

D-59 Series Digital Vibration Controllers for Windows 10, which can be used for not only Electro-dynamic Shakers but also Hydraulic Shakers, are featured by user-friendly usability thus enabling complicated vibration tests to be carried out easily as well as a variety of control functions available such as Sine, PSD Random, Shock, Mixed Mode, RSTD, Waveform Reproduction etc. and also input channels being expandable up to 8.

Two Main Controllers Available

D-59 Series

・Single-axis Control

・Multi-axis Sequential Control

Input: 4 channels as standard, expandable up to 8 channels
Output: 1 channel for control & COLA output as option

D-0960 Series

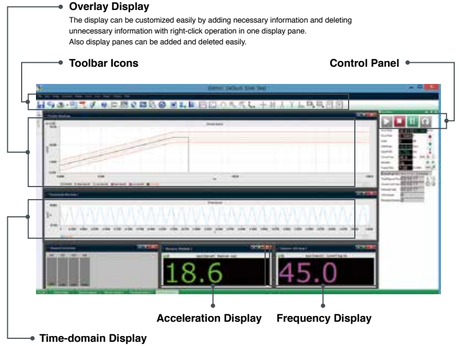
・Multi-axis Simultaneous & Sequential Control

・Single-axis Control

Input: 6 channels (for 3-axis), 4 channels (for 2-axis) as standard
Output: 3 channels (for 3-axis), 2 channels (for 2-axis) as standard

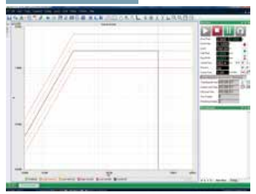
Easy Operation

'The easier, the better!' - required for any Controllers: Featured by 'easy to recall test patterns used often' and also 'easy to change test conditions or make new test patterns', anyone can use D-59 Series Controllers easily!

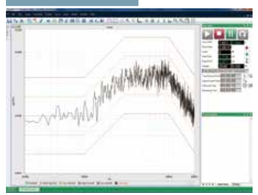


Software

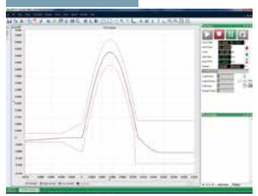
Sine Control



Random Control



Shock Control



Waveform Simulation

Field vibration data such as 'seismic waveforms' and 'vibration waveforms during vehicle driving recorded with a field data recorder' can be simulated:

- Transient Time History Control (TTH)
  (Up to 32k-point waveform time-domain data such as earthquakes and collisions)
- Long Time History Control (LTH)
  (longer waveforms than 32k points such as road driving data)

Options

A Variety of Add-on Software also Available

- Sine on Random Control (SoR)
- Random on Random Control (RoR)
- Sine & Random on Random Control (SRoR)
- Resonance Search, Track & Dwell (RSTD)
- Multi-Sine Control
- Shock Response Spectrum (SRS)

By adding optional 'Digital I/O', linkage operation with an Environmental Chamber is possible.

Compactly Accommodable

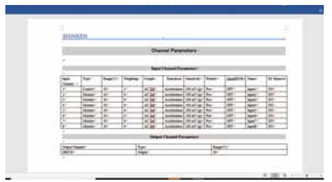
The Controller can be accommodated in the Power Amplifier console (also separately placed possible) with 2 types available:
B-type: Stand-alone type with PC and TFT built-in
A-type: Control Unit type which can be connected with any Windows 10 PC.

B-type

A-type

Quick Report

The Test Report can be made in PDF and MS-Word files and control data can be exported to MS-Excel.



Display of the Word Quick Report

SPECIALIZED VIBRATION TEST SYSTEMS

SPECIALIZED VIBRATION TEST SYSTEMS

Car Seat Test Systems

G-8210-1LB-110

The Car Seat Test System is mainly used for testing characteristics and durability of car seats.

Usage
- Vibration Endurance Test
- Seat Vibration Characteristics Test
- Seat Damping Test

Car Ride-comfort Test Systems

G-9220LS

The Car Ride-comfort Test System is featured by quietness, high fidelity and minute vibration thus best suited to the evaluation of the human sense of 'Ride Comfort'.

Usage
- Ride-comfort Test
- Road Noise Test

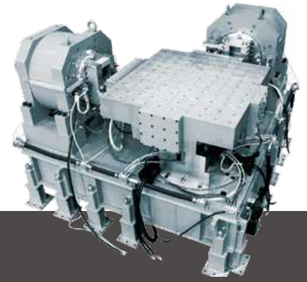
Shock Absorber Test Systems

G-9210S

The Shock Absorber Test System with the Gatepost Preload Mechanism is used for vibration tests with preload given onto suspension-system automobile parts such as shock absorbers. Water-cooled systems are also available for squeak & rattle tests.

Usage
- Vibration Characteristics Tests
- Vibration Fatigue Tests
- Vibration Endurance Tests
- Squeak & Rattle Tests

Long-stroke 3-axis simultaneous Seismometer Calibrator

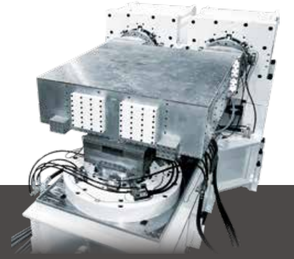


G-6230L-3LT-115

With large displacement of 400mmp-p for horizontal and 200 mmp-p for vertical, the System has been used for calibration of all the seismometers installed all over Japan for quick information transmmission upon earthquake occurrence as well as simulation of various earthquakes.

Usage
- Calibration of Seismometers
- Seismic Simulation
- Seismic Test for Structure Models

2-axis Vibration Test System, one of the largest Electro-dynamic Multi-Axis Vibrations in the world



G-8340-1LT-120

This is the 2-axis Vibration Test System, one of the largest Electro-dynamic Multi-Axis Vibrations in the world.
- Max. Sine Force Output : 400 kN
- Max. Shock Force Output : 1000 kN
- Max. Sine Acceleration : 117 m/s² (with 1500kg load)

Usage
- for Railway Rolling Stock Parts (especially for high-speed trains)
- for Heavy Specimens

Electromagnetic Shakers for Dynamic Centrifuge Model Test Systems

G-3220M

The Electromagnetic Shakers are employed in the Dynamic Centrifuge Model Test System for simulating deformation and destruction of soil structures or the like with vibration being given while applying large gravity.

Usage
- Dynamic Soil-structure Interaction Experiment
- Earth Pressure Experiment
- Liquefaction Phenomenon Simulation

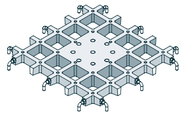
OPTIONS

OPTIONS

AUXILIARY TABLES

Aux. Vertical Tables G62 Series / G62-H Series

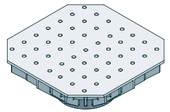
Aux. Vertical Tables are available when the specimen and its fixture if any are bigger than the diameter of the Movable Mass of the Vibration Generator with a variety of choices such as standard frequency or high frequency, casting or assembled and Aluminum alloy or Magnesium alloy dependent upon the required test conditions.



Standard Frequency Type

【Typical Examples】

- 600×600[mm] / Al：21kg,Mg：14kg / Natural Frquency 600Hz
- 800×800[mm] / Al：54kg,Mg：36kg / Natural Frquency 550Hz
- 1000×1000[mm] / Al：95kg,Mg：65kg / Natural Frquency 450Hz



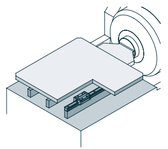
For High-frequency

【Typical Examples】

- 600×600[mm] / Al：50kg,Mg：35kg / Natural Frquency 1400Hz
- 800×800[mm] / Al：110kg,Mg：73kg / Natural Frquency 1000Hz
- 1000×1000[mm] / Al：150kg,Mg：110kg / Natural Frquency 800Hz

Horizontal Tables G61 Series

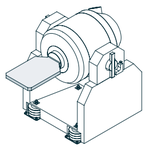
For horizontal excitation, the Horizontal Table on which specimens can be mounted is needed. Three kinds of Horizontal Tables are available and can be selected dependent upon the required test conditions and budget.



Linear-guide Bearing Type

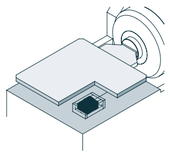
The Linear-guide Bearing Type is SHINKEN's standard method for horizontal excitation, featured by cleaner and more rigid than the conventional Slip Table Type.

※Periodic replacement of Linear-guide Bearings is need.



Direct-coupling Type

Without a horizontal common base, the Horizontal Table can be connected directly to the Movable Mass of the Vibration Generator for cheaper solution but the table size and loadable weight are limited dependent upon the eccentric moment of the Vibration Generator.



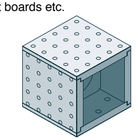
Hydrostatic Bearing Type

The Hydrostatic Bearing Type is recommended for high frequency and high eccentric moment requirements.

*Hydraulic Power Supply is included.
*Periodic replacement of turbine oil is need.

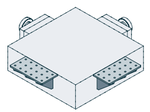
Cubic Fixtures G63 Series

Cubic Fixtures are used for 3-axis tests of small parts, printed circuit boards etc.

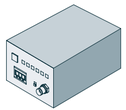


Extended Tables G65 Series

Extended Tables, detachable & mainly for Multi-axis Vibration Generators, are used for the large specimen which is rarely tested and slightly overhangs the Vibration Table.

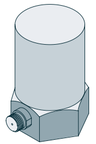


SENSORS



Charge Amplifier

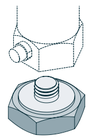
The Charge Amplifier, accommodable in the Power Amplifier Console, is employed for control from 1Hz (or 0.6Hz) or for the Multi-axis Sequential Vibration Test Systems.



Accelerometers

A variety of Accelerometers, for measuring acceleration, are available and the right selection of the accelerometer is required in accordance with the test conditions.

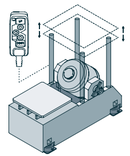
V11-101S/T	General Purpose/Piezoelectric Type
V11-102S	Ultra Light & High Frequency/Shared Type
V11-104/M	Light & High Frequency/Piezoelectric Type
V11-105S	Low Frequency/Shared Type
V11-107	General Environmental/Shared Type
V11-108S	Miniature & Low Frequency/Bending Type
V11-301	Miniature 3-Axis/Shared Type
V12-101S	ICP (Charge Amplifier built-in)



Insulation Adapter

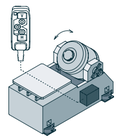
The Insulation Adapter is used for isolating electrical noises caused by external factors from the accelerometer.

WORK EFFICIENCY



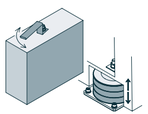
Vertical Table UP-DOWN Device

The Vertical Table UP-DOWN Device with 4 Cylinders makes handling of the Aux. Vertical Table relatively easy and safe upon a changeover of vibration directions (vertica ⇔ horizontal) with one-touch switch operation.



Vibration Generator Geared-motor Rotating Mechanism

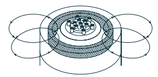
The Vibration Generator Geared-motor Rotating Mechanism makes a changeover of vibration directions (vertical ⇔ horizontal) relatively easy and safe with one-touch switch operation.



Pneumatic Isolator UP-DOWN Device

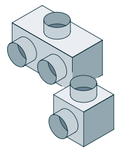
With the Pneumatic Isolators UP-DOWN Device, the balance of the Pneumatic Isolators can be easily adjusted with one-touch lever operation. Also for tests requiring large displacement, the air in the Pneumatic Isolators can be let out easily.

OTHERS



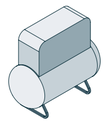
Degaussing Coil

The Degaussing Coil is employed when specimens are susceptible to magnetic fields to suppress the stray magnetic field.



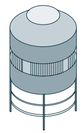
Duct Hose Relay Boxes

The Duct Hose Relay Box is used for connecting two or more Duct Hoses, especially for Vibration Generators installed in a pit, large Vibration Generators and Multi-axis Vibration Generators.



Air Compressor

Compressed Air is needed for axial support upon the specimen mounting. The Air Compressor is available upon request.



Patents No. 6736750
Obtained on 17th July, 2020

Cooling tower Clean Magnesium Packs (CCMP)

CCMP, featured by chemical-free, environmental-friendly, easy after-treatment and 1-year usable, can prevent the increase of chlorine and scale that leads to deterioration in Cooling Tower capabilities.

SHINKEN : Specialist in Vibration

Obtained a number of patents and certifications in Japan and overseas

Since its establishment in 1975 SHINKEN has been accumulating knowledge of and experience in 'Vibration' for nearly half a century with the world-first productization in 1977 of the Electro-dynamic Multi-axis Vibration Test System (patented in US, UK and Japan-already expired) and development of a variety of customized Vibration Test Systems (some patented) & Vibration-related Products by overcoming many tough difficulties.

Headquarters & Factory

There are some patents whose term has already expired.

Globally Recognized Technology

Overseas Installation Record reaching 600 Systems

Typified by Hydrostatic Bearing and Air Bearing Guide Systems as well as the accumulation of technology for nearly half a century, SHINKEN has been technically leading the vibration test system industry with an overseas installation record reaching 600 Systems.

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