

Shinken's New Technology for Electro-dynamic Vibration Generators (VGs)

With over 50 years having passed since the development of the first electro-dynamic vibration generator (ED VG), big progress has been made technically and price-wise in vibration controllers <analog sine control digital sine control digital random & shock control> and power amplifiers <vacuum tube analog transistor FET>.

To the contrary, only a few small changes for guiding the driving coils have been made in the VGs by the other ED VG's manufacturers with the mechanical structure unchanged for a long time, while **Shinken** has developed a lot of new ED VGs to meet a variety of customers' needs.

1. Multi-axial VGs 《Hydro-static Bearing employed》

The employment of **Shinken's** globally patented (4 patents in Japan, one each in USA & UK) hydro-static bearing for guiding the driving coils made multi-axis excitation possible and global installation records of Multi-axis Vibration Test Systems (VTSs) are reaching 200 sets with a rapid increase in the number of installations in the last few years. The Japanese Patent No.3152411 obtained in 2001 covers all the multi-axis excitation with the cross-coupling hydro-static bearing structure.

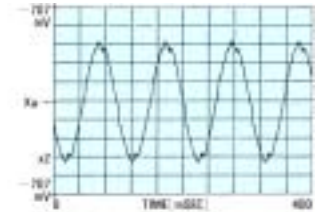
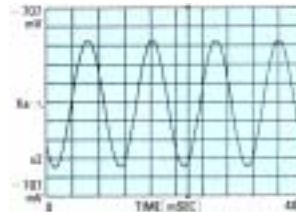
The hydro-static bearing has the following features despite higher price than the other guide methods:

- A Wide Frequency Range (from 0.1 ~ 2KHz)
- High Waveform Fidelity
- High Uniformity in Acceleration Mode on Tables
- High Eccentric Moment & Less Cross-talk

《In-company Comparison of ACC waveforms》

10Hz 9.8m/s²(1G)

10Hz 9.8m/s²(1G)

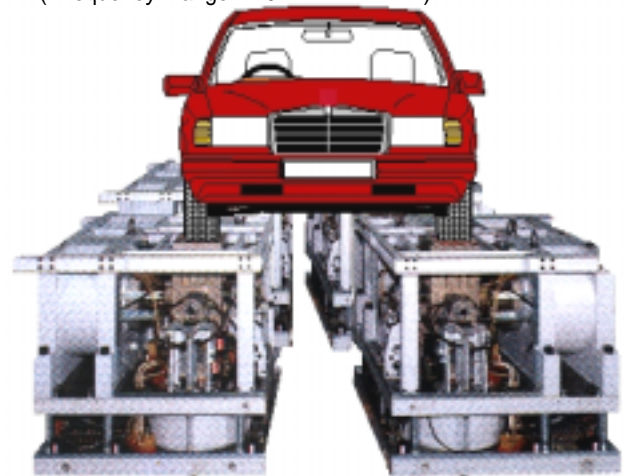


Hydro-static Bearing

Mechanical Bearing

《Main Usage of Multi-axis VTSs》

- 1) Automobile Road-surface Excitation Simulation
 - Ride-comfort, Car Body, Road-noise studies
 - (Frequency Range : 0.1Hz ~ 1 KHz)



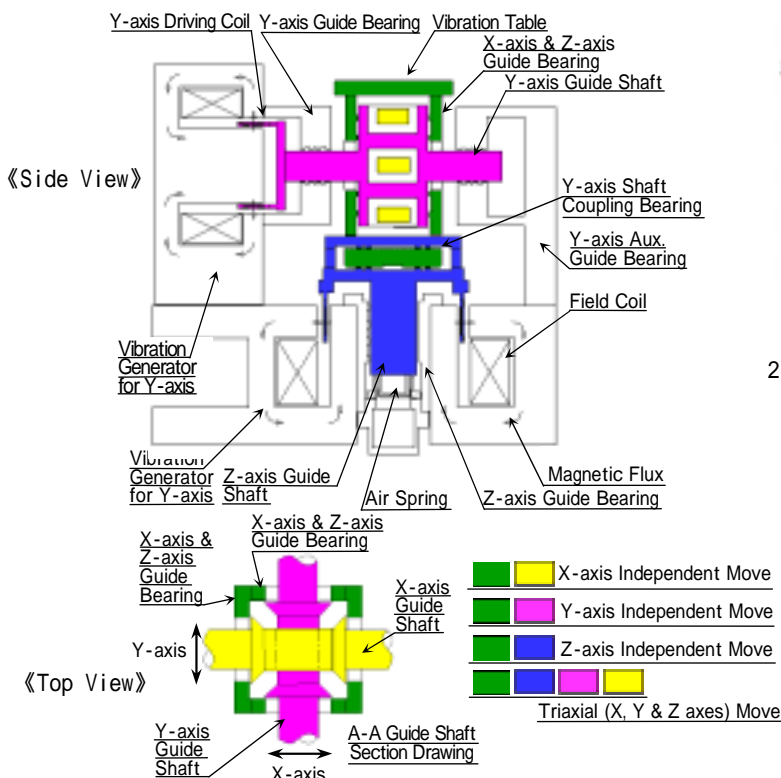
《4-wheels-3-axis Vibration Test System》

- 2) CD, MD & Car Navigator's Malfunction Simulation
 - 3-axis simultaneous simulation using waveforms obtained on test courses and real roads
 - Automated sound-skip sine test at each frequency



<Meeting about 90% real-world results>

《High Frequency 3-axis VG for Car Audio Device Tests》



Inner Structure of High Frequency & Acceleration 3-axis VG



<For Lab. & Office Use>
Size: W850 × D900 × H1220mm

《Compact 3-axis VG for Car Audio Device Tests》

- 3) Car Components & Parts Endurance Tests
 - Endurance simulation tests for Automotive Components & Parts
- 4) Transportation Simulation
 - With tailoring technique, PSD simulation tests during transportation
- 5) Seismic Simulation
 - Simulation of earthquakes with model structure and calibration of seismometers



Displacement
Horizontal: 400mmp-p
Vertical: 200mmp-p

《Low-frequency Large-stroke 3-axis VTS》

- 6) Standardized Tests for Electric devices & Components
 - Time-saving with automated 3-axis sequential tests
 - 3-axis simultaneous screening tests
 - More real-world environmental simulation tests



《2-axis VTS with Espec's Chamber》

2 . Newly-patented VGs 《Air Bearing 》



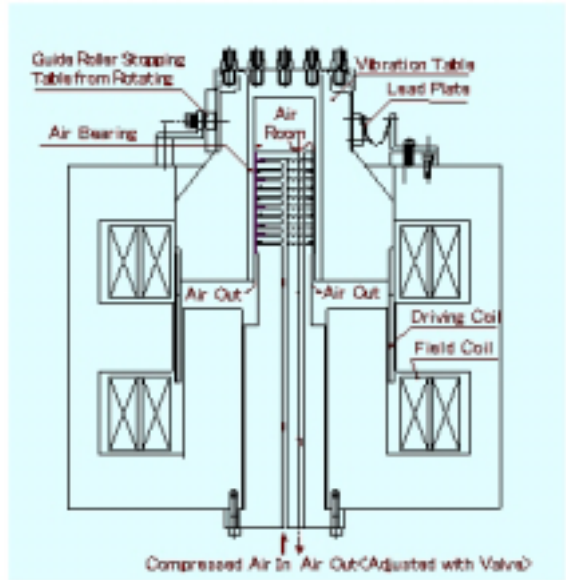
G-0N Series VG

Energy Saving,
Cleanness &
Maintenance Free
for 21st Century



G-5 Series
Shock-Vibration Generator

Up to 4900m/s²
<500G>
Long-stroke of
150mmp-p



Inner Structure of VG (Patent No.327204)

3 . Rotary (Twist) VGs

Table Moving Directions



Requirements for rotary (twist) VTSs have increased lately as mobile rotary devices such as CDs, MDs & HDs in note PCs are more popular than ever. To meet various requirements, **Shinken** can supply small to large rotary (twist) VTSs.



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