EMIC

VIBRATION TESTING SYSTEM

PRODUCT CATALOG

EMIC CORPORATION

Every item in the world experiences vibrations!

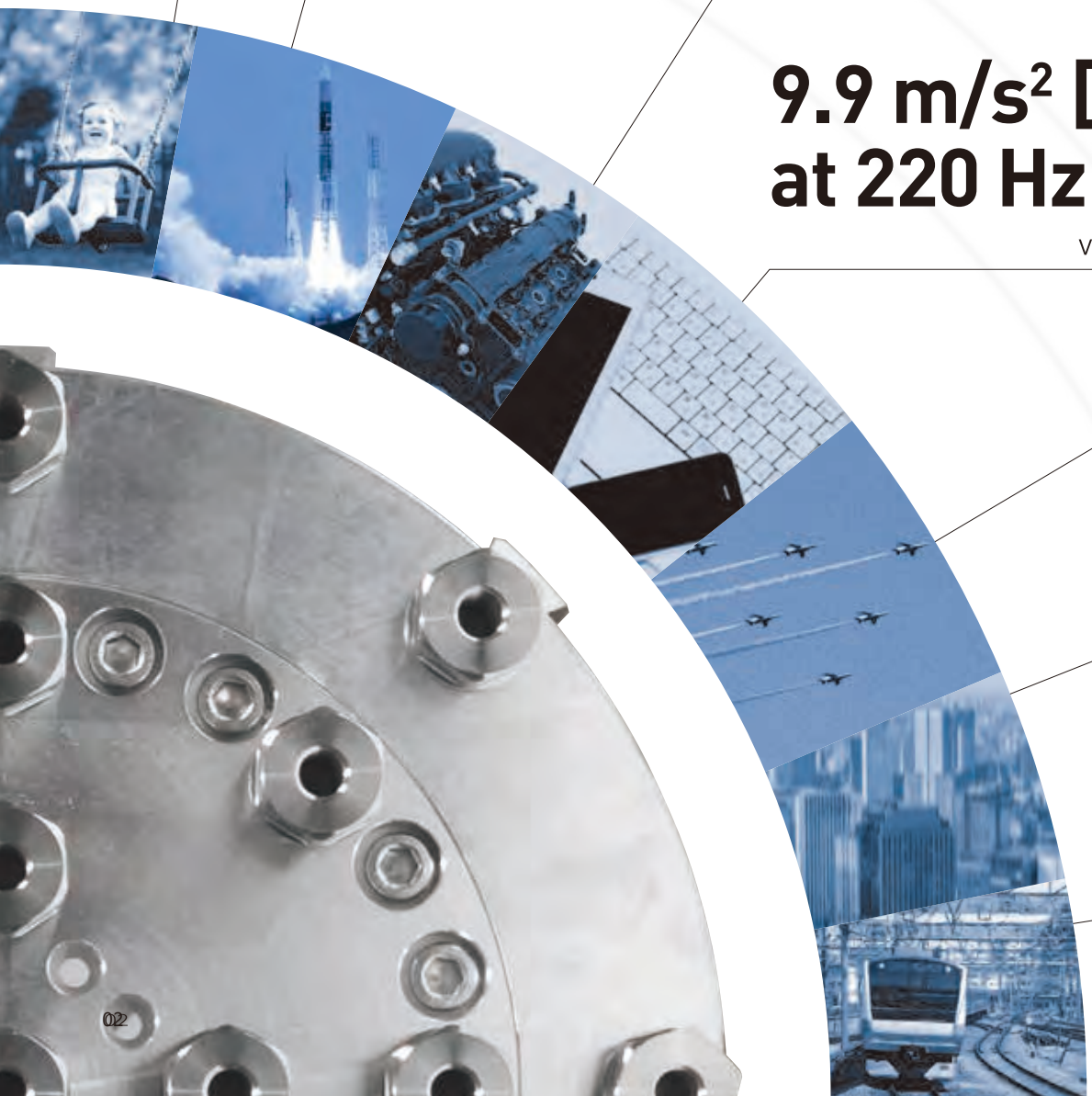
9.8 m/s² [1 G] at 2.8 Hz Swing in the park

70.7 m/s² [7.2 G] rms (137 dB) from 20 Hz to 8 kHz Launch of a rocket

100,197 m/s² [10,000 G] at 250 Hz Motion of F1 engine piston

9.9 m/s² [1.01G] at 220 Hz

Vibrations of cell-phone



Partner for Your Quality.

Technological advances bring about rapidfire succession in each field of industry, and produce many epoch-making products.

Furthermore, reliability and safety with "Excellent Durability" guaranteed are necessary for highly advanced products.

It is EMIC that provides testing systems and solution to offer various tests such as vibration, combined environmental, quality assurance, quality control, reliability, durability, etc.

We support each customer with the highest product and quality and, as a partner, will contribute to people, society and the future.

43.4 m/s² [4.43 G] rms from 5 Hz to 500 Hz

Fighter jets (Max. 9 G)

10.764 m/s² [1.09 G]from 2 Hz to 33 Hz

Equivalent to upper 6 seismic intensity

5.7 m/s² [0.58 G] rms from 2 Hz to 250 Hz

Vibrations in commuter express

*The vibration level mentioned above introduces the representative level and maximum, not for specifying a real vibration environment.

Vibration Testing Products Catalog

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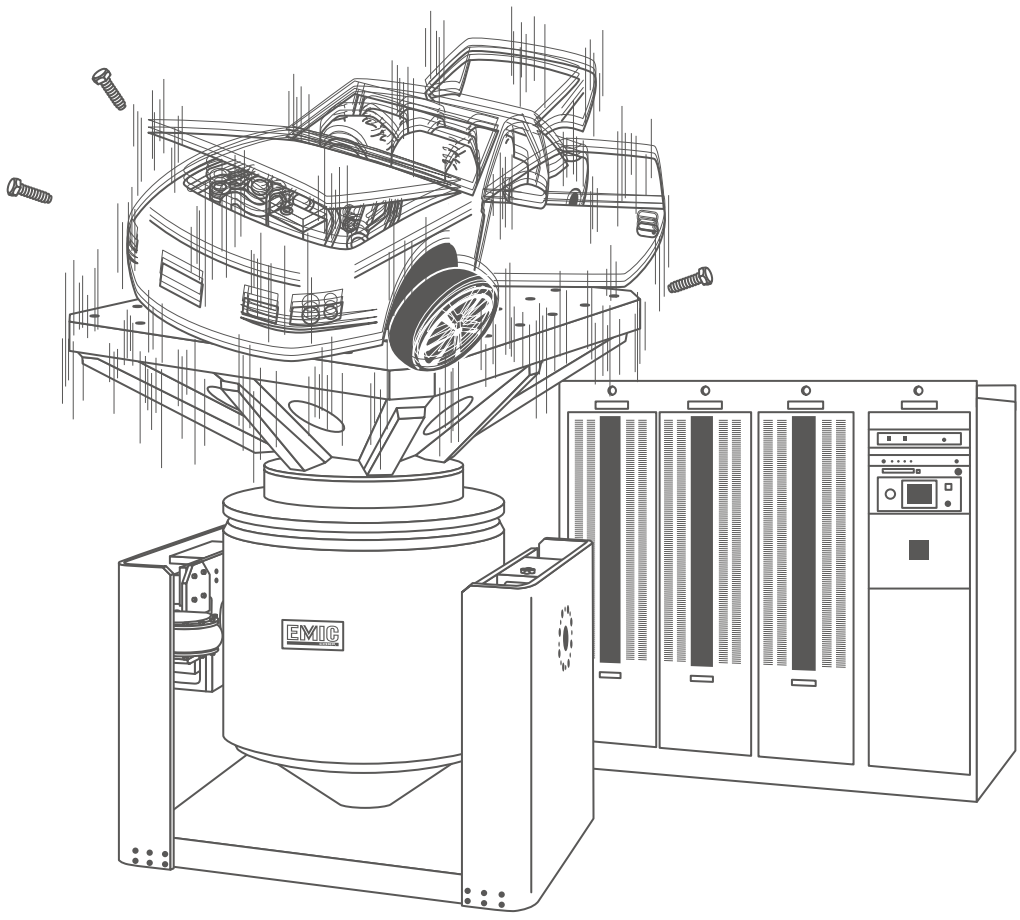
From a product that cannot be judged for reliability. To a product that cannot be broken due to reliability.

All industrial products shall be utilized safely and trouble free from the framework such as automobile, railroad, aerospace to an IT apparatus, and imminent household electrical appliance.
The product must endure against the temperature of scorching heat and arctic weather, humidity, severe vibration and shock.
EMIC's testing systems can evaluate the function, performance, reliability and quality of various industrial products. In addition, the testing equipment will provide safety and security.
Vibration test and combined environmental test are used for evaluating products at the designing and experimental stage of products.

How you look at an example of how a vibration test is performed.



Influence of stresses caused by vibration and shock environments:

- Cracks and damage due to fatigue
- Electrical and mechanical characteristic change
- Wear of contact parts
- Surface change due to abrasion
- Loosening of screws and bolts
- Corrosion acceleration
- Interference between components

The vibration testing system is used for applying vibration stresses to a testing object by creating a fore rating. As an artificial vibration source, it is suitable for precise and severe loading.

Configuration of Electrodynamic Vibration Testing System

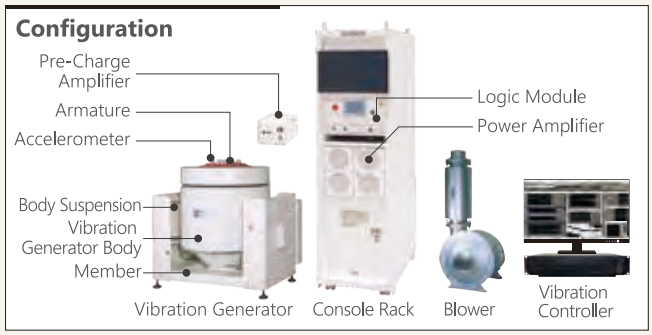
EMIC's vibration testing system can perform various vibration tests by forcefully exciting a test object with frequency and acceleration set arbitrarily.
The electrodynamic type uses electrical energy to create dynamic motion and the feature is that the waveform distortion is less and frequency higher compared with the servo-hydraulic and mechanical type.

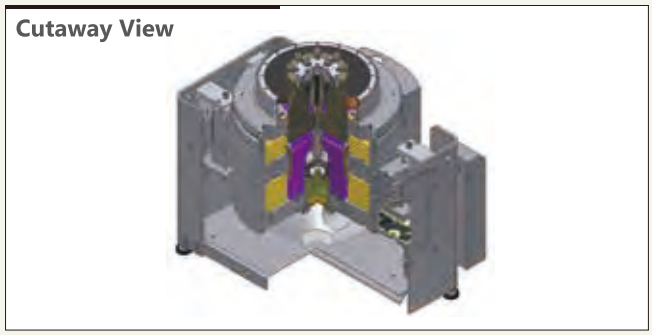
Names of Components:

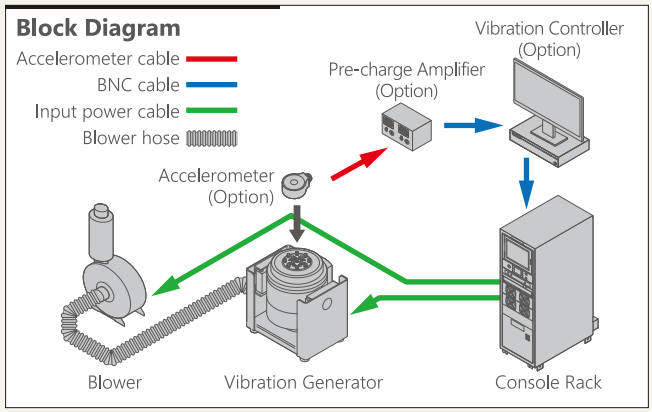
- **Vibration Generator**
  Generates vibrations for exciting a test object including a fixture which is attached to the top. The force is created with two kinds of coils, armature coils and field coil for magnet structure.
- **Power Amplifier**
  Provides AC power for armature coil.
- **Console Rack**
  Incorporates a power module, field power supply, vibration controller, operator panel and other (I/O).
- **Air Cooling Blower**
  Cools moving element (armature) and field coil of a vibration generator with forced air.
- **Accelerometer**
  Measures vibration acceleration.
- **Pre-charge Amplifier**
  Converts the charge output from an accelerometer into a voltage signal, and then amplifies it.
- **Vibration Controller**
  Controls the vibration on the vibration generator to match to the user defined frequency and amplitude specification.

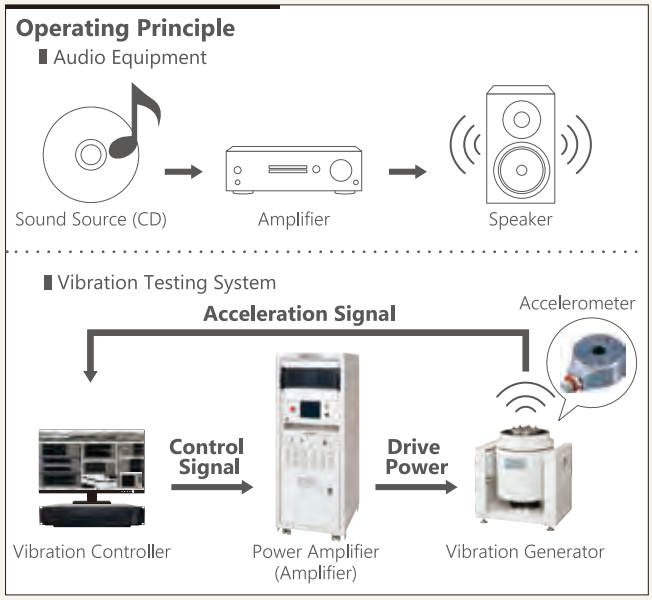
Operating Principle:

The vibration generator generates any desired vibration, but its operating principle is the same as audio equipment which plays music. The audio equipment amplifies the minute electrical signal of the sound source (CDs) with an amplifier and makes a sound with a dynamic loudspeaker with high power. In the same manner the electrodynamic vibration system also amplifies the minute electrical signal from the vibration controller with the power amplifier to generate the vibration with the vibration generator corresponding to the loudspeaker. However, one operating principle is different from the audio equipment because the vibration testing system controls the frequency and amplitude using the accelerometer and vibration controller.









Lineup

Uniaxial Vibration Testing System

Velocity, Displacement

FL Series
Large Displacement
→Page 14

FV Series
Ultra High Speed
→Page 15

FT Series
Transportation
→Page 16

FX Series
Standard
→Page 10

FC Series
Large Water-Cooled
→Page 18

F/FH Series
Standard/High Speed
→Page 13

FP Series
Ultra Energy-Saving
FP01 | FP02
FP10 | FP20
→Page 20

Compact Vibration Generator System
9514 Series
Permanent Magnet
→Page 40

Compact Vibration Generator System
510 Series
Permanent Magnet
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Rated Force

Triaxial Vibration Testing System

Velocity, Displacement

FB Series
Triaxial Electric Servo
→Page 29

FM Series
Triaxial Electrodynamic
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Frequency

Applications

	Electronic Parts Precision Equipment				Automotive Equipment					Railroad		Aerospace			Transport (Truck)		Building	
	Home electric appliance (Television monitor, Camera)	IT equipment (Notebook PC, Tablet)	Industrial electric apparatus (Large motor, Control unit, Industrial robot, Electricity meter, Solar panel)	Measuring instruments (Sensor, Accelerometer)	Power train (Engine, Motor, Catalyst, Exhaust system)	Large battery (Lithium ion battery, Inverter)	In-vehicle electric apparatus (ECU, Car navigation system, Light, Accessory for meter)	Body, Interior finishing (Seat, Interior)	Collision damping device (Airbag)	Rolling stock equipment (Train security, Inverter controller, Master controller, Brakes, Bogie)	Railroad facilities (Rail, Turnout, Signal)	Aircraft engine and airframe parts	Electronic device for aircraft (Radar)	Space apparatus (Rocket propulsion apparatus, Satellite)	Daily necessities (Drinking water, Pharmaceutical products, Food)	Delivery to home, baggage transportation (Cardboard packing materials, Transportation means)	Structure analysis (Building, Apartment, Bridge, Earthquake-related)	Damage evaluation (Concrete structure, Bridge)
FX Series →Page 10	◎	◎	○	◎	◎	○	◎	◎	○	△	△	◎	◎	◎	○	○	○	○
F/FH Series →Page 13	◎	◎		◎			◎								○	○		
FL Series →Page 14	○	○	◎	○	○	○	○	◎	○	◎	◎	△	△	△	◎	◎	○	○
FV Series →Page 15	△	△	○	△	◎	◎	○	○	◎	◎	◎	○	○	○	△	△	◎	◎
FT Series →Page 16															◎	◎	○	○
FC Series →Page 18					◎	◎	◎	◎		○	○	◎	◎	◎			△	△
FP Series →Page 20	◎	◎	◎				◎	◎							○	○		
VC Series General Purpose VIBRO CHAMBER® →Page 22	○	○		◎	◎	◎	◎	◎	△			◎	◎	◎	○			
FM Series →Page 28						○												
FB Series →Page 29						○		○							◎	◎	○	
FS Series →Page 44				◎					◎									

(Adaptation level: ◎-○-△)

Energy Saving Drive System

ECO Vibe advance

Green Energy Saving Vibe-system

The ECO Vibe advance minimizes the operation of the blower by measuring the temperature when cooling the heat generated by excitation current (DC magnetic field) or drive current with the blower. This results in improved energy efficiency and reduced noise compared to conventional products.
Methods that rely on linked current values, for example, are influenced by environmental temperature, the degree of equipment degradation, individual differences, and impedance frequency characteristics. As a result, the blower stops when cooling is unnecessary, leading to excessive and unnecessary cooling.
With the ECO Vibe advance, this excess power consumption and noise are suppressed.

The energy-saving system of ECO Vibe advance.

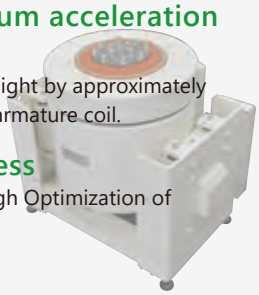
Key Features

Reduce power consumption by up to approximately 36%

Compared to conventional products, power consumption is reduced by up to approximately 36%.
*At 20% output of excitation force in normal mode.

Improvement of maximum acceleration performance

The reduction of the armature weight by approximately 10–15% and optimization of the armature coil.

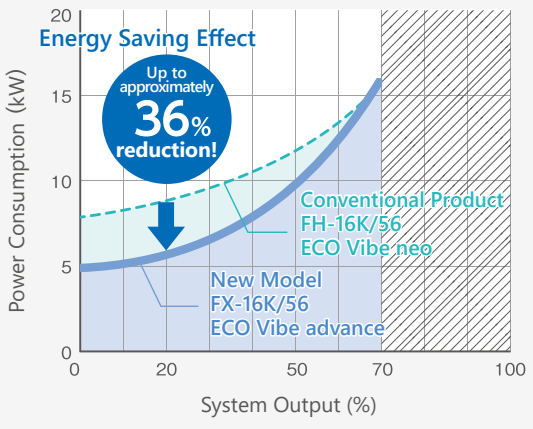


Improvement of quietness

Improvement of Quietness through Optimization of Cooling Blower Operation.

Comparison of Power Consumption Reduction Effects

(Normal Mode)



Energy saving effect of ECO Vibe advance

Reduction of Electric Charge :

Approximately **2,087,333** yen per year

(Assuming 25% device output, 70% annual operating time, and an electricity rate of 23 yen/kWh)

*The annual electricity cost (JPY) = Power consumption per hour (kWh) × Annual operating hours (h) × Energy rate set by Tokyo Electric Power Energy Partner Inc. (23 JPY/kWh).(As of May 2023)
*Comparison between our FH-35K/60 model (35,000N) without Eco Mode and the FX-35K/60 model (35,000N) with ECO Vibe advance in normal mode.

Reduction of CO_2 :

Approximately **41.5** tons per year

(Device output 25%, estimated annual operating time 70%)

*CO_2 emissions are calculated using the CO_2 emission factor of 0.457 kg-CO2/kWh from Tokyo Electric Power Energy Partner Co., Ltd.
(This follows the "Greenhouse Gas Emission Calculation, Reporting, and Disclosure System" based on the Global Warming Countermeasure Promotion Act and the emission factors published by the Ministry of the Environment and the Ministry of Economy, Trade and Industry on January 24, 2023.)

ECO Vibe advance compatible models (for new installation)

Series	Model	●Supported ×Non-supported
FX Series	FX-16K/56	Standard support
	FX-26K/60	Standard support
	FX-35K/60	Standard support
	FX-40K/60	Standard support
	FX-60K/60	Standard support
F/FH Series	F-3K/40	×
	F-6K/51	×
	FH-8K/51S	●
	FH-35K/60	●
FL Series	FL-16K/100	●
	FL-26K/100	●
	FL-35K/100	●
	FL-60K/100	●
	FL-100K/100	×
	FL-125K/100	×
FV Series	FV-15K/100	●
	FV-26K/100	●
	FV-35K/100	●
	FV-60K/100	●
	FV-100K/100	×
	FV-125K/100	×
FT Series	FT-02K/100	- (★1)
	FT-3K/40	×
	FT-8K/51	●
	FT-16K/80	●
	FT-26K/80	●
	FT-35K/80	●
	FT-60K/80	●

Series	Model	●Supported ×Non-supported
FC Series	FC-060K/60	×
	FC-080K/60	×
	FC-100K/60	×
	FC-125K/60	×
	FC-200K/60	×
FP Series	FP-01K/30	- (★1)
	FP-02K/30A	- (★1)
	FP-10K/51	- (★1)
	FP-10K/76	- (★1)
	FP-20K/51	- (★1)
FM Series	FM-20K/60-3D-040	●
	FM-30K/60-3D-040	●
	FM-40K/60-3D-050	●
	FM-60K/60-3D-050	●
FB Series	FB-10K/50-3D-100	×
	FB-20K/50-3D-120	×
	FB-30K/50-3D-150	×
	FB-60K/50-3D-150	×
FS Series	FS-1022B/05-A69/03-E271	×
	FS-2045B/15-A68/06-E271	×
	FS-3085B/12H-A68/12-E271	×
	FS-3093B/29H-A68/18-E271	×

*The FX series is equipped with ECO Vibe advance on all models.
*There are models of older vibration test devices not listed above that can also be equipped with an energy-saving drive system. Please contact us for more details.
(★1) This product does not include an excitation coil or excitation power supply (permanent magnet type), and is energy-efficient even in models that do not support ECO Vibe advance.

New FX Series

Electronic Parts Precision Equipment | Automotive Equipment | Railroad | Aerospace | Transport (Truck) | Building

ECO Vibe advance
Green Energy Saving Vibe-system

*The vibration controller is mounted in the console rack. (Optional)

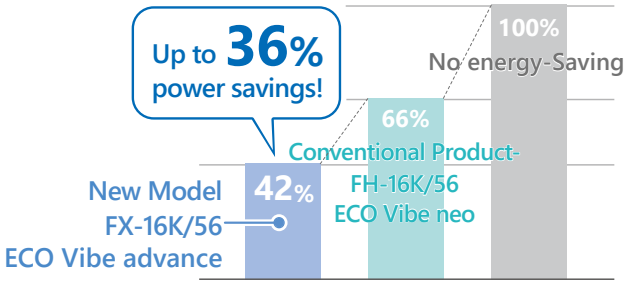
- Equipped with the advanced energy-saving drive system "ECO Vibe advance."
- Significantly reduces power consumption compared to conventional products.
- Enhanced durability due to the new feeder and newly designed rubber cover.
- Improved quietness through the optimization of the air-cooled blower operation.

The FX series is an environmentally friendly vibration testing device with excellent energy-saving performance. Featuring the advanced "ECO Vibe advance" drive system, it reduces power consumption significantly compared to the previous model, ECO Vibe neo. It also lowers both power consumption and noise by controlling the blower speed based on internal temperature, improving energy efficiency and quietness.

Environmentally friendly vibration test equipment

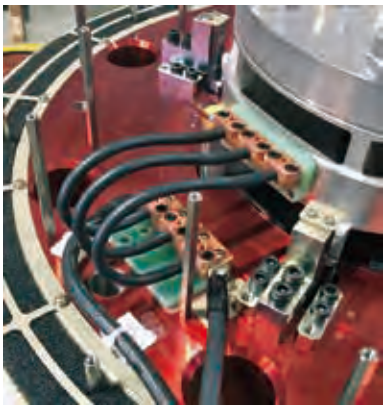
- Equipped with the advanced energy-saving drive system "ECO Vibe advance"
- Reduces power consumption by up to approximately 36% compared to conventional products

■ Comparison of Energy-Saving Effects: ECO Vibe neo vs. ECO Vibe advance



Improvement of durability

- The new feeder supplying power to the armature coil is break-resistant.
- The linear guides used in the armature support mechanism have improved durability.
- The newly designed rubber cover excels in durability and heat resistance.

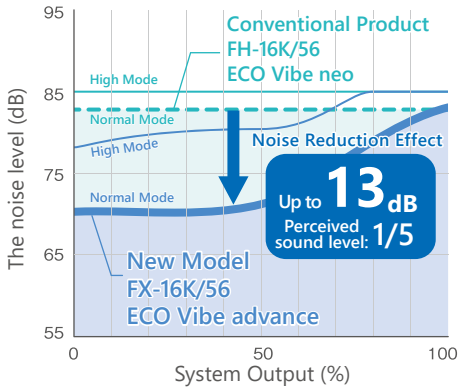


New model electrical wire feeder

Noise reduction improvement

- Monitor the temperature inside the equipment and control the blower speed to suppress it.
- Significantly reduce the blower's power consumption and noise.
- Reduce noise by up to approximately 13dB compared to conventional products.
- Reduce the perceived noise volume by about 1/5.

■ Comparison of Noise Reduction Effects of Air-Cooled Blowers



FX Series Specifications

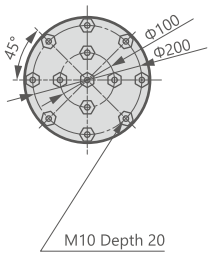
	Model		FX-16K/56	FX-26K/60	FX-35K/60	FX-40K/60	FX-60K/60
Rated Force	Sine	$kN_{0\text{-}p}$	16.0	26.0	35.0	40.0	60.0
	Random	kN_{rms}	16.0	26.0	35.0	40.0	60.0
	Shock(6ms)	$kN_{0\text{-}p}$	35.2	57.2	77.0	100	150
Frequency range		Hz	to 3000	to 2400	to 2200	to 2200	to 2500
Max. acceleration		m/s^2	1000(★1)	1000(★1)	1000(★1)	1000(★1)	870
Max. velocity		m/s	2.3	2.3	2.0	2.0	1.78
Max. displacement		$mm_{p\text{-}p}$	56	60	60	60	60
Max. payload		kg	200	400	400	400(500)(★2)	500
Input power		kVA	27.9	35.3	53.3	64.6	82.6
Circuit breaker rating(200V/400V)		A	100/60	125/75	200/100	250/125	300/175
Power supply voltage		V	200 or 400	200 or 400	200 or 400	200 or 400	200 or 400
Power supply frequency		Hz	50 or 60	50 or 60	50 or 60	50 or 60	50 or 60
Number of Phases		Φ	3	3	3	3	3
Armature Mass		kg	12.8	23.0	28.0	36.0	69.0
Allowable offset load		N·m	500	700	900	900	1200
Cooling method			Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
Model	Vibration Generator		916-X	926-X	936-X	936-AW/LA	960-AW/LA
	Power Amplifier		369A-0403A-16X	369A-0605A-26X	369A-0606A-36X	368A-0606B-36AW	368A-1007B-60AW
	Console Rack		CRD-1700-16X	CRD-2000-26X	CRD-2000-36X	CRD-2000-36	CRD-2000W-60
Size	Table Pattern		PCD-200	PCD-200	PCD-300	PCD-300	PCD-400
	Vib. Generator	mm	1005W×866H×701D	1232W×1034H×865D	1336W×1152H×971D	1125W×1200H×965D	1452W×1297H×1231D
	Power Amplifier/Console Rack	mm	554W×1776H×1010D	554W×1900H×1010D	554W×1900H×1010D	554W×2000H×1010D	1108W×2009H×1010D
	Blower	mm	707W×1681H×908D	707W×1681H×908D	869W×1856H×1094D	1094W×1856H×869D	1147W×2016H×869D
Mass approx.	Vib. Generator	kg	1200	2100	3500	3900	5000
	Power Amplifier/Console Rack	kg	440	550	600	600	800
	Blower	kg	220	220	325	325	450

*Lower limit frequency should be determined by a performance of an available vibration control system.
*When exporting Vibration Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as rated force. Please contact us for details.
(★1) Not a theoretical value, for limiting the maximum acceleration. (★2) We will customize per your instructions.

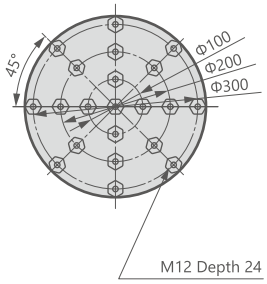
FX Series

Table Pattern

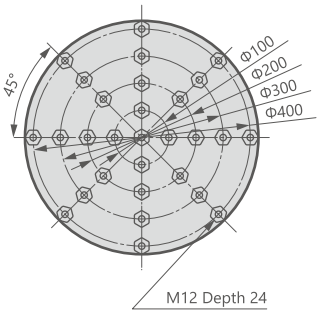
PCD-200



PCD-300

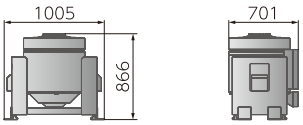


PCD-400

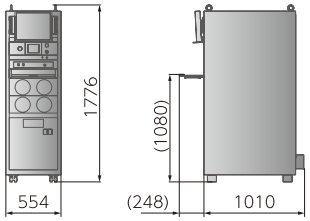


Outline Drawing

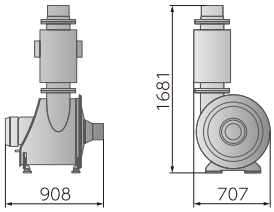
- FX-16K/56
  Vibration Generator



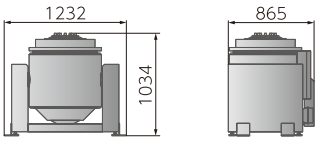
Console Rack



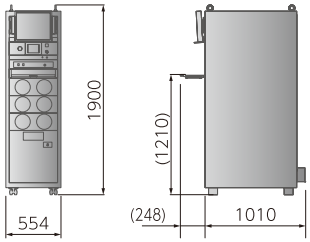
Blower



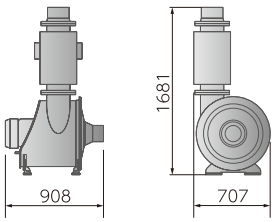
- FX-26K/60
  Vibration Generator



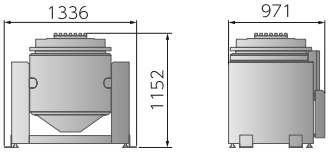
Console Rack



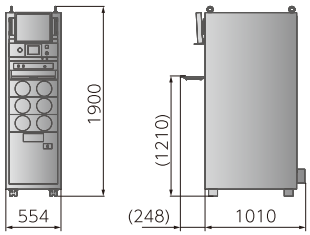
Blower



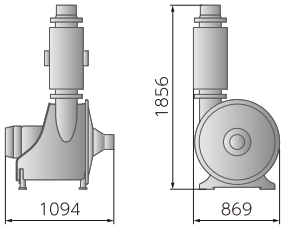
- FX-35K/60
  Vibration Generator



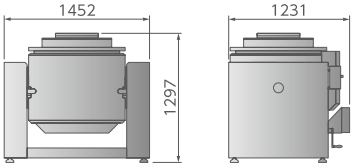
Console Rack



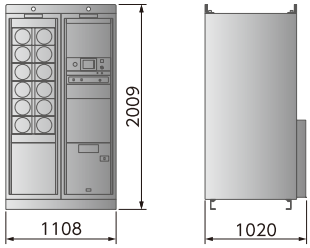
Blower



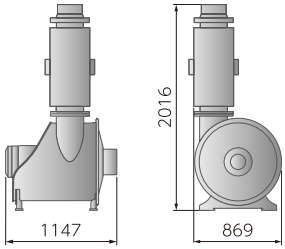
- FX-60K/60
  Vibration Generator



Console Rack



Blower



F/FH Series

Standard

Optional

Electronic Parts Precision Equipment

Automotive Equipment

Railroad

The F series, the standard for vibration test equipment, covers a wide range of vibration frequencies with excitation forces from 3.0 kN to 35.0 kN and is highly durable, ensuring reliable execution of various vibration tests. On the other hand, the FH series is designed to accommodate vibration tests that require higher accelerations, particularly in the frequency range of 20 to 80 Hz.

*The vibration controller is mounted in the console rack. (Optional)

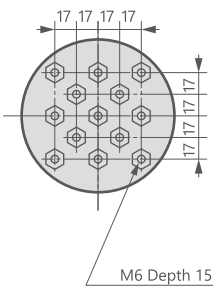
F/FH Series Specifications

Model			F-3K/40A	F-6K/51	FH-8K/51S	FH-35K/60
Rated Force	Sine	$kN_{0\text{-}p}$	3.0	6.0	8.5	35.0
	Random	kN_{rms}	3.0	6.0	8.5	35.0
	Shock(6ms)	$kN_{0\text{-}p}$	6.0	13.2(★2)	17.0	87.5
Frequency Range		Hz	to 2500	to 2000	to 3000	to 2200
Max. Acceleration		m/s^2	667	600	850	1000(★1)
Max. Velocity		m/s	1.6	1.8	2.0	2.0
Max. Displacement		$mm_{p\text{-}p}$	40	51	51	60
Max. Payload		kg	200	200	350	400(500)(★3)
Input Power		kVA	7.3	9.8	19.5	55.9
Circuit Breaker Rating(200v/400v)		A	30/20	40/30	75/40	200/100
Power Supply Voltage		V	200 or 400	200 or 400	200 or 400	200 or 400
Power Supply Frequency		Hz	50 or 60	50 or 60	50 or 60	50 or 60
Number Of Phases		Φ	3	3	3	3
Armature Mass		kg	4.5	10.0	10.0	33.0
Allowable Offset Load		N·m	60	120	500	900
Cooling Method			Air-cooled	Air-cooled	Air-cooled	Air-cooled
Model	Vibration Generator		903-FN/FA/Z05	906-FN/FA/Z14	S085-AW/LA	936-AW/LA
	Power Amplifier		369A-0101A-03	369A-0101A-06	369A-0202A-085SF	368A-0505B-36AW
	Console Rack		CRD-1500-03	CRD-2000-06	CRD-1500-085	CRD-2000-36
Size	Table Pattern		PS-068	PS-140	PCD-200	PCD-300
	Vib. Generator	mm	630W×602H×528D	720W×675H×628D	797W×775H×635D	1125W×1200H×965D
	Console Rack	mm	554W×1462H×1010D	554W×2000H×1010D	554W×1462H×1010D	554W×2025H×1010D
	Blower	mm	474.5W×1040H×753D	474.5W×1040H×674D	411W×810H×525D	869W×1856H×1094D
Mass approx.	Vib. Generator	kg	350	500	640	3500
	Console Rack	kg	290	420	300	630
	Blower	kg	39	55	60	325

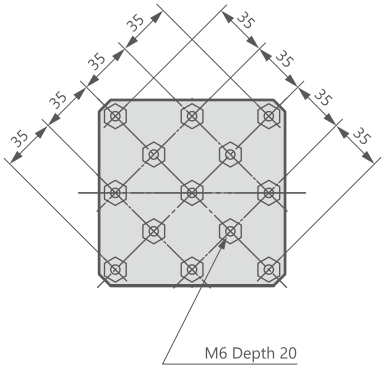
*Lower limit frequency should be determined by a performance of an available vibration control system.
*When exporting Vibration Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as rated force. Please contact us for details.
(★1) Not a theoretical value, for limiting the maximum acceleration. (★2) Shock rated force can be increased by adding power modules.
(★3) We will customize per your instructions.

Table Pattern

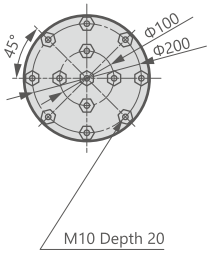
PS-068



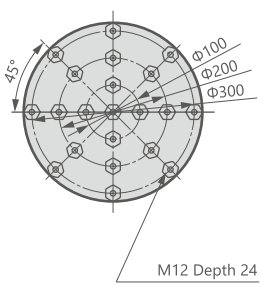
PS-140



PCD-200



PCD-300



FL Series

Standard Optional

Electronic Parts Precision Equipment | Automotive Equipment | Railroad | Aerospace | Transport (Truck) | Building

The FL series system expands the maximum displacement to 100 mm_{p-p}. In particular, it responds to the test condition of large displacement of less than 10 Hz.

*The vibration controller is mounted in the console rack. (Optional)

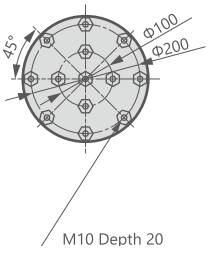
FL Series Specifications

Model			FL-16K/100	FL-26K/100	FL-35K/100	FL-60K/100	FL-100K/100	FL-125K/100
Rated Force	Sine	kN_{o-p}	16.0	26.0	35.0	60.0	100	125.0(★4)
	Random	kN_{rms}	16.0	26.0	35.0	60.0	100	100.0
	Shock(6ms)	kN_{o-p}	35.2(★2)	65.0	87.5	150	250	312.5(★4)
Frequency Range		Hz	to 2000	to 2000	to 2000	to 2000	to 2000	to 2000
Max. Acceleration		m/s^2	640	765	833	750	714	892(★4)
Max. Velocity		m/s	2.0	2.0	2.0	1.78	1.8	1.8
Max. Displacement		mm_{p-p}	100	100	100	100	100	100
Max. Payload		kg	200(300)(★1)	200(300)(★1)	200(300)(★1)	300	1000	1000
Input Power		kVA	31.8	39.0	55.9	82.6	154.0	187.5
Circuit Breaker Rating(200v/400v)		A	125/60	150/75	200/100	300/175	500/300	630/350
Power Supply Voltage		V	200 or 400	200 or 400	200 or 400	200 or 400	200 or 400	200 or 400
Power Supply Frequency		Hz	50 or 60	50 or 60	50 or 60	50 or 60	50 or 60	50 or 60
Number Of Phases		Φ	3	3	3	3	3	3
Armature Mass		kg	25.0	34.0	42.0	80.0	140	140
Allowable Offset Load		N·m	350	500	700	1000	1500	1500
Cooling Method			Air-cooled	Air-cooled	Air-cooled	Air-cooled	Water-cooled	Water-cooled
Cooling Water Flow		L/min	-	-	-	-	305(★3)	400(★3)
Model	Vibration Generator		916-AW/SLS	926-AW/SLS	936-AW/SLS	960-AW/SLS	9100-AWW/SLS	9100-AWW/SLS
	Power Amplifier		369A-0504A-16SLS	368A-0504B-26SLS	368A-0505B-36SLS	368A-1007B-60SLS	368A-1614B-3BAY100KSLS	368A-2421B-4BAY125KSLS
	Console Rack		CRD-2000-16	CRD-2000-26	CRD-2000-36	CRD-2000W-60	CRD-2000T-100KSLS	CRD-2000F-125KSLS
Size	Table Pattern		PCD-200	PCD-240	PCD-300	PCD-400	PCD-400	PCD-400
	Vib. Generator	mm	974W×1035H×700D	1082W×1163H×866D	1125W×1200H×965D	1452W×1297H×1231D	1489W×1455H×1149D	1489W×1455H×1149D
	Console Rack	mm	554W×2000H×1010D	554W×2025H×1010D	554W×2025H×1010D	1108W×2009H×1010D	1662W×2059H×1030D	2216W×2059H×1010D
	Blower(Air-Cooled)	mm	707W×1681H×908D	707W×1681H×908D	869W×1856H×1094D	869W×2016H×1147D	–	–
Mass Approx.	Vib. Generator	kg	1300	2500	3400	5000	5250	5250
	Console Rack	kg	450	600	630	800	1800	2550
	Blower(Air-Cooled)	kg	220	220	325	400	-	-
	Cooling Unit(Water-Cooled)	kg	-	-	-	-	700	700
	Chiller Unit(Water-Cooled)	kg	-	-	-	-	200	200

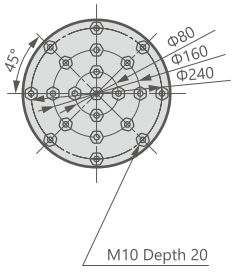
*Lower limit frequency should be determined by a performance of an available vibration control system.
*When exporting Vibration Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as rated force. Please contact us for details.
(★1)We will customize per your instructions. (★2)Shock rated force can be increased by adding power modules. (★3)The water temperature is 32°C.
(★4)Instantaneous maximum ratings

Table Pattern

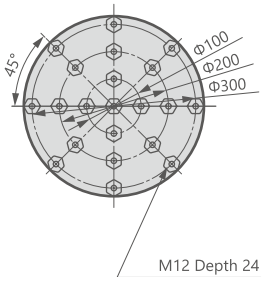
PCD-200



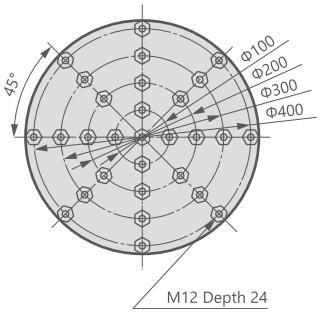
PCD-240



PCD-300



PCD-400



Outline Drawing

- Cooling Unit
- Chiller unit

➡ Page No. 19

FV Series

Standard

Optional

Electronic Parts Precision Equipment | Automotive Equipment | Railroad | Aerospace | Transport (Truck) | Building

The FV series system responds to shock test conditions; Shock Pulse Duration 11 ms & Level 980 m/s² (100 G)

*The vibration controller is mounted in the console rack. (Optional)

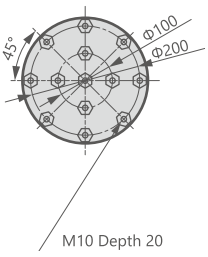
FV Series Specifications

Model			FV-15K/100	FV-26K/100	FV-35K/100	FV-60K/100	FV-100K/100	FV-125K/100
Rated Force	Sine	kN_{0-p}	15.6	26.0	35.0	60.0	100	125.0(★4)
	Random	kN_{rms}	15.6	26.0	35.0	60.0	100	100.0
	Shock (6ms)	kN_{0-p}	46.0	68.0	90.0	150	250	312.5(★4)
	Shock (11ms)	kN_{0-p}	46.0	68.0	90.0	150	250	312.5(★4)
Frequency Range		Hz	to 2000	to 2000	to 2000	to 2000	to 2000	to 2000
Max. Accel. (Sine)		m/s^2	636	765	833	750	714	892(★4)
Max. Accel. (Shock)		m/s^2	1470(★2)	1470(★2)	1470(★2)	1470(★2)	1470(★2)	1470(★2)
Max. Velocity. (Sine)		m/s	2.0	2.0	2.0	1.8	1.8	1.8
Max. Velocity. (Shock)		m/s	3.5	3.5	3.5	3.5	3.5	3.5
Max. Displacement		mm_{p-p}	100	100	100	100	100	100
Max. Payload		kg	200(300)(★1)	200(300)(★1)	200(300)(★1)	200	1000	1000
Input Power		kVA	31.6	43.6	68.1	148.7	159.3	192.8
Circuit Breaker Rating(200v/400v)		A	125/60	150/100	250/125	500/250	600/300	630/350
Power Supply Voltage		V	200 or 400	200 or 400	200 or 400	200 or 400	200 or 400	200 or 400
Power Supply Frequency		Hz	50 or 60	50 or 60	50 or 60	50 or 60	50 or 60	50 or 60
Number Of Phases		Φ	3	3	3	3	3	3
Armature Mass		kg	24.5	34.0	42.0	80.0	140	140
Allowable Offset Load		N·m	350	500	700	1000	1500	1500
Cooling Method			Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
Cooling Water Flow		L/min	-	-	-	-	305(★3)	400(★3)
Model	Vibration Generator		916-AW/SLS	926-AW/SLS	936-AW/SLS	960-AW/SLS	9100-AWW/SLS	9100-AWW/SLS
	Power Amplifier		369A-1212B-16SLS	368A-1212B-26SLS	368A-2016B-36SLS	369A-4040B-60SLS	3625A-1614B-3BAY100KSLS	3625A-2421B-4BAY125KSLS
	Console Rack		CRD-2000W-16SLS	CRD-2000T-26SLS	CRD-2000T-36SLS	CRD-2000Q-60SLS	CRD-2000T-100KSLS	CRD-2000F-125KSLS
Size	Table Pattern		PCD-200	PCD-240	PCD-300	PCD-400	PCD-400	PCD-400
	Vib. Generator	mm	974W×1035H×700D	1106W×1135H×880D	1225W×1200H×965D	1452W×1297H×1231D	1489W×1455H×1149D	1489W×1455H×1149D
	Console Rack	mm	1108W×2009H×1010D	1662W×2059H×1010D	1662W×2059H×1010D	2770W×2059H×1010D	1662W×2059H×1030D	2216W×2059H×1010D
	Blower(Air-Cooled)	mm	707W×1681H×908D	707W×1681H×908D	869W×1856H×1094D	869W×2016H×1147D	-	-
Approx. Mass	Vib. Generator	kg	1300	2500	3400	5000	5250	5250
	Console Rack	kg	800	1150	1300	2000	2200	2950
	Blower(Air-Cooled)	kg	220	220	325	400	-	-
	Cooling Unit(Water-Cooled)	kg	-	-	-	-	700	700
	Chiller Unit(Water-Cooled)	kg	-	-	-	-	200	200

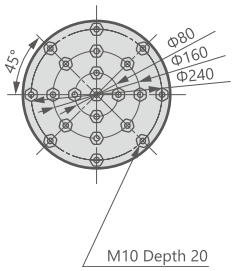
*Lower limit frequency should be determined by a performance of an available vibration control system.
*When exporting Vibration Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as rated force. Please contact us for details.
(★1)We will customize per your instructions. (★2) Not a theoretical value, for limiting the maximum acceleration. (★3)The water temperature is 32°C.
(★4)Instantaneous maximum ratings

Table Pattern

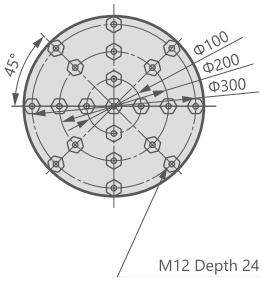
PCD-200



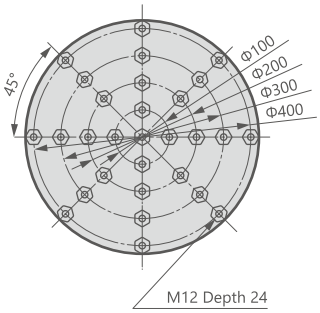
PCD-240



PCD-300



PCD-400



Outline Drawing

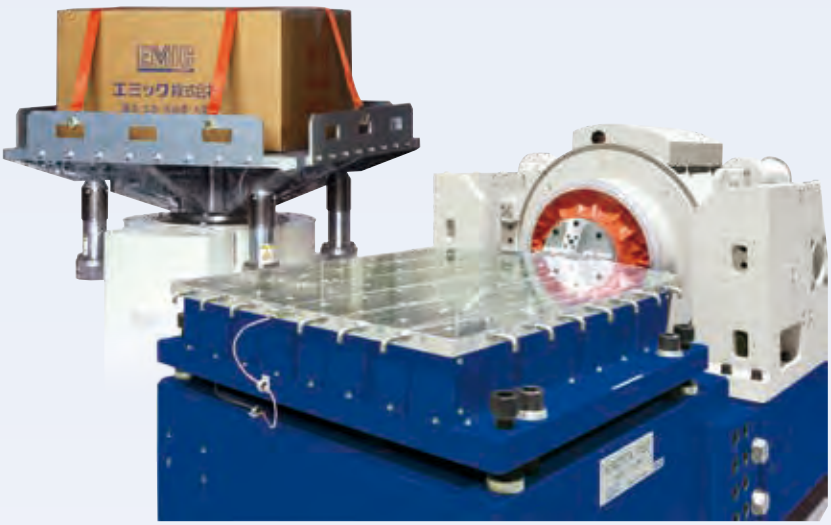
- Cooling Unit
- Chiller unit

➡ Page No. 19

FT Series

Standard → Optional

Transport (Truck) Building



The FT series vibration testing system is specialized for"Safe Transportation of Packaged Products". It can be equipped with a reinforcement mechanism against the offset or heavy load so that a stacked or large product may be mounted. In order to easily attach the packaged products with fixing bands, the fixture of honeycomb structure or slip table with hooks are available. Moreover, the oilless slip table reduces the burden of maintenance.

New

Transport Packaging Vibration Testing Equipment

FT-02K/100

It covers a wide frequency range from 1 Hz to 300 Hz and can conduct vibration tests from 1 to 3 Hz, meeting standards like "ASTM D4169-22" that include low frequencies.

- Supports low-frequency random transportation tests starting from 1Hz
- Reduces installation costs compared to larger systems
- Energy-efficient with permanent magnets
- Compact design for flexible installation

■ Correspondence table for each transport packaging test standard

Standard Number	Specification Name	Mechanical Max Displacement: $10mm_{p-p}$	Conventional Equipment Max Displacement: $30mm_{p-p}$	New product FT-02K/100 Max Displacement: $100mm_{p-p}$
ISO 13355:2016	Packaging-Complete, filled transport packages and unit loads-Vertical random vibration test	×	△	○
ISO 4180:2019	Packaging-Complete, filled transport packages-General rules for the compilation of performance test schedules	×	×	○
JIS Z 0200:2023	Packaging-Complete, filled transport packages-General rules for the compilation of performance test schedules (excluding certain parts)	×	×	○
JIS Z 0232:2020	Packaging-Complete, filled transport packages and unit loads-Method of vibration test	×	△	○
JIS C 60068-2-64	Environmental testing-Part 2-64: Tests-Test Fh: Vibration, broadband random and guidance	×	×	○
ASTM D4169-22	Standard Practice for Performance Testing of Shipping Containers and Systems	×	×	○
ISTA 3A	Packaged-Products for Parcel Delivery System Shipment 70 kg (150 lb) or Less	×	×	○
ISTA 6 Amazon.com-S.I.O.C	Ships in Own Container for Amazon.com Distribution System Shipment	×	×	○

FT Series Specifications

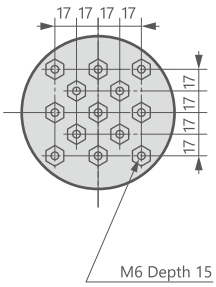
Model			FT-02K/100	FT-3K/40A	FT-8K/51	FT-16K/80	FT-26K/80
Rated Force	Sine	$kN_{0\text{-}p}$	2.0	3.0	8.5	16.0	26.0
	Random	kN_{rms}	1.0	3.0	8.5	16.0	26.0
	Shock(6ms)	$kN_{0\text{-}p}$	3.0	6.0	17	32.0	57.2(★3)
Frequency Range(★1)		Hz	to 300	to 2500	to 3000	to 2000	to 2000
Max. Acceleration		m/s^2	250	667	850	640	764
Max. Velocity		m/s	1.0	1.6	2.0	1.0	1.0
Max. Displacement		$mm_{p\text{-}p}$	25(100$mm_{p\text{-}p}$ for random)	40	51	80	80
Max. Payload(★2)		kg	60	200+	350+	200+	200+
Input Power		kVA	7.0	7.3	19.5	27.8	32.0
Circuit Breaker Rating(200v/400v)		A	20/-	30/20	75/40	100/60	125/60
Power Supply Voltage		V	200	200 or 400	200 or 400	200 or 400	200 or 400
Power Supply Frequency		Hz	50 or 60	50 or 60	50 or 60	50 or 60	50 or 60
Number Of Phases		Φ	3	3	3	3	3
Armature Mass		kg	8	4.5	10	25	34
Allowable Offset Load		N·m	70	60	500	350	500
Cooling Method			Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
Model	Vibration Generator		Σ9515-AB/LAS	903-FN/FA/Z05	S085-AW/LA	916-AP/SLA	926-AP/SLA
	Power Amplifier		369A-0101A-15LAS	369A-0101A-03	369A-0202A-085SF	369A-0503A	369A-0504A
	Console Rack		CRD-1000-15LAS	CRD-1500-03	CRD-1500-085	CRD-2000-16	CRD-2000-26
Size	Table Pattern		PCD-100-03	PS-068	PCD-200	PCD-200	PCD-240
	Vib. Generator	mm	540W×822.5H×1308D	630W×693H×588D	797W×775H×625D	950W×1029H×665D	1082W×1163H×866D
	Console Rack	mm	554W×1000H×1010D	554W×1462H×1010D	554W×1462H×1010D	554W×2000H×1010D	554W×2000H×1010D
	Blower	mm	474.5W×1040H×495D	474.5W×1040H×753D	411W×810H×525D	707W×1681H×850D	707W×1681H×850D
Mass Approx.	Vib. Generator	kg	700	350	640	1300	2500
	Console Rack	kg	160	290	300	440	530
	Blower	kg	32	39	60	220	220
Compatible Size	VHT-060		●	●	●	●	●
	VHT-080		-	●	●	●	●
	VHT-100		-	-	●	●	●
	VHT-120		-	-	-	●	●

Model			FT-35K/80	FT-60K/80
Rated Force	Sine	$kN_{0\text{-}p}$	35.0	60.0
	Random	kN_{rms}	35.0	60.0
	Shock(6ms)	$kN_{0\text{-}p}$	77.0(★3)	132(★3)
Frequency Range(★1)		Hz	to 2000	to 2500
Max. Acceleration		m/s^2	833	750
Max. Velocity		m/s	1.0	1.0
Max. Displacement		$mm_{p\text{-}p}$	80	80
Max. Payload(★2)		kg	200+	200+
Input Power		kVA	47.8	68.3
Breaker Capacity(200v/400v)		A	175/100	250/125
Supply Voltage		V	200 or 400	200 or 400
Supply Frequency		Hz	50 or 60	50 or 60
Power Phases		Φ	3	3
Armature Mass		kg	42	80
Allowable Offset Load		N·m	700	1000
Cooling Method			Air-cooled	Air-cooled
Model	Vibration Generator		936-AP/SLA	960-AP/SLA
	Power Amplifier		369A-0505A	369A-1007A
	Console Rack		CRD-2000-36	CRD-2000W-60
Size	Table Pattern		PCD-300	PCD-400
	Vib. Generator	mm	1186W×1255H×971D	1461W×1375H×1115D
	Console Rack	mm	554W×2000H×1010D	1108W×2009H×1010D
	Blower	mm	869W×1856H×1094D	1461W×1375H×1115D
Mass Approx.	Vib. Generator	kg	3400	5000
	Console Rack	kg	580	800
	Blower	kg	325	450
Compatible Size	VHT-060		●	●
	VHT-080		●	●
	VHT-100		●	●
	VHT-120		●	●

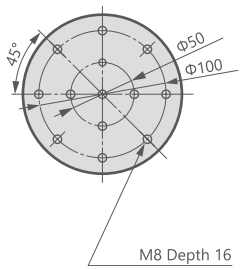
*Lower limit frequency should be determined by a performance of an available vibration control system.
*When exporting Vibration Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as rated force. Please contact us for details.
(★1)The highest usable frequency depends on an available fixture. As for the details, ask your local.
(★2)The maximum payload can be increased using options, a reinforcing mechanism against offset load, load support enhancement mechanism. Contact us if any.
(★3)Shock rated force can be increased by adding power modules.

Table Pattern

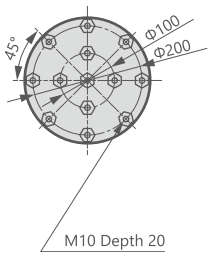
PS-068



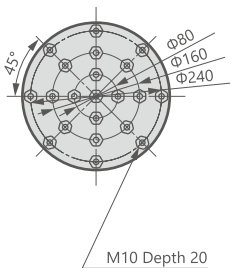
PCD-100-03



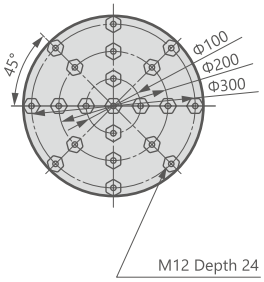
PCD-200



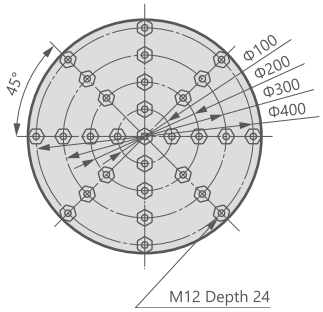
PCD-240



PCD-300



PCD-400



FC Series

Automotive Equipment | Railroad | Aerospace | Building

The FC series is a large system most suitable for testing a large specimen with high rated force. Because the water-cooled type is more efficient than the air-cooled, a larger rated force can be generated. It copes with vibration tests for large electronic equipment, automobile parts, airplane parts, airborne electronic apparatus, artificial satellites, aerospace and defense system. This series is designed to perform the vibration test specified in the military or international standards including MIL, NDS, ASTM, IEC, ISO, BS, JIS.

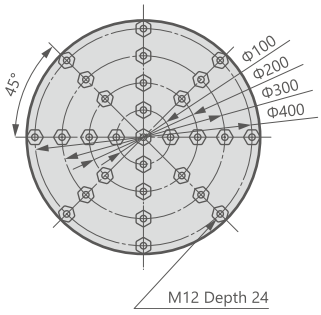
FC Series Specifications

Model			FC-060K/60	FC-080K/60	FC-100K/60	FC-125K/60	FC-200K/51
Rated Force	Sine	$kN_{0\text{-}p}$	60	80	100	125(★3)	200
	Random	kN_{rms}	60	80	100	100	140
	Shock(6ms)	$kN_{0\text{-}p}$	150	200	250	250	400
Frequency Range		Hz	to 2000	to 2000	to 2000	to 2000	to 2000
Max. Acceleration		m/s^2	667	889	1000(★1)	1000(★1)	1000(★1)
Max. Velocity		m/s	1.8	1.8	1.8	1.8	1.8
Max. Displacement		$mm_{p\text{-}p}$	60	60	60	60	51
Max. Payload		kg	1000	1000	1000	1000	2000
Input Power		kVA	88	100	154	187.5	351.5
Breaker Capacity(200v/400v)		A	300/175	350/200	500/300	630/350	---/600
Supply Voltage		V	200 or 400	200 or 400	200 or 400	200 or 400	400
Supply Frequency		Hz	50 or 60	50 or 60	50 or 60	50 or 60	50 or 60
Power Phases		Φ	3	3	3	3	3
Armature Mass		kg	90	90	90	90	130
Allowable Offset Load		N-m	1500	1500	1500	1500	5000
Cooling Method			Water-cooled	Water-cooled	Water-cooled	Water-cooled	Water-cooled
Cooling Water Flow		L/min	140(★2)	162(★2)	305(★2)	400(★2)	688(★2)
Model	Vibration Generator		9100-AWW/LA	9100-AWW/LA	9100-AWW/LA	9100-AWW/LA	9200-AWW/LA
	Power Amplifier		368A-1610B-3BAY100	368A-1612B-3BAY100	368A-1614B-3BAY100	368A-2421B-4BAY125K	368A-3232A-200K
	Console Rack		CRD-2000T	CRD-2000T	CRD-2000T	CRD-2000F-125K	CRD-2000F-200K
Size	Table Pattern		PCD-400	PCD-400	PCD-400	PCD-400	PCD-550
	Vib. Generator	mm	1489W×1338H×1149D	1489W×1338H×1149D	1489W×1338H×1149D	1489W×1338H×1149D	1905W×1348H×1473D
	Console Rack	mm	1662W×2059H×1030D	1662W×2059H×1030D	1662W×2059H×1030D	2216W×2059H×1030D	3324W×2030H×1030D
Mass Approx.	Vib. Generator	kg	4800	4800	4800	4800	8182
	Console Rack	kg	1680	1740	1800	2550	3950
	Cooling Unit	kg	700	700	700	700	700
	Chiller unit	kg	-	-	200	200	360

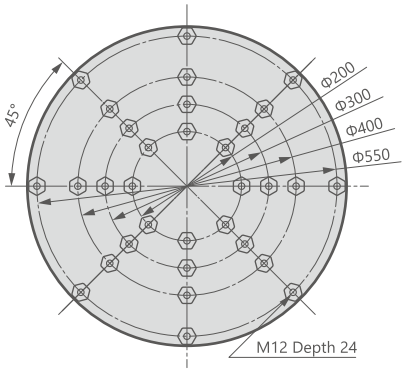
*Lower limit frequency should be determined by a performance of an available vibration control system.
*When exporting Vibration Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as rated force. Please contact us for details.
(★1)Not a theoretical value, for limiting the maximum acceleration. (★2)The water temperature is 32°C.
(★3)The maximum excitation force is the peak value. The continuous operating force is 100 kN.

Table Pattern

PCD-400



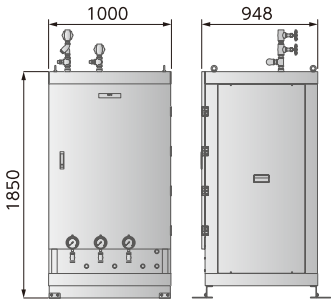
PCD-550



*The inch standard mounting hole is also available.

Outline Drawing(Utility)

- Cooling Unit

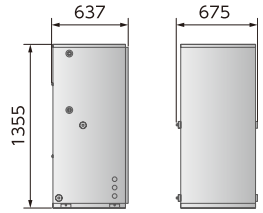


Outline Drawing(Option)

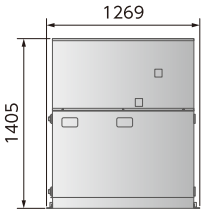
- 200 VAC 3-phase 50/60 Hz Input Power
- Hydraulic Power Supply

- Chiller unit

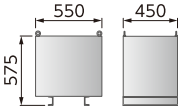
FC-100K/60	FC-125K/60
FL-100K/100	FL-125K/100
FV-100K/100	FV-125K/100



- Chiller unit
  FC-200K/51



- Transformer For Chiller unit



FP Series

ECO Vibe energy saving vibe-system

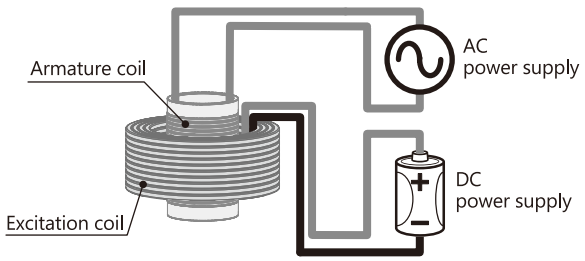
Electronic Parts Precision Equipment | Automotive Equipment | Transport (Truck)

*The vibration controller is mounted in the console rack. (Optional)

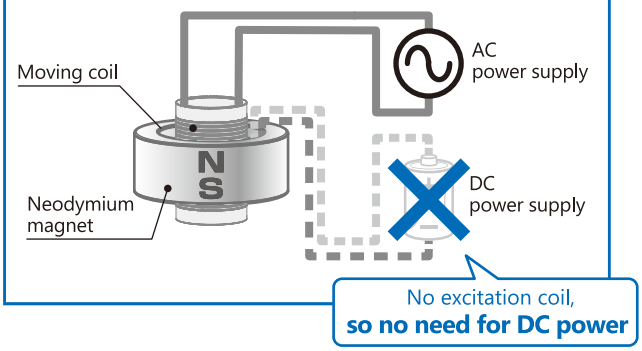
- Ultimate energy-saving design (low power, CO_2 reduction, low noise)
- No excitation coil or power supply (permanent magnet type)
- Industry's first, supports vibration force up to 20kN"

Basic Structure and Energy-saving Features of Permanent Magnet Vibration Generators

Excitation coil type



Permanent magnet type



Energy-Saving Effect of The Fp Series.

Reduction of Electric charge:

Approximately **1,753,060** yen per year

(Assuming 25% device output, 70% annual operating time, and an electricity rate of 23 yen/kWh)

*The annual electricity cost (JPY) = Power consumption per hour (kWh) × Annual operating hours (h) × Energy rate set by Tokyo Electric Power Energy Partner Inc. (23 JPY/kWh).(As of May 2023)

* Comparison between our conventional products, FH-10K/56 model (10,000N) and FP-10K/51 model (10,000N), using the equivalent vibration generator from the 916 series, assuming 70% operating time.

Reduction of CO_2:

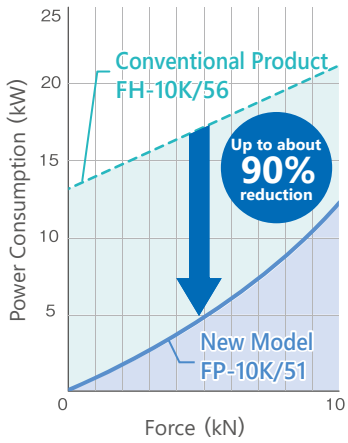
Approximately **34.8** tons per year

(Device output 25%, estimated annual operating time 70%)

*CO_2 emissions are calculated using the CO_2 emission factor of 0.457 kg-CO_2/kWh from Tokyo Electric Power Energy Partner Co., Ltd. (This follows the "Greenhouse Gas Emission Calculation, Reporting, and Disclosure System" based on the Global Warming Countermeasure Promotion Act and the emission factors published by the Ministry of the Environment and the Ministry of Economy, Trade and Industry on January 24, 2023.)

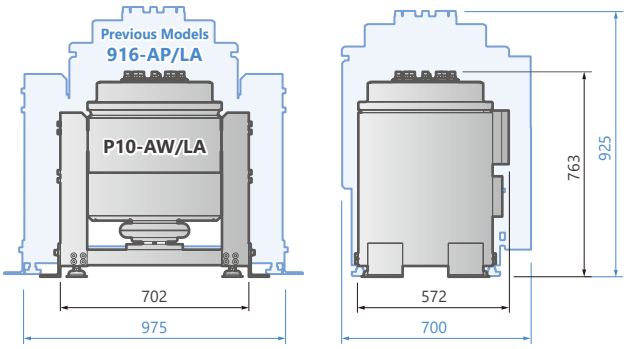
■ Reduction effect of power consumption for new drive system

(According to our survey)



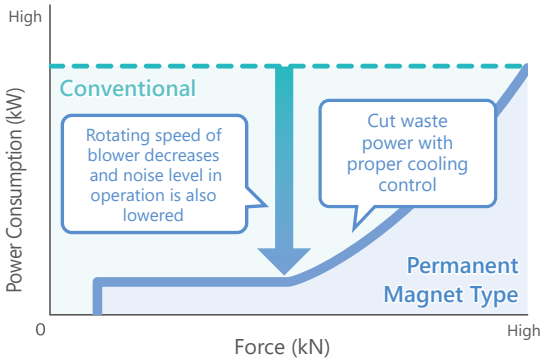
Miniaturization of Vibration Generators

■ Size comparison with previous models.



Blower Speed Control

■ Effect of Power Saving Control for Blower



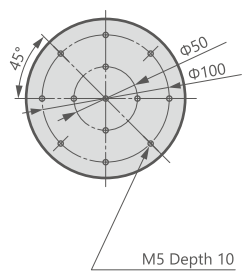
FP Series Specifications

Model			FP-01K/30	FP-02K/30A	FP-10K/51	FP-10K/76	FP-20K/51
Rated Force	Sine	$kN_{0\text{-}p}$	1.2	2.0	10.0	10.0	20.0
	Random	kN_{rms}	0.48	1.4	10.0	10.0	20.0
	Shock(6ms)	$kN_{0\text{-}p}$	1.5	3.0	22.0(★1)	20.0	36.0
Frequency Range		Hz	to 2500	to 2500	to 3000	to 2500	to 2500
Max. Acceleration		m/s^2	500	444	1000	625	833
Max. Velocity		m/s	1.6	1.5	2.0	2.1	2.0
Max. Displacement		$mm_{p\text{-}p}$	30	30	51	76.2	51
Max. Payload		kg	150	100	350	300	350
Input Power		kVA	1.4	6.2	11.5	11.5	27
Breaker Capacity(200v/400v)		A	-	20/15	40/30	40/30	100/50
Supply Voltage		V	200	200	200 or 400	200 or 400	200 or 400
Supply Frequency		Hz	50 or 60	50 or 60	50 or 60	50 or 60	50 or 60
Power Phases		Φ	1	3	3	3	3
Armature Mass		kg	2.4	4.5	10	16	24
Allowable Offset Load		N·m	3	4	500	500	500
Cooling Method			Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
Model	Vibration Generator		P01-AB/AS	Σ9515-AB/AS	P10-AW/LA	P10-AW/SLS	P20-A
	Power Amplifier		375-D/P01	369A-0101A-Σ15	369A-0202A-P10	369A-0202A-P10SLS	369A-0606A-P20
	Console Rack		-	CRD-1500-Σ15	CRD-1500-P10	CRD-1500-P10	CRD-2000-P20
Size	Table Pattern		PCD-100-01	PCD-100-02	PCD-200	PCD-200	PCD-300
	Vib. Generator	mm	384W×391.5H×360D	442W×360H×340D	702W×763H×572D	702W×948H×625D	982W×1000H×750D
	Power Amplifier/Console Rack	mm	480W×189H×450D	554W×1462H×1010D	554W×1462H×1010D	554W×1462H×1010D	554W×1900H×1010D
	Blower	mm	365.5W×700H×434D	474.5W×1040H×495D	411W×810H×525D	411W×810H×525D	707W×1681H×946D
Mass Approx.	Vib. Generator	kg	75	165	690	760	1650
	Power Amplifier/Console Rack	kg	35	290	300	300	600
	Blower	kg	16	31	60	60	245

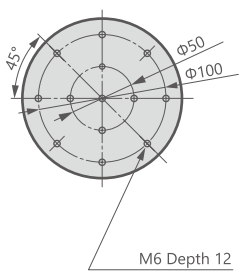
*Lower limit frequency should be determined by a performance of an available vibration control system.
*When exporting Vibration Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as rated force. Please contact us for details.
(★1) Shock rated force can be increased by adding power modules.

Table Pattern

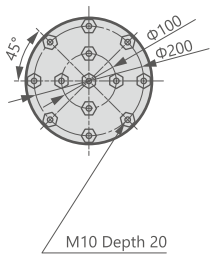
PCD-100-01



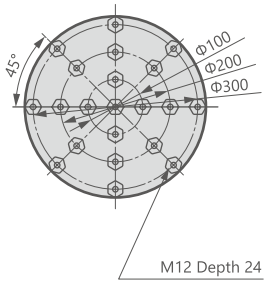
PCD-100-02



PCD-200



PCD-300



Vibration-Temperature (Humidity) Combined Environmental Reliability Test System

バイブロ チャンバー
VIBRO CHAMBER

*The vibration controller is mounted in the console rack. (Optional)

VC Series General Purpose VIBRO CHAMBER®

A combined environmental reliability test system is designed for performing vibration test under specified temperature and humidity conditions. The combined reliability tests have been performed to evaluate reliability of equipment from early days in the field of aerospace industry. But in recent years, electronic devices such as semiconductors, etc. are rapidly advanced in technology and complex materials made of plastic are used in the automobile industry. The combined reliability test today becomes indispensable to assure product reliability.

Until now, temperature, humidity, vibration, these three tests have been done separately. But, EMIC's combined environmental reliability test system enables simultaneous performance, therefore, the required test time can be reduced drastically, and the reliability of a test unit can be checked under more severe combined environmental condition than conventional test methods.

VIBRO CHAMBER® Specifications

Selection Item	Code	Specification		
Base Model	VC-062	600W×700H×600D mm Volume[252ℓ]		
	VC-082	800W×800H×800D mm Volume[512ℓ]		
	VC-102	1000W×1000H×1000D mm Volume[1000ℓ]		
Category	A	Oven		
	B	Temperature Chamber		
	D	Temperature Humidity Chamber		
Refrigerator Condensation	A	Air-cooled		
	W	Water-cooled		
		Not applicable		
Moving Mechanism	F	Fixed to Floor Type		
	M	Moving on Rail Type		
Combination with Shaker	X	Drawer Type		
	Y	Detachable Diaphragm Floor Plug Type		
	Z	Through Hole Type		
Temperature Range	(01) / (02) / (03)	(01) RT+10°C to 100°C	(02) RT+10°C to 150°C	(03) RT+10°C to 180°C*
	(21) / (22) / (23)	(21) −25°C to 100°C	(22) −25°C to 150°C	(23) −25°C to 180°C*
	(31) / (32) / (33)	(31) −40°C to 100°C	(32) −40°C to 150°C	(33) −40°C to 180°C*
	(41)/ (42) / (43)	(41) −55°C to 100°C	(42) −55°C to 150°C	(43) −55°C to 180°C*
	(51) / (52) / (53)	(51) −70°C to 100°C	(52) −70°C to 150°C	(53) −70°C to 180°C*
Programmer/ Controller	M1	Manually Operated Digital Controller		
	P3	LCD Touch Screen Controller		
Recorder	K	5.7" TFT Color LCD, 8ch standard input (expandable to 16ch), data storage via USB, remote monitoring via LAN connection.		

*Upper limit of 200°C: Option
*When exporting Combined Environmental Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as temperature range and rated force. Please contact us for details.

Cantilever Type Chamber

The cantilever type temperature/humidity chamber has no frame around its test room to make the setup of the specimen easier, therefore, the operating efficiency can be greatly improved. The test room can be moved with the specimen mounted on the vibration generator.

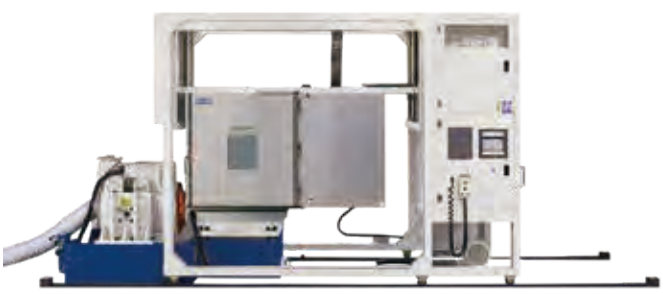
Vertical

Horizontal

Chamber Transfer Mechanism for switching Vibration Axis between Horizontal and Vertical Direction (Optional)

This mechanism is used for combining a chamber with the vibration testing system which a slip table is attached. The chamber can be easily joined with the vibration generator and slip table through a special interface using a lift mechanism to move the chamber up and down and the rails to move it horizontally. In addition, they can be used independently from each other by separating the vibration testing system from the chamber.

Vertical



Horizontal

Option

Horizontal Testing Solution

The slip table system is the most familiar option to perform horizontal testing of a bulky unit or an article, which the mounted configuration cannot be changed. It has many uses for various tests such as: transportation test of electrical appliances, computers and office equipment, durability test of railway rolling stocks, signaling equipment and automobile parts, and environmental test of aeronautical equipment.

The general purpose ST series slip table system incorporates oil film slip table technology of circulating oil between a sliding slab and a slip table, which applies to most commonly applied operated range.

The oil circulating linear bearing strongly restrains and supports a specimen against eccentric moment. Therefore, a high center of gravity and off-center loads can be excited safely. The ST series slip table system is the most practical because of its high restraint while maintaining high accuracy.

Horizontal Testing Solution Specification

Model		ST-050-○○	ST-060-○○	ST-070-○○	ST-080-○○
Working Area	mm	500×500	600×600	700×700	800×800
Screw Size(Standard)		M10	M10	M10	M10
Screw Pitch(Standard)	mm	100	100	100	100
Operating Frequency	Hz	2000	2000	1800	1700
Maximum Payload	kg	500	500	600	600
Table & Joint Mass	kg	28to 44(★1)	35to 52(★1)	46 to 65(★1)	59 to 80(★1)

Model		ST-100-○○	ST-120-○○
Working Area	mm	1000×1000	1200×1200
Screw Size(Standard)		M10	M10
Screw Pitch(Standard)	mm	100	100
Operating Frequency	Hz	1500	1200
Maximum Payload	kg	1000	2000
Table & Joint Mass	kg	100 to 110(★1)	147 to 152(★1)

(★1)Variations may occur depending on the combination with the vibration generator used.

Bearing Line Slip Table

Compared to the oil film slip method of the ST series, the BT series is held by bearings, making it more cost-effective and suitable for transport tests up to several hundred Hz.

Bearing Line Slip Table Specification

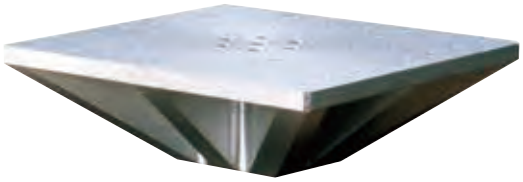
Model		BT-060-○○	BT-080-○○	BT-100-○○	BT-120-○○
Size	mm	600×600	800×800	1000×1000	1200×1200
Freq. Range	Hz	to 200	to 200	to 200	to 200
Table Mass	kg	42	65	93	150

*Table mass changes with the available vibration generator.
*Frequency range and max. payload can be enhanced by a special order.

• Uneven load reinforcement and increased mounted mass mechanism

➡ Page No. 26

Vertical Auxiliary Table



The vertical auxiliary table is the fixture most commonly used in various vibration tests to expand a mounting surface of the vibration generator for performing the transportation package test such as food, drink, chemicals, and large products as home electric appliances, and OA apparatus. Specifications in this fixture are important, but there is close relationship among table area, upper limit of frequency, and mass. In consideration of convenience and versatility, the vertical auxiliary table has various table sizes, threaded hole pattern for attaching a specimen and L-type hook (option) available.

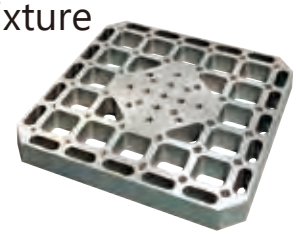
Vertical Auxiliary Table Specification

Model		VT-060-○○-N-A	VT-060-○○-N-A	VT-080-○○-N-A	VT-080-○○-N-A
Working Area	mm	600W×75H×600D	600W×175H×600D	800W×75H×800D	800W×175H×800D
Maximum Frequency	Hz	500	1000	200	500
Mass	kg	30.5 to 31.5(★1)	58.0 to 59.0(★1)	48.5 to 49.5(★1)	81.0 to 82.0(★1)
Screw Size(Standard)		M10, DP:15	M10, DP:15	M10, DP:15	M10, DP:15
Screw Pitch(Standard)	mm	100	100	100	100

Model		VT-100-○○-N-A	VT-120-○○-N-A
Working Area	mm	1000W×125H×1000D	1200W×150H×1200D
Maximum Frequency	Hz	200	200
Mass	kg	90.0 to 92.0(★1)	126.0 to 127.0(★1)
Screw Size(Standard)		M10, DP:15	M10, DP:15
Screw Pitch(Standard)	mm	100	100

* Fixture is made of Aluminum. Magnesium alloy fixture is also available.
* Auxiliary tables for special specimens or special vibration conditions are available. Please contact us for details.
(★1)Variations may occur depending on the combination with the vibration generator used.

Grid Table Fixture



Grid Table Fixture Specification

Model		VTL-060-○○	VTL-080-○○	VTL-100-○○	VTL-120-○○
Size	mm	600×600	800×800	1000×1000	1200×1200
Freq. Range	Hz	to 200	to 200	to 200	to 200
Table Mass	kg	33	53	115	230

*Table mass changes with the available vibration generator.
*Frequency range and max. payload can be enhanced by a special order.

• Uneven load reinforcement and increased mounted mass mechanism

➡ Page No. 26

Cubic Style Fixture

The JSA series cubic style fixture is used for performing vibration test of relatively small and light specimen such as various sensors, electrical components including electronic parts, printed circuit boards. In addition, we design and produce fixtures that meets the requirements for strength, stiffness, resonance frequency by taking the mass of the specimen and frequency range of the vibration testing system into consideration.

Cubic Style Fixture Specification

Model		JSA-150-○○	JSA-200-○○	JSA-300-○○
Cube Size	mm	150W×150H×150D	198W×198H×198D	297W×297H×297D
Maximum Frequency	Hz	2000	2000	1000
Mass	kg	6	11 to 15(★1)	30 to 31(★1)
Screw Size(Standard)		M5, DP:10	M6, DP:12	M10, DP:20

*Parts mounting plate for X, Y and Z axes of test allows for tailoring of its feature to fit to your specimen. *Cube mass does not include specimen mounting board. Fixture is made of Aluminum. Magnesium alloy fixture is also available. *Auxiliary tables for special specimens or special vibration conditions are available. Please contact us for details.
(★1)Variations may occur depending on the combination with the vibration generator used.

Option

Add-on Mechanism for Vibration Generator

Reinforcing Mechanism against Offset Load

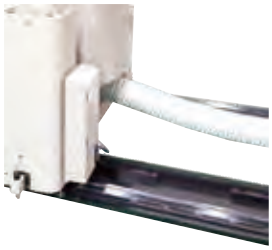
We added a guide mechanism to the vibration generator to handle vibrations with large eccentric moments. Additionally, by adding air springs, we can increase the mounted mass.

Counter Mass

The counter mass is necessary for exciting large and heavy test specimens by suppressing shaking of the vibration generator body.

Electrical Towing Mechanism

This mechanism is covenient for moving a vibration generator placed on the rails.



Add-on Mechanism for Slip Table System

Electric Rollover Mechanism

This mechanism rotates the vibration generator body to easily change the thrust axis.

Table Liftup Mechanism

This mechanism is used for moving the vertical auxiliary table up and down for easy attachment and removal. The work for this operation can be reduced to utilize a narrow working space effectively.

Duct Switching For Thrust Axis

This duct eliminates the handling of a blower hose in changing the thrust axis of the vibration generator.

Fixture Transfer Mechanism

Installing and removing of the vertical auxiliary table can be performed by putting it on the movement base. The work for this operation can be reduced.

HV Joint [Horizontal Vertical]

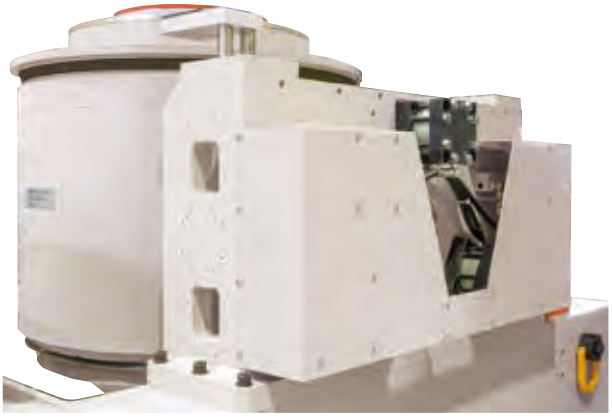
Direct connection to the horizontal vibration table eliminates the need for a joint bar, reducing vibration switching and improving efficiency.

Additional options

We are manufacturing new convenient option so that we can proceed with vibration test smartly.

CE Marking

It is possible to fit our product in the CE marking process specified in Europe (EU).

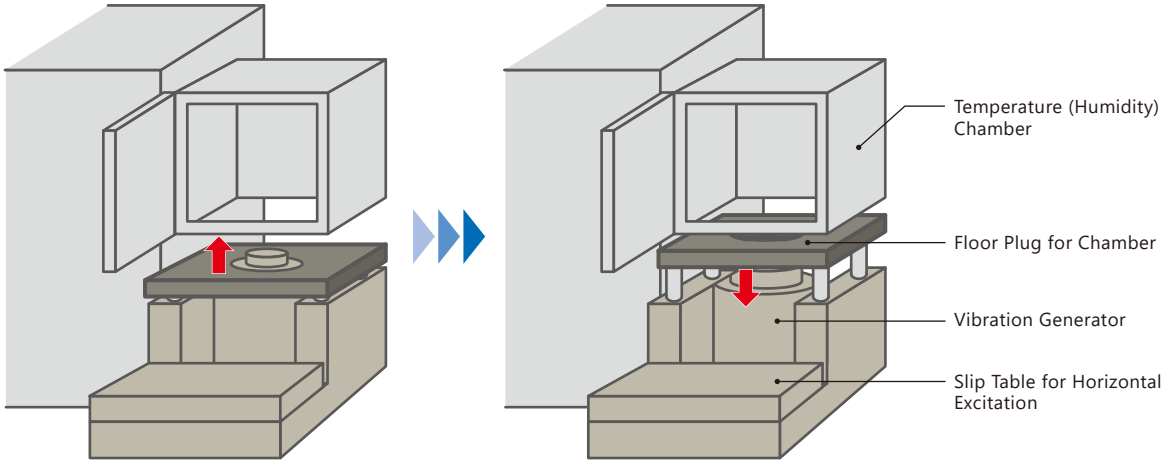


Stand Automatic Lock Mechanism

A mechanism for fixing the vibration generator automatically when changing the thrust axis between vertical and horizontal.
It automatically changes the thrust axis and fixes the vibration generator with one button (In case of using an electric rotating mechanism together).
In case of installing a temperature chamber, it is possible to drastically reduce the burden of narrow space work and manual work.

Chamber Floor Plug Lifting Device

This mechanism for raising and lowering the floor plug of the chamber, makes it easy to change the vibration direction and install the chamber.
This mechanism allows operators to combine the vibration testing system and chamber without the necessity of physically placing the floor plug on the VTS. In addition, since the floor plug can be lifted to the chamber, the installation space for the entire system will be smaller.

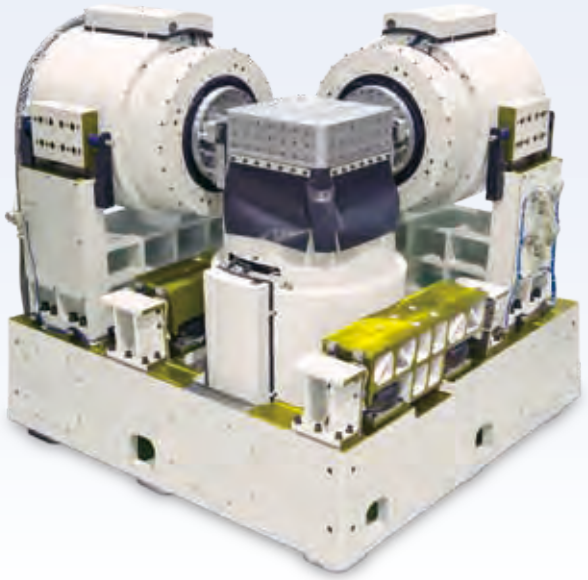


FM Series

Standard

Optional

Automotive Equipment



- The FM series electrodynamic exciting system makes it possible to simultaneously excite a specimen in three directions
- According to the military standard MIL-STD-810G
- Responding to the frequency range from 5 Hz to 2000 Hz

- Multi-axis vibration test system that can excite a specimen in three axes simultaneously, which unites the electrodynamic vibration generator cultivated by EMIC for a long time with linear bearing guide mechanism manufactured by KOKUSAI Co., Ltd.
- The eco-friendly vibration test system is equipped with a energy saving drive system “ECO-Vibe neo”. It is possible to reduce power consumption after performed range selection of the rated force for application.
- The FM series can be combined with a temperature/humidity chamber for environmental reliability tests.

FM Series Specifications

Model		FM-20K/60-3D-040	FM-30K/60-3D-040	FM-40K/60-3D-050	FM-60K/60-3D-050
Rated Force(Sine)	$kN_{0\text{-}p}$	20	30	40	60
Rated Force(Random)	kNrms	20	30	40	60
Upper Limit Frequency	Hz	2000	2000	2000	2000(★1)
Max. Acceleration(No Load)	m/s^2	133	188	235	316
Max. Velocity	m/s	1.2	1.2	1.2	1.2
Max. Displacement	$mm_{p\text{-}p}$	60	60	60	60
Max. Payload	kg	100	100	100	100
Input Power	kVA	80.4(26.8/axis)	126.6(42.2/axis)	171.0(57.0/axis)	204.9(68.3/axis)
Breaker Capacity	A	150	500	600	400
Supply Voltage	V	200	200	200	400
Supply Frequency	Hz	50 or 60	50 or 60	50 or 60	50 or 60
Power Phases	Φ	3	3	3	3
Armature Mass	kg	150	160	170	190
Table Size	mm	400×400	400×400	500×500	500×500
Cooling Method		Air-cooled	Air-cooled	Air-cooled	Air-cooled

*Input power specification is for 3Φ AC200 V 50/60 Hz. *Lower limit frequency should be determined by a performance of an available vibration control system. *The table size of 600x600 mm is also available. Please contact us. *When exporting Vibration Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as rated force. Please contact us for details.
(★1) The rated force is available up 500 Hz and the force level from 500 Hz to 2000 Hz is 70% of its maximum.

FB Series

Automotive Equipment | Transport (Truck) | Building

■ Multiaxial vibration testing system for transportation test or aseismatic performance evaluation

■ A new type of vibration testing system superior in cost performance

- It is an ideal vibration testing system for transportation vibration tests and seismic evaluations.
- Reproduction of actual vibration with triaxial simultaneous excitation
- Both vertical and horizontal vibration tests can be performed by switching among three axes in a sequential manner. Since there is no need to switch the thrust axis of the vibration generator, transferring a specimen becomes unnecessary, thus the test period can be reduced.

FB Series Specifications

Model		FB-10K/50-3D-100	FB-20K/50-3D-120	FB-30K/50-3D-150	FB-60K/50-3D-150
Rated Force(Sine)	kN_{0-p}	9.8	19.6	29.4	59.5
Rated Force(Random)	kNrms	6.9	13.7	20.6	41.7
Frequency Range	Hz	to 200	to 2200	to 2200	to 2200
Max. Acceleration	m/s^2	20	20	20	20
Max. Velocity	m/s	1	1	1	1
Max. Displacement	mm_{p-p}	100	100	100	100
Max. Payload	kg	300	500	1000	1500
Table Size	mm	1000×1000	1200×1200	1500×1500	2000×2000
Input Power	kVA	80	101	212	264
Breaker Capacity	A	300	400	500	500
Supply Voltage	V	200	200 or 400	200 or 400	200 or 400
Supply Frequency	Hz	50 or 60	50 or 60	50 or 60	50 or 60
Power Phases	Φ	3	3	3	3
Moving Element	kg	130	210	300	400
Cooling Method		Air-cooled	Air-cooled	Air-cooled	Air-cooled

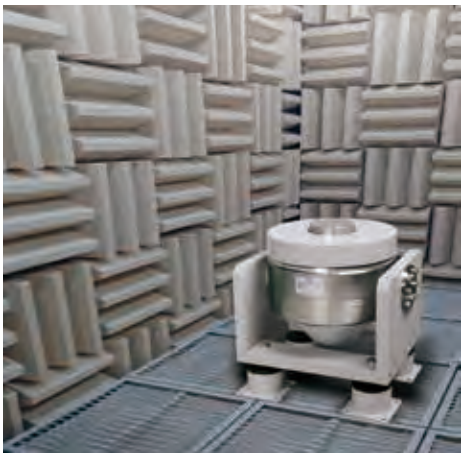
*Input power specification is for 3Φ AC200 V 50/60 Hz.
*The maximum random acceleration is about 1/3 of the maximum sine acceleration.
*Lower limit frequency should be determined by a performance of an available vibration control system.
*When exporting Vibration Testing System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan may be required depending on the specifications such as rated force. Please contact us for details.

Vibration Test Device for Rattle Noise

With reduced vehicle noise, vibration-related sounds like rattling and creaking inside the cabin have become more noticeable. This testing device evaluates these abnormal sounds, accommodating different sizes of test subjects, from individual parts (motors, switches) to full instrument panels with three model options.

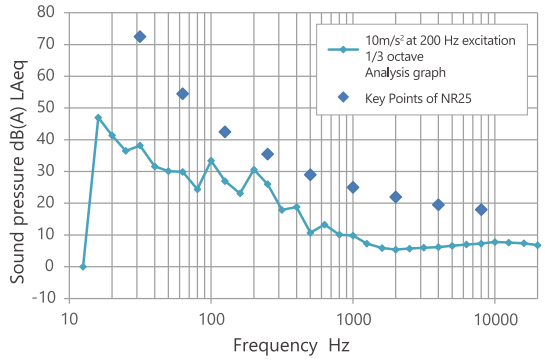
The vibration generator is designed to minimize noise other than excitation noise, and the setup includes a vibration tester, sound measurement device, and soundproof (anechoic) chamber. We also offer customized sound measurement devices and soundproof chambers based on customer needs.

Photo courtesy of Wakabayashi Acoustic Co., Ltd.



9515-BSR

■ **Noise data of the P10-BSR with soundproof panels**



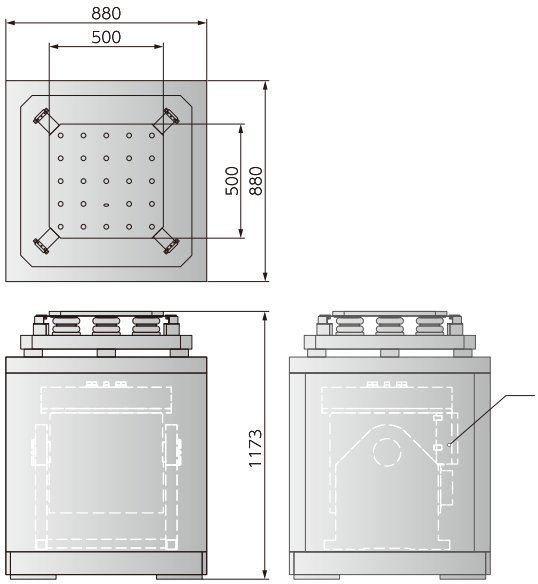
Vibration Test Device for Rattle Noise Specifications

Model		9514-BSR	9515-BSR	P10-BSR(Ref.)
Rated Force	N	300	600	2000
Frequency Range	Hz	5 to 300	5 to 300	5 to 300
Max. Acceleration	m/s^2	40	40	40
Max. Velocity	m/s	1.2	1.5	1.5
Max. Displacement	mm_{p-p}	15	15	30

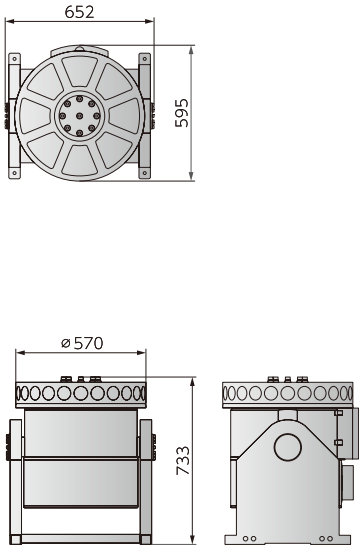
*The specifications vary based on table dimensions and installed weight.

Outline Drawing

● P10-BSR (with Soundproof Box)



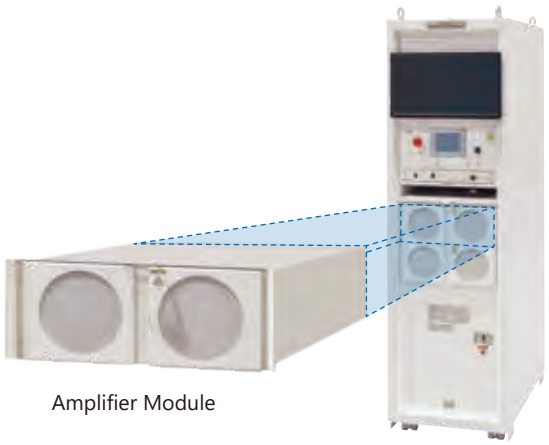
● P10-BSR



Power Amplifier

The power amplifier of EMIC's vibration testing system adopts the high-power D class digital switching amplifier which is most suitable for an electrodynamic vibration testing system. (On the other hand, the Linear amplifier is used for the compact vibration generator system.)

- Equip high-power D class digital switching amplifier.
- Attain much space saving (our conventional products).
- Reduction of approx. 40% of consumption electricity (our conventional products).
- Electro-magnetic compatibility in accordance with both FCC and VDE rule
- Flexible built-in design using power modules of 8 kVA and 12 kVA
- Realization of wide band frequency response from DC to 4 kHz with low distortion
- Specimen protection with soft start feature from shock due to overshooting
- Complete protection with multiple interlocking features.



Amplifier Module

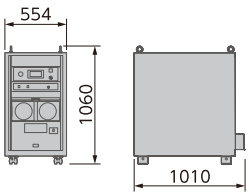
Power Amplifier Specifications

Specifications of Switching Amplifier Module

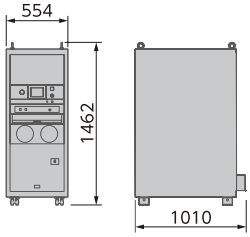
Model		368A	369A	3625
Amplifier Circuit		Switching	Switching	Switching
Apparent Power	kVA	12.0	8.0	25.0
Frequency Range	Hz	DC to 4000	DC to 4000	DC to 3500
Input Voltage	Vrms	1.5	1.8	1.8
Output Voltage	Vrms	120	160	250
Output Current (Sine)	Arms	100	50	100
Output Current (Random)	$A_{0\text{-}p}$	350	170	350

Outline Drawing

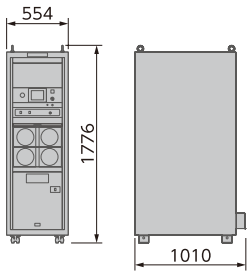
- CRD-1000



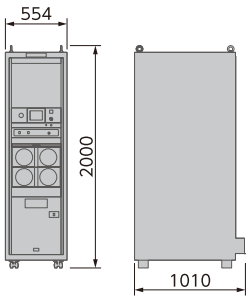
- CRD-1500



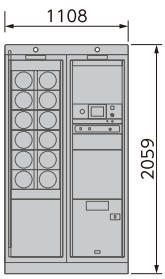
- CRD-1700



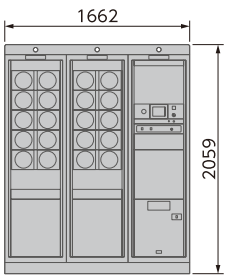
- CRD-2000



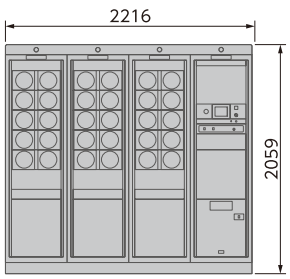
- CRD-2000W



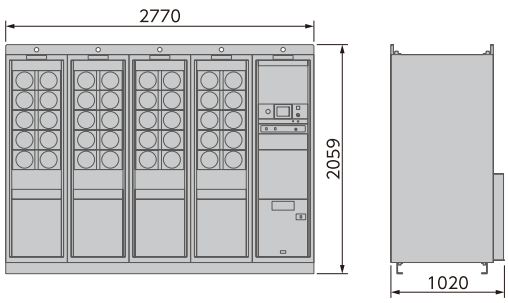
- CRD-2000T



- CRD-2000F



- CRD-2000Q



Vibration Control System MX Series

- Full-HD 1920×1080 high resolution 16:9 wide screen
- Test condition settings consolidated into a multi-window screen, improving ease of setting changes
- Easy input of existing data via drag-and-drop, achieving efficient operation

High-Resolution Wide Display

Vibration Control System MX Main Unit

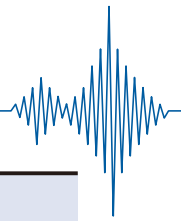
Includes a Small PC

The vibration control system MX is the optimal hardware for controlling electrodynamic vibration test systems. It supports random vibration, sine vibration, and shock excitation control. A variety of vibration control software is available, enabling arbitrary waveform reproduction and compliance with various standard tests.
This network-compatible, single-axis control system integrates a multi-core DSP and Arm® SoC. It features 4-channel input, a △Σ 24-bit A/D converter, and a maximum input voltage of ±10V. It inherits the DCS-98000MJ's user-friendly interface and functionality.
Test conditions are displayed on a single screen with a multi-window function for easy operation, improving work efficiency. Graphs and measurements are shown on a 16:9 full HD wide display for better visibility.

*Arm is a registered trademark of Arm Limited (or its subsidiaries) in the EU or other countries.

Vibration Control System MX Series specifications

Software	**Random Vibration Control Package** Random wave vibration testing and simultaneous vibration measurement are possible using an arbitrary random wave spectrum.	
Model	KSP-e101J(Japanese)／KSP-e101E(English)	
Major Specifications	Vibration Control Axis	1 Axis
	Controlled Target Channel	MX-04 : 1–4CH, MX-08 : 1–8CH, MX-16 : 1–16CH
	Control Mode	Acceleration
	Measured Target Channel	Number of channels excluding control channels among all channels
	Measurement Mode	Acceleration, Velocity, Displacement
	Control Frequency Bandwidth	100, 160, 200, 250, 400, 500, 800, 1000, 1250, 2000, 2500, 4000, 5000, 10000Hz
	Control Frequency Range	2Δf - Control frequency bandwidth (Δf = control frequency bandwidth / control line number)
	Dynamic Range	144dB (theoretical value)
	Control Accuracy	±1.5dB or less (with a flat transfer function at DOF 200)
	Control Method	PSD control by closed-loop feedforward system
	Response Averaging Method	Average PSD control, maximum PSD control, minimum PSD control
	PSD Breakpoint	Up to 3200 points (depending on resolution)
	Random Signal	True Gaussian distribution pure random signal
	Number of Control Channels	50, 100, 200, 400, 800, 1600, 3200 lines



Software	Sine Vibration Control Package The device supports constant frequency testing, sweep testing, and scheduled testing. Vibration measurement can also be performed simultaneously during testing.	
Model	KSP-e201J(Japanese)／KSP-e201E(English)	
Major Specifications	Excitation Control Axis	1 Axis
	Control Target Channel	MX-04 : 1 to 4 channels　MX-08: 1 to 8 channels　MX-16 : 1 to 16 channels
	Control Mode	Acceleration, velocity, displacement
	Measurement Target Channel	Number of channels excluding control channels from the total channels
	Measurement Mode	Acceleration, velocity, displacement
	Control Frequency Range	1Hz to 10,000Hz (Note : This is limited by sensor characteristics and shaker characteristics.)
	Test Mode	Frequency constant test, frequency sweep test
	Sweep Mode	Frequency sweep (Log Linear)
	Sweep Speed	Log sweep : oct/min, Linear sweep : Hz/s
	Test Duration	Maximum 9999 hours
	Control Method	Level control using closed-loop feedback system
	Response Averaging Method	Average control, maximum control, minimum control
	Level Estimation Method	Tracking, average value, RMS (Root Mean Square)

Software	Shock Control Package It is possible to conduct impact tests with standard waveforms, arbitrary waveforms, etc.	
Model	KSP-e301J(Japanese)／KSP-e301E(English)	
Major Specifications	Vibration Control Axis	1 axis
	Controlled Channel	1CH
	Control Mode	Acceleration
	Measurement Channel	Number of channels excluding control channel
	Measurement Mode	Acceleration, velocity, displacement
	Control Method	Time-series waveform control using closed-loop feedforward method
	Control Frequency Band	25, 50, 100, 200, 500, 1000, 2000, 5000, 10000, 20000Hz (automatically selected based on target waveform)
	Number of Control Lines	100, 200, 400, 800, 1600, 3200, 6400, 12800, 25600, 51200 lines
	Target Waveform Type	Defined waveforms : Half-sine, Sawtooth, Trapezoidal, user-defined Complies with JIS and MIL test standards, user-defined waveforms possible Arbitrary waveform : Can load text data such as measured shock waves for settings Target waveform points : 128K points
	Adjustable Pulse Width	Half-sine : 0.25 to 150msec, Sawtooth, Trapezoidal : 1 to 150msec
	Sampling	64 to 25600Hz
	Output Polarity	± adjustable

*When exporting Vibration Control System Software from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan is required. Please contact us for details.

MX Software Package Option

Software Package Option	Model
Random Vibration Control Package	KSP-e101J
ROR Control Option	KSP-e102J
SOR Control Option	KSP-e103J
Random Notch Control Option	KSP-e104J
Waveform Editing and Analysis Tools	KSP-e108J
SOROR Control Option	KSP-e109J
Sine Vibration Control Package	KSP-e201J
Resonance Point Tracking Function Option	KSP-e202J
Sine Notch Control Option	KSP-e204J
Triangle Wave Output Control Option	KSP-e205J
Sine Sweep Function Option	KSP-e206J
Multi-Sine SOS Control Option	KSP-e207J
Open Loop Control Option	KSP-e208J

Software Package Option	Model
Shock Vibration Control Package	KSP-e301J
SRS Analysis & Waveform Creation Software	KSP-e302J
Sine Beat Wave Creation Software	KSP-e303J
Sine Burst Wave Creation Software	KSP-e304J
Custom Waveform Long-duration Correction Control Package	KSP-e401J
Combined Test Control Software	KSP-e601J
Vibration Test Scheduling Software	KSP-e602J
Manual Variable Sine Control Software	KSP-e603J
LAN Remote Monitoring Software	KSP-e801J
Watchdog Timer Function	KSP-e803J
HOST Offline Function	KSP-e805J

*As for the detailed information of Software Package, please contact us.

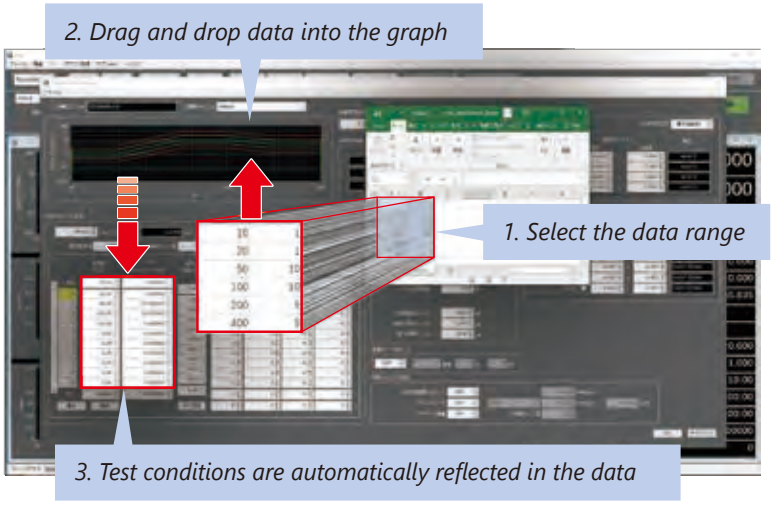
Vibration Control System MX Series

Multi-Window Feature

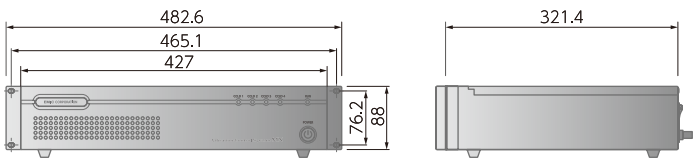
The Full-HD 1920×1080 high-resolution wide display allows for various windows, such as target acceleration, control acceleration, transfer functions, time-series graphs, and multiple measurement channels, making it easier to monitor vibration test conditions.

Easy Operation with Drag and Drop

You can easily input PSD patterns and sign test condition data created in Microsoft Excel® or CSV files by simply dragging and dropping. Compared to manual entry, this method allows you to reflect and utilize existing data, enabling more efficient operations.



Outline Drawing



Vibration Control System
MJ Series

DCS-98000MJ provides extensive software along with its hardware, which is most suitable for the vibration control of an electrodynamic vibration testing system. The vibration controller executes the vibration test profile that the customer requires and is designed to be able to easily perform a complicated vibration test. It carries DSP performing high-speed digital signal processing and is comprised of the industrial use PC main body of high reliability, the controller is equipped with the latest Microsoft Windows OS which it is easy to operate, and the control software standardized on the random, sine and shock and provide rich option software.

*When exporting Software of Vibration Control System from Japan to overseas, Export License from the Ministry of Economy, Trade and Industry in Japan is required. Please contact us for details.

Vibration Control System MJ Series specifications

Software	**Random Vibration Control Package**
Model	ESP-121MJ(Japanese) / ESP-121ME(English)
Overview	**Sine Vibration Control Package**
Model	ESP-221MJ(Japanese) / ESP-221ME(English)
Overview	**User-Defined Waveform Long Period Equalization**
Model	ESP-421MJ(Japanese) / ESP-421ME(English)
Overview	**Shock Control Package**
Model	ESP-321MJ(Japanese) / ESP-321ME(English)

MJ Software Package Option

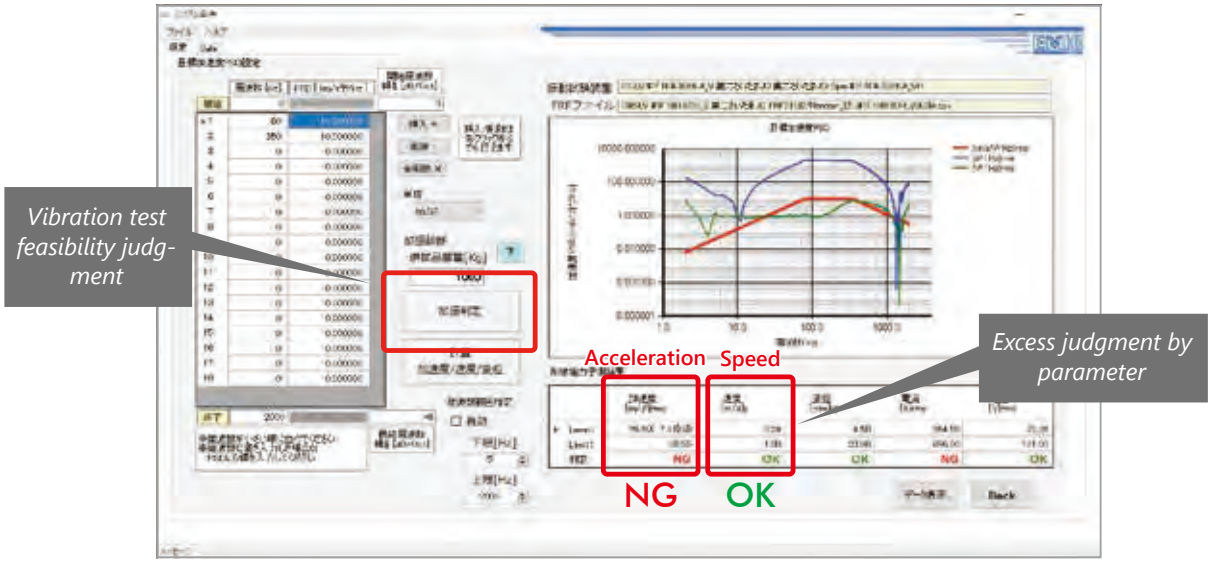
Software Package Option
Random-on-Random (ROR) Software (10 band)
Sine-on-Random (SOR) Software (28 tone)
Limit Channels Control (Random)
PSD Conversion
Resonant Search and Dwell Control
Sound Skip Check
Limit Channels Control (Sine)
Swept Triangular Control
Shock Response Spectrum (SRS)
Sine Beat Control
CERT Program Software
LAN Remote Monitor Package
e-mail Control Package (ESP-821ME(English) / ESP-821MJ(Japanese) required)
Watch Dog Timer Control Package

*As for the detailed information of Software Package, please contact us.

Vibration Test Pre-Operation Diagnostic Tool

PO Checker

Patented
Patent No. 7086411



Vibration Evaluation Window
*The image is of a product under development and may differ from the final specifications.

Vibration Test Pre-Operation Diagnostic Tool, PO Checker [Pre-Operation Checker], is a tool that pre-assesses whether vibration tests can be executed without interruptions by considering the test system's specifications, transfer function characteristics, and operating conditions, including the mass of the test specimen and fixtures.
If test conditions exceed the system's ratings during the test program, limiters may activate, causing interruptions. By using this tool, you can determine feasibility before testing, preventing interruptions and significantly reducing downtime.

- Simply set the test conditions and press "Vibration Test." You can determine whether the vibration test can proceed.
- Instantly see which parameters—acceleration, displacement, velocity, current, or voltage—are exceeding limits.

PO Checker Specifications

Supported Os	Windows 7 or later .NET Framework 4.6 required
Compatible Test Equipment	Electrodynamic vibration test device
Imported Transfer Function	Sine transfer function Random transfer function
Supported Vibration Test (Random)	Random vibration Sine-on-random vibration
Supported Vibration Test (Sine)	Constant level sweep Interpolated sweep Constant frequency
Supported Vibration Test (Shock)	Sine half-wave
Test Condition Settings	Vibration test standards or arbitrary vibration test Test specimen mass
Judgment Value	Excitation force, acceleration, velocity, displacement, current, voltage Frequency division (lower frequency limit, upper frequency limit)
Judgment Output	Vibration test device operational suitability diagnostic tool
Report Output	Excel format
Data Output	Excel format
Security	License authentication method

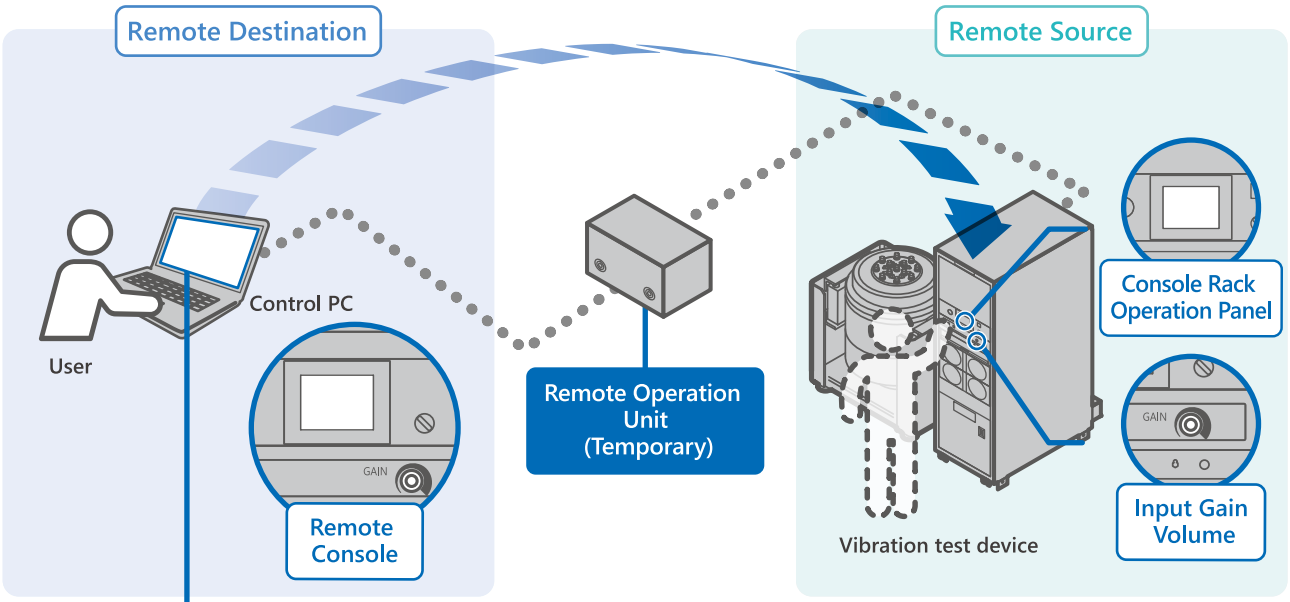
Scheduled For Release

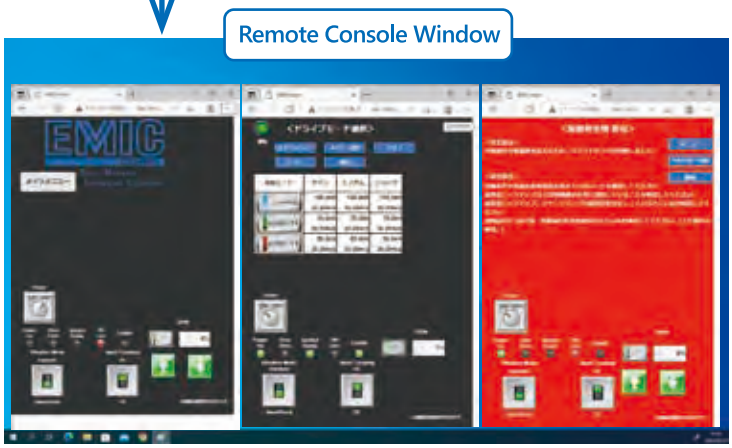
Remote Operation Unit

The remote control unit is an option that allows operations previously performed directly on the console rack's control panel to be remotely operated and configured on a PC.

Ideal for users like this:

- ☑ The console rack and operation location of the vibration test equipment are isolated or distant, requiring frequent trips between the devices.
- ☑ I want to check the operational status and error details of the vibration test equipment displayed on the console rack panel, in conjunction with the vibration control software.
- ☑ The frequency of changing the operation mode is high, depending on the test conditions.
- ☑ There is a high frequency of screen captures.





*The screen is under development, so it may differ from the actual specifications.

510 Series

The Compact Vibration Test System is used for vibration meter calibration, mechanical impedance measurement, modal analysis excitation source and small light weight component vibration-proof test.
Particularly, concerning the Model:512-D and 513-D vibration generator, ceramic materials are used for their armatures becoming the first in the world, making excitation up to 30 kHz possible (up to 24 kHz for Model:513-D).

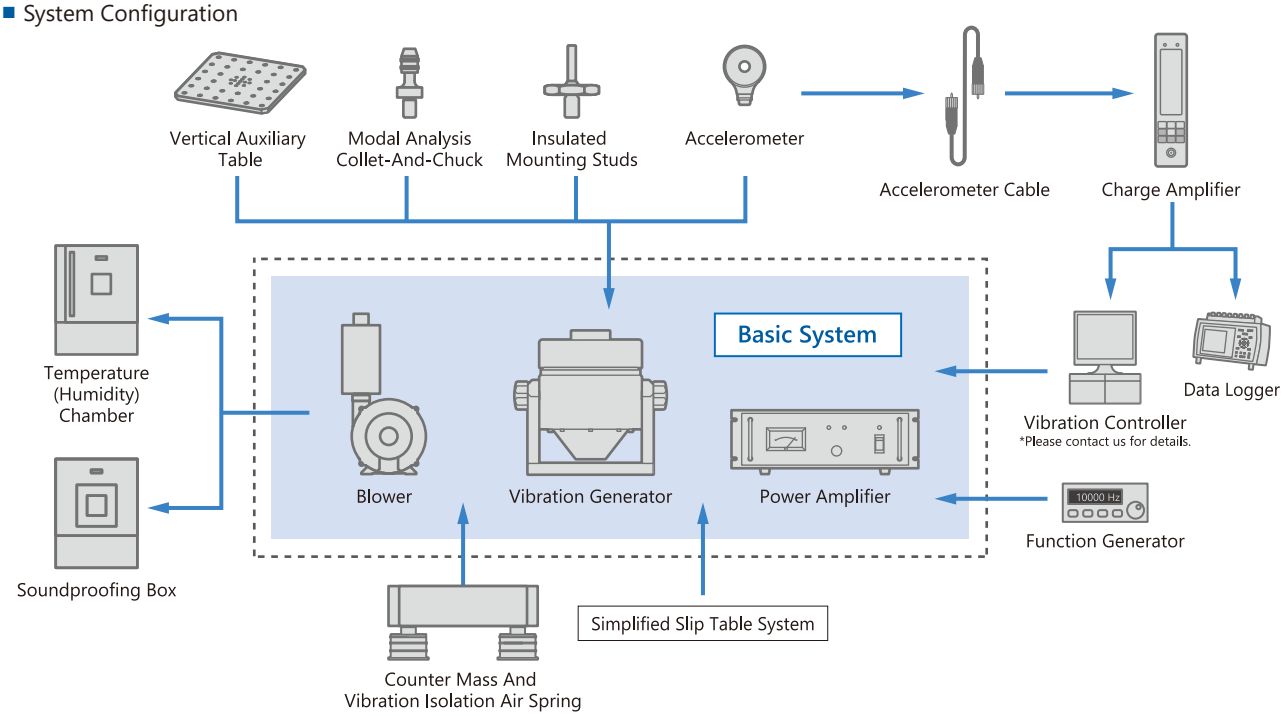
- Highly accurate vibration meter calibration, mechanical impedance measurement and modal analysis excitation source
- Vibration-proof test of various sensors and small light weight specimens such as electronic and electric components
- Educational material for fundamental experiment in vibration engineering

511-A

512-A
(standard product without trunnion stand)

513-B
(with optional trunnion stand)

System Configuration



Control System or Oscillator Required:

In addition to the compact vibration generator and power amplifier unit, a vibration control system or function generator, accelerometer and charge amplifier may be required for your application. An optional oscillator is available for the power amplifier unit. As for details, please contact our sales department.

511·512 Series Specifications

Model		511-A	512-A	512-A/A	512-D	512-D/A
Type		Modal Analysis	Standard	High Force:64N	High Frequency:30kHz	High Frequency:30kHz·High Force:64N
Rated Force	N	15	49	64	49	64
Frequency Range	Hz	2 to 5k	2 to 20k	2 to 20k	2 to 30k	2 to 30k
Max. Acceleration	m/s^2	230.7	376.9	492.3	272.2	355.5
Max. Velocity	m/s	1.26	1.14	1.31	1.00	1.14
Max. Displacement	mm_{p-p}	5.0	7.0	7.0	7.0	7.0
Axial Resonance		More than 3.9kHz	More than 16kHz	More than 16kHz	More than 32kHz	More than 32kHz
Moving Element	kg	0.065	0.13	0.13	0.18	0.18
Armature Material		Aluminum	Magnesium	Magnesium	Ceramic	Ceramic
Stiffness	N/mm	5	12	12	12	12
Armature Size	mm	M6 L=20	Φ40	Φ40	Φ40	Φ40
Maximum Payload	kg	-	2.0	2.0	2.0	2.0
Stray Field		-	-	-	-	-
Field Power		Permanent Magnet	Permanent Magnet	Permanent Magnet	Permanent Magnet	Permanent Magnet
Operating Environment	℃	−10 to +40 w/o dewdrop	−10 to +40 w/o dewdrop	−10 to +40 w/o dewdrop	−10 to +40 w/o dewdrop	−10 to +40 w/o dewdrop
Cooling		Natural	Natural	Forced air	Natural	Forced air
Dimensions	mm	120W×190H×100D	Φ150×178H(★1)	Φ150×178H(★1)	Φ150×178H(★1)	Φ150×178H(★1)
Mass	kg	4.2	9.5	9.5	9.5	9.5
Matched Amplifier		371-A	371-A	372-A	371-A	372-A
Blower		-	-	Yes	-	Yes
Accessory		Trunnion Stand	Interconnecting Cable×1 Grip× 2	Interconnecting Cable×1 Grip× 2	Interconnecting Cable×1 Grip× 2	Interconnecting Cable×1 Grip× 2
Option		-	Trunnion Stand (Mass 2.4kg)	Trunnion Stand (Mass 2.4kg)	Trunnion Stand (Mass 2.4kg)	Trunnion Stand (Mass 2.4kg)

(★1) Except for grip.

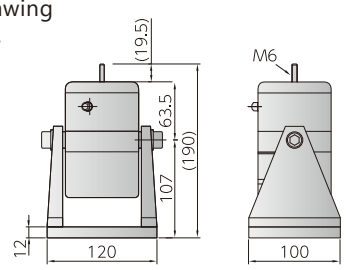
513 Series Specifications

Model		513-B	513-B/A		513-D	513-D/A
Type		Standard	High Force:147N·196N		High Frequency:24kHz	High Frequency:24kHz·High Force:147N
Rated Force	N	98	147	196	98	147
Frequency Range	Hz	3 to 13k	3 to 13k		3 to 24k	3 to 24k
Max. Acceleration	m/s^2	264.8	397.2	529.7	175	262.5
Max. Velocity	m/s	1.17	1.43	1.67	0.92	1.14
Max. Displacement	mm_{p-p}	10	10		10	10
Axial Resonance		More than 12kHz	More than 12kHz		More than 23kHz	More than 23kHz
Moving Element	kg	0.37	0.37		0.56	0.56
Armature Material		Magnesium	Magnesium		Ceramic	Ceramic
Stiffness	N/mm	14.0	14.0		14.0	14.0
Armature Size	mm	Φ79	Φ79		Φ79	Φ79
Maximum Payload	kg	3.0	3.0		3.0	3.0
Stray Field		-	-		-	-
Field Power		Permanent Magnet	Permanent Magnet		Permanent Magnet	Permanent Magnet
Operating Environment	℃	−10 to +40 w/o dewdrop	−10 to +40 w/o dewdrop		−10 to +40 w/o dewdrop	−10 to +40 w/o dewdrop
Cooling		Natural	Forced air		Natural	Forced air
Dimensions	mm	Φ215×230H(★1)	Φ215×230H(★1)		Φ215×230H(★1)	Φ215×230H(★1)
Mass	kg	26	26		26	26
Matched Amplifier		371-A	372-A	374-A	372-A	374-A
Blower		-	Yes		-	Yes
Accessory		Interconnecting Cable×1 Grip× 2	Interconnecting Cable×1 Grip× 2		Interconnecting Cable×1 Grip× 2	Interconnecting Cable×1 Grip× 2
Option		Trunnion Stand (Mass 4.0kg)	Trunnion Stand (Mass 4.0kg)		Trunnion Stand (Mass 4.0kg)	Trunnion Stand (Mass 4.0kg)

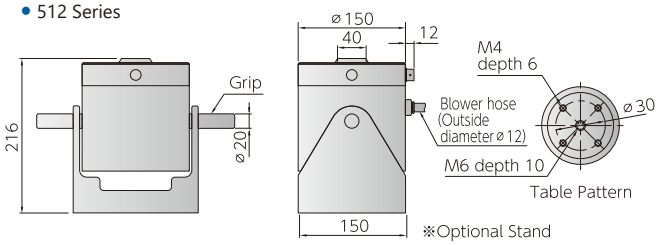
(★1) Except for grip.

Outline Drawing

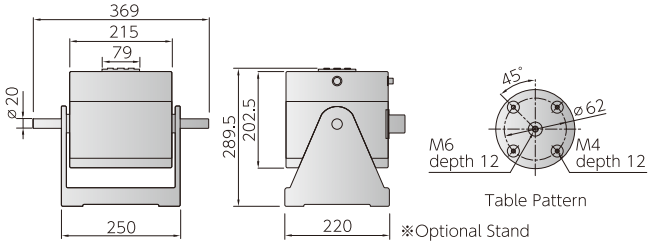
• 511 Series



• 512 Series



• 513 Series



9514 Series

Our new standard compact vibration generator system is able to cover various type of test.
The compact vibration generator systems, the 9514 Series, communize the major components for the vibration generator. In addition, standard specifications, increased payload specifications, through type specifications, and heat resistant specifications can apply to this system, so this enables these high-performance vibration generators to be used in various purposes. These systems also have the extensibility to handle rattle noise measurements and other required specifications, and have the capability of performing various kinds of test by combining peripheral equipment.

9514 Series

9514 Series Specifications

Model		9514-AN/SD	9514-AB/SD	9514-AN/AS	9514-AB/AS
Type		Standard	High Force:500N	Integrated Pneumatic Support Large Displacement30mm$_{p-p}$	Integrated Pneumatic Support Large Displacement30mm$_{p-p}$ High Force500N
Rated Force	N	300	500	300	500
Frequency Range	Hz	5 to 5k	5 to 5k	5 to 3k	5 to 3k
Max. Acceleration	m/s^2	250.0	416.7	230.8	384.6
Max. Velocity	m/s	1.2	1.2	1.2	1.2
Max. Displacement	mm$_{p-p}$	15(★1)	25	30	30
Axial Resonance		More than 4350Hz	More than 4350Hz	More than 3600Hz	More than 3600Hz
Moving Element	kg	1.2	1.2	1.3	1.3
Armature Material		Aluminum	Aluminum	Aluminum	Aluminum
Suspension&Guide		Half Loop Flexure Sleeve Shaft	Half Loop Flexure Sleeve Shaft	Pneumatic Payload Support Roller Bearing and Sleeve Shaft	Pneumatic Payload Support Roller Bearing and Sleeve Shaft
Stiffness	N/mm	25.0(★1)	25.0	-	-
Armature Size	mm	Φ75	Φ75	Φ75	Φ75
Maximum Payload	kg	12	12	12	12
Thrust Axis		Vertical	Vertical	Vertical	Vertical
Stray Field		Less than 3mT(★2)	Less than 3mT(★2)	Less than 3mT(★2)	Less than 3mT(★2)
Field Power		Permanent Magnet	Permanent Magnet	Permanent Magnet	Permanent Magnet
Operating Environment	℃	−10 to + 40 w/o dewdrop	−10 to + 40 w/o dewdrop	−10 to + 40 w/o dewdrop	−10 to + 40 w/o dewdrop
Cooling		Natural	Forced air(Blower)	Natural	Forced air(Blower)
Dimensions(★4)	mm	283W×270H×200D	283W×270H×200D	283W×276H×200D	283W×276H×200D
Mass	kg	25	26	27	27
Matched Amplifier		373-A	375-D	373-A/Z12	375-D
Blower		-	Yes	-	Yes
Accessory		-	-	•Air Pump •Midpoint Adjuster Block	•Air Pump •Midpoint Adjuster Block
Option		Accelerometer Counter Mass(★3) Isolation (Rubber) Pad	Accelerometer Counter Mass(★3) Isolation (Rubber) Pad Muffler for Air Cooling Blower	Accelerometer Counter Mass(★3) Isolation (Rubber) Pad	Accelerometer Counter Mass(★3) Isolation (Rubber) Pad Muffler for Air Cooling Blower

Model		9514-AN/MD	9514-AB/WF	9514-AB/AW	
Type		Modal Analysis	High Frequency	All-weather Type used in Workspace of Environmental Chamber	
Rated Force	N	300	500	300	500
Frequency Range	Hz	5 to 2.5k	5 to 10k	5 to 3k	5 to 3k
Max. Acceleration	m/s^2	300.0	277.7	250.0	416.7
Max. Velocity	m/s	1.2	1.2	1.2	1.2
Max. Displacement	mm$_{p-p}$	15	20(★1)	10	10
Axial Resonance		More than 3600Hz	More than 6500Hz	More than 4300Hz	More than 4300Hz
Moving Element	kg	1.0	1.8	1.2	1.2
Armature Material		Aluminum	Aluminum	Aluminum	Aluminum
Suspension&Guide		Half Loop Flexure Sleeve Shaft	Half Loop Flexure Sleeve Shaft	Half Loop Flexure Sleeve Shaft	Half Loop Flexure Sleeve Shaft
Stiffness	N/mm	25.0	28.0	30.0	30.0
Armature Size	mm	Φ50	Φ75	Φ83	Φ83
Maximum Payload	kg	8.0	12	10	10
Thrust Axis		Vertical (Any direction by using flexure)	Vertical	Vertical	Vertical
Stray Field		Less than 3mT(★2)	Less than 3mT(★2)	Less than 3mT(★2)	Less than 3mT(★2)
Field Power		Permanent Magnet	Permanent Magnet	Permanent Magnet	Permanent Magnet
Operating Environment	℃	−10 to + 40 w/o dewdrop	−10 to + 40 w/o dewdrop	−40 to +125(less than 98%RH)	−40 to +125(less than 98%RH)
Cooling		Natural	Forced air(Blower)	Forced air(Blower)	Forced air(Blower)
Dimensions(★4)	mm	283W×270H×200D	283W×270H×200D	382.5W×205H×333.5D	382.5W×205H×333.5D
Mass	kg	26	26	31	31
Matched Amplifier		373-A/Z13	375-A/Z22	373-FW	375-D
Blower		-	Yes	Yes	Yes
Accessory		Collet-and-chuck Set(Φ1.0, Φ1.5, Φ2.0, Φ2.35, Φ3.0)	-	Built-in Accelerometer Model : 731-B, T-wrench (M5)	
Option		Accelerometer Counter Mass(★3) Isolation (Rubber) Pad Model : 9514-AN/MD/Z12 Reinforced Stiffness : 50 N/mm (limited to max. 10 mm$_{p-p}$) Model : 9514-AN/MD/Z13 Low level acceleration with low distortion (limited to max. 10 mm$_{p-p}$)	Accelerometer Isolation (Rubber) Pad Muffler for Air Cooling Blower	Interconnection compatibility with chamber whose wall thickness is other than 70 to 100 mm Muffler for Air Cooling Blower	

(★1) 25 mm$_{p-p}$ displacement is available by changing axial stiffness to 15 N.mm. (★2) At 50 mm above table center.
(★3) When attempting to drive the vibration generator at its rated force, vibration generator should be secured to reaction mass, rigid base or floor. (★4) Without any projection.

Air-suspension mechanism ensures displacement 9514 Series

■ Relationship between payload, decreased displacement, and maximum displacement

Since the test object is supported by a spring, the increased mass of the loaded object will result in a lower neutral position thus reducing the maximum displacement for the armature of the compact vibration generator. As part of our 9514 series, we offer an optional "air suspension mechanism" that eliminates any reduction in the maximum displacement.

*Please contact our sales dept for details.

• Standard

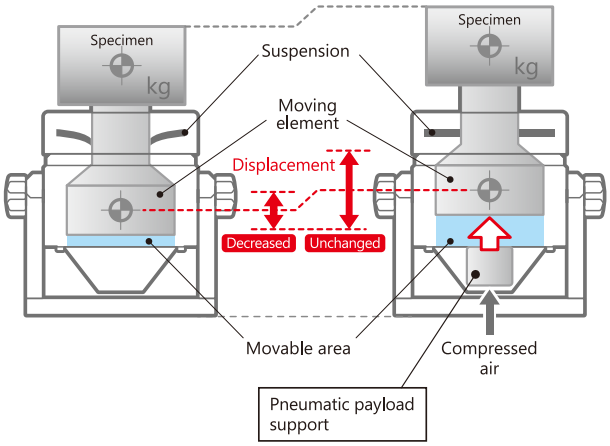
When a heavy test object is loaded, the support spring extends and causes the moveable range to decrease.

→ Maximum displacement decreases

• Air Suspension Mechanism

When a heavy test object is loaded, the air suspension raises the armature equivalent to the increase in mass.

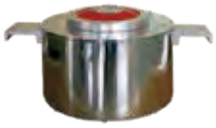
→ Maximum displacement is maintained



All-weather vibration test system

The compact all-weather vibration test system can be placed in temperature and humidity test chambers to enable combined environmental reliability testing.

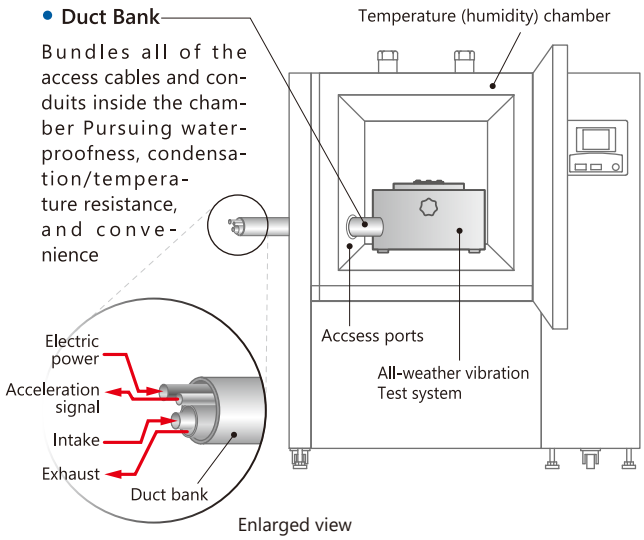
Compact, light-weight, waterproof, and highly resistant to condensation and temperature, this test system can be placed in temperature and humidity test chambers for use as a combined environmental reliability test system. The test chamber access ports can be used to connect the devices, thus, eliminating the need to modify the testing chamber. This system can also be used as a stand-alone vibration test system, thesefore allowing for the effective use of various testing equipment.



9514-A Series
(All-weather type used in workspace of environmental chamber)

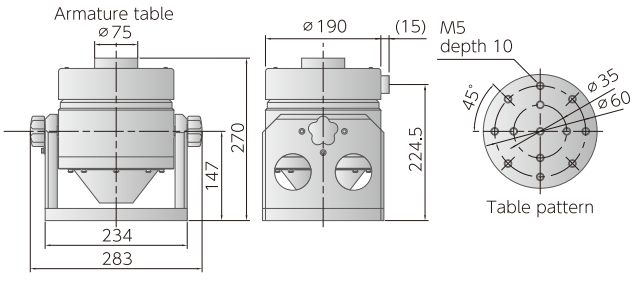
• Duct Bank

Bundles all of the access cables and conduits inside the chamber Pursuing waterproofness, condensation/temperature resistance, and convenience

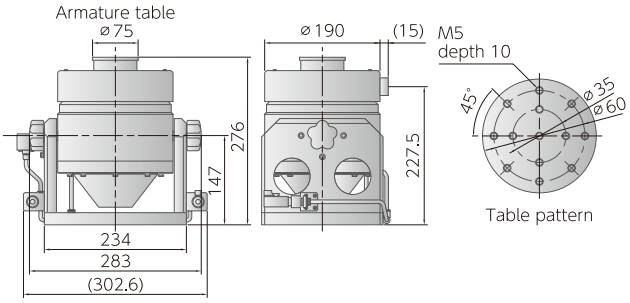


Outline Drawing

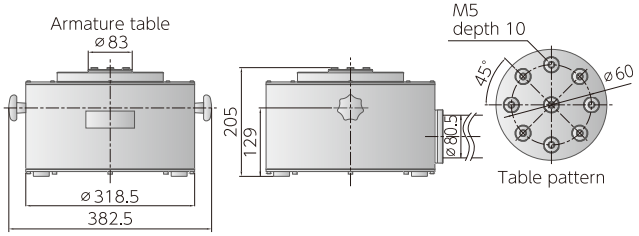
• 9514-AN/SD · 9514-AB/SD · 9514-AB/WF



• 9514-AN/AS · 9514-AB/AS



• 9514-AB/AW



Power Amplifier
For Compact Vibration Test System


371-A


372-A


373-A


375-D

This power amplifier is specialized for Compact Vibration Testing System. This specialized vibration testing power amplifier is optimally designed for Compact Vibration Testing System and can also supply power for air-cooling blowers.
In addition, many options, such as oscillator, constant current mode, remote start and stop, duct silencers, and fan stop functions can apply, so this gives it the extensibility to suit all types of testing conditions.

Power Amplifier Specifications

Model		371-A	372-A	373-A	373-A/Z12	373-A/Z13
Apparent Power	VA	110	220	330	330	330
Output Voltage	V_{rms}	20.0	27.5	20.0	20.0	20.0
Output Current	A_{rms}	5.5	8.0	16.5	16.5	16.5
Frequency Range	Hz	2 to 30k	2 to 30k	2 to 10k	2 to 10k	DC to 10k(★1) DC to 4k(★2)
Input Impedance	Ω	10k	10k	10k	10k	10k
Input Voltage	V_{rms}	1.0	1.0	1.0	1.0	1.0
Matching Impedance	Ω	3.64	3.44	1.21	1.21	1.21
Load Impedance	Ω	1.82	1.72	0.67	0.67	0.67
S/N	dB	80	80	80	80	80
Distortion		Less than 0.5%	Less than 0.5%	Less than 0.5%	Less than 0.5%	Less than 0.5%
Meter	A_{rms}	7.5	10.0	20.0	20.0	20.0
Input Connector		BNC	BNC	BNC	BNC	BNC
Input To Blower	VA	-	200Max.	-	-	-
Protector		Over current Transistor tmperature	Over current Transistor tmperature	Over current Transistor tmperature	Over current Transistor tmperature Air pressure	Over current Transistor tmperature Air pressure
Input Power		AC100V 50/60Hz	AC100V 50/60Hz	AC100V 50/60Hz	AC100V 50/60Hz	AC100V 50/60Hz
Maximum Power	VA	300	800	1.1k	1.1k	1.1k
Dimensions	mm	480W×149H×350D	480W×149H×350D	480W×249H×400D	480W×249H×400D	480W×249H×400D
Mass	kg	15.0	15.0	37.0	37.0	37.0
Operating Environment		Temp. : 0 to 40°C, hum. : 20 to 85%RH w/o dewdrop				

Model		373-FW	374-A	375-A/Z22	375-D
Apparent Power	VA	360	440	840	840
Output Voltage	V_{rms}	30.0	40.0	35.0	35.0
Output Current	A_{rms}	12.0	11.0	24	24
Frequency Range	Hz	2 to 5k	2 to 20k	DC to 10.0k	DC to 5.0k
Input Impedance	Ω	50k	10k	10k	10k
Input Voltage	V_{rms}	1.0	1.0	1.5	1.5
Matching Impedance	Ω	1.21	3.64	1.25	1.46
Load Impedance	Ω	0.67	1.82	0.63	0.73
S/N	dB	70	80	80	70
Distortion		Less than 0.5%	Less than 0.5%	Less than 0.5%	Less than 1.0%
Meter	A_{rms}	20.0	20.0	25.0	25.0
Input Connector		BNC	BNC	BNC	BNC
Input To Blower	VA	200Max.	300Max.	400Max.	200Max.
Protector		Over current Transistor tmperature	Over current Transistor tmperature Leakage Protector	Over current Transistor tmperature Leakage Protector	Over current Over voltage Transistor tmperature Overdisplacement Interlock
Input Power		AC100V 50/60Hz	AC100V 50/60Hz	1Φ AC200V 50/60Hz	1Φ AC200V 50/60Hz
Maximum Power	VA	1.1k	1.5k	2.4k	1.8k
Dimensions	mm	480W×249H×400D	480W×249H×400D	480W×249H×602D	480W×199H×450D
Mass	kg	37.0	37.0	52.0	35.0
Operating Environment		Temp. : 0 to 40°C, hum. : 20 to 85%RH w/o dewdrop			

(★1) Under voltage mode (★2) Under current mode

Oscillator Option for Power Amplifier Unit

Model	Power Amplifier Model/G
Frequency Range	2 ranges,1 to 1kHz and 100 to 100kHz
Frequency Adjust	FINE: Resolution 2Hz from 1 to 1kHz 200Hz from 100 to 100kHz COARSE : More than 5hz adjustable from 1 to 1khz More than 50hz adjustable from 100 to 100khz
Frequency Accuracy	±2% (+2 scale) @min FINE
Frequency Stability	0.5Hz/°C TYP at 1kHz (from 1 to 1kHz)
Output Waveform	Sinusoidal waveform
Output Voltage	±1.0dB (within same range) 500 Hz standard from 1 to 1kHz 5 kHz standard from 100 to 100kHz
Distortion	Less than 0.3% From 5 to 1khz(1 to 1khz range) Less than 0.5% From 100 to 50khz(100 to 100khz range) Less than 0.7% From 50k to 100khz(100 to 100khz range)

■ Frequency Counter

Frequency Range	1 to 100kHz
Display	6 digits
Resolution	1Hz
Accuracy	±1Hz
Gate Time	1s fixed

■ Miscellaneous (Option Feature)

- Manual Operation of Blower
- DC 12 V Input Power with Pressure Alarm Switch
- Constant Current Mode
- Remote Start/Stop with Remote Control Box
- Remote Start/Stop with Timer and Remote Control Box
- Duct Silencer
- Stop Function of Fan
- Oscillator, Vibration Meter, Timer, Remote Control Switch

Application

The following introduces several application examples using compact vibration generators.
We offer many kinds of testing systems by adding various applications to our products corresponding to clients' requirement.

■ Horizontal Testing Solution and Reinforcement against Offset Load

The figure shows the add-on features, horizontal slip table with linear bearing and einforcement against offset load in vertical vibration mode. The table size can be changed according to the customer's needs.

Model : EM-983
Ultra High Frequency Vibration Generator

The EM-983 is a high performance vibration generator of ultra high frequency and small cross-talk.
Designed for primarily measuring the high frequency characteristic of head suspension for a hard disk.

- Upper Operating Frequency : 100kHz
- Ceramic armature structure
- Use : Measuring frequency characteristic of head suspension for hard disk and accelerometer, and spurious of crysta l for cellular phone.

Raised Type for
Horizontal Application

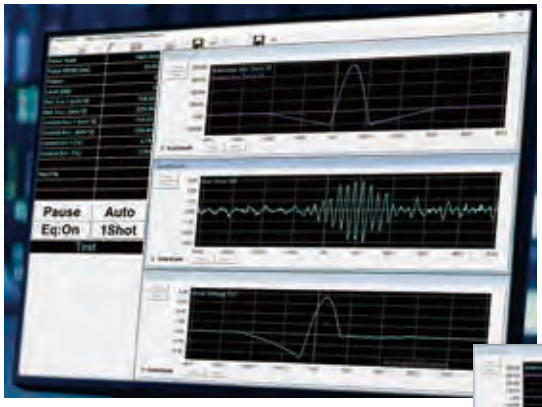
Equipped with
Degaussing Coil

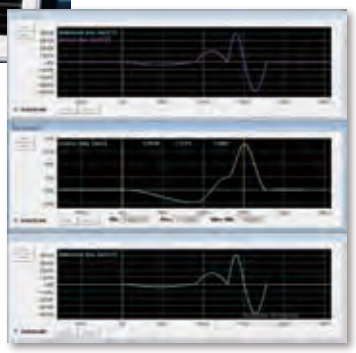
FS Series

Electronic Parts Precision Equipment

Automotive Equipment

The FS series is specialized in high performance shock tests designed for developing air bag sensors.
The reliability of the sensor to be incorporated into an air bag system needs to be extremely sensitive in its nature. To succeed in controlling the characteristics of each sensor, the test system itself must be highly reliable and accurate. The outstanding response characteristics and control technology of an electrodynamic actuator allows success in manufacturing the test system that can meet the above requirements. We have a large selection of shock test systems depending on your application such as development, inspection in-production line and head-on and flank crash simulation.





People's Republic Of China National Standard (GB)
Defined Waveform
GB39732-2020

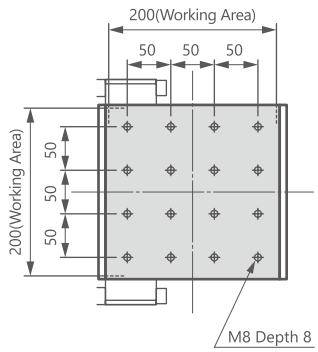
FS Series Specifications

	Model		FS-1022B/05-A69/03-E271	FS-2045B/15-A68/06-E271
Configuration	Shock Generator		905-SH/10	922-SH/20
	Power Amplifier		369A-0503-05SH(CRD-1500)	368A-0606-22SH(CRD-2000)
	Control System		271-C(CRJ-1500)	271-C(CRJ-1500)
Rating	Shock Force	kN_{0-p}	4.9	15.2
		(kgf_{0-p})	(500)	(1550)
	Maximum Acceleration	m/s^2	612(at 2kg load)	980(at 5kg load)
	Maximum Displacement	mm_{p-p}	100	200
	Maximum Velocity	m/s	2.2	4.5
	Maximum Velocity Change	m/s	4.4	6
	Power Consumption	kVA	16	40
	Maximum Payload	kg	10	10
	Supply voltage	V	200 or 400	200 or 400
	Supply frequency	Hz	50 or 60	50 or 60
	Power phases	Φ	3	3
Shock Generator	Moving Element	kg	6(including table)	10.5(including table)
	Table Pattern	mm	PS-200	PS-150-01
	Table Screw	mm	36-M6 depth9	16-M8 depth9
	Outline Dimensions	mm	620W×1203H×920D	900W×970H×1460D
	Mass	kg	500	1500
Amplifier Rack	Outline Dimensions	mm	554W×1521H×1010D	554W×2025H×1010D
	Mass	kg	400	700
Console Rack	Outline Dimensions	mm	554W×1505H×814D	554W×1505H×814D
	Mass	kg	180	180

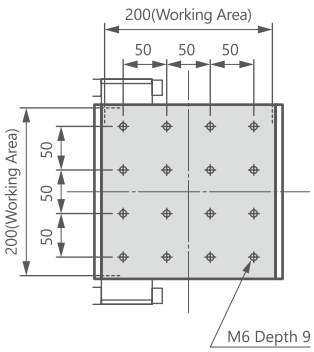
	Model		FS-3085B/12H-A68/12-E271	FS-3093B/29H-A68/18-E271
Configuration	Shock Generator		922-SH/30	922-SH/30H
	Power Amplifier		369A-1010-22SH(CRD-2000W)	369A-1818-22SH(CRD-2000T)
	Control System		271-C(CRJ-1500)	271-C(CRJ-1500)
Rating	Shock Force	kN_{0-p}	12	29
		(kgf_{0-p})	(1224)	(2957)
	Maximum Acceleration	m/s^2	500(at 5kg load)	1870(at 4kg load)
	Maximum Displacement	mm_{p-p}	300	300
	Maximum Velocity	m/s	8.5	9.3
	Maximum Velocity Change	m/s	12	16
	Power Consumption	kVA	70	115
	Maximum Payload	kg	10	5
	Supply voltage	V	200 or 400	200 or 400
	Supply frequency	Hz	50 or 60	50 or 60
	Power phases	Φ	3	3
Shock Generator	Moving Element	kg	11.5(including table)	11.5(including table)
	Table Pattern	mm	PS-150	PS-150
	Table Screw	mm	16-M8 depth8	16-M8 depth8
	Outline Dimensions	mm	900W×991H×1660D	900W×991H×1660D
	Mass	kg	2100	2100
Amplifier Rack	Outline Dimensions	mm	1108W×2009H×1010D	1662W×2059H×1010D
	Mass	kg	800	1300
Console Rack	Outline Dimensions	mm	554W×1505H×814D	554W×1505H×814D
	Mass	kg	180	180

Table Pattern

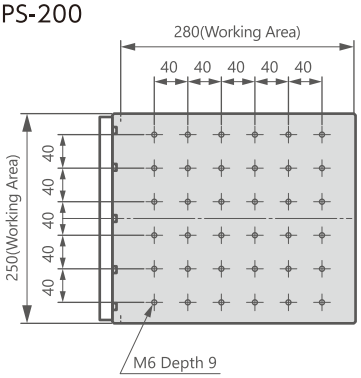
PS-150



PS-150-01



PS-200



Accelerometer

EMIC offers many kinds of accelerometers available for various vibration measurements. They are ultra small, light weight accelerometers for highly precise measurements. A special tri-axial accelerometer for simultaneously measuring a vibration in three orthogonal axes is available. A large output accelerometer for measuring earthquakes and a suitable accelerometer for measuring and analyzing building structures.






Accelerometer Specification

Model		710-D	712-B3	720-BW	731-B	760-B	541-DSH
Type		Small/Light Weight	Tri-Axial	Water-Proof	General Purpose	Large Output	High Temperature
Dimensions	mm	Φ8×5	17.5W×9H×17.5D	Φ15×8	Φ17.5×9.8	24_{HEX}×30	14_{HEX}×29
Feature		Vibration measurement and modal analysis on small object	Simultaneous dynamic measurement in three orthogonal axes on small object	Center hole type suited to narrow space. Water-proof against 0.6 MPa	Center hole type suited to attach to narrow space. Side connector for easily routing cable	Most suited to low acceleration measurement on building and structure	Most suited to measurement at high temperature such as combined environmental test
Sine Vibration Limit	m/s^2	5000	5000	5000	5000	1250	-
Shock Limit	m/s^2	10000	10000	10000	15000	2500	16000
Mass	g	1.9	14	11	13.5	98.6	35
Frequency Response	Hz	*~20 k±3dB	*~8 k±1dB	*~8 k±1dB	*~7 k±1dB	*~3.5 k±1dB	*~5 k
Charge Sensitivity	$pC/(m/s^2)$	0.2±15%	0.347±20%	1.33±20%	3.67±20%	35±20%	5.0±25%
Mounted Resonance	Hz	More than 60 k	More than 25 k	More than 26 k	38 k±5	13.5 k±4	More than 27k
Temperature Range	°C	−50 to +160	−50 to +160	−20 to +120	−50 to +160	−20 to +120	−20 to +250
Construction		Piezoelectric Shear	Piezoelectric Shear	Piezoelectric Shear	Piezoelectric Shear	Piezoelectric Shear	Piezoelectric Compression
Capacitance	pF	1200±20%	750±25%	1900±25%	1900±25%	1500±25%	1000±25%
Transverse Sensitivity		Less than 5%	Less than 5%	Less than 5%	Less than 5%	Less than 5%	Less than 5%
Piezoelectric Material		Pb(Zr, Ti)O_3	Pb(Zr, Ti)O_3	Pb(Zr, Ti)O_3	Pb(Zr, Ti)O_3	Pb(Zr, Ti)O_3	Pb(Zr, Ti)O3
Case Material		Stainless	Titanium	Stainless	Titanium	Stainless	Stainless
Mounting		M2 thru, adhesive	M2 thru, adhesive	M4 thru	M4 thru	M8×5 Internal thread	M6×5 Internal thread
Cable/Adapter(Micro BNC)		AC-7020-BM(BLM-001)	AC-8030-AB×3	Integral 10m BNC w/plug	AC-8030-AB	AC-8030-AB	AC8020-ABH High temp.

*Low-frequency response frequency is dependent on the charge vibration meter.

Accelerometer Cable

■ Standard Product

Product Description	Cable Outline	Length	Model
Microdot Plug - BNC Plug Accelerometer Cable	10-32UNF — BNC	2m	AC-8020-AB
		3m	AC-8030-AB
		6m	AC-8060-AB
		9m	AC-8090-AB
Microdot Plug - Microdot Plug Accelerometer Cable	10-32UNF — 10-32UNF	2m	AC-8020-AM
		3m	AC-8030-AM
		6m	AC-8060-AM
		9m	AC-8090-AM
Mini-Microdot Plug - Microdot Plug Accelerometer Cable	M3 — 10-32UNF	2m	AC-7020-BM
		3m	AC-7030-BM

*For environments exceeding 160°C, please use the high-temperature accelerometer cable.
*For accelerometer cables excluding the above cable lengths, please use made-to-order or custom-made products.

■ Made To Order Products (Less than or equal to 10 meters)

Product Description	Cable Outline	Length	Model
Microdot Plug - BNC Plug Accelerometer Cable	10-32UNF — BNC	L≤10m	AC-8XXX-AB
Microdot Plug - BNC Plug High Temp. Acc. Cable		L≤10m	AC-8XXX-ABH
Microdot Plug - Microdot Plug Accelerometer Cable	10-32UNF — 10-32UNF	L≤10m	AC-8XXX-AM
Microdot Plug - Microdot Plug High Temp. Acc. Cable		L≤10m	AC-8XXX-AMH
Mini-Microdot Plug - Microdot Plug Accelerometer Cable	M3 — 10-32UNF	L≤10m	AC-7XXX-BM

*For environments exceeding 160°C, please use high-temperature pickup cables. *XX specifies the cable length (in 0.1m increments).

■ Custom Made Products (Exceeding 10 meters)

Product Description	Cable Outline	Length	Model
Microdot Plug - BNC Plug Accelerometer Cable(Standard use)	10-32UNF — BNC	L>10m	AC-8XXX-AB
Microdot Plug - BNC Plug High Temp. Acc. Cable		L>10m	AC-8XXX-ABH
Microdot Plug - Microdot Plug Accelerometer Cable(Standard use)	10-32UNF — 10-32UNF	L>10m	AC-8XXX-AM
Microdot Plug - Microdot Plug High Temp. Acc. Cable		L>10m	AC-8XXX-AMH
Mini-Microdot Plug - Microdot Plug Accelerometer Cable	M3 — 10-32UNF	L>10m	AC-7XXX-BM

*For environments exceeding 160°C, please use high-temperature pickup cables. *XX specifies the cable length (in 0.1m increments).

Accessories

■ Conversion Adapter / Coaxial Coupler

Product Description	Outline View	Model
Conversion Adapter (BNC Plug - Microdot Jack)	10-32UNF — BNC	BLM-001
Coaxial Coupler (Microdot Jack - Microdot Jack)	10-32UNF — 10-32UNF	EJ-34

■ Insulated Mounting Stud

Product Description	Model
Insulated Stud for 540-DT	RS-171D
Insulated Stud for 710-D	TJ-1026AC
Insulated Stud (M5) for 731-B	RS-171B14C6
Insulated Stud (M6) for 731-B	RS-171B14D6

Charge Amplifier

6000 Series

Measuring a wide variety of vibrations: automotive, rail transportation equipment vibration, motor/pump vibration, vibration response during vibration test. Also available for a vibration test device for calibration of equipment.
Compatible with input of piezoelectric accelerometers and accelerometers with built-in pre-amplifiers. Various options are available: PC communication port, etc.

6001-AHD

6002-A

Charge Amplifier Specifications

Model	6001-AHD	6002-A
Input Channel	1ch	2ch
	Piezoelectric accelerometers (Front Connector) Accelerometers w/built-in pre-amplifier (Rear Connector)	
Measuring Mode	Acceleration : m/s² Velocity : mm/s Displacement : mm	Acceleration : m/s²
Measuring Range	Acceleration : 0.1 to 10000m/s² Velocity : 0.1 to 10000mm/s Displacement : 0.01 to 1000mm	Acceleration : 0.1 to 10000m/s²
Input Power	DC9 to 15V	DC9 to 15V
Dimension	36W×149H×240D	36W×149H×240D
Mass	1.0kg	
Ambient Conditions	−10 to +50°C(No condensation)	

■ AC Power Supply, USB Port

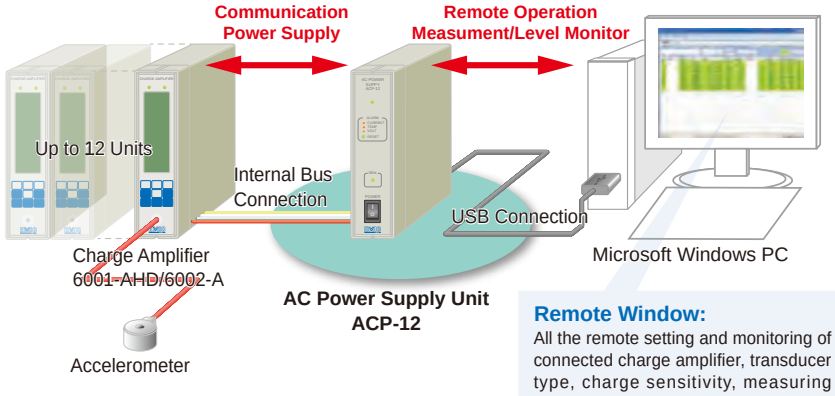
Model	ACP-12
Input Power	AC 85 to 265 V 47 to 66 Hz
Output	DC+12V±5% 4A
Combined Number Of Units	Max. 12 units
Usb Port	USB2.0
Dimension	36(W)×149(H)×240(D)
Mass	1.0 kg

SVM Remote Software

The software can operate the 6001-AHD charge amplifier and 6002-A 2-channel charge amplifier by making it possible to remotely set the operator panel through a USB interface.
The ACP-12 can connect up to 12 units in total enabling the remote operation of up to 24 channels.

* It is also possible to configure the 6001-AHD up to 24 units (24 channels) using two ACP-12 units (one of them has no communication function).
* As for the configuration from 25 to 99 channels, please contact us.

Model: ACP-12 AC Power Supply Unit and Remote Software



Remote Window:
All the remote setting and monitoring of connected charge amplifier, transducer type, charge sensitivity, measuring mode, filter can be performed.

Pre-charge Amplifier

504 Series

The 504 series precharge amplifiers are converters that transform the charge output from piezoelectric accelerometers into voltage signals. They are available in 1-channel, 2-channel, and 4-channel units to suit various vibration measurement and control applications.
Each precharge amplifier allows for flexible input sensitivity settings within its specification range, making it compatible with a wide range of general-purpose accelerometers.
In addition to vibration test systems, we offer power supply units (Model: Suffix PS) to enable use with various measurement devices, making these amplifiers versatile for general applications.

504 Series Pre-charge Amplifier Specifications

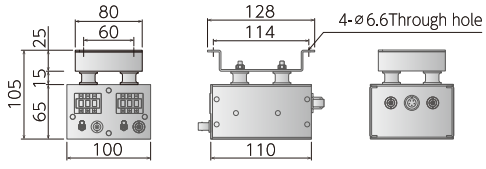
Model(★1)		504-E	504-E-2	504-E-4	504-E-2/Z18	504-E-4/Z18
Input Channel		1	2	4	2	4
Sensitivity Range	pC/(m/s²)	0.100 to 0.999 1.00 to 9.99	0.100 to 0.999 1.00 to 9.99	0.100 to 0.999 1.00 to 9.99	0.100 to 0.999 1.00 to 9.99	0.100 to 0.999 1.00 to 9.99
Maximum Input (★2)	pC	2200 (0.100 to 0.999pC/(m/s²))	2200 (0.100 to 0.999pC/(m/s²))	2200 (0.100 to 0.999pC/(m/s²))	2200 (0.100 to 0.999 pC/(m/s²))	2200 (0.100 to 0.999pC/(m/s²))
	pC	22000 (1.00 to 9.99pC/(m/s²))	22000 (1.00 to 9.99pC/(m/s²))	22000 (1.00 to 9.99pC/(m/s²))	22000 (1.00 to 9.99pC/(m/s²))	22000 (1.00 to 9.99pC/(m/s²))
Frequency Range	Hz	5 to 5000	5 to 5000	5 to 5000	1 to 5000	1 to 5000
Output Voltage	mV/(m/s²)	5	5	5	5	5
Max. Output Voltage	V	±10	±10	±10	±10	±10
Input Power		DC± 15V±15% 30mA	DC±15V ±15% 30mA	DC±15V ±15 30mA	DC±15V ±15% 30mA	DC±15V ±15% 30mA
Mass	kg	0.45	0.6	1.0	0.6	1.0

Model(★1)		504-CB/TKS	504-CB/TKS-2	504-CB/TKS-4
Input Channel		1	2	4
Sensitivity Range	pC/(m/s²)	0.100 to 9.999	0.100 to 9.999	0.100 to 9.999
Maximum Input(★2)	pC	100000	100000	100000
Frequency Range	Hz	0.25 to 5000	0.25 to 5000	0.25 to 5000
Output Voltage	mV/(m/s²)	10	10	10
Max. Output Voltage	V	±10	±10	±10
Input Power		DC±15V ±15% 30mA	DC±15V ±15% 30mA	DC±15V ±15% 30mA
Mass	kg	0.45	0.65	1.0

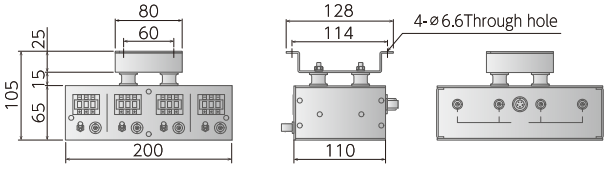
(★1)The model with a code "-PS" that can receive the input power of AC 100 V±0 V 50/60 Hz is also available.
(★2)The maximum input charge is limited by the maximum output voltage.

Outline Drawing

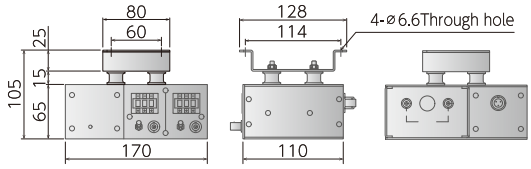
- 504-E-2



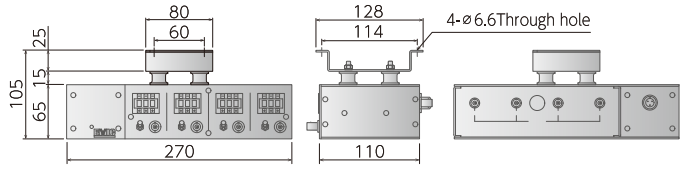
- 504-E-4



- 504-E-2-PS



- 504-E-4-PS



Primax Series

Large Temperature (Humidity) Testing Equipment

The Primax series temperature (humidity) test chambers are made to order, allowing us to provide products tailored to your specifications, such as temperature and humidity ranges and chamber capacity. We can also accommodate conditions beyond the standard specifications and accept special orders, so feel free to contact us. With a wide range of models available, including large-sized ones, you can choose the test chamber that best suits your needs.

Infrared Temperature (Humidity) Test Chamber

This test device installs infrared lamps in a temperature (humidity) test chamber to simulate sunlight exposure. It can recreate real-world conditions, such as those for automotive instrument panels and seats, for durability testing.

Large Temperature (Humidity) Test Equipment Specifications

	Temperature (Humidity) Chamber	Large Temperature (Humidity) Chamber
Temperature Range	−70 to +200°C(300°C)	−70 to +200°C(300°C)
Rate Of Temperature Change	1 to 10°C/min	1 to 3(5)°C/min
Humidity Range	30 to 98%RH	30 to 98%RH
Test Chamber Capacity	800 to 3400L	3400 to 12000L

Dry Air Temperature (Humidity) Test Chamber

This is a temperature (humidity) test chamber that generates a low-humidity environment with a built-in dehumidifier. It can perform drying processes such as temperature control, eutectic point confirmation, adhesive solvent drying, and moisture removal.

Battery Evaluation Temperature(Humidity) Test Chamber with enhanced safety

This temperature (humidity) test chamber is equipped with safety features such as a pressure relief vent, emergency stop switch, screw-lock door, gas detector alarm, and automatic fire suppression system, designed for testing secondary batteries with the potential for explosion or combustion of flammable gases.

Shielded Temperature (Humidity) Test Chamber

It is a combined EMC test device that shields electromagnetic waves with a metal plate on the walls of a temperature (humidity) test chamber, evaluating resistance to noise from electronic device connectors, BCI tests, and ESD tests.

Qualitec Series

Temperature (Humidity) Walk-In Chamber

This is a fully customized large temperature (humidity) test chamber utilizing our unique technology. The door opening is large enough to accommodate test items such as rapid chargers and large control racks. Please consult us regarding the dimensions and temperature (humidity) range.

Energy-Efficient Temperature (Humidity) Walk-In Chamber

The adoption of the brine method reduces excess humidification and improves cooling performance. Compared to direct expansion, it enables easier temperature control, reduces compressor operation time, and lowers power consumption.

Temperature (Humidity) Testing Room Specifications	
Temperature Range	−30 to +80°C (−50 to +120°C)
Humidity Range	5 to 95%RH
Interior Dimensions	Width : 2500 to 3600mm Height : 2200 to 2500mm Depth : 3400 to 4500mm

Calibration Room

We provide a reliable calibration environment by calibrating instruments and analyzers, maintaining stable temperature, humidity, and specific environmental conditions. We can also provide necessary conditions for calibration, such as noise and vibration control wall structures and high-frequency shields.

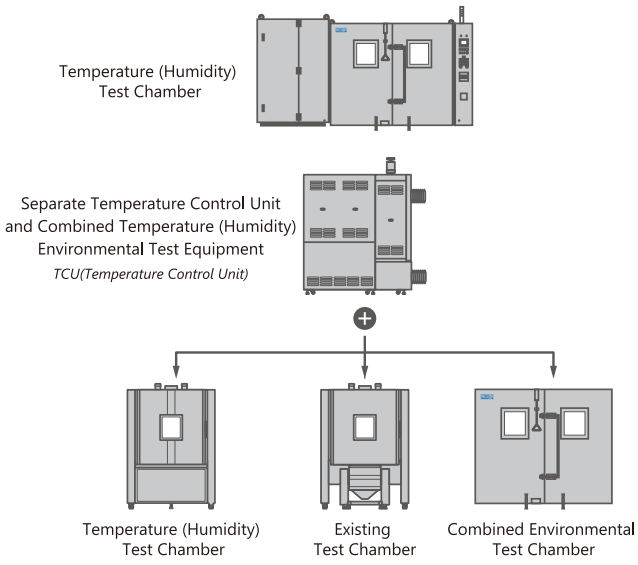
Artificial Weather Chamber

We recreate desired weather conditions by adjusting temperature, humidity, air pressure, solar radiation, and air composition, simulating climates like deserts, Antarctica, or specific temperature environments for various research needs.

Carry Pack CP Series

This is a temperature control booth that is easy to assemble, move, and handle compactly. It features temperature setting programs and a timer function. It is used for industrial product aging, food fermentation, and plant growth. Harmonizing and control units are also available, and custom sizes for the test chamber can be provided.

Separate Temperature Control Unit
and Combined Temperature (Humidity) Environmental Test Equipment

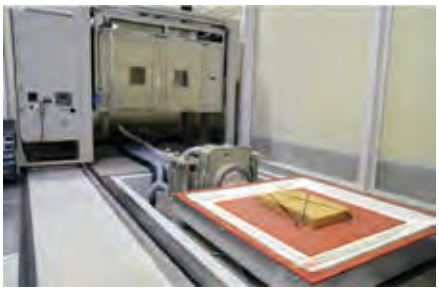


This Separate Temperature Control Unit has a separate design with the test chamber and air conditioning unit. Air for temperature and humidity control circulates between them, allowing flexible layouts that maximize space. Isolating the chamber from vibration sources minimizes impact on the specimen. The chamber achieves a rapid temperature change rate of 12.5°C/min (from -45°C to +130°C), enabling fast testing and shorter temperature cycle times. The separate air conditioning unit can also be connected to existing chambers to improve temperature and humidity control.

Large Environmental Test Chamber with Infrared Radiation

- It supports horizontal and vertical vibration testing with a max force of 40 kN, displacement of 100 mm (p-p), and a 1500 × 1500 mm table.
- Temperature (humidity) testing is possible from -40 to +150°C and 20 to 98 %RH in a 2000 W × 1500 H × 2000 D mm chamber.
- Infrared environmental testing at +80°C surface temperature is also available.
  Combined vibration, temperature, humidity, and infrared testing is supported.

Infrared lamp-equipped temperature (humidity) test chamber section



- Temperature (Humidity) Test Chamber with Infrared Lamp
  VC-202DWMYS(32)P4T-H/V-IR
- Large Horizontal and Vertical Vibration Test System
  FL-40K/100

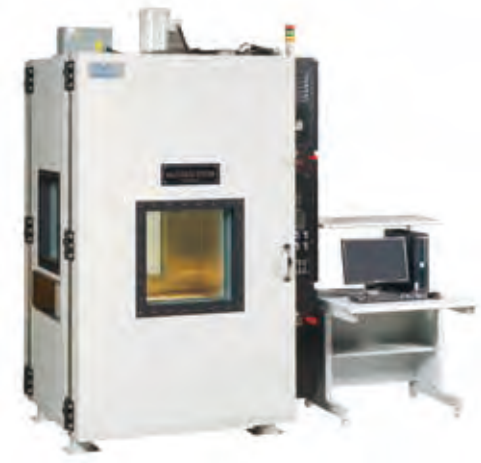
EHVC Series Rapid VIBRO CHAMBER®

*The vibration controller is mounted in the console rack (Optional)

The EHVC Series Rapid VIBRO CHAMBER® is designed for highly accelerated life testing, the demand is increasing today. This is a joint system of the AGREE chamber and thermal shock chamber that we have manufactured and makes the temperature rate up to 16.8°C/min feasible with a compressor only.
With this feature, the highly accelerated life test such as AGREE tests, most thermal shock tests can be done with one unit. Also the area requirement for installing the unit is about a half the space compared with the thermal shock test chamber composed of three compartments made by us until now.

"VIBRO CHAMBER" is a trademark of EMIC CORPORATION. バイブロ チャンバー VIBRO CHAMBER

HALT/HASS EVTC Series Highly Accelerated Life Test System



HALT/HASS testing challenges the design, components, sub-assemblies and final assemblies of today's manufactured products. Stresses are applied through a number of conditions to set operational limits and ultimately precipitate failure in the HALT/HASS test environment. Rapid thermal change rate is one of the classic conditions that facilitate product stress.

- Six degrees of freedom random vibration
- Temperature range : -100 to +200 °C
- Temperature transition rate : 60 °C per minute (average)

*To limit the usage of LN2 gas, Hybrid models equipped with refrigerators are available.

Applied Products

We offer custom orders based on vibration and temperature-humidity testing equipment, adding unique features, different mechanisms, and subsystems tailored to your specifications, budget, and requirements. The original custom testing equipment we have developed and manufactured supports the unique technologies of major automobile manufacturers and others. We provide consistent service from design and manufacturing to adjustment and on-site installation.

*Because these products are custom ordered, EMIC may no longer manufacture these systems.

Vacuum CERT

Vacuum CERT simulates the vibration generated by launching rockets to test aerospace components such as bearings, gears, harmonic drives, and valves. Specimen characteristics are sequentially evaluated under temperature/vacuum combined environments.

- Vacuum chamber dimensions : φ1000mm×l1000mm
- Attainable pressure : Less than 1×10−5pa
- Temperature range : −150°c to +100°c
- Force : 80,000n(sine)57,700n rms(random)

NASDA (now JAXA)
Vacuum Environment Testing Facility

Vacuum Chamber

Heat Durability of Material Surface with Infrared Ray Irradiation/vibration Cert System

CERT with Infrared Ray Irradiation for testing Heat Durability of Material Surface Combined Environmental Reliability Test System for testing inner packaging material such as instrumentation panels, cut-out bodies, doors and bumpers. In addition to a customary vibration-temperature combined environmental stress, the surface of a specimen can be simultaneously subjected to heat stress due to sunlight.

- Temperature range : −45°C to +150°C
- Humidity range : 30 to 90%RH
- Surface Temperature range : +50°C to +150°C

CERT with Rotation Added

Vibration - Temperature/Humidity Combined Environmental Reliability Test System which forcefully rotates an actually configured specimen such as: water pumps, dynamos, alternators, etc. for a car.

- Temperature range : −40°C to +150°C
- Humidity range : 30 to 95%RH
- Rotation : 0 to 12000rpm
- Rotation torque : 0.4N·m

Details of Rotating Feature

CERT with Hose Pressure Testing

Combined Environmental Reliability Test System for testing a pressure-proof hose or radiator hose for a car. It tests the durability of a pressure-proof hose in its actual configuration under heating and circulating antifreeze or oil while pressurizing statistically or dynamically with a controlled temperature and vibration stress.

- Ambient temperature : −40°C to +150°C
- Hose pressurizing specification :
  - Maximum compression : 80kN
  - Maximum displacement : ±75mm
  - Pressurizing force : 19MPa
  - Circulating quantity : Maximum 40ℓ /min

Configuration of Hose in Workspace

Model : EMS-224
Angular Electrodynamic Shock Test System

EMS-224 is designed for testing the characteristic of an overturn angular velocity sensor (angular accelerometer for a reference acceleration signal) to be installed in a car. It is one of the various sensors used for cars and recently high performance test system for its development has been required. This shock test system is developed on an electrodynamic rotating actuator, and its control technology enables the reproductions of a haversine shock pulse and any angular velocity waveform as well as a half-sine shock pulse.

Agree Type
Combined Environmental
Reliability Test System

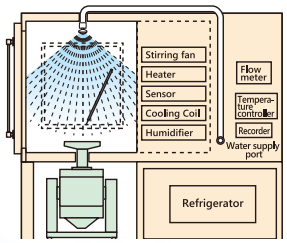
Combined Environmental Reliability Test (CERT) system is to test equipment for aircraft according to the MIL-STD-781C standard.

- Rapid heating and cooling performance from 5°C/min to 10°C/min
- Temperature range : −55°C to +177°C

CERT with Rain and Water Spray

Combined Environmental Reliability Test System for parts around the wheel of a car and those for motorcycle. In addition to ordinary temperature and humidity tests, the water can be also sprayed simulating the conditions of water pools and rain.

- Water splashing : Maximum 50ℓ/min
- Water splashing port : Spray nozzle
- Temperature range : −40°C to +150°C



Applied Products

*Because these products are custom ordered, EMIC may no longer manufacture these systems.

Model : VC-101DWFX(31)P2R-070BM/PAZ
Vibration-temperature/humidity Characteristic Inspection System

This is the latest system installed in an inspection agency for the purpose of inspecting and measuring vibrometers and vibration sensors. The system is designed for inspecting according to the qualification system of the industrial research institute specified in the ISO/IEC directive 25 (ISO/IEC17025). Measuring accuracy is set high and the measuring features meet customer specifications. The measuring accuracy is especially determined by how to force the armature to behave in a particular way. Due to the advanced armature constraint method, the pneumatic air support will increase the clearence, lower distortion, will have low waverse sensitivity.

Inside View of Workspace

Model : EMS-225
Dual Angular Electrodynamic Shock Test System

EMS-225 is designed for testing the characteristic of an angular velocity and acceleration sensor.
A specimen-mounting table moves back and forth along a circular arc to generate angular velocity or angular acceleration according to a reference profile. It is used for measuring the frequency characteristic of sensors loaded on a car and gyro sensor for AV equipment.
It is constructed to be easily combined with an environmental chamber to add temperature or humidity, which is an important environment for measuring characteristics.

Small Triaxial Vibration Sysytem

This device was developed for testing the characteristics of sensors, vibration devices, and similar equipment. By combining a compact shaker that can be used on a desk, it allows for multi-axis evaluation, such as 2-axis and 3-axis testing. The structure enables simulation close to real-world multi-axis conditions.

CERT for Exhaust Catalyst

Combined Environmental Reliability Test System for exhaust catalyst (catalyzer) of a car. The hot air of 1000°C generated with gas burner and the open air are supplied alternatively into the specimen on a shaker armature table. In addition, the water is also sprayed simulating the conditions of water pools and rain.

- Hot air temperature : RT to 1000°C
- Available gas : City gas, LP gas

Bridge Model Exciting And Attenuating Test System

The system is designed for analyzing its structure by exciting the model of a large bridge before construction. Its attenuation constant can be measured by switching it into attenuation mode after excited with an electrodynamic shaker. The moving element is supported by the bearings, thus mechanical friction is reduced as much as possible to realize a more accurate test.

Low Frequency and Acceleration CERT

Combined Environmental Reliability Test System for calibration and characteristic measurement at low frequency, it can be applied to test a low frequency acceleration sensor, riding comfort sensor, sensitive instrument to earthquakes, heater safety device against earthquakes.

- Frequency range : 0.1 to 100Hz
- Max. displacement : 300mm$_{p\text{-}p}$
- Rated force : 49N
- Temperature range : −50°C to +100°C

Contracted Test Services

*This service is limited to domestic use.

Outsourcing includes quality, reliability, durability, and environmental tests EMIC's contracted test service provides high-quality and reliable services.

We receive test specimens from our customers and conduct vibration tests, temperature (humidity) tests, and combined environmental tests at our contract testing center. Our engineers specializing in vibration and temperature (humidity) testing provide reliable test results based on their expertise and experience.

Information on Contract Testing Equipment

EMIC's contract testing services provide various testing equipment, including vibration testers, temperature (humidity) chambers, and environmental test systems, to meet customer requirements for environmental, quality, and durability testing.

200 kN Large-Scale Vibration-Temperature Combined Environmental Reliability Test System
Maximum excitation force: 200 kN
Table size: 2000 × 2000 mm

Large-Scale Triaxial Vibration Test System

Railway vehicle standards, earthquake simulation compatible
Table size: 2800 × 2800 mm

YouTube

Introduction to
Contract Testing Services

Test Lab Center

EMIC's testing centers are located at 7 sites in Japan and 1 abroad, offering optimal testing equipment tailored to the test requirements and applications, leveraging the strengths of a vibration test equipment manufacturer.

Mizunami Test Lab Center

Kobe Test Lab Center

Saitama Test Lab Center

Utsunomiya Test Lab Center

Hyogo Test Lab Center

Mizunami Test Lab Center

Yokkaichi Test Lab Center

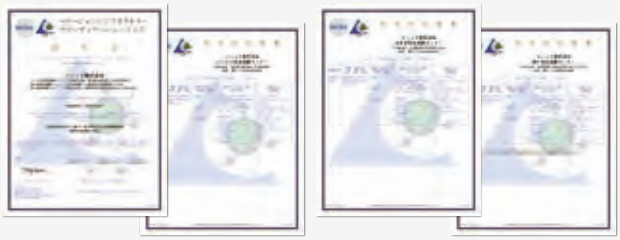
THAI EMIC CO., LTD.
(Thailand Contracted Testing Center)

Information about
the Testing Service Center

ISO/IEC 17025 Accreditation For Technical Competence

EMIC CORPORTION. is a testing laboratory accredited to ISO/IEC 17025:2017.

- **Certification Scope:**
  Sine wave vibration test of electronic components based on JIS C60068-2-6.
- **Certification Target:**
  Saitama Test Lab Center
  Yokkaichi Test Lab Center
  Kobe Test Lab Center
- **Certification Body:**
  Perry Johnson Laboratory Accreditation Inc. (PJLA)



ISO/IEC 17025 Certificate (Japanese)

Entrusted Test Service Guidance for Inquiry >>>

Feel free to contact us with any questions or requests for quotes regarding our testing services.

Inquiry Form

Solution Service

*This service is limited to domestic use.

EMIC's solution services provide fixture design and analysis for vibration testing to improve test accuracy. By measuring and analyzing various data during tests, we enable early detection of vibration phenomena. We also verify analysis models through experimental mode analysis to support development.

Vibration Test × **Vibration Analysis**

Pre-vibration test analysis

1. *Fixture design*
2. *Frequency analysis*
3. *Experimental mode analysis*
4. *Test condition proposal*

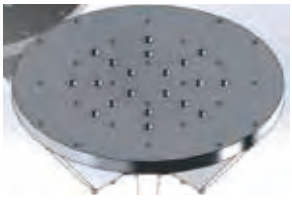
Data acquisition and analysis during vibration testing

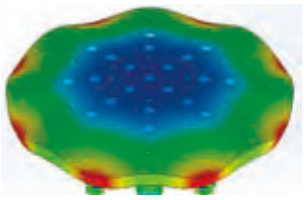
1. *Measurements using various sensors (accelerometers, strain gauges, etc.)*
2. *Non-contact measurements with high-speed cameras*
3. *Operating deflection shape analysis (operating deflection shapes)*

Development support for vibration issues

1. *Troubleshooting*
2. *Validation of analysis models*
3. *Optimization analysis*

Analysis Before Vibration Testing





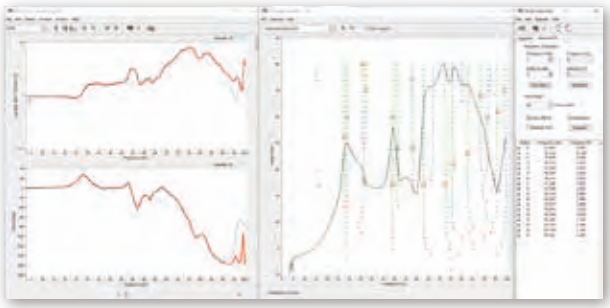
Fixture design and analysis

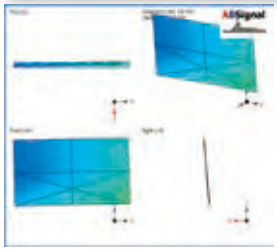
We design and manufacture vibration test fixtures, including CAE analysis for design fixtures and experimental mode analysis for fabricated fixtures.

Experimental mode analysis

We offer Experimental Mode Analysis (EMA) services using the "Modal VIEW Plus" software from F-MA Consulting Co., Ltd. Modal VIEW is a high-performance software that supports EMA, Operational Modal Analysis (OMA), and Order Tracking Analysis (OTA).
With Experimental Mode Analysis, you can quickly obtain results, including mode parameters, from multi-channel data.
Additionally, analysis of measurement data collected during vibration testing is also possible.

■ Vibration Analysis of Car Rear Door Operation





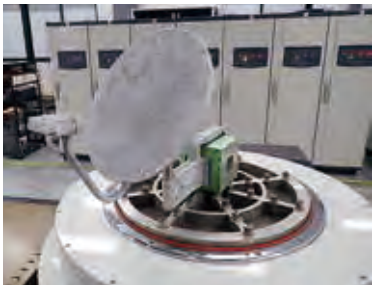
YouTube
Introduction to Vibration Analysis and Solution Service

Data Acquisition And Analysis During Vibration Testing.

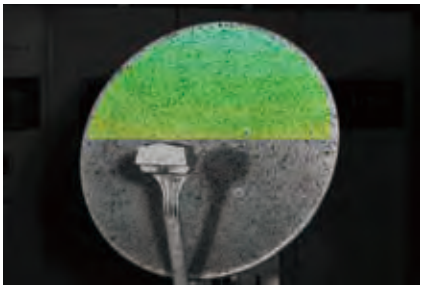
DIC analysis using a high-speed camera

DIC (Digital Image Correlation) is a method that uses two high-speed cameras to calculate strain and 3D displacement from shape and position changes. The results are provided as graphical data, such as strain distribution color maps and animations.

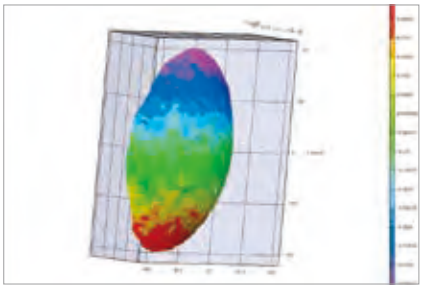
■ Example of DIC Analysis for a Parabolic Antenna



Parabolic Antenna Vibration Analysis



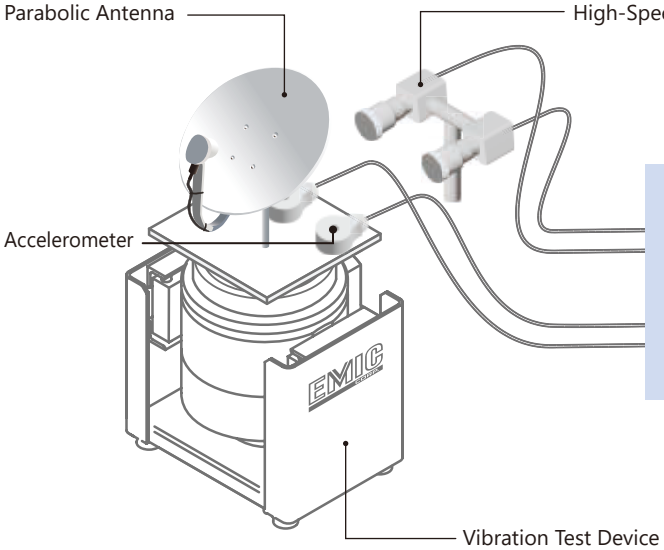
High-Speed Camera Recording



Dic Analysis

Non-contact measurement using a high-speed camera

In addition to conventional accelerometer measurements, we offer vibration measurement and strain/stress analysis solutions using high-speed cameras. We provide analysis-based support services for the vibration evaluation of development materials and products.

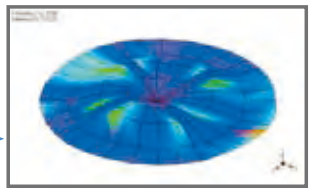


Common Response Data

Vibration Test Response Data

Various Vibration Analyses

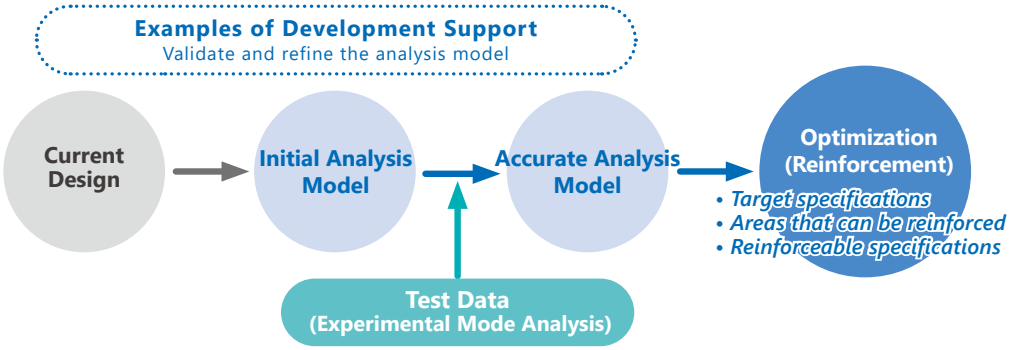
Operational Mode Analysis



Stress Mode Analysis

Development Support For Vibration Issues.

We conduct tests to solve customer challenges based on vibration analysis results, leading to development testing. Feel free to contact us.



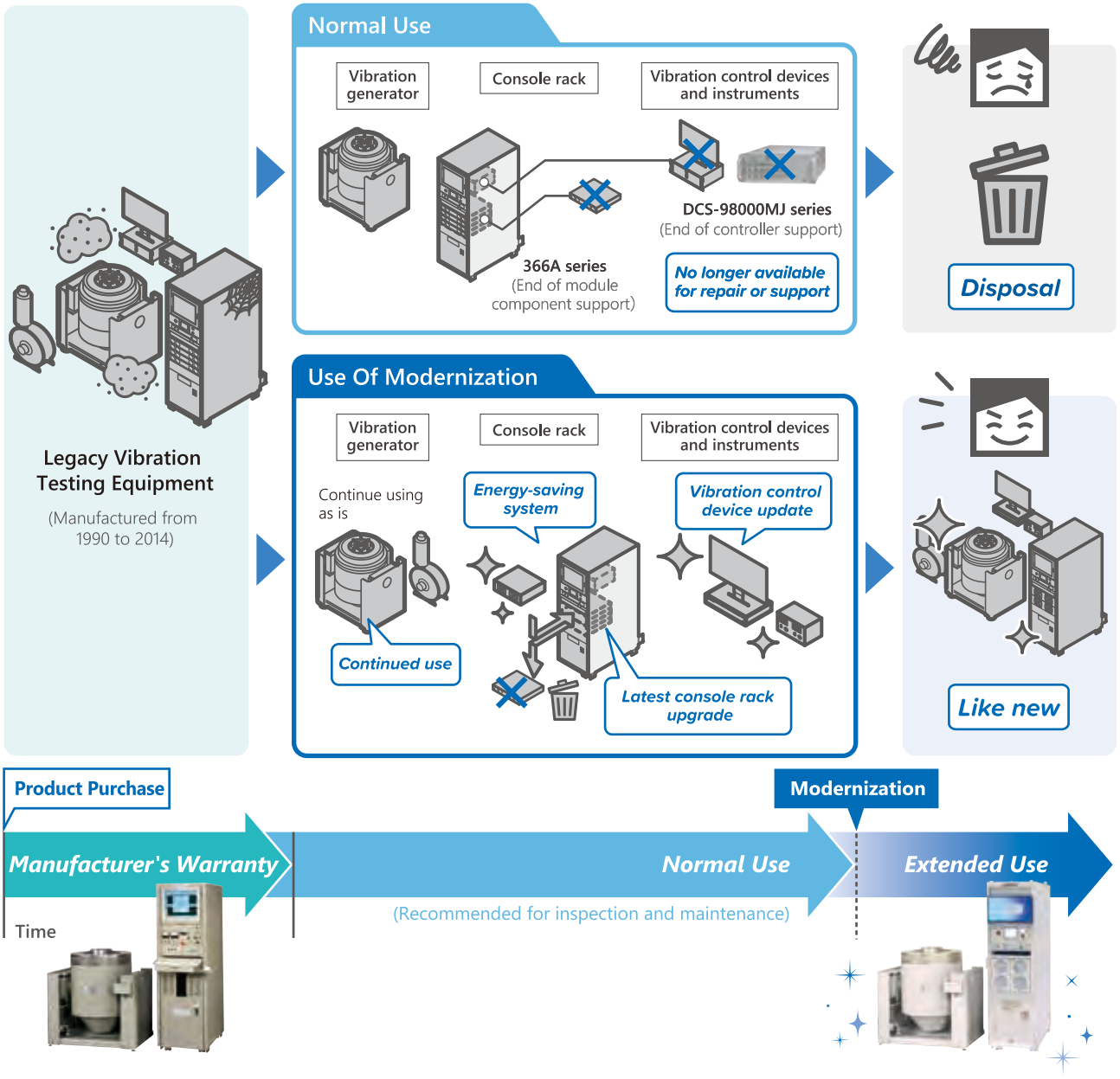
Modernization Program

This service involves collecting vibration test devices that are no longer supported with replacement parts or repair services, and refurbishing them to like-new condition through overhauling (disassembly, inspection, and repair), updating amplifier modules, and replacing parts. It offers a cost-effective alternative to new products while also providing environmental benefits, such as resource conservation and waste reduction. These efforts are known as the "Rebuild Program" or "Remanufacturing," and contribute to improved service, including "minimizing ownership costs" and "reducing downtime through quick parts supply."

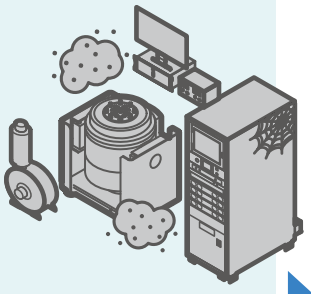
Perfect For These Types Of Users.

- The test equipment is used infrequently, but it has been used for long periods under nearly the same test conditions.
- The vibration control system and parts of the vibration test equipment are no longer supported, making repairs impossible.
- There is a desire to use the vibration test equipment long-term at a low cost.
- There is an interest in adding horizontal vibration and temperature (humidity) testing functions.
- There is a focus on reducing resource consumption and waste.

Product Lifecycle



Modernization Menu

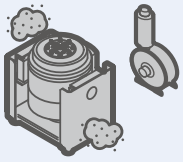


Legacy Vibration Testing Equipment

(Manufactured from 1990 to 2014)

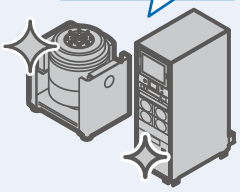
Vibration Generator Overhaul Course

Continue using as is

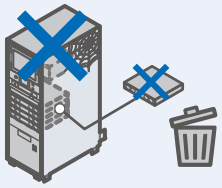


Others:
- Inspection
- Replacement of consumable parts
- Overhaul

Rebuilt to like-new condition



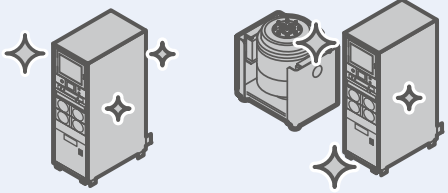
Console Rack Replacement Course



Amplifier Module Model 366A
(Discontinued in 2014)

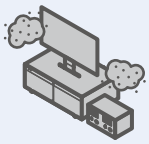
Console rack upgrade

Extended use with the latest components



Amplifier modules
Models 369A, 368A, etc.

Vibration Control System Replacement Course



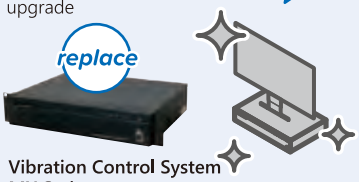
End of vibration control device support

Previous Model DCS-98000MJ
(Discontinued in 2014)

Vibration control system upgrade

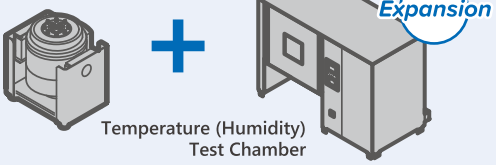
Support for the latest equipment

replace



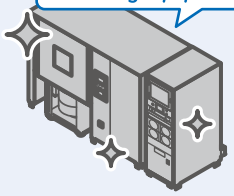
Vibration Control System
MX Series

Temperature (Humidity) Test Chamber Expansion Course

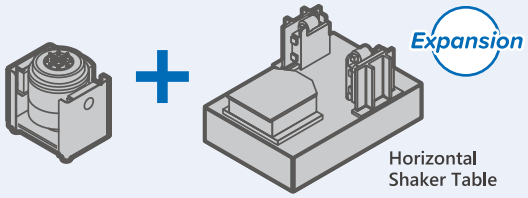


Temperature (Humidity) Test Chamber

Power up for combined environmental testing equipment

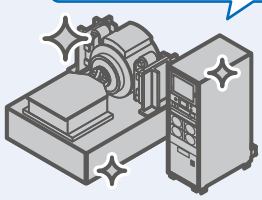


Horizontal Shaker Table Expansion Course



Horizontal Shaker Table

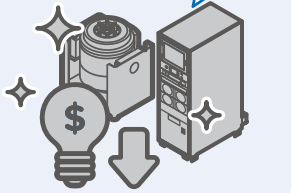
Power-up with a horizontal vibration table



Energy Saving Drive Modification Course

Energy Saving Drive System
ECO Vibe neo

Energy saving = Reduction in electricity costs



Customer Service

EMIC provides specialized technical support for maintenance after the installation of testing equipment and measuring instruments. Testing systems consist of components such as mechanical devices, auxiliary equipment, electrical systems, and measurement control devices.
The performance and durability of these systems can be affected by factors like frequent use and long-term wear, potentially leading to reduced performance or safety concerns.
Regular inspections are crucial to prevent issues and accidents.

Service Details

EMIC offers fast and reliable maintenance services to ensure uninterrupted operations.
We provide a variety of services tailored to your needs and testing or measurement equipment.

Regular Inspection

We help prevent test equipment failures and support the smooth execution of planned tests by ensuring stable device operation. Regular inspections and maintenance reduce the risk of major failures, minimize downtime and repair costs, and enable long-term use.

Main items of regular inspection
- Vibration test equipment inspection
- Temperature (humidity) chamber inspection.

Fluorocarbon Leak Inspection

The "Act on Rational Use and Proper Management of Fluorocarbons," which came into effect on April 1, 2020, mandates quarterly simplified inspections for all equipment classified as "designated products" under the fluorocarbon emission control law. Additionally, periodic inspections conducted by qualified personnel are required every one or three years for equipment of a certain scale or larger.
Our company conducts annual leak inspections performed by qualified personnel as stipulated in the "Act on Rational Use and Proper Management of Fluorocarbons."

Maintenance

Regular maintenance is essential to obtain reliable measurement data. By performing routine cleaning, replacing consumable and worn parts, and conducting proper servicing, you can use measuring instruments and test equipment effectively and for a long time.

Malfunction and Defect Repair, Pickup, and On-Site Repair.

If a malfunction occurs in the measurement instruments or test equipment, or if there are issues with the accuracy of measurement data, we provide repair services through equipment pickup or on-site visits. We aim for quick response and fast restoration of equipment to minimize any impact on the customer's production schedule.

Calibration Service

We have implemented a calibration certification system. Calibration services are performed by engineers who have passed the certification exam. We also offer ISO/IEC 17025 calibration.

Main calibration targets:
- Accelerometers, charge amplifiers, system calibration
- Vibration Controller calibration
- Vibration Test System calibration
- Temperature (humidity) test chamber system calibration

ISO/IEC 17025 Certificate of Accreditation

EMIC CORPORATION Calibration Department is an ISO/IEC 17025:2017-accredited calibration organization.

Certification scope Calibration of vibration testing equipment using the EMIC method (calibration of acceleration, velocity, displacement, and frequency of the vibration testing equipment).

Certification body Perry Johnson Laboratory Accreditation Inc. (PJLA)

ISO/IEC 17025 Certificate (Japanese)

ISO/IEC 17025 Overview

ISO 17025 is a standard that accredits testing and calibration laboratories, ensuring they have the ability to produce accurate measurement and calibration results. It sets requirements for laboratories conducting product inspections, analysis, and measurements, as well as calibration organizations for measurement instruments.

Parts and Equipment Sales

Our engineers will conduct an inspection and perform necessary repairs and replacement of worn parts.

Main replacement parts

- Wet-bulb gauze
- Accerometer cable
- Feeders, etc.

Equipment Relocation and Support

We provide relocation services for your valuable test equipment due to layout changes or moves. Our expert staff offers full support, including disassembly, packing, transportation, installation, and post-relocation checks and adjustments.

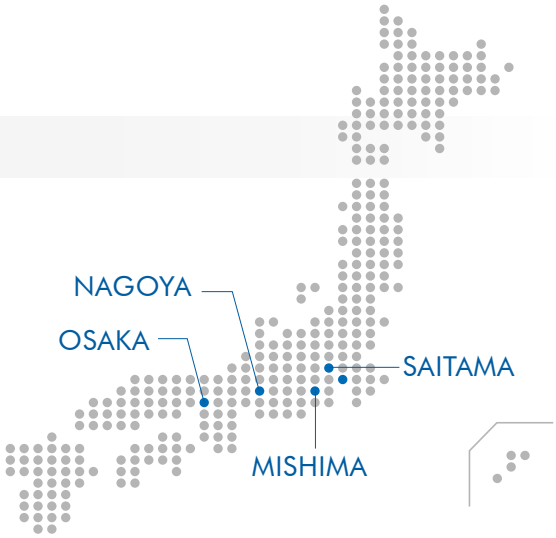
Customer Service Information

Domestic Service Locations

- Mishima Customer Service Center
- Nagoya Office Customer Service Center
- Osaka Office Customer Service Center
- Saitama Customer Service Center

Overseas service center

【Thailand】THAI EMIC CO., LTD.



Inquiry about Customer Service and Calibration Service >>>

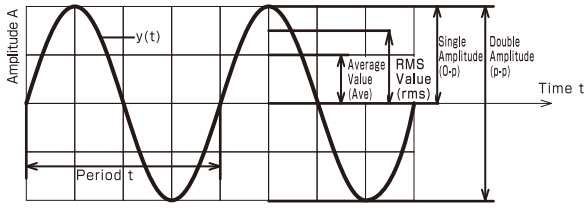
Please feel free to contact us for maintenance or inspection inquiries.

Inquiry Form

Basic Knowledge of Vibration Testing

Fundamentals of Vibration

Basic Vibration

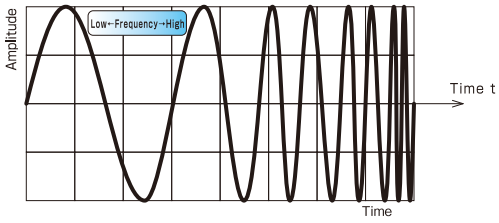


The most fundamental vibration is motion such that the amplitude is a sinusoidal function of time. The vibration level is generally represented by acceleration, velocity and displacement. The sinusoidal vibration is specified by the following parameter as;

- Period t=1/f(f:Frequency)
- Single Amplitude (0-p)
- Double Amplitude (p-p)=Single Amplitude (0-p)×2
- Root-mean-square Value (rms)=Single Amplitude (0-p)×1/√2
- Average Value (Ave)=Single Amplitude (0-p)×2/π

Basic Equation $y(t)=A\cdot\sin\omega t$ (ω:Angular Frequency)

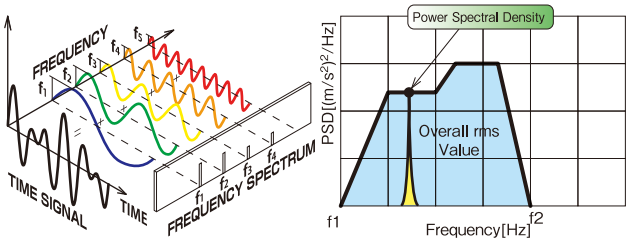
Sine Vibration Test



Point Test (Fixed frequency test)
The point test is done at a frequency fixed to any given value. The aim is to evaluate the durability of a unit under test at its resonant condition or the characteristics at a specified frequency.
Main Parameter ●Frequency [Hz] ●Acceleration [m/s²] ●Test Time [t]

Swept Sine Test
The frequency of a swept sine test changes with time continuously for the purpose of resonant search or the evaluation of characteristics over any frequency range.
Main Parameter ●Frequency [Hz] ●Acceleration [m/s²] ●Test Time [t] ●Sweep Rate [oct/min]、[Hz/s]

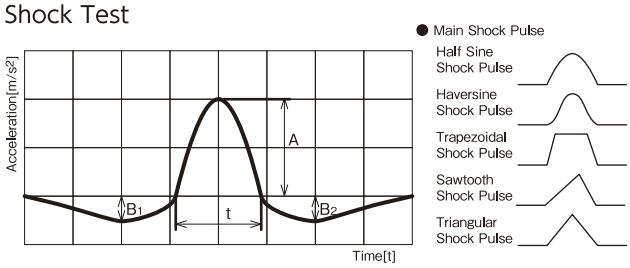
Random Vibration Test



A random vibration happens when sinusoidal waves of different frequency and phase are combined. The random vibration test permits to detect many vibrations in resonance in a short time because it can excite the specimen at many different frequencies simultaneously. Also it can simulate vibrations close to a real environment.

Main Parameter
- Overall rms Value (rms) [m/s²rms]
- Power Spectral Density (PSD) [(m/s²)²/Hz]
- Test Time [t]

Shock Test



The shock test assures that material can withstand the nonrepetitive shocks and transient vibrations as well as measuring the item's fragility.

Main Parameter
- Main Shock Pulse
- Shock Pulse Duration [s] t
- Acceleration [m/s²] A
- Velocity [m/s] V
- Pre-load [%] P_1 $P_1=B_1/A\times100$[%]
- Post-load [%] P_2 $P_2=B_2/A\times100$[%]

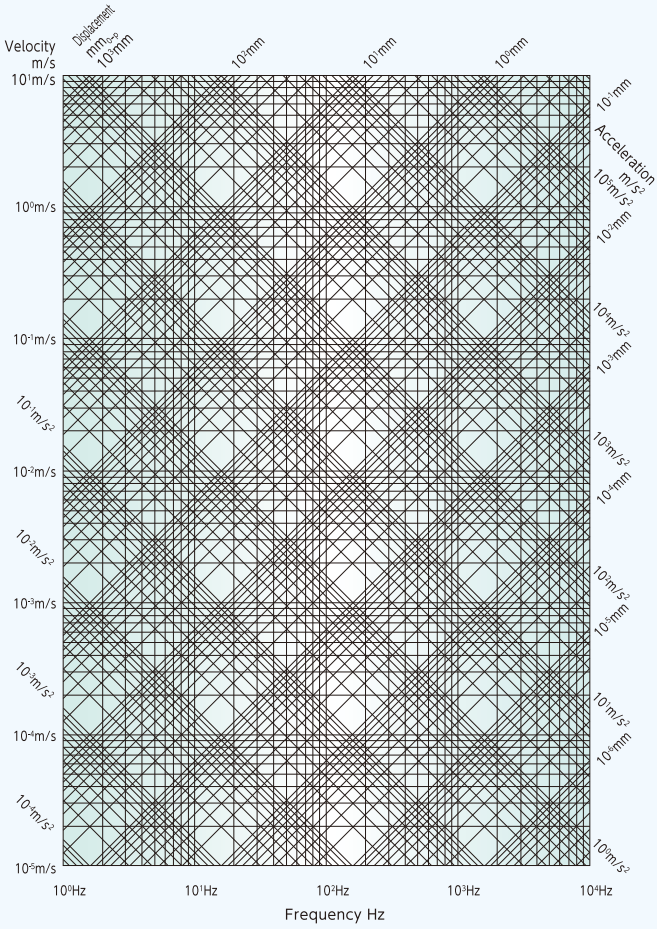
Unit System

	International System of Units SI(JIS Z 8202)		
	Quantity	Unit Name	Unit Symbol
Base Unit	Length	meter	m
	Mass	kilogram	kg
	Time	second	s
	Thermodynamical Temperature	Kelvin	K
Auxiliary	radian	radian	rad
Derived Unit	Velocity	meter per second	m/s
	Acceleration	meter per second square	m/s^2
	Angular Velocity	radian per second	rad/s
	Angular Acceleration	radian per second squared	rad/s^2
	Force	newton	N
	Moment, Torque	newton-meter	N·m

Terminology

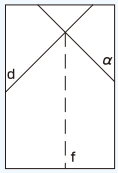
- **Power Spectral Density**
  Power level (energy per unit time) at each frequency. In particular, it shows a vibration environment for equipment in a random vibration test.
- **Overall rms Value**
  The square root of the sum of vibration power over a certain frequency range. In particular, it shows the overall value of vibration power (kinetic energy) such as random vibration.
- **Pre-Pulse, Post-Pulse**
  Compensation pulse of the waveform to yield zero final velocity and displacement. the compensation pulse to be added before and after the main pulse is called pre-pulse post pulse respectively.

Vibration Nomograph

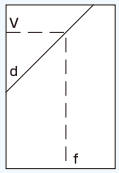


How to Use Vibration Nomograph

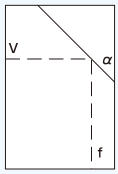
●Relation among displacement, d, acceleration, α and frequency, f.



●Relation among velocity, v, frequency, f and displacement, d.



●Relation among velocity, v, frequency, f and acceleration,α.



d : Displacement (mm_{o-p})
V : Velocity (m/s_{o-p})
α : Acceleration (m/s^2_{o-p})
f : Frequency (Hz)

Relationship Formula Between Acceleration, Velocity, and Displacement

Relation	Equation for Estimation
Acceleration $\alpha[m/s^2_{0-p}]$ = $(2\pi f)^2 d/1000$	$\alpha[m/s^2_{0-p}]$ ≒ $0.0394df^2$ ※1
= $2\pi fv$	≒ $6.28fv$ ※1
Velocity $V[m/s_{0-p}]$ = $2\pi fd/1000$	$v[m/s_{0-p}]$ ≒ $0.00628fd$
= $\alpha/2\pi f$	≒ $0.159\alpha/f$ ※2
Displacement $d[mm_{0-p}]$ = $1000\alpha/(2\pi f)^2$	$d[mm_{0-p}]$ ≒ $25.3\alpha/f^2$ ※2
= $1000v/2\pi f$	≒ $159.2v/f$

※1 Divide the acceleration value by 9.8 when its unit is G.
※2 Multiply the acceleration value by 9.8 when its unit is G.

Decibel Value

The unit, decibel [dB] is used to compare the ratio of two sound intensities or vibration levels.
Calculation Formula:
Gain of acceleration, voltage, sound pressure, etc. $Gv(dB) = 20\times\log_{10}$ (Output Voltage/Input Voltage)
Gain of electric power, acoustic power, etc. $Gp(dB) = 10\times\log_{10}$ (Output Power/Input Power)

- **A multiple calculation can be simplified.**
  The ratio can be calculated by summing the quantity in decibels of the individual components, rather than multiply the amplification factors. For example, let's compare how to calculate the amplification factor when amplifiers of different amplification factor are connected in series. If the amplifiers amplify the input signal to 56 times (35 dB or app.) and 9 times (19 dB or app.) respectively are connected in series, the total amplification factor is 56×9 = 504 times for the multiple calculation, on the other hand, 35 + 19 = 54 dB for the decibel calculation. Because the decibel calculation is the summation, it can be performed easier than the multiplication.
- **Decibel indicating relative value to reference value**
  The decibel indicates how many times the value (signal) to be compared is to the reference value (signal). Since the comparison of sound intensity (sound pressure), vibration and power, and the attenuation, etc. are expressed by the ratio of energy, the decibel is employed. The amplification factor and attenuation rate in the electrical system, for example, transmitting the electrical power, the ratio of output power to input power is used. The decibel expresses the ratio to a certain reference physical quantity by the common logarithm. It is the relative value, not the absolute value.
- **Correlativity of decibel and human perception is best**
  In human hearing the resolution of perception is constant when the sound level changes 2 times, 4 times, 8 times, 16 times,....logarithmically (Weber-Fechner's law). This is because it uses the decibel that the volume of sound to hear changes in the same way when the volume of the acoustic equipment has been turned up.

Relation between Decibel Value and Magnification Ratio

Decibel Value	Magnification Ratio	
-120[dB]	0.000001	(1/1000000)
-100[dB]	0.00001	(1/100000)
-80[dB]	0.0001	(1/10000)
-60[dB]	0.001	(1/1000)
-20[dB]	0.100	(1/10)
-10[dB]	0.316	(1/3)
-6[dB]	0.501	(1/2)
-3[dB]	0.709	(7/10)
0[dB]	1.000	(1)
3[dB]	1.410	(1.41)
6[dB]	2.000	(2)
10[dB]	3.160	(3)
20[dB]	10.00	(10)
40[dB]	100.0	(100)
60[dB]	1000	(1000)
80[dB]	10000	(10000)
100[dB]	100000	(100000)
120[dB]	1000000	(1000000)

Vibration Test System Selection

How to Select a Vibration Testing System

1. Definition of Test Conditions

First, check and define the test conditions for the vibration test to be put into execution.

- Estimated mass of specimen and fixture
- Maximum acceleration (velocity or displacement)
- Frequency or frequency range

2. Calculation of Required Force

Determine the required force for the vibration test using the following equation by substituting the defined test conditions above.

$F = (m_0+m_1+m_2) \times \alpha$

F : Force (N) m_1 : Fixture mass (kg)

α : Acceleration (m/s^2) m_2 : Specimen mass (kg)

m_0 : Moving element mass (kg)

Example: Assuming that Model: FX-35K/60 system is suitable for your application, the moving element mass m_0, fixture mass m_1 and specimen mass m_2 be 28 kg, 30 kg and 70 kg respectively. Determine the required force for generating the acceleration level α of 196 m/s^2 as follows;

$F = (28kg+30kg+70kg)\times 196m/s^2$

$= 25088N$

3. Selection of Vibration Testing System

If the following specifications of a certain vibration testing system can meet the test conditions and calculated force, that system is available for your application.

- Frequency range
- Rated force
- Maximum acceleration
- Maximum velocity
- Maximum displacement

Choosing the Most Suitable Vibration Testing System:

1. Requirement for force generated by vibration testing system

When customers select the vibration testing system by themselves, its rated force shall be larger than 1.25 times of the required force for a test by taking the dynamical behavior of the specimen, etc. into consideration. Please contact us for advice on the above condition.

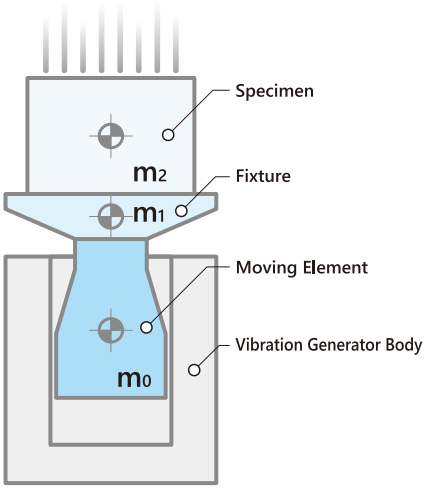
2. Allowable moment against offset load

The ideal mounting method of a specimen is to be placed on the armature table so that its center of gravity will be positioned at the center of the armature table. The eccentric moment increases with the distance between them. Please attach the load to a suitable position by taking high acceleration level due to resonance into consideration. Please contact us for advice on large distance condition.

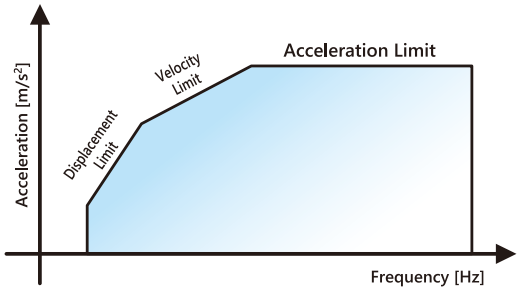
Conversion between SI and others

Unit	SI	Gravitional
Force	1N	0.10197kg (0.102kgf or app.)
	9.80665N (9.8N or app.)	1kgf
Acceleration	$1m/s^2$	0.101972G (0.102G or app.)
	$9.80665m/s^2$ ($9.8m/s^2$ or app.)	1G

Outline Block Diagram



Performance Curve



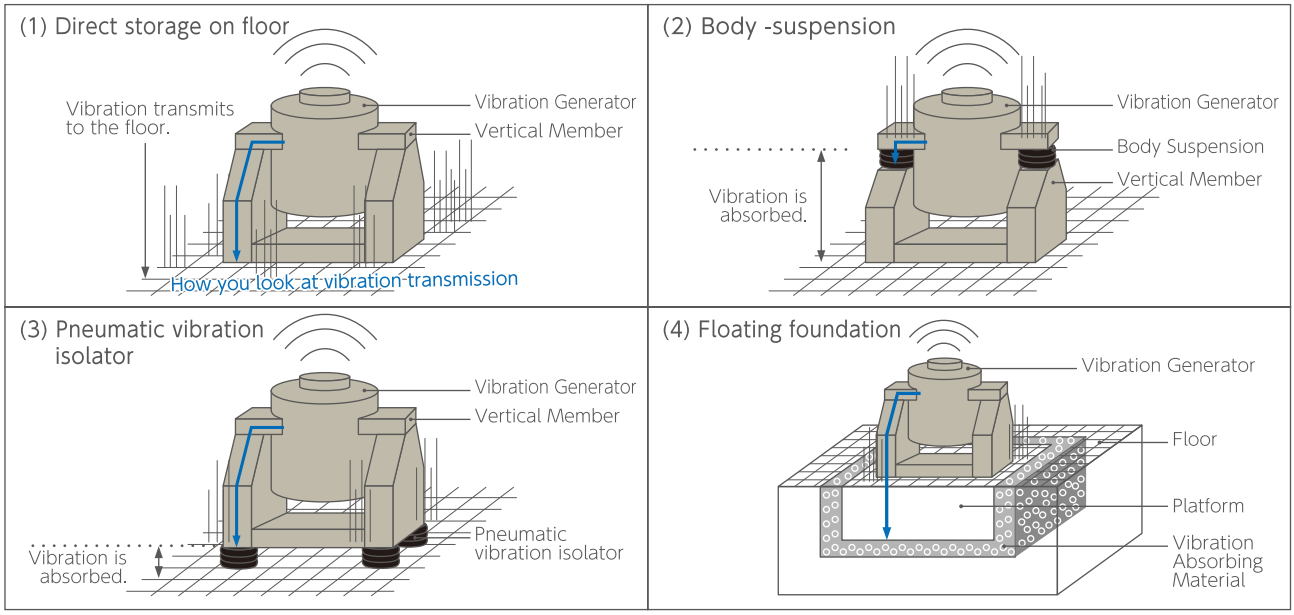
Specification Notes:

1) The catalogue states specifications when the input power of 200 VAC 3φ 50/60 Hz is applied to the vibration test system (except some parts).
2) If operating equipment under a high velocity condition such as swept-sine or fixed frequency test for a long time the velocity shall be less than 1.5 m/s as a guide.
3) The random force rating is based on our specified condition according to ISO 5344 standard.

Vibration Isolation and Noise Control

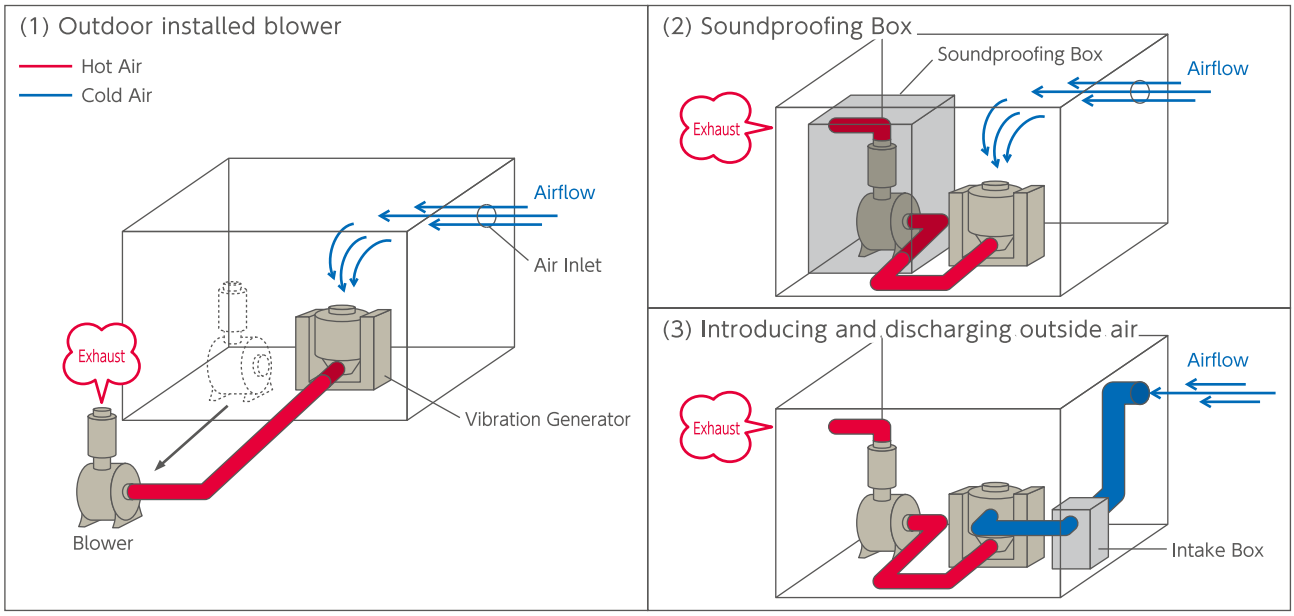
When operating a vibration testing system, the vibration transmits from a vibration generator to the floor or the building structure. When the frequency of this vibration coincides with the resonance frequency in turn, the vibration can increase significantly. To prevent vibrations from transmitting to the system, the sound or vibration control is required for the vibration testing system. The following are various countermeasures against vibration and sound depending on the test specimen, testing equipment and installation site.

Vibration Isolation Mechanism



Countermeasures Against Noise

The vibration testing system, dependent on a test condition, makes noise larger than 100 dB. Therefore, countermeasures against noise may be necessary. The noise can be reduced by more than approx. 20 dB by constructing a soundproofing box/room. There are various noise made in exciting a specimen, intake of outside air, operating the blower motor, exhausting from the blower, etc..



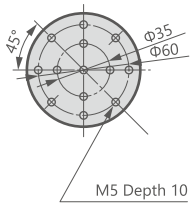
Compliance with Various Regulations and Rules for Facilities

Vibration and the noise generated from various test equipment can correspond to the levels regulated in the local regulations and the company's regulations. In this case we can provide appropriate specifications and configurations based on the applicable regulations and rules.

Armature Table Hole Pattern and Size

Table Pattern

PCD-060



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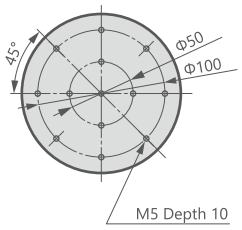

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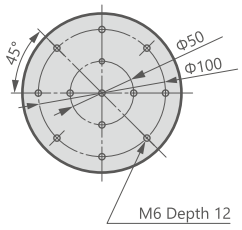

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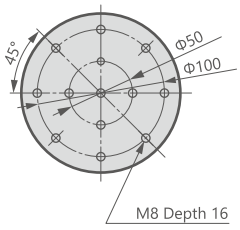
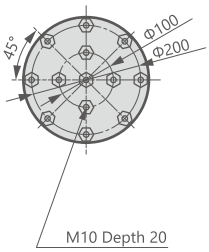
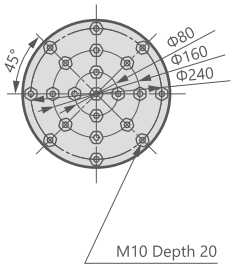


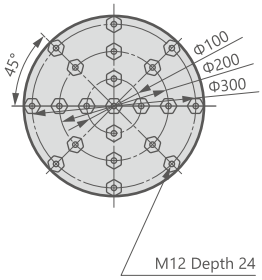
PCD-200



PCD-240



PCD-300



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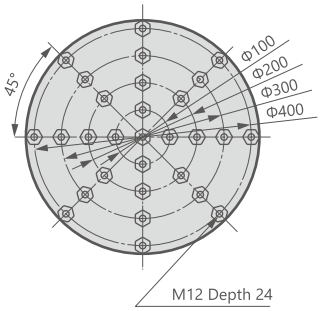

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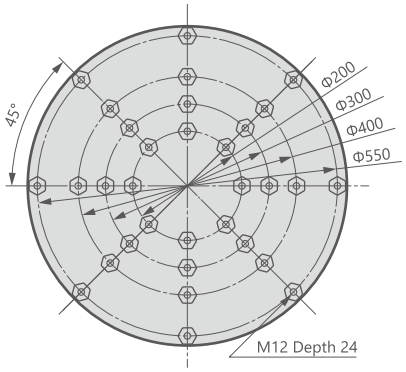
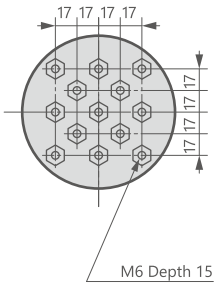
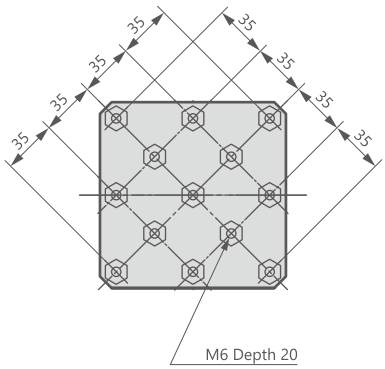


PS-068

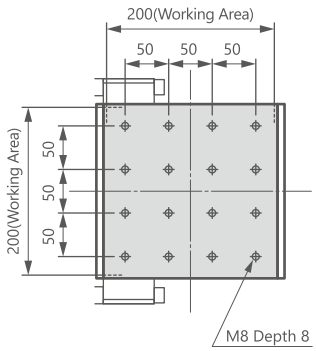


PS-140



*The inch standard mounting hole is also available.

PS-150



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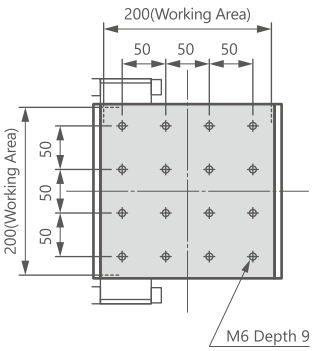

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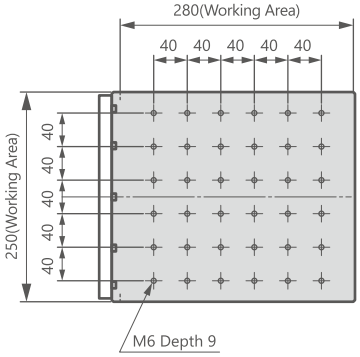

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