



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

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

Motion of F1 engine piston

9.9 m/s² [1.01 G] 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

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



Triaxial Vibration Testing System



Energy-saving Vibration Testing System

Applications

Applica	tio	ns										V	BR		N STIN	<mark>G</mark> YSTI	EM	MW	//////////////////////////////////////
	1 0			s O))	Ð	V			<i>?</i>	.				
	Electi Prec	ric, Ele	ectroni Equipn	c and nent	Aut	omot	ive Eq	luipm	ent	Railr	oad	Ae	rospa	ice	Tran (Tru	sport uck)	Buil	ding	1
	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)	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)	
Compact Vibration Series → _{Page 24}	4	3	1	5			4						3		4		5	4	
FP Series →Page 16	5	5	4	5	5	5	5	4	2	4	5	3	3	3	4	4	3	3	
F Series →Page 8	5	5	5	5	3	3	4	2	4	5	5	5	5	5	5	5	3	3	
FH Series →Page 10	4	4	4	4	5	5	5	3	2	5	5	5	5	5	3	5	2		
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FC Series →Page 15	2	2	4	1	5	5	3	5	2	5	5	5	5	5	2	2			
FT Series →Page 14	5	4	2				4	4							5	5			
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FB Series →Page 19	5	2	4	3	3		3	1		3	1				4	4	5	1	
FS Series →Page 20				5					5										

(Adaptation level: 1 being the least efficient. 5 being the most efficient)

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.



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.



ESTING







F Series Vibration Testing System

Standard



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

Maximum Rated Exciting Capability Curve of Standard System



Frequency (Hz)

*This performance curve is how you look at each system for comparison.

F Series Specifications

Model		F-1K/15	F-2K/20	F-2K/20A	F-3K/20	F-3K/20A	F-6K/20
<u>ي پ</u> Sine	kN _{0-P}	1.3	2.0	2.0	3.0	3.0	6.0
Random	kNrms	1.3	2.0	2.0	3.0	3.0	6.0
Shock	kN _{0-P}	2.6	4	4	6	6	15
Frequency range	Hz	to 4000	to 4000	to 3000	to 4000	to 3000	to 3500
Max. acceleration	m/s²	1.4	625	500	938	/50	923
Max. Velocity Max. displacement	mm _e	1.4	20	20	20	20	20
Max navload	kσ	30	40	150	40	150	60
Input power	kVA	4.1	6.2	6.2	7.3	7.3	9.8
Armature Mass	kg	1.3	3.2	4.0	3.2	4.0	6.5
Allowable offset load	N∙m	26	40	40	60	60	120
Cooling method		Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
Uibration Generator		902-FN	903-FN	903-FN/A	903-FN	903-FN/A	906-FN
Power Amplifier		369A-0101-02	369A-0101-03	369A-0101-03	369A-0101-03	369A-0101-03	369A-0101-06
Console Rack		CRD-1500-02	CRD-1500-03	CRD-1500-03	CRD-1500-03	CRD-1500-03	CRD-2000-06
Armature Size	mm	Ø 80	Ø 120	Ø 120	Ø 1 20	Ø 1 20	
Vib. Generator	mm	460W×490H×490D	630W×602H×528D	630W×602H×528D	630W×602H×528D	630W×602H×528D	/20W×6/5H×628D
	mm	554WX1462HX1010D	554WX1462HX1010D	554WX1462HX1010D	554WX1462HX1010D	554WX1462HX1010D	554WX2000HX1010D
Vib Conorator	mm	4/4.5WX1040HX495D	4/4.5WX1040HX495D 350	4/4.5WX1040HX495D 350	4/4.5WX1040HX/53D	4/4.5WX1040HX/53D	4/4.5VV×1040H×6/4D
So VID. Generator	kg kg	240	290	290	290	290	420
S Blower	ka	31	31	31	39	39	55
Blower	110	51	51	51			33
Model		F-6K/30	F-10K/56	F-15K/56	F-22K/60	F-25K/60	F-28K/60
- _{σ ω} Sine	kN _{0-P}	6.0	10.0	15.0	22.0	25.0	28.0
Random	kNrms	6.0	10.0	15.0	22.0	25.0	28.0
[∞] Shock	kN _{0-P}	15	25	37.5	55	62.5	70
Frequency range	Hz	to 2300	to 3000	to 3000	to 2500	to 2500	to 2200
Max. acceleration	m/s ²	706	667	1000	846	961	848
Max. velocity	m/s	1.8	1.2	1.8	1.8	1.8	1.8
Max. displacement	mm _{p-p}	30	200(200)(±2)	200(200)(±2)	60 400(E00)(+2)	60 400(E00)(+2)	6U 400(E00)(+2)
Input power	Kg KV/A	9.8	19.3	200(300)(★2)	26.8	28.4	<u>400(500)(★2)</u> 37.5
Armature Mass	ko	8.5	15.0	15.0	26.0	26.4	33.0
Allowable offset load	N•m	120	500	500	700	700	900
Cooling method		Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
J Vibration Generator		906-FN/A	916-BP/LA	916-AP/LA	926-AP/LA	926-AP/LA	936-AP/LA
Power Amplifier		369A-0101-06	369A-0501-16BP	369A-0502-16AP	369A-0503-26AP	369A-0504-26AP	369A-0504-36AP
≥ Console Rack		CRD-2000-06	CRD-2000-16	CRD-2000-16	CRD-2000-26	CRD-2000-26	CRD-2000-36
Armature Size	mm	□120	ø230	ø230	ø270	ø270	ø330
Vib. Generator	mm	720W×675H×628D	975W×885H×700D	975W×885H×700D	1106W×1047H×855D	1106W×1047H×855D	1224W×1107H×971D
Console Rack	mm	554W×2000H×1010D	554WX2000HX1010D	554WX2000HX1010D	554WX2000HX1010D	554WX2000HX1010D	554W×2000H×1010D
Blower	mm	4/4.5WX1040HX6/4D	1200	1200	70/WX1681HX908D	70/WX1681HX996D	2100
So Console Rack	kg	420	520	520	520	530	570
	ka ka	55	220	220	220	255	260
Blower	116		220	220	220	233	200
Model		F-33K/60	F-35K/60	F-40K/60	F-43K/60	F-51K/60	F-60K/60
- _{σ α} Sine	kN _{0-P}	33.0	35.0	40.0	43.0	51.0	60.0
Random	kNrms	33.0	35.0	40.0	43.0	51.0	60.0
Shock	kN _{0-P}	82.5	87.5	100	107.5	127.5	150
Frequency range	Hz	to 2200	to 2200	to 2200	to 2500(★1)	to 2500(★1)	to 2500(★1)
Max. acceleration	m/s ²	1000	1000(★3)	1000(★3)	623	/39	869
Max. Velocity	m/s	1.8	6.0	6.0	1.3	1.3	1.3
Max payload	mmp.p	400(500)(+2)	400(500)(+2)	400(500)(+2)	500	500	500
Input power	kVΔ	400(300)(2)	400(300)(2)	57.0	61.8	64.8	68.3
Armature Mass	kg	33.0	33.0	36.0	69.0	69.0	69.0
Allowable offset load	N•m	900	900	900	1200	1200	1200
Cooling method		Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
vibration Generator		936-AP/LA	936-AP/LA	936-AP/LA	960-AP/LA	960-AP/LA	960-AP/LA
Power Amplifier		369A-0505-36AP	369A-0505-36AP	369A-1006-36AP	369A-1005-60AP	369A-1006-60AP	369A-1008-60AP
Console Rack		CRD-2000-36	CRD-2000-36	CRD-2000W-36	CRD-2000W-60	CRD-2000W-60	CRD-2000W-60
Armature Size	mm	ø 330	ø 330	ø 330	ø430	ø430	ø430
Vib. Generator	mm	1224W×1107H×971D	1224W×1107H×971D	1224W×1107H×971D	1452W×1252H×1215D	1452W×1252H×1215D	1452W×1252H×1215D
∽ Console Rack	mm	554WX2000HX1010D	554WX2000HX1010D	1108W×2000H×1010D	1108W×2000H×1010D	1108W×2000H×1010D	1108WX2000HX1010D
Blower	mm	/U/WX1681HX946D	009WX1056HX1094D	009WX1056HX1094D	1021WX21/0HX1149D	1021WX21/0HX1149D	1021WX21/0HX1149D
S VID. Generator	kg	580	600	5900	600	650	700
	∿б kg	260	325	380	400	400	450
* Input power specification	n is for 3	2.00 3.6 AC200 V 50/60 Hz **	Lower limit frequency should	be determined by a perform	ance of an available vibration	control system	.50

(★1) The rate force is available up 500 Hz and the force level from 500 Hz to 2500 Hz is 70% of its maximum. (★2) We will customize per your instructions. (★3) Not a theoretical value, for limiting the maximum acceleration.

MIC BRATION

ESTING SYSTEM

FH Series Vibration Testing System

High Speed





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

Comparison of High Speed System with Standard System



Frequency (Hz)

*This performance curve is how you look at each system for comparison.

					-	ESTIN	STEM
	-						~~v\/v^v
FH Series S	Spec	ifications					
Model		FH-8K/51S	FH-10K/56	FH-15K/56	FH-08K/56	FH-12K/56	FH-16K/56
Sine	kN₀-₽	8.5	10.0	15.0	8.0	12.0	16.0
Random	kNrms	8.5	10.0	15.0	8.0	12.0	16.0
Shock	kNo.p	17	25	37.5	20	30	40
Frequency range	Hz	to 3000	to 3000	to 2000	to 3000	to 3000	to 3000
Max acceleration	m/s ²	850	667	1000	533	800	1000(★2)
Max velocity	m/s	2.0	2.0	2.0	23	23	23
Max displacement	mmoo	51	56	56	56	56	56
Max navload	kσ	350	200(300)(+1)	200(300)(+1)	200(300)(+1)	200(300)(+1)	200(300)(+1)
Input power	κVΔ	195	229	259	235	276	31.8
Armature Mass	kg	10.0	15.0	15.0	15.0	15.0	15.0
Allowable offset load	NI-m	500	500	500	500	500	500
Cooling method	IN-111	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
- Vibration Conorator		S085_A\A//LA	916-R\//LA	916-B\//I A	916-A\A//I A	916_0\//LA	
		360A 0202 00ECT	360A 0502 160M	360A 0503 160M	360A 0502 16AM	360A 0502 16 AM	360A 0504 16AM
S Concolo Pack		CPD 1E00 095	CPD 2000 16	CPD 2000 16	CPD 2000 16	CPD 2000 16	CPD 2000 16
		CKD-1500-005	CKD-2000-16	CKD-2000-16	CKD-2000-16	CKD-2000-16	CKD-2000-16
Armature Size	mm	Ø 230	Ø 230	Ø 230	Ø 230	Ø 230	Ø 230
Nib. Generator	mm	/9/WX//5HX635D	9/4WX1035HX/00D	9/4WX1035HX/00D	9/4WX1035HX/00D	9/4WX1035HX/00D	9/4W×1035H×/00D
∽ Console Rack	mm	554WX1462HX1010D	554W×2000H×1010D	554W×2000H×1010D	554W×2000H×1010D	554W×2000H×1010D	554W×2000H×1010D
Blower	mm	411W×810H×525D	/0/W×1681H×908D	/0/W×1681H×908D	/0/W×1681H×908D	/0/W×1681H×908D	/0/W×1681H×908D
28 Vib. Generator	kg	640	1200	1200	1200	1200	1200
Console Rack	kg	300	520	520	430	440	520
े ल Blower	kg	60	220	220	220	220	220
Model		FH-22K/60	FH-26K/60	FH-28K/60	FH-33K/60	FH-35K/60	FH-40K/60
Sine	kNo.p	22.0	26.0	28.0	33.0	35.0	40.0
Random	kNrm	5 22.0	26.0	28.0	33.0	35.0	40.0
Shock	kNo.n	55	65	70	82.5	87.5	100
Frequency range	H ₇	to 2500	to 2500	to 2200	to 2200	to 2200	to 2200
Max acceleration	m/c2	846	1000	848	1000	1000(+2)	1000(+2)
Max. velocity	m/s	23	2 3	2.0	2.0	2.0	2.0
Max displacement	mm-	60	60	60	60	60	60
Max payload	illilip.p	400(500)(+1)	400(500)(+1)	400(500)(+1)	400(500)(+1)	400(500)(+1)	400(500)(+1)
Input power	Kg ka	35.0	400(300)(★ 1)	400(300)(x 1)	400(300)(★1)	400(300)(X I)	400(300)(x 1)
Armature Mass	KVA ka	20.9	29.0	40.0	49.0	33.0	26.0
Allowable officiat load	Kg	20.0	20.0	000	900	000	30.0
Cooling mathe	IN•M	/ UU	/ UU	JUU Air coolod	JUU Air cooled	JUU Air coolod	900
		Alf-cooled	All-Cooled	All-Cooled	Alf-Cooled	All-cooled	
		926-AVV/LA	926-AVV/LA	936-AVV/LA	936-AVV/LA	936-AVV/LA	936-AVV/LA
Power Amplitier		368A-0503-26AW	368A-0504-26AW	368A-0504-36AW	368A-0505-36AW	368A-0505-36AW	368A-0606-36AW
< Console Rack		CRD-2000-26	CRD-2000-26	CRD-2000-36	CRD-2000-36	CRD-2000-36	CRD-2000-36
Armature Size	mm	ø 270	ø270	ø330	ø 330	ø330	ø330
Vib. Generator	mm	1106W×1135H×880D	1106W×1135H×880D	1106W×1135H×880D	1125W×1200H×965D	1125W×1200H×965D	1125W×1200H×965D
Console Rack	mm	554W×2000H×1010D	554W×2000H×1010D	554W×2000H×1010D	554W×2000H×1010D	554W×2000H×1010D	554W×2000H×1010D
Blower	mm	707W×1681H×908D	707W×1681H×908D	946W×1681H×908D	946W×1681H×908D	869W×1856H×1094D	869W×1856H×1094D
Vib. Generator	kg	2200	2200	3500	3500	3500	3900
Console Rack	kg	600	600	600	600	600	600
Blower	kg	220	220	260	245	325	325
Model			EH 51K/60				
- Sine	kNia -	43 0	51 0	60.0			
20200	KIN0-P	43.0	51.0	00.0			

ω	, Sine	kN _{0-P}	43.0	51.0	60.0	
ate	Random	kNrm	s 43.0	51.0	60.0	
كنت	Shock	kN _{0-p}	107.5	127.5	150	
Fre	equency range	Hz	to 2500	to 2500	to 2500	
Má	ax. acceleration	m/s²	623	739	869	
Ma	ax. velocity	m/s	1.78	1.78	1.78	
Mã	ax. displacement	mm _{P-P}	60	60	60	
Ma	ax. payload	kg	500	500	500	
Inp	out power	kVA	68.2	72.2	82.6	
Ar	mature Mass	kg	69.0	69.0	69.0	
Allo	owable offset load	N·m	1200	1200	1200	
Сс	ooling method		Air-cooled	Air-cooled	Air-cooled	
ē	Vibration Generator		960-AW/LA	960-AW/LA	960-AW/LA	
00	Power Amplifier		368A-1005-60AW	368A-1006-60AW	368A-1007-60AW	
Ś	Console Rack		CRD-2000W-60	CRD-2000W-60	CRD-2000W-60	
	Armature Size	mm	ø430	ø430	ø430	
Ð	Vib. Generator	mm	1452W×1297H×1231D	1452W×1297H×1231D	1452W×1297H×1231D)
S	Console Rack	mm	1108W×2000H×1010D	1108W×2000H×1010D	1108W×2000H×1010D)
	Blower	mm	1021W×2170H×1149D	1021W×2170H×1149D	869W×2016H×1147D	
s X	Vib. Generator	kg	5000	5000	5000	
Aas	Console Rack	kg	700	750	800	
< 2	Blower	kσ	450	450	450	

Input power specification is for 3¢ AC200 V 50/60 Hz.
 Lower limit frequency should be determined by a performance of an available vibration control system.
 (★1) We will customize per your instructions.

BRATION

ESTING

FL Series Vibration Testing System Large Displacement





EL Series Specification

The FL series system expands the maximum displacement to 100 $mm_{\text{p-p}}.$ 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)

	L-28K/100
	29.0
σ_0 Sine kNop 0.0 12.0 10.0 22.0 20.0 σ_0	20.0
Restandulin knrms o.0 12.0 16.0 22.0 20.0	28.0
Shock kN _{0-P} 20 30 40 55 65	70
Frequency rangeHzto 2000to 2000to 2000to 2000	to 2000
Max. acceleration m/s ² 320 480 640 647 765	667
Max. velocity m/s 2.0 2.0 2.0 2.0 2.0 2.0	2.0
Max. displacement mm _{PP} 100 100 100 100 100	100
Max. payload kg 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(★1) 200(300)(\pm1) 2	0(300)(★1)
Input power kVA 23.5 27.6 31.8 35.9 39.0	45.3
Armature Mass kg 25.0 25.0 25.0 34.0 34.0	42.0
Allowable offset load N·m 350 350 350 500 500	700
Cooling method Air-cooled Air-coo	Air-cooled
with the second secon	36-AW/SLS
B Power Amplifier 369A-0502-16SLS 369A-0503-16SLS 369A-0504-16SLS 368A-0503-26SLS 368A-0504-26SLS 368A	A-0504-36SLS
Console Rack CRD-2000-16 CRD-2000-16 CRD-2000-16 CRD-2000-26 CRD-2000-20 CRD-2000-2000-20 CRD-2000-20 CRD-2000-2000-20 CRD-2000-20 CRD-2000-2000-2000-2000-2000-2000-2000-20	RD-2000-36
Armature Size mm Ø 230 Ø 230 Ø 230 Ø 270 Ø 270	ø330
g Vib. Generator mm 974W×1035H×700D 974W×1035H×700D 974W×1035H×700D 1082W×1163H×866D 1082W×1163H×866D 1125	W×1200H×965D
☆ Console Rack mm 554W×2000H×1010D 554W×2000H×10	V×2000H×1010D
Blower mm 707W×1681H×996D 707W×1681H×908D 707W×1681H×908D 707W×1681H×908D 707W×1681H×908D 869W	V×1856H×1094D
ر المراجع (kg 1300 1300 1300 2500 2500 2500	3400
<u>පි</u> <u>E</u> <u>Console Rack kg</u> 430 440 450 600 600	600
⁴ ⁶ Blower kg 255 220 220 220 220 220	325

odel		FL-35K/100	FL-60K/100	
ne	kN _{0-P}	35.0	60.0	
Indom	kNrms	35.0	60.0	
lock	kN _{0-P}	87.5	150	
lency range	Hz	to 2000	to 2000	
acceleration	m/s²	833	750	
velocity	m/s	2.0	1.78	
displacement	mm _{P-P}	100	100	
payload	kg	200(300)(★1)	300	
power	kVA	55.9	82.6	
iture Mass	kg	42.0	80.0	
able offset load	N∙m	700	1000	
ing method		Air-cooled	Air-cooled	
ration Generator		936-AW/SLS	960-AW/SLS	
wer Amplifier		368A-0505-36SLS	368A-1007-60SLS	
onsole Rack		CRD-2000-36	CRD-2000W-60	
mature Size	mm	ø330	ø430	
b. Generator	mm	1125W×1200H×965D	1452W×1297H×1231D	
onsole Rack	mm	554W×2000H×1010D	1108W×2000H×1010D	
ower	mm	869W×1856H×1094D	869W×2016H×1147D	
b. Generator	kg	3400	5000	
onsole Rack	kg	600	1800	
ower	kg	325	400	
	odel ne ndom ock Jency range acceleration velocity displacement payload power ture Mass ble offset load ing method ration Generator wer Amplifier onsole Rack mature Size o. Generator onsole Rack ower onsole Rack	bodel ne kNop ndom kNrms ock kNop jency range Hz acceleration m/s² velocity m/s jaglacement mmp.p payload kg power kVA ture Mass ble offset load N-m ing method ration Generator wer Amplifier onsole Rack mature Size mm op Generator mm obselerator mm power kg	bodelFL-35K/100nekN _{PP} 35.0ndomkNrms35.0ockkNrms35.0ockkNrms35.0ockkNoP87.5Jency rangeHzto 2000accelerationm/s²833velocitym/s²833velocitym/s²200(300)(★1)payloadkg200(300)(★1)powerkVA55.9ture Masskg42.0ble offset loadN·m700ing methodAir-cooledration Generator936-AW/SLSwer Amplifier368A-0505-36SLSonsole RackCRD-2000-36mature Sizemm \emptyset 330o. Generator554W×2000H×1010Dowermm869W×1856H×1094Do. Generatorkg3400onsole Rackkg600owerkg325	Predel FL-35K/100 FL-60K/100 ne kN ₀ p 35.0 60.0 ndom kNrms 35.0 60.0 ock kNop 87.5 150 jency range Hz to 2000 to 2000 acceleration m/s² 833 750 velocity m/s² 833 750 velocity m/s² 833 750 payload kg 200(300)(★1) 300 power kVA 55.9 82.6 ture Mass kg 42.0 80.0 ble offset load N·m 700 1000 1000 ing method Air-cooled Air-cooled Air-cooled ration Generator 936-AW/SLS 960-AW/SLS 960-AW/SLS onsole Rack CRD-2000-36 CRD-2000W-60 mature Size mm $Ø 330$ $Ø 430$ 0 o. Generator mm 1125W×120H×965D 1452W×1297H×1231D onsole Rack

■ Comparison of Large Displacement System with Standard System



*This performance curve is how you look at each system for comparison.

* Input power specification is for 3 AC200 V 50/60 Hz.
 * Lower limit frequency should be determined by a performance of an available vibration control system.
 12 (*1) We will customize per your instructions.

FV Series	5	
Vibration	Testing	System

Ultra High Speed



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)

RATION

ESTING SYSTEM

ъ

FV Series Specifications

	Model		FV-15K/100	FV-26K/100	FV-35K/100	FV-60K/100	
	Sine	kN _{0-P}	15.6	26.0	35.0	60.0	
99 99	Random	kNrms	15.6	26.0	35.0	60.0	
Foil Tot	Shock (6ms)	kN _{0-P}	46	68	90	150	
	Shock (11ms)	kN0-p	46	68	90	150	
F	Frequency range	Hz	to 2000	to 2000	to 2000	to 2000	
ľ	Max. accel. (Sine)	m/s²	636	765	833	750	
Ν	Max. accel. (Shock)	m/s²	1470(★2)	1470(★2)	1470(★2)	1470(★2)	
Ν	Max. velocity. (Sine)	m/s	2.0	2.0	2.0	1.8	
Λ	Nax. velocity. (Shock)	m/s	3.5	3.5	3.5	3.5	
Λ	Nax. displacement	mm _{p-p}	100	100	100	100	
Ν	Max. payload (Sine)	kg	200(300)(★1)	200(300)(★1)	200(300)(★1)	200	
Ν	Nax. payload (Shock)	kg	22	35	50	73	
	nput power	kVA	31.6	43.6	68.1	148.7	
ŀ	Armature Mass	kg	24.5	34.0	42.0	80.0	
	Allowable offset load	N∙m	500	500	500	500	
(Cooling method		Air-cooled	Air-cooled	Air-cooled	Air-cooled	
ē.	Vibration Generator		916-AW/SLS	926-AW/SLS	936-AW/SLS	960-AW/SLS	
po_	Power Amplifier		369A-1212-16SLS	368A-1212-26SLS	368A-2016-36SLS	368A-3027-60SLS	
S	Console Rack		CRD-2000W-16SLS	CRD-2000T-26SLS	CRD-2000T-36SLS	CRD-2000Q-60SLS	
	Armature Size	mm	ø230	ø270	ø330	ø430	
e –	Vib. Generator	mm	974W×1035H×700D	1106W×1135H×880D	1225W×1200H×965D	1452W×1297H×1231D	
Siz	Power Amplifier	mm	1108W×2000H×1010D	1662W×2059H×1010D	1662W×2059H×1010D	2216W×2059H×1010D	
	Blower	mm	707W×1681H×908D	707W×1681H×908D	869W×1856H×1094D	869W×2016H×1147D	
ν×.	Vib. Generator	kg	1300	2500	3400	5000	
pro	Power Amplifier	kg	800	1150	1300	2000	
sq	Blower	kg	220	220	325	400	

※ Input power specification is for 3
 AC200 V 50/60 Hz.
 ※ Lower limit frequency should be determined by a performance of an available vibration control system.
 (★1) We will customize per your instructions. (★2) Not a theoretical value, for limiting the maximum acceleration.







*This performance curve is how you look at each system for comparison.

FT Series Vibration Testing System

Transportation





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 and or slip table with hooks are available. Moreover, the oilless slip table reduces the burden of maintenance.



FT Series Specifications

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	_	Madal		FT 2K (20		FT 10K (00	FT 16K (00	FT 10K (00	
B = Sine kM∞ 3.0 8.5 10.0 16.0 18.0 26.0 Sendom kN∞ 6.0 17.0 20.0 32.0 45.0 65.0 Frequency rage(★1) Hz to 2500 to 3000 to 2000 to 200 t		Nodel		F1-3K/30	F1-8K/51	F1-10K/80	F1-16K/80	F1-18K/80	F1-26K/80
Bit Random kNrms 3.0 8.5 10.0 16.0 18.0 26.0 Shock kNo≠ 6.0 17.0 20.0 32.0 45.0 65.0 Frequency range(★1) Hz to 2500 to 3000 to 2000 to 200 to 200 to 200 to 200 to 200 <thto 200<="" th=""></thto>	200	Sine	kNo-p	3.0	8.5	10.0	16.0	18.0	26.0
La Shock KNee 6.0 17.0 20.0 32.0 45.0 65.0 Frequency range(★1) Hz to 2500 to 3000 to 2000 to 2000 to 2000 to 2000 Max. velocity m/s² 667 850 400 640 529 764 Max. velocity m/s 1.6 2.0 1.0 1.0 1.0 1.0 1.0 Max. velocity m/s 1.6 2.0 1.0 1.0 1.0 1.0 1.0 Max. palocad(★2) g00+α 350+α 200+α 200+α 200+α 200+α 200+α Input power kVA 7.3 19.5 22.6 27.8 26.8 32.0 Armature Mass psyload(★2) kg 200+α 350 350 500 500 500 Cooling method Air-cooled	orgi	Random	kNrms	3.0	8.5	10.0	16.0	18.0	26.0
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Shock	kN _{0-P}	6.0	17.0	20.0	32.0	45.0	65.0
Max. acceleration m/s² 667 850 400 640 529 764 Max. velocity m/s 1.6 2.0 1.0 1.0 1.0 1.0 Max. displacement mm _p 30 51 80 80 80 80 Max. payload(★2) kg 200+α 350+α 200+α 200+α 200+α 200+α 200+α 200+α Input power k/A 7.3 19.5 22.6 27.8 26.8 32.0 Armature Mass kg 4.5 10 25 25 34 34 Allowable offset load N·m 60 500 350 500 500 500 Cooling method Air-cooled	Fre	quency range(★1)	Hz	to 2500	to 3000	to 2000	to 2000	to 2000	to 2000
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Ma	 acceleration 	m/s ²	667	850	400	640	529	764
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Ma	ax. velocity	m/s	1.6	2.0	1.0	1.0	1.0	1.0
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Ma	x. displacement	mm _{p-p}	30	51	80	80	80	80
Input power kva 7.3 19.5 22.6 27.8 26.8 32.0 Armature Mass kg 4.5 10 25 25 34 34 Allowable offset load N·m 60 500 350 350 500 500 Cooling method Air-cooled	Má	ax. payload (★2) kg	200+α	350+α	200+α	200+α	200+α	200+ <i>α</i>
Armature Mass kg 4.5 10 25 25 34 34 Allowable offset load N-m 60 500 350 350 500 500 Cooling method Air-cooled	Inp	out power	kVA	7.3	19.5	22.6	27.8	26.8	32.0
Allowable offset load N·m 60 500 350 350 500 500 Cooling method Air-cooled	Ar	mature Mass	kg	4.5	10	25	25	34	34
Cooling method Air-cooled Air	Allo	wable offset load	N∙m	60	500	350	350	500	500
witation Generator 903-FN/FA S085-AW/LA 916-AP/SLA 916-AP/SLA 926-AP/SLA	Co	oling method		Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
0 Power Amplifier 369A-0101-03 369A-0202-0855F 369A-0502 369A-0503 369A-0503 369A-0504 Console Rack CRD-1500-03 CRD-1500-085 CRD-2000-16 CRD-2000-16 CRD-2000-26 CRD-2000-26 Armature Size mm #120 #230 #230 #230 #230 #270 #270 Vib. Generator mm 630Wx693Hx588D 797Wx75Hx625D 950Wx1029Hx665D 1082Wx1163Hx866D 1082Wx1163Hx866D 1082Wx1163Hx866D 1082Wx1163Hx866D 1082Wx1163Hx866D 1082Wx1163Hx866D 707Wx168Hx850D	e	Vibration Generator		903-FN/FA	S085-AW/LA	916-AP/SLA	916-AP/SLA	926-AP/SLA	926-AP/SLA
E Console Rack CRD-1500-03 CRD-1500-085 CRD-2000-16 CRD-2000-16 CRD-2000-26 CRD-2000-26 Armature Size mm Ø120 Ø230 Ø230 Ø230 Ø230 Ø270 Ø270 Vib. Generator mm 630W×693H×588D 797W×775H×625D 950W×1029H×665D 950W×1029H×665D 1082W×1163H×866D 1082W×1163H×860D 707W×168H×850D 707W	8	Power Amplifier		369A-0101-03	369A-0202-085SF	369A-0502	369A-0503	369A-0503	369A-0504
Armature Size mm Ø 120 Ø 230 Ø 230 Ø 230 Ø 270 Ø 270 Vib. Generator mm 630Wx693Hx588D 797Wx775Hx625D 950Wx1029Hx665D 950Wx1029Hx665D 1082Wx1163Hx866D 1082Wx1163Hx860D 707Wx168Hx850D 707Wx168Hx8	S	Console Rack		CRD-1500-03	CRD-1500-085	CRD-2000-16	CRD-2000-16	CRD-2000-26	CRD-2000-26
vib. Generator mm 630Wx693Hx588D 797Wx775Hx625D 950Wx1029Hx665D 950Wx1029Hx665D 1082Wx1163Hx866D 1082Wx1163Hx866D Blower mm 554Wx1462Hx1010D 554Wx1500Hx1010D 554Wx2009Hx1010D	_	Armature Size	mm	ø120	ø230	ø230	ø230	ø270	ø270
30 Console Rack mm 554Wx1462Hx1010D 554Wx1500Hx1010D 554Wx2009Hx1010D 554Wx2009Hx1010	Ð	Vib. Generator	mm	630W×693H×588D	797W×775H×625D	950W×1029H×665D	950W×1029H×665D	1082W×1163H×866D	1082W×1163H×866D
Blower mm 474.5W×1040H×753D 411W×810H×525D 707W×1681H×850D 707W×1681H×850D <t< td=""><td>Si</td><td>Console Rack</td><td>mm</td><td>554W×1462H×1010D</td><td>554W×1500H×1010D</td><td>554W×2009H×1010D</td><td>554W×2009H×1010D</td><td>554W×2009H×1010D</td><td>554W×2009H×1010D</td></t<>	Si	Console Rack	mm	554W×1462H×1010D	554W×1500H×1010D	554W×2009H×1010D	554W×2009H×1010D	554W×2009H×1010D	554W×2009H×1010D
Style Generator kg 350 640 1300 1300 2500 2500 Console Rack kg 290 300 430 440 520 530 Blower kg 39 60 220 220 220 220 g VHT-060 • • • • • • GEN VHT-080 • • • • • • • VHT-100 - • • • • • • VHT-120 - - • • • • •		Blower	mm	474.5W×1040H×753D	411W×810H×525D	707W×1681H×850D	707W×1681H×850D	707W×1681H×850D	707W×1681H×850D
Reference Reference Reference Reference Reference Reference State State <t< td=""><td>s X</td><td>Vib. Generator</td><td>kg</td><td>350</td><td>640</td><td>1300</td><td>1300</td><td>2500</td><td>2500</td></t<>	s X	Vib. Generator	kg	350	640	1300	1300	2500	2500
A Belower kg 39 60 220 200 200 200 200<	las Drc	Console Rack	kg	290	300	430	440	520	530
mg VHT-060 M M WHT-080 Image: WHT-080 Image: WHT-080 Image: WHT-080 Image: WHT-100 Image: WHT-100 Image: WHT-080 Image: WHT-080 Image: WHT-120 Image: WHT-080 Image: WHT-080 Image: WHT-080	20	Blower	kg	39	60	220	220	220	220
HT-080 Image: Constraint of the cons	e l	VHT-060		•	•	•	•	•	•
€ ² / _V VHT-100 - ● ● ● VHT-120 - - ● ● ●	atik	VHT-080		•	•	•	•	•	•
<u>8 VHT-120 - ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● </u>	Ê	VHT-100		-	•	•	•	•	•
	ů,	VHT-120		-	-	•	•	•	•

Model		FT-28K/80	FT-35K/80	FT-60K/80
w Sine k	KN _{0-P}	28.0	35.0	60
Random k	Nrms	28.0	35.0	60
[₩] Shock k	(N _{0-P}	70.0	87.5	150
Frequency range(★1) ⊢	Ηz	to 2000	to 2000	to 2500
Max. acceleration	n/s²	667	833	750
Max. velocity n	n/s	1.0	1.0	1.0
Max. displacement	nm _{P-P}	80	80	80
Max. payload(★2) k	g	200+α	200+a	200+α
Input power k	(VA	37.5	47.8	68.3
Armature Mass k	g	42	42	80
Allowable offset load	N∙m	700	700	1000
Cooling method		Air-cooled	Air-cooled	Air-cooled
Uibration Generator		936-AP/SLA	936-AP/SLA	960-AP/SLA
Power Amplifier		369A-0504	369A-0505	369A-1007
≤ Console Rack		CRD-2000-36	CRD-2000-36	CRD-2000W-60
Armature Size n	nm	ø330	ø330	ø430
♥ Vib. Generator n	nm	1186W×1255H×971D	1186W×1255H×971D	1461W×1375H×1115D
Console Rack n	nm	554W×2009H×1010D	554W×2009H×1010D	1108W×2009H×1010D
Blower n	nm	707W×1681H×946D	869W×1856H×1094D	1461W×1375H×1115D
<u>പ്പ്</u> Vib. Generator k	g	3400	3400	5000
윤동Console Rack k	g	570	580	800
<u>≤ &</u> Blower k	g	245	325	450
		•	•	•
통当VHT-080		•	•	•
불춘 VHT-100		•	•	•
ර VHT-120		•	•	•

* 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.

(★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.

Option • VHT Series Honeycomb Table VHT-060-XX VHT-080-XX Model VHT-100-XX VHT-120-XX Size mm 600×600 800×800 1000×1000 1200×1200 Freq. range Hz to 200 to 200 to 200 to 200 Table mass kg Bearing Line Slip Table Model BT-060-XX BT-080-XX BT-100-XX BT-120-XX Size mm 1000×1000 600×600 800×800 1200×1200 Freq. range Hz to 200 to 200 to 200 to 200 Table mass kg 93 150 *Table mass changes with the available vibration generator.

*Frequency range and max. payload can be enhanced by a special order.

- Reinforcing Mechanism against Offset Load (Page No. 34)
- Load Support Enhancement Mechanism (Page No. 34)
- Data Logger

FC Series Vibration Testing System

Large Water-cooled

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.



MIC BRATION

FC Series Specifications

Model		FC-060K/60	FC-080K/60	FC-100K/60	FC-200K/60	
Sine	kNo-p	60	80	100	200	
Random	kNrms	60	80	100	160	
Shock	kN _{0-P}	150	200	250	400	
Frequency range	Hz	to 2000	to 2000	to 2000	to 2000	
Max. acceleration	m/s²	667	889	1000(★1)	1000(★1)	
Max. velocity	m/s	1.8	1.8	1.8	1.78	
Max. displacement	mm _{P-P}	60	60	60	51	
Max. payload	kg	1000	1000	1000	2000	
Input power	kVA	88	100	154	351.5	
Armature Mass	kg	90	90	90	130	
Allowable offset load	N•m	1500	1500	1500	5000	
Cooling method		Water-cooled	Water-cooled	Water-cooled	Water-cooled	
Cooling water flow	L/min	140(★2)	162(★2)	305(★2)	688(★2)	
Uibration Generator		9100-AWW/LA	9100-AWW/LA	9100-AWW/LA	9200-AWW/LA	
Power Amplifier		368A-1610-3BAY100	368A-1612-3BAY100	368A-1614-3BAY100	368A-3232-200K	
≥ Console Rack		CRD-2000T	CRD-2000T	CRD-2000T	CRD-2000F-200K	
Armature Size	mm	ø 450	ø 450	ø450	ø 590	
. [™] Vib. Generator	mm	1489W×1338H×1149D	1489W×1338H×1149D	1489W×1338H×1149D	1905W×1348H×1473D	
Console Rack	mm	1662W×2059H×1030D	1662W×2059H×1030D	1662W×2059H×1030D	3324W×2059H×1030D	
vib. Generator	kg	4800	4800	4800	8182	
Console Rack	kg	1650	1650	1650	3950	
Cooling Unit	kg	700	700	700	700	

Dimensions (approx.) mm

• Cooling Unit



Option

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

- Chiller
- Transformer for Chiller



FP Series Vibration Testing System

Permanent Magnet





■ Industry's first adoption of permanent magnet for more than 10 kN sine force system

"Ultimate Energy Saving" for a conventional medium-sized vibration testing system can be realized by eliminating the field coil and power supply. In addition, the cooling blower is downsized approximately 70% and its rotating speed is controlled according to the temperature of the vibration generator to drastically reduce the required input power and sound level.

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

Reduction effect of power consumption for new drive system

[Energy-saving Effect]

Reduction of electric charge:

Approx. \$13820.00/year at 25% of rated output (Approx. JPY1,520,000.00/year at 25% of rated output) Approx. \$14550.00/year at 10% of rated output (Approx. JPY1,600,000.00/year at 10% of rated output)

Reduction of CO2:

Approx. 42,200 kg/year at 25% of rated output Approx. 79,716 kg/year at 10% of rated output *Compared to our 916 series system for 70% of operating time *The discharge of CO₂ emission assumes it to be 0.555 kg-CO₂/kWh.

(according to law enforcement order about the promotion of global warming countermeasures, Article 3)

FP Series Specifications

_								
	Model		FP-01K/30	FP-02K/25	FP-02K/30A	FP-10K/51	FP-10K/76	FP-20K/51
۵ م	Sine	kN _{0-p}	1.2	2.0	2.0	10	10	20
ate	Random	kNrms	0.48	1.4	1.4	10	10	20
œu	Shock	kN _{0-P}	1.5	3.0	3.0	25	20	36
Fr	equency range	Hz	to 2500	to 3000	to 2500	to 3000	to 2500	to 2500
Ma	ax. acceleration	m/s ²	500	800	444	1000	606	833
Ma	ax. velocity	m/s	1.6	1.5	1.5	2.0	2.0	2.0
Má	ax. displacement	mmp.p	30	25	30	51	76.2	51
Ma	ax. payload	kg	150	40	100	350	300	350
Inp	out power	kVA	1.4	6.2	6.2	11.5	16	27
Ar	mature Mass	kg	2.4	2.5	4.5	10	16	24
All	owable offset load	N∙m	3	5	4	500	500	500
С	ooling method		Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled	Air-cooled
ē	Vibration Generator		P01-AB/AS	Σ9515-AB/SD	Σ9515-AB/AS	P10-AW/LA	P10-AW/SLS	P20-A
00	Power Amplifier		375-D/P012	369A-0101-Σ15	369A-0101-Σ15	369A-0202-P10	369A-0202-P10SLS	369A-0606-P20
S	Console Rack		-	CRD-1500-Σ15	CRD-1500-Σ15	CRD-1500-P10	CRD-1500-P10	CRD-2000-P20
	Armature Size	mm	ø120	ø120	ø120	ø 230	ø230	ø330
Ð	Vib. Generator	mm	384W×391.5H×360D	442W×360H×340D	442W×360H×340D	702W×763H×572D	702W×948H×625D	982W×1000H×750D
Si	Console Rack	mm	480W×189H×450D	554W×1462H×1010D	554W×1462H×1010D	554W×1462H×1010D	554W×1462H×1010D	554W×2000H×1010D
	Blower	mm	365.5W×700H×434D	474.5W×1040H×495D	474.5W×1040H×495D	411W×810H×525D	411W×810H×525D	707W×1681H×946D
	Vib. Generator	kg	75	160	165	690	760	1650
Aas: opro	Console Rack	kg	35	290	290	300	300	600
< 9	Blower	kg	16	31	31	60	60	245

* Input power specification is for 1¢ AC100 V 50/60 Hz. or 3¢ AC200 V 50/60 Hz.

* Lower limit frequency should be determined by a performance of an available vibration control system.









FM Series Vibration Testing System



- 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	kN _{0-P}	20	30	40	60
Random force	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-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)
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 3
 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.
 (★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 Vibration Testing System

Triaxial Electric Servo

ION

ESTING



- Multiaxial vibration testing system for transportation test or aseismatic performance evaluation
- A new type of vibration testing system superior in cost performance



- •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-050	FB-60K/50-3D-050
Rated force	кN _{0-Р} 9.8	19.6	29.4	59.5
Random force	kNrms 6.9	13.7	20.6	41.7
Frequency range	Hz to 200	to 200	to 200	to 200
Max. acceleration	m/s² 20	20	30	30
Max. velocity	m/s 0.7	0.7	0.7	0.7
Max. displacement	mm _{P-P} 50	50	50	50
Max. payload	kg 200	300	500	1000
Table size	mm 1000×1000	1200×1200	1500×1500	1500×1500
Input power	kVA 84	102	126	264
Power supply voltage	v 200	200	200/400	200/400
Moving element	kg 130	210	300	400
Cooling method	Air-cooled	Air-cooled	Air-cooled	Air-cooled

** 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.

FS Series Shock Test System

Shock

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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.



FS Series Specifications

	Model	FS-1022/05	FS-1240B/13	FS-1040B/19	FS-2078B/29	FS-3055B/15
	Shock Generator	905-SH/10	912-SH/12	922-SH/10	922-SH/20H	922-SH/30
Configuration	Power Amplifier	369A-0503-S05	369A-0907-1/S	369A-0906-1/S	369A-0909-3/S	369A-0907-2/S
	Control System	271-C	271-C	271-C	271-C	271-C
	Shock Force kNo-	4.9	13.72	19.62	29.43	15.69
	(kgf	.p) (500)	(1400)	(2000)	(3000)	(1600)
	Maximum m/s ²	608(62G)	980(100G)	980(100G)	2451(250G)	980(100G)
	Acceleration	at 2kg load	at 5kg load	at 10kg load	at 2kg load	at 5kg load
Rating	Maximum Displacement mmg	.р 100	120	100	200	300
	Maximum Velocity m/s	±2.2	±4.0	±4.0	±7.8	±5.5
	Maximum Velocity Change m/s	4.4	6	6	10	7
	Power Consumption kVA	9	30	33	97	50
	Maximum Payload kg	10	10	10	10	10
	Moving Element kg	6(including table)	9(including table)	10(including table)	10(including table)	11(including table)
	Table Dimensions mm	250W×280D	250W×280D	200W×200D	200W×200D	200W×200D
Shock Generator	Table Screw mm	36-M6 depth9	36-M6 depth9	16-M6 depth9	16-M8 depth8	16-M6 depth9
	Outline Dimensions mm	620W×920D×610H	760W×1200D×810H	900W×1260D×930H	900W×1460D×950H	900W×1660D×990H
	Mass kg	450	860	1470	1680	1900
Consola Back	Outline Dimensions mm	630W×891D×1912H	1220W×956D×2150H	1830W×956D×2150H	2440W×956D×2150H	1830W×956D×2150H
CONSOLE RACK	Mass kg	390	1000	1500	2500	1500
	Model	FS-3050B/22	FS-3093B/30H	FS-5080/16	FS-60160/20	
	Model Shock Generator	FS-3050B/22 922-SH/30	FS-3093B/30H 922-SH/30H	FS-5080/16 950-SH	FS-60160/20 960-SH	
Configuration	Model Shock Generator Power Amplifier	FS-3050B/22 922-SH/30 369A-0907-2/S	FS-3093B/30H 922-SH/30H 369A-0908-4/S	FS-5080/16 950-SH 369A-0907-2/S	FS-60160/20 960-SH 369A-0907-3/S	
Configuration	Model Shock Generator Power Amplifier Control System	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C	FS-5080/16 950-SH 369A-0907-2/S 271-C	FS-60160/20 960-SH 369A-0907-3/S 271-C	
Configuration	Model Shock Generator Power Amplifier Control System Shock Force kNea	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61	
Configuration	Model Shock Generator Power Amplifier Control System Shock Force kNed (kgfi	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957)	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600)	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000)	
Configuration	Model Shock Generator Power Amplifier Control System Shock Force kNee (kgfn Maximum m/si	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G)	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G)	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G)	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G)	
Configuration	Model Shock Generator Power Amplifier Control System Shock Force kNo- (kgfn Maximum m/si Acceleration	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load	
Configuration	Model Shock Generator Power Amplifier Control System Shock Force kNo- (kgf Maximum m/si Acceleration Maximum Displacement mmm	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600	
Configuration	Model Shock Generator Power Amplifi Control Syste Shock Force kNo- (kgf Maximum m/si Acceleration Maximum Displacement mm/s Maximum Velocity m/s	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load 9 300 ±5.0	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0	
Configuration	Model Shock Generator Power Amplifi Control System Shock Force kNo- (kgf Maximum m/si Acceleration Maximum Velocity m/s Maximum Velocity Change m/s	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load \$900 ±5.0 6	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3 16	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0 8	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0 16	
Configuration	Model Shock Generator Power Amplifi Control Syste Shock Force kNo- (kgf Maximum m/si Acceleration Maximum Velocity m/s Maximum Velocity Charge m/s Power Consumption k∨A	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load p 300 ±5.0 6 56	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3 16 115	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0 8 64	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0 16 100	
Configuration	Model Shock Generator Power Amplifi Control Syste Shock Force kNo- (kgr Maximum m/si Acceleration Maximum Velocity m/s Maximum Velocity Charge m/s Power Consumption k∨A Maximum Payload kg	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3 16 115 5	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0 8 64 5	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0 16 100 5	
Configuration	Model Shock Generator Power Amplifier Control System Shock Force kNo- %gr Maximum m/si Acceleration m/si Maximum Velocity m/si Maximum Velocity Charge m/si Power Consumption kVA Maximum Payload kg Moving Element kg	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load 9 50 ±5.0 6 56 10 11(including table)	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3 16 115 5 11.5(including table)	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0 8 64 5 14(including table)	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0 16 100 5 18(including table)	
Configuration	Model Shock Generator Power Amplifier Control System Shock Force kNe- %gr Maximum m/si Acceleration m/si Maximum Velocity Charge m/s Maximum Velocity Charge m/s Power Consumption kVA Maximum Payload kg Moving Element kg	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3 16 115 5 11.5(including table) 200W×200D	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0 ±6.0 8 64 5 14(including table) 200W×200D	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0 16 100 5 18(including table) 200W×200D	
Configuration Rating Shock Generator	Model Shock Generator Power Amplifi Control Syste Control Syste Shock Force (kgr Maximum m/si Acceleration Maximum Velocity Maximum Velocity Maximum Velocity Maximum Velocity Maximum Velocity Maximum Payload kg Moving Element Kg Table Dimensions mm Table Screw mm	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load 9 50 ±5.0 6 56 56 10 11(including table) 200W×200D 16-M6 depth9	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3 16 115 5 11.5(including table) 200W×200D 16-M8 depth8	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0 ±6.0 8 64 5 14(including table) 200W×200D 16-M6 depth9	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0 16 100 5 18(including table) 200W×200D 16-M6 depth9	
Configuration Rating Shock Generator	Model Shock Generator Power Amplifi Control Syste Shock Force kNee (kgf Maximum m/si Acceleration Maximum Velocity m/s Maximum Velocity Charge m/s Power Consumption kVA Maximum Payload kg Moving Element kg Table Dimensions mm Outline Dimensions mm	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load 9 56 56 10 11(including table) 200W×200D 16-M6 depth9 900W×1660D×990H	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3 16 115 5 11.5(including table) 200W×200D 16-M8 depth8 900W×1660D×990H	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0 8 64 5 14(including table) 200W×200D 16-M6 depth9 1180W×2446D×1215H	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0 16 100 5 18(including table) 200W×200D 16-M6 depth9 1180W×2469D×1215H	
Configuration Rating Shock Generator	Model Shock Generator Power Amplifier Control System Shock Force kNe- Shock Force kno- Maximum m/si Acceleration m/si Maximum Velocity Charge m/si Maximum Velocity Charge m/si Power Consumption kVA Maximum Payload kg Moving Element kg Table Dimensions mm Outline Dimensions mm Mass kg	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load * 300 ±5.0 6 56 10 11(including table) 200W×200D 16-M6 depth9 900W×1660D×990H 1900	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3 16 115 5 11.5(including table) 200W×200D 16-M8 depth8 900W×1660D×990H 1900	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0 8 64 5 14(including table) 200W×200D 16-M6 depth9 1180W×2446D×1215H 3400	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0 16 100 5 18(including table) 200W×200D 16-M6 depth9 1180W×2469D×1215H 3520	
Configuration Rating Shock Generator Console Rack	Model Shock Generator Power Amplifier Control System Shock Force kNo- Shock Force kno- Maximum m/si Acceleration m/si Maximum Velocity m/si Maximum Velocity Charge m/si Maximum Velocity Charge m/si Moving Element kg Moving Element kg Table Dimensions mm Outline Dimensions kg Outline Dimensions mm	FS-3050B/22 922-SH/30 369A-0907-2/S 271-C 22.07 (2250) 1470(150G) at 4kg load * 300 ±5.0 6 56 10 11(including table) 200W×200D 16-M6 depth9 900W×1660D×990H 1900 1830W×956D×2150H	FS-3093B/30H 922-SH/30H 369A-0908-4/S 271-C 29 (2957) 1870(190G) at 4kg load 300 ±9.3 16 115 5 11.5(including table) 200W×200D 16-M8 depth8 900W×1660D×990H 1900 3660W×956D×2150H	FS-5080/16 950-SH 369A-0907-2/S 271-C 15.69 (1600) 980(100G) at 2kg load 500 ±6.0 8 64 5 14(including table) 200W×200D 16-M6 depth9 1180W×2446D×1215H 3400 1830W×956D×2150H	FS-60160/20 960-SH 369A-0907-3/S 271-C 19.61 (2000) 980(100G) at 2kg load 600 ±10.0 16 100 5 18(including table) 200W×200D 16-M6 depth9 1180W×2469D×1215H 3520 2444W×975D×1956H	

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
- Test article protection with soft start feature from shock due to overshooting
- Complete protection with multiple interlocking features.



Power Amplifier Specifications

Specifications of Switching Amplifier Module					
Model		368A	369A		
Amplifier circuit		Switching	Switching		
Apparent power	kVA	12.0	8.0		
Frequency range	Hz	0 to 4000	0 to 4000		
Input voltage	Vrms	1.5	1.8		
Output voltage	Vrms	120	160		
Output current (Sine)	Arms	100	50		
Output current (Random)	A _{0-p}	350	170		





Energy Saving Drive System [ECO-Vibe neo]





"ECO-Vibe neo" is an energy saving drive system designed to be environmentally-friendly.

The vibration test condition changes with the test specifications. Generally, the required rated force can be calculated by the product of the mass such as test article, fixture, table, etc. and testing acceleration. On generic models for the other manufacturers, if the required excitation force for a test is less than the maximum force specified, the ratio of power output will be at 100% with the FCO vive NFO, power consumption can be reduced by choosing the excitation force required for the specified test. The user chooses the force range and power output of the system.

Energy Saving Drive Mode

- NORMAL ··· System Output 100%
- MODE1 ··· System Output 70%
- MODE2 ··· System Output 50%

Energy Saving Effect

Reduction of Electric Charge:

Approx. \$7080.00/year (Approx. JPY790,000.00/year) (Estimation at 25% of rated output for 70% of operating time)

Reduction of CO2

Approx. 38 ton/year

(Estimation at 25% of rated output for 70% of operating time)

 **On March 29, 2006, estimated based on the Ministry of Economy, Trade and Industry, environment departmental order third.
 **Data of random excitation with our F-33000BD/LA36AP (33,000 N)

Reduction of power consumption/ Difference from conventional products



Correspondence to presence/absence of ECO-Vibe neo

New Model	Former Model	●Supported ×Non-supported	New Model	Former Model SI	upported on-supported
F-1K/15	F-01000BM	×	FH-60K/60	F-60000BDH/LA60AW	•
-	F-01300BM	×	FL-08K/100	F-08000BDH/SLS16	•
F-2K/20	F-02000BM	×	FL-12K/100	F-12000BDH/SLS16	•
F-2K/20A	F-02000BM/A	×	FL-16K/100	F-16000BDH/SLS16	•
-	F-02000BM/FA	×	-	F-15000BDH/SLS26	•
-	F-02500AM/A	×	FL-22K/100	F-22000BDH/SLS26	•
-	F-02500AM/FA	×	FL-26K/100	F-26000BDH/SLS26	
F-3K/20	F-03000BM	×	FL-28K/100	F-28000BDH/SLS36	•
F-3K/20A	F-03000BM/A	×	FL-35K/100	F-35000BDH/SLS36	•
FT-3K/30	F-03000BM/FA	×	FL-60K/100	F-60000BDH/SLS60	•
F-6K/20	F-06000BM	×	FV-15K/100	F-15600BDHH/SLS16	•
F-6K/30	F-06000BM/A	×	FV-26K/100	F-26000BDHH/SLS26	•
-	F-06000BM/FA	X	FV-35K/100	F-35000BDHH/SLS36	•
F-10K/56	F-10000BD/LA16B	P I	FV-60K/100	F-60000BDHH/SLS60	•
F-15K/56	F-15000BD/LA16A	P $igodot$	FT-8K/51	-	•
-	F-15000BD/LA26A	P 🕒	FT-10K/80	-	•
F-22K/60	F-22000BD/LA26A	P $igodot$	FT-16K/80	-	•
F-25K/60	F-25000BD/LA26A	P 🕒	FT-18K/80	-	•
F-28K/60	F-28000BD/LA36A	P $igodot$	FT-26K/80	-	•
F-33K/60	F-33000BD/LA36A	P 🕒	FT-28K/80	-	•
F-35K/60	F-35000BD/LA36A	P $igodol $	FT-35K/80	-	
F-40K/60	F-40000BD/LA40A	P 🕒	FT-60K/80	-	
F-43K/60	F-43000BD/LA60A	P $igodot$	FC-060K/60	F-060kBDH/LA100AWV	V X
F-51K/60	F-51000BD/LA60A	P 🕒	FC-080K/60	F-080kBDH/LA100AWV	V X
F-60K/60	F-60000AD/LA60A	P $igodol $	FC-100K/60	F-100kBDH/LA100AWV	V X
FH-8K/51S	F-08500BDH/LA08	5SF 🛛 🕒	FC-200K/60	F-200kBDH/LA200AWV	V X
FH-10K/56	F-10000BDH/LA16	BW •	FP-01K/30	P01	Х
FH-15K/56	F-15000ADH/LA16	BW •	FP-02K/25	Σ9515-AB/SD	×
FH-08K/56	F-08000BDH/LA16	AW	FP-02K/30A	Σ9515-AB/AS	×
FH-12K/56	F-12000BDH/LA16	AW	FP-10K/51	-	•
FH-16K/56	F-16000BDH/LA16	AW	FP-20K/51	-	•
-	F-15000BDH/LA26	AW	FM-20K/60-3D-0	-50 -	
FH-22K/60	F-22000BDH/LA26	AW 🕒	FM-30K/60-3D-0		•
FH-26K/60	F-26000BDH/LA26	AW 🕒	FM-40K/60-3D-0	-50 -	•
FH-28K/60	F-28000BDH/LA36	AW 🕒	FM-60K/60-3D-0		•
FH-33K/60	F-33000BDH/LA36	AW	FB-10K/50-3D-1	- 00	Х
FH-35K/60	F-35000BDH/LA36	AW •	FB-20K/50-3D-1	20 -	×
FH-40K/60	F-40000BDH/LA40	AW •	FB-30K/50-3D-1	50 -	×
FH-43K/60	F-43000BDH/LA60	AW •	FB-60K/50-3D-1	50 -	×
FH-51K/60	F-51000BDH/LA60	AW $ullet$			

* Some former models not listed above are provided with the ECO-Vibe neo. Please contact us for more information.

MIC BRATION

ESTING

Compact Vibration Generator System 510 Series



The compact vibration generator 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).

512-A

- •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 (standard product without trunnion stand) (with optional trunnion stand) System Configuration Vertical Auxiliary Table Modal Analysis Isolated mounting stud Accelerometer Collet-and-chuck Accelerometer cable Charge amplifier Basic System Temperature (Humidity) Chamber Vibration Controller Data Logger Ē se contact us for detail Blower Vibration Generator Power Amplifier 10000 Hz Function Generator Soundproofing Box

Vibration Isolator

Simplified Slip Table System

Control System or Oscillator Required:

Counter Mass

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.

513-B

511.512 Series Specifications

Model		511-A	512-A	512-A/A	512-D	512-D/A
Туре		Modal Analysis	Standard	High Force:64N	High Frequency:30kHz	High Frequency:30kHz·High Force:64N
Rated force	Ν	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/s²	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	ø 40	ø 40	ø40	ø 40
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
On exerting Equiverse	*	-10 to +40	-10 to +40	-10 to +40	-10 to +40	-10 to +40
Operating Environment	C	w/o dewdrop	w/o dewdrop	w/o dewdrop	w/o dewdrop	w/o dewdrop
Cooling		Natural	Natural	Forced air	Natural	Forced air
Dimensions	mm	120W × 190H × 100D	ø150×178(★1)	ø150×178(★1)	ø150×178(★1)	ø150×178(★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
Accoscony		Truppion Stand	Interconnecting Cable×1	Interconnecting Cable×1	Interconnecting Cable×	1 Interconnecting Cable×1
ACCESSOLY		Truminon stand	Grip×2	Grip×2	Grip×2	Grip×2
Ontion			Trunnion Stand	Trunnion Stand	Trunnion Stand	Trunnion Stand
Option		—	(Mass 2.4kg)	(Mass 2.4kg)	(Mass 2.4kg)	(Mass 2.4kg)

(★1)Except for grip.

513 Series Specifications

Model		513-B	51	3-B/A		513-D	513-D/A	
Туре		Standard	High Forc	e:147N•196N	High Fr	equency:24kHz	High Frequency:24kHz•High Force	e:147N
Rated force	Ν	98	147	196		98	147	
Frequency range	Hz	3 to 13k	3 t	o 13k	2	3 to 24k	3 to 24k	
Max. acceleration	m/s²	264.8	397.2	529.7		175	262.5	
Max. velocity	m/s	1.17	1.43	1.67		0.92	1.1.4	
Max. displacement	mm _{P-P}	10		10		10	10	
Axial Resonance		More than 12kHz	More t	han 12kHz	More	e than 23kHz	More than 23kHz	
Moving Element	kg	0.37	().37		0.56	0.56	
Armature Material		Magnesium	Mag	nesium	(Ceramic	Ceramic	
Stiffness	N/mm	14.0		4.0		14.0	14.0	
Armature Size	mm	ø79	1	ø79		ø79	ø79	
Maximum Payload	kg	3.0		3.0		3.0	3.0	
Stray Field		_		_		_	_	
Field Power		Permanent Magnet	Perman	ent Magnet	Perma	anent Magnet	Permanent Magnet	
On continue Facilitation	~	-10 to +40	-10	to +40	-1	10 to +40	-10 to +40	
Operating Environment	C	w/o dewdrop	w/o d	w/o dewdrop		w/o dewdrop	w/o dewdrop	
Cooling		Natural	For	ced air		Natural	Forced air	
Dimensions	mm	ø215×230H(★1)	ø 215 ×	230H(★1)	ø 215	× 230H(★1)	ø215×230H(★1)	
Mass	kg	26		26		26	26	
Matched Amplifier		371-A	372-A	374-A		372-A	374-A	
Blower		_		Yes		_	Yes	
A	In	terconnecting Cable×1	Interconne	cting Cable×1	Intercon	necting Cable×1	Interconnecting Cable	×1
Accessory		Grip×2	Gr	ip×2		Grip×2	Grip×2	
Onting		Trunnion Stand	Trunn	ion Stand	Trur	nnion Stand	Trunnion Stand	
Option		(Mass 4.0kg)	(Mas	s 4.0kg)	(M	ass 4.0kg)	(Mass 4.0kg)	
(+1)Except for grip		<u> </u>		U		-	0.	

216

ø62

1-M4

*Optional Stand

(★1)Except for grip.





220





Compact Vibration Generator System 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-A Series All-weather Type used in Workspace of Environmental Chamber

9514 Series

9514 Series Specifications

Model	9514-AN/SD	9514-AB/SD	9514-AN/AS	9514-AB/AS
-	C		Integrated Pneumatic Support	Integrated Pneumatic Support
Type	Standard	High Force:500N	Large Displacement30mmpp	Large Displacement30mm _{PP} 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	416.7	230.8	384.6
Max. velocity	m/s 1.2	1.2	1.2	1.2
Max, displacement	mm∞ 15(★1)	25	30	30
Axial Resonance	More than 4350Hz	More than 4350Hz	More than 3600Hz	More than 3600Hz
Moving Element	kg 12	12	13	13
Armature Material	Aluminum	Aluminum	Aluminum	Aluminum
7 innatare material	Half Loop Elevure	Half Loop Elevure	Pneumatic Payload Support	Pneumatic Payload Support
Suspension & Guid	e Sleeve Shaft	Sleeve Shaft	Roller Bearing and Sleeve Shaft	Roller Bearing and Sleeve Shaft
Stiffness	N/mm 25.0(± 1)	25.0	-	-
Armature Size	mm Ø75	ø 75	ø 75	ø 75
Maximum Payload	kg 12	12	12	12
Thrust Avis	Ng 12	Vortical	Vortical	Vortical
Ctray Field	locs than $2mT(+2)$	locs than 2mT(+2)	locs than 2mT(+2)	locs than $2mT(+2)$
Stray Field	Less than Shiri (#2)	Less tildii Siili (₹2)	Less triali Silli (₹2)	Less than Shiri (#2)
Field Power	Permanent Magnet	Permanent Magnet	Permanent Magnet	Permanent Magnet
Operating Environment	C -10 to + 40 w/o dewarop	-10 to + 40 w/o dewarop	-10 to +40 w/o dewarop	-10 to + 40 w/o dewarop
Cooling	Natural	Forced air (Blower)	Natural	Forced air (Blower)
Dimensions	mm 283W × 2/0H × 205D	283W × 270H × 205D	283W × 276H × 205D	283W × 276H × 205D
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
	Accelerometer	Accelerometer	Accelerometer	Accelerometer
Option	Counter Mass(★3)	Counter Mass(★3)	Counter Mass(★3)	Counter Mass(★3)
	Isolation (Rubber) Pad	Isolation (Rubber) Pad	Isolation (Rubber) Pad	Isolation (Rubber) Pad
		Muffler for Air Cooling Blower		Muffler for Air Cooling Blower
			0544	
Nodel	9514-AN/MD	9514-AB/WF	9514-7	AB/AW
		High Frequency	All-weather Type used in Works	space of Environmental Chamber
Rated force	N 300	500	300	500IN
Frequency range	Hz 5 to 2.5k	5 to 10k	5 to 3.0k	5 to 3.0k
Max. acceleration	m/s ² 300	277.7	250.0	416.7
Max. velocity	m/s 1.2	1.2	1.2	1.2
Max. displacement	mm _{PP} 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 & Guid	Half Loop Flexure	Half Loop Flexure	Half Loop Flexure	Half Loop Flexure
suspension & Guiu	e Sleeve Shaft	Sleeve Shaft	Sleeve Shaft	Sleeve Shaft
Stiffness	N/mm 25.0	28.0	30.0	30.0
Armature Size	mm ø50	ø75	ø83	ø83
Maximum Payload	kg 8.0	12	10	10
Thrust Axis	Vertica (I 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	$^{\circ}$ C -10 to +40 w/o dewdrop	-10 to +40 w/o dewdrop	- 40 to +125(le	ess than 98%RH)
Cooling	Natural	Forced air (Blower)	Forced air (Blower)	Forced air (Blower)
Dimensions (±4)	mm 283W × 270H × 205D	283W × 270H × 205D	382 5W × 20)5H × 333 5D
Mass	kg 26	26	31	31
Matched Amplifier	373-Δ/713	375-A/722	373-FW	375-D
Blower		Vac	Vas	 Vos
	at-and-chuck Set(@10 @15 @20 @23	5 @30) —	Built-in Accelerometer Mo	del · 731-B T-wrench (M5)
Accessory Colle				compatibility with
	Counter Mass (1.2)	Accelerometer	interconnection (Unipationity with
	Counter Mass (★3)	ISUIDITI (KUDDEI) POU	cnamper whose wa	all unickness is other
0.111	Isolation (Rubber) Pad	munier for Air Cooling Blower	than 70 to	
Option	Model: 9514-AN/MD/Z12	10	Muttler for Air	Cooling Blower
Rein	norcea Stiffness : 50 N/mm (limited to max.	IU mmp-p)		
	Model : 9514-AN/MD/Z13			
Low level	acceleration with low distortion (limited to	max. 10 mm _{P-P})		

(★1)25 mm_{PP} displacement is available by changing axial stiffness to 15 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.



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

• Air suspension mechanism

RATION

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.



Dimensions

382.5



Compact Vibration Generator System Power Amplifier

This power amplifier is specialized for compact vibration generators.

This specialized vibration testing power amplifier is optimally designed for compact vibration generator systems and can also supply power for air-cooling blowers.

In addition, many options, such as transmitters, 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 Ampl	ifier Specification	S			
Model	371-A	372-A	373-A	373-A/Z12	373-A/Z13
Apparent power VA	110	220	330	330	330
Output voltage Vrm	s 20.0	27.5	20.0	20.0	20.0
Output current Arm	s 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 Vrm	s 1.0	1.0	1.0	1.0	1.0
Matching Impedance Q	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 Arm	s 7.5	10.0	20.0	20.0	20.0
Input Connector	BNC	BNC	BNC	BNC	BNC
Input to Blower VA	—	200Max.	—	_	—
	Over current	Over current	Over current	Over current	Over current
Protector	Transistor tmperature	Transistor tmperature	Transistor tmperature	Transistor tmperature	Over voltage
				Air pressure	Transistor tmperature
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	12.5	18.5	37.0	37.0	37.0
Operating Environme	nt	Temp.: 0 to	40°C, hum.: 20 to 85%RH v	v/o dewdrop	
			275 4	27E D	
Model	373_E\//	374-1	5/5-/1	5/5-11	
Model	373-FW	374-A		840	
Apparent power VA	373-FW 360	374-A 440	720 30.0	840 35.0	
Model Apparent power VA Output voltage Vrm	373-FW 360 s 30.0 c 12.0	374-A 440 40.0 11.0	720 30.0 24.0	840 35.0 24.0	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz	373-FW 360 s 30.0 s 12.0 2 to 5k	374-A 440 40.0 11.0 2 to 20k	720 30.0 24.0 2 to 5 0k	840 35.0 24.0	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance 0	373-FW 360 s 30.0 s 12.0 2 to 5k 50k	374-A 440 40.0 11.0 2 to 20k 10k	720 30.0 24.0 2 to 5.0k	840 35.0 24.0 DC to 5.0k	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Ω Input voltage Vrm	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0	374-A 440 40.0 11.0 2 to 20k 10k 1.0	720 30.0 24.0 2 to 5.0k 10k 1.0	840 35.0 24.0 DC to 5.0k 10k 1.5	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Q Input voltage Vrm Matching Impedance Q	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Ω Input voltage Vrm Matching Impedance Ω Load Impedance Ω	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63	840 35.0 24.0 DC to 5.0k 1.0k 1.5 1.46 0.73	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Input voltage Vrm Matching Impedance Ω Load Impedance Ω Sx/N dB	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Ω Input voltage Vrm Matching Impedance Ω Load Impedance Ω S/N dB Distortion Distortion	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5%	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5%	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5%	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0%	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input lmpedance Ω Input voltage Vrm Matching Impedance Ω Load Impedance Ω S/N dB Distortion Meter Arm	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Ω Input voltage Vrm Matching Impedance Ω Load Impedance Ω S/N dB Distortion Meter Arm Input Connector Arm	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Ω Input voltage Vrm Matching Impedance Ω Load Impedance Ω Load Impedance Ω Joistortion Meter Arm Input Connector Input Collawer Vrm	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max.	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max.	720 720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max.	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max.	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Ω Input voltage Vrm Matching Impedance Ω Load Impedance Ω S/N dB Distortion Meter Meter Arm Input to Blower VA	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max. Over current	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max. Over current	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max. Over current	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max. Over current	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Ω Input voltage Vrm Matching Impedance Ω Load Impedance Ω S/N dB Distortion Meter Metter Arm Input to Blower VA	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max. Over current Transistor tmperature	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max. Over current Transistor tmperature	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max. Over current Transistor tmperature	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max. Over current Over voltage	
Model Apparent power VA Output voltage Vrm Output limpedance Ω Input voltage Vrm Matching limpedance Ω Load Impedance Ω S/N Distortion Meter Arm Input to Blower VA Protector	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max. Over current Transistor tmperature	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max. Over current Transistor tmperature Leakage Protector	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max. Over current Transistor tmperature Leakage Protector	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max. Over current Over voltage Transistor tmperature	
Model Apparent power VA Output voltage Output current Arm Frequency range Hz Input Impedance Input voltage Vrm Matching Impedance S/N Bistortion Meter Arm Input to Blower VA Protector	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max. Over current Transistor tmperature	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max. Over current Transistor tmperature Leakage Protector	373-A 720 30.0 24.0 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max. Over current Transistor tmperature Leakage Protector	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max. Over current Over voltage Transistor tmperature Overdisplacement	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Ω Input oltage Vrm Matching Impedance Ω Load Impedance Ω S/IN dB Distortion Meter Meter Arm Input to Blower VA Protector Protector	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max. Over current Transistor tmperature	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max. Over current Transistor tmperature Leakage Protector	720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max. Over current Transistor tmperature Leakage Protector	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max. Over current Over voltage Transistor tmperature Overdisplacement Interlock	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input lmpedance Ω Input voltage Vrm Matching Impedance Ω Load Impedance Ω S/N dB Distortion Meter Metor Arm Input to Blower VA Protector Input Power	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max. Over current Transistor tmperature AC100V 50/60Hz	374-A 440 440. 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max. Over current Transistor tmperature Leakage Protector AC100V 50/60Hz	373-A 720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max. Over current Transistor tmperature Leakage Protector AC200V 50/60Hz	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max. Over current Over voltage Transistor tmperature Overdisplacement Overdisplacement Interlock AC200V 50/60Hz	
Model Apparent power VA Output voltage Output current Arm Input lmpedance Input voltage Vrm Matching Impedance Q Load Impedance O Joistortion Meter Input to Blower VA Protector Input Power Maximum Power VA	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max. Over current Transistor tmperature AC100V 50/60Hz 1.1k	374-A 440 440. 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max. Over current Transistor tmperature Leakage Protector AC100V 50/60Hz 1.5k	373-A 720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max. Over current Transistor tmperature Leakage Protector AC200V 50/60Hz 2.4k	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max. Over current Over voltage Transistor tmperature Overdisplacement Interlock AC200V 50/60Hz 1.8k	
Model Apparent power VA Output voltage Vrm Output limpedance Ω Input voltage Vrm Matching limpedance Ω Load Impedance Ω S/N dB Distortion Meter Meter Arm Input to Blower VA Protector Input Power Maximum Power VA Dimensions mm	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max. Over current Transistor tmperature AC100V 50/60Hz 1.1k 480W × 249H × 400D	374-A 440 40.0 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max. Over current Transistor tmperature Leakage Protector AC100V 50/60Hz 1.5k 480W × 249H × 400D	373-A 720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max. Over current Transistor tmperature Leakage Protector AC200V_50/60Hz 2.4k 480W × 249H × 602D	840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max. Over current Over voltage Transistor tmperature Overdisplacement Interlock AC200V 50/60Hz 1.8k 480W × 200H × 450D	
Model Apparent power VA Output voltage Vrm Output current Arm Frequency range Hz Input Impedance Ω Input oltage Vrm Matching Impedance Ω Load Impedance Ω S/N dB Distortion Meter Meter Arm Input Connector Input to Blower Protector VA Dimensions mm Maximum Power Naximum Seg	373-FW 360 s 30.0 s 12.0 2 to 5k 50k s 1.0 1.21 0.67 70 Less than 0.5% s 20.0 BNC 200Max. Over current Transistor tmperature AC100V 50/60Hz 1.1k 480W × 249H × 400D 37.0	374-A 440 440. 11.0 2 to 20k 10k 1.0 3.64 1.82 80 Less than 0.5% 20 BNC 300Max. Over current Transistor tmperature Leakage Protector AC100V 50/60Hz 1.5k 480W × 249H × 400D 37.0	373-A 720 30.0 24.0 2 to 5.0k 10k 1.0 1.25 0.63 80 Less than 0.5% 25.0 BNC 400Max. Over current Transistor tmperature Leakage Protector AC200V 50/60Hz 2.4k 480W × 249H × 602D 52.0	840 840 35.0 24.0 DC to 5.0k 10k 1.5 1.46 0.73 70 Less than 1.0% 25.0 BNC 200Max. Over current Over voltage Transistor tmperature Over displacement Interlock AC200V 50/60Hz 1.8k 480W × 200H × 450D 35.0	

(\bigstar 1)Under voltage mode (\bigstar 2)Under current mode

Oscillator C	ption for Power Amplifier Unit				
Madal	Power Amplifier Model/C				
Model					
Frequency range	2 ranges,1 to 1kHz and 100 to 100kHz				
	COARSE : Resolution 2Hz from 1 to 1kHz				
Froquoney Adjust	200Hz from 100 to 100kHz				
Frequency Aujust	FINE : 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/℃ TYP at 1kHz (from 1 to 1kHz)				
Output Waveform	Sinusoidal waveform				
	±1.0dB (within same range)				
Output voltage	500 Hz standard from 1 to 1kHz				
	5 kHz standard from 100 to 100kHz				
	less than 0.3% from 5Hz to 1kHz(1 to 1kHz range)				
Distortion	less than 0.5% from 100Hz to 50kHz(100 to 100kHz range)				
	less than 0.7% from 50kHz to 100kHz(100 to 100kHz range)				

Frequency Counter					
Frequency range	1Hz 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

ESTING SYSTEM

- 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.

Rattle Noise Check System

equipment such as CD,

generator and

power amplifier.



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

Vibration Control System DCS-98000MJ



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.

Typical Software Package Specifications

	Random vibration control package						
Model	ESP-121ME (English) / ESP-121MJ (Japanese)						
Major Specifications	Control method:	PSD profile					
	Frequency range:	Max. 5000 Hz					
	Frequency resolution:	Max. 3200 line					
	Control dynamic range:	144 dB (Theoretical value)					
	■Loop time:	Less than 200 ms @ 400 line and 2000 Hz					
	■Max. input number:	16 ch					
	Random setup profile:	Breakpoint (Hz), power spectral density (PSD), slope					
	■Max. test time:	9999 hours 59 minutes 59 seconds					
	■Data I/O function:	Text format output (CSV), Microsoft Excel form (xlsx)					



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Sine vibration control package								
Model	ESP-221ME (English) / ESP-221MJ (Japanese)							
Major Specifi- cations	■ Control method:	Maximum acceleration level Minimum acceleration level Average acceleration level						
	Frequency range:	0.1 to 10000 Hz						
	Preset parameter:	Frequency, Acceleration, Velocity, Displacement.						
	Frequency control:	Sweep mode (LIN or LOG mode), Fixed mode, Manual setting mode.						
	■ Time and cycle:	Duration (Max. 999 h 59 m 59 s) Cycle (Max. 10 ¹⁰ cycles)						
	■Control system:	Max. 2 systems						
	Input channel:	Max. 16 ch						
	Monitor parameter:	Acceleration, Vibration level, Frequency, Output voltage.						
	Graphic function:	Preset acceleration, Input response, Output response.						
	■Analysis feature:	Transfer function, Response spectrum.						

User-defined waveform long period equalization							
Model	ESP-421ME (English) / ESP-421MJ (Japanese)						
Major	■Control method:	Equalizing transfer function					
Specifi-	Frequency range:	Max. 1000 Hz					
Cations	■Freq. resolution:	Max. 1600 line					
	Permissible data:	Max. 4096000 (app. 4.5 h/app. 100 sample)					
	Monitor function:	Target waveform,					
		Control waveform,					
		Output waveform.					
	■Graphic function:	Spectrum,					
		Transfer function.					

Nax. 2 systems						
Nax 16 ch		Shock control package				
cceleration,	Model	ESP-321ME (English)	/ ESP-321MJ (Japanese)			
'ibration level, requency, Dutput voltage. reset acceleration,	Major Specifi- cations	Control method:	Classical shock pulse (Half sine, sawtooth, trapezoidal), Arbitrary shock waveform, Output level and spectrum.			
nput response,		 Pulse duration: Frog. resolution: 	0.5 to 150 ms			
ransfer function,		 Preset parameter: 	Shock waveform.			
esponse spectrum.			Pulse duration.			
	Model					
e (10 band)	ESP-122M	ESP-122ME (English) / ESP-122MJ (Japanese)				

Random-on-Random (ROR) Software (10 band)	ESP-122ME (English) / ESP-122MJ (Japanese)
Sine-on-Random (SOR) Software (28 tone)	ESP-123ME (English) / ESP-123MJ (Japanese)
Limit Channels Control (Random)	ESP-124ME (English) / ESP-124MJ (Japanese)
PSD Conversion	ESP-125ME (English) / ESP-125MJ (Japanese)
Resonant Search and Dwell Control	ESP-222ME (English) / ESP-222MJ (Japanese)
Sound Skip Check	ESP-223ME (English) / ESP-223MJ (Japanese)
Limit Channels Control (Sine)	ESP-224ME (English) / ESP-224MJ (Japanese)
Swept Triangular Control	ESP-225ME (English) / ESP-225MJ (Japanese)
Shock Response Spectrum (SRS)	ESP-322ME (English) / ESP-322MJ (Japanese)
Sine Beat Control	ESP-323ME (English) / ESP-323MJ (Japanese)
CERT Program Software	ESP-621ME (English) / ESP-621MJ (Japanese)
LAN Remote Monitor Package	ESP-821ME (English) / ESP-821MJ (Japanese)
e-mail Control Package (ESP-821ME(English) / ESP-821MJ(Japanese) required)	ESP-822ME (English) / ESP-822MJ (Japanese)
Watch Dog Timer Control Package	ESP-823ME (English) / ESP-823MJ (Japanese)

 $\ensuremath{\overset{\scriptstyle <}{_{\scriptstyle \rm T}}}$ As for the detailed information of Software Package, please contact us.

Software Package Option

Model	Language	Input
DCS-98104ME(G)-W10	English	4ch
DCS-98104MJ(G)-W10	Japanese	4ch
DCS-98104ME(GS)-W10	English	4ch
DCS-98104MJ(GS)-W10	Japanese	4ch
DCS-98108ME(G)-W10	English	8ch
DCS-98108MJ(G)-W10	Japanese	8ch
DCS-98112ME(G)-W10	English	12ch
DCS-98112MJ(G)-W10	Japanese	12ch
DCS-98116ME(G)-W10	English	16ch
DCS-98116MJ(G)-W10	Japanese	16ch

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.

Specification

						-			
Model	ST	-050-06	ST-050-16	ST-050-26	ST-050-36	ST-060-06	ST-060-16	ST-060-26	ST-060-36
Working Area mm	n 50)0×500	500×500	500×500	500×500	600×600	600×600	600×600	600×600
Screw Size	2	5-M10	25-M10	25-M10	25-M10	36-M10	36-M10	36-M10	36-M10
Screw Hole Pattern mm	n	100	100	100	100	100	100	100	100
Operating Frequency Hz		2000	2000	2000	2000	2000	2000	2000	2000
Maximum Payload kg		500	500	500	500	500	500	500	500
Table & Joint Mass kg		28	32	34	44	35	40	41	52
Matched Shaker		906	916	926	936	906	916	926	936
Model	ST	-070-06	ST-070-16	ST-070-26	ST-070-36	ST-080-06	ST-080-16	ST-080-26	ST-080-36
Working Area mm	n 70)0×700	700×700	700×700	700×700	800×800	800×800	800×800	800×800
Screw Size	4	9-M10	49-M10	49-M10	49-M10	64-M10	64-M10	64-M10	64-M10
Screw Hole Pattern mm	n	100	100	100	100	100	100	100	100
Operating Frequency Hz		1800	1800	1800	1800	1700	1700	1700	1700
Maximum Payload kg		600	600	600	600	600	600	600	600
Table & Joint Mass kg		46	51	52	65	59	64	65	80
Matched Shaker		906	916	926	936	906	916	926	936
Model	ST	-100-06	ST-100-16	ST-100-26	ST-100-36	ST-120-16	ST-120-26	ST-120-36	
Working Area mm	n 100	00×1000	1000×1000	1000×1000	1000×1000	1200×1200	1200×1200	1200×1200	
Screw Size	10	00-M10	100-M10	100-M10	100-M10	144-M10	144-M10	144-M10	
Screw Hole Pattern mm	n	200	200	200	200	200	200	200	
Operating Frequency Hz		1500	1500	1500	1500	1200	1200	1200	
Maximum Payload kg		1000	1000	1000	1000	2000	2000	2000	
Table & Joint Mass kg		100	105	106	110	147	148	152	
Matched Shaker		906	916	926	936	916	926	936	





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.

Specification

Model		VT-060	-16-N-A	VT-060	-26-N-A	VT-060	-36-N-A	VT-080	-16-N-A	VT-080	-26-N-A	VT-080	-36-N-A
Working Area ^m	ım	600W×75H ×600D	600W×175H ×600D	600W×75H ×600D	600W×175H ×600D	600W×75H ×600D	600W×175H ×600D	800W×75H ×800D	800W×175H ×800D	800W×75H ×800D	800W×175H ×800D	800W×75H ×800D	800W×175H ×800D
Table Size m	nm	600	600	600	600	600	600	800	800	800	800	800	800
Maximum Frequency на	z	500	1000	500	1000	500	1000	200	500	200	500	200	500
Mass kg	g	30.5	58.0	31.0	58.5	31.5	59.0	48.5	81.0	49.0	81.5	49.5	82.0
Screw Size		36-M10), DP:15	32-M10), DP:15	36-M10), DP:15	64-M10), DP:15	60-M10), DP:15	64-M10), DP:15
Screw Pitch m	nm	100	100	100	100	100	100	100	100	100	100	100	100
Compatible Model		916/P1	0/S-085	92	26	9	36	916/P1	0/S-085	9	26	93	36
P.C.D		100	-200	80-16	0-240	100-20	00-300	100	-200	80-16	50-240	100-20	00-300
Part Number		B3-J•4870	B3-J•4873	B3-J•4871	B3-J•4874	B3-J•4872	B3-J•4875	B3-J•4876	B3-J•4879	B3-J•4877	B3-J•4880	B3-J•4878	B3-J•4881

71-100-16-N-A	VI-100-26-N-A	VT-100-36-N-A :	VT-120-16-N-A	VT-120-26-N-A	VT-120-36-N-A
1000W×125H ×1000D	1000W×125H ×1000D	1000W×125H ×1000D	1200W×150H ×1200D	1200W×150H ×1200D	1200W×150H ×1200D
1000	1000	1000	1200	1200	1200
200	200	200	200	200	200
90.0	91.5	92.0	126.0	126.5	127.0
00-M10, DP:15	96-M10, DP:15	100-M10, DP:15	144-M10, DP:15	140-M10, DP:15	144-M10, DP:15
100	100	100	100	100	100
916/P10/S-085	926	936	916/P10/S-085	926	936
100-200	80-160-240	100-200-300	100-200	80-160-240	100-200-300
B3-J•4882	B3-J•4883	B3-J•4884	B3-J•4885	B3-J•4886	B3-J•4887
	1000W×125H ×1000D 200 90.0 20-M10, DP:15 100 16/P10/S-085 100-200 B3-J-4882	1000 FOTAX 01100 ZOTAX 1000W×125H 1000W×125H ×1000D 1000 1000 1000 200 200 90.0 91.5 00-M10, DP:15 96-M10, DP:15 100 100 16/P10/S-085 926 100-200 80-160-240 B3-J-4882 B3-J-4883	1000 IOTA 1000 Z0TA 1100 Z0TA 1100 Z0TA 1000W×125H 1000W×125H 1000D 1000 1000 1000 1000 1000 1000 200 200 200 90.0 91.5 92.0 00-M10, DP:15 96-M10, DP:15 100-M10, DP:15 100 100 100 16/P10/S-085 926 936 100-200 80-160-240 100-200-300 B3-J-4882 B3-J-4883 B3-J-4884	1000 ISTA 01100 ISTA 01100 ISTA 01100 ISTA 01100 ISTA 1000W×125H 1000W×125H 1000W×125H 1200W×150H ×1000D 1000 1000 1200 1000 1000 1000 1200 200 200 200 200 90.0 91.5 92.0 126.0 00-M10, DP:15 96-M10, DP:15 100-M10, DP:15 144-M10, DP:15 100 100 100 100 16/P10/S-085 926 936 916/P10/S-085 100-200 80-160-240 100-200-300 100-200 B3-J-4882 B3-J-4883 B3-J-4884 B3-J-4885	1000 IO IVA 01 100 10 IVA 1000W×125H ×1000D 1000W×125H ×1000D 1000W×125H ×1000D 1200W×150H ×1200D 1200W×150H ×1200D 1000 1000 1000 1200 1200 200 200 200 200 200 90.0 91.5 92.0 126.0 126.5 00-M10, DP:15 96-M10, DP:15 100-M10, DP:15 144-M10, DP:15 140-M10, DP:15 100 100 100 100 100 100 16/P10/S-085 926 936 916/P10/S-085 926 100-200 80-160-240 100-200-300 100-200 80-160-240 B3-J-4882 B3-J-4883 B3-J-4884 B3-J-4885 B3-J-4886

* Fixture is made of Aluminum. Magnesium alloy fixture is also available.

Option 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 a test article and frequency range of the vibration testing system into consideration.

Specification

Model		JSA-150			JSA-200		:		JSA-300	
Cube Size mm	150	W×150H×1	50D	200	W×200H×2	00D		300	W×300H×3	00D
Maximum Frequency Hz	2000	2000	2000	2000	2000	2000		1000	1000	1000
Mass kg	6	6	6	11	15	11		31	31	30
Screw Size	M5, DP:10	M5, DP:10	M5, DP:10	M6, DP:12	M6, DP:12	M6, DP:12	:	M10, DP:20	M10, DP:20	M10, DP:20
Compatible Model	916/P10/S-085	926	936	916/P10/S-085	926	936		916/P10/S-085	926	936
P.C.D	100	80-160	100	100-200	80-160	100-200	:	100-200	80-160-240	100-200-300
Part Number	B3-J•5100	B3-J•5101	B3-J•5102	B3-J•5103	B3-J•5104	B3-J•5105		B3-J•5106	B3-J•5107	B3-J•5108

* 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.

Option Add-on Mechanism for Vibration Generator

Reinforcing Mechanism against Offset Load

This mechanism enables the mounting of a load whose center of gravity is not on the centerline of the armature table. The guide mechanism added to the vibration generator can respond to vibrations causing a large eccentric moment.

The counter mass is neces-

sary for exciting large and

heavy test specimens by suppressing shaking of the

vibration generator body.

Counter Mass



Load Support Enhancement Mechanism

The addition of a pneumatic spring to the reinforcing mechanism against the offset load makes it possible to increase the payload mass capability of the vibration generator.



Electrical Towing Mechanism

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



Option Add-on Mechanism for Slip Table System

Electric Rollover Mechanism

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



Duct switching for Thrust Axis

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



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.



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.



Option Others

CE Marking

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

New Addition Options

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



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.







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.

Vib-Tech Chamber® is a trademark of EMIC CORPORATION.

Selection Item	Code	Specification					
	VC-062	600W×700H×600D mm Volume [252ℓ]					
Base Model	VC-082	800W×800H×800D mm Volume [512ℓ]					
	VC-102	1000W×1000H×1000D mm Volume [1000ℓ]					
	Α	Oven					
Category	В	Temperature Chamber					
	D	Temperature Humidity Chamber					
D () .	Α	Air-cooled					
Refrigerator	W	Water-cooled					
Condensation		Not applicable					
Maying Machanicm	F	Fixed to Floor Type					
MOVINg Mechanism	M	Moving on Rail Type					
	Χ	Drawer Type					
Combination with Shaker	Υ	Detachable Diaphragm Floor Plug Type					
	Ζ	Through Hole Type					
	(01)(02)(03)	01 (RT+10℃ to 100℃) 02 (RT+10℃ to 150℃) 03 (RT+10℃ to 180℃)※					
	(21)(22)(23)	21 (-25℃ to 100℃) 22 (-25℃ to 150℃) 23 (-25℃ to 180℃)※					
Temperature Range	(31)(32)(33)	31 (-40℃ to 100℃) 32 (-40℃ to 150℃) 33 (-40℃ to 180℃) %					
	(41)(42)(43)	41 (-55℃ to 100℃) 42 (-55℃ to 150℃) 43 (-55℃ to 180℃)※					
	(51)(52)(53)	51 (-70°C to 100°C) 52 (-70°C to 150°C) 53 (-70°C to 180°C)*					
Drammar /Castrollar	M1	Manually Operated Digital Controller					
Programmer/Controller	РЗ	LCD Touch Screen Controller					
Deservelar	Τ	5.7" TFT Color LCD, 6 CH Input, SD Card, Option: 12CH Input					
Recorder	Х	5.7" TFT Color LCD, 10CH Input (Expandable up to Max. 100 CH), SD Card, LAN Connection					

Vib_Tech Chamber[®] Specification

* Upper limit of 200℃: Option



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.





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



*Crane is an option.





in the console rack. (Optional)

The EHVC Series Rapid Vib-Tech 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.

Vib-Tech Chamber® is a trademark of EMIC CORPORATION.

Specification				
Model	EHVC-1118BWFY(53H13)	EHVC-1372BWFY(53H18)	EHVC-1118DWFY(53H11)	EHVC-1372DWFY(53H15)
Interior Dimensions	1118W×914H×1118D mm	1372W×1016H×1372D mm	1118W×914H×1118D mm	1372W×1219H×1372D mm
Dimensions	1981W×2440H×2845D mm	1980W×2540H×2972D mm	1981W×2440H×2845D mm	1980W×2795H×3300D mm
Temperature Range	-73 to +180℃	-73 to +180℃	-73 to +180℃	-73 to +180℃
Tomostatura Dias Data	13°C/min	18℃/min	10℃/min	15°C/min
Temperature kise kate	20℃/min	25℃/min	18℃/min	18℃/min
Tomporaturo Docroaco P	13°C/min	18℃/min	11℃/min	15℃/min
Temperature Decrease R	20°C/min	25℃/min	18℃/min	18℃/min
Temperature Decrease w/	LN2 60°C/min	60℃/min	60℃/min	60℃/min
Humidity Range	_	_	10 to 98%RH	10 to 98%RH
Option	LN2	LN2	LN2	LN2

*The above temperature change rate is achieved under the condition of room temperature + 26°C, power supply frequency 60 Hz, regulated coolant temperature and specified flow rate. When the power supply frequency is 50 Hz, the temperature change rate is different from the above value, so please contact us. It is the average temperature change rate at the vent without a test specimen over the temperature range from -40°C to +85°C.



EMIC BRATION



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-degree-of-freedom (6DoF), pseudo-random vibration
- Temperature range: -100 to +200 ℃
- Temperature transition rate: 60 ℃ per minute (average)

Specification

Model	EVTC-4	EVTC-6	EVTC-9	EVTC-16	EVTC-25	EVTC-36
Interior	762W/×014U×762D mm	01/W/×01/H×01/D mm	1067W×965H×1067D mm	1372W×965H×1372D mm	1676W×965H×1676D mm	1930W×965H×1930D mm
Dimensions	/0200/9146//02D 1111	91410 9140 9140	1067W×1270H×1067D mm	1372W×1270H×1372D mm	1676W×1270H×1676D mm	1930W×1270H×1930D mm
Table Dimensions	610 mm×610 mm	762 mm×762 mm	914 mm×914 mm	1220 mm×1220 mm	1524 mm×1524 mm	1778 mm×1778 mm
Temperature Range	-100 to +200℃	-100 to +200℃	-100 to +200℃	-100 to +200℃	-100 to +200℃	-100 to +200℃
Transition Rate	60 ℃/min(average)	60 ℃/min(average)	60 ℃/min(average)	60 ℃/min(average)	60 ℃/min(average)	60 ℃/min(average)
Maximum	588 m/s²(59.9G)	588 m/s ² (59.9G)	588 m/s²(59.9G)	588 m/s ² (59.9G)	588 m/s²(59.9G)	588 m/s²(59.9G)
Acceleration	Pseudo-random	Pseudo-random	Pseudo-random	Pseudo-random	Pseudo-random	Pseudo-random
Frequency Range	10 to 10 kHz	10 to 10 kHz	10 to 10 kHz	10 to 10 kHz	10 to 10 kHz	10 to 10 kHz
Maximum Payload	315 kg	315 kg	315 kg	225 kg	225 kg	225 kg
Assess Darts	ø152 mm×2	ø152 mm×2	ø152 mm×3	ø152 mm×3	ø152 mm×3	ø152 mm×3
ACCESS POILS	ø25.4 mm×1	ø25.4 mm×1	ø25.4 mm×1	ø25.4 mm×1	ø25.4 mm×1	ø25.4 mm×1
Door	2	2	2(Front & Rear)	2(Front & Rear)	2(Front & Rear)	2(Front & Rear)
Viewing Window	2	2	4	4	4	4
Exterior Dimensions	1524W×2413H×1118D mm	1676W×2438H×1245D mm	1829W×2712H×1397D mm	2134W×2712H×1702D mm	2438W×2717H×2007D mm	2692W×2717H×2260D mm
Uncrated Weight	855 kg	1125 kg	1800 kg	2250 kg	2700 kg	3150 kg
Input Power	3¢AC 415V 70A	3¢AC 415V 70A	3¢AC 415V 145A	3¢AC 415V 145A	3¢AC 415V 202A	3¢AC 415V 214A

* As for the detailed utilities (LN2, compressed air, ventilation, exhaust), please contact us.

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℃/min to 10℃/min
- Temperature range: −55°C to +177°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



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℃ to +150℃
- Humidity range : 30 to 90%RH
- Surface Temperature range : +50℃ to +150℃



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 400 /min



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℃
- Available gas : City gas, LP gas



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-p}
- Rated force : 49N
- Temperature range : -50°C to +100°C



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 : Ø1000mm×L1000mm
- Attainable pressure : Less than 1×10⁻⁵Pa
- Temperature range : -150°C to +100°C
- Force : 80,000N (Sine) 57,700N rms (Random)



Because these products are custom ordered, EMIC may no longer manufacture these systems. If you have any questions or requests, please contact us.

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 500/min
- Water Splashing Port : Spray nozzle
- Temperature range to −40°C to +150°C





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.



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.



Model : EM-852 Rotating Type Shock Test System

The EM-852 applies rotating shock force to various storage devices such as: hard disk for servers, magnetic tapes, DVD drive units, vehicle-mounted equipment that has a rotor, gyro, sensor.

- Produced Energy : 60J
- Maximum Acceleration : 100krad/s²(for pulse wodth of 0.5 ms)
- Table Size : Ø 250mm



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

- Upper Operating Frequency : 100kHz(f₀:Higher than 60kHz)
- Ceramic armature structure
- Use : Measuring frequency characteristic of head suspension for hard disks and accelerometers, and spurious of crystals for cellular phone.





Base for setting thrust axis to horizontal direction (left) and degaussing device (right) are option for EM-772.

Rattle Noise Check System

The system is designed for measuring and evaluating faint unusual sounds (commonly called "Rattle Noise") generated from audio equipment such as a CD player mounted mainly on a car audio. A sound-proof box for attenuating surrounding noise and vibration test system matching to the usage shall be custom designed.





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.



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.



** Because these products are custom ordered, EMIC may no longer manufacture these systems. If you have any questions or requests, please contact us.

Vibration Measuring Instruments

Slim & High-Performance Charge Amplifier

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.

Specifica	ition				
Model	6001-AHD	6002-A			
Input channel	1ch	2ch			
Types	Piezoelectric accelerometers (Front Connector) Accelerometers w/built-in pre-amplifier (Rear Connector				
	Acceleration: m/s ²	Acceleration: m/s ²			
Measuring Mode	Velocity: m/s				
	Displacement: mm				
	Acceleration: 0.1 to 10000m/s	² Acceleration: 0.1 to 10000m/s ²			
Measuring Range	Velocity: 0.1 to 10000m	/s			
0 0	Displacement: 0.01 to 1000m	ım			
Input power	DC9	to 15V			
Dimension	36W×14	49H×240D			
Mass	1.	0 kg			
Ambient Condition	ns −10 to +50°C	(No condensation)			

6001-AHD

6002-A



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 o	f 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.

4 Channel Constant Current Power Supply Unit for Accelerometer with Integral Electronics

Power Supply Unit for Accelerometer with Integral Electronics





Power Supply Unit for Accelerometer with integral Electronics

Model	PS-504
Input channel	4 channels
I/O connector	BNC receptacle
I/O gain	×1 (fixed)
Lower limit freq.	0.2 Hz(within -3 dB), 0.7 Hz(within -5%)
Linnar limit frag	For accelerometer
opper unit ried.	with integral electronics
Max. voltage	DC 24 V
Output current	DC 4mA
Input power	AC100V±10%
Max. power consum	otion 10 VA
Operating	Temp.: 0 to 50 ℃,
environments	hum.: 95%RH w/o dewdrop
Outline dimensions	200W×55H×140D mm
Mass	1.3 kg

Pre-charge Amplifier 504 Series

The 504 series pre-charge amplifier is a signal conditioner for converting high impedance charge input into a low impedance voltage signal from a piezo-electric type accelerometer. One(1) input channel unit, two(2) input channel unit and four(4) input channel unit are available for your specific vibration control/measuring purpose. As any input charge sensitivity can be exactly set to the 504 series pre-charge amplifier within its preset range, the general purpose accelerometer in various sizes are available. A unit with a power supply is also available for various measuring purposes including vibration other than for a vibration test system as a general purpose pre-charge amplifier.





504-E

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504-E-2

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504-E-4



504-E-4-PS

504 Series Pre-charge Amplifier Specifications

Model ★ 1		504-E	504-E-2	504-E-4	504-E/Z01	504-E-4/Z18
Input channel		1	2	4	1	4
Constitution	pC/(m.	/s ²) 0.100 to 0.999	0.100 to 0.999	0.100 to 0.999	0.100 to 0.999	0.100 to 0.999
sensitivity range		1.00 to 9.99	1.00 to 9.99	1.00 to 9.99	1.00 to 9.99	1.00 to 9.99
		2200pC	2200pC	2200pC	2200pC	2200pC
Mavimum input+2	(0.100 to 0.999pC/(m/s ²))	(0.100 to 0.999pC/(m/s ²))			
		22000pC	22000pC	22000pC	22000pC	22000pC
		(1.00 to 9.99pC/(m/s ²))	(1.00 to 9.99pC/(m/s ²))	(1.00 to 9.99pC/(m/s ²))	(1.00 to 9.99pC/(m/s ²))	(1.00 to 9.99pC/(m/s ²))
Frequency range	Hz	5 to 5000	5 to 5000	5 to 5000	5 to 5000	1 to 5000
Output voltage	mV/(m	1/s²) 5	5	5	1	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	0.6	0.6	1.0	0.45	1.0
Model ★ 1		504-CB/TKS	504-CB/TKS-2	504-CB/TKS-4		
Input channel		1	2	4		
Sensitivity range	pC/(m.	/s ²) 0.100 to 9.999	0.100 to 9.999	0.100 to 9.999		
Maximum input★2		100000pC	100000pC	100000pC		
Frequency range	Hz	0.25 to 5000	0.25 to 5000	0.25 to 5000		
Output voltage	mV/(m	1/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 po	wer of AC 100 V±0 V 50/60 Hz is	also available.		

 \star 2 : The maximum input charge is limited by the maximum output voltage.

Outline Drawing

• 504-E-2







• 504-E-4





• 504-E-4-PS



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.



Specification

Model		710-D	712-B3	720-BW	731-B	760-B	541-DSH
Туре		Small/Light Weight	Tri-axial	Water-proof	General Purpose	Large Output	High Temperature
Dimensions	mm	ø8×5	17.5W×9H×17.5D	ø15×8	ø17.5×9.8	24 _{HEX} ×30	14 _{HEX} ×29
Feature		Vibration mea- surement and modal analysis on small object	Simultaneous dynamic measure- ment 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 Lim	it m/s²	5000	5000	5000	5000	1250	-
Shock Limit	m/s²	10000	10000	10000	15000	2500	16000
Mass	g	1.9	14	11	13.5	98.6	35
Frequency Response	Ж Hz	Up to 20k±3dB	Up to 8k±1dB	Up to 8k±1dB	Up to 7k±1dB	Up to 3.5k±1dB	Up to 5k
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	e Hz	More than 60k	More than 25k	More than 26k	38k±5	13.5k±4	More than 27k
Temperature Range	e °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	рF	1200±20%	750±25%	1900±25%	1900±25%	1500±25%	1000±25%
Transverse sensi	tivity	Less than 5%	Less than 5%	Less than 5%	Less than 5%	Less than 5%	Less than 5%
Piezoelectric mat	terial	Pb(Zr•Ti)O₃	Pb(Zr•Ti)O₃	Pb(Zr•Ti)O₃	Pb(Zr•Ti)O₃	Pb(Zr•Ti)O₃	Pb(Zr•Ti)O₃
Case Materia	l	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	o 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 re	coonco fro	quency is dependent on the	charge vibration meter				

Outline View

• 710-D







• 712-B3

Ø 0.8 Low-Noise Cable LN-008(Black)One end

Tube

Microdot Jack

(10-32UNF)

Microdot Jack(CZ320)×3

8

<u>Y</u>xrY

Length:0.3

х



• 720-BW

α2 Low-Noise Cable LN-020





• 731-B

Microdot Connector (10-32UNF)



● 760-В

18.5

Microdot Connector (10-32UNF)

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ø 10

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M5, Depth:5

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(4.5)

• 541-DSH



Accelerometer Cable

Product Description	Model	Cable Outline
Microdot Plug - BNC Plug Accelerometer Cable (2 m)	AC-8020-AB	
Microdot Plug - BNC Plug High Temp. Acc. Cable (2 m)	AC-8020-ABH	
Microdot Plug - BNC Plug Accelerometer Cable (3 m)	AC-8030-AB	10-32UNF BNC
Microdot Plug - BNC Plug High Temp. Acc. Cable (3 m)	AC-8030-ABH	
Microdot Plug - BNC Plug Accelerometer Cable (5 m)	AC-8050-AB	
Microdot Plug - BNC Plug High Temp. Acc. Cable (5 m)	AC-8050-ABH	
Microdot Plug - BNC Plug Accelerometer Cable (10 m)	AC-8100-AB	
Microdot Plug - BNC Plug High Temp. Acc. Cable (10 m)	AC-8100-ABH	
Microdot Plug - Microdot Plug Accelerometer Cable (2 m)	AC-8020-AM	
Microdot Plug - Microdot Plug High Temp. Acc. Cable (2 m)	AC-8020-AMH	
Microdot Plug - Microdot Plug Accelerometer Cable (3 m)	AC-8030-AM	
Microdot Plug - Microdot Plug High Temp. Acc. Cable (3 m)	AC-8030-AMH	10-32UNF 10-32UNF
Microdot Plug - Microdot Plug Accelerometer Cable (5 m)	AC-8050-AM	
Microdot Plug - Microdot Plug High Temp. Acc. Cable (5 m)	AC-8050-AMH	
Microdot Plug - Microdot Plug Accelerometer Cable (6 m)	AC-8060-AM	
Microdot Plug - Microdot Plug High Temp. Acc. Cable (6 m)	AC-8060-AMH	
Microdot Plug - Microdot Plug Accelerometer Cable (10 m)	AC-8100-AM	
Microdot Plug - Microdot Plug High Temp. Acc. Cable (10 m)	AC-8100-AMH	
Mini-microdot Plug - Microdot Plug Acc. Cable (2 m)	AC-7020-BM	M3 - 10-32UNF
Extension Cable (Every 1 m)	-	
Conversion Adapter (BNC Plug - Microdot Jack)	BLM-001	

Insulated Mounting Stud

Product Description	Model
Insulated Stud for 540-DT	RS-171D
Insulated Stud for 710-D	TJ-1026AC

Product Description	Model
Insulated Stud (M5) for 731-B	RS-171B14C6
Insulated Stud (M6) for 731-B	RS-171B14D6

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Accelerometer Set

In addition to the accelerometer body, this set includes all required accessories such as dedicated cables and insulators.

Set Screw



Accelerometer Set

Draduct Description	721 D Accoloromotor	Cat 2 m	721 B Assolatometer	Sat 6 m
Product Description	731-B Accelerometer	Set 3 m	731-B Accelerometer	Set 6 m
Model	731-B(FSET3m)	731-B(FSET6m	1)
	Accelerometer	731-B	Accelerometer	731-B
Contents of Set	Accelerometer Cable	AC-8030-AM	Accelerometer Cable	AC-8060-AM
contents of set	Microdot - BNC Adapter	BLM-001	Microdot - BNC Adapter	BLM-001
	Insulated Stud	RS-171B14C6	Insulated Stud	RS-171B14C6
Product Description	Built-in Set for 902 Vibration Generator		Built-in Set for 903 Vibration Generator	
Model	BIN-PU902SET		BIN-PU903SE	Г
	Accelerometer	540-DS	Accelerometer	540-DS
	Accelerometer Cable	AC-8030-AM	Accelerometer Cable	AC-8030-AM
Contents of Set	Microdot - BNC Adapter	BLM-001	Microdot - BNC Adapter	BLM-001
			Insulator	541AR-5100
			Set Screw	M6×10
Product Description	Built-in Set for 906 Vibrati	on Generator	Built-in Set for BD Vibration	on Generator
Model	BIN-PU906SET	-	BIN-PUBDSET	-
	Accelerometer	540-DS	Accelerometer	731-B
Contrate of Cot	Accelerometer Cable	AC-8030-AM	Accelerometer Cable	AC-8030-AM
Contents of Set	Microdot - BNC Adapter	BLM-001	Microdot - BNC Adapter	BLM-001

M6×10

RS-171B14C6

Insulated Stud

The modernization program is the renewal program of an old type vibration testing system that you currently use.

Renewal of Power Amplifier

This program replaces an old type power amplifier with the latest switching amplifier of high output and efficiency. The power amplifier can be reduced in size and the service life of the vibration testing system can be extended.

Overhaul of Vibration Generator

Although the cleaning of the inside of the vibration generator body and replacement or adjustment of some deteriorated parts cannot be performed in usual inspection. An overhaul can allow the system to operate in an optimum working mode for the long term.

Renewal of Vibration Controller

This program replaces your vibration controller with the state-of-the-art vibration controller. As a result, operations can be easily executed and the latest vibration control including the basic operations such as sine, random, shock becomes available.

Addition of Chamber

An existing vibration testing system can be enhanced to a combined environmental reliability test system by adding a temperature (humidity) chamber.

Addition of Slip Table

The addition of the slip table enables horizontal vibration tests by changing the thrust axis. It also enables testing of heavy equipment.

ECO-Vibe neo Modification for Energy-saving Drive Mode

ECO-Vibe neo modifies an existing F series vibration test system and can achieve higher power saving.





















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-proof Mechanism



Countermeasure against Sound

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.

STING

Contracted Test Services

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



This service we offer allows customers to bring in test articles and perform various tests using the test equipment in our test laboratories. In addition, we can discover and solve the underlying problems that are hard to predict and provide test solutions to improve test quality and get accurate results.

Object to be tested by the customer















Electric/Electronic and Precision Machine

Equipment for Automobile

Railroad





Construction (Truck)

Function and Durability

Test of Engine

Test Planning

We will jointly examine your desired test purpose, then offer you the appropriate test plan.

Reliability Resistance Reliability	Safety	Reliability	Durability	Quality	Impact Resistance	Packaging Reliability
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Vibration Test. Combined Environmental Test

Sine Vibration, Random Vibration, Shock, Temperature Humidity Test, Vibration-Temperature/Humidity Combined Reliability Test, Actual Environment Simulation Test

Temperature Test

Heat Resistance and High Temperature Test

Large-scale Vibration Test

- Enriched large vibration testing system (fully equipped with the rated force 180kN/100kN scale) corresponding to assembling item, large product and heavy specimen
- Additional large triaxial vibration testing system corresponding to the latest railway rolling stock standard and seismic simulation
 - JIS E 4031 Rolling stock equipment -- Vibration and shock tests
 - Corresponding to JIS E 3014 Parts for railway signal -- Vibration methods
 - Corresponding to JIS Z 0232 Packaged freights -- Method of vibration test
 - The earthquake simulation by seismic intensity, earthquake acceleration and earthquake actual survey data is possible.



Highly Accelerated Life Testing (HALT), Highly Accelerated Stress Screening (HASS)

Although the conventional environmental simulation test is performed to shorten a designed validation test, lower the failure rate of products, extend the service life of products and decrease claims after the sale, the HALT and HASS apply the excessive stress to a product to check its operational limit and destructive limit to verify the design.

Design and Manufacture of Specialized Fixture

The key role of the fixture is to attach a specimen and transmit vibration. We offer the design, analysis and manufacturing of specialized fixtures.

The advisors with the most experience will support the testing needs of your company

In performing vibration tests, the technical design of the fixture for mounting a test article is essential.

- The key role of the fixture is to attach a specimen and transmit vibration, in particular transmitting vibration is most important.
- The fixture becomes inherently deformed depending on the test condition or vibration mode.
- Depending on the vibration mode the fixture may not transmit vibration to a specimen, therefore, the intended vibration test may not be performed.
- The vibration mode shows distinctive changes depending on the difference in size and mass of a specimen and test conditions.

EMIC has the design, analysis and manufacture of a fixture meeting the requirement for the customer's demands based on the abundant technique and actual performance of manufacturing, selling and contracted test service and realizes an accurate test.

Customer Response by Support Staffs



EMIC CORPORATION

Technical Advisor Yoshio ISHITA

- Chairman, Subcommittee on Mechanical Environment of Japan Testing Machinery Association
- Association IEC/TC104/A National Deliberation Committee & JIS Drafting Committee ISO/TC108/SC6 National Deliberation
- Committee Former Guest Professor, National Institute
- Former Technology, Numazu College
 Former Technical Advisor, Yamagata-Pref. and Fukushima-Pref.
- Former research committee member, Ministry of Economy, Trade and Industry

Our experts support the setup of test specimens, and operational procedure of test equipment.

Provision of Solution required for Testing

We offer solution to discover and solve a problem with various tests.

East Japan Contracted Test Sales Dept.	Utsunomiya Test Lab Center First Saitama Test Lab Center Second Saitama Test Lab Center Mishima Test Lab Center	23-1 Kiyohara Kogyo-danchi, Utsunomiya-shi, Tochigi 321-3231, Japan622-1 Asahigaoka, Hidaka-shi, Saitama 350-1203, Japan11 Heiseidai, Mishima-shi, Shizuoka 411-0042, Japan
Center Japan Contracted Test Sales Dept.	Mizunami Test Lab Center Yokkaichi Test Lab Center Hikone Test Lab Center	2020 Yamada Cho, Mizunami-shi, Gifu 509-6104, Japan 2-1-26 Noda, Yokkaichi-shi, Mie 510-0815, Japan 746-1 Nodayama Cho, Hikone-shi, Shiga 522-0025, Japan
West Japan Contracted Test Sales Dept.	Kobe Test Lab Center Hyogo Test Lab Center	5-2-13 Mitsugaoka, Nishi-ku, Kobe-shi, Hyogo 651-2228, Japan 47-13 Niijima, Harima-cho, Kako-gun, Hyogo 675-0155, Japan
Overseas	Thailand Test Lab. Center	15/1 Soi Punnawithi 28, Sukhumvit 101 Road, Bangchak, Prakanong, Bangkok 10260, Thailand

The ISO/IEC 17025 accreditation for technical competence.

First Saitama Test Lab, Yokkaichi Test Lab and Kobe Test Lab received the accreditation on ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories" and can issue the test data with accreditation marks listed. IEC/ISO 17025 also takes the requirements in ISO/IEC Guide 25 of its technical requirements based on the requirements in ISO 9001:2000. In addition, it requires the environmental condition necessary to estimate uncertainty, validity confirmation, etc. according to UM. Accreditation of testing laboratories according to this standard assesses the conformity of technical competence as well as the operation and effectiveness of the quality management system within the laboratory. Based on accumulated much knowledge for longer than 40 years and accreditation EMIC gives a customer a reliable test result.

Entrusted Test Service Guidance for Inquiry >>> E-mail test-lab@emic-net.co.jp Note: It is available even from an inquiry form of the HP.

Fundamentals of Vibration



Unit System

	International System of Units SI(JIS Z 8202)		
	Quantity	Unit Name	Unit Symbol
	Length	meter	m
Base Unit	Mass	kilogram	kg
	Time	second	S
	Thermodynamical Temperature	Kelvin	К
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	Ν
	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.



How to Use Vibration Nomograph





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



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



d : Displacement (mm_{0-p}) V: Velocity (m/so-p) α : Acceleration (m/s²_{0-p}) f: Frequency (Hz)

Relation Among Acceleration, Velocity and Displacement.

Relation	Equation for Estimation	
Acceleration α [m/s ² _{0-p}]= (2 π f) ² d/1000	$\alpha[m/s^2_{0-p}] \Rightarrow 0.0394df^2 \gg 1$	
$=2\pi fv$	≑ 6.28fv %1	
Velocity V[m/s _{0-p}] = $2\pi fd/1000$	v[m/s₀. _p] ≒ 0.00628fd	
$= \alpha/2\pi f$	≑0.159α/f %2	
Displacement d[mm _{0-p}] = $1000\alpha/(2\pi f)^2$	$d[mm_{0-p}] \doteqdot 25.3\alpha/f^2 \& 2$	
$= 1000v/2\pi f$	≒ 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 $56 \times 9 = 504$ 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	Magnifica	ation 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)

1.Definition of Test Conditions

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

- Estimated mass of test article 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) m1: Fixture mass (kg)

 α : Acceleration (m/s²) m₂ : Test article mass (kg) mo: Moving element mass (kg)

Example: Assuming that Model: F-10K/56 system is suitable for your application, the moving element mass m₀, fixture mass m₁ and test article mass m₂ be 15 kg, 20 kg and 35 kg respectively. Determine the required force for generating the acceleration level α of 98.0 m/s² as follows;

 $F = (15kg+20kg+35kg) \times 98.0 \text{ m/s}^2$

= 6860N

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

To choose 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 a 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	other	5
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Unit	SI	Gravitional
Force	1N	0.10197kg (0.102kgf or app.)
TOICE	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

Test Article С m_2 Fixture $hm_1 \circ$ Moving Element Ð С Vibration Generator Body m₀ Performance Curve Acceleration Limit Acceleration [m/s²] 0300 Frequency [Hz] 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.

Outline Block Diagram

Armature Table Hole Pattern and Size



Exterior



Shaker	Exterior Dimensions
902-FN	460W×490H×490D mm
903-FN 903-FN/A 903-FN/FA	630W×602H×528D mm
906-FN 906-FN/A	720W×675H×628D mm
916-BP/LA 916-AP/LA	975W×885H×700D mm
926-AP/LA	1106W×1047H×855D mm
936-AP/LA	1224W×1107H×971D mm
960-AP/LA	1452W×1252H×1215D mm
S085-AW/LA	797W×775H×635D mm
916-BW/LA 916-AW/LA	974W×1035H×700D mm
926-AW/LA	1106W×1135H×880D mm
936-AW/LA	1106W×1135H×880D mm
960-AW/LA	1452W×1297H×1231D mm
916-AW/SLS	974W×1035H×700D mm
926-AW/SLS	1082W×1163H×866D mm
936-AW/SLS	1125W×1200H×965D mm
960-AW/SLS	1452W×1297H×1231D mm
916-AP/SLA	950W×1029H×665D mm
926-AP/SLA	1082W×1163H×866D mm
936-AP/SLA	1186W×1255H×971D mm
960-AP/SLA	1461W×1375H×1115D mm
9100-AWW/LA	1489W×1338H×1149D mm
9200-AWW/LA	1905W×1348H×1473D mm
P10-10AW/LA	702W×763H×572D mm
P20-A	982W×1000H×750D mm
P01-AB/AS	384W×391.5H×360D mm
Σ9515-AB/SD	442W×360H×340D mm

BRATION







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% Specifications are subject to change without notice for improvement.