

ECON Vibration Testing System



Selection Guide

Electro-dynamic Vibration Shaker 20N to 200kN

Air cooled, Water Cooled

Long Stroke, Multi-axial

Climate Chamber Combined

Shaker Controller



20N to 1000N

VE Series

Features

- Compact design, portable and easy handling
- Permanent magnetic structure, highly reliable
- Compatible design to work with slip table and expander
- Rugged design with high lateral stiffness
- Long service life and maintenance free

Applicable Vibration Test

- Chips/IC/Electronic components
- Computer/Instruments components
- Optical/Medical device and components
- Educational and research
- Small products stress screening
- DUT (device under test) with weight <5kg and dimension <200mm in each axis



Model Selection

System	VE-5102	VE-5110	VE-5120	VE-5150	VE-51100
Shaker	VE-5102	VE-5110	VE-5120	VE-5150	VE-51100
Power Amplifier	VSA-H40A (Built-in)	VSA-H181A	VSA-H751A	VSA-H102A	VSA-H132A
Blower	/	/	√	√	√
Rated Sine Force (N)	20	100	200	500	1000
Frequency Range (Hz)	5-10,000	2-7,000	2-7,000	5-5,000	5-6,500
Max. Displacement (mm, p-p)	5	13	13	10	25.4
Max. Velocity (m/s)	1.5	1.5	1.5	1.0	1.5
Max. Acceleration (bare table, m/s ²)	200	400	800	340	500
Max. Load (kg)	0.8	2	2	8	20
Armature Diameter (mm)	30	60	60	80	120
Effective Moving Elements Mass (kg)	0.1	0.25	0.25	1.5	2.0
Max. Power Output of Power Amplifier (VA)	40	180	750	1,000	1,300
Options	• Head expander • Slip table • Chamber thermal barrier				

All parameters are measured and verified as per ISO 5344. For detailed technical information, please see product datasheets.

Air Cooled, 3kN to 6kN EDS Series

Features

- Double field coil design to reinforce uniform magnetic field
- Standard IOF (Isolator on Frame) design to save cost to build foundation
- Connection and instant use, easy handling
- Standard degauss kit to reduce magnetic flux leakage
- Latest SiC-FET technique based, modularized power module with higher switching frequency range, SNR and more safety
 - Smarter remote control on power amplifier thru Ethernet connectivity
- System MTBF > 6,000 Hours, long-time operation with minimum maintenance

Applicable Vibration Test

- Chips/IC/Electronic components
- Optical/Computer/Instruments components
- Automotive components
- Lamp/Optical/Medical products
- DUT (device under test) with weight <100kg and dimension <500mm in each axis

Model Selection

System	EDS-300-D402A	EDS-600-D802A
Shaker	EDS-300	EDS-600
Power Amplifier	VSA-D402A	VSA-D802A
Blower	PBL-W03	PBL-W06
Rated Sine Force (kN)	3	6
Frequency Range (Hz)	5-4,000	5-3,500
Max. Displacement (mm, p-p)	25.4	51
Max. Velocity (m/s)	2.0	2.0
Max. Acceleration (bare table, m/s ²)	981	981
Max. Load (kg)	120	300
Armature Diameter (mm)	150	200
Effective Moving Elements Mass (kg)	3	6
Max. Power Output of Power Amplifier (kVA)	4	8
Options	• IOT (Isolator on Trunnion) • Degaussing coil (magnetic flux leakage <1mT) • Head expander • Slip table • Chamber thermal barrier	

All parameters are measured and verified as per ISO 5344. For detailed technical information, please see product datasheets.



Air Cooled, 10kN to 60kN EDM Series

Features

- Double field coil design to reinforce uniform magnetic field
- Standard IOT (Isolator on Trunnion) design to enhance cross axial stiffness and give flexible full displacement at low frequencies and heavy loads
- Equipped with fully automatic centering control (ACC) on all models
- Fully automatic pneumatic load compensation for heavy test loads
- Standard degauss kit to reduce magnetic flux leakage
- Latest SiC-FET technique based, modularized power module with higher switching frequency range, SNR and more safety
- Smarter remote control on power amplifier thru Ethernet connectivity
- **System MTBF > 6,000 Hours, long-time operation with minimum maintenance**

Applicable Vibration Test

- Automotive components/structures
- IT/Computer/Instruments/Optical products
- Electrics/Electrical products
- Medical equipment and devices
- Aerospace/Aviation components
- DUT (device under test) with weight <1000kg and dimension <1000mm in each axis



Model Selection

System	EDM-1000-D123A	EDM-2000-D243A	EDM-3200-D323A	EDM-4000-D483A	EDM-5000-D563A	EDM-6000-D643A
Shaker	EDM-1000	EDM-2000	EDM-3200	EDM-4000	EDM-5000	EDM-6000
Power Amplifier	VSA-D123A	VSA-D243A	VSA-D323A	VSA-D483A	VSA-D563A	VSA-D643A
Blower	PBL-W10	PBL-W20	PBL-W30	PBL-W40	PBL-W50	PBL-W60
Rated Sine Force (kN)	10	20	32	40	50	60
Frequency Range (Hz)	5-3,000	5-3,000	5-2,500	5-2,500	5-2,500	5-2,500
Max. Displacement (mm, p-p)	51	51	51	51	51	51
Max. Velocity (m/s)	2.0	2.0	2.0	2.0	2.0	2.0
Max. Acceleration (bare table, m/s ²)	981	981	981	800	981	981
Max. Load (kg)	300	300	500	800	1,000	1,000
Armature Diameter (mm)	240	320	320/370	445	445	445
Effective Moving Elements Mass (kg)	10	20	32	50	50	60
Max. Power Output of Power Amplifier (kVA)	12	24	32	48	56	64
Options	• IOF (Isolator on Frame) • Degaussing coil (magnetic flux leakage <1mT) • Head expander • Slip table • Chamber thermal barrier					

All parameters are measured and verified as per ISO 5344. For detailed technical information, please see product datasheets.

Air Cooled, 32kN to 50kN, Long Stroke EDM Series

Features

- 76/100mm long stroke
- Double field coil design to reinforce uniform magnetic field
- Standard IOT (Isolator on Trunnion) design to enhance cross axial stiffness and give flexible full displacement at low frequencies and heavy loads
- Equipped with fully automatic centering control (ACC) on all models
- Fully automatic pneumatic load compensation for heavy test loads
- Standard degauss kit to reduce magnetic flux leakage
- Latest SiC-FET technique based, modularized power module with higher switching frequency range, SNR and more safety
- Smarter remote control on power amplifier thru Ethernet connectivity
- System MTBF > 6,000 Hours, long-time operation with minimum maintenance

Applicable Vibration Test

- IEC, ISTA, ASTM test standard compliant
- Automotive components/structures
- IT/Computer/Instruments/Optical products
- Electrics/Electrical products
- Medical equipment and devices
- Aerospace/Aviation components
- DUT (device under test) with weight <1000kg and dimension <1000mm in each axis

Model Selection

System	EDM-2000LS-D243A	EDM-3200LS-D323A	EDM-4000LS-D483A	EDM-5000LS-D563A
Shaker	EDM-2000LS	EDM-3200LS	EDM-4000LS	EDM-5000LS
Power Amplifier	VSA-D243A	VSA-D323A	VSA-D483A	VSA-D563A
Blower	PBL-W20	PBL-W30	PBL-W40	PBL-W50
Rated Sine Force (kN)	20	30	40	50
Frequency Range (Hz)	1-2,500	1-2,500	1-2,500	1-2,500
Max. Displacement (mm, p-p)	76/100	76/100	76/100	76/100
Max. Velocity (m/s)	2.0	2.0	2.0	2.0
Max. Acceleration (bare table, m/s ²)	500	750	630	800
Max. Load (kg)	500	500	800	800
Armature Diameter (mm)	350	350	445	445
Effective Moving Elements Mass (kg)	40	40	63	63
Max. Power Output of Power Amplifier (kVA)	24	32	48	56
Options	• IOF (Isolator on Frame) • Degaussing coil (magnetic flux leakage <1mT) • Head expander • Slip table • Chamber thermal barrier			

All parameters are measured and verified as per ISO 5344. For detailed technical information, please see product datasheets.



Water Cooled, 80kN to 200kN EDH Series

Features

- Intensified armature design by specific reinforced material
- Unique parallel circulating water cooling design with higher cooling efficiency
- Dedicated filtration mechanism with 1 μm filtration accuracy
- Precise measurement and interlocks protection on cooling water failure
- Complex upper suspension design for better low frequency performance
- Stronger anti-overturning moment by using high wear resistance and self-lubricating material on lower guidance mechanism
- System MTBF > 6,000 Hours, long-time operation with minimum maintenance

Applicable Vibration Test

- Electric vehicle battery pack
- Automotive/Aerospace/Aviation/Train/Transportation/Civil structures
- Power/Electricity equipment
- DUT (device under test) with weight <5000kg and dimension <2500mm in each axis



Model Selection

System	EDH-8000-D104A	EDH-10000-D124A	EDH-12000-D134A	EDH-16000-D174A	EDH-18000-D194A	EDH-20000-D214A
Shaker	EDH-8000	EDH-10000	EDH-12000	EDH-16000	EDH-18000	EDH-20000
Power Amplifier	VSA-D104A	VSA-D124A	VSA-D134A	VSA-D174A	VSA-D194A	VSA-D214A
Blower	CU-1	CU-1	CU-1	CU-2	CU-2	CU-2
Rated Sine Force (kN)	80	100	120	160	180	200
Frequency Range (Hz)	5-2,500	5-2,500	5-2,500	5-2,100	5-2,100	5-2,100
Max. Displacement (mm, p-p)	76	76	76	76	76	76
Max. Velocity (m/s)	2.0	2.0	2.0	2.0	2.0	2.0
Max. Acceleration (bare table, m/s^2)	981	981	981	981	981	981
Max. Load (kg)	1,000	1,000	1,000	2,000	2,000	2,000
Armature Diameter (mm)	480	480	550	650	650	650
Effective Moving Elements Mass (kg)	80	85	100	160	180	180
Max. Power Output of Power Amplifier (kVA)	100	120	130	170	190	210
Options	• Degaussing coil (magnetic flux leakage <1mT) • Head expander • Slip table • Chamber thermal barrier					

All parameters are measured and verified as per ISO 5344. For detailed technical information, please see product datasheets.

Monobase Slip Table, 100mm to 2500mm

For VE/EDS/EDM/EDH Series

Slip table is an often-use test platform in combined working with shaker. ECON is supplying different size of slip table for VE/EDS/EDM/EDH series shakers, from mini size 100mm to large size 2500mm. The material of slip plate is optional Magnesium or Aluminum as per request.

Shaker rotation mechanism (SRM) is equipped for slip tables by using motor-driven mechanism, to rotate shaker to work in X/Y direction for horizontal vibration testing (if we regard vertical vibration as in Z direction).

Model Selection

Slip Table Model	Dimension (mm)	Thickness (mm)	Compliant with Shaker Model
ST-100	100x100	20	VE-5102
ST-150	150x150	20	VE-5110
ST-200	200x200	20	VE-5120
ST-250	250x250	20	VE-5150/51100
ST-300	300x300	25	VE-51100, EDS-300
ST-400	400x400	25	EDS-300/600 EDM-1000
ST-500	500x500	40	EDS-300/600 EDM-1000/2000(LS)/3200(LS)
ST-600	600x600	40	EDS-600 EDM-1000/2000(LS)/3200(LS)/4000(LS)/5000(LS)/6000
ST-800	800x800	40	EDM-1000
		50	EDM-2000(LS)/3200(LS)/4000(LS)/5000(LS)/6000 EDH-8000/10000
ST-1000	1000x1000	50	EDM-2000(LS)/3200(LS)/4000(LS)/5000(LS)/6000 EDH-8000/10000/12000
ST-1200	1200x1200	50	EDM-4000(LS)/5000(LS)/6000 EDH-8000/10000/12000
ST-1500	1500x1500	50	EDM-5000(LS)/6000 EDH-8000/10000/12000/16000/18000/20000
ST-1800	1800x1800	60	EDH-10000/12000/16000/18000/20000
ST-2000	2000x2000	60	EDH-10000/12000/16000/18000/20000
ST-2500	2500x2500	60	EDH-16000/18000/20000

For detailed technical information, please see product datasheets.



Monobase Slip Table

Monobase slip tables share one common frame with shaker. This design can supply precise alignment working and easy-to-use coupling between slip tables and the shaker.

Oil-film Guidance

Oil-film guidance based slip table is cost-effective solution for general purpose X/Y direction vibration testing, with Magnesium or Aluminum plate sliding on V-groove Bearings.

Oil-film guidance slip table is most often selected for horizontal vibration testing by working with air cooled shakers.



Hydrostatic Guidance

Hydrostatic guidance based slip table is designed based on specific T-groove Bearings, which can generate high yaw, roll and pitch over-turning moments. Hydrostatic guidance based slip table is especially used for horizontal vibration testing where the DUT (device under test) is very heavy or has high center of gravity.



Head Expander, 200mm to 2500mm

HE Series

Head expander is rather useful in cases that shaker armature square is not enough to mount large dimension specimen, or more specimens need to be tested at once to save test time.

ECON is supplying customer series of head expanders made by lightweight Magnesium alloy with higher strength-to-weight ratio, and by aluminum alloy with higher cost efficiency.



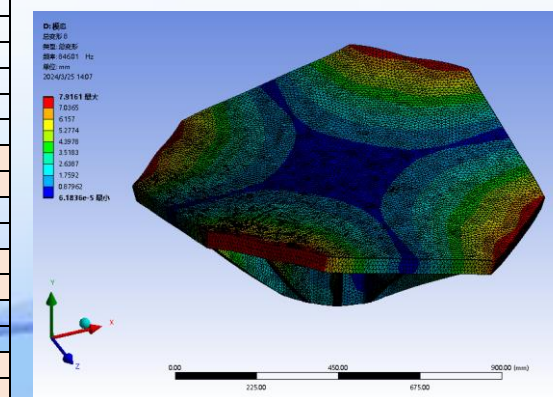
Model Selection

Head Expander Square	Φ150		Φ200		Φ240		Φ320		Φ445		Φ480		Φ550		Φ650	
HE-300S	7	2000	10	2000												
HE-400S	12	2000	14	2000	20	2000										
	5.5	1800	7.5	2000	11	2000										
HE-500S	20	2000	20	2000	30	2000	35	2000	32	2000	32	2000				
			10	1800	18	2000	20	2000								
HE-600S	28	1400	35	1500	30	1500	45	2000	80	2000	80	2000				
			22	1400	16	1200	30	1700								
HE-700S					45	1000	70	2000	85	2000						
					29	900										
HE-800S					80	800	80	1300	100	1300	100	1300	120	1300		
							42	1000	65	1200	65	1200				
HE-1000S							110	1200	160	1000	160	1000	220	900	220	900
									105	900	105	900				
HE-1200S									280	500	280	500	280	500	300	450
							130	400	180	700	180	700				
HE-1500S									400	400	400	400	425	400	450	400
									260	400			300	400	340	400
HE-1800S				Mass (Al)		Freq. (Al)									850	300
				Mass (Mg)		Freq. (Mg)									550	300
HE-2000S									460	400	430	400	900	300	910	300
															620	300
HE-2500S															1200	200
															840	200

More size options are available for HE series expanders. The actual weight and frequency will differ as per designed upon request.

FEA and EMA Test Passed

All ECON head expanders have excellent dynamic performances after test of FEA (Finite Element Analysis) and EMA (Experimental Modal Analysis)



Multi-Axial, 500N to 60kN

EDS/EDM Series

Features

- Dedicated and sophisticated multi-axial design
- Specific low friction linear bearings
- Usable frequency range ~1000Hz (sine) and ~2,000Hz (random)
- Latest SiC-FET technique based, modularized power module with higher switching frequency range, SNR and more safety
- Smarter remote control on power amplifier thru Ethernet connectivity
- Dedicated foundation-free design by pneumatic isolators, no need to build specific foundation and use the shaker instantly

Applicable Vibration Test

- Electric vehicle battery pack
- Automotive structures
- Aerospace/Aviation structures
- Train/Ship/Transportation structures
- Power/Electricity equipment
- Mechanical/Civil Structures
- DUT (device under test) with weight <5000kg and dimension <2500mm in each axis



Model Selection

System	VE-50-3AX-200M	EDS-600-3AX-400M	EDM-1000-3AX-400M	EDM-2000-3AX-500M	EDM-3200-3AX-600M	EDM-5000-3AX-800M
Shaker	VE-5150	EDS-600	EDM-1000	EDM-2000	EDM-3200	EDM-5000
Power Amplifier	VSA-H102A	VSA-D802A	VSA-D123A	VSA-D243A	VSA-D323A	VSA-D563A
Blower	HG-370	PBL-W06	PBL-W10	PBL-W20	PBL-W30	PBL-W50
Rated Sine Force (kN)	0.5	6	10	20	30	50
Table Dimension	200x200	400x400	400x400	500x500	600x600	800x800
Sine Working Frequency Range (Hz)	1,000	800	800	800	600	500
Random Working Frequency Range (Hz)	2,000	2,000	2,000	2,000	2,000	1,000
Max. Displacement (mm, p-p)	10	38	38	38	38	38
Max. Velocity (m/s)	0.5	1.0	1.0	1.0	1.0	1.0
Max. Acceleration (bare table, m/s ²)	100	125	200	300	200	200
Max. Load (kg)	2	200	200	200	300	750
Armature Diameter (mm)	80	200	240	320	320	445
Effective Moving Elements Mass (kg)*	5	48	50	65	160	235
Max. Power Consumption (kVA)	3.6	48	78	120	195	270
Notes and Options	*including mass of armature, table and bearings • Chamber thermal barrier is optional					

All parameters are measured and verified as per ISO 5344. For detailed technical information, please see product datasheets.

Power Amplifier, 4kVA to 210KVA

VSA-D Series, Digital Switching

Powered by SiC-FET Technique

SiC-FET (Silicon Carbide Field Effect Transistor) is latest power device. It has much higher efficiency than MOSFET and IGBT device in power conversion, especially it has superb performance in higher voltage resistance, higher switching frequency, lower distortion, long-time operation with minimum maintenance



Performances

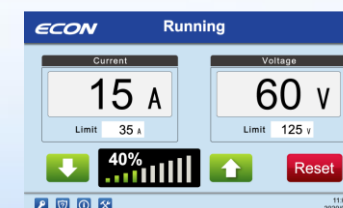
Rated Output Power	4kVA-210kVA
Output Voltage (rated)	120Vrms
Max. Output Current	35Arms....1850Arms
Frequency Range (rated)	DC-8000Hz
Signal-noise Ratio (SNR)	≥70dB
Conversion Efficiency	>93%
Frequency Response (5Hz-5000Hz)	±1.5dB
Harmonic Distortion (100Vpk, 5Hz-5000Hz)	≤0.8%
Full Power Bandwidth	5Hz-5000Hz
Switching Frequency	400kHz
Parallel Operation Current Unbalanceness	≤1.0%
Input Impedance	>10kΩ
Output Bias Voltage	±50mV
Interlocks and Protection	over-travel, over/less voltage, over/less current module/cooling/oil pressure failure, etc
Power Module	8kVA/14kVA, modularized
Operation	7" Touch screen

For detailed technical information, please see product datasheets.

Easy Operation and Remote Control Supported

VSA-D series power amplifier delivers easy operation to operator with convenient parameter setting up and instant result checking.

Also, VSA-D series power amplifier supports remote control thru Ethernet from far computer to maximize operators' conveniences.



ECON Status	
-RModule	Off
-LModule	Off
-Cooling	OK
-Voltage Supply	179V
-Field Current	25A
-Power supply 3 phase	380V
-Shaker temperature	35 C

ECON Operation History	
-08.01.2020 09:12	-Off
-08.01.2020 08:48	-Gain Off
-08.01.2020 09:00	-Gain 50%
-08.01.2020 09:12	-Gain 30%
-08.01.2020 12:10	-Gain 10%
-08.01.2020 12:10	-On
-08.01.2020 12:10	-Power on

Climate Chamber Combined Shaker Vibration+Temperature+Humidity

ECON climate chamber combined shaker is designed for the comprehensive environmental test on the product which is exposed to the temperature, humidity and vibration at same time, especially for the products of aerospace, aviation, electrics and transportation. This kind of tests cover reliability test, identification test and stressing test, to search product fatigue or estimate its reliability more rapidly and more effectively than under single testing condition.

Our electric-dynamic shakers are capable to be combined with all kinds of climate chambers, running comprehensively or separately. We supply turn-key solution to customers with dedicated combination design to save time, energy and funds for them.

Features

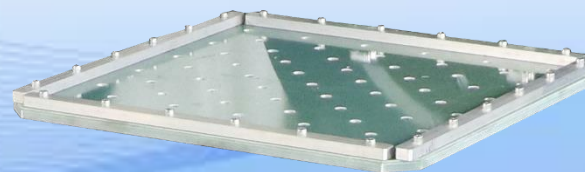
- Integrated combination design with chamber
- Sophisticated water proof and thermal insulation design
- Flexible working mode in vertical, horizontal or both
- Optional hydraulic lift and movable rail
- "One station" control of testing running of vibration, temperature and humidity



For detailed technical specification, please see quoted proposal and datasheet.



Thermal Barrier on Table



Water Proof Plate for Shaker



Vibration Controller, Single Shaker Control

VT-9 Series

ECON is proud with its prestigious and classical VT-9 series vibration controller since 2002.

VT-9 series vibration controller is one of the most reliable and cost-effective vibration controller in the world, covering all types of vibration test, and making vibration test easier and trustable in control.

Features

- PC independent by latest DSP technique
- Real-time loop-control with advanced adaptive vibration control algorithms
- 24-bit ADC/DAC and 32-bit DSP for all models
- Control dynamic range higher than 95dB
- 0.1 to 10,000Hz range in Sine Control and DC to 20,000Hz in Random Control
- Full range of control software for all types vibration testing
- Versatile for all kinds of shakers/vibrators
- User friendly software, easy in operation



Model Selection

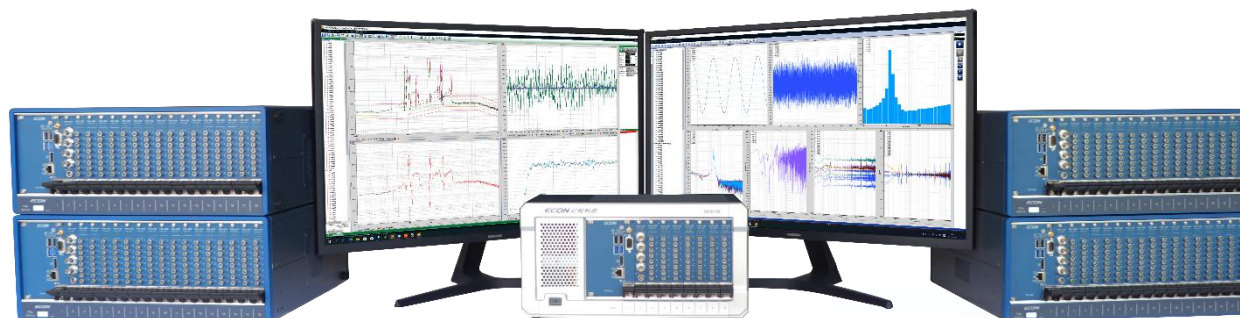
Hardware	VT-9002	VT-9008-4	VT-9008-8
Input Channel	2	4	8
Drive Output Channel	1	1	1
COLA	N/A	1	1
Digital I/O	N/A	DB-37	DB-37
Sensors Compatible	Voltage/IEPE/Charge/TEDS		
Software	VT-9002	VT-9008-4	VT-9008-8
Sine	√	√	√
Step Sine, RSTD, THD Detection	√	√	√
Multi-sine		√	√
Sine Notching		√	√
Sine 0.1Hz to 10,000Hz		√	√
Random	√	√	√
SoR, RoR, SRoR		√	√
Kurtosis Control		√	√
Random Notching		√	√
Random DC to 20,000Hz		√	√
Classical Shock	√	√	√
Shock Response Spectrum		√	√
F.D.R-TTH (Transient Time History)		√	√
Damping Sine		√	√
Earthquake Simulation		√	√
F.D.R-LTH (Long Time History)		√	√
Road Simulation		√	√
Vibro-shock		√	√
Shaker Performance Verification		√	√
Digital I/O Communication		√	√
Data Record and Offline Review		√	√
Test Report Generation	√	√	√
Multi-user Control	√	√	√
Self-calibration	√	√	√

For detailed technical information, please see product datasheets.

Vibration Controller, MIMO Shaker Control MI-81 Series, Powered by PXIe bus

Features

- PXIe bus based with real-time operating system
- Long time running with self-sustained
- High scalability for higher channel count, max. 1024 with synchronization precision within 100ppm difference
- Modularized input and output modules
- Real-time Processing by 32-bit high Performance floating DSP
- Embedded-in storage with high data throughput rate
- High Versatility for different tasks: Vibration control, Modal test Measurement and analysis, Data recording, HUMS, etc.



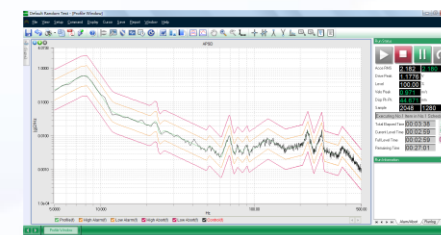
Model Selection

Hardware	MI-8104	MI-8109	MI-8118
System Structure	PXIe bus with input module and output module		
Working Slots	3	8	17
Input Channel	16	56	128
Drive Output Channel	Max.4	Max.16	Max.16
Synchronization	Support, Max. 1024		
Sensors Compatible	Voltage/IEPE/TEDS		
COLA	Support		
Digital I/O	Support		
ADC Resolution	24-bit		
Sampling Rate	Max. 204.8kHz		
Embedded-in Storage	320GB (1TB optional)		
Computer Connectivity	Gigabit Ethernet Connectivity		
Data Throughput Rate	Max. 10Gbps		
Computer O/S Compatible	Microsoft Windows 7/8/10/11 (32-bit and 64-bit)		

For detailed technical information, please see product datasheets.

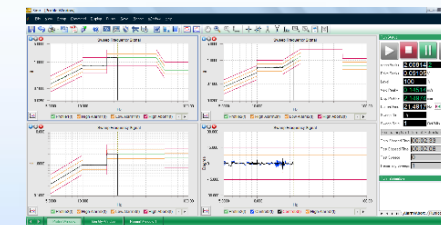
Single Shaker Control

Sine, Random, Classical Shock, RSTD, SoR, RoR, SRoR, Shock Response Spectrum, F.D.R-TTH (Transient Time History), F.D.R-LTH (Long Time History), Vibro-shock, Multi-sine, Kurtosis, Notching, Frequency Extension, Data Record and Offline Review, Test Report Generation, Self-calibration



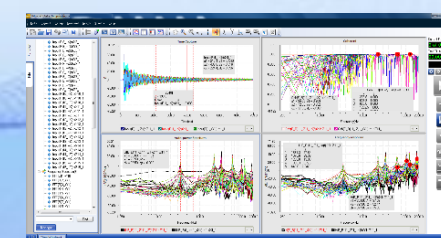
Multi-shaker Control

Sine, Random, Classical Shock, RSTD, SoR, RoR, Shock Response Spectrum, F.D.R-TTH (Transient Time History), F.D.R-LTH (Long Time History), Vibro-shock



Measurement and Analysis

Dynamic Signal Analysis, Shock Data Capture, Shock Response Spectrum (SRS) Analysis, Modal Data Acquisition, Data Record and Playback and Offline Analysis



How to select a proper shaker system?

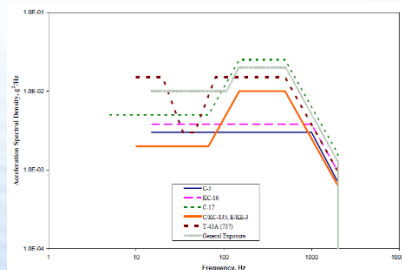
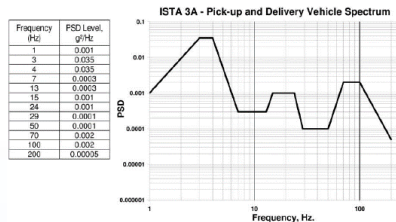
Learn Test Condition and Calculation

A proper shaker system can help customer to fulfill their vibration test in a best cost-effective way, but it is not an easy job to select a proper shaker system to test customer DUT (device under test). We recommend a selection as in below way.

Fully understand the required test conditions

These test conditions commonly consists of expected vibration direction, acceleration, and a certain frequency range or time duration. These conditions may come from a standard or criterion, like, ISO, IEC, ISTA or MIL-STD, and sometimes they will be defined by purchaser who will buy or use these DUT.

For example, ISTA standard requests random tests on DUT within 1Hz to 200Hz by low level acceleration, and a shaker with long stroke is mandatorily required. While, wider frequency range and higher acceleration tests are determined in MIL-STD standard and in this case, the selected shaker must be qualified with more performance to achieve needed tested conditions.



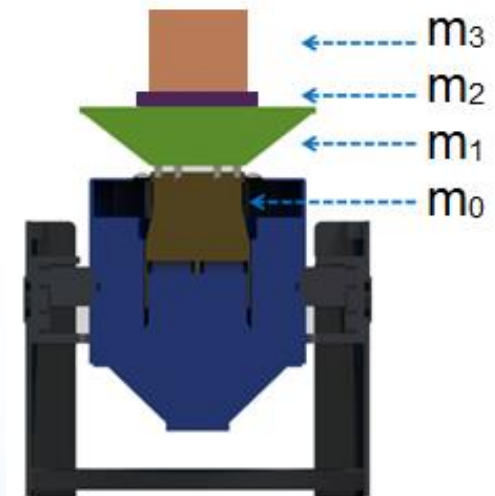
Vibration must be rigidly transmitted

All parts in vibration, especially expander, fixture or jig, should have enough rigidity. And all connections must be fixed rigidly between moving parts (armature, expander, fixture or jig, DUT), this is to assure that the vibration is transmitted to DUT without loss.

Calculation Principle

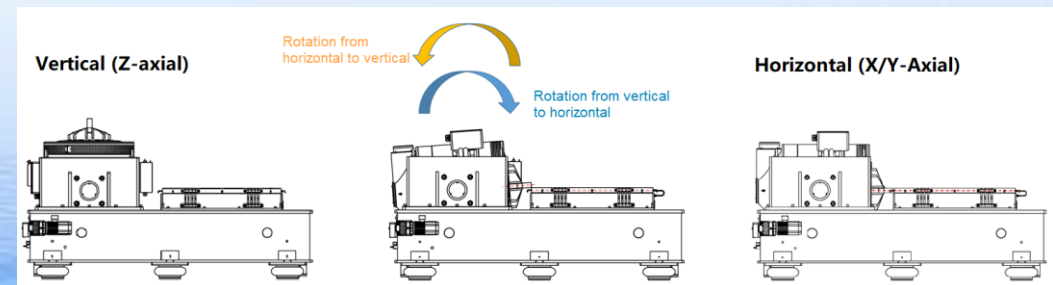
$$F=M*a$$

- M total mass in vibration
 $M=m_1+m_2+m_3$
- m_0 mass of Armature
- m_1 mass of head expander or slip table
- m_2 mass of fixture, jig or thermal barrier on which the DUT is mounted
- m_3 mass of DUT (device under test)
- a requested acceleration
- a_{max} shaker max. acceleration
commonly $a = a_{max} * (70\%-80\%)$
to protect shaker for long time use
- v shaker velocity (m/s)
 $v=(2\pi f/1000)*d$
- d shaker displacement (mm, zero-peak)
 $a=(2\pi f)*v=[(2\pi f)^2/1000]*d$



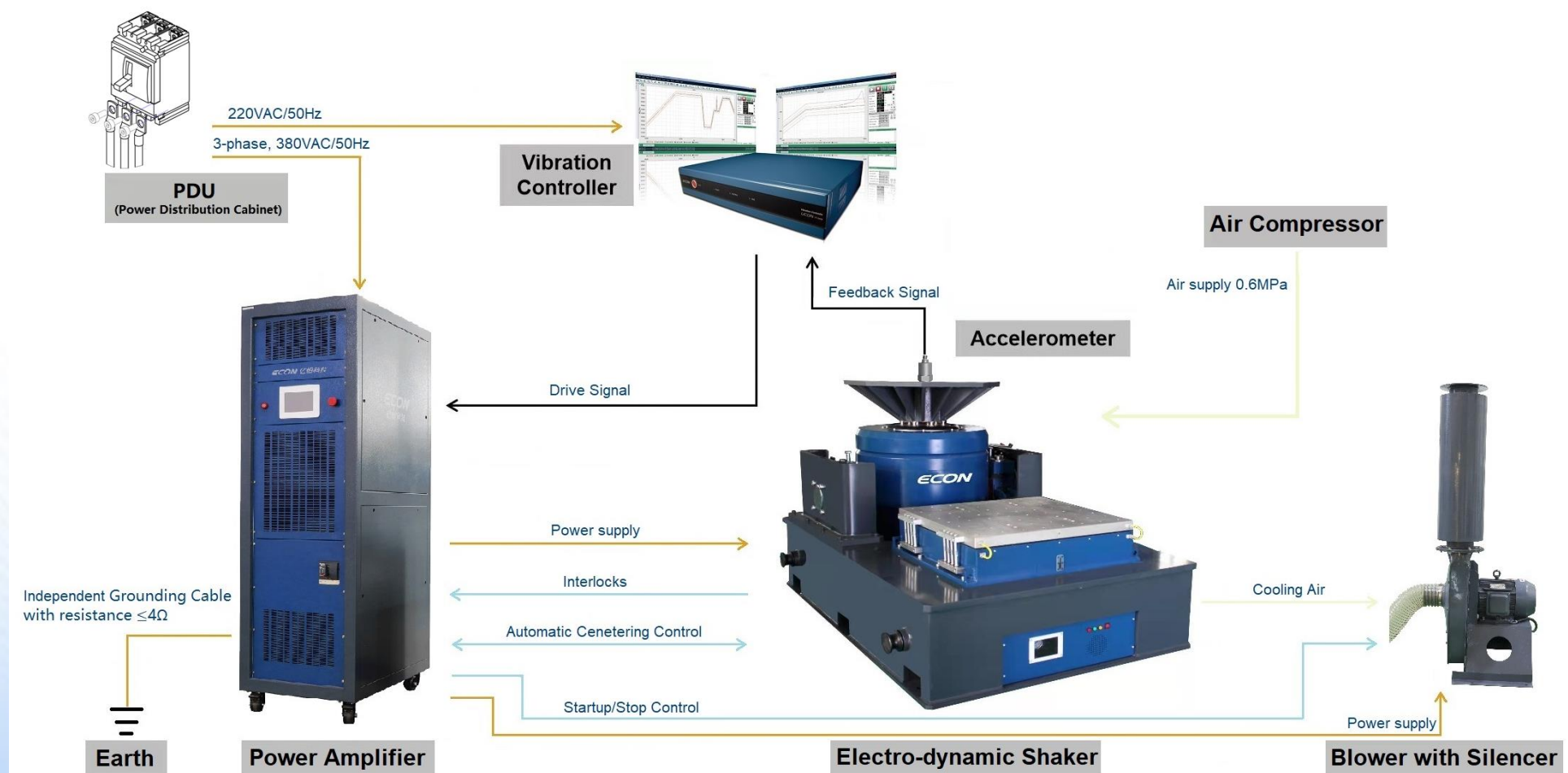
Vibration Direction

Shaker vibration direction can be exchanged between Z-axis and X/Y-axis thru manual rotation or SRM (shaker body rotation mechanism) as per requested vibration conditions.



Installation and Commissioning

Working Environmental Requirement



About Us

ECON is a world-wide one station manufacturer and supplier for equipment and solution of vibration testing, measurement and calibration. Founded in 2002, ECON have been dedicated in developing better quality and higher cost-efficiency equipment and solutions to help customers to meet market crucial demand on their products quality and reliability. More than 20 years experiences and innovative ambition support us to fulfill this vision into reality.

Today, ECON is well-known and taking leading role in China to produce and supply Electro-dynamic Shaker, Servo-hydraulic Shaker, Vibration Controller, Measurement Instrument and Transducer Calibration system.



- Headquarter
- R&D Center
- Sales and Market Center
- CNAS and CMA qualified Testing lab
- 5,000 sqm Facility



- Factory
- Production Center
- Logistics Center
- 20,000 sqm Facility

Qualification & Certification

- China Certificate of High & New Technological Enterprise
- ISO 9001:2015 Qualified
- CNAS (China National Accreditation Service for Conformity Assessment)
- CMA (China Inspection Body and Laboratory Mandatory Approval)
- CE Compliance with all main products

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