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**Silent Vibration Testing
System UME200**



**Middle-Sized Electrokinetics-
Type Vibration Testing System
EDS2000**



**Large-Sized Electorkinetics-
Type Vibration Testing
System EDS900 / EDS1000**



**Complex Environment
Testing Machine**

New Products



UME200



EDS2000

MES Series

SERIES 840 — Compact Electrokinetics-Type Vibration Testing System

FEATURES

A fault or malfunction due to vibration during transportation as well as in the operating environment is a big problem for electrical and electronic parts, mounting boards, and instruments incorporating these parts. The MES is a desktop-type small-footprint testing machine that can

reproduce vibrations in diverse operating environments or those that occur during transportation, when used in combination with a variety of easy-to-operate vibration control units (sold separately). Use the MES to improve quality and reliability in terms of vibration.



MES151

Oscillator FG-273 (optional)



Vibration control unit 9991 (optional)



MES661



SPECIFICATIONS

| System No. | Vibration generator | Power amplifier |
|------------|---------------------|-----------------|
| MES151 | MEE15 | AME50 |
| MES251 | MEE25 | AME50 |
| MES351 | MEE35 | AME100 |
| MES451 | MEE45 | AME100 |
| MES561 | MEE56 | EDA030 |
| MES661 | MEE66 | SDA07 |

The standard MES configuration consists of the vibration generator and power amplifier. A vibration control unit or oscillator is separately required

| System No. | MES151 | MES251 | MES351 | MES451 | MES561 | MES661 |
|-----------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Sine wave excitation force rating | 9.8N | 19.6N | 49.0N | 98.0N | 200N | 500N |
| Maximum frequency | 12000Hz | 12000Hz | 10000Hz | 10000Hz | 3000Hz | 3000Hz |
| Maximum acceleration | 653m/s ² | 753m/s ² | 490m/s ² | 392m/s ² | 333m/s ² | 294m/s ² |
| Maximum speed | 1.27m/s | 1.37m/s | 1.31m/s | 1.40m/s | 1.15m/s | 1.21m/s |
| Rated displacement | 5mm _{p-p} | 5mm _{p-p} | 7mm _{p-p} | 10mm _{p-p} | 8mm _{p-p} | 10mm _{p-p} |
| Weight of movable section | 0.015kg | 0.026kg | 0.1kg | 0.25kg | 0.575kg | 1.7kg |
| Table diameter | ø8mm | ø8mm | ø38mm | ø38mm | ø120mm | ø200mm |
| Supporting spring constant | 1.47N/mm | 1.17N/mm | 2.15N/mm | 1.10N/mm | 24.5N/mm | 39.2N/mm |
| Cooling method | Natural air cooling | Natural air cooling | Natural air cooling | Natural air cooling | Forced-air cooling | Forced-air cooling |
| Mounting screw for test article | 1 - M5 | 1 - M5 | 7 - M4 | 7 - M4 | 13-M6 | 17-M6 |
| Maximum output | 50VA | 50VA | 100VA | 100VA | 300VA | 700VA |
| Frequency range | DC - 15000Hz | DC - 15000Hz | DC - 15000Hz | DC - 15000Hz | DC - 10000Hz | 10 - 10000Hz |
| Power consumption | 83VA | 72VA | 181VA | 171VA | 720VA | 1000VA |
| Dimensions (generator, Dia. x H) | ø60 x 80mm | ø80 x 119mm | ø99 x 169mm | ø162 x 195mm | ø225 x 147mm | ø300 x 170mm |
| Dimensions (amplifier, W x D x H) | 230 x 400 x 87mm | 230 x 400 x 87mm | 230 x 400 x 87mm | 230 x 400 x 87mm | 430 x 420 x 150mm | 430 x 520 x 150mm |
| Mass (generator / amplifier) | 1kg / 3kg | 3kg / 3kg | 5.5kg / 5kg | 18kg / 5kg | 26kg / 25kg | 50kg / 30kg |

UME200

SERIES 840 — Silent Vibration Testing System

FEATURES

This system can be widely used for rattle tests that must be free from noise, a variety of stress screening tests for electrical and electronic parts as well as applied instruments, and tests for certification and inspection of detectors and other machines used for vibration pick-up and seismograph.

The small-footprint design combining the vibration generator and power amplifier makes this machine suitable for almost all installation locations and facilitates relocation and other work. (The vibration control unit is optional.)



SPECIFICATIONS

| Model No. | UME200 |
|-----------------------------------|-------------------------------------|
| Sine wave excitation force rating | 200N |
| Sine wave frequency range | 5 - 200Hz |
| Maximum acceleration | 90m/s ² |
| Maximum speed | 0.5m/s |
| Rated displacement | 10mm _{p-p} |
| Weight of movable section | 2.2kg |
| Table diameter | ø112mm |
| Specimen weight (max.) | 20kg |
| Cooling method | Natural/forced-air cooling switched |
| Acceleration pickup | Built-in |
| Mounting screw for specimen | 4-M10 |
| Air pressure | 0.15MPa |
| Power consumption | 180W |
| Dimensions (W x D x H) | 290 x 300 x 365mm |
| Mass | 50kg |

EDS2000 Series

Middle-Sized Electrokinetics-Type Vibration Testing System

FEATURES

This high performance series has a wide frequency range and excellent allowed momentum and maximum speed. This machine supports test articles that would be decentered when set onto the table as well as severe test conditions.



SPECIFICATIONS

| System No. | EDS2010 | EDS2020 | EDS2030 | EDS2040A | EDS2040B | EDS2050 | EDS2060 |
|-----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Rated sine wave excitation force | 10kN | 20kN | 30kN | 40kN | 40kN | 50kN | 60kN |
| Sine wave frequency range | 5 - 3000Hz | 5 - 3000Hz | 5 - 2800Hz | 5 - 2800Hz | 5 - 2800Hz | 5 - 2800Hz | 5 - 2800Hz |
| Maximum acceleration | 1000m/s ² | 1000m/s ² | 1000m/s ² | 1000m/s ² | 800m/s ² | 1000m/s ² | 1000m/s ² |
| Maximum speed | 1.8m/s | 2.0m/s | 1.8m/s | 1.8m/s | 1.8m/s | 1.8m/s | 1.8m/s |
| Rated displacement | 51mm _{p-p} | 51mm _{p-p} | 51mm _{p-p} | 51mm _{p-p} | 51mm _{p-p} | 51mm _{p-p} | 51mm _{p-p} |
| Allowed momentum | 640Nm | 850Nm | 1150Nm | 1150Nm | 1300Nm | 1300Nm | 1300Nm |
| Maximum output | 10kVA | 20kVA | 30kVA | 40kVA | 40kVA | 50kVA | 60kVA |
| Power consumption | 22kVA | 36kVA | 44kVA | 56 kVA | 56 kVA | 74 kVA | 89 kVA |
| Dimensions (generator, Dia. x H) | 982 x 712 x 823mm | 1179 x 837 x 1101mm | 1286 x 927 x 1205mm | 1286 x 927 x 1205mm | 1636 x 1127 x 1365mm | 1636 x 1127 x 1365mm | 1636 x 1127 x 1365mm |
| Dimensions (amplifier, W x D x H) | 580 x 830 x 1850mm | 580 x 830 x 1850mm | 580 x 830 x 1850mm | 1130 x 830 x 1850mm | 1130 x 830 x 1850mm | 1130 x 830 x 1850mm | 1130 x 830 x 1850mm |
| Mass (generator / amplifier) | 830kg / 310kg | 1700kg / 440kg | 2430kg / 540kg | 2430kg / 790kg | 4500kg / 790kg | 4500kg / 910kg | 4500kg / 1040kg |

EDS200 / EDS300 / EDS400 / EDS500 Series

Middle-Sized Electrokinetics-Type Vibration Testing System

FEATURES

- This is a middle-sized electrokinetics-type vibration testing system series with an excitation force of 10 kN or less.
- This is a general-purpose series with a high side rigidity and superior durability adopting Geared Roller™ guide.



SPECIFICATIONS

| Code | EDS251 | EDS252 | EDS351 | EDS352 |
|-----------------------------------|---------------------|---------------------|---------------------|---------------------|
| Rated sine wave excitation force | 1kN | 1.5kN | 2kN | 2.5kN |
| Sine wave frequency range | 5 - 5000Hz | 5 - 5000Hz | 5 - 4500Hz | 5 - 4500Hz |
| Maximum acceleration | 454m/s ² | 681m/s ² | 606m/s ² | 757m/s ² |
| Maximum speed | 1.8m/s | 1.6m/s | 1.8m/s | 1.8m/s |
| Rated displacement | 26mm _{p-p} | 26mm _{p-p} | 26mm _{p-p} | 26mm _{p-p} |
| Allowed momentum | 150Nm | 150Nm | 200Nm | 200Nm |
| Maximum output | 2kVA | 2kVA | 3kVA | 3kVA |
| Power consumption | 5.8kVA | 6.0kVA | 11.1kVA | 11.1kVA |
| Dimensions (generator, Dia. x H) | 420 x 360 x 489mm | 420 x 360 x 489mm | 520 x 410 x 590mm | 520 x 410 x 590mm |
| Dimensions (amplifier, W x D x H) | 585 x 810 x 1800mm | 585 x 810 x 1800mm | 585 x 810 x 1800mm | 585 x 810 x 1800mm |
| Mass (generator / amplifier) | 160kg / 300kg | 160kg / 300kg | 270kg / 300kg | 270kg / 300kg |

| Code | EDS451 | EDS452 | EDS453 | EDS551 |
|-----------------------------------|---------------------|---------------------|---------------------|---------------------|
| Rated sine wave excitation force | 3kN | 4kN | 4.5kN | 5kN |
| Sine wave frequency range | 5~5000Hz | 5~5000Hz | 5~5000Hz | 5~3500Hz |
| Maximum acceleration | 566m/s ² | 754m/s ² | 849m/s ² | 625m/s ² |
| Maximum speed | 1.9m/s | 1.9m/s | 1.9m/s | 1.6m/s |
| Rated displacement | 26mm _{p-p} | 26mm _{p-p} | 26mm _{p-p} | 26mm _{p-p} |
| Allowed momentum | 265Nm | 265Nm | 265Nm | 451Nm |
| Maximum output | 5kVA | 5kVA | 10kVA | 5kVA |
| Power consumption | 6.4kVA | 7.5kVA | 8.3kVA | 9.5kVA |
| Dimensions (generator, Dia. x H) | 600 x 470 x 700mm | 600 x 470 x 700mm | 600 x 470 x 700mm | 760 x 470 x 837mm |
| Dimensions (amplifier, W x D x H) | 580 x 830 x 1850mm | 580 x 830 x 1850mm | 580 x 830 x 1850mm | 580 x 830 x 1850mm |
| Mass (generator / amplifier) | 380kg / 220kg | 380kg / 220kg | 380kg / 310kg | 560kg / 220kg |

| Code | EDS552 | EDS553 |
|-----------------------------------|---------------------|---------------------|
| Rated sine wave excitation force | 6kN | 7kN |
| Sine wave frequency range | 5~3500Hz | 5~3500Hz |
| Maximum acceleration | 750m/s ² | 875m/s ² |
| Maximum speed | 1.6m/s | 1.6m/s |
| Rated displacement | 26mm _{p-p} | 26mm _{p-p} |
| Allowed momentum | 451Nm | 451Nm |
| Maximum output | 5kVA | 10kVA |
| Power consumption | 10.3kVA | 11.2kVA |
| Dimensions (generator, Dia. x H) | 760 x 470 x 837mm | 760 x 470 x 837mm |
| Dimensions (amplifier, W x D x H) | 580 x 830 x 1850mm | 580 x 830 x 1850mm |
| Mass (generator / amplifier) | 560kg / 220kg | 560kg / 310kg |

Model 9991 / 9995

Vibration Control Unit

Optional Sine Wave Control Software

Control section
 Frequency range: 1 - 10kHz
 Sweep mode: Log/linear, one-way/both-way
 Control method: Average value, maximum value, minimum value, average and maximum value control

Program section
 Breakpoint: Up to 256 steps (acceleration, speed, and displacement, constant/slope)

Counter/timer
 Timer: Up to 9,999 hours 59 minutes 59 seconds, unlimited
 Sweeping counter: Up to 10,000 times, unlimited.
 Waveform counter: Up to 109 times, unlimited.

Resonance point tracking Available
 *Mitutoyo also offer random, shock, SRS, true wave reproduction, SPR, ROR and unlimited length wave control optional software, in addition to the control above.

FEATURES

The 9995 and 9991 are high performance vibration control units that can test not only sine, random and shock waves, but also true waves, SOR, ROR, and SRS. The 9995 supports input from vibration sensors through up to six channels in addition to multiaxial control. The 9991 is a model dedicated to one-axis vibration control.

SPECIFICATIONS

| Model No. | 9995 | 9991 |
|-----------------------|----------------------|------|
| Input No. of channel | 2 (max. 6, optional) | 2 |
| Output No. of channel | 1 (max. 3, optional) | 1 |

*The standard 9995 configuration includes an RCA-90 charge amplifier (standard I/O: two channels) in addition to the computer (above, in photo) and control unit (below, in photo).

*The standard 9991 configuration includes an SA-611 charge amplifier (manufactured by TEAC, standard I/O: one channel) in addition to the computer (above, in photo) and control unit (below, in photo).

*Both the 9995 and 9991 require a piezoelectric-type acceleration pickup sold separately. Please contact Mitutoyo for details.



9995



9991

Optional Sine Wave Control Software

Control section
 Frequency range: 1 - 10kHz
 Sweep mode: Log/linear, one-way/both-way
 Control method: Average value, maximum value, minimum value, and maximum value control

Program section
 Breakpoint: Up to 50 steps (equipped with the automatic break calculator)

Counter/timer
 Timer: Up to 9,999 hours 59 minutes 59 seconds, unlimited
 Sweeping counter: Up to 10,000 times, unlimited.
 Waveform counter: Up to 109 times, unlimited.

Resonance point tracking Available
 *Mitutoyo also offer random wave control optional software, in addition to the control software above.

Model 9920

Vibration Control Unit

FEATURES

- The 9920 is a compact economical vibration control unit. In addition to a superior ease of operation through a Japanese man-machine interface, adoption of a digital signal processor (DSP) realizes a highly accurate realtime control.

SPECIFICATIONS

| Model No. | 9920 |
|-----------------------|---|
| Input No. of channel | 2 (standard); input method: voltage/charge |
| Output No. of channel | 1 |
| Display | 15" LCD |
| Operation | Keyboard (general-purpose 109 keyboard usable, PS2 connector) |

*An optional piezoelectric-type acceleration pickup is necessary. Please contact Mitutoyo for details.



Standard Random Wave Control Software

Control section
 Frequency range: Up to 400Hz
 No. of lines: 100/200/400
 Setting: Sweep rate setting for fixed point acceleration/breakpoint

Program section
 Breakpoint: Up to 256 steps

Counter/timer: 9,999 hours 59 minutes 59 seconds, unlimited

Condition setting: Write data from an external computer into the CF card and set it via a USB interface.

*Mitutoyo also offer random wave control optional software, in addition to the control software above.

Model 9300

Vibration Control Unit

FEATURES

This is a control unit dedicated to random vibration tests, with a superior ease of operation. You can start vibration tests at your site by pressing the start/stop switch just after setting a pre-recorded CF card. You can avoid setting troublesome test conditions.

SPECIFICATIONS

| Model No. | 9300 |
|-----------------------|-------------------|
| Input No. of channel | 1 |
| Output No. of channel | 1 |
| Operation | Start/stop switch |



AST Series

Vertical and Horizontal Vibration Side Tables

FEATURES

Vertical and horizontal vibration side tables are required when applying vibration to a large-sized heavy specimen in the vertical or horizontal direction. With a lightweight but sufficiently strong structure, they reliably transfer vibration from the vibration generator to the specimen.



SPECIFICATIONS (vertical vibration side table)

| Model No. | | AST-14V | AST-15V | AST-16V | AST-18V | AST-110V | AST-23V | AST-24V | AST-25V | AST-26V | AST-28V | AST-210V |
|-------------------------------------|--------------------|------------|------------|------------|------------|-------------|-------------|------------|------------|------------|------------|------------|
| Vibration table dimension | mm | 400 x 400 | 500 x 500 | 600 x 600 | 800 x 800 | 1000 x 1000 | ø300 | ø400 | ø500 | ø600 | ø800 | ø1000 |
| Standard / For high frequency model | Maxi. frequency Hz | 500 / 2000 | 500 / 2000 | 500 / 1500 | 500 / 1000 | 200 / 1000 | 1500 / 2000 | 500 / 2000 | 500 / 2000 | 500 / 1500 | 200 / 1000 | 200 / 1000 |
| | Mass kg | 15 / 23 | 25 / 43 | 30 / 80 | 60 / 190 | 115 / 350 | 7 / 10 | 11 / 20 | 18 / 35 | 21 / 70 | 50 / 180 | 100 / 320 |

* The actual maximum frequency may be lower than those specified above, due to loads.
Above values assume that the vibration table is made of aluminum. A lighter magnesium alloy table is also available.
Contact Mitutoyo for other dimensions.

SPECIFICATIONS (horizontal vibration side table)

| Model No. | | AST-12H | AST-13H | AST-14H | AST-15H | AST-16H | AST-18H | AST-110H | AST-115H | AST-120H |
|----------------------------------|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-------------|-------------|
| Vibration table dimension | mm | 200 x 200 | 300 x 300 | 400 x 400 | 500 x 500 | 600 x 600 | 800 x 800 | 1000 x 1000 | 1500 x 1500 | 2000 x 2000 |
| Static pressure bearing S series | Max. frequency Hz | — | — | — | 2000 | 2000 | 1500 | 1000 | — | — |
| | Max. load kg | — | — | — | 4000 | 4000 | 4000 | 4000 | — | — |
| Slip guide F series | Max. frequency Hz | — | — | 2000 | 2000 | 2000 | 2000 | 2000 | — | — |
| | Max. load kg | — | — | 200 | 350 | 500 | 750 | 1000 | 135 | — |
| Linear bearing guide G series | Max. frequency Hz | 500 | 500 | 500 | 500 | 500 | 500 | — | 1500 | — |
| | Max. load kg | 60 | 80 | 150 | 300 | 400 | 500 | — | — | — |
| Board panel guide T series | Max. frequency Hz | 200 | 200 | 200 | 150 | 150 | 100 | — | — | — |
| | Max. load kg | 10 | 30 | 30 | 40 | 50 | 60 | — | — | — |
| Pad bearing guide E series | Max. frequency Hz | — | — | — | 350 | 350 | 300 | 200 | 100 | 60 |
| | Max. load kg | — | — | — | 3000 | 3000 | 3000 | 5000 | 5000 | 5000 |

EDS900 / EDS1000

Large-Sized Electrokinetics-Type Vibration Testing System

FEATURES

- The EDS900 and EDS1000 are best suited to vibration tests of heavy products. For example, they support transportation tests of copy machines and other precision equipment, shakedown of automobile bodies and other transport devices, and static testing of aerospace satellites.
- We offer 19 models having an excitation force which varies from 35 kN to 343 kN.
- The EDS135 has achieved the world's largest excitation force as an electrokinetics-type vibration testing system (343kN).



Complex Environment Testing Machine

FEATURES

Industrial goods such as home appliances, transportation machines and the electronics devices in them are influenced by temperature, humidity, vibration and other environmental conditions when we use them. The environmental tests for such parts or products are intended for reliability evaluation, so the complex environmental

tests using temperatures, humidity, and vibrations closer to real-world data have recently gained in importance. Mitutoyo also offers complex environment testing machines comprising the vibration testing system and temperature/humidity-controlled chambers as systems to meet such needs.

