

Assembly drawing and the names of features

M-2T model main body



Product specifications

Main body	Power supply	100V 35VA for 50Hz/60HzVibration characteristics will differ depending on the power frequency.To operate the sieve shaker at voltage other than 100V, use a transformer.
	Power switch	ON/OFF
	Amplitude control switch	0 to 10
	Digital timer	START key STOP key An operation time can be set in steps of one second and up to 99 minutes 59 seconds.
	Sieves to be used	JIS test sieves ϕ 75×h20mm Max. 7 No sieves or sieve pan are supplied with the sieve shaker as accessories.
Accessories	Clamping lid with hooks	
	Clamping springs	For 2 - 3 stages of 35mm sieves x 3 springs For 4 - 5 stages of 50mm sieves x 3 springs For 6 - 7 stages of 70mm sieves x 3 springs

Power cable, instruction manual

Operation method

Installation

- 1. Unpack the sieve shaker from its package and check for the accessories. This sieve shaker generates vibrations of different acceleration magnitudes depending on the power frequency. Please check the seal showing rated frequencies attached to the main body.
- 2. Place the main body on a level surface such as a robust laboratory table. If the sieve shaker moves about when it is set to vibrate fiercely, place a rubber sheet, waste cloth or some other friction-providing material beneath it. (A vibration isolation rubber plate is also available as an optional part.)
- 3. Plug in the power cable after you have made sure that the Power Switch is in the OFF position and the Amplitude Control Dial is set at "0".
- 4. Place a sieve pan on the sieve holder and stack up sieves of desired mesh sizes in order with the finest one first. (It is recommendable that the weight of empty sieves be measured beforehand.)
- 5. Weigh a test sample accurately. Depending on the properties of a test sample (apparent specific gravity etc.) and the mesh size of sieves, the amount of a required test sample will vary. (Normally, a quantity of 1 5g is most appropriate.) Too large a quantity of a test sample can result in poor sieving efficiency from clogged sieves.
- 6. Put a precisely weighed test sample over the uppermost sieve (coarsest one) and distribute it over the sieve as uniformly as possible.
- 7. Place a clamping lid over the uppermost sieve. Select clamping springs suitable for the number of sieves used and clamp them by setting the springs onto the three hooks each provided on the holder and the clamping lid.
- 8. When the Power Switch is turned on, the lamp will light and the LCD timer screen will be turned on.

How to set the Timer

(The following are instructions applicable when the M-2T is not in vibrating motion. If it is in vibrating motion, first stop it by pressing the STOP key and then set the Timer.)

- 9. Set a vibration duration time. Set a desired duration time by operating four Up-down keys dedicated to the respective digits provided in the lower part of the Timer. (A maximum duration time you can set is 99 minutes 59 seconds.) Make sure that your desired duration time is indicated correctly on the Timer Setting Display area.
- 10. Press the STOP key. Make sure that the desired duration time setting is indicated on the Elapsed Time Display area.
 - * When you set a vibration duration time, always press the STOP key. Pressing the STOP key will enter a set time in the Timer memory. While the STOP key is depressed, "RST (RESET)" is shown on the LCD screen.

- 11. When the vibration duration time is set at 0 second, the sieve shaker will generate vibrations while the START key is depressed.
- 12. When you change the time indicated on the Timer Setting Display area while it is in vibrating motion, the M-2T will continue to generate vibrations until the timer count shown in the Elapsed Time Display area becomes "0", and the new vibration duration time setting will take over when the sieve shaker ceases the generation of vibrations. When you change the time indicated on the Timer Setting Display area while it is in vibrating motion and then, press the STOP key, the M-2T will cease the generation of vibrations and the new vibration duration time setting will take over.
- 13. When you press the STOP key while the MT-2 is in vibrating motion, the vibration duration time setting will be reset to the time shown on the Timer Setting Display area then. You cannot pause the elapsed time count.
- 14. The RESET key functions similarly to the STOP key.
- 15. Pressing the LOCK key will block inputs from the Up-down keys and the RESET key. (Inputs from the START key and the STOP key will be accepted.) While the Timer is locked, A "LOCK" sign is indicated on the LCD screen; pressing the LOCK key again will cancel the lock state.

How to set vibration acceleration magnitude

- 16. Press the START key to start generating vibrations. While the M-2T is in vibrating motion, the Timer Operation Indicator flashes with the "OP" sign lit. To raise vibration acceleration magnitude, turn the Amplitude Control Dial.
- 17. Unless a test sample is something vulnerable to vibration acceleration, a sieving process is performed normally for about 5 to 10 minutes at an output level between 8 and 10.

Finish sieving

- 18. Turn off the power, disengage the springs and remove the clamping lid. Observe residues on the respective sieves and determine whether the test sample has been separated properly. If yes, starting from the uppermost sieve, take residues from a sieve on drug wrapping paper and weigh the quantity of residues left on each sieve. When the weight of an empty sieve is known from the measurement made earlier, weigh residues together with the sieve.
- 19. If the test sample is yet to be separated properly, give another 5 to 10 minute vibrations.
- 20. When all residues left on the respective sieves are weighed, process measurement data to obtain the particle size distribution of the test sample.
- 21. When the measurement is finished, clean sieves. If you are to measure the same sample again, clean sieves thoroughly to remove all clogging particles with a vacuum, an air gun, a cleaning brush, waste cloth, etc. before you make a measurement again. If you are to use sieves for another sample or find sieves clogged heavily, use an ultrasonic washing machine or wash sieves with neutral detergent and a sponge block and dry thoroughly before you use them for the next measurement.

Separation by wet sieving



Wet sieving head with a hopper



Wet sieve pan with an outlet



The M-2T set up for wet sieving with optional wet sieving adapters (Back view) The outlet of the wet sieve pan should be directed toward the backside of the sieve shaker.

With the use of wet sieving adapters (option), a fine powder (45μ m or less) that is hard to separate into size ranges through dry sieving and a powder that tends to form lumps due to poor flowability or runs poorly due to static charges may be separated by size through wet sieving with a 20μ m sieve (SUS mesh) or a micro-sieve (5μ m nylon mesh). Wet sieving adapters are optional parts.

Set up

M-2T model main body, Wet sieving adapters (head with a hopper, sieve pan with an outlet), O-rings for sieves (option parts)

Dispersing medium

Water, ethanol, methanol

To use a fine-mesh sieve, with which you may find it difficult to sieve a slurry made up with water alone, add a small amount of sodium hexamethaphosphate or surfactant.

How to make up a slurry

Add about 1g to 5g of test sample to 50ml to 100ml of liquid dispersing medium. (The required volume of liquid dispersing medium may differ depending on the properties of a test sample.)

Disperse a test sample in a liquid medium using a high-speed mixer or an ultrasonic washing machine or manually.

How to measure

- 1. Attach an O-ring to the bottom frame of each sieve to be used for measurement and weigh its empty weight beforehand.
- 2. Put a wet sieve pan with an outlet on the main body's sieve holder and stack sieves on it in order with the finest one first. Next, put a wet sieving head with a hopper on top and clamp them with clamping springs suitable for the number of sieves used.

- 3. Place a receptacle such as a beaker beneath the wet sieve pan's outlet.
- 4. Set the Amplitude Control Dial at "0" and turn on the Power Switch. Pour the dispersed test sample into the hopper slowly. In doing so, adjust the Amplitude Control Dial to a level that does not cause the sample to splash off the hopper.
- 5. Wash the sample powder residues remaining in the receptacle containing the dispersed sample with the liquid used as a dispersing medium and pour them into the hopper.
- 6. Please note that an overflow from a sieve may be caused, if a large quantity of the liquid is poured at once.
- 7. Pour the liquid until clear liquid comes out of the wet sieve pan's outlet, and finish washing when you cannot see turbid liquid flowing out anymore.
- 8. Left sieves to dry in the air and then in an oven (50°C 60°C) before they are weighed. Let the sample slurry collected through the outlet into the beaker settle thoroughly, discard the supernatant and weigh the solid part of the sample slurry left as the sediment.

CAUTION!

- X This sieve shaker generates vibrations of different acceleration magnitudes depending on the power frequency. Please check with the seal showing rated frequencies attached to the main body. Operating the sieve shaker at a wrong frequency can result in a machine breakdown.
- ※ Ideally, the quantity of test sample should be such that its depth as distributed uniformly over the uppermost sieve becomes 5 to 6 times the mesh opening size (5 - 6 mm for 1 mm mesh opening size).
- X Use corner rings (inner rings) with sieves. Use O-rings (outer rings) to sieve fine powder or perform wet sieving.
- * Be careful not to splash water over the main body. (Otherwise a machine breakdown may be caused.)
- * This sieve shaker is designed to use with test sieves (75mm ϕ). Do not use it with sieves of different diameters or for other purposes. Be sure to observe this instruction, otherwise a machine breakdown may be caused.
- X Do not operate the sieve shaker continuously for a long time (1 hour or longer).
- X Although this sieve shaker generates high-pitched metallic sounds when operated without load (without any sieves placed on it), this is not a sign indicative of a machine breakdown.