OPERATING MANUAL

GilSonic UltraSiever
GA-8

06/02/2015

PHONE: 800-444-1508
740-548-7298

P.O. Box 200, Lewis Center, Ohio 43035-0200
E-mail: customerservice@gilsonco.com **Website:** www.globalgilson.com

FAX: 800-255-5314
740-548-5314

Table of Contents

GilSonic UltraSiever

The speed and accuracy of sonic sieving coupled with microprocessor control make the UltraSiever the ultimate instrument for sieving as fine as 5µm.

1.0 INTRODUCTION

1.1 Sonic Sieving to 5µm with 8in Sieves

Now the speed and accuracy of the sonic sieving method can be used with conventional 8in diameter test sieves via the newest model of Gilson's family of GilSonic instruments. The GilSonic UltraSiever uses up to seven 8in diameter full-height test sieves. Woven wire sieves in the No.635 (20µm) to 1/4in (6.3mm) range, or special 8in diameter electroformed sieves with precision nickel mesh in the 5µm—25µm range and precision to ±2µm can be used. Electroformed mesh sizes larger than 25µm are also available. Sample capacities are more than seven times those of our popular AutoSiever. Up to 10g is typical for precision electroformed sieving below 20µm. Coarser samples range from 50g or 20cc up to 100g or more, depending on sizes of mesh and number of sieves used. Particle size range is extended to 1/4in (6.3mm) topsize for many materials via special switchable high-energy tapping to reorient particles for separation. Typical sieving time for complete separation is five minutes.

1.2 Unique Features

- Fine Particle separation range of 5.6mm to 5µm using 8in (203mm) standard woven wire or precision electroformed sieves. Larger topsizes may be tested with some sample types.
- Electronic controls give exact repeatability of programmed time and amplitude sequences.
- Amplitude may be set precisely on a 0—99 scale, displayed on a digital LED screen. Memory stores up to ten programs with instant recall.
- Built-in electromechanical vertical tapping or alternating vertical and horizontal tapping helps clear sieves, and deagglomerate samples.
- Large digital LED display and sixteen LED mode indicators tell operator at a glance the mode or function in progress.

1.3 Revolutionary Sieving Technique

The UltraSiever automatically takes full advantage of the unique capabilities of sonic sieving. Intensity of sieving action is varied by changing the amplitude of sonic pulses. The UltraSiever replaces simple test timing with a user-programmable combination of exact repeatable times and amplitudes that can be stored in memory and recalled. Programs vary with sample types and particle size range. Once stored in memory, test sequences can be rerun on demand to repeat testing of similar samples.

1.4 How It Works

Sonic sieving uses a vertically oscillating air column to lift particles, then carry them back against mesh openings at 3,600 pulses per minute. Addition of tapping action helps clear blinding of near-sized particles and deagglomerates samples with electrostatic, hygroscopic, or other adhesion problems.

GA-8 Sonic Sieving Action

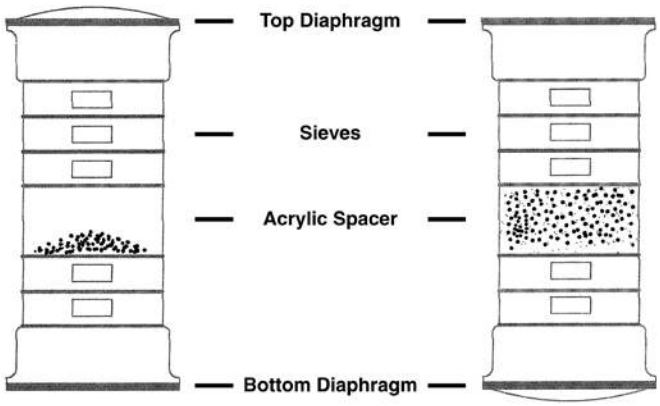

Figure 1.4

The UltraSiever's control panel features electronic controls and ten program memory for exact repeatability of sequences of time and vibration amplitude, plus user-selection of vertical and horizontal tapping. Each program has timed segments for buildup to desired maximum amplitude, hold time at maximum, then down-ramp to zero. Amplitude is displayed on a 0—99 digital LED scale.

Additional controls include switches for the seven sets of adjustable dual horizontal tappers. Four vertical tappers in the base plate are switchable to operate as one or two pairs. All switch settings and time-amplitude sequences are stored for each of the ten program memory slots. They are available for instant recall and use without resetting any controls.

2.0 SAFETY INSTRUCTIONS

You are responsible for the safe operation of this device, and maintaining this equipment in compliance with these instructions. You must read and completely understand these operating and safety instructions before using this machine.

WARNING!

This machine operates on electric current. Improper operation could result in electric shock, electrocution, or an explosion.

1. The GA-8 UltraSiever is configured to operate on 115V/60Hz or 230V/50Hz power supplies, as noted in the assembly instructions. Make sure that the Voltage Selector Switch on the back of the unit is set to operate with the proper voltage supply.

NOTE: This unit is **NOT** explosion-proof.

2. **ALWAYS** check electrical wiring for loose connections and for pinched or frayed wiring.
3. **ALWAYS** use a properly configured three-pronged plug, as supplied with the unit. Connect the machine to a properly-wired, three-pronged receptacle. Make sure the cord is routed safely.
4. **ALWAYS** disconnect and lock-out power supply before performing maintenance and repairs.
5. **NEVER** operate this device without having all covers and case in place.
6. **ALWAYS** unplug or disconnect machine from the power source when the unit is not in operation.

3.0 UNCRATING & SETUP

1. The UltraSiever weighs approximately 150lb (68kg). Use appropriate equipment and manpower to uncrate the device. Wear safety glasses and work gloves.
2. Examine the shipping carton for signs of damage before opening. Report damage to the shipping company immediately. Leave the carton as intact as possible to facilitate return shipping, if necessary.
3. Lift the UltraSiever from the carton, and position it on a solid, level work surface capable of supporting its weight. The UltraSiever performs best in an environment with stable temperature and humidity. Examine the unit again for damage that may have been concealed.
4. Remove the shipping tape covering the four Vertical Tapper Pins in the Base Plate on the bottom of the sieving chamber.
5. One each Top and Bottom Adapters, four diaphragms for top or bottom use, two standard and one double-height clear acrylic spacers, and twelve polyurethane O-rings are included with the GA-8.
6. Insert the female end of the included three-wire grounded power cord into the power connection on the back of the UltraSiever.
7. When ready for operation, plug the power cord into a properly grounded power outlet.

3.1 GA-8 Assembled

GA-8 Assembled

4.0 CONTROL & DISPLAY FUNCTIONS

4.1 Programmable Control Keypad

RUN/STOP
The Run/Stop button starts and stops the sieving action. The “Run” LED light is on when the UltraSiever is running. If “Stop” is pressed during a sequence, the UltraSiever will abort the test. If “Start” is pressed again another sequence will be initiated from the beginning.

MAN/AUTO
This function selects manual or automatic modes of operation for the UltraSiever. The Manual mode is generally used when determining proper time and amplitude settings for particular samples. The Auto mode is used when inputting data in programs or selecting programs from memory.

PAUSE/RES
The Pause/Resume function interrupts the progress of a sieving sequence. The “Pause” LED light is lit when this function is activated. When paused, remaining time and sequence position will be indicated on the display and program LED’s. Press the Pause/Resume button a second time to resume operation.

PGM
The Program function is used to enter amplitude and phase times. The button is pressed to accept the displayed value and advance to the next entry. This function is also used to review saved values in an existing program.

REC/↑and Save/↓
The Recall and Save functions are used to store or recall programs from any of the ten memory locations coded 0—9. The buttons are enabled when programming in the “Auto” mode. The up and down arrow functions are used for setting time and amplitude values and are enabled in the “Manual” mode.

4.2 Tapping Action Control Buttons

Horizontal and vertical tapping assists in particle separation and freeing lodged, near-size particles from blinded openings:

OFF
This disables all tapping. Pressing this will make sieving action of the unit solely dependent on sonic energy.

↑
This button activates vertical tapping. The platform of the Sieving Chamber is struck from underneath by two tappers on opposite corners of the base plate, elevating and reorienting particles to the sieve cloth during the sieving sequence.

↑↑
The *Extended Vertical Tapping* button activates two additional vertical tappers in the base for greater vertical agitation when testing heavier or coarser samples. These tappers may be toggled ON/OFF.

↑/→
This button engages both horizontal and vertical tapping. The horizontal tappers are positioned on each side of the sieve stack. Use of both Vertical and horizontal tapping assures maximum movement of hard to separate material.

<—>
This row of buttons across the top of the control panel are numbered 1 through 7 and control individual pairs of horizontal tappers. See Figure 5.1 for information on position adjustment of the horizontal tappers.

Control Panel

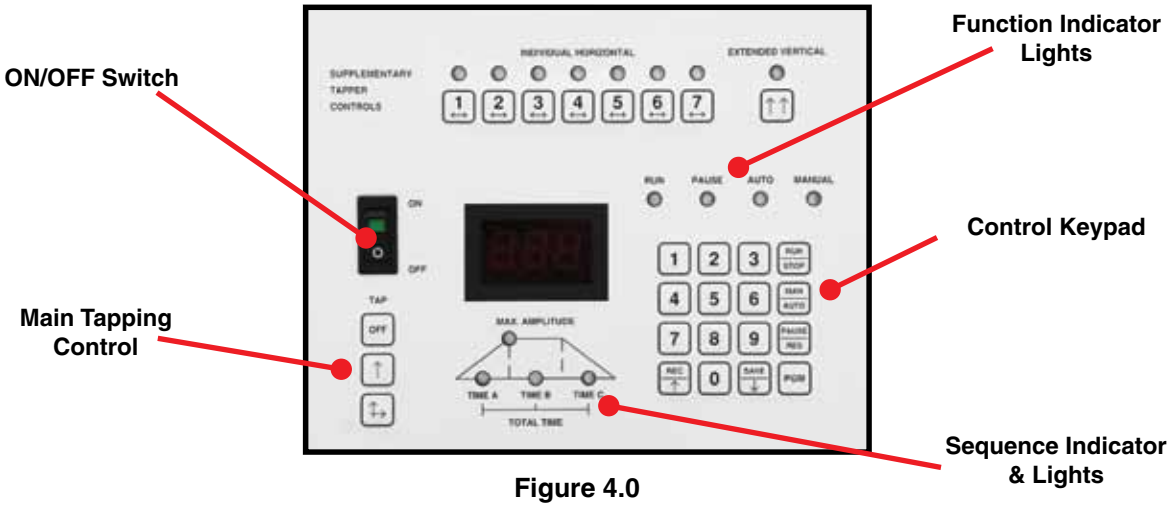

Figure 4.0

4.3 Test Phase Indicator Lights

Time A
This phase begins the test sequence and determines the time in which amplitude is increased from zero to the programmed setting. Gradual increase of amplitude allows samples with large amounts of fines, low density or electrostatic tendencies to gently separate before more severe action generates static buildup and causes particles to agglomerate.

Time B
This phase determines the time that the test will be run at the programmed maximum amplitude setting. Most of the testing time will be in this setting.

Time C
This is the duration needed for the amplitude to decline from maximum to zero. Each sieve size has an optimum separation amplitude that decreases with particle size. The gradual decrease at the end of the test serves to clean up separation of near-sized particles on each sieve.

Max. Amplitude
This LED is on at any time the programmed maximum amplitude setting is reached.

4.4 Operating Mode Indicator Lights

Run
This LED is active whenever the UltraSiever is in operation.

Pause
This LED flashes when the “PAUSE/RES” button is pressed. In this mode, the test in progress is interrupted, but the time and amplitude settings are saved. When the button is pressed again, the test sequence resumes. This LED is also lit when the stack assembly is removed during a run.

Auto
The Auto LED is lit when programming, saving programs or testing with a saved program.

Manual
The Manual LED is lit when establishing amplitude levels and sequencing for materials.

The LED Digital display shows all of the settings and values needed when programming and using the UltraSiever. When numerical values are entered, they appear in the space for the right-hand digit and “push” any digit currently displayed to the left. It may be necessary to enter a series of zeroes if you want to start from a “clear” display.

5.0 PREPARING THE SIEVE STACK ASSEMBLY

PLEASE NOTE: Using brands of sieves, only diaphragms and/or diaphragms other than Gilson may void the warranty.

A. Select desired sieves for testing. Sieve Stack Assembly must consist of seven sieves. If fewer sieves are used, the appropriate number of spacers must be added (see Figure 5.0). Mixing of wire-woven and precision sieves in the same stack is not recommended. O-rings must be used to maintain proper height of the sieve stack to engage the interlock.

NOTE: 8in diameter O-Rings **MUST** be used on all Sieve and Spacer Skirts as well as the Upper Adapter.

CAUTION: Fine sieve (less than 20µm) openings may impede airflow, placing higher strains on sieve cloth. Sieves may be damaged if power settings are too high.

B. On a balance sensitive to at least 0.01g, determine and record the tare mass of parts that will contact the sample during testing:

- Bottom Diaphragm
- Top & Bottom Adapters
- Each Sieve
- Each Spacer

C. Seat the bottom O-ring in the Handle Plate and install the Bottom Diaphragm over the centering ring on the plate. Place the Bottom Adapter into the ring of the Bottom Diaphragm.

D. Nest the stack of sieves to be used, the finest sieve at the bottom, coarsest on top, with spacers as necessary to maintain correct stack height. Spacers, if used, may be located for convenient viewing of sample action during separation.

E. Carefully deposit the sample onto the top sieve. Finish assembling the sieve stack by placing the Top Adapter on the sieves.

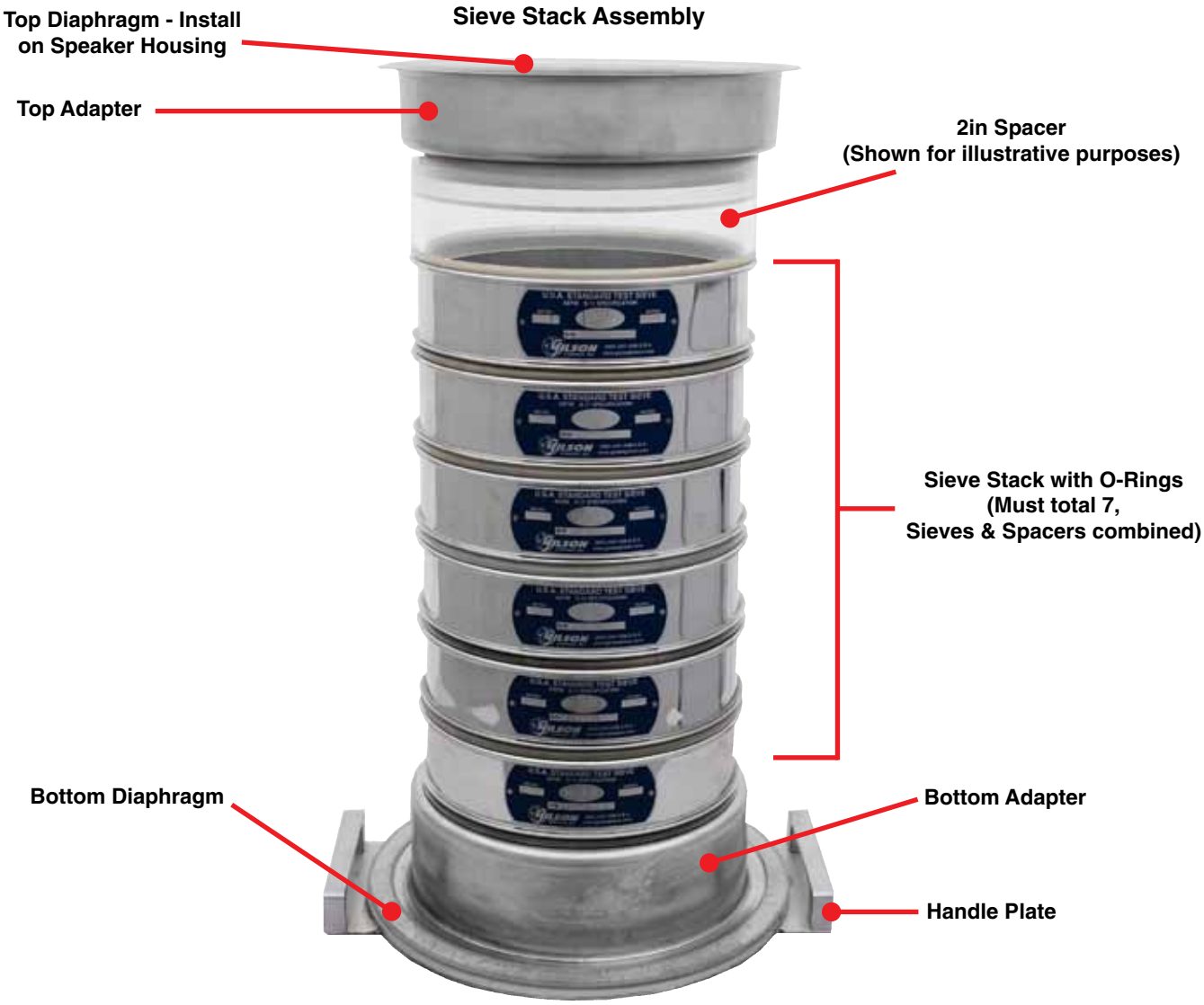

Figure 5.0

NOTE: There are two issues involving quantity of the sample to be tested.

1. Physical load on the sieve cloth. The finer sieves in either woven wire or electroform versions can be quite delicate and excessive mass repeatedly loading and unloading the cloth can dramatically shorten the useful life of a sieve. Additionally, excessive volume can restrict free movement of the air column created by the sonic energy in the UltraSiever. This also creates excessive loads on the sieve cloth and may result in damage to the sieves. Generally, following the guidelines below for effective separation will prevent most problems from physical overloading. If your material has especially high or low bulk density, you should discuss your application with a Gilson Technical Support representative.

2. Optimum sample quantity for effective separation. This is dependant upon density of the powder, sieve sizes to be used and sample load on each sieve at completion of sieving. For most efficient separation, there should be no more than a thin layer of sample on any one sieve surface when the test is complete.

Maximum total sample quantity for wire woven sieves No.400 (38mm) or larger can be 100g or more, depending on sample type and particle size distribution. For finer wire woven sieves, 50g is the maximum. For precision sieving with electroformed sieves below 20µm, 10g is the recommended maximum.

F. Verify that the O-Ring is in place in the upper centering ring on the bottom of the Speaker Assembly. Seat the Top Diaphragm on the upper centering ring and rotate the diaphragm clamps to secure.

G. Raise the Speaker Assembly to the highest position by rotating the Stack Knob (located in the top front of the speaker assembly case) counterclockwise until it stops.

H. Using the Handle Plate to lift the sieve stack, insert the stack into the sieving chamber until it rests against the stops on the Base Plate.

I. Carefully rotate the Stack Knob clockwise to lower the Speaker Assembly onto the sieve stack. The Speaker Assembly should contact the sieve stack before bottoming out. If not, check to see that the proper number of sieves and spacers are making up the sieve stack and that they are each separated by an O-Ring.

NOTE: The sieve stack must be in place and the Speaker Assembly lowered into its proper place or the UltraSiever will not operate. Insert the stack and lower the Speaker Assembly correctly, then press the **Pause/Resume** key or the **Run** key twice to return to operation.

J. Referring to Figure 5.1 adjust the Horizontal Tappers to their proper positions.

Adjusting Tappers

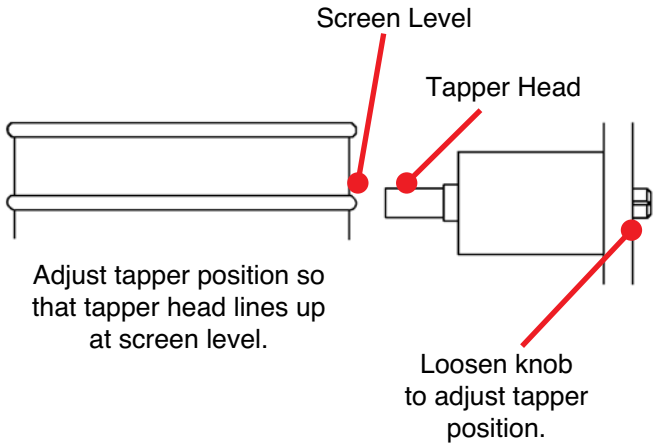

Figure 5.1

6.0 ESTABLISHING TEST SEQUENCES

For each type of material tested, a sequence should be established that most effectively processes the particular material type. This assures the highest degree of accuracy and repeatability from the UltraSiever and enables subsequent samples of similar materials to be processed efficiently using custom-programmed sequences.

- Prepare a sample of material to be tested, place it in the sieve stack and put together the Sieve Stack Assembly as discussed in Section 5.0.
- Insert the assembly into the Sieving Chamber and lower the Speaker Assembly as discussed in Section 5.0.
- Turn the power switch on and check that the Manual mode LED is lit. If not, set it for Manual operation by pressing the **MAN/AUTO** button.

6.1 Setting Maximum Amplitude

A. Using the **REC/↑** and **SAVE/↓** arrow keys, adjust the amplitude level to an initial low number, such as 5, and press the **Run/Stop** button to start.

CAUTION!: The Electroformed cloth in Precision Sieves and the woven wire cloth of some finer standard sieves is especially delicate and may be destroyed if the amplitude setting is too high. While it is impossible to state an exact maximum value, an amplitude setting of 25 or more for sieves of 20mm or less should be approached incrementally. Coarser Electroformed sieves will be more robust, as will most wire-woven sieves, but it is still possible to damage them with excessively high settings or prolonged run-times. Abnormally high amplitude settings may also damage components of the UltraSiever and void the warranty.

If you are unable to achieve satisfactory separations in 15 minutes or less at amplitude settings under 50, please consult a Technical Support representative at Gilson. Attempting higher settings may void the warranty.

B. Gradually increase the amplitude until the sample material on the top sieve flows smoothly in a gentle fluid action. Note the final number on the display for later programming as the maximum amplitude value.

6.2 Establishing Phase Times

Phase times require experimentation to find the best values. The settings below offer a starting point:

- Time “A” (Ramp-up) 0.5 minutes
- Time “B” (Testing time) 5.0 minutes
- Time “C” (Clean-up) 0.3 minutes

C. Press **MAN/AUTO** to return the unit to automatic operation.

D. Press **PGM** until the Time A indicator LED is blinking.

E. Use the keypad to enter the time for the amplitude to ramp up from 0 to the established maximum setting. There is a default value of 0.1 already programmed.

> **NOTE:** Time is displayed in 0.1 minute (6 second) increments. 1 minute, 18 seconds would be displayed as 1.3. Digits entered appear in the right-hand space of the display and “push” other digits to the left. When entering new values, it may be necessary to enter 0’s until the display is cleared.

F. Press **PGM** to accept the displayed value. The setting will be stored and the Max. Amplitude LED will begin to blink.

G. Enter the maximum amplitude setting as determined in manual mode above and press **PGM**. The value will be stored and the Time B LED will start blinking.

H. Continue entering and storing values for Time B and Time C phases. After a value for Time C is entered and stored, the total time for the test (A+B+C) will be displayed.

I. Select the appropriate Tapping Action buttons to program tapping during operation.

> **NOTE:** For most materials, operation with both horizontal and vertical tapping (↑/→) insures the best separation. Some problem materials may respond best using only vertical tapping or none at all.

Horizontal Tappers and Extended Vertical Tappers, as needed, may be selected using the number keys 1—7 along the top row, and the **Extended Vertical** key. An LED will light to indicate those selected. A second key press will toggle the selection.

J. To execute the entered program a single time, press the **RUN/STOP** button. The UltraSiever will run the sequence and stop automatically at completion.

> **NOTE:** After running through a test cycle at these initial settings, the individual fractions can be weighed, and then tested again for an additional minute at the previously determined amplitude setting. If the amount passing a given sieve increases less than about 1%, then the original settings are adequate. If there is more than an additional 1% passing, the process of increasing test times in one minute increments should be continued. If the material being tested is exceptionally dense or lightweight, prone to agglomerate or gather static charges, time and amplitude settings may have to be increased. (See Caution note in Section 6.1)

K. To store the entered program into memory, press **SAVE** and enter a number from 0—9 for the memory location.

7.0 PERFORMING A TEST

A. Prepare the Sieve Stack Assembly as noted in Section 5.0. Place the stack with the sample into the unit and close the doors.

B. Turn the power switch on and either enter amplitude and phase time values as described in Section 6.0, or select a previously stored program from one of the ten memory locations by pressing **REC/ ↑** and the memory location.

C. Press the **RUN/STOP** button to initiate the test. The UltraSiever will execute the program and automatically stop at completion.

D. Remove and disassemble the stack assembly and weigh the individual sieves with the separated fractions. Subtract the tare weights of the individual sieves to determine fraction weights.

E. Total sample weight can be determined by adding the fraction weights to the weight of the fines retained on the tared Top and Bottom Adapters, Bottom Diaphragm and Spacers.

8.0 CARE & HANDLING OF SIEVES

8.1 Precision Electroformed Sieves

Gilson 8in Precision Electroformed Sieves have unsupported electroformed nickel mesh for the maximum open area. Sieves with support grid are also available. These sieves are delicate testing instruments and must be handled with care.

- When testing with sieves of 20mm or less, airflow may be impeded and result in damage or poor separations.
- Never exceed recommended sample weight when using Precision Sieves.
- For cleaning, use an Ultrasonic Cleaner of 150 Watts or less with water temperature between 70°—90°F (21°—32°C). Place sieves in on edge for thirty seconds to one minute, then remove and allow to air-dry. **Do NOT brush or use compressed air to clean precision sieves!**
- **DO NOT** expose to radiant heat or attempt to dry in a conventional or microwave oven.
- When dry, store Precision Sieves in their cases until ready for next use.
- **NEVER** touch the mesh of Precision Sieves with the fingers. Acids and oils on the skin will quickly discolor and corrode the mesh.

8.2 Standard Sieves

Sieves with woven wire mesh are generally more robust than Precision Sieves, but must still be handled with care to maintain their effectiveness as testing instruments.

- **DO NOT** subject sieves to temperatures higher than 120°F (49°C).
- Coarser sieves may be gently brushed to clean. Finer sieves should be immersed in an ultrasonic cleaner as noted above.
- **DO NOT** use compressed air to clean sieves.

9.0 MONITORING PERFORMANCE

For a number of reasons, it may not be practical to attempt to “calibrate” the UltraSiever device itself. However, some things can be done to monitor performance of the unit as related to particle separation. Tracking ongoing performance and repeatability can be an important part of a QC/QA program and should be done periodically for any testing device.

At a minimum, an appropriately sized reference material will be needed. Gilson offers Whitehouse Sieve Standards, which are single-use vials of glass beads for use on individual sieves. We also have Standard Reference Materials supplied directly from NIST or BCR (European Community Bureau of Reference), designed to cover a range of sizes. These materials are intended for use to monitor average size openings on sieves, but will also reflect the repeatability of an individual UltraSiever unit over time.

For the most meaningful results, the reference material should be tested on a master sieve or set of sieves and sieve stack assembly that is set aside only for this purpose. UltraSiever controller settings must be the same for each performance check. If significant variations are found, adjustment of amplitude or time settings or changing the diaphragms may reconcile the results. If these adjustments do not help, it may be a sign of more complex problems. Gilson may be consulted at any time to assist with diagnosis.

10.0 MAINTENANCE & REPAIR

10.1 General Repairs

Simple replacement of fuses is easily accomplished by following the instructions below. More complex diagnosis and repair, including replacement of the speaker should be performed in cooperation with Gilson personnel or by returning the unit to Gilson.

WARNING!

Always disconnect the unit from its power supply before attempting any maintenance, adjustment or repair procedure.

10.2 Fuse Replacement

A. The fuse holder is contained in the power receptacle at the rear of the unit. The fuse holder is a small “drawer” at the bottom of the receptacle, which may be opened with a fingernail or small screwdriver. The fuse holder can then be pulled out.

B. There are two fuses in the holder. The one closest to the cabinet is the functional unit. The fuse to the outside is a spare.

C. Test the fuse for continuity with an ohmmeter. If no continuity, replace with the spare fuse.

D. Push the fuse holder back in until it latches.

E. Replace the power cord.

11.0 APPENDIX: ADDITIONAL INFORMATION

GILSONIC ULTRASIEVER

- **Sonic sieving for samples up to 100g.**
- **Uses 8in or 200mm diameter sieves.**
- **Fully programmable time, amplitude and vertical or horizontal tapping sequences.**

The GA-8 GilSonic UltraSiever uses up to seven 8in (203mm) diameter full-height test sieves. Woven wire sieves in the 1/4in to No.635 (6.3mm to 20µm) range or special 8in (203mm) diameter precision sieves with electroformed mesh in the 150µm to 5µm range can be used for ±2µm precision. Sample capacities are more than seven times those of our popular GA-6 AutoSiever. A sample size of 10g or less is typical for precision electroformed sieving below 20µm. Coarser samples range up to over 100g, depending on mesh sizes and number of sieves used. Particle size range is extended to 1/4in (6.3mm) topsize for many materials. Typical sieving time is 1—5 minutes.

Maximum amplitude is determined in manual mode by viewing action of largest particles in each sample type. Each program has timed segments for build-up to desired maximum amplitude, hold time at maximum, then down-ramp to zero. A 0—99 digital LED displays amplitude. Additional GA-8 controls include switches for seven pairs of horizontal tappers positioned to tap on selected sieves. Switchable vertical tappers operate as one or two pairs. A single pair is sufficient for most powder separations. Two pairs are used for samples containing larger particles. Ten-program memory stores all settings and sequences.

Vertically-hinged Lexan™ doors enclose the sieve chamber. Sample material is contained by flexible top and bottom diaphragms. The stack is sealed when the upper enclosure is lowered. Upon test completion, fines are recovered from the bottom diaphragm. Acrylic spacers are required when using less than seven sieves or for viewing sieving action.

The GA-8 includes top and bottom sieve stack adapters, four diaphragms for top or bottom use, two acrylic spacers, one double-height acrylic spacer, and twelve polyurethane sieve Seal Gaskets. GAA-5 Assembly for Extra Sieve Stack includes top and bottom sieve adapters, handle plate, bottom diaphragm and sieve seal gaskets to assemble a second sieve stack for faster processing. Sieves are ordered separately. Dimensions: 19x19x41in (483x483x1,041mm), WxDxH. Est. Ship Wt.: 150lb (68kg).

GA-8

GILSONIC ULTRASIEVER	
Description	**Model**
GilSonic UltraSiever, 115/230V, 50/60Hz	GA-8
Accessories	
Replacement Top/Bottom Diaphragm	GAA-15
8in Sieve Seal Gasket	SSA-10
Diaphragm Seal Gasket	GAA-18
Spacer, 8in	GAA-19
Double-Height Spacer	GAA-16
Assembly for Sieve Stack	GAA-5
Adapter Set for 200mm Sieves	GAA-10
Spacer, 200mm	GAA-19M
Double-Height Spacer, 200mm	GAA-16M

: PRODUCT SPOTLIGHT ::::::::::::

GILSONIC ULTRASIEVER

Program Memory:	10 Programs
LED Digital Indicator:	3 digits, 5/8in high
Timing Range:	0—99.9 minutes
Amplitude:	0—99 linear scale
Sonic Pulsing:	3,600 pulses per minute at 50/60Hz
Tapping:	Selectable: Switches for each of 7 horizontal pairs Select 1 or 2 vertical pairs
Sieve Capacity:	7 full-height 8in (200mm) stainless steel sieves
Cabinet:	Powder-coated steel with hinged Lexan™ doors
Electrical:	115/230V, 50/60Hz selectable; 100 Watts maximum
Memory:	Non-volatile RAM

GILSON TEST SIEVES
ASTM E11; AASHTO M 92; ISO 565, 3310-1

Gilson stocks the widest range and largest quantity of sieves of any major supplier. Immediate shipment is available for all popular sizes. Custom sieves with special diameters and stacking heights are also available.

ASTM Sieves meet the requirements of ASTM E11. ISO Sieves meet ISO 565 specifications with tolerances to ISO 3310-1. All are serial numbered and supplied with a certificate of manufacturing conformance.

ASTM E11 STANDARD WOVEN WIRE SIEVES

All stainless steel, full-height, 8in (203mm) diameter Test Sieves

Mesh Size	Size (mm/µm)	Model
1/4in	6.3mm	V8SF 1/4"
No. 3-1/2	5.6mm	V8SF #3-1/2
No.4	4.75mm	V8SF #4
No.5	4.00mm	V8SF #5
No.6	3.35mm	V8SF #6
No.7	2.80mm	V8SF #7
No.8	2.36mm	V8SF #8
No.10	2.00mm	V8SF #10
No.12	1.70mm	V8SF #12
No.14	1.40mm	V8SF #14
No.16	1.18mm	V8SF #16
No.18	1.00mm	V8SF #18
No.20	850µm	V8SF #20
No.25	710µm	V8SF #25
No.30	600µm	V8SF #30
No.35	500µm	V8SF #35
No.40	425µm	V8SF #40
No.45	355µm	V8SF #45
No.50	300µm	V8SF #50
No.60	250µm	V8SF #60
No.70	212µm	V8SF #70
No.80	180µm	V8SF #80
No.100	150µm	V8SF #100
No.120	125µm	V8SF #120
No.140	106µm	V8SF #140
No.170	90µm	V8SF #170
No.200	75µm	V8SF #200
No.230	63µm	V8SF #230
No.270	53µm	V8SF #270
No.325	45µm	V8SF #325
No.400	38µm	V8SF #400
No.450	32µm	V8SF #450
No.500	25µm	V8SF #500
No.635	20µm	V8SF #635

ISO 200MM TEST SIEVES

ISO 565, 3310-1	Stainless Cloth Stainless Frame
	Full Ht.
6.3mm	V200SF 6.3M
5.6mm	V200SF 5.6M
5.0mm	V200SF 5M
4.75mm	V200SF 4.75M
4.50mm	V200SF 4.5M
4.00mm	V200SF 4M
3.55mm	V200SF 3.55M
3.35mm	V200SF 3.35M
3.15mm	V200SF 3.15M
2.80mm	V200SF 2.8M
2.50mm	V200SF 2.5M
2.36mm	V200SF 2.36M
2.24mm	V200SF 2.24M
2.00mm	V200SF 2M
1.80mm	V200SF 1.8M
1.70mm	V200SF 1.7M
1.60mm	V200SF 1.6M
1.40mm	V200SF 1.4M
1.25mm	V200SF 1.25M
1.18mm	V200SF 1.18M
1.12mm	V200SF 1.12M
1.00mm	V200SF 1M
900µm	V200SF 900U
850µm	V200SF 850U
800µm	V200SF 800U
710µm	V200SF 710U
630µm	V200SF 630U
600µm	V200SF 600U
560µm	V200SF 560U
500µm	V200SF 500U
450µm	V200SF 450U
425µm	V200SF 425U
400µm	V200SF 400U
355µm	V200SF 355U
315µm	V200SF 315U
300µm	V200SF 300U
280µm	V200SF 280U
250µm	V200SF 250U
224µm	V200SF 224U
212µm	V200SF 212U
200µm	V200SF 200U
180µm	V200SF 180U
160µm	V200SF 160U
150µm	V200SF 150U
140µm	V200SF 140U
125µm	V200SF 125U
112µm	V200SF 112U
106µm	V200SF 106U
100µm	V200SF 100U
90µm	V200SF 90U
80µm	V200SF 80U
75µm	V200SF 75U
71µm	V200SF 71U
63µm	V200SF 63U
56µm	V200SF 56U
53µm	V200SF 53U
50µm	V200SF 50U
45µm	V200SF 45U
40µm	V200SF 40U
38µm	V200SF 38U
36µm	V200SF 36U
32µm	V200SF 32U
25µm	V200SF 25U
20µm	V200SF 20U

NOTE: ISO Sieves with 200mm diameter frames require use of optional GAA-10 Adapter Set.

PRECISION ELECTROFORMED SIEVES
ASTM E161, C430; ISO 3310

Openings of Gilson's square-hole Precision Electroformed Sieves are consistently more accurate than ASTM E11 woven-wire sieves. Tolerances for electroformed sieve openings are ±2µm, while woven-wire tolerances are two to ten times higher in comparable sizes. Opening sizes are available to 5µm, considerably below the 20µm smallest ASTM E11 size, and a number of ASTM E161 sizes are equivalent to E11. Electroformed sieve cloth is precisely formed from nickel using an electrodeposition process to produce a planar mesh with very consistent square openings. Each sieve is measured at 100 random openings and supplied with a Certificate of Compliance to meet listed standards. When calibrated with glass beads or other means, electroformed sieves can serve as a reliable reference standard.

PRECISION ELECTROFORMED SIEVES

With unsupported nickel mesh mounted in stainless steel, full-height 8in (203mm) diameter Test Sieve Frames Mesh in lines per inch (LPI)

µm	LPI	Model
[1]500	40	EF-8D500U
[1]425	45.4	EF-8D425U
[1]355	51	EF-8D355U
[1]300	60	EF-8D300U
[1]250	66	EF-8D250U
[1]212	83	EF-8D212U
200	83	EF-8D200U
190	90.9	EF-8D190U
[1]180	90.9	EF-8D180U
170	100	EF-8D170U
160	100	EF-8D160U
[1]150	110	EF-8D150U
140	110	EF-8D140U
130	117.6	EF-8D130U
[1]125	125	EF-8D125U
120	125	EF-8D120U
110	125	EF-8D110U
[1]106	125	EF-8D106U
100	150	EF-8D100U
[1]90	150	EF-8D090U
80	150	EF-8D080U
[1]75	150	EF-8D075U
70	181	EF-8D070U
[1]63	181	EF-8D063U
60	181	EF-8D060U
[1]53	250	EF-8D053U
50	250	EF-8D050U
[1]45	250	EF-8D045U
40	300	EF-8D040U
[1]38	300	EF-8D038U
[1]32	300	EF-8D032U
30	300	EF-8D030U
[1]25	400	EF-8D025U
[1]20	400	EF-8D020U
15	400	EF-8C015U
10	500	EF-8B010U
5	500	EF-8A005U

[1] Openings are equivalent to ASTM E 11 woven wire sieves.

Electroformed sieves for the Gilsonic UltraSiever are stainless steel in 8in (203mm) diameter, with full-height frames. Stacking height is 2in (50.8mm). The Lines Per Inch (LPI) value indicates the number of openings of the specified size occurring in one linear inch (25.4mm). Inquire for other LPIs. Higher LPIs are more fragile while low LPIs have thicker metal, but result in fewer openings. Standard electroformed cloth has a reinforcing support grid that blocks some openings and reduces sieving efficiency. Gilson recommends that Precision Electroformed Sieves for the UltraSiever use unsupported cloth. To order sieves without this support grid, add a "U" suffix to model numbers as shown. Sieves are heliarc welded and sealed with an epoxy ring. Frames stack with ASTM E11 woven-wire sieves. Sieves with openings larger than 500µm and/or with other LPIs can be quoted on request.

Electroformed Sieves in combination with instruments like Gilson's AutoSiever and UltraSiever are often more productive than standard mechanical shakers with woven wire sieves. While the initial price of Electroformed Sieves is substantially higher than woven wire sieves, their accuracy, efficiency and size range often make them a better solution for precision particle sizing operations.

Electroformed sieves are precision instruments and should be treated carefully. For ultrasonic cleaning, use extreme caution until it is known that the system is suitable for each sieve size. Select lower energy output with frequency above 40kHz for 20 seconds or less. Sieves should be positioned vertically, and addition of ethyl or isopropyl alcohol to tank water will decrease erosion risk. Drying temperature should not exceed 100°C. Because of the fragile nature of Precision Electroformed Sieves and their special ordering requirements, Gilson assumes no responsibility for damage in use, and electroformed sieves are nonreturnable when supplied as ordered. Delivery time is 4—6 weeks.

TECH NOTE!

Read ordering instructions carefully. Electroformed Sieves are made to order and are nonreturnable when supplied as ordered.

TEST SIEVE VERIFICATION & SERVICES

There have been extensive revisions to the newest version of ASTM standard E11, *Specification for Wire Cloth and Sieves for Testing Purposes*. Gilson is leading the way in educating our customers about the new specification and making these new products available. The new specification affects all test sieves and wire cloth, and changes the way the mesh openings are evaluated by looking at the statistical distribution of aperture sizes, rather than just the average opening sizes. In addition to a more accurate and reliable system of evaluation, the new system also allows compatibility with ISO 3310-1 requirements. There are now three grades, or classes of ASTM or ISO test sieves available; Compliance, Inspection and Calibration.

- **Compliance Test Sieves** are manufactured with wire cloth that has been inspected and measured in roll or sheet quantities prior to being cut and mounted in the individual sieve frames. Opening sizes are not measured in individual sieves. Each Compliance sieve is supplied with a certificate of manufacturing compliance, but no statistical documentation is given. Compliance sieves are designed for applications where a basic, reliable degree of accuracy and repeatability are sufficient.

- **Inspection Test Sieves** have a specified number of openings measured in each sieve after the cloth is mounted in the frame. There is a 99% confidence level that the standard deviation of these openings is within the maximum allowed by ASTM. Inspection Sieves are a good choice in applications where accuracy and repeatability are critical. Each Inspection Sieve consists of a Compliance Sieve with added Inspection Sieve Verification service.

- **Calibration Test Sieves** have about twice as many openings measured as Inspection Sieves. The higher number of openings measured on each sieve increases the confidence level to 99.73% that the standard deviation of these openings is within the maximum allowed by ASTM. Calibration Sieves should be used in applications where a very high degree of accuracy is required. Each Calibration Sieve consists of a compliance sieve with added Calibration Sieve Verification service.

New Gilson Test Sieves are guaranteed to meet the requirements of ASTM or ISO for Compliance, Inspection or Calibration grades as ordered, but for continued assurance of performance, procedures should be in place to regularly check working sieves as they age. Wire cloth stretches, sags, or even tears, and abrasive materials reduce wire diameter, causing an increase in opening size and loss of accuracy over time.

Periodic, measurement of opening sizes helps to determine whether a sieve is still usable. Measurements may be taken directly, using calipers or an optical comparator, or can be performance-based, by testing a standard reference material on the working sieves, as outlined in ASTM E2427, *Sieve Acceptance by Performance Testing*.

Gilson Reverification Services can be performed on used ASTM or ISO Test Sieves. An optical comparator with NIST traceable calibration measures opening and wire diameter sizes on each sieve. Certification reports are produced for the appropriate grade. These services are available for all ASTM and ISO sieve sizes and types, and are ordered by specifying model numbers for Inspection Sieve Verification, or Calibration Sieve Verification. Sieves are not included in the purchase price. When verifying used sieves, contact a Gilson customer service representative for shipping instructions.

Master-Matched Sieves are ASTM woven-wire sieves from No.8 (2.36mm) to No.325 (45µm) that have been measured and shown to closely match a set of master sieves maintained by Gilson in a reference laboratory. Master-Matched Sieves from Gilson are always matched to the same master set, assuring that one sieve is very close to another. Master-Matched Sieves are also certified to meet ASTM E11, so additional verification is not normally necessary. Master-Matching is done using special standard reference materials, sized for each sieve. Each sieve is performance tested to insure it yields ±2.5% of the weight retained value of the master sieve (equivalent to about ±1.25% of sample weight).

Ordering

All Gilson test sieves meet ASTM or ISO requirements for Compliance Test Sieves. Ordering additional verification services for each individual sieve upgrades them to meet Inspection or Calibration specifications.

TEST SIEVE VERIFICATION & SERVICES

Description	Model
Inspection Test Sieve Verification, ASTM E 11	GV-60
Calibration Test Sieve Verification, ASTM E 11	GV-65
Inspection Test Sieve Verification, ISO 3310-1	GV-62
Calibration Test Sieve Verification, ISO 3310-1	GV-63
Master-Matched Sieves	MM-70