EPISONIC™

User Manual 2000 Series

AN ADVANCED, HIGH THROUGHPUT SONICATION DEVICE FOR:

- DNA SHEARING
- CHROMATIN SHEARING

EpigenTek
Complete Solutions for Epigenetics

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WARRANTY INFORMATION

EpigenTek warrants that the EPISONIC 2000 sonication generator device is free from defects in material and workmanship under normal use and service for twenty (20) months from the date that the warranty period begins, unless otherwise indicated. Warranty periods begin on the date of delivery. All warranties apply only to the original purchaser of this product. EpigenTek's obligation under this warranty is limited to the repair or replacement at its sole discretion of any product or part thereof if the product is deemed to have a manufacturing defect upon examination by EpigenTek or its authorized repair service provider.

The sample processing horn and chiller are each covered under a nine (9) month warranty from defects in material and workmanship under normal use and service.

Included soundproof enclosure box, cables, tubing, and tools are not covered by any warranties. Discoloration or paint wear is not covered by any warranties.

Any warranties shall cover only manufacturing defects and do not cover any damage resulting from accidents, misuse, abuse, neglect, modifications, repair or service by any unauthorized parties, exposure to extreme temperatures, exposure to acids or chemical solvents, failure to comply with the instructions in this user manual, or maintenance not in accordance with any information contained in literature accompanying the product. Any unauthorized modifications, repair, or servicing by parties not approved by EpigenTek shall void any warranties.

All returns for repairs or replacement must be accompanied with a Return Merchandise Authorization number (RMA #) which can be obtained through EpigenTek's customer service department. Equipment should be returned in the original packaging. If you no longer have the original packaging, you will need to contact EpigenTek for approved packaging methods. Damage occurred from return shipping due to poor packing is not covered by this warranty.

You are responsible for shipping costs when shipping to EpigenTek for service. EpigenTek is responsible for shipping costs when shipping back to you after service.

WHEN RETURNING ANY MATERIALS TO EPIGENTEK, YOU MUST CERTIFY THAT THE MATERIALS BEING RETURNED ARE FREE OF ANY HAZARDOUS, INFECTIOUS, OR RADIOACTIVE SUBSTANCES, AND ALL PARTS HAVE BEEN PROPERLY DECONTAMINATED.

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PRECAUTIONS

The EpiSonic™ 2000 has been designed, constructed, and tested to assure your safety as the operator of the sonication device. However, for complete safety and protection of this equipment, PLEASE READ ALL OF THE INSTRUCTIONS IN THIS MANUAL CAREFULLY PRIOR TO OPERATION, INCLUDING THE FOLLOWING WARNINGS:

I. SAFETY PRECAUTIONS

- Do NOT open the sonication generator cover without supervision by an authorized service provider.
- Do NOT open the chiller unit cover without supervision by an authorized service provider.
- Do NOT open the ultrasonic converter or high voltage cables without supervision by an authorized service provider.
- Do NOT operate the sonication generator without any connection or sound processing horn attached to the high voltage cable as this may pose a shock hazard.
- Do NOT attempt to disconnect the high voltage cable while the sonication generator is running as this may pose a shock hazard.
- Do NOT plug in the power cord on either side while the sonication generator's power switch is on.
- Do NOT touch any open cable connections on the sonication generator while the power is on.
- Do NOT immerse the ultrasonic converter in liquids of any sort, or let condensed moisture or liquid drip into the ultrasonic converter.
- Do NOT touch the activated sample processing horn or ultrasonic converter as it may cause burns or tissue damage.
- Do NOT operate the sonication generator while the soundproof enclosure box is open or this may result in injury to your ears.
- Inspect high voltage cable for cracks or rips in the protective outer jacket. Do NOT operate the sonication generator with a damaged cable or this may result in serious injury.
- Do NOT use any substitute or third party cables -- only use approved cables specifically designed for use with EpiSonic™.
- Power off and unplug the sonication generator from both sides before attempting to replace any fuses.
- This device is intended for use in research applications and has not been tested or authorized for diagnostic use.
- Plug in the power cord directly into the unit (e.g., generator and chiller) first, before plugging into the outlet in order to avoid accidental shock.

II. EQUIPMENT PROTECTION

- Do NOT place the EpiSonic device in direct sunlight or near magnets. Install the device in an area free from dirt, excessive dust, and explosive or corrosive fumes. Keep the device away from extreme temperature and humidity. Do NOT place the generator within a fume hood.
- Do NOT allow the vibrating horn to touch any hard surfaces or it may overload the sonication generator, become damaged, or cause damage to the surface.
- Do NOT turn off the sonication generator while it is in the middle of sonication. Press STOP on the generator prior to disabling power.
- Do NOT let water sit for extended periods of time in the sonication processing horn if unused.
- If the sample processing horn is attached to the converter, do NOT hold this assembly by the converter as this may bend or damage the threaded connection.
- In the event of loss of power, wait at least three minutes before reapplying power.
- Make sure your electrical outlet has proper grounding before plugging in the sonication generator.
- Only use parts provided or approved by EpigenTek for use with your EpiSonic™ device.
- Install your EpiSonic™ device according to this manual's instructions. Failure to follow the instructions, including hand tightening the sample processing horn and converter instead of using the included wrenches, may result in damage of the instrument.
- Do NOT operate the chiller without water.
- Do NOT store the chiller at temperatures in excess of 60°C. Do NOT operate the chiller at ambient temperatures of 40°C or higher.
- Do NOT ship the chiller with any water remaining inside the pump. Always fully pump out the water prior to transport.

INTRODUCTION

Congratulations on obtaining your new EpiSonic™ 2000 Sonication System from EpigenTek! You made the right choice by selecting EpiSonic™ as your primary means for processing your DNA and chromatin samples. The sample processing horn is designed for high throughput processing with multiple microtubes, but is also suitable for single sample processing if desired. The new and innovative design of the double-concave sample processing horn allows for the transmission of sonication energy throughout the entire processing surface leading to (a) higher consistency and reproducibility in results than other waterbath-based methods; and (b) less harsher processing and less over-fragmentation than probe-based methods.

I. BACKGROUND INFORMATION

The technology behind the EpiSonic™ 2000 is Digitally Adaptive Sonocavitation™ (DAS), a principle that is ideal for shearing DNA or chromatin as well as for lysing cells and tissues. During the DAS™ process, the electronic signal produced at 20 kHz frequency by a digitally-controlled generator is converted into acoustic/mechanical energy through a piezoelectric converter (transducer). When the acoustic energy is produced in water, negative pressure is generated and causes the distance between the water molecules to exceed the maximum molecular distance necessary to hold liquid intact. Consequently, the liquid breaks down to create millions of cavitation bubbles. These cavitation bubbles expand in size through several acoustic cycles as more acoustic energy is introduced. The size of the cavitation bubbles and the corresponding cavitation energy can be manipulated and digitally controlled by adjusting fully scaled amplitude levels (20-100% in intervals of 1%) with a DAS™-based device such as the EpiSonic™ 2000. When the acoustic energy is suddenly removed, these cavitation bubbles collapse, creating intense shock waves in an extremely short period of time (microseconds), which transmit into vessels containing samples. This in turn forms highly targeted shearing forces to break up or disperse biomolecular samples including DNA, chromatin, and tissues in a non-contact, non-invasive manner. In a nutshell, a DAS™-based device such as the EpiSonic™ 2000 is able to shear samples with more precision and reproducibility than non-DAS™ instruments.

II. TECHNICAL SPECIFICATIONS

Input Voltage	100-120 VAC or 220-240 VAC @ 50/60 Hz
Rated Current	10 Amps max slo-blo; 5 Amps max slo-blo
Fuse Rating	15 Amps; 8 Amps
Generator Weight	16 lbs. / (7.3 Kg)
Generator Dimensions	8”W x 15”L x 9”H (20.3 cm x 38.1 cm x 22.9 cm)
Sound Enclosure Weight	24.5 lbs (11.1 kgs)
Sound Enclosure Dimensions	10”L x 10”W x 16.5”H (25.5 cm x 25.5 cm x 42 cm)
Chiller Dimensions	7.5"L x 5"W x 7"H (19 cm x 12.7 cm x 17.6 cm)
Output Voltage	1000 V rms (max.)
Output Frequency	20 KHz
Operating Environment	Temperature: 39°-95°F (4°-35°C), Relative Humidity 20-90% (Non Condensing), For indoor use only
Shipping Environment	Temperature: 35°-120°F (2°-49°C), Relative Humidity 10-90% (Non Condensing) Ambient Pressure Extremes: 40,000 ft. (12,000 meters)

CE

WEEE (Directive on Waste Electrical and Electronic Equipment)
This product contains electrical or electronic materials which must be disposed of properly. The end user should dispose this product in an environmentally friendly way through a separate collection and not as unsorted waste. For more information, consult your institution’s disposal guidelines or e-mail info@epigentek.com.

COMPONENTS

Sonication Generator

Soundproof Enclosure

Sample Processing Horn

Ultrasonic Converter

Flow Tubing Set

Water Release Connector

Line Filter Release Connector

Filter (with included Filter Cartridge)

Power Cord x2

Recirculating Chiller

Converter Cable

Power Adapter

Tube Rack

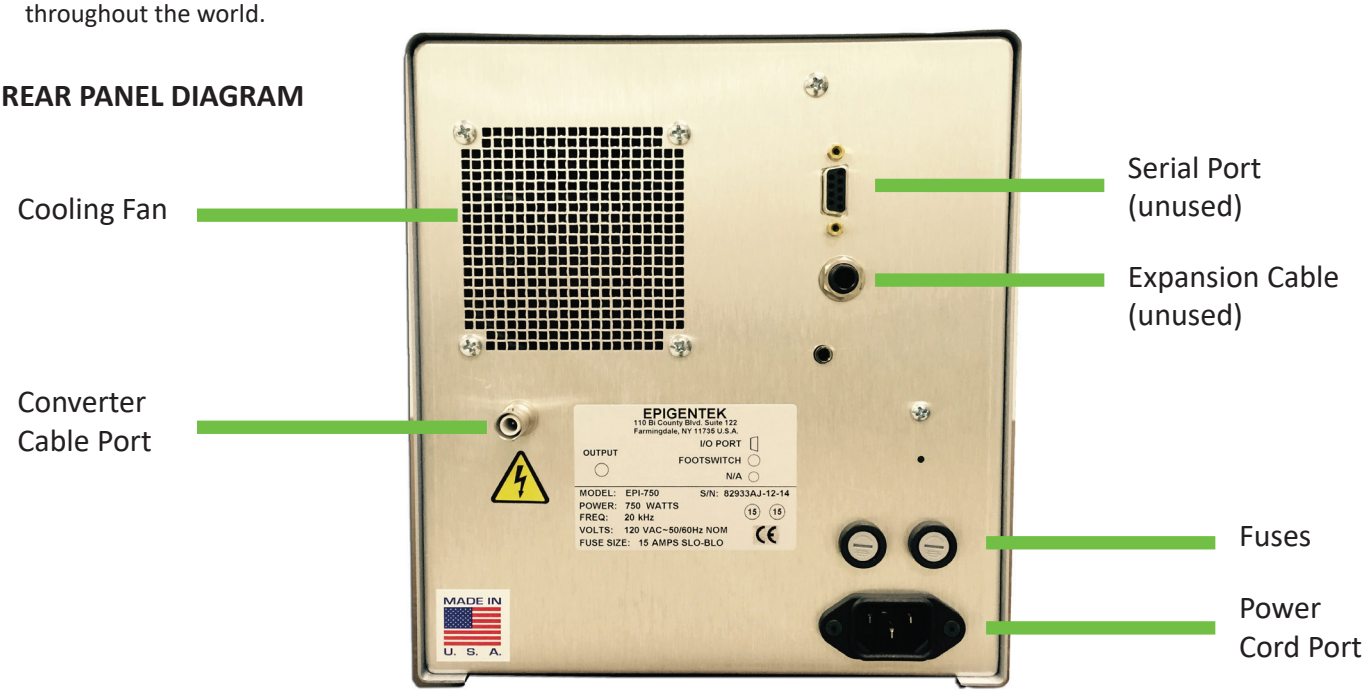
Assembly Wrench Set

INSTALLATION

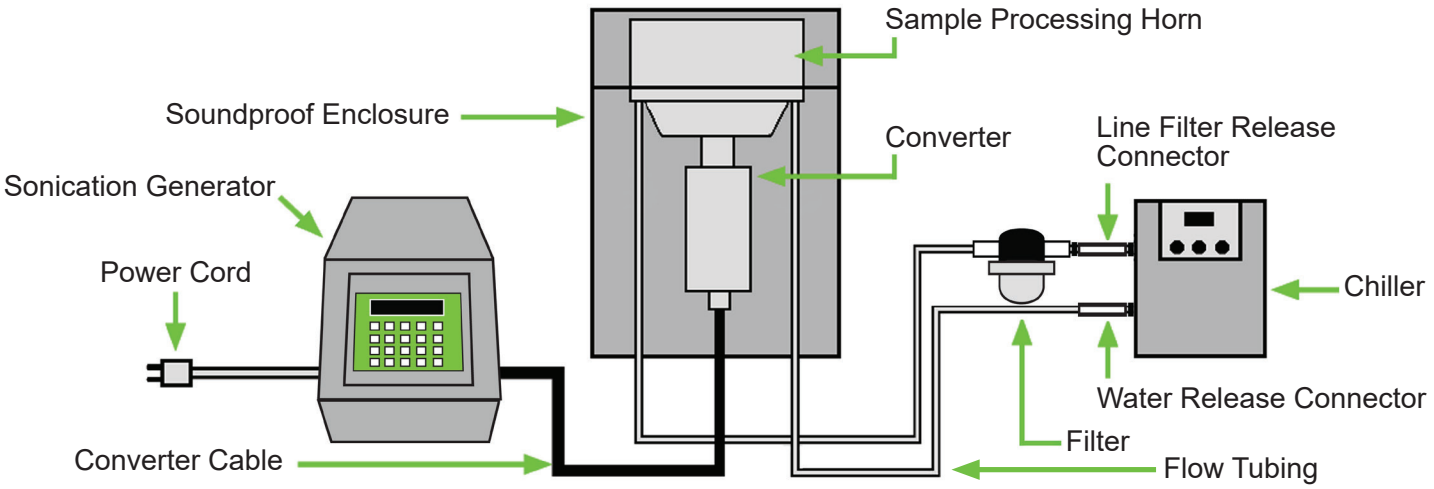
Prior to installing your EpiSonic™ device, please take note of the following:

- Do not discard the original packaging. You may need the packaging materials in the future for servicing your device.
- The EpiSonic™ device contains sensitive electronics. Always be gentle when removing parts from the packaging box or handling parts in general.
- To prevent any unnecessary failure in the fuse, make sure to always turn off the power supply before connecting or disconnecting the power cord.
- Confirm that the power is switched to the OFF position.
- Use only the power cord supplied by EpigenTek. You can also use an appropriate adapter for your specific country in the event the plug does not match your wall outlet. The EpiSonic™ device uses a universal power supply that recognizes any AC mains voltage throughout the world.

I. REAR PANEL DIAGRAM



II. SETUP DIAGRAM



III. SAMPLE PROCESSING HORN ASSEMBLY

Lay *Sample Processing Horn* upside-down on a flat surface. Carefully attach converter by tightening clockwise with hands.

Firmly tighten with *Assembly Wrenches*. Rotate the top wrench clockwise and the bottom wrench counterclockwise.

Connect *Flow Tubing* to the black fittings.

Connect one end of the *Converter Cable* to the bottom of the *Converter*. Make sure it is securely attached by turning the fastening mechanism clockwise at the end of the cable.

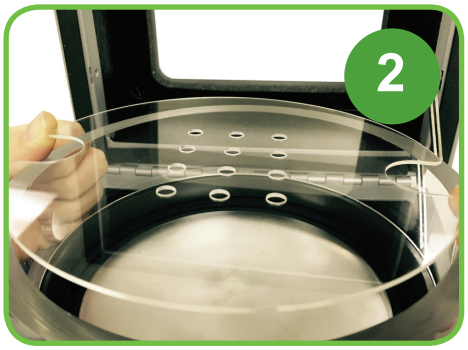
IV. RECIRCULATING CHILLER ASSEMBLY

Connect the *Power Adapter*'s cord to the back of the *Recirculating Chiller*.

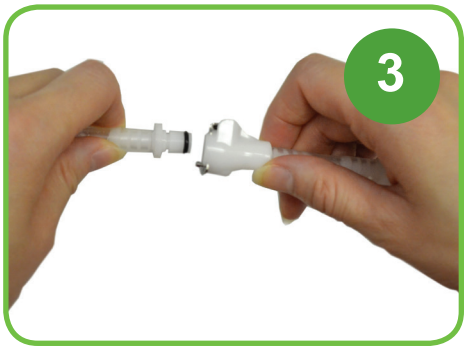
Connect the *Power Cord* to the *Power Adapter*. Plug *Power Cord* into a grounded power outlet.

V. MAIN ASSEMBLY

Open the lid of the *Soundproof Enclosure* and feed the *Flow Tubing* through the two holes at the bottom of the *Soundproof Enclosure*. Feed the other end of the *Converter Cable* through the main opening at the bottom until you can rest the *Converter* comfortably and firmly in the opening.



Place the *Tube Rack* into the *Sample Processing Horn* so that it rests on the gray inner rim inside the reservoir.



Connect the "white fitting" end of one *Flow Tubing* to the *Water Release Connector*.

Connect the "white fitting" end of other *Flow Tubbing* to the "filter in" side of the *Filter*. Connect the *Line Filter Release Connector* to the "filter out" side of the *Filter*.

Connect the *Water Release Connector* to the "supply" connection of the *Recirculating Chiller*. Connect the *Line Filter Release Connector to the "return" connection* of the *Recirculating Chiller.*

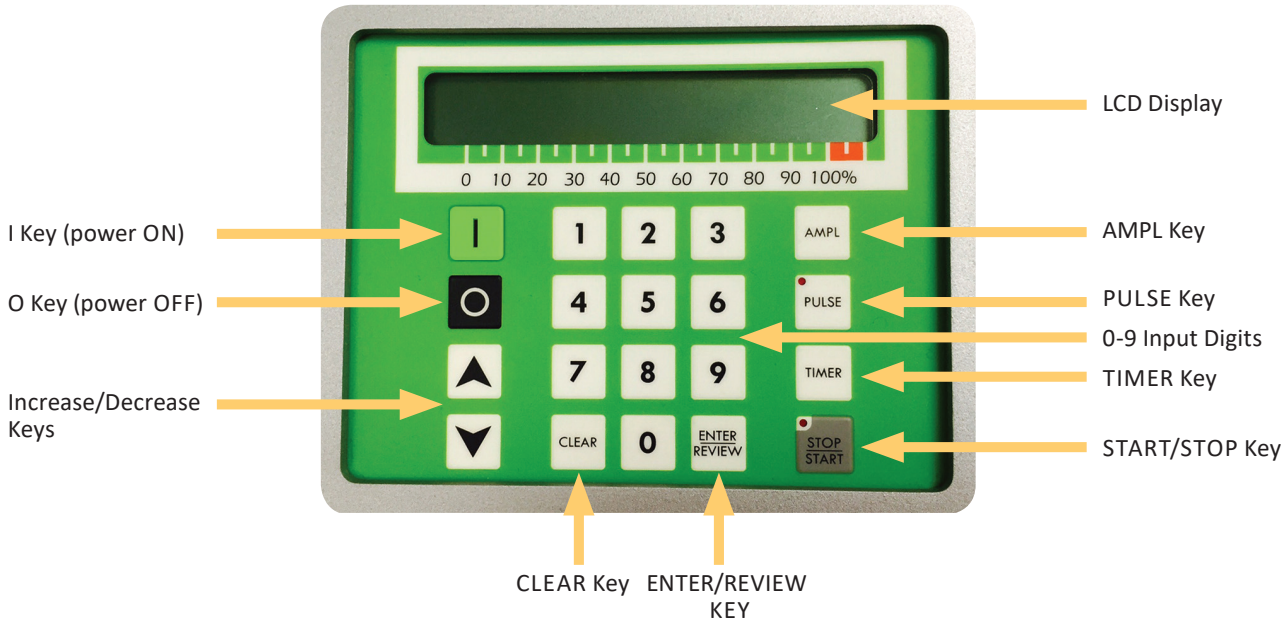
Connect and fasten the other end of the *Converter Cable* to the rear panel of the *Sonication Generator*. Make sure it is securely attached by turning the fastening mechanism clockwise at the end of the cable.

Connect the *Power Cord* to the rear panel of the *Sonication Generator*. Plug the *Power Cord* into a grounded power outlet. The device is now installed and ready for use.

Note: Make sure all connections are securely attached.

OPERATION

I. FUNCTIONS OF KEYS AND CONTROLS



FRONT PANEL	
LCD Display	*Displays prompts and the following control parameters:* • Amplitude selected • Output power delivered to the horn in Watts, and as percentage of the total power • Selected duration of processing • Actual processing time • Elapsed time • Pulse duration • Accumulated amount of energy in Joules delivered to the horn
0 – 9 Keys	Input digits
CLEAR Key	Clears the preceding entry
ENTER/REVIEW Key	Enters data into the program, and selects various parameters, for display on the LCD display
TIMER Key	Used with the numeric keys to set the duration of sonication – from 1 second to 9 hours, 59 minutes, 59 seconds
PULSE Key	Used with the numeric keys to set the pulse mode. The ON cycle and OFF cycle can be set independently from 1 second to 59 seconds. Red indicator lights when pulser is in the OFF portion of the cycle.
START/STOP Key	Starts or stops the sonication. In the STOP mode the red indicator goes off.
I Key	Switches the main power ON
0 Key	Switches the main power OFF
AMPL	Controls the amplitude of vibration at the probe tip
Increase/Decrease Keys (△ or ▽)	Used with the AMPL key when the unit is on stand-by to set the amplitude of vibration at the probe tip. Also used to increase or decrease the amplitude in small increments while the unit is running. To accomplish this task, depress the ENTER/REVIEW key twice to display AMPLITUDE CONTROL, then depress the △ or ▽ key as required.

1. POWERING ON

The screen will display the power rating and frequency of the EpiSonic 2000 and the following control parameters.

Time - : --: --
Pulse -- -- Ampl -- %

2. SETTING INTENSITY

Desired amplitude must be set in order for the EpiSonic 2000 to be operational. AMPL displays the percentage of amplitude that was previously selected. Follow your application protocols for the optimal settings for your application. As an example, to set the amplitude at 40% while the sonication is off, press the AMPL key and the numeric or △ or ▽ keys to achieve a 40% reading on the screen, and then press the ENTER/REVIEW key. To clear an incorrect entry, press the CLEAR key. The minimum amplitude setting is 20%.

The screen will display:

Time - : --: --
Pulse -- -- Ampl 40%

For continuous operation, press the START key to begin the sonication. To end the sonication, press the STOP key.

For programmed ON-OFF cycle operation, known as “pulse mode” or “cycled operation”, refer to the SETTING TIME and SETTING CYLCES sections below.

Note: To increase or decrease the amplitude in small increments when the sonication is on, depress the AMPL to display Amplitude Setting on the screen, then press the △ or ▽ key. Since the amplitude required is application dependent and subject to the volume and type of sample, it may be necessary to adjust the AMPL during sonication.

3. SETTING TIME

In pulse mode, the Time Setting or the “processing time” is the total time that sonication energy will be delivered to your samples. It factors in the Sonication-ON cycle times only and disregards the Sonication OFF cycle times. This is different from the elapsed time.

1. To set the processing time, press the TIMER key. The screen will display:

Time Setting
Hrs: - Min: -- Sec: --

2. Using the numeric keys, set the processing time as required. For example:

Time Setting
Hrs: 0 Min: 10 Sec: 00

3. Press the ENTER/REVIEW key. The screen will display:

Time 0:10:00
Pulse -- -- Ampl 40%

4. SETTING CYCLES

In “pulse mode” or “cycled operation”, sonication will automatically turn on and off depending on your duration of Sonication-ON and Sonication-OFF settings. The ON and OFF pulse duration can be set independently between 1 second and 59 seconds. During the OFF portion of the cycle, the red indicator on the PULSE key will illuminate.

1. To set the cycles, press PULSE key. The screen will display:

Pulse on _._ sec
Pulse off _._sec

2. Using the numeric keys, set the ON portion of the cycle, then press the ENTER/REVIEW key. The screen will display:

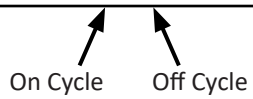
Pulse on 10 sec
Pulse off _._ sec

3. Using the numeric keys set the OFF portion of the cycle, then press the ENTER/REVIEW key. The screen will display:

Pulse on 10 sec
Pulse off 10 sec

4. Press the ENTER/REVIEW key. The screen will display:

Time 0:10:00
Pulse 10 10 Ampl 40%



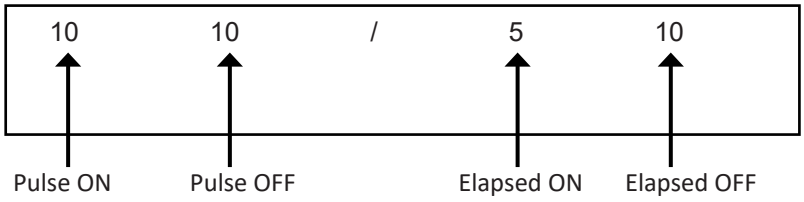
5. VIEWING OPERATION INFO

The REVIEW function provides a “window” on the process by displaying various operating parameters without process interruption. Pressing the ENTER/REVIEW key repeatedly during processing will consecutively display the following information.

a) Selected amplitude:
e.g. Amplitude 40%

b) Selected processing time and elapsed processing time:
e.g. Set 0:10:00 Time 0:05:00

c) Selected pulsing cycle settings in seconds on the left and actual pulsing cycle in seconds on the right:



d) Amount of power in Watts, and accumulated amount of energy in JOULES delivered to the horn:
e.g. 20 Watts 0000015 Joules

Note: The amount of energy displayed will be only for one cycle. Initiating a new cycle will reset the display to zero.

e) Elapsed time since processing was initiated:
e.g. Elapsed time 00:05:00

II. HANDLING YOUR SAMPLES

- The proper sample vessel is critical to obtaining optimal and reproducible results. It is highly recommended to use official EpiSonic™-branded 0.2ml PCR Tubes (Cat. No. EQC-1000-X02).
- All sample vessels should be surrounded by water on all sides so there is an even distribution of sonication energy. Do not use racks or vessels that will cause the sample to be partially blocked from the water level.
- The bottom of the vessel should touch or be as close as possible to the surface of the sample processing horn for maximum exposure to ultrasonic energy, but avoid direct contact with the sample processing horn's surface unless otherwise instructed.
- Avoid using vessels made of extra thick or hardened plastic.
- The actual sample inside your vessel should be completely submerged just below the water level. When determining the volume of water to add, remember to take the lengths of the *Flow Tubing* into consideration.
- Be careful not to cross-contaminate wells when handling tube/well caps or adhesive covering film. Wear gloves.
- Do not allow your sample vessels to move horizontally or vertically during sonication as this may affect consistency of results.
- Sonication energy naturally moves outwards from its origin, and there may be a bit of sonication discrepancy along the outer edges of the *Sample Processing Horn*.

III. OPTIMIZATION TIPS

Certain samples will shear or process quite fast and easily. Other samples may require higher sonication intensity or a longer processing duration. Due to variability between each type of sample you process, you will need to optimize the sonication conditions for maximum efficiency. You can also refer to EpigenTek example protocols (provided separately) and then modify or fine tune a procedure from there. To minimize variability in results, use the following recommended steps toward optimization of your conditions:

1. *Use a Proper Vessel*
The most suitable sample vessels for optimal transmission of sonication energy are composed of polystyrene or polycarbonate. Non-EpiSonic™-branded polypropylene sample vessels are also suitable, but since the material can absorb some of the sonication energy before it reaches the sample, extended sonication times or higher intensity may be required for certain brands. Avoid using brittle plastics which may crack when exposed to long periods of ultrasonic energy. For optimal performance, always position samples into the central area of the *Sonication Processing Horn* first, then load outwards.

2. *Maximize Energy Contact*
For the best transmission of sonication energy into your sample vessel, ensure that the bottom of the vessel is close to the surface of the *Sample Processing Horn*, preferably 1mm to 3mm apart. The amount of water added should be just above the sample level so that the sample is completely submerged. Avoid overflowing or adding the water past the vessel's height.

3. *Adjust Amplitude/Power*
The higher the amplitude setting, the more energy will be transmitted to your sample and the quicker the sample will be processed. However, higher amplitude will heat up the water in the sample processing horn more quickly. Power (measured in wattage) is the amount of energy that the sonication generator is delivering to the sonication processing horn, not to the sample, in order to achieve the amplitude setting. Thus even with the same amplitude setting, the power output can vary if you change the vessel size, type, and/or composition, in addition to the amount of water added. During optimization of new conditions of which amplitude is uncertain, it is always better to set the amplitude at a lower setting and to adjust upwards.

4. *Maintain Water Temperature*
You will want to avoid degradation of your sample or reduction in processing efficiency due to overheating. The *Recirculating Chiller* will automatically provide cold re-circulation of water. Set the target temperature on the *Recirculating Chiller* to 2°C. Pre-cool the water for several minutes before starting sonication. When the sonication energy is being generated, it will also generate heat which will thus increase the temperature in your water and sample. The actual temperature of the water will be a few degrees higher than the target temperature of the *Recirculating Chiller* once sonication begins. For DNA and chromatin shearing during extended use, ensure that the water temperature does not exceed 20°C, unless specifically instructed in an EpigenTek approved protocol for use with EpiSonic™.

5. *Adjust Sonication Timing*
Because every sample is different, along with variations in the sample vessel, temperature, and water level, it is important to determine appropriate pulse on and off program durations and cycles. Sonication durations will vary based upon different sample sources and sample concentrations used. Every sample is different -- some are harder to shear or process than others. Controlling the pulse on and off durations will also help regulate the rate of which the temperature increases.

6. *Test Degasification*
For difficult-to-process samples, degassed water (removal of carbon dioxide and/or oxygen) will allow sonication energy to transmit better. You can sonicate the water in the sample processing horn for several minutes to degas the water.

7. *Maintain Sample Consistency*
While optimizing your sonication procedure you must maintain the following constant sample conditions: (a) sample volume; (b) sample concentration; (c) sample type or source; (d) cross-linking fixation duration, for ChIP; (e) concentration of formaldehyde, for ChIP (use less than 1%); and (f) antibody lot, if applicable.

8. *Monitor and Record Parameters*
Make sure to keep a record of your sonication parameters in order to achieve reproducibility or to compare against different parameters. Note the following: (a) amplitude setting; (b) sonication ON and OFF times; (c) total sonication duration; (d) water temperature; (e) rate of water circulation, if applicable; (f) sample vessel used; (g) conditions of the assay sample itself; and (h) any other parameters that you believe may affect processing results.

Additional Tips for Chromatin Shearing
In addition to the above optimization suggestions, the following are also important when working with chromatin:

- *Cell/Tissue Fixation* - Appropriate chromatin cross-linking is required. Insufficient or over-cross-linking will cause DNA loss or increased background. Make sure the cross-linking time (10-15 min), concentration of formaldehyde (1% as final concentration), and quench solution (0.125 M glycine) are correctly used during the cross-linking step of chromatin preparation.
- *Chromatin Quality* - Make sure that chromatin is properly extracted from a sufficient amount of cells or tissues. Chromatin extract should be properly stored at -80°C.

POST-OPERATION

When you are finished processing your samples and do not intend to continue use with the EpiSonic™ again within a few hours, you will need to perform the following steps:

1. Power Off All Devices
Make sure the sonication program is no longer processing or running (PAUSE or STOP). You can now safely turn the power switch off at the rear panel of the *Sonication Generator*. Do not leave the EpiSonic on and unattended for extended periods of time as this may damage the LCD display or unnecessarily wear down the internal fan. Make sure to also power off the *Recirculating Chiller*.

2. Drain Out the Water
Disconnect the *Water Release Connector* and *Line Filter Release Connector f*rom the *Recirculating Chiller*. Lower the tubings on top of a sink or beaker while disconnecting the *Water Release Connector* and *Line Filter* from the *Flow Tubings* to siphon the water out. Water will drain out more completely and quickly if it is lower than the surface on which the EpiSonic sits.

3. Dry the Sample Processing Horn
Remove any vessels and vessel holders from the *Sample Processing Horn*. Using a clean cloth or paper towel, thoroughly wipe down any excess water or moisture inside and around the *Sample Processing Horn* and the *Soundproof Enclosure*. It is normal to see white oxidation on the aluminum surface of the *Sample Processing Horn* through normal wear and tear, but it is not recommended to leave unused water in the *Sample Processing Horn* for extended periods of time. Be careful not to get water or moisture on the ultrasonic converter.

CARING FOR YOUR DEVICE

The design of EpiSonic™ allows for easy self maintenance. Regular maintenance is necessary to facilitate optimal performance (it is recommended that you have an EpiSonic service plan). It is helpful to periodically inspect the unit, both visually and physically. Before performing any maintenance procedure, make sure the power switch is in the OFF position with the power cord unplugged from the outlet.

1. Observe the Power (Watts) Delivery
During your sonication runs, if you notice a significant reduction in Watts compared to prior runs, then it may suggest there is a loosening of the connection between the *Ultrasonic Converter* and the *Sample Processing Horn* (assuming all other variables and run conditions are exactly the same). In such a case, see #2 below.

2. Clean and Tighten Connective Areas
Sonication devices create intense vibration which can put stress on or loosen the threaded connection between the *Ultrasonic Converter* and the *Sample Processing Horn* over time. The *Ultrasonic Converter* and *Sample Processing Horn* should be disassembled with the wrench set. The threading, hole, and flat surfaces around this area should be cleaned with a cotton swab dipped in isopropyl alcohol. Let the parts air dry, and reassemble tightly with the wrench set, as shown in "Sample Processing Horn Assembly" on Page 8. Do not use any lubricants, grease, or WD-40 on any of the parts, unless instructed otherwise. For maximum protection, this preventive maintenance should be performed weekly, assuming regular use.

3. Clean The Sampling Processing Horn
The top surface of the *Sample Processing Horn* should be gently cleaned with a mild soap solution and wiped down with a wet cloth or towel. Do not use any cleaning solvents or abrasives. Do not let any water drip into the *Ultrasonic Converter*. Remember to drain any water after use. The *Sample Processing Horn* is constructed from aluminum and you will notice a bit of white oxidation over time. You may also notice black specks in the water occasionally as a side effect of sonication on the rubber rim of the Sample Processing Horn. Both of these circumstances are normal and they have no effect on the performance of the *Sample Processing Horn*.

4. Clean The Recirculating Chiller
Proper cleaning is important to prevent mold growth in the *Recirculating Chiller* and *Flow Tubing*, especially if there is a prolonged lack of use. You can treat the water used inside the chiller with Clear Bath® (Spectrum Labs) or a similar, non-reactive product. Pump the treated water through a sink or alternate reservoir. Solvents may damage the acrylic rim of the *Sample Processing Horn*.

5. Inspect Connections and Cables
Inspect the *Converter Cable* and *Power Cord* to ensure there is no fraying or damage to the rubber sleeve or insulation. Never use a cable with broken end connections, exposed wires, or frayed insulation.

6. Replace Tubings, Fittings, Release Connectors, and Filter Cartridges
The *Flow Tubings* and their paired fittings will build up residue over time, resulting in possible clogging or even error messages on the *Recirculating Chiller* due to change in pump pressure. Extensive use of the EpiSonic will increase the rate of such build up. It is recommended to replace the *Flow Tubings and Fittings*, as well as the *Water Release Connector, Line Filter Release Connector,* and *Filter Cartridge* every 3 months. Replacement *Flow Tubings with Fittings Sets* (#EQC-2000-PFT), *Water Release Connector* (#EQC-2000-PWR), *Line Filter Release Connector* (#EQC-2000-PFR) and *Filter Cartridges* (EQC-2000-PFC) can be purchased directly from Epigentek or can be supplied regularly with a service plan.

7. Replace Racks
The provided *Tube Rack* will warp over time, especially during extended runs. Warping may result in uneven sample processing due to changes in water elevation of your sample vessels. Replacement *Tube Racks* (#EQC-2000-PTR) can be purchased directly from Epigentek or can be supplied regularly with a service plan.

ACCESSORIES

APPROVED CONSUMABLES

0.2 ml PCR Tube with Strip Caps (1000/box)	*EpigenTek*	Cat #EQC-1000-X02
ChIP Buffer	*EpigenTek*	Cat #EQC-1000-CCB
Filter Cartridges (4/pack)	*EpigenTek*	Cat #EQC-2000-PFC

REPLACEMENT PARTS

Sonication Generator (100-120V)	*EpigenTek*	Cat #EQC-2000-PSG
Sonication Generator (220-240V)	*EpigenTek*	Cat #EQC-2000-PSG2
Sample Processing Horn	*EpigenTek*	Cat #EQC-2000-PPH
Soundproof Enclosure	*EpigenTek*	Cat #EQC-2000-PSE
Ultrasonic Converter	*EpigenTek*	Cat #EQC-2000-PUC
Recirculating Chiller	*EpigenTek*	Cat #EQC-2000-PRC
Power Cord (US)	*EpigenTek*	Cat #EQC-2000-PPC
Power Cord (UK)	*EpigenTek*	Cat #EQC-2000-PPCUK
Power Cord (Euro)	*EpigenTek*	Cat #EQC-2000-PPCEU
Flow Tubing with Fittings Set (Set of 2)	*EpigenTek*	Cat #EQC-2000-PFT
Water Release Connector	*EpigenTek*	Cat #EQC-2000-PWR
Line Filter Release Connector	*EpigenTek*	Cat #EQC-2000-PFR
Line Filter	*EpigenTek*	Cat #EQC-2000-PLF
Converter Cable	*EpigenTek*	Cat #EQC-2000-PCC
Assembly Wrench Set (Set of 2)	*EpigenTek*	Cat #EQC-2000-PSW
Tube Rack	*EpigenTek*	Cat #EQC-2000-PTR