



**LIFE CARE
EQUIPMENTS PVT.LTD.**

MUMBAI.....INDIA

ULTRASONIC PROBE SONICATOR



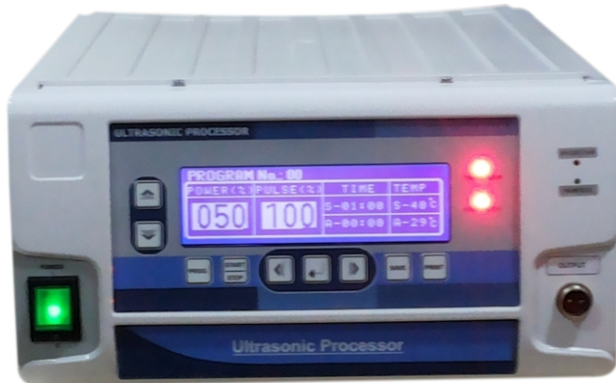
ULTRASONIC PROBE SONICATORS // LIQUID PROCESSORS

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*Specifications are subject to changes without any prior notice due to continuous up-gradation procedure.

HOW DOES A SONICATOR WORK?



U/S Generator



Converter



Probe/Horn

A Sonicator system is comprised of 3 major components: U/S Generator, Converter and Horn (also known as a probe). The ultrasonic Generator converts input AC supply into high frequency electrical / mechanical energy. The generator features a keypad or buttons which allow the user to control the sonication parameters. The generator provides high voltage pulsation of energy at a frequency @ 20 ± 3 kHz that drives a piezoelectric Converter.

The converter is a cylindrical device which is connected to the generator by a high voltage cable. The converter transforms electrical energy to mechanical vibration due to the natural characteristics of the internal piezoelectric crystals. The vibration is amplified and transmitted down the length of the Probe/Horn. Probes have threaded ends and attach to the converter.

During operation, the probe's tip longitudinally expands and contracts. Amplitude is the distance the tip travels and is dependent on the amplitude setting selected by the user. In liquid, the high freq vibration of the tip causes cavitation, the formation and violent implosion of microscopic bubbles. The implosion of thousands of cavitation bubbles releases tremendous energy in the cavitation field. Objects and surfaces within the cavitation field are "processed." By increasing the amplitude setting, cavitation intensity within the sample is also increased.

The probe tip diameter and power dictates the amount of sample that can be effectively processed. Smaller tip diameters deliver high intensity sonication but the energy is focused within a small, concentrated area. Larger tip diameters can process larger volumes, but offer lower intensity. Boosters can be used to increase the intensity of a larger tip probe to speed up processing times. To ensure a positive outcome, it is important to select the appropriate generator and probe to match the volume, viscosity and other parameters of each particular application. Please consult with a Sonicator product specialist for help making the optimum choices.

DIRECT VS. INDIRECT SONICATION METHODS

DIRECT

Sonication (inserting a probe directly into a sample vessel) is the most common way to process a sample. Energy is transmitted from the probe directly into the sample with high intensity and the sample is processed quickly. The diameter of the probe's tip dictates the liquid volume that can be effectively processed. Smaller tip diameters (Microtip probes) deliver high intensity sonication and the energy is focused within a small, concentrated area. Larger tip diameters can process larger volumes. Probes are offered with either replaceable or solid tips and are made from titanium.

INDIRECT

Sonication eliminates the need for a probe to come in contact with your sample. This technique is often described as a high intensity ultrasonic bath. The ultrasonic energy is transmitted from the horn, up through the water and into a vessel or multiple sample tubes.

Indirect sonication is most effective for very small samples because damages like loss, over temp, etc to the sample are eliminated. Pathogenic or sterile samples are ideal for this method because aerosols and cross contamination are prevented. The Cup Horn deliver indirect sonication and are ideal for many high throughput applications.



DIRECT



INDIRECT

ENUP 750 SONICATOR

The new ENUP 750 is the most technologically advanced sonicator available indigenously today. A state-of-the-art GRAPHIC DISPLAY screen interface offers intuitive control and provides a user-friendly experience. The most important feature of a Sonicator is reproducibility. Highly advanced Generator circuitry and Programmable Micro controller based control panel guarantees more efficient operation, sample-to-sample consistency and most importantly, a reliable end result.

The ENUP 750 is the only sonicator on the market that offers amplitude control from 20 -100%. This enables greater control of the probe's intensity, helping to pinpoint the optimum settings for efficient sample processing. We have increased maximum power output to 750 watts making the system more durable and capable of handling even larger samples if necessary. Our new display, design improvements and added accessories make this the most sophisticated and versatile Sonicator available today.



Stand sold separately.

OUTSTANDING FEATURES

AMPLITUDE CONTROL

Amplitude (intensity) is controlled from 20 -100% giving a greater degree of resolution and the ability to pinpoint the amplitude needed to effectively process your sample.

PROGRAMMABILITY

Parameters including processing times, pulse on/off and amplitude can be saved to memory and run by the touch of a button. 10 such programmes can be stored..

PULSE MODE

Adjustable pulse On and Off times to reduce the heat gain in temperature sensitive samples and thus ensuring the safety of the samples..

TEMPERATURE MONITORING

An optional temperature probe is available for those customers who wish to monitor the temperature of their sample. If the temperature limit is reached, sonication shuts down to prevent overheating

RUN MULTIPLE PROGRAMS IN SEQUENCE (optional)

Multiple programs can be run in sequence. For example, the unit can be programmed to sonicate at 40% amplitude for 3 minutes, shut off for 1 minute and re-start at 25% amplitude for 6 minutes. Up to 5 programs can be run in succession.

TOTAL ENERGY OUTPUT DISPLAY

Energy delivered to the probe is displayed in both Watts and Joules.

TRUALLY AUTO TUNING

The Sonicator digitally tracks frequency changes in the converter / tip assembly caused by load and temperature changes and maintains electrical efficiency at all times. Manual tuning is unnecessary.

OVERLOAD PROTECTION

The unit is equipped with fault detection circuitry to shut down sonication in the event that a fault occurs.

GRAPHIC LCD DISPLAY SCREEN CONTROL

A large, MONO CHROM LCD screen clearly displays all operating parameters and options. Intuitively and quickly access any of the sonicator's functions with a simple touch.

750 WATTS

GRAPHIC LCD DISPLAY



'CE 'CERTIFIED

Standard Accessories

- Generator
- Converter
- 12.7mm /19mm diameter probe
- Power cable
- Converter cable
- Wrench set

TECHNICAL SPECIFICATIONS:

Power Rating	:	750 Watts
Frequency	:	20 ± 2 KHz
Programmability	:	10 memories
Programmable Timer	:	99 hours
Sequencing	:	Optional
Adjustable Pulse On/Off	:	1 second to 10 seconds
Dimensions	:	@ 15'W × 12'L × 6.5'H
Voltage	:	230V, 50 Hz



Certified

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Specify desired voltage for export.

ENUP 500 SONICATOR

The ENUP 500 is a powerful & multipurpose ultrasonic processor featuring programmable operation and a digital display of operating parameters. Popular applications include nanoparticle dispersion, creating emulsions, cell lysis and homogenization.

Adjustable pulsation can be programmed from 1 second to 10 seconds. Total programming has a maximum setting of 10 hours. A wide variety of probes and accessories are available to handle virtually every application.

ENUP 500 M/C WITH PROBE



FEATURES:

Programmable operation

Set time, Temp, Time, Pulsation and amplitude for hands free operation.

Pulse mode

Prevent heat build-up in temperature sensitive samples

Digital amplitude / intensity control

Output intensity can be set from 20-100%

Elapsed time indicator

Displays duration of sonication

Overload protection

Prevents damage to circuitry if a fault occurs

'CE' Certified

PART NO. ENUP500 INCLUDES:

- Generator
- Converter
- 1/2"/ 3/4" diameter probe
- Power cable
- Converter cable
- Wrench set

TECHNICAL SPECIFICATIONS:

Power Rating	:	500 Watts
Frequency	:	20 ± 2 KHz
Programmable Timer	:	10 hours
Adjustable Pulse On/Off	:	1 second to 10 seconds
Dimensions	:	@ 12.5"W × 11.5"L × 5"H
Voltage	:	230V, 50/60 Hz

Specify desired voltage for export.



ENUP 150/250 SONICATOR

The ENUP 150/250 is a microprocessor based programmable ultrasonic processor. Features include pulse mode and a digital display of Time, Pulsation and power control.....

The unit is effective for standard cell disruption, DNA/RNA shearing, Homogenization and many other applications. The **ENUP 150/250** is ideal for small samples and for customers that do not plan to scale up to larger volumes in the future. This model offers the same programming and display features as the higher models.

**ENUP 150/250
M/C WITH
Microtip & Switch**



FEATURES:

Programmable operation

Set time, Temp, Time, Pulsation and amplitude for hands free operation.

Pulse mode

Prevent heat build-up in temperature sensitive samples

Digital amplitude / intensity control

Output intensity can be set from 20-100%

Elapsed time indicator

Displays duration of sonication

Overload protection

Prevents damage to circuitry if a fault occurs

Hand Held Operation (For ENUP 150)

A micro **ON/OFF** switch will be provided on converter for ease of operation to the user during process of very small volumes in vials as well as test tubes.

'CE' Certified

Compact design

Takes up less space than competitive units

PART NO. ENUP 150 INCLUDES:

- Generator
- Converter
- 1/8" diameter probe
- Power cable
- Converter cable
- Wrench set

TECHNICAL SPECIFICATIONS:

Power Rating	:	150/250 Watts
Frequency	:	20 ± 2 KHz
Programmable Timer	:	10 hours
Adjustable Pulse On/Off	:	1 second to 10 seconds
Dimensions	:	@ 12.5"W × 11.5"L × 5"H
Voltage	:	230V, 50/60 Hz

Specify desired voltage for export.

ENUP 750/500 ACCESSORIES DIRECT HORN OPTIONS

Horns (also known as probes) are made from titanium and machined to specific sizes and shapes. When driven at their resonant frequency, they expand and contract longitudinally. This mechanical vibration is amplified and transmitted down the length of the probe. In liquid, the probe causes cavitation which is processing the sample.

Choosing the appropriate horn is extremely important. The sample volume to be processed is directly related to the tip diameter. Smaller tip diameters (Microtip probes) deliver high intensity sonication, but the energy is focused within a small, limited & concentrated area. Larger tip diameters can process larger volumes, but offer lower intensity. Probes are offered with replaceable (button) or solid tips. We can also offer glass probes or tips as per requirement.



Probe tips will have pitting or erosion over the time and require replacement. Using an excessively worn tip can affect your results and possibly overload the generator. Solid probes must be used for samples containing organic solvents or low surface tension liquids. Glass tips erode more slowly than titanium and are recommended for processing solutions that include abrasive materials.

Standard Probes



Replaceable Solid Glass

Part	Type of Tip	Processing Volume	Tip Diameter
Pr 500 -1	Replaceable Button Tip	50 ml to 500 ml	12.7 mm (1/2")
Pr 500 -2	Solid	50 ml to 500 ml	12.7 mm (1/2")
Pr 500 -3	Replaceable Button Tip	25 ml to 100 ml	9 mm (3/8")
Pr 750 -1	Replaceable Button Tip	50 ml to 750 ml	19 mm (3/4")
Pr 750 -2	Replaceable Button Tip	50 ml to 500 ml	12.7 mm (1/2")
Pr 750 -3	Solid	50 ml to 750 ml	12.7 mm (1/2")
Pr 500 -4	Replaceable Button Glass Tip	50 ml to 300 ml	12.7 mm (1/2")
Pr 750 -4	Replaceable Button Glass Tip	50 ml to 500 ml	12.7/19 mm



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ACCESSORIES DIRECT HORN OPTIONS

Replacement Tips for Standard Probes

Standard 1/2", 3/4" and 1" horns have replaceable tips. During normal use, tips erode and become less effective over time. These worn tips can be easily removed and replaced.



Part	Tip Diameter
Pr 500 -1	12.7 mm (1/2")
Pr 500 -2	19 mm (3/4")
Pr 750-1	19 mm (3/4")

Microtip Probes

Microtips are thin, high intensity probes which are designed for processing small sample volumes. Microtips screw into the threaded end of the standard 1/2" probe.



Part	Processing Volume	Tip Diameter
Pr 250 -1	0.5l To 15 ml	3 mm (1/8")
Pr 250 -2	5 To 50 ml	6 mm (1/4")
Pr 150-1	0.5l To 15 ml	3 mm (1/8")
Pr 150-2	5 To 50 ml	6 mm (1/4")



- Coupler

Stepped Microtip

* Stepped Microtip Assembly

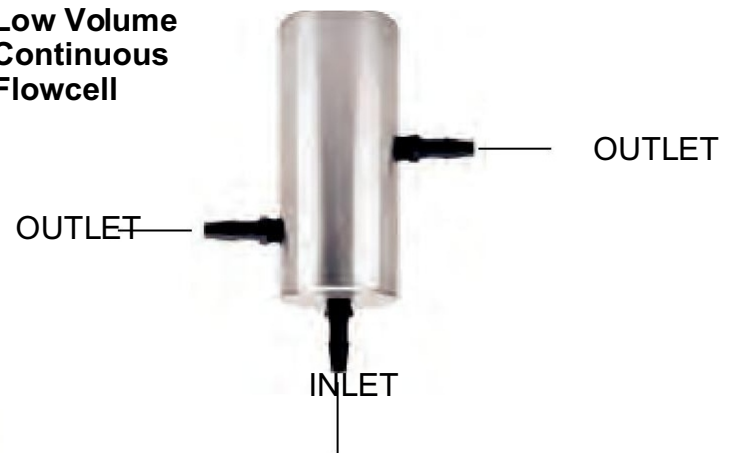
The coupler screws directly into the converter.

ENUP 750/500 ACCESSORIES FLOWCELLS

Flowcells offer inline or continuous, large volume, batch sample processing. Flowcells are ideal for mixing and dispersing applications. Batch volumes can be recirculated through the system multiple times if increased sonication time is needed. Multiple units can be used in succession to reduce processing time and/or maintain an even higher flow rate.

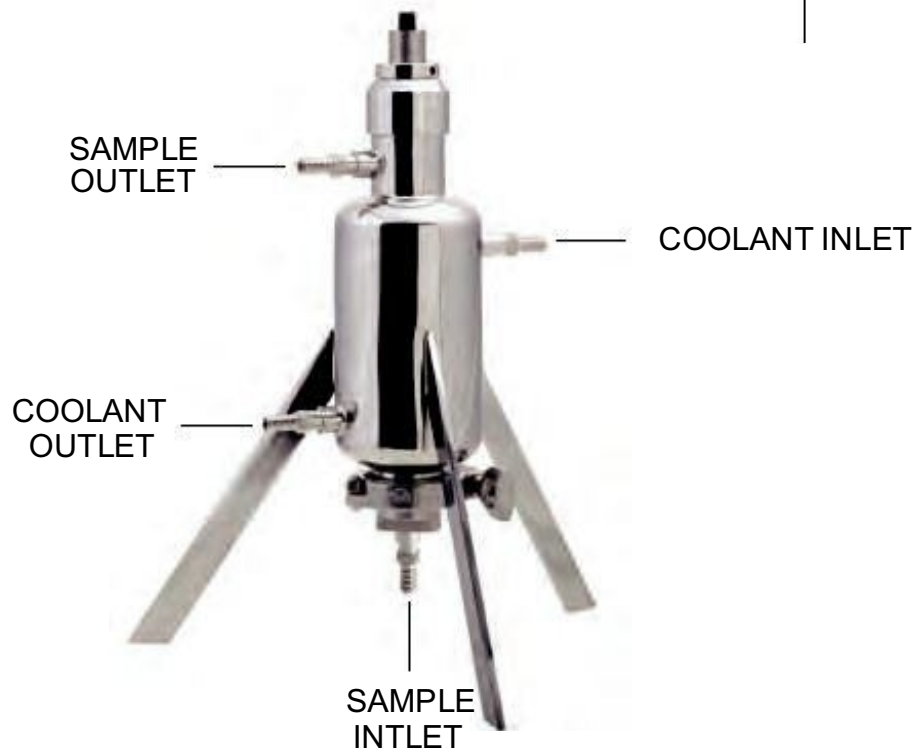
The liquid sample is pumped into the Flowcell through the inlet at the bottom of the unit. As the sample passes through the cavitation field, it is processed. The processed liquid exits the unit through an outlet port. The sample can be recirculated multiple times if necessary. The degree of processing can be controlled by adjusting the intensity of sonication as well as flow rate.

**Low Volume
Continuous
Flowcell**



**High Volume
Continuous
Flowcell**

(only for use with ENUP750)



GENERAL ACCESSORIES

Sound Enclosure

Probe Solicitors make loud sound sound (around 95 db) and will cause discomfort to the user and the people around in a lab . The Sound Enclosure reduces this noise by approximately 20 db and is made to work with standard accessories. A specially designed Sound Enclosure suitable for all accessories like Low Volume Flowcell with and without cooling sample. The converter with probe will be mounted on the top of the enclosure as per photograph. There is a provision for inserting temperature probe in the enclosure. The door of the enclosure has a window so that user can visually monitor the process.



GENERAL ACCESSORIES

Replacement Converter



Replacement Microtube Racks



Part	Discription
Mtr 1	8 Tube Capacity
Mtr 2	14 Tube Capacity

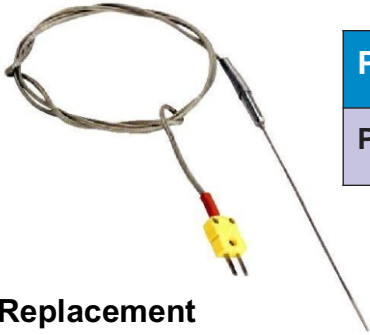
Raises and lowers sample vessels to a stationary probe as needed.

Jack Stand



Temperature Monitoring Options

(ENUP750 only)



Part	Discription
PT	PT100 Temperature Probe

Replacement Converter Cable

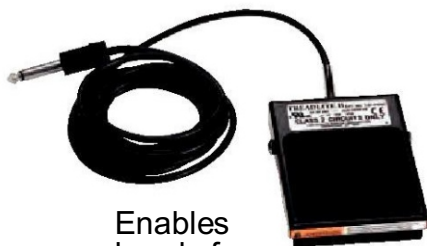


Part	Discription
CC1	2 Meters
CC2	3 Meters

Large Clamp Stand



Footswitch



Enables hands free operation

Part	Discription
Fs	Single Peddle

