THANK YOU FOR PURCHASING A NEW SONIX IV ULTRASONIC CLEANER!

If you already own a Sonix IV product you know the quality and have seen the high performance results.

Your new ultrasonic cleaner is engineered and built to speed you through your cleaning applications.

Please take a few moments of your time to read this instruction manual paying particular attention to the safety instructions.

**Limited Warranty**

Your ultrasonic cleaning system is warranted to be free from defects in material and workmanship as covered herein under the 2/10 Year Warranty Policy. This warranty extends only to the first user/purchaser and is not otherwise assignable, nor transferable.

The electrical components, generator units, tank, and housing are warranted to be free from defects in materials and workmanship for two years from the provable purchase date - provided that these components have not been affected by mechanical or thermal shock, chemical attack, or cavitation erosion and are used in accordance with the instruction/operation manual.

Transducers and their bond to the radiating surface are guaranteed not to deteriorate or fail for ten years from the provable purchase date - provided that the transducer, bond, and radiating surface have not been affected by mechanical or thermal shock, chemical attack, or cavitation erosion and are used in accordance with the instruction/operation manual.
Any part which has been determined by the factory to be defective in material or workmanship will be as the exclusive remedy - repaired, or replaced at the factory's option. For limited warranty claim procedures see PROMPT DISPOSITION.

PROMPT DISPOSITION - The factory will make a good faith effort for prompt correction or adjustment with respect to products or components of that product which prove to be defective within the limitation of this warranty. All equipment which is believed to be defective must be returned to the factory, postage or freight prepaid together with proof of purchase and warranty mail-in card (if it has not already been mailed) along with a purchase order or written instructions.

LIMITATION OF LIABILITY - To the extent allowable under applicable law, our liability for consequential and incidental damages is expressly disclaimed. Our liability in all events is limited to and shall not exceed the purchase price paid.

WARRANTY DISCLAIMER - We have made a diligent effort to illustrate and describe our products in our literature accurately; however, such illustrations and descriptions are for the sole purpose of identification and do not express, nor imply that the products are merchantable, or fit for a particular application, or that the equipment will conform to the illustrations.

PRODUCT STABILITY - Many states and localities have codes and regulations governing sales, construction, installation, and use of equipment. While we attempt to comply with all such codes we cannot guarantee compliance and cannot be responsible for how the equipment is installed or used. Before purchase please review your local codes and regulations to insure that the equipment will comply.

Some states do not allow the exclusion or limitation of incidental, or consequential damages; therefore, the aforementioned limitations and exclusions may not apply to you. Furthermore, some states do not allow limitation on how long an implied warranty lasts, consequently the aforementioned limitation may not apply to you and by law during the period of this limited warranty and implied warranties for application of use may not be excluded or otherwise disclaimed.

IMPORTANT SAFETY INSTRUCTIONS

WHEN USING ELECTRICAL EQUIPMENT, BASIC SAFETY PRECAUTIONS SHOULD ALWAYS BE FOLLOWED TO REDUCE THE RISK OF FIRE, ELECTRICAL SHOCK, AND PERSONAL INJURY, INCLUDING THE FOLLOWING SAFETY INSTRUCTIONS:

THIS EQUIPMENT IS FOR USE ONLY UNDER THE FOLLOWING ENVIRONMENTAL CONDITIONS:

Indoors
Altitudes up to 2000 Meters
Environment Temperatures of 5 degrees C to 40 degrees C
Maximum Relative Humidity of 80%
For Temperatures up to 31 degrees C
Category II Installation
Degree 2 Pollution
SAFETY INSTRUCTIONS

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the equipment.
3. Plug the power cord into grounded GFI receptacle only.
4. This product should only be operated from the type of power source indicated on the equipment.
5. Keep the work area clean and dry.
6. Do not place the equipment on an unstable cart, stand, or table.
7. Slots and openings in the cabinet are provided for ventilations. To protect the unit from overheating, do not cover or block these openings.
8. Do not allow anything to rest on the power cord. Do not locate the product in a place where the cord can be abused, or where person will walk on it.
9. Do not overload wall outlets and extension cords as this can result in fire, or electrical shock.
10. Do not operate the unit without adequate amounts of liquid. A Minimum liquid level is 2/3 full. Failure to Maintain Adequate Liquid Levels Can Cause Serious Damage.
11. DO NOT USE FLAMMABLE LIQUIDS!!!
12. DO NOT USE ACIDIC LIQUIDS!!!
   a. Only solutions with a PH greater than 7 should be used.
   b. Refer to the *Chemical List: in these instructions for unsafe chemicals.
13. Do not place objects directly onto the tank bottom. Many accessories such as baskets, trays, and beakers are available from your dealer.
14. Do not overload the unit with excessively large batches. This can cause damage to the unit, and will result in ineffective cleaning.
15. The operating cycle is not to exceed the time limits of the timer. Do not modify the equipment for continuous operation.
16. Do not disassemble the equipment.
   a. Opening or removing panels may expose you to dangerous voltage or other risks.
   b. Incorrect reassemble can cause an electrical shock when the equipment is subsequently used.
   c. Opening and removing the covers will void the warranty.
17. Unplug the equipment and contact the factory under any of the following circumstances:
   a. Damaged power cord;
   b. If the product has been dropped, or cabinet has been damaged;
   c. If the unit does not operate properly when following the instructions;
   d. If the unit exhibits a distinct change in performance.

SR-SERIES ULTRASONIC CLEANER INSTALLATION INSTRUCTIONS:

1. Cut an opening on the counter top for the ultrasonic cleaner according to the Cut-Out Template dimensions.
2. Cut an opening on the front of the counter for the control box according to the Control Box Cut-Out Template dimensions. **Note:** allow the appropriate set back for the ultrasonic unit cutout to avoid interference with the control unit.

3. Apply plumbers putty around the underside of the ultrasonic cleaner’s mounting flange. Mount the ultrasonic cleaner into the counter top as shown in fig 1 and wipe off any excess material from around the recess flange.

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**SONIX IV RECESSED ULTRASONIC CLEANER CUTOUT DIMENSIONS**

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**RECESSED UNIT INSTALLATION INSTRUCTIONS**

1. Apply a continuous bead of plumbers putty on the underside of the unit flange prior to placement.

2. Install solenoid drain valve.

3. Connect drain system fittings to the unit.

4. Connect drain line tubing by installing a hose band and union fitting (not supplied) to sink drain. **Note:** the drain line tubing requires an upward riser at the solenoid outlet for proper draining (see diagram).

5. Make electrical connections – solenoid and control unit.

6. Plug system into 120 volt outlet.

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1. Connect one end of the enclosed clear vinyl drain tubing to the solenoid value and the other end to the waste drain as shown if fig 2.

2. For maximum fluid flow create an upward bend on the drain tubing shown in fig 2.

3. Connect the control box make cable to the sonic female cable.
4. Connect one end of the enclosed clear vinyl drain tubing to the solenoid value and the other end to the waste drain as shown if fig 2.

5. Connect the control box and ultrasonic cables: The electrical connections on the tank unit consist of: solenoid cable with mating IEC connectors, control box cable with male IEC connector, male IEC power entry receptacle.

6. The electrical connections on the control unit consist of: power entry cable with female IEC connector, female IEC receptacle, male IEC receptacle and mating A/C cord.

7. Plug in the **Solenoid Cord** into the mating attachment cable or solenoid connection receptacle on the ultrasonic.

8. Plug the Control Box Cable from the tank unit to the mating receptacle on the control box.

9. Plug the Power Entry Cable (from the control box) into the power entry receptacle on the tank unit.

10. Plug the **A/C Power Cord** into the mating male IEC receptacle on the control box.

11. Plug the **A/C Power Cord** into an approved 120 Volt A/C receptacle.
OPERATING INSTRUCTIONS

1. Plug the unit into the appropriate grounded outlet. (See Grounding and Power Supply Section.)
2. Fill the tank approximately 2/3 full with the appropriate cleaning solution.
   a. Follow the instructions as marked on the cleaning product label for proper dilution and use.
3. HEATED MODELS- depress rocker switch to its ON- illuminated position and allow temperature to reach the desired operating temperature. Note: Heater may be turned off when the desired temperature is attained.
4. For standard Units. Note: Turn timer to the desired cleaning cycle time.
5. For Touch-Pad units: Press the desired cycle, Light (approx. 5 minutes), Normal (10 minutes), Heavy (30 minutes).
6. When the cleaning cycle is complete remove the parts apparatus, rinse and dry as required.
   Notes: Contact your local dealer for the various cleaning accessories that best suit your cleaning application.
   Before parts can be efficiently cleaned, particularly after fresh solution has been added to the ultrasonic tank the bath must be degassed. The degassing process may take a few minutes depending on the solution being used- see section under “Degassing”.

RECESS ULTRASONIC CLEANER

TIMER INSTRUCTIONS
1. Press the desired CYCLE TIME, Light, Normal, Heavy as determined by the size of the batch being cleaned
2. To interrupt the cleaning cycle process before the cycle time has elapsed press STOP/CANCEL.

SOLENOID DRAIN INSTRUCTIONS
1. To drain the tank press OPEN. The solenoid will automatically shut off in 10 minutes. If the tank has not drained completely repeat.
2. It is recommended to flush the tank with fresh water while the unit is draining to cleanse the tank and drain lines.
3. To terminate the draining cycle press STOP/CANCEL; DO NOT OPERATE THE DRAIN AND ULTRASONICS AT THE SAME TIME
   Note: UNITS WITH SOLENOID DRAINS ARE FITTED WITH A T-STRAINER FILTER THAT MUST BE CLEANED ON A REGULAR BASIS TO PREVENT DAMAGE TO THE SOLENOID VALVE.
   CLEANING SOLUTIONS SHOULD BE CHANGED DAILY

CLEANING PROCEDURES
There are generally two methods of cleaning which you can use for optimum results, depending upon your particular application.

DIRECT METHOD
1. Load your parts into a parts basket, or other apparatus that will prevent parts from setting on the tank bottom.
2. Place the parts basket directly into the tank. Note: **Parts or parts basket must not be allowed to sit on the bottom of tank.**

3. When the cleaning cycle is finished, parts are typically rinsed and dried.
   a. Rinsing can be accomplished by passing parts under tap water, or through a series of increasingly purer water baths, depending upon the level of cleanliness required.
   b. Drying can be achieved by simply air drying the parts or by processing the parts through a drier unit.

**INDIRECT METHOD**

The indirect method utilizes a number of sub-tanks, or beakers that can be filled with different solutions and immersed into the ultrasonic tank.

1. Fill your ultrasonic cleaning tank with water and general purpose solution - allow for the displacement of the liquid when beakers or sub-tanks are immersed.
2. Fill each beaker or sub tank with the desired cleaning, rinsing, or drying solutions.
3. Place parts into the appropriate beakers/sub-tank, place into the ultrasonic tank, and select the desired cycle time.
   a. Do not allow the beaker/ sub-tank to sit on the tank bottom. Positioning covers are available for use with beakers.

Continue the process by transferring the parts into the various beakers/sub-tank as needed.

**Ultrasonic Cleaner Foil Test**

Using standard household aluminum foil, immerse a foil sample vertically into the ultrasonic bath for 30 seconds. The foil sample should be large enough to be immersed 2/3's of the tanks liquid depth - not touching the bottom, and should be centered in the tank. Creased or wrinkled foil samples should not be used for testing.

After 30 seconds, remove the foil sample and inspect.

The ultrasonic cleaner is working properly if upon inspection there is a defined dimpling pattern over the entire immersed section of foil - free of noticeable voids.

The ultrasonic cleaner is not working properly if there are any noticeable voids in the pattern - evidenced by smooth, untouched areas on the foil sample. Noticeable voids would be any areas void of dimpling in excess of 1/4 square inch (6.3 square millimeters).

This simple procedure should be performed monthly to ensure adequate performance of the ultrasonic cleaner is being attained. Perform the test using clean, degassed solution.

**MAINTENANCE OF EQUIPMENT**

This equipment requires no maintenance other than periodic cleaning of the tank, cabinet, and drain. It is very important that the tank be kept clean, not allowing any residue from the cleaning operation to build up.

- Cleaning solutions should be changed often and regularly.
- Good tank maintenance is achieved by rinsing the tank out with fresh water, and wiping the tank out after each change of cleaning solution.
Occasionally the assistance of a "SCOTCH BRITE" pad may be needed. Run fresh water through the drain mechanism after each change of cleaning solution.

If the unit is fitted with a drain, be sure to flush water through the drain assembly after each change of solution.

The cabinet must be kept dry. Immediately wipe dry any spills onto the cabinet. Periodic cleaning of the cabinet with a household appliance cleaner will help maintain an attractive finish.

ELECTRICAL GROUNDING
In the event of a malfunction break-down, grounding provides a path of least resistance for electrical shock. This equipment is fitted with an electrical cord having a grounding conductor and a grounding plug in accordance with all local codes and ordinances.

- Do not modify the plug provided. If it does not fit into an existing outlet have the proper outlet installed by a qualified electrician.
- This equipment is intended for use on a circuit that has a GFI outlet.

ULTRASONIC PRINCIPLES
The mechanism of ultrasonic cleaning is "Cavitations" which is by product of transmitting high frequency sound waves into a liquid medium.

Alternating phases of rarefaction and compression during sound wave transmission into a liquid produce and collapse millions of microscopic vacuum cavities each second. The collapse or implosion of these cavities cause high powered micro jets of liquid to be propelled throughout the bath removing even the most tenacious particles on impact.

The rates at which these cavities form and implode, as well as the intensity of the implosions are proportional to the frequency that is being transmitted. During the rarefactions or minimal pressure phase of sound wave transmission that liquid is stretched beyond its tensile strength whereby millions of microscopic vacuum cavities form.

These cavities grow and build to tremendous temperature-then upon the compression phase of the sound transmission the cavities are compressed beyond their elastic threshold until they collapse or implode. The implosions radiate shockwaves that drives the liquid violently creating micro jets of effluent to blast throughout the bath.

Not only does ultrasonic cleaning provide a mechanism to blast away the most tenacious soils even when hidden in the smallest of crevices, but it also improves the chemical efficiency that acoustic cavitations provides is by violently propelling the solution to all surface of a part causing soils to dislodge upon impact.

Acoustic cavitations also accelerates the rate at which soils dissolve by intimately mixing the cleaning solutions with the contaminants and attacking the molecular cement by which soil attach themselves to a parts surface. The micro jets effect from acoustic cavitations prevents the formation of a neutral film on parts which is common with other types of cleaning process, and impedes cleaning results. Acoustic cavitation also raises the temperature of the liquid which increases the rate of chemical activity of the cleaning solution.

The key factor in cleaning effectiveness of an ultrasonic system is cavitations. The greater the cavitations intensity of the liquid- the better the cleaning results will be.

FACTORS IN CAVITATION
The point at which cavitations begins is called the cavitations threshold. The cavitations threshold is reached when the energy applied is sufficient to drop the pressure within the liquid below its vapor pressure during rarefaction.
The initial quantity of energy required to attain cavitations threshold varies with the different cleaning solutions. Physical properties of a cleaning solution affect its ability to achieve cavitations as well. Therefore different cleaning agents will cavitate at different intensity levels according to their density, viscosity, surface tension, vapor pressure and operating temperature. Sonix IV offers its line of SIV-Chem. cleaning solutions that have been specifically formulated for use in its line of ultrasonic cleaners. If cleaning solutions other than the SIV-Chem. line are going to be used then the following physical properties should be considered for maximum cavitations.

**DENSITY:** Ideally should be high to generate intense cavitations but require more energy to expand the vacuum cavities and produce greater implosion forces.

**TEMPERATURE:** Of the liquid will affect both cavitations quality and chemical cleaning action. Usually both can be improved by increasing operating temperature, however the cleaning solutions have a temperature point where they begin to break down, thus decreasing the cavitations and cleaning results. The optimum temperatures will vary according to the physical properties already mentioned but as a rule of thumb most aqueous solutions cavitate best within the temperature range of 140-190 degrees Fahrenheit (60-88 degrees C). Beyond this optimum range cavitations will gradually decrease, and at the boiling point cavitations will cease altogether.

**VAPOR PRESSURE** of moderate value is most suitable for ultrasonic cleaning. Low vapor pressures produce vacuum cavities that implode with relatively greater force, but it also produces fewer cavities and a higher cavitation threshold. High vapor pressure solutions will have a lower cavitation threshold and create more vacuum cavities but will implode with less intensity.

**SURFACE TENSION** should also be moderate for optimum results. High surface tension will generate cavities with less elasticity that will collapse with high intensity, but will impede the formation of the vacuum cavities. Low surface tension solutions will allow the vacuum cavities to grow larger, but will have lower cavitations intensity.

**VISCOSITY** should be low for best cavitations. High viscosity liquids require increased in amplitude of sound wave transmission.

**DEGRASSING**
Before ultrasonic cleaning can effectively be applied dissolved gases must be removed. Otherwise, the vacuum cavities will fill with gas cushioning the implosion force.

Degassing is accomplished by ultrasonically agitating a liquid while raising its temperature. The time required for initial degassing of a cleaning solution varies with its physical properties. Most water based solutions, required only a few minutes to degas (depending also upon volume) while solvent based solutions can take up to one hour to degas completely.

Note: A degassing period should be allowed after each change of cleaning solutions, and may be required when solutions have been left static for long period of time. However, the degas time will only be a fraction of the original degas period.

The following list represents those chemical which are known to attack the stainless steel tank in your Sonix IV ultrasonic cleaner. In addition to these chemicals many contaminants that are being removed from parts can be harmful to the stainless steel tank; therefore, IT IS VERY IMPORTANT THAT THE CLEANING SOLUTION CHANGED OFTEN AND REGULARLY DO NOT USE ANY OF THESE CHEMICALS!

<table>
<thead>
<tr>
<th>Acidic acid 70degrees F</th>
<th>Acetol Chloride</th>
<th>Acetol Bromide</th>
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<tr>
<td>Ethers</td>
<td>Ethyl Bromide</td>
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