



because clean matters.



EFFICA™ E1 Series Ultrasonic Cleaning System

Owner/Operator Manual

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Safety Precautions and Warnings

Before using your Ultrasonic Cleaner, please read and thoroughly understand these safety precautions. Failure to comply with these warnings and safety precautions may result in serious personal injury or property damage.

To avoid electrical shock:

- Unplug your machine from the power source before filling or emptying the tank.
- Keep the area around the ultrasonic cleaning machine clean and dry.
- Do not operate in wet area.
- Ensure that the ultrasonic cleaning machine is properly grounded. Do not remove the grounding prong on the line cord plug.
- Do not immerse your ultrasonic cleaning machine in water.
- Do not disassemble your ultrasonic cleaning machine—hazardous voltages inside the tank are dangerous.

- **Warning:** Unplug the machine before moving it.
- **Warning:** Do not ever use alcohol, gasoline or flammable solutions. Doing so could cause a fire or explosion.
- **Warning:** Do not immerse the ultrasonic cleaning machine in water or any other liquid. To maintain the tank unplug, rinse and wipe dry.

CAUTIONS:

- Do not use acids or bleach. These materials can damage the ultrasonic cleaning tank.
- Use only L&R solutions for best results. CHANGE THE ULTRASONIC CLEANING SOLUTION DAILY, OR AS NEEDED.
- Do not allow the solution to drop below the operating level of the tank while the ultrasonic cleaning machine is in operation.
- Never run the ultrasonic cleaning machine at solution temperatures over 160°F, 71°C.
- Do not place parts or containers directly on the bottom of the ultrasonic cleaning tank.
- When using beakers or an auxiliary pan, enough solution must be in the tank to act as a coupling agent. The beakers should be suspended below the solution level, but above the bottom of the tank.
- Do not leave the instruments in the ultrasonic cleaning machine overnight; this may cause corrosion (to the instruments). All instruments must be rinsed and dried before using.
- Avoid operating the ultrasonic cleaning machine in extremely dusty areas.
- Keep the ventilating louvers clean and free of obstructions.
- Do not disassemble your machine. Contact your dealer or the factory.
- Do not use Plastic Solvents or strong chemicals on surface. Take care not to spill solution on plastic.

**FAILURE TO COMPLY WITH THESE WARNINGS AND PRECAUTIONS
WILL VOID YOUR WARRANTY.**

Chemicals Harmful To Your Ultrasonic Cleaner

Acetophenone	Ferric Chloride
Aluminum Chloride	Ferrous Chloride
Aluminum Fluoride	Ferris Sulfate
Aluminum Sulphate	Fluoboric Acid
Ammonium Bifluoride	Fluorine
Ammonium Chloride	Hydrobromic Acid
Ammonium Hydroxide	Hydrochloric Acid
Amyl Chloride	Hydrogen Peroxide
Antimony Trichloride	Hydrocyanic Acid
Aqua Regia	Hydrofluoric Acid
Benzethonium Chloride	Hydrofluosilicic Acid
Bromine	Iodoform
Calcium Bisulfate	Mercuric Chloride
Calcium Bisulfite	Muriatic Acid
Calcium Hypochloride	Nitric Acid
Chloracetic Acid	Phosphoric (crude)
Chloric Acid	Sodium Hypochlorite
Chlorine, Anhydrous	Potassium Chloride
Chromic Acid	Stannic Chloride
Chlorine Bleach	Stannous Chloride
Citric Acid	Sulfur Chloride
Copper Chloride	Sulfuric Acid
Copper Fluoborate	Zinc Chloride
Ethyl Chloride	

The use of these chemicals will damage your machine
and void the warranty.

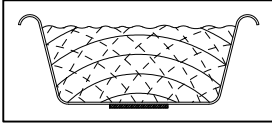
Plastic Maintenance:

- Sodium Hydroxide contamination can weaken housing.
- Phenols can stain housing.
- Solvents can cause damage.
- Abrasives can scratch plastic.

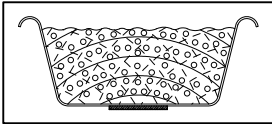
Congratulations on your purchase of an L&R Ultrasonic Cleaning System. Your machine is part of a complete cleaning process which is thoroughly described in this owner/operator manual.

What is Ultrasonic Cleaning?

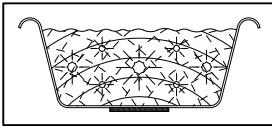
Ultrasonic cleaning is created by sound waves that are transmitted at frequencies beyond the range of human hearing. A generator located within your system develops the high frequency power which causes a transducer to radiate and produce the sound waves.



Sound waves are carried through the solution in the tank and create a unique vibrational pattern causing alternating high and low pressures in the liquid.



During the low pressure stage, millions of tiny bubbles form. This process is called CAVTATION, meaning the formation of cavities.



During the high pressure stage, the bubbles collapse or implode, releasing enormous amounts of energy. Working in all directions, the bubbles attack every surface and invade all recesses and crevices, pulling debris off the object being cleaned.

Equally important to efficient cleaning is selecting a proper solution for the cleaning task. See page 18 of this manual for cleaning applications and solutions.

EFFICA™ Table Top Models									
Model	Description All Units Include cover	Voltage	Input Power Average Watts 117 VAC 60 Hz	Fuse	Output nominal frequency sweep range Sweep rate	Overall Dimensions Inches & Centimeters L x W x H	Shipping Weight Lbs. & Kgs. (Approx.)	Tank Capacity Gallons & Liters	Tank Internal Dimensions Inches & Centimeters L x W x D
E1 W/TL/NA E1 W/TL/EU E1 W/TL/UK	Timer, drain standard	117 230 230	100	T3.15 T2.0 T2.0	45 KHz +/- 2KHz 3Hz	14.75 x 10.5 x 10.5 37.5 x 26.7 x 26.7	17.7 8.0	0.92 3.5	11.25 x 5.5 x 3.5 28.6 x 14 x 8.9
E1 W/THL/NA E1 W/THL/EU E1 W/THL/UK	Heater optional	117 230 230	155 w/heat	T5.0 T3.15 T3.15					

Key to Options; H - Heater, L - Latch, NA - US Plug, EU - EURO Plug, UK - UK Plug

** Line frequency all EFFICA units = 50/60 Hz.

ENVIRONMENTAL:

- Allow 2" behind unit for air flow.
- Unit to be located in a dry location, 0-35° C, RH 96% Non-Condensing non-corrosive atmosphere below 2000 M altitude.

Unpack, Set-Up and Start-Up

Unpack

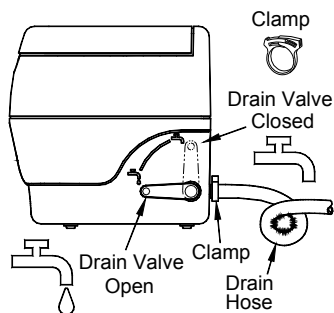
- Remove your ultrasonic cleaner from its shipping container and inspect it for any possible damage which may have occurred during shipping. (Claims for shipping damage should be made immediately against the carrier.)
- Check the serial number of your machine with the serial number on the shipping carton. If they are not the same, contact your dealer or the factory.
- Complete the warranty card and mail it to L&R Mfg. Co. or visit www.LRultrasonics.com to register.

Set-Up

- Select your desired location for the cleaner. It should be in close proximity to a sink or waste lines to facilitate ease of draining. The supplied drain assembly, will allow you to place the unit on either side of the sink or to connect it directly into a waste line. Provide at least two inches all around the machine to allow for adequate cooling.

Drain assembly: Place drain tube over valve exit. Use pinch clamp to secure.

Drain Operation: The Drain valve is open when the valve lever is horizontal.



Start Up

STEP	ACTION
1	Select the proper L&R Cleaning Solution.
2	Dilute with warm tap water as specified and fill one half to two-thirds of the tank.
3	Place parts to be cleaned in the basket or other accessory. If necessary, add more solution to bring the level to about 3/4 inch below bottom edge of plastic.
4	Plug the cleaner's line cord into a grounded outlet.
5	To activate your machine, simply set your timer to the number of minutes desired for cleaning. These self-timing units will automatically shut themselves off at the end of the cycle.

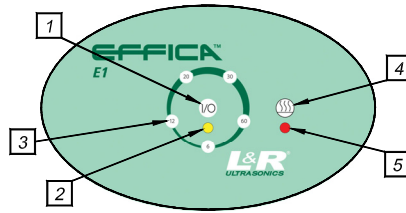
NOTE: If this is the first time you are running the cleaner or you have changed the cleaning solution, you must degas the solution. Fresh solutions contain many dissolved gasses which reduce effective ultrasonic action. Although solutions will naturally degas over time, operating the machine for five to ten minutes before using it to clean will accelerate the degas process.

FEATURES:

EFFICA Cover Operation: Close the cover prior to the start of a cleaning cycle to use the latch option. The cover can be totally removed or opened and allowed to rest in the open position.

Locking Cover: When the Ultrasonic Cleaner is in use, the cover automatically locks. Therefore, you are unable to open the cover during the Ultrasonic Cleaning Cycle. To open the cover, you must stop the Ultrasonic Cleaning Cycle. The cover automatically unlocks once the cycle is complete.

Digital Timer



The L&R Digital timer controls the operation of the Ultrasonic cleaning machine and its options. There are three sections of control; Main Power, Timer, Heat.

The Main power on/off switch: Located on the rear panel of the machine near the line cord and fuse holder. This switch controls the main power to the unit. When this switch is in the on position it is illuminated and the yellow standby light, on the front panel, is lit (item 2).

Timer Section: The timer section controls the Ultrasonic operation of the machine. There are five different timer settings (6, 12, 20, 30, 60 minutes). The timer set button (1) is in the center of the control panel just above the yellow standby indicator light (Item 2).

- | |
|--|
| <ol style="list-style-type: none">1) Timer on/off2) Standby light3) Preset timer light4) Heat on/off5) Heat on light |
|--|

Pressing the timer button once, when the unit is in standby mode will start the ultrasonic cleaner and select an operating time of 6 minutes. Pressing the button again increases the time. If the timer button is pressed while the machine is operating the next time interval is selected and the machine will continue to operate until the end of this preset time. Pressing the timer button will increment the time interval and then to on/off (off).

Optional Heater: Pressing the heat button will turn the heat on, pressing again will turn it off. The heat light is on when the heat is on. A thermostat regulates the temperature (to 140°F.) while the heat is on.

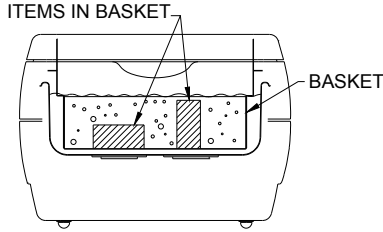
If the unit has not had any buttons pressed for 1 hour the heat turns off as a safety precaution. **Heat should not be left on unattended.** The operator should not rely on this automatic feature to turn the heat function off automatically - this feature is for safety only.

The main power switch is intended to be turned off when the machine is not in use. None of the digital timer functions will work if the main power switch is in the off position.

Cleaning Methods

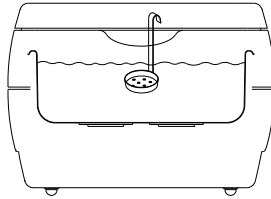
Direct Method

In this method, the part(s) to be cleaned are placed in your accessory basket. The basket is then placed directly into the main tank already containing the proper L&R cleaning solution.

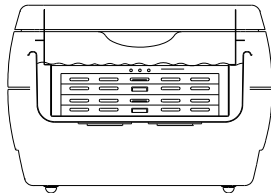


Cleaning times may vary depending on the amount and types of contamination on the items. We suggest that a 3-5 minute cycle be initiated and more time added if necessary.

Other applications of direct cleaning are pictured below:



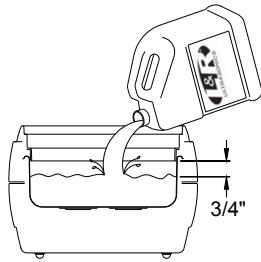
Bur tray suspended directly into the tank.



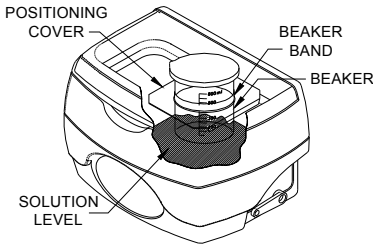
Instrument cassettes, held in a cassette rack and placed directly into the tank.

Indirect Method

When a cleaning application necessitates a series of different solutions, or when a specialized solution which is not to be placed directly into the tank is to be used, the following procedure is recommended.



Fill the stainless steel tank approximately $\frac{2}{3}$ full with a proper **L&R** solution or carrier bath.

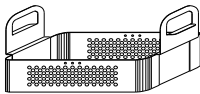


If a beaker or beakers are used, place the beaker in an L&R positioning cover using the beaker band to adjust the depth of the suspension so that the beaker bottom is slightly below the surface of the solution in the main tank, but off the bottom.

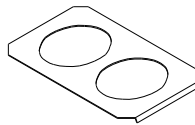
Popular Accessories

For Machine	Accessory	Part Number
EFFICA E1	Solid Side Draining Basket full size	26732
	Accessory Kit	26876
	Positioning Cover, half size	26872
	Positioning Cover, full size	26873
	Beaker, 600ml	40006
	Beaker Cover, 600ml	41042
	Beaker Band	41089

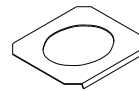
L&R supplies a full line of accessories for your Ultrasonic Cleaning System. Consult your dealer for more information or visit our web site at www.LRUltrasonics.com.



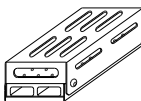
Solid Side Basket



Full size Positioning cover



Half size Positioning cover



Bur Box



Beaker cover



600ml Beaker

Ultrasonic Cleaning Solutions

L&R chemists have formulated a complete line of aqueous and non-aqueous based solutions to compliment our ultrasonic cleaning systems. Listed below are some of the common cleaning tasks and recommended L&R cleaning solutions.

Solutions / General Cleaning Applications			
L&R Solution	P/C	Qty	Soils/Substrate
SF-1	221	Gallon	Light oils and greases. Safe on metals, glass, plastic
SF-50	071	Gallon	Carbonaceous soils, heavy oils, greases
Hydrosonic Concentrate	201	Gallon	Fingerprints, oils, greases, lapping and buffing compounds
Hydrosonic Concentrate, non-ammoniated	110	Gallon	Same as above without ammonia
General Purpose Cleaner, ammoniated	226	Gallon	Buffing compounds, tripoli and rouge

For more information please visit our web site at
www.LRultrasonics.com.

Note: Most solutions listed above are also available in 55-gallon drums. Contact your dealer or the factory for ordering assistance.

Dental/Medical Cleaning Applications

Product	Product code	size	Description
UltraDose® Ultrasonic Cleaning Solution	UD012	24 x 1oz. tubes	Blood, debris, buffing compounds, soils, oxides, rouges & tripoli
UltraDose® Germicidal hospital grade Ultrasonic Cleaner Concentrate	UD036	16 oz.	Cleans and disinfects instruments and apparatus
General Purpose Cleaner Concentrate, non-ammoniated	228	Gallon	Dried blood, debris, foreign matter, buffing compounds
Tartar, Light Stain and Perm. Cement Remover	232	Gallon	Tartar & light stains, hard water scale
Advanced Formula Temporary Cement Remover	293	Gallon	Most temporary cements
Plaster and Stone Remover	230	Gallon	Plaster and stone
Evacuation Cleaner Concentrate	107	Gallon	Organic debris from evacuation lines
Barrier Milk Concentrate	076	Gallon	To protect instruments before autoclave from corrosion

For more information please visit our web site at www.LRultrasonics.com.

Using safety glasses and gloves is recommended to safeguard against potential eye and skin injury or irritation.

Disposal of the solutions should be in accordance with local regulations.

Your Application Notes

Trouble Shooting

If your ultrasonic cleaner does not operate to your satisfaction, please consult the guide below before calling your authorized service center.

Problem	Symptom	Action
Cleaner will not start	<ul style="list-style-type: none"> • Cleaner not plugged in properly; • Timer not ON; • Timer Light Not on; • Blown fuse 	<p><i>Plug into a functioning electrical outlet;</i></p> <p><i>Press timer button</i></p> <p><i>Turn rear power switch ON</i></p> <p><i>Call authorized service center</i></p>
Cleaner operates but does not heat solution	<ul style="list-style-type: none"> • Heat switch not ON; • Heater malfunctions 	<p><i>Turn heat ON</i></p> <p><i>Call authorized service center</i></p>
Cleaner will not drain	<ul style="list-style-type: none"> • Clogged drain 	<p><i>Call nearest service center</i></p>
Decreased ultrasonic activity	<ul style="list-style-type: none"> • Solution is not degassed • Solution is dirty • Solution level is incorrect for the load • Tank bottom is covered with soil particles • Using de-ionized water in the tank 	<p><i>Make sure the tank was filled with warm tap water plus cleaning solution and has run 5 to 10 minutes</i></p> <p><i>Change solution</i></p> <p><i>Adjust solution level to one inch from the top of the tank with the load</i></p> <p><i>Empty, clean the tank with warm water and a non-abrasive cloth</i></p> <p><i>Use tap water</i></p>

Foil Test

An aluminum foil test is a method to evaluate the general cleaning intensity and soundwave coverage throughout the tank. Perform this test as follows:

- Obtain any regular grade (not heavy duty) aluminum foil sold in a supermarket (less than 0.001 in. thick). Cut a piece large enough to cover $\frac{1}{2}$ to $\frac{3}{4}$ of your tank bottom.
- Fill the tank with room temperature water, then add L&R general purpose cleaner, diluted as specified.
- Run the machine for 10 minutes without a basket and with heat off, to de-gas the solution.
- With the machine running lower the foil vertically into the center of the tank.
- Continue to hold the foil and let the machine run for one minute.
- Turn the machine off and remove the foil.
- Examine your piece of foil. There should be a peening effect and/or some perforations on the foil. The location and size of those peening or perforation patterns indicate the cleaning intensity and uniformity of the ultrasonic sound waves in the tank.

Service Center Locations

For International service, please contact your local distributor.

- A. Do not send covers or accessories with machine.
- B. When a warranty repair is requested, please include a copy of the invoice with the repair, showing the date of purchase.

California

Electronic Instrument Service
190 Deep Stone Dr.
San Rafael, CA 94903
Phone: 415-479-8960
Fax: 415-492-8565
Email: richwong@electronicinstrumentservice.com
Contact person: Richard Wong

New Jersey

L&R Manufacturing Co.
Foot of John Hay Ave.
Kearny, NJ 07032-0607
Phone: 201-991-5330
Fax: 201-991-5870
Email: repairs@LRultrasonics.com
Contact person: Eleanor Narozny

New York

S&E TV and Electronics
442 Niagara Falls Blvd.
Buffalo, NY 14223
Phone: 716-832-1595
Fax: 716-836-7329
Email: jewels@adelphia.net
Contact person: Jim Bastedo

Texas

Alpha Omega Ultrasonics
2821 National Dr.
Garland, TX 75041
Phone: 972-271-5569
Fax 972-840-3668
Email: jdnewman2@aol.com
Contact person: Jim Newman

International Service Centers

Australia

Intersonic Systems
9 Mapiiti Place
Acacia Gardens NSW
Australia
Phone: 61 2 9837 3210
Fax: 61 2 9837 3298
Email: intersonic@bigpond.com
Contact person: Sam Granata

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Email: Marleen.Cortvriend@arseus-tec.be
Contact person: Marleen Cortvriend

Canada

Electro Dental Services
6984 McPherson Ave.
Burnaby, B.C. Canada V5J 4N3
Phone: 604-439-0024
Fax: 604-439-1059
Email: tsemil@yahoo.com
Contact person: Tomas Soltesz

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Email: Fiona.cort@claudiusash.co.uk
Contact person: Fiona Cort

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Email: info@crystalelectronics.ca
Contact person: Terri Barber

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