

Service Centers

With normal use, your Ultrasonic Cleaner should not require servicing. However, if it fails to operate satisfactorily, first try to diagnose the problem by following the suggestions in the Troubleshooting Guide.

WARNING



DO NOT DISASSEMBLE YOUR CLEANER OR YOU WILL VOID THE WARRANTY. HIGH VOLTAGE INSIDE THE CLEANER IS DANGEROUS.

If you find that your cleaner needs repair, carefully pack and return it to your local distributor. If under warranty, remember to include proof of purchase.
Your cleaner will be shipped by ground service unless you specify otherwise.

Master Sonics

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ULTRASONIC CLEANERS



INSTRUCTION MANUAL

EDP: 600-220-039

MODELS

B1500A/B2500A/B3500A/B5500A/B8500A/B9500A

B1500E/B2500E/B3500E/B5500E/B8500E/B9500E

WARRANTY

VWR Ultrasonic Cleaners, when used in accordance with manufacturer's instructions and under normal use, are guaranteed for two years after date of shipment. Within the period guaranteed, VWR will repair or replace free of charge, at its sole discretion, all parts that are defective because of material or workmanship, not including costs for removing or installing parts.

VWR Ultrasonic Cleaners, when used in accordance with manufacturer's instructions and under normal environment conditions as described in equipment specifications, are guaranteed to satisfy the 61010-1 IEC:2002 safety provisions (for "E" cleaners) or UL 61010-1:2004, CAN/CSA C22.2 61010-1:2004 safety provisions (for "A" cleaners) as pollution degree 2 and protection class I. If used in a manner not specified by the manufacturer's instructions, the protection provided by the cleaners may be impaired.

WARNING



- Don't place parts or containers directly on the bottom of the cleaning tank; use a tray, wire or beaker cover to suspend items.
- Don't allow the solution to drop more than 3/8 inch below the operating level line with the cleaner on.
- Don't ever use alcohol, gasoline or flammable solution. Doing so could cause a fire or explosion. Use only water-based solutions.
- Don't ever use mineral acids or bleaches. These could damage the tank.

Failure to comply with these warnings will void your warranty.

VWR's liability, whether based on warranty, negligence or other cause, arising out of and/or incidental to sale, use or operation of the transducer elements, or any part thereof, shall not in any cause exceed the cost of repair or replacement of the defective equipment, and such repair or replacement shall be the exclusive remedy of the purchaser, and in no case shall VWR be responsible for any and/or all consequential damages including without limitation, and/or all consequential damages arising out of commercial losses.

Unpacking your cleaner:

Please check your cleaner and its carton carefully for any external or internal damage. If you find damage, contact shipping carrier immediately, before contacting your distributor.

Please retain your packaging for future use.

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Safety Pre-Cautions



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

To avoid electrical shock

- Do unplug from power source before filling or emptying the tank.
- Do keep the control panel and the area around the cleaner clean and dry-wipe up solution which spills over the tank brim. Water and high voltage can cause electrical shock.
- Don't operate the cleaner without proper grounding.
- Don't remove the grounding prong on the line cord plug.
- Don't disassemble your cleaner-high voltage inside the cleaner is dangerous.
- Don't immerse the cleaner in water

To prevent personal and/or property damage:

- Do use water-based solutions.
- Don't ever use alcohol, gasoline or flammable solutions. Doing so could cause a fire or explosion and void your warranty. Use only water-based solutions.
- Don't ever use mineral acid. These could damage the tank.
- Don't clean the front operating panel with alcohol, gasoline, mineral acid or harsh chemicals. These could damage the operating panel.
- Don't touch the stainless steel tank or cleaning solution-they may be hot.
- Don't allow fluid temperature to exceed 70 °C.
- Don't place your fingers or hands into the tank while the cleaner is operating. Doing so may cause discomfort and possible skin irritation. Avoid contact with solution and provide adequate ventilation.
- Do not use solutions containing chlorine bleach.

Safety Pre-Cautions



To prevent damage to the cleaner:

- Do change your solution regularly.
- Don't operate the cleaner dry.
- Don't place parts or containers directly on the bottom of the cleaning tank; use a tray, wire or beaker cover to suspend items. Failure to comply may cause transducer damage and will void your warranty.
- Don't allow the solution to drop more than 3/8 inch below the operating level line with heat or ultrasonics on. Failure to comply may cause transducer and/or heater damage and will void your warranty.

Installing your cleaner

Check the place on the back of the cleaner for correct power requirements. Position your cleaner within easy reach of a standard grounded electrical outlet. Do not place the cleaner on a circuit which could become overloaded.

If your cleaner does not operate correctly, first refer to the troubleshooting section for possible cause. Please contact the authorized service center listed at the bank of this manual, for additional information.

Introduction

Ultrasonic cleaners:

The ultrasonic cleaners are classified as A = 117 volts and E=230 volts:

B1500A B2500A B3500A B5500A B8500A B9500A
 B1500E B2500E B3500E B5500E B8500E B9500E

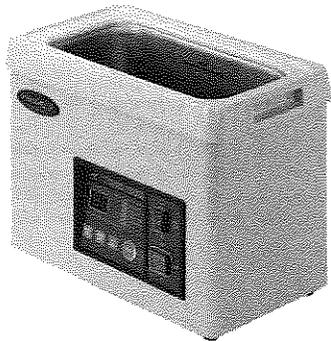
Each model is constructed using durable industrial style 40 kHz transducers.

All cleaners have built-in sweep frequency to ensure uniform cleaning activity throughout the bath except the B8500 and B9500.

All cleaners have built-in drains except the B1500.

Models can be purchased in the following configurations:

- with a Mechanical Timer(MT);
- with a Mechanical Timer plus Heat (MTH);
- with Digital Controller, plus Heat and Timer (DTH).



When you first fill your unit, or refill it with fresh solution, use warm water for the solution. Turn on the heater (press the HEAT switch, if available), turn on the ultrasonics (press SONICS or rotate the Timer), add the cover and the solution will heat quickly to temperature.

Equipment Specifications

Model B1500A,B2500A,B3500A,B5500A,B8500A,B9500A:

Model	Capacity (L)	Tank Size WxH xD (mm)	Freq. (kHz)	Max. Power Require (W)	RF- Power (W)	Heating Power (W)	
B1500A-MT B1500A-MTH B1500A-DTH	1.9	150 ×100 ×135	42 ±2.5	85 145 145	20 -50	- 60 60	
B2500A-MT B2500A-MTH B2500A-DTH	2.8	230 ×100 ×135		120 210 210	50 -85	- 90 90	
B3500A-MT B3500A-MTH B3500A-DTH	5.7	300 ×150 ×150		170 350 350	80 -135	- 180 180	
B5500A-MT B5500A-MTH B5500A-DTH	9.5	300 ×150 ×240		230 510 510	110 -175	- 280 280	
B8500A-MT B8500A-MTH B8500A-DTH	20.8	500 ×150 ×300		45 ±2.5	320 880 880	145 -230	- 560 560
B9500A-MT B9500A-MTH B9500A-DTH	28.4	500 ×200 ×300			410 970 970	195 -300	- 560 560

NOTE:

- In DTH cleaner, the temperature readout accuracy is+4/-6 °C.
- Input power supply : 110V-120V~±10% ,50/60Hz; 115V ~, 60 Hz is optimum voltage for all "A" cleaners.
- All units have a ground leakage current less than 0.5mA.
- Satisfied pollution degree 2 and protection class I.
- Operating temperature range: 5 – 45 °C; Relative humidity range: RH 0 – 90% @25°C.
- Operated under altitude up to 2000 m and as indoor use
- Storage/Shipping temperature range: -25 – 55 °C; Relative humidity range: RH 0 – 90%.

Equipment Specifications

Model B1500E, B2500E, B3500E, B5500E, B8500E, B9500E:

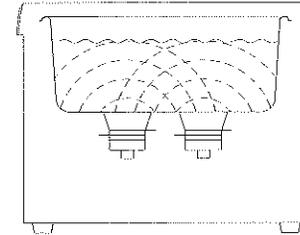
Model	Capacity (L)	Tank Size WxH xD (mm)	Freq. (kHz)	Max. Power Require (W)	RF- Power (W)	Heating Power (W)
B1500E-MT	1.9	150	42 ±2.5	85	20	-
B1500E-MTH		×100		140	-50	55
B1500E-DTH		×135		140	-	55
B2500E-MT	2.8	230		120	50	-
B2500E-MTH		×100		220	-85	100
B2500E-DTH		×135		220	-	100
B3500E-MT	5.7	300		170	80	-
B3500E-MTH		×150		370	-135	200
B3500E-DTH		×150		370	-	200
B5500E-MT	9.5	300	230	110	-	
B5500E-MTH		×150	505	-175	275	
B5500E-DTH		×240	505	-	275	
B8500E-MT	20.8	500	320	145	-	
B8500E-MTH		×150	900	-230	580	
B8500E-DTH		×300	900	-	580	
B9500E-MT	28.4	500	410	195	-	
B9500E-MTH		×200	990	-300	580	
B9500E-DTH		×300	990	-	580	

NOTE:

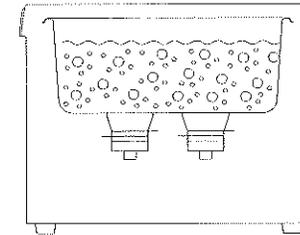
- In DTH cleaner, the temperature readout accuracy is +4/-6 °C.
- Input power supply : 220V-230V~±10% ,50/60Hz; 230V ~, 50 Hz is optimum voltage for all "E" cleaners.
- All units have a ground leakage current less than 0.5mA.
- Satisfied pollution degree 2 and protection class I.
- Operating temperature range: 5 – 45 °C; Relative humidity range: RH 0 – 90% @25°C.
- Operated under altitude up to 2000 m and as indoor use
- Storage/Shipping temperature range: -25 – 55 °C; Relative humidity range: RH 0 – 90%.

How Ultrasonics Works

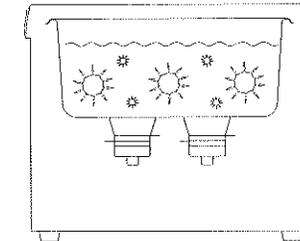
Ultrasonic sound is sound transmitted at frequencies generally beyond the range of human hearing. In your ultrasonic cleaner, ultrasonic sound (sonics) is used for cleaning materials and parts. This is how it works:



- As the sound waves from the transducer radiate through the solution in the tank, they cause alternating high and low pressures in the solution.



- During the low pressure stage, millions of microscopic bubbles form and grow. This process is called CAVITATION, meaning "formation of cavities."

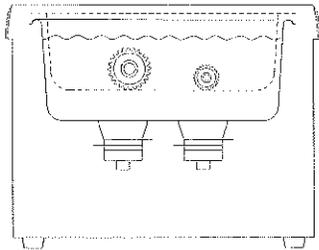


- During the high pressure stage, the bubbles collapse, or "implode" releasing enormous amounts of energy. These implosions act like an army of tiny scrub brushes. They work in all directions, attacking every surface and invading all recesses and openings.

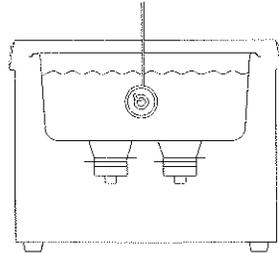
Cleaning Methods

There are two methods of cleaning—direct and indirect. Each has advantages and disadvantages. When in doubt, run test samples using both methods to decide which one produces the best results for you.

Direct method:



Place the items in a tray



Utilize a wire to suspend items

How it works:

- Fill the tank with warm water and a cleaning solution.
- Place the items to be cleaned in a perforated tray and lower them into the solution.

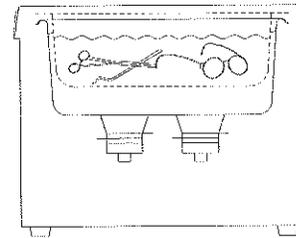
The advantage of this method are the simplicity of operation and cleaning effectiveness.

Rinsing, drying and lubrication:

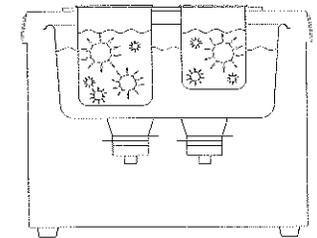
- Rinse the parts to remove the chemicals which adhere to the parts after cleaning.
- Dry the parts with clean compressed air, hot air blower or in an oven.
- Relubricate parts that need lubrication.

Cleaning Methods

Indirect method:



Utilize a solid insert tray to contain parts



Utilize a beaker cover with beakers to contain parts

How it works:

- Fill the tank with warm water and a cleaning solution.
- Pour your solution medium into one or more beakers or into a solid insert tray.
- Place the beakers in a beaker positioning cover or a solid tray to fit your cleaner. Beakers should not touch the tank's bottom.

The advantages of this method are:

- Removed soil stays in the beaker or tray so you can easily examine, filter or discard it.
- You can use one or more solutions at the same time:
 - two completely different cleaning solutions.
 - one beaker or tray with a cleaning solution and one with a rinse solution.
- Cleaning solution in your tank needs to be changed less often.

Rinsing, drying and lubrication:

- Rinse the parts to remove the chemicals which adhere to the pads after cleaning.
- Dry the pads with clean compressed air, hot air blowers or in an oven.
- Relubricate parts that need lubrication.

Application Hints

WARNING



- Never clean **novelty or inexpensive jewelry** in the cleaner. The combination of heat and vibration may loosen a cement-held setting.
- Never clean **gemstones** such as emerald, amethyst, pearl, opal, coral, turquoise peridot or lapis lazuli in the cleaner.

First time cleaning - First experiment with one piece, then proceed with the remainder.

Solution level - Be sure to maintain solution level within 3/8 inch of the tank's "operating level" line.

Load size - It is faster and more efficient to run several small loads rather than a few big loads.

Placing items - Never allow items to sit on the bottom of the tank. Always place them in a tray or beaker or suspend in the solution.

Rinsing items - After cleaning, use a clean water bath to rinse away chemicals adhering to items.

Drying items - Air drying at room temperature works well for some items. Place items requiring faster drying under hot air blowers or in ovens.

Lubricating items - When necessary, relubricate items immediately after cleaning.

Please call VWR if you have application questions.

Cleaning Solutions

WARNING



Do not use corrosive solutions, such as bleaches, strong acids or powerful caustics, in ultrasonic tanks, or you will void the warranty. Only use non-flammable solutions and water-based solutions.

Solution types:

Water-based solutions are either slightly acidic or alkaline. They include detergents, soaps and industrial cleaners designed to remove specific soils.

Acidic water-based solutions: remove rust, tarnish or scale. They range from mild solutions that remove tarnish, to concentrated, inhibited acidic solutions that remove investment plaster, milk-stone, zinc oxide and rust from steel and cast iron as well as smut and heat-treat scale from hardened steel.

Alkaline water-based solutions: include carbonates, silicates and caustics. These cause emulsifying action, which keeps soil from redepositing on the cleaned surface, and improves cleaning action in hard water.

Alkaline strength: Removes:

Mild	Light oils and greases, cutting oils and coolant compounds.
Mild to strong	Heavy grease and oil, waxes, vegetable oils, inks, wax or fat-base buffing and polishing compounds, milk residues and carbohydrates.
Heavy-duty	Mill scale, heat-treat scale, corrosion or oxides.

Change the cleaning solution periodically. Cleaning solutions can become contaminated with suspended soil particles which coat the tank bottom. This coating dampens the ultrasonic action and reduces

Cleaning Solutions

cleaning efficiency. Certain solutions will cavitate better than others. Contact VWR for further information.

Heat and cavitation: increase the chemical activity of cleaning solutions. Some materials may be damaged by this stronger chemical action. When in doubt, test run samples of items to be cleaned.

Caustic solutions: used to remove rust from steels, metal alloy corrosion and a variety of tenacious soils.

Solution amounts: Solution amounts may vary. The amount you use depends on the detergent and the type of soil to be removed. Follow instructions on the solution container and refer to the table below for the effects of solutions on metals.

Cleaning Solutions

Solution Effects on Metals:

Cleaning agent	Steel	Brass	Aluminum	Magnesium	Zinc	S. Steel Copper	Tin
Optical(1)	none	none	none	none**	none**	none	none**
Jewelry Cleaner(1)	none	none	none	none	none	none	none
Buffing(1) compound	none	Slight stain	none	none	attacks	none	none
Oxide Remover (2)	slight etch	none	slight attack	attacks	attacks	none	none
Electronic cleaner(1)	none	none	slight attack	none	none	none	none
General purpose(1)	none	none	slight attack	none	none	none	none
Industrial strength(1)	none	none	slight attack	none	none	none	none
Metal(1) cleaner 1	none	none	none	none	none	none	none
Metal(1) cleaner 2	none	none	slight attack	none	none	none	none
Metal(1) cleaner 3	none	none	none	none	none	none	none
Rust(3) stripper	none	none	attacks	attacks	attacks	none	slight attack

(1) = Alkaline; (2) = Acidic; and(3)=Caustic.

** No effect if solution temperature is less than 140°F

WARNING



Free hydrogen may be released if solution comes in contact with reactive metals.

Optimizing Your Cleaner

Tanks:

Cleaning - check the tank for contamination whenever you change solution. if necessary, remove contaminants with a nonabrasive cloth and water.

Emptying - always unplug the cleaner before emptying the tank. Empty the solution into a waste disposal unit.

Filling - always unplug the line cord before filling the tank. Fill the cleaner to the operating level (1 inch (or 1 1/4 inches for B9500) from the top with beaker/tray in place), using warm tap water.

Low solution level- will cause the cleaner to fail. When you remove heavy or bulky loads from the cleaner, the solution level may drop below the operating level. If so, be sure to replace lost solution and degas, if necessary, depending on the amount used.

Overload- do not rest any items on the tank bottom. Weight on the tank bottom dampens sound energy and will cause damage to the transducer. Instead, use a tray and/or beaker positioning cover to support all items. Allow at least 1 inch between the tank bottom and the beaker or receptacle for adequate cavitation.

Covers - allow the cleaner to heat up faster, to a higher temperature, and avoid excessive liquid evaporation.

Temperature:

Heater- the heater may cause some discoloration of the tank wall. This is normal and will not affect the performance of the unit.

Solution - a cleaner with mechanical timer and heater, without a cover, will stabilize at 50 °C approx, when ultrasonics and heat are running continuous. However, a cleaner with mechanical timer and heater but with a cover will stabilize at 62 °C approx, running continuously. Ultrasonics will add heat to the solution.

Optimizing Your Cleaner

Setting the temperature - the cleaner will shut down at 75°C and the LED display will blink "75". Turn the cleaner off and allow it to cool down. For a faster cool down, replace some of the warm solution with cold solution.

Solution:

Solution activity- the amount of visible activity is not necessarily related to optimum cavitation for cleaning.

Degassing - fresh solutions contain many dissolved gases (usually air), which reduce effective ultrasonic action. Although solutions will naturally degas over time, using Degas mode speeds up the degassing process. Solutions that have been sitting unused for 24 hours or longer have reabsorbed some gases.

Heat- increases the chemical activity of cleaning solutions.

Surface tension - can be reduced by adding a wetting agent or surfactant to the bath. Reduced surface tension will increase cavitation.

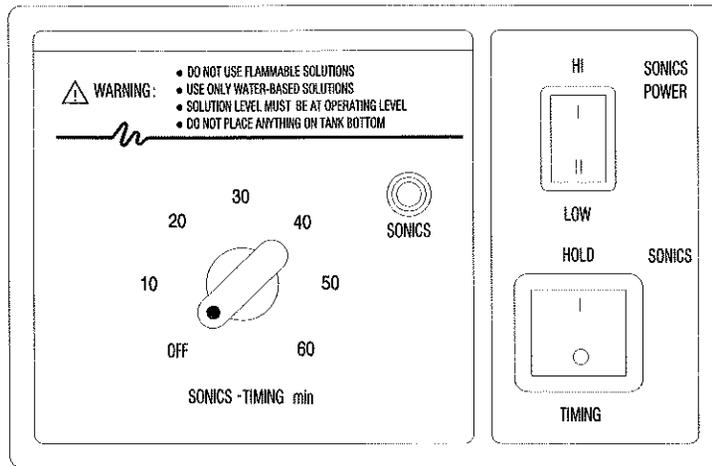
Solvents - never use solvents. Vapors of flammable solutions will collect under the cleaner, where ignition is possible from electrical components.

Renewal - replace cleaning solutions often to increase ultrasonic cleaning activity. Solutions, as with most chemicals, become spent over time. Solutions can become contaminated with suspended soil particles which coat the tank bottom, inhibiting ultrasonic activity.

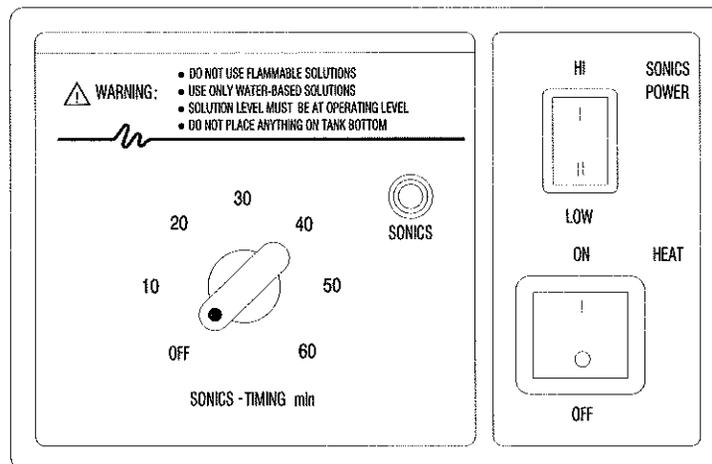
Operating Your MT or MTH Cleaner

NOTE: If this is the first time you are using the cleaner, please read "**Optimizing Your Cleaner**" before operating your cleaner.

MT Cleaner with mechanical timer



MTH Cleaner with mechanical timer and heater



Operating Your MT or MTH Cleaner

Explanation of controls:

Control	Function
"HEAT" (MTH only)	Activates heat to 60°C maximum.
TIMER	<ul style="list-style-type: none"> • Turn knob clockwise to activate ultrasonics and to set time (60 min. max.). • Turn knob counter clockwise to operate the ultrasonics continuously. • Use to turn unit OFF.
SONICS POWER	<ul style="list-style-type: none"> • "HI"---RF output power is rated value. • "LOW"---RF output power is about 73% of rated value.
"SONICS" (MT only)	<ul style="list-style-type: none"> • "HOLD"---Sonics constant ON. • "TIMER"---Sonics ON/OFF by timer.

Before you start cleaning:

WARNING



- Don't place parts or containers directly on the bottom of the cleaning tank; use a tray or wire or beaker cover to suspend items.
- Don't allow the solution to drop more than 3/8 inch below the operating level line with the cleaner on.
- Don't ever use alcohol, gasoline or flammable solutions. Doing so could cause a fire or explosion. Use only water-based solutions.
- Don't ever use mineral acids. These could damage the tank. Failure to comply with these cautions will void your warranty.

Step	Action
1	Select your cleaning solution.
2	Allowing for the volume of the parts you will be cleaning and cleaning solution, fill the tank with warm tap water to the operating level line.
3	Add cleaning solution to the tank water.
4	Plug the cleaner into a grounded outlet.

Operating Your MT or MTH Cleaner

NOTE: If this is the first time you are running the cleaner, or if you have changed cleaning solution, you must degas the solution. If not, skip to **"Cleaning Items"**.

Degassing:

Step	Action
1	Turn the HEAT ON (<i>MTH</i> Cleaner only).
2	Turn the TIMER to 5-10 and let the cleaner run to allow the solution to "degas."

Cleaning items:

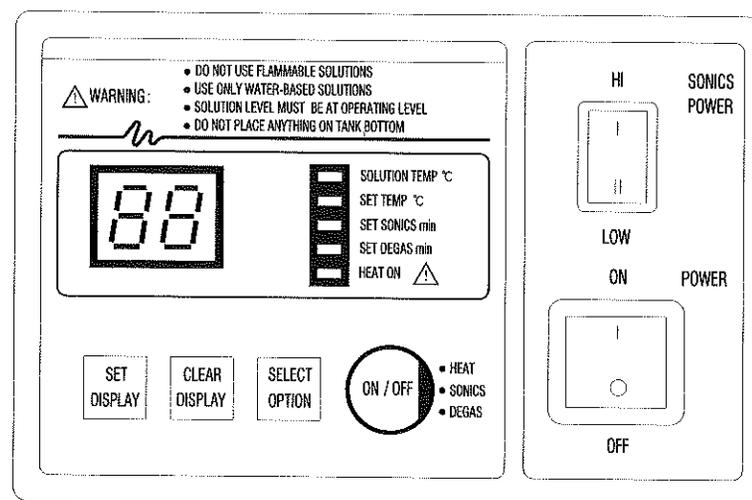
NOTE: To stop ultrasonics at any time, turn the TIMER to zero.

Step	Action
1	Set the TIMER for the amount of time you wish the items to be cleaned.
2	Place the items into a basket or beakers in a positioning cover.
3	If using beakers, add cleaning solution to beakers to cover the items.
4	Slowly lower the basket or beakers into the tank. Do not allow items to contact the tank bottom. Do not stir the solution.
5	When items are clean, slowly remove them from the cleaner.
6	Rinse the clean items with clean water and dry them, if necessary.
7	Sonics can be constant ON by setting the "SONICS" key at "HOLD".

Operating Your DTH Cleaner

NOTE: If this is the first time you are using the cleaner, please read **"Optimizing Your Cleaner"** before operating your cleaner.

DTH Cleaner with digital timer and heater



Explanation of controls:

Control	Function
POWER	Press to activate/deactivate power to the cleaner.
ON/OFF	After you press SELECT OPTION and set the LED Display for the selected option, press to activate HEAT (SET TEMP), Sonics (SET SONICS) and/or Degas (DEGAS TIME).
LED-Display	Indicates the tank temperature, set temperature, ultrasonics time or degas time setting, depending on your SELECT OPTION choice.
SET/CLEAR DISPLAY	Used in conjunction with SELECT OPTION to set or clear the LED-display. Press CLEAR DISPLAY to clear the LED-display to 00. Press SET DISPLAY to reach your selection.

Operating Your DTH Cleaner

Control	Function
SELECT OPTION	When pressed, toggles through the Function Indicators. This allows you to check or set the tank temperature and set ultrasonic cleaning or degas time.
FUNCTION INDICATORS	<p>Lights indicate the option selected by pressing SELECT OPTION:</p> <ul style="list-style-type: none"> ● SOLUTION TEMP: Displays current solution temp. (10-75°C, + 4/-6°C); ● SET TEMP: Set tank temperature (01-60°C); ● SET SONICS: Set ultrasonic time (01-99 min., 60 min. default); ● SET DEGAS: Set degas time (01-99 min., 5 min. default); ● HEAT ON: Indicates heat is activated and has been set (SET TEMP).

Before you start cleaning:

Step	Action
1	Select your cleaning solution.
2	Allowing for the volume of the parts you will be cleaning and for the cleaning solution, fill the tank to the operating level line with warm tap water.
3	Add a cleaning agent to the tank water.
4	Plug the cleaner into a grounded outlet.
5	Turn the POWER switch ON. The cleaner will run through a three-second self-test. Wait until the LED Display shows 05 and the DEGAS TIME Function Indicator lights.

Operating Your DTH Cleaner

Degassing:

Step	Action
1	Degas for 5-10 minutes. If necessary, using SET/CLEAR DISPLAY to alter this setting. Default degas time is 5 minutes.
2	Press ON/OFF once to start the degas process.
3	After completing the degas time, you are ready to set operating parameters.

Setting operating parameters:

Step	Parameter	Action
1	SET SONICS	The cleaner is now in Set Sonics mode with a default time of 60 min. if necessary, use SET/CLEAR DISPLAY to alter this setting. Press ON/OFF once to activate timed ultrasonics.
2	SET TEMP	To set the tank temperature, press SELECT OPTION until the SET TEMP LED lights. Then press SET DISPLAY to alter the setting until the LED display indicates the tank temperature you wish to maintain. Press ON/OFF once to activate heat. The heat indicator lights.
3	SOLUTION TEMP	To monitor the solution temperature, press SELECT OPTION until the SOLUTION TEMP LED lights. The LED display will indicate the actual temperature of the solution.

NOTE:

You may require an exact/constant temperature for your application. Please note that ultrasonics may continue to heat the solution beyond your set temperature, even though the heater has cycled off and the "Heat On" light is still light. If this happens, turn the cleaner off and allow the solution to cool down. For a fast cool down, replace some of the warm solution with cold solution.

Operating Your DTH Cleaner

Cleaning items:

WARNING



- Don't place parts or containers directly on the bottom of the cleaning tank; use a tray or wire or beaker cover to suspend items.
- Don't allow the solution to drop more than 3/8 inch below the operating level with the cleaner on.
- Don't ever use alcohol, gasoline or flammable solutions. Doing so could cause a fire or explosion. Use only water-based solutions.
- Don't ever use mineral acids. These could damage the tank.

Failure to comply with these cautions will void your warranty.

NOTE: Select SET SONICS then press ON/OFF once to stop ultrasonics at any time.

Step	Action
1	Place the items into a basket, perforated tray, or beakers in a positioning cover.
2	If using beakers or a solid tray, add cleaning solution to beakers or tray to cover the items.
3	Slowly lower the tray or beakers into the tank. Do not stir
4	Press ON/OFF once to activate ultrasonics.
5	When the items are clean, press ON/OFF once to deactivate ultrasonics, then slowly remove the items from the cleaner.
6	Rinse clean items with clean water and dry, if necessary.

Operating Your DTH Cleaner

- **To repeat a timed cleaning cycle:**
Press ON/OFF once while in the SET SONICS mode. This cleaning cycle time will remain in memory until reset or you turn off the power to the cleaner.
- **To reset ultrasonics time during a cleaning:**
Press ON/OFF once, press SELECT OPTION until the Set SONICS LED lights. To increase time, press SET DISPLAY to your desired setting To decrease time, press CLEAR DISPLAY, press SET DISPLAY to set the time, then press ON/OFF once to resume the cycle.
- **To monitor the solution temperature:**
Press SELECT OPTION until the SOLUTION TEMP LED lights. The LED Display will display the solution temperature in degrees Centigrade (+4/-6 °C). The cycle will continue during this process.

Draining Your Cleaner

Draining Your Cleaner:

WARNING



- Do not immerse the cleaner in water.
- Unplug the cleaner from the power source.

Models B1500A and B1500E do not have a drain. To empty, use the indented side of the rim to pour the used solution into a waste disposal unit, rinse the tank thoroughly and refill with new solution.

Models B2500A, B3500A, B5500A, B8500A and B9500A / Models B2500E, B3500E, B5500E, B8500E and B9500E include a drain.

Step	Action
1	Place the cleaner to allow easy reach of the drain tube into a waste disposal unit.
2	Hand tighten the hose adaptor into the end of the drain valve. Slide the drain tube over the barbed hose adaptor end.
3	Close the drain valve by turning the handle perpendicular to the valve body and the cleaner is ready to fill with solution. To open the valve and drain the cleaner, turn the handle so that it is in line with the valve body.

Troubleshooting

If your cleaner does not operate satisfactorily, please check the tables below for possible causes before calling your authorized service center.

WARNING



High voltage inside - dangerous shock hazard. DO NOT attempt to disassemble or repair the cleaner.

Problem	Cause	What to do
Cleaner will not start.	Cleaner not plugged in properly.	Plug into functioning electrical outlet.
	Model MT/MTH: Mechanical timer not ON	Turn timer clockwise.
	Model DTH: POWER switch not ON.	Press power switch ON.
	Model DTH: Malfunctioning start button.	Call authorized service center.
Cleaner operates but does not heat solution.	Blown fuse.	Call authorized service center.
	Model MTH: HEAT not ON.	Turn HEAT ON.
	Model DTH: HEAT not set properly.	See " Operating Your DTH Cleaner ".
	Model DTH: Malfunctioning membrane.	Call authorized service center.

Troubleshooting

Problem	Cause	What to do
Cleaner operates but does not maintain set temperature.	Malfunctioning heater or sensor components.	Call authorized service center.
Cleaner operates but display does not function.	Interrupted calibration sequence. Model DTH: Malfunctioning timer board.	Press SET DISPLAY. Call authorized service center.
Cleaner stops operating and display blinks "75".	Overheat condition.	Turn cleaner off. Allow cleaner to cool, check solution level, then restart. Refer to "Optimizing Your Cleaner".
Decreased ultrasonic activity.	Solution is not degassed Solution is spent. Solution level is incorrect for load. Tank bottom is covered with soil particles. Using deionized water in the tank.	Make sure that tank was filled with warm tap water plus cleaning solution and has run 5-10 minutes. Change solution. Adjust solution to operating level line with load. Empty, then clean tank with warm water. Wipe with a nonabrasive cloth. Deionized water does not cavitate as actively as soapy tap water.
Clogged drain	Clogged drain	Unblock