Omegasonics

Ultrasonic Cleaning Equipment

Operation & Instruction Manual

OMEGASONICS
Bench Top Unit
Model OMG-1420BTD

120 VAC 15 A

Read all instructions thoroughly before operating this equipment

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INTRODUCTION

About the Ultrasonic Cleaning Process

Congratulations! You have purchased an Omegasonics Ultrasonic Parts Washer.

But how does Ultrasonic Cleaning work?

When ultrasonic energy is introduced into a cleaning solution, alternating patterns of low and high pressure phases occur. This process forms microscopic vacuum bubbles. During the subsequent high pressure phases, the bubbles implode violently. This is called cavitation.

Cavitation provides an intense scrubbing action that leads to an unsurpassed cleaning speed and consistency when compared with simple soaking or immersion with agitation. Additionally, the bubbles are small enough to penetrate even microscopic crevices, cleaning them thoroughly and consistently. As a result, ultrasonic cleaning is one of the most highly effective and efficient methods you can use for cleaning a wide array of items.

Omegasonics provides a complete line of quality ultrasonic cleaning washers that have been developed for industries that have historically used technology that is quickly becoming outdated. While other companies use environmentally harmful cleaning solvents, we provide state-of-the-art, labor saving, fast, efficient and environmentally safe alternatives.

WARNINGS

Failure to read these warnings may cause the unit to fail, personal injury or property damage.

- Equipment should only be operated on a single phase, 120VAC, 15 Amp **grounded** electrical system. The plug is a Hubbell #5266C. A Hubbell #5261, or compatible, receptacle is required.

- Do not plug equipment into a power source that utilizes a GFI receptacle. Ultrasound passes a small, trickle current through the neutral which will cause GFI's to trip.

- Never plug in or operate the unit (heat or ultrasound) without the appropriate liquid level in the tank (2/3 full).

- Any detergents or chemicals used in this equipment must be compatible with 300 series stainless steel. Do not use any chemicals that contain any strong acids i.e. hydrochloric, sulfuric or muriatic acid. These chemicals will cause permanent damage to the stainless steel welds.

- Due to the heated liquid in the tank, use baskets, tongs or wires to insert or remove parts from the tank.

- Do not operate the unit with wet hands.

- Use only biodegradable cleaning agents. Never use solvents or flammable cleaning solvents without approval from Omegasonics. Any chemistry with a flash point below 180˚F should never be used with an ultrasonic cleaner.

- Do not rest parts to be cleaned directly on the radiating surface. The custom Omegasonics 1420 basket, which suspends the basket bottom above the tank, must be used.

- Do not open the internal circuitry of the equipment, disassemble any part or parts, or move or remove any components or electrical devices.

- Never attempt to perform maintenance on the equipment when the unit is energized or when the cleaning solution is hot.

- Disconnect the power source when moving the unit to a new location.

- Avoid splashing water outside the tank.

Only qualified technically trained personnel should perform any electrical maintenance on this machine.

SET-UP

General

- Place the machine on a level surface.
- Be sure the drain valve (located at the back of the machine) is completely closed (handle perpendicular to the drain) before filling the machine.
- Fill the wash tank with water (*see note at the end of this section)* and the proper dilution of soap until the machine is 2/3 full. Using hot water will shorten the amount of time required to reach the desired temperature. Check drain assembly to insure that there is no leakage.
- The Model 1420BTD tank dimensions are 15” x 21” with a 12” working depth. This tank will hold 16 gallons and has a working volume of approximately 14 gallons. Use this volume for calculating the amount of detergent you will use.
- If the machine does not have enough water the machine will fail.
- Plug the power cord into a proper electrical outlet and press green **POWER** button.
- Unlock the lid by pulling the hinge, located on the right side of the lid, towards yourself and close the lid over the tank to maximize insulation efficiency
- Set digital timer and temperature controls.
- The OMG-1420BTD utilizes (1) 900 Watt built-in silicone heating element and is well insulated. The time required to heat the machine initially will vary between one (1) and three (3) hours. The unit heats water at approximately fifteen (15) degrees per hour. After the initial heating period, the temperature will remain constant with very limited electrical draw. It is important that the lid remain closed when not in use to minimize heat loss and evaporation.

Note About Water

The quality of your water source can have an important effect on the performance of the ultrasonic equipment. High levels of calcium, magnesium, sulfur and other contaminants in the water source can have a negative effect on the type of cleaning soap used. High levels of calcium and/or magnesium (constitutes hard water) can cause the soap to work less efficiently and less effectively as intended and can also leave a white, flaky residue on the parts once dried. If this white spotting occurs and is not desired, it will be necessary to use soft water, drinking water or distilled water, in the machine. The level of final cleanliness will dictate the water source used in the machine.

Digital Temperature

Knowing Your Temperature Controller

- PV: This upper display indicates the actual Process Value (or current temperature) of the bath and cannot be changed manually.
- SV: The lower display indicates the Set Value or desired bath temperature. This Set Value is adjustable.
- ALM 1: If this light is on, it means that the machine is currently heating. It will shut off once the desired temperature has been reached.
- OUT: If this light is on, it means that the bath temperature is out of the preset range of 50˚F - 160˚F. There is a 5˚ hysteresis which means that the heating mechanism (and the OUT light) will go on/off based on a 5˚ variance. This protects the life of the motor contactor.
- AT, ALM 2: Omegasonics use only.
- Return Key

Operation

- The temperature controller is factory set at 150˚F.
- To change the Set Value, lightly press the up or down arrows Pressing and holding down either arrow key will change the displayed value rapidly.
- Upon changing the Set Value, this lower display will flicker indicating the new value is not set. To make this value permanent, press the RETURN Key .
- Experience shows that the optimum ultrasonic cleaning temperature for most applications is 120˚F - 160˚F.
- When ready to activate the heat, turn the selector switch marked **HEAT** to the **ON** position.

Digital Timer

Operation

- The 4-digit number on the upper display is the amount of time that the machine has been in actual operation. It will count up to the preset value.
- The illuminated 4-digit number on the lower display is the preset value.
- Pressing the **RESET** button will deactivate the timer and reset it to 0. Turning the switch to **RESET** will also deactivate the timer.
- Pressing the **LOCK** button will prevent you from changing the preset time value. **LOCK** will display in the lower orange display.
- The ultrasound is factory set to 15:00 minutes.
- To adjust the preset value, press the blue keys. Press the up arrow key, to increase, or down arrow key, to decrease.
- Left most blue key corresponds to 10 minute increments.
- Second blue key from the left corresponds to 1 minute increments.
- Third blue key from the left corresponds to 10 second increments.
- Right most blue key corresponds to 1 second increments.

- The time is activated by turning the selector switched marked **SOUND** to the **ON** position. The button will return to center. The “OP” light will illuminate on the lower, left side orange display. A red light will illuminate and blink on the upper, left side red display while the timer is operational.

CLEANING PROCEDURES

Machine Operation

- If you haven't done so already, press the green button marked **POWER.** The button will illuminate. The control panel is now energized.
- To activate the ultrasound, turn the switch marked **SOUND** to the **ON** position. The selector switch will spring back to the center position.
- Before cleaning your first batch of items, operate the ultrasound for fifteen (15) minutes. This process is called degassing and helps eliminate any air from the water in the tank.
- To deactivate the ultrasound before the timer has completed its cycle, turn selector switch to the **RESET** position. The selector switch will spring back to the center position.

CLEANING PROCEDURES – FDM PARTS

- Be careful not to overload the system and/or the baskets.
- Many times you can achieve better results by cleaning two smaller loads rather than one large load.
- When lowering the items into the tank via baskets or tongs, be sure to arrange the items so they are not touching the bottom of the tank. They should be suspended at least ½" above the tank bottom. This can be achieved with the use of a tank rack.
- Items should not be stacked too densely.
- The volume of parts to be cleaned should not exceed thirty percent (30%) of the total tank volume.
- Temperature settings can be found in Table 1: FDM RECIPES.
- Time settings are unique to the size and complexity of the parts being rapid prototyped. Guidelines are as follows:
    a. Small parts: >2" generally require 15-30 minute intervals
    b. Medium parts: 2" – 10" require 30 – 60 minutes
    c. Larger parts: <10" require 1 – 3 hours plus
- Activate the ultrasound by switching **SONICS** to **ON**.
- Parts being cleaned do not require continuous supervision or labor intensive cleaning. Parts should however be inspected during the cleaning process.
- Large parts should be rotated 180° midway through the cleaning cycle.
- Visually inspect each part for desired decontamination after the parts have dried completely. If parts must be handled, wear gloves when touching surfaces to protect against heated parts.
- Remove cleaned parts and rinse off all the remaining Water Works soap residue with either of the following methods:
    a. Rinse for one (1) minute in clean, free flowing water.
    b. Rinse in a static bath of fresh water for fifteen (15) minutes.

CLEANING AGENTS

- **Water Works –** Use only Stratasys Water Works Soluble Concentrate to clean Fused Deposition Modeled parts. Use 1 bottle (2.1 lbs.) to every 11 gallons of water. 2 bottles of Water Works should be used to charge the 1900BT tank with a liquid depth of 16".

TABLE 1: FDM RECIPES

	Support Structure			
MATERIAL	**SR20**	**SR30**	**SR100**	**SR110**
ABS	158°F	158°F		
Polycarbonate			167° - 176°F	
Nylon 12 >2" Part				145°F
Nylon 12 <3" Part				158°F
PCABS	158°F	158°F		
Polycarbonate ISO			167° - 176°F	
ABS Translucent	158°F	158°F		
ABS I-Medical	158°F	158°F		
Ultem	Break away only			
PPFS	Break away only			
ABS ESD7	158°F	158°F		

EQUIPMENT MAINTENANCE

General

- Keep the bath free of oils, grease and any foreign materials.
- Skim off oil and grease residue periodically, if necessary.
- Cleaning agents should be changed periodically depending on usage.

Draining Tank

- Turn equipment off and unplug the power cord.
- Wait at least twenty (20) minutes after the heat circuit is turned off before emptying the tank. Permanent damage to the heater elements will occur if the tank is drained too soon after the heaters are turned off.
- Drain the contaminated cleaning solution from the tank using the valve.
- Rinse the inside of the tank with clean water.
- Buff the inside of the tank with a clean, soft cloth. Do not use steel wool cleaning pads as they are too abrasive and will scratch the tank surface.
- Rinse the tank again.
- If the tank will not be used for a long period of time, wipe the inside and the outside of the tank dry with a dry, clean, soft cloth.
- Close the lid on the cleaning tank. The lid should remain closed when the equipment is not in use to keep dust and debris from accumulating.
- This tank cleaning procedure should be performed every time the bath is changed. Always thoroughly inspect drain areas for leaks.

When discharging bath and waste, follow all environmental and regulatory requirements. A reputable and licensed waste transportation firm should perform removal of all waste materials. Omegasonics is not liable for improper handling of waste materials.

LIMITED WARRANTY

Omegasonics warrants the OMG-1420BTD ultrasonic cleaner for a period of two (2) years from the date of delivery, when used in accordance with the manufacturer's instructions. During the warranty period, Omegasonics will repair or replace free of charge at an authorized repair service center all parts that are defective because of material or workmanship. Freight charges to an authorized service centers are the responsibility of the user.

This warranty does not include damage or product failure, which results from cavitation erosion, misuse, abuse or transportation damage. This warranty is limited to the original purchaser and is not transferable. Total liability for any reason whatsoever, shall not in any case exceed the cost of repair or replacement of the defective part. In no case shall Omegasonics be responsible for any incidental or consequential damages.

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TROUBLE SHOOTING

Isolate the exact issues(s) you are experiencing by following the following procedure.

1. Turn off Ultrasound
2. Turn off Heat
3. Leave Green Power push button pressed in and illuminated.
4. Turn on Heat – Does it operate?
5. Turn off Heat
6. Turn on Ultrasound – Does it operate?
7. Turn off Ultrasound
8.

Control panel has lights, but there is no Heat action.

1. Is the water level to the middle height of the tank?
2. If NO - fill water to the appropriate level (14” – 16”).
3. If this doesn’t correct the problem:
    a. Unplug the machine from the facility power supply.
    b. Remove the panel located on the right end of the machine.
    c. Look for the ice cube relay located at the left end of the back panel.
    d. Flip the window up (window has a red button) – this bypasses the thermal overload. You will see an orange flag visible in the upper right window.
    e. The machine will be operational, but will have no low water level protection.
4. If either instruction does not solve the issue, replace ice cube relay.
5. Contact Omegasonics to order a replacement ice cube relay.

No lights on the control panel.

1. Is the Power push button pushed in?
2. Is there power to the facility outlet?
3. Turn off Power and unplug the machine.
4. Remove upper panel located on the right end of the machine.
5. Is the circuit breaker energized (UP-Red) or (DOWN-Green)?
6. If the circuit breaker is tripped, re-set the circuit breaker.
7. Plug in machine.
8. Follow the steps above to isolate the exact issue.

Heat is causing the circuit breaker to trip.

1. Likely cause is a shorted heat blanket.
2. Remove the front (if applicable) and back lower access panels.
3. Inspect the heat blanket(s) – they should be an orange/ pinkish color.
4. If the heat blankets are black or charcoal white, they must be replaced.
5. Call Omegasonics to order new heat blanket(s).

Ultrasound is causing the circuit breaker to trip.

1. Remove vented/ panel located on the right end of the machine.
2. Remove the power plug from the back of the generator.
3. Activate the ultrasound.
4. If the circuit breaker trips again, then the corrective action is to replace the digital timer.
5. If the circuit breaker does not trip, then follow these procedures.
    a. Contact Omegasonics to have the existing generator repaired or replaced.
6. If no specific circuit causes the internal circuit breaker to trip but the issue occurs sporadically, then the circuit breaker will need to be replaced.
7. Call Omegasonics to order a new circuit breaker.

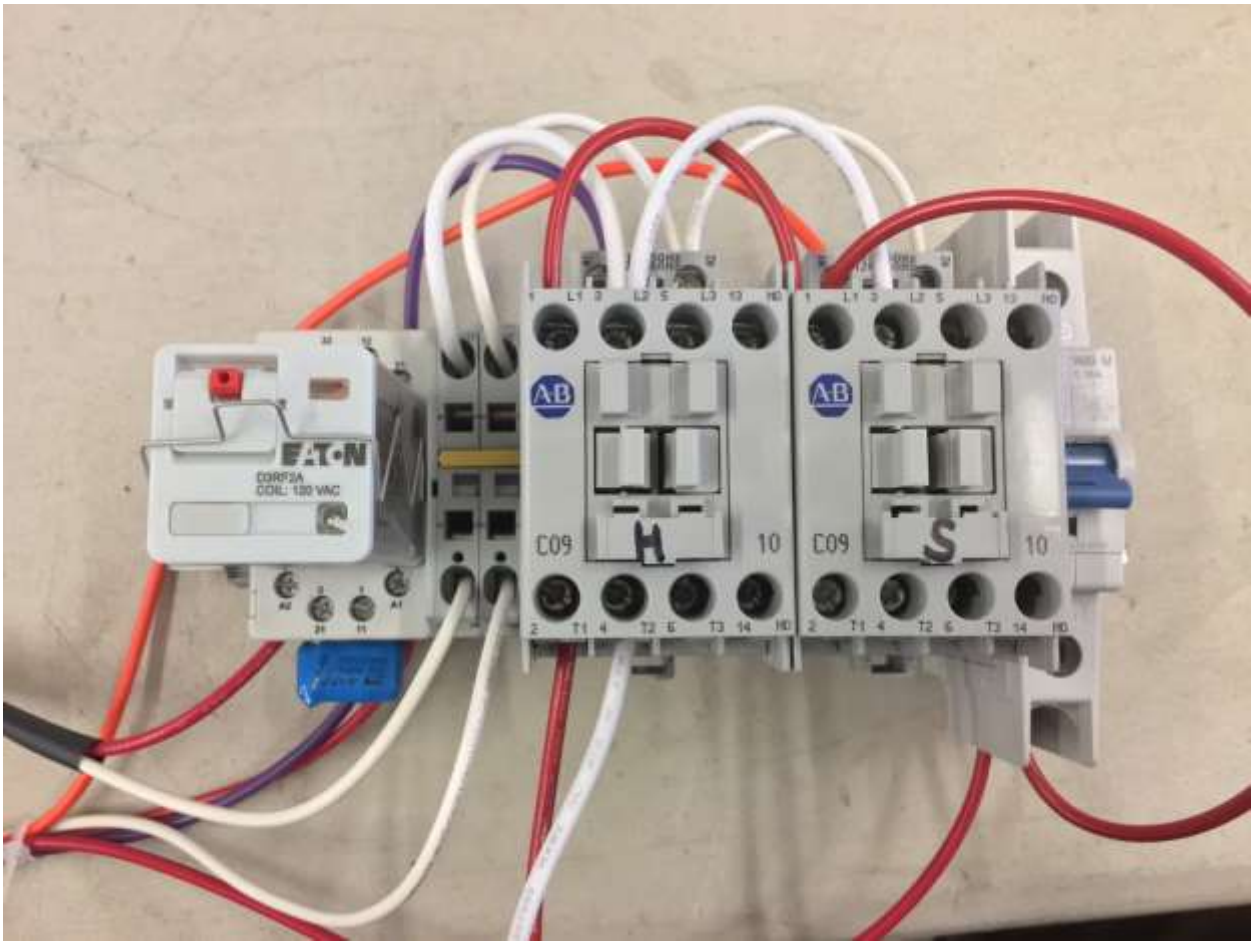
Ultrasound circuit is not operational.

1. Does the digital timer have a visible display?
2. Does the timer count up?
3. Does the timer display flash “OP.” in the lower left side?
4. Does the timer display flash a RED dot in the upper left side?
5. If the answer to 1 -4 is NO, replace the digital timer.
6. If the answer to 1, 2 or 3 is YES, use the following steps.
7. Remove upper panel located on the right end of the machine.
8. Does the center plunger on the Ultrasound contactor pull in when timer activates?
9. If the answer is YES, the generator is the likely cause.
10. If the answer is NO, can you manually push in the coil to activate the ultrasound?
    a. NOTE: Use an insulated screwdriver to push in the center coil.
    b. If you cannot push in the coil manually, the contactor needs to be replaced.
11. Contact Omegasonics for a generator RMA or to order a replacement contactor.

The unit trips the GFCI circuit breaker when the ultrasound operates.

1. GFCI circuit breakers will cause intermittent trips with ultrasound.
2. Install non-GFCI circuit breaker.

NOTE: Always inspect the back panel wires for burnt or loose wires. Burnt wires are typically caused by a loosened connection and must be replaced.



Thermal Overload
Ice Cube Relay

Heat
Contactor

Sonics
Contactor

Circuit
Breaker

PARTS LIST

- Thermal Overload Auto Reset – *Thermal Overload*
- Generator (1) – *OMG-9001-40U*
- Digital Timer - *Timer*
- Digital Temperature Controller – *Digital Temp*
- 3 Position Selector (“Sonics”) – *Switch-3 Position Selector*
- 2 Position Selector (“Heat”) – *Switch-2 Position Selector*
- Power Button – *Push Button*
- Motor Contactor –*Contactor-120*
- Heat Blanket – *Heat Blanket-900/120V*
- Ice Cube Relay - *Relay-120*