ULTRASONICPOWER CORPORATION

Operator and Maintenance Manual

39-GALLON ULTRASONIC CLEANING CONSOLE

90-GALLON ULTRASONIC CLEANING CONSOLE

135-GALLON ULTRASONIC CLEANING CONSOLE

204-GALLON ULTRASONIC CLEANING CONSOLE

Ultrasonic Power Corporation™

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Le manuel est disponible en français sur demande.
5-6-11

Congratulations,

You have just purchased the best Ultrasonic cleaning system available to the market today. We here at Ultrasonic Power Corporation™ take pride in our products and our ability to provide you, our customer the best quality service available. Please take some time to familiarize yourself with this manual and all aspects of the system configuration prior to start-up. We know that your Ultrasonic Power Corporation™ cleaning system will serve you for years to come. Thank You again for selecting Ultrasonic Power Corporation for your cleaning needs.

Sincerely,

The Ultrasonic Power Family

Please read the entire manual. The console series of cleaning systems require special care for proper operation. This manual gives you the education and special skill required to operate the system at its peak performance.

Table of Contents

1. Warnings

Warning Symbols

Danger

The DANGER symbol means that failure to follow this safety statement WILL result in personal injury or death.

Warning

The WARNING symbol means that failure to follow this safety statement MIGHT result in personal injury or death.

Caution

The WARNING symbol means that failure to follow this safety statement MIGHT result in personal injury or property damage.

High Voltage

The HIGH VOLTAGE symbol means that failure to follow this safety statement MIGHT result in personal injury or death.

SAFETY PRECAUTIONS

The following *safety precautions* should be observed when operating or servicing this equipment.

WARNING: Utilize this equipment with accordance to the manual and good safety practices. Failure may result in poor equipment performance, personnel injury or death, or equipment damage.

WARNING: USE ONLY WATER OR WATER-DETERGENT MIX IN CLEANING CHAMBER. NEVER USE FLAMMABLE SOLVENTS (FIRE OR EXPLOSION COULD RESULT) OR CARBON TETRACHLORIDE (PRODUCES TOXIC FUMES).

CAUTION: Never use ultrasonic cleaning console as a sink. Under no circumstances should waste water be poured into it as the water could overflow the drain and damage delicate components.

CAUTION: Incorrect voltage can damage the generator. Do not operate the equipment unless the correct voltage is available. Contact the proper authority about necessary changes at the wall receptacle.

CAUTION: Never operate unit without at least 8 inches of water in the cleaning chamber. Failure to observe this precaution could damage the heating system.

WARNING: ALWAYS DISCONNECT ALL POWER TO THE SYSTEM PRIOR TO PERFORMING PREVENTATIVE MAINTENANCE WITHIN THE COMPARTMENTS. ELECTRICAL SHOCK CAN CAUSE SERIOUS INJURY OR DEATH.

WARNING: Do not operate this equipment for other than its intended use. The system is intended for cleaning components with water and an aqueous, non-flammable, detergent.

WARNING: EXTREMELY HIGH VOLTAGES, WHICH CAN CAUSE DEATH ON CONTACT, ARE PRESENT IN ELECTRICAL CIRCUITS OF THE SYSTEM. ALWAYS USE THE FOLLOWING PRECAUTIONS WHEN WORKING ON THE EQUIPMENT:

1. DO NOT ATTEMPT TO OVERRIDE SAFETY INTERLOCKS.

2. NEVER REACH ACROSS ANY SYSTEM WHICH HAS NOT BEEN TURNED OFF, THE PLUG PULLED AND HIGH-VOLTAGE CAPACITORS DISCHARGED.

3. WHEN SERVICING LIVE ELECTRONIC EQUIPMENT, ALWAYS WORK WITH ONE HAND IN YOUR POCKET OR BEHIND YOUR BACK AND STAND ON AN INSULATED PAD (e.g. RUBBER). THAT WAY IF YOU GET SHOCKED, THE CURRENT WILL NOT PASS THROUGH YOUR BODY.

4. DON'T CARRY ON CONVERSATION OR PERMIT YOURSELF TO BE DISTRACTED IN ANY MANNER WHILE SERVICING LIVE EQUIPMENT.

5. NEVER SERVICE LIVE EQUIPMENT UNLESS SOMEONE IS IN THE SAME ROOM WITH YOU.

6. NEVER TURN OFF THE MAIN POWER SWITCH IN SOME REMOTE SPOT AND THEN SERVICE EQUIPMENT WITHOUT ALSO PULLING PLUG ON LINE CORD.

7. IN THE EVENT OF SHOCK, ARTIFICIAL RESPIRATION SHOULD BE APPLIED IMMEDIATELY. IF POSSIBLE, BY A PERSON TRAINED IN ADMINISTERING SUCH TREATMENT.

WARNING: ALWAYS DISCHARGE ALL HIGH-VOLTAGE CAPACITORS BEFORE ATTEMPTING ANY SERVICING. DON'T ASSUME THAT THE DISCHARGE FROM A CAPACITOR WILL NOT PRODUCE A SERIOUS SHOCK. THE DISCHARGE FROM A HIGH-CAPACITY, HIGH-VOLTAGE CAPACITOR IS LETHAL!

WARNING: THE TRANSDUCERS CAN BUILD UP A CHARGE, REGARDLESS OF POWER BEING APPLIED, DUE TO MECHANICAL SHOCK OR HEAT OF SOLUTION IN CLEANING CHAMBER. THEREFORE, TO REMOVE SHOCK HAZARD, DISCONNECT TRANSDUCER CABLE AND SHORT THE CABLE TO GROUND BEFORE SERVICING THE GENERATOR. USE CAUTION WHEN WORKING ON THE TRANSDUCER ASSEMBLY.

CAUTION: Failure to reconnect wires in their original positions when replacing components in the system may lead to failure of the system. Carefully note proper arrangement before removing wires from components to be replaced.

This equipment is intended to be utilized indoors in an ambient temperature of 50°F to 95°F.

The console systems are all protected by splashing water and debris to a rating of IP 23.

This system contains one power cord that is required to be attached to a properly rated three wire fusible disconnect with a grounding connection capable of handling twice the rated current. The wires are colored as follows: black - hot / ungrounded, white - return / grounded, green & yellow - protective earth. The system also contains one drain valve for tank content drainage. The drain can be plumbed into a facility drain or remaining unplumbed for added mobility on draining locations.

Approved hearing protection is recommended for use with this system.

Recommend the use of NRTL approved electrical plug for use with this system. Select the appropriate plug for the voltage and current rating of the unit as per the respective national standard. When the plug is installed, make sure the wires are cut so that the protective earth is the last to take the strain. Electrical plugs should be installed only by a certified electrician.

Ground fault circuit protection shall be provided at the time of installation.

2. Specifications

CONSOLE CLEANER				
	39-GALLON	**90-GALLON**	**135-GALLON**	**204-GALLON**
Overall Width	23.15"	26"	29"	33"
Overall Length	40.65"	60.5"	66.5"	82.5"
Overall Height	39"	41.5"	42.1"	42.1"
Tank Width	18"	22"	24"	28"
Tank Length	32"	48"	54"	70"
Tank Depth	16"	20"	24"	24"
Total Volume of Liquid	39-Gallon (Optimum)	90-Gallon (Optimum)	135-Gallon (Optimum)	204-Gallon (Optimum)
Weight (Empty)	150 Pounds*	375 Pounds*	700 Pounds*	900 Pounds*
Electrical Supply Requirements	230V/240V*	230V/ 240V*	230V/ 240V*	230V/ 240V*
	18.0A*	20.7A*	36.0A*	41.3A*
Ultrasonic Power	1500 Watts*	2000 Watts*	3000 Watts*	4000 Watts*
Nominal Frequency of the 5300 series Generator	40 kHz*	40 kHz*	40 kHz*	40 kHz*
Heater Power	2000 Watts*	2000 Watts*	4000 Watts*	4000 Watts*
Maximum dB level	94	94	96	96
	(*) Dependant on selected options			

All systems will work with either 50 Hz or 60 Hz.

Only trained personnel, not the operator, should replace the fuses.

MUSIC CONSOLE CLEANER					
Fuse #	**Description**	**39-GALLON**	**90-GALLON**	**135-GALLON**	**204-GALLON**
F1	Control Circuit Fuse	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM
F2	Control Circuit Fuse	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM
F3	Generator Fuse	250V / 8A / FLM	250V / 12A / FLM	250V / 20A / FLM	250V / 20A / FLM
F4	Generator Fuse	250V / 8A / FLM	250V / 12A / FLM	250V / 20A / FLM	250V / 20A / FLM
F5	Heater Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 25A / FLM	250V / 25A / FLM
F6	Heater Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 25A / FLM	250V / 25A / FLM
F7*	Pump Fuse	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM
F8*	Pump Fuse	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM

(*) Dependant on selected options

INDUSTRIAL CONSOLE CLEANER					
Fuse #	**Description**	**39-GALLON**	**90-GALLON**	**135-GALLON**	**204-GALLON**
F1	Control Circuit Fuse	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM
F2	Control Circuit Fuse	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM
F3	Generator Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 20A / FLM	250V / 25A / FLM
F4	Generator Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 20A / FLM	250V / 25A / FLM
F5	Heater Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 25A / FLM	250V / 25A / FLM
F6	Heater Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 25A / FLM	250V / 25A / FLM
F7*	Pump Fuse	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM
F8*	Pump Fuse	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM

(*) Dependant on selected options

* F7 and F8 are only applicable if the pump and filter option is installed. To determine if this option is installed, check for an external filter housing.

Fuse Schedule: (applicable to 240V / 1PH units, for fuse schedules for other voltages / phases contact the manufacturer)

****All fuses are slo-blow time delay**

3. Operating Instructions

If the unit is installed with the Sonic Touch™ panel, see the Sonic Touch™ Addendum for controls. The Sonic Touch™ panel integrates the digital timer, digital thermostat, heater 7-day control, and power intensity control with SOVI™ fault diagnostic system in a waterproof capacitive touch control panel.

3.1. General

The following instructions are intended to guide the serviceman when: (1) instructing operators in techniques designed to ensure optimum equipment performance; and (2) verifying the validity of operator complaints. See Section 7 - Troubleshooting, if the console is not operating properly.

3.2. Before Operating this Equipment

1. Ensure that the liquid level is at an appropriate height as to not to damage the heaters. Minimum level is 8 inches.
    A. If the tank contains a sparger and overflow weir, fill the tank until the weir reservoir (located on the end of the machine) contains 2" of water. The pump for the sparger is tied into the weir reservoir. When the pump is activated, the sparger will push the water over the surface, pushing surface residue towards the overflow and into the weir. The contamination will remain in the weir reservoir as the pump will pull water from the reservoir and return it to the sparger.
2. Check for leaks in the plumbing for a precautionary measure before adding chemicals.
3. Plug the power cable into the appropriate voltage outlet. Using incorrect voltage will not allow the cleaner to operate properly and may damage the system.

4. Turn on the electronics in the following order:
    A. Main Power
    B. Ultrasonics
    C. Heaters
    D. Pump

If necessary, adjust the timer to the desired cycle time.

3.3. Operating the Equipment

1. Preheat the liquid in the tank. (TUV units only: Tank temperature is limited to 130°F)
2. Completely immerse soiled components into the tank (preferably in a basket) filled with water - detergent mix.
3. Turn the ultrasonics switch to the **"ON"** position. Increase the power intensity dial to the desired level. Allow ultrasonics to penetrate soiled components (Caution: excessive use of ultrasonics may cause damage to components being cleaned).
4. Remove components from ultrasonic bath. Check for desired cleanliness. Repeat step #2 and #3 until desired cleanliness is achieved.
5. Decrease the power intensity dial to the minimum level. Turn ultrasonic switch to the **"OFF"** position.

3.4. At the End of Each Day

1. Turn filter system to the **"ON"** position (if applicable). Allow the filter system to clean the water-detergent solution. (Note: Operating the filter system may interfere with the ultrasonic cleaning process.) Make sure that the external valve is opened to allow for proper flow
2. Turn filter system to the **"OFF"** position (if applicable).
3. Turn the heater switch to the **"OFF"** position.
4. Turn the main power switch to the **"OFF"** position.
5. Remove the power cord from the outlet.
6. Wipe off the machine to remove excess dirt and water.

4. Optional Control Accessories

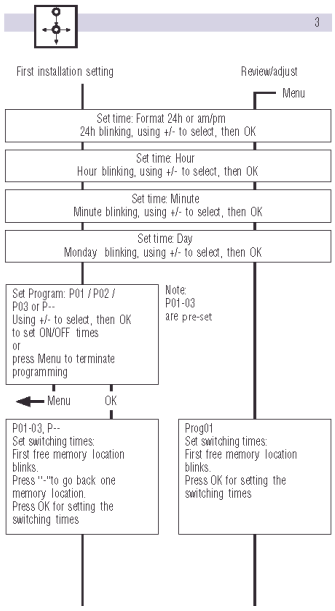
1. **Digital Timer**
    a. Allows the capability to set the cleaning ultrasonics to run for a predetermined time.
    b. Operating Digital Timer
    c. Set the desired run time by utilizing the up and down keys directly under the corresponding digit. Press the reset button to start the timer.

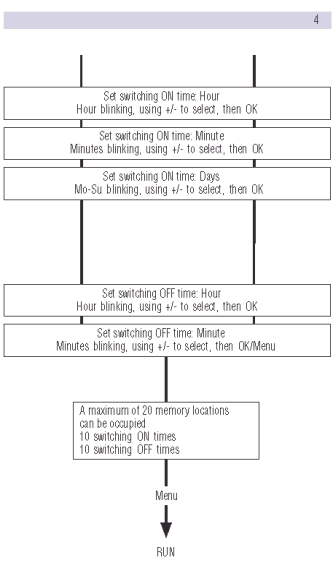
2. **Digital Thermostat**
    a. When power is applied to the control panel the digital thermostat will automatically display the temperature of the liquid in the cleaning tank.
    b. Operating Digital Thermostat
    c. Select the desired temperature using the up and down arrow keys. To lock the selected temperature, press the enter key.
    d. It may be necessary to set the offset between the actual liquid temperature and the digital thermostat. For optimum accuracy, make sure that the system is heated to the temperature that will be typically used. Check Love 16C Thermostat instructions for how to set this offset (variable = tPoF).

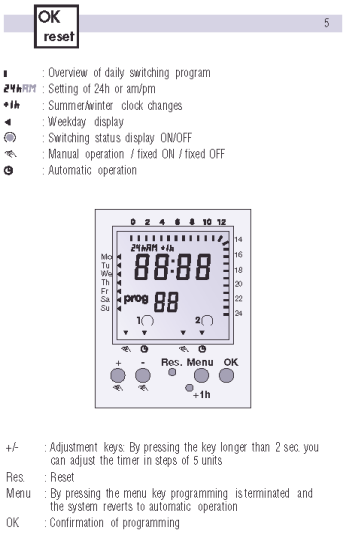
3. **Digital 7-Day Timer**
    a. Allows the capability of having the systems heaters to turn on at a predetermined time.

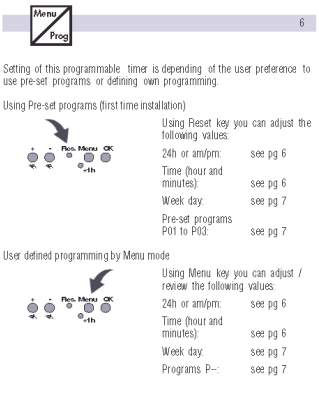
4. **Low Liquid Sensor**
    a. Low liquid sensor operates automatically to prevent damage to the machine. The tank must maintain a minimum of 8" of water to operate properly.

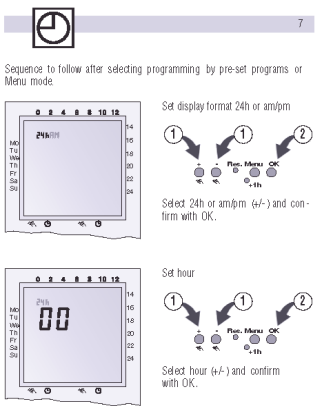
Operating Digital 7-Day Timer

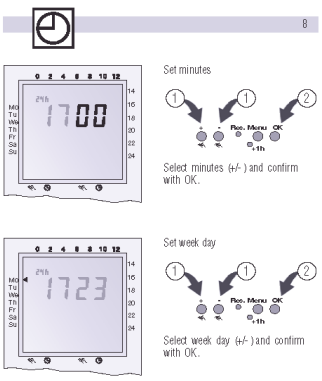












Prog. 9

P01: Mo - Su, 1 x ON/OFF

P01: Mo - Su, 2 x ON/OFF

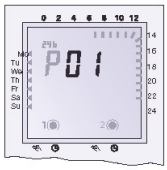
P01: Mo - Su, 3 x ON/OFF

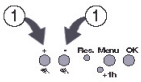
Programs P01-03
The switching on and off times for programs P01 to P03 are preset (pre).
The user can change these programs.

Individual program, P--
Under the menu option P-- you have the option of creating a user-defined program.
This program can be changed at any time. There are up to 20 memory locations available for 10 OFF and 10 ON commands.
You can allocate a corresponding weekday or week block to each memory location.

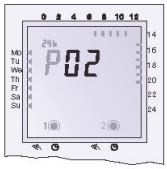
P0x prog 10

Sequence to follow after setting time in the Reset mode.





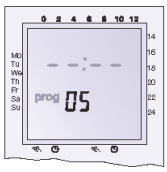
Select pre-set program (+/-).



Once selected the program desired there are following options.

Menu : terminate programming

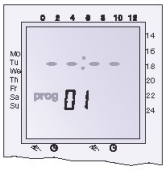
OK: Going through pre-set programs to modify selection (any program ON or OFF can be modified by using "+" or "-" keys and confirming with OK) or accept it with OK key to go the next free memory location in order to add new user defined programs (see pg 30).



e.g. after selecting P02 you should also program:
Sa-Su 22:30 ON (prog05)
23:00 OFF (prog06)

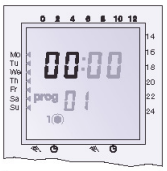
P-- prog 11

Sequence to follow after setting time and week day while running Menu mode or adding programs to the pre-set P01 to P03.



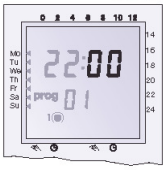
Select program ON

and confirm with OK.



Set hour ON

Select hour (+/-) and confirm with OK.



Set minutes ON

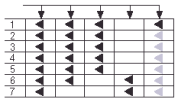
Select minutes (+/-) and confirm with OK.

P-- prog 12

Set week day ON

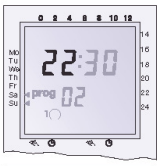
Select week day (+/-) and confirm with OK.

Possible week blocks and individual days

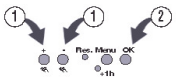


Select Ch1 or Ch2 (+/-) and confirm with OK.

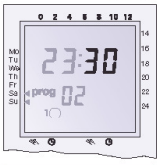
P-- prog 13



Set hour OFF



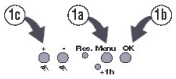
Select hour (+/-) and confirm with OK.



Set minutes OFF

Select minutes (+/-) and confirm with OK.

Set week day OFF



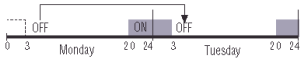
Should the OFF command be the same day of ON command then select Menu to terminate programming or select OK to go to a new program ON setting.

P-- prog 14

Shift
Should the OFF command be the following day of ON command then select "+" key then select Menu or OK.

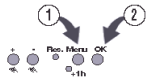
Example:
Mo-Fr
20:00 p.m. - 03:00 a.m. ON
03:00 a.m. - 20:00 p.m. OFF

→ Mo-Fr
20:00 p.m. - 03:00 a.m. ON
Tu-Sa
03:00 a.m. - 20:00 p.m. OFF



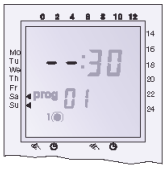
del

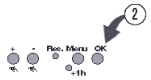
15



Select Menu, then select OK key until getting onto the ON time of the program you want to delete.

Select "--" with (+/-) key and confirm with OK.





Note:
Switching programmes are deleted in ON-OFF pairs. If you delete a single ON instruction, the correspond - ing OFF instruction is also deleted.

+1h

16

The +1h key is for the change to daylight savings time.

- By pressing the +1h key 1 hour is added to the current time.
- +1h is shown on the display.
- By pressing +1h again 1 hour is subtracted from the current time.

Mode

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The "+" key serves to change over between automatic, AUTO to override (OVR) ON and override (OVR) OFF (CH1).

5. Inspection and Maintenance

5.1. General

The maintenance described in this section should be performed at best intervals determined by the usage of the equipment, unless otherwise indicated. Should a problem occur when operating the unit, refer to Section 7, Troubleshooting. If it is required for calibration of the unit, due to critical cleaning tolerances, the generators may be sent back to Ultrasonic Power Corporation for calibration. It is recommended in these situations that the generators be calibrated annually. Please request an RMA number before shipping the generators back to the manufacturer.

5.2. PERFORMANCE VERIFICATION

1. Check installation requirements against specifications in Section 1. Also:
    a. Inspect overall unit for signs of damage or misaligned parts.
    b. If applicable, make sure leveling feet are adjusted to fit the floor.
    c. If applicable, make sure the castors are locked in place to prevent movement of system during operation.
    d. Be sure both side panels are in place on the system.

NOTE: Both side panels must be installed prior to operation to allow for proper airflow to the system. This also protects the operator from potential shock.

2. Check input voltage at the wall receptacle , the voltage at the wall receptacle must be the same rating for the system for the system to operate properly.

Caution: Incorrect voltage can damage the generator. Do not proceed unless the above voltage readings are obtained. Contact the proper authority about necessary changes at the wall receptacle.

3. Enable the power switches for reach sub-system to check their operability.
    a. ULTRASONICS- Enable the ULTRASONICS power switch. Rotate the power intensity control (PIC) clockwise to increase the cleaning action. Sound from

transducers should increase/ decrease and you should visually see ripples in the liquid.

CAUTION: Never turn on the system without having at least 8" of liquid in the tank or damage to the system will occur.

b. HEATER (if applicable)- Enable the HEATER switch. Over time, the liquid will heat up.
c. PUMP (if applicable) - Enable the PUMP switch. The pump will circulate the liquid in the tank.

5.3. Preventative Maintenance

WARNING: ALWAYS SET BUILDING ELECTRICAL-SUPPLY DISCONNECT SWITCH AND CLEANER MASTER POWER SWITCH AT "OFF", OR DISCONNECT POWER CORD FROM WALL RECEPTACLE, BEFORE PERFORMING ANY PREVENTATIVE MAINTENANCE FUNCTIONS WITHIN ANY COMPARTMENTS. ELECTRICAL SHOCK CAN CAUSE SERIOUS INJURY.

Recommended maintenance cycle is 3 months.

1. Wash chamber interior with mild detergent. Rinse with tap water using a sponge or damp cloth. Dry with a lint free cloth.

2. Clean exterior of system with stainless steel cleaner.

3. Remove side panels and clean interior of system with compressed air.

Caution: Do not use liquid to clean the interior of the system. Electric shock may occur.

4. Replace system filter(s) by removing filter housing from the machine. It is recommended to change the filter once a week or as needed.

6. Reshipment or Relocation

When relocating or reshipping the system, ensure that the power has been disconnected and that the liquid has been entirely drained from the system prior to movement. Wipe down the system to remove all excess liquid. Wrap up the power cable to avoid presenting a tripping hazard. Disengage castor locks (if applicable). If system has console legs, lift machine up to move (DO NOT drag the machine).

Fuse Schedule: (applicable to 240V / 1PH units, for fuse schedules for other voltages / phases contact the manufacturer)

Only trained personnel, not the operator, should replace the fuses.

MUSIC CONSOLE CLEANER					
Fuse #	**Description**	**39-GALLON**	**90-GALLON**	**135-GALLON**	**204-GALLON**
F1	Control Circuit Fuse	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM
F2	Control Circuit Fuse	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM
F3	Generator Fuse	250V / 8A / FLM	250V / 12A / FLM	250V / 20A / FLM	250V / 20A / FLM
F4	Generator Fuse	250V / 8A / FLM	250V / 12A / FLM	250V / 20A / FLM	250V / 20A / FLM
F5	Heater Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 25A / FLM	250V / 25A / FLM
F6	Heater Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 25A / FLM	250V / 25A / FLM
F7*	Pump Fuse	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM
F8*	Pump Fuse	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM

(*) Dependant on selected options

INDUSTRIAL CONSOLE CLEANER					
Fuse #	**Description**	**39-GALLON**	**90-GALLON**	**135-GALLON**	**204-GALLON**
F1	Control Circuit Fuse	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM
F2	Control Circuit Fuse	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM	250V / 1A / FLM
F3	Generator Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 20A / FLM	250V / 25A / FLM
F4	Generator Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 20A / FLM	250V / 25A / FLM
F5	Heater Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 25A / FLM	250V / 25A / FLM
F6	Heater Fuse	250V / 12A / FLM	250V / 12A / FLM	250V / 25A / FLM	250V / 25A / FLM
F7*	Pump Fuse	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM
F8*	Pump Fuse	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM	250V / 2A / FLM

(*) Dependant on selected options

* F7 and F8 are only applicable if the pump and filter option is installed. To determine if this option is installed, check for an external filter housing.

Fuse Schedule: (applicable to 240V / 1PH units, for fuse schedules for other voltages / phases contact the manufacturer)

****All fuses are slo-blow time delay**

7. Troubleshooting

Only trained personnel are allowed into the inside of the machine.

7.1. GENERAL

This section contains detailed information for locating and correcting malfunctions. The following steps provide an effective approach to the use of this information in conjunction with other areas of the manual.

If possible, consult the operator's who used the Cleaner last. Find out what happened just before the trouble started and indicated the a problem existed. Check to be sure that the system has the minimum specified level of water in the cleaning tank and that the system has power prior to troubleshooting.

7.2. PRINCIPLES OF OPERATION

General

Ultrasonic cleaning systems employ high frequency, mechanical vibrations transmitted into and through a suitable cleaning liquid where the cleaning action takes place. High frequency or ultrasonic vibrations are similar to audible sound, but the frequencies used are generally above a level that can be heard (>18 kHz). Since sound is a compression wave, the action of this high frequency energy in a liquid may be considered as the rapid generation and violent collapse of minute bubbles. Countless small but intense impacts erode surface soil from immersed parts. This action (cavitation) wears away surface contamination...it does not "shake off the dirt".

An ultrasonic cleaning system consists of the following components:

1. An ultrasonic generator capable of producing high frequency electrical energy. Ultrasonic Power Corporation utilize our 5300 or 5400 series generator.

2. Vibra-bar™ transducer technology to convert electrical energy received from the generator into mechanical energy.
    a. Transducers fall into two main classes: Piezoelectric (electrostrictive) and magnetostrictive. In the first instance , a material changes dimensions in the presence of an electric field is utilized; in the second instance, the material is influenced by a magnetic field (causes it to vibrate). Ultrasonic Power Corporation uses the Piezoelectric (electrostrictive) transducers with its generators.

3. A tank to contain the cleaning liquid (water-detergent mix) and into which the mechanical (ultrasonic) energy is transmitted by the transducers.
    a. Use of a suitable detergent is important because the liquid that transmits the energy from the transducers also participates in the cleaning process: (1) the mechanical action (cavitation), and (2) by solvent action, physical wetting or chemical attack on surface soil.

Optional components:

4. The Heater pads are affixed to the sides of the tank. The heater controls are located on the control panel.

5. A pump is located in the understructure of the skirt. The plumbing is comprised of customer specified dimensions and material. The pump controls are located on the control panel. The filter is located on the outside face of the machine.

7.3. HOW TO USE TROUBLESHOOTING CHARTS

1. Select the proper Table.

2. Refer to Problem and select example you think most appropriate for your particular trouble symptom. Examples are presented in cycle sequence.

3. Perform a mechanical and electrical checkout of components to designated under ITEMS TO CHECK. Note the following:

    a. Examine electrical as well as mechanical component for signs of damage and loose or misaligned parts.

    b. When applicable, use the schematic component designation and the appropriate schematic to determine the circuit and component function. Correct all loose wires or improper connections.

4. When troubleshooting is complete, replace defective items, restore circuits to normal and reinstall removed items

7.4. Troubleshooting Table

Only trained personnel are allowed into the inside of the machine.

PROBLEM	ITEMS TO CHECK*
1. System does not receive power when "**Main Power**" switch is turned to "ON" position.	a. Unit Power Cord
	b. Building Power Supply
	c. Units Fuses
	d. Loose/ disconnected wires
	e. Switches

PROBLEM	ITEMS TO CHECK*
2. The Ultrasonics do not work.	a. Unit Power Cord
	b. Building Power Supply
	c. Units Fuses
	d. Loose/ disconnected wires
	e. Switches and Settings

PROBLEM	ITEMS TO CHECK*
3. The Heater does not work.	a. Unit Power Cord
	b. Building Power Supply
	c. Units Fuses
	d. Loose/ disconnected wires
	e. Switches and Settings

PROBLEM	ITEMS TO CHECK*
4. The Pump does not work.	a. Unit Power Cord
	b. Building Power Supply
	c. Units Fuses
	d. Loose/ disconnected wires
	e. Switches
	f. Filter

PROBLEM	ITEMS TO CHECK*
5. Oil Sparger does not work.	a. Unit Power Cord
	b. Building Power Supply
	c. Units Fuses
	d. Loose/ disconnected wires
	e. Switches

PROBLEM	ITEMS TO CHECK*
6. Oil Skimmer does not work.	a. Unit Power Cord
	b. Building Power Supply
	c. Units Fuses
	d. Loose/ disconnected wires
	e. Switches

* Where applicable the component schematic for a console model follows the component description.

If the problem has not been solved using the trouble shooting guide, call the Ultrasonic Power Corporation service department at (815) 235-6020 7:00 AM - 3:30 PM CST Monday - Friday.

8. Component Repair and Replacement

Only trained personnel are allowed into the inside of the machine.

8.1. GENERAL

This section includes instructions for the adjustment, disassembly, repair and replacement of selected components. Illustrations showing the various parts and assemblies referred to in this Section are in Section 9.

WARNING: EXTREMELY HIGH VOLTAGES, WHICH CAN CAUSE DEATH ON CONTACT, ARE PRESENT IN ELECTRICAL CIRCUITS OF THE ULTRASONIC SYSTEM. ALWAYS USE THE FOLLOWING PRECAUTIONS WHEN WORKING ON THE EQUIPMENT:

1. **NEVER REACH ACROSS A SYSTEM WHICH HAS NOT BEEN TURNED OFF, THE PLUG PULLED AND THE HIGH-VOLTAGE CAPACITORS DISCHARGED.**

2. **WHEN SERVICING LIVE ELECTRONIC EQUIPMENT, ALWAYS WORK WITH ONE HAND IN YOUR POCKET OR BEHIND YOUR BACK AND STAND ON AN INSULATED PAD (e.g. RUBBER). THAT WAY, IF YOU DO GET SHOCKED, THE CURRENT WILL NOT PASS THROUGH YOUR BODY.**

3. **DON'T CARRY ON CONVERSATION OR PERMIT YOURSELF TO BE DISTRACTED IN ANY MANNER WHILE SERVICING LIVE EQUIPMENT.**

4. **NEVER SERVICE LIVE EQUIPMENT UNLESS SOMEONE IS IN THE SAME ROOM WITH YOU.**

5. **NEVER TURN OFF THE MAIN POWER SWITCH IN SOME REMOTE SPOT AND THE SERVICE EQUIPMENT WITHOUT ALSO PULLING PLUG ON LINE CORD.**

6. **IN THE EVENT OF SHOCK, ARTIFICIAL RESPIRATION SHOULD BE APPLIED IMMEDIATELY. IF POSSIBLE, BY A PERSON TRAINED IN ADMINISTERING SUCH TREATMENT.**

8.2. MODEL 5300 GENERATOR

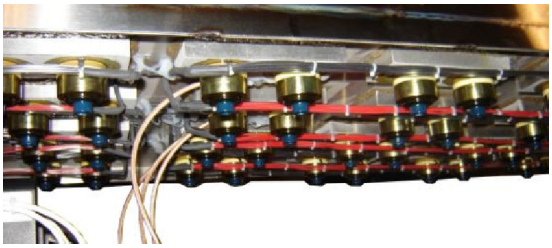
Checkout

NOTE: Use the following procedure whenever the generator is not operating properly. Do not attempt to do more than is listed below as it may void the warranty.

1. Remove power from the system.
2. Check fuses (on control panel and on back of generator), replace if necessary.
3. Check for loose connection of wires.
4. Check supplied power for correct voltage specifications.
5. Test generator by turning the system on.
6. If generator does not work, contact Ultrasonic Power Corporation service department for repair or replacement.

NOTE: **DO NOT** open the generator as this will immediately void the warranty of the generator.

8.3. VIBRABAR™ TRANSDUCER PACK

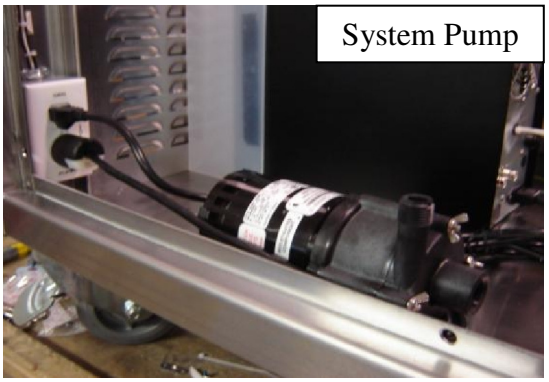


1. Remove power from the system.
2. Check packs for damage and loose wires.
3. If damage is visible, contact Ultrasonic Power Corporation service department for repair or replacement.

8.4. HEATERS (IF APPLICABLE)

1. Remove power from the system.
2. Check heater fuses located on the inside of the control panel.
3. Check heater pad for proper contact with the system tank.
4. Check for loose or damaged wires.
5. If damage is visible, contact Ultrasonic Power Corporation service department for repair or replacement.

8.5. PUMP, FILTER & PRE-STRAINER



1. Remove power from the system.
2. Check pump fuses located on the inside of the control panel. Replace fuse as needed.
3. Turn filter valve to "OFF" Position. Unscrew blue filter located outside the machine. Replace filter with similar size filter (located at any hardware store). Hand tighten filter back in place.

4. Remove access panel of machine.

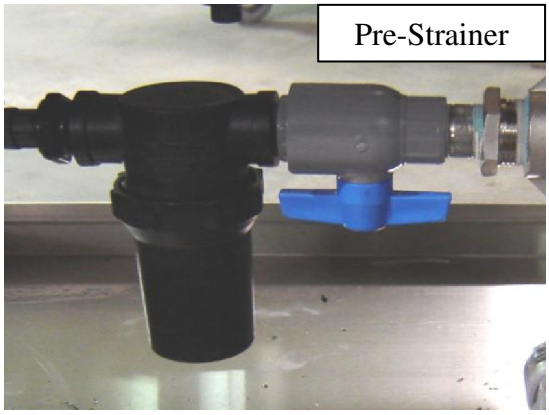
5. Check for plumbing for leaks.

6. Inspect pump for damage and/or loose wires.

7. Turn pre-strainer valve to "OFF" position. Unscrew black pre-strainer and remove contaminants from mesh screen. Return screen to pre-strainer. Ensure washer is seated properly. Hand tighten pre-strainer back in place. Return pre-strainer valve to "ON" position.

8. Reattach access panel and return filter valve to desired position.

Filter Housing



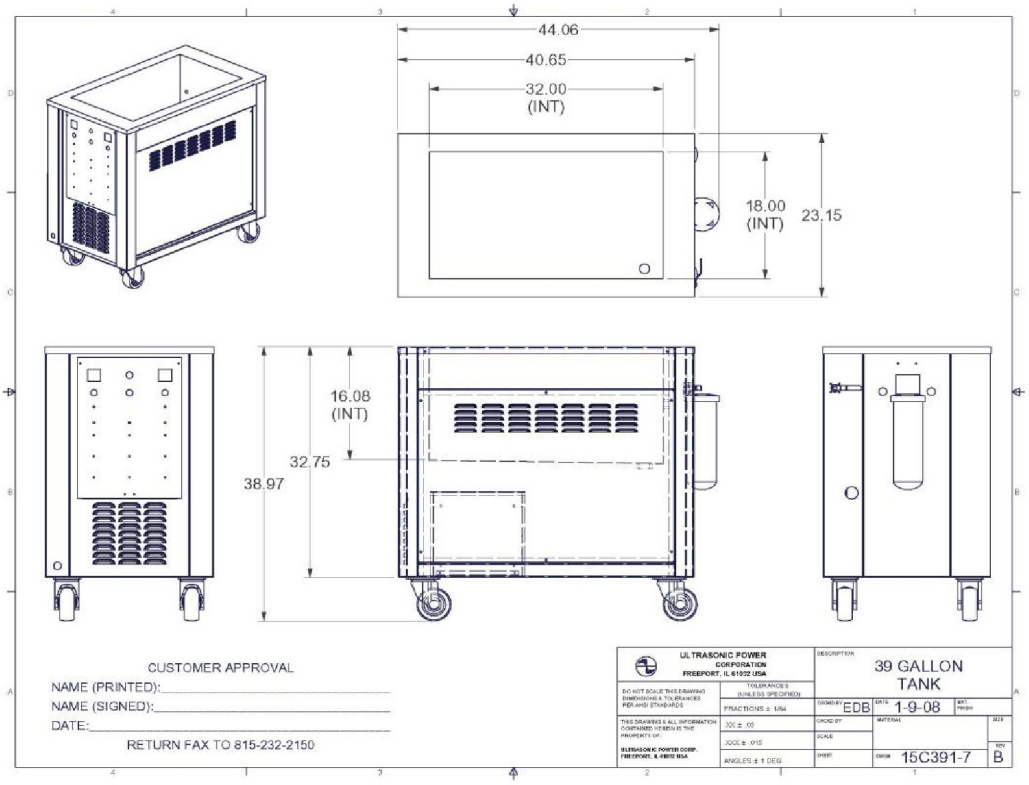
Pre-Strainer

NOTE: If damage is visible at any of these steps, contact Ultrasonic Power Corporation service department for repair or replacement.

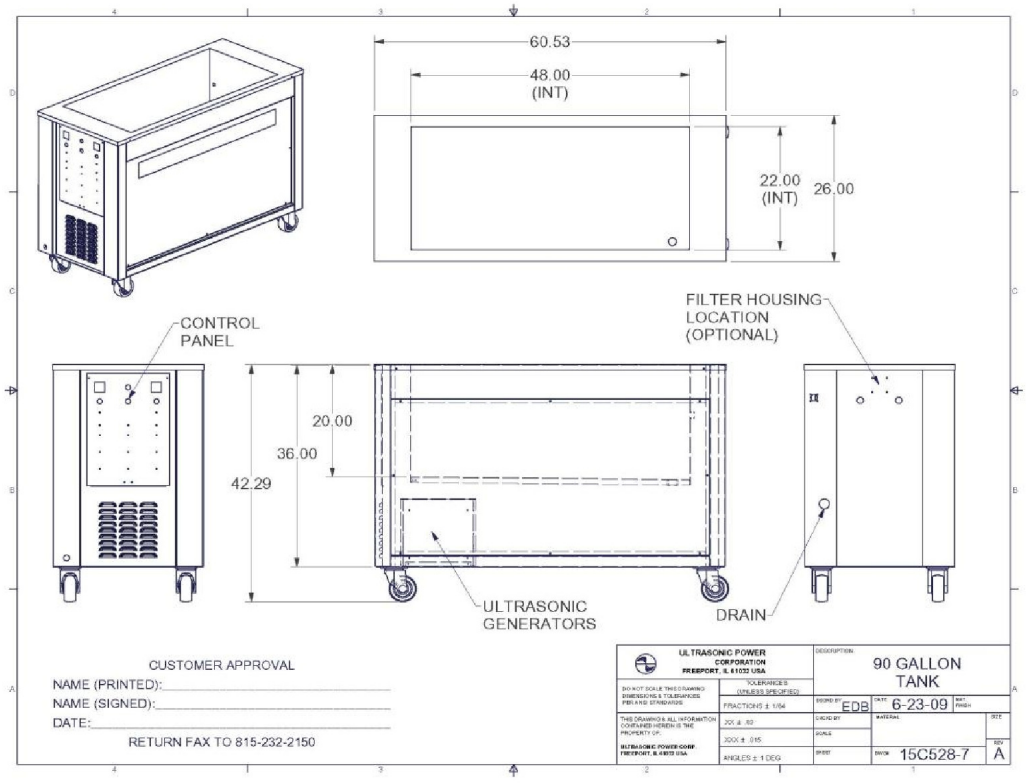
Open System Filter Housing with Filter Shown.

Opened Pre-Strainer with Mesh Screen Shown.

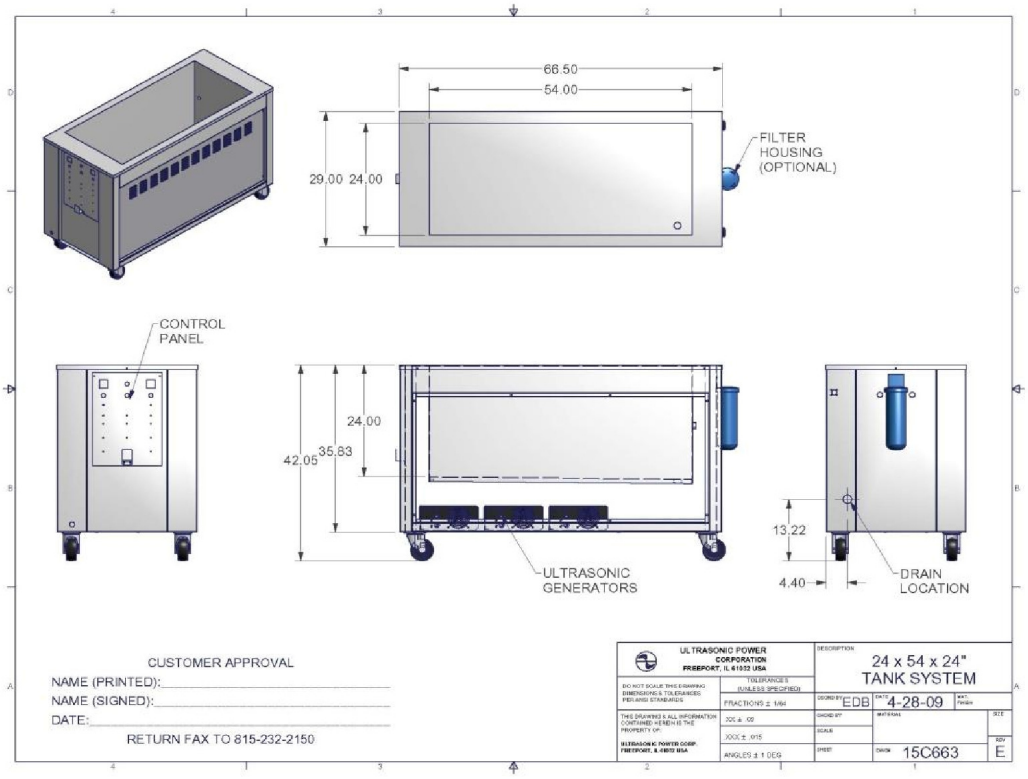
9. Illustrations and Schematics



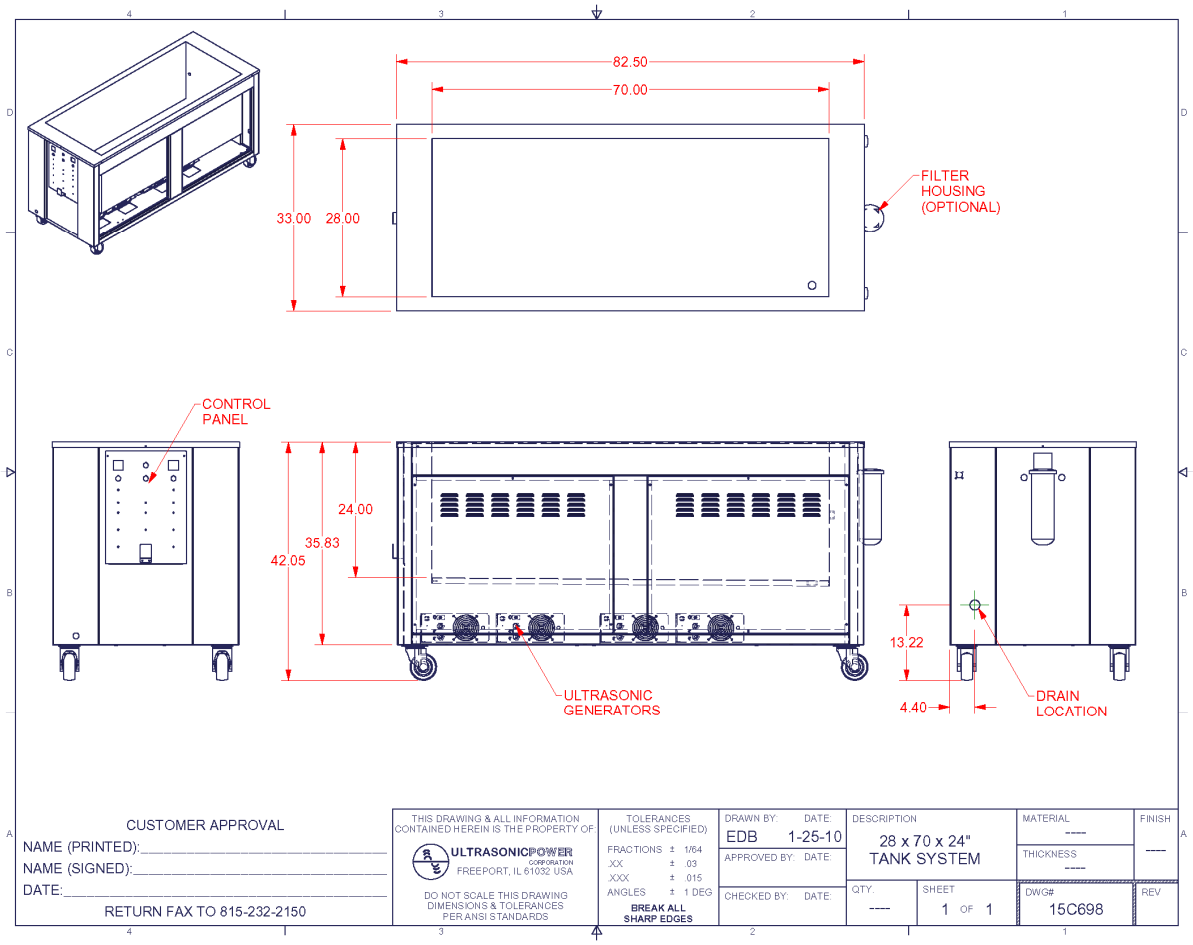
39-Gallon System



90-Gallon System



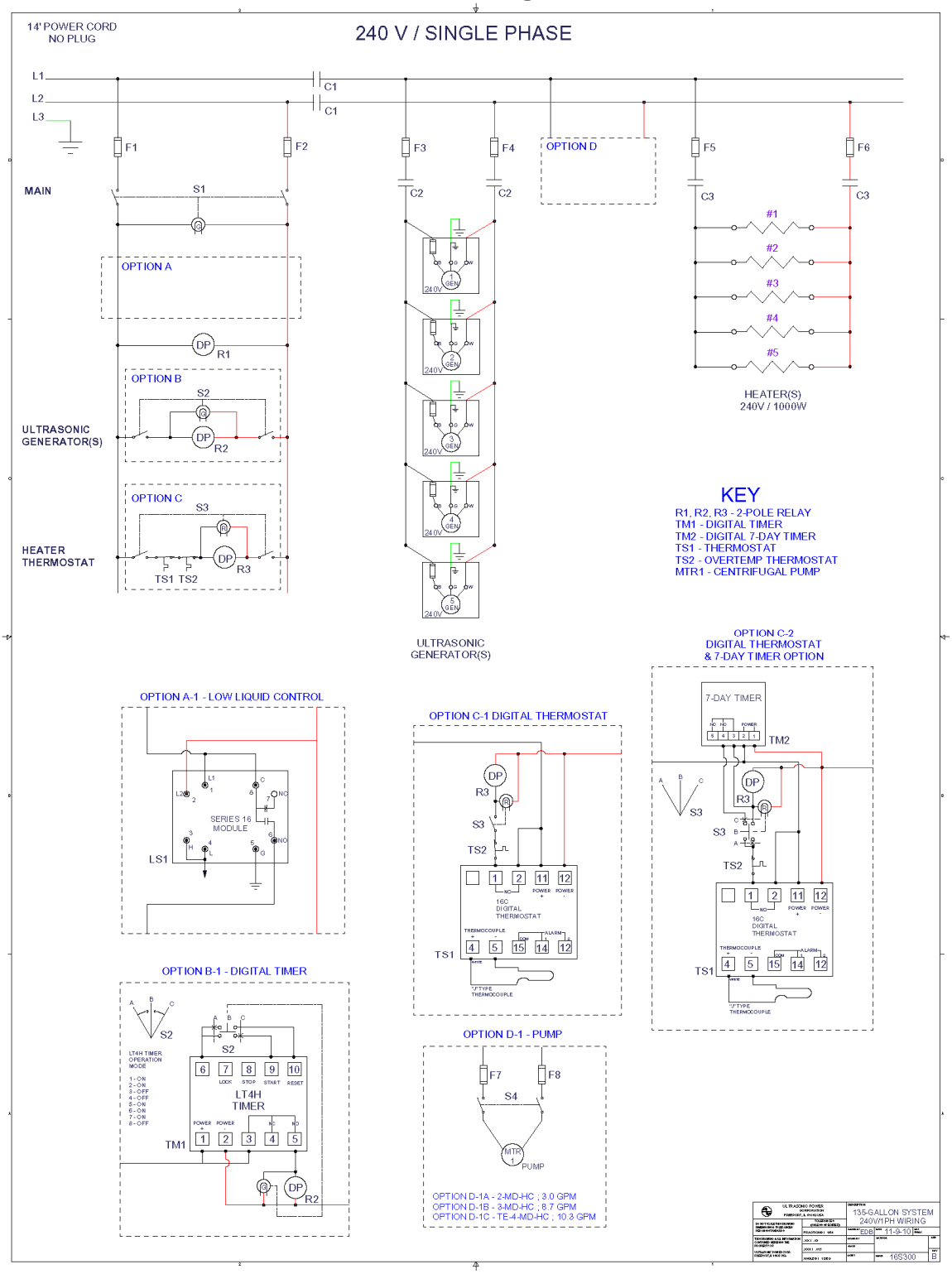
135-Gallon System



204-Gallon System

If the unit is installed with the Sonic Touch ™ panel, see the Sonic Touch ™ Addendum for electrical schematic.

Electrical Diagram



Standard System Configuration -- 240V, Single Phase

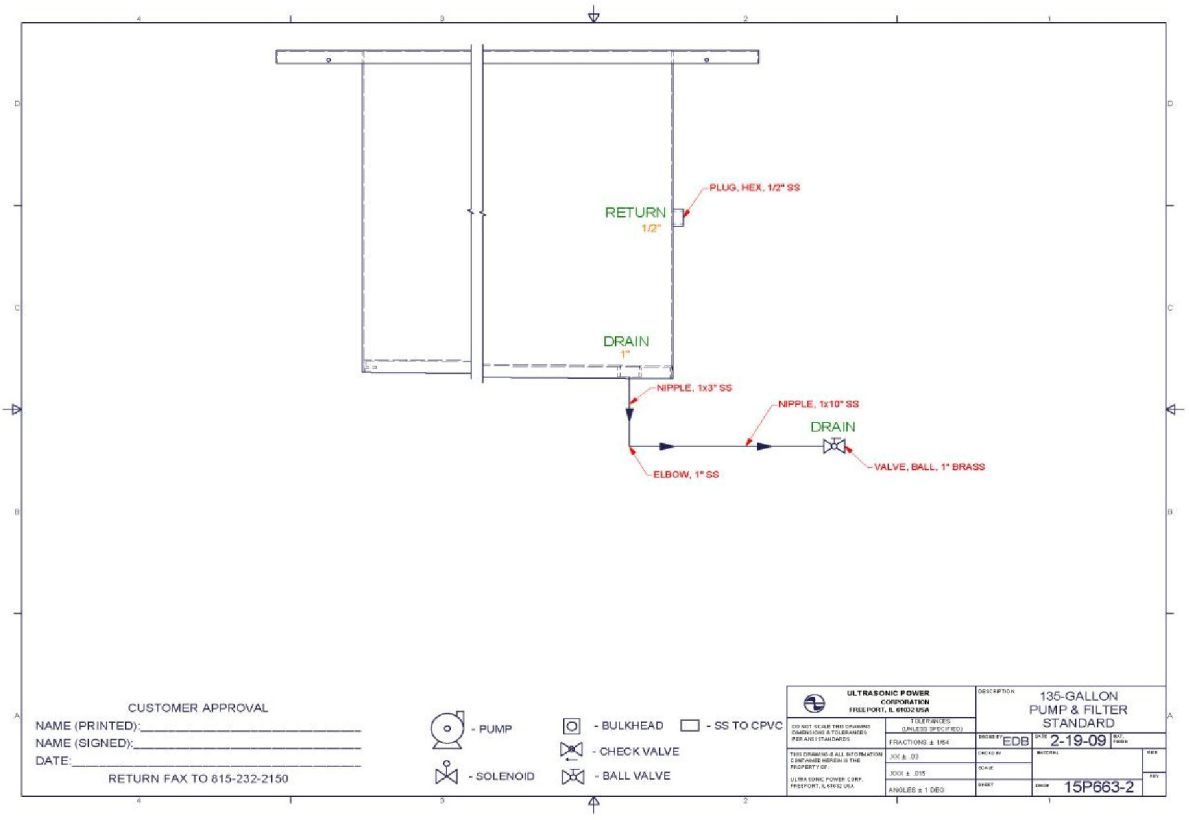
Heater Wattage (W)

Generator Wattage (W)	1000		2000		3000		4000		5000	
1000	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A
	Generator -	5.3 A	Generator -	5.3 A	Generator -	5.3 A	Generator -	5.3 A	Generator -	5.3 A
	Generator QTY -	1.0	Generator QTY -	1.0	Generator QTY -	1.0	Generator QTY -	1.0	Generator QTY -	1.0
	F3, F4 -	8.0 A	F3, F4 -	8.0 A	F3, F4 -	8.0 A	F3, F4 -	8.0 A	F3, F4 -	8.0 A
	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A
	Heater -	5.0 A	Heater -	10.0 A	Heater -	15.0 A	Heater -	20.0 A	Heater -	25.0 A
	Heater QTY -	1.0	Heater QTY -	2.0	Heater QTY -	3.0	Heater QTY -	4.0	Heater QTY -	5.0
	F5, F6 -	8.0 A	F5, F6 -	12.0 A	F5, F6 -	20.0 A	F5, F6 -	25.0 A	F5, F6 -	30.0 A
	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	30.0 A
	System Amperage -	10.3 A	System Amperage -	15.3 A	System Amperage -	20.3 A	System Amperage -	25.3 A	System Amperage -	30.3 A
	Power Cord -	14.0 GA	Power Cord -	12.0 GA	Power Cord -	10.0 GA	Power Cord -	10.0 GA	Power Cord -	8.0 GA
2000	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A
	Generator -	10.7 A	Generator -	10.7 A	Generator -	10.7 A	Generator -	10.7 A	Generator -	10.7 A
	Generator QTY -	2.0	Generator QTY -	2.0	Generator QTY -	2.0	Generator QTY -	2.0	Generator QTY -	2.0
	F3, F4 -	12.0 A	F3, F4 -	12.0 A	F3, F4 -	12.0 A	F3, F4 -	12.0 A	F3, F4 -	12.0 A
	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A
	Heater -	5.0 A	Heater -	10.0 A	Heater -	15.0 A	Heater -	20.0 A	Heater -	25.0 A
	Heater QTY -	1.0	Heater QTY -	2.0	Heater QTY -	3.0	Heater QTY -	4.0	Heater QTY -	5.0
	F5, F6 -	8.0 A	F5, F6 -	12.0 A	F5, F6 -	20.0 A	F5, F6 -	25.0 A	F5, F6 -	30.0 A
	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	30.0 A
	System Amperage -	15.7 A	System Amperage -	20.7 A	System Amperage -	25.7 A	System Amperage -	30.7 A	System Amperage -	35.7 A
	Power Cord -	12.0 GA	Power Cord -	10.0 GA	Power Cord -	10.0 GA	Power Cord -	8.0 GA	Power Cord -	8.0 GA
3000	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A
	Generator -	16.0 A	Generator -	16.0 A	Generator -	16.0 A	Generator -	16.0 A	Generator -	16.0 A
	Generator QTY -	3.0	Generator QTY -	3.0	Generator QTY -	3.0	Generator QTY -	3.0	Generator QTY -	3.0
	F3, F4 -	20.0 A	F3, F4 -	20.0 A	F3, F4 -	20.0 A	F3, F4 -	20.0 A	F3, F4 -	20.0 A
	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A
	Heater -	5.0 A	Heater -	10.0 A	Heater -	15.0 A	Heater -	20.0 A	Heater -	25.0 A
	Heater QTY -	1.0	Heater QTY -	2.0	Heater QTY -	3.0	Heater QTY -	4.0	Heater QTY -	5.0
	F5, F6 -	8.0 A	F5, F6 -	12.0 A	F5, F6 -	20.0 A	F5, F6 -	25.0 A	F5, F6 -	30.0 A
	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	30.0 A
	System Amperage -	21.0 A	System Amperage -	26.0 A	System Amperage -	31.0 A	System Amperage -	36.0 A	System Amperage -	41.0 A
	Power Cord -	10.0 GA	Power Cord -	10.0 GA	Power Cord -	8.0 GA	Power Cord -	8.0 GA	Power Cord -	6.0 GA
4000	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A
	Generator -	21.3 A	Generator -	21.3 A	Generator -	21.3 A	Generator -	21.3 A	Generator -	21.3 A
	Generator QTY -	4.0	Generator QTY -	4.0	Generator QTY -	4.0	Generator QTY -	4.0	Generator QTY -	4.0
	F3, F4 -	25.0 A	F3, F4 -	25.0 A	F3, F4 -	25.0 A	F3, F4 -	25.0 A	F3, F4 -	25.0 A
	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A	Generator Relay -	25.0 A
	Heater -	5.0 A	Heater -	10.0 A	Heater -	15.0 A	Heater -	20.0 A	Heater -	25.0 A
	Heater QTY -	1.0	Heater QTY -	2.0	Heater QTY -	3.0	Heater QTY -	4.0	Heater QTY -	5.0
	F5, F6 -	8.0 A	F5, F6 -	12.0 A	F5, F6 -	20.0 A	F5, F6 -	25.0 A	F5, F6 -	30.0 A
	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	30.0 A
	System Amperage -	26.3 A	System Amperage -	31.3 A	System Amperage -	36.3 A	System Amperage -	41.3 A	System Amperage -	46.3 A
	Power Cord -	10.0 GA	Power Cord -	8.0 GA	Power Cord -	8.0 GA	Power Cord -	6.0 GA	Power Cord -	6.0 GA
5000	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A	F1, F2 -	1.0 A
	Generator -	26.7 A	Generator -	26.7 A	Generator -	26.7 A	Generator -	26.7 A	Generator -	26.7 A
	Generator QTY -	5.0	Generator QTY -	5.0	Generator QTY -	5.0	Generator QTY -	5.0	Generator QTY -	5.0
	F3, F4 -	30.0 A	F3, F4 -	30.0 A	F3, F4 -	30.0 A	F3, F4 -	30.0 A	F3, F4 -	30.0 A
	Generator Relay -	30.0 A	Generator Relay -	30.0 A	Generator Relay -	30.0 A	Generator Relay -	30.0 A	Generator Relay -	30.0 A
	Heater -	5.0 A	Heater -	10.0 A	Heater -	15.0 A	Heater -	20.0 A	Heater -	25.0 A
	Heater QTY -	1.0	Heater QTY -	2.0	Heater QTY -	3.0	Heater QTY -	4.0	Heater QTY -	5.0
	F5, F6 -	8.0 A	F5, F6 -	12.0 A	F5, F6 -	20.0 A	F5, F6 -	25.0 A	F5, F6 -	30.0 A
	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	25.0 A	Heater Relay -	30.0 A
	System Amperage -	31.7 A	System Amperage -	36.7 A	System Amperage -	41.7 A	System Amperage -	46.7 A	System Amperage -	51.7 A
	Power Cord -	10.0 GA	Power Cord -	8.0 GA	Power Cord -	6.0 GA	Power Cord -	6.0 GA	Power Cord -	6.0 GA

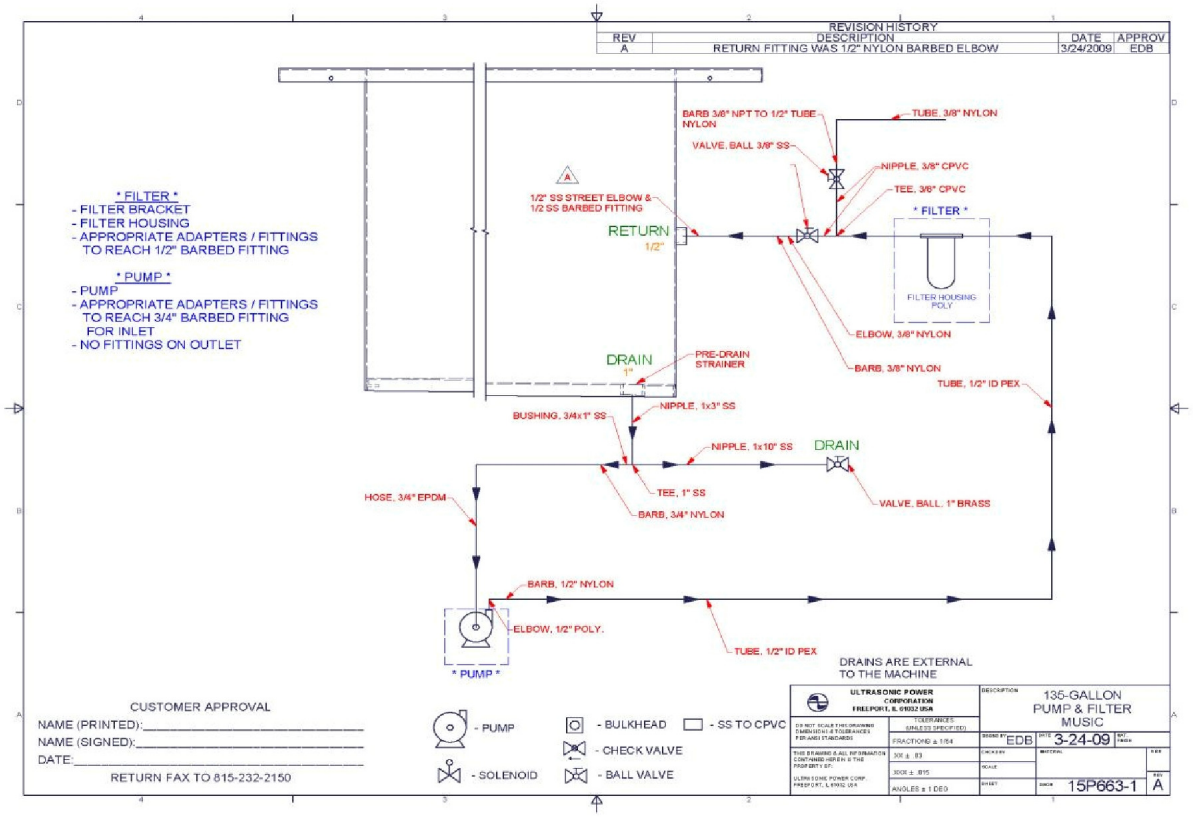
		F7, F8	Adds to System Amps
Pumps	2-MD-HC	2.0 A	0.7 A
	3-MD-HC	2.0 A	1.2 A
	TE-4-MD-HC	2.0 A	0.7 A

1500W Ultrasonics use 2000W Column
2500W Ultrasonics use 3000W Column

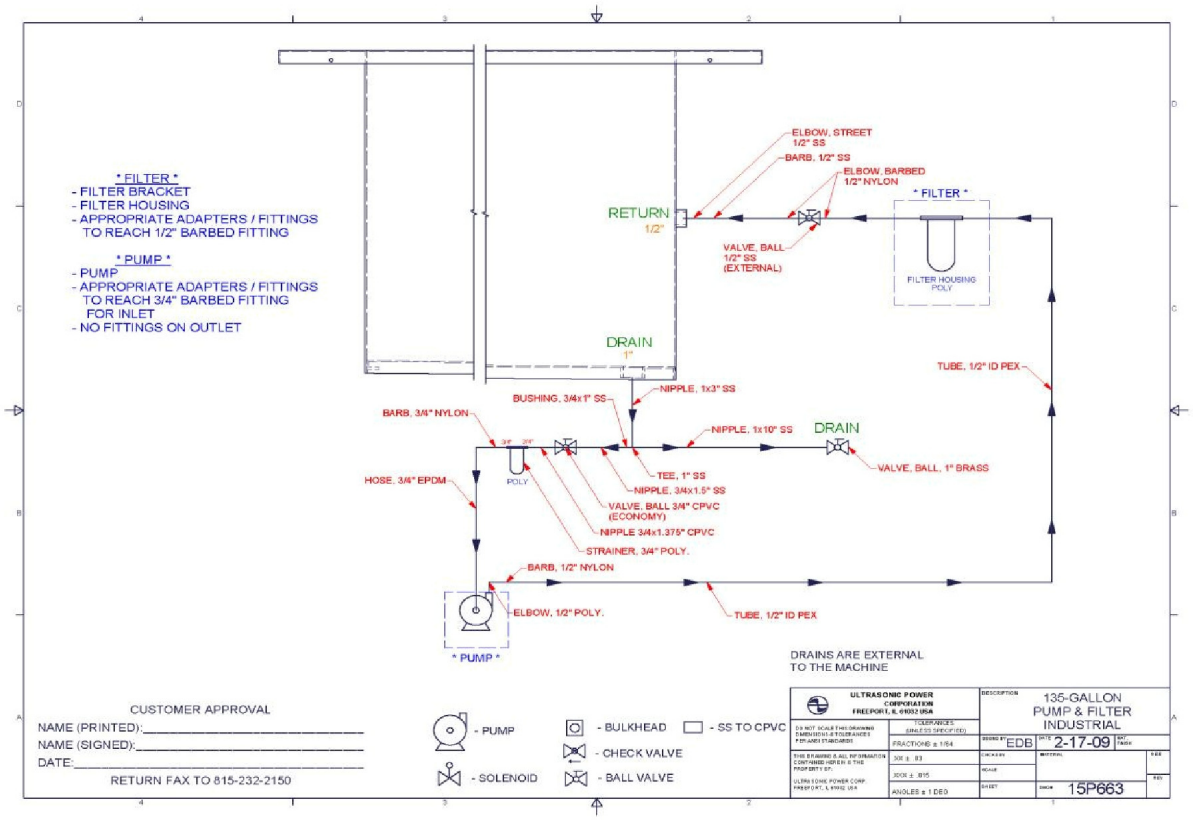
Plumbing Diagrams



Standard Plumbing Diagram



"Music" Plumbing Diagram



"Industrial" Plumbing Diagram

10. Warranty

Ultrasonic Power Corporation™ Warranty

Ultrasonic Power Corporation VIBRA-BAR™ *transducer modules and the bond to the radiating surface are unconditionally guaranteed not to crack, depolarize, deteriorate or detach from the radiating surface for ten (10) years from date of shipment.*

The radiating surface of the transducer is constructed of high quality stainless steel, but wear can result from cavitation erosion or chemical attack. This wear is excluded from the terms of this guarantee.

The Ultrasonic Power Corporation™ ultrasonic generator is guaranteed to be free from defects in workmanship and materials for a period of two (2) years from initial shipment date.

These guarantees are not applicable to equipment showing abuse, or when equipment has been used other than in accordance with the Manufacturer's instructions. Liability under this guarantee is limited to repair or replacement at Ultrasonic Power Corporation's™ expense, F.O.B. Ultrasonic Power Corporation™ service location. The nearest service locations shall be designated by Ultrasonic Power Corporation™ upon request.

11. Return of Equipment Policy

Please use the troubleshooting guide before contacting the customer service department. This will help in identifying the specific problem and expedite any repairs that may be needed.

All requests for repairs and replacements parts should be directed to the customer service department at Ultrasonic Power Corporation™, following the outlines procedure below.

1. Call the Customer Service Department at 1-815-235-6020 or 1-800-575-0168 Monday – Friday 7:00 A.M. to 4:30 P.M. Central Standard Time.
2. Please have the following information ready:
    A. The make and model of the system.
    B. The Serial Number of your system (can be found on the serial number plate).
    C. The specific problem or concern.

If it is determined that the system needs to be returned for repairs, the Customer Service Representative will assign a Return Material Authorization number (RMA). Please maintain this number for your records as this number will be the number for future reference on the system during the repair process.

Packaging

Be sure to package the system so that the shipping process will not cause additional damage to the system.

Ultrasonic Power Corporation™ is not responsible for shipping damage on equipment returned to the repair facility. Damage that occurs from shipping is not covered by the systems warranty.

Important notice

BY RETURNING ANY MATERIAL TO ULTRASONIC POWER CORPORATION™, THE CUSTOMER OR THE CUSTOMER'S AGENT THUS CERTIFIES THAT ANY MATERIALS SO RETURNED, OR HAVE BEEN RENDERED, FREE OF ANY HAZARDOUS OR NOXIOUS AND/OR INFECTIOUS MATTER OR RADIOACTIVE CONTAMINATION AND ARE SAFE FOR HANDLING UNDER NORMAL REPAIR SHOP CONDITIONS. **DO NOT** RETURN ANY MATERIAL, FOR WHICH SUCH CERTIFICATION CANNOT BE MADE WITHOUT PRIOR APPROVAL FROM ULTRASONIC POWER CORPORATION™.

The return address should be as follows:

Ultrasonic Power Corporation

RMA#_____

239 E. Stephenson Street

Freeport, IL 61032

Date of Shipment: _____

Two Year Warranty Expires: _____

Ten Year VIBRA BAR Warranty Expires: _____

Please contact your Ultrasonic Power Corporation™ representative with any question regarding your Ultrasonic cleaning system.