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1. Ultrasonic Cleaning

1.1 Introduction



Operating the generator with any portion of the safety systems or procedures bypassed can result in severe system damage and human injury.

This manual provides product descriptions, operating instructions, maintenance recommendations and troubleshooting procedures. Due to our constant efforts to build a better product, changes are made from time to time to our generators. These changes may not be reflected in this instruction manual. Therefore, when ordering replacement parts, please tell us the generator model number, serial number, and voltage, which may be found on a label at the rear of the generator chassis. You should also refer to the circuit board part number (with revision notation) and serial number, which are printed on the circuit board.

Serial Numbers: When communicating with Crest about transducerized tanks, please refer to the serial numbers of the tank and generator(s) shown on the metal identification plates. Most serial numbers will have the following type of numeric configuration: XXXX-T-YYYY (*example*).

If you have purchased Crest ultrasonic cleaning equipment which utilizes cable lengths greater than 20 feet between the generator(s) and transducers, you will need a *capacitance compensation package*. If such a package is not part of your current order, please contact the Crest Sales Department (609 883-4000) or your local Crest representative for a quotation.

1.2 Important Safety Notifications





For every cleaning liquids used, keep readily available all manufacturers' data with regard to toxicity, stability against corrosive breakdown, compatibility issues, and treatment of adverse reactions. Before using a chemical, read all instructions provided by the manufacturer and refer to them whenever there is any question at all about the use of the cleaning liquids.



Adequate Ventilation. Some cleaning liquids can be harmful or toxic to human life when used improperly. Always avoid skin contact with cleaning liquids. Do not ingest cleaning liquids.



Do not touched the sink and power transistors. The sink and power transistors will remain warm for some time after the generator is turned OFF and the power is disconnected.



High voltages exist in this equipment when the electrical power is turned on. Always disconnect power when servicing the equipment. When operating the generator, observe all practical precautions for the use of high voltage machinery, as dictated by applicable electrical codes and regulations. Observe all operating precautions as they are stated throughout this manual.

2. Product Description

2.1 Introduction



Figure 2-1: Genesis Ultrasonic Generator front view

This Genesis Ultrasonic Generator module consists of a narrow profile cabinet and a plug-in chassis. The cabinet has four rubber feet, a carrying handle, and an eight-pin connector receptacle to which is attached the line cord. At the front of the cabinet are two receptacles to receive the captive fasteners which hold the "Plug-In" chassis module. Metal brackets at the rear of the cabinet and the rear of the chassis module provide a convenient area for storing the line cord when the chassis is in the cabinet. Access to the eight-pin connector receptacle is gained by removing the four screws holding the angled metal cover at the rear of the cabinet.

2.2 Power and Grounding Requirement

The power cord from the cabinet has a conventional three-prong plug. The generator must be grounded through a third prong of the power cord or by use of a conventional grounding lug adapter.

Generators are available for operation at nominal voltages of 100, 120, 200, 208, 220, 230 or 240; 50/60 Hz; single phase A.C. current.

2.3 Potentiometers

The level of output power delivered to the transducers is adjustable by a trim potentiometer mounted on one of the generator circuit boards. This adjustment changes the peak amplitude of the power delivered to the load, but it does not change the duty cycle as a power intensity control would. It is particularly useful when power reduction is necessary to protect fragile items during cleaning.

The frequency of the power delivered to the load is also adjustable by a trim potentiometer on one of the generator circuit boards. The factory set frequency of 68 kHz, 40 kHz, or 25 kHz may be changed to eliminate standing waves in the cleaning solution or to minimize resonances in the structure of the cleaning system. These two adjustments are factory calibration procedures which should not be performed without adequate instrumentation and technical assistance from the factory.



Figure 2-2: Genesis Ultrasonic Generator without casing

2.4 Standard Controls



Figure 2-3: Genesis Ultrasonic Generator front view



Figure 2-4: Genesis Ultrasonic Generator rear view

The features on the Genesis Ultrasonic Generators are as follows:

Item	Feature
	With integral pilot light
On/Off Switch	• Located at the front panel of the Genesis Ultrasonic Generator

Item	Feature
	• Located at the front panel of the Genesis Ultrasonic Generator
	• This control may be turned fully clockwise for full output power
Adjustable Output Power Intensity Control	• Amplitude type PIC (Power Intensity Control) keeps the generator running non-stop over each half cycle of the line frequency
(Amplitude)	• The ultrasonic energy is controlled by adjusting the amplitude
	• The range of adjustment is about 50W to maximum (maximum being the power level to which the generator was factory adjusted).
	• Located at the rear side of the Genesis Ultrasonic Generator
	• The "Hi" position is a "full wave" modulation
Degassing	• The "Lo" position is a "half-wave" modulation
Modulation Selector Toggle	• "Half wave" may be required for degassing some solutions
Switch	• These the two modes of degassing modulation are required to obtain the correct balance between degassing and cleaning, under the broad range of cleaning conditions that can be encountered.
	Duty Cycle PIC (Power Intensity Control)
	Frequency Control
Optional Features	• Wattmeter
	Single Channel Network
	Three Channel Network
	• Logic Board
	Power Board
	• Back Panel
Other Electrical	• Jumper
Design Details	Multiple Generator Systems
	• Transformer
	Radio Frequency Interface
	Sweep Frequency

3. Operating Instructions

3.1 Introduction

Before operating, user is required to perform manual check on items as listed below in sequence:

- Verify that the plastic cap on the drain nipple of the tank is securely tight. Or, if the drain outlet is fitted with a valve, be sure that the valve is closed
- Fill the tank with the appropriate liquid to a depth sufficient to cover the parts being cleaned
- Check generator serial tag for proper power requirement

3.2 Importance Safety Notification



CAUTION	Be certain generator location permits air passage through the
	cabinet. Rear of generator should be at least 6" from any wall
	or other obstruction.



3.3 Operation

	Do not skip the degassing step. Some cleaning chemicals
	behave peculiarly in that when they are cold and not
CAUTION	degassed, a large burst of energy will appear in the tank
	immediately after the generator switch is turned "On."
	In general, cleaning may not be as efficient as possible when this occurs.

3.3.1 Tanks and Generator

Follow instruction below to operate tank and generator:

No.	Description
1	Refer to Ultrasonic Cleaning Tank manual for more information on the tank's operations.
2	Connect the tank coaxial cable 1/4 turns connector to the rear generator panel MHV connector.
2	NOTE : Do NOT move the wire soldered to the 120 volt tap. Instead, move the one with the spade connection.
3	Before operating, check generator serial tag for proper power requirement.
4	Plug the generator line cord into the appropriate outlet.
5	Set the modulation toggle switch on the rear of the generator to "Hi" position for full-wave modulation.
6	Plug the generator power cord into an appropriate wall outlet.
7	Turn on the cavitation in the tank by pressing on the front panel on/off switch. The red pilot light will turn on.
8	If the generator has more than one module, energize all modules by activating each front panel on/off switch.
9	Check to insure the fan is operating for proper cooling.
10	Allow time for degassing of the solution. Degassing of normal water detergent solutions will usually be completed within ten minutes. During degassing you may switch to the "Lo" position for half-wave modulation. NOTE : Although the peak power is the same, average power is
	reduced by one-half.

No.	Description
	For generators that have the optional output power intensity control
11	on the generator module, turn the control fully clockwise for full
11	output power.
	To reduce the output power, turn the control counterclockwise.
	Place the parts to be cleaned in a basket or fixture. Or, you may
	suspend a part using tongs. Either way, is certain that all surfaces to
10	be cleaned are fully immersed in the cavitating liquid. Tip parts with
12	blind holes to permit air to escape.
	NOTE : Ultrasonic cleaning will not take place if air is present, for
	ultrasonic cavitation does not occur in air.
12	After cleaning the prescribed time, the parts should be rinsed and
15	dried.
14	Turn off the cavitation in the tank by pressing on the front panel
14	on/off switch. The red pilot light will turn off.

3.3.2 Immersible Transducers and Generator

Follow instruction below to operate immersible transducers and generator:

No.	Description
1	Refer to Immersible Transducer manual for more information on the
1	immersible's operations.
	Fill the tank or container with enough cleaning solution to cover the
	radiating surface completely. Immersible may be placed at any
	position within the tank, but the radiating surface should be
	directed toward parts being cleaned.
2	Since immersibles will tend to float, mechanical fixtures should be provided. It is best not to use any fixture which touches the radiating surface.
	The smaller units can be held by a clamp or rod on the end fitting where the flexible cable is attached.
	For longer units, brackets can be provided on the housings if
	specified at time of purchase.
2	Connect the coaxial cable from the junction box to the generator
5	module.
4	Follow steps for degassing and processing parts as described in
4	Section 3.3.1 step 5 to 18.

3.3.3 Bulkhead Immersible and Generator

Follow instruction below to operate bulkhead immersible and generator:

No.	Description
1	Place the immersible in the tank or container with the 3/4" diameter mounting stud in the appropriate hole or holes in the tank wall. The diameter of these holes should be 7/8".
	By use of the hardware provided, make the connection liquid-tight.
2	Mount or place the junction box so that liquid from the tank will not spill on the box. If two mounting studs are present such as in Type DBB, one stud may not have any wires for it because it is used only to provide a stable mounting.
3	Fill the tank or container with enough cleaning solution to completely cover the radiating surface.
4	Connect the coaxial cable from the junction box to the generator module.
5	Follow steps for degassing and processing parts as described in <i>Section 3.3.1.</i>
6	Check and re-tighten lock nuts periodically.

4. Routine Maintenance

4.1 Cleaning the Generator



Always disconnect the generator from its power source and from the transducers before removing the generator cabinet to service the interior. Failure to do so may result in injury or death due to the presence of high voltages.

Item	PM Activity/Schedule	
Ultrasonic	Cleaning ultrasonic generator.	М

(D-daily; W-weekly; M-monthly;, Q-quarterly; HY-half-yearly; Y-yearly; TBD-to be determine)

Step	Description
1	Visually inspect generator to be sure they have not been expose to moisture, especially in the fan area.
2	If moisture present, clean up immediately. Determine cause of moisture and eliminate.
3	Clean generator vents and chassis modules by using air blow or air gun.