

OPTIONAL ULTRASONICS

If the ultrasonic cleaning option for the T-Series Liftkleen is purchased, the machine controls are located in a control enclosure on the side of the cleaning tank. The following controls are found on the enclosure control panel:

Control	Function
Temp/Time Controller	Sets the tank operating temperature and the cleaning cycle time.
Platform Up Pushbutton	Raises the cleaning platform.
Platform Down Pushbutton	Lowers the cleaning platform.
Main Power Selector Switch	Turns the control power on or off.
Ultrasonics On/Off Selector Switch	Turns the ultrasonic power on or off.
Oil Skimmer On/Off Selector Switch	Turns the belt-type oil skimmer on or off.
Heat On/Off Selector Switch	Turns the heater power on or off.
Heat Enabled Lamp	Indicates that the 7-day timer is allowing power to be supplied to the tank heaters.
7-Day Timer	Programmed to turn the tank heaters on and off according to a pre-set schedule. Can be set to turn on the heaters in advance of the workday so that the fluid is up to temperature when the shift starts. Turns off the heaters at the end of the workday to prevent excessive loss of cleaning fluid due to evaporation. Can be programmed to skip weekends.

INSTALLATION AND SETUP

MAKE SURE THAT THE ELECTRIC POWER AND THE COMPRESSED AIR SUPPLY TO THE MAIN CONTROL PANEL ARE DISCONNECTED.

1. Unpack the ultrasonic generator modules and place in the enclosure at the rear of the cleaning tank.
2. Connect the four RF cables from the cleaning tank to the connectors on the rear of the generator module enclosures.
3. Connect the power cables from the rear of the generator modules to the receptacles inside of the generator enclosure.
4. Turn on the power switches on the generator enclosures.
5. Turn the POWER and FREQUENCY SWEEP controls on the generator modules to the maximum (fully clockwise) position.

INSTALLATION AND SETUP (CONT'D.)

6. Fill the cleaning tank with the proper cleaning fluid. Follow the fluid manufacturer's recommendation when diluting the cleaning fluid with water. Make sure to leave approximately 6" of freeboard between the fluid surface and the top of the tank to prevent splashing.

NOTE:

Always start with the lowest concentration of cleaning fluid. Additional concentrate can be added during operation to achieve the required cleaning performance.

7. Connect the electrical power and compressed air supply to the Liftkleen control panel.
8. Turn on the Main Power selector switch.
9. Using the Temp/Time controller on the main control panel, set the desired fluid temperature. REFER TO THE TEMP/TIME CONTROLLER INSTRUCTION MANUAL INCLUDED WITH THIS EQUIPMENT.

NOTE:

The proper cleaning temperature will be in the range of 115° F. to 160° F. Always use the lowest cleaning temperature that will produce the desired cleaning performance.

10. Set the 7-day timer to allow heater power to be supplied. The Heat Enabled pilot lamp should illuminate. Turn on the Heat On/Off selector switch, the fluid should begin heating up.
11. Using the Platform Up and Platform Down pushbuttons, raise and lower the work platform.

NOTE:

FOR ULTRASONIC OPERATION, THE PLATFORM AGITATION SPEED MUST BE SET SLOWER THAN NORMAL. USING THE PLATFORM SPEED CONTROLS AT THE REAR OF THE LIFTING CYLINDER, SET THE PLATFORM AGITATION TO NO MORE THAN 6 STROKES PER MINUTE.

EXCESSIVE PLATFORM AGITATION SPEED WILL PREVENT THE ULTRASONICS FROM OPERATING PROPERLY AND RESULT IN DECREASED CLEANING PERFORMANCE

INSTALLATION AND SETUP (CONT'D.)

12. Turn on the Ultrasonics selector switch. It is necessary to de-gas the fluid in the tank before cleaning parts so the unit can operate efficiently. Degassing is done by running the ultrasonics with the new fluid in the tank for approximately 20 minutes. Using the Temp/Time controller, set the time for 20 minutes. REFER TO THE TEMP/TIME CONTROLLER INSTRUCTION MANUAL INCLUDED WITH THIS EQUIPMENT.
13. Press the START button on the Temp/Time controller. During this time you will notice a change in the pitch and volume of the sound of the unit that indicates degassing is taking place. At the end of the pre-set cycle, the ultrasonics will shut off and the unit will be ready for use.
14. Turn on the Oil Skimmer selector switch. The skimmer belt should begin moving. Make sure that the lower pulley of the skimmer is completely submerged in the cleaning fluid. Attach a ½" I.D. tube to the skimmer oil discharge and direct the other end to a pail or other receptacle to contain the separated oil for eventual disposal.

OPERATION

1. Load parts to be cleaned in parts baskets or directly on the work platform. Arrange parts to allow free fluid flow to all areas of the work. Make sure that concave or hollow parts can fill and drain completely when lowered into or raised from the cleaning fluid.

CAUTION:

DO NOT EXCEED THE LIFTING CAPACITY OF THE WORK PLATFORM – 120 LBS FOR THE 24" MODEL, 200 LBS FOR THE 36" MODEL.

2. Set the Temp/Time controller for the desired cycle time or for continuous operation. REFER TO THE TEMP/TIME CONTROLLER INSTRUCTION MANUAL INCLUDED WITH THIS EQUIPMENT.
3. Press the Platform Down pushbutton. The platform will lower into the cleaning tank and begin agitating.
4. **NOTE: IF AGITATION IS NOT REQUIRED DURING THE CLEANING CYCLE, SIMPLY HOLD THE PLATFORM DOWN BUTTON UNTIL THE PLATFORM RESTS AT THE BOTTOM OF THE TANK. THIS WILL PREVENT AGITATION.**
5. Press the Start pushbutton on the Temp/Time controller. The ultrasonics will start operation.
6. At the end of the pre-set cycle time the ultrasonics will shut off. The platform will stay submerged and remain agitating.
7. Press the Platform Up pushbutton. The platform will stop agitating and raise the work out of the cleaning fluid.
8. Allow the work to drain completely into the cleaning tank before removal.



This machine utilizes dangerous high voltage to operate the ultrasonic transducers. Only qualified trained personnel should attempt any repairs or servicing of the ultrasonic components. Disconnect all power before servicing the ultrasonic generators or tank heaters.

If in doubt about any servicing procedures, contact Graymills' customer service department at (773) 248-6825.

PRINCIPLES OF ULTRASONIC CLEANING

Ultrasonics is defined as a mechanical vibration above the range of human hearing (i.e., above 18,000 Hz.). Ultrasonic cleaning refers to the use of ultrasonic energy to assist in the cleaning of soiled objects while they are immersed in a cleaning fluid. Typical frequencies used in ultrasonic cleaning are: 20 kHz, 25 kHz, 40 kHz and 80 kHz.

Every ultrasonic cleaning system consists of three basic components:

An **Ultrasonic Generator** that converts 50 or 60 Hz. electric power from the electric utility supply to a high frequency electric signal in the ultrasonic range.

Ultrasonic Transducers to convert the ultrasonic electrical signal into mechanical vibrations.

A **tank** with the ultrasonic transducers bonded to its exterior and that contains the cleaning fluid and workpieces.

The tank is filled with a fluid suitable for the cleaning application. When the ultrasonic generator is activated, the transducers begin to vibrate at their natural frequency and couple the ultrasonic energy into the cleaning fluid. If sufficient energy is produced, the fluid molecules are pulled apart, creating microscopic "voids" or bubbles. This phenomenon is called **cavitation**. These cavitation bubbles increase and shrink in size in step with the ultrasonic frequency. Above a certain energy threshold, the bubbles will grow to an unstable size and then suddenly collapse, releasing a tremendous amount of energy into the fluid. If a soiled workpiece is immersed in the fluid, the cavitation bubbles will tend to collapse on the surfaces of the parts. This creates a scrubbing action that literally "blasts" away the contaminants from the parts.

TIPS AND GUIDELINES FOR EFFECTIVE CLEANING

1. Choose a workbasket with the largest openings possible without allowing the parts to fall through.
2. For extremely small parts, a solid bottom basket with weep holes is preferred.
3. If the parts tend to "nest" or stick together, gentle agitation or tumbling will insure that the cleaning fluid reaches all the surfaces.
4. Hollow or concave parts should be positioned so that they fill and drain completely during the cleaning cycle.

NOTE:

Remember that the ultrasonics can only reach where the cleaning fluid reaches.

CAUTION:

Always test a cleaning fluid with a sample part before cleaning a large workload.

5. Choose a detergent or cleaning fluid that is effective against the soil without damaging the parts or part surfaces.
6. Use the mildest cleaning fluid that will be effective in your application. Start with the weakest dilution ratio recommended by the detergent manufacturer and gradually add more concentrate until satisfactory cleaning is obtained.
7. Gentle heating usually improves the cleaning performance. The optimum cleaning range is between 120°F and 140°F. Higher temperatures may be required in some applications.

CAUTION:

Excessive Temperatures (Above 180⁰ F) will decrease the effectiveness of ultrasonic cavitation.

MAINTENANCE



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Be sure to unplug the power cord and allow the tank to cool for 15 minutes before draining the fluid. Operating the heaters or the ultrasonics with a dry tank or with insufficient fluid level will permanently damage the heaters or the ultrasonic transducers.

CLEANING TANK

The cleaning tank should be cleaned periodically to remove accumulated debris from the sides and bottom. This should be done at least weekly, or more often if soil accumulation is high.

Place the **HEATER** and **ULTRASONIC GENERATOR** switches in the **OFF** position.

1. Unplug the power cord from the electrical outlet.
2. Open the drain valve and allow the tank to empty.

3. Using a stiff brush or sponge, wash out the tank interior using a mild detergent solution. Rinse thoroughly and repeat as needed.
4. Close the drain valve and re-fill the tank with fresh water and cleaning solution.
5. Re-connect the power cord and resume parts cleaning operations.

ULTRASONIC GENERATORS



Turn off the ultrasonic generators and heaters, and allow the cleaning solution to cool to room temperature before immersing your hands into the cleaning fluid. Use rubber gloves to protect your hands.

GENERAL

Daily

1. Inspect the power cords and connector for deterioration or damage. Repair or replace a damaged power cord or connector immediately.
2. Do not allow the Sonic Liftkleen to sit on a wet surface. Wipe or mop up spilled water or cleaning fluid.
3. Remove any parts that may drop into the tank.

Weekly

1. Clean the tank interior as described above.
2. Inspect the drain valve and fitting for leaks. Repair any leaks immediately. Replace the drain valve if necessary.
3. Wipe the tank cabinet with a damp (**NOT WET**) cloth to remove accumulated detergent residues and soils. If left on the cabinet, the detergent residues may produce a permanent stain on the metal surfaces.

As Required

The ultrasonic generators have fans to cool the electronic components. The fans may become blocked with lint or debris that will inhibit the free flow of air. Periodically (every 2-3 months) under normal conditions, the fans should be inspected (for debris build-up), cleaned and placed back into service.