Ultrasonic Cleaning Baths

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User Guide
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ULTRASONIC CLEANING BATHS

QUICK START INSTRUCTIONS FOR USE

CLEANING LARGER ITEMS

Fill the stainless steel tank with hot water up to approximately 1-2 cm from the top.
Add cleaning fluid diluted according to the instructions.
Connect the plug to an earthed 220V power supply.
Turn the timer dial on the front panel clockwise to the required time (Range 0 – 15 minutes.)

CLEANING SMALLER ITEMS

Fill the tank to the halfway point with hot or cold water.
Immerse beakers, to create a bain-marie set up.
Make sure that the beakers are immersed at least halfway into the bath and that the water does not flow over the top.
Fill the beakers with diluted cleaner, watch solvent or pure water.
Continue the cleaning process as described above.

The cleaning times vary from about one minute to fifteen minutes depend on the amount of dirt to remove and the temperature of the cleaning bath.
Never operate ultrasonic cleaning baths without water in the tank.

INTRODUCTION

Ultrasonic cleaning baths use cavitation to remove dirt from objects that are immersed in the cleaning liquid. Cavitation is the sequential formation and collapse of vapour bubbles and voids in a liquid subjected to acoustic energy at high frequency and intensity. Cavitation occurs wherever the liquid penetrates, ensuring that the smaller and larger aperture sieves are cleaned equally well. Ultrasonic baths are also useful for cleaning fragile items such as glassware.

DESCRIPTION

High-frequency ultrasonic energy is generated by the ultrasonic generator. This is a high efficiency completely transistorised energy source. Ultrasonic generators are made of simple exchangeable electronic modules and are available with various power ratings and operating frequencies of 25kHz and 40kHz.

Operation is extremely simple: only one on/off timer switch. When switched on, full power is immediately attained. This power is not dependent upon temperature, level of liquid in the cleaning tank, or the number of parts cleaned per charge.

Ultrasonic generators are suitable for continuous operation. Ultrasound is generated by converting an alternating electrical voltage with a frequency in the ultrasonic range, into an acoustical vibration. The ultrasonic generator functions as power source. The conversion of electrical energy takes place in the transducers, which start vibrating.

Ultrasonic cleaning takes place through the immersion of articles in a cavitating liquid in the cleaning tanks. This cavitation is caused by the transducers attached under the bottom of the tank. This causes the bottom, or radiating surface, to operate as a membrane and results in a homogenous cleaning cavitation field. Magnetic influences on material to be cleaned are not possible.

CLEANING LIQUIDS

Do not use flammable, toxic or chemically aggressive liquids or agents.

The selection of a cleaning agent will generally be determined by the nature of the contamination, the items to be cleaned and by subsequent processing. The liquid should accelerate the cleaning process by chemically dissolving the specific contamination. Chemical attack of the surface to be cleaned must be avoided. Therefore, it is usually recommended that the user firstly experiments with a cleaning liquid that efficient without the use of ultrasonics. Cavitation is generated by the supply of mechanical energy by the transducers to the bottom of the vessel and thence to the liquid. The lower the surface tension of the liquid, the more contact there is between this liquid and the tank walls and bottom. Therefore, better energy transmission will take place when using liquids with a lower surface tension.

OPERATING INSTRUCTIONS

Before using your ultrasonic cleaning bath please consider the following points:

- Do not install the unit in a hot, humid or dusty area.
- Allow at least 15cm of free space between any surrounding objects to allow for proper ventilation.
- Fill the tank. Add suitable cleaning agent or a detergent to lower the surface tension.

A short time after switching on, once the liquid has degassed, the cavitation will start. This is indicated by a surface pattern and a fizzing or hissing sound.
Care should be taken that the cleaning tank is not overloaded with too large an item for the tank, or too many small parts in a single load.
Remember that the time required to clean any particular object depends upon the time, amount and location of the dirt to be removed. In some cases, where only surface dirt and grime are present, dirt may actually explode away in seconds. More deeply imbedded dirt and rust often require several minutes to remove.

MAINTENANCE

1. Drain the unit at least once a month, or as often as necessary and clean out the tank. Never wait until the dirt is baked on and can only be removed with difficulty.

- Regularly check the quality of liquid in the tank, and follow your supplier's instructions
- Ask the relevant (official) authorities about the regulations that apply to working with chemicals and organic solvents.

2. Visually check the installation for mechanical damage to submersible items, connection boxes, wiring, generators and the agitating mechanism.
3. Check the installation for leaks, for example from gaskets, taps, piper work and weld seams.
4. Check the ball bearings of the agitation mechanism. Re-grease them in good.
5. Check the oil level of worm gear reduction units. Clean the fan cover of the motor.
6. Check that there is no moisture in the connection boxes.
7. Check the connection cable for damage due to overheating and moisture.
8. Check the connecting plug for mechanical and moisture damage.
9. Check the generator for charred components.
10. Check that the fan in the generator is working. Replace the fan if bearing wear is audible.
11. Clean out dust and other dirt from inside the generator, using clean compressed air. Remember to clean the fan grille.
12. Check that the thermostat is working properly.
13. Check any safety devices (such as boil-dry thermostats, level switch).

WHAT TO DO IF THE GENERATOR MAIN FUSE BLOWS

Before replacing the generator main fuse, investigate whether the fuse has blown due to a fault:

- Check the generator load for a short circuit by measuring the resistance.
  The transducer connection plug with an ohmmeter (10 Kohm range).

  The reading must be:

- Check the printed circuits for blown fuses.
  If a fuse has blown, check the circuit board for faulty components, transistors, diodes, coils, etc.
- Check the connection of the supply transformer.
- Check the on/off switch.
- Check that the mains voltage is the same as the voltage stated on the generator.
- The rating of the fuse may be too low.