BioLAB

OPERATING MANUAL

MECHANICAL ULTRASONIC DESKTOP CLEANER

BULC-403 BULC-404 BULC-405 BULC-406 BULC-407

CE ISO9001 CERTIFIED

www.biolabscientific.com

INDEX

1. Packing List 2
2. Principle of ultrasonic cleaning 3
3. Product Features 3
4. Technical Parameters 4
5. Scope of Application 5
6. Installation and Preparation 5
7. Operation Instructions 6
8. Factors Influencing Performance 7
9. Maintenance 8
10. Malfunctions and Solutions 9
11. Application Safety 9
12. Warranty 11

1. Packing List

Item	Quantity	Accessories	Quantity
Ultrasonic cleaner	1	Cover	1
Operation manual	1	Power cable	1
Washing basket	1 (optional)		

Table 1

Please confirm whether the above items are complete and intact. If there is any damage or lack of accessories, please contact the dealer.

2. Principle of ultrasonic cleaning

Ultrasonic cleaning machine generates ultrasonic frequency electricity, which is converted by energy converter into high-frequency mechanical oscillation that is transferred to cleaning fluid. Ultrasound wave is beamed forwards unevenly in the cleaning fluid to make the fluid vibrate and generate tens of thousand of micro bubbles, which form and grow in the negative pressure area where the ultrasound wave travels longitudinally and close (crush out) in positive pressure area. Formation, growth and quick closure of the micro bubbles is called cavitation. In cavitation, closure of bubbles will generate instantaneous high pressure higher than 1,000 times of atmospheric pressure, and the continuous high pressure force hits surface of the work piece like numerous small blasts to peel off dirty on the surface and in clearance of object, and this is how the ultrasonic cleaning machine operates.

3. Product Features

1. Proprietary MCU-sweep ultrasonic generator driver circuit to present better cleaning performance and to minimize noise level.
2. Proprietary industrial ultrasonic transducer with high Q value and energy conversion efficiency and long service life.
3. Imported high-strength glue, staple-free bonding, and long service life of tank.
4. Mechanical timed cleaning for 1-60 mins and digital heating control, arbitrary set temperature up to 80 °C.
5.Internal tank fabricated of 1.0mm SUS304 stainless steel to present good performance and long service life.
6.Cleaning basket made of 304 stainless steel and electro-polished.
7. Outer Shell made of high-quality stainless steel to present good corrosion resistance.

4. Technical Parameters

Model	Internal Dimensions (L*W*H)	External Dimensions (L*W*H)	Volume(L)	Gross Weight(KG)	UltrasonicPower(W)	Heating Powery(W)	Drain valve	Frequency(KHz)	Time(Min)	Heating Temperature(°C)
BULC-403	240*135*100	268*170*243	3.2	4.77	120	100	no	40	1-60	30~80
BULC-404	240*135*150	268*170*290	5.0	5.4	120	200				
BULC-405	300*150*100	325*178*243	4.8	5.65	180	200	no			
BULC-406	302*150*150	325*178*290	6.8	6.2	180	200	no			
BULC-407	300*240*150	368*270*290	11	8.5	240	300	yes			
BULC-408	330*300*150	397*320*317	15	11.5	360	400	yes			
BULC-409	330*300*200	397*320*368	20	12.5	360	400	yes			
BULC-410	500*300*150	560*320*317	22	14.5	480	500				
BULC-411	500*300*200	560*320*385	30	16.0	600	500	yes			

Table 2

5. Scope of Application

Industry	Describe
Instrumentation	cleaning of measuring tools and fine cleaning of precision parts prior to assembly
Electronics	Removal of rosin and welding spots on printing circuit board and cleaning of HV contacts and other electronic parts.
Medical care	Cleaning, disinfection and sterilization of medical devices and lab glassware.
Semiconductor	Fine cleaning of semiconductor chips.
Timepiece and jewelry	Removal of grease, dirt, scale and polishing paste.
Chemicals and biologicals	Cleaning of lab glassware.
Optics	Cleaning of optical components and lens.
Textile dyeing and finishing	Cleaning of spinning spindle and spinneret.
Petrochemicals	Cleaning of metal filter mesh, chemical containers and exchanger.
Surface treatment	Removal of oil and rust before galvanic coating, cleaning and phosphating process before ion plating, removal of accumulated carbon, scale and polishing paste, activation of surface of work piece.
Machinery	Removal of oil/grease on parts and components, cleaning of engine, carburetor and automobile parts and components, filter, and filter mesh.

Table 3

6. Installation and Preparation

1. Place the machine horizontally at a well-ventilated and dry location.
2. Select appropriate detergent, cleaning water or other solution based on properties of work piece to be cleaned.
3. Properly and firmly connect the plug to a three-pin power socket which is grounded reliably to ensure safety.

7. Operation Instructions

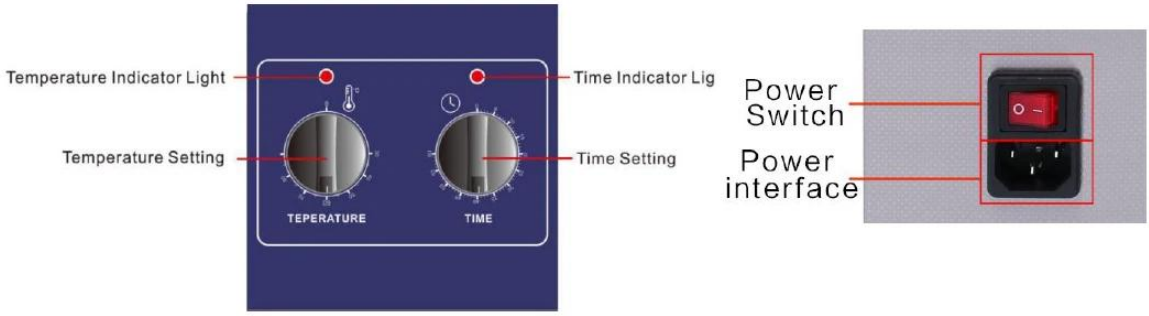

Figure 1

Operation Instructions:
1. Load cleaning fluid into the tank and connect the power supply (which shall be grounded reliably).
2. Adjust the ultrasonic working time: twist the knob to set the time, adjust the ultrasonic working time range: 1-60minutes, at this time the ultrasonic working indicator light is on, the ultrasonic working;When the ultrasonic working time is up, the working indicator light is off and the ultrasonic stops working.
3. Adjust the heating temperature: twist the knob to set the heating temperature, the range of heating temperature is 30-80 degree. When the actual water temperature is lower than the set temperature, the heating indicator lights up and starts to work. When the actual water temperature is higher than the set temperature, the heating indicator lights out and the heating stops.

8. Factors Influencing Performance

1. Ultrasonic power density:Higher power density results in better cleaning performance and higher cleaning speed. Higher power density is appropriate for cleaning of work piece with stubborn dirt, and lower power density is suitable for any precision work piece (generally ultrasonic power density ranges between 0.01-0.02w/ml).
2. Ultrasonic Frequency: Lower frequency results in better cavitation performance. Higher frequency contributes to better refraction/ reflection performance. Lower frequency should be applied for cleaning of simple surface while higher frequency for cleaning of complex surface with deep or inaccessible hole. (80KHz, 120KHz)
3. Cleaning temperature: Ultrasound wave will present the best cavitation performance at a temperature range between 40~50°C.Higher cleaning temperature facilitates breakdown of dirt, while a temperature above 70°C~80°C may impair effect of ultrasound wave and deteriorate cleaning performance.
4. Cleaning duration:Longer cleaning duration presents better cleaning performance (except for special material).
5. Other influential factors include type and properties of cleaning fluid and the dirt to be removed.

9. Maintenance

This machine shall be used, maintained by dedicated personnel and a full check on the equipment shall be performed regularly.
1. Check the power supply and line connections for any looseness, overheating, damp absorption or poor contact.
2. Inspect sealing of the bottom board of cleaning tank for any leakage.Check the joint between drain pipe and cleaning tank for leakage.
3. For looseness of ultrasound wave converter or burnout of power tube, contact the manufacturer immediately.
4. The ultrasound wave equipment shall be operated and stored at well-ventilated, dry and clean place to facilitate good performance and long service life.

10. Malfunctions and Solutions

malfunctions	solutions
Failure of Ultrasonic Wave	(1) Check whether the power cable has been connected properly (by inspecting operation of power indicator lamp). (2) Check whether PCB has been connected properly to the power socket. (3) Check whether the fuse tube is broken

Weak ultrasonic wave	(1) Check whether the power voltage is normal. (2) Inspect whether the energy converter get loose or there is any shock absorption material or work piece under the tank. (3) Check whether cleaning fluid temperature is normal (recommended operating temperature is higher than 30 degree) or there are many air bubbles in the fluid or on the tank wall (repeated power-on/off will reduce the bubbles). (4) Check whether the solvent is added excessively.
No heating	(1) Check whether target temperature is too lower (lower than current actual temperature). (2) Check whether the heater cable is disconnected or gets loose. (3) Check whether heater is broken (due to shortage of cleaning fluid)
Electric leakage	(1) Check whether the machine has absorbed damp or corroded. (2) Check whether cable tray to each component is damaged, loosened or broken. (3) Check whether the earthing wire is in good condition.

Table 4

11. Application Safety

Safety Considerations
1. Warns: This product contain dangerous voltage, so do not start it at a high-temperature or humid location to avoid electric shock.
2. Do not impose great impact to this machine, and handle it with care to prevent impairment to performance or life span of it.
3. Locate this machine properly to avoid any accident resulted from children's access to it.
4. Perform any maintenance operation only after the power supply is disconnected to avoid any safety accident.
5. The machine contain high voltage during operation, so do not dismantle its enclosure to avoid any hazard.
6. For any damage to the power cable, contact your service center or your dealer for replacement.
7. Clean the enclosure with soft dry cloth after disconnecting the power cable.
8. Protect the machine from splash of rain or water to avoid electric shock or fire, and keep it away from any location with high temperature or humidity.
9. For reason of personal safety, do not dismantle the enclosure for repair or change on your own.

Safety Considerations
1. During normal operation of ultrasonic generator, a consistent sound is resulted from the harmonic oscillation of the tank body impacted by ultrasound wave, and no agitation but ripple is caused on the surface of cleaning fluid by explosion of cavity. In case of discontinuous oscillation, increase or reduce the cleaning fluid by a small quantity to eliminate such oscillation to facilitate cleaning of work piece.
2. While ensuring adequate cleaning of work piece, keep the generator operating intermittently, as long-term consecutive operation may result in high temperature insides and accelerate aging of electronic components in it.
3. Absolutely do not use any inflammable detergent.
4. Start heating or ultrasonic wave generator only when the cleaning tank contains fluid, or otherwise the machine may be burnt out or even result in fire.

5. Prevent splash of cleaning fluid or water into the machine or energy converter, which may cause electric leakage or short circuiting, and thereby damage to the converter.
6. Any foreign matter falling into the tank shall be taken out immediately.
7. Before changing or discharging the cleaning fluid, make sure the fluid is at normal temperature and the ultrasonic wave generator is shut down and the power supply is disconnected.
8. Remove any dirt in the tank after operation.
9. Keep the external surface of the machine clean.

12. Warranty

1. Validity of warranty: One year from the date of purchase
2. Please keep this after-sale service card properly, or otherwise the warranty will be invalid.
Warranty will be invalid in any one of the following cases:
• The machine fails or is damaged due to improper use or unauthorized disassembly of the product by user.
• The machine is damaged due to force majeure (e.g. fire, flood, earthquake).
• The machine is damaged due to failure to operate the machine in accordance with the instructions.
• The machine is damaged due to improper repair by anyone other than our technician.
• The warranty card and/or purchase invoice is unavailable or be altered without authorization.

Warranty Card			
User Information			
Customer Name	_____	User's Telephone	_____
User's Address	_____		
Product Information			
Product Model	_____	Attached Number	_____
Purchase Date	_____	Dealer Name	_____
Dealer's Telephone	_____	Dealer's Seal	_____
Dealer's Address	_____		

Table 5

Biolab Scientific Ltd.
Trillium Executive Center, East Tower, 675 Cochrane Dr, Markham, Ontario L3R 0B8, Canada
Email: info@biolabscientific.com | Website: www.biolabscientific.com