Kalstein®

# Ultrasonic Cleaner

# Model Series YR05210

# Instruction Manual

Thank you very much for purchasing our Ultrasonic Cleaner Model Series YR05210.

Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” at a hand place for future reference.

Warning: Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.

## I. Packing List

One ultrasonic cleaning machine
One power cable
One copy of product operation manual
(*One cleaning basket (optional))

Please verify your product pack for integrity against the aforesaid list. For any damage to the packing or missing of any component, immediately contact your dealer.

## II. Operating Principle

Ultrasonic cleaning is based on such a principle that, high frequency oscillation signals from ultrasonic wave generator is converted into high-frequency mechanical oscillation, which is transferred into the medium - solution, where the waves are radiated forwards in an alternative density to make the liquid flow and generate tens of thousands of tiny air bubbles in diameter of 50~500μm which keep vibrating under the effect of the acoustic field, forming and growing in negative pressure areas through which the ultrasound waves travel vertically and rapidly enlarging and suddenly closing in positive pressure areas when acoustic pressure reaches to a certain value; such closure of air bubbles generates shock waves and impose over one thousand of atmospheric pressure around them, and thus breaks down and disperse insoluble dirt around the cleaning fluid, and any solid grains covered by oily dirt and attached to the surface of the work piece are removed off when the oily dirt is emulsified, so that the work piece is cleaned and sterilized.

## III. Product Features

1. Higher ultrasound wave power conversion ratio, faster cleaning and times or scores of times higher cleaning efficiency than conventional method.
2. High cleaning performance, excellent cleanliness and effective cleaning of even any inaccessible parts such as hole and seam.
3. Sterilization of work piece, dissolution of organic contaminant and corrosion protection.
4. Fabrication of high-quality embossed stainless steel with excellent rust protection and aesthetical appearance; cleaning tank made of quality SUS304 stainless steel pressed formed free of welding seam and watertight.
5. Cleaning temperature adjustable between 20~80℃, operating time displayed and controlled digitally with LED and ranging between 0~30 minutes to meet various cleaning needs.
6. Drain and heat dissipater provided in models of 6L or larger in user-friendly design for quick discharge of waste water after cleaning.
7. Cleaning basket with mesh screen fabricated of stainless steel argon arc welded for easy use.
8. High-quality key component imported overseas for easy use.
9. Safe and reliable cleaning process without need of manual intervention and free of damage to surface of work piece, using less solvent, heat energy, space occupation and manpower.

## IV. Technical Parameters

| Model | Internal Dimensions (L*W*H) | External Dimensions (L*W*H) | Volume (L) | Net Weight (KG) | Ultrasonic Capacity (W) | Frequency (KHz) | Heating Capacity (W) | Time (Min.) | Heating Temperature (℃) |
|---|---|---|---|---|---|---|---|---|---|
| YR05210 | 240*135*100 | 342*240*310 | 3.2 | 5.92 | 120 | 80/100/130 | 100 | 0~30 | 20~80 |
| YR05211 | 240*135*150 | 342*240*345 | 5.0 | 6.55 | 120 | | 100 | | |
| YR05212 | 302*150*100 | 402*252*311 | 4.5 | 6.7 | 180 | | 200 | | |
| YR05213 | 300*240*100 | 368*270*253 | 6.8 | 7.2 | 180 | | 300 | | |
| YR05214 | 300*240*150 | 412*357*380 | 11 | 7.4 | 240 | | 300 | | |
| YR05215 | 330*300*150 | 472*437*470 | 15 | 9.65 | 360 | | 400 | | |
| YR05216 | 330*300*200 | 472*437*470 | 20 | 10.5 | 360 | | 400 | | |
| YR05217 | 500*300*150 | 657*452*430 | 22 | 12.31 | 480 | | 500 | | |
| YR05218 | 500*300*200 | 657*452*475 | 30 | 13.8 | 600 | | 500 | | |

## V. Scope of Application

1. Machinery: Removal of oil/grease on parts and components, cleaning of engine, carburetor and automobile parts and components, filter, and filter mesh.
2. 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.
3. Instrumentation: cleaning of measuring tools and fine cleaning of precision parts prior to assembly.
4. Electronics: Removal of rosin and welding spots on printing circuit board and cleaning of HV contacts and other electronic parts.
5. Medical care: Cleaning, disinfection and sterilization of medical devices and lab glassware.
6. Semiconductor: Fine cleaning of semiconductor chips.
7. Timepiece and jewelry: Removal of grease, dirt, scale and polishing paste.
8. Chemicals and biologicals: Cleaning of lab glassware.
9. Optics: Cleaning of optical components and lens.
10. Textile dyeing and finishing: Cleaning of spinning spindle and spinneret.

11. Petrochemicals: Cleaning of metal filter mesh, chemical containers and exchanger.

## VI. Installation and Preparation

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

## VII. Operation Instructions

### Picture of Product


### Operation Instructions

1. Load cleaning fluid into the tank and connect the power supply (which shall be grounded reliably). After power-on, current actual temperature is displayed and the default temperature is 0℃. The ultrasound wave operating time is 3 minutes by default.
2. Adjustment of ultrasound wave operating duration: Increase the duration by one second by each press on Duration Increase (press down and hold the button to increase consecutively). Decrease the duration by one second by each press on Duration Decrease (press down and hold the button to decrease consecutively).
3. Adjustment of operating temperature: Increase the temperature by one degree by each press on Temperature Up (press down and hold the button to increase consecutively). Decrease the temperature by one degree by each press on Temperature Down (press down and hold the button to decrease consecutively). When the set temperature is higher than current ambient temperature, the heating system is started and the heating indicator light turns on. When the set temperature is lower than current ambient temperature, the heating system stops operating.
4. After the operating time and temperature have been set, press ON/OFF button to start operation, and press ON/OFF again to

stop operation.

## VIII. Factors Influencing Performance

1. Ultrasonic wave 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, 130KHz)
3. Cleaning temperature: Ultrasound wave will present the best cavitation performance at a temperature range between 40~50℃. Higher cleaning temperature facilitates breakdown of dirt, while a temperature above 70℃~80℃ 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.

## IX. 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 converted 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.

## X. Troubleshooting

| Problem | Solution |
|---|---|
| Failure of Ultrasonic Wave | (1) Check whether the power voltage meets the rated value, or fluctuate significantly.<br>(2) Check the power socket, switch, connection terminal and joint for looseness.<br>(3) Inspect the fuse for any abnormal flash or noise.<br>(4) Check the power tube for any damage. |
| Weak ultrasound wave or operation with whistle | (1) Check whether the energy converter is affected with damp or the insulation resistance is normal.<br>(2) Inspect the power cable for any external damage or damp absorption.<br>(3) Check whether the power voltage is normal.<br>(4) Inspect whether the energy converter get loose or there is any shock absorption material or work piece under the tank.<br>(5) Check whether the cleaning fluid is in normal temperature or any improper operation was performed. |
| Electric leakage (distinguish between failure of | (1) Check whether the power cable is affected with damp, or the supply voltage is in frequent excessive fluctuation.<br>(2) Check whether the machine is affected with damp and thereby corroded. |

| | |
|---|---|
| the main unit and that of generator by removing the HF connector and checking insulation) | (3) Check the cable tray to each component is damaged, loosened or broken.<br>(4) Check whether the heating plate is destroyed or broken.<br>(5) Check whether the ground wire is in good condition. |
| Arc strike or abnormal flash or noise | (1) Poor isolation or damp absorption of oscillator.<br>(2) Check whether any connection or terminal gets loosened or in poor contact. |

If the problem cannot be removed, contact our service center or return the equipment to the HQ or your local office for handling.

## XI. Application Safety

### Safety Considerations

1. Power voltage of AC240V/50Hz shall be used for this machine.
2. Warns: This product contain dangerous voltage, so do not start it at a high-temperature or humid location to avoid electric shock.
3. Do not impose great impact to this machine, and handle it with care to prevent impairment to performance or life span of it.
4. Locate this machine properly to avoid any accident resulted from children's access to it.
5. Perform any maintenance operation only after the power supply is disconnected to avoid any safety accident.
6. The machine contain high voltage during operation, so do not dismantle its enclosure to avoid any hazard.
7. For any damage to the power cable, contact your service center or your dealer for replacement.
8. Clean the enclosure with soft dry cloth after disconnecting the power cable.
9. 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.
10. 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.

# XII. Warranty

## 1. Return free of charge within seven days of purchase

Within seven days of purchase (based on the date on the invoice), you may return the product or have it replaced or repaired free of charge in case of any malfunction of any component as identified. For return of the product as a whole, please take the product along with any accessories to your dealer. The product price as paid by you (based on the formal invoice) will be fully refunded.

## 2. One-Year Warranty

We provide the product with warranty which is valid for one year from the purchase date, during which, any breakdown or failure of any component in the product will be subject to repair service free of charge.

## 3. Customer Service Approach

We may choose to repair, replace or accept return of the product to fulfil the warranty hereunder to the extent as required by any applicable laws. In case of any failure of the product, you may take it to the nearest service agency as approved by us for repair. Or you may choose to deliver the failed product at your own cost to our HQ for repair service.

## 4. Exemptions

1) Unless explicitly stated herein, we have made no commitment or warranty, express or implicit.
2) We are not responsible for any commitment made by any third party (e.g. the dealer) other than those contained herein upon purchase of the product or any auxiliary software/hardware attached thereto. You should request any written certificate from such third party to ensure fulfillment of the said commitment.

## 5. Certificate of Warranty

The purchase invoice is the basis for our warranty and service standard, and shall be kept properly as a certificate of warranty. For fulfillment of the warranty by us or any service agency approved by us, you have to take the effective purchase invoice and the warranty card along.

## 6. Notes:

We will provide you with the warranty as specified in our service standard. For any other service which is out of the range of the warranty, you may select another service agency as approved by use for any paid service.

You must show related certificate for provision of the warranty by a service agency approved by us.

The decision on replacement of the whole machine or any component thereof shall be made by us or any service agency approved by us, and the original failed machine or any component thereof replaced shall be owned by us or the service agency.

| 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 | | | |
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