
Operation and maintenance manual

Micro mini centrifuge



MiniL-12G

**Safety
code**

For your safety, please read the operating manual carefully before starting the operation. Parts are subject to heat, humidity and biological changes that can cause functional degradation or even loss of safety and cause accidents!

Foreword

The copyright of this manual belongs to Changsha Yingtai Instrument Co.,Ltd and no one may reprint or distribute any content related to this manual, including pictures and audio-visual products.

The device operator can copy some of the sections of this operating manual, but only for internal use, for example, to guide the user how to deal with emergencies.

The chapters are clearly marked in the manual's catalogue.

Yingtai is not responsible or liable for any damage to the instrument caused by the user's failure to use the "instrument environment" as stated in the manual.

Yingtai reserves the right to modify the contents of the operating manual at any time without proper notice.

Instrument use environment



To ensure the continued safety of the machine, the following factors may damage the centrifuge:

- chemical effects;
- environmental impacts, including natural UV radiation;
- Corrosion and wear of hood parts and other safety parts.

- * indoor use;
- * Altitude: $\leq 2000\text{m}$;
- * The applicable ambient temperature range of the instrument is $+5^{\circ}\text{C} \sim +40^{\circ}\text{C}$;
- * The working temperature range of the instrument is $\leq 80\%$;
- * ***The working model of the instrument working power supply and its main technical parameters;***
- * There must be sufficient ventilation in the room;
- * There are no vibrations and airflows around the performance;
- * There is no conductive dust in the surrounding air, explosive gas and corrosive gas;

safety warning

- * Use this machine for the first time, please read this manual carefully!
- * MiniL mini centrifuges can only be operated by trained and authorized personnel;
- * Equipment maintenance can only be done by Yingtai or Yingtai authorized agents;
- * Do not use the following materials in the centrifuge:
 - Flammable and explosive materials;

- strong chemical action materials;
- Toxic or radioactive substances, or pathogenic microorganisms.
- * Only qualified maintenance personnel can use the appropriate tools to perform maintenance on the MiniL mini centrifuge system.
- * If the operator encounters a situation not mentioned in this manual, please contact the authorized agent of Yingtai or Yingtai to inquire about the correct treatment.
- * Try to use the accessories provided by Yingtai. If the user wants to use other accessories, Yingtai will not be responsible for the adverse consequences. However, the user can apply to Yingtai to verify that the accessory meets Yingtai's requirements.
- * The MiniL mini centrifuge must be inspected and maintained at regular intervals.

Safety warning sign description



Note: Please read the instruction manual carefully before using the instrument!



Attention: Danger of high voltage! Risk of electric shock!



Meaning of the safety instructions

In order to avoid damage to surrounding people or damage to surrounding objects and the environment, please be sure to follow all safety instructions in this user manual.

In addition to accident prevention, environmental protection, and recognized professional rules in safety and occupation, including the country where the user is located and the local laws and regulations for the installation of the centrifuge, they must be carefully observed.

Neglecting the consequences of safe operating procedures

Any violation of safe operating procedures, laws, regulations and rules will lead

to harm to people, objects and the environment.



Safety Precautions

- * Do not plug or unplug the power plug and toggle the power button when the hands are in possession of liquid!
- * Do not plug or unplug the power plug when the instrument is powered!
- * It is strictly forbidden to maintain and scrub the instrument under power-on state!
- * Do not allow the sample volume to exceed 70% of the tube capacity for centrifugation!
- * It is strictly forbidden to install the instrument on the work surface with unevenness and shaking vibration!
- * When the rotor is not completely stopped, it is strictly forbidden to put the hand or other objects on the rotor, in an attempt to replace the instrument brake!

1. Product Description:

MiniL adopts international advanced design concept and manufacturing technology, the shape is smooth and beautiful, the structure is compact and firm, the high versatility, the simple operation and so on, it is a rare instrument for scientific research experiments. This handheld centrifuge is ideal for microtube filtration and rapid centrifugation, micro blood cell separation, microbial sample processing, PCR experiment zone centrifugation, and prevention of liquid wall hanging in the centrifuge tube.

2.Product main technical parameters and rotor parameter description:

Product number	MiniL-12G
Input power	AC100-250V/50/60Hz
Power fuse	PPTC / self-recovery fuse / no need to replace
Input power [W]	45W
control method	ST16 bit MCU/PWM/speed regulation;
Display method	Black and white LCD
motor	DC24V/DC permanent magnet motor
Effective centrifuge time	1-99min./1-59sec.
Speed [r/min.]	500 ~ 12000rpm±5%
Speed increase	500rpm
Maximum relative centrifugal force [×g]	9660×g
Misoperation/fault alarm	Voice prompt + display code
Size: length × width × height [mm]	194×229×120
Weight (no rotor)	2Kg
Noise at maximum speed	≤47dB(A)
Fastest acceleration time	≤12s
Fastest deceleration time	≤16s
Protection level	IP21
Allowable ambient temperature / relative humidity	5-40℃/80%
Power Consumption(W)	a.Highest power :48W b.During normal operation 45Wc.Stand-by mode:5W
Plug	Hospital Grade Type F power plug in compliance with Indonesia requirements.

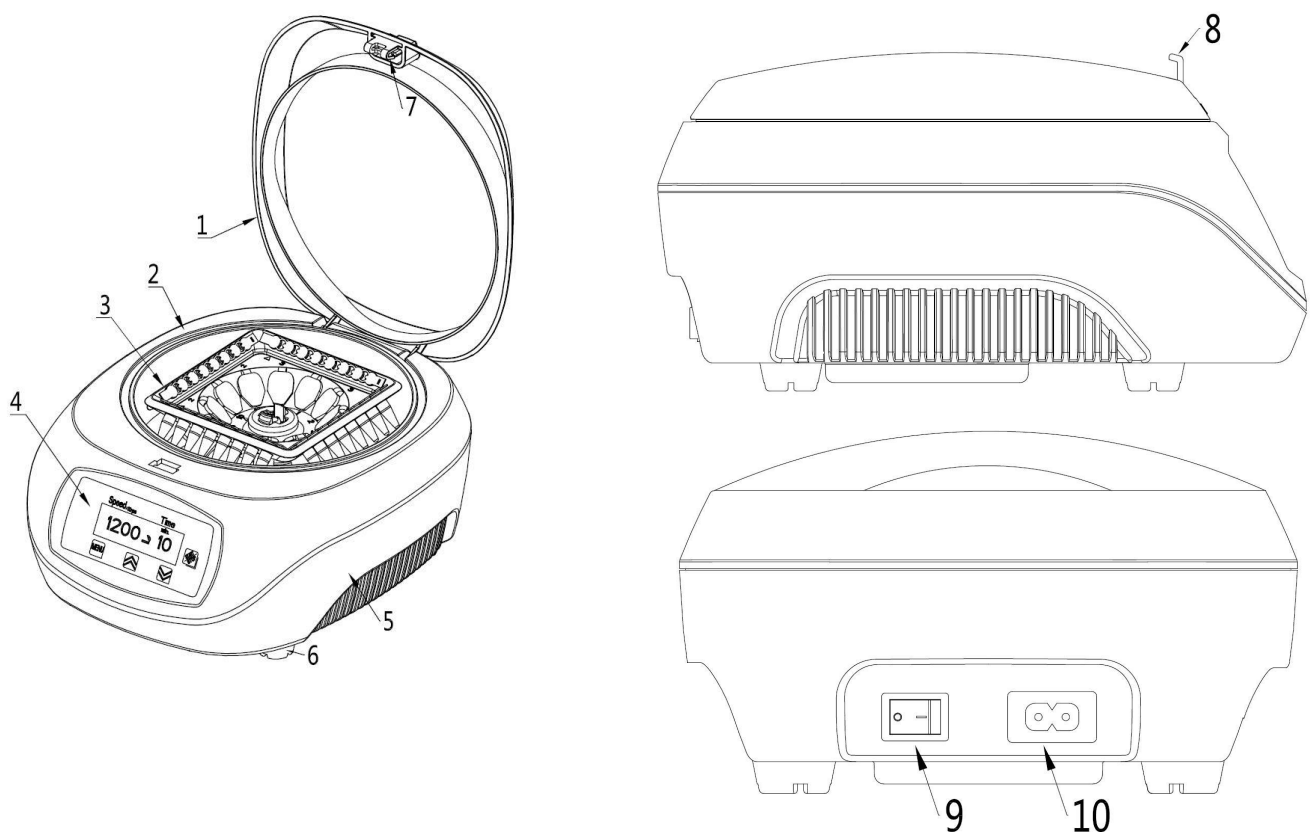
Note: Ambient temperature 23 ° C / at 23 ° C ambient temperature

MiniL rotor parameter description:

MiniL-12G

Product number	Rotor number (Rotor)	Capacity (ml × tube number)	Maximum speed (r/min.)	Max Rcf	Test tube type
MiniL-12G-A-1	#1 Angle-rotor	1.5/2.2×12+PCR0.2× 8×4 row	12000	9500	PP cone bottom cover
MiniL-12G-A-2	#2 Angle-rotor	PCR 0.2×12×4 row	12000	5960	PP cone bottom cover
MiniL-12G-A-3	#3 Angle-rotor	5×4	12000	9660	PP cone bottom cover
MiniL-12G-A-4	#4 Angle-rotor	Capillary blood volume tube × 12	12000	8371	Diameter 1.5mm×40
MiniL-12G-A-5	#5 Angle-rotor	5/1.8/1.1×4	7000	3180	PP can be screwed

3. MiniL mini centrifuge appearance function introduction



- 1.Transparent cover. 2. On the base.
3. Turn the head. 4. Operation display panel. 5 lower base. 6. Non-slip mat.
7. Locking. 8. Open the lever. 9. Power switch.
- 10.AC100-250V power socket The picture above shows MiniL (appearance diagram 1)

4.Operation instructions



Note: Before using the instrument, please ensure that the instrument is transported without damage!

*** Whether the appearance of the instrument is brand new!**

*** The transparent cover pulls the cover lever to make it easy to open without any abnormal sound!**

*** Whether the rotor elastic buckle is tightly fitted on the motor spindle!**

*** Whether the edge of the cushion is firmly stuck on the main body casing!**

*** The power switch and power cord are securely attached to the main body casing without looseness!**

****The instrument can be safely used without any of the above phenomena****



If there is any of the above, please contact the manufacturer or the authorized dealer of the manufacturer in time, and do not repair it yourself without the guidance of professional maintenance personnel!

4.1 [open/close]

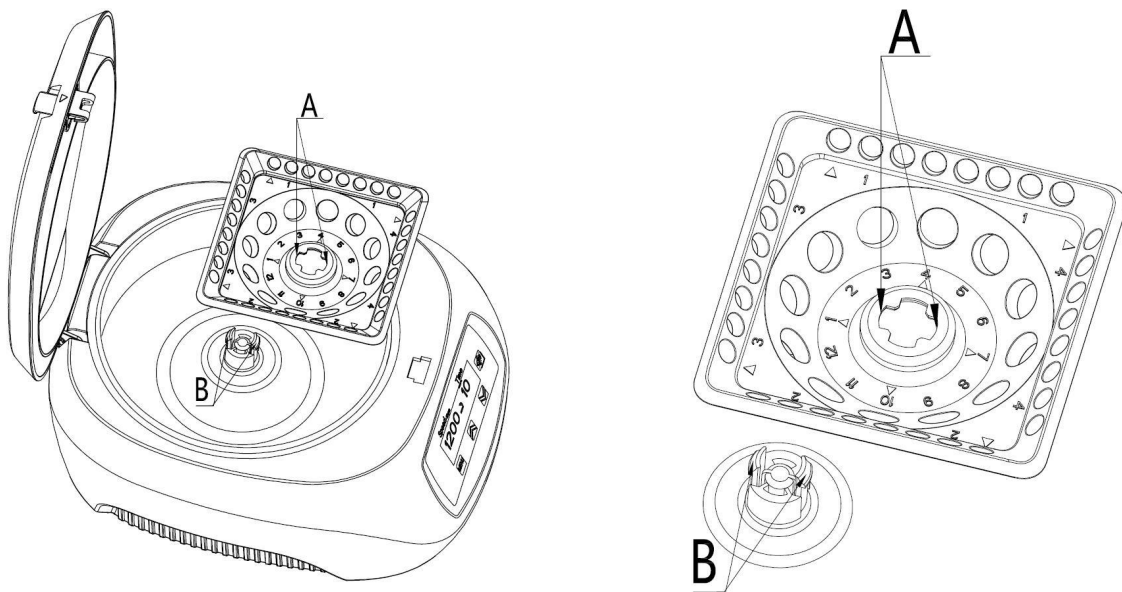
[Open cover] The cover lever (8) in the appearance diagram 1 is pulled in the direction of the panel and then lifted upwards to open the transparent cover at this time;

[Close] The transparent upper cover in the schematic view of the first one, and the cover is slowly closed downwards. When the sound of "Carbazole" is heard, it indicates that the transparent upper cover has been locked with the main body casing;

4.2 [Turn On/Off Power]

The power switch button in the appearance diagram 1 is set to the “ I ” position to turn the power on, and the “O” position to turn the power off;

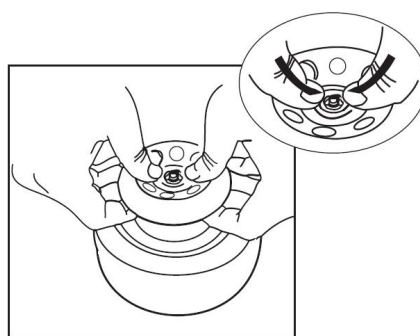
4.3 [Installation / Disassembly of the rotor]



The picture above shows the universal rotor of MiniL mini centrifuge (installation diagram 1)

[A" and "B" directions in the "mounting rotor" (installation diagram 3), that is, the position indicated by the arrow "A" of the rotor and the position of the rotor elastic buckle "B", to ensure that the positioning holes of the two positions are the same. Hold the rotor symmetrically with both hands and press it vertically. When you hear the sound of "Carbazole", it indicates that the rotor has been locked with the elastic buckle of the rotor. It should be further verified whether the installation is in place. At this time, grasp the rotor with both hands and slowly lift it up. The head is firmly fixed on the elastic buckle of the rotor, indicating that it has been correctly installed in place; (Note: The configuration of the adapter is the same!)

[Disassembly Turn]



The picture above shows the universal rotor of the MiniL mini centrifuge (disassembly diagram 1)

According to the direction of the arrow in (disassembly diagram 1), hold the rotor with both hands and squeeze the two thumbs inward, slowly lift the rotor up and take it out; (Note: The disassembly method is the same!)

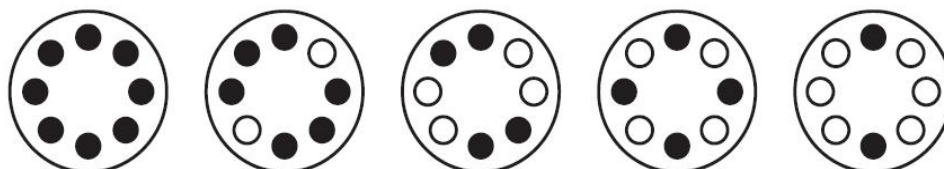
Never use a strong pull out of the rotor!

Will cause the rotor to deform or damage the motor!

The face with the Arabic numerals printed on the head is front.

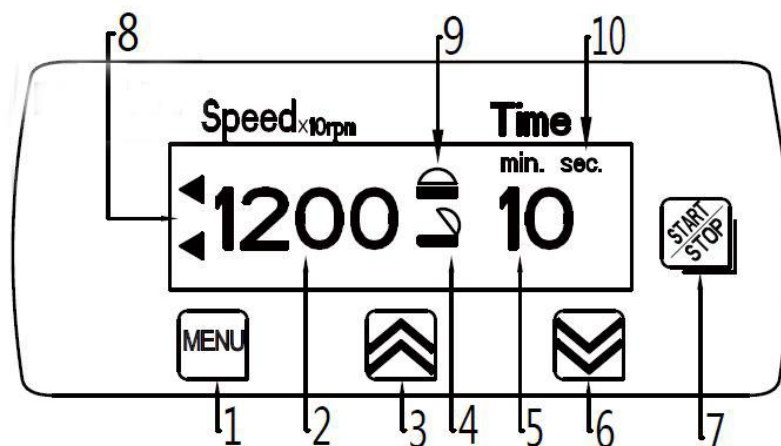
Should be facing up, the reverse may cause the machine to be damaged and the personnel to be hurt!

4.4 [Test tube placement method]



Symmetrically balanced placement of 12-, 8-, 6-, 4- and 2-tube angles (Figure 1)

4.5 【Operation Panel Description】



1. MENU button:

switch speed / time (min. / sec.); 2. speed display area; 3. parameter increment key; 4. door cover open indicator; 5. time display area; 6. parameter decrement key; .Start/stop button; 8.Operation indicator; 9. Door cover closing indicator; 10. Time unit indicator character;



4.6 [Start/Stop Instrument]

4.6.1 Example of use

[Start the instrument]

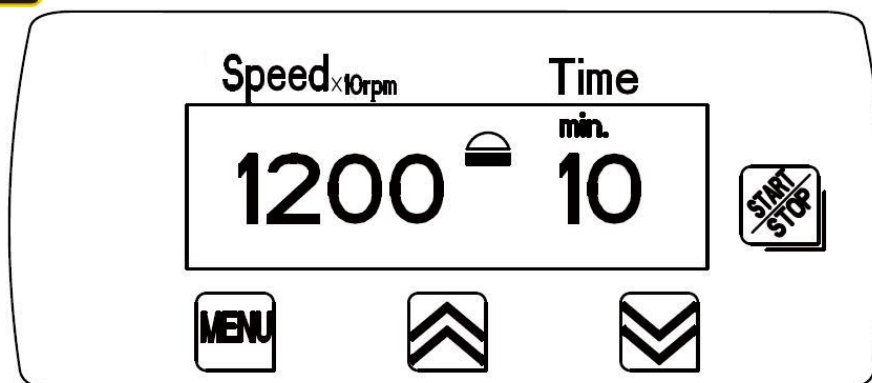
Open the transparent cover → install the required rotor → symmetrically place the sample → turn on the power → close the transparent cover;

For example: If the speed is set to 12000 rpm, the time is 10 min.

press The key speed display area flashes, press Increase the key to 1200, then press Key to time zone min. flashing, press Key or The key is adjusted to 10, and the system flashes 2 times automatically defaults;



The settings are as follows:



press



When the key is activated, the machine will stop the operation according to the set time countdown, and the buzzer alarm will prompt the completion of the centrifugation;

The first time the instrument is turned on, due to the vibration generated during transportation, the static brushing of the carbon brush for a long time will cause a slight carbon brush friction noise at the start-up. If the instrument is idling for 2-3 minutes, the motor will operate normally without worrying about the instrument. quality!

[Stop instrument]



Centrifuge at the end of the process can be directly pressed The key stops, the standby device stops running, the transparent upper cover is opened → the sample is taken out → the power is turned off (the transparent upper cover is closed without the need to lock when the instrument is no longer used);

4.6.2 [About Calculation of Centrifugal Force]

The relative centrifugal force is typically thousands of times the Earth's gravity (g), which is a measure of the efficiency of various instruments to separate or precipitate objects. The calculation of the centrifugal force is related to the centrifugal speed and the centrifugal radius, and is calculated according to the following equation:

$$RCF = 11.18 \times (n/1000)^2 \times r$$

r: is the radius of the centrifuge, in cm;

n: centrifugal speed, unit rpm (revolutions per minute)

Note: "The maximum centrifugal force value is related to the maximum centrifugal radius";

5. Maintenance matters

Do not attempt to clean the centrifuge when the power cord is plugged in or the

power switch is turned on. If the equipment or accessories are contaminated by pathogenicity, toxicity or radioactive materials, it is the responsibility of the user to perform proper purification. This should be explained when developing the "Laboratory Biosafety Manual". **Cleaning and Decontamination** In addition to the other requirements mentioned in this chapter, please contact our company to check if they are likely to damage the equipment. If you plan to return equipment or accessories to the company or request repair, you must ensure that the equipment or accessories are clean and harmless to the human body!

Do not use organic solvents because it can decompose the grease in the motor bearings; during the cleaning process, liquids, especially organic solvents, cannot be contacted to the motor shaft and the bearings.

5.1 Do not use sharp objects to collide with the rotor. Prevent bumps during handling and disassembly. Prevent cracks in the rotor during use due to scratches or trauma.

5.2 Regularly check the rotor assembly (especially the bottom of the test tube hole) for corrosion spots, grooves, and small cracks. If any of the above conditions are found, stop using the rotor and contact the production unit.



When disassembling the rotor, grasp the rotor with both hands and lift it up vertically. Do not shake it from side to side!

5.3 Normally, the rotor is cleaned once a week. If it is separated from salt solution or other corrosive samples, please wash it immediately after use. If the sample is found to be spilled during use, dipped or dripped on the rotor, it should be immediately drained and partially cleaned.

5.4 When cleaning the rotor, clean it with a mild detergent dampened with a sponge or cotton cloth, then wash off the detergent with distilled water. Do not sprinkle or spray the rotor with water as the liquid may be left somewhere and cause corrosion. Allow to invert and dry after washing.

5.5 Check the locking of the transparent cover and the main body casing, and whether the cover can be opened and closed smoothly.

5.6 Carefully wipe the surface of the instrument with a soft cloth dampened with a mild detergent, then remove the detergent with a clean, damp cloth.

5.7 If there is a major problem with the instrument, if the power supply is not working properly, there is a burnt smell inside the machine, the rotor is broken, and the instrument is shaking sharply during operation. Please contact the

manufacturer or the authorized dealer of the manufacturer in time. Repair by yourself under the guidance of maintenance personnel!

6.Troubleshooting

The following table lists the faults of the instrument and the causes of the related faults and the treatment methods. You can follow the prompts to eliminate them. If the user still cannot solve the faults or the faults are not included in the list below, the user should contact the production immediately. Unit maintenance staff.



After an abnormality occurs, turn off the power, unplug the plug, and then start the fault after troubleshooting.

Table 1: Fault phenomenon, cause and troubleshooting

Fault phenomenon	Causes and troubleshooting
The instrument does not rotate	1. Check if the power socket and wiring are good, and whether the power socket has power. 2. The power switch is not in good contact. 3. If it cannot be excluded, please contact the manufacturer's maintenance personnel.
Suddenly stopped while the instrument is running	1. Is the power connection good? 2. Determine the time limit for use, whether the carbon brush is within the service life (carbon brush life is about 1600 hours). 3. The motor is overheated or overloaded. Turn off the power and wait for 10-20 minutes before restarting. 4. Does the instrument have a burnt smell? If it is, please unplug the power immediately and contact the manufacturer's maintenance personnel. 5. The voltage range may be too large. Check if the power supply voltage meets the specified AC100-250V.
Transparent cover can't be opened or closed	1. The transparent cover cannot be opened, and there is any foreign matter under the cover plate. 2. The transparent cover cannot be closed, and the triangular-shaped button above the cover plate is worn out.
Instrument vibration noise is relatively large	1. The rotor has a critical speed and some vibrations of the machine are normal. 2. Check if the rotor is locked. 3. Check the symmetry balance of the rotor load and check the level of the instrument. 4. Check if the rotor is installed. 5. Check the drive shaft and rotate it by hand. If it cannot rotate smoothly, there may be a problem with the drive shaft or the motor. If it cannot be excluded, please contact the manufacturer's service personnel.

Panel LCD does not light after turning on the power switch	1. The power supply is not connected, check the power distribution. 2. Switch the remaining indicators to check if they are normally lit. If not, please contact the manufacturer. 3. If it cannot be excluded, please contact the manufacturer's maintenance personnel.
E3 code	1. Whether the transparent cover is tightly closed or the buckle wear cover does not tighten automatically. 2. Exclude the first reason, please contact the manufacturer's maintenance personnel!
Beyond the above fault content	Solved by the manufacturer's professionals!

7. Cleaning Instruction

Applicable: Mini centrifuge with PC transparent lid, ABS housing, PP/PPCO rotor

Disinfectants selected: 500- 1000 mg/L sodium hypochlorite solution; 3% hydrogen peroxide solution

7.1 Pre- operation Requirements

7.1.1 Power off the centrifuge and disconnect the power cord before cleaning and disinfection.

7.1.2 Remove the rotor and sample tubes from the chamber.

7.1.3 Prevent disinfectant liquid from flowing into internal electronic components. Do not pour liquid directly onto the machine.

7.2 Cleaning & Disinfection Procedures

7.2.1 Routine disinfection (preferred: 500- 1000 mg/L sodium hypochlorite)

1. Moisten a lint- free cloth with 500- 1000 mg/L sodium hypochlorite solution.

2. Wipe the PC transparent lid, ABS outer housing, inner chamber surface and rotor surface.

3. Keep the disinfectant in contact for 5- 10 minutes.

4. Wipe all surfaces with clean purified water to remove residual disinfectant.

5. Dry all parts completely with lint- free cloth before reassembly and power- on.

7.2.2 Alternative disinfection (3% hydrogen peroxide, for chloride- residue- sensitive scenarios)

1. Moisten lint- free cloth with 3% hydrogen peroxide solution.
2. Wipe PC lid, ABS housing, inner chamber and rotor.
3. Maintain contact for 5- 10 minutes.
4. Wipe surfaces with purified water, then fully dry all components.

7.3. Material- compatibility Restrictions

7.3.1 PC transparent lid: Do NOT use ethanol for routine disinfection. Ethanol may cause stress cracking, crazing and whitening. If any cracks, crazing or whitening appear on PC lid, replace the lid immediately, do not continue using the device.

7.3.2 Rotor (PP/PPCO): Resistant to the above two disinfectants; avoid long- time soaking.

7.3.3 Prohibited agents: Acetone, aldehyde- based disinfectants, strong alkalis, high- concentration alcohols.

7.4 Post- disinfection Check

7.4.1 Ensure all surfaces are fully dry before reinstalling rotor and powering on.

7.4.2 Inspect PC lid for crazing, micro- cracks or discoloration after each disinfection cycle.

7.4.3 Do not immerse the main unit in any liquid.

8. Warranty (including repair) basis

8.1 We have one – year warranty on our all products

8.2 After the machine fixed, our professional technician will file it and keep track of the usage of the machine.

8.3 We will pay attention to the feedback of the customers within 24 hours.

8.4 We won ' t charge customers any cost for repairing the machine in

one-year warranty time.

8.5 We only charge for the accessories on repairing the machine beyond the one-year warranty time.

8.6 The damage caused by improper use by the user, the sales company authorized by the production unit or the production unit is responsible for repair, but it is not free.

- **Company Name: Changsha Yingtai Instrument Co.,Ltd**
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