

**L500**  
**Tabletop Low Speed Centrifuge**

**Instruction Manual**

**(Read the Instruction Carefully Before Operation)**

<b>Index.....</b>	<b>Page</b>
1、Attention for safety.....	2
1.1 Attention for installation and maintenance .....	2
1.2 Attention for electric system.....	2
1.3 Attention for fireproofing .....	2
1.4 Attention for safety in mechanical parts .....	3
1.5 Attention for safety in chemistry and biology .....	3
2、Symbols and meanings.....	4
3、Application and scope.....	4
4、Work theory.....	4
5、Classify and name.....	5
5.1 Classify .....	5
5.2 Name .....	5
6、Main technical parameters .....	5
7、Features.....	6
8、The structure of main machine, control panel and accessory.....	6
8.1 The structure of main machine.....	6
8.2 Control panel .....	7
8.3 Accessory.....	9
9、Installation and adjustment.....	9
9.1 Installation and its requirements .....	9
9.1.1 Installation requirements.....	9
9.1.2 Install centrifuge .....	9
9.2 Adjust centrifuge .....	10
10、Operation.....	10
10.1 Check the rotor and tube.....	10
10.2 Install rotor.....	10
10.3 Adding liquid and placing of the centrifugal tube.....	10
10.4 Close the door lid .....	10
10.5 Set program, rotor number, speed and time.....	11
10.6 RCF display .....	12
10.7 Start and stop .....	12
10.8Take out the centrifugal tube .....	12
10.9 Uninstall the rotor .....	12
10.10 Power off .....	12
11、Service and maintenance .....	13
12、Common trouble and trouble shooting.....	14
12.1 Common error code.....	14
12.2 Common trouble shooting.....	15
13、Transportation and storage.....	16
13.1 Transportation .....	16
13.2 Storage .....	16
14、Warranty.....	17
15、Packing list.....	18
16、Qualified certificate.....	19

## **1、Attention for safety**



**Attention for safety** clarifies the requirements of safe operation in the instruction manual. Please carefully read it before installation, operation, maintenance and repairing. Understanding the warning and correct operation can avoid the personal injury and the damage of centrifuge.

### **1.1 Attention for installation and maintenance**

- The rotor accessory and package may be placed in the centrifugal chamber. You should open the door lid for checking when installing.
- In the machine maintenance process, the parts that need remove cover may cause electrical shock or personal injury. Ensure that the power has been cut off and the power line has been removed from the socket, and qualified staff manipulates it.
- The replaced part must be consistent with the requirements of this centrifuge.

### **1.2 Attention for electric system**

- To reduce the risk of electric shock, the centrifuge adopts the plug with three points which must connect with the socket with ground lead.
- Make sure if the wall socket is connect with the ground wire. The voltage of power supply must accord with the voltage of centrifuge.
- Don't use the power adapter from three holes to two holes.
- It is forbidden to use the expanding socket with two lines or all-purpose power adaptor without ground wire.
- Don't put container with liquid on the centrifuge or around the centrifuge. If the container is knocked over, the liquid will infiltrate into centrifuge and damage the electrical or mechanical parts.

### **1.3 Attention for fireproofing**

- Please use the overload fuse with same model and specification.
- The centrifuge is not designed for the flammable and explosive matters. You cannot make centrifugation for the matters (chloroform, acetaldehyde), and cannot put the matters in the centrifuge or store them around centrifuge within 30cm.

#### **1.4 Attention for safety in mechanical parts**

- Please use the rotor and accessories which are designed for this centrifuge
- Make sure if the centrifugal chamber is cleaned before operation.
- Make sure if the screw (nut) of the rotor in the centrifugal chamber has been screwed down.
- Not exceed its max speed of rotor during operation.
- Don't decelerate rotor speed or stop by hand.
- Don't hold or move centrifuge when rotor is rotating.
- If the glass test tube is cracked in centrifuge chamber, please carefully check and clean the gasket and centrifugal chamber because the glass fragment may have inserted into their surface.
- Don't open the door lid of centrifuge in the running status.
- The distance between centrifuge and other objects must be kept 30cm during operation. You should not stand around centrifuge within 30cm unless adjusting it. Anything is not allowed to enter into centrifuge during operation.

#### **1.5 Attention for safety in chemistry and biology**

- The routine manipulation may include all kinds of liquid and test sample which may be the disease-causing and poisonous matters. The centrifuge can not be manipulated with the matters unless you have taken the protection measures.
- Please pay attention to the liquid explanation in container before operation.
- Be careful of the infectious liquid. If not understanding the provided sample, please at least make sure that they aren't microbe. You must make further aerosol protection ( the suspended speck in the air, such as smoke and fog. ) for the easier disease-causing hepatitis virus(B or C), HIV, atypical mycobacteria and the fungus of physical structure.
- The infectious samples must be manipulated according to the manipulating program and method in lab for avoiding expanding disease.
- The spilt matters may produce aerosol ( the suspended speck in the air, such as smoke and fog. ) , so please pay attention to the warning about aerosol (the suspended speck



in the air, such as smoke and fog.)

·**Only use the suitable rotor and adaptor.** The centrifuge can not be manipulated with disease-causing, poisonous or radioactive matters unless you have taken the protection measures. When the second type of hazardous substances (according to “Laboratory Biosafety Manual” of the World Health Organization.) is manipulated, the air safety level must be monitored. The superior substances require a higher level of safe protection measurements.

·You should follow the environment security and protection requirements when destroying the discarded liquid.

**Users have the responsibility to clean and sterilize centrifuge and accessory if you need maintenance service from our company.**

## 2、Symbol and its meanings

No.	Symbol	GB No.	Meanings
1	~	4706.1	Alternating current
2		5465.2	Power on(general supply)
3	○	5465.2	Power off (general supply)
4		4728.2	Protective earthing(ground)
5		4793	Warning!

Form 1

## 3、Application and scope

L500 tabletop low speed centrifuge makes use of centrifugal settling theory to separate, purify and condense the granule. It can be widely used in the fields of clinical medicine, biochemistry, genetic engineering and radioimmunology. It is ideal equipment for scientific research institute and hospitals.

## 4、Working Theory

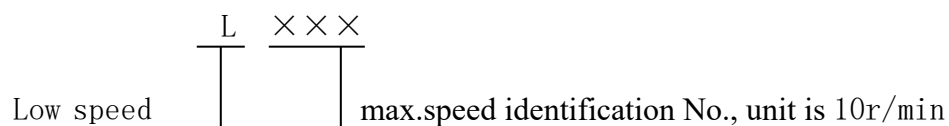
Centrifuge makes use of the strong RCF that centrifuge rotates with high speed in order to accelerate the settling speed of the granule in the liquid, and separate, condense and purify the matters with different settling coefficient and density.

## 5、Classify and Name

### 5.1 Classify

- It belongs to Class 1 of medical laboratory equipment according to the management of “The Classified Catalogue of Medical Devices”.
- It belongs to Class 1 of ordinary equipment with protective grounding according to the protection against electric shock.
- It belongs to tabletop centrifuge according to the structure.
- It belongs to low speed centrifuge according to the speed.

### 5.2 Name



For example, L500 tabletop low speed centrifuge whose Max.speed is 500×10r/min.

## 6、Main technical parameters

Model	L500
Max.speed	5000r/min
Max.RCF	4030×g
Max.capacity	24×10mL
Speed Accuracy	±50r/min
Time range	1s~99min99s
Power supply	~220±10%V 50Hz 3A
Noise	< 65dB (A)
Dimension	370 mm×432 mm×260mm (W×D×H)
Package Dimension	435 mm×580 mm×312mm (W×D×H)
Weight:	GW: 16.5 Kg      NW: 15 Kg

Environment requirements:

Temperature: 10 °C~35

°C

Relative humidity

## 7、Features

- Microprocessor control
- Touch panel and LCD display
- The speed is controlled by PWM with the function of high accuracy and fast Acc/Dec.
- It is controlled by DC brushless frequency conversion electromotor with low-noise and vibration. It runs without carbon dust pollution, which can meet the requirements of lab.
- RCF value can be calculated automatically.
- Adopt special shock isolator for ideal effect of vibration damping, with the function of automatic balance.
- Electronic lock door for safe operation. The centrifuge will reluctant to work if the lid isn't closed properly; the centrifuge will stop automatically while the lid is open abnormally during a run.

## 8、 The structure of main machine and control board and accessories

### 8.1 The structure of main machine

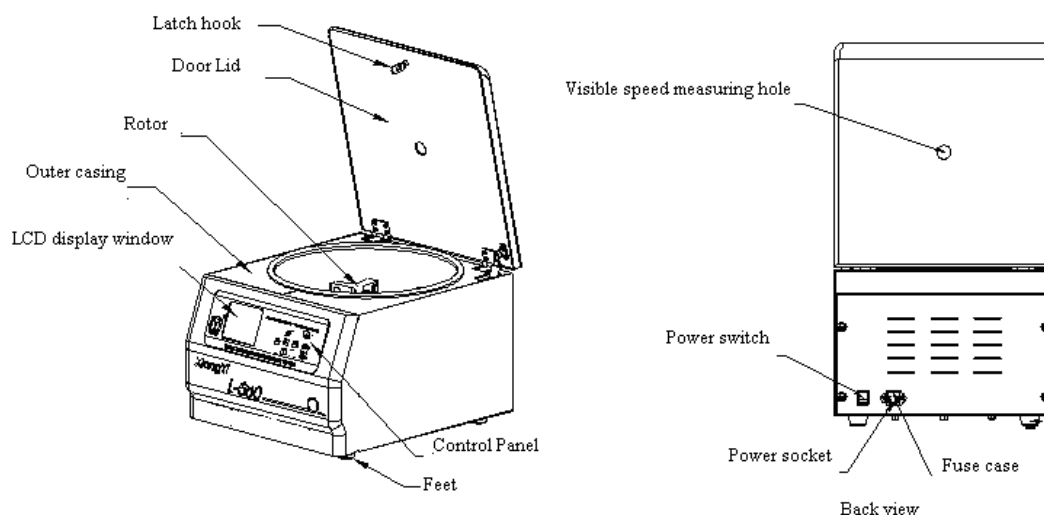


Figure 1 Outside view of main machine

The centrifuge is composed of the main machine and accessories. The main machine is composed of outer casing (which is founded by high strength ABS plastic and insulated/resistant to corrosion), centrifugal chamber, drive system, control system

and the part of manipulation display. The rotor and centrifugal tube(bottle) belong to accessory(provide according to contract).

## 8.2 Control Panel

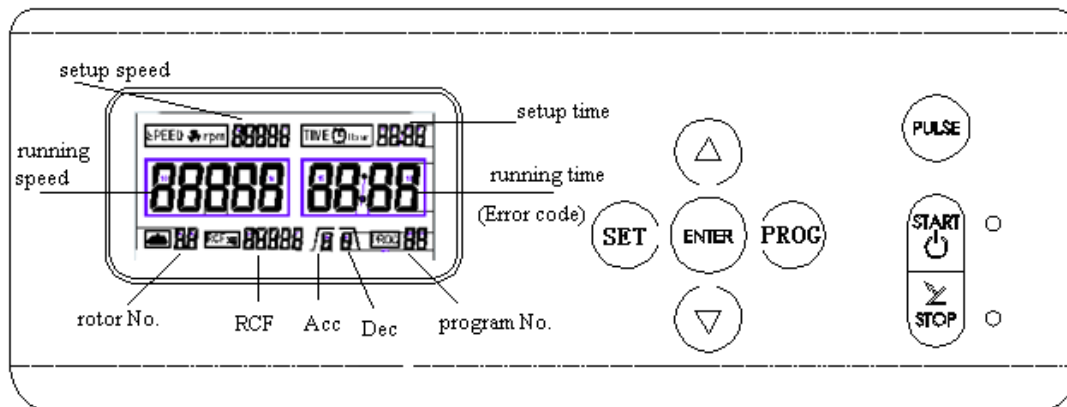


Diagram 2

### • LCD Display window:

#### Function of key:

**Set:** Set the parameter of rotor No., acceleration gear, deceleration gear, speed and time.

**PROG:** Choice and modify initialize program. The initialize program must be choiced in the state of stop.

▲: Increase key, press “▲” to increase the setting parameter value when set rotor No., acceleration gear, deceleration gear, speed, time etc.

▼: Decrease key, press “▼” to decrease the setting parameter value when set rotor No., acceleration profile, deceleration profile, speed, time etc.

**ENTER:** Comfirm key to confirm the setup working parameter value of rotor No. speed, time and so on.

**START :** Press [START] to begin centrifugation after setting and confirming the parameters or repeating the setup parameters last time, and the start indicator light on.

**STOP:** The key to stop centrifugation and open the door lid. When the centrifuge is working (the time isn't counted down to “0”), you can stop it by



manual and the stop indicator light on. When the centrifuge is in the state of rest and rotor does not run (but the centrifuge is power on), press it to open the door lid.

**PULSE:** Shortrun key ( short-time centrifugation ) . Press the key and hold on, then the centrifuge will run swiftly; Release the key, the centrifuge will stop automatically.

• **The function of indicator lights:**

**[START] indicator light:** The [START] indicator light is on, which means the centrifuge has started and in the running status.

**[STOP] indicator light:** The [STOP] indicator light is on, which means [STOP] is pressed or the work time is counted down to “0”. The centrifuge is slowing down for stopping or has stopped.

**[PULSE] indicator light:** The [PULSE] indicator light is on, which means the centrifuge has started and in short-time centrifugation.

### 8.3 Accessory

Rotor	Capacity (ml)	Max.speed (r/min)	Max.RCF (×g)
No.1 Angle Rotor	24×10mL	5000r/min	4030×g
No.2 Swing Rotor	4×50mL	4200r/min	2760×g
	24×5mL		
	16×10mL (16×100mm)	4000r/min	2510×g
	24×10mL (16×100mm)		
Supply by Contract			

## 9、 Installation and adjustment

### 9.1 Instrument installation and its requirements:

#### 9.1.1 Installation requirements:



Warning: Don't install centrifuge in the place with flammable and explosive matters. The flammable and explosive gas comes into the running centrifuge, which may lead to fires.

- The centrifuge should be installed on the flat and solid platform.
- The large free space should be kept around the two sides and back of centrifuge for heat dissipation for ventilation.
- It is prohibited to put lab equipment with large heating production and strong vibration around centrifuge.
- The working environment temperature is 10°C to 35°C, and the relative humidity is no more than ≤85%.

#### 9.1.2 Install centrifuge

- Open the outer package, carefully take out the centrifuge with foam package, then put it on the even platform and take off the foam package. The four rubber feet of centrifuge should touch with platform evenly.
- You should confirm that the voltage of the power supply should be consistent with the voltage the centrifuge requires. (Check the marking beside the electric outlet on centrifuge back, and the instrument's power requirement is AC 220V 50Hz with single phase and three wires.) Connect the power cord (three wires and 10A) to the electric outlet on centrifuge back first, then put the plug on the other end into the external electric supply socket. Press one side marked “I” on the switch to power on.
- Press “STOP” key to open the door lid. Or, push the pull rod of electric door interlock in emergent unlock hole on right flank with attached tool “screw driver”(door emergency release tool) when power is off (see diagram 1).
- Take out the foam case from centrifugal chamber and put the brackets in foam case into rotor body. Clear the centrifugal chamber.

- Check the main machine, accessory, attached tools and documents according to the packing list.
- If there are any electronic problems, it should be repaired by the professional technicians

## 9.2 Centrifuge adjustment



Warning: It is forbidden to start before the centrifuge chamber is not cleaned. Otherwise, the centrifuge may be damaged.

According to the operation steps of Chapter 10, first run with low speed, and gradually accelerate to the max.speed. If no abnormal phenomenon happens, you have succeeded in adjustment.

## 10、 Operation

**10.1 Check the rotor and tube:** You should carefully check the rotor, tube or test bottle before operation. It is forbidden to use the cracked and damaged rotor, tube or test bottle. Otherwise, all damages should be borne by user.

**10.2 Install Rotor:** Aim the slot on the bottom of rotor central hole to the horizontal slot on drive shaft, then place the rotor on drive shaft and make the slot in the pin. Then put on a spacer and make the lock screw into tapped hole on the top of drive shaft, tighten it with screw driver.(The rotor has been installed before delivery, and please check whether the lock screw is tighten.)

**10.3 Adding liquid and placing the centrifugal tube:** Put centrifugal tubes with adding liquid into the centrifugal tube of rotor and tubes should be placed symmetrically in even number. Otherwise, there will be vibration and noise because of imbalance.

**10.4 Close the door lid:** Press down the door lid until you hear “clicking” sound

which means the door lid pin enter into the hook. Then lift the door lid by hand to check whether it is closed properly. If the door lid can not be opened, it means it is closed properly. If press the [START] key and centrifuge can not run, the buzzer will tweet and LCD display window shows [D/M5] error code which means the door lid is not closed properly. Press [STOP] key to clear the error show, and close the door lid properly again.

### 10.5 Set rotor number, speed, time, acceleration profiles, deceleration profiles and program number:

- In state of **rest**, users can set rotor number, speed and time.
- During a **run**, users can change the setup parameters of speed and time under current program number.

(1)、 **Program storing::** You can set or modify the parameters under current program number “0” according to following steps (2)~(5). Press “**PROG**” once (program number flashes only), then press“▲” or “▼”to set program number. At last press “**ENTER**” to confirm. Current parameters will be stored under the selected PROG number. **Program selecting/using:** Press “**PROG**” twice (“**PROG 00**” flashes simultaneously), then press“▲” or “▼”to set program number. At last press “**ENTER**” to confirm. You can select and use already stored program to run.

(2)、 **Speed set:** Press “**SET**” key to enter into the speed setting status while the Nixie light on “**SPEED/RCF**” display window flashes. Then press “▲” or “▼”to set speed for this centrifugation. Centrifuge program has locked its maximum speed according to rotor number. The setting speed should not exceed of its max speed. Finishing above procedures, press key “**ENTER**” to confirm the setup parameter.

(3)、 **Time set:** Press “**SET**” key for second time, the Nixie light on “**TIME min**” display window flashes. Then press “▲” or “▼”to select min for this centrifugation. Press “**SET**” key for third time, the Nixie light on “**TIME seconds**” display window flashes. Then press “▲” or “▼”to select seconds for this centrifugation. Selecting the time for this centrifugation (the longest time is 99 min 59s). Time for countdown. Finishing above procedures, press key “**ENTER**” to confirm the setup parameter.

(4)、 **Rotor set:** Press “**SET**” key again, the “**SPEED**” light on. Then press “▲” or “▼”to select the installed rotor number. (it should be set correctly). Finishing above procedures, press key “**ENTER**” to confirm the setup parameter.



**Warning:** The rotor type should be set according as the installed one.  
Wrong setting will make the rotor overspeed and lead to accident.

(5)、**Acceleration/deceleration profiles set:** Press “SET” key again, the “ACC” light on. Then press “▲” or “▼”to select acceleration profile, Press “SET” key again, the “DEC” light on. Then press “▲” or “▼”to select deceleration profile. There is 1~9 profiles, and the ACC/DEC time would be shorter while the setting figure is bigger. We choose 5 usually. Finishing above procedures, press key “ENTER” to confirm the setup parameter.

(6)、Then press “START” key to start centrifuge.

**10.6 Check RCF :** RCF value synchronously displayed on the screen during a run.

### **10.7 Start and stop**

- (1)、**Start:** Press [START] to start centrifuge and the [START] indicator light is on.
- (2)、**Automatic stop:** When time is counted down to “0”, the centrifuge automatically slows down and stops running. When the speed is 0 r/min, the buzzer will tweet and the [STOP] indicator light is on.
- (3)、**Stop by manual:** In the running status (the working time isn’t counted down to “0”), press [STOP] to slow down and stop running. The buzzer will not tweet, and the [STOP] indicator light is on.

**10.8 Take out the centrifugal tube:** When the rotor stops rotating, press the [STOP] key to open the door lid. Then press the switch with the mark“O” to cut off the power. Open the door lid and take out the centrifugal tubes.

**10.9 Uninstall the rotor:** When replacing the rotor, you should uninstall the used rotor (unscrewing the bolt with screwdriver and take out the rotor after removing spacer.)

⚠ Don’t hold up or move the centrifuge during operation.

⚠ Don’t open the door lid when rotor is rotating.

**10.10 Power off:** Turn off power and unplug power cable after finishing work.

## 11、Service and maintenance

- Please wipe up the rotor with neutral cleaning mixture after taking out for avoiding corrosion and then stock it at dry and ventilated place. Central hole in rotor should be smeared some lubricating oil for protection.
- All action on rotor should be soft, and rotor should be taken out vertically for protecting the shaft.
- Please wipe up the water in centrifuge chamber if it is leaving unused for long time. Some lubricating oil should be smeared on drive shaft for protection.
- Replace fuse
  - (1) Cut off the power, and unplug the plug the power cord connected with the external electric supply socket. Then draw another end of the power cord connected with the centrifuge.
  - (2) There is a fuse case equipped on the under part of electric outlet on instrument back. (See figure 3) There is a marking for fuse symbol, and find the V-shape slot on fuse case. (See figure 4) Pull out the fuse case with slotted point screw driver into the V-shape slot.
  - (3) Take out the damaged fuse and replace it. The model of fuse of the centrifuge is BGXP 5×20 、 250V 10A.
  - (4) Put the fuse case into electric outlet.

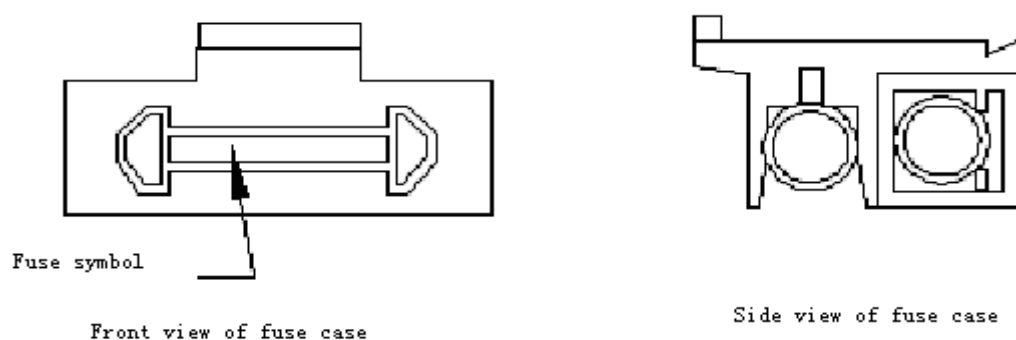


Figure 3

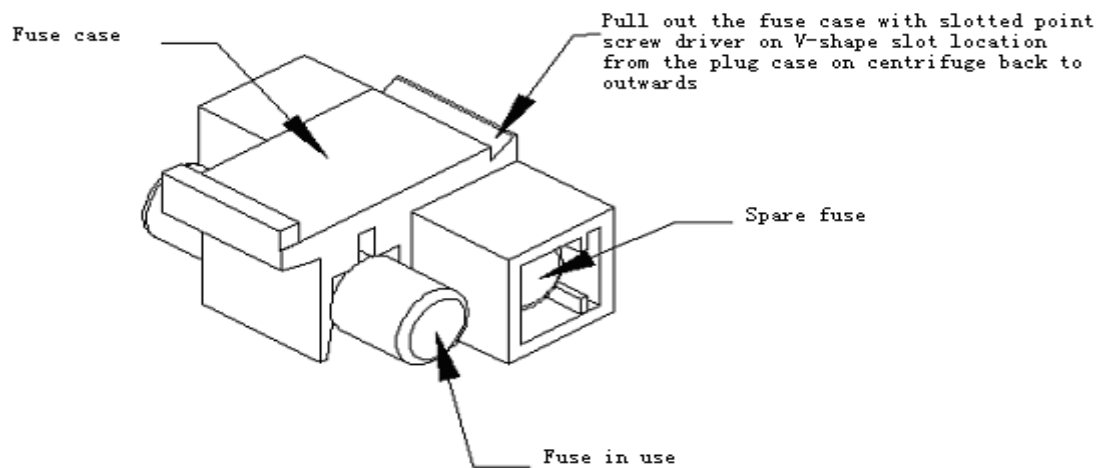






Figure 4

## 12、 The common trouble and trouble shooting

### 12.1 Common error code:

Error code	Description	Reasons	Solution
	Door lid protection	The door lid isn't closed when pressing [START].	Close door lid properly
		The installed sensitive switch of door lid is not in place or damaged.	Check and replace
	Overspeed	Overspeed, rotor number setting wrong or power control board can not be controlled	Check and replace
		The acceleration profile value is too large when the load is exceeded	Turn down acceleration profile value
	Motor does not run or runs without speed	Motor runs without speed; The speed-detecting signal is unreliable or the speed sensor is damaged.	Check and replace
		Motor does not run, and the shaft is blocked.	Replace motor
		Connecting terminal is loosened or power control board /drive module is damaged	Check and replace
	Wrong connection	The connecting terminal of display board to power control board is loosened or power control board is damaged.	Check and replace

## 12.2 Common trouble shooting:

Trouble	Cause	Removal
The display window is not working when power is on	Check whether the power plug is plugged in completely.	Plug in
	No 220V power supply	Check the power supply
	The overload fuse blew out	Check and replace
	The connecting terminal of transformer to control board is not properly connected or lessened.	Connect it properly
The rotor doesn't run when Start key is pressed	Display "Warning: the door lid open"; The door lid is not closed or locked.	Close door lid properly
	The connecting terminal to circuit board is loosened	Connect it properly
	The power transformer is damaged.	Replace
	The motor is powered on, but it doesn't work. The motor is damaged.	Replace the motor
	Circuit board is damaged	Inform supplier to replace
Abnormal vibration of the centrifuge	Tubes in rotor are not arranged symmetrically.	Check and rearrange
	The test tube is broken.	Check and replace
	Large difference of liquid in tubes	Add liquid in even
	The shock absorber is damaged	Replace it

Form 4

If the centrifuge still can not work after removing the above several troubles, please connect with our company or service stations designated by our company.



## **13、Transportation and storage**

### **13.1 Transportation**

- You should use the wooden case and carton during long-distance transportation. Put centrifuge with dust cap into the case, and fill with foam or plastic shock absorption materials. It is forbidden to be hit, inverted, rolled and soaked by rain and snow.
- You can directly move the centrifuge in room, but avoid big vibration, hitting and inversion.

### **13.2 Storage**

- If it is leaving unused for long time, you should open the door lid and store it in ventilated, dry and clean room where is no corrosive, flammable and explosive matters.
- As the technology continuously renews, please consult us if there is something unconformable with this instruction manual.

# Warranty

Respected customers,

Thank you for purchase of our company's products. To protect your legal rights and avoid your worries, we provide warranty service for one year with the main machines. If it is broken under warranty with inartificial reason, we will supply free maintenance service. The customer needs to pay an amount of money if the product has exceeded the warranty period. We will not supply free maintenance if any following matter is happened:

- Exceed of the warranty period or without the warranty card.
- The trouble is caused by wrong installation, operation and maintenance.
- The trouble is caused by the unauthorized uninstalling and repairing by our company.
- The trouble is caused by using the rotor not equipped with this centrifuge.
- The trouble is caused by war, natural disasters or other irresistible factors.

## Packing List

Item	No	Name	Quantity	Unit	Remark	Check
Main machine	1	L500(LCD)	1	set		
Option of rotor and its accessories	2	Swing rotor 16×10ml	1	pc		
	3			set		
	4			pc		
	5			set		
Attached accessories and tool	1	Fuse BGXP 5×20	2	pc	250V 10A	
	2	Power cord	1	pc		
	3	Door emergency release tool	1	pc	Screw driver	
	4	17-19 mm open end wrench	1	pc		
Attached file	1	Packing List	1	copy		
	2	Instruction Manual	1	copy		
	3	Qualified Certificate	1	copy		
	4			copy		

Checker: \_\_\_\_\_

Date: \_\_\_\_\_

# Quality Certificate

Product Name: Tabletop Low Speed Centrifuge

Product Model: L500

Serial No.: \_\_\_\_\_

This product is tested and qualified for delivery.

Checker: \_\_\_\_\_

Date: \_\_\_\_\_