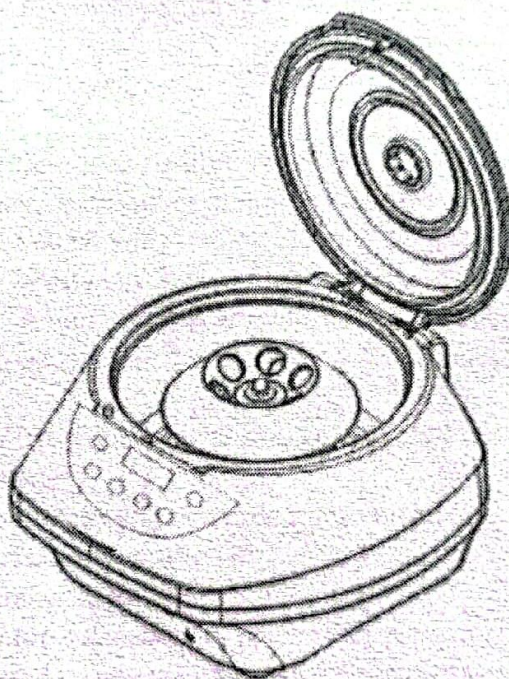


Benchtop Centrifuge Operation Manual

Version 1.0



Foreword

Thank you for purchasing our products: LC-6S/LC-8S/LC-12S Centrifuge. This Manual for users contains function and operation of the instrument. In order to ensure the safety of users and use the instrument properly, please read this manual carefully before using the Instrument. If you have any questions and this operation manual cannot provide you with your answers, please contact our company. For your convenience in the future, please keep the user manual with the centrifuge.

Opening Check

Please check the Instrument and Appendix with the packing list when you first open the instrument packing case. And Check for whether it is damaged. If you find there is something wrong with the Instrument and the Appendix, do contact the vendor or the producer immediately.

Safety Tips



Before using the centrifuge, please read this instruction manual carefully. Incorrect or inappropriate use may result in equipment damage or personal injury!

- * Centrifuge can only be operated by trained or authorized persons;
- * When the centrifuge is running (rotor is spinning), Please keep an area of about 12 inches around the centrifuge clear while operating it and ensure nothing is blocking the vents.
- * The maintenance of the instrument can only be done by Our Company or authorized dealers of Our Company;
- * Please NEVER use the following materials in the centrifuges:
 - Inflammable and explosive materials;
 - Strengthen chemical materials;
 - Toxic or radioactive substances or pathogenic micro-organisms and so on.
- * Only qualified maintainer using appropriate tools can do the maintenance for the system of the High-speed centrifuge.
- * If there is any situation that not mentioned in this manual, please kindly contact Our Company or authorized dealers to ask for best way of dealing with it.
- * You must do the inspection and maintenance for centrifuge at the stated interval.

Security warning signs



Note: Before using this instrument, please read this manual carefully.



Note: The high pressure is dangerous!

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1. Introduction of Benchtop centrifuge

1.1 Overview

This centrifuge suitable for 15ml centrifuge, tube, Vacuity Blood Collection Tubes and glass tube for centrifuging. Before starting up this centrifuge for the first time, please read the rest of this operations manual. This manual describes the components, functions, and Intentionally use this product centrifuge 6 or 8 tubes x15mL and 12 tubes x 10ml/5ml. This manual is intended to help users Operate the product centrifuge 6 or 8 tubes x15mL and 12 tubes x 10ml/5ml correctly and safely. Several Warnings and notices are included in this manual.

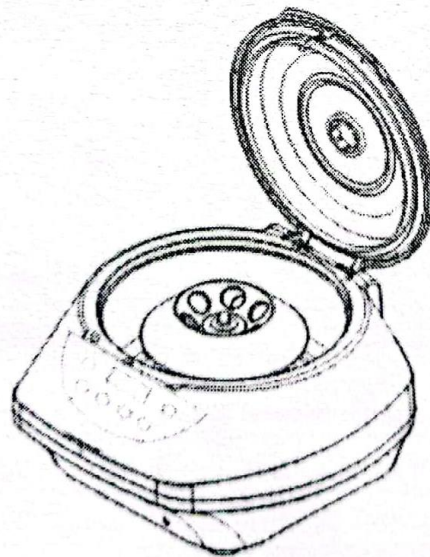
1.2. Centrifuge features

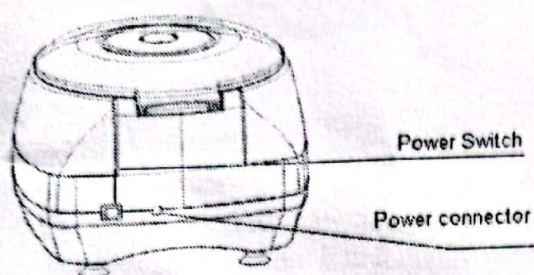
Benchtop Centrifuge is a medium-sized utility device and easy to handle. Widely used in clinical medicine, analytical laboratories, biology, genetic engineering, immunology, etc. The density of the separated sample cannot exceed 1.2g/cm^3 under the maximum speed, when the density of the sample exceeds 1.2g/cm^3 , the maximum speed of the rotor must be reduced accordingly.

It is characterized by:

- Fixed angle rotor;
- microprocessor control system;
- LCD display;
- An audible warning sounds when the rotation is complete.
- End the run, the lid lock of centrifuge opens automatically.

1.3 Structure Description

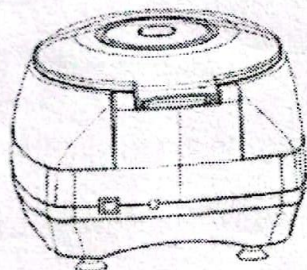




1.4 Installing the device

1.4.1 The centrifuge should be installed in a clean, stable location. Place the centrifuge onto a level, horizontal surface. Solvents and flammable materials should not be placed on top one side of the centrifuge. Make sure that the ventilation slits are not blocked.

1.4.2 Insert the column connector of the adapter to power connector of the device, and insert another connector of the adapter to mains power supply. Check the operating voltage according to the equipment.



110V OR 220V



2. Technical parameters

Model	LC-6S/LC-8S/LC-12S	
Voltage Supply	AC 110v-60Hz or 230v-50/60Hz	
Power	40W	
Max . Speed (RPM)	500-5000rpm(100rpmincrements)	
Relative centrifugal force (RCF)	3074 x g	
Capacity	LC-6S	Angle rotor 6 tubes × 15ml
	LC-8S	Angle rotor 8 tubes × 15ml
	LC-12S	Angle rotor 12 tubes × 10ml/5ml
Time Range	0 --99 min 59 sencods	
Lid Open Auto Stop	Yes	
Ambient temperature	5 ℃ ~ 35℃	
Dimension (mm) (W ×D ×H)	340x400x270	
Weight (kg)	5	

3. Safety precautions



The rotor and the rotor lid must always be securely fastened. If the centrifuge makes unusual noises when started, the rotor or rotor lid is not fastened correctly. Switch the device off immediately by pressing



" " key.



Do not use damaged rotors! (Fence, scratch, corrosion, cracking).



Do not move the centrifuge during the run!

3.1 When centrifuging a sample that is dangerous to the human body, Wear masks and protective clothing, all Other appropriate security measures.

3.2 Corrosive, explosive and flammable liquids shall not used in centrifuges.

3.3 Start the centrifuge after confirming the safety condition surroundings.

3.4 Never let non-professionals solve

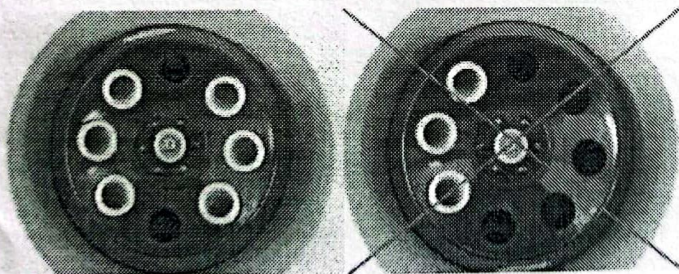
3.5 Place the tubes

3.5.1 A liquid density of 1.2g/ml must not be exceeded at the max. speed. Do not overfill the tube to avoid the liquid overflows.

3.5.2 Damaged tubes can not be centrifuged. This is because broken tubes can, in addition to sample loss, result in further damage to the centrifuge.

3.5.3 Close the test tube lids before centrifuging. Open lids can be ripped off during centrifuging and damage the centrifuge.

3.5.4 Must load the test tubes symmetrically. Load the rotor with a symmetrically distributed sample. The opposite tubes must have the same weight. If necessary Please use a water pipe to balance the tube with a sample with weight different.



3.6 Maintain of rotor

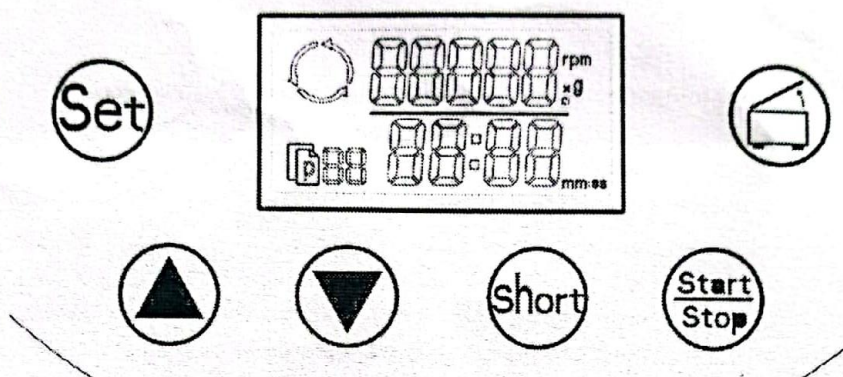
3.6.1 Even slight scratches and tears of the rotor can lead to serious internal material damage.

3.6.2 Avoid damage caused by aggressive chemicals, including among others: strong and weak alkali, strong acids.

3.6.3 In the event of contamination caused by aggressive agents, The rotor must be cleaned immediately using a neutral cleaning Liquid.

4. Operation guide

4.1 Introduction of control panel and display interface



	Rpm display, or RCF display Time display
	SET button to select the adjustment parameters
	Increases rotation up speed or RCF or Time
	Decrease rotation speed or RCF or Time
	SHORT-SPIN---for reduced-time centrifugation
	for start or stop centrifugation
	to open the lid

4.2 Rotor insertion and removal

Fit the rotor onto the motor shaft, followed by the rotor nut.


Tighten the rotor nut by turning clockwise. To release the rotor, turn the rotor nut counterclockwise. Before each start, check that the rotor is firmly tightened!




4.3 Loading the rotor




Rotor must always be loaded symmetrically. Minimize differences in weight between the filled sample tubes-taring with a scale is recommended. This will reduce wear on

the drive and cut running noise.

4.4 Centrifugation with a preset time



4.4.1 Turn on the mains switch, pressing " " to open the lid, load the rotor symmetrically. Fasten the rotor lid and close the centrifuge lid completely.

4.4.2 Setting of run speed: Pressing  → make the number flash on the speed → press  or  to increase or decrease speed up to you need → It will confirmed automatically after flash for 3 times. To change the run speed, the max. speed is 5000rpm.

4.4.3 Setting of run time: Pressing  → make the number flash on the time → press  or  to increase or decrease time up to you need → It will be confirmed automatically after flash for 3 times. The time can be pre-selected between 001 seconds to 99minutes and 59 seconds.




If you need set the parameters continuously, after finishing the last parameters setting, you can continue press the "set " button to set next one until finish all the parameters setting. And then it will flash for 7 times automatically. That's sign of conferment of the parameters setting. No need do that manually.


4.4.5 Pressing the  to start the run . Pressing the second  to end the run prematurely. The remaining run time appears in the display. Time setting will reduce from set value to zero, when it shows zero, the centrifuge will stop working. The door cover will open automatically and the machine will buzz for 4 times. The time setting and the rotational speed may be changed during the run. The remaining run time appears in the display.



End the run , the lid lock of centrifuge opens automatically.

4.5 Short-spin centrifugation

4.5.1 Turn on the mains switch, pressing  to open the lid, load the rotor symmetrically. Fasten the rotor lid and close the centrifuge lid completely.

4.5.2 Pressing " ". Short-spin centrifugation is possible for as long as this key is held down.

4.6 Switching to the RCF display

Pressing ▲ and ▼ simultaneously the display switches from rpm to RCF. Also

pressing ▲ and ▼ simultaneously again, the display switches from RCF to rpm.

You can calculate with the following formula :

$$rcf = 1118 \cdot 10^{-5} \cdot n^2 \cdot r_{max}$$

n: rotational speed in 1/min

r_{max}= 6 cm, max. centrifuging radius in cm

4.7 Open the centrifuge in the event of a power failure

Make sure that the rotor stops completely, Disconnect the centrifuge from the mains supply. There is a plastic plug under the bottom plate of the fore side of the machine, Remove it, and there is a rope behind the plastic plug, once you pull the rope, the door cover can be open, and then you can remove the centrifugal samples out from the machine.



Emergency door handle

5. Maintenance and cleaning



The rotor and the outside of centrifuge should be cleaned regularly with a moist cloth. Disconnect the centrifuge from the mains supply, remove the rotor and clean it separately. Only neutral agents may be used for cleaning.



Please check the rotor and especially the rotor bores regularly for deposits or damage, then reinsert the rotor and tighten the rotor nut.

5.1 External equipment

- Clean the outside of the machine with a damp cloth. in case the cloth must be immersed in a neutral detergent the part of the pollution. After that, it remains completely dry Cleaning.
- Do not use volatile chemicals such as alcohol or benzene.

5.2 Internal Equipment Section

- Keep indoors dry after use device.
- Clean used parts with a mild detergent.

5.3 Recommended cleaning methods

Clean weekly and monthly, using neutral detergents and the soft cloth must be cleaned after use. Avoid using strong chemicals or organic solutions and cloth rough. Before cleaning the device, please make sure no power is connected.

6. Troubleshooting

Table 1:

Error	Cause	Solution
No display	Power failure, no main power connection.	Check the mains fuse, Plug in mains cable on both sides.
Lid can't be opened.	Power failure. Rotor is still spinning. Lid lock failure.	Emergency lid release(see 4.7) Stop centrifuge run. Contact service.
Centrifuge shakes during acceleration	Rotor not loaded symmetrically.	Stop centrifuge run and load centrifuge symmetrically.

Table 2: Data of trouble alarm

Symbols	Information of abnormal phenomenon	Troubleshooting
E1	Unbalance protection	Check the sample in tube or Contact Service
E2	Over speed. It stops to work because of detection of over speed of rotor	Problem of microcomputer control system, please contact us. Problem of speed sensor. Please contact us.
E3	Door cover protecting	Re-close the door cover Please contact us if the door cover is broken
E6	voltage supply is too high	voltage supply is too high. and please contact us if the control board is damaged
E7	Fault of driving	contact our company please
E11	Fault reach the speed	Voltage supply is too low, try to change the power supply or contact our company please.

7. Packing List

No.	Item	Type	QTY
1	Low speed benchtop centrifuge	LC-6S/LC-8S/LC-12S	1unit
2	Rotor		1unit
3	Centrifuge tube adapter		
4	Rotor lid		
5	Operations manual		1unit

8. Certificate of Compliance

Low-speed Benchtop centrifuge

Certificate of Compliance

Maximum rotate speed: 5000r/min

Maximum relative centrifugal force: 3074×g

This product is qualified after examination. It can be sold in the market.