



High Speed Refrigerated Centrifuge **LB-15HRC**

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1. Safety Measures

- The instrument must be installed on a flat, stable, horizontal, and solid surface.
- Before operating the instrument, check if the rotor is securely fastened, never run the machine before the rotor is well installed.
- Never exceed its max speed and RCF of the relative rotors.
- Do not move the instrument when it is not completely stopped.
- Operate with a stable & appropriate power inlet.
- Don't place dangerous materials within a 30cm distance around the instrument.
- Only use rotors from us and with appropriate tubes for centrifugation.
- Don't use hazardous, inflammable, or radioactive materials as samples.
- The sample must be loaded in a weight-balanced way so as not to cause imbalance.
- Never run the machine before closing the lid lock well.
- Any improper handling or any usage of unqualified accessories is not able to be protected.

2. Introduction

High speed refrigerated centrifuge LB-15HRC is a benchtop unit with a high speed of 22000 rpm and a temperature range between -20 °C ~ 40 °C. Capable of maintaining lower temperature (below -4 °C) even at maximum speed. Digitalized LCD panel for viewing ongoing parameters with simultaneous regulation of speed and time. Features automated calibration of RCF/RPM values and automatically displays it.

3. Features

1. Maximum speed - 22000 rpm
2. Short spin function for instantaneous centrifugation
3. Microprocessor control feature, automatically detects rotors and speed limit
4. Ten types of acceleration and deceleration control, with free stopping 9th control time longer than 540s
5. Maintains lower temperature value (-4 °C), even at maximum speed
6. Automatically calibrates speed and centrifugal force value
7. User friendly interface for convenient simple operation
8. LCD control panel – viewing and regulating ongoing parameters (speed and time)
9. Secondary display for viewing countdown less than one minute
10. Electronic lid locking system for user's safety (over speed protection and imbalance)
11. Lid opens automatically on completion, preventing overheating of samples
12. Equipped with replaceable rotors for different sample concentrations

4. Specifications

Model No	LB-15HRC
Speed range	22000 rpm
Maximum RCF	32465 × g
Speed accuracy	± 20 rpm
Time range	1 min ~ 99 mins
Maximum capacity	4 × 750 ml
Temperature range	- 20 °C ~ 40 °C
Temperature accuracy	± 2.0 °C
Power supply	AC 220 V ± 22 V, 50 Hz, 16 A
Power	1300 W
Noise level	< 65 dB
Dimensions	735 mm × 800 mm × 545 mm
Weight	105 kgs

5. Applications

Used in research laboratories for DNA and RNA analysis, PCR or antibody analysis, radioactive immunology, isolation and purification of blood samples

6. Installation

6.1 Unpacking

At the time of unpacking, open the box and take out the accessories and machine.

6.2 Placement

Remove the packing stuffing inside the box and take out the centrifuge with hands (four people), it is about 105 Kgs. Both hands hold onto a centrifuge after raising it. and putting it on the smooth ground. The machine should be placed on a horizontal surface with sufficient rigidity and kept away from the vibrating and punching equipment as well as the heat source. It should not be exposed directly to the sunshine. A space between 10cm and 15cm should be reserved on all sides of the machine.

7. Operations

- Turn on the power and open the lid cover by pressing the button.
- Install the rotors with the attached wrench.

Note: Never run the machine without a rotor and never run the machine before the rotor is installed well, or it will meet accidents.

- Prepare the samples; the samples in the buckets should be of the same weight, their weight difference is suggested not more than 1g. Otherwise, it will result in severe vibration in the process of spin.
- Load samples into the rotor in a centrosymmetric way.
- Fasten the rotor lid with the attached wrench.
- Close the lid, and ensure it is locked
- Set parameters
- All the parameters will be shown on the panel, switches, and buttons in the following figure:

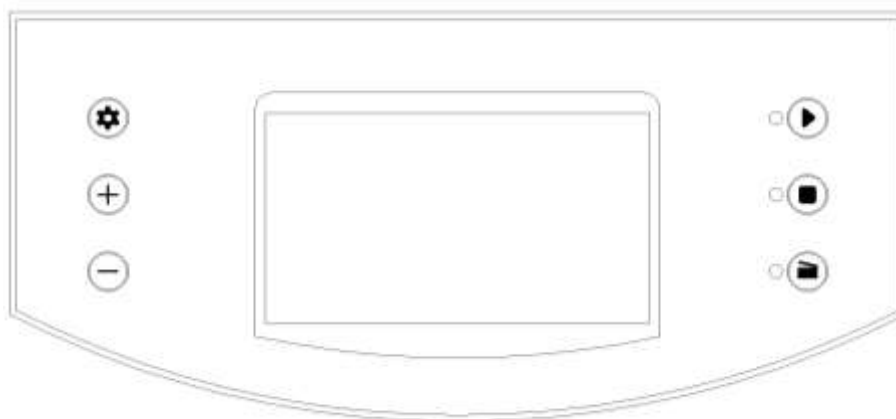
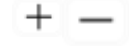


Figure-1

7.1 Explanation Of Button and Display Panel

- | | |
|---|--|
|  | Set button, press this button once you want to set all the parameters. |
|  | Start button, once press this button, the machine will start to work. |
|  | Stop button, once press this button, the machine will stop working. |
|  | Open button, once press this button, it will open the lid. |
|  | Adjusting parameters button. Press the + and – buttons together to unlock the rotor number, then you can set the rotor number. |

Note: Each rotor has its number, if you need to change the rotor, then also need to change its number in the program, for setting the rotor number, kindly press the + and – buttons together for 4 seconds, then the rotor number is unlocked, now you can set the number of the rotor.

On the Display Panel, It Shows

- 1) Rotors information.
- 2) Deceleration and Acceleration rate.
- 3) Real speed, time, and RCF.
- 4) Machine status: Stop or Run
- 5)  Rotors number
- 6) Temperature
- 7)  Memory or Program Number

7.2 Parameter Setting

Press  , All the parameters "SPEED, RCF, TIME, ROTORS No, ACCE/DECC" can be set by a button  and button  

For Example. Set the Speed

Press  button till the "Speed" flashes on the panel, and then press   to the speed you want, Till the blue flash disappears, then the speed value is set well. You can set all the other parameters in this way.

Note: Rotors number setting, as this machine combines the low-speed large capacity swing rotors and high-speed fixed rotors function, considering the safety reasons, We designed a lock for the rotors number function, if need to change the rotors number, then kindly press the + and – button together for 4 seconds, till the rotors number unlocked, then you can set the rotors number with the set button and adjust rotors number by + or – button.

Close the lid cover after you set all the parameters

1) Start the Centrifuge by pressing the button

The start indicator will be brightened, the centrifuge will start to work, the speed window will show the speed; the time window will begin to count down, and the speed will be up to what you pre-selected within 1-2 minutes.

2) Stop the Centrifuge

When the time window counts down to 0(or press the stop button )stop indicator will be brightened, the speed will be down to 0, the centrifuge will stop running, and then the alarm  press the button to open the lid.

Open the lid; take out samples, centrifugation finished.

Note: Acceleration and deceleration explanation

There are 10 kinds of Acceleration and Deceleration for choice, the small value means faster in speed up and down, for example, Acceleration 0 is faster than Acceleration 9 in speed up.

3) Power Off

Press the right side of the switch button, now the panel is cut off, but the whole machine is not powered off, if you stop using the machine, you should take out the plug from the power supply socket.

8. Maintenance

Cleaning:

Clean the centrifugal cavity with a cleaning cloth, the imported cooling system with perfect cooling performance, it is suggested to clean the chamber again when turning off the power and till the chamber temperature is the same as the room temperature. Or it will be water in the chamber that causes the temperature difference.

9. Rotor Selection

Rotor Type	Max Speed	Capacity	Max.RCF
Angle Rotar	22000rpm	12 × 1.5 /2.2 ml	32465 × g
	21000 rpm	16 × 1.5 /2.2 ml	29200 × g
	18000 rpm	10 × 5 ml	20800 × g
	16500 rpm	24 × 1.5 /2.2 ml	24890 × g
	16000 rpm	18 × 0.5 ml	19200 × g
	15000 rpm	2 × 8 × 0.2 ml PCR tubes	13890 × g
	15000 rpm	12 × 10 ml	23120 × g
	14000 rpm	6 × 50 ml round bottom	19800 × g
	13000 rpm	6 × 50 ml sharp bottom	17950 × g
	11000 rpm	12 × 15 ml	12450 × g
	11000 rpm	4 × 100 ml	13000 × g
	10000 rpm	6 × 100ml	11890 × g
Horizontal rotar	5500 rpm	4 × 50 /100 ml	5310 × g
	4200 rpm	8 × 50 ml	3100 × g
	4200 rpm	16 /24 × 10 /15 ml	3100 × g
	4200 rpm	32 × 10 /15 ml	3100 × g
	4200 rpm	48 × 5 /7 ml	3100 × g
	4200 rpm	64 × 5 /7 ml	3100 × g
	4200 rpm	72 × 5 /7 ml	3100 × g
	4200 rpm	4 × 250 ml	3850 × g
	4200 rpm	6 × 250 ml	3850 × g
	4200 rpm	4 × 500 ml	3950 × g
	4200 rpm	4 × 750 ml	3950 × g
	4200 rpm	4 × 24 × 5 ml	3950 × g
ELISA plate	4200 rpm	2 × 2 × 96 wells	2530 × g
	4200 rpm	4 × 2 × 96 wells	3550 × g

Formula

As the sample density $> 1.2\text{g/cm}^2$, the rotor Max. speed shall be as the following formula:

$$N'_{\max} = \sqrt{\frac{1.2}{P}}$$

P—Sample Density

$N'_{\max}$ – The rotor max. speed