

# **HIGH SPEED CENTRIFUGE**



## **Instruction Manual**



**Model : LHSC-50**

**Please read this manual carefully before using the instrument**

**Labnics Equipment**

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## CHAPTER 1. INTRODUCTION :

### 1.1 Specifications:-

<b>Model</b>	<b>LHSC-50</b>
Max. Speed	22,000 rpm (Angle)
Max. RCF	53,029 x g
Max. Capacity	4 x 1000ml
Speed Setting & Display	1 rpm
Temperature Setting	-20°C to +40°C
Timer	9hr59min59sec
Deceleration	10 steps
Program	10 memories
Applicable Rotors	Angle rotor
Display	Digital type RPM, RCF, Time, Temperature, Program, Braking Steps
Standard Power Supply	Single Phase, 60Hz, 220V, 3.0kW (It depends on customers)
Dimension (W x D x H) mm	665 x 620 x 460
Weight (kg)	112
Drive Motor	Brushless AC Induction Motor

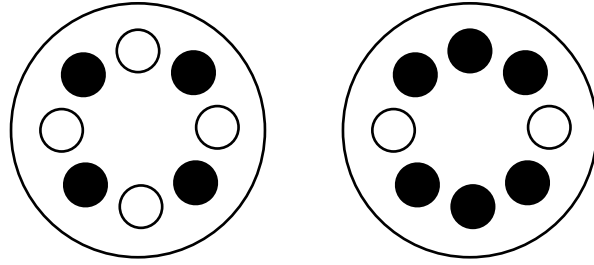
### 1.2 Caution:-

#### OVERSPEED

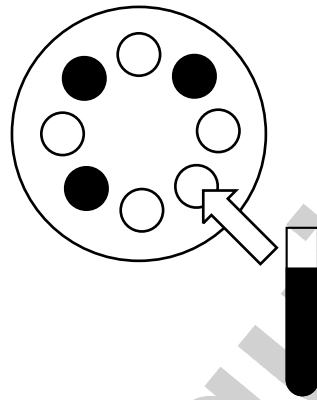
Make sure that Rotor speed is not more than maximum rotation speed. Don't over the maximum speed of rotor. When the rotor is given to relative centrifugal force over the allowed seal intensity, the destruction of rotor occurs because the shape of rotor is designed so that rotor can stand an external force in accordance with the allowed seal intensity of the rotor.

#### IMBALANCE OF TUBE

Put samples measured exactly into tube each and load tubes symmetrically each other in the rotor. If the volume of opposite sample is different, the serious turbulence occurs during rotation and a motor, rotor and shaft are damaged.



Tubes must be loaded symmetrically when you put the tubes on rotor



IF the tubes are not loaded symmetrically then load another tube having same weight.

### 1.3 Safety Note:-

#### Power On/Off

An automatic circuit breaker, for emergency situations, such as power surges, which could damages the unit, protects instrument's circulation when it is overpowered.

#### DOOR

The Rotor will stop automatically when door opens which is sensing by limit Switch.

#### CHAMBER SAFETY

- The double stainless steel protection kit which has enough intensity, structure and material of instrument to stand all kinds of risks is installed at the outer of chamber. The head and bottom plate manufactured with 25mm of stainless steel protect users from danger as rotor is destructed, and the chamber is enclosed by 45c stainless steel having 13mm in thickness.
- Above safety devices are inspected by **Labnics** Equipment Pvt. Ltd. And confirmed safety

## SPEED

- If the rotor is used with speed more than the maximum speed continuously for a long time, it is incurred that rotor is destructed.
- The centrifuge should be used with designated speed according to rotors respectively and if operated with overspeed, overspeed control system gives an alarm signal and stops the centrifuge by the designated deceleration time.

## IMBALANCE & VIBRATION

- During rotation, if rotor is operated with imbalance over standard, motor also moves. In this case, the danger is detected by measuring the vibration of motor. With an alarm imbalance "LED" lit up and the rotation stops by preset deceleration level. Safety device as above keeps the instrument from an accident during operator's absence in Lab.

## TEMPERATURE

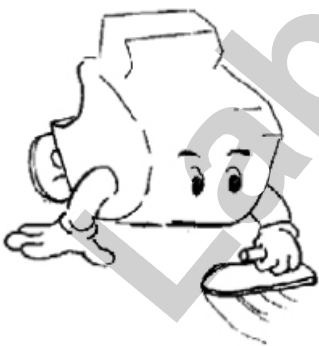
- When the inner temperature of chamber rises abruptly beyond the limit, over temperature LED lits up and an alarm sounds continuously.

## SYSTEM

- When the system has abnormality itself, it is lit up and notify the user of abnormality.

## CHAPTER 2. NOTE FOR INSTALLATION:-

### 2.1 Location:-



#### Best Location

The rotating instrument should be set on the flat and solid surface. In the case of setting the instrument at the incline surface, it is possible the shaft become bent by the heavy weight rotor because of a long time of rotation in inclining of the shaft and ground.



### AIR CIRCULATION

For the circulation of air, the distance of at least 30 must be observed around the centrifuge during operation. Avoid to set it on the dusty place.



### TEMPERATURE & HUMIDITY

The centrifuge which is controlled by a high-tech microprocessor is affected by the external conditions such as temperature or humidity. If a room temperature is extremely high by the direct ray of light or heater, or very low, the accuracy and reliance of instrument are reduced by errors of electronic parts. On top of that the high humidity makes the corrosion of rotor or parts. A proper temperature and humidity should be maintained accordingly.



### AVOID CORROSIVE GAS

Place the centrifuge at the place which the corrosive gas doesn't occur. If there is sulfur dioxide or chlorine gas in atmosphere, it cause a corrosion of rotor and shaft, and cause great damage of metals.

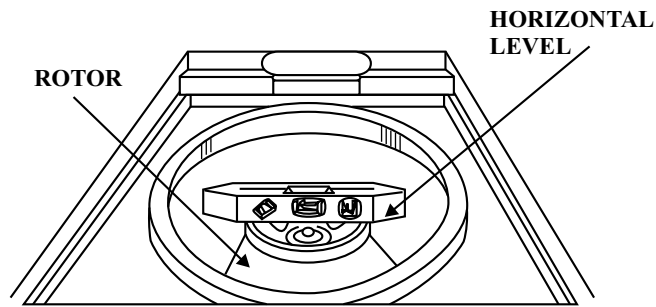
## 2.2 Balance:-



### BALANCING

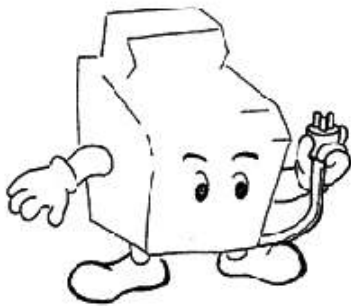
The shaft has to be perpendicular to the ground. At this time, a balancing gauge should put on head part, mounting rotor on the instrument.

If you measure a balancing gauge not on the shaft but on the main body of the instrument, in spite of balancing, it can't help the shaft to be rotated normally.



If not easy to balance with balancing gauge on the shaft, it is allowed that you do a balance, placing a balancing gauge on the upper rotor without a lid onto the shaft. Each control bolt on the corner of square, which is at the bottom of centrifuge, adjusts the height.

### 2.3 ELECTRICAL REQUIREMENTS:-



#### POWER

The standard power requirements are a single phase and 220V but those are changeable depending on User's request. Therefore, plug in after checking the name plate located on the rear panel. Be sure not to be three phases



#### Grounding method of centrifuge :

Grounding line of our centrifuge is a green line of power line and the power is a single phase power and 220V.

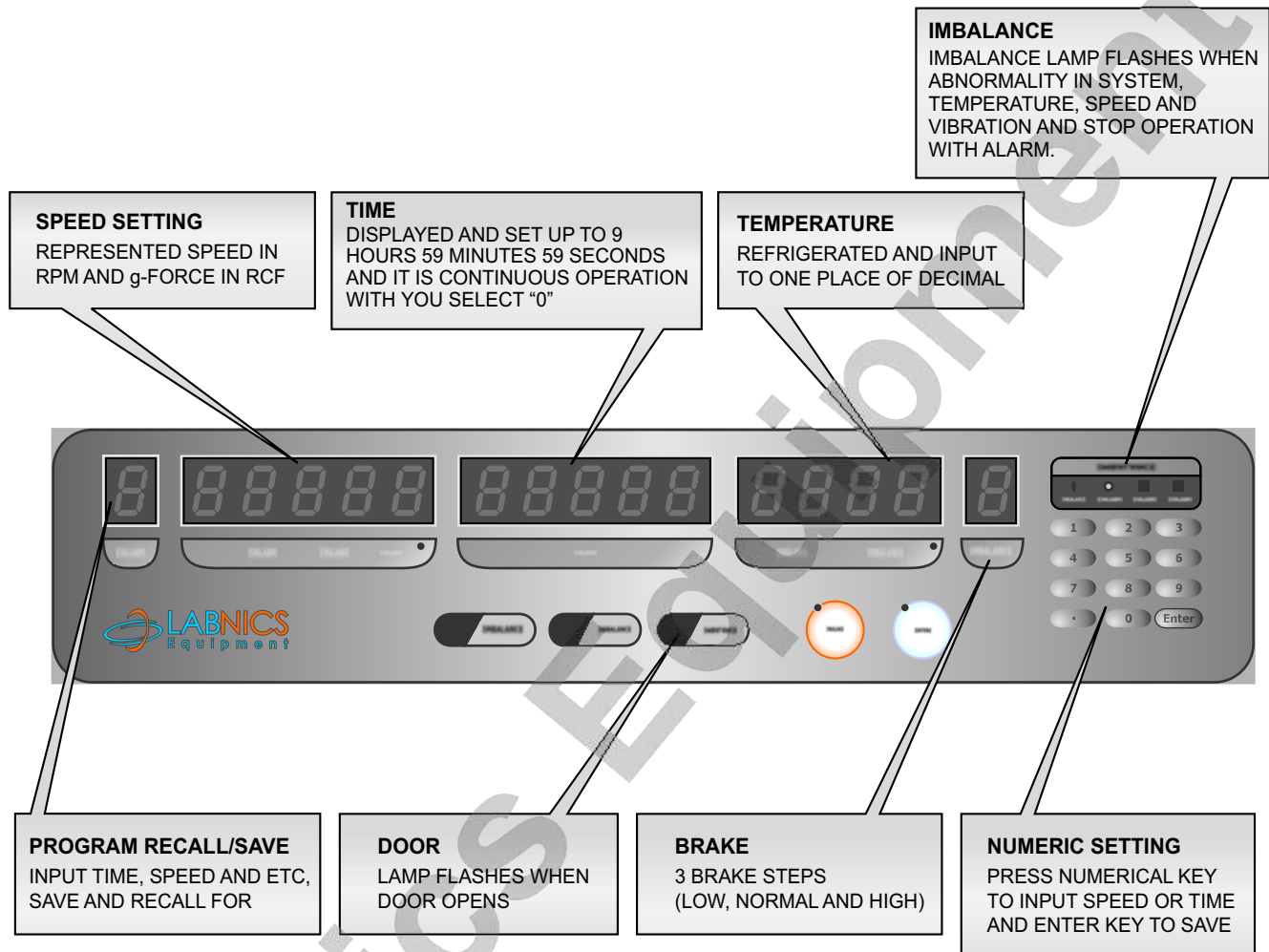
If users want to certify whether external grounding is connected well or not in the power line, users have only to certify whether between one of black or white line and green line is 110V.

In case of installation of instrument, If the grounding isn't conducted well, it may cause a wrong operation of centrifuge, and the electronic system of centrifuge may be damaged by the external electrical shock, so that it is necessary to conduct the grounding.

Don't connect a grounding line to a water pipe, a gas pipe, a electric line, a lighting rod and a telephone line. Especially, in case of a water pipe, although an exposed part is a copper pipe, as a grounding function may be impossible according to that the PVC line connected to in the middle of pipe sometimes, you had better avoid. As for using a gas pipe to ground, a flame can cause a fire. In the moist place , Installation of an electric leakage cut off is much safer.

## CHAPTER 3. PARTS DESCRIPTION:-

### 3.1 Control Panel:-



## CHAPTER 4. OPERATION PROCEDURE:-

### 4.1 Standard Operation-

#### 1. Power Supply

- Turn on the main power switch on the back of the instrument.
- Turn the key switch located in front of instrument to "On" position.
- With the power being connected, the lamp is off and be to the operation standby status.
- When turn the switch to "Power on" status, all the indicators on the board light off with alarm and last data before power out is indicated.



## 2. Open the door and install the rotor onto the shaft

- Door opens when power on.
- Door closes automatically when the rotor starts to spin and will open when rotor stops.
- Door will open when press the door button on the panel during the spinning stage.



Don't press door button when rotors spins.

## 3. Input desired setting parameters.

- Reset the desired data for RPM, Time, Temp., Brake system.
- Press the control button to change the data for speed, time, temperature and so on.
- The previous setting data flashes.
- Input desired parameters.
- Press "save" button to save it.

## 4. Press "start" button to run the instrument

- Press "start" button to run the unit without changing any parameters such as rpm, time and temperature.
- The refrigeration system will run to calibrate temperature and the rotor will not run when the actual temperature is not in the temperature limit range.
- The centrifuge will start to decelerate when it reaches the time limit.
- Door will open when it stops and setting parameters be displayed. Press the "stop" button to stop operation.

## 4.2 Programmed Operation:-

### Speed Setup

- Whenever "RPM" key and "RCF" key are pressed, the indicator lights on alternately and Users can select the desired speed .
- When the indicator of "RPM" lights on, it sets in the number of rotation per minute and the when the indicator of "x g" lights on, it sets up in g-Force.
- When the indicator lights on, finish the setting according to pressing the numerical key.
- After entering the number of speed, press the "Speed" key two times, and you can confirm that g-Force sets up automatically.

### Time Setup

- After pressing "TIME" key and input the numerical data, press "ENTER" key. The setting range is 0 minute to 59 seconds 59 minutes 9 hours and after setting up "0 minute" and running the instrument, It functions "Free-run" continuously without time.

In case of lower than 1 minute, "SEC" indicator light on and is displayed in second

### **Program Save & Recall**

- When "SAVE" lights on, it means save mode to save the current setting data. Input the data in using of numerical key and press "ENTER" key. When "PROG" key lights off, it means recall mode to return the stored data.
- The numbers are available to 0 through 9.

### **Start**

- Press "START" key to run. If door opens, Alarm sounds 3 times and note the door opening and it is standby status for the running.
- When the door closes, the instrument starts to run.
- It is able to regardless of temperature, so that If pre-cooling for sample protection and preserving refrigeration is needed, start to run after confirming the temperature to set up to the designated data.
- During the running, the door doesn't open. If the running time sets up, it stops automatically after the running Time.

### **Stop**

- Press "STOP" key to suspend the running.
- If the stop is finished, the short alarm sound 7 times and notify the stop status. When "STOP" key lights on, it means the stop.

### **Door Opening**

- If the dial on the right side is turned, the door opens.

### **Brake Setup**

- After pressing "brake" key, press the desired brake step on the numeric board and "Enter" key.

## **CHAPTER 5. MAINTENANCE:-**

This chapter explains how to keep your unit in good operating order. It includes instructions for cleaning, decontaminating and storing. This chapter also covers the cover interlock by pass.

### **Care and Cleaning:-**

- Keep your centrifuge cleans, to ensure good operation, and to extend it's life.
- Clean the sample chamber, rotor and lid at the end of each works day and immediately after any spill. To clean the chamber, use a damp sponge, warm water, and a mild liquid detergent, suitable for washing dishes by hand. Don't use caustic detergents or detergents that contain chlorine ions. These attack metals.

- Remove stubborn stains with a plastic scrub pad. Don't use steel wool, wire brushes, abrasives, or sandpaper. They create corrosion sites. Never pour water directly into the rotor chamber. Scrub the rotor's tube cavities with a stiff test tube brush that has end bristles and a non-metallic tip. Dry each part, after cleaning, with a clean, absorbent towel.
- If glass breakage occurs, remove all broken glass embed in the plastic or rubber accessories.
- Glass particles can come in contact with new glass tubes, creating pressure points that may results in breakage recurring. Glass particles, in the chamber, grind to a fine gray dust, during centrifugation.
- This dust can coat the inside of the centrifuge.

#### **Storage :**

- Store parts on a soft surface, to avoid damage.
- Rotors and other parts should be clean and dry. Store them open to the air, not in a plastic bag, so that any residual moisture evaporates. Face the parts upward to avoid moisture retention in the cavities.

#### **Decontamination:-**

- If tube breakage occurs, releasing toxic, infections, pathogenic, or radioactive material into the unit, decontaminate the chamber.
- Rotors have sealed containers that provide aerosol containment and, if used as directed, keep sillage confined. If breakage occurs, it may be sufficient to only decontaminate the sealed carriers.

#### **Cover Door Lock:-**

- The cover will remain locked, if power fails. If you need to remove samples from the unit, before power is restored, use the cover door-lock, after the rotor has come to a stop.

#### **Refrigeration:-**

##### **Condenser**

- Condenser is to liquidize gas which has high temperature and pressure by refrigeration.
- The condenser refrigerated by air circulation attaches with refrigeration pin consist of the thin board. it makes heat down according that air contacts the refrigeration pin. Therefore, If the refrigeration fan is contaminated by dirt, it may cause a break down.
- The dirt of refrigeration pin should be cleaned by the brush or air pump one time Per 6 Months. The refrigeration pin has material of copper or aluminum so that be Sure to be bent.

##### **Refrigerators**

- It runs normally but sounds water flow.
- This is the sound flowing according that the refrigeration reagent is liquidized.
- The instrument has no abnormality and use it without anxiety.
- The collision sounds in the centrifuge.
- This is the sound indicating the contraction and expansion of parts related in refrigeration. The instrument has no abnormality and use it without anxiety.

## CHAPTER 6. TROUBLESHOOTING:-

ERROR	SOLUTION
No running	Check power supply cable.
	Check the door switch.
	Check the temperature setting data. (Check the temperature deviation from temperature limit)
	Check the inverter output.
	Check the motor status.
Centrifuge shakes and makes a noise during running	Check rotor loading.
	Fasten rotor correctly.
	Check the motor status.
No putting the data / No input	Check the membrane.
	Check the rotor number.
Abnormality of temperature	Check the temperature sensor.
	Inspect the connector.
Abnormality of the operation	Reput the acceleration and deceleration.
Abnormality of the refrigeration	Check the sealing of the door.
	Check the drive of the refrigerator.
	Check SSR.
	Check the radiator.

If the above solutions are unsuccessful, please contact technical & service team.

### <Error Code>

Display	Cause	Solution
HELP 1	The spinning speed isn't recognized. It causes by the disconnection Of the sensor or abnormality of Inverter or PCB and so on.	Contact Technical & Service Team.
HELP 2	It causes when the "START" button is pressed during spinning.	Press the "START"key after the motor stops.
HELP 3	When the setting data are used to the memory element, it is displayed that the running is defective. Abnormality of IC Socket.	Replace it into new IC.





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