



## CLINICAL CENTRIFUGE, FLOW T45

*Please read the User Manual carefully before use, and follow all operating and safety instructions*

**User Manual**

English

# User Manual

EN

CLINICAL CENTRIFUGE, FLOW T45

## Preface

Thank you for purchasing our product. Users should read this manual carefully, follow the instructions and procedures, and be aware of all preventive measures when using this instrument.

## Service

If help is needed, you can always contact your dealer or Labbox via [www.labbox.com](http://www.labbox.com).

Please provide the customer service representative with the following information:

- Serial number
- Description of the problem
- Your contact information

## Warranty

This instrument is guaranteed to be free from defects in materials and workmanship under normal use and service for a period of 24 months from the date of invoice. The warranty is extended only to the original purchaser and shall not apply to any product or parts that have been damaged due to improper installation, improper connections, misuse, accidents, or abnormal conditions of operation.

For claims under the warranty, please contact your supplier.

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## 1. INTRODUCTION

This manual provides important safety information for this centrifuge. It should be kept near the centrifuge for quick and easy references. This centrifuge is equipped with maintenance free brushless DC motor drive and a safety feature of imbalance detection. The centrifuge can be used for multiple application diagnostics and will work with variety of blood collection tubes.

## 2. INTENDED USE

This is a bench top centrifuge which is designed to separate, sediment, spin down aqueous solutions and solvent suspensions of differing densities in compatible sample containers.

**NOTE:** Before using the centrifuge, please read this user manual carefully. This user manual is intended to assist with the operation and care of the unit and is not a document which aids in repair. For repairs, please contact the supplier.

## 3. SYMBOL

 Warning	 Waste electrical
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## 4. FEATURES

- Maximum volume of 4 x 50 ml
- Imbalance detector with auto cutoff for safe operation
- Brushless DC motor for maintenance free performance
- Lid lock safety-the lid opens automatically on run completion
- Digital display with speed and time indicator
- RPM setting from 500-4500 RPM with a count of 100
- Long press changeover from RPM to RCF functionality
- Digital countdown Timer
- Reduction adapters for tubes with volume less than 15 ml
- Emergency lid release during power failure
- Automatic internal diagnosis and error display
- Silent operation programing option

## 5. TECHNICAL SPECIFICATION

Option to choose 8 tube rotor that comes with Autoclavable and Tube holders.

Motor Type	Brushless Motor
Maximum Volume	4 x 50 ml
Speed Setting	500 to 4500 RPM
Maximum RCF	2109 x g
Speed Accuracy	± 100 RPM
Speed Steps	± 100 RPM
Run time	1 to 99 mins and infinite mode
Noise Level	≤62 dB (A)
Ambient Temperature	5-40 °C
Permissible Relative Humidity	≤80%
Acceleration Time	35 ± 5 seconds
Deceleration Time	45 ± 5 seconds
Size (L x W x H)	330 x 265 x 161 mm
Weight	4 Kg (with rotor)
Altitude	Use up to an altitude of 2000 m above MSL
Pollution Degree	2
Environment	For indoor use only
Power Adapter Details	Input: 100-240 VAC, 50/60 Hz Output: 24V --- 3A
Power Consumption	40 W

## 6. STANDARD ACCESSORIES

- Power adapter
- 8 - slots rotor (pre-installed)
- T-Allen Key
- 15 ml Reduction adapters (set of 4)
- Product user manual and warranty card
- Reduction adapter and spacer (set of 8)

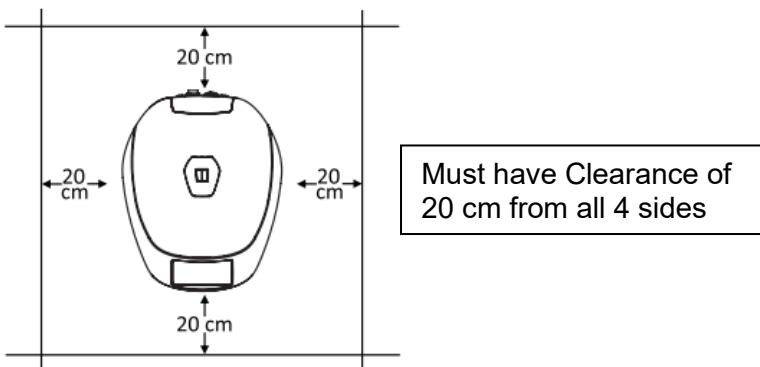
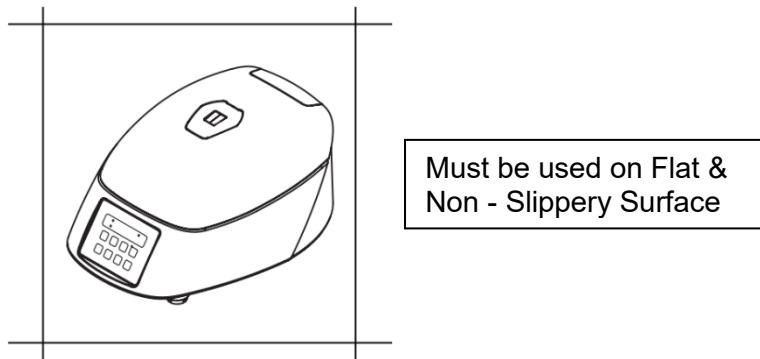
## 7. INSTALLATION

Gently remove the upper packaging and take out the centrifuge by holding it from the bottom. When the centrifuge is used for the first time, ensure that all the packaging and accessories are removed from the rotor chamber. The rotor is pre-installed. Please make sure that rotor is firmly tightened. Accessories and user manual are kept inside the box with the centrifuge. Please keep all packaging in safe storage for warranty purposes.

### PRECAUTIONS

1. Make sure to install the centrifuge on flat stable surfaces, devoid of vibration.
2. Not to lean on or insert outside weight on centrifuge to be strictly followed.
3. Keep the installation area uncrowded, especially with potentially hazardous materials.
4. A single technician / lab personnel should only be allowed near the centrifuge while it's running.

The following points are important for proper installation:



### 7.1 MOUNTING

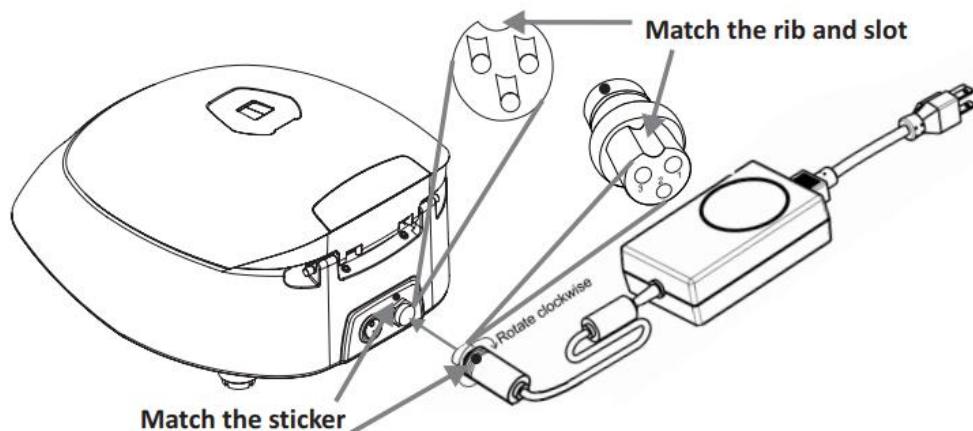
Place the centrifuge on a flat and leveled surface, ensure that the four feet of this

centrifuge stands on the surface firmly. Avoid installing on a slippery surface or surface prone to vibration.

1. Ideal ambient temperature is  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , avoid placing the centrifuge in direct sunlight.
2. Keep clearance of at least 30-35 cm on both sides and at least 20 cm behind it to guarantee cooling efficiency.
3. Keep away from heat or water to avoid sample temperature issues or centrifuge failures.
4. Do not place the centrifuge in any area where operating the unit may be difficult.

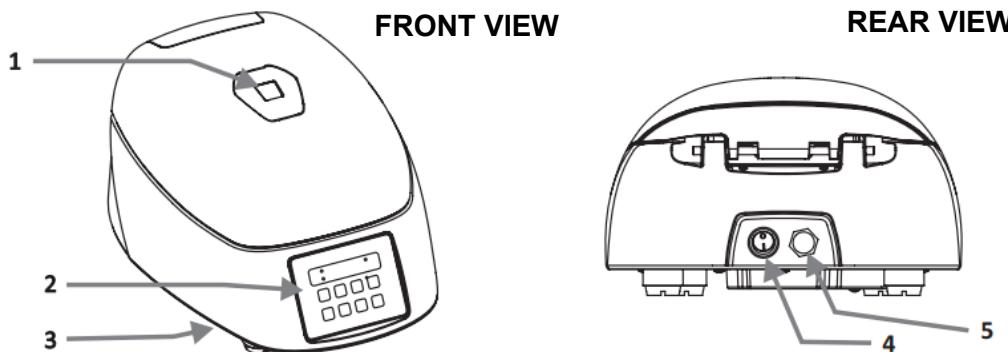
## 7.2 CONNECTING POWER ADAPTER

1. Connect one side of power adapter to rear side of centrifuge and another to supply as shown in the figure below.
2. Rotate clockwise the adapter nut to tighten the adapter with the centrifuge. Ensure the power switch is OFF while connecting the power adapter.
3. The sticker on the body and jack indicate the position of the rib on the jack. While fitting the adapter to the unit, please match the sticker position as shown in the figure below and gently push it in.

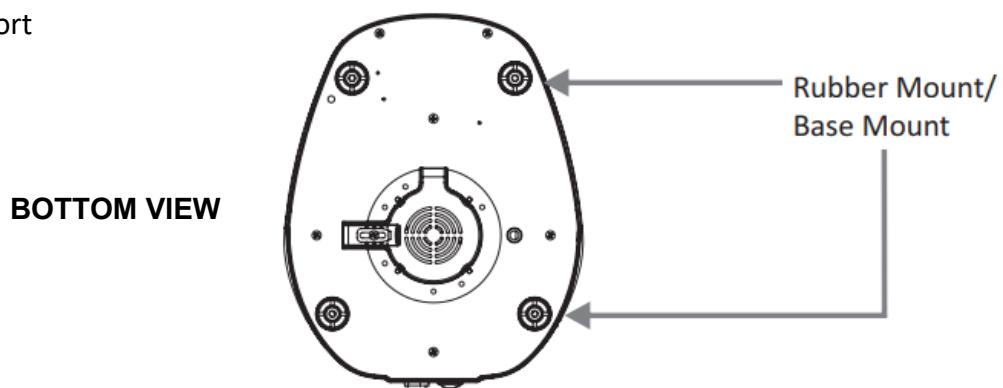


4. If matched correctly the plug will go in easily without much force (do not try to force the plug in if it is not matched properly). Once the plug is inserted into position, turn the loose upper ring clockwise to tighten and to secure the fitment.

## 8. STANDARD PARTS LISTING



1. View window
2. Operation and setting buttons and Display
3. Emergency lid release
4. Power switch
5. Adapter port



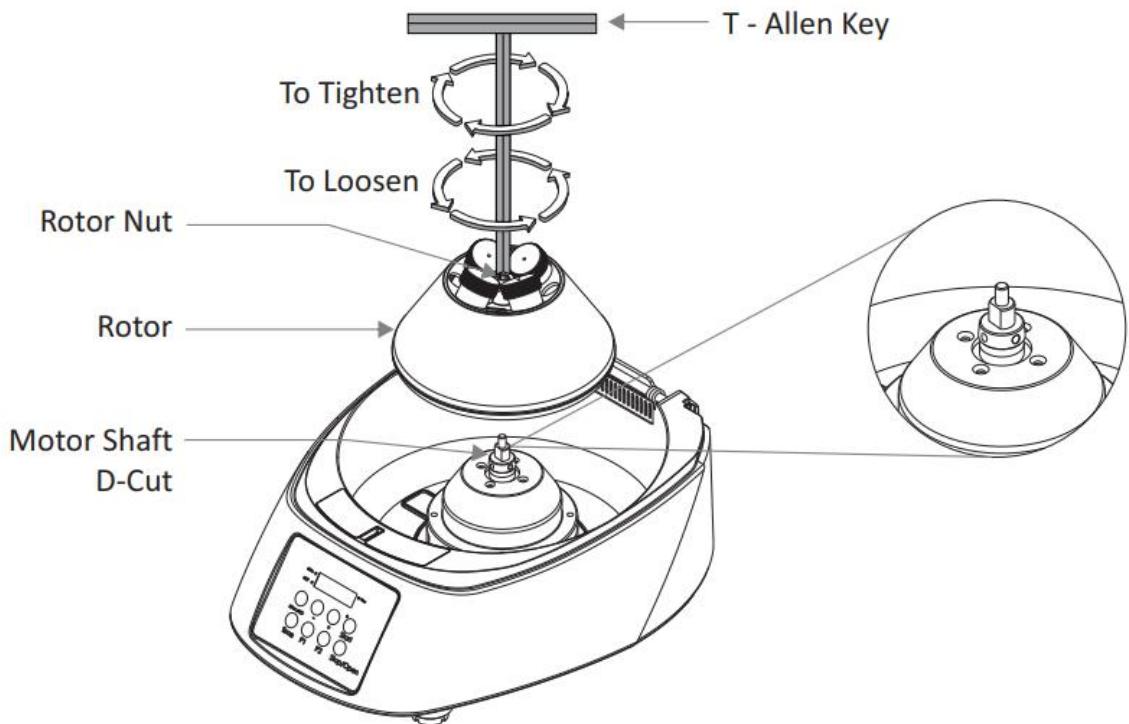
## 9. REDUCTION ADAPTERS

This centrifuge features centrifugation for wide range of volumes from 5ml to 50ml with the combination of its adapters. The accessories included are:

Rotor Options						
			Standard Blood Collection Tubes			
Tube Capacity	50 ml	15 ml	10 ml	7 ml	5 ml	2 ml
Dimension (mm)	Ø29 x 115	Ø17 x 120	Ø16 x 100	Ø13 x 100	Ø12 x 75	Ø13 x 55
Rotor Radius (mm)	87.5	93	89	86.7	73	64
Speed (RPM)	4500	4500	4500	4500	4500	4500

Max. RCF	1985 x g	2109 x g	2019 x g	1966 x g	1656 x g	1452 x g
Total no. of tube	4	8	8	8	8	8
Adapter Required		No	No	Yes	Yes	Yes
D08SP1		No	No	No	Yes	Yes
D08SP2		No	No	No	Yes	No
D08SP3		No	No	No	No	Yes

## 10. ROTOR INSTALLATION



The rotor of the centrifuge is pre-installed. In case of any spillage, remove the rotor as shown in the above figure to clean the rotor and its chamber thoroughly.

### 10.1 REMOVING ROTOR

1. To remove rotor, first remove the Tube Holders.
2. Using T-Allen key, loosen the rotor nut by rotating rotor nut counterclockwise and take the out rotor vertically.

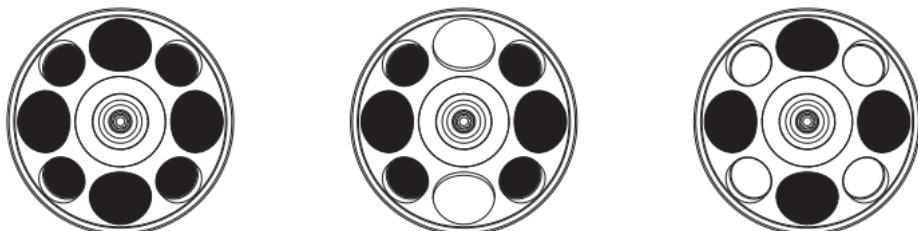
## 10.2 INSTALLING THE ROTOR

1. Make sure the rotor shaft and the rotor mounting hole are clean. Load the rotor vertically into the motor shaft.
2. Align the D-Cut motor shaft and rotor.
3. Put the T-Allen key in the rotor nut and turn clockwise to tighten the rotor.
4. After properly fastening the rotor, place the Tube Holders into the rotor.

**NOTE:** Care should be taken to open lid of centrifuge via the function button only, do not use external pressure to pull it open. In case of lid getting jammed please use emergency lid release.

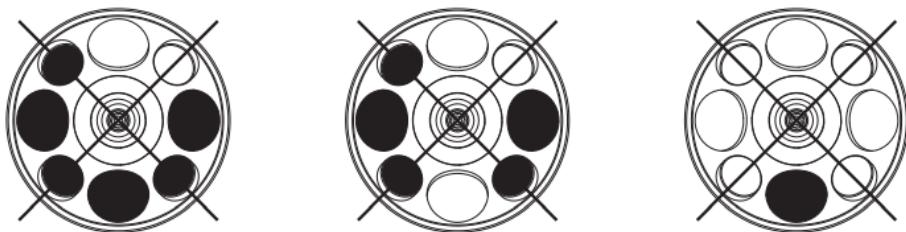
## 11. BALANCING THE ROTOR

1. Always balance the rotor before centrifugation. Symmetrical loading of tubes in the rotor is necessary. Otherwise, vibration or imbalance may occur, which can cause serious damage to the centrifuge. The following steps describe the correct procedure for symmetrically loading centrifuge tubes into the rotor.

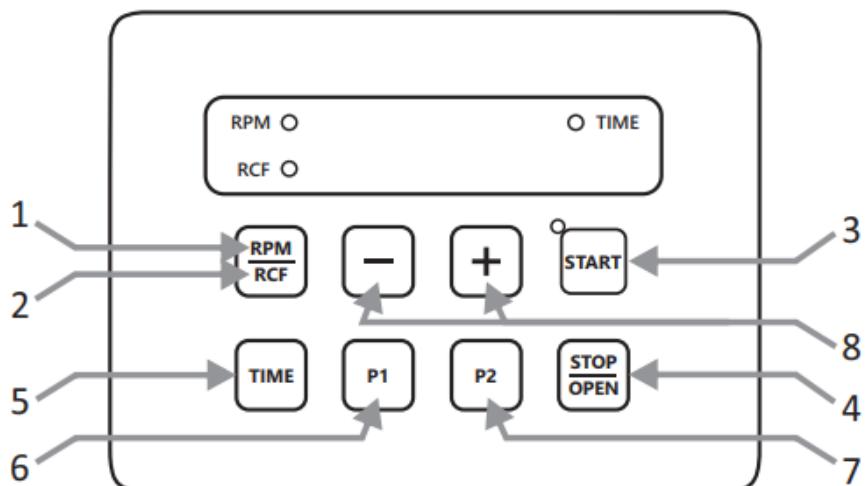


2. The samples in the tubes should be of equal volume. To achieve a balanced condition of the 8-reduction adapter it is mandatory to place inside the rotor whether 2, 3, 4 or 6 / 8 tubes are being used.
3. If the tubes are not loaded symmetrically then the imbalance detector will cut off the running centrifuge for safety reasons. This will stop the centrifuge and Err 55 will be seen indicating the tubes are not loaded symmetrically. To resume operation, load the tubes symmetrically and restart the centrifuge.

4. Below are examples of incorrect method of loading tubes into the centrifuge rotor. cause serious damage to the centrifuge. The following steps are the process of symmetrical loading of centrifuge tubes inside the rotor.



## 12. USER INTERFACE and DISPLAY

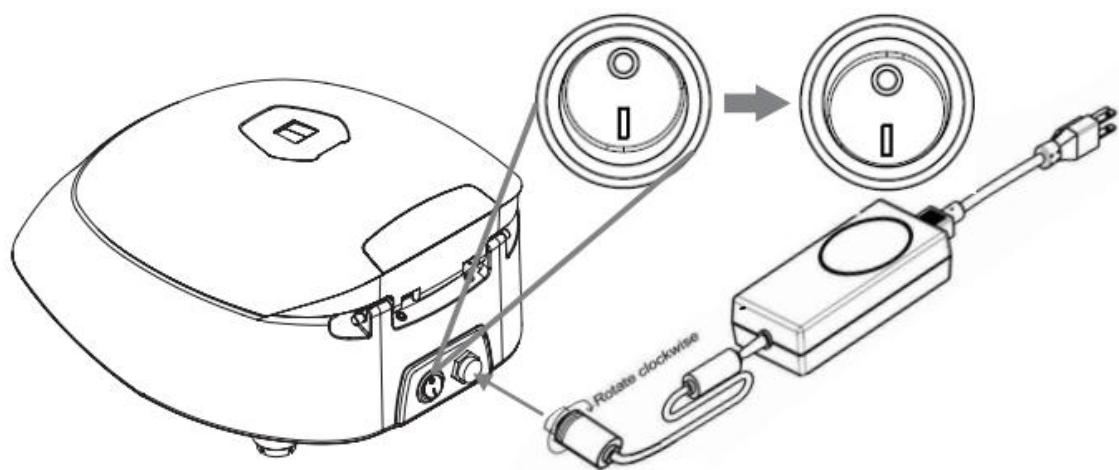


Item	Name	Function
1	RPM	Press this button to select RPM value. Then Press “+/-” to set RPM value.
2	RCF	Long press “RPM/RCF” to toggle between RPM/RCF value. Select the RCF value to be set for centrifugation.
3	START	Single press “START” button centrifuge will start as per set RPM and TIME. START button works only if lid is closed.
4	STOP/OPEN	Single press “STOP/OPEN” button will stop centrifuge. Centrifuge lid will open automatically after the centrifugation.
5	TIME	Press this button to select Time value. Then Press “+/-” to set Time value.
6	P1	Single press “P1” button to set program mode.

7	P2	Single press "P2" button to set program mode.
8	+/-	"+" is used to increase and "-" is used to decrease values.

## 13. OPERATION

After properly installing the centrifuge, switch ON the centrifuge from the rear side by pressing the power switch. The lid status will be seen in the display. If the lid is open, the display will show "Lid" and if it is closed, the set RPM will be displayed. Please ensure that the Tube Holders are inside the rotor.



### 13.1 SPEED SETTING

After closing the centrifuge lid, press "RPM/RCF" button to select speed setting in RPM/RCF mode. Speed display will blink for 5 seconds. Now press (+) button to increase the speed value and press (-) button to decrease the speed value. Minimum and Maximum RPM of the centrifuge is 500 RPM to 4500 RPM respectively. Blinking of RPM value will stop and the RPM value will be stored automatically if no button is pressed after around 1 seconds of the adjustment.

The speed can also be changed while the centrifuge is under operation. Press the "RPM/RCF" button and use setting (+) and (-) to change speed. Changing the speed between the ongoing centrifugation will run the centrifuge at updated speed for the rest of time as indicated by the timer. The speed can be selected in RCF value, too. Long Press "RPM/RCF" button to change the RCF setting. Press the (+) and (-) button to increase or decrease the value. Blinking of RCF value will stop and the RCF value will be stored automatically if no button is pressed after around 1 second of the adjustment. The value

will blink 5 times to indicate acceptance.

### **13.2 TIME SETTING**

Operating time can be selected from 1 min to 99 min or “continuous”. Press “TIME” button to change the time setting. Press the (+) and (-) button to increase or decrease the value and after 5-time blink of the set value. The centrifuge timer is set for running between 1min to 99 minutes or operated in infinite time mode or roll over mode. Infinite timer will be indicated by ][:][ in display. The timer in the centrifuges’ countdown timer in the display will be in “Min/Sec” mode. Time will be shown after 5 sec. Time indicate on Time LED light.

The input will be accepted if we leave the setting for around 1 second. The value will blink 5 times to indicate acceptance.

### **13.3 START and STOP OPERATION**

Press “START” button to start operation and press “STOP” button to stop the ongoing



operation. When the centrifuge is running LED light will be ON. Pressing the “STOP/OPEN” button will stop the operation. Once operation is over centrifuge lid will open automatically. If lid is not open press “STOP/OPEN” button to open the centrifuge lid.

**NOTE:** In case of power failure once the rotor has stopped, pull out the emergency lid release as shown in the figure. This will open the centrifuge lid.

### **13.4 PROGRAM MODE**

Single press “P1” button to enter program mode. and Press “RPM/RCF” Button to change in RPM/RCF in program mode and select to (+) and (-) button to change RPM/RCF value and press “TIME” button to change in time in program mode. Values for any parameter gets saved after 5 blinks. Once program is set, press “Start” button to start program.

Single press “P1” button to enter only one program. and to use second program press “P2” button. On first time usage, all programs will have zero (0) values and once the “P1” button is pressed display will appear indicating P1. To enter normal mode long press “P1/P2” button.

## 14. SAFETY PRECAUTION



Read all safety and usage information provided in this manual carefully before using the device.

1. Never use the centrifuge in any manner not specified in the manual.
2. Never move the centrifuge while it's operating.
3. The rotor must always be securely fastened. If the centrifuge makes an unusual noise during the operation, the rotor fit needs to be checked.
4. The rotor must be loaded symmetrically.
5. Do not use the centrifuge or rotor, if it is not installed correctly or it is damaged.
6. Do not use the centrifuge or rotor if it shows any sign of external mechanical or electrical damage.
7. The centrifuge must be used only for the specified application. It must not be operated in hazardous or flammable environment, and no hazardous or flammable content should be centrifuged.
8. Do not fill tubes while they are in the rotor. Liquid spillage may harm the device.
9. If liquid is spilled on the rotor or rotor chamber, the centrifuge must be cleaned immediately.

## 15. MAINTENANCE and CLEANING

Before cleaning the centrifuge, turn it off device and disconnect the power cord.

### OUTSIDE OF THE DEVICE

1. Clean the outside of the centrifuge with soft dry cloth.
2. Do not use aggressive chemicals such as alcohol, benzene, acetone or phenol.
3. If the device is contaminated, use a 70% IPA solution to decontaminate it.
4. Be careful not to scratch the surface of equipment when cleaning it.
5. Do not use a metal sponge.
6. The brushless motor in the centrifuge requires no routine maintenance. Any required service should be performed by authorized, qualified personnel only. Repairs performed by unauthorized personnel may void the warranty. Protective bonding continuity would be checked by authorized service person only.

### INTERIOR OF THE DEVICE (CHAMBER)

1. If the chamber is not dry, wipe away any moisture from the chamber with a dry cloth.
2. Clean the chamber and motor shaft at least once a week with a mild cleaning fluid.

#### **SAFEGUARDS FOR THE OPERATOR**

1. The operator must wear standard PPE during the cleaning process.
2. Ensure proper seal proof gloves are worn while cleaning the interior surface of centrifuge.

### **16. TROUBLESHOOTING**

This centrifuge has a self – diagnostic function. If a problem occurs, an error/warning code will be displayed on the display screen, and the operator can determine the malfunction with the warning code below.

ERROR	PROBLEM	SOLUTION
No display	No main power connection	Check power and properly plugin power adapter at both ends
	Power failure	Check the main fuse
	Improper connection	Connect adapter properly
Error 1	Latch jammed or any limit switch of latch got damaged	Contact service representative
Error 52	Rotor stuck or incorrect operating voltage	Turn off the centrifuge, check rotor fitment or apply correct 230 VAC $\pm$ 10VAC operating voltage. Restart unit
Error 55	Rotor not loaded symmetrically	Load rotor symmetrically and restart centrifuge. restart unit
Centrifuge lid cannot be opened	Rotor is still spinning	Wait for the rotor to come to a stop
	Power Failure	Emergency lid release after rotor stop

Centrifuge shakes during acceleration and exceptional running noise	Rotor not loaded symmetrically	Load rotor symmetrically and restart operation
	Either a broken tube, damage to the rotor or motor is cause for run noise	Replace broken tube. For damaged rotor/motor contact service representative
	Rotor damaged	Remove and change rotor
Display Error	Lose connection of display	Contact service representative
Power tripping	Cable does not fit properly	Remove cable and connect properly

**IMPORTANT NOTE:**

1. If the centrifuge is working slowly or hot due to overdraw current, restart the centrifuge and check it again.
2. Do not use liquid with density higher than 1.2g/ml for full load operation.

## **17. WARRANTY STATEMENT**

This product is guaranteed to be free from defects in material and workmanship. Your product will be duly repaired upon prompt notification in compliance with the following conditions:

This warranty is valid only if the product is used for its intended purpose and within the guidelines specified in this instruction manual. This warranty does not cover damage caused by accident, neglect, misuse, improper service, natural forces or other causes not arising from defects in original material or workmanship. This warranty does not cover any incidental or consequential damage, commercial loss or any other damage from the use of this product.

The warranty is invalidated by any non-factory modification, which will immediately terminate all liabilities on us for the products or damage caused by their use. The buyer and its customer shall be responsible for the product or use of products as well as any supervision required for safety. If requested the products must be returned to the

distributor in a well-packed and insured manner and all shipping charges must be paid. Some states do not allow limitation on the length of implied warranties or the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights. This warranty is given expressly in lieu of all other warranties, expressed or implied.

The purchaser agrees that there is no warranty for merchantability or fitness for any intended purpose and that there are no other remedies or warranties, expressed or implied, which extend beyond description on the face of the agreement. This warranty is only applicable to the original purchaser.

Products received without proper authorization will not be entertained. All items returned for service should be sent postage prepaid in the original packaging or other suitable carton, padded to avoid damage. We will not be responsible for damage incurred by improper packaging. All items returned for service should be sent postage prepaid in the original packaging or other suitable carton, added to avoid damage.

This warranty is valid only if the warranty is registered with the supplier within 30 days of the date of purchase.

For details regarding the warranty period, please refer to the warranty card provided with the product.

## **18. PRODUCT DISPOSAL**

In case the product is to be disposed of, the relevant legal regulations are to be observed.

### **Information on the disposal of electrical and electronic devices in the European Community**

The disposal of electrical devices is regulated within the European Community by national regulations based on EU Directive 2012/19/EU on waste electrical and electronic equipment (WEEE). According to these regulations, any devices supplied after 13.06.05 in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. They are marked with the following symbol to indicate this.

As disposal regulations within the EU may vary from country to country, please contact your supplier if necessary.



### **Nota importante para los aparatos electrónicos vendidos en España**

Instrucciones sobre la protección del medio ambiente y la eliminación de aparatos electrónicos:



Los aparatos eléctricos y electrónicos marcados con este símbolo no pueden ser eliminados en forma de residuos urbanos.

De conformidad con la Directiva 2012/19/UE, los usuarios de la Unión Europea de aparatos eléctricos y electrónicos, tienen la posibilidad de devolver sus RAEE para su eliminación al distribuidor o fabricante del equipo después de la compra de uno nuevo. La eliminación ilegal de aparatos eléctricos y electrónicos es castigada con multa administrativa.

### **Remarque importante pour les appareils électroniques vendus en France**

Informations sur la protection du milieu environnemental et élimination des déchets électroniques :



Les appareils électriques et électroniques portant ce symbole ne peuvent pas être jetés dans les décharges.

En réponse à la réglementation, Labbox remplit ses obligations relatives à la fin de vie des équipements électriques de laboratoire qu'il met sur le marché en finançant la filière de recyclage de ecosystem dédiée aux DEEE Pro qui les reprend gratuitement (plus d'informations sur [www.ecosystem.eco](http://www.ecosystem.eco)).

L'élimination illégale d'appareils électriques et électroniques est punie d'amende administrative.

### **Nota importante per le apparecchiature elettroniche vendute in Italia**

Istruzioni sulla protezione ambientale e sullo smaltimento dei dispositivi elettronici:



Le apparecchiature elettriche ed elettroniche contrassegnate con questo simbolo non possono essere smaltite come rifiuti urbani.

In conformità con la Direttiva 2012/19 / UE, gli utenti dell'Unione Europea di apparecchiature elettriche ed elettroniche hanno la possibilità di restituire i propri RAEE per lo smaltimento al distributore o al produttore di apparecchiature dopo averne acquistato uno nuovo. La rimozione illegale di apparecchiature elettriche ed elettroniche è punibile con una sanzione amministrativa.



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