

# CAPP®

D E N M A R K

## CR-68X



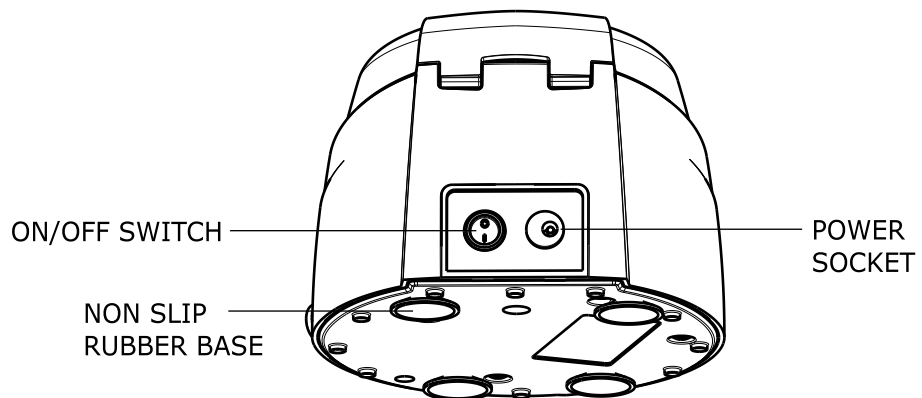
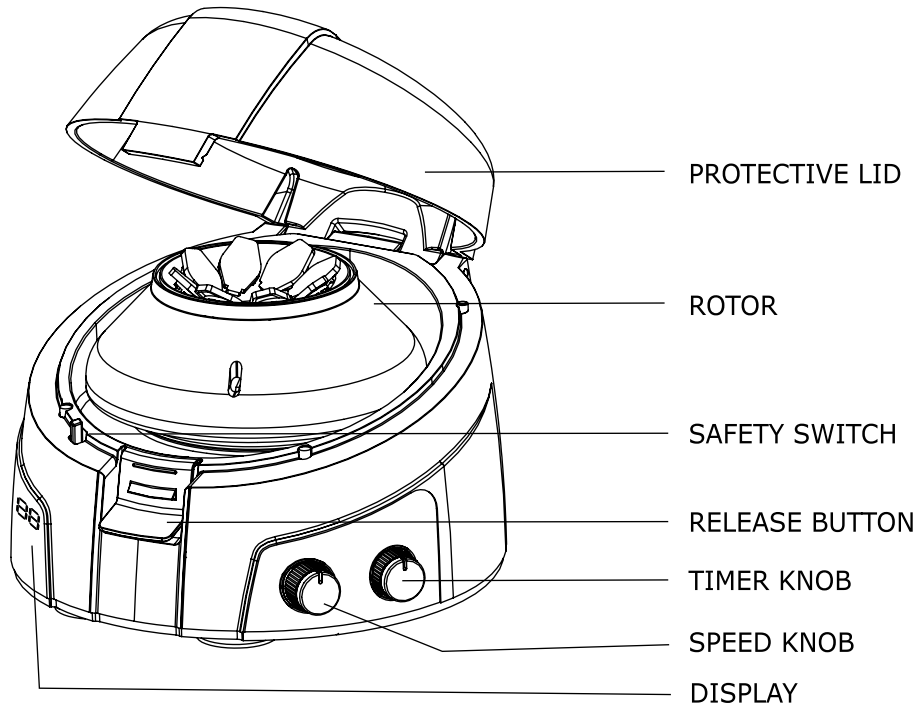
## USER MANUAL



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## STANDARD PARTS LISTING



## ■ INTRODUCTION

Congratulations! You are using long lasting brushless motor personal centrifuge. The smart microprocessor controlled variable speed and time personal Micro Centrifuge offers versatility, simplicity, safety and ease of usage in a single package. This product comes with unique features like imbalance detection & closed loop control. This product has been designed after studying centrifuges and its usage in innumerable scenarios of the lab environment. The Micro centrifuge is supplied with 2 rotors - round rotor and strip rotor. The 8 x 2/1.5ml rotor can centrifuge up to 8 individual 2/1.5ml plastic micro tubes & comes with reduction adaptors. The strip tube rotor is designed to centrifuge two strips of 8 x 0.2 ml strip tubes.

This Micro centrifuge is specially suitable for Microfiltration, cell separations, centrifugal tube sedimentation and spin down applications. Please read this manual thoroughly before operating the centrifuge.

## ■ INTENDED USE

Centrifuge is used in various laboratories to separate particles from suspension or even macromolecules from solutions according to their density. The different biological substances that are usually separated by centrifugation are microbial cells, mammalian cells, organelles, proteins, DNA and RNA. It is majorly used in research laboratories.

**Note :** *This user guide is intended to assist with the operation and care of the unit only and not for its repair. The customer should not attempt to service or repair the unit. If repairs are required, please contact the supplier.*

<i>For your reference, make a note of the serial number, date of purchase and supplier here.</i>	
Serial No.	Purchase Date
Supplier	

## ■ FEATURES

- BLDC MOTOR FOR MAINTENANCE FREE LONG LIFE
- CLOSED ROTOR LEADS TO LESSER FRICTION, REDUCING NOISE & HEAT GENERATION
- 8 POSITION CLOSED MICRO TUBE ROTOR
- DIGITAL DISPLAY ALTERNATES BETWEEN SPEED AND TIME
- HIGHLY EFFICIENT & ACCURATE WITH  $\pm 25$  RPM
- MICROPROCESSOR BASED CLOSED LOOP SYSTEM
- CLOSED LOOP SYSTEM SELF ADJUSTS TO VARYING LOAD CONDITIONS TO DELIVER SET RPM
- SPEED & TIME SETTING FEATURE
- DIGITAL TIMER PROGRAMMING FUNCTION
- VARIABLE SPEED SETTINGS RPM INCREMENTS AT 100 RPM
- ELECTRONIC SAFETY BRAKE ON LID OPENING FOR USER SAFETY
- IMBALANCE CUT OFF SAFETY
- QUICK START & STOP FOR SPIN-DOWN
- SMOOTH AND QUIET RUNNING
- TINY FOOTPRINT CAN SQUEEZE EASILY ON TO A CROWDED COUNTER TOP
- INTERCHANGEABLE PCR ROTOR & ADAPTOR
- LOW VOLTAGE INSTRUMENT WITH EXTERNAL POWER SUPPLY

## ■ SPECIFICATIONS

MOTOR TYPE	BLDC MOTOR
MAXIMUM SPEED	6000 rpm
SPEED TYPE	Variable speed up to 6000 RPM
SPEED ACCURACY	± 25 RPM
MAX RCF	2000 x g
SIZE (LxWxH)	162 x 157 x 116 mm
WEIGHT	1.1 Kg
ELECTRICAL	100 - 240 VAC, 50 / 60 Hz
POWER CONSUMPTION	15W

## ■ STANDARD ACCESSORIES

- 2/1.5 ml closed rotor
- PCR strip rotor
- Allen wrench
- Individual adapters for 0.4/0.5 ml tubes, pack of 8
- Individual adapters for 0.2 ml tubes, pack of 8
- Power Adaptor
- Product user manual, Warranty card & Declaration of Conformity

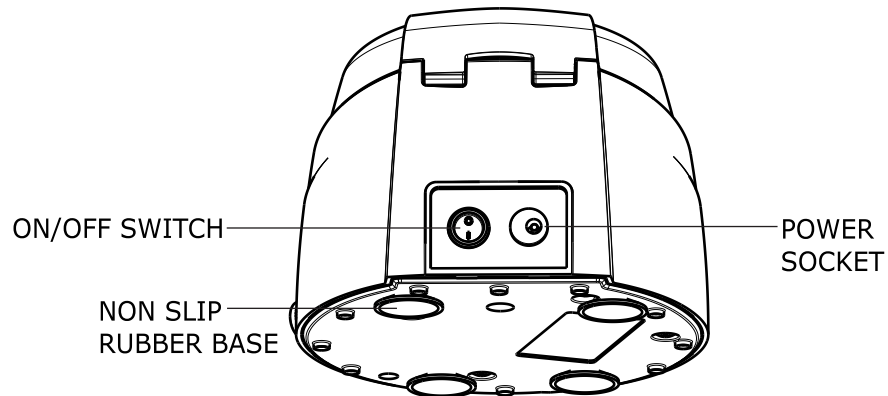
## ■ OPERATING CONDITIONS AND PRECAUTIONS

The personal Micro centrifuge is designed to be safe under the following conditions when operated with necessary precautions mentioned hereunder:

- For indoor use only.
- Ambient temperature of 4°C to 65°C.
- Main supply voltage fluctuations not to exceed +/- 10% of the nominal voltage.
- Position at least 20 cm from walls, 20 cm from ceiling and 20 cm between other products.
- Make sure to always install the centrifuge on stable flat surfaces only & place it near the electrical outlet.
- Make sure to always load the rotor symmetrically every time. Each tube should be counterbalanced by another tube.
- Make sure to always use only specified Micro Centrifuge tubes made from plastic and designed to withstand centrifugal forces of at least 2000 g.
- Do not use the centrifuge in any manner not specified in these instructions.
- Do not operate the centrifuge without the rotor being properly attached to the shaft. Re-check by trying to pull it up manually, especially after rotor assembly.
- Do not move the centrifuge while the rotor is spinning.
- Do not fill tubes while they are in the rotor, liquid spillage may harm the unit.
- Do not put hands in the rotor unless the rotor has completely stopped.
- Do not centrifuge flammable, explosive or corrosive materials.
- Do not use solvents or flammables near this or other electrical equipment.
- For safety we have provided protective earthing with power supply.
- In case of the unit dropping from the table please check the casing for any cracks/damage.



## ■ INSTALLATION



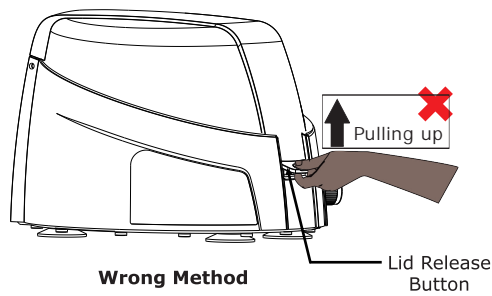
The smart BLDC variable speed and time Micro Centrifuge is supplied in a Box. Open the Box, then gently remove centrifuge from the Box and plug-in adaptor pin before connecting to power source. The instruction manual and the accessories should be kept with the centrifuge. Please keep all packaging in safe storage for at least 2 years for warranty purposes.

Put 'On' the switch at rear side, make sure the rotor is tight enough to avoid accident. Load the rotor with micro tube for centrifugation and set switch to 'On' position. Close the lid to start centrifugation.

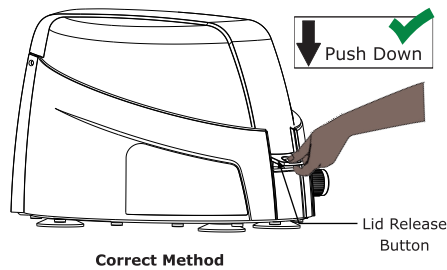
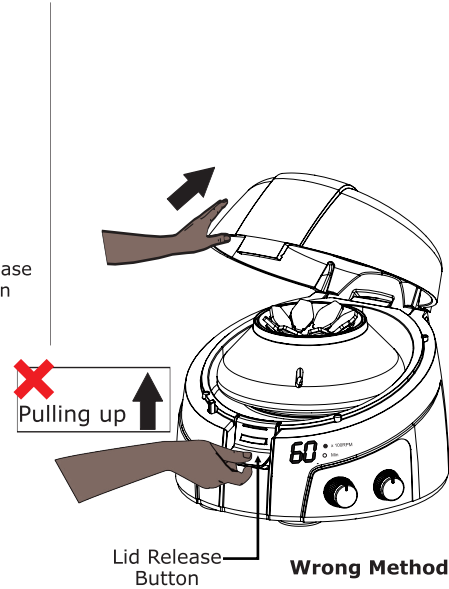
For More Clarification Refer RCF Chart as below :-

RCF CHART					
RPM	ROUND ROTOR				PCR STRIP
	0.2 ml	0.5 ml	1.5 ml	2 ml	0.2 ml
1000	35.5	47	52	54	52
2000	142	188	208	217	208
3000	319	424	468	488	467
4000	567	753	832	868	830
4500	718	953	1053	1098	1050
5000	886	1177	1300	1356	1297
<b>6000</b>	<b>1276</b>	<b>1695</b>	<b>1872</b>	<b>1952</b>	<b>1868</b>

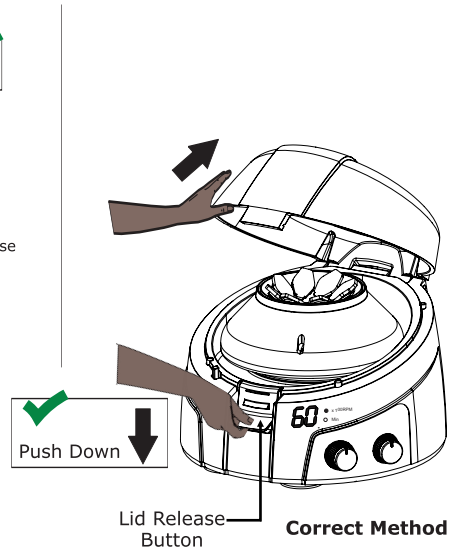
## OPENING CENTRIFUGE LID



Trying to open the centrifuge lid by pulling up the "Lid Release button" is wrong method of opening lid. Pulling up the "Lid Release Button" will break the button or damage the button.



To open the centrifuge lid, press down the "Lid Release Button".



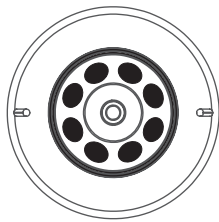
## ■ OPERATION

To operate this personal Micro Centrifuge below steps should be followed:-

1. Switch 'On' the centrifuge from rear side so that display will show you the readings.  
Note :  $\epsilon_n$  Symbol indicates that *Imbalance detection feature is enabled*.
2. Load the Rotor symmetrically to avoid accident and damage of centrifuge.
3. Close the lid to start centrifugation. Use the Speed knob to set the speed and the Timer knob to set the run time.
4. Once the centrifugation is completed either use speed knob or use timer knob to bring the display value to zero. This will gradually stop the rotor.
5. If you want to stop the centrifuge quickly, push the lid release button and the rotor will stop within 2 seconds.
6. After the rotor has stopped, press the lid release button and open lid with your thumb in front and fingers on the top - simply lift the lid back on the hinge.

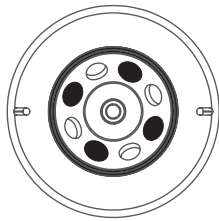
In the following pages the routine centrifuge operation procedures are explained in brief.

## Balancing the Rotor



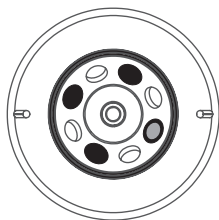
**PICTURE:-1**

TO CENTRIFUGE 8 SAMPLES AT A TIME FILL 8 TEST TUBES EQUALLY. THEN INSERT THEM INTO THE HOLES OF THE ROTOR AS SHOWN IN PICTURE 1.



**PICTURE:-2**

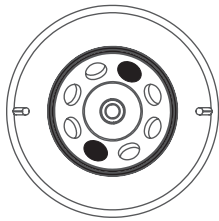
TO CENTRIFUGE 4 SAMPLES AT A TIME FILL THE 4 TEST TUBES EQUALLY. THEN INSERT THEM INTO ALTERNATE HOLES OF THE ROTOR AS SHOWN IN PICTURE 2.



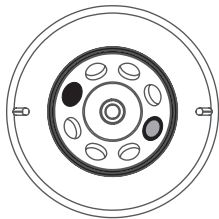
**PICTURE:-3**

TO CENTRIFUGE 3 SAMPLES AT A TIME FILL THE 3 TEST TUBES EQUALLY WITH ORIGINAL SAMPLES. THEN INSERT THEM IN ALTERNATE HOLES OF THE ROTOR. NOW FILL A TEST TUBE WITH WATER AND INSERT INTO REMAINING ALTERNATE HOLE FOR BALANCING THE ROTOR AS SHOWN IN PICTURE 3.

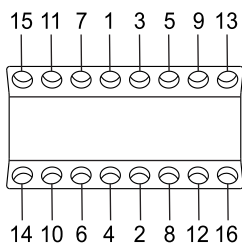
## Balancing the Rotor



**PICTURE:- 4** TO CENTRIFUGE 2 SAMPLES AT A TIME FILL 2 TEST TUBES EQUALLY. THEN INSERT THEM INTO THE HOLES OF ROTOR IN OPPOSITE DIRECTION AS SHOWN IN PICTURE 4. POSITIONS CAN BE 1-5, 2-6, 3-7, 4-8.

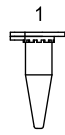


**PICTURE:- 5** TO CENTRIFUGE 1 SAMPLE FILL A TEST TUBE WITH SAMPLE THEN INSERT INTO ANY ONE HOLE OF THE ROTOR. NOW INSERT 1 TEST TUBE FILLED WITH WATER IN OPPOSITE DIRECTION OF THE SAMPLE AS SHOWN IN THE PICTURE 5. POSITIONS CAN BE 1-5, 2-6, 3-7, 4-8.

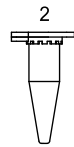


**PICTURE:- 6** TO CENTRIFUGE 16 SAMPLES FILL ALL TEST TUBES WITH SAMPLE. THEN INSERT INTO THE HOLES OF PCR ROTOR IN OPPOSITE DIRECTION AS SHOWN IN THE PICTURE 6. PLACE THE 2 PCR STRIP TUBE IN OPPOSITE DIRECTION.

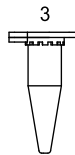
User Guide



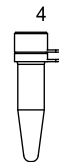
0.2 ML



0.4 ML



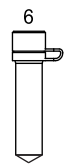
0.5 ML



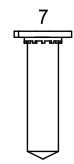
1.5 ML / 2.0 ML



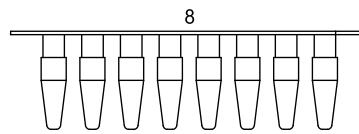
1.5 ML / 2.0 ML



1.5 ML / 2.0 ML



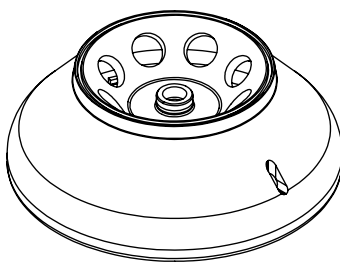
1.5 ML / 2.0 ML



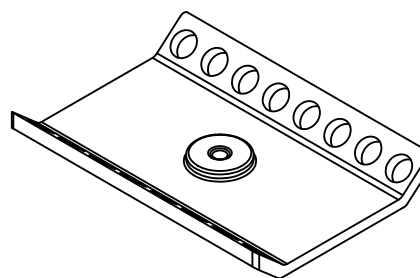
PCR STRIP

8 DIFFERENT TYPES OF TEST TUBES CAN BE  
CENTRIFUGED BY USING TWO INTERCHANGEABLE ROTORS

## Interchangeable Rotor

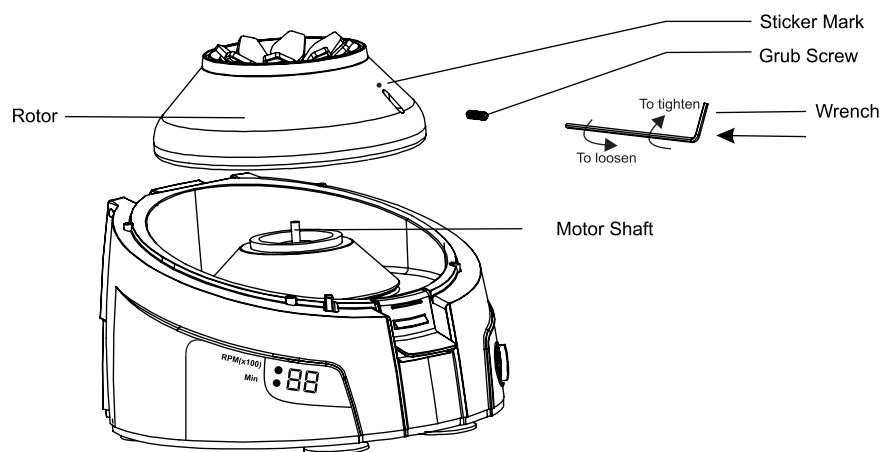


**ROTOR\_8 SLOT**  
8 x 0.2,0.4,0.5,1.5,2 ml



**PCR ROTOR**  
16 x 0.2 ml

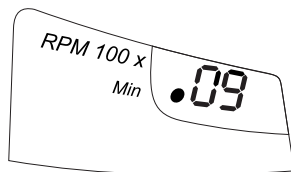
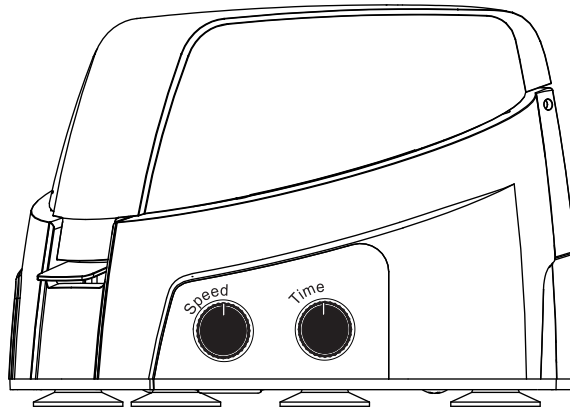
## Changing the Rotor



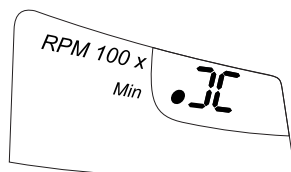
Insert the hexagonal Allen wrench into the marked hole provided on the side of the rotor. The grub screw is located at the bottom of the rotor on the marked side. To remove the rotor, turn anticlockwise to loosen the screw and then gently pull up the rotor up vertically. Insert the new rotor from the top onto motor shaft and tighten the screw again. Turn clockwise to tighten screw which is located under the bottom of rotor. Please check the rotor is tight enough to avoid any accident.

*Note : Tightening the screw will be in clockwise direction and the loosening will be counter clockwise direction*

## Time & Speed Settings and Display



time indicator display

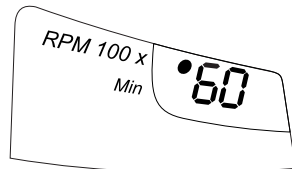


infinite time display

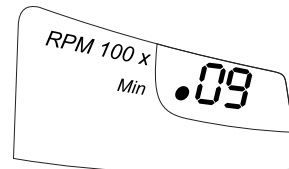
### Time control, Speed control and display :

The unit is equipped with a 0-25 minutes timer. By operating the timer knob one can set the desired time cycle. The time increments/decrements will be in minutes and will show on display and indicator. The timer can be set from 00 to 25 minutes, if the user needs to operate without time control he can change it to next position after 25, here it will be set to infinite time '∞'. The timer used is a count down timer and can be reset or adjusted in between the runs. ∞, actually means stop position of centrifuge.





speed indicator



time indicator

During the running of centrifuge the time and speed will be displayed alternatively accompanied by speed indicator and time indicator respectively.

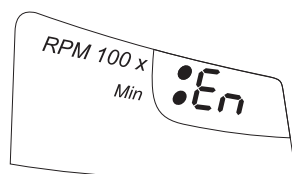
**Quick spin function** : By keeping the timer to 'H' position and speed set to any desired setting, one can open and close the lid to operate the centrifuge in quick spin function mode.

**Speed control** : Speed is set by rotating the speed control knob. While adjusting the speed, the speed indicator comes on. The minimum increment or decrement will be to the order of 100 RPM. The speed indicator must be read with a multiplication factor of 100 to get the actual rpm.

**Rcf value** : Based on the speed and rotor the actual rcf value will vary. One can refer to the table (given on the installation page of this booklet) to get the actual RCF of different rotors at certain given speed values.

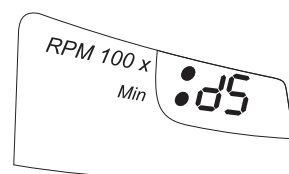
## Imbalance detection Activation/De-activation

When you switch 'On' the centrifuge either it shows 'En' or 'd5'



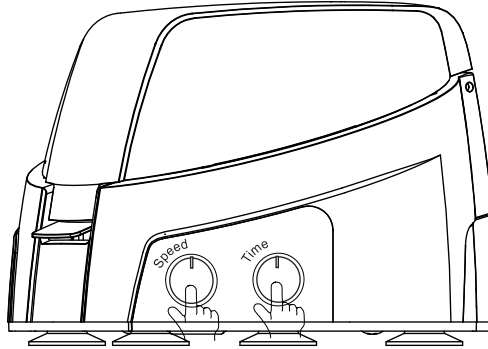
imbalance activated display

If the display shows 'En' that means the imbalance detection is activated



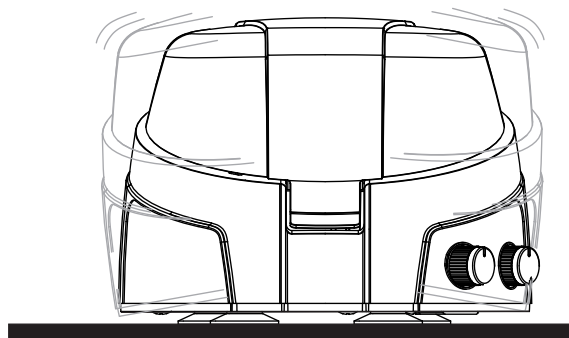
imbalance de-activated display

If the display shows 'd5' it means the imbalance detection is de-activated



User can activate and deactivate the unbalance detection function by pressing the timer & speed knobs together as shown in above picture. The display will change to show  $E_n$  or  $d5$  to show active status.

### Unbalance detection and cut off



When imbalance detection is activated ' $E_n$ ' & if centrifuge is running with an unbalanced rotor, (by not placing the weights on the rotor equally and symmetrically) it may lead to excessive vibrations resulting in damage to the centrifuge. This centrifuge has an unbalance detector to protect the centrifuge, its user & the surroundings against such an accidental run. When such an event occurs, the piezoelectric sensor built inside the centrifuge will sense the resonance created by unbalanced rotor & will shut down the centrifuge indicating the event by flashing ' $U_n$ '.

## Unbalance Indicator



### User action :

Open the lid of centrifuge, correct the unbalanced load by various methods described in the balancing the rotor part of this manual. Then close the lid and `reset the centrifuge`. Resetting is done by switching `Off` and again switching `On` the centrifuge by using the On/Off switch located on the rear side of the centrifuge.

## ■ CARE & MAINTENANCE

Your personal centrifuge and its rotor should be cleaned periodically, ensure that while cleaning the unit is not plugged in. To clean the personal Centrifuge, use a damp cloth and a mild, noncorrosive detergent (ph < 8). Do not immerse the centrifuge in liquid or pour liquids over it. Excessive amounts of liquid should be avoided, Liquid should not come into contact with the motor. After cleaning, ensure all parts are dried thoroughly before attempting to operate the unit.

Should a spill of infectious materials occur within the rotor or rotor chamber, the unit should be disinfected. This should be performed by qualified personnel with proper protective equipment. Do not use any cleaning or decontamination methods except those recommended by the manufacturer, check with the manufacturer that the proposed method will not damage the equipment.

## ■ WARRANTY STATEMENT

This products is warranted to be free from defects in material and workmanship for a period of two (2) years from date of purchase. 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 damages, commercial loss or any other damages 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 damages caused by its 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 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 of merchantability or of fitness for any intended purpose and that there are no other remedies or warranties, expressed or implied, which extend beyond the 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 set postage prepaid in the original packaging or other suitable carton, added to avoid damage.

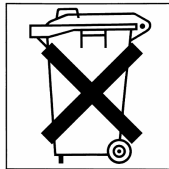
This warranty is valid only if the warranty is registered with the supplier within 30 days from the date of purchase.

## ■ 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 off 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.





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