



# Operating Manual

## Micro-Centrifuge

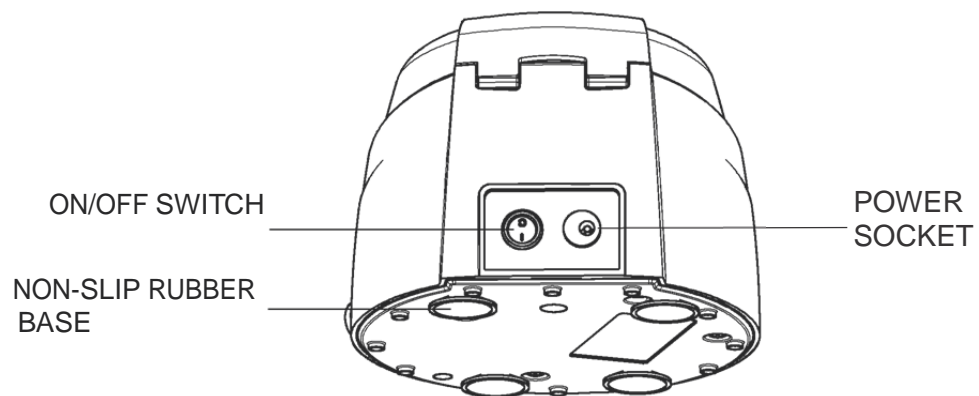
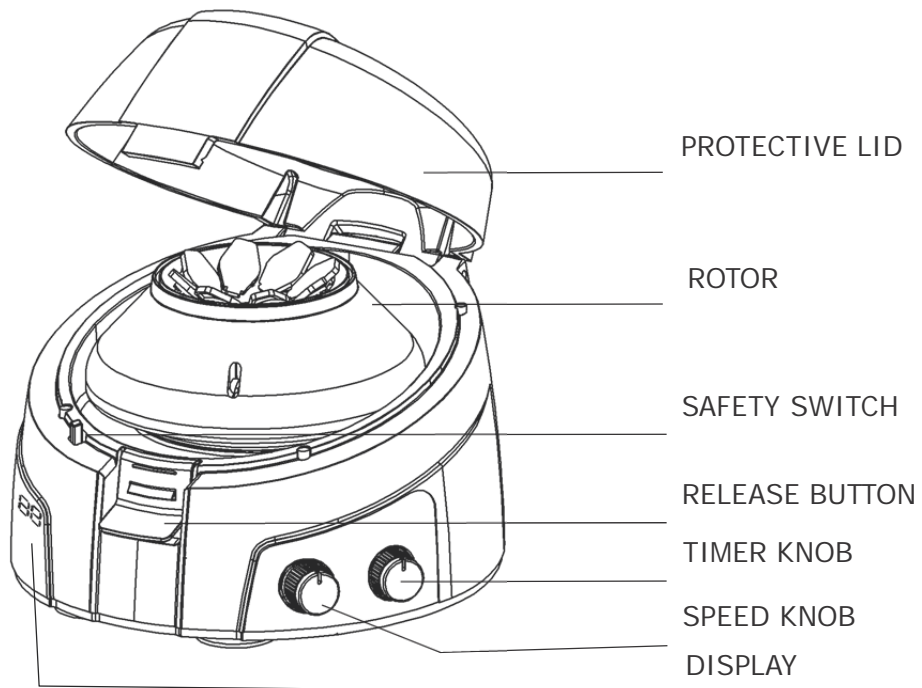
### uniCFUGE 3



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## STANDARD PARTS



## INTRODUCTION

Thank you very much for purchasing LLG-uniCFUGE 3. You are using a 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 centrifuge and its usage in innumerable scenarios of lab environment. The Micro centrifuge is supplied with 2 rotors: round rotor for micro-tubes and strip rotor for 0.2ml PCR strip tubes. The 8 x 2/1.5ml rotor can centrifuge up to 8 individual 2/1.5ml plastic micro-tubes and comes with reduction adaptors. The strip tube rotor is designed to centrifuge two strips of 8 x 0.2ml strip tubes.

The micro centrifuge uniCFUGE 3 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

Centrifuges are used in various laboratories to separate particles from suspension or even macro molecules 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. Centrifuges are 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 your supplier.

*For your reference, make a note of the serial number, date of purchase and supplier here.*

Serial No.	Date Purchased
Supplier	

## ■ FEATURES

- BLDC MOTOR FRO MAINTENANCE FREE LONG LIFE
- CLOSED ROTOR LEADS TO LESS FRICTION, REDUCED NOISE & HEAT GENERATION
- 8 POSITION 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	Brushless BLDC MOTOR
MAXIMUM SPEED	6000 rpm
SPEED TYPE	Variable speed up to 6000 rpm
RPM SPEED ACCURACY	± 25 rpm
MAX RCF	2000 x g
SIZE ( <i>LxWxH</i> )	162 x 157 x 116 mm
WEIGHT	1.1 Kg
POWER SUPPLY	100 - 240 VAC, 50 / 60 Hz
POWER CONSUMPTION	15W

## ■ STANDARD ACCESSORIES

- Round rotor for 2/1.5 ml tubes
- Strip rotor for 0.2 ml PCR tubes
- Allen wrench
- Individual adaptors 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

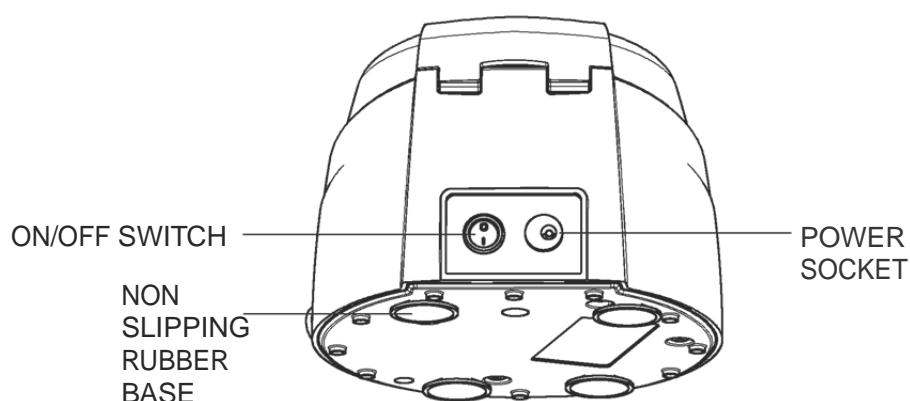
## ■ OPERATING CONDITIONS AND PRECAUTIONS

The personal Micro centrifuge uniCFUGE 3 is designed to be safe under the following conditions:

- 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 20cm from walls, 20cm from ceiling and 20cm between other products.
- Make sure to always install the centrifuge on a 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 x 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 after rotor assembly, re-check by trying to pull out the rotor using manual force.
- 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 flammable liquids close to this electrical equipment.
- For safety reason, protective earthing is supplied with power supply.
- In case of the unit dropping from the table, please check the casing for any cracks/damage.



## ■ INSTALLATION



The Micro Centrifuge uniCFUGE 3 is supplied in a box. Open the box, then gently remove the centrifuge from the box and connect the power adaptor. The instruction manual and the accessories should be kept with the centrifuge. Please keep all packaging in safe storage for at least 1 year for warranty purposes.

Make sure to tighten it using the allen wrench to avoid any accident. Load the rotor with Micro tubes for centrifugation. Put on the switch on the rear, set the desired speed and time and close the lid to start centrifugation.

For More Clarification Refer RCF Chart as below:

RCF CHART					
RPM	ROUND ROTOR				PCR STRIP
	0.2	0.5	1.5	2 ml	0.2 ml
100	35.5	4	5	5	52
200	142	188	208	217	208
300	319	424	468	488	467
400	567	753	832	868	830
450	718	953	1053	109	1050
500	886	1177	1300	135	1297
600	127	169	187	195	1868

## ■ OPERATING

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: En Symbol indicates that *Imbalance detection feature is enabled*.

2. Load the Rotor symmetrically to avoid any accident and damage of centrifuge.

3. Close the lid to start the centrifuge. Use the speed knob to set the speed and the timer knob to set the runtime.

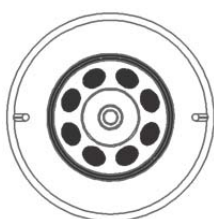
4. Once the centrifugation is completed, either use the speed knob or use the timer knob to bring the display value back to zero. This will gradually stop the rotor.

5. If you want to stop the centrifuge quickly, press the lid release button and the rotor will stop within 2 seconds.

6. After the rotor has stopped, press the lid release button and push the lid up with your thumb in front and fingers on the top - simply lift the lid back on the hinge.

In the following pages, 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 ON PICTURE1.

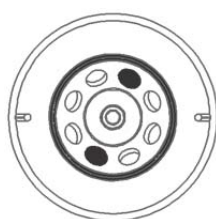
**PICTURE 2**

TO CENTRIFUGE 4 SAMPLES AT A TIME, FILL 4 TEST TUBES EQUALLY. THEN INSERT THEM INTO ALTERNATE HOLES OF THE ROTOR AS SHOWN ON PICTURE2.

**PICTURE 3**

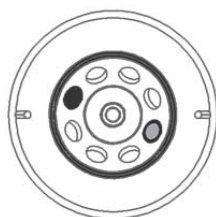
TO CENTRIFUGE 3 SAMPLES AT A TIME, FILL 3 TEST TUBES EQUALLY WITH ORIGINAL SAMPLES. THEN INSERT THEM IN ALTERNATE HOLES OF THE ROTOR. NOW FILL A TEST TUBE WITH WATER AND INSERT INTO REMAINING ALTERNATE HOLE FOR BALANCING THE ROTOR AS SHOWN ON PICTURE3.

## Balancing the Rotor



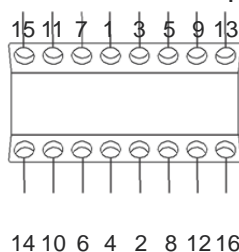
PICTURE 4

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 ON PICTURE4. POSITIONS CAN BE 1-5,2-6,3-7,4-8.



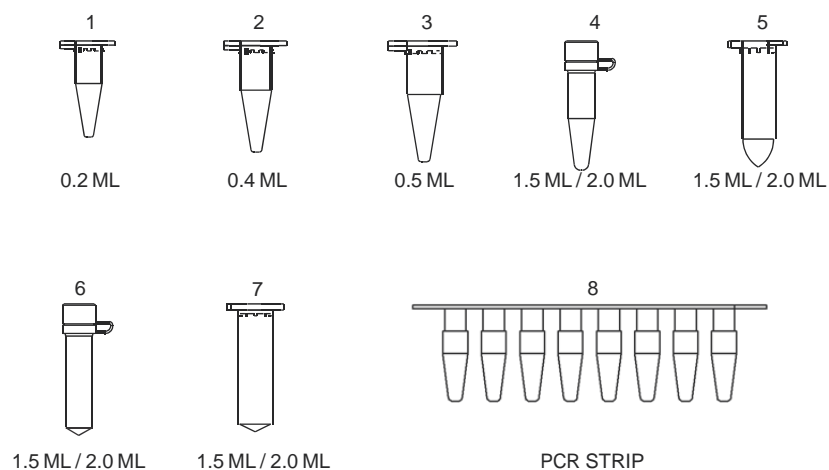
PICTURE 5

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 ON PICTURE 5.



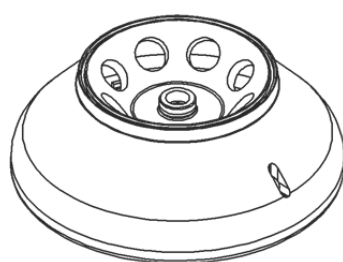
PICTURE:- 6

TO CENTRIFUGE 16 SAMPLES, FILL ALL TEST TUBES WITH SAMPLE, THEN INSERT THEM INTO THE HOLES OF PCR ROTOR IN OPPOSITE DIRECTION AS SHOWN ON PICTURE6. PLACE THE 2 PCR STRIP TUBE IN OPPOSITE DIRECTION.

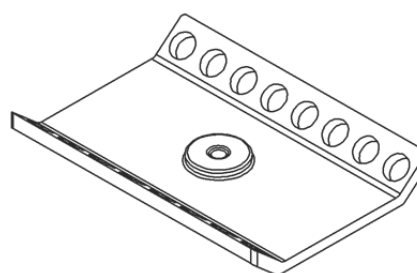


8 DIFFERENT TYPES OF TEST TUBES CAN BE  
CENTRIFUGED BY USING TWO INTERCHANGEABLE ROTORS

### Interchangeable Rotor

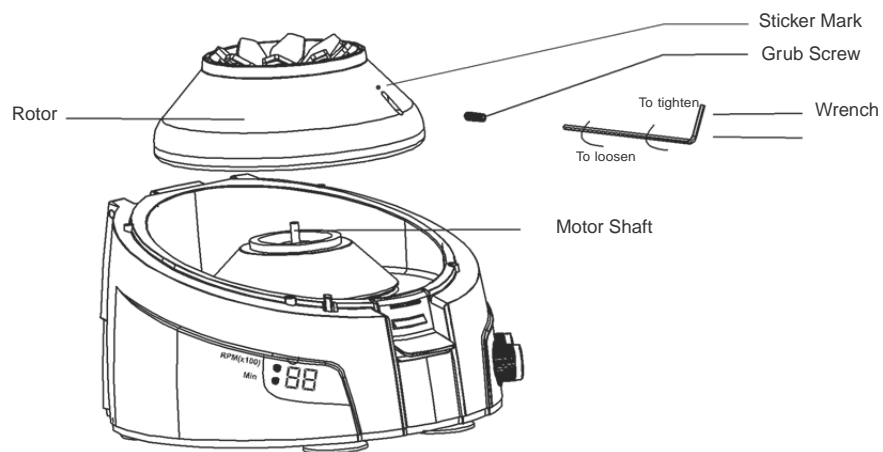


**ROTOR\_8 SLOT**  
**8 x 0.2, 0.4, 0.5, 1.5, 2ml**



**PCR ROTOR**  
**16 x 0.2 ml**

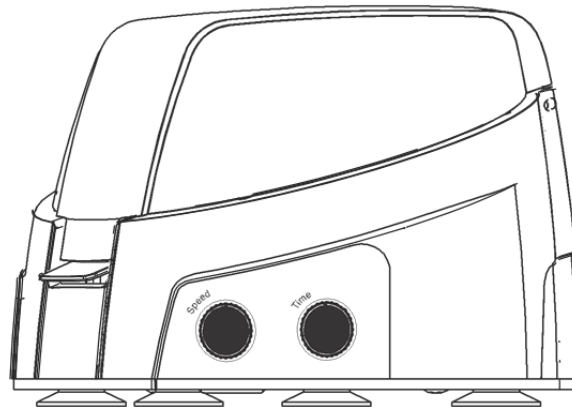
## Changing the Rotor



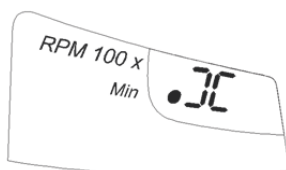
Insert Hexagonal Allen wrench into the marked hole provided on the side of the rotor. The grub screw is located at the bottom of the rotor on the marked side. To remove the rotor, turn anticlockwise to loosen the screw and then gently pull up the rotor up vertically. Insert the new rotor from the top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

*Note: The tightening the screw is in clockwise direction and the loosening is counterclockwise direction*

## Time & Speed Settings and Display



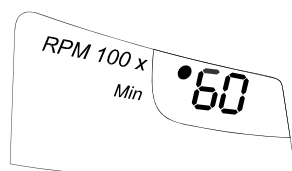
Time indicator display



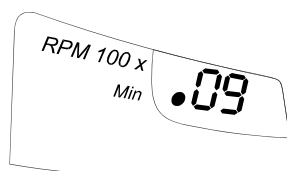
Infinite time display

### Time control, Speed control and display:

The unit is equipped with a 00-25-minute timer. By operating the timer knob, one can set the desired time cycle. The time increments/decrements are in minutes and appear 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. The timer used is a countdown timer and can be reset or adjusted in between the runs. 00 actually means 'stop' to the centrifuge.



speed indicator



time indicator

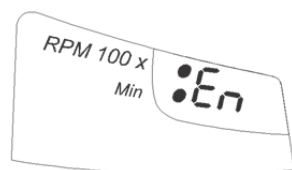
During the running of centrifuge the time and speed will be displayed alternatively accompanied by time indicator and speed indicator respectively.

Quick spin function: keep the timer to infinity and set the speed to any suitable speed, one can open and close the lid to operate the centrifuge in quick spin function mode.

Speed control: the speed can be changed by rotating the speed control knob. When adjusting the speed, the speed indicator gets on. The minimum increment or decrement will be of about 100 RPM. The speed indicator reading is red with multiplication factor of 100 to get the actual rpm. The rpm indicator shows the set rpm value, not the actual rpm value. Depending on the load and the rotor used, the rpm will differ slightly from the set rpm (see the calibration function to set the speed accurately).

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

### Imbalance detection Activation/De-activation



imbalance activated display

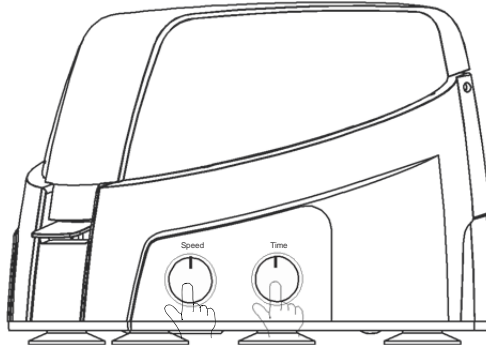


imbalance de-activated display

When you switch on the centrifuge, either En or dS will be displayed. En means the imbalance detection is activated.

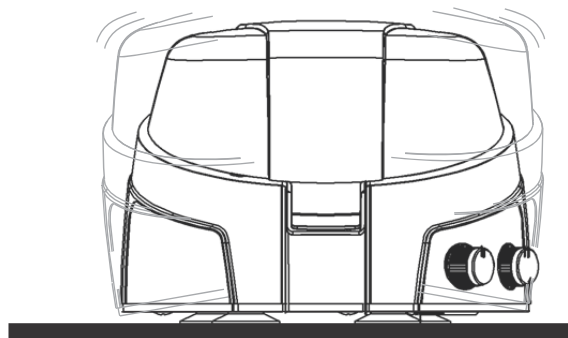
dS means the imbalance detection is de-activated.





The user can activate and deactivate the unbalance detection in minor unbalance of the rotor by long pressing on the timer knob as shown on the above picture.

### Unbalance Rotor



When imbalance detection is activated 'En' & the 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 and its 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 and will shut down the centrifuge, indicating the event by flashing 'ub:'

## Unbalance Indicator



User ction:

Open the lid of the centrifuge, correct the unbalanced load by various methods described in rotor loading part of the manual. Then close the lid of the centrifuge 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 rotors should be cleaned periodically. Make sure that while cleaning the unit is not plugged in. To clean the uniCFUGE 3, use a damp cloth and a mild, non-corrosive detergent (ph < 8). Do not immerse the centrifuge into a liquid or pour liquids over it. Excessive amounts of liquid should be avoided. No liquid should come into contact with the motor. After cleaning, make sure that 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 then 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

The uniCFUGE 3 is warranted to be free from defects in material and workmanship for a period of one (1) year 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.

This warranty does not cover motor brush or damage to paint or finish and defects or damages caused by physical and chemical abuse or normal wear and tear. 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.

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.

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 electronics 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.

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