CRC-1544UCR

USER MANUAL

HYDROCARBON
COOLING

CONTENTS

1. INTRODUCTION

This universal centrifuge is equipped with a maintenance free drive, a large display & simple interface for efficient operation for daily lab usage. The programmable centrifuge can deliver up to 15000 RPM and can accommodates different types of rotors. It features various programmable mode to save time & add convenience.

2. INTENDED USE

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

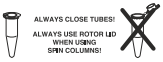
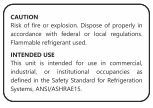
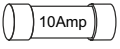
NOTE: *Before using the centrifuge, please read this user manual carefully. This user manual is intended to assist with the operation and care of the unit & is not a document which aids in repair. For repair please contact the supplier.*

3. SYMBOL

Information on the device

Information	Meaning	Location
	Warning Observe the safety-relevant information in the operating manual.	Keypad
	Read the operating manual.	Right side of the device
	Warning The device contains the flammable R290 Refrigerant.	Right side of the device
	Warning Risk of cryogenic burns.	Upperside of the device, under the centrifuge lid
	Warning Risk of hand injuries.	Upperside of the device, under the centrifuge lid
	Risk of damage to health when handling infectious liquids of pathogenic germs.	Upperside of the device, under the centrifuge lid

3. SYMBOL

	Always seal the tubes. If you are inserting centrifuge tubes, use the rotor lid to seal the rotor	Upperside of the device, under the centrifuge lid
	Tighten the rotor nut using the rotor key provided.	Upperside of the device, under the centrifuge lid
	Fire hazard or explosion hazard. Dispose of the device in accordance with the applicable laws and regulation. The device contains a flammable refrigerant. Use the device in accordance with the intended use.	Right side of the device
	Fuse	Rear side of the device (Near power socket)
	High Voltage	Rear side of the device (Near power socket)
	Waste electrical	Right side of the device (In barcode sticker)

4. SALIENT FEATURES

Centrifuge has following features:

- Delivers up to 15000 RPM for all compatible rotors
- BLDC maintenance free motor drive
- Imbalance detection safety with auto cutoff feature
- Lid lock safety feature : Lid does not open during operation
- Program mode for customized operation
- Speed setting by RPM/RCF mode
- Countdown timer range from 30 sec to 999 mins 59 second & infinite mode

4. SALIENT FEATURES

- Last run memory feature
- Convenient and easy user interface
- Emergency lid release during power cutoff
- Automatic internal diagnosis & error display
- Auto rotor detection feature
- Hydrocarbon Cooling
- Temperature range from -10°C to 40°C
- 4°C temperature maintained even at maximum speed.
- Speed setting : 500-15000 RPM

5. STANDARD ACCESSORIES

- Power Cord
- T - Allen key
- User manual & Warranty card
- Grease Tube
- Fuse 10A

6. TECHNICAL SPECIFICATIONS

Motor Type	Brushless DC Motor
Max capacity	400 ml (4x 100 ml)
Speed Setting	Variable 500 - 15000 RPM
Speed Steps	100 RPM
Speed Accuracy	± 100 RPM*
Temperature accuracy	± 2°C
Temperature Range	-10°C to 40°C
Run Time	30 sec to 999 mins 59 second & infinite mode
Min. Acceleration Time	60 seconds**
Min. Deceleration Time	60 seconds**
Noise Level	<64 dB (A)
Ambient Temperature	5 - 40°C
Permissible Relative Humidity	≤80%
Size (L x B x H)	705 X 585 X 330 mm

6. TECHNICAL SPECIFICATIONS

Weight	< 57 kgs without rotor
Refrigerant	R290
Altitude	Use upto an altitude of 2000 m above MSL
Pollution Degree	2
Environment	For indoor use only
Total mass of Refrigerant	110 g
Maximum allowable pressure (PSI) under normal condition	260
High end pressure (PSI)	200
Low end pressure (PSI)	10
Power Supply	230 VAC, 50Hz
Power Consumption	710 W
Safety Fuse Rating	10 Amp

** After achieving RPM need 2 min to stable RPM.*
*** Acceleration & deceleration time claim for 4 x 100ml rotor*

7. SAFETY PRECAUTIONS

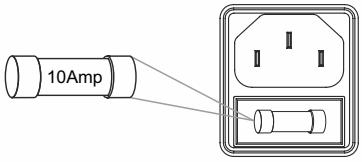
Read all safety & usage information provided in this manual carefully before using the device.

- Never use the centrifuge in any manner not specified in this manual.
- Always use recommended original rotors and spare parts for best result & product safety.
- The rotors must be loaded symmetrically. Each tube should be counter balanced by another tube of same weight.
- Do not use centrifuge or rotor that have not been correctly installed or shows any sign of damage .
- The rotor must always be securely fastened. If the centrifuge makes unusual noise during operation, the rotor fitment needs to be checked. Switch OFF the device immediately by pressing STOP, check fitment & fasten it well.
- Never move the centrifuge during its operation.
- Prior to centrifugation, the tubes should be visually inspected for material damage. Damaged tubes must not be centrifuged. This is because broken tubes can result in

7. SAFETY PRECAUTIONS

sample loss and can create imbalance which can result in further damage to the centrifuge and accessories.

- Do not fill tubes while they are in the rotor. Liquids spillage may harm the device. If liquids are spilled on the rotor or rotor chamber, the centrifuge must be cleaned carefully and properly before being used again.
- Do not use liquid with density higher than 1.2 gm/ml during full load product operation.
- Centrifuge may be used for the specified applications only. It must not be operated in a hazardous or flammable environment and must not be used to centrifuge explosive or highly reactive substances. Also do not place the potential hazardous material within the clearance area/envelope.
- Equipment if used in any manner not specified in this manual or by the manufacturer can result in the lapse of the product warranty.
- Repairs must only be performed by authorized service technician.
- Do not lean on the equipment. It may damage the equipment or even harm the operator.
- In the event of contamination caused by aggressive agents, the rotor must be cleaned immediately using 70% IPA. This is particularly important for the bores of the tubes. If any damage is seen, contact the service technician.
- Before using cleaning or decontamination methods other than those mentioned by the manufacturer, contact the manufacturer to ensure that the intended method will not damage the centrifuge.
- For safety we have provided protective earthing with power supply. Make sure power supply is earthened.
- Safety Fuse is provided of 10Amp configuration which can be replace by the operator. The same will protect the machine circuit during an electrical fault or overload.



- Be sure to close the tubes lid tightly prior to centrifugation. Open tubes lid can be torn off during centrifugation and can damage the rotor or centrifuge.
- Rotor and adapters are high graded components which are subject to extreme mechanical strain. Scratches and tears can lead to serious internal material damage. Ensure to check rotor for any signs of corrosion or mechanical damage should not be used.
- This centrifuges capacity must not be exceeded as it is the maximum capacity.
- For safety and air-tight sealing to minimize the air noise, the gentle force needs to be applied on the lid to close the latch properly.
- WARNING: Keep all ventilation openings in the enclosure or, in the structure for building-in, clear of obstruction.

7. SAFETY PRECAUTIONS

- WARNING: Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.
- WARNING: Do not damage the refrigerant circuit.
- The R290 refrigerant used in the device is flammable. If the refrigeration cycle is defective, the refrigerant may escape and form explosive mixtures with the ambient air.
  - Observe the regulations that apply to your laboratory.
  - Make sure there is a sufficient volume of air at the location.
  - Ensure adequate ventilation of the device at the location.
- Power cord given with centrifuge unit is designed to use for that particular centrifuge. Use of any other power cord may damage centrifuge & will void the warranty.
- **EXPLOSION HAZARD:** The R290 refrigerant used in the device is flammable. If the refrigeration cycle is defective, the refrigerant may escape and form explosive mixtures with the ambient air.
  - Observe the regulations that apply to your laboratory.
  - Make sure there is a sufficient volume of air at the location.
  - Ensure adequate ventilation of the device at the location.

8. INSTALLATION

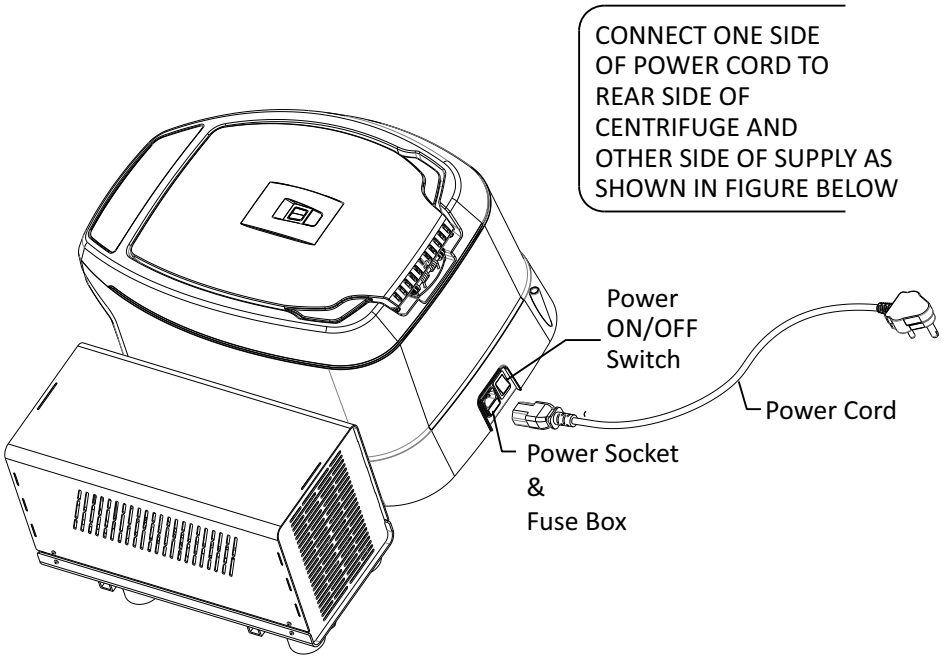
The Laboratory centrifuge is supplied in packaging box. Open the box, remove the packaging and gently place the centrifuge out of the box. Before 1st time usage, open the centrifuge & ensure to remove all packaging from the rotor chamber. Please keep all packaging in safe storage for warranty purposes.

Location & Mounting

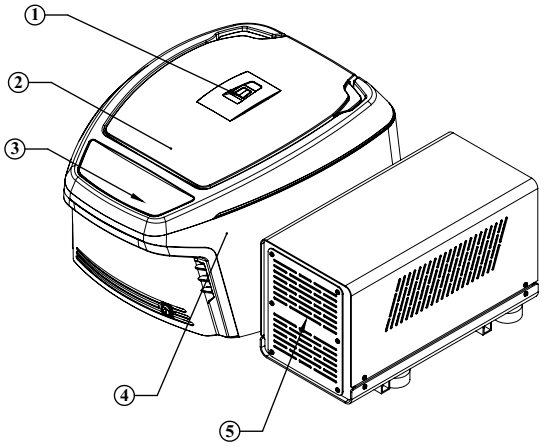
Place the centrifuge on a flat, solid and leveled surface and ensure that all the six feets of this centrifuge stand on the surface firmly. Avoid installing on slippery or surface prone to vibration.

- Ideal ambient temperature is 25°C ± 5°C, avoid placing the centrifuge in direct sunlight.
- Keep clearance of minimum of 2 meter from all side for ease of usage.
- Keep away from heat or water to avoid sample temperature issues or centrifuge failures.
- Do not place the centrifuge such that it becomes difficult to operate the disconnecting device.
- Ensure there are no source of ignition (flame or sparking electrical components) within 3 meter of working area.

8. INSTALLATION



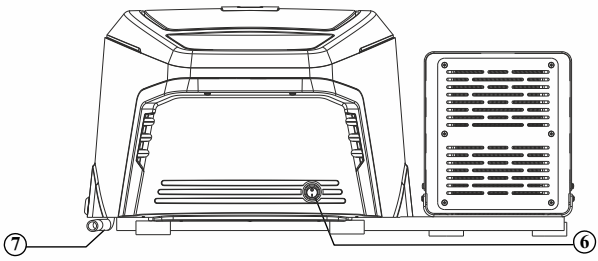
9. STANDARD PARTS LISTING

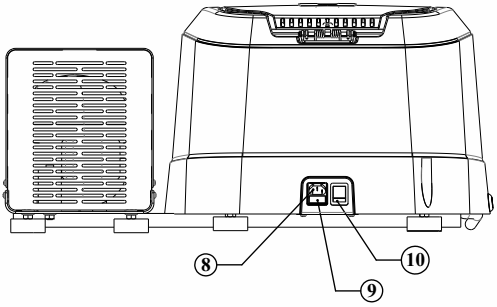


1. **View Window**
2. **Top Lid**
3. **Operation and setting Buttons**
4. **Main Body**
5. **Refigrartion System**

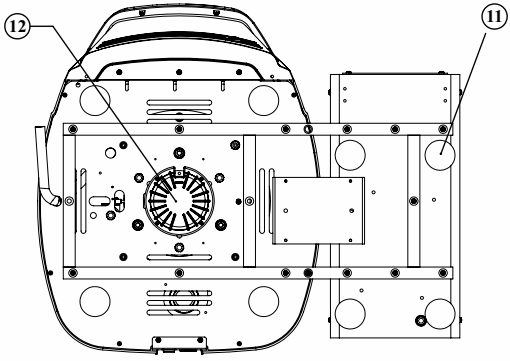
9. STANDARD PARTS LISTING

6. **Power Swtich**
7. **Drain Pipe**



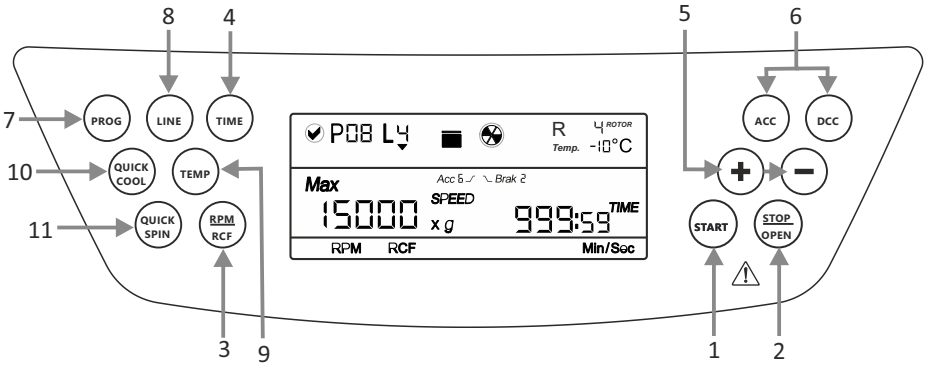


8. **Power Socket**
9. **Fuse Holder**
10. **Power Swtich**



11. **Rubber Mount**
12. **Motor Cap**

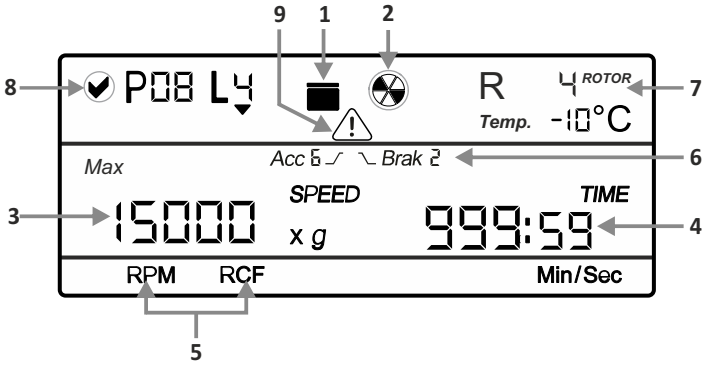
10. USER INTERFACE & DISPLAY

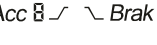


Item	Button Name	Function
1	Start	Single press, motor will start as per selected RPM, Time & Temp if lid closed. Start button works only if lid closed. Motor start or stop, indicates with rotation symbol in LCD.
2	Stop/open	Single press stop/open button, will stop motor as per set DCC rate if motor is running. Second press stop/ open button, will open the lid once the motor stops. Also used for lid open if centrifuge motor is not running.
3	RPM/RCF	Single press, Speed display will be blink to set. Long press, RPM/RCF will toggle between RPM to RCF. RPM , RCF mode is also indicated on LCD display.
4	Time	Single press, Minute can be set, another single press then second can be set. Timer can be set from 0 min 30 sec to 999 min 59 sec and Infinite Mode.
5	+ / - Button	Use to set parameter (speed, time, temp, acc, brak, program, line) values. Pressing “+” button to increase and Pressing “-” button to decrease values.
6	Acceleration	Single press, Acceleration will display as ACC1. ACC can be set between 1 to 9 using {+} and {-} button. The timers for Acc1-Acc9 is mention
	Deceleration	Single press, Deceleration will on display as BRAK1. This can be set between 1 to 9 by using {+} and {-} buttons. The timers for BRAK1- BRAK9 is mention.
7	Prog	Long Press: to toggle between Normal mode and Program mode. Short press: to select Program number. it can be access only in program mode.

10. USER INTERFACE & DISPLAY

8	**Line**	Press line button to select line of any specific program out of 4 available lines in each program. it can be access only in program mode.
9	**Temp.**	Press button to set the temperature from -10°C to 40°C.
10	**Quick cool**	Press for setting the centrifuge on quick/pre cool.
11	**Quick spin**	To set short spin on a set speed. Press short spin continues press for short spin operation.



Item	Symbol	Description
1		Indicates lid Status. Left image = lid close & Right image = lid open.
2		Indicates centrifuge status. When centrifuge is running the symbol rotates and when centrifuge is not running the symbol is stable.
3		RPM indicates the speed value at which centrifuge is running. x g indicates the value in RCF mode.
4		The timer is a countdown timer. Indicates the time for which the centrifuge will run. Indicates the time in Min/Sec mode.
5	RPM/RCF	Indicate RPM or RCF mode and shows corresponding values.
6		Indicates selection of Acceleration and deceleration rate.

10. USER INTERFACE & DISPLAY

7	RUUH ROTOR	Indicates selected rotor.
8	P05 L4	Indicates selected program number and the line number specific to that program.
9	⚠	Warning Symbol! It appear when some error occur.
10	-10°C	Chamber temperature indication.

11. ROTOR INSTALLATION

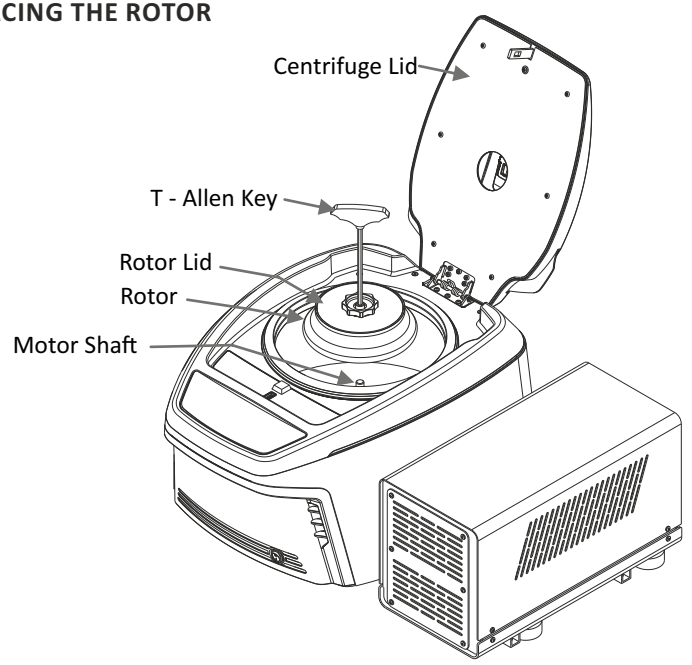
ROTOR REMOVAL AND REPLACEMENT PROCESS

If you want to remove or replace the rotor, follow the instructions below.

REMOVING THE ROTOR

1. Do not remove or loosen the rotor lid before attempting to remove the rotor.
2. Using the T - Allen Key, loosen the rotor nut by turning it counter clockwise. Do not try to pull the rotor, the rotor will come up automatically.
3. Once the rotor nut is loosen completely, pull up the rotor vertically.

REPLACING THE ROTOR

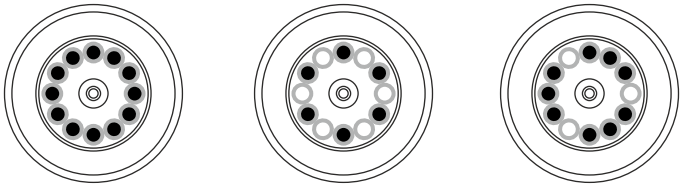


11. ROTOR INSTALLATION

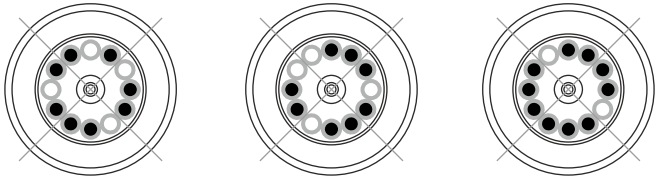
1. To replace or install the rotor, take the rotor and load vertically onto the motor shaft.
2. Place the rotor nut in the center hole of the rotor onto the motor shaft.
3. Put T -Allen Key into the rotor nut and turn clockwise to tighten and counter clockwise to loosen the rotor.
4. After properly fastening the rotor, place the rotor lid on the rotor lid nut by hand and rotate the rotor lid nut clockwise.

NOTE: *1) Check the rotor is firmly tightened before running the next program.*
2) Do not remove or loosen the rotor lid before removing the rotor.

BALANCING THE ROTOR (Below are the representational images of rotor)



1. Always balance the rotor before centrifugation. Above are examples of properly balanced rotors.
2. The samples in the tubes should be of equal volume.
3. If the tubes are not loaded correctly - vibration or imbalance can occur which can cause serious damage to the centrifuge.
4. If the tubes are not loaded symmetrically then the imbalance detector will cut off the running centrifuge for device & user safety. This will stop the centrifuge and Err 55 will be seen indicating tubes are not loaded symmetrically. To resume operation, load tubes symmetrically & restart the centrifuge.
5. Incorrect method of loading tubes in centrifuge rotor :



12. OPERATING THE CENTRIFUGE

12.1 SWITCH ON THE CENTRIFUGE

After connecting the power cord. Switch ON the main power supply & then Switch on the power switch located on the front side of the instrument. Make sure to check the rotor fitment before use. Centrifuge will not operate with open lid.

NOTE: *Maintain a gap of 3 seconds between switch OFF and switch ON again. DO NOT switch OFF and ON again instantly.*

12.2 SPEED SETTING

Press “RPM/RCF” button to set speed from 500 to 15000 RPM. Single press to set speed, long press to toggle mode RPM/RCF. The parameter can be set when the speed screen blinks by using "+" button for increment & "- "button for decrement. The values will automatically saves after screen stops blinking.

The speed can also be changed while the centrifuge is under operation. Press the “RPM / RCF” button & use “+/-” button 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.

12.3 TIMER SETTING

Press the “Timer” button to set timer. Time can be set by "+" for increment & "-" for decrement. The timer will save automatically once the blinking stops. The timer can be set in minutes & seconds.

12.4 TEMPERATURE SETTING

Press “Temperature” button for setting the temperature from -10°C to 40°C. The parameters can be set when the Temperature value blinks by pressing “+” button (for increasing the temperature) & “-” button (to reduce the temperature). The values will automatically saves after screen stops blinking. For quick cool, press the temp. key longer. Indication by this (cubic rotation) symbol.

12.5 QUICK COOL SETTING

Press “Quick Cool” Key, indicated by (cubic rotation) on top right (Indication will be in dotted rotation in place of rotor digit indication). During quick cool operation RPM :- FIX 2000 & TEMP :- On set value. Press “START” button for centrifuge to start at FIX RPM & set TEMP. After reaching set TEMP, motor stops thus RPM becomes zero but compressor continues to keep the chamber temperature at the set value. The quick cool works for 1 hour only (for indication of refrigeration running process, TEMP display will blink). If time overs and TEMP does not reach to set value, TIME will switch-over from beginning.

NOTE: **Quick cool will not run If centrifuge is running. *Quick cool will not work in Programmable mode.*

12. OPERATING THE CENTRIFUGE

12.6 SHORT SPIN OPERATION

Short Spin Centrifugation is the feature for short/pulse run. It will run as long as the button is pressed. Set rotational speed prior to short spin as required. During short spin the timer will be in incremental mode. After releasing short spin button the time in the display will show duration of short spin.

12.7 SETTING ACCELERATION / DECELERATION RATE

This button will set the parameters of acceleration or deceleration of the rotor ramp. Press “ACC/DCC” button once to set the acceleration from 1-9 by using "+/-" button for increment/decrement respectively. Similarly press once again the “ACC/DCC” button to set deceleration from 1-9 by using "+/-" button for increment/decrement respectively. The values of acceleration & deceleration timings are listed below.

ACC1	BRAK 1	180 Seconds
ACC2	BRAK 2	165 Seconds
ACC3	BRAK 3	150 Seconds
ACC4	BRAK 4	135 Seconds
ACC5	BRAK 5	120 Seconds

ACC6	BRAK 6	105 Seconds
ACC7	BRAK 7	90 Seconds
ACC8	BRAK 8	75 Seconds
ACC9	BRAK 9	60 Seconds

12.8 ROTOR SELECTION

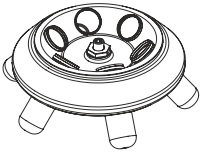
This centrifuge is equipped with auto selection rotor technology. Fix the rotor on the shaft & follow the operation guideline.

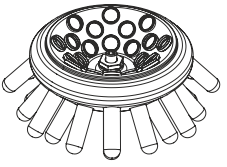
Fixed Angle Rotors			
Rotor Cat Code	**Max. Volume**	**Max. RPM**	**Max. RCF**
CR-15-6UC-UCR	6 X 50 ml	4500	2834
CR-15-24UC-UCR	24 x 15 ml	4500	2961
CR-15-44UC-UCR	44 x 2 ml	15000	22388

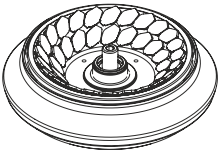
Swing Out Rotors			
Rotor Cat Code	**Max. Volume**	**Max. RPM**	**Max. RCF**
CR-15-4UC-UCR	4 x 50 ml	4500	3305
CR-15-32UC-UCR	32 x 6 ml	4500	3164

12. OPERATING THE CENTRIFUGE

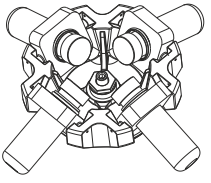
FIX ANGLE ROTORS
ROTOR MAXIMUM SERVICE LIFE : 50000 CYCLES FROM FIRST USE

DATA	VALUE	REFERENCE IMAGE
ROTOR CAPACITY	06 x 50ML	
MAX. SPEED (RPM)	4500	
MAX. G FROCE	2834	
MAX. LOAD	50ML/EACH TUBE	
ROTOR WEIGHT (GRAMS)	2725	
CAT. CODE	CR-15-6UC-UCR	

ROTOR CAPACITY	24 x 15ML	
MAX. SPEED (RPM)	4500	
MAX. G FROCE	2961	
MAX. LOAD	15ML/EACH TUBE	
ROTOR WEIGHT (GRAMS)	2680	
CAT. CODE	CR-15-24UC-UCR	

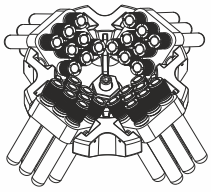
ROTOR CAPACITY	44 x 02ML.	
MAX. SPEED (RPM)	15000	
MAX. G FROCE	22388	
MAX. LOAD	2ML/EACH TUBE	
ROTOR WEIGHT (GRAMS)	1624	
CAT. CODE	CR-15-44UC-UCR	

SWING ROTORS
ROTOR MAXIMUM SERVICE LIFE : 30000 CYCLES FROM FIRST USE

DATA	VALUE	REFERENCE IMAGE
ROTOR CAPACITY	04 x 50ML	
MAX. SPEED (RPM)	4500	
MAX. G FROCE	3305	
MAX. LOAD	50ML/EACH TUBE	
ROTOR WEIGHT (KG) (INCLUDING STEEL TUBES & ADAPTOR)	2.4	
CAT. CODE	CR-15-4UC-UCR	

12. OPERATING THE CENTRIFUGE

SWING ROTORS
ROTOR MAXIMUM SERVICE LIFE : 30000 CYCLES FROM FIRST USE

DATA	VALUE	REFERENCE IMAGE
ROTOR CAPACITY	32 x 6ML.	
MAX. SPEED (RPM)	4500	
MAX. G FROCE	3164	
MAX. LOAD	06ML/EACH TUBE	
ROTOR WEIGHT (KG) (INCLUDING STEEL TUBES & ADAPTOR)	2.5	
CAT. CODE	CR-15-32UC-UCR	

NOTE: *Always use recommended accessories for best results and product safety. Optional rotors & additional accessories must be ordered separately.*

12.9 START AND STOP OPERATION

Press “START BUTTON” to start operation and press “STOP/OPEN BUTTON” to stop the ongoing operation. When the centrifuge is running the symbol “ ☢ ” will rotate. Pressing the “STOP/OPEN BUTTON” will stop the operation. Once operation is stopped, press Button again to open the centrifuge lid. If the time gets over, centrifuge will stop automatically. When the centrifuge is not running the symbol “ ☢ ” will be idle. To open the lid in non-operating stage, press the “STOP/OPEN BUTTON”.

After completing run, before any another operation, it is mandatory to open the lid once before starting new operation. Centrifuge will not do 2nd operation if lid is not opened and closed for at least one time after completion of 1st operation.

NOTE: *It is mandatory to open the lid once after completion of operation for 2nd operation. Centrifuge will not start if lid is not opened and closed after completion of a operation.*

12.10 PROGRAM MODE

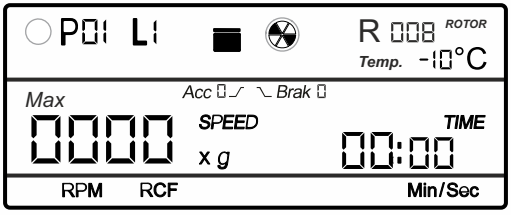
Long press “PROG” button to enter into program mode. Short press select program and press "+/-" button for increment & decrement to select desire program out of 99 available programs. User can select any program from 1 to 99 programs and can have user specific setting parameter for all programs. Each program has 4 lines indicated by

12. OPERATING THE CENTRIFUGE

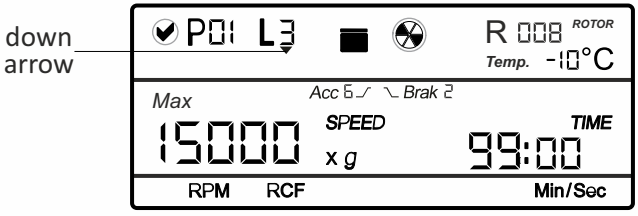
L1, L2, L3, L4. Press “LINE” button to enter in line selection mode and press "+/-" button to select line out of 4 lines.

Every line of the program can have different values for all setting parameters. User can set and save different speed, different time, different temperature, different Acceleration and Deceleration rate for any line of program. Only Rotor will not remain save for any program. Rotor selection is not Program specific. Rotor selection is universal and it should be set before setting any other parameters.

On first time usage, all programs will have zero (0) values and once the “PROG” button is pressed below display will appear indicating selection of program mode.

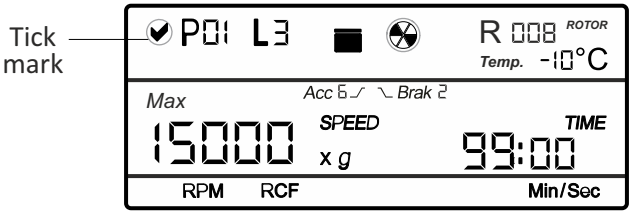


As per above image, the circle O left of “P01 L1” is blank indicating no values in any line of specific program. Once any line of Program in filled or set, below change of display will appear.



The circle ⊘ left to “P01 L3” will have a tick mark indicating that any one line of the specific program is filled. If any line leading to selected line is set, then the arrow below the line number will appear.

12. OPERATING THE CENTRIFUGE



If no leading line is filled or last line L4 is selected then the arrow below Line will not appear. It indicates there is no further operation left as leading lines of the specific program are empty.

Once a particular line of the program is selected set the parameters like speed time, temperature and acc/brak parameters as in normal case. It is recommended to select the rotor before selecting a program or even before setting any other parameters in program mode. Rotor selection is not program specific. Rotor number is not saved for any program and selected rotor remains active for all programs until new rotor number is not selected. Select the rotor, Press “PROG” button to enter in Program mode, select specific program using "+/-" button, Press “LINE” button to select specific line and set different parameter for that particular line of program. Values for any parameter gets save after 5 blinks. Once Program is set, press “START” button to start program.

After completion of any operation, it is mandatory to open the lid at least once for another operation. Open the lid, close it again and press START for another operation.

NOTE: *1) Rotor is not program specific. Selected rotor will be active for any new operation.*
2) It is mandatory to open the lid once after completion of operation for 2nd operation. Centrifuge will not start if lid is not opened and closed after completion of ongoing operation.

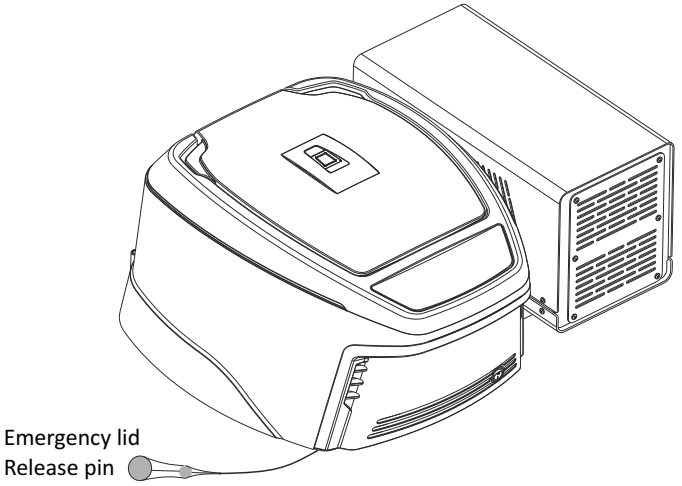
12.11 IMBALANCE DETECTION

The centrifuge is equipped with an imbalance detection safety feature. When the rotor is not loaded symmetrically, the imbalance detector gets activated and will cut off the centrifugation. The error "Err 55" will be shown on the display. First correct the imbalance load then switch OFF & switch it ON again. The values will be same as set before imbalance. The imbalance detection feature cannot be deactivated, as it is factory fitted.

12. OPERATING THE CENTRIFUGE

12.12 OPENING CENTRIFUGE LID IN POWER FAILURE

Disconnect the centrifuge from the main power supply. Wait until the rotor has come to a standstill (this may take longer time). Once the rotor has stopped, then pull the lid release thread located at the bottom left (to your right) of the machine This will open the centrifuge lid.



NOTE: *This method of opening the lid should be used only in case of Emergency or power failure.*

13. MAINTENANCE AND CLEANING

- The rotor and the outside of the centrifuge should be cleaned regularly with a mild wet (with water) cloth.
- Ensure that while cleaning the unit is not plugging in.
- Wear protective glove & safety glass while operating & cleaning the device.
- 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.
- Always keep the centrifuge housing, rotor chamber and rotor clean. All parts should be wiped down periodically with a soft cloth. For more thorough cleaning, use a neutral cleaning agent (Ph between 6 and 8) and clean with a soft cloth. Exclusive amounts of liquid should be avoided.
  NOTE: *Liquid should not come into contact with the motor.*
- After cleaning, ensure that all parts are dry before re-use.
- Regularly cleaning of the rotor is important.

13. MAINTENANCE AND CLEANING

- If the rotor chamber needs cleaning, clean with cloth or sponge moistened with a neutral detergent solution.
- Do not place the rotor into the cleaning solution.
- If corrosive, toxic or pathogenic bacteria are accidentally spilled in the rotor or rotor chamber the centrifuge must be decontaminated throughly.
- Grease tube has been provided as part of standard accessory. Minor Grease has to be applied on the Motor shaft (Threaded Parts, Grooves) at every 2 weeks interval to prevent rotor & shaft jam. This also would ease installation process in case of regular rotor change.
- Switch off the device and disconnect it from the mains/power line before starting cleaning or disinfection.
- Do not connect the device to the mains/power line unless both the inside and outside of the device are completely dry.

CHECKLIST BEFORE EACH OPERATION AS BELOW

1. Checking the device
   - Check the device, mains/power cord and motor shaft for visible damage. If the device is damaged, take it out of operation. Inform the authorized service technician.
   - Check the rotor chamber for
     - Corrosion
     - Ice
     - Condensation water

     NOTE: *In case of corrosion, recurring ice formation or condensation water in the rotor chamber, inform the authorized service technician.*
2. Checking the rotor and accessories
   - Check the rotors and accessories for damage.
     Take damaged rotors and damaged accessories out of operation.
   - Check the service life of the rotors and the accessories.
     Replace rotors and accessories that have exceeded their service life.

DOCUMENTING THE SERVICE LIFE

The service life of rotors, rotor lids and accessories may be limited. Information on how long you may use rotors, rotor lids and accessories can be found in the technical data.

1. Document the following data for rotors, rotor lids and accessories:
   - Date of initial setup
   - Number of centrifugation cycles
   - Number of autoclaving cycles

14. 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	Power check & proper plug-in of mains cable at both ends
	Power failure	Check the mains fuse of the lab
	Improper connection	Connect adaptor properly
	Fuse blown of unit	Replace the fuse of unit
	Lid not closed correctly	Close lid correctly
	Error with lid closing and opening mechanism	Contact service
Err 55	Rotor not loaded symmetrically	Load rotor symmetrically & restart centrifuge
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 stops
Centrifuge shakes during acceleration & exceptional running noise	Rotor not loaded symmetrically	Load rotor symmetrically & 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 & change rotor
Display error	Loose connection of display	Contact service representative
Err 1	Latch motor damaged, Latch jammed or any Limit switch of latch got damaged	Contact service representative

14. TROUBLESHOOTING

Err 52	Motor Stuck or incorrect operating voltage	Turn OFF the centrifuge, Check rotor fitment or apply correct 230VAC ± 10VAC operating voltage
Power tripping	Cable not fit properly	Remove cable and connect properly
Last run memory not displayed	Turing ON centrifuge immediately after turning it OFF	Maintain 3 seconds gap Between switch OFF and switching ON again
System gets hang	Electronics error	Switch off centrifuge and then switch it ON again If the error still shows, contact service representative
Err 41	Selected Temp value not rechable for selected set speed	Set temperature value will be taken automatically that it can be archived after 1 hour, Error indication will be displayed every 15 second
Err 42	Temperature is out of control	Error indication will be displayed every 15 second If it persist in every operation consistently, contact service representative
Err 43	Over Temperature inside chamber	Turn off the centrifuge and wait until temperature goes down
Err 44	Temperature sensor failure	contact service representative

IMPORTANT NOTE:

- If system get hangs or gets heated due to over current, switch OFF & switch ON (restart) the centrifuge and check it again.
- Maintain 3 seconds gap between switch OFF and switch ON. Instant ON-OFF can lead to a reset, erasing last run memory.
- If motor gets hot due to which there will be fluctuation in speed value then allow centrifuge to get cool for at least 30 minutes. Do not do any operation for 30 minutes.

14. TROUBLESHOOTING

FUSE REPLACEMENT INSTRUCTION

1. Disconnect the device from the electrical system.
2. Remove the fuse from power socket, In some cases you may need a small minus screwdriver to unscrew the fuse holder cap.
3. Look at the fuse wire. If there is a visible gap in the wire or a dark or metallic smear inside the glass then the fuse is blown and needs to be replaced.
4. Replace the fuse with one that is exactly the same. Make sure to note the fuse ampere and voltage ratings.

15. WARRANTY STATEMENT

This product is warranted 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 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.

15. WARRANTY STATEMENT

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

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

For you reference, make a note of serial number, date of purchase and supplier here.	
Serial No.:	Purchase Date:
Supplier:	

16. PRODUCT DISPOSAL

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.

Caution! Fire hazard or explosion hazard

The device contains a flammable refrigerant. If the refrigerants used come into contact with sparks, they will ignite. Persons may be injured.

- Dispose of the device properly in accordance with national or local regulations.

17. TRANSPORTATION & STORAGE

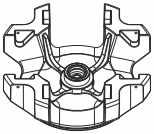
This devices is heavy & weighs approximately 57kgs. Care must be taken while lifting up. Always take few people help to lift this instrument. The refrigerated centrifuge must be kept always in upright position while storing/transporting from place to place.

17. TRANSPORTATION & STORAGE

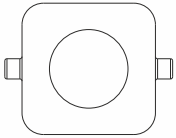
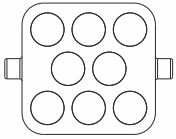
- Use only original packaging during transportation.
- For longer distance take transportation aid like hard trucks.
- Avoid knocking, harsh shaking or jolting the device.
- Always retain the packaging material & transportation protections for longer storage or transportation.
- The transportation conditions for the instrument is -25°C to 60°C with a Relative Humidity up to ≤80% & max pressure of 106kPa for both general & air transportation.
- For storage the instrument is recommended to be stored in original package. the instrument is -5°C to 45°C with a Relative Humidity up to ≤80% & max pressure of 106kPa.

SR. NO.	ROTOR CAPACITY	ROTOR IMAGE	TUBE		ADAPTOR		
1	44x02 ml			**Tube Type:** Conical Centrifuge Tube **Capacity:** 2ml **Diameter:** Ø10.8 mm **Length:** 42 mm **Weight (approx.):** 2 grams	N/A	N/A	**Max. g. Force/RCF:** 22388 **Max. Rotation Speed:** 15000 RPM **Radius:** 8.8cm
2	6x50 ml			**Tube Type:** Conical Centrifuge Tube **Capacity:** 50 ml **Diameter:** Ø28 mm **Length:** 115 mm (with cap) **Weight (approx.):** 13 gm		**Adaptor type:** Spherical **Diameter:** Ø32.50 mm **Material:** SS **Inner Depth:** 100 mm **Weight (approx.):** 42 gm	**Max. g. Force/RCF:** 2834 **Max. Rotation Speed:** 4500 RPM **Radius:** 12.5cm
3	24x15 ml			**Tube Type:** Conical Centrifuge Tube **Capacity:** 15 ml **Diameter:** Ø16 mm **Length:** 100 mm **Weight (approx.):** 9 gm		**Adaptor type:** Spherical **Diameter:** Ø19 mm **Material:** SS **Inner Depth:** 98 mm **Weight (approx.):** 23 gm	**Max. g. Force/RCF:** 2961 **Max. Rotation Speed:** 4500 RPM **Radius:** 12.6cm

SWING OUT ROTOR (4X100ML)



Max g.-force/RCF: 3515	**Max.Load (adapter, tube holder, tube & contents):** 100ML/EACH TUBE
Max.Rotation Speed: 4500	**Rotor Weight:** 1.7 kg
Acc/Dcc Time: 60/60 Sec.	**MAX. Service Life Cycles:** 30000 Cycles from first use

SR. NO.	TUBE		ADAPTOR		HOLDER			
2		**Tube Type:** Conical Centrifuge Tube **Capacity:** 50 ml **Diameter:** Ø28 mm **Length:** 115 mm (with cap) **Weight (approx.):** 13 gm		**Adaptor type:** Spherical **Diameter:** Ø32.50 mm **Material:** SS **Inner Depth:** 100 mm **Weight (approx.):** 42 gm		**Holder:** 4x50 ml **Type:** Bucket Holder **Material:** Aluminum Alloy **Diameter:** Ø36.5 mm **Weight:** 142.51 gm	**Tube/Holder:** 1/1 **Tube/Holder:** 4/1 **Holder/Rotor:** 4/1	**Max. g. Force/RCF:** 3305 **Max. Rotation Speed:** 4500 RPM **Radius:** 14.9cm
4		**Tube Type:** Centrifuge Tube **Capacity:** 6 ml **Diameter:** Ø12 mm **Length:** 98 mm (with cap) **Weight (approx.):** 6 gm		**Adaptor type:** Spherical **Diameter:** Ø15 mm **Material:** SS **Inner Depth:** 90 mm **Weight (approx.):** 17 gm		**Holder:** 32x6 ml **Type:** Bucket Holder **Material:** Aluminum Alloy **Diameter:** Ø15.50 mm **Weight:** 114.5 gm	**Tube/Holder:** 1/1 **Tube/Holder:** 8/1 **Holder/Rotor:** 4/1	**Max. g. Force/RCF:** 3164 **Max. Rotation Speed:** 4500 RPM **Radius:** 14.8cm

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