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INSTRUCTION MANUAL FOR

# Hematocrit Type Centrifuge

## HCEN-203



**PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION**

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## **( I ) SPECIFICATION**

SPEED (rpm)	0~12,000      LED digital display
Centrifugal Force	15000 X g
Max. Capacity	Hematocrit x 24pcs
Electronic	Microprocessor control system
	10 memory programs available
Safety Device	Imbalance and cut off power system
	Triple balance system
	Automatic Lid lock , lift cover and power cut off
	Fuse 7A
Timer	1 ~ 99 min : 59 SEC. . digital time setting
Weight (kg)	10 KGS
Dimension (cm)	29 x 32 x 24.5
Brake System	Automatically brake system
Power	90V ~250 V , 50 / 60Hz
Power Consumption	150 W

## **(// ) ROTOR AND ACCESSORY**

1. Centrifugal force calculation: Use its speed and radius to calculate force as following formula.

$$RCF = (\text{rpm})^2 \times 0.00001118 \times R$$

R : radius (cm)

RCF : Relative Centrifugal Force ( X g )

2. Sterilizing and cleaning rotor:

Rotor is made of stainless steel or steel or aluminum with high density coating and highly resistant to corrosion ,but not fit to alkaline and strong acid substance.

**Don't heat the rotor to a high temperature ( 100 °C ) to clean or sterilize it.**

3. ROTOR SPECIFICATIONS

Rotor		Capacity (ml x pcs)	Max. Speed (rpm)	Max. RCF (x g)	Tube size (mm)	
RHT-240		Hematocrit x 24	12,000	15,000	φ 1.1 x 75 mm	

\*\* Tubes are not attachable. \*\*

Option:



HT tube



Seal



Reader

**Special Caution:**

Please be notice with carefully, Stop to use, if any fissure or rift , Found at face of the Rotor, even very small it may course the function fault when using continue.

Contact your distributor immediate with above matter. Thank you very much.

**Before using the centrifuge, please must refer to the rotor's max. speed setting value.**

### ***(III) INSTALLATION***

1. When you take centrifuge out from carton box , please check if there is any scratch , press trace or other damage from out look. If yes, please contact local dealer immediately.
2. Please install the centrifuge on a horizontal and stable table or bench. If not, it will affect anti-vibration efficiency.
3. Please use power voltage as following range , to avoid electric shock please make sure to connect ground wire to the ground terminal.

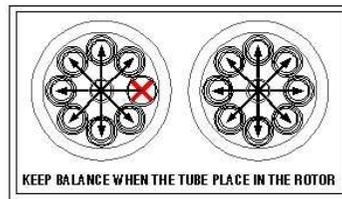
<b>Power voltage</b>	<b>Acceptable voltage range</b>
100V / 110V	90V ~ 250V

4. Keep it away from dusty and moist working place.
5. Avoid the same power source from the large electric consumption machine.
6. Not suggest to stop the centrifuge suddenly , to avoide the broken motor.
7. After dismantle or clean rotor, be sure to screw it tightly again.

## (IV) OPERATION

### 1. PROPER SETTING OF TUBE AND SAMPLE

(1) Tubes and sample in use must be arranged in even number. Glass tube must be placed in carrier, which are positioned symmetrically toward rotor center. If tubes are in odd number, then put same volume of water in a separate tube and place such tubes into carrier for dummy purpose.



(2) Tube strength should consider if it can bear speed and centrifugal force or not. If not, the tube will be easy broken.

(3) When you use hematocrit rotor , **please note the tube length should be within 75 mm.**

(4) The plastic cushion around hematocrit rotor should connect well with clay tube end, then put on rotor's cover.

### 2. THE PROPER SETTING OF ROTOR'S COVER

After placing the hematocrit tubes well , please turn rotor's cover tightly by clockwise; when you finish revolving then open it by counter clockwise.

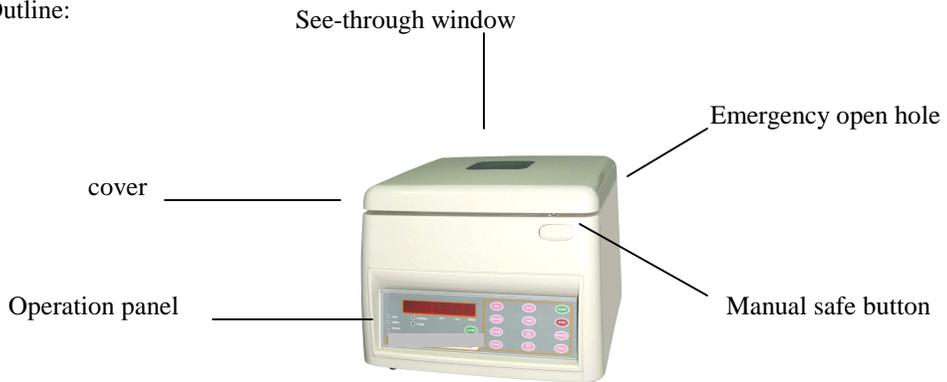
**Caution:** The plastic cushion around hematocrit rotor has been used for a period, it is much better to renew it to avoid tube broken.

### 3. DOOR LOCK AND COVER

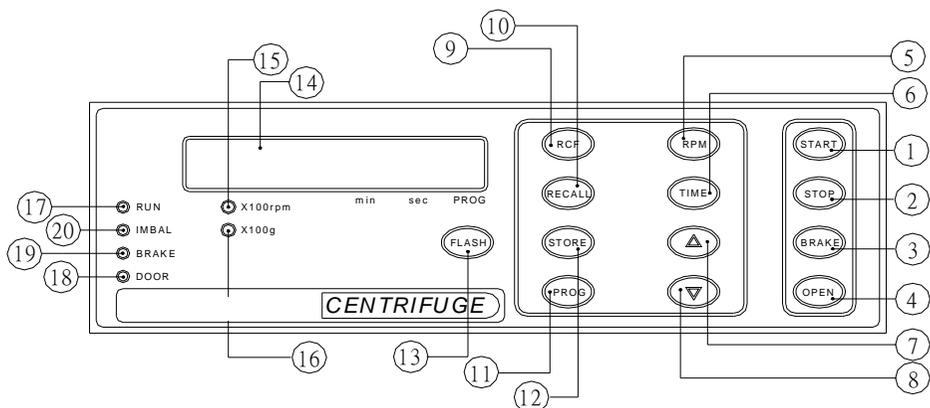
(1) Please close cover tightly, otherwise rotor can not move , cover can not be opened during rotation.

- (2) Plug power and switch it on, then press **【OPEN】** button and **【Manual safe button】** to open cover.
- (3) If power cut off and cover can't be opened, then use a small rod in more 5cm length to put into the hole at the right side of centrifuge and press manual safe button at the same time then cover can be opened.

4. Outline:



5. OPERATION PANEL FUNCTION



- (1). **START:** After settle time and speed, press it and rotor rotates immediately. .

- (2). STOP: for emergency stop.
- (3). BRAKE: It is with auto-braking function, when presetting time is due.
- (4). OPEN : It is used at speed under 100rpm.
- (5). RPM: Press “RPM” / RPM( flash) , adjust ▲ or ▼ then press “RPM” to finish it.
- (6). TIME : Press “ TIME”/ MIN (flash), adjust ▲ or ▼ then press “TIME” /SEC (flash) then press ▲ or ▼ press again TIME to finished.
- (7). ▲ INCREASE : to add speed or time .
- (8). ▼ DECREASE: to reduce speed or time.
- (9). RECALL : to display settled speed and time.
- (10). STORE : to remember settled speed and time.

After setting speed and time , press ” STORE” twice. If you need presetting function first press “STORE” then “PROG” to select demand figure then press “STORE” .

- (11). PROG : one program represents one set of speed and time .

If your want to change specific program then press “RECALL”( flash) then “PROG” to select demand figure, then press “RECALL” again and “START “.

- (12). DOOR LAMP : when cover is open , it lights up.
- (13). BRAKE LAMP : when it lights up, it will decrease speed automatically.
- (14). IMBALANCE : when it lights up, it is imbalance on rotor and stop running. You have to press “OPEN” to open cover and check problem.
- (15). RUN: it lights up during rotation..
- (16). DISPLAY: to show speed , time and settled figure.
- (17). Transient centrifugal function : it can reach specified speed in transient time without speed and time limited.
- (18) Unbalance lamp. : the this lamp light, it mean something inside unbalance. Will Auto stop, should press “OPEN” the check the balance.
- (19) Brake : When this lamp light on, centrifuge in auto slow down fuction.
- (20) Open cover: light on when the cover open .

## 6. OPERATION PROCEDURE

- (1). Insert power plug and switch power to “ON” at the right front side of centrifuge °
- (2). Press **【OPEN】** button then press **【Manual safe button】** at the same time, then cover can be opened.
- (3). Place sample into carrier. ( refer page 5 – setting sample )

- (4). Close cover.
- (5). Set “RPM” and “ TIME” at the desired speed and time separately. (see operation panel function)
- (6). Press 【START】 , rotor begins to rotate and goes up to desired speed.
- (7). Time is up, the buzzer sounds automatically.
- (8). Press 【OPEN】 button then press 【Manual safe button】 at the same time to open the cover.
- (9). You may change the time when operation, and it'll be re timer again.
- (10). Microcomputer soft control, , it'll show any time when speed or time have problems.
- (11). If power off when using, a small hole at the right side of cover can use to open .
- (12). At the memoir system, will keep the manual in memoir from the last use.  
It'll not remove until next time use. Even the poser off.
- (13). Please concerning the speed list on 2-4, to setting the rpm.

**Do not over duty at the speed.**

Caution:

1. Please refer nameplate function , there are 10 sets of program available to store the desired rpm and time. When you start to run the centrifuge next time, it will perform the last running program. These programs don't disappear at power off and on.
2. During rotation , if you want to change speed or time , then press “ RPM” or “ TIME” and adjust ▲ or ▼ then press “RPM” or “ TIME” to finish it separately.
3. During rotation, please don't exceed the max. speed (refer page 3 ) of the centrifuge and place substandard rotor or carrier. The centrifuge is without anti-explosion , don't use explosive material.

**Special Caution:**

Please be notice with carefully, Stop to use, if any fissure or rift , Found at face of the Rotor, even very small it may course the function faul when using continue.  
Contact your distributor immediate with above matter. Thank you very much.

## *(V) REPAIR*

### 1. Checking before and after operation

Check to see if there is any material or water inside chamber and keep it clean.

Check to see if the rotor is loose or not ; if yes, after screw it then use it again.

Check if cover is properly close and screws fixed or not; if not, then stop it and contact with local distributor.

∴ Check if the ground wire is connected well , lamps and switch are available.

∴

### 2. Daily checking:

Clean stain in chamber, check if there is any scratch, deformation, corrosion on rotor or carrier. If yes, please contact local dealer for further checking.

### 3. Yearly checking:

A: Check if “rotor fixing nut” is loose or not; B: and the indication value of speed meter can match real value or not . if not , please contact local dealer.

### 4. Cleaning:

When sample is split over rotor or carrier , please use cloth with little detergent to wipe and dry it. When sterilization is made on rotor or carrier, do not heat it to a temperature exceeding 100°C .

### 5. Trouble shooting :

ReasonS Symptom	Power	Electrical circuit	Cover problem	Motor problem	Imbalance
Main lamp is not light up	*	*	*		
Fuse blows very often	*	*		*	
Motor does not drive	*	*	*	*	*
Set rpm can not be attained	*	*		*	

Big vibration			*		*
Unusual noise				*	*

Repair methods :

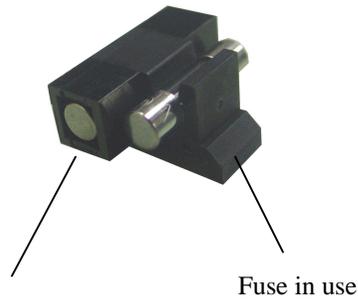
Cause	Details of cause	Repairing way
Power	a. Power cord is not connected. b. Power voltage is not proper.	Checking power plug , replace fuse
Lid problem	Lid can not be closed	Contact local dealer
Electrical circuit	Parts can not connect well	Contact local dealer
Motor problem	Over- heat , carbon brush use out	Stop using it and wait for cool, replace carbon brush or contact local dealer.
Imbalance	Carrier or tube is put improperly.	Please refer operation description

6. Machine Check:

- a. If checking carbon brush: loosen 6 screws at the baseboard.
- b. If checking PC board: loosen 8 screws at front board.
- c. If checking motor: dismantle rotor and loosen 4 screws around chamber and take chamber off. Loosen screws then you can take the motor easily.
- d. Fuse is under the power plug, please take power cord off then check if fuse burnt or not.



Fuse position



Reserved fuse

Fuse in use

7. Signal of display :

Signal	status	description	Repairing
Err-1	1. motor can not drive	Carbon brush connect badly. Wire matched badly. The outlet of controller is out of order.	1. check carbon brush 2. check wiring 3. check the outlet of controller 4. replace controller
	2. motor stops during operating	Carbon brush connect badly. Wire matched badly. The outlet of controller is out of order.	1. check carbon brush 2. check wiring 3. check the outlet of controller 4. replace controller
	3. sensor can not detect well	Sensor is out of order Wire matched badly. The outlet of controller is out of order.	1. check sensor or replace new one 2. check wiring 3. check the outlet of controller 4. replace controller
Err-3	Open the cover when operation	1. Lock on the door open is Out of order.	1. Check the door lock/ If need to replace a new one
		2. Electric wire wrong	2. Check the wire.
Err-4	1. No time setting	1. The time show "0" when operation	1. Re setting the timer again
Err-5	1. Imbalance	1. Auto imbalance switch out of order	1. Change a new one
		2. Electric wire wrong	2. Check the wire

## *(VI) PARTS LIST*

ITEMS	QUANTITY
MOTOR	1
ROTOR	1
SPEED SENSOR	1

CARBON BRUSH	2
PC BOARD	1
KEY BOARD	1
FILTER CAPACITY	1
BRAKE RESISTANCE	2
POWER SWITCH	1
SOLENOID	1
FUSE 6A	2
LID MICRO SWITCH	1
TRANSFORMER	1

# (VII) CIRCUIT DIAGRAM

